



# CC-Link Communication Unit for Energy Measuring Unit (EcoMonitorLight)

EcoMonitorPlus) Model EMU4-CM-C

## User's Manual

If you are considering using this module for special purpose such as nuclear power plants, aerospace, medical care or passenger vehicles please refer to our sales representative.

- Before using the product, please read this manual carefully to ensure correct use.
• Make sure that the end users read this manual and then keep the manual in a safe place for future reference.
• Make sure to deliver this manual to the end-user.

About this manual
You can download User's manual of this Unit from the following site.
http://www.mitsubishielectric.com/fa/worldwide/index.html

### 1 Features

- This Unit is the optional dedicated product for Energy Measuring Unit (EcoMonitorLight, EcoMonitorPlus)
• This Unit enables to transfer measured data to programmable controllers for data acquisition via CC-Link communication.

### 2 Checking package content

These following items for this device are included in package. Check that no items are missing.
(1) CC-Link Communication Unit x1 (2) Connector for CC-Link communication (Included in the Unit) x1
(3) User's manual x1

### 3 Safety Precautions

#### 3.1 Precautions for Operating Environment and Conditions

This Unit is premised on being used in pollution degree II environment. When used in higher pollution degree, protect this Unit from pollution on another device side to be incorporated. For the definition of the pollution degree and the over voltage category, refer to EN61010-1/2010.

Do not use this product in the places listed below. Failure to follow the instruction may cause malfunctions or decrease of product-life.

- Places the Ambient temperature exceeds the range -5 to +55°C
• Dust, corrosive gas, saline and oil smoke exist
• Places the Relative humidity exceeds the range 30 to 85% or places with dewfall
• Places exposed to rain or water drop
• Operating altitude exceeds 2000m
• Vibration and impact exceed the specifications
• Places metal fragments or conductive substance are flying
• Places the average daily temperature exceeds +35°C
• Places in strong electromagnetic field or places large amounts of external noise exist
• Places exposed to direct sunlight.

This Unit is the open type device, which are designed to be housed within another device for prevention of electric shock. House this unit within the device such as the control panel before use. (Indoor use)

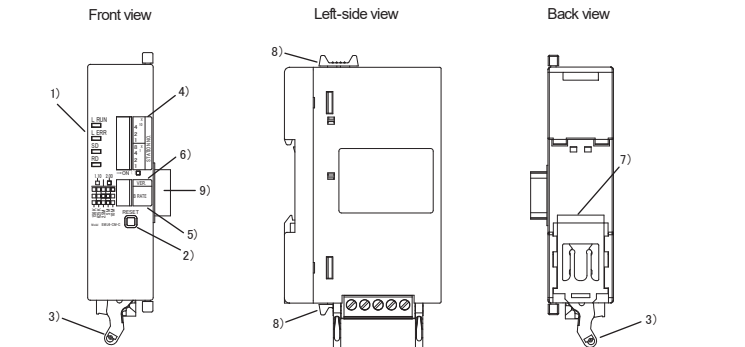
#### 3.2 Matters concerning the precaution before use

- Use the Unit in the specified usage environment and conditions.
• Before using this Unit, set CC-Link station, transmission speed and version of this Unit.
※Please refer to "9. Setting methods" of this manual.

#### 3.3 Installation Precautions

- For installation and wiring works, make sure that the power source is shut off for all outside phases. If all phases are not turned off, it may cause an electric shock or product damages.
• Any person who is involved in installation and wiring of this Unit should be fully competent to do this work.
• Work under the electric outage condition when installing and wiring. Failure to do so may cause electric shock or a failure of the Unit, a fire etc.

### 4 Name and function of each part



#### <Name and function of each part>

Table with 3 columns: No., Name of part, Functions. Lists components like L.RUN/ERR/SD/RD LED, RESET switch, Connector for CC-Link communication, STATION switch, B RATE switch, VER. switch, IEC rail stop, Connection stop, and Connector.

### 5 Procedure for operation

The following describes the procedure for operation before using this Unit.

