



DeviceMaster™ RTS

16-Port Hardware Installation

[Red](#) underscored text link to Internet URLs. [Blue](#) underscored text link to sections within this document or to another document in the library.

Note: *If you copy this document from the ftp/web or CD and do not maintain the file structure, you will get error messages when selecting hyperlinks to other documents.*

Scope

Use this document for information about the following topics:

- Installation overview that discusses the steps you will need to perform for installation and configuration.
- Connecting the DeviceMaster RTS to the network (Page 2).
- Connecting devices to the DeviceMaster RTS (Page 3).
- Connectors, loopback plugs, and building cables:
 - [DB9](#) pinouts and building loopback plugs
 - [RJ45](#) pinouts and building loopback plugs (Page 4)
 - [Null-modem](#), [straight-through](#), and an [RS-485 test](#) cables (Page 4)
- [Adding](#) a unit to an existing installation.
- [Replacing](#) hardware
- Hardware [specifications](#)
- [Technical Support](#)

Product Installation Overview

You will need to perform the following steps to install and configure the DeviceMaster RTS. The CD that ships with the product contains the software and documentation that you will need to setup the DeviceMaster RTS.

Note: *You may want to [use the CD](#) to guide you through the installation and configuration process.*

1. Install the hardware by connecting the DeviceMaster RTS to the network on [Page 2](#).

Note: *You may want to review the [Getting Started](#) document after installing the hardware.*

2. Establish communications with the DeviceMaster RTS using one of the following methods:
 - Serial connection between a COM port on your PC and **Port 1** on the DeviceMaster RTS, which is discussed in the [Establishing Serial Communications for Setup and Configuration](#) document.
 - Telnet connection, which is discussed in the [Establishing Telnet Communications for Setup and Configuration](#) document.

Note: *Optionally, you can use one of the DeviceMaster RTS utilities to establish a connection. You can download the utilities from the appropriate ftp://ftp.comtrol.com/Dev_Mstr/RTS/Utility subdirectory.*

3. [Configure the DeviceMaster RTS](#) network setup using one of the following methods:

- Serial or telnet connection using Redboot
- One of the DeviceMaster RTS utility programs
- NS-Link™ driver if you are planning on using COM or TTY ports:
 - [Linux](#) and [Software Installation](#) documentation
 - [Windows 2000](#) and [Software Installation](#) documentation
 - [Windows 98/ME](#) and [Software Installation](#) documentation
 - [Windows NT](#) and [Software Installation](#) documentation

4. Configure the port attributes on the DeviceMaster RTS using one of these methods:
 - **SocketServer** is the web-based program that you can use to configure port attributes.
 - **NS-Link driver** to configure the COM or TTY port attributes.
5. Connect your serial devices on Page 3.

Connecting to the Network

Use the following procedure to install the DeviceMaster RTS and connect it to your ethernet hub, ethernet switch, or a server's NIC.

1. Record the MAC address, model number, and serial number of the DeviceMaster RTS unit on the customer service label provided.

Note: You may need the MAC address during driver configuration.

Serial Number*	MAC*
	00 C0 4E _ _ _ _ _

* The serial number and MAC address are located on a label on the unit.

2. Place the DeviceMaster RTS on a stable surface, or in a rack.

Rack Installation:

- a. Attach the L brackets to the interface using the screws supplied with the unit.
- b. You can mount the unit facing in either direction.
- c. Attach the L bracket into your rack



3. Connect the DeviceMaster RTS to the ethernet network using one of the following methods:

- **Ethernet hub or switch (10/100Base-T):** Connect to the port labeled **UP** on the DeviceMaster RTS using a standard ethernet cable.
- **Server NIC (10/100Base-T):** Connect to the port labeled **DOWN** on the DeviceMaster RTS using a standard ethernet cable.
- **Daisy chaining DeviceMaster RTS units:** Connect the port labeled **DOWN** on the first DeviceMaster RTS to the port labeled **UP** on the second DeviceMaster RTS or other device using a standard ethernet cable.



