

Synapse

Modular interfacing and conversion



Committed.

[®] **AXON**

About us

AXON is committed to developing products that meet customer requirements in an industry that forever changes. As a company of ideas, innovation and solid engineering, we champion progress. We're proud that major players in broadcasting worldwide choose our state-of-the-art modular systems to serve the wide range of their audio and video signal processing demands – in OB trucks, studios and transmission and play-out facilities.

AXON customers often build their technology infrastructures around our systems – but we are driven purely by their needs and their success. Our tradition, of long-term cooperation and intimate collaboration with customers, helps us to deliver ever-more reliable, cost-effective and space-saving products that have a big impact in the machine room, and to the bottom line.

This is what sets us apart, and what Synapse is all about. Within a range of modestly-sized frame options come an amazing array of possibilities, all easily tailored to meet your particular application requirements. Synapse enables you to seamlessly transition between analog and digital platforms – right up to 3Gb/s – with the pleasing possibility of impressive comparative cost savings in the mix.

Being flexible, extendable and intuitive, Synapse is equally at home with straightforward procedures as it is in the most exacting of broadcasting environments. What's more, our commitment to R&D means that whatever occurs next in the world of signal processing, Synapse will keep you ahead.

AXON supports customers worldwide. A growing business, we are headquartered in The Netherlands, and now have offices in the UK, Dubai and China. We also work hand-in-hand with over 50 distributors and experienced local systems integrators around the globe.

Ultimately, we enjoy to being a great company to do business with. The passion, commitment and vision of our team keep AXON focused on meeting today's demands and the challenges of the future.



AXON headquarters

■ The Netherlands

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Greater than the sum of the cards

Enjoy reduced cost-of-ownership from a system that delivers unrivalled functionality, density and flexibility. Just give us your technical requirements, and we'll show you how Synapse can deliver potentially dramatic savings against comparative solutions.

1 The industry's most versatile system

One form factor and three space-saving frame sizes – all cooled to perfection and offering reliable operation in the busiest of broadcast environments. The rack controller at the heart of the system is the gateway to our huge choice of cards. Features include dual redundant central genlock, back-up and restore of user settings. Setup and monitoring is via free-of-charge software, local control panels or remote control. SNMP support is optional.



2 Extremely broad & ever-growing range of cards

Over 150 exceptional processing modules are available now, with many more in development – each designed for the most demanding application, and providing you with local control of settings/alarm monitoring.

3 Unmatched functionality per card

Featuring leading-edge design, every card brings you more functionality, more condensed, than ever. Especially in the larger projects, the multi-functional feature sets give an unmatched cost-efficiency. Take a look at f.e. TWINS, our smart, double-density modules, to see our optimized real-estate in action.

4 Unique architecture

Synapse's daisy-chain bus reduces labor and costs, whilst improving signal integrity and overall performance. For your engineering ease, all cards are color-coded by function group, and there's no need for dual-width connector panels (except on our high-end format conversion range). Optional fiber I/Os, with CVBS outputs provided via I/O-panels.

5 Unrivalled in quality & reliable – whatever the situation

Designed for dependable use, 24/7, in OB vans, studios and TX suites, with true 75Ω internal connections ensuring signal integrity. Synapse cards and power supplies are hot-swappable, with the 2RU/4RU versions featuring power redundancy.

6 Futureproofed – for your peace-of-mind

We've built for the future. Synapse lets you transition and grow smoothly between analog audio, SD, AES/EBU, Dolby, HD and 3Gb/s platforms. You get free lifetime software updates too. Plus, our continuous investment in R&D means that whatever happens in the world of signal processing, Synapse will deal you a winning hand.

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Highlights

Three frames, one form factor with local control of settings and monitoring of alarms. No dual width connector panels are required (except for the high-end format conversion range). Redundant power supply for the SFR18 (4RU) and SFR08 (2RU). Hot swappable cards and power supplies.

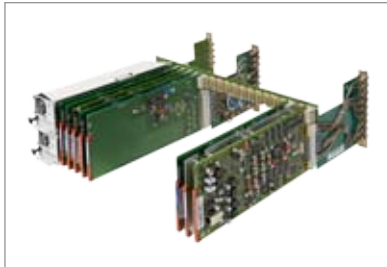
Synapse





Single form factor and unmatched functionality per card

3Gb/s, HD, SD, Dolby, AES/EBU and analog audio in one frame.
See page 12 + 34.



Unique architecture

Synapse daisy chain bus PCB reduces cost and labour, improves signal integrity and generates powerful applications. See page 39.



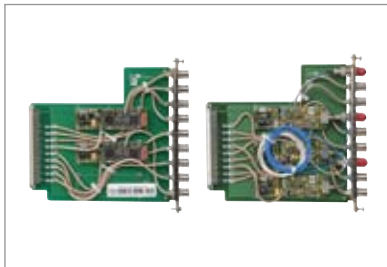
Cortex

A powerful maintenance, control and monitoring software applications.
See page 14.



Reference

Dual reference distribution is part of the frame. See page 26.



Fiber and CVBS connectivity

Optional fiber transmitter/receiver and CVBS connectivity to most modules. See page 28.



Ethernet

Ethernet connection directly into the frame is standard. See page 26.



Local control panel

See page 23.



Remote control panel

See page 24.



Future proof

See pages 47-48.

1. Most versatile system in the broadcast industry

Synapse is an intuitive, easy-to-use system that is developed for advanced applications, as well as straight-forward systems. It not only satisfies the requirements of current technology, but will also accommodate developments far into the future. The single form factor now contains technologies covering analog and digital audio and video, SD, HD and 3Gb/s. Indeed, the Synapse system has proven to be 'future proof'.

SFR04

The smallest frame is the SFR04, a 1RU frame designed to house 4 cards. It has all the features of the SFR18 with the same card and connector panels, but limited to one power supply and one reference input.

SFR08

The mid-sized frame is the SFR08, designed to house 8 cards. Dual redundant power supplies, autoranging from 100V to 240V AC, can be used. Two individual reference inputs synchronize the frame. It has a front-removable fan tray.

SFR18

The larger frame is the SFR18, a 4RU frame designed to house 18 cards. Dual redundant power supplies, autoranging from 100V to 240V AC, can be used. Two individual reference inputs synchronize the frame.



AXON'S DNA

When I started working for AXON 14 years ago, it was what you would call a small, engineering-driven company. SDI was our main focus, and that proved to be a good choice.

Now, with over 70 employees, customers and major installations at key sites worldwide (and a slightly larger turnover), a lot has changed.

Fortunately a lot has stayed the same. We are still as enthusiastic, technology-conscious and quality-driven as we were back then – it's in our genes. We call it 'AXON's DNA'.

Our future focus is to remain true to our heritage. What else can we do but build great products? Look at our new 100 series of up, down, cross converters in this brochure. These products are packed with new features, and we offer flexible upgrade paths all the way to 1080p helping you to protect your investment when standards evolve again.



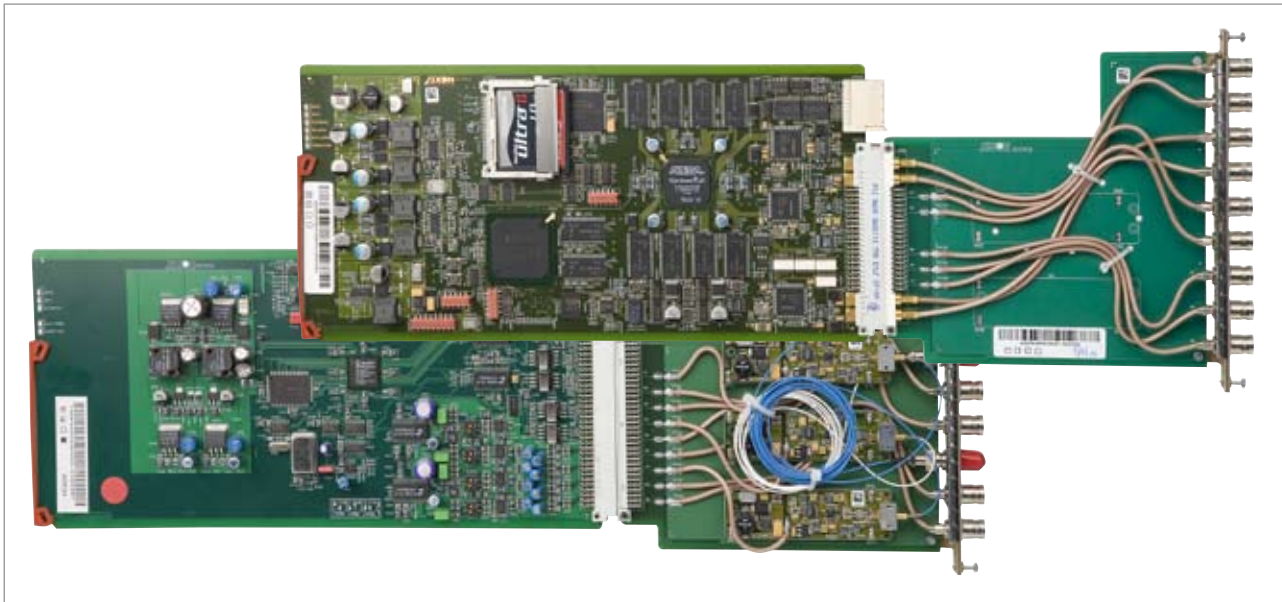
Peter Schut

■ Chief Technical Officer

1.1 Three frames, one form-factor

Analog and digital audio and video, SD, HD, AES/ EBU, Dolby processing, 3Gb/s in one form factor.

A single form factor increases the value of a modular system. Your investment is safe, you don't have to worry about re-use and swapping of cards and/or frames, and will be able to use the latest developments in frames you already own.



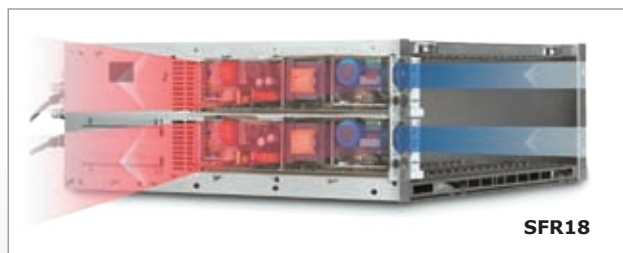
1.2 Cooling

Considerable effort was put into the mechanical design of this high-density frame. AXON has managed to combine many functions into a confined area without running into temperature or power issues.

The fan units can be replaced while the Synapse SFR18 is operational. They are easily removed via the top of the frame.

The SFR18 is built around a 'sandwich' construction. Two powerful fan units placed in a tunnel, which runs across the top and rear of the frame, ensure a reliable and evenly spread airflow over all 18 cards. The airflow intake is on the front of the frame with outlets at either side.

The SFR18 power supply has its own cooling system.



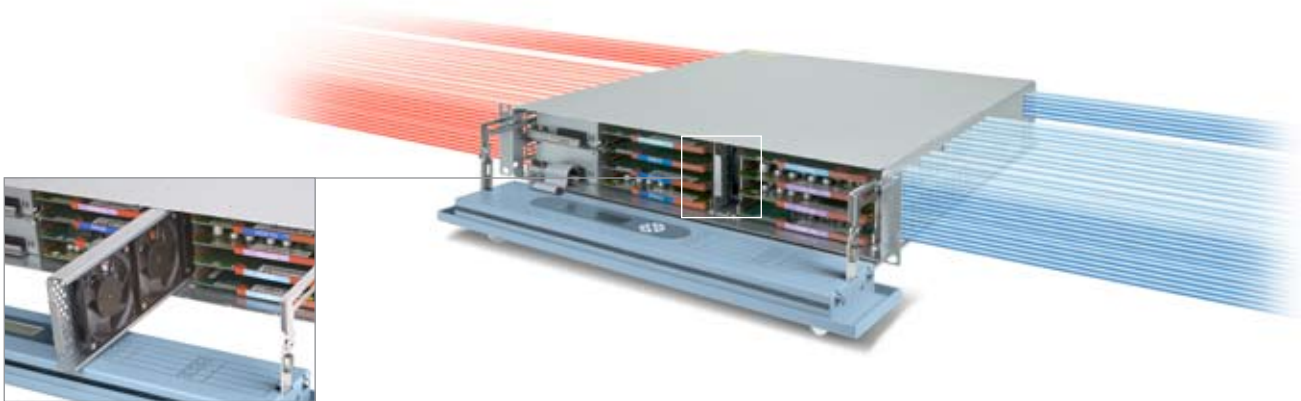
SFR04

The SFR04 has its air intake on the right side and outlets for the warm air on the left side of the chassis. The removable power-supply of the SFR04 also houses the fan unit for easy maintenance.



SFR08

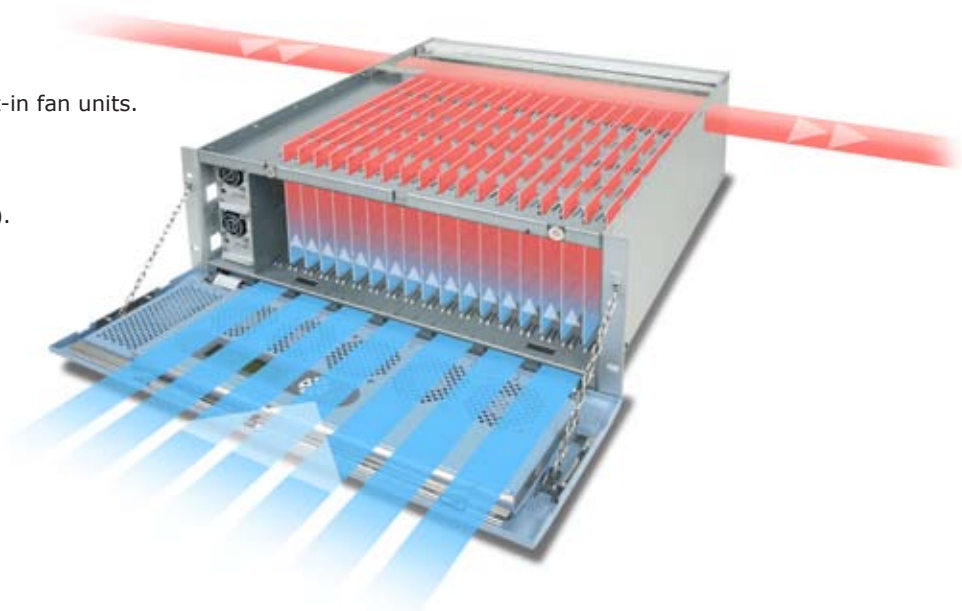
The SFR08 has its air intake on the right side and outlets for the warm air on the left side of the chassis. It features a front removable fan tray between the two groups of four cards.



SFR18

SFR18 active cooling by built-in fan units.

Optional frontpanel fans for heavy duty use (Q12009).

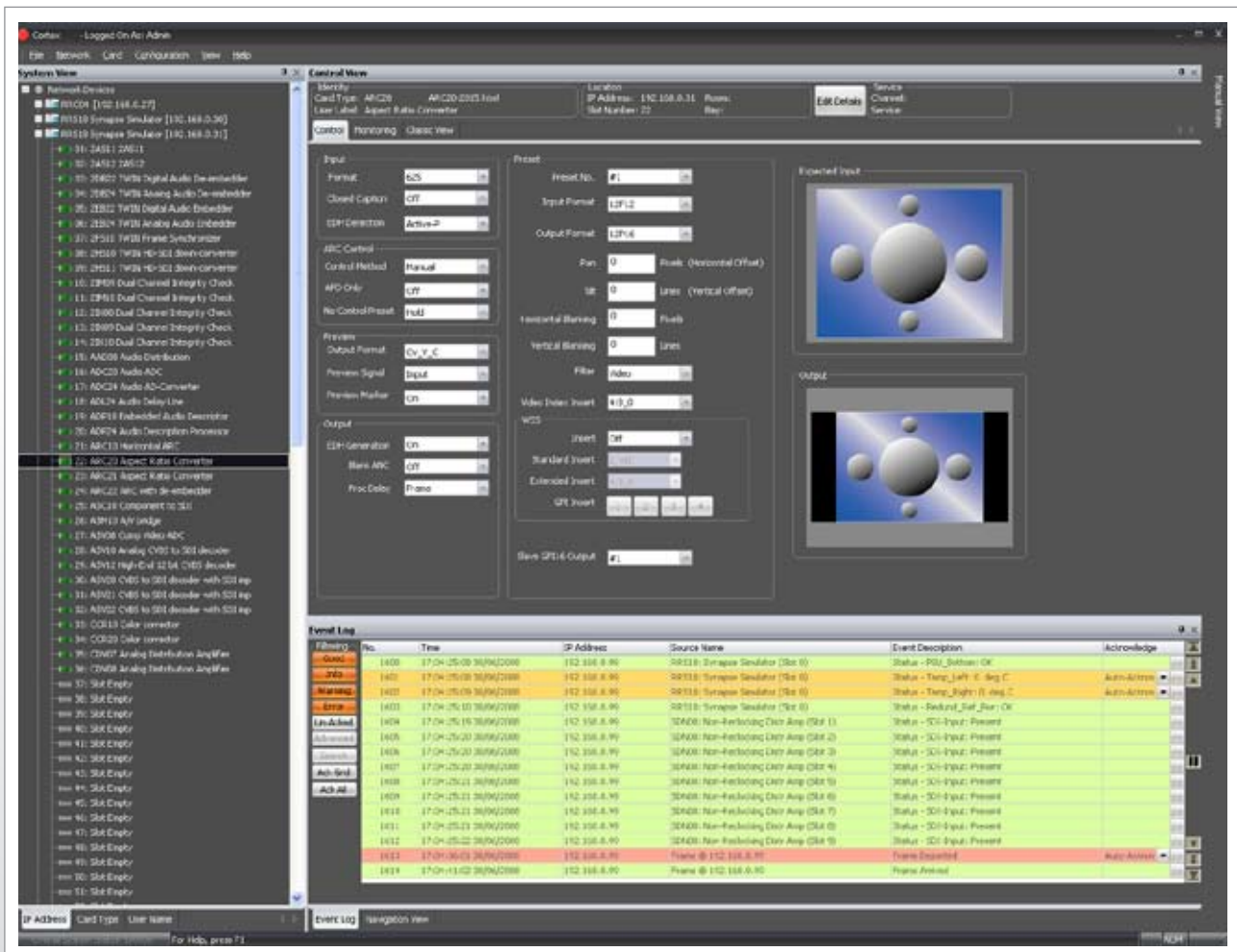


CORTEX®

1.3 Cortex Set Up, Monitor and Control Software

The AXON Cortex software application provides comprehensive configuration, monitoring and maintenance tools for Synapse. This Windows based application includes functionality which enables the user to remotely:

- Configure a complex system in a short space of time,
- View, record and archive the system events and report these to the user using a hierarchical system status,
- Control devices using a user intuitive graphical interface,
- Maintain the system over its lifetime.



The Cortex application uses Ethernet communication to each device in the system enabling the ability to both configure and monitor systems at local and remote sites. It uses an SQL database to record, view and archive the historical system events as well as store the user definable aspects of the system configuration. This database can also be used for the users own requirements via ODBC or similar interface.

The application allows up to 64 user groups to be defined, for each group the level of access can be restricted not only to program functionality but also to control access of individual settings on specific devices. Limitless users can then be added and assigned to one of these groups, each with their own unique password, ensuring that Cortex can be used for operational areas where conditional access is required as well as a system administrative tool.

The standard functionality of Cortex is available free of charge to customers from the AXON's Web Site (www.axon.tv), and will work with all Synapse products without upgrade or purchase of additional software.

System Configuration

Aspect ratio standards

Widescreen Signaling (WSS) and Video Lden (VL) are used to transport aspect ratio information in the video signal. VL is only used by other broadcasting equipment which all act differently. WSS data is used by Modern 16:9 consumer televisions to switch to different types of aspect ratio displays. The following table shows example screens of how different WSS signals are displayed on a modern Pioneer TV. Keep in mind that various consumer TVs act differently to the WSS data as shown here.

More user settings are used here. With some TVs the signal type is 1_16:9 (the default)

WSS setting	Aspect ratio	Picture placement	Active lines	Result on 16:9 screen with full 4:3 source	Result on 16:9 screen with full 16:9 source	Result on 16:9 screen with letterboxed 16:9 source
1_wid	4:3	Full	576			
2_wid	14:9	Letterbox Centre	504			
3_wid	14:9	Letterbox Top	504			
4_wid	16:9	Letterbox Centre	410			
5_wid	16:9	Letterbox Top	410			
6_wid	16:9	Letterbox Above the 16:9				
7_wid	14:9	Full 4:3, based to be "14:9-cats"	576			
8_wid	16:9	Full height 16:9 (anamorphic)	576			

The ability to configure a system quickly and easily is an essential part of any system and Cortex provides a number of tools to do this. Each device is represented by one or more graphical dialog interfaces which are shown in the Control view automatically when the device is selected from the system view. These provide a clear idea of function and signal flow within the module making the setting clear in its effect on the signal path. For some devices such as Aspect Ratio Converters, visualisations are given for the output display. If further clarification of function is required a view to the manual for the selected card is always available.

When configuration of a device is complete it can be saved as a template file or to the clipboard and copied to other selected devices in the system easily. Using the Compare function, settings and status for devices of the same type can be compared with differences being highlighted. In order to ease some aspects of configuration and make monitoring of the system more applicable to the users particular application, additional user data can be added to the devices to provide information about the location, channel and/or service the device is providing as well as a free form notes field for all other information.

System view and event monitoring

The screenshot displays the Cortex application interface. On the left, the 'System View' shows a list of devices with their status icons (Good, Info, Warning, Error, UnAck, Subscribed, Search, Ask Grpl, Ack Ad). The main area shows the 'Event Log' table with the following columns: Filter, ID, Time, IP Address, Source Name, Event Description, and Acknowledge. A modal window is open over the event log, showing details for event ID 1771.

Filter	ID	Time	IP Address	Source Name	Event Description	Acknowledge
Good	1760	17-12-05 11:30:06.2000	192.168.3.27	HL20 Logo: Serwack (3A.1)	Status - PPGA-Stat: OK	
Info	1767	17-12-05 11:30:06.2000	192.168.3.27	HL20 Logo: Serwack (3A.2)	Status - CRC-Stat: OK	
Warning	1768	17-12-04 01:30:06.2000	192.168.3.27	HL20 Logo: Serwack (3A.2)	Status - PPGA-Stat: OK	
Error	1769	17-12-05 14:30:06.2000	192.168.3.21	AP514: I (3ur 6)	Status - Temp_Right_24 deg.C	
UnAck	1770	17-12-11 01:30:06.2000	192.168.3.21	Frame 0 (192.168.3.21)	Frame Detected	Auto-Acknow
Subscribed	1771	17-12-05 06:30:06.2000	192.168.3.21	AP514: I (3ur 6)	Status - Temp_Left: 15 deg.C	
Search	1772	17-12-11 11:30:06.2000	192.168.3.21	361.1	Card removed	
Ask Grpl	1773	17-12-11 09:30:06.2000	192.168.3.21	AP514: I (3ur 6)	Alarm - Card-Prevent: CARD_FETCHED	
Ack Ad	1774	17-12-11 01:30:06.2000	192.168.3.21	361.1	Card removed	Auto-Acknow
	1775	17-12-21 11:30:06.2000	192.168.3.21	AP514: I (3ur 6)	Status - HB_31: empty	
	1776	17-12-23 11:30:06.2000	192.168.3.21	361.8	Card removed	
	1777	17-12-23 09:30:06.2000	192.168.3.21	AP514: I (3ur 6)	Alarm - Card-Prevent: CARD_FETCHED	
	1778	17-12-23 09:30:06.2000	192.168.3.21	AP514: I (3ur 6)	Card removed	Auto-Acknow
	1779	17-12-24 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1780	17-12-24 02:30:06.2000	192.168.3.21	361.1	Card removed	
	1781	17-12-24 02:30:06.2000	192.168.3.21	361.1	Card removed	
	1782	17-12-24 11:30:06.2000	192.168.3.21	361.1	Card removed	
	1783	17-12-24 11:30:06.2000	192.168.3.21	361.1	Card removed	
	1784	17-12-25 02:30:06.2000	192.168.3.21	361.1	Card removed	
	1785	17-12-25 04:30:06.2000	192.168.3.21	361.1	Card removed	
	1786	17-12-25 06:30:06.2000	192.168.3.21	361.1	Card removed	
	1787	17-12-25 10:30:06.2000	192.168.3.21	361.1	Card removed	
	1788	17-12-25 14:30:06.2000	192.168.3.21	361.1	Card removed	
	1789	17-12-25 18:30:06.2000	192.168.3.21	361.1	Card removed	
	1790	17-12-26 02:30:06.2000	192.168.3.21	361.1	Card removed	
	1791	17-12-26 06:30:06.2000	192.168.3.21	361.1	Card removed	
	1792	17-12-26 10:30:06.2000	192.168.3.21	361.1	Card removed	
	1793	17-12-26 14:30:06.2000	192.168.3.21	361.1	Card removed	
	1794	17-12-26 18:30:06.2000	192.168.3.21	361.1	Card removed	
	1795	17-12-30 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1796	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1797	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1798	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1799	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1800	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1801	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1802	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1803	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1804	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1805	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1806	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1807	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1808	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1809	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1810	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1811	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1812	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1813	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1814	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1815	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1816	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	
	1817	17-12-31 01:30:06.2000	192.168.3.21	361.1	Card removed	

The modal window shows the following details for event ID 1771:

- Event ID: 1771
- IP Address: 192.168.3.21
- Card Name: SASB
- Card ID: E00000PTE000R
- Object Group: 3
- Object Name: ARC-Stat
- Location: [Empty]
- Room: [Empty]
- Service: [Empty]
- Channel: [Empty]
- Event Date: 17/12/2014
- Event Time: 17:11:36.14
- Source Name: SASB: B (Stat 13)
- Description: Status - ARC-Stat: Error
- Ack Status: [Empty]
- Acknowledged: [Empty]
- Signal lost due to faulty upstream router switch (36.00s)

Each device in the system is shown in the Status view and will display its current and historical status using an icon. Cortex will actively monitor each device to check for its current status. The status of each device is passed to its parent node within the System view so that a hierarchical status of the complete system can be shown using a single icon, this is also reflected in the applications optional status bar and in the system icon tray when the application is either obscured or minimised. The System view can be displayed in order of their network address or alphabetically by the device or user name.



Well engineered

AXON has complemented its successful Synapse product range with Cortex – a well-engineered configuration, monitoring and control software system. Cortex harnesses the experience gained from the original Synapse set-up program as well as close liaison with customers. It's a product that is scalable for the ever-increasing requirements we are asked to fulfill.

Ian Hollamby

■ Manager Research, Development & Engineering UK

Each event that occurs on the network for the devices being monitored, either by ACP (AXON Control Protocol), SNMP or 3rd party protocol is logged to the database and shown in the Event log. A status priority can be assigned to each event to determine whether an alarm or warning action should be triggered. Each state of a devices status can be configured by the system administrator to reflect the severity of the event and the method by which the warning or error should be cleared (either manually or automatically on a good event state).

The Event log window can be filtered on different criteria to show the information required. Each event can be edited to allow additional user data to be stored with the event, such as the cause/reason for the related warning or error.

The screenshot displays the Cortex monitoring software interface. On the left, the 'System View' shows a tree of monitored devices, with 'SA500 Embedded Audio Shifter' selected. The main 'Control View' for this device shows various status indicators: 'Present' (red), 'EEM' (green), 'AAC' (green), and 'Internal' (green). It also displays 'Audio Channel Status' (Channels 1-4, all green) and 'Audio Output Status' (Channels 1-4, all green). Below this, there are 'Add Or Audio Status' and 'GPS Status' sections. At the bottom, the 'Status History' table is visible, showing a list of events with columns for Priority, ID, Time, IP Address, Source Name, Event Description, and Acknowledge.

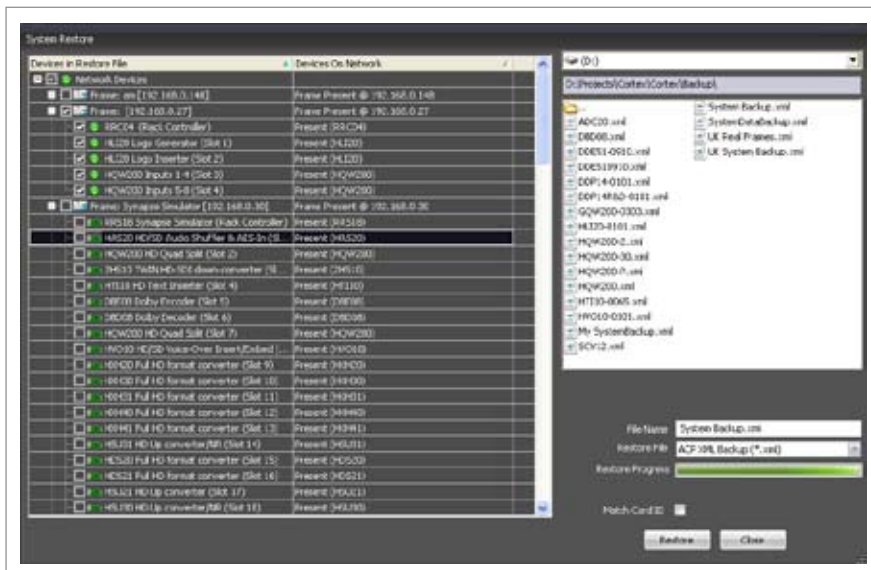
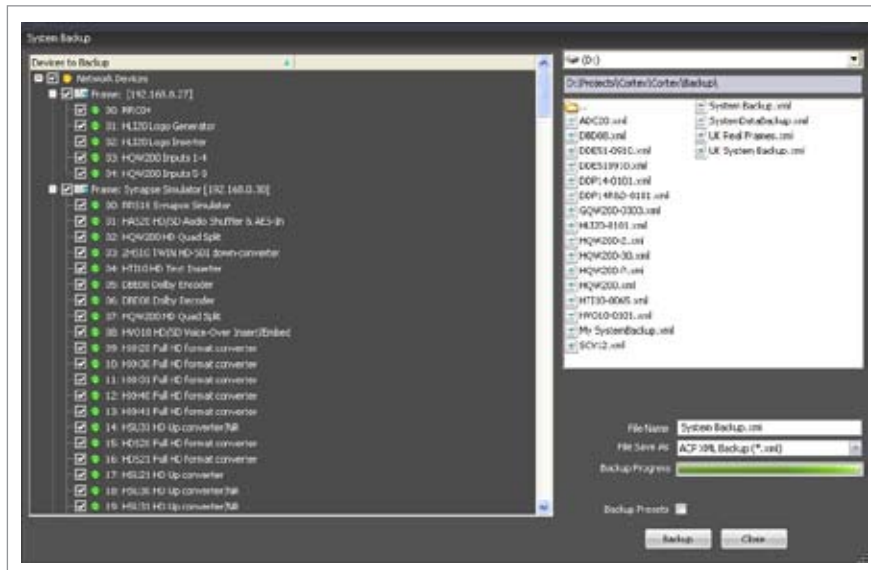
Priority	ID	Time	IP Address	Source Name	Event Description	Acknowledge
Good	1106	17/01/2010 20:09:2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	No card ID slot	Auto-Act
Info	1191	17/01/2010 20:09:2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Card Arrived-Running error free	
Warning	1400	17/02/11:24 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Gp-2m: OK	
Error	1409	17/02/12:02 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_1: OK	
UnAcked	1410	17/02/13:01 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_2: OK	
UnAcked	1411	17/02/12:03 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_3: OK	
UnAcked	1412	17/02/12:03 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_4: OK	
UnAcked	1413	17/02/12:04 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - EPM: OK	
UnAcked	1375	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Audio-All: OK	
UnAcked	1376	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Gp-2m: OK	
UnAcked	1377	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Audio-All: OK	
UnAcked	1378	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_1: OK	
UnAcked	1379	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_2: OK	
UnAcked	1380	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_3: OK	
UnAcked	1381	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Out_4: OK	
UnAcked	1382	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - EPM: OK	
UnAcked	1383	17/01/20:14 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Audio-All: OK	
UnAcked	2387	17/01/20:08 20/09/2000	192.168.0.31	SA500 Embedded Audio Shifter (Slot 9)	Status - Audio-All: NA	

When each device is selected using the Status view a monitoring tab is also displayed in the Control view for the device. This dialog shows both the current status of the device as well as a status history grid similar to the event log but automatically filtered for events specific to the selected device. For many devices this dialog uses LED's to aid the quick visual status recognition of the current state for the device.

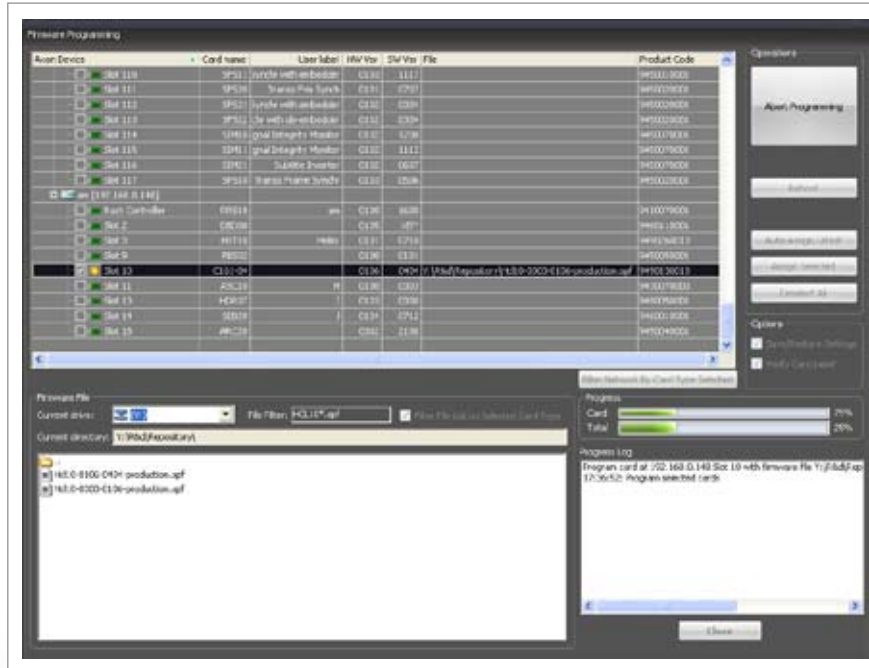
This event table within the database can optionally archive 'old' events (which are not currently determining the current state of the system) from the SQL database to an external XML file. This allows an automated historical record for the system to be kept without user intervention, up to the limit of storage size configured by the administrator.

System maintenance

Once the system has been configured for an installation or for a particular programme or event the Backup function can be used to record the settings of a complete or partial system and stored in a single file. This file can be used using the Restore function to ensure that the system is in the same state at some point in the future, e.g. when the same programme/event is being recorded again.



As and when new features are available for the Synapse modules, customers can download firmware from the web site and upgrade their devices. The Firmware dialog within Cortex allows the upgrading of multiple cards as a single operation, saving and restoring the settings of devices before and after programming and logging the progress of this programming operation.



The System inventory function allows a file to be generated containing the identity information for all devices on the system, this file can be used as an input for audit control systems, firmware version monitoring or network identification purposes.

Creative solutions

My teammates and I in the internal sales department are here to guide you through order and logistics processes – which can sometimes be pretty complex. If any unexpected issues arise we always try to find creative solutions to suit your needs.



Sin-Hang Wat

■ Sales Correspondent



Understanding

Service is about actions not slogans. Understanding customers, getting into their heads, seeing difficulties and problems as they do, is how we create solutions for them.

Maarten Hoogedoorn

■ Senior Systems Engineer

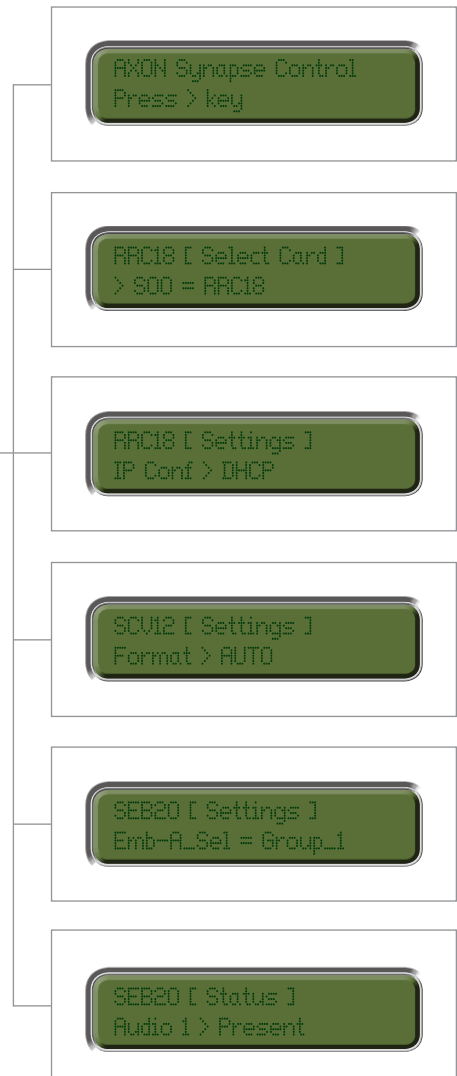
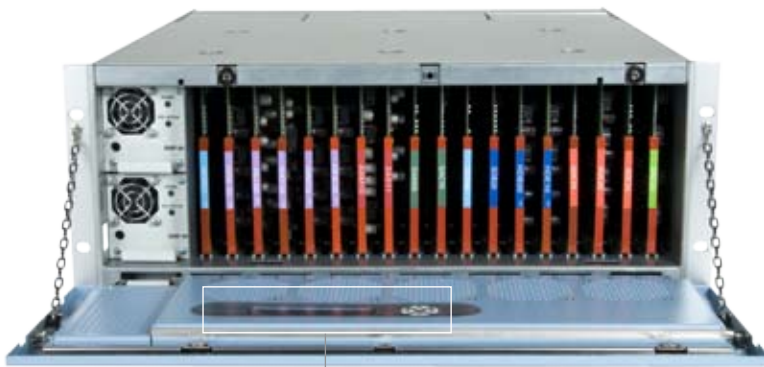


1.4 Local control directly into the frame

The local control panel uses the same path as a remote control, hence contributing to the ease of use of the system.

The control panel

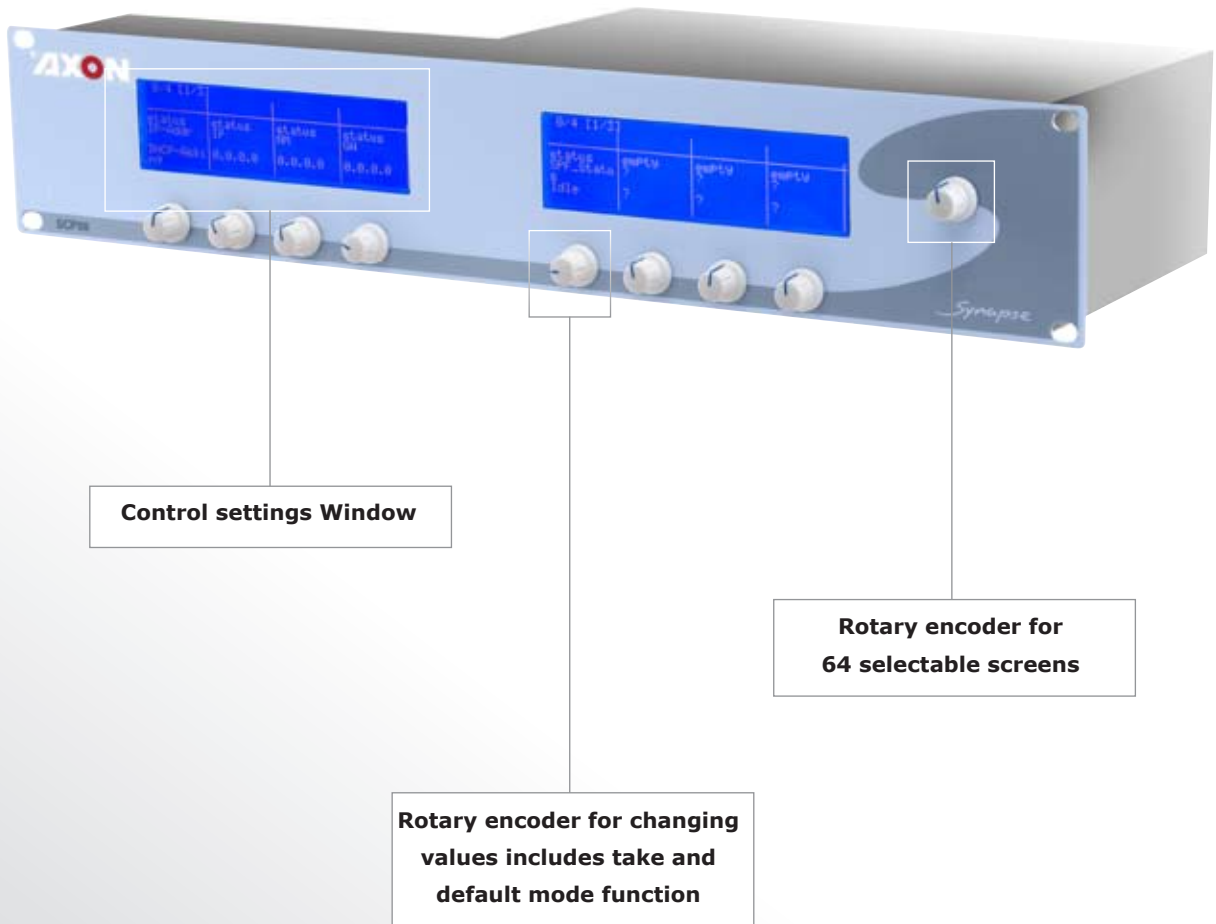
All card settings are modified and maintained via an intuitive control panel. The menu is an easy to understand tree structure that facilitates safe and fast local control.



1.5 SCP08 Universal Remote Control Unit

The SCP08 is a stand-alone Synapse control panel that operates with the TCP/IP protocol (Ethernet) and can control 8 different parameters on one screen or more (a maximum of 64 screens). This means that the total amount of controllable parameters/status information is no less than 512.

Within Cortex all settings and status monitoring can be specified. The panel has software to select/browse all desired parameters of all the cards in all the Synapse frames that are connected. Any parameter per screen can be user-defined, in complete freedom. In other words, a parameter of each and every card within each networked frame can be selected.



1.6 Infrastructure of remote control

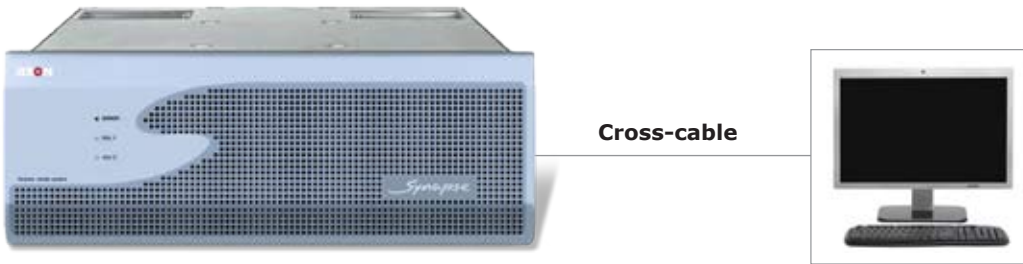
SNMP compatible

Each Synapse frame is fitted with a rack controller (RRC18 for the SFR18, RRC08 for the SFR08 and RRC04 for the SFR04) which stores all user settings and houses the input for the genlock signals. The standard Ethernet interface features a UDP/IP stack. The rack controller can store all parameters of each card in the frame. This information can be updated as soon as a card in a previously used slot has been replaced. All parameters on each individual card are stored into flash memory. In the event of rack controller failure, each card will operate independently. Changing the settings can be done remotely (Cortex), or by using the front panel user interface.

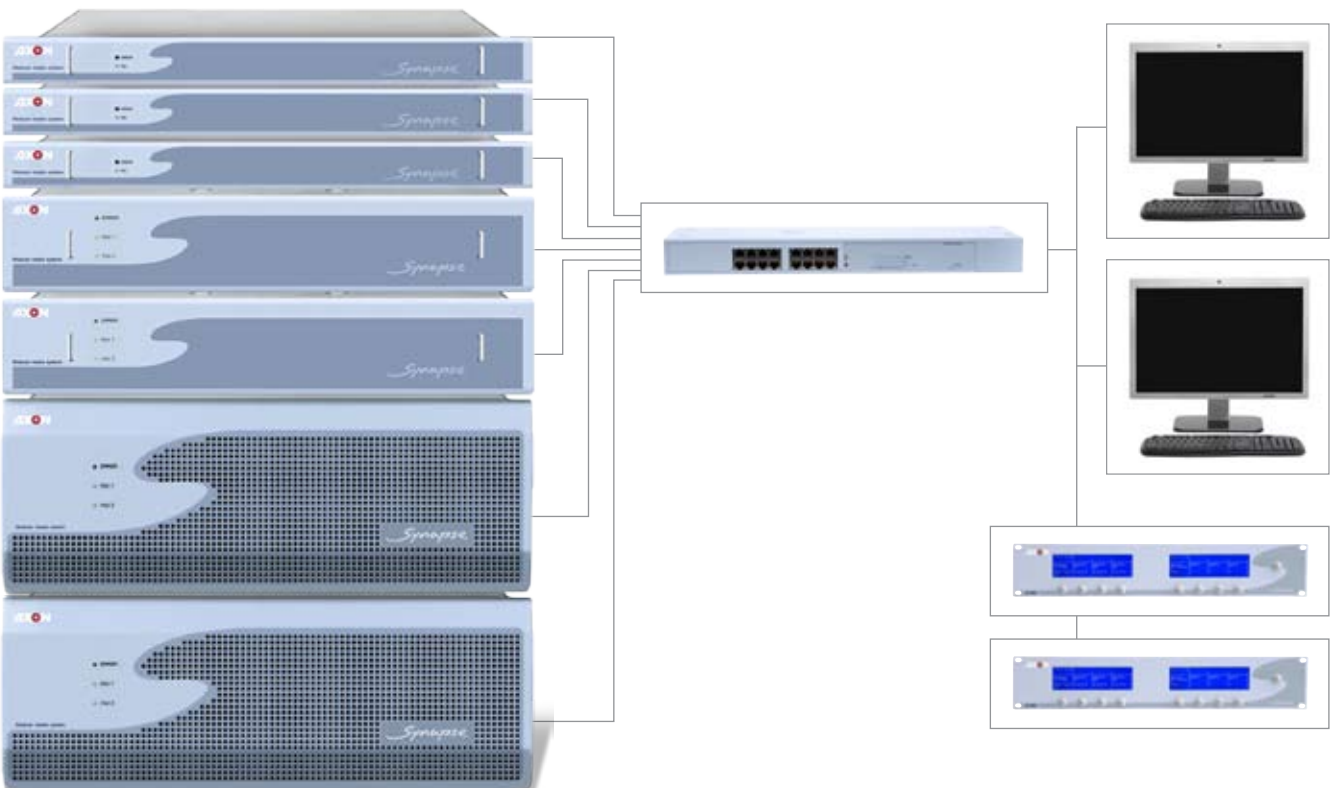
The system supports several levels of remote control:

- For low level control a dedicated protocol, based on TCP/IP, is available,
- SNMP support is optional (RRS18/08/04) allowing easy control by 3rd parties.

MIB files can be downloaded at: www.AXON.tv.



Stand alone



Network



Built-in Ethernet



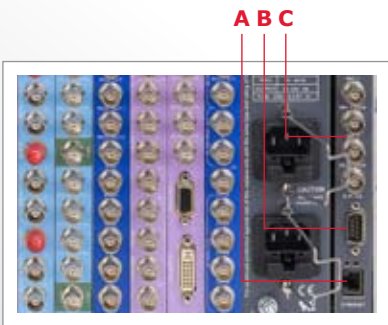
1 or 2 power supplies



Independent AC inlets

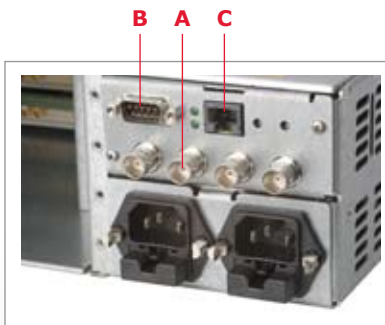
1.7 Rack controllers, Ethernet, Reference and alarm GPI

The Rack controller is the heart of the Synapse system. It tells the user what cards are present, what kind of alarms are reported and is the gateway to control the modules. It also provides the possibility to back-up and restore all user settings of the cards present in the same frame. This controller comes standard in each frame and is mounted in the back of the frame without sacrificing a card slot. It also provides the I/O for the dual redundant central genlock (single on the SFR04).



Central genlock (A)

(2 and 3 level sync and word clock)
The Synapse range has a built-in reference distribution system (dual for the SFR18, SFR08 and single for the SFR04).



GPI/O out (B)

Power supply failure and programmable GPI's can be monitored.



Ethernet (C)

Built-in Ethernet based networking.

Vitality

Eight years after launching, Synapse is one of the most flexible systems available – but we've barely scratched the surface of its capabilities. The level of cooperation between AXON and its customers, to refine the existing portfolio and define new products, is terrific and will maintain Synapse's vitality for a very long time.



Jean Pierre Nouws

■ Product Manager

1.8 Enhanced fiber connectivity and CVBS outputs

The Synapse system is prepared for interfacing through fiber. Connector panels can hold fiber in- and outputs. The standardized connection of SDI in- and outputs allow numerous combinations of fiber processing and connections. For example, a BPL01R_SC (fiber input panel) combined with an SFS10 (Framesynchronizer) provides a stand-alone optical receiver with frame synchronizer and 4 processed outputs. It is also possible to go from SDI on fiber to composite while using only one slot in an SFR18, SFR08 or SFR04. These cost effective options increase the flexibility of the Synapse system even more.

Common fiber specifications

All Fiber optic transmitters for HD-SDI (ANSI/SMPTE 292M 1,485 Gbps.) and SDI (270 Mbps).

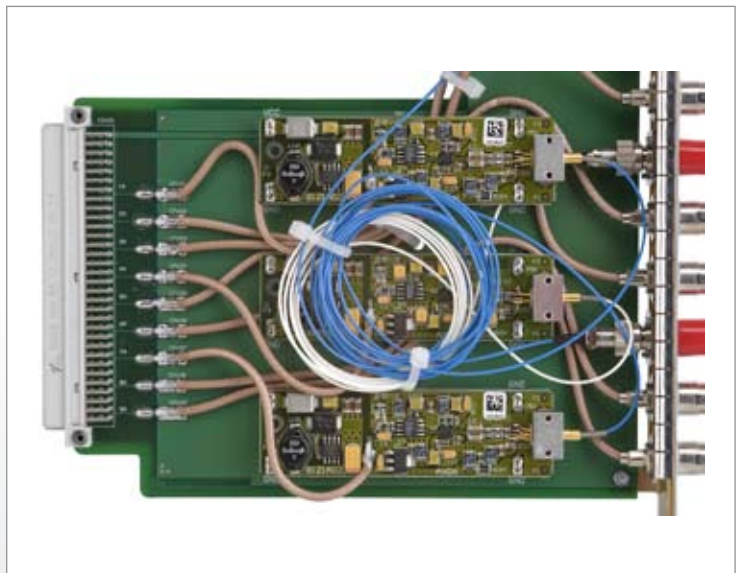
- FC/PC or SC connector for single mode fiber (9/125 μ m)
- 1310nm FP laser with monitor photodiode feedback power control
- Optical output avg. power level -6dBm
- Ext. ratio 9dBm
- Class 1 laser product

All Fiber optic receiver for HD-SDI (ANSI/SMPTE 292M 1,485 Gbps.) and SDI (270 Mbps)

- FC/PC or SC connector for single mode fiber (9/125 μ m)
- Compatible with multi mode fiber (50/125 μ m - 62,5/125 μ m)
- 1260 - 1610nm SFP module
- Optical input avg. power level 0dBm to -20dBm (with ANSI/SMPTE 292M pathological signals)

Synapse includes an extensive range of CVBS rear connectors

Synapse offers now the ability to add CVBS (PAL/NTSC) outputs on a selection of SD modules. This option to a standard connector panel replaces an SDI output with a CVBS output. For example, the BPL01C combined with the same SFS10 gives you 3 processed outputs and a single CVBS output on the same card in a single slot.



1.9 Color coding

The Synapse product groups are color coded for easy recognition between card fronts and connector panels at the back.



Analog Audio Distribution



Digital Audio Distribution



Analog Video Distribution



Digital Video Distribution



Audio A/D Conversion



Video A/D Conversion



Audio D/A Conversion



Video D/A Conversion



Audio for Video



Video Processing



Audio Processing



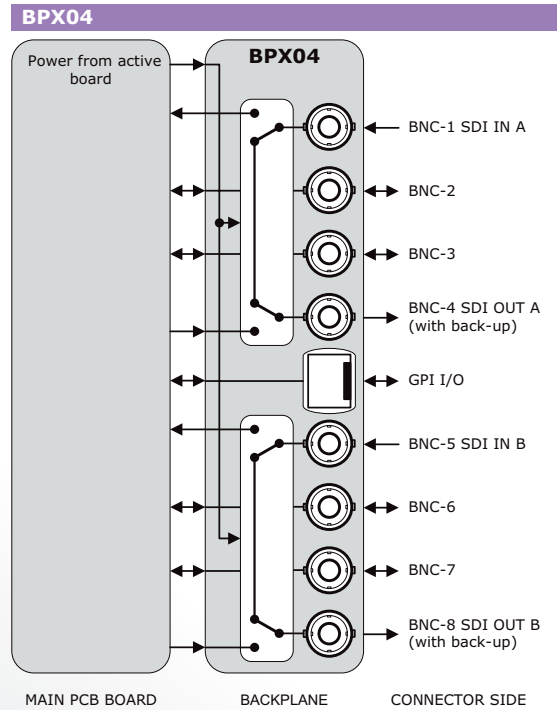
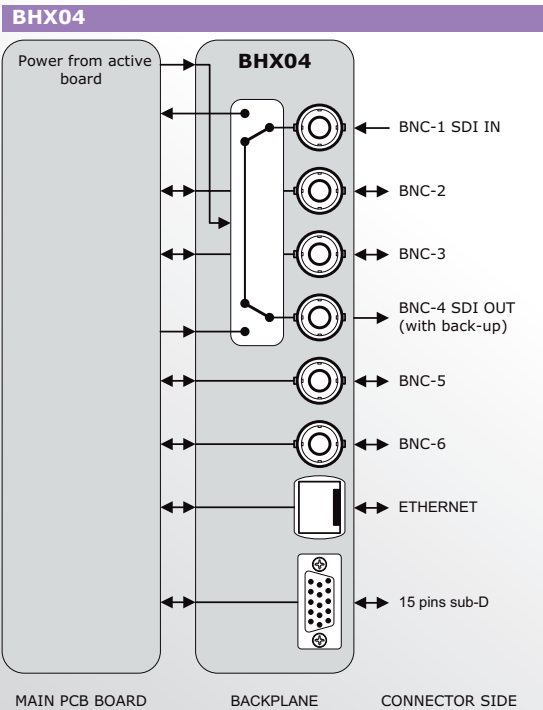
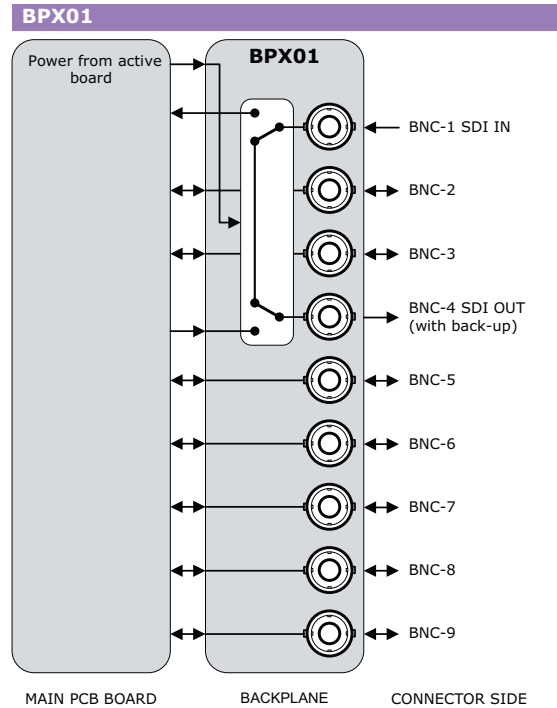
Synapse Miscellaneous



1.10 Connection facilities

How Synapse offers different I/O connectivity for every active module

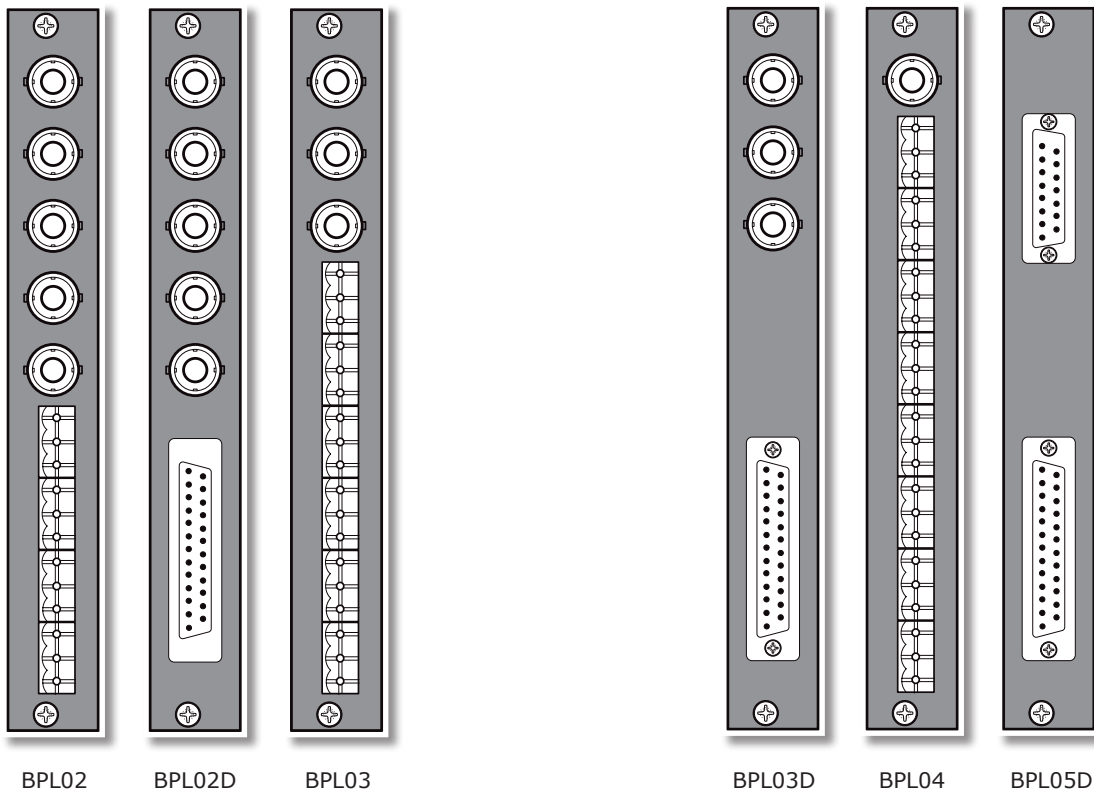
The Synapse modules can be combined with different connector panels (backplanes). These connector panels are supplied with screw terminals and sub-D connectors for audio, BNC and fiber optic connection for audio and video. All AES/EBU in- and outputs can be supplied with either BNC for 75 Ohm impedance, 3 pole screw terminals or sub-D connectors for 110 Ohms by selecting the corresponding connector panel. There are also a couple of electro mechanical relay protected connector panels that offer a passive pass-through when the card loses power or is physically removed. These connector panels are identified with an 'X' in the product name. Alongside a schematic representation of these switch-based connector panels.



High density is an important design criterion in the development of the Synapse range

The intelligent cooling topology saves space and enables the use of 9 BNC connectors on a standard AXON connector panel (BPL01). Where other systems have blind spaces or ventilation holes, Synapse is able to place physical connections.

The use of 3-pole screw terminals allows easy connection without the need for breakout cables. Sub-D connectors are also supported. The use of multiple relocked outputs facilitates efficient system planning and cost savings.



Example of connector panel options for an ADC24.

The AES/EBU is available on BNC, screw terminal and sub-D connector. The analog audio is available on screw terminal and sub-D.



The right person

Every call is important to us, especially if it's to do with service or support. We will always do our utmost to help you contact the right person quickly.

Pascale Schalks

■ Frontdesk Officer

1.11 Floating inputs

CE regulations prevent floating BNC connectors to be used on a connector panel range. These inline isolators are to be used when ground potentials are not equal. Solutions for analog video and digital audio and video are available.



ST1 for 270 Mb/s SDI



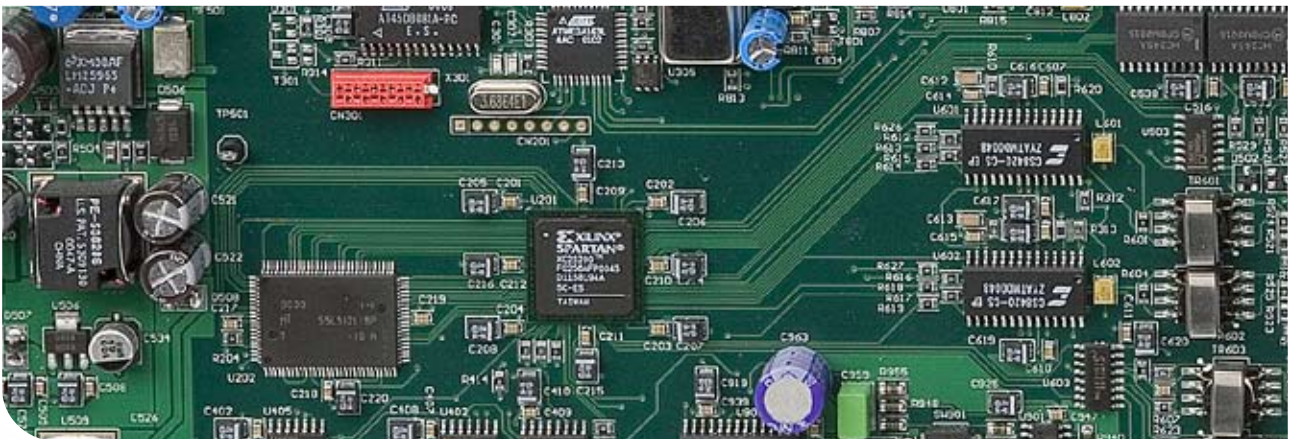
AT1 for AES/EBU for 75 Ohms



VT1 for analog video

2. Extremely broad range of cards

Synapse is an intuitive, easy-to-use system that is developed for advanced applications, as well as straightforward systems. It not only satisfies the requirements of current technology, but will also accommodate developments far into the future. The single form factor now contains technologies covering analog and digital audio and video, SD, HD and 3Gb/s. Indeed, the Synapse system has proven to be 'future proof'.



More than 150 individual Synapse cards covering:

- Analog and digital audio distribution
- Analog and digital video distribution
- Audio and video A/D and D/A conversion
- Embedding and de-embedding in HD, SD or as part of a processing card
- Embedded audio processing like shuffling, mixing, compressing/limiting and voice-over functions
- Up, down, cross and standards conversion
- Aspect ratio conversion
- Color correction
- Frame synchronization
- Integrity checking and probing
- Multi image processing with SDI and DVI output
- Video delay
- Legalization
- Backup functions
- 3Gb/s, HD and SD distribution
- Logo insertion
- Dolby processing

Several of them are unique:

- Low latency up and downconverters (<6ms)
- TWINS, two individual channels on a single card
- Teranex based algorithms
- Dolby E
- Dolby Digital
- Dolby Digital Plus
- Audio description processing
- HD, SD, CVBS plus sixteen channels of embedding in both SD and HD as a single card transmission feed: HXT10, see page 284



2.1 Smart double density modules

Next to the advanced functionality of the existing Synapse modules, AXON extended the range by providing cards containing dual functionality. These cards within the Synapse range are named TWINS. TWINS is developed to serve two purposes:

- Extremely high space-efficiency by providing 36 individual processing channels in 4RU
- Superb flexibility for the customer: Synapse now offers basic cost-effective solutions as well as advanced processing cards in the same frame

■ Dual channel 12-bit composite decoder with 5 line comb filter (2AS11).	See page 162
■ Dual channel 12-bit composite decoder with 5 line comb filter and frame synchronizer (2AS12).	See page 164
■ Dual 4 channel digital audio de-embedder (2DB22).	See page 86
■ Dual 4 channel analog audio de-embedder (2DB24).	See page 88
■ Dual 4 channel digital audio embedder (2EB22).	See page 68
■ Dual 4 channel analog audio embedder (2EB24).	See page 70
■ Dual channel SDI frame synchronizer (2FS10).	See page 206
■ Dual channel high end HD-SDI to SD-SDI / composite down converter with de-embedding function (2HS10).	See page 248
■ Dual channel high-end HD-SDI to SD-SDI/composite down converter with embedding function (2HS11).	See page 250
■ Dual channel (enhanced) integrity checking probe with built-in frame synchronizers (2IM09 - 2IM10).	See page 228
■ Dual channel basic integrity checking probe with switch-over function (2IX08).	See page 230
■ Dual channel (enhanced) integrity checking probe with switch-over function and frame synchronizer (2IX09 - 2IX10).	See page 232
■ Dual channel HD/SD integrity checking probe with clean switch over function and wings or split screen creation capabilities (2HX10).	See page 226
■ Dual channel HD upconverter with color correction (2HU10).	See page 266
■ Dual channel HD upconverter with color correction and audio shuffler (2HU11).	See page 266

3. Unmatched functionality per card

Designed to bring you as much functionality as condensed as possible

The fairly large real-estate of a Synapse PCB allows for expanded functionality beyond what is normally expected of the product that you would initially choose. It is further enhanced by increased processing power of modern integrated circuits, thus challenging the designers of broadcast systems.

Due to, for instance the Synapse daisy chain bus, modular infrastructures look slightly different on paper. Well used to its full potential, you save space, labor and therefore money! Feel free to contact AXON or its distributors for optimizing your system design and fully utilize the power of the Synapse system.

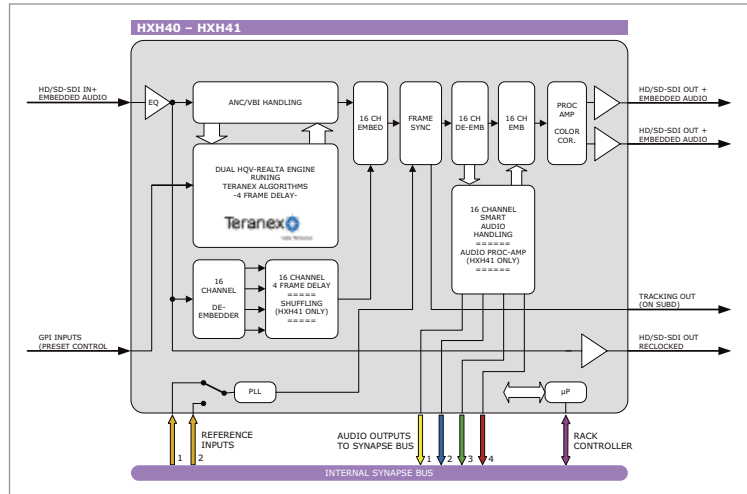
On the opposite page some examples of the powerful functionality per card are shown.



- Embedding
- De-embedding
- Audio shuffling
- Audio gain and phase
- Frame synchronization
- Auto phasing
- Color correction
- Proc amp
- Integrity checking
- De-interlacing
- Scaling
- Color space conversion
- Legalization
- Compressing
- Limiting
- VI/WSS reading and insertion
- Time code handling
- Delaying
- Alignment
- Tracking audio
- Noise reduction

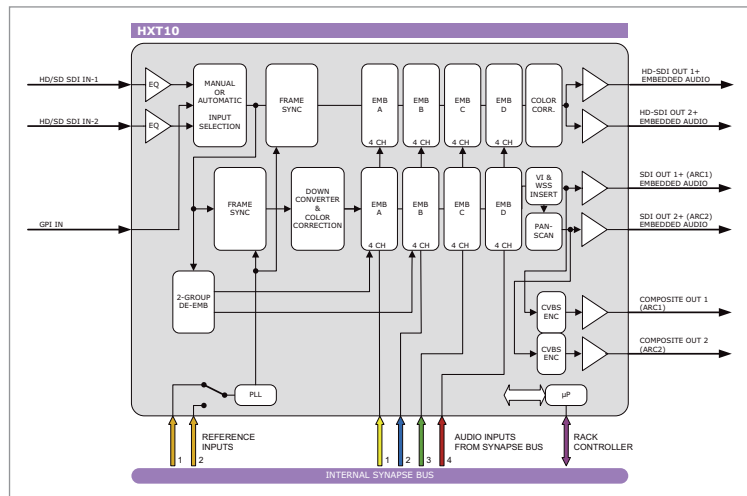
HXH41 powerful up, down, cross and standards converter

Beside being an HD/SD, up, down, cross and standards converter, the HXH41 offers preset based 16 channels of audio gain, phase, delay and shuffling, color correction and a proc-amp. The add-on daisy chain function allows for monitoring all 16 channels without the need for a separate de-embedder.



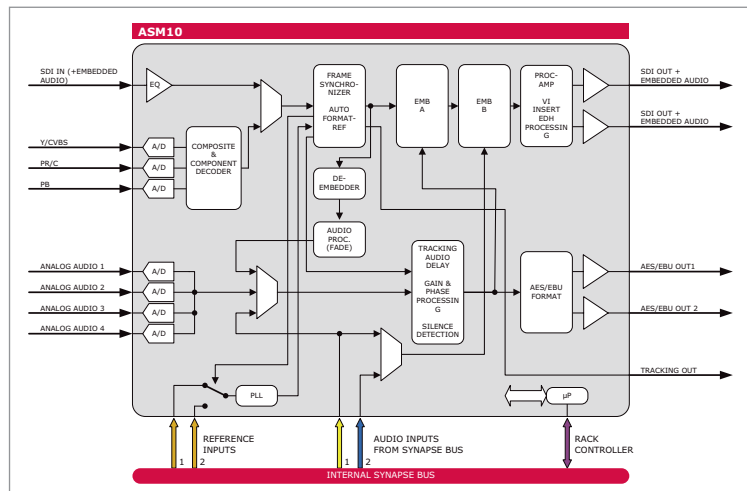
HXT10 dual HD input frame synchronizer, embedder, down converter and CVBS encoder

Dual input, individual frame sync for HD and SD, 16 channels of audio embedding in HD and SD, color correction, simultaneous anamorphic and pan-scan SD output are all combined on one card.



ASM10 12 bit analog to digital, A/V bridge with SDI plus embedded audio processing mode

Analog audio and video inputs, digital audio and video (with embedded audio) outputs are all combined as physical I/O on this single width card (18 x in SFR18). On top of this an extra SDI input with de-embedding capabilities and daisy chain bus inputs for two additional groups are provided.





High standard

Having worked my entire life in television, I feel like a fish-in-water at AXON. The company operates with the same high standards, and these are reflected in the products, services and the people. Being immersed in this kind of professional environment gives you satisfaction, and gives customers peace of mind.

Marc Derks

■ Area Sales Manager

4. Unique architecture



Embedding and the ADD-ON daisy chain bus

One of the unique features the Synapse system offers is the ability to embed audio (and other future data formats) into a master card. This master card can be for instance a frame synchronizer or a A/D converter. This feature has become especially cost-effective in combination with HD and SD functions.

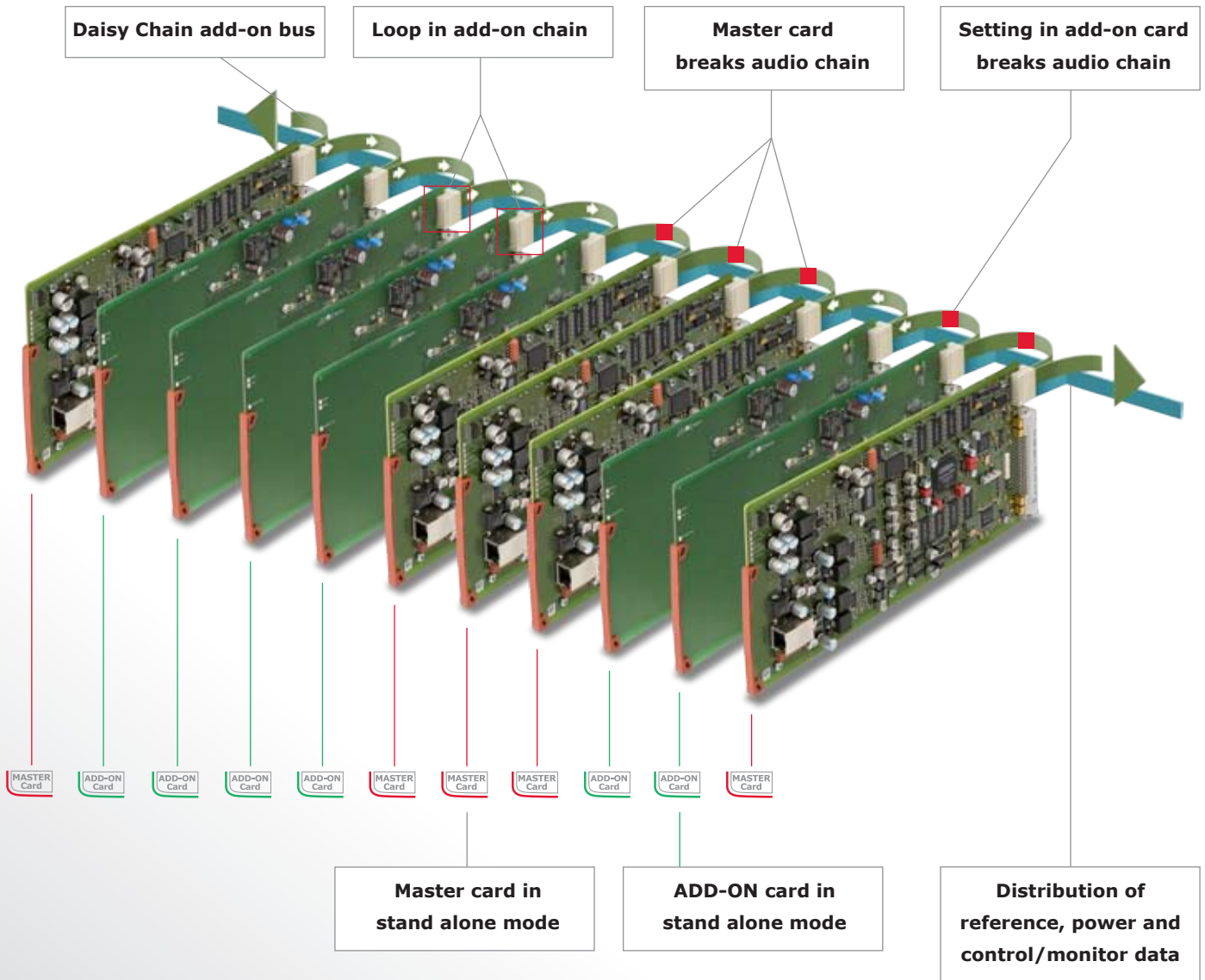
The bus PCB and ADD-ON functionality

The Synapse frame has an internal bus PCB comprising a central (passive) interface between the power supply, the front panel control, the cards and the I/O card. Above this there is a slot-to-slot connection. The dedicated wires running from slot-to-slot provide the opportunity to send signals to and from a card placed immediately on the right-hand side. With this topology, AXON can embed into the existing logic core of a composite decoder and skip two full re-clocking stages and serial to-parallel/parallel-to-serial conversions.

All slots are coded so that each card can be readily located. The control interface provides full control, stores settings and transmits warning information to the front panel and external devices. It also carries the references and provides a passive inter-slot bus to transport data from one slot to the next.

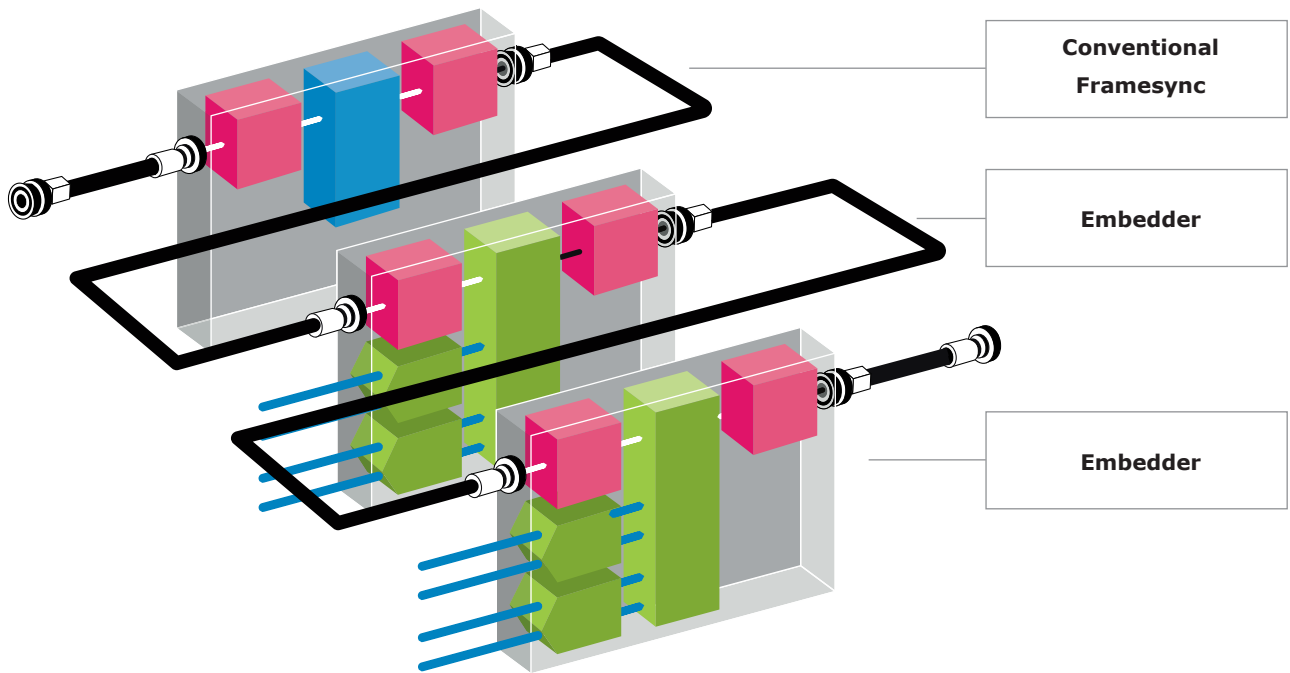
4.1 Embedding and the ADD-ON daisy chain bus

The unique add-on principle that lowers cost and increases signal integrity.

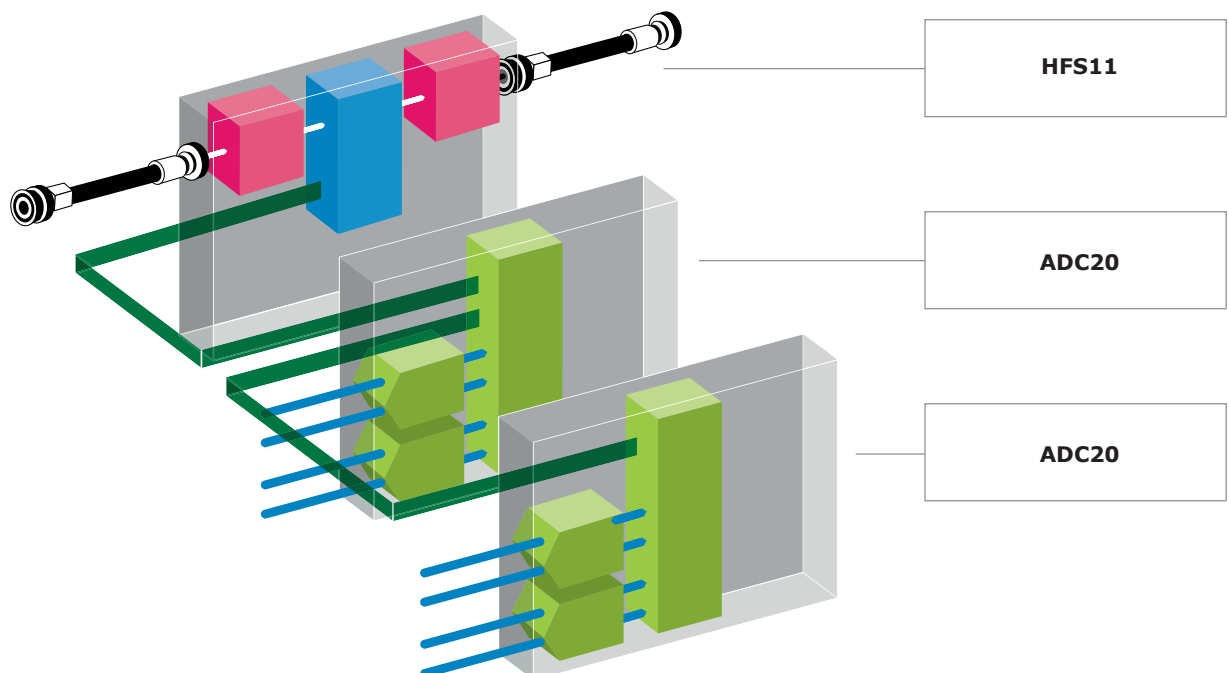


- The daisy chain ADD-ON bus is passive, guaranteeing absolute stability
- The ADD-ON principle can be started anywhere in the frame
- The ADD-ON card is placed immediately on the right side of a master card (front view)
- Up to sixteen channels of audio can be transported to or from a master card with a maximum of four ADD-ON cards
- This topology on average saves 15-40% in cost to customers

Conventional embedding of 8 analog signals with 2 cascaded embedders



Synapse embedding of 8 analog audio signals with 2 ADD-ON cards



4.2 ADD-ON examples

Explaining arrows and color codes

AXON provides a comprehensive listing of the modular functions that the Synapse system offers. The description of the functions per module is accompanied by a block schematic to provide you with a quick overview of the possibilities. The following color convention applies to the arrows:

- Black (in the cards descriptions): defines the I/O connections on the back panel
- Purple: defines internal rack control
- Orange: is used for reference inputs
- Yellow: indicates the first 'add-on' audio pair (in- or output)
- Blue: indicates the second 'add-on' audio pair (in- or output)
- Green: indicates the third 'add-on' audio pair (in- or output)
- Red: indicates the fourth 'add-on' audio pair (in- or output)

Synapse bus

The ADD-ON principle can be used in several ways.

Example 1

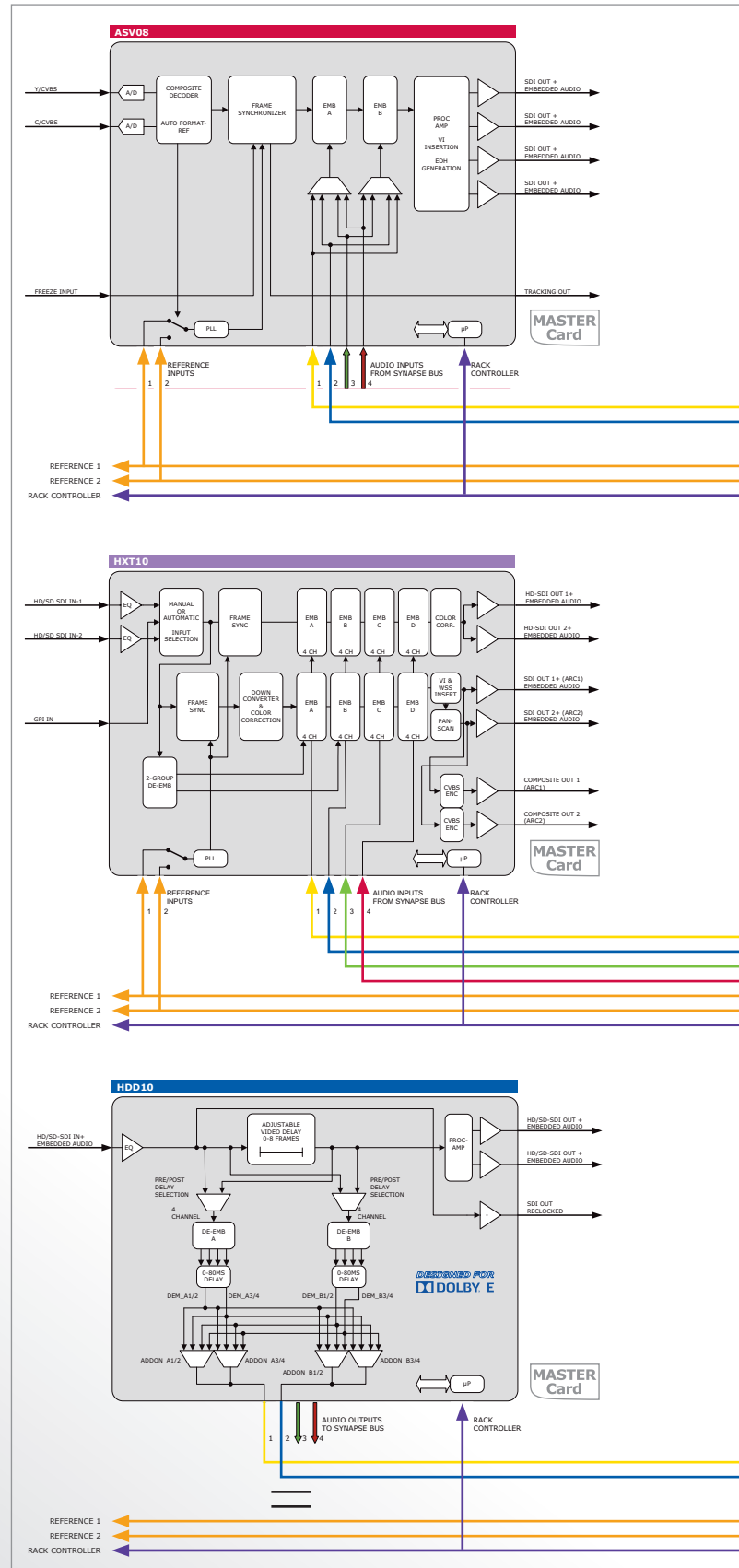
An ASV08 is used to decode CVBS and embed 8 channels of analog audio via 2 ADC20 ADD-ON cards.

Example 2

A truck transmission application where an HXT10 is used to provide a synchronous HD-SDI, SD-SDI and CVBS signal. The 2 DIO48 ADD-ON cards are used to inject a total of 16 channels via 8 AES/EBU streams.

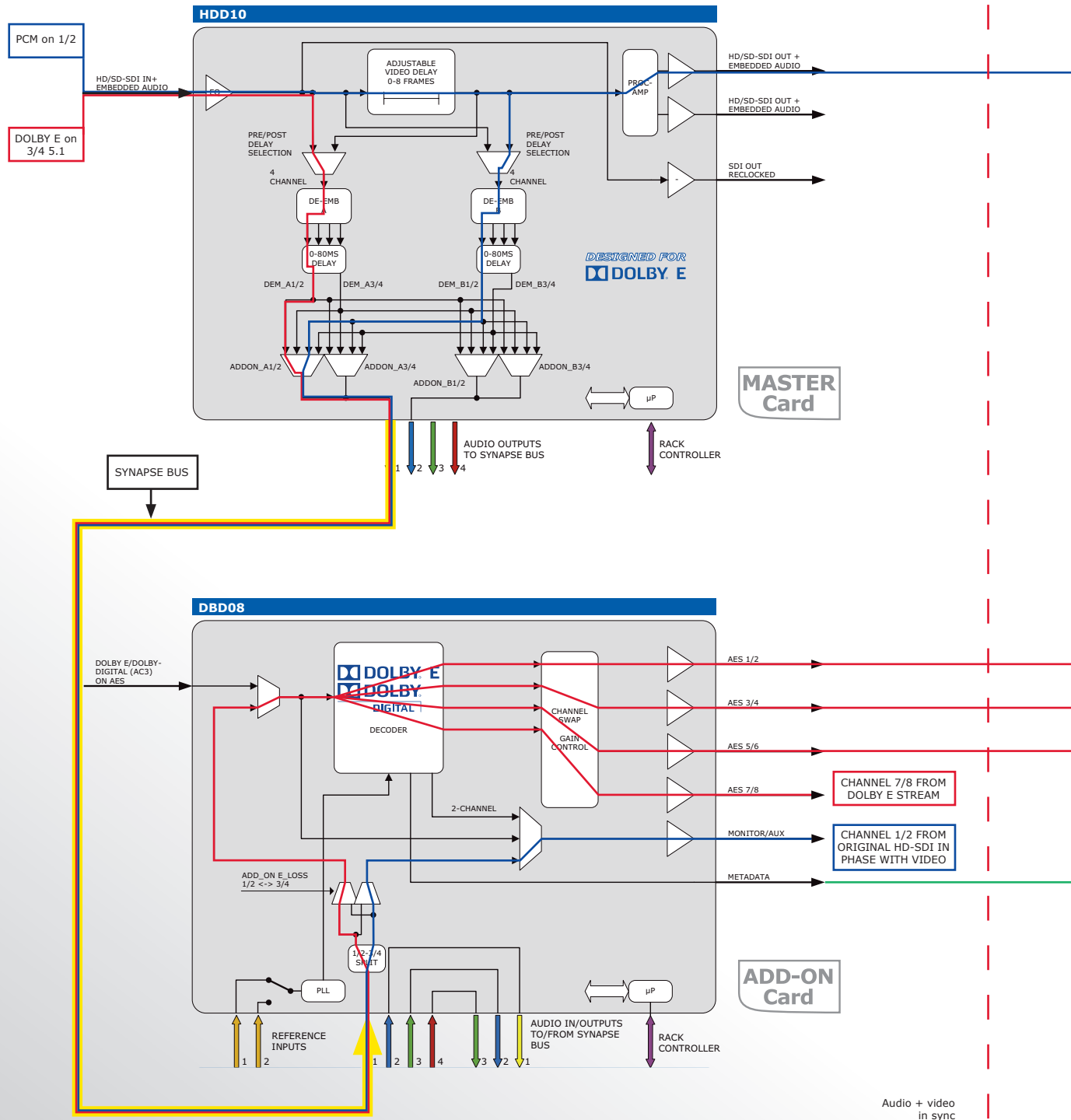
Example 3

This application shows a dual Dolby E de-embedding and de-coding with controlled lip-sync. The two Dolby E streams that are part of the incoming HD-SDI stream are de-embedded before the video delay block of the HDD10. If additional PCM streams are available, they also can be de-embedded after the video delay block and presented on the monitor outputs of the DBD08. Full lip-sync is maintained with this method.

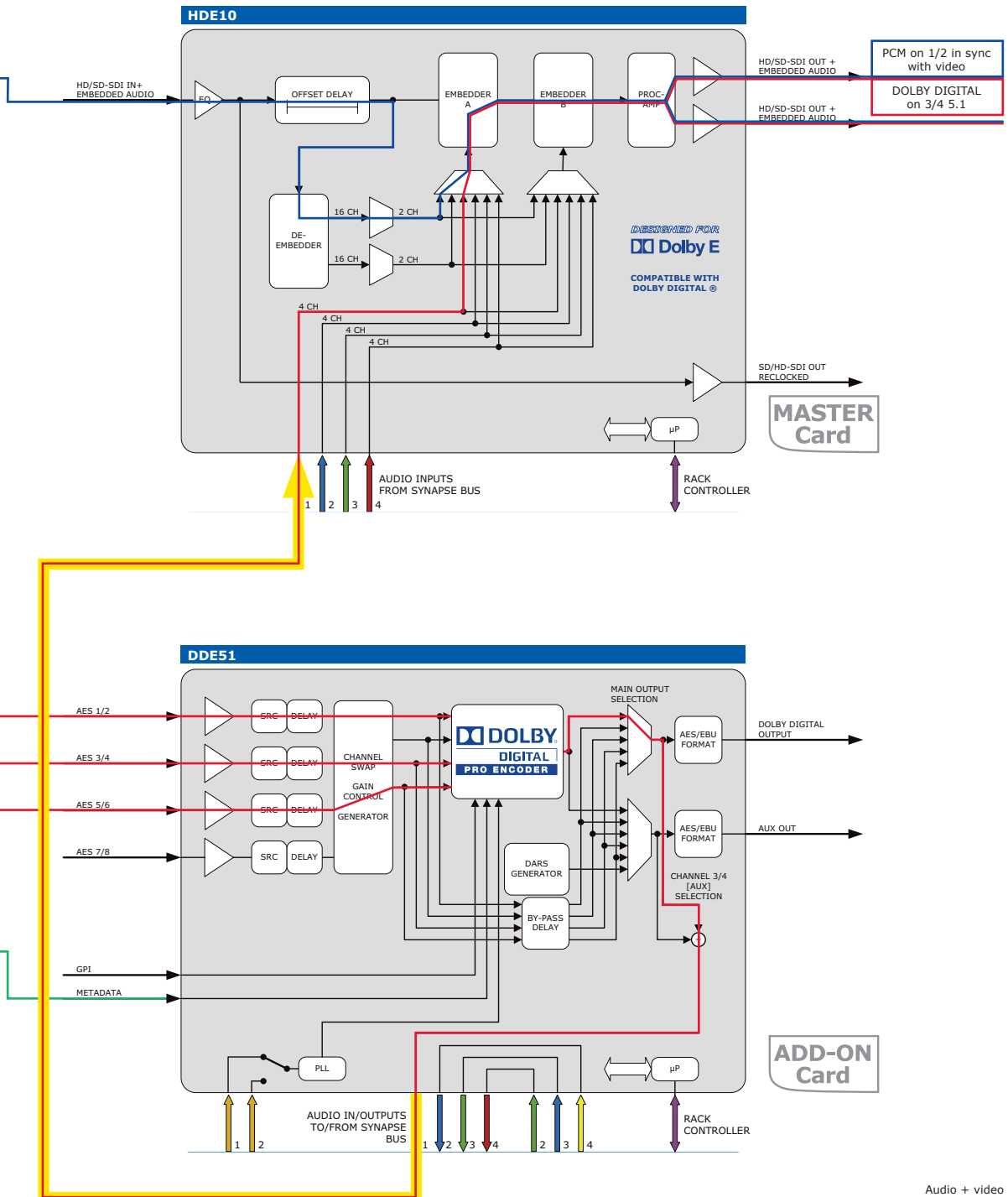


4.3 Synapse, Dolby® and the internal ADD-ON daisy chain bus

Synapse has probably the most extensive Dolby based infrastructure. Beside several discrete Dolby encoding and decoding cards, Synapse also offers a range of Dolby application specific "master cards".



These cards are the ideal building blocks for a Dolby E, or Dolby Digital application. The following example shows how we de-embed Dolby E. Decode Dolby E, and encode the discrete audio to Dolby Digital to re-embed this in the serial digital (HD) domain. *Note: After de-embedding and decoding to discrete audio, video and audio are in absolute sync (lip-sync) with one frame delay. After encoding to Dolby Digital again in sync with 200 ms of propagation delay.*



Audio + video in sync

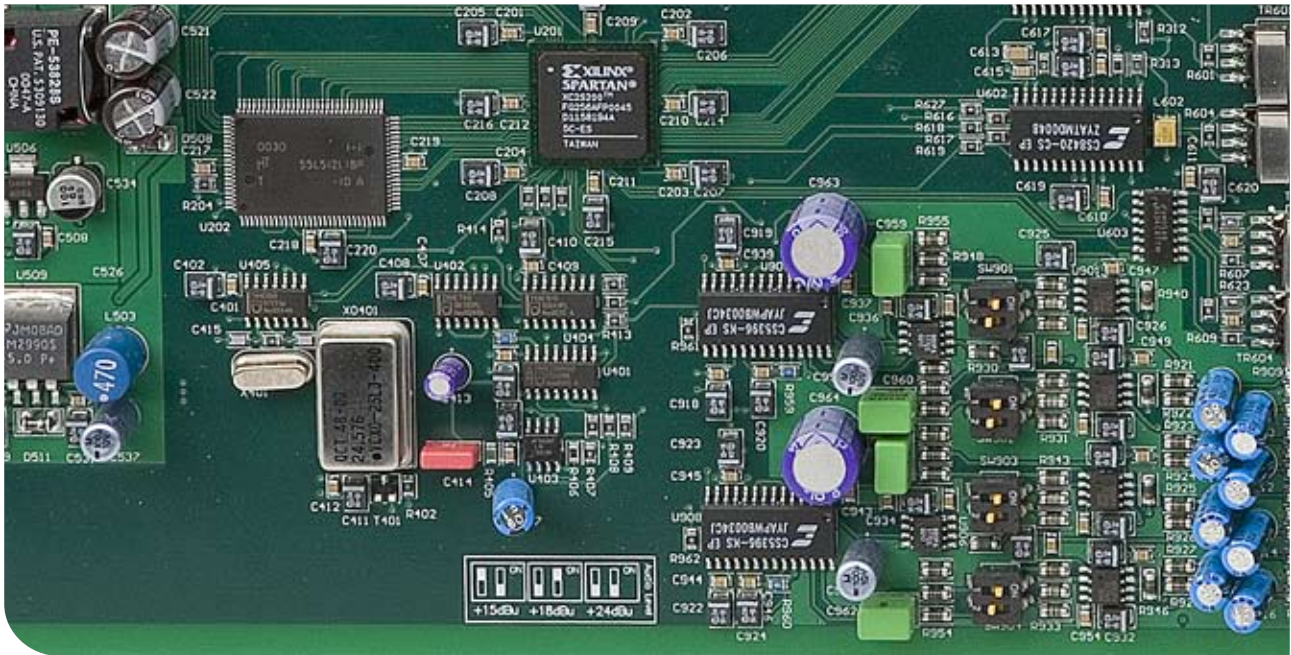


Optimise design

Increasing the capabilities and speed of technology within the same PCB space is the name of the game. Our designs have changed dramatically in the last few years to optimise new developments such as 3Gb/s. We can now put 1,400 components on a PCB, pushing the performance benchmark that our developers want to make evermore incredible and innovative products.

Paul van Avesaath

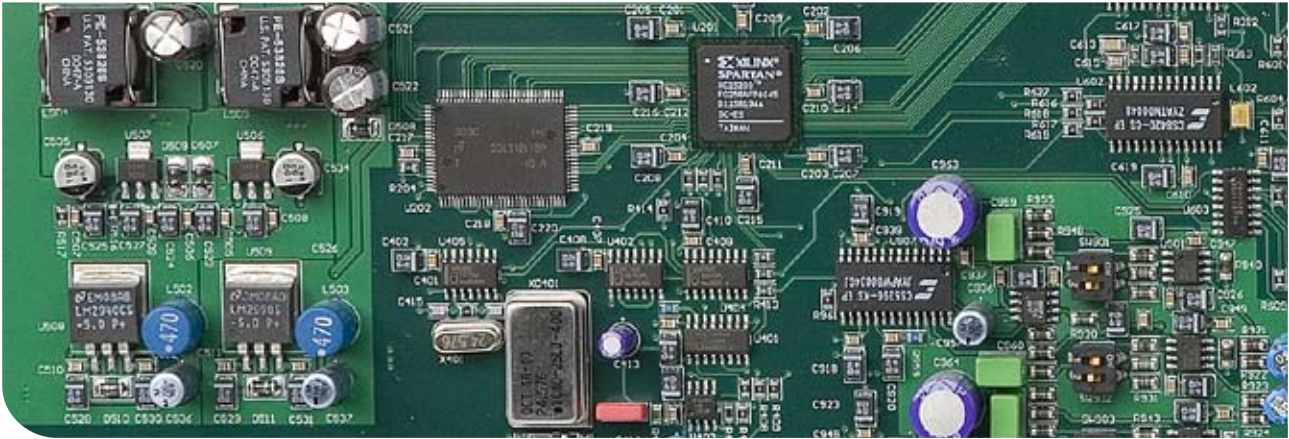
■ PCB Designer



5. High quality

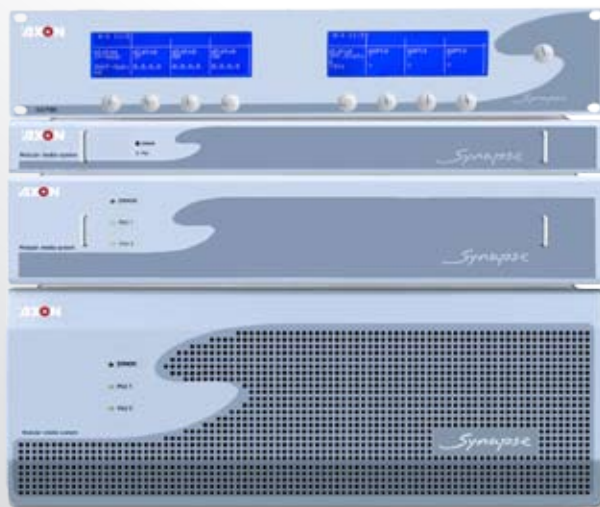


AXON uses the finest components in building the Synapse range. Our products are developed for 24/7 use and to survive in sometimes difficult environments such as OB-Vans. Signal integrity is one of those key differentiators that defines the product's quality. That is why we use true 75 Ohm contacts between the Synapse card and connector panel. These coaxial contacts guarantee a high return-loss and therefore allow extremely long cable (up to 160m/480ft) unmatched in the industry.



6. Fits the future

The constant improvements and enhancements that we put into the firmware on our Synapse cards are shared throughout the total customer base. Every Synapse user benefits from this life-time free upgrade policy. Just visit www.axon.tv for the latest updates of your 'future proof' Synapse card.



The modules

On the previous pages, the Synapse concept with its frames, the control, and the topology of combining modules is explained. These properties are fundamental to the powerful Synapse system. On the next pages you can find the ingredients of an extensive and flexible range of hot swappable modules in different flavours. This range is constantly being expanded and enhanced. Please refer to our website for the latest updates and specifications.

www.axon.tv



Can be used as a master card



Can be used as an ADD-ON card



Product is 3Gb/s capable or upgradeable



Product is 1.5Gb/s capable



2 Identical channels on a single card



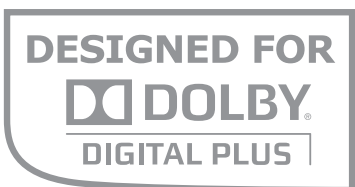
Linux is also used as an embedded OS



Product is compatible with Dolby E streams



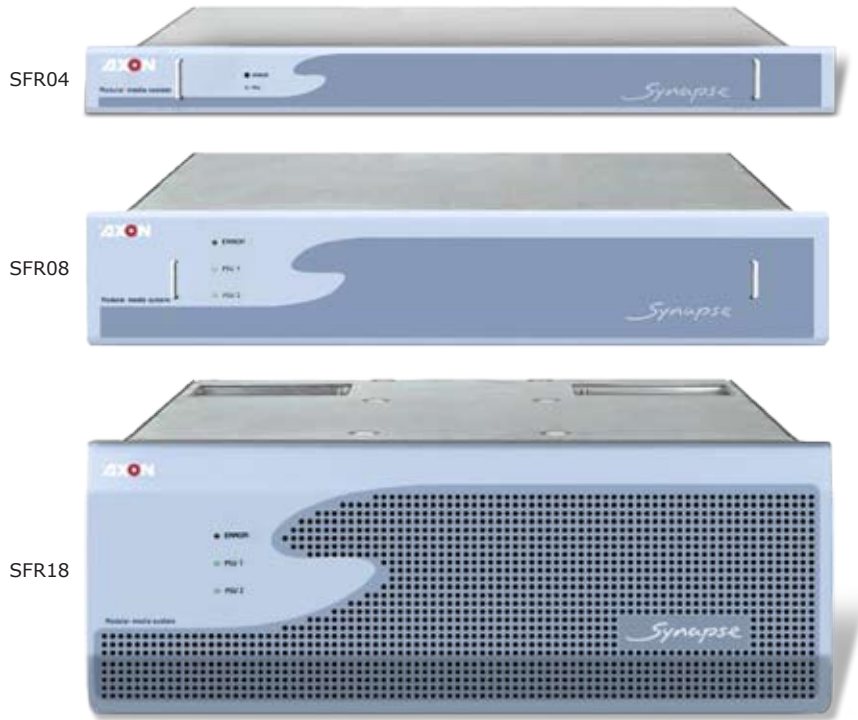
Product is designed especially for Dolby E streams



Product is compatible with Dolby Digital Plus streams



Product is compatible with Dolby Digital streams



SFR04 - SFR08
- SFR18

19" rack frames: 4, 8 and 18 slots

The SFR04, SFR08 and SFR18 are the generic module holders for the Synapse system.

The SFR04 is a 1 RU rack with 4 card slots, the SFR08 is a 2 RU frame with 8 slots, and the SFR18 is our most dense frame with 18 slots in 4 RU. These frames incorporate several unique functions that stand out from the conventional frames found in most other card based infrastructure products.

- Central genlock input for all cards that require a reference.
- 2 for the SFR08 and SFR18, one for the SFR04
- Ethernet connection for remote control, setup and maintenance
- GPI outputs for alarm and power supply failure
- Auto input range power supply (redundant for SFR08 and SFR18)
- Full control of all card and frame parameters through intuitive GUI on inside front panel.
- Internal Synapse ADD-ON daisy chain bus for audio, GPI and multiview applications



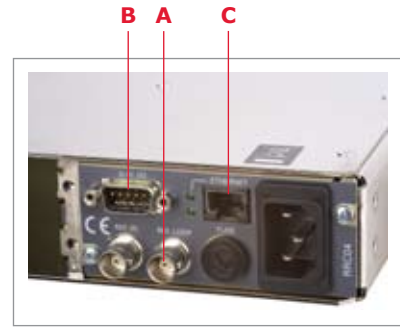
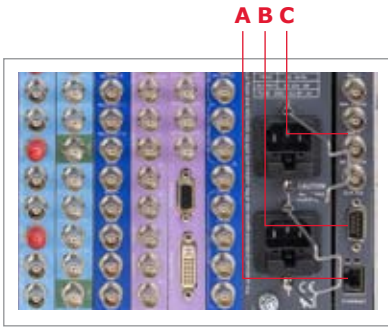
Built-in Ethernet



1 or 2 power supplies



Independent AC inlets



Central genlock (A)

(2 and 3 level sync and word clock)
The Synapse range has a built-in reference distribution system (dual for the SFR18, SFR08 and single for the SFR04).

GPI/O out (B)

Power supply failure and programmable GPI's can be monitored.

Ethernet (C)

Built-in Ethernet based networking.

Ordering information

- **SFR04:** 19"-1RU housing with 4 slots, including rack controller (RRC04) and 1 power supply unit
- **SFR04S:** 19"-1RU housing with 4 slots, including rack controller (RRS04) and 1 power supply unit, SNMP compatible
- **SFR08:** 19"-2RU housing with 8 slots, including rack controller (RRC08 and 1 power supply unit
- **SFR08S:** 19"-2RU housing with 8 slots, including rack controller (RRS08) and 1 power supply unit, SNMP compatible
- **SMP50:** Extra power supply unit for SFR08
- **SFR18:** 19"-4RU housing with 18 slots, including rack controller (RRC18) and 1 power supply unit
- **SFR18S:** 19"-4RU housing with 18 slots, including rack controller (RRS18) and 1 power supply unit, SNMP compatible
- **SMP80:** Extra power supply unit for SFR18

Specifications

Dimensions

height SFR18: 176 mm (6.93") (4RU)
SFR08: 87 mm (3.43") (2RU)
SFR04: 44 mm (1.73") (1RU)

Width

SFR18: 483 mm (19")
SFR08: 483 mm (19")
SFR04: 483 mm (19")

Depth (including front lid)

SFR18: 528 mm (20.79")
SFR08: 537 mm (21.14")
SFR04: 532 mm (20.94")

Depth (excluding front lid)

SFR18: 510 mm (20.08")
SFR08: 492 mm (19.37")
SFR04: 494 mm (19.45")

Weight

SFR04 8.5 kg (18.7 lbs)
SFR08 11.5 kg (25.3 lbs)
SFR18 11 kg (24.2 lbs) – (new for Q1-2009) yes less weight then the SFR08

Power

SFR04 Input: AC100 – 240V ~ 4 – 1.5A
Frequency: 50 – 60 Hz
Output: DC 32V – 8A
Fuse: 250V / 6.3 AT – 2x
Maximum output: 250 Watt

SFR08 Input: AC100 – 240V ~ 4 – 1.5A
Frequency: 50 – 60 Hz
Output: DC 32V – 8A
Fuse: 250V / 6.3 AT – 1x
Maximum output: 150 Watt

SFR18 Input: AC100 – 240V ~ 4 – 1.5A
Frequency: 50 – 60 Hz
Output: DC 32V – 8A
Fuse: 250V / 6.3 AT – 2x
Maximum output: 250 Watt

Miscellaneous

Operating

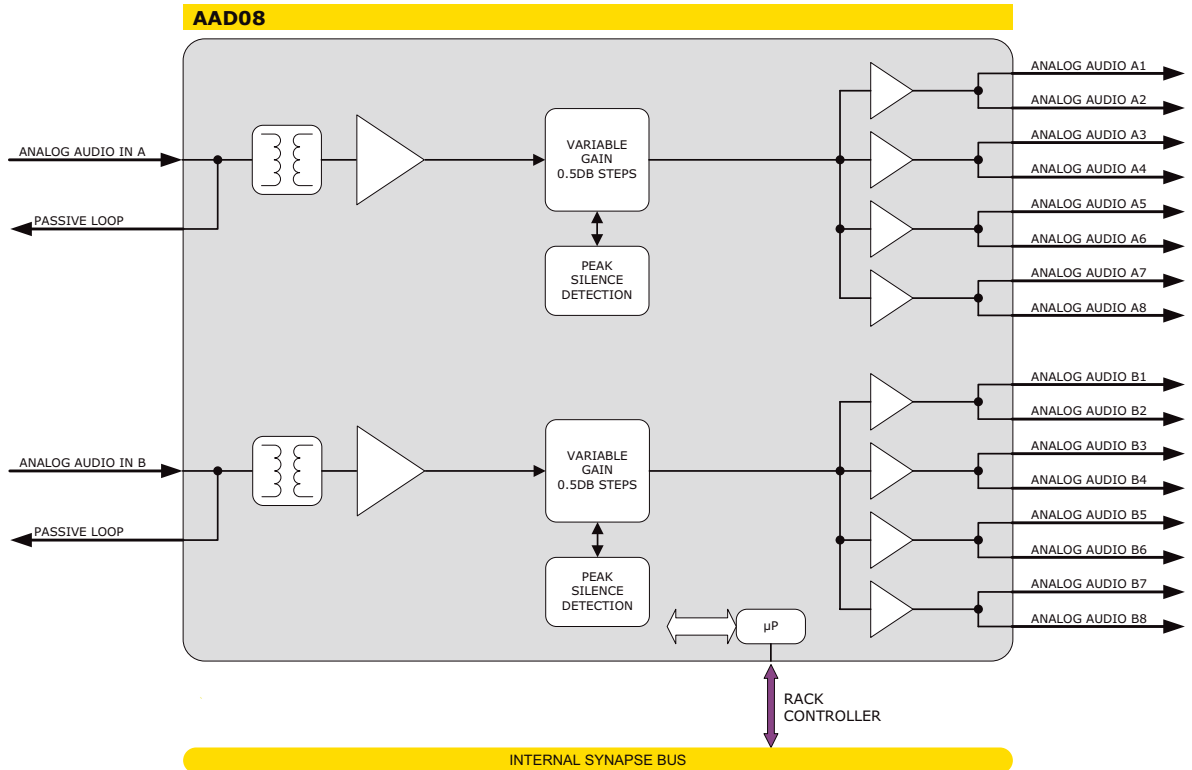
temperature 0° to 40° C environmental temperature (32° to 104° F)

Storage

-20° to 70 ° environmental temperature (-4° to 158° F)

Fan units

SFR18: 2 in frame, 1 in each PSU, 5 in front (new for Q1-2009)
SFR08: 3 in frame, 1 in each PSU
SFR04: 1 in the PSU



AAD08 Dual channel 1 to 8 analog audio distribution amplifier

The AAD08 Analog Audio Distribution Amplifier provides dual channel 8 way distribution. It utilizes high quality components to provide high reliability and excellent audio performance. The AAD08 features Real Transformers on its inputs, Variable Gain, Peak Detection and Silence Detection.

- 8 balanced outputs per channel
- Transformer coupled input
- Low impedance output with transformer properties
- Level control (0.5dB increments)
- Peak detection 0 dBu to 24 dBu
- Silence detection
- 24dBu maximum input level
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- Generic analog audio distribution
- Analog audio silence and clipping detection/probing
- Analog audio galvanic isolation / hum suppression

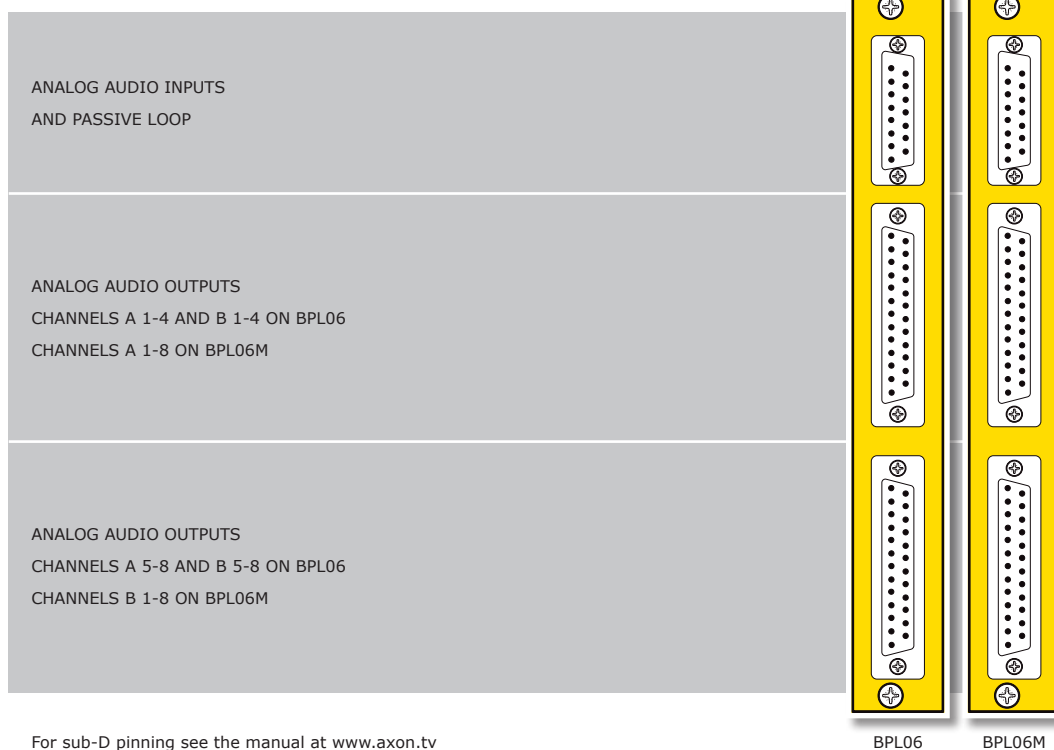
Ordering information

Module:

- **AAD08:** Dual channel 1 to 8 analog audio distribution amplifier

Standard I/O:

- **BPL06_AAD08:**
I/O panel for AAD08 with 4 stereo outputs on sub-D
- **BPL06M_AAD08:**
I/O panel for AAD08 with 8 mono outputs on sub-D



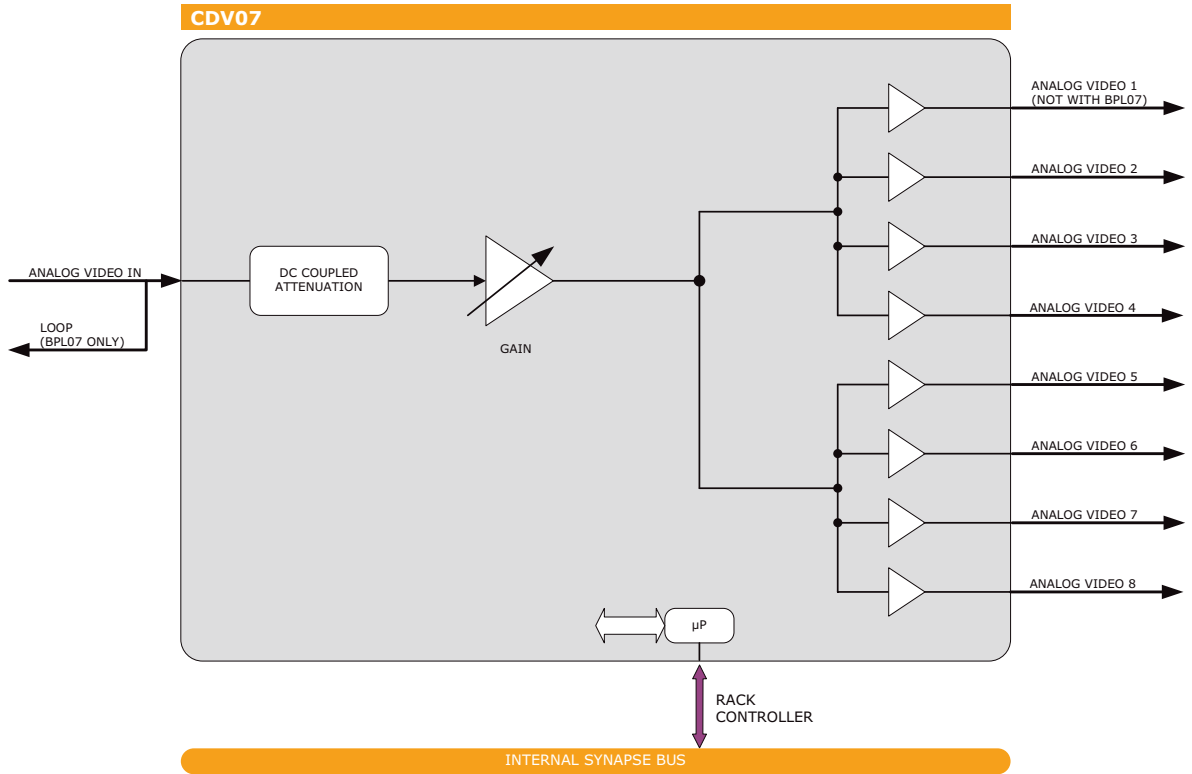
Specifications

Analog audio input

Type	Balanced analog audio
Number of inputs	2 Transformer coupled
Connector	15 pins female sub-D
Impedance	10k Ohms nominal (differential)
Signal level	24dBu max
Level control range	+30dB to -90dB 0.5dB increments
Frequency response	< ±0.1dB, 20Hz to 20kHz (broadcast quality)
Dynamic range	100dB @-60 dBFS
THD+N	< 0.002% (>96dB) @ 1kHz
CMRR	< 0.003% (> 94dB) @ 20Hz to 20kHz, > 60dB at 1kHz

Analog audio output

Type	Balanced analog audio
Number of outputs	2
Connector	25 pins female sub-D
Impedance	50 Ohms balanced
Signal level	24dBu max
Miscellaneous	
Weight	Approx. 250g
Operating temperature	0° C to +50° C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<8 Watts



CDV07 Analog video (B&B / Tri-Level) distribution amplifier (word clock DA for high impedance circuits)

The CDV07 is a basic analog distribution amplifier providing a low loss electronically balanced input with loop through when used with the BPL07 or terminated when used with the BPL01. If necessary the input can be used fully floating by unscrewing the tabs on the BPL07.

- Adjustable input gain
- DC coupled
- Compatible with Tri-Level sync
- Compatible with Word clock for high impedance circuits
- Floating inputs and loop through with BPL07
- +/- 6dB gain adjustment
- Input status detection
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

CDV07

Applications

The CDV07 is designed for applications where a cost effective analog video or Black & Burst distribution is needed. The straightforward design enables easy installation and reliable operation.

- Can be used for word clock distribution into high impedance circuits
- Tri-Level sync distribution.

Ordering information

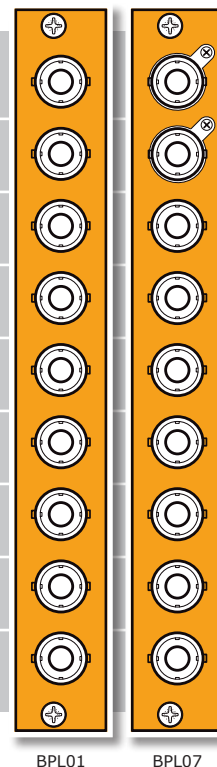
Module:

- **CDV07:** Analog video distribution amplifier

Standard I/O:

- **BPL01_CDV07:**
I/O panel for CDV07
- **BPL07_CDV07:**
I/O panel for CDV07 with loop through

ANALOG VIDEO INPUT
ANALOG VIDEO OUTPUT 1(OR LOOP BPL07 ONLY)
ANALOG VIDEO OUTPUT 2
ANALOG VIDEO OUTPUT 3
ANALOG VIDEO OUTPUT 4
ANALOG VIDEO OUTPUT 5
ANALOG VIDEO OUTPUT 6
ANALOG VIDEO OUTPUT 7
ANALOG VIDEO OUTPUT 8



Specifications

Analog input

Input levels 700 mV. White to black.
Nominal 1 V sync tip to white.
75 Ohms terminated with BPL01. Floating with BPL07

Return loss Measured with Mini Circuits ZFDC-15-6-75
> 40 dB, @ 5 MHz
> 36 dB, @ 15 MHz
> 28 dB, @ 30 MHz
75 Ohms terminated

Common mode

rejection (CMR) Measured with BPL07 BNC inputs floating CM signal on both inner and outer leads. CM input impedance 5K Ohms. 10 KOhms each input to GND
> 68 dB, @ 50Hz
> 55 dB, @ 5 MHz
> 40 dB, @ 15 MHz
> 30 dB, @ 30 MHz

Analog outputs with BPL01(8x) with BPL07(7x)

Output levels 1 V sync tip to white, 75 Ohms terminated

Return loss

Measured with Mini Circuits ZFDC-15-6-75
> 37 dB, @ 5 MHz
> 34 dB, @ 15 MHz
> 29 dB, @ 30 MHz.
Other outputs 75 Ohm terminated

Performance

Frequency

response within 0,4 dB, 0 to 5 MHz.

Signal to noise

ratio 66.5 dB. 10KHz to 6MHz, Tektronix VM700T

Bar tilt 0,1 %

Gain stability 1%

Miscellaneous

Weight Approx. 250g

Operating

temperature 0° C to +50° C

Dimensions 137 x 296 x 20 mm (HxWxD)

Word-clock distribution

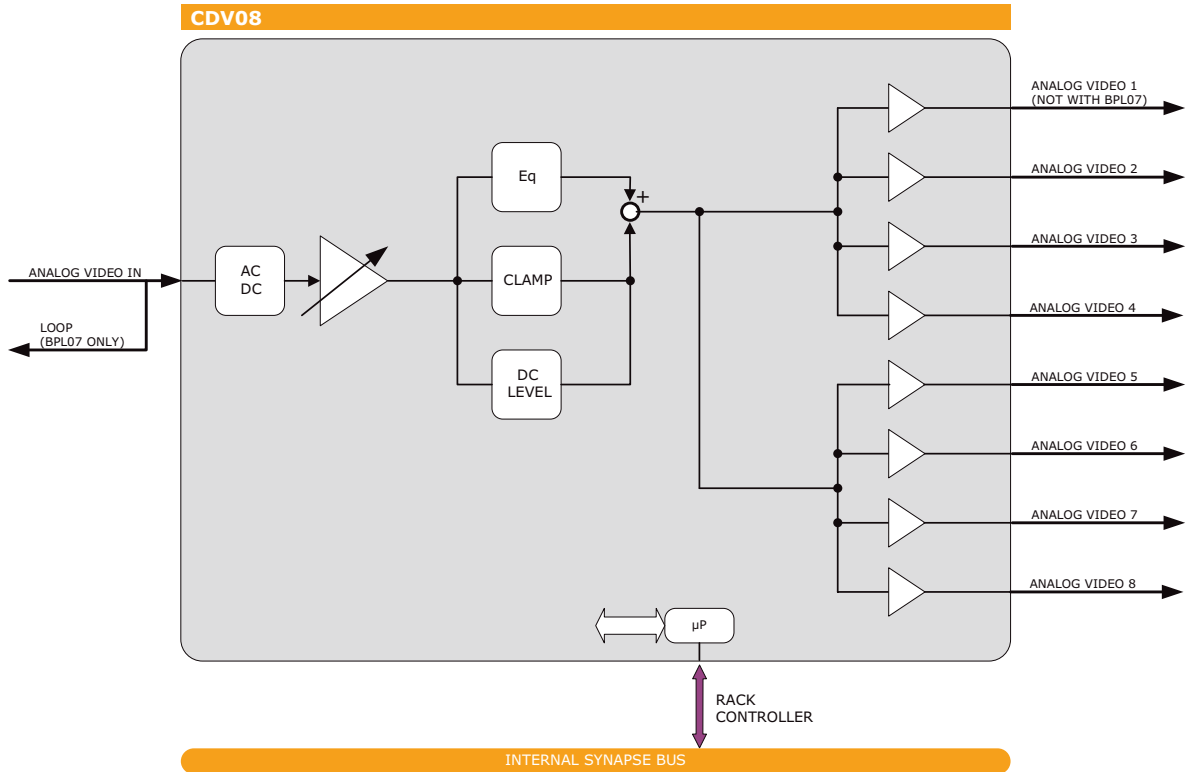
Input voltage Maximum 5V

Output voltage Maximum 3.5V into high impedance (1K Ohms)

Electrical

Voltage +24V to +30V

Power <5 Watts



CDV08 Analog video distribution amplifier with cable equalizer

The CDV08 is an enhanced analog distribution amplifier providing a low loss electronically balanced input with loop through when used with the BPL07 or terminated when used with the BPL01. If necessary the input can be used fully floating by unscrewing the tabs on the BPL07.

- Adjustable input gain
- AC or DC coupled
- Equalizer for up to 300 meter of RG59 or equivalent cable
- Equalizer level of up to 230%
- Floating inputs and loop through with BPL07
- +/- 3 dB gain adjustment
- Input status detection
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

CDV08

Applications

The CDV08 is designed for applications where a long cable length is used and analog video or Black & Burst signals need equalization. The straightforward design enables easy installation and reliable operation.

