

# Metasys Integrator® 3500 Series

## Commissioning Guide

MS-MIG3520-0

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Software Release 10.0

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# Metasys Integrator® 3500 Series

## Commissioning Guide

### Introduction

This document explains how to commission a Metasys Integrator® 3500 (MIG3500) Series unit. Included is how to inspect the installation, download the MIG3500 firmware, download vendor communication tables (.VCT), add/modify/delete vendor devices, and verify device communication.

This document does not describe how to mount, wire, or power the MIG3500. Also, this document does not contain specific details about integrating vendor equipment (for example, cable pinouts and point mapping tables). For that information, refer to the vendor-specific application notes available separately on QuickLit. For information on vendor controllers, see vendor documentation (obtainable from your vendor representative).

### Related Documentation

Table 1 lists documents related to the Metasys system.

**Table 1: Related Documentation**

<b>For Information On</b>	<b>See Document</b>	<b>LIT or Part Number</b>
<b>Features and Benefits of the MIG3500</b>	<i>Metasys Integrator® MIG3500 Series Product Bulletin</i>	<i>LIT-12011440</i>
<b>Installing the MIG3500 and Replacing an Existing MIG300</b>	<i>Metasys Integrator MIG3500 Series Installation Instructions</i>	<i>Part No. 24-10050-30</i>
<b>Mounting an EN-EWC25-0 Enclosure</b>	<i>Universal Packaging Module Technical Bulletin</i>	<i>LIT-6363070</i>
<b>Specific Vendor Application Information</b>	<i>Metasys Integrator Application Notes</i>	<i>LIT-6295xxx<sup>1</sup></i>
<b>Supported Vendor Equipment</b>	<i>Metasys Integrator 300/3500 Series Product Bulletin Supplement</i>	<i>LIT-629075</i>
<b>Understanding How the N2 Bus Is Integrated to the MIG3500</b>	<i>N2 Communications Bus Technical Bulletin</i>	<i>LIT-636018</i>
<b>Overview of N2 Bus Controllers</b>	Technical Bulletin for each N2 Bus field controller	Various

1. For the LIT numbers of specific documents, refer to the *Metasys Integrator* section on QuickLit.

# MIG3500 Commissioning Overview

## *About the MIG3500 Metasys Integrator*

The MIG3500 is an interface device that connects third-party devices to a Metasys® Building Automation System (BAS). Operators can monitor and control third-party devices along with the entire BAS from a single Metasys workstation.

Using a computer with terminal emulation software, you can download the drivers for the equipment you want to integrate. You can choose from many third-party products currently supported. The MIG3500 can integrate two different sets of vendor equipment.

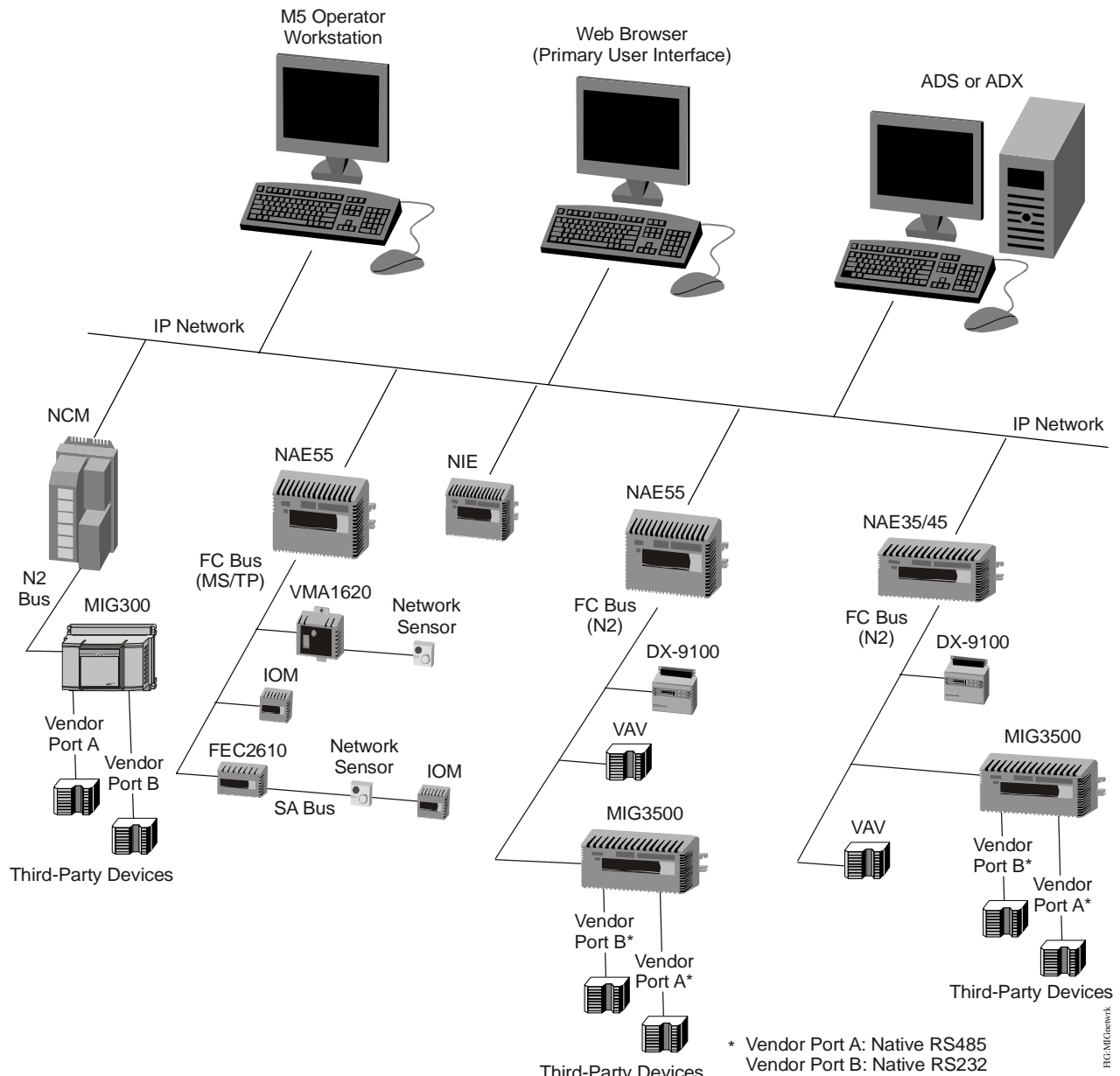
The MIG3500 uses the same hardware platform as the Network Automation Engine (NAE) 35/45 models, but with different firmware. The firmware on the electronics board contains:

- commissioning software (for selecting and configuring vendor integrations)
- vendor and N2 open protocol support software

In addition, there is a Metasys Integrator CD-ROM containing the Metasys MIG Update Utility, download software, .VCT files, the N2 Bus Checkout Tool, and software models in Data Definition Language (DDL) syntax for all applications.

## Metasys Network with the MIG3500

The MIG3500 exists on the N2 Bus portion of the Metasys network. Figure 1 shows an example of this type of configuration. As shown, the MIG3500 may connect to the N2 Bus on an NAE55 or NAE35/45. The MIG3500 is added as an N2 device at the Application and Data Server (ADS) or Extended Application and Data Server (ADX). With the addition of a Network Integration Engine (NIE), an older Metasys Integrator model (MIG300) that communicates to a Network Control Module (NCM) can report to the same ADS/ADX as the newer NCM3500 model.



**Figure 1: MIG3500 with Other System Components**

## ***Comparison between Metasys Integrator 300 and 3500 Series***

For those who are familiar with the Metasys Integrator 300 Series, the following section outlines the most important similarities and differences between the older model and the MIG3500. If you are looking specifically for details on the communication options, see Table 2.

- The MIG3500 model supports vendor tables that the MIG300 supports (version 9.0 and above).
- The MIG3500 is also powered with a 24 VAC power transformer, ordered separately. The adapter requires a standard power outlet near the MIG3500. The 24 VAC power connector on the MIG3500 has a different style and therefore is incompatible with the MIG300 power connector.
- Unlike the MIG300, the firmware for the MIG3500 is updated over an Ethernet connection. Similar to the MIG300, the vendor tables are downloaded over the RS-232 commissioning port from a computer running the DOWNPC software. The DOWNPC software transfers VCT files from the computer to the MIG3500.
- The MIG3500 offers four communication ports labeled as follows:
  - **Config Port - RS232C:** Configuration/commissioning port
  - **Vendor A - RS485:** RS-485 vendor communications port
  - **Vendor B - RS232C:** RS-232 vendor communications port
  - **N2 - RS485 - N2 Bus** communications port
- If you have a second RS-232 or RS-485 vendor device to connect, you can use a signal converter with the appropriate MIG3500 vendor port and gender changer/adaptor if required. The type of signal converter you need depends on the requirements of the vendor device. Some devices can use the MM-CVT101-1, AS-CVTPROx00-1, or IU-9100-8401 (Europe only) Johnson Controls® converters, while others may require a different converter. For assistance with selecting an appropriate converter, refer to the specific vendor Metasys Integrator Application Note or contact the Systems Integration Services (SIS) team at Johnson Controls.
- The code for the MIG3500 is downloaded and updated with a tool called the MIG Update Utility, available on the Metasys Integrator CD-ROM. (The code download process described in the *Downloading Metasys Integrator 300 Series Code Application Note [LIT-6933500]* is not used.) This tool is also used to return the MIG3500 to factory condition. Whenever the device is reflashed, all vendor tables in the device must be redownloaded because the flash process erases the tables.
- If a VCT table in the MIG3500 becomes corrupt, causing the unit to reboot continuously, first reflash the unit with the MIG Update Utility, then redownload the tables with the DOWNPC software. With the MIG300, you only needed to remove the power and battery, then restart the unit.



- The MIG3500 is a bit longer than the MIG300. If the MIG3500 is replacing an older MIG300, the new unit can fit in the same location as the MIG300 that it is replacing.
- The N2 Bus terminal connection on the MIG3500 is called **N2 - RS485**. Similar to the MIG300, this connector has four terminals, including a termination for an optional shield. The MIG300 N2 Bus connector is compatible with the RS485A (N2 Bus) terminal block on the MIG3500.
- The Fault Light-Emitting Diode (LED) on the MIG3500 indicates failure. For details, see Table 3.

## Communication Port Comparison: MIG300 and MIG3500 Series

Table 2 is a comparison chart that shows the choices for each MIG3500 port as compared to the MIG300 Series.

**Note:** A vendor device using RS-232 communication and connected to Vendor Port A (Port 2) on the MIG300 can be moved to Vendor B - RS232C port on the MIG3500. A device using RS-232 communication and connected to Vendor Port B (Port 3) on the MIG300 can be moved to Vendor A - RS485 port on the MIG3500 (with the use of a converter). A device using RS-485 communication and connected to either port on the MIG300 can be moved to Vendor A - RS485 port on the MIG3500 (no converter required).

**Table 2: Communications Port Comparison between Models**

Port Number	Label		MIG3500 Use
	MIG300	MIG3500	
Port 0	N2	N2 - RS485	N2 Bus connection
Port 1	Commissioning Port	Config - RS232C	Configuration/commissioning port
Port 2	Vendor Port A <sup>1</sup>	Vendor A - RS485	Vendor A connection; RS-485 protocol
Port 3	Vendor Port B <sup>1</sup>	Vendor B - RS232C	Vendor B connection; RS-232 protocol
N/A	N/A	Ethernet	Ethernet connection <sup>2</sup>

1. Vendor Port A and Vendor Port B on the MIG300 are both native RS232 ports.
2. The Ethernet connection is used exclusively for firmware updates to the MIG3500. The unit does not broadcast as a node over the Ethernet network.

## Required Hardware

The MIG3500 requires the following hardware:

- laptop or desktop computer for downloading the vendor tables and reflashing the firmware (if required)
- RS-232 null modem cable for connecting the computer to the Metasys Integrator unit for commissioning purposes
- Cable for connecting the Metasys Integrator unit to vendor equipment (RS-232 or RS-485 cable, depending on equipment interface). You can find pinouts for this cable in the vendor-specific application note. (For example, cable pinouts for connecting Fireye® equipment are in the *Metasys Integrator Fireye Application Application Note [LIT-6295280]*.)

- N2 Bus cable for connecting the Metasys Integrator unit to a Metasys supervisory controller. Refer to the *N2 Integration with the NAE Technical Bulletin (LIT-1201683)*.