Note: Do not connect multiple units until you have changed the default IP address because all DeviceMaster RTS units have **192.168.250.250** as the default address (Host Name).



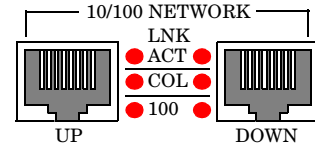
The DeviceMaster RTS NS-Link driver's default port setting is RS-232. Make sure that you do not connect RS-422 / 485 devices until the appropriate port interface type has been configured in NS-Link.

4. Connect the AC power adapter to the DeviceMaster.
 5. Connect the power cord to the power adapter and plug the power cord into a power source.
- Note:** You may need to select the appropriate AC power cable for your location.
6. Verify that the network connection for the DeviceMaster RTS is functioning properly:
 - The red **PWR LED** on the front panel of the DeviceMaster RTS is lit, indicating you have power and it has completed the boot cycle.

Note: The PWR LED flashes while booting and it takes approximately 10 seconds for the bootloader to complete the cycle.

- The red LNK ACT LED is lit, indicating that you have a working Ethernet connection.
- The red 100 LED is lit, indicating a working 100 MB Ethernet connection (100 MB network, only).

Note: If necessary, see the [Adding a Unit to an Existing Installation](#) discussion (Page 5).



If the red COL LED is lit, there is a network collision.

7. Ping the DeviceMaster RTS default IP address: **192.168.250.250**. (If you are reading this from the *DeviceMaster RTS CD*, you can use this [shortcut](#) to run a DOS batch file that will ping the default address.)
8. Program the IP address into the DeviceMaster RTS flash ROM to prepare the device for port configuration. (See [Step 3](#) in the *Product Installation Overview* for information.)

Connecting Devices

Use the following discussion to connect asynchronous serial devices to the DeviceMaster RTS ports.



If necessary, make sure that you have configured the ports using the *NS-Link* driver or *SocketServer* for the correct communications mode before connecting any devices. The default mode in the *NS-Link* drivers is RS-232. There is a remote possibility that connecting a peripheral for the wrong mode could damage the peripheral.

1. Connect your serial devices to the appropriate port on the DeviceMaster RTS using the appropriate cable. You can build your own cables using the [Building Null-Modem Cables](#) (Page 4) or [Building Straight-Through Cables](#) (Page 4) discussions.

Note: Use the hardware manufacturer's installation documentation if you need help with connector pinouts or cabling for the peripheral device.

2. Verify that the devices are communicating properly:

- The yellow Rx LED shows that the data receiver is connected to another RS-232 device or receiving data in RS-422/485 mode.
- The green Tx LED shows that the data is transmitting.

Rx1* ●
Tx1* ● 1* represents the port number

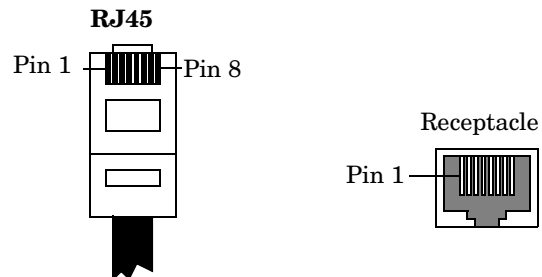
Locate the appropriate subsection with these links:

- [RJ45 Connector Pinouts](#)
- [Building Additional RJ45 Loopback Plugs](#) (Page 4)
- [Building Null-Modem Cables](#)
- [Building Straight-Through Cables](#)
- [Building an RS-485 Test Cable](#)

RJ45 Connector Pinouts

Use the following pinout information for the RJ45 serial port connectors on the DeviceMaster RTS.

Pin	RS-232	RS-422	RS-485
1	RTS	TxD+	TxD/RxD+
2	DTR	Not Used	Not Used
3	Signal GND	Not Used*	Not Used*
4	TxD	TxD-	TxD/RxD-
5	RxD	RxD-	Not Used
6	DCD	Not Used	Not Used
7	DSR	Not Used	Not Used
8	CTS	RxD+	Not Used

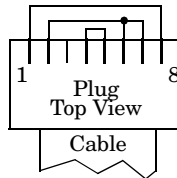


* Pin 3 is tied to ground on the board, but is not used in the cable.

