Panasonic® **INSTRUCTION MANUAL**

Communication Unit for EtherCAT SC-GU3-03

CMJE-SCGU303 No.0037-48V

Thank you very much for purchasing Panasonic products. Read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

⚠ WARNING

- Never use this product in a device for personnel protection.
- In case of using devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

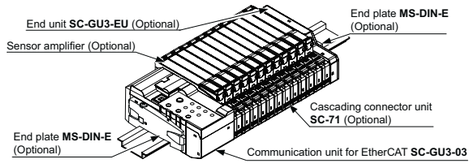
For details of the communication commands etc. of the communication unit for EtherCAT **SC-GU3-03**, refer to "**Product Specification**" or "**Communication Command Specification**." EtherCAT is registered trade mark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

1 CE MARKED PRODUCT

- The models listed under "8 **SPECIFICATIONS**" come with CE Marking. As for all other models, please contact our office.
- Contact for CE
  <Until June 30 ,2013>
  Panasonic Electric Works Europe AG
  Rudolf-Diesel-Ring 2, D-83607 Holzkirchen, Germany
  <From July 1 ,2013>
  Panasonic Marketing Europe GmbH Panasonic Testing Center
  Winsbergring 15, 22525 Hamburg,Germany

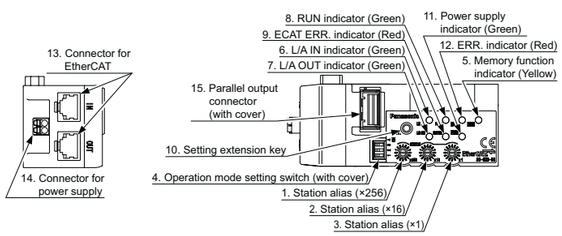
2 OUTLINE

- Communication unit **SC-GU3-03** can output the output signal (in case of 2-output type, only the output 1) of a sensor amplifier (NPN output type) that is connectable to cascading connector unit **SC-71** (optional), as the communication data of EtherCAT.
- **SC-GU3-03** enables to connect max. 16 units of sensor amplifier (**FX-300** series or **LS-400** series, etc.). In case of **FX-500** series, max. 12 units of sensor amplifier can be connected.
- This product can output all the output signals of the connected sensor amplifiers to PLC (Programmable Logic Controller) etc. in one time.
- By using end unit **SC-GU3-EU**, settings and control of the connected optically communicationable sensor amplifier (**FX-500** series, **LS-403** or **DPS-400** series) can be done.

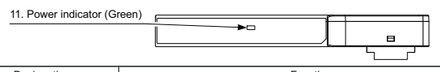


3 FUNCTIONAL DESCRIPTION

- **Communication unit for EtherCAT SC-GU3-03**

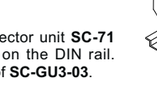


- **End unit SC-GU3-EU**



	Designation	Function
1	Station alias (×256) (Note 1) (Factory setting is 0)	Setting for station alias. The setting is possible in range of 000 to FFFh.  Setting direction of switch. As for number displays on switches, refer to each switch.
2	Station alias (×16) (Note 1) (Factory setting is 0)	
3	Station alias (×1) (Note 1) (Factory setting is 0)	
4	Operation mode setting switch (with cover) (Factory setting is full mode)	Data amount of I/O message can be changed by this setting.

DIP switch	Operation mode	Occupied memory IN	Occupied memory OUT
	I/O mode	2 bytes	0 bytes
	Check mode	4 bytes	0 bytes
	Full mode	44 bytes	10 bytes

