Moxa EtherDevice™ Router

EDR-G903/G902
Hardware Installation Guide

Second Edition, July 2011

Package Checklist

The Moxa EtherDevice Router is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- 1 EtherDevice Router
- Hardware Installation Guide
- CD-ROM with User's Manual and Windows utility
- Moxa product warranty statement
- RJ45 to DB9 console port cable
- Protective caps for unused ports

Features

Advanced Industrial Networking Capability

- Router/Firewall/VPN all in one.
- High performance Gigabit copper/fiber combo port.
- Supports 1 WAN, 1 LAN, and 1 user-configurable WAN or DMZ interface (EDR-G903).
- Supports 1 WAN and 1 LAN (EDR-G902)
- Firewall with Quick Automation Profile for Fieldbus protocols.
- Network address translation (N-to-1, 1-to-1, and port forwarding).
- Intelligent PolicyCheck and SettingCheck tools.
- -40 to 75°C operating temperature (T models).
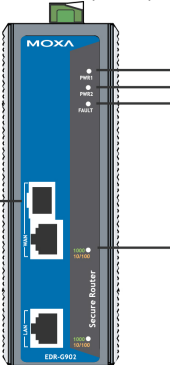
Panel Views of EtherDevice Router

Front Panel (G903)
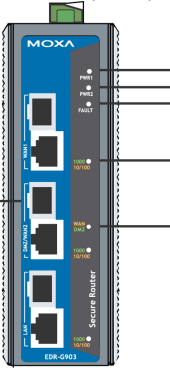
Front Panel (G903):

1. WAN1, DMZ/WAN2, LAN port: 10/100/1000 BaseT(X) or 100/1000Base SFP slot combo ports
2. Power input PWR1 LED
3. Power input PWR2 LED
4. Fault LED
5. 10/100/1000BaseT(X) LED indicator
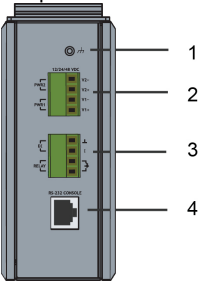6. LED for DMZ/WAN2 port

Front Panel (G902)

Front Panel (G902):

1. WAN, LAN port 10/100/1000 BaseT(X) or 100/1000Base SFP slot combo ports
2. Power input PWR1 LED
3. Power input PWR2 LED
4. Fault LED
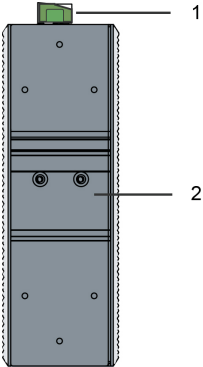5. 10/100/1000BaseT(X) LED indicator

Top Panel

Top Panel:

1. Grounding screw
2. 4-pin terminal block for PWR 1, PWR 2
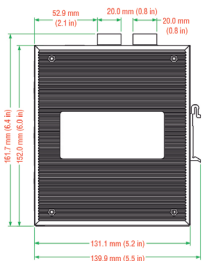3. 4-pin terminal block for DI and Relay
4. RS-232 console port

Rear Panel

Rear Panel:

1. Terminal block
2. DIN-Rail kit
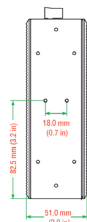
Mounting Dimensions (unit = mm)

Side View   Front View (EDR-G903)   Front View (EDR-G902)   Rear View   DIN-Rail Mounting Kit

DIN-Rail Mounting

The aluminum DIN-Rail attachment plate should already be fixed to the back panel of the EtherDevice Router when you take it out of the box. If you need to reattach the DIN-Rail attachment plate to the EtherDevice Router, make sure the stiff metal spring is situated towards the top, as shown in the following figures.

STEP 1—Insert the top of the DIN-Rail into the slot just below the stiff metal spring.