## **Required Software**

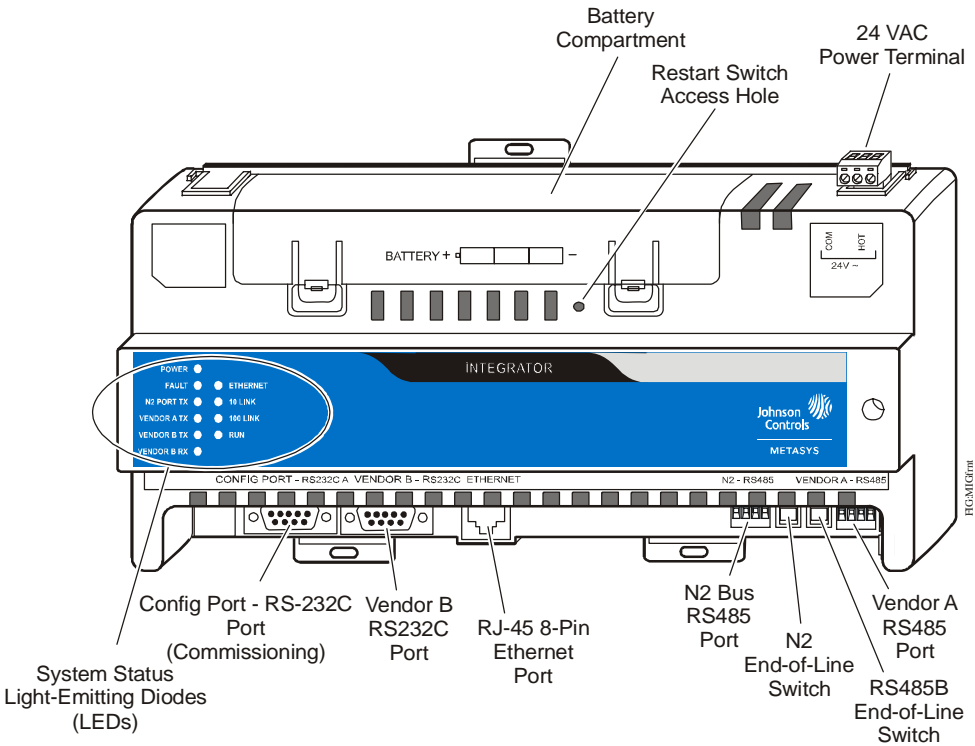
The MIG3500 requires the following software:

- VT100 Terminal Emulation software for commissioning and setting up the Metasys Integrator unit
- DOWNPC, commissioning software for selecting and downloading vendor configuration tables, provided on the Metasys Integrator CD-ROM
- vendor and N2 open protocol support software
- Metasys Integrator software CD-ROM labeled *Tables and Models* (MS-MIGSWO-0). Use software CDs with a revision number 9.00 or higher with the MIG3500 Release 10 firmware.

In addition, there is one Metasys Integrator CD-ROM containing the Metasys MIG Update Utility, download software, .VCT files, the N2 Bus Checkout Tool, and software models in DDL syntax for all applications.

# MIG3500 Components

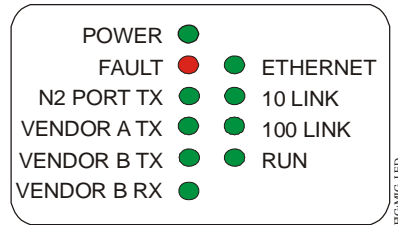
Figure 2 illustrates the basic components of the MIG3500. The Metasys Integrator unit has an N2 terminal, commissioning port, Ethernet port, and two vendor ports. The power terminal requires an external 24 VAC power supply.



**Figure 2: MIG3500 Components**

## System Status LEDs

Figure 3 shows the designation of the LED status indicators on the MIG3500. Table 3 describes the purpose of each LED.



**Figure 3: MIG3500 LED Status Indicators**

**Table 3: MIG3500 LED Designations, Normal Status, and Descriptions**

LED Designation	Normal Status	Descriptions/Other Conditions
<b>POWER</b> (Green)	On Steady	<b>On Steady</b> = Unit is getting power from the 24 VAC supply. <b>Off Steady</b> = Unit is shut down.
<b>FAULT</b> (Red)	Off Steady	<b>Flicker Once, Then Device Continually Restarts</b> = Internal fault has occurred.
<b>N2 PORT TX</b> (Green)	Flicker	<b>Flicker</b> = Normal communications; the MIG3500 is transmitting data. Flickers are generally in sync with data transmission, but should not be used to indicate specific transmission times. <b>Off Steady</b> = the MIG3500 is not responding to N2 Bus communication.
<b>VENDOR A TX</b> (Green)	Flicker	<b>Flicker</b> = Data is being transmitted from the MIG3500 to the vendor device connected to the Vendor A - RS485 port.
<b>VENDOR B TX</b> (Green)	Flicker	<b>Flicker</b> = Data is being transmitted from the MIG3500 to the vendor device connected to the Vendor B - RS232C port.
<b>VENDOR B RX</b> (Green)	Flicker	<b>Flicker</b> = Data is being received by the MIG3500 from the vendor device connected to the Vendor B - RS232C port.
<b>ETHERNET</b> (Green)	Flicker	<b>Flicker</b> = Data is transferring on the Ethernet connection. This LED is only active when the MUU is downloading the firmware to the unit. <b>Off Steady</b> = No Ethernet traffic on the Ethernet connection, indicating the MUU is not in use or is not downloading the firmware to the unit.
<b>10/LINK</b> (Green)	On Steady	<b>On Steady</b> = Ethernet connection is established at 10 Mbps.
<b>100/LINK</b> (Green)	On Steady	<b>On Steady</b> = Ethernet connection is established at 100 Mbps.
<b>RUN</b> (Green)	On Steady	<b>On Steady</b> = MIG3500 software is fully initialized. <b>Off</b> = MIG3500 unit is not powered or is starting up. <b>On 0.5 seconds, Off 0.5 seconds</b> = MIG3500 software is starting up.

## Config Port - RS232C

This RS-232C serial port is used for downloading the vendor tables into the MIG3500 using a laptop computer and the DOWNPC software. This port is also used to configure the device with Microsoft® HyperTerminal. These communication baud rates are supported: 300; 600; 1200; 2400; 4800; 9600; 19,200; 38,400; 57,600; and 115,200 bps.

## **Vendor B - RS232C Port**

This RS232C serial port is used for interfacing to a vendor device that communicates with RS-232C signals. These communication baud rates are supported: 300; 600; 1200; 2400; 4800; 9600; 19,200; 38,400; 57,600; and 115,200 bps.

## **RJ-45 8-Pin Ethernet Port**

The Ethernet connector on the MIG3500 allows for the unit to be flashed with its firmware over an IP connection. Communication occurs at 10 or 100 Mbps, depending on the capabilities of the computer's network card.

## **N2 Bus RS485 Port**

This is an N2 Bus termination block (N2 - RS-485) that allows the MIG3500 to communicate vendor data to a supervisory controller over the N2 Bus at 9600 bits per second. Devices on the N2 Bus constitute a local network controlled by a supervisory controller. Each vendor device is assigned an N2 Bus address when you commission the MIG3500.

Each end of the N2 Bus is terminated with an End-of-Line (EOL) termination resistor provided by a switch. For information on setting the N2 EOL switch, see *Setting the N2 Bus and RS485B End-of-Line Switches* on page 25.

## **Vendor A - RS485 Port**

This RS-485 serial port is used for interfacing to a vendor device that communicates with RS-485 signals. These communication baud rates are supported: 300; 600; 1200; 2400; 4800; 9600; 19,200; 38,400; 57,600; and 115,200 bps.

## **Battery**

A battery is located under the battery cover of the MIG3500. Its purpose is to maintain the current date and time when the unit is turned off. The battery does not serve any other function. It is field replaceable.

## ***Power Up/Power Down Behavior***

When the MIG3500 is turned on, it runs through a series of diagnostic checks. If an internal fault is detected after the unit is fully operational, the FAULT LED turns on red momentarily, then the unit continually restarts. The LEDs do not indicate any particular error condition code.

When the MIG3500 is turned off, either manually or by a power failure, the firmware and vendor tables are retained within the flash image. When power is restored, the unit restarts and comes back online.

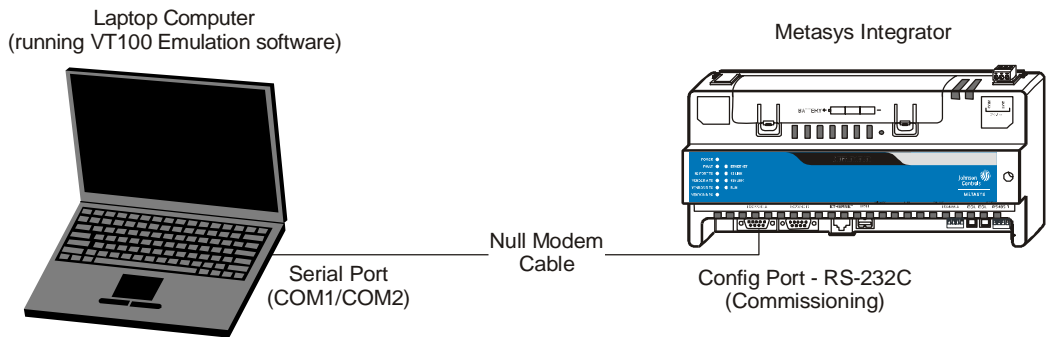
## Resetting the MIG3500

The MIG3500 can be manually reset by depressing the Restart Switch located on top of the unit. You can access the switch by inserting a small opened paper clip into the access hole (Figure 2 on page 11). An MIG3500 reset simply restarts the unit. The restart process takes about 2 minutes to complete. The firmware and vendor tables are not affected by a manual reset.

## Communication Cabling

### Configuration Port Cabling

Figure 4 shows the connection between a laptop computer and the configuration port on the Metasys Integrator unit.

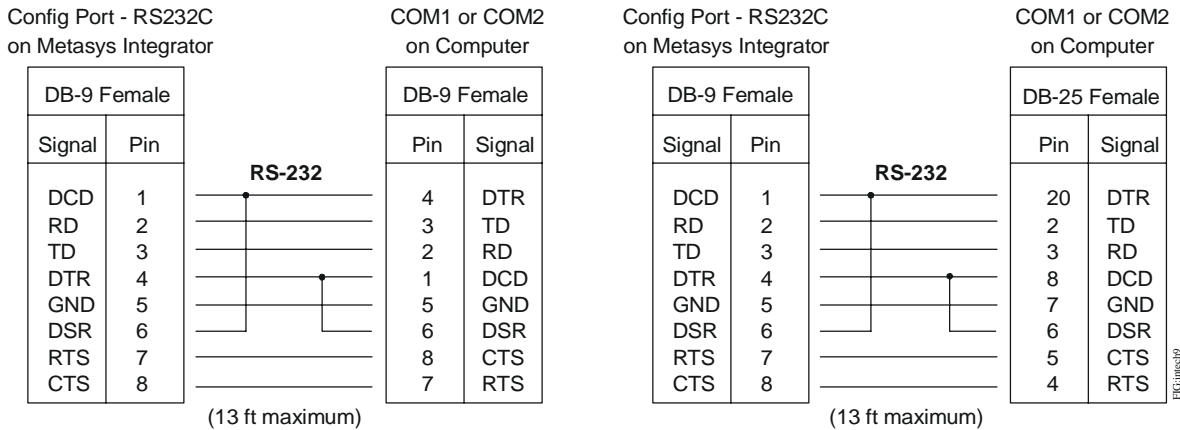


**Figure 4: Connecting Computer to MIG3500 Config Port**

As indicated, an RS-232 null modem cable is required between the Metasys Integrator configuration port (Config Port - RS232C) and the computer's serial port (for example, COM1). Total distance between the Metasys Integrator unit and the computer can be 13 feet. Figure 5 shows cable pinouts for a computer with either a 9 pin serial port or a 25-pin serial port.

If the computer has a 9-pin port, use this cable:

If the computer has a 25-pin port, use this cable:



**Figure 5: Cables for Connecting Computer to MIG3500 Config Port**

## Vendor Port Cabling

The MIG3500 has two vendor ports: Vendor A - RS485 and Vendor B - RS232C. If the vendor communications interface uses RS-485, you need an RS-485 cable between the Metasys Integrator Vendor A - RS485 terminal block and the vendor communications interface. If the vendor device uses RS-232, you need an RS-232 cable between the Metasys Integrator Vendor B - RS232C port and the vendor communications interface. For RS-232 cable pinouts, refer to the vendor-specific application note for the vendor equipment you are integrating. These application notes are available on the Johnson Controls QuickLit Product Literature Web site. If the vendor equipment requires a second RS232 port, use the RS485B terminal block with the appropriate signal converter.

The RS-232 cable length between the Metasys Integrator unit and the vendor communications interface may not exceed 50 feet. The maximum length for RS-485 cabling is 5,000 feet maximum without repeaters or 15,000 maximum with repeaters (or as instructed by the vendor equipment manufacturer).

