Synapse

GPI16

Universal GPI Card with 10 GPI inputs and 16 GPI outputs

®**AXON**

Synapse

TECHNICAL MANUAL

GPI16

**Universal GPI Card with 10 GPI inputs
and 16 GPI outputs**

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

Axon Digital Design GPI16	This device complies with part 15 of the FCC Rules
FC Tested To Comply With FCC Standards	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.
FOR HOME OR OFFICE USE	

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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 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, RRS18, RRC10 RRC04 and RRS04 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/RRS18/RRC10/RRC04/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 the 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 and 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 the default condition, the GPI16 acts as a universal GPI input & Output card for the Synapse SFR18/SFR08/SFR04 frame.

Changing settings and parameters

The front panel controls or the Axon Cortex 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

```
[No Alarms]
```
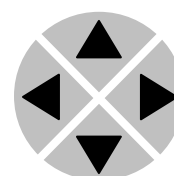
Settings are displayed and changed as follows;

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
```
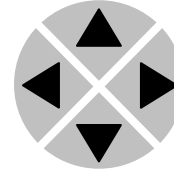
Pressing the ► selects the SFS10 in frame slot 01.

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

```
SFS10 [Select Menu]
>Settings
```
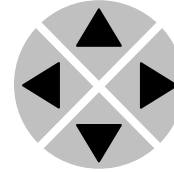
Pressing the ► selects the menu item shown, in this example Settings.

(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 it current setting is Auto.

