



digital keying modular
interface audio
converters analogue video

Indigo 1

1U frames

(Includes Indigo 1, 1AE, 1SE,
1-DP, 1AE-DP and 1SE-DP)

USER MANUAL



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1 Introduction

The Indigo range comprises of four frame types: 4U frames for up to 24 modules, 2U frames for up to 12 modules, 1U frames for up to six modules and desk top boxes for up to two modules.

There are three main variants of the 1U frame - passive front panel, active panel with controls and a display or a Statesman-enabled version without controls or a display.

Both the active panel and Statesman-enabled frames are also available with Ethernet capability. All variants are also available with single or dual redundant power supplies.

This manual covers:

Indigo 1 - with passive front panel

Indigo 1AE - Ethernet capable with active panel controls and display

Indigo 1SE - Ethernet capable with active panel, no controls or display

Indigo 1-DP - with passive front panel and dual redundant power supplies

Indigo 1AE-DP - Ethernet capable with active panel controls and display plus dual redundant power supplies

Indigo 1SE-DP - Ethernet capable with active panel, no controls or display. Has dual redundant power supplies

The Indigo 1AE and Indigo 1AE-DP versions also support Statesman.

Each 1U frame can be used with any single or double slot rear module in the Crystal Vision range. There is a single slot for the single or dual redundant plug-in power supply.

A hinged front panel allows easy access to removable fan assemblies, the installed modules and the power supply or supplies in the case of the Indigo 1-DP frame.

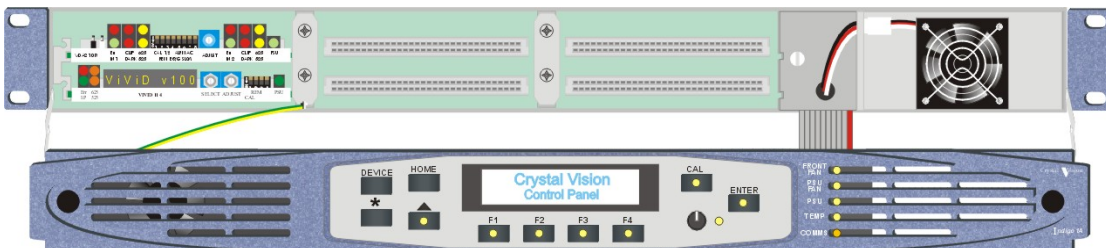


The Indigo 1AE Crystal Vision frame



The Indigo 1/1SE Crystal Vision frame

The 1AE version has an active control panel built into them that remains forward facing allowing panel operation even when the front panel is open.



The Indigo 1AE Crystal Vision frame with front control panel open

There is an easily accessible front fan fitted on a detachable plate in front of the PSU. A second removable fan is fitted at the rear of the front panel on the left.

If the front panel is opened an optical sensor switches the PSU fan to fast operation and the panel mounted fan is switched off. If one fan fails, or operates too slowly, the other fan is automatically switched to full power and an alarm will be raised.

A frame temperature sensor mounted above the top central module position (slot 3) controls fan speed.

There are three cooling modes: normal, quiet and maximum.

With normal cooling both fans run continuously, increasing in speed as the temperature inside the frame goes up.

Quiet mode is intended for a lightly loaded frame in an environment where ambient noise is a concern. When the frame temperature is below approximately 45°C the panel fan is switched off and the PSU fan runs at minimum speed. If the frame temperature goes above 45°C it reverts to normal cooling and goes back to quiet mode when frame temperature falls below 42°C.

In Maximum cooling mode both fans never run below near maximum speed. Fan speed increases to maximum at high frame temperature. This mode is ideal for equipment bays where noise is not a concern.

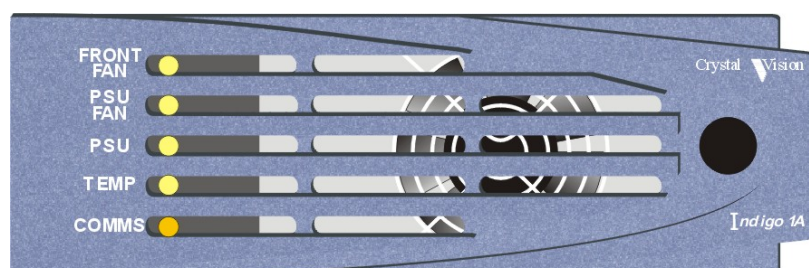
Only one of the fans is essential in normal operation. If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of 40°C.

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 PSU has 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) and the PSU fan speed. The PSU also stores its own serial number in non-volatile memory.

The panel processor regularly receives status updates from the PSU processor about power rails and fan speed. This allows the front panel to update its status LEDs and control the alarm relay. The relay contacts are available on the Remote 2 connector on the rear of the frame.

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



The Indigo 1 LEDs

Five of the LEDs show the status of the front fan, PSU, PSU fan, and frame temperature.

A Comms LED monitors external RS422 activity and will flash amber when there is external communications with the frame.

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

2 Installation

2.1 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 a power cord that meets the required specification for this product.
Fuses	To avoid fire hazard use only fuses of the type and rating specified.
Service	<p>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.</p> <p>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.</p> <p>On no account should the unit be powered whilst any covers are removed.</p>
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	<p>To comply with EMC regulations the following guide lines should be observed:</p> <p>Do not operate this unit for extended periods with the front panel open.</p> <p>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.</p> <p>Do not operate the equipment with covers or panels removed.</p>
General	<p>To avoid electric shock do not operate this product in wet or damp conditions.</p> <p>To avoid injury or fire hazard do not operate this product in an explosive atmosphere.</p> <p>Only use this rack in conjunction with Crystal Vision modules designed for that purpose.</p>



The Indigo 1 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.

2.2 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 1 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 of the fans 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.

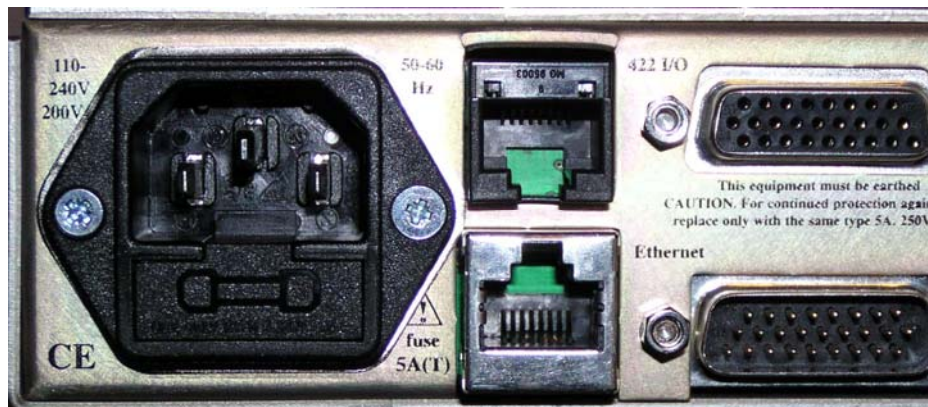
2.3 Frame connectors

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

Connector	Function	Notes
IEC	PSU AC input	85 to 264V, fuse under flap
Dual flying IEC	PSU AC inputs Indigo 1-DP only	85 to 264V, fuse on PSU modules.
Remote 1	GPI and DC out	Refer to pinout tables
Remote 2	GPI, serial/Statesman, upper PSU alarm relay and DC out	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

Note: Ethernet support will be added in the near future.

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



Indigo 1 rear connectors

Connecting mains cables

Indigo 1

The Indigo 1 frame is powered by connecting a power cord to the IEC socket.

Ensure that it has a minimum current rating of 6A, is fitted with an IEC 320 female connector, includes a protective ground connection and meets relevant local safety standards.

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.

Indigo 1-DP



Indigo 1-DP rear connectors

The Indigo 1-DP frame is powered by connecting two power cords to the flying IEC sockets.

Ensure they have a minimum current rating of 6A and are fitted with an IEC 320 female connector, which includes a protective ground connection and meets relevant local safety standards.

Note: The mains inlets are not fused. Mains fuses for each inlet are situated on the power supply modules. Access to these fuses requires the removal of the power supply module. 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.

2.4 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 RMT 1 and RMT 2. 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.

RMT 1 and RMT 2 connections (26 way high density D-type socket)

Pin number	RMT (Remote) 1- function	RMT (Remote 2) - function
1	+5.3V +/- 10% dc out	Slot 3 GPI 'e'
2	Frame GND	Slot 3 GPI 'f'
3	Slot 5 GPI 'a'	Slot 4 GPI 'e'
4	Slot 4 GPI 'a'	Slot 4 GPI 'f'
5	Slot 3 GPI 'a'	Relay close on fault on PSU
6	Slot 3 GPI 'b'	Frame GND
7	Slot 2 GPI 'a'	RX+ RS422 - link bus i/p
8	Slot 1 GPI 'a'	TX- RS422 Statesman o/p
9	Slot 1 GPI 'b'	TX+ RS422 Statesman o/p
10	Slot 6 GPI 'a'	Slot 2 GPI 'e'
11	Slot 6 GPI 'b'	Slot 2 GPI 'f'
12	Slot 5 GPI 'b'	Slot 5 GPI 'e'
13	Slot 4 GPI 'c'	Slot 5 GPI 'f'
14	Slot 4 GPI 'b'	Relay common on PSU
15	Slot 3 GPI 'c'	+5.3V +/- 10% dc out
16	Slot 2 GPI 'b'	RX- RS422 – link bus i/p
17	Slot 2 GPI 'c'	TX+ RS422 – link bus o/p
18	Slot 1 GPI 'c'	RX+ RS422 Statesman i/p
19	Slot 6 GPI 'c'	Slot 1 GPI 'e'
20	Slot 6 GPI 'd'	Slot 1 GPI 'f'
21	Slot 5 GPI 'd'	Slot 6 GPI 'e'
22	Slot 5 GPI 'c'	Slot 6 GPI 'f'

23	Slot 4 GPI 'd'	Relay open on fault on PSU
24	Slot 3 GPI 'd'	N/C
25	Slot 2 GPI 'd'	TX- RS422
26	Slot 1 GPI 'd'	RX- RS422 Statesman i/p

Note: The total current available from the 5.3V dc outputs is limited to approximately 1.5Amps. To maintain EMC compliance only good quality screened cable assemblies should be used.

