Indigo DT and Indigo DTSE

Desk top boxes

Crystal Vision

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Revision 8	Added note about new security introduced with frame software version V5.9 build 16216 to beginning of page 12.	05/07/18

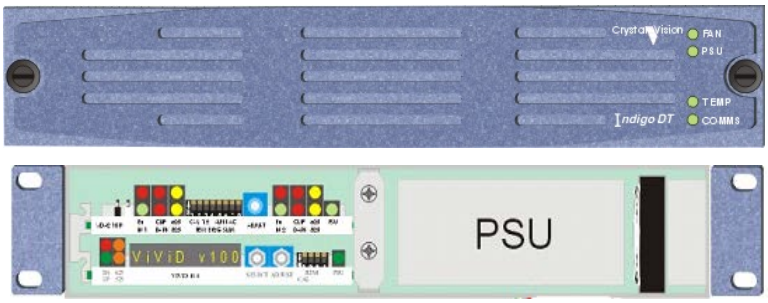
1 Introduction

The Indigo desk top box is available as two variants – the DT with a passive front panel and the DTSE with an active panel, Ethernet capability and Statesman enabled.

This manual covers both variants.

Each desk top box can be used with any single or double slot rear module in the Crystal Vision range.

A removable front panel allows easy access to installed modules.



The Indigo DT/DTSE Crystal Vision desk top box

Each desk top box has a built in power supply and an internal fan on the right hand side.

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

With normal cooling the fan runs continuously, increasing in speed as the temperature inside the frame goes up.

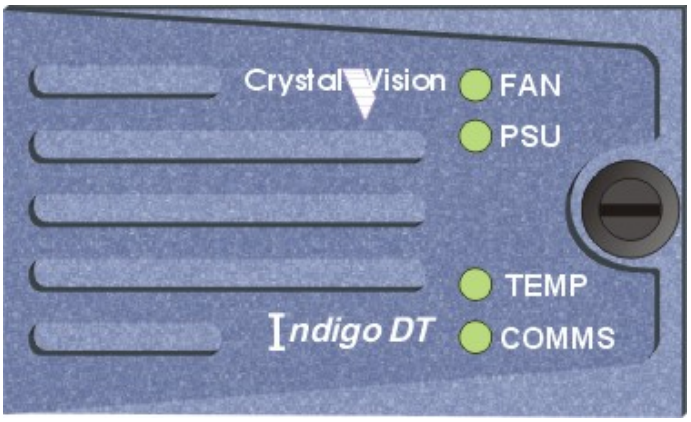
In quiet mode the fan does not run at temperatures below 45°C (as measured by the sensor inside the frame) and always runs at temperatures above 45°C. This mode is ideal where noise is an issue or where the ambient temperature is low.

In maximum cooling mode the fan is always turning at maximum speed. This mode is ideal for equipment bays where noise is not a concern.

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 DT and Indigo DTSE have front panel processors. These processors monitor the power rail voltage levels (+5.5V and -6.0V) and the fan speed. Status information is indicated by the state of the FAN, PSU and TEMP LEDs on the front panel and the alarm relay. The relay contacts are available on the remote 2 connector on the rear of the frame.

There are four two-colour LEDs on the front panel, with yellow/green indicating a normal condition and red an abnormal condition.



The Indigo DT (passive panel) LEDs

The LEDs show the status of the internal fan, PSU, frame temperature and RS422 activity.

The COMMS LED monitors external RS422 activity and will flash amber when there are external communications with the frame.

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

Note: The term ‘frame’ and ‘desk top box’ are used interchangeably in this manual.

***Note**: Serial RS422 control from Statesman or third party applications is no longer supported. All connections should be made via Ethernet. Crystal Vision AE and SE frames running v4.6 software or later support Statesman, ASCII and HTTP/JSON control protocols. An optional SNMP licence can be purchased to enable control and monitoring via SNMP. Contact Crystal Vision Support for protocol documentation.*

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

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. The left and right ventilation grilles must not be obstructed. If installed in a standard 19" rack, cool air circulation should be available.

EMC

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

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

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

Do not operate the equipment with covers or panels removed.

General

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

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

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

The Indigo DT 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 Indigo series of desk top boxes are designed for tabletop use, however they must have adequate ventilation. On no account should the side ventilation grilles be blocked.

If the optional rack ears are fitted, and the unit is installed in a standard 19" rack, cool air circulation should be available and both side ventilation grilles should be unobstructed.

Indigo DT airflow

Install the Indigo DT in a standard 19" rack as follows:

- Fit the optional rack ears
- Mount in the rack and secure via the rack ears
- Allow adequate space for the fan intake at the right hand side and the exhaust through the left hand side (viewed from front)

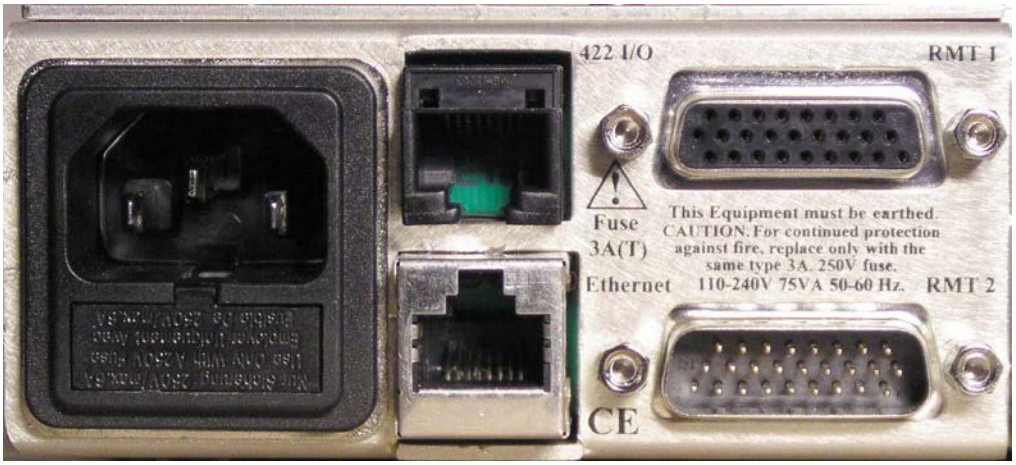
Note: It is possible to operate the frame with the front panel open, however the frame may not meet electromagnetic compatibility (EMC) requirements in this condition.

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
RMT 1	GPI and DC out	Refer to pinout tables
RMT 2	GPI, serial/Statesman, PSU alarm relay and DC out	Refer to pinout tables
RS422 I/O	RS422 control/link bus using CAT5 cabling	Refer to pinout tables
Ethernet	Ethernet control using CAT5 cabling	Refer to pinout tables

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



Indigo DT rear connectors

Connecting mains cables

The desk top box is powered by connecting a power cord to the IEC connector.

Ensure that the power cord has a minimum current rating of 6A 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.

2.4 Connector pinout

Remote control / GPI connections

Each module slot has six connections that are brought out to one or more of the two 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	N/C
2	Frame GND	N/C
3	N/C	N/C
4	N/C	N/C
5	N/C	Relay close on fault on PSU
6	N/C	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	N/C	Slot 2 GPI ‘e’
11	N/C	Slot 2 GPI ‘f’
12	N/C	N/C
13	N/C	N/C
14	N/C	Relay common on PSU
15	N/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	N/C	Slot 1 GPI ‘e’
20	N/C	Slot 1 GPI ‘f’
21	N/C	N/C
22	N/C	N/C
23	N/C	Relay open on fault on PSU
24	N/C	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 1.5 Amps.
To maintain EMC compliance only good quality screened cable assemblies should be used.

Power supply relay connections

Fitted inside the unit is 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 I/O (Statesman/link bus) connector

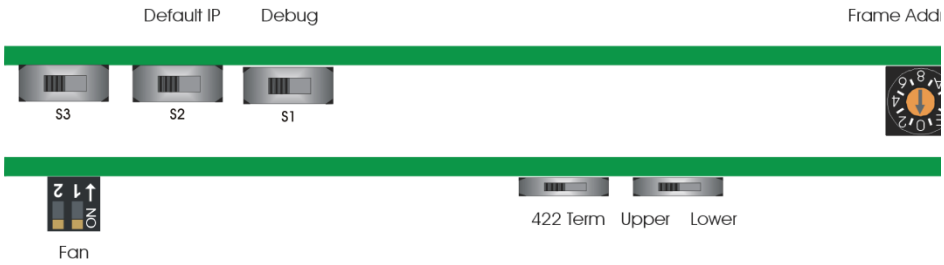
Pin number	Function
1	RX+ RS422 Statesman i/p
2	RX- RS422 Statesman i/p
3	TX+ RS422 Statesman o/p
4	TX+ RS422 – Link bus o/p
5	TX- RS422 – Link bus o/p
6	TX- RS422 Statesman o/p
7	RX+ RS422 – Link bus i/p
8	RX- RS422 – Link bus i/p

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

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



DTSE 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 Switches

Switches 1 and 2 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.
422 Term		Terminates RS422 input – no longer supported.
Upper/Lower		No user function – leave set to ‘Lower’.

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

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. See section 3 for more information.

Upper/Lower

The slot address range switch was used when two frames were paired together. This arrangement is no longer supported and the switch must be left in the ‘Lower’ position.

422 Term

This switch was used to terminate the RS422 chain of older pre-Ethernet enabled frames and is no longer supported by Crystal Vision.

