



User Manual

6026 Series 2U Control Panels

6026776 (6276), 6026778 (6277 20/40), 6026777 (6277 60/80),
6026783

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Contents

1. Warnings	4
1.1 Explanation of Safety Symbols	4
1.2 Safety Warnings	4
1.3 Mains Supply Voltage	4
1.4 Safety Standards	5
2. Introduction	6
2.1 Description	6
2.2 Control Panel Types	6
2.2.1 LED Panels	6
2.2.2 LCD Panel	7
3. Installation	8
3.1 Rack Mounting	8
3.2 Rear Panel	8
3.3 Panel Configuration	9
3.4 Communication Selection	10
3.5 Power	10
3.6 Ethernet Connection Setup	11
4. LED Panel Operation	12
4.1 General	12
4.1.1 Panel Types	12
4.1.2 Panel Display	12
4.2 Panel Modes	13
4.2.1 XY Panel (6026776)	13
4.2.2 Multi-bus Panel (6026778)	14
4.2.3 Multi-bus Panel (6026777)	15
5. LCD Panel Operation	16
5.1 General	16
5.1.1 Panel Types	16
5.1.2 Panel Display	16
5.1.3 Text	16
5.2 Panel Modes	17
5.2.1 Key Functions	17
5.2.2 6712 Summary Table	18
6. Configuration	19
6.1 Hex Switches	19
6.1.1 Hex Switch 1 - Multi-Drop Address	19
6.1.2 Hex Switch 2 - Key Brightness	19
6.2 Serial (RS485) DIP Switches	20
6.3 GPIO	20
6.3.1 Joystick Overrides	20
6.4 Panel Reset	21
6.4.1 Reboot the Panel	21
6.4.2 Restoring Factory Default IP Settings	21
6.5 Panel Software Update	22
6.6 Panel Key Label Templates	22
7. Technical Specification	23
7.1 Description	23
7.2 Power	23
7.3 RS485 (Serial Comms)	23
7.4 GPIO	24
7.5 RS232 Debug	24
7.6 Ethernet	24

1. Warnings

1.1 Explanation of Safety Symbols



This symbol refers the user to important information contained in the accompanying literature.



This symbol indicates that hazardous voltages are present inside. No user serviceable parts inside. This system should only be serviced by trained personnel.

1.2 Safety Warnings



Servicing instructions, where given, are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any actions on this equipment other than contained in the operating instructions, unless you are qualified to do so. Refer all servicing to qualified personnel.



TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Always ensure that the unit is properly earthed and power connections correctly made.

This equipment must be supplied from a power system providing a PROTECTIVE EARTH connection and having a neutral connection which can be reliably identified.

The power circuit breakers or switches supplying power to the unit should be close to the unit and easily accessible.

1.3 Mains Supply Voltage

Before connecting the equipment, observe the safety warnings section and ensure that the local mains supply is within the rating stated on the rear of the equipment.



The power supplies contain dangerous high voltages. There are no serviceable items.

1.4 Safety Standards

This equipment complies with the following standards:



EN60950-1 2nd edition 2006

Safety of information Technology Equipment Including Electrical Business Equipment.

UL1419 (3rd Edition)

Standard for Safety - Professional Video and Audio equipment

EMC Standards

This unit conforms to the following standards:

EN55103-1:1996 (Environment E4)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1. Emission

EN55103-2:1996 (Environment E2)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

EMC Performance of Cables and Connectors

Snell products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M.

D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having "dimples" which improve the contact between the plug and socket shells, are recommended.

2. Introduction

2.1 Description

The 2U Control Panels are compatible with any Aurora, Nebula, Nucleus or Centra control system. The panels are currently used as plug-in replacements for older panel types.

Note: LCD panels only work with Aurora systems.

Please refer to the respective control system handbooks for configuration guidance: Aurora, Nebula, or Centra Workbench for Nucleus/2450 and Centra/2330.

2.2 Control Panel Types

Control Panels are made up of either LED keys with LCD display strips, or LCD keys. Each 2U Control Panel chassis houses two or three modules depending on the model type. There are currently five fixed configurations available.

2.2.1 LED Panels

These panels are compatible with Aurora, Nebula, Nucleus, and Centra device controllers. In the following figures the images are based on standard Nebula/Nucleus database settings.

6026776 (6276 XY Panel Equivalent)

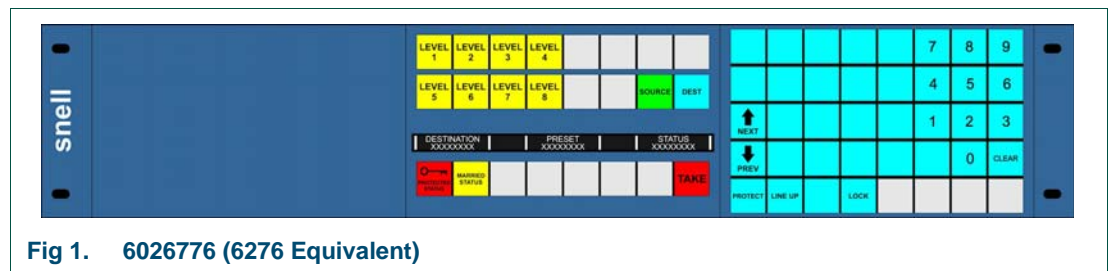


Fig 1. 6026776 (6276 Equivalent)

6026778 (6277 20/40 Multi-bus Panel Equivalent)

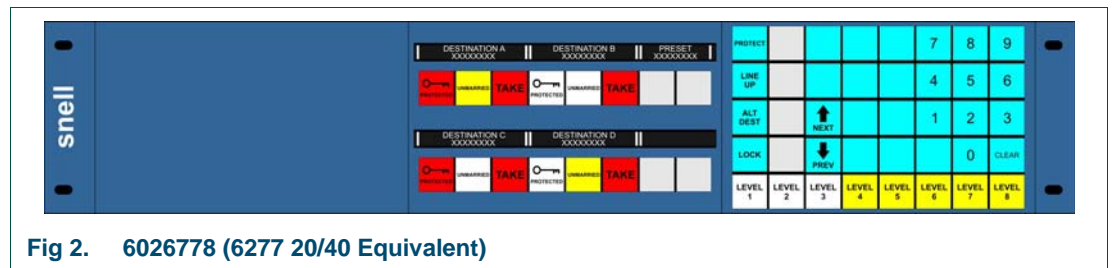


Fig 2. 6026778 (6277 20/40 Equivalent)

6026777 (6277 60/80 Multi-bus Panel Equivalent)

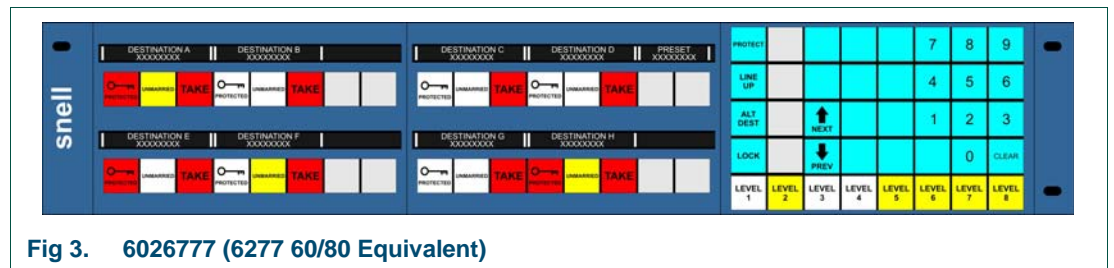


Fig 3. 6026777 (6277 60/80 Equivalent)

2.2.2 LCD Panel

The LCD panel has a 64x32 pixel LCD on each key and a single rotary encoder. The LCD panel is compatible with Aurora control systems.

