Indigo 2-48V

48V 2U frames

(Includes Indigo 2-48V, 2A-48V, 2AE-48V, 2S-48V and 2SE-48V)

USER MANUAL

Crystal Vision

Crystal Vision Ltd., Lion Technology Park, Station Road East, Whittlesford, Cambridge, CB22 4WL, England.
E-mail: sales@crystalvision.tv Website: www.crystalvision.tv Tel: +44(0) 1223 497049 Fax: +44(0) 1223 497059

Contents

1 Introduction 3

2 Installation 5

General Safety Summary 5

2.1 Rack mounting and ventilation 6

2.2 Frame connectors 6

Connecting supply cables 7

2.3 Connector pinout 8

Remote Control / GPI Connections 8

Power supply relay connections 10

RJ45 422 Bus Output connector 10

RJ45 422 Control Input connector 11

RJ45 Ethernet connector 11

2.4 Controlling two frames from one panel 12

Establishing a serial link 12

Setting frame addresses 13

2.5 Ethernet control 14

Board settings 15

Setting up and connecting 17

Changing the IP Address 17

Adding a frame serial number 20

2.6 Installing Crystal Vision modules 21

Module positions 22

Inserting modules 22

Removing modules 22

Rear connectors 22

Fitting rear connectors 23

2.7 Indigo power supplies 24

2.8 Select the cooling mode 25

3 Operating the active panel 27

4 Trouble shooting 29

Reading LED status and active display messages 29
PSU relays 30
Panel diagnostics 30
Frame diagnostics 31

4.1 Maintenance 32

Inserting and removing power supplies 32
Replacing the PSU fan 34
Replacing the front panel fan 35
Replacing the supply input fuses 36
Software upgrades 37

4.2 Frequently asked questions 38

5 Appendix 40

Active panel setup 40
Module addresses and node numbers 41

6 Specification 42

Revision 1	Ethernet control information added	14/03/07
Revision 3	Note added to Bus IO table, page 10	02/12/08

1 Introduction

The Indigo range comprises four frame types: 4U frames for up to 24 modules, 2U frames for up to 12 modules, 1U frames for up to 6 modules and desk top boxes for up to 2 modules.

There are three 2U frame variants - 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.

This manual covers:

Indigo 2-48V with passive front panel
Indigo 2A-48V with active panel controls and display
Indigo 2AE-48V Ethernet capable with active panel controls and display
Indigo 2S-48V with active panel, no controls or display. Statesman enabled
Indigo 2SE-48V Ethernet capable with active panel, no controls or display.

The Indigo 2A-48V and 2AE-48V versions also support Statesman.

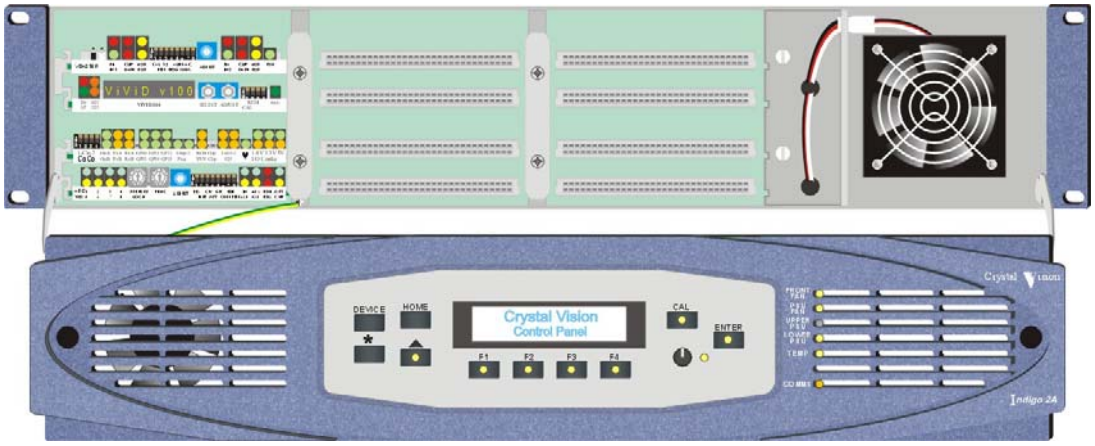
There are configurable rear connectors and space for up to two plug-in power supplies. The dual supply facility allows for redundancy and continued operation in the event of a power supply failure.

All models have a hinged front panel that allows easy access to removable fan assemblies, power supplies and modules.

The Indigo 2A-48V/2AE-48V Crystal Vision frame

The Indigo 2-48V/2S-48V/2SE-48V Crystal Vision frame

The 2A-48V and 2AE-48V versions have an active control panel built into them that remains forward-facing allowing panel operation even when the front panel is open.



The Indigo 2A-48V Crystal Vision frame with front control panel open

There are two easily accessible front fans. One is fitted on a detachable plate in front of the PSUs and the other is attached to the rear of the front panel.

If the front panel is opened an optical sensor switches the PSU fan to fast operation and at the same time the front 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 raised.

A frame temperature sensor mounted above the top central module position (slot 5) also 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.

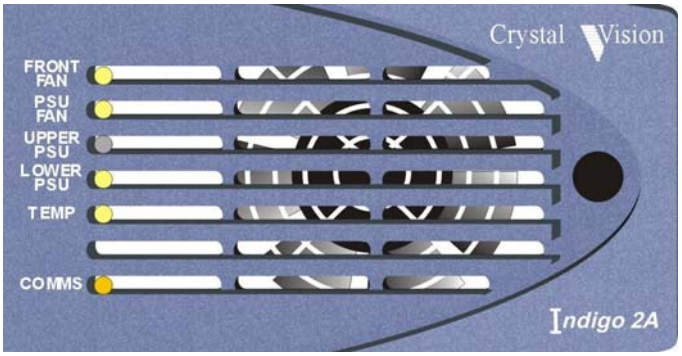
Only one of the fans is essential in normal operation. If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of 40 degrees.

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) and the PSU fan speed. 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 and fan speed. This allows the front panel to update its status LEDs and control the alarm changeover relay. The relay contacts are available on Remote 2/4 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 plus a yellow comms LED.



The Indigo 2-48V status LEDs

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 guide lines 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.

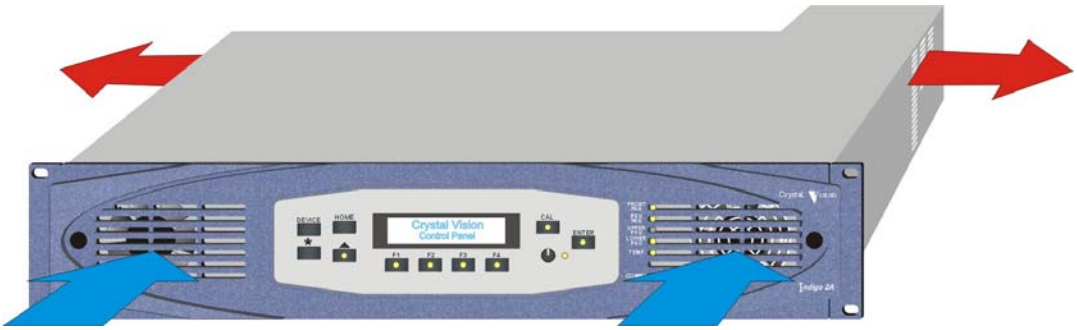
To avoid injury or fire hazard do not operate this product in an explosive atmosphere.

