Densité 3+ FR1

1RU housing frame for Densité modular products

User Manual

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Miranda

A **BELDEN** BRAND

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Change History

Revision	Published	Description of Changes
974-99M00-100	26 Oct 2012	Initial release

Notice

Because of continued product development, the accuracy of the information in this document may change without notice. The information and intellectual property contained herein is confidential between Miranda and the client and remains the exclusive property of Miranda. If you find any problems in the documentation, please report them to us in writing. Miranda does not warrant that this document is error-free.

Trademarks

Software License Agreement and Warranty Information

Contact Miranda for details on the software license agreement and product warranty.

Safety Compliance

This equipment complies with:

- CSA/UL/IEC 60065, 7th Ed. + AM1, Audio, video and similar electronic apparatus - Safety requirements

The power cord supplied with this equipment meets the appropriate national standards for the country of destination.

WARNING: **An appropriately listed/certified mains power supply cord must be used for the connection of the equipment to the mains voltage at either 120V~ or 240V~.**

CAUTION: **These servicing instructions are for use by qualified personnel only.**

To *reduce the 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.*

Electromagnetic Compatibility

This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for Class A digital devices.

NOTE: 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.

CE This equipment has been tested and found to comply with the requirements of the EMC directive 2004/108/CE:

- EN 55022   Conducted emissions, Class A
- EN 55022   Radiated emissions, Class A
- EN 61000-3-2   Harmonic current emission limits
- EN 61000-3-3   Voltage fluctuation and flicker limitations
- EN 61000-4-2   Electrostatic discharge immunity
- EN 61000-4-3   Radiated electromagnetic field immunity - RF
- EN 61000-4-4   EFT immunity
- EN 61000-4-5   Surge immunity
- EN 61000-4-6   Conducted immunity
- EN 61000-4-8   Power frequency magnetic field immunity
- EN 61000-4-11   Voltage dips, short-interruption and voltage variation immunity

Important Safeguards and Notices

This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions appear throughout the manual where they apply. Please read and follow this important information, especially those instructions related to the risk of electric shock or injury to persons.

WARNING

Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any service other than that contained in the operating instructions unless you are qualified to do so.

Restriction on Hazardous Substances (RoHS)

Miranda is in compliance with EU Directive RoHS 2002/95/EC governing the restricted use of certain hazardous substances and materials in products and in our manufacturing processes.

Miranda has a substantial program in place for RoHS compliance that includes significant investment in our manufacturing process, and a migration of Miranda product electronic components and structural materials to RoHS compliance.

It is our objective at Miranda to maintain compliance with all relevant environmental and product regulatory requirements. Detailed information on specific products or on the RoHS program at Miranda is available from Miranda Customer Support.

General Warnings

A warning indicates a possible hazard to personnel which may cause injury or death. Observe the following general warnings when using or working on this equipment:

- Heed all warnings on the unit and in the operating instructions.

- Do not use this equipment in or near water.

- This equipment is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting the equipment inputs or outputs.

- Route power cords and other cables so they are not likely to be damaged.

- Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners; use only a damp cloth.

- Dangerous voltages may exist at several points in this equipment. To avoid injury, do not touch exposed connections and components while power is on.

- Do not wear rings or wristwatches when troubleshooting high current circuits such as the power supplies.

- To avoid fire hazard, use only the specified fuse(s) with the correct type number, voltage and current ratings as referenced in the appropriate locations in the service instructions or on the equipment. Always refer fuse replacements to qualified service personnel.

- There are no user-serviceable fuses in this equipment. Connection to the mains supply should be via a circuit breaker or by a mains plug which meets the relevant local standards in the country of installation.

- To avoid explosion, do not operate this equipment in an explosive atmosphere.

- Have qualified service personnel perform safety checks after any service.

- To avoid electrical shock or fire hazard, do not operate the equipment with its covers removed.

- To prevent equipment from overheating, provide proper ventilation.

General Cautions

A caution indicates a possible hazard to equipment that could result in equipment damage. Observe the following cautions when operating or working on this equipment:

- When installing this equipment, do not attach the power cord to building surfaces.

- To prevent damage to equipment when replacing fuses, locate and correct the problem that caused the fuse to blow before re-applying power.

- Use only the specified replacement parts.

- Follow static precautions at all times when handling this equipment.

- This product should only be powered as described in the manual. To prevent equipment damage, select the proper line voltage on the power supply(ies) as described in the installation documentation.

- To prevent damage to the equipment, read the instructions in the equipment manual for proper input voltage range selection.

- Some products include a backup battery. There is a risk of explosion if the battery is replaced by a battery of an incorrect type. Dispose of batteries according to instructions.
- Products that have (1) no on/off switch and (2) use an external power supply must be installed in proximity to a main power output that is easily accessible.

Table of Contents

Introduction

Chapter 1 is an introduction to the Densité 3+ FR1 housing frame.

Topics

The Densité 3+ FR1 Frame

Overview

The 1RU Densité 3+ FR1frame offers true multi-format operation, with the ability to process simultaneously 3Gbps, HD, SD, and analog video, as well as AES and analog audio. The frame provides advanced monitoring and back-up capabilities. It can be fitted with 3RU and 2RU Densité modules (using card extenders). The frame features dual hot-swappable power supplies and fans. The modules for the frame are also hot-swappable, and can be configured automatically when a card is replaced. The frame is air-cooled and all modules, redundant PSUs and fans are monitored to provide status via GPI or the Ethernet port. The basic frame configuration includes one PSU and a controller card, which allows card adjustments by the front panel. Front panel multi-color LEDs provide status reporting. Multiple video and audio formats can be fitted in a single chassis.

Key Features and Benefits

- Multiple video and audio formats can be fitted in a single chassis
- Up to 4 cards in a single 1RU frame
- Backwards compatible with Densité 2 or Densité 3 modules
- Easy configuration by front panel or remotely via Ethernet
- Remote control by RCP-200 advanced control panel, and by Miranda's iControl system
- Hot-swappable power supply, with optional redundant power supply
- Supports full range of interfacing, distribution and monitoring modules
- Can be stacked without additional cooling spaces
- Redundant Ethernet connections
- A dedicated slot for designated system cards

Available Options

Second power supply for redundant power security

Cards (maximum 4 per frame)

The Densité 3+ FR1 housing frame supports all current Densité 3 series cards directly. Many Densité 2 series cards can also be installed with the use of an adapter that fits on the card, plus an additional adapter to extend the rear panel.

Densité 3+ FR1 Housing Frame

Chapter 2 describes the Densité 3+ FR1 housing frame and details of its installation.
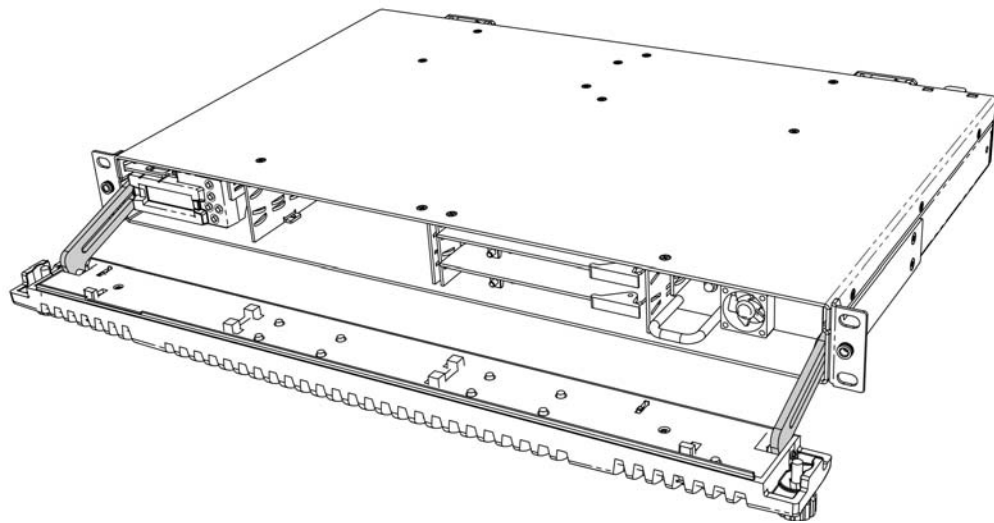
Topics

Description

Mechanical Layout

Front of the frame

When the frame door is opened, the front of the unit is visually divided into three sections:

- Left side - the Controller card with its attached control panel is seen on the left. The card itself is installed in a horizontal slot near the top. A power supply is located below the controller card in the frame.
- Center - four Densité 3 slots are laid out horizontally, two across by two down.
- Right side - a second power supply is located on the lower right, and above it is a single slot reserved for System Cards.

NOTE - This slot supports ONLY designated System Cards; do not insert any other cards.

- At the time of writing, only the GPI-1501 card is supported
- For an up-to-date list of available System Cards, go to the Miranda website at www.miranda.com

When the frame door is closed, the status LED on each of the cards in the frame is visible via a light pipe in the door. No other controls or indicators are present.

Rear of the frame
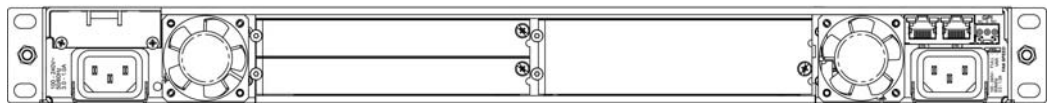
The rear of the Densité 3+ FR1 frame is visually divided into three sections:

- Right side - this area contains inputs and outputs for the Controller Card - the Fan Speed control setting switch, the GPI port and the two Ethernet ports. It also contains the power socket for the power supply located beneath the controller card, and one of the two frame fans.
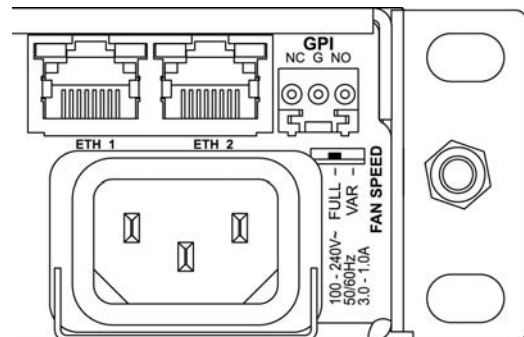
- Center - this area holds the rear panels associated with the frame's four Densité-3 slots
- Left side - this area contains the power socket for the power supply located beneath the System Card, and one of the two frame fans.