6026783



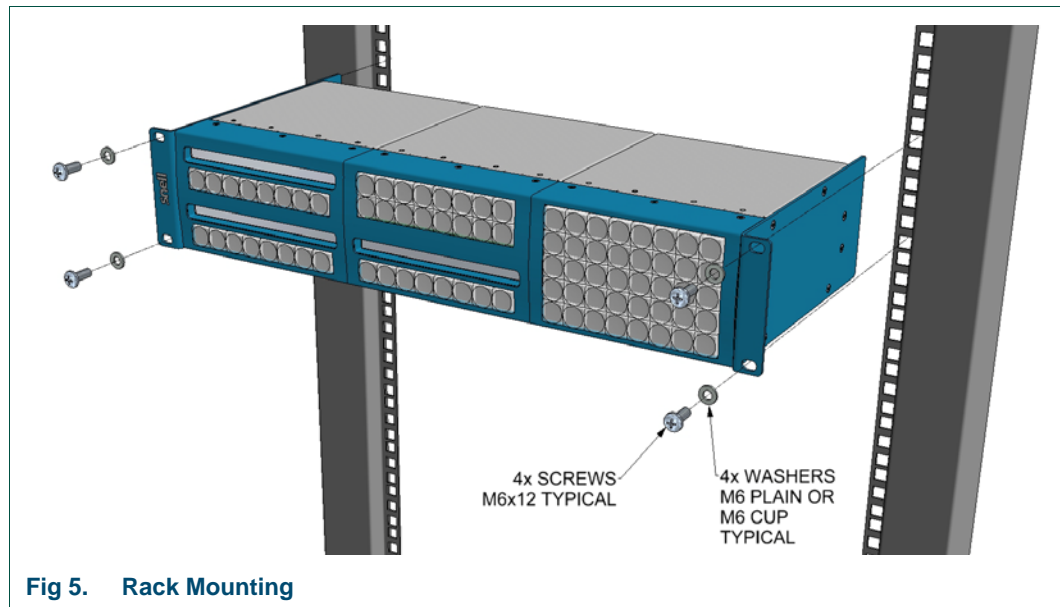
Fig 4. 6026783 LCD Panel

3. Installation

This chapter describes the system requirements and procedures for installing 2U Control Panels.

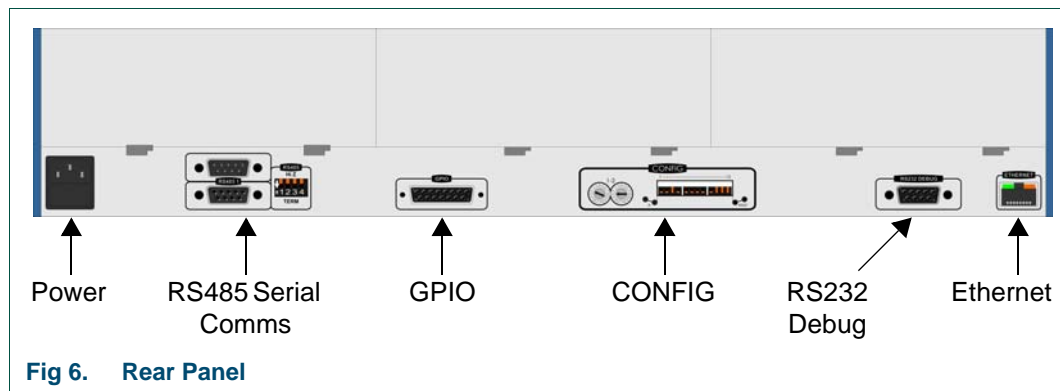
3.1 Rack Mounting

The Control Panels require a 2RU space within a rack system. When the panel is in position, use four M6 screws and washers to fasten it to the rack system, see Fig 5.



3.2 Rear Panel

All connections are made to the rear panel.



3.3 Panel Configuration

Note: Configure the panel type before connecting to a power source.

The panel configuration is set using the DIP switches in the CONFIG section of the rear panel.

The DIP switches are used to set:

- Communications
- Control system
- GPIO override

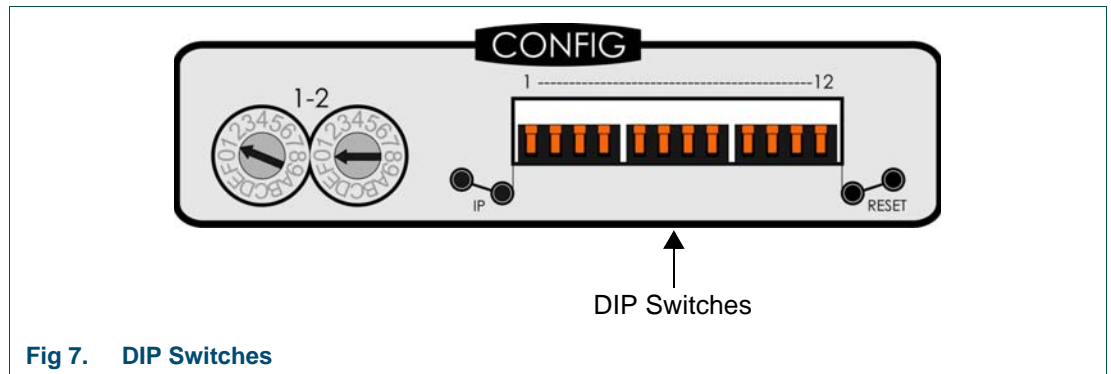


Fig 7. DIP Switches

See Table 1 on page 9.