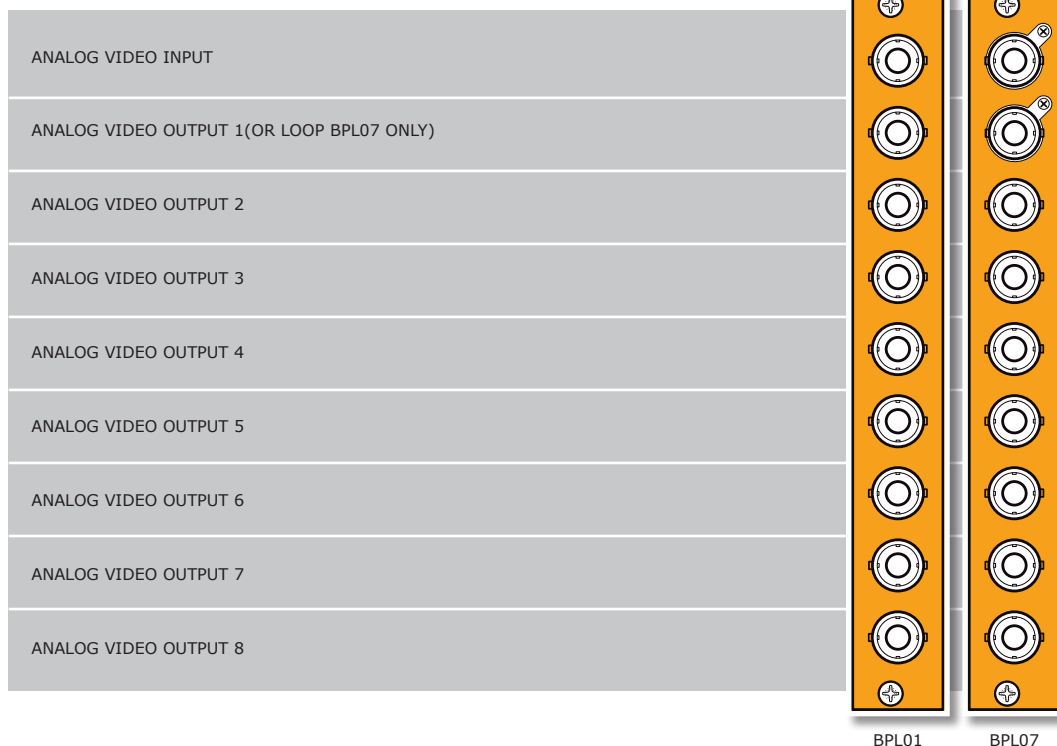
Ordering information

Module:

- **CDV08:** Analog video distribution amplifier with cable equalizer

Standard I/O:

- **BPL01_CDV08:**
I/O panel for CDV08
- **BPL07_CDV08:**
I/O panel for CDV08 with loop through



Specifications

Analog input

Input levels	700 mV. White to black. Nominal 1 V sync tip to white. 75 Ohms terminated with BPL01 Floating with BPL07
Return loss	Measured with Mini Circuits ZFDC-15-6-75 > 40 dB, @ 5 MHz > 36 dB, @ 15 MHz > 28 dB, @ 30 MHz 75 Ohms terminated

Common mode

rejection (CMR)	Measured with BPL07 BNC inputs floating CM signal on both inner and outer leads. CM input impedance 5 kOhms. 10 kOhms each input to GND > 68 dB, @ 50Hz > 55 dB, @ 5 MHz > 40 dB, @ 15 MHz > 30 dB, @ 30 MHz
------------------------	--

Analog outputs with BPL01(8x) with BPL07(7x)

Output levels	1 V sync tip to white, 75 Ohms terminated
Return loss	Measured with Mini Circuits ZFDC-15-6-75 > 37 dB, @ 5 MHz > 34 dB, @ 15 MHz > 29 dB, @ 30 MHz. Other outputs 75 Ohms terminated

Performance

Frequency response	within 0,4 dB, 0 to 5 MHz.
Signal to noise ratio	66.5 dB. 10KHz to 6MHz, Tektronix VM700T
Bar tilt	0,1 %
Gain stability	1%

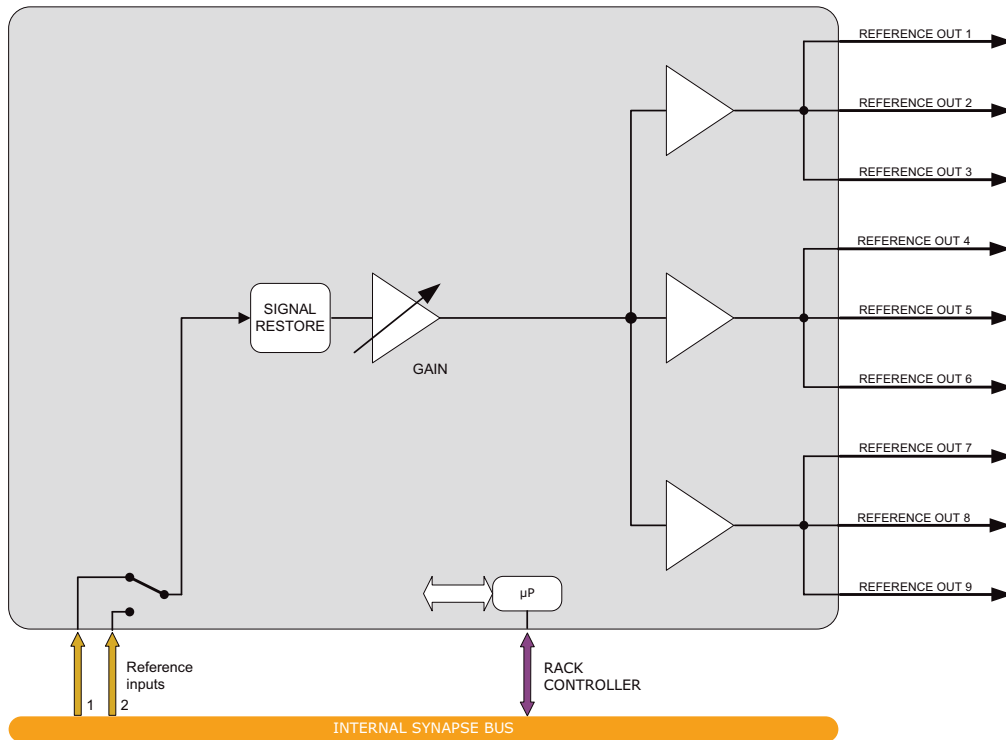
Miscellaneous

Weight	Approx. 250g
Operating temperature	0° C to +50° C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<5 Watts

CDV29



NEW

CDV29 Reference (B&B / Tri-Level) distribution amplifier with 9 outputs and Synapse reference inputs

The CDV29 is a basic analog distribution amplifier providing 9 buffered outputs via the use of the internal Synapse Reference distribution system.

- 9 outputs
- Adjustable input gain
- DC restored
- Compatible with Tri-Level sync
- +/- 6dB gain adjustment
- Input status detection
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

The CDV29 is designed for applications where a cost effective analog Tri-level or Bi-level (B&B) distribution is needed. The straightforward design enables easy installation and reliable operation.

- Tri-level sync distribution

Ordering information

Module:

- **CDV29:** Analog video distribution amplifier with 9 outputs and Synapse reference inputs

Standard I/O:

- **BPL01_CDV29:** I/O panel for CDV29

REFERENCE OUTPUT 1
REFERENCE OUTPUT 2
REFERENCE OUTPUT 3
REFERENCE OUTPUT 4
REFERENCE OUTPUT 5
REFERENCE OUTPUT 6
REFERENCE OUTPUT 7
REFERENCE OUTPUT 8
REFERENCE OUTPUT 9



BPL01

Specifications

Reference input through RRC

Number of inputs	2 on SFR18, 2 on SFR18 and 1 on SFR04
Input levels	700 mV. White to black. nominal 1 V sync tip to white. 75 Ohms terminated through loop
Return loss	Measured with Mini Circuits ZFDC-15-6-75 > 40 dB, @ 5 MHz > 36 dB, @ 15 MHz > 28 dB, @ 30 MHz 75 Ohms terminated

Analog outputs with BPL01 (9x)

Number of outputs	9
Output levels	1 V sync tip to white, 75 Ohms terminated
Return loss	Measured with Mini Circuits ZFDC-15-6-75 > 37 dB, @ 5 MHz > 34 dB, @ 15 MHz > 29 dB, @ 30 MHz. Other outputs 75 Ohms terminated

Performance

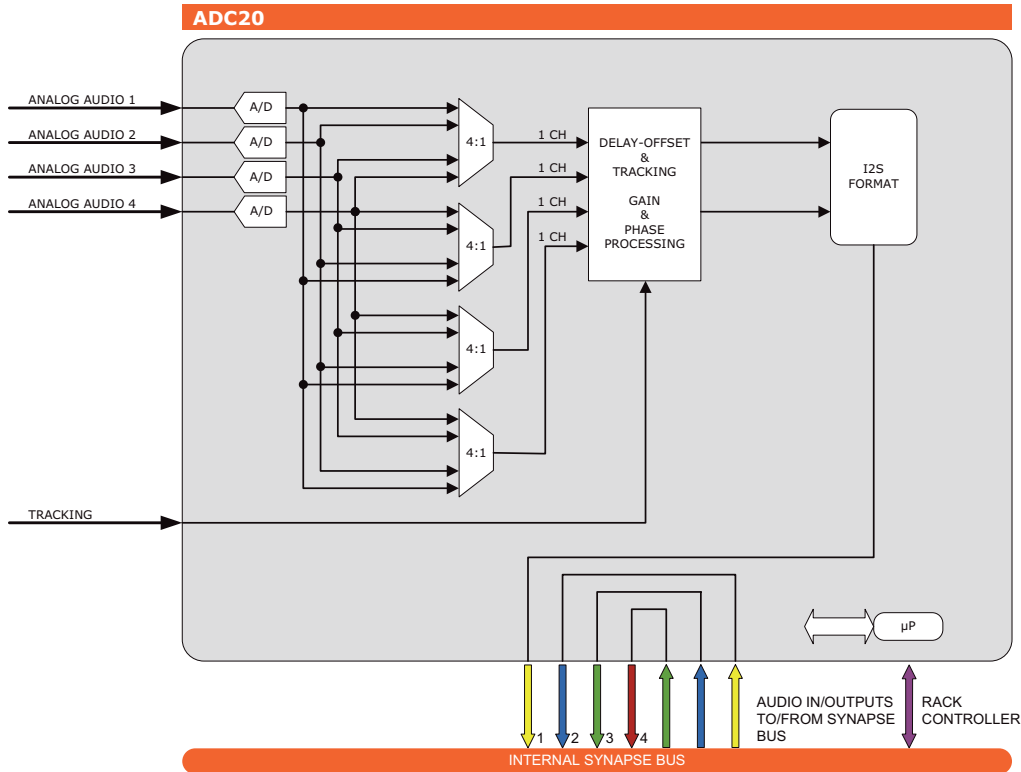
Frequency response	within 0,4 dB, 0 to 5 MHz.
Signal to noise ratio	66.5 dB. 10KHz to 6MHz, Tektronix VM700T
Bar tilt	0,1 %
Gain stability	1%

Miscellaneous

Weight	Approx. 250g
Operating temperature	0° C to +50° C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<4 Watts



ADC20 4 channel Analog audio input Synapse ADD-ON card

The ADC20 is an analog audio to digital audio converter with tracking delay and delay offset. The delay offset range is from 0 ms up to 5200 ms at 48 kHz. This card can only be used as an ADD-ON card. In this mode the card is set to embed audio signals and acts as an Analog input board that feeds a master card positioned to the left, with embedding functionality. The SEB10, for example, can perform an embedding function with the ADC20 as its input card. The ADC20 converts the analog audio into AES/EBU signals and puts it on the Synapse bus. The signals can be embedded into the SDI data stream. Other cards with an embedding function are: ASV08, ASV12, ASV22, HFS11 and more. The compatible cards of this product can be recognized by a yellow arrow pointing towards the block schematic.

- 24-bit audio conversion
- 48k sampling locked to Master Card
- Tracking audio delay
- Adjustable audio delay offset up to 5200ms in 1ms increments
- Phoenix or sub-D input connectors
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Input channel swapping
- Analog reference levels adjustable for 12, 15, 18 and 24dBu (software)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary card to:

- SFS11, HFS11
- SEB10, SEB11, SEB20, HEB20
- ASV08, ASV12, ASV22, ASM10
- All embedding master cards

Applications

The ADC20 is a generic analog audio ADD-ON card for dedicated Synapse master cards that have an embedding function.

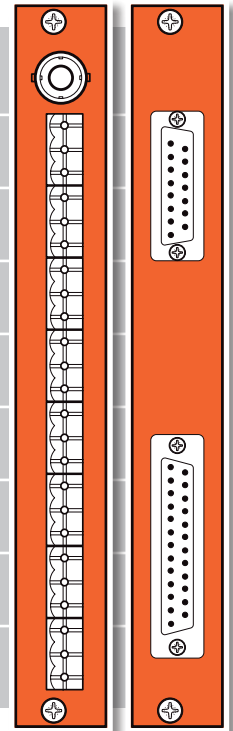
Ordering information

Module:

- **ADC20:** 4 channel analog audio input Synapse ADD-ON card

Standard I/O:

- **BPL04_ADC20:**
I/O panel for ADC20 with analog audio input
- **BPL05D_ADC20:**
I/O panel for ADC20 with analog audio in on sub-D



BPL04

BPL05D

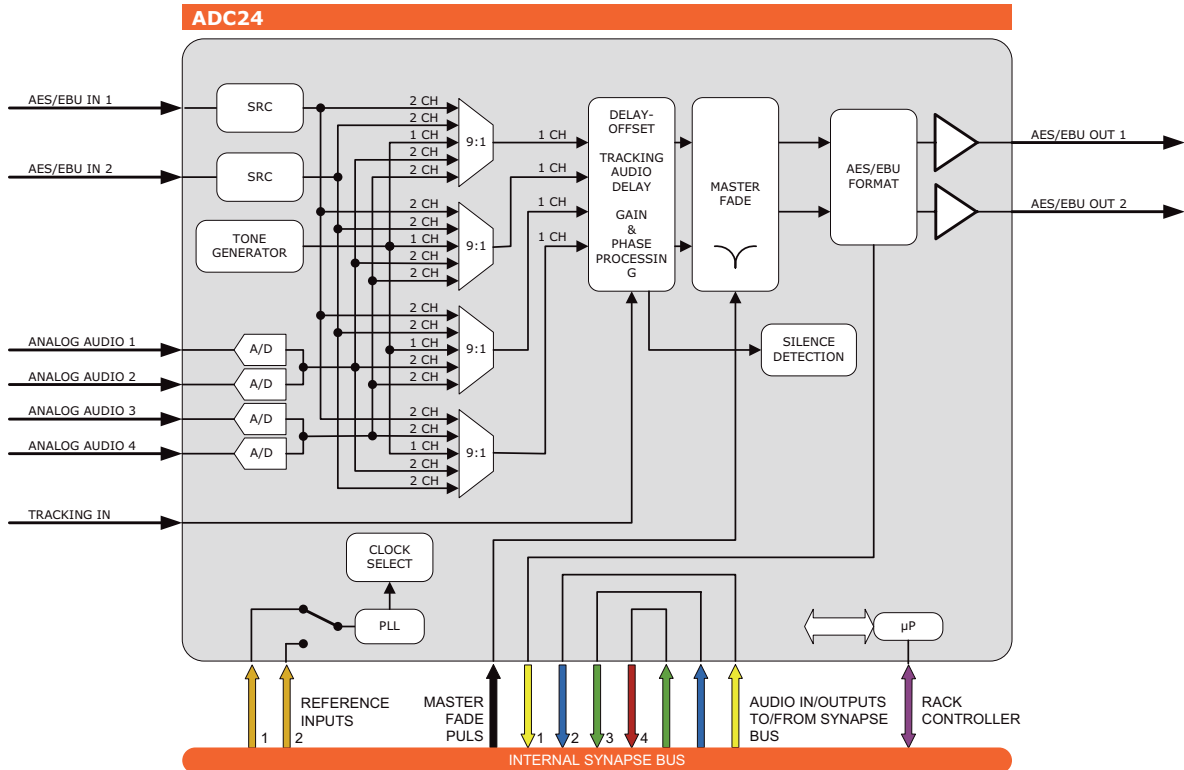
Specifications

Analog audio input

Type	Balanced analog audio
Number of inputs	4
Connector	Removable terminal strip or 15 pins and 25 pins female sub-D
Impedance	10k Ohms nominal (differential)
Sampling rate	48KHz
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Level control range	+12dB to -60dB 0.25dB increments
Frequency response	< ±0.1dB, 20Hz to 20kHz (broadcast quality)
Dynamic range	100dB @-60 dBFS
THD+N	< 0.002% (>96dB) @ 1kHz, -1dB FS < 0.002% (> 96dB) @ 20Hz to 20kHz, -1dB FS
CMRR	> 60dB at 1kHz

Master card output

Number of outputs	2
Connector	NA
Resolution	24 bits
Sampling rate	48KHz synchronous to master video card
Minimum Input/output delay	2.5ms
Maximum Input/output delay	5400 ms
Miscellaneous	
Weight	Approx. 250g
Operating	
Temperature	0° C to +50° C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	8 Watts



ADC24 4 channel 24-bit audio A/D converter with AES/EBU bypass inputs

The ADC24 is a multi-functional product. Its basic function is the conversion of analog audio to AES/EBU digital audio. In addition to the Analog inputs it has AES/EBU inputs with a sample rate converter (SRC). The ADC24 has a tracking audio delay, and a delay offset of up to 650ms at 96kHz or 1300ms at 48kHz. It can also perform the Synapse ADD-ON function. In ADD-ON mode the card acts as an analog or digital audio input board that feeds a master card positioned one slot left of the ADD-ON card. The ADC24 for example acts as an analog audio embedder if used in combination with the ASV12, SFS11 or HFS11 (many more options available). The audio data that enters the Synapse bus to a master card is identical to the data present in the local AES/EBU outputs. The AES/EBU in- and outputs are available on 75 Ohms BNC or 110 Ohms on screw terminals and sub-D connectors. This selection is determined by the type of connector panel.

- 24-bit audio conversion
- Any input to any output selection (This can be a mix of analog and digital signals)
- AES/EBU inputs with selectable SRC (32 to 96kHz sampling)
- 96kHz and 48kHz sample clock locked to: B&B ref or word clock ref. (In ADD-ON, only 48kHz)
- 96kHz and 48kHz sample clock in free running mode (In ADD-ON, only 48kHz)
- Available with 110 Ohms (phoenix or sub-D) or 75 Ohms (BNC) AES/EBU
- In- and outputs analog reference levels adjustable for 12, 15, 18 and 24dBu
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Can be used as a Synapse ADD-ON card
- Adjustable audio delay offset up to 1300ms in 1ms increments (@48kHz)
- Tracking audio delay on dedicated BNC input
- 1kHz tone generator
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary products:

- SFS11, HFS11
- SEB10, SEB11, SEB20, HEB20
- ASV08, ASV12, ASV22, ASM10
- All embedding master cards

Applications

- Stand alone high quality 4 channel Audio A/D conversion
- The ADC24 is also a generic analog and digital audio ADD-ON card for dedicated Synapse master cards that have an embedding function
- AES/EBU proc-amp
- Tone generator for service applications

Ordering information

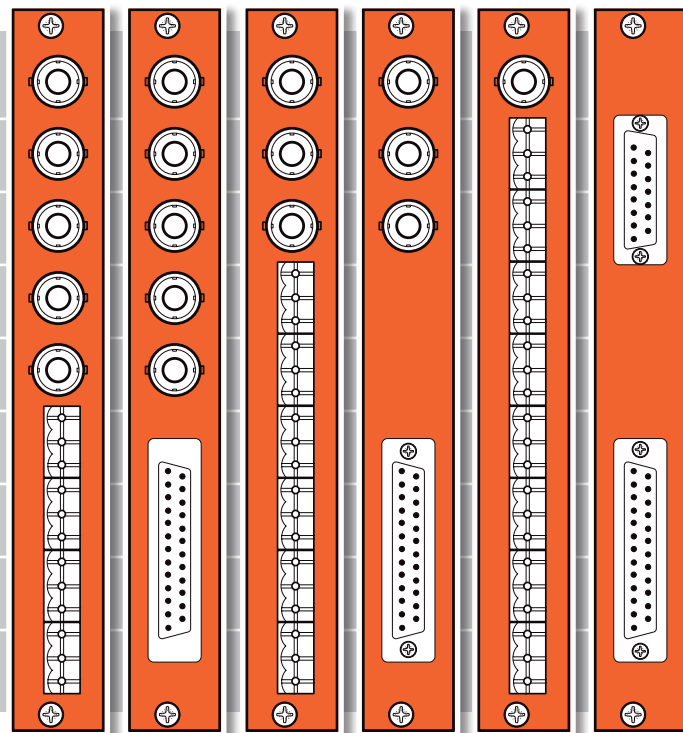
Module:

- **ADC24:** 4 channel 24-bit A/D converter with AES/EBU bypass inputs

Standard I/O:

- **BPL02_ADC24:**
I/O panel for ADC24 with balanced analog audio in, unbalanced AES/EBU in and unbalanced AES/EBU out
- **BPL02D_ADC24:**
I/O panel for ADC24 with balanced analog audio in on sub-D, unbalanced AES/EBU in and unbalanced AES/EBU out
- **BPL03_ADC24:**
I/O panel for ADC24 with balanced analog audio in, balanced AES/EBU out and unbalanced AES/EBU in
- **BPL03D_ADC24:**
I/O panel for ADC24 with balanced analog audio in, balanced AES/EBU out on sub-D and unbalanced AES/EBU in
- **BPL04_ADC24:**
I/O panel for ADC24 with balanced analog audio in, balanced AES/EBU in and balanced AES/EBU out
- **BPL05D_ADC24:**
I/O panel for ADC24 with balanced analog audio in, balanced AES/EBU in, balanced AES/EBU out and tracking on sub-D

TRACKING
AES/EBU INPUT 1
AES/EBU INPUT 2
AES/EBU OUTPUT 1
AES/EBU OUTPUT 2
ANALOG AUDIO INPUT 1
ANALOG AUDIO INPUT 2
ANALOG AUDIO INPUT 3
ANALOG AUDIO INPUT 4



For detailed sub-D connections see the manual

Specifications

Analog audio input

Type	Balanced analog audio
Number of inputs	4
Connector	Removable terminal strip or female sub-D
Impedance	10k Ohms nominal (differential)
Sampling rate	48KHz
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Level control range	+12dB to -60dB 0.25dB increments
Frequency response	< ±0.1dB, 20Hz to 20kHz (broadcast quality)
Dynamic range	100dB @-60 dBFS
THD+N	< 0.002% (>96dB) @ 1kHz, -1dB FS < 0.002% (> 96dB) @ 20Hz to 20kHz, -1dB FS
CMRR	> 60dB at 1kHz

AES audio input

Connector	BNC, Screw terminal or female Sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	32 kHz to 96 kHz Synchronous 48 kHz in Master/ADD-On mode

Resolution	24 bits when AES inputs selected, 20 bits in Master/ADD-On mode
Minimum input/output delay	2.5ms
Number of inputs	2
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

AES audio output

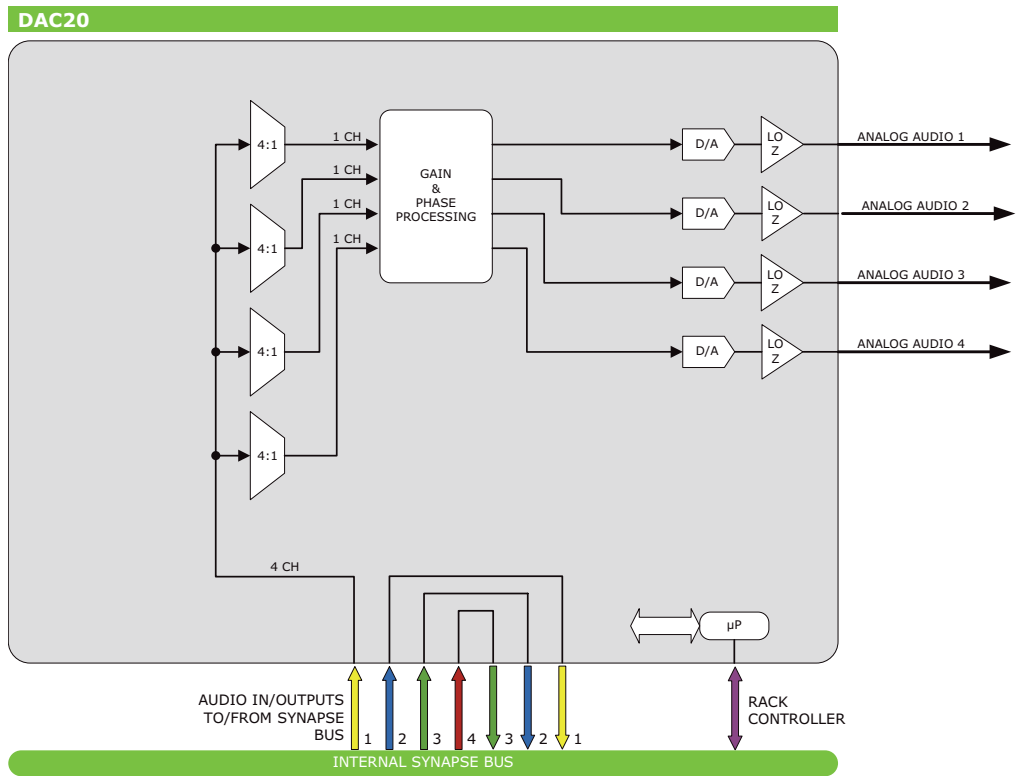
Number of Outputs	2
Connector	BNC, Screw terminal or female Sub-D (balanced)
Resolution	24 bits
Sampling rate	48KHz synchronous
Minimum input/output delay	2.5ms
Maximum input/output delay	1300 ms

Miscellaneous

Weight	Approx. 250g
Operating temperature	0° C to 50° C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<11 Watts



DAC20 4 channel analog audio output ADD-ON card

The DAC20 is an ADD-ON module with analog audio outputs. It has no stand alone function, but is entirely designed to function as an ADD-ON card to the Synapse master cards. The master card is positioned to the left of the DAC20 and is required to have a de-embedding function. Cards that have a de-embedding function are the SDB20, SDB10, SAV10, SFS12/22, HFS12, SAS30, SAS10 etc. These cards can be recognized by a yellow arrow pointing outward the block schematic.

- 24-bit audio D/A conversion
- 48k sampling locked to Master Card
- Phoenix or sub-D output connectors
- Adjustable audio gain (in 0.25dB steps) and phase (0-180 deg)
- Analog reference levels adjustable for 12, 15, 18 and 24dBu (software)
- Input channel swapping
- Clip indication
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary card to:

- SFS12, HFS12
- SDB10, SDB20, HDB20
- SCV12, SAM10
- All de-embedding master cards

Applications

The DAC20 is a generic analog audio ADD-ON card for dedicated Synapse master cards that have a de-embedding function.

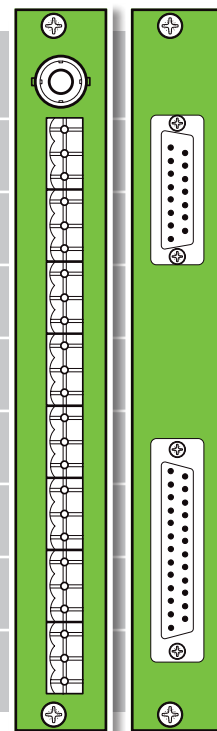
Ordering information

Module:

- **DAC20:** 4 channel analog audio output Synapse ADD-ON card

Standard I/O:

- **BPL04_DAC20:** I/O panel for DAC20 with analog audio out
- **BPL05D_DAC20:** I/O panel for DAC20 with analog audio out on sub-D



BPL04

BPL05D

Specifications

Analog audio input

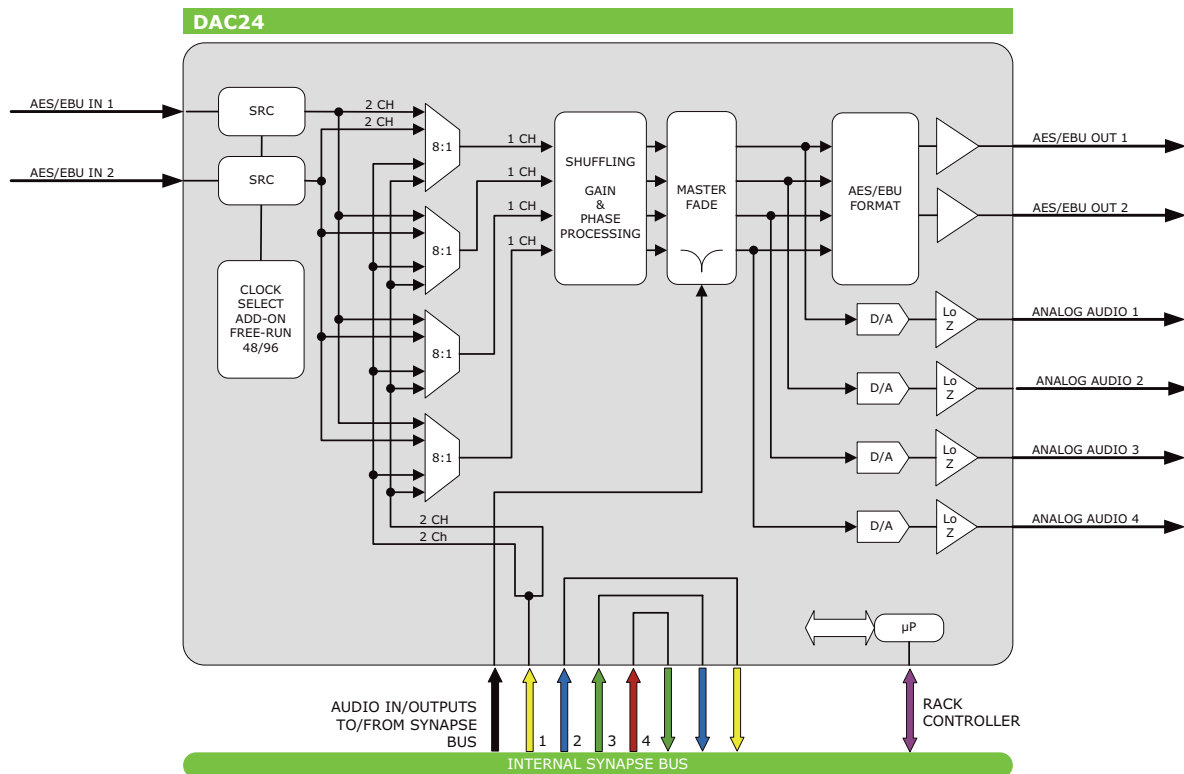
Type	Balanced analog audio
Number of outputs	4
Connector	removable terminal strips or female sub-D
Impedance	50 Ohms balanced
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Frequency response	< ±0.05dB (20Hz to 20kHz)
Gain mismatch	< 0.25 dB @997Hz, -20dBFS Multi channel
Dynamic range	>100 dB @ -60dBFS
THD+N	< 92dB @ 1kHz, -1dBFS
Crosstalk	< -100dB (20Hz to 20kHz)
DC offset	< ±30mV
Dynamic range	> 97dB @-60dBFS

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



DAC24 4 channel 24-bit audio D/A converter with AES/EBU outputs

The DAC24 is a multi-functional product. Its basic function is the conversion of AES/EBU digital audio to analog audio. In addition to the analog outputs it has AES/EBU outputs and offers the Synapse ADD-ON function. In ADD-ON mode the card acts as an input board that is fed by a master card that is positioned one slot left of the ADD-ON card. The DAC24 for example acts as an analog and digital audio de-embedder when used in combination with the AXON SAV12 or SFS12 (more options available see below). The AES/EBU in- and outputs are available on 75 Ohms BNC or 110 Ohms screw terminals and sub-D. This selection is determined by the type of connector panel. The BPL02 has 75 Ohms AES/EBU in- and outputs. The user has control over channel selection/swapping, and gain and phase control of all 4 audio channels.

- 24-bit audio conversion
- Additional AES/EBU outputs
- 96kHz and 48kHz sample clock locked to: B&B ref or word clock ref. (in ADD-ON, only 48kHz)
- 96kHz and 48kHz sample clock in free running mode (In ADD-ON, only 48kHz)
- Available with 110 Ohms (phoenix or sub-D) or 75 Ohms (BNC) AES/EBU
- Output analog reference levels adjustable for 12, 15, 18 and 24dBu
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Can be used as a Synapse ADD-ON card
- Individual selection of each mono channel out of the AES/EBU domain
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary card to:

- SFS12, HFS12
- SDB10, SDB20, HDB20
- SCV12, SAM10, HSU10, HSU20, 2HS10
- All de-embedding master cards

Applications

- Generic audio D/A converter, with AES/EBU processed outputs
- ADD-ON D/A converter next to Synapse de-embedding products

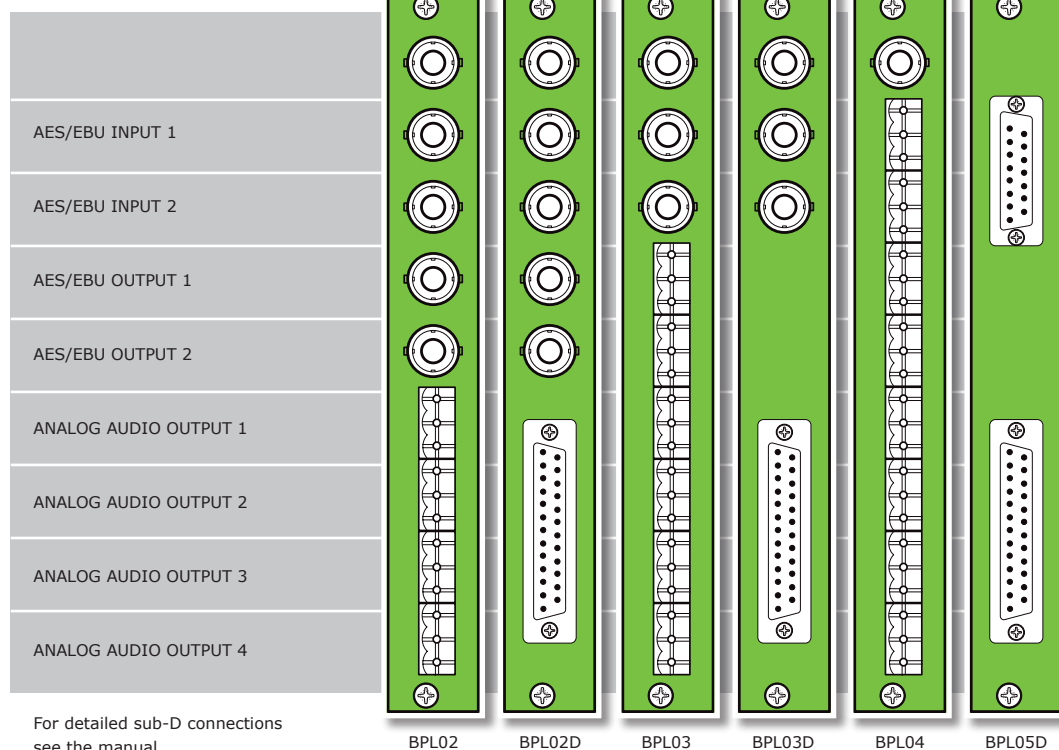
Ordering information

Module:

- **DAC24:** 4 channel 24 bit audio D/A converter with AES/EBU outputs

Standard I/O:

- **BPL02_DAC24:**
I/O panel for DAC24 with balanced analog audio out, unbalanced AES/EBU in and unbalanced AES/EBU out
- **BPL02D_DAC24:**
I/O panel for DAC24 with balanced analog audio out on sub-D, unbalanced AES/EBU in and unbalanced AES/EBU out
- **BPL03_DAC24:**
I/O panel for DAC24 with balanced analog audio out, balanced AES/EBU out and unbalanced AES/EBU in
- **BPL03D_DAC24:**
I/O panel for DAC24 with balanced analog audio out, balanced AES/EBU out on sub-D and unbalanced AES/EBU in
- **BPL04_DAC24:**
I/O panel for DAC24 with balanced analog audio out, balanced AES/EBU in and balanced AES/EBU out
- **BPL05D_DAC24:**
I/O panel for DAC24 with balanced analog audio out, balanced AES/EBU in, balanced AES/EBU out on sub-D and tracking



Specifications

AES audio input

Connector	BNC, Screw terminal or female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	32 kHz to 96 kHz Synchronous 48 kHz in Master/ADD-On mode
Resolution	24 bits when AES inputs selected, 20 bits in Master/ADD-On mode
Minimum input/output delay	2.5ms
Number of inputs	2
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation
Minimum input/output delay	3.5ms

Analog audio output

Type	Balanced analog audio
Number of outputs	4
Connector	removable terminal strips or female sub-D
Impedance	50 Ohms balanced
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu

Frequency response

response	< ±0.05dB (20Hz to 20kHz)
Gain mismatch	< 0.25 dB @997Hz, -20dBFS Multi channel
Dynamic range	>100 dB @ -60dBFS
THD+N	< 92dB @ 1kHz, -1dBFS
Crosstalk	< -100dB (20Hz to 20kHz)
DC offset	< ±30mV
Dynamic range	> 97dB @-60dBFS

AES audio output

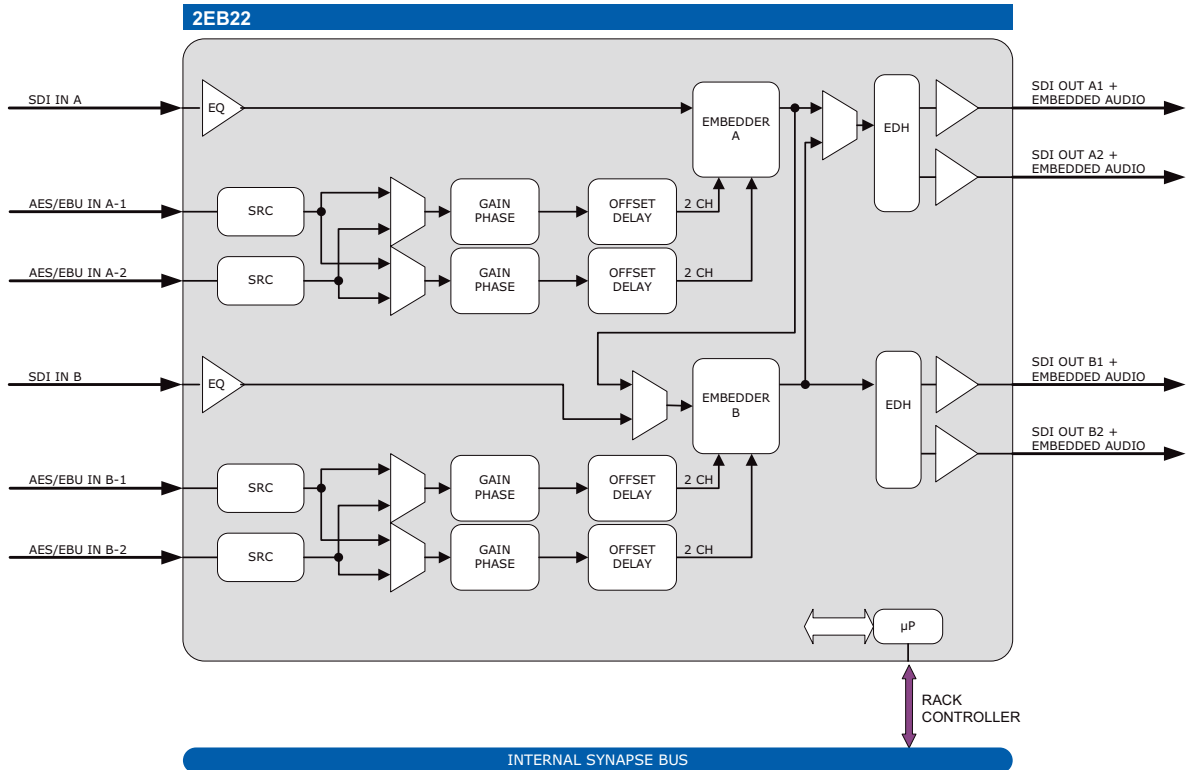
Number of outputs	2
Connector	BNC, Screw terminal or female sub-D (balanced)
Resolution	24 bits
Sampling rate	48 or 96kHz synchronous or free running
Minimum input/output delay	1 ms

Miscellaneous

Weight	Approx. 250g
Operating temperature	0° C to +50° C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<12 Watts



2EB22 Dual 4 channel digital audio embedder

The 2EB22 contains two fully independent digital audio embedders. This card allows for 36 embedders in 4 Rack Units, and has its counterpart in the mirror image 2DB22. The AES/EBU inputs can handle sample rates between 32 and 96 kHz. This SRC can be by-passed for Dolby E or other transparent applications.

- 2 x 2 AES/EBU inputs
- Sample rate converter
- 110 Ohm balanced digital audio inputs on sub-D
- 2 x 2 embedded SDI output
- Single channel mode for embedding 4 x AES/EBU signals on a single SDI
- Audio level and phase control
- Append and overwrite modes
- Individual audio channel delay up to 2600ms in 1 ms intervals
- SRC on AES inputs with transparent (bypass) mode
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

Applications

- Generic multi channel digital audio embedding
- 2 group (4 x AES/EBU) embedding
- High density applications as in OB-Trucks

Ordering information

Module:

- **2EB22:** Dual 4 channel digital audio embedder

Standard I/O:

- **BPL12T2_FC/PC_2EB22:**
I/O panel for 2EB22 with 2 fiber transmitters on FC/PC
- **BPL12T2_SC_2EB22:**
I/O panel for 2EB22 with 2 fiber transmitters on SC

Fiber inputs:

- **BPL12R2_FC/PC_2EB22:**
I/O panel for 2EB22 with 2 fiber receivers on FC/PC
- **BPL12R2_SC_2EB22:**
I/O panel for 2EB22 with 2 fiber receivers on SC

CVBS outputs:

- **BPL12C2_2EB22:**
I/O panel for 2EB22 with 2 CVBS output

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1 EMBEDDED
SDI OUTPUT A-2 EMBEDDED (OPTIONAL FIBER OR CVBS OUTPUT)
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1 EMBEDDED
SDI OUTPUT B-2 EMBEDDED (OPTIONAL FIBER OR CVBS OUTPUT)
BALANCED DIGITAL AUDIO INPUT

For fiber connectivity see www.axon.tv



BPL12

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4 (2 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

AES Input

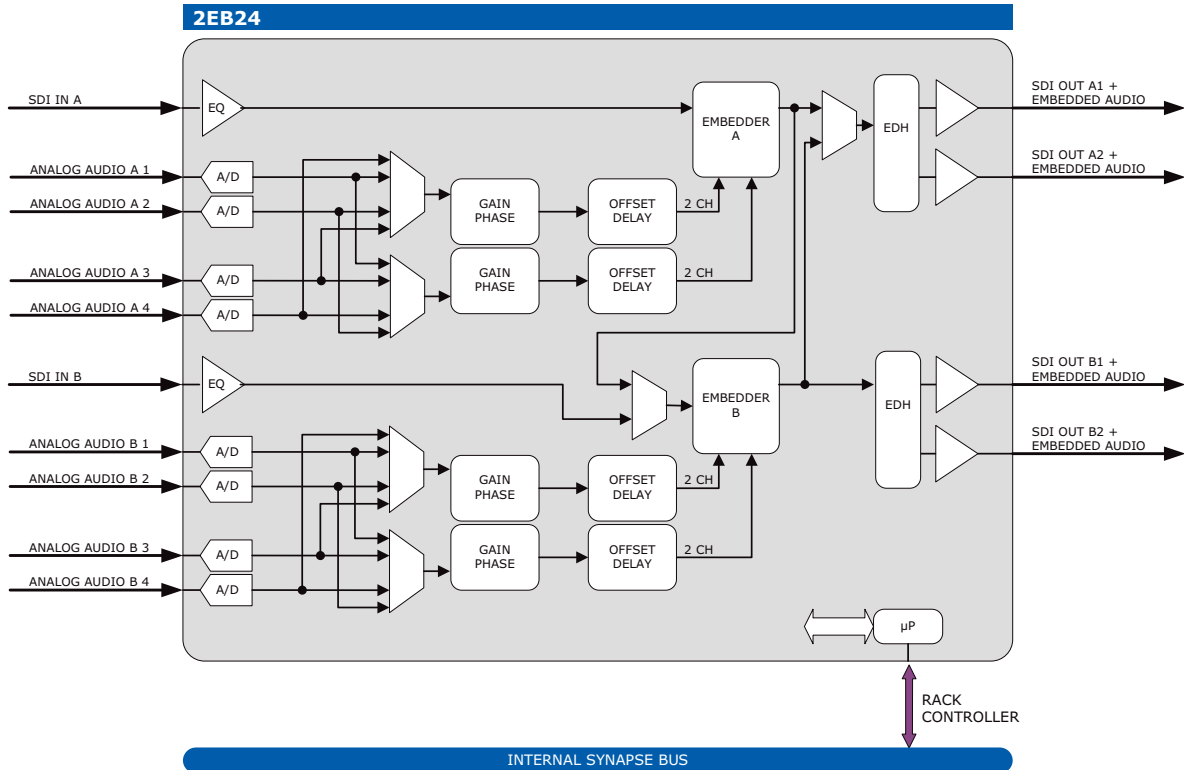
Inputs	4 (2 per channel)
Connector	26 pins female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES
Input Level	2V to 7V for balanced operation
Coupling	Transformer
Impedance	110 Ohms
Sampling	
Frequency	32kHz to 96kHz or 48kHz locked to video SRC=off

Miscellaneous

Weight	Approx. 250g
Operating temperature	0° C to +50° C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	7 Watts



2EB24 Dual 4 channel analog audio embedder

The 2EB24 contains two fully independent analog audio embedders. This card allows for 36 embedders in 4 Rack Units, and has its counterpart in the mirror image 2DB24. The Analog inputs can handle up to +24dBu and are converted to digital through 24-bit high quality A/D converters.

- 2 x 4 Analog audio inputs
- Analog audio on sub-D
- 2 x 2 embedded SDI output
- Single channel mode for embedding 8 analog audio signals on a single SDI
- Audio level and phase control
- +24 dBu, +18 dBu, + 15 dBu and +12 dBu Analog input levels for 0 dBFS
- Append and overwrite modes
- Individual audio channel delay up to 2600ms in 1 ms intervals
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

Applications

- Generic multi channel analog audio embedding
- 2 group (8 x analog audio) embedding
- High density applications as in OB-Trucks

Ordering information

Module:

- **2EB24:** Dual 4 channel analog audio embedder

Standard I/O:

- **BPL12_2EB24:**
I/O panel for 2EB24

Fiber outputs:

- **BPL12T2_FC/PC_2EB24:**
I/O panel for 2EB24 with 2 fiber transmitters on FC/PC
- **BPL12T2_SC_2EB24:**
I/O panel for 2EB24 with 2 fiber transmitters on SC

Fiber inputs:

- **BPL12R2_FC/PC_2EB24:**
I/O panel for 2EB24 with 2 fiber receivers on FC/PC
- **BPL12R2_SC_2EB24:**
I/O panel for 2EB24 with 2 fiber receivers on SC

CVBS outputs:

- **BPL12C2_2EB24:**
I/O panel for 2EB24 with 2 CVBS outputs

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1 EMBEDDED
SDI OUTPUT A-2 EMBEDDED (OPTIONAL FIBER OR CVBS OUTPUT)
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1 EMBEDDED
SDI OUTPUT B-2 EMBEDDED (OPTIONAL FIBER OR CVBS OUTPUT)
BALANCED ANALOG AUDIO INPUT

For fiber connectivity see www.axon.tv



BPL12

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4 (2 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog audio input

Type	Balanced analog audio
Number of inputs	4 per SDI input (8 in single channel mode)

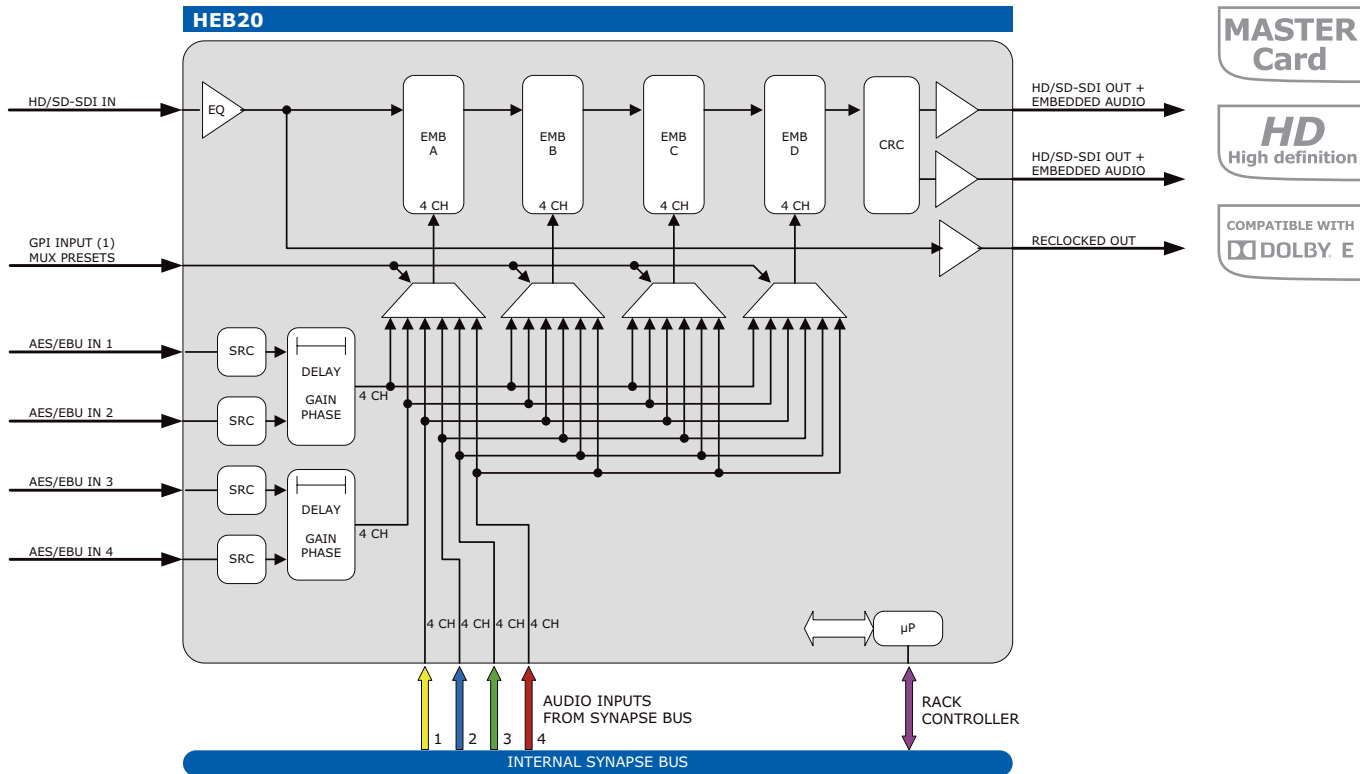
Connector	26 pins female sub-D
Impedance	10 Ohms nominal (differential)
Sampling rate	48KHz
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Level control range	+12dB to -60dB 0.25dB increments
Frequency response	< ±0.1dB, 20Hz to 20kHz (broadcast quality)
Dynamic range	100dB @ -60 dBFS
THD+N	< 0.002% (>96dB) @ 1kHz, -1dB FS < 0.002% (> 96dB) @ 20Hz to 20kHz, -1dB FS
CMRR	> 60dB at 1kHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<12 Watts



HEB20 Dual HD/SD preset based audio embedder

The HEB20 is an HD SDI and SD SDI digital audio embedder. It is capable of inserting or appending 4 free-running AES/EBU digital audio channels (8 channels). The core of the HEB20 consists of four embedder-blocks Emb_A, Emb_B and Emb_C and Emb_D. Each block is capable of embedding 4 audio channels into one group, which gives a total of 16 audio channels into four groups. In addition, four ADD-ON cards can be connected to create a routing matrix. One ADD-ON card is needed to get 16 embedded channels (DIO48). The architecture of Emb_A to Emb_D blocks is identical. The local inputs have the opportunity to do additional Phase and Gain corrections (on the fly). The HEB20 has two HD-SDI processed outputs and 4 local AES/EBU inputs.

- 4 AES/EBU inputs with sample rate converter (available with 110 Ohm and 75 Ohm inputs)
- 4 extra AES/EBU inputs through the Synapse bus
- 1 x relocked HD SDI output
- 2 x HD SDI + embedded audio outputs
- 8 presets that configure all 16 input channels at once. One controlled by closing of BNC 5
- Audio level and phase control (local inputs only)
- Audio offset delay (local inputs only) up to 2600 ms
- 8 extra audio channels (2 groups) with ADD-ON card
- Peak detection 0, -6, -12 and -18dBFS
- Silence detection with threshold (-100 to -20dBFS) and time control (1 to 255 sec)
- Transparent for ATC time code RP188, RP196, RP215
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- HD/SD audio embedding
- Preset based 8 channel audio embedding
- Preset based 16 channel audio embedding with DIO48 ADD-ON card

Ordering information

Module:

- **HDB20:** HD/SD preset based audio de-embedder

Standard I/O:

- **BPH01_HEB20:**
I/O-panel for HEB20 with unbalanced AES/EBU in
- **BPH02_HEB20:**
Rear connector for HEB20 with balanced AES/EBU in
- **BPH02D_HEB20:**
I/O-panel for HEB20 with balanced AES/EBU in on sub-D

Fiber outputs:

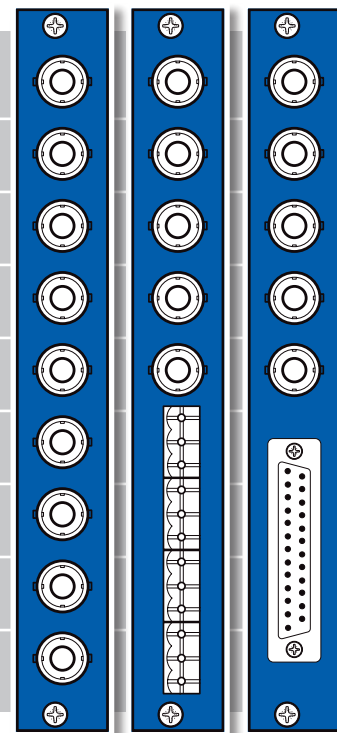
- **BPH01T_FC/PC_HEB20:**
I/O-panel HEB20 with fiber transmitter on FC/PC
- **BPH01T_SC_HEB20:**
I/O-panel for HEB20 with fiber transmitter on SC
- **BPH02T_FC/PC_HEB20:**
I/O-panel for HEB20 with fiber transmitter on FC/PC
- **BPH02T_SC_HEB20:**
I/O-panel for HEB20 with fiber transmitter on SC
- **BPH02DT_FC/PC_HEB20:**
I/O-panel for HEB20 with fiber transmitter on FC/PC
- **BPH02DT_SC_HEB20:**
I/O-panel for HEB20 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HEB20:**
I/O-panel for HEB20 with fiber receiver on FC/PC
- **BPH01R_SC_HEB20:** I/O-panel for HEB20 with fiber receiver on SC
- **BPH02R_FC/PC_HEB20:**
I/O-panel for HEB20 with fiber receiver on FC/PC
- **BPH02R_SC_HEB20:** I/O-panel for HEB20 with fiber receiver on SC
- **BPH02DR_FC/PC_HEB20:**
I/O-panel for HEB20 with fiber receiver on FC/PC
- **BPH02DR_SC_HEB20:**
I/O-panel for HEB20 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROC. OUTPUT 2 (OPTIONAL FIBER OUTPUT)
GPI (MUX PRESETS) INPUT
AES/EBU INPUT 1
AES/EBU INPUT 2
AES/EBU INPUT 3
AES/EBU INPUT 4

For fiber connectivity see www.axon.tv



BPH01

BPH02

BPH02D

Specifications

HD/SD serial video input

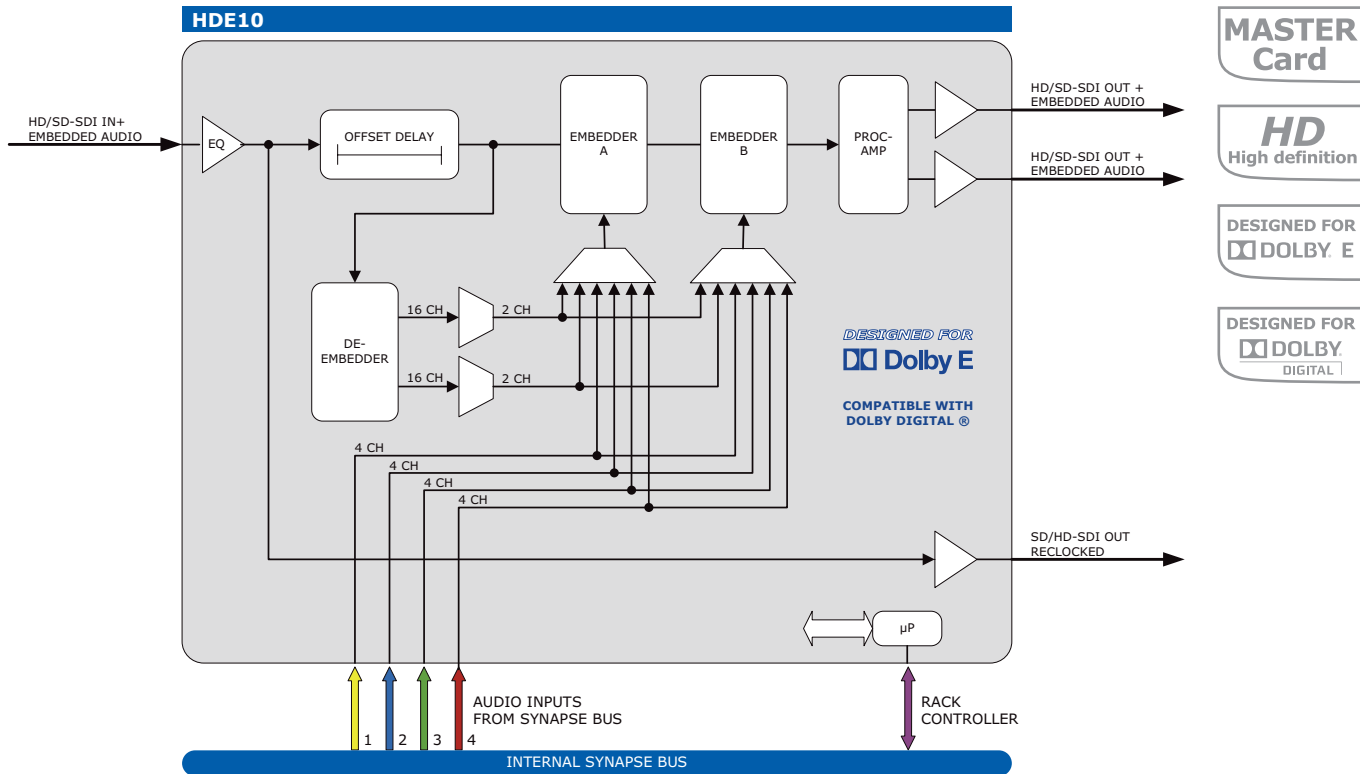
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

AES audio input

Connector	BNC, Screw terminal or 25 pins female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	4
Sampling rate	32 kHz to 96 kHz A-Synchronous via SRC and 48 kHz Synchronous in transparent mode (Dolby E)
Resolution	24 bits in HD, 20 bits in SD
Minimum input/output delay	1 ms
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation
Miscellaneous	
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<8 Watts



HDE10 HD/SD Dolby E/Dolby Digital embedder

The HDE10 is a master card especially designed to be used in combination with the Synapse Dolby E encoder the DBE08, and the Dolby Digital Encoder DDE51. The propagation delay of the HD/SD-SDI is adjustable to Dolby E or Dolby Digital encoders. The HDE10 has a dual (2 channel) de-embedder that can be used to re-insert program channel 1 and 2. On 3 and 4 the unit can embed Dolby-E or Dolby Digital. A second embedder block can embed a full extra group.

- Master card with embedding functionality designed for Dolby E and Dolby Digital
- PCM and Dolby E transparency
- Built-in de-embedder for re-insertion of existing embedded audio
- Up to 8 frame HD/SD propagation delay for use with Dolby Digital encoders
- Automatic Dolby E propagation delay compensation
- Compatible with 4 PCM/Dolby E streams
- Append and overwrite modes
- Any 4 channels out of all 16 embedded channels can be re-inserted into the SDI stream
- Built-in proc amp
- Transparent for ATC time code RP188, RP196, RP215
- Full control and status monitoring through the front panel of the SFR04/SFR08/18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Dolby Digital embedding with correct lip-sync video propagation delay
- Dolby E embedding with correct lip-sync video propagation delay
- Embedding of external Dolby Digital + one stereo embedded pair into the same group, and 2 external AES pairs (requires a DDE51 and DIO24)

Ordering information

Module:

- **HDE10:** HD/SD Dolby E/Dolby Digital embedder (master card)

Standard I/O:

- **BPH01_HDE10:**
I/O panel for HDE10

Fiber outputs:

- **BPH01T_FC/PC_HDE10:**
I/O panel for HDE10 with fiber transmitter on FC/PC
- **BPH01T_SC_HDE10:**
I/O panel for HDE10 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HDE10:**
I/O panel for HDE10 with fiber receiver on FC/PC
- **BPH01R_SC_HDE10:**
I/O panel for HDE10 with fiber receiver on SC

HD/SD-SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD-SDI RECLOCKED OUTPUT
HD SDI PROCESSED OUTPUT 1
HD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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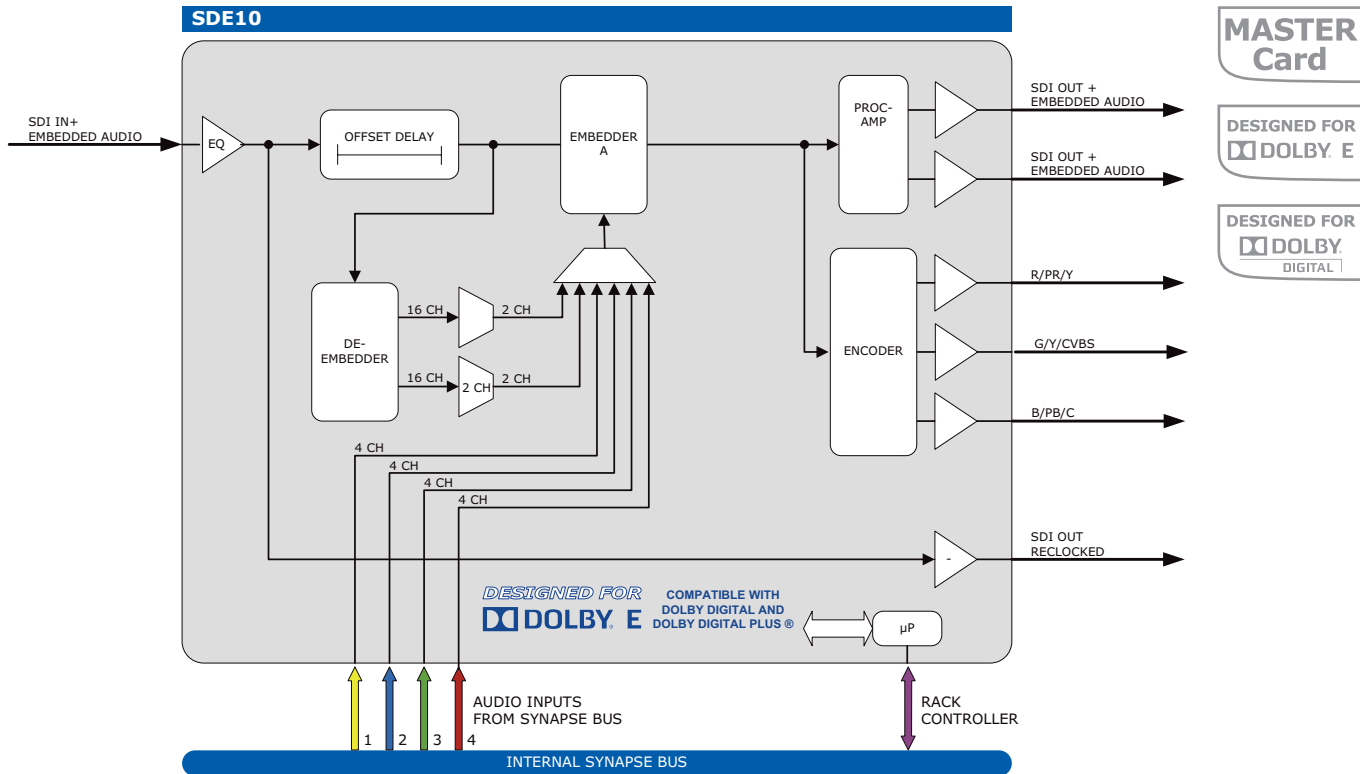
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



SDE10 SD Dolby E/Dolby Digital embedder

The SDE10 is a master card especially designed to be used in combination with the Synapse Dolby E encoder the DBE08 or the Dolby Digital encoder DDE51. The propagation delay of the SDI is adjustable to Dolby E or Dolby Digital encoders. The SDE10 has a dual (2 channel) de-embedder that can be used to re-insert program channel 1/2. On 3/4 the unit can embed Dolby-E or Dolby Digital.

- Master card with embedding functionality designed for Dolby E and Dolby Digital
- PCM and Dolby E transparency
- Built-in de-embedder for re-insertion of existing embedded audio
- Up to 24 frame SD propagation delay for use with Dolby Digital encoders
- Automatic Dolby E propagation delay compensation
- Compatible with 2 PCM/Dolby E streams
- Append and overwrite modes
- Any 4 channels out of all 16 embedded channels can be re-inserted into the SDI stream
- Analog component, RGB or CVBS+YC output
- Full control and status monitoring through the front panel of the SFR04/18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Complementary cards:

- DBE08, DDE51, DIO24

Applications

- Dolby Digital embedding with correct lip-sync video propagation delay
- Dolby E embedding with correct lip-sync video propagation delay
- Embedding of external Dolby Digital + one stereo embedded pair into the same group

Ordering information

Module:

- **SDE10:** SD Dolby E / Dolby Digital embedder

Standard I/O:

- **BPL01_SDE10:**
I/O panel for SDE10
- **BPX01_SDE10:**
I/O panel for SDE10 with relay bypass

Fiber outputs:

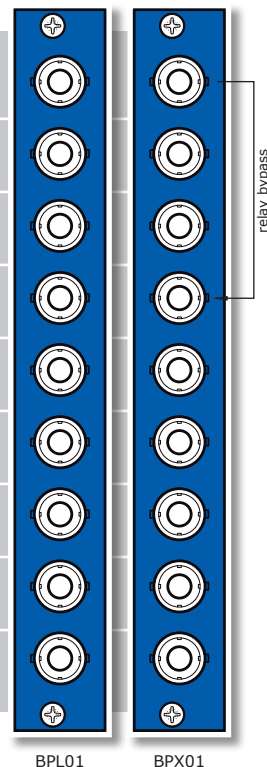
- **BPL01T_FC/PC_SDE10:**
I/O panel for SDE10 with fiber transmitter on FC/PC
- **BPL01T_SC_SDE10:**
I/O panel for SDE10 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_SDE10:**
I/O panel for SDE10 with fiber receiver on FC/PC
- **BPL01R_SC_SDE10:**
I/O panel for SDE10 with fiber receiver on SC

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT
SDI PROCESSED OUTPUT 1
SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
G/Y/CVBS OUTPUT
B/PB/Y OUTPUT
R/PR/C OUTPUT

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX01
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (2 processed and 1 reclocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Analog video output

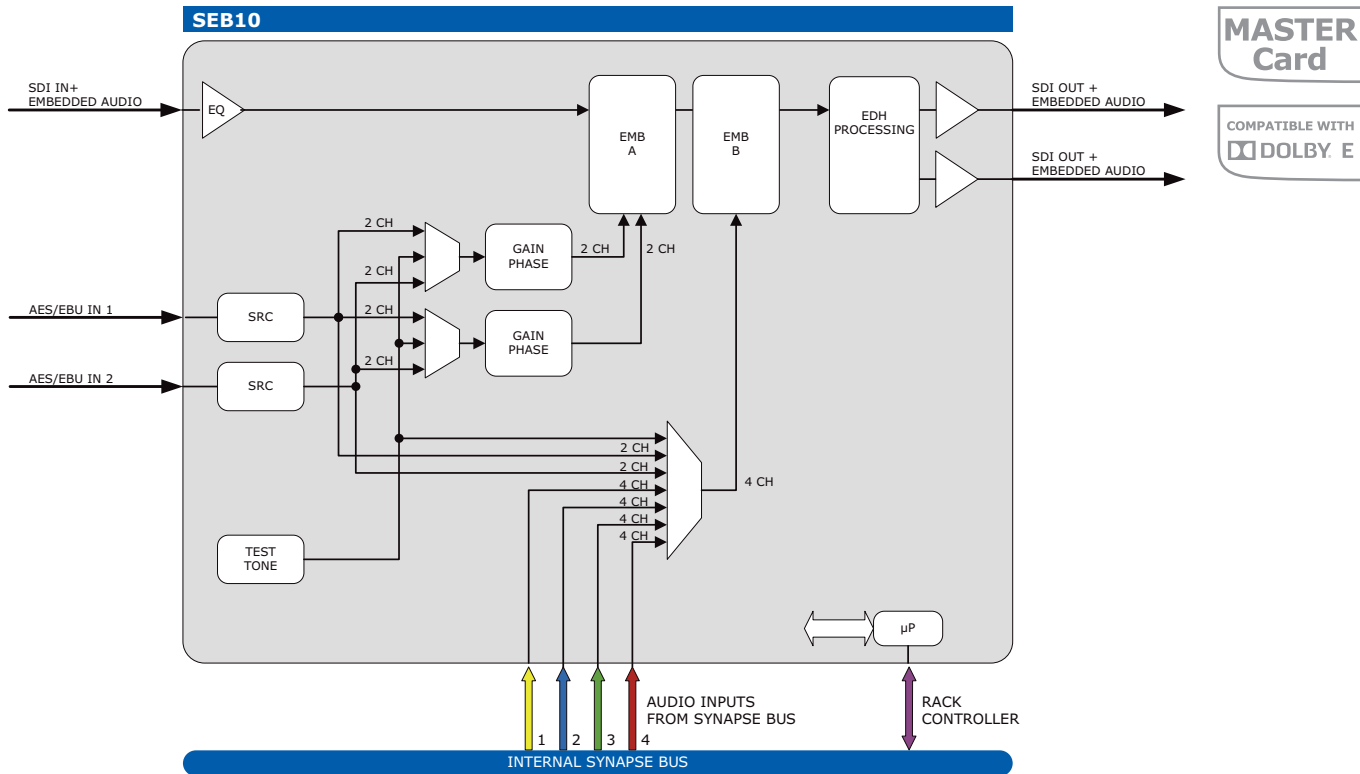
Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component and RGB
Number of outputs	3
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



SEB10 SD-SDI 4 channel (2 AES/EBU) digital audio embedder

The SEB10 is a digital audio embedder with 2 local AES/EBU inputs and the possibility to add 4 extra channels through the Synapse ADD-ON bus. The inputs can have a sample rate of 32 to 96 kHz by using the built-in sample rate converter. For Dolby-E and other transparent applications the SRC can be by-passed. 4 AES/EBU inputs with sample rate converter (available with 110 Ohms and 75 Ohms inputs).

- group embedder (1 local 1 ADD-ON)
- Sample Rate Converter on AES/EBU input
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- 4 extra audio channels (1 groups) with optional ADC20, ADC24, ADL24, and DIO24
- AES/EBU inputs on 3pole screw terminal or sub-D (110-Ohms) or BNC (75 Ohms)
- Selectable test tone for all stereo inputs (including embedder B)
- EDH detection
- Full control and status monitoring through the front panel of the SFR04/SFR08/18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Generic AES/EBU embedding

Ordering information

Module:

- **SEB10:** SD-SDI 4 channel (2 AES/EBU) digital audio embedder

Standard I/O

- **BPL02_SEB10:** I/O panel for SEB10 with unbalanced AES/EBU in
- **BPL03_SEB10:** I/O panel for SEB10 with balanced AES/EBU in
- **BPL03D_SEB10:** I/O panel for SEB10 with balanced AES/EBU in on sub-D

Fiber outputs:

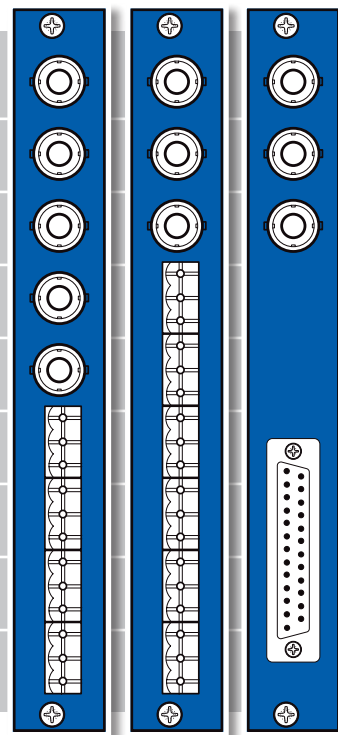
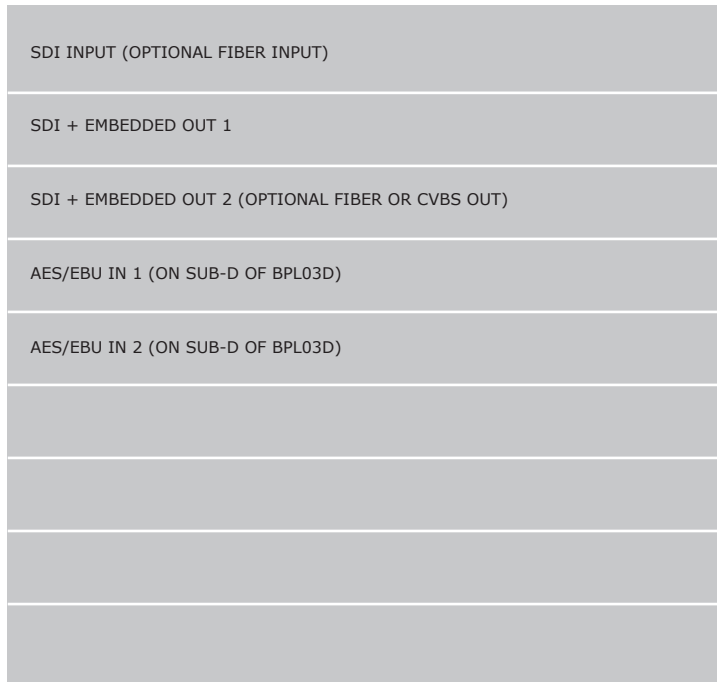
- **BPL02T_FC/PC_SEB10:**
I/O panel for SEB10 with fiber transmitter on FC/PC
- **BPL02T_SC_SEB10:**
I/O panel for SEB10 with fiber transmitter on SC
- **BPL03T_FC/PC_SEB10:**
I/O panel for SEB10 with fiber transmitter on FC/PC
- **BPL03T_SC_SEB10:**
I/O panel for SEB10 with fiber transmitter on SC
- **BPL03DT_FC/PC_SEB10:**
I/O panel for SEB10 with fiber transmitter on FC/PC
- **BPL03DT_SC_SEB10:**
I/O panel for SEB10 with fiber transmitter on SC

Fiber inputs:

- **BPL02R_FC/PC_SEB10:**
I/O panel for SEB10 with fiber receiver on FC/PC
- **BPL02R_SC_SEB10:**
I/O panel for SEB10 with fiber receiver on SC
- **BPL03R_FC/PC_SEB10:**
I/O panel for SEB10 with fiber receiver on FC/PC
- **BPL03R_SC_SEB10:**
I/O panel for SEB10 with fiber receiver on SC
- **BPL03DR_FC/PC_SEB10:**
I/O panel for SEB10 with fiber receiver on FC/PC
- **BPL03DR_SC_SEB10:**
I/O panel for SEB10 with fiber receiver on SC

CVBS outputs:

- **BPL02C_SEB10:** I/O panel for SEB10 with CVBS output
- **BPL03C_SEB10:** I/O panel for SEB10 with CVBS output
- **BPL03DC_SEB10:** I/O panel for SEB10 with CVBS output



BPL02 BPL03 BPL03D

For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

AES input

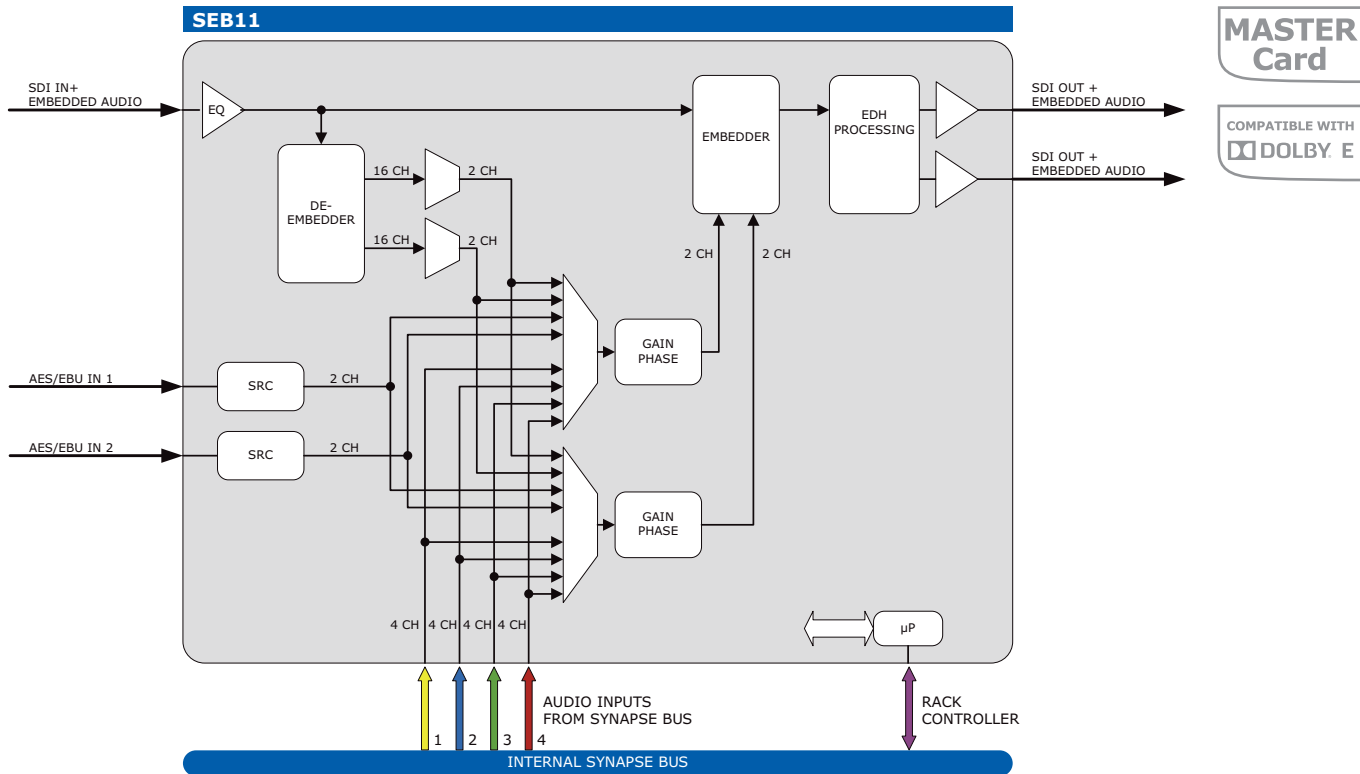
Connector	BNC, Screw terminal or Sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	32 kHz to 96 kHz asynchronous 48 kHz Synchronous (SRC=off)
Resolution	20 bits
Minimum input/output delay	2 ms
Number of inputs	2
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



SEB11 SD-SDI 4 channel (2 AES/EBU) digital audio embedder with 4 channel de-embedder, re-insertion unit

The SEB11 is a digital audio embedder with the possibility to add a stereo pair to an existing audio group. This is possible through a built-in de-embedder which outputs can be selected in the input multiplexer of the main embedder. The inputs can have a sample rate of 32 to 96 kHz by using the built-in sample rate converter. For Dolby-E and other transparent applications the SRC can be by-passed.

- 4 Channel de-embedder with 1 group embedder
- Sample Rate Converter on AES/EBU input
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Swapping and combining of local AES/EBU with embedded and ADD-ON audio channels
- AES/EBU inputs on 3pole screw terminal or sub-D (110 Ohms) or BNC (75 Ohms)
- EDH detection and generation
- Full control and status monitoring through the front panel of the SFR04/18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Adding an AES/EBU channel to an existing group (by de-embedding the audio you want to keep)

Ordering information

Module:

- **SEB11:** SD-SDI 4 channel (2 AES/EBU) digital audio embedder

Standard I/O

- **BPL02_SEB11:** I/O panel for SEB11 with unbalanced AES/EBU in
- **BPL03_SEB11:** I/O panel for SEB11 with balanced AES/EBU in
- **BPL03D_SEB11:** I/O panel for SEB11 with balanced AES/EBU in on sub-D

Fiber outputs:

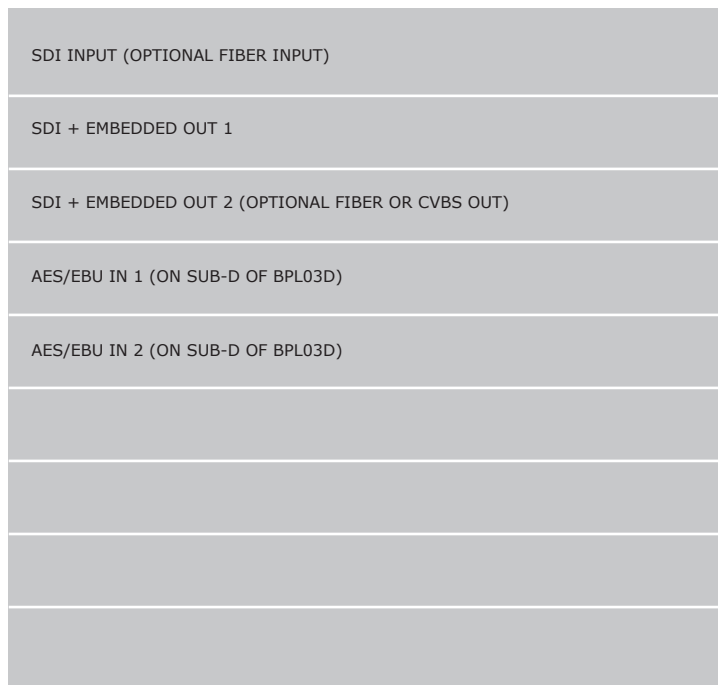
- **BPL02T_FC/PC_SEB11:**
I/O panel for SEB11 with fiber transmitter on FC/PC
- **BPL02T_SC_SEB11:**
I/O panel for SEB11 with fiber transmitter on SC
- **BPL03T_FC/PC_SEB11:**
I/O panel for SEB11 with fiber transmitter on FC/PC
- **BPL03T_SC_SEB11:**
I/O panel for SEB11 with fiber transmitter on SC
- **BPL03DT_FC/PC_SEB11:**
I/O panel for SEB11 with fiber transmitter on FC/PC
- **BPL03DT_SC_SEB11:**
I/O panel for SEB11 with fiber transmitter on SC

Fiber inputs:

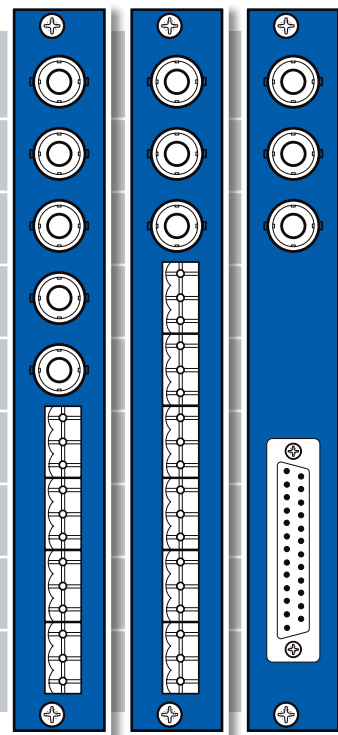
- **BPL02R_FC/PC_SEB11:**
I/O panel for SEB11 with fiber receiver on FC/PC
- **BPL02R_SC_SEB11:**
I/O panel for SEB11 with fiber receiver on SC
- **BPL03R_FC/PC_SEB11:**
I/O panel for SEB11 with fiber receiver on FC/PC
- **BPL03R_SC_SEB11:**
I/O panel for SEB11 with fiber receiver on SC
- **BPL03DR_FC/PC_SEB11:**
I/O panel for SEB11 with fiber receiver on FC/PC
- **BPL03DR_SC_SEB11:**
I/O panel for SEB11 with fiber receiver on SC

CVBS outputs:

- **BPL02C_SEB11:** I/O panel for SEB11 with CVBS output
- **BPL03C_SEB11:** I/O panel for SEB11 with CVBS output
- **BPL03DC_SEB11:** I/O panel for SEB11 with CVBS output



For fiber connectivity see www.axon.tv



BPL02 BPL03 BPL03D

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

AES input

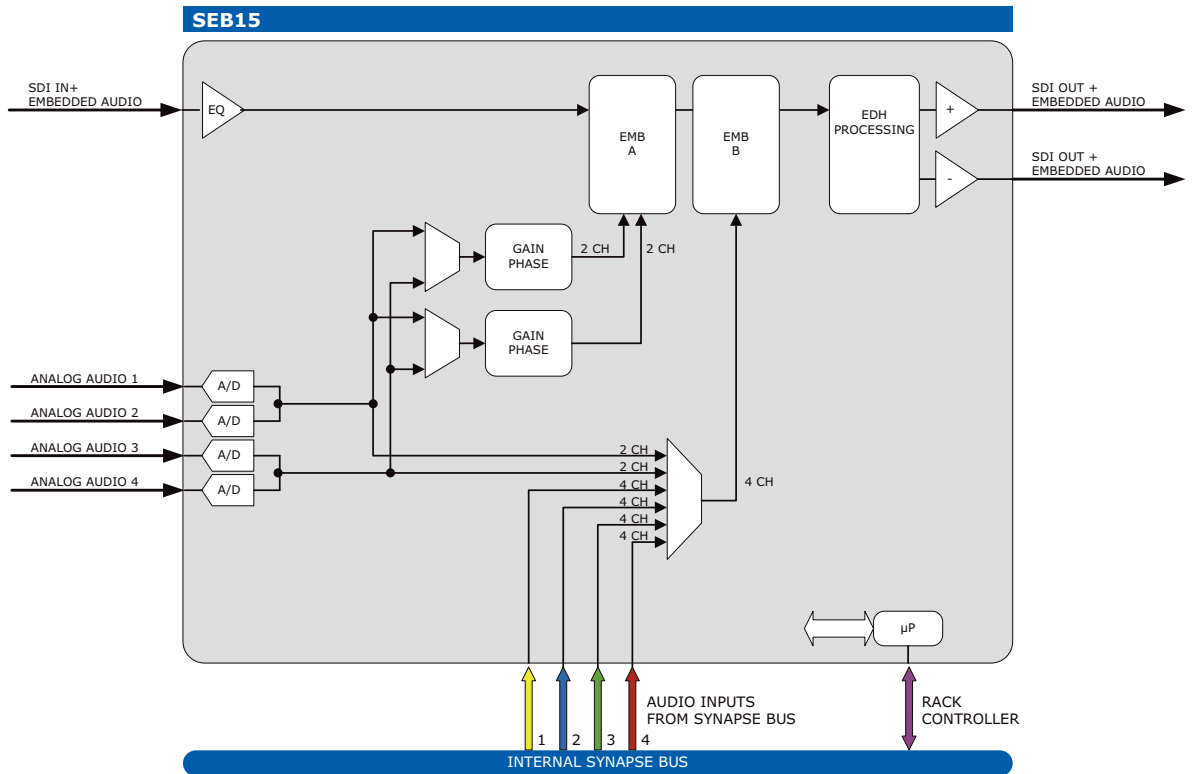
Connector	BNC, Screw terminal or sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	kHz to 96 kHz asynchronous 48 kHz Synchronous (SRC=off)
Resolution	20 bits
Minimum input/output delay	2 ms
Number of inputs	2
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxLxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts

MASTER
Card

SEB15 SD-SDI 4 channel analog audio embedder

The SEB15 is an analog audio embedder with 4 local inputs and the possibility to add 4 extra channels through the Synapse ADD-ON buss. A reference level audio adjustment for the analog audio inputs is provided to optimize the signal to noise ratio for different 0dBFS levels.

- 2 group embedder (1 local 1 ADD-ON)
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Selectable +12, +15, +18 and +24 dBu for 0dBFS
- 4 extra audio channels (1 groups) with optional ADC20, ADC24, ADL24, DBE08 and DIO24
- Analog audio inputs on 3 pole screw terminals or sub-D
- EDH detection and generation
- Full control and status monitoring through the front panel of the SFR04/18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Generic analog audio embedding

Ordering information

Module:

- **SEB15:** SD-SDI 4 channel analog audio embedder

Standard I/O:

- **BPL02_SEB15:** I/O panel for SEB15 with balanced analog audio in
- **BPL02D_SEB15:** I/O panel for SEB15 with balanced analog audio in on sub-D

Fiber inputs:

- **BPL02T_FC/PC_SEB15:** I/O panel for SEB15 with fiber transmitter on FC/PC
- **BPL02T_SC_SEB15:** I/O panel for SEB15 with fiber transmitter on SC
- **BPL02DT_FC/PC_SEB15:** I/O panel for SEB15 with fiber transmitter on FC/PC
- **BPL02DT_SC_SEB15:** I/O panel for SEB15 with fiber transmitter on SC

Fiber outputs:

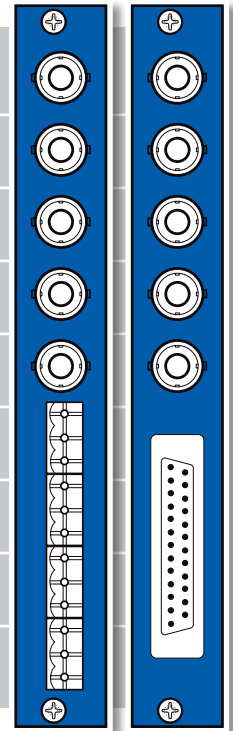
- **BPL02R_FC/PC_SEB15:** I/O panel for SEB15 with fiber receiver on FC/PC
- **BPL02R_SC_SEB15:** I/O panel for SEB15 with fiber receiver on SC
- **BPL02DR_FC/PC_SEB15:** I/O panel for SEB15 with fiber receiver on FC/PC
- **BPL02DR_SC_SEB15:** I/O panel for SEB15 with fiber receiver on SC

CVBS outputs:

- **BPL02C_SEB15:** I/O panel for SEB15 with CVBS output
- **BPL02DC_SEB15:** I/O panel for SEB15 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI + EMBEDDED OUT 1
SDI + EMBEDDED OUT 2 (OPTIONAL FIBER OR CVBS OUT)
ANALOG AUDIO INPUT 1
ANALOG AUDIO INPUT 2
ANALOG AUDIO INPUT 3
ANALOG AUDIO INPUT 4

For fiber connectivity see www.axon.tv



BPL02

BPL02D

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog audio input

Type	Balanced analog audio
Number of inputs	4
Connector	Removable terminal strip or sub-D
Impedance	10k Ohms nominal (differential)
Sampling rate	48KHz

Signal level 0dBFS => 12dBu, 15dBu, 18dBu or 24dBu

Level control range +12dB to -60dB 0.25dB increments

Frequency response < ±0.1dB, 20Hz to 20kHz (broadcast quality)

Dynamic range 100dB @ -60 dBFS

THD+N < 0.002% (>96dB) @ 1kHz, -1dB FS

< 0.004% (> 96dB) @ 20Hz to 20kHz, -1dB FS

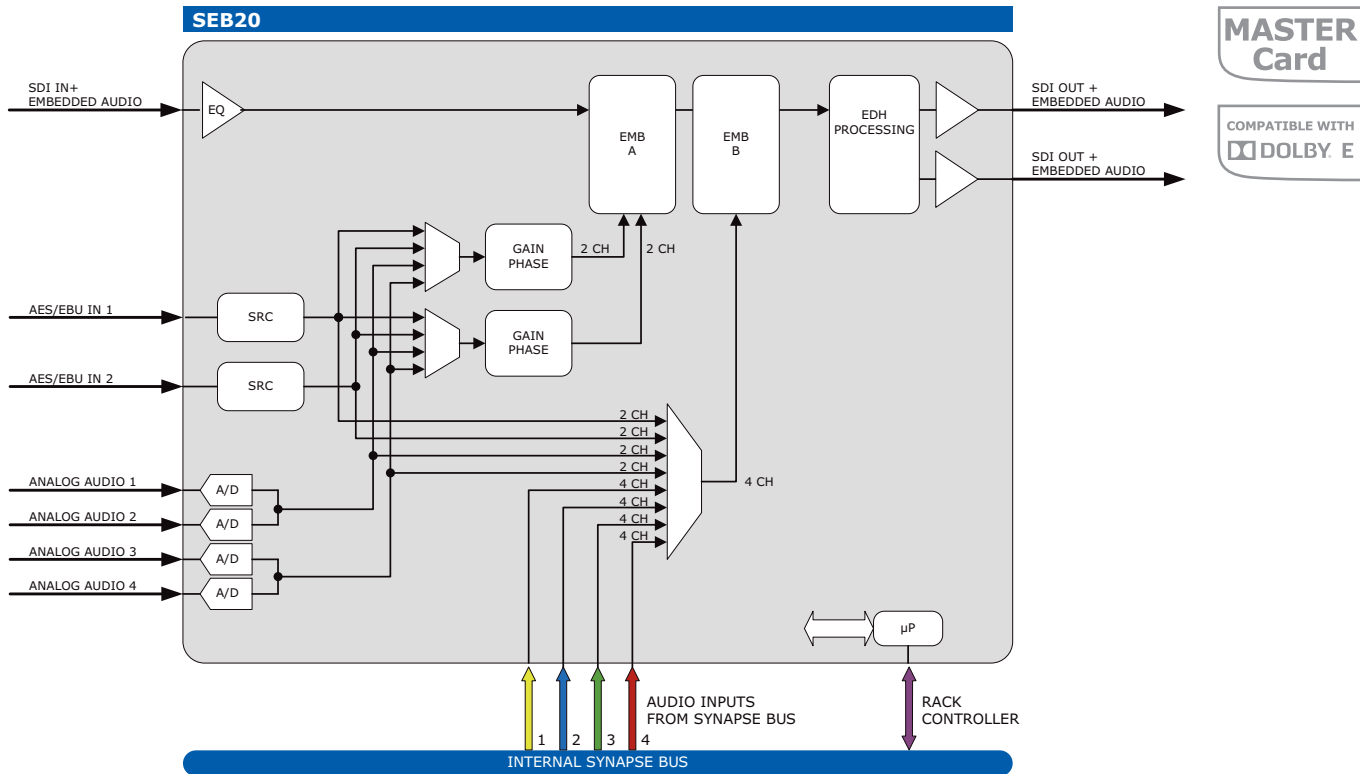
CMRR > 60dB at 1kHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<7 Watts



SEB20 SD-SDI 4 channel analog audio and digital audio embedder

The SEB20 is an analog and digital audio embedder with 4 local analog audio and 2 local digital audio inputs. The card has the possibility to add 4 extra channels through the Synapse ADD-ON buss. A reference level audio adjustment for the analog audio inputs and an SRC for the digital audio inputs are provided. For Dolby-E and other transparent applications the SRC can be by-passed.

- 2 group embedder (1 local 1 ADD-ON)
- Sample Rate Converter on AES/EBU input
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Selectable +12, +15, +18 and +24 dBu for 0dBFS for the analog audio inputs.
- 4 extra audio channels (1 groups) with optional ADC20, ADC24, ADL24, DBE08 and DIO24
- Analog audio inputs on 3 pole screw terminals or sub-D
- EDH detection and generation
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Generic analog and/or digital audio embedding

Ordering information

Module:

- **SEB20:** SD-SDI 4 channel analog Audio and digital Audio embedder

Standard I/O:

- **BPL02_SEB20:** I/O panel for SEB20 with unbalanced AES/EBU in and balanced analog audio in
- **BPL02D_SEB20:** I/O panel for SEB20 with unbalanced AES/EBU in and balanced analog audio in on D-sub
- **BPL03_SEB20:** I/O panel for SEB20 with balanced AES/EBU in and balanced analog audio in
- **BPL03D_SEB20:** I/O panel for SEB20 with balanced AES/EBU in and balanced analog audio in on sub-D

Fiber outputs:

- **BPL02T_FC/PC_SEB20:** I/O panel for SEB20 with fiber transmitter on FC/PC
- **BPL02T_SC_SEB20:** I/O panel for SEB20 with fiber transmitter on SC
- **BPL02DT_FC/PC_SEB20:** I/O panel for SEB20 with fiber transmitter on FC/PC
- **BPL02DT_SC_SEB20:** I/O panel for SEB20 with fiber transmitter on SC
- **BPL03T_FC/PC_SEB20:** I/O panel for SEB20 with fiber transmitter on FC/PC
- **BPL03T_SC_SEB20:** I/O panel for SEB20 with fiber transmitter on SC
- **BPL03DT_FC/PC_SEB20:** I/O panel for SEB20 with fiber transmitter on FC/PC
- **BPL03DT_SC_SEB20:** I/O panel for SEB20 with fiber transmitter on SC

Fiber inputs:

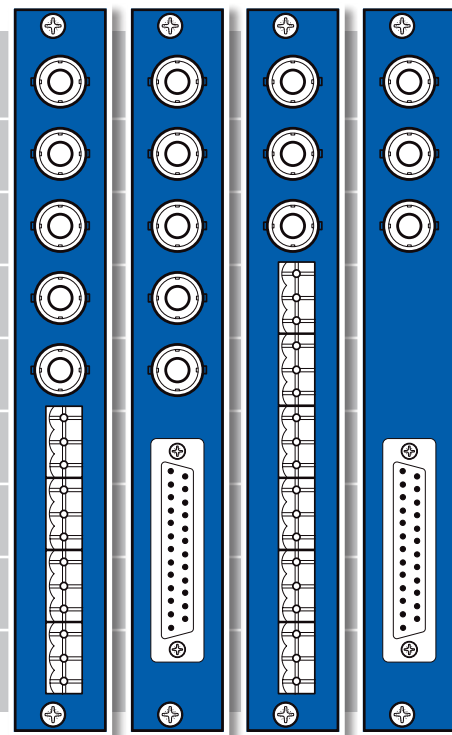
- **BPL02R_FC/PC_SEB20:**
I/O panel for SEB20 with fiber receiver on FC/PC
- **BPL02R_SC_SEB20:** I/O panel for SEB20 with fiber receiver on SC
- **BPL02DR_FC/PC_SEB20:**
I/O panel for SEB20 with fiber receiver on FC/PC
- **BPL02DR_SC_SEB20:** I/O panel for SEB20 with fiber receiver on SC
- **BPL03R_FC/PC_SEB20:**
I/O panel for SEB20 with fiber receiver on FC/PC
- **BPL03R_SC_SEB20:** I/O panel for SEB20 with fiber receiver on SC
- **BPL03DR_FC/PC_SEB20:**
I/O panel for SEB20 with fiber receiver on FC/PC
- **BPL03DR_SC_SEB20:** I/O panel for SEB20 with fiber receiver on SC

CVBS outputs:

- **BPL02C_SEB20:** I/O panel for SEB20 with CVBS output
- **BPL02DC_SEB20:** I/O panel for SEB20 with CVBS output
- **BPL03C_SEB20:** I/O panel for SEB20 with CVBS output
- **BPL03DC_SEB20:** I/O panel for SEB20 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI + EMBEDDED OUT 1
SDI + EMB OUT 2 (OPTIONAL FIBER OR CVBS OUT)
AES/EBU INPUT 1 (WITH BPL03D ON D-SUB)
AES/EBU INPUT 2 (WITH BPL03D ON D-SUB)
ANALOG AUDIO INPUT 1
ANALOG AUDIO INPUT 2
ANALOG AUDIO INPUT 3
ANALOG AUDIO INPUT 4

For fiber connectivity see www.axon.tv



BPL02

BPL02D

BPL03

BPL03D

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog audio input

Type	Balanced analog audio
Number of inputs	4
Connector	Removable terminal strip or sub-D
Impedance	10k Ohms nominal (differential)
Sampling rate	48KHz
Signal level	0dBFS => 12dBu, 15dBu, 18dBu or 24dBu
Level control range	+12dB to -60dB 0.25dB increments
Frequency response	< ±0.1dB, 20Hz to 20kHz (broadcast quality)

Dynamic range	100dB @ -60 dBFS
THD+N	< 0.002% (>96dB) @ 1kHz, -1dB FS < 0.004% (> 96dB) @ 20Hz to 20kHz, -1dB FS
CMRR	> 60dB at 1kHz

AES input

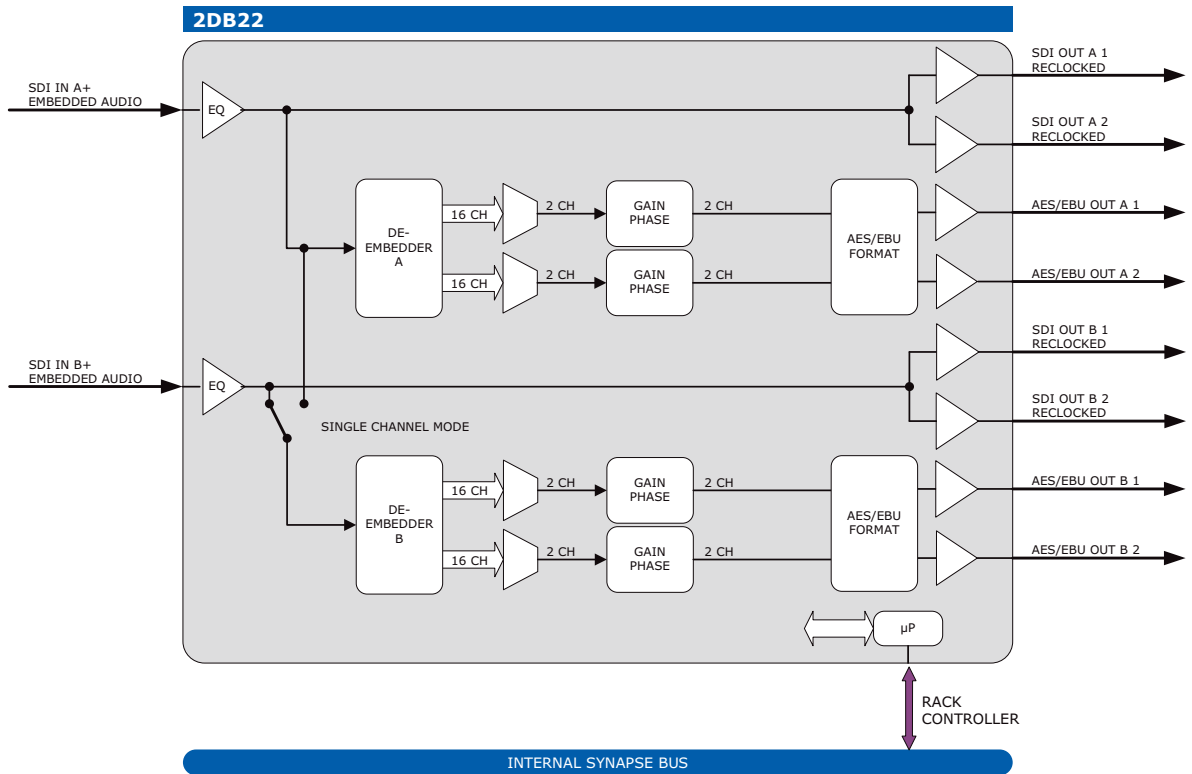
Connector	BNC, Screw terminal or sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	32 kHz to 96 kHz asynchronous 48 kHz Synchronous (SRC=off)
Resolution	20 bits
Minimum input/output delay	2 ms
Number of inputs	2
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

Miscellaneous

Weight	Aprox. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<7 Watts



2DB22 Dual 4 channel digital audio de-embedder

The 2DB22 contains two fully independent digital audio de-embedders. This card allows for 36 de-embedders in 4 Rack Units, and has its counterpart in the mirror image 2EB22.

- 2 x 2 AES/EBU outputs
- 110 Ohms balanced digital audio outputs on sub-D
- 2 x 2 reclocked SDI output
- Single channel mode for de-embedding (2 group de-embedder)
- 4 x AES/EBU out of a single SDI
- Audio level control for each individual channel
- -60 to +12dB
- Phase Control per output channel
- 0 or 180 deg
- Free selection of all embedded channels (any out of 16)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

Applications

- Generic multi channel digital audio de-embedding
- 2 group (4 AES/EBU) de-embedding
- High density applications as in OB-Trucks

Ordering information

Module:

- **2DB22:** Dual 4 channel digital audio de-embedder

Standard I/O:

- **BPL12_2DB22:** I/O panel for 2DB22

Fiber outputs:

- **BPL12T2_FC/PC_2DB22:** I/O panel for 2DB22 with 2 fiber transmitter on FC/PC
- **BPL12T2_SC_2DB22:** I/O panel for 2DB22 with 2 fiber transmitter on SC

Fiber inputs:

- **BPL12R2_FC/PC_2DB22:** I/O panel for 2DB22 with 2 fiber receivers on FC/PC
- **BPL12R2_SC_2DB22:** I/O panel for 2DB22 with 2 fiber receivers on SC

CVBS outputs:

- **BPL12C2_2DB22:** I/O panel for 2DB22 with 2 CVBS outputs

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1 RECLOCKED
SDI OUTPUT A-2 RECLOCKED (OPTIONAL FIBER OR CVBS OUTPUT)
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1 RECLOCKED
SDI OUTPUT B-2 RECLOCKED (OPTIONAL FIBER OR CVBS OUTPUT)
BALANCED DIGITAL AUDIO OUTPUT

For fiber connectivity see www.axon.tv



BPL12

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4 (2 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

AES output

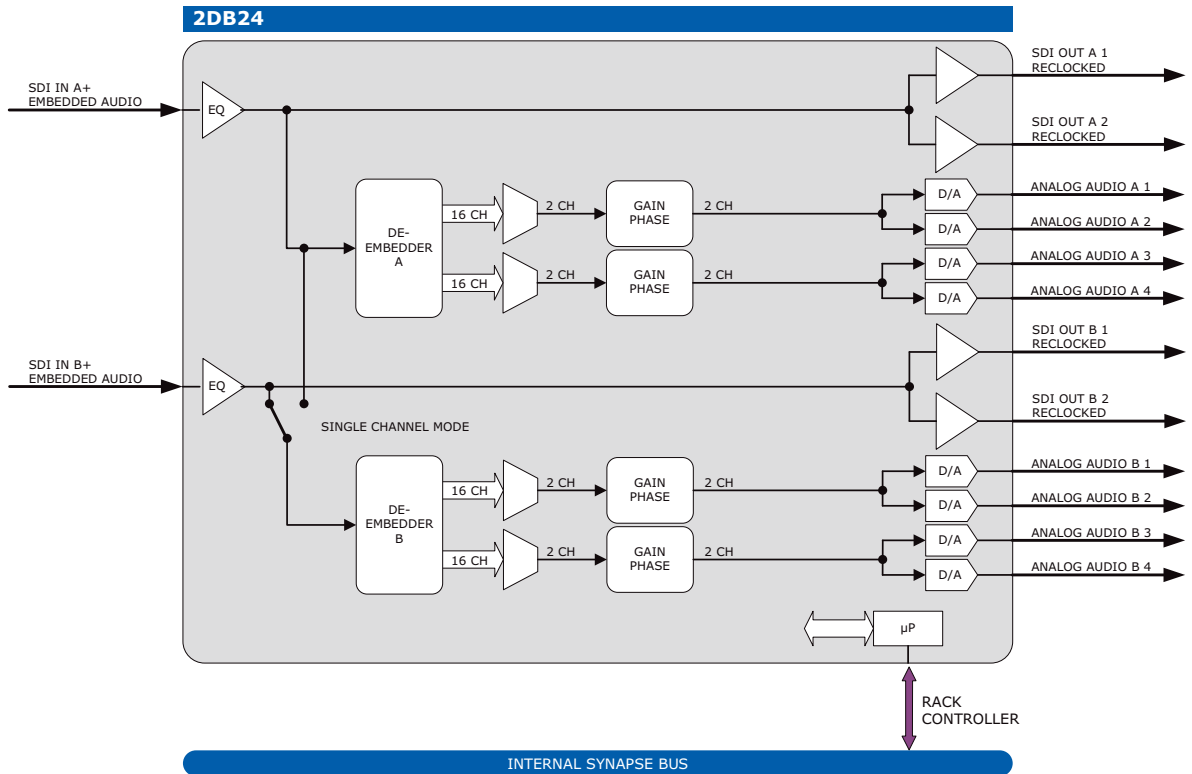
Number of outputs	2 per channel (4 in single channel mode)
Connector	26 pins female sub-D (balanced)
Signal level	2.5V nominal
Impedance	110 Ohms

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<5 Watts



2DB24 Dual 4 channel analog audio de-embedder

The 2DB24 contains two fully independent analog audio de-embedders. This card allows for 36 de-embedders in 4 Rack Units, and has its counterpart in the mirror image 2EB24.

- 2 x 4 analog outputs
- 2 x 2 reclocked SDI outputs
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- +24 dBu, +18 dBu, + 15 dBu and +12 dBu analog output levels at 0 dBFS
- EDH detection and generation
- Single channel mode for de-embedding (2 group de-embedding)
- 8 analog channels out of a single SDI signal
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

Applications

- Generic multi channel analog audio de-embedding
- 2 group (8 x analog audio) de-embedding
- High density applications as in OB-Trucks

Ordering information

Module:

- **2DB24:** Dual 4 channel digital audio de-embedder

Standard I/O:

- **BPL12_2DB24:**
I/O panel for 2DB24

Fiber outputs:

- **BPL12T2_FC/PC_2DB24:**
I/O panel for 2DB24 with 2 fiber transmitter on FC/PC
- **BPL12T2_SC_2DB24:**
I/O panel for 2DB24 with 2 fiber transmitter on SC

Fiber inputs:

- **BPL12R2_FC/PC_2DB24:**
I/O panel for 2DB24 with 2 fiber receivers on FC/PC
- **BPL12R2_SC_2DB24:**
I/O panel for 2DB24 with 2 fiber receivers on SC

CVBS outputs:

- **BPL12C2_2DB24:**
I/O panel for 2DB24 with 2 CVBS outputs

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1 RECLOCKED
SDI OUTPUT A-2 RECLOCKED (OPTIONAL FIBER OR CVBS OUTPUT)
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1 RECLOCKED
SDI OUTPUT B-2 RECLOCKED (OPTIONAL FIBER OR CVBS OUTPUT)
BALANCED ANALOG AUDIO OUTPUT

For fiber connectivity see www.axon.tv



BPL12

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4 (2 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog audio output

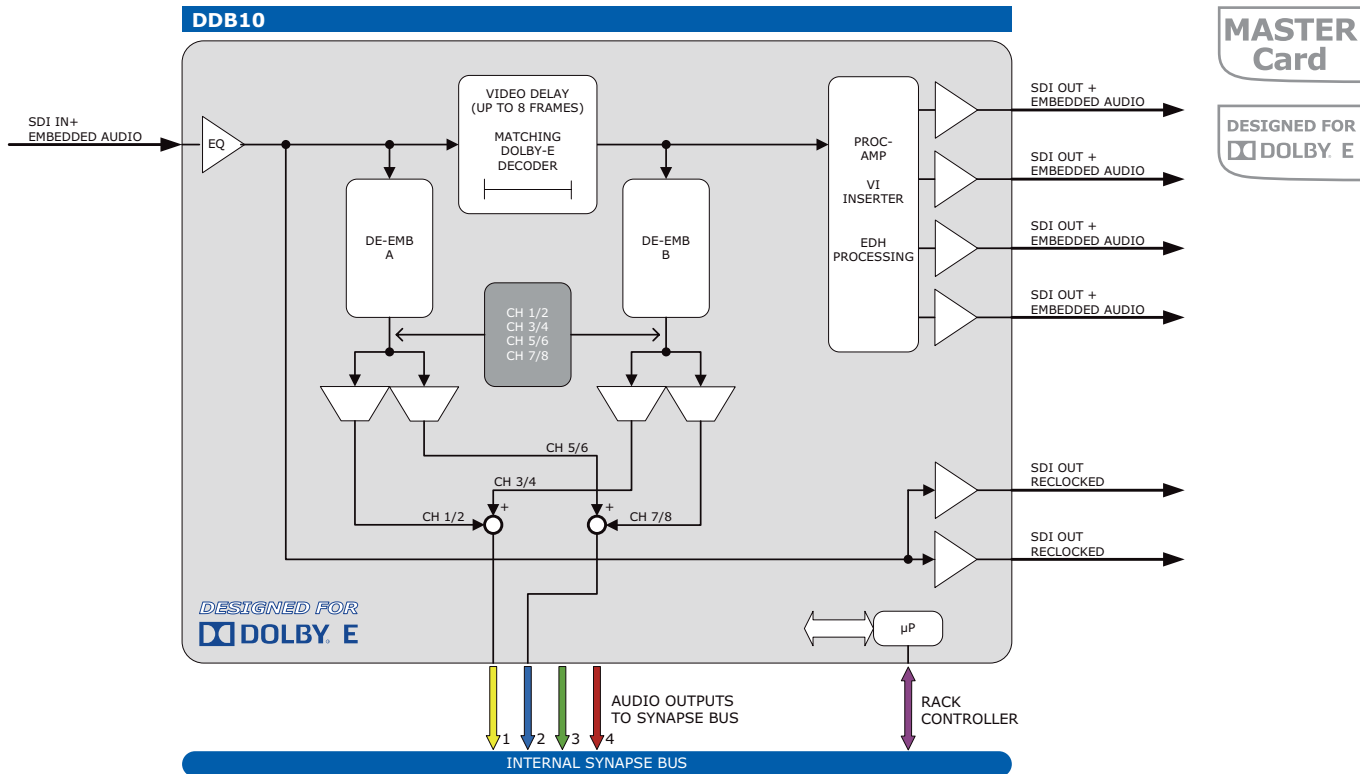
Type	Balanced analog audio
Number of outputs	4 per channel (8 in single channel mode)
Connector	26 pins female sub-D
Impedance	50 Ohms balanced
Signal level	0dBFS => 12dBu, 15dBu, 18dBu or 24dBu
Frequency response	< ±0.05dB (20Hz to 20kHz)
Gain mismatch	< 0.25 dB @997Hz, -20dBFS Multi channel
THD+N	< 92dB @ 1kHz, -1dBFS
Crosstalk	< -100dB (20Hz to 20kHz)
DC offset	< ±30mV
Dynamic range	> 97dB @-60dBFS

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<12 Watts



DDB10 SD Dolby E de-embedder

The DDB10 is a master card especially designed to be used in combination with the Synapse Dolby E decoder the DBD08. The propagation delay of the SDI is matched to the Dolby E decoder card to 1 frame. The nice touch to this card is that there is a full de-embedder block before and after the delay. This ensures a matched audio delay for Dolby E and PCM that both can be sent to the ADD-ON bus. The unit has fixed dual channel selection criteria so that the Dolby E stream can not be taken apart and corrupted.

- De-embedder master card designed for Dolby E
- Unique PCM and Dolby E transparency
- Automatic Dolby E propagation delay compensation
- Compatible with 2 PCM and 2 Dolby E streams
- VLI insertion
- EDH detection and processing
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Complementary card to:

- DBD08

Applications

- Dolby E de-embedding with PCM and Dolby E latency compensation

Ordering information

Master:

- **2DB24:** Dual 4 channel digital audio de-embedder

Standard I/O:

- **DDB10:** SD Dolby E de-embedder (master card)

Standard I/O:

- **BPL01_DDB10:**
I/O panel for DDB10
- **BPX01_DDB10:**
I/O panel for DDB10 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_DDB10:**
I/O panel for DDB10 with fiber transmitter on FC/PC
- **BPL01T_SC_DDB10:**
I/O panel for DDB10 with fiber transmitter on SC

Fiber inputs:

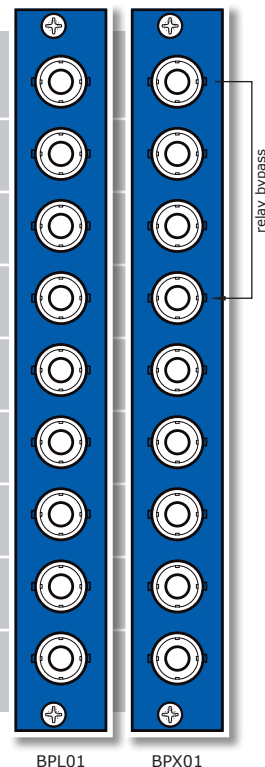
- **BPL01R_FC/PC_DDB10:**
I/O panel for DDB10 with fiber receiver on FC/PC
- **BPL01R_SC_DDB10:**
I/O panel for DDB10 with fiber receiver on SC

CVBS output:

- **BPL01C_DDB10:**
I/O panel for DDB10 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

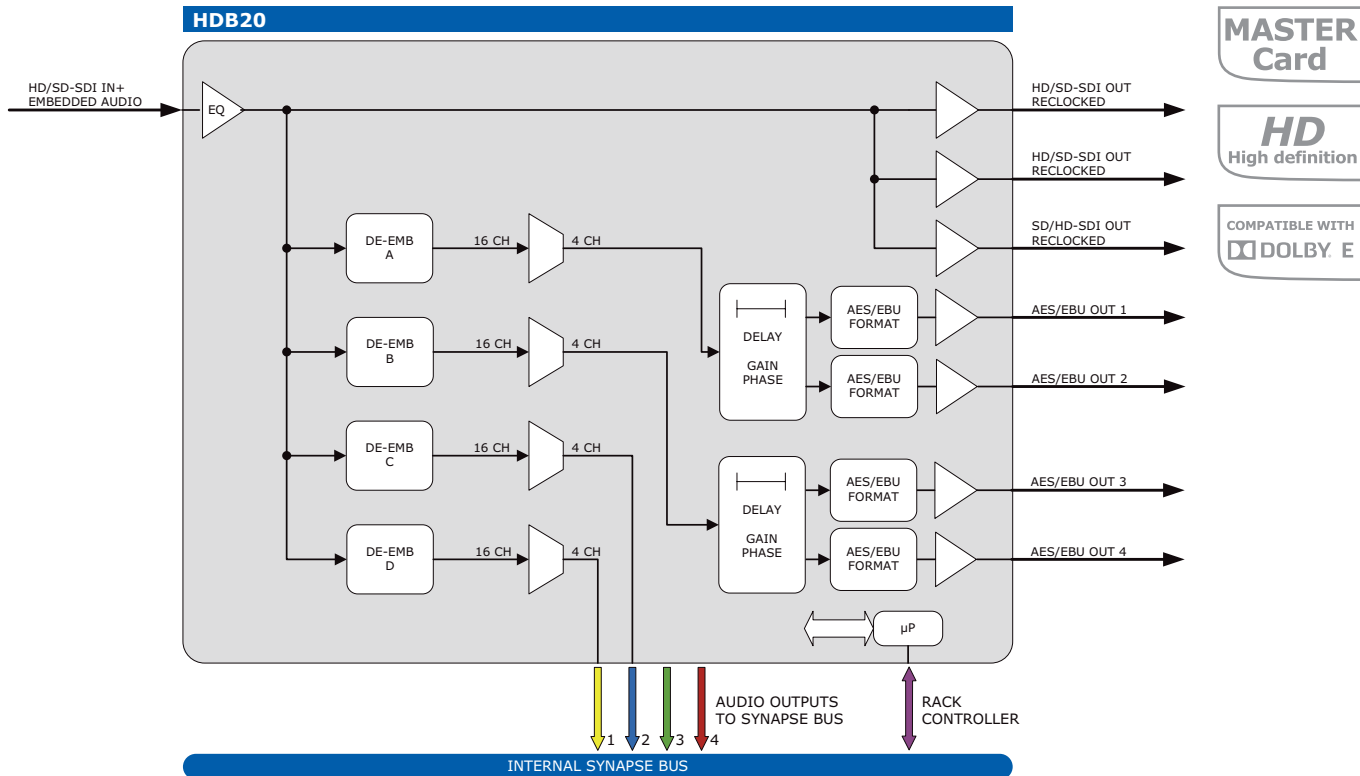
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2 reclocked 4 processed
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<7 Watts



HDB20 HD/SD preset based audio de-embedder

The HDB20 is an HD SDI and SD SDI digital audio de-embedder. It is an audio extractor that outputs four AES/EBU streams on the board itself and four ADD-ON audio signals via the local bus to two ADD-ON cards. All chosen settings are stored in presets, these presets (8) can be restored via automation to fire up a salvo with 16 independent audio channels in any combination (even duplicates).

- 16 channel (4 group) de-embedder
- 4 local AES/EBU outputs
- 8 extra outputs through ADD-ON cards
- 3 x reclocked HD SDI output
- 8 presets that configure all 16 output channels at once.
- Audio level and phase control (local outputs only)
- Audio offset delay (local outputs only) up to 2600 ms
- Free selection of all embedded channels
- Peak detection 0, -6, -12 and -18dBFS
- Silence detection with threshold (-100 to -20dBFS) and time control (1 to 255 sec)
- Audio format detection (e.g. AC3, Dolby E and PCM)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- HD and SD preset based 8 channel de-embedding
- HD and SD preset based 16 channel de-embedding with DIO48

Ordering information

Module:

- **HDB20:** HD/ SD preset based audio de-embedder

Standard I/O:

- **BPH01_HDB20:** I/O panel for HDB20 with unbalanced AES/EBU out
- **BPH02_HDB20:** I/O for HDB20 with balanced AES/EBU out
- **BPH02D_HDB20:** I/O panel for HDB20 with balanced AES/EBU out on sub-D

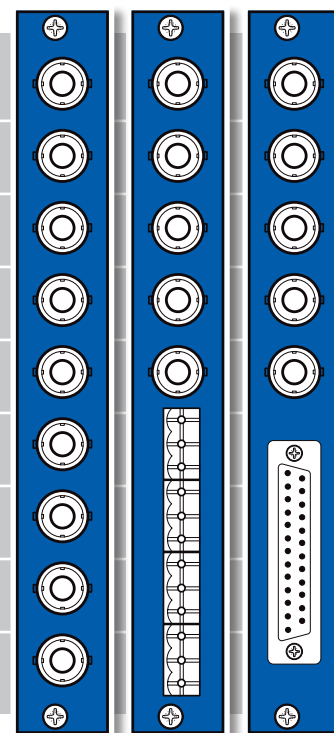
Fiber outputs:

- **BPH01T_FC/PC_HDB20:** I/O panel HDB20 with fiber transmitter on FC/PC
- **BPH01T_SC_HDB20:** I/O panel for HDB20 with fiber transmitter on SC
- **BPH02T_FC/PC_HDB20:** I/O panel for HDB20 with fiber transmitter on FC/PC
- **BPH02T_SC_HDB20:** I/O panel for HDB20 with fiber transmitter on SC
- **BPH02DT_FC/PC_HDB20:** I/O panel for HDB20 with fiber transmitter on FC/PC
- **BPH02DT_SC_HDB20:** I/O panel for HDB20 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HDB20:** I/O panel for HDB20 with fiber receiver on FC/PC
- **BPH01R_SC_HDB20:** I/O panel for HDB20 with fiber receiver on SC
- **BPH02R_FC/PC_HDB20:** I/O panel for HDB20 with fiber receiver on FC/PC
- **BPH02R_SC_HDB20:** I/O panel for HDB20 with fiber receiver on SC
- **BPH02DR_FC/PC_HDB20:** I/O panel for HDB20 with fiber receiver on FC/PC
- **BPH02DR_SC_HDB20:** I/O panel for HDB20 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
AES/EBU OUTPUT 1
AES/EBU OUTPUT 2
AES/EBU OUTPUT 3
AES/EBU OUTPUT 4



BPH01

BPH02

BPH02D

For fiber connectivity see www.axon.tv

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

Equalization

Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.

Return loss > 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Signal level

DC offset 0V ±0.5V

Rise and

fall time 200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

AES audio output

Number of outputs	4
Connector	BNC, Screw terminal or 25 pins female sub-D (balanced)
Resolution	24 bits
Sampling rate	48kHz synchronous

Minimum Input/output delay 1.5ms

Maximum Input/output delay 5400 ms

Minimum Input/output delay 1.5ms

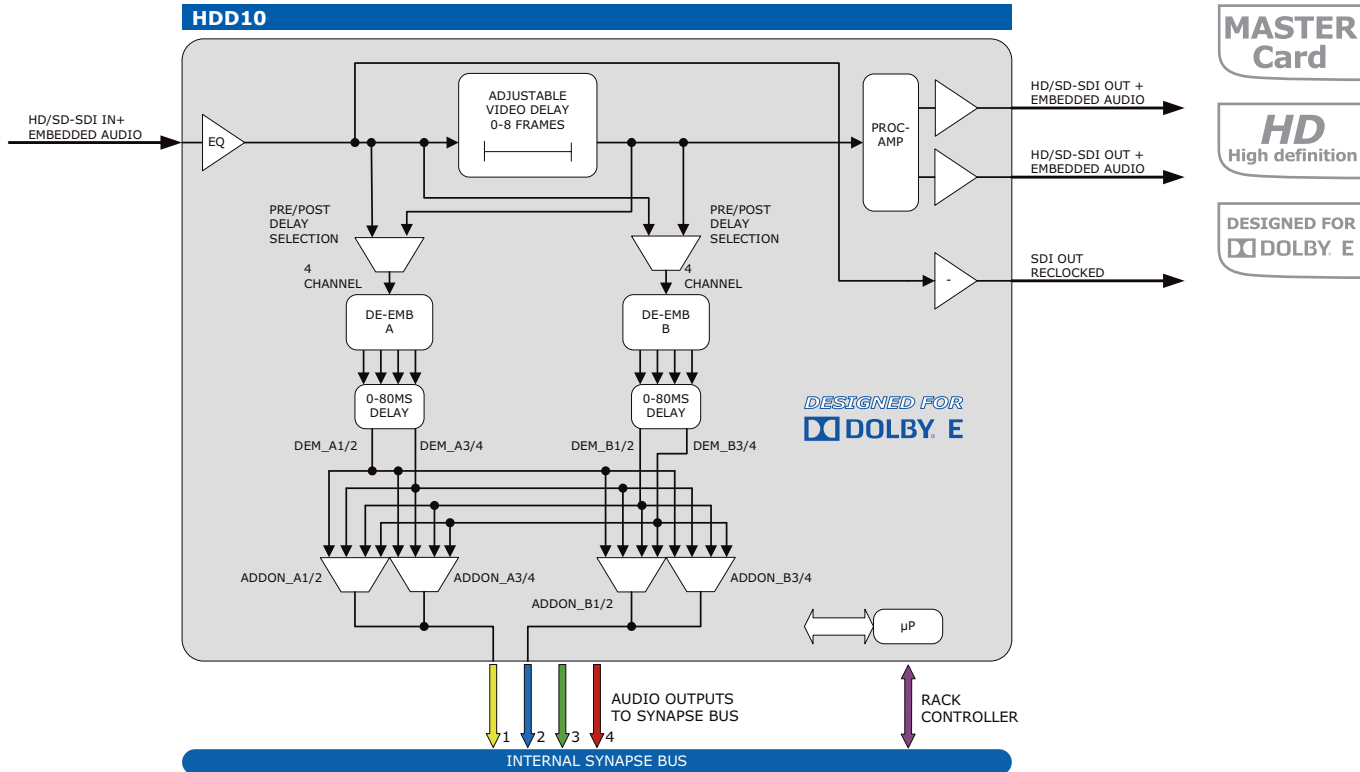
Maximum Input/output delay 5400 ms

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<7 Watts



HDD10 HD/SD Dolby E de-embedder (master card)

The HDD10 is a HD master card especially designed to be used in combination with the Synapse Dolby E decoder DBD08. The propagation delay of the HD/SD-SDI is matched to the Dolby E decoder card to 1 Frame. The nice touch to this card is that there are 2 assignable de-embedder blocks switchable before or after the transparent video delay. This ensures a matched audio delay for Dolby E and PCM that both can be send to the ADD-ON bus. The unit has fixed dual channel selection criteria so that the Dolby E stream can not be taken apart and corrupted.

