GUGEN

UI-IM001-2208-07

PUSHLOG

GW-400 Series

Instruction Manual

Thank you for choosing PUSHLOG GW-400 Series.

This instruction manual explains the installation, wiring, and specifications of the product. For the handling and operation of the product, please read this manual before using the product to get the knowledge of the device and understand the precautions when handling it.
Also, please take care so that this instruction manual reaches the end-users of the product.

Trademarks: The names of the companies and products mentioned in this manual are the registered trademarks or trademarks owned by the respective companies.
This instruction manual is effective as of January 2022. Specifications are subject to change without notice. Thank you for your understanding.

Safety Precautions

(Please make sure to read the instructions before using the product)

This manual uses the following symbols for precautions. The precautions shown below describe important safety information.

⚠ WARNING	This symbol indicates the contents that could result in death or serious injury if the product is improperly handled without following the instructions.
⚠ CAUTION	This symbol indicates the contents that could result in personal injury or physical damage if the product is improperly handled without following the instructions.
⃠	This symbol indicates (prohibitory) items that must not be done for the proper use of the product.
❗	This symbol indicates (mandatory) items that must be done for the proper use of the product.

Product Summary

Remote monitoring and data collection
The function collects internal data of PLC or control device connected to this product in the database on the cloud and checks them on a PC or Tablet type terminal at a remote location.

General Precautions

⚠ WARNING	・Do not use this product for the purpose of protecting the human body and any part of it. ・This product is not designed for use in explosion-proof areas. Do not use it in explosion-proof areas. ・Do not use the LOG button (switch) for any purpose that could lead to a risk to human life and damage to equipment. In addition, implement a system design in a manner that can handle any malfunction of the LOG button (switch).
⚠ CAUTION	・When starting to work or operating the product, check if the product is operating properly in terms of its functions and performance. ・In the event that our products break down, take sufficient safety measures to prevent various damages before use. ・If the product is used in any manner other than those specified in this instruction manual, the protection provided by this product may be damaged.
⃠	・Do not give a shock to the LOG button (switch), and do not push it hard more than necessary. Doing so could result in breakage. ・Do not expose each device, including peripheral equipment, to a sudden temperature change. Doing so could result in the malfunction of the device to dew condensation.
❗	・When using the product in combination with other devices, perform a sufficient prior examination before use. There are cases where its functions and performance may not be satisfactory depending on the conditions of use and the environment. ・Keep cables as far away from high voltage lines and power lines as possible. Failure to do so could result in malfunction or failure due to noise.

1. Approved Standards

EMC-related standards
Applicable standards: EN61000-6, EN55011 Class A subpart B
・Enclosures (such as control panels) should be grounded to FG. (Positive grounding is not possible.)
・Be sure to use shielded cables for signal lines that go out from the enclosures (such as control panels) and ground the shielded cables to the enclosures (such as control panels). However, any USB shielded cables should not be grounded.
・The wiring cable for the external I/O terminal block should be less than 3m long. Also, when supplying power (DC5V) to the RJ45 connector, keep the wiring length within 3m.
・Wrap the communication cable one turn around “ESD-SR-150 (TOIKIN).” Also, when supplying power (DC5V) to the RJ45 connector, wrap the cable two turns around“MRFC-8 (Kitagawa Kogyo).”
・Compatibility testing must be performed by the equipment manufacturer who implemented the installation.

Safety Standards
Applicable standards: EN61010-1
When using this product, use either of the following power sources.
・Any UL-certified or CSA-certified power supply with Class 2 output as specified in NFPA70 (NEC: National Electrical Code) and CEC (Canadian Electrical Code).
・Any UL-certified or CSA-certified power supply that has been rated as a Limited Power Source as specified in UL60950-1 and CAN/CSA-C22.2 No.60950-1.

RoHS Directive Compliance

FCC Compliance Statement:
FCC ID: 2A7SV-2230A
Contains FCC ID: XPY2AGQN4NNN

This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received,
including interference that may cause undesired operation.

Modifications:
The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by GUGEN could void the user’s authority to operate the equipment.

Note:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on,
the user is encouraged to try to correct the interference by one or more of the following measures:
・Reorient or relocate the receiving antenna.
・Increase the separation between the equipment and receiver.
・Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
・Consult the dealer or an experienced radio/TV technician for help.

RF Exposure:
This device should be operated with a minimum separation distance of 20 cm (8 inches) between the equipment and a person’s body.

