

# DENSITÉ series

## Densité 3 Housing Frame Guide to Installation and Operation

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## SAFETY COMPLIANCE



This equipment complies with:  
CSA C22.2 No. 60950-1-07 Safety of Information Technology Equipment  
UL 60950-1 (2nd Edition) Safety of Information Technology Equipment  
IEC 60950-1 (2nd Edition) Safety of Information Technology Equipment  
K60065 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 supply power 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 service 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.



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 injection
- EN 61000-3-3 Limitation of voltage changes, voltage fluctuations and flicker
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated electromagnetic field immunity – radio frequencies
- EN 61000-4-4 Electrical fast transient immunity
- EN 61000-4-5 Surge immunity
- EN 61000-4-6 Conducted emissions immunity
- EN 61000-4-11 Voltage dips, short interruptions and voltage variations immunity
- K00022
- K00025



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## *Guide to Installation and Operation*

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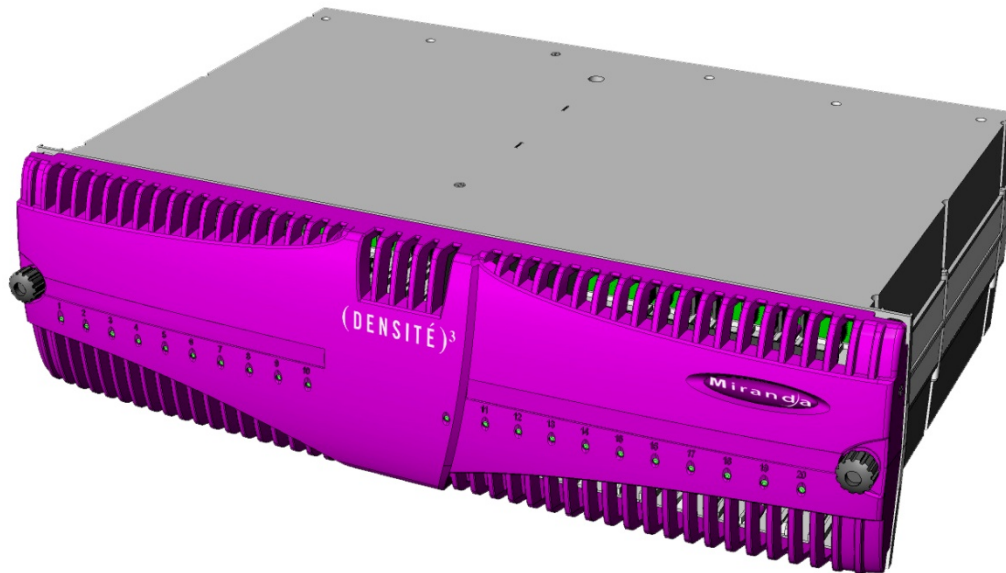
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# 1 Densité 3 Housing Frame

## 1.1 Introduction

The Densité 3 is a 3-RU housing frame, designed for hosting 2-RU and 3-RU Densité cards providing maximum configuration flexibility in a high density and low cost 3-RU chassis. The basic configuration includes one power supply unit and a menu-driven chassis controller card for configuring the system and individual card options. Up to 20 cards can be installed within a single frame. The Densité 3 frame offers full flexibility and integration of a variety of functions and signal types. All components are hot-swappable and can be quickly configured. The frame is air-cooled, the PSUs and fans are monitored and status reporting is available. Each card has a multicolored LED (visible with the door closed) for status reporting as well. Remote control via Ethernet is available as an option.

