



OPERATING MANUAL

Network Converter EtherCAT Compatible

NETC01-ECT



R-REM-OMC-110

Introduction

■ Before use

Only qualified personnel of electrical and mechanical engineering should work with the product.

Use the product correctly after thoroughly reading the section "Safety precautions" on p.4 In addition, be sure to observe the contents described in warning, caution, and note in this manual.

The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment. Do not use for any other purpose. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

■ Related operating manuals

For operating manuals not included with the product, contact your nearest Oriental Motor sales office or download from Oriental Motor Website Download Page.

Name	Included or not included with product
Network converter EtherCAT compatible NETC01-ECT OPERATING MANUAL (this document)	Included
Network converter EtherCAT compatible NETC01-ECT USER MANUAL	Not included

■ CE Marking

● Low Voltage Directives

The input power supply voltage of this product is 24 VDC. Therefore this product is not subject to the Low Voltage Directive, but install and connect it as follows.

- This product is designed and manufactured to be incorporated in equipment. Be sure to install the product inside an enclosure.
- For the power supply of the **NETC01-ECT**, use a DC power supply with reinforced insulation on its primary and secondary sides.
- Overvoltage category: I
- Pollution degree: 2
- Degree of protection: IP10

● EMC Directive

This product is conducted EMC testing under the conditions specified in "Example of installation and wiring" on the [USER MANUAL](#). The conformance of your mechanical equipment with the EMC Directive will vary depending on such factors as the configuration, wiring, and layout for other control system devices and electrical parts used with this product. It therefore must be verified through conducting EMC measures in a state where all parts including this product have been installed in the equipment.

Applicable Standards

EMI	EN 55011 group 1 class A, EN 61000-6-4
EMS	EN 61000-6-2

Thank you for purchasing an Oriental Motor product.

This Operating Manual describes product handling procedures and safety precautions.

- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

⚠ CAUTION

This equipment is not intended for use in residential environments nor for use on a low-voltage public network supplied in residential premises, and it may not provide adequate protection to radio reception interference in such environments.

■ Republic of Korea, Radio Waves Act

This product is affixed the KC Mark under the Republic of Korea, Radio Waves Act.

■ RoHS Directive

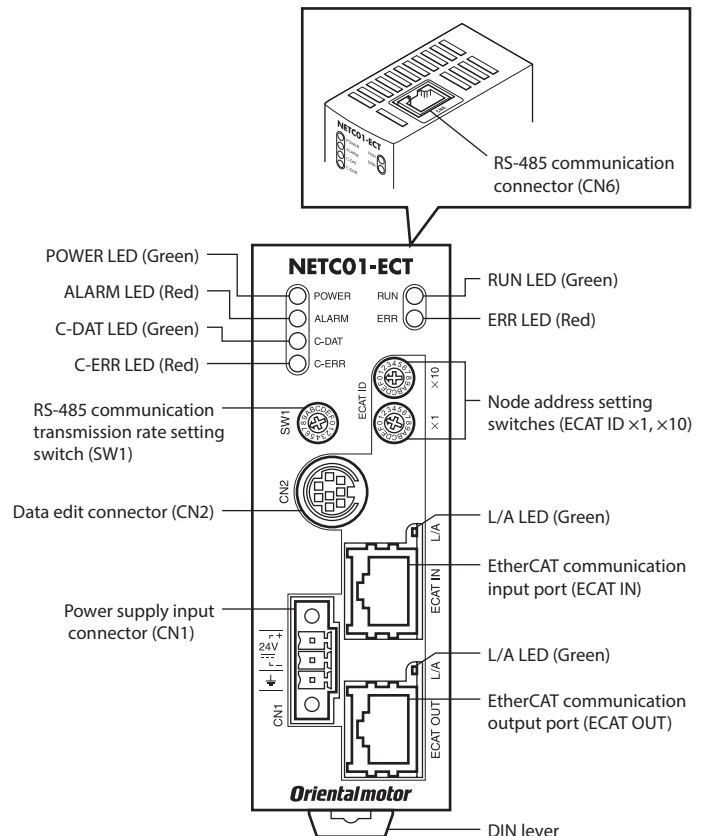
The products do not contain the substances exceeding the restriction values of RoHS Directive (2011/65/EU).

■ Checking the product

Verify that the items listed below are included. Report any missing or damaged items to the Oriental Motor sales office from which you purchased the product.

