MODULUS 9 -48VDC ENCLOSURE Documentation Update

Overview

Introduction

This document contains update information for the -48 Volt direct-current (VDC) Modulus 9 equipment enclosure. The Modulus 9 was previously available only in alternating-current (AC) models.

Warning!

Only qualified service personnel should perform the procedures described in this notice. Use of these procedures by unqualified personnel could result in personal injury or equipment damage, and could jeopardize your warranty and maintenance agreement.

Safety

The enclosures are approved in accordance with the following standards. Installation as an office machine or an item of information technology equipment must comply with these standards.

Compliance with Safety Standards

Standard	*-48VDC Modulus 9*
EN 60950:1992	Yes
EN41003	Yes
UL 1950	Yes
CSA C22.2, No. 950	Yes

■ IMPORTANT

The Modulus 9 enclosure's input voltage must be supplied by a Safety Extra-Low Voltage (SELV) Isolated Secondary or Battery Circuit source.

09564-3 A

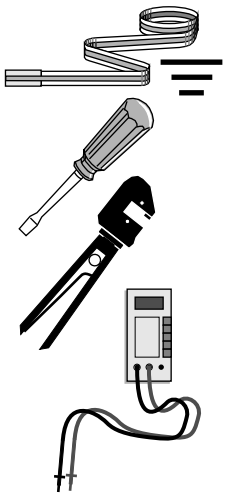
Modulus Package Contents

The Modulus 9 -48VDC shipping carton contains:

- The Modulus 9 enclosure
- The *Modulus 9 and 21 Installation and Operation Guide*
- This document

Remove the parts and store the carton for later re-use. If parts are missing, contact your Motorola ISG Customer Support representative.

Tools Needed



The following tools and supplies are required for procedures in this notice:

- Grounding wrist strap
- Straight-blade screwdriver
- Crimper
- Multimeter

Installing a Modulus 9 -48VDC Enclosure

Assembling an Enclosure

The Modulus 9 is shipped from the factory in one of these ways:

- Unassembled, with a power supply
- Assembled, containing product cards and backplanes, filler panels, and a power supply module

Determine which way your enclosure was shipped. Follow the appropriate instructions in the installation procedure below.

Positioning an Enclosure

The Modulus 9 can be positioned as follows:

- On a flat surface—a tabletop or bench
- On a shelf in a standard 19-inch electrical-equipment rack

Determine which way your enclosure will be positioned. Follow the appropriate instructions in the installation procedure below.

Installing an Enclosure

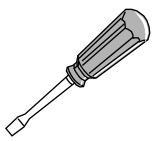
Install the enclosure as follows. Refer to the *Modulus 9 and 21 Installation and Operation Guide* for general enclosure information.

Warning!

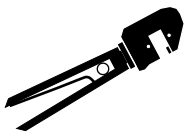
Before beginning the installation procedure, ensure that *the electrical power source is disconnected from input wires* to be connected to the Modulus.

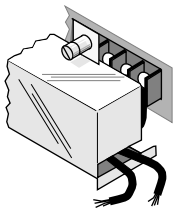
Installing a Modulus 9 -48VDC Enclosure

Step	*Action*
1	Position the enclosure on: • A flat surface, for standalone operation • An equipment-rack shelf, for rack-mount operation Note the key, taped inside the front door, as shown in Figure 2. You can lock the enclosure to prevent unauthorized access.
2	If the enclosure is empty, install communications-product backplane(s) in it, as described in the *Modulus 9 and 21 Installation and Operation Guide*, Chapter 3.
3	■ **IMPORTANT** At the rear of the enclosure, ensure that the Power switch is in the OFF (left) position.
4	At the rear of the enclosure, remove the terminal cover by unscrewing the captive screw and pulling up and out (Figure 1).



Installing a Modulus 9 -48VDC Enclosure (continued)





Step	*Action*
5	Obtain UL/CSA approved power cables and connectors with insulated, crimp-on terminals. The power cables must be rated for at least 8A input current. Use cable harnesses and terminal-connector assemblies that conform to applicable electrical codes.
6	Connect the primary power input wires to the terminals marked **-48V A(-)** and **-48V Return (+)**. Bend the wires to the right, so that they will trail through the terminal cover's right slot when you replace it.
7	■ **IMPORTANT** Connect the ground wire to the terminal marked **Chassis Ground** (⏚).
8	Optionally, connect the second set of input wires to the terminals marked **-48V B(-)** and **-48V Return (+)**. In this case, the **-48V Return (+)** terminal accepts two wires.
9	Optionally, connect an alarm mechanism to the alarm-relay terminals, marked 5 and 6.
10	*If you connected an alarm mechanism in the step above*, set the rear-panel Failure Output switch to one of these options: • **FAIL**=OPEN: Alarm-relay contacts 5 and 6 are open when the power supply module fails • **FAIL**=SHORT: Alarm-relay contacts 5 and 6 are shorted when the power supply module fails
11	Replace the terminal cover as follows: a) Trail the wires through the cover's right slot. b) Hook the cover's tabs into the Modulus rear-panel holes. c) Engage and tighten the captive screw until it is snug.
12	Connect the power cables to the SELV power source.
13	Apply power to the enclosure.
14	Set the circuit breaker switch, marked Power, to the ON (right) position.
15	From the front of the Modulus, note the LEDs, visible between the fan blades (Figure 2). The LEDs show DC-voltage and cooling-fan status: • When the LEDs are green, the enclosure is operating OK. • When an LED is off, a component is not OK. Refer to the Installation Troubleshooting procedure at the end of this notice.