Switch	Function	Switch Position	
		Up	Down
1	No function	-	-
2	No function	-	-
3	GPIO - Override Input	Normal	Button Mimic ^[1]
4	No function	-	-
5	No function	-	-
6	Control System	6026777 and 6026778 panels on a Nebula controller, and Centra controllers	All other panel types and controllers
7	No function	-	-
8	No function	-	-
9	No function	-	-
10	Communications	RS485	Ethernet
11	No function	-	-
12	No function	-	-

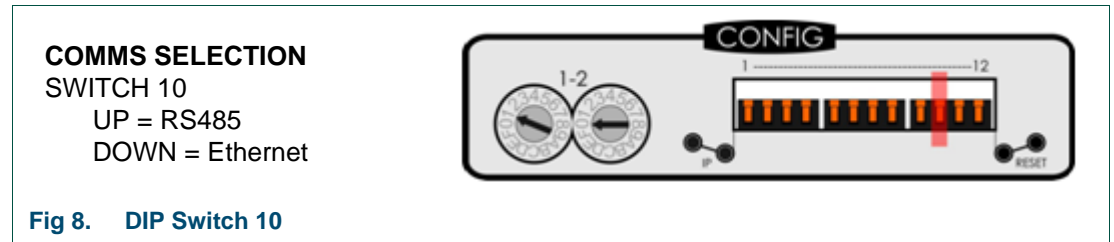
Table 1. DIP Switch Settings

^[1] Not currently used

3.4 Communication Selection

The panels support RS485 (serial) or Ethernet (**Nucleus controller only**) communication.

1. Select the communication required by setting DIP Switch 10 on the rear panel:

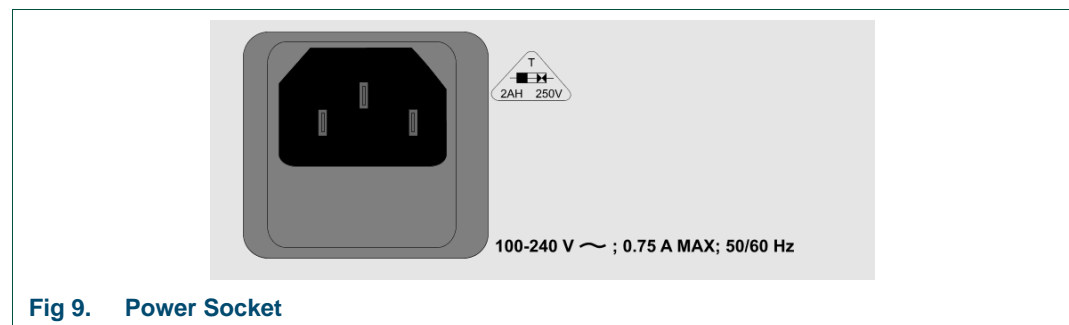


2. Reboot the panel using one of the following methods:
 - Click on **Reset Control Panel** in the browser window
 - Remove and replace the power lead
 - Press the Reset button on the rear of the panel. See “Reboot the Panel” on page 21.

When using RS485 serial comms you can terminate a long cable run or the end of a multi-drop chain. See “Serial (RS485) DIP Switches” on page 20.

3.5 Power

Connect the single mains lead into the fused IEC connector. There is no redundancy.



Note: If you connect power before connecting any valid comms (serial or Ethernet) the panel will:

- LED - cycle through the keys lighting and extinguishing each in turn.
- LCD - light up the eight keys at the top left of the panel.

3.6 Ethernet Connection Setup

The panels are supplied with default settings:

IP:	192.168.1.1
Subnet Mask:	255.255.255.0
Gateway:	0.0.0.0

To change the IP Address:

1. Use a PC isolated from the main network (on the same subnet as the panel default) connect to the Ethernet port on the panel.

The panel autodetects the type of cable connected.

2. Open a web browser and type the default IP address into the Address Bar of the browser.
3. Press **Return**.
4. The browser displays the Control Panel Setup screen.

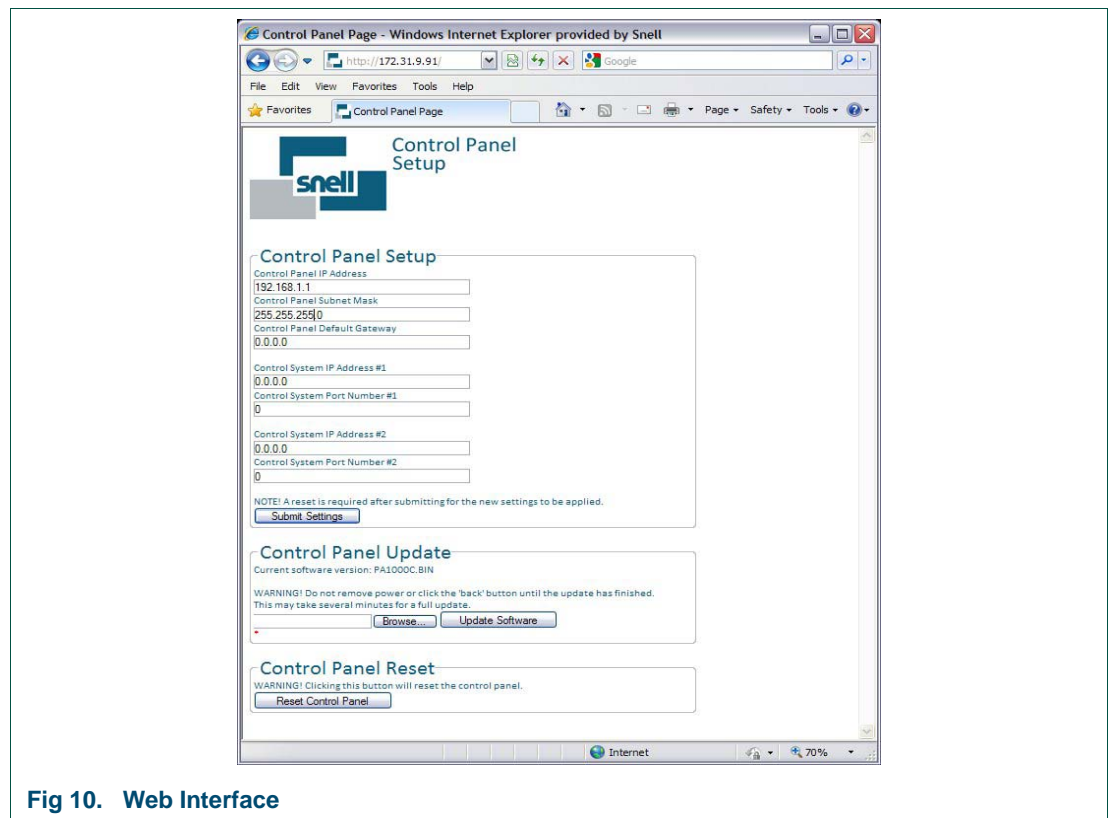


Fig 10. Web Interface

5. Type in the new Control Panel IP address, subnet mask, and gateway information.
6. Type in the Nucleus controller IP addresses and port numbers. Controller port numbers must be greater than 1024 (excluding 3000).
7. Click the **Submit Settings** button.
8. Either, press and hold the **Reset** button on the rear panel, or cycle power to the panel.

Note: Enter the panel IP address into the Nucleus panel configuration for the system to work. See Nucleus documentation for details.

Note: Upon changing the subnet value, the browser will no longer work with the default PC settings, as it will be on a different subnet.

4. LED Panel Operation

4.1 General

This chapter describes the modes of operation when used with any of the control systems referred to as legacy mode for complete compatibility with Nebula and Aurora.