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

The Indigo 2 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.

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 2-48V 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

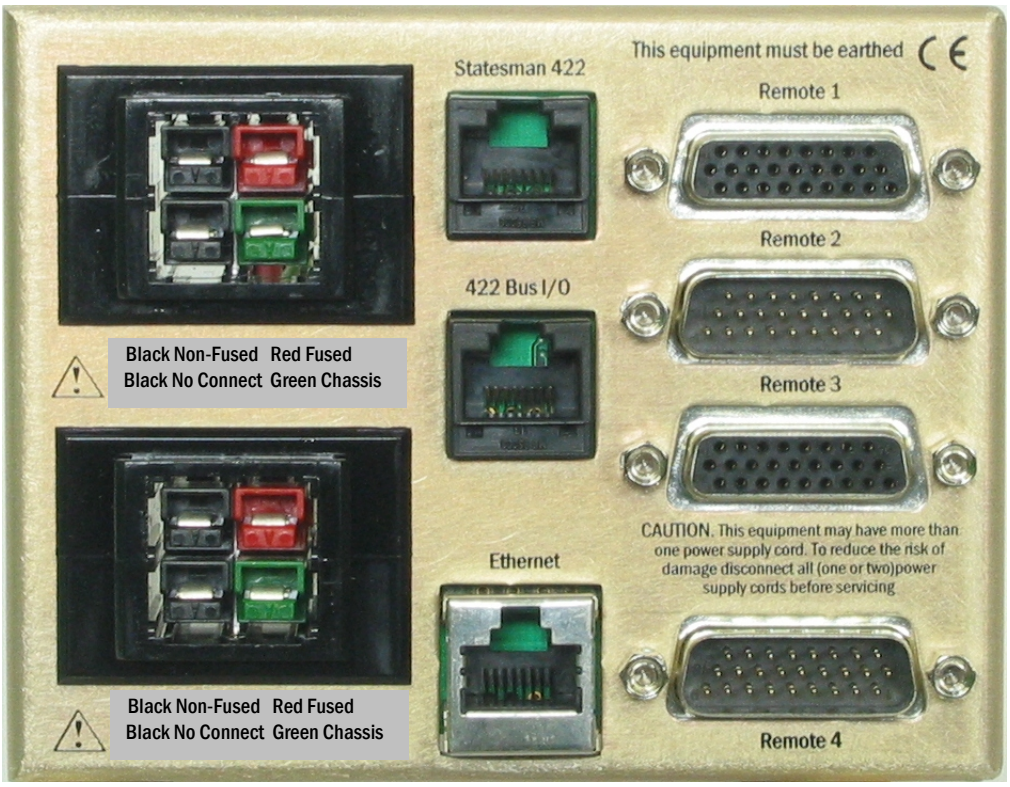
Note: Only one of the fans is essential in normal operation. If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of 40 degrees. It is also possible to operate the frame with the front panel open, however the frame may not meet electromagnetic compatibility (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 input	40-70VdcV, PSU fused
IEC (bottom)	Lower PSU input	40-70VdcV, PSU fused
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
Remote 3	GPI and DC out	Refer to pinout tables
Remote 4	GPI, lower 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

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



Indigo 2-48V rear connectors

Connecting supply cables

To connect the range of 48 Volt Indigo 2 frames to a DC supply proceed as follows:

The 48Vdc range of Indigo frames is designed to be able to run in both positive and negative earth situations. This has been achieved by designing the PSU module to be insensitive to supply polarity. The only precaution to be taken is that the fused line is always the non-earth connection.

For a positive earth installation the supply -ve would be connected to the 'Red Fused' inlet. And the supply +ve would be connected to the 'Black Non-Fused' inlet. In this case the chassis connection would be connected to a 'clean earth' which would be of the +ve polarity.

For a negative earth installation the supply +ve would be connected to the 'Red Fused' inlet. And the supply -ve would be connected to the 'Black Non-Fused' inlet. In this case the chassis connection would be connected to a 'clean earth' which would be of the -ve polarity.

Note: The fuse holder is part of the PSU 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.

2.3 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 and Remote 3 connections (26 way high density D-Type socket)

Pin number	Remote 1- function	Remote 3 - function
1	+5.3V +/- 10% dc out	+5.3V +/- 10% dc out
2	Frame GND	Frame GND
3	Slot 9 GPI 'a'	Slot 11 GPI 'a'
4	Slot 6 GPI 'a'	Slot 8 GPI 'a'
5	Slot 5 GPI 'a'	Slot 7 GPI 'a'
6	Slot 5 GPI 'b'	Slot 7 GPI 'b'
7	Slot 2 GPI 'a'	Slot 4 GPI 'a'
8	Slot 1 GPI 'a'	Slot 3 GPI 'a'
9	Slot 1 GPI 'b'	Slot 3 GPI 'b'
10	Slot 10 GPI 'a'	Slot 12 GPI 'a'
11	Slot 10 GPI 'b'	Slot 12 GPI 'b'
12	Slot 9 GPI 'b'	Slot 11 GPI 'b'
13	Slot 6 GPI 'c'	Slot 8 GPI 'c'
14	Slot 6 GPI 'b'	Slot 8 GPI 'b'
15	Slot 5 GPI 'c'	Slot 7 GPI 'c'
16	Slot 2 GPI 'b'	Slot 4 GPI 'b'
17	Slot 2 GPI 'c'	Slot 4 GPI 'c'
18	Slot 1 GPI 'c'	Slot 3 GPI 'c'
19	Slot 10 GPI 'c'	Slot 12 GPI 'c'
20	Slot 10 GPI 'd'	Slot 12 GPI 'd'
21	Slot 9 GPI 'd'	Slot 11 GPI 'd'
22	Slot 9 GPI 'c'	Slot 11 GPI 'c'
23	Slot 6 GPI 'd'	Slot 8 GPI 'd'
24	Slot 5 GPI 'd'	Slot 7 GPI 'd'
25	Slot 2 GPI 'd'	Slot 4 GPI 'd'
26	Slot 1 GPI 'd'	Slot 3 GPI 'd'

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.

