



MAXNET[®]

Pat. #s U.S. 6,842,348; Cdn. 2,404,844

MNAC / MNDC Modular Power Supply Manual

TABLE OF CONTENTS

	Page
1. PRODUCT DESCRIPTION	1-1
1.1. Technical Specifications	1-1
1.2. Functional Diagrams.....	1-2
2. INSTALLATION	2-1
2.1. Product Inspection.....	2-1
2.2. Module Installation into the Active MAXNET® Chassis.....	2-1
2.3. DC Redundant Powering of Active MAXNET® Chassis.....	2-2
2.4. Module Power Requirements	2-2
2.5. LED Indicator.....	2-2
2.6. Voltage Monitor.....	2-2
3. MAINTENANCE & TROUBLESHOOTING.....	3-1
3.1. Maintenance.....	3-1
3.2. Troubleshooting.....	3-1
4. SERVICE & SUPPORT.....	4-1
4.1. Contact ATX Networks.....	4-1
4.2. Warranty Information	4-1
4.3. Safety	4-1

Index of Figures & Tables

Figures

#1 MNDC Power Supply Functional Diagram	1-2
#2 MNAC-110 Power Supply Functional Diagram.....	1-2
#3 MNAC-220 Power Supply Functional Diagram	1-2
#4 MNAC-110CM Power Supply with Current Monitoring Functional Diagram.....	1-2
#5 MNAC-220CM Power Supply with Current Monitoring Functional Diagram.....	1-2
#6 MNRPS Remote Power Supply Functional Diagram.....	1-2
#7 MNRPS(CM) Remote Power Supply with Current Monitoring Functional Diagram	1-2
#8 MNAC Front & Rear Panel	2-2
#9 MNDC Front & Rear Panel	2-2
#10 MNRPS Front & Rear Panel.....	2-2

Tables

#1 Ordering Information.....	1-1
#2 Technical Specifications	1-1
#3 Rear Terminal Block Assignment.....	2-1
#4 Module Power Requirements	2-2

PRODUCT DESCRIPTION

1. Product Description

The MNAC and MNDC are modular power supplies that supply the required +24 VDC to the MAXNET Active Chassis backplane. This allows any MAXNET active module (AMP's, RF Switch) to be installed in any remaining active chassis slot to receive power. Both MNAC and MNDC have 24 VDC redundant powering capabilities, although only the MNDC provides true load sharing. Installing two power supply modules into the chassis will maintain power to the backplane in the event that one of them fails. Both the MNAC and the MNDC include a 24 VDC rear terminal block connection for the remote chassis powering options. They are connected to the Active MAXNET Chassis through a hot-swapping backplane. The MNAC and MNDC modules feature front panel LED power indication and +24 VDC backplane voltage monitor connections.

In addition to the standard powering modules, an optional current monitoring function is available in both the MNAC and MNDC to provide remote indication (via the rear terminal block) of current fluctuations caused by an active module failure.

The MNRPS is a module that supplies power to an Active MAXNET Chassis backplane from a remote 24 VDC source. It features front panel LED power indication and +24 VDC backplane voltage monitor connections.

Please refer to the web page for up-to-date specifications – www.atxnetworks.com

Part Number	Description
MNRPS	24V, 3.6A Remote Powering Unit
MNRPSCM	24V, 3.6A Remote Powering Unit with Current Monitoring
MNAC-110	110 VAC to 24V, 3.6A Diode or'd Redundant Power Supply
MNAC-110CM	110 VAC to 24V, 3.6A Power Supply with Current Monitor
MNAC-220	220 VAC to 24V, 3.6A Diode or'd Available (Consult ATX)
MNAC-220CM	220 VAC to 24V DC, 3.6A Power Supply with Current Monitor
MNDC	-48 VDC to 24V, 3.6A True Load Sharing Redundant Power Supply
MNDCCM	-48 VDC to 24V, 3.6A Power Supply with Current Monitor
Dimensions	8.66"H x 1.82"W x 11.75"D (21.99H x 4.62W x 29.84D cm)

