

*Synapse*

SAV38

**3 Channel SDI to composite encoder**

*Synapse*

**TECHNICAL MANUAL**

**SAV38**

**3 Channel SDI to composite encoder**

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**WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE**

- ALWAYS disconnect your entire system from the AC mains before cleaning any component. The product frame (SFR18 or SFR04) must be terminated with three-conductor AC mains power cord that includes an earth ground connection. To prevent shock hazard, all three connections must always be used.
- NEVER use flammable or combustible chemicals for cleaning components.
- NEVER operate this product if any cover is removed.
- NEVER wet the inside of this product with any liquid.
- NEVER pour or spill liquids directly onto this unit.
- NEVER block airflow through ventilation slots.
- NEVER bypass any fuse.
- NEVER replace any fuse with a value or type other than those specified.
- NEVER attempt to repair this product. If a problem occurs, contact your local Axon distributor.
- NEVER expose this product to extremely high or low temperatures.
- NEVER operate this product in an explosive atmosphere.

**Warranty:** Axon warrants their products according to the warranty policy as described in the general terms. That means that Axon Digital Design BV can only warrant the products as long as the serial numbers are not removed.

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This product complies with the requirements of the product family standards for audio, video, audio-visual entertainment lighting control apparatus for professional use as mentioned below.



EN60950	Safety
EN55103-1: 1996	Emission
EN55103-2: 1996	Immunity

Axon Digital Design SAV38



Tested To Comply  
With FCC Standards

FOR HOME OR OFFICE USE

This device complies with part 15 of the FCC Rules  
Operation is subject to the following two conditions:  
(1) This device may cause harmful interference, and  
(2) This device must accept any interference received, including interference that may cause undesired operation.

# Table of Contents

<b>Chapter 1</b>	<b>Introduction to Synapse</b> An introduction to Synapse Local Control Panel Remote Control Capabilities
<b>Chapter 2</b>	<b>Unpacking and Placement</b> Unpacking Locating the card
<b>Chapter 3</b>	<b>A Quick Start</b> When powering-up Default settings Changing parameters and settings Front Panel Control Example of changing parameter using Front Panel control Synapse Setup Software Menu Structure Example
<b>Chapter 4</b>	<b>The SAV38 card</b> Introduction Key Features
<b>Chapter 5</b>	<b>Settings Menu</b>
<b>Chapter 6</b>	<b>Status Menu</b>
<b>Chapter 7</b>	<b>Events Menu</b>
<b>Chapter 8</b>	<b>LED Indication</b>
<b>Chapter 9</b>	<b>Block Schematic</b>
<b>Chapter 10</b>	<b>Connector panel</b>
<b>Chapter 11</b>	<b>Specifications</b>

# 1 Introduction to Synapse

## An Introduction to Synapse

Synapse is a modular system designed for the broadcast industry. High density, intuitive operation and high quality processing are key features of this system. Synapse offers a full range of converters and processing modules. Please visit the AXON Digital Design Website at [www.axon.tv](http://www.axon.tv) to obtain the latest information on our new products and updates.

## Local Control Panel

The local control panel gives access to all adjustable parameters and provides status information for any of the cards in the Synapse frame, including the Synapse rack controller. The local control panel is also used to back-up and restore card settings. Please refer to the RRC18, RRC10, RRC08 and RRC04 manuals for a detailed description of the local control panel, the way to set-up remote control over IP and for frame related settings and status information.

## Remote Control Capabilities

The remote control options are explained in the rack controller (RRC18/RRC10/RRC04/RRS18/RRS04) manual. The method of connection to a computer using Ethernet is described in the RRC manual.



**CHECK-OUT: “AXON CORTEX” SOFTWARE WILL INCREASE SYSTEM FLEXIBILITY OF ONE OR MORE SYNAPSE FRAMES**

Although not required to use Cortex with a Synapse frame, you are strongly advised to use a remote personal computer or laptop PC with Axon Cortex installed, as this increases the ease of use and understanding of the modules.

## 2 Unpacking and Placement

### Unpacking

The Axon Synapse card must be unpacked in an anti-static environment. Care must be taken NOT to touch components on the card – always handle the card carefully by the edges. The card must be stored and shipped in anti-static packaging. Ensuring that these precautions are followed will prevent premature failure from components mounted on the board.