5	Memory function indicator (Yellow)	Lights up when using memory function. Blinks when connecting a sensor amplifier whose set contents are different from the ones that are storing in this product.
6	L/A IN indicator (Green)	Lights up or blinks in normal operation of Link activity IN.
7	L/A OUT indicator (Green)	Lights up or blinks in normal operation of the Link activity OUT.
8	RUN indicator (Green)	Lights UP: In OPERATIONAL condition. Use in this condition. Blinks: In SAFE-OPERATIONAL / PRE-OPERATIONAL condition Turns off: In INIT condition
9	ECAT ERR. indicator (Red)	For the detail, refer to "7 **ERROR INDICATOR**".
10	Setting extension key (Note 1)	Used for memory function (Note 2), teaching and light intensity adjustment (Note 3). Also, used for canceling communication error.
11	Power indicator (Green)	Lights up when power is ON.
12	ERR. indicator (Red)	Blinks when an optical communication error occurs.
13	Connector for EtherCAT	Use a cable conformed category 5e .
14	Connector for power supply	24V 0V 
15	Parallel output connector (with cover)	 **CN-M20-C2** (optional) For detail, refer to "**Product Specification**" or <Recommended product> Housing 503149-2000 Terminal 503429-0000 (AXG 26 to 30) [MOLEX Japan co. Ltd.]

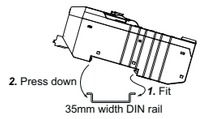
	Description			Description	
1	Signal 0	Output info for 1ch amplifier	11	Signal 10	Output info for 11ch amplifier
2	Signal 1	Output info for 2ch amplifier	12	Signal 11	Output info for 12ch amplifier
3	Signal 2	Output info for 3ch amplifier	13	Signal 12	Output info for 13ch amplifier
4	Signal 3	Output info for 4ch amplifier	14	Signal 13	Output info for 14ch amplifier
5	Signal 4	Output info for 5ch amplifier	15	Signal 14	Output info for 15ch amplifier
6	Signal 5	Output info for 6ch amplifier	16	Signal 15	Output info for 16ch amplifier
7	Signal 6	Output info for 7ch amplifier	17	Open	Not used
8	Signal 7	Output info for 8ch amplifier	18	Open	Not used
9	Signal 8	Output info for 9ch amplifier	19	V+	24V
10	Signal 9	Output info for 10ch amplifier	20	V+	24V

Notes: 1) For changing the setting, use a flat-head screwdriver etc.
2) In case using the memory function, **SC-GU3-EU** is required. Refer to "**Communication Command Specification**" for detail of memory function.
3) For the teaching and memory function, refer to "**Communication Command Specification**".

4 MOUNTING AND CONNECTION

How to mount

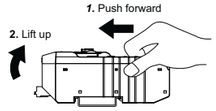
1. Fit the rear part of the mounting section of the unit on a DIN rail.
2. Press down the rear part of the mounting section of the unit on the DIN rail and fit the front part of the mounting section to the DIN rail.



How to remove

1. Push the unit forward.
2. Lift up the front part of the unit to remove it.

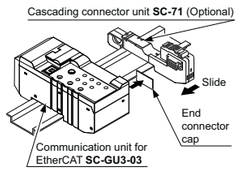
Note: Take care that if the front part is lifted without pushing the unit forward, the hook on the rear portion of the mounting section is likely to break.



How to connect

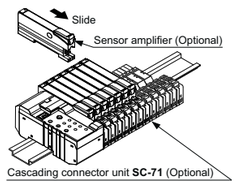
- Be sure that the power supply is OFF while adding / removing units.
- When the units are mounted in cascade, mount the end plates **MS-DIN-E** (optional) at the both ends of the units to hold them between the flat sides of the plates.
- Up to maximum 16 sensor amplifiers can be connected in cascade. (In case of **FX-500,** up to maximum 12 sensor amplifiers can be connected in cascade.)
- In case two different models of sensor amplifier are mounted in cascade, be sure to mount identical models together.
- For the cautions of the sensor amplifiers, refer to the instruction manuals enclosed with the amplifiers.

1. Mount communication unit **SC-GU3-03** on DIN rail.
   When mounting, remove the end connector cap which is attached to the connector area.

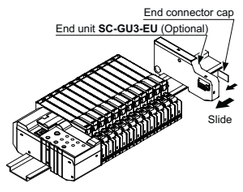


2. Mount cascading connector unit **SC-71** (optional) one by one on the DIN rail. And slide them to side of **SC-GU3-03**.

