Turin NETWORKS

MASTERseries

QUICK START GUIDE

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Corporate Contact Information:

Turin Networks, Inc.
1415 North McDowell Blvd.
Petaluma, CA 94954
Phone: +1-707-665-4400
Fax: +1-707-793-4935
www.TurinNetworks.com

Turin Technical Assistance Center:
E-mail: tech-support@TurinNetworks.com
Phone (US): 1-800-887-4638
Phone (International/Direct): 1-707-665-4355

PREFACE

Safety Information

CAUTION! **ALWAYS USE CAUTION WHEN INSTALLING TELEPHONE LINES. READ THE CAUTIONS BELOW FOR DETAILS ON SAFETY GUIDELINES TO PREVENT INJURY.**

- **The installation of a MASTERseries unit is to be performed by qualified personnel only.**
- **Never touch uninsulated telephone wires and terminals** unless the telephone line has been disconnected at the Network Interface (NI) as voltage potentials as high as 300 VAC may be present across the transmit and receive pairs.
- **Only use No. 26 AWG or larger** telecommunication line cord, to reduce the risk of fire.
- Never install telephone wiring during a lightning storm.
- **Never install telephone jacks in wet locations** unless the jack is specifically designed for wet locations.
- Refer to the installation section of this manual for a safe and proper installation procedure. All wiring external to this equipment should follow the current provision of the National Electrical Code.

Electrostatic Discharge (ESD) Precautions

ESD can damage processors, circuit cards, and other electronic components. Always observe the following precautions before installing a system component.

1. Do not remove a component from its protective packaging until ready to install it.
2. Wear a wrist grounding strap and attach it to a metal part of the system unit before handling components. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

WARNING! **INTEGRATED CIRCUITS (ICS) ARE EXTREMELY SUSCEPTIBLE TO ELECTROSTATIC DISCHARGE. UNLESS YOU ARE A QUALIFIED SERVICE TECHNICIAN WHO USES TOOLS AND TECHNIQUES THAT CONFORM TO ACCEPTED INDUSTRY PRACTICES, DO NOT HANDLE ICS.**

The ESD warning label appears on packages and storage bags that contain static-sensitive products and components.

QUICK START GUIDE

In this Guide

- Unpacking and Inspection
- Installation Environment
- 2-Slot Chassis Installation
- 8-Slot Chassis Installation
- Local Management - Logging in to the FLEXmaster
- Connectors
- LEDs

NOTE: Multiple modules, master/slave functionality, and E1 functionality are not supported in this release.

Unpacking and Inspection

WARNING! **OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC DEVICES.**

1. Inspect containers for damage during shipment. Report any damage to the freight carrier for possible insurance claims.
2. Compare packing list with office records. Report any discrepancies to the office.
3. Open shipping containers, be careful not to damage contents.
4. Inspect contents and report any damage.
5. If equipment must be returned for any reason, carefully repack equipment in the original shipping container with original packing materials if possible.
6. If equipment is to be installed later, replace equipment in original shipping container and store in a safe place until ready to install.

Installation Environment

The environment in which you are installing the Adit 600 must meet the following conditions:

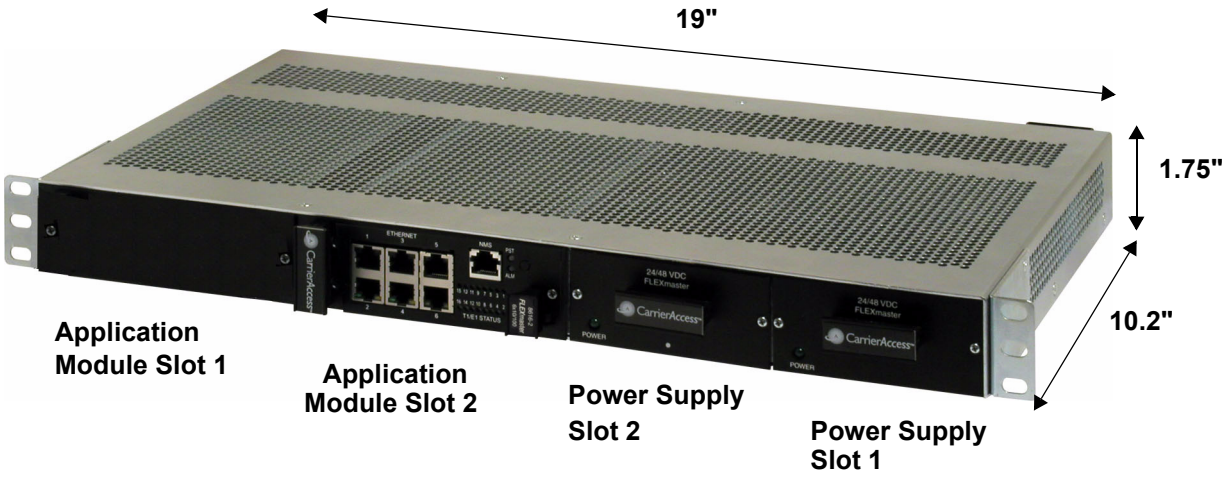
- Operating temperature range: -40° to 149° F (-40° to 65° C)
- Storage temperature range: -40° to 158° F (-40° to 70° C)
- Maximum operating altitude: 10,000 ft. (3,048 m)
- Minimum operating altitude: 197 ft. (60 m) below sea level
- Maximum non-operating altitude: 40,000 ft. (12,192 m)
- Relative humidity (non-condensing) range: 0 to 95%

2-Slot Chassis Installation

The 2-slot chassis has two application module slots and two power supply slots for redundant power.

Dimensions:

- 1.75 in (H) x 19 in (W) x 10.2 in (D).
- Maximum depth of the shelf, including cables, is 12 inches
- Rack Mounting: 19 or 23 inch rack



NOTE: Blank faceplates must be installed on each empty slot to be in compliance with product emission standards.

Supported Configurations

The following table indicates the configurations supported by the 2-slot chassis.

Double Fan	Triple Fan	FM16 TDM	FM16 ATM	FM16 PWE	Total Number of Modules
	✓	1			1*
	✓		1		1*
	✓			1	1*

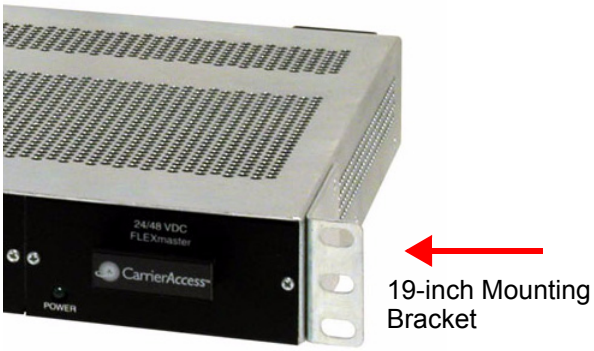
For information about configurations supported by the 8-slot chassis, see *8-Slot Chassis Installation on page 20*.

Rack Mount Installation

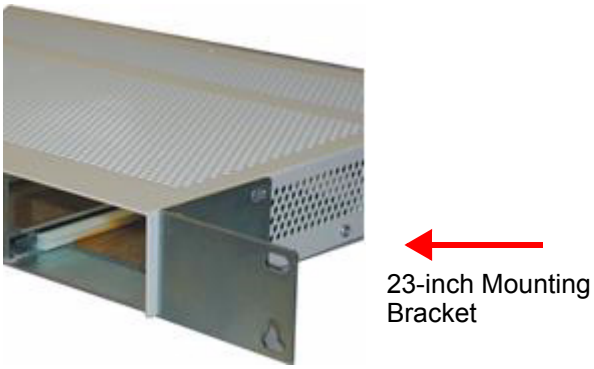
Mounting brackets for a 19-inch rack are installed on the chassis when shipped. If you want to install the chassis in a 23-inch rack, you must purchase 23-inch mounting brackets from Turin Networks.

Installation of the 2-slot chassis is as follows:

1. To install the unit in a 19-inch rack, attach the unit with the brackets to the rack using the screws provided.

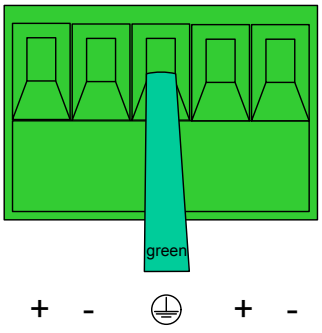


2. To install the unit in a 23-inch rack, remove the 19-inch mounting brackets and replace them with 23-inch mounting brackets purchased from Turin Networks.



3. Ground the unit by attaching ground wire from the terminal block to the frame ground.

WARNING! THE GROUND TERMINAL ⏚ ON THE POWER BLOCK MUST BE CONNECTED TO THE FRAME GROUND TO PREVENT POSSIBLE DAMAGE TO THE EQUIPMENT.