Table #1: Ordering Information

1.1. Technical Specifications

ELECTRICAL SPECIFICATIONS	REMOTE POWER SUPPLIES MNRPS or MNRPSCM ⁽¹⁾	AC POWER SUPPLIES MNAC-110 or MNAC-110CM ⁽¹⁾	AC POWER SUPPLIES MNAC-220 or MNAC-220CM ⁽¹⁾	DC POWER SUPPLIES MNDC or MNDCCM ⁽¹⁾
INPUT				
INPUT VOLTAGE	24.0 ± 0.5 VDC	110 ± 10 VAC	220 ± 20 VAC	48.0 ± 12.0 VDC
FREQUENCY	DC	50/60 Hz	50/60 Hz	DC
INPUT CURRENT	⁽³⁾	2.0 Amps AC	1.0 Amps AC	2.5 Amps DC (48 VDC)
POWER FACTOR	N/A	> 0.8	> 0.8	N/A
OUTPUT				
OUTPUT VOLTAGE	23.5 ± 0.5 VDC	24.0 ± 1.0 VDC	24.0 ± 1.0 VDC	24.0 ± 1.0 VDC
DC OUTPUT CURRENT	3.6 Amps (max.) ^(3,4)	3.6 Amps (max.) ⁽⁵⁾	3.6 Amps (max.) ⁽⁵⁾	3.6 Amps (max.) ⁽⁵⁾
RIPPLE VOLTAGE	N/A	200 mV P-P (max.)	200 mV P-P (max.)	200 mV P-P (max.)
MAXIMUM POWER OUTPUT	N/A	86.4 Watts	86.4 Watts	86.4 Watts
OTHER				
EFFICIENCY	> 95%	> 80%	> 80%	> 80%
OPERATING TEMPERATURE	-40°C to +60°C (-40°F to +140°F)	-40°C to +60°C (-40°F to +140°F)	-40°C to +60°C (-40°F to +140°F)	-40°C to +60°C (-40°F to +140°F)
APPROVALS	N/A	Power Supply Component: UL, CSA, CE; Entire Module: cULus, FCC	Power Supply Component: UL, CSA, CE; Entire Module: cULus	Power Supply Component: UL, CSA, CE; Entire Module: cULus, FCC
TEST POINT	Front Panel (Red(+), Blk(Com))	Front Panel (Red(+), Blk(Com))	Front Panel (Red(+), Blk(Com))	Front Panel (Red(+), Blk(Com))
24V POWER INDICATOR	Front Panel LED	Front Panel LED	Front Panel LED	Front Panel LED
24V FAILURE NOTIFICATION ⁽²⁾	Form 'A' Relay (MNRPS) Form 'A' Relay (MNRPSCM)	Form 'C' Relay (MNAC-110) Form 'A' Relay (MNAC-110CM)	Form 'C' Relay (MNAC-220) Form 'A' Relay (MNAC-220CM)	Form 'C' Relay (MNDC) Form 'A' Relay (MNDCCM)
CURRENT VARIATION NOTIFICATION ⁽¹⁾	Rear Panel Form 'A' Relay and Front LED (MNRPSCM only)	Rear Panel Form 'A' Relay and Front LED (MNAC-110CM only)	Rear Panel Form 'A' Relay and Front LED (MNAC-220CM only)	Rear Panel Form 'A' Relay and Front LED (MNDCCM only)
TERMINAL BLOCK WIRING	# 14 AWG	# 14 AWG	# 14 AWG	# 14 AWG
WEIGHT	1.5 lbs (700 g)	2.9 lbs (1300 g)	2.9 lbs (1300 g)	2.2 lbs (980 g)

NOTES:

(1) CM on the end of the part number indicates current monitoring capabilities. Current through the chassis interface is monitored. Fluctuation in DC current greater or less than 200mA from nominal operating level is annunciated by opening a contact wired to the rear terminal block and turning 'off' the current monitor LED.

(2) 24V failure notification is initiated when DC voltage level drops to less than 22 VDC.

(3) 24V A and 24V B inputs are diode 'OR'd' prior to connection to the chassis power bus interface connector. Maximum DC current to the chassis is 3.6 Amps.

(4) Maximum DC current delivered through the remote power supply interface connector (to chassis power bus).

(5) Total DC output current delivered through the power supply interface connector (to chassis power bus) and through the output terminals on the rear of the power supply.