3. Insert sensor amplifiers (optional) to **SC-71**.

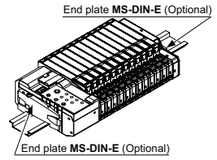


4. In case using end unit **SC-GU3-EU** (optional), mount **SC-GU3-EU** on DIN rail. And slide it to side of the sensor amplifiers.
   Attach the end connector cap which is removed in the step *1* to the connector area for cascading of the last unit.



5. Mount the end plates **MS-DIN-E** (optional) at both ends to hold the amplifiers between their flat sides.

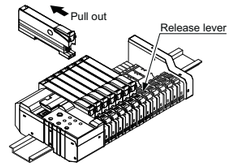
6. Tighten the screws of **MS-DIN-E** to fix the end plates.



How to remove sensor amplifiers

1. Press down release lever of **SC-71** and pull out the sensor amplifier. (Note)
   In state of cascading, the sensor amplifiers can be pulled out.

Note: Be sure that the release lever is broken without pressing down release lever when pulling out the sensor amplifiers.
Do not use the cascading connector unit that the release lever is broken.



How to remove units

1. Loosen screws of **MS-DIN-E**.
2. Remove **MS-DIN-E.**
3. Slide **SC-71** to disconnect the connection.
4. Remove each units.

5 MEMORY FUNCTION

- Memory function can be used only when connecting the optically communicationable sensor amplifier (**FX-500** series, **LS-403** or **DPS-400** series) and the end unit **SC-GU3-EU** (optional).
- This function enables to store the set contents of connected sensor amplifiers in the communication unit **SC-GU3-03** by each channel and send the stored contents to newly connected sensor amplifiers by each channel.

When storing set contents

1. Turn ON the power in the condition that the sensor amplifiers are connected to **SC-GU3-03**.
2. Storing starts after pressing the setting extension key down for approx. 2 sec.
3. When the storing to **SC-GU3-03** is complete, the memory function indicator (yellow) lights up.

Note: To cancel the memory function, press the setting extension key for approx. 2 sec. again.

When sending the stored set contents

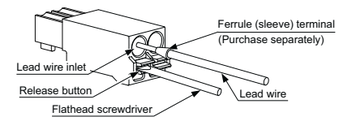
1. Turn OFF the power of **SC-GU3-03**.
2. Remove the sensor amplifiers that are connected to **SC-GU3-03** and mount new sensor amplifiers to which the set contents are transmitted to **SC-71**.
3. When turning ON the power of **SC-GU3-03**, memory function indicator (yellow) blinks.
   However, if the setting contents of the connected sensor amplifiers are same as the one that are stored in **SC-GU3-03**, it lights up.
4. When pressing the setting extension key, transmission of the set contents is started.
5. When the transmission is complete, the memory function indicator (yellow) turns to light up from blinking.

6 CONNECTING TO UPPER COMMUNICATION CABLE AND POWER CABLE

- Make sure that the power is OFF while wiring.
- Be sure to use the specified communication cable.
- The communication distance should be within the specification.

Connecting power cable

- When connecting to the terminal block, insert a solid wire or twisted wire (lead wire) with a ferrule (sleeve) terminal (please arrange separately) all the way in the lead wire inlet as shown in the figure below.



- The wire is locked when it is properly inserted. However, do not to pull the wire with excessive force, as this can cause a cable break.
- When connecting the twisted wire (lead wire) without a ferrule (sleeve), insert the wire all the way in the lead wire inlet while pressing the release button.
- When releasing the solid wire or the twisted wire (lead wire), pull the wire while pressing the release button.
- The following solid wire and twisted wire (lead wire) 0.2 to 1.0mm^2 (AWG 24 to 16) are recommended.

Connecting upper communication cable

- When connecting to EtherCAT network, use a category 5e cable.

7 ERROR INDICATOR

- In case of errors, attempt the following measures.

Indicator	State	Cause	Corrective action
ECAT ERR. indicator (Red)	Blinks	Watchdog time out / Configuration error	Check connection to master. Check allocation of process data objects.
L/A IN indicator (Green) / L/A OUT indicator (Green)	Turns OFF	There is possibility that ether net is not connected.	Check that connection of ether net is connected properly.
Power supply indicator (Green)	Turns OFF	There is possibility that power is not supplied to this product.	Check that the power is supplied to this product.
ERR. indicator (Red)	Blinks	Optical communication does not work properly.	Check the connection status of the connected sensor amplifiers or sensor unit and connection of end unit. Check the optical communication command and the transmitted data. For details, refer to "**Product Specification**" or "**Communication Command Specification**." By pressing down the setting extension key, error indicator (Red) turns off.