Remote 2 and Remote 4 connections (26 way high density D-Type plug)

Pin number	Remote 2- function	Remote 4 - function
1	Slot 5 GPI ‘e’	Slot 7 GPI ‘e’
2	Slot 5 GPI ‘f’	Slot 7 GPI ‘f’
3	Slot 6 GPI ‘a’	Slot 8 GPI ‘e’
4	Slot 6 GPI ‘f’	Slot 8 GPI ‘f’
5	Relay close on fault ,upper PSU	Relay close on fault, lower PSU
6	Frame GND	Frame GND
7	RX+ bus RS422	N/C
8	TX- RS422 o/p Statesman	N/C
9	TX+ RS422 o/p Statesman	N/C
10	Slot 2 GPI ‘e’	Slot 4 GPI ‘e’
11	Slot 2 GPI ‘f’	Slot 4 GPI ‘f’
12	Slot 9 GPI ‘e’	Slot 11 GPI ‘e’
13	Slot 9 GPI ‘f’	Slot 11 GPI ‘f’
14	Relay common , upper PSU	Relay common, lower PSU
15	+5.3V +/- 10% dc out	N/C
16	RX- bus RS422	N/C
17	TX+ bus RS422	N/C
18	RX+ RS422 i/p Statesman	N/C
19	Slot 1 GPI ‘e’	Slot 3 GPI ‘e’
20	Slot 1 GPI ‘f’	Slot 3 GPI ‘f’
21	Slot 10 GPI ‘e’	Slot 12 GPI ‘e’
22	Slot 10 GPI ‘f’	Slot 12 GPI ‘f’
23	Relay open on fault ,upper PSU	Relay open on fault, lower PSU
24	N/C	N/C
25	TX- bus RS422	N/C
26	RX- RS422 i/p Statesman	N/C

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

Pinout is as follows:

Upper Power Supply 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

Lower Power Supply 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

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

RJ45 422 Bus Output 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 2 connector.

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 422 Control Input connector

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 2 connector.

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 bottom of the front control panel by opening the panel and lifting it upwards.

Front panel hardware settings – 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

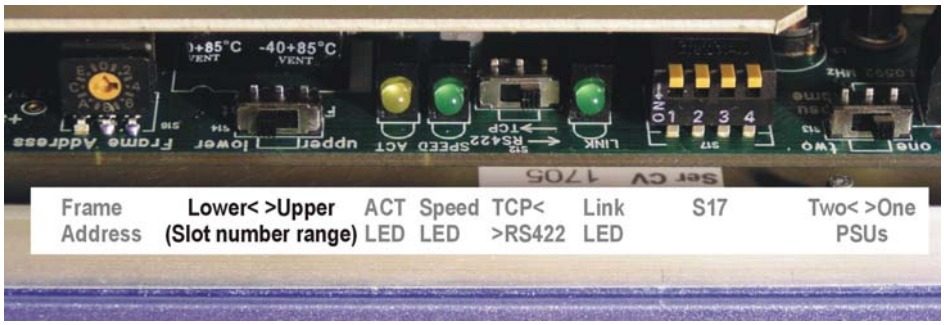
2.4 Controlling two frames from one panel

A single active or remote control panel may control modules in up to two frames. This constitutes a frame pair where one frame is set to its upper slot address range and the other to its lower address range. Only one panel in a frame pair needs to be non-passive.

If a remote REMIND panel is used the controlled frames need only have passive panels, if both frames are controlled from one frame that frame should have an active panel and the other a passive 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.

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



Front panel hardware settings – slot number range

The position of the two-position slide switch labelled Upper/Lower on the top edge of the 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 2A-48V frame and Upper for Indigo 2-48V or Indigo 1-48V 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 two power supplies have an address and are treated as modules. Refer to the address range table in chapter 3 '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.

Establishing a serial link

This can be accomplished with a special cable linking the Remote 2 connectors or by using a CAT-5 patch cable linking the '422 Bus Output' connectors.

Using a CAT-5 patch cable

A CAT-5 cable (TIA/EIA 568A CAT-5 PATCH) is plugged in the connectors labelled ‘422 Bus Output’ on each frame.

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.

Note: The Comms LED will flash when communication has been established.

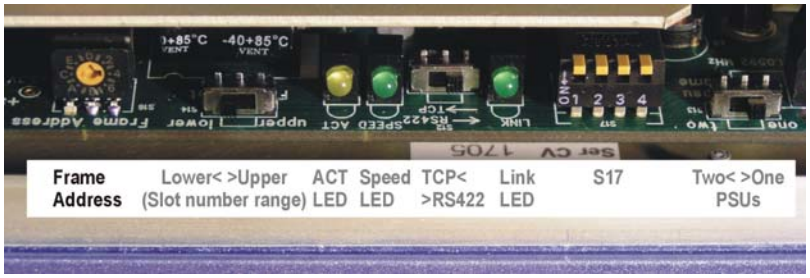
Signal	Female 26-way high density D-Type plug pin No		Female 26-way high density D-Type socket pin No
GND	**6 / Shell**		**6/ Shell**
PBRX +	**17**	Twisted Pair	**17**
PBRX -	**25**		**25**
PBTX +	**7**	Twisted Pair	**7**
PBTX -	**16**		**16**

Frame link cable connections

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

Setting frame addresses

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 address of a frame pair is set by its non-passive panel.



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

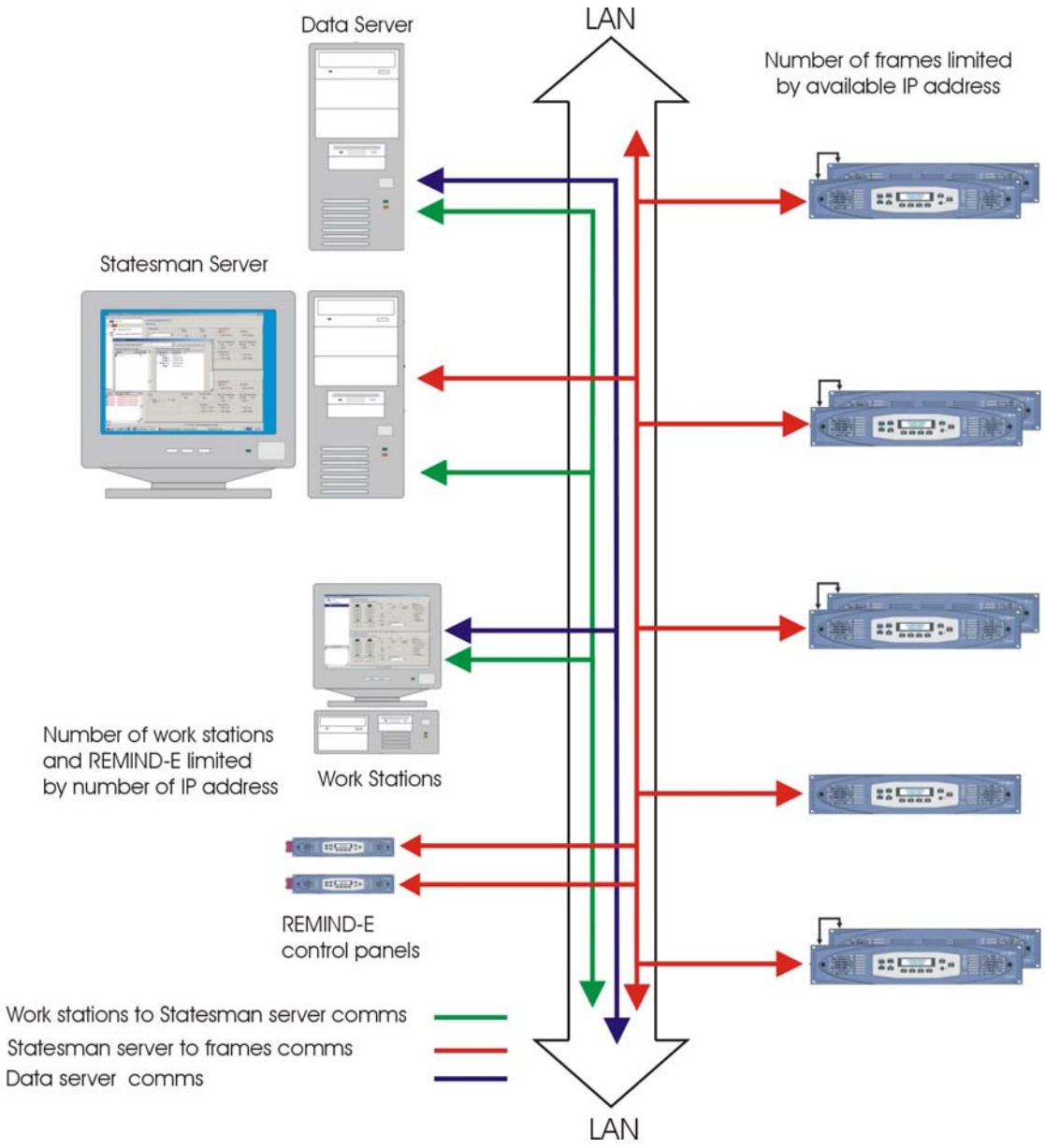
Note: Passive panels do not have a Frame Address switch.