Power Supply Installation and Cabling

DANGER! POSSIBLE SHOCK HAZARD EXISTS - PLEASE FOLLOW INSTRUCTIONS CAREFULLY. ENSURE THAT NO POWER IS PRESENT ON POWER LEADS AND THAT THE CHASSIS POWER SWITCH IS OFF WHEN PERFORMING THE PROCEDURES IN THIS SECTION.

This section describes the power supplies used in the 2-slot chassis and provides instructions for installing and setting up cabling for the power supplies.

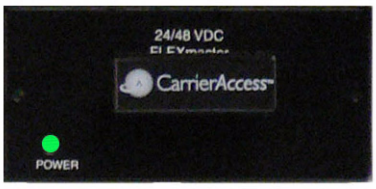
+24/-48 VDC Power Supply

FLEXmaster modules are powered by +24/-48 VDC power supplies. The power supplies are redundant and load sharing.

DC Configuration	Power Supply Wattage	Input Power Feed(s)	Fuse
+24/-48VDC (24 – 65VDC input)	30W	dual	3.15A

The LED states of the power supply are as follows:

LED	State	Description
Power	Off	DC input missing or failure
	Green	DC input present

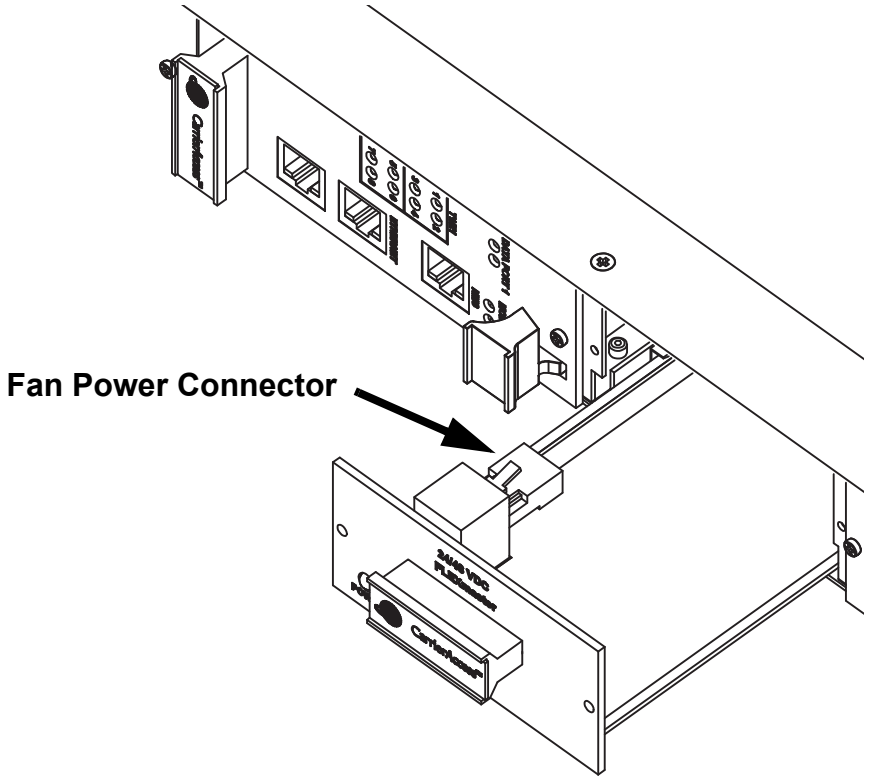


NOTE: MASTERseries Release 6.0 introduced a new 24/-48 VDC power supply that is identified by a small white dot on the faceplate.

Power Supply Installation

To install the first power supply:

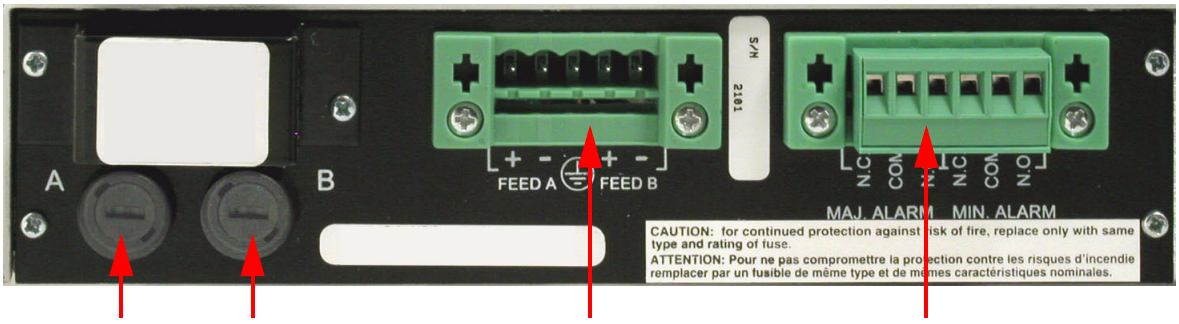
1. Remove the blank faceplate from power supply slot 2.
2. Slide the power supply halfway into the empty slot, and plug the fan's power connector into the power supply.



3. Slide the power supply the rest of the way into the slot. Press firmly to make full contact with the connector at the back of the chassis.
4. Insert and tighten the screws on the front of the power supply.
5. For redundant systems, install a second power supply into power supply slot 1 following the same procedure (except for connecting the fan).

Power Lead Connection

The +24/-48 VDC power entry module provides DC power protection and isolation when the leads are properly attached.



DC Line Input Fuses (A and B feeds) **Power Entry Module** **Alarm Terminal Block**

Each input has its own return. The labels of the power entries vary based on what version of the chassis you have:

- **FEED A (IN A/RTN A)** operates power supply A
- **FEED B (IN B/RTN B)** operates power supply B

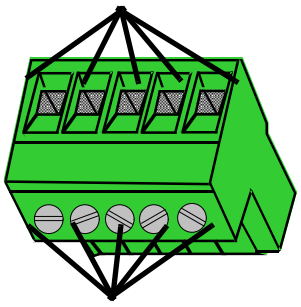
DANGER! POSSIBLE SHOCK HAZARD EXISTS - PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

ENSURE THAT NO POWER IS PRESENT ON THE POWER LEADS TO BE CONNECTED AND THAT THE CHASSIS POWER SWITCH IS OFF.

To connect the power leads:

1. Remove the power terminal block for easier lead attachment by prying off the block with a screwdriver.
2. Strip the two wires from the power source so that approximately 5/16 inch of bare wire is exposed. 16 or 18 AWG insulated copper wire is recommended for power connections.
3. Attach leads to the appropriate terminals using the screws on the block to secure them. The illustrations on the following page show the positioning of the leads.
4. Be sure to attach the ground wire as described in *Rack Mount Installation on page 8*.
5. Ensure that no bare wire shows after the wires are installed.
6. **IMPORTANT:** Do not connect power yet.

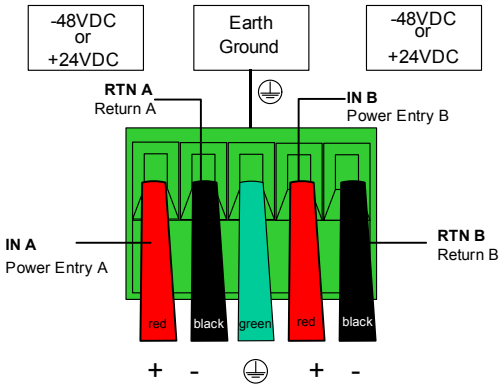
Connect 16-18 Gauge Wire Here



Wire Securing Screws

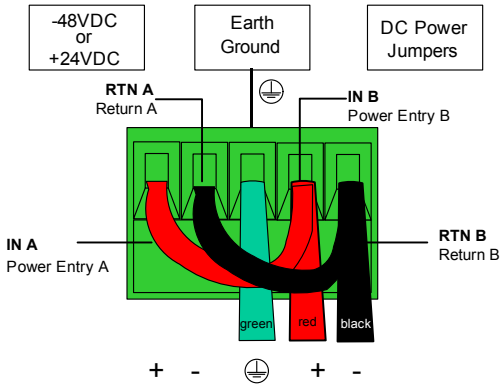
If You are Using Redundant Power Supplies...

Power must be connected to both A and B feeds. Attach the leads to the appropriate terminals as indicated in the diagram at the right.