Table with 3 columns: No., Procedure, Details. Lists steps for connecting the unit, attaching the Energy Measuring Unit, setting station number, transmission speed, and CC-Link version.

CAUTION section with text: 'When tapping or wiring, take care not to entering any foreign objects such as chips and wire pieces into this Unit. Check the connection way when connecting this Unit to the Energy Measuring Unit. Wrong wiring may cause failure of the Unit, a fire or electric shock.'

### 3.4 Precautions for Use

- Before operating the product, check that active bare wire and so on does not exist around the product. If any exposed conductor is found, stop the operation immediately and take an appropriate action such as isolation protection.
• In the event of a power outage during the setting, the Unit is not set correctly. Please set again after power recovery.
• When you connect to Energy Measuring Unit of the Unit, Contrast of the LCD display of Energy Measuring Unit is reduced to small.

DANGER section with text: 'Do not touch the live part. It may cause electric shock, electric burn injury or burnout of the device. Work under the electric outage condition when installing and wiring.'

CAUTION section with text: 'Do not disassemble or modify this Unit. It may cause failure, malfunction, injury or fire. Do not touch the CC-Link communication connectors when communicating. It may cause a malfunction or failure of the Unit. Push the RESET switch with an appropriate force (1.6N). The addition of force than necessary, it may cause a malfunction or failure of the Unit.'

### 3.5 Maintenance Precautions

- Use a soft dry cloth to clean off dirt of the Unit surface. Do not let a chemical cloth remain on the surface for an extended period of time nor wipe the surface with thinner or benzene.
• Check for the following items to use this Unit properly for long time.
• Daily maintenance: (1) No damage on this Unit, (2) No abnormality with LED indicators, (3) No abnormal noise, smell or heat, (4) No looseness with installation and wire connection.
(Check item No.4 under the power failure condition. Failure to do so may cause electric shock, failure of the Unit or a fire.)

### 3.6 Storage Precautions

- To store this Unit, put it in a plastic bag. For long-time storage, avoid the following places. Failure to follow the instruction may cause a failure and reduced life of the Unit.
• Places the ambient temperature exceeds the range -10 to +60°C
• Places the average daily temperature exceeds +35°C
• Places exposed to rain, water drop or direct sunlight
• Vibration and impact exceed the specifications
• Places the Relative humidity exceeds the range 30 to 85% or places with dewfall
• Places metal fragments or conductive substance are flying
• Places where dust, corrosive gas, saline and oil smoke exist

### 3.7 Disposal Precautions

- When disposing of this Unit, treat it as industrial waste.

### 3.8 About packaging materials and this manual

For reduction of environment load, packaging materials are produced with cardboard.

### 6. How to wire

Connect the CC-Link communication Unit to the Energy Measuring Unit.
This unit can be attached to EcoMonitorLight in below. This unit can be attached to EcoMonitorPlus as well.
In EcoMonitorPlus, connect to the base unit (model name: EMU4-BM1-MB/EMU4-HM1-MB/EMU4-LG1-MB/EMU4-CNT-MB).

- (1) Remove the blank label stuck to the left side of the Energy (2) Insert the connector of the CC-Link communication Unit into the Measuring Unit.
• When setting Ver.2.00, setting is fixed to one station occupied and eightfold.

Diagrams showing the removal of a blank label and the connection of the CC-Link communication unit to the Energy Measuring Unit. Includes a CAUTION note: 'Work under the electric outage condition when connecting the Energy Measuring Unit. Failure to do so may cause electric shock, a failure of the Unit, a fire etc.'

### 7. Mounting the Unit

There are two mounting methods, surface mounting and panel mounting.

#### 7.1 Mounting the Unit on an IEC rail

\*This unit can be attached to EcoMonitorLight in below. This unit can be attached to EcoMonitorPlus as well.

Mounting instructions for IEC rail. Includes diagrams for hooking on the rail and pushing the unit down. CAUTION: 'Work under the electric outage condition when connecting the Energy Measuring Unit. Failure to do so may cause electric shock, a failure of the Unit, a fire etc.'