Power supply relay connections

The power supply module has a 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:

Description	Pin number
relay common	Remote 2 pin 14
open on fault	Remote 2 pin 23
close on fault	Remote 2 pin 5

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

RJ45 422 Statesman/Link Bus IO connector

Pin number	Function
1	RX+ RS422 Statesman i/p
2	RX- RS422 Statesman i/p
3	TX+ RS422 Statesman o/p
4	TX+ RS422 – Link Bus o/p
5	TX- RS422 – Link Bus o/p
6	TX- RS422 Statesman o/p
7	RX+ RS422 – Link Bus i/p
8	RX- RS422 – Link Bus i/p

Note: These signals are also available on the RMT 2 connector.

Note: TX-Link Bus o/p and RX-Link Bus i/p are defined on the boards. This connector can be used to link two frames where one frame is either an active frame or Statesman enabled. Alternatively a REMIND remote control panel can also be connected here and used to control up to two passive Indigo 1/2 frames. If an external RS422 control device is to be used ensure that the controller will drive the RX+ Link Bus i/p with TX+ etc.

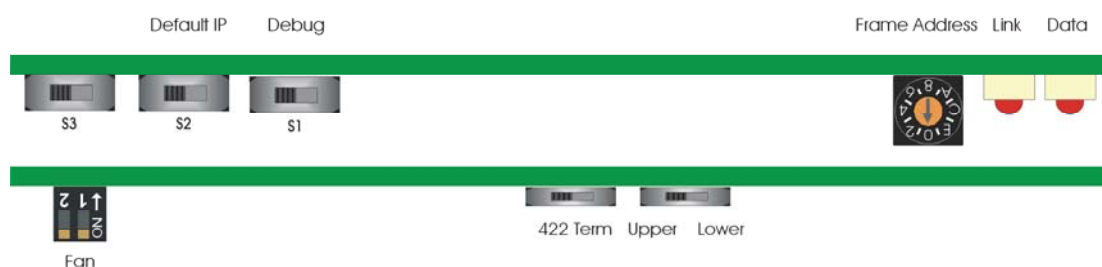
Note: Since the 422 Bus Output connector has no GND pin, two frames or other pieces of equipment which make a connection from the 422 Bus Output should ensure the GND of the two frames are connected together. This will normally occur through the earth pin on the mains connector.

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

2.5 Board settings

On the upper edge of the 1U front panel PCB the config switches and status LEDs can be found.



1U board top-edge switches and LEDs

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.

Piano Switch

Switches one and two configure the cooling fan modes.

Levers 1 & 2	Function	Notes
Both up	Normal cooling	Both fans run continuously, increasing in speed as the temperature inside the frame goes up.
1 down, 2 up	Quiet mode	For use with a lightly loaded frame for low ambient temperature. When the frame temperature is below approximately 45°C the panel fan is switched off and the PSU fan runs at minimum speed. If the frame temperature goes above 45°C it reverts to normal cooling and goes back to quiet mode when frame temperature falls below 42°C.
1 up 2 down	Max cooling mode	In Maximum cooling mode both fans never run below near maximum speed. Fan speed increases to maximum at high frame temperature. This mode is ideal for equipment bays where noise is not a concern.
Both down	Reserved for future use	Operates as normal mode with current software.

Slide switches

Switch	Function	Notes
1	Debug	Normally right, no user function.
2	Default IP address	Normally right. Left set IP address to default 10.0.0.201.
3		Normally right, no user function.

Note: Quiet mode is dependent on PSU 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 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.

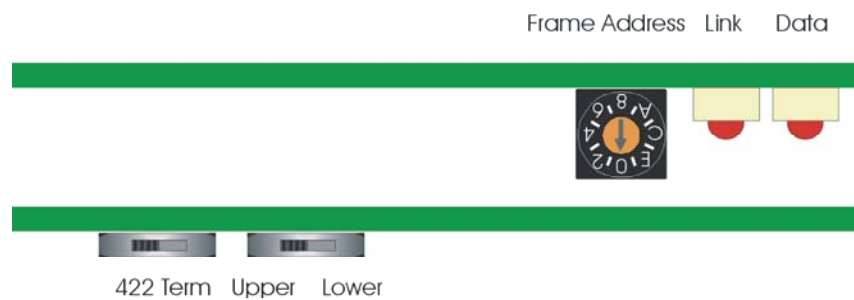
Default IP address (Indigo AE only)

Switch 2 in its left 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.

Terminating the RS422 Statesman chain

The RS422 communication 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 communication termination access the RS422 term/unterm switch at the top of the front control panel by opening the panel.



Statesman RS422 term/unterm switch

To terminate the Statesman RS422 chain move the switch to the left, to unterminate it move it to the right.

Note: Passive panels do not have a term/unterm switch and the second panel PCB (shown at the top).

2.6 Controlling two frames from one panel

An active control panel or REMIND remote active panel can control up to two frames of cards by coupling the frame link bus ports of the two frames. The two frames do not need to be the same type so any combination of Indigo 1, Indigo 2 or Indigo DT can be used. The only exception to this is the Indigo 4 frame, which cannot be linked to other frames, as the card count will exceed the maximum. Linking two frames in this way constitutes a frame pair so one frame must be set to its upper slot address range and the other to its lower address range. One frame in the pair must be an active frame i. e. has an active control panel or be Statesman capable, although either frame can be set to be the upper or lower address.

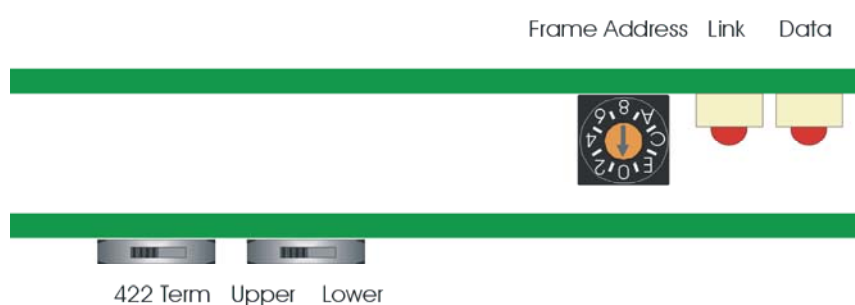
An important thing to note is that there must be only one active panel to a frame pair i.e. one active Indigo 1AE or 1SE frame, the second frame must be passive. If the Indigo REMIND remote control panel is used both frames in the pair must be passive. Connecting together two active frames will cause the processors to clash and give erroneous messages.

- A frame pair must consist of one active frame and one passive frame.
- Two passive panels must be used with a REMIND remote panel.

Note: If a frame pair has been established solely for Statesman control, one of the frames can have a Statesman panel and the other a passive panel.

A passive frame pair can be Statesman controlled via a REMIND control panel.

The two frames can be up to 10m apart depending on cable type and ambient electrical noise.



Slot number range

The position of the two-position slide switch labelled Upper / Lower on the top edge of the main front panel PCB must be placed in the Lower position for one frame and in the Upper position for the other. For example it could be set to 'Lower' position for the Indigo 1AE frame and 'Upper' for an Indigo 1 or Indigo 2 frame.

The number of modules reported to the active display includes the PSUs and front panel/frame as the Indigo front panel PIC and the power supply have an address and are treated as modules. Refer to the address range table in chapter 2.10 'Operating the active panel' for more information.

The two frames should be connected so that control can pass from one frame to the other using an RS422 serial link.

Note: The switch will only have an effect the next time the front panel is powered up.

Frame linking configurations

This can be accomplished with a special cable linking the Remote 2 connectors or by using a standard 4-pair CAT-5 patch cable linking the '422 I/O' connectors.

Using a CAT 5 patch cable

Active-Passive frame pair

A CAT-5 cable (TIA/EIA 568A CAT-5 PATCH) is plugged in the connectors labelled '422 I/O' on each frame.

REMIND-Passive frame pair

This combination will require two CAT-5 cables and a RJ45 splitter/doubler.



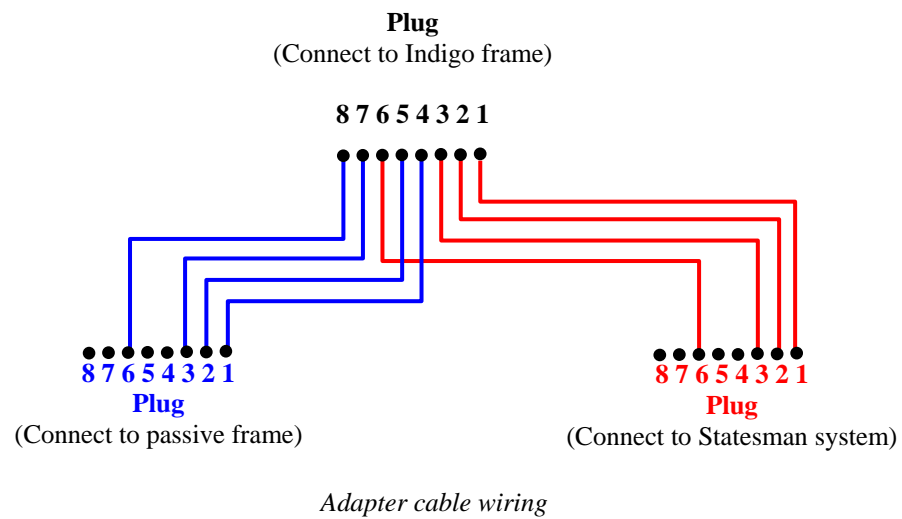
Commercially available RJ45 splitter/doubler

Depending on the relationship of the frames to each other the splitter/doubler can be placed on the rear of the REMIND panel with a CAT-5 cable to each frame, or on the rear of the first frame so the REMIND and frames can be connected 'daisy-chain' fashion.

Frame combinations with Statesman connection

Due to the compact nature of the 1U frame the Statesman and frame link buses share the same RJ45 rear frame connector. Because of this, special care must be taken when making certain combinations of interconnected frames.