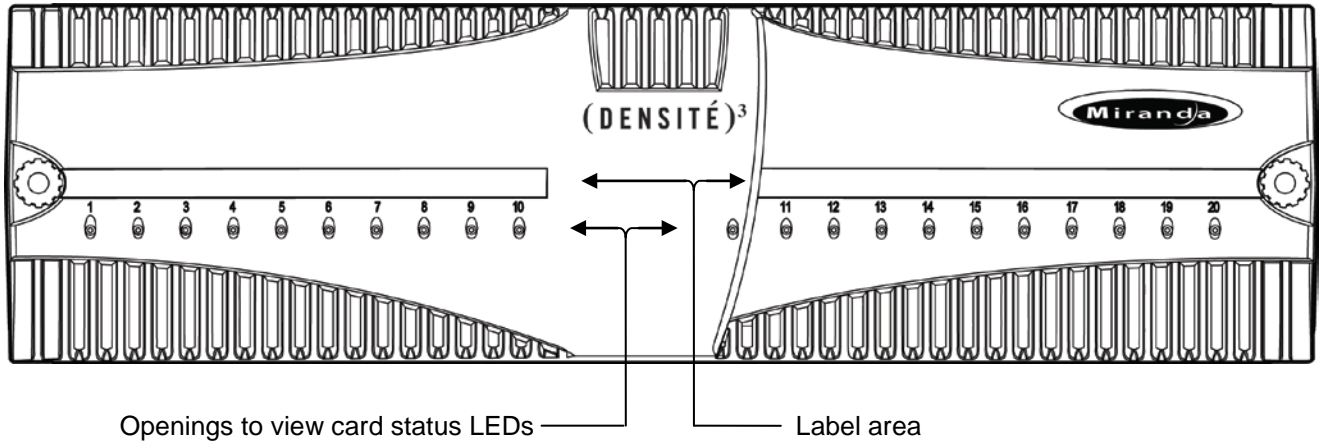


## 1.2 Features

- 3 RU with 19" rack mount
- Up to 20 cards (300 Watts)
- Hot-swappable PSU with optional 2<sup>nd</sup> redundant PSU
- Thermostatically-controlled PSU fans
- Menu-driven front panel for card configuration
- Backwards-compatible with 2RU Densité cards
- Multiple video and audio formats can be fitted in a single chassis

### 1.3 Physical Layout

#### Front Panel Appearance

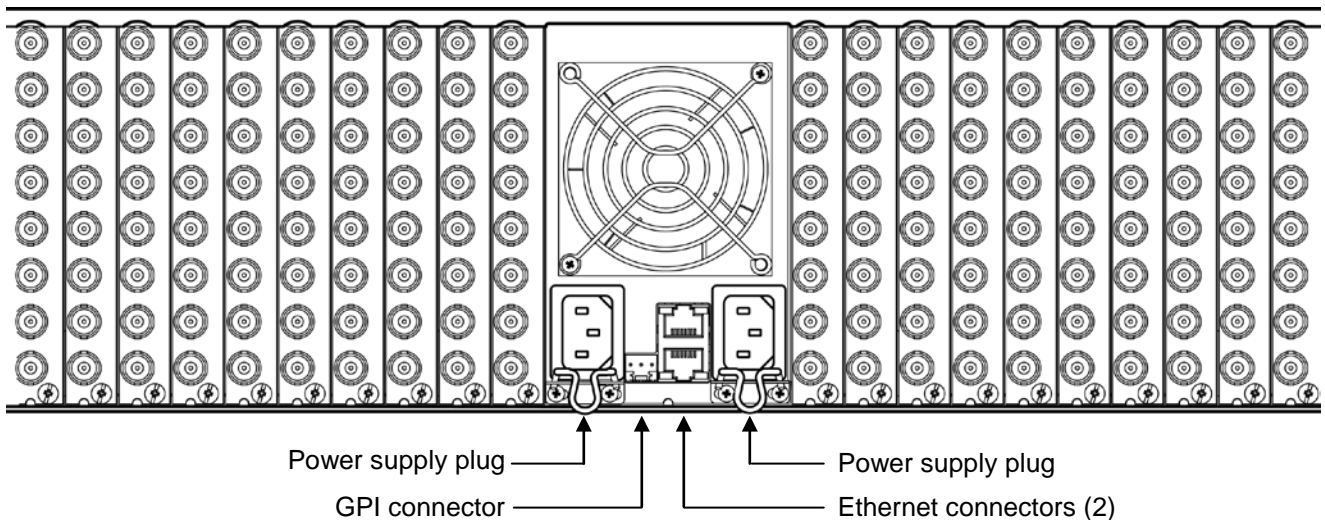


Note the openings in the panel (numbered 1 to 20) which allow the status LEDs on the installed cards to be seen while the panel door is closed. The unnumbered opening near the center of the panel is for the controller card status LED.