Installation

Unpacking

Make sure the following items have been shipped with your Densité 3+ FR1 frame:

- Densité 3+ FR1 frame, including 1 Power Supply unit (AC in) with power cord
- CPU-ETH2 controller card
- Power cord retaining clips (2)
- A second power supply and AC cord (optional)
- A system card, per order
- Densité-series cards (per order) with associated rear panels

Opening the Front Door

The front door of the Densité 3+ FR1 frame is fastened in place by two captive thumbscrews, one at each end of the door.

- To open the door, turn both thumbscrews counterclockwise until they release, and pull the door away from the front of the frame.
- The door is attached to the frame by guides that slide out of the frame as the door is pulled, and allow the door to be lowered below the frame so that cards and power supplies can be removed and installed.
- The door can be removed completely by slipping the ends of the guides off the posts on the door assembly. Note that you must tilt the door on an angle so the guide can move freely.

There are no electrical connections to the door.

Close the door by sliding it into position against the front of the frame, and turning the captive thumbscrews clockwise until the door is securely fastened into place

Mounting

The Densité 3+ FR1 housing frame occupies 1RU in a standard 19" rack.

To mount the frame:

- Open the front door to expose the rack mounting flanges at the ends of the chassis.
- Install the frame in the rack using 4 standard rack-mounting screws (not supplied) through the four holes in the mounting flanges.

Installing Cards in the Densité 3+ FR1 Frame

All cards can be installed with the frame power on. Each card has a connector which plugs into the frame's backplane for distribution of power and connection to the controller card, and a second connector that plugs into the associated rear panel for inputs and outputs.

IMPORTANT - the rear panel must be installed before the card is inserted into the frame.

Note: If you need to install a Densité 2 series card in this frame, which has Densité 3 slots, please see Using Densité 2 cards in the Densité 3+ FR1 Frame on page 7

To install the rear connector panel:

1 If a card is installed in the slot whose rear panel is being changed, remove it as described below.

2 Remove the existing panel (either blank or belonging to an existing card that is being changed) by releasing the captive screw(s) on the right-hand side

3 Position the new panel and secure it in place with the captive screw(s) on the right-hand side.
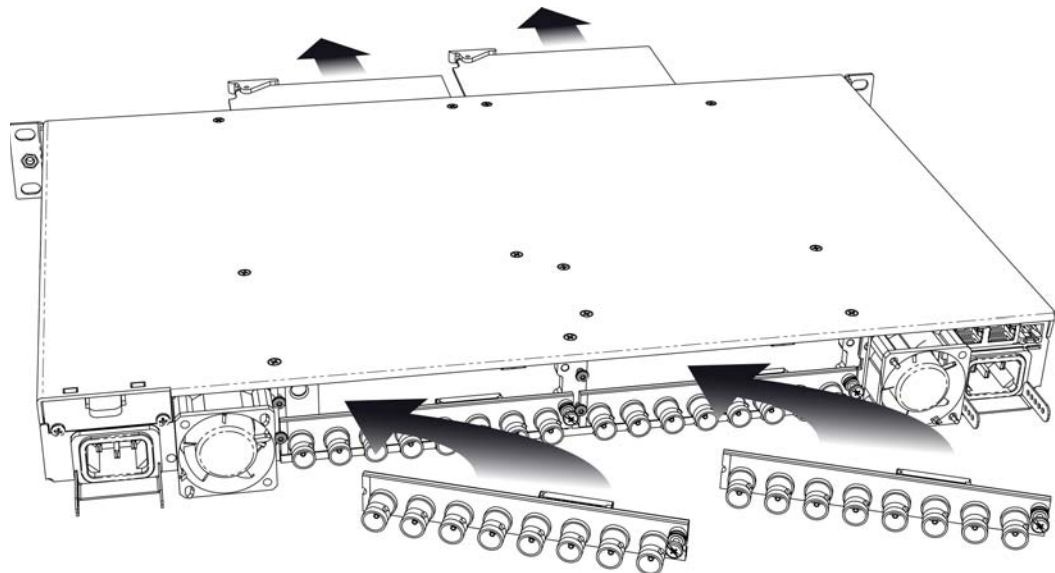
Card Installation and removal:

1 Open the front door of the frame

2 To install a card into an empty slot, slide the card into the slot with the swivel handle to the right, and push gently on the handle to seat the connectors. If the card requires a double-width rear panel to accommodate a large number of connectors, it should be inserted into the lower slot. Inserting the card into the wrong slot will not damage the card, and will be flagged by the on-card status LED flashing red to indicate that there is no connection to the rear panel.

N.B. the rear panel must be installed before the card.

3   To remove a card from a slot, tilt the swivel handle on the front of the card to lever the connectors apart, then use the handle to pull the card straight out of the slot.

4   Close the front door of the frame

Note: *Detailed information about the rear panel connections is included in the user manual for the card.*

Using Densité 2 cards in the Densité 3+ FR1 Frame

The Densité 3+ FR1 frame supports Miranda Densité 2 series cards. Should you need to install a Densité 2 card in your Densité 3+ FR1 frame, you will need two adapters – one for the card, and one for the rear panel. These adapters extend the height of the Densité 2 devices so that they will fit into the slots of the Densité 3+ FR1 frame.

Card adapters:

There are 3 different types of adapters that can be used, depending on the Densité 2 card geometry:

> o   DENSITE 3-EXT-A
>
> o   DENSITE 3-EXT-B
>
> o   DENSITE 3-EXT-C

Install these on the Densité 2 card as follows:

1   Fit the top edge of the card into the holding slot along the bottom edge of the adapter.

2   Align the holes in the top of the card with the holes on the adapter, and secure them together with the two provided screws and lock washers, as shown in the figure.
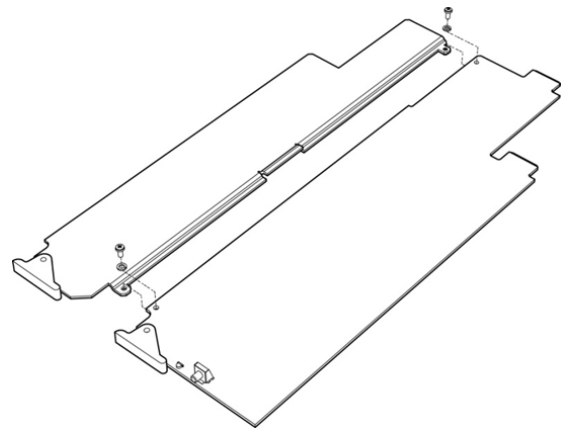
Rear Adapters

3-RU rear panel adapters are available for Single and Double Densité 2 rear panels:

- DENSITE SRP-3RU   for single slot-width rear panels
- DENSITE DRP-3RU   for double slot-width rear panels

Install the adapter and the rear panel as follows:

1   Position the adapter at the left of the empty slot(s) on the rear of the frame.

2   Use the captive screw in the adapter to fasten it securely in position.
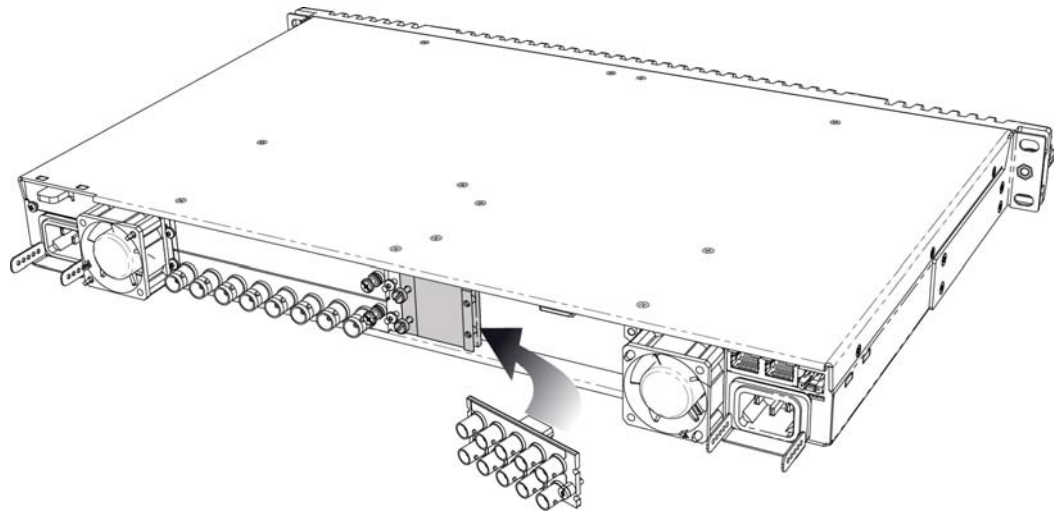
3 Slip the top of the 2RU rear panel into the slot on the right of the adapter, and secure the panel to the frame using the captive screw at the bottom of the panel.

Installing the Power Cord Retaining Clips

Each power supply is provided with a power cord retaining clip that holds the power cord in place to prevent inadvertent disconnections.

With the power cord removed, install the clip into the plate that extends out beneath the power cord socket on the rear of the frame, by slipping the two ends of the clip into a pair of holes in the plate Several pairs of holes are provided to accommodate different sizes of plugs. Use the holes that position the clip closest to the body of the plug.

Position the clip vertically and insert the plug into the socket. Then, rotate the clip down and press the cord into the gripping loop of the clip.
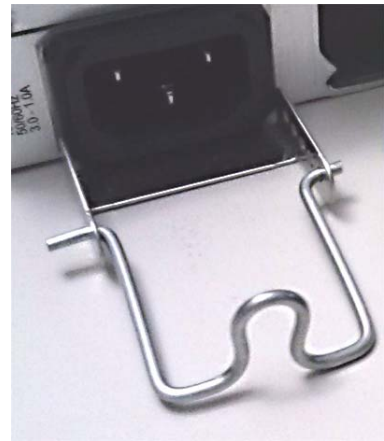
Ventilation

Ventilation for the frame is provided by two fans, one located at each end of the rear panel. The fans draw air through the frame from the front and exhaust it to the rear. Ventilation slots are provided in the front door of the frame to allow air to flow into the frame.