4.1.1 Panel Types

Fig 11. shows the LED panel configurations on each panel.

- 6026776 - 2-module panel (containing a 3-bus module and a keypad module)
- 6026778 - 2-module panel (containing a 2-bus module and a keypad module)
- 6026777 - 3-module panel (containing two 2-bus modules and a keypad module)

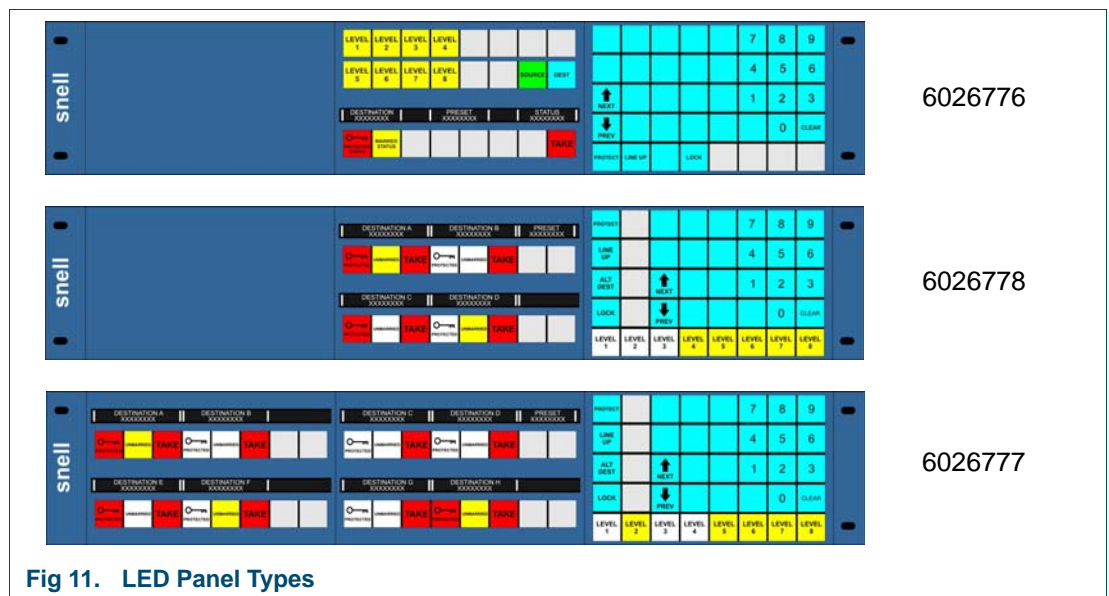


Fig 11. LED Panel Types

4.1.2 Panel Display

As long as the panel has power to it, some keys will be lit:

- If the panel does not have comms connected then the keys will light and extinguish in turn mimicking a cycle effect.
- If valid comms is connected to the panel, the keys will light in the appropriate way according to each module within the panel.

4.2 Panel Modes

4.2.1 XY Panel (6026776)

This panel replicates the operation of a 6276 panel.

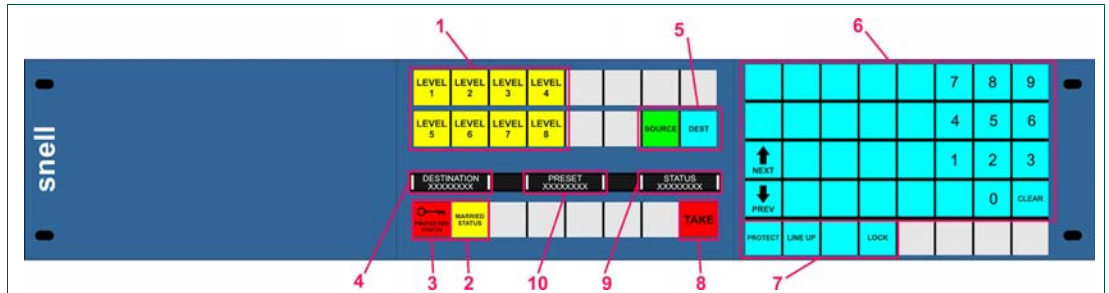


Fig 12. 6026776 Panel Layout

1	Level Select Keypad	8 Illuminated keys	 Yellow	Level Deselected
			 White	Level Selected
2	Married Tally	Illuminated key ^[1]	 Yellow	Unmarried
			 White	Married
3	Protect Tally	Illuminated key ^[1]	 Red	Unprotected
			 White	Protected
4	Destination Detail	LCD display (94 x 16 pixels) ^[2]	 DESTINATION XXXXXXXX	8 characters, defined in control database
5	Destination / Source Selection	Illuminated key	 Green	Source Selection
			 Cyan	Destination Selection
6	Source / Destination Keypad	32 illuminated keys	 Cyan	Labels and functions defined in control database
7	Editable Keypad Keys ^[3]	4 illuminated keys	 Cyan	Labels and functions defined in control database
8	TAKE Key	Illuminated key	 Red	Take Preset source to selected destination
9	Status Display	LCD display (94 x 16 pixels) ^[2]	 STATUS XXXXXXXX	8 characters, defined in control database
10	Preset Display	LCD display (94 x 16 pixels) ^[2]	 PRESET XXXXXXXX	8 characters, defined in control database

Table 2. 6026776 Key Descriptions

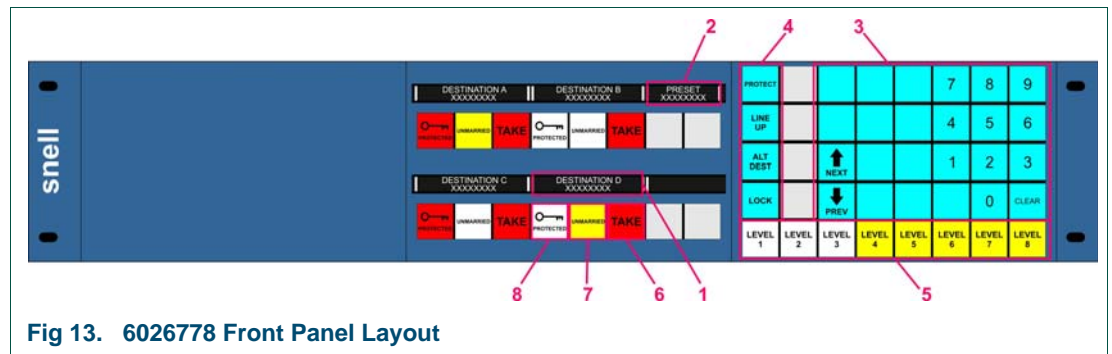
^[1] Indicator only. Key has no function

^[2] The top row of text on the LCD display is fixed

^[3] If required, PROTECT, LINE-UP, ALT LEV, ALT DEST, and LOCK must be assigned to these four keys

4.2.2 Multi-bus Panel (6026778)

The 6026778 panel replicates the operation of a 6277 (20/40) panel.