<b>IMPORTANT:</b> For baud rates faster than 19,200 bps, the serial cables must be shorter than 4 m (13 ft).
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## VT100 Terminal Emulator Setup

You can use any terminal emulation software, such as HyperTerminal, provided it supports the VT100 Terminal type. See Table 4 for the settings that the MIG3500 requires. For more information on terminal emulation software setup, see the respective terminal emulator literature.

**Table 4: VT100 Emulation Software Setup Parameters**

Setting	Value
Baud Rate	57600
Data Bits	8
Parity	No
Stop Bits	1
Flow Control	None
Terminal Emulation	VT100, VT102, or ANSI

## Vendor Communication Tables (.VCT)

The .VCT files provided on the Metasys Integrator CD contain information that allows the Metasys Integrator unit to communicate with vendor equipment. The Metasys Integrator unit can store up to 36 .VCT files.

**Note:** Refer to the vendor-specific application documents for the name of the .VCT files you need to download. These documents are available on QuickLit.

## Advanced Diagnostics

You can view the Metasys Integrator's operational status by selecting Advanced Diagnostics from the Commissioning main menu (Figure 21).

## Resetting the Metasys Integrator

The reset function available under Advanced Diagnostics in the Commissioning main menu restarts the Metasys Integrator software. See *Resetting the Metasys Integrator* on page 16. The Error Log screen helps you to determine the cause of the last reset.

## Recommissioning the Metasys Integrator

The Metasys Integrator unit must be recommissioned in the following circumstances:

- upgrading to a new firmware revision (see *Downloading the MIG3500 Code* on page 17)
- downloading updates to an existing application

## Error Log

Pressing F2 from the Advanced Diagnostics screen (Figure 29) accesses the Error Log screen. The Error Log displays the cause of the last reset, as well as any other serious errors that may have occurred since the log was last cleared.

**Note:** If the error log contains an **Exception Occurred!** error, contact the Field Support Center.

The log contains up to 256 entries. Once the error log reaches 256 entries, it no longer adds new entries. To allow for new entries, you must clear a full error log by selecting Yes from the Clear Error Log prompt.

## Commissioning Overview

MIG3500 commissioning includes inspecting the installation, loading the Flash image (if required), setting the EOL switches, and connecting the communication cables. These procedures are covered within the *Detailed Procedures* section.

## Configuration Overview

MIG3500 configuration steps include downloading the vendor tables, configuring the ports, and verifying communication to the vendor equipment. These procedures are covered within the *Detailed Procedures* section.



## Detailed Procedures

To perform the following procedures, you should have:

- a laptop or desktop computer with the Metasys MIG Update Utility, which is available on the Metasys Integrator CD or the Johnson Controls Portal intranet site
- 1 FS10x 10/100 Netgear® switch (for example, FS105NA Netgear 5 Port **or** 10/100 is CompuCom #464163, Model FS105NA), or 1 W-Linx 5-port 10/100 Mini Hub (Universal Serial Bus [USB]) E63746 (part number SW-005CM-X), or 1 Netgear 5 Port **or** 10/100 Desktop switch (model FS605) connected to your computer

**Note:** Do not use any other hub or dual-speed hub.

- the Media Access Control (MAC) address of each MIG3500 you want to update (MAC address sticker located on the unit)
- null-modem serial cable (9- or 25-pin female)
- 2 RJ45 Ethernet patch cables (equivalent to CompuCom #131740, Model A3L791-07)
- VT100 emulation software, such as HyperTerminal

### ***Inspecting the Installation***

To inspect the connections and wire terminations on the electronics board:

**IMPORTANT:** Prevent any static electric discharge to the MIG3500. Static electric discharge can damage the unit and void any warranties.

1. If the Metasys Integrator unit is in an enclosure, open the enclosure door.
2. Examine the N2 terminal block for stray wire strands; loose screw terminals; and nicked, loose, or broken wires.
3. Check the wire insulation to ensure that it has not been stripped back so far as to cause a short, or that it is not tucked under a screw terminal.
4. Verify the wire polarity of the N2 Bus connection. (Check that each screw terminal of the N2 block has the same wire color entering as it does exiting.)
5. Verify that the power cable is properly connected.

### ***Downloading the MIG3500 Code***

This step is only required if the MIG3500 has lost its factory-installed code (flash image) or if a code update is required. If you cannot communicate with the MIG3500 using the VT100 interface, then another download may be required to return the unit to its factory state. A tool called the Metasys MIG Update Utility is used. If an update to the flash image is not required, go to the next section, *Setting the N2 Bus and RS485B End-of-Line Switches*.

The MIG Update Utility has the following characteristics:

- must be run on a computer that has the Microsoft Windows® 2000 Professional, Microsoft Windows XP®, or Microsoft Windows Server 2003 operating system and Microsoft .NET Framework 1.1 or later installed
- updates only one MIG3500 at a time
- only one instance of the MIG Update Utility should be running in computer memory
- should not be used across a building network
- no other devices besides the computer and MIG3500 should be connected to the Ethernet switch or hub during the update process
- the cables used to connect to the switch or hub should be Category 5 computer network cables; crossover cables should not be used
- the FAULT LED is On during the update process, which is normal

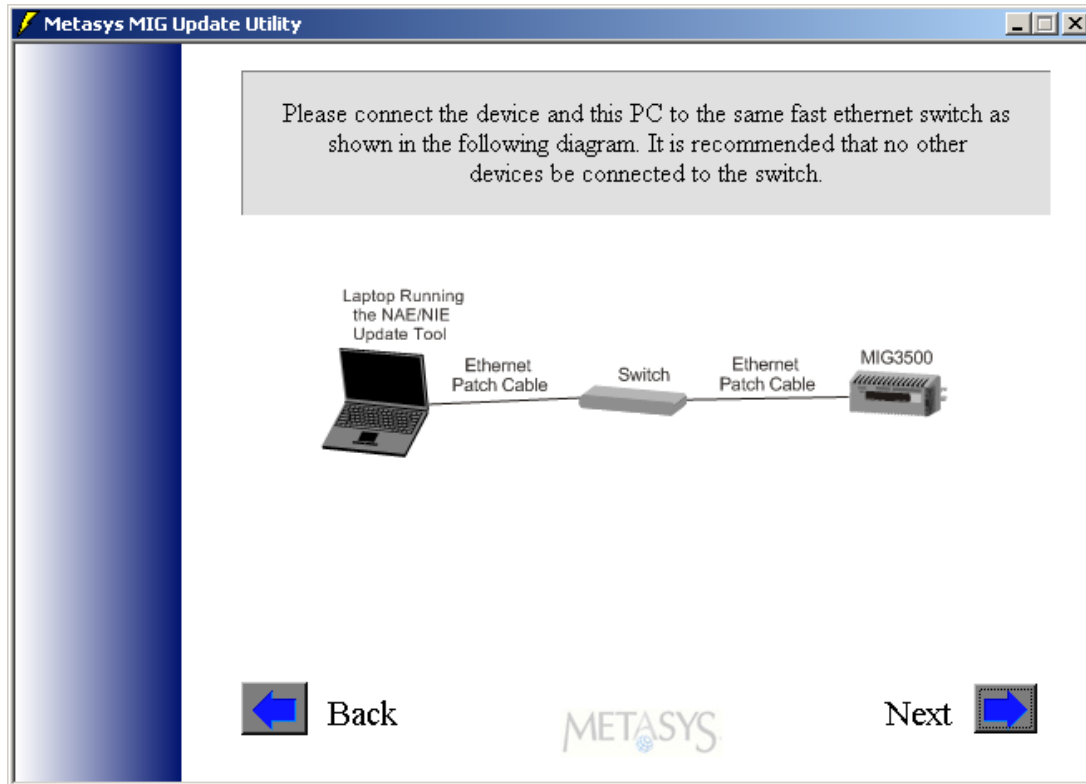
To download or update the code for the MIG3500:

1. Connect the computer and MIG3500 to the Ethernet switch or hub. Turn on power to the MIG3500, the computer, and switch or hub.
2. After a few minutes, verify that the computer has received an IP address from the operating system. (If not, restart the computer once more.)
3. Start the Metasys MIG Update Utility on the computer. The Welcome screen appears (Figure 6).



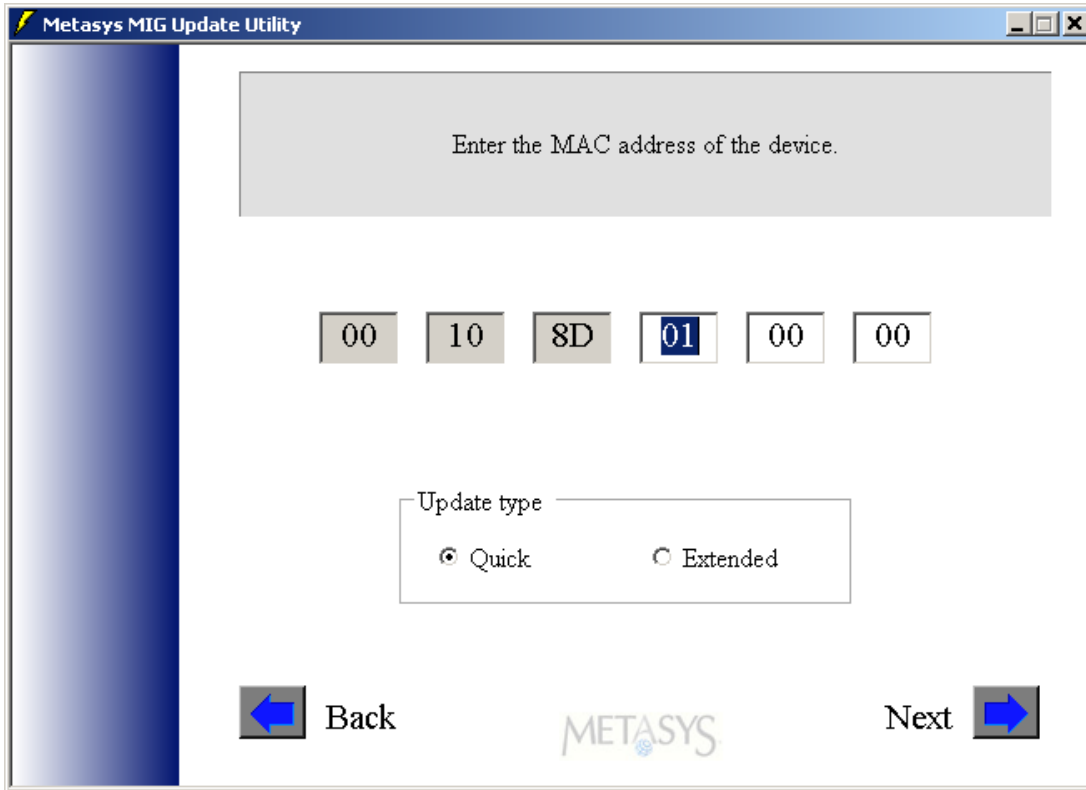
**Figure 6: Metasys MIG Update Utility Welcome Screen**

4. Click the Next button to continue. The Connection screen appears (Figure 7).



**Figure 7: Connection Screen**

5. Click the Next button to continue. The MAC Address Entry screen appears (Figure 8).

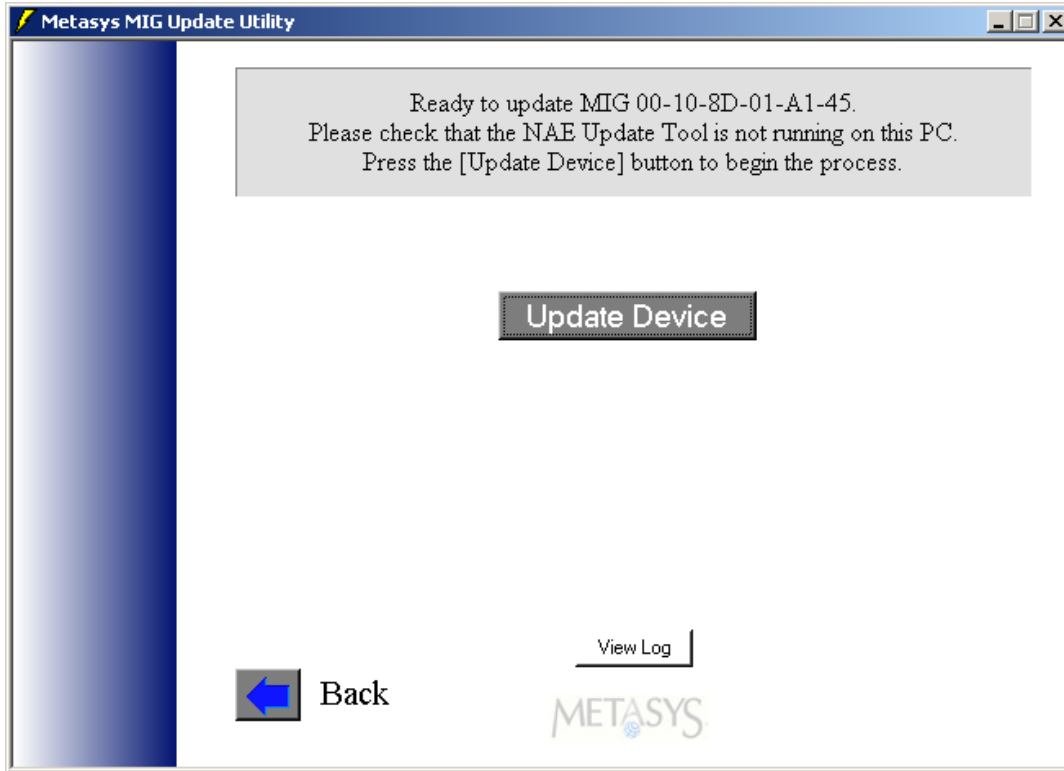


**Figure 8: MAC Address Entry Screen**

**Note:** A selection for Update type is given, with **Quick** as the default. The **Extended** update takes much longer to complete; **do not use** this update unless Technical Support requests that you do so.