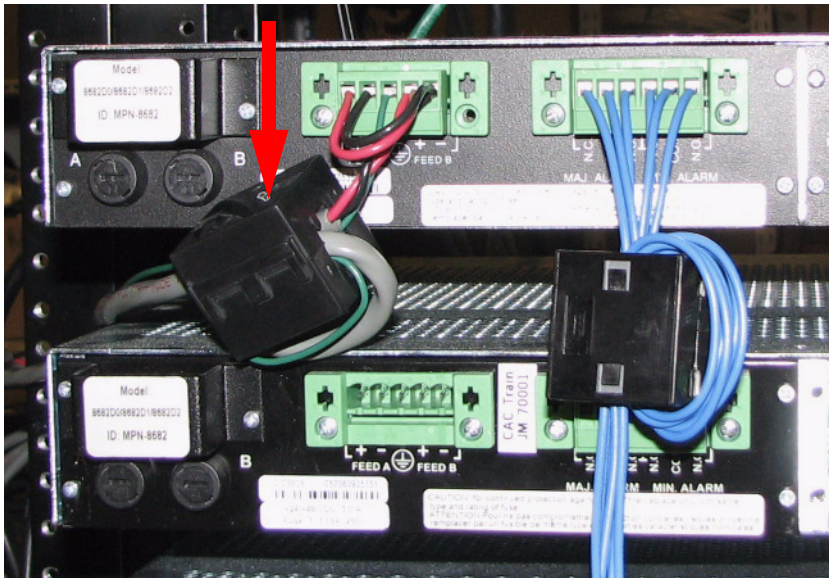
If You are Using a Single Power Feed with Dual Power Supplies...

If you only power the A feed and are using two power supplies, you need to jumper between Input A and Input B and also between Return A and Return B. Make this jumper the same gauge as the feed. Attach the leads to the appropriate terminals as indicated in the diagram at the right.



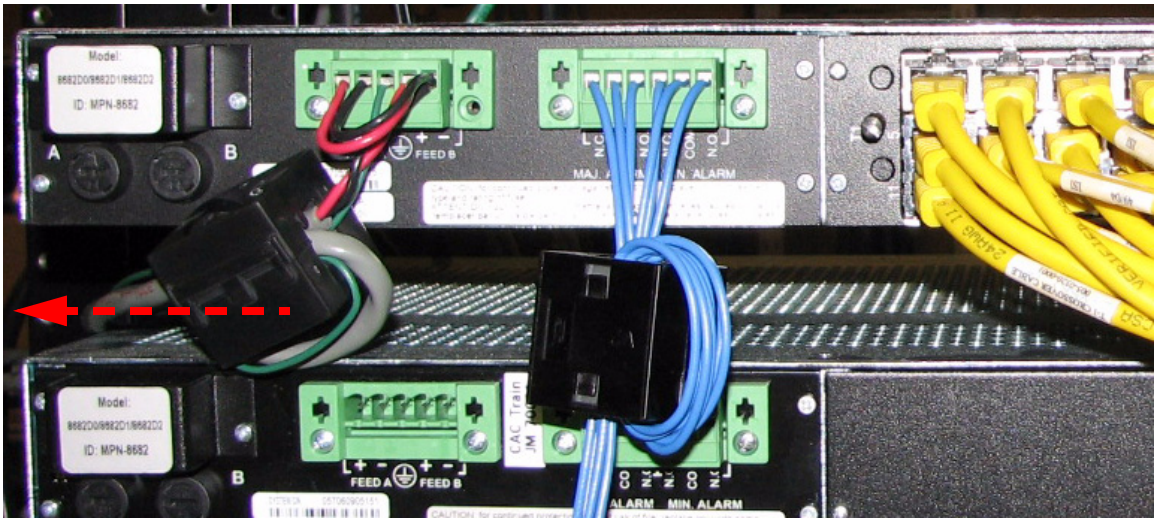
Ferrite Bead

A ferrite bead is required on the power cable. Install a ferrite bead (part number 010-0051) on the power cable with a loop as shown below. It is recommended that the ground wire be included in the ferrite bead.



Power Cable Routing

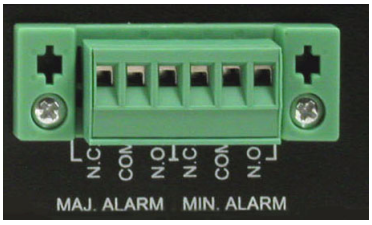
To meet emissions standards, the power cable must be routed away from all other cables connected to the chassis. These include the alarm, Ethernet, NMS, T1/E1, and V.35 cables. As an example, you might route the power cable as shown below.



Alarm Contacts

The alarm terminals are located next to the power entry module. If you use the alarm contact feature, attach leads to the appropriate terminal using the screws on the terminal block to secure them. The alarm terminal block can be removed for easier lead attachment. Plug the terminal block back into the alarm module when finished.

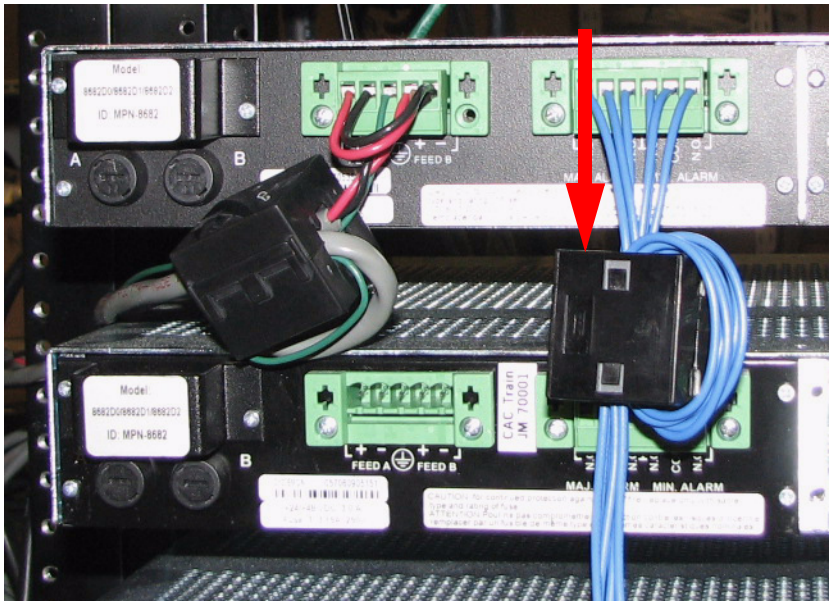
The following table describes the alarm terminal contacts.



Contact	Alarm	Description
Major Alarm	**N.C.** **COM** **N.O.**	Normally Closed Common Normally Open
Minor Alarm	**N.C.** **COM** **N.O.**	Normally Closed Common Normally Open

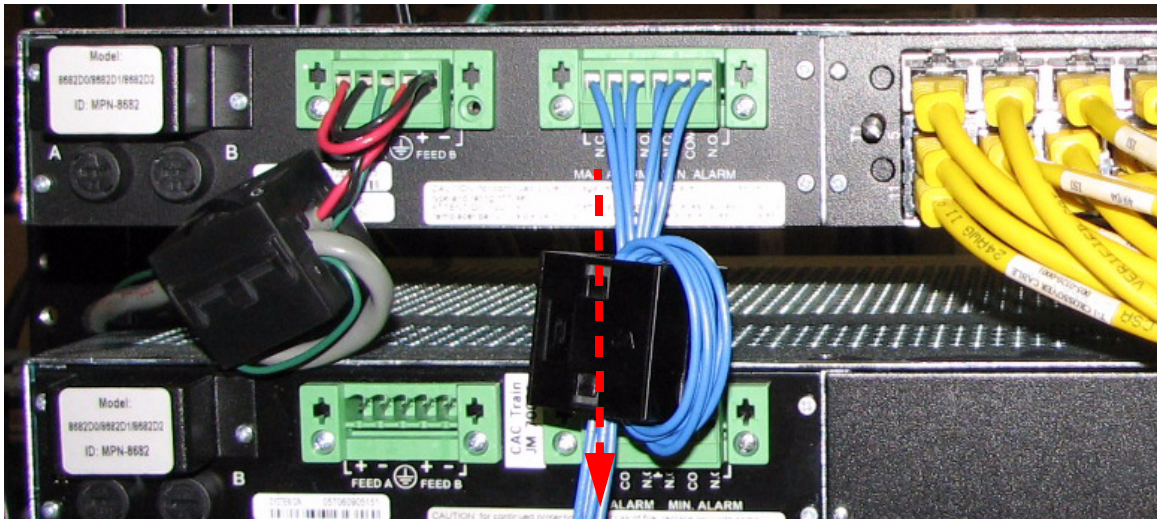
Ferrite Bead

Install a ferrite bead (part number 010-0051) with a loop on the alarm leads as shown below.



Alarm Lead Routing

To meet emissions standards, the alarm leads must be routed away from all other cables connected to the chassis. These include the power, Ethernet, NMS, T1/E1, and V.35 cables. As an example, you might route the alarm leads as shown below.



Applying Power

DANGER! POSSIBLE SHOCK HAZARD EXISTS - PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

After all procedures in *Power Supply Installation and Cabling on page 9* and (optionally) *Alarm Contacts on page 14* have been completed, apply power as follows:

1. If you have not yet done so, plug the power terminal block into the power entry panel.
2. Apply power to the chassis by turning on the power switch.