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

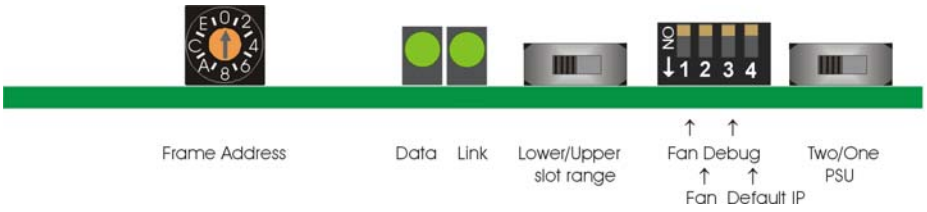
Ethernet control is provided by the Indigo 2E series of frames. This allows the Statesman PC control system or remote active control panels to control a large number of the Indigo Ethernet series frames over a local area network.



Statesman control over the Ethernet of Indigo frames

Board settings

On the upper edge of the 2U front panel PCB, the config switches and status LEDs can be found.



2U board top-edge switches and LEDs

Frame Address

The frame address, which only relates to active panels such as the Statesman enabled or active control panel, is set to give a frame or frame pair a unique address when used in a 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.

LED	LED status	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

This switch is used when configuring a frame pair where the two frames must have their individual slot addresses. The position of the two-position slide switch labelled Lower/Upper on the top edge of the front panel PCB must be placed in the lower position for one frame and in the upper position for the other. Which frame of a pair selected to be upper and lower is not important.

Refer to the address range table in the section entitled 'Selecting different modules' in chapter two for the module addresses assigned when frames are operated as a pair.

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

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.

Levers 3 & 4	Function	Notes
3	Debug	Normally up, no user function.
4	Default IP address	Normally up. Down sets IP address to default 10.0.0.201.

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.

Switch three is for debug purposes and should normally be left in the up position.

Default IP address

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

PSU configuration only applies to the 2U and 4U frames where it is possible to have multiple power supplies fitted into a single frame. Should a power supply not be fitted in either the upper or lower slots of the 2U frame or the upper or lower slots of the lower section of the 4U frame, the position of the two-position slide switch must be set accordingly.

If both power supplies are fitted the slide switch is set to position two. If the switch is set to one and there are two power supplies fitted, the LOWER PSU LED will flash from GREEN to OFF every two to three seconds to warn that the switch is set to one instead of two. Should only a single supply be fitted with the switch set to Two, a power supply fault will be registered.

Setting up and connecting

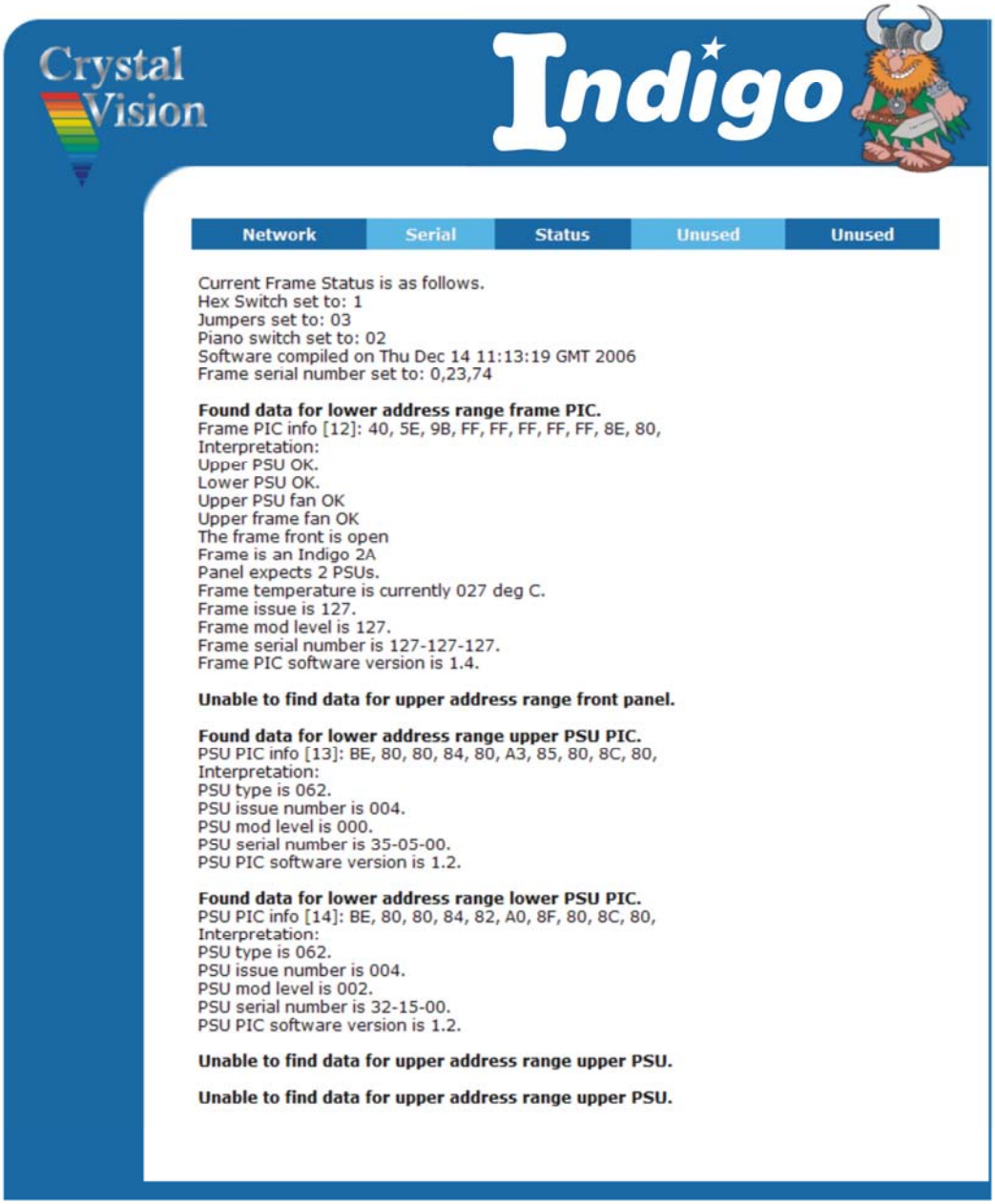
The frame can be connected to a network port or directly to a PC from the rear panel RJ45 port labelled Ethernet. If connecting directly to a PC, a CAT-5 cross over cable will be required. Connecting to a network port hub uses a straight CAT-5 cable.

