



# DeviceMaster® Primo Hardware Installation

Use this document to initially configure the DeviceMaster Primo hardware. It also discusses all hardware related information.

Red, underscored items are links to URLs. Blue, underscored items are links within this document or to another document on the media (CD or web site).

**Note:** *If you copy this document from the ftp/Web or CD and do not use the procedure discussed on the CD, you will get an error message when selecting hyperlinks outside of this document.*

## Product Overview

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The DeviceMaster Primo provides a data communication solution for connecting Windows and Unix/Linux hosts to asynchronous serial devices over a TCP/IP based Ethernet network. You may connect your Windows NT/98/ME/2000/XP host to a native RS-232/422/485 serial port, or your PC-based Unix/Linux host to a fixed tty port, through a TCP/IP Ethernet connection.

With one asynchronous serial port connection on one end, and a 10/100 Mbps Ethernet connection on the other, the DeviceMaster Primo allows any device that primarily supports the asynchronous communications protocol to attach to a network. The DeviceMaster Primo works like an add-on single-port serial board to your PC server, but with one major advantage — the TCP/IP network. Since the host communicates with the COM port on the DeviceMaster Primo over a TCP/IP network, you are able to control your asynchronous serial device from virtually any location.

Although it connects through the virtual link of the Ethernet network, the port on the DeviceMaster Primo is recognized as a real COM port by Windows or a fixed tty port by Unix/Linux. The DeviceMaster Primo provides both the basic transmit/receive data functions, as well as RTS, CTS, DTR, DSR, and DCD control signals.

## Locating the Drivers

You can use the following links to locate the appropriate driver for your host PC system.

- [Windows XP](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinXP/) — [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/WinXP/](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinXP/)
- [Windows 2000](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win2000/) — [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/Win2000/](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win2000/)
- [Windows NT](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinNT/) — [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/WinNT/](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinNT/)
- [Windows 98/Me](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win98/) — [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/Win98/](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win98/)
- [Linux](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Linux/) — [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/Linux/](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Linux/)

## Locating Other Installation Documents

You may need one of these DeviceMaster Primo documents to install the driver in the host PC. You can use the links below to locate the appropriate driver installation document.

- [Windows XP](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinXP/SW_Doc/p1pwinxp.pdf) or [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/WinXP/SW\\_Doc/p1pwinxp.pdf](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinXP/SW_Doc/p1pwinxp.pdf)
- [Windows 2000](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win2000/SW_Doc/p1pwin2k.pdf) or [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/Win2000/SW\\_Doc/p1pwin2k.pdf](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win2000/SW_Doc/p1pwin2k.pdf)

- [Windows NT](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinNT/SW_Doc/p1pwinnt.pdf) or [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/WinNT/SW\\_Doc/p1pwinnt.pdf](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/WinNT/SW_Doc/p1pwinnt.pdf)
- [Windows 98/Me](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win98/SW_Doc/p1pwin9x.pdf) or [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Drivers/Win98/SW\\_Doc/p1pwin9x.pdf](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Drivers/Win98/SW_Doc/p1pwin9x.pdf)
- [Using Pair Connect and Raw Connect](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Raw_Pair/raw_pair.pdf) or [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Raw\\_Pair/raw\\_pair.pdf](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Raw_Pair/raw_pair.pdf)

## Initial Configuration Procedures

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If the DeviceMaster Primo has not been configured for your site, you must first configure the IP address. IP configuration can be done using one of these methods.

- **Telnet session**
- **Serial console mode**
- **Custom Mode** (DeviceMaster Manager), which is automatically installed when installing one of the Windows device drivers. See [Locating Other Installation Documents](#) on Page 1 to locate the appropriate document.

### Telnet Method

Use the following procedure to configure the Primo using a telnet session. The default IP address for the DeviceMaster Primo is 192.168.127.254.