6. Select Quick and enter the MAC address of the MIG3500 you want to flash. Refer to the MAC address sticker on the unit.

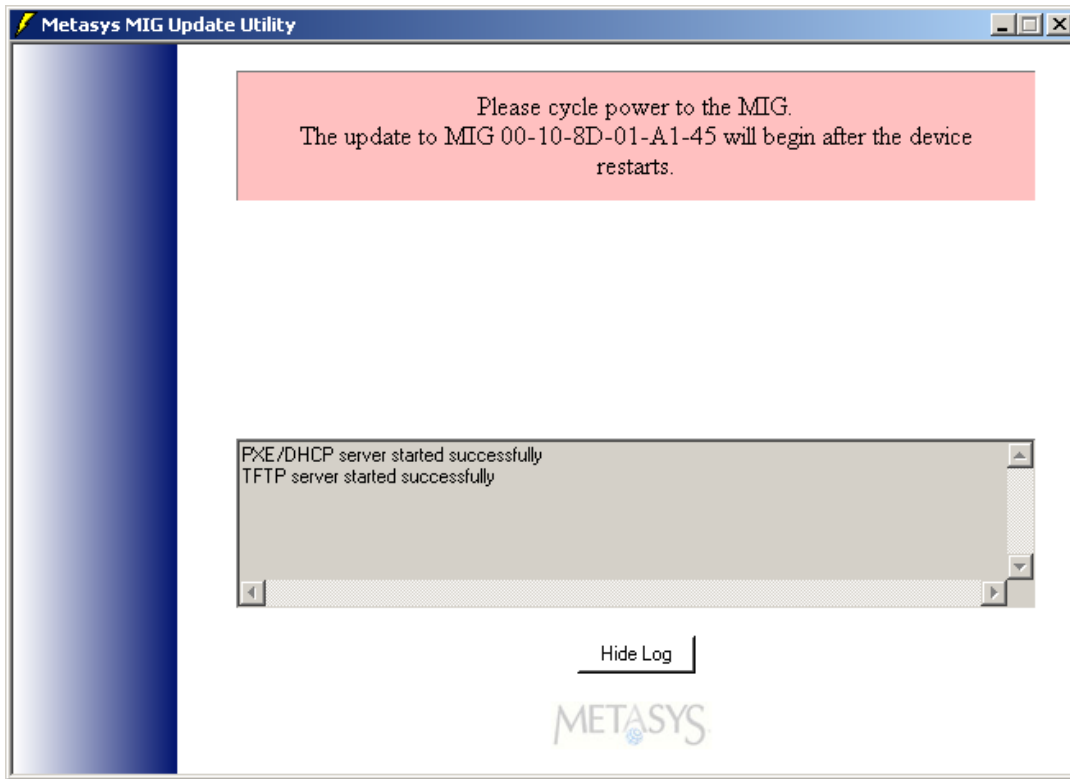
7. Press the Next button. The Update Device screen appears (Figure 9).



**Figure 9: Update Device Screen**

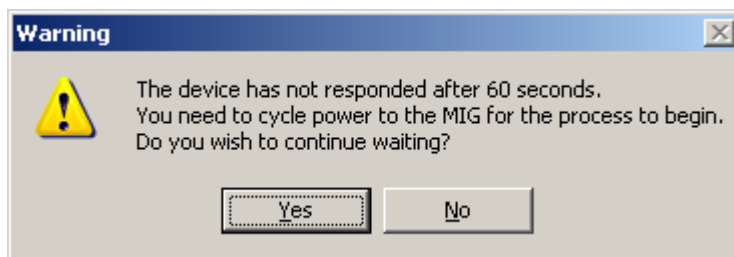
8. Click the View Log button if you want to display the log window that shows progress messages. Click Update Device. The Waiting for Response Screen appears (Figure 10).

9. Cycle power to the MIG3500. Within a minute or so, the update process starts. If you get the message **Device will begin downloading necessary files** and the files do not begin to download, cycle power on the MIG3500 again to restart the process.



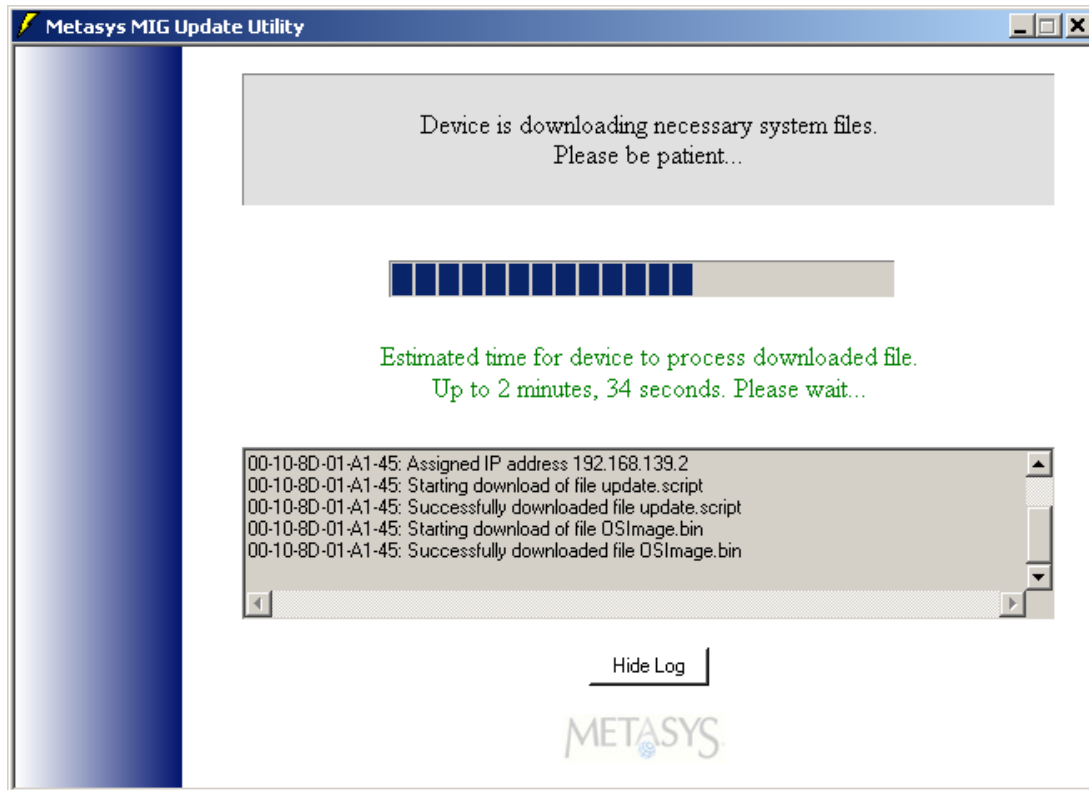
**Figure 10: Waiting for Response Screen**

**Note:** If the device does not respond within a minute, a Warning message appears (Figure 11). Try again by cycling power on the MIG3500, then clicking Yes to continue. Or, click No to cancel the update and return to the Welcome screen.



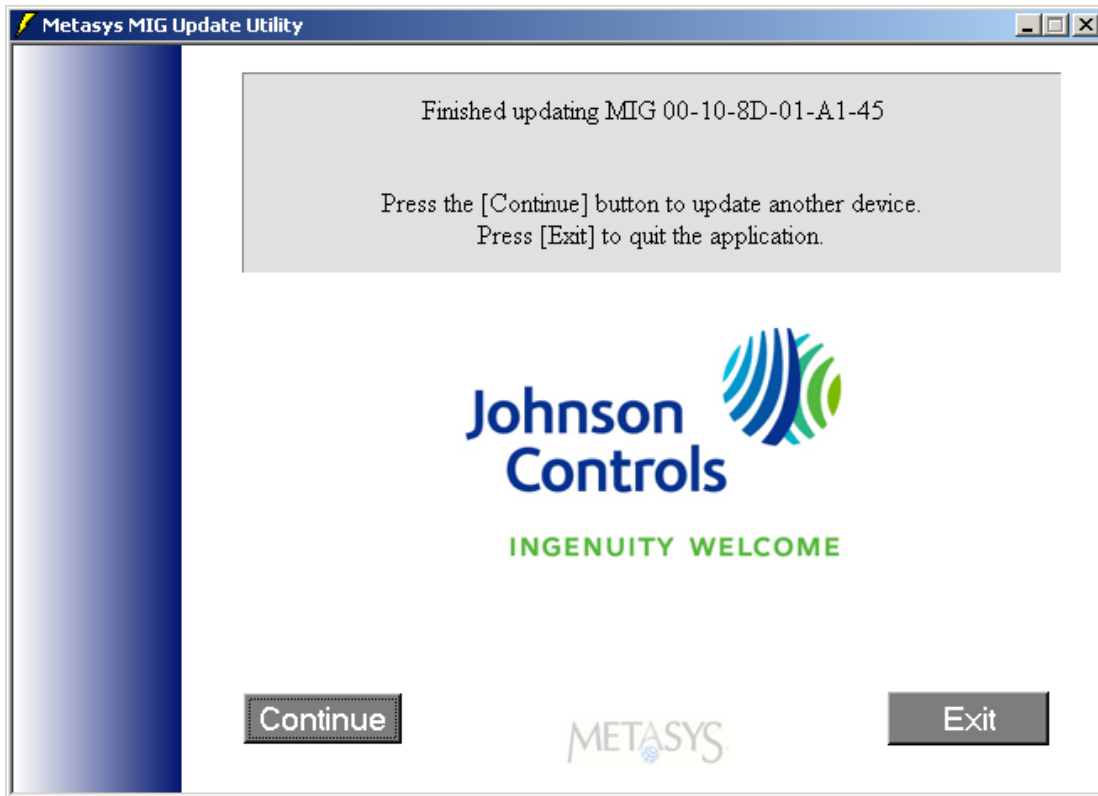
**Figure 11: MIG3500 Not Responding to Update Request**

During the update, a Progress screen indicates the approximate time left in the process (Figure 12).



**Figure 12: Download Progress Screen**

If the update was successful, the Completion screen appears (Figure 13). **If the update was unsuccessful, this screen indicates that the MIG3500 update failed.** Recheck the cable connections and try again.



**Figure 13: Completion Screen**

10. If you need to update another MIG3500, click Continue, which returns you to the Welcome screen (Figure 6). If you have no other devices to update, click Exit.

Within a few minutes, the RUN LED on the MIG3500 should stop flashing, indicating it is ready for the next step. Go to [Setting the N2 Bus and RS485B End-of-Line Switches](#).



## Setting the N2 Bus and RS485B End-of-Line Switches

Network and field devices at either end of the N2 Bus and RS-485 network must be set as network terminated devices. The MIG3500 model has an EOL switch for each of the two RS-485 terminal blocks (Figure 2). The switch labeled **EOL A** applies to the N2 - RS485 (N2 Bus) terminal and the one labeled **EOL B** applies to the Vendor A - RS485 terminal. The MIG3500 is shipped with the EOL switch in the factory default, ON (up) position (Figure 14). Set the EOL switches to the appropriate positions for each MIG3500 in your network. For more details, refer to the *N2 Communications Bus Technical Bulletin (LIT-636018)*.

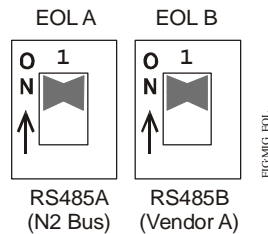


Figure 14: End-of-Line Switches on MIG3500

## Installing DOWNPC and Vendor Communication Tables

You need to install the DOWNPC software on the commissioning computer before downloading the .VCT files. Be sure to have the Metasys Integrator CD-ROM labeled *Tables and Models* on hand.