8 SPECIFICATIONS

- **Communication unit for EtherCAT SC-GU3-03**

Designation		Communication unit for EtherCAT
Model No.		**SC-GU3-03**
Applicable sensor amplifier		Sensor amplifier (NPN output type) that can connect the cascading connector **SC-71** (optional)
Number of connectable units		Max. 16 units per 1 of **SC-GU3-03** (Max. 12 units for **FX-500** series)
Supply voltage		24V DC 10% Ripple P-P ±10% or less
Current consumption		100mA or less at 24V source voltage (excluding connected sensor amplifiers, etc.)
Allowable passing current (Note)		Total: 2A or less
Specification for communication	Appricable standard / regulation	IEEE802.3u (100BASE-TX)
	Transmission rate	100Mbps (100BASE-TX)
	Transmission medium	Category 5e
	Internodal distance	100m
	Communication port	RJ-45×2
	Specification for EtherCAT communication	Process data object communication (cyclic communication) Mail box communication (message communication) compliant with CoE
Ambient temperature		-10 to +55ºC (If 4 to 7 units are connected in cascade: -10 to +50ºC, if 8 to 16 units are connected in cascade: -10 to +45ºC) (No dew condensation or icing allowed), Storage: -20 to +70ºC
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH
Material		Enclosure: Polycarbonate
Net wight		Approx. 75g

Note: It is the value that can supply to **SC-GU3-03** or the sensor units connected to **SC-GU3-03**, etc.

- **End unit SC-GU3-EU**

Designation	End unit
Model No.	**SC-GU3-EU**
Applicable sensor amplifier	• Communication unit for EtherCAT **SC-GU3-03** • Between **SC-GU3-03** to **SC-GU3-EU**: **FX-500** series, **LS-400** series etc.
Number of connectable units	1 unit for 1 of **SC-GU3-03**
Supply voltage	24V DC ±10% Ripple P-P 10% or less
Current consumption	25mA or less
Ambient temperature	-10 to +55ºC (If 4 to 7 units are connected in cascade: -10 to +50ºC, if 8 to 16 units are connected in cascade: -10 to +45ºC) (No dew condensation or icing allowed), Storage: -20 to +70ºC
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH
Material	Enclosure: Polycarbonate
Weight	Approx. 20g

- **Cascading connector unit SC-71**

Designation	Cascading connector unit
Model No.	**SC-71**
Applicable sensor amplifier	• Communication unit for EtherCAT **SC-GU3-03** • Communication end unit **SC-GU3-EU** • Between **SC-GU3-03** to **SC-GU3-EU**: **FX-500** series, **LS-400** series etc.
Number of connectable units	Max. 16 units per 1 of **SC-GU3-03** (Max. 12 units for **FX-500** series)
Ambient temperature	-10 to +55ºC (If 4 to 7 units are connected in cascade: -10 to +50ºC, if 8 to 16 units are connected in cascade: -10 to +45ºC) (No dew condensation or icing allowed), Storage: -20 to +70ºC
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH
Material	Enclosure: Polycarbonate, Metal plate: Aluminum
Weight	Approx. 10g

9 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure that the power supply is OFF while wiring and adding the units.
- Take care that wrong wiring will damage the product.
- Verify that the supply voltage variation is within the rating including the sensor amplifier.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not use during the initial transient time (2 sec.) after the power supply is switched on. In case using memory function or not using a **SC-GU3-EU**, be sure that transient time after the power supply is switched on becomes longer
- This product is suitable for indoor use only.
- This product cannot be used in an environment containing inflammable or explosive gases.
- Never disassemble or modify the product.
- Any protective devices or safety circuits against system malfunction should be designed to be external to the system.
- In case needing XML file, download from our home page (**http://panasonic.net/id/pidsx/global**).

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