#### 7.2 JIS agreement size mounting

\*This unit can be attached to EcoMonitorLight in below. This unit can be attached to EcoMonitorPlus as well.

Mounting instructions for JIS agreement size. Includes diagrams for hooking on the attachment plate and pushing the unit down. CAUTION: 'Work under the electric outage condition when connecting the Energy Measuring Unit. Failure to do so may cause electric shock, a failure of the Unit, a fire etc.'

### 7.3 Screw mounting

Diagram showing screw mounting on a panel. Includes dimensions and a table for recommended mounting screws: 'Cross recessed pan-head screw with captive spring or plain washer JIS B 1188 Two screws (M3x10) Tightening torque: 0.63N·m'

### 7.4 Screw mounting (When using the attachment for panel mounting model: EMU4-PAT )

Diagram showing screw mounting using an attachment plate. Includes dimensions and notes: 'Panel cut dimensions are made larger than the product considering tolerance in panel cut. The mounting screws and the screws for fixing the attachment are included in Attachment (optional part). Before use, you need to cut each part of the attachment.'

### 8. Wiring methods

Wiring instructions including: (1) Pull off the connector for CC-Link communication from this Unit. (2) Loosen the cable tightening screw of the connector for CC-Link communication. (3) Insert a signal wire according to notations of connector for CC-Link communication side. (4) When connecting two wires, make sure that each wire is fixed before using. (5) Fix the Unit with a screw (recommended tightening torque : 0.5 to 0.6N·m) (6) Insert the CC-Link communication connector in its original position and secure it with the levers on both ends.

### 9.3 Setting of CC-Link version (VER.)

Setting instructions for CC-Link version. Includes a table for settings: 'Setting Ver.1.10 Ver.2.00' and notes: 'Push the reset switch when setting or changing station numbers, transmission speed or version after energizing. Reset require a few seconds. Continue to press the reset switch and release the reset switch after having confirmed L.RUN LED turns off.'

Supplement information: 'Maximum total extension cable length and length between stations differ depending on the transmission speed. Avoid setting the same station numbers in the identical transmission path. The same station numbers result in errors. Number of devices to be connected is according to the conditions 1 and 2 below. Can connect up to 42 devices maximum when only this unit is connected. (When connecting only remote device station of one station occupied.)'

### 10. External dimensions

External dimensions diagrams showing front and side views with dimensions in mm. Unit: mm.

### 11. Contained harmful substances

- (1) 电器电子产品有害物质限制使用标识
根据《电器电子产品有害物质限制使用管理办法》，该标识适用于在中国销售的电器电子产品，其中的数字为产品的环保使用期限。只要遵守本产品在安全和使用方面的注意事项，从生产日期算起的环保使用期限内不会造成环境污染或对人体、财产产生深刻的影响。注)产品正常使用废弃后，应按照国家 and 地方的法律法规完成该电器电子产品回收和再利用。

- (2) 产品中有害物质的名称及含量
本产品中所含有的 6 种有害物质的名称、含有信息及含有部件如下表所示。

Table with 3 columns: 部件名称 (Component Name), 有害物质 (Harmful Substance), and 含量 (Content). Lists lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers.

本表格依据 SJ/T11364 的规定编制。
○: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
×: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T26572 规定的限量要求。且虽然目前业界没有成熟的替代方案，但是符合欧盟 RoHS 指令要求。

Table with 3 columns: Wire type, When connecting one wire, When connecting two wires. Lists single wire, stranded wire, and shielded wire with bar terminal.