### Locating the card

The Synapse card can be placed vertically in an SFR18 frame or horizontally in an SFR04 or SFR08 frame. Locate the two guide slots to be used, slide in the mounted circuit board, and push it firmly to locate the connectors.

Correct insertion of card is essential as a card that is not located properly may show valid indicators, but does not function correctly.

**REMARK:** On power up all LEDs will light for a few seconds, this is the time it takes to initialise the card.

### 3 A Quick Start

#### When Powering-up

On powering up the Synapse frame, the card set will use basic data and default initialisation settings. All LEDs will light during this process. After initialisation, several LEDs will remain lit – the exact number and configuration is dependant upon the number of inputs connected and the status of the inputs.

#### Default settings

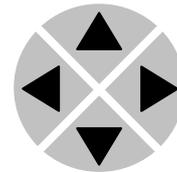
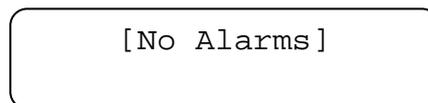
In its default condition, the SAV38 will act as an triple SDI to triple composite encoder.

#### Changing settings and parameters

The front panel controls or the Synapse Set-Up Software can be used to change settings. An overview of the settings can be found in chapter 5, 6 and 7 of this manual.

#### Front Panel Control

Front Panel Display and Cursor



Settings are displayed and changed as follows;

Use the cursor 'arrows' on the front panel to select the menu and parameter to be displayed and/or changed.

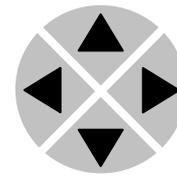
- Press ► To go forward through the menu structure.
- Press ◀ To go back through the menu structure.
- Press ▲ To move up within a menu or increase the value of a parameter.
- Press ▼ To move down through a menu or decrease the value of a parameter.

**REMARK:** Whilst editing a setting, pressing ► twice will reset the value to its default.

## Example of changing parameters using front panel control

With the display as shown below

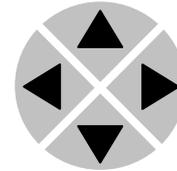
```
RRC18 [Select Card]
>S01=SFS10
```



Pressing the ► selects the SFS10 in frame slot 01.

The display changes to indicate that the SFS10 has been selected. In this example the Settings menu item is indicated.

```
SFS10 [Select Menu]
>Settings
```

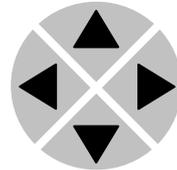


Pressing the ► selects the menu item shown, in this example Settings.

(Pressing ▲ or ▼ will change to a different menu eg Status, Events).

The display changes to indicate that the SFS10 Settings menu item SDI-Format has been selected and shows that its current setting is Auto.

```
SFS10 [Settings]
>SDI-Format=Auto
```



Pressing the ► selects the settings item shown, in this example SDI-Format.

(Pressing ▲ or ▼ will change to a different setting, eg Mode, H-Delay).

The display changes to indicate that the SFS10 Edit Setting menu item SDI-Format has been selected.

```
SFS10 [Edit Setting]
```



To edit the setting of the menu item press ▲ or ▼.

All menu items can be monitored and/or changed in this way. Changing a setting has an immediate effect.

**Axon Cortex Control Software**

Axon Cortex can be used to change the settings of Synapse modules from a PC, either locally or remotely. The software enables communication based on TCP/IP between the Setup PC and Synapse frames/modules.

Each Synapse frame is addressed through its rack controller's unique IP address, giving access to each module, its menus and adjustment items. Axon Cortex has access to data contained within the Synapse module and displays it on a GUI. The software has an intuitive structure following that of the module that it is controlling.

For operation of Axon Cortex, please refer to the Cortex helpfiles.

**Menu Structure Example**

Slot	Module	Item	Parameter	Setting
▲				
▲				
S02		Identity		
▲				
S01	SFS10	▶ Settings	▶ SDI-Format	▶ Auto
▼				
S00	RRC18	▼ Status	▼ Mode	▼ 625
		▼ Events	▼ Ref-Input	▼ 525
			▼ H-Delay	
			▼	
			▼	

REMARK: Further information about Front Panel Control can be obtained from the RRC and RRS operational manuals.