```
SFS10 [Settings]
>SDI-Format=Auto
```
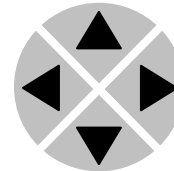
Pressing the ► selects the settings item shown, in this example SDI-Format.

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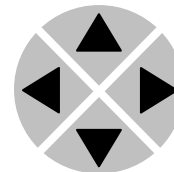
To edit the setting of the menu item press ▲ or ▼.

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

Axon Cortex

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. The 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.

Details about how to use Cortex can be found in the help-file of Cortex.

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	
			▼	
			▼	

4 The GPI16 Card

Introduction

The AXON 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 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.

Back planes

The GPI16 can be used with the BPL06 backplane.

Miscellaneous

The GPI16 cards fit into the Axon SFR18 or SFR04 rack.

LEDs on the front of the board indicate the presence of electrical input signals & Processor Errors.

The GPI16 can be controlled by Axon Synapse Set-Up Software.

5 | Settings Menu

Introduction

The settings menu displays the current state of each 2HX10 setting and allows you to change these.

Settings can be changed by using the front panel of the Synapse frame (SFR18, SFR08 or SFR04) or Cortex software. The SCP08 control can also be used.

Please refer to chapter 3 for information on Synapse front panel control and Axon Cortex.

Source

The settings item `Source` controls the functionality of the card. The GPI16 can be either used as a general purpose card or a card dedicated to one master card.

The settings of `Source` are:

- `Frame`: The GPI16 is set to general purpose where events from several cards within the Synapse frame can be mapped to the GPI16. The card can be placed in any slot of the frame.

- `Mastercard`: When the GPI16 is set to `Mastercard`. The GPI16 then functions as an interface between a mastercard (VWI10, SDX08, ARC20) and hardware switches or automation pulses. The GPI16 card has to be placed at the right side of a mastercard.

The default setting of `Source` is `Frame`.

GPI_in

`GPI_in` can be set to `Latch`, `Non_Latch`, or `Loop-Through`. `Latch` when a contact is closed all the time. `Non_Latch` when a contact is closed momentarily. `Loop-Through` When you want the GPI outputs to be triggered by the GPI inputs.

The default setting of `GPI_in` is `Non_Latch`.

DeBounce

`DeBounce ON` will de-bounce the GPI inputs when a mechanical switch is used. `OFF` will de-activate this feature. `OFF` also improves the reaction speed.

Default is `On`.

GPO_1-Card