Table #2: Technical Specifications

1.2 Functional Diagrams

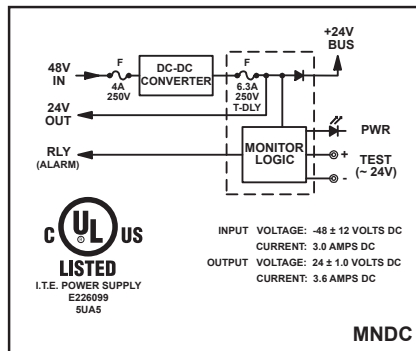


Figure #1: MNDC Power Supply Functional Diagram

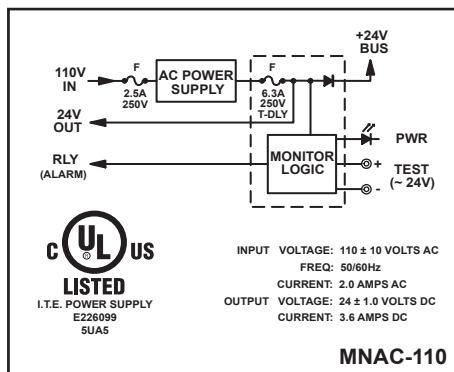


Figure #2: MNAC-110 Power Supply Functional Diagram

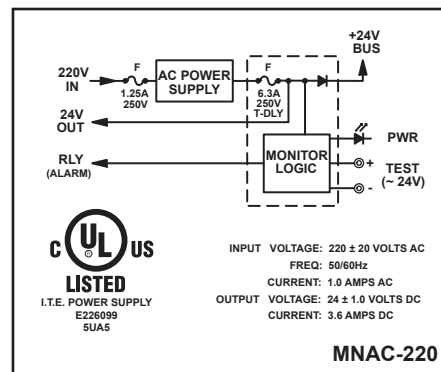


Figure #3: MNAC-220 Power Supply Functional Diagram

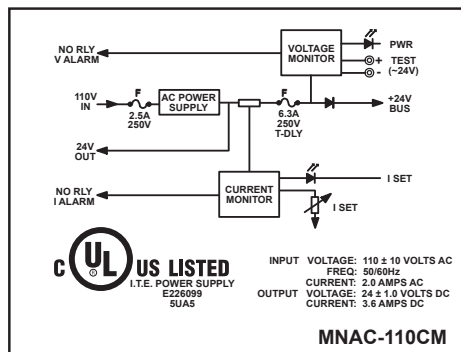


Figure #4: MNAC-110CM Power Supply with Current Monitoring Functional Diagram

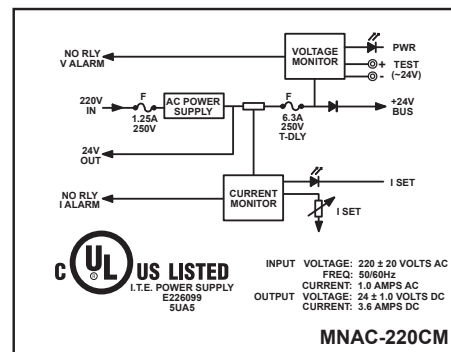


Figure #5: MNAC-220CM Power Supply with Current Monitoring Functional Diagram

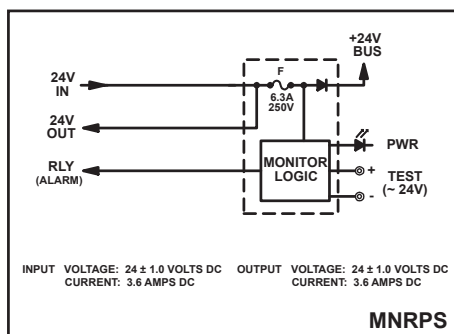


Figure #6: MNRPS Remote Power Supply Functional Diagram

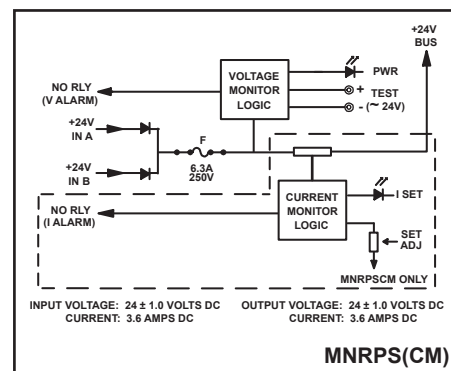


Figure #7: MNRPS(CM) Remote Power Supply with Current Monitoring Functional Diagram

INSTALLATION

2. Installation

2.1. Product Inspection

Carefully unpack the power supply module from the shipping box. If the box or power supply module is damaged, please notify the freight company to make a damage claim. If you suspect that there is a problem with the power supply module that may affect its safe operation, do not install such a suspect Power Supply into the Active MAXNET Chassis.