To install the download software on your computer:

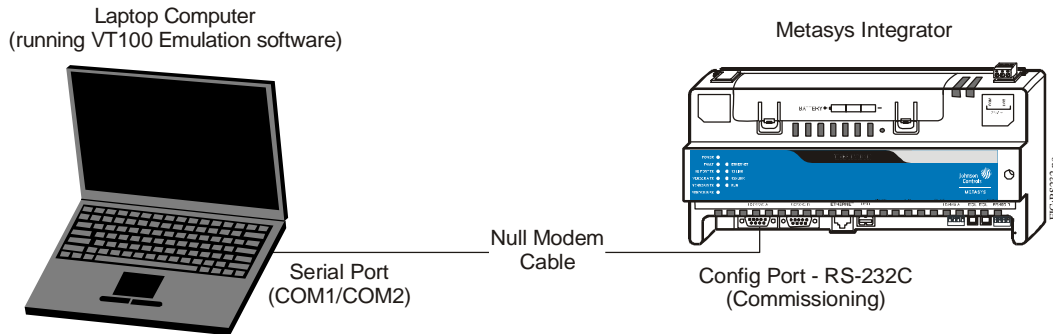
1. Insert the Metasys Integrator CD-ROM labeled *Tables and Models* in the CD-ROM drive.
2. Run the **setup.exe** file on the CD-ROM and follow the on-screen instructions. Alternatively, you can manually copy the files that you need from the *Tables and Models* CD-ROM. If you do not know what files you need, run setup.exe.

## Downloading Vendor Communication Tables

After installing the DOWNPC software, you can download the appropriate .VCT files to the Metasys Integrator unit. Up to 36 .VCTs may be downloaded.

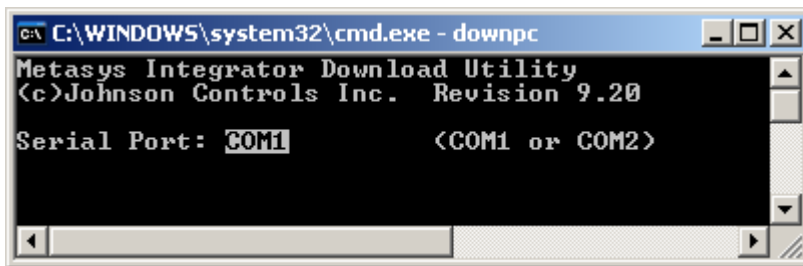
To download the .VCT files:

1. Connect a null modem cable between the serial port on the laptop computer (COM1 or COM2) and Config Port - RS232C on the MIG3500 (Figure 15). Do not use the Vendor B - RS232C port.



**Figure 15: Connecting a Laptop Computer to the MIG3500**

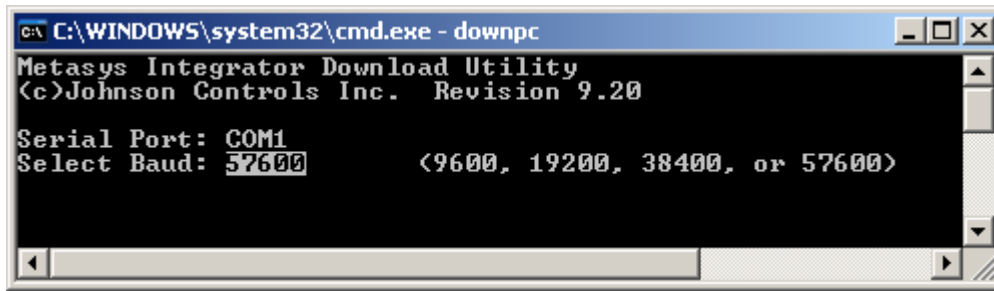
2. Using the computer, open a Disk Operating System (DOS) window.
3. At the command prompt, change to the directory where you installed the DOWNPC software. The default is C:\MIG10\Tables.
4. Type DOWNPC (case insensitive) to start the Metasys Integrator Download Utility. The following appears (Figure 16):



**Figure 16: DOWNPC Utility - Selecting Serial Port**

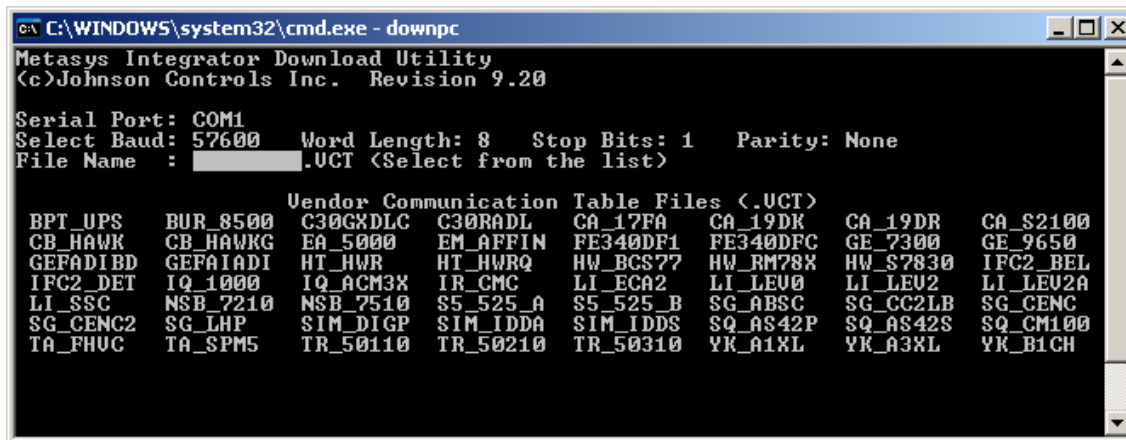
5. Accept the default (COM1) serial port or type COM2 to select this port on the computer that connects to Metasys Integrator commissioning port. (Note: Serial ports COM3 and COM4 are not supported.)

- Press Enter with the correct port selected. The screen shown in Figure 17 appears, prompting for the baud rate.



**Figure 17: DOWNPC Utility - Selecting Baud Rate**

- Accept the 57600 default baud rate and press Enter. The screen shown in Figure 18 appears, displaying currently available vendor communication table files.



**Figure 18: DOWNPC Utility - Selecting Vendor Table**

- Select a .VCT file to download in one of two ways:
  - Type the name of the file to download in the File Name field. This name must match the name in the .VCT file as displayed on the Download screen.
  - Select the file name from the .VCT file list by pressing the Tab key once, then using the function keys listed in Table 5.

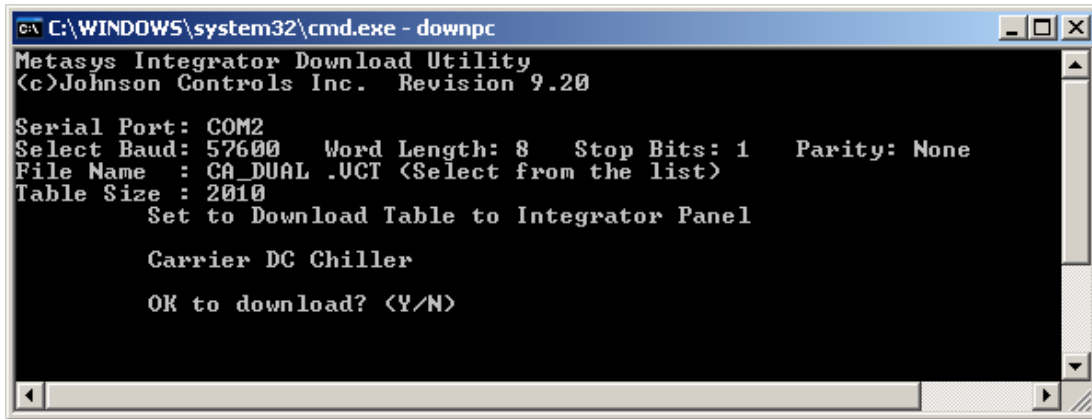
**Table 5: Download Select Function Keys (Part 1 of 2)**

Key	Function
Tab	Highlights the next file name in the list.
Backspace	Highlights the previous file name in the list.

**Table 5: Download Select Function Keys (Part 2 of 2)**

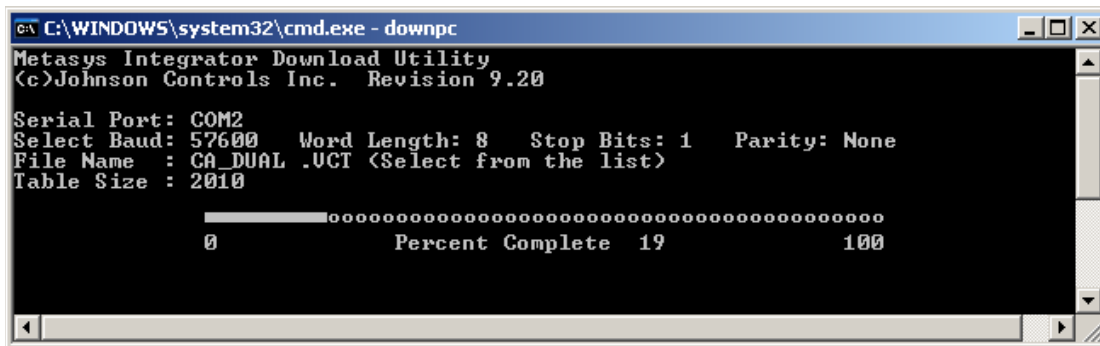
Key	Function
A through Z	Highlights the first file name beginning with that letter, if one exists.
PGUP (Page Up)	Displays the previous page of file names.
PGDN (Page Down)	Displays the next page of file names.
Space Bar	Highlights the next file name in the list.
F1 Key or Esc	Exits without downloading.

9. Press Enter. The screen shown in Figure 19 appears, briefly describing the selected file.



**Figure 19: Download Confirmation Screen**

10. Press N to return to the .VCT file name list shown in Figure 18. Press Y to begin downloading. The screen in Figure 20 appears.



**Figure 20: Download in Progress Screen**

The solid bar moves across the screen as the download continues. When complete, the following appears:

**Download completed without errors**

**Press Any Key To Exit Download**

If an error occurs, attempt the download again.

11. Press any key.
  12. To download another table, type DOWNNPC and start the procedure again.
- Note:** Do not download the same table more than once. A single table can be used for multiple vendor devices of the same type.
13. Restart the VT100 Terminal emulation software.
  14. Press F1 to refresh the Commissioning menu.

### **Configuring the MIG3500 with VT100 Interface**

A VT100 emulation software program is used to communicate with and configure a new or updated MIG3500. Use the VT100 interface to establish the MIG3500's configuration and parameters in flash memory.

### **Establishing Communication with MIG3500**

To establish communication with the MIG3500:

1. Connect a null modem cable between the serial port on the laptop computer (COM1 or COM2) and Config Port - RS232C on the MIG3500 (Figure 15). Do not use the Vendor B - RS232C port.
2. Start the VT100 emulation software on the computer, using the settings listed in Table 4. The Commissioning Menu appears (Figure 21). All commissioning steps occur from this menu. This menu also lists contact information in case you need assistance with the product.

**Note:** The date and time displayed on the menu are not set until the MIG3500 is connected to the N2 Bus.

```

Metasys Integrator Commissioning Menu      10.0.0      Tue Jan  1, 2008  09:01
=====
                               SShow Point Data
                               Network Modify/Add/Delete
                               Port Configuration
                               Device Diagnostics
                               Vendor and N2 Port Diagnostics
                               Advanced Diagnostics
                               Quit
=====
                               Standard Firmware
                               Johnson Controls Inc.
                               Systems Integration Services
US Office      Milan Office      Essen Office
9410 Bunsen Pkwy Ste 100A  Via Manzoni, 44      Westendhof 3
Louisville, KY 40220      20095 Cusano Milanino, Italy  45143 Essen, Germany
phone 502-671-7400      phone ++39 02 28042.1      phone ++49 201 2400 425
US:  http://publish.cg.na.jci.com:9085/publish/controls/us/eng/sis/h/about.html
Europe:  http://advisor.cg.jci.com/a_offices/sp_europe/bas/library/sysint.htm
=====
F1 Refresh Menu  Press F1 to refresh or to return to this menu at anytime.

```

**Figure 21: Metasys Integrator Commissioning Menu**

## Setting up Ports

To set up ports:

1. From the Commissioning menu (Figure 21), select Port Configuration. The Port Configuration screen appears (Figure 22).