The flat space above the numbered openings can be used for labels to identify the installed cards. Use standard 9 mm or 12 mm (3/8" or 1/2") labeler tape as required.

- The label area is 0.4" (10.2 mm) wide, and holes are spaced 0.69" (17.5 mm) apart.

#### Rear Panel Appearance



The functionality of the GPI and ethernet connectors is described in the Controller manual.

The details of the rear panel connectors will vary depending on the card type.

## 2 Installation

### 2.1 Unpacking

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

- Densité 3 frame, including 1 Power Supply unit (AC in) and 1 controller card
- An AC power cord
- Densité series cards (per order)
- Blank rear panels (for empty slots)
- A second power supply and AC cord (optional)

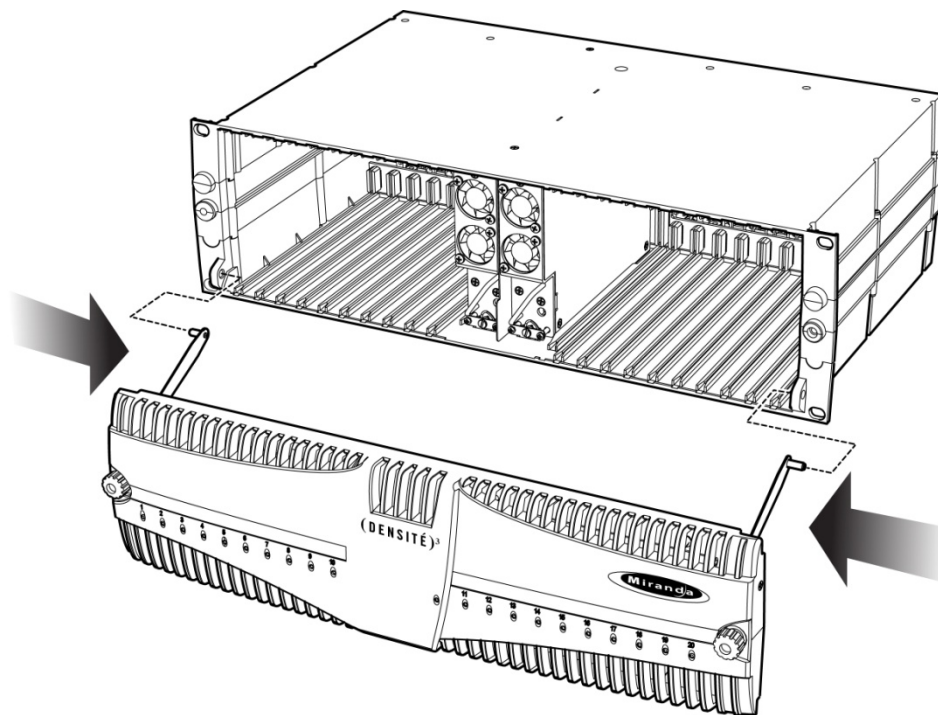
### 2.2 Mechanical Installation

The Densité 3 frame should be installed directly into a standard 19" rack using 4 standard rack-mounting screws through the four holes in the corners of the front mounting flange.

### 2.3 Opening the Front Panel

The front panel of the Densité 3 frame is attached by swivel brackets. Two multi-turn knobs secure the panel in the closed position. To open the panel, turn the knobs to the open position and pull gently on them until the panel is in the desired position.

