Indigo 4 CoolFlow

4U frames

(Includes Indigo 4 CoolFlow and Indigo 4SE CoolFlow)

USER MANUAL

Crystal Vision

Contents

Revision 7.   Notes added concerning fuses. Pages 36, 39 & 40.   19-11-12

1 Introduction

The Indigo CoolFlow range comprises two frame types: 4U frames for up to 24 modules and 2U frames for up to 12 modules.

There are two 4U frame variants - passive front panel and an active panel which is a Statesman enabled version without controls or a display. The active panel Statesman enabled frame also has Ethernet capability.

This manual covers:

Indigo 4 CoolFlow with passive front panel
Indigo 4SE CoolFlow Ethernet capable with active panel, no controls or display.

The Indigo 4SE CoolFlow version also supports Statesman.

There are configurable rear connectors and space for up to four plug-in power supplies. The four power supply facility allows for redundancy and continued operation in the event of a power supply failure.

All models have a hinged front panel that allows easy access to removable fan assemblies, power supplies and modules.
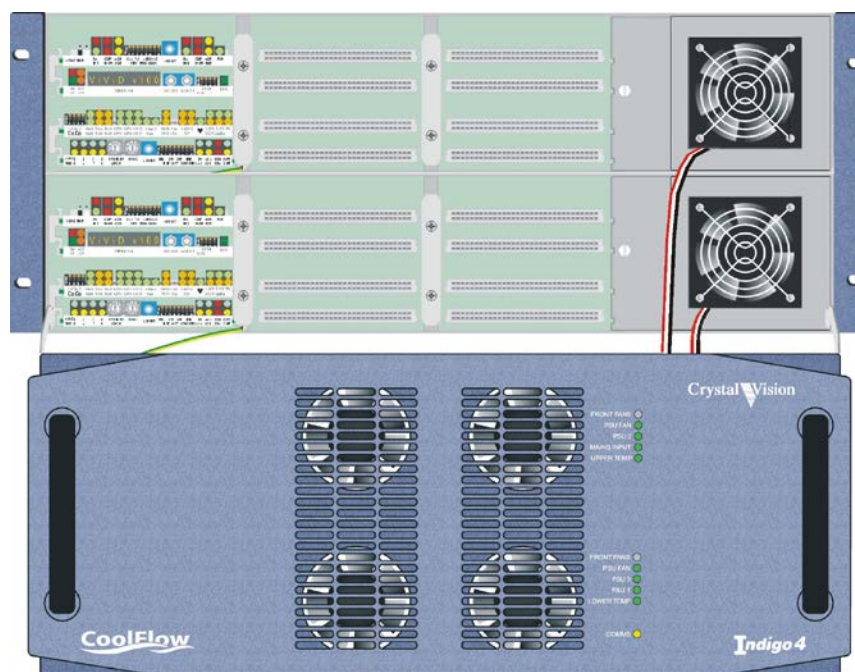
The Indigo 4 CoolFlow frame with front control panel open

There are six easily accessible front fans. One is fitted on a detachable plate in front of the upper and lower PSU bays and the other four are attached to the rear of the front panel.

If the front panel is opened, an optical sensor switches the PSU fans on and at the same time the front panel mounted fans are switched off. If one fan fails, or operates too slowly, the other fans are automatically switched to full power and an alarm asserted.

A frame temperature sensor mounted above the top central module position in both the upper and lower parts of the frame (slot 5 and slot 17) also controls fan speed.

There are two cooling modes: automatic and maximum.

With automatic cooling all front panel fans run continuously, increasing in speed as the temperature inside the frame goes up.

In maximum cooling mode all front panel fans are set to maximum speed. This mode is ideal for equipment bays where noise is not a concern.

Only one of the fans is essential in each of the upper and lower sections for normal operation. If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of 40°C.

Warning: Although it is possible to operate the frame with the front panel open, the frame may not meet electromagnetic compatibility (EMC) requirements in this condition.

The Indigo PSUs have a built-in processor, which communicates with the front panel display processor (referred to as a PIC) and monitors power rail voltage levels (+5.75V and -6.0 V). The PSUs also store their own serial number in non-volatile memory.

The panel processor regularly receives status updates from the PSU processors about power rails. This allows the front panel to update its status LEDs and control the alarm changeover relay. The relay contacts are available on the Remote 2/4/6 & 8 connectors to be found on the rear of the frame.

There are ten two-colour LEDs on an active or passive front panel, with yellow/green indicating a normal condition and red an abnormal. Off will indicate an inactive condition such as a PSU not fitted or PSU fan not running with the front panel closed. There is also a yellow comms LED that flashes when comms are received.

The Indigo 4 CoolFlow status LEDs

The following LED status indications may be seen:

LED	Colour	Notes
Upper section		
Front Fan	Unlit	Door open
	Grn	Normal operation
	Red	Change the panel fan
PSU Fan	Unlit	Door closed and fan idle
	Grn	Door open and fan operational
	Red	Change PSU fan
PSU2	Unlit	No PSU2 detected
	Grn	Normal operation
	Red	PSU2 fault
PSU4	Unlit	No PSU4 detected
(Mains Input)	Grn	Normal operation
	Red	PSU4 fault
Upper Temp	Grn	Normal operation
	Red	Internal temperature too high (approx 65°C)
Lower section		
Front Fan	Unlit	Door open
	Grn	Normal operation
	Red	Change the panel fan
PSU Fan	Unlit	Door closed and fan idle
	Grn	Door open and fan operational
	Red	Change PSU fan
PSU3	Unlit	No PSU3 detected
	Grn	Normal operation
	Red	PSU3 fault
PSU1	Unlit	No PSU1 detected
	Grn	Normal operation
	Red	PSU1 fault
Lower Temp	Grn	Normal operation
	Red	Internal temperature too high (approx 65°C)
Comms	Unlit	Press Device in Statesman mode for comms status
	Flash amber	

Warning: In frames where only two power supplies are fitted, to maintain redundancy the power supplies must be fitted so that they are in alternate positions in both the upper and lower sections of the frame, e.g. upper frame upper position and lower frame lower position or upper frame lower position and lower frame upper position. Any other combination will result in a loss of redundancy.

2 Installation

General Safety Summary

The following warnings are intended for user guidance and safety.

Ground This product must be grounded through the grounding conductor of the power cord.

Power cable Use only power cords that meet the required specification for this product.

Fuses To avoid fire hazard use only fuses of the type and rating specified.

Service These servicing instructions are for use by qualified personnel only. To reduce risk of electric shock, do not perform any servicing other than that contained in this manual unless you are qualified to do so. Refer all servicing to qualified service personnel.

Apart from procedures described in this manual there are no user serviceable parts within the frame. If the frame requires any other servicing it should be returned to the manufacturer or dealer.

On no account should the unit be powered whilst any covers are removed.

Ventilation The unit must have adequate ventilation. Installation should be in standard 19" racks with cool air circulation available at the front. The left and right ventilation grilles must not be obstructed.

EMC To comply with EMC regulations the following guidelines should be observed:

Do not operate this unit for extended periods with the front panel open.

Do not use the frame unless all the rear connector positions are filled, either with Crystal Vision rear modules, or with Crystal Vision blanking plates.

Do not operate the equipment with covers or panels removed.

General To avoid electric shock do not operate this product in wet or damp conditions.

To avoid injury or fire hazard do not operate this product in an explosive atmosphere.

Only use this rack in conjunction with Crystal Vision modules designed for that purpose.

The Indigo 4 range of frames is capable of housing the Crystal Vision range of optical modules. Although these modules are not capable of causing personal injury, care should be exercised when exposing unshielded optical signals, not to look directly into the light beam.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.1 Rack mounting and ventilation

The unit must have adequate ventilation. Install in standard 19" racks with cool air circulation at the front and with both side ventilation grilles unobstructed.
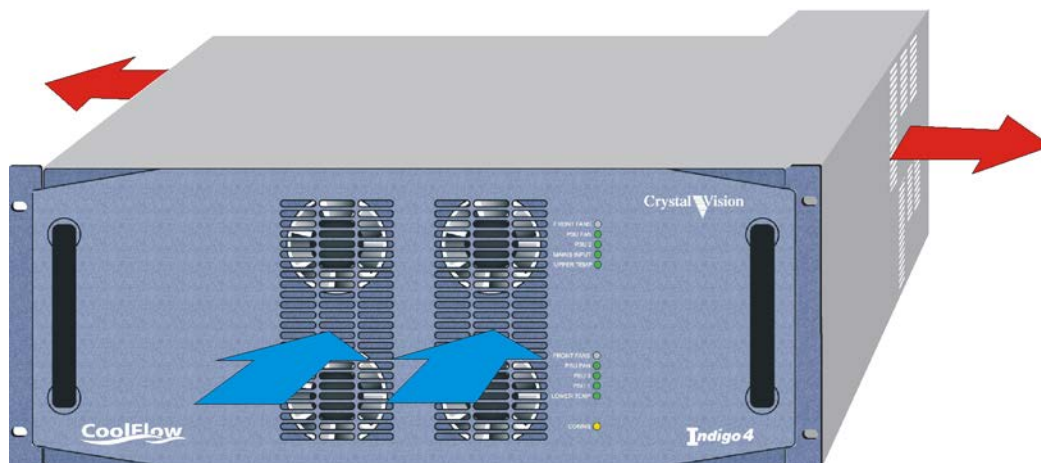
Indigo 4 CoolFlow air-flow

Install the Indigo frame in a standard 19-inch rack as follows:

- Mount in the rack and secure via the rack ears

- Allow adequate space for the fan intakes at the front and the exhaust through the left and right sides

Note: Only one fan in each section is essential in normal operation. If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of 40°C. It is also possible to operate the frame with the front panel open; however the frame may not meet electromagnetic compatibility (EMC) requirements in this condition.

2.2 Frame connectors

The following connectors are available at the rear of the frame:

Connector	Function	Notes
IEC (top)	Upper PSU AC input	85 to 264V, fuse under flap
IEC (bottom)	Lower PSU AC input	85 to 264V, fuse under flap
Upper frame		
Remote 1	GPI and DC out	Refer to pinout tables
Remote 2	GPI, PSU2 (upper PSU) alarm relay and DC out	Refer to pinout tables
Remote 3	GPI and DC out	Refer to pinout tables
Remote 4	GPI and PSU4 alarm relay	Refer to pinout tables

Connector	Function	Notes
Lower frame		
Remote 5	GPI and DC out	Refer to pinout tables
Remote 6	GPI, serial/Statesman, PSU3 alarm relay and DC out	Refer to pinout tables
Remote 7	GPI and DC out	Refer to pinout tables
Remote 8	GPI and PSU1 (lower PSU) PSU alarm relay	Refer to pinout tables
Statesman RS422	Statesman RS422 control using CAT-5 cabling	Refer to pinout tables
RS422 in/bus	RS422 control using CAT-5 cabling	Refer to pinout tables
Ethernet	Ethernet control using CAT-5 cabling	Refer to pinout tables

All frame connectors are grouped together behind the PSUs at the rear of the frame.

Indigo 4 CoolFlow rear connectors

Connecting mains cables

To connect the Indigo 4 frame to AC mains proceed as follows:

- Power the unit by connecting an IEC power cord(s) to the upper and/or lower IEC connectors depending on the number of installed power supply modules.

Mains cables must have a minimum current rating of 6A, be fitted with an IEC 320 female connector, include a protective ground connection and meet relevant local safety standards.

Tip: To reduce the risk of electric shock, if two power supply cords are used plug each power supply cord into separate branch circuits employing separate service grounds.