1. Connect the cross-over Ethernet cable supplied with the Primo between the 10/100 Base-T jack and the host PC NIC.

*Note: You may need to temporarily change the IP address on the host PC so that they are on the same subnet.*

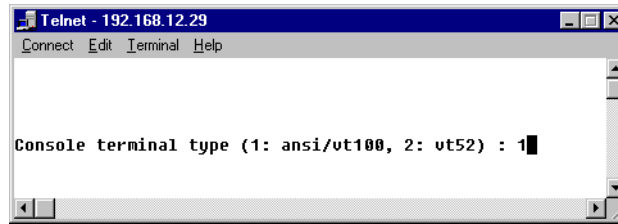
2. Set DIP switch SW1 to OFF (down) to establish a Telnet connection.
3. Plug the power adapter DC plug into the jack labeled DC-IN.
4. Plug the power adapter into an electrical outlet.

*Note: There is no on/off switch. The Primo automatically turns on when plugged into the outlet. The PWR LED on the Primo top panel will glow to indicate that it is receiving power and the Link LED will light when the Primo is properly connected to a live Ethernet device or network. Orange indicates a 10 Mbps Ethernet connection and green indicates a 100 Mbps Ethernet connection.*

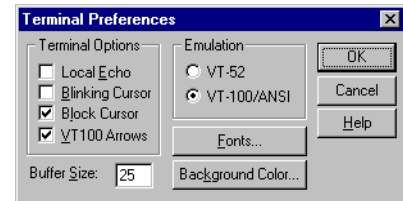
5. Start a Telnet session for either Microsoft Windows or Unix. The following illustrates telnet in Windows NT.
  - a. On the Windows toolbar, select the **Start** button, then select **Run**.



- b. Type **telnet 192.168.127.254** (use your IP address if it is different from the default) in the **Open** box, and then select **OK**.

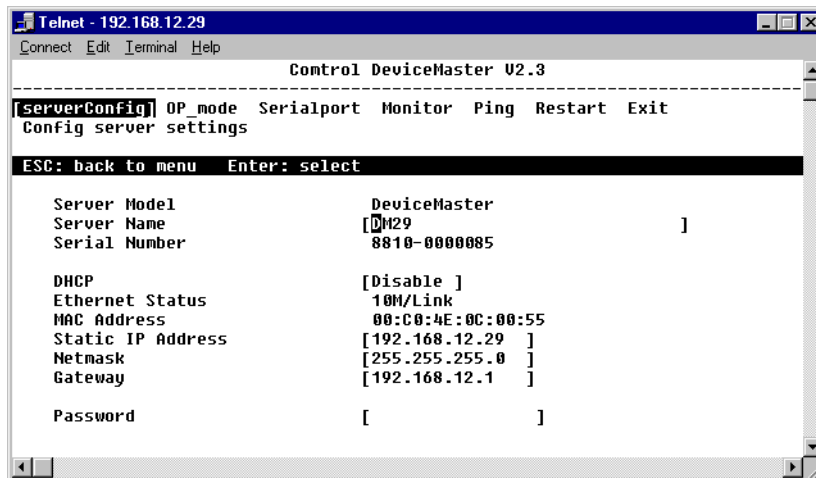


- c. Type **1** to select ansi/vt100 for Console terminal type, and then press the **Enter** key.
- d. If you are prompted for the Console password, type the password and then press the **Enter** key. A connection between your computer and DeviceMaster should now be established, and the DeviceMaster utility program will automatically start running.



**Note:** To ensure proper operation, on the **Terminal** menu, select **Preferences**, and then make sure the **VT100 Arrows** option is selected.

- e. Use the keyboard arrow keys to select **[serverConfig]**, and then press the **Enter** key. The next telnet window appears.



- f. Use the keyboard arrow keys to position the cursor over the first digit of the IP address. Type the correct IP address, and then press the **Enter** key to accept this value.
- g. Press the **ESC** key to return to main menu, and then select **Restart** and press the **Enter** key to activate the change.
6. Optionally remove the Ethernet cross-over cable from the PC host NIC and the Primo. Connect a standard Ethernet cable between the Primo Ethernet port and an Ethernet hub.