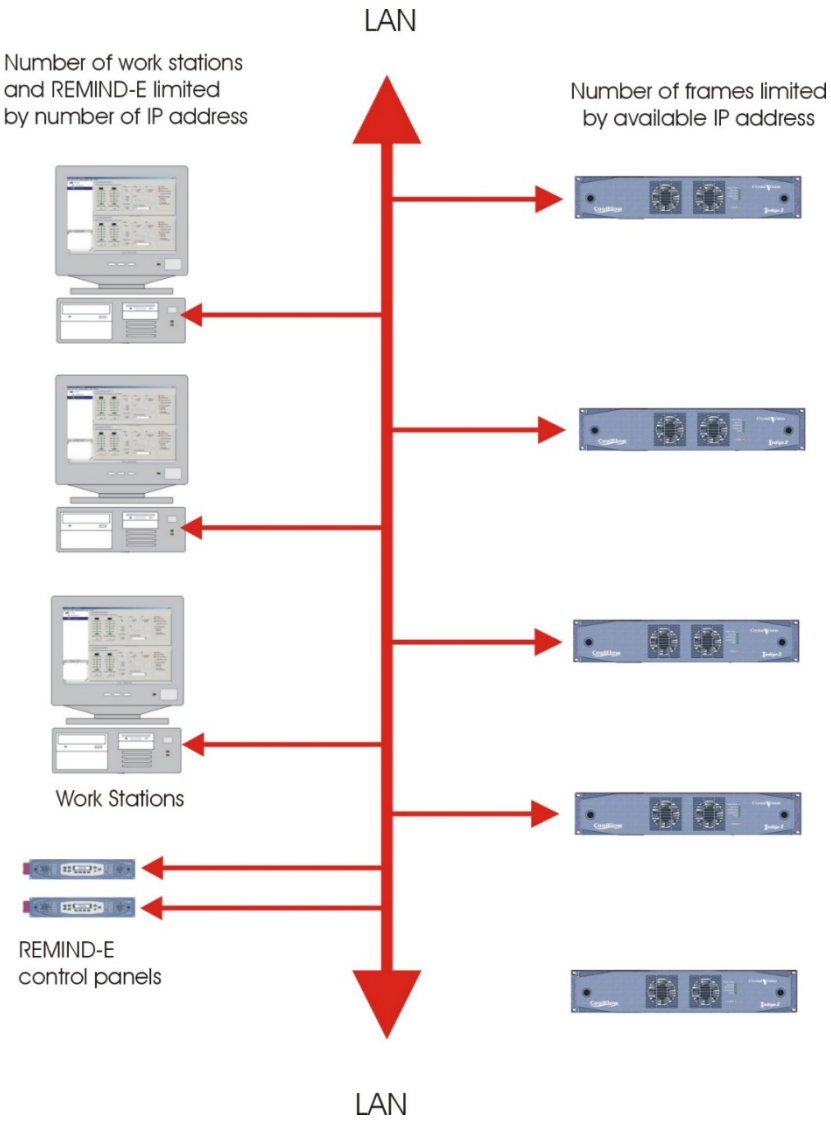
Frame Address

This switch must be left in position 0.

3 Control

The Indigo DTSE desk top box supports ping, FTP, HTTP, SNMP, Statesman and ASCII control protocols. From frame software version V5.9 build 16216, it is possible for a user to disable all services except ping in order to prevent unwanted access. It is also possible to remove the Network Configuration, SNMP Configuration and Software Upgrade menus should restricted access be required to these settings. Please contact support@crystalvision.tv for further information including the necessary frame login credentials.

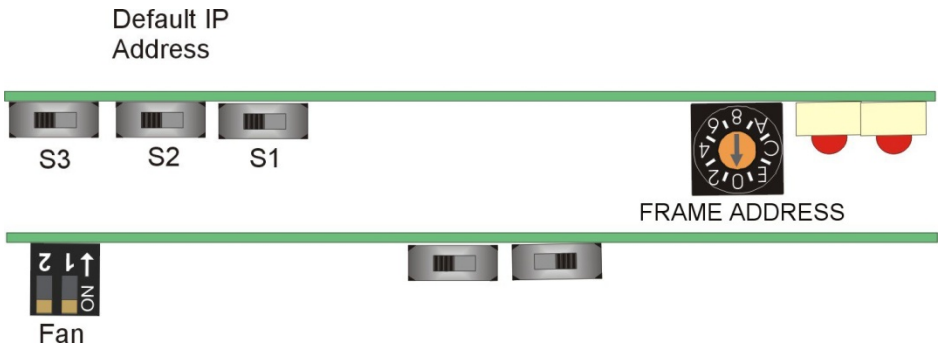
Ethernet control is provided by the Indigo DTSE frame. This allows the Statesman PC control system or remote active control panels to control a large number of the Indigo Ethernet series frames over a local area network.



Statesman control of Indigo frames over Ethernet

3.1 Setting up and connecting

The frame address, which only relates to Indigo DTSE, must be set to zero.



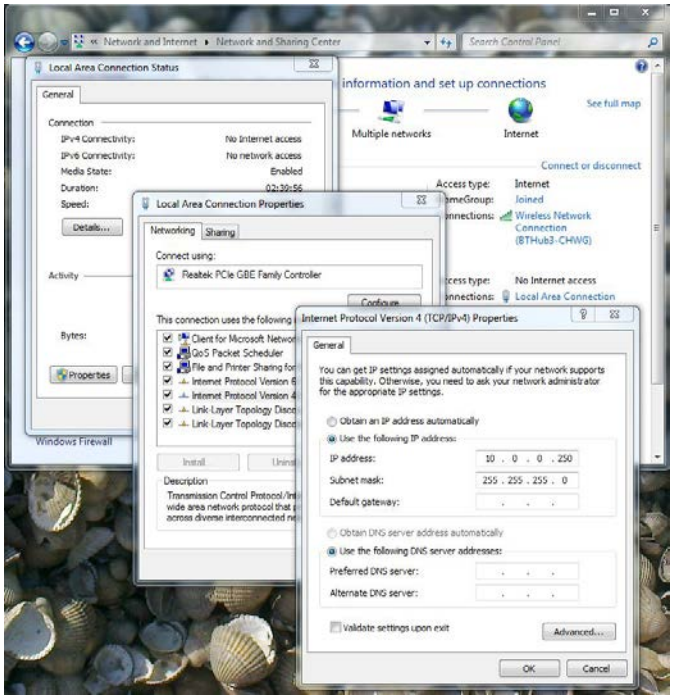
The frame can be connected to a network port or directly to a PC from the rear panel RJ45 port labelled ‘Ethernet’. Usually, if connecting directly to a modern computer, a straight CAT5 cable only is needed. A crossover cable might be necessary with older equipment.

Set the default IP address 10.0.0.201

For Indigo DTSE frames, the configuration switches and status LEDs can be found on the upper edge of the front panel PCB. To access the internal web page, set the frame to the default IP address (10.0.0.201) by setting switch S2 on the upper PCB to the left.

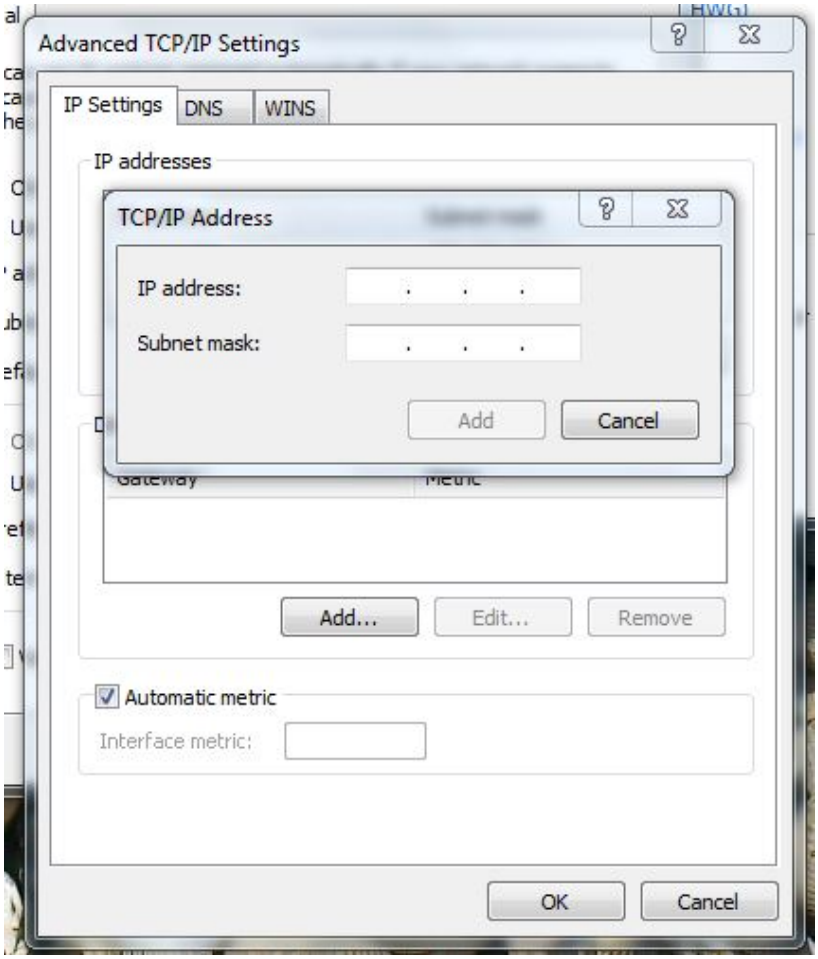
The front panel PCB must now be power cycled in order for changes in the switch settings to be implemented. This can be achieved by either briefly interrupting the power to the frame or, if this is not convenient, removing the ribbon-cable connection to the front panel. Care must be taken not to bend any pins in the cable connect as attempting to re-straighten any bent pins will likely result in their fracture.

Set the PC’s Local Area Connection (LAN) controller’s sub-mask to 255.255.255.0 and the IP address within the same IP group i.e. 10.0.0.250. For Windows 7 users this is most easily accessed from the Network and Sharing Centre:



Setting up the PC's LAN controller with Windows 7

It is worth noting here that Windows does allow LAN controllers to operate with several IP addresses and sub-masks simultaneously, which can be useful if a number of frames need to be set up. Once a frame is programmed with its final IP address it may be that the PC will no longer be able to control the frame without changing its LAN controller's IP address. In this case setting an additional IP address could save time if a large number of frames are to be configured. Additional IP addresses can be added via the 'Advanced' tab in Windows 7:



Windows 7 Advanced LAN settings

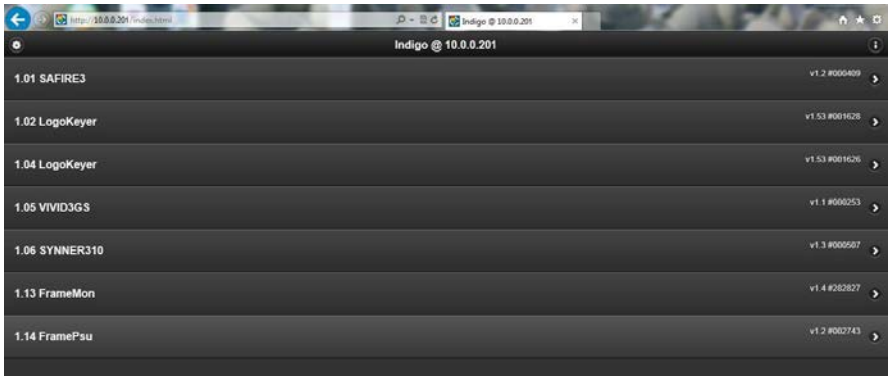
Alternatively, the LAN controller sub-mask can be extended to allow control of frames of similar IP address. For instance, if a frame is to be finally configured as 10.0.1.0 then a sub-mask of 255.255.0.0 would allow control of the frame in its default and final configuration.