Port/Usage	Baud Rate	Word Length	Stop Bits	Parity	Interface
P0 - N2	[9600]	[8]	[1]	[None]	[RS485]
P1 - Commissioning	[57600]	[8]	[1]	[None]	[RS232]
P2 - Vendor A	[9600]	[8]	[1]	[None]	[RS485]
P3 - Vendor B	[9600]	[8]	[1]	[None]	[RS232]

F1 Cancel      F2 Save  
Select baud rate

**Figure 22: Port Configuration Screen**

2. Either type the information or use the space bar to scroll through the valid options to enter information into each field. To move between fields, press Enter or Tab, or use the arrow keys. The help line at the bottom of the screen displays information about the field you have currently selected.
  - The N2 Port (P0) has fixed settings; do not change these settings.
  - The P1 Commissioning port settings must match the VT-100 Emulator software settings.
  - The Vendor A (P2/RS485) and Vendor B (P3/RS232C) settings must match the vendor equipment settings. The vendor equipment settings are listed in the vendor-specific application note.
  - If your application has an RS-485 interface but you need to use the RS232C port (P3), set the vendor port to RS485 and use an external signal converter. This converter is described in the vendor-specific application note.
3. Press F2 to save the information to Metasys Integrator database. The Commissioning menu appears.

## Connecting Vendor-Specific Cabling

To connect vendor-specific cabling:

- Refer to the vendor-specific application notes located in QuickLit for the cable pinouts.
- Assemble and connect the cabling between the Metasys Integrator unit and the vendor equipment.

## Adding Vendor Devices to the Network

**Note:** See the vendor-specific application note for the correct vendor address and timeout values.

**Note:** To add a vendor device to the network, you must have already downloaded its vendor communication table. For details, see [Downloading Vendor Communication Tables](#) on page 25.

To add a device to the network:

1. To avoid annoying messages at the Metasys system, disconnect the N2 Bus connection from the Metasys Integrator unit until proper communication with the vendor equipment has been verified (see [Verifying Vendor Device Communications](#) on page 33 and [Verifying Point Data](#) on page 35).
2. From the Commissioning menu, select the Network Modify/Add/Delete option. The screen shown in Figure 23 appears.

N2 Address	Interface Type	Vendor Address	Port	Timeout	Poll Delay	Retry
0	[REDACTED]	[REDACTED]	[A]	[REDACTED]	[REDACTED]	[3]
1	[CA 17FA, 19FA,19XR]	[1]	[B]	5000	550	[8]
2	[LIEBERT LEVEL 2]	[3]	[A]	4000	[REDACTED]	[8]
3	[REDACTED]	[REDACTED]	[A]	[REDACTED]	[REDACTED]	[3]
4	[REDACTED]	[REDACTED]	[A]	[REDACTED]	[REDACTED]	[3]
5	[REDACTED]	[REDACTED]	[A]	[REDACTED]	[REDACTED]	[3]
6	[REDACTED]	[REDACTED]	[A]	[REDACTED]	[REDACTED]	[3]
7	[REDACTED]	[REDACTED]	[A]	[REDACTED]	[REDACTED]	[3]

PN\_TMS Modbus CA 17FA, 19FA,19XR LIEBERT LEVEL 2 Tek-Air FVC-2000

F1 Cancel F2 Save F3 More F4 Goto N2 Address  
Select a vendor interface type from the list

**Figure 23: Network Modify/Add/Delete Screen**

3. Specify the network configuration for each of the vendor devices.

- To enter information in a field, you can either type the information or use the space bar to scroll through the valid options. To move between fields, press Enter or Tab, or use the arrow keys. The help line at the bottom of the screen displays information about the field that you have selected.

**Note:** N2 Address 0 can be defined at the Metasys Integrator unit, but cannot be used at the Metasys system.

- To display the next screen of network addresses, press F3. Pressing F3 also saves the current screen of data.
  - To go to a specific N2 address, press F4. Pressing F4 also saves the current screen of data.
4. Press F2 to save the information to the Metasys Integrator database and return to the Commissioning menu.

### ***Modifying Vendor Devices***

To modify the settings for a vendor device, add the device with the new settings:

1. Move the cursor to the Interface Type field of the device whose settings you want to change (Figure 23).

**Note:** If you need to change the Interface Type or Port selection, you need to first delete the device, then re-add it selecting an appropriate Interface Type or Port.

2. Press the space bar to scroll through the options until a blank name is selected.
3. Press F2 to delete the device.
4. Add the device by filling in the new settings.
5. Press F2 to save the changes.

**Note:** If communication is still in progress with the device deleted in Step 3, the Metasys Integrator unit displays the following error message: **Cannot add until previous delete is completed.**

### ***Deleting Vendor Devices***

To delete a device:

1. Move the cursor to the Interface Type field of the device you want to delete (Figure 23).
2. Press the space bar to scroll through the options until a blank name is selected.
3. Press F2 to save the changes.

**Note:** If a scan is in progress for a deleted device, it is deleted after the scan is complete.



## Verifying Vendor Device Communications

To verify vendor device communication:

1. From the Commissioning menu, select the Device Diagnostics option. The screen shown in Figure 24 appears.

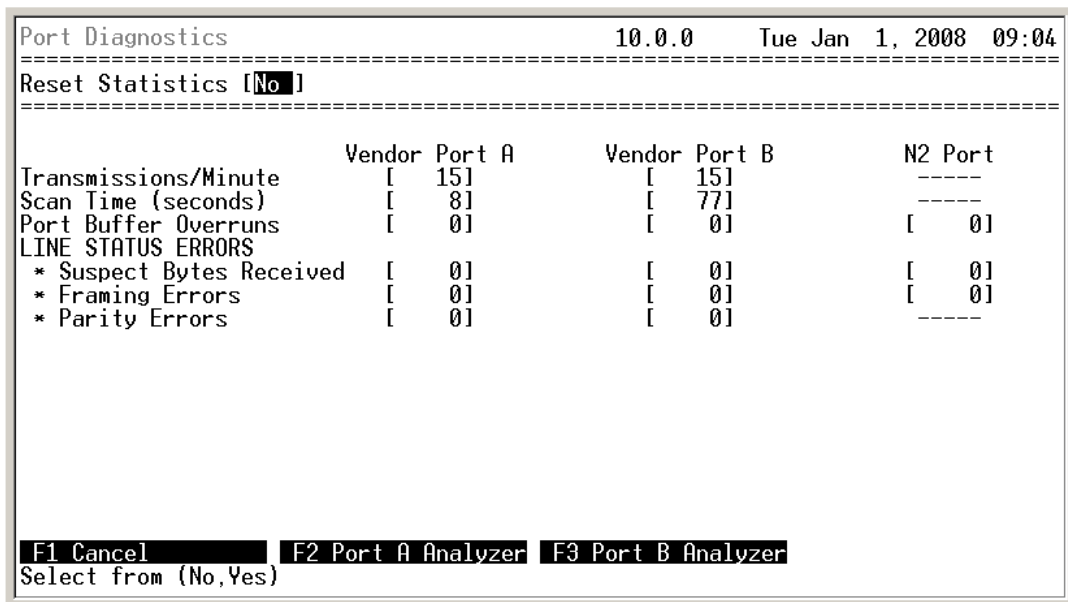
```
Device Diagnostics                               10.0.0    Tue Jan  1, 2008 09:04
=====
N2 Address [ 18]  Reset Statistics [No]
=====
Simplex DigitalPsd at N2 Address [ 18] on Vendor Port B:
      Online      [No ]      Transmissions/Minute [  71]
      Writes [ 50630]      Scan Time (seconds) [  771]
      Commands [  0]
      Retries [  75]
      Offlines [  16]
      Errors [  0]

[F1 Cancel] [F2 Data Analyzer] [F3 Next N2 Address]
Select an N2 address (0 - 255)
```

**Figure 24: Device Diagnostic Screen**

2. Enter the device's N2 address and press Tab or Enter twice.
3. If the vendor device is offline, press F2 to display the device specific Data Analyzer to determine if there is any communication.
4. Press F3 to view the statistics for the next N2 address that has been defined at this Metasys Integrator unit.

- If no devices for the vendor port are online, display the Vendor and N2 Port Diagnostics screen (Figure 25) for vendor port statistics.



**Figure 25: Vendor and N2 Bus Diagnostic Screen**

- From the Vendor and N2 Port Diagnostics screen, press F2 or F3 to display the Port Analyzer. This helps you determine if communication occurs with any vendor device on the port.
- For additional information on diagnostics fields, see Table 6 and Table 12. For additional information on the serial data analyzer, see *Using the Serial Data Analyzers* on page 42.

**Table 6: Diagnostic Fields (Part 1 of 2)**

Field	Description	Normal Readings	Device	Vendor and N2 Port
<b>Vendor Device Statistics for Selected N2 Address</b>				
<b>N2 Address</b>	Selected N2 Address (with vendor table name)		X	
<b>Online</b>	Indicates whether device is currently online	Yes	X	
<b>Writes</b>	Number of general communications messages		X	
<b>Commands</b>	Number of commands to device		X	
<b>Retries</b>	Number of retries for polls and writes for online devices only	0 is ideal	X	
<b>Errors</b>	Number of times a returned message from vendor device had an error (for example, a CRC or checksum error)	0 is ideal	X	

**Table 6: Diagnostic Fields (Part 2 of 2)**

Field	Description	Normal Readings	Device	Vendor and N2 Port
<b>Offline</b>	Number of online to offline transitions for device at this vendor address	0 is ideal	X	
<b>Reset Statistics</b>	Allows you to reset statistics to zero	No is default	X	X
<b>Port Statistics</b>				
<b>Transmissions per Minute</b>	Number of polls and writes that occurred in last minute	Depends on vendor device response time and poll delay	X	X
<b>Point Scan Time (seconds)</b>	Number of seconds it takes for all points on this vendor trunk to be scanned	Depends on transmissions per minute, vendor device response time, and poll delay	X	X
<b>Port Buffer Overruns</b>	Number of Vendor Port A, Vendor Port B, and N2 Port input buffer overruns on the UART's First In-First Out (FIFO)	0 is ideal		X
<b>Line Status Errors</b>				
<b>Suspect Bytes Received</b>	Number of line status errors in general	0 is ideal		X
<b>Framing Errors</b>	Number of line status errors caused by framing errors	0 is ideal		X
<b>Parity Errors</b>	Number of line status errors caused by parity errors	0 is ideal		X

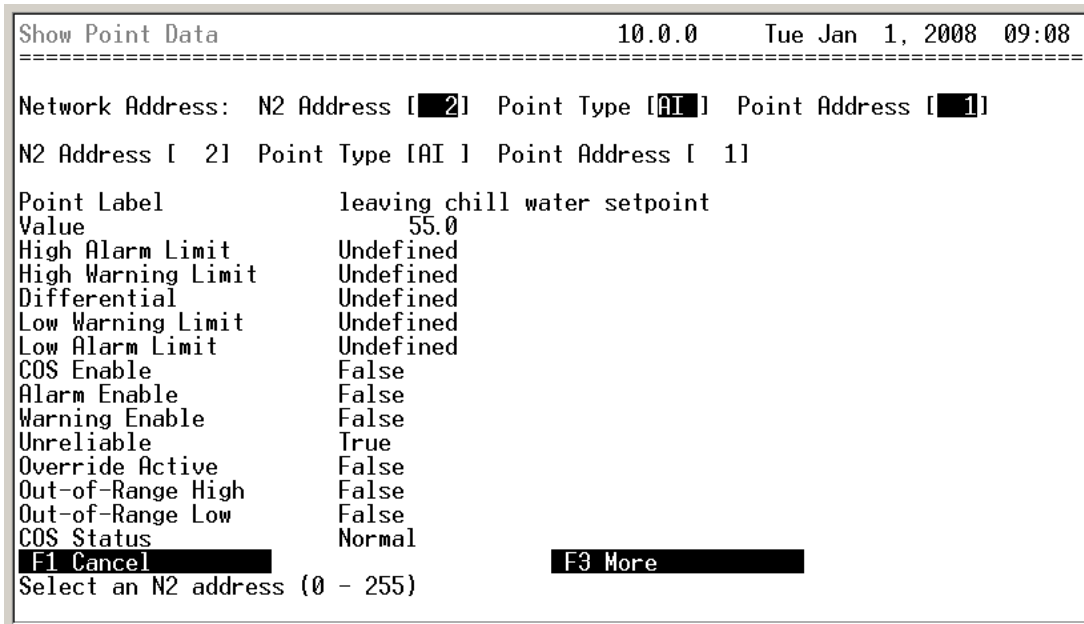
### **Verifying Point Data**

Before mapping vendor points to the Metasys network, verify that vendor equipment and processes are operating properly. Use the Show Point Data screen to display current point data in the vendor controllers.