7. Set the DIP switch for your serial device using the following table:

SW1	SW2	SW3	Interface Mode
OFF	OFF	OFF	RS-232 Data Comm
	OFF	ON	RS-422
	ON	OFF	RS-485 by RTS (Ready to Send)
	ON	ON	RS-485 by ADDC (Automatic Data Detection)

8. Connect the appropriate serial cable between the DB9 serial port on the Primo and your serial device. See [The Serial Connector and Building Cables](#) on Page 8, if you need to build a cable.
9. Install a device driver on your PC host if you want to use the serial port as a COM or tty port. See [Locating the Drivers](#) and [Locating Other Installation Documents](#) on Page 1 to continue the installation.

To use pair-connect or raw-connect (socket mode), see [ftp://ftp.comtrol.com/Dev\\_Mstr/Primo/Raw\\_Pair/raw\\_pair.pdf](ftp://ftp.comtrol.com/Dev_Mstr/Primo/Raw_Pair/raw_pair.pdf).

## Serial Console Method

Use the following information to configure the Primo using a serial connection.

1. Connect a null-modem cable between the serial port on the Primo and a PC COM port. See [The Serial Connector and Building Cables](#) on Page 8, if you need to build a cable.
2. Set SW1 to ON (up), SW2 or SW3 can be set to any position.
3. Plug the power adapter DC plug into the jack labeled DC-IN.
4. Plug the power adapter into an electrical outlet.

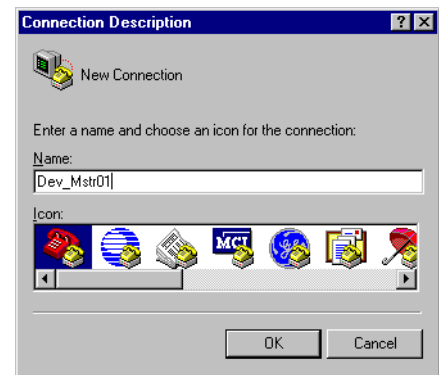
**Note:** *There is no on/off switch. The Primo automatically turns on when plugged into the outlet. The PWR LED on the Primo top panel will glow to indicate that it is receiving power.*



5. Start a terminal emulator such as the latest version of HyperTerminal for Windows or Minicom for Linux. The following procedure uses HyperTerminal in Windows NT.
  - a. On the Window's desktop toolbar, select the **Start** button, then point to **Programs**, then **Accessories**, then **Communications**, then **Hyperterminal**, then select a HyperTerminal session. The **HyperTerminal** window appears.

**Note:** *Some versions of HyperTerminal may or may not support every keystroke.*

- b. On the **File** menu, select **New Connection**. The **Connection Description** dialog box appears.
- c. In the **Name** box, type the desired name and select an icon from the **Icon** list.

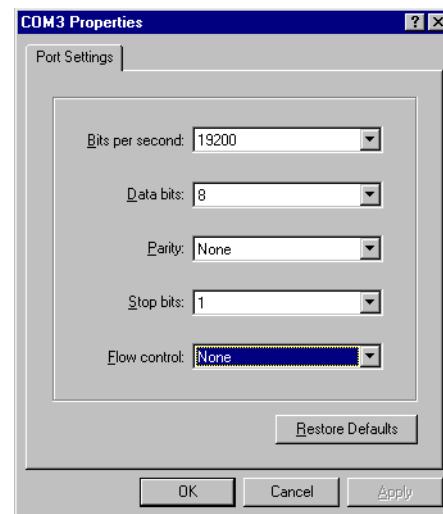


- d. Select the **OK** button. The **Connect To** dialog box appears.

