| **LIGHTNING SURGE PROTECTOR FOR** LONWORKS (ultra-slim, FTT-10A) | MODEL **MD7LWA** |
| --- | --- |

# BEFORE USE ....

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

## ■ PACKAGE INCLUDES:

Surge protector.....................................................................(1)

## ■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

## ■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

---

**LIMITATION APPLICABLE TO M-RESTER**

The M-RESTER will protect electronics equipment from damage caused by lightning by absorbing most of the surge voltages.

However, M-RESTER may not be effective against certain extremely high voltages caused by a direct or almost direct hit by lightning.

M-RESTER must be installed according to this installation / instruction manual.

---

# GENERAL

## ■ FUNCTION & FEATURES

- High discharge current capacity 20 kA (8 / 20 µs), 1 kA (10 / 350 µs)
- Ultra-thin 7-mm-wide module can be mounted in high density
- Excellent protection employing multi-stage SPD circuits
- DIN rail mounting and grounding
- Shield terminal provided

## ■ SPECIFICATIONS

| | LINE TO LINE | LINE TO EARTH | SHLD TO EARTH |
| --- | --- | --- | --- |
| Max. continuous operating voltage (Uc) | ±1.5V | ±100V | ±160V[*1] |
| Voltage protection level (Up) @4kV (1.2 / 50 µs) | ±30V | ±370V | ±800V[*1] |
| Leakage current @Uc | ≤ 5µA | ≤ 20µA | ≤ 5µA[*1] |
| Response time | ≤ 4 nsec. | ≤ 20 nsec. | ≤ 20 nsec.[*1] |
| Approx. capacitance @10 kHz | 100 pF | 100 pF | 5 pF[*1] |
| Max. discharge current (Imax) | 20kA (8 / 20 µs) 1.0kA (10 / 350 µs) | | |
| Nominal current ($I_N$) | 100mA | | |
| Internal series resistance | ≤3.3Ω including return | | |
| Insertion loss | -0.5 dB max. @DC...5 MHz, $Z_0$ = 100Ω | | |

[*1]. Values for the MD7LWA-FF.
Shortcircuited for the MD7LWA-FG.

# POINTS OF CAUTION

## ■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -25 to +85°C (-13 to +185°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.
- This unit needs a DIN rail as earth grounding bar. Oxide coating of an aluminium rail may lower the electric conductivity between this module and the ground. Use a steel or copper rail.

## ■ NETWORK SPECIFICATIONS

- The MD7LWA is applicable to networks which consist only of FTT-10A. Not applicable to the ones connected to Link Power network.
- For detailed information on the network, refer to LONWORKS FTT-10A Free Topology Transceiver User's Guide provided by Echelon.
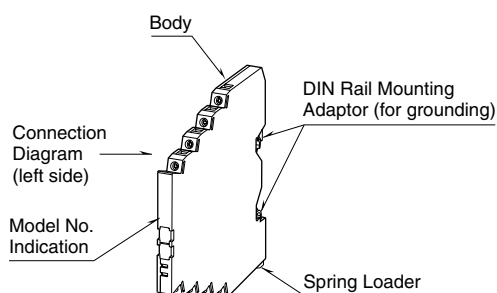
## ■ DIELECTRIC STRENGTH TESTING

- The surge protector starts discharging when 100V or greater voltage is applied between lines and earth. Remove the grounding wire before conducting a test. Be sure to return the wire after the test.

## ■ AND ....

- We recommend that you keep spare surge protectors so that you can replace them when necessary.
- Lightning surge can enter not only through signal lines but also through power supply lines. We recommend that you also use the Lightning Surge Protector for Power Lines for adequate protection.

# COMPONENT IDENTIFICATION



Body

DIN Rail Mounting
Adaptor (for grounding)

Connection
Diagram
(left side)

Model No.
Indication

Spring Loader

# INSTALLATION

Mount the unit on a DIN rail.  Once installed, do not move it to another DIN rail.

■ **MOUNTING THE UNIT ON A DIN RAIL**

A) Hang the upper hook of the DIN rail mounting adaptor at the rear side of unit, on the DIN rail.