There are two main criteria to be considered when linking a number of active frames and passive frames to a Statesman control system. First, all passive frames must be in combination with an active frame or panel as a frame pair. Second, only the Statesman wiring can be 'daisy-chained' between active frames. A passive frame will ignore the Statesman commands but the frame link bus must not be connected across frame pairs due to processor clashing. This isolation between the Statesman bus and frame link bus can be achieved by the use of a commercially available RJ45e economiser or adapter cable.



Commercially available CATe economiser

Using Remote 2 connectors

A special cable is connected between the 'Remote 2' D-Type connectors of the two frames.

The cable required uses two female 26 way high density D-Type sockets. These should be connected with screened twisted pair cable containing two pairs. All the wiring is pin to pin. Pins 16 and 7 should use one twisted pair, pins 17 and 25 the other. The screen should be connected to pin 6 on both connectors.

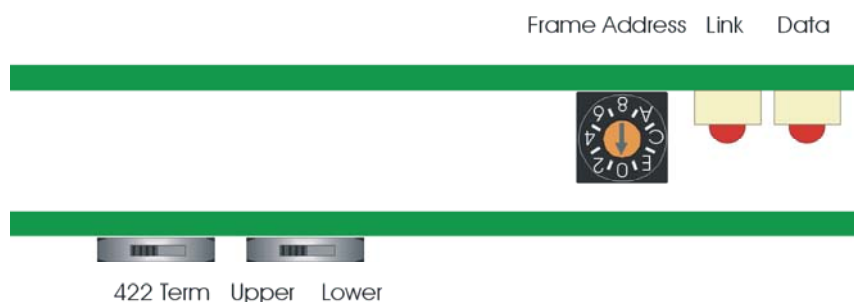
Frame link cable connections

Signal	Female 26 way high density 'D' type plug pin No		Female 26 way high density 'D' type socket pin No	
GND	6 / Shell		6/ Shell	
PBRX +	17	Twisted Pair	17	
PBRX -	25		25	
PBTX +	7	Twisted Pair	7	
PBTX -	16		16	

To ensure continued EMC compliance it is recommended to use high quality shielded twin pair cable for RS422 cabling.

2.7 Setting frame addresses

The frame address, which only relates to an active or Statesman (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 address of a frame pair is set by its non-passive panel.



Indigo active/remote/Statesman panel hardware settings – Frame address

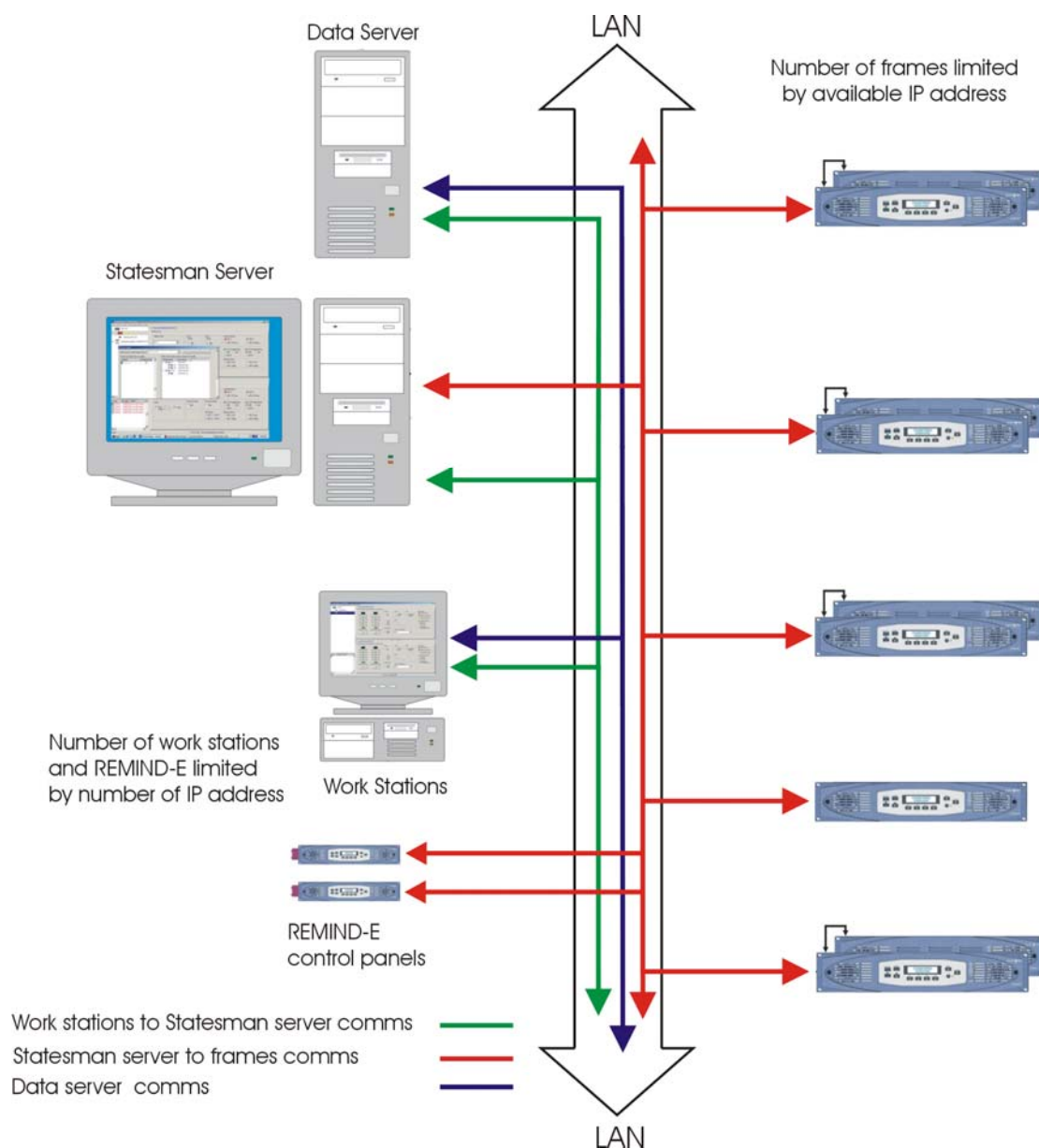
Note: Passive panels do not have a Frame Address switch.

	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.

2.8 Ethernet control

The Indigo 1AE and 1SE series of frames are provided with Ethernet control. 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 over the Ethernet of Indigo frames

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. 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.

Crystal Vision

Indigo

Software compiled on Fri Feb 6 12:43:09 GMT 2009
Frame serial number set to: 0,23,56

Board is type: Indigo_panel (or number 1000)

Board IP address is 10.0.0.111
Board Netmask is 255.255.255.0
Board MAC Address is 00:50:C2:26:CE:2B
System hostname is uCLinux

Crystal Vision board name is Gary's frame

Frame specific status is as follows:

Hardware State
Hex Switch set to: 0
Jumpers set to: 03
Piano switch set to: 03

Licenses
Found a License for SNMP

Found data for lower address range frame PIC.

Upper PSU status	Upper PSU OK.
Lower PSU status	Lower PSU OK.
PSU fan status	PSU fan OK
Frame fan status	Frame fan OK
Frame front status	Frame Front open
Frame type	Indigo 2A
Number of PSUs expected	2 PSUs
Frame temperature	026° C
Frame issue	3
Frame mod level	0
Frame serial number	56-23-00
Frame software version	1.4

Unable to find data for upper address range front panel.

Found data for lower address range upper PSU PIC.

PSU type	PSU-160i
PSU issue	3
PSU mod level	0
PSU serial number	40-07-00
PSU software version	1.2

Found data for lower address range lower PSU PIC.

PSU type	PSU-160i
PSU issue	3
PSU mod level	0
PSU serial number	83-16-00
PSU software version	1.2

Unable to find data for upper address range upper PSU.

Unable to find data for upper address range upper PSU.

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 and verify that the correct frame is being communicated with.

Status

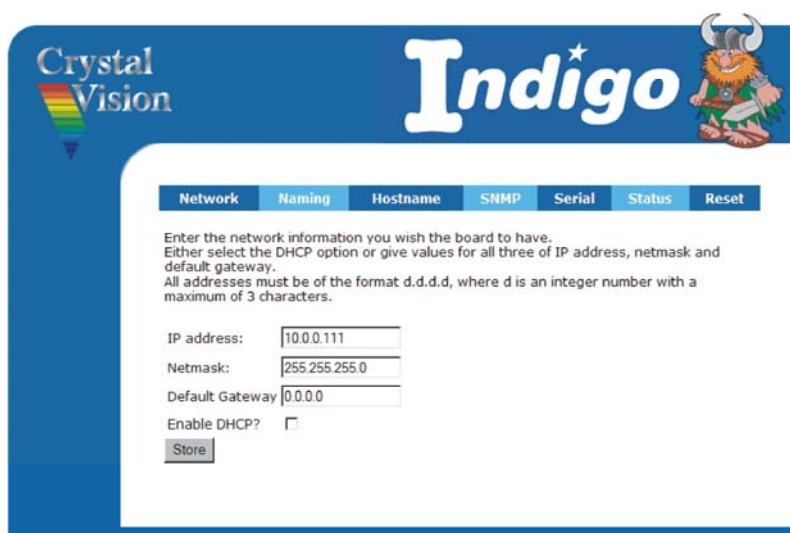
The status page gives an overview of the frame and its power supplies. The information that can be found here includes general information about the network attributes, frame name and serial number etc plus more frame specific information like internal temperature, fan status and PSU type. Further information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

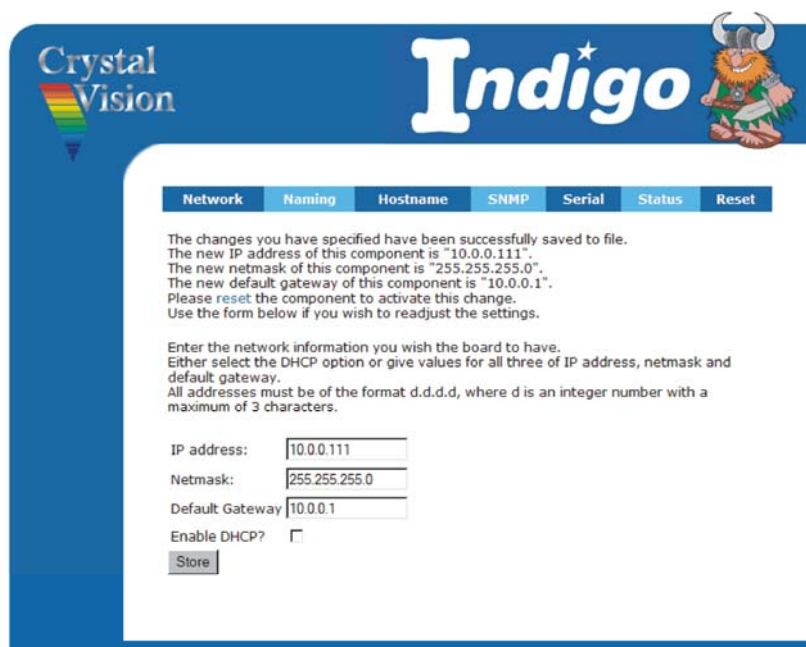
From this web page you are able then to change the IP address manually or automatically if DHCP is available. A frame serial number may also be entered.