If required, the door can easily be detached from the frame. Push inward on the two support arms until they release from the frame body. There are no electrical connections to the panel. Reinstall the panel by pushing the support arms inward until the bracket ends can be inserted into the mounting holes on the frame.

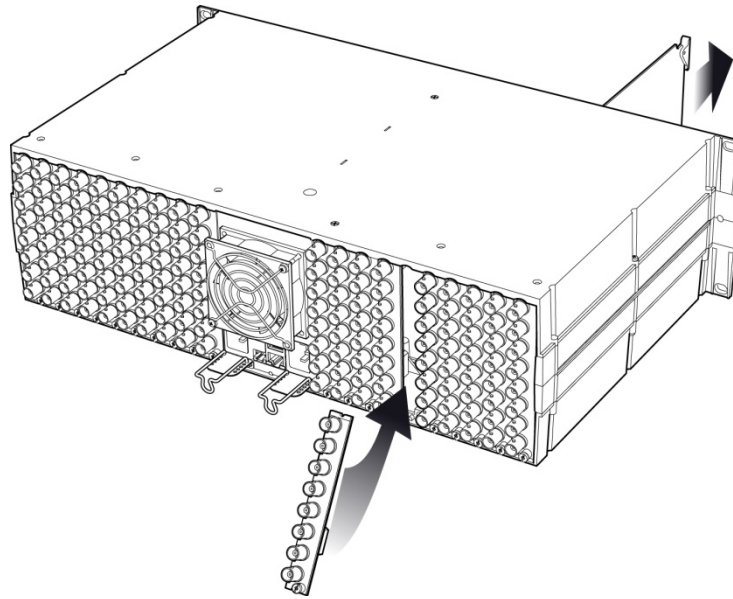


## 2.4 Installing Cards in the Densité 3 Frame

Each card comes with a rear connector panel which must be installed at the same time.

All cards and rear panels can be installed with the frame power on. The card has connectors which plug into a mid-frame mother board for distribution of power and for connection to the controller card, and a second connector which plugs directly into the rear connector panel for input and output.

***The rear connector panel should be installed with the card out of the frame.***



### ***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) at the bottom.
3. Position the new panel and secure it in place with the captive screw(s) at the bottom.

### ***To install the card:***

1. Open the front panel of the frame
2. To remove an existing card from the slot, tilt up 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.
3. Slide the new card into the slot and push gently on the handle to seat the connectors. If the card requires a double-width rear panel to accommodate many connectors, it should be inserted into the right-hand 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.
4. Close the front panel of the frame.

**Note:** Detailed descriptions of the rear panel connections are included in the individual manuals for each card. Information about the ethernet and GPI connections is found in the Controller manual



## 2.5 Installing Densité 2 Cards and Rear Modules in a Densité 3 Frame

The Densité 3 frame supports the many Miranda Densité 2 series cards. Should you need to install a Densité 2 card in your Densité 3 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 3 RU Densité 3 frame.

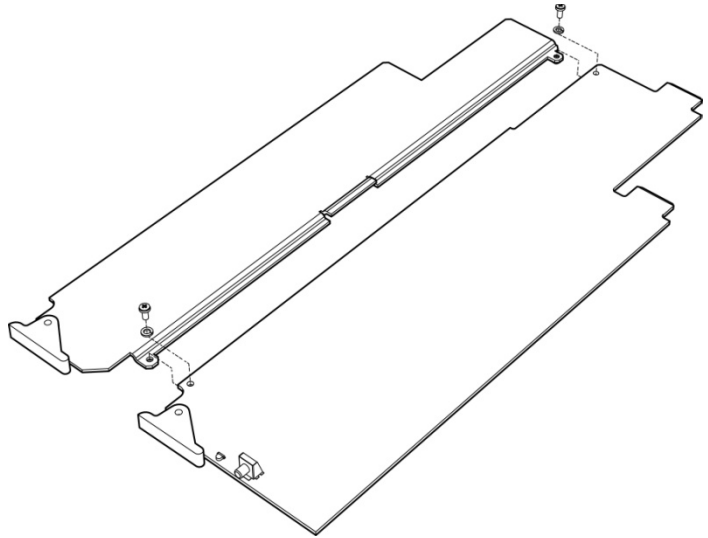
### Card adapters:

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

- DENSITE 3-EXT-A
- DENSITE 3-EXT-B
- 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.