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.

To access the internal web page set the frame to the default IP address by setting the default IP address switch to down or to the left for the 1U front. 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.

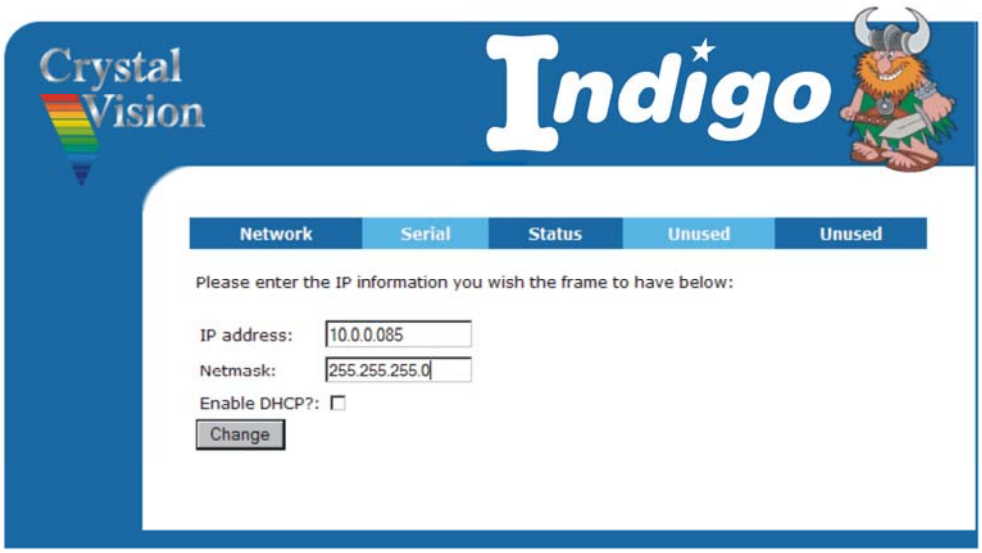
From this web page you are able then to change the IP address manually or automatically if DHCP is available. A frame serial number may also be entered.



The Indigo Status page

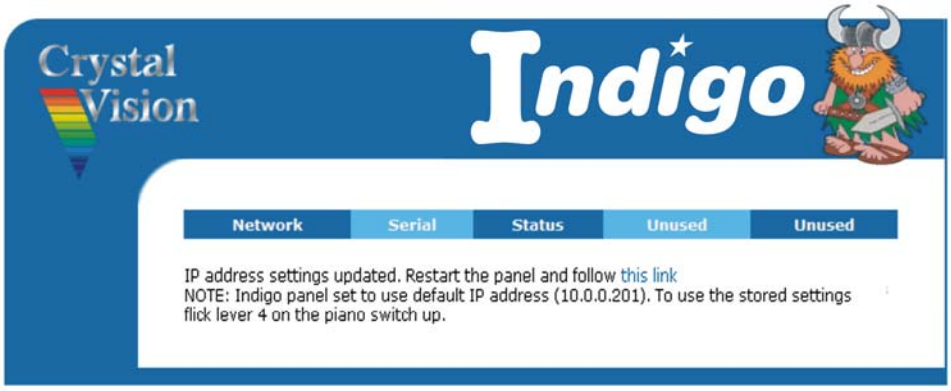
Note: It is possible to verify that the correct frame is being viewed by first recording the Hex switch setting (second line in status list), this is the setting of the frame address switch. Rotate this switch to something other than the number displayed. Refreshing the browser will then reflect this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

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 will likely result in their fracture.



Confirmation Window

Should an incorrect IP address be added an error dialogue box will be displayed indicating the likely cause of the error condition.

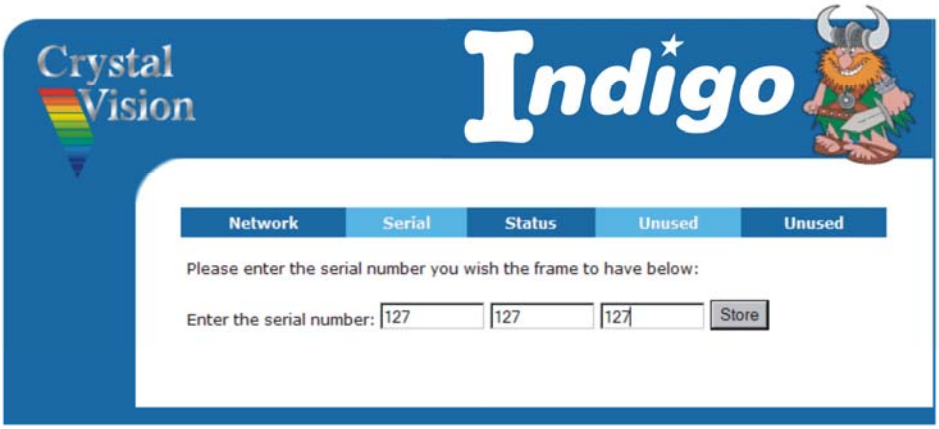
Adding a frame serial number

The facility is given 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

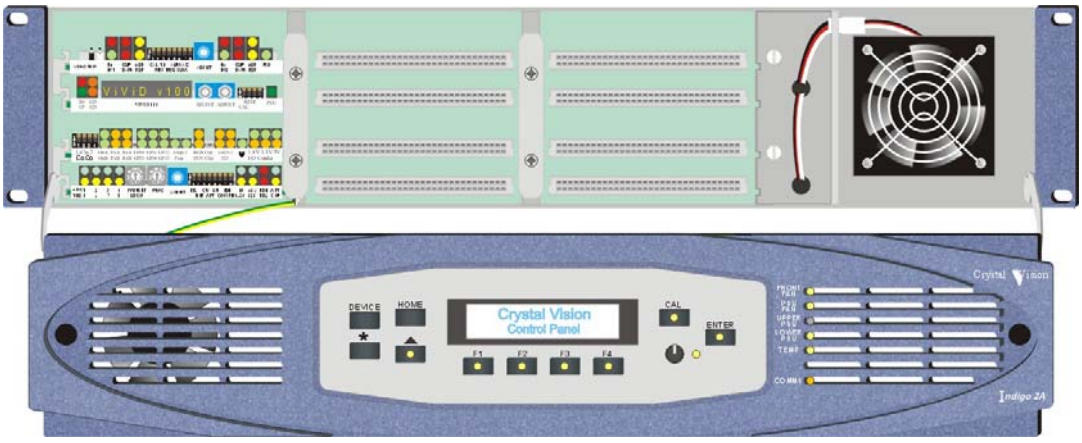
Once a serial number has been successfully entered a confirmation dialogue is displayed. The Status page will also echo the new serial number.

Serial number successfully added

2.6 Installing Crystal Vision modules

The Indigo 2 frames each have 12 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.