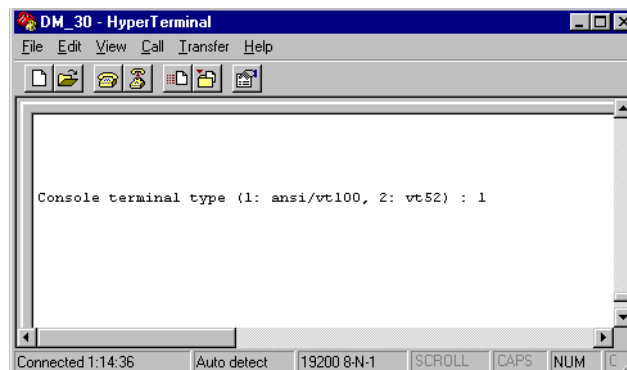


- e. From the **Connect using** drop-down list box, select the COM port that you are using. Select the **OK** button. The **Properties** dialog box appears.
- f. Select the following parameters:

- \* Bits per second: 19200
- \* Data bits: 8
- \* Parity: None
- \* Stop bits: 1
- \* Flow Control: None

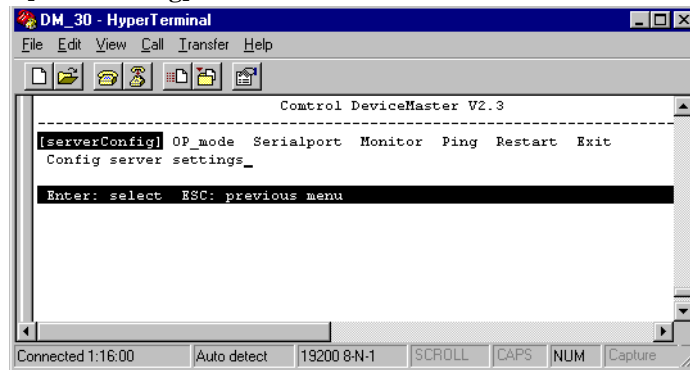


- g. Select the **OK** button. The **HyperTerminal** main window appears.
- h. At the Console terminal type command line, type **1** for ansi/vt100 parameter.

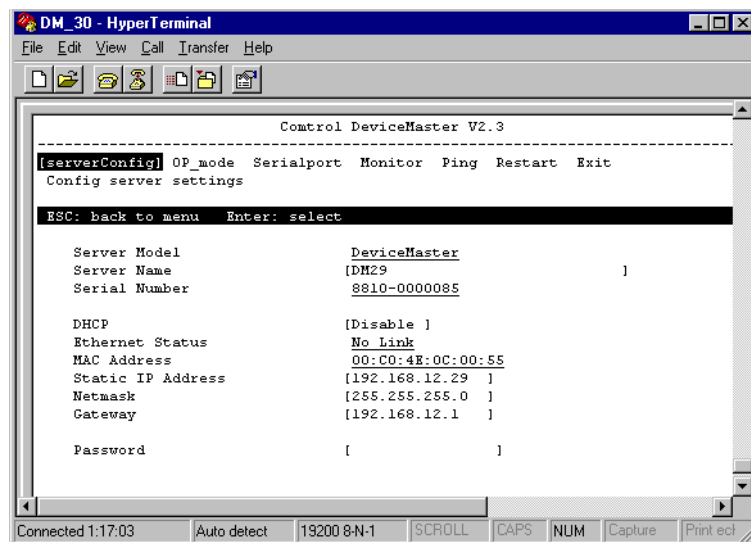


- i. Press the **Enter** key. HyperTerminal displays a configuration menu.

- j. Select **[serverConfig]** from the menu.



- k. Press the **Enter** key. Hyperterminal displays various parameters that are required to configure the DeviceMaster Primo. The parameters are enclosed in square brackets.



