

**LIGHTNING SURGE PROTECTOR
for CC-Link IE Field Network**

MODEL **MDCAT-NC**

BEFORE USE

Thank you for choosing M-System. Before use, check the 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)
LAN cable.....(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.

POINTS OF CAUTION

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the surge protector inside proper housing with sufficient ventilation.
- Do not install the surge protector 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 10 to 90% RH in order to ensure adequate life span and operation.
- This unit can be earthed via a DIN rail. Oxide film on the surface of an aluminum rail may lower the electric conductivity between this module and the ground. When this unit is earthed via a DIN rail, use a steel or copper rail.
- Steel rails may be coated with thin oxide film. Discharging surge current may produce sparks with the film. However, this does not affect the surge protection. If you need to avoid sparks, prior to mounting on the DIN rail, remove the film by a wire brush.

■ CONNECTION

Network: RJ-45 modular jack

Grounding: M3 screw terminal (torque 0.6 N·m) or via DIN rail

■ 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 surge protectors for power line for sufficient protection.

GENERAL

■ FUNCTION & FEATURES

- Recommended for CC-Link IE Field Network
- LAN cable's shield wire can be floating or grounding by a shortcircuit bar
- DIN rail mounting
- Grounding with M3 screw terminal or via DIN rail

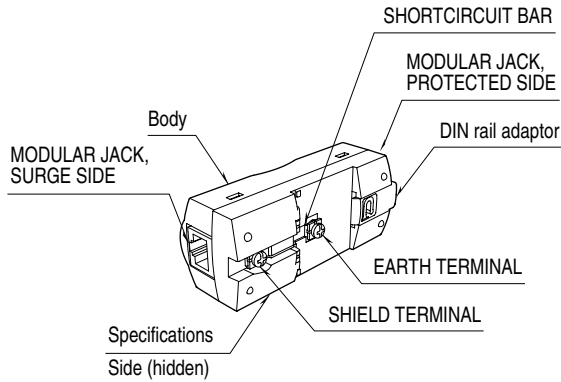
■ SPECIFICATIONS

	LINE TO LINE 1	LINE TO LINE 2	LINE TO EARTH
Max. continuous operating voltage (Uc)	±6 V	±58 V	±150 V
Voltage protection level (Up)	±15 V @2 kV	±100 V @2 kV	±600 V @4 kV
Leakage current @Uc	25 µA	5 µA	5 µA
Response time	4 nsec.	4 nsec.	20 nsec.
Max. discharge current (Imax)	100 A	100 A	10 kA
Nominal current (IN)	1A		
Series resistance	Approx. 0Ω		

Note: "Line to line 1" stands for electrodes 1 – 2, 3 – 6, 4 – 5 and 7 – 8, "line to line 2" stands for electrodes 1 or 2 – 3 or 6 and 4 or 5 – 7 or 8 of RJ-45 Modular jack.

Transmission performance: TIA/EIA-568-B.2 CAT5e

COMPONENT IDENTIFICATION

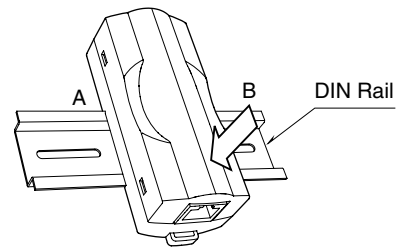


INSTALLATION

Mount the unit on a DIN rail such that the DIN rail adaptor is at the bottom. When grounding via DIN rail, once installed, do not move it to another DIN rail. There may be poor contact due to variation in DIN rail shape.

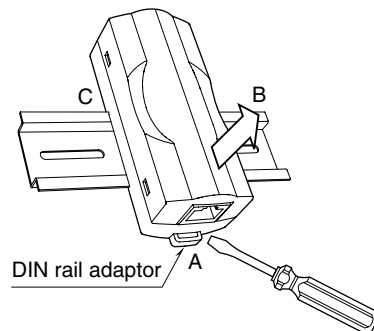
■ MOUNTING THE UNIT ON A DIN RAIL

- 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.



■ REMOVING THE UNIT

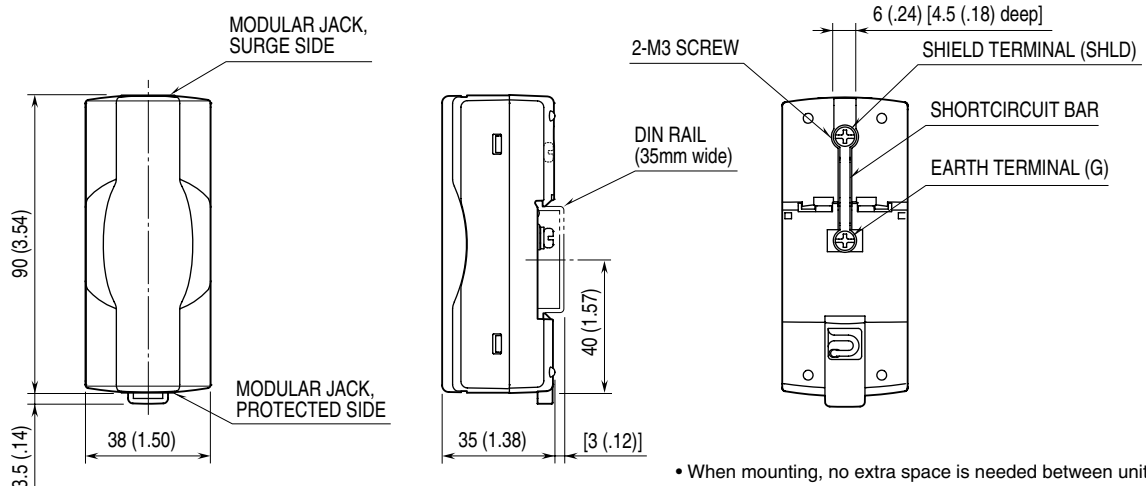
- A) Pull down the DIN rail adaptor utilizing a minus screwdriver.
- B) Pull out the lower part of the unit.
- C) Detach the upper part from the DIN rail.