Note: The fuse holder is part of the mains inlet. The mains cable must be disconnected before the fuse can be accessed. Replace the fuse only with one of the same type and rating. Refer to the Maintenance section of the Trouble shooting guide for more information.

2.3 Connector pinout

Remote Control / GPI Connections

Each frame slot has six connections that are brought out to one or more of the four high density D-Type connectors on the rear of the frame labelled Remote 1 to 4. These connections are referred to as lines 'a' to 'f'. The functions assigned to them are dependent on the module inserted in each slot, but a typical use is as a GPI line. Refer to the documentation supplied with each Crystal Vision module to determine the actual functions assigned.

Remote 1 – 4 Upper frame connections (26-way high density D-Type plug/socket)

Pin number	Remote 1 function (socket)	Remote 2 function (plug)	Remote 3 function (socket)	Remote 4 function (plug)
1	+5.5V nom. dc out	Slot 5 GPI 'e'	+5.5V nom. dc out	Slot 7 GPI 'e'
2	Frame GND	Slot 5 GPI 'f'	Frame GND	Slot 7 GPI 'f'
3	Slot 9 GPI 'a'	Slot 6 GPI 'e'	Slot 11 GPI 'a'	Slot 8 GPI 'e'
4	Slot 6 GPI 'a'	Slot 6 GPI 'f'	Slot 8 GPI 'a'	Slot 8 GPI 'f'
5	Slot 5 GPI 'a'	Relay close on fault, upper PSU2	Slot 7 GPI 'a'	Relay close on fault, PSU4
6	Slot 5 GPI 'b'	Frame GND	Slot 7 GPI 'b'	Frame GND
7	Slot 2 GPI 'a'	N/C	Slot 4 GPI 'a'	N/C
8	Slot 1 GPI 'a'	N/C	Slot 3 GPI 'a'	N/C
9	Slot 1 GPI 'b'	N/C	Slot 3 GPI 'b'	N/C
10	Slot 10 GPI 'a'	Slot 2 GPI 'e'	Slot 12 GPI 'a'	Slot 4 GPI 'e'
11	Slot 10 GPI 'b'	Slot 2 GPI 'f'	Slot 12 GPI 'b'	Slot 4 GPI 'f'
12	Slot 9 GPI 'b'	Slot 9 GPI 'e'	Slot 11 GPI 'b'	Slot 11 GPI 'e'
13	Slot 6 GPI 'c'	Slot 9 GPI 'f'	Slot 8 GPI 'c'	Slot 11 GPI 'f'
14	Slot 6 GPI 'b'	Relay common, upper PSU2	Slot 8 GPI 'b'	Relay common, PSU4
15	Slot 5 GPI 'c'	+5.5V nom. dc out	Slot 7 GPI 'c'	N/C
16	Slot 2 GPI 'b'	N/C	Slot 4 GPI 'b'	N/C
17	Slot 2 GPI 'c'	N/C	Slot 4 GPI 'c'	N/C
18	Slot 1 GPI 'c'	N/C	Slot 3 GPI 'c'	N/C
19	Slot 10 GPI 'c'	Slot 1 GPI 'e'	Slot 12 GPI 'c'	Slot 3 GPI 'e'
20	Slot 10 GPI 'd'	Slot 1 GPI 'f'	Slot 12 GPI 'd'	Slot 3 GPI 'f'
21	Slot 9 GPI 'd'	Slot 10 GPI 'e'	Slot 11 GPI 'd'	Slot 12 GPI 'e'
22	Slot 9 GPI 'c'	Slot 10 GPI 'f'	Slot 11 GPI 'c'	Slot 12 GPI 'f'
23	Slot 6 GPI 'd'	Relay open on fault, upper PSU2	Slot 8 GPI 'd'	Relay close on fault, lower mains inlet
24	Slot 5 GPI 'd'	N/C	Slot 7 GPI 'd'	N/C
25	Slot 2 GPI 'd'	N/C	Slot 4 GPI 'd'	N/C
26	Slot 1 GPI 'd'	N/C	Slot 3 GPI 'd'	N/C

Remote 5 – 8 Lower frame connections (26-way high density D-Type plug/socket)

Pin number	Remote 5 function (socket)	Remote 6 function (plug)	Remote 7 function (socket)	Remote 8 function (plug)
1	+5.5V nom. dc out	Slot 17 GPI 'e'	+5.5V nom. dc out	Slot 19 GPI 'e'
2	Frame GND	Slot 17 GPI 'f'	Frame GND	Slot 19 GPI 'f'
3	Slot 21 GPI 'a'	Slot 18 GPI 'e'	Slot 23 GPI 'a'	Slot 20 GPI 'e'
4	Slot 18 GPI 'a'	Slot 18 GPI 'f'	Slot 20 GPI 'a'	Slot 20 GPI 'f'
5	Slot 17 GPI 'a'	Relay close on fault, PSU3	Slot 19 GPI 'a'	Relay close on fault, PSU1
6	Slot 17 GPI 'b'	Frame GND	Slot 19 GPI 'b'	Frame GND
7	Slot 14 GPI 'a'	RX+ bus RS422	Slot 16 GPI 'a'	N/C
8	Slot 13 GPI 'a'	TX- RS422 o/p Statesman	Slot 15 GPI 'a'	N/C
9	Slot 13 GPI 'b'	TX+ RS422 o/p Statesman	Slot 15 GPI 'b'	N/C
10	Slot 22 GPI 'a'	Slot 14 GPI 'e'	Slot 24 GPI 'a'	Slot 16 GPI 'e'
11	Slot 22 GPI 'b'	Slot 14 GPI 'f'	Slot 24 GPI 'b'	Slot 16 GPI 'f'
12	Slot 21 GPI 'b'	Slot 21 GPI 'e'	Slot 23 GPI 'b'	Slot 23 GPI 'e'
13	Slot 18 GPI 'c'	Slot 21 GPI 'f'	Slot 20 GPI 'c'	Slot 23 GPI 'f'
14	Slot 18 GPI 'b'	Relay common, PSU3	Slot 20 GPI 'b'	Relay common, PSU1
15	Slot 17 GPI 'c'	+5.5V nom. dc out	Slot 19 GPI 'c'	N/C
16	Slot 14 GPI 'b'	RX- bus RS422	Slot 16 GPI 'b'	N/C
17	Slot 14 GPI 'c'	TX+ bus RS422	Slot 16 GPI 'c'	N/C
18	Slot 13 GPI 'c'	RX+ RS422 i/p Statesman	Slot 15 GPI 'c'	N/C
19	Slot 22 GPI 'c'	Slot 13 GPI 'e'	Slot 24 GPI 'c'	Slot 15 GPI 'e'
20	Slot 22 GPI 'd'	Slot 13 GPI 'f'	Slot 24 GPI 'd'	Slot 15 GPI 'f'
21	Slot 21 GPI 'd'	Slot 22 GPI 'e'	Slot 23 GPI 'd'	Slot 24 GPI 'e'
22	Slot 21 GPI 'c'	Slot 22 GPI 'f'	Slot 23 GPI 'c'	Slot 24 GPI 'f'
23	Slot 18 GPI 'd'	Relay open on fault, PSU3	Slot 20 GPI 'd'	Relay open on fault, PSU1
24	Slot 17 GPI 'd'	N/C	Slot 19 GPI 'd'	N/C
25	Slot 14 GPI 'd'	TX- bus RS422	Slot 16 GPI 'd'	N/C
26	Slot 13 GPI 'd'	RX- RS422 i/p Statesman	Slot 15 GPI 'd'	N/C

Note: The total current available from the 5.5V DC outputs is limited to approximately 1.0 amp from the upper frame and 1.0 amp from the lower frame. Note the upper frame and lower frame DC outputs are separately fused with thermal auto resetting fuse.
To maintain EMC compliance only good quality screened cable assemblies should be used.

All comms connections are common to all remotes and RJ45s.

Power supply relay connections

Each power supply module has a changeover relay to indicate if the frame is in an alarm state caused by a power supply problem, a fan stopping or an overheating frame.

Pinout is as follows:

Upper Power Supply (PSU2) Relay Connections

Description	pin number
Relay common	Remote 2 pin 14
Open on fault	Remote 2 pin 23
Close on fault	Remote 2 pin 5

Power Supply (PSU4) Relay Connections

Description	pin number
Relay common	Remote 4 pin 14
Open on fault	Remote 4 pin 23
Close on fault	Remote 4 pin 5

Power Supply (PSU3) Relay Connections

Description	pin number
Relay common	Remote 6 pin 14
Open on fault	Remote 6 pin 23
Close on fault	Remote 6 pin 5

Lower Power Supply (PSU1) Relay Connections

Description	pin number
Relay common	Remote 8 pin 14
Open on fault	Remote 8 pin 23
Close on fault	Remote 8 pin 5

The PSU alarm relays are grouped in two groups. PSU1 and PSU3 relays act together and similarly PSU2 and PSU4 relays act together. Should an error occur in the top half of the frame – say a front panel fan failure or PSU failure – and assuming all PSUs are fitted, both relays situated in that half of the frame will go to the alarm state. Note there may be a delay between the relays changing state depending on the type of error. This is because the relay can be controlled both locally by the PSU and by being asserted by the front panel which could rely on the front panel completing a poll before initialising the alarm.

The failure of any one mains inlet will result in all PSU relays indicating an alarm.

Note: The current through the relay contacts should be limited to a maximum of 200mA.

RJ45 422 Bus IO connector

Pin number	Function
1, 2 and 3	Not used – 75 ohm resistor to GND in frame
4	TX+ bus RS422
5	TX- bus RS422
6	Not used – 75 ohm resistor to GND in frame
7	RX+ bus RS422
8	RX- bus RS422

The signals on pins 4, 5, 7 and 8 are also available on the Remote 6 connector.

Note: TX and RX are defined on the boards. This connector can be used to connect a REMIND remote control panel. If an external RS422 control device is to be used ensure that the controller will drive the RX+ with TX+ etc.

Note: Since there is no ground connection via the 422 Bus, two frames or other pieces of equipment that share this connection must have a common ground connection. This will normally occur through the earth pins on the mains connectors.

RJ45 422 Control Input connector (Indigo 4SE only)

Pin number	Function
1	RX+ RS422 i/p Statesman
2	RX- RS422 i/p Statesman
3	TX+ RS422 o/p Statesman
4 and 5	Not used – 75 ohm resistor to GND in frame
6	TX- RS422 o/p Statesman
7 and 8	Not used – 75 ohm resistor to GND in frame

The signals on pins 1, 2, 3 and 6 are also available on the Remote 6 connector.

Note: Since there is no ground connection via the 422 Bus, two frames or other pieces of equipment that share this connection must have a common ground connection. This will normally occur through the earth pins on the mains connectors.

Terminating the RS422 Statesman chain

The RS422 communication chain used for Statesman should be terminated when a frame is the last device in a chain or when a frame is the only device. It is unterminated for all other applications including when frames are used with a Statesman Hub.

To change the RS422 communications termination, access the RS422 term/unterm switch at the top of the lower front panel PCB.

Statesman RS422 term/unterm switch
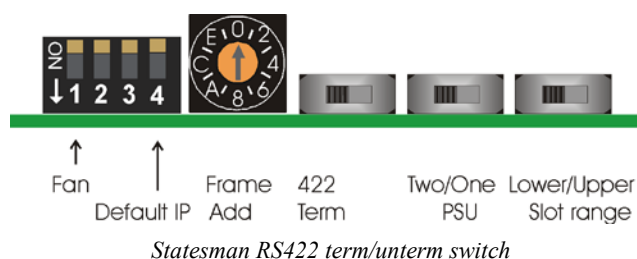
To terminate the RS422 link, move the switch to the left. To unterminate it, move it to the right.