- HD de-embedder master card designed for Dolby E
- Unique PCM and Dolby E transparency
- Automatic Dolby E propagation delay compensation
- Compatible with 4 PCM or Dolby E streams or any combination of 4 stereo streams.
- Delay status measurement
- Variable transparent video delay up to 8 frames in pixel increments
- Video proc amp
- Individual audio delay offset up to 85 ms per channel (8 total)
- Transparent for ATC time code RP188, RP196, RP215
- Full control and status monitoring through the front panel of the SFR04/SFR08/18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Complementary cards:

- DBD08

Applications

- Dolby E de-embedder
- Lip-sync de-embedding of up to 4 Dolby E streams

Ordering information

Module:

- **HDD10:** HD/SD Dolby E de-embedder (master card)

Standard I/O:

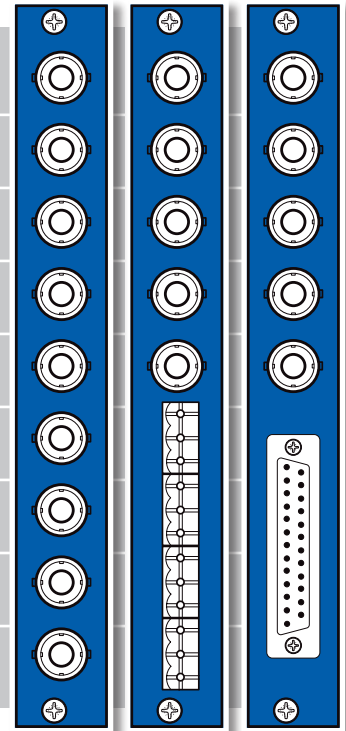
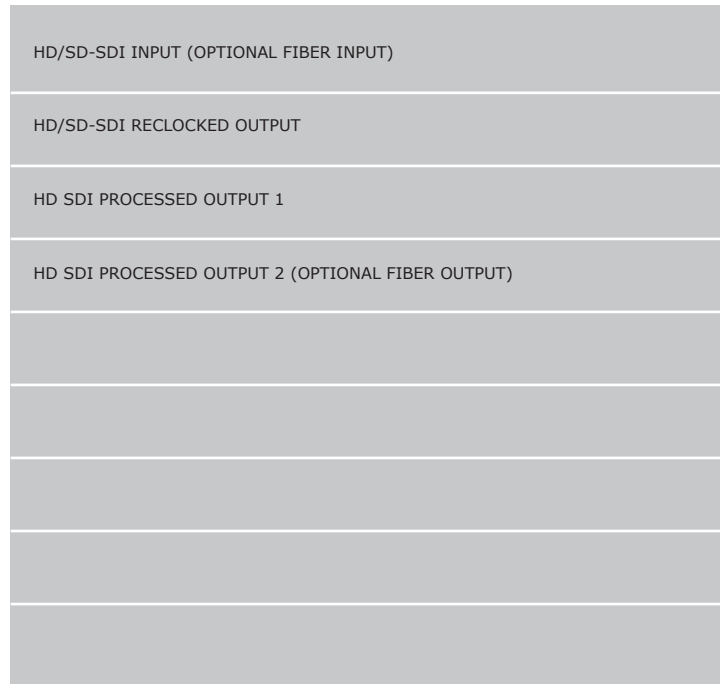
- **BPH01_HDD10:** I/O panel for HDD10

Fiber outputs:

- **BPH01T_FC/PC_HDD10:** I/O panel for HDD10 with fiber transmitter on FC/PC
- **BPH01T_SC_HDD10:** I/O panel for HDD10 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HDD10:** I/O panel for HDD10 with fiber receiver on FC/PC
- **BPH01R_SC_HDD10:** I/O panel for HDD10 with fiber receiver on SC



For fiber connectivity see www.axon.tv

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

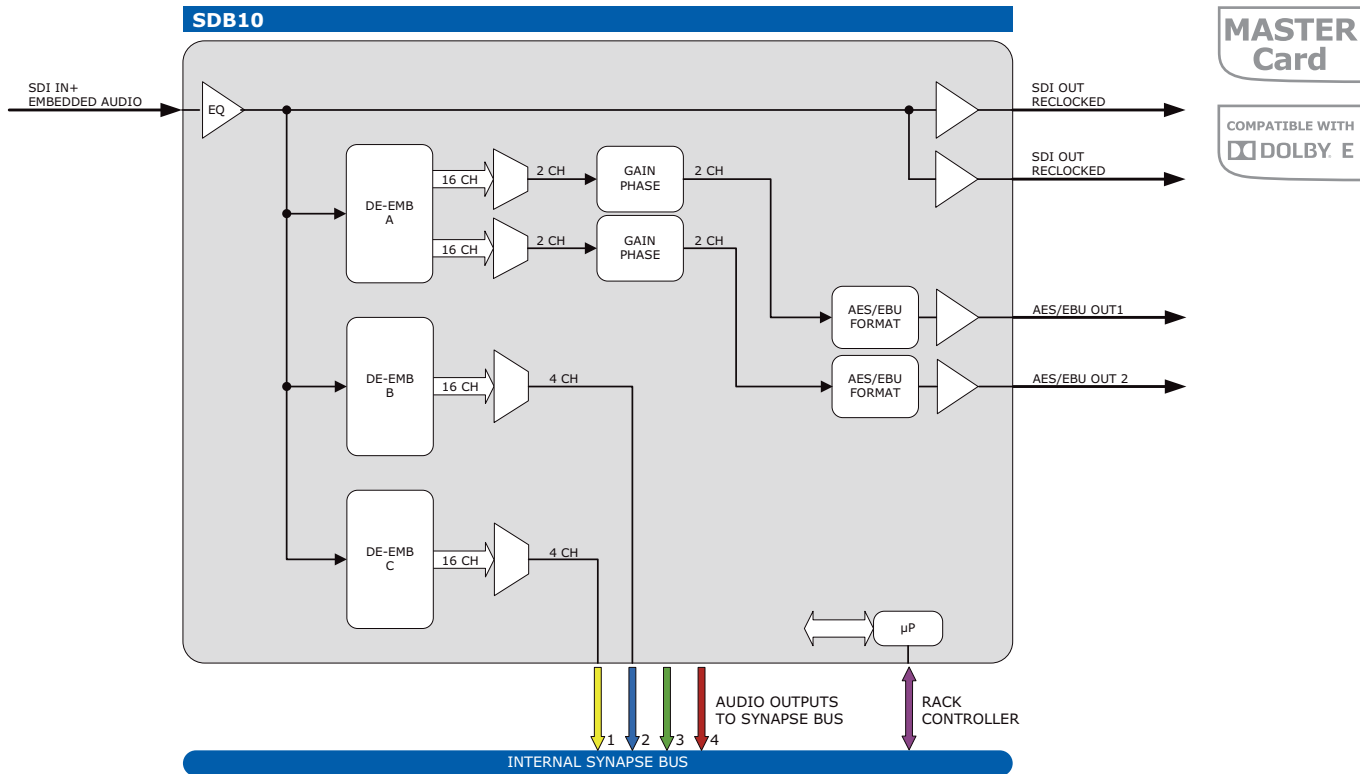
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



SDB10 SD (2 AES/EBU) digital audio de-embedder with 8 extra channels through the ADD-ON bus

The SDB10 is a SD-SDI embedded audio extractor that outputs four local audio signals on the board itself and eight ADD-ON audio signals to one or two ADD-ON cards. All outputs of the SDB10 can be configured independently and every configuration is possible. The SDB10 outputs to two AES/EBU digital audio outputs. The SDB10 contains 3 groups de-embedding. (1 local 2 ADD-ON).

- Free selection of all mono embedded channels (1 out of 16 for every AES/EBU left or right output channel)
- Mono mode for the local AES/EBU outputs
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- 8 extra audio channels (two groups) with optional DAC20, DAC24, DAS24 and DIO48
- AES/EBU outputs on 3pole screw terminal (110 Ohms) or BNC (75 Ohms)
- EDH detection
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Generic AES/EBU de-embedding

Ordering information

Module:

- **SBD10:** SD (2 AES/EBU) digital audio de-embedder with 8 extra channels through the ADD-ON bus

Standard I/O:

- **BPL02_SDB10:** I/O panel for SDB10 with unbalanced AES/EBU out
- **BPL03_SDB10:** I/O panel for SDB10 with balanced AES/EBU out
- **BPL03D_SDB10:** I/O panel for SDB10 with balanced AES/EBU out on sub-D

Fiber outputs:

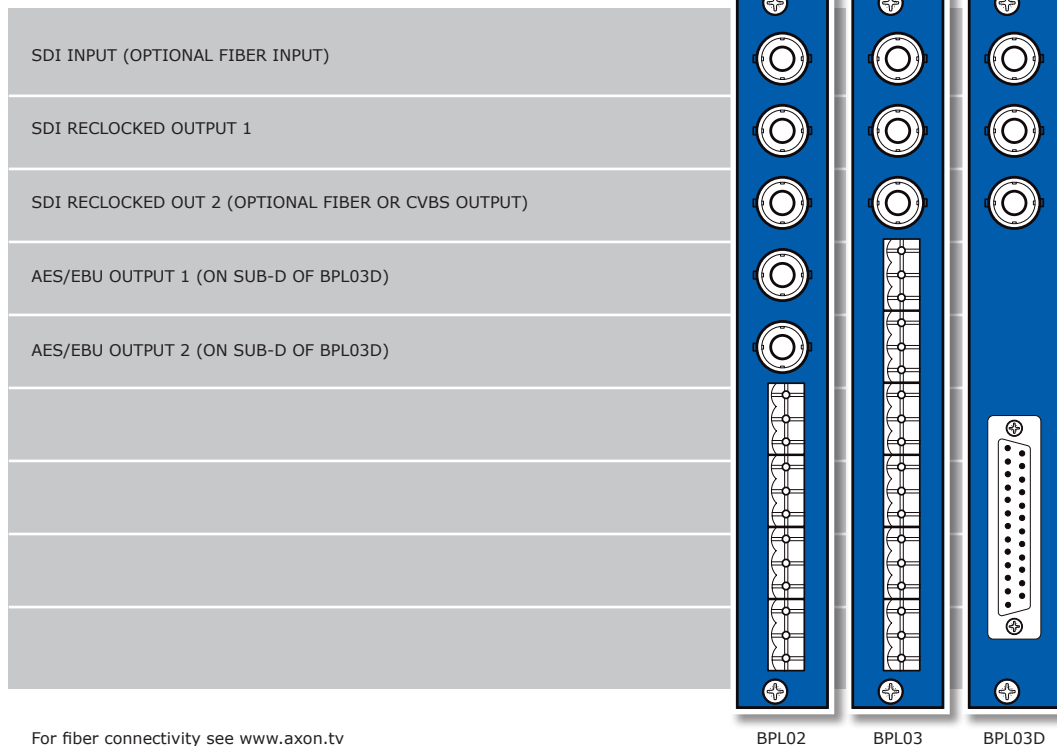
- **BPL02T_FC/PC_SDB10:**
I/O panel for SDB10 with fiber transmitter on FC/PC
- **BPL02T_SC_SDB10:**
I/O panel for SDB10 with fiber transmitter on SC
- **BPL03T_FC/PC_SDB10:**
I/O panel for SDB10 with fiber transmitter on FC/PC
- **BPL03T_SC_SDB10:**
I/O panel for SDB10 with fiber transmitter on SC
- **BPL03DT_FC/PC_SDB10:**
I/O panel for SDB10 with fiber transmitter on FC/PC
- **BPL03DT_SC_SDB10:**
I/O panel for SDB10 with fiber transmitter on SC

Fiber inputs:

- **BPL02R_FC/PC_SDB10:**
I/O panel for SDB10 with fiber receiver on FC/PC
- **BPL02R_SC_SDB10:**
I/O panel for SDB10 with fiber receiver on SC
- **BPL03R_FC/PC_SDB10:**
I/O panel for SDB10 with fiber receiver on FC/PC
- **BPL03R_SC_SDB10:**
I/O panel for SDB10 with fiber receiver on SC
- **BPL03DR_FC/PC_SDB10:**
I/O panel for SDB10 with fiber receiver on FC/PC
- **BPL03DR_SC_SDB10:**
I/O panel for SDB10 with fiber receiver on SC

CVBS outputs:

- **BPL02C_SDB10:**
I/O panel for SDB10 with CVBS output
- **BPL03C_SDB10:**
I/O panel for SDB10 with CVBS output
- **BPL03DC_SDB10:**
I/O panel for SDB10 with CVBS output



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

AES output

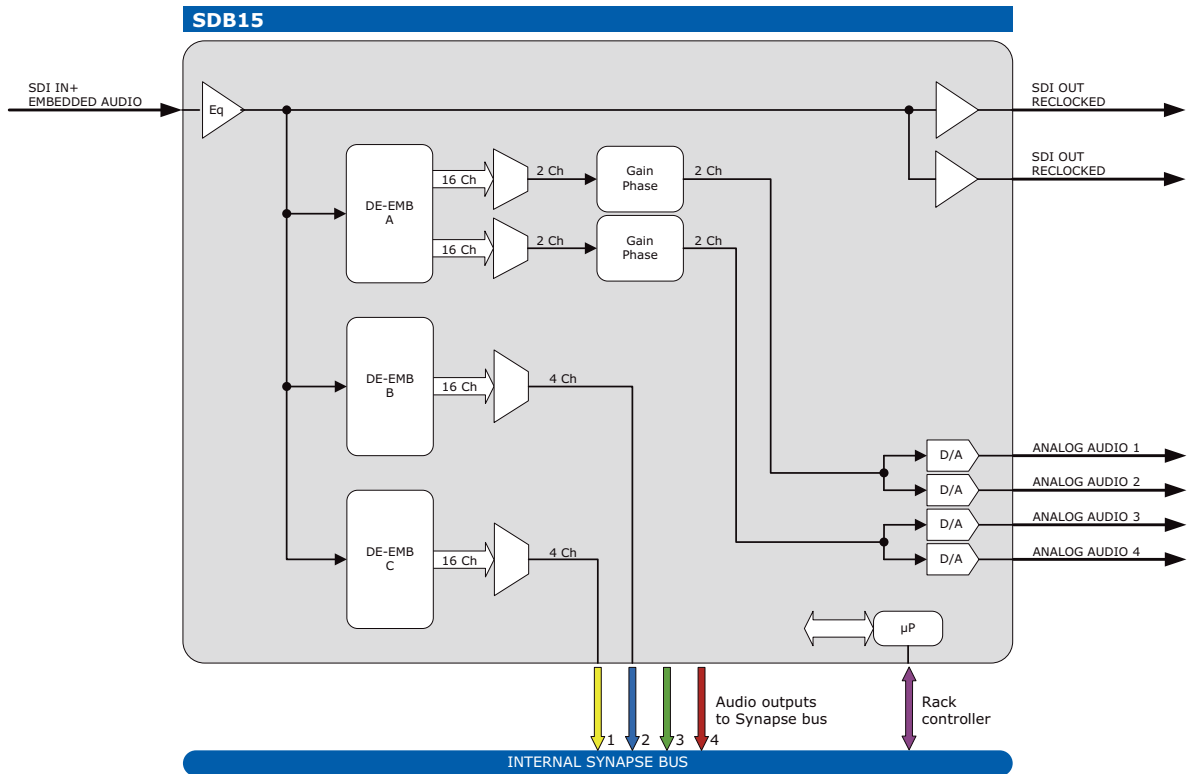
Number of outputs	2
Connector	BNC, Screw terminal or 25 pins female sub-D (balanced)
Resolution	24 bits
Sampling rate	48KHz synchronous

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<5 Watts


**MASTER
Card**

SDB15 SD 4 channel analog audio de-embedder with 8 extra channels through the ADD-ON bus

The SDB15 is a SD-SDI embedded audio extractor that outputs four local analog audio signals on the board itself and eight ADD-ON audio signals to one or two ADD-ON cards. All outputs of the SDB15 can be configured independently and every configuration is possible. There are 4 local-outputs and up to 8 ADD-ON outputs. Every local or ADD-ON output can be independently assigned to one of the 16 embedded audio channels. Note, that the Phase and Gain control of the ADD-ON outputs of the SDB15 can be manipulated on the ADD-ON cards. The SDB15 contains a 3 groups de-embedder. (1 local 2 ADD-ON).

- 12 channel de-embedder (4 local 8 ADD-ON)
- Free selection of all mono embedded channels (1 out of 16 for every output channel)
- Mono mode for the local outputs
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- 8 extra audio channels (two groups)with optional DAC20, DAC24, DAS24 and DIO48
- Transformer properties with low impedance audio drivers.
- Selectable +12, +15, +18 and +24 dBu for 0dBFS
- Outputs on 3 pole screw terminal or sub-D
- EDH detection
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Generic analog audio de-embedding

Ordering information

Module:

- **SBD15:** SD 4 channel analog audio de-embedder with 8 extra channels through the ADD-ON bus

Standard I/O:

- **BPL02_SDB15:** I/O panel for SEB15 with balanced analog audio out
- **BPL02D_SDB15:** I/O panel for SEB15 with balanced analog audio out on sub-D

Fiber outputs:

- **BPL02T_FC/PC_SDB15:** I/O panel for SDB15 with fiber transmitter on FC/PC
- **BPL02T_SC_SDB15:** I/O panel for SDB15 with fiber transmitter on SC
- **BPL02DT_FC/PC_SDB15:** I/O panel for SDB15 with fiber transmitter on FC/PC
- **BPL02DT_SC_SDB15:** I/O panel for SDB15 with fiber transmitter on SC

Fiber inputs:

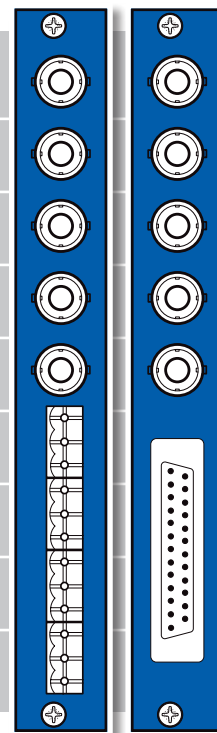
- **BPL02R_FC/PC_SDB15:** I/O panel for SDB15 with fiber receiver on FC/PC
- **BPL02R_SC_SDB15:** I/O panel for SDB15 with fiber receiver on SC
- **BPL02DR_FC/PC_SDB15:** I/O panel for SDB15 with fiber receiver on FC/PC
- **BPL02DR_SC_SDB15:** I/O panel for SDB15 with fiber receiver on SC

CVBS outputs:

- **BPL02C_SDB15:** I/O panel for SDB15 with CVBS out
- **BPL02DC_SDB15:** I/O panel for SDB15 with CVBS out

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2 (OPTIONAL FIBER OR CVBS OUTPUT)
ANALOG AUDIO OUTPUT 1
ANALOG AUDIO OUTPUT 2
ANALOG AUDIO OUTPUT 3
ANALOG AUDIO OUTPUT 4

For fiber connectivity see www.axon.tv



BPL02

BPL02D

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog audio output

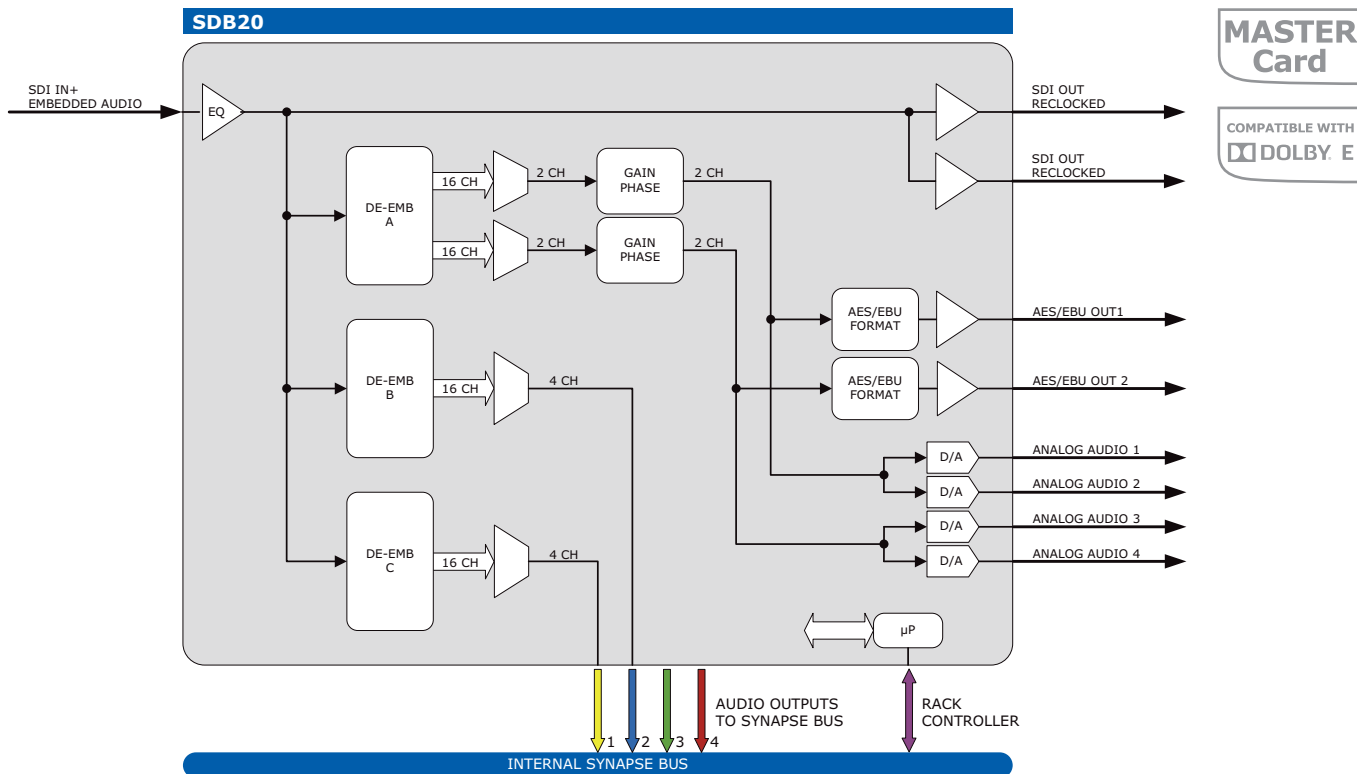
Type	Balanced analog audio
Number of outputs	4
Connector	removable terminal strips or 25 pins female sub-D
Impedance	50 Ohms balanced
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Frequency response	< ±0.05dB (20Hz to 20kHz)
Gain mismatch	< 0.25 dB @997Hz, -20dBFS Multi channel
THD+N	< 92dB @ 1kHz, -1dBFS
Crosstalk	< -100dB (20Hz to 20kHz)
DC offset	< ±30mV
Dynamic range	> 97dB @-60dBFS

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



SDB20 SD 4 channel analog audio and digital audio de-embedder with 8 extra channels through the ADD-ON bus

The SDB20 is an SD-SDI de-embedder with analog and digital audio outputs. The 4 Analog audio outputs are coupled with the local AES/EBU outputs. Audio can be routed with SDB20 from any embedded audio channel to any addressable output channel. There are 4 local-outputs (duplicated in digital and analog domain) and up to 8 ADD-ON outputs.

Every local or ADD-ON output can be independently assigned to one of the 16 embedded audio channels. Note, that the Phase and Gain control of the ADD-ON outputs of the SDB20 can be controlled on the ADD-ON cards.

- 12-channel de-embedder (4 local 8 ADD-ON)
- Free selection of all mono embedded channels (1 out of 16 for every output channel)
- Mono mode for the local outputs
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- 8 extra audio channels (two groups) with optional DAC20, DAC24 and DAS24
- AES/EBU outputs on 3 pole screw terminal or sub-D (110 Ohms) or BNC (75 Ohms)
- Transformer properties with low impedance audio drivers for analog outputs
- Selectable +12, +15, +18 and +24 dBu for 0dBFS
- Analog outputs on 3pole screw terminal or sub-D
- EDH detection

- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Generic analog and/or digital audio de-embedding

Ordering information

Module:

- SDB20: SD 4 channel analog audio and digital audio de-embedder with 8 extra channels through the ADD-ON bus

Standard I/O:

- **BPL02_SDB20:**
I/O panel for SDB20 with unbalanced AES/EBU out and balanced analog audio out
- **BPL02D_SDB20:**
I/O panel for SDB20 with unbalanced AES/EBU out and balanced analog audio out on sub-D

■ BPL03_SDB20:

I/O panel for SDB20 with balanced AES/EBU out and balanced analog audio out

■ BPL03D_SDB20:

I/O panel for SDB20 with balanced AES/EBU out and balanced analog audio out on sub-D

Fiber outputs:

■ BPL02T_FC/PC_SDB20:

I/O panel for SDB20 with fiber transmitter on FC/PC

■ BPL02T_SC_SDB20:

I/O panel for SDB20 with fiber transmitter on SC

■ BPL03T_FC/PC_SDB20:

I/O panel for SDB20 with fiber transmitter on FC/PC

■ BPL03T_SC_SDB20:

I/O panel for SDB20 with fiber transmitter on SC

■ **BPL02DT_FC/PC_SDB20:**

I/O panel for SDB20 with fiber transmitter on FC/PC

■ **BPL02DT_SC_SDB20:**

I/O panel for SDB20 with fiber transmitter on SC

■ **BPL03DT_FC/PC_SDB20:**

I/O panel for SDB20 with fiber transmitter on FC/PC

■ **BPL03DT_SC_SDB20:**

I/O panel for SDB20 with fiber transmitter on SC

Fiber inputs:

■ **BPL02R_FC/PC_SDB20:**

I/O panel for SDB20 with fiber receiver on FC/PC

■ **BPL02R_SC_SDB20:**

I/O panel for SDB20 with fiber receiver on SC

■ **BPL03R_FC/PC_SDB20:**

I/O panel for SDB20 with fiber receiver on FC/PC

■ **BPL03R_SC_SDB20:**

I/O panel for SDB20 with fiber receiver on SC

■ **BPL02DR_FC/PC_SDB20:**

I/O panel for SDB20 with fiber receiver on FC/PC

■ **BPL02DR_SC_SDB20:**

I/O panel for SDB20 with fiber receiver on SC

■ **BPL03DR_FC/PC_SDB20:**

I/O panel for SDB20 with fiber receiver on FC/PC

■ **BPL03DR_SC_SDB20:**

I/O panel for SDB20 with fiber receiver on SC

CVBS outputs:

■ **BPL02C_SDB20:**

I/O panel for SDB20 with CVBS out

■ **BPL02DC_SDB20:**

I/O panel for SDB20 with CVBS out

■ **BPL03C_SDB20:**

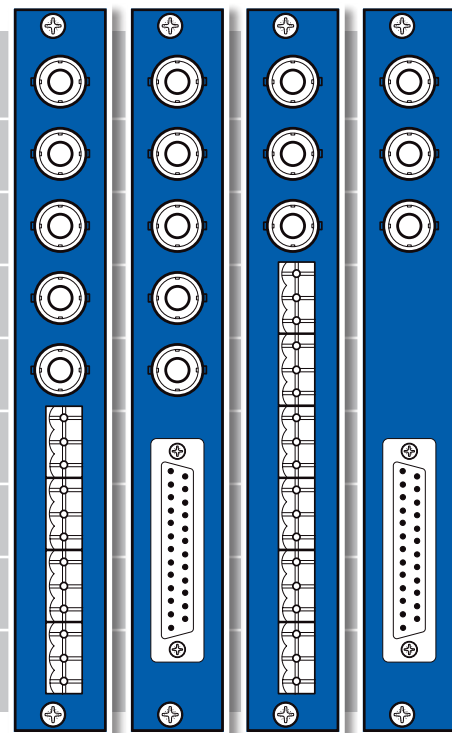
I/O panel for SDB20 with CVBS out

■ **BPL03DC_SDB20:**

I/O panel for SDB20 with CVBS out

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECL. OUT 2 (OPT. FIBER OR CVBS OUTPUT)
AES/EBU OUTPUT 1 (WITH BPL03D ON SUB-D)
AES/EBU OUTPUT 2 (WITH BPL03D ON SUB-D)
ANALOG AUDIO OUTPUT 1
ANALOG AUDIO OUTPUT 2
ANALOG AUDIO OUTPUT 3
ANALOG AUDIO OUTPUT 4

For fiber connectivity see www.axon.tv



BPL02

BPL02D

BPL03

BPL03D

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog audio output

Type	Balanced analog audio
Number of outputs	4
Connector	removable terminal strips or 25 pins female sub-D
Impedance	50 Ohms balanced

Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Frequency response	< ±0.05dB (20Hz to 20kHz)
Gain mismatch	< 0.25 dB @997Hz, -20dBFS Multi channel
THD+N	< 92dB @ 1kHz, -1dBFS
Crosstalk	< -100dB (20Hz to 20kHz)
DC offset	< ±30mV
Dynamic range	> 97dB @-60dBFS

AES output

Number of outputs	2
Connector	BNC, Screw terminal or 25 pins female sub-D (balanced)
Resolution	24 bits
Sampling rate	48KHz synchronous

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

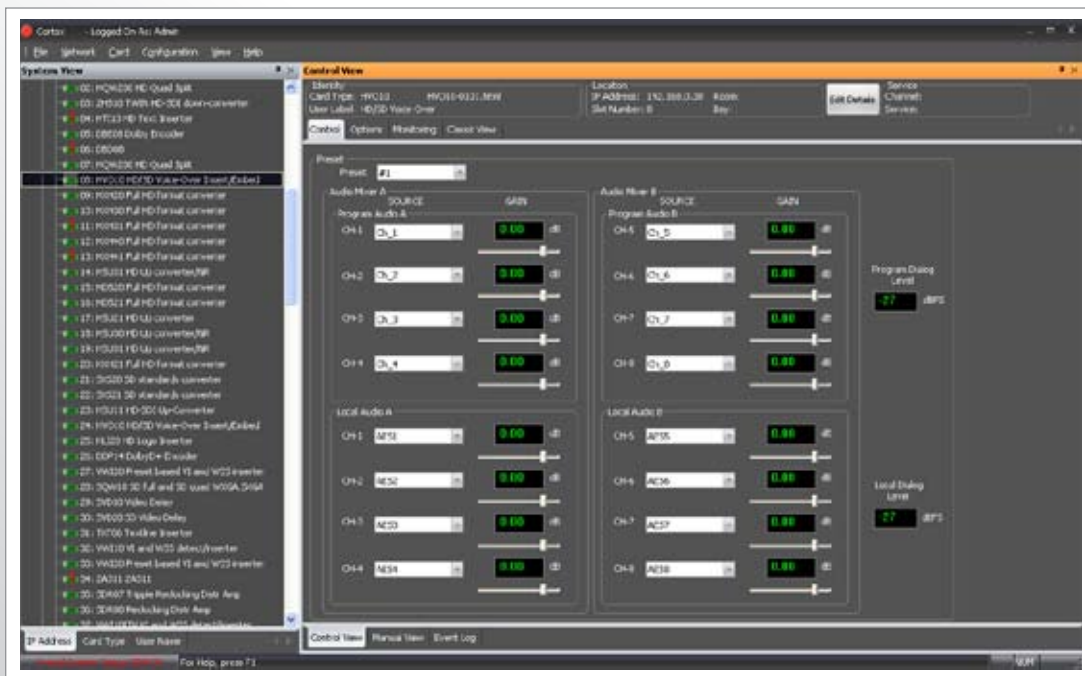
Voltage	+24V to +30V
Power	<8 Watts

HAS20: GUI shows the logical flow of signal processing through the card, multiple controls within a card which combine to produce an end result such as the selection, shuffling and embedder group of audio in the HAS20 are presented to ease understanding.

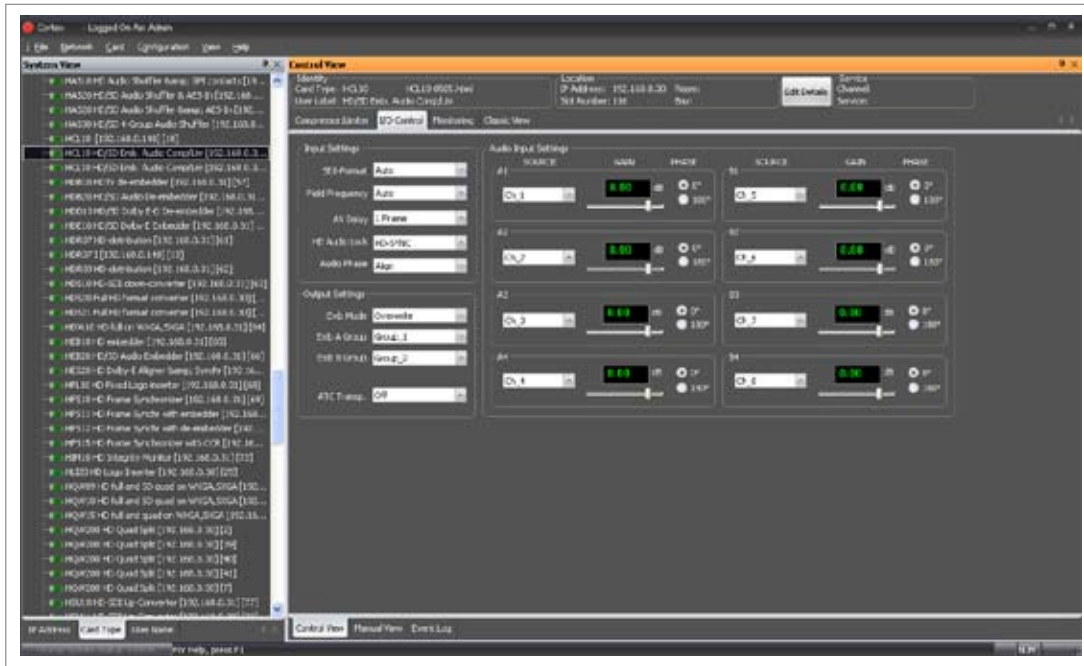


HAS20 - HVO10
HCL10

HVO10: Shows the logical flow of signal processing through the card.

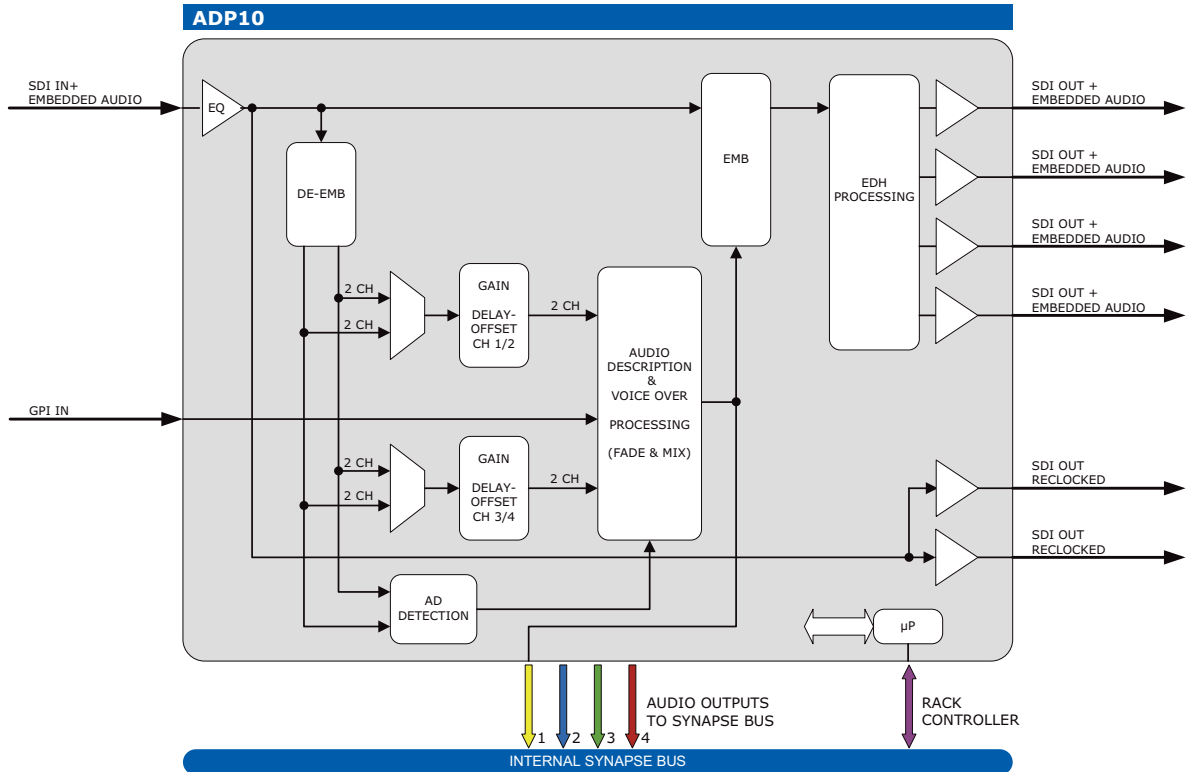


HCL10: Shows the status at a glance and represents audio levels in a traditional way with level meters rather than numbers that potentially change rapidly.



HAS20 - HVO10
HCL10




**MASTER
Card**

ADP10 Audio description processor for SDI embedded audio

The ADP10 is the embedded equivalent of the ADP24. The card is designed to decode an audio description track that is part of an SDI embedded audio stream. It reads the audio description track (default channel 3/4) and mixes this with the program material (channel 1/2). The result is then overwritten in the original audio description track (default 3/4). The user is free to change the default track description, and change the individual offset delay of the audio tracks. The ADP cards are designed for flexible integration in transmission environments.

- Audio description or voice-over mode
- Automatic audio description detection
- Any 4 channels out of any 16 embedded.
- Adjustable voice-over, fade-in and fadeout time
- Flexible channel assignment
- Audio re-insertion in any of 4 groups
- 2 relocked outputs
- 4 processed outputs
- Adjustable offset delay per mono channel
- Gain (0.25db steps) and phase control (0-180 deg) per channel
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Embedded domain audio description processing
- Embedded domain voice over applications

Ordering information

Module:

- **ADP10:** audio description processor for SDI embedded audio

Standard I/O:

- **BPL01_ADP10:**
I/O panel for ADP10
- **BPX01_ADP10:**
I/O panel for ADP10 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_ADP10:**
I/O panel for SFS10 with fiber transmitter on FC/PC
- **BPL01T_SC_ADP10:**
I/O panel for SFS10 with fiber transmitter on SC

Fiber inputs:

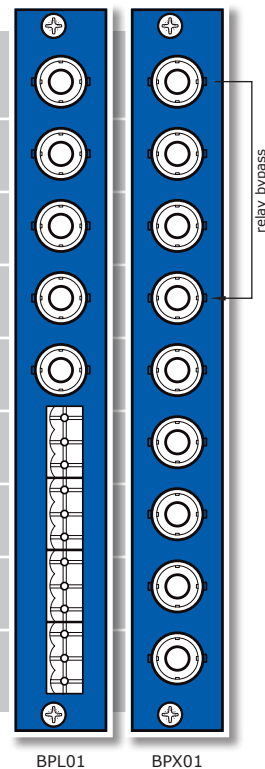
- **BPL01R_FC/PC_ADP10:**
I/O panel for SFS10 with fiber receiver on FC/PC
- **BPL01R_SC_ADP10:**
I/O panel for SFS10 with fiber receiver on SC

CVBS output:

- **BPL01C_ADP10:**
I/O panel for ADP10 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
GPI INPUT (VOICE OVER)

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

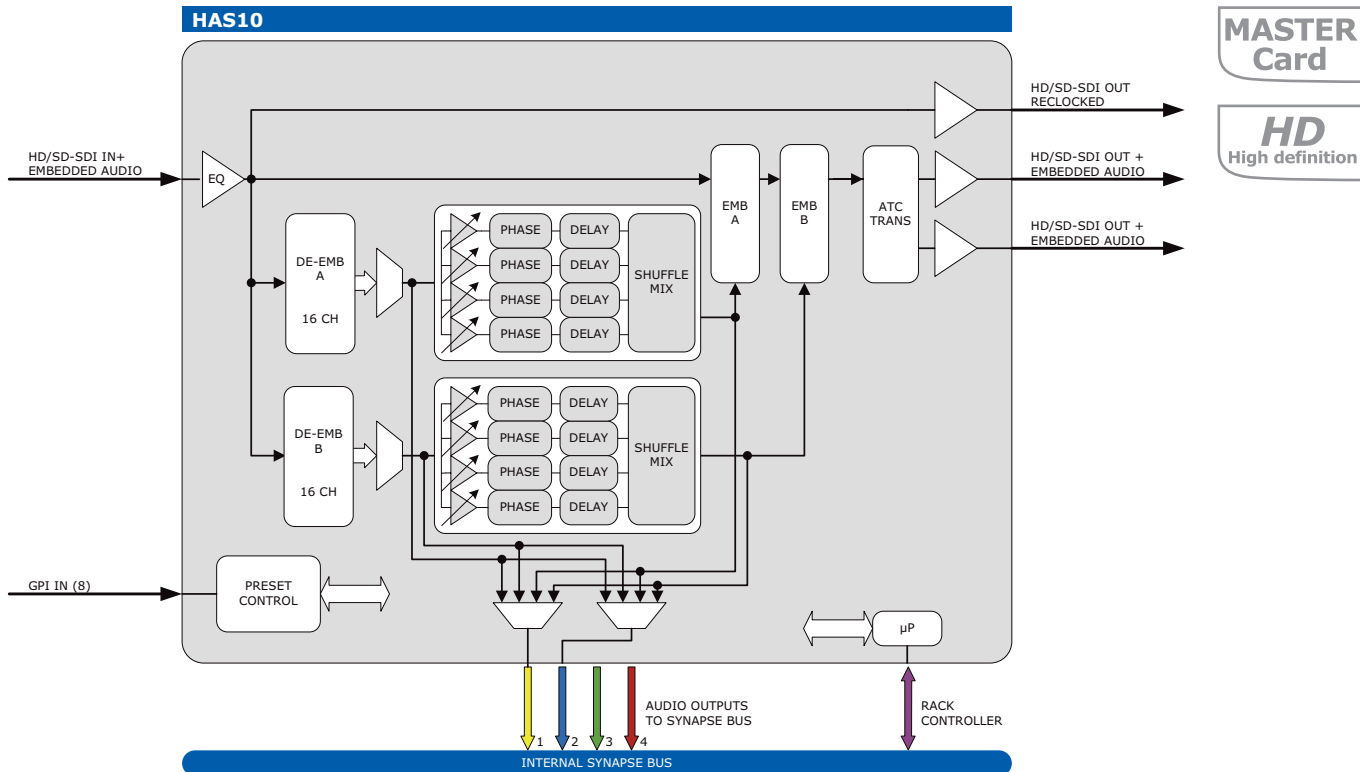
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



HAS10 HD/SD 8-channel 2-group embedded audio processing card with presets

The HAS10 is an 8 channel in 2 group preset based HD/SD-SDI embedded audio shuffler/mixer. AXON is an industry first with this comprehensive card, and puts full audio control power in to the hands of an HD-SDI embedded signal user. Individual gain, phase and delay control for each channel are also part of this powerful card. The preset based control of this card makes it ideal for repeated corrections or standard channel swapping occasions in a multi lingual environment. If dynamic control is required the card can still perform this task as every preset is remote controllable by a third party control protocol or our dedicated control panel SCP08.

- HD-SDI and SD-SDI compatible (functional equivalent to SD is SAS30)
- 8 channel selection (any 8 out of 16)
- 8 presets (GPI or ACP controlled)
- Dual 4 channel mix (group) with the option to add 4 channels into 1.
- Pre and post monitoring with ADD-ON card
- Audio input gain (0.25dB steps)
- Audio input phase (0 – 180 deg)
- Audio peak detection
- Audio input delay offset (0 to 2600 ms)
- Transparent for ATC time code RP188, RP196, RP215
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Ingest audio channel correction (HD)
- Preset based play-list audio shuffling
- OB van audio shuffling with job determined presets

Ordering information

Module:

- **HAS10:** HD/SD 8-channel 2-group embedded audio processing card with presets

Standard I/O:

- **BPH03_HAS10:**
I/O panel for HAS10

Fiber outputs:

- **BPH03T_FC/PC_HAS10:**
I/O panel for HAS10 with fiber transmitter on FC/PC
- **BPH03T_SC_HAS10:**
I/O panel for HAS10 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HAS10:**
I/O panel for HAS10 with fiber receiver on FC/PC
- **BPH03T_SC_HAS10:**
I/O panel for HAS10 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
RECLOCKED OUTPUT
PROCESSED OUTPUT 1
PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
GPI INPUTS (PRESETS)

For fiber connectivity see www.axon.tv



BPH03

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

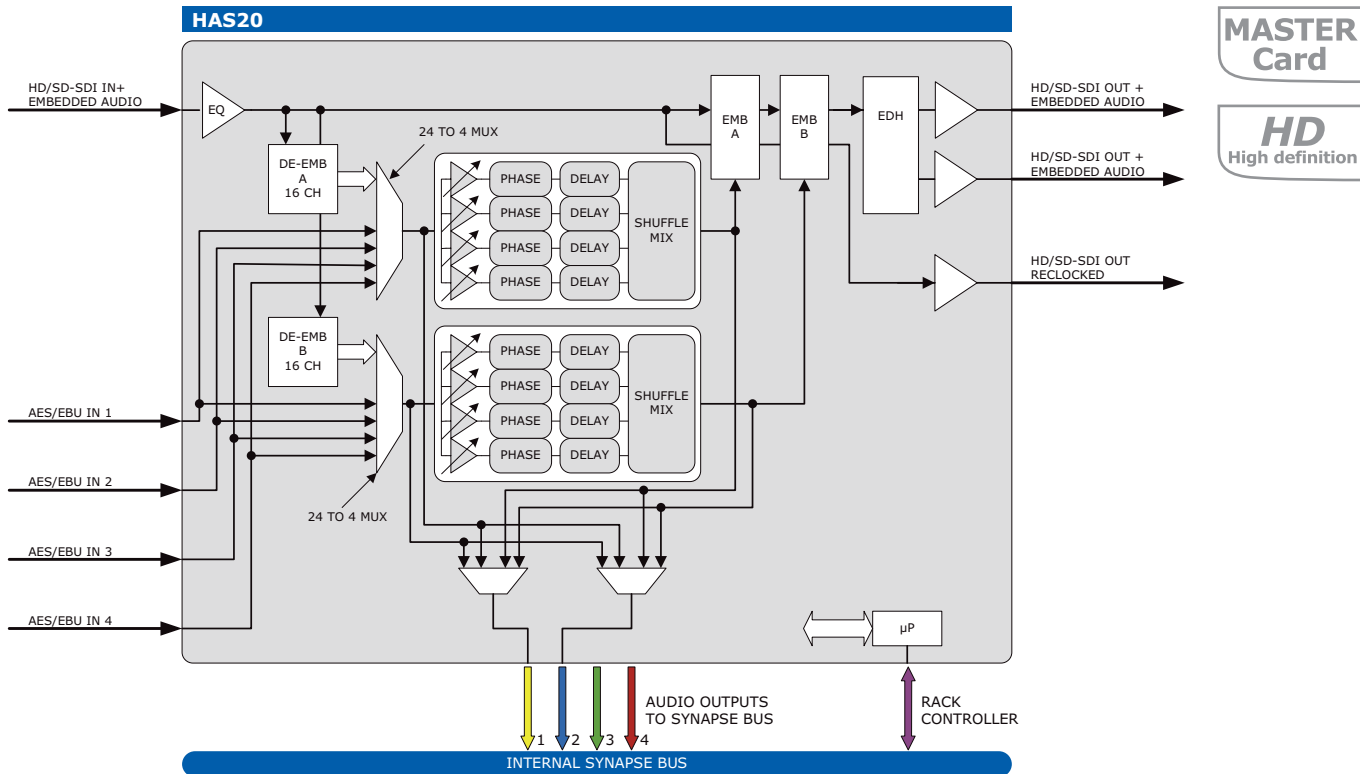
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<7 Watts



HAS20 HD/SD 8-channel 2-group embedded audio processing card with local AES/EBU inputs

The HAS20 is an 8-channel in 2-group preset-based HD-SDI embedded audio shuffler/mixer. AXON is an industry first with this comprehensive card, and puts full audio control power into the hands of an HD-SDI embedded signal user. Individual gain, phase and delay control for each channel are also part of this powerful card. The preset-based control of this card makes it ideal for repeated corrections or standard channel swapping occasions in a multi-lingual environment. If dynamic control is required the card can still perform this task as every preset is remote controllable by a third party control protocol or the dedicated control panel SCP08.

- 4 local AES/EBU inputs
- HD-SDI and SD-SDI compatible (functional equivalent to SD is SAS30)
- 8-channel selection (any out of 16 embedded + any out of 8 from local AES/EBU inputs)
- 8 presets (ACP controlled)
- Pre and post monitoring with ADD-ON card
- Audio input gain (0.25dB steps)
- Audio input phase (0 - 180 deg)
- Audio input delay offset
- Mix of any 4 channels in group A embedder and group B embedder
- Overwrite and append modes
- Peak detection 0, -6, -12 and -18dBFS
- Silence detection with threshold (-100 to -20dBFS) and time control (1 to 255 sec)

- Transparent for ATC time code RP188, RP196, RP215
- Audio format detection (e.g. AC3, Dolby E and PCM)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- HD/SD SDI audio shuffling with external source inputs
- MCR audio shuffling and swapping (for non compliant input signals)

Ordering information

Module:

- **HAS20:** HD/SD 8 channel 2 group embedded audio processing card with local AES/EBU inputs

Standard I/O:

- **BPH01_HAS20:**
I/O panel for HAS20 with unbalanced AES/EBU out
- **BPH02_HAS20:**
I/O for HAS20 with balanced AES/EBU out
- **BPH02D_HAS20:**
I/O panel for HAS20 with balanced AES/EBU out on sub-D

Fiber outputs:

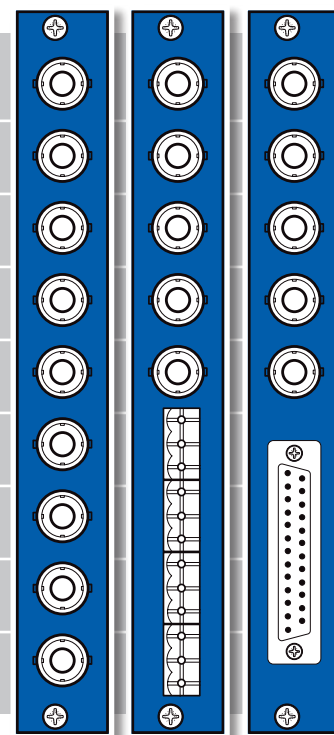
- **BPH01T_FC/PC_HAS20:**
I/O panel for HAS20 with fiber transmitter on FC/PC
- **BPH01T_SC_HAS20:**
I/O panel for HAS20 with fiber transmitter on SC
- **BPH02T_FC/PC_HAS20:**
I/O panel for HAS20 with fiber transmitter on FC/PC
- **BPH02T_SC_HAS20:**
I/O panel for HAS20 with fiber transmitter on SC
- **BPH02DT_FC/PC_HAS20:**
I/O panel for HAS20 with fiber transmitter on FC/PC
- **BPH02DT_SC_HAS20:**
I/O panel for HAS20 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HAS20:**
I/O panel for HAS20 with fiber receiver on FC/PC
- **BPH01R_SC_HAS20:**
I/O panel for HAS20 with fiber receiver on SC
- **BPH02R_FC/PC_HAS20:**
I/O panel for HAS20 with fiber receiver on FC/PC
- **BPH02R_SC_HAS20:**
I/O panel for HAS20 with fiber receiver on SC
- **BPH02DR_FC/PC_HAS20:**
I/O panel for HAS20 with fiber receiver on FC/PC
- **BPH02DR_SC_HAS20:**
I/O panel for HAS20 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROC. OUTPUT 2 (OPTIONAL FIBER OUTPUT)
AES/EBU INPUT 1
AES/EBU INPUT 2
AES/EBU INPUT 3
AES/EBU INPUT 4

For fiber connectivity see www.axon.tv



BPH01

BPH02

BPH02D

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

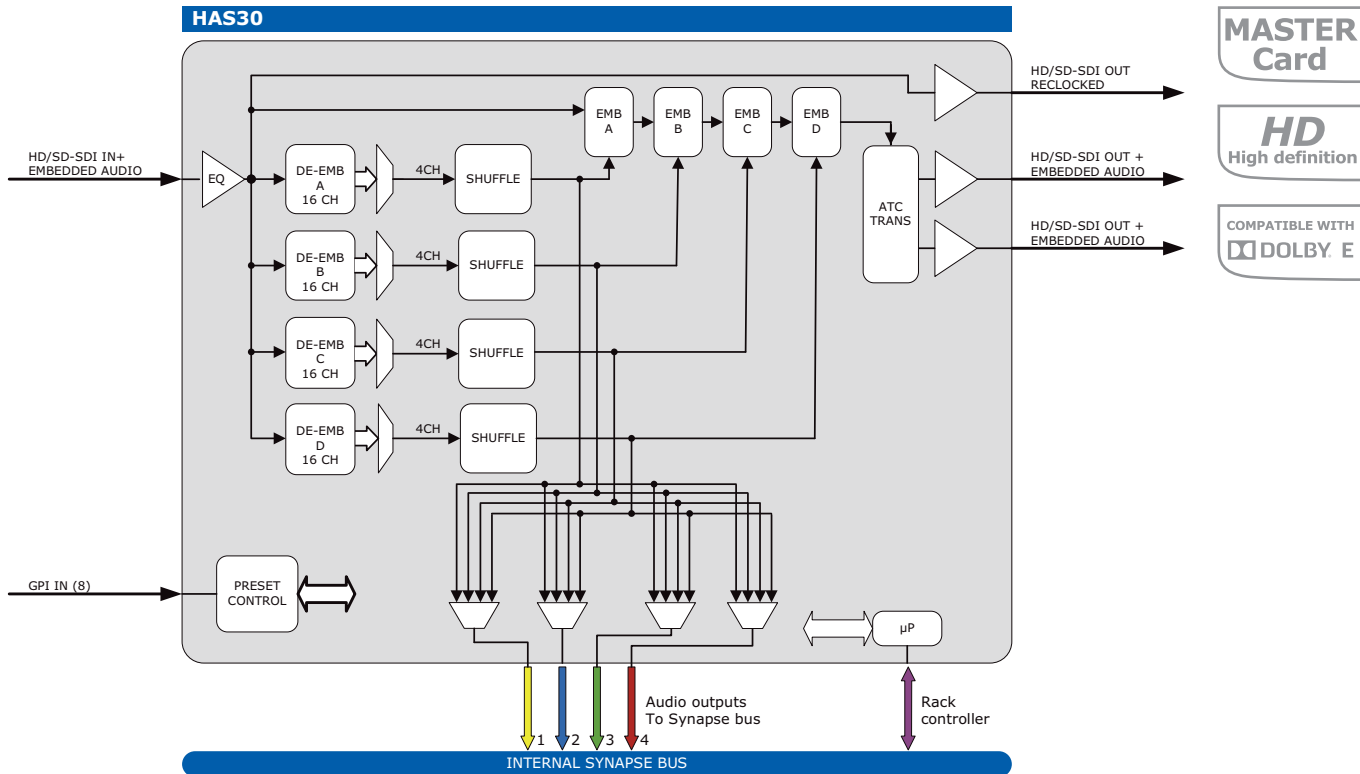
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

AES audio input

Connector	BNC, Screw terminal or 25 pins female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	4
Sampling rate	32 kHz to 96 kHz A-Synchronous via SRC and 48 kHz Synchronous in transparent mode (Dolby E)
Resolution	24 bits in HD, 20 bits in SD
Minimum input/output delay	1 ms
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<8 Watts



HAS30 HD/SD 16-channel 4-group embedded audio shuffler card with presets

The HAS30 is a 16 channel in 4 group preset based HD/SD-SDI embedded audio shuffler. AXON is an industry first with this comprehensive card, and puts full audio control power in to the hands of an HD-SDI embedded signal user. The preset based control of this card makes it ideal for repeated corrections or standard channel swapping occasions in a multi lingual (combined with Dolby E) environment. If dynamic control is required the card can still perform this task as every preset is remote controllable by a third party control protocol or our dedicated control panel SCP08.

- HD-SDI and SD-SDI compatible
- 16 channel selection (any 16 out of 16)
- 8 presets (GPI or ACP controlled)
- Post monitoring with ADD-ON card
- Silence detection with threshold (-100 to -20dBFS) and time control (1 to 255 sec)
- Transparent for ATC time code RP188, RP196, RP215
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Preset based play-list audio shuffling
- OB van audio shuffling with job determined presets

Ordering information

Module:

- **HAS30:** HD/SD 16-channel 4-group embedded audio processing card with presets

Standard I/O:

- **BPH03_HAS30:**
I/O-panel for HAS30

Fiber outputs:

- **BPH03T_FC/PC_HAS30:**
I/O-panel for HAS30 with fiber transmitter on FC/PC
- **BPH03T_SC_HAS30:**
I/O-panel for HAS30 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HAS30:**
I/O-panel for HAS30 with fiber receiver on FC/PC
- **BPH03R_SC_HAS30:**
I/O-panel for HAS30 with fiber receiver on SC



For fiber connectivity see www.axon.tv



BPH03

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

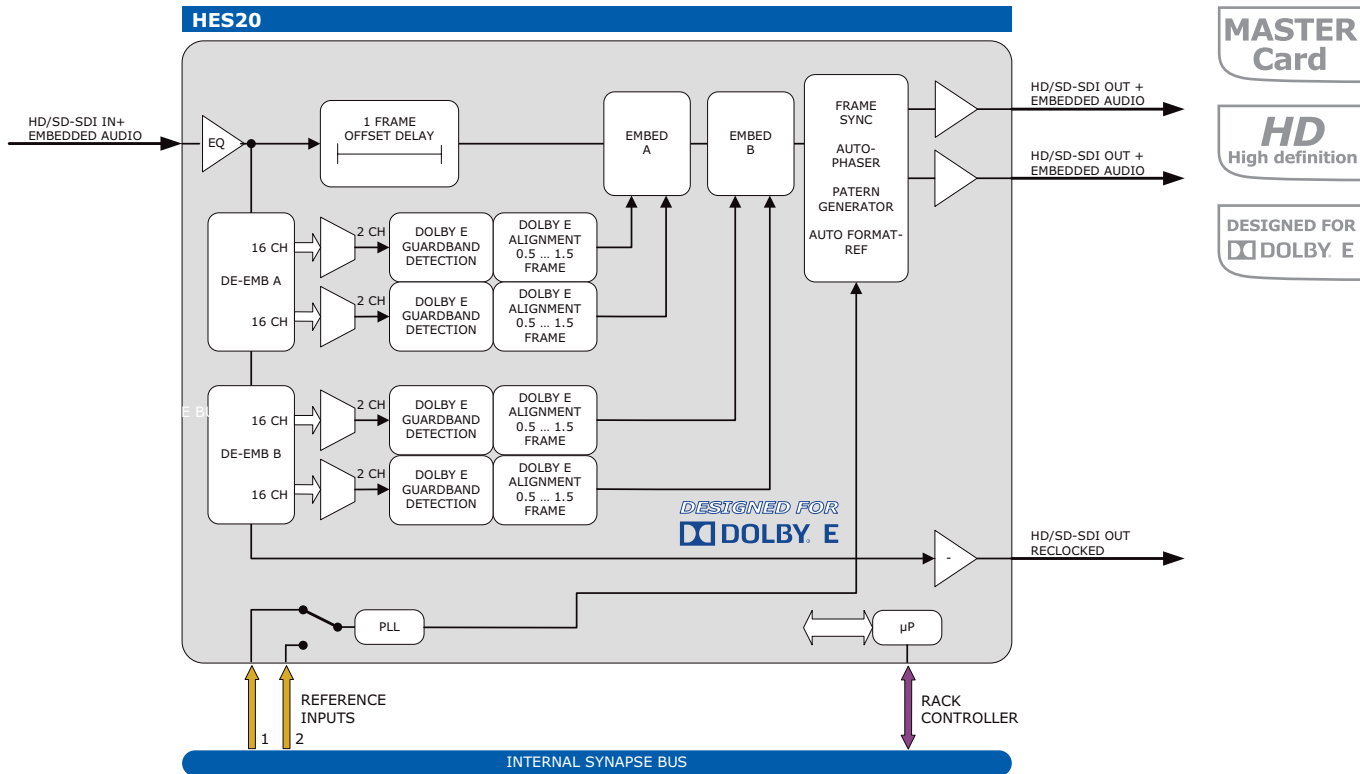
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	7 Watts



HES20 HD/SD embedded Dolby E alignment engine / frame synchronizer

The HES20 is a Dolby-E aligner + frame synchronizer. The use of Dolby E in modern SD and HD SDI embedded infrastructures becomes more and more common. Dolby E has a guard-band that ideally sits exactly on top of the frame boundaries of the SDI video stream. Unfortunately this is not always the case. Individual audio and video propagation delay problems can cause a time shift of the Dolby E stream with respect to the SDI carrier, even when it is embedded. A common cause is an MPEG encoder – decoder configuration in a contribution environment. The shift in guard-band removes the feature within Dolby E to drop or rewrite a video-frame without audible clicks. Beside the compression this is one of the main reasons Dolby E is used.

The HES20 is the answer to this problem. The card automatically detects Dolby E and a possible offset of the guard band is measured. Any offset of up to +/- 0.5 Frame will be corrected automatically by delaying the Dolby E between 0.5 and 1.5 frame (The video part of the SDI stream is delayed by one frame as default). A free selection of four stereo pairs, out of the full embedded audio domain can be chosen. If a PCM channel is detected it will get an automatic offset delay of 1 Frame, equal to the video delay.

- Automatic Dolby E alignment of up to 4 embedded Dolby E streams
- Individual offset delay for each Dolby E track -10 to + 10 lines
- Automatic detection of Dolby E versus PCM

- Full functioning Frame synchronizer allows for a-synchronous operation
- Compatible with the following standards:
 - 1080i-59.94 ■ 1080i-50 ■ 1080p-30
 - 1080p-25 ■ 1035i-59.94 ■ 720p-60
 - 720p-50 ■ SD525 ■ SD625
- Synchronize, delay and free-run modes
- ATC transparency acc. RP188, RP196, RP215
- Locks to Bi and Tri level syncs
- Offset H and V adjustment
 - Up to 2199 pixels H
 - Up to 1124 lines V
- Manual Freeze
- GPI Freeze
- OSD identity text
- I/O measurement propagation delay
- Built-in Proc-amp with individual controls for Y, Cr, Cb, Y-Black, Cb-Black, Cr-Black
- Line lock mode for better auto-phasing
- Audio format detection (e.g. AC3, Dolby E and PCM)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Post MPEG transport embedded Dolby E alignment and synchronization
- Post server Dolby E alignment
- Contribution network embedded Dolby E alignment

Ordering information

Module:

- **HES20:** HD/SD embedded Dolby E alignment engine / Frame synchronizer

Standard I/O:

- **BPH01_HES20:**
I/O panel for HES20

Fiber output:

- **BPH01T_FC/PC_HES20:**
I/O panel for HES20 with fiber transmitter on FC/PC
- **BPH01T_SC_HES20:**
I/O panel for HES20 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HES20:**
I/O panel for HES20 with fiber receiver on FC/PC
- **BPH01R_SC_HES20:**
I/O panel for HES20 with fiber receiver on SC

HD/SD-SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD-SDI RECLOCKED OUTPUT
HD SDI PROCESSED OSD OUTPUT 1
HD SDI PROCESSED OSD OUTPUT 2 (OPTIONAL FIBER OUTPUT)
FREEZE INPUT

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude

Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
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Wideband jitter	< 0.2UI
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Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
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Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04,
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Connector	BNC
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Signal level	1V nominal
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Impedance	High impedance, with loop for termination
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Return loss	> 25dB to 10MHz
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Miscellaneous

Weight	Approx. 250g
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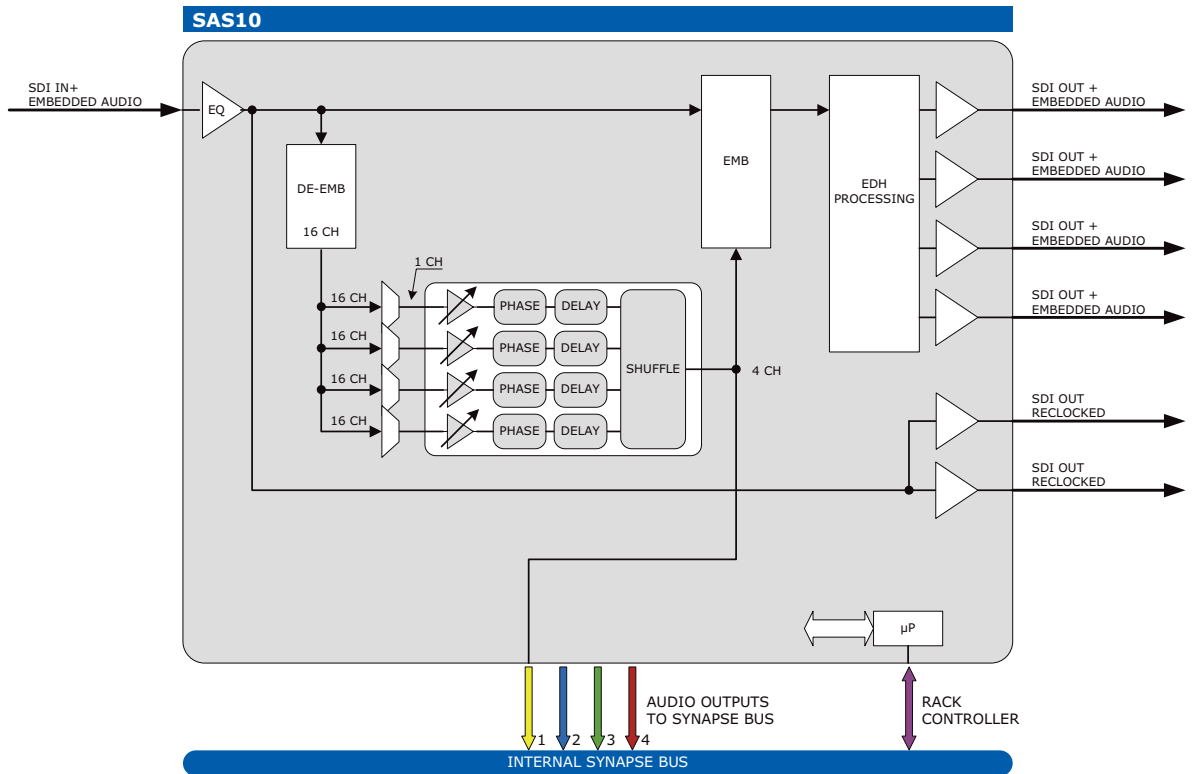
Operating temperature	0 °C to +50 °C
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Dimensions	137 x 296 x 20 mm (HxWxD)
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Electrical

Voltage	+24V to +30V
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Power	9 Watts
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**MASTER
Card**

SAS10 SD 4 channel into one group embedded audio shuffler/mixer

The SAS10 is a SD-SDI embedded 4-channel audio shuffler. The SAS10 accept an incoming SDI stream with embedded audio, de-embeds the audio and relocates (shuffles) the audio channels as required by the user. Each audio channel can be selected as one out of 16. The channels can be individual processed before mixing and swapping. The control items are gain, phase and delay.

- Free selection of all 16 channels, and re-insert these channels in a free selectable group.
- Individual audio gain (0.25dB steps) and phase (0-180 deg) per channel
- Full 4 channel mixing and swapping
- Delay 2600ms max for each independent channel.
- Audio peak detection
- Peak reference 0, -6, -12, -18dBFS
- Processed (shuffled/mixed) result is available on ADD-ON bus to be monitored with DAC20 or DAS24
- EDH processing
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Ingest audio channel correction

Ordering information

Module:

- **SAS10:** 4 channel into one group embedded audio shuffler/mixer

Standard I/O:

- **BPL01_SAS10:** I/O panel for SAS10
- **BPX01_SAS10:** I/O panel for SAS10 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SAS10:** I/O panel for SAS10 with fiber transmitter on FC/PC
- **BPL01T_SC_SAS10:** I/O panel for SAS10 with fiber transmitter on SC

Fiber inputs:

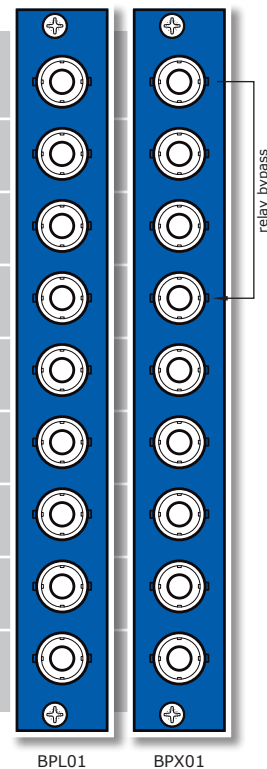
- **BPL01R_FC/PC_SAS10:** I/O panel for SAS10 with fiber receiver on FC/PC
- **BPL01R_SC_SAS10:** I/O panel for SAS10 with fiber receiver on SC

CVBS output:

- **BPL01C_SAS10:** I/O panel for SAS10 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4

For fiber connectivity see www.axon.tv



BPL01

BPX01

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

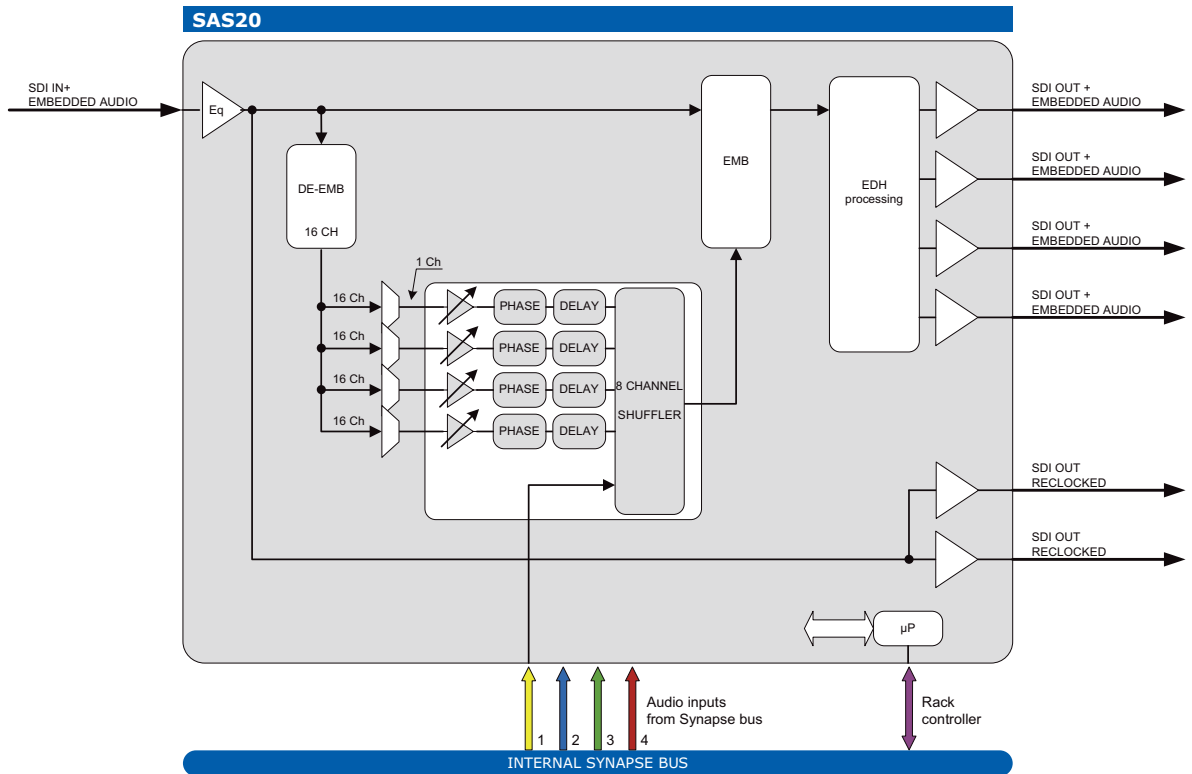
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts


**MASTER
Card**

SAS20 SD 8 channel into one group embedded audio + ADD-ON input shuffler/mixer

The SAS20 is a SD-SDI embedded 8-channel audio shuffler. The SAS20 accepts an incoming SDI stream with embedded audio, de-embeds the audio and relocates (shuffles) and combines the audio channels with 4 channels that can be sourced by an ADD-ON card as the ADC20/24 and DIO24. Each local audio channel can be selected as one out of 16. The local channels can be individual processed before mixing and swapping. The control items are gain, phase and delay. The ADD-ON channels can be processed before mixing on the ADD-ON card.

- Free selection of all 16 channels + 4 ADD-ON channels and re-insert these channels in a free selectable group.
- Individual local audio gain (0.25dB steps) and phase (0-180 deg) per channel
- Full 8 channel mixing and swapping into one group (4 channels)
- Delay 2600ms max for each local channel.
- Audio peak detection
- Peak reference 0, -6, -12, -18dBFS
- EDH processing and generation
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Correction of embedded audio channels by combining local and external audio channels

Ordering information

Module:

- **SAS20:** 8 channel into one group embedded audio + ADD-ON input shuffler/mixer

Standard I/O:

- **BPL01_SAS20:** I/O panel for SAS20
- **BPX01_SAS20:** I/O panel for SAS20 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SAS20:** I/O panel for SAS20 with fiber transmitter on FC/PC
- **BPL01T_SC_SAS20:** I/O panel for SAS20 with fiber transmitter on SC

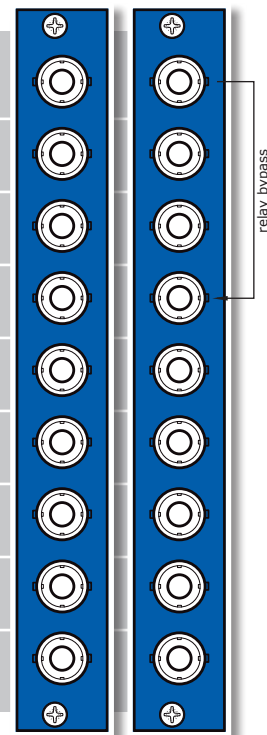
Fiber inputs:

- **BPL01R_FC/PC_SAS20:** I/O panel for SAS20 with fiber receiver on FC/PC
- **BPL01R_SC_SAS20:** I/O panel for SAS20 with fiber receiver on SC

CVBS output:

- **BPL01C_SAS20:** I/O panel for SAS20 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4



BPL01

BPX01

For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

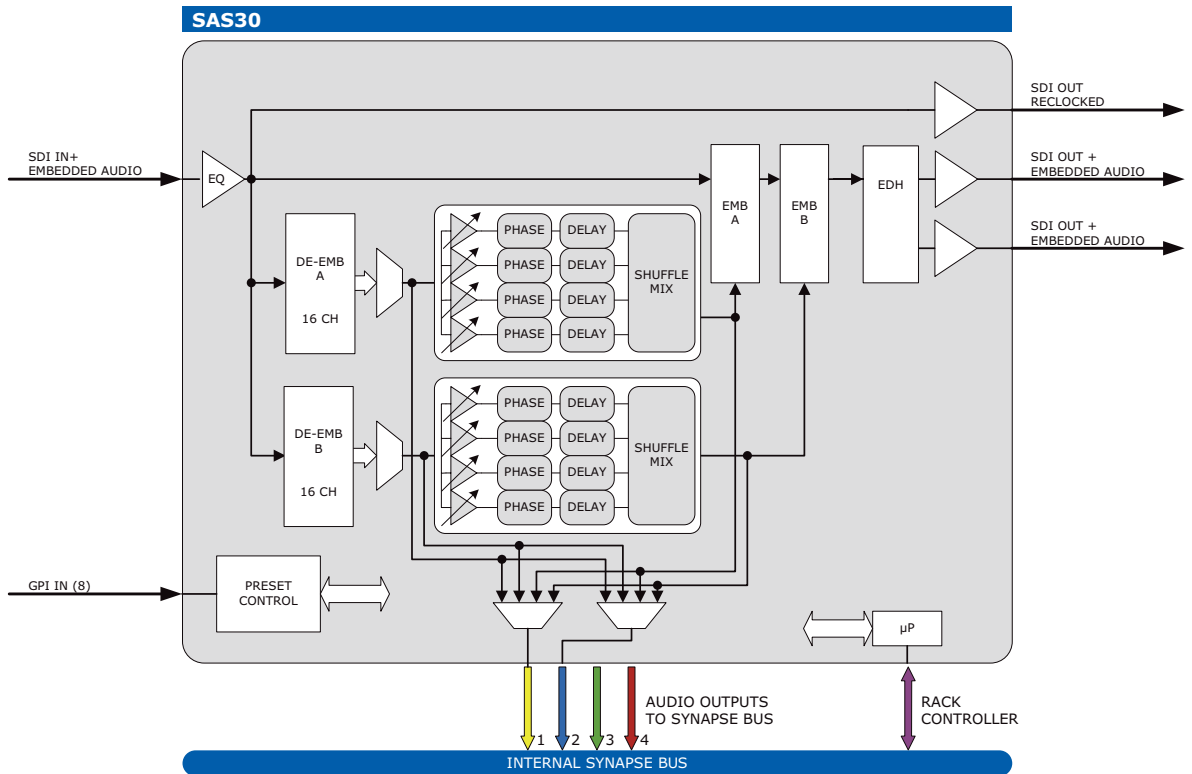
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



SAS30 SD 2 group GPI (preset) triggered SDI embedded audio shuffler

The SAS30 is an 8-channel in 2 group preset based SDI embedded audio shuffler/mixer. AXON is the first in the industry to offer this comprehensive card, and puts full 8 channel audio control power in to the hands of an SDI embedded signal user. Individual gain, phase and delay control for each channel are also part of this powerful card. The preset based control of this card makes it ideal for repeated corrections or standard channel swapping in a multi-lingual environment. If dynamic control is required the card can still perform this task as every preset is remote controllable by a third party control protocol or our dedicated SCP08 control panel.

- SD-SDI compatible (functional equivalent to HD capable HAS10)
- 8-channel selection (any out of 16)
- 8 presets (GPI or ACP controlled)
- Pre and post monitoring with ADD-ON card
- Audio input gain (0.25dB steps)
- Audio input phase (0 – 180 deg)
- Audio input delay offset
- EDH detection and generation
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O-panel

Applications

- Preset based 2 group audio shuffling/mixing

Ordering information

Module:

- **SAS30:** 2 group GPI (preset) triggered SDI embedded audio shuffler

Standard I/O:

- **BPL01_SAS30:** I/O panel for SAS30
- **BPX01_SAS30:** I/O panel for SAS30 with backup bypass loop
- **BPX03_SAS30:** I/O panel for SAS30 with GPI in and output on GPI, with backup bypass loop

Fiber outputs:

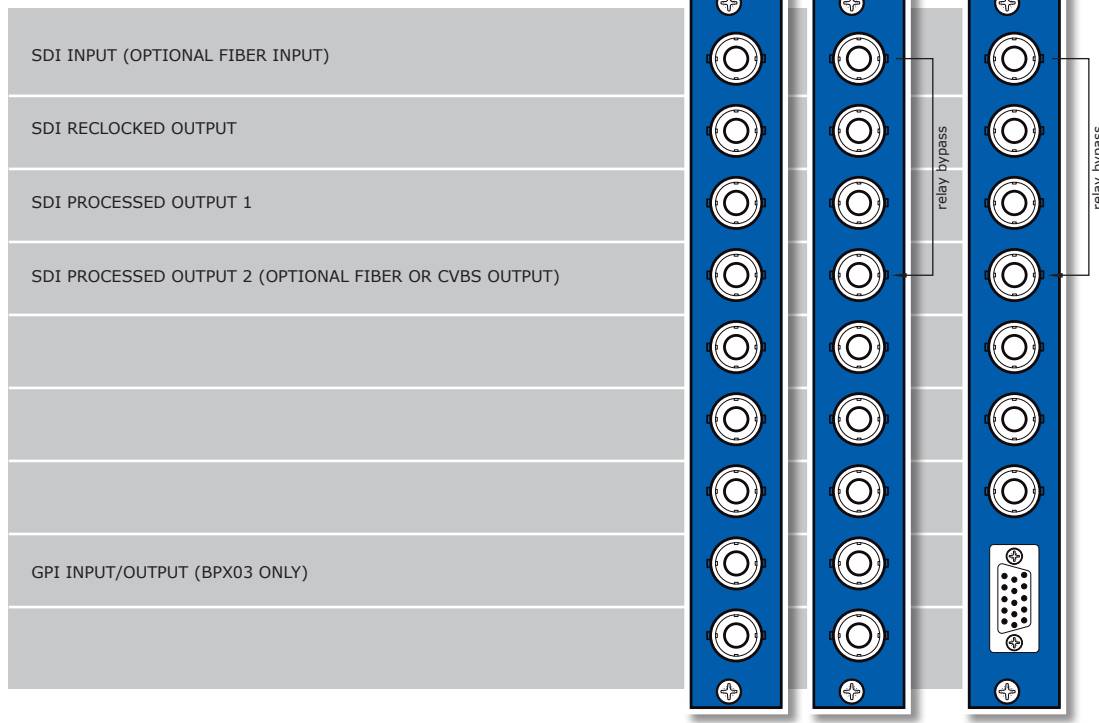
- **BPL01T_FC/PC_SAS30:** I/O panel for SAS30 with fiber transmitter on FC/PC
- **BPL01T_SC_SAS30:** I/O panel for SAS30 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_SAS30:** I/O panel for SAS30 with fiber receiver on FC/PC
- **BPL01R_SC_SAS30:** I/O panel for SAS30 with fiber receiver on SC

CVBS output:

- **BPL01C_SAS30:** I/O panel for SAS30 with one CVBS output



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

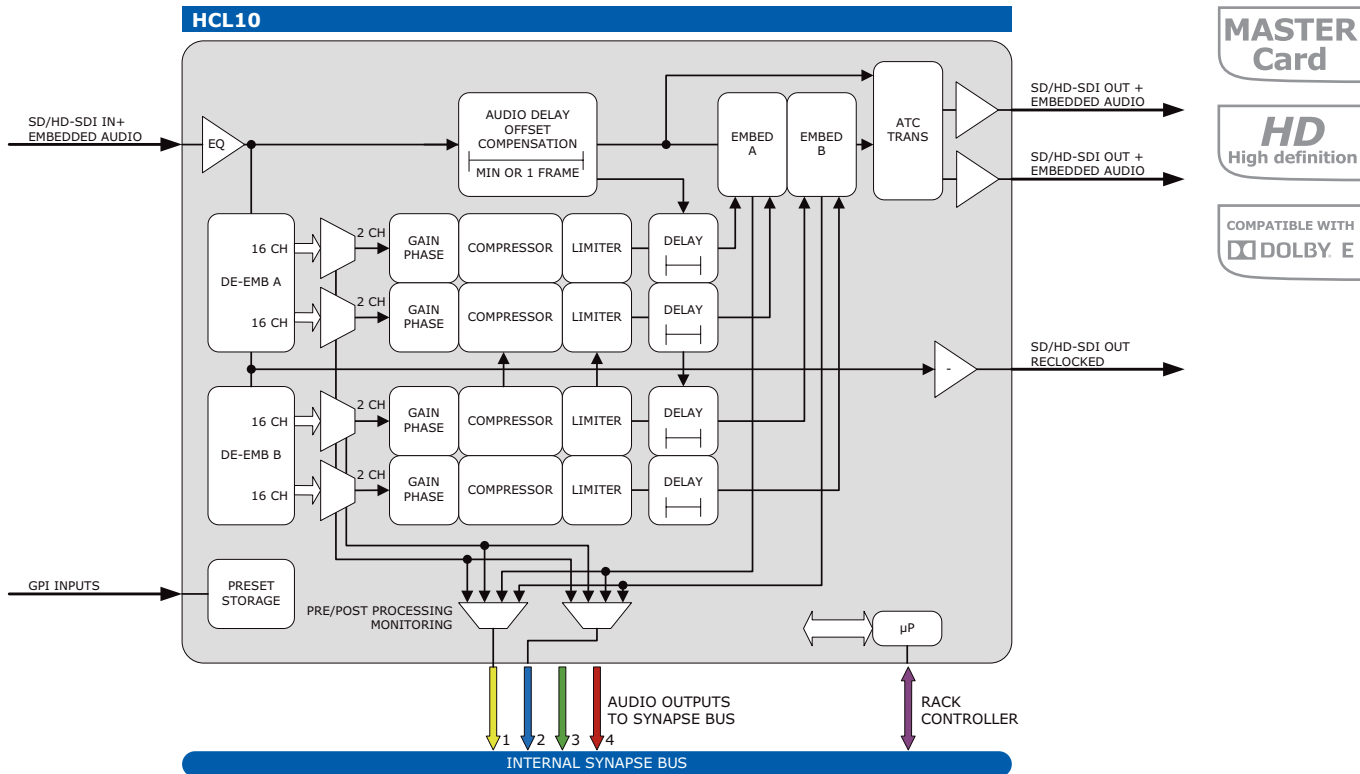
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (one reclocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<9 Watts



HCL10 HD/SD embedded audio compressor/limiter

The HCL10 is a high quality preset based 8 channels HD/SD embedded audio compressor/limiter. The card is able to compress and limit 8 channels and insert them in to 2 groups of embedded audio. Main features are:

- Free selection of any 8 channels out of all 16 channels
- Input Gain and Phase control
- Adjustable Video offset delay to minimum (approx. 2.5 ms) or 1 frame
- Preset control of audio processing parameters for all 6 presets include:
 - User defined preset label of 16 characters
 - Bypass for non PCM on stereo pairs
 - Bypass of Compressor or Limiter on stereo pairs
 - Channel link:
 - Multi mono
 - Dual Stereo
 - Quad
 - All 8 channels
 - 2+6
 - 6+2
- Threshold
 - -80 dBFS to 0 dBFS
- Compression ratio
 - 1:1 to 15:1 in 0.1 increments
- Compressor Attack adjustment
 - 1 to 500ms
- Compressor release adjustment
 - 10 to 5000ms
- Compressor Knee adjustment
 - Hard
 - Medium
 - Soft
 - Tube-Soft
- Compressor Level detection
 - Peak
 - RMS
- Compressor Makeup gain
 - -60 dB to +12 dB
- Limit Threshold adjustment
 - -60 dBFS to 0dBFS
- Limit Knee adjustment
 - Hard
 - Medium
 - Soft
 - Tube-Soft
- Limit release adjust
 - 100 to 5000 ms
- Limit output gain
 - -60dB to +12dB
- Level meters & reduction meters (in status menu)
 - Off
 - Input Limiter
 - Output Limiter
 - Compressor + limiter
- Pre and post processor monitoring via Synapse ADD-ON card
- Full status information of the video and all embedded audio parameters.
- Audio format detection (e.g. AC3, Dolby E and PCM)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

The primary application of the HCL10 will be seen in output stages of the transmission chain. The card can be used next to a video legalizer, a truck output and all transmission outputs.

The HCL10 will “legalize” all leaving audio content to predefined audio parameters that can be recalled in pre-sets. Another application is seen as an ingest compressor limiter.

Ordering information

Module:

- **HCL10:** HD/SD embedded audio compressor/limiter

Standard I/O:

- **BPH03_HCL10:**
I/O-panel for HCL10 with GPI I/O on sub-D

Fiber outputs:

- **BPH03T_FC/PC_HCL10:**
I/O-panel for HCL10 with fiber transmitter on FC/PC
- **BPH03T_SC_HCL10:**
I/O-panel for HCL10 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HCL10:**
I/O-panel for HCL10 with fiber receiver on FC/PC
- **BPH03R_SC_HCL10:**
I/O-panel for HCL10 with fiber receiver on SC

HD/SD-SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD-SDI RECLOCKED OUTPUT
HD/SD-SDI RECLOCKED OUTPUT
HD/SD-SDI PROC. OUTPUT (OPTIONAL FIBER OUTPUT)
GPI INPUT/OUTPUT

For fiber connectivity see www.axon.tv



BPH03

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

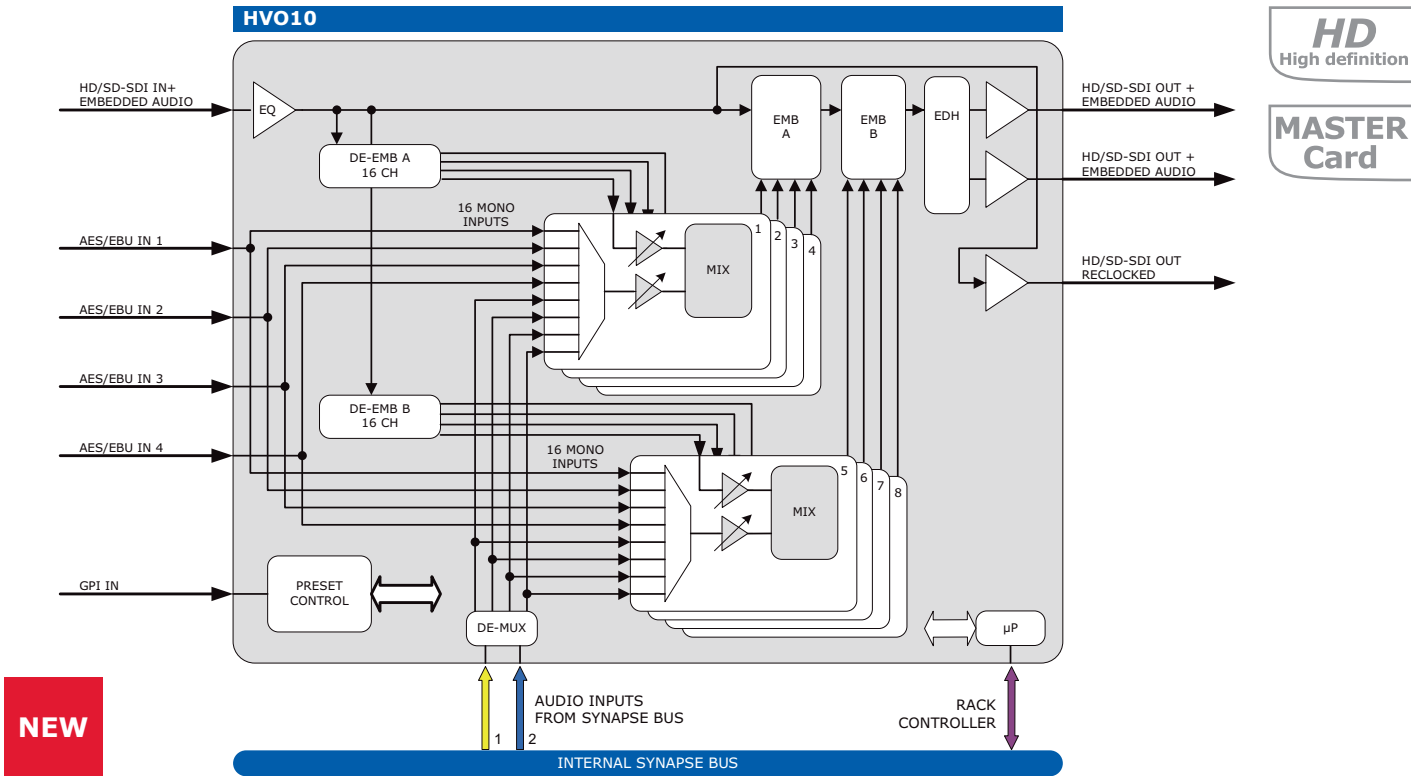
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



HVO10 HD/SD Voice Over inserter/embedder

The HVO10 is an 8-channel in 2-group preset-based HD embedded audio shuffler/mixer/Voice over card. AXON is again an industry first with this powerful card, and puts full audio mixing and shuffling control power into the hands of an HD embedded signal user. The preset-based control of this card makes it ideal for repeated corrections. If dynamic control is required the card can still perform this task as every preset is remote controllable by a third party control protocol or the dedicated control panel SCP08.

- MIX one embedded channel with one external channel (times 8 into 2 groups)
- 8 presets
- ADD dialog levels in mixing calculation
- 4 local AES/EBU inputs (8 Mono)
- 4 ADD-ON inputs (8 Mono)
- HD-SDI and SD-SDI compatible
- Control objects per channel are:
 - Embedded audio Gain (1 dB steps)
 - External audio gain (1 dB steps)
 - Mixing fade time (100-10,000ms)
 - Overwrite and append modes
- Transparent for ATC time code RP188, RP196, RP215
- Transparent for Dolby-E; processing bypassed
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Multi channel voice over card
- MCR audio shuffling/mixing and swapping

Ordering information

Module:

- **HVO10:** HD/SD 8 channel 2 group embedded audio processing card with local AES/EBU inputs

Standard I/O:

- **BPH01_HVO10:** I/O panel for HVO10 with unbalanced AES/EBU out
- **BPH02_HVO10:** I/O for HVO10 with balanced AES/EBU out
- **BPH02D_HVO10:** I/O panel for HVO10 with balanced AES/EBU out on sub-D

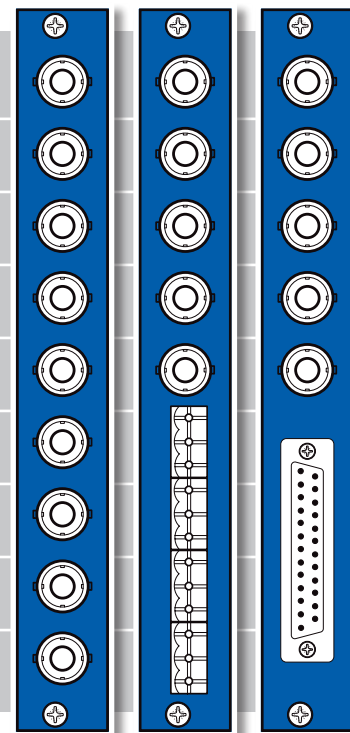
Fiber outputs:

- **BPH01T_FC/PC_HVO10:** I/O panel for HVO10 with fiber transmitter on FC/PC
- **BPH01T_SC_HVO10:** I/O panel for HVO10 with fiber transmitter on SC
- **BPH02T_FC/PC_HVO10:** I/O panel for HVO10 with fiber transmitter on FC/PC
- **BPH02T_SC_HVO10:** I/O panel for HVO10 with fiber transmitter on SC
- **BPH02DT_FC/PC_HVO10:** I/O panel for HVO10 with fiber transmitter on FC/PC
- **BPH02DT_SC_HVO10:** I/O panel for HVO10 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HVO10:** I/O panel for HVO10 with fiber receiver on FC/PC
- **BPH01R_SC_HVO10:** I/O panel for HVO10 with fiber receiver on SC
- **BPH02R_FC/PC_HVO10:** I/O panel for HVO10 with fiber receiver on FC/PC
- **BPH02R_SC_HVO10:** I/O panel for HVO10 with fiber receiver on SC
- **BPH02DR_FC/PC_HVO10:** I/O panel for HVO10 with fiber receiver on FC/PC
- **BPH02DR_SC_HVO10:** I/O panel for HVO10 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
AES/EBU INPUT 1
AES/EBU INPUT 2
AES/EBU INPUT 3
AES/EBU INPUT 4



BPH01

BPH02

BPH02D

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Number of inputs 3

Equalization Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.

Return loss > 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Number of outputs 3 (1 reclocked and 2 processed)

Signal level 800mV nominal

DC offset 0V ±0.5V

Rise and fall time 200ps nominal for HD, 750ps nominal for SD

Overshoot < 10% of amplitude

Return loss > 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s

Wideband jitter < 0.2UI

AES audio input

Connector BNC, Screw terminal or 25 pins female sub-D (balanced)

Standard AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES

Number of inputs 4

Sampling rate 32 kHz to 96 kHz A-Synchronous via SRC and 48 kHz Synchronous in transparent mode (Dolby E)

Resolution 24 bits in HD, 20 bits in SD

Minimum input/output delay 1 ms

Impedance 110 Ohms or 75 Ohms

Level 0.2V to 1V nom for BNC, 2V to 7V for balanced operation

Miscellaneous

Weight Approx. 250g

Operating temperature 0 °C to +50 °C

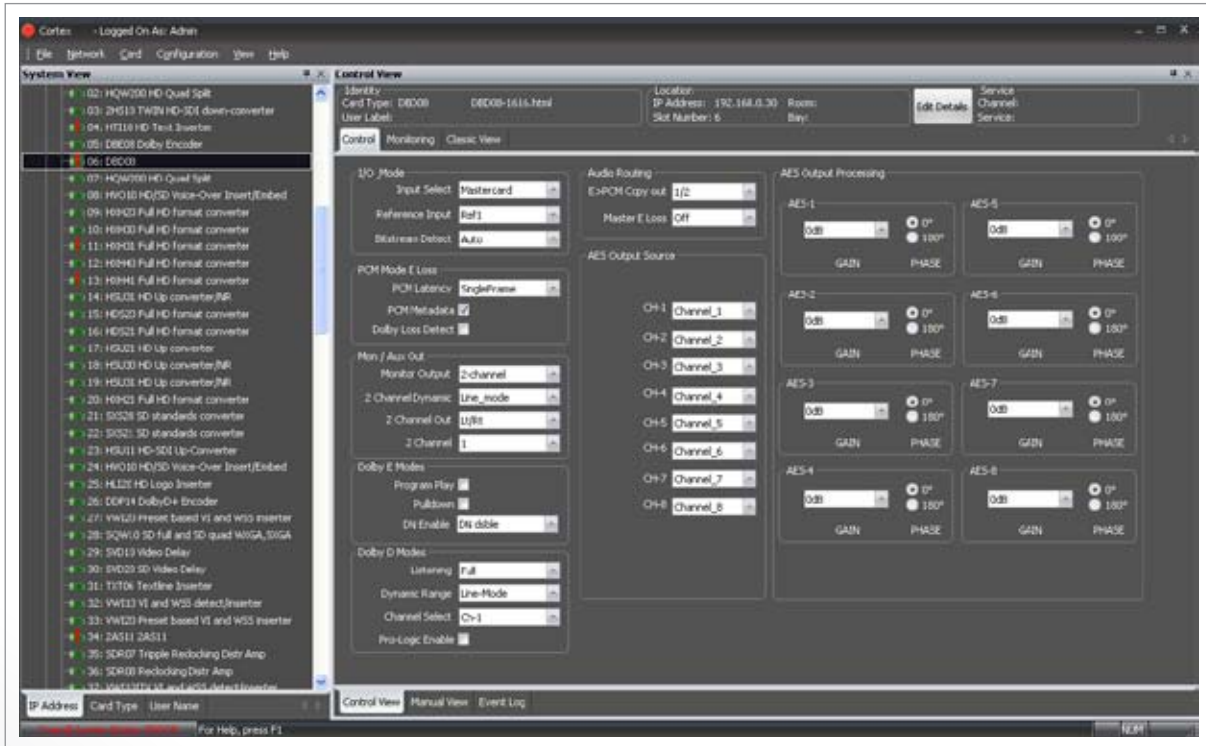
Dimensions 137 x 296 x 20 mm (HxWxD)

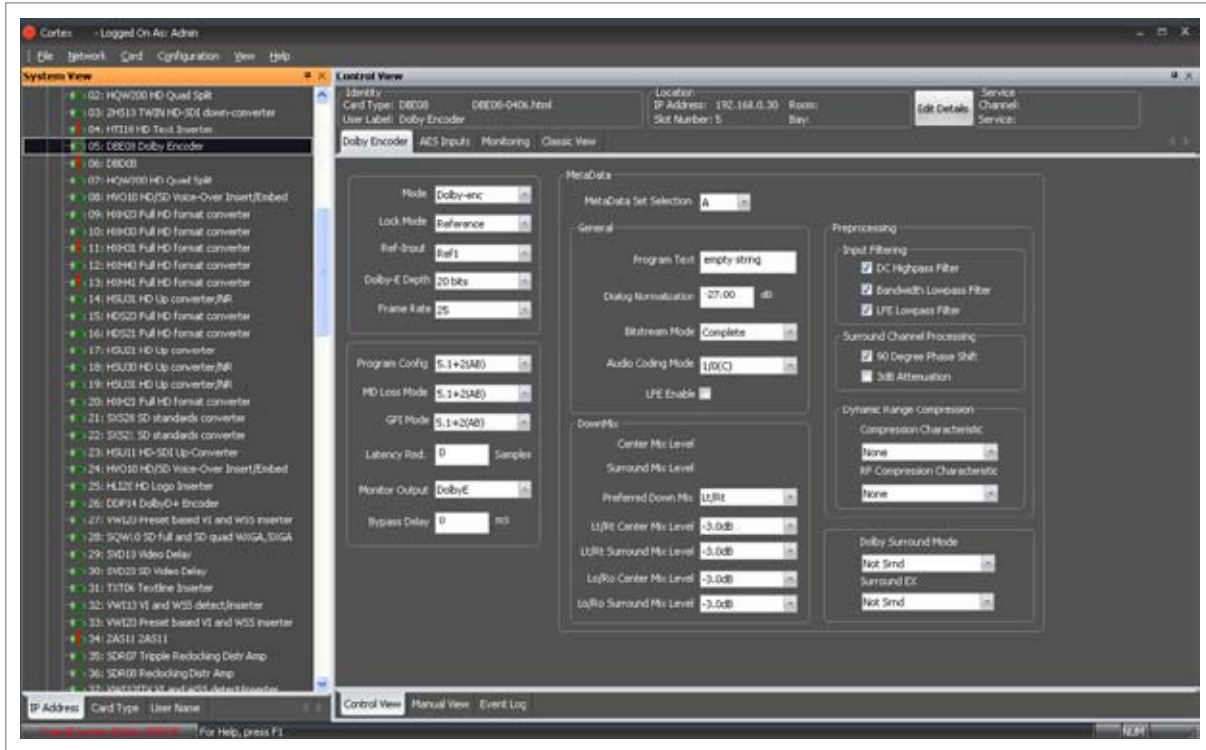
Electrical

Voltage +24V to +30V

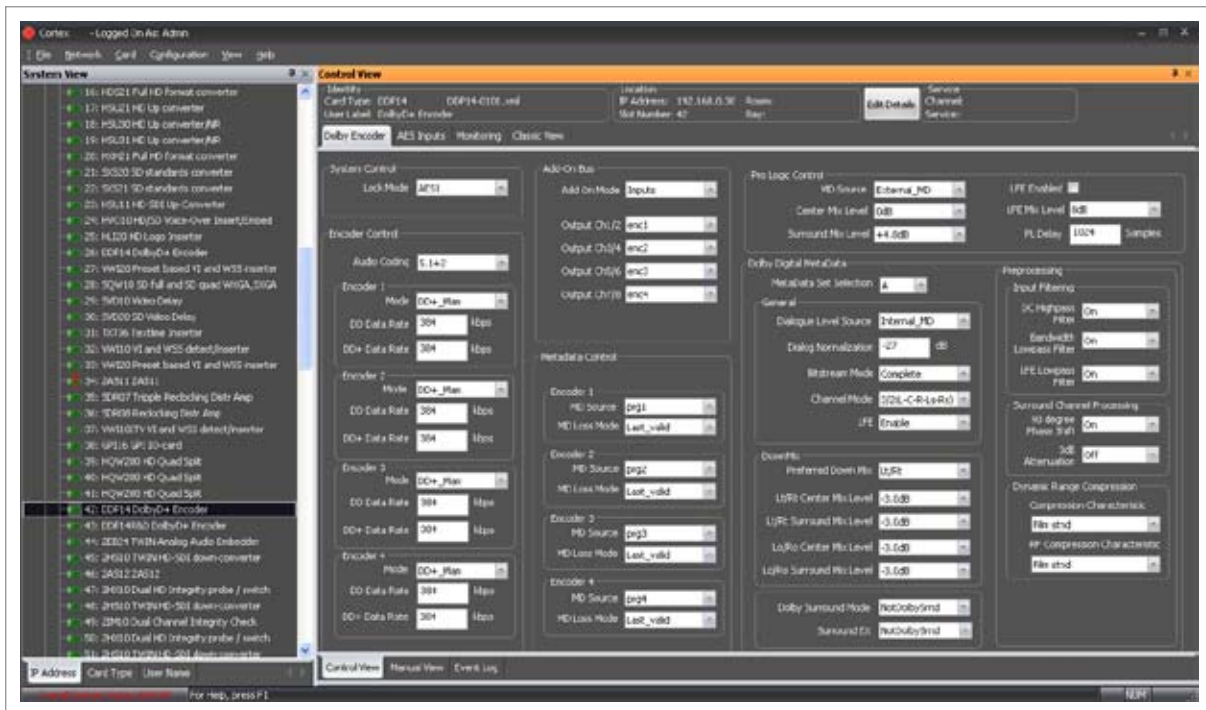
Power <8 Watts

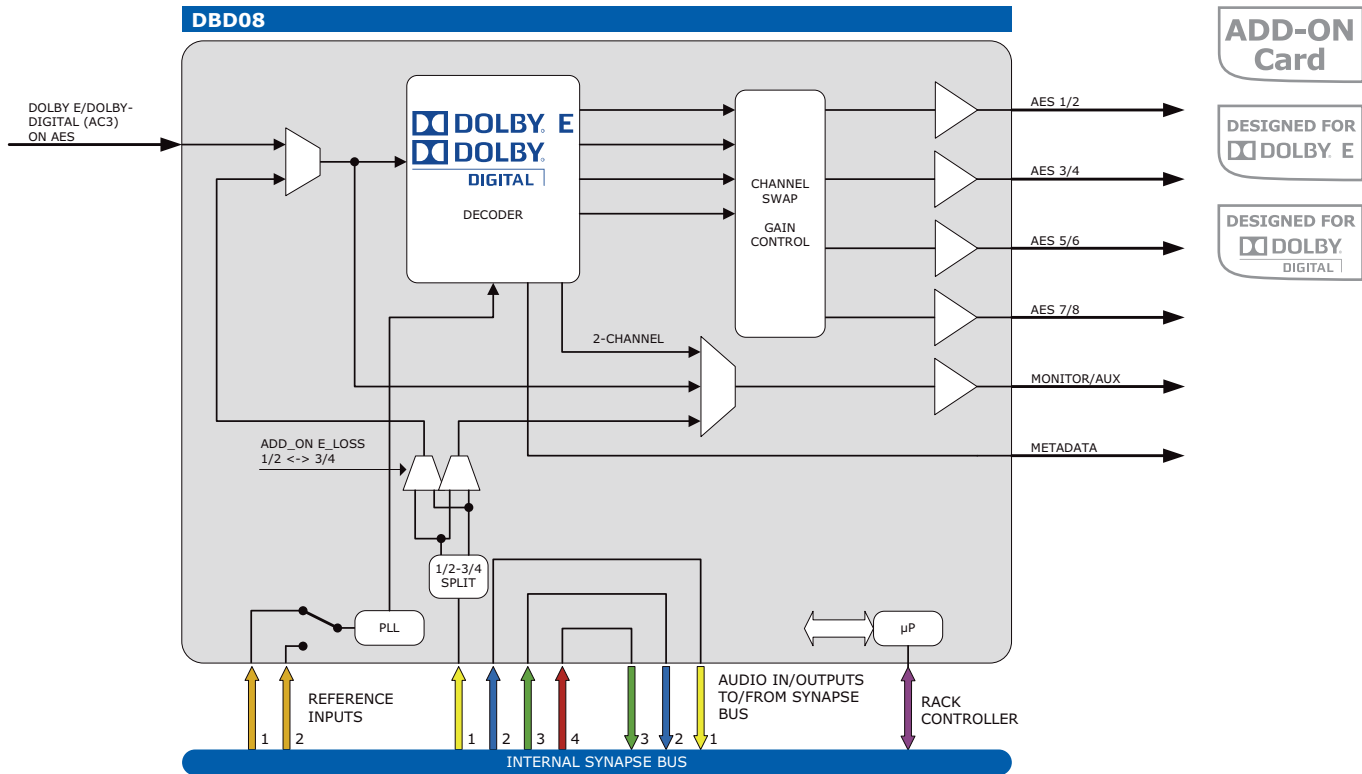
DBD08 - DBE08 - DDP14: Uses the Dolby terminology for the settings rather than the limited Synapse ACP label. On/Off options use checkbox rather than drop down.





DBD08 - DBE08
 DDP14





DBD08 Dolby E and Dolby Digital Decoder stand alone or ADD-ON card

The DBD08 is a fully compliant Dolby E decoder. Dolby E is designed to transport multichannel audio (discrete 5.1 surround Dolby Digital) in a broadcast environment. The DBD08 decodes up to 8 channels of high quality audio plus Dolby digital metadata from a single AES pair. Fundamental to the operation of Dolby E is the synchronization of audio with video, in order to provide an exact match between encoded Dolby E audio frames and video frames. Dolby E requires synchronization to a video signal. All Dolby E encoders and decoders must have either a direct reference video signal, or derive the information from a video reference signal. The DBD08 can also be used as a Dolby Digital (AC3) surround sound decoder.

- Independent Dolby E decoder
- Compatible with Dolby Digital (AC3)
- Monitor output can be used for Dolby E, PCM from channel 3/4 of bus
- ADD-ON Dolby E decoder with DBD10 or HDD10 for the de-embedding function, including before and after delay de-embedding for PCM and E data
- 8 channels on 75 Ohms BNC (4xAES/EBU)
- Output channel swapping
- Audio output gain and phase control
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary cards:

- DBE08, DDE51
- HDD10

Applications

- OB Van Dolby E decoder when space, hot swap ability, SNMP, or redundant supply is important
- 18 decoders in 4 RU
- Dolby E decoding in trucks, studios and contribution sites.

Ordering information

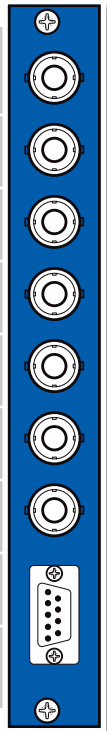
Module:

- **DBD08:** Dolby E and Dolby Digital Decoder stand alone or ADD-ON

Standard I/O:

- **BPL08_DBD08:** I/O panel for DBD08

DOLBY E, DOLBY DIGITAL (BIT-STREAM) INPUT
AES/EBU 1/2 OUTPUT
AES/EBU 3/4 OUTPUT
AES/EBU 5/6 OUTPUT
AES/EBU 7/8 OUTPUT
MONITOR/AUX OUTPUT
META-DATA OUTPUT



BPL08

Specifications

AES audio input (Dolby E)

Connector	BNC or ADD-ON bus
Standard	SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	1
Sampling rate	48 kHz Synchronous
Resolution	NA
Minimum Input/output delay	1 Frame
Impedance	75 Ohms
Level	0.2V to 1V nom

AES audio output

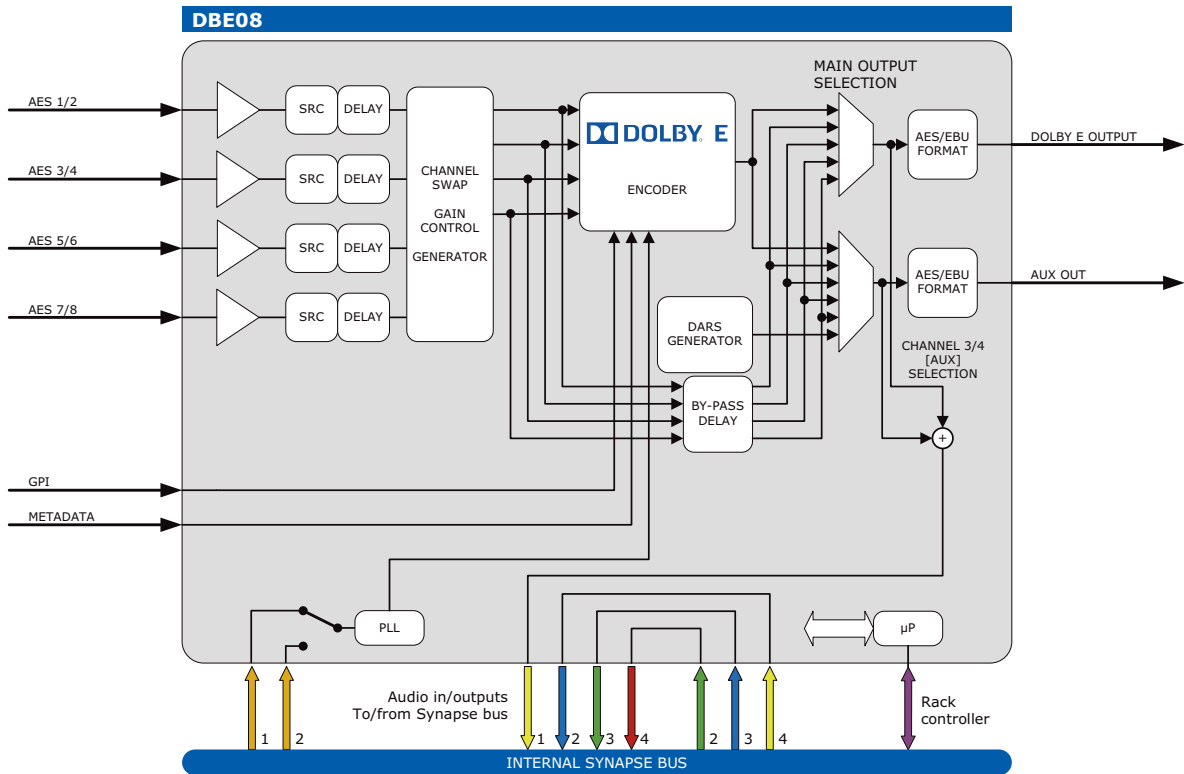
Number of outputs	5
Connector	BNC ADD-ON bus
Resolution	24 bits
Sampling rate	48KHz synchronous
Nominal input/output delay	1 Frame

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<5 Watts



ADD-ON Card
DESIGNED FOR DOLBY E

DBE08 Dolby E Encoder stand alone or ADD-ON card

The DBE08 is a stand-alone Dolby E encoder. Although it is not a complete replacement for the DP571 from Dolby Laboratories, it can be considered as a functional equivalent. The advantages however are the facts that the DBE08 is modular, can run on a dual power supply, Ethernet and SNMP compatible, and has a nice enhancement to the menu structure. This last item is an interesting feature. The DBE08 can handle 8 presets with metadata (A through H) and 10 presets of different program combinations. The often used program combinations like 5.1+2 are available with 4 times the individual metadata sets. This will result in the possibility to have 4 times the program combination 5.1+2, but with 8 different metadata settings.

- Stand alone Dolby E encoder
- Fully compatible with Audio ADD-ON bus
- 20 bit mode for 8 channels, 16 bit mode for 6 channels encoding
- 4 presets 5.1+2 (with 8 different metadata sets)
- 4 presets 2+2 (with 8 different metadata sets)
- 2 presets 2+2+2+2 (with 8 different metadata sets)
- Metadata settings for:
 - Program text (16 character text)
 - Dialog level
 - Bit-stream identification
 - Dynamic range (film, music, speech, etc.)

- RF mode Dynamic range (11 dB more sensitive)
- Center downmix level
- Surround downmix level
- Dolby surround
- Preferred downmix
- Lt/Rt Center and Surround downmix level
- Lo/Ro Center and Surround downmix level
- Surround-EX flag
- DC filter
- LFE filter
- Low-pass filter
- Surround 3dB attenuation
- Surround phase shift
- Input channel swapping (any channel to any encoder input)
- Individual gain and phase adjustment per mono channel
- Individual delay offset adjustment (0 to 1300 ms)
- Built-in generator
- One selectable AES/EBU bypass input with additional delay settings

Complementary cards:

- DBD08, DDE51
- SDE10, HDE10

DBE08

Applications

- OB van Dolby E encoder when space, hot swap ability, SNMP, or redundant supply is important
- 18 encoders in 4 RU
- Dolby E encoding in trucks, studios and contribution sites.

Ordering information

Module:

- **DBE08:** Dolby E Encoder stand alone or ADD-ON

Standard I/O:

- **BPL08_DBE08:**
I/O panel for DBE08

DOLBY E (BIT-STREAM) OUTPUT
AES/EBU 1/2 INPUT
AES/EBU 3/4 INPUT
AES/EBU 5/6 INPUT
AES/EBU 7/8 INPUT
AUXILARY OUTPUT
GPI INPUT
META-DATA INPUT



BPL08

Specifications

AES audio input

Connector	BNC
Standard	SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	4
Sampling rate	32 kHz to 96 kHz asynchronous
Resolution	24 bits
Minimum Input/output delay	1 Frame
Impedance	75 Ohms
Level	0.2V to 1V nom for BNC

AES audio output (Dolby E)

Number of outputs	2
Connector	BNC ADD-ON bus
Resolution	NA
Sampling rate	48KHz synchronous
Nominal input/output delay	1 Frame

GPI

Connector	BNC Contact closure +5V
Number of inputs	1

Meta-Data Input

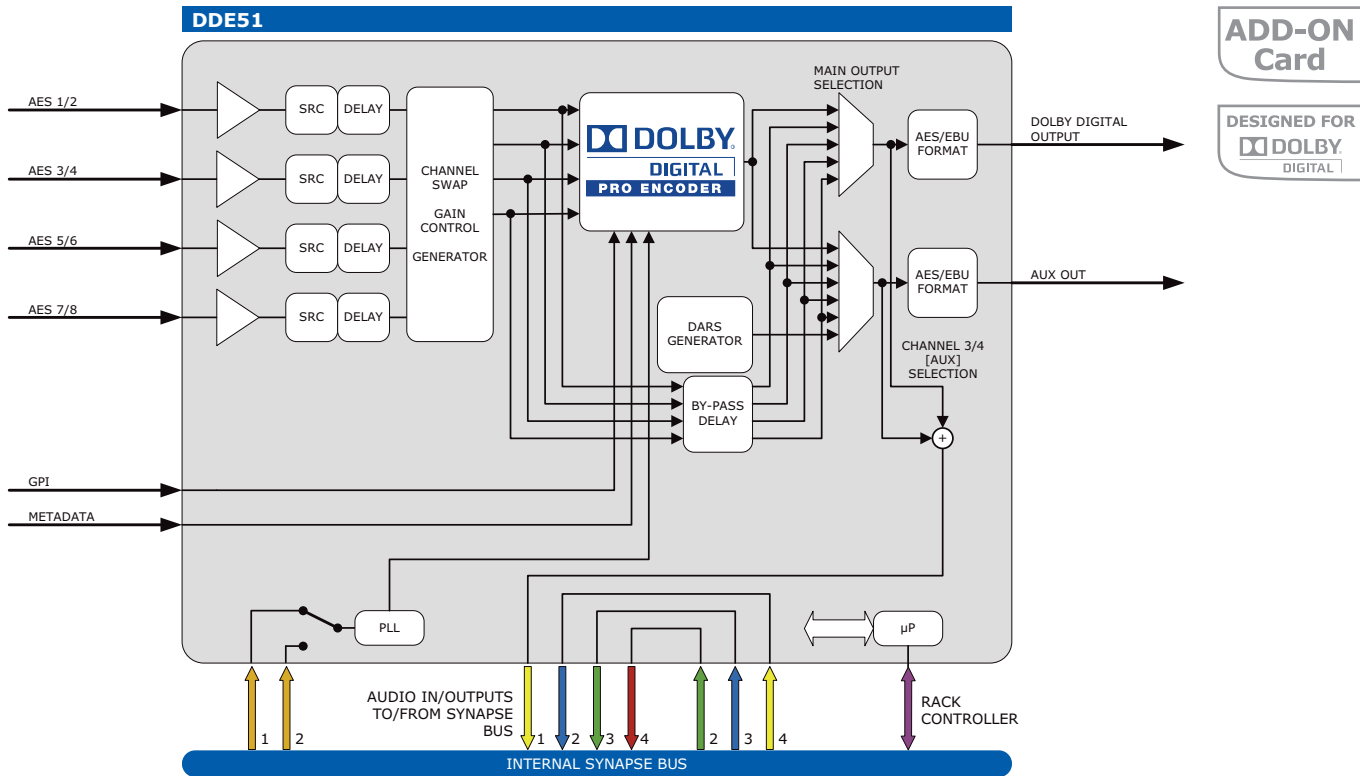
Connector	9 pins female sub-D
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Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



ADD-ON
Card

DESIGNED FOR
DOLBY
DIGITAL I

DDE51 Dolby Digital Pro encoder

The DDE51 was at introduction the first modular Dolby Digital Pro encoder in the world. Targeted at transmission environments the DDE51 has all the advantages of the Synapse system, such as hot swap ability, redundant power supplies, SNMP compatibility and a host of other modular solutions that fit the same chassis. The DDE51 is a functional equivalent to the DP569 from Dolby Laboratories.

- Preset based meta-data insertion
- Dolby Digital encoding or bypass mode (individual for both outputs)
- Adjustable encoding data rate (56 kb/s to 640 kb, part of 8 presets)
- Full 8 channel independent input selection
- Built-in generator per mono channel
- Input gain control per individual mono channel
- Input phase control per individual mono channel
- Input offset delay for phase compensation (0 to 1300 ms in 1 ms intervals)
- Auxiliary output can source a second AC3 stream or a copy of each input
- Up to 18 AC3 pro encoders in 4RU
- Metadata input
- 5.1, 4.0, 3.1, 3.0, 2.0, 1.0 modes
- GPI triggered preset
- Status information of each input (including clipping)
- Encoder OK status reporting
- AES/EBU in and outputs on 75 Ohms BNC according to AES3ID-1995
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18

Note: The latency of the DDE51 has been 200ms, but has recently decreased to 166ms with latest firmware updates. In the future the latency will be user definable in the menu of the card.

Applications

- Transmission Dolby Digital Encoding

Ordering information

Module:

- **DDE51:** Dolby Digital Pro encoder

Standard I/O:

- **BPL08_DDE51:** I/O-panel for DDE51

DOLBY DIGITAL (BIT-STREAM) OUTPUT
AES/EBU 1/2 INPUT
AES/EBU 3/4 INPUT
AES/EBU 5/6 INPUT
AES/EBU 7/8 INPUT
AUXILARY OUTPUT
GPI INPUT
META-DATA INPUT



BPL08

Specifications

AES audio input

Connector	BNC
Standard	SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	4
Sampling rate	32 kHz to 96 kHz asynchronous
Resolution	24 bits
Minimum Input/output delay	163ms
Impedance	75 Ohms
Level	0.2V to 1V nom

AES audio output (Dolby Digital)

Number of outputs	2
Connector	BNC ADD-ON bus
Resolution	NA
Sampling rate	48KHz synchronous
Nominal input/output delay	5 Frames

GPI

Connector	BNC
Number of inputs	1

Meta-Data Input

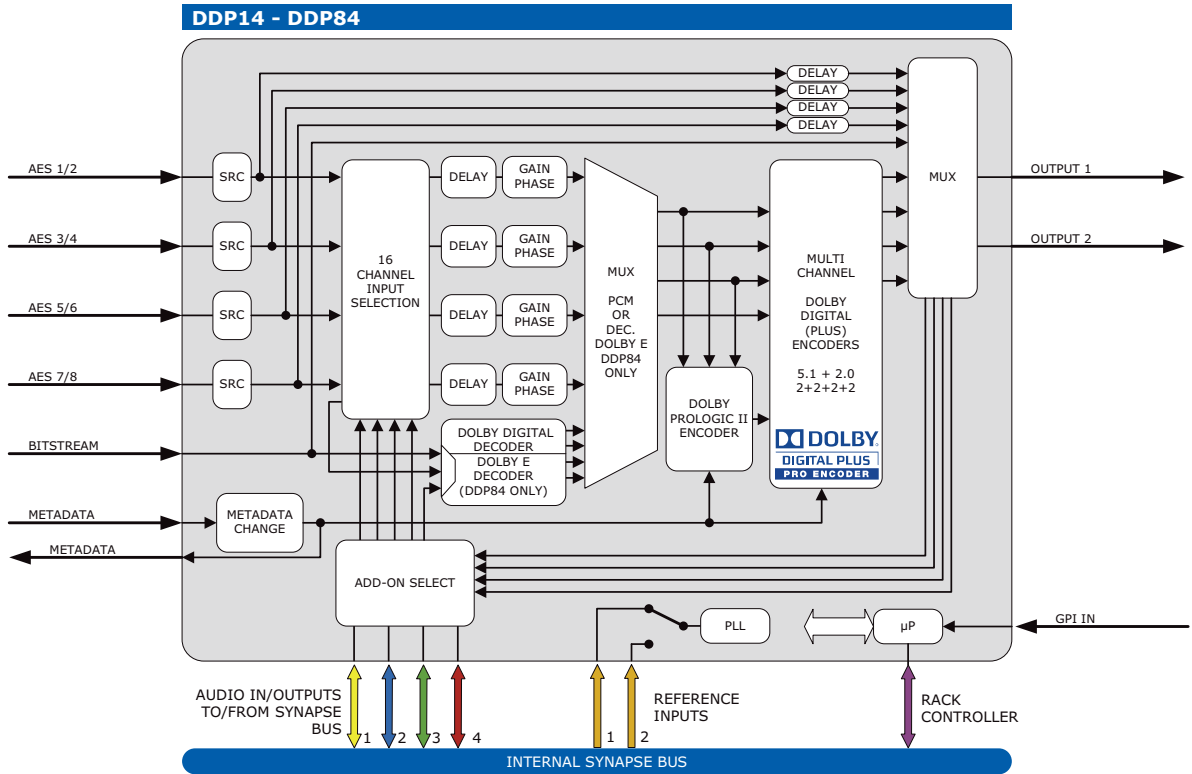
Connector	15 pins female sub-D
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Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



ADD-ON Card
DESIGNED FOR DOLBY DIGITAL PLUS

DDP14 - DDP84

DDP14 - DDP84 Multi stream Dolby Digital Plus and Pro encoder with Dolby E decoder (DDP84 only)

Dolby Laboratories, with Dolby Digital Plus, is targeting at the next generation of digital transmission and optical formats. The advantage of Dolby Digital Plus is a channel count of up to 7.1 (13.1 in the future) and bit rates of about 50 percent of normal Dolby Digital.

An important application is the transcoding of normal Dolby Digital to Dolby Digital plus for cable head-ends. This gives a data rate reduction of 50% for the audio path. The DDP84 includes a Dolby E decoder. This enables the decoding of Dolby E and encoding that into Dolby Digital (plus) with only one Synapse card.

The calculation power of the DDP14/84 make a simultaneous encoding of 4 individual stereo channels (languages) to 4 Dolby Digital (Plus) 2.0 streams possible.

The DDP14/84 is a stand alone Dolby Digital Plus encoder. It will support the following encoding algorithms:

- Up to 4 times 2.0 Dolby Digital (Plus) outputs.
- 5.1 Dolby Digital (Plus) + 2.0 Dolby Digital (Plus)
- Dolby Pro Logic II
- Individual offset delay per input
- Individual gain control per input (except bitstream input)
- Able to handle all AES/EBU input formats
- Full audio channel shuffling
- Ability to use the Synapse ADD-ON bus for in- and output purposes.
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

The DDP84 will add:

- Decoding Dolby E and encoding to Dolby Digital (Plus)

Applications

- Multi channel encoding
- Transcoding of Dolby Digital to Dolby Digital Plus
- Multi language encoding, 4 x stereo Dolby Digital (Plus)
- Decoding Dolby E, to encode into Dolby Digital (Plus) with one card (DDP84 only)

Ordering information

Module:

- **DDP14:** Dolby Digital Plus and Pro encoder
- **DDP84:** Dolby Digital Plus and Pro encoder with Dolby E decoder

Standard I/O:

- **BPL08_DDP14:** I/O panel for DDP14
- **BPL08_DDP84:** I/O panel for DDP84

AES/EBU 1/2 INPUT
AES/EBU 3/4 INPUT
AES/EBU 5/6 INPUT
AES/EBU 7/8 INPUT
BITSTREAM INPUT (DOLBY DIGITAL (PLUS) OR DOLBY E)
DOLBY DIGITAL (PLUS) OUTPUT 1
DOLBY DIGITAL (PLUS) OUTPUT 2
META-DATA INPUT/OUTPUT AND GPI INPUT



BPL08

Specifications

AES audio input

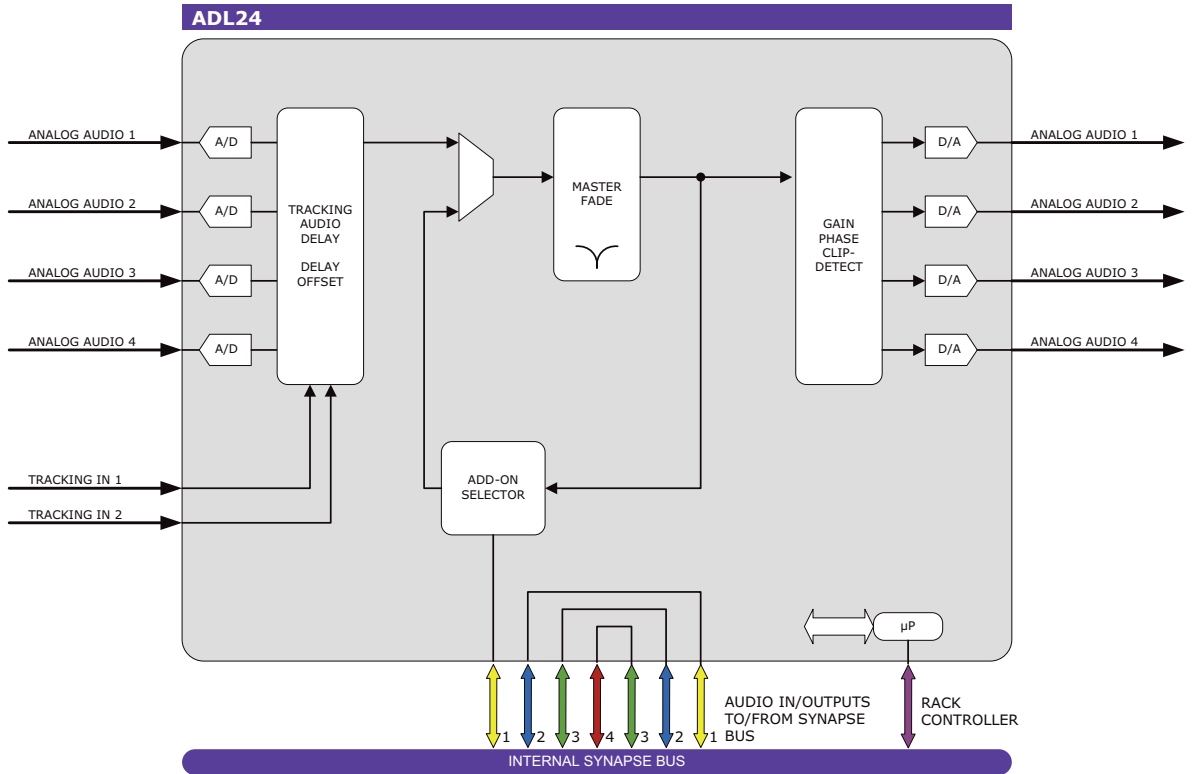
Connector	BNC
Standard	SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	5
Sampling rate	32 kHz to 96 kHz asynchronous 48 kHz synchronous in SRC off mode
Resolution	24 bits
Minimum Input offset delay	0 to 1300 ms
Input gain control	+12dB to -60 dB
Gain step size	0.25dB
Impedance	75 Ohms
Level	0.2V to 1V nom

Encoding (e.g.)