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 four 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 is likely to result in their fracture.



The screenshot shows the 'Indigo' web interface with the 'Network' tab selected. A confirmation message states that changes have been saved, including a new IP address of 10.0.0.111, a netmask of 255.255.255.0, and a default gateway of 10.0.0.1. It instructs the user to use the form below to readjust settings. The form includes input fields for IP address, Netmask, and Default Gateway, all containing the same values. There is an unchecked checkbox for 'Enable DHCP?' and a 'Store' button.

Confirmation Window

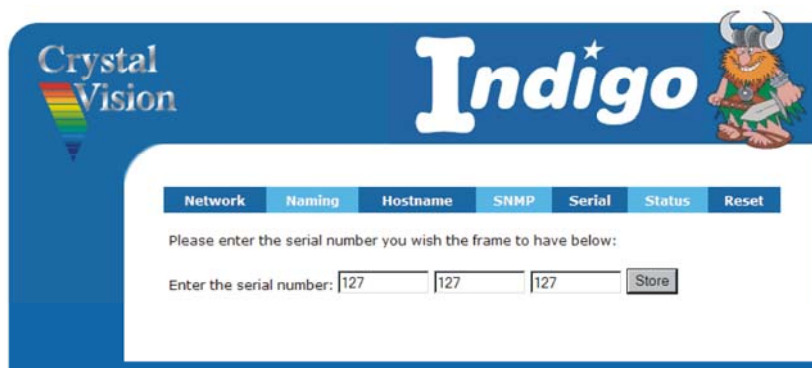
Should incorrectly formatted information be added, an error dialogue box will be displayed indicating the likely cause of the errors.

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; this will be 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.

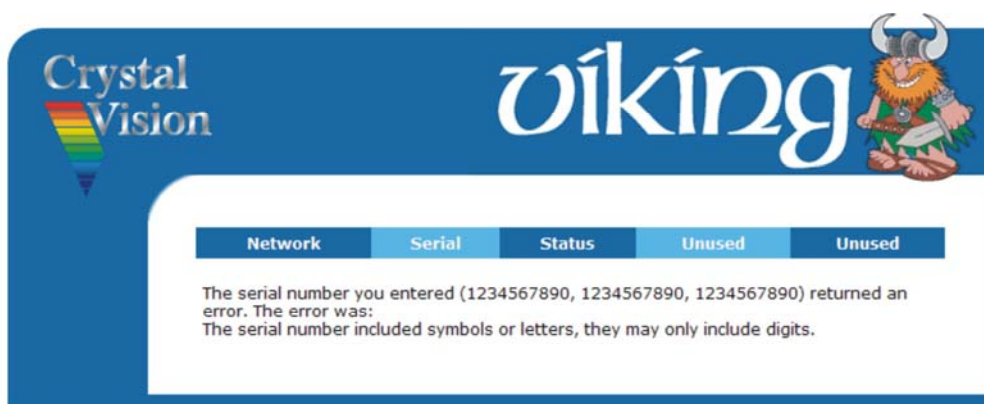
From the Status window select Serial. The following box will open.



The screenshot shows the 'Indigo' web interface with the 'Serial' tab selected. It prompts the user to enter a serial number. The form consists of three input fields, each containing the number '127', followed by a 'Store' button.

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 with up to 20 characters and no spaces.



Serial number successfully added

Hostname

A **hostname** (occasionally also known as 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.

The screenshot shows the 'Indigo' web interface with the 'Hostname' tab selected. The interface has a blue header with the 'Crystal Vision' logo and the 'Indigo' title. Below the header is a navigation bar with tabs: Network, Naming, Hostname, SNMP, Serial, Status, and Reset. The main content area contains instructions: 'Enter the hostname you wish the board to have. The name must be between 1 and 63 characters long, and consist only of alphanumeric characters and hyphens. Additionally, it cannot start or end with a hyphen.' Below this is a text input field labeled 'Hostname:' containing the text 'juClinux'. A 'Store' button is located below the input field.

Hostname window

Reset

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

The screenshot shows the 'Indigo' web interface with the 'Reset' tab selected. The interface has a blue header with the 'Crystal Vision' logo and the 'Indigo' title. Below the header is a navigation bar with tabs: Network, Naming, Hostname, SNMP, Serial, Status, and Reset. The main content area contains the instruction: 'Click the button below to reset the frame:'. Below this is a button labeled 'RestartFrame'.

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 1AE 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

2.9 SNMP agent

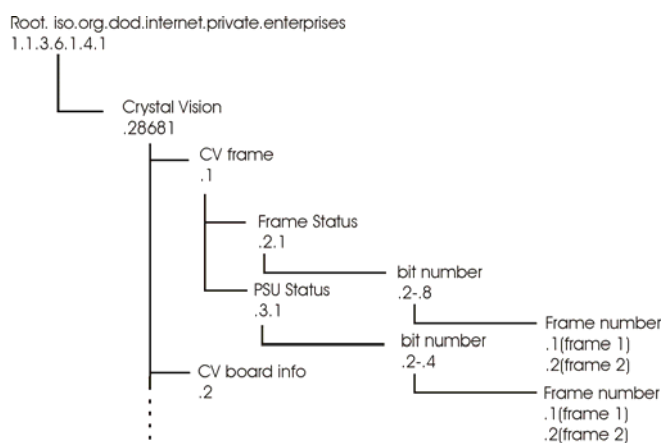
The Indigo 1AE frame comes with a pre-installed SNMP agent that can either report the status or generate traps on a status change of the PSU and frame systems. These SNMP traps can then be used to trigger alarms for example say when a signal has been removed, video standard changed or any of the many 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, in this case the front panel, to be monitored 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 addresses 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 addresses 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.

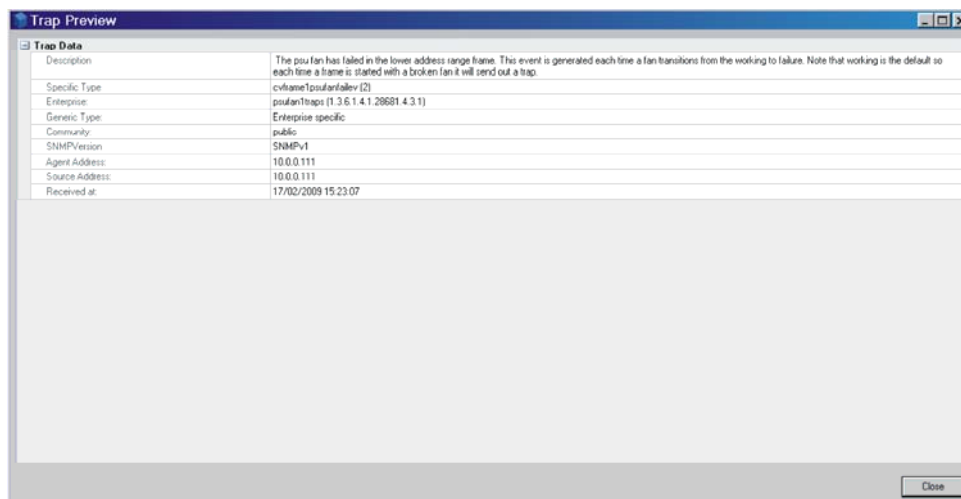
Note: The SNMP monitor allows for two frames to be connected as a frame pair. The second frame will be reported as Unknown when not present.

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. E.g. 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.

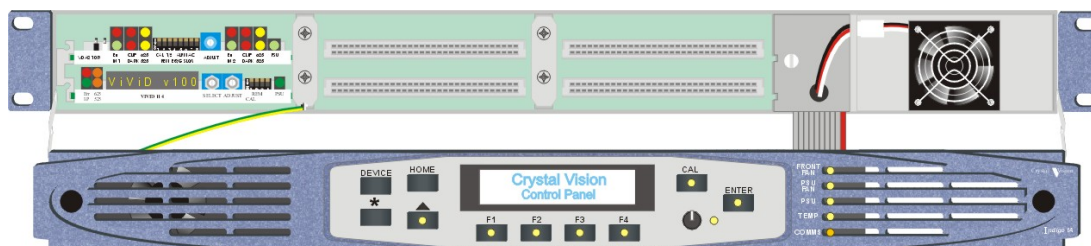


Example of a trap received by the SNMP manager

2.10 Installing Crystal Vision modules

The 1U Indigo frames have six 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 knobs, one on each side of the front panel.

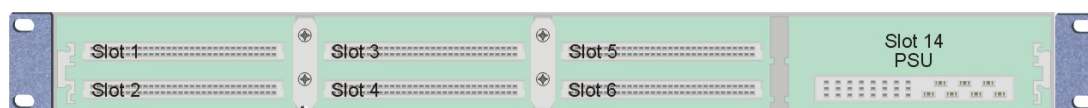


The Indigo 1AE Crystal Vision frame with front control panel open

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 one to six as shown below:



The Indigo 1 frame showing slot numbers

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

Note: The PSU module fits into the PSU slot on the right, which has the reserved location or slot number of 14 to avoid conflict with module slot numbers in both 1U and 2U frames. Slot 14 is also the location of the upper PSU in 2U frames.