- **NETC01-ECT** 1 unit
- CN1 connector (3 pins) 1 pc.
- RS-485 communication cable 2 pcs.
[0.1 m (3.94 in.), 0.25 m (9.84 in.) each 1 pc.]
- OPERATING MANUAL (this document) 1 copy

■ Names and functions of parts



Name	Description
POWER LED (Green)	This LED is lit while the power is input.
ALARM LED (Red)	This LED blinks when an alarm generates. It is possible to check the generated alarm by counting the number of times the LED blinks.
C-DAT LED (Green)	This LED is lit while transmitting and receiving data via RS-485 communication.
C-ERR LED (Red)	This LED is lit when an error has occurred via RS-485 communication.
RUN LED (Green) ERR LED (Red) L/A LED (Green)	These LEDs indicate the status of EtherCAT communication.
Power supply input connector (CN1)	Connects a 24 VDC power supply.
Data edit connector (CN2)	Connects a PC in which the MEXE02 has been installed, or an accessory OPX-2A .
RS-485 communication connector (CN6)	Connects the RS-485 communication cable.
EtherCAT communication input port (ECAT IN)	This is a connector to perform EtherCAT communication. Connects the master controller.
EtherCAT communication output port (ECAT OUT)	This is a connector to perform EtherCAT communication. Connects the following slave.
RS-485 communication transmission rate setting switch (SW1)	Sets the transmission rate of RS-485 communication. Factory setting: 7
Node address setting switches (ECAT ID ×1, ×10)	Set the node address of the EtherCAT communication in the 0 to 255 (00h to FFh) range. ×10: Sets the upper ×1: Sets the lower Factory setting: 1 (×10: 0, ×1: 1)

● LEDs to indicate the status of EtherCAT communication

LED indicator	LED status *	Description
RUN (Green)	OFF	Initialization state
	Blinking	Pre-Operational state
	Single flash	Safe-Operational state
	Lit	Operational state (normal condition)
ERR (Red)	OFF	No communication error
	Blinking	Communication setting error
	Single flash	Communication data error
	Double flash	Communication watchdog timeout
L/A (Green)	OFF	No link
	Lit	Link establishment
	Flickering	Operation in progress after link establishment

* Blinking	Repetition of "ON (200 ms), OFF (200 ms)"
Single flash	Repetition of "ON (200 ms), OFF (1,000 ms)"
Double flash	Repetition of "ON (200 ms), OFF (200 ms), ON (200 ms), OFF (1,000 ms)"
Flickering	Repetition of "ON (50 ms), OFF (50 ms)"

Installation

■ Location for installation

The **NETC01-ECT** has been designed and manufactured to be incorporated in equipment. Install it in a well-ventilated location that provides easy access for inspection.

The location must also satisfy the following conditions:

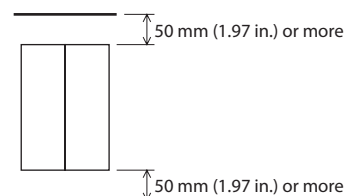
- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature 0 to +40 °C (+32 to +104 °F) (non-freezing)
- Operating ambient humidity 85% or less (non-condensing)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum
- 1,000 m (3,300 ft.) or lower above sea level

■ Installation method

Install the **NETC01-ECT** to a 35 mm (1.38 in.) width DIN rail.

There must be a clearance of at least 50 mm (1.97 in.) in the horizontal and vertical directions, between the **NETC01-ECT** and enclosure or other equipment within the enclosure.

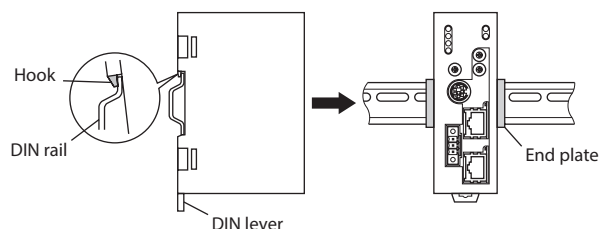
When installing two or more **NETC01-ECT**s in parallel, it is possible to install them closely in the horizontal direction. Provide a minimum clearance of 50 mm (1.97 in.) in the vertical direction.



Be sure to install the **NETC01-ECT** in the vertical direction (vertical position). If the **NETC01-ECT** is installed in the direction other than vertical position, its heat radiation effect will deteriorate.

