

**EtherCAT-compatible Communication Unit for HG Series  
SC-HG1-ETC**

MJE-SCHG1ETC No.0090-55V

Thank you for purchasing a Panasonic product.  
Before using this product, read and understand this instruction manual. Use the product correctly and in the optimum manner.  
Keep this manual in a safe location for reference whenever necessary.

- For details on communication commands and other related subjects for the EtherCAT-compatible **SC-HG1-ETC** communication unit for **HG-series** controllers, refer to the "**SC-HG1-ETC User's Manual**"(our Website: <https://panasonic.net/id/pidsx/global>).
- EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
- Ethernet is a registered trademark of Fuji Xerox Co., Ltd.

**WARNING**

- Do not use this product as a device for personal protection.
- For devices for personal protection, use products that conform to the laws and standards related to personal protection in each country, such as OSHA, ANSI, and IEC.

**1 STANDARDS AND REGULATIONS**

- This product conforms to the standards and regulations below.

**<Conformity Directives / Conforming Regulations>**

EU Law : EMC Directive 2014/30/EU

British Legislation : EMC Regulations 2016/1091

**- Applicable Standards**

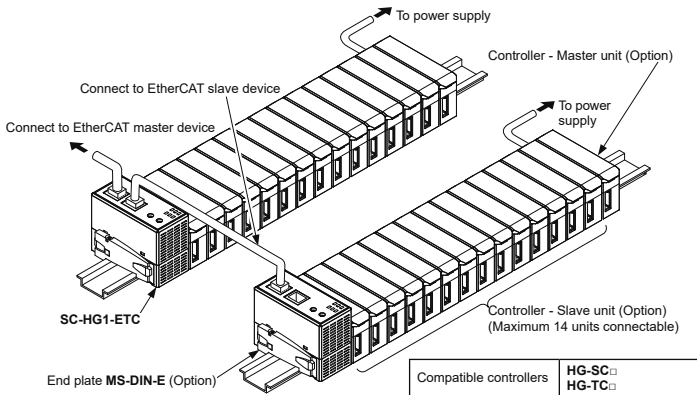
EN 61000-6-4 : 2007 +A1:2011, EN 61000-6-2 : 2005

**2 CONTENTS OF PACKAGE**

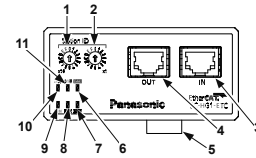
- Main unit 1 pc.
- Instruction Manual (English / Japanese, Chinese / Korean) 1 pc. each
- General Information for Safety, Compliance, and Instructions 1 pc.

**3 SYSTEM CONFIGURATION**

- This product is a communication unit that monitors sensor ON / OFF output, the amount of detection, and other data through EtherCAT communications between each controller and the EtherCAT master device.
- This product can be connected to up to 15 controllers (one master unit and 14 slave units).
- Electric power required for this product is supplied from the master controller connected to it.



**4 DESCRIPTION OF PARTS**



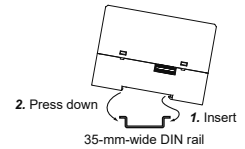
Name	Function
1 Station ID (x16)	Rotary switch for setting a station alias. (Note 1)
2 Station ID (x1)	[Station aliases can be set between 00 and FF]
3 IN	RJ45 connector for EtherCAT connection. This connector connects the master device and the Ethernet cable.
4 OUT	RJ45 connector for EtherCAT connection. This connector connects the slave device and the Ethernet cable.
5 Male connector for lateral connection	This connector connects a controller (master unit or slave unit). Electric power required for the communication unit is supplied from the master unit or slave unit through this connector.
6 ERR indicator (Red)	This indicator indicates the state of communication between the communication unit and the controller connected to it. OFF : Normal operation state ON: Communication error occurs between the communication unit and the controller
7 POWER indicator (Green)	OFF : The power is off ON : The power is on
8 RUN indicator (Green)	OFF : INIT state Flashing (Single flash (Note 2)) : SAFE-OPERATIONAL state Flashing (Blinking (Note 3)) : PRE-OPERATIONAL state ON : OPERATIONAL state
9 L/A IN indicator (Green)	OFF : The communication unit is not connected to the Ethernet Flashing : Link is normal and data is sent or received
10 L/A OUT indicator (Green)	OFF : Link is normal and data is not sent or received ON : Link is normal and data is not sent or received
11 ECAT ERR indicator (Red)	OFF : Normal operation state Flashing (Double flash (Note 4)) : Watchdog timeout occurs Flashing (Blinking (Note 3)) : Configuration error occurs