Figure 1 shows the Modulus 9 -48VDC enclosure rear panel.

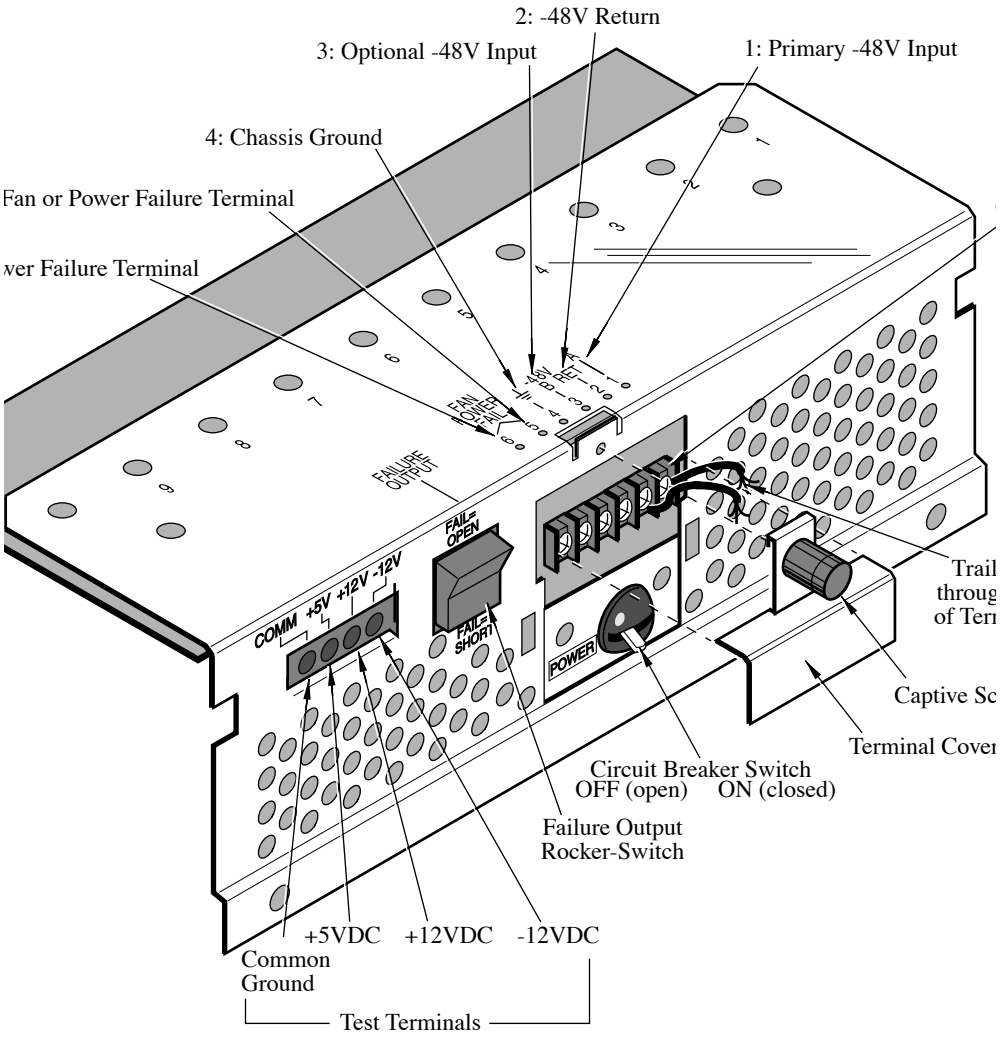


Figure 1. -48VDC Modulus 9 Enclosure, Rear View

The rear-panel terminal connectors function as follows.

Rear-Panel Terminal Connectors (Left to Right)

This Terminal...	*Connects to the:*
6	Fan or power failure relay
5	Fan or power failure relay
4	Chassis ground
3	Optional, redundant -48VDC input
2	-48VDC return
1	Primary -48VDC input

Figure 2 shows the Modulus 9 -48VDC enclosure front view.