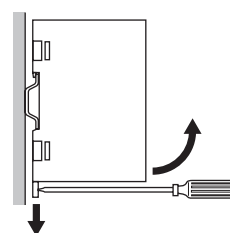
● Mounting to DIN rail

Pull down the DIN lever of the **NETC01-ECT** and lock it. Hang the hook at the rear to the DIN rail. Hold the **NETC01-ECT** to the DIN rail, and push up the DIN lever to secure. Secure both sides of the **NETC01-ECT** using end plates.



● Removing from DIN rail

Pull the DIN lever down until it locks using a slotted screwdriver, and lift the bottom of the **NETC01-ECT** to remove it from the rail. Use force of about 10 to 20 N (2.2 to 4.5 lb.) to pull the DIN lever to lock it. Excessive force may damage the DIN lever.



Pin assignment list

● CN1: Power supply input connector

Connect the power supply using the included CN1 connector (3 pins).

Pin No.	Name	Description
1	+	+24 VDC 0.2 A or more
2	–	Power supply GND
3		Frame Ground

● CN6: RS-485 communication connector

Connect the RS-485 communication cable.

Since RS-485 communication cables of two lengths are included, use either one of the two.

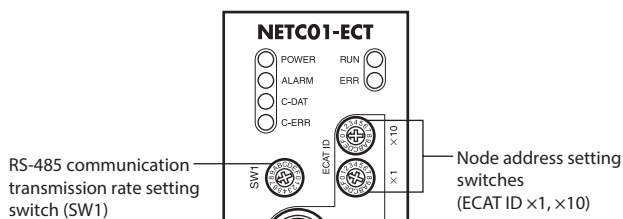
Pin No.	Signal name	Description
1	N.C.	Not used (Do not connect anything.)
2	GND	GND
3	TR+	RS-485 communication signal (+)
4	N.C.	Not used
5	N.C.	Not used
6	TR–	RS-485 communication signal (–)
7	N.C.	Not used
8	N.C.	Not used

● ECAT IN: EtherCAT communication input port ECAT OUT: EtherCAT communication output port

Connect the EtherCAT communication cable.

Pin No.	Signal name	Description
1	TD+ output	Transmitted data+ output
2	TD– output	Transmitted data– output
3	RD+ input	Received data+ input
4	N.C.	Not used
5	N.C.	Not used
6	RD– input	Received data– input
7	N.C.	Not used
8	N.C.	Not used

Setting the switches



Note Be sure to turn off the **NETC01-ECT** power before setting the switches. If the switches are set while the power is still on, the new switch settings will not become effective until the power is cycled.

● RS-485 communication transmission rate

Set the RS-485 communication transmission rate setting switch (SW1) to "7."

Factory setting: 7 (625 kbps)

Note For the SW1, always set to "7." If the switch is set to the dial of "8" or higher, the communication switch setting error alarm will generate when turning on the power. Also, do not set the switch to the dial of "0" to "6" because they can not be used. (An alarm will not be generate.)

● Node address (ECAT ID)

Set the node address of the **NETC01-ECT** using the two node address setting switches (ECAT ID x1 and ECAT ID x10).

When connecting two or more EtherCAT-compatible products, do not set duplicate node address.

Set the upper using the "ECAT ID x10" and the lower using the "ECAT ID x1."

Setting range : 0 to 255 (00h to FFh)

Factory setting: 1 (x10: 0, x1: 1)

Inspection

It is recommended that periodic inspections would be conducted for the items listed below after each operation of the motor. If an abnormal condition is noted, discontinue any use and contact your nearest Oriental Motor sales office.

Inspection item

- Are any of the DIN rail mounting parts of the **NETC01-ECT** loose?
- Are any of the connection parts of the **NETC01-ECT** loose?
- Is there attachment of dust, etc., on the **NETC01-ECT**?
- Are there any strange smells or appearances within the **NETC01-ECT**?



The **NETC01-ECT** uses semiconductor elements. Handle the **NETC01-ECT** with care since static electricity may damage semiconductor elements.

Troubleshooting and remedial actions

The **NETC01-ECT** provides alarms (protective functions). If an alarm generates, the ALARM LED of the **NETC01-ECT** is blink. You can check the generated alarm by counting the number of times the LED blinks.