2. List of Packaged Items

☐ Main unit × 1
☐ Mounting screws (M3×8) × 4
☐ Instruction manual (this manual) × 1

3. Installation

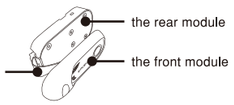
Cautions for installation ⚠ CAUTION

・When installing the product, make sure to shut off the power supply externally before installation. Failure to do so could result in damage to the product.
・The installation location should be in an environment within the specification range described in this manual.
Do not use the product in any place where it is subjected to direct sunlight, high temperatures, dust, moisture, or frequent vibration, or where it is exposed to oil smoke, corrosive gases, or flammable gases. Doing so could result in malfunction.
・Do not install the front module inside any metal control panel or metal equipment. Doing so could result in loss or instability of LTE-M communication.

Installation procedure (without using the mounting bracket (optional))

● When installing with a 30mm-diameter mounting hole

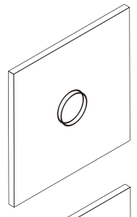
①Packing condition at shipment from our company.



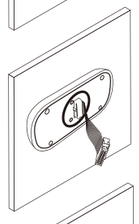
②Separate the connection cable from the rear module.

③Drill a 30mm-diameter mounting hole on the mounting panel.

Mountable panel thickness t =1.2 ~ 2.3mm

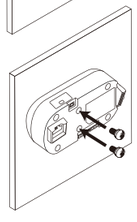


④Align the front module with the center of the mounting hole.
Be careful not to allow the two packings to drop off.

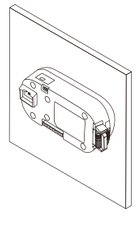


⑤Position the rear module so that it is aligned with the front module.

⑥Insert the supplied screws (M3×8) into the two mounting holes on the rear module as indicated by the arrows, and tighten the screws into the screw holes of the front module.
Tightening torque: 0.3 ~ 0.5 N・m

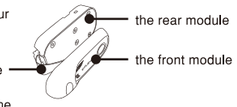


⑦Attach the connection cable to the connector on the rear module.



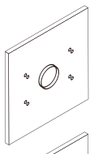
● When installing with 3.8mm-diameter mounting holes (4 locations)

①Packing condition at shipment from our company.



②Separate the connection cable from the rear module.

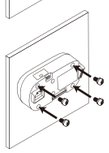
③Drill a 30mm-diameter mounting hole and four 3.8mm-diameter mounting holes on the mounting panel.
Mountable panel thickness
t = 1.2 ~ 2.3mm
※ Refer to the dimensional outline drawing for the locations of the mounting holes.



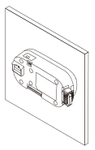
④Align the front module with the center of the 30mm-diameter mounting hole.
Be careful not to allow the two packings to drop off.

⑤Position the rear module so that it is aligned with the front module.

⑥Insert the supplied screws (M3×8) into the four mounting holes on the rear module as indicated by the arrows, and tighten the screws into the screw holes of the front module.
Tightening torque: 0.3 ~ 0.5 N・m



⑦Attach the connection cable to the connector on the rear module.

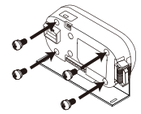


Cautions for installation to the panel ⚠ CAUTION

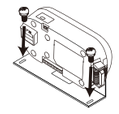
・If the thickness of the mounting panel exceeds the default value (2.3mm), use M3 screws with a length of the thickness of the mounting panel plus 6mm, and check that there is no danger of dropping off before use.
・Check that there is no distortion or unevenness on the surface of the mounting panel.
If there is distortion or unevenness on the surface of the mounting panel, the modules may drop off, or the protection structure (IP64) of the frontal portion of the front module may not be guaranteed.
・Retighten the screws at the specified tightening torque (0.3~0.5 N・m).
Also, implement a design so that target devices or systems will not be damaged even if the product drops off due to the loosening of the screws and other reasons.

Installation procedure (when using the mounting bracket (optional))

①Attach the gateway to the mounting bracket by referring to “When installing with 3.8mm-diameter mounting holes (4 locations).”



②Fix the mounting bracket to the device using the mounting holes (two locations) of the mounting bracket.
The screws for fixing the mounting bracket need to be prepared by the user.



Cautions on the screws for fixing the mounting bracket ⚠ CAUTION

・M3 screws and washers should be used. Also, the recommended tightening torque is 0.3N・m or more.
・Use M3 screws with a length of the thickness of the mounting panel plus 5mm or more, and check that there is no danger of dropping off before use.