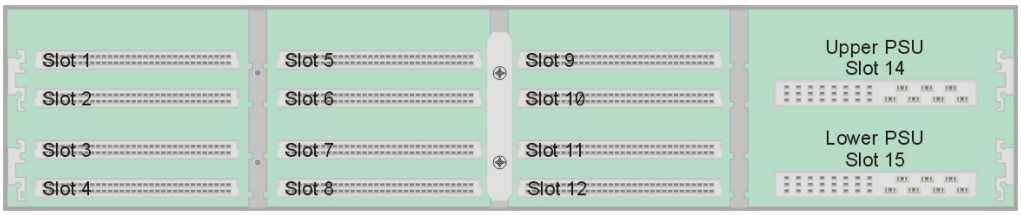


The Indigo 2A-48V Crystal Vision frame with front control panel open

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 1 to 12 as shown below:



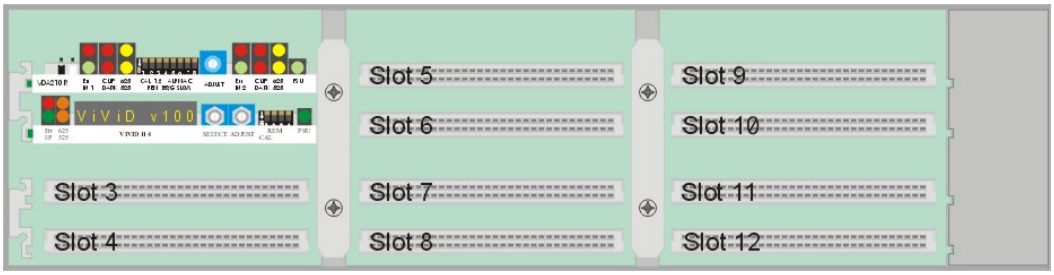
The Indigo 2-48V frame showing slot numbers (and left hand retaining bracket removed)

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 2-48V frame with two modules fitted in slots 1 and 2

Removing modules

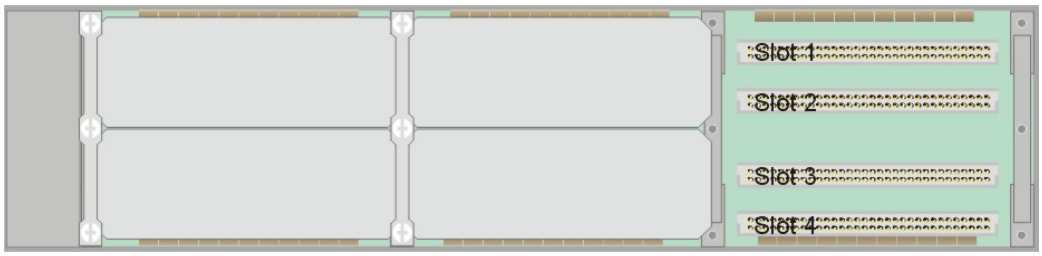
To remove signal modules simply pull on the handle and withdraw them from the frame, with the retaining brackets removed.

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 2-48V frame rear view with EMC covers removed for slots 1 to 4

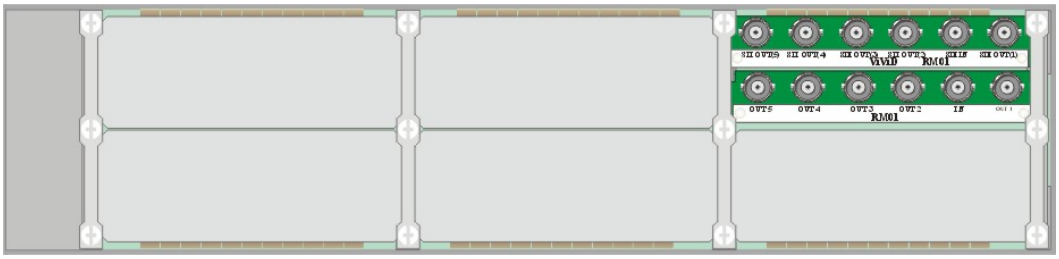
The rear modules are held in place by a retaining bar at each side. These run the height of the frame and provide mechanical support as well as ensuring EMC compliance.

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

Fitting rear connectors

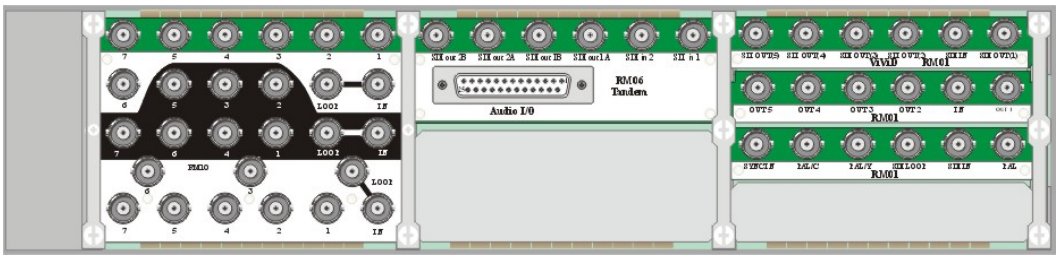
To fit a rear connector, proceed as follows:

- 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 2-48V 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 2-48V 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 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 reapplied.**

2.7 Indigo power supplies

There is only one supply available for the Indigo 2-48V. This is the 150 Watt rated PSU-150i-48Vdc. The PSU-150i-48Vdc may be used for up to 12 Crystal Vision modules.

PSU-150i-48V – top view

Monitoring power supply status

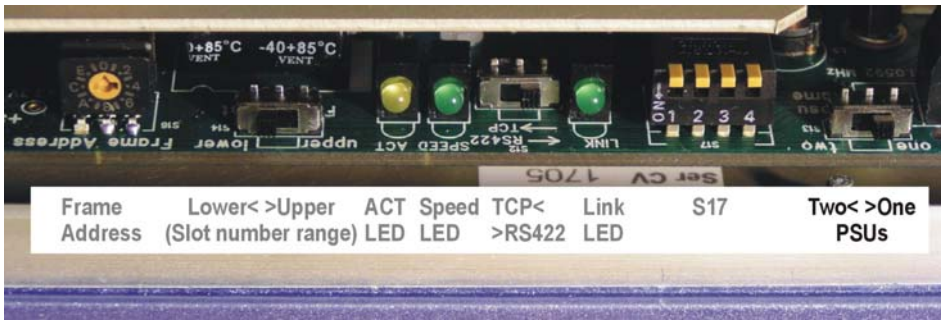
A signal from the each of the power supplies is routed through the frame wiring to the front panel electronics. This allows an indication by the UPPER PSU LED and LOWER PSU LED of the status of one or both power supplies.

A faulty condition is indicated when the corresponding LED is red and a normal condition when it is green/yellow. If only one PSU is fitted the corresponding led will be un-lit.

The status of the PSUs can also be investigated using the front control panel of the Indigo 2A-48V as shown in Chapter 3 - Operating the active panel.

Configuring PSUs

If a power supply is not fitted in either the upper or lower slots, the position of the two-position slide switch on the top right of the front panel PCB must be set to one.