● Descriptions of alarms

● No. of ALARM LED blinks: 7

Alarm code	Alarm type	Cause	Remedial action
83h	Communication switch setting error	RS-485 communication transmission rate setting switch (SW1) was out-of-specification.	Set the SW1 to 7.
84h	RS-485 communication error	The RS-485 communication error has been detected three times consecutively.	• Check the transmission rate of RS-485 communication. • Check the connector or cable of RS-485 communication.
86h			Check whether the address number of the RS-485 communication compatible products has duplicated.

● No. of ALARM LED blinks: 9

Alarm code	Alarm type	Cause	Remedial action
41h	EEPROM error	The stored data in the NETC01-ECT was damaged.	Initialize all data.

● No. of ALARM LED blinks: Lit




Alarm code	Alarm type	Cause	Remedial action
F0h	CPU error	CPU malfunctioned.	Cycle the power.

● Alarm reset

Before resetting an alarm, always remove the cause of the alarm and ensure safety.

Safety precautions

The precautions described below are intended to prevent danger or injury to the user and other personnel through safe, correct use of the product. Use the product only after carefully reading and fully understanding these instructions.

 WARNING	Handling the product without observing the instructions that accompany a "WARNING" symbol may result in serious injury or death.
 CAUTION	Handling the product without observing the instructions that accompany a "CAUTION" symbol may result in injury or property damage.
 Note	The items under this heading contain important handling instructions that the user should observe to ensure the safe use of the product.

WARNING

General

- Do not use the product in explosive or corrosive environments, in the presence of flammable gases, locations subjected to splashing water, or near combustibles. Doing so may result in fire or injury.
- Assign qualified personnel to the task of installing, wiring, operating/controlling, inspecting and troubleshooting the product. Failure to do so may result in fire, injury or damage to equipment.

Connection

- Always keep the power supply voltage of the **NETC01-ECT** within the specified range. Failure to do so may result in fire.
- For the power supply of the **NETC01-ECT**, use a DC power supply with reinforced insulation on its primary and secondary sides. Failure to do so may result in electric shock.
- Connect the cables securely according to the wiring diagram. Failure to do so may result in fire.
- Do not forcibly bend, pull or pinch the cable. Doing so may result in fire. Repetitive stress or overstress on the connection part may cause damage to the product.

Operation

- Turn off the **NETC01-ECT** power in the event of a power failure. Otherwise, the motor may suddenly start when the power is restored, causing injury or damage to equipment.
- If the **NETC01-ECT** generates an alarm, stop the motor. Failure to do so may result in fire, injury or damage to equipment.

Repair, disassembly and modification

- Do not disassemble or modify the **NETC01-ECT**. Doing so may result in injury. Refer all such internal inspections and repairs to your nearest Oriental Motor sales office.

CAUTION

General

- Do not use the **NETC01-ECT** beyond its specifications. Doing so may result in injury or damage to equipment.
- Keep your fingers and objects out of the openings in the **NETC01-ECT**. Failure to do so may result in fire or injury.

Installation

- Install the **NETC01-ECT** inside an enclosure. Failure to do so may result in injury.
- Keep the area around the **NETC01-ECT** free of combustible materials. Failure to do so may result in fire or a skin burn(s).
- Do not leave anything around the **NETC01-ECT** that would obstruct ventilation. Doing so may result in damage to equipment.

Connection

- The power supply connector (CN1), EtherCAT communication input port (ECAT IN), EtherCAT communication output port (ECAT OUT), data edit connector (CN2) and RS-485 communication connector (CN6) of the **NETC01-ECT** are not electrically insulated. When grounding the positive terminal of the power supply, do not connect any equipment (PC, etc.) whose negative terminal is grounded. Doing so may result in the **NETC01-ECT** and the equipment to short, damaging both.

Operation

- Use the **NETC01-ECT** in combination with the designated applicable products. Failure to do so may result in fire.
- When operating the product, do so after making preparations that an emergency stop can be performed at any time. Failure to do so may result in injury.
- Set a suitable operation speed and acceleration/deceleration rate. Improper setting may cause loss of the motor synchronism and moving the load to an unexpected direction, which may result in injury or damage to equipment.
- Immediately when trouble has occurred, stop running and turn off the **NETC01-ECT** power. Failure to do so may result in fire or injury.
- Static electricity may cause the **NETC01-ECT** to malfunction or suffer damage. Do not touch the **NETC01-ECT** while the power is input. Always use an insulated screwdriver to adjust the switches of the **NETC01-ECT**.

Disposal

- Dispose the product correctly in accordance with laws and regulations, or instructions of local governments.

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- Please contact your nearest Oriental Motor office for further information.

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