Indigo Home Page

***Note**: For frame software versions earlier than v4.6 please refer to Appendix 2.*

To access the Home page, open up your web browser***** and enter the IP address 10.0.0.201. The web page displayed is the Indigo home page that shows the names of the cards installed, the slot number they are fitted into, and the firmware version and serial number. This page will give status information about the frame, its power supplies and means to access each card's controls.

**Recommended web browsers include IE10, Google Chrome and Mozilla Firefox.*



Indigo Home page

Indigo Setup Pages

Click on the circle at the top left of the Home page to open the Indigo Setup home page:

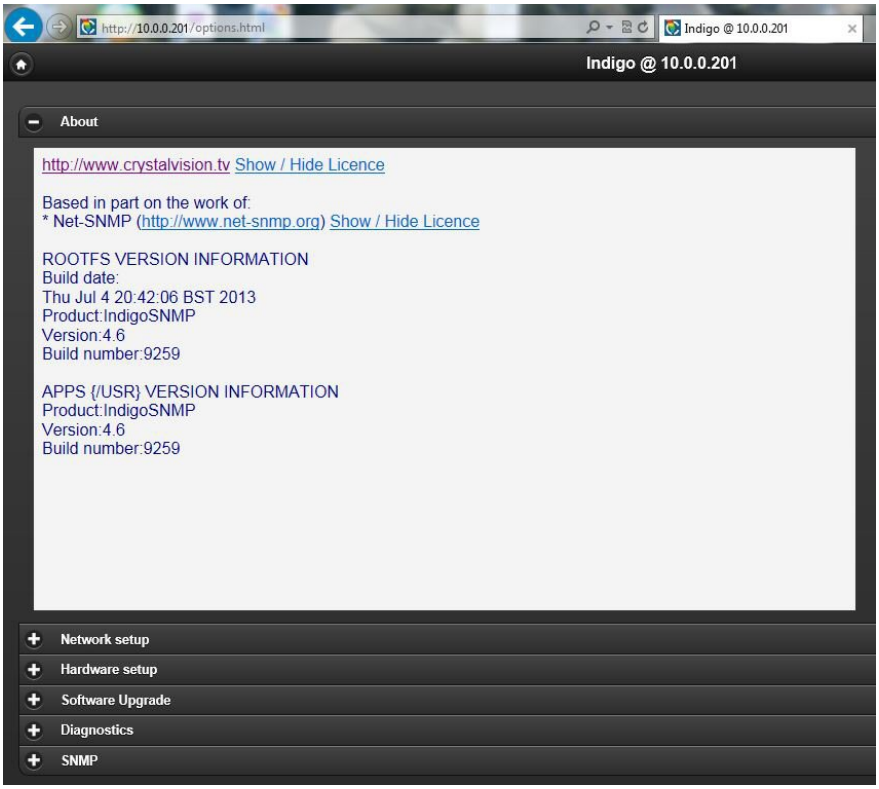
Click on the ‘house’ icon to return to the Home page:

The Setup page gives access to other pages that enable adjustment and give information of Network, Hardware, SNMP settings and diagnostic information:

Indigo Setup home page

About

From the Setup home page, clicking on the ‘About’ link will open a web page that shows, amongst other things, the frame’s software version number and build:



Indigo 'About' page

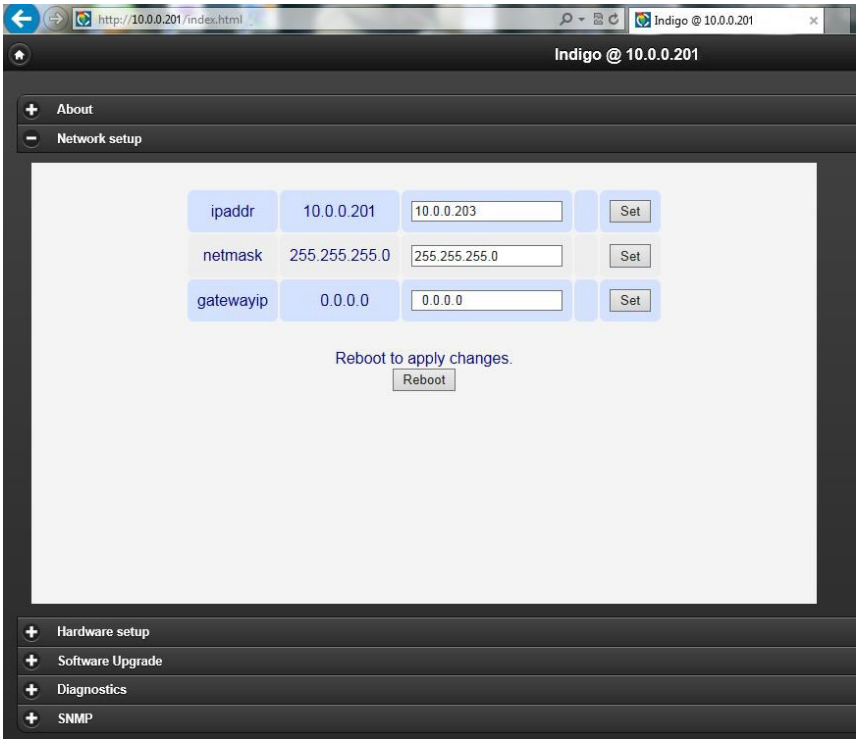
The above example shows that the frame is equipped with IndigoSNMP software version 4.6, build version 9259. Crystal Vision may ask you to provide this information if there is a problem. Note that only frames fitted with IndigoSNMP software are capable of supporting an SNMP interface. An SNMP enabled Crystal Vision frame supports SNMP, ASCII and HTTP/JSON control protocols. A non-SNMP enabled frame supports ASCII and HTTP/JSON control protocols. Contact Crystal Vision customer support for protocol details.

Network Setup

From the Setup home page, clicking on the Network Setup link will bring up the Network Setup page. If the installation includes more than one Indigo frame then the IP address will need changing as all frames need a unique IP address. Enter the new IP address in the **ipaddrr** edit box and click on 'Set'. In the example below, the IP address will be changed to 10.0.0.203 from its default value.

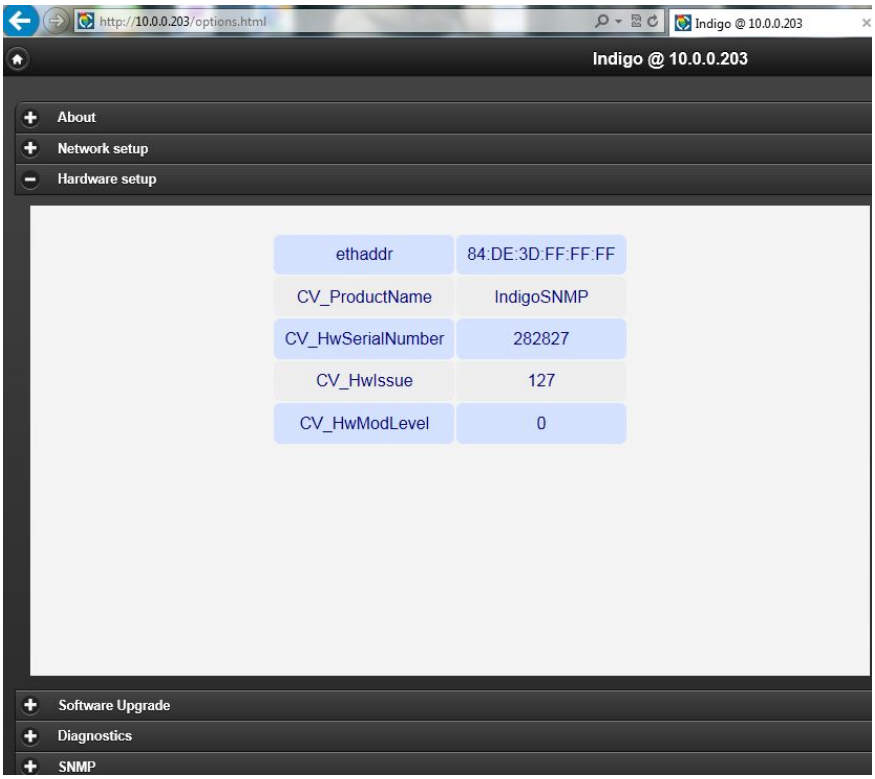
The **netmask** address can also be changed on this page if required. The Gateway IP address should be set to 0.0.0.0 in the **gatewayip** box unless a router is in circuit, in which case the correct gateway address should be entered. Click on 'Reboot' to implement the changes and the web page should refresh itself showing the updated parameters.

The 'Default IP' DIP or slide switch must be returned to the up/right 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. Should incorrectly formatted information be added, an error dialogue box will be displayed indicating the likely cause of the errors.



Indigo 'Network Setup' page

Hardware Setup



Indigo 'Hardware Setup' page

From the Setup home page, clicking on the 'Hardware Setup' link will bring up a page containing information about the frame:

'**ethaddr'** is the MAC address of the frame's network card.

'**CV_ProductName'** is the frame's product name – SNMP indicates that the frame supports optional SNMP control.

'**CV_HwSerialNumber** is the serial number of the frame entered during manufacture and will be the front panel serial number. The serial number will be in the range 1-999999 and is a useful aid for identification or auditing purposes.