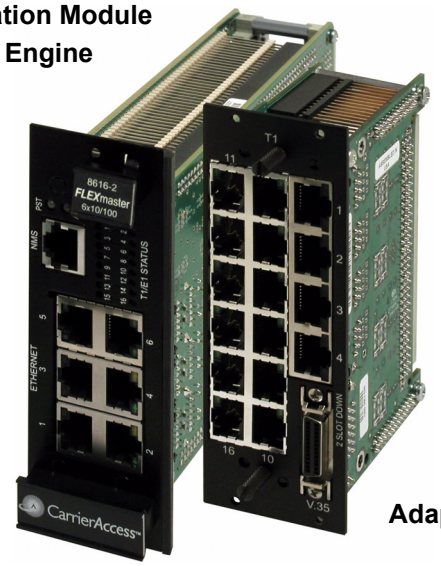
A green light should appear on the power LED on the front of the power supply.

Modules

WARNING! **STATIC PROTECTION IS REQUIRED DURING INSTALLATION. PROPER HANDLING, GROUNDING AND PRECAUTIONARY ESD MEASURES ARE ESSENTIAL WHEN INSTALLING AND SERVICING PARTS OR MODULES.**

NOTE: This section describes how to install application modules and adapter modules. If your chassis came with modules already installed, skip this section and go to *Local Management - Logging in to the FLEXmaster on page 29*.

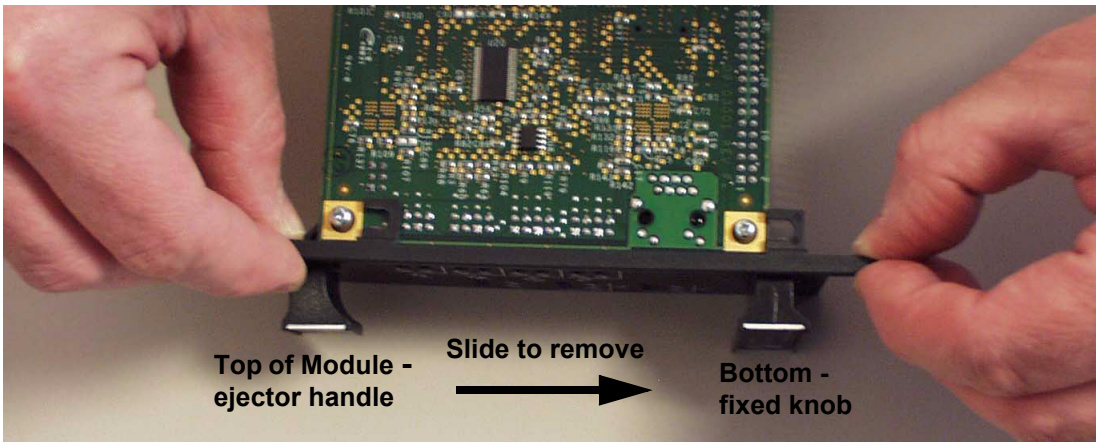
Each module is made up of an engine, or application module, and an adapter module.

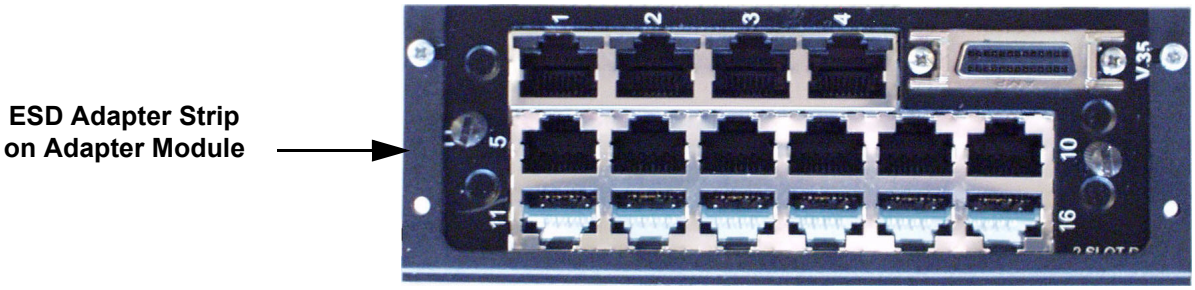


Removing Adapter Strips

Engine and adapter modules may have ESD adapter strips attached when shipped. These adapter strips are required for 8-slot chassis installation, but must be removed for 2-slot chassis installation.

To remove the adapter strips, loosen the screws holding the strips and slide the strips off the modules. Re-tighten the screws.

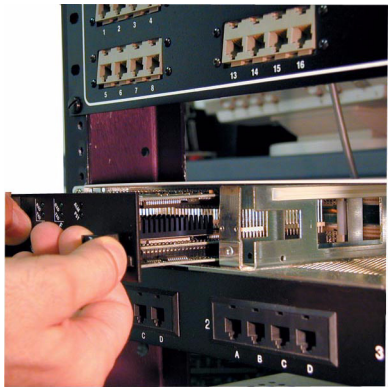




Application Module Installation

- When installing **two** modules in a 2-slot chassis, install the first in slot 1 (first slot from the left).
- When only using **one** module, install it in slot 2. This is to ensure optimal cooling performance.

To install an application module:



1. Gently slide the module into the slot and press firmly to make full contact with the midplane connector of the chassis.
2. Be sure that the ID tag on the engine is to the *right* when inserting into the chassis. The text along the edge (2 SLOT DOWN) should be upright.
3. Secure the application module to the chassis with the screws on the faceplate of the application module. When correctly installed, the application module faceplate will make contact with the chassis.
4. To install a second application module, repeat the process for slot 2.

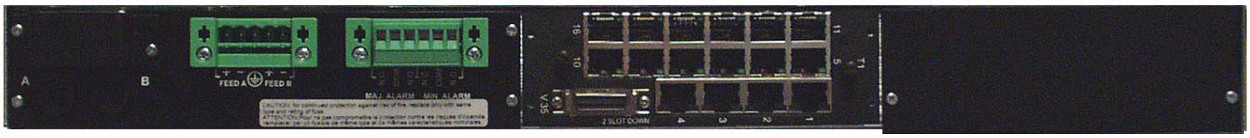
Removing an Application Module

To remove an application module from a 2-slot chassis, remove the two screws that lock the module faceplate to the chassis, then push the ejector handle to the right to disengage the connectors. Slide the module out carefully.

Adapter Installation

1. Insert the adapter module into the back of the 2-slot chassis (directly behind the application module installed in steps above) and press firmly to make full contact with the midplane connector of the chassis.

   Note: The text along the edge "2 SLOT DOWN" should be upright.
2. Secure the adapter module to the chassis, by tightening the screws on the faceplate.



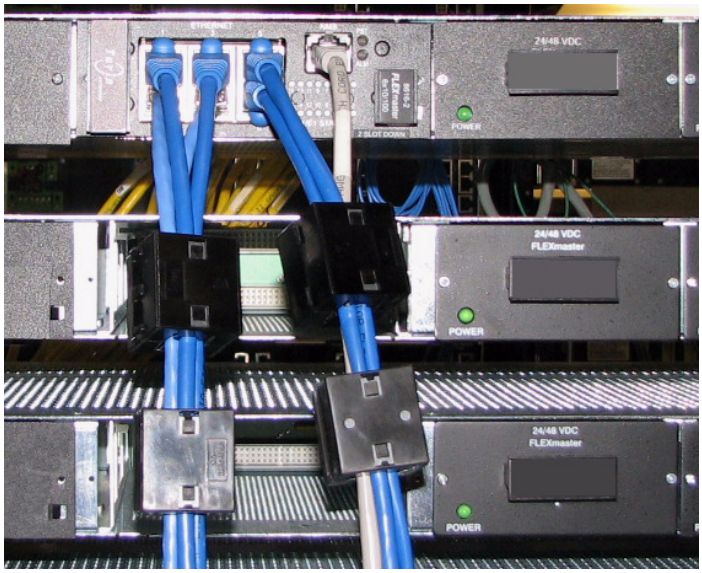
NOTE: Empty slots should always be covered with faceplate covers (front and back) to be in compliance with product emission standards.

Ethernet Switch Cabling

If you attach cables to the Ethernet switch ports at the front of the FLEXmaster16 module, you must install ferrite beads (part number 010-0051) on the cables to meet emissions requirements. Ferrite bead guidelines are as follows:

- Up to four Ethernet cables can be grouped together within two ferrite beads.
- The NMS cable can be grouped with Ethernet cables (up to the limit of four cables within two ferrite beads).
- If the installation is limited to the backhaul Ethernet and/or the NMS cable, a single ferrite bead with a loop can be used. **Note:** The ferrite bead should be 4 to 5 inches from the connectors.

Example: If all of the Ethernet ports and the NMS port are cabled, four ferrite beads are required for the seven cables, as shown below.