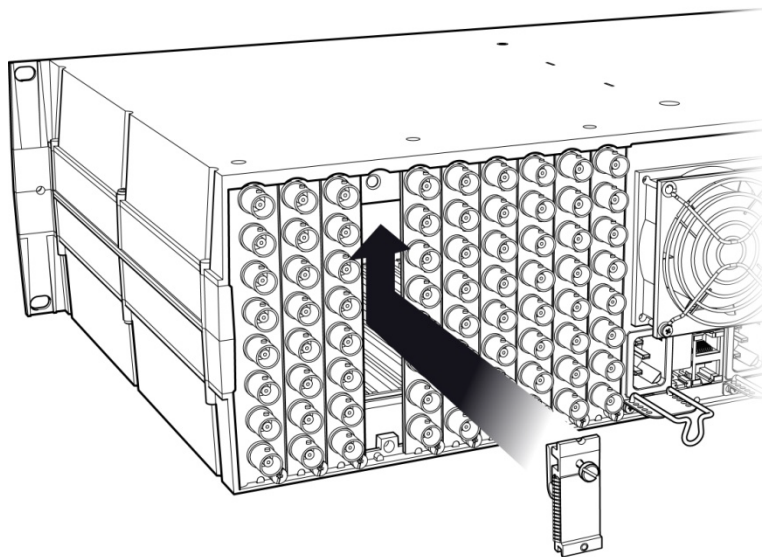
### Rear adapters:

3-RU rear module adapters are available for Single and Double Densité 2 rear modules:

- DENSITE DRP-3RU
- DENSITE SRP-3RU

Install these as follows:

1. Position the adapter at the top 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.



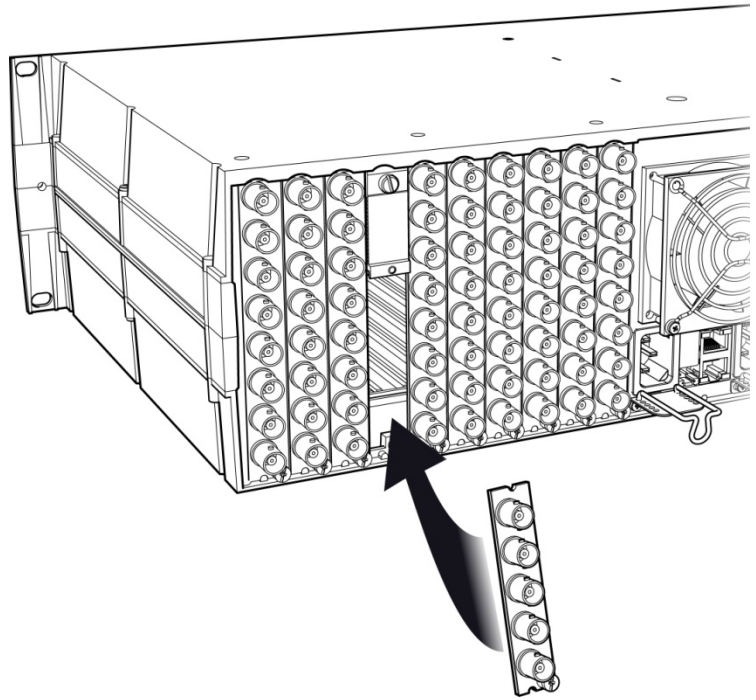
## Guide to Installation and Operation

3. Slip the top of the 2RU rear module into the slot at the bottom of the adapter, and secure it to the frame using the captive screw at the bottom of the module.