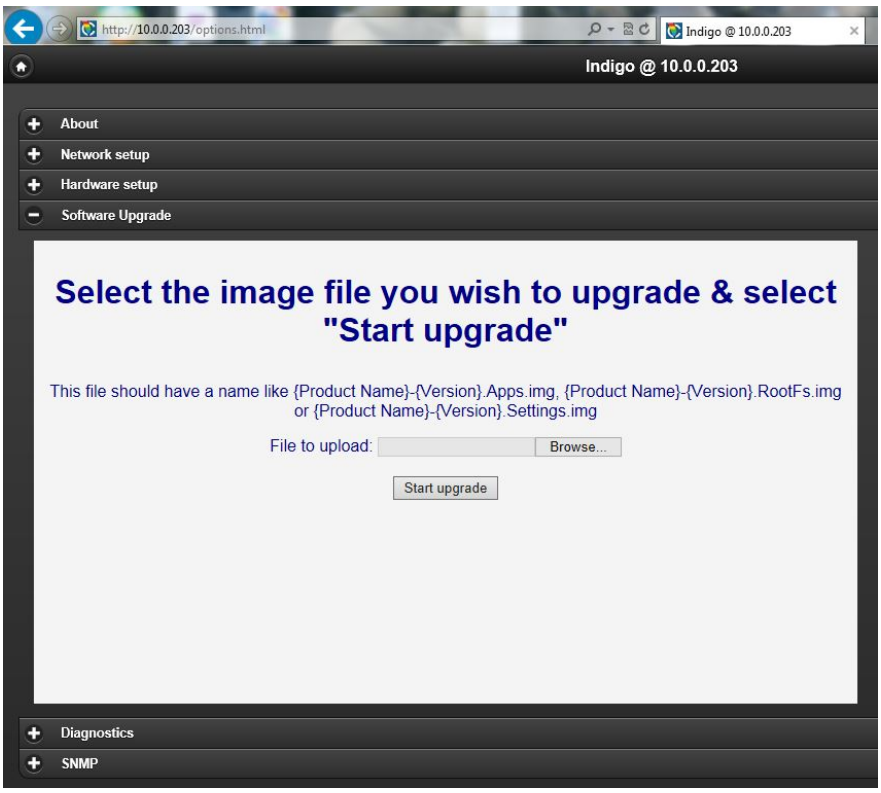
'**CV_Hwissue'** is the version of the frame hardware entered during manufacture.

'**CV_HwModLevel'** indicates modifications to the frame hardware.

Software Upgrade

Clicking on the 'Software Upgrade' link will open a page that enables the frame software to be upgraded. You may be asked to perform an upgrade by Crystal Vision who will supply the software and instructions to perform this task.

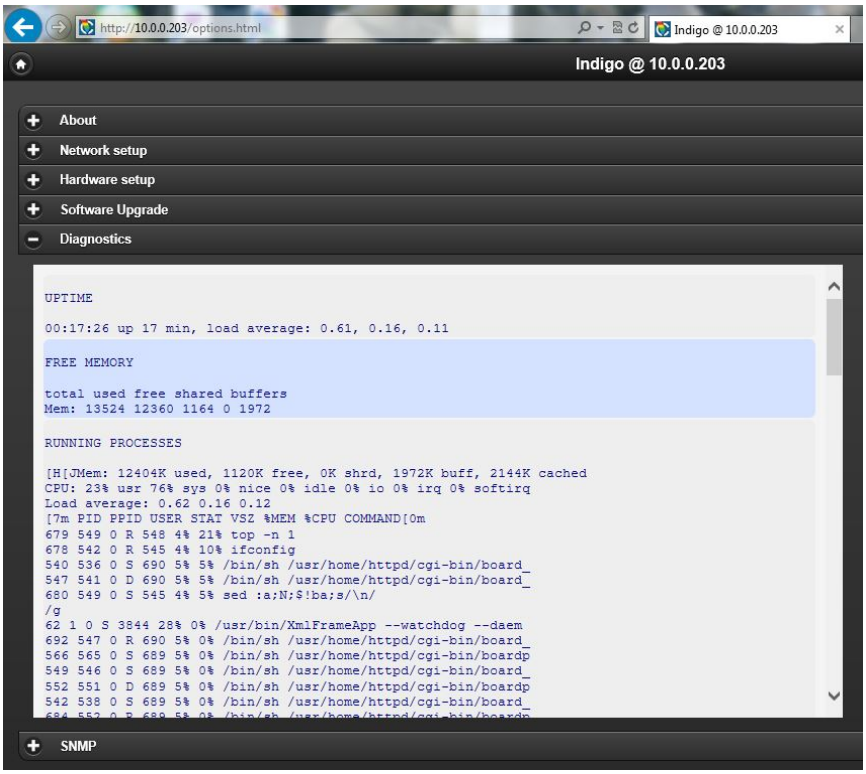
Typically there are three image files: Indigoxxx.RootFS, Indigoxxx.Apps and Indigoxxx.Settings. Each of the files is selected in turn and the upgrade performed on each before re-booting the frame. Do not attempt to do this without specific instruction from Crystal Vision or its representatives.



Indigo 'Software Upgrade' page

Diagnostics

The ‘Diagnostics’ link opens a page which will help Crystal Vision diagnose any faults encountered with your system. Crystal Vision may ask you to supply this information by copying and pasting part or all of the data:



Indigo ‘Diagnostics’ page

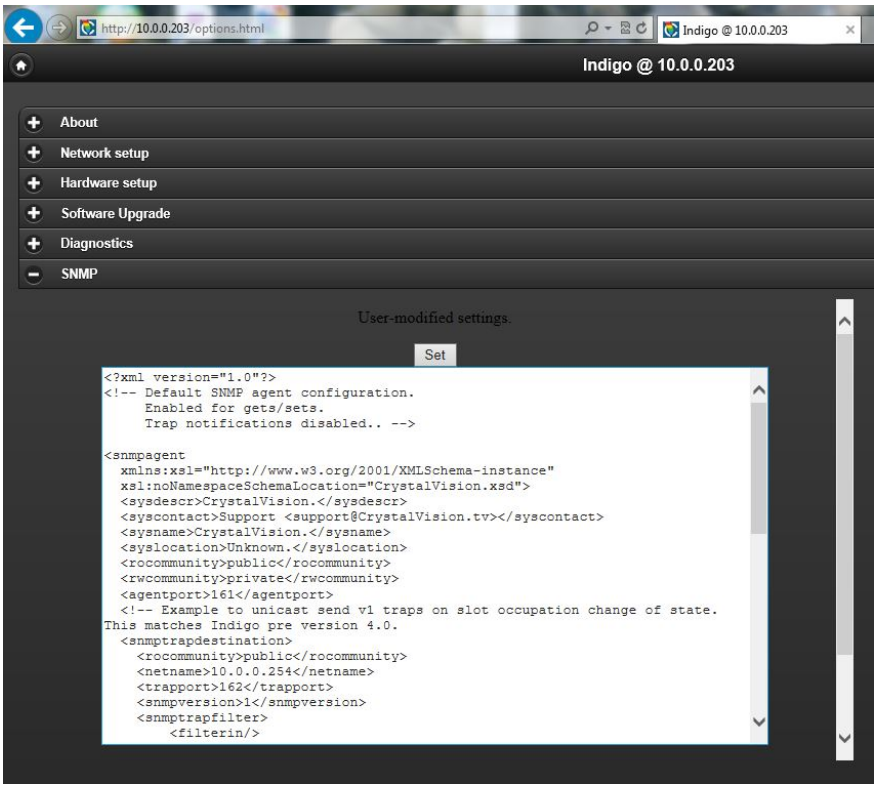
3.2 SNMP

Access this window by clicking on the ‘SNMP’ link from the Setup home page. Indigo SNMP enabled frames can control and report status of cards, PSU and frames. SNMP traps can 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 changed. The SNMP window can be edited and changes applied by clicking on ‘**Set’**.

Indigo SNMP enabled front panels use the Net-SNMP agent and a Crystal Vision XML Schema Definition document to control its operation and the management information provided. The user-configurable SNMP configuration window easily allows the user to:

- Edit the list of configuration files.
- Program the IP and port address of the destination SNMP Manager.
- Enable or disable individual trap events individually by OID.
- Select SNMP v1 or v2 operation.

The full list of available XML commands is contained within the Schema Definition document **CrystalVision.xsd** available from Crystal Vision.



Indigo 'SNMP' configuration page

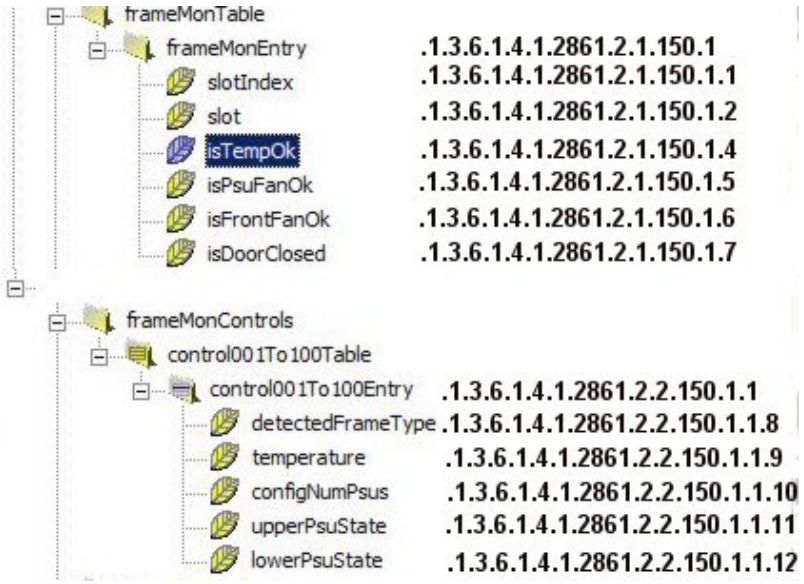
Management information base (MIB)

As is normal for an SNMP manager system, each of the remotely-controllable boards, frame and PSUs that are to be monitored have an associated MIB. Each MIB is a collection of object identifiers that identify all variables that can be read via SNMP and these MIBs are available from Crystal Vision. Use a MIB Browser to view all status and control possibilities.