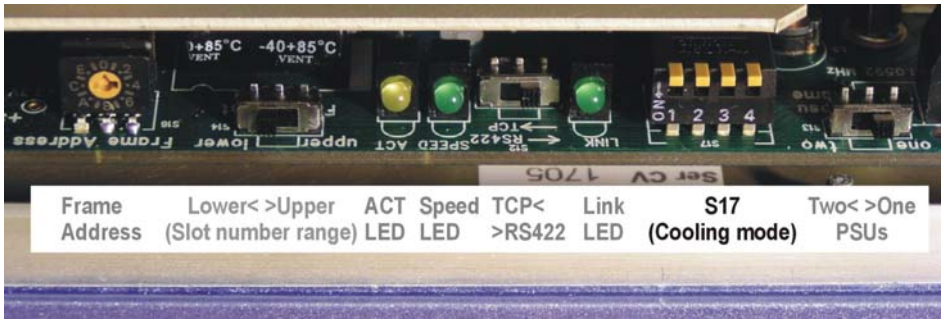


Front panel hardware settings – PSU configuration

If both power supplies are fitted the slide switch is set to position two. If the switch is set to one and there are two power supplies fitted, the LOWER PSU LED will flash from GREEN to OFF every two to three seconds to warn that the switch is set to one instead of two.

2.8 Select the cooling mode

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



Indigo 2-48V front panel hardware settings – cooling mode

The three modes are normal, quiet and maximum cooling.

Switches one and two of the four-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.

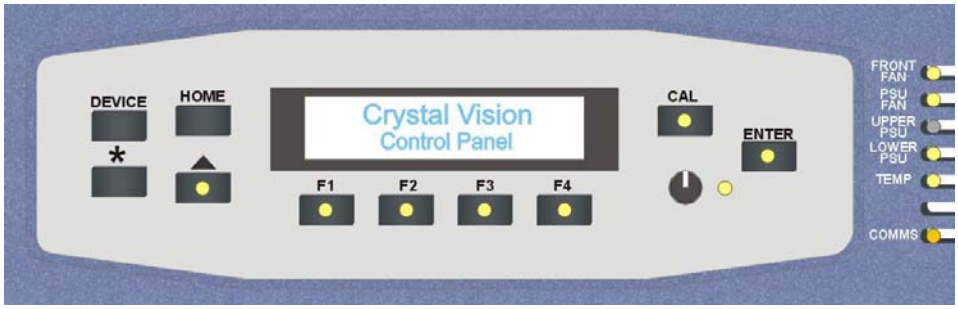
Note: Quiet mode is dependent on PSU and PSU fans not being in an alarm state.
Switches three and four are not used.
Only one of the fans is essential in normal operation. If one of the fans should fail, the closed frame can still operate indefinitely with an ambient temperature of 40°C.

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.

3 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 2A-48V/2AE-48V active panel controls and LEDs

The active panel on the Indigo 2A-48V/2AE-48V 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 PSUs and front panel as the Indigo front panel PIC and the two power supplies 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 first frame	Address in second frame	Notes
Modules	1.01 to 1.12	2.01 to 2.12	Press Enter for module home menu
Indigo PIC	1.00	2.00	Press Enter for frame s/n and temp
Upper PSU	1.14	2.14	Press Enter for PSU s/n and type
Lower PSU	1.15	2.15	Press Enter for PSU s/n and type

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 centigrade, inside the frame above slot five 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).

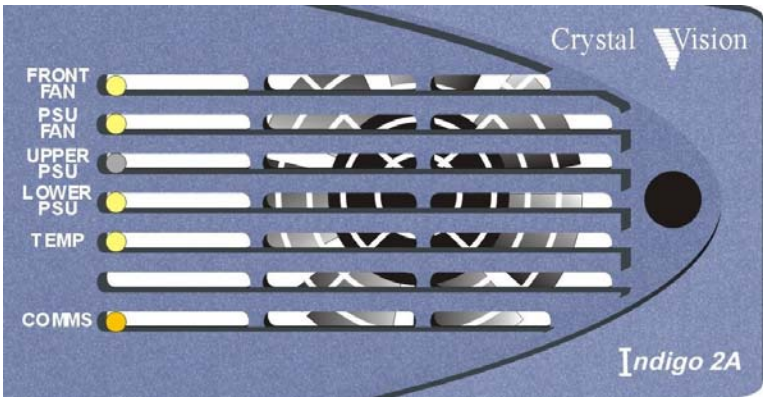
Please refer to the Appendix to find out how node numbers relate to slot numbers in particular frames and frame combinations.

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.

4 Trouble shooting

Reading LED status and active display messages

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



The Indigo 2-48V LEDs

The following LED status indications and/or Indigo 2A-48V/2AE-48V messages may be seen:

LED	Colour	Indigo 2A message	Notes
Front Fan	Unlit	None	Quiet mode/Door open
	Yell/Grn	None	Normal operation
	Red	Front fan speed low	Change the panel fan
PSU Fan	Yell/Grn	None	Normal operation
	Red	PSU fan speed low	Change PSU fan
Upper PSU	Unlit	None	No upper PSU detected
	Yell/Grn	None	Normal operation
	Red	Upper PSU fault	Change upper PSU
Lower PSU	Unlit	None	No lower PSU detected
	Yell/Grn	None	Normal operation
	Red	Lower PSU fault	Change lower 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	

If a PSU is not fitted, the corresponding LED will not illuminate. If the front panel is open, the Front Fan LED will also 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.

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 and Remote 4 connectors. 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 left hand side 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 left hand side 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.

PSU relays

Each PSU contains a relay, the contacts of which are brought out to the Remote 2 connectors. This relay is under frame control and will change state whenever a frame fault is present.

Note: If the frame is fitted with two PSUs the frame will control both 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.

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 422 or TCP	SHAFT 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 binary Comms from PC received by front panel
2	y = binary Comms to PC transmitted from panel
3	y = valid binary Comms received from boards by front panel
4	y = binary 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

4.1 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

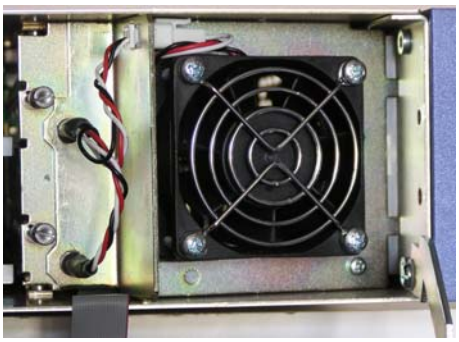
The PSU-150i-48V power supplies can be inserted and removed while the system is powered without damage. However, this must be done quickly as there will be no forced convection air, as the PSU fan assembly has to be removed.

To gain access to the Indigo PSUs proceed as follows:

- If possible, power down the frame
- Pull down the front panel using the black knobs at either side of the panel
- Release the two captive screws 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 plugs, the PSU fan will stop and the front panel PSU FAN LED will change from green to red.



Removing the PSU fan assembly

Lower PSU-150i-48Vdc – 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 if there is no fan speed signal present on the fan connector SK1 when the PSU fan assembly is removed or if the PSU fan stops.

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.

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: 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.