When the settings item `Source` is set to `Frame`, the setting `GPO_1-Card` is active. `GPO_1-Card` maps GPI output 1 to the card in the selected slot within the Synapse frame. `GPO_1-Card` select slots `1` to `18` and can also be given the setting `0`. When `GPO_1-Card` is set to `0`, all slots with the Tag selected will provide the source for the GPI switching, (see Setting item `GPO_1-Tag` below). The default setting of `GPO_1-Card` is `0`.

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GPO_1-Tag	When the settings item `Source` is set to Frame, the setting `GPO_1-Tag` is active. `GPO_1-Tag` selects the Tag that will be used to enable the GPI output to switch for the card selected in setting item `GPO_1-Card`.

When the settings item `Source` is set to Frame, the setting `GPO_1-Tag` is active. `GPO_1-Tag` selects the Tag that will be used to enable the GPI output to switch for the card selected in setting item `GPO_1-Card`.

There is no TAG selected, when the value of the GPO_1-Card is 0. The TAG number can be found in the events menu of the card that has to be controlled. E.g. loss of input is TAG1. And also the TAG can be found in the manual of the card that has to be controlled.

Most important TAGS:
- Lost input = TAG1
- Lost reference = TAG2
- EDH status = TAG3
- ANC status = TAG4
- Audio data = TAG5
- GRP-insert = TAG6

The default setting of `GPO_1-Tag` is 0.

GPO_2-Card to GPO_16-Card

The functionality of `GPO_2-Card` to `GPO_16-Card` is the same as `GPO_1-Card`. Please refer to the above description for details.

GPO_2-Tag to GPO_16-Tag

The functionality of `GPO_2-Tag` to `GPO_16- Tag` is the same as `GPO_1- Tag`. Please refer to the above description for details.

GPOut_1-Default ~ GPOut_16-Default

The GPI outputs are based on mechanical relays. The advantage of using a relay is the galvanic isolation and polarity independent switching capabilities. The relays have switch over contacts with a normally closed (NC) and normally open (NO) contacts. The default position is: `On`. This means that in the default state all relays are activated and the NO contact is closed. The advantage is that if the card looses power all relays will be in their non-activated state.

The settings menu items `GPOut_1-Default` till `GPOut_16-Default` allows the relays to be put in their released (non-activated) state which also can be used as manual triggering of the GPI outputs. The state can also be changed by the GPInputs 1 till 10.

The settings of `GPOut_1-Default` are `On`, `Off` and `GPI_1 till GPI_10`. The default setting of `GPOut_1-Default` is `On`.

6 Status Menu

Introduction

The status menu indicates the current status of each item listed below.

GPIn_1