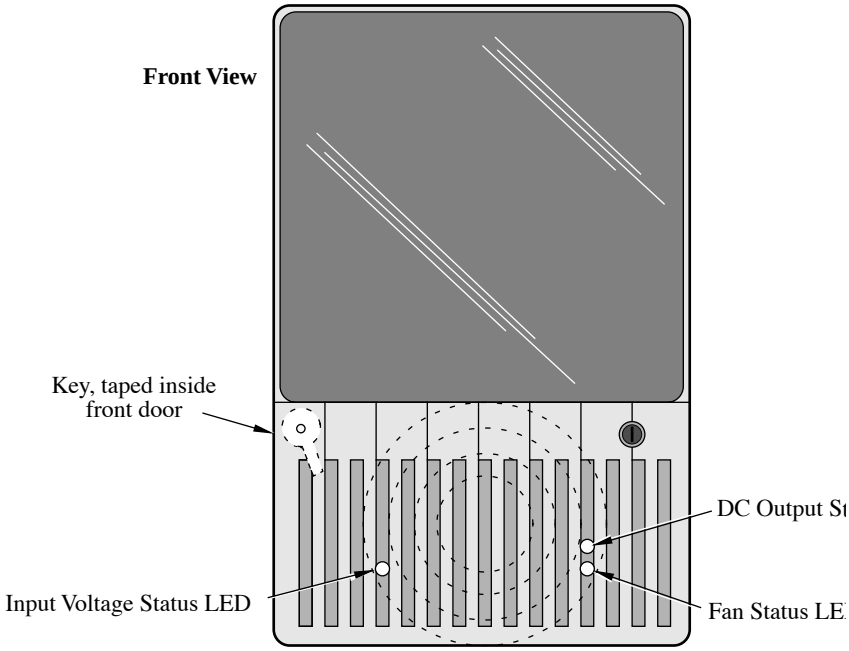


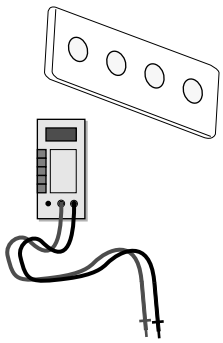
Figure 2. -48VDC Modulus 9 Enclosure, Front View, Status LEDs

Troubleshooting a -48V Modulus 9 Enclosure

Check the enclosure for proper operation as follows. Refer to Figures 1 and 2.

Troubleshooting a Modulus 9 -48VDC Enclosure

Step	*Action*
1	From the front of the Modulus, note the LEDs, visible between the fan blades (Figure 2). The LEDs show component status: • When the LEDs are green, the enclosure is operating OK. No troubleshooting is needed. • When the left LED is off, there may be a problem with the input voltage, or the LED itself. Check the power source. • When the upper right LED is off, there may be a problem with the output voltage, or the LED itself. • When the lower right LED is off, there may be a problem with the cooling fan, or the LED itself. If an LED is off, continue with this procedure.
2	Check the circuit breaker switch (Figure 2). Ensure that it is in the ON (right) position.
3	From the front of the Modulus, note the fan blades. When power is applied to the Modulus, the blades should rotate. If they do not, replace the power supply module. Refer to the *Modulus 9 and 21 Installation and Operation Guide* for details.
4	From the rear of the Modulus, with power applied to the unit, test the power outputs with a multimeter, as follows: a) Connect the multimeter's negative (-) probe to the Common Ground (**Comm**) terminal and the positive (+) probe to the **+5V** terminal. The meter should read about **+5V**. b) Connect the multimeter's negative (-) probe to the **Comm** terminal and the positive (+) probe to the **+12V** terminal. The meter should read about **+12V**. c) Connect the multimeter's negative (-) probe to the **Comm** terminal and the positive (+) probe to the **-12V** terminal. The meter should read about **-12V**. If any power outputs are not correct, replace the power supply module. Refer to the *Modulus 9 and 21 Installation and Operation Guide* for details.



Troubleshooting a Modulus 9 -48VDC Enclosure (continued)

Step	*Action*
5	From the rear of the Modulus, *with power removed from the unit*, test the resistances with a multimeter, as follows. For all connections, the meter should read ∞ Ω. ■ **IMPORTANT** Ensure that power is removed from the unit by disconnecting the wires from terminals 1, 2, and 3, and by setting the POWER switch to the OFF (left) position. Connect the multimeter's negative (-) probe to the: a) **Comm** terminal, and the positive (+) probe to the **+5V** terminal b) **Comm** terminal, and the positive (+) probe to the +**12V** terminal c) **Comm** terminal, and the positive (+) probe to the **-12V** terminal d) **+5V** terminal, and the positive (+) probe to the **+12V** terminal e) **+5V** terminal, and the positive (+) probe to the **-12V** terminal f) **+12V** terminal, and the positive (+) probe to the **-12V** terminal If any resistance readings are not ∞ Ω, contact Motorola ISG Customer Support. Contact information is listed at the back of this document.
6	Test the input voltage at the power source. If it is not within specifications, have it corrected.
7	If the Modulus still does not operate correctly, contact Motorola ISG Customer Support. Contact information is listed at the back of this document.

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