Encoding bitrate:	~200kbps for broadcast ~800kbps for disc based formats
Encoding modes:	5.1 Dolby Digital 5.1 Dolby Digital plus Dolby Surround Pro Logic II 4 x Dolby Digital plus 2.0 (multi language)

AES audio output (Dolby Digital (Plus))

Number of outputs	2
Connector	BNC 75 Ohms ADD-ON bus
Resolution	NA
Sampling rate	48kHz synchronous
Nominal input/output delay	200ms
Miscellaneous	
Weight	Approx. 300g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<8 Watts



ADL24 Analog audio tracking delay with offset

The ADL24 is an audio delay card, its main application is to delay analog audio signals. The card has a tracking audio delay and a delay offset ranging from 0 ms up to 5200 ms at 48 kHz. This card can also be used as an ADD-ON card. In ADD-ON mode the card acts as an Analog input or output board that feeds a master card positioned to the left with embedder or de-embedder functionality. For example the SDB20 can perform a de-embedder function with the ADL24 as its output card.

The audio data that enters the synapse bus from a master card is identical to the analog audio on the local outputs. If the ADL24 is used with an SEB20 master card, the ADL24 performs as an Analog input. The ADL24 converts the analog audio digital audio signals and put these on the Synapse bus. The signals can be embedded into the SDI data stream.

- 24 bit audio conversion
- 48, 96 and 192 kHz internal sampling for up to 90kHz analog audio bandwidth
- Sample clock can be derived from Master card (ADD-ON mode).
- Analog reference levels adjustable for +12, +15, +18 and +24dBu
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Can be used as a Synapse ADD-ON card for embedding or de-embedding
- Adjustable audio delay offset up to 5200ms in 1ms increments
- Tracking audio delay
- Master fade function for dedicated Synapse applications
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- Analog audio tracking delay functions
- Generic analog audio ADD-ON card for dedicated Synapse master cards that have an embedding function. Both in and output options
- Offset delay for compensation of large screen venue displays

Ordering information

Module:

- **ADL24:** Analog audio tracking delay with offset

Standard I/O:

■ BPL04_ADL24:

I/O panel for ADC24 with balanced analog audio in and balanced analog audio out

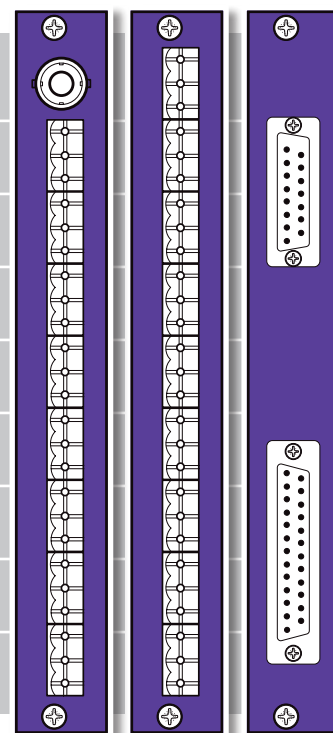
■ BPL05_ADL24:

I/O panel for ADC24 with balanced analog audio in and balanced analog audio out and tracking on Phoenix

■ BPL05D_ADL24:

I/O panel for ADC24 with balanced analog audio in and balanced analog audio out and tracking on sub-D

TRACKING INPUT
ANALOG AUDIO INPUT 1
ANALOG AUDIO INPUT 2
ANALOG AUDIO INPUT 3
ANALOG AUDIO INPUT 4
ANALOG AUDIO OUTPUT 1
ANALOG AUDIO OUTPUT 2
ANALOG AUDIO OUTPUT 3
ANALOG AUDIO OUTPUT 4



BPL04

BPL05

BPL05D

For detailed sub-D connections see the manual

Specifications

Analog audio input

Type	Balanced analog audio
Number of inputs	4
Connector	Removable terminal strip or female sub-D
Impedance	10k Ohms nominal (differential)
Sampling rate	48KHz
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Level control range	+12dB to -60dB 0.25dB increments
Frequency response	< ±0.1dB, 20Hz to 20kHz (broadcast quality)
Dynamic range	100dB @-60 dBFS
THD+N	< 0.002% (>96dB) @ 1kHz, -1dB FS < 0.002% (> 96dB) @ 20Hz to 20kHz, -1dB FS
CMRR	> 60dB at 1kHz

Internal processing

Resolution	24 bits
Sampling rate	48, 96 or 192KHz synchronous 48k in Mastermode

Minimum

Input/output delay	4ms
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Maximum

Input/output delay	5200 ms
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Analog audio output

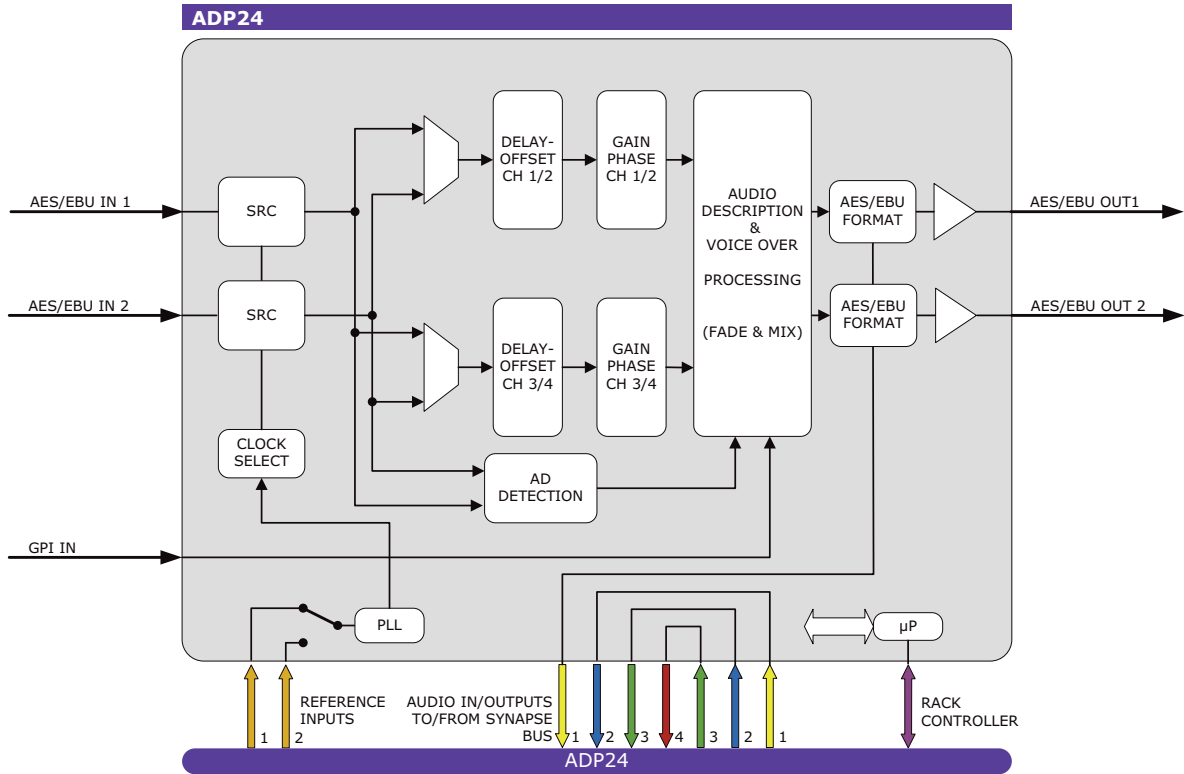
Type	Balanced analog audio
Number of outputs	4
Connector	removable terminal strips or female sub-D
Impedance	50 Ohms balanced
Signal level	0dBFS => 12dBu, 15dBu, 18dBu or 24dBu
Frequency response	< ±0.05dB (20Hz to 20kHz)
Gain mismatch	< 0.25 dB @997Hz, -20dBFS Multi channel
THD+N	< 92dB @ 1kHz, -1dBFS
Crosstalk	< -100dB (20Hz to 20kHz)
DC offset	< ±30mV
Dynamic range	> 97dB @-60dBFS

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<10 Watts



ADP24 Audio description and voice-over processing card

The ADP24 is the AES/EBU equivalent of the ADP10. The card is designed to decode the audio description track that is part of an AES/EBU audio stream. It reads the description track and mixes this with the program material. The result is then overwritten in the original audio description track (default 3/4). The user is free to change the default track description, and can change the individual offset delay of the audio tracks. The adjustable delay can also be used for compensation of other video related propagation delay like Dolby Digital encoding.

- Audio description or voice-over mode
- Automatic Audio Description recognition
- Adjustable voice-over, fade-in and fadeout time
- Flexible channel assignment
- 1 original program output
- 1 audio described (mixed) output
- Adjustable offset delay per stereo pair
- Gain (0.25db steps) and phase control (0-180 deg) per channel
- Compatible with pan information
- Can be locked to AES1, AES2, Master Synapse card, Wordclock and B&B
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port

ADP24

Applications

- Generic digital audio description processing
- AES/EBU voice over module

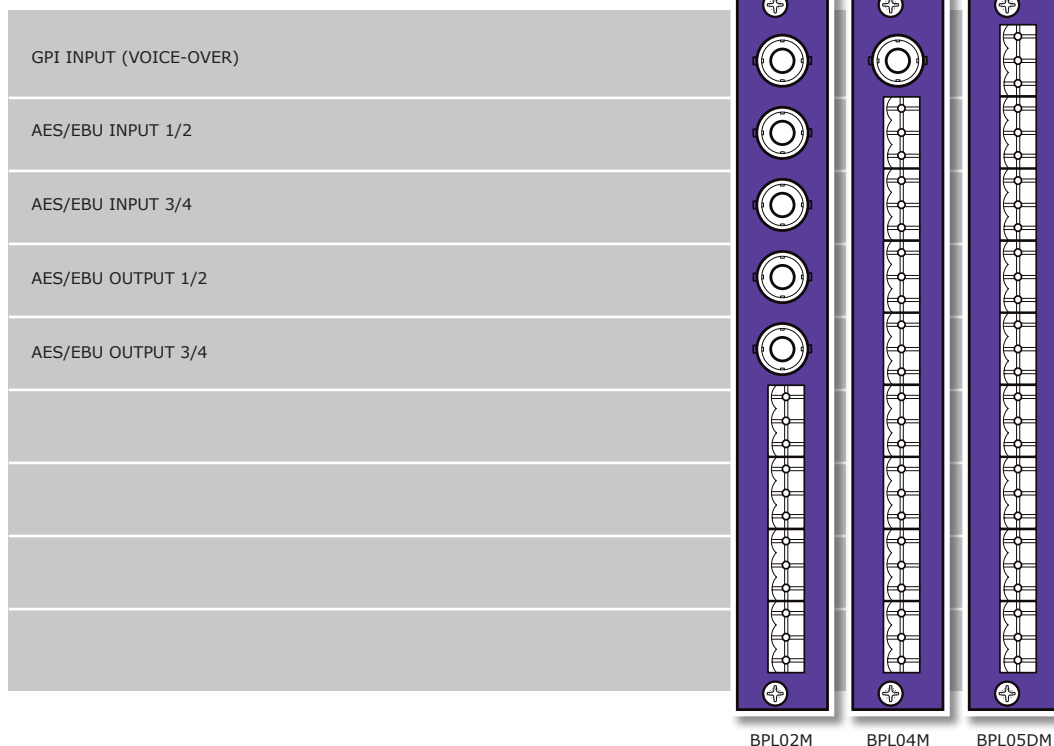
Ordering information

Module:

- **ADP24:** Audio description and voice-over processing card

Standard I/O:

- **BPL02M_ADP24:**
I/O panel for ADP24 with unbalanced AES/EBU in and unbalanced AES/EBU out
- **BPL04M_ADP24:**
I/O panel for ADP24 with balanced AES/EBU in and balanced AES/EBU out
- **BPL05DM_ADP24:**
I/O panel for ADP24 with balanced AES/EBU in, balanced AES/EBU out and tracking on sub-D



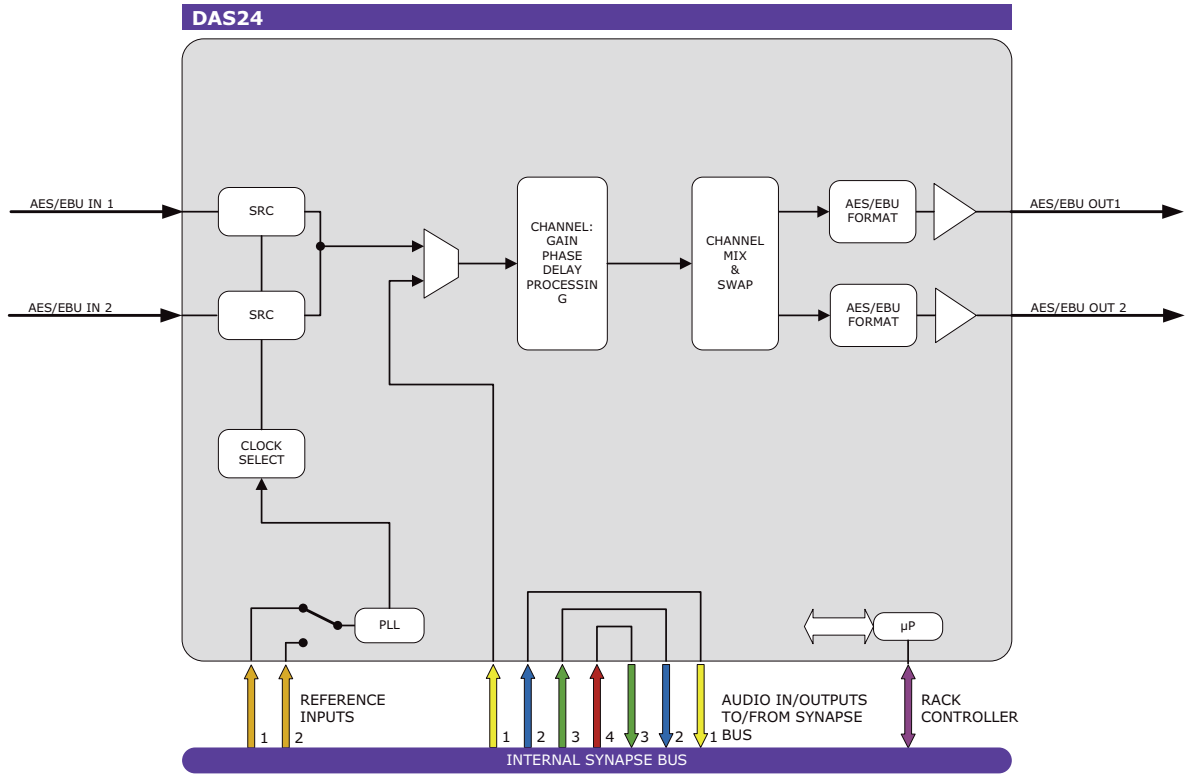
Specifications

AES audio input

Connector	BNC, Screw terminal or sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	48 kHz
Resolution	24 bits when AES inputs selected, 20 bits in Master/ADD-ON mode
Minimum Input/output delay	2.5ms
Number of inputs	2
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation
Minimum Input/output delay	3.5ms

AES audio output

Number of outputs	2
Connector	BNC, Screw terminal or female sub-D (balanced)
Resolution	24 bits
Sampling rate	48kHz synchronous
Minimum Input/output delay	2.5ms
Maximum Input/output delay	1300 ms
Miscellaneous	
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<6 Watts



DAS24 4 channel (2 x AES/EBU) digital audio mixing and shuffle module

The DAS24 is 4 channel digital audio ADD-ON card. Its basic function is the routing and processing of de-embedded audio from a master card to external devices. The DAS24 can perform channel swapping, mixing, gain/phase control. The card has additional AES/EBU inputs with a Sample Rate Converter (SRC) and can therefore be used as an audio shuffler/mixer. The DAS24 has a delaying capability for each channel of up to 1300ms. In ADD-ON mode the card acts as a digital audio output board that is fed from a master card positioned one slot left of the ADD-ON card. The AES/EBU in and outputs are available on 75 Ohms BNC or 110 Ohms screw terminals. AES/EBU inputs with optional SRC (32 to 96kHz sampling).

- Sample clock can be derived from master card (ADD-ON mode)
- 96kHz and 48kHz sample clock locked to: B&B ref or wordclock ref.
- 96kHz and 48kHz sample clock in free running mode
- Available with 110 Ohms (phoenix) or 75 Ohms (BNC) AES/EBU in- and outputs
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Can be used as a Synapse ADD-ON output card
- Full 4 channel shuffling and mixing
- Tracking audio delay on dedicated BNC input
- Offset delay up to 1300 ms
- Master fade function for dedicated Synapse applications
- Clip indication
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary card to:

- SFS12, HFS12
- SDB10, SDB20, HDB20
- SCV12, SAM10, HSU10, HSU20, 2HS10

DAS24

Applications

- AES/EBU audio shuffling and mixing
- Synapse ADD-ON digital audio output

Ordering information

Module:

- **DAS24:** 4 channel (2 x AES/EBU) digital audio mixing and shuffle module

Standard I/O:

■ BPL02_DAS24:

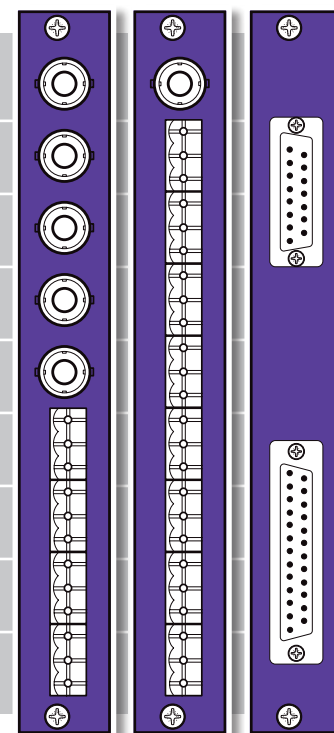
I/O panel for DAS24 with unbalanced AES/EBU in and unbalanced AES/EBU out.

■ BPL04_DAS24:

I/O panel for DAS24 with balanced AES/EBU in and balanced AES/EBU out

■ BPL05D_DAC24:

I/O panel for DAS24 with balanced AES/EBU in and balanced AES/EBU out on sub-D



For detailed description of sub-D see manual at www.axon.tv

BPL02

BPL04

BPL05D

Specifications

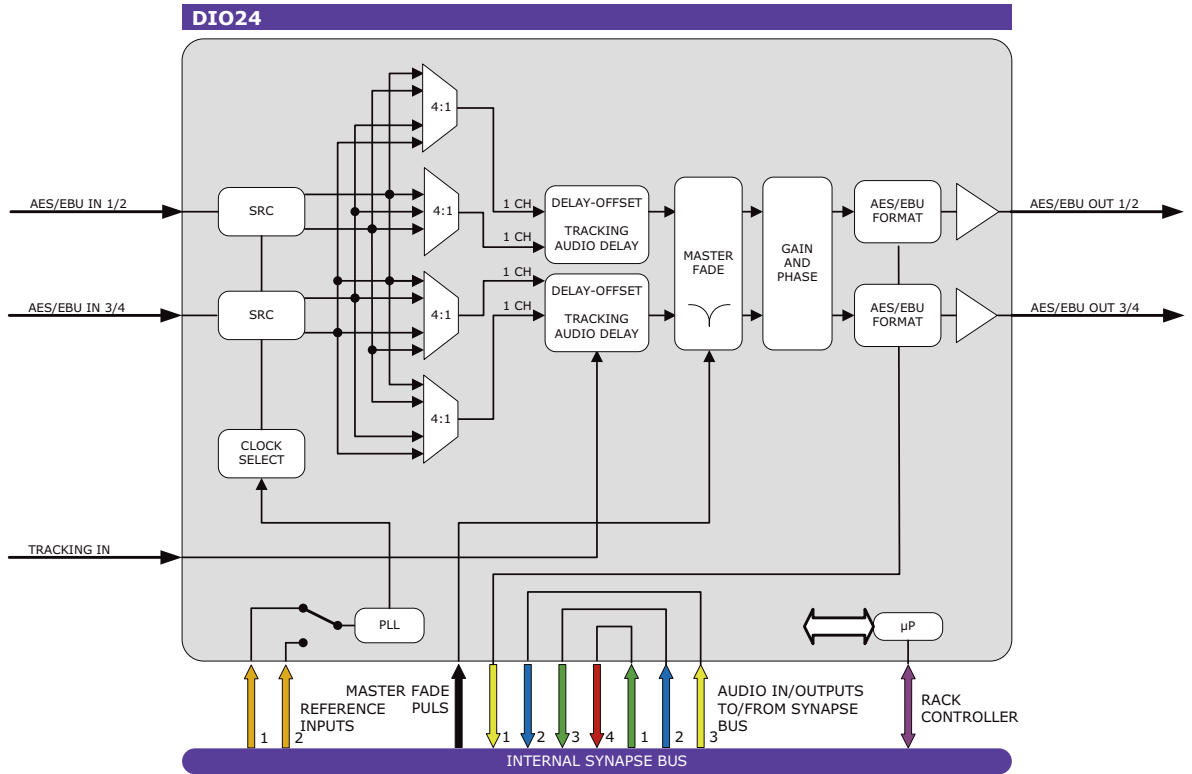
AES audio input

Connector	BNC, Screw terminal or female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	32 kHz to 96 kHz Synchronous 48 kHz in Master/ADD-ON mode
Resolution	24 bits when AES inputs selected, 20 bits in Master/ADD-ON mode
Minimum input/output delay	1 ms
Number of Inputs	2
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

AES audio output

Number of outputs	2
Connector	BNC, Screw terminal or female sub-D (balanced)
Resolution	24 bits
Sampling rate	48kHz synchronous
Minimum Input/output delay	2.5ms
Maximum Input/output delay	1300 ms
Miscellaneous	
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<8 Watts

ADD-ON Card
 COMPATIBLE WITH
 DOLBY E



DIO24 4 channel digital audio sample rate converter, tracking (and offset) delay - ADD-ON card

The DIO24 is a multi-functional product. Its basic function is the conversion of asynchronous AES/EBU digital audio into synchronous AES/EBU utilizing the on-board sample rate converter. The DIO24 has a tracking audio delay, with a delay offset possibility of up to 1300ms, and it can perform the Synapse ADD-ON input and output function.

- AES/EBU inputs with optional SRC (32 to 192kHz sampling)
- Sample clock can be derived from master card (ADD-ON mode)
- 96kHz and 48kHz sample clock locked to: B&B ref or word clock ref.
- 96kHz and 48kHz sample clock in free running mode
- Available with 110 Ohms (phoenix or sub-D) or 75 Ohms (BNC)
- AES/EBU in- and outputs
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Can be used as a Synapse ADD-ON input or output card
- Adjustable audio delay offset up to 1300ms in 1ms increments
- Tracking audio delay on dedicated BNC input
- Master fade function for dedicated Synapse applications
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

DIO24

Applications

- Dual AES/EBU stand alone tracking digital audio delay
- Dual AES/EBU offset delay
- Dual generic sample rate converter (lock AES to Black & Burst)

Ordering information

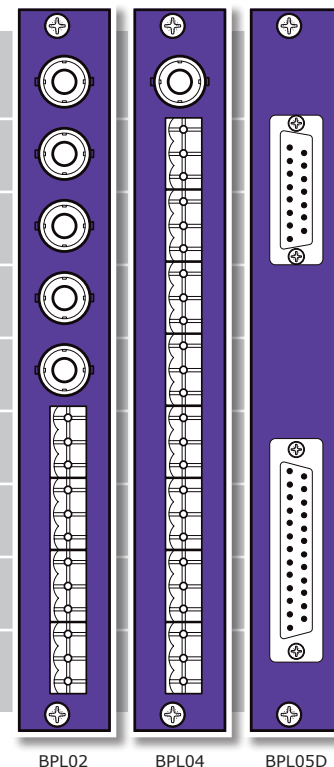
Module:

- **DIO24:** 4 channel digital audio sample rate converter, tracking (and offset) delay - ADD-ON card

Standard I/O:

- **BPL02_DIO24:** I/O panel for DIO24 with unbalanced AES/EBU in and balanced AES/EBU out
- **BPL04_DIO24:** I/O panel for DIO24 with balanced AES/EBU in and balanced AES/EBU out
- **BPL05D_DIO24:** I/O panel for DIO24 with balanced AES/EBU in and balanced AES/EBU out on sub-D

TRACKING INPUT
AES/EBU INPUT 1/2
AES/EBU INPUT 3/4
AES/EBU OUTPUT 1/2
AES/EBU OUTPUT 3/4



Specifications

AES audio input

Connector	BNC, Screw terminal or female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	32 kHz to 192 kHz Synchronous 48 kHz in Master/ADD-ON mode
Resolution	24 bits when AES inputs selected, 20 bits in Master/ADD-ON mode
Minimum Input/output delay	1 ms
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

AES audio output

Number of outputs	2
Connector	BNC, Screw terminal or female sub-D (balanced)
Resolution	24 bits
Sampling rate	48KHz synchronous

Minimum

Input/output delay	2.5ms
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Maximum

Input/output delay	1300 ms
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Reference video input

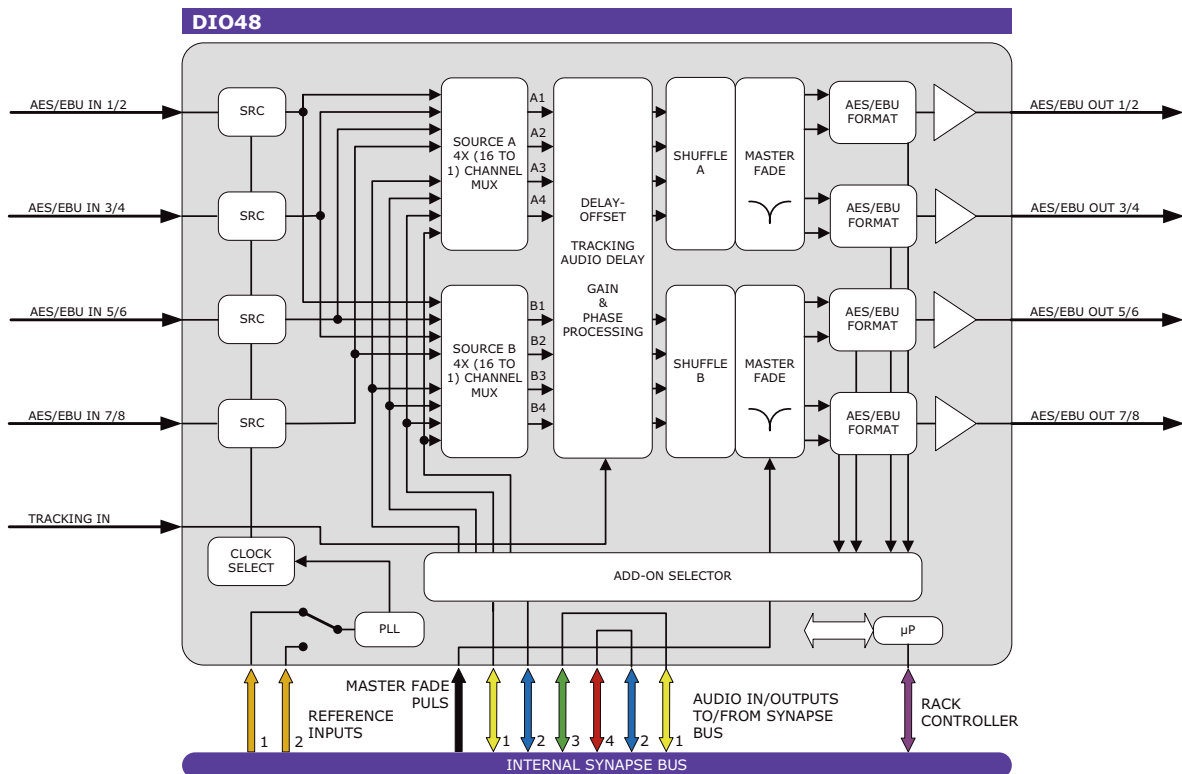
Standard	PAL (ITU624-4), NTSC (SMPTE 170M) Word clock 48k square-wave
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<4 Watts



ADD-ON Card
 COMPATIBLE WITH
DOLBY E

DIO48 8 channel digital audio (192kHz) sample rate converter, tracking (and offset) delay - ADD-ON card

The DIO48 is a multi-functional product. Its basic function is the conversion of asynchronous AES/EBU digital audio into synchronous AES/EBU utilizing the on-board sample rate converter. The DIO48 has a tracking audio delay, with a delay offset possibility of up to 5200 ms, and it can perform the Synapse ADD-ON input and output function. Also provided in this module is shuffling and mixing of the AES channels. This board can be used as an input or output ADD-ON board.

- Selection of 8 channels out of all local and ADD-ON inputs
- Full mixing capabilities of 2 x 4 channels (A and B)
- AES/EBU inputs with optional SRC (32 to 192kHz sampling)
- Sample clock can be derived from master card (ADD-ON mode)
- 48kHz sample clock locked to: B&B ref or word clock ref.
- 48kHz sample clock in free running mode
- Available with 110 Ohms (phoenix or sub-D) or 75 Ohms (BNC)
- AES/EBU in- and outputs
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Can be used as a Synapse ADD-ON input or output card
- Adjustable audio delay offset up to 5200 ms in 1ms increments
- Tracking audio delay on dedicated BNC input
- Master fade function for dedicated Synapse applications
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

DIO48

Applications

- Can be used as an independent audio delay with tracking possibility
- Can be used as a four channel sample rate converter
- 8 channel ADD-ON input card to the HXT10 (and many other 2 group embedding master cards)

Ordering information

Module:

- **DIO48:** 8 channel digital audio (192kHz) sample rate converter, tracking (and offset) delay - ADD-ON card

Standard I/O:

- **BPL01_DIO48:** I/O panel for DIO48 with unbalanced AES/EBU in and out
- **BPL02_DIO48:** I/O panel for DIO48 with unbalanced AES/EBU in and balanced AES/EBU out
- **BPL04_DIO48:** I/O panel for DIO48 with balanced AES/EBU in and balanced AES/EBU out
- **BPL05D_DIO48:** I/O panel for DIO48 with balanced AES/EBU in and balanced AES/EBU out on sub-D



Specifications

AES audio input

Connector	BNC, Screw terminal or female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES

Number of inputs	4
Sampling rate	32 kHz to 192 kHz Synchronous 48 kHz in Master/ADD-ON mode
Resolution	24 bits when AES inputs selected, 20 bits in Master/ADD-ON mode

Minimum Input/output delay	1 ms
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

AES audio output

Number of outputs	4
Connector	BNC, Screw terminal or female sub-D (balanced)
Resolution	24 bits
Sampling rate	48KHz synchronous

Minimum

Input/output delay	2.5ms
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Maximum

Input/output delay	5200 ms
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Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M) Word clock 48k square-wave
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Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
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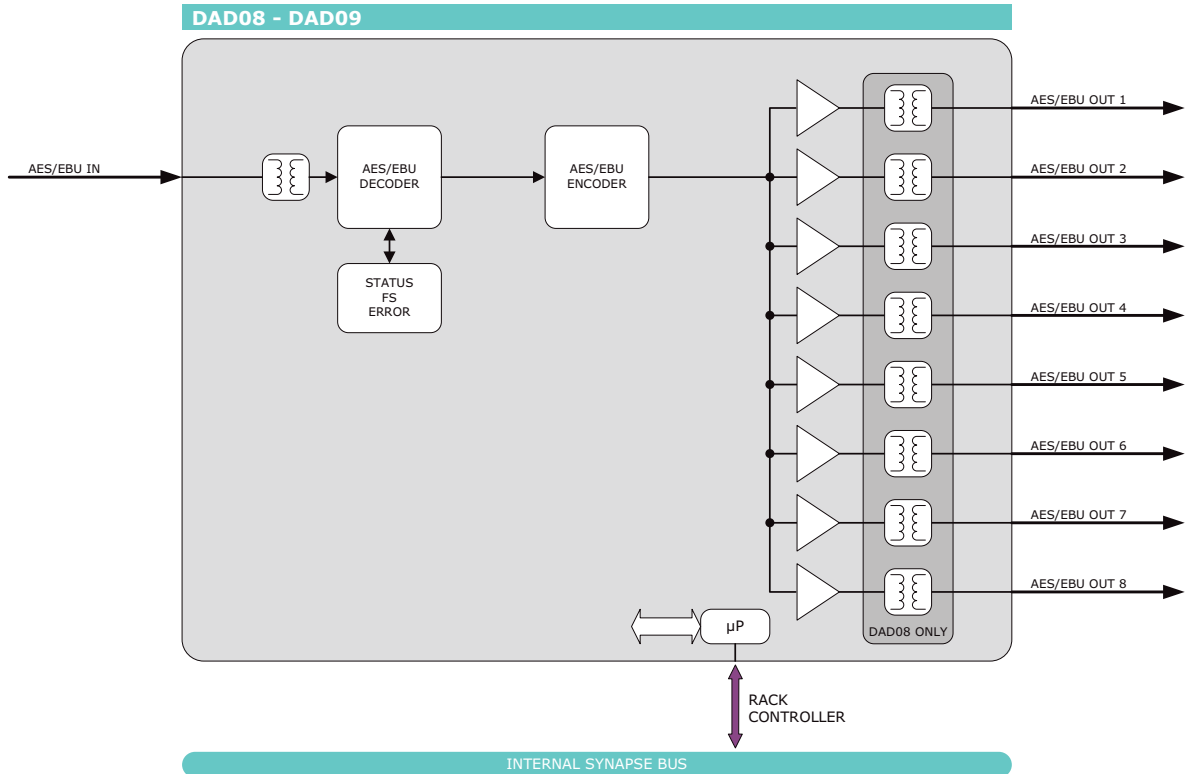
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<4 Watts



DAD08 - DAD09 Digital (AES/EBU) audio distribution amplifier (08 has transformer coupled outputs)

The DAD08 and DAD09 are digital audio distribution amplifiers that distribute a single input to eight outputs. The DAD08/09 accepts AES/EBU or SPDIF (Consumer Interface Format) digital audio input that is then relocked, buffered and distributed to the eight outputs. The DAD08 has transformer coupled balanced input and outputs, whereas the DAD09 has a transformer coupled balanced input and direct balanced outputs. Multiple regenerated independent low jitter outputs make the DAD08 and DAD09 ideal for the most demanding digital audio signal distribution requirements in both large and small audio and video facilities. Balanced or unbalanced use is automatically selected by use of the appropriate connector panel.

- 8 outputs
- Transformer coupled input
- Transformer coupled outputs (on DAD08 only)
- 32 to 96 kHz compatibility
- Signal present indication
- Sample frequency indication
- Compatible with 110 Ohms and 75 Ohms environments
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel; DAD09 only.

Applications

- Generic digital audio distribution

Ordering information

Modules:

- **DAD08:** Digital (AES/EBU) audio distribution amplifier with transformed coupled outputs
- **DAD09:** Digital (AES/EBU) audio distribution amplifier

Standard I/O:

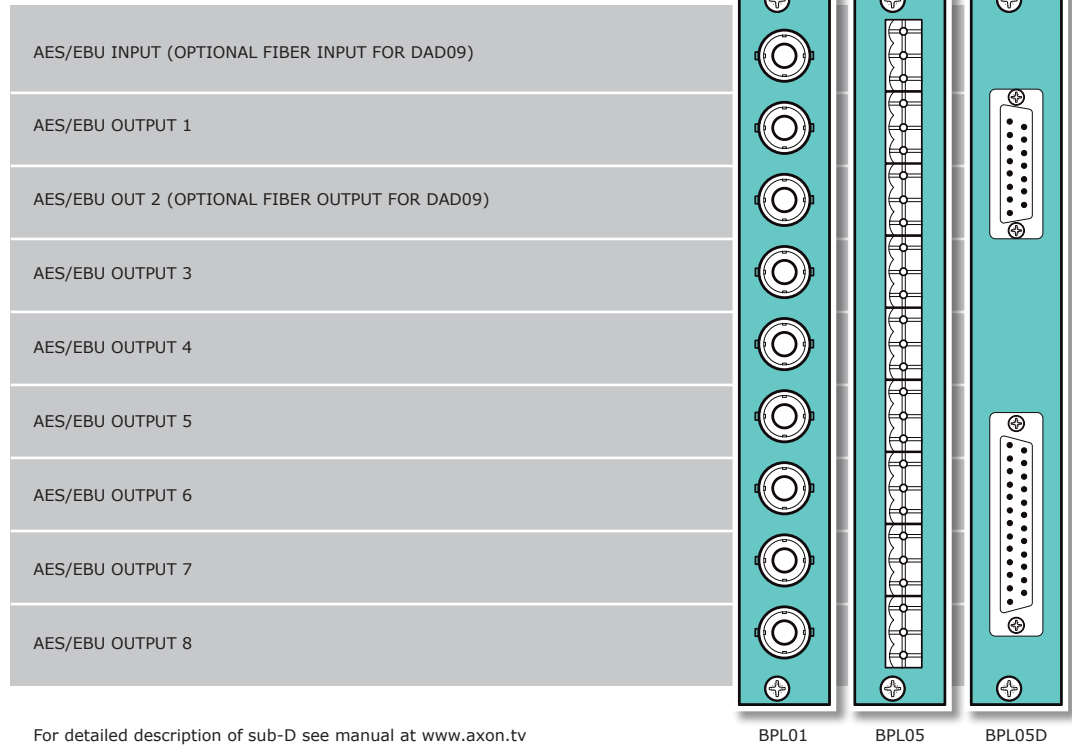
- **BPL01_DAD08:** I/O panel for DAD08 with unbalanced AES/EBU in and unbalanced AES/EBU out.
- **BPL05_DAD08:** I/O panel for DAD08 with balanced AES/EBU in and balanced AES/EBU out.
- **BPL05D_DAD08:** I/O panel for DAD08 with balanced AES/EBU in and balanced AES/EBU out on sub-D
- **BPL01_DAD09:** I/O panel for DAD09 with unbalanced AES/EBU in and unbalanced AES/EBU out.
- **BPL05_DAD09:** I/O panel for DAD09 with balanced AES/EBU in and balanced AES/EBU out.
- **BPL05D_DAD09:** I/O panel for DAD09 with balanced AES/EBU in and balanced AES/EBU out on sub-D

Fiber outputs:

- **BPL01T_FC/PC_DAD09:** I/O panel for DAD09 with fiber transmitter on FC/PC
- **BPL01T_SC_DAD09:** I/O panel for DAD09 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_DAD09:** I/O panel for DAD09 with fiber receiver on FC/PC
- **BPL01R_SC_DAD09:** I/O panel for DAD09 with fiber receiver on SC



For detailed description of sub-D see manual at www.axon.tv

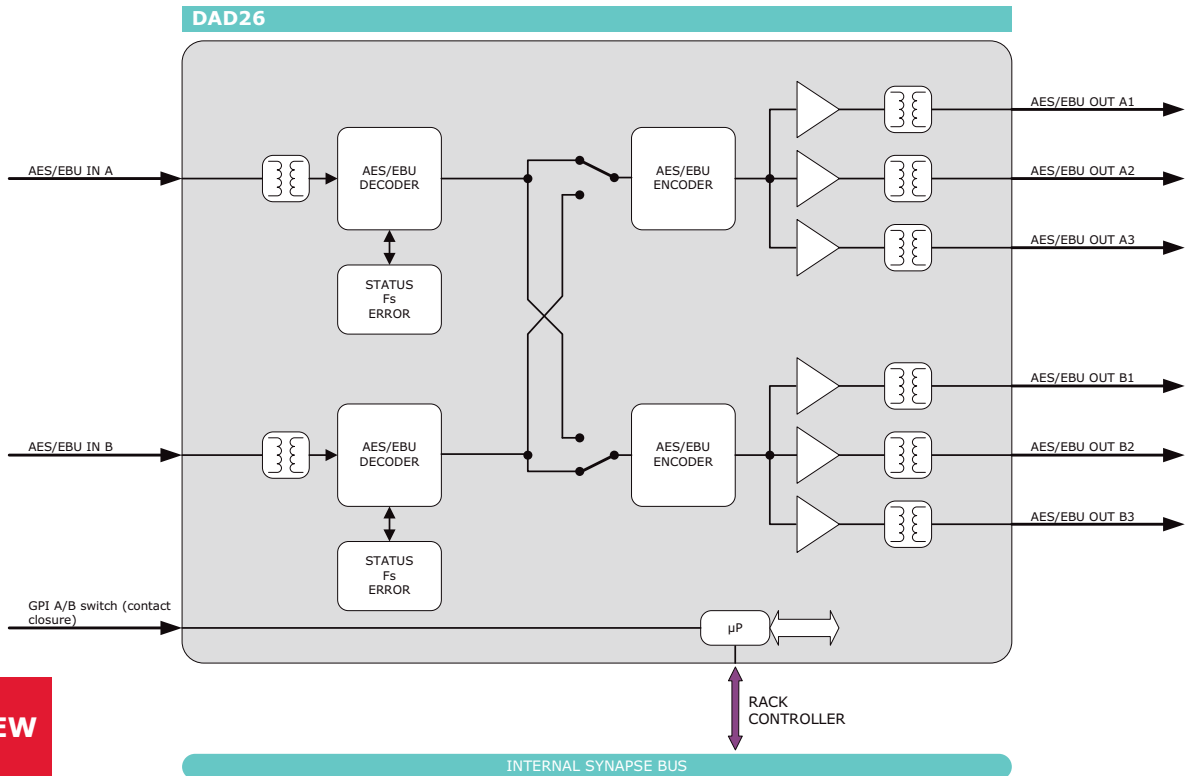
Specifications

AES audio input

Connector	BNC, Screw terminal or sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	1
Sampling rate	32 kHz to 96 kHz
Resolution	24 bits
Minimum Input/output delay	4 samples
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

AES audio output

Number of outputs	1
Connector	BNC, Screw terminal or female sub-D (balanced)
Resolution	24 bits
Sampling rate	Equal to input
Miscellaneous	
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<3 Watts



NEW

DAD26 Dual channel digital (AES/EBU) audio distribution amplifier with 2x2 and 2x1 function

The DAD26 is a dual (AES/EBU) channel digital audio distribution amplifier. It has 2 individual inputs and two times three outputs. All outputs can be assigned to a single input making the device a 1 to 6 DA. A (GPI controlled) switch can be used to enable a 2x2 or 2x1 function. The DAD26 accept AES/EBU or SPDIF (Consumer Interface Format) digital audio input that is then relocked, buffered and distributed to the dual 3 outputs. The DAD26 has transformer coupled balanced input and outputs and can be used with unbalanced I/O via the BPL01. Multiple regenerated independent low jitter outputs make the DAD26 ideal for the most demanding digital audio signal distribution requirements in both large and small audio and video facilities. Balanced or unbalanced use is automatically selected by use of the appropriate connector panel.

- 2 Inputs
- 2 x 3 Outputs
- 2x1 or 2x2 function (GPI, Ethernet, signal detection)
- Transformer coupled input
- Transformer coupled outputs
- 32 to 192 kHz compatibility
- Signal present indication
- Sample frequency indication
- Compatible with 110 Ohms and 75 Ohms environments
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 or 2 fiber inputs (replacing 1 or 2 SDI inputs) or 1 or 2 fiber outputs (replacing 1 or 2 SDI outputs) on I/O panel

Applications

- Generic digital audio distribution
- AES/EBU back-up switching

Ordering information

Modules:

- **DAD26:** Dual channel Digital (AES/EBU) audio distribution amplifier with 2x2 and 2x1 function

Standard I/O:

- **BPL01_DAD26:** I/O panel for DAD26 with unbalanced AES/EBU in and unbalanced AES/EBU out.
- **BPL04_DAD26:** I/O panel for DAD26 with balanced AES/EBU in and balanced AES/EBU out.
- **BPL05D_DAD26:** I/O panel for DAD08 with balanced AES/EBU in and balanced AES/EBU out on sub-D

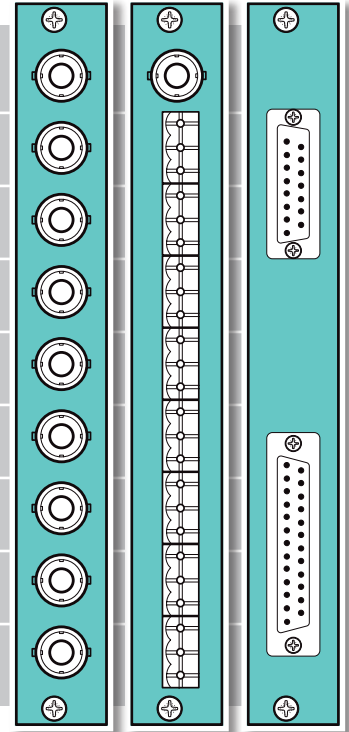
Fiber outputs:

- **BPL01T_FC/PC_DAD26:** I/O panel for DAD26 with fiber transmitter on FC/PC
- **BPL01T_SC_DAD26:** I/O panel for DAD26 with fiber transmitter on SC
- **BPL01T2_FC/PC_DAD26:** I/O panel for DAD26 with 2 fiber transmitters on FC/PC
- **BPL01T2_SC_DAD26:** I/O panel for DAD26 with 2 fiber transmitters on SC

Fiber inputs:

- **BPL01R_FC/PC_DAD26:** I/O panel for DAD26 with fiber receiver on FC/PC
- **BPL01R_SC_DAD26:** I/O panel for DAD26 with fiber receiver on SC
- **BPL01R2_FC/PC_DAD26:** I/O panel for DAD26 with 2 fiber receivers on FC/PC
- **BPL01R2_SC_DAD26:** I/O panel for DAD26 with 2 fiber receivers on SC

GPI INPUT FOR A/B SWITCH
AES/EBU INPUT A (OPTIONAL FIBER INPUT ON BPL01)
AES/EBU OUTPUT A1 (OPTIONAL FIBER OUTPUT ON BPL01)
AES/EBU OUTPUT A2
AES/EBU OUTPUT A3
AES/EBU INPUT B (OPTIONAL FIBER INPUT ON BPL01)
AES/EBU OUTPUT B1 (OPTIONAL FIBER OUTPUT ON BPL01)
AES/EBU OUTPUT B2
AES/EBU OUTPUT B3



BPL01 BPL04 BPL05D

For detailed description of sub-D see manual at www.axon.tv

Specifications

AES audio input

Connector	BNC, Screw terminal or female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
Number of inputs	2
Sampling rate	32 kHz to 192 kHz
Resolution	24 bits
Minimum input/output delay	4 samples
Impedance	110 Ohms or 75 Ohms
Level	0.2V to 1V nom for BNC, 2V to 7V for balanced operation

AES audio output

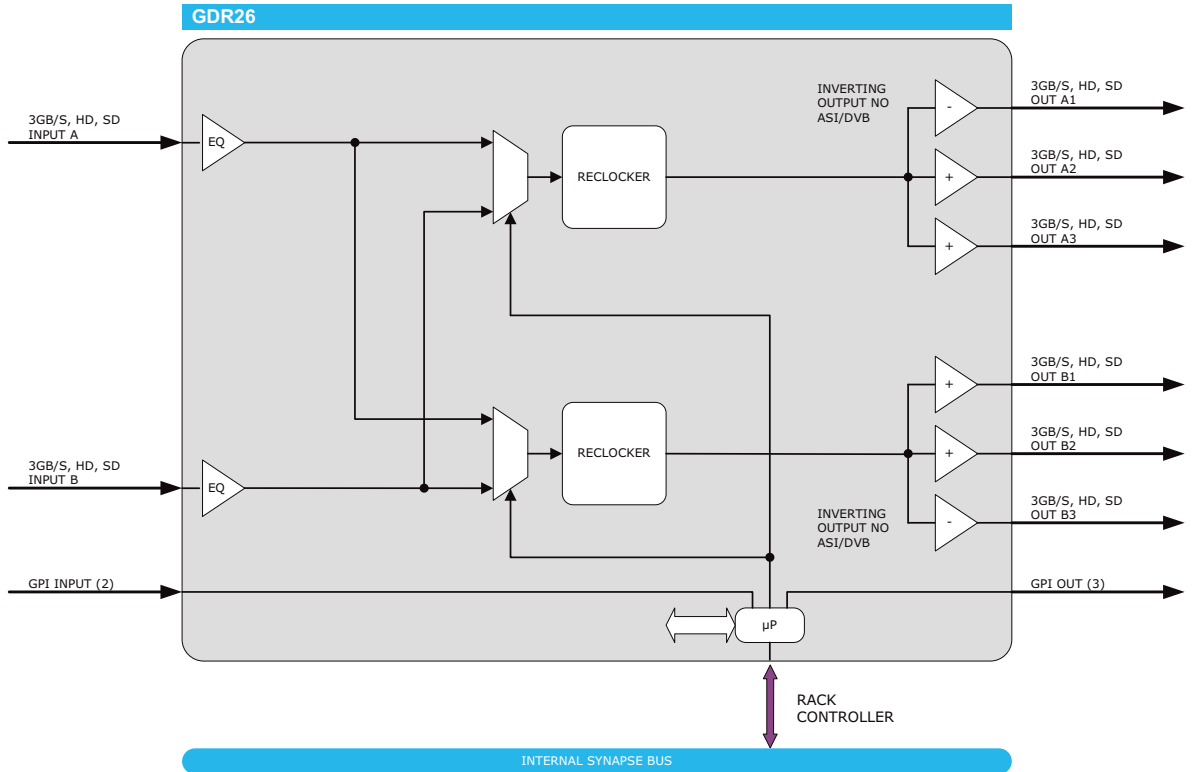
Number of outputs	2x 3
Connector	BNC, Screw terminal or female sub-D (balanced)
Resolution	24 bits
Sampling rate	Equal to input

Miscellaneous

Weight	Approx. 250g
Operating temperature	0° C to +50° C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<3 Watts



GDR26 3Gbit/s dual input distribution amplifier with 3 reclocked outputs per channel (ASI/DVB compatible)

The GDR26 is a dual channel 3Gb/s, HD, SD SDI reclocking distribution amplifier.

- Dual channel with 3 outputs each
- Single channel with 6 outputs
- GPI controlled input swapping and status monitoring
- GPI-1 = select input 1
- GPI-2 = select input 2
- GPO-1 = input 1 OK
- GPO-2 = input 2 OK
- GPO-3 = status of selected input
- 2x2 or 2x1 function
- Compatible with:
 - 270 Mbit/s (SMPTE 259M)
 - 1485 Mbit/s (SMPTE 292M)
 - 2970 Mbit/s (SMPTE 424M) = 3Gb/s
- Non inverting outputs (ASI/DVB compatible)
- Bypass function of the reclocker for non-standard frequencies

Applications

The GDR26 can be used as a dual channel generic extreme wideband 3Gb/s DA

Ordering information

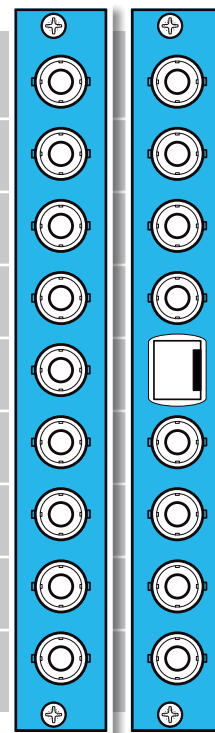
Module:

- **GDR26:** 3Gb/s, HD, SD-SDI dual reclocking distribution 1 to 3 amplifiers

Standard I/O:

- **BPH07_GDR26:** I/O-panel for GDR26
- **BPH17_GDR26:** I/O-panel for GDR26 with RJ45 GPI/O

3GB/S, HD, SD OUTPUT A3
3GB/S, HD, SD OUTPUT A2
INVERTING 3GB/S, HD, SD OUTPUT A1
3GB/S, HD, SD INPUT A
GPI INPUT/OUTPUT
3GB/S, HD, SD INPUT B
3GB/S, HD, SD OUTPUT B1
3GB/S, HD, SD OUTPUT B2
INVERTING 3GB/S, HD, SD OUTPUT B3



BPH07

BPH17

Specifications

Video input

Standard	3Gb/s ,HD and SD SDI: SMPTE424, SMPTE259M, SMPTE 292M
Number of inputs	2
Connector	BNC
Equalization	Typical maximum equalized length of Belden 1694A cable: 70m at 2.97Gb/s, 140m at 1.485Gb/s, and 350m at 270Mb/s
Return loss	> 15dB up to 3GHz

Serial video output

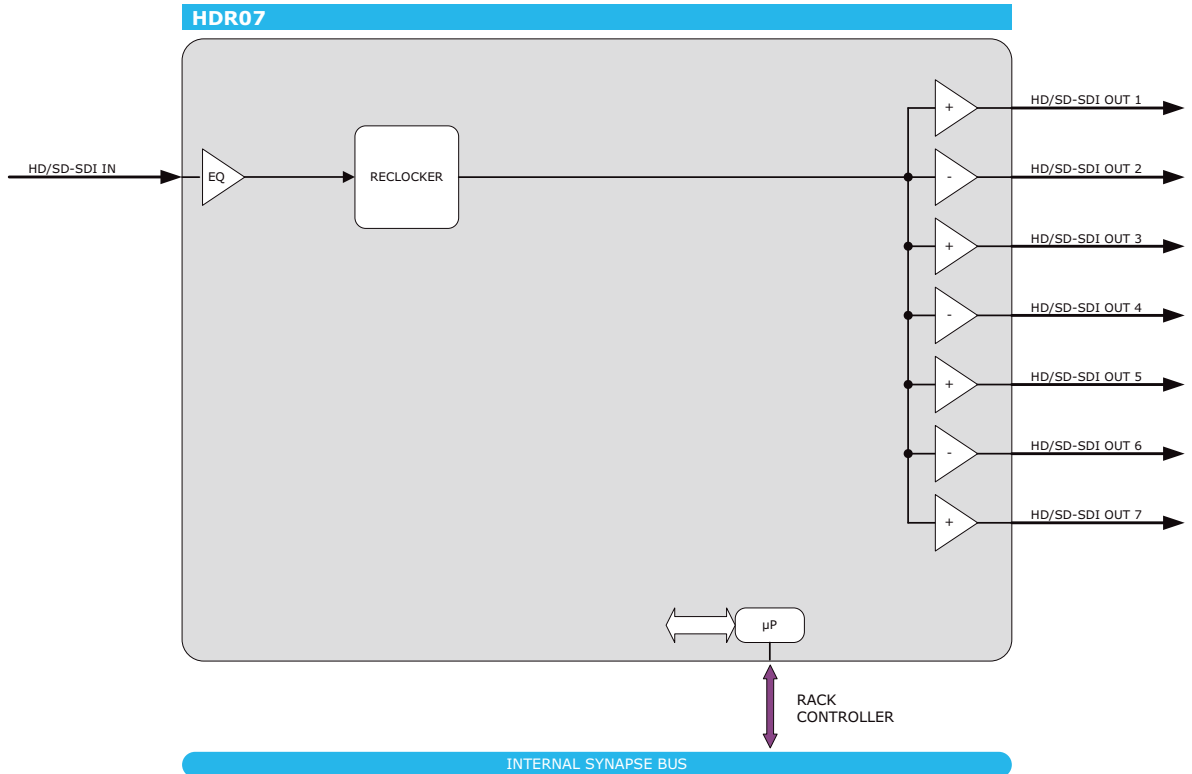
Number of outputs	6 (2 x 3)
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	135ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.5GHz (typ.) > 10dB up to 3GHz (typ.)
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



HDR07 HD reclocking distribution amplifier

The HDR07 is an HD/SD-SDI reclocking distribution amplifier.

- Compatible with:
 - 143 Mbit/s
 - 177 Mbit/s
 - 270 Mbit/s
 - 360 Mbit/s
 - 540 Mbit/s
 - 1485 Mbit/s
- Inverting and non inverting outputs
- Bypass function of the reclocker for non-standard frequencies
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

The HDR07 can be used as a generic wideband DA

Ordering information

Module:

- **HDR07:** HD/SD reclocking distribution amplifier

Standard I/O:

- **BPH07_HDR07:** I/O panel for HDR07

Fiber outputs:

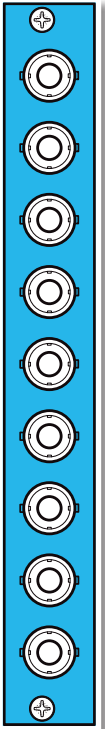
- **BPH07T_FC/PC_HDR07:** I/O panel for HDR07 with fiber transmitter on FC/PC
- **BPH07T_SC_HDR07:** I/O panel for HDR07 with fiber transmitter on SC

Fiber inputs:

- **BPH07R_FC/PC_HDR07:** I/O panel for HDR07 with fiber receiver on FC/PC
- **BPH07R_SC_HDR07:** I/O panel for HDR07 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI OUTPUT 1
HD/SD SDI OUTPUT 2
HD/SD SDI OUTPUT 3 (OPTIONAL FIBER OUTPUT)
HD/SD SDI OUTPUT 4
HD/SD SDI OUTPUT 5
HD/SD SDI OUTPUT 6
HD/SD SDI OUTPUT 7

For fiber connectivity see www.axon.tv



BPH07

Specifications

HD/SD Serial video input

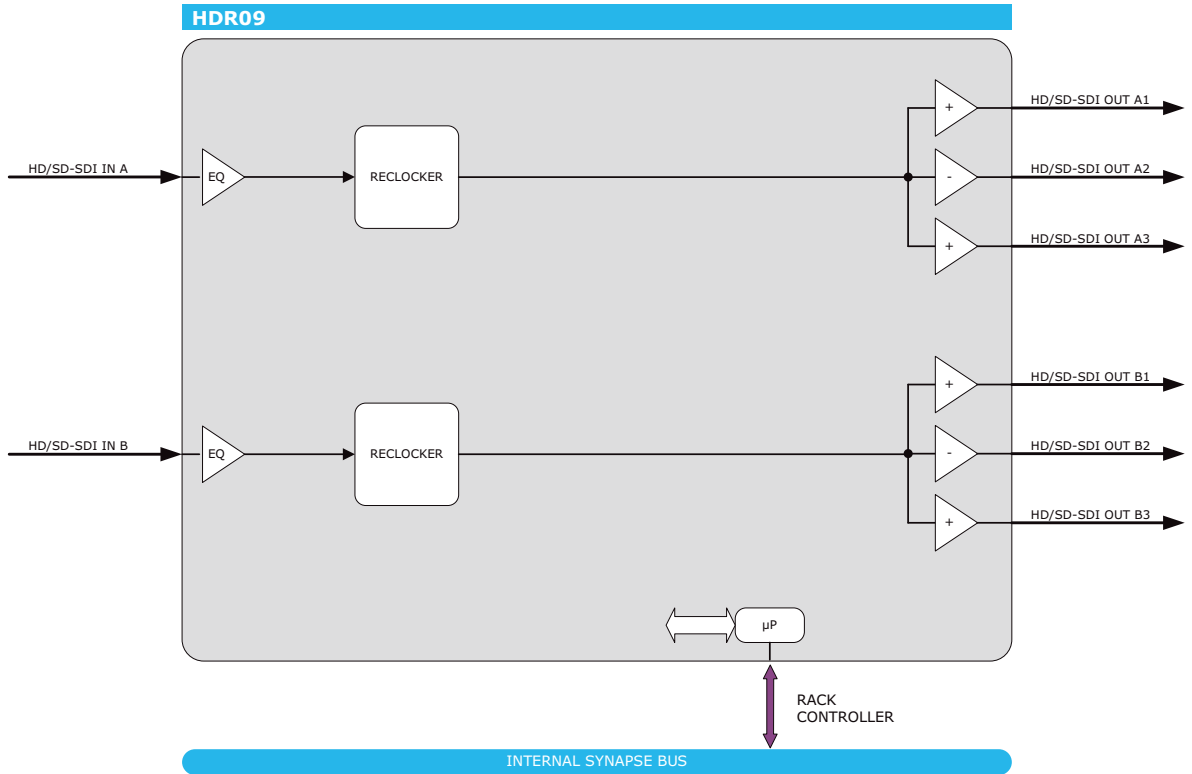
Standard	SD and HD SDI: SMPTE 292M, SMPTE 259M
Number of inputs	1
Connector	BNC
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694 (or equivalent)
Return loss	> 15dB up to 1.485GHz

Serial video output

Number of outputs	7
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	200ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.485GHz
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	4 Watts



HDR09 HD dual input 1 to 3 reclocking distribution amplifier

The HDR09 is a dual channel HD/SD-SDI reclocking distribution amplifier.

- Compatible with:
 - 143 Mbit/s
 - 177 Mbit/s
 - 270 Mbit/s
 - 360 Mbit/s
 - 540 Mbit/s
 - 1485 Mbit/s
- Inverting and non inverting outputs
- Bypass function of the reclocker for non-standard frequencies
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber input (replacing 2 SDI inputs) or 2 fiber output (replacing 2 SDI outputs) on I/O panel

Applications

The HDR09 can be used as a dual channel generic wideband DA

Ordering information

Module:

- **HDR09:** HD dual reclocking distribution dual 1 to 3 amplifier

Standard I/O:

- **BPH07_HDR09:** I/O panel for HDR09

Fiber outputs:

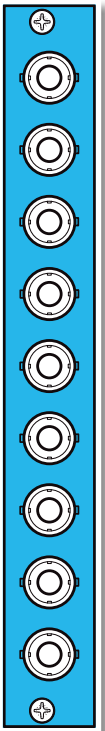
- **BPH07T2_FC/PC_HDR09:** I/O panel for HDR09 with 2 fiber transmitters on FC/PC
- **BPH07T2_SC_HDR09:** I/O panel for HDR09 with 2 fiber transmitters on SC

Fiber inputs:

- **BPH07R2_FC/PC_HDR09:** I/O panel for HDR09 with 2 fiber receivers on FC/PC
- **BPH07R2_SC_HDR09:** I/O panel for HDR09 with 2 fiber receivers on SC

HD/SD SDI INPUT A (OPTIONAL FIBER INPUT)
HD/SD SDI OUTPUT A1
HD/SD SDI OUTPUT A2
HD/SD SDI OUTPUT A3 (OPTIONAL FIBER OUTPUT)
HD/SD SDI INPUT B (OPTIONAL FIBER INPUT)
HD/SD SDI OUTPUT B1
HD/SD SDI OUTPUT B2
HD/SD SDI OUTPUT B3 (OPTIONAL FIBER OUTPUT)

For fiber connectivity see www.axon.tv



BPH07

Specifications

HD/SD Serial video input

Standard	SD and HD SDI: SMPTE 292M, SMPTE 259M
Number of inputs	2
Connector	BNC
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694 (or equivalent)
Return loss	> 15dB up to 1.485GHz

Serial video output

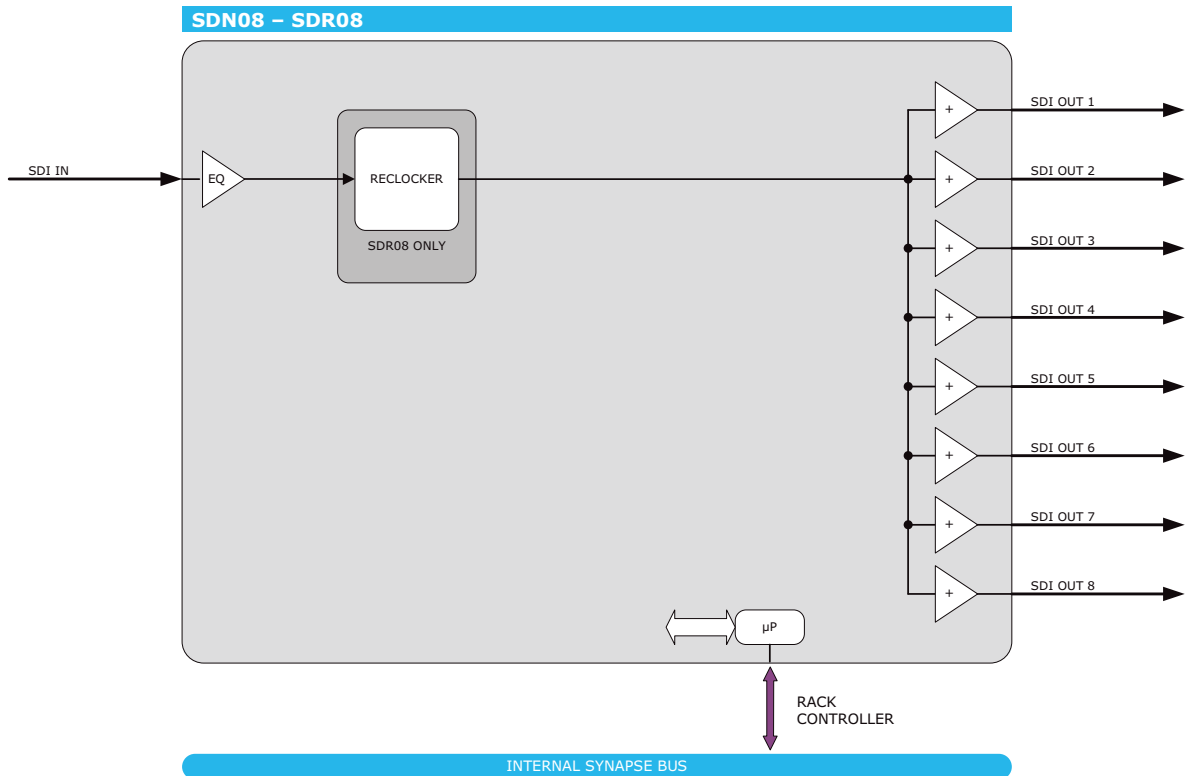
Number of outputs	6 (2 x 3)
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	200ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.485GHz
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	5 Watts



SDN08 - SDR08 SD-SDI (Non=N) reclocking distribution amplifier (ASI/DVB compatible)

The SDR & SDN series provide a range of distribution amplifiers with flexible input and output variations. The SDR08 reclocks the input signal. The SDN/R08 is a 1 to 8 distribution amplifier compatible with ASI/DVB.

- 8 standard or reclocked outputs
- Input carrier detection
- Reclocking compatible with:
 - 143Mb/s
 - 177Mb/s
 - 270Mb/s
 - 360Mb/s
- ASI/DVB compatible
- Guaranteed output on BNC 4 with the BPX01 electromechanical by-pass relay
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Compatible with Fiber I/O panels
- Optional CVBS output (replacing one SDI output)

Applications

- The SDN08 and SDR08 can be used as a generic DA
- ASI/DVB distribution
- Dual Fiber I/O driver/receiver

Ordering information

Modules:

- **SDR08:** SD-SDI reclocking distribution amplifier (ASI/DVB compatible)
- **SDN08:** SD-SDI non-reclocking distribution amplifier (ASI/DVB compatible)

Standard I/O :

- **BPL01_SDR08:** I/O panel for SDR08
- **BPL01_SDN08:** I/O panel for SDN08
- **BPX01_SDR08:** I/O panel for SDR08 with relay bypass
- **BPX01_SDN08:** I/O panel for SDN08 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SDR08:** I/O panel for SDR08 with fiber transmitter on FC/PC
- **BPL01T_FC/PC_SDN08:** I/O panel for SDN08 with fiber transmitter on FC/PC
- **BPL01T_SC_SDR08:** I/O panel for SDR08 with fiber transmitter on SC
- **BPL01T_SC_SDN08:** I/O panel for SDN08 with fiber transmitter on SC

Fiber inputs:

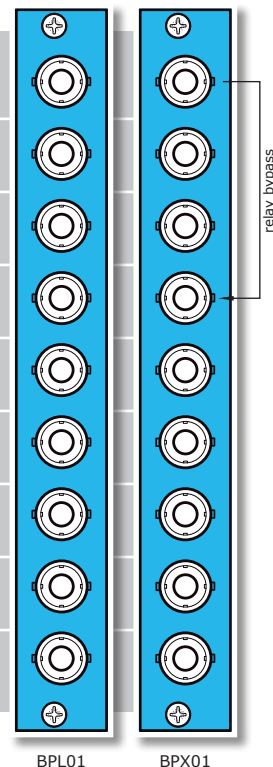
- **BPL01R_FC/PC_SDR08:** I/O panel for SDR08 with fiber receiver on FC/PC
- **BPL01R_FC/PC_SDN08:** I/O panel for SDN08 with fiber receiver on FC/PC
- **BPL01R_SC_SDR08:** I/O panel for SDR08 with fiber receiver on SC
- **BPL01R_SC_SDN08:** I/O panel for SDN08 with fiber receiver on SC

CVBS outputs:

- **BPL01C_SDR08:** I/O panel for SDR08 with CVBS output
- **BPL01C_SDN08:** I/O panel for SDN08 with CVBS output

SD SDI INPUT (OPTIONAL FIBER INPUT)
SD SDI OUTPUT 1
SD SDI OUTPUT 2
SD SDI OUTPUT 3 (OPTIONAL FIBER OR CVBS OUTPUT)
SD SDI OUTPUT 4
SD SDI OUTPUT 5
SD SDI OUTPUT 6
SD SDI OUTPUT 7
SD SDI OUTPUT 8

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

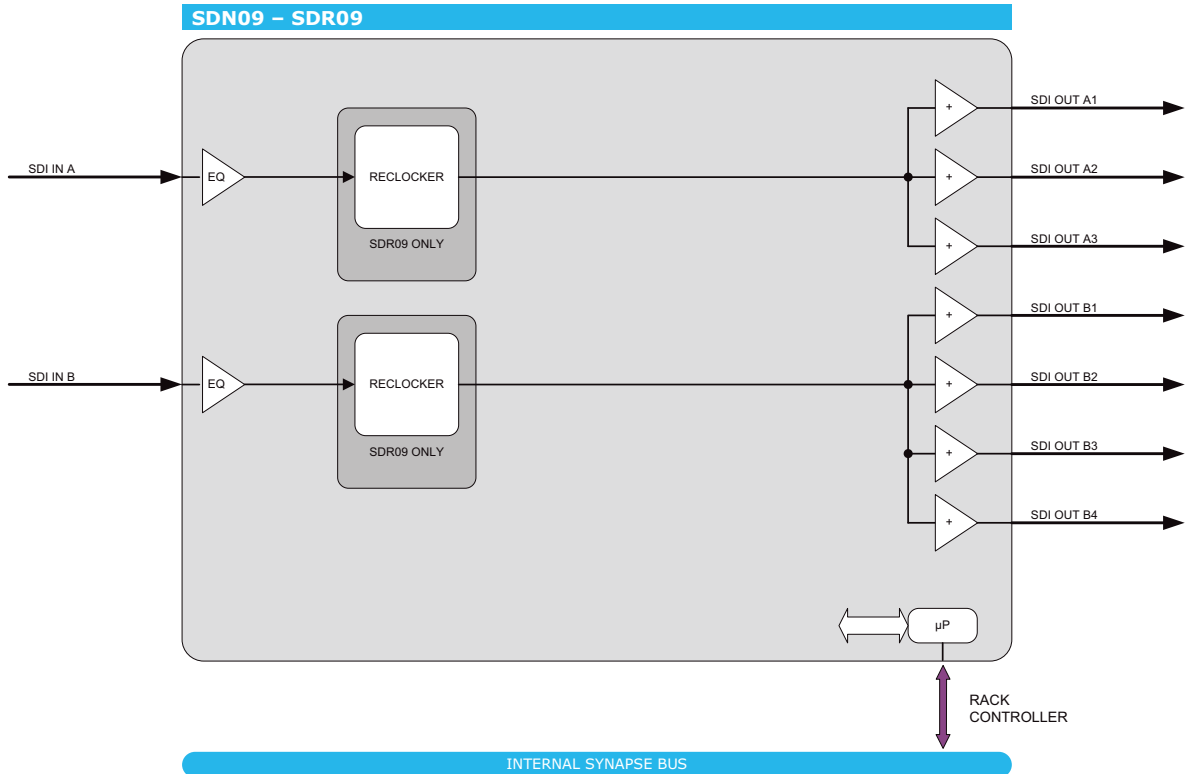
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	8
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<5 Watts



SDN09 - SDR09 SD-SDI (Non=N) reclocking dual channel distribution amplifier (ASI/DVB compatible)

The SDR & SDN series provide a range of distribution amplifiers with flexible input and output variations. The SDR09 reclocks the input signal. The SDN/R09 is a 1 to 3 and 1 to 4 distribution amplifier compatible with ASI/DVB.

- Dual channel
- 3 and 4 standard or reclocked outputs
- Input carrier detection
- Reclocking compatible with:
 - 143Mb/s
 - 177Mb/s
 - 270Mb/s
 - 360Mb/s
- ASI/DVB compatible
- Guaranteed output on BNC 4 with the BPX01 electromechanical by-pass relay
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Compatible with fiber I/O panels
- Optional CVBS output (replacing one SDI output)

Applications

- The SDN09 and SDR09 can be used as a generic dual channel DA
- ASI/DVB distribution
- Fiber I/O driver/receiver

Ordering information

Module:

- **SDR09:** SD-SDI reclocking dual channel distribution amplifier (ASI/DVB compatible)
- **SDN09:** SD-SDI non-reclocking dual channel distribution amplifier (ASI/DVB compatible)

Standard I/O:

- **BPL01_SDR09:** I/O panel for SDR09
- **BPX01_SDR09:** I/O panel for SDR09 with relay bypass
- **BPL01_SDN09:** I/O panel for SDN09
- **BPX01_SDN09:** I/O panel for SDN09 with relay bypass

Fiber outputs:

- **BPL01T2_FC/PC_SDR09:** I/O panel for SDR09 with two fiber transmitters on FC/PC
- **BPL01T2_SC_SDR09:** I/O panel for SDR09 with two fiber transmitters on SC
- **BPL01T2_FC/PC_SDN09:** I/O panel for SDN09 with two fiber transmitters on FC/PC
- **BPL01T2_SC_SDN09:** I/O panel for SDN09 with two fiber transmitters on SC

Fiber inputs:

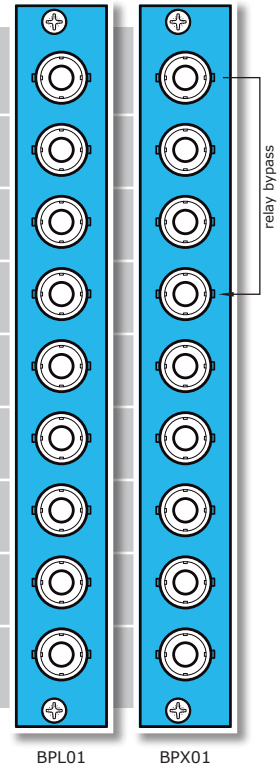
- **BPL01R2_FC/PC_SDR09:** I/O panel for SDR09 with two fiber receivers on FC/PC
- **BPL01R2_SC_SDR09:** I/O panel for SDR09 with two fiber receivers on SC
- **BPL01R2_FC/PC_SDN09:** I/O panel for SDN09 with two fiber receivers on FC/PC
- **BPL01R2_SC_SDN09:** I/O panel for SDN09 with two fiber receivers on SC

CVBS outputs:

- **BPL01C2_SDN09:** I/O panel for SDN09 with 2 CVBS outputs
- **BPL01C2_SDR09:** I/O panel for SDR09 with 2 CVBS outputs

SD SDI INPUT A (OPTIONAL FIBER INPUT)
SD SDI OUTPUT A1
SD SDI OUTPUT A2
SD SDI OUTPUT A3 (OPTIONAL FIBER OR CVBS OUTPUT)
SD SDI INPUT B (OPTIONAL FIBER INPUT)
SD SDI OUTPUT B1
SD SDI OUTPUT B2
SD SDI OUTPUT B3
SD SDI OUTPUT B4 (OPTIONAL FIBER OR CVBS OUTPUT)

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

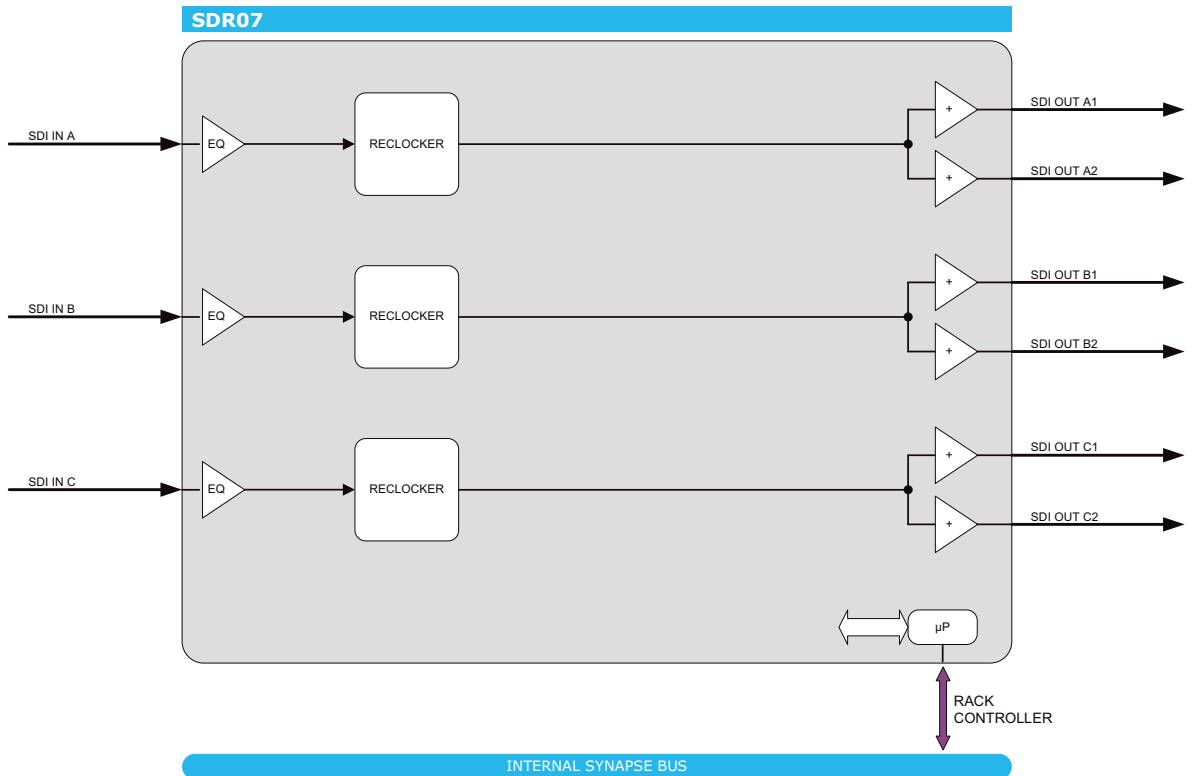
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 and 4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



SDR07 SD-SDI triple channel reclocking distribution amplifier (ASI/DVB compatible)

The SDR07 is a triple channel reclocking distribution amplifier compatible with ASI/DVB.

- All outputs are non-inverting, ASI/DVB compatible
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Compatible with fiber I/O panels

Applications

- The SDR07 can be used as a generic triple channel 1 to 2 DA
- ASI/DVB distribution

Ordering information

Module:

- **SDR07:** SD-SDI reclocking triple channel distribution amplifier (ASI/DVB compatible)

Standard I/O:

- **BPL01_SDR07:** I/O panel for SDR07

Fiber outputs:

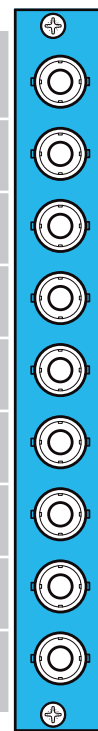
- **BPL01T3_FC/PC_SDR07:** I/O panel for SDR07 with three fiber transmitters on FC/PC
- **BPL01T3_SC_SDR07:** I/O panel for SDR07 with three fiber transmitters on SC

Fiber inputs:

- **BPL01R3_FC/PC_SDR07:** I/O panel for SDR07 with three fiber receivers on FC/PC
- **BPL01R3_SC_SDR07:** I/O panel for SDR07 with three fiber receivers on SC

SD SDI INPUT A (OPTIONAL FIBER INPUT)
SD SDI OUTPUT A1
SD SDI OUTPUT A2 (OPTIONAL FIBER OUTPUT)
SD SDI INPUT B (OPTIONAL FIBER INPUT)
SD SDI OUTPUT B1
SD SDI OUTPUT B2 (OPTIONAL FIBER OUTPUT)
SD SDI INPUT C (OPTIONAL FIBER INPUT)
SD SDI OUTPUT C1
SD SDI OUTPUT C2 (OPTIONAL FIBER OUTPUT)

For fiber connectivity see www.axon.tv



BPL01

Specifications

Serial video input

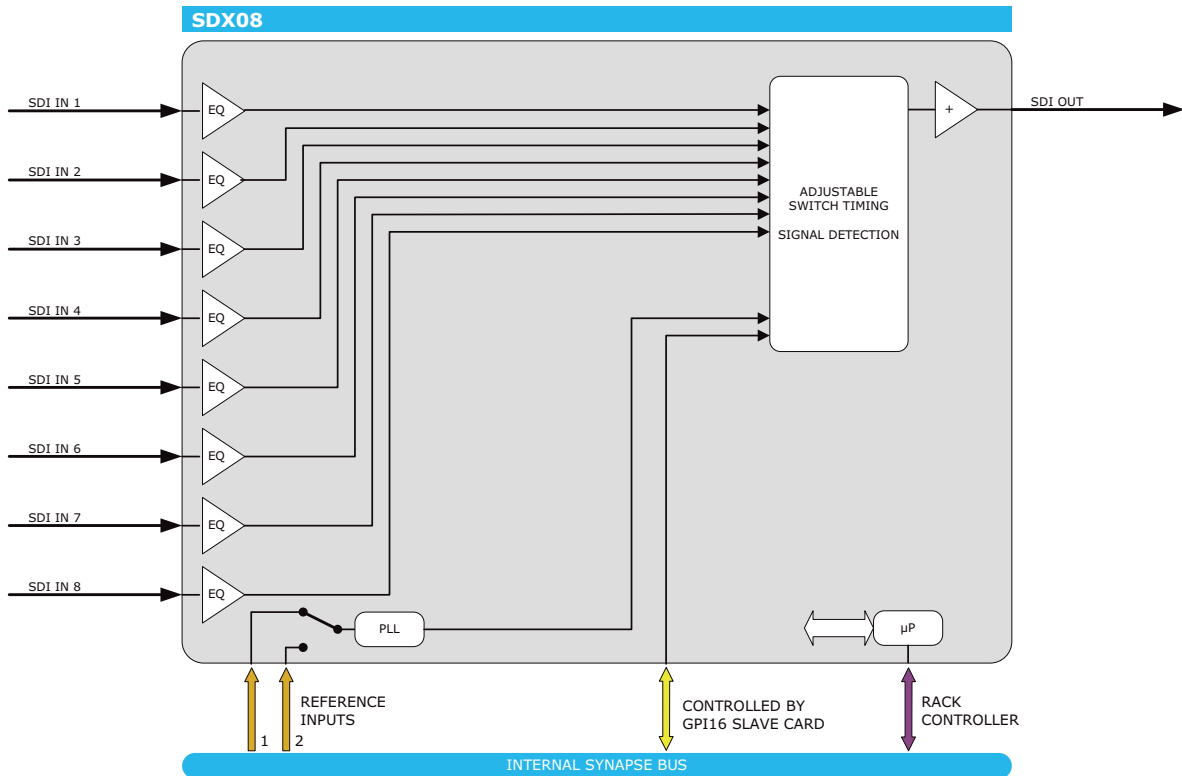
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	3
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 x 2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<6 Watts



SDX08 8 SD-SDI to 1 SD-SDI switcher

The SDX08 is an 8 channel SDI video switcher. The SDX08 routes 1 of 8 SDI-inputs to 1 SDI-output. The SDX08 has 2 main functions, it can act as a backup-switcher and as a router.

- Automatic backup function on all channels
- Switch back function in back-up mode
- Can be controlled by a dedicated GPI16 card (with tally back response)
- Free selection of line and sample for switching.
- EDH detection
- Reclocked output
- Full control and status monitoring through the front panel of the SFR04/18 frame and the Ethernet port (ACP)
- Compatible with fiber I/O panels
- Optional CVBS output (replacing one SDI output)

Applications

- Generic or monitoring 8 by 1 switch
- Back-up switcher
- Small routing applications

Ordering information

Module:

- **SDX08:** SD-SDI reclocking dual channel distribution amplifier (ASI/DVB compatible)

Standard I/O:

- **BPL01_SD X08:** I/O panel for SDX08
- **BPX01_SD X08:** I/O panel for SDX08 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SD X08:** I/O panel for SDX08 with fiber transmitter on FC/PC
- **BPL01T_SC_SD X08:** I/O panel for SDX08 with fiber transmitter on SC

Fiber inputs:

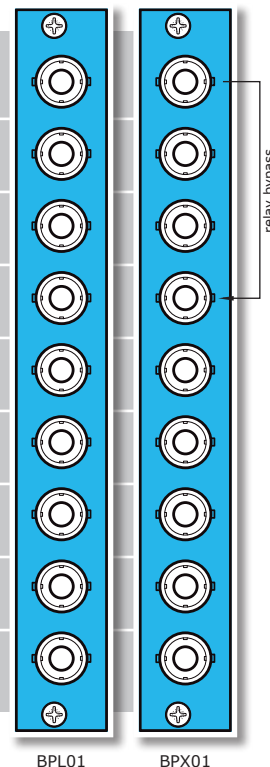
- **BPL01R2_FC/PC_SD X08:** I/O panel for SDX08 with two fiber receivers on FC/PC
- **BPL01R2_SC_SD X08:** I/O panel for SDX08 with two fiber receivers on SC
- **BPL01R_FC/PC_SD X08:** I/O panel for SDX08 with fiber receiver on FC/PC
- **BPL01R_SC_SD X08:** I/O panel for SDX08 with fiber receiver on SC

CVBS output:

- **BPL01C_SD X08:** I/O panel for SDX08 with CVBS output

SD SDI INPUT 1 (OPTIONAL FIBER INPUT)
SD SDI INPUT 2
SD SDI INPUT 3 (OPTIONAL FIBER INPUT)
SD SDI OUTPUT (OPTIONAL FIBER OR CVBS OUTPUT)
SD SDI INPUT 4
SD SDI INPUT 5
SD SDI INPUT 6
SD SDI INPUT 7
SD SDI INPUT 8

For fiber connectivity see www.axon.tv



Specifications

Serial video input

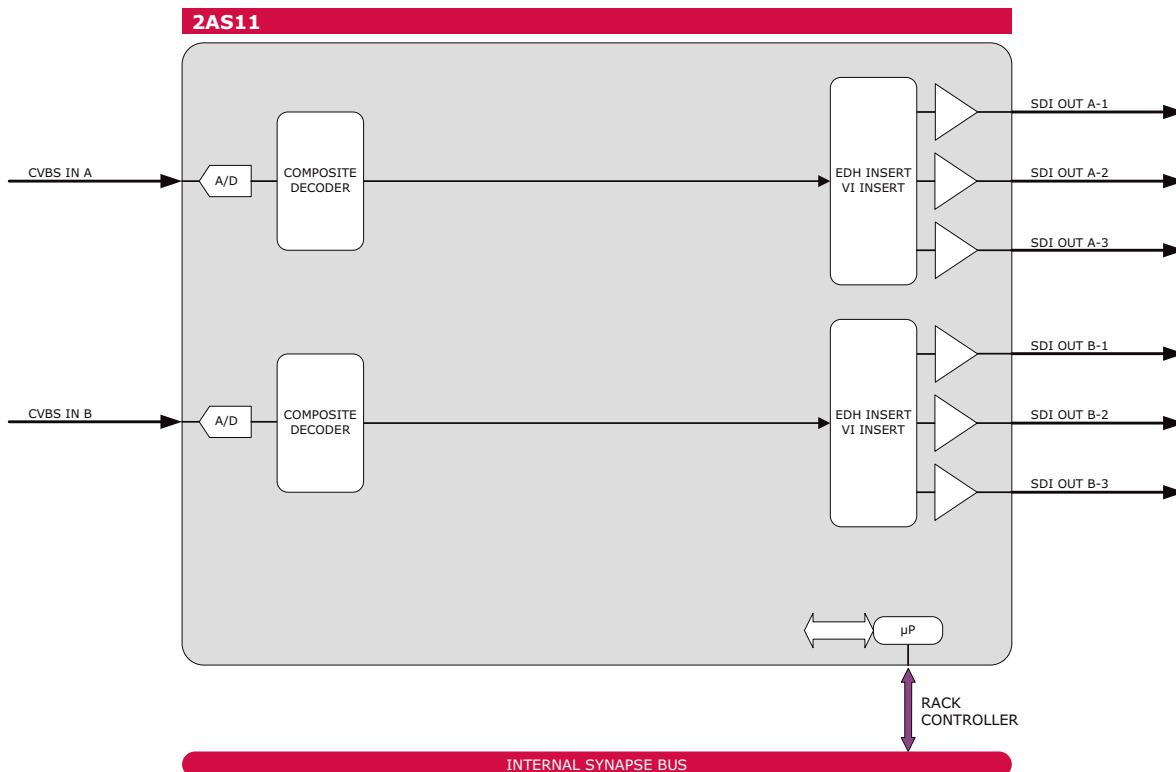
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	8
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	1
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<7 Watts



2AS11 Dual channel 12-bit composite decoder with 5 line comb filter

The 2AS11 is a broadcast quality dual channel composite decoder. The 12-bit high performance digital decoding stages provide superior quality 5-line comb filtering.

Because the 2AS11 (TWINS) has 2 fully independent channels, it increases the Synapse decoding density by 100%, allowing 36 individual composite decoders in 4 rack units. When frame synchronization is required the 2AS12 should be used.

- Dual channel (TWINS)
- 12 bit full broadcast specified decoding
- Compatible with:
 - NTSC-J
 - NTSC-M
 - PAL60
 - NTSC443
 - PAL-BGHID
 - PAL-N
 - PAL-M
 - PAL-M-setup
 - PALcmbN
 - PALcmbN-setup
 - SECAM
 - SECAM-setup
- 3 SDI outputs per channel
- On Input loss display:
 - Black
 - Green
 - Continuous Analog input
- 8 channels in 1 RU
- 16 channels in 2RU
- 36 channels in 4 RU
- EDH insertion
- VI insertion (individual per channel)
- Gain adjustment
- Hue adjustment
- Y shaping filters
- Y peaking adjustment
- Compatible with PAL, NTSC and Secam
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

Applications

- The 2AS11 is ideal for converting locked CVBS sources into SDI.
- High density multi channel decoding in OB-Trucks

Ordering information

Module:

- **2AS11:** Dual 12-bit composite decoder with 5 line comb filter

Standard I/O:

- **BPL11_2AS11:**
I/O panel for 2AS11

Fiber outputs:

- **BPL11T2_FC/PC_2AS11:**
I/O panel for 2AS11 with 2 fiber transmitters on FC/PC
- **BPL11T2_SC_2AS11:**
I/O panel for 2AS11 with 2 fiber transmitters on SC

CVBS outputs:

- **BPL11C2_2AS11:**
I/O panel for 2AS11 with 2 CVBS outputs

CVBS INPUT A
SDI OUTPUT A-1
SDI OUTPUT A-2
SDI OUTPUT A-3 (OPTIONAL FIBER OR CVBS OUTPUT)
CVBS INPUT B
SDI OUTPUT B-1
SDI OUTPUT B-2
SDI OUTPUT B-3 (OPTIONAL FIBER OR CVBS OUTPUT)

For fiber connectivity see www.axon.tv



BPL11

Specifications

Video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9 ns
Minimum delay	3 lines

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Serial video output

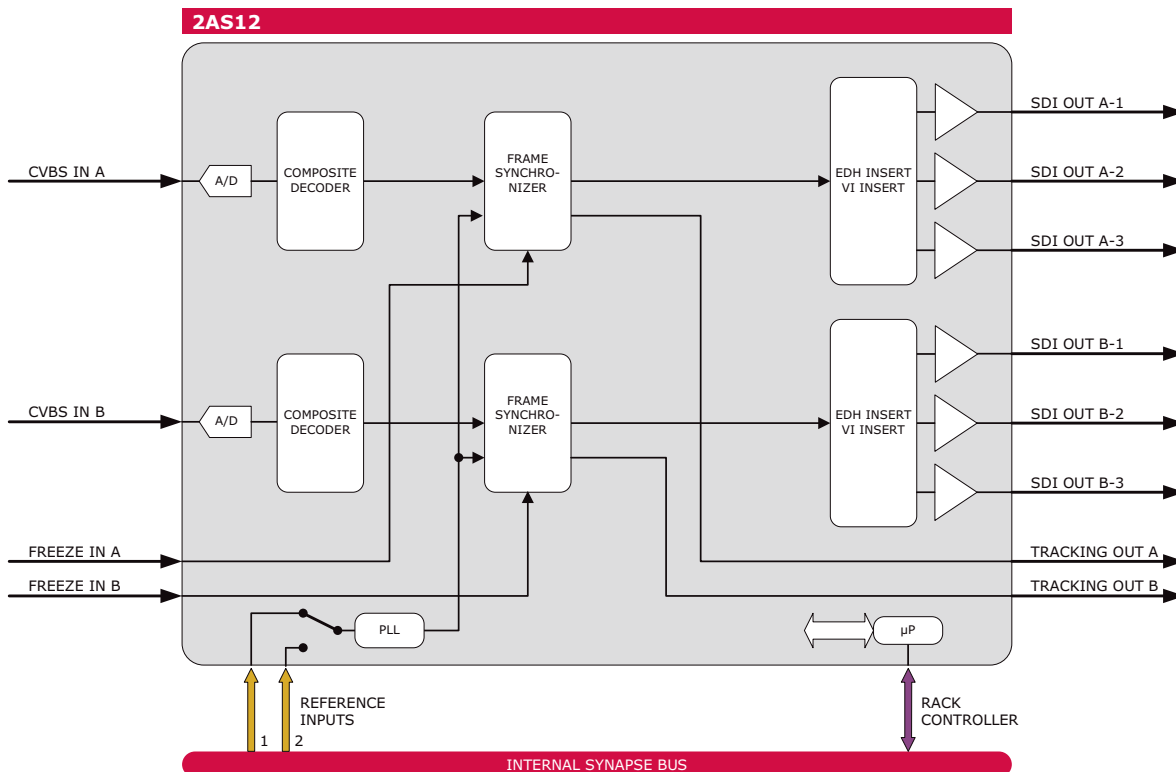
Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	2
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	4 Watts



2AS12 Dual channel 12-bit composite decoder with 5 line comb filter and frame synchronizer

The 2AS12 is a broadcast quality dual channel composite decoder with frame synchronizer. The 12-bit high performance digital decoding stages provide superior quality 5-line comb filtering. Because the 2AS12 (TWINS) has 2 fully independent channels, it increases the Synapse decoding density by 100%, allowing 36 individual composite decoder in 4 rack units. When no frame synchronization is required the 2AS11 should be used.

- Dual channel (TWINS)
- 12 bit full broadcast specified decoding
- Compatible with:
 - NTSC-J
 - NTSC-M
 - PAL60
 - NTSC443
 - PAL-BGHID
 - PAL-N
 - PAL-M
 - PAL-M-setup
 - PALcmbN
 - PALcmbN-setup
 - SECAM
 - SECAM-setup
- 3 SDI outputs per channel

- On Input loss display:
 - Black
 - Green
 - Continuous Analog input
- Full frame adjustable output phase with respect to reference in sample increments
- Freeze mode
- Audio delay tracking output
- 3 SDI outputs per channel
- 8 channels in 1RU
- 16 channels in 2RU
- 36 channels in 4RU
- EDH insertion
- VI insertion (individual per channel)
- Gain adjustment
- Hue adjustment
- Y shaping filters
- Y peaking adjustment
- Compatible with PAL, NTSC and SECAM
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

Applications

- The 2AS12 is ideal for converting non sync CVBS sources into SDI
- High density multi channel decoding

Ordering information

Module:

- **2AS12:** Dual 1-bit composite decoder with 5 line comb filter and frame synchronizer

Standard I/O:

- **BPL11_2AS12:** I/O panel for 2AS12

Fiber outputs:

- **BPL11T2_FC/PC_2AS12:** I/O panel for 2AS12 with 2 fiber transmitters on FC/PC
- **BPL11T2_SC_2AS12:** I/O panel for 2AS12 with 2 fiber transmitters on SC

CVBS outputs:

- **BPL11C2_2AS12:** I/O panel for 2AS12 with 2 CVBS outputs

CVBS INPUT A
SDI OUTPUT A-1
SDI OUTPUT A-2
SDI OUTPUT A-3 (OPTIONAL FIBER OR CVBS OUTPUT)
FREEZE & TRACKING INPUT/OUTPUT
CVBS INPUT B
SDI OUTPUT B-1
SDI OUTPUT B-2
SDI OUTPUT B-3 (OPTIONAL FIBER OR CVBS OUTPUT)

For fiber connectivity see www.axon.tv



BPL11

Specifications

Video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9 ns
Minimum delay	3 lines
Maximum delay	1 frame

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Serial video output

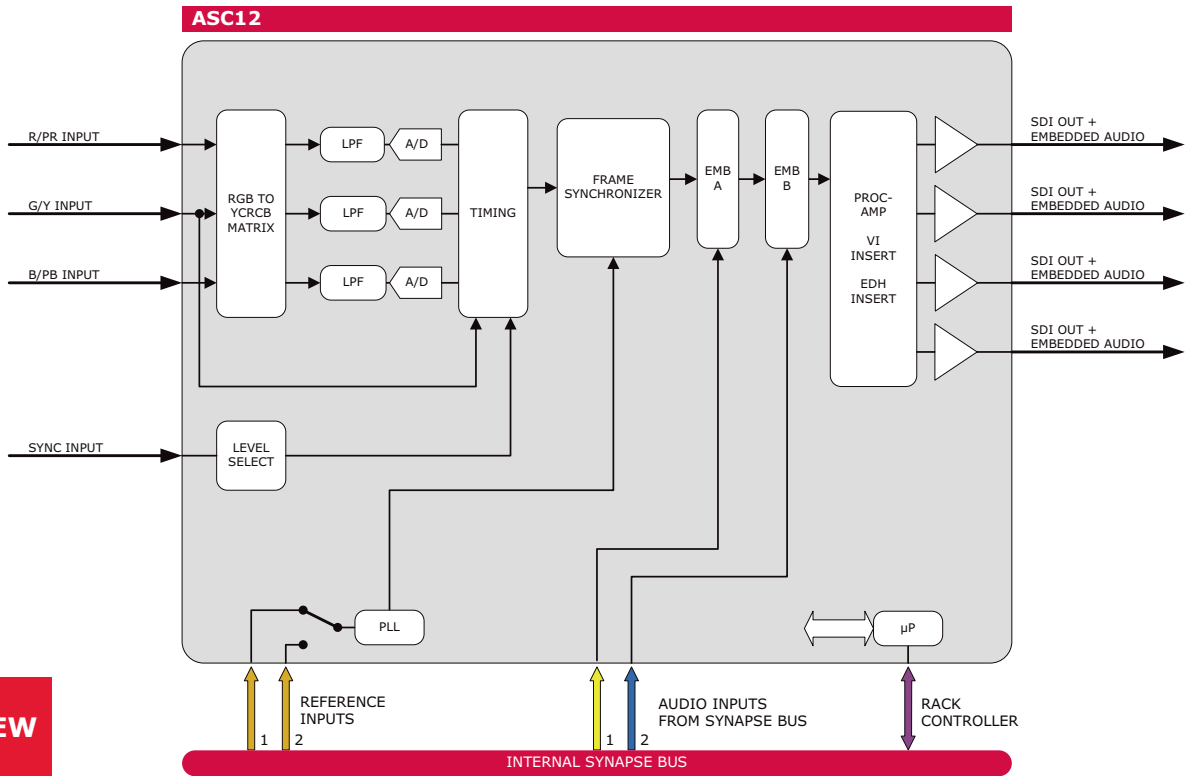
Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	2
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	4 Watts



NEW

ASC12 Component (near CCIR601) or RGB to SDI converter

The ASC12 is the ideal solution for component video or RGB to SDI conversion. It features near CCIR601 input filtering for benchmark flat frequency response and uses 12-bit A/D conversion and processing, to obtain high quality 10-bit operation. Digital 12-bit feedback clamps with noise filtering provides accurate clamping of the input signals. The unit has an industry leading jitter performance, resulting in a high degree of output signal stability. The ASC12 accepts analog component signals in YCrCb format or RGB format. Betacam level selection allows the level of the component color difference signal to be set in accordance with Betacam levels and EBU/SMPTE levels.

The module has the unique ADD-ON embedding function by adding a Synapse A/D converter or AES/EBU input card that allows 2 group embedding. Four SDI outputs are available with embedded audio, reducing the need for distribution amplifiers and external embedders.

- 12-bit A/D
- Reference on Y. G.
- Compatible with Betacam and EBU levels
- 2 group embedding with ADD-ON card
- Auto format detection
- VI insertion
- EDH insertion
- Compatible with fiber connector panels
- Frame synchronization
- Video Proc amp
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

ASC12

Applications

- Analog camera A/D converter
- Analog VTR A/D converter

Ordering information

Module:

- **ASC12:** Component (near CCIR601) or RGB to SDI converter

Standard I/O:

- **BPL01_ASC12:** I/O panel for ASC12

Fiber outputs:

- **BPL01T_FC/PC_ASC12:** I/O panel for ASC12 fiber transmitter on FC/PC
- **BPL01T_SC_ASC12:** I/O panel for ASC12 fiber transmitter on SC

CVBS output:

- **BPL01C_ASC12:** I/O panel for ASC12 with CVBS output

SDI OUTPUT 1
SDI OUTPUT 2
SDI OUTPUT 3
SDI OUTPUT 4 (OPTIONAL FIBER OR CVBS OUTPUT)
EXT SYNC INPUT
Y/G INPUT
PB/B INPUT
PR/R INPUT

For fiber connectivity see www.axon.tv



BPL01

Specifications

Video input

Standard	625/50 and 525/59.94
Number of inputs	3
Impedance	75 Ohms
Return loss	> 32dB up to 5MHz
Luminance freq. resp.	Near CCIR601/656
Stability	1%
Propagation delay	3.81 μs
Noise floor	< -57dB (Unified Weighted)
Internal operation	12 Bit
Differential delay	< 5ns

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Serial video output

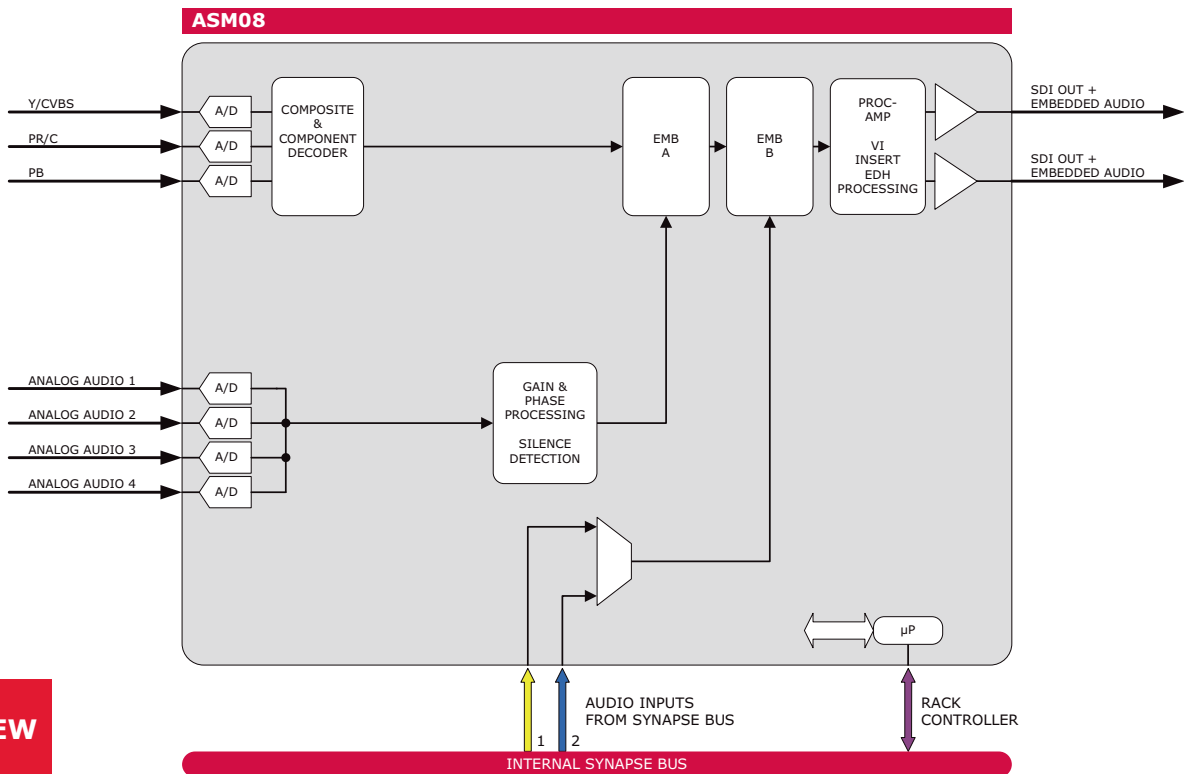
Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	4
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<7 Watts



NEW

ASM08 Analog to digital A/V converter with composite or component input capability

The ASM08 is an audio and video analog to digital converter. It accepts both component and composite analog video together with 4 channels of analog audio.

The ASM08 is the counter part of the SAM08.

- 12-bit video A/D conversion and decoding
- 20-bit audio A/D conversion and processing
- Auto detecting of PAL, NTSC or SECAM with correct reference input selection (SFR18 + SFR08)
- Automatic input gain adjustment
- Video Proc amp
- Noise reduction
- Hue adjustment
- Decoder Y-shaping and Y-peaking adjustment
- Adjustable analog audio reference levels of +15, +18 and +24dBu for 0 dBFS
- Adjustable audio gain +12 db to -60 dB
- Adjustable audio phase 0 deg or 180 deg
- Individual selection local analog audio input or ADD-ON audio input

- Second group embedding through ADD-ON card
- VI and WSS insertion
- EDH insertion
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- A/V bridge to digitize an analog tape machine (Beta SP)
- VHS digitizer (+ embedded audio)
- Analog set-top box or IRD digitizer (+embedded audio)

Ordering information

Module:

- **ASM08:** Analog to digital A/V bridge (12 bit) with SDI & embedded audio bypass / processing input

Standard I/O:

- **BPL12_ASM08:** I/O panel for ASM08

Fiber outputs:

- **BPL12T_FC/PC_ASM08:** I/O panel for ASM08 with fiber transmitter on FC/PC
- **BPL12T_SC_ASM08:** I/O panel for ASM08 with fiber transmitter on SC

Fiber inputs:

- **BPL12R_FC/PC_ASM08:** I/O panel for ASM08 with fiber receiver on FC/PC
- **BPL12R_SC_ASM08:** I/O panel for ASM08 with fiber receiver on SC

CVBS Output:

- **BPL12C_ASM08:** I/O panel for ASM08 with CVBS output

NC
SDI OUTPUT 1
SDI OUTPUT 2 (OPTIONAL FIBER OR CVBS OUTPUT)
Y/CVBS INPUT
C/PR INPUT
PB INPUT
ANALOG AUDIO INPUT



BPL12

Specifications

Video input

Standard PAL (ITU624-4), NTSC (SMPTE 170M)

Number of inputs 1

Impedance 75 Ohms

Return loss > 35dB up to 10MHz

Frequency response < ±0.25dB (100KHz to 4.2MHz)

Differential gain < ±0.5% typical

Differential

phase < ±0.2° typical

Noise floor < -57dB RMS (black video, 15KHz to 5MHz)

C/L gain < ±0.5%

C/L delay < ±9ns

Minimum delay 3 lines

Maximum delay 1 frame

Analog audio input

Type Balanced analog audio

Number of inputs 4

Connector Removable terminal strip or female sub-D

Impedance 10k Ohms nominal (differential)

Sampling rate 48KHz

Signal level 0dB FS => 12dBu, 15dBu, 18dBu or 24dBu

Level control

range +12dB to -60dB 0.25dB increments

Frequency

response < ±0.1dB, 20Hz to 20kHz (broadcast quality)

Dynamic range 100dB @ -60 dBFS

THD+N < 0.002% (>96dB) @ 1kHz, -1dB FS

< 0.002% (> 96dB) @ 20Hz to 20kHz, -1dB FS

CMRR > 60dB at 1kHz

Serial video output

Standard SMPTE 259M 525/59.95 or 625/50

Number of outputs 2

Connector BNC

Signal level 800mV nominal

DC offset 0V ±0.5V

Rise/fall time 900ps nominal

Overshoot < 10% of amplitude

Return loss > 15dB to 270MHz

Jitter < 0.1UI

Miscellaneous

Weight Approx. 250g

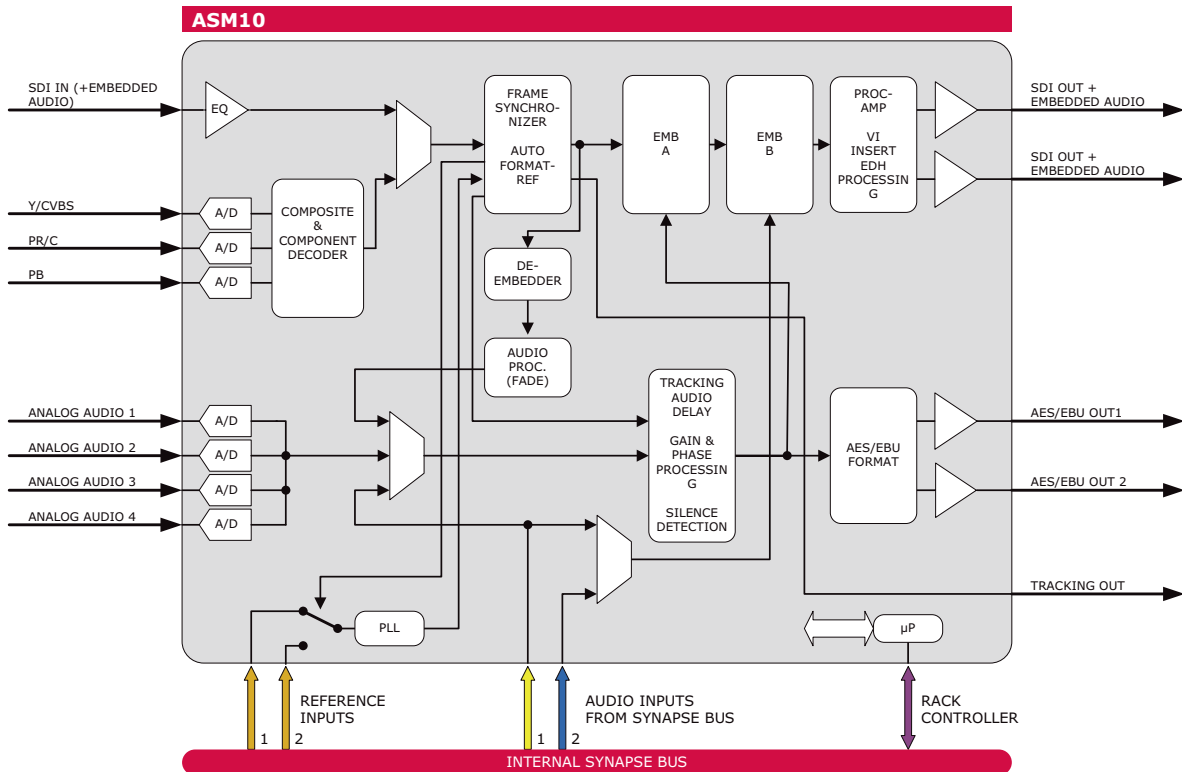
Operating temperature 0 °C to +50 °C

Dimensions 137 x 296 x 20 mm (HxWxD)

Electrical

Voltage +24V to +30V

Power 9 Watts



ASM10 Analog to digital A/V (12 bit) bridge with SDI & embedded audio bypass/processing input

The ASM10 is an ultimate example of combined functions and features in a single module. The module bridges the analog world to the digital world. With composite or component video and Analog audio inputs, the ASM10 is ideal to digitize an analog tape machine to an SDI + embedded audio signal. It can also be found in a studio or transmission environment that is being upgraded to a central SDI + embedded audio single layer router. If an AES/EBU layer is required, the ASM10 provides this signal too. To preserve your investment after the infrastructure is digitized; it comes with an Analog input by-pass function and can be used as an SDI frame synchronizer and embedder. The ASM10 is the mirror function of the SAM10 (without frame sync).

- 12-bit video A/D conversion and decoding
- 24-bit audio A/D conversion and processing
- Frame synchronizer with smooth audio handling
- Delay mode (input lock)
- Individual H and V offset adjustment in pixel and lines (with respect to reference)
- Auto detecting of PAL, NTSC or SECAM with correct reference input selection (SFR18 + SFR08)
- Automatic input gain adjustment
- Video Proc amp
- Noise reduction

- Hue adjustment
- Decoder Y-shaping and Y-peaking adjustment
- Adjustable analog audio reference levels of +15, +18 and +24dBu for 0 dBFS
- Adjustable audio gain +12 db to -60 dB
- Adjustable audio phase 0 deg or 180 deg
- Individual selection of embedded domain audio, or local Analog audio input, or ADD-ON audio input
- Tracking audio delay on Analog audio inputs
- Second group embedding through ADD-ON card
- SDI frame sync mode
- Auto format detection
- VI and WSS insertion
- EDH insertion
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- A/V bridge to digitize an analog tape machine (Beta SP)
- Mobile truck input capture card for free running audio and video sources
- Lines centre input capture card for free running audio and video sources
- VHS digitizer (+ embedded audio)
- Analog set-top box or IRD digitizer (+embedded audio)

Ordering information

Module:

- **ASM10:** Analog to digital A/V bridge (12 bit) with SDI & embedded audio bypass / processing input

Standard I/O:

- **BPL12_ASM10:**
I/O panel for ASM10

Fiber outputs:

- **BPL12T_FC/PC_ASM10:**
I/O panel for ASM10 with fiber transmitter on FC/PC
- **BPL12T_SC_ASM10:**
I/O panel for ASM10 with fiber transmitter on SC

Fiber inputs:

- **BPL12R_FC/PC_ASM10:**
I/O panel for ASM10 with fiber receiver on FC/PC
- **BPL12R_SC_ASM10:**
I/O panel for ASM10 with fiber receiver on SC

CVBS output:

- **BPL12C_ASM10:**
I/O panel for ASM10 with CVBS output

Specifications

Video input

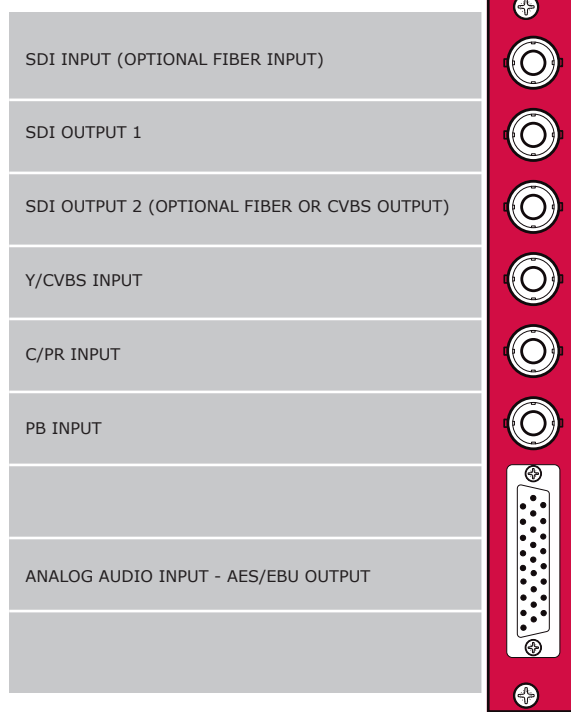
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	3 lines
Maximum delay	1 frame

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Analog audio input

Type	Balanced analog audio
Number of inputs	4
Connector	Removable terminal strip or female sub-D
Impedance	10k Ohms nominal (differential)
Sampling rate	48KHz
Signal level	0dB FS => 12dBu, 15dBu, 18dBu or 24dBu
Level control range	+12dB to -60dB 0.25dB increments
Frequency response	< ±0.1dB, 20Hz to 20kHz (broadcast quality)
Dynamic range	100dB @-60 dBFS
THD+N	< 0.002% (>96dB) @ 1kHz, -1dB FS < 0.002% (> 96dB) @ 20Hz to 20kHz, -1dB FS
CMRR	> 60dB at 1kHz



BPL12

AES audio output

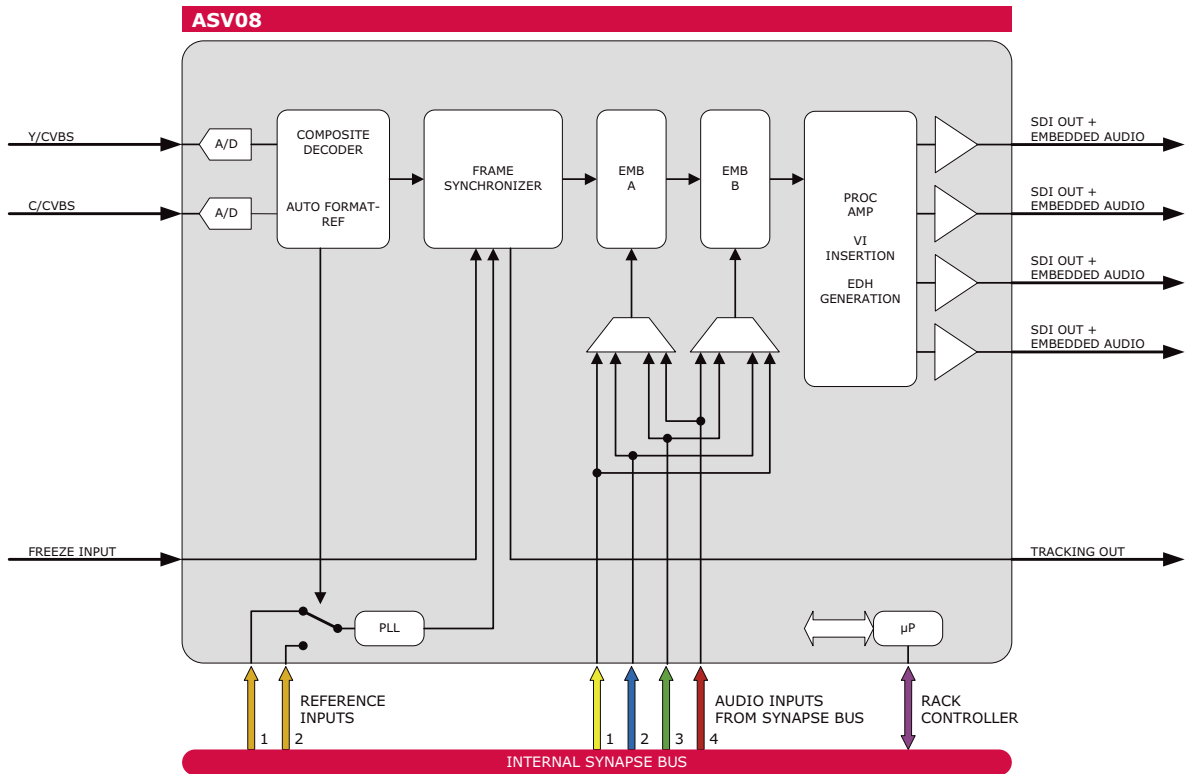
Number of outputs	2
Connector	sub-D (balanced)
Resolution	24 bits
Sampling rate	48KHz synchronous
Minimum input/output delay	2.5ms
Maximum input/output delay	1300 ms

Serial video output

Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	2
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Miscellaneous	
Voltage	+24V to +30V
Power	9 Watts



ASV08 Standard quality composite decoder with 4 SDI outputs

The ASV08 is a very popular standard quality decoder with time base corrector. The stable operation attained under poor conditions make the ASV08 a real workhorse. It can operate in places where other decoders fail to lock.

- "Eat it all" card with a very tolerant input decoder
- Selectable lock mode (TV, Normal VTR mode)
- TBC through local quartz reference (free running mode)
- Automatic Gain Control (AGC)
- Compatible with PAL, NTSC and SECAM
- 2 inputs with auto-detection capability (or YC mode)
- Frame synchronizer
- Full frame adjustable output phase with respect to reference in sample increments
- Auto detecting of PAL or NTSC with correct reference input selection (SFR18 + SFR08)
- Transparent or blanked vertical interval
- Variable or automatic input gain
- Adjustable HUE phase
- Proc-Amp
- VI insertion
- EDH insertion
- 2 Group embedder with tracking pulse output for: ADC24, ADC20, DIO24, DIO48, etc.
- Selectable panic or manual freeze (GPI)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- VTR composite decoder/synchronizer
- VTR digitizer with embedded audio (requires an ADC20)
- Helicopter RF feed digitizer and TBC

Ordering information

Module:

- **ASV08:** Standard quality composite decoder with 4 SDI outputs

Standard I/O:

- **BPL01_ASV08:** I/O panel for ASV08

Fiber outputs:

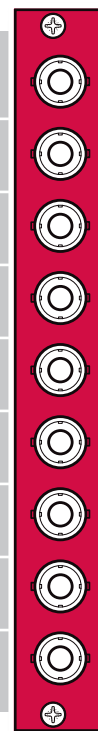
- **BPL0T_FC/PC_ASV08:** I/O panel for ASV08 with fiber transmitter on FC/PC
- **BPL0T_SC_ASV08:** I/O panel for ASV08 with fiber transmitter on SC

CVBS output:

- **BPL01C_ASV08:** I/O panel for ASV08 with CVBS output

SDI OUTPUT 1
SDI OUTPUT 2
SDI OUTPUT 3
SDI OUTPUT 4 (OPTIONAL FIBER OR CVBS OUTPUT)
CVBS INPUT 1 / Y
CVBS INPUT 2 / C
TRACKING OUTPUT
FREEZE INPUT

For fiber connectivity see www.axon.tv



BPL01

Specifications

Video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M), SECAM
Number of inputs	1
Impedance	75 Ohms
Return loss	> 39dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±2% typical
Differential phase	< ±0.5° typical
Noise floor	< -57dB (Unified weighted)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	3 lines
Maximum delay	1 frame

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Serial video output

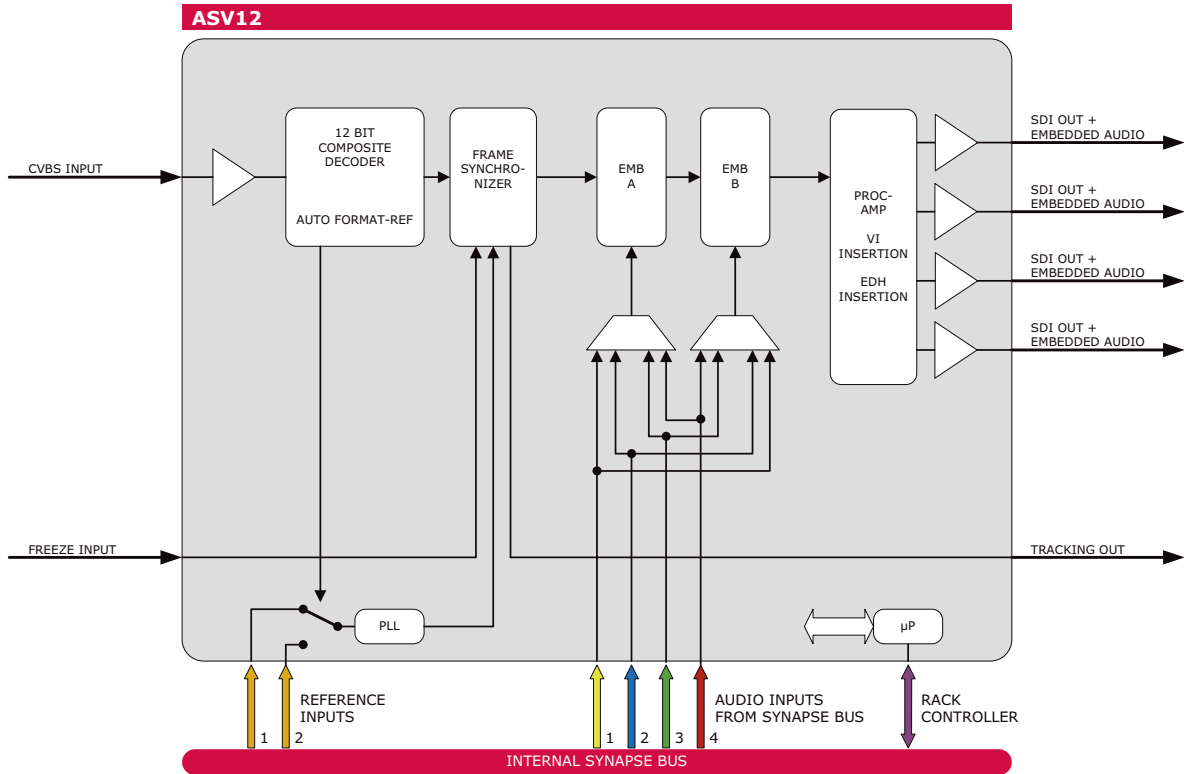
Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	2
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



ASV12 High-end CVBS decoder (12 bit) with 5 line comb filter, frame synchronizer and 2 group embedder

The ASV12 is an analog to digital converter which converts analog composite signals to serial digital (SDI). The ASV12 has a frame synchronizer, video proc-amp, VI-inserter and an adaptive 5-line comb filter for signal enhancement. A 2 group embedder is part of the internal processing core and can be enabled by using an ADD-ON card like the ADC20/24 and DIO24.