An air filter is installed in the front door behind the slots.
- Ensure that the front door ventilation slots are not obstructed.
- Check the air filter regularly to ensure that it is not plugged up with debris.

The filter may be cleaned by rinsing in warm water. Dry thoroughly before replacing it in the frame.

In addition to the main frame cooling fans, each installed power supply has its own fan that pulls air into the front of the supply. This fan only operates when the frame temperature is high.

Fan Speed Control

A slider switch beside the controller-side fan on the rear panel allows the speed of the two rear-panel fans to be specified by the user. Two settings are provided:

- FULL - the fans operate at top speed at all times.
- VAR - the fan speed is managed by the controller card, which is monitoring the temperature inside the frame.

Use a small tool (e.g. a pen tip or a small screwdriver) to change the switch setting.

GPI

Alarms generated on the controller card may be reported on the GPI connector on the rear panel.

Users who wish to utilize this alarm reporting mechanism should be aware of the circuit driving the GPI connector, in order to correctly interpret its signalling.
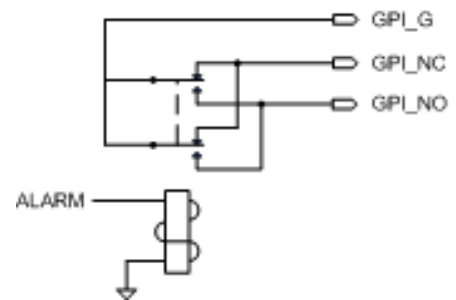
Field-Serviceable Items

Field-serviceable items on the Densité 3+ FR1 frame itself include the power supplies, the controller card, and the ventilation fans.

The power supplies and controller card are located behind the door on the front panel.
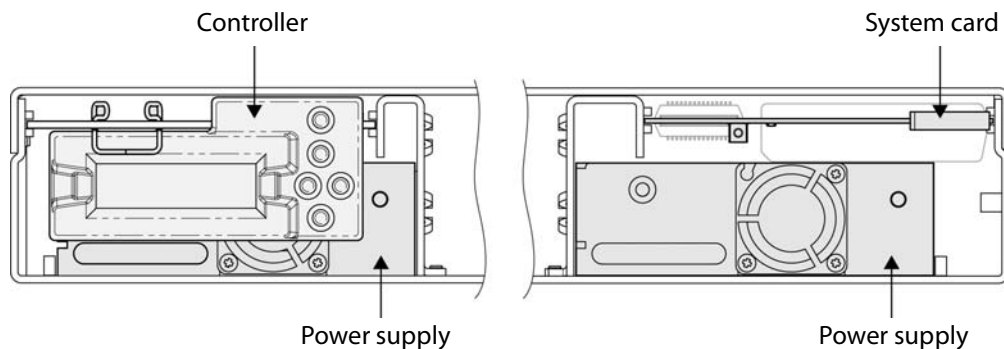
Changing the Power Supply

The Densité 3+ FR1 frame supports dual redundant hot-swappable power supplies. The basic configuration includes a single supply, plus an empty slot for the optional redundant power supply. Installing a second power supply module and applying power to it automatically engages the redundant supply mode. Each power supply has its own power socket on the rear panel, and should be connected to the AC supply using the supplied power cord or other approved cord.

- A single power supply can be installed in either of the two slots, but it makes sense to install it in the right hand slot so that it is not necessary to remove the controller card if you need to remove the power supply.
- Power integrity is enhanced if the two supplies are plugged into different circuits

To install or change a power supply module:

1. Open the front door of the frame
2. If you are removing the left-side power supply, you must first remove the controller card. See the following section.
3. Remove the power supply module by pulling on the handle on its front panel and sliding it out of the frame
4. Slide the new power supply module into the slot, and push it gently into position to seat the connectors. There is no guiding slot - the supply base sits on the floor of the frame.
5. If you removed the controller card in step 2, reinstall it according to the instructions in the next section.
6. Close the front door of the frame. The door secures the power supplies in place.

Replacing the Controller Card

The Controller card is located on the upper left-hand side of the frame, above the power supply. To replace the card, proceed as follows:

1. Open the front door of the frame.
2. Grasp the metal handle on the upper left-hand side of the card; it will slide out so that it can be gripped properly.
3. Pull gently on the handle until the card is released from the rear connector, and then slide the card out of the frame.
4. Slide the new card into the controller slot, and push gently on the card edge to engage the rear connectors.
5. Be sure to close the front door before operating the Densité 3+ FR1 frame, to ensure proper ventilation.
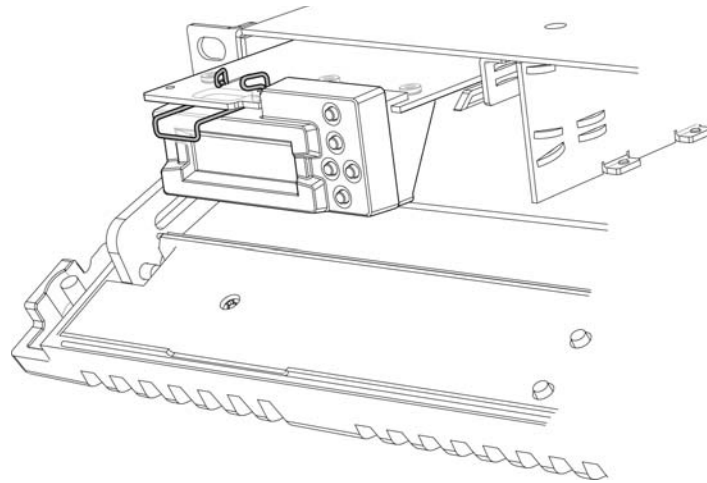
Replacing the Frame Ventilation Fans

In case of failure of one of the two cooling fans on the rear of the frame, replace it according to the following steps.

1 Procure a replacement fan assembly. It is comprised of a fan and an attached circuit board. It is available from Miranda as part #0969-0400
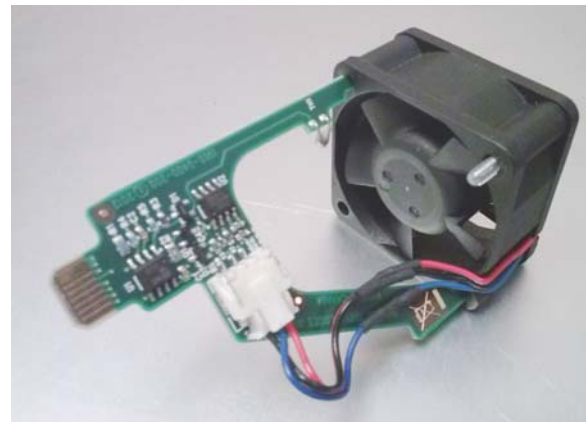

2 Remove the defective fan from the frame:
   • Remove the two screws that secure the fan assembly to the frame and pull the fan assembly straight out of the frame.
   • Retain the screws, as they will be used to install the replacement fan assembly.
3 Install the replacement fan:
   • Slide the new fan assembly into the opening on the rear panel, pushing it straight in and ensuring that the connector on the assembly mates with the socket in the frame.
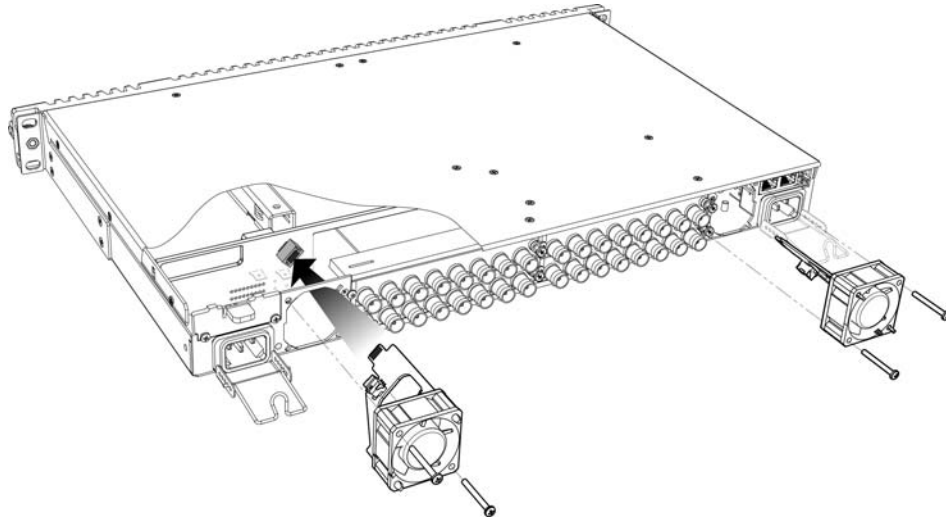
NOTE: the two ventilator fans are mounted at different angles, as shown in the above figure. Align the circuit board on the fan assembly with the notches in the edge of the rear-panel opening (see arrows in figure at right) to ensure the correct alignment.

The socket into which the circuit board connects is hidden from view by the fan assembly during installation and there is no guide to ensure that they are aligned. The easiest way to make sure that the connector and socket have mated properly is to install the fan with the frame power turned on. You will hear the fan start up when the connection is made.

- Use the two screws that were retained when the old fan assembly was removed to secure the new fan assembly to the rear panel.
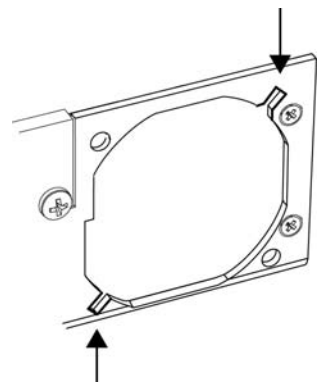
Specifications

MECHANICAL

Dimensions	1RU x 19" W (485 mm) x 11.25" D (286 mm) with connectors
Weight:	7.16 lbs (3,25 kg) with 1 PSU and controller card installed

POWER

Input Range:	AC 100-240V, 50-60 Hz
Rating:	150 W max each power supply
Operating Temp. Range:	0-40° C

COOLING

Fans:	2 on frame, serviceable
	1 on each installed power supply

COMMUNICATION

Connectors:	RJ45 (2)
Compliant to:	Ethernet 10/100 Base-T

ALARM

|	
Connectors:	GPI

3 CPU-ETH2 Controller Card

Chapter 3 describes the installation and functionality of the CPU-ETH2 Controller card in the Densité 3+ FR1 housing frame.