Notes: 1) For numerical display on the switch, refer to each switch.  
2) The indicator repeatedly lights for 0.2 seconds and goes out for 1 second.  
3) The indicator repeatedly lights for 0.2 seconds and goes out for 0.2 seconds.  
4) The indicator repeatedly lights for 0.2 seconds, goes out for 0.2 seconds, lights up for 0.2 seconds, and goes out for 1 second in this order.

**5 MOUNTING AND CONNECTION METHODS**

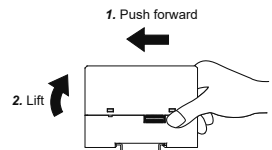
**How to mount**

- Hook the rear of the mounting part onto the 35-mm-wide DIN rail.
- While pressing the rear of the mounting part against the 35-mm-wide DIN rail, insert the front of the mounting part into the 35-mm-wide DIN rail.



**How to remove**

- Grasp the unit and push it forward.
- Lifting the front of the unit removes it from the DIN rail.



Note: If you attempt to lift the front without pushing the unit forward, you will break the hook on the rear of the mounting part.

**How to connect**

- This product must be connected to a controller.
  - Up to 15 controllers (1 master unit and 14 slave units) can be connected to this product.
- Always turn OFF the power before connecting or disconnecting a controller to/from this product. Connecting a controller to this product with the power turned ON may damage the product and controller. Insert the male connector all the way into the female connector. If the connector is not connected completely, the product and controller may become damaged.
- To connect this product to a controller, always mount them on a DIN rail. To do so, mount end plates **MS-DIN-E** (optional) or commercially available fittings so as to enclose the connected units at both ends.
  - For notes on using controllers, refer to the instruction manual provided with the controller.
  - When the **HG-S** controller and **HG-T** controller are used in combination, note the following points.
    - Connect the slave units of the same series to the side closer to the master unit, and connect the slave units of the different series to the far side.
    - Some functions such as computation function and copy function are restricted. For detailed information, refer to the user's manual of each controller(our Website: <https://panasonic.net/id/pidsx/global>).
    - If the **HG-T** controller is connected with **HG-S** controller manufactured prior to January 2019, it will not operate properly. Be sure to connect the product to **HG-S** controller manufactured in or after February 2019.

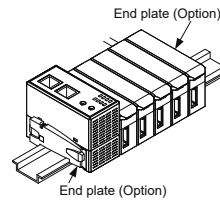
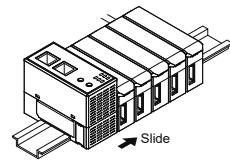
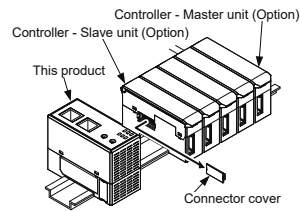
1. Mount this product on a 35-mm-wide DIN rail.

2. Remove the connector cover from the controller. (Note)

3. Slide this product until it directly contacts the controller.

4. Attach end plates (optional) with the flat side facing in so as to enclose the connected units at the ends.

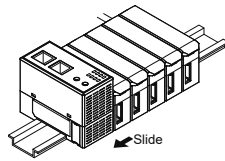
5. Tighten the screws to fasten the end plates.



Note: Keep the connector cover removed from the controller in a safe place.

### How to disconnect

- Loosen the screws on the end plates and remove the end plates.
- Slide and remove the product and controllers.



## 6 COMMUNICATION SETUP

- To perform communications over the EtherCAT network, you need an EtherCAT master device, a configuration tool for the EtherCAT master device, and an ESI file.
- For details, refer to the respective manuals for the EtherCAT master device and configuration tool that you use.
- You can download the ESI file of this product from our website. <https://panasonic.net/id/pidsx/global>  
Install the ESI file of this product according to the manual of the configuration tool to be used.
- For details on communication conditions and commands, refer to the "SC-HG1-ETC User's Manual"(our Website: <https://panasonic.net/id/pidsx/global> ).