B) Push in the lower in keeping pressing the unit to the DIN rail.

C) DIN rails generally have slight individual variability in size.  If you find it difficult to push in the lower part, go back to (A) and hang the upper part more deeply onto the rail and try (B) again.



DIN Rail

A

B
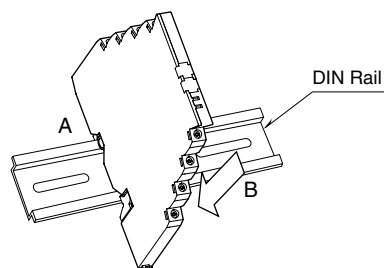
■ **REMOVING THE UNIT**

A) Push down the spring loader utilizing a minus screwdriver.

B) Confirm that it is pulled enough down and pull out the lower part of the unit.

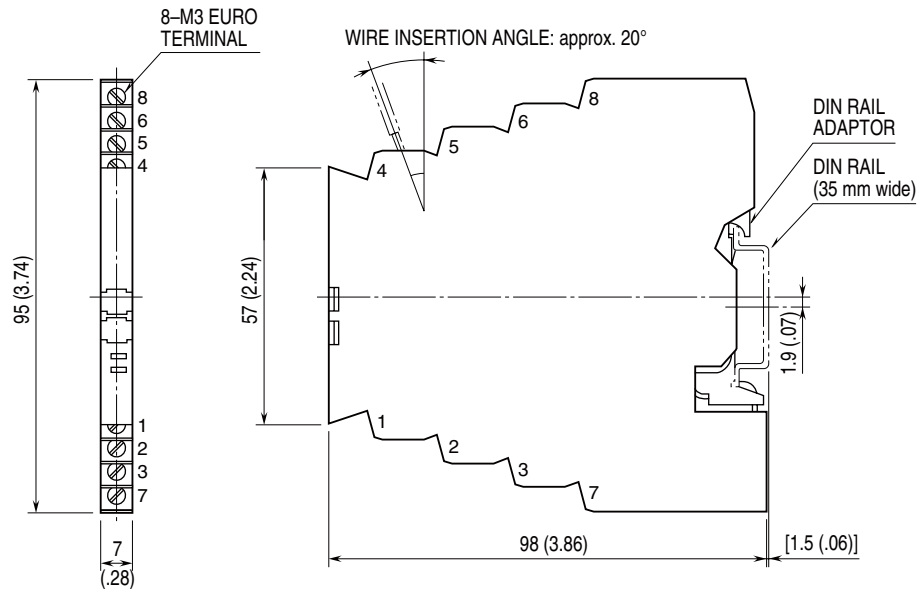C) Detach the upper part from the DIN rail.



C

B

Spring Loader

A
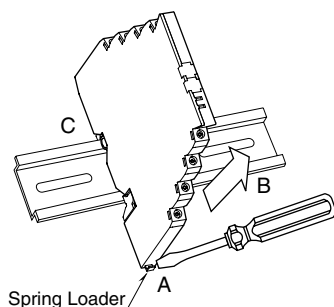
# TERMINAL CONNECTION
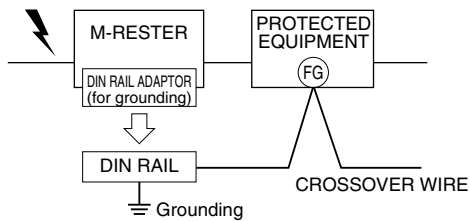
Connect the unit as in the diagram below.

Be sure to ground the DIN rail on which the unit is mounted and cross-wire between the rail and FG terminal of the protected device as shown in Figure 1 in order to equalize the earth potential.

When the unit is connected with a device which has no FG terminal, ground the surge protector only.