Topics

Overview

The CPU-ETH2 Controller installed in the Densité 3+ FR1 frame supports all on-frame communication between cards, and incorporates a front control panel for local control and adjustment of the frame and installed cards. The CPU-ETH2 Controller serves as the communications port for control and alarm information entering and leaving the frame. The CPU-ETH2 controller features two Ethernet ports for system-wide monitoring and control of the frame, using Miranda's control solutions or a third party monitoring system. This controller card is compatible with the TCP/IP protocol and can support polling or report on error modes (unsolicited messaging).
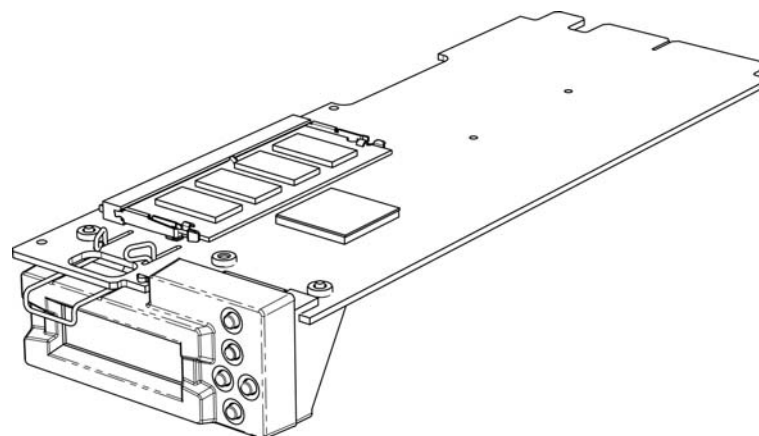
Features

- Dual Ethernet RJ-45 ports (10/100Base-T) - the two ports can be configured independently for full network redundancy
- In addition to static IP address configuration , each port allows DHCP dynamic addressing
- Provides ultra-robust Ethernet connectivity for LAN/WAN
- Accelerated data throughput: allows video thumbnail and audio level meter and line scope streaming from all installed modular cards
- Linux-based operating system for robust, mission-critical operations
- Removable Compact Flash memory card for portable and quickly-recoverable device and frame configuration
- User-configurable GPI alarm port
- Features front display panel and push-buttons for local configuration of cards and frame
- Can be remotely configured via iControl
- Provides card and frame health monitoring and status reporting
- Provides extensive frame monitoring:
  - Ethernet port monitoring, with communication settings and overall bit rate
  - detailed bitrate and communication thoughput from individual cards
  - self-monitoring with CPU load, memory usage
  - Power Supply and GPI status reporting
- Individual Card parameter storage for easy card swapping
- Communication speeds of up to 10 Mbps via Ethernet ports

Control Interfaces

The CPU-ETH2 controller is the control point for the Densité 3+ FR1 frame and the Densité-series cards installed in the frame. There are no separate operating controls on the frame or cards.

The CPU-ETH2 supports two methods for card control, and these two are also used to configure and operate the CPU-ETH2 itself.

Using the Ethernet interface

The CPU-ETH2 controller supports remote operation through two rear-panel 10/100 Base-T ethernet ports, using Miranda's iControl or a third-party solution. The command set available for communicating with a DENSITÉ frame permits more complex and comprehensive control, parameter storage, and field upgrading than is supported by the local control panel.

The operation of the CPU-ETH2 card can be controlled using Miranda's iControl system. This manual describes the control panels associated with the CPU-ETH2 and their use.

Please consult the iControl User's Guide for information about setting up and operating iControl.

In iControl Navigator or iControl Websites, double-click on the icon of the controller to open its control panel.

- CPU-ETH2 controllers are identified as Controller2 in the Type column of the iControl Navigator window.

- For convenience, enter a descriptive Label in the Info panel of the card, to make it easy to locate this specific frame controller amongst those in the list. See Identification on page 20 for instructions.

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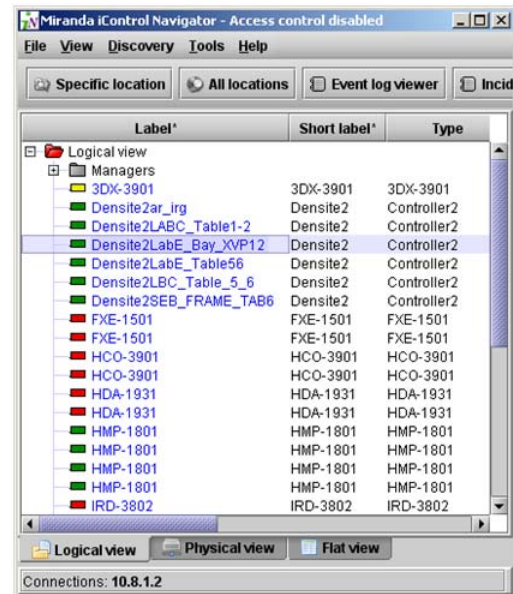
The iControl panel for the CPU-ETH2 controller displays a series of buttons down the left-hand side. Clicking a button changes the contents of the main window to display status reports and controls related to the topic named on the button.

A full description of the use of the iControl interface to configure the CPU-ETH2 card is given below, beginning on page 20.
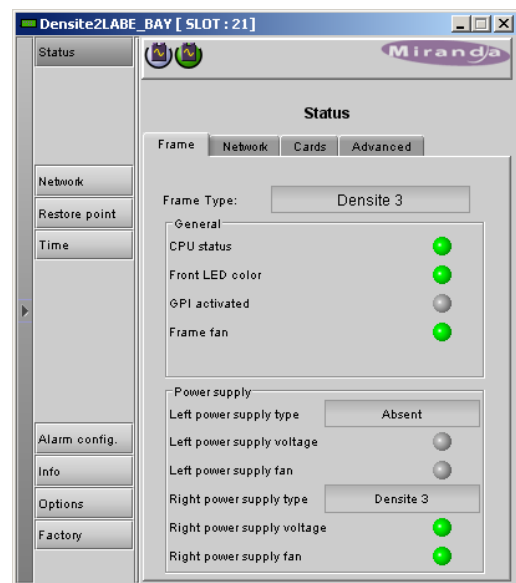
Using the local control panel

The local control panel is fastened to the front of the CPU-ETH2 controller card, and when installed is located in the top left of the frame, above the left-hand power supply.

The panel consists of a display unit capable of displaying two lines of text, each 16 characters in length, and five pushbuttons.
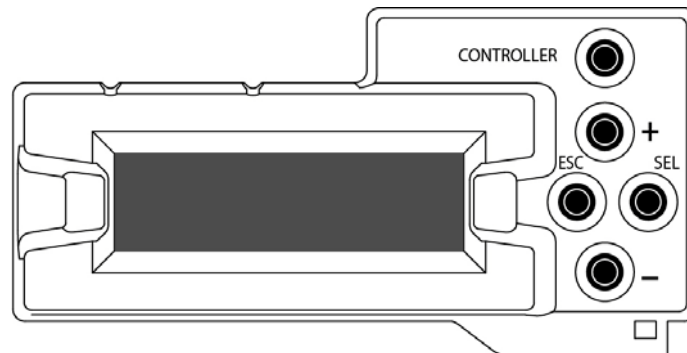
Pushing the CONTROLLER button on the control panel assigns the panel to operate the CPU-ETH2 card itself. The STATUS LED on the CPU-ETH2 card flashes yellow to show that it is selected for control.

The local control panel displays a menu that can be navigated using the four pushbuttons located beside the display.

The full menu is shown beginning on page 35.

The functionality of the four pushbuttons is as follows:

[+] [−]   Move up and down the menu when a parameter name is shown

Change to the next or previous value when a variable value is shown and change has been enabled using the [SEL] button

[SEL]   Gives access to the next menu level. When a parameter value is shown, pushing this button once enables modification of the value using the [+] and [−] buttons; a second push confirms the new value

[ESC]   Cancels the effect of parameter value changes that have not been confirmed; pushing [ESC] causes the parameter to revert to its former value.

Pushing [ESC] moves the user back up to the previous menu level. At the main menu, [ESC] does *not* exit the menu system. To exit, re-push the [CONTROLLER] button.

If no controls are operated for 30 seconds, the controller reverts to its normal operating status, and the STATUS LED ceases flashing yellow and reverts to its normal operating mode.

Card-Front Status LED

The status LED is located on the front card-edge of the controller module, and is visible through the front access door of the Densité 3+ FR1 frame. This multi-color LED indicates module status by color, and by flashing/steady illumination, according to the chart below. The chart also indicates fault reporting for this card on the DENSITÉ frame's serial and GPI interfaces.

The table shows how the various error conditions are flagged on the CPU-ETH2 status LED.

Alarm/Status	Priority	LED	
Power supply failure	1	FLASHING RED	
Fan failure	1	FLASHING RED	
Internal error	2	RED	
Normal (no errors)		GREEN	
LOCAL CONTROL SELECTED		FLASHING YELLOW	

The status LED can display only one alarm/status, so it displays only the highest priority. For example if there is an internal error, it should display RED. But if at the same time the chassis fan has failed, then the LED will display FLASHING RED.

Be aware that a high priority alarm can mask a lower priority one.

Configuring the CPU-ETH2 Controller

This section introduces the operating features of the CPU-ETH2 controller, and describes how to access and control them using:

- The iControl interface
- The local control panel and menu.

In general, the iControl interface is more comprehensive and easier to use, so it will be used as the primary interface for purposes of describing the configuration process.

In each case, the menu path which must be navigated on the local control panel to access the configuration item under discussion will also be given.

The following topics are covered:

Identification

iControl - click the *Info* button

The CPU-ETH2 controller is accessible on a network, and must be identifiable in order to function in the iControl environment. The identification data is entered in the iControl INFO control panel. This panel also shows other data that is not user-adjustable.