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 tree by a unique number sequence coded within the MIB. As an example, from the FrameMon MIB (see tree below), the front panel status variable **isTempOK** is accessed by the OID **1.3.6.1.4.28681.1.2.1.150.1.4**. The OID will then be accompanied by a value to indicate its status, in this case, 1= NO, 2= YES. Any status change will cause the transmitting of a trap to the SNMP manager.

The following grab from a MIB Browser shows the FrameMon MIB tree with its identifying number sequences:



Partial tree of FrameMon MIB showing identifiers

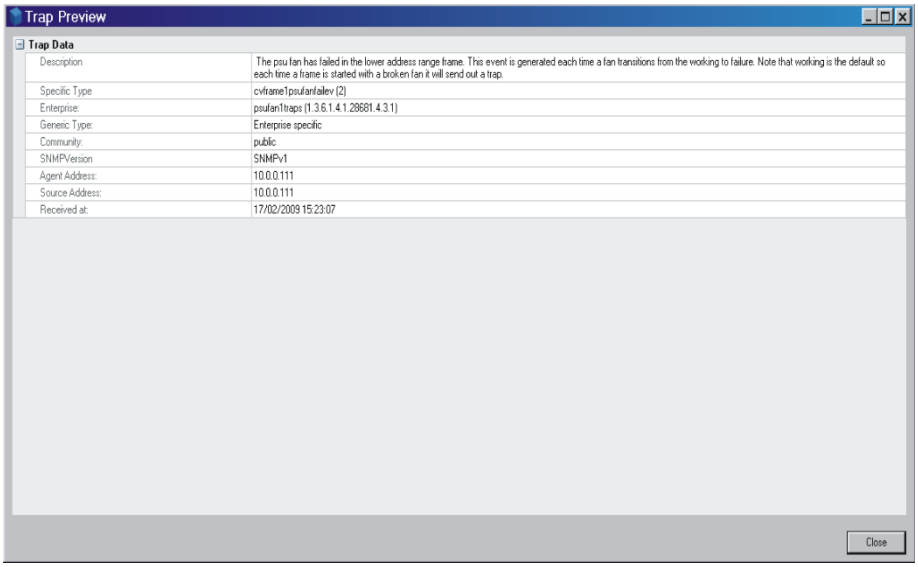
The frame variables monitored by the FrameMon MIB are:

Name	Function	Syntax	Value
Slot	Frame's virtual slot number	INTEGER 0..31	1.1...2.16
isTempOk	Frame temperature OK?	INTEGER	1=NO, 2=TRUE
isPSUFanOk	Frame's PSU fan OK?	INTEGER	1=NO, 2=TRUE
isFrontFanOk	Frame's front panel fan OK?	INTEGER	1=NO, 2=TRUE
isDoor Closed	Frame's front panel closed?	INTEGER	1=NO, 2=TRUE
detectedFrameType	Type of Indigo frame	INTEGER	0=Indigo1SE, 1=IndigoDTSE, 2=Indigo4SE, 3=Indigo2SE, 4=Indigo1AE, 5=IndigoDTAE, 7=Indigo2AE
temperature	Frame temperature	INTEGER 0..127	0...1...2...127
configNumPsus	No. of PSUs fitted	INTEGER	Number of PSUs e.g. 1, 2 etc.
UpperPsuState	Condition of upper PSU	INTEGER	0=OK, 1=Alarm, 2=Not present, 3=Configuration error
LowerPsuState	Condition of lower PSU	INTEGER	0=OK, 1=Alarm, 2= Not present, 3=Configuration error

FrameMon MIB variables

Traps

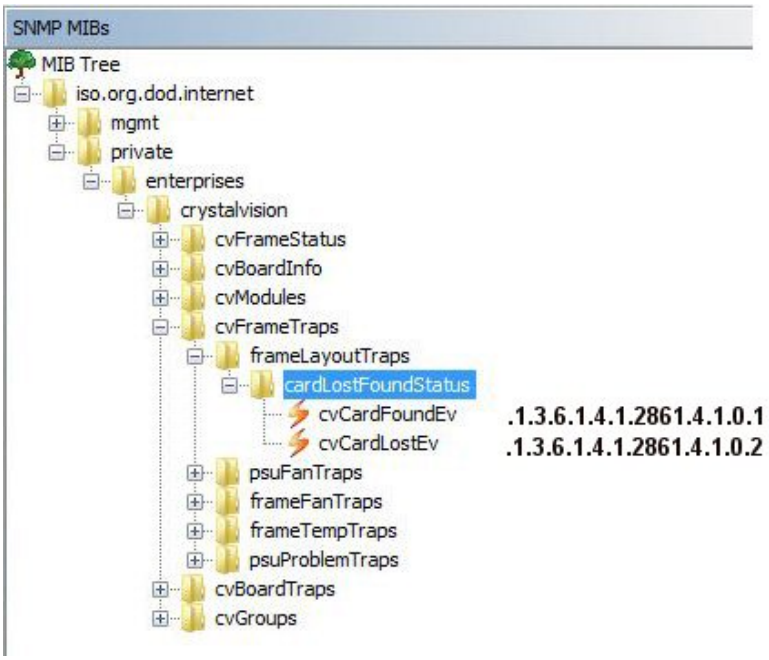
Whenever a status or control value changes, a trap will be sent to the SNMP manager unless filtered (see MIB for trap OIDs). By interrogating this trap it is possible to identify the status change and its consequences. It will be quite common for multiple traps to be sent for any one incident – for example,removing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



Example of a trap received by the SNMP manager

Filters

Any status or control value change can potentially send a trap but these can be filtered by information in the configuration file. The following extract from the MIB tree shows two events with their OIDs that will generate traps if a card is found or lost:



Unless previously edited, the SNMP configuration window will show an example of enabling the trap filter using the events shown above:

```
 <-- Example to unicast send v1 traps on slot occupation change of state.
This matches Indigo pre version 4.0.

 <snmptrapdestination>

  <rocommunity>public</rocommunity>

  <netname>10.0.0.254</netname>

  <trapport>162</trapport>

  <snmpversion>1</snmpversion>

  <snmptrapfilter>

     <filterin/>

     <snmpoidmask>1.3.6.1.4.1.28681.4.1.0.1-2</snmpoidmask>

  </snmptrapfilter>

 </snmptrapdestination>

 -->
```

Extract from SNMP configuration window showing example of trap filtering

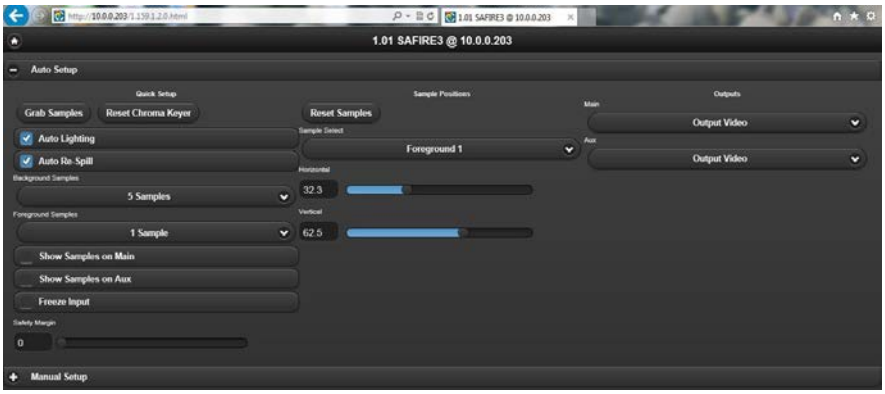
3.3 Controlling cards via Ethernet

Crystal Vision cards fall into two categories. The first (newer) type uses an XML file to create a control database that is used by the card's front-edge controller, Statesman, the Indigo frame front panel controller and the Indigo web page interface. This type offer a full range of controls via the web page interface with slider controls etc. similar to that available with the Statesman PC software. The other type offers control via the web page interface similar to that available with an Indigo frame control panel.

Accessing the Indigo Home page with a PC browser via the Ethernet connector will display a list of the cards fitted.

Indigo home page

Clicking on the Safire 3 link – one of the XML supporting cards – will open up the web interface for this product:



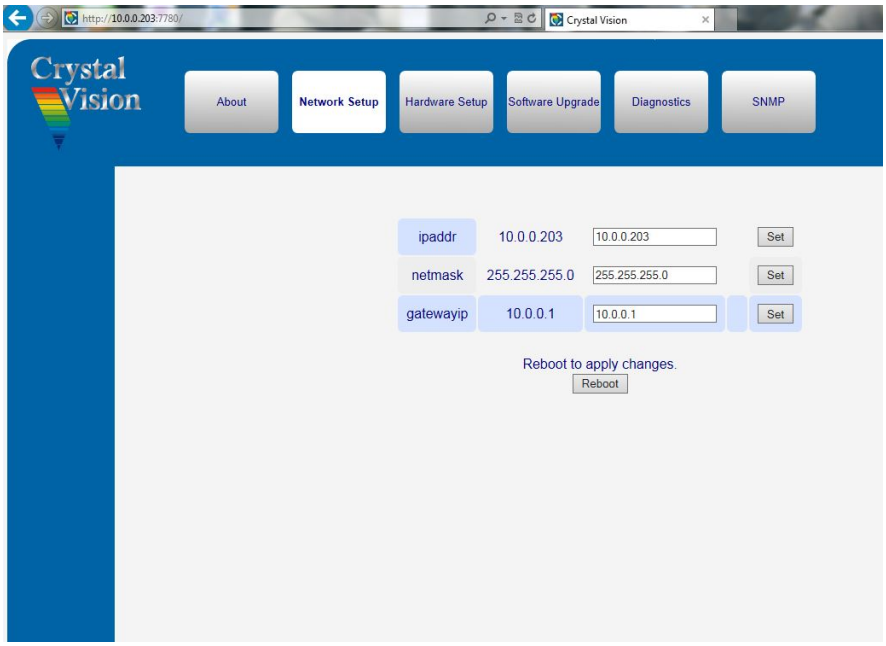
Safire 3 'Auto Setup' web page showing various controls

All of the Safire 3 controls can be adjusted via the web page interface – see User Manuals for details of the Safire 3 controls and other products.

3.4 Alternative method to access Network Setup

An alternative method of accessing the Setup home web page is to use port address 7780. Connect your web browser and enter the frame's IP address (10.0.0.201 as default or if you've switched S2 on the upper PCB to the left) followed by port address 7780 i.e. 10.0.0.201:7780.