## 4 The SAV38 Card

<b>Introduction</b>	The AXON SAV38 is an triple SDI to triple Composite or Y/C.
<b>Key Features</b>	The Key features of the SAV38 are as follows.
<b>Analog Composite, Component and YC outputs</b>	The SAV08 has 3 SDI inputs that each have 2 Composite or 1 Y/C outputs which can be selected (so 2 Composite outputs or 1 Y and 1 C output).
<b>Automatic Cable Equalization</b>	The SAV38 employs automatic cable equalization to compensate for cable losses up to a maximum length of 300m, applicable for each SDI input.
<b>Standard Selection</b>	Manual selection of 525 TV line and 652 TV line systems is provided by the SAV38 allowing use in multi-standard systems.
<b>Blanking Modes</b>	The SAV38 has sophisticated vertical blanking, allowing pass-through or blanking that enables the input blanking to be maintained or modified. The set mode applies to all SDI inputs .
<b>Internal Test Signal Generator</b>	The SAV38 card has an internal test signal generator that has a selectable 75% Color Bars test pattern. This only works if correct SDI signal is applied
<b>Back planes</b>	The SAV38 can only be used with the BPL01.
<b>Miscellaneous</b>	The SAV38 cards fit into the Axon SFR04, SFR08 & SFR18 rack. The SAV38 can be controlled by Axon Cortex, the SCP08 or the frontpanel.

## 5 Settings Menu

<b>Introduction</b>	<p>The settings menu displays the current state of each setting within the 2AS11 and enables the item to be changed or adjusted.</p> <p>Settings can be changed using the front panel of the Synapse frame (SFR18, SFR08 or SFR04) or Axon Cortex.</p> <p>Please refer to chapter 3 for information on the Synapse front panel control and Cortex.</p>
<b>Standard 1</b>	<p>This item determines the input video standard and the setting of the internal colorbar generator. Standard can be set to, NTSC, NTSC-J, PAL-BDGHI, iCB75_525, iCB75_625. The settings iCB75_525 &amp; iCB75_625 select the internal colorbar generator. Auto format detection is not available.</p> <p>The default setting is PAL-BDGHI.</p>
<b>Standard 2</b>	<p>This item determines the input video standard and the setting of the internal colorbar generator. Standard can be set to, NTSC, NTSC-J, PAL-BDGHI, iCB75_525, iCB75_625. The settings iCB75_525 &amp; iCB75_625 select the internal colorbar generator. Auto format detection is not available.</p> <p>The default setting is PAL-BDGHI.</p>
<b>Standard 3</b>	<p>This item determines the input video standard and the setting of the internal colorbar generator. Standard can be set to, NTSC, NTSC-J, PAL-BDGHI, iCB75_525, iCB75_625. The settings iCB75_525 &amp; iCB75_625 select the internal colorbar generator. Auto format detection is not available.</p> <p>The default setting is PAL-BDGHI.</p>
<b>Output 1</b>	<p>The setting menu item Output selects the format of the video signal at the outputs of the SAV38. Output can be set to the following settings:</p> <p>CVBS: selects a composite video signal on both outputs.</p> <p>Y/C: selects a Y signal on upper output and a separate C signal on the lower output.</p> <p>The default setting is CVBS.</p>