NOTE: This equipment is intended for installation in a **RESTRICTED ACCESS LOCATION** only.

NOTE: Not for use in a computer room as defined in the Standard for Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.

Rack Mounting Precautions

- Elevated Operating Ambient** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (35°C) specified by the manufacturer.
- Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- Mechanical Loading** - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing** - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

2.2. Module Installation into the Active MAXNET® Chassis

Slide the MNAC or MNDC or MNRPS power supply module into an open slot in the Active MAXNET Chassis, until the module seats into the chassis. Finger tighten the upper and lower knurled screws to lock the module into the chassis. If the power supply is an MNAC module, connect an appropriate power cord (depending on the voltage rating used and the plug type required at the installation site) to the MNAC's IEC power inlet.

If the power supply is an MNDC module, use bus wire to connect the -48 VDC to the terminal block on the back of module following the terminal block labeling (see Table 3 below). A disconnect device is required between the -48 VDC supply and the MNDC power supply.

If the power supply is an MNRPS module, use bus wire to connect the +24 VDC to the terminal block on the back of module following the terminal block labeling (see Table 3 below).

TB #	REMOTE POWER SUPPLY MNRPS	REMOTE POWER SUPPLY WITH CURRENT MONITOR MNRPSCM	AC POWER SUPPLIES MNAC-110 and MNAC-220	AC POWER SUPPLIES WITH CURRENT MONITOR MNAC-110CM and MNAC-220CM	DC POWER SUPPLY MNDC	DC POWER SUPPLY WITH CURRENT MONITOR MNDCCM
1	P24V IN A	P24V IN A	P24V OUT ⁽¹⁾	P24V OUT ⁽¹⁾	P24V OUT ⁽¹⁾	P24V OUT ⁽¹⁾
2	COM A	COM A	COM/GND	COM/GND	COM/GND	COM/GND
3	P24V IN B	P24V IN B			P48V IN	P48V IN
4	COM B	COM B			N48V IN	N48V IN
5	RLY NO (V)	RLY NO (V)	RLY NO	RLY NO (V)	RLY NO	RLY NO (V)
6	RLY COM	RLY COM	RLY COM	RLY COM	RLY COM	RLY COM
7	RLY NO (I)* (* - used for MNRPSCM only)	RLY NO (I)* (* - used for MNRPSCM only)	RLY NC	RLY NO (I)	RLY NC	RLY NO (I)

NOTE:
(1) 24V Output on rear panel terminal block allows for daisy-chain powering to other active MAXNET chassis which utilize MAXNET remote power supplies.

Table #3: Rear Terminal Block Assignment



Figure #8: MNAC Front & Rear Panel



Figure #9: MNDC Front & Rear Panel



Figure #10: MNRPS Front & Rear Panel

2.3. DC Redundant Powering of Active MAXNET® Chassis

If more than one power supply is connected to the chassis, the extra power supply acts as a redundant source of power. Using internal logic within the module (MNAC uses diode steering, MNDC uses load sharing logic) if the dominant power supply in the chassis fails, the other power supply becomes the active supplier to the +24 VDC chassis backplane ensuring that power is maintained to all active modules in the chassis.

2.4. Module Power Requirements

MODULE	MNAC/MNDC	QMN870/QMN1000	MNRS/MNRS	MNRS/DAB
MAX CURRENT (AMPS)	3.6	0.42	0.07	0.07

Table #4: Module Power Requirements

2.5. LED Indicator

The MNAC and MNDC power supply module have an LED indicator. The LED verifies, by lighting solid GREEN, that the power supply is supplying +24 VDC to the Active MAXNET Chassis backplane.

2.6. Voltage Monitor

The MNAC and MNDC power supply module have test ports on the front panel. By connecting a DVM between the Pos (RED) and Neg (Black) port, the chassis backplane +24 VDC level can be monitored.

MAINTENANCE & TROUBLESHOOTING

3. Maintenance & Troubleshooting

3.1. Maintenance

Daily, ensure that the Power LED's are on for all of the power and active modules.