STEP 2—The DIN-Rail attachment unit will snap into place as shown in the following illustration.
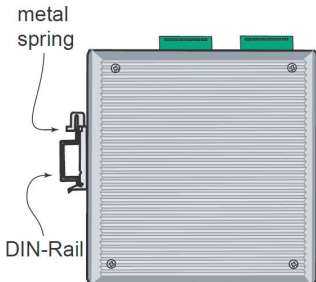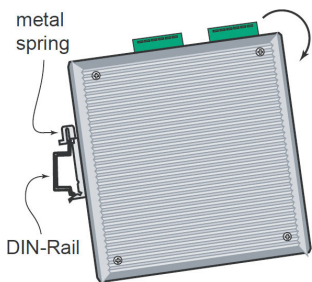
To remove the EtherDevice Router from the DIN-Rail, simply reverse Steps 1 and 2 above.

Wiring Requirements

Please read and follow these guidelines:

• Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
  NOTE: Do not run signal or communications wiring and power wiring through the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.
• You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring sharing similar electrical characteristics can be bundled together
• You should separate input wiring from output wiring
• We advise that you label the wiring to all devices in the system.

Grounding the Moxa EtherDevice Router

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

> ⚠️ **ATTENTION**
>
> This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.

Wiring the Relay Contact

The EtherDevice Router has one set of relay outputs. This relay contact uses one contacts of the terminal block on the EtherDevice Router's top panel. Refer to the next section for detailed instructions on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor.

In this section, we illustrate the meaning of the contact used to connect the relay contact.
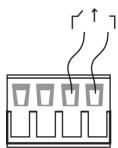
Top View
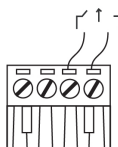
Front View

FAULT:
The two right contacts of the 4-pin terminal block connector are used to detect user-configured events. The two wires attached to the fault contacts form an open circuit when a user-configured event is triggered. If a user-configured event does not occur, the fault circuit remains closed.

Wiring the Redundant Power Inputs

The EtherDevice Router has two sets of power inputs—power input 1 and power input 2. The top and front views of one of the terminal block connectors are shown here.

V2- V2+   V1- V1+

Top View

V2- V2+   V1- V1+

Front View

STEP 1: Insert the negative/positive DC wires into the V-/V+ terminals, respectively.
STEP 2: To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.
STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the EtherDevice Router's top panel.

Wiring the Digital Inputs

The EtherDevice Router has one set of digital input, DI. The DI consists of two left contacts of the 4-pin terminal block connector on the EtherDevice Router's top panel, which are used for the DC inputs. The top and front views of one of the terminal block connectors are shown here.

Top View

Front View

STEP 1: Insert the negative (ground)/positive DI wires into the ⊥/I terminals, respectively.
STEP 2: To keep the DI wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.
STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the EDR-G903's top panel.
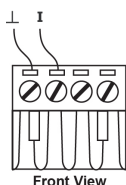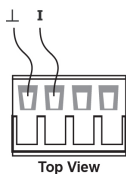
Communication Connections

Each EtherDevice Router has 2 types of communication port:

- 1 RJ45 console port (RS-232 interface)
- 3 combination 10/100/1000T(X)/1000BaseSFP ports (EDR-G903)
- 1 combination 10/100/1000T(X)/1000BaseSFP port and 1 10/100/1000T(X) Ethernet port (EDR-G902)

RS-232 Connection

The EtherDevice Router has one RS-232 (10-pin RJ45) console port, located on the top panel. Use either an RJ45-to-DB9 (see the cable following wiring diagrams) to connect the EtherDevice Router's console port to your PC's COM port. You may then use a console terminal program, such as Moxa PComm Terminal Emulator, to access the EtherDevice Router's console configuration utility.

RJ45 (10-pin) Console Port Pinouts

Pin	Description
1	------
2	DSR
3	RTS
4	------
5	TxD
6	RxD
7	GND
8	CTS
9	DTR
10	------
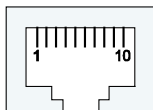
RJ45 (10-pin) to DB9 (F) Cable Wiring

RJ45 Connector		Cable Wiring		Female DB9 Connector
DCD	1	───────────	1	DCD
DSR	2	───────────	6	DTR
RTS	3	───────────	7	CTS
GND	4/7	───────────	5	GND
TxD	5	───────────	3	RxD
RxD	6	───────────	2	TxD
CTS	8	───────────	8	RTS
DTR	9	───────────	4	DSR