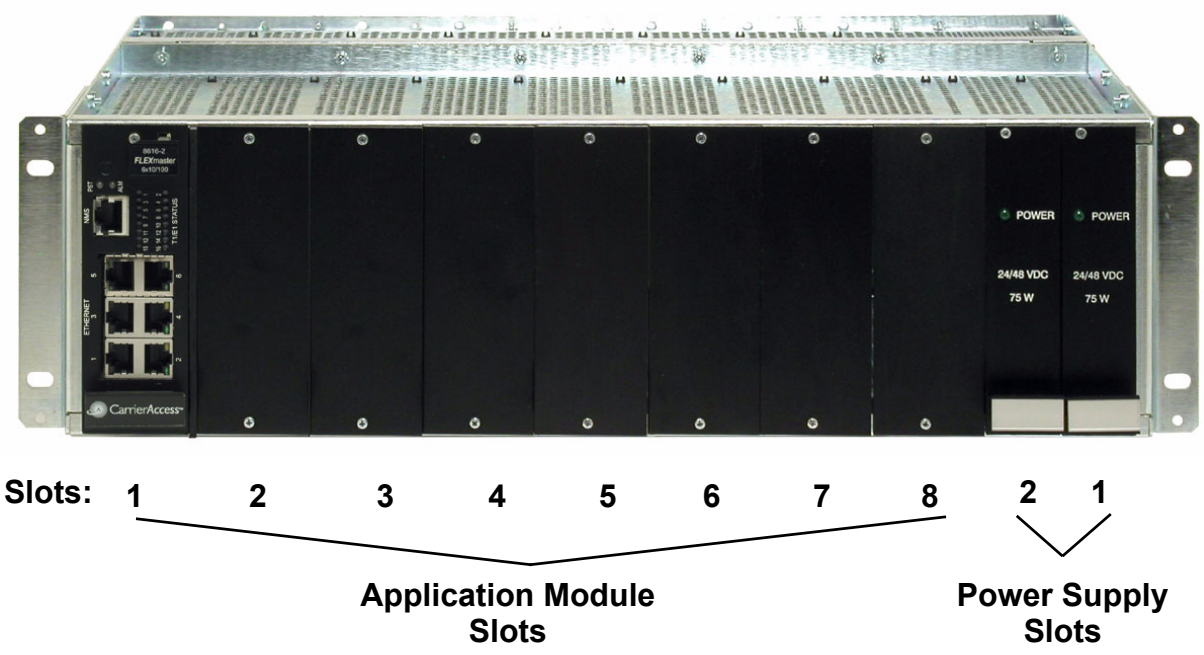


8-Slot Chassis Installation

The 8-slot chassis has eight application module slots and two power supply slots for redundant power.

Dimensions:

- 5.2 in. (H) x 10.2 in. (D) x 19 in. (W)
- Maximum depth of the shelf, including cables, is 12 inches



NOTE: Blank faceplates must be installed on each open slot to be in compliance with product emission standards.

Supported Configurations

The following table indicates the configurations supported by the 8-slot chassis.

FM16 TDM	FM16 ATM	FM16 PWE	Total Number of Modules
1			1*
	1		1*
		1	1*

For information about configurations supported by the 2-slot chassis, see *2-Slot Chassis Installation on page 7*.

Rack Mount Installation

Mounting brackets for a 19-inch rack are installed on the chassis when shipped. If you want to install the chassis in a 23-inch rack, you must purchase 23-inch mounting brackets from Turin Networks.

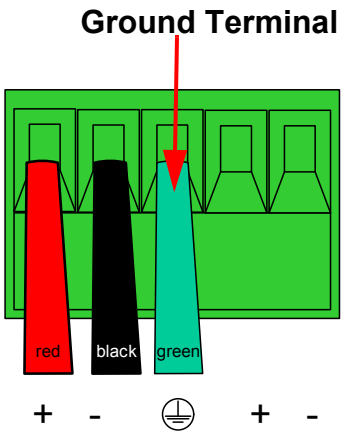
1. To install the unit in a 19-inch rack, attach the unit with the brackets to the rack using the screws provided.

Mounting Bracket for a 19 inch rack

Mounting Bracket for 23 inch rack

2. To install the unit in a 23-inch rack, remove the 19-inch mounting brackets and replace them with 23-inch mounting brackets purchased from Turin Networks.
3. Ground the unit.
   a. Connect ground wire (16 - 18 gauge) from the ground terminal to earth ground.
   b. Connect the chassis ground screw to earth ground.

      The chassis ground screw is the raised green screw on the side of the chassis. When mid-mounting the chassis, you can replace this screw with a flat-head screw, if needed.



Chassis Ground Screw

WARNING! THE GROUND TERMINAL ⏚ ON THE POWER BLOCK MUST BE CONNECTED TO EARTH GROUND TO PREVENT POSSIBLE DAMAGE TO THE EQUIPMENT. THE CHASSIS GROUND SCREW MUST ALSO BE CONNECTED TO THE EARTH GROUND

Power

The 8-slot chassis is available as a DC powered unit. The wide-ranging DC power supply is used for both -48 and +24 VDC applications. All power supplies are redundant and load sharing.

DC Configurations	Power Supply Wattage	Input Power Feed(s)	Fuse
±20 to 60 VDC	75W	Dual	5A, 250 V

LEDs

The LED states of both power supplies.

LED	State	Description
Power	Off	DC input missing or failure
	Green	DC input present

Power Supply Installation

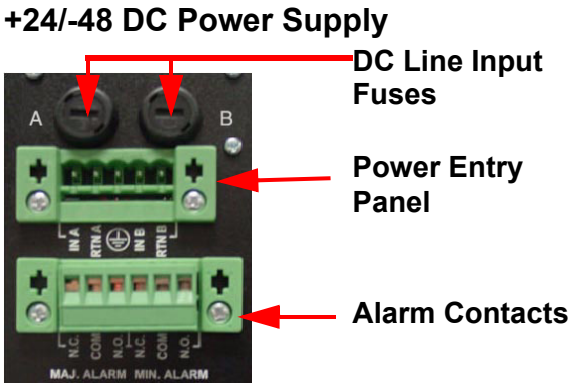
To install the first power supply:

1. Remove the blank faceplate from power supply in slot 1.
2. Slide the first power supply into the empty power supply slot.
3. Press firmly to make full contact with the connector in the back of the chassis.
4. Tighten the screws found on the front of the power supply.
5. Install a second power supply (for redundancy) into power supply slot 2, as in steps 1-4.

DC Power

The power entry modules provide DC power protection and isolation.

- Each input has its own return.
- The recommended wire gauge for connecting power is 16 to 18 gauge.

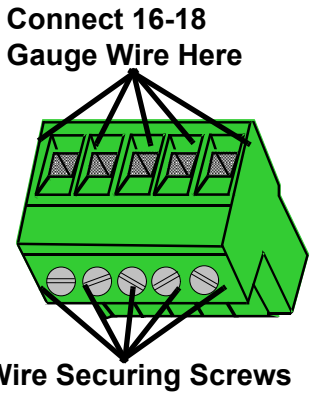


NOTE: When using two power supplies, the input power must be connected to both A and B feeds. If you only power the A feed and are using two power supplies, you will need to jumper between input A and input B and also between return A and return B. Make this jumper the same gauge as the feed.

Terminal Block

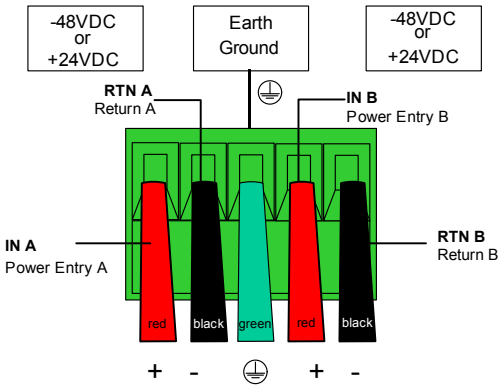
Attach the leads to the appropriate terminal using the securing screws on the block to tighten them.

The power terminal block and the alarm terminal block can be removed for easier lead attachment. Pry off the block with a screwdriver and remove it.



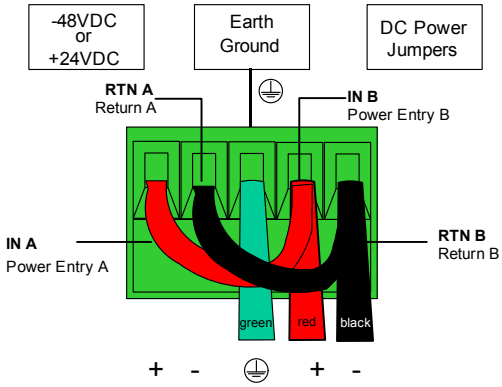
Dual Power Feed - Dual Power Supplies

Attach the leads to the appropriate terminal as indicated in the following diagram. Secure the leads with screws on the terminal block to tighten them.