This will bring up the older style web page:



Indigo Setup home page accessed via port 7780

4 Installing Crystal Vision modules

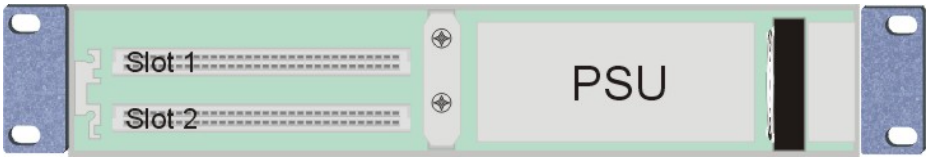
The Indigo desk top boxes each have two slots for Crystal Vision video or audio cards. Signal connections are made through single or double rear modules.

An optional rack mount kit IDT-RK allows the 1U Indigo desk top box to be mounted into a 19" rack mount frame.

The inside of the frame can be accessed to change the modules by unscrewing the two black knobs, one on each side of the front panel.

Module positions

Module positions are numbered 1 to 2 as shown below:



The Indigo DT box showing slot numbers

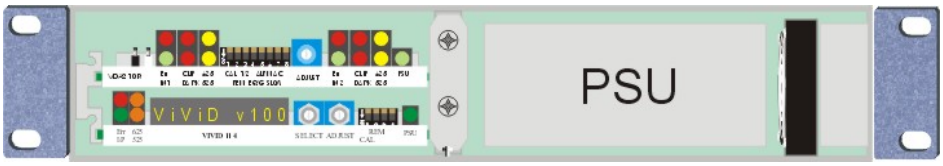
Before fitting or removing signal modules the retaining brackets may need to be removed. Retaining brackets prevent modules from being inadvertently disconnected or from coming out during transit. They may also prove useful in OB vehicles when travelling over rough ground.

Note: The internal PSU is fitted inside the right hand compartment.

Inserting modules

To insert a module proceed as follows:

- Remove the two screws holding the bracket 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 bracket if required



The Indigo DT box 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 bracket 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 a blanking plate.

Details of signal types and pinouts are given the documentation supplied with each Crystal Vision video or audio card.

The Indigo DT rear view with EMC cover removed for slots 1 and 2

The rear modules are held in place by retaining screws which ensure EMC compliance.

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

Fitting rear connectors

To fit a rear connector, proceed as follows:

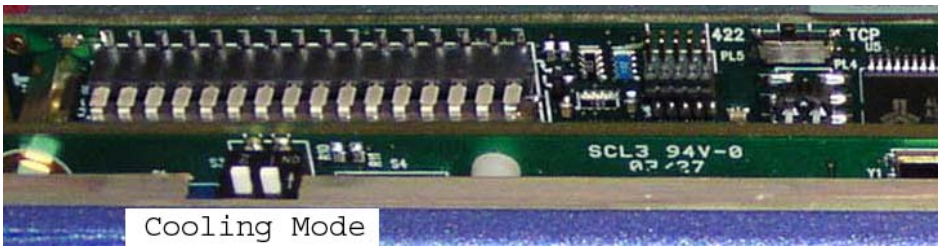
- Disconnect the mains power lead from the frame
- Remove the rear relevant EMC cover(s) at the rear of the frame by unscrewing the retaining screws.
- Push fit the selected rear connector onto the appropriate frame slots
- Refit an EMC cover if required and replace the retaining screws.

The Indigo DT with one EMC cover and an RM01 connector fitted to slot 1

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 screws before power is reapplied.**

4.1 Select the cooling mode

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



Indigo DT front panel hardware settings – cooling mode

The three modes are normal, quiet and maximum cooling.

The two-position DIL switch controls the three cooling modes as follows:

Piano Switches

Switches 1 and 2 configure the cooling fan modes.

Levers 1 & 2	Function	Notes
Both up	Normal cooling	The fan runs 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 fan is switched off. 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.

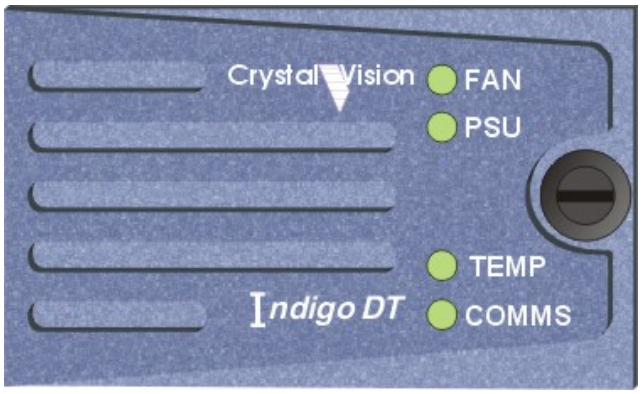
Note: Quiet mode is dependent on the frame temperature being below 45°C and not being in an alarm state.

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.

5 Trouble shooting

Reading LED status

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



The Indigo DT LEDs

The following LED status indications may be seen:

LED	Colour	Notes
FAN	Yell/Grn	Normal operation
	Red	Change fan
PSU	Yell/Grn	Normal operation
	Red	Change PSU
TEMP	Yell/Grn	Normal operation
	Red	Frame temperature too high
COMMS	Unlit	Press Device in Statesman
	Flash amber	mode for COMMS status

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

When a fault is cleared, the corresponding LED (if appropriate) will return to normal.

Power supply related faults operate a relay, the contacts of which are brought out to the Remote 2 connector. These contacts can be used to operate external indicators as desired.

Please refer to the connector pinout section for more details.

5.1 Maintenance

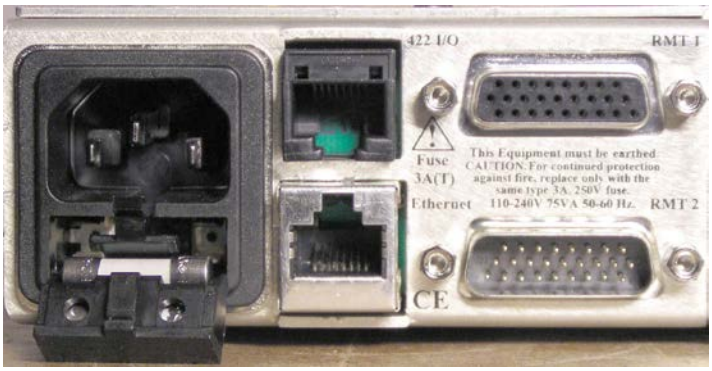
Warning: **These servicing instructions must only be carried out by qualified personnel only. To reduce risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.**
Refer also to the general safely summary in the installation chapter.

Replacing the mains input fuses

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).

Software upgrades

Software upgrades for the Indigo DTSE front panel are done via the Ethernet connection. See the Indigo active front panel manual for information concerning remote software uploading.

5.2 Frequently asked questions

Why are 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?

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 FAN LED is not red

What should I do if the FAN LED is red?

Check that the fan is plugged in correctly

Try replacing the fan

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 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

6 Specification

Indigo desk top box

General

Dimensions:	223mm wide, 44.5mm high (1U), 365mm deep. Weight 2.5 kg
Power requirements:	85 to 264 Volts, 47 to 400Hz
Operating conditions:	0 to 40 degrees C non-condensing Ventilation front to right hand side, without air filter
Power supply:	Single built in power supply

Module control

Remote options:	Six control lines per module. Assigned on module (eg. GPI or RS422/RS232) Contact open/closure for power supply or frame fault condition (supply out of range or failure, fan too slow or fail, overheat) 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) Second serial port available via 26-pin high density D-Type connector and RJ45 connector Ethernet control capable SNMP control and monitoring option.

7 Appendix 1

7.1 Module addresses and node numbers

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

Device/Indigo frame	Lower address in 1st frame
Modules in 2U frames	to 1.12
Modules in 1U frames	1.01 to 1.06
Modules in desk top frames	1.01 to 1.02
Panel PIC in all frames	1.00
Upper PSU in 2U frames	1.14
Lower PSU in 2U frames	1.15
PSU in 1U frames	1.14

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 a card is detected by the front panel processor, 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

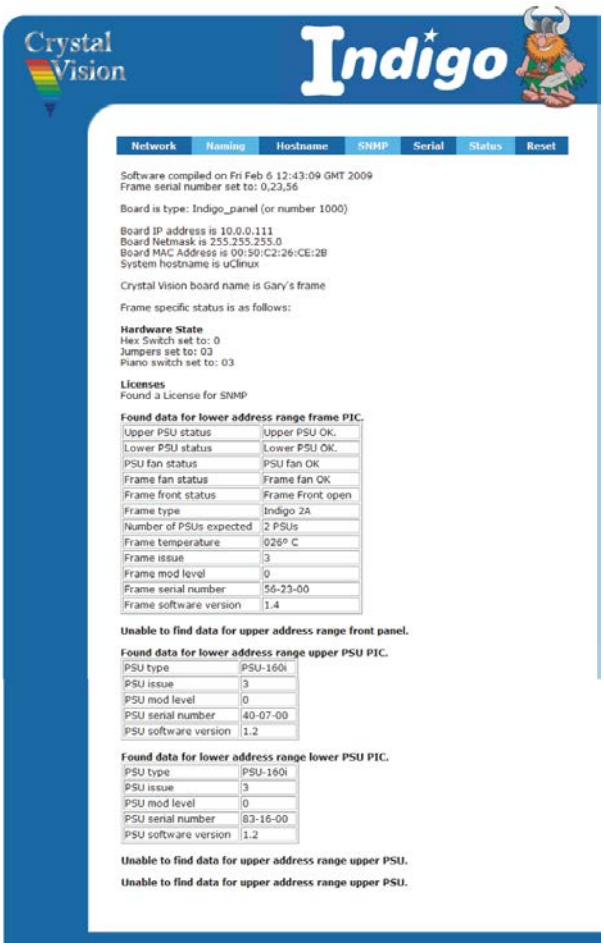
8 Appendix 2

Indigo Frame Software prior to v4.6

Prior to frame software version 4.6, Ethernet-enabled Indigo frames used an entirely different web interface. The following is documented for users of older frame software.

