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1 Introduction

The 2323 is a Pro-Bel ICON interface module which allows RS232 and RS485 based control systems to operate parallel controlled (button per crosspoint) switchers from the Pro-Bel ICON range of modular products. It is designed to fit in the 1050 3U Pro-Bel ICON modular product rackframe.

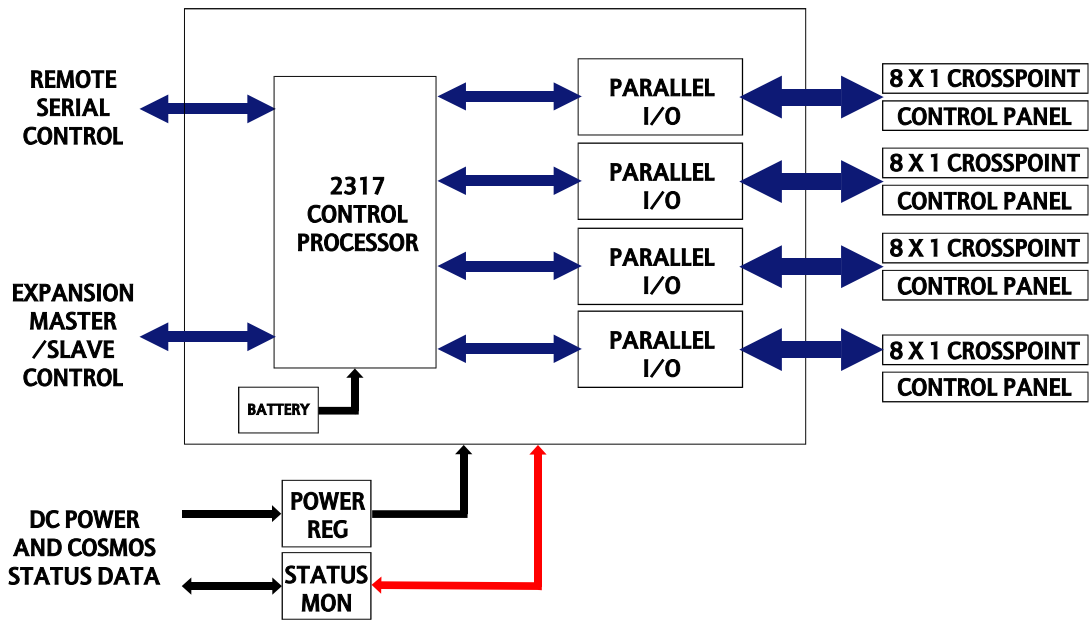
The ICON family of analogue and digital audio and video 8x1 modular switchers provides solutions for small ancillary or monitoring matrices. Crosspoint outputs can be bussed together to allow switchers above eight inputs to be built and married multi-level matrices can be formed using other modules in the Pro-Bel range.

Two serial ports are provided, one for system communication and the second for master/slave expansion to a second 2323 Serial Control Interface. The interface module generates 32 parallel control lines which are arranged in four groups of 8. The control lines can select crosspoints and read back tally information on ICON 8x1 switchers.

A dual or master/slave configuration can address up to 64 crosspoints on a single level. Multilevel switchers can be built and logical addressing can be used to facilitate the construction of larger systems via matrix controllers such as Pro-Bel's System 3 or Aurora.

Characteristics of the 2323 module are:

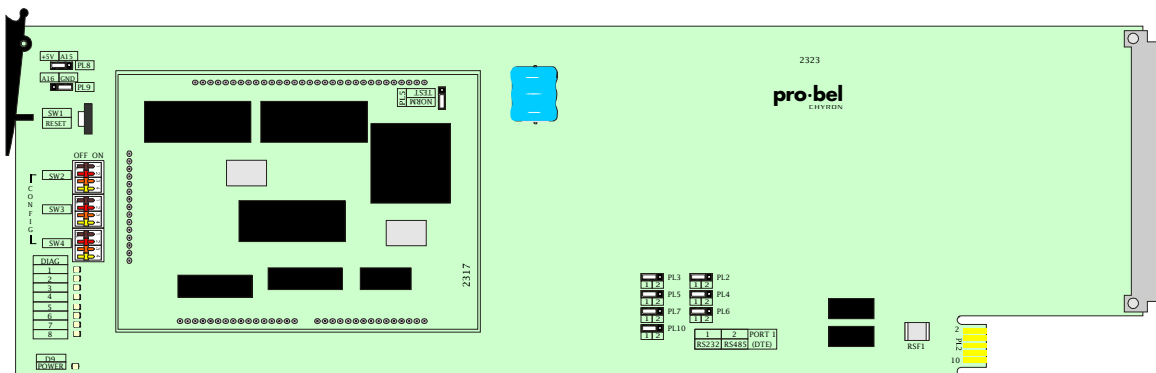
- main and expansion serial control ports
- four parallel control ports for various arrangements of Pro-Bel 8x1 switchers for analogue and digital video and audio and control (relays)
- controller RAM crosspoint memory retention via battery backup
- simple card edge set-up and LED diagnostic display
- compatible with Pro-Bel COSMOS status monitoring