The status item `GPIn_1` indicates that GPI input 1 has been triggered. If a voltage is supplied to the input the status will be displayed as `On`, if a voltage is not present the Status will be `Off`.

GPIn_2 to GPIn_10

Please refer to the description of GPIn_1

GPOut_1

The status item `GPOut_1` indicates that GPI output 1 has been triggered. This means that activation of this GPI output relay changes it from the default state selected in `GPOut_1-Default`.

For example, if `GPOut_1-Default` is set to `Off`. In its untriggered state the `GPOut_1` indicates `Off`. When the output is triggered the status changes to `On`.

GPOut_2 to GPOut_16

Please refer to the description of GPOut_1

7 Events Menu

Introduction

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.

What is the Goal of an event?

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.

GPI16 Events

The events reported by the GPI16 are as follows;

Announcements

Announcements is not an event. This item is only used for switching the announcement of status changes on/off. 0=off, other =on

GPI_1

GPI_1 generates a GPI trigger and can be selected between 0 .. 255. 0= no event, 1..255 is the priority setting. When a GPI input is activated, an event will be generated.

GPI_2 to GPI10

Please refer to GPI_1.

What information is available in an event?

The message consists of the following items;

1) A message string to show what has happened in text, for example: "INP_LOSS", "REF_LOSS", "INP_RETURN".

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.

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.

4) A slot number of the source of this event.

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.

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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.

When an 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_{hex}) (e.g. 129 (81_{hex}) for Return of Input).

Defining Tags The tags defined for the GPI16 are:

Event Menu Item	Tag*		Description
Announcements	0 or NA	0 or NA	Announcing of report and control values
GPI	08_{hex}=GPI_ON_#	88_{hex}= GPI_OFF_#	GPI relay event

* For all tags see selected card numbers

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

Error LED | The error LED indicates an error if the internal logic of the GPI16 card is not configured correctly or has a hardware failure.

Input LED | The Input LED illuminated to indicate a GPO trigger.

Connection LED | 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 Connection Details
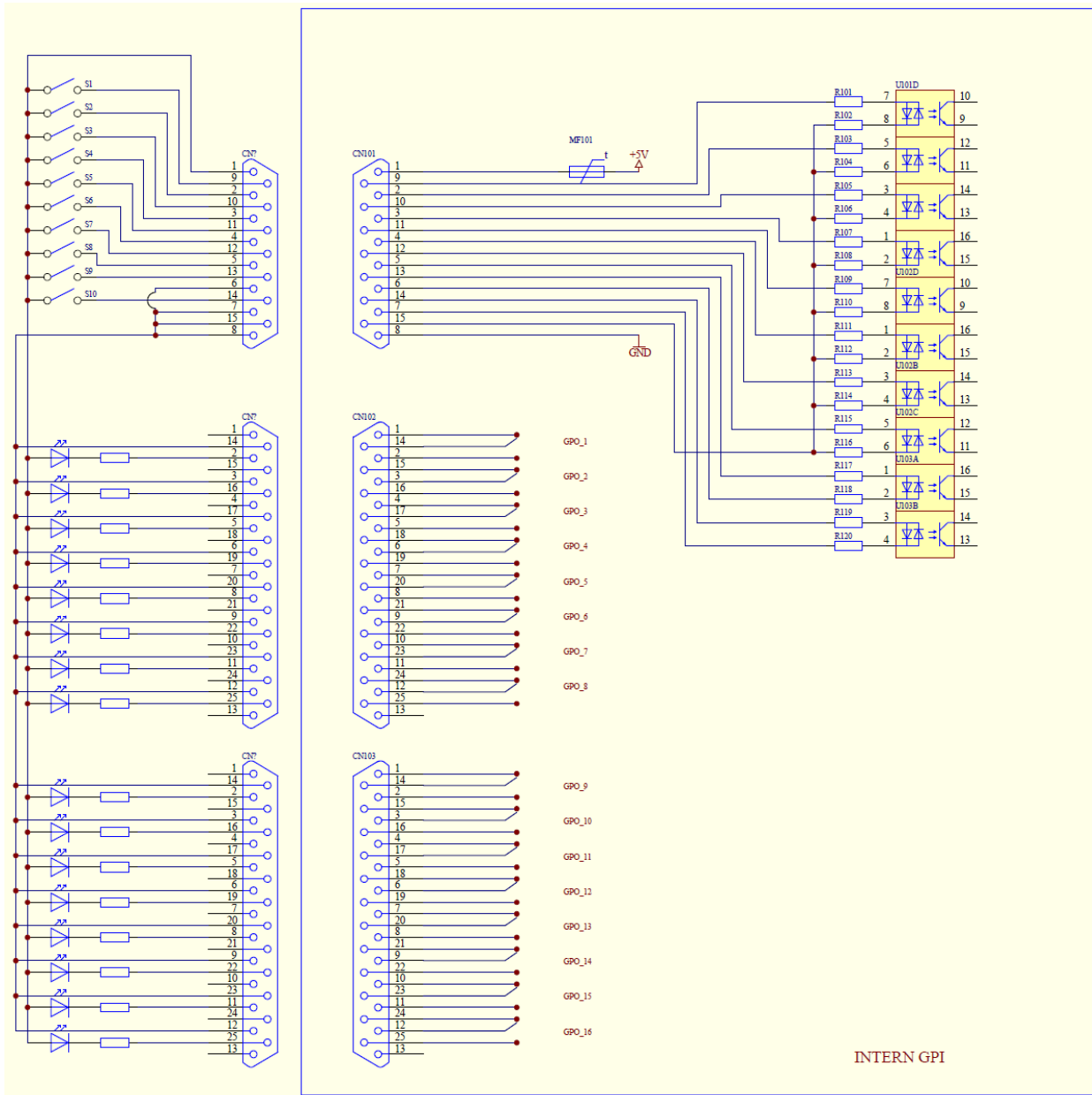
10 Block Schematic
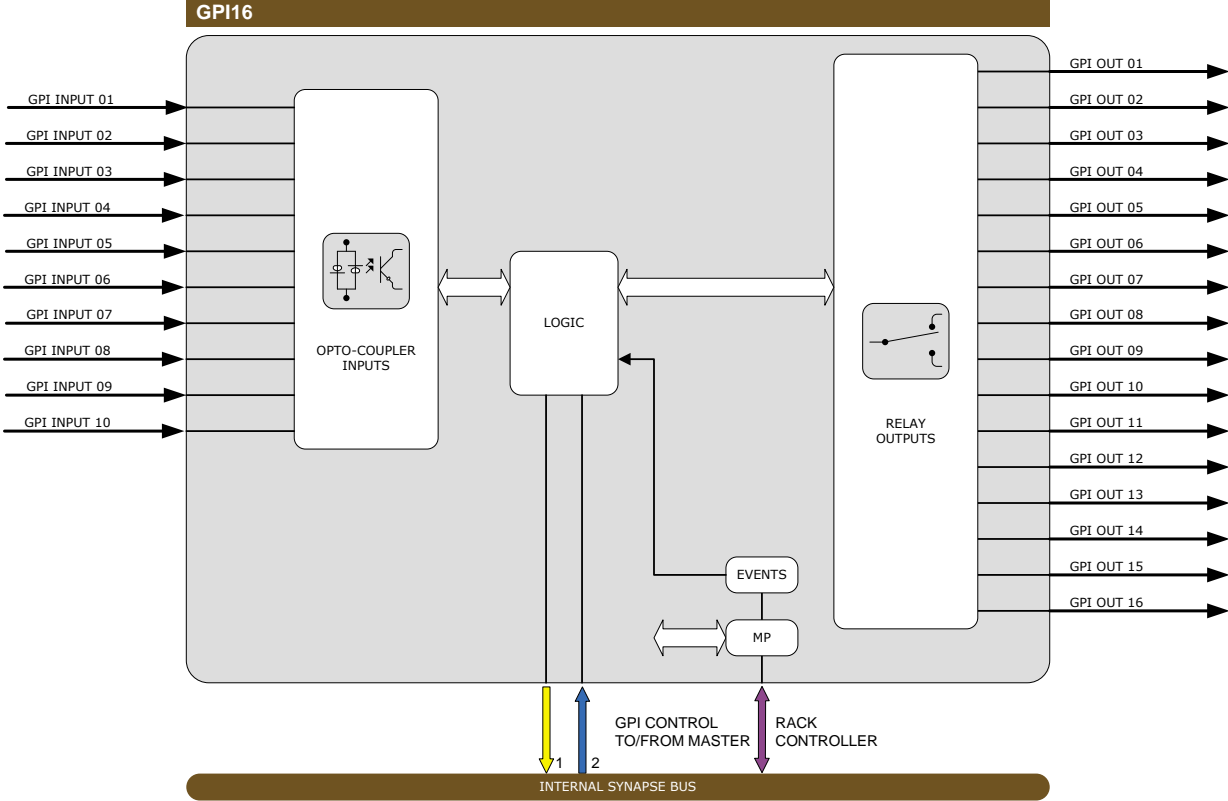
11 Connector Panel

The GPI16 can be used with the following backplane: BPL06.