To view point data:

1. From the Commissioning menu, select the Show Point Data option. The following fields appear, prompting you to specify a point:  
N2 Address [1] Point Type [AI] Point Address [1]
2. Enter the point's network address, point type, and point address. To accept the default, press Enter. (If the cursor is in the N2 Address field, press Enter three times to accept the default.)
3. To move between fields, press Enter or Tab, or use the arrow keys. To scroll through the Point Type options (AI, BI, AO, BO, ADF, ADI, BD), press the space bar repeatedly when the cursor is in the Point Type field.

- After you have specified the point, press Enter. The Show Point Data screen appears. Figure 26 shows an example of a Show Point Data screen for an AI point. (Each Show Point Data screen displays data appropriate to the point type.)



**Figure 26: Show Point Data Screen**

- Press F3 to view the next point, which scrolls through the points. When the last point of a type is reached, the first point of the next type is displayed.
- Press F1 to return to the Commissioning menu.

### ***Saving Metasys Integrator Configuration***

Record the settings for Metasys Integrator configuration. You can do this manually, or use a screen capture utility. See [Collecting Screen Data](#) on page 43 for additional information.

### ***Restarting Metasys Integrator Software***

To restart Metasys Integrator software:

- From the Advanced Diagnostics screen in the main menu, press F3. The Reset screen appears.

2. Change the reset option by using the space bar. Table 7 lists the Reset types available.

**Table 7: Types of Software Resets Available**

Title	Description
<b>Reset Only</b>	Resets Metasys Integrator unit without any effect on the firmware or vendor tables.
<b>Reset and Destroy Metasys Integrator Database</b>	Resets Metasys Integrator unit, but also erases the database that is currently stored in the unit. If you select this option, you need to recommission the unit by reloading all vendor tables.
<b>Cancel and Return to Main Menu</b>	Cancels this procedure and returns you to the Commissioning menu.

3. Press Enter to select and execute the option you choose.

### **Connecting MIG3500 to the Metasys System**

After you have configured the MIG3500, you can connect it to the Metasys N2 Bus network. The MIG3500 is connected as a device on the N2 Bus that terminates to an NAE or Network Control Engine (NCE). Connect the MIG3500 to the N2 Bus network, then follow the instructions in *Metasys Help* for adding it as a new field device. Select the MIG device type and specify the correct N2 Bus address. Also, be sure to use the resource file (.VCT file) for each vendor device that is connected to the MIG3500, so that you can easily select which points to map to the supervisory controller. For more details on the set of points that you can map, refer to the vendor-specific application notes available on QuickLit.

### **Verifying Online Status of MIG3500, Devices, and Objects**

Follow these steps to verify the status of the MIG3500, its devices and objects:

1. Log on to the Metasys Site Management Portal User Interface (UI).
2. Locate the MIG3500 on the Navigation map and double-click on its name to verify its status is Online.
3. Open the summary of points under the MIG3500 and verify that each is online.
4. Resolve any issues for those points that are reporting offline.

### **Replacing a MIG300 Series with a MIG3500 Series**

This section describes how to replace a MIG300 Series Metasys Integrator unit with the MIG3500 Series. Follow these steps:

1. Using your VT100 software, open the Port Configuration menu and record the communication port settings configured for the MIG300. Also, record the vendor tables currently in use by the MIG300. You need to configure the new MIG3500 with these same settings and tables in a later step.
2. Put any critical equipment in manual mode while replacing the MIG300.
3. Disconnect all wiring from the MIG300 and remove the unit.

4. Install the MIG3500, referring to the *MIG3500 Series Network Control Module Installation Instructions (Part No. 24-10050-30)* for details.
5. Connect the N2 Bus, any serial devices, and the MIG3500 power supply. Neatly reroute wires and cables as necessary.
6. Turn on the MIG3500 and connect a computer directly to the Config Port - RS232C port with a serial cable. Use VT100 interface software to configure the MIG3500, using the settings recorded in Step 1. Also download vendor tables; see *Downloading Vendor Communication Tables* on page 25 for details.
7. After configuration is complete, verify that the MIG3500 is communicating with the vendor equipment.

### **Replacing a Defective MIG3500**

If an MIG3500 fails and must be replaced with a new MIG3500, the steps to swap out the old unit with a new one are relatively straightforward. Follow these steps:

1. Record the port and network settings used on the old unit.
2. Power down the old unit.
3. Disconnect all wiring from the old unit.
4. Unscrew the old unit from the enclosure.
5. Install the new unit in the same location as the old one.
6. Reconnect all wiring to the new unit.
7. Power up the new unit.
8. Commission the new unit with the same settings as the old one, including the download of the previous Metasys Integrator vendor table(s).
9. Verify that the new MIG3500 is communicating with the vendor equipment.

## Troubleshooting

This section describes some of the most common problems encountered when setting up and operating the MIG3500. This section also provides general solution guidelines, and references to procedures and documents for resolving these common problems. Table 12 provides a list of common MIG3500 problems and their solutions.

This section is not a troubleshooting guide for Metasys system networks, customer Local Area Networks (LANs), BAS networks, or the field devices connected to the MIG3500. Troubleshooting field devices is covered in the field device documentation. Refer to the appropriate field device documentation for additional information.

### ***Corrupted MIG3500 Memory***

Corruption of MIG3500 flash memory may render an MIG3500 inoperable. Corrupted flash memory may occur for a variety of reasons, and the typical recovery procedure is to redownload the MIG3500 code with the MIG Update Utility. This procedure returns the unit to its factory default setting. When you return a unit to its factory condition, you must redownload the vendor tables as well. Once you complete this task, the unit should be back to an operational state.

### ***Verifying N2 Bus Communication***

The N2 network is confirmed when you open the Metasys Site Management Portal UI software, define vendor devices and points, and display information about the points on the workstation screen.

If something does not work correctly:

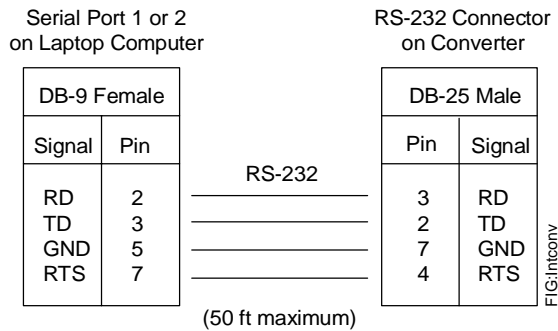
- Verify that the vendor equipment is energized. If the vendor equipment is not online and communicating, the Metasys Integrator unit appears offline to the NAE.
- Verify that the vendor points are appropriately defined in software.
- Recheck the N2 wiring connections throughout the network, including the N2 terminal blocks on the Metasys Integrator unit.

### ***Using the N2 Bus Checkout Tool***

Some Metasys Integrator jobs require extensive end-to-end checkout on site with vendor equipment and a supervisory system. The N2 Bus Checkout Tool allows engineers to do the checkout at the Metasys Integrator unit with a tool that uses the same table loaded in the Metasys Integrator unit. You can check out the vendor system and its interface with the Metasys Integrator unit from the Metasys Integrator N2 terminals to the vendor equipment. The user interface accepts any N2 address and a Release 5.0 or greater .VCT table as inputs.

The N2 Bus Checkout Tool requires the following:

- laptop computer with an available serial port or an available Universal Serial Bus (USB) port for use with a USB-to-serial adapter
- RS-232 to RS-485 converter
- RS-232 cable configured as shown in Figure 27



**Figure 27: Cable Pinouts for N2 Bus Checkout Tool**

Connect the cable between the serial port on the laptop computer to the serial connector on the converter. Then attach the RS-485 (N2) wires from the converter to the Metasys Integrator N2 Bus terminal connection.

Table 8 shows the available mouse sensitive operation fields displayed between the dashed delimiter lines. Click the mouse on these items to execute the function.

**Table 8: Mouse Sensitive Function Keys**

Function Key	Operation Performed
<b>AI</b>	Select AI points for display.
<b>BI</b>	Select BI point for display.
<b>AO</b>	Select AO points for display.
<b>BO</b>	Select BO points for display.
<b>ADF</b>	Select ADF points for display.
<b>ADI</b>	Select ADI points for display.
<b>BD</b>	Select BD points for display.
<b>RSt</b>	Reset N2 statistics.
<b>NuAdr</b>	Select a new N2 address (1 to 255).
<b>NuVct</b>	Select a new .VCT file name.
<b>Pgdn</b>	Page down the points list.
<b>PgUp</b>	Page up the points list.
<b>Exit</b>	Return to DOS (the Alt-X key does the same).



Table 9 shows point counts and Table 10 shows the statistics that are displayed on the right-hand side of the screen. The N2 Statistics values roll over at 65535.

**Table 9: Point Counts**

Point	Description
AI	Count of Analog Inputs in current table
BI	Count of Binary Inputs in current table
AO	Count of Analog Outputs in current table
BO	Count of Binary Outputs in current table
ADF	Count of Analog Data Floats in current table
ADI	Count of Analog Data Integers in current table
BD	Count of Binary Data (Byte) in current table

**Table 10: N2 Statistics**

N2 Statistics	Description
Poll	Number of polls
Data	Number of data requests
OvrC	Number of override commands
RelC	Number of release commands
COSs	Number of change-of-state responses
NAks	Number of negative acknowledge responses
CksE	Number of checksum errors
LnSE	Number of line status errors
RTry	Number of retries
OffL	Number of offline occurrences

Figure 28 shows a screen snapshot of the tool in use.

To perform the check:

1. Remove all N2 connections other than the RS-485 connection from the converter that is attached to the Metasys Integrator unit.
2. Start the N2 Bus Checkout Tool from the DOS command line by typing the command **N2CHECK 1** for COM1 or **N2CHECK 2** for COM2.
3. Click NuAdr to select an N2 address.
4. Click NuVct to select the same .VCT that you downloaded into the Metasys Integrator unit.
5. Use the mouse to select the point type you want to inspect or command.
6. Command AO and BO point types by clicking on the point line and entering a new value.
7. Click on the point line and press the Esc key to perform a release command.
8. Press the Alt+X key to exit to DOS.

Metasys Integrator N2 Bus Checkout Tool at address 1 using rileyhsp.vct													
AI	BI	AO	BO	ADF	ADI	BD	RSt	NuAdr	NuVct	PgDn	PgUp	Exit	
AO	1		67.100	PICU 1 Supply Airflow Setpoint.....									-Pt Count-
AO	2		0.000	PICU 1 Min Exhaust Airflow Setpoint...									AI 30
AO	3		0.000	PICU 2 Supply Airflow Setpoint.....									BI 16
AO	4		0.000	PICU 2 Min Exhaust Airflow Setpoint...									AO 32
AO	5		0.000	Anteroom Supply 1 Airflow Setpoint....									BO 0
AO	6		0.000	Anteroom Supply 2 Airflow Setpoint....									ADF 0
AO	7		0.000	Anteroom Min Exhaust Airflow Setpoint.									ADI 0
AO	8		0.000	PICU 1 Pressure Setpoint.....									BD 0
AO	9		0.000	PICU 2 Pressure Setpoint.....									
AO	10		0.000	Anteroom Pressure Setpoint.....									-N2 Stats-
AO	11		0.000	Iso-Tek 0 High Alarm Setpoint.....									Poll 0
AO	12		0.000	Iso-Tek 0 Low Alarm Setpoint.....									Data 0
AO	13		0.000	Iso-Tek 1 High Alarm Setpoint.....									OvrC 0
AO	14		0.000	Iso-Tek 1 Low Alarm Setpoint.....									RelC 0
0 AO	15		0.000	Iso-Tek 2 High Alarm Setpoint.....									COSs 0
0 AO	16		0.000	Iso-Tek 2 Low Alarm Setpoint.....									Naks 0
AO	17		0.000	PICU 3 Supply Airflow Setpoint.....									CksE 0
AO	18		0.000	PICU 3 Min Exhaust Airflow Setpoint...									LnSE 0
X AO	19		0.000	PICU 4 Supply Airflow Setpoint.....									RTry 100

**Figure 28: Show Point Data Screen**

### **Using the Serial Data Analyzers**

The commissioning software provides serial data analyzers for troubleshooting communication between the Metasys Integrator unit and the vendor devices. The serial data analyzers collect data from the devices on a vendor port. This data aids in establishing whether communication occurs. The available operations are as follows:

- To access the device specific serial data analyzer from the Device Diagnostics screen, enter F2.
- To access the vendor port serial data analyzer from the Port Diagnostic screen, enter F2 for Vendor Port A or F3 for Vendor Port B.
- To pause the flow of data, press F4. To resume the flow of data, press F4 again. To exit the serial data analyzer, press F1.
- To return to the Diagnostics screen, press F2.
- To view a log of the last abnormal events that occurred on a particular port, press F3 from that port's serial data analyzer screen.
- To capture the data being sent to the screen in a text file, copy the contents of the screen and paste into a text file.