### NOTE:

Native 3-RU single and double rear modules are also available for some Densité 2 cards to optimize chassis configuration by providing maximum density (e.g. maximum number of supported Audio or Video connections) in a single or double 3-RU slot.

- Cards which required a double-width rear in a Densité 2 frame may only need a single-width rear in a Densité 3 frame, freeing up a slot for another card.
- Cards which required a triple-width rear in a Densité 2 frame may only need a double-width rear in a Densité 3 frame, freeing up a slot for another card.



## 2.6 Ventilation

Ventilation for the frame is provided by a fan mounted in the center of the rear panel. The fan draws air through the frame and exhausts it to the rear. Ventilation slots are provided in the front panel to allow air to flow into the frame, and an air filter is mounted in the frame door.

**Important Note:** to ensure proper cooling, the front panel of the Densité 3 frame must be closed at all times when cards are installed and operating

The frame-mounted fan is supplemented by two thermostatically-controlled fans mounted in each power supply. These are not field-serviceable.

Ensure that the front panel 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. See section 3.4 for details.

### 3 Field-Serviceable Items

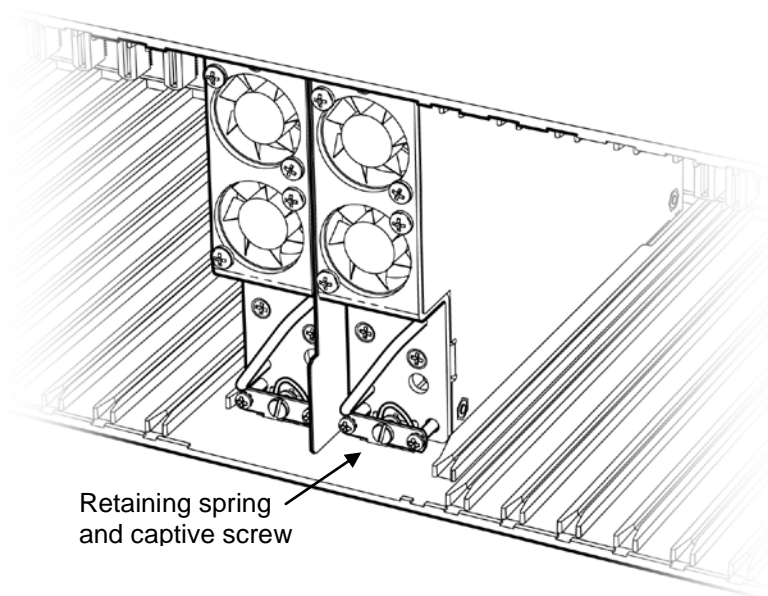
#### 3.1 Changing the Power Supply

The Densité 3 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 supply can be installed in either of the two slots

To install or change a power supply module:

1. Open the front panel of the frame
2. Swing the controller card operating panel open – it is hinged on its right-hand side – to provide access to the power supply slots
3. Release the retaining spring by turning the captive screw mounted on the lower front panel of the power supply counterclockwise
4. Remove the power supply module by pulling on the handle on its front panel and sliding it out of the frame
5. Slide the new power supply module into the slot, and push it gently into position to seat the connectors
6. Secure the supply in position by turning the captive screw mounted on the lower front of the power supply clockwise. This engages a retaining spring which holds the supply securely in place.
7. Swing the controller operating panel into the closed position
8. Close the front panel of the frame.



### 3.2 Replacing or Upgrading the Controller Card

The Controller card is located to the right of the power supply slots at the center of the frame. To replace the card, proceed as follows:

1. Hook your finger through the opening at the top of the card. Pull gently until the card is released from the rear connector, and then slide the card out of the frame.