1	Destination Detail	4 LCD displays (94 x 16 pixels) ^[2]		8 characters, defined in control database
2	Preset Display	LCD display (94 x 16 pixels) ^[2]		8 characters, defined in control database
3	Source / Destination Keypad	24 illuminated keys	Cyan	Labels and functions defined in control database
4	Editable Keypad Keys ^[3]	4 illuminated keys	Cyan	Labels and functions defined in control database
5	Level Select Keypad	8 illuminated keys	Yellow	Level Deselected
			White	Level Selected
6	TAKE Key	4 illuminated keys	Red	Take Preset source to selected destination
7	Married Tally	4 illuminated keys ^[1]	Yellow	Unmarried
			White	Married
8	Protect Tally	4 illuminated keys ^[1]	Red	Unprotected
			White	Protected

Table 3. 6026778 Key Descriptions

^[1] Indicator only. Key has no function

^[2] The top row of text on the LCD display is fixed

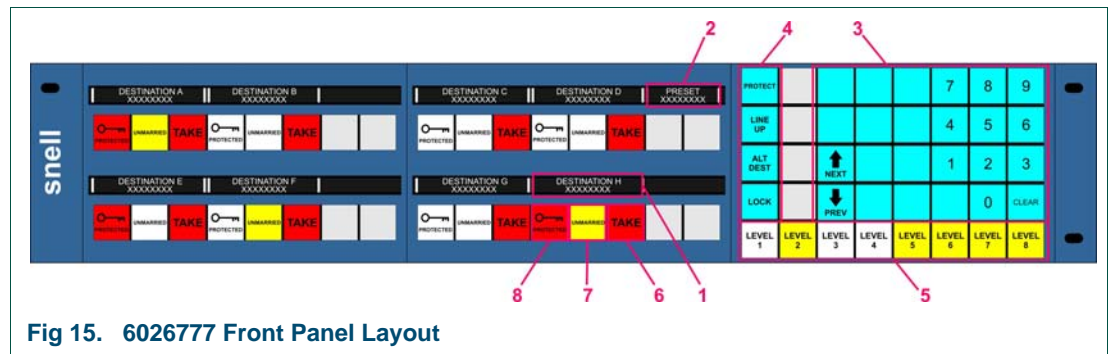
^[3] If required, PROTECT, LINE-UP, ALT LEV, ALT DEST, and LOCK must be assigned to these four keys



Fig 14. 6026778 Destinations

4.2.3 Multi-bus Panel (6026777)

The 6026777 panel replicates the operation of a 6277 (20/40) panel.



1	Destination Detail	8 LCD displays (94 x 16 pixels) ^[2]		8 characters, defined in control database
2	Preset Display	LCD display (94 x 16 pixels) ^[2]		8 characters, defined in control database
3	Source / Destination Keypad	24 illuminated keys		Cyan Labels and functions defined in control database
4	Editable Keypad Keys ^[3]	4 illuminated keys		Cyan Labels and functions defined in control database
5	Level Select Keypad	8 illuminated keys		Yellow Level Deselected
				White Level Selected
6	TAKE Key	8 illuminated keys		Red Take Preset source to selected destination
7	Married Tally	8 illuminated keys ^[1]		Yellow Unmarried
				White Married
8	Protect Tally	8 illuminated keys ^[1]		Red Unprotected
				White Protected

Table 4. 6026777 Key Descriptions

^[1] Indicator only. Key has no function

^[2] The top row of text on the LCD display is fixed

^[3] If required, PROTECT, LINE-UP, ALT LEV, ALT DEST, and LOCK must be assigned to these four keys

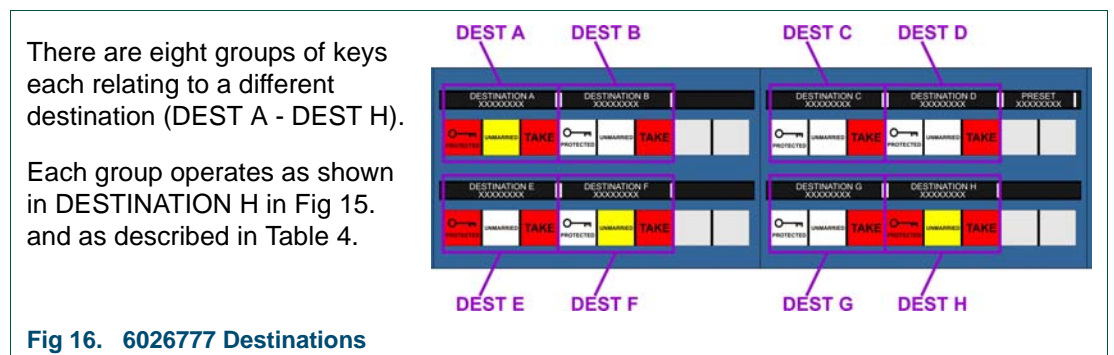


Fig 16. 6026777 Destinations

5. LCD Panel Operation

5.1 General

This section defines the operation of the 2U LCD panel connected to the Aurora controller. Most functionality is defined by the configuration in the Aurora controller. This document aims to define the differences and operations specific to this panel.

Note: To make use of the rotary encoder, version 1.23 or above of Aurora is required.

5.1.1 Panel Types

Fig 17. shows the LCD panel configuration.

- 6026783 - 3-module LCD panel (71 LCD Switches & 1 Rotary Encoder)

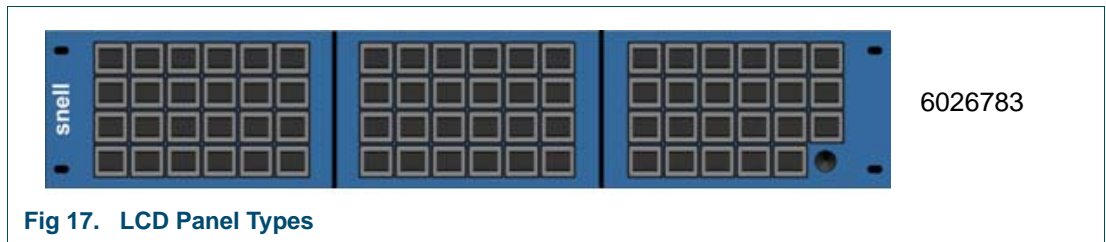


Fig 17. LCD Panel Types

5.1.2 Panel Display

As long as the panel has power to it, some keys will be lit:

- If the panel does not have comms connected then the eight keys at the top left of the panel will light.
- If valid comms is connected to the panel, the keys will light in the appropriate way according to each module within the panel.

5.1.3 Text

Each key on the panel can display text as either three lines of six characters, or one line of four characters. Table 5. lists the character codes.

Value	Text Characters Assigned
0x20 to 0x7F	Standard ASCII character set
0x05	'↑' (Up Arrow)
0x10	'..' (dot dot)
0x11	'+' (plus dot)
0x12	'.'+' (dot plus)
0x13	'++' (plus plus)
0x14	'.'+' (dot space)
0x15	'+'+' (space +)

Table 5. Text Display

5.2 Panel Modes

The LCD panel can mimic the existing 6712 panel. For full details of the 6712 panel, please refer to the user manual.