TERMINAL CONNECTIONS

Connect the unit as in the diagram below.

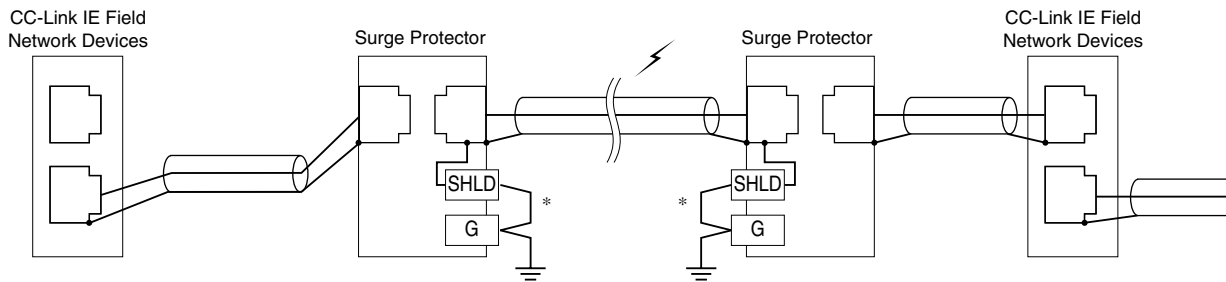
■ EXTERNAL DIMENSIONS unit: mm (inch)



• When mounting, no extra space is needed between units.

■ CONNECTION DIAGRAM

- Install the lightning surge protectors in places where it is considered that lightning surge may enter (where panels/cabinets are greatly separated, such as outdoor wiring).
- The maximum number of surge protectors that can be installed between devices is two (2). Take into account insertion loss 1 dB per surge protector as a rough indication.
- Refer to “CC-Link IE Field Network Cable Installation Manual” issued by CC-Link Partner Association for details.



* LAN cable's shield wire (SHLD) is 'earthed' when shortcircuit bar is connected.
Make sure to connect the shortcircuit bar when you use shielded LAN cable.

MAINTENANCE

Check surge protectors periodically. Many cases of lightning are unrecognized, and yet 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 there is a strong lightning occurrence.

Checking procedures are explained in the following:

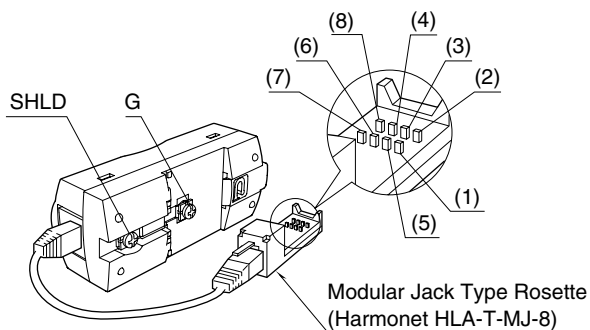
■ CHECKING WIRING

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

DISCHARGE ELEMENT

Checking can be conducted as following.

- 1) Remove all LAN cables connected to the unit.
- 2) Remove also the shortcircuit bar.
- 3) Connect between the surge side modular jack and a modular jack type rosette with a LAN cable and remove the rosette's cover to expose its connecting pines.



4) Shortcircuit Test

Check resistance across following terminals on the high resistance range of multimeter and confirm there is no conduction. (The meter will indicate the same value as when these terminals are open.)

SHLD – G

Then, apply $\pm 6V$ DC across following terminals and check that each leakage current shows $\leq 25 \mu A$. If a voltage generator is not available, check resistance on the high resistance range of multimeter and confirm there is no conduction. (Use of a voltage generator is strongly recommended.)

Rosette pins (1) – (2), (3) – (6), (4) – (5), (7) – (8)

Then, apply $\pm 58V$ DC across following terminals and check that each leakage current shows $\leq 5 \mu A$. If a voltage generator is not available, check resistance on the high resistance range of multimeter and confirm there is no conduction. (Use of a voltage generator is strongly recommended.)

Rosette pins (1) – (3), (2) – (6), (4) – (7), (5) – (8)

5) Discharging Test

Check that discharging occurs across following terminals with a $\pm 500V$ DC 1000 M Ω insulation tester. (The tester will show $\leq 20 M\Omega$.)

Each rosette pin of (1) through (8) – G, SHLD – G