- Auto detecting of PAL or NTSC with correct reference input selection (SFR18 + SFR08)
- Frame synchronizer
- Full frame adjustable output phase with respect to reference in sample increments
- ANC data blanking
- Adaptive or narrow Comb filter
- Automatic color control
- Hue adjustment
- Proc-Amp
 - Y gain
 - C gain
 - Y Black
 - Cb Black
 - Cr Black
- PAL averaging
- VI insertion
- EDH insertion
- 2 Group embedder with tracking pulse output for: ADC24, ADC20, DIO24 and DIO48
- Variable, automatic or fixed input gain
- Selectable NTSC setup removal
- GPI Freeze input
- Selectable panic freeze or manual freeze
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- High quality decoding in MCR input lines (together with timing correction)
- CVBS and analog audio decoding and embedding (requires an additional ADC20)

Ordering information

Module:

- **ASV12:** High-end CVBS decoder (12 bit) with 5 line comb filter and frame synchronizer and 2 group embedder

Standard I/O:

- **BPL01_ASV12:**
I/O panel for ASV12

Fiber outputs:

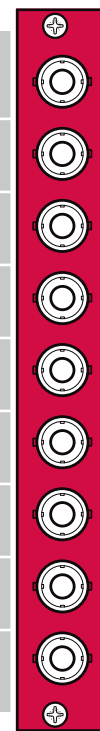
- **BPL01T_FC/PC_ASV12:**
I/O panel for ASV12 with fiber transmitter on FC/PC
- **BPL01T_SC_ASV12:**
I/O panel for ASV12 with fiber transmitter on SC

CVBS output:

- **BPL01C_ASV12:**
I/O panel for ASV12 with CVBS output

SDI OUTPUT 1
SDI OUTPUT 2
SDI OUTPUT 3
SDI OUTPUT 4 (OPTIONAL FIBER OR CVBS OUTPUT)
CVBS INPUT
TRACKING OUTPUT
FREEZE INPUT

For fiber connectivity see www.axon.tv



BPL01

Specifications

Video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	3 lines
Maximum delay	1 frame

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Serial video output

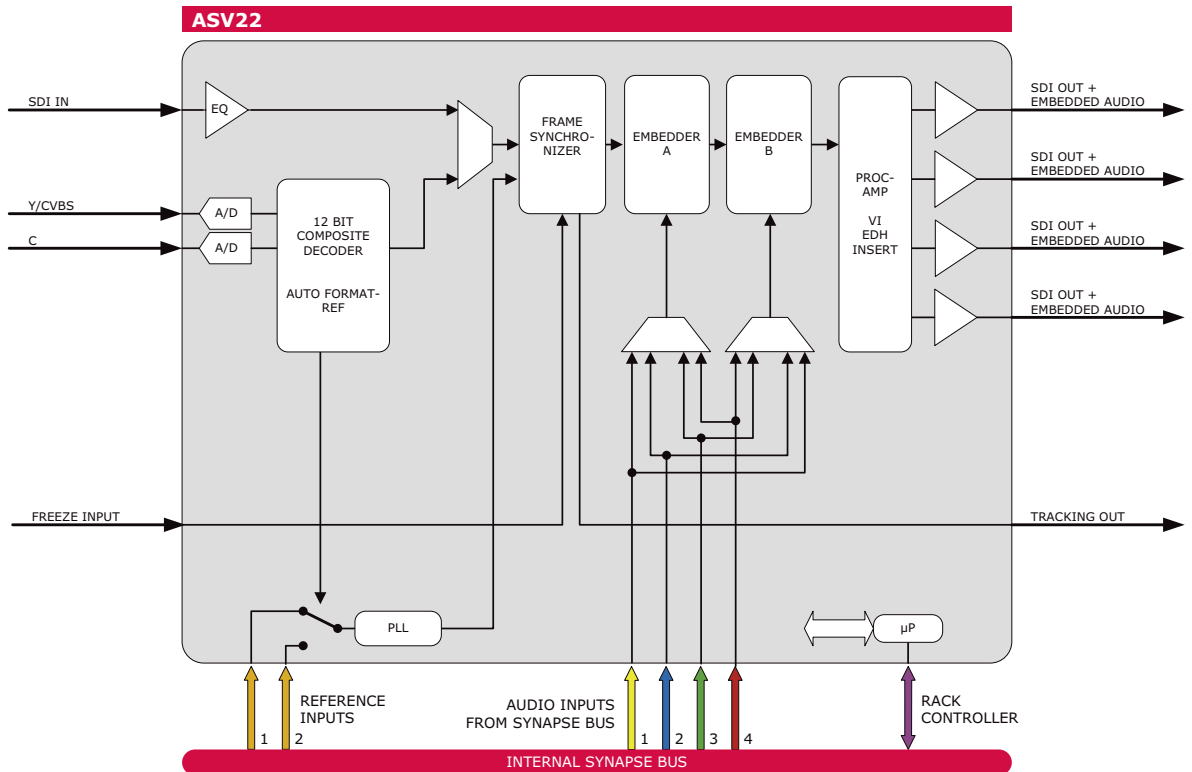
Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	2
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



ASV22 High-end CVBS decoder with 5 line comb filter and frame synchronizer and SDI bypass input

The ASV22 is a composite decoder/frame synchronizer with ADD-ON embedding functionality. On top of the features listed with the ASV12, the ASV22 has an SDI bypass input. This card can also combine horizontal and vertical intervals of the analog and digital (SDI) inputs and is the ideal partner for dynamically changing input requirements in a lines center or OB-Van application. This card combines the ASV12 and SFS11 into one platform.

- Auto detecting of PAL or NTSC with correct reference input selection (SFR18 + SFR08)
- Frame synchronizer
- SDI input for by-pass or combine functions.
- Full frame adjustable output phase with respect to reference in sample increments
- ANC data blanking
- Proc-Amp
 - Y gain
 - C gain
 - Y Black
 - Cb Black
 - Cr Black
- VI insertion
- EDH detection, insertion
- 2 Group embedder with tracking pulse output for: ADC24, ADC20, DIO24 and others
- Variable, automatic or fixed input gain
- Selectable NTSC setup removal
- GPI Freeze input
- Selectable panic freeze or manual freeze
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- OB Truck input synchronizer with SDI, YC and CVBS inputs.
- High-end CVBS legacy decoding with SDI synchronizer grow path
- Lines center

Ordering information

Module:

- **ASV22:** High-end CVBS decoder (12 bit) with 5 line comb filter and frame synchronizer and SDI bypass input

Standard I/O:

- **BPL01_ASV22:**
I/O panel for ASV22
- **BPX01_ASV22:**
I/O panel for ASV22 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_ASV22:**
I/O panel for ASV22 with fiber transmitter on FC/PC
- **BPL01T_SC_ASV22:**
I/O panel for ASV22 with fiber transmitter on SC

Fiber inputs:

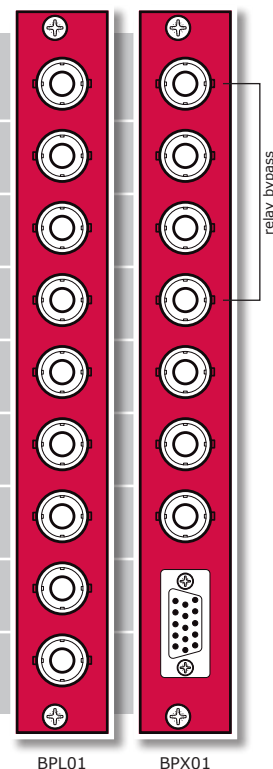
- **BPL01R_FC/PC_ASV22:**
I/O panel for ASV22 with fiber receiver on FC/PC
- **BPL01R_SC_ASV22:** I/O panel for ASV22 with fiber receiver on SC

CVBS output:

- **BPL01C_ASV22:**
I/O panel for ASV22 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI OUTPUT 1
SDI OUTPUT 2
SDI OUTPUT 3 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI OUTPUT 4
Y/CVBS INPUT
C INPUT
TRACKING OUTPUT
FREEZE INPUT

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

Video Input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	3 lines
Maximum delay	1 frame

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of Inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal Level	1V nominal
Impedance	75 Ohms
Return loss	> 25dB to 10MHz

Serial video output

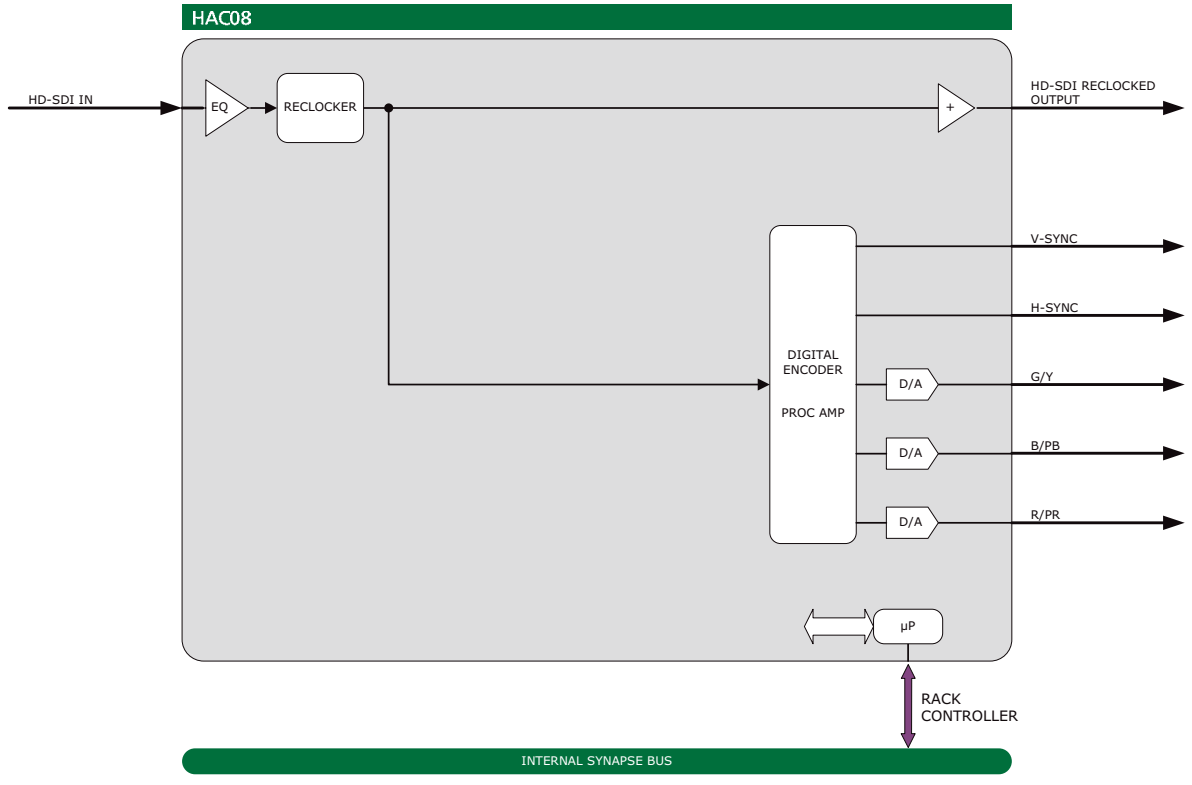
Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	2
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	6 Watts



HAC08 HD/SD monitoring D/A converter (component outputs)

The HAC08 is a monitoring HD/SD-SDI to analog component converter with a relocked HD/SD-SDI output. It can output HD/SD RGB and YPrPb signals.

- HD/SD-SDI input
- HD/SD-SDI relocked output
- 525/59.94
- 625/50
- 720p 59.94/50/30/25/24
- 1035i/60
- 1080i 59.94/50
- 1080p 30/25/24
- Tri-Level sync, V-sync and H-sync output for HD standards
- Proc. Amp
- Selectable sync on green
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) on I/O panel

HAC08

Applications

- HD/SD-SDI to analog CRT conversion
- HD-SDI to Tri-level sync conversion

Ordering information

Module:

- **HAC08:** HD/SD monitoring D/A converter (component outputs)

Standard I/O:

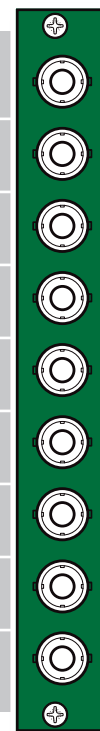
- **BPH01_HAC08:** I/O panel for HAC08

Fiber inputs:

- **BPH01R_FC/PC_HAC08:** I/O panel for HAC08 with fiber receiver on FC/PC
- **BPH01R_SC_HAC08:** I/O panel for HAC08 with fiber receiver on SC

HD/SD-SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD-SDI RECLOCKED OUTPUT 1
TRI-LEVEL SYNC OUPUT
V-SYNC OUPUT
H-SYNC OUPUT
G/Y OUPUT
B/PB OUPUT
R/PR OUPUT

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD serial video input

HD standard	SMPTE 292 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
SD standard	625/50 CCIR 601R or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD/SD serial reclocked output

HD standard	SMPTE 292 1080i/59.94, 1080i/50, 720p/59.94, 720p/50 625/50 CCIR 601R or 525/59.94 SMPTE 259M-C (270Mb/s)
SD standard	with SMPTE 272M embedded audio
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Analog video output

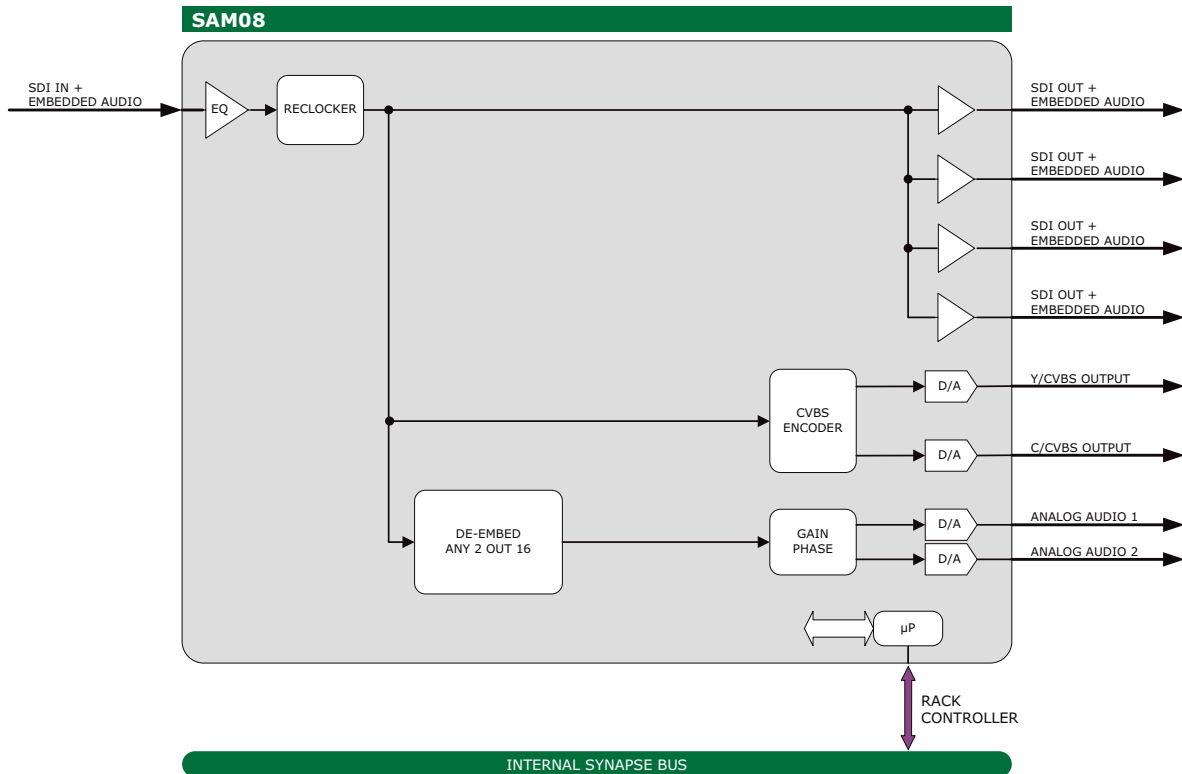
HD standard	SMPTE 274M, 296M
SD standard	SMPTE 253M
Outputs	6 BNC 3 x video 2 x Sync H, V 1 x Tri-level sync
Signal level	1V p-p (YPrPb/RGB+S)
Impedance	75 Ohms
Sync	300 mV/ 600 mV (Tri-level = 600)
DC offset Y-GBR	100 mV max

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<7 Watts



SAM08 Distribution amplifier with monitoring analog audio and video outputs

The SAM08 is a rellocking DA with 4 SDI outputs and monitoring quality composite and Analog audio outputs. Its main application is as a one to four SDI distribution amplifier with 2 analog composite and 2 Analog audio outputs. The Analog audio outputs can be configured to de-embed any 2 channels out of the 16 channels of audio that are available in the SDI domain. The analog audio is routed to the lower BNC-outputs of the connector panel and is unbalanced on default. The connector panel BPA09 provides a balanced audio signal up to +24dBu.

- 4 reclocked SDI outputs
- 2 composite or Y+C Analog video outputs
- 2 Analog audio outputs (2 out of any embedded 16 channels)
- Unbalanced audio outputs with BPL01 (+6 dBu max)
- Active low output Z balanced audio output with BPA9 (max 24dBu in 600 Ohms)
- Adjustable audio gain (in 0.25dB) and phase (0-180 deg)
- Selected audio channels can be summed (MONO)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) on I/O panel

Applications

- Cost effective audio and video monitoring

Ordering information

Module:

- **SAM08:** Distribution amplifier with monitoring analog audio and video outputs

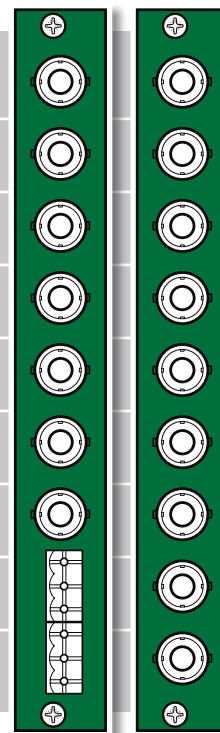
Standard I/O:

- **BPL01_SAM08:** I/O panel for SAM08
- **BPA09_SAM08:** I/O panel with balanced analog audio outputs for SAM08

Fiber inputs:

- **BPL01R_FC/PC_SAM08:** I/O panel for SAM08 with fiber receiver on FC/PC
- **BPL01R_SC_SAM08:** I/O panel for SAM08 with fiber receiver on SC

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI RECLOCKED OUTPUT 3
SDI RECLOCKED OUTPUT 4
CVBS/Y OUTPUT
CVBS/C OUTPUT
ANALOG AUDIO OUTPUT 1
ANALOG AUDIO OUTPUT 2



BPA09

BPL01

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
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Number of inputs 1

Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
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Return loss	> 15dB up to 270MHz
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SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
-----------------	---

Number of outputs 4

Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M)
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Number of outputs 2

Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz

Differential gain	< 0.6%
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Differential phase	< 0.7°
SNR	> 75dB

Analog audio output

Type	Balanced analog audio (unbalanced with BPL01)
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Number of outputs 2

Connector	Removable terminal strips (BNC with BPL01)
Impedance	50 Ohms balanced
Signal level	+24dBu max (+ 6 dBu on BNC output)

Frequency response	< ±0.1dB (20Hz to 20kHz)
Gain mismatch	< 0.5 dB @997Hz, -20dBFS Multi channel

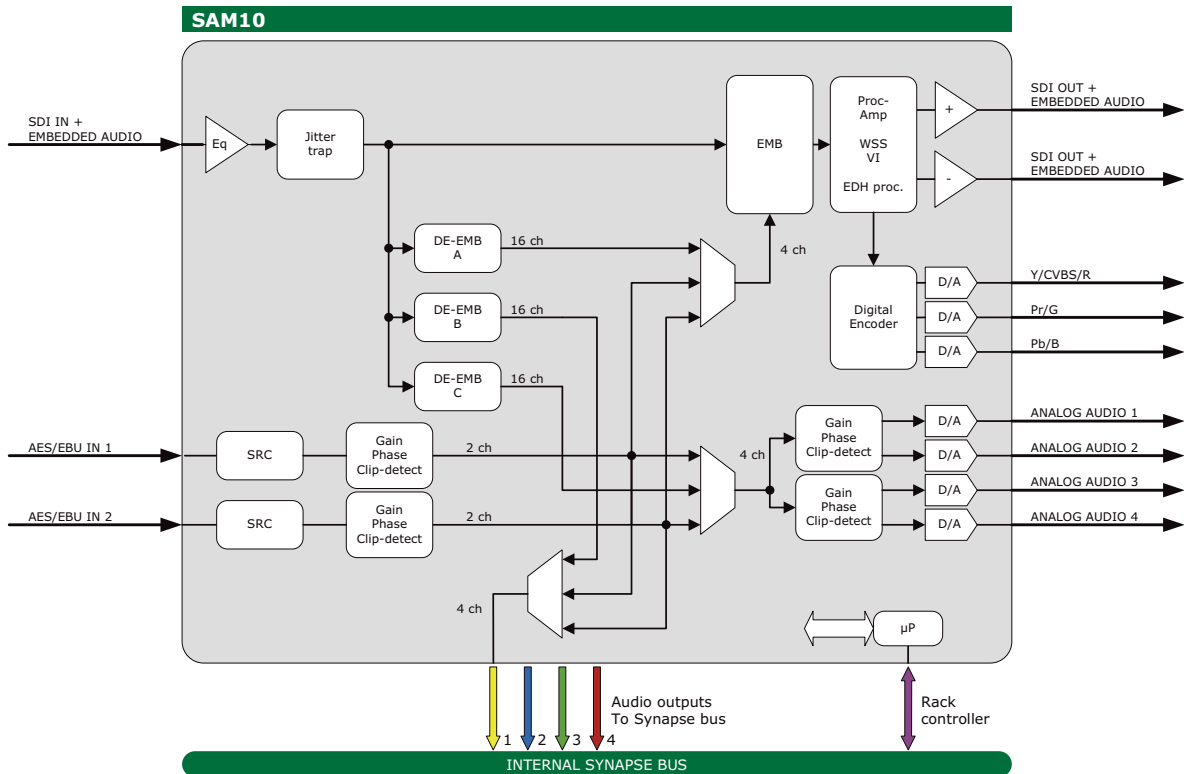
Dynamic range	>87 dB @ -60dBFS
THD+N	< 85dB @ 1kHz, -1dBFS
Crosstalk	< -85dB (20Hz to 20kHz)
DC offset	< ±30mV

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



SAM10 Digital to analog A/V bridge with SDI processed outputs

The SAM10 is another ultimate example of combined functions and features in a single module. The module bridges the digital world to the analog world. With composite or component video and analog audio outputs, the SAM10 is the ideal card to source an analog tape machine from an SDI + embedded audio or digital audio signal. It can also be found in a studio or transmission environment that is being upgraded to a central SDI + embedded audio single layer router. If an AES/EBU layer is required, the SAM10 accepts this signal too. To preserve your investment after the infrastructure is digitized; it comes with an SDI by-pass function and can be used as an SDI de-embedder. The SAM10 is the mirror function of the ASM10.

- 12-bit video D/A conversion and encoding
- 24-bit audio D/A conversion and processing
- CVBS or Component Analog video outputs
- Adjustable chroma filter
 - 1.3Mhz
 - 0.65Mhz
 - 1.0Mhz
 - 2.0Mhz
 - 3.0Mhz
 - CIF
 - QCIF

- Sub-carrier phase adjustment (-89 to 89 deg)
- Hue adjustment (-22 to 22deg)
- DAC gain (0.99 to 1.14 x)
- Selectable pedestal
- Proc-Amp
 - Y gain
 - C gain
 - Y-Black
 - C-Black
- Jitter trap for maximum isolation of SDI input
- Video Index and WSS insertion
- Embedding function into SDI output
- De-embedding function from SDI input to local analog outputs, bus outputs and local embedder
- Analog audio output @0dBFS can be selected between +12, +15, +18 and +14dBu
- Analog audio output can be any channel of the de-embedder or AES/EBU source
- ADD-ON audio output can be any channel of the de-embedder or AES/EBU source
- Individual AES/EBU input gain and Analog audio output gain.
- SDI by-pass mode
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Connecting analog legacy equipment to an SDI-Embedded infrastructure
- Converting a analog VTR to the digital world (together with an ASM10)

Ordering information

Module:

- **SAM10:** Digital to analog A/V bridge with SDI processed outputs

Standard I/O:

- **BPL12_SAM10:** I/O panel for SAM10

Fiber outputs:

- **BPL12T_FC/PC_SAM10:** I/O panel for SAM10 with fiber transmitter on FC/PC
- **BPL12T_SC_SAM10:** I/O panel for SAM10 with fiber transmitter on SC

Fiber inputs:

- **BPL12R_FC/PC_SAM10:** I/O panel for SAM10 with fiber receiver on FC/PC
- **BPL12R_SC_SAM10:** I/O panel for SAM10 with fiber receiver on SC

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

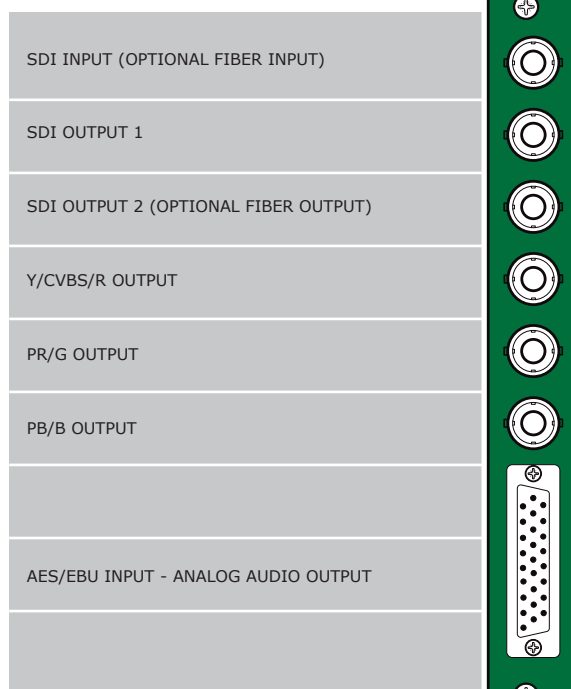
SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
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Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz
AES input	
Inputs	2
Connector	26 pins female sub-D (balanced)
Standard	AES-1992 for balanced synchronous or asynchronous PCM/AES
Input level	2V to 7V for balanced operation
Coupling	Transformer
Impedance	110 Ohms
Sampling frequency	32kHz to 96kHz or 48kHz locked to video SRC=off

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M)
Number of outputs	3
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB



BPL12

Analog audio output

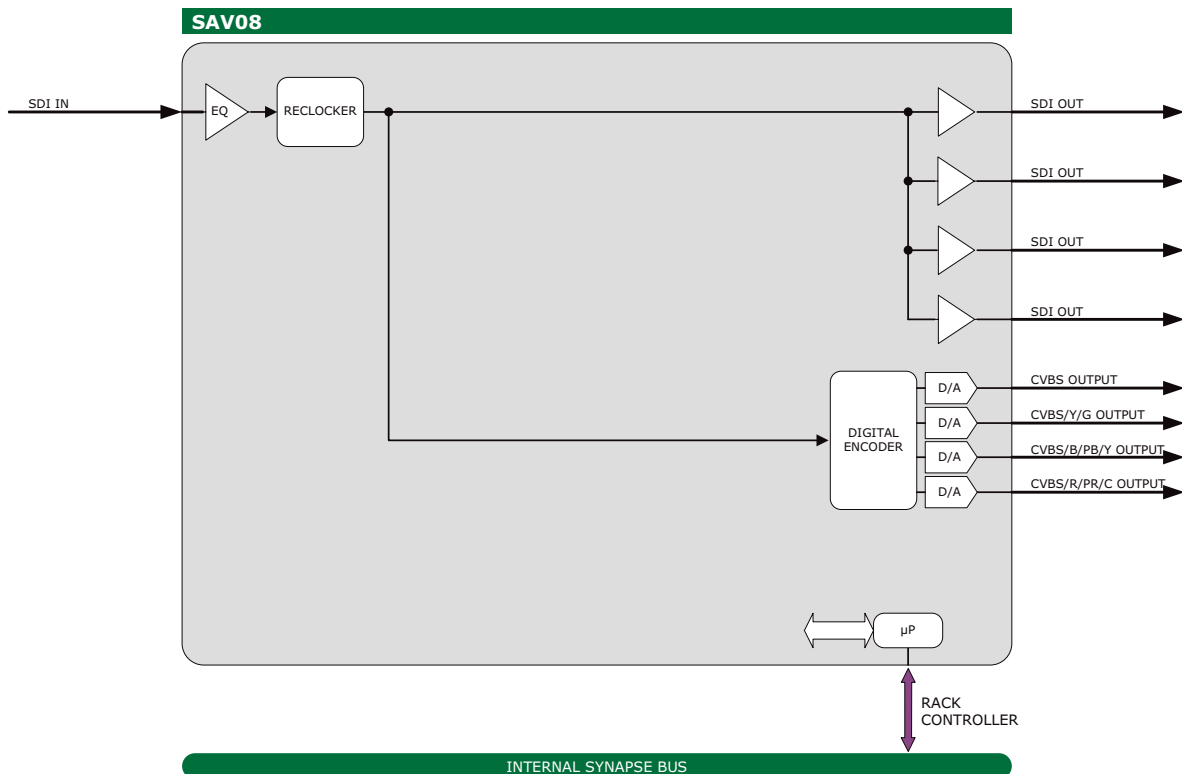
Type	Balanced analog audio
Number of outputs	4 per channel (8 in single channel mode)
Connector	26 pins female sub-D
Impedance	50 Ohms balanced
Signal level	0dBFS => 12dBu, 15dBu, 18dBu or 24dBu
Frequency response	< ±0.05dB (20Hz to 20kHz)
Gain mismatch	< 0.25 dB @997Hz, -20dBFS Multi channel
THD+N	< 92dB @ 1kHz, -1dBFS
Crosstalk	< -100dB (20Hz to 20kHz)
Dynamic range	> 97dB @-60dBFS

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<13 Watts



SAV08 Distribution amplifier with Analog video outputs

The SAV08 is an SDI to composite, component and Y/C converter with a built-in SDI distribution amplifier. Its main application is a one to four SDI distribution amplifier with 4 analog outputs. It can also be used as a large router preview card or a generic monitoring D/A.

- 4 reclocked SDI outputs
- 4 configurable Analog video outputs
 - 4 composite outputs
 - 1 composite and YC output
 - 1 composite and RGB output
 - 1 composite and YPrPb output
- Selectable vertical interval blanking
- 3 Y-Filters
 - Normal
 - Low pass
 - Notch
- 4 C-Filters
 - 1.3 MHz
 - 0.65 MHz
 - 1.0 MHz
 - 2.0 MHz
- Selectable NTSC setup removal
- Y level adjustable for SMPTE, BetaCam
- Adjustable PrPb levels (700/1000mV)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) on I/O panel

Applications

- Pre-routing DA with monitoring output
- Generic SDI Distribution with preview output

Ordering information

Module:

- **SAV08:** Distribution amplifier with analog video outputs

Standard I/O:

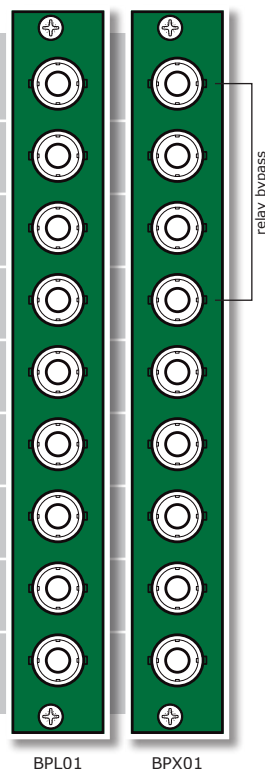
- **BPL01_SAV08:**
I/O panel for SAV08
- **BPX01_SAV08:**
I/O panel for SAV08 with relay bypass

Fiber inputs:

- **BPL01R_FC/PC_SAV08:**
I/O panel for SAV08 with fiber receiver on FC/PC
- **BPL01R_SC_SAV08:**
I/O panel for SAV08 with fiber receiver on SC

SDI INPUT (OPTIONAL FIBER INPUT)
SDI OUTPUT 1
SDI OUTPUT 2
SDI OUTPUT 3
SDI OUTPUT 4
CVBS OUTPUT 1
CVBS/Y/G OUTPUT 2
CVBS/B/PB/Y OUTPUT 3
CVBS/R/PR/C OUTPUT 4

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Analog video output

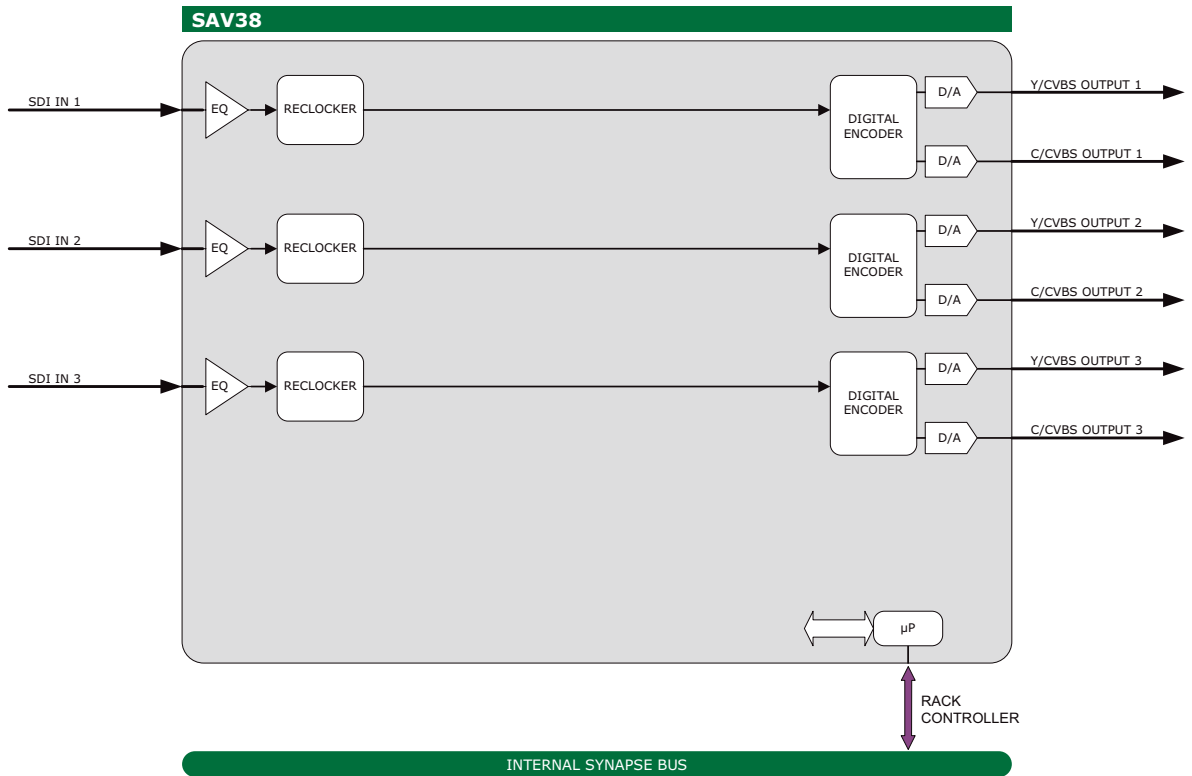
Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component, YC and RGB
Number of outputs	4
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts



SAV38 Triple monitoring D/A converter (composite or Y/C outputs)

The SAV38 is a triple channel monitoring D/A converter. The three individual channels can be used for dual composite or Y/C output signals. By introducing this triplet, AXON is able to provide an extreme high density monitoring system with up to 12 channels in one rack unit (SFR04), 24 channels in a SFR08 and 54 channels in four rack units (SFR18).

- 3 individual SDI inputs
- Selectable individual standards
 - NTSC
 - NTSC-J
 - PAL-BDGH1
- 3 dual composite or Y/C outputs
- Selectable vertical interval blanking
- Selectable NTSC set-up removal
- Internal colorbar (only when SDI is connected)
- Input status monitoring
- EDH status monitoring
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 3 fiber inputs (replacing 3 SDI inputs) on I/O panel

SAV38

Applications

- High density monitor wall applications

Ordering information

Module:

- **SAV38:** Triple monitoring D/A converter (composite or Y/C outputs)

Standard I/O:

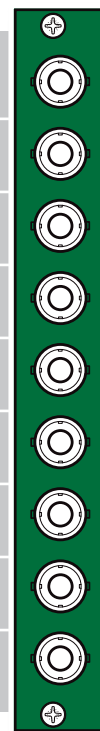
- **BPL01_SAV38:**
I/O panel for SAV38

Fiber inputs:

- **BPL01R3_FC/PC_SAV38:**
I/O panel for SAV38 with 3 fiber receivers on FC/PC
- **BPL01R3_SC_SAV38:**
I/O panel for SAV38 with 3 fiber receivers on SC

SDI INPUT 1 (OPTIONAL FIBER INPUT)
Y/CVBS OUTPUT
C/CVBS OUTPUT
SDI INPUT 2 (OPTIONAL FIBER INPUT)
Y/CVBS OUTPUT
C/CVBS OUTPUT
SDI INPUT 3 (OPTIONAL FIBER INPUT)
Y/CVBS OUTPUT
C/CVBS OUTPUT

For fiber connectivity see www.axon.tv



BPL01

Specifications

Serial video input

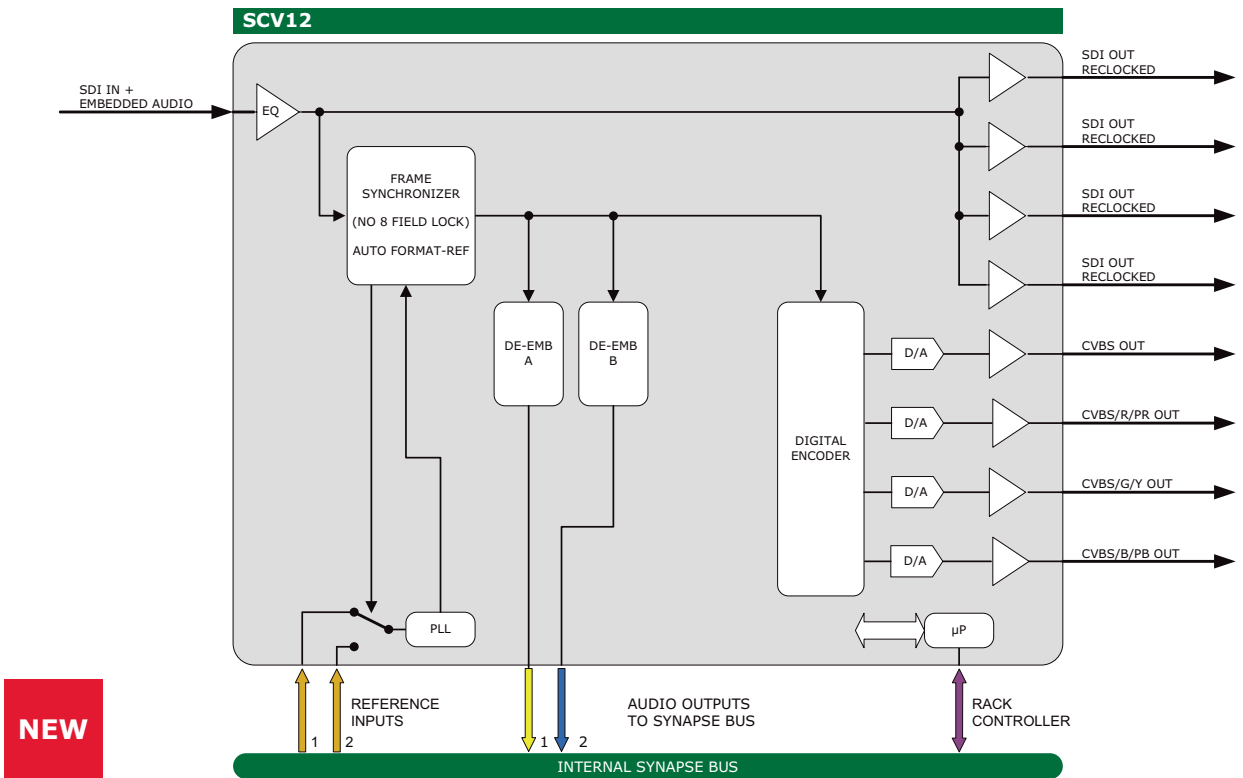
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	3
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 20dB up to 270MHz

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), YC
Number of outputs	6 (3 x 2)
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical Voltage	+24V to +30V
Power	<8 Watts



NEW

SCV12 High-end 12 bit SDI to composite/component/RGB encoder with frame synchronizer

The SCV12 is an SDI to Composite or Component or RGB converter with frame synchronizer or video delay and video proc-amp. The encoder has a very flexible timing circuit that allows for multiple output phase options. In addition, it has an 8 channel de-embedding function in combination with 1 or 2 ADD-ON cards. The synchronizer function can be used to synchronize a non-synchronous signal or to compensate a delay. The unit has four composite outputs in CVBS mode. The black & burst reference is connected through the central gen-lock input of the SFR18, SFR08 or SFR04.

- 12 bit encoding
- 4 relocked SDI and 4 composite video outputs
- Frame synchronizer
- Fully adjustable output delay up to 1 frame (with respect to the SDI input or B&B reference in 1/16 pixel increments)
- Adjustable Sub-H phase or sub carrier reference phase in between -89 and 89 degrees
- Colorbar generation adjustable for 100%, 75%
- Auto detecting of format (525/625) with correct reference input selection (SFR08 - SFR18)
- Selectable vertical interval blanking (line 6 to 23)
- Selectable NTSC setup
- Proc-amp
- EDH detection
- Selectable panic freeze or manual freeze
- 2 Group de-embedder in combination with DAC24, DAC20 or DAS24
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) on I/O panel

SCV12

Applications

- Hi-end pre-transmission encoding in analog and cable TV transmitters

Ordering information

Module:

- SCV12:** High-end 12 bit SDI to composite encoder with frame synchronizer

Standard I/O:

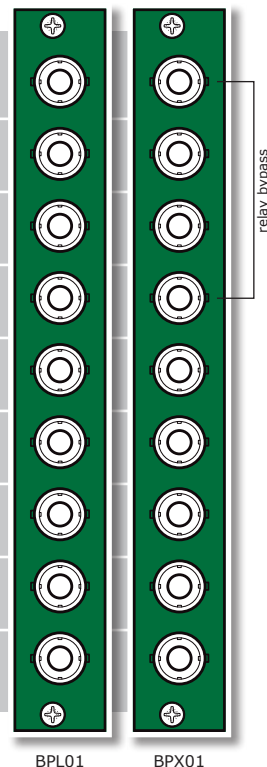
- BPL01_SCV12:** I/O panel for SCV12
- BPX01_SCV12:** I/O panel for SCV12 with relay bypass

Fiber inputs:

- BPL01R_FC/PC_SCV12:** I/O panel for SCV12 with fiber receiver on FC/PC
- BPL01R_SC_SCV12:** I/O panel for SCV12 with fiber receiver on SC

SDI INPUT (OPTIONAL FIBER INPUT)
SDI OUTPUT 1
SDI OUTPUT 2
SDI OUTPUT 3
SDI OUTPUT 4
CVBS OUTPUT 1
CVBS/G/Y OUTPUT 2
CVBS/B/PB OUTPUT 3
CVBS/R/PR OUTPUT 4

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V +/- 0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Analog video output component or RGB mode

Standard	Component and RGB + composite
Number of outputs	3+sync
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 28dB to 10MHz

Frequency

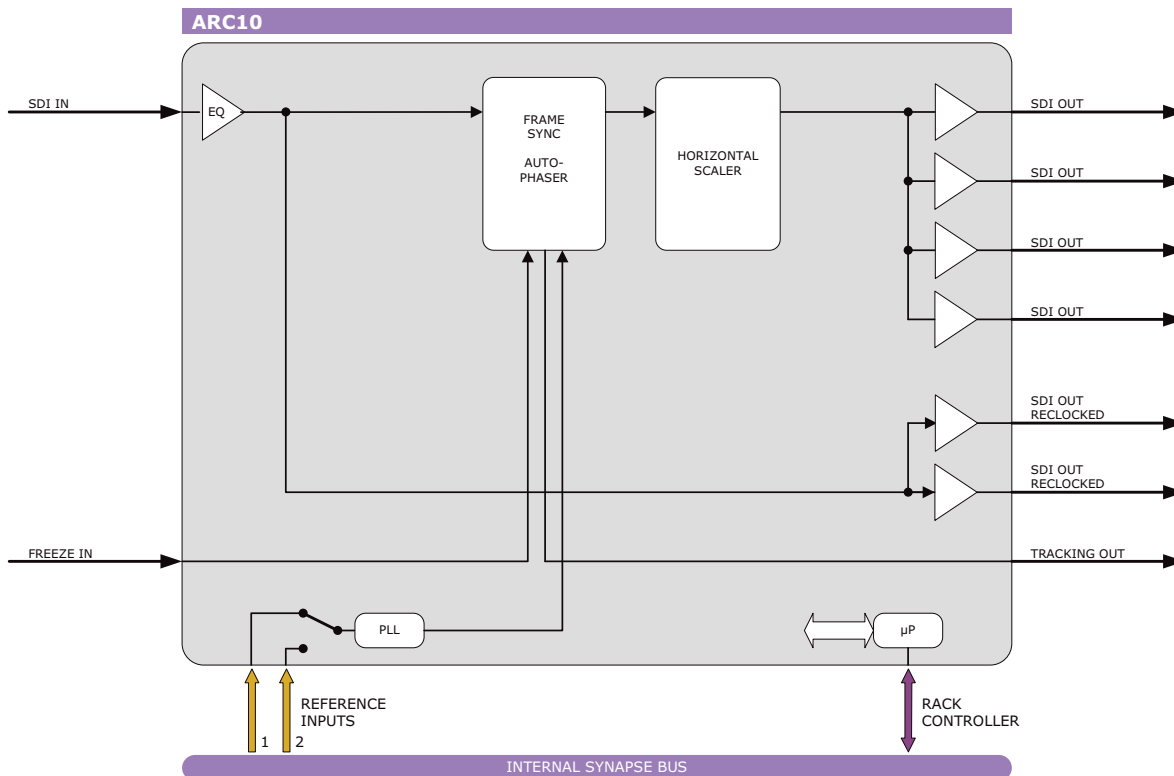
response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Analog video output CVBS mode

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M)
Number of outputs	4
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 28dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical Voltage	+24V to +30V
Power	<12 Watts



ARC10 Basic aspect ratio converter, 10-bit, horizontal scaling only

The ARC10 is a basic aspect ratio converter that provides horizontal scaling, synchronization and Video Index Insertion. The ARC10 is compatible with a wide range of 525 and 625 TV formats. The horizontal scaling functions enable a "pan-scan" or pillar box function when going from 16:9 to 4:3 and vice versa. The scaling is variable and therefore the picture geometry can be manipulated into non-standard aspect ratios. The unit also provides a horizontal picture or position panning. The ARC10 is capable of inserting Video Index data performed in accordance with the SMPTE Recommended Practice RP186. The ARC10 supports Class 1.1.

- 10-bit broadcast quality horizontal scaling with 12 tap filtering
- 'Pillar box' and 'pan-scan' modes
- Synchronizer mode
- Transparent blanking
- Panic freeze function
- Video Index inserting
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Pan and scan aspect ratio conversion
- Pillar box aspect ratio conversion

Ordering information

Module:

- **ARC10:** Basic aspect ratio converter, 10-bit, horizontal scaling only

Standard I/O:

- **BPL01_ARC10:** I/O panel for ARC10
- **BPX01_ARC10:** I/O panel for ARC10 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_ARC10:** I/O panel for ARC10 with fiber transmitter on FC/PC
- **BPL01T_SC_ARC10:** I/O panel for ARC10 with fiber transmitter on SC

Fiber inputs:

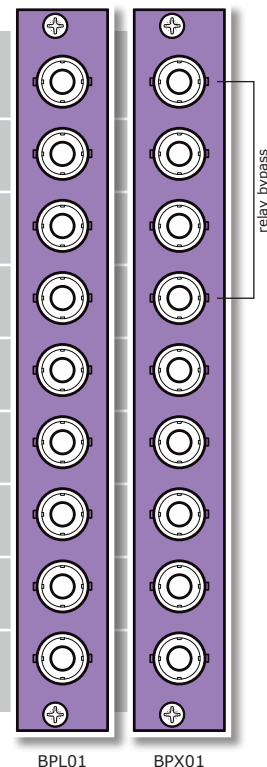
- **BPL01R_FC/PC_ARC10:** I/O panel for ARC10 with fiber receiver on FC/PC
- **BPL01R_SC_ARC10:** I/O panel for ARC10 with fiber receiver on SC

CVBS output:

- **BPL01C_ARC10:** I/O panel for ARC10 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
TRACKING OUTPUT
FREEZE INPUT

For fiber connectivity see www.axon.tv



BPL01

BPX01

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

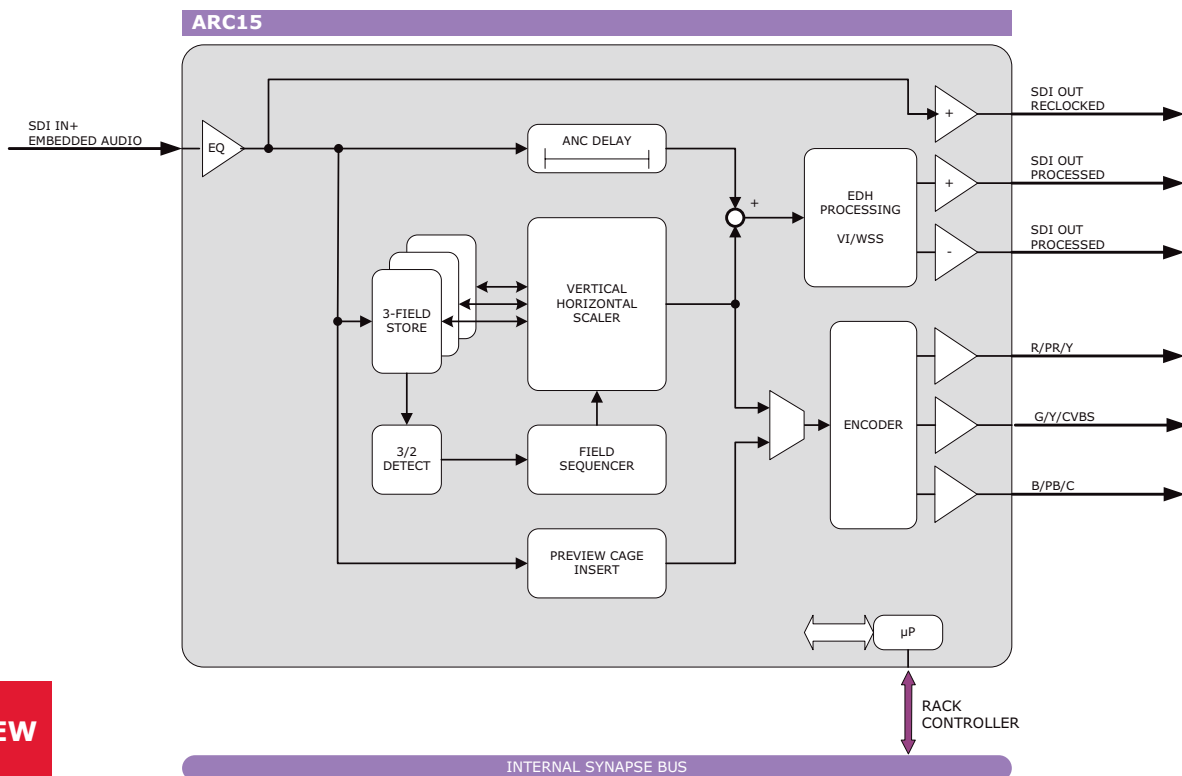
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	7 Watts



NEW

INTERNAL SYNAPSE BUS

ARC15 High-end bi-directional manual controlled aspect ratio converter with digital and analog outputs

The ARC15 is a manual controlled high quality Aspect Ratio Converter. It features optimized conversion between different aspect ratios such as 4:3, 13:9,14:9, 15:9, 16:9 and 21:9 with full 10-bit resolution (20-bit internal). High quality vertical filtering is reached by using a temporal (3 field), 12-taps FIR filter. The aspect ratios can be switched manual by Cortex or the SCP08. Input and outputs are SDI, 10-bit serial digital video (270 Mb). No genlock reference is needed because the total delay of the ARC15 is fixed. An analog preview monitoring output is provided with several comprehensive functions, including a scaling cage. For transmission applications where WSS or VI control is needed the ARC15 is the solution.

- Functional equivalent to the "industry standard" AXON ARC-1000
- Any format between 4:3 and 21:9 in both directions
- Fixed scaling 4:3, 13:9, 14:9, 15:9, 16:9 and 21:9
- Transparent ANC handling
- Analog preview output configurable for CVBS + YC, RGB or YPrPb
- Preview marker on analog output when input is selected
- Preview output selectable on input or processed output
- Propagation delay 1 frame +0/-7 lines
- Video and film filtering with 3/2 pull down detection
- H and V blanking (black wipe)
- H and V ANC blanking
- CC handling for Line 21/22
- Pan and tilt adjustment
- Full control and status monitoring through the front panel of the SFR04/18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Post production aspect ratio conversion
- Studio floor monitor aspect ratio conversion

Ordering information

Module:

- **ARC15:** High-end bi-directional manual controlled aspect ratio converter with digital and analog video outputs

Standard I/O:

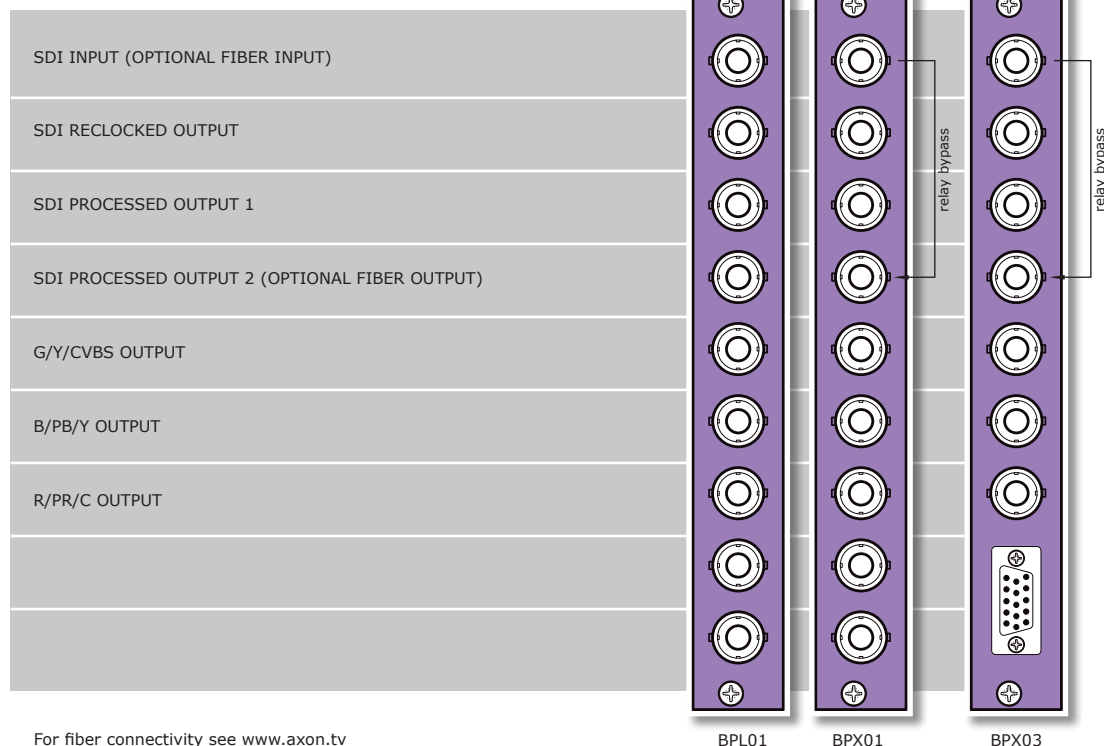
- **BPL01_ARC15:** I/O panel for ARC15
- **BPX01_ARC15:** I/O panel for ARC15 with relay bypass
- **BPX03_ARC15:** I/O panel for ARC15 with relay bypass with an unused female sub-D

Fiber outputs:

- **BPL01T_FC/PC_ARC15:** I/O panel for ARC15 with fiber transmitter on FC/PC
- **BPL01T_SC_ARC15:** I/O panel for ARC15 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_ARC15:** I/O panel for ARC15 with fiber receiver on FC/PC
- **BPL01R_SC_ARC15:** I/O panel for ARC15 with fiber receiver on SC



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (2 processed and 1 relocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Analog video output

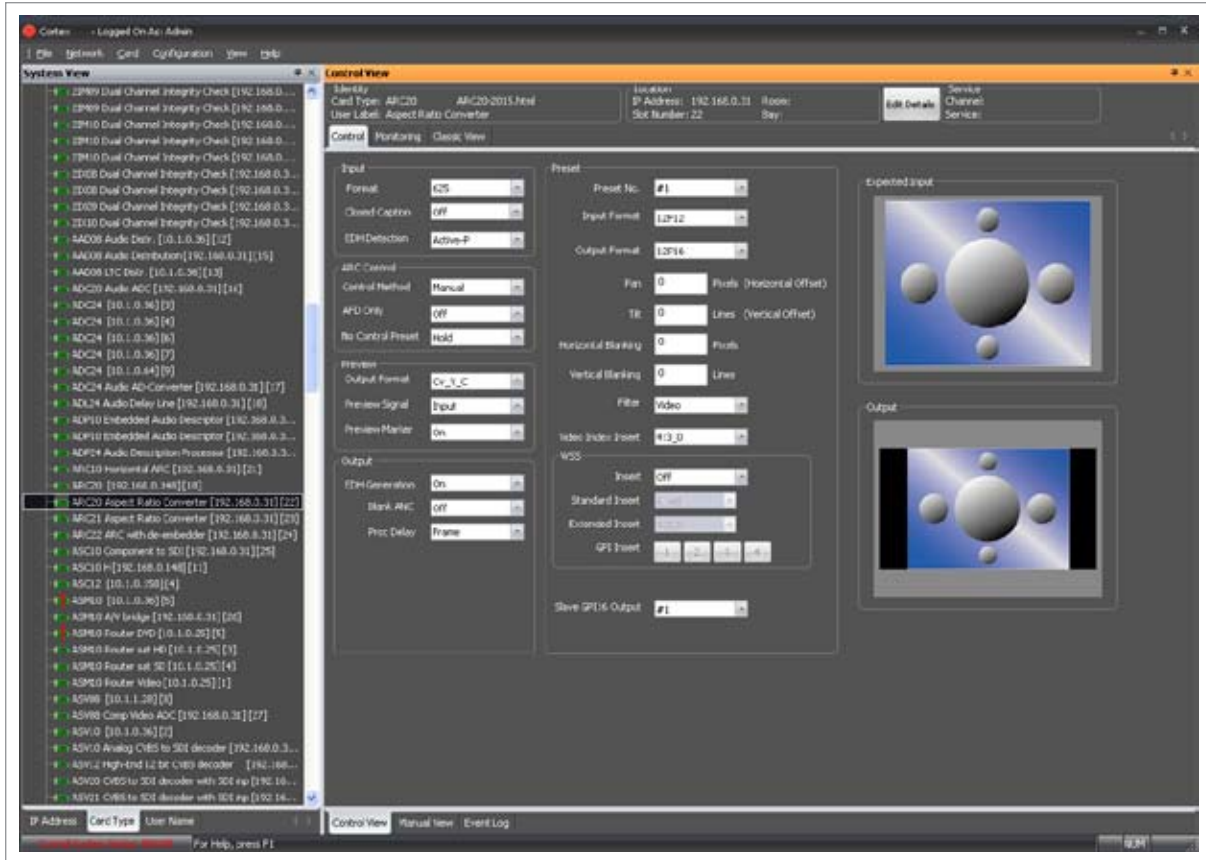
Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component and RGB
Number of outputs	3
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

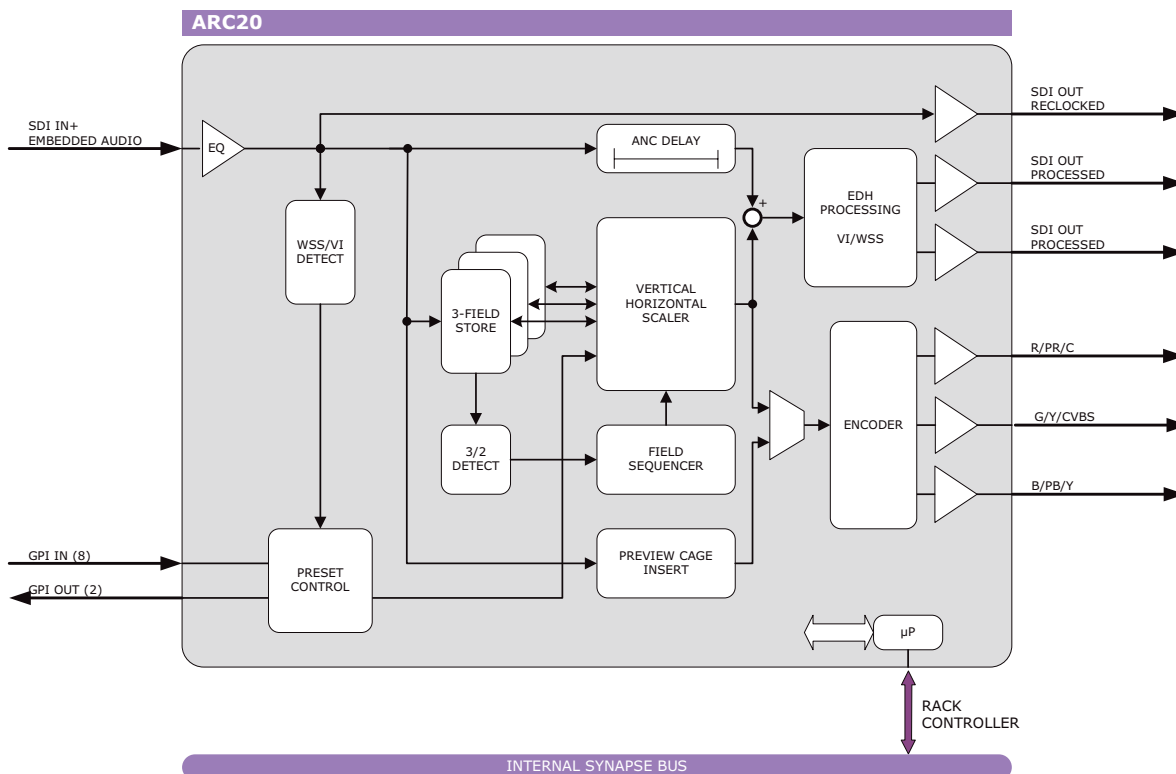
Electrical

Voltage	+24V to +30V
Power	<11 Watts



ARC20





ARC20 High-end bi-directional aspect ratio converter with digital and analog outputs

The ARC20 is a preset based broadcast quality aspect ratio converter. It features optimized conversion between different aspect ratios such as 4:3, 13:9, 14:9, 15:9, 16:9 and 21:9 with full 10-bit resolution (20-bit internal). High quality vertical filtering is reached by using a temporal (3 field), 12-taps FIR filter. The aspect ratios can be switched using WSS, VI, GPI or manual control. Input and outputs are SDI, 10-bit serial digital video (270 Mb). No genlock reference is needed because the total delay of the ARC20 is fixed. An analog preview monitoring output is provided with several comprehensive functions, including a scaling cage. This is the ultimate transmission environment aspect ratio converter, with an extensive record of key-plate usage.

- Functional equivalent to the "industry standard" AXON ARC-2000
- Any format between 4:3 and 21:9 in both directions
- Fixed scaling 4:3, 13:9, 14:9, 15:9, 16:9 and 21:9
- Transparent ANC handling
- Analog preview output configurable for CVBS + YC, RGB or YPrPb
- Preview marker on analog output when input is selected
- Preview output selectable on input or processed output
- Propagation delay 1 frame +0/-7 lines
- Video and film filtering with 3/2 pull down detection

- H and V blanking (black wipe)
- H and V ANC blanking
- CC handling for Line 21/22
- 16 user configurable presets
- Preset control:
 - Manual (Synapse setup –Front panel)
 - By Video Index
 - By WSS standard
 - By WSS extended (AFD)
 - By single GPI (max 8 presets with BPX03)
 - By 4 GPI's in binary form
 - By GPI16 as ADD-ON card
- VI, WSS and WSS_ext insertion WSS_ext GPI insertion individually for each preset
- Pan and tilt adjustment per preset
- If VI or WSS lost on input the card jumps to any preset or holds current preset
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Station output aspect ratio conversion (ideally with BPX03 passive back-up connector panel)
- Ingest aspect ratio conversion
- Post production aspect ratio conversion
- Studio floor monitor aspect ratio conversion

Ordering information

Module:

- **ARC20:** High-end bi-directional aspect ratio converter with digital and analog output

Standard I/O:

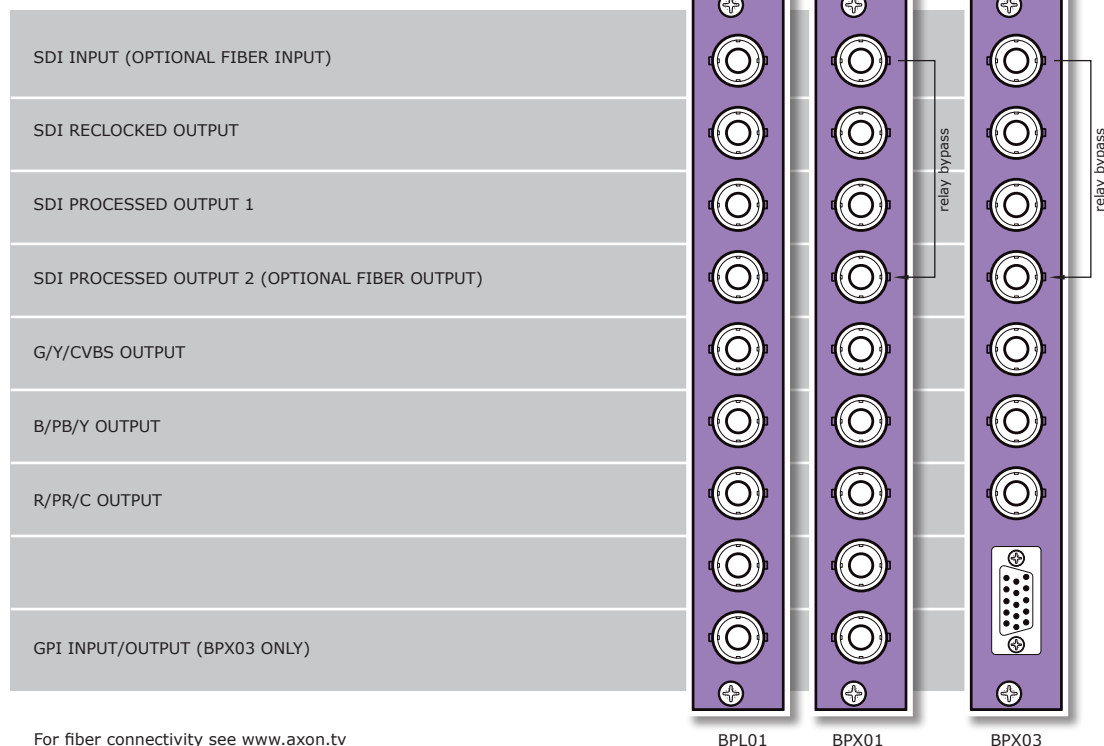
- **BPL01_ARC20:**
I/O panel for ARC20
- **BPX01_ARC20:**
I/O panel for ARC20 with relay bypass
- **BPX03_ARC20:**
I/O panel for ARC20 with relay bypass with GPI I/O on female sub-D

Fiber outputs:

- **BPL01T_FC/PC_ARC20:**
I/O panel for ARC20 with fiber transmitter on FC/PC
- **BPL01T_SC_ARC20:**
I/O panel for ARC20 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_ARC20:**
I/O panel for ARC20 with fiber receiver on FC/PC
- **BPL01R_SC_ARC20:**
I/O panel for ARC20 with fiber receiver on SC



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
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Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
-----------------	---

Number of outputs	3 (2 processed and 1 reclocked)
Signal level	800mV nominal
DC offset	0V \pm 0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPP

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component and RGB
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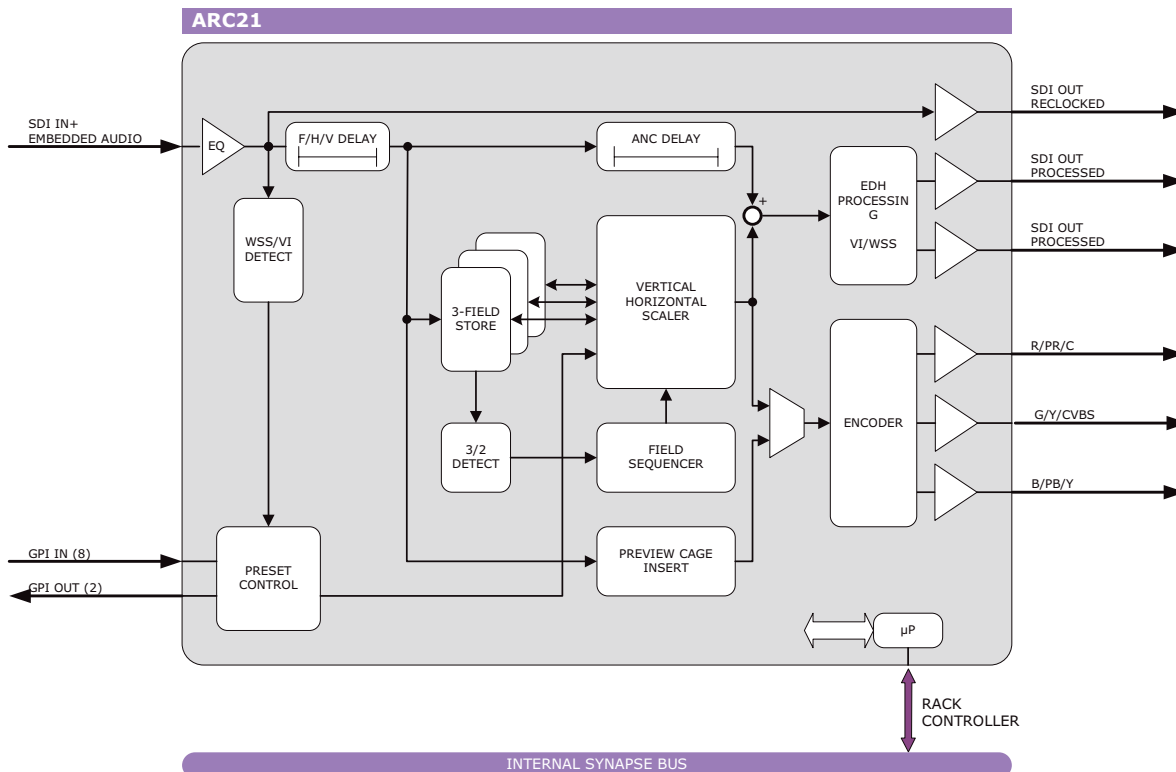
Number of outputs	3
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<11 Watts



ARC21 Full feature bi-directional aspect ratio converter, digital and analog outputs, with serial video offset delay

The ARC21 is a preset based broadcast quality aspect ratio converter. It features optimized conversion between different aspect ratios such as 4:3, 13:9, 14:9, 15:9, 16:9 and 21:9 with full 10-bit resolution (20-bit internal). High quality vertical filtering is reached by using a temporal (3 fields), 12-taps FIR filter. The aspect ratios can be switched using WSS, VI, GPI or manual control. Input and outputs are SDI, 10-bit serial digital video (270 Mb). No genlock reference is needed because the total delay of the ARC21 is fixed. An analog preview monitoring output is provided with several comprehensive functions, including a scaling cage. This is the ultimate transmission environment aspect ratio converter, with an extensive record of key-plate usage. The difference to the ARC20 is that the ARC21 has a video offset propagation delay adjustment of up to 16 frames in pixel and line increments.

- Additional offset delay to compensate external audio (i.e. Dolby digital)
- Any format between 4:3 and 21:9 in both directions
- Fixed scaling 4:3, 13:9, 14:9, 15:9, 16:9 and 21:9
- Transparent ANC handling
- Analog preview output configurable for CVBS + YC, RGB or YPrPb
- Preview marker on analog output when input is selected
- Preview output selectable on input or processed output
- Propagation delay 1 frame to 16 frames
- Video and film filtering with 3/2 pulldown detection
- H and V blanking (black wipe)
- H and V ANC blanking
- CC handling for Line 21/22
- 16 user configurable presets
- Preset control:
 - Manual (Synapse setup –Front panel)
 - By Video Index
 - By WSS standard
 - By WSS extended (AFD)
 - By single GPI (max 8 presets on BPX03)
 - By 4 GPI's in binary form
 - By GPI16 as ADD-ON card
- VI, WSS and WSS_ext insertion WSS_ext GPI insertion individually for each preset
- Pan and tilt adjustment per preset
- If VI or WSS lost on input the card jumps to any preset or holds current preset
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Station output aspect ratio conversion (ideally with BPX03 passive back-up connector panel)
- Ingest aspect ratio conversion
- Post production aspect ratio conversion
- Studio floor monitor aspect ratio conversion

Ordering information

Module:

- **ARC20:** High-end bi-directional aspect ratio converter with digital and analog output

Standard I/O:

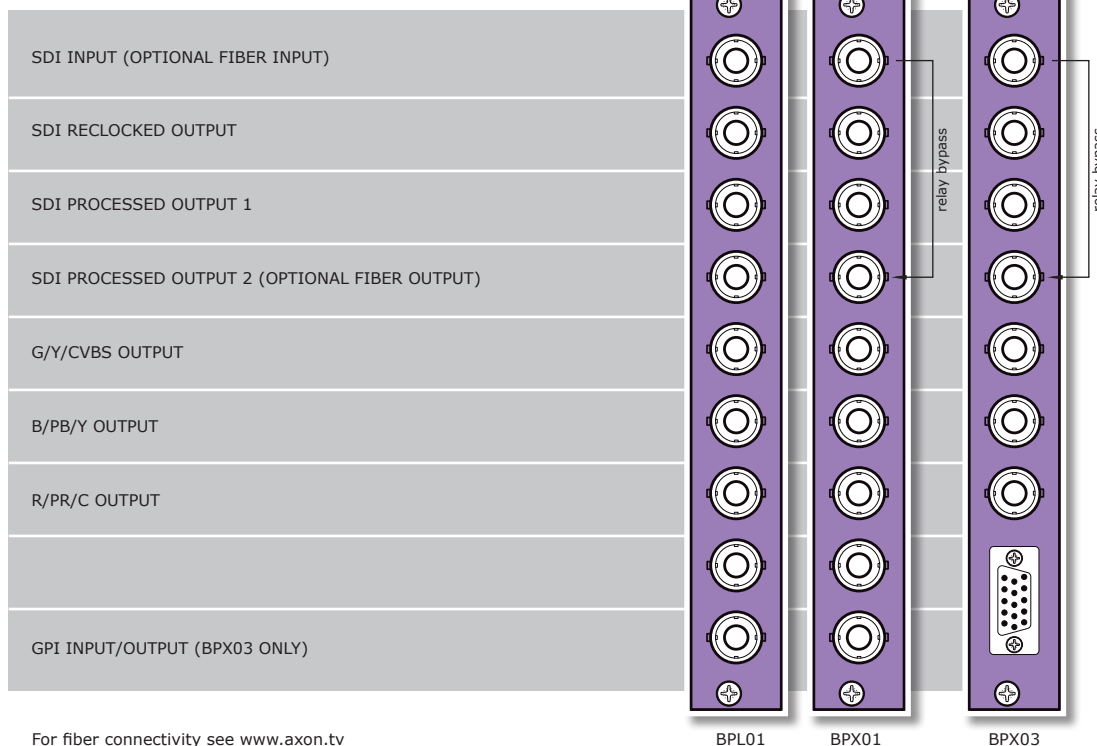
- **BPL01_ARC21:**
I/O panel for ARC21
- **BPX01_ARC21:**
I/O panel for ARC21 with relay bypass
- **BPX03_ARC21:**
I/O panel for ARC21 with relay bypass with GPI I/O on female sub-D

Fiber outputs:

- **BPL01T_FC/PC_ARC21:**
I/O panel for ARC21 with fiber transmitter on FC/PC
- **BPL01T_SC_ARC21:**
I/O panel for ARC21 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_ARC21:**
I/O panel for ARC21 with fiber receiver on FC/PC
- **BPL01R_SC_ARC21:**
I/O panel for ARC21 with fiber receiver on SC



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
-----------------	---

Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
-----------------	---

Number of outputs	3 (2 processed and 1 relocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component and RGB
-----------------	--

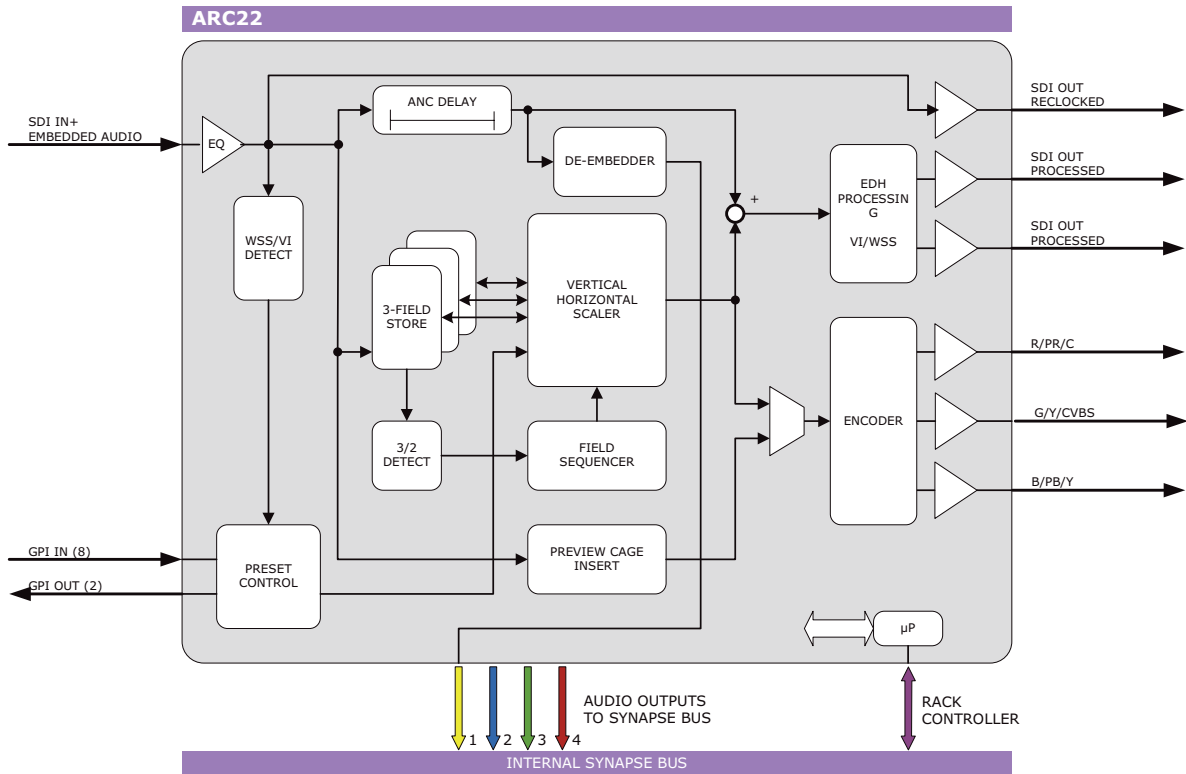
Number of outputs	3
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<11 Watts



ARC22 High-end bi-directional aspect ratio converter, digital and analog outputs, with de-embedder

The ARC22 is a preset based broadcast quality aspect ratio converter. It features optimized conversion between different aspect ratios such as 4:3, 13:9, 14:9, 15:9, 16:9 and 21:9 with full 10-bit resolution (20-bit internal). High quality vertical filtering is reached by using a temporal (3 fields), 12-taps FIR filter. The aspect ratios can be switched using WSS, VI, GPI or manual control. Input and outputs are SDI, 10-bit serial digital video (270 Mb). No genlock reference is needed because the total delay of the ARC22 is fixed. An analog preview monitoring output is provided with several comprehensive functions, including a scaling cage. This is the ultimate transmission environment aspect ratio converter, with an extensive record of key-plate usage. With respect to the ARC20, the ARC22 has a built in de-embedder that outputs on the Synapse bus.

- Master card de-embedding function. Requires a Synapse ADD-ON audio output card such as the DAC20
- Any format between 4:3 and 21:9 in both directions
- Fixed scaling 4:3, 13:9, 14:9, 15:9, 16:9 and 21:9
- Transparent ANC handling
- Analog preview output configurable for CVBS + YC, RGB or YPrPb
- Preview marker on analog output when input is selected
- Preview output selectable on input or processed output
- Propagation delay 1 frame +0/-7 lines
- Video and film filtering with 3/2 pulldown detection
- H and V blanking (black wipe)
- H and V ANC blanking
- CC handling for Line 21/22
- 16 user configurable presets
- Preset control:
 - Manual (Synapse setup –Front panel)
 - By Video Index
 - By WSS standard
 - By WSS extended (AFD)
 - By single GPI (max 8 presets on BPX03)
 - By 4 GPI's in binary form)
 - By GPI16 as ADD-ON card
- VI, WSS and WSS_ext insertion WSS_ext GPI insertion individually for each preset
- Pan and tilt adjustment per preset
- If VI or WSS lost on input the card jumps to any preset or holds current preset
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Station output aspect ratio conversion (ideally with BPX03 passive back-up connector panel)
- Ingest aspect ratio conversion
- Post production aspect ratio conversion
- Studio floor monitor aspect ratio conversion

Ordering information

Module:

- **ARC22:** High-end bi-directional aspect ratio converter, digital and analog outputs, with de-embedder

Standard I/O:

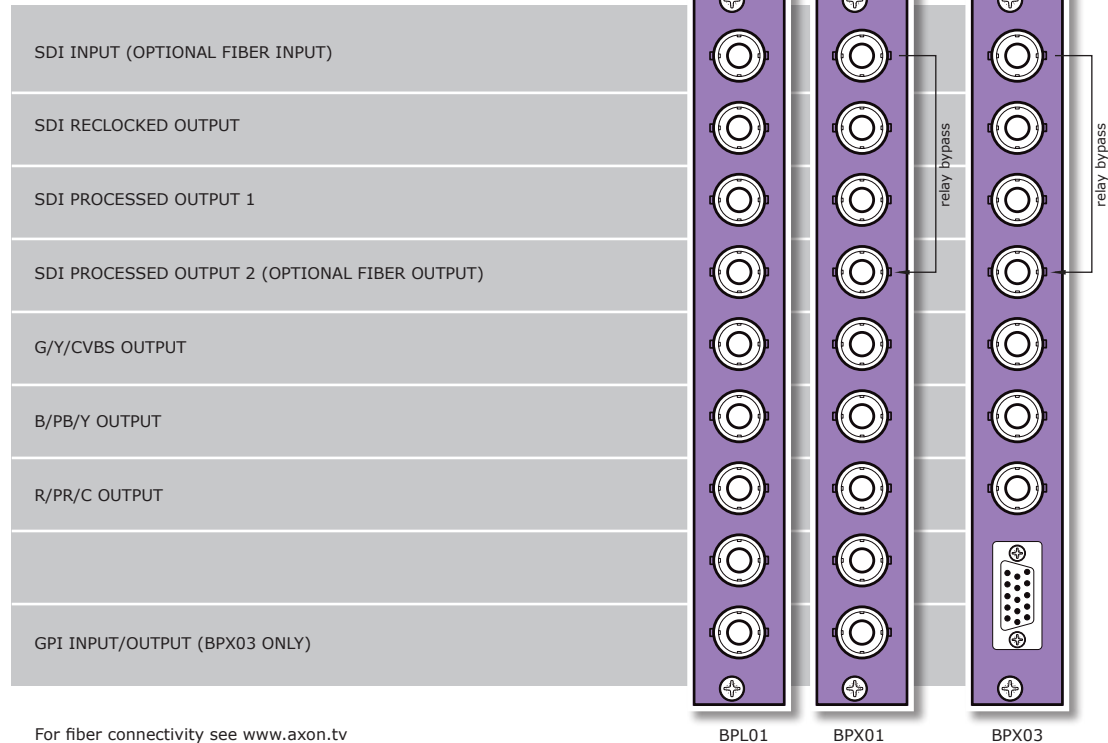
- **BPL01_ARC22:**
I/O panel for ARC22
- **BPX01_ARC22:**
I/O panel for ARC22 with relay bypass
- **BPX03_ARC22:**
I/O panel for ARC22 with relay bypass with GPI I/O on female sub-D

Fiber outputs:

- **BPL01T_FC/PC_ARC22:**
I/O panel for ARC22 with fiber transmitter on FC/PC
- **BPL01T_SC_ARC22:**
I/O panel for ARC22 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_ARC22:**
I/O panel for ARC22 with fiber receiver on FC/PC
- **BPL01R_SC_ARC22:**
I/O panel for ARC22 with fiber receiver on SC



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard 625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio

Number of inputs 1

Equalization Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03

Return loss > 20dB up to 270MHz

SD serial video output

Standard 625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio

Number of outputs 3 (2 processed and 1 relocked)

Signal level 800mV nominal

DC offset 0V ±0.5V

Rise/fall time 520ps nominal

Overshoot < 10% of amplitude

Return loss > 18dB up to 270MHz

Jitter < 600ps 10Hz HPF

Analog video output

Standard PAL (ITU624-4) or NTSC (SMPTE 170M), Component and RGB

Number of outputs 3

Connector BNC

Signal level 1V nominal

Impedance 75 Ohms

Return loss > 35dB to 10MHz

Frequency response 0.5dB to 4.5 MHz

Differential gain < 0.6%

Differential phase < 0.7°

SNR > 75dB

Miscellaneous

Weight Approx. 250g

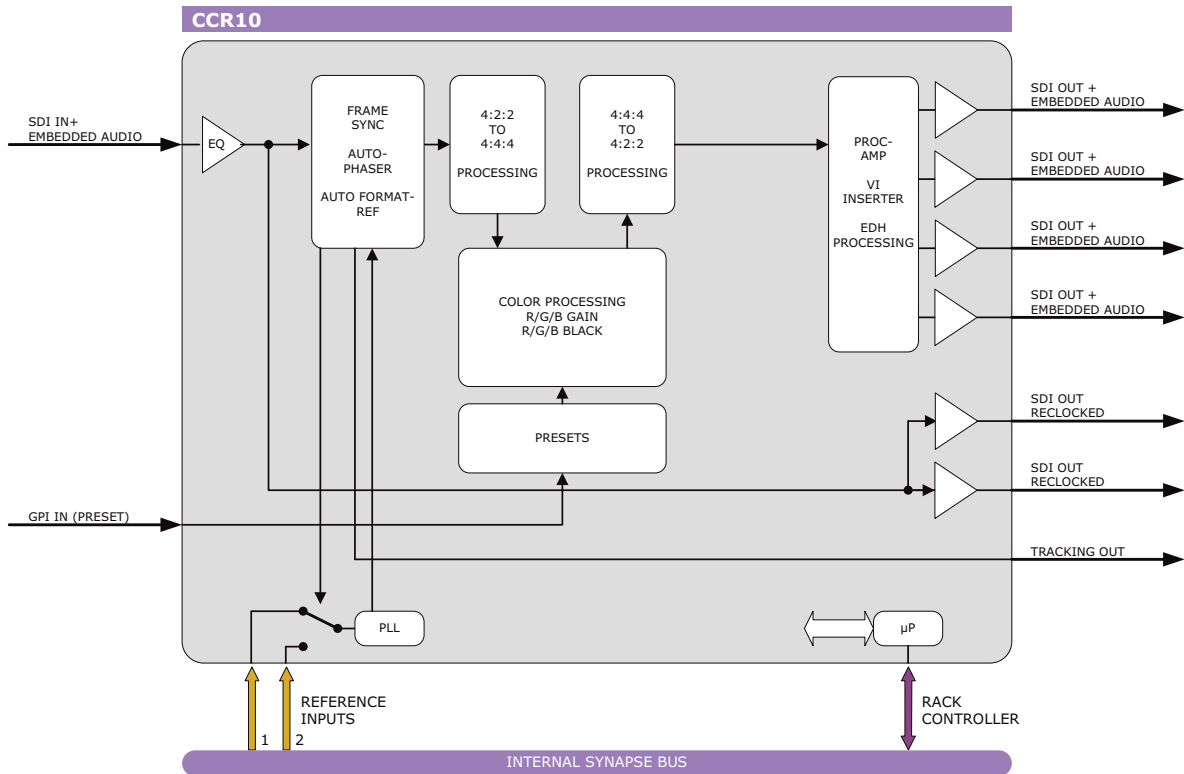
Operating temperature 0 °C to +50 °C

Dimensions 137 x 296 x 20 mm (HxWxD)

Electrical

Voltage +24V to +30V

Power <11 Watts



CCR10 SDI preset based color corrector with frame synchronizer

The CCR10 is a color corrector with a built-in frame synchronizer and black level adjustment. The internal processing of the color corrector is based on the RGB sampling format 4:4:4. The card has 4 processed outputs and 2 reclocked outputs and allows you to adjust individual or combined R,G,B gain and black levels. Eight presets can be selected directly or via an external GPI16. Only 2 presets can be selected via the local GPI input. The card is ideal for color correction on studio floor monitors or low-cost CCD cameras.

- 4 processed outputs
- 8 presets containing the following items:
 - R, G and B gain control
 - R, G and B black level control
 - RGB total gain
 - Black total gain
 - Chroma gain
- Clip status indication
- 2 user presets with local GPI
- 8 user presets with optional GPI16
- Adjustable delay up to 1 frame
- Full frame synchronizer with adjustable H and V offset
- Video Index (VI) insertion
- Ideal in combination with the SCP08 control panel
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

CCR10

Applications

- Free running CCD camera color correction (includes frame synchronizer)
- Preset based color correction for change from day light to artificial light (sport events)
- In picture display color correction (screens that are visible in a studio shot)
- Post production color correction
- Lines center and ingest color correction

Ordering information

Module:

- **CCR10:** SDI preset based color corrector with frame synchroniser

Standard I/O:

- **BPL01_CCR10:**
I/O panel for CCR10
- **BPX01_CCR10:**
I/O panel for CCR10 with relay bypass

Fiber outputs:

- **BPL0T_FC/PC_CCR10:**
I/O panel for CCR10 with fiber transmitter on FC/PC
- **BPL0T_SC_CCR10:**
I/O panel for CCR10 with fiber transmitter on SC

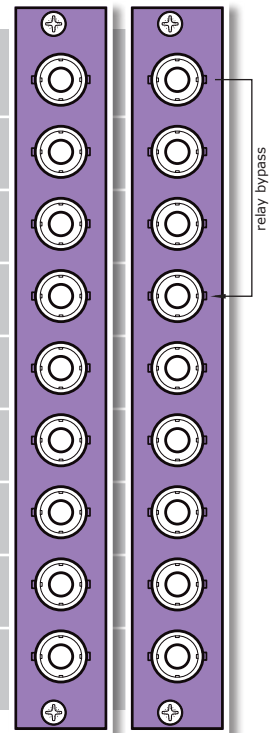
Fiber inputs:

- **BPL0R_FC/PC_CCR10:**
I/O panel for CCR10 with fiber receiver on FC/PC
- **BPL0R_SC_CCR10:**
I/O panel for CCR10 with fiber receiver on SC

CVBS output:

- **BPL01C_CCR10:**
I/O panel for CCR10 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
TRACKING OUTPUT
GPI INPUT (PRESET)



For fiber connectivity see www.axon.tv

BPL01

BPX01

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

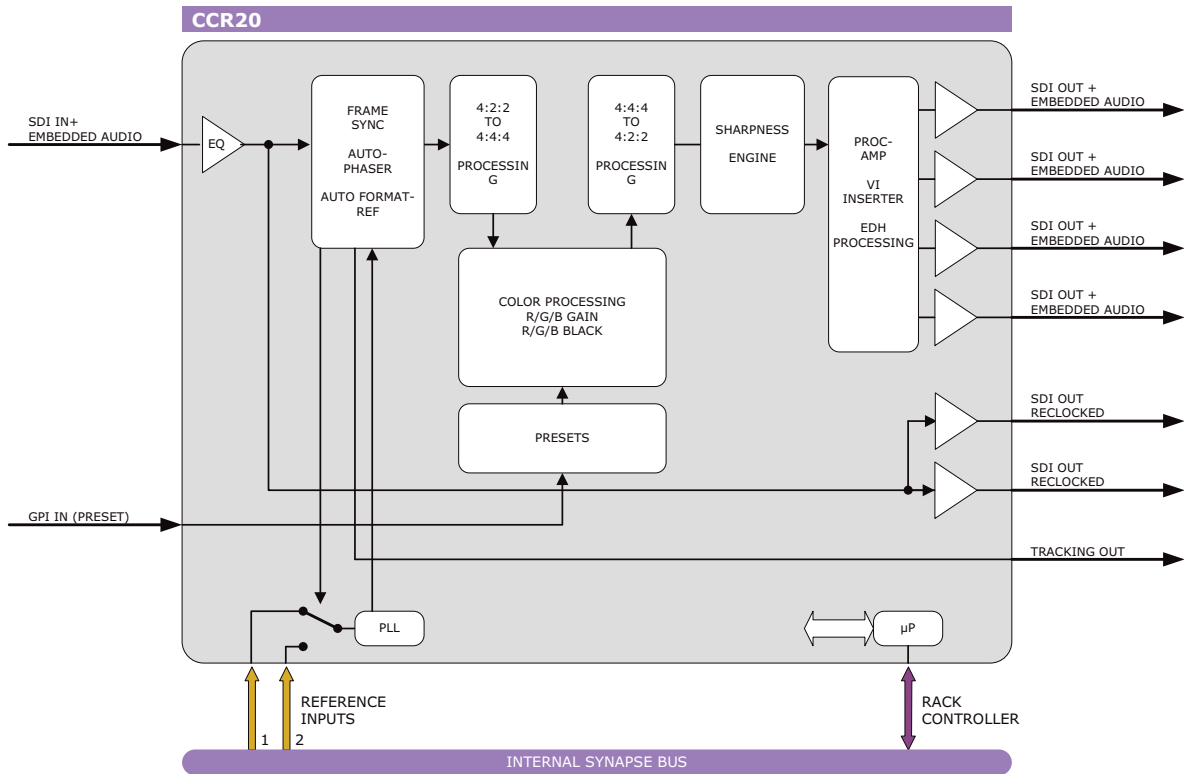
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<6 Watts



CCR20 SDI preset based color corrector with frame synchronizer and enhancement engine

The CCR20 is a color corrector enhancement engine with a built-in frame synchronizer and black level adjustment. The enhancement engine (the difference between this card and the CCR10) enables post down-conversion sharpness. The internal processing of the color corrector is based on the RGB sampling format 4:4:4. The card has 4 processed outputs and 2 relocked outputs and allows you to adjust individual or combined R,G,B gain and black levels. Eight presets can be selected directly or via an external GPI16. Only 2 presets can be selected via the local GPI input. The card is ideal for color correction on studio floor monitors or low-cost CCD cameras.

- H+V Sharpness adjustment
- 4 processed outputs
- 8 presets containing the following items:
 - R, G and B gain control
 - R, G and B black level control
 - RGB total gain
 - Black total gain
 - Chroma gain
- Clip status indication
- 2 user presets with local GPI
- 8 user presets with optional GPI16
- Adjustable delay up to 1 frame
- Full frame synchronizer with adjustable H and V offset
- Video Index (VI) insertion
- Ideal in combination with the SCP08 control panel
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

CCR20

Applications

- Free running CCD camera color correction (includes frame synchronizer)
- Preset based color correction for change from day light to artificial light (sport events)
- In picture display color correction (screens that are visible in a studio shot)
- Post production color correction
- Lines center and ingest color correction

Ordering information

Module:

- **CCR20:** SDI preset based color corrector with frame synchronizer and enhancement engine

Standard I/O:

- **BPL01_CCR20:**
I/O panel for CCR20
- **BPX01_CCR20:**
I/O panel for CCR20 with relay bypass

Fiber outputs:

- **BPL0T_FC/PC_CCR20:**
I/O panel for CCR20 with fiber transmitter on FC/PC
- **BPL0T_SC_CCR20:**
I/O panel for CCR20 with fiber transmitter on SC

Fiber inputs:

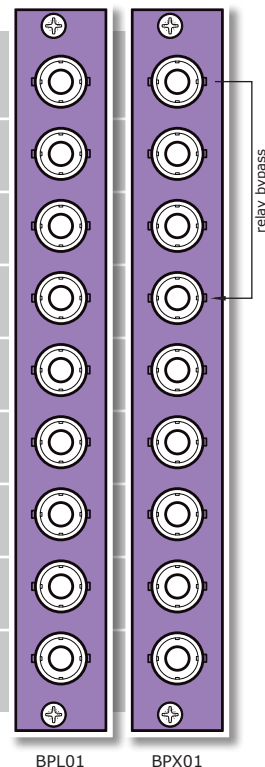
- **BPL0R_FC/PC_CCR20:**
I/O panel for CCR20 with fiber receiver on FC/PC
- **BPL0R_SC_CCR20:**
I/O panel for CCR20 with fiber receiver on SC

CVBS output:

- **BPL01C_CCR20:**
I/O panel for CCR20 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
TRACKING OUTPUT
GPI INPUT (PRESET)

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

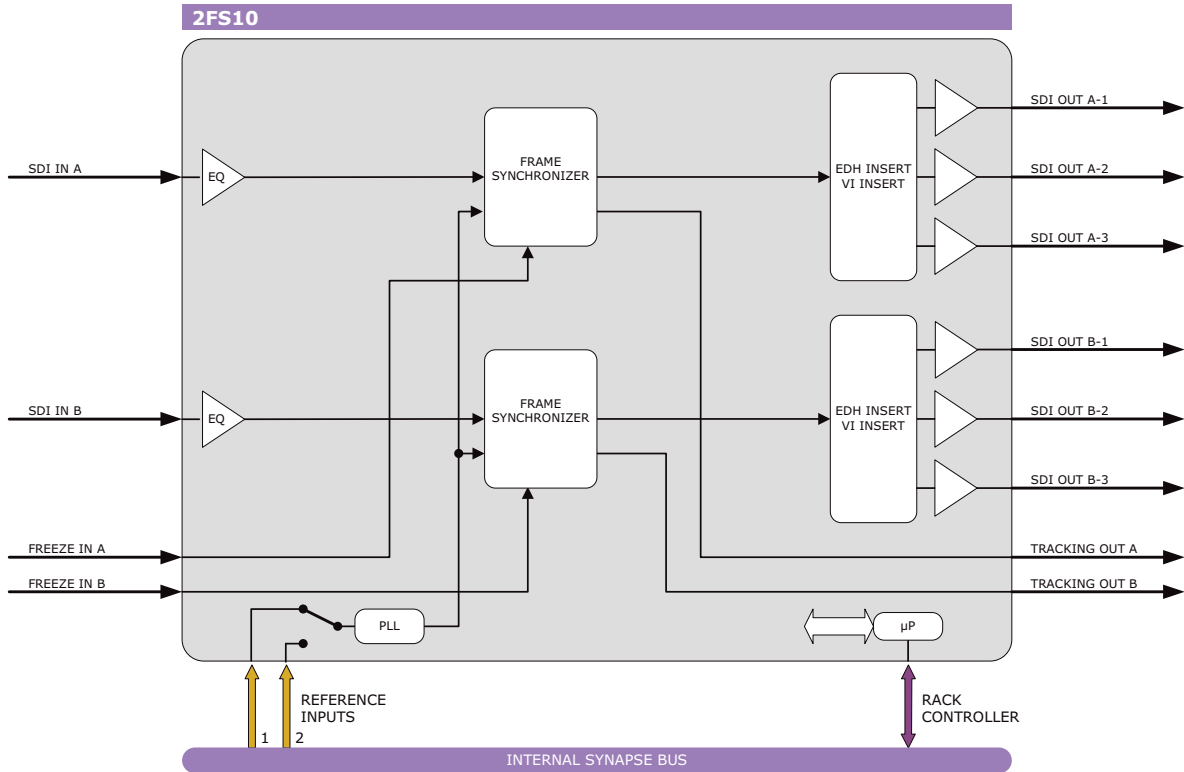
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<7 Watts



2FS10 Dual channel frame synchronizer

The 2FS10 is a broadcast quality full featured dual channel frame synchronizer/autophaser. Two fully independent free running signals can be synchronized to the same Black & Burst reference. The density of the Synapse system is doubled by the introduction of "TWINS", to an impressive 8 channels in 1 rack unit and 36 channels in 4 rack units. The 2FS10 is fully transparent for embedded audio.

- Frame synchronizer or delay mode
- Line synchronizer/autophaser
- Full frame adjustable output phase (channel independent) with respect to reference in sample increments
- V-bit autophasing (625 only)
- VI insertion
- EDH processing
- GPI Freeze input
- Tracking audio output
- Selectable manual freeze
- Black, Green or freeze video output on loss of input
- Selectable horizontal and vertical blanking
- Freeze and tracking signals on an easy to wire RJ45 connector
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

Applications

- Generic multi channel frame synchronization
- Lines centre input synchronization
- Post router autophasing – line synchronization
- Dual SDI delay line applications
- High density applications as in OB-Trucks

Ordering information

Module:

- **2FS10:** Dual channel frame synchronizer

Standard I/O:

- **BPL11_2FS10:** I/O panel for 2FS10
- **BPX04_2FS10:** I/O panel for 2FS10 with relay bypass

Fiber outputs:

- **BPL11T2_FC/PC_2FS10:** I/O panel for 2FS10 with 2 fiber transmitter on FC/PC
- **BPL11T2_SC_2FS10:** I/O panel for 2FS10 with 2 fiber transmitter on SC

Fiber inputs:

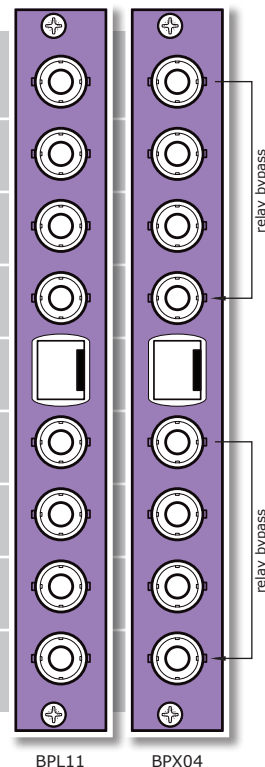
- **BPL11R2_FC/PC_2FS10:** I/O panel for 2FS10 with 2 fiber receiver on FC/PC
- **BPL11R2_SC_2FS10:** I/O panel for 2FS10 with 2 fiber receiver on SC

CVBS outputs:

- **BPL11C2_2FS10:** I/O panel for 2FS10 with 2 CVBS outputs

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1
SDI OUTPUT A-2
SDI OUTPUT A-3 (OPTIONAL FIBER OR CVBS OUTPUT)
FREEZE & TRACKING INPUT/OUTPUT
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1
SDI OUTPUT B-2
SDI OUTPUT B-3 (OPTIONAL FIBER OR CVBS OUTPUT)

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	6 (3 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

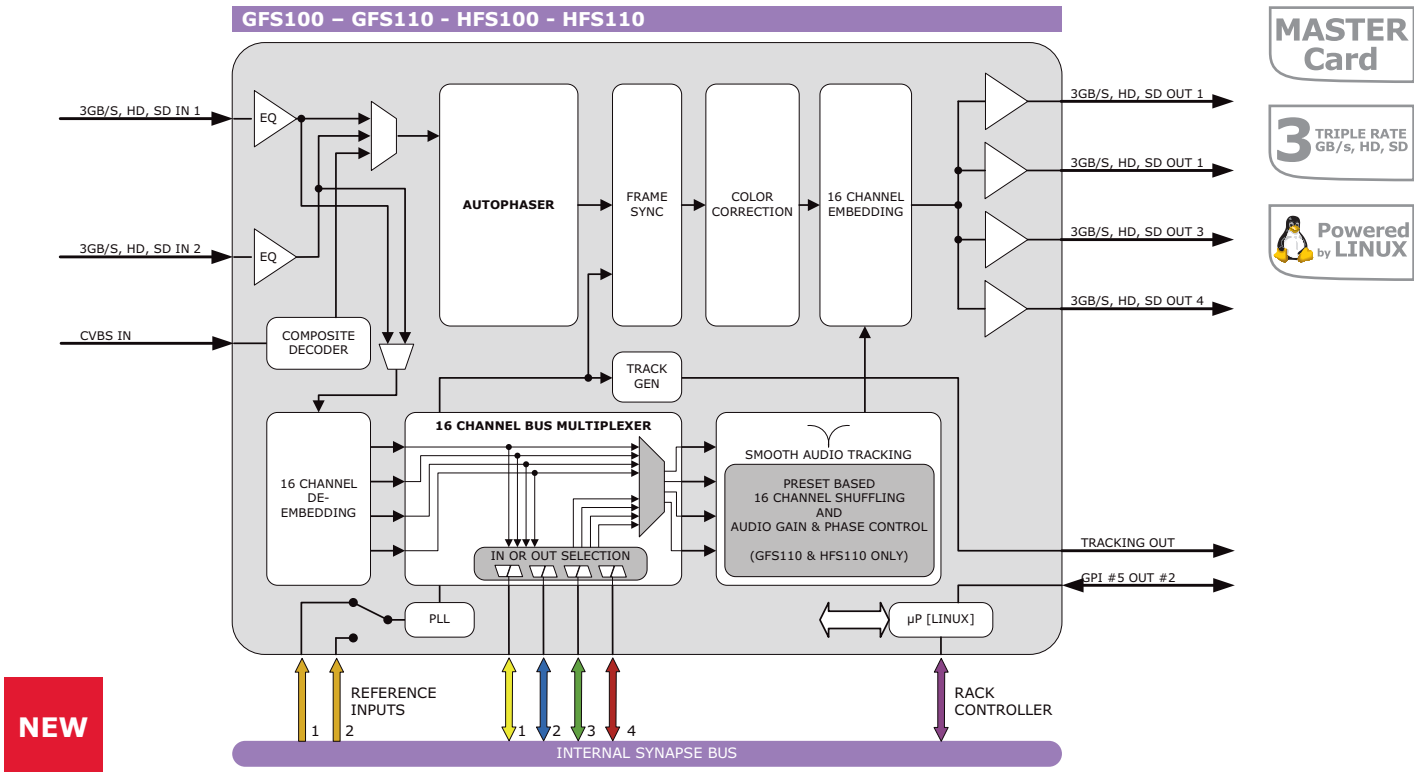
Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<9 Watts

2FS10



GFS100 - GFS110
HFS100 - HFS110

GFS100 - GFS110 - HFS100 - HFS110 3Gb/s, HD, SD frame synchronizer with optional audio shuffler

The GFS100/110 and HFS100/110 are frame synchronizers with backup inputs and 16 channel audio transparency and color correcting capabilities. The powerful matrix multiplexer can feed audio from the embedded domain into the Synapse bus to an ADD-ON card like the DIO48. This matrix multiplexer also allows for audio to be inserted from the ADD-ON bus into the embedded domain of the GFS100/110 or HFS100/110.

The GFS110 or HFS110 add a full audio shuffler and audio proc-amp with gain and phase control.

The GFS100/110 are compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use. The HFS100/110 are compatible with SD-SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility.

- Autophaser
- Frame Synchronizer
- Adjustable offset delay up to +1 second
- Video proc-amp (Y and C control)
- Hue control for NTSC inputs
- Color corrector (RGB and total gain, RGB and total black)
- Second (backup) input
- 5 GPI inputs for ARC and Shuffle triggers
- Transparent for 16 channels of embedded audio
- Embedded domain audio shuffling, gain and phase control (GFS - HSF110 only)
- Embedding through Synapse bus
- De-embedding to Synapse bus with transparent input to output handling
- Compatible with:
 - 270 Mbit/s (SMPTE 259M) 50 and 59.94Hz
 - 1485 Mbit/s (SMPTE 292M) 50 and 59.94Hz
 - 2970 Mbit/s (SMPTE 424M) 50 and 59.94Hz (GFS100/110 only)

Applications

Transmission output frame synchronizer with backup input.

Ordering information

Module:

- **GFS100:** 3Gb/s, HD, SD Frame synchronizer
- **GFS110:** 3Gb/s, HD, SD Frame synchronizer with audio shuffler proc-amp
- **HFS100:** HD, SD Frame synchronizer converter*
- **HFS110:** HD, SD Frame synchronizer with audio shuffler proc-amp*

Standard I/O:

- **BPH17_GFS100:** I/O-panel for GFS100 with RJ45 GPI/O
- **BPH17_GFS110:** I/O-panel for GFS110 with RJ45 GPI/O
- **BPH17_HFS100:** I/O-panel for HFS100 with RJ45 GPI/O
- **BPH17_HFS110:** I/O-panel for HFS110 with RJ45 GPI/O

* Upgradable to 3Gb/s

3GB/S, HD, SD INPUT 1
3GB/S, HD, SD INPUT 2
3GB/S, HD, SD OUTPUT 1
3GB/S, HD, SD OUTPUT 2
GPI INPUT/OUTPUT
3GB/S, HD, SD OUTPUT 3
3GB/S, HD, SD OUTPUT 4
CVBS INPUT

For fiber connectivity see www.axon.tv



BPH17

Specifications

Serial video input

Standard	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
Number of inputs	2
Connector	BNC
Equalization	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
Return loss	> 15dB up to 1.5GHz

Serial video output

Number of outputs	4
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	135ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.5GHz (typ.) > 10dB up to 3GHz (typ.)
Wideband jitter	< 0.2UI

Miscellaneous

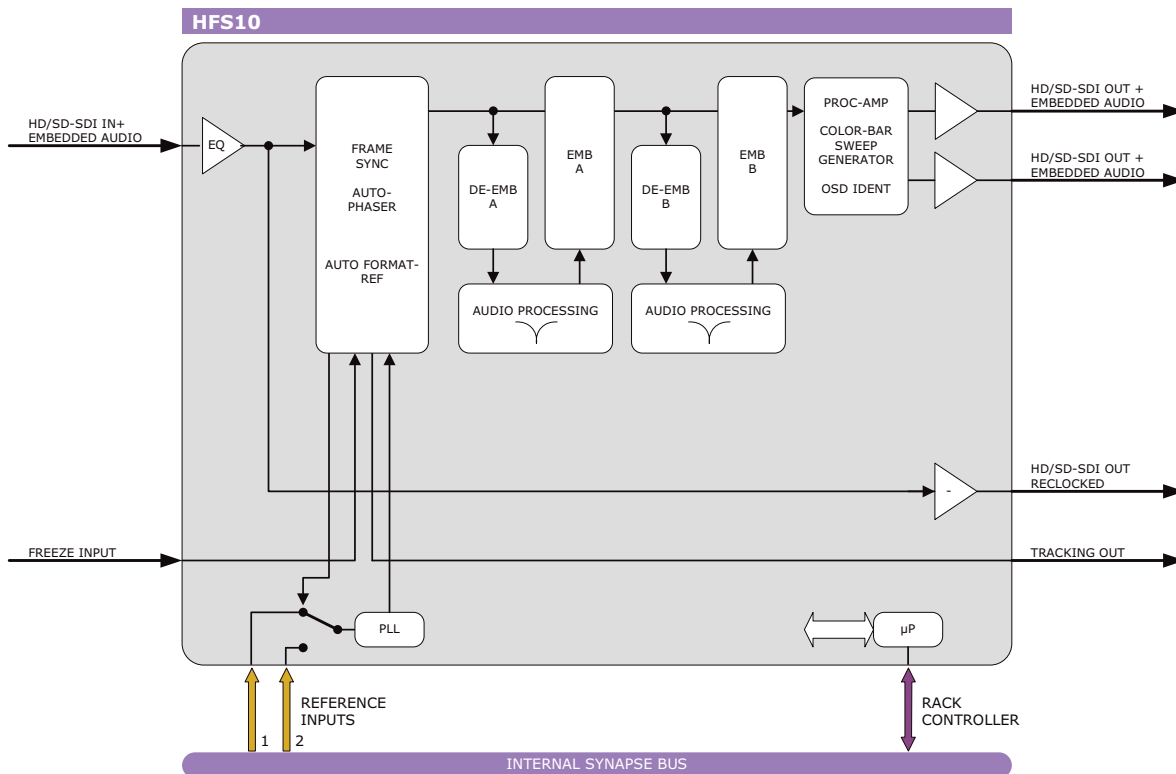
Weight	Approx. 450g
Operating temperature	0 °C to +40 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<17 Watts

GFS100 - GFS110
HFS100 - HFS110





HFS10 HD/SD frame synchronizer with smart audio handling for 2 groups

The HFS10 is an HD/SD frame synchronizer/video delay/autophaser module, video proc-amp and if in synchronizer mode, the HFS10 has smart audio handling for 2 embedded audio groups. The synchronizer function can be used to synchronize a non-synchronous signal or to compensate for a delay. The HFS10 has full transparent blanking, both horizontally and vertically. The video reference is connected through the central genlock input of the SFR18, SFR08 or SFR04 frames and is compatible with 2-level and 3-level sync. The line synchronizer function corrects timing errors (hops) that occur due to switching in a router. In addition the HFS10 can be used as a delay line, giving up to 1 frame delay. A video reference is not required in this case as the output clock frequency is derived from the input video clock.

- HD-SDI and SD-SDI compatible
- Formats:
 - 1080i/50/60
 - 1035i/60
 - 720p/50/60/
 - 1080p(sf)/24/25/30
- Built-in proc amp
- 2 groups smart audio handling (user selectable out of all 4 groups)
- Audio processing pass through, processed or mute
- 2-level, 3-level sync compatible

- Tracking output
- Freeze input
- On loss of input:
 - Freeze
 - Black
 - Green
 - Gray
- One relocked output
- Two processed outputs
- I/O delay measurement
- Switch positioning measurement (in autophase mode)
- H and V delay offset adjustment with respect to input or reference
- ANC blanking of H, V or H+V
- Test pattern (color bar/sweep)
- OSD ident label with maximum 10 characters (for set-up purposes)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Free running external video synchronization
- Post router line synchronization or autophasing
- Video timing adjustment for virtual studios
- Jitter killer

Ordering information

Module:

- **HFS10:** HD/SD frame synchronizer with smart audio handling for 2 groups

Standard I/O:

- **BPH01_HFS10:**
I/O panel for HFS10

Fiber outputs:

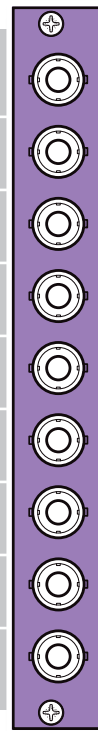
- **BPH01T_FC/PC_HFS10:**
I/O panel for HFS10 with fiber transmitter on FC/PC
- **BPH01T_SC_HFS10:**
I/O panel for HFS10 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HFS10:**
I/O panel for HFS10 with fiber receiver on FC/PC
- **BPH01R_SC_HFS10:**
I/O panel for HFS10 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
FREEZE INPUT
TRACKING OUTPUT

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

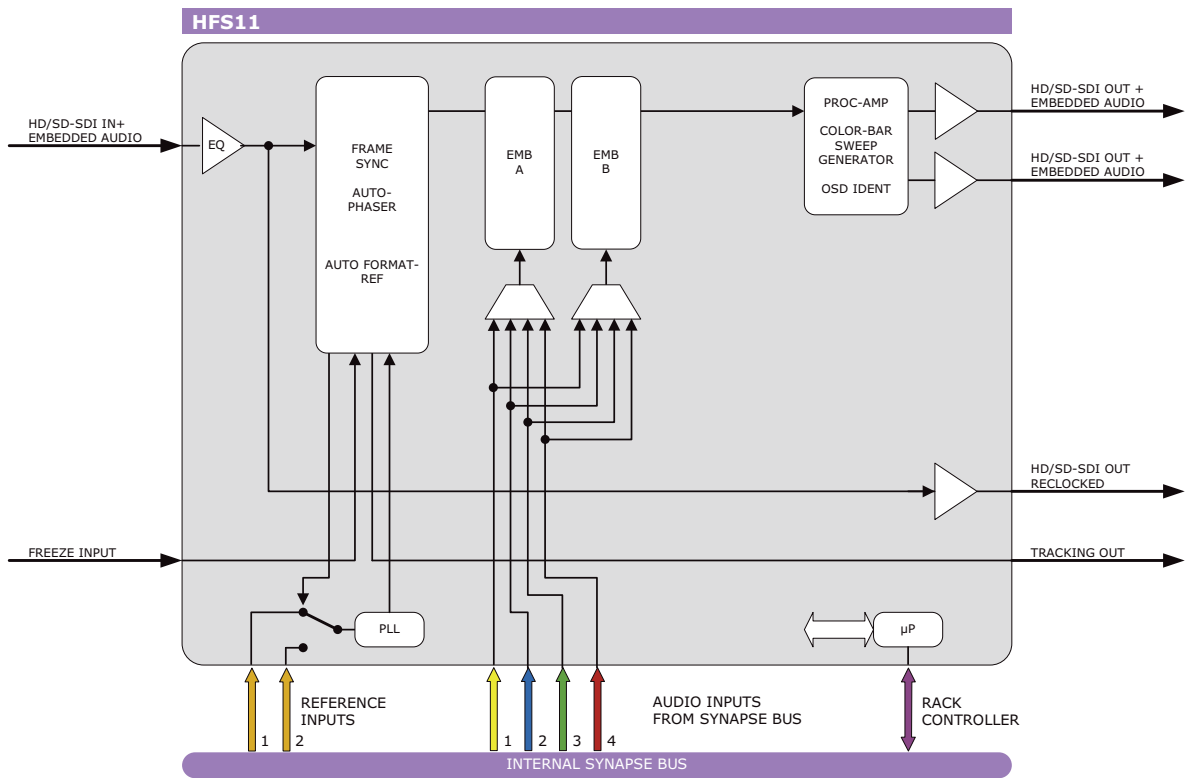
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



HFS11 HD/SD frame synchronizer with audio embedding for 2 groups

The HFS11 is an HD/SD frame synchronizer/video delay/autophaser module, video proc amp. In addition, the HFS11 has a 2 group embedding function. The synchronizer function can be used to synchronize a non-synchronous signal or to compensate a delay. The HFS11 has full transparent blanking, both horizontally and vertically. The video reference is connected through the central genlock input of the SFR18, SFR08 or SFR04 frames and is compatible with a bi-level and tri-level sync. The line synchronizer function corrects timing errors (hops) that occur due to switching in a router. In addition the HFS11 can be used as a delay line, giving up to 1 frame delay. A video reference is not required in this case, as the output clock frequency is derived from the input video clock.

- HD-SDI and SD-SDI compatible

- Formats:

- 1080i/50/60
- 1035i/60
- 720p/50/60
- 1080p(sf)/24/25/30

- Built-in proc amp

- 2 groups of audio embedding with Synapse ADD-ON card

- Audio processing pass through, processed or mute

- 2-level, 3-level sync compatible

- Tracking output

- Freeze input

- On loss of input:

- Freeze
- Black
- Green
- Gray

- One reclocked output

- Two processed outputs

- I/O delay measurement

- Switch positioning measurement (in auto phase mode)

- H and V delay offset adjustment with respect to input or reference

- ANC blanking of H, V or H+V

- Test pattern (color bar/sweep)

- OSD ident label with maximum 10 characters (for set-up purposes)

- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Free running external video synchronization with tracking embedding function
- Post router line synchronization or auto phasing
- Video timing adjustment for virtual studios
- Jitter killer

Ordering information

Module:

- **HFS11:** HD/SD frame synchronizer with audio embedding for 2 groups

Standard I/O:

- **BPH01_HFS11:**
I/O panel for HFS11

Fiber outputs:

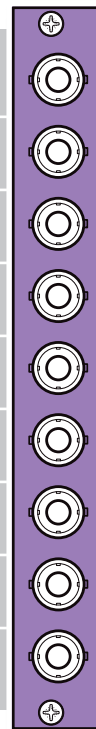
- **BPH01T_FC/PC_HFS11:**
I/O panel for HFS11 with fiber transmitter on FC/PC
- **BPH01T_SC_HFS11:**
I/O panel for HFS11 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HFS11:**
I/O panel for HFS11 with fiber receiver on FC/PC
- **BPH01R_SC_HFS11:**
I/O panel for HFS11 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED INPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
FREEZE INPUT
TRACKING OUTPUT

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

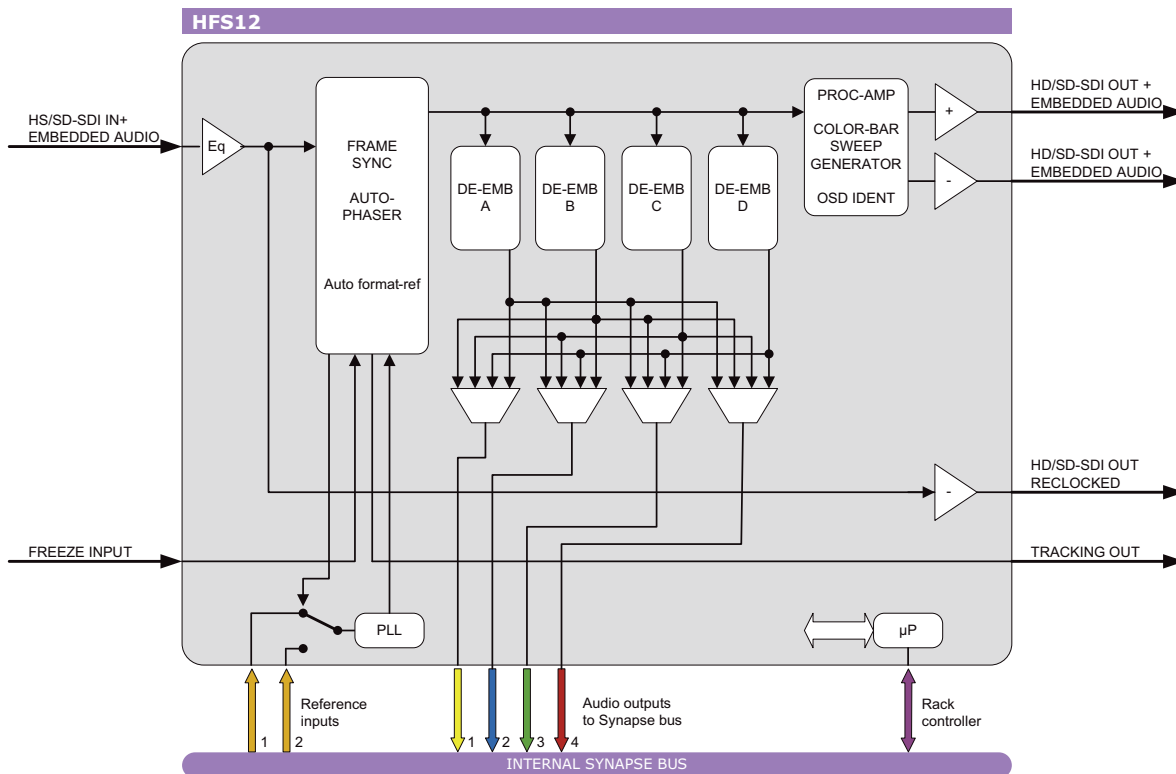
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	7 Watts



HFS12 HD/SD frame synchronizer with audio de-embedding of 16 channels

The HFS12 is an HD/SD frame synchronizer/video delay/autophaser module, video proc amp. In addition, the HFS12 has a 4 group de-embedder function. The synchronizer function can be used to synchronize a non-synchronous signal or to compensate a delay. The HFS12 has total transparent blanking, both horizontally and vertically. The video reference is connected through the central genlock input of the SFR18, SFR08 or SFR04 frames and is compatible with bi-level and tri-level sync. The line synchronizer function corrects timing errors (hops) that occur due to switching in a router. In addition the HFS12 can be used as a delay line, giving up to 1135 lines of delay. A video reference is not required in this case as the output clock frequency is derived from the input video clock.

- HD-SDI and SD-SDI compatible
- Formats:
 - 1080i/50/60
 - 1035i/60
 - 720p/50/60/
 - 1080p(sf)/24/25/30
- Built-in proc amp
- 16 channels of audio de-embedding with Synapse ADD-ON card
- Audio processing pass through, processed or mute
- Bi-level, tri-level sync compatible
- Tracking output
- Freeze input

- On loss of input:
 - Freeze
 - Black
 - Green
 - Gray
- One relocked output
- Two processed outputs
- I/O delay measurement
- Switch positioning measurement (in autophase mode)
- H and V delay offset adjustment with respect to input or reference
- ANC blanking of H, V or H+V
- Test pattern (color bar/sweep)
- OSD ident label with maximum 10 characters (for set-up purposes)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SF18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

HFS12

Applications

- Free running external video synchronization with tracking de-embedding function
- Post router line synchronization or autophasing
- Video timing adjustment for virtual studios
- Jitter killer

Ordering information

Module:

- **HFS12:** HD/SD frame synchronizer with audio de-embedding of 16-channels

Standard I/O:

- **BPH01_HFS12:**
I/O panel for HFS12

Fiber outputs:

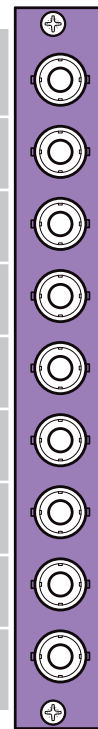
- **BPH01T_FC/PC_HFS12:**
I/O panel for HFS12 with fiber transmitter on FC/PC
- **BPH01T_SC_HFS12:**
I/O panel for HFS12 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HFS12:**
I/O panel for HFS12 with fiber receiver on FC/PC
- **BPH01R_SC_HFS12:**
I/O panel for HFS12 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
FREEZE INPUT
TRACKING OUTPUT

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

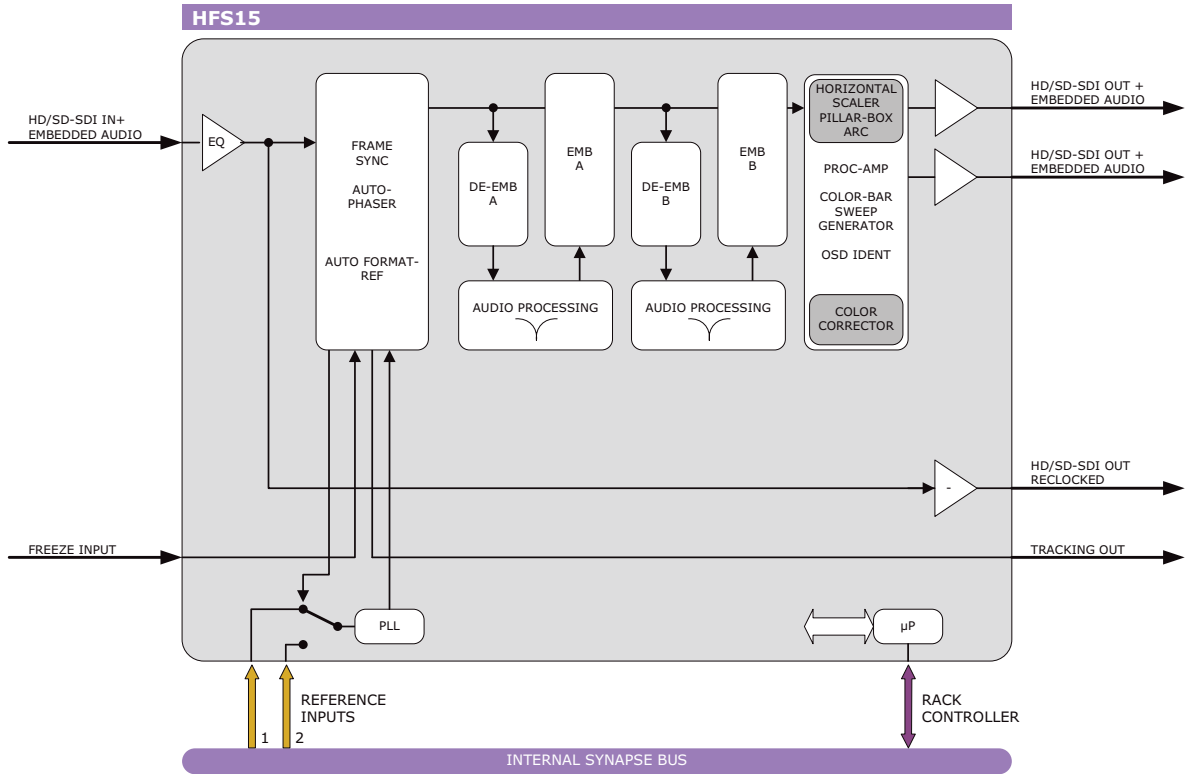
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	7 Watts



HFS15 HD/SD frame synchronizer with color corrector and smart audio handling

The HFS15 is an HD/SD frame synchronizer/video delay/autophaser module with color corrector. In addition this unit features a video proc amp and if in synchronizer mode, the HFS15 has smart audio handling for 2 embedded audio groups. The synchronizer function can be used to synchronize a non-synchronous signal or to compensate for a delay. The HFS15 has full transparent blanking, both horizontally and vertically. The video reference is connected through the central gen-lock input of the SFR18, SFR08 or SFR04 frames and is compatible with 2-level and 3-level sync. The line synchronizer function corrects timing errors (hops) that occur due to switching in a router. In addition the HFS15 can be used as a delay line, giving up to 1 frame delay. A video reference is not required in this case as the output clock frequency is derived from the input video clock.