Building Additional RJ45 Loopback Plugs

Loopback connectors are RJ45 serial port plugs, with pins wired together as shown, that are used in conjunction with application software to test serial ports. The DeviceMaster RTS is shipped with a single loopback plug (RS-232/422).

- Pins 4 to 5
- Pins 1 to 8
- Pins 2 to 6 to 7



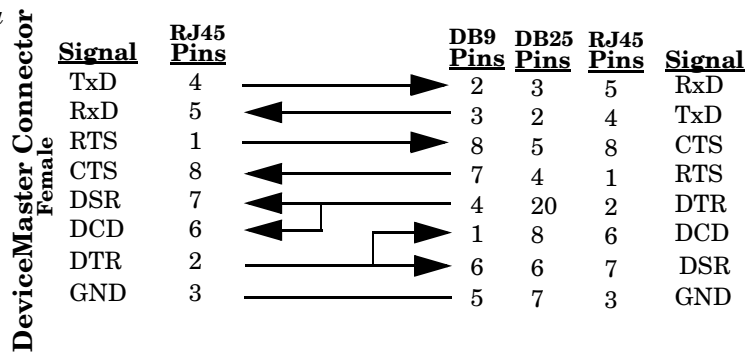
The RS-232 loopback plug also works for RS-422.

Note: Drivers for Windows 98 and Windows NT are bundled with the Test Terminal (WCOM32) program. Linux users can use MiniCom. See the NS-Link driver documentation for your system for information about using these applications.

Building Null-Modem Cables

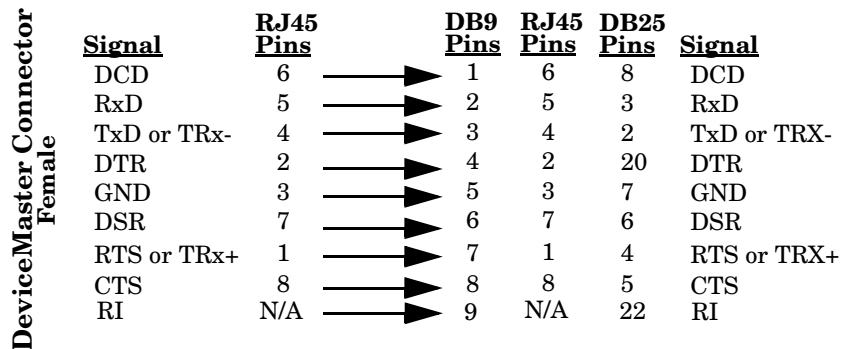
Use the following figure if you need to build a null-modem cable. A null-modem cable is required for connecting DTE devices.

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



Building Straight-Through Cables

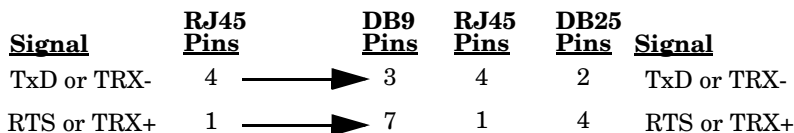
Use the following figure if you need to build a straight-through cable. Straight-through cables are used to connect DCE devices.



Building an RS-485 Test Cable

You can use a straight-through cable [as illustrated previously](#), or build your own cable.

RS-485 Loopback Cable for WCOM or MiniCom



Adding a Unit to an Existing Installation

Use this procedure to add another DeviceMaster RTS to an existing configuration.

1. Install the DeviceMaster RTS to an Ethernet hub or server NIC using the [Connecting to the Network](#) discussion.
2. Power-up the new DeviceMaster RTS and verify that the PWR LED lights.
3. Program an IP address into the new DeviceMaster.
4. Configure serial ports to support the serial devices.