RJ45 Ethernet connector

Pin number	Function
1	TD+
2	TD-
3	RD+
4 and 5	Not used – 75 ohm resistor to GND in frame
6	RD-
7 and 8	Not used – 75 ohm resistor to GND in frame

2.4 Front panel settings

The Indigo 4 CoolFlow front panel has two control PCBs, one in the upper position to control the Upper section of the frame (lower slot numbers) and the second in the lower position to control the lower section of the frame (higher slot numbers) See section 2.7 for an explanation of the slot numbers.

On the upper edge of the front panel PCBs, the config switches and status LEDs can be found.

PCB top-edge switches and LEDs
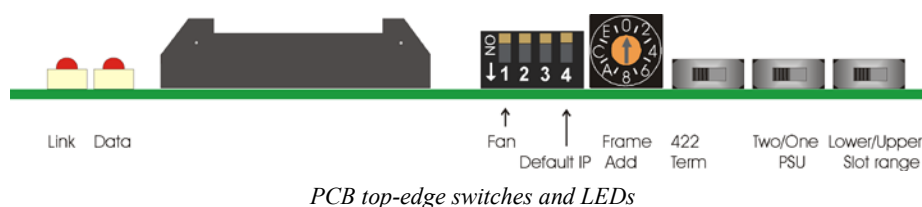
Note: There are two versions of front panel PCB used in the Indigo 4 CoolFlow, these being a full build and part build. The PCB in the upper position will always be the part build type. The lower position PCB type fitted will depend on the frame version. The Indigo 4 CoolFlow (passive frame) has a part build PCB in the lower position whereas the Indigo 4SE CoolFlow (active frame) will have the full build PCB.

Frame Address

The frame address, which only relates to active panels such as the Statesman enabled, is set to give the frame a unique address when used in serial 422 connected systems. In a TCP system the frame address switch must be set to zero.

Rotary Switch	Position	Description
Frame Address	Normally zero	This is usually the address of the frame from 0 to 15.

Note: Set this switch to position 0, unless multiple frames communicate with a single PC port in a Statesman system, or if multiple control panels connect to a single frame via one multi-drop cable.
Statesman will display the Hex switch settings 0 to E as frame addresses 1 to F; switch setting F will be displayed as frame address 10.

Status LEDs

These LEDs are useful for trouble shooting the network link. The link LED will be illuminated whenever the frame is connected to a network. Should this LED not be lit check the cable connection between the frame and network outlet. The data LED flashing will indicate that communications between the frame and the network exists.

		Description
Data	Flashing	This LED will flash to indicate activity.
Link	Normally lit	This LED will be lit whenever the frame is connected to an Ethernet network.

Lower/Upper slot range

These switches have been factory set and their settings should not be changed.

The default settings are: upper PCB should be set to lower address range and the lower PCB to upper address range.

Warning: Incorrectly setting these switches will not damage the frame but is likely to cause a loss of proper communications.

Config Switches

Piano switch

Switches 1 and 2 control the cooling fan modes. Switch 1 controls which of the two cooling regimes is to be implemented. Quiet mode uses a set of slightly higher temperature bands and will allow the frame to heat further before increasing the fan speed. This setting is idea for when the frame is situated in a noise-sensitive area and is lightly loaded. Switch 2 controls whether the fans are in auto mode or maximum speed.

1	Fan	Normally up (best cooling). Down quieter running.
2	Not assigned	Normally up (auto). Down front panel fans full speed.
3	Debug	Normally up. No user function.
4	Default IP address	Normally up. Down sets IP address to default 10.0.0.201.

Note: The fan mode switches should be set the same on both front panel boards

Note: Auto mode is dependent on PSUs and PSU fans not being in an alarm state.
If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of up to 40°C.
Although only one of the fans is essential in each of the upper and lower sections for normal operation, a faulty fan should be replaced as soon as practical to prevent the long-term stressing of the modules.

Warning: Although it is possible to operate the frame with the front panel open, the frame may not meet electromagnetic compatibility (EMC) requirements in this condition.

Default IP address (Indigo 4SE only)

On the lower front panel PCB, switch four in the down position sets the active front panel to the default IP address of 10.0.0.201. This default address is necessary to be able to change the IP address during installation.

PSU Configuration

As it is possible to have multiple power supplies fitted into the Indigo 4 CoolFlow frame it will be necessary to configure the front panel according to the number fitted. The Indigo 4 CoolFlow frame expects to have either two or four power supplies fitted.

Note: If only two power supplies are fitted they should be distributed so that there is one power supply in each half of the frame, not both together in one half.

Warning: In frames where only two power supplies are fitted to maintain redundancy, the power supplies must be fitted so that they are in alternate positions in both the upper and lower sections of the frame, e.g. upper frame upper position and lower frame lower position or upper frame lower position and lower frame upper position. Any other combination will result in a loss of redundancy.

For two power supplies fitted, set both front panel PCBs switches to 1. Set the front panel switches to 2 if four power supplies are fitted.

If the switch is set to 1 and there are two power supplies fitted into either the lower or upper section, the appropriate PSU LED will flash from GREEN to OFF every two to three seconds to warn that the switch is incorrectly set. Should only a single supply be fitted within either the lower or upper section with the switch set to 2, a power supply fault will be registered.

Note: There is a PSU select switch on both the upper and lower front panel PCBs. Both switches must be set correctly for the frame to register the PSU configuration.

Setting RS422 frame addresses (Indigo 4SE only)

The frame address, which only relates to a non-passive panel, is normally set to zero. However unique frame addresses are required in Statesman systems where multiple frames communicate with a single PC port. The frame address switch is located on the lower front panel PCB.

Indigo active/remote/Statesman panel hardware settings – Frame address
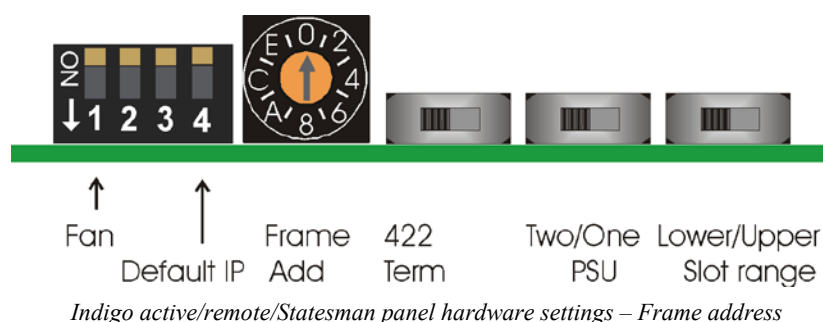
Note: Passive panels do not have a Frame Address switch.

Rotary Switch	Position	Description
Frame Address	Normally zero	This is usually the address of the frame from 0 to 15.

Note: Set this switch to position 0, unless multiple frames communicate with a single PC port in a Statesman system, or if multiple control panels connect to a single frame via one multidrop cable.
Statesman will display the Hex switch settings 0 to E as frame addresses 1 to F; switch setting F will be displayed as frame address 10.

2.5 Ethernet control

Ethernet control is provided by the Indigo 4SE CoolFlow frame. This allows the Statesman PC control system or remote active control panels to control a large number of the Indigo Ethernet series frames over a local area network.
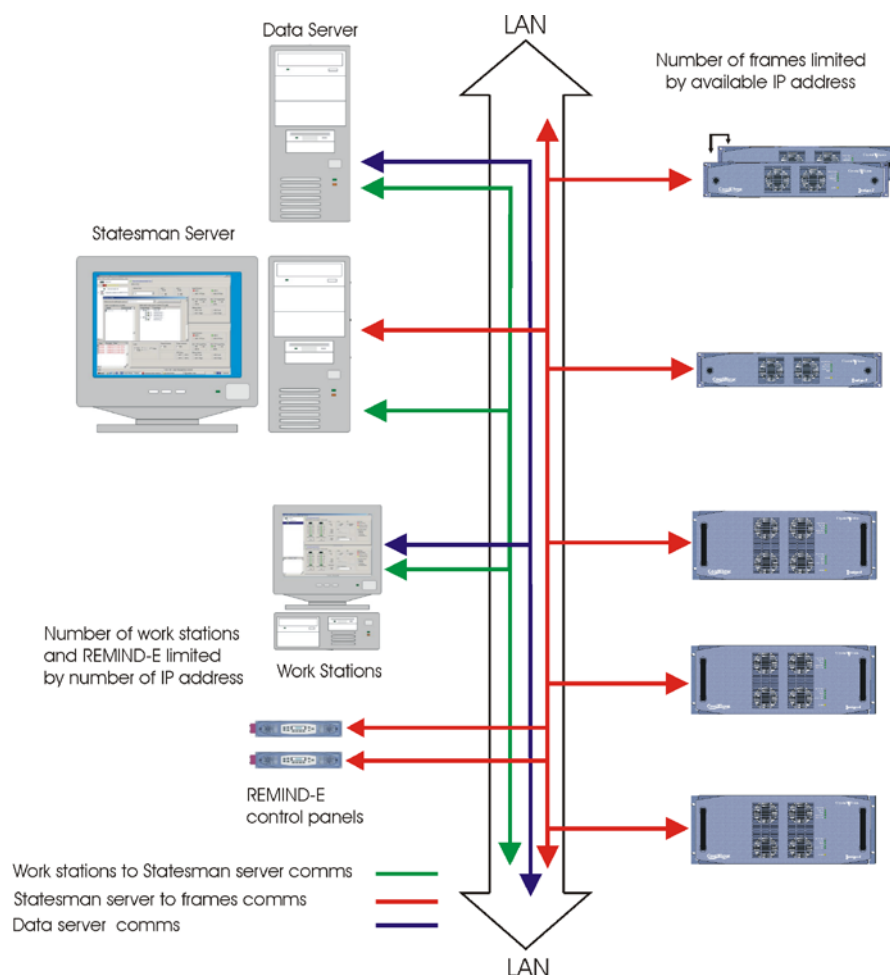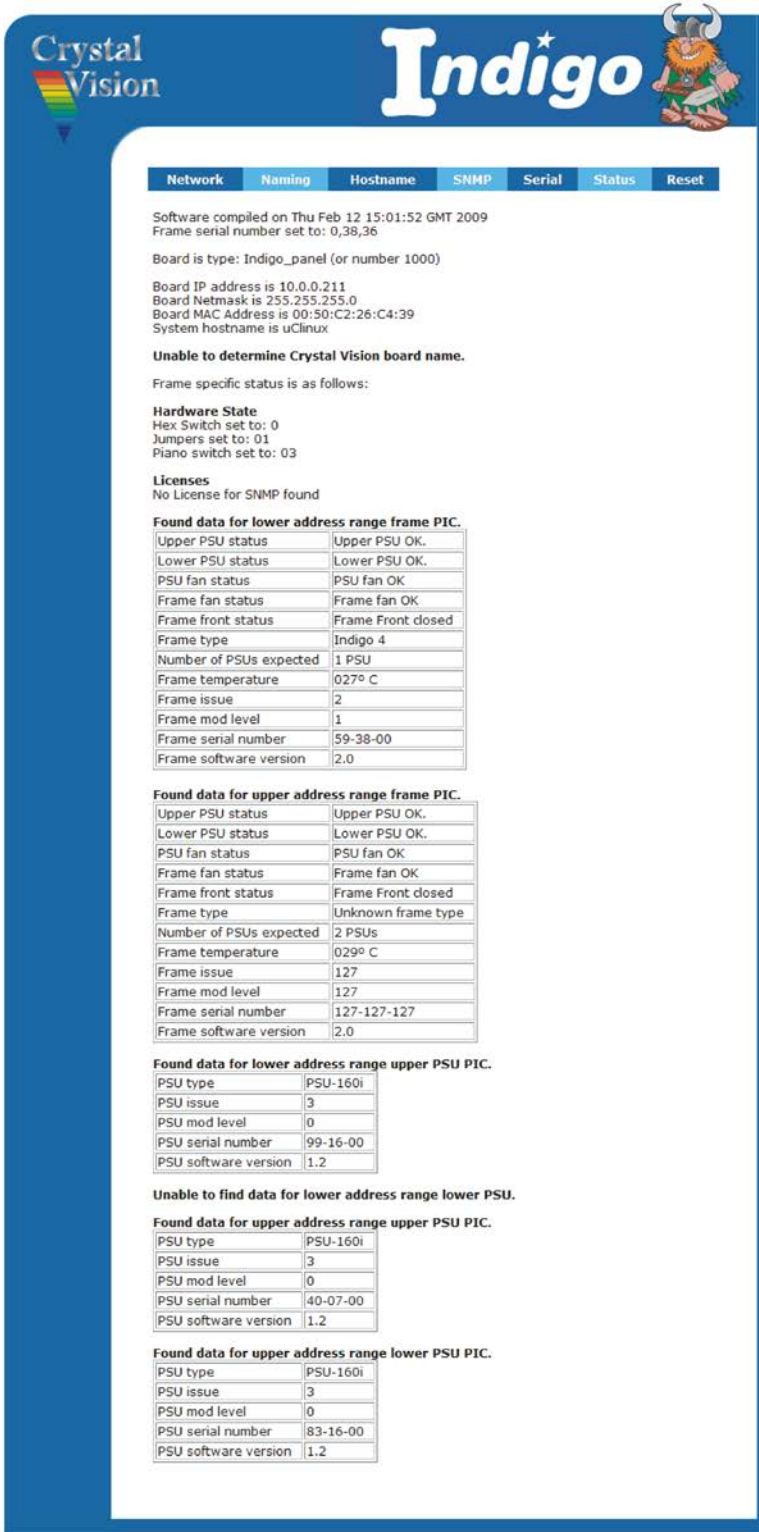
Statesman control of Indigo frames over the Ethernet