- HD-SDI and SD-SDI compatible
- Formats:
 - 1080i/50/60
 - 1035i/60
 - 720p/50/60
 - 1080p(sf)/24/25/30
- Color corrector
- Built-in proc amp
- 2 groups smart audio handling (user selectable out of all 4 groups)

- Audio processing pass through, processed or mute
- 2-level, 3-level sync compatible
- Tracking output
- Freeze input
- On loss of input:
 - Freeze
 - Black
 - Green
 - Gray
- One relocked output
- Two processed outputs
- I/O delay measurement
- Switch positioning measurement (in autophase mode)
- H and V delay offset adjustment with respect to input or reference
- ANC blanking of H, V or H+V
- Test pattern (color bar/sweep)
- OSD ident label with maximum 10 characters (for set-up purposes)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

HFS15

Applications

- Free running external video synchronization with tracking de-embedding function
- Post router line synchronization or autophasing
- Video timing adjustment for virtual studios
- Jitter killer

Ordering information

Module:

- **HFS15:** HD/SD frame synchronizer with color corrector and smart audio handling

Standard I/O:

- **BPH01_HFS15:**
I/O panel for HFS15

Fiber outputs:

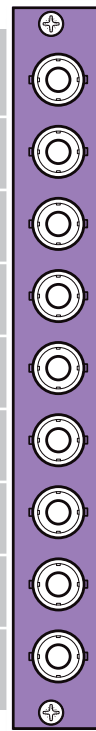
- **BPH01T_FC/PC_HFS15:**
I/O panel for HFS15 with fiber transmitter on FC/PC
- **BPH01T_SC_HFS15:**
I/O panel for HFS15 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HFS15:**
I/O panel for HFS15 with fiber receiver on FC/PC
- **BPH01R_SC_HFS15:**
I/O panel for HFS15 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
FREEZE INPUT
TRACKING OUTPUT

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

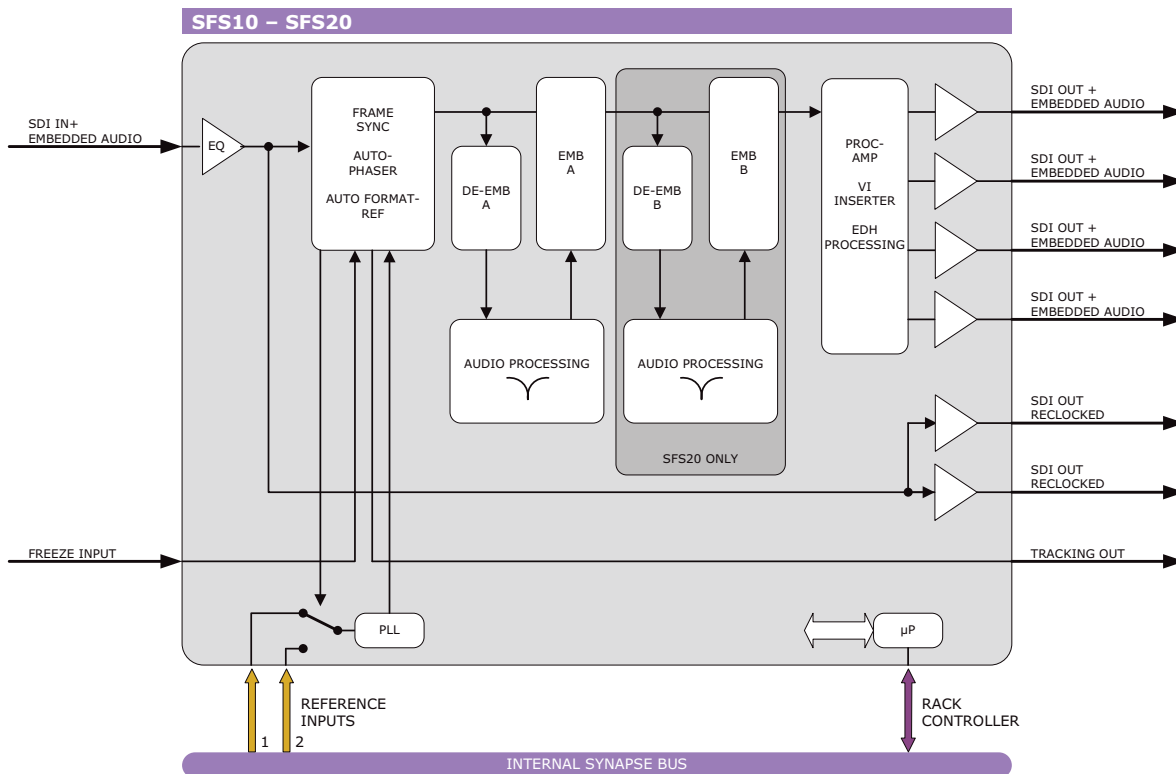
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	7 Watts



SFS10 - SFS20 Multi functional frame/line synchronizer with smooth emb. audio processing (10:1 group, 20:2 groups)

The SFS10/20 is an SD frame synchronizer, line synchronizer/ autophaser, video delay, video proc-amp and Video Index inserter. In addition, the SFS10/20 has smart audio handling for embedded audio when in synchronizer mode. The synchronizer function can be used to synchronize a non-synchronous signal or to compensate for a delay. New sync codes (TRS) are being generated and re-inserted in the output signal. The SFS10/20 has total transparent blanking, both horizontally and vertically. The video reference is connected through the central genlock input of the SFR18, SFR08 or SFR04 frames. The line synchronizer function corrects timing errors (hops) that occur due to router switching. The SFS10/20 can also be used as a delay line, giving up to 625 lines of delay. A video reference is not required in this case as the output clock frequency is derived from the input video clock.

- Auto detecting of 525/625 with correct reference input selection (SFR08 and SFR18 only)
- Frame synchronizer or delay mode
- Automatic Line synchronizer/autophaser function
- Full frame adjustable output phase with respect to reference in sample and line increments
- Adjustable vertical interval blanking (selectable start and stop line)
- V-bit autophasing (625 only)
- Proc-Amp
 - Y, Cr and Cb gain
 - Y, Cr and Cb Black
- Smooth embedded audio handling for one (SFS10) or 2 (SFS20) groups
- Embedded audio pass, blank or processed modes
- Individual group selection for processed mode
- Blanking of two adjustable ranges in the vertical interval from line 4 to 23
- VI insertion
- EDH processing
- GPI Freeze input
- Tracking audio output
- Selectable panic freeze or manual freeze
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

SFS10 - SFS20

Applications

- Free running SDI signal synchronizer
- Post router autophasing (line synchronization)
- Jitter killer
- Adjustable vertical blanking cleaning
- Adjustable delay line for timing corrections

Ordering information

Modules:

- SFS10:** Multi functional frame/line synchronizer with smooth emb. audio processing (1 group)
- SFS20:** Multi functional frame/line synchronizer with smooth emb. audio processing (2 groups)

Standard I/O:

- BPL01_SFS10:** I/O panel for SFS10
- BPX01_SFS10:** I/O panel for SFS10 with relay bypass
- BPL01_SFS20:** I/O panel for SFS20
- BPX01_SFS20:** I/O panel for SFS20 with relay bypass

Fiber outputs:

- BPL01T_FC/PC_SFS10:** I/O panel for SFS10 with fiber transmitter on FC/PC
- BPL01T_SC_SFS10:** I/O panel for SFS10 with fiber transmitter on SC
- BPL01T_FC/PC_SFS20:** I/O panel for SFS20 with fiber transmitter on FC/PC
- BPL01T_SC_SFS20:** I/O panel for SFS20 with fiber transmitter on SC

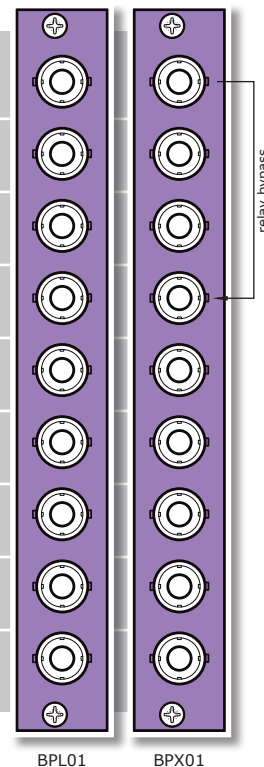
Fiber inputs:

- BPL01R_FC/PC_SFS10:** I/O panel for SFS10 with fiber receiver on FC/PC
- BPL01R_SC_SFS10:** I/O panel for SFS10 with fiber receiver on SC
- BPL01R_FC/PC_SFS20:** I/O panel for SFS20 with fiber receiver on FC/PC
- BPL01R_SC_SFS20:** I/O panel for SFS20 with fiber receiver on SC

CVBS outputs:

- BPL01C_SFS10:** I/O panel for SFS10 with CVBS output
- BPL01C_SFS20:** I/O panel for SFS20 with CVBS output

SDI IN (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
TRACKING OUTPUT
FREEZE GPI INPUT



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

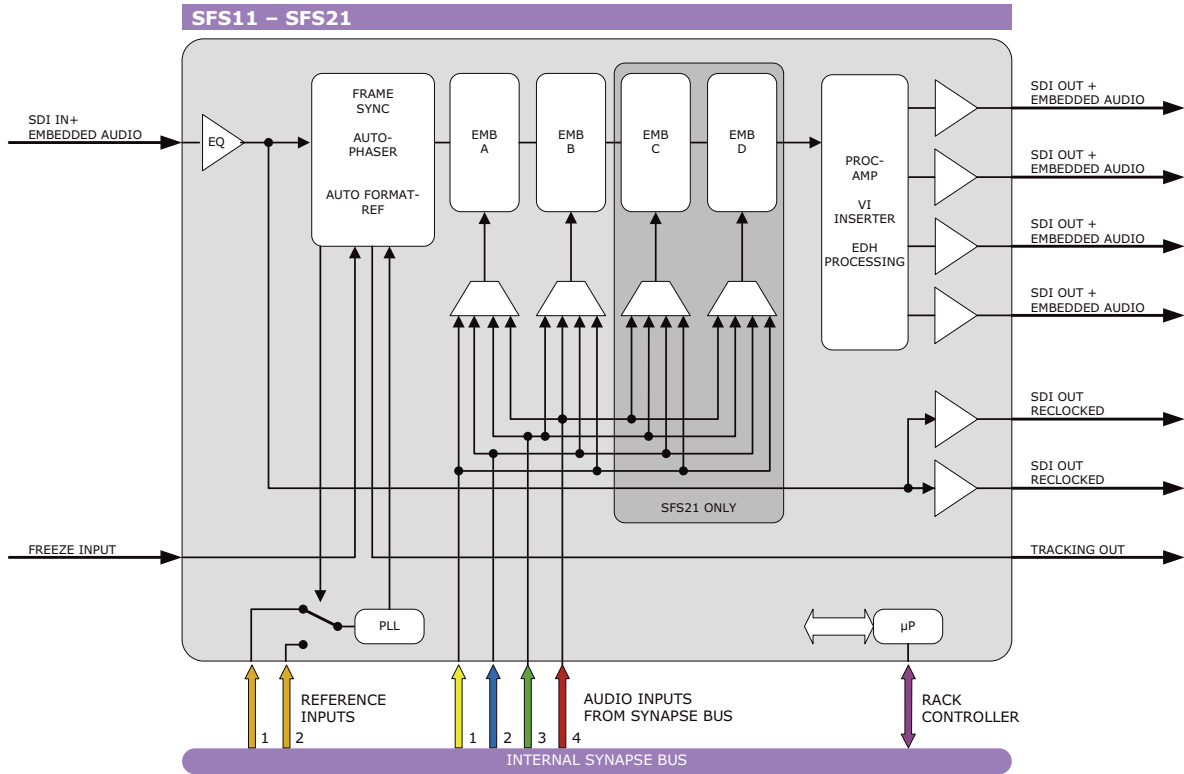
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<7 Watts



SFS11 - SFS21 Multi functional frame/line synchronizer with embedding function (11: 2 groups, 21: 4 groups)

The SFS11 is an SD frame synchronizer, line synchronizer/autophaser, video delay, video proc-amp and Video Index inserter. In addition, the SFS11 has a 2 group embedder (4 group in the SFS21). The synchronizer function can be used to synchronize a non-synchronous signal or to compensate for a delay. New sync codes (TRS) are being generated and re-inserted in the output signal. The SFS11/21 has total transparent blanking, both horizontally and vertically. The video reference is connected through the central genlock input of the SFR18, SFR08 or SFR04 frames. The line synchronizer function corrects timing errors (hops) that occur due to switching in a router. In addition the SFS11/21 can be used as a delay line, giving up to 625 lines of delay. A video reference is not required in this case as the output clock frequency is derived from the input video clock.

- Auto detecting of 525/625 with correct reference input selection (SFR08 and SFR18 only)
- Frame synchronizer or delay mode
- Automatic Line synchronizer/autophaser function
- Full frame adjustable output phase with respect to reference in sample and line increments
- Adjustable vertical interval blanking (selectable start and stop line)

- V-bit autophasing (625 only)
- Proc-Amp
 - Y, Cr and Cb gain
 - Y, Cr and Cb Black
- 2 Group (4 for the SFS21) embedding with Synapse ADD-ON card like the ADC20, DIO24 and others
- Blanking of two adjustable ranges in the vertical interval from line 4 to 23
- VI insertion
- EDH processing
- GPI Freeze input
- Tracking audio output
- Selectable panic freeze or manual freeze
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

Applications

- Free running SDI signal synchronizer with embedding function
- Post router autophasing (line synchronization) with embedding function
- Jitter killer with embedding function
- Adjustable vertical blanking cleaning with embedding function
- Adjustable delay line for timing corrections with embedding function

Ordering information

Modules:

- **SFS11:** Multi functional frame/line synchronizer with embedding function
- **SFS21:** Multi functional frame/line synchronizer with embedding function

Standard I/O:

- **BPL01_SFS11:** I/O panel for SFS11
- **BPX01_SFS11:** I/O panel for SFS11 with relay bypass
- **BPL01_SFS21:** I/O panel for SFS21
- **BPX01_SFS21:** I/O panel for SFS21 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SFS11:** I/O panel for SFS11 with fiber transmitter on FC/PC
- **BPL01T_SC_SFS11:** I/O panel for SFS11 with fiber transmitter on SC
- **BPL01T_FC/PC_SFS21:** I/O panel for SFS21 with fiber transmitter on FC/PC
- **BPL01T_SC_SFS21:** I/O panel for SFS21 with fiber transmitter on SC

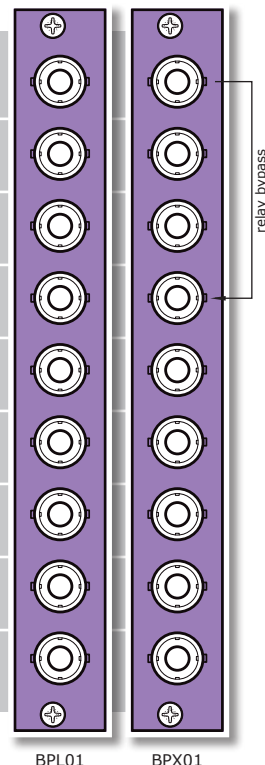
Fiber inputs:

- **BPL01R_FC/PC_SFS11:** I/O panel for SFS11 with fiber receiver on FC/PC
- **BPL01R_SC_SFS11:** I/O panel for SFS11 with fiber receiver on SC
- **BPL01R_FC/PC_SFS21:** I/O panel for SFS21 with fiber receiver on FC/PC
- **BPL01R_SC_SFS21:** I/O panel for SFS21 with fiber receiver on SC

CVBS outputs:

- **BPL01C_SFS11:** I/O panel for SFS11 with CVBS output
- **BPL01C_SFS21:** I/O panel for SFS21 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
TRACKING OUTPUT
FREEZE GPI INPUT



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

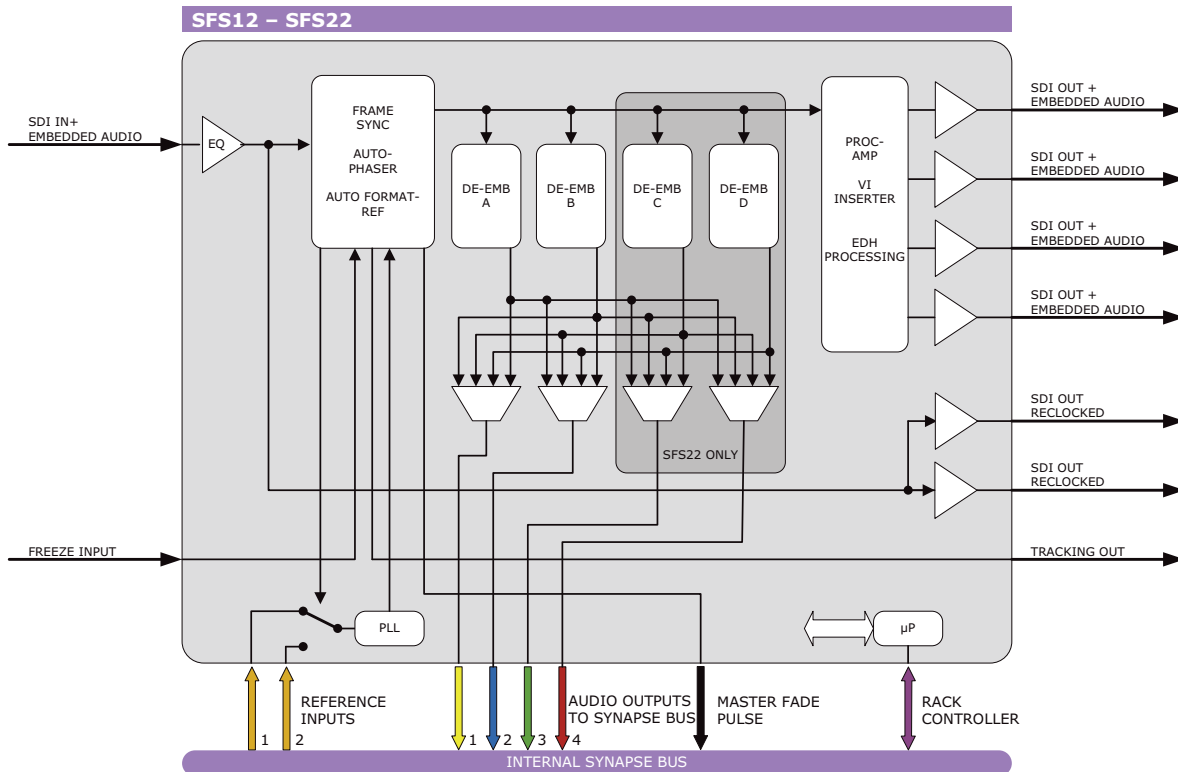
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<7 Watts



SFS12 - SFS22 Multi functional frame/line synchronizer with de-embedding function (12: 2 groups, 22: 4 groups)

The SFS12 is an SD frame synchronizer, line synchronizer/autophaser, video delay, video proc-amp and Video Index inserter. In addition, the SFS12 has a 2 group de-embedder (4 group in the SFS22). The synchronizer function can be used to synchronize a non-synchronous signal or to compensate for a delay. New sync codes (TRS) are being generated and re-inserted in the output signal. The SFS12/22 has total transparent blanking, both horizontally and vertically. The video reference is connected through the central genlock input of the SFR18, SFR08 or SFR04 frames. The line synchronizer function corrects timing errors (hops) that occur due to switching in a router. In addition the SFS12/22 can be used as a delay line, giving up to 625 lines of delay. A video reference is not required in this case as the output clock frequency is derived from the input video clock.

- Auto detecting of 525/625 with correct reference input selection (SFR08 - SFR18 only)
- Frame synchronizer or delay mode
- Automatic Line synchronizer/autophaser function
- Full frame adjustable output phase with respect to reference in sample and line increments
- Adjustable vertical interval blanking (selectable start and stop line)

- V-bit autophasing (625 only)
- Proc-Amp
 - Y, Cr and Cb gain
 - Y, Cr and Cb Black
- 2 Group (4 for the SFS22) de-embedding with Synapse ADD-ON card like the DAC20, DAS24 and others
- Blanking of two adjustable ranges in the vertical interval from line 4 to 23
- VI insertion
- EDH processing
- GPI Freeze input
- Tracking audio output
- Selectable panic freeze or manual freeze
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

Applications

- Free running SDI signal synchronizer with de-embedding function
- Post router autophasing (line synchronization) with de-embedding function
- Jitter killer with de-embedding function
- Adjustable vertical blanking cleaning with de-embedding function
- Adjustable delay line for timing corrections with de-embedding function

Ordering information

Modules:

- **SFS12:** Multi functional frame/line synchronizer with de-embedding function (12: 2 groups)
- **SFS22:** Multi functional frame/line synchronizer with de-embedding function (22: 4 groups)

Standard I/O:

- **BPL01_SFS12:** I/O panel for SFS12
- **BPX01_SFS12:** I/O panel for SFS12 with relay bypass
- **BPL01_SFS22:** I/O panel for SFS22
- **BPX01_SFS22:** I/O panel for SFS22 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SFS12:** I/O panel for SFS12 with fiber transmitter on FC/PC
- **BPL01T_SC_SFS12:** I/O panel for SFS12 with fiber transmitter on SC
- **BPL01T_FC/PC_SFS22:** I/O panel for SFS22 with fiber transmitter on FC/PC
- **BPL01T_SC_SFS22:** I/O panel for SFS22 with fiber transmitter on SC

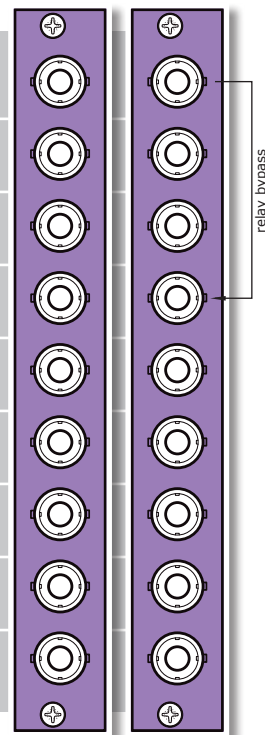
Fiber inputs:

- **BPL01R_FC/PC_SFS12:** I/O panel for SFS12 with fiber receiver on FC/PC
- **BPL01R_SC_SFS12:** I/O panel for SFS12 with fiber receiver on SC
- **BPL01R_FC/PC_SFS22:** I/O panel for SFS22 with fiber receiver on FC/PC
- **BPL01R_SC_SFS22:** I/O panel for SFS22 with fiber receiver on SC

CVBS outputs:

- **BPL01C_SFS12:** I/O panel for SFS12 with CVBS output
- **BPL01C_SFS22:** I/O panel for SFS22 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
TRACKING OUTPUT
FREEZE GPI INPUT



BPL01

BPX01

For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

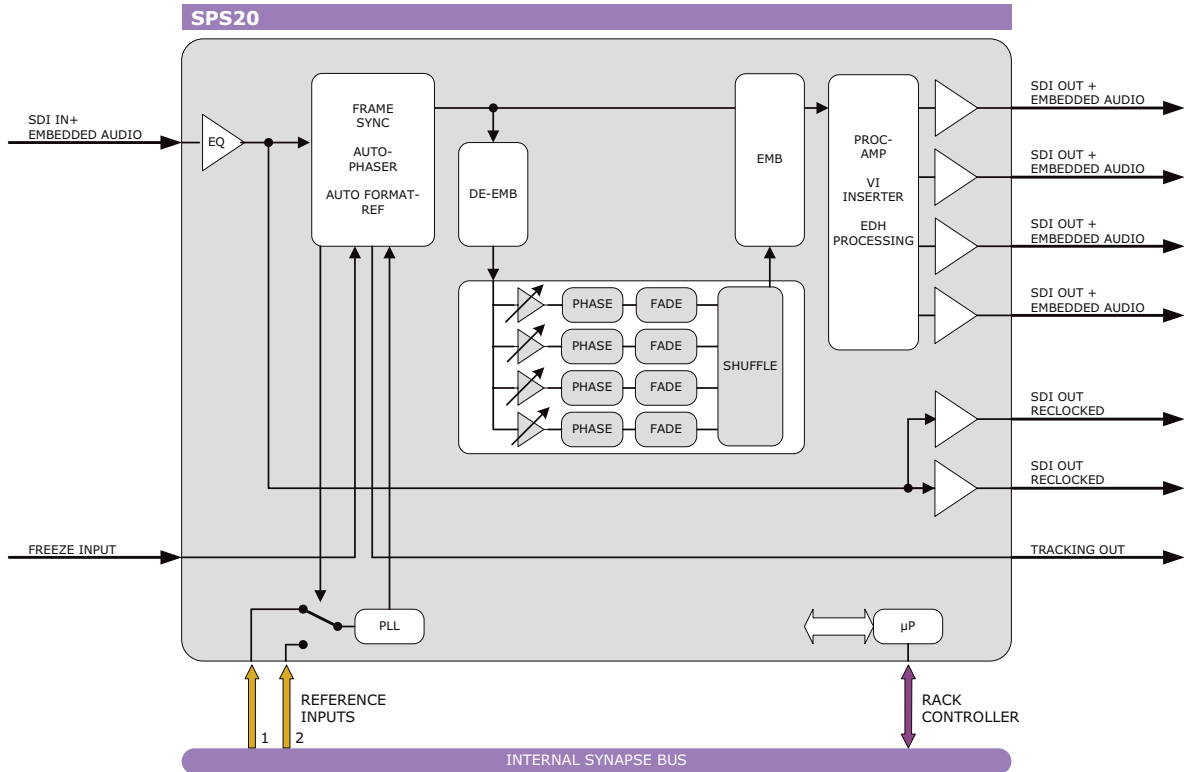
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<7 Watts



SPS20 SD-SDI Multi functional frame/line synchronizer with full embedded audio processing

The SPS20 is a frame synchronizer, line synchronizer/autophaser, video delay, video proc-amp and Video Index inserter. In addition, the SPS20 has smart audio handling for embedded audio when in synchronizer mode. The SPS20 accepts an incoming SDI stream with embedded audio, de-embeds the audio and relocates (shuffles) the audio channels as required by the user. Each audio channel is individually routed giving selection independence. The synchronizer function can be used to synchronize a non-synchronous signal or to compensate for a delay. New sync codes (TRS) are being generated and re-inserted in the output signal. The SPS20 has totally transparent blanking, both horizontally and vertically.

- 4 (out of 16) embedded audio channel control
- Gain, phase and shuffle control in one group
- Auto detecting of 525/625 with correct reference input selection (SFR08 - SFR18 only)
- Frame synchronizer or delay mode
- Automatic Line synchronizer/autophaser function
- Full frame adjustable output phase with respect to reference in sample and line increments
- V-bit autophasing (625 only)

- Proc-Amp
 - Y, Cr and Cb gain
 - Y, Cr and Cb Black
- Embedded audio pass, blank or processed modes
- Individual group selection for processed mode
- VI insertion
- EDH processing
- GPI Freeze input
- Tracking audio output
- Selectable panic freeze or manual freeze
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

SPS20

Applications

- Free running SDI signal synchronizer with de-embedding function
- Post router autophasing (line synchronization) with de-embedding function
- Jitter killer with de-embedding function
- Adjustable vertical blanking cleaning with de-embedding function
- Adjustable delay line for timing corrections with de-embedding function

Ordering information

Module:

- **SPS20:** SD-SDI Multi functional frame/line synchronizer with full embedded audio processing

Standard I/O:

- **BPL01_SPS20:** I/O panel for SPS20
- **BPX01_SPS20:** I/O panel for SPS20 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SPS20:** I/O panel for SPS20 with fiber transmitter on FC/PC
- **BPL01T_SC_SPS20:** I/O panel for SPS20 with fiber transmitter on SC

Fiber inputs:

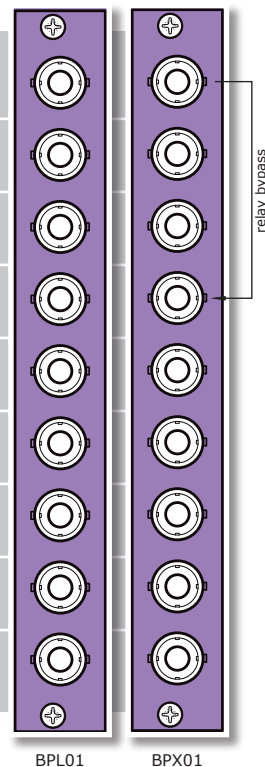
- **BPL01R_FC/PC_SPS20:** I/O panel for SPS20 with fiber receiver on FC/PC
- **BPL01R_SC_SPS20:** I/O panel for SPS20 with fiber receiver on SC

CVBS output:

- **BPL01C_SPS20:** I/O panel for SPS20 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUTPUT 1 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI PROCESSED OUTPUT 2
SDI PROCESSED OUTPUT 3
SDI PROCESSED OUTPUT 4
TRACKING OUTPUT
FREEZE GPI INPUT

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

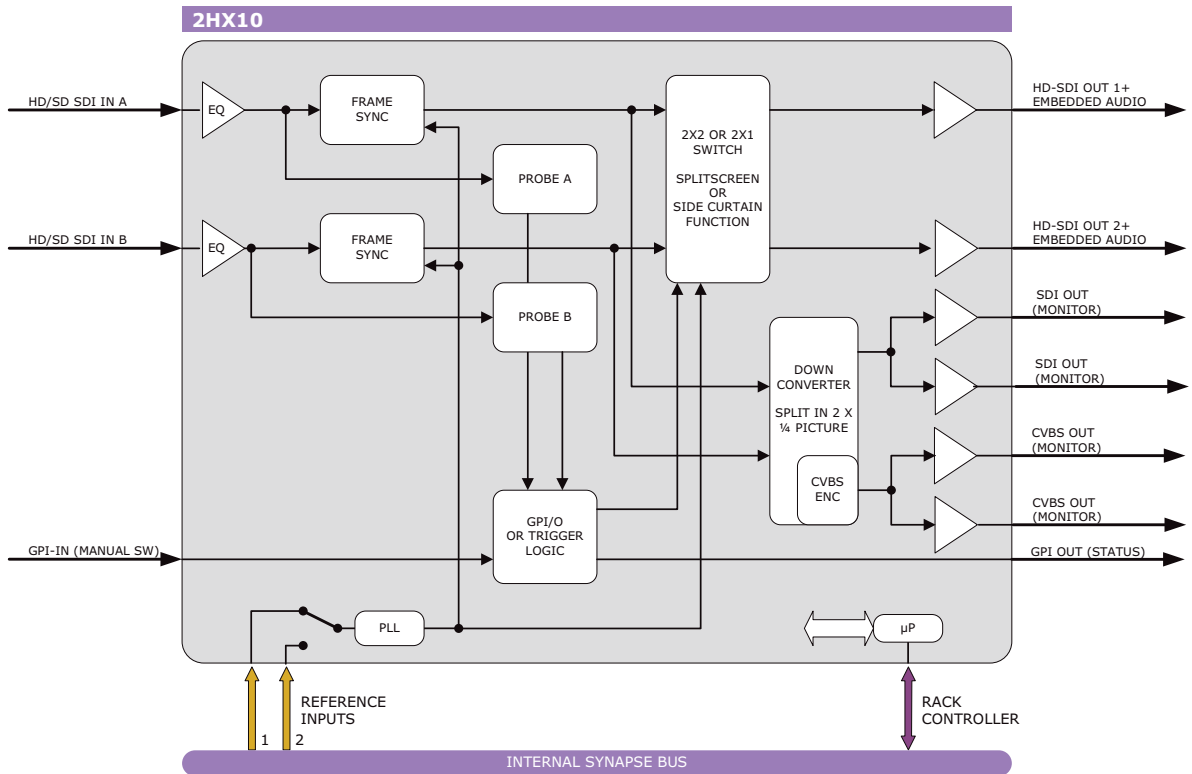
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<7 Watts



2HX10 Dual channel HD/SD integrity checking probe with clean switch over function and wings or split screen creation capabilities

The 2HX10 is a dual channel high performance HD/SD SDI video and embedded audio probe (signal integrity monitor) with clean switch-over function. The switch function can be triggered by any of the integrity controls or by GPI. Besides the extensive probe functions, the cards also provide full line and frame synchronization on both inputs. A monitor output available in both SD and CVBS shows both inputs on a single screen (1/4 size each).

- Clean backup switching through built-in frame synchronizers
- Preview output showing both signals on a single screen (monitoring quality)
- Creating wings and split screens
- Probe functions:
 - SDI carrier detect
 - TRS validation
 - ANC checksum validation
 - Video content freeze detection
 - Video content black detection
 - Timecode availability
 - Audio channel detection (16 channels)
 - Audio silence detection (4 pairs 2 groups)
 - Audio Phase reversal detection within one group (4 pairs)
 - Audio Clip/5 sample full-scale indication (4 pairs)
 - Dolby E present detection
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel

2HX10

Applications

- The 2HX10 can be used as station output card, and ingest quality control card or a generic 2 x 2 switch
- The integrity checking can also be performed for alarm monitoring purposes with the switch function disabled
- Generic probing with automatic back-up switching
- Creation of wings (see picture 1)
- Creation of split screens (see picture 2)

Ordering information

Module:

- **2HX10:** Dual channel HD/SD integrity checking probe with switch over function

Standard I/O:

- **BPH05_2HX10:** I/O-panel for 2HX10

Fiber outputs:

- **BPH05T2_FC/PC_2HX10:** I/O-panel for 2HX10 with 2 fiber transmitter on FC/PC
- **BPH05T2_SC_2HX10:** I/O-panel for 2HX10 with 2 fiber transmitter on SC

Fiber inputs:

- **BPH05R2_FC/PC_2HX10:** I/O-panel for 2HX10 with 2 fiber receiver on FC/PC
- **BPH05R2_SC_2HX10:** I/O-panel for 2HX10 with 2 fiber receiver on SC

HD/SD SDI INPUT 1 (OPTIONAL FIBER INPUT)
HD/SD SDI OUTPUT 1(OPTIONAL FIBER OUTPUT)
SD-SDI OUTPUT (MONITOR)
CVBS OUTPUT (MONITOR)
GPI INPUT/OUTPUT
HD/SD SDI INPUT 2 (OPTIONAL FIBER INPUT)
HD/SD SDI OUTPUT 2 (OPTIONAL FIBER OUTPUT)
SD-SDI OUTPUT (MONITOR)
CVBS OUTPUT (MONITOR)



BPH05

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable
Number of inputs	2 (auto or manual selection)
Return loss	> 15dB up to 1.5GHz

HD/SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s

SD serial video output

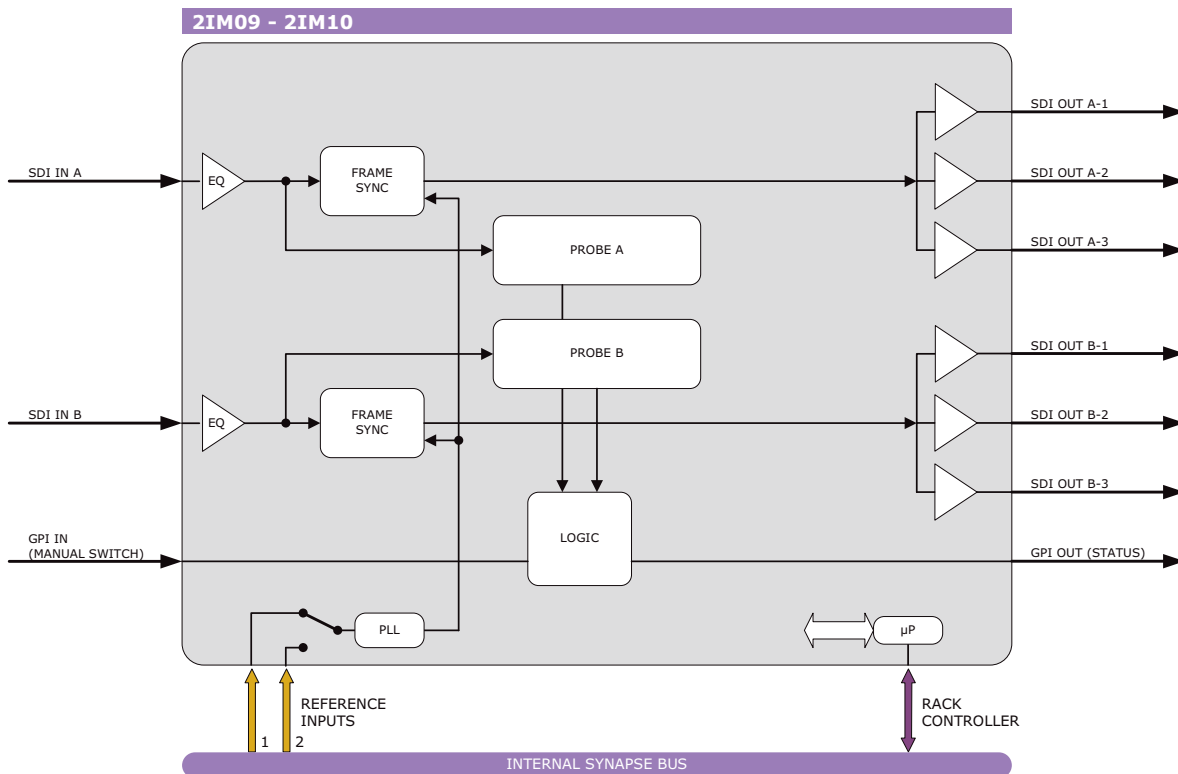
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz
Return loss	> 15dB at 270Mb/s
Wideband jitter	< 0.2UI
Video delay	1 field

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<13 Watts



2IM09 - 2IM10 Dual channel (enhanced) integrity checking probe with built-in frame synchronizers

The 2IM09/10 is a dual channel high performance SDI video and embedded audio probe (signal integrity monitor). The difference between the 2IM09 and 2IM10 is that the latter has an enhanced range of probing functions that include phase reversal and macro blocking detection. The switch function can be triggered by any of the integrity controls or by GPI. Besides the extensive probe functions, the cards also provide full line and frame synchronization on both inputs. Each output has a fan-out of 3.

- Dolby E present detection*
 - Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
 - Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
 - Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel
- *= 2IM10 only

- SDI carrier detect
- EDH detection
- TRS validation
- ANC checksum validation*
- Y/Pr/Pb Range validation (64<Y<940, 64<Pr or Pb<960)*
- Video content freeze detection
- Video content black detection
- Video monochrome detection (Stuck C value)*
- Macro blocking detection*
- Timecode availability*
- VI value detection*
- WSS value detection*
- Audio channel count detection (8 stereo pairs)*
- Audio silence detection (8 channels)*
- Audio Phase reversal detection within one group (2 pairs)*
- Audio Clip/5 sample full-scale indication*

Applications

- The 2IM09/10 can be used as station output card and ingest quality control card
- Generic lines centre probe
- Infrastructure (studio) probing
- Transmission probing

Ordering information

Module:

- **2IM09:** Dual channel integrity checking probe with built-in frame synchronizers
- **2IM10:** Dual channel enhanced integrity checking probe with built-in frame synchronizers

Standard I/O:

- **BPL11_2IM09:**
I/O panel for 2IM09
- **BPX04_2IM09:**
I/O panel for 2IM09 with relay bypass
- **BPL11_2IM10:**
I/O panel for 2IM10
- **BPX04_2IM10:**
I/O panel for 2IM10 with relay bypass

Fiber outputs:

- **BPL11T2_FC/PC_2IM09:**
I/O panel for 2IM09 with 2 fiber transmitters on FC/PC
- **BPL11T2_SC_2IM09:**
I/O panel for 2IM09 with 2 fiber transmitters on SC
- **BPL11T2_FC/PC_2IM10:**
I/O panel for 2IM10 with 2 fiber transmitters on FC/PC
- **BPL11T2_SC_2IM10:**
I/O panel for 2IM10 with 2 fiber transmitters on SC

Fiber inputs:

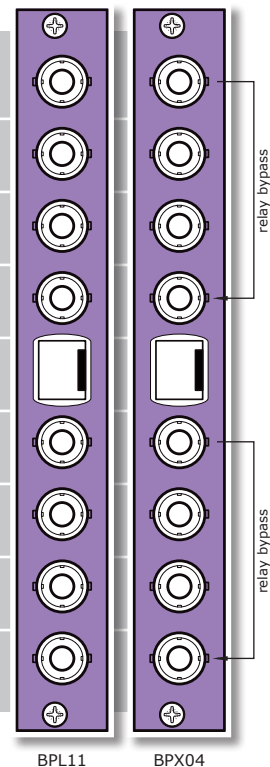
- **BPL11R2_FC/PC_2IM09:**
I/O panel for 2IM09 with 2 fiber receivers on FC/PC
- **BPL11R2_SC_2IM09:**
I/O panel for 2IM09 with 2 fiber receivers on SC
- **BPL11R2_FC/PC_2IM10:**
I/O panel for 2IM10 with 2 fiber receivers on FC/PC
- **BPL11R2_SC_2IM10:**
I/O panel for 2IM10 with 2 fiber receivers on SC

CVBS outputs

- **BPL11C2_2IM09:**
I/O panel for 2IM09 with 2 CVBS outputs
- **BPL11C2_2IM10:**
I/O panel for 2IM10 with 2 CVBS outputs

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1
SDI OUTPUT A-2
SDI OUTPUT A-3 (OPTIONAL FIBER OR CVBS OUTPUT)
GPI INPUT/OUTPUT
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1
SDI OUTPUT B-2
SDI OUTPUT B-3 (OPTIONAL FIBER OR CVBS OUTPUT)

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	6 (3 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

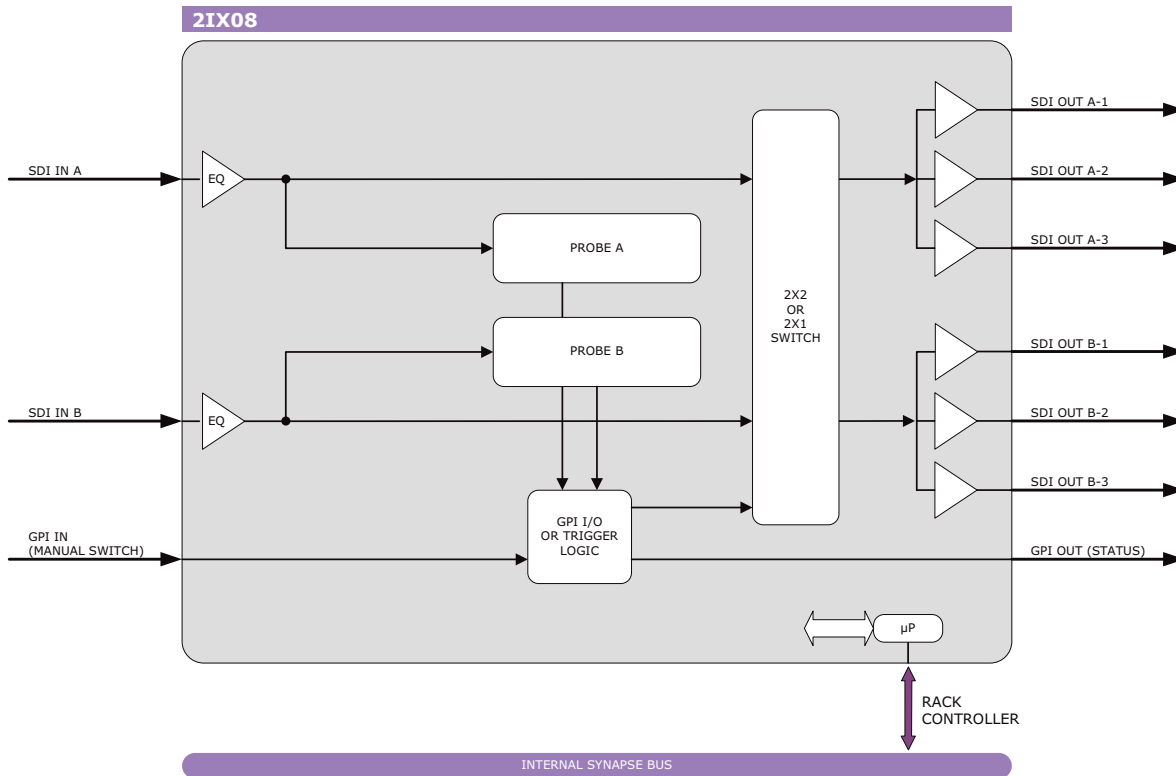
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<9 Watts

2IM09 - 2IM10





2IX08 Dual channel basic integrity checking probe with switch-over function

The 2IX08 is a dual channel basic signal integrity monitor with switch-over function. The difference with the 2IX09 and 2IX10 is that these have an enhanced range of probing functions and 2 built-in frame-synchronizers for clean switching. The switch function can be triggered by any of the integrity controls or by GPI. Each output has a fan-out of 3 and all outputs can be sourced from the same input. The module has the following features:

- SDI carrier detect
- EDH detection
- TRS validation
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
- Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel

2IX08

Applications

- The 2IX08 can be used as station output card, and ingest quality control card or a generic 2 x 2 switch
- Generic probing with automatic back-up switching

Ordering information

Module:

- **2IX08:** Dual channel basic integrity checking probe with switch-over function

Standard I/O:

- **BPL11_2IX08:**
I/O panel for 2IX08
- **BPX04_2IX08:**
I/O panel for 2IX08 with relay bypass

Fiber outputs:

- **BPL11T2_FC/PC_2IX08:**
I/O panel for 2IX08 with 2 fiber transmitters on FC/PC
- **BPL11T2_SC_2IX08:**
I/O panel for 2IX08 with 2 fiber transmitters on SC

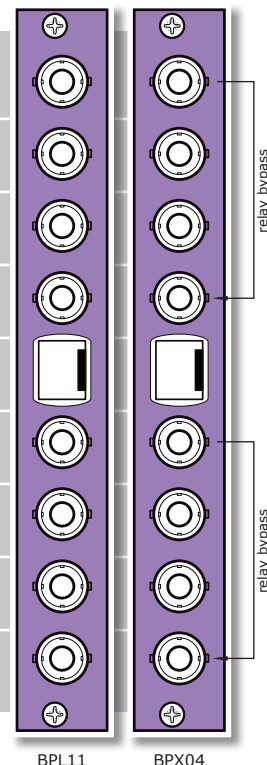
Fiber inputs:

- **BPL11R2_FC/PC_2IX08:**
I/O panel for 2IX08 with 2 fiber receivers on FC/PC
- **BPL11R2_SC_2IX08:**
I/O panel for 2IX08 with 2 fiber receivers on SC

CVBS output:

- **BPL11C2_2IX08:**
I/O panel for 2IX08 with 2 CVBS outputs

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1
SDI OUTPUT A-2
SDI OUTPUT A-3 (OPTIONAL FIBER OR CVBS OUTPUT)
GPI INPUT/OUTPUT
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1
SDI OUTPUT B-2
SDI OUTPUT B-3 (OPTIONAL FIBER OR CVBS OUTPUT)



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

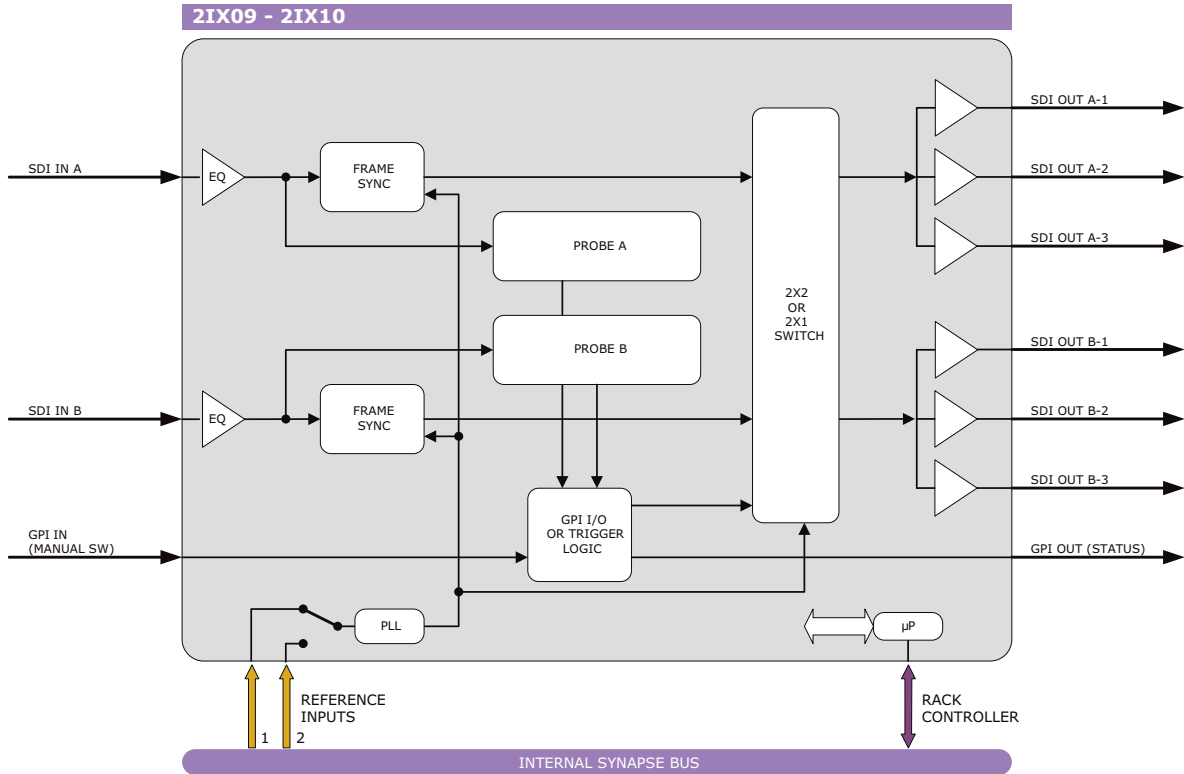
SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 per channel or 6 in 2x1 mode
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<9 Watts

2IX08



2IX09 - 2IX10 Dual channel (enhanced) integrity checking probe with switch-over function and frame synchronizer

The 2IX09/10 is a dual channel high performance SDI video and embedded audio probe (signal integrity monitor) with clean switch-over function. The difference between the 2IX09 and 2IX10 is that the latter has an enhanced range of probing functions that include phase reversal and macro blocking detection. The 2IX08 is the basic version without the integrated frame synchronizers. The switch function can be triggered by any of the integrity controls or by GPI. Besides the extensive probe functions, the cards also provide full line and frame synchronization on both inputs. Each output has a fan-out of 3 and all outputs can be sourced from the same input. The module has the following features:

- SDI carrier detect
- EDH detection
- TRS validation
- ANC checksum validation*
- Y/Pr/Pb Range validation (64<Y<940, 64< Pr or Pb <960)*
- Video content freeze detection
- Video content black detection
- Video monochrome detection (Stuck C value)*
- Macro blocking detection*
- Timecode availability*
- VI value detection*
- WSS value detection*

- Audio channel detection (16 channels)*
 - Audio silence detection (4 pairs)*
 - Audio Phase reversal detection within one group (4 pairs)*
 - Audio Clip/5 sample full-scale indication (4 pairs)*
 - Dolby E present detection*
 - Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
 - Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel
 - Optional 2 CVBS outputs (replacing 2 SDI outputs) on I/O panel
- * = 2IX10 only

Applications

- The 2IX10 can be used as station output card, and ingest quality control card or a generic 2 x 2 switch
- The integrity checking can also be performed for alarm monitoring purposes with the switch function disabled
- Generic probing with automatic back-up switching

Ordering information

Module:

- **2IX09:** Dual channel integrity checking probe with switch-over function and frame synchronizer
- **2IX10:** Dual channel enhanced integrity checking probe with switch over function and frame synchronizer

Standard I/O:

- **BPL11_2IX09:**
I/O panel for 2IX09
- **BPX04_2IX09:**
I/O panel for 2IX09 with relay bypass
- **BPL11_2IX10:**
I/O panel for 2IX10
- **BPX04_2IX10:**
I/O panel for 2IX10 with relay bypass

Fiber outputs:

- **BPL11T2_FC/PC_2IX09:**
I/O panel for 2IX09 with 2 fiber transmitters on FC/PC
- **BPL11T2_SC_2IX09:**
I/O panel for 2IX09 with 2 fiber transmitters on SC
- **BPL11T2_FC/PC_2IX10:**
I/O panel for 2IX10 with 2 fiber transmitters on FC/PC
- **BPL11T2_SC_2IX10:**
I/O panel for 2IX10 with 2 fiber transmitters on SC

Fiber inputs:

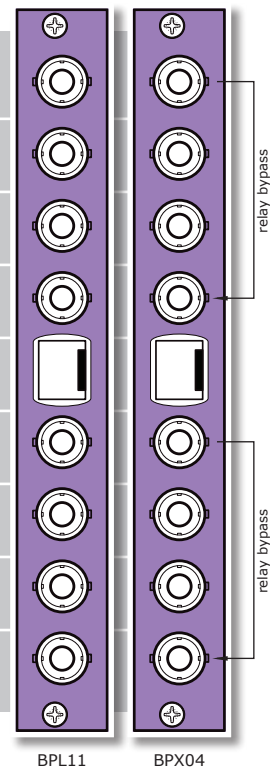
- **BPL11R2_FC/PC_2IX09:**
I/O panel for 2IX09 with 2 fiber receivers on FC/PC
- **BPL11R2_SC_2IX09:**
I/O panel for 2IX09 with 2 fiber receivers on SC
- **BPL11R2_FC/PC_2IX10:**
I/O panel for 2IX10 with 2 fiber receivers on FC/PC
- **BPL11R2_SC_2IX10:**
I/O panel for 2IX10 with 2 fiber receivers on SC

CVBS outputs:

- **BPL11C2_2IX09:**
I/O panel for 2IX09 with 2 CVBS outputs
- **BPL11C2_2IX10:**
I/O panel for 2IX10 with 2 CVBS outputs

SDI INPUT A (OPTIONAL FIBER INPUT)
SDI OUTPUT A-1
SDI OUTPUT A-2
SDI OUTPUT A-3 (OPTIONAL FIBER OR CVBS OUTPUT)
GPI INPUT/OUTPUT
SDI INPUT B (OPTIONAL FIBER INPUT)
SDI OUTPUT B-1
SDI OUTPUT B-2
SDI OUTPUT B-3 (OPTIONAL FIBER OR CVBS OUTPUT)

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2 (1 per channel)
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 per channel or 6 in 2x1 mode
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

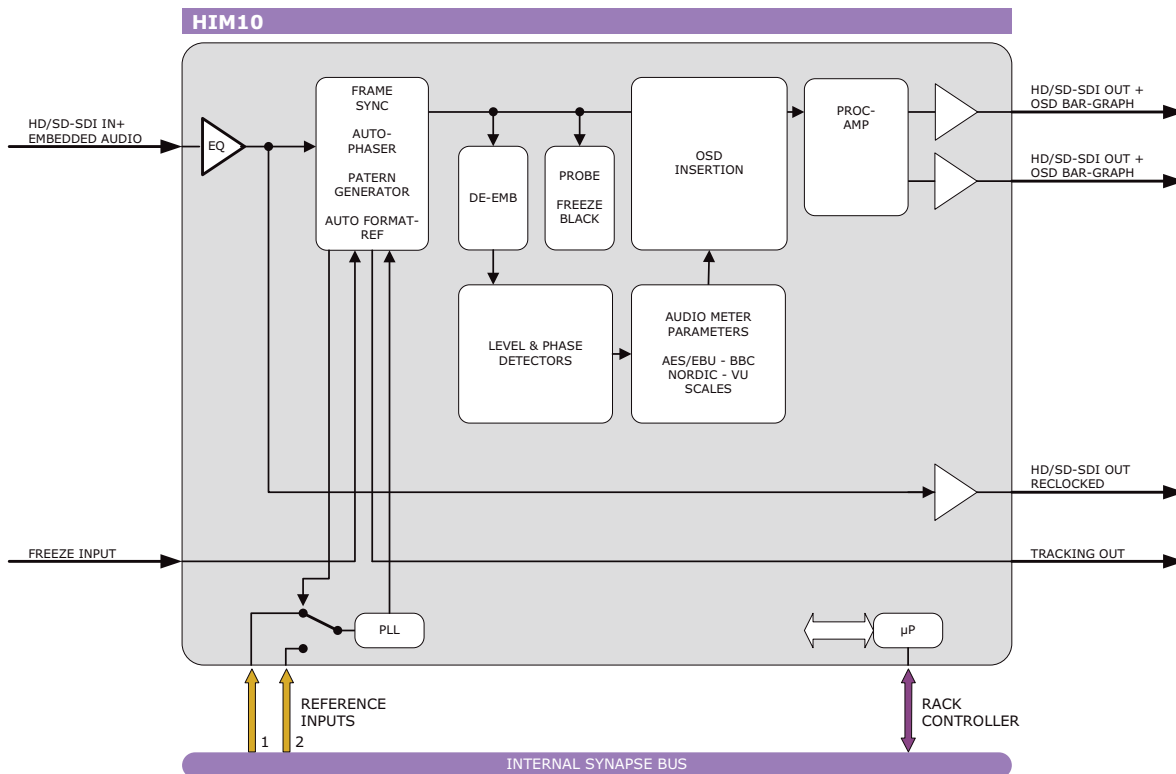
Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<9 Watts

2IX09 - 2IX10



HIM10 HD/SD integrity checking/probe with audio and phase OSD bar-graph insertion

The HIM10 is an HD/SD Integrity checking probe with OSD audio level & phase bar graphs. The input can detect loss of input, freeze frame and black level. It is based on a full functioning frame synchronizer with auto phasing capabilities (line-synchronizer). The OSD bargraph features up to 4 audio levels where each bar can be any of the 16 embedded audio channels. The two phase meters show the phase between the bars 1 and 2, and between bar 3 and 4.

- Full HD/SD frame synchronizer
- Compatible with the following standards:
 - 1080i-59.94
 - 1080i-50
 - 1080p-29.97
 - 1080p-25
 - 1080p-24
 - 1035i-59.94
 - 720p-59.94
 - 720p-50
 - SD525
 - SD625
- Synchronize, delay and free-run modes
- Locks to Bi and Tri level syncs
- Offset H and V adjustment
 - Up to 2199 pixels H
 - Up to 1124 lines V

- Manual Freeze
- GPI Freeze
- Field and Frame Freeze modes
- On input loss display:
 - Freeze
 - Black
 - Grey
 - Green
- Built-in Proc-amp with individual controls for Y, Cr, Cb, Y-Black, Cb-Black, Cr-Black
- Line lock mode for better auto-phasing
- Selectable ANC blanking of H, V or H&V
- Delay status information
- Switch status information
- Embedded audio locking to embedded audio clock or Video clock
- 4 free selectable OSD audio level Bar-graphs
- Masked or transparent bar-graphs
- AES/EBU, BBC, Nordic and VU scales
- Picture freeze and black detection between 1 and 4000 frames
- Adjustable thresholds for freeze and black (allows for detection of noisy signals)
- Audio silence detection with adjustable time (1-255 sec) and level (-20 to -100 dBFs)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

The HIM10 can be used as an active probe in an ingest or lines centre. The unit can also perform audio level and phase insertion (OSD) for use in a lines centre, Control-room and OB van applications.

Ordering information

Module:

- **HIM10:** HD/SD integrity checking/probe with audio and phase OSD bar-graph insertion

Standard I/O:

- **BPH01_HIM10:** I/O panel for HIM10

Fiber outputs:

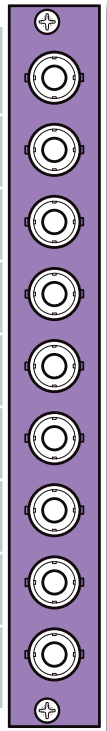
- **BPH01T_FC/PC_HIM10:** I/O panel for HIM10 with fiber transmitter on FC/PC
- **BPH01T_SC_HIM10:** I/O panel for HIM10 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HIM10:** I/O panel for HIM10 with fiber receiver on FC/PC
- **BPH01R_SC_HIM10:** I/O panel for HIM10 with fiber receiver on SC

HD/SD-SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD-SDI RECLOCKED OUTPUT
HD SDI PROCESSED OSD OUTPUT 1
HD SDI PROCESSED OSD OUTPUT 2 (OPTIONAL FIBER OUTPUT)
FREEZE INPUT
TRACKING OUTPUT

For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 1.5GHz

HD/SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

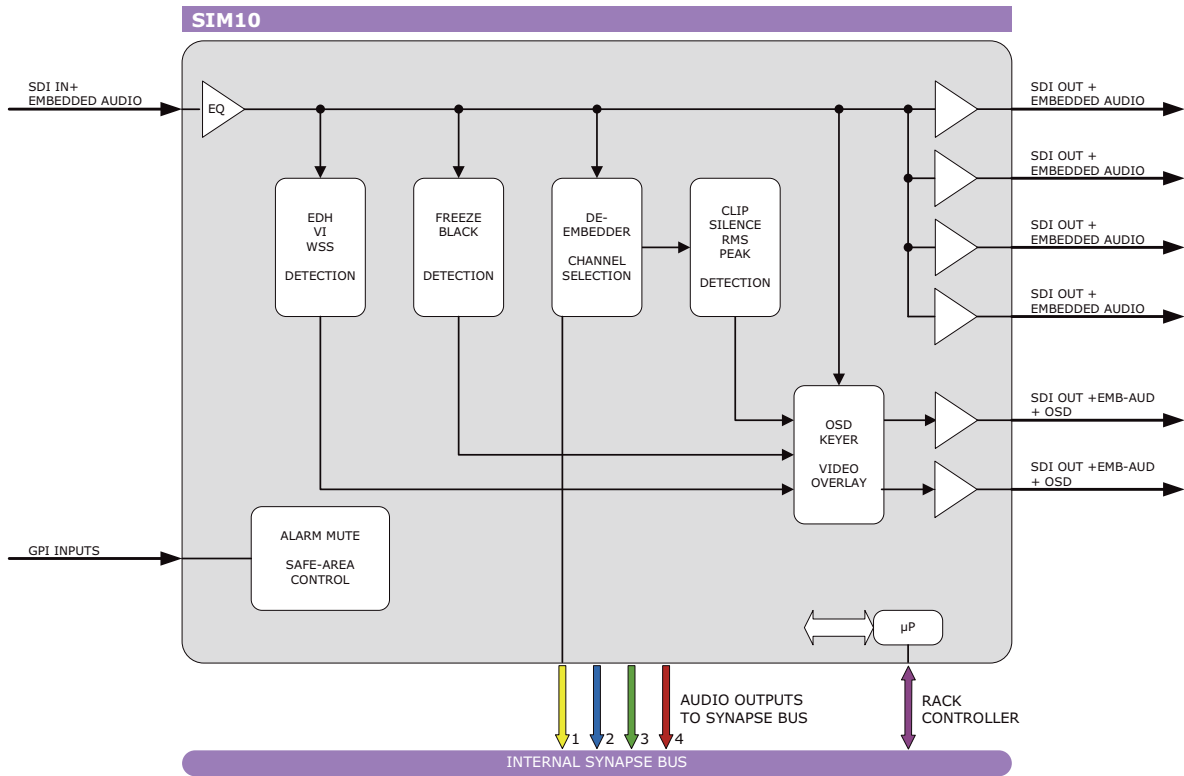
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



SIM10 SDI distribution amplifier checking and monitoring signal integrity (with OSD)

The SIM10 is a 1 to 4 distribution amplifier that checks the integrity of a SDI signal, and displays the status of that SDI signal on two processed outputs; the other 4 outputs are re-clocked and de-jittered. The items that can be displayed are: name label, embedded audio channels, level bars, silence, freeze, black, EDH, VLI, WSS and Safe area. The name label is related to the card label. The level bars of the incoming channels are free selectable and the scale of these bars is also selectable: EBU, BBC, NORDIC, VU. "Peak hold" is also an option. The user can select the level of reaction sensitivity of the items: Freeze frame, Black detection and Silence. All items can be switched off when it is not necessary to display them.

- 1 to 4 distribution amplifier
- 2 additional outputs with optional OSD information
- Detection of freeze frame with threshold and time adjustment
- Detection of Black with threshold and time adjustment
- Detection of audio silence with threshold and time adjustment
 - (-80 to -40 dBFS within 1-10 seconds)
- 4 (out of any 16) OSD audio bar graphs
- Adjustable colors in Bar ranges
- EBU, Nordic, BBC, VU and dBFS scales
- Safe area markers
 - 16:9_Full
 - 16:9 Shoot & Protect 4:3
 - 16:9 Shoot & Protect 14:9
 - 4:3 Shoot & Protect 14:9
 - 4:3 Action 14:9
 - 4:3 Graphics 14:9
- GPI control of
 - Safe area markers
 - Mute Alarms and event reporting
- EDH, VI and WSS OSD status
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

SIM10

Applications

- Generic station SDI distribution amplifier with probe function
 - With 6 outputs if no OSD is required
- Alarm probe with OSD / audio meters for monitor stacks
- Safe area inserter for camera control

Ordering information

Module:

- **SIM10:** SDI distribution amplifier checking and monitoring signal integrity (with OSD)

Standard I/O:

- **BPL01_SIM10:** I/O panel for SIM10
- **BPL08_SIM10:** I/O panel for SIM10
- **BPX01_SIM10:** I/O panel for SIM10 with relay bypass
- **BPX03_SIM10:** I/O panel for SIM10 with relay bypass

Fiber outputs:

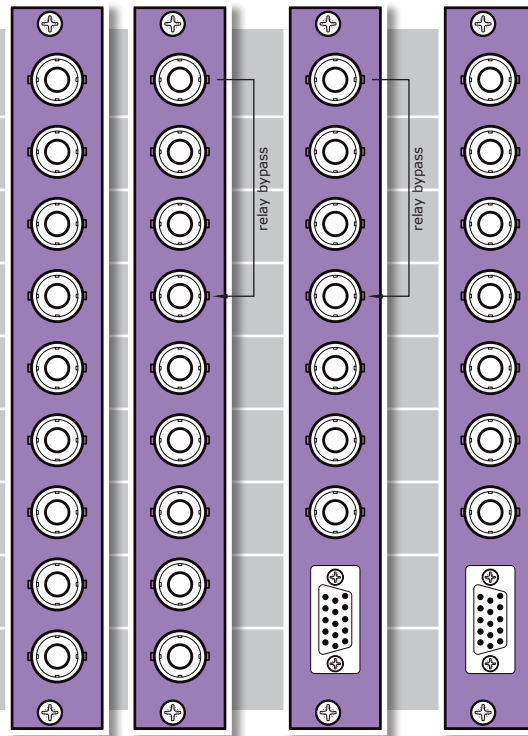
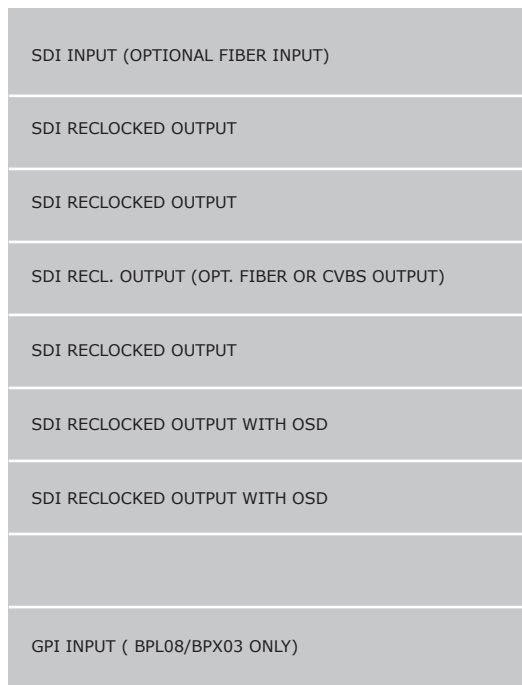
- **BPL01T_FC/PC_SIM10:** I/O panel for SIM10 with fiber transmitter on FC/PC
- **BPL01T_SC_SIM10:** I/O panel for SIM10 with fiber transmitter on SC
- **BPL08T_FC/PC_SIM10:** I/O panel for SIM10 with fiber transmitter on FC/PC
- **BPL08T_SC_SIM10:** I/O panel for SIM10 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_SIM10:** I/O panel for SIM10 with fiber receiver on FC/PC
- **BPL01R_SC_SIM10:** I/O panel for SIM10 with fiber receiver on SC
- **BPL08R_FC/PC_SIM10:** I/O panel for SIM10 with fiber receiver on FC/PC
- **BPL08R_SC_SIM10:** I/O panel for SIM10 with fiber receiver on SC

CVBS outputs:

- **BPL01C_SIM10:** I/O panel for SIM10 with CVBS output
- **BPL08C_SIM10:** I/O panel for SIM10 with CVBS output



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	6 (2 processed and 4 reclocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Miscellaneous

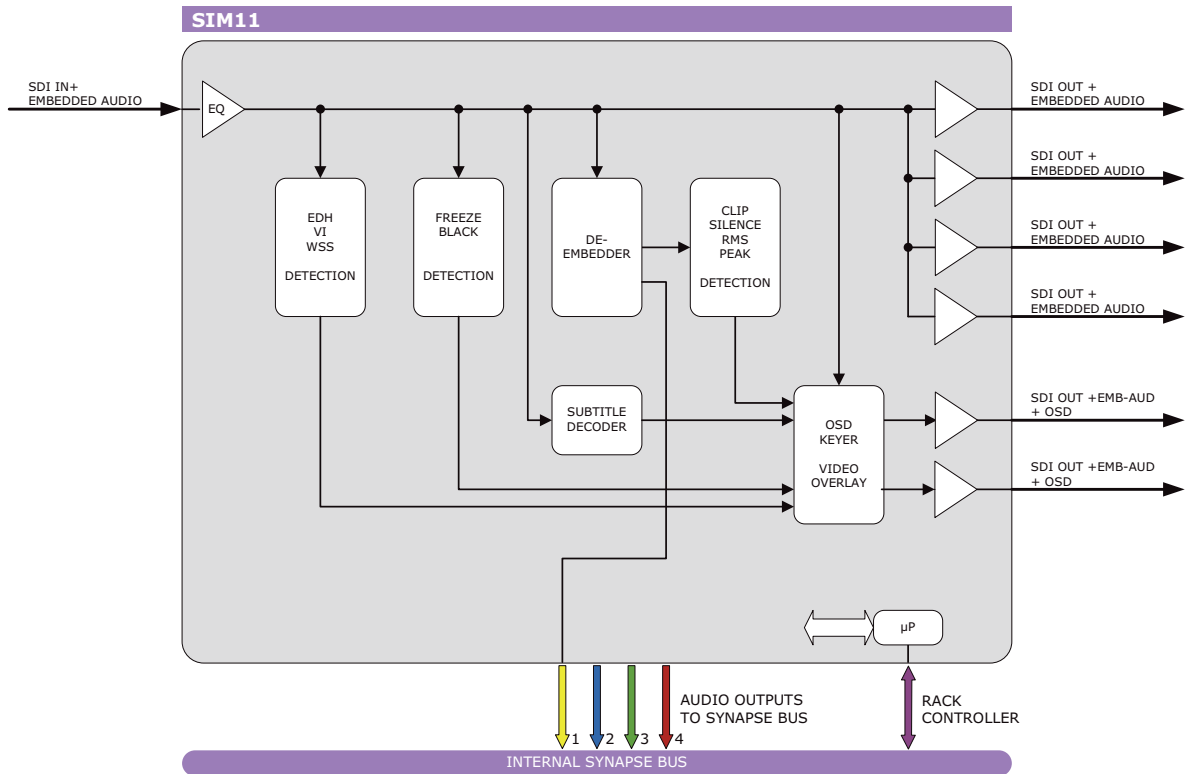
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts

SIM10





SIM11 SDI distribution amplifier checking and monitoring signal integrity (with OSD) + subtitle decoding

SIM11

The SIM11 is a 1 to 4 distribution amplifier that checks the integrity of a SDI signal, and displays the status of that SDI signal on two processed outputs; the other 4 outputs are re-clocked and de-jittered. The items that can be displayed are: name label, embedded audio channels, level bars, silence, freeze, black, EDH, VLI, WSS and Safe area. The name label is related to the card label. The level bars of the incoming channels are freely selectable and the scale of these bars is also selectable: EBU, BBC, NORDIC, VU. The user can select the level of reaction sensitivity of the items: Freeze frame, Black detection and Silence. All items can be switched off when it is not necessary to display them. On top of that the SIM11 can show a teletext derived subtitle.

- Teletext subtitle decoding and OSD keying
 - Subtitles in white or original colors
 - Adjustable Page selection (100 to 899)
 - Slicing clock adjustment
 - Slicing level adjustment (200 to 550 mV)
- 1 to 4 distribution amplifier
- 2 additional outputs with optional OSD information
- Detection of freeze frame with threshold and time adjustment
- Detection of Black with threshold and time adjustment
- Detection of audio silence with threshold and time adjustment
 - (-80 to -40 dBFS within 1-10 seconds)
- 4 (out of any 16) OSD audio bar graphs
- Adjustable colors in Bar ranges
- EBU, Nordic, BBC, VU and dBFS scales
- Safe area markers
 - 16:9_Full
 - 16:9 Shoot & Protect 4:3
 - 16:9 Shoot & Protect 14:9
 - 4:3 Shoot & Protect 14:9
 - 4:3 Action 14:9
 - 4:3 Graphics 14:9
- EDH, VI and WSS OSD status
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

Applications

- Generic station SDI distribution amplifier with probe function
 - With 6 outputs if no OSD is required
- Alarm probe with OSD / audio meters for monitor stacks
- OSD teletext decoding for monitor stacks

Ordering information

Module:

- **SIM11:** SDI distribution amplifier checking and monitoring signal integrity (with OSD), with subtitle decoding

Standard I/O:

- **BPL01_SIM11:** I/O panel for SIM11
- **BPX01_SIM11:** I/O panel for SIM11 with relay bypass

Fiber outputs:

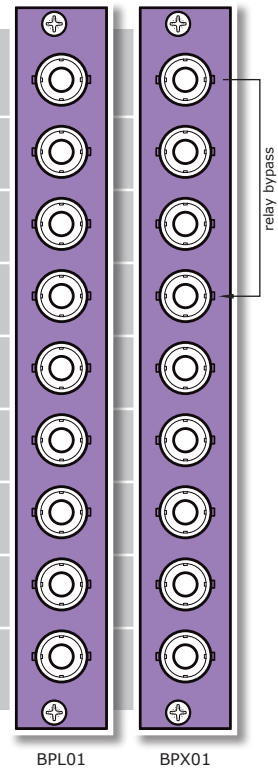
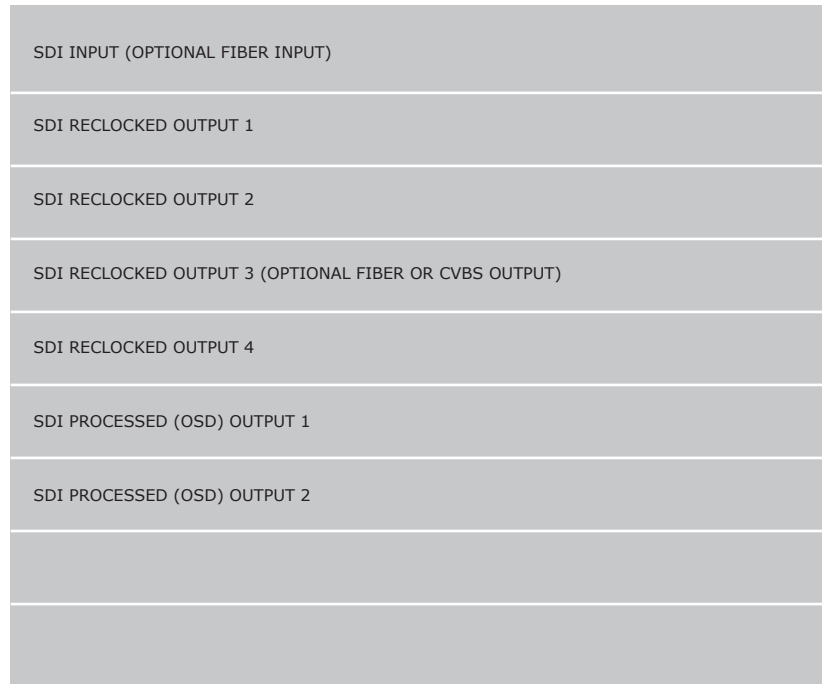
- **BPL01T_FC/PC_SIM11:** I/O panel for SIM11 with fiber transmitter on FC/PC
- **BPL01T_SC_SIM11:** I/O panel for SIM11 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_SIM11:** I/O panel for SIM11 with fiber receiver on FC/PC
- **BPL01R_SC_SIM11:** I/O panel for SIM11 with fiber receiver on SC

CVBS output:

- **BPL01C_SIM11:** I/O panel for SIM11 with CVBS output



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

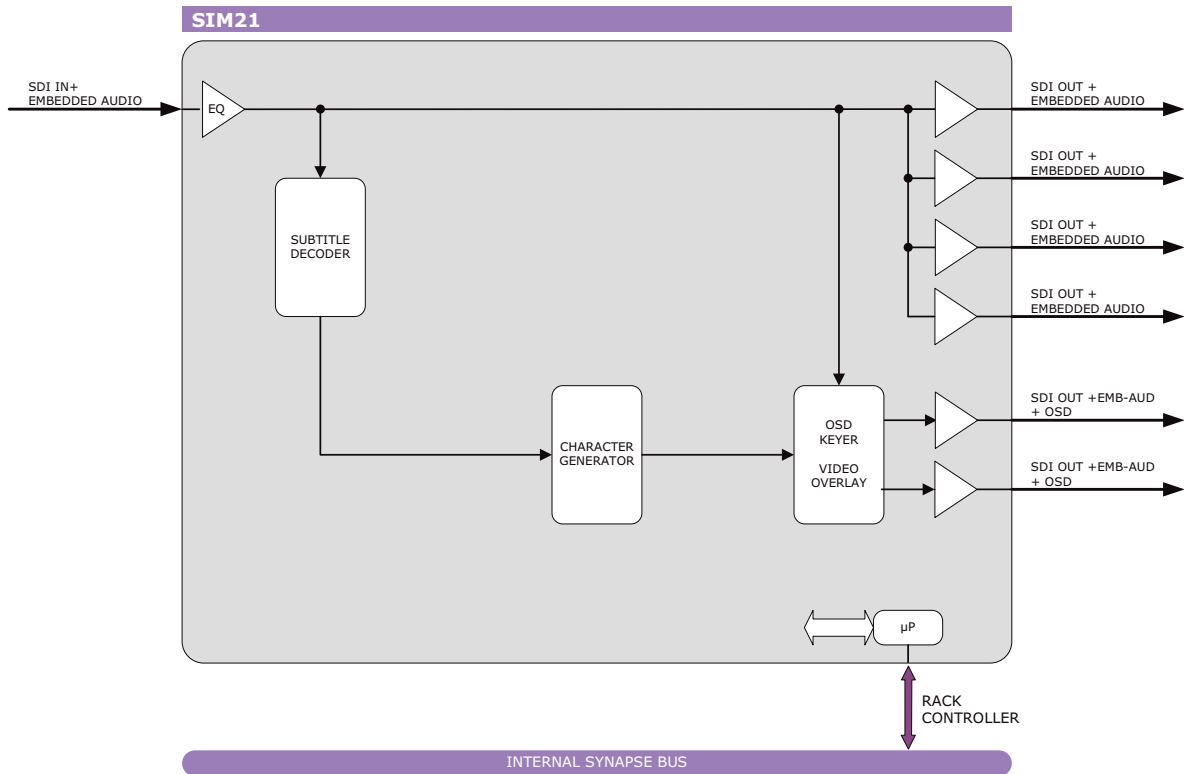
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	6 (2 processed and 4 reclocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



SIM21 SDI hearing aid subtitles decoder and inserter keyer from Teletext based subtitles

The SIM21 is a 1 to 4 distribution amplifier with teletext derived subtitle insertion in a quality suitable for transmission. This unit inserts and displays fully shaped fonts. Every individual character is designed and stored in memory for an optimum subtitle presentation with white characters on a dark (anti-aliased) background.

- Clean and rendered (transmission ready) subtitle keying from teletext based subtitles
- Manual 2 line subtitle insertion
- Adjustable page for decoding (100 to 899)
- Adjustable subtitle position (0 to 300 pix and 300 to 510 lines)
- Adjustable slicing frequency
- Adjustable slice level (200 to 550 mV)
- 1 to 4 distribution amplifier
- 2 outputs for OSD subtitle insertion
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

SIM21

Applications

- Transmission subtitle insertion out of teletext based subtitles

Ordering information

Module:

- **SIM21:** SDI hearing aid subtitles decoder and inserter keyer from Teletext base subtitles

Standard I/O:

- **BPL01_SIM21:** I/O panel for SIM21
- **BPX01_SIM21:** I/O panel for SIM21 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SIM21:** I/O panel for SIM21 with fiber transmitter on FC/PC
- **BPL01T_SC_SIM21:** I/O panel for SIM21 with fiber transmitter on SC

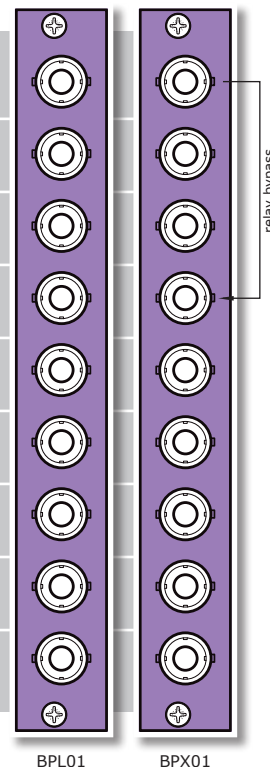
Fiber inputs:

- **BPL01R_FC/PC_SIM21:** I/O panel for SIM21 with fiber receiver on FC/PC
- **BPL01R_SC_SIM21:** I/O panel for SIM21 with fiber receiver on SC

CVBS output:

- **BPL01C_SIM21:** I/O panel for SIM21 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI RECLOCKED OUTPUT 3 (OPTIONAL FIBER OR CVBS OUTPUT)
SDI RECLOCKED OUTPUT 4
SDI PROCESSED (OSD) OUTPUT 1
SDI PROCESSED (OSD) OUTPUT 2



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

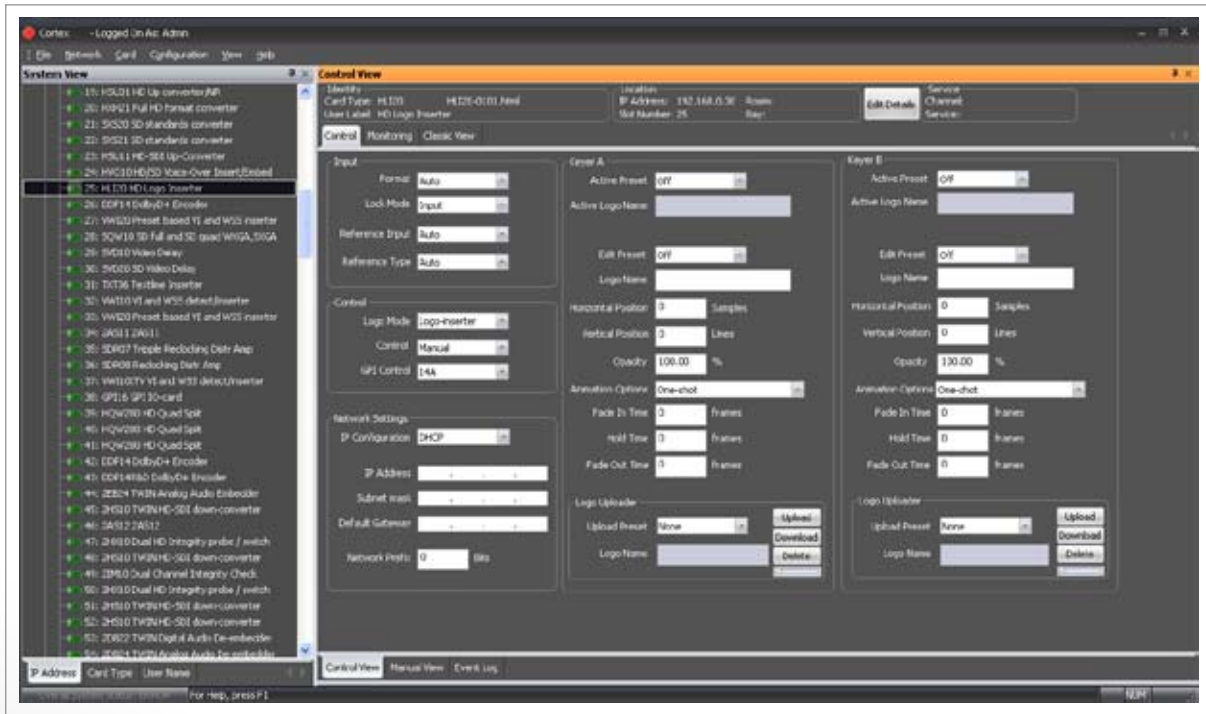
SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	6 (2 processed and 4 reclocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Miscellaneous

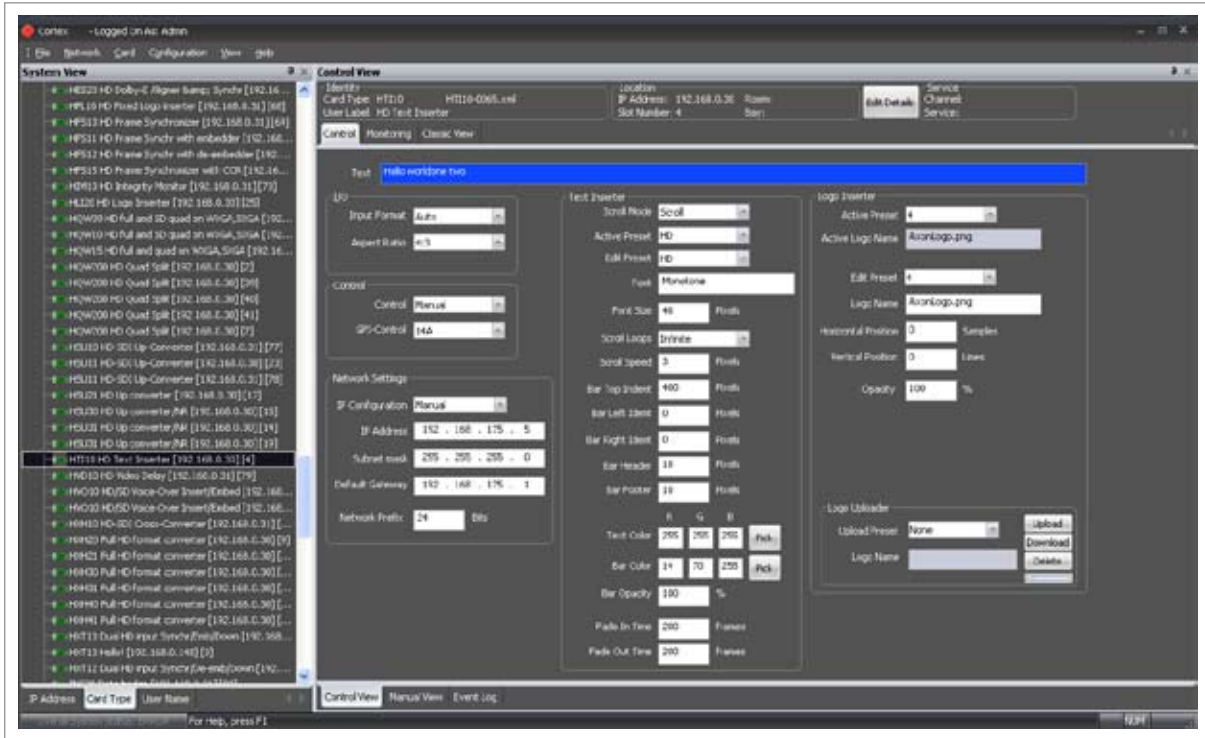
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<8 Watts

HLI20: Gives direct access for uploading and downloading images to the HLI20 card via WebDAV protocol. Shows the ability for control and status items to be shown on the same page as and when required.



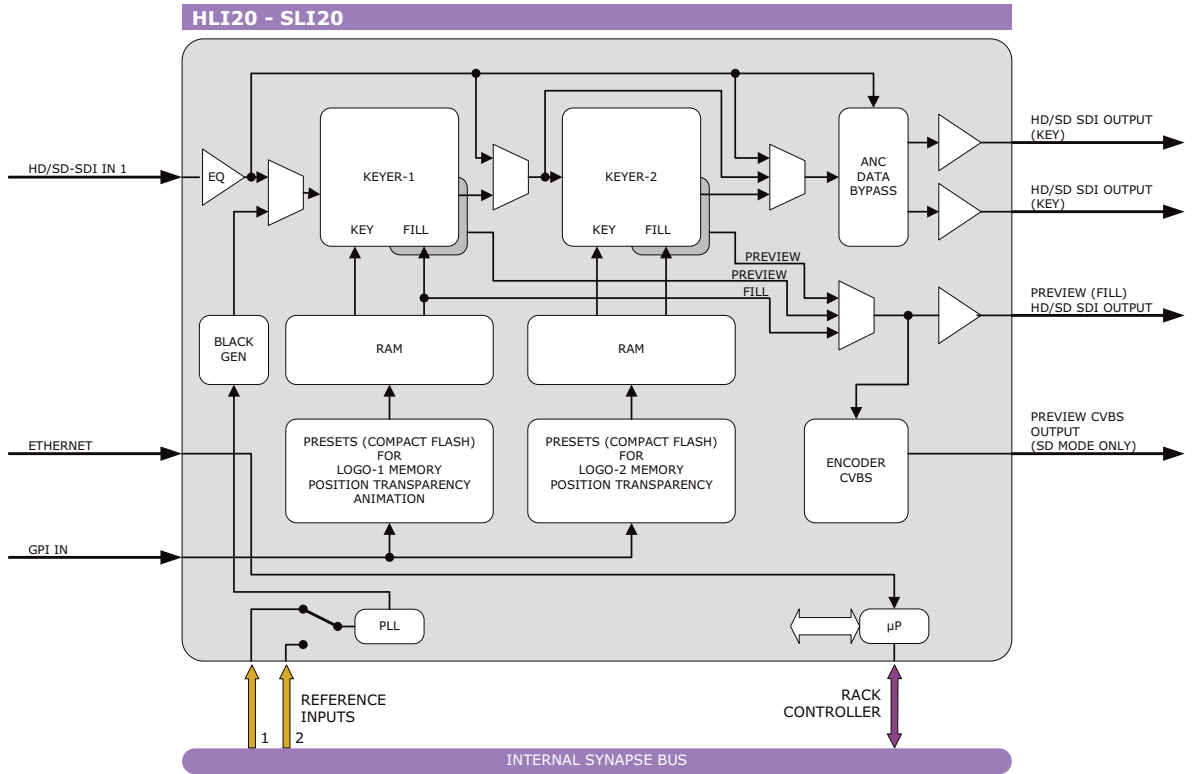
HLI20 - HTI10

HTI10: Shows the ability to show a mimic the output of the device, resultant text in the color chosen. The color can be optionally chosen using standard Windows Color selection dialogs. Again direct access for uploading and downloading images to the HTI10 card via WebDAV protocol.



HLI20 - HTI10





HLI20 - SLI20 HD/SD preset based dual logo inserter

The HLI20 and SLI20 are logo inserters, with a preset based logo recall function through a flexible user interface and a local storage, multiple logo's including animated ones can be selected through the synapse menu or GPI. The HLI20 is capable of inserting logo's into both HD and SD signals and the SLI20 is SD only.

The HLI20/SLI20 will be used for channel branding with the option to alter the main channel logo on the fly, preset based and simultaneously add a "theme logo" that is triggered as on shot with predefined fade in and fade out times.

- HD-SDI and SD-SDI compatible (SLI20 SD only)
- Formats HLI20:
 - 1080i/50/59.94
 - 720p/50/59.84
 - 625/50
 - 525/59.94
- Formats SLI20:
 - 625/50
 - 525/59.94
- Two individual logo inserters

- Logo A:
 - 16 presets for full HD logos, or 384x216 400 frames of animation with a maximum of 64Mpixels in total
 - H+V position
 - Transparency
 - Fade in time
 - Fade out time
 - Macro: fade in, hold, fade out and animation one shot or loop
- Logo B:
 - 32 presets for 384 x 216 with a maximum of 64 Mpixels in total
 - H+V position
 - Transparency
 - Fade in time
 - Fade out time
 - Macro: fade in, hold, fade out and animation one shot or loop
- BCD control of GPI with 5 GPIs + take for bank 1 (16) and 6 GPIs + take for bank 2 (32)
- Selectable priority GPI control for 14 contacts
- 2-level and 3-level sync compatible in generator mode
- Safety relay bypass when using a BHX04
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Logo uploading through dedicated Ethernet port on the BPH04/ BHX04 connector panel
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Channel branding
- Full screen static announcements
- Small animations and dynamic theme logo's

Ordering information

Module:

- **HLI20:** HD/SD preset based dual Logo Inserter
- **SLI20:** SD preset based dual Logo Inserter

Standard I/O:

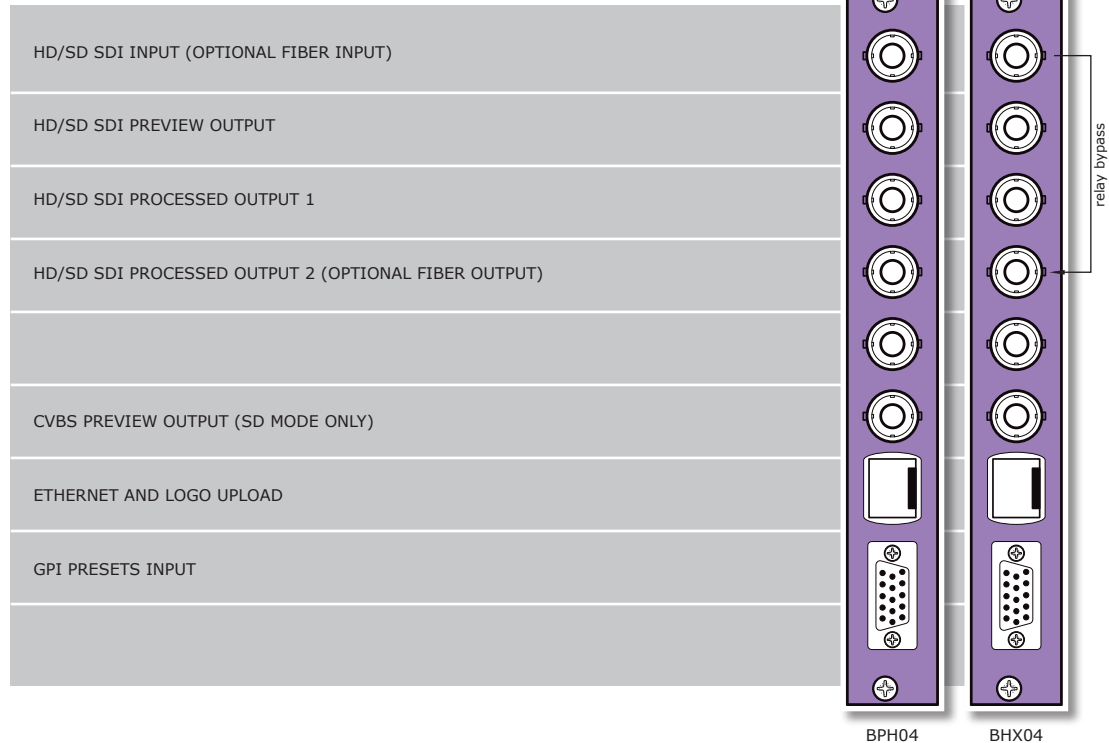
- **BPH04_HLI20:**
I/O-panel for HLI20
- **BHX04_HLI20:**
I/O-panel with relay bypass for HLI20
- **BPH04_SLI20:**
I/O-panel for SLI20
- **BHX04_SLI20:**
I/O-panel with relay bypass for SLI20

Fiber outputs:

- **BPH04T_FC/PC_HLI20:**
I/O-panel for HLI20 with fiber transmitter on FC/PC
- **BPH04T_SC_HLI20:**
I/O-panel for HLI20 with fiber transmitter on SC
- **BPH04T_FC/PC_SLI20:**
I/O-panel for SLI20 with fiber transmitter on FC/PC
- **BPH04T_SC_SLI20:**
I/O-panel for SLI20 with fiber transmitter on SC

Fiber inputs:

- **BPH04R_FC/PC_HLI20:**
I/O-panel for HLI20 with fiber receiver on FC/PC
- **BPH04R_SC_HLI20:**
I/O-panel for HLI20 with fiber receiver on SC
- **BPH04R_FC/PC_SLI20:**
I/O-panel for SLI20 with fiber receiver on FC/PC
- **BPH04R_SC_SLI20:**
I/O-panel for SLI20 with fiber receiver on SC



Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 1.5GHz

HD/SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude

Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Ethernet

Standard	10Base-T, 100Base-Tx IEEE 802.3
Connector	8P8C

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
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Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
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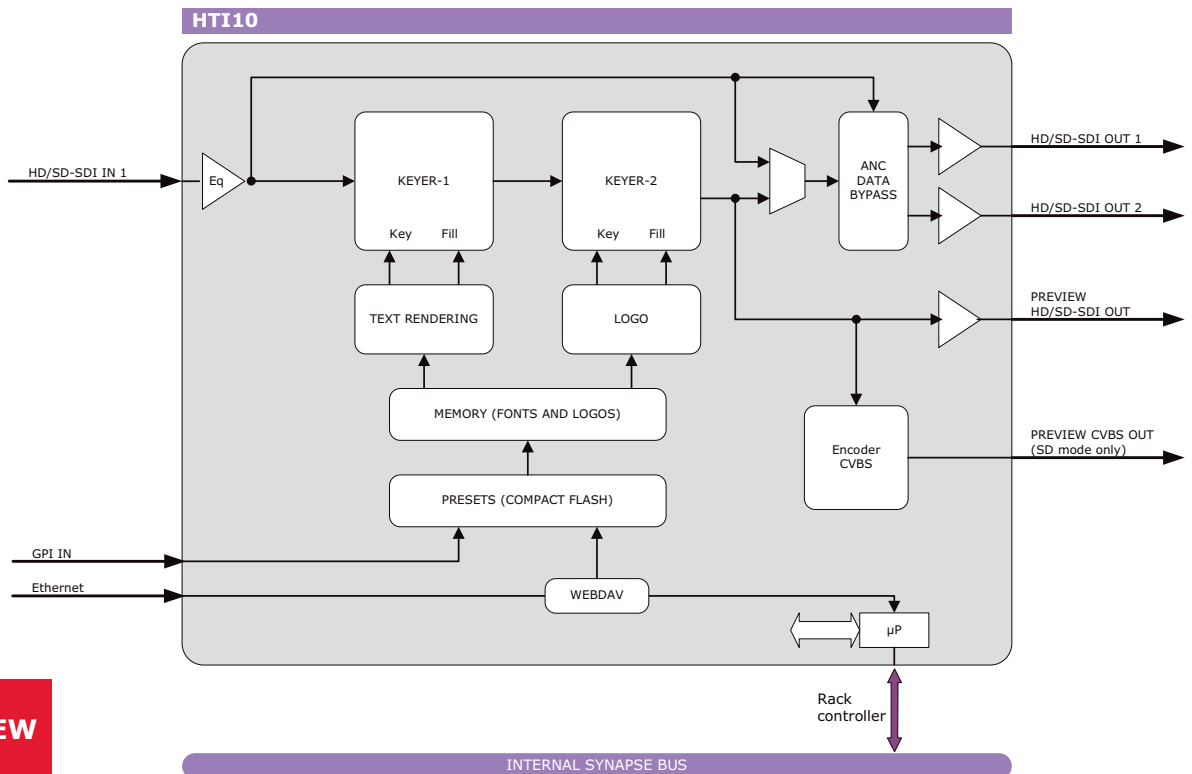
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<10 Watts



NEW

INTERNAL SYNAPSE BUS

HTI10 HD/SD-SDI preset based text inserter

The HTI10 is a universal emergency text inserter. An external pc (web) application provides for the possibility to insert a text on top of a partial back ground.

The HTI10 will be used in a transmission chain where the viewer will be prompted by an important message that scrolls x-times over the video with several user adjustable parameters.

- Insert scrolling text and/or a logo over HD or SD SDI video
- Formats:
 - 1080i/50/59.94
 - 720p/50/59.84
 - 625/50
 - 525/59.94
- Preview output for evaluation of result
- Adjustable parameters for text:
 - Background color (individual for HD and SD)
 - Background geometry (individual for HD and SD)
 - Background opacity (individual for HD and SD)
 - User definable text
 - Font
 - Font size (individual for HD and SD)
 - Font color
 - Scroll speed
 - Scroll loops (1, 2, 3, infinite)

- Insert on/off
- Fade-In and Fade-Out length
- Adjustable parameters for logos:
 - Position
 - Transparency
 - Fade-In and Fade-Out length
- HD preview in HD-SDI only
- SD preview in SDI and CVBS
- GPI on/off
- Full control and status monitoring through the front panel of the SFR04/18 frame and the Ethernet port (ACP)
- Full control and logo/font uploading through dedicated Ethernet port on the BPH04 connector panel
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

HTI10

Applications

- (Emergency) Text inserter
- Bug/logo inserter
- Full screen static announcements

Ordering information

Module:

- **HTI10:** HD/SD-SDI preset based text inserter

Standard I/O:

- **BPH04_HTI10:** I/O-panel for HTI10
- **BHX04_HTI10:** I/O-panel with relay bypass for HTI10

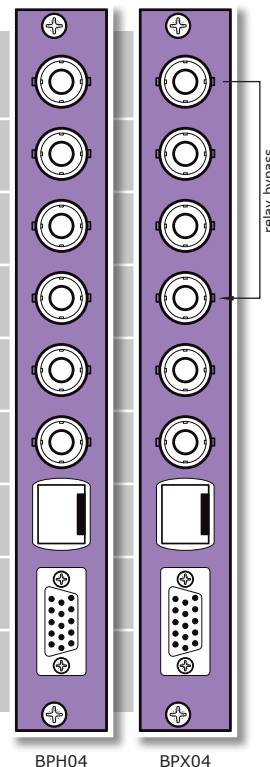
Fiber outputs:

- **BPH04T_FC/PC_HTI10:** I/O-panel for HTI10 with fiber transmitter on FC/PC
- **BPH04T_SC_HTI10:** I/O-panel for HTI10 with fiber transmitter on SC

Fiber inputs:

- **BPH04R_FC/PC_HTI10:** I/O-panel for HTI10 with fiber receiver on FC/PC
- **BPH04R_SC_HTI10:** I/O-panel for HTI10 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI PREVIEW OUTPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
CVBS PREVIEW OUTPUT (SD MODE ONLY)
CONTROL AND UPLOAD (ETHERNET)
GPI PRESETS



Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

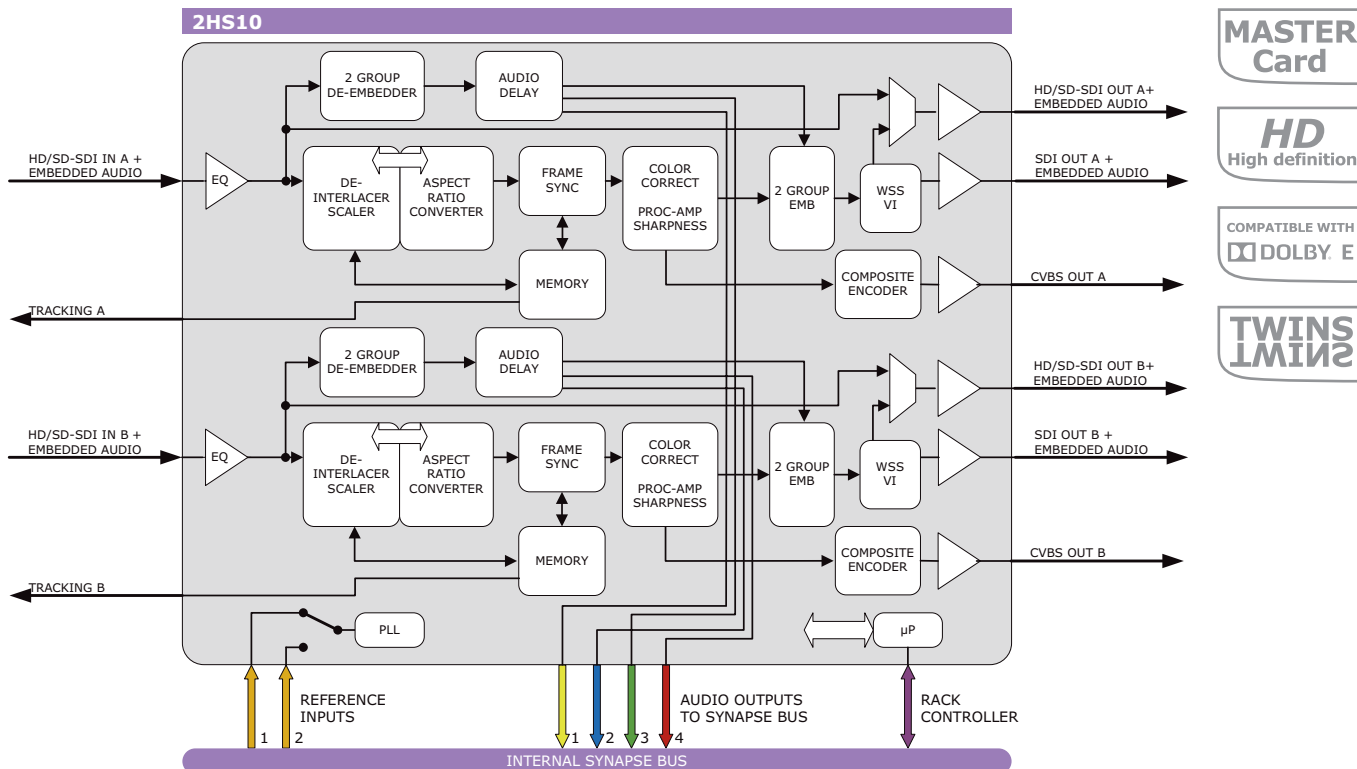
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<10 Watts



2HS10 Dual channel high-end HD-SDI to SD-SDI/composite down converter with de-embedding function

The 2HS10 is a dual channel ultra high-quality down converter. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native HD source, by the use of a 64 tap FIR filters. The 2HS10 will allow you to simulcast SD signals from a native HD infrastructure. The embedded audio is carried over into the SD domain; the appropriate aspect ratio can be applied and the correct VI or WSS data can be added. Each channel has a composite monitoring output. Each channel has a 2 group de-embedder which lets you de-embed audio to the Synapse bus.

- 2 independent channels, these have to be the same format
- Frame-synchronizer on SD outputs with control of H and V delay
- HD-SDI or SD-SDI input (auto selecting)
- 1080i or 720p 50 to 625/50
- 1080i or 720p 59.94 to 525/59.94
- 1080p or 720p 25 to 625/50
- 1080p or 720p 29.97 to 525/59.94
- 1080p or 720p 23.98 to 525/59.94
- Correct color space conversion (709-601)
- 3 outputs per channel
 - 1 HD/SD selectable output
 - 1 SD output
 - 1 CVBS output
- Built-in ARC for 4:3 pan-scan, 14:9, 16:9 letterbox and anamorphic output formats
- Built-in color corrector
- H+V sharpness control (picture enhancements)
- Proc-amp and color corrector
- De-embeds 8 channels of audio to the Synapse internal bus
- Fully independent WSS and VI insertion
- 4:3 Safe area generator on SD-SDI output
- I/O delay measurement
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel

Applications

- Broadcast quality down conversion with monitoring function
- Generic (monitoring) down conversion
- Down conversion with analog or digital audio embedding (requires an additional ADD-ON card such as the DIO24)
- High density applications as in OB-Trucks

Ordering information

Module:

- **2HS10:** Dual channel high-end HD-SDI to SD-SDI / composite down converter with de-embedding function

Standard I/O:

- **BPH05_2HS10:** I/O-panel for 2HS10

Fiber outputs:

- **BPH05T2_FC/PC_2HS10:** I/O-panel for 2HS10 with 2 fiber transmitter on FC/PC
- **BPH05T2_SC_2HS10:** I/O-panel for 2HS10 with 2 fiber transmitter on SC

Fiber inputs:

- **BPH05R2_FC/PC_2HS10:** I/O-panel for 2HS10 with 2 fiber receiver on FC/PC
- **BPH05R2_SC_2HS10:** I/O-panel for 2HS10 with 2 fiber receiver on SC

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Number of inputs	2 (1 per channel)
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD/SD serial video output

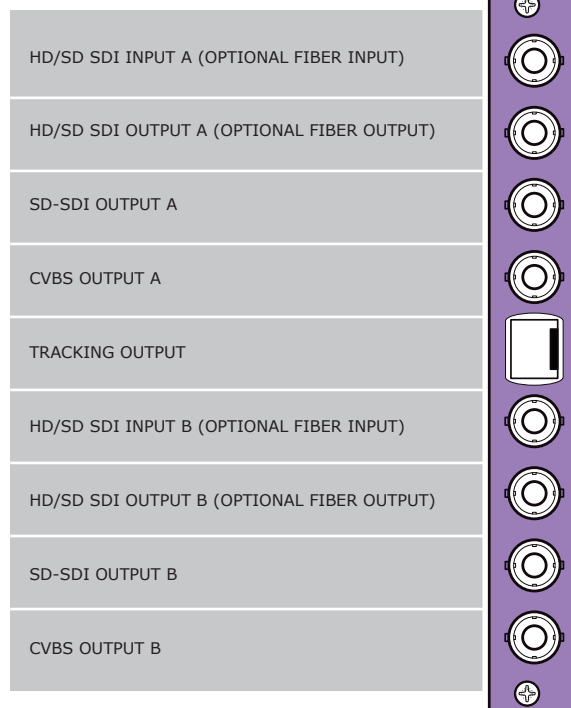
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
-----------------	---

Number of outputs	2 (1 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
-----------------	---

Number of outputs	2 (1 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz
Return loss	> 15dB at 270Mb/s
Wideband jitter	< 0.2UI
Video delay	minimum of 56 SD lines, maximum 1F +56 lines



For fiber connectivity see www.axon.tv

BPH05

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M)
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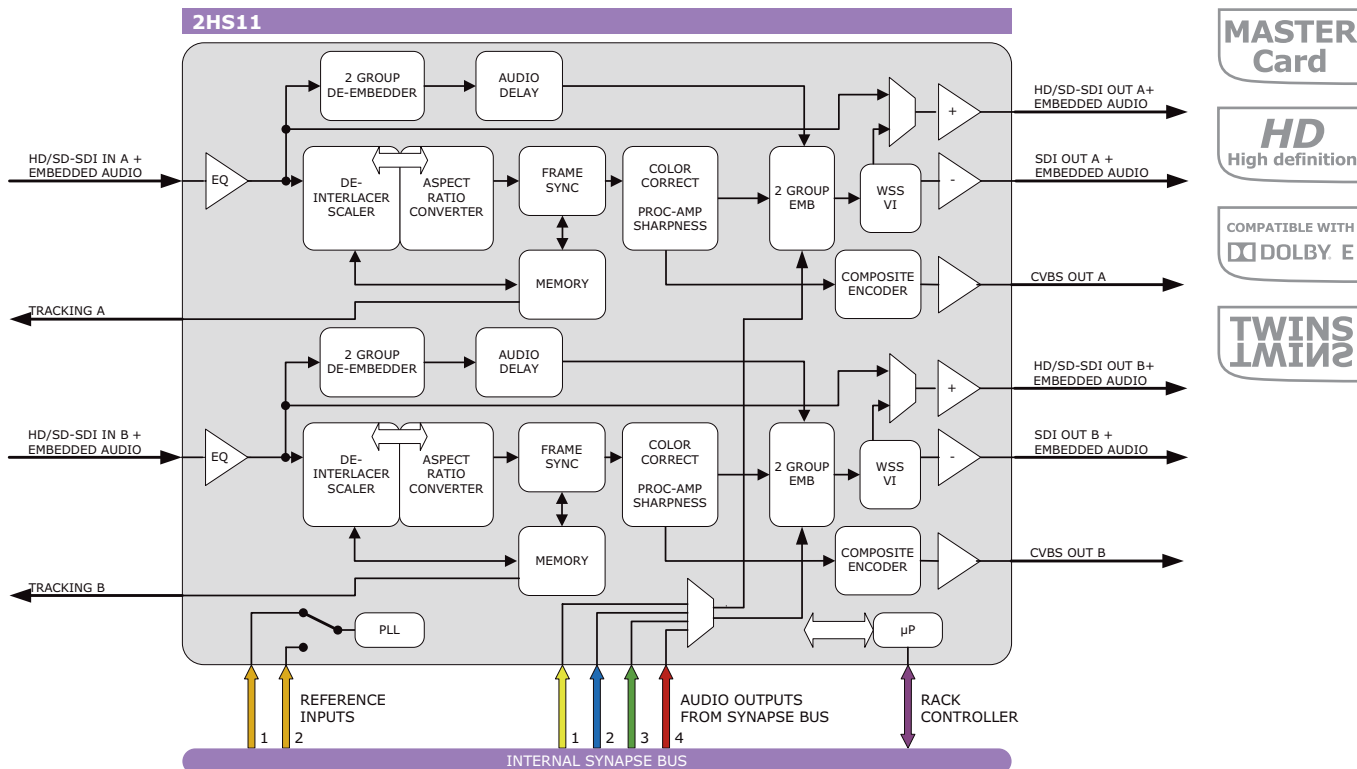
Number of outputs	2 (1 per channel)
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<12 Watts



2HS11 Dual channel high-end HD-SDI to SD-SDI/composite down converter with embedding function

The 2HS11 is a dual channel ultra high-quality down converter. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native HD source, by the use of a 64 tap FIR filters. The 2HS11 will allow you to simulcast SD signals from a native HD infrastructure. The embedded audio is carried over into the SD domain; the appropriate aspect ratio can be applied and the correct VI or WSS data can be added. Each channel has a composite monitoring output. Each channel has a 2 group embedder which lets you embed audio from the Synapse bus.

- 2 independent channels, these have to be the same format
- Frame-synchronizer on SD outputs with control of H and V delay
- HD-SDI or SD-SDI input (auto selecting)
- 1080i or 720p 50 to 625/50
- 1080i or 720p 59.94 to 525/59.94
- 1080p or 720p 25 to 625/50
- 1080p or 720p 29.97 to 525/59.94
- 1080p or 720p 23.98 to 525/59.94
- Correct color space conversion (709-601)
- 3 outputs per channel
 - 1 HD/SD selectable output
 - 1 SD output
 - 1 CVBS output
- Built-in ARC for 4:3 pan-scan, 14:9, 16:9 letterbox and anamorphic output formats
- Built-in color corrector
- H+V sharpness control (picture enhancements)
- Proc-amp and color corrector
- Embeds 8 channels of audio from the Synapse internal bus
- Fully independent WSS and VI insertion
- 4:3 Safe area generator on SD-SDI output
- I/O delay measurement
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 2 fiber inputs (replacing 2 SDI inputs) or 2 fiber outputs (replacing 2 SDI outputs) on I/O panel

Applications

- Broadcast quality down conversion with monitoring function
- Generic (monitoring) down conversion
- Down conversion with analog or digital audio embedding (requires an additional ADD-ON card such as the DIO24)
- High density applications as in OB-Trucks

Ordering information

Module:

- **2HS11:** Dual channel high-end HD-SDI to SD-SDI / composite down converter with embedding function

Standard I/O:

- **BPH05_2HS11:** I/O-panel for 2HS11

Fiber outputs:

- **BPH05T2_FC/PC_2HS11:** I/O-panel for 2HS11 with 2 fiber transmitter on FC/PC
- **BPH05T2_SC_2HS11:** I/O-panel for 2HS11 with 2 fiber transmitter on SC

Fiber inputs:

- **BPH05R2_FC/PC_2HS11:** I/O-panel for 2HS11 with 2 fiber receiver on FC/PC
- **BPH05R2_SC_2HS11:** I/O-panel for 2HS11 with 2 fiber receiver on SC

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
-----------------	---

Number of inputs	2 (1 per channel)
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD/SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
-----------------	---

Number of outputs	2 (1 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2 (1 per channel)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz
Return loss	> 15dB at 270Mb/s
Wideband jitter	< 0.2UI
Video delay	minimum of 56 SD lines, maximum 1F +56 lines

HD/SD SDI INPUT A (OPTIONAL FIBER INPUT)
HD/SD SDI OUTPUT A (OPTIONAL FIBER OUTPUT)
SD-SDI OUTPUT A
CVBS OUTPUT A
TRACKING OUTPUT
HD/SD SDI INPUT B (OPTIONAL FIBER INPUT)
HD/SD SDI OUTPUT B (OPTIONAL FIBER OUTPUT)
SD-SDI OUTPUT B
CVBS OUTPUT B

For fiber connectivity see www.axon.tv



BPH05

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M)
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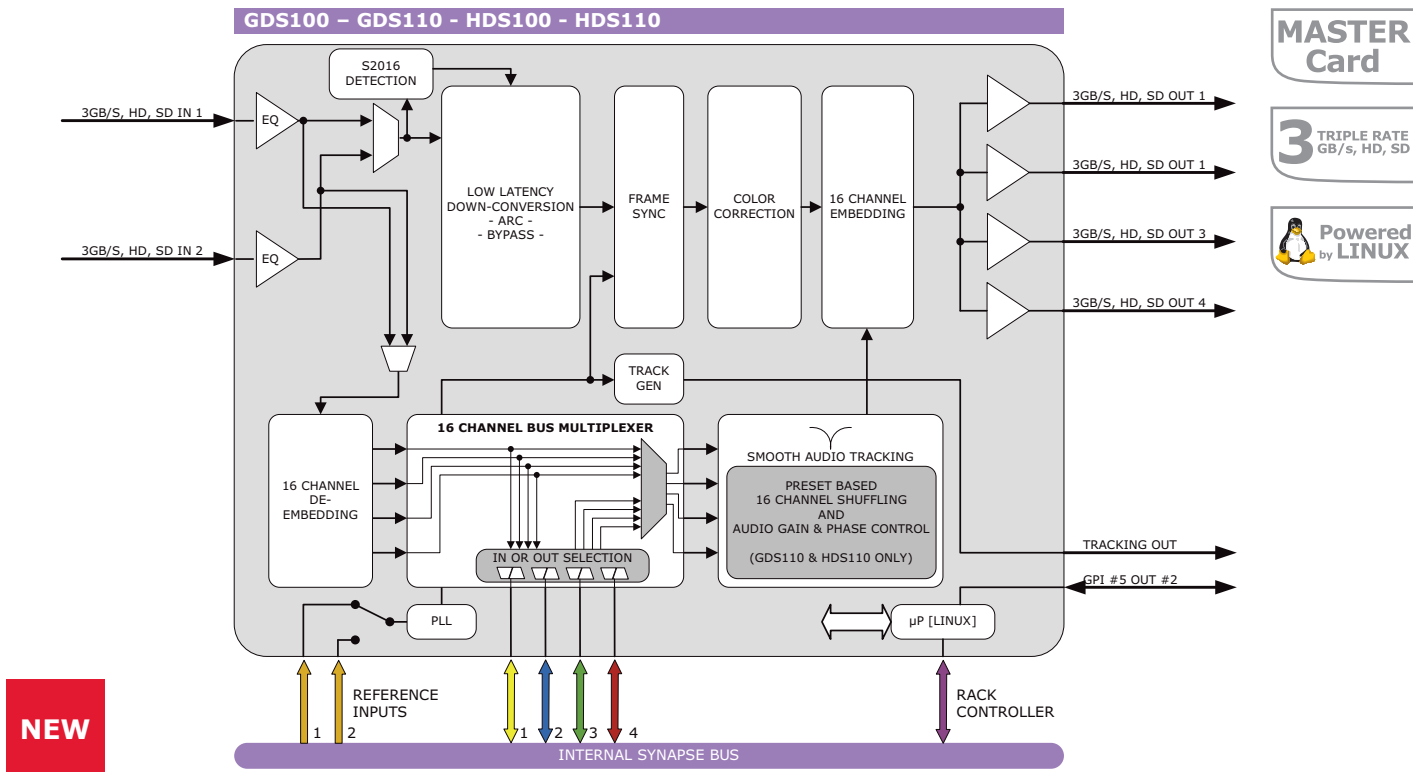
Number of outputs	2 (1 per channel)
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<12 Watts



NEW

GDS100 - GDS110 - HDS100 - HDS110 3Gb/s, HD, SD down converter/ synchronizer with optional audio shuffler

The GDS100/110 and HDS100/110 are low latency down converters with 16 channel audio transparency. The powerful matrix multiplexer can feed audio from the embedded domain into the Synapse bus to an ADD-ON card like the DIO48. This matrix multiplexer also allows for audio to be inserted from the ADD-ON bus into the embedded domain of the GDS100/110 or HDS100/110.

The GDS110 or HDS110 add a full audio shuffler and audio proc-amp with gain and phase control.

The GDS100/110 are compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use. The HDS100/110 are compatible with SD-SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility.

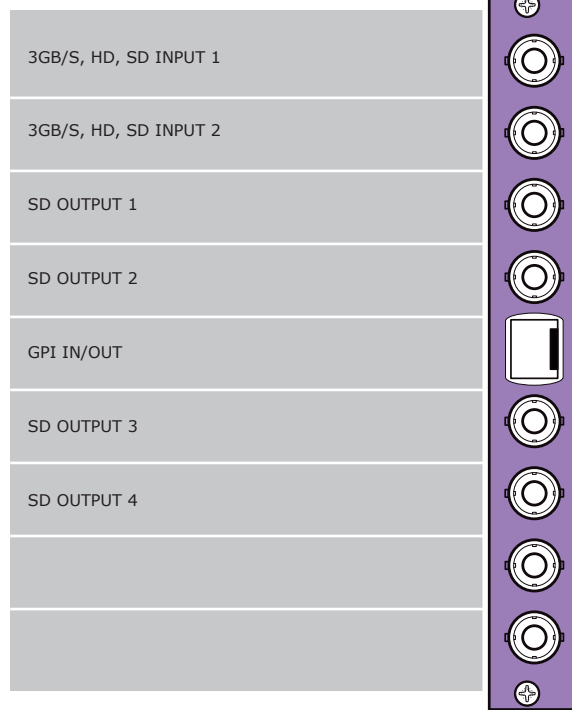
- Low latency conversion process (as low as 1 field in controlled timing environment)
- Down-conversion from 2 selectable SDI inputs
- Down conversion (including 1080p to SD-SDI)
- 5 GPI inputs for ARC and Shuffle triggers
- Transparent for 16 channels of embedded audio
- Embedded domain audio shuffling, gain and phase control (GDS - HDS110 only)
- Embedding through synapse bus
- De-embedding to Synapse bus with transparent input to output handling
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Hue control for NTSC inputs
- Compatible with:
 - 270 Mbit/s (SMPTE 259M) 50 and 59.94Hz
 - 1485 Mbit/s (SMPTE 292M) 50 and 59.94Hz
 - 2970 Mbit/s (SMPTE 424M) 50 and 59.94Hz (GDS100/110 only)

Conversion abilities

The GDS-HDS100/110 can handle the following conversions:

CONVERSION	Output														
	1080p29.97	1080p25	1080p23.97	1035i59.97	1080p50*	1080p59.94*	1080i59.94	1080i50	720p59.94	720p50	720p29.97	720p25	720p23.98	480i59.94(525)	576i50(625)
1080p29.97	■													■	
1080p25		■													■
1080p23.97			■											■	
1035i59.97				■										■	
1080p50*					■										■
1080p59.94*						■								■	
1080i59.94							■							■	
1080i50								■						■	
720p59.94									■					■	
720p50										■				■	
720p29.97											■			■	
720p25												■		■	
720p23.98													■	■	
480i59.94(525)														■	
576i50(625)															■

* = GDS models only



BPH17

Applications

- Transmission output down conversion with backup input

Ordering information

Module:

- **GDS100:** 3Gb/s, HD, SD down converter
- **GDS110:** 3Gb/s, HD, SD down converter with audio shuffler proc-amp
- **HDS100:** HD, SD down converter*
- **HDS110:** HD, SD down converter with audio shuffler proc-amp*

Standard I/O:

- **BPH17_GDS100:** I/O-panel for GDS100 with RJ45 GPI/O
- **BPH17_GDS110:** I/O-panel for GDS110 with RJ45 GPI/O
- **BPH17_HDS100:** I/O-panel for HDS100 with RJ45 GPI/O
- **BPH17_HDS110:** I/O-panel for HDS110 with RJ45 GPI/O

* Upgradeable to 3GB/s

Specifications

Serial video input

Standard	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
Number of inputs	2
Connector	BNC
Equalization	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
Return loss	> 15dB up to 1.5GHz

Serial video output

Number of outputs	4
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	135ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.5GHz (typ.) > 10dB up to 3GHz (typ.)
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 450g
Operating temperature	0 °C to +40 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

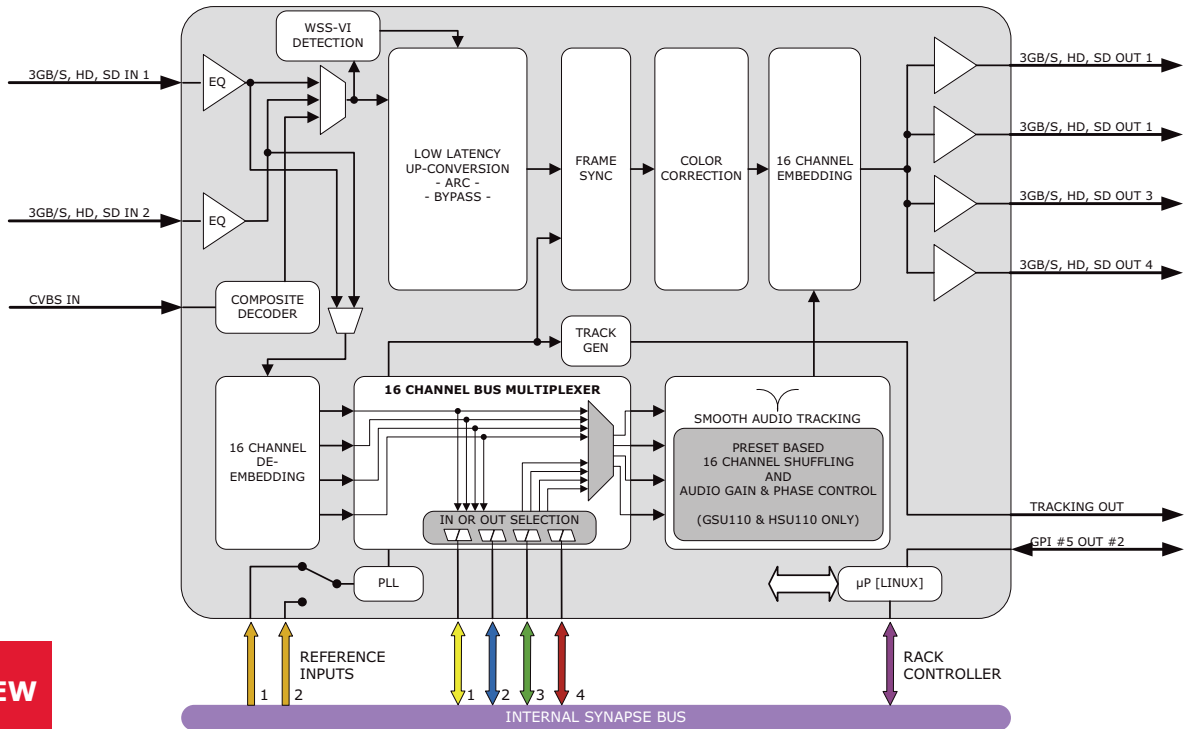
Electrical

Voltage	+24V to +30V
Power	<17 Watts

GDS100 - GDS110
HDS100 - HDS110



GSU100 - GSU110 - HSU100 - HSU110



MASTER Card

3 TRIPLE RATE GB/s, HD, SD

Powered by **LINUX**

NEW

GSU100 - GSU110 - HSU100 - HSU110 3Gb/s, HD, SD up converter/synchronizer with optional audio shuffler

The GSU100/110 and HSU100/110 are low latency up, converters with 16 channel audio transparency. The powerful matrix multiplexer can feed audio from the embedded domain into the Synapse bus to an ADD-ON card like the DIO48. This matrix multiplexer also allows for audio to be inserted from the ADD-ON bus into the embedded domain of the GSU100/110 or HSU100/110.