## ■ EXTERNAL DIMENSIONS  unit: mm (inch)

8–M3 EURO TERMINAL

WIRE INSERTION ANGLE: approx. 20°

DIN RAIL ADAPTOR

DIN RAIL (35 mm wide)

95 (3.74)

57 (2.24)

1.9 (.07)

7 (.28)

98 (3.86)

[1.5 (.06)]

## ■ Figure 1. GROUNDING

M-RESTER

DIN RAIL ADAPTOR (for grounding)

PROTECTED EQUIPMENT

FG

DIN RAIL

Grounding

CROSSOVER WIRE

Cross-wire from the DIN rail to the metal housing of the protected device to equalize the ground potential.
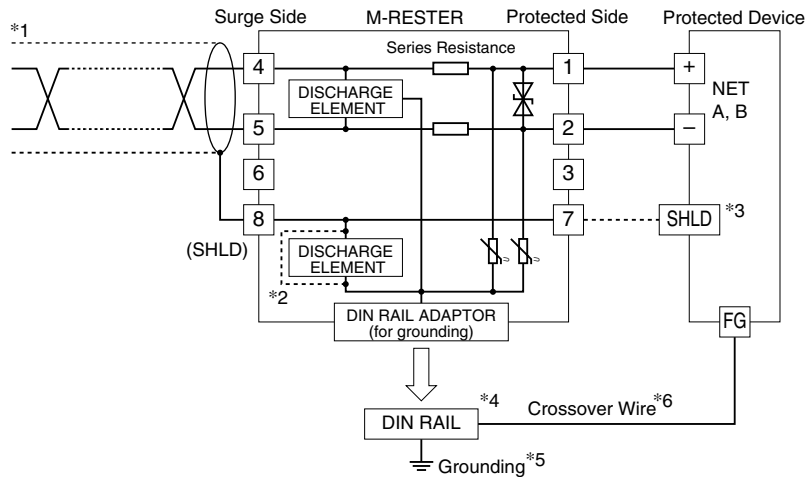Ground only the surge protector when the protected device has no grounding terminal.

## ■ CAUTION WHEN WIRING
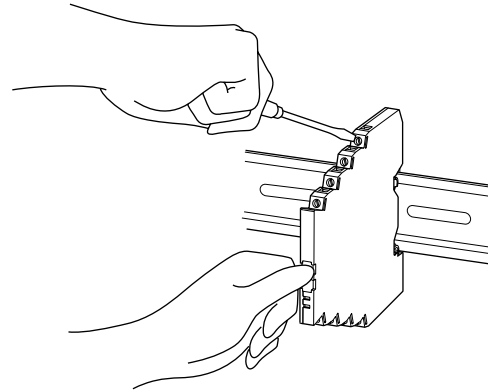
Hold the module steady at the front when you tighten/loosen screw terminals.

■ **CONNECTION DIAGRAM**

*1 Surge Side  M-RESTER  Protected Side  Protected Device

Series Resistance

4 — 1 — + NET A, B
DISCHARGE ELEMENT
5 — 2 — −
6 — 3
8 — 7 ······ SHLD *3
(SHLD)
DISCHARGE ELEMENT
*2
DIN RAIL ADAPTOR (for grounding)
FG