4.Wiring

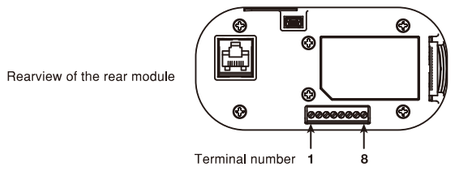
Cautions for wiring ⚠ CAUTION

- When wiring, be sure to shut off the power supply externally beforehand. Failure to do so could result in damage to the product.
- Do not use the product at any voltage other than the specified power supply voltage (DC12~24V or DC5V). Doing so could result in fire, electric shock, or malfunction.

Cautions for wiring

- Do not let the cable come into close contact with the main circuit lines, high voltage lines, or power lines.
  Doing so could increase the susceptibility to noise and surge, which may cause malfunction or failure.

Power supply and I/O terminal block



Terminal layout

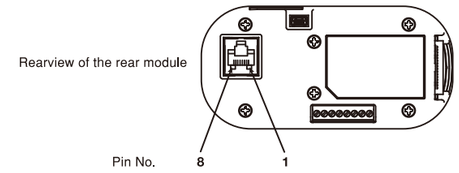
Terminal number	Name	Description
1	24V	Power supply DC + 12 ~ 24V *1
2	0V	Power supply GND *1
3	IN1	External input terminal 1
4	IN2	External input terminal 2
5	COM(−)	External I/O common *2
6	OUT1	External output terminal 1
7	OUT2	External output terminal 2
8	COM(−)	External I/O common *2

*1 This cannot be used when power is supplied from the power supply terminal of the serial communication interface (RJ45 connector).
Use of any UL-certified or CSA-certified power supply rated as a Limited Power Source with Class 2 output is recommended.
*2 The external I/O common is internally shared.

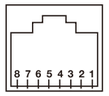
Terminal specifications

Item	Description
Wire size	AWG16 ~ 26
Tightening torque	0.22 ~ 0.25N・m
Wire material	Copper
Wire type	Single wire/Stranded wire

Serial communication interface (RJ45 connector)



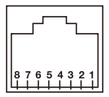
RJ45 connector pinout



GW-402, GW-402i (RS-232C type)

Pin No.	Name	Description	Wire color *1
1	RTS(RS)	Request To Send	White/Green
2	CTS(CS)	Clear To Send	Green
3	RXD(RD)	RS-232C Receive Data	White/Orange
4	SG	RS-232C GND	Blue
5	TXD(SD)	RS-232C Transmit Data	White/Blue
6	SG	RS-232C GND	Orange
7	0V	Power supply GND *2	Not connected
8	5V	Power supply DC+5V *2	Not connected

*1 The wire colors show those of the standard cable OP-C001 (optional).
*2 This cannot be used when power is supplied from the power supply terminal of the power supply and I/O terminal block.
Use of any UL-certified or CSA-certified power supply rated as a Limited Power Source with Class 2 output is recommended.



GW-404, GW-404i (RS-485 type)

Pin No.	Name	Description	Wire color *1
1	NC	Not connected	White/Green
2	NC	Not connected	Green
3	NC	Not connected	White/Orange
4	S/R(-)	RS-485 Transmit and Receive Data(−)	Blue
5	S/R(+)	RS-485 Transmit and Receive Data(+)	White/Blue
6	SG	RS-485 GND	Orange
7	0V	Power supply GND *2	Not connected
8	5V	Power supply DC + 5V *2	Not connected

*1 The wire colors show those of the standard cable OP-C001(optional).
*2 This cannot be used when power is supplied from the power supply terminal of the power supply and I/O terminal block.
Use of any UL-certified or CSA-certified power supply rated as a Limited Power Source with Class 2 output is recommended.

5. Specifications

General specifications

Item	Specifications
Power supply voltage	DC12V(−10%)～24V(+20%) (DC5V (-0,+10%) when supplied from the serial communication interface)
Current consumption	0.2A or less(0.45A or less when supplied from the serial communication interface (at 5VDC))
Ambient operating temperature	0 ～ 55℃ (non-freezing)
Ambient operating humidity	10 ～ 85%RH (non-condensing)
Ambient storage temperature	-20 ～ 85℃ (non-freezing)
Ambient storage humidity	10 ～ 85%RH (non-condensing)
Operating atmosphere	No excessive dust or corrosive gases
Operating altitude	2000m or less
Pollution degree	2 (indoor use)
Overvoltage category	1
Noise resistance	1500Vp-