3.2. Troubleshooting

The following guide will help the operator to diagnose problems in active modules or chassis'. If none of the items in this section are of help, please contact ATX for Technical Support.

3.2.1. Module Will Not Fully Insert into Chassis

- a) Remove the module and inspect it for damage or bent guide rails.
- b) Inspect the chassis for bent metal or obstructions.
- c) Be sure that the active module is inserted such that the left side is above an odd numbered slot and the right side is above an even number slot.
- d) Try the module in a different slot. Due to machinery tolerances, some modules may be more snug in some slot than others. If the tolerances are unacceptable, contact ATX.

3.2.2. Module Power LED Off or Intermittent

Check the GREEN Power LED on each Power Supply module. If one is off or intermittent, then the chassis is not getting correct power. Refer to the MNAC/MNDC Not Powering Chassis troubleshooting section. If power availability is not an issue and other modules in the chassis are okay, the module itself is suspect. Continue.

Remove the suspect module and trade slot positions with another functioning module.

- a) If the suspect module is okay and the previously good module fails, contact ATX and report a defective chassis.
- b) If the suspect module fails and the previously good module is okay, contact ATX and report that the suspect module is defective.

3.2.3. MNAC/MNDC Not Powering Chassis

NOTE: 220 VAC applied to an MNAC 110 will damage the module, but 110 VAC applied at an MNAC-220 will simply not turn it ON.

- a) Check the fuse continuity on the MNAC or MNDC module
- b) Verify that the 110 VAC/220 VAC electrical outlet is active using a voltmeter and checking the circuit breaker (in the case of the MNDC, insure that there is -48 VDC on the rear terminal block).
- c) Verify that the IEC power cord is properly inserted into the receptacle on the rear of the module and properly connected to a 110 VAC/220 VAC electrical outlet.

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SERVICE & SUPPORT

4. Service & Support

4.1. Contact ATX Networks

Please contact ATX Technical Support for assistance with any ATX products. Please contact ATX Customer Service to obtain a valid RMA number for any ATX products that require service and are in or out-of-warranty before returning a failed module to the factory.

ATX Networks
1-501 Clements Road West
Ajax, ON L1S 7H4 Canada

Tel: (905) 428-6068
Toll Free: (800) 565-7488
Fax: (905) 427-1964
Toll Free Fax: (866) 427-1964
Web: www.atxnetworks.com
E-mail: support@atxnetworks.com

4.2. Warranty Information

All of ATX Networks' products have a 1-year warranty that covers manufacturer's defects or failures.

4.3. Safety

IMPORTANT! FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

Water and Moisture: Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

Power Sources: The device should be connected to a power supply only of the type described in the operating instructions or as marked on the device.

Grounding or Polarization: Precautions should be taken so that the grounding or polarization means of the device is not defeated.

NOTE: When installing the MNAC or MNDC Power Supply, the GND bonding terminal #1 on the back of the MNAC or MNDC Power Supply shall be connected to the chassis ground lug.

Power Cord Protection: Power supply cords should be routed so that they are not likely to be pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the device.

Servicing: The user should not attempt to service the device beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

Fusing: If your device is equipped with a fused receptacle, replace only with the same type fuse. Refer to replacement text on the unit for correct fuse type.

Recommended external fusing of the MNDC supply to be limited to 4 Amps.

The MNAC-110 Power Supply receptacle fuse rating is 2.50 Amps 250 Volts slo blo.

The MNAC-220 Power Supply receptacle fuse rating is 1.25 Amps 250 Volts slo blo.

CAUTION: For continued protection against the risk of fire, replace only with the same type and rating of fuse.

Power Supply Removal: Power (AC or DC) should be disconnected from the module before removing for replacement or service. This is accomplished by removing the AC IEC plug for the MNAC unit and wires from the terminal block of the MNDC unit. To remove a power supply module from the chassis, unscrew the two thumb screws on the front panel and pull back on the module handle until the unit is clear of the chassis guide slot.



1-501 Clements Road West, Ajax, ON L1S 7H4 Canada
Tel +1 (905) 428-6068 Toll Free +1 (800) 565-7488 Fax +1 (905) 427-1964 Toll Free Fax +1 (866) 427-1964
www.atxnetworks.com support@atxnetworks.com