Note: Check that the two/one switch behind the control panel is 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 second 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: PSU modules should only fit into the PSU slots behind the PSU fan assembly. Do not attempt to fit a PSU into a video or audio module slot.
Check that the two/one switch behind the control panel is 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 just in front of a plastic stop
- Carefully move the fan assembly into position ensuring that the two PSU fan jacks fit into the PSU jack sockets (SK 1)
- Take care not to damage the panel ribbon cable
- Tighten the two captive screws to the left of the PSU fan ensuring that they are not too tight to be undone without a screwdriver.
- If the unit was unpowered it may now be powered and tested

Replacing the PSU fan

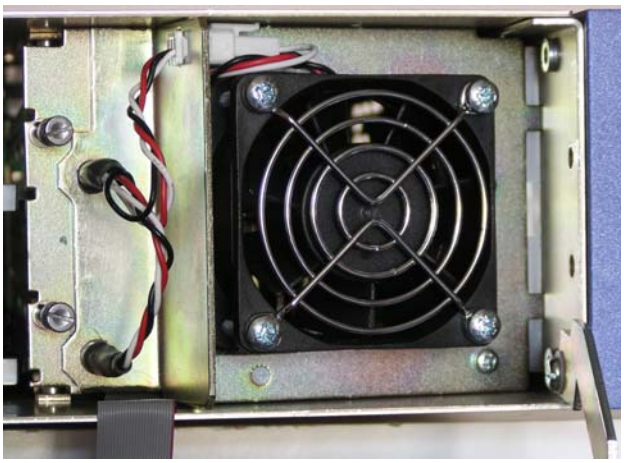
It is recommended that PSU fan replacement should be performed as quickly as possible if performed whilst the frame is powered, to prevent overheating.

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(s) connected to the frame
- Remove the PSU fan assembly as shown in the preceding section
- Undo the 3-way connector which is attached to three 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 cords

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



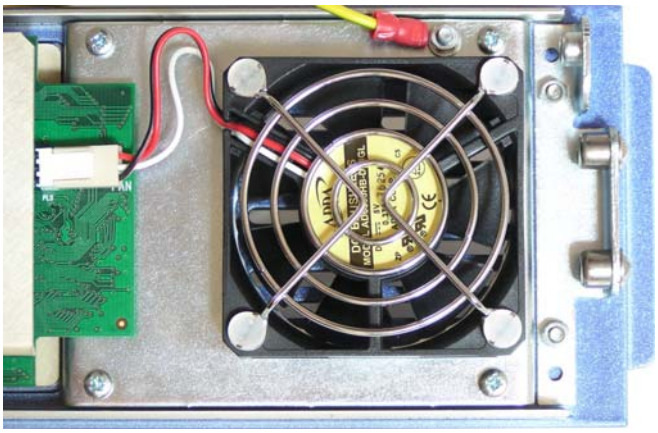
PSU fan showing 3-pin connector and finger guard

Replacing 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. 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 three wires on the fan from the front panel PCB labelled FAN
- Using a screwdriver slacken the four plastic screws 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. Be sure to fit the finger guards on the outer side of the fan
- Reconnect the 3-way connector which is attached to three wires on the fan onto the front panel PCB connector labelled FAN
- 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. The display on an active panel will indicate 'Fault cleared'.



Front panel fan showing 3-pin connector and finger guard

Replacing the supply input fuses

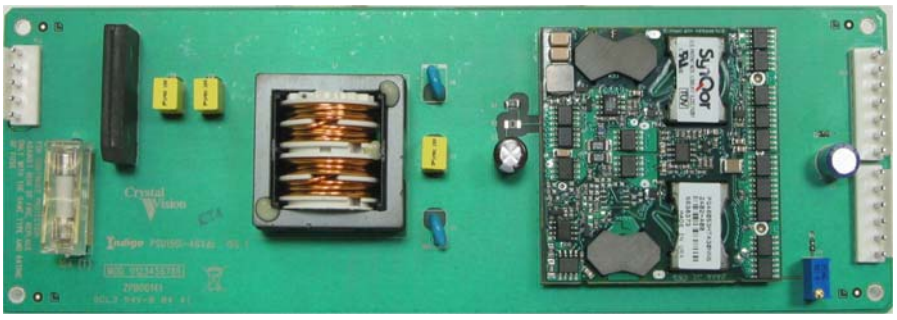
The supply input fuse is fitted inside the PSU-150i-48Vdc module. The fuse can only be accessed once the PSU module has been removed from the frame.

The sequence for replacing the fuse is as follows: -

- Remove the un-powered PSU module from the frame
- Using a pozi headed cross-bladed screwdriver remove the six screws securing the transparent insulation cover from the under side of the PSU
- Remove the four further screws, one from each corner of the dc-dc module and prise its rear edge from the carrier board. The DC-DC module will then swing out still attached by its input wiring loom. This loom may be disconnected to allow the complete removal of the module, or it is possible to replace the fuse whilst still attached.

Note: As a precaution the screw retaining the CPU module may be removed to prevent excessive strain being put on it.

- Remove the defective fuse and replace with either the spare fuse or with a 10A, 250V time delay fuse
- A spare fuse is stored in a clip, which is attached to the PSU module and can be accessed once the module is removed
- Reassemble in reverse order



DC-DC converter module showing fuse carrier on the left side

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 (10A, 250V time delay).

Software upgrades

The software for the Indigo 2-48V, 2A-48V and 2S-48V panel is contained in a single EPROM in position U17.

To change the EPROM proceed as follows:

- Switch off the power and remove or drop down the front panel by undoing the two thumb screws
- If necessary remove any protective metal shielding and keep the screws
- 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 any shielding using the screws retained

Front panel PCB with cover removed showing firmware EPROM in the top right corner

Note: PL1 (on the right of the EPROM) is normally fitted away from the panel edge. No jumper link is fitted in position PL4.

Note. The Indigo 2AE-48V and 2SE-48V 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.

4.2 Frequently asked questions

Why is the display black and/or 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 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 fan

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

Check that the front control panel fan is plugged in correctly

Try replacing the fan

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

Try replacing the appropriate PSU

Why do I keep getting a warning message about a power supply problem?

If PSU warnings persist even when no PSU fault is suspected, check that the Two/One PSU switch at the rear of the front panel is set correctly for the number of power supplies installed

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

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

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 in to 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 were '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

5 Appendix

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, Asterisk or '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'

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

The front panel should now boot up as normal.

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 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

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

6 Specification

Indigo 2U 48V frame

General

Dimensions:	482mm wide (19 inches), 89mm high (2U), 425mm deep. Weight 5 kg
Power requirements:	40-75Vdc
Operating conditions:	0 to 40 degrees C non-condensing Ventilation front to sides, without air filters
Power supply:	Up to two plug-in power supplies (150W PSU-150i-48Vdc)

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

Frames
Summary

Indigo 2-48V	2U frame without active control panel (passive) for up to 12 modules
Indigo 2A-48V	2U frame with active panel with controls and display for up to 12 modules
Indigo 2AE-48V	2U frame Ethernet capable with active panel, with controls and display for up to 12 modules
Indigo 2S-48V	2U frame Statesman enabled with no controls or display for up to 12 modules
Indigo 2SE-48V	2U frame Ethernet capable and Statesman enabled with no controls or display for up to 12 modules
PSU-150i-48Vdc	150 Watt PSU for Indigo 2-48V frames