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 CAT5 crossover cable may be required. Connecting to a network port hub uses a straight CAT5 cable. To access the internal web page set the frame to the default IP address by setting the default IP address switch DIP4 to down. Open up your PC web browser and set its search to http://10.0.0.201 and select 'go to'. This is the default IP address, the sub-mask being 255.255.255.0. After a dialogue box has briefly appeared the Indigo main status page will be displayed.



Indigo Status page

This page will give a large amount of status information about the frame and its power supplies. From the web page 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.*

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

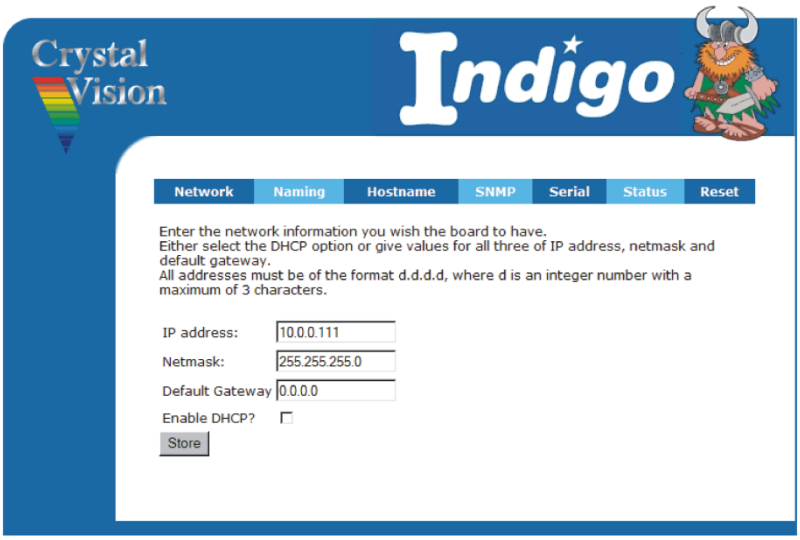
The status page gives an overview of the frame and its power supplies. The information that can be found here includes general information about the network attributes, frame name and serial number etc. plus more frame specific information like internal temperature, fan status and PSU type. Further information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

Confirmation Window

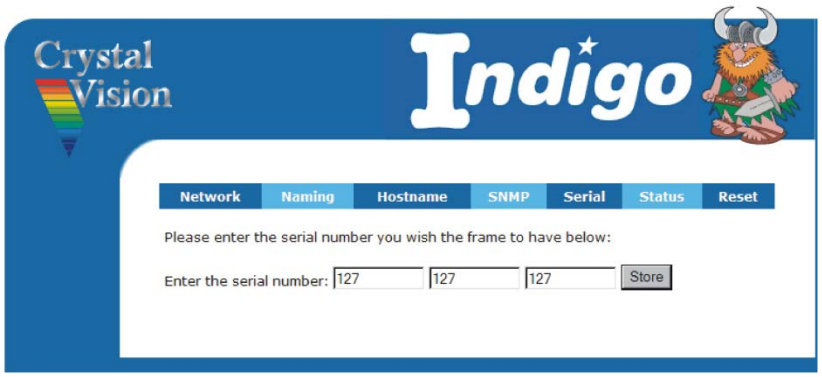
Should incorrectly formatted information be added, an error dialogue box will be displayed indicating the likely cause of the errors.

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.

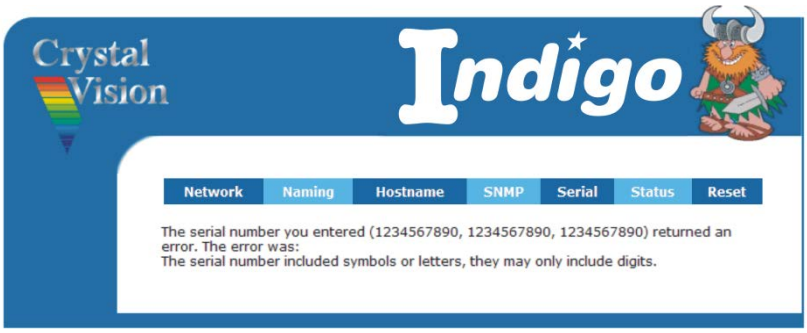
An example would be 0 0 0 or 127 127 127.

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



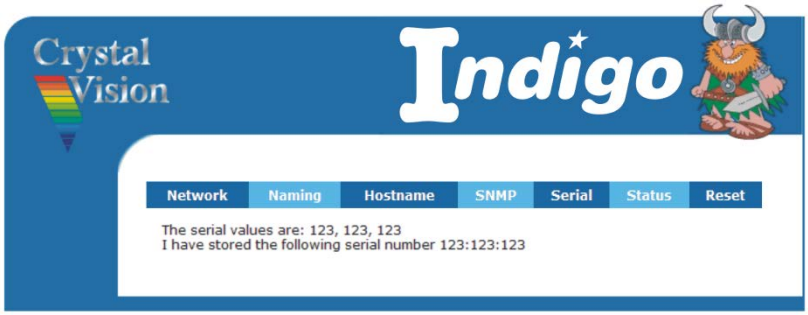
Serial number entry box

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.

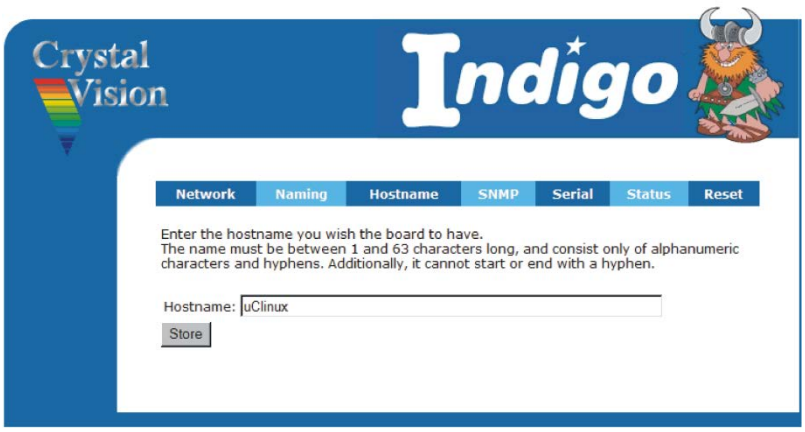
Naming the frame

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.



Hostname window

Reset

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

Reset window

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

SNMP

The Indigo DTSE 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

8.1 SNMP agent

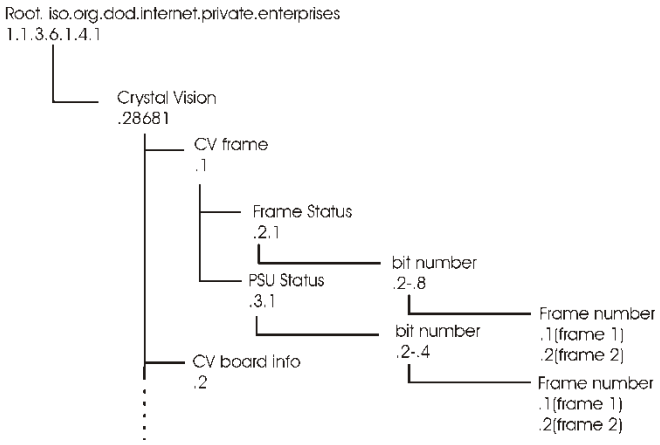
The Indigo DTSE comes with a pre-installed SNMP agent that can either report the status or generate traps on a status change of the PSU and frame systems. These SNMP traps can then be used to trigger alarms – for example, say when a signal has been removed, video standard changed or any of the many monitored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

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.

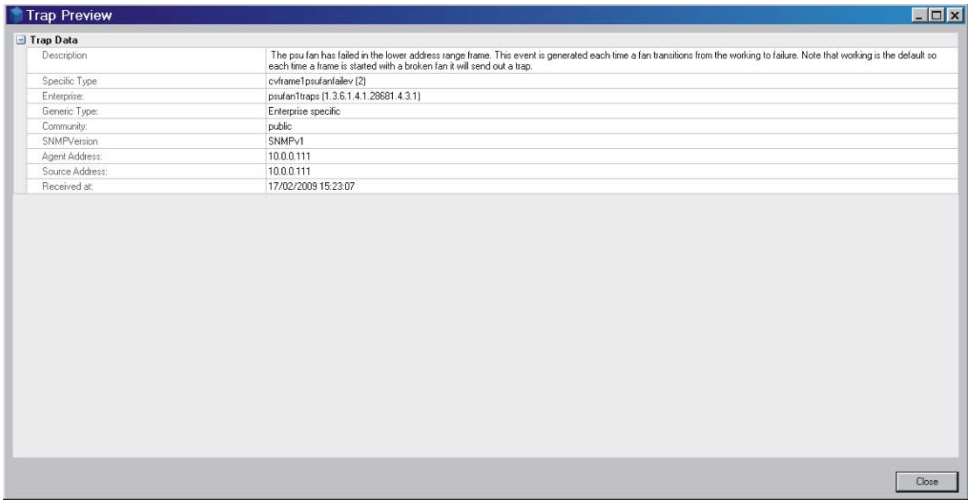
Note: The SNMP monitor allows for two frames to be connected as a frame pair. The second frame will be reported as Unknown when not present.

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 – for example, removing an input may typically trigger eight traps. It will then be down to the SNMP manager to sort these into a hierarchical order or mask as necessary.



Example of a trap received by the SNMP manager

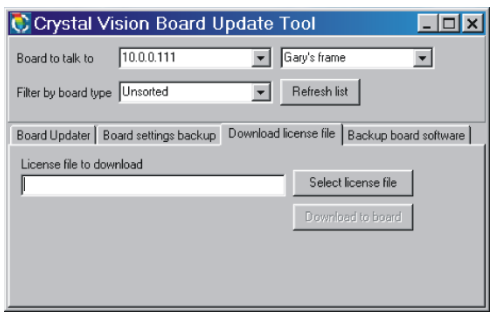
Downloading licences

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

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

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

Select the "Download license file" tab and click on the Browse button. Navigate to the folder containing the Licence file. Click "Download to Board" and wait.



It will now be necessary to reboot the frame. This can be achieved by cycling the mains supply to the frame or, if not convenient, carefully removing the ribbon-cable connector from the front panel PCB.