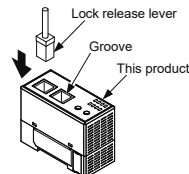
## 7 CONNECTING AN EXTERNAL DEVICE

### Connecting the Ethernet cable

- Before wiring, always turn the power OFF.
- For the Ethernet cable, use shielded twisted pair cables that are compatible with category 5e or higher.
- The communication distance must be within the specified range.
- Make sure that there is no duplication when setting station numbers.
- Always run the Ethernet cable through a duct or secure the cable with clamps. Failure to do so may affect the contact state of the connectors due to vibration or impact, resulting in malfunction.

### How to connect

- Hold the connector of the Ethernet cable and align the lock release lever of the Ethernet cable with the groove in IN or OUT.
- Insert the connector until it snaps in.

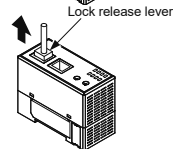


### How to disconnect

- Press on the lock release lever on the Ethernet cable and pull it out.

Notes: 1) Attempting to pull out the connector without pressing the lock release lever may break the lock release lever. Do not use an Ethernet cable whose lock release lever is broken. Do not grasp the cable to pull, as this may cause wire breakage in the cable.

2) To ensure communication reliability, always ground the shield of the Ethernet cable on the master device side. This product does not have a grounding terminal.



## 8 SPECIFICATIONS

Product name	EtherCAT-compatible communication unit for digital displacement sensors
Model	<b>SC-HG1-ETC</b>
Compatible sensor units	<b>HG-SC□, HG-TC□</b>
Maximum number of sensor units that can be connected	15 sensor units (1 master unit and 14 slave units) per one SC-HG1-ETC unit
Power supply voltage (Note 1)	24VDC ±10%, including 0.5V ripple (P-P)
Current consumption	100mA or less
Communication method	EtherCAT
Compliance	IEEE 802.3u (100BASE-TX)
Communication speed	100Mbps (100BASE-TX)
Node-to-node distance	100m or less
Telecommunications cable	Category 5e (shielded twisted pair cable recommended)
Telecommunications connector	RJ-45×2
Supported functions	Process data object communication (cyclic communication) Mailbox communication (message communication) CoE Explicit Device Identification Station Alias
Ambient operating temperature	-10 to +45°C, Storage: -20 to +60°C (No condensation or icing)
Ambient operating humidity	35% to 85% RH, Storage: 35% to 85% RH
Operating altitude (Note 2)	2,000m or less
Contamination level	2
Grounding method	Casing: Floating type
Material	Case: Polycarbonate
Weight	Approx. 90g

Notes: 1) Electric power required for this product is supplied from the master controller connected to it.  
2) Do not use or store this product in environments where ambient air is pressurized to an air pressure higher than the atmospheric pressure at an altitude of 0m.

## 9 CAUTIONS

- This device has been developed / produced for industrial use only.
- Do not use this product outside the range of the specifications. Risk of an accident and product damage. There is also a risk of a noticeable reduction of service life.
- Verify that fluctuations of power supply input voltage including that of the controllers do not exceed the rating.
- When noise generating devices (such as switching regulators and inverter motors) are used around this product, always ground the frame ground (F.G.) terminal of each device separately.
- Do not use during the initial transient time after the power supply is switched ON.
- Before connection work, always turn the power OFF.
- This product is suitable for indoor use only.
- Avoid using the product in steamy or dusty locations or other similar locations.
- Avoid using the product in atmospheres that contain corrosive or other harmful gases.
- Ensure that the product does not come into contact with organic solvents such as thinner.
- Ensure that the product does not come into contact with strong acid or alkaline.
- Ensure that the product does not come into contact with oils or fats.
- This product cannot be used in an environment that contains flammable or explosive gases.
- Performance may not be satisfactory in a strong electromagnetic field.
- Do not use this product in locations subject to severe vibration or shock.
- This product is a precision device. Do not drop or otherwise subject to shock. Doing so may result in failure.
- Do not apply stress such as excessive bending or pulling to the connector base of the Ethernet cable. Doing so may result in malfunctioning due to damage or connection failure.
- Never attempt to disassemble, repair, or modify the product.
- When the product becomes unusable or unneeded, dispose the product appropriately as industrial waste.
- For details on how to use the PC to be connected, refer to the instruction manual provided with the PC.

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<https://panasonic.net/id/pidsx/global>

Please visit our website for inquiries and about our sales network.

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