You can enter the following information by clicking and typing in the data box:

Label: allows the user to define the label that identifies this device when it appears in iControl applications

Short Label: allows the user to define the short-form label for iControl (8 characters)

Source ID: type a descriptive name for this CPU-ETH2 controller

Comments: type any desired text

The remaining data boxes show manufacturing information about this card.

Three buttons in the panel give access to other information:

Details: Reports the Firmware version, service version, and panel version for this card

Advanced: Shows the Miranda LongID for this card. The Miranda LongID is the address of this CPU-ETH2 controller in the iControl network.

Remote System Administration:. Opens the Joining Locators data box, which lists remote lookup services to which this CPU-ETH2 is registered.

> **Add:** Force the iControl service for this AMX-3981 to register itself on a user-specified Jini lookup service, using the following syntax in the data box:
>
> jini://<ip_address>

where <ip_address> is the ip address of the server running the lookup service, e.g.:
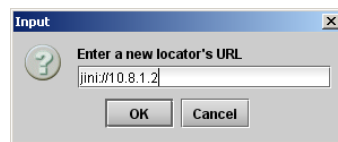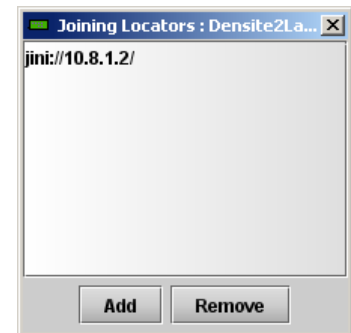
> **Remove:** select one of the services listed in the window by clicking on it, and click *Remove* to open a query box allowing you to delete it from the window.
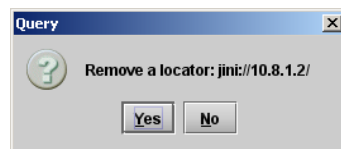
Using the menu

None of this data can be accessed via the local control panel menu, except to read the Firmware version.

Status Monitoring

The CPU-ETH2 controller continuously monitors the operating condition and status of the housing frame's power supplies and ventilating fans. It also monitors the status and usage of its two ethernet ports, and the status of its on-board memory, as well as the data throughput of all cards installed in the frame.

In addition to the information displayed on the Card-Front Status LED (see page 19), status information acquired by the controller can be viewed in the iControl interface, and on the local controller display through the menu.

iControl - click the *Status* button

The iControl interface always displays two icons in the upper left of the window. These report the status of the two power supplies.

The graphic shows the possible icon displays and the associated messages that appear below them. Error messages are always displayed; other status messages appear only upon mouse-over of the icon.
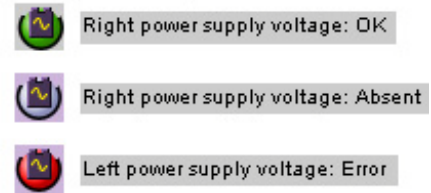
The Status panel shows status information in four categories, each accessed by clicking the appropriate tab.

Status - *Frame*

Select the *Frame* tab to see a report on the status of the frame's CPU, fans and power supplies.
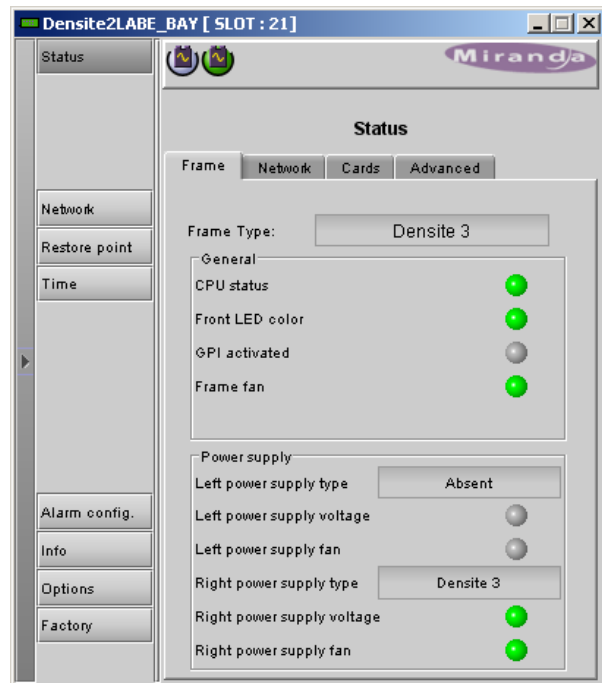
Status - Network

Select the *Network* tab to see a report on the status of the two Ethernet ports on the CPU-ETH2 card.
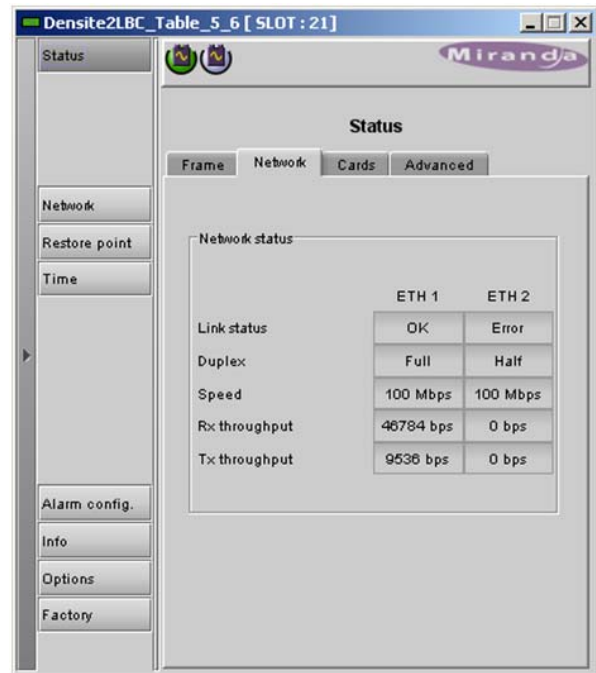
Status - Cards

Select the *Cards* tab to see a chart of the current send (Tx) and receive (Rx) data rates, and speed, for all cards installed in the Densité frame.

- Note that in the Densité 3+ FR1 frame, only slots 1 to 4 are available

For a more detailed report on the status of a specific card, open that card's control panel in iControl.

Status - CPU-ETH2 Resource Usage

Select the *Advanced* tab to view a report on the usage of the card's resources:
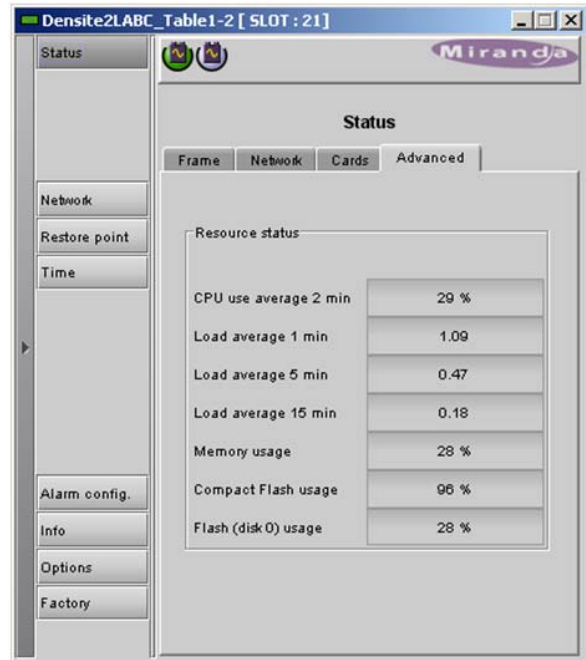
Using the Menu

Select STATUS and then [SEL] to cycle through the list of current faults. The information shown on the *Network*, *Cards* and *Advanced* tabs is not available through the menu.

Network Configuration

iControl - click the *Network* button and select the ETH tab

The CPU-ETH2 controller's two Ethernet ports can be configured using the iControl interface.
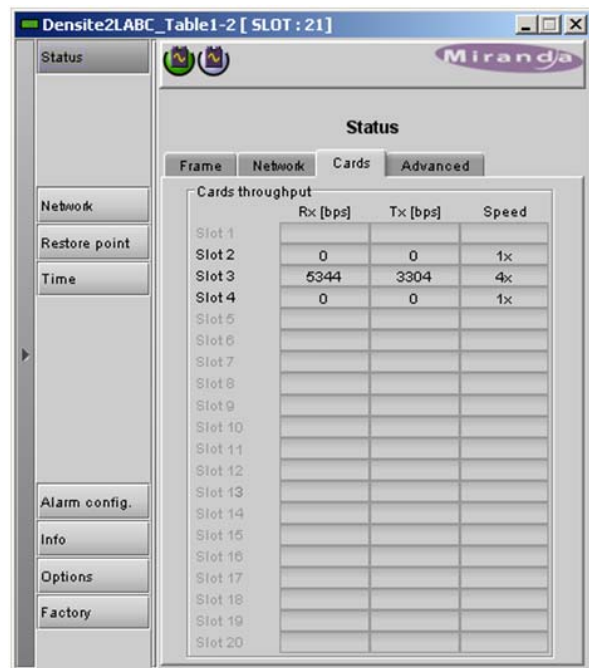
Enter the HOSTNAME in the box at the top.

- The hostname is the unique name by which this Densité CPU-ETH2 is known on the network. The hostname should be 15 characters or less, and may contain only the ASCII letters 'a' through 'z' (case-insensitive), the digits '0' through '9', and the hyphen.

Then configure the two ports individually.

Consult your IT department if necessary before configuring the ports, to ensure that the Densité controller is correctly integrated into your local network.

The CPU-ETH2 card is shipped with the following settings:

IP address:	192.168.3.1
Subnet mask:	255.255.0.0
Gateway:	0.0.0.0

Hint: the first time you set up the CPU-ETH2 card, get the Network details from your IT manager and install them on the card using the menu. The card will then be easy to find in iControl applications.

IP Address:	Enter the values supplied
Subnet mask:	by your network
Gateway:	administrator

The MAC (Media Access Control) address is reported in the data box

- The MAC address is not user-configurable.

The **Ethernet Link Redundancy** option is configured in this panel.

- *Note that the option must be purchased and activated before these controls become available. See* Options *on page 34* for details.