Setting up and connecting

The frame can be connected to a network port or directly to a PC from the rear panel RJ45 port labelled Ethernet. If connecting directly to a PC, a CAT-5 cross over cable will be required. Connecting to a network port hub uses a straight CAT-5 cable.

To access the internal web page set the frame to the default IP address by setting the default IP address switch DIP4 to down. Open up your PC web browser and set its search to http://10.0.0.201 and select 'go to'. This is the default IP address, the sub-mask being 255.255.255.0. After a dialogue box has briefly appeared the Indigo main status page will be displayed. This page will give a large amount of status information about the frame and its power supplies. From the webpage several options are available such as changing the IP address and frame naming.

Note: Once the IP address has been changed the status page will be accessible via this new address.

The Indigo Status page

Note: It is possible to verify that the correct frame is being viewed by first recording the Hex switch setting (second line in status list); this is the setting of the frame address switch. Rotate this switch to something other than the number displayed. Refreshing the browser will then reflect this change, therefore verifying that the correct frame is being communicated with.

Status
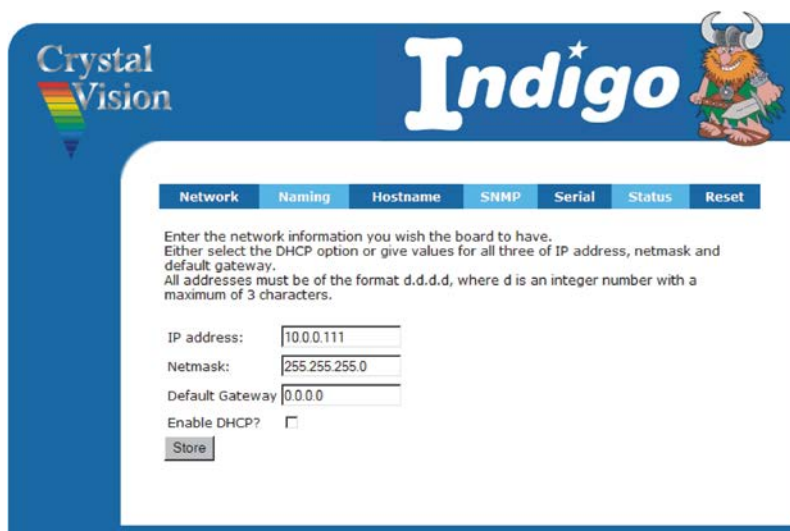
The status page gives an overview of the frame and its power supplies. The information that can be found here includes general information about the network attributes, frame name and serial number etc. plus more frame specific information like internal temperature, fan status and PSU type. Further information is also given about the individual power supplies.

Changing the IP Address

An Ethernet-enabled frame will need to have its IP address set upon installation. This is made possible by setting the frame to act as a web server and then accessing an internal web page. Any software upgrades can also be downloaded to the frame via this web page.
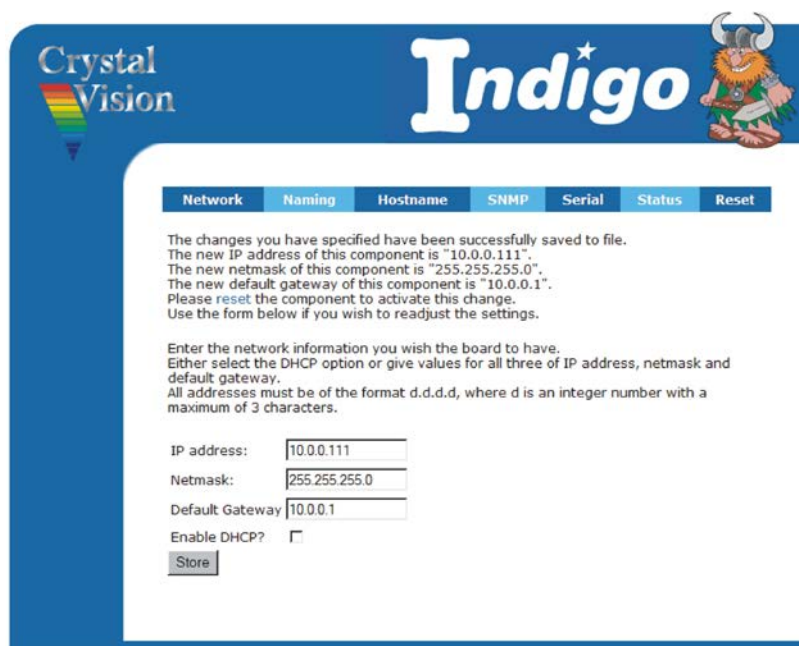
From this web page you are able then to change the IP address manually or automatically if DHCP is available. A frame serial number may also be entered.

To reset the IP address, from the status page select the Network link. A new page will open allowing entry of the required IP address and Netmask. Enter the new IP address and Netmask information and select Change. Should the frame be connected to a DHCP running network and a fixed IP address is not required, leave all the information blank and tick the DHCP box before selecting 'Change'.

Network Window

Once Change has been selected the Network screen will be replaced by a confirmation screen. As instructed, lever 4 on the lower front panel PCB must be returned to the up position and the front panel power cycled. This can be achieved by either briefly interrupting the power to the frame or if this is not convenient removing the ribbon-cable connection to the front panel. Care must be taken not to bend any pins in the cable connect as attempting to re-straighten any bent pins will likely result in their fracture.
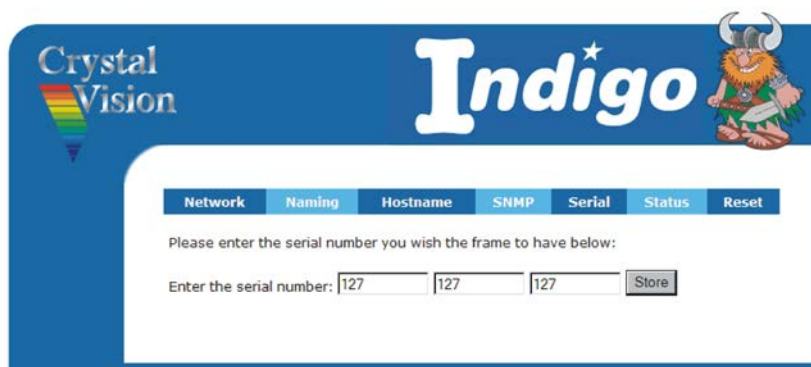
Confirmation Window

Should incorrectly formatted information be added, an error dialogue box will be displayed indicating the likely cause of the errors.

Adding a frame serial number

There is a facility to add a serial number to each frame to aid identification or for auditing purposes. The frame will have had a serial number entered during manufacture, presently this is the front panel serial number. This serial number can be freely overwritten with any series of numbers within the specified range. The electronic serial number consists of three groups of numbers. These groups must only contain digits with no gaps and must fall into the range of 0-127.

An example would be 0 0 0 or 127 127 127.

From the Status window select Serial. The following box will open:

Serial number entry box

Once the desired serial number has been entered press the Store button to save it to memory. Should the chosen serial number contain an error or be out of range, an error dialogue box will be displayed.
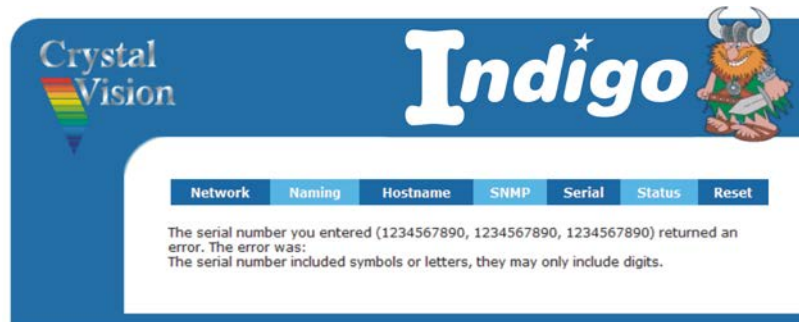
Error dialogue box

Once a serial number has been successfully entered a confirmation dialogue is displayed. The Status page will also echo the new serial number.
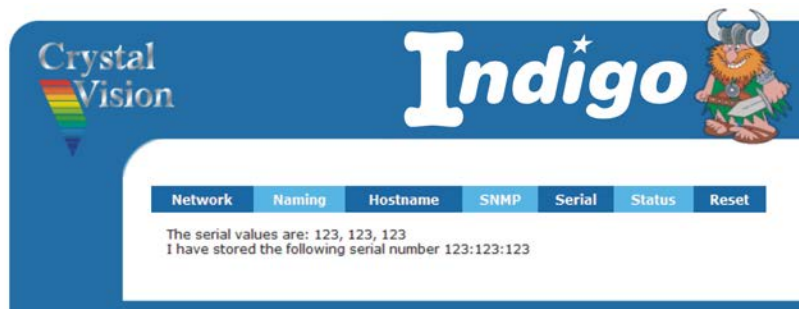
Serial number successfully added

Naming

As well as having a discrete IP address it can be useful to give a frame its own unique name, perhaps to reflect its location. The naming tab allows this name to be added, with up to 20 characters and no spaces.
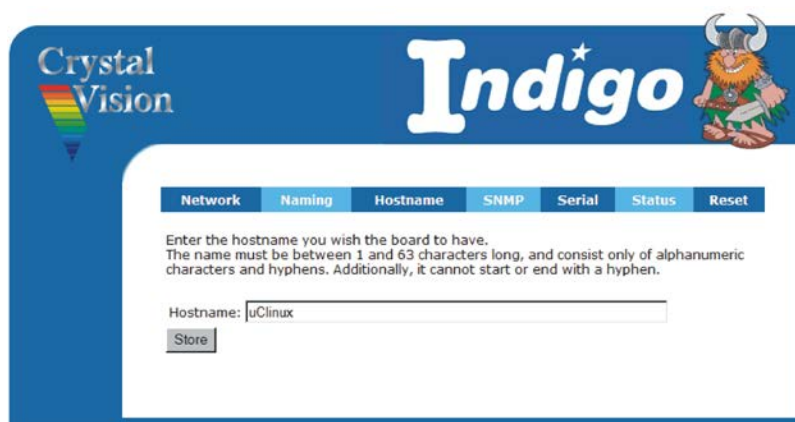
Serial number successfully added

Hostname

A **hostname** (occasionally also, a **sitename**) is the unique name by which a network-attached device (which could consist of a computer, file server, network storage device, fax machine, copier, cable modem, etc.) is known on a network. The hostname is used to identify a particular host in various forms of electronic communication such as the World Wide Web, e-mail or Usenet.