Single Power Feed - Dual Power Supplies

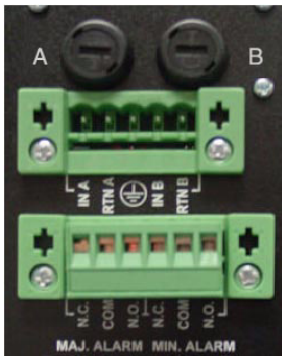
Attach the leads to the appropriate terminal as indicated in the following diagram. Secure the leads with screws on the terminal block to tighten them.



WARNING! **THE TERMINAL ⏚ ON THE POWER BLOCK MUST BE CONNECTED TO THE EARTH GROUND TO PREVENT POSSIBLE DAMAGE TO THE EQUIPMENT.**

Alarm Terminal Block

The following table describes the alarm contacts on the DC powered chassis.



Contact	Alarm	Description
Major Alarm	**N.C.** **COM** **N.O.**	Normally Closed Common Normally Open
Minor Alarm	**N.C.** **COM** **N.O.**	Normally Closed Common Normally Open

Alarm Contact

If you use the alarm contact feature, install a ferrite bead (part number 010-0051) with a loop.

Applying Power

DANGER! POSSIBLE SHOCK HAZARD EXISTS - FOLLOW INSTRUCTIONS CAREFULLY.

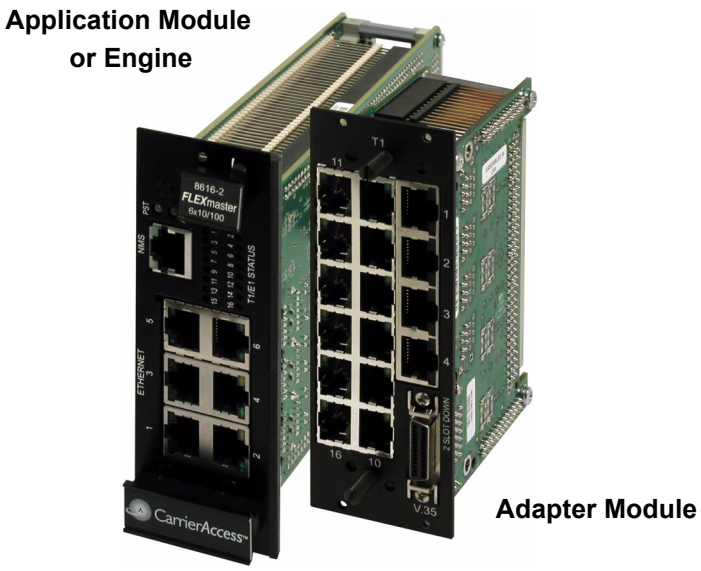
Wire Feed A and Feed B to a power source:

1. Ensure that no power is present on the two wires to be connected.
2. Remove the terminal block from the power entry panel.
3. Strip the two wires from the power source so that approximately 5/16 inch of bare wire is exposed. 16 or 18 AWG insulated copper wire is recommended for power connections.
4. Insert the wires (from the power source) into the appropriate square holes, one at a time.
5. Tighten screws to clamp wires.
6. Ensure that no bare wire shows after the wires are installed.
7. Plug the terminal block into the power entry panel.
8. Apply power to the chassis.
9. A green light should appear on the power LED on the front of the power supply.

Modules

NOTE: This section describes how to install application modules and adapter modules. If your chassis came with modules already installed, skip this section and go to *Local Management - Logging in to the FLEXmaster on page 29*.

Each module is made up of an engine or application module, and an adapter module.



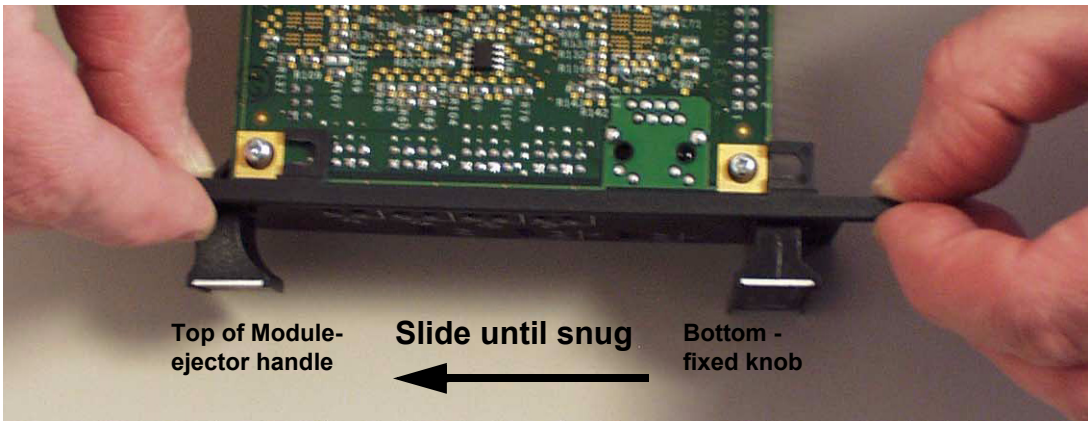
WARNING! **STATIC PROTECTION IS REQUIRED DURING INSTALLATION. PROPER HANDLING, GROUNDING AND PRECAUTIONARY ESD MEASURES ARE ESSENTIAL WHEN INSTALLING AND SERVICING PARTS OR MODULES.**

Adapter Strip Installation

To be compliant with EMI, an adapter strip must be installed on the engine and adapter modules in an 8-slot chassis. Typically, adapter strips are shipped attached to the engine and adapter modules. If not, perform the following procedures to install the adapter strips.

Adapter Strip Installation on Engine

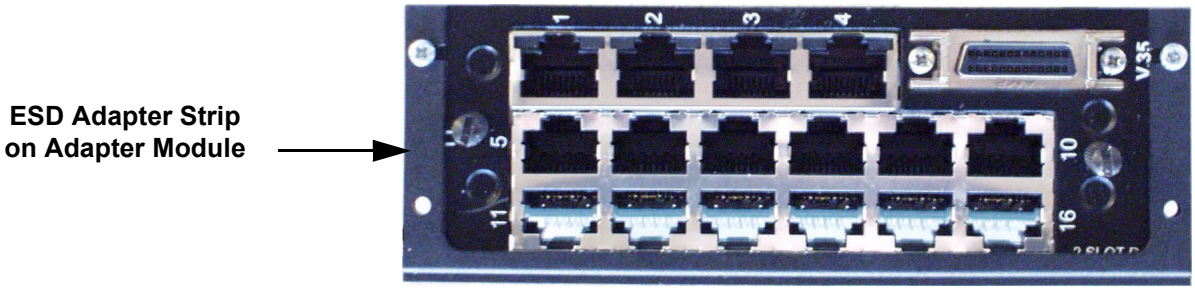
1. Slide the adapter strip under the screw heads until snug, as shown in the following figure. Spacers below the screw heads allow enough space to install the adapter strip without loosening the screws. (If the screws have been driven tight to the panel, loosen them enough to allow the slotted end of the adapter strip to fit under the screw heads.)



2. Tighten the screws to hold the adapter strip in place.

Adapter Strip Installation on Adapter Module

1. Slide the adapter strip under the screw heads until snug. Spacers below the screw heads allow enough space to install the adapter strip without loosening the screws. (If the screws have been driven tight to the panel, loosen them enough to allow the slotted end of the adapter strip to fit under the screw heads.)
2. Tighten the screws to hold the adapter strip in place.



Application Module Installation

FLEXmaster modules use more power than series 3 modules. As a result, you must install them in alternating slots. **NOTE:** Multiple modules are not supported in this release.

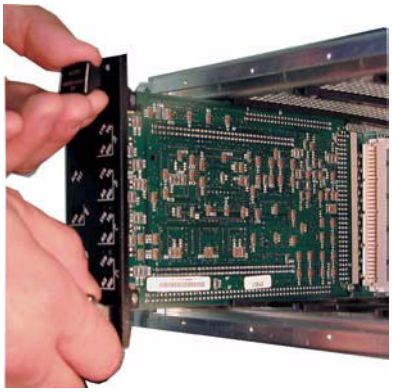
- Do not install an engine in slot 8 next to the power supplies.