Mode: enable or disable the link redundancy function

**Type:** select one of the available bonding modes

- Round Robin
- Active Backup

See Options on page 34 for more information about channel bonding modes.

Changes to these parameters require a controller reboot. Click **Reboot…** to accept the changes and restart the controller. Click **Cancel…** to reject the changes and leave the settings unchanged.
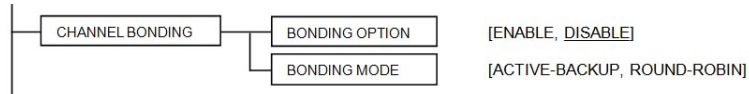
Using the Menu:

To change the IP address::
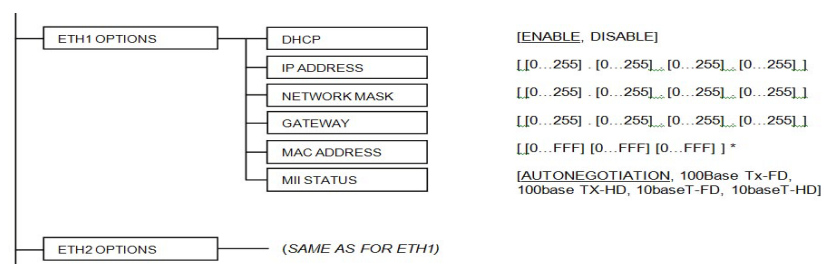
Note that DHCP function (enable/disable) and MII (network speed setting) are ONLY available on the menu, and cannot be set in the iControl interface.

To enable/disable the Redundancy option, and select the bonding mode:

```
┌─ CHANNEL BONDING ─┬── BONDING OPTION       [ENABLE,  DISABLE]
│                   └── BONDING MODE          [ACTIVE-BACKUP,  ROUND-ROBIN]
```

Note that the Host Name and the MAC address are reported in the menu but cannot be changed from there.

SNMP functionality

The CPU-ETH2 card can function as an SNMP agent, sending SNMP traps to designated targets.

iControl - click the *Network* button and select the SNMP tab.

Click the **Activate SNMP Agent** box to activate this feature

Enter the IP addresses of up to three SNMP trap targets in the boxes provided.
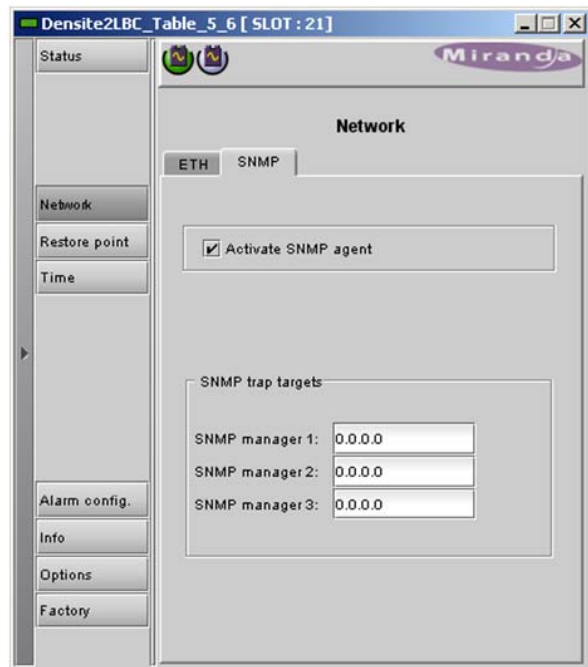
Using the Menu:

SNMP activation and up to three target IP addresses can be entered in the menu via the SNMP OPTIONS item.

```
┌─ SNMP OPTIONS ─┬── SNMP AGENT            [ENABLE, DISABLE]
│                └── SNMP TRAPS ─┬── LIST IP ADDRESS     [ [0…255] . [0…255] . [0…255] . [0…255] ]
│                                ├── ADD IP ADDRESS      [ [0…255] . [0…255] . [0…255] . [0…255] ]
│                                └── REMOVE ADDRESS      [ [0…255] . [0…255] . [0…255] . [0…255] ]
```
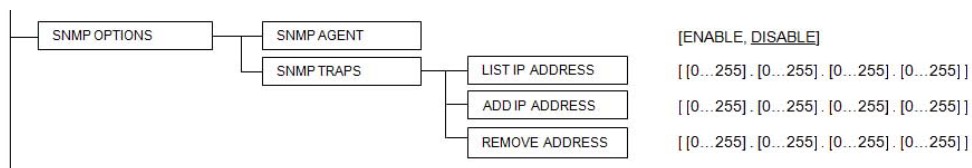
Data Restoration

Many of the Densité-series cards that can be installed in the Densité 3+ FR1 frame are complex and have a lot of data stored on-board related to their configuration and parameter values. The CPU-ETH2 controller provides a backup of this data, which can be restored to the card when needed. This is valuable if the card is inadvertently reconfigured, or is replaced after failure with a new card of the same type. The saving of the current data into the controller's memory, and restoring the data onto the Densité-series card, can be done manually or automatically.

For manual operation:

iControl - click the *Restore Point* button and view the Cards tab.

The tab show a list of the slots available in the Densité frame, with a check box, name, and status box for each.

- The Densité 3+ FR1 frame uses only slots 1 to 4.

Click the check box to activate the Data Restore feature for the card in that slot,

-or-

Click the Select All box at the top to activate the feature for all slots in the frame.

Click **Save to controller** at the bottom to copy all restorable data from the cards in the selected slots into the memory on board the CPU-ETH2 controller.

Click **Load to cards** to load the cards in the selected slots with data from the controller's memory.
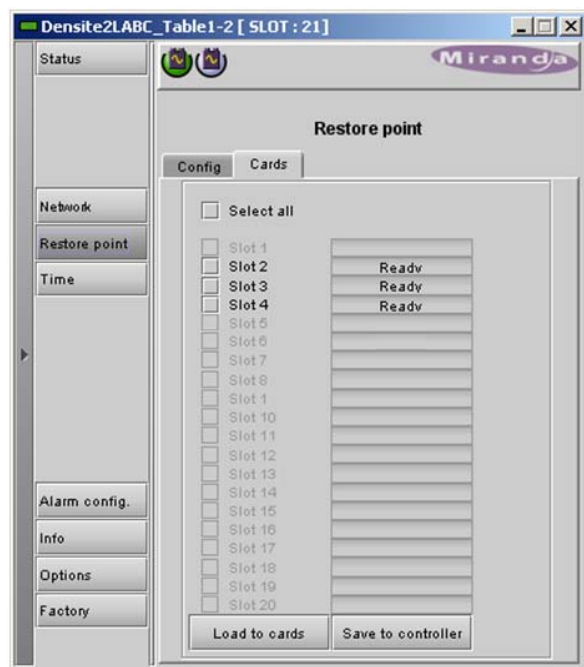
Note that a data restore will only work if the card in the slot is the same type as the card that was there when the data was saved.

For automatic restore and save:

iControl - click the *Restore Point* button and view the Config tab.

Restore: The CPU-ETH2 card can be set up to automatically update a card when it is inserted in a slot previously occupied by a card of the same type whose data was saved. Thus, a new card can be configured automatically to replace the card that was removed, saving a lot of time when cards are swapped.

Click the *Default Action* box to enable the auto restore function for all the cards in the frame.
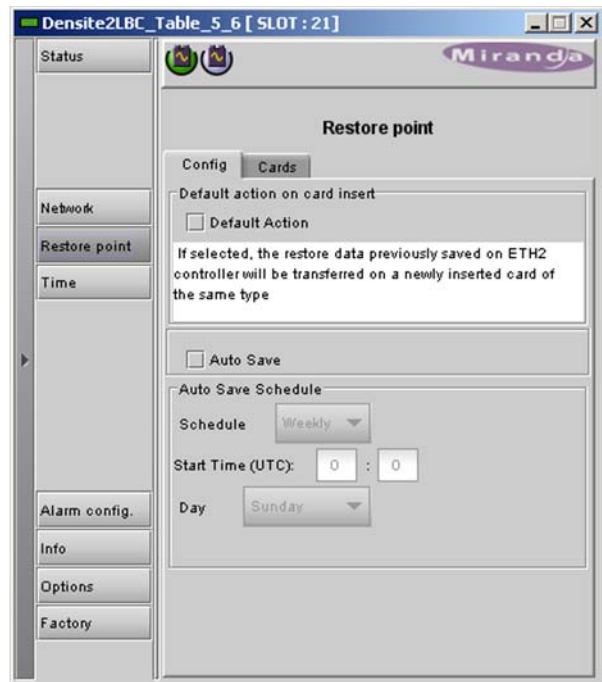
Save: The CPU-ETH2 card can be configured to automatically back up the data on the cards in its slots according to a set schedule.

Click the *Auto Save* box to enable the automatic save function.

Set up the schedule for data backup using the controls provided.

Schedule: Daily, Weekly, Monthly

Start Time (UTC): Time in hours (24-hour clock) and minutes

The label and function of the pulldown at the bottom changes to follow the Schedule selection:

Schedule	Label	Pulldown Options
Daily	Freq	Every day, Weekdays
Weekly	Day	Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday
Monthly	Week	Week1, Week2, Week3, Week4, Last Week
	Day	Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday

Using the menu:

Configure the data restoration functions, including default action and auto save, from the *Restore Points* menu item.
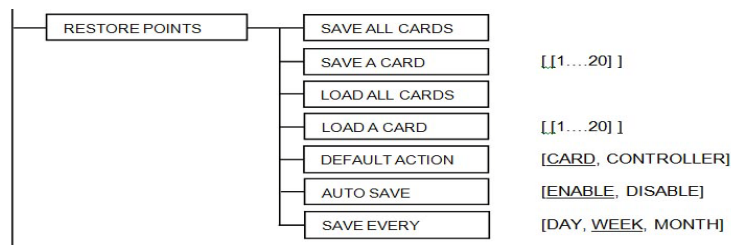
Factory Alignment

There may be times when the CPU-ETH2 settings have been adjusted and it is useful to restore them to a normalized condition. The CPU-ETH2 controller maintains a "Factory Default" alignment in its memory, to which it can be restored at any time.