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 1 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.

Note: During 2011 the Indigo frames are being introduced with individually retained rear modules. The range of rear modules can be used in both types of frame but may require an additional screw fixing kit. These kits are available from Crystal Vision direct or via your local dealer.



The Indigo 1 frame rear view with EMC covers removed for slots 1 and 2

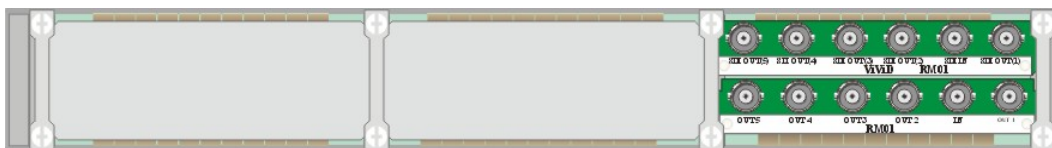
The rear modules are held in place by a retaining bar at each side. These run the height of the frame and provide mechanical support as well as ensuring EMC compliance.

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

Fitting rear connectors

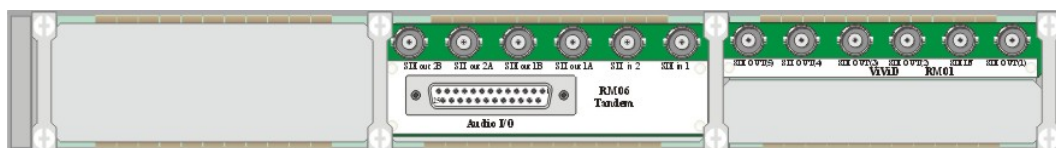
To fit a rear connector, proceed as follows:

- Disconnect the mains power lead 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 1 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.



The Indigo 1 frame showing the use of full and half size EMC covers and the use of single and double rear connectors

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 reapplied.

2.11 Indigo power supplies

The power supply found in the Indigo 1 frame is the 160W rated PSU-160i and in the Indigo 1-DP series a dual power supply containing two PS-80i modules.

As a general rule, only the PSU-75i was fitted in the 1U frames, although the PSU-150i may also have been used. On its introduction the PSU-160i has superseded both the PSU-75i and PSU-150i. A dual power supply module is fitted to the Indigo 1-DP frame series only.



PSU-160i - top view



Dual PSU module

Note: The Indigo PSUs are **not** compatible with similar PSUs used on FR2AV and FR1AV Frames.

Indigo 1-DP power supply module

The Indigo 1-DP is fitted with a pair of removable slim-line 80 Watt power supply modules. These modules fit side by side in the place of the single PSU module in an adapted Indigo 1 frame.

Left/Right conversion

For a pair of PS-80i power supply modules to fit side by side in the 1U power supply bay it is necessary for them to be handed i.e. a power supply module set for the right hand position will not fit into the left-hand and vice versa. Reconfiguring a PS-80i to its opposite handing

requires the power supply module to be repositioned on its carrier board. The removal of two fixing screws will allow this repositioning of the module.



Underside of PS-80i showing alternate fixing positions

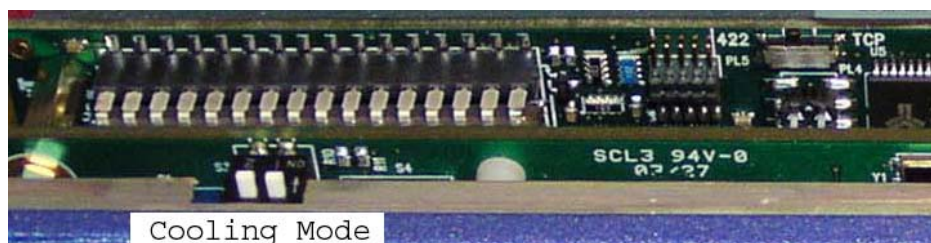
Monitoring power supply status

A signal from the power supply is routed through the frame wiring to the front panel electronics. This allows an indication by the PSU LED of the status of the power supply fitted.

A faulty condition is indicated when the corresponding LED is red and a normal condition when it is green/yellow.

2.12 Select the cooling mode

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



Indigo 1/IAE/ISE front panel hardware settings – cooling mode

The three modes are normal, quiet and maximum cooling.

Switches 1 and 2 of the two-position DIL switch control the three cooling modes as follows:

Levers 1 & 2	Function	Notes
Both up	Normal cooling	Both fans run continuously increasing in speed as the temperature inside the frame goes up.
1 down, 2 up	Quiet mode	For use with a lightly loaded frame for low ambient temperature. When the frame temperature is below approximately 45°C the panel fan is switched off and the PSU fan runs at minimum speed. If the frame temperature goes above 45°C it reverts to normal cooling and goes back to quiet mode when frame temperature falls below 42°C.
1 up, 2 down	Max cooling mode	In Maximum cooling mode both fans never run below near maximum speed. Fan speed increases to maximum at high frame temperature. This mode is ideal for equipment bays where noise is not a concern.
Both down	Reserved for future use	Operates as normal mode with current software.

Note: Quiet mode is dependent on PSU/fan not being in an alarm state. Only one of the fans 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.

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.

Operating the active panel

The Indigo active control panel supports a panel lockout feature. A password will be required to use the panel when it has been 'locked' to prevent unauthorised access.

Warning: It is **ESSENTIAL** that the clear-password procedure in the active panel setup in the Appendix is followed so that any old or unknown passwords are reset to all spaces prior to using the locked mode. If the panel is locked without knowing the password, the panel/frame will have to be power cycled to exit the locked mode.



Indigo 1AE active panel controls and LEDs

The active panel on the Indigo 1AE maintains a list of controllable modules, which is accessed by pressing the 'DEVICE' button. The display will give information about the number and location of all remote-enabled cards that are available.

Caution: Older modules that do not respond to panel interrogation cannot be controlled, unless updated with a firmware update (if available).

The reported number of cards available includes the PSU and front panel as the Indigo front panel PIC and the power supply each have an address and are treated as modules.

Slot numbers

In Indigo frames, the slot or location numbers are determined by the position of the card in the frame, and by the two-position address range switch on the top edge of front panel PCB labelled Upper/Lower. Refer to section 2.4 'Controlling two frames from one panel' for details of the address range switch.

Note: The switch will only have an effect the next time the front panel is powered up.

The address range setting also affects the addresses of modules, panels and PSUs as the following table shows:

Device	Address in 1 st frame	Address in 2 nd frame	Notes
Modules	1.01 to 1.06	2.01 to 2.06/2.12*	Press Enter for module Home menu
Indigo PIC	1.00	2.00	Press Enter for frame s/n and temp
PSU	1.14	2.14/2.15*	Press Enter for PSU s/n and type

Note: * The second frame can be an Indigo 2 containing up to 12 cards and two power supplies.

Turn the panel rotary knob to scroll through the available modules. Press ENTER to display information for the selected module.

The Indigo PIC '1.00' and '2.00' modules will display the air temperature, in degrees Celsius, inside the frame above slot 3 where the temperature sensor is located.

Node numbers

Whilst most Crystal Vision cards have their unique card location address assigned automatically, older cards and frames use a 'node' switch on each card.

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

For compatibility reasons, the Home menu for each module may display the module's node number (one less than its location or slot number).

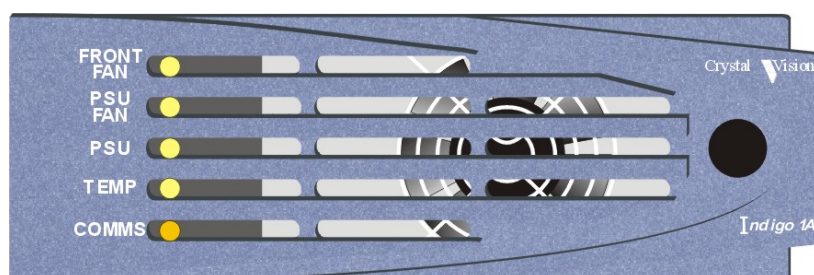
Please refer to the Appendix to find out how node numbers relate to slot numbers in particular frames and frame combinations.

Further details of control panel operation can be found in the Indigo Control Panel User Manual and details of module operation can be found in the documentation supplied with each module.

3 Trouble shooting

Reading LED status and active display messages

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



The Indigo 1 LEDs

The following LED status indications and/or Indigo 1AE messages may be seen:

LED	Colour	Indigo 1AE message	Notes
Front Fan	Unlit	None	Quiet mode/Door open
	Yell/Grn	None	Normal operation
	Red	Front fan speed low	Change the panel fan (single fan)
	8 sec flashing	Dual fan fault	Change the faulty panel fan (dual fan)
PSU Fan	Yell/Grn	None	Normal operation
	Red	PSU fan speed low	Change PSU fan
PSU	Yell/Grn	None	Normal operation
	Red	PSU fault	Change PSU
None	None	Front open	Close panel
Temp	Yell/Grn	None	Normal operation
	Red	FRAME TOO HOT	Ambient temperature too high/fan fault
Comms	Unlit	None	Press Device in Statesman mode for comms status
	Flash amber	None	

Note: If the front panel is open, the Front Fan LED will be unlit.

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.

When a fault is cleared, the corresponding LED (if appropriate) will return to normal and an active panel will display 'fault cleared'. Press an active button to clear the display. The active

front panel can also be used to interrogate the status of the front panel and installed PSUs by pressing Enter when those devices are listed in Device view.

PSU relays

Each PSU contains a relay, the contacts of which are brought out to the Remote 1 connectors. This relay is under frame control and will change state whenever a fault is present. These contacts can be used to operate external indicators as desired.

Please refer to the Connector pinout section for more details.

Note: The red LED built into the front of the vertical PCB on the LHS of the PSU will flash repeatedly (on for one second and off for one second) if there is no speed fan signal present on the connector SK1 (the front LHS of the PSU). This will occur when the PSU Fan assembly is removed or if the PSU fan stops. When the fan speed signal is present the LED is unlit. 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 2.6 for further details.