<b>Output 2</b>	<p>The setting menu item <code>Output</code> selects the format of the video signal at the outputs of the SAV38. Output can be set to the following settings:</p> <p>CVBS: selects a composite video signal on both outputs.</p> <p>Y/C: selects a Y signal on upper output and a separate C signal on the lower output.</p> <p>The default setting is CVBS.</p>
<b>Output 3</b>	<p>The setting menu item <code>Output</code> selects the format of the video signal at the outputs of the SAV38. Output can be set to the following settings:</p> <p>CVBS: selects a composite video signal on both outputs.</p> <p>Y/C: selects a Y signal on upper output and a separate C signal on the lower output.</p> <p>The default setting is CVBS.</p>
<b>Y-Filter</b>	<p><code>Y-Filter</code> allows the selection of filters with different characteristics that can be used to enhance Luminance performance. <code>Y-Filter</code> can be set to <code>Normal</code>, <code>Low-Pass</code> and <code>Notch</code>. Selection applies for all 3 inputs</p> <p>The default setting is <code>Normal</code>.</p>
<b>C-Filter</b>	<p>The <code>C-Filter</code> setting adjusts the bandwidth of the chroma channel. Selection is made between <code>LP1.3</code>, <code>LP.65</code>, <code>LP1.0</code>, and <code>LP2.0</code> all of which represent the bandwidth in MHz. Selection applies to all 3 inputs</p> <p>The default setting is <code>LP1.3</code>.</p>
<b>Y_Level</b>	<p>The setting item <code>Y_Level</code> sets the amplitude of the output to either <code>Betacam</code> or <code>SMPTE</code> levels in Y/C mode.</p> <p>The default setting is <code>SMPTE</code>.</p>
<b>VBI</b>	<p>The <code>VBI</code> menu sets the handling of the Vertical Blanking Interval. It can either be set to <code>Blanked</code> or <code>Pass-Through</code>.</p> <p>The default setting is <code>Blanked</code>.</p>

## 6 Status Menu

<b>Introduction</b>	The status menu indicates the current status of each item listed below.
<b>SDI-Input 1</b>	This status item indicates the presence of a valid serial digital video signal at the input. <code>SDI-Input</code> indicates if an input signal is <code>NA</code> (not available) or <code>Present</code> .
<b>SDI-Input 2</b>	This status item indicates the presence of a valid serial digital video signal at the input. <code>SDI-Input</code> indicates if an input signal is <code>NA</code> (not available) or <code>Present</code> .
<b>SDI-Input 3</b>	This status item indicates the presence of a valid serial digital video signal at the input. <code>SDI-Input</code> indicates if an input signal is <code>NA</code> (not available) or <code>Present</code> .
<b>EDH-Stat 1</b>	<p><code>EDH-Stat</code> indicates the status of the EDH within the incoming SDI signal. <code>OK</code> is indicated if the status of the detected EDH does not indicate errors.</p> <p><code>UES</code> is shown if an EDH data block is not present.</p> <p><code>EDA</code> is displayed if an EDH error has previously been detected by another card in the SDI stream.</p> <p><code>EDH</code> is displayed if an error is detected by this device.</p>
<b>EDH-Stat 2</b>	<p><code>EDH-Stat</code> indicates the status of the EDH within the incoming SDI signal. <code>OK</code> is indicated if the status of the detected EDH does not indicate errors.</p> <p><code>UES</code> is shown if an EDH data block is not present.</p> <p><code>EDA</code> is displayed if an EDH error has previously been detected by another card in the SDI stream.</p> <p><code>EDH</code> is displayed if an error is detected by this device.</p>

**EDH-Stat 3**

EDH-Stat indicates the status of the EDH within the incoming SDI signal. OK is indicated if the status of the detected EDH does not indicate errors.

UES is shown if an EDH data block is not present.

EDA is displayed if an EDH error has previously been detected by another card in the SDI stream.

EDH is displayed if an error is detected by this device..

## 7 Events Menu

<b>Introduction</b>	An event is a special message that is generated on the card asynchronously. This means that it is not the response to a request to the card, but a spontaneous message.
<b>What is the Goal of an event?</b>	The goal of events is to inform the environment about a changing condition on the card. A message may be broadcast to mark the change in status. The message is volatile and cannot be retrieved from the system after it has been broadcast. There are several means by which the message can be filtered.
<b>SAV38 Events</b>	The events reported by the SAV38 are as follows;
<b>Announcements</b>	Announcements is not an event. This item is only used for switching the announcement of status changes on/off. 0=off, other =on
<b>Input 1</b>	Input can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>Input 2</b>	Input can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>Input 3</b>	Input can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting.
<b>What information is available in an event?</b>	<p>The message consists of the following items;</p> <ol style="list-style-type: none"><li>1) A message string to show what has happened in text, for example: "INP_LOSS", "REF_LOSS", "INP_RETURN".</li><li>2) A tag that also shows what happens, but with a predefined number: e.g. 1 (= loss of input), 2 (= loss of reference), 129(= 1+128 = return of input). For a list of these predefined tags see the table on the next page.</li><li>3) A priority that marks the importance of an event. This value is defined by the user and can have any value between 1 and 255, or 0 when disabled.</li><li>4) A slot number of the source of this event.</li></ol>

## The Message String

The message string is defined in the card and is therefore fixed. It may be used in controlling software like Synapse Set-up to show the event.