The hostname tab enables such a name to be entered.

Hostname window

Reset

The reset button allows the frame front panel to be rebooted remotely such as required when the IP address is changed.

Reset window

Note: Restart only affects the front panel and not any other cards within the frame. No stored information will be lost.

SNMP

The Indigo 4SE CoolFlow front panel uses the Net-SNMP agent which uses one or more configuration files to control its operation and the management information provided. The SNMP window provides a list of these config files. An in-depth explanation can be found by following the link from the SNMP window.


SNMP window

2.6   SNMP agent

The Indigo 4SE CoolFlow frame comes with a pre-installed SNMP agent that can either report the status or generate traps on a status change of the PSU and frame systems. These SNMP traps can then be used to trigger alarms – for example, when a signal has been removed, the video standard changed or any of the many monitored status variables change.

Note: It will be necessary to import the frame MIB into the SNMP manager. See the manager instructions if necessary to accomplish this.

Management information base (MIB)

As is normal for an SNMP manager system, each board to be monitored (in this case the front panel) has an associated MIB. Each MIB is a collection of object identifiers that identify all variables that can be read via SNMP.

The following diagram gives an overview of the OID sequences within the MIB tree.
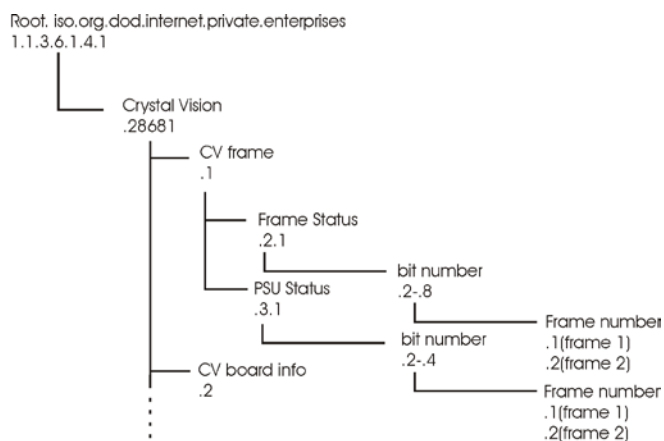
MIB tree

Object identifiers (OID)

For each variable to be monitored there is an object identifier or OID which can be distinguished from any other OID within the MIB by its unique bit number.

As an example, the front panel open status for the frame with slot address set to lower (see section 2.4 for an explanation of slot addresses) is recorded by the OID 1.3.6.1.4.28681.**1**.2.1.**5**.1 where 1 is the board type (Frame), the 5 is the bit number (Frame Open) and the final 1 indicates that the frame slot address is set to lower. If the frame was set to upper slot addressing, the OID would be 1.3.6.4.28681.1.2.1.5.2. The OID will then be accompanied by a value to indicate its status. Any status change will cause the transmitting of a trap to the SNMP manager.

The frame variables monitored are:

Name	Value	Name	Value
Frame Present 1	Frame PIC found/not found	PSU Present 1	Found/Not yet found
Frame Present 2	Frame PIC found/not found	PSU Present 2	Found/Not yet found
Frame Type 1	Reserved/Unknown	PSU Present 3	Found/Not yet found
Frame Type 2	Reserved/Unknown	PSU Present 4	Found/Not yet found
Frame Temperature 1	Integer (temp)	PSU Type 1	PSU-160i/Unknown
Frame Temperature 2	Integer (0)	PSU Type 2	PSU-160i/Unknown
Frame Open 1	Front panel open/closed/unknown	PSU Type 3	PSU-160i/Unknown
Frame Open 2	Front panel open/closed/unknown	PSU Type 4	PSU-160i/Unknown
Frame PSU Fan Status 1	PSU fan OK/problem/ unknown	PSU Status 1	PSU OK/problem/unknown
Frame PSU Fan Status 2	PSU fan OK/problem/ unknown	PSU Status 2	PSU OK/problem/unknown
Frame Panel Fan Status 1	Panel fan OK/problem/unknown	PSU Status 3	PSU OK/problem/unknown
Frame Panel Fan Status 2	Panel fan OK/problem/unknown	PSU Status 4	PSU OK/problem/unknown
Frame Temperature Alarm 1	Frame temperature OK/too high/unknown	Expected but not fitted PSU	PSU not fitted or not powered
Frame Temperature Alarm 2	Frame temperature OK/too high/unknown		

Traps

Whenever a status value changes, a trap will be sent to the SNMP manager. By interrogating this trap it is possible to identify the status change and its consequences. It will be quite common for multiple traps to be sent for any one incident. For example, removing an input may typically trigger eight traps – it will then be down to the SNMP manager to sort these into a hierarchical order or mask as necessary.
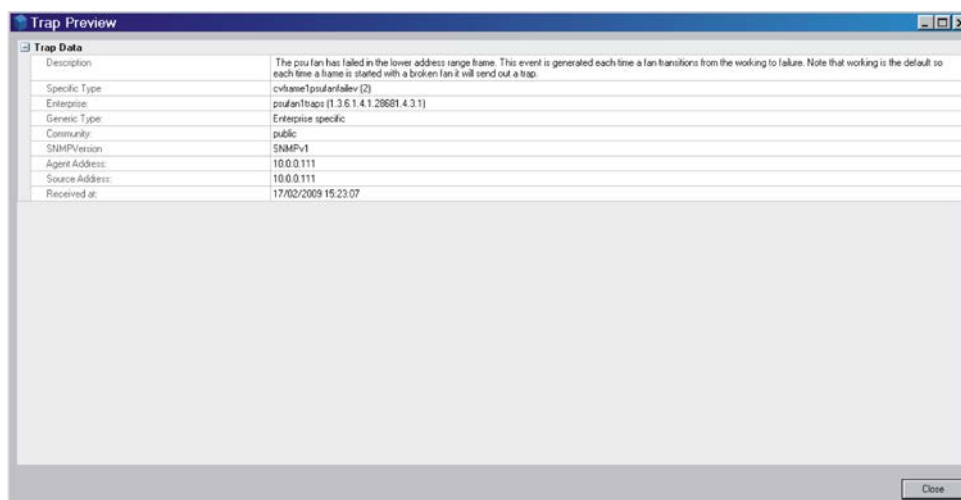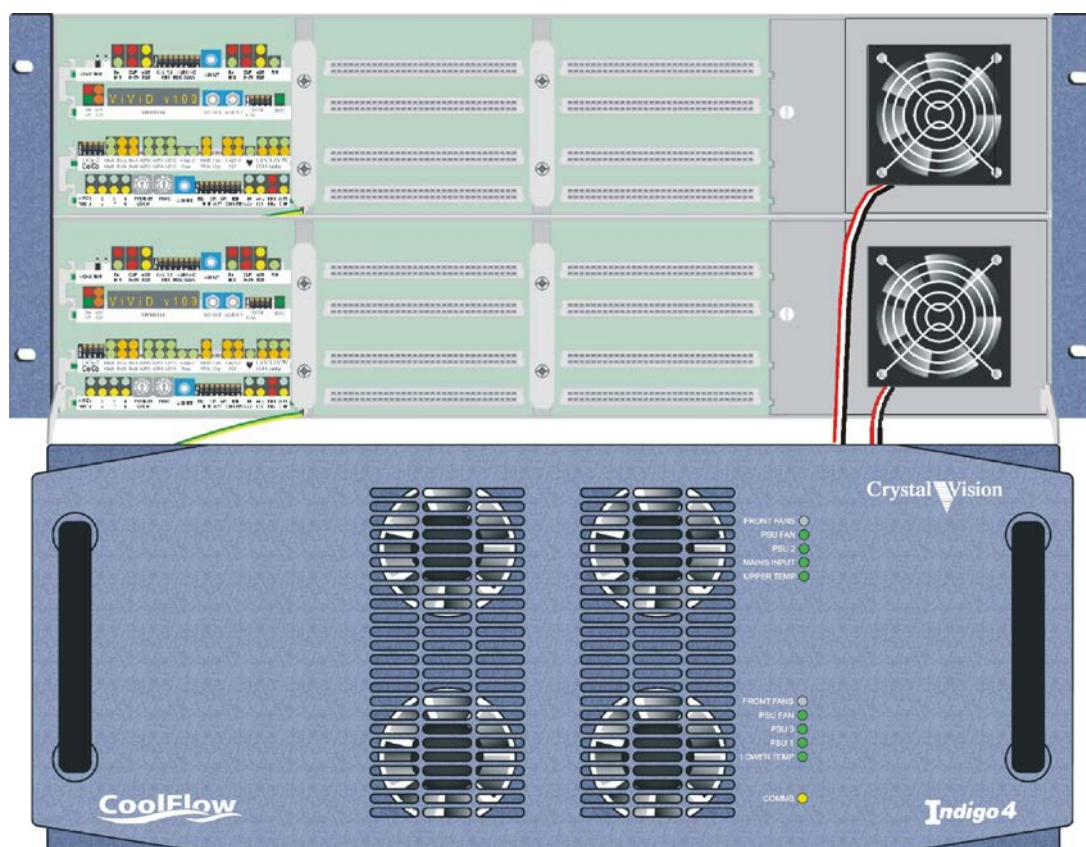

Example of a trap received by the SNMP manager

2.7 Installing Crystal Vision modules

The Indigo 4 CoolFlow frame has 24 slots for Crystal Vision video or audio cards. Signal connections are made through rear modules.

The inside of the frame can be accessed to change the modules by pulling forward the two black grab handles, one on each side of the front panel.
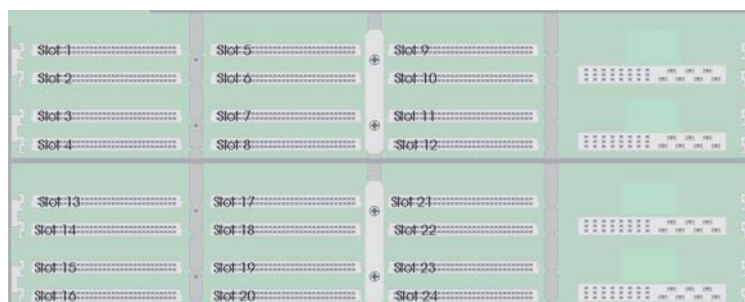

The Indigo 4 CoolFlow frame with front control panel open

Warning: Although the frame can be operated with the front panel open, the frame may not meet electromagnetic compatibility (EMC) requirements in this condition.