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

8.2 SNMP Quick Start Guide

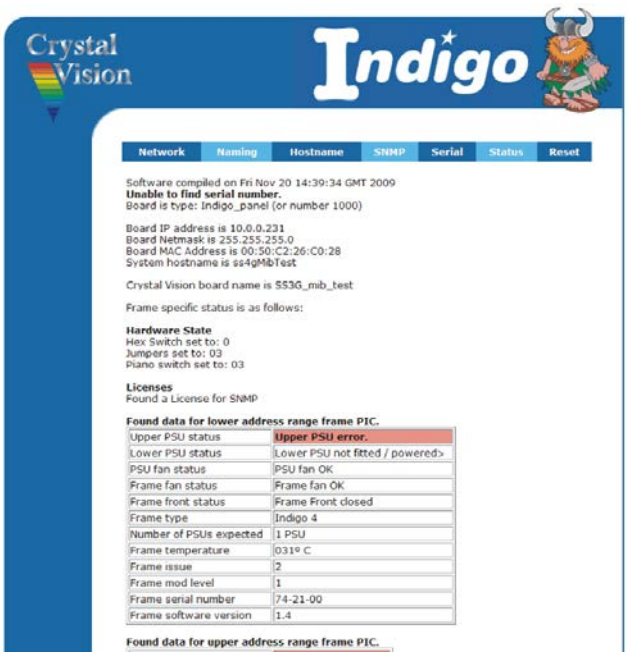
Introduction

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

Frame Setup

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

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



Frame Home page

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

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

SNMP page

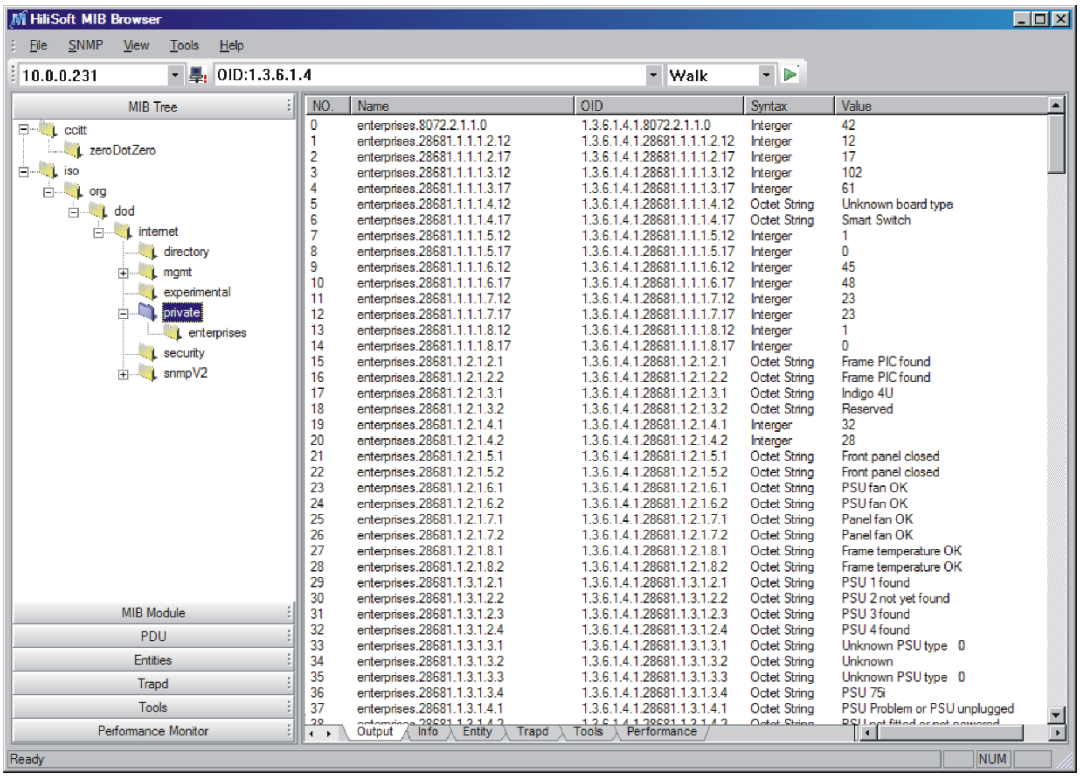
The SNMP Agent in the frame is highly configurable. However, the default settings are correct for most systems and it is likely that only the 'trapsink' address needs to be changed. Click and drag to select the trapsink IP address and type in the IP address of the SNMP manager being used as the trap receiver.

Then click on the ‘Store’ button to write the new value into the frame. This will take a few seconds. You will then need to re-boot the frame (as described in the "Resetting the Frame" below) for the setting to take effect.

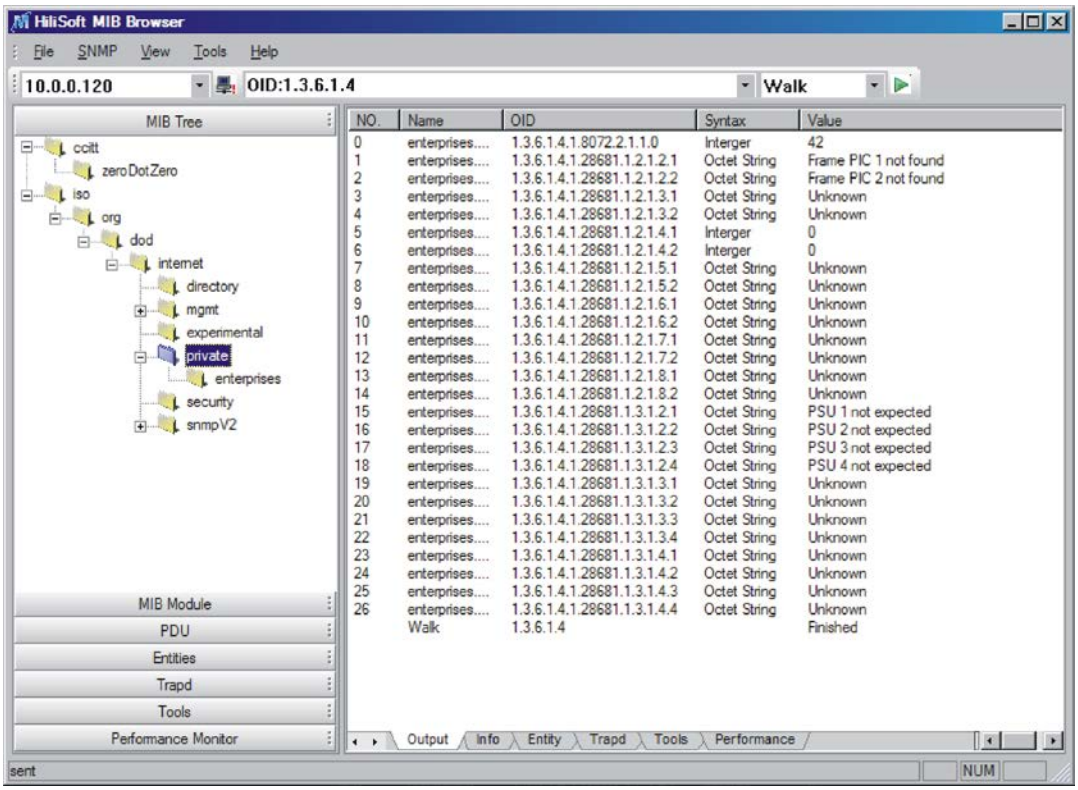
Checking

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

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



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



Resetting the Frame

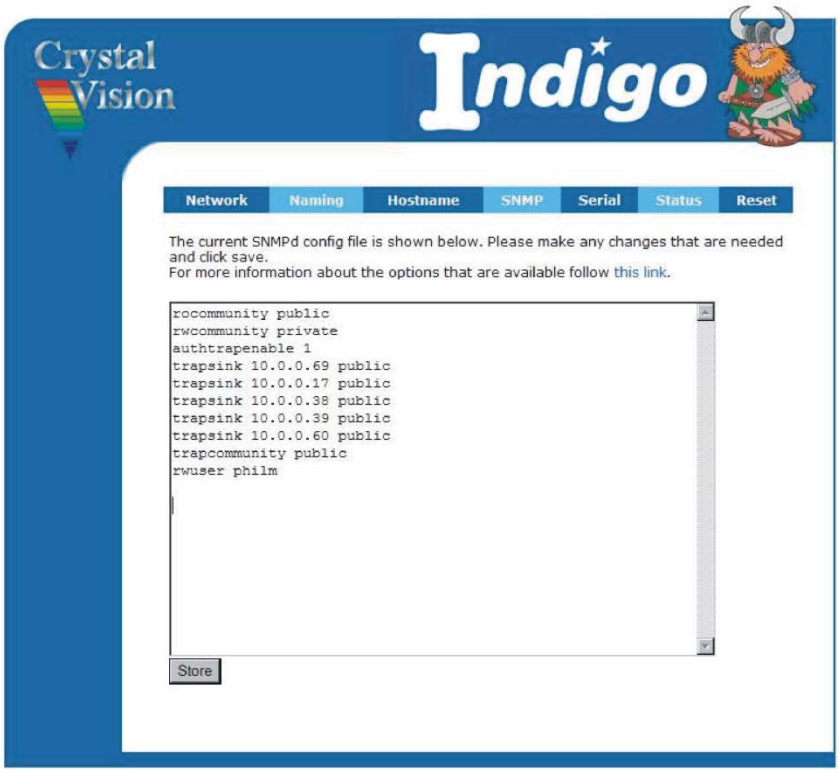
The frame can be reset from the web page. From the home page select the 'Reset' tab.

Click on the button to restart the frame. Note 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.


Crystal Vision
Indigo
Network
Naming
Hostname
SNMP
Serial
Status
Reset
The current SNMPd config file is shown below. Please make any changes that are needed and click save.
For more information about the options that are available follow this link.
rocommunity public
rwcommunity private
authtrapenable 1
trapsink 10.0.0.69 public
trapsink 10.0.0.17 public
trapsink 10.0.0.38 public
trapsink 10.0.0.39 public
trapsink 10.0.0.60 public
trapcommunity public
rwuser philm
Store