Panel diagnostics

The panel status/test will provide the following tests or information:

- Function test of all panel LEDs
- Comms mode – 422 or TCP and shaft encoder test
- Panel key test and frame/panel address (Hex switch position) readout

To enter this menu press the CAL key as the panel powers up

Menu 1	Comment
Testing LEDs	Each LED is illuminated in sequence from left to right

When this test terminates, the PSU and shaft encoder status is displayed:

Menu 2	Comment
Comms mode	SHAFT
422 or TCP	00 - 999
	Rotate the shaft encoder to test its function

Note: Comms mode is the state of the RS422/TCP switch at the rear of the control panel. This switch should be left in the 422 position.

Press the CAL button again to move on to the switch and panel address test.

Menu 3	Comment
KEYS and HEX switch	Press each key to test function
F4 pressed	addr 00
	Hex switch is read and setting displayed

Power cycle the panel to exit the diagnostic menus.

Frame diagnostics

The frame diagnostics display will show the following information:

- The status of the panel communications mode
- First frame node

To enter this menu, press the DEVICE key when in Statesman mode.

Status menu	Comment
Comms* = 422/TCP	Shows Comms mode
Node = 01 Comms* = xxxx	First frame node and Comms status

Note: Comms (422/TCP) reflects the state of the RS422/TCP switch at the rear of the control panel. This switch should be left in the 422 position. See Reading Comms mode and status below for further help.

The first expression in the bottom line gives the Statesman rack address = hex switch setting + 1.

Press CAL to exit the Frame Diagnostics menu.

***Reading Comms mode and status**

The top line indicates the mode of the external Comms connection.

Comms = 422 (tcp ok)	Comms is in 422 mode, TCP is available as a service. If TCP mode is the only method of Comms to the frame, this indicates the network connection has not been set up
Comms = TCP active	Comms in TCP mode. Network connection ok
Comms = net failed	Network connection failure
Comms = 422	Comms in 422 mode. TCP is not available as a service
Comms = TCP n/a	TCP mode selected but unavailable in this software version

The second expression in the bottom line provides further Comms status with four character positions, Comms = xxxx, each of which can be either 'y' or 'n'.

Character position	Meaning when 'y' appears in given position
1	y = valid Comms from PC received by front panel
2	y = Comms to PC transmitted from panel
3	y = valid Comms received from boards by front panel
4	y = Comms transmitted from panel to boards.

Example

A frame containing boards, but not connected to a PC could therefore have the display:

Comms [mode] =422

node = 03 Comms [status] =nnyy

3.1 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

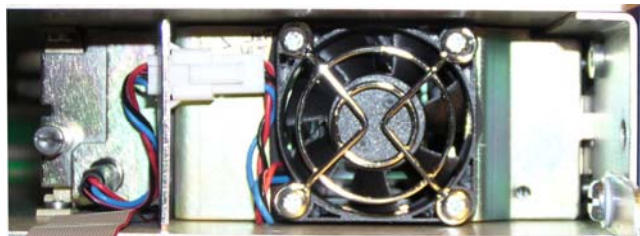
The PSU-160i and Dual PSU power supplies can be inserted and removed while the system is powered without damage. However, this will result in loss of frame power.

Note: The Indigo 1-DP can have a single power supply removed without loss of frame power.
To gain access to the Indigo PSUs proceed as follows:

- If possible, power down the frame
- Pull down the front panel using the black knobs at either side of the panel
- Release the captive screw to the left of the PSU fan
- Remove the fan assembly by applying sideways pressure on the fan assembly outwards and towards the right hand frame side

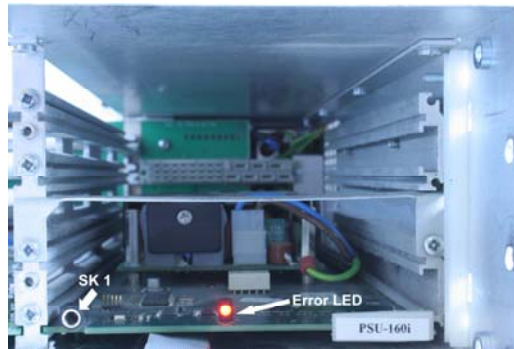
Note: Take care not to damage the panel ribbon cable when removing the fan assembly.

Once the fan assembly has been pulled backwards to free the fan connector plug, the PSU fan will stop and the front panel PSU FAN LED will change from green to red.



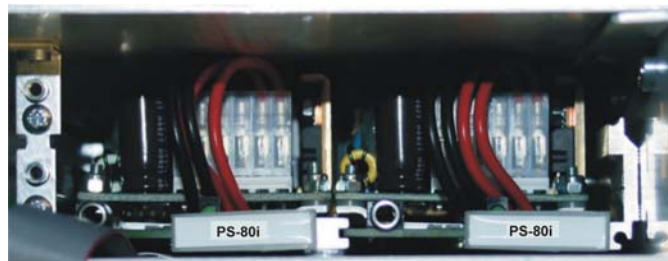
The PSU fan assembly

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 if there is no fan speed signal present on the fan connector SK1 caused by the fan removal.



PSU-160i – front view

The error LED will light up continuously if power rail levels are outside operational limits. When the fan speed signal is present and power rails are normal the error LED is unlit.



The Indigo 1-DP has two PS-80i modules side by side.

Either PS-80i module can be removed independently without loss of frame power.

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 not to damage the panel ribbon cable

Caution: There are no user serviceable parts inside the power supply module covers. The safety covers should not be removed even when the module is disconnected.

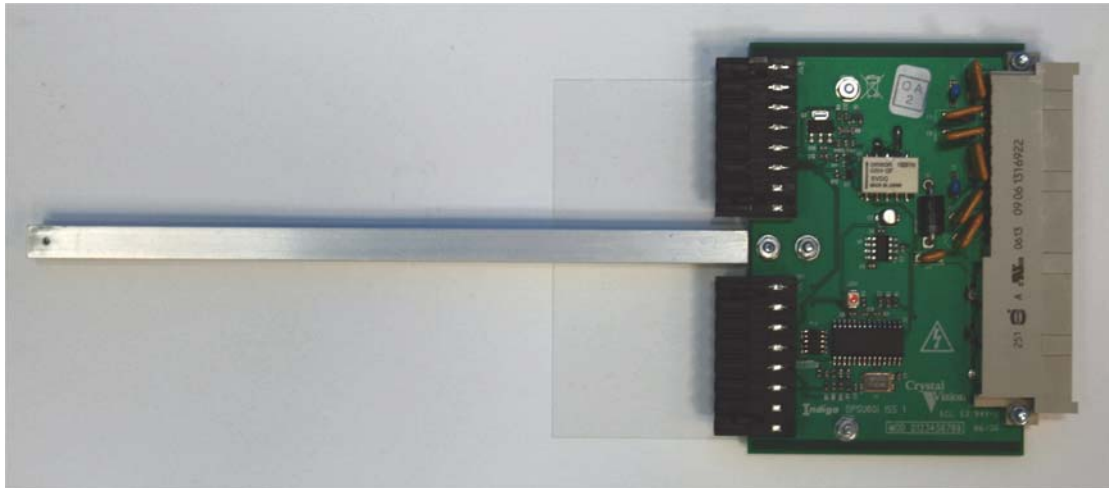
Inserting a PSU

To insert a PSU proceed as follows:

- Offer up the PSU to the frame guide rails – it may help to turn the handle fully outwards to clear the panel hinge
- Carefully push the PSU all the way into its socket
- The PS-80i module is handed and can only be fitted in its correct position. See Installation chapter, left/right side conversion.

Dual power supplies mother-board.

The PS-80i power supply modules are mounted into the Indigo 1-DP frame by way of a carrier board. This carrier board which remains in situ contains the CPU, alarm relay and low voltage fusing for the frame bays. There are no user adjustments on this carrier board so removal should not normally be necessary.



Dual PSU carrier board assembly

A pin at the front end of the central runner retains the dual power supply carrier board. This pin is press fitted into a hole in the chassis. To remove the carrier board lift the front of the runner to disengage the pin and pull forward to unplug and remove.

Refit in reverse ensuring that the pin is fully located into the hole in the chassis.

Fitting the fan assembly

To replace the PSU fan assembly proceed as follows:

- Offer up the fan assembly ensuring that the lug fits into the slot in the right hand side of the frame
- Carefully move the fan assembly into position ensuring that the PSU fan jack fits into the PSU jack socket (SK 1)
- Take care not to damage the panel ribbon cable
- Tighten the captive screw to the left of the PSU fan - it need only be hand tight
- 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 whilst 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 from the frame
- Remove the PSU fan assembly as shown in the preceding section
- Undo the 3-way connector which is attached to 3 wires on the fan
- 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
- Plug in the 3-way connector from the new fan
- Replace the PSU fan assembly as shown in the preceding section
- Reconnect the power supply cord

If the frame is powered, the PSU fan should now be operating and the PSU FAN LED should be green.



PSU fan showing 3-pin connector and finger guard

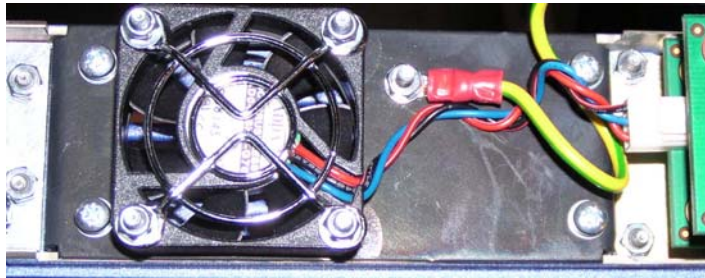
Replacing a front panel fan

To replace a front panel fan proceed as follows:

Single fan front panel

- If possible disconnect the power cord
- Open the front panel - the display on an active panel will indicate 'Front open'
- 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 3 wires on the fan from the front panel PCB labelled PL6
- Using a suitable spanner remove the four M3 nuts that hold the fan and fan's finger guard on a mounting plate which is on 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, ensure the fan is fitted with its air flow direction the same as the removed fan - be sure to fit the finger guards on the outer side of the fan
- Reconnect the 3-way connector on the fan into the front panel PCB connector labelled PL6
- Close the front panel and reconnect the power supply cord

The front panel fan should be operating and the FRONT FAN LED should be lit green. The display on an active panel will indicate 'Fault cleared'.