The 2323 Serial Control Interface

2 Installation

The 2323 Serial Control Interface consists of a 2323 ICON module which fits in the 3U 1050 ICON Pro-Bel modular rackframe. It is available with one rear connector, the 50mm K2323.5.

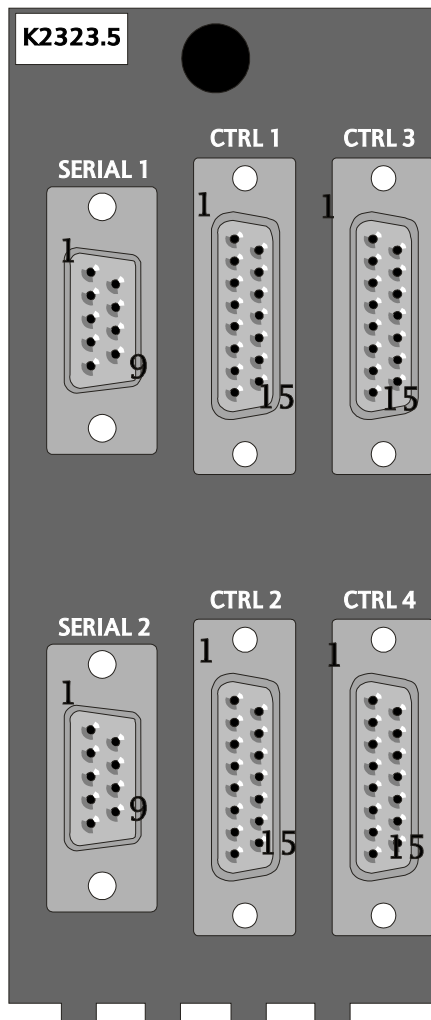


The 2323 Serial Control Interface

For module and rear connector installation please refer to the appropriate ICON rackframe section of the manual.

2.1 Control pinout

The K2323.5 rear connector has one 9 way 'D' female socket (Serial 1) for serial control, and one for expansion (Serial 2) and four 15 way 'D' type sockets for parallel switcher control.



SERIAL 1 connector pinout

Pin	RS485 Function	RS232 Function
1	Chassis	N/C
2	TX-	RX
3	RX+	TX
4	GND	GND
5	N/C	N/C
6	GND	GND
7	TX+	N/C
8	RX-	N/C
9	Chassis	N/C

Control port pinout

Pin	Function	Pin	Function
1	$\overline{\text{SEL 1}}$	9	N/C
2	$\overline{\text{SEL 2}}$	10	I/C
3	$\overline{\text{SEL 3}}$	11	N/C
4	$\overline{\text{SEL 4}}$	12	I/C
5	$\overline{\text{SEL 5}}$	13	LAMPSUP
6	$\overline{\text{SEL 6}}$	14	OV
7	$\overline{\text{SEL 7}}$	15	SCREEN
8	$\overline{\text{SEL 8}}$		

There are 32 control lines arranged in groups of four to form the SEL 1-8 lines for each parallel control port. These lines can be tri-stated to allow the crosspoint settings on switcher modules to be read by the control processor.

Each port can control up to three modules when all select lines are wired in parallel to allow married control.

Alternatively, multi-level switchers can be built using inter-card ribbon cabling. The first 8x1 switcher can be used as a select line driven master which controls further married modules via front ribbon cables carrying binary control data. See the section on level expansion in the relevant ICON switcher manual for more information.

SERIAL 2 connector pinout	
Pin	RS485 Function
1	Chassis
2	RX-
3	TX+
4	GND
5	N/C
6	GND
7	RX+
8	TX-
9	Chassis

Note: connect Serial 2 between two 2323 modules to create a master/slave system. Refer to the Configuration chapter for DIL switch settings.

Note: N/C stands for no connection and I/C denotes internal connections that are bussed between CNTL ports.