Module positions

Module positions are numbered 1 to 24 as shown below:

The Indigo 4 CoolFlow frame showing slot numbers (and left hand retaining bracket removed)

Before fitting or removing signal modules, one or more retaining brackets may need to be removed. Retaining brackets prevent the modules from being inadvertently removed or from coming out during transit. They may also prove useful in OB vehicles when travelling over rough ground.

Inserting modules

To insert a module proceed as follows:

- Remove the two screws holding the bracket adjacent to the slot intended for the module and keep both the screws and bracket in a safe place

- Insert the module into the appropriate guides and push it fully home

- Refit the retaining brackets if required

The Indigo 4 CoolFlow upper frame with two modules fitted in slots 1 and 2

Removing modules

To remove signal modules simply pull on the handle and withdraw them from the frame, with the retaining brackets removed.

All Crystal Vision cards can be inserted and removed whilst the frame is powered without damage

Rear connectors

The frame will be supplied with an appropriate selection of rear connectors for any cards installed in it at the time of order. Unused slots will be fitted with blanking plates.

Details of signal types and pin-outs are given in the documentation supplied with each Crystal Vision video or audio card.
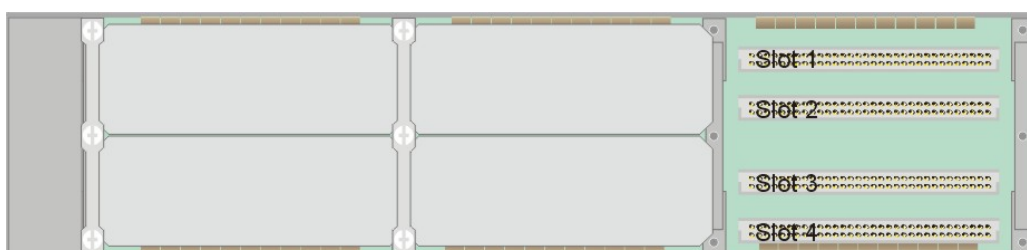
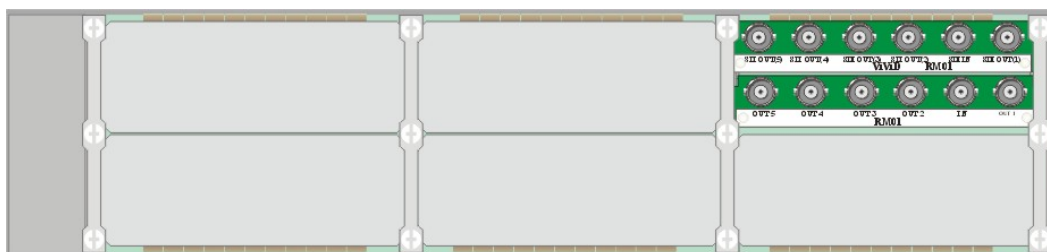*The Indigo 4 CoolFlow upper frame rear view with EMC covers removed for slots 1 to 4*

The rear modules are held in place by a retaining bar at each side. These run the height of the frame and provide mechanical support as well as ensuring EMC compliance.

To access the rear connector motherboard the appropriate EMC covers and retaining brackets must be removed.
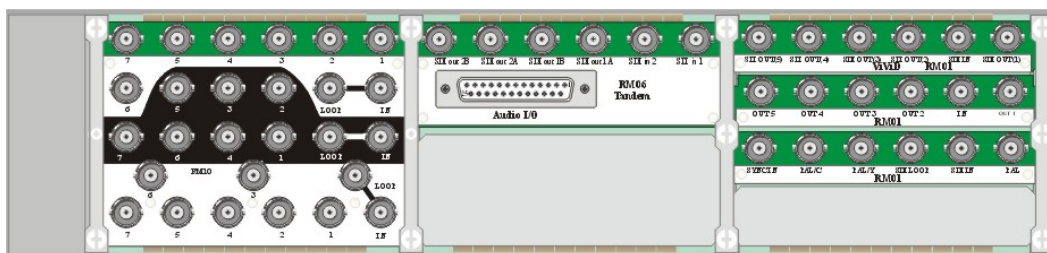
Fitting rear connectors

To fit a rear connector proceed as follows:

- Disconnect the mains power leads from the frame

- Remove the rear relevant EMC cover(s) at the rear of the frame by unscrewing the adjacent retaining bars

- Push fit the selected rear connector onto the appropriate frame slots

- Refit full or half size EMC covers and replace the retaining bars

The Indigo 4 CoolFlow upper frame rear view with EMC covers fitted and RM01 connectors fitted to slots 1 and 2

If only a single slot remains uncovered, half size EMC covers are available.

Part of an Indigo 4 CoolFlow frame showing the use of full and half size EMC covers and the use of single, double and quad rear connectors

Note: In order to accommodate the connectors of some full height (quad) rear modules such as the RM02, RM10 and RM19, special retaining bars without a central captive screw should be used. The centre of the bar is then retained with a separate M3 x 8mm screw.

Warning: **To maintain product safety and EMC compliance the rear of the frame should be filled with Crystal Vision rear connectors and/or EMC covers and held in place with retaining brackets before power is re-applied.**

2.8 Indigo power supplies

The Indigo 4 CoolFlow frame is supplied with the 160W rated PSU-160i. It is possible to use the older PSU-75i and PSU-150i but it is preferred that these are not mixed in any one frame.
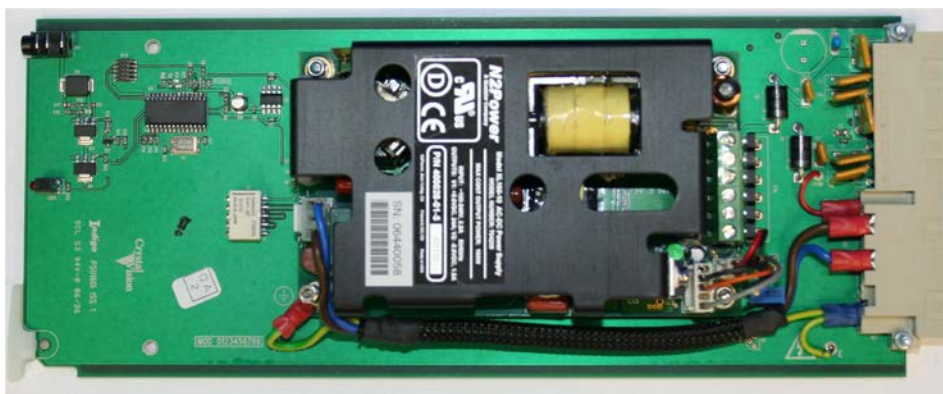
PSU-160i - top view

Note: Care should be taken if mixing power supply types. It is not recommended to combine the PSU-75i with anything other than a second PSU-75i. The Indigo power supply modules are **not** compatible with similar PSUs used in FR2AV and FR1AV frames.

*Monitoring power supply status*

A signal from the each of the power supplies is routed through the frame wiring to the front panel electronics. This allows an indication by the PSU LEDs of the status of the installed power supplies.

A faulty condition is indicated when the corresponding LED is red and a normal condition when it is green/yellow. If a PSU is removed for maintenance the corresponding LED will be unlit.

The status of the PSUs can also be investigated using the Indigo REMIND control panel and Statesman PC control software.

Configuring PSUs

As it is possible to have multiple power supplies fitted into the Indigo 4 CoolFlow frame, it will be necessary to configure the front panel according to the number fitted. The Indigo 4 CoolFlow frame expects to have either two or four power supplies fitted.
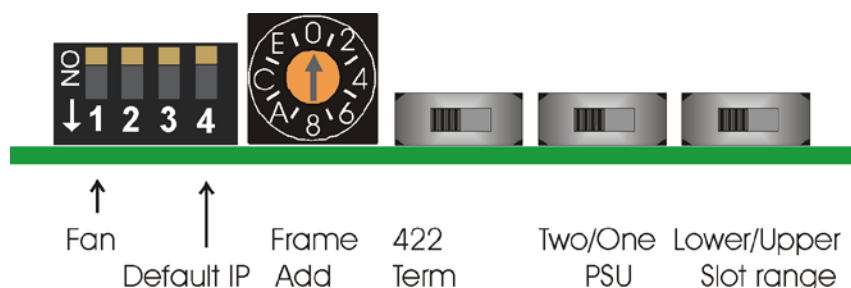
Indigo 4 CoolFlow front panel hardware settings – PSU configuration

Note: If only two power supplies are fitted they should be distributed so that there is one power supply in each half of the frame, not both together in one half.

For two power supplies fitted set both front panel PCBs switches to 1. Set the front panel switches to 2 if four power supplies are fitted.

If the switch is set to 1 and there are two power supplies fitted into either the lower or upper section, the appropriate PSU LED will flash from GREEN to OFF every two to three seconds to warn that the switch is incorrectly set. Should only a single supply be fitted within either the lower or upper section with the switch set to 2, a power supply fault will be registered.

Warning: In frames where only two power supplies are fitted, to maintain redundancy the power supplies must be fitted so that they are in alternate positions in both the upper and lower sections of the frame, e.g. upper frame upper position and lower frame lower position or upper frame lower position and lower frame upper position. Any other combination will result in a loss of redundancy.

2.9 Select the cooling mode

With the front panel closed the front panel fans will be functioning and the PSU fans will be idle. When the front panel is opened, the front panel fans will be switched off and the frame cooling will be maintained by the PSU fans which will have been activated by the front panel being opened.

There are two cooling modes that can be selected using a switch at the rear of the control panel.

Note: The upper and lower pairs of fans are controlled separately by the upper and lower front panel PCBs. Although individual operation is possible it is advisable to set both to the same mode i.e. both to auto or both to maximum.

Indigo 4 CoolFlow front panel hardware settings – cooling mode
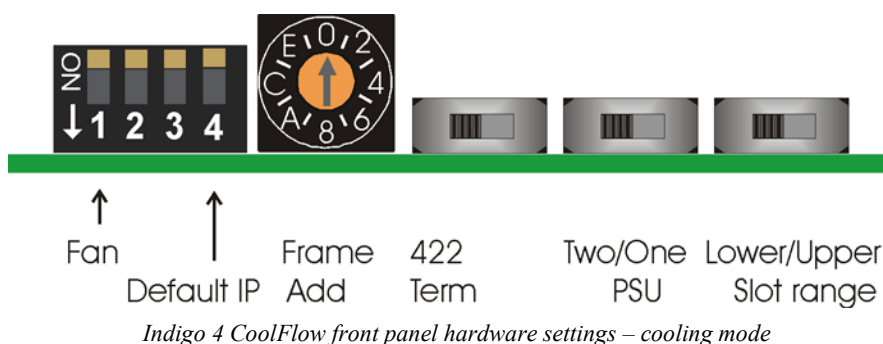
The two modes are normal (auto) and maximum cooling.

Switch 1 of the four-position DIL switch controls the two cooling modes as follows:

Levers 1	Function	Notes
1 up	Normal (auto) cooling	Both fans in each section run continuously increasing in speed as the temperature inside the frame goes up. When the frame temperature is below approximately 30°C the panel fans run at minimum speed. If the frame temperature goes above 30°C the fan speed will increase to maintain adequate cooling.
1 down	Max cooling mode	In Maximum cooling mode both front panel fans in each section run at maximum speed. This mode is ideal for equipment bays where noise is not a concern.