The GSU110 or HSU110 add a full audio shuffler and audio proc-amp with gain and phase control.

The GSU100/110 are compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use. The HSU100/110 are compatible with SD-SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility.

- Color corrector (RGB and total gain, RGB and total black)
- Hue control for NTSC inputs
- Compatible with:
 - 270 Mbit/s (SMPTE 259M) 50 and 59.94Hz
 - 1485 Mbit/s (SMPTE 292M) 50 and 59.94Hz
 - 2970 Mbit/s (SMPTE 424M) 50 and 59.94Hz (GSU100/110 only)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Conversion abilities

See page 257.

- Low latency conversion process (as low as 6ms in controlled timing environment)
- Up conversion from 2 selectable SDI inputs or a CVBS input
- 5 GPI inputs for ARC and Shuffle triggers
- Transparent for 16 channels of embedded audio
- Embedded domain audio shuffling, gain and phase control (GSU - HSU110 only)
- Embedding through synapse bus
- De-embedding to Synapse bus with transparent input to output handling
- Video proc-amp (Y and C control)

GSU100 - GSU110
HSU100 - HSU110

Applications

- Truck input up converter/ synchronizer
- Infra structure up/down/ cross conversion

Ordering information

Module:

- **GSU100:** 3Gb/s, HD, SD-SDI up converter
- **GSU110:** 3Gb/s, HD, SD-SDI up converter with audio shuffler proc-amp
- **HSU100:** HD, SD-SDI up converter*
- **HSU110:** HD, SD-SDI up converter with audio shuffler proc-amp*

Standard I/O:

- **BPH17_GSU100:**
I/O-panel for GSU100 with RJ45 GPI/O
- **BPH17_GSU110:**
I/O-panel for GSU110 with RJ45 GPI/O
- **BPH17_HSU100:**
I/O-panel for HSU100 with RJ45 GPI/O
- **BPH17_HSU110:**
I/O-panel for HSU110 with RJ45 GPI/O

* Upgradeable to 3Gb/s

3GB/S, HD, SD INPUT 1
3GB/S, HD, SD INPUT 2
3GB/S, HD OUTPUT 1
3GB/S, HD OUTPUT 2
GPI INPUT/OUTPUT
3GB/S, HD OUTPUT 3
3GB/S, HD OUTPUT 4
CVBS INPUT



BPH17

Specifications

Serial video input

Standard	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
Number of inputs	2
Connector	BNC
Equalization	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
Return loss	> 15dB up to 1.5GHz

CVBS video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	3 lines

Serial video output

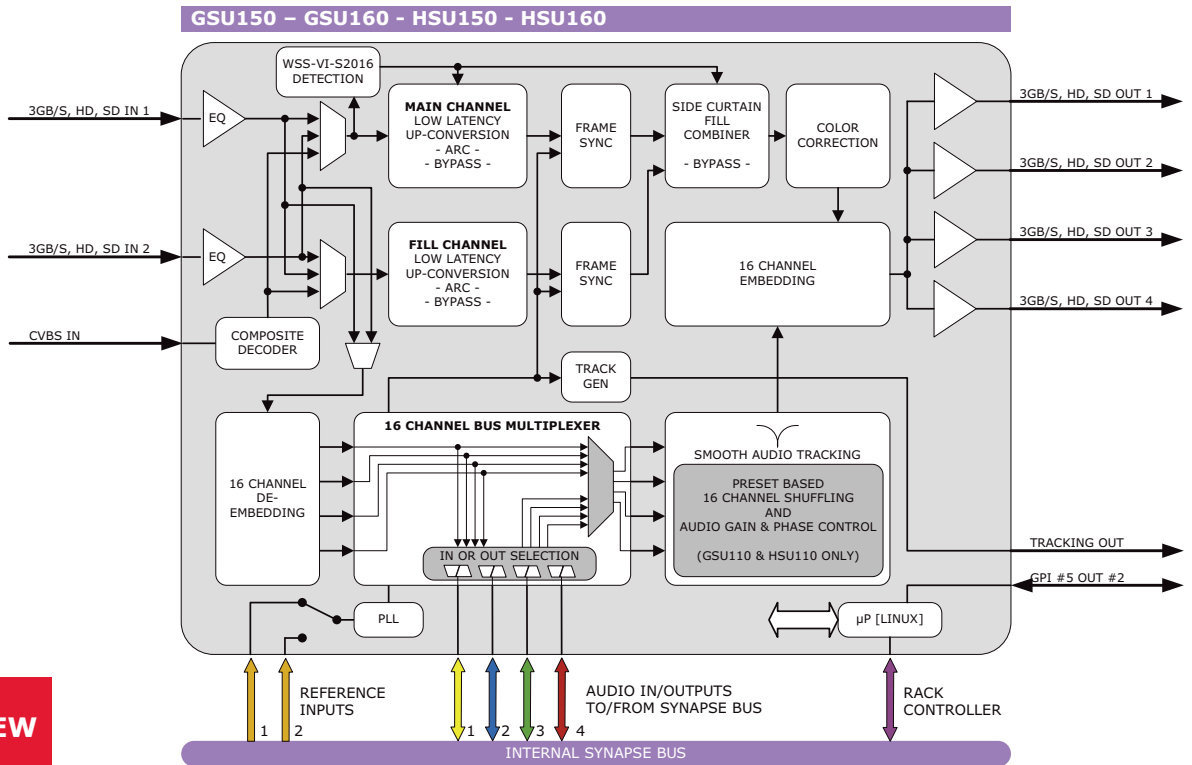
Number of outputs	4
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	135ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.5GHz (typ) > 10dB up to 3GHz (typ)
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 450g
Operating temperature	0 °C to +40 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<17 Watts

MASTER
Card3 TRIPLE RATE
Gb/s, HD, SDPowered
by LINUX

GSU150 - GSU160 - HSU150 - HSU160 3Gb/s, HD, SD up converter/synchronizer with side curtain input and optional audio shuffler

The GSU150/160 and HSU150/160 are low latency up, down, cross converters with 16 channel audio transparency. The powerful audio matrix multiplexer can transport audio from the embedded domain to the Synapse bus and vice versa.

The GSU160 or HSU160 add a full audio shuffler and audio proc-amp with gain and phase control.

The GSU150/160 are compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use. The HSU150/160 are compatible with SD-SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility.

- Low latency conversion process (as low as 6ms in controlled timing environment)
- Up conversion from 2 selectable SDI inputs or a CVBS input
- 5 GPI inputs for ARC and Shuffle triggers
- Transparent for 16 channels of embedded audio
- Side wing/curtain up-conversion for 4:3 pillarbox on graphics background
- Embedded domain audio shuffling, gain and phase control (GSU - HSU160 only)
- Embedding through synapse bus
- De-embedding to Synapse bus with transparent input to output handling
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Hue control for NTSC inputs
- Compatible with:
 - 270 Mbit/s (SMPTE 259M) 50 and 59.94Hz
 - 1485 Mbit/s (SMPTE 292M) 50 and 59.94Hz
 - 2970 Mbit/s (SMPTE 424M) 50 and 59.94Hz (GSU150/160 only)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

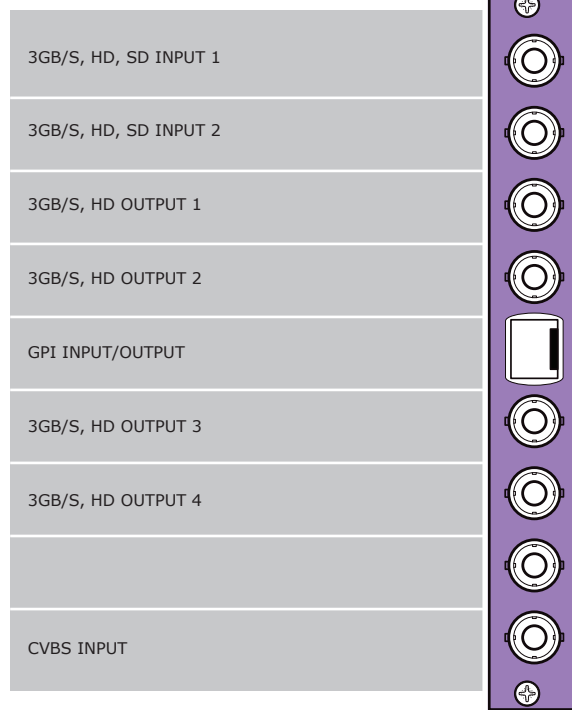
* Upgradeable to 3Gb/s

Conversion abilities

The G-HSU150/160 cards are able to convert the following video formats:

CONVERSION		Output														
		1080p29.97	1080p25	1080p23.97	1035i59.97	1080p50*	1080p59.94*	1080i59.94	1080i50	720p59.94	720p50	720p29.97	720p25	720p23.98	480i59.94(525)	576i50(625)
Input 1 or 2	1080p29.97	■														
	1080p25		■													
	1080p23.97			■												
	1035i59.97				■											
	1080p50*					■										
	1080p59.94*						■									
	1080i59.94							■								
	1080i50								■							
	720p59.94									■						
	720p50										■					
	720p29.97											■				
	720p25												■			
	720p23.98													■		
	CVBS	480i59.94(525)	■	■	■	■	■	■	■	■	■	■	■	■	■	■
576i50(625)			■			■			■			■		■		■
480i59.94(NTSC)		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	576i50(PAL)	■				■			■			■		■		■

* = GSU models only



BPH17

Applications

- Truck input up converter/synchronizer
- Infra structure up/down/cross conversion
- Up conversion with side-fill/curtain input

Ordering information

Module:

- **GSU150:** 3Gb/s, HD, SD-SDI up converter
- **GSU160:** 3Gb/s, HD, SD-SDI up with audio shuffler proc-amp
- **HSU150:** HD, SD-SDI up converter*
- **HSU160:** HD, SD-SDI up converter with audio shuffler proc-amp*

Standard I/O:

- **BPH17_GSU150:** I/O-panel for GSU150 with RJ45 GPI/O
- **BPH17_GSU160:** I/O-panel for GSU160 with RJ45 GPI/O
- **BPH17_HSU150:** I/O-panel for HSU150 with RJ45 GPI/O
- **BPH17_HSU160:** I/O-panel for HSU160 with RJ45 GPI/O

Specifications

Serial video input

Standard SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424

Number of inputs 2

Connector BNC

Equalization Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s

Return loss > 15dB up to 1.5GHz

CVBS video input

Standard PAL (ITU624-4), NTSC (SMPTE 170M)

Number of inputs 1

Impedance 75 Ohms

Return loss > 35dB up to 10MHz

Frequency response < ±0.25dB (100KHz to 4.2MHz)

Differential gain < ±0.5% typical

Differential phase < ±0.2° typical

Noise floor < -57dB RMS (black video, 15KHz to 5MHz)

C/L gain < ±0.5%

C/L delay < ±9ns

Minimum delay 3 lines

Serial video output

Number of outputs 4

Connector BNC

Signal level 800mV nominal

DC offset 0V ±0.5V

Rise/fall time 135ps nominal

Overshoot < 10% of amplitude

Return loss > 15dB up to 1.5GHz (typ)
> 10dB up to 3GHz (typ)

Wideband jitter < 0.2UI

Miscellaneous

Weight Approx. 450g

Operating temperature 0 °C to +40 °C

Dimensions 137 x 296 x 20 mm (HxWxD)

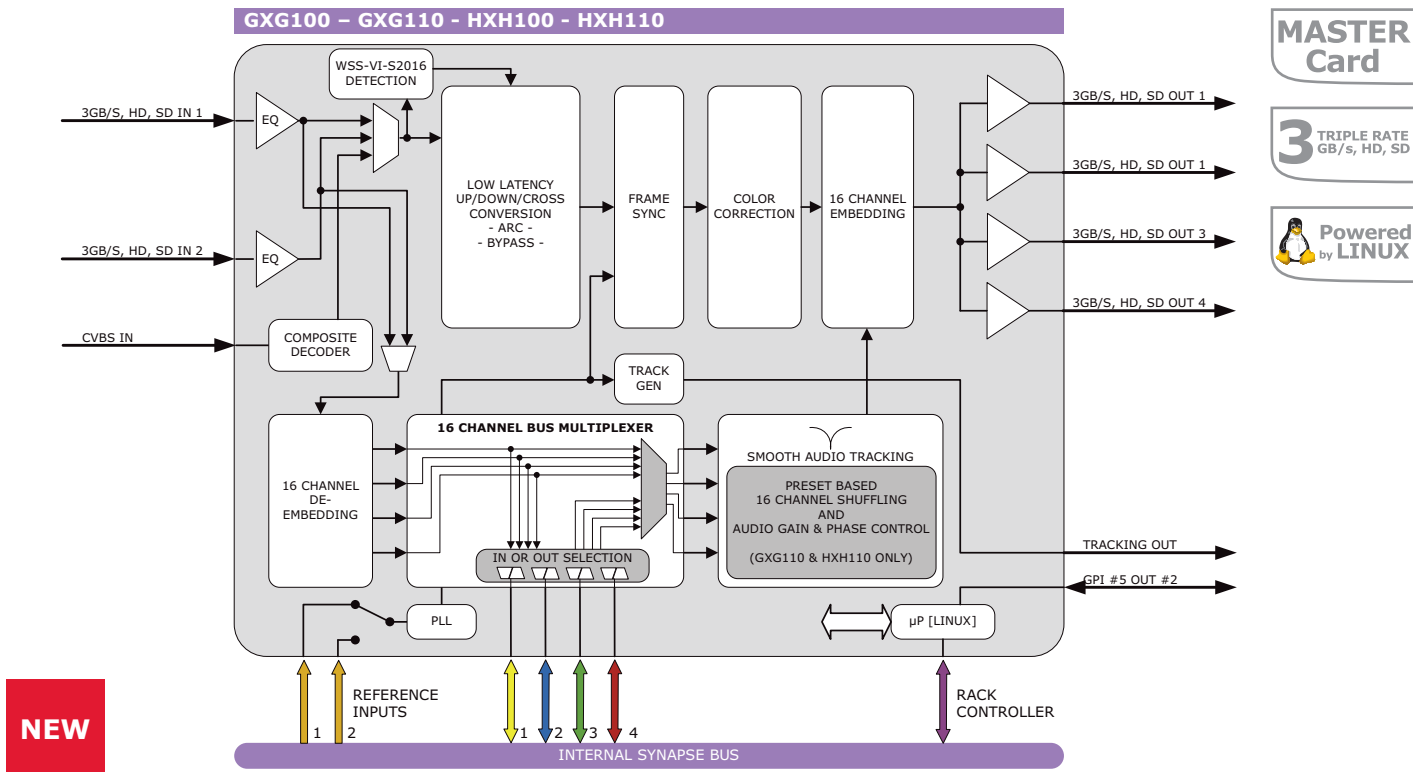
Electrical

Voltage +24V to +30V

Power <17 Watts

GSU150 - GSU160
HSU150 - HSU160





GXG100 - GXG110 - HXH100 - HXH110 3Gb/s, HD, SD up/down/cross converter/synchronizer with optional audio shuffler

The GXG100/110 and HXH100/110 are low latency up, down, cross converters with 16 channel audio transparency. The powerful audio matrix multiplexer can transport audio from the embedded domain to the Synapse bus and vice versa.

The GXG110 or HXH110 add a full audio shuffler and audio proc-amp with gain and phase control.

The GXG100/110 are compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use. The HXH100/110 are compatible with SD-SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility.

- Low latency conversion process (as low as 1 field in controlled timing environment)
- Up-conversion from 2 selectable SDI inputs or a CVBS input
- Up-conversion from 720p or 1080i to 1080p (equal frame-rate)
- Down conversion (including 1080p to SD-SDI)
- Cross conversion 720p to 1080i and vice versa
- 5 GPI inputs for ARC and Shuffle triggers
- Transparent for 16 channels of embedded audio
- Embedded domain audio shuffling, gain and phase control (GXG-HXH110 only)
- Embedding through synapse bus
- De-embedding to Synapse bus with transparent input to output handling
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Hue control for NTSC inputs
- Compatible with:
 - 270 Mbit/s (SMPTE 259M) 50 and 59.94Hz
 - 1485 Mbit/s (SMPTE 292M) 50 and 59.94Hz
 - 2970 Mbit/s (SMPTE 424M) 50 and 59.94Hz (GXG100/110 only)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

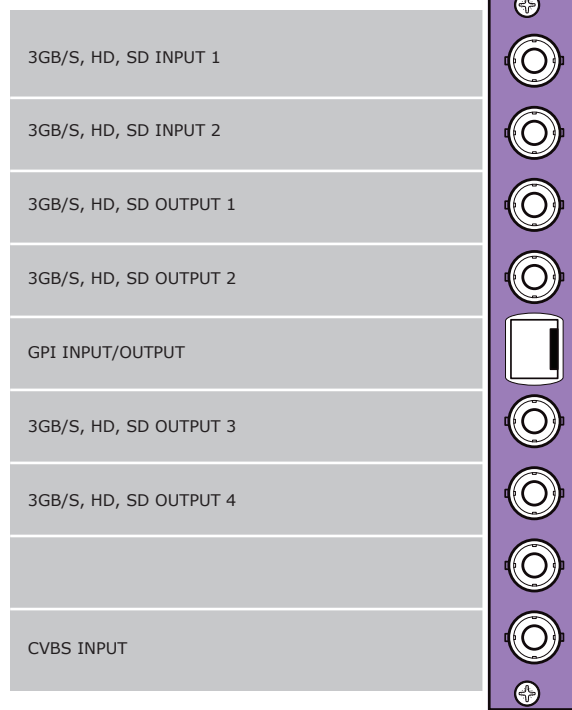
* Upgradeable to 3Gb/s

Conversion abilities

The GXG-HXH100/110 cards are able to convert the following video formats:

CONVERSION		Output														
		1080p29.97	1080p25	1080p23.97	1035i59.97	1080p50*	1080p59.94*	1080i59.94	1080i50	720p59.94	720p50	720p29.97	720p25	720p23.98	480i59.94(525)	576i50(625)
Input 1 or 2	1080p29.97	■		■	■			■			■		■	■		
	1080p25		■			■			■		■		■			■
	1080p23.97	■		■	■					■				■		
	1035i59.97	■		■	■		■	■		■				■	■	
	1080p50*		■			■			■		■		■			■
	1080p59.94*	■		■	■		■	■		■		■		■	■	
	1080i59.94	■		■	■		■	■		■		■		■	■	
	1080i50		■						■		■		■			■
	720p59.94	■		■	■		■	■		■		■		■	■	
	720p50		■			■			■		■		■			■
	720p29.97	■		■	■		■			■		■		■	■	
	720p25		■			■				■		■		■		■
	720p23.98	■		■	■		■			■		■		■	■	
	CVBS	480i59.94(NTSC)	■		■	■		■	■		■		■		■	■
576i50(PAL)		■		■	■		■		■		■		■	■		■

* = GXG models only



BPH17

Applications

- Truck input up converter/synchronizer
- Infra structure up/down/cross conversion

Ordering information

Module:

- **GXG100:** 3Gb/s, HD, SD-SDI up/down/cross converter
- **GXG110:** 3Gb/s, HD, SD-SDI up/down/cross converter with audio shuffler proc-amp
- **HXH100:** HD, SD-SDI up/down/cross converter*
- **HXH110:** HD, SD-SDI up/down/cross converter with audio shuffler proc-amp*

Standard I/O:

- **BPH17_GXG100:** I/O-panel for GXG100 with RJ45 GPI/O
- **BPH17_GXG110:** I/O-panel for GXG110 with RJ45 GPI/O
- **BPH17_HXH100:** I/O-panel for HXH100 with RJ45 GPI/O
- **BPH17_HXH110:** I/O-panel for HXH110 with RJ45 GPI/O

Specifications

Serial video input

Standard SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424

Number of inputs 2

Connector BNC

Equalization Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s

Return loss > 15dB up to 1.5GHz

CVBS video input

Standard PAL (ITU624-4), NTSC (SMPTE 170M)

Number of inputs 1

Impedance 75 Ohms

Return loss > 35dB up to 10MHz

Frequency

response < ±0.25dB (100KHz to 4.2MHz)

Differential gain < ±0.5% typical

Differential

phase < ±0.2° typical

Noise floor < -57dB RMS (black video, 15KHz to 5MHz)

C/L gain < ±0.5%

C/L delay < ±9ns

Serial video output

Number of outputs 4

Connector BNC

Signal level 800mV nominal

DC offset 0V ±0.5V

Rise/fall time 135ps nominal

Overshoot < 10% of amplitude

Return loss > 15dB up to 1.5GHz (typ.) > 10dB up to 3GHz (typ.)

Wideband jitter < 0.2UI

Miscellaneous

Weight Approx. 450g

Operating

temperature 0 °C to +40 °C

Dimensions 137 x 296 x 20 mm (HxWxD)

Electrical

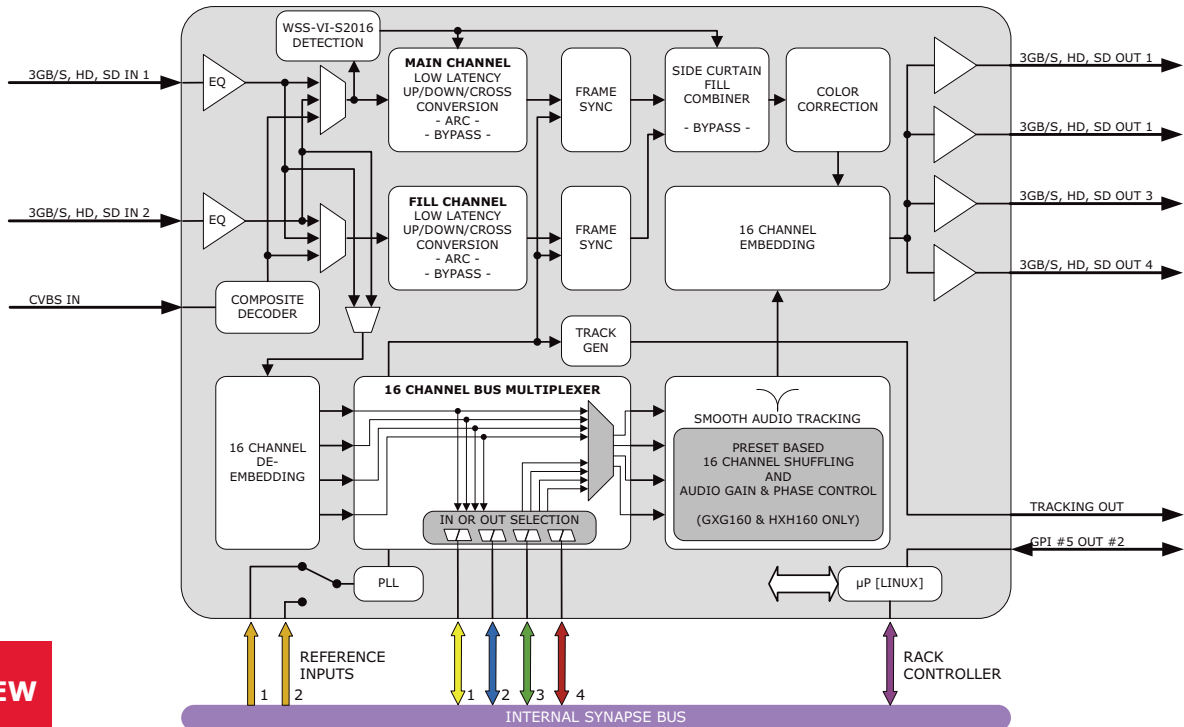
Voltage +24V to +30V

Power <17 Watts

GXG100 - GXG110
HXH100 - HXH110



GXG150 - GXG160 - HXH150 - HXH160

MASTER
Card3 TRIPLE RATE
Gb/s, HD, SDPowered
by LINUX

NEW

GXG150 - GXG160 - HXH150 - HXH160. 3Gb/s, HD, SD up/down/cross converter/synchronizer with side curtain conversion and optional audio shuffler

The GXG150/160 and HXH150/160 are low latency up, down, cross converters with 16 channel audio transparency. The powerful audio matrix multiplexer can transport audio from the embedded domain to the Synapse bus and vice versa. The GXG160 or HXH160 add a full audio shuffler and audio proc-amp with gain and phase control.

The GXG150/160 are compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use. The HXH150/160 are compatible with SD SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility.

- Low latency conversion process (as low as 1 field in controlled timing environment)
- Two conversion paths
- Conversion Path 1
 - Up-conversion from 2 selectable SDI inputs or a CVBS input
 - Up-conversion from 720p or 1080i to 1080p (equal frame-rate)
 - Down conversion (including 1080p to SD-SDI)
 - Cross conversion 720p to 1080i and vice versa
- Conversion Path 2
 - Up-conversion from 2 selectable SDI inputs or a CVBS input
 - Up-conversion from 720p or 1080i to 1080p (equal frame-rate)
 - Side wing/curtain up-conversion for 4:3 pillarbox on graphics background
- 5 GPI inputs for ARC and Shuffle triggers
- Transparent for 16 channels of embedded audio
- Embedded domain audio shuffling, gain and phase control (GXG - HXH160 only)
- Embedding through synapse bus
- De-embedding to Synapse bus with transparent input to output handling
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Hue control for NTSC inputs
- Compatible with:
 - 270 Mbit/s (SMPTE 259M) 50 and 59.94Hz
 - 1485 Mbit/s (SMPTE 292M) 50 and 59.94Hz
 - 2970 Mbit/s (SMPTE 424M) 50 and 59.94Hz (GXG150/160 only)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- Truck input up converter/ synchronizer
- Infra structure up/down/ cross conversion
- Up conversion with side-fill/ curtain input

Ordering information

Module:

- **GXG150:** 3Gb/s, HD, SD-SDI up/down/cross converter with side curtain
- **GXG160:** 3Gb/s, HD, SD-SDI up/down/cross converter with audio shuffler proc-amp with side curtain
- **HXH150:** HD, SD-SDI up/down/cross converter with side curtain*
- **HXH160:** HD, SD-SDI up/down/cross converter with audio shuffler proc-amp with side curtain*

Standard I/O:

- **BPH17_GXG150:** I/O-panel for GXG100 with RJ45 GPI/O
- **BPH17_GXG160:** I/O-panel for GXG110 with RJ45 GPI/O
- **BPH17_HXH150:** I/O-panel for HXH100 with RJ45 GPI/O
- **BPH17_HXH160:** I/O-panel for HXH110 with RJ45 GPI/O

* Upgradeable to 3GB/s

Specifications

Serial video input

Standard	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
Number of inputs	2
Connector	BNC
Equalization	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
Return loss	> 15dB up to 1.5GHz

CVBS video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
-----------------	-----------------------------------

Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)

Differential gain < ±0.5% typical

Differential

phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	1 field

Serial video output

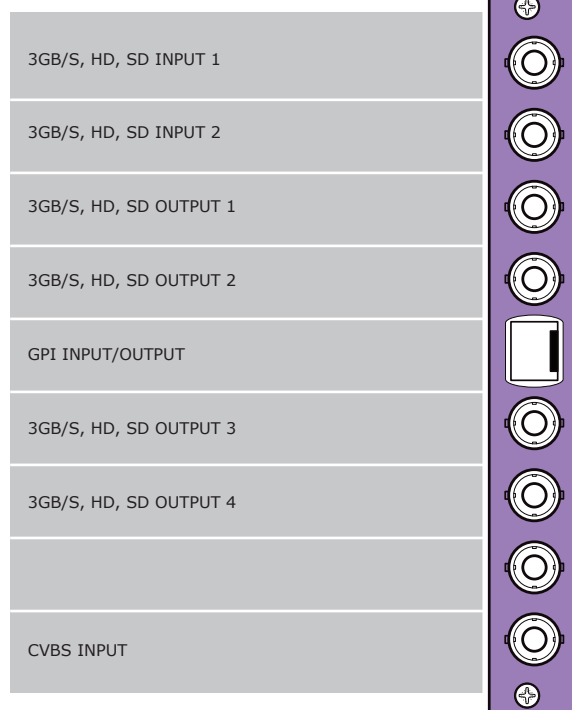
Number of outputs	4
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	135ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.5GHz (typ.) > 10dB up to 3GHz (typ.)
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 450g
Operating temperature	0 °C to +40 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<17 Watts

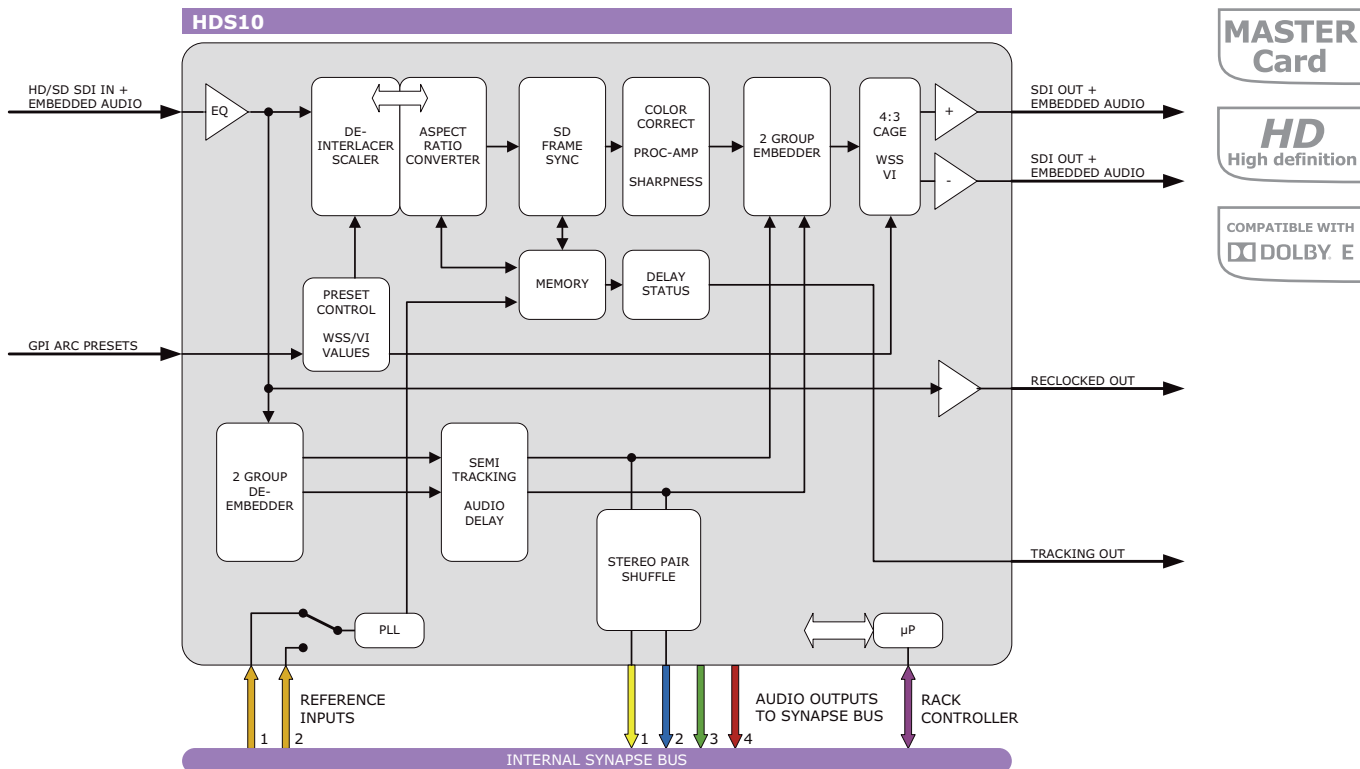


BPH17

Conversion abilities

See page 259.

GXG150 - GXG160
HXH150 - HXH160



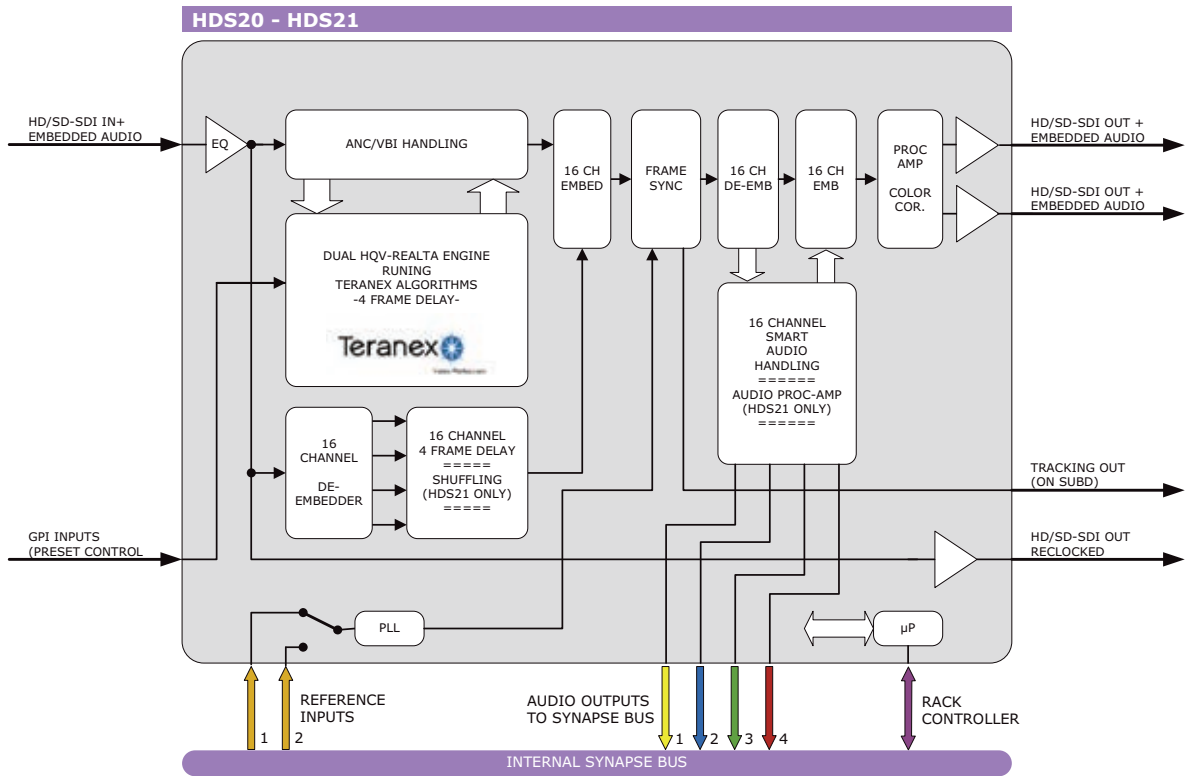
HDS10 Premium quality HD-SDI to SD-SDI down converter with frame-synchronizer

The HDS10 is a premium quality down converter. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native HD source, by use of a 64 tap FIR filters. The HDS10 will allow you to simulcast SD signals from a native HD infrastructure. The embedded audio is carried over to the SD domain; the appropriate aspect ratio can be applied and the correct VI or WSS data can be added. When fed with an SD SDI signal the down converter goes in by-pass mode with a functional frame synchronizer.

- HD-SDI or SD-SDI input (auto selecting)
- 1080i or 720p 50 to 625/50
- 1080i or 720p 59.94 to 525/59.94
- 1080p or 720p 25 to 625/50
- 1080p or 720p 29.97 to 525/59.94
- 1080p or 720p 23.98 to 525/59.94
- Correct color space conversion (709-601)
- Output aspect ratio:
 - Anamorphic
 - Letterbox 16:9
 - Letterbox 14:9
 - Pan & Scan
- Adjustment of H position in pan & scan mode (+/- 64 pixel)
- Low latency mode with 54 SD lines delay
- Adjustable H and V delay with respect to input or reference
- 2 group audio transparency (selectable)
- 2 group de-embedding to Synapse ADD-ON card
- Semi tracking audio delay in 1ms intervals
- Audio delay offset adjustment up to 1000 ms
- Sharpness / enhancement for a perfect crisp SD image
- Coring adjustment
- Proc-amp and color corrector
- 4:3 marker in anamorphic output
- Vi and WSS insertion (including WSS-ext with GPI)
- CC transparent
- One reclocked output (active loop)
- 2 SD-SDI processed outputs
- Preset controlled ARC + WSS/VI inserter
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Complementary cards:

- DAC20, DAC24, DAS24, DIO48



MASTER Card

HD High definition

COMPATIBLE WITH **DOLBY E**

HDS20 - HDS21

HDS20 - HDS21 High performance HD-SDI to SD-SDI down converter with optional audio shuffler

The HDS20/21 High Down Converter is based on the advanced Teranex algorithms. This high performance dual-slot processing module is the pinnacle of the huge range of SD and HD conversion modules in the Synapse range. It is based on an AXON Synapse that enables full compatibility with the unique ADD-ON functionality of the Synapse system.

The advanced algorithms are running on two HQV Realta DSP's. This gives the board 2 Trillion operations per second processing power, and is the most powerful modular processing card at the time of its introduction.

- HD/SD-SDI input
- 1 reclocked output
- 2 processed outputs
- Frame sync with built-in 16 channel smooth audio handling
- Offset delay -30ms to +1270ms
- Full audio shuffling of all 16 channels (HDS21 only)
- Audio gain and phase control of all 16 channels (HDS21 only)
- GPI preset control for audio shuffling (HDS21 only)
- GPI preset control for the built-in ARC
- Transparent to Closed Captioning

- Testpattern generator
- All audio is present on ADD-ON bus for monitoring
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Conversion abilities

The HDS20 and HDS21 can process the following conversion:

CONVERSION		Output			
		1080i50	1080i59.94	720p50	720p59.94
Input	1080i50	■			
	1080i59.94		■		
	720p50			■	
	720p59.94				■
	576i50(625)				■
	480i59.94(525)				■

Applications

The HDS20 will find its use in MCR, Trucks and post production applications where a dynamic change of different formats is required. The unsurpassed conversion quality will enable the smooth transition with minimal artifacts to and from any HD source with the same frame rate.

- Highest quality down-conversion
- Studio output cross-conversion
- Ingest converting with preset audio shuffling (HDS21 only)

Ordering information

Modules

- **HDS20:** High performance down converter
- **HDS21:** High performance down converter with full 16 channels of audio swapping

Standard I/O:

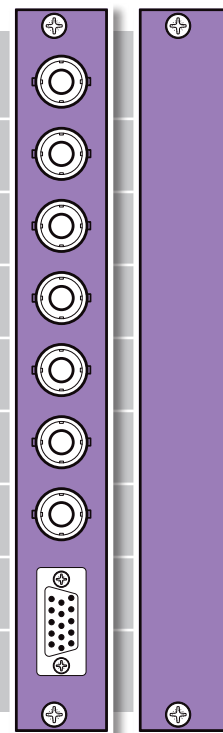
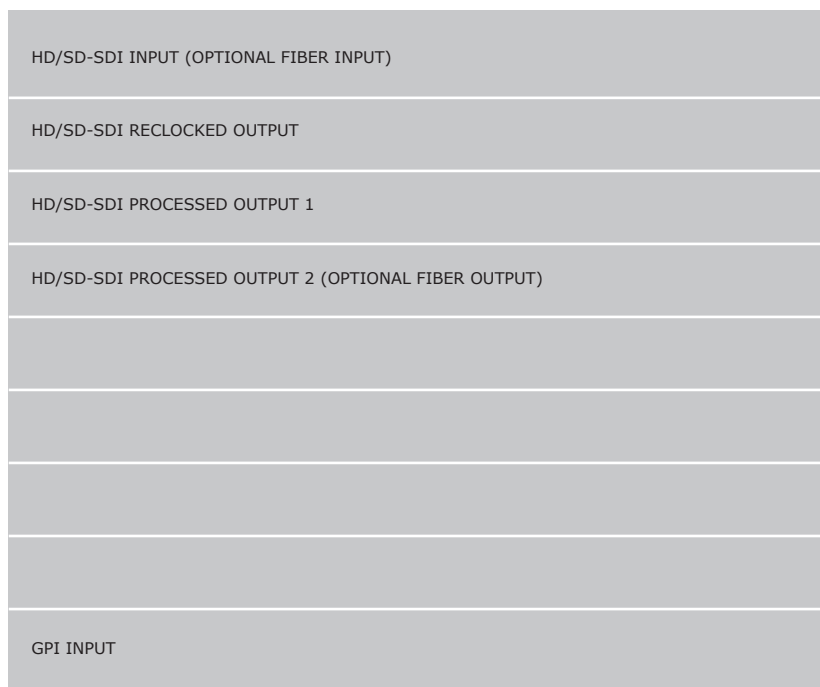
- **BPH03_HDS20:** I/O-panel for HDS20
- **BPH03_HDS21:** I/O-panel for HDS21

Fiber outputs:

- **BPH03T_FC/PC_HDS20:** I/O-panel for HDS20 with fiber transmitter on FC/PC
- **BPH03T_SC_HDS20:** I/O-panel for HDS20 with fiber transmitter on SC
- **BPH03T_FCPC_HDS21:** I/O-panel for HDS21 with fiber transmitter on FC/PC
- **BPH03T_SC_HDS21:** I/O-panel for HDS21 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HDS20:** I/O-panel for HDS20 with fiber receiver on FC/PC
- **BPH03R_SC_HDS20:** I/O-panel for HDS20 with fiber receiver on SC
- **BPH03R_FC/PC_HDS21:** I/O-panel for HDS21 with fiber receiver on FC/PC
- **BPH03R_SC_HDS21:** I/O-panel for HDS21 with fiber receiver on SC



BPH03 + BPL00

The HDS20/21 is a dual slot card taking up 2 card positions in a frame. For fiber connectivity see www.axon.tv

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
Number of inputs	1
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (1 relocked and 2 processed)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

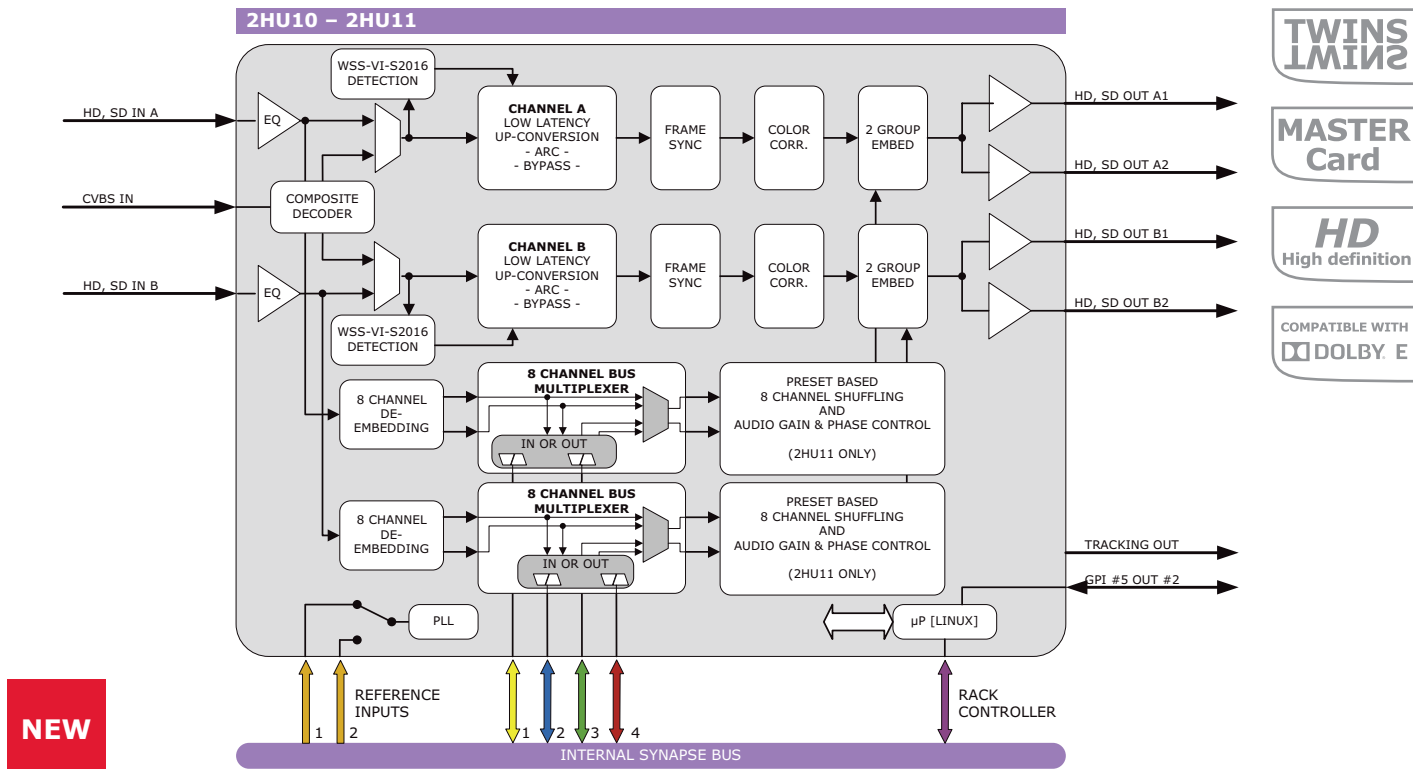
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 500g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<32 Watts (dual slot)

HDS20 - HDS21





NEW

2HU10 - 2HU11 Dual channel HD up-converter with color corrector

The 2HU10/11 is a dual channel high-quality up converter. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native SD source, by use of a 64 tap FIR filters. The 2HU10/11 allows you to simulcast 2 HD signals from 2 native SD or 1 CVBS and a SD infrastructure. The embedded audio is carried over to the HD domain. The appropriate aspect ratio can be applied by control of VI, WSS and GPI inputs by use of 16 presets that can store the aspect ratio conversions. The 2HU11 adds a audio shuffler proc-amp to this all.

- 2x HD or SD input (auto by-pass mode with no processing)
- 1x CVBS input
- Full functioning frame synchronizer in all modes
- 625/50 to 1080i/50 or 720p/50
- 525/59.94 to 1080i/59.94 or 720p/59.94
- 625/50 to 1080p/25 or 720p/25
- 525/59.94 to 1080p/29.97 or 720p 29.97
- PAL or NTSC to SD/HD SDI converter
- Single field (low latency) and 3 field de-interlacing
- Sharpness control for crisp image quality
- Adjustable H and V delay with respect to input or reference
- Color corrector
- Aspect ratio control:
 - Embedded WSS
 - Embedded WSS-ext
 - Embedded VI
 - GPI

- 16 presets for aspect ratio conversion
 - Anamorphic (16F16 to 16F16)
 - Pillarbox (12F12 to 12P16)
 - Pillarbox 14:9 (12F12 to 14P16)
 - Inverse pan-scan (12F12 to 16F16)
- Variable H + V setting
- V position control between -128 and + 127 lines (for inverse pan-scan/zoom mode)
- Jump to preset or hold at loss of WSS or VI control
- 2 group audio transparency (selectable)
- 2 group de-embedding to Synapse ADD-ON card or embedding from the Synapse bus
- Smooth audio handling
- Audio delay offset adjustment up to 1000 ms
- Audio shuffler proc-amp (2HU11 only)
- Correct color space conversion(601-709)
- VITC transparency with selectable line selection and duplication
- CC transparent
- 2 HD-SDI processed outputs
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Complementary cards:

- DAC20, DAC24, DAS24, DIO48, ADC20, ADC24, DIO24

2HU10 - 2HU11

Applications

- High quality low latency up-conversion (with zero motion artifacts) for 2 channels
- Free running fill-in camera positions up-conversion and synchronization

Ordering information

Module:

- **2HU10:** Dual channel HD up-converter with color corrector
- **2HU11:** Dual channel HD up-converter with color corrector and audio shuffler proc-amp

Standard I/O:

- **BPH17_2HU10:** I/O panel for 2HU10
- **BPH17_2HU11:** I/O panel for 2HU10

Specifications

Serial video input

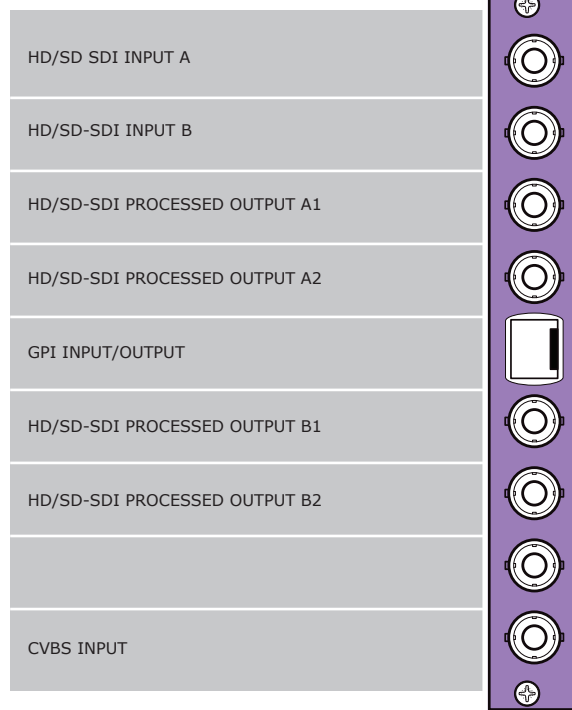
Standard	SD,HD SDI: SMPTE 292M, SMPTE 259M.
Number of inputs	2
Connector	BNC
Equalization	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
Return loss	> 15dB up to 1.5GHz

CVBS video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	3 lines

Serial video output

Number of outputs	4
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	135ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.5GHz (typ) > 10dB up to 3GHz (typ)
Wideband jitter	< 0.2UI



For fiber connectivity see www.axon.tv

BPH17

Miscellaneous

Weight	Approx. 450g
Operating temperature	0 °C to +40 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical Voltage	+24V to +30V
Power	<17 Watts

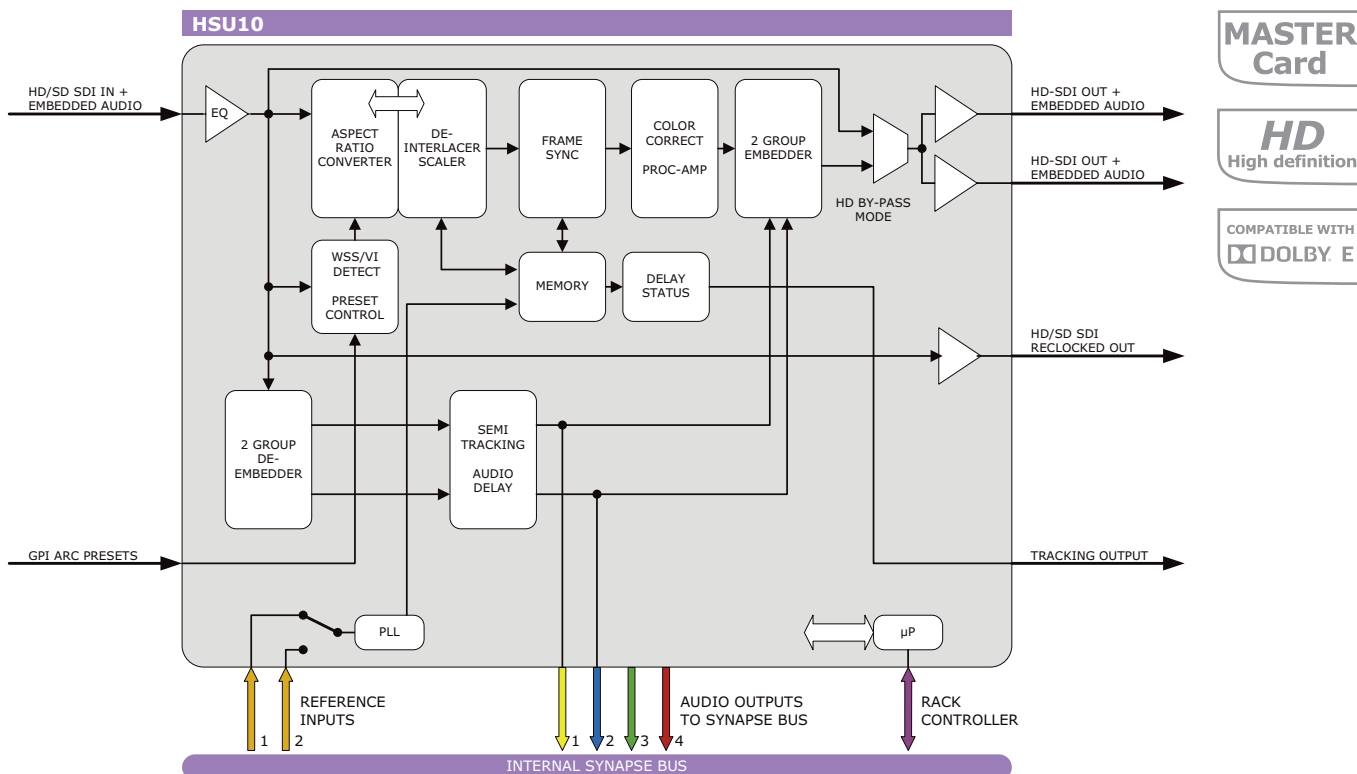
Conversion abilities

The 2HU10/11 can handle the following conversions:

CONVERSION	Output			
	1080i50	1080i59.94	720p50	720p59.94
1080i50	■			
1080i59.94		■		
720p50			■	
720p59.94				■
576i50(625)	■		■	■
480i59.94(525)		■	■	■
576i50(PAL)	■		■	■
480i59.94(NTSC)		■	■	■

2HU10 - 2HU11





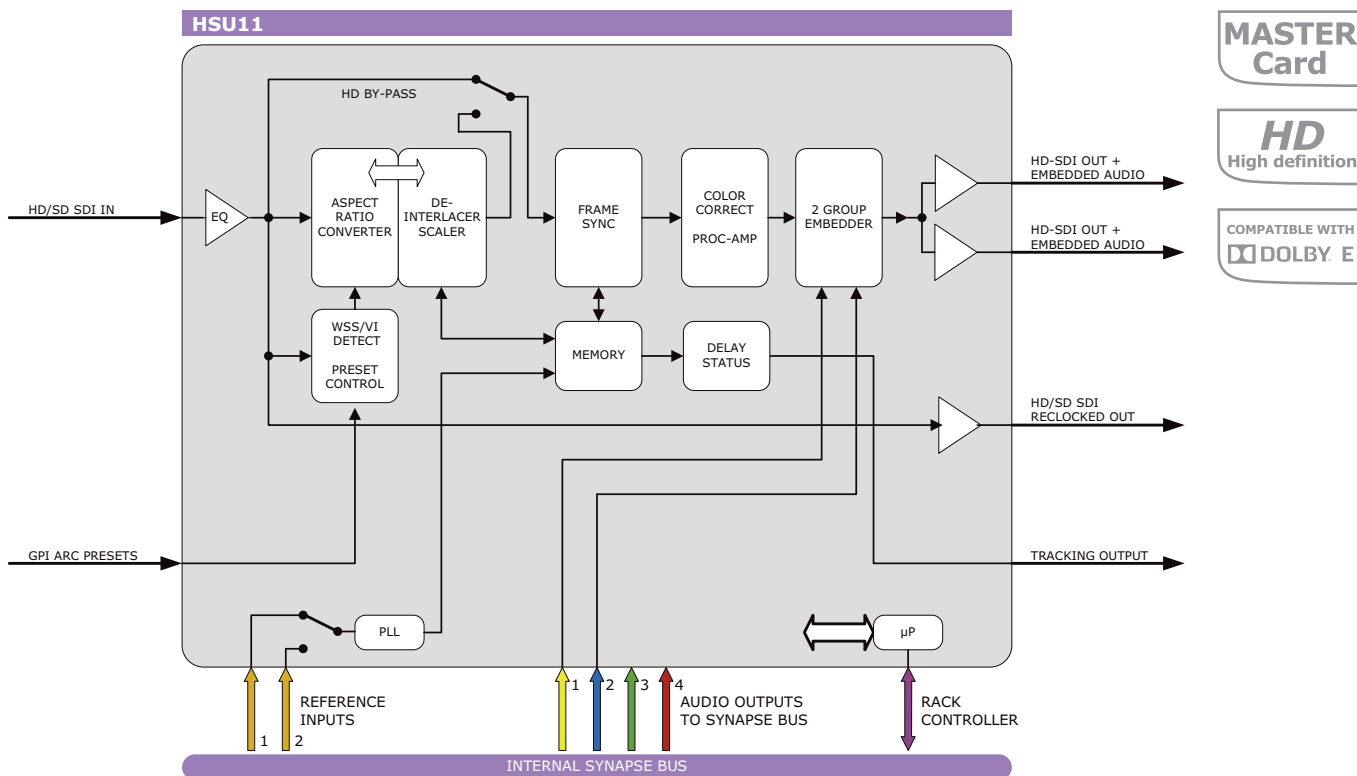
HSU10 HD up-converter with color corrector

The HSU10 is high-quality up converter. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native SD source, by use of a 64 tap FIR filters. The HSU10 will allow you to simulcast HD signals from a native SD infrastructure. The embedded audio is carried over to the HD domain. The appropriate aspect ratio can be applied by control of VI, WSS and GPI inputs by use of 16 presets that can store the aspect ratio conversions.

- HD-SDI or SD-SDI input (auto by-pass mode with no processing)
- 625/50 to 1080i/50 or 720p/50
- 525/59.94 to 1080i/59.94 or 720p/59.94
- 625/50 to 1080p/25 or 720p/25
- 525/59.94 to 1080p/29.97 or 720p 29.97
- Single field (low latency) and 3 field de-interlacing
- Sharpness control for crisp image quality
- Low latency mode with 54 SD lines delay
- Adjustable H and V delay with respect to input or reference
- Color corrector
- Aspect ratio control:
 - Embedded WSS
 - Embedded WSS-ext
 - Embedded VI
 - GPI (BPH03)
- 16 presets for aspect ratio conversion
 - Anamorphic (16F16 to 16F16)
 - Pillarbox (12F12 to 12P16)
 - Pillarbox 14:9 (12F12 to 14P16)
 - Inverse pan-scan (12F12 to 16F16)
- V position control between -128 and + 127 lines (for inverse pan-scan/zoom mode)
- Jump to preset or hold at loss of WSS or VI control
- 2 group audio transparency (selectable)
- 2 group de-embedding to Synapse ADD-ON card
- Semi tracking audio delay in 1ms intervals
- Audio delay offset adjustment up to 1000 ms
- Correct color space conversion(601-709)
- VITC transparency with selectable line selection and duplication
- CC transparent
- One relocked output (active loop)
- 2 HD-SDI processed outputs (active loop in HD by-pass mode)
- Built-in ARC for 4:3 and 14:9 pillar box and inverse pan scan output formats
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Complementary cards:

- DAC20, DAC24, DAS24, DIO48



HSU11 HD up-converter with color corrector and 2 group embedder

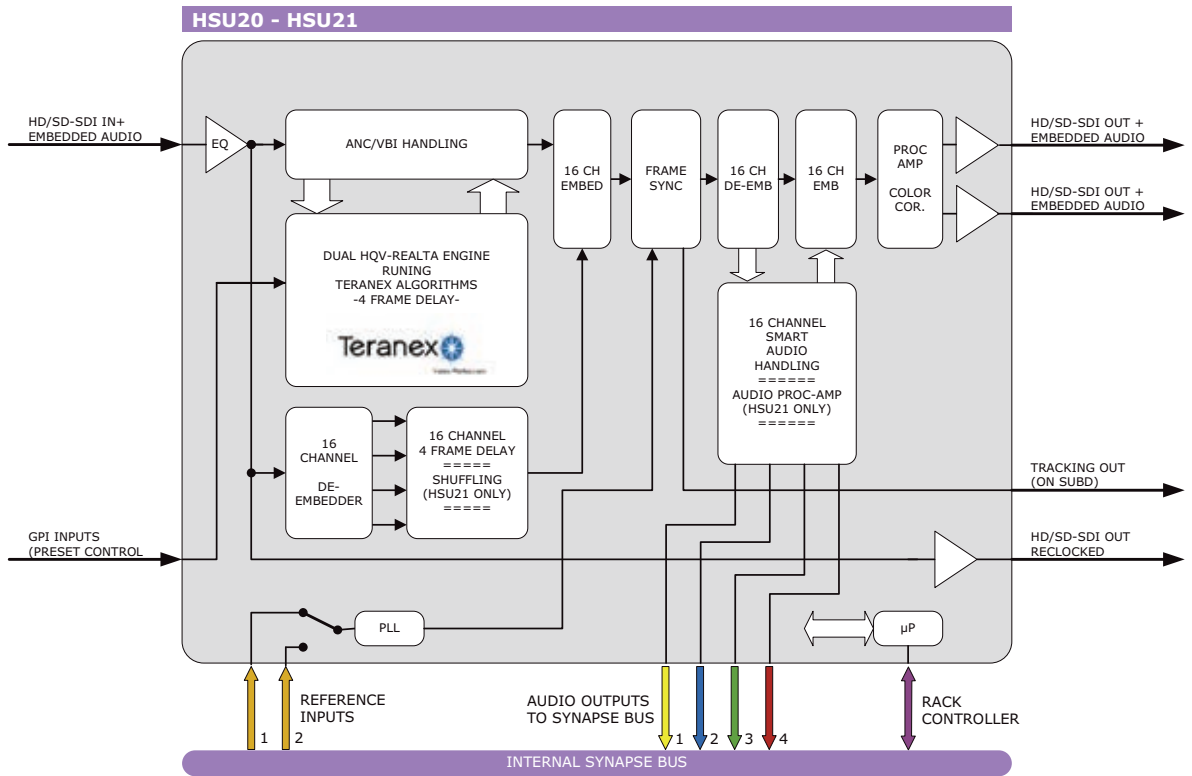
The HSU11 is high-quality up converter. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native SD source, by use of a 64 tap FIR filters. The HSU11 will allow you to simulcast HD signals from a native SD infrastructure. The embedded audio is carried over to the HD domain. The appropriate aspect ratio can be applied by control of VI, WSS and GPI inputs by use of 16 presets that can store the aspect ratio conversions. Additional, the HSU11 contains a 2 group embedder which enables you to embed audio from the Synapse bus.

- HD-SDI or SD-SDI input (auto by-pass mode with no processing)
- 625/50 to 1080i/50 or 720p/50
- 525/59.94 to 1080i/59.94 or 720p/59.94
- 625/50 to 1080p/25 or 720p/25
- 525/59.94 to 1080p/29.97 or 720p 29.97
- Single field (low latency) and 3 field de-interlacing
- Sharpness control for crisp image quality
- Low latency mode with 54 SD lines delay
- Adjustable H and V delay with respect to input or reference
- Color corrector
- Aspect ratio control:
 - Embedded WSS
 - Embedded WSS-ext
 - Embedded VI
 - GPI (BPH03)

- 16 presets for aspect ratio conversion
 - Anamorphic (16F16 to 16F16)
 - Pillarbox (12F12 to 12P16)
 - Pillarbox 14:9 (12F12 to 14P16)
 - Inverse pan-scan (12F12 to 16F16)
- V position control between -128 and + 127 lines (for inverse pan-scan/zoom mode)
- Jump to preset or hold at loss of WSS or VI control
- 2 group embedding from Synapse bus
- Automatic Correct color space conversion(601-709)
- VITC transparency with selectable line selection and duplication
- One relocked output (active loop)
- 2 HD-SDI processed outputs (active loop in HD by-pass mode)
- Built-in ARC for 4:3 and 14:9 pillar box and inverse pan scan output formats (SD only)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Complementary cards:

- ADC20, ADC24, DIO24, DIO48



MASTER Card

HD High definition

COMPATIBLE WITH **DOLBY E**

HSU20 - HSU21

HSU20 - HSU21 High performance HD-SDI upconverter with optional audio shuffler

The HSU20/21 is a Linear SD/HD Up converter based on the advanced Teranex® algorithms. This high performance dual slot processing module is the pinnacle of the huge range of SD and HD conversion modules in the Synapse range.

The advanced algorithms are running on two HQV Realta chips supplied by Silicon Optix. This gives the board 2 Trillion operations per second processing power, and makes it the most powerful modular processing card at the time of its introduction.

- HD/SD-SDI input
- 1 reclocked output
- 2 processed outputs
- Frame sync with built-in 16 channel tracking audio delay
- Audio offset delay -60ms to +1240ms
- Full audio shuffling of all 16 channels (HSU21 only)
- Audio gain and phase control of all 16 channels
- GPI preset control for audio shuffling (HSU21 only)
- All audio is present on ADD-ON bus for monitoring

- Transparent to Closed Captioning
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Conversion abilities

The HSU20 and HSU21 can process the following conversion:

CONVERSION		Output			
		1080i50	1080i59.94	720p50	720p59.94
Input	1080i50	■			
	1080i59.94		■		
	720p50			■	
	720p59.94				■
	576i50(625)	■	■	■	■
	480i59.94(525)	■	■	■	■

Applications

The HSU20/21 is the choice for all HD format UP conversions

- Ultra High quality Up conversion
- Conversion with preset audio shuffling (HSU21 only)
- Mobile truck applications
- DVD mastering and authoring

Ordering information

Module:

- **HSU20:** High performance HD up converter
- **HSU21:** High performance HD up converter with full 16 channels of audio swapping

Standard I/O:

- **BPH03_HSU20:** I/O-panel for HSU20
- **BPH03_HSU21:** I/O-panel for HSU21

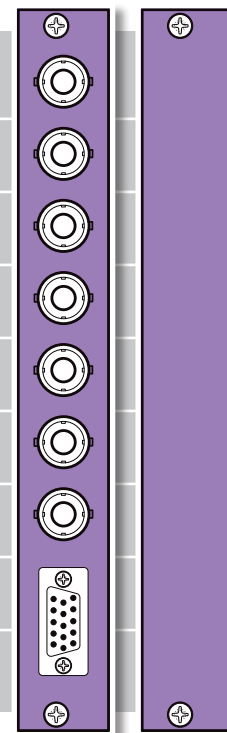
Fiber outputs:

- **BPH03T_FC/PC_HSU20:** I/O-panel for HSU20 with fiber transmitter on FC/PC
- **BPH03T_SC_HSU20:** I/O-panel for HSU20 with fiber transmitter on SC
- **BPH03T_FC/PC_HSU21:** I/O-panel for HSU21 with fiber transmitter on FC/PC
- **BPH03T_SC_HSU21:** I/O-panel for HSU21 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HSU20:** I/O-panel for HSU20 with fiber receiver on FC/PC
- **BPH03R_SC_HSU20:** I/O-panel for HSU20 with fiber receiver on SC
- **BPH03R_FC/PC_HSU21:** I/O-panel for HSU21 with fiber receiver on FC/PC
- **BPH03R_SC_HSU21:** I/O-panel for HSU21 with fiber receiver on SC

HD/SD-SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD-SDI RECLOCKED OUTPUT
HD SDI PROCESSED OUTPUT 1
HD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
GPI INPUT



BPH03 + BPL00

The HSU20/21 is a dual slot card taking up 2 card positions in a frame. For fiber connectivity see www.axon.tv

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD/SD serial video output

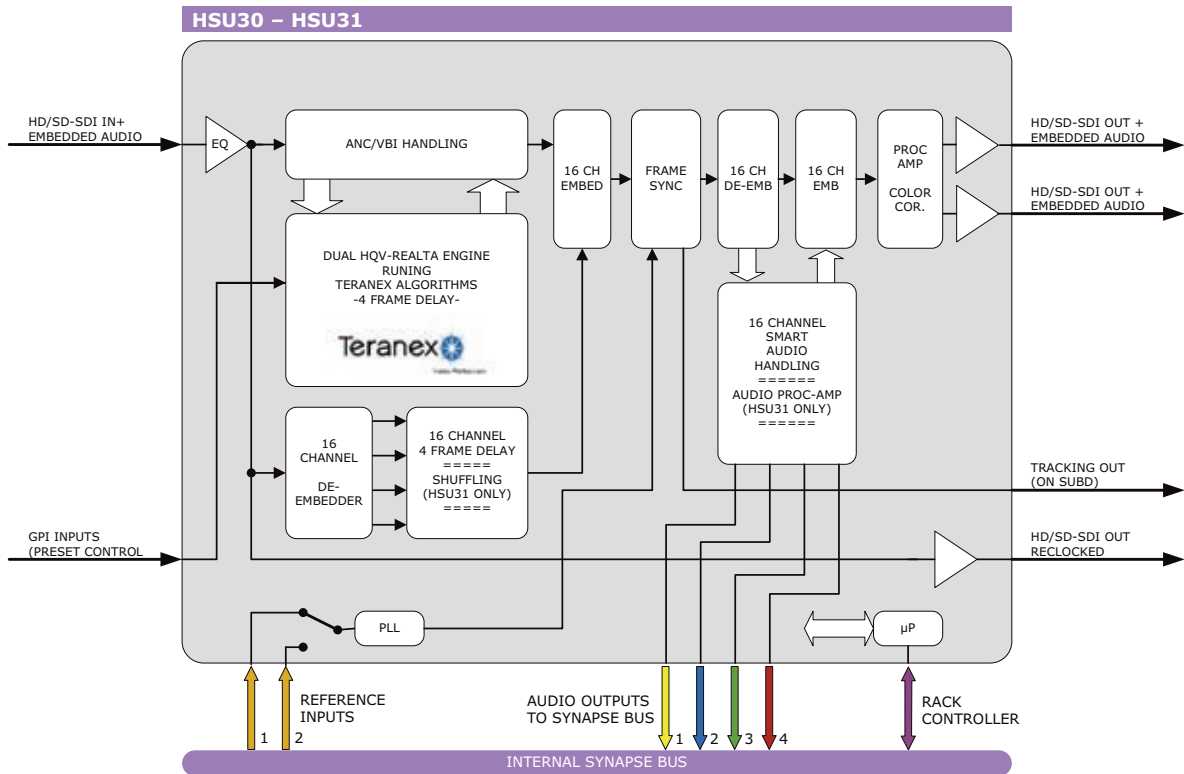
Standard	SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 500g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 40 mm (HxWxD) = DUAL SLOT
Electrical	
Voltage	+24V to +30V
Power	<29 Watts (dual slot)



MASTER Card

HD High definition

COMPATIBLE WITH **DOLBY E**

HSU30 - HSU31

HSU30 - HSU31 High performance HD-SDI upconverter with enhanced noise reduction with optional audio shuffler

The HSU30/31 High-end up-converter is similar to the HSU20, but with enhanced noise reduction algorithm that can be applied to the input signal for smooth conversion quality where the source is less than ideal. The unit runs the advanced Teranex algorithms. It is based on an AXON Synapse card that enables compatibility with the unique ADD-ON functionality of the Synapse system.

The advanced algorithms are running on two HQV Realta DSP's. This gives the board 2 Trillion operations per second processing power, and is the most powerful modular processing card at the time of its introduction.

- Enhanced noise reduction
- HD/SD-SDI input
- 1 reclocked output
- 2 processed outputs
- Frame sync with built-in 16 channel smooth audio handling
- Audio offset delay -30ms to +1270ms
- Full audio shuffling of all 16 channels (HSU31 only)
- Audio gain and phase control of all 16 channels (HSU31 only)
- GPI preset control for audio shuffling (HSU31 only)
- GPI preset control for the built-in ARC

- All audio is present on ADD-ON bus for monitoring
- Transparent to Closed Captioning
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Conversion abilities

The HXH30 and HXH31 can process the following conversion:

CONVERSION		Output				
		1080i50	1080i59.94	720p50	720p59.94	480i59.94(525)
Input	1080i50	■				
	1080i59.94		■			
	720p50			■		
	720p59.94				■	
	576i50(625)	■	■	■	■	
	480i59.94(525)	■	■			■

Applications

The HSU30 and HSU31 are engineered for applications in MCR and OB trucks where analog sources or sources with MPEG artifacts are used. Also in transmission applications where a station output needs to convert every possible (legacy) source into the HD transmission chain. The HSU31 enables 16 channels of audio swapping when the SD and HD embedded audio designation is different.

- Highest quality up-conversion (for noisy signals)
- Archive material restoration for HD replay purposes
- Studio output up-conversion
- Ingest up-converting with preset audio shuffling (HSU31 only)

Ordering information

Module:

- **HSU30:** High performance upconverter with enhanced noise reduction
- **HSU31:** High performance upconverter with enhanced noise reduction, with full 16 channels of audio swapping

Standard I/O:

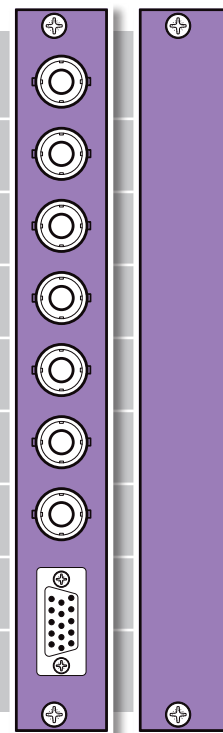
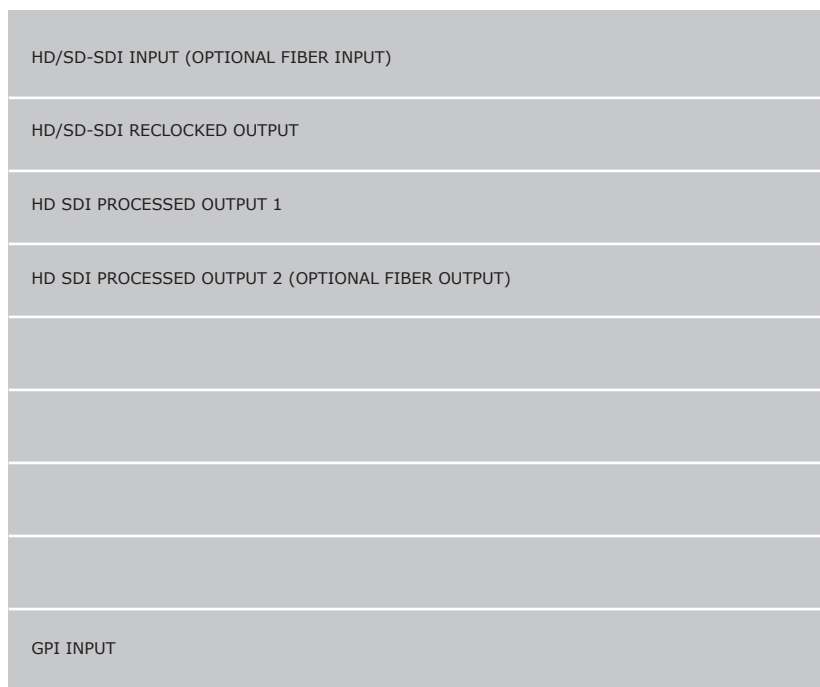
- **BPH03_HSU30:** I/O-panel for HSU20
- **BPH03_HSU31:** I/O-panel for HSU31

Fiber outputs:

- **BPH03T_FC/PC_HSU30:** I/O-panel for HSU30 with fiber transmitter on FC/PC
- **BPH03T_SC_HSU30:** I/O-panel for HSU30 with fiber transmitter on SC
- **BPH03T_FC/PC_HSU31:** I/O-panel for HSU31 with fiber transmitter on FC/PC
- **BPH03T_SC_HSU31:** I/O-panel for HSU31 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HSU30:** I/O-panel for HSU30 with fiber receiver on FC/PC
- **BPH03R_SC_HSU30:** I/O-panel for HSU30 with fiber receiver on SC
- **BPH03R_FC/PC_HSU31:** I/O-panel for HSU31 with fiber receiver on FC/PC
- **BPH03R_SC_HSU31:** I/O-panel for HSU31 with fiber receiver on SC



BPH03 + BPL00

The HSU30/31 is a dual slot card taking up 2 card positions in a frame. For fiber connectivity see www.axon.tv

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD/SD serial video output

Standard	SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

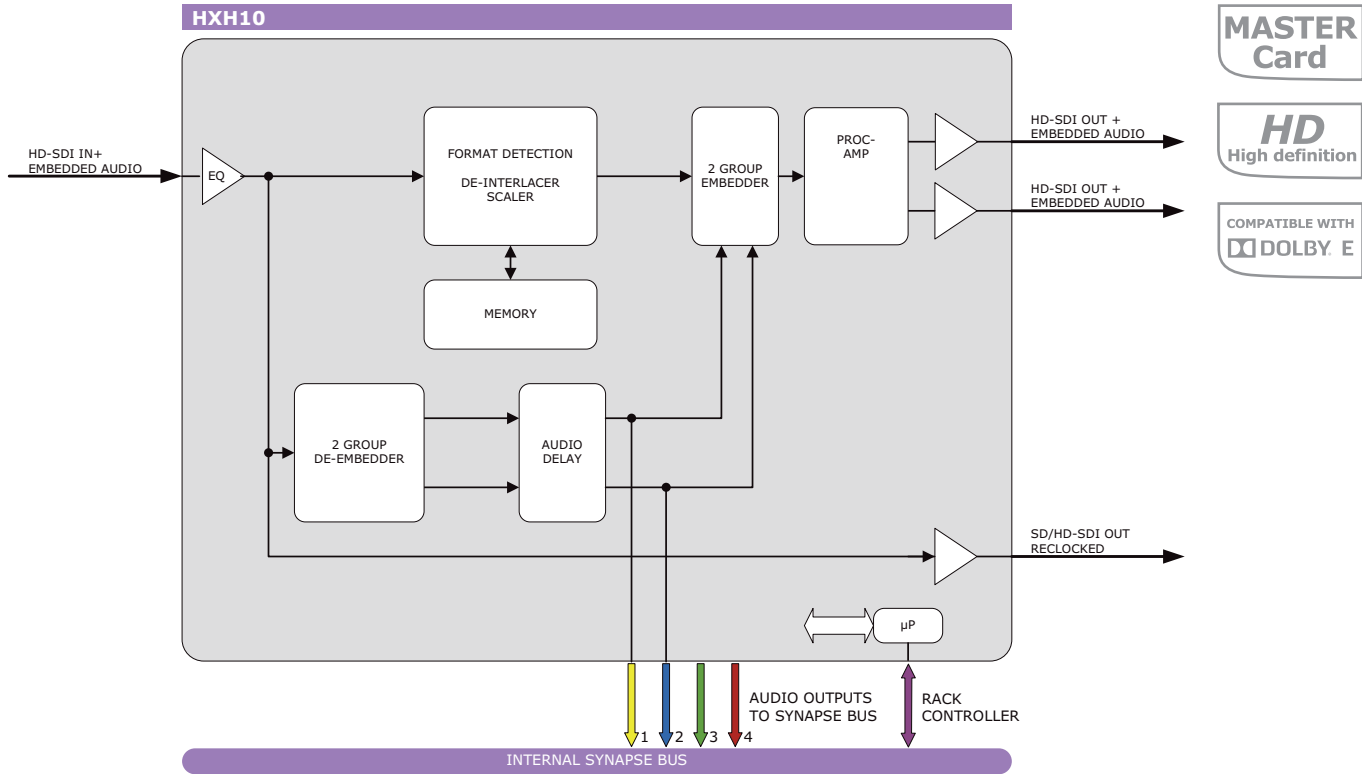
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 500g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 40 mm (HxWxD) = DUAL SLOT
Electrical	
Voltage	+24V to +30V
Power	<29 Watts (dual slot)

HSU30 - HSU31





MASTER Card

HD High definition

COMPATIBLE WITH **DOLBY E**

HXH10 HD-SDI cross converter between 1080i and 720p

The HXH10 is a HD-SDI cross converter. This module can output either 1080i 50/59.94 and have 720p or 1080i (with the same frequency as selected output frequency) on its input, and 720p to 1080i. This means that in an HD infrastructure with dynamically changing formats, 720p to 1080i can be used. If the output format is applied to its input the unit will switch into a transparent mode.

- 1080i to 720p conversion in either 50Hz or 59.94Hz
- 720p to 1080i conversion in either 50Hz or 59.94Hz
- Selectable color conversion - 601 to 709 or vice versa
- Color corrector & Proc-amp
- Total Gain, C Gain, R,G,B Gain - Black R,G,B Gain
- High quality de-interlacing (1080i to 720p) and scaling algorithms
- 2 Group audio transparency with selectable groups
- Adjustable audio delay up to 42ms
- Delay status
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

		Output			
		1080i59.94	1080i50	720p59.94	720p50
Input	1080i59.94	■		■	
	1080i50		■		■
	720p59.94	■		■	
	720p50		■		■

HXH10

Applications

- Generic equal frame cross conversion, that provides a fixed output format independent of the HD input format
- Pre MPEG4 processing with zero motion artifacts de-interlacing

Ordering information

Module:

- **HXH10:** HD-SDI cross converter 1080i > 720p and vice versa

Standard I/O:

- **BPH01_HXH10:**
BPH01_HXH10: I/O panel for HXH10

Fiber outputs:

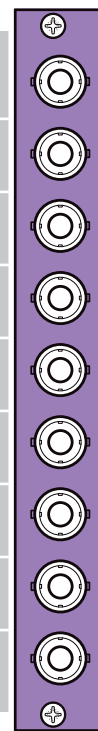
- **BPH01T_FC/PC_HXH10:**
I/O panel for HXH10 with fiber transmitter on FC/PC
- **BPH01T_SC_HXH10:**
I/O panel for HXH10 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HXH10:**
I/O panel for HXH10 with fiber receiver on FC/PC
- **BPH01R_SC_HXH10:**
I/O panel for HXH10 with fiber receiver on SC



For fiber connectivity see www.axon.tv



BPH01

Specifications

HD/SD serial video input

Standard	SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M, 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 150m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

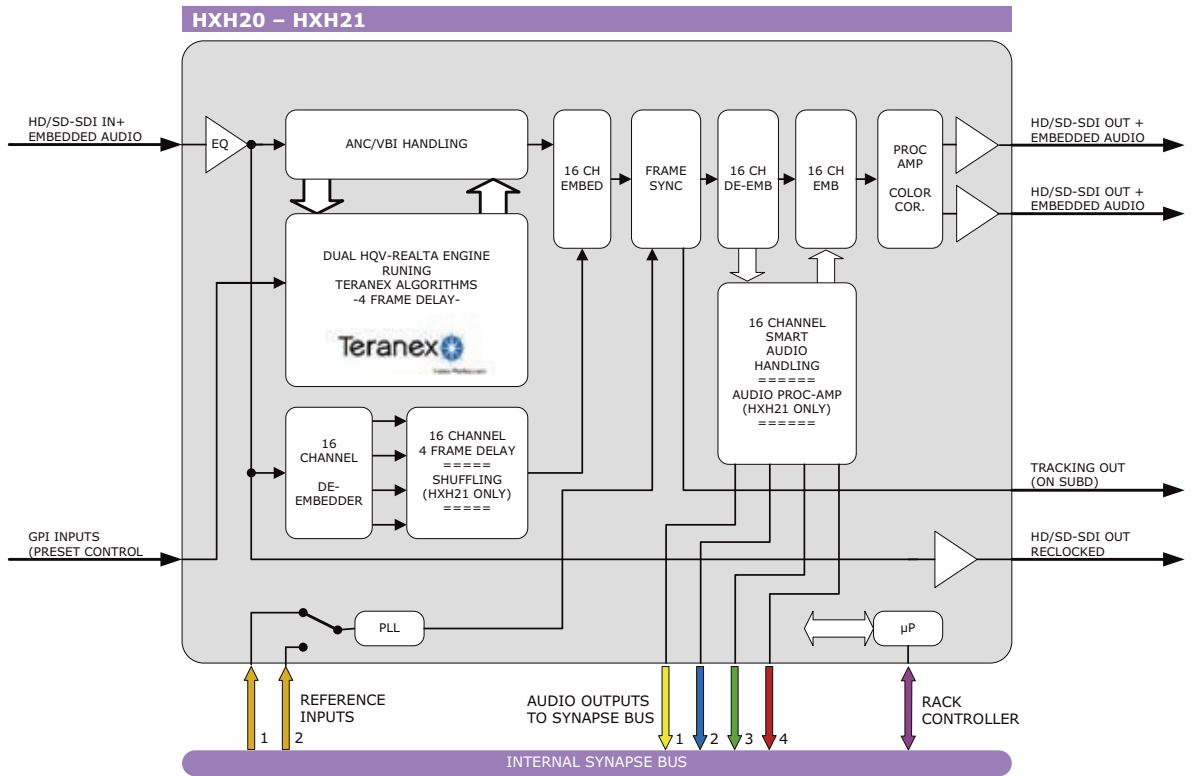
HD serial video output

Standard	SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M, 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	9 Watts

HXH10



MASTER Card

HD High definition

COMPATIBLE WITH **DOLBY E**

HXH20 - HXH21

HXH20 - HXH21 High performance up, down and cross converter with optional audio shuffler

The HXH20 High-end Up, Down and Cross Converter is based on the advanced Teranex® algorithms. This high performance dual-slot processing module is the pinnacle of the huge range of SD and HD conversion modules in the Synapse range. It is based on an Axon Synapse that enables full compatibility with the unique ADD-ON functionality of the Synapse system.

The advanced algorithms are running on two HQV Realta DSP's. This gives the board 2 Trillion operations per second processing power, and is the most powerful modular processing card at the time of its introduction.

- HD/SD-SDI input
- 1 relocked output
- 2 processed outputs
- Frame sync with built-in 16 channel smooth audio handling
- Offset delay -30ms to +1270ms
- Full audio shuffling of all 16 channels (HXH21 only)
- Audio gain and phase control of all 16 channels
- GPI preset control for audio shuffling (HXH21 only)
- GPI preset control for the built-in ARC

- All audio is present on ADD-ON bus for monitoring
- Transparent to Closed Captioning
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Conversion abilities

The HXH20 and HXH21 can process the following conversion:

CONVERSION		Output				
		1080i50	1080i59.94	720p50	720p59.94	480i59.94(525)
Input	1080i50	■	■	■	■	■
	1080i59.94		■	■	■	■
	720p50			■	■	■
	720p59.94		■	■	■	■
	576i50(625)				■	■
	480i59.94(525)					■

Applications

The HXH20 will find its use in MCR, Trucks and post production applications where a dynamic change of different formats is required. The unsurpassed conversion quality will enable the smooth transition with minimal artifacts to and from any HD source with the same frame rate.

- Highest quality up/down/cross-conversion
- Studio output cross-conversion
- Ingest cross-converting with preset audio shuffling (HXH21 only)

Ordering information

Module:

- **HXH20:** High performance Up, Down and Cross converter
- **HXH21:** High performance up converter with full 16 channels of audio swapping

Standard I/O:

- **BPH03_HXH20:** I/O-panel for HXH20
- **BPH03_HXH21:** I/O-panel for HXH20

Fiber outputs:

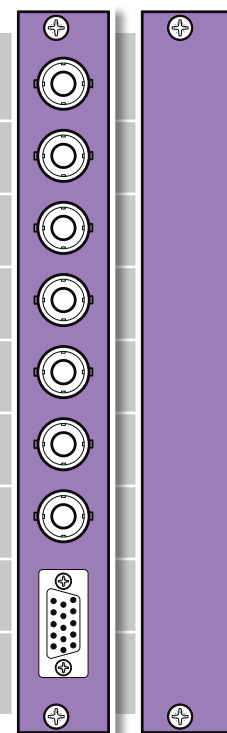
- **BPH03T_FC/PC_HXH20:** I/O-panel for HXH20 with fiber transmitter on FC/PC
- **BPH03T_SC_HXH20:** I/O-panel for HXH20 with fiber transmitter on SC
- **BPH03T_FCPC_HXH21:** I/O-panel for HXH21 with fiber transmitter on FC/PC
- **BPH03T_SC_HXH21:** I/O-panel for HXH21 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HXH20:** I/O-panel for HXH20 with fiber receiver on FC/PC
- **BPH03R_SC_HXH20:** I/O-panel for HXH20 with fiber receiver on SC
- **BPH03R_FC/PC_HXH21:** I/O-panel for HXH21 with fiber receiver on FC/PC
- **BPH03R_SC_HXH21:** I/O-panel for HXH21 with fiber receiver on SC

HD/SD-SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD-SDI RECLOCKED OUTPUT
HD/SD-SDI PROCESSED OUTPUT 1
HD/SD-SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
GPI INPUT

The HXH20/21 is a dual slot card taking up 2 card positions in a frame. For fiber connectivity see www.axon.tv



BPH03 + BPL00

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

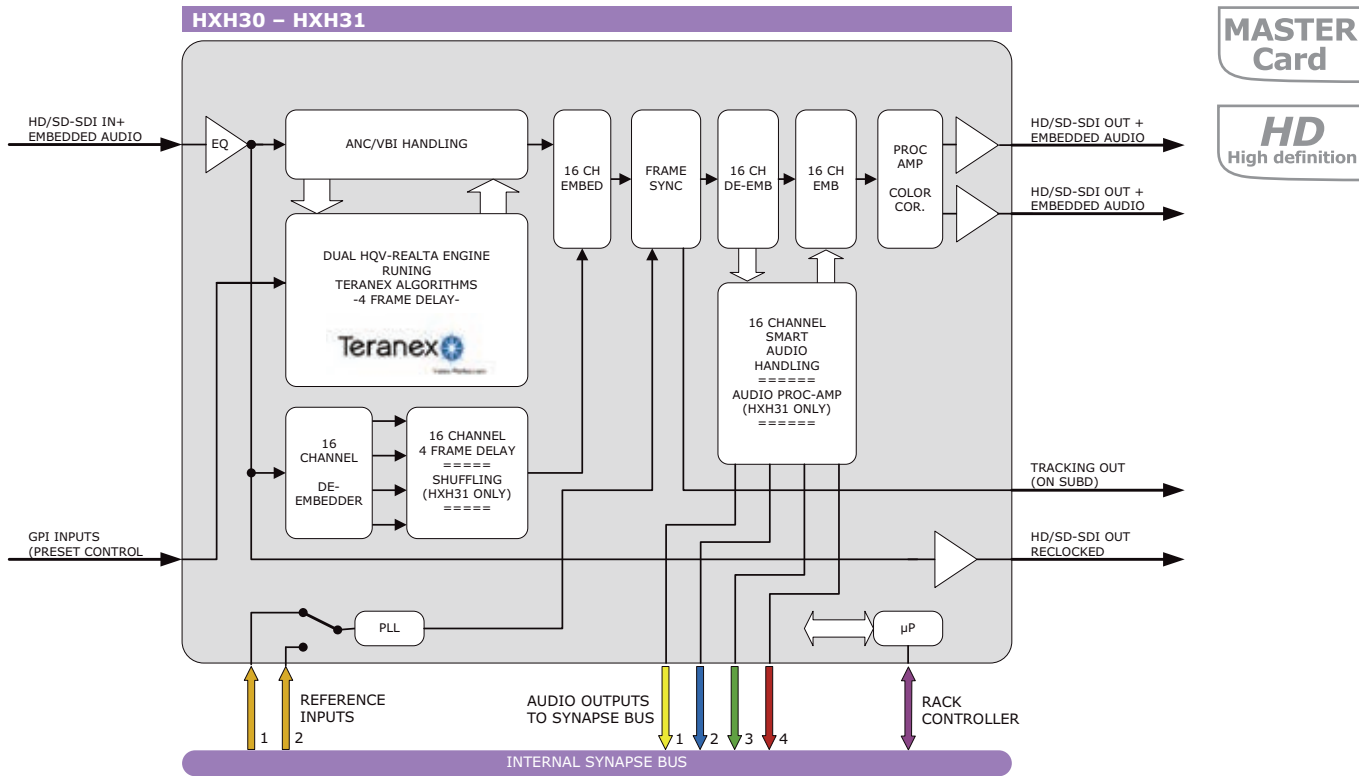
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 500g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 40 mm (HxWxD) = DUAL SLOT

Electrical

Voltage	+24V to +30V
Power	<36 Watts (dual slot)



HXH30 - HXH31 High performance HD standards converter with optional audio shuffler

The HXH30/31 Linear HD Standards Converter is based on the advanced Teranex® algorithms. This high performance dual slot processing module is the pinnacle of the huge range of SD and HD conversion modules in the Synapse range. HD and SD standard conversion is a process of converting (mostly US-based) 59.94 frames/fields per second video stream is converted to 50 frames/fields per second and vice versa for 1080i, 720p, 576i, 480i.

The advanced algorithms are running on two HQV Realta chips supplied by Silicon Optix. This gives the board 2 Trillion operations per second processing power, and makes it the most powerful modular processing card at the time of its introduction.

- SD/HD-SDI input
- 1 relocked output
- 2 processed outputs
- Frame sync with built-in 16 channel tracking audio delay
- Audio offset delay -60ms to +1240ms
- Full audio shuffling of all 16 channels (HXH31 only)
- Audio gain and phase control of all 16 channels
- GPI preset control for audio shuffling (HXH31 only)

- All audio is present on ADD-ON bus for monitoring
- Transparent to Closed Captioning
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Conversion abilities

The HXH30 and HXH31 can process the following conversion:

CONVERSION		Output			
		1080i50	1080i59.94	720p50	720p59.94
Input	1080i50	■	■		
	1080i59.94	■	■		
	720p50			■	■
	720p59.94			■	■
	576i50(625)				■
	480i59.94(525)				■

HXH30 - HXH31

Applications

The HXH30 is the choice for all HD standards conversion applications where a modular implementation with redundant power supplies, SNMP and hot swap ability is required.

- Highest quality HD standards-conversion
- Ingest standards-converting with preset audio shuffling (HXH31 only)
- Mobile truck applications
- DVD mastering and authoring

Ordering information

Module:

- **HXH30:** High performance HD standards converter
- **HXH31:** High performance up converter with full 16 channels of audio swapping

Standard I/O:

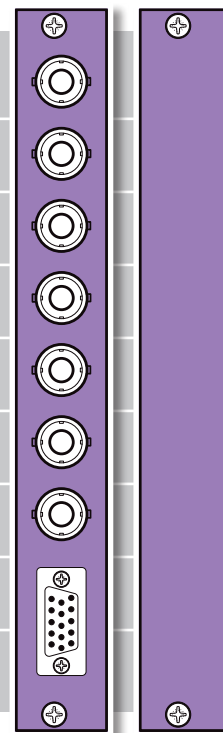
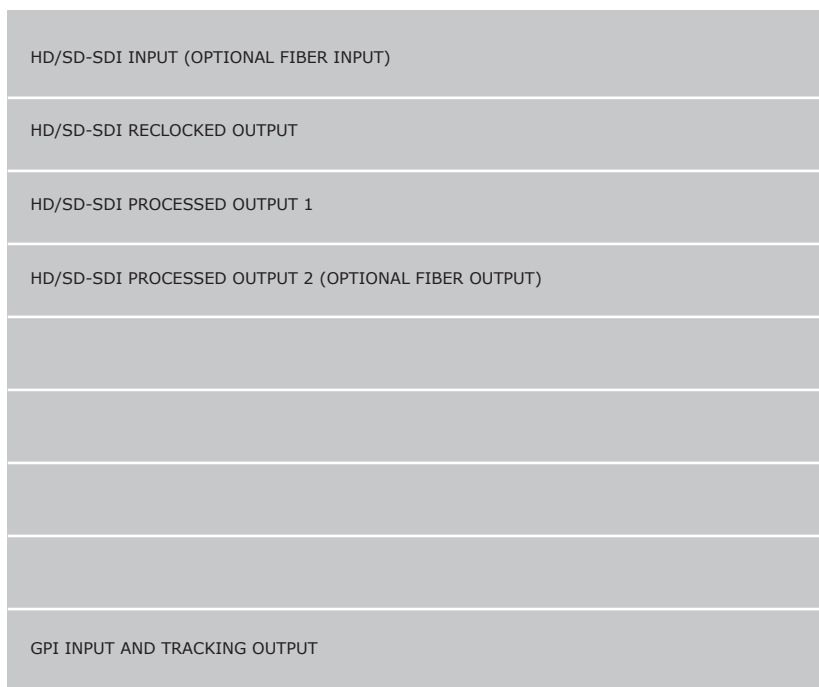
- **BPH03_HXH30:** I/O-panel for HSU20
- **BPH03_HXH31:** I/O-panel for HXH31

Fiber outputs:

- **BPH03T_FC/PC_HXH30:** I/O-panel for HXH30 with fiber transmitter on FC/PC
- **BPH03T_SC_HXH30:** I/O-panel for HXH30 with fiber transmitter on SC
- **BPH03T_FC/PC_HXH31:** I/O-panel for HXH31 with fiber transmitter on FC/PC
- **BPH03T_SC_HXH31:** I/O-panel for HXH31 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HXH30:** I/O-panel for HXH30 with fiber receiver on FC/PC
- **BPH03R_SC_HXH30:** I/O-panel for HXH30 with fiber receiver on SC
- **BPH03R_FC/PC_HXH31:** I/O-panel for HXH31 with fiber receiver on FC/PC
- **BPH03R_SC_HXH31:** I/O-panel for HXH31 with fiber receiver on SC



BPH03 + BPL00

The HXH30/31 is a dual slot card taking up 2 card positions in a frame. For fiber connectivity see www.axon.tv

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

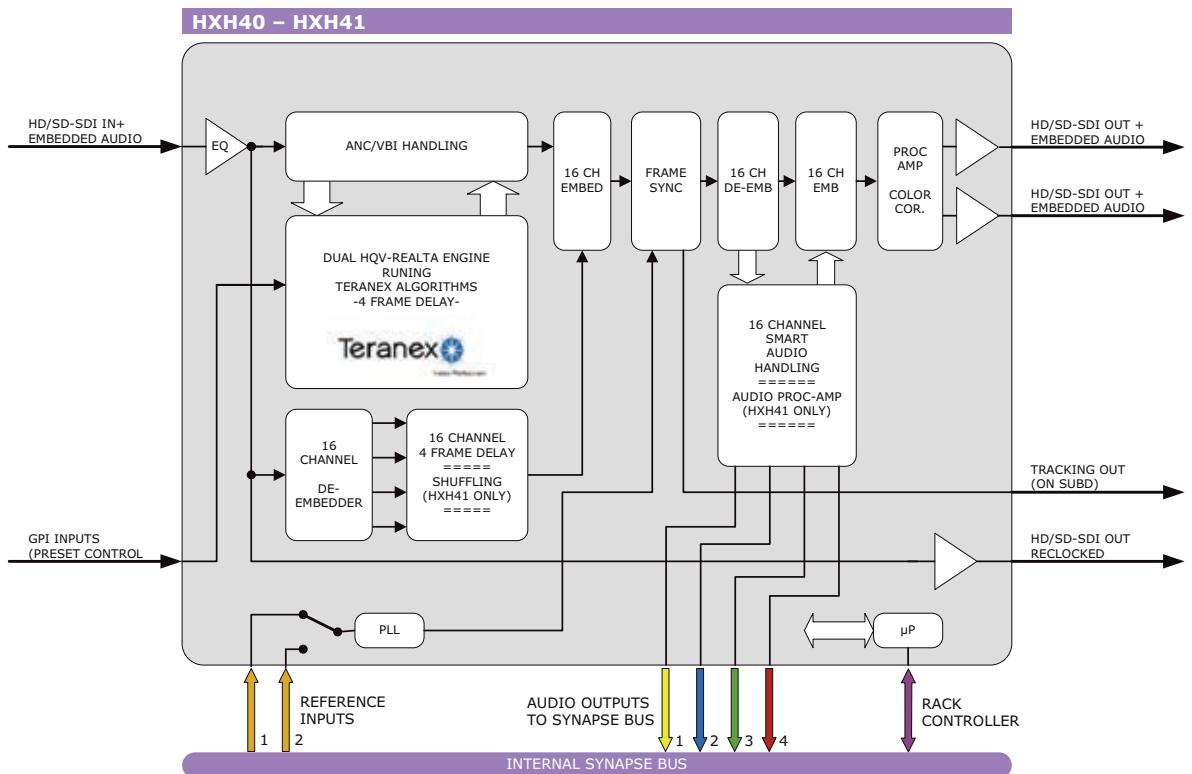
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 500g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 40 mm (HxWxD) = DUAL SLOT

Electrical

Voltage	+24V to +30V
Power	<36 Watts (dual slot)



HXH40 - HXH41 High performance HD up/down/cross & standards converter with optional audio shuffler

The HXH40/41 is a Linear SD/HD Standards converter, Up converter, Down Converter and Cross converter based on the advanced Teranex® algorithms. This high performance dual slot processing module is the pinnacle of the huge range of SD and HD conversion modules in the Synapse range. HD and SD standard conversion is a process of converting (mostly US-based) 59.94 frames/fields per second video stream is converted to 50 frames/fields per second and vice versa for 1080i, 720p, 576i, 480i.

The advanced algorithms are running on two HQV Realta chips supplied by Silicon Optix. This gives the board 2 Trillion operations per second processing power, and makes it the most powerful modular processing card at the time of its introduction.

- HD/SD-SDI input
- 1 reclocked output
- 2 processed outputs
- Frame sync with built-in 16 channel tracking audio delay
- Audio offset delay -60ms to +1240ms
- Full audio shuffling of all 16 channels (HXH41 only)
- Audio gain and phase control of all 16 channels
- GPI preset control for audio shuffling (HXH41 only)
- All audio is present on ADD-ON bus for monitoring
- Transparent to Closed Captioning

- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Conversion abilities

The HXH40 and HXH41 can process the following conversion:

CONVERSION		Output				
		1080i50	1080i59.94	720p50	720p59.94	480i59.94(525)
Input	1080i50	■	■	■	■	■
	1080i59.94	■	■	■	■	■
	720p50	■	■	■	■	■
	720p59.94	■	■	■	■	■
	576i50(625)	■	■	■	■	■
	480i59.94(525)	■	■	■	■	■

Applications

The HXH40/41 is the choice for all HD format conversions in a dynamically changing environment.

- High quality HD standards-conversion
- Ultra High quality Up, Down and Cross conversion
- Conversion with preset audio shuffling (HXH41 only)
- Mobile truck applications
- DVD mastering and authoring

Ordering information

Module:

- **HXH40:** High performance HD standards converter
- **HXH41:** High performance up converter with full 16 channels of audio swapping

Standard I/O:

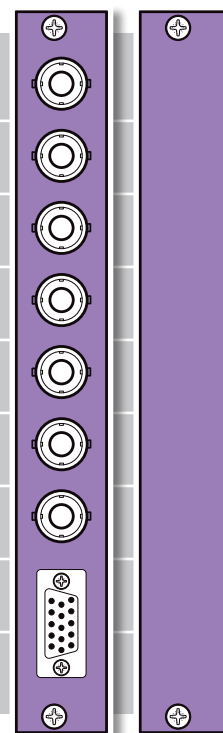
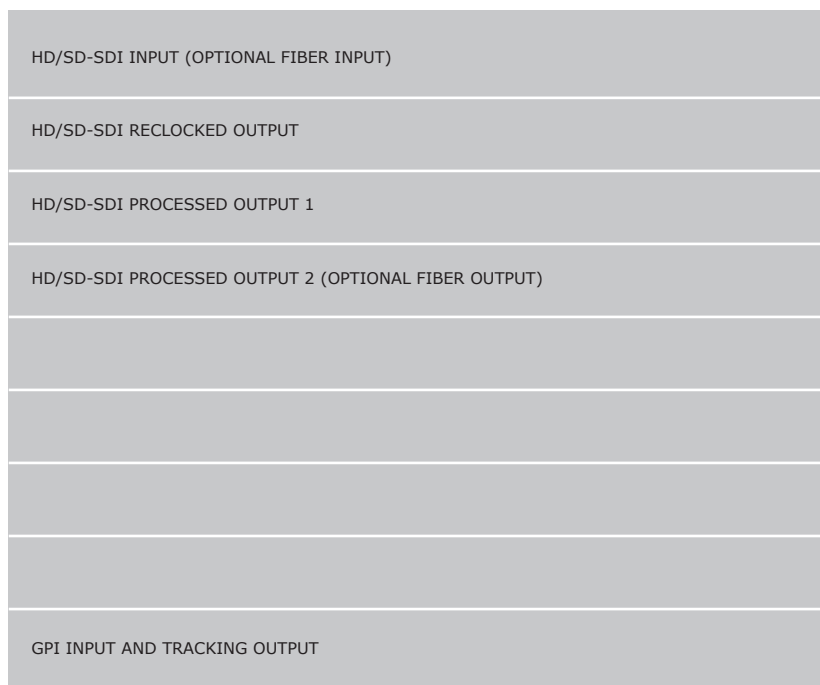
- **BPH03_HXH40:** I/O-panel for HSU20
- **BPH03_HXH41:** I/O-panel for HXH41

Fiber outputs:

- **BPH03T_FC/PC_HXH40:** I/O-panel for HXH40 with fiber transmitter on FC/PC
- **BPH03T_SC_HXH40:** I/O-panel for HXH40 with fiber transmitter on SC
- **BPH03T_FC/PC_HXH41:** I/O-panel for HXH41 with fiber transmitter on FC/PC
- **BPH03T_SC_HXH41:** I/O-panel for HXH41 with fiber transmitter on SC

Fiber inputs:

- **BPH03R_FC/PC_HXH40:** I/O-panel for HXH40 with fiber receiver on FC/PC
- **BPH03R_SC_HXH40:** I/O-panel for HXH40 with fiber receiver on SC
- **BPH03R_FC/PC_HXH41:** I/O-panel for HXH41 with fiber receiver on FC/PC
- **BPH03R_SC_HXH41:** I/O-panel for HXH41 with fiber receiver on SC



BPH03 + BPL00

The HXH40 - HXH41 is a dual slot card taking up 2 card positions in a frame. For fiber connectivity see www.axon.tv

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD

Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

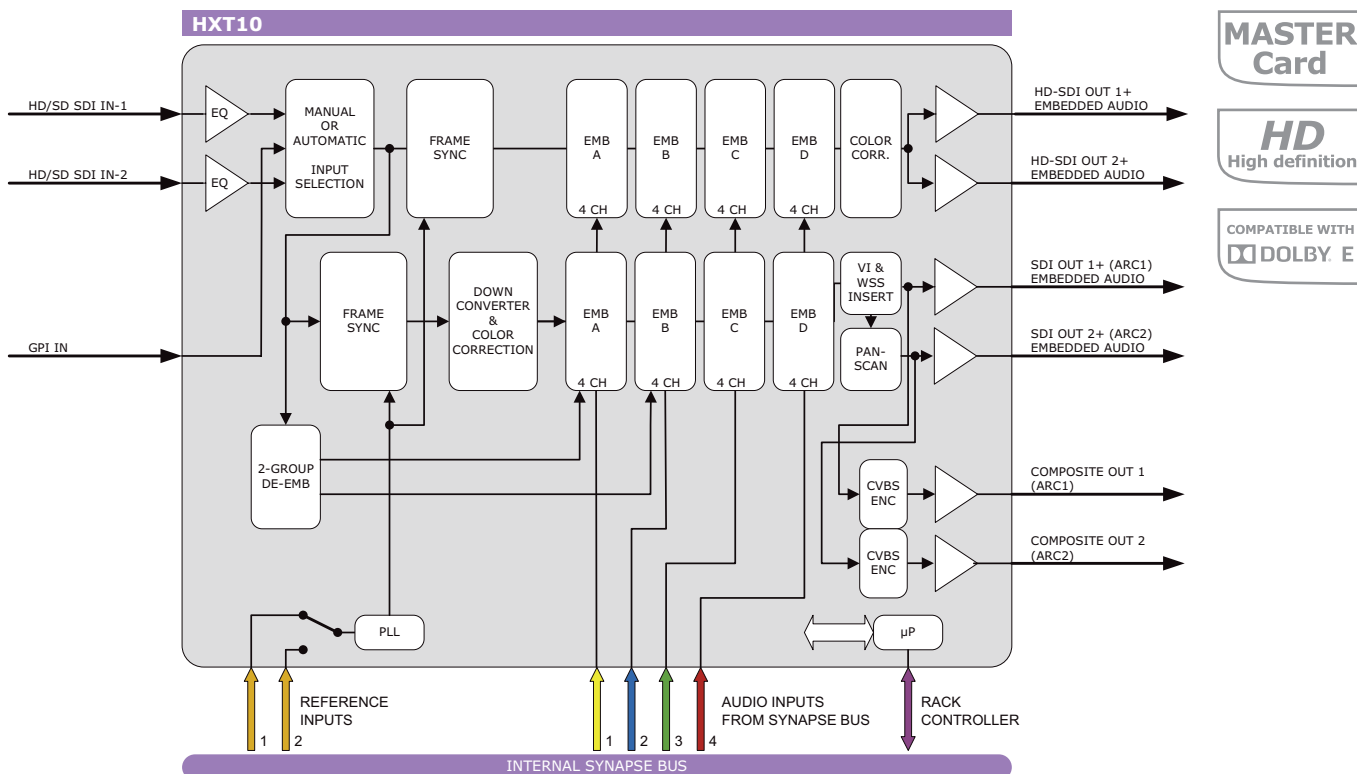
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 500g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 40 mm (HxWxD) = DUAL SLOT

Electrical

Voltage	+24V to +30V
Power	<36 Watts (dual slot)



HXT10 Dual HD input, frame synchronizer, down converter, embedder, CVBS encoder

The HXT10 is a frame synchronizer and 16 channel embedder combined with an ultra high-quality down converter. The dual input capability can be used as an emergency bypass switch. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native HD source, by use of a 64 tap FIR filters. This card is designed as a transmission output module that enables simultaneous feeding of HD, SD (with embedded audio) and dual composite monitoring output transmitters. The ideal companion is the new DIO48 to add 8 audio channels.

- HD/SD or SDI input (auto selecting)
- Dual input backup function
 - Automatic by input carrier detection
 - Manual by direct control (ACP)
 - GPI
- 2 Frame synchronizers for the HD and SD domain with individual output timing control
- 16 channel embedder in both HD and SD domain
 - HD is 16 channel (4 group) transparent in embedder off mode
 - SD is 8 channel (2 group) transparent in embedder off mode (after Frame-sync)
- Dual HD output
- Dual SD output (simultaneous anamorphic widescreen and pan-scan)
- Dual 8 bits composite monitoring output
- Color correction in both HD and SD domain
- 1080i or 720p 50 to 625/50
- 1080i or 720p 59.94 to 525/59.94
- 1080p or 720p 25 to 625/50
- 1080p or 720p 29.97 to 525/59.94
- 1080p or 720p 23.98 to 525/59.94
- Built-in ARC for 4:3 pan-scan and 14:9 and 16:9 letterbox output and anamorphic formats
- SD Safe area marker 4:3
- H+V sharpness control in SD domain for crisp down converted picture quality
- SD coring adjustment
- WSS, WSS-ext and VI insertion in SD domain
- I/O Delay measurement for both output domain
- Reporting of chosen input
- CRC status information for both inputs
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- OB Truck output card with 16 channel embedding (in combination with 2 x DIO48)
- 2x1 HD protection switch with SD and CVBS monitoring output
- Dual domain (HD & SD) production down converter with individual timing adjustment

Ordering information

Module:

- **HXT10:** Dual HD input, frame synchronizer, own converter, embedder, CVBS encoder

Standard I/O:

- **BPH05_HXT10:** I/O panel for HXT10

Fiber outputs:

- **BPH05T2_FC/PC_HXT10:** I/O panel for HXT10 with 2 fiber transmitters on FC/PC
- **BPH05T2_SC_HXT10:** I/O panel for HXT10 with 2 fiber transmitters on SC

Fiber inputs:

- **BPH05R2_FC/PC_HXT10:** I/O panel for HXT10 with 2 fiber receivers on FC/PC
- **BPH05R2_SC_HXT10:** I/O panel for HXT10 with 2 fiber receivers on SC

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.

Number of inputs 2 (auto or manual selection)

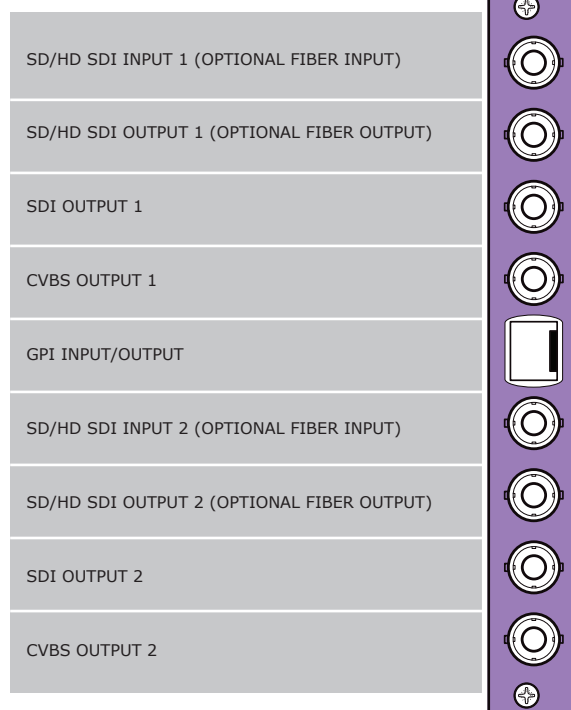
Return loss > 15dB up to 1.5GHz

HD/SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz > 15dB at 270Mb/s
Wideband jitter	< 0.2UI
Video delay	minimum of 56 SD lines, maximum 1F +56 lines



For fiber connectivity see www.axon.tv

BPH05

Analog video output

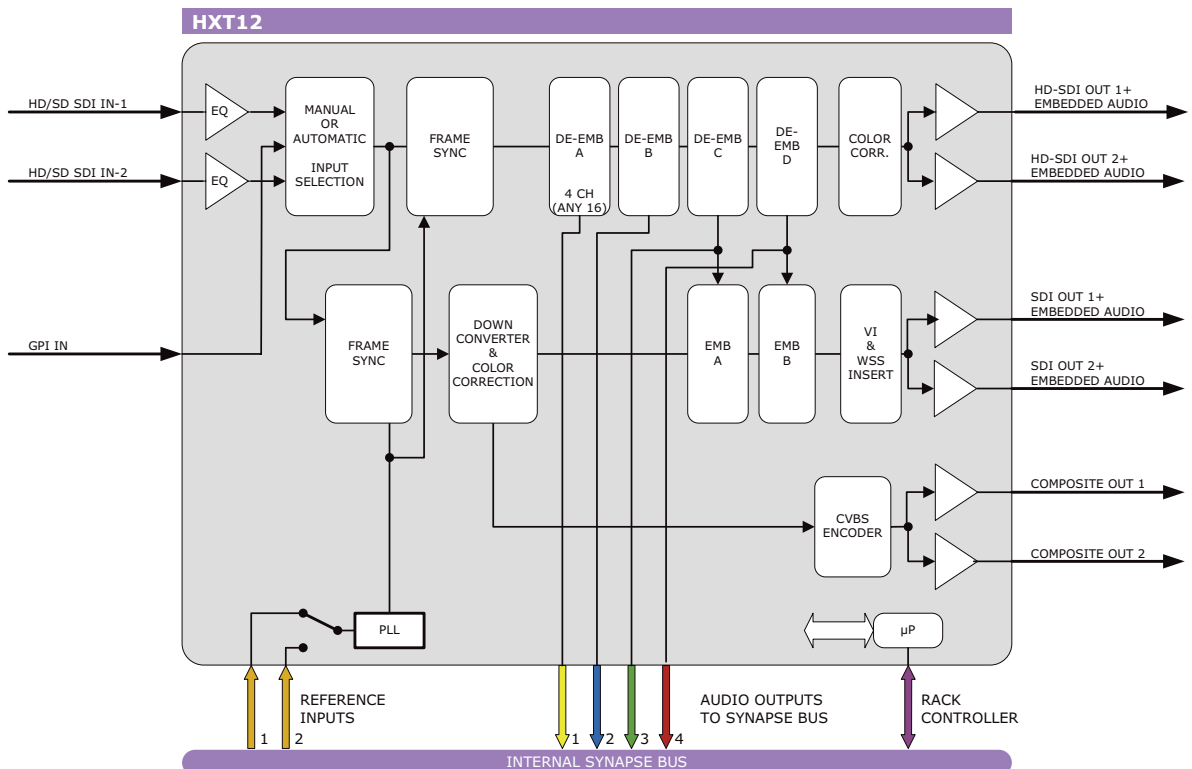
Standard	PAL (ITU624-4) or NTSC (SMPTE 170M)
	8 bits
Number of outputs	2
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	< 11 Watts

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HXT12 Dual HD input, frame synchronizer, down converter with embedder, de-embedder and CVBS encoder

The HXT12 is a frame synchronizer and 16 channel de-embedder combined with an ultra high-quality down converter. The dual input capability can be used as an emergency bypass switch. The optimized scaling and filter algorithms ensure crisp broadcast ready pictures from a native HD source, by use of a 64 tap FIR filters. This card is designed as a transmission output module that enables simultaneous feeding of HD, SD (with embedded audio) and dual composite monitoring output transmitters with the ability to de-embed 16 channels of audio to the synapse bus.

- HD/SD or SDI input (auto selecting)
- Dual input backup function
 - Automatic by input carrier detection
 - Manual by direct control (ACP)
 - GPI
- 2 Frame synchronizers for the HD and SD domain with individual output timing control
- 16 channel de-embedder in both HD and SD domain
 - SD is 8 channel (2 group) transparent in embedder off mode (after Frame-sync)
- Dual HD output
- Dual SD output
- Dual 8 bits composite monitoring output
- Color correction in both HD and SD domain
- 1080i or 720p 50 to 625/50
- 1080i or 720p 59.94 to 525/59.94
- 1080p or 720p 25 to 625/50
- 1080p or 720p 29.97 to 525/59.94
- 1080p or 720p 23.98 to 525/59.94
- Built-in ARC for 4:3 pan-scan and 14:9 and 16:9 letterbox output and anamorphic formats
- SD Safe area marker 4:3
- H+V sharpness control in SD domain for crisp down converted picture quality
- SD coring adjustment
- WSS, WSS-ext and VI insertion in SD domain
- I/O Delay measurement for both output domain
- Reporting of chosen input
- CRC status information for both inputs
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- OB Truck output card with 16 channel de-embedding
- 2x1 HD protection switch with SD and CVBS monitoring output
- Dual domain (HD & SD) production down converter with individual timing adjustment

Ordering information

Module:

- **HXT12:** Dual HD input, frame synchronizer, down converter with embedder, de-embedder, CVBS encoder

Standard I/O:

- **BPH05_HXT12:** I/O-panel for HXT12

Fiber outputs:

- **BPH05T2_FC/PC_HXT12:** I/O-panel for HXT12 with 2 fiber transmitters on FC/PC
- **BPH05T2_SC_HXT12:** I/O-panel for HXT12 with 2 fiber transmitters on SC

Fiber inputs:

- **BPH05R2_FC/PC_HXT12:** I/O-panel for HXT12 with 2 fiber receivers on FC/PC
- **BPH05R2_SC_HXT12:** I/O-panel for HXT12 with 2 fiber receivers on SC

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable
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Number of inputs	2 (auto or manual selection)
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Return loss	> 15dB up to 1.5GHz
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HD/SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Signal level	800mV nominal
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DC offset	0V ±0.5V
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Rise and fall Time	200ps nominal for HD, 750ps nominal for SD
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Overshoot	< 10% of amplitude
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Return loss	> 15dB up to 1.0Gb/s,
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	> 10dB up to 1.5Gb/s
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SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
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Number of outputs	2
--------------------------	---

Signal level	800mV nominal
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DC offset	0V ±0.5V
------------------	----------

Rise/fall time	800ps nominal
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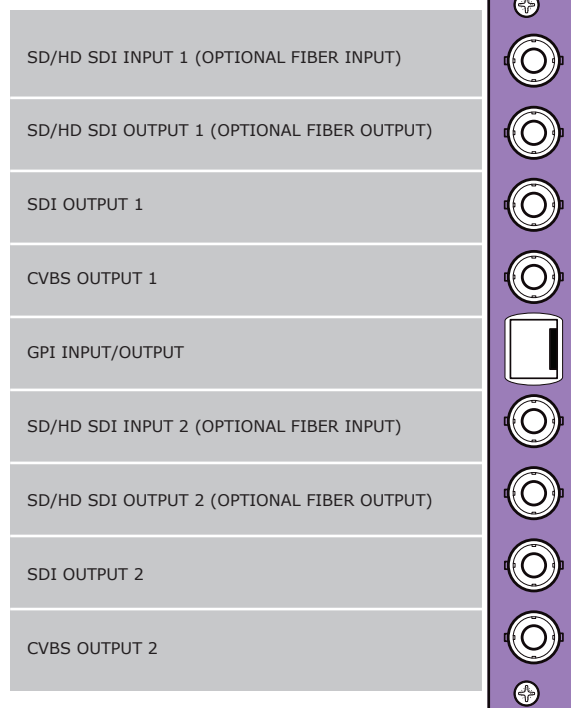
Overshoot	< 10% of amplitude
------------------	--------------------

Return loss	> 15dB up to 270MHz
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Return loss	> 15dB at 270Mb/s
--------------------	-------------------

Wideband jitter	< 0.2UI
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Video delay	minimum of 56 SD lines, maximum 1F +56 lines
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For fiber connectivity see www.axon.tv

BPH05

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M)
	8 bits

Number of outputs	2
--------------------------	---

Connector	BNC
------------------	-----

Signal level	1V nominal
---------------------	------------

Impedance	75 Ohms
------------------	---------

Return loss	> 35dB to 10MHz
--------------------	-----------------

Frequency response	0.5dB to 4.5 MHz
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Differential gain	< 0.6%
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Differential phase	< 0.7°
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SNR	> 75dB
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Miscellaneous

Weight	Approx. 250g
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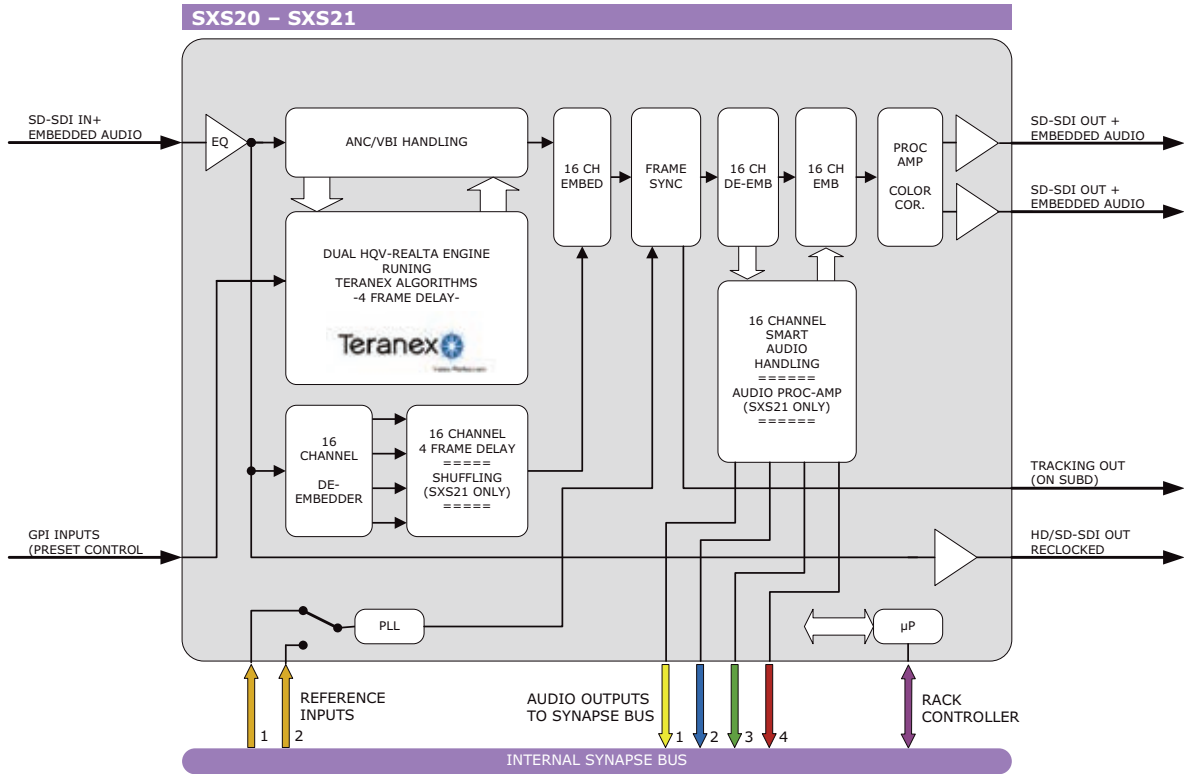
Operating temperature	0 °C to +50 °C
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Dimensions	137 x 296 x 20 mm (HxWxD)
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Electrical

Voltage	+24V to +30V
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Power	<11 Watts
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SXS20 - SXS21 High performance SD standards converter

The SXS20/21 Linear SD Standards Converter is based on the advanced Teranex® algorithms. This high performance dual slot processing module is the pinnacle of the huge range of SD and HD conversion modules in the Synapse range. SD standard conversion is a process of converting (mostly US-based) 59.94 frames/fields per second video stream is converted to 50 frames/fields per second and vice versa for 576i, 480i.

The advanced algorithms are running on two HQV Realta chips supplied by Silicon Optix. This gives the board 2 Trillion operations per second processing power, and makes it the most powerful modular processing card at the time of its introduction.

- SD -SDI input
- 1 reclocked output
- 2 processed outputs
- 576i/50 to 480i/59.94 conversion
- 480i/59.94 to 576/50 conversion
- Frame sync with built-in 16 channel tracking audio delay
- Audio offset delay -60ms to +1240ms
- Full audio shuffling of all 16 channels (SXS21 only)
- Audio gain and phase control of all 16 channels (SXS21 only)

- GPI preset control for audio shuffling (SXS21 only)
- All audio is present on ADD-ON bus for monitoring
- Transparent to Closed Captioning
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Conversion abilities

The SXS20 and SXS21 can process the following conversion:

		Output			
		1080i50	1080i59.94	720p50	720p59.94
Input	1080i50				
	1080i59.94				
	720p50				
	720p59.94				
	576i50(625)				■ ■
480i59.94(525)				■ ■	

Applications

The SXS20/21 is the choice for all SD standards conversion applications where a modular implementation with redundant power supplies, SNMP and hot swap ability is required.