- l. If you want to set the IP address of the server, use the keyboard arrow keys to position the cursor over the first digit of the IP address. Type in the correct IP address and then press the **Enter** key to accept this value. Press the **ESC** key to return to the main menu. HyperTerminal displays the previous main menu.
- m. Using the arrow keys, select **Restart** from the menu.
6. Set the DIP switch for your serial device using the following table:

SW1	SW2	SW3	Interface Mode
OFF	OFF	OFF	RS-232 Data Comm
	OFF	ON	RS-422
	ON	OFF	RS-485 by RTS (Ready to Send)
	ON	ON	RS-485 by ADDC (Automatic Data Detection)

7. Disconnect the null-modem cable from the PC COM port.
8. Connect the appropriate serial cable between the DB9 serial port on the Primo and your serial device. See [Building RS-232 Straight-Through Cables](#) on Page 9, if you need to build a cable.

9. Install a device driver on your PC host if you want to use the serial port as a COM or tty port. See [Locating the Drivers](#) and [Locating Other Installation Documents](#) on Page 1 to continue the installation.

To use pair-connect or raw-connect (socket mode), see [ftp://ftp.control.com/Dev\\_Mstr/Primo/Raw\\_Pair/raw\\_pair.pdf](ftp://ftp.control.com/Dev_Mstr/Primo/Raw_Pair/raw_pair.pdf).

## Connecting a Previously Configured Primo

Use the following procedures to connect a previously configured DeviceMaster Primo; that is, the IP has been configured for your network.

1. Connect the appropriate serial cable between the Primo and the serial device. See [The Serial Connector and Building Cables](#) on Page 8, if you need to build a cable.
2. Plug the power adapter DC plug into the jack labeled DC-IN.
3. Plug the power adapter into an electrical outlet.

**Note:** *There is no on/off switch. The Primo automatically turns on when plugged into the outlet. The PWR LED on the Primo top panel will glow to indicate that it is receiving power.*

4. Connect a straight-through Ethernet cable between the 10/100 Base-T jack and the network hub.

**Note:** *The Link LED will light when the Primo is properly connected to a live Ethernet device or network. Orange indicates a 10 Mbps Ethernet connection and green indicates a 100 Mbps Ethernet connection.*



5. Set the DIP switch, using the following table to set the interface mode:

SW1	SW2	SW3	Interface Mode
OFF	OFF	OFF	RS-232 Data Comm
	OFF	ON	RS-422
	ON	OFF	RS-485 by RTS (Ready to Send)
	ON	ON	RS-485 by ADDC (Automatic Data Detection)

**Note:** *After changing the setting of SW1, you must wait a few seconds for the green Ready LED to turn off and on, indicating that the function of the serial port has been changed.*

## Replacing Hardware

Follow this procedure, to replace a DeviceMaster Primo with another DeviceMaster Primo in an existing configuration.

1. Disconnect the power from the Primo to be removed from service.
2. Remove the old unit and attach a new or spare Primo.
3. Connect the new Primo to the network hub or server NIC.
4. Connect the power source to the new Primo.
5. If necessary, change the driver to reflect the MAC or IP address of the new Primo.

6. If necessary, configure any RS-422 or RS-485 ports to match the previous unit.
7. Transfer *all* cabling from the old Primo to the new Primo.
8. It is **not** necessary to shut down and restart the server.

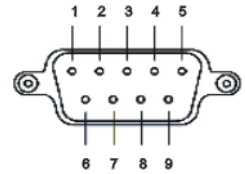
## The Serial Connector and Building Cables

This subsection provides you with information about the serial port pinout, building additional loopback plugs, and building several types of serial cables.

### DB9 Male Pinouts

Use the following illustration and table for DB9 male pinout data.

Pin	RS-232	RS-422	RS-485
1	DCD	TXDB(-)	TXDB/RXDB(-)
2	RXD	TXDA(+)	TXDA/RXDA(+)
3	TXD	RXDA(+)	
4	DTR	RXDB(-)	
5	GND	GND	
6	DSR	RTSB(-)	
7	RTS	RTSA(+)	
8	CTS	CTSA(+)	
9		CTSB(-)	



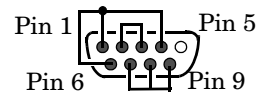
### Building Additional DB9 Loopback Plugs

*Loopback connectors* are DB9 female serial port plugs, with pins wired together as shown, that are used in conjunction with application software to test serial ports.