Note: Ethernet settings are not included in the Factory data set, and are not changed when the Factory Default alignment is installed.

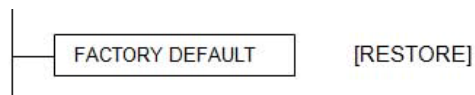### iControl - click the *Factory Control* button

Click the *Load Factory* button to restore the card to the Factory default alignment.

Click the *Load Factory* button to restore the card to the Factory default alignment.

Using the menu

The factory default values can be loaded from the FACTORY DEFAULT menu item.

The default values are shown underlined in the menu listing beginning on page 35.

Time Management.

The CPU-ETH2 controller is time-aware, and its internal clock can be updated manually or via NTP.

iControl - click the *Time* button

Time (UTC)

The data boxes in this section display the time and date currently held in the card.

Enter new values in these boxes to change the current setting. If an automatic update via NTP is not enabled, the clock will continue to run using an on-board reference, but precision is not guaranteed.

NTP IP address

Click the *Enable NTP* box to use an NTP (Network Time Protocol) source. Enter up to three IP addresses of NTP servers. The CPU-ETH2 card will use the first source of valid time it finds in this list.
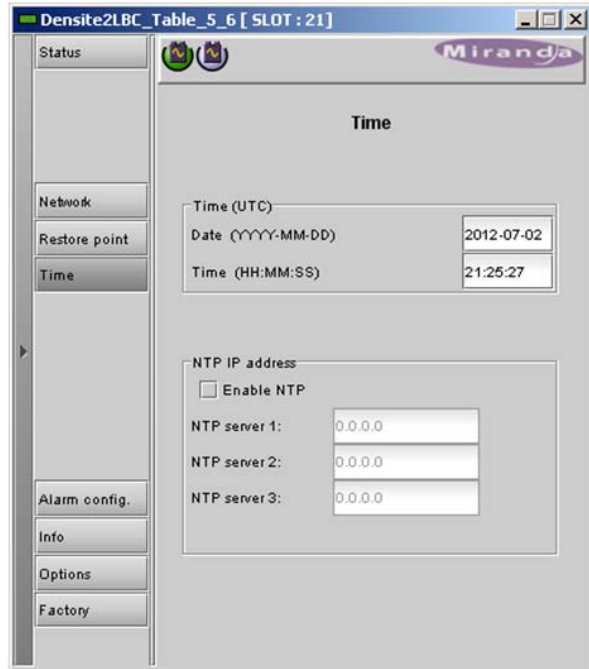
Using the menu

You can enter the current time and date, and activate the NTP time sourcing through the TIME OPTIONS menu item.
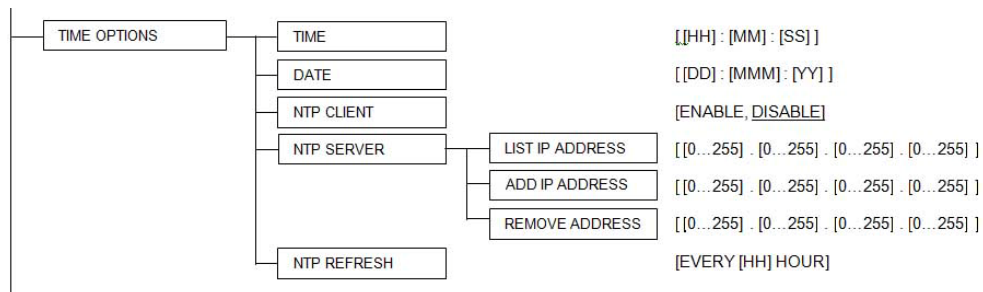
Note that the NPT REFRESH item, setting the interval at which the local clock is refreshed from the NTP server, is ONLY available from the menu, and does not appear on the iControl interface.

Alarms

The CPU-ETH2 controller generates alarms for the frame in which it is installed when error conditions are detected. These alarms are used to set the card-front Status LED and the status icon in the top left of the iControl window.

The alarms are reported to the iControl network, and can be reported locally on the frame's GPI port.

- GPI reporting can only be accessed from the menu, as described at the end of this section (page 32).
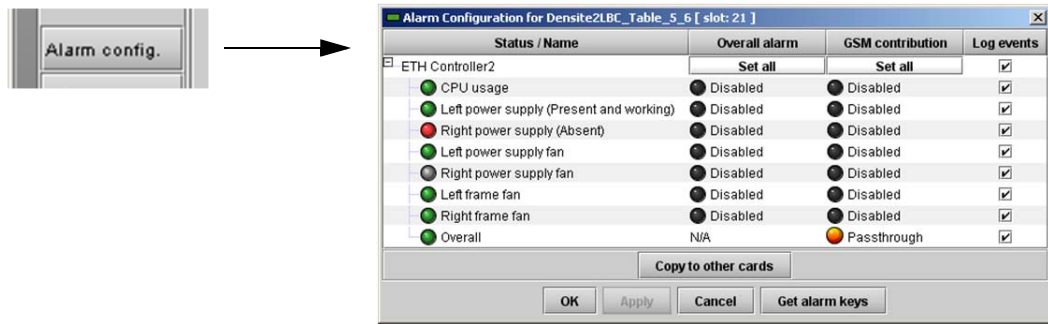
iControl - click the *Alarm Config* button

The iControl Alarm Configuration panel opens in a new window when the *Alarm Config* button is clicked, and can be resized if needed. It allows the alarm reporting of the CPU-ETH2 to be configured. The panel is organized in columns.

Status/Name

This contains an expandable tree listing all the alarms reported by this CPU-ETH2 controller.

Each alarm name includes an icon that shows its current status

The **Overall alarm** and **GSM contribution** columns contain pulldown lists that allow the level of contribution of each individual alarm to the alarm named in the column heading to be set. Click on the alarm status in either of these columns to show the status options that are available, then click on one to select it. If no options appear, the alarm is not user-configurable

Overall Alarm

This column allows configuration of the contribution of each individual alarm to the Overall Alarm associated with this card. The Overall Alarm is shown in the upper left corner of the iControl panel, and also appears at the bottom of the Status/Name column.

GSM Contribution

This column allows configuration of the contribution of each individual alarm to the GSM Alarm Status associated with this card. GSM is a dynamic register of all iControl system alarms, and is also an alarm provider for external applications. The possible values for this contribution are related to the Overall alarm contribution:

- If the Overall alarm contribution is selected as Disabled, the GSM alarm contribution can be set to any available value
- If the Overall alarm contribution is selected as any level other than disabled, the GSM contribution is forced to follow the Overall Alarm.

Levels associated with these alarms:

The alarm status list may contain some or all of the following options:

Alarm status	Significance
Disabled	The alarm makes no contribution (black icon)
Minor	The alarm is of minor importance (yellow icon)
Major	The alarm is of major importance (orange icon)
Critical	The alarm is of critical importance (red icon)
Passthrough	The alarm exists but has no effect (used for text and composite alarms)

Shortcut: if you click on "Set All" at the top of one of these columns, you will open a pulldown list that lets you assign a level to all alarms in that column simultaneously.

Once the alarms are configured, you may accept the changes or discard them:

Log Events

iControl maintains a log of alarm events associated with the card. The log is useful for trouble-shooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

At the bottom of the window are several other controls:

Copy to other cards

Click this button to open a panel that allows the alarm configuration set for this card to be copied into other CPU-ETH2 controllers in other frames.

Select one or more destination controllers from the list in the window by clicking in the checkboxes, or all of them by clicking in the *All* checkbox
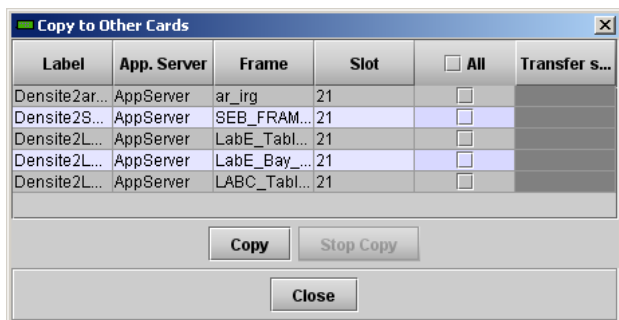
Get alarm keys

Click this button to open a save dialog where you can save a file containing a list of all alarms on this controller and their current values, along with an Alarm Key for each. The alarm keys are useful for system integration and troubleshooting.

The file is saved in .csv format
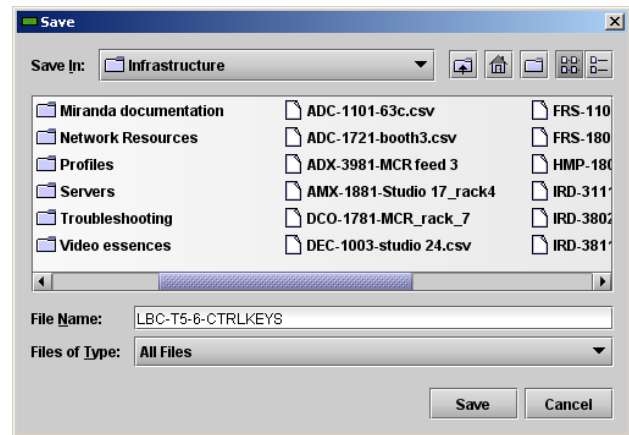
OK, Apply, Cancel

- **OK** accepts the settings and closes the window once the controller confirms that there are no errors.
- **Apply** accepts the settings, but leaves the window open
- **Cancel** closes the window without applying any changes, and leaves the previous settings intact.

Using the Menu

Access the Alarm Report menu item, and scroll through the list of available alarms, setting each to OFF or to report through GPI. Use the GPI Report item to turn GPI reporting on or off.
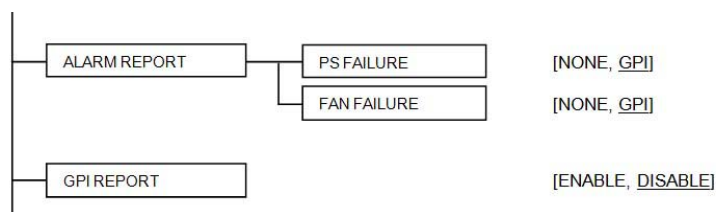
Options

The Ethernet Link Redundancy option uses channel bonding between the two rear panel ethernet interfaces to achieve redundancy (Active Backup mode) or increased throughput (Round Robin mode).