## The Tag

The tag is also defined in the card. The tag has a fixed meaning. When controlling or monitoring software should make decisions based on events, it is easier to use the tag instead of interpreting a string. The first implementation is the tag controlled switch in the GPI16.

In cases where the event marks a change to fault status (e.g. 1 for Loss of Input) the complement is marked by the tag increased by 128 (80<sub>hex</sub>) (e.g. 129 (81<sub>hex</sub>) for Return of Input).

## Defining Tags

The tags defined for the SAV38 are:

Event Menu Item	Tag		Description
Announcements	0 or NA	0 or NA	Announcing of report and control values
Input	01 <sub>hex</sub> =INP_LOSS	81 <sub>hex</sub> =INP_RETURN	primary input lost or returned

## The Priority

The priority is a user-defined value. The higher the priority of the alarm, the higher this value. Setting the priority to Zero disables the announcement of this alarm. Alarms with priorities equal or higher than the Error Threshold setting of the RRC will cause the error LED on the Synapse rack front panel to light.

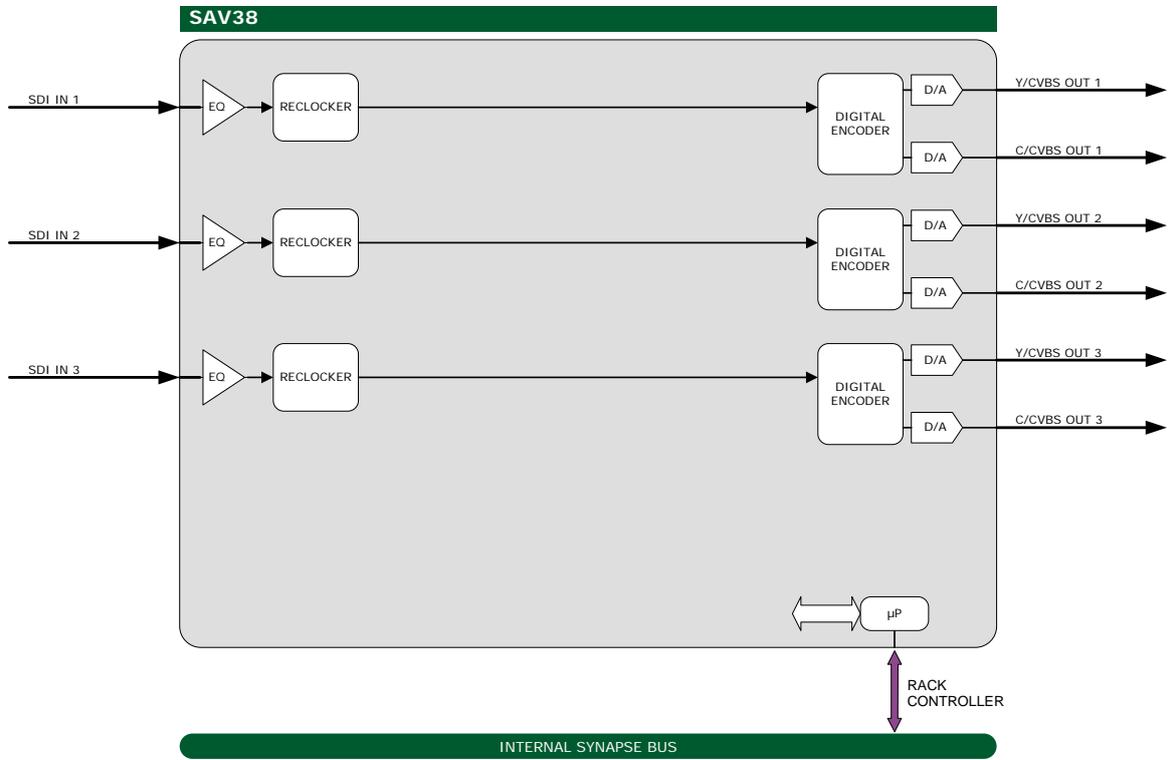
## The Address

Together with the message string or the tag, the slot number or address of the card is relevant to be able to assign the event to a certain card.