Note: Auto mode is dependent on PSUs and PSU fans not being in an alarm state.
If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of up to 40°C.
Although only one of the fans is essential in each of the upper and lower sections for normal operation, a faulty fan should be replaced as soon as practical to prevent the long-term stressing of the modules

Warning: Although it is possible to operate the frame with the front panel open, the frame may not meet electromagnetic compatibility (EMC) requirements in this condition.

3 Maintenance

Warning: **These servicing instructions are for use by qualified personnel only. To reduce risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.**
Refer also to the General Safety Summary in the Installation chapter.

Inserting and removing power supplies

The PSU-160i power supplies can be inserted and removed while the system is powered without damage. However, this must be done quickly as there will be no forced convection air, as the PSU fan assembly has to be removed.

To gain access to the Indigo PSUs proceed as follows:

- Pull down the front panel using the black knobs at either side of the panel

- Unplug the wiring to front panel PCB

- Release the captive screw to the left of the PSU fan. It will be necessary to use a screwdriver

- Remove the fan assembly by unclipping the right side from the frame and pull away.

Note: Take care not to damage the panel ribbon cable when removing the fan assembly.

Once the fan assembly has been unplugged from the front panel, the front panel PSU FAN LED will change from green to red. The alarm relay will also be set to the alarm condition.

Removing the PSU fan assembly   *Lower PSU-160i – front view*
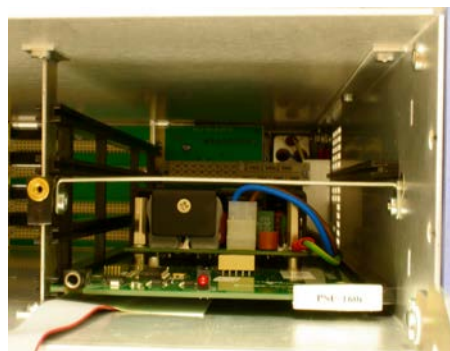
In addition to the PSU and fan LEDs on the front control panel, there is also a red error LED on the PSU. This LED will flash slowly.

The error LED will light up continuously if power rail levels are outside operational limits or – in the presence of a second fitted PSU-160i – the power supply is unpowered or has failed.

Removing a PSU

To remove a PSU proceed as follows:

- Apply sideways pressure on the PSU handle towards the right and remove the PSU by pulling it forward

- Take care when removing the lower PSU not to damage the panel ribbon cable

Caution: The power supply does not contain any serviceable parts.

Note: Check that the 2/1 switches behind the control panel are set correctly for the number of PSUs installed to prevent redundant PSU warnings.

Inserting a PSU

To insert a PSU proceed as follows:

- Check that any additional power supply is the same type as already fitted

- Offer up the PSU to the frame guide rails – it may help to turn the lower PSU handle fully outwards to clear the panel hinge

- Carefully push the PSU all the way into its socket

Notes: Check that the 2/1 switches behind the control panel are set correctly for the number of PSUs installed to prevent redundant PSU warnings.

Fitting the fan assembly

To replace the PSU fan assembly proceed as follows:

- Offer up the fan assembly ensuring that the two lugs fit into two slots in the right hand side of the frame

- Take care not to damage the panel ribbon cable

- Tighten the captive screw to the left of the PSU fan

- Connect to the plug on the front panel PCB

- If the unit was unpowered it may now be powered and tested

Replacing the PSU fan

It is recommended that PSU fan replacement should be performed as quickly as possible if performed whilst the frame is powered, to prevent overheating.

Tip: Close the front panel once the PSU fan assembly is removed when the frame is powered to allow the front panel fan to operate and provide cooling.

To replace the fan proceed as follows:

- If possible disconnect the power cord(s) connected to the frame

- Remove the PSU fan assembly as shown in the preceding section

- Remove the finger guard and fan by unscrewing the four retaining screws

- Replace the fan with a Crystal Vision supplied replacement part to ensure adequate cooling and continued fire protection

- Be sure to refit finger guards on the outer side of the mounting plate assembly

- Replace the PSU fan assembly as shown in the preceding section

- Plug in the 3-way connector from the new fan to the front panel PCB

- Reconnect the power supply cords

If the frame is powered, the PSU fan should now be operating and the PSU FAN LED should be green. Once the front panel is closed the PSU fan will stop rotating and the PSU FAN LED will be unlit.
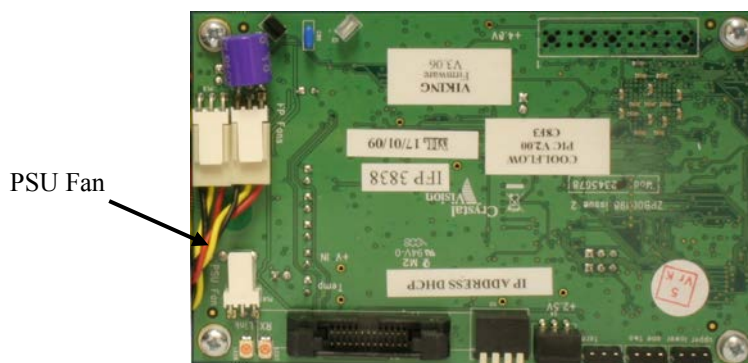
PSU Fan

Front panel PCB showing PSU fan connector

Replacing the front panel fan

To replace the front panel fan proceed as follows:

- If possible disconnect the power cord(s) connected to the frame

- Open the front panel

- If the frame is powered, the fan on the front panel will stop and the PSU fan will automatically speed up to maximum speed

- Undo the 3-way connector which is attached to three wires on the fan from the front panel PCB

- Using a screwdriver remove the four screws that hold the fan and fan's finger guard to the front panel

- Remove the fan and finger guard completely

- Replace the fan with a Crystal Vision supplied replacement part to ensure adequate cooling and continued fire protection. Be sure to fit the finger guards on the outer side of the fan

- Reconnect the 3-way connector which is attached to the front panel PCB.

- Close the front panel and reconnect the power supply cords

The front panel fan should be operating and the FRONT FAN LED should be lit green.

Front panel fan showing 3-pin connector and finger guard. (Indigo 2 front panel shown)

Replacing the mains input fuses

The mains input fuses are fitted inside the IEC 320 connectors at the rear of the frame. A spare fuse is also stored inside the connector. The fuse can only be accessed when the power cord is disconnected.

The sequence is as follows:

- Disconnect ALL the power cords (one or two depending on configuration) from the rear of the frame.

- Using a flat bladed screwdriver or similar tool gently lever out the fuse drawer from the relevant IEC connector using the tab visible at the bottom of the connector depression. Whilst levering the fuse holder out, support the fuse holder with your free hand to prevent the fuse holder being dropped or lost.

- Remove the defective fuse and replace with either the spare fuse or with a 5A, 250V time delay fuse

- Replace the fuse drawer and reconnect the power cords
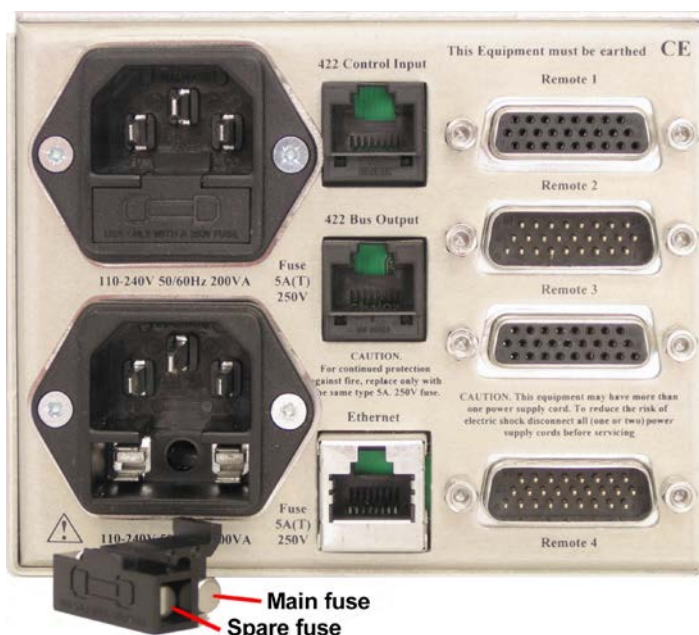
Rear connectors showing IEC mains inputs and fuse tray with main and spare fuses. (Indigo 2 rear connections shown)

If a fuse blows repeatedly this indicates a fault either in the associated power supply module or elsewhere. Return the frame and/or power supply to the manufacturer or dealer for repair.

Note: Replace the fuse only with one of the same type and rating (5A, 250V time delay).

FAQs

Question:

How do I tell which fuse supplies which power supplies?

Answer:

Each fuse feeds two power supply modules. The lower fused inlet supplies PSU1 and PSU4. The upper fused inlet supplies PSU2 and PSU3.

Question:

How do I tell which fuse has failed as my frame is still working normally?

Answer:

If a fuse should fail the front panel will indicate which powers supplies are no longer functioning by their status LEDs having turning from green to red. The red LED present at the front of the power supply will also change from a steady condition to flashing to indicate an error condition. If PSU1 and PSU4 are showing a fault condition change the fuse in the lower mains inlet. If PSU2 and PSU3 are showing a fault condition change the fuse in the upper mains inlet.

Software upgrades

From time to time software updates may become available to add additional functionality etc. to the active front panelled Indigo 4SE CoolFlow. The software updater is available from Crystal Vision customer support or as a download from www.crystalvision.tv.

Once the updater software "cv_reflasher.exe" is on your PC, double click it to run.

The following popup box will appear:
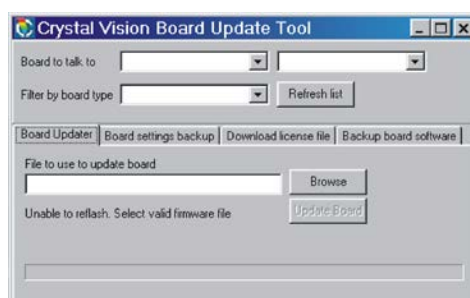
Note: This is a generic tool used for updating both cards and frames.

Click 'Refresh list' button and wait whilst the network is scanned. Once done then select the frame for upgrading from the 'Board to talk to' drop-down list by IP address or name.

If not already selected, select the Board Updater tab and click on the Browse button. Navigate to the folder containing the new software. Click 'Update Board' and wait.
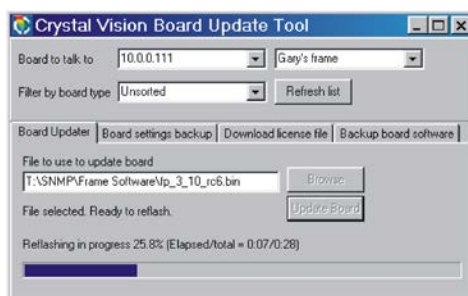
Once the download is complete the updater will confirm that the update was successful.
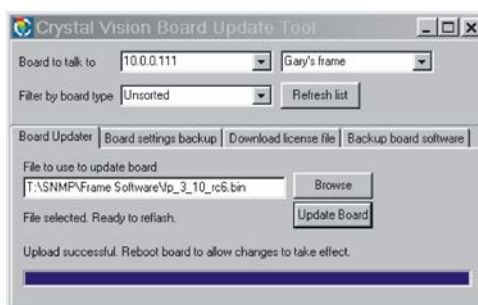
It will now be necessary to reboot the frame. This can be achieved by cycling the mains supply to the frame or if not convenient carefully remove the ribbon cable connector from the front panel PCB.