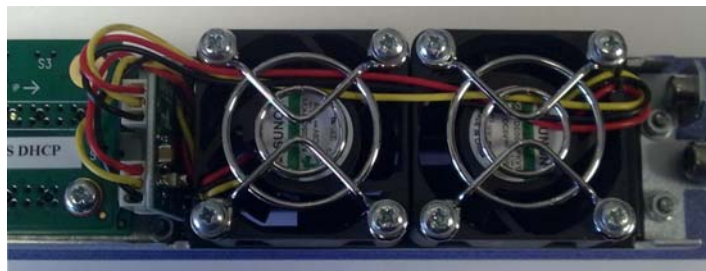


Front panel fan showing 3-pin connector and finger guard

Dual fan front panel

- If possible disconnect the power cord
- Open the front panel - the display on an active panel will indicate 'Front open'
- If the frame is powered, the fan on the front panel will stop and the PSU fan will automatically speed up to maximum speed
- Disconnect the faulty fan from the fan mux PCB
- Using a screwdriver, remove the four screws that hold the fan and fan's finger guard on a mounting plate which is on the front panel
- Remove the fan by pulling away from the panel. For the fan furthest from the PCB it will be necessary to remove the finger guard from the other fan to release the wiring.
- Replace the fan with a Crystal Vision supplied replacement part to ensure adequate cooling and continued fire protection. Ensure the fan is fitted with its air flow direction and orientation the same as the removed fan - be sure to fit the finger guards on the outer side of the fan and that the wiring is between the fan body and finger guard.
- Reconnect the 3-way connector to the fan mux PCB connector
- Close the front panel and reconnect the power supply cord

The front panel fan should be operating and the FRONT FAN LED should be lit green. The display on an active panel will indicate 'Fault cleared'.



Front panel dual fans showing 3-pin connectors and finger guards

Replacing the mains input fuses

This information refers to all frames except the Indigo 1-DP.

The mains input fuse is fitted inside the IEC 320 connector 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 the power cord from the rear of the frame
- Using a flat bladed screwdriver or similar tool gently lever out the fuse drawer from the IEC connector using the tab visible at the bottom of the connector depression
- 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 cord



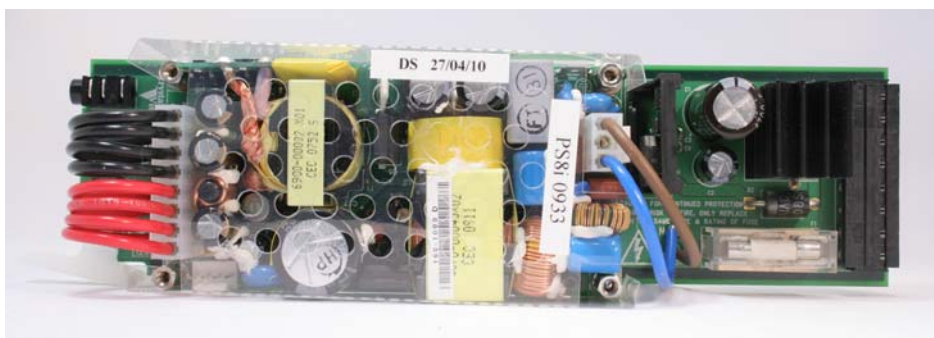
Rear connectors showing IEC mains input and fuse tray with main and spare fuses

If a fuse blows repeatedly this indicates a fault either in the 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).

Indigo 1-DP

The Indigo 1-DP does not have externally accessible mains fuses. These are situated on each of the power supply modules. To service these fuses it is necessary to remove the power supply module from the frame.



PS-80i showing mains fuse

To replace the mains fuse first remove the protective cover. The fuse may then be prised from its carrier with the aid of an instrument such as a flat bladed screwdriver. Take care not to damage any surrounding components or wiring. Once the replacement fuse has been inserted ensure the safety cover is replaced before refitting the module.

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

Software upgrades

The pre-Ethernet ready front panels have their software available on a single EPROM in position U10 on the second (top) PCB. A passive panel does not have an upgradeable EPROM.

To change the EPROM proceed as follows:

- Switch off the power and remove or drop down the front panel
- Remove and retain the 6 screws securing the top panel PCB
- The EPROM can now be accessed and removed from its holder
- Fit the new EPROM ensuring it is placed the correct way round (note the position of pin 1)
- Replace the top PCB using the screws retained, taking care not to bend any of the header pins



Front panel top PCB showing firmware EPROM in the bottom right corner

Note: It is normal for two of the pins on PL2 to NOT mate with its header socket on the main PCB.

The Indigo 1AE and 1SE front panels do not have a removable EPROM. Software upgrades are done via the Ethernet connection. See the Indigo active front panel manual for information concerning remote software loading.

3.2 Frequently asked questions

Why is the display black and/or no LEDs illuminated?

- Check that the 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 and/or the FRAME TOO HOT message is displayed?

- 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 PSU fan

What should I do if the FRONT FAN LED is red or flashing red?

- Check that the front control panel fans are plugged in correctly
- Replace a panel fan if stopped or running slow

Why do some cards not appear in the available cards list?

- Some cards take longer than others to finish their initialisation routines - try waiting at least 30 seconds for all cards to initialise
- Check that any cards with remote/local switches are set for remote control
- Check that any hex node switches are set to zero

The panel is locked and the password is not known. What do I do?

- Ask your system administrator for the password
- Clear the old password as explained in the Active panel setup in the Appendix

Is there a way to check all panel switches and LEDs?

- Hold the CAL button down as the panel powers up to enter the Panel Diagnostics mode

How do I check PSU or RS422 comms status?

- Press the DEVICE key in Statesman mode to display frame diagnostics
- 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 do control panels behave erratically when using a Statesman Hub?

- Check that each control panel has a unique address

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

- Check that the appropriate cabling is connected correctly and is intact.
- Check that the 422/TCP panel switch is in the RS422 position

Can both panels in a frame pair have active (or Statesman) panels?

No, only one frame in a frame pair can have an active front panel

Why does the Home menu not use custom card names?

The rename feature only changes card names as shown in the Device menu

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 does more than one password unlock the panel?

The password is not case sensitive and if a password contains a space then it is assumed that the previous character was the last valid one. If the set-up password was 'a cd' then the following would all pass the test conditions 'abcd' 'ABCD' 'A ' and 'A zz'

Why does the Lock menu not lock the panel when I enter the correct password?

The Lock Panel menu does not require a password to lock the panel. The panel is locked the moment the previous menu (Really lock the panel?) is left by pressing F1 (Yes)

The password is used in the resulting panel lock menu (Locked Password =) to unlock it

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

4 Appendix

4.1 Active panel setup

The control panel supports the use of NVRAM to store product information and a panel lockout feature. A password will be required to use the panel when it has been 'locked' to prevent unauthorised access.

Warning: It is **ESSENTIAL** that the Clear Password procedure is followed and any old or unknown passwords are reset to all spaces prior to using the locked mode. If the panel is locked without knowing the password, the panel/frame will have to be power cycled to exit the locked mode.

To enter the Panel Setup procedure hold the DEVICE, ENTER or any 'F' key down whilst powering the panel/frame. After a few seconds the display will change and the first menu will appear.

Note: **DO NOT CHANGE THE DATA IN ANY MENUS OTHER THAN THE CLEAR PASSWORD MENU (MENU 3)**

Menu 1	Ethernet MAC address:	Comment
	Mac Address Set: 00:50:C2:26:26:C0:0B	This address should be unique on the network that the panel is used. Do not alter this address if you are not sure.

Press ENTER to go to menu 2.

The number of user alarms enabled can be selected as follows:

Menu 2	User Alarms:	Comment
	User Alarms Enabled temp psus fans misc	Rotate the shaft encoder to select alarms enabled (default all enabled)

Press ENTER to go to menu 3.

The front panel has a lock out password, which can be used to prevent unauthorised access. This menu provides a means of changing the password if it has been forgotten.

Menu 3	Clear password:	Comment
	Reset password to: all spaces Yes No	Press F3 to reset the password to all spaces

Press F3 to reset the password or F4 to abort and continue to the next menu.

Menu 4	Company menu:	Comment
	Front Panel Company Crystal Vision	Rotate the shaft encoder to select 'Crystal Vision' etc

Press ENTER to pass over menu 4 and re-boot the panel.

The front panel should now boot up as normal.

4.2 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 1 st frame	Upper address in 2 nd frame
Modules in 2U frames	1.01 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

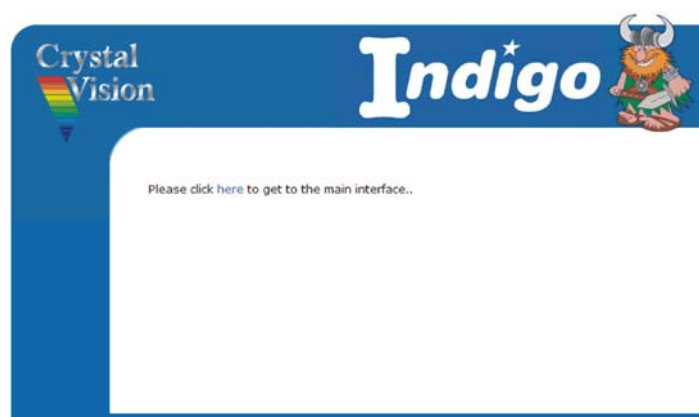
4.3 SNMP Quick Start Guide

Introduction

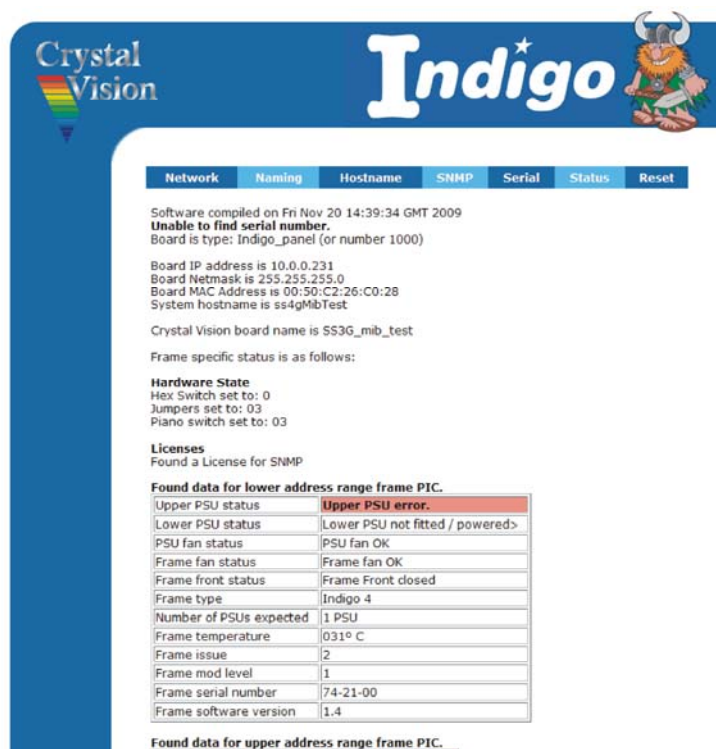
This should provide the information you need to set up and check a Crystal Vision frame for operation with an SNMP manager.