## 8 LED Indication

<b>Error LED</b>	The error LED indicates an error if the internal logic of the SAV38 card is not configured correctly or has a hardware failure.
<b>Input LED 1</b>	This LED indicated the presence of a valid SDI video signal on the input.
<b>Input LED 2</b>	This LED indicated the presence of a valid SDI video signal on the input.
<b>Input LED 3</b>	This LED indicated the presence of a valid SDI video signal on the input.
<b>Data Error LED</b>	This LED indicates one type of error: <ul style="list-style-type: none"><li>- EDH error</li></ul>
<b>Connection LED</b>	This LED illuminates after the card has initialised. The LED lights for 0.5 seconds every time a connection is made to the card.

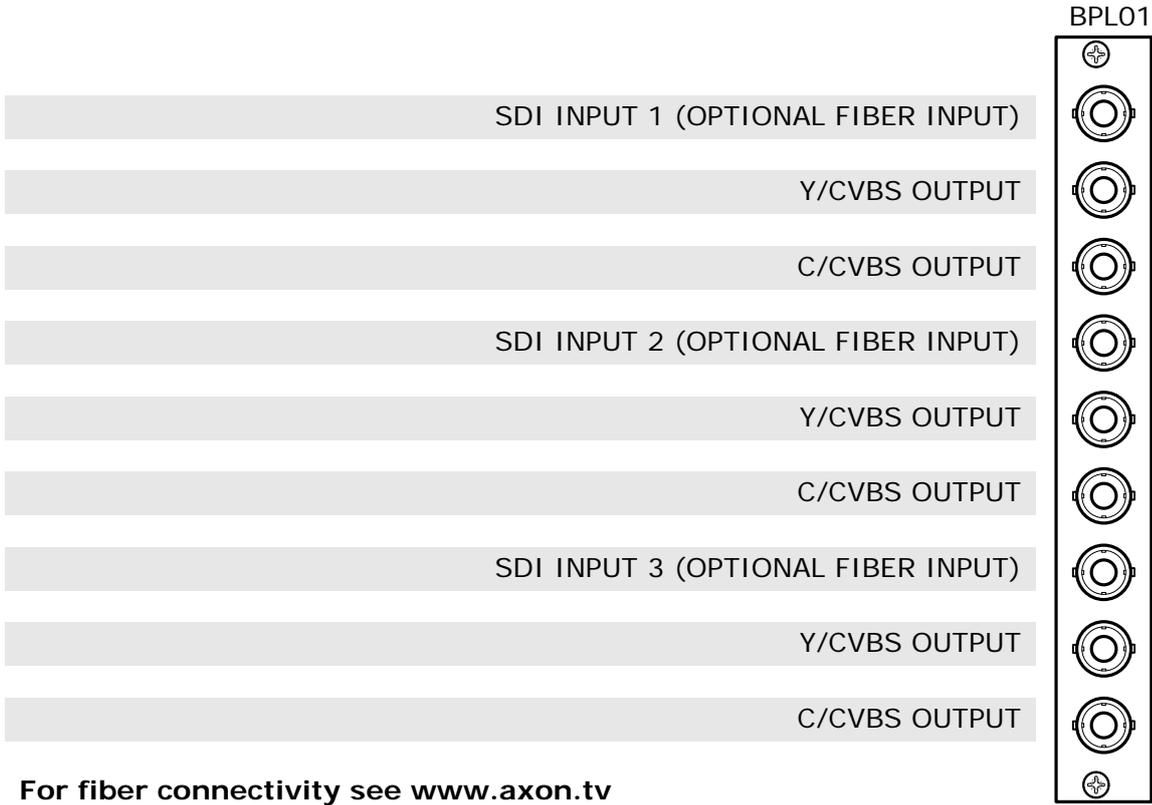
# 9 Block Schematic



# 10 Connector Panel

The SAV38 can be used with the following backplane: BPL01,  
Fiber backplanes: BPL01R3\_FC/PC, BPL01R3\_SC

**!Unused inputs and outputs must be terminated with the correct impedance!**



For fiber connectivity see [www.axon.tv](http://www.axon.tv)