Note: Take great care when reinserting the front panel ribbon cable that none of the pins in the PCB connector become bent or misaligned.

Downloading licences

The Indigo 4SE CoolFlow frame is pre-installed with an SNMP manager which will require a licence to be downloaded and installed. The licence is available by email from Crystal Vision's customer support. To obtain a licence, the frame's MAC address will be required.

Once obtained the licence file is downloaded to the frame using the board update tool.

Click 'Refresh list' button and wait whilst the network is scanned. Once done then select the frame for upgrading from the 'Board to talk to' drop-down list by IP address or name.

Select the 'Download licence file' tab and click on the Browse button. Navigate to the folder containing the Licence file. Click 'Download to Board' and wait.
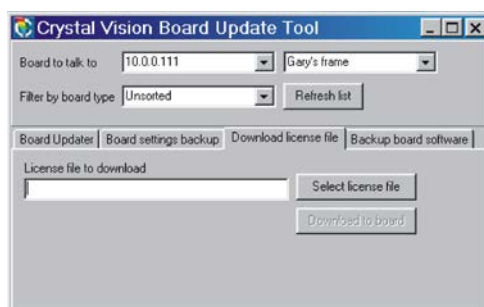
It will now be necessary to reboot the frame. This can be achieved by cycling the mains supply to the frame or if not convenient carefully remove the ribbon cable connector from the front panel PCB.

Note: Take great care when reinserting the front panel ribbon cable that none of the pins in the PCB connector become bent or misaligned.

4 Trouble shooting

Reading front panel LED status

There are ten two-colour LEDs on an active or passive front panel, with yellow/green indicating a normal condition and red an abnormal condition.
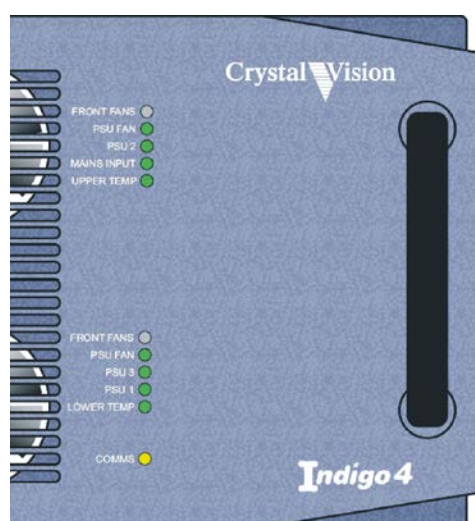
The Indigo 4 CoolFlow LEDs

The following LED status indications may be seen:

LED	Colour	Notes
Upper section		
Front Fan	Unlit	Door open
	Grn	Normal operation
	Red	Change the panel fan
PSU Fan	Unlit	Door closed and fan idle
	Grn	Door open and fan operational
	Red	Change PSU fan
PSU2	Unlit	No PSU2 detected
	Grn	Normal operation
	Red	Check upper inlet fuse or change PSU2
	Flashing red	Number of PSUs incorrectly set
Mains Input (PSU4)	Unlit	No PSU4 detected
	Grn	Normal operation
	Red	Check lower inlet fuse or change PSU4
	Flashing red	Number of PSUs incorrectly set
Upper Temp	Grn	Normal operation
	Red	Internal temperature too high (approx 65°C)
	Flashing red	

Lower section		
Front Fan	Unlit	Door open
	Grn	Normal operation
	Red	Change the panel fan
PSU Fan	Unlit	Door closed and fan idle
	Grn	Door open and fan operational
	Red	Change PSU fan
PSU3	Unlit	No PSU3 detected
	Grn	Normal operation
	Red	Check upper inlet fuse or change PSU3
	Flashing red	Number of PSUs incorrectly set
PSU1	Unlit	No PSU1 detected
	Grn	Normal operation
	Red	Check lower inlet fuse or change PSU1
	Flashing red	Number of PSUs incorrectly set
Lower Temp	Grn	Normal operation
	Red	Internal temperature too high (approx 65°C)
Comms	Unlit	Press Device in Statesman mode for comms status
	Flash amber	

If a PSU is not fitted, the corresponding LED will not illuminate unless the incorrect number of PSUs are selected when it will flash.

The Comms LED indicates external communication with the frame. On a passive panel this will mean communication from the frame or an active control panel. On an active panel this will be communication with Statesman via an RS422 link or via Ethernet.

The Comms LED flashes slowly at medium intensity if communication has been established. It will flash at higher intensity when the communication channel is active.

Statesman users will be able to remotely monitor frame temperature and fan speed.

Power supply related faults operate a relay, the contacts of which are brought out to the Remote 2, 4, 6 and 8 connectors. These contacts can be used to operate external indicators as desired. Please refer to the Connector pinout section for more details.

PSU relays

Each PSU contains a relay, the contacts of which are brought out to the remote connectors. This relay is under frame control and will change state whenever a frame fault is present.

Note: As the frame is fitted with multiple PSUs the frame will control all relays simultaneously.

These contacts can be used to operate external indicators as desired.

Note: In certain circumstances there may be a delay of several seconds between the first relay and any other relay's state changing.

Note: The red LED built into the front of the PSU will flash repeatedly (on for one second and off for one second). The same red LED will light up continuously if levels of the power rails (+5.75V or -6.0V) are outside operational limits. Refer to section 4 for further details.

Frequently asked questions

Why are there no LEDs illuminated?

Check that at least one frame PSU is functioning

Check that the frame is powered and that the fuse is intact

Check that the panel is cabled correctly

What should I do if the TEMP LED is red?

Check that cool air is able to circulate through the front panel grilles and out of the ventilation holes at each side of the frame

Check that the panel and PSU fans are operational and that the FRONT FAN and PSU FAN LEDs are not red

What should I do if the PSU FAN LED is red?

Check that the PSU fan is plugged in correctly

Try replacing the fan

What should I do if a FRONT FAN LED is red?

Check the front control panel fans are plugged in correctly

Try replacing the fans

What should I do if the UPPER or LOWER PSU LED is red?

Check that the mains cord is connect to the PSU indicating the fault

Try replacing the appropriate PSU

Why does the LOWER PSU LED flash from green to off?

This will occur if two PSUs are fitted when the 2/1 PSU switch at the rear of the front panel is set for only one PSU. Move the switch into the 2 position.

How do I check RS422 comms status?

Look at the Comms LED. It should flash slowly at medium intensity when a valid communication link is present. It will flash brightly when the communication link is active

Why has Statesman and/or two-panel link serial communication failed?

Check that the appropriate cabling is connected correctly and is intact

Why does a custom card name change to the default name when I plug in a card of the same type?

A custom name is only retained if a card is plugged into a slot that had held a custom named card of exactly the same type and version

Why doesn't the switch on the front panel that sets the slot address work?

Changing this switch only takes effect the next time the front panel is powered up

Why does the frame appear not to have power supply redundancy even though two PSUs are fitted?

The power supplies may have been distributed incorrectly

5 Appendix

5.1 Module addresses and node numbers

The following table shows the upper/lower address or slot number range on the panel PIC, PSUs and installed modules for a variety of Indigo frames.

Device/Indigo frame	Lower address in 1st frame	Upper address in 2nd frame
Modules in 4U frames	1.01 to 1.12 (upper half)	2.01 to 2.12 (lower half)
Modules in 2U frames	1.02 to 1.12	2.01 to 2.12
Modules in 1U frames	1.01 to 1.06	2.01 to 2.06
Modules in desktop frames	1.01 to 1.02	2.01 to 2.02
Panel PIC in all frames	1.00	2.00
Upper PSU in 2U frames	1.14	2.14
Lower PSU in 2U frames	1.15	2.15
PSU in 1U frames	1.14	2.14

Most Crystal Vision cards have their unique node or card location address assigned automatically by the panel processor based on the slot occupied in the frame and the Upper/Lower range address setting.

Older cards may have a special 16-position node switch for use with older frames such as the FR2-12 or FR1-6.

In all of the current frames, this node switch should be set to zero (factory default).

When the front panel processor detects a card some older cards will identify their location with a node address instead of a slot address.

The relationship between the two methods of referring to card addresses is as follows.

In the Indigo desk top box the node address is calculated as follows:

- slot number minus 1: giving a range of 0 - 1 in frame 1 and 16 - 17 in frame 2

In the 1U frame the node address is calculated as follows:

- slot number minus 1: giving a range of 0 - 5 in frame 1 and 16 - 21 in frame 2

In the 2U frame the node address is calculated as follows:

- slot number minus 1: giving a range of 0 - 11 in frame 1 and 16 - 27 in frame 2

Note: Please refer to the FR1/2 Frame Manual for further information about node addresses.

5.2 SNMP Quick Start Guide

Introduction

This should provide the information you need to set up and check a Crystal Vision frame for operation with an SNMP manager.

Frame Setup

The frame must have a licence for SNMP operation for it to respond properly to SNMP requests. This can be checked by looking at the frame web page. Look at the frame IP address using a web browser. You should see a page like this:

If you click as indicated, you should go to the frame home page. This may happen automatically.

Check that the 'Licences' section shows "Found a Licence for SNMP". If no licence is found contact Crystal Vision to get an SNMP licence for this frame.

Once the frame is licensed for SNMP you will need to set the address that you want it to send unprompted SNMP messages (traps) to. On the web page shown above, select the 'SNMP' tab.

The SNMP Agent in the frame is highly configurable. However, the default settings are correct for most systems and it is likely that only the 'trapsink' address needs to be changed. Click and drag to select the trapsink IP address and type in the IP address of the SNMP manager being used as the trap receiver. Then click on the 'Store' button to write the new value into the frame. This will take a few seconds. You will then need to re-boot the frame (as described in the "Resetting the Frame" below) for the setting to take effect.

Checking

The frame should now be ready for SNMP operation. You can check this by setting a SNMP Manager, or MIB browser, to the frame IP address and performing an SNMP walk of the 'private' section of the Object ID tree.

See below for a screen shot of a successful walk; in this case of a 4U frame containing two boards.

If you do not see something similar to this, then the frame may need to be reset to activate the SNMP licence. The frame will report the presence of the licence even if it has not been activated by a reset. The same walk of an unlicensed frame gives the results below.

Resetting the Frame

The frame can be reset from the web page. From the home page select the 'Reset' tab.

Click on the button to restart the frame.

Note: If the frame has been set to DHCP it may come back at a different IP address.

The frame should now be set up to respond to SNMP requests and send traps to the desired IP address.

Sending traps to multiple addresses

To send traps to multiple addresses, define multiple trapsinks in the config file.

6 Specification

Indigo 4U frame

General

Dimensions: 482mm wide (19 inches), 176mm high (4U), 425mm deep. Weight 10 kg

Power requirements: 85 to 264 Volts, 47 to 400Hz

Operating conditions: 0 to 40°C non-condensing

Ventilation front to sides, without air filters

Power supply: Two or four plug-in power supplies (160 Watt PSU-160i)

Module control

Remote options: Six control lines per module. Assigned on module (e.g. GPI or RS422/RS232)

Contact open/closure for any power supply or frame fault condition (supply out of range or failure, fan too slow or fail, over-heat)

RS485 loop system for front panel to all modules and rear connection (rear connection by way of 26-pin high density D-Type connector and RJ45 connector)

For shared control, frame address selectable on front panel for first or second frame in a pair

Second serial port available for Statesman control (connection via 26-pin high density D-Type connector and RJ45 connector)

Ethernet control capable

SNMP control and monitoring option