**Note:** Control includes the *Test Terminal (WCOM32)* program on the CD for Windows 98 and Windows NT drivers. See the on-line help for WCOM32 for information about using these applications. Linux users can use *MiniCom*.

Wire the following pins together to replace a missing RS-232 loopback plug:

- Pins 1 to 4 to 6
- Pins 2 to 3
- Pins 7 to 8 to 9

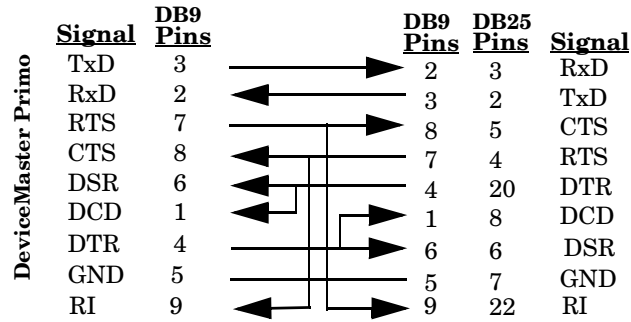


**RS-232 Only  
(Back View)**



**Building (RS-232) Null-Modem Cables**

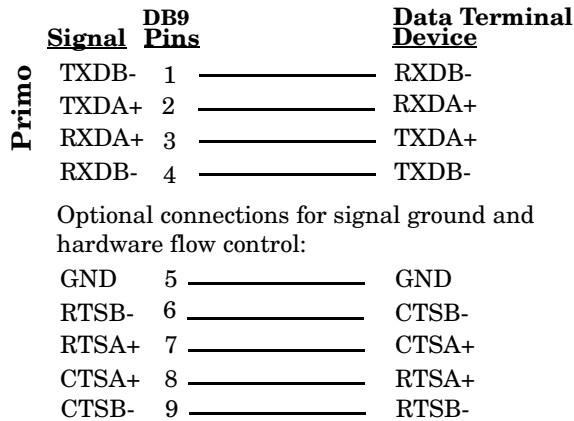
Use the following figure if you need to build a null-modem cable. A null-modem cable is required for connecting DTE devices.



**Note:** You may want to purchase or build a straight-through cable and purchase a null-modem adapter.

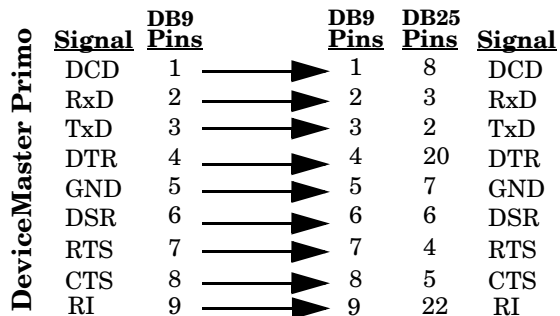
**Building RS-422 Null-Modem Cables**

Use the following figure if you need to build an RS-422 null-modem cable. A null-modem cable is required for connecting DTE devices. Make sure that you use twisted-pair cable.



**Building RS-232 Straight-Through Cables**

Use the following figure if you need to build an RS-232 straight-through cable. Straight-through cables are used to connect modems and other DCE devices.



## Hardware Specifications

### LED Indicators

The top panel on the Primo contains three LED indicators, which described below.

LED Name	LED Function
<b>PWR</b>	Red indicates that the power is on.
<b>Link</b>	Orange indicates a 10 Mbps Ethernet connection. Green indicates a 100 Mbps Ethernet connection.
<b>Ready</b>	Green indicates the Primo is ready.



### Reset Button

The reset button is located next to the Ethernet RJ45 port on the rear panel. To reset the Primo, press the button for three seconds to erase the password and reset the parameters back to the manufacturer's default values.