10/100/1000BaseT(X) Ethernet Port Connection

The 10/100/1000BaseT(X) ports located on Moxa EtherDevice Router's front panel are used to connect to Ethernet-enabled devices. Most users will choose to configure these ports for Auto MDI/MDI-X mode, in which case the port's pinouts are adjusted automatically depending on the type of Ethernet cable used (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.
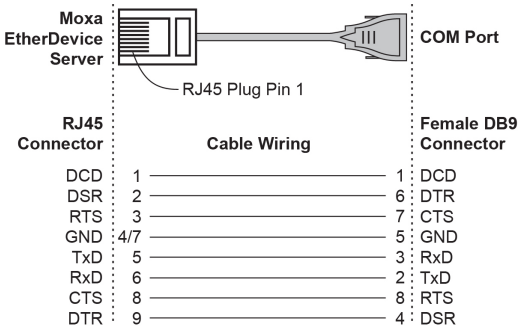
In what follows, we give pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports. We also give cable wiring diagrams for straight-through and cross-over Ethernet cables.

10/100Base T(x) RJ45 Pinouts

MDI Port Pinouts

Pin	Signal
1	**Tx+**
2	**Tx-**
3	**Rx+**
6	**Rx-**

MDI-X Port Pinouts

Pin	Signal
1	**Rx+**
2	**Rx-**
3	**Tx+**
6	**Tx-**

8-pin RJ45
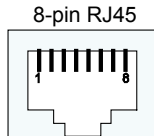
1000BaseT RJ45 Pinouts

Pin	MDI	MDI-X
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-
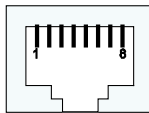
RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring

RJ45 Connector	Cable Wiring		RJ45 Connector
Tx+	3	3	Rx+
Tx-	6	6	Rx-
Rx+	1	1	Tx+
Rx-	2	2	Tx-
DD+	4	4	DC+
DD-	5	5	DC-
DC+	7	7	DD+
DC-	8	8	DD-
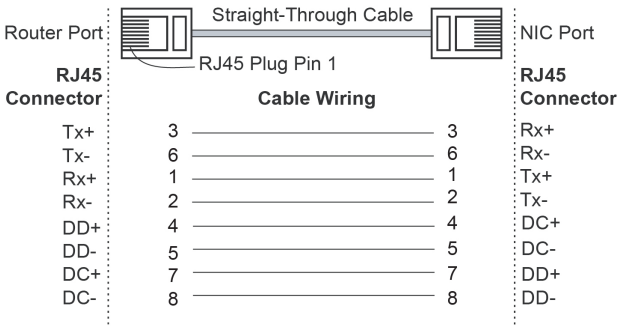
RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring

RJ45 Connector	Cable Wiring		RJ45 Connector
(Rx+) Tx+	3	1	Rx+ (Tx+)
(Rx-) Tx-	6	2	Rx- (Tx-)
(Tx+) Rx+	1	3	Tx+ (Rx+)
(Tx-) Rx-	2	6	Tx- (Rx-)
(DD+) DC+	4	7	DD+ (DC+)
(DD-) DC-	5	8	DD- (DC-)
(DC+) DD+	7	4	DC+ (DD+)
(DC-) DD-	8	5	DC- (DD-)
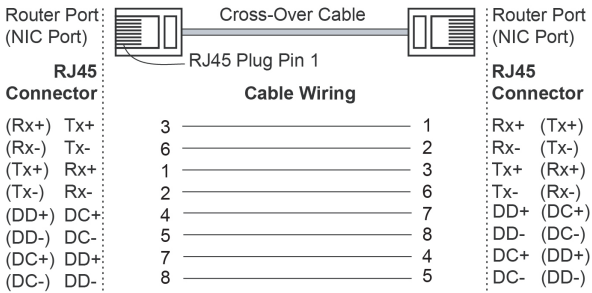
100 BaseFX or 1000BaseSFP Fiber Port

The Gigabit Ethernet ports on the EtherDevice Router are SFP slots, which require 100BaseFX SFP or Gigabit mini-GBIC fiber transceivers to work properly. Moxa provides complete transceiver models for various distance requirements.