DIN RAIL *4  Crossover Wire *6

Grounding *5

*1. Be sure to use twisted-pair cables.
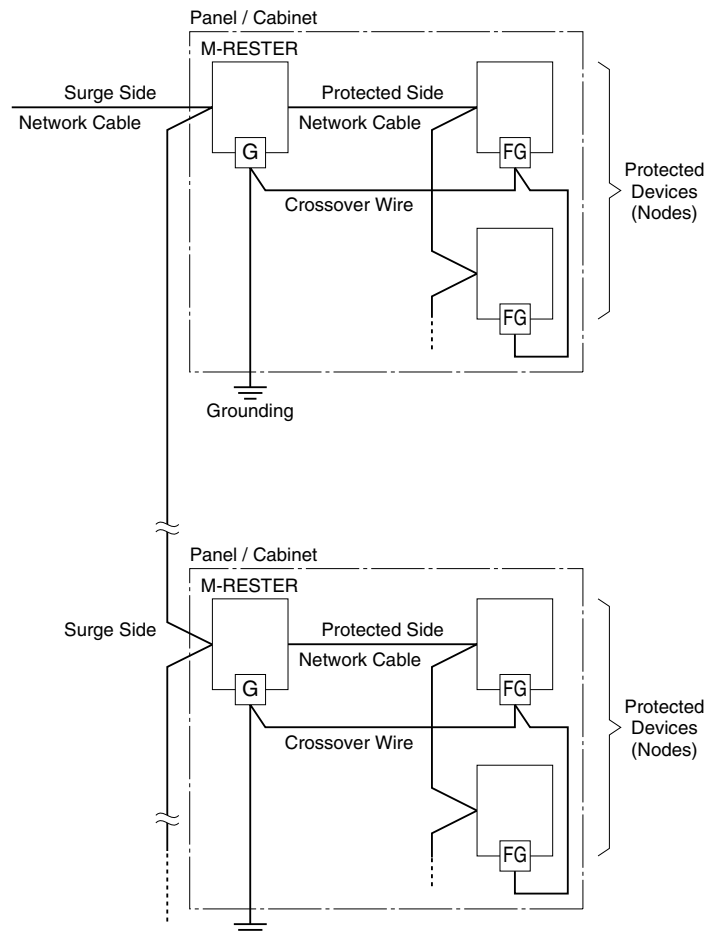*2. Choose the M-RESTER − FG when the shield wire is to be grounded.
*3. When the twisted-pair cable is with a shield, connect it to the surge protector's terminal 8, and follow instructions given by the protected device for the terminal 7.  When SHLD is not isolated from NET A / B, DO NOT connect the terminal 7 to SHLD.
*4. Oxide film on the surface of an aluminium rail may lower the electric conductivity between this module and the ground.  Use a steel or copper rail.
*5. Be sure to ground the DIN rail.  Recommended grounding resistance max. 100 ohms.
*6. Cross-wire from the DIN rail to the metal housing of the protected device to equalize the ground potential.
Ground only the surge protector when the protected device has no grounding terminal.

■ **NETWORK CONFIGURATION**

Panel / Cabinet
M-RESTER
Surge Side  Protected Side
Network Cable  Network Cable
G  FG
Crossover Wire  FG
Protected Devices (Nodes)
Grounding

Panel / Cabinet
M-RESTER
Surge Side  Protected Side
Network Cable
G  FG
Crossover Wire  FG
Protected Devices (Nodes)

• The M-RESTER is applicable to networks which consist only of FTT-10A.
   Not applicable to the ones connected to Link Power network.
• The maximum number of nodes connectable to the network segment is reduced by one
   when one unit of M-RESTER is added.
• When the distance between nodes are relatively long (e.g. grouped and separated by cabinets),
   install the M-RESTER by each group of devices.  Insert the M-RESTER at the surge side of the network.
• For detailed information on the network, refer to LONWORKS FTT-10A Free Topology Transceiver
   User's Guide provided by Echelon.

# WIRING INSTRUCTIONS

## ■ EURO TERMINAL

Torque: 0.3 N·m
Applicable wire size: 0.2 – 2.5 mm²
Stripped length: 8 mm

# MAINTENANCE

Check surge protectors periodically. Many cases of lightning are ignored, and even lightning at a far distance often causes inductive surges.

We recommend that you check your surge protector about twice a year, before and after the rainy season. Check whenever you experience a strong lightning occurrence. Checking procedure is explained in the following:

## ■ CHECKING

### WIRING

1) Make sure that wiring is done as instructed in the connection diagram.

2) Make sure that the DIN rail is connected to the metal enclosure of protected device.

3) Make sure that the surge protector is securely attached to the DIN rail, and that the rail is grounded to earth.

### DISCHARGE ELEMENT

1) Remove all wiring connected to the surge protector when you test the module.

2) Check resistance across the following terminals on the high resistance range of multimeter (measuring current ≤ 0.25 µA) and confirm no conduction.

Terminals (4) – (5), (4) – (DIN rail),

(5) – (DIN rail), (8) – (DIN rail)

The tester should show 1 MΩ or greater across the (4) – (5) and 10 MΩ or greater across the other terminals.

For the MD7LWA-FG, (8) – (DIN rail) should show approx. 0 Ω.

3) Confirm conduction across the same terminals with a 500 V DC 1000 MΩ insulation tester. The tester should show 20 MΩ or less.

4) If any of the above tests shows negative, replace the surge protector.