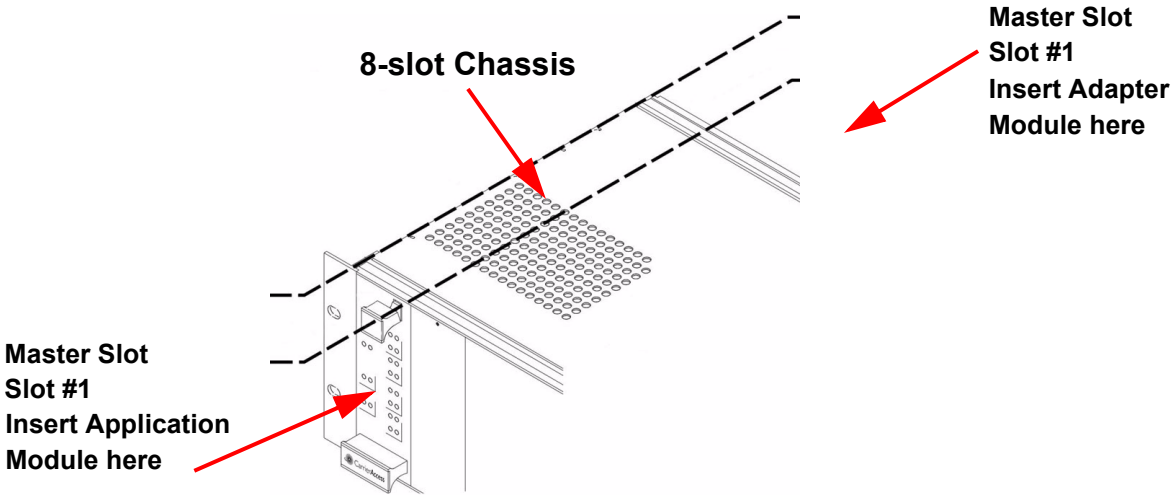
Install modules in alternating slots

When installing the first module into the chassis, it is recommended to install it into slot 1 (first slot from the left).

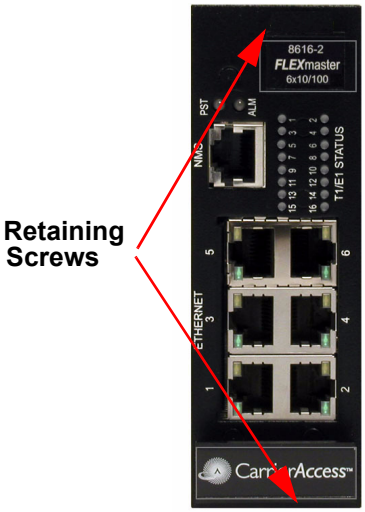
1. Gently slide the application module into slot 1 and press firmly to make full contact with the midplane connector of the chassis.

   Master Module - The master module configures the rest of the modules (slaves). When installing modules into the 8-slot chassis, insert a module, and when this module has completed its initialization (link LEDs show active - green), then install additional modules, if needed.





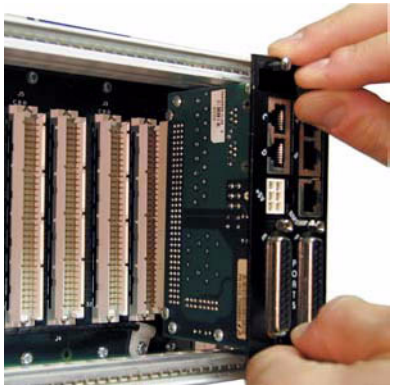
2. Secure the application module to the chassis, with the screws on the faceplate of the module. When correctly installed, the application module faceplate will make contact with the chassis.
3. To install additional modules, repeat the process above for the remaining slots.



Removing an Application Module - To remove an application module from an 8-slot chassis, remove the two screws that lock the module faceplate to the 8-slot chassis, then lift up on the ejector handle (labeled with the module name) to disengage the connectors. Slide the module out carefully.

Adapter Module Installation

1. Insert the adapter module into the back of the 8-slot chassis (directly behind the application module installed using the application module installation procedure) and press firmly to make full contact with the midplane connector of the chassis.
2. Secure the adapter module to the chassis, using the screws on the faceplate.



Local Management - Logging in to the FLEXmaster

The following sections describe how to log in to the FLEXmaster's command line interface (CLI).

- Connection Requirements
- Connecting to the FLEXmaster's NMS Port
- Logging In

Connection Requirements

To use the FLEXmaster's CLI, you must have the following items:

- Laptop
- VT100 terminal emulation software (such as HyperTerminal) on your laptop
- Network Management cable (NMS cable) - MASTERseries network management cable, part number 80001/NM
- Ferrite bead (part number 010-0051) for NMS cable
- USB-to-serial adapter (if your laptop does not have a DB9 RS-232 port). Refer to PTN-06-0011 for more information.

Ferrite Bead (2-Slot Chassis)

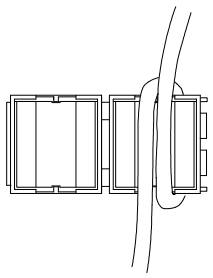
For the 2-slot chassis, a ferrite bead (part number 010-0051) is required for the NMS cable. Under certain circumstances, the NMS cable can be included in ferrites with the Ethernet switch cable(s). See *Ethernet Switch Cabling* on page 19 for instructions.

Ferrite Bead (8-Slot Chassis)

For the 8-slot chassis, add a ferrite bead (part number 010-0051) to the NMS cable. Install the bead with a single loop.

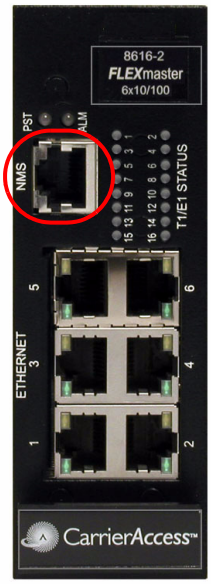
Installing the Bead:

1. Open ferrite bead with the depressions facing up.
2. Wrap the NMS cable around the ferrite bead. **Note:** The ferrite bead should be 4 to 5 inches from the connector (RJ-45)
3. Make sure that two (2) turns are inside of the ferrite bead.
4. Snap the ferrite bead shut.



NOTE: The following instructions assume you are using a laptop. You can also use a PC or VT 100 terminal.

Connecting to the FLEXmaster's NMS Port



To connect to the FLEXmaster's management (NMS) port:

1. Insert the network management cable into the NMS port on the front of the module.
2. Plug the other end of the NMS cable into the serial port on your laptop.
3. Launch your terminal emulation program and set the following port parameters:

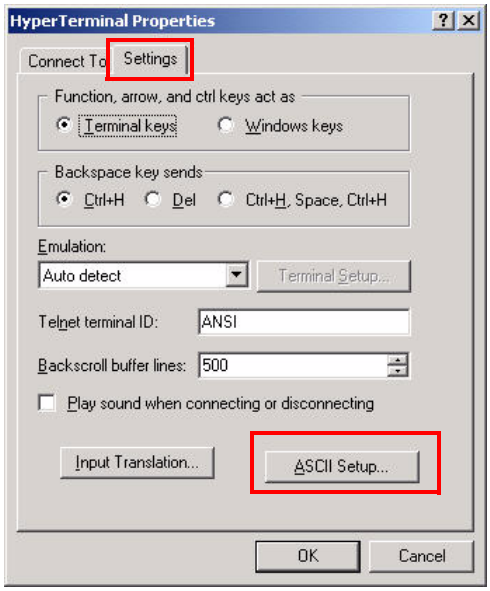
   Bits per Second: 9600
   Data bits: 8
   Parity: None
   Stop Bits: 1
   Flow Control: None

4. Make sure that the emulation is set to VT100 in your terminal emulation program.

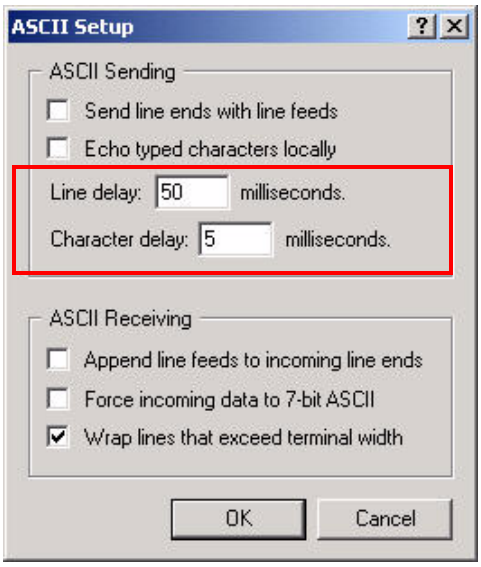
HyperTerminal Users

Turin Networks recommends modifying HyperTerminal settings as described below.

1. From within the HyperTerminal application, select File > Properties from the menu bar.
2. Select the Settings tab.
3. Click the ASCII Setup button.



4. Set the Line delay to **50** milliseconds and the Character delay to **5** milliseconds.
5. Click OK.



Procomm Users

If you are unsure of the baud rate set on a module, connect to that module at 19200 baud and press the **R** key. If there is no response, use 9600 baud using the same approach. If there is a baud rate mismatch between Procomm and the master module, the master module could reboot. To prevent this:

1. Go to Options> Data Options > Setup Files...
2. Select the Data tab.
3. Select Terminal Options.
4. Set the Enquiry Type field to OFF.