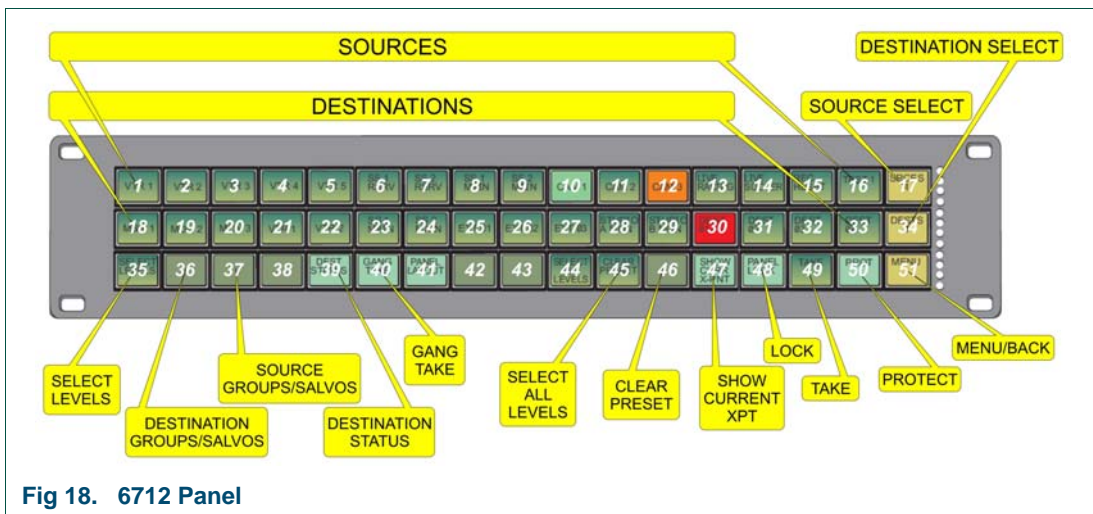


Fig 18. 6712 Panel

5.2.1 Key Functions

The following diagram indicates the keys used on the panel for each function.

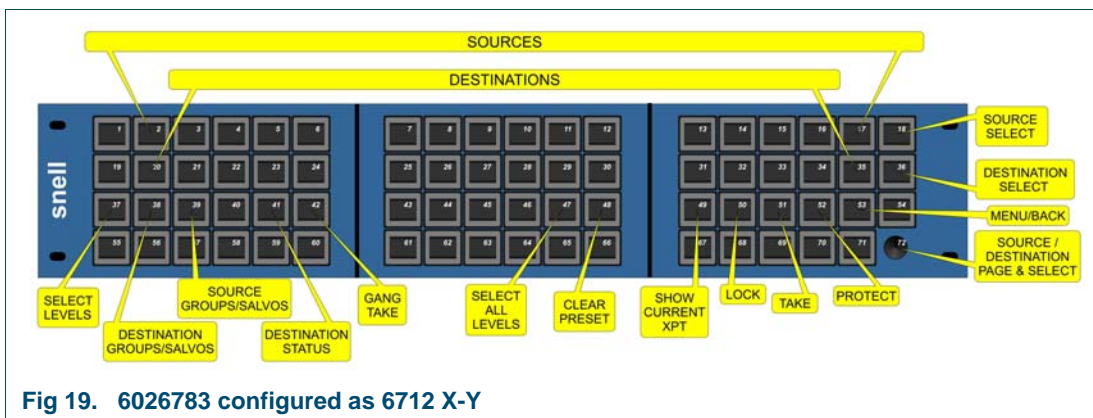


Fig 19. 6026783 configured as 6712 X-Y

See "6712 Summary Table" on page 18.

5.2.2 6712 Summary Table

Function	6712	6026783 panel
Sources (paged)	1-16	2-17
Destinations (paged)	18-33	20-35
Destination Select (& page)	34	18 / 72 (rotary)
Source Select (& page)	17	36 / 72 (rotary)
Source / Destination Page & Select	/	72 (rotary)
Select Levels	35	37
Destination Groups / Salvos	36	38
Source Groups / Salvos	37	39
Destination Status	39	41
Gang Take	40	42
Select All Levels	45	47
Clear Preset	46	48
Status / Goto XPT	47	49
Lock	48	50
Take	49	51
Protect	50	52
Menu / Back	51	53

Table 6. 6712 Summary Table

6. Configuration

This chapter describes the configuration of the panels, including:

- Hex Switches
- Serial (RS485) DIP Switches
- GPIO / Joystick Overrides
- Panel Reset
- Panel Software Update
- Panel Key Label Templates

6.1 Hex Switches

- Hex switch 1 defines the panel's multi-drop address. An address is only necessary when panel communications are on the serial interface (RS485).
- Hex switch 2 controls the brightness of the keys.

6.1.1 Hex Switch 1 - Multi-Drop Address

Note: If the panel is running and the address is changed, the comms are broken.

Switch	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	0
Address	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Table 7. Multi-drop Addresses and Switches

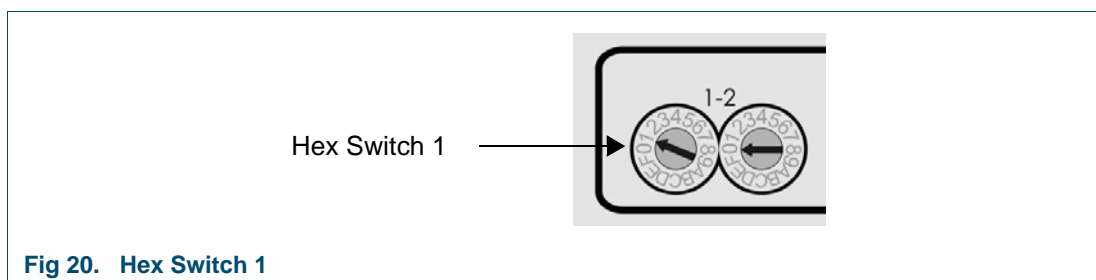


Fig 20. Hex Switch 1

6.1.2 Hex Switch 2 - Key Brightness

Switch Value	Key Brightness
0	Minimum Brightness
1..6	Intermediate brightness according to the panel hardware
7	Maximum Brightness
8..F	These switch settings have no specific values but, if set before power up, the panel will default to minimum brightness. Changing to one of these settings after power up retains the previous brightness setting used (0..7).