Replacing Hardware

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

1. Configure the IP address of the new DeviceMaster.
2. Disconnect the power from the DeviceMaster RTS to be removed from service.
3. Remove the old unit and attach a new or spare DeviceMaster RTS.
4. Connect the new DeviceMaster RTS to the network hub or server NIC.
5. Connect the power source to the new DeviceMaster RTS and verify that it passes the power on self-test.
6. If necessary, change the NS-Link driver to reflect the MAC or IP address of the new DeviceMaster RTS.
7. If necessary, configure any RS-422 or RS-485 ports to match the previous unit.
8. Transfer *all* cabling from the old DeviceMaster RTS to the new DeviceMaster RTS.
9. *It is not necessary* to shut down and restart the server.

DeviceMaster RTS Specifications

Environmental Conditions	Value
Air temperature: System on (operational) System off (storage)	0 to 45°C -20 to 85°C
Altitude	0 to 10,000 feet
Heat output	40.1 BTU/Hr
Humidity (non-condensing): System on (operational) System off (storage)	8% to 80% 20% to 80%
Mean Time between Failures (MTBF)	13.2 years

Electromagnetic Compliances	Status
Emission: Canadian EMC requirements CISPR-22/EN55022 Class A FCC Part 15 Class A	Yes Yes Yes
Immunity: EN55024: 1998 IEC 1000-4-3: 1996 RF IEC 1000-4-4: 1994 Fast Transient IEC 1000-4-5: 1995 Surge IEC 1000-4-6: 1996 Conducted disturbance IEC 1000-4-8: 1994 Magnetic field IEC 1000-4-11: 1994 Dips and Voltage Variations IEC 1000-4-2: 1995 ESD	Yes Yes Yes Yes Yes Yes Yes
Safety: EN60950 UL Listed	Yes Yes

Topic	Specification
Current consumption	490 mA
Power consumption	11.76 W
External power supply: Line frequency Line voltage	50 - 60 Hz 100 - 240VAC
Processor type	ARM7
Memory	8M SDRAM/4M flash
Real time clock	Battery backup, 256 RAM, watchdog time/power off monitor
Baud rate/port (maximum)	230.4 Kbps
Ethernet host interface (upstream and downstream)	10/100Base-T (10/100 Mbps - RJ45)
Serial interface	RS-232, RS-422, and RS-485
Serial connector types	RJ45
Network default values IP address Subnet mask Gateway	192.168.250.250 255.255.0.0 192.168.250.1
Network protocols	TCP, UDP, BOOTP, TFTP, ICMP, ARP, SNMP (MIB-II), Telnet, HTTP
NS-Link control: Data bits Parity Stop bits	7 or 8 Odd, Even, None 1 or 2
SNMP support	Monitoring only.
Dimensions	17.25" x 8.0" x 1.74"
Weight (hub, only)	36.3 oz

Notices

Radio Frequency Interference (RFI) (FCC 15.105)

This equipment has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules.

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.

Labeling Requirements (FCC 15.19)

This equipment complies with part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Comtrol Corporation may void the user's authority to operate this equipment.

Serial Cables (FCC 15.27)

This equipment is certified for Class A operation when used with unshielded cables.

Underwriters Laboratory

This equipment is Underwriters Laboratory "UL" listed.

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.



Technical Support

You may want to review the [DeviceMaster RTS Technical Support](#) document. This document contains troubleshooting procedures that you may want to perform before contacting Technical Support because they will request that you perform, some or all of the procedures before they will be able to help you diagnose your problem.

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

Contact Method	Corporate Headquarters	Comtrol Europe
FAQ/Online	http://www.comtrol.com/coperate.htm#online	
Email	support@comtrol.com	support@comtrol.co.uk
Web site	http://www.comtrol.com	http://www.comtrol.co.uk
Fax	(763) 494-4199	+44 (0) 1 869-323-211
Phone	(763) 494-4100	+44 (0) 1 869-323-220
FTP site	ftp://ftp.comtrol.com	

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The logo for DIREKTRONIK is written in a bold, italicized, red sans-serif font with a white outline.

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