Other versions of Procomm might require you to navigate to the Enquiry Type field differently. Consult your Procomm manual for more information.

Additional Settings

Hardware flow control: Off

XON/XOFF flow control: Off

Use DTR (for hang-up): Off

Monitor DCD (carrier): Off

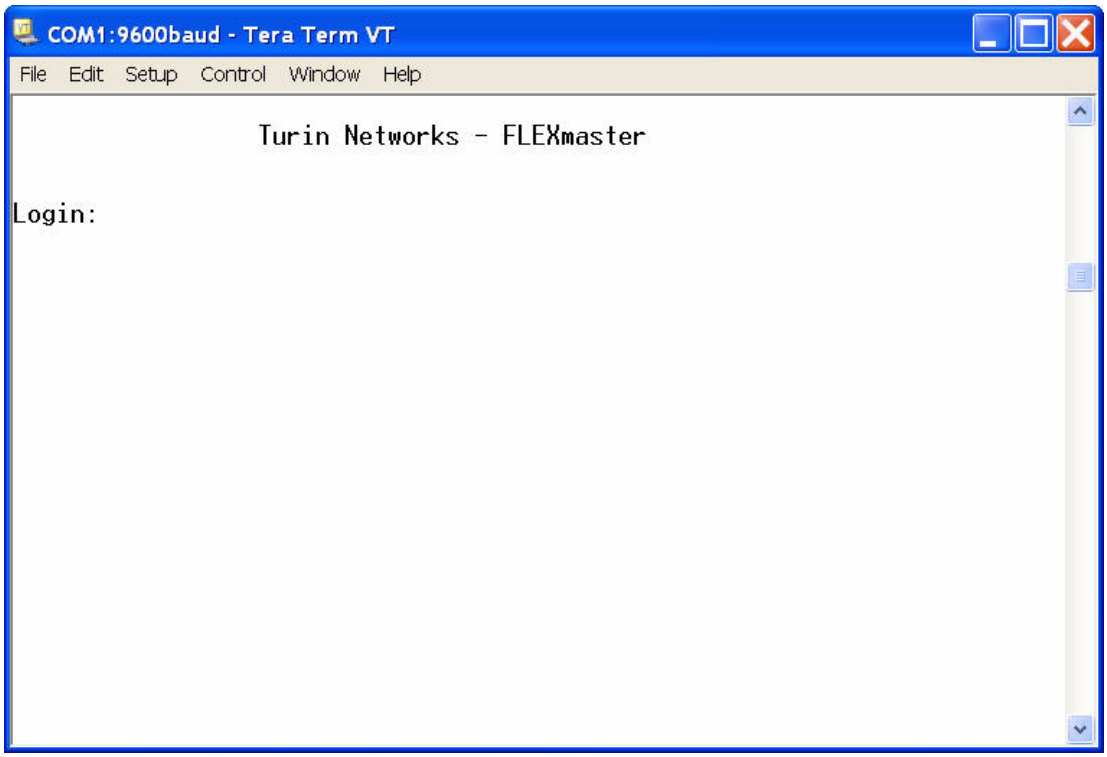
Exit on hang-up: Off

Logging In

After connecting with your VT Terminal Emulation software, press **ENTER**, and the Login prompt appears.

Default Login: **admin**

Default Password: **networknm**



When you log in to the FLEXmaster, you start in the **root** mode of the command line interface (CLI). At this point you can issue commands through the CLI.

Note: You may see one of the following messages immediately upon logging in:

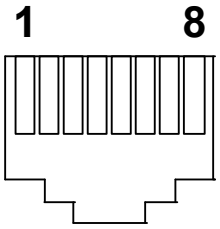
```
Unable to open userid file
Problem reading userid file
```

The admin user can still log in. You can correct this situation by adding, modifying, or deleting users. For information about these commands, see the **adduser**, **moduser** and **deluser** commands in the *MASTERseries User Manual*.

Connectors

Engine (Front)

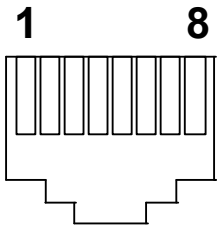
10/100Base-T Ethernet (RJ-45)



The 10/100Base-T Ethernet (female) port to connect to a remote management tool such as Telnet or an SNMP-based Network Management System. The pinouts are as follows:

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4-5	N/C	Not connected
6	Transmit -	Transmit to network
7 - 8	N/C	Not connected

NMS Port



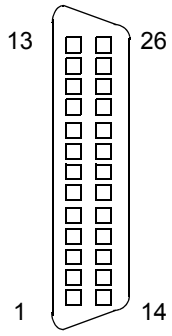
The Network Management Systems (NMS) craft port is a RJ-45 connector, with the following pinouts:

Pin	Name	Description
1	N/C	Not connected
2	Tx Data	Transmit Data
3	Rx Data	Receive Data
4	N/C	Not connected
5	Ground/Drain	Ground
6	N/C	Not connected
7	DSR	Data Set Ready
8	DTR	Data Terminal Ready

NOTE: A ferrite bead is required on this cable, see *Ferrite Bead* on page 15 for further information.

Adapter (Back)

RS-232 (Subminiature DB-26 Connector)

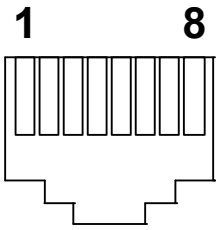


Pin	Description	Pin	Description
1	Shield (Prot. Ground)	14	Transmit Data B
2	Transmit Data A	15	Receive Clock A
3	Receive Data A	16	Receive Data B
4	RTS	17	Receive Clock B
5	CTS	18	Open Pins/No Contact
6	DSR	19	Open Pins/No Contact
7	Signal Ground	20	DTR
8	CD (RLSD)	21	Open Pins/No Contact
9	Open Pins/No Contact	22	N/C Not Connected
10	Xmit Clock A	23	Xmit Clock B
11	External Clock A	24	External Clock B
12	N/C Not Connected	25	N/C Not Connected
13	Open Pins/No Contact	26	Open Pins/No Contact

Turin Networks makes a V.35 female to DB-26 male cable which can be used with the FLEXmaster16.

Part Number	Length
005-0014	10 feet
005-0068-0100	25ft
005-0069-0100	50ft

T1/E1 Connection Ports (RJ-48C)

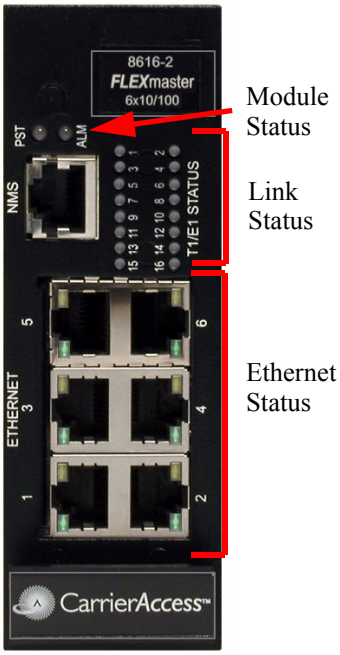


The rear adapter supports 16 T1/E1 link interfaces on the FLEXmaster16. The pinouts are as follows:

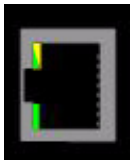
Pin	Description
1	Receive Ring
2	Receive Tip
3	N/C
4	Transmit Ring
5	Transmit Tip
6 - 7	N/C
8	Chassis Ground

LEDs

The LEDs on the FLEXmaster16 application module are described below.

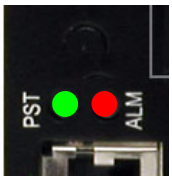


Ethernet LEDs



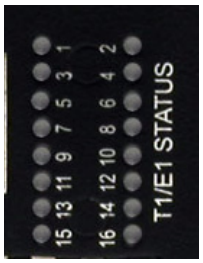
LED	State	Description
Activity (Top in 8-slot; Right in 2-slot)	Off	No activity.
	Blinking Yellow or Blinking Green	Activity on circuit. (Connector may have a yellow or green LED at this position.)
Status (Bottom in 8-slot; Left in 2-slot)	Off	No connection to port.
	Solid Green	Port connected to a valid source.

Module Status LEDs



LED	State	Description
PST	Flashing Green	Passed power system test. Master module.
	Off	Slave module.
ALM	Solid Red	Alarm on a T1/E1 port, or failed power system test.
	Off	No alarm.

T1/E1 Link LEDs



LED	State	Description
FM16 1-16	Solid Red	OOF - Out of Frame or AIS.
	Solid Green	Normal, link is up.
	Flashing Red	LOS - Loss of Signal.
	Solid Yellow	Yellow sync alarm or RAI. Indicates red alarm on the far end.
	Flashing - alternating Yellow and Green	Loopback in progress.
	Off	Link is disabled.