If you need help interpreting the data, call your product supplier.

## Collecting Screen Data

You may need to collect Metasys Integrator screen data when getting help from a technical support person. Use the capture text function of Microsoft HyperTerminal to save incoming data to a text file. E-mail this file to your technical support representative using the contact information that appears on the MIG3500 Commissioning Menu.

## Using Advanced Diagnostics

Table 11 provides information on advanced diagnostics fields.

**Table 11: Advanced Diagnostics Fields (Part 1 of 2)**

Field	Description	Normal or Example Reading
<b>Metasys Integrator 300 Flash Statistics</b>		
<b>MAC Address</b>	Similar to a serial number, every MIG3500 Series has a unique 6-byte Media Access Control (MAC) address (displayed in dotted-decimal notation).	00.10.8D.01.A1.45
<b>IP Address</b>	Identifies the IP address assigned to the MIG3500. <b>Note:</b> Typically, the IP address consists of all zeros, because an Ethernet connection is not used for device communication, unless its firmware is being updated.	000.000.000.000
<b>Date of Manufacture</b>	The date the Metasys Integrator firmware was manufactured.	July 5 2008
<b>Application Revision</b>	Revision number of the firmware application.	10.0.0.0000
<b>OS Revision</b>	Revision number of the operating system.	2.1.20.4
<b>CPU Utilization</b>		
<b>CPU Usage</b>	Percentage of total task utilization	0 to 100
<b>Allocated Memory Statistics</b>		
<b>Current Free<sup>1</sup></b>	Memory available for tables and N2 database in bytes, and as a percentage of the total allocated.	447158 89.4%
<b>N2 Database Using</b>	Memory used for the N2 database in bytes and as a percentage of total allocated. The N2 database stores point data for all vendor points. Memory is used as follows: 119 bytes overhead for each N2 address added, plus: <ul style="list-style-type: none"> <li>• 27 bytes for each AI point</li> <li>• 5 bytes for each ADF point</li> <li>• 3 bytes for each BI point</li> <li>• 3 bytes for each BO point</li> <li>• 3 bytes for each ADI point</li> <li>• 7 bytes for each AO point</li> <li>• 2 bytes for each BD point</li> </ul>	8160 1.6%

**Table 11: Advanced Diagnostics Fields (Part 2 of 2)**

Field	Description	Normal or Example Reading
<b>VCTs Using</b>	Amount of memory used for the downloaded vendor communication control tables in bytes and as a percentage of total allocated	20951 4.2%
<b>Total</b>	Total amount of allocated memory in use.	500000
<b>Lowest Free</b>	Smallest block of free acquired memory currently available.	447158 89.4%
<b>Acquired Memory Statistics</b>		
<b>Current Free</b>	Memory available for tables and N2 database in bytes, and as a percentage of the total acquired.	150000 100%
<b>Largest Block Free</b>	Largest block of free acquired memory currently available.	150000 100%
<b>Total</b>	Total amount of acquired memory in use.	150000
<b>Lowest Free</b>	Smallest block of free acquired memory currently available.	149708 99.8%

1. The current free allocated memory should not be less than 10%.

Figure 29 shows an example of an Advanced Diagnostics screen.

```

Advanced Diagnostics                10.0.0   Tue Jan 1, 2008  10:18
-----
MAC Address: 00.10.8D.01.A1.45      Date of Manufacture: [Jul 5 2008]
IP Address:  192.168.134.002        Application Revision: [10.0.0.0000]
                                       OS Revision:         [2.1.20.4  1]

:
:
:                               CPU Usage: [ 5.81 %
:
:
:
: M : ALLOCATED (Bytes) (%) : ACQUIRED (Bytes) (%) :
: E : Current Free [447158] 89.4 : Current Free [150000] 100.0 :
: M : N2 Database Using [ 8160] 1.6 : Largest Block Free [150000] 100.0 :
: O : VCTs Using [ 20951] 4.2 : Total [150000] :
: R : Total [500000] : Lowest Free [149708] 99.8 :
: Y : Lowest Free [447158] 89.4 :
:
-----
F1 Cancel      F2 Error Log      F3 Reset
Press <TAB> or <ENTER> to refresh statistics.

```

**Figure 29: Advanced Diagnostics Screen Example**

## MIG3500 Troubleshooting Guide

Use the information in Table 12 to assist in diagnosing and solving potential MIG3500 operational problems.

**Table 12: MIG3500 Troubleshooting Guide (Part 1 of 3)**

Symptom	Cause	Solution
<b>Metasys MIG Update Utility fails to download the device.</b>	MIG3500 was not power cycled or reloaded.	After clicking the Update Device button, you need to cycle power on the MIG3500 to continue the update process.
	Incorrectly defined MAC address.	Verify that the MAC address of the device you specified is correct. A MAC address sticker on the unit indicates the correct address to use.
	Crossover cable is used directly between the computer and MIG3500.	Use a standard Ethernet patch cable with a network switch or hub between the computer and the MIG3500.
	Bad patch cables	Use reliable patch cables between the devices.
	Computer has no IP address.	Restart the computer and wait a few minutes for the operating system to assign an IP address. Addresses are handed out to any two computers set for dynamic addressing and connected via an Ethernet switch.
	Communication problem	Remove all devices from the network switch or hub except the computer and MIG3500.
<b>VT100 Terminal Emulation software is unable to connect to the Metasys Integrator unit</b>	VT100 settings are not correct.	<ul style="list-style-type: none"> <li>Verify that the computers' settings match the commissioning port settings, which should be: 57600,8,1,N.</li> <li>Verify that the Terminal emulation mode is set to VT100, not Auto.</li> </ul>
	There is incorrect cabling.	<ul style="list-style-type: none"> <li>Verify that the computer is connected to the commissioning port (P1 connector) on the electronics board.</li> <li>Verify that the RS-232 cable pinouts are correct as described in Figure 5.</li> </ul>
<b>Metasys Integrator unit cannot talk to the vendor device</b>	Cable is not connected.	<ul style="list-style-type: none"> <li>Verify that the cables are properly plugged into vendor ports.</li> <li>Verify that the vendor device is connected and powered up.</li> </ul>
	Incorrect cable is being used.	Verify that the cable between the Metasys Integrator unit and vendor device matches the cable specified in the vendor application document.
	Incorrect settings on the Port Configuration screen.	Verify that the vendor port setup matches the settings specified in the vendor application document.
	An incorrect vendor address is entered in the Network Modify/Add/Delete screen.	Verify that the vendor address entered in the Network Modify/Add/Delete screen is left justified.
<b>Point is unreliable (use Show Point Data menu option).</b>	The device is offline.	Verify that the device is online.
	The point does not exist at the vendor device.	Verify that the point exists at the vendor device.
	Custom firmware has not been downloaded.	If using a custom application that requires custom firmware, verify that this firmware has been downloaded.
<b>Point values are incorrect, but point is reliable.</b>	Commissioned with an incorrect .VCT.	Verify that the correct vendor communication table (.VCT) is being used.
	Vendor equipment setup is incorrect.	Refer to vendor documents.

**Table 12: MIG3500 Troubleshooting Guide (Part 2 of 3)**

Symptom	Cause	Solution
<b>Metasys Integrator unit resets automatically.</b>	The Metasys Integrator unit has encountered a serious software error.	<ul style="list-style-type: none"> <li>View the Error Log screen (from the Advanced Diagnostics screen, press F2).</li> <li>Call the Field Support Center.</li> </ul>
<b>Metasys Integrator unit resets cyclically.</b>	The Metasys Integrator unit has encountered a serious software error.	Reflash the unit and reload the VCTs. If this behavior continues, save the error log file, then contact the Field Support Center.
<b>Device repeatedly toggles online and offline.</b>	Commissioned with incorrect .VCT.	Verify that the correct application for the device is being used.
	The 485 converter is malfunctioning.	If a 485 or 422 port-powered converter is being used, use a converter that includes a power supply.
	The vendor device does not support commands.	If you are sending commands, verify that the device is commissioned to support commands. Be aware that the Auto Restore functions of Metasys NCM, Companion, or N30 resends commands as devices report online.
<b>Current date and time are not retained after a restart or shutdown.</b>	Battery may be dead.	Replace the battery with Panasonic® CR2025 or equivalent.
<b>Continuous line status errors occur for an RS-485 vendor trunk.</b>	The vendor communication trunk is experiencing excessive noise or is unbalanced.	Verify End-of-Line (EOL) resistor and cable shield requirements and installation.
<b>MIG3500 is offline to the supervisory controller.</b>	Various	Be sure that 24 VAC power is connected correctly and that the RUN LED is on steady.
		Be sure that communication terminal blocks and other communication connectors are firmly in place.
		Check that the wiring is the correct size (18 AWG minimum for power, 18 AWG for N2 Bus, 26 AWG for Ethernet communication).
		Check that you have set the correct baud rate on each connected device.
		Check the integrity of the wires and cables.
		Be sure that the vendor equipment is online.
	N2 address mismatch.	Check the N2 address defined on the Network Modify/Add/Delete screen of the Metasys Integrator unit to verify it matches the N2 address defined at the supervisory controller.

**Table 12: MIG3500 Troubleshooting Guide (Part 3 of 3)**

Symptom	Cause	Solution
Devices on MIG3500's N2 Bus are offline.	N2 Bus not connected or wired incorrectly.	Verify that the N2 Bus is connected to the RS485A (N2 Bus) terminal and securely wired in correct polarity.
	N2 EOL switches not set properly.	Check that the MIG3500's N2 End-of-Line (EOL) switch is set correctly. Refer to the <i>Setting Terminations</i> section of the <i>N2 Communications Bus Technical Bulletin (LIT-636018)</i> for details on N2 EOL terminations.
	Vendor device is offline.	Check power and wiring to the vendor device.
MIG3500 continually resets every few minutes.	Continual application failure.	Call the Field Support Center for assistance.
FAULT LED flickers, then unit restarts. Continues to restart repeatedly.	Internal fault has occurred.	Call Field Support Center for assistance.
RUN LED continues to blink once every second, even several minutes after MIG3500 was turned on.	MIG3500 is waiting to be commissioned.	Update the controller with the Metasys MIG Update Utility, then try to communicate with it again using the VT100 emulation program.

## Technical Specifications

### MIG3500 Model (Part 1 of 2)

Product Code Number	MS-MIG3520-0
Power Requirement	Dedicated nominal 24 VAC, Class 2 power supply (North America), Safety Extra-Low Voltage (SELV) power supply (Europe), at 50/60 Hz (20 VAC minimum to 30 VAC maximum)
Power Consumption	25 VA maximum
Ambient Operating Temperature	0 to 50°C (32 to 122°F)
Ambient Operating Conditions	10 to 90% RH, 30°C (86°F) maximum dew point
Ambient Storage Temperature	-40 to 70°C (-40 to 158°F)
Ambient Storage Conditions	5 to 95% RH, 30°C (86°F) maximum dew point
Battery	Panasonic CR2025 - Lithium non-rechargeable battery: 3.0 V 160 mAh, with a typical life of 5 to 7 years at 21°C (70°F)
Processor	192 MHz Renesas™ SH4 7760 RISC 32-bit processor
Memory	128 MB Flash nonvolatile memory 128 MB Synchronous Dynamic Random Access Memory (SDRAM)
Operating System	Microsoft Windows CE embedded Release 5.0
Network and Serial Interfaces	One Ethernet port; 10/100 Mbps; 8-pin RJ-45 connector One optically isolated RS-485 port; 9600 bps; pluggable and keyed 4-position terminal block (for N2 Bus connection) One optically isolated RS-485 port; pluggable and keyed 4-position terminal block (for vendor device connection) One RS232C serial port with standard 9-pin sub-D connector (for commissioning purposes only) One RS232C serial port with standard 9-pin sub-D connector (for vendor device connection)
Dimensions (Height x Width x Depth)	131 x 270 x 62 mm (5.2 x 10.6 x 2.5 in.) Minimum space for mounting: 210 x 350 x 110 mm (8.3 x 13.8 x 4.3 in.)

## MIG3500 Model (Part 2 of 2)

<b>Housing</b>	Plastic housing material: ABS + polycarbonate Protection: IP20 (IEC60529)
<b>Mounting</b>	On flat surface with screws on three mounting clips or a single 35 mm DIN rail (DIN rail mount recommended)
<b>Compliance</b>	<b>United States</b> UL Listed (PAZX), UL 916 FCC compliant, CFR47, Part 15, Class B
	<b>Canada</b> UL Listed (PAZX7), CAN/CSA C22.2 No. 205 Industry Canada compliant
	<b>Europe</b> EMC Directive, 89/336/EEC
	<b>Australia/New Zealand</b> C-Tick mark compliant
<b>Shipping Weight</b>	1.2 kg (2.7 lb)

*The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls® office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*



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