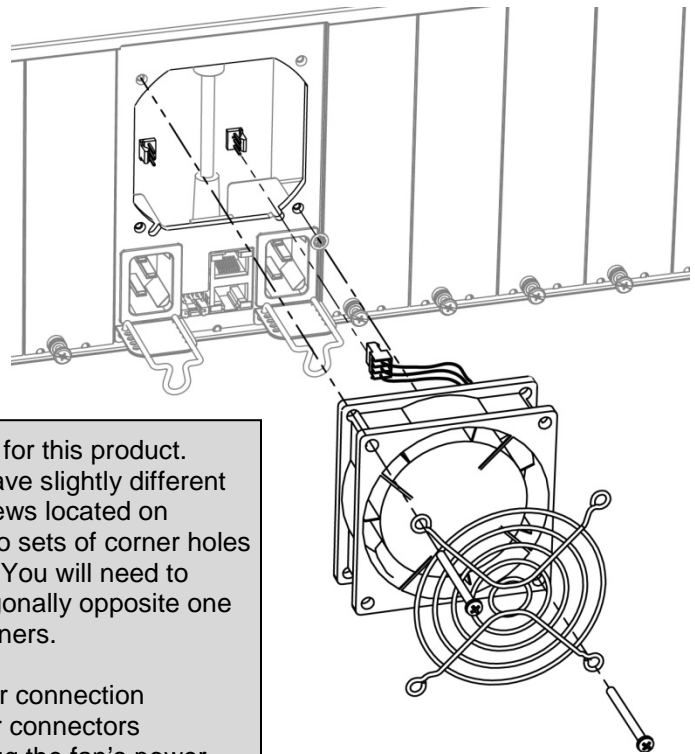
**NOTE: do not pull on the hinged control panel to remove the card.**

2. Slide the new card into the controller slot, and push gently on the card edge to engage the rear connectors. The connectors will not engage if the card is accidentally inserted in the wrong slot.

### 3.3 Replacing the Frame Ventilation Fan

In case of failure of the main cooling fan on the rear of the frame, replace it according to the following steps.

1. Procure a replacement fan. It is available from Miranda as part #1844-3000-200
2. Remove the defective fan from the frame:
  - Remove the two screws that secure the grill and fan unit to the frame.
  - Retain the screws and grill, as they will be used with the replacement fan.
  - Pull the unit away from the frame, and disconnect the power feed by grasping the connector and pulling straight out.



3. Install the replacement fan:

**NOTE** – Miranda uses two different fan units for this product. While they are electrically equivalent, they have slightly different dimensions. The fan is installed with two screws located on opposite corners. The mounting plate has two sets of corner holes – one to fit each of the available fan models. You will need to install one corner screw and then try the diagonally opposite one to see if it fits. If not, use the other pair of corners.

These two fan units also have different power connection configurations. There are two identical power connectors available on the frame into which you can plug the fan's power cable. When you install the fan, you will be able to tell which one you should use.

- Grasp the power connector attached to the fan assembly, and push it onto the appropriately-located power outlet inside the cutout on the rear panel.
- Use the two screws that were retained when the old fan was removed to install the new fan and grill. See the note above.

### **3.4 Replacing the air filter**

To remove the air filter for cleaning or replacement, proceed as follows:

- Open the front panel of the frame
- Grasp the top of the filter installed on the rear of the door, and pull it gently out of its mounting slot

To install a filter, proceed as follows:

- Slide the filter into the slot at the bottom of the front panel door. Ensure that the filter is not bunched or folded.
- Close the front panel of the frame

## **4 Specifications**

### **MECHANICAL**

Dimensions:	3RU x 19" W (485 mm) x 11.25" D (286 mm) with connectors
Weight:	10.2 lbs (4.6 kg) with 1 PSU and controller card installed

### **POWER**

Input Range:	AC 100-120, 200-240V, 60-50 Hz
Rating:	500 W max
Operating Temp. Range:	0-40° C
Alarm:	GPI contact

### **COOLING**

Fans:	1 on frame 1 on each PSU
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