The concept behind the LC port and cable is quite straightforward. Suppose you are connecting devices I and II. Unlike electrical signals, optical signals do not require a circuit in order to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used to transmit data from device II to device I, for full-duplex transmission.

Remember to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you make your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A and B-to-B, as shown below, or A1-to-A2 and B1-to-B2).
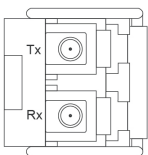
LC-Port Pinouts   **LC-Port to LC-Port Cable Wiring**

Cable Wiring		
A		A
B		B
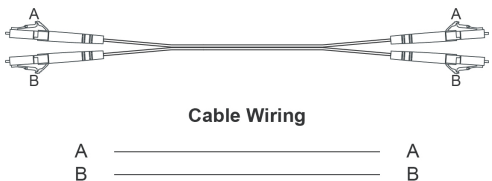
> ⚠️ **ATTENTION**
>
> This is a Class 1 Laser/LED product. To avoid causing serious damage to your eyes, do not stare directly into the Laser Beam.

LED Indicators

The front panel of the Moxa EtherDevice Router contains several LED indicators. The function of each LED is described in the following table:

LED	Color	State	Description
PWR1	AMBER	On	Power is being supplied to power input P1 on the main module.
		Off	Power is **not** being supplied to power input P1 on the main module.
PWR2	AMBER	On	Power is being supplied to power input P2 on the main module.
		Off	Power is **not** being supplied to power input P2 on the main module.
FAULT	RED	On	When a user-configured event is triggered.
		Off	When a user-configured event has not been triggered.
10/100/1000M	AMBER	On	TP or FX port's 10/100 Mbps link is active.
		Blinking	Data is being transmitted at 10/100 Mbps.
		Off	TP or FX port's 10/100 Mbps link is inactive.
	GREEN	On	TP or FX port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps.
		Off	TP or FX port's 1000 Mbps link is inactive.
WAN/DMZ (EDR-G903 only)	AMBER	On	The WAN2/DMZ port is set to the "WAN" function.
		Off	The WAN2/DMZ port is disabled.
	GREEN	On	The WAN2/DMZ port is set to the "DMZ" function.
		Off	The WAN2/DMZ port is disabled.

Specifications

Technology

Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3ab for 1000BaseT(X) IEEE 802.3z for 1000BaseX
Protocols	SNMPv1/v2c/v3, DHCP Server/Client, TFTP, NTP, HTTP, HTTPS, Telnet, SSH, Syslog, SMTP, LLDP, PPPoE, PPTP, Dynamic DNS, QoS (Quality of Service)
Flow Control	IEEE 802.3x flow control, back pressure flow control

Interface

RJ45 Ports	10/100/1000BaseT(X) auto negotiation speed
Fiber Ports	100/1000BaseSFP slot
LED Indicators	PWR1, PWR2, FAULT, 10/100/1000M, DMZ/WAN
Alarm Contact	One relay output with current carrying capacity of 1 A @ 24 VDC
Digital Input	1 input • For state "1": +13 to +30 V • For state "0": -30 to +3 V • Max. input current: 8 mA

Power

Input Voltage	12/24/48 VDC redundant dual inputs
Connection	Removable terminal block
Overload Current Protection	Present
Reverse Polarity Protection	Present

Physical Characteristics

Housing	Metal
Dimensions (W × H × D)	51.2 × 152 × 131.1 mm (2.02 × 5.98 × 5.16 in)
Weight	1250g
Installation	DIN-Rail mounting

Environmental Limits

Operating Temperature	0 to 60°C (32 to 140°F), standard models -40 to 75°C (-40 to 167°F) for -T models
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	5 to 95% (non-condensing)

Regulatory Approvals

Safety	UL 508(Pending)
EMI	FCC Part 15, CISPR (EN55022); class A
EMS	IEC 61000-4-2 (ESD), level 3;

	IEC 61000-4-3 (RS), level 3;
	IEC 61000-4-4 (EFT), level 3;
	IEC 61000-4-5 (Surge), level 3;
	IEC 61000-4-6 (CS), level 3

Shock	IEC60068-2-27
Free Fall	IEC60068-2-32
Vibration	IEC60068-2-6
WARRANTY	5 years

Technical Support Contact Information

www.moxa.com/support