- Round-Robin: This mode provides load balancing, fault tolerance and increased throughput. Transmissions are received and sent out sequentially on each bonded slave interface beginning with the first one available. This mode requires that the remote equipment (host or switch) be configured to aggregate traffic over several ports (Trunk, EtherChannel, etc).

- Active-Backup: This mode provides fault tolerance. Transmissions are received and sent out via the first available bonded slave interface. Another bonded slave interface is only used if the active bonded slave interface fails. This mode doesn't require any configuration of the remote equipment.

When Channel Bonding is enabled, the two Ethernet interfaces are seen as one, and configured as ETH1 in the Network-ETH panel.

Once this option is activated, the bonding mode can be selected, and the option itself enabled or disabled, in the ETH tab of the Network iControl panel – see page 24, or in the CHANNEL BONDING menu item.

iControl - click the *Options* button

To activate this option, you must

- Obtain a licence key from Miranda Technologies Inc.

- Type the licence key in the *Enter Key* box

- Click on ENABLE OPTION to activate the option's features.
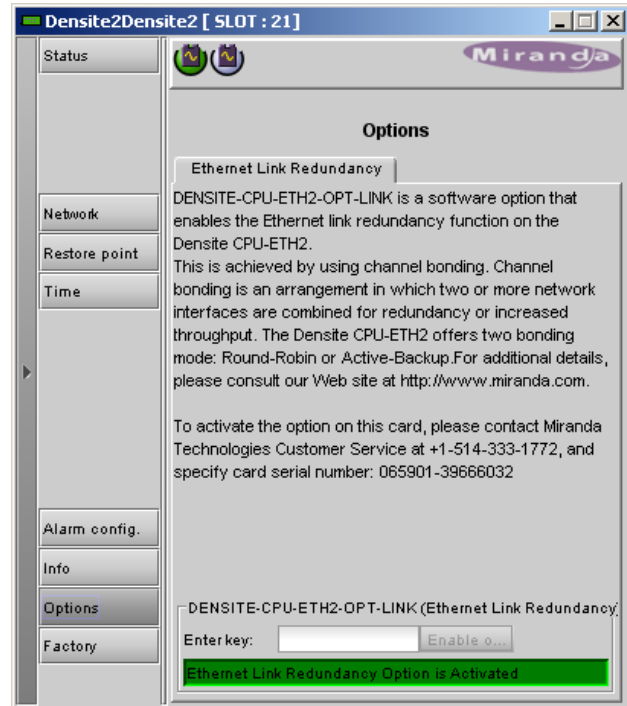
Using the menu

The option cannot be installed and activated from the menu. Use the iControl *Options* panel.

Once it has been installed and activated, you can enable or disable it from the CHANNEL BONDING menu item.

Local Control Panel Menu

Here is the complete on-board menu for the CPU-ETH2 controller, accessed through its local control panel.

STATUS	PS1 FAILURE	
	PS2 FAILURE	
	PS1 FAN FAILURE	
	PS2 FAN FAILURE	
	FAN1 FAILURE	
	FAN2 FAILURE	
	GPI ACTIVATED	
	INTERNAL FAILURE	
	CF CARD FAILURE	
	RAM FAILURE	
	FPGA LOAD FAIL	
	ETH1 FAILURE	*ETH1 DOWN, ETH1 UP <SPEED> <DUPLEX>*
	ETH2 FAILURE	*ETH2 DOWN, ETH2 UP <SPEED> <DUPLEX>*

HOST NAME	<HOST NAME>*

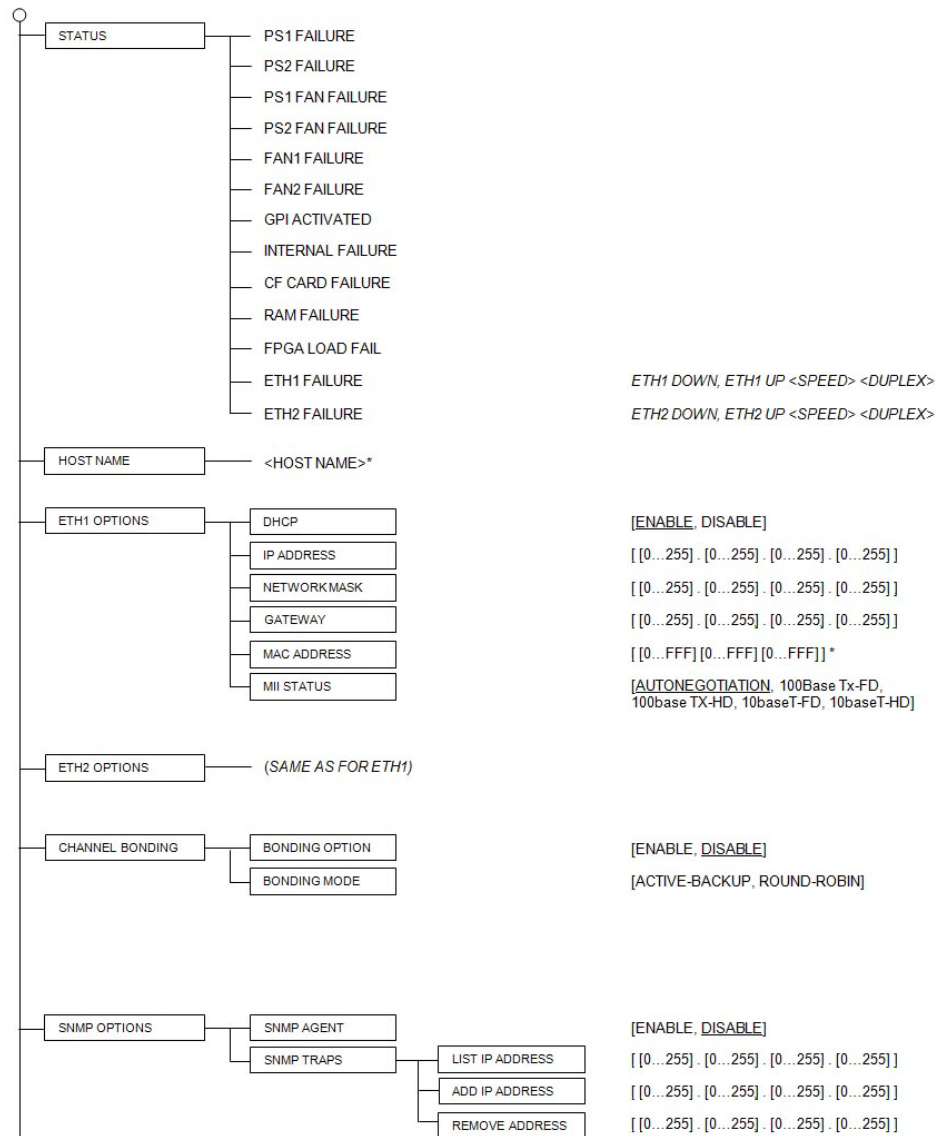| ETH1 OPTIONS	DHCP	[ENABLE, DISABLE]
	IP ADDRESS	[[0…255] . [0…255] . [0…255] . [0…255]]
	NETWORK MASK	[[0…255] . [0…255] . [0…255] . [0…255]]
	GATEWAY	[[0…255] . [0…255] . [0…255] . [0…255]]
	MAC ADDRESS	[[0…FFF] [0…FFF] [0…FFF]] *
	MII STATUS	[AUTONEGOTIATION, 100Base Tx-FD, 100base TX-HD, 10baseT-FD, 10baseT-HD]

ETH2 OPTIONS	*(SAME AS FOR ETH1)*

CHANNEL BONDING	BONDING OPTION	[ENABLE, DISABLE]
	BONDING MODE	[ACTIVE-BACKUP, ROUND-ROBIN]

SNMP OPTIONS	SNMP AGENT		[ENABLE, DISABLE]
	SNMP TRAPS	LIST IP ADDRESS	[[0…255] . [0…255] . [0…255] . [0…255]]
		ADD IP ADDRESS	[[0…255] . [0…255] . [0…255] . [0…255]]
		REMOVE ADDRESS	[[0…255] . [0…255] . [0…255] . [0…255]]

continued...

Local Control Panel Menu continued.

Menu	Submenu	Value
WEB SERVER		[ENABLE, DISABLE]
RESTORE POINTS	SAVE ALL CARDS	
	SAVE A CARD	[[1....20]]
	LOAD ALL CARDS	
	LOAD A CARD	[[1....20]]
	DEFAULT ACTION	[CARD, CONTROLLER]
	AUTO SAVE	[ENABLE, DISABLE]
	SAVE EVERY	[DAY, WEEK, MONTH]
TIME OPTIONS	TIME	[[HH] : [MM] : [SS]]
	DATE	[[DD] : [MMM] : [YY]]
	NTP CLIENT	[ENABLE, DISABLE]
	NTP SERVER → LIST IP ADDRESS	[[0...255] . [0...255] . [0...255] . [0...255]]
	NTP SERVER → ADD IP ADDRESS	[[0...255] . [0...255] . [0...255] . [0...255]]
	NTP SERVER → REMOVE ADDRESS	[[0...255] . [0...255] . [0...255] . [0...255]]
	NTP REFRESH	[EVERY [HH] HOUR]
ALARM REPORT	PS FAILURE	[NONE, GPI]
	FAN FAILURE	[NONE, GPI]
GPI REPORT		[ENABLE, DISABLE]
CTRL VERSION		[FIRMWARE V.XXX] *
BOOT-LOADER VER		[VERSION X.X.X] *
OPTIONS		[LINK REDUN ON/OFF] *
FACTORY DEFAULT		[RESTORE]

Sets all parameters shown above to their underlined default values.

| CTRL EXECUTION | | [REBOOT] |

* Values marked with an asterisk are displayed but cannot be modified through this menu.

Specifications

PROCESSING PERFORMANCE

Microcontroller	ARM Cortex A3
Latency:	<1 second

Power:	<1W

Index

Contact Us

Miranda Technical Support

For technical assistance, please contact the Miranda Technical Support center nearest you:

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