Table 8. Key Brightness

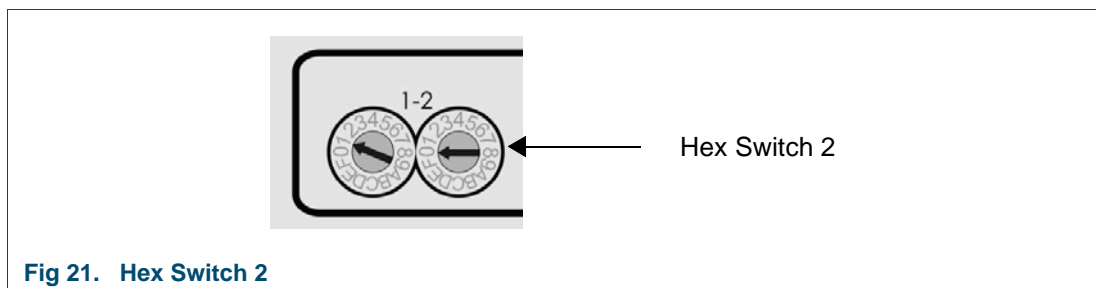
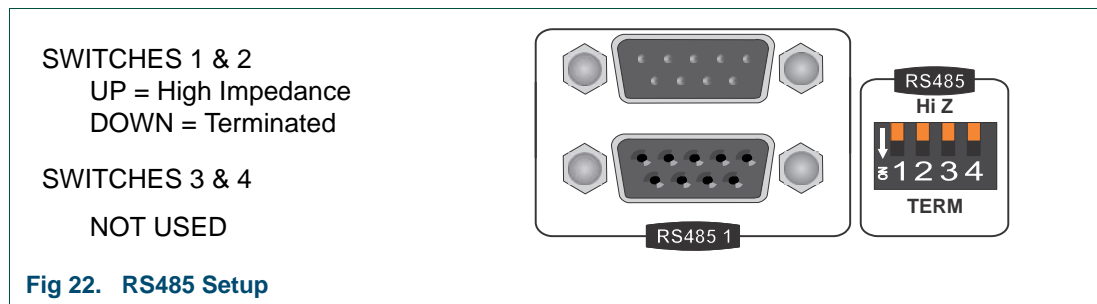


Fig 21. Hex Switch 2

6.2 Serial (RS485) DIP Switches

The RS485 DIP switches provide termination in case of a long cable run, or if the panel is at the end of a multi-drop chain.



The pinouts for these connectors are in the Technical Specification. See “RS485 (Serial Comms)” on page 23.

6.3 GPIO

The I/O port provides opto-coupled I/O access to the panel. The functions on each I/O are fixed by the user through the control software. Equipment connected through the GPIO may require supply references (+5V & GND). Current Limit stops any connected equipment overloading the panel supply.

In the current configuration these ports are inputs only.

The pinouts for this connector are in the Technical Specification. See “GPIO” on page 24.

6.3.1 Joystick Overrides

Each control panel includes a joystick override feature which allows the GPI to be used as inputs.

There are two forms of override:

Normal	In Normal mode (DIP switch 3 = UP) if the state of any of the 12 GPI changes, a message is passed back to the control system. The effect of a state change is dependent on the controller systems.
Button Mimic	Not currently used

Table 9. Overrides

See “Serial (RS485) DIP Switches” on page 20.

6.4 Panel Reset

6.4.1 Reboot the Panel

To reboot the panel without having to remove the power, for example, after performing a software update:

1. Press the **RESET** button.
2. The LED lights and the panel resets.

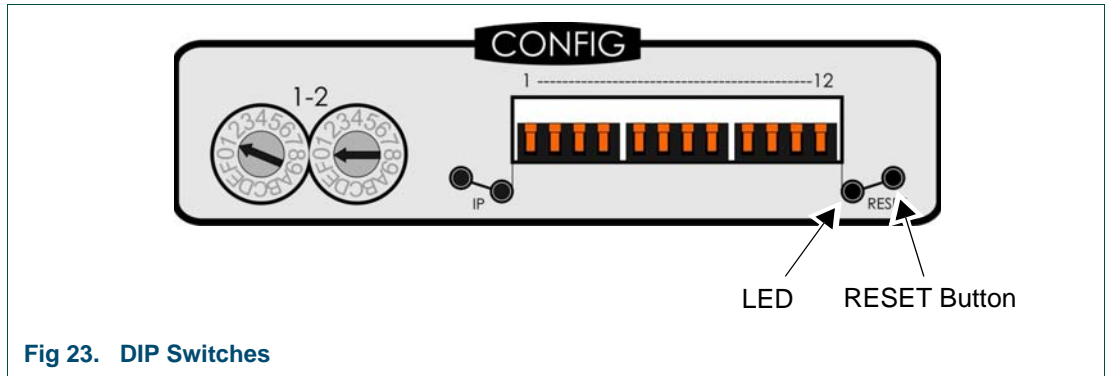


Fig 23. DIP Switches

6.4.2 Restoring Factory Default IP Settings

1. Remove the panel from the main network.
2. On the rear of the panel, press and hold the **IP** button until the adjacent LED displays solid white.

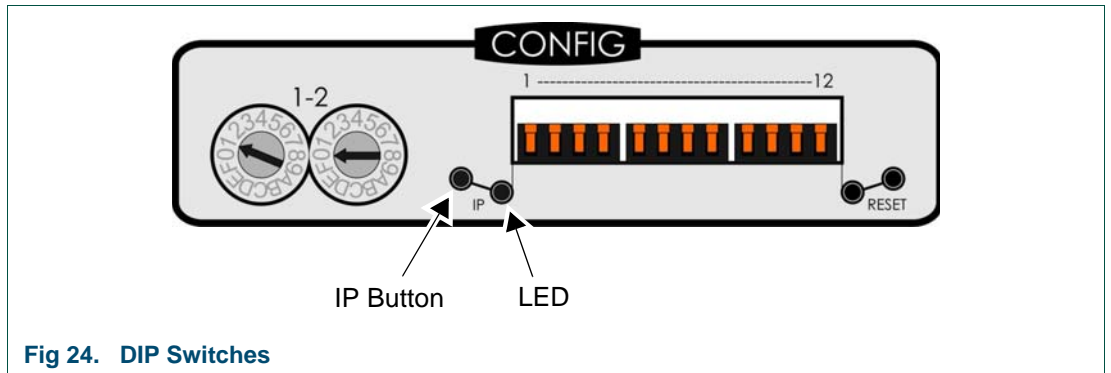


Fig 24. DIP Switches

3. Continue holding the button until it flashes white.
4. Release the button.

The panel resets and powers up with the default IP settings:

IP:	192.168.1.1
Subnet Mask:	255.255.255.0
Gateway:	0.0.0.0
Control System IP Port:	0.0.0.0

6.5 Panel Software Update

The software on the panels may be updated via the web interface. Updates, in the form of a .bin file, will be available on the Snell web site or from Customer Services.

Note: Do not power down the panel or click back in the browser during an update.

1. Store a copy of the .bin update file locally.
2. Connect to the panel using a web browser and type the panel's allocated IP address.