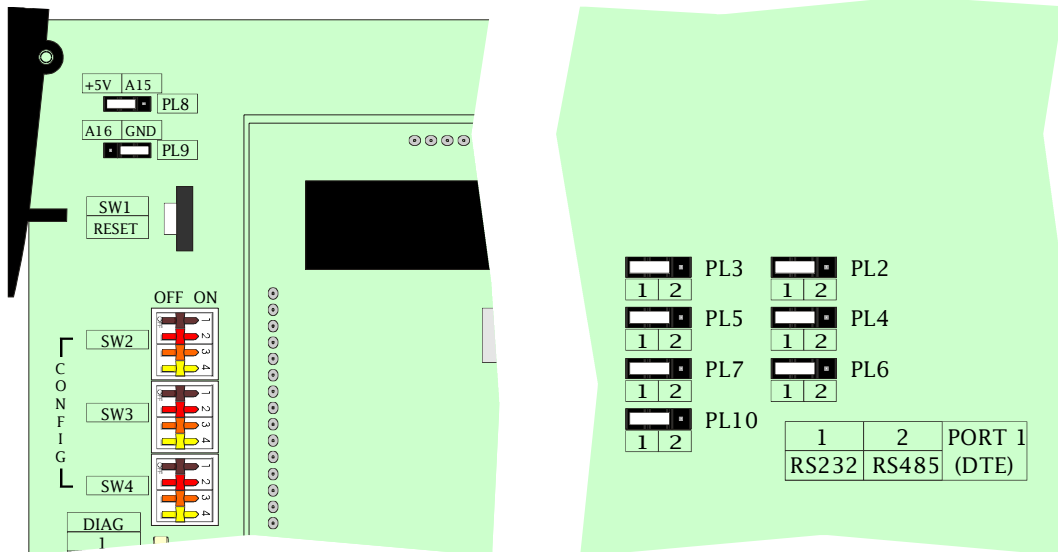


3 Configuration

Link jumper settings PL2-PL7 and PL10 provide RS485/RS232 select and PL8 and PL9 allow for different EPROMs to be fitted on the 2317 sub-board.

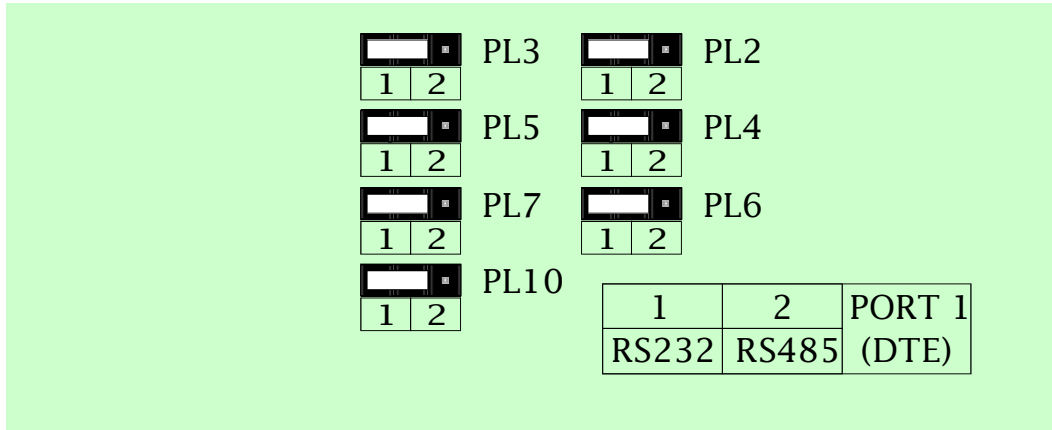
Configuration DIL switches SW2, SW3 and SW4 provide selection of the following:

- master/slave selection
- protocol
- Baud rate
- switcher configuration



3.1 Selecting the main serial port type

The serial port type for the main serial control connector, Serial 1, can be set for RS232 or RS485 with jumpers PL2 - PL7 and PL10.



NOTE: All seven jumpers must be placed in either position 1 (RS232) or position 2 (RS485).

3.2 EPROM select

The jumpers PL8 and PL9 are provided to allow for a choice of EPROM.



Example: PL8 and PL9 set for 27256 EPROM

3.3 Master/Slave selection

Front edge DIL switch SW2, lever 1 selects the operating mode of the 2323 module between master and slave. Only one slave 2323 can be connected to a master 2323 using the Serial 2 connector on both modules.

SW2-1 - master/slave	
Position	Function
OFF	Master
ON	Slave

3.4 Slave block number selection

To facilitate the integration of the switchers built with the 2323 Serial Control Interface into larger systems using controllers such as the Pro-Bel System3, it is possible to map the crosspoints controlled on a slave 2323 into larger 'logical' address ranges.