- Highest quality SD standards-conversion
- Ingest standards-converting with preset audio shuffling (SXS21 only)
- Mobile truck applications
- DVD mastering and authoring

Ordering information

Module:

- **SXS20:** High performance SD standards converter
- **SXS21:** High performance SD standards converter with full 16 channels of audio swapping

Standard I/O:

- **BPH03_SXS20:** I/O-panel for SXS20
- **BPH03_SXS21:** I/O-panel for SXS21

Fiber outputs:

- **BPH03T_FC/PC_SXS20:** I/O-panel for SXS20 with fiber transmitter on FC/PC
- **BPH03T_SC_SXS20:** I/O-panel for SXS20 with fiber transmitter on SC
- **BPH03T_FC/PC_SXS21:** I/O-panel for SXS21 with fiber transmitter on FC/PC
- **BPH03T_SC_SXS21:** I/O-panel for SXS21 with fiber transmitter on SC

Fiber inputs:

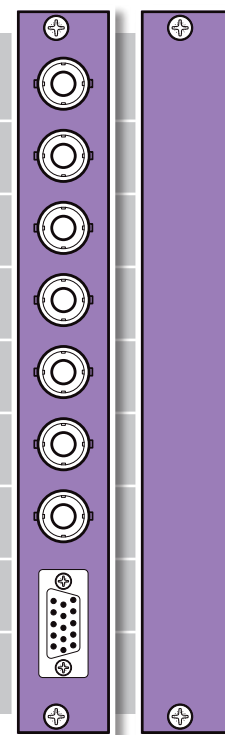
- **BPH03R_FC/PC_SXS20:** I/O-panel for SXS20 with fiber receiver on FC/PC
- **BPH03R_SC_SXS20:** I/O-panel for SXS20 with fiber receiver on SC
- **BPH03R_FC/PC_SXS21:** I/O-panel for SXS21 with fiber receiver on FC/PC
- **BPH03R_SC_SXS21:** I/O-panel for SXS21 with fiber receiver on SC

CVBS outputs:

- **BPH03C_SXS20:** I/O-panel for SXS20 with CVBS output
- **BPH03C_SXS21:** I/O-panel for SXS21 with CVBS output

SD-SDI INPUT (OPTIONAL FIBER INPUT)
SD-SDI RECLOCKED OUTPUT
SD-SDI PROCESSED OUTPUT 1
SD-SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OR CVBS OUTPUT)
GPI INPUT AND TRACKING OUTPUT

The SXS20/21 is a dual slot card taking up 2 card positions in a frame. For fiber connectivity see www.axon.tv



BPH03 + BPL00

Specifications

SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Reference video input

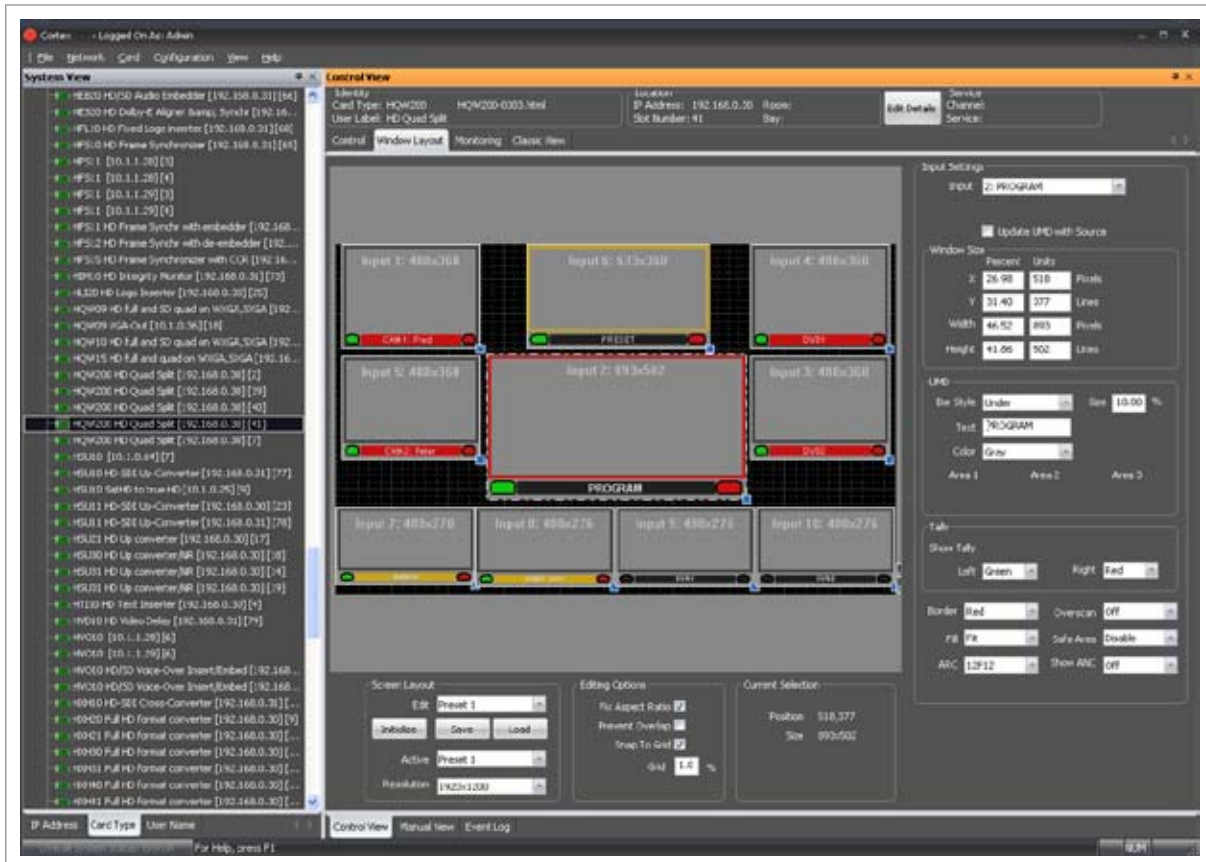
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 40 mm (HxWxD) = DUAL SLOT

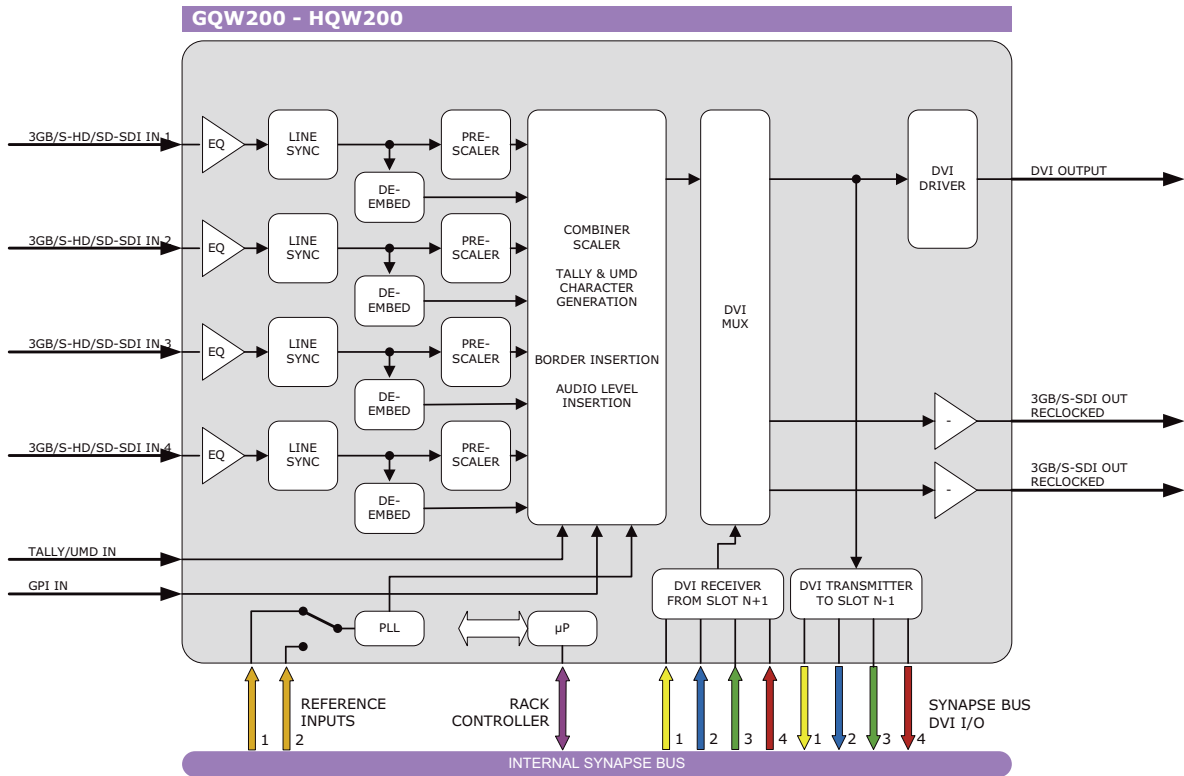
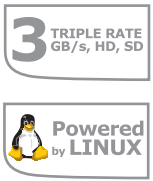
Electrical

Voltage	+24V to +30V
Power	<33 Watts (dual slot)



HQW200





GQW200 - HQW200 - SQW200

GQW200 - HQW200 - SQW200 Triple rate SDI quad split/multiview building block

The GQW200 is a high-quality 4x 3Gb/s or HD or SD-SDI (in any combination) to QWXGA converter on DVI or 3Gb/s HD SDI out. The unit supports resolutions up to 1920x1200. A Tally and UMD OSD is included. This will enable a very compact monitor solution with the UMD and Tally as part of the set. High-quality in-house developed de-interlacing and scaling algorithms ensure crisp picture quality. The GQW200 is triple rate (3Gb/s, HD and SD) and the HQW200 is HD and SD, the SQW200 is SD, both are upgradeable to handle 3Gb/s.

- Quad-split function or full-screen mode for each input
- Low latency (20 mS for 50Hz, 17 mS for 59.94Hz)
- Full 10 bit in RGB domain (internal 20bit processing for scaling)
- UP to 1920x1200 resolution on DVI (BPH15)
- Up to 1920x1080p on 3Gb/s SDI output (BPH16)
- Full variable scaling and positioning for all individual inputs
- All inputs compatible with (mixing is allowed within equal framerates):
 - 1080p 50 and 59.94
 - 1080i and 720p 50 and 59.94 Hz
 - 1080p (sf) and 720p 29.97/25/24
 - 1035i 60
 - SD 625 and 525
- 15-pole sub-D connector for serial UMD, Tally protocols (TSL and ASCII) and GPI triggers
- 8 and 16 character UMD capability

- Three assignable regions in or under monitor
 - Input format
 - Static UMD
 - Dynamic UMD
- Lock to input, reference or free running
- Audio metering
- 4 free selectable OSD audio level Bar-graphs
 - Masked or transparent bar-graphs
 - AES/EBU, BBC, Nordic and VU scales
 - Phase correlation between two AES channels
- Color corrector
- UMD colors:
 - White
 - Red
 - Green
 - Amber
- Border, UMD and tally brightness adjustment
- Safe area:
 - Action
 - Action + Graphics
 - Shoot and protect Action
 - Shoot and protect Graphics
 - Shoot and protect Action + Graphics
 - Graphics
 - Shoot and protect 4:3
- Automatic 4:3 and 16:9 modes through VI or WSS triggers (SD-SDI inputs)
- GPI control for:
 - Aspect ratio (4:3 or 16:9)
 - Full screen or quad mode
 - Tally
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Clock on VITC possible

Applications

- High resolution monitor walls
- OB Truck preview monitoring and shading

Ordering information

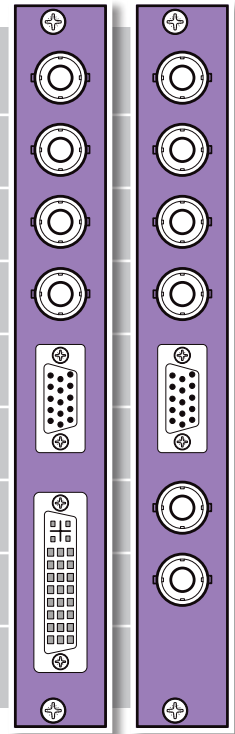
Module:

- **GQW200:** 3Gb/s, HD, SD SDI quad split to QWXGA converter on DVI or (3Gb/s-HD) SDI
- **HQW200:** HD/SD-SDI quad split to QWXGA converter on DVI or HD SDI. (upgradeable to handle 3Gb/s)
- **SQW200:** SD-SDI quad split to QWXGA converter on DVI or SDI. (upgradeable to handle 3Gb/s)

Standard I/O:

- **BPH15_GQW200:**
I/O-panel for GQW200 with DVI output
- **BPH15_HQW200:**
I/O-panel for HQW200 with DVI output
- **BPH15_SQW200:**
I/O-panel for SQW200 with DVI output
- **BPH16_GQW200:**
I/O-panel for GQW200 with SDI output
- **BPH16_HQW200:**
I/O-panel for HQW200 with SDI output
- **BPH16_SQW200:**
I/O-panel for SQW200 with SDI output

3GB/S, HD, SD SDI INPUT 1
3GB/S, HD, SD SDI INPUT 2
3GB/S, HD, SD SDI INPUT 3
3GB/S, HD, SD SDI INPUT 4
TALLY UMD AND GPI
DVI OUTPUT (BPH15) 2X SDI OUT (BPH16)



BPH15

BPH16

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M, SMPTE424
Equalization	Automatic to 130m @ 1.5Gb/s with Belden 1694A or equivalent cable Automatic to 100m @ 3Gb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 1.5GHz
Number of inputs	4

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

DVI output

Standard	DVI digital single link 1920 x 1200
Number of outputs	1
Cable driver	Up to 10 meter of high quality DVI cable (Gefen)

SDI output

Standard	SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M, SMPTE424A
Number of outputs	2 (optional Dual link)

Miscellaneous

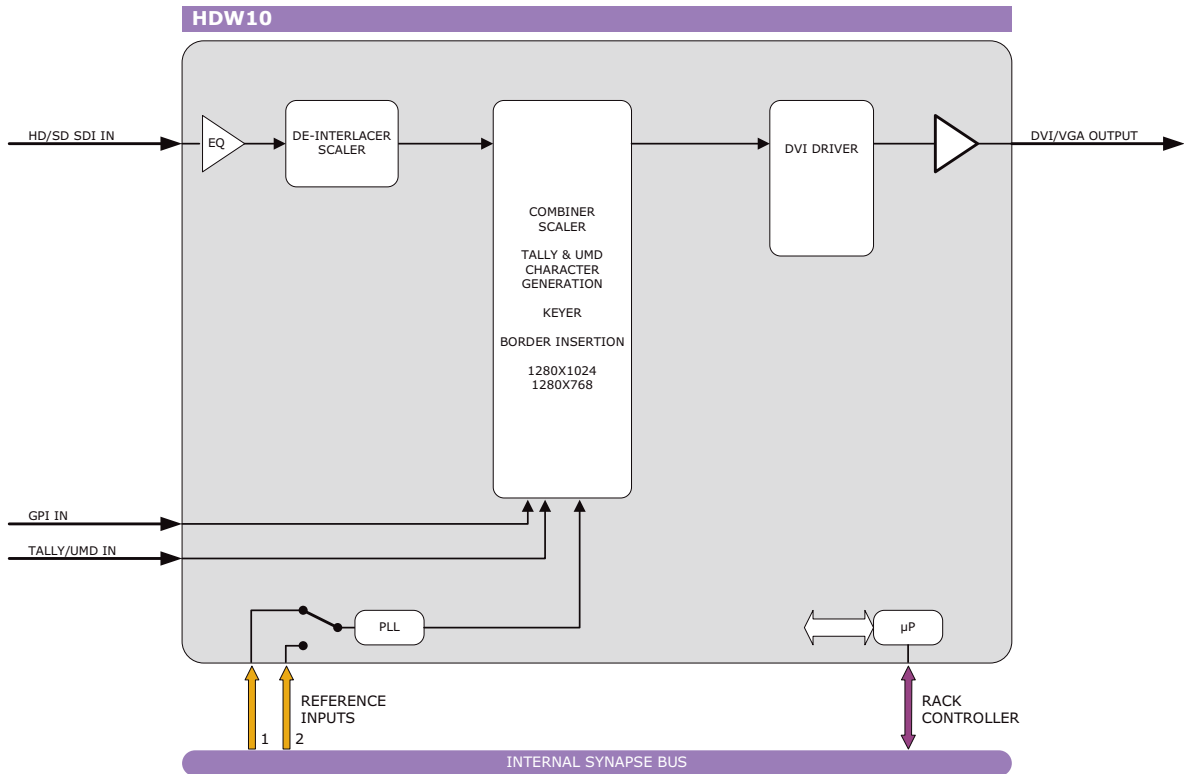
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<16 Watts

GQW200 - HQW200
- SQW200





HDW10 HD/SD SDI to WXGA converter on VGA and DVI

The HDW10 is a high-quality SD/HD-SDI converter on DVI or VGA. The unit supports 2 output resolutions: 1280x768 and 1280x1024. A Tally and UMD OSD is included. This will enable a very compact monitor solution with the UMD and Tally as part of the set. High-quality in-house developed de-interlacing and scaling algorithms ensure crisp picture quality.

- 1280x1024 and 1280x768 resolution on DVI (BPH10)
- 1280x1024 on VGA (BPH11)
- HD SDI input 1 compatible with:
 - 1080i and 720p 50 and 59.95 Hz
 - 1080p(sf) and 720p 29.97/25/24
 - 1035i 59.94
 - SD 625 and 525
- 15-pole sub-D connector for serial UMD, Tally protocols (TSL and ASCII) and GPI triggers
- 8 and 16 character UMD capability
- Lock to input, reference or free running
- Color corrector
- UMD colors:
 - White
 - Green
 - Red
 - Amber
- Border, UMD and tally brightness adjustment
- Safe area:
 - Action
 - Graphics
 - Action + Graphics
 - Shoot and protect 4:3
 - Shoot and protect Action
 - Shoot and protect Graphics
 - Shoot and protect Action + Graphics
- Automatic 4:3 and 16:9 modes through VI or WSS triggers
- GPI control for:
 - Aspect ratio (4:3 or 16:9)
 - Full screen or quad mode
 - Tally
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- High resolution monitor walls
- Truck preview monitoring and shading
- Compact Sony LMD-170/171/172 and 230W control unit (replaces MEU-WX1) 18 channels in 4 RU

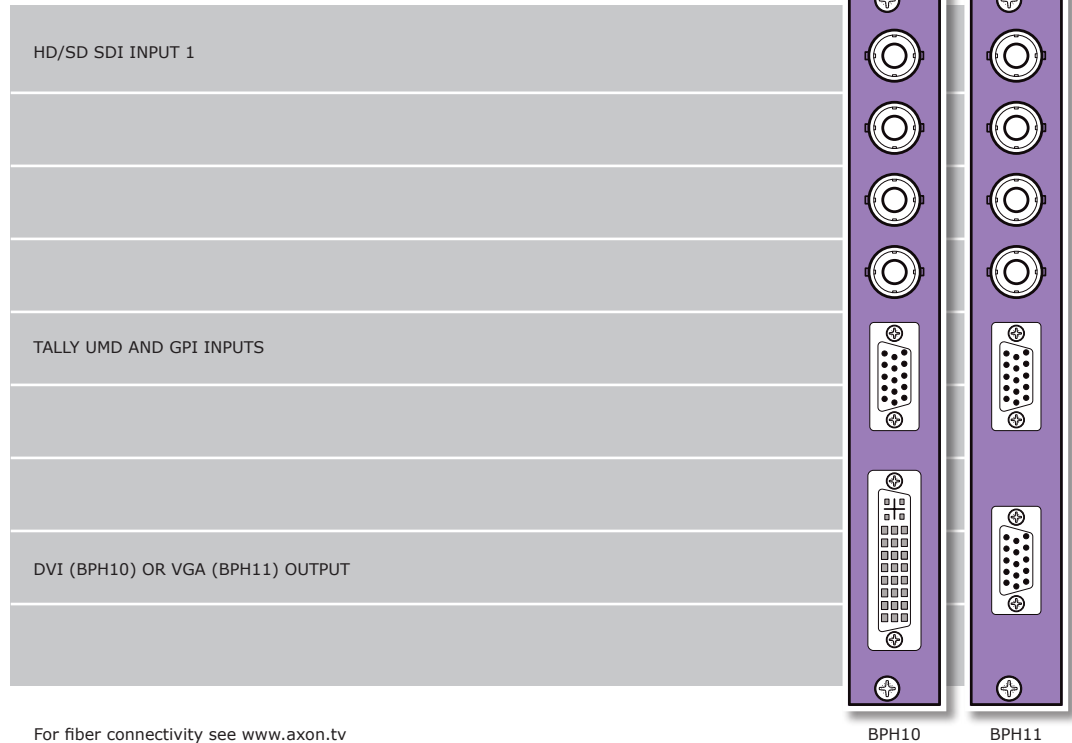
Ordering information

Module:

- **HDW10:** HD/SD-SDI to WXGA converter on VGA and DVI

Standard I/O:

- **BPH10_HDW10:**
I/O panel for HDW10 with DVI output
- **BPH11_HDW10:**
I/O panel for HDW10 with VGA output



Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Number of inputs	1
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

DVI output

Standard	DVI digital single link
Number of outputs	1
Cable driver	Up to 10 meter of high quality DVI cable (Gefen)

Miscellaneous

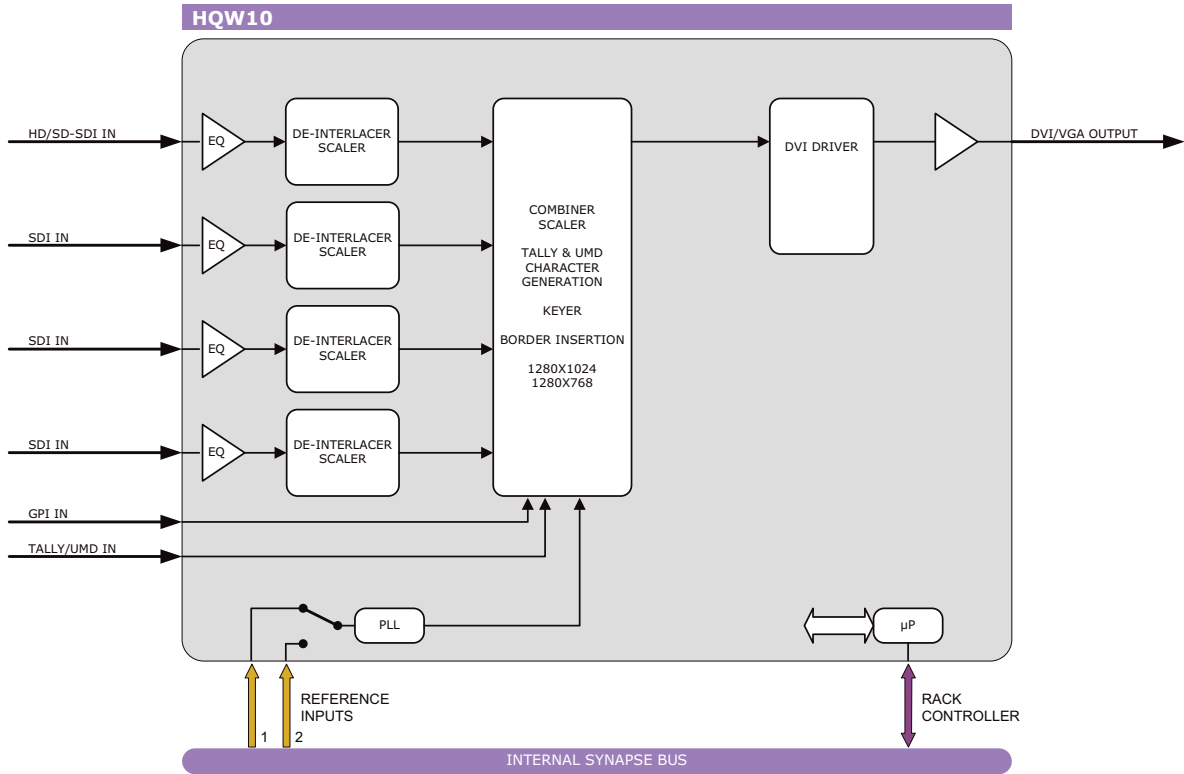
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	11 Watts

HDW10





HQW10 HD (1)/SD quad split to WXGA converter on VGA and DVI with HD-SDI single channel display capabilities

The HQW10 is a high-quality 3x SD-SDI + 1 HD-SDI or 4x SD-SDI to WXGA converter on DVI or VGA. The unit supports 2 output resolutions: 1280x768 and 1280x1024. A Tally and UMD OSD is included. This will enable a very compact monitor solution with the UMD and Tally as part of the set. High-quality in-house developed de-interlacing and scaling algorithms ensure crisp picture quality.

- Quadsplit function or full-screen mode for each input
 - 1x HD + 3x SD in 1280x768 output resolution
- 1280x1024 and 1280x768 resolution on DVI (BPH10)
- 1280x1024 on VGA (BPH11 no HD)
- HD SDI input 1 compatible with:
 - 1080i and 720p 50 and 59.95 Hz
 - 1080p (sf) and 720p 29.97/25/24
 - 1035i 60
 - SD 625 and 525
- 15 pins sub-D connector for serial UMD, Tally protocols (TSL and ASCII) and GPI triggers
- 8 and 16 character UMD capability
- Lock to input, reference or free running
- Color corrector
- UMD colors:
 - White
 - Green
 - Red
 - Amber
- Border, UMD and tally brightness adjustment
- Safe area:
 - Action
 - Graphics
 - Action + Graphics
 - Shoot and protect 4:3
 - Shoot and protect Action
 - Shoot and protect Graphics
 - Shoot and protect Action + Graphics
- Automatic 4:3 and 16:9 modes through VI or WSS triggers
- GPI control for:
 - Aspect ratio (4:3 or 16:9)
 - Full screen or quad mode
 - Tally
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

HQW10

Applications

- High resolution monitor walls
- Truck preview monitoring and shading
- Compact Sony LMD-170/171/172 and 230W control unit (replaces MEU-WX1) 18 channels in 4 RU (72 SDI inputs)

Ordering information

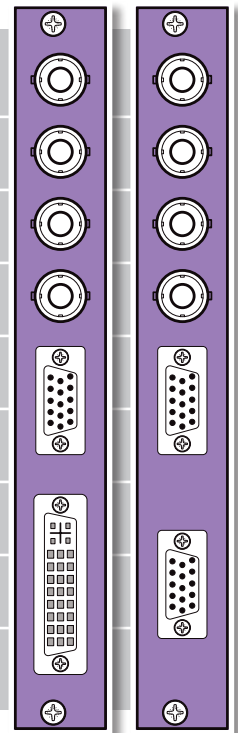
Module:

- **HQW10:** HD (1)/SD quad split to WXGA converter on VGA and DVI with HD-SDI single channel display capabilities

Standard I/O:

- **BPH10_HQW10:** I/O panel for HQW10 with DVI output
- **BPH11_HQW10:** I/O panel for HQW10 with VGA output

HD/SD SDI INPUT 1
SD SDI INPUT 2
SD SDI INPUT 3
SD SDI INPUT 4
TALLY UMD AND GPI INPUTS
DVI (BPH10) OR VGA (BPH11) OUTPUT



BPH10

BPH11

Specifications

HD/SD serial video input

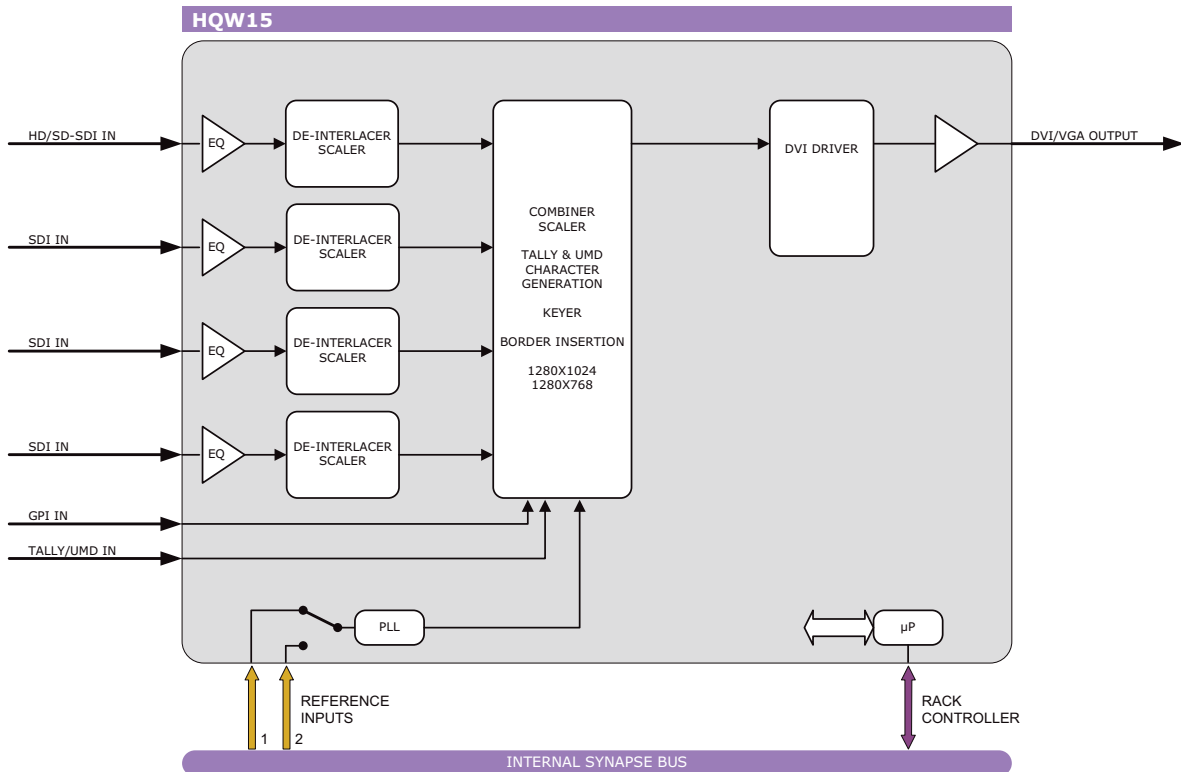
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Number of inputs	4
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

DVI output

Standard	DVI digital single link
Number of outputs	1
Cable driver	Up to 10 meter of high quality DVI cable (Gefen)
Miscellaneous	
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	11 Watts



HQW15 HD/SD quad split to WXGA converter on VGA and DVI with full-screen display capabilities

The HQW15 is a high-quality 4x HD/SD-SDI to WXGA converter on DVI or VGA. The unit supports 2 output resolutions: 1280x768 and 1280x1024. A Tally and UMD OSD is included. This will enable a very compact monitor solution with the UMD and Tally as part of the set. High-quality in-house developed de-interlacing and scaling algorithms ensure crisp picture quality with a very low 1 Field internal propagation delay.

- Quad-split function or full-screen mode for each input
- Low latency (1 Field)
- 1280x1024 and 1280x768 resolution on DVI (BPH12)
- 1280x1024 and 1280x768 resolution on DVI with extended DVI cable length (BPH13)
- 1280x1024 and 1280x768 on VGA (BPH14)
- All inputs compatible with (mixing is allowed within equal framerates):
 - 1080i and 720p 50 and 59.95 Hz
 - 1080p (sf) and 720p 29.97/25/24
 - 1035i 60
 - SD 625 and 525
- 15 pins sub-D connector for serial UMD, Tally protocols (TSL and ASCII) and GPI triggers
- 8 and 16 character UMD capability
- Lock to input, reference or free running
- Color corrector
- UMD colors:
 - White
 - Green
 - Red
 - Amber
- Border, UMD and tally brightness adjustment
- Safe area:
 - Action
 - Graphics
 - Action + Graphics
 - Shoot and protect 4:3
 - Shoot and protect Action
 - Shoot and protect Graphics
 - Shoot and protect Action + Graphics
- Automatic 4:3 and 16:9 modes through VI or WSS triggers
- GPI control for:
 - Aspect ratio (4:3 or 16:9)
 - Full screen or quad mode
 - Tally
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- High resolution monitor walls
- Truck preview monitoring and shading
- Compact Sony LMD-170/171/172 and 230W control unit (replaces MEU-WX1) 18 channels in 4 RU (72 HD/SD SDI inputs)

Ordering information

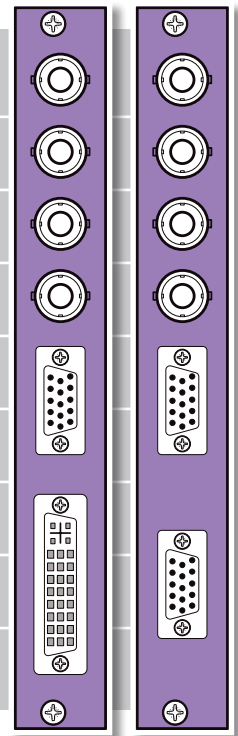
Module:

- **HQW15:** HD/SD quad split to WXGA converter on VGA and DVI with full screen capabilities

Standard I/O:

- **BPH12_HQW15:** I/O-panel for HQW15 with DVI output
- **BPH14_HQW15:** I/O-panel for HQW15 with VGA output

HD/SD SDI INPUT 1
HD/SD SDI INPUT 2
HD/SD SDI INPUT 3
HD/SD SDI INPUT 4
TALLY UMD AND GPI INPUTS
DVI (BPH12) OR VGA (BPH14) OUTPUT



BPH12

BPH14

Specifications

HD/SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
Number of inputs	4
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 1.5GHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

DVI output

Standard	DVI digital single link
Number of outputs	1
Cable driver	Up to 10 meter of high quality DVI cable (Gefen)

VGA output

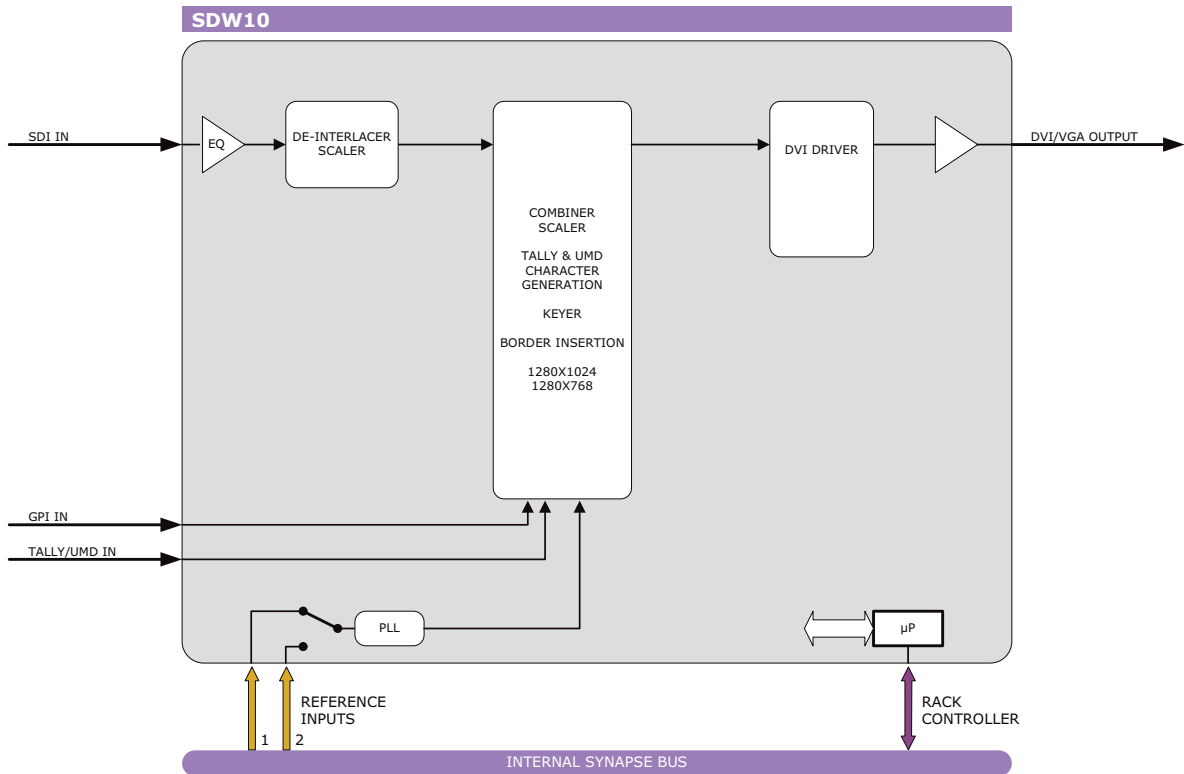
Standard	VGA analog
Number of outputs	1
Miscellaneous	
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	11 Watts

HQW15





SDW10 SDI to WXGA converter on VGA and DVI

The SDW10 is a high-quality 1x SDI to WXGA converter on DVI or VGA. The unit supports 2 output resolutions: 1280x768 and 1280x1024. A Tally and UMD OSD is included. This will enable a very compact monitor solution with the UMD and Tally as part of the set. High-quality in-house developed de-interlacing and scaling algorithms ensure crisp picture quality.

- 1280x1024 and 1280x768 resolution on DVI (BPH10)
- 1280x1024 on VGA (BPH11)
- SD 625 and 525
- 15-pole sub-D connector for serial UMD, Tally protocols (TSL and ASCII) and GPI triggers
- 8 and 16 character UMD capability
- Lock to input, reference or free running
- Color corrector
- UMD colors:
 - White
 - Green
 - Red
 - Amber
- Border, UMD and tally brightness adjustment
- Safe area:
 - Action
 - Graphics
 - Action + Graphics
 - Shoot and protect 4:3
 - Shoot and protect Action
 - Shoot and protect Graphics
 - Shoot and protect Action + Graphics
- Automatic 4:3 and 16:9 modes through VI or WSS triggers
- GPI control for:
 - Aspect ratio (4:3 or 16:9)
 - Full screen or quad mode
 - Tally
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- High resolution monitor walls
- Truck preview monitoring and shading
- Compact Sony LMD-170/171/172 and 230W control unit (replaces MEU-WX1) 18 channels in 4 RU

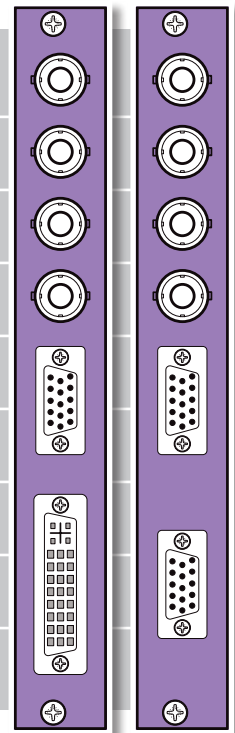
Ordering information

Module:

- **SDW10:** SDI to WXGA converter on VGA and DVI

Standard I/O:

- **BPH10_SDW10:** I/O panel for SDW10 with DVI output
- **BPH11_SDW10:** I/O panel for SDW10 with VGA output



BPH10

BPH11

For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 150m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

DVI output

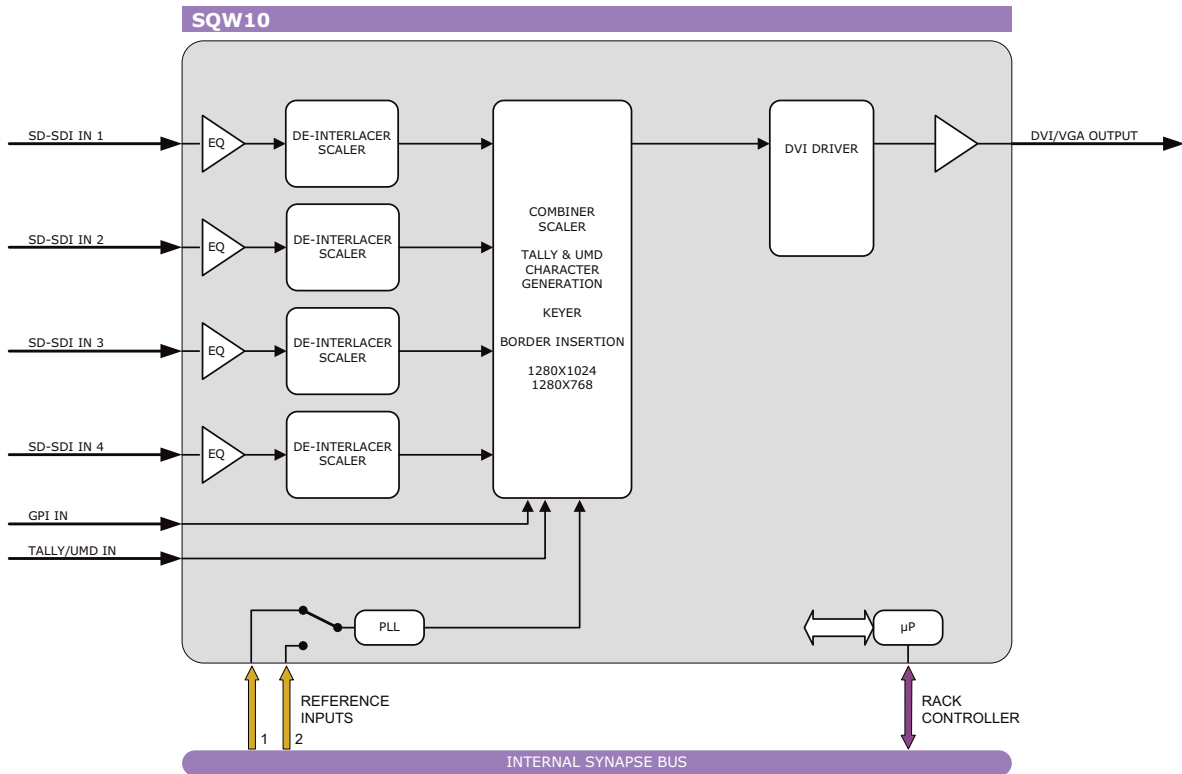
Standard	DVI digital single link
Number of outputs	1
Cable driver	Up to 10 meter of high quality DVI cable (Gefen)

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	11 Watts

SDW10





SQW10 SDI quad split to WXGA converter on VGA and DVI

The SQW10 is a high-quality 4x SDI to WXGA converter on DVI or VGA. The unit supports 2 output resolutions: 1280x768 and 1280x1024. A Tally and UMD OSD is included. This will enable a very compact monitor solution with the UMD and Tally as part of the set. High-quality in-house developed de-interlacing and scaling algorithms ensure crisp picture quality.

- Quad split or full-screen mode for each input
- 1280x1024 and 1280x768 resolution on DVI (BPH10)
- 1280x1024 on VGA (BPH11)
- SD 625 and 525
- 15-pole sub-D connector for serial UMD, Tally protocols (TSL and ASCII) and GPI triggers
- 8 and 16 character UMD capability
- Lock to input, reference or free running
- Color corrector
- UMD colors:
 - White
 - Green
 - Red
 - Amber
- Border, UMD and tally brightness adjustment
- Safe area:
 - Action
 - Graphics
 - Action + Graphics
 - Shoot and protect 4:3
 - Shoot and protect Action
 - Shoot and protect Graphics
 - Shoot and protect Action + Graphics
- Automatic 4:3 and 16:9 modes through VI or WSS triggers
- GPI control for:
 - Aspect ratio (4:3 or 16:9)
 - Full screen or quad mode
 - Tally
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- High resolution monitor walls
- Truck preview monitoring and shading
- Compact Sony LMD-170/171/172 and 230W control unit (replaces MEU-WX1) 18 channels in 4 RU (72 SDI inputs)

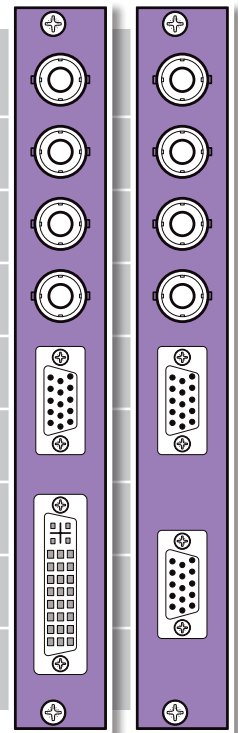
Ordering information

Module:

- **SQW10:** SDI quad split to WXGA converter on VGA and DVI

Standard I/O:

- **BPH10_SQW10:**
I/O panel for SQW10 with DVI output
- **BPH11_SQW10:**
I/O panel for SQW10 with VGA output



BPH10

BPH11

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	4
Equalization	Automatic to 150m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

Reference video input

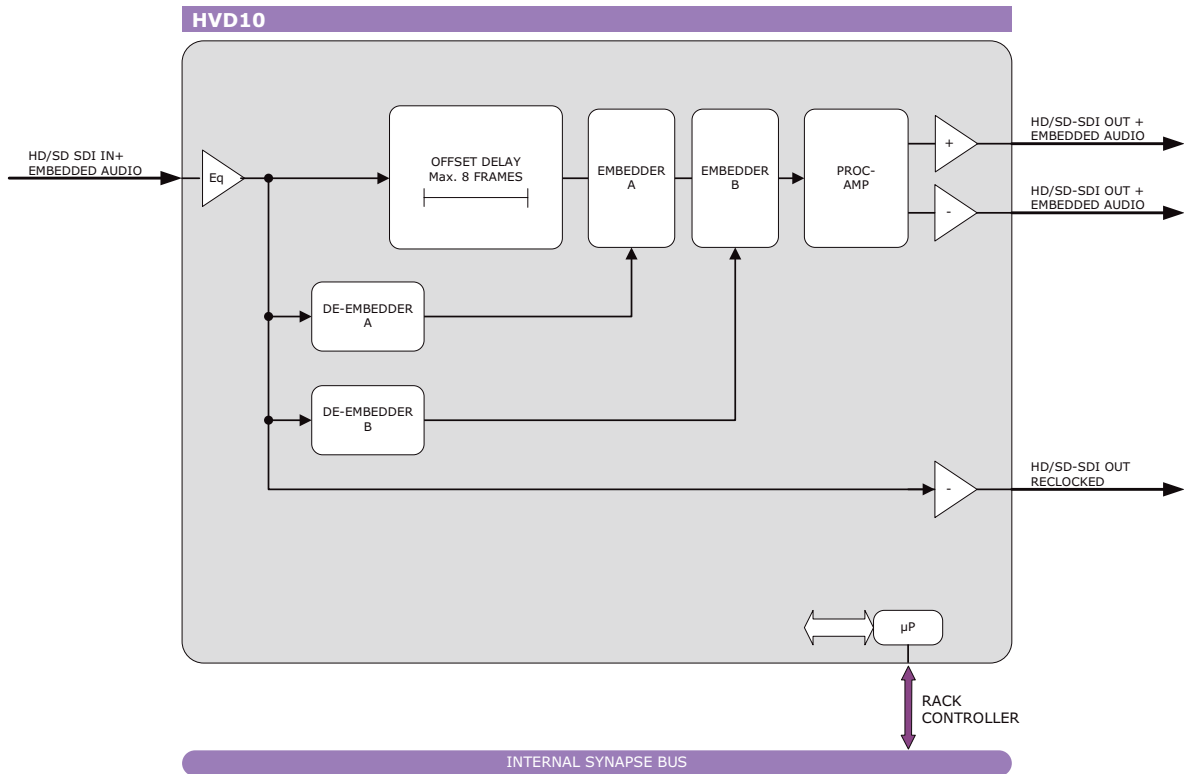
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

DVI output

Standard	DVI digital single link
Number of outputs	1
Cable driver	Up to 10 meter of high quality DVI cable (Gefen)

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	11 Watts



HVD10 HD video delay (31 frames)

The HVD10 is an HD-SDI video offset delay of up to 31 frames (adjustable in frames, lines and pixels). The unit has a Serial Digital (HD-SDI) component input at 1.485 Gb/s, one re-clocked HD-SDI output and 2 delayed HD-SDI outputs.

- Adjustable offset delay up to 31 frames
- Adjustable delay setting per format i.e. 1080, 720 and SD
- Adjustment in frames, lines and pixels
- Proc Amp
- Full transparent delay for video and audio
- 2 Groups of audio can be processed with minimum delay (or matching video delay)
- ANC H + V blanking
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Timing correction in HD virtual studios
- 'Late' embedded audio correction

Ordering information

Module:

- **HVD10:** HD/SD video delay (8 frames)

Standard I/O:

- **BPH01_HVD10:** I/O panel for HVD10

Fiber outputs:

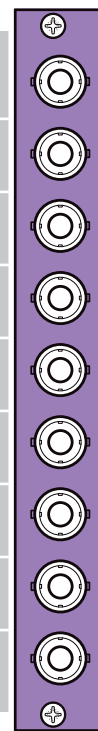
- **BPH01T_FC/PC_HVD10:** I/O panel for HVD10 with fiber transmitter on FC/PC
- **BPH01T_SC_HVD10:** I/O panel for HVD10 with fiber transmitter on SC

Fiber inputs:

- **BPH01R_FC/PC_HVD10:** I/O panel for HVD10 with fiber receiver on FC/PC
- **BPH01R_SC_HVD10:** I/O panel for HVD10 with fiber receiver on SC

HD/SD SDI INPUT (OPTIONAL FIBER INPUT)
HD/SD SDI RECLOCKED INPUT
HD/SD SDI PROCESSED OUTPUT 1
HD/SD SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OUTPUT)
FREEZE

For fiber connectivity see www.axon.tv



BPH01

Specifications

SD/HD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Number of inputs	1
Equalization	Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.
Return loss	> 15dB up to 1.5GHz

HD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio SMPTE 292M (1.5Gb/s), SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M 1080i/59.94, 1080i/50, 720p/59.94, 720p/50
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Number of outputs	3 (1 reclocked and 2 processed)
Signal level	800mV nominal

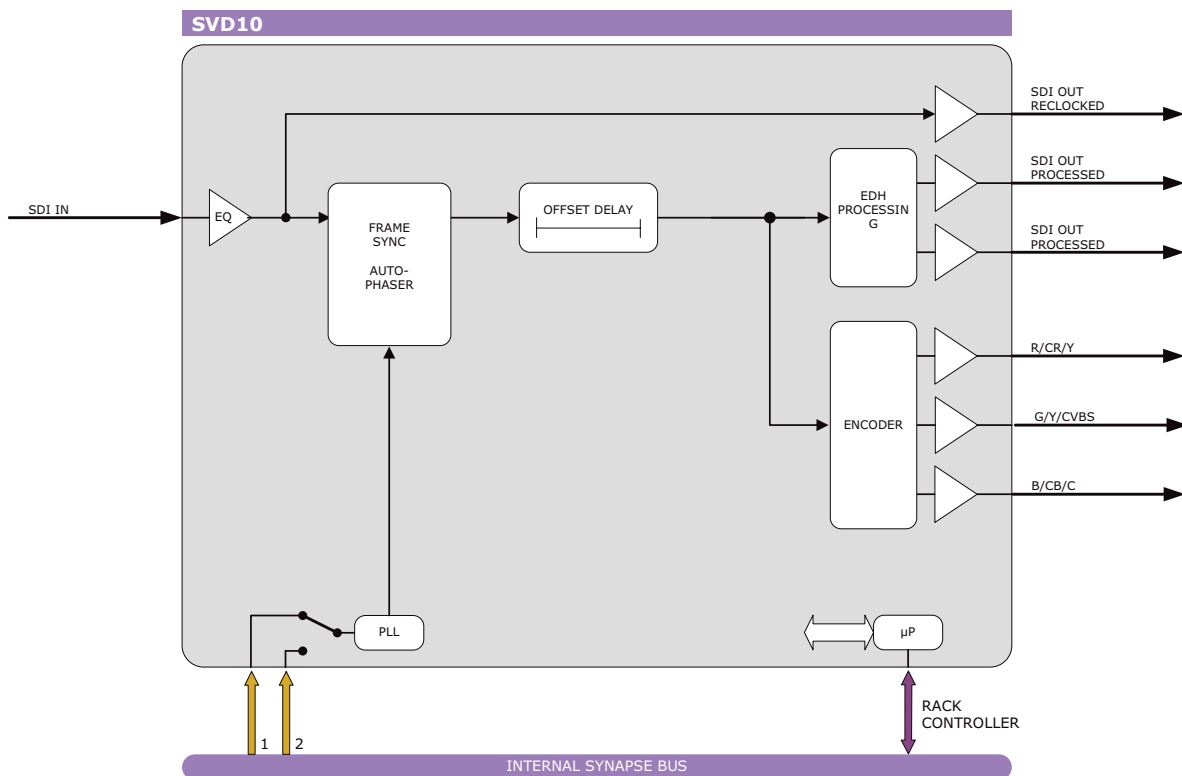
DC offset	0V ±0.5V
Rise and fall time	200ps nominal for HD, 750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s
Wideband jitter	< 0.2UI

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



SVD10 Universal frame synchronizer with extended (24 frames) video delay offset and monitoring D/A converter

The SVD10 is a frame synchronizer, with autophaser and video delay of up to 24 frames (adjustable in frames, lines and pixels). The synchronizer function can be used to synchronize a non-synchronous signal or to compensate for a delay. New sync codes (TRS) are being generated and re-inserted in the output signal. The SVD10 has a totally transparent blanking, both horizontally and vertically. The unit has a Serial Digital (SDI) component input at 270Mb/s, one re-clocked SDI output and two synchronized/delayed SDI outputs. Furthermore, the card has a programmable analog video output, RGB, composite and component. The video reference is connected through the central genlock input of the SFR18, SFR08 or SFR04 frames. The line synchronizer function corrects timing errors (hops) that occur due to switching in a router. In this case, a video reference is not required as the output clock frequency is derived from the input video clock.

- Adjustable offset delay up to 24 frames
 - Adjustment in frames, lines and pixels
- Frame synchronizer mode
- Line synchronizer/autophaser function in synchronizer mode
- Panic Freeze and manual Freeze
- V-bit synchronizing for enhanced autophasing (in 626 only)
- Analog preview output (RGB, YPrPb, CVBS+YC)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 and the Ethernet port (ACP)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Compensation of uplink video delays
- Generic multi-frame timing compensation
- Virtual studio delay compensation

Ordering information

Module:

- **SVD10:** Universal frame synchronizer with extended (24 frames) video delay offset and monitoring D/A converter

Standard I/O:

- **BPL01_SVD10:** I/O panel for SVD10
- **BPX01_SVD10:** I/O panel for SVD10 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_SVD10:** I/O panel for SVD10 with fiber transmitter on FC/PC
- **BPL01T_SC_SVD10:** I/O panel for SVD10 with fiber transmitter on SC

Fiber inputs:

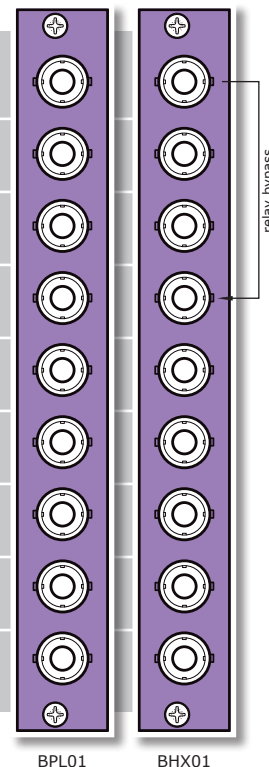
- **BPL01R_FC/PC_SVD10:** I/O panel for SVD10 with fiber receiver on FC/PC
- **BPL01R_SC_SVD10:** I/O panel for SVD10 with fiber receiver on SC

CVBS output:

- **BPL01C_SVD10:** I/O panel for SVD10 with CVBS output

SDI IN (OPTIONAL FIBER OUTPUT)
SDI RELOCKED OUTPUT
SDI PROCESSED OUTPUT 1
SDI PROCESSED OUTPUT 2 (OPTIONAL FIBER OR CVBS OUTPUT)
G/Y/CVBS
B/PB/Y
R/PR/C

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (1 relocked and 2 processed)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Analog video output

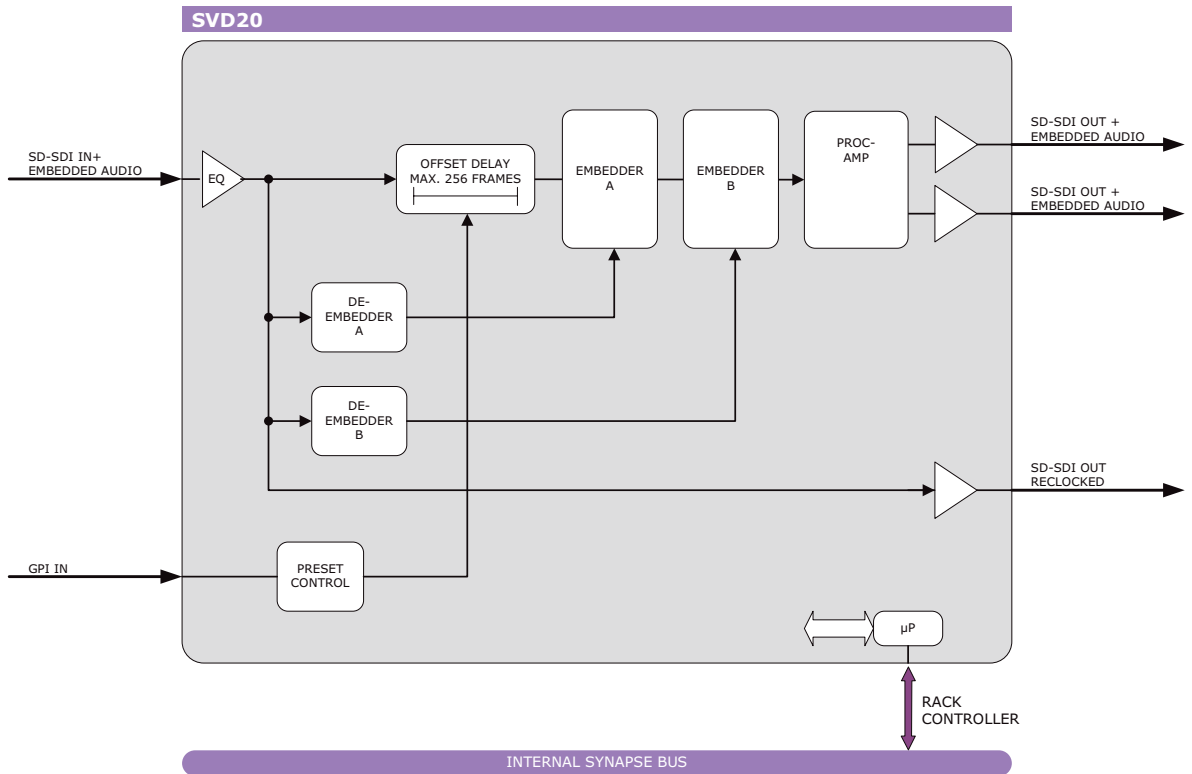
Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component and RGB
Number of outputs	3
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<9 Watts



SVD20 SDI Extended (254 frames) video delay

The SVD20 is an adjustable 254 frames video delay. This delay can be used in an emergency overwrite application where the broadcaster needs to censure live transmissions.

- Adjustable offset delay up to 254 frames
- Adjustment in frames, lines and pixels
- 2 group audio transparency (user selectable)
- Processed embedded audio with the same or minimum delay or blank
- Delay status
- Proc Amp
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- Censorship of live broadcasts
- Video with extreme embedded audio delay compensation
- Extreme audio delay compensation

Ordering information

Module:

- **SVD20:** SDI Extended (254 frames) video delay

Standard I/O:

- **BPH01_SVD20:** I/O panel for SVD20

Fiber outputs:

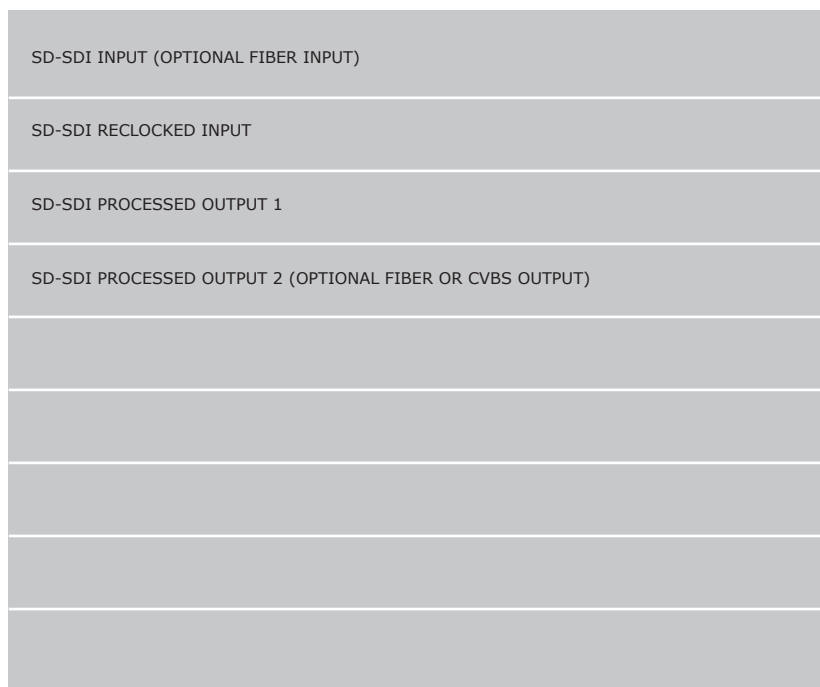
- **BPH01T_FC/PC_SVD20:** I/O panel for SVD20 with fiber transmitter on FC/PC
- **BPH01T_SC_SVD20:** I/O panel for SVD20 with fiber transmitter on SC

Fiber inputs:

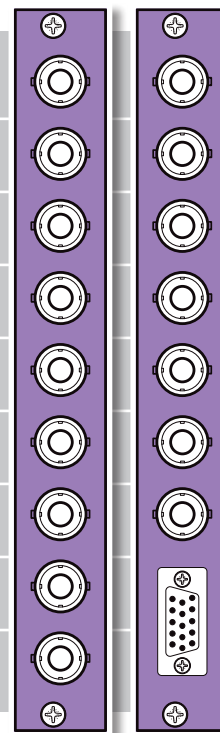
- **BPH01R_FC/PC_SVD20:** I/O panel for SVD20 with fiber receiver on FC/PC
- **BPH01R_SC_SVD20:** I/O panel for SVD20 with fiber receiver on SC

CVBS output:

- **BPH01C_SVD20:** I/O panel for SVD20 with CVBS output



For fiber connectivity see www.axon.tv



BPH01

BPH03

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 200m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial videoutput

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (1 reclocked and 2 processed)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

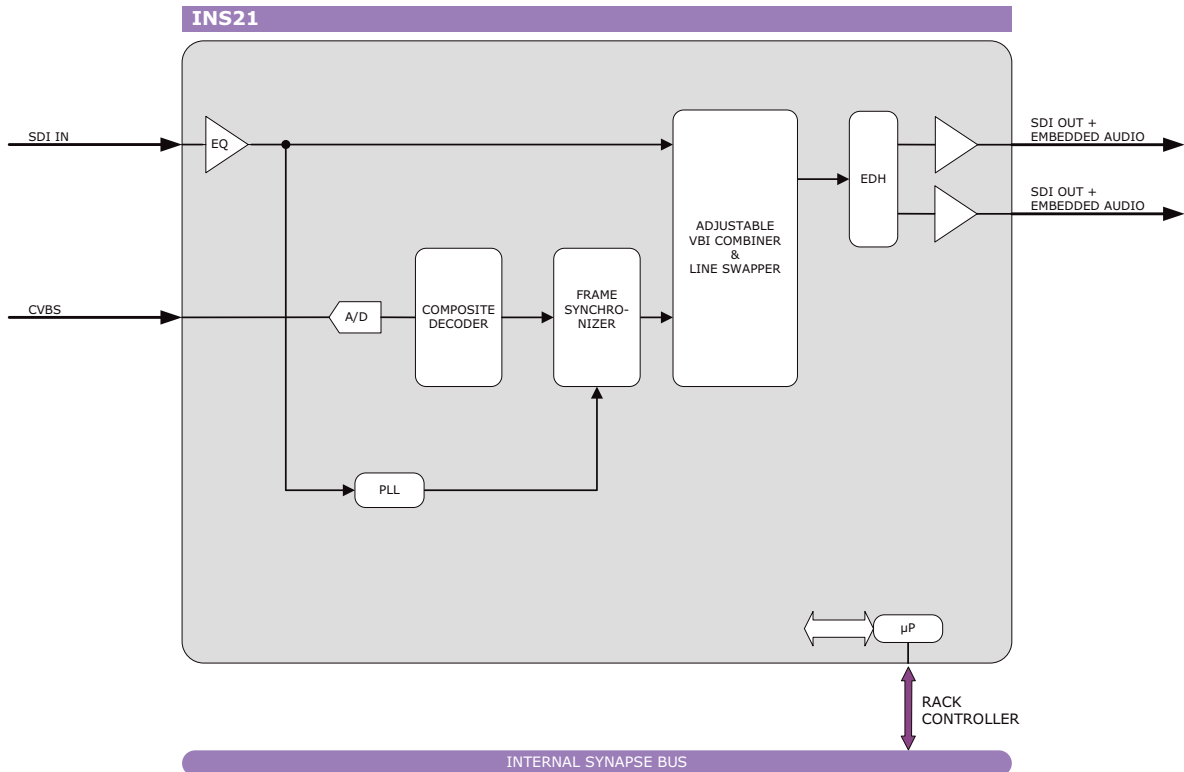
Specifications

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<8 Watts



INS21 VBI line inserter/swapper (data bridge)

The INS21 is a vertical interval (Vertical Blanking) inserter with a composite input and an SDI input and output. VBI (for example Teletext) information present in the composite signal can be inserted into the SDI signal. The INS21 can insert any composite line between line 7 – 22 and line 320 – 335 from the composite domain to any line between line 7 – 22 and line 320 – 335 in the SDI domain. For example, line 7 of the CVBS input can be inserted into line 335 of the SDI signal.

This line exchange is transparent to embedded audio that might be present in the SDI domain.

- Takes any line between 7 and 22 of Field 1 and any line between line 320 and 335 of field 2 of the composite input and inserts it any line between 7 and 22 of Field 1 and any line between line 320 and 335 of field 2 of the SDI domain
- Lines can be swapped, blanked or set transparent.
- Built-in proc-amp
- 2 processed outputs
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

- Generic data bridge application where composite domain vertical blanking lines are inserted in the SDI domain

Ordering information

Module:

- **INS21:** VBI line inserter/swapper (data bridge)

Standard I/O:

- **BPL12_INS21:** I/O panel for INS21

Fiber outputs:

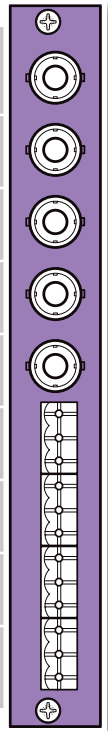
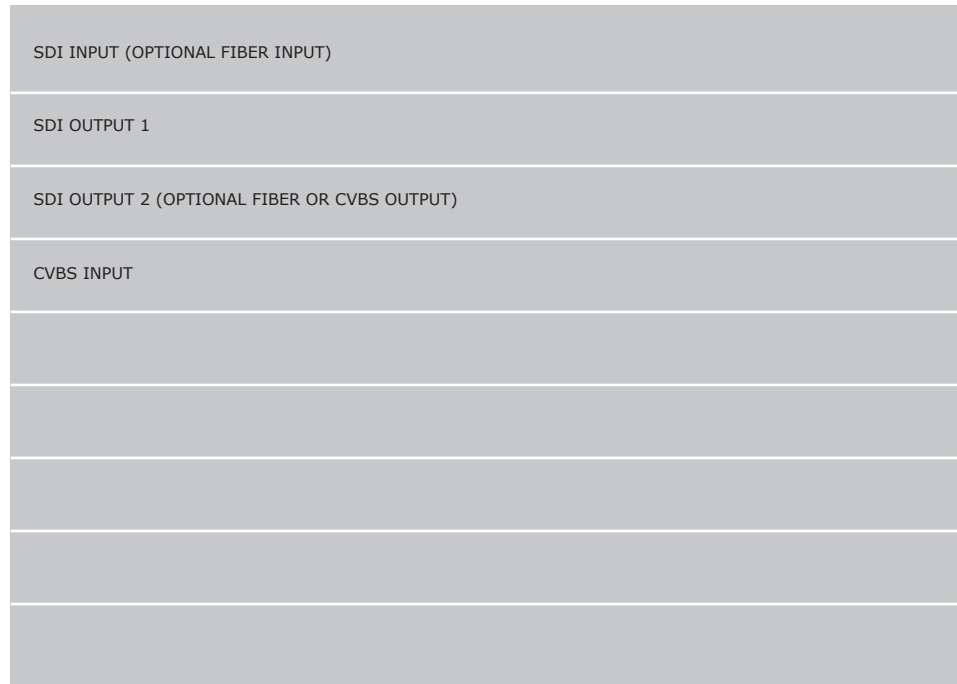
- **BPL12T_FC/PC_INS21:** I/O panel for INS21 with fiber transmitter on FC/PC
- **BPL12T_SC_INS21:** I/O panel for INS21 with fiber transmitter on SC

Fiber inputs:

- **BPL12R_FC/PC_INS21:** I/O panel for INS21 with fiber receiver on FC/PC
- **BPL12R_SC_INS21:** I/O panel for INS21 with fiber receiver on SC

CVBS output:

- **BPL12C_INS21:** I/O panel for INS21 with CVBS output



BPL12

For fiber connectivity see www.axon.tv

Specifications

Video input (CVBS)

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	1
Impedance	75 Ohms
Return loss	> 35dB up to 10MHz
Frequency response	< ±0.25dB (100KHz to 4.2MHz)
Differential gain	< ±0.5% typical
Differential phase	< ±0.2° typical
Noise floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L gain	< ±0.5%
C/L delay	< ±9ns
Minimum delay	3 lines

Serial video input (SDI)

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

Serial video output

Standard	SMPTE 259M 525/59.95 or 625/50
Number of outputs	2
Connector	BNC
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	900ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB to 270MHz
Jitter	< 0.1UI

Miscellaneous

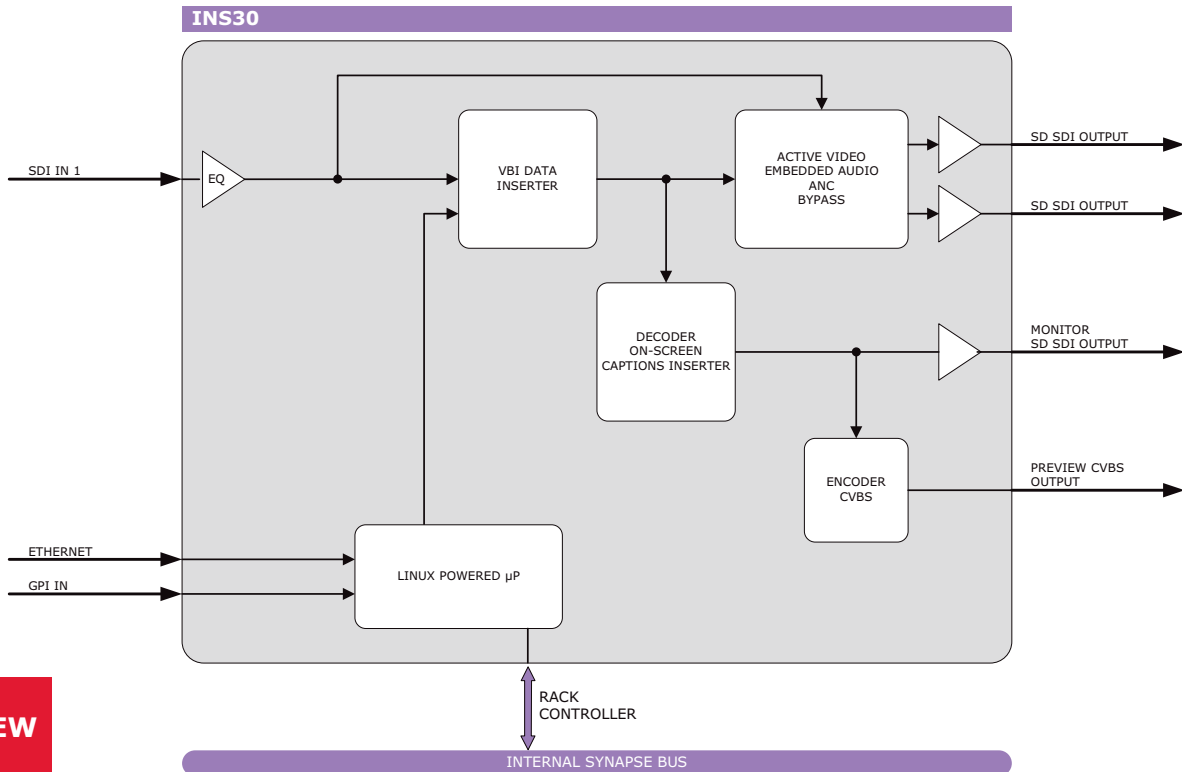
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<9 Watts

INS21





NEW

INS30 SD Closed Caption and Teletext encoder with monitoring outputs

The INS30 is a standalone card that enables closed caption data to be encoded onto a program feed; it will allow the captions to be previewed on the optional monitoring outputs using an On Screen Display (OSD) to simulate the output of a decoder.

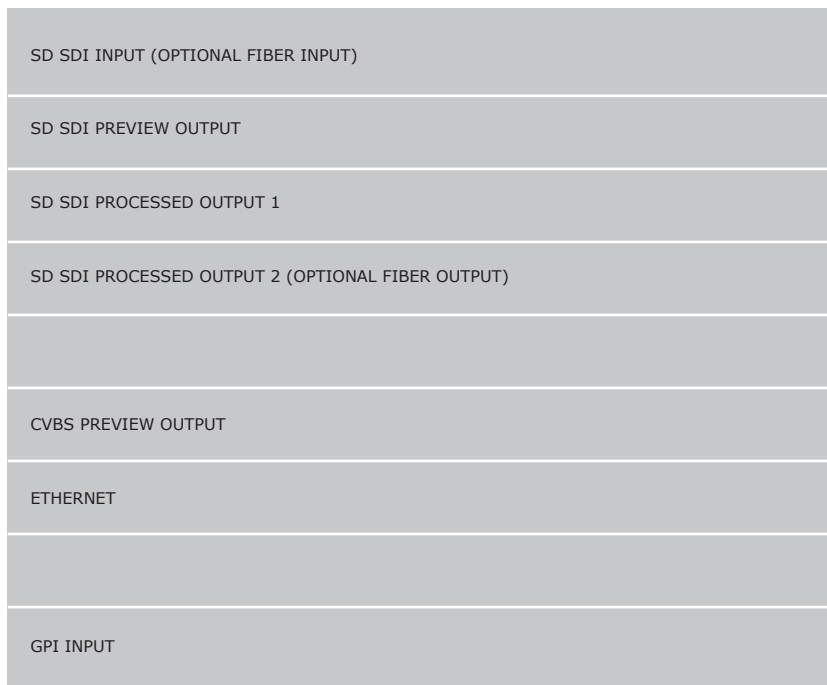
Typically this functionality has been serviced by 1RU box, single PSU solutions from specialist subtitling companies, so the modular INS30 should save on rack space, increase reliability and be more cost effective, certainly in multi-channel applications.

- SD-SDI compatible
- Formats:
 - 625/50
 - 525/59.94
- Insert incoming caption data from the NEWFOR protocol in a parallel WST-B or EIA-608 (line 21) format
- Monitor the encoded signal as 'burnt-in' captions or pages over the program stream on SD and CVBS outputs
- Ability to Clear-Caption in the event of a 'hanging' caption.
- Ethernet connector for Caption and Teletext data input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

■ The INS30 will typically be used in applications where closed caption subtitling is required on the program stream as part of the play out process. Generally this will be for live captioning where the program material is not available in time for the captions to be pre-prepared and added to the program material as part of the production process.

The subtitle data stream will normally be generated either from a subtitle preparation workstation directly or from a subtitle transmission product.



For fiber connectivity see www.axon.tv

BPH04

BHX04

Ordering information

Module:

■ **INS30:** Closed Caption and Teletext encoder with monitor outputs

Standard I/O:

■ **BPH04_INS30:** I/O-panel for INS30

■ **BHX04_INS30:** I/O-panel for INS30, with relay bypass

Fiber outputs:

■ **BPH04T_FC/PC_INS30:** I/O-panel for INS30 with fiber transmitter on FC/PC

■ **BPH04T_SC_INS30:** I/O-panel for INS30 with fiber transmitter on SC

Fiber inputs:

■ **BPH04R_FC/PC_INS30:** I/O-panel for INS30 with fiber receiver on FC/PC

■ **BPH04R_SC_INS30:** I/O-panel for INS30 with fiber receiver on SC

Specifications

SD serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 100m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

Serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (1 preview and 2 processed)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise and fall time	750ps nominal for SD
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz
Wideband jitter	< 0.2UI

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component, YC and RGB
Number of outputs	1
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz

Frequency

response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Ethernet

Standard	10Base-T, 100Base-Tx IEEE 802.3
Connector	8P8C

Reference video input

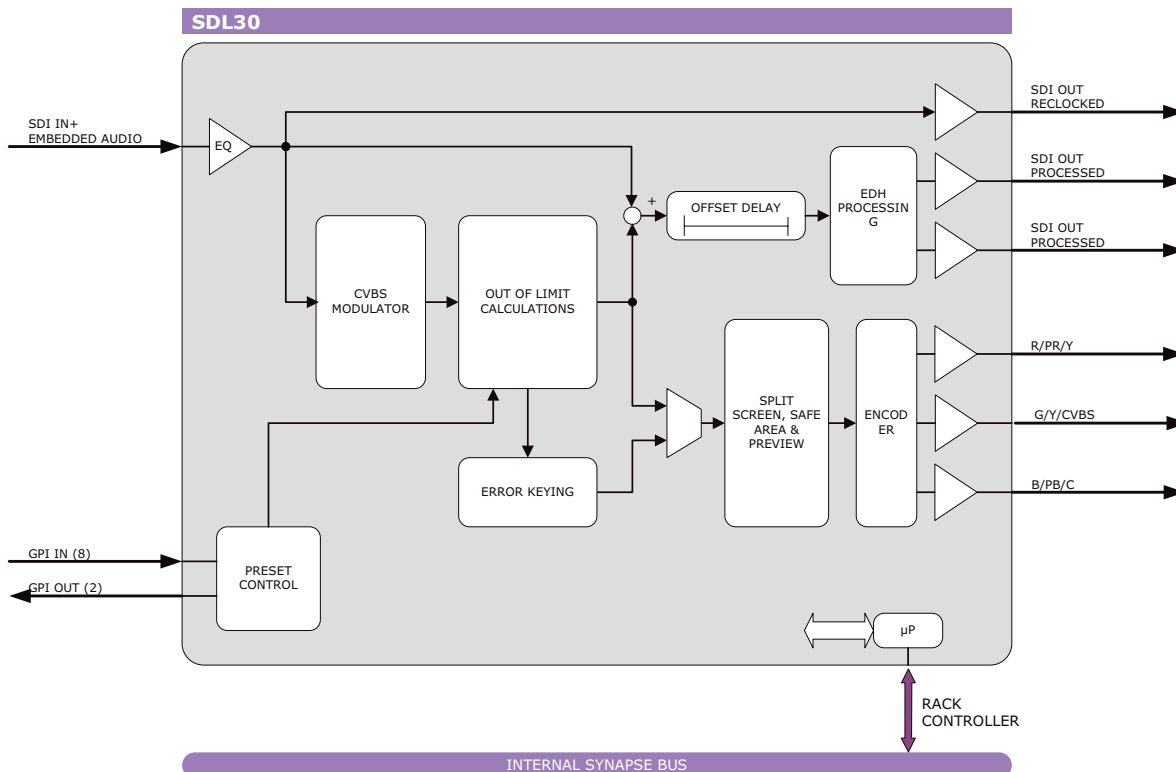
Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<10 Watts



SDL30 SDI legalizer in the composite domain

The SDL30 is a broadcast quality legalizer that legalizes the digital serial component signal into the composite domain in full 10-bit resolution. Internally the component signal is converted (calculated) to composite to determine the correction factors. Input and outputs are in 10-bit digital serial video (270Mb). And an analog preview monitoring output is provided that shows you before and after processing changes through a split-screen display mode. The analog preview output can also highlight illegal pixels for convenient error determination in a production environment. Different clipping and limitation curves can be selected for both top (Y+C) and bottom (black level) of the signal dynamics. Personal and program determined settings can be stored in 8 presets.

- Functional equivalent of AXON's standalone SDL-3000
- 8 user presets
 - Upper hard limit (48 to 1633 mV)
 - Upper soft limit (48 to 1633 mV)
 - Upper slope (hard, knee, soft, off)
 - Lower hard limit (-714 to -2 mV)
 - Lower soft limit (-714 to -2 mV)
 - Lower slope (hard, knee, soft, off)
- Horizontal blanking
- Vertical blanking
- Functions
 - YC upper + YC lower
 - Y (only) upper + YC lower
 - C (only) upper + YC lower
- Preview output:
 - Split screen function for pre and post monitoring
 - Adjustable split position
 - Highlight of errors
- Passive back-up relay with BPX03
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

Applications

- CVBS transmission legalization
- Post production and graphics legalization
- Education in graphics area

Ordering information

Module:

- **SDL30:** SDI legalizer in the composite domain

Standard I/O:

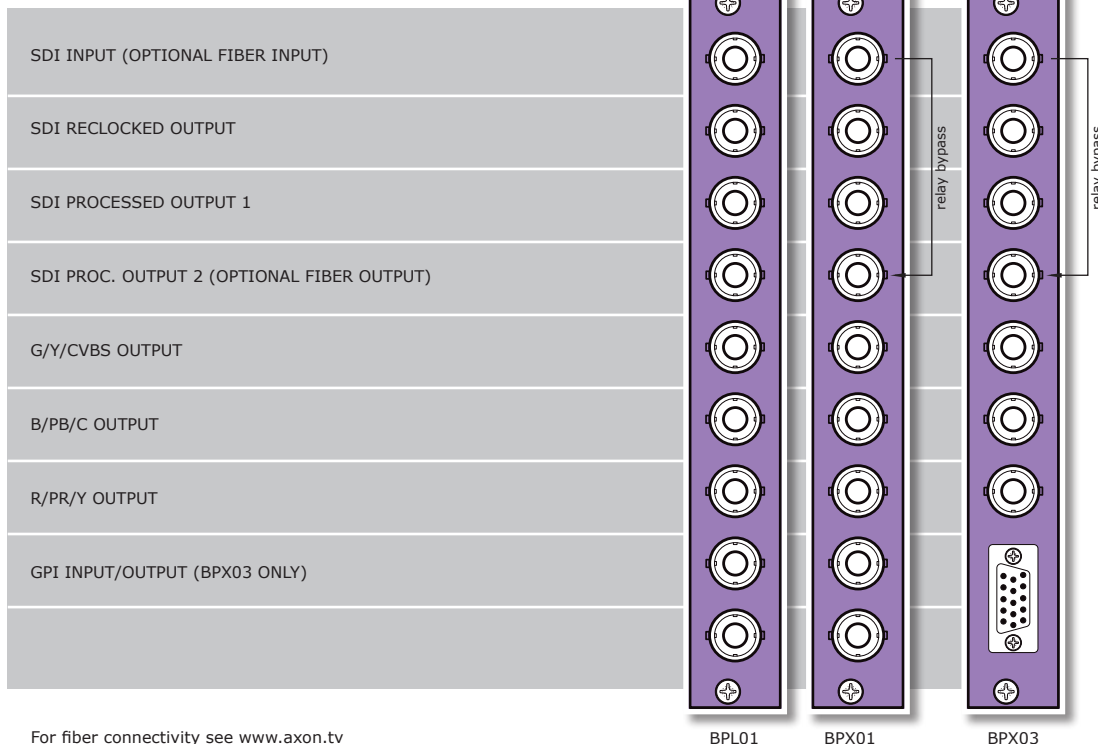
- **BPL01 SDL30:**
I/O panel for SDL30
- **BPX01 SDL30:**
I/O panel for SDL30 with relay bypass
- **BPX03 SDL30:**
I/O panel for SDL30 with relay bypass, with GPI I/O on sub-D

Fiber outputs:

- **BPL01T_FC/PC SDL30:**
I/O panel for SDL30 with fiber transmitter on FC/PC
- **BPL01T_SC SDL30:**
I/O panel for SDL30 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC SDL30:**
I/O panel for SDL30 with fiber receiver on FC/PC
- **BPL01R_SC SDL30:**
I/O panel for SDL30 with fiber receiver on SC



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	3 (1 relocked and 2 processed)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Analog video output

Standard	PAL (ITU624-4) or NTSC (SMPTE 170M), Component and RGB
Number of outputs	3
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

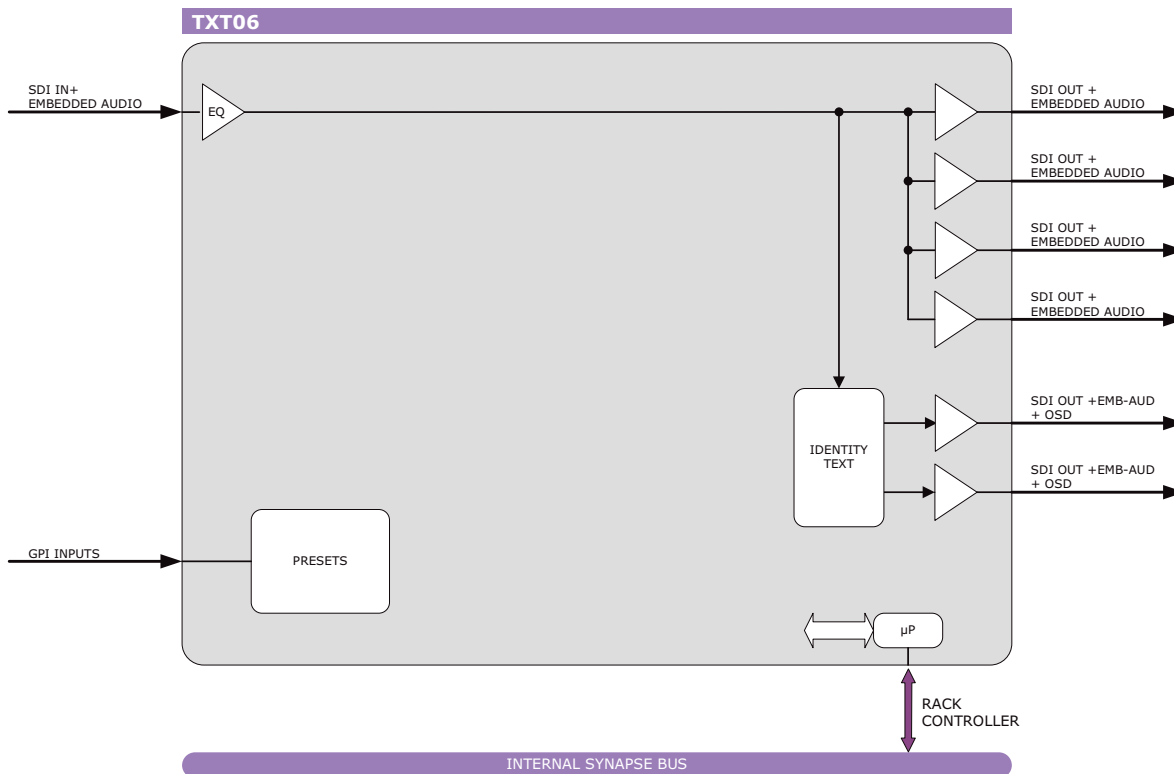
Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<9 Watts

SDL30





TXT06 OSD identity generator with user definable text

The TXT06 is an Identity generator. It displays a user definable text as source recognition.

- 1 to 4 distribution amplifier
- 2 additional outputs with optional OSD information
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

Applications

- Router source identity card.
- Tie – Line in use identifier

Ordering information

Module:

- **TXT06:** OSD identity generator with user definable text

Standard I/O:

- **BPL01_TXT06:** I/O panel for TXT06
- **BPX01_TXT06:** I/O panel for TXT06 with relay bypass
- **BPX03_TXT06:** I/O panel for TXT06 with relay bypass, with GPI I/P on sub-D

Fiber outputs:

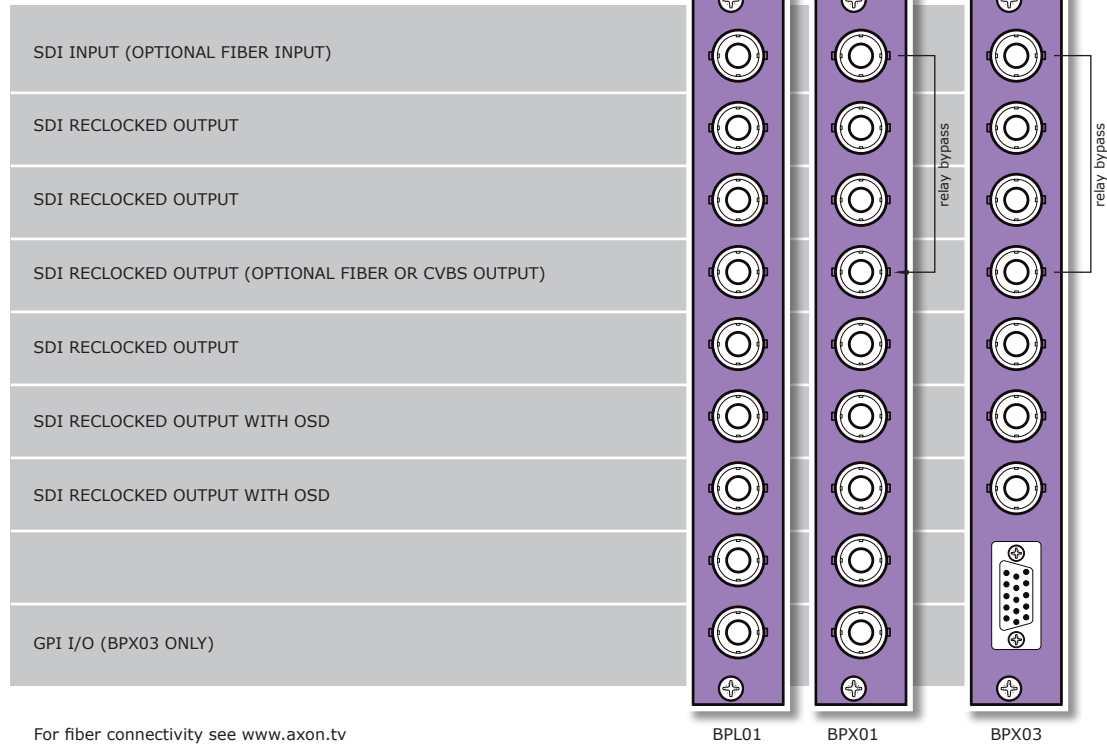
- **BPL01T_FC/PC_TXT06:** I/O panel for TXT06 with fiber transmitter on FC/PC
- **BPL01T_SC_TXT06:** I/O panel for TXT06 with fiber transmitter on SC

Fiber inputs:

- **BPL01R_FC/PC_TXT06:** I/O panel for TXT06 with fiber receiver on FC/PC
- **BPL01R_SC_TXT06:** I/O panel for TXT06 with fiber receiver on SC

CVBS output:

- **BPL01C_TXT06:** I/O panel for TXT06 with CVBS output



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable 150m with BPX03
Return loss	> 20dB up to 270MHz

SD serial video output

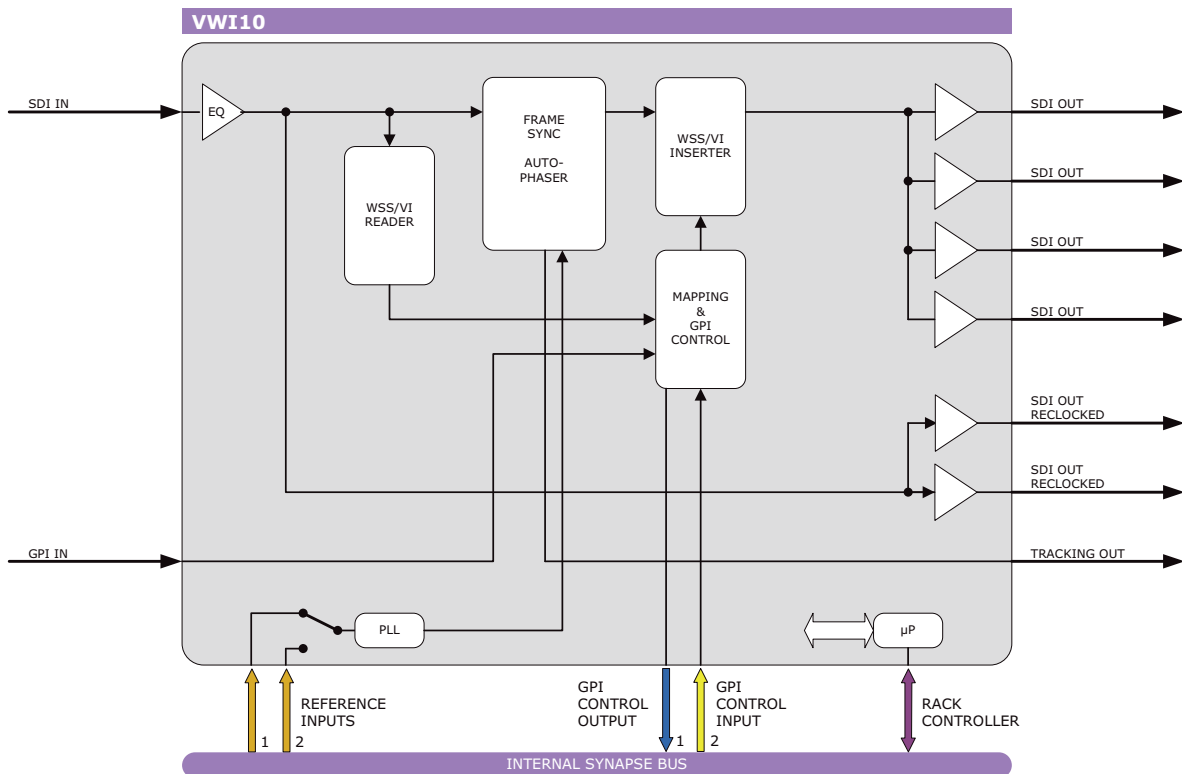
Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	6 (2 processed and 4 reclocked)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	520ps nominal
Overshoot	< 10% of amplitude
Return loss	> 18dB up to 270MHz
Jitter	< 600ps 10Hz HPF

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<8 Watts

TXT06




**MASTER
Card**

VWI10 Multi functional frame/line synchronizer with VLI/WSS inserter

The VWI10 is a universal VI and WSS inserter/reader. Video Index and Wide Screen Signaling provide a standardized way of embedding certain legacy information. VI can only be used in the digital environment when the data is serialized and embedded in a low-significance bit of the chrominance during the active part of one line of each field in the vertical blanking interval. The VI information is lost, when going from the digital domain to the analog domain. WSS is designed for the analog domain but can also be used in the digital domain. Since the data is inserted in the first half of line 23, almost all equipment is transparent because it is not in the vertical blanking. Please note that the WSS standard is only developed for the 625-line format.

- Auto detecting of 525/625 with correct reference input selection (SFR08 - SFR18 only)
- Frame synchronizer
- Line synchronizer/autophaser
- Full frame adjustable output phase with respect to reference in sample increments
- EDH processing
- Manual freeze and panic freeze
- 2 individual GPI presets can insert:
 - WSS or WSS-extended
 - WSS embedded GPI
 - VI
- VL PAN, TILT, ZOOM
- WSS insert, standard, extended, blank
- WSS and VI detection
- GPI16 can be used as interface to VWI10
- Transparent for embedded audio
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS outputs (replacing 1 SDI output) on I/O panel

Applications

- Generic VI and/or WSS inserter/reader
- Transmission PAL-PLUS flag inserter/reader

Ordering information

Module:

- **VWI10:** Multi functional frame/line synchronizer with VLI/WSS inserter

Standard I/O:

- **BPL01_VWI10:** I/O panel for VWI10
- **BPX01_VWI10:** I/O panel for VWI10 with relay bypass

Fiber outputs:

- **BPL01T_FC/PC_VWI10:** I/O panel for VWI10 with fiber transmitter on FC/PC
- **BPL01T_SC_VWI10:** I/O panel for VWI10 with fiber transmitter on SC

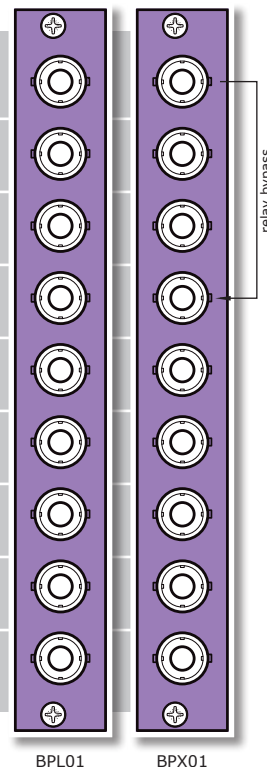
Fiber inputs:

- **BPL01R_FC/PC_VWI10:** I/O panel for VWI10 with fiber receiver on FC/PC
- **BPL01R_SC_VWI10:** I/O panel for VWI10 with fiber receiver on SC

CVBS output:

- **BPL01C_VWI10:** I/O panel for VWI10 with CVBS output

SDI IN (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUT 1
SDI RECLOCKED OUT 2
SDI PROCESSED OUT 1 (OPTIONAL FIBER OR CVBS OUT)
SDI PROCESSED OUT 2
SDI PROCESSED OUT 3
SDI PROCESSED OUT 4
TRACKING OUTPUT
FREEZE GPI INPUT



For fiber connectivity see www.axon.tv

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	6 (2 reclocked and 4 processed)
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

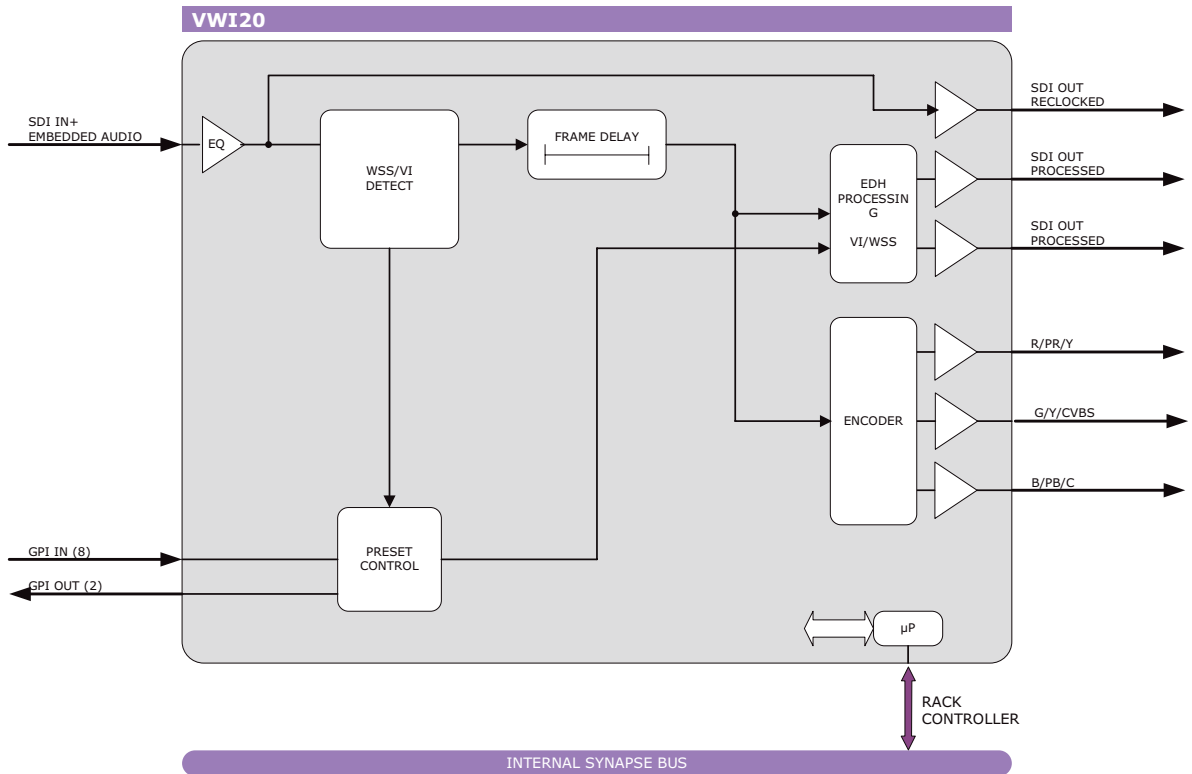
Specifications

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal
Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)
Electrical	
Voltage	+24V to +30V
Power	<7 Watts



VWI20 Preset based VI and WSS inserter

The VWI20 inserts VI (Video index) or WSS (wide screen signaling) into a SDI video signal. These VI and WSS values can then be used to pass on the right aspect ratio to other studio equipment, or to set top boxes (WSS only). With the VWI20 you can use presets to translate or adjust existing VI and WSS values and re-insert them in the video signal.

Main features are:

- Auto detecting of 525/625 with correct reference input selection (SFR08 - SFR18 only)
- Full frame adjustable output phase with respect to reference in sample increments
- EDH processing
- Translate VI values into a WSS value.
- Presets controllable through 8 local GPI contacts.
- Analog output
- Manual freeze and panic freeze
- WSS insert, standard, extended, blank
- WSS and VI detection
- Transparent for embedded audio
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel
- Optional 1 CVBS output (replacing 1 SDI output) on I/O panel

Applications

The applications where a preset based VI/WSS inserter is used:

- Insert VI or WSS values to control Aspect ratio converters or other equipment in studio environment.
- Insert WSS for analog services or setup boxes to follow the correct aspect ratio.
- Convert existing VI or WSS values in a video stream.

Ordering information

Module:

- **VWI20:** Preset based VI and WSS inserter

Standard I/O:

- **BPL01_VWI20:** I/O panel for VWI20
- **BPX03_VWI20:** I/O panel for VWI20 with GPI I/O on sub-D

Fiber outputs:

- **BPL01T_FC/PC_VWI20:** I/O panel for VWI20 with fiber transmitter on FC/PC
- **BPL01T_SC_VWI20:** I/O panel for VWI20 with fiber transmitter on SC

Fiber inputs:

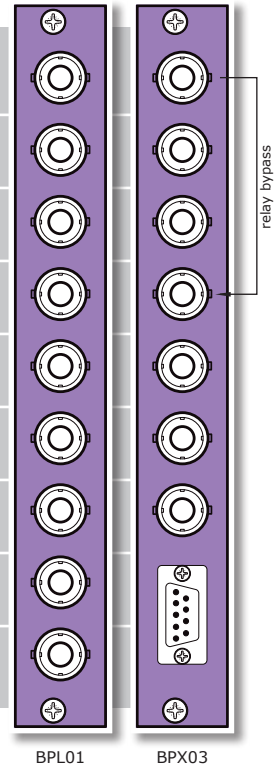
- **BPL01R_FC/PC_VWI20:** I/O panel for VWI20 with fiber receiver on FC/PC
- **BPL01R_SC_VWI20:** I/O panel for VWI20 with fiber receiver on SC

CVBS output:

- **BPL01C_VWI20:** I/O panel for VWI20 with CVBS output

SDI INPUT (OPTIONAL FIBER INPUT)
SDI RECLOCKED OUTPUT 1
SDI RECLOCKED OUTPUT 2
SDI PROCESSED OUT 1 (OPTIONAL FIBER OR CVBS OUT)
C/Y/CVBS OUTPUT
B/PB/Y OUTPUT
R/PR/C OUTPUT
GPI INPUT/OUTPUT (BPX03 AND BPL08 ONLY)

For fiber connectivity see www.axon.tv



Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	1
Equalization	Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	4
Signal level	800mV nominal
DC offset	0V ±0.5V
Rise/fall time	800ps nominal
Overshoot	< 10% of amplitude
Return loss	> 15dB up to 270MHz

Reference video input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of inputs	2 on SFR18, 2 on SFR08, 1 on SFR04
Connector	BNC
Signal level	1V nominal

Impedance	High impedance, with loop for termination
Return loss	> 25dB to 10MHz

Analog video output

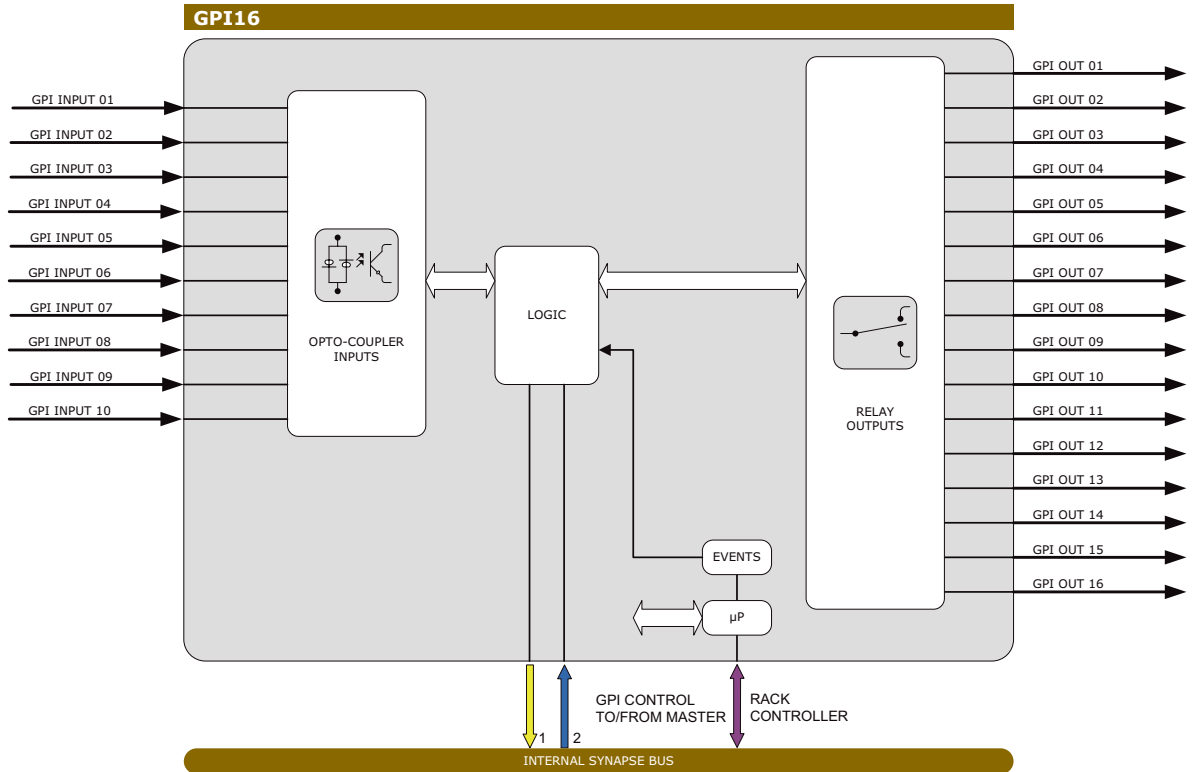
Standard	Component and RGB + composite
Number of outputs	3+sync
Connector	BNC
Signal level	1V nominal
Impedance	75 Ohms
Return loss	> 35dB to 10MHz
Frequency response	0.5dB to 4.5 MHz
Differential gain	< 0.6%
Differential phase	< 0.7°
SNR	> 75dB

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<11 Watts



GPI16 Universal GPI card with 10 GPI inputs and 16 GPI outputs

The GPI16 card is a universal Synapse GPI I/O (Input/Output) card. The card is capable of forcing GPI output triggering based on events that are generated by cards located in the same rack. (E.g. An alarm/event generated by any specific card in frame. This alarm/event is put on the bus. The GPI16 card will monitor the internal bus for events and close a relay in case of an event). The GPI16 can also be used as a slave card for Synapse functions, the 8x1 switcher (SDX08) or the VWI10 card for example. In these applications it is possible to control functions directly in to a Master, e.g. GPI based channel selection of the 8x1 switcher SDX08.

- 10 GPI inputs (opto coupled)
- 16 GPI outputs (change-over contacts by electromechanical relays)
- Frame surveillance mode where card events can be mapped to GPI outputs
- Slave mode where GPI in and outputs are mapped directly to card status and settings (SDX08, VWI10, ARC20/21/22, CCR10)
- Frame mode where the card detect events from other cards in the same frame
- Latching and non-latching GPI inputs
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- GPI alarm monitoring of Synapse events
- GPI to SNMP conversion
 - Where a third party GPI/O only product is integrated via the GPI16 into the Synapse network and/or SNMP system
- GPI to Synapse triggers (with ARC, VWI or SDX cards)

Ordering information

Module:

- **GPI16:** Universal GPI card with 10 GPI inputs and 16 GPI outputs

Standard I/O:

- **BPL06_GPI16:** Rear connector panel for GPI16



BPL06

Specifications

GPI I/O

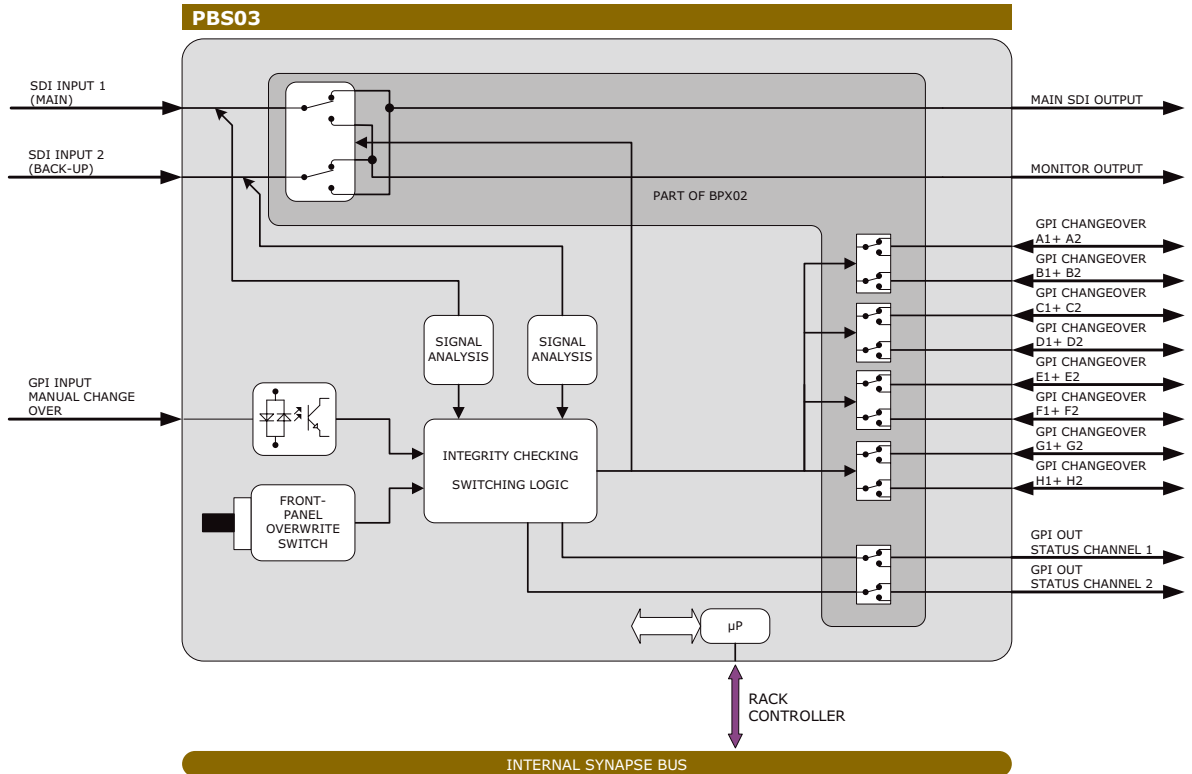
Inputs	Opto coupled
Number of inputs	10
Number of outputs	Relay based with change-over contacts
Number of outputs	16

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<5 Watts



PBS03 Dual channel relay based back-up switcher with signal integrity checking

The PBS03 is a dual channel digital SD-SDI change-over back-up switch with integrity checking. The PBS03 has 2 SDI inputs to 2 outputs. The loop-through input is high impedance and must be terminated in 75 Ohms when not used. The cross-switching can be executed by several signal analysis triggers. These triggers are loss of input, loss of embedded audio, freeze frame, TRS errors or any combination of these.

- Electromechanical Relay based switching on connector panel for optimal reliability (even when the probing card is removed)
- 2 SDI inputs
- 2 SDI outputs
- Switching triggers based on:
 - GPI
 - Carrier loss
 - TRS error
 - Audio silence
 - Freeze detection
 - Event (an event triggered by a different card in the same frame)
- Automatic switching (with control of back-up channel)
- Freeze length and threshold adjustments
- Silence time and threshold adjustment
- 8 fully wired alternated relay based switches (suitable for AES/EBU and analog audio)
- Cable length up to 100 meter
- Automatic (signal quality controlled) switching
- GPI based switching
- Manual overwrite on front panel switch
- Channel 'OK' indication by GPI output
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- Ultra reliable transmission output back-up switch
- Truck output bypass switch

Ordering information

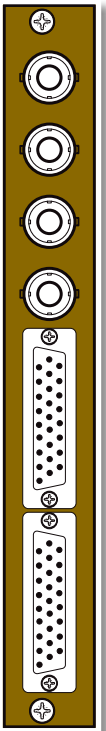
Module:

- **PBS03:** Dual channel relay based back-up switcher with signal integrity checking

Standard I/O:

- **BPX02_PBS03:** I/O panel for PBS03

SDI MAIN INPUT
SDI BACK-UP INPUT
SDI MONITOR OUTPUT (TERMINATE WHEN NOT IN USE)
SDI MAIN OUTPUT
GPI INPUT/OUTPUT
GPI INPUT/OUTPUT



BPX02

For detailed sub-D connections see the manual

Specifications

Serial video input

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of inputs	2
Equalization	Automatic to 100m @ 270Mb/s with Belden 1694A or equivalent cable
Return loss	> 15dB up to 270MHz

SD serial video output

Standard	625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio
Number of outputs	2
Signal level	As input
DC offset	As input
Rise/fall time	As input
Overshoot	As input
Return loss	> 15dB up to 270MHz

GPI input/output

Connector	26 pins female sub-D
Number of connectors	2
Number of GPI inputs	10
Type of inputs	Opto coupled
Number of GPI outputs	16
Type of outputs	relay

Miscellaneous

Weight	Approx. 250g
Operating temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<6 Watts

Alphabetical index of products

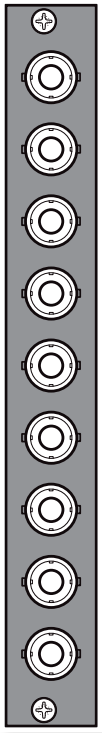
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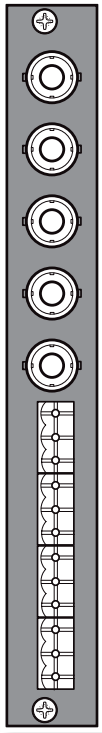
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Connector Panels

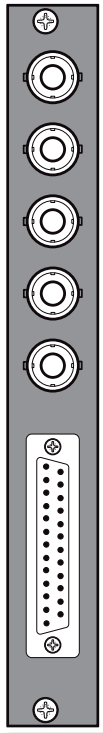
SD and audio



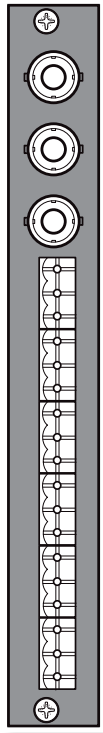
BPL01



BPL02



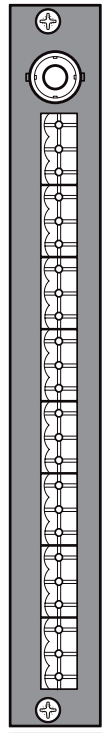
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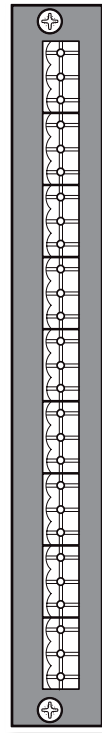
BPL03



BPL03D



BPL04



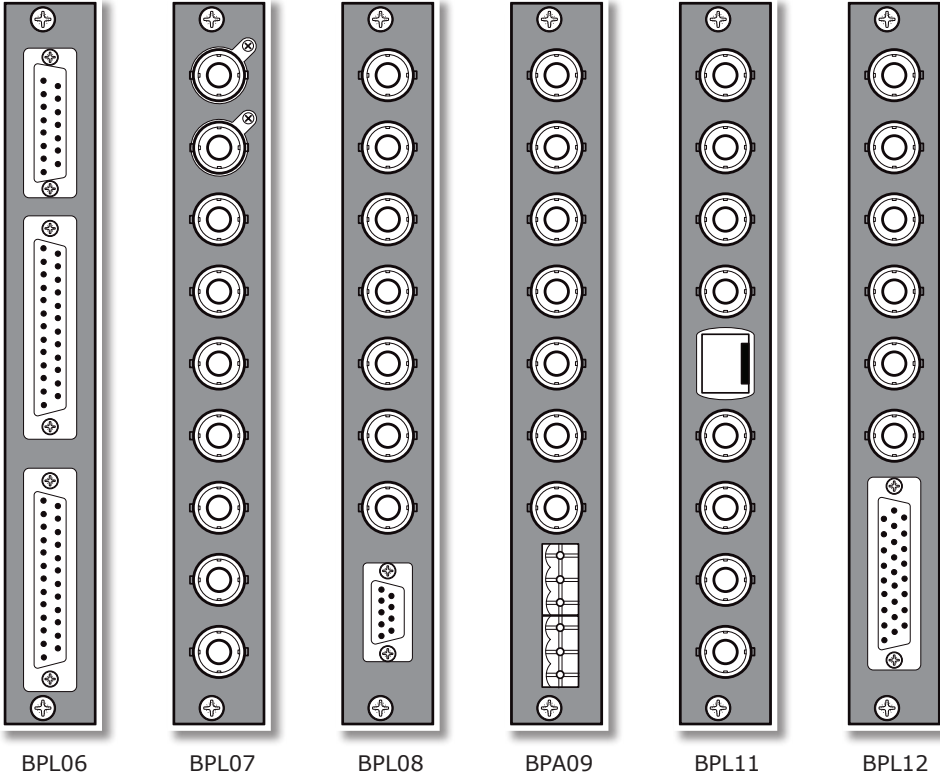
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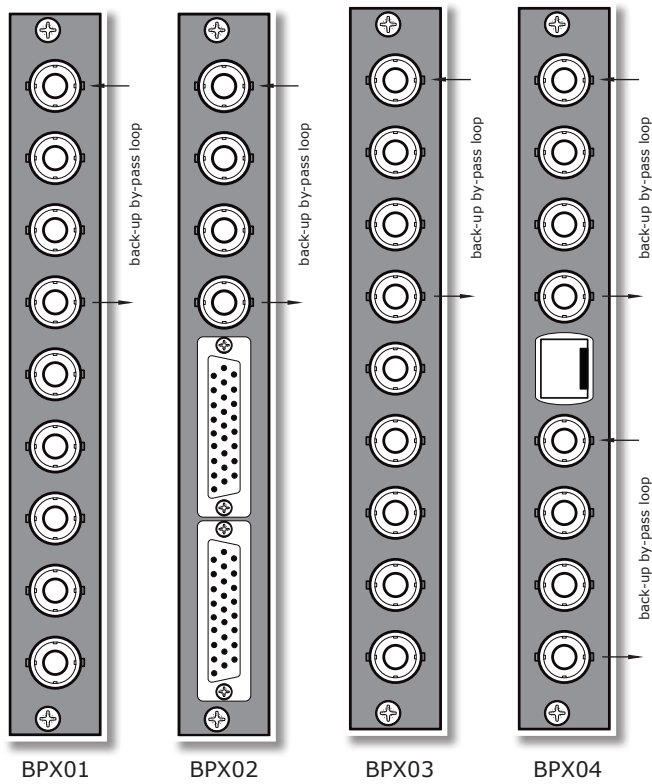
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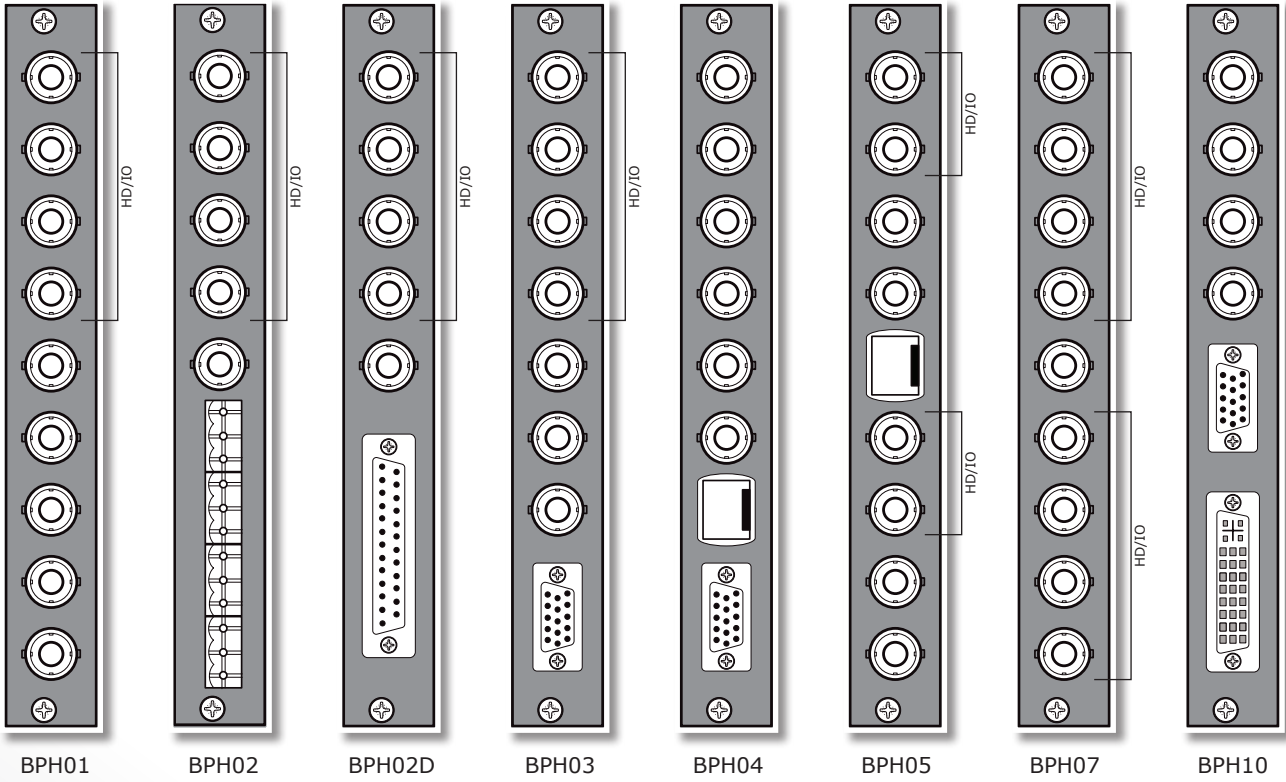
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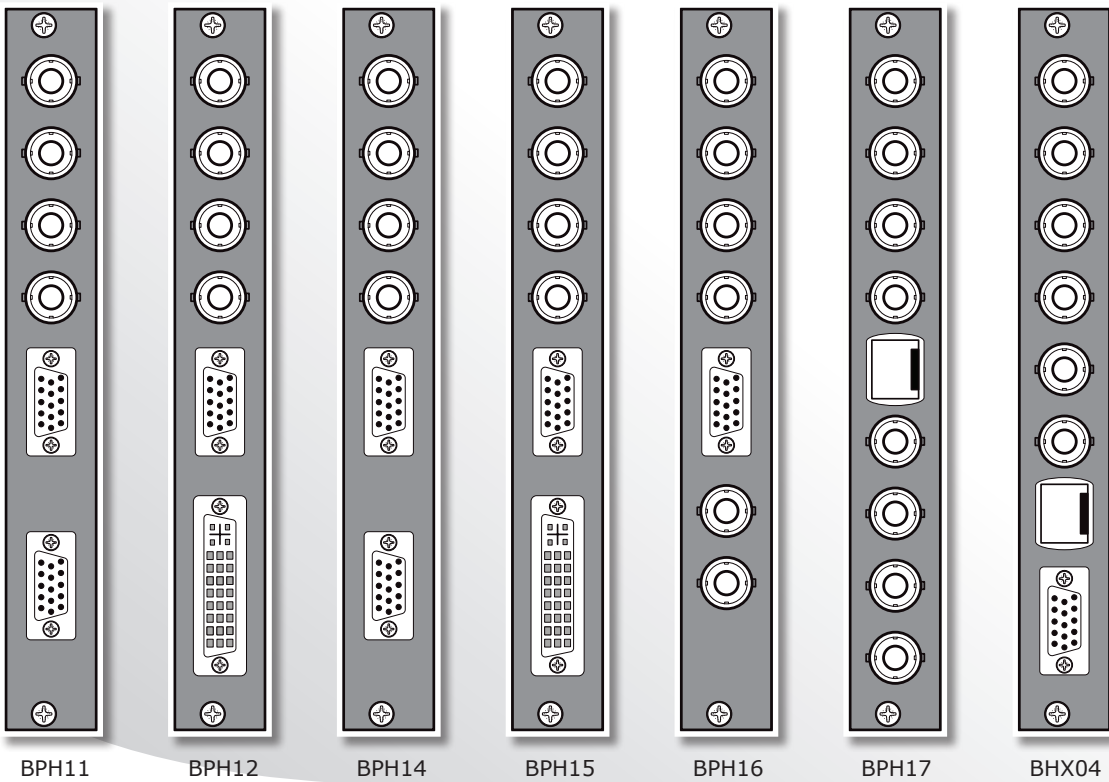
SD and audio



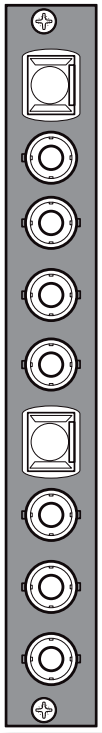
HD and audio



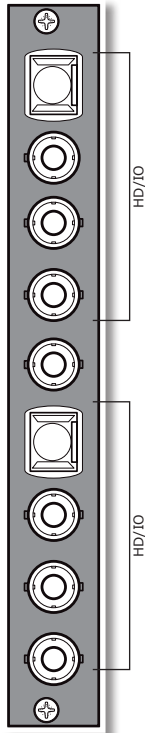
HD and audio



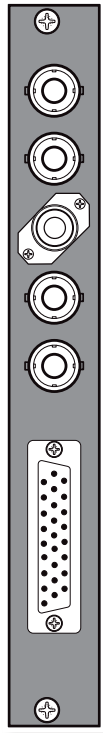
Some fiber optic examples



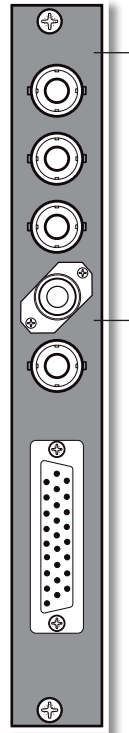
BPL01R2_SC



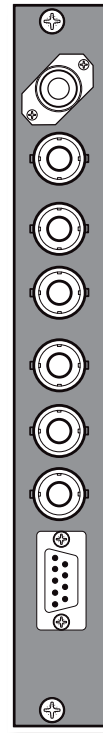
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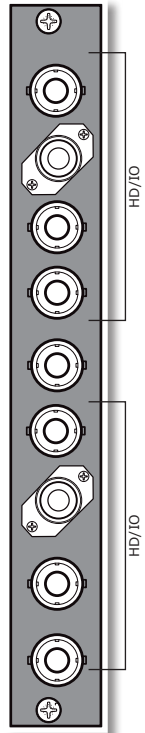
BPL02DT_FC/PC



BPL02DT_FC/PC



BPL08R_FC/PC

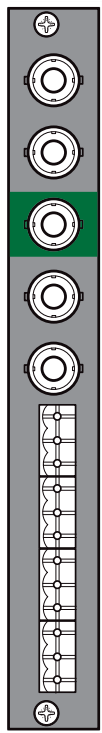


BPH07T2_FC/PC

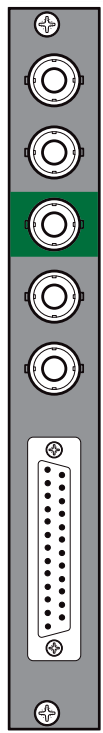
Some examples of CVBS outputs



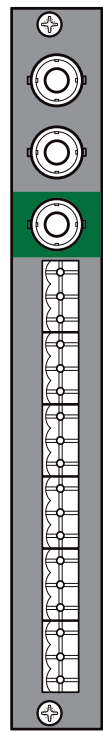
BPL01C



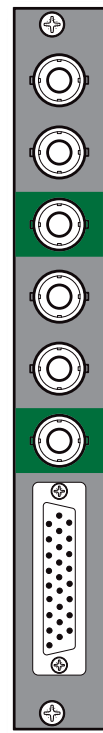
BPL02C



BPL02DC



BPL03C



BPL12C2

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Committed.