### Supplement

- Strip the signal wires 7mm. Do not plate the wires with solder.
• Use specified cables for CC-Link connection cables. Multi using of dedicated cable and high-performance dedicated cable for CC-Link should be avoided.
• The termination resistances differ according to dedicated cable type.
• The specifications of the CC-Link dedicated cables or any other inquiries, visit website for CC-Link Partner Association.
• Shielded cable of the CC-Link connection cable should be connected to "SLD" and "FG" terminal must be D-type ground (ground resistance is not exceed 100Ω). "SLD" and "FG" are connected inside of the Unit.
• CC-Link communication wire must be dedicated wire, and observe total wiring distance, distance between stations and termination resistances value according to the B RATE. No use of dedicated wire or unsatisfying wiring condition may cause abnormal communication.
• Connect the termination resistances which are included in CC-Link Master Unit to both ends Units of the CC-Link communication line. Connect it between DA terminal and DB terminal if the Energy Measuring Unit is at the end of the CC-Link transmission line.
• The termination resistances values differ according to CC-Link dedicated cable type. Refer to instruction of termination resistances included in CC-Link Master Unit.

### 9 Setting methods

When connecting this Unit to CC-Link transmission line, set different stations (STATION) before energizing according to each unit and set transmission speed (B RATE), CC-Link version (VER.). For Units with CC-Link communication function, set station numbers and transmission speed to ensure mutual communication at the setting transmission speed by using with the station numbers.

CAUTION section: 'Do not use a mechanical pencil when changing station number switch and transmission speed switch. Several shreds from a pencil which had been sharpened may fly into internal circuits and cause malfunction or damage of the product. Push the RESET switch with an appropriate force (1.6N). The addition of force than necessary, it may cause a malfunction or failure of the Unit.'

#### 9.1 Setting of station number (STATION)

- This Unit is Remote Device Station of one station occupied. Station number setting range is from 1 to 64.
• Station number is the total of the Station Setting Switch value which is "ON".
• When switching "ON" of the Station Setting Switch, change it with narrow screwdriver or a stick.
• For example, when setting the Station number of this Unit as number 36, set as below:
Set "ON" of 1 and 2 of side x10, 2 and 4 of side x1 of the Station Setting Switch.
\*Symbol direction is "ON". ■ shows position of switch.

Diagram showing switch settings for station number 36. Side x10: Switch 1 and 2 to "ON". Side x1: Switch 2 and 4 to "ON". Calculation: X10 (Digit of 10) = (1+2) x 10 = 30, X1 (Digit of 1) = (2+4) x 1 = 6, 30+6 = 36. Station number is 36.

#### 9.2 Setting of transmission speed (B RATE)

- When switching the "B RATE" setting switch, change it with narrow screwdriver.
• Relation between transmission speed and setting switch is as below: (■ shows position of switch.)

Table for B RATE settings: Transmission speed (156K, 625K, 2.5M, 5M, 10M) vs Setting (switch positions).

※ Do not set other combination than described above. It will result in error.

### 12. Specifications

Basic Specifications table: Product (Energy Measuring Unit (EcoMonitorLight) CC-Link Communication Unit), Model (EMU4-CM-C), Rating (6.4V DC), Accommodating model (EcoMonitorLight, EcoMonitorPlus).

CC-Link Communication specifications table: Item (Number of occupied stations, Version, Station, Transmission speed, Maximum connection devices, Cable termination resistances) vs Specifications.

### 13. After-sales service

- If you have any questions or the product is broken down, contact our sales representative near you.
• The charge-free warranty is effective until the earlier of 1 year after the date of your purchase or 18 months after manufacturing.
• The gratis warranty shall apply if the product fails even though it is being used properly in the conditions, with the methods and under the environments in accordance with the terms and precautions described in the catalogs, the instruction manual, caution label on the product, etc.
• Regardless of Gratis Warranty Period, our company shall not be liable to compensate for any loss arising from events not attributable to our company, opportunity loss and lost earning of the customer due to failure of the product, and loss, secondary loss, accident compensation, damage to other products besides our products and other operations caused by a special reason regardless of our company's predictability.
• If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

CAUTION: 'If an abnormal sound, bad-smelling smoke, lever break out from this Unit, switch it off promptly and don't use it.'

### 14. Customer Service

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BUILDING, 2-7-3, MARUNOUCHI, CHYODAI-KU, TOKYO 100-8310, Japan
Please refer to "catalog" or "user's manual (Details)" for more detail.