Frame Setup

The frame must have a license 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 'Licenses' section shows "Found a License for SNMP". If no licence is found contact Crystal Vision to get an SNMP license 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.

NO	Name	OID	Syntax	Value
0	enterprises.8072.2.1.1.0	1.3.6.1.4.1.8072.2.1.1.0	Integer	42
1	enterprises.28581.1.1.1.2.12	1.3.6.1.4.1.28581.1.1.1.2.12	Integer	12
2	enterprises.28581.1.1.1.2.17	1.3.6.1.4.1.28581.1.1.1.2.17	Integer	17
3	enterprises.28581.1.1.1.3.12	1.3.6.1.4.1.28581.1.1.1.3.12	Integer	102
4	enterprises.28581.1.1.1.3.17	1.3.6.1.4.1.28581.1.1.1.3.17	Integer	61
5	enterprises.28581.1.1.1.4.12	1.3.6.1.4.1.28581.1.1.1.4.12	Octet String	Unknown board type
6	enterprises.28581.1.1.1.4.17	1.3.6.1.4.1.28581.1.1.1.4.17	Octet String	Smart Switch
7	enterprises.28581.1.1.1.5.12	1.3.6.1.4.1.28581.1.1.1.5.12	Integer	1
8	enterprises.28581.1.1.1.5.17	1.3.6.1.4.1.28581.1.1.1.5.17	Integer	0
9	enterprises.28581.1.1.1.6.12	1.3.6.1.4.1.28581.1.1.1.6.12	Integer	45
10	enterprises.28581.1.1.1.6.17	1.3.6.1.4.1.28581.1.1.1.6.17	Integer	48
11	enterprises.28581.1.1.1.7.12	1.3.6.1.4.1.28581.1.1.1.7.12	Integer	23
12	enterprises.28581.1.1.1.7.17	1.3.6.1.4.1.28581.1.1.1.7.17	Integer	23
13	enterprises.28581.1.1.1.8.12	1.3.6.1.4.1.28581.1.1.1.8.12	Integer	1
14	enterprises.28581.1.1.1.8.17	1.3.6.1.4.1.28581.1.1.1.8.17	Integer	0
15	enterprises.28581.1.2.1.2.1	1.3.6.1.4.1.28581.1.2.1.2.1	Octet String	Frame PIC found
16	enterprises.28581.1.2.1.2.2	1.3.6.1.4.1.28581.1.2.1.2.2	Octet String	Frame PIC found
17	enterprises.28581.1.2.1.3.1	1.3.6.1.4.1.28581.1.2.1.3.1	Octet String	Indigo 4U
18	enterprises.28581.1.2.1.3.2	1.3.6.1.4.1.28581.1.2.1.3.2	Octet String	Reserved
19	enterprises.28581.1.2.1.4.1	1.3.6.1.4.1.28581.1.2.1.4.1	Integer	32
20	enterprises.28581.1.2.1.4.2	1.3.6.1.4.1.28581.1.2.1.4.2	Integer	28
21	enterprises.28581.1.2.1.5.1	1.3.6.1.4.1.28581.1.2.1.5.1	Octet String	Front panel closed
22	enterprises.28581.1.2.1.5.2	1.3.6.1.4.1.28581.1.2.1.5.2	Octet String	Front panel closed
23	enterprises.28581.1.2.1.6.1	1.3.6.1.4.1.28581.1.2.1.6.1	Octet String	PSU fan OK
24	enterprises.28581.1.2.1.6.2	1.3.6.1.4.1.28581.1.2.1.6.2	Octet String	PSU fan OK
25	enterprises.28581.1.2.1.7.1	1.3.6.1.4.1.28581.1.2.1.7.1	Octet String	Panel fan OK
26	enterprises.28581.1.2.1.7.2	1.3.6.1.4.1.28581.1.2.1.7.2	Octet String	Panel fan OK
27	enterprises.28581.1.2.1.8.1	1.3.6.1.4.1.28581.1.2.1.8.1	Octet String	Frame temperature OK
28	enterprises.28581.1.2.1.8.2	1.3.6.1.4.1.28581.1.2.1.8.2	Octet String	Frame temperature OK
29	enterprises.28581.1.3.1.2.1	1.3.6.1.4.1.28581.1.3.1.2.1	Octet String	PSU 1 found
30	enterprises.28581.1.3.1.2.2	1.3.6.1.4.1.28581.1.3.1.2.2	Octet String	PSU 2 not yet found
31	enterprises.28581.1.3.1.2.3	1.3.6.1.4.1.28581.1.3.1.2.3	Octet String	PSU 3 found
32	enterprises.28581.1.3.1.2.4	1.3.6.1.4.1.28581.1.3.1.2.4	Octet String	PSU 4 found
33	enterprises.28581.1.3.1.3.1	1.3.6.1.4.1.28581.1.3.1.3.1	Octet String	Unknown PSU type 0
34	enterprises.28581.1.3.1.3.2	1.3.6.1.4.1.28581.1.3.1.3.2	Octet String	Unknown
35	enterprises.28581.1.3.1.3.3	1.3.6.1.4.1.28581.1.3.1.3.3	Octet String	Unknown PSU type 0
36	enterprises.28581.1.3.1.3.4	1.3.6.1.4.1.28581.1.3.1.3.4	Octet String	PSU 75
37	enterprises.28581.1.3.1.4.1	1.3.6.1.4.1.28581.1.3.1.4.1	Octet String	PSU Problem or PSU unplugged
38	enterprises.28581.1.3.1.4.2	1.3.6.1.4.1.28581.1.3.1.4.2	Octet String	PSU Left slot not secured

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

NO	Name	OID	Syntax	Value
0	enterprises....	1.3.6.1.4.1.8072.2.1.1.0	Integer	42
1	enterprises....	1.3.6.1.4.1.28581.1.2.1.2.1	Octet String	Frame PIC 1 not found
2	enterprises....	1.3.6.1.4.1.28581.1.2.1.2.2	Octet String	Frame PIC 2 not found
3	enterprises....	1.3.6.1.4.1.28581.1.2.1.3.1	Octet String	Unknown
4	enterprises....	1.3.6.1.4.1.28581.1.2.1.3.2	Octet String	Unknown
5	enterprises....	1.3.6.1.4.1.28581.1.2.1.4.1	Integer	0
6	enterprises....	1.3.6.1.4.1.28581.1.2.1.4.2	Integer	0
7	enterprises....	1.3.6.1.4.1.28581.1.2.1.5.1	Octet String	Unknown
8	enterprises....	1.3.6.1.4.1.28581.1.2.1.5.2	Octet String	Unknown
9	enterprises....	1.3.6.1.4.1.28581.1.2.1.6.1	Octet String	Unknown
10	enterprises....	1.3.6.1.4.1.28581.1.2.1.6.2	Octet String	Unknown
11	enterprises....	1.3.6.1.4.1.28581.1.2.1.7.1	Octet String	Unknown
12	enterprises....	1.3.6.1.4.1.28581.1.2.1.7.2	Octet String	Unknown
13	enterprises....	1.3.6.1.4.1.28581.1.2.1.8.1	Octet String	Unknown
14	enterprises....	1.3.6.1.4.1.28581.1.2.1.8.2	Octet String	Unknown
15	enterprises....	1.3.6.1.4.1.28581.1.3.1.2.1	Octet String	PSU 1 not expected
16	enterprises....	1.3.6.1.4.1.28581.1.3.1.2.2	Octet String	PSU 2 not expected
17	enterprises....	1.3.6.1.4.1.28581.1.3.1.2.3	Octet String	PSU 3 not expected
18	enterprises....	1.3.6.1.4.1.28581.1.3.1.2.4	Octet String	PSU 4 not expected
19	enterprises....	1.3.6.1.4.1.28581.1.3.1.3.1	Octet String	Unknown
20	enterprises....	1.3.6.1.4.1.28581.1.3.1.3.2	Octet String	Unknown
21	enterprises....	1.3.6.1.4.1.28581.1.3.1.3.3	Octet String	Unknown
22	enterprises....	1.3.6.1.4.1.28581.1.3.1.3.4	Octet String	Unknown
23	enterprises....	1.3.6.1.4.1.28581.1.3.1.4.1	Octet String	Unknown
24	enterprises....	1.3.6.1.4.1.28581.1.3.1.4.2	Octet String	Unknown
25	enterprises....	1.3.6.1.4.1.28581.1.3.1.4.3	Octet String	Unknown
26	enterprises....	1.3.6.1.4.1.28581.1.3.1.4.4	Octet String	Unknown
	Walk	1.3.6.1.4		Finished

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 that 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.



5 Specification

Indigo 1U frame

General

Dimensions:	482mm wide (19 inches), 44.5mm high (1U), 425mm deep. Weight 3.5 kg
Power requirements:	85 to 264 volts, 47 to 400Hz
Operating conditions:	0 to 40 degrees C non-condensing Ventilation front to sides, without air filters
Power supply:	160 Watt PSU-160i fitted as standard from mid 2007 Dual redundant 2 x PS-80i - 80 Watt power supply (Indigo 1-DP only)

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. Statesman and active frame can control a second passive frame One or two passive frames can be controlled via a remote active panel
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