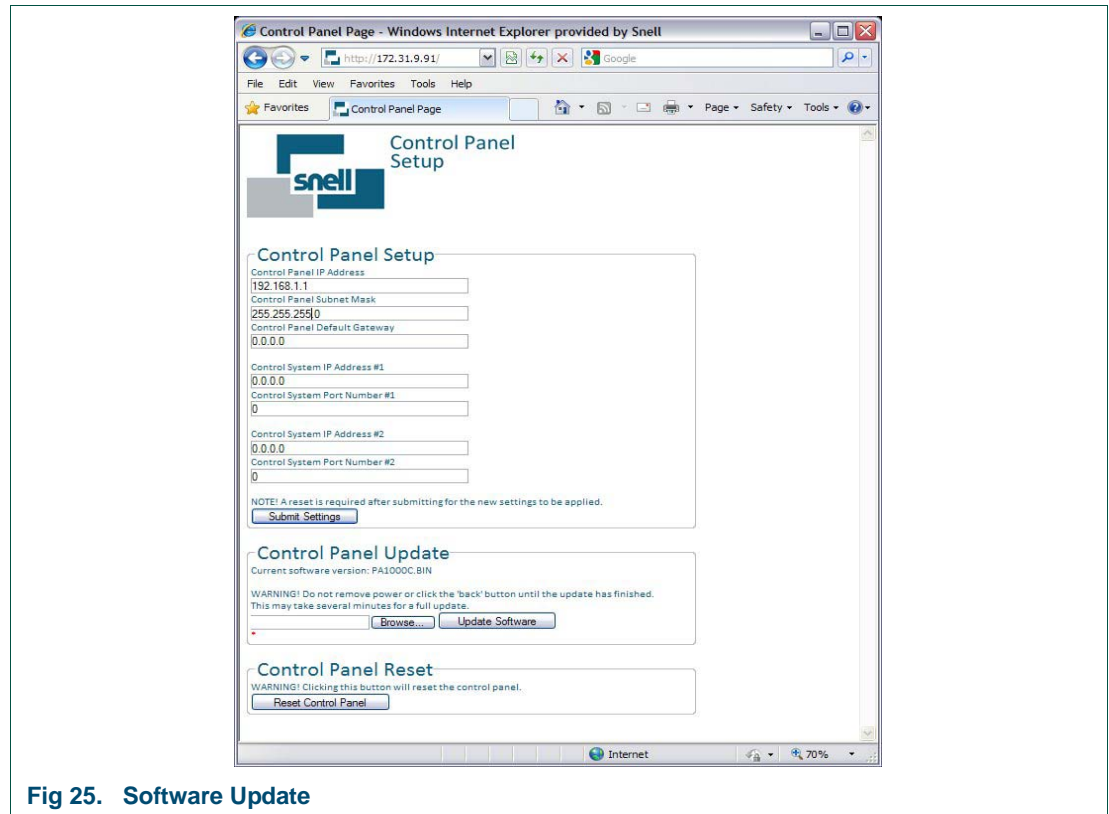


Fig 25. Software Update

3. In the Control Panel Update section, browse to the local location of the .bin file.
4. Click **Update Software**.

A counter displays at the bottom of the Control Panel Update section. The update could take up to ten minutes.

5. Upon completion, a message indicating update success replaces the counter.

If a message displays indicating a failure, repeat the update from the start. In the event of subsequent failure, contact Customer Services.

6. Reboot the panel. Either,
 - Click on **Reset Control Panel** in the browser window.
 - Remove and replace the power lead.
 - Press the Reset button on the rear of the panel. See "Reboot the Panel" on page 21.

6.6 Panel Key Label Templates

Printable templates for each of the LED panel types can be downloaded from the internet: www.snellgroup.com/support/customer-support/documentation/templates

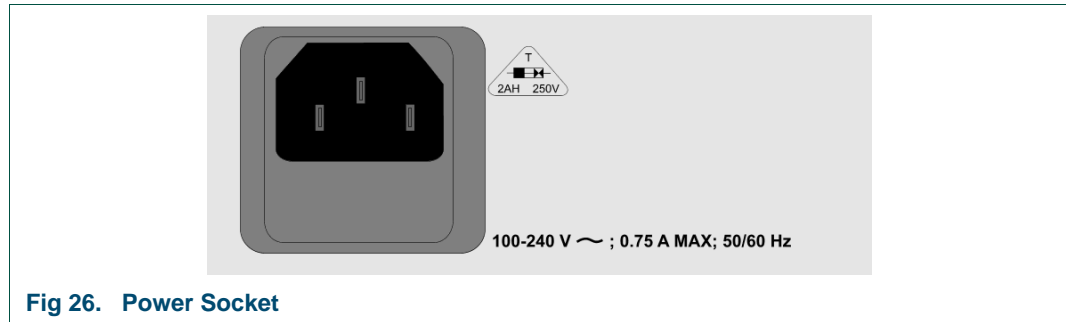
7. Technical Specification

7.1 Description

This section provides details of the pinouts of each connector on the rear panel.

7.2 Power

Fused IEC connector, supplied with a 2A quick blow fuse.



7.3 RS485 (Serial Comms)

Panel has a dual stacking 9-way D-type configured as an RS485 port. Either, or both, connectors may be used, as there is an internal loop-through to the other connector.

Pin	Function
1	GND
2	RX- / Tx -
3	TX+ / Rx +
4	GND
5	N/C
6	GND
7	RX+ / Tx +
8	TX- / Rx -
9	GND

Table 10. RS485

DIP switches 1-2 terminate long cable or end of multi-drop chain. DIP switches 3-4 are not used.

Note: The panel can behave as a loop-through for serial comms whether it is powered or unpowered.

7.4 GPIO

This 15-way D-type connector provides opto-coupled I/O access to the panel.

Pin	Function	Pin	Function
1	GPIO1	9	GPIO9
2	GPIO2	10	GPIO10
3	GPIO3	11	GPIO11
4	GPIO4	12	GPIO12
5	GPIO5	13	+5 V 0.2 A (current limited)
6	GPIO6		
7	GPIO7	14	GND
8	GPIO8	15	GND

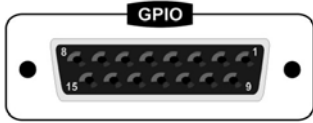


Table 11. RS485

7.5 RS232 Debug

This serial port can be used for fault diagnosis.

Pin	Function	Pin	Function
1	N/C	6	N/C
2	TX	7	N/C
3	RX	8	N/C
4	N/C	9	GND
5	GND		

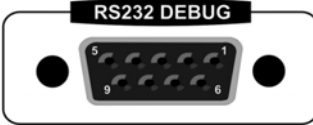


Table 12. RS232 Debug

Note: Do not connect to this serial port during normal operation.

7.6 Ethernet

The panel has a single 10/100Base-T Ethernet Port with standard pin out.

Pin	Function
1	TX+
2	TX-
3	RX+
4	N/C
5	N/C
6	RX-
7	N/C
8	N/C

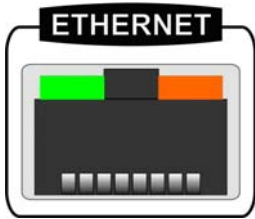


Table 13. Ethernet