### DIP Switch

This table illustrates the Primo DIP switch settings.

SW1	SW2	SW3	Interface Mode
ON	---	---	RS-232 Console
OFF	OFF	OFF	RS-232 Data Comm
	OFF	ON	RS-422
	ON	OFF	RS-485 by RTS
	ON	ON	RS-485 by ADDC

### Environmental Conditions

This table illustrates environmental conditions.

Environmental Conditions	Value
Operating temperature*: System off (storage) System on (operational)	-20 to 85°C 0 to 60°C
Altitude	0 to 10,000 feet
Heat output	16.4 BTUs/Hr
Humidity (non-condensing): System on (operational) System off (storage)	8% to 80% 20% to 80%

\* *If this product is stacked, the environmental air flow must insure that the Ambient Operating Temperature does NOT exceed these limits.*

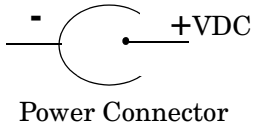
**Electromagnetic Compliances**

This table illustrates electromagnetic compliances for the Primo.

Electromagnetic Compliances	Status
<b>EMC:</b> (conforms to the following standards) FCC Class B EN55022: 1994 class B EN61000-3-2: 1995 class B EN61000-3-3: 1995 EN55082-1: 1997 EN61000-4-2: 1995 Contact Discharge 4kV, Air Discharge 8kV EN61000-4-3: 1995 EN61000-4-4: 1995 AC/DC Power supply 1kV, Data/Signal lines 5kV EN61000-4-5: 1995 AC/DC Line to Line 1kV, AC/DC Line to Earth 2kV EN61000-4-6: 1995 EN61000-4-8: 1993 3A/m at 50Hz EN61000-4-11: 1994	Yes
<b>Safety:</b> EN60950 UL/CUL, TUV	Yes Yes

**Other Specification Information**

This table provides other data that you may require about the Primo.



Topic	Specification
External power supply adapter (if provided): Input line frequency Input line voltage Output voltage Output current  <i>Note: Any power source that meets the output voltage and current requirements can be used.</i>	<i>See illustration at left.</i>  60 Hz 100 - 120VAC 12 VDC 400 mA (minimum)
Processor type	x186 or equivalent
Memory	512 KB
Baud rate/port range	50 bps - 230 Kbps
Ethernet host interface (upstream and downstream)	10/100Base-T (10/100 Mbps - RJ45)
Serial interface	RS-232, RS-422, and RS-485, Dip Switch Selectable
Network protocols	TCP, UDP, ICMP, Telnet, IP, RTelnet, DHCP
Configuration: Data bits Parity Stop bits	7 or 8 Odd, Even, None 1 or 2 (with parity setting of None)
SNMP support	Monitoring only.

## Notices

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This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### Important Safety Information

To avoid contact with electrical current:

- Never install electrical wiring during an electrical storm.
- Never install the power plug in wet locations.
- Use a screwdriver and other tools with insulated handles.



**Warning**

## Technical Support

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If you need technical support, contact Comtrol using one of the following methods.

Contact Method	Corporate Headquarters	Comtrol Europe
FAQs	<a href="http://forum.comtrol.com/">http://forum.comtrol.com/</a>	
Downloads	<a href="http://support.comtrol.com/download.asp">http://support.comtrol.com/download.asp</a>	
E-mail	<a href="mailto:support@comtrol.com">support@comtrol.com</a>	<a href="mailto:support@comtrol.co.uk">support@comtrol.co.uk</a>
Web site	<a href="http://www.comtrol.com">http://www.comtrol.com</a>	<a href="http://www.comtrol.co.uk">http://www.comtrol.co.uk</a>
Fax	(763) 494-4199	+44 (0) 1 869-323-211
Phone	(763) 494-4100	+44 (0) 1 869-323-220
FTP site	<a href="ftp://ftp.comtrol.com">ftp://ftp.comtrol.com</a>	

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**Document Number: 2000212 Rev. E**