Selecting the destination range			
Slave block no	SW4-3	SW4-4	Function
0	OFF	OFF	Sources 33-64 or 2nd destination range
1	ON	OFF	Sources 65-96 or 3rd destination range
2	OFF	ON	Sources 97-128 or 4th destination range
3	ON	ON	Not used

Notes:

- only 1 slave 2323 can be connected to a master 2323
- normally the slave block number should be set to 0, but other block numbers can be used if address range discontinuities are required
- these switches are ignored on 2323 configured as a master which uses sources 1-32

3.5 Selecting the communications protocol

Comms protocol		
SW2-2	State	Function
0	OFF	Pro-Bel General Switcher Protocol
1	ON	Not used

Sw2-2 should be left in the OFF position for normal operation.

3.6 Baud rate selection

The serial port baud rate may be chosen from 2400, 4800, 9600 and 38.4K with front edge switches SW2-3 and SW2-4.

Baud rate selection		
Baud rate	SW2-3	SW2-4
2400	OFF	OFF
4800	ON	OFF
9600	OFF	ON
38.4K	ON	ON

3.7 Switcher configuration

The 2323 Serial Control Interface may be used to control a variety of switcher configurations ranging from 8x1 up to 64x1 with a master/slave system. The required front card edge switch configuration is summarised in the following table:

Switcher configuration - SW3 (1-4) and SW4 (1-2)									
Mode	3-1	3-2	3-3	3-4	4-1	4-2	O/Ps	I/Ps	Crosspoints
0	OFF	OFF	OFF	OFF	OFF	OFF	4	8	4 of 8X1
1	ON	OFF	OFF	OFF	OFF	OFF	3	16	2 of 8x1 + 1 of 16x1
2	OFF	ON	OFF	OFF	OFF	OFF	2	16	2 of 16x1
3	ON	ON	OFF	OFF	OFF	OFF	2	24	1 of 8x1 + 1 of 24x1
4	OFF	OFF	ON	OFF	OFF	OFF	1	32	1 of 32x1 (Dest expansion)
5	ON	OFF	ON	OFF	OFF	OFF	1	32	1 of 32x1 (Source expansion)
8	OFF	OFF	ON	ON	OFF	OFF			Not used
16	OFF	OFF	OFF	OFF	ON	OFF			Not used

Notes:

- all other switch positions select mode 0
- a slave 2323 must be in the same mode as the master 2323
- the O/Ps column defines the number of outputs per 2323, thus when a master/slave 2323 configuration is used, the number of outputs that can be controlled is doubled, except for mode 5 which provides control of a 64x1 switcher
- jumper PL5 on the 2317 sub-module must be in the NORM position

4 **Trouble shooting**

The green card edge POWER LED is not lit

- check the PSU indicator to confirm that there is power to the frame
- check the resettable fuses protecting the card - do this by removing the power to the card for about 30 seconds then restoring the power
- if necessary, refer to the power supply trouble shooting guide in the appropriate ICON rackframe manual section

Crosspoint control cannot be achieved

- ensure that the green power LED on the front of the card is lit
- check that switcher can be controlled as expected from a simple button per crosspoint control panel
- ensure that the switch and jumper link settings are correct for the configuration used
- if necessary press the reset switch on the front edge of the card

Only half a master/slave configuration works

- check that the appropriate master/slave settings have been made and that SERIAL 2 on each 2323 module is linked by a master/slave cable

Note: The diagnostic LEDs on the front of the card are for Pro-Bel use only.

5 COSMOS status monitoring

If the frame is equipped with a COSMOS controller card the following parameters will be reported back to the COSMOS status monitoring system:

- module present
- power OK

In addition, the module is programmed with the following information, which can be read by the status monitoring controller:

- module type
- module bar code
- module issue no

For further details of the Pro-Bel status monitoring system please refer to the COSMOS status monitoring manual.

6 Specification

Functional

Serial ports:	1 x RS232 or RS485 control, 1 x RS485 expansion
Parallel:	32 I/O lines in 4 groups of 8
Indications:	8 diagnostic LEDs 1 green LED for +5V
Links:	PL2-PL7 and PL10 RS485/RS232 port select PL8 and PL9 EPROM select (2317)
Switches:	Configuration DIL switches SW2, SW3 and SW4 Reset switch, SW1

Performance

Communications speed:	Baud rate of 2400, 4800, 9600 or 34.8K
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Temperature range

Operating:	0° to +40°C
Storage:	-10°C to +70°C

General

Weight:	250g approx
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7 **Ordering Information**

Part number

ICO-2323-5000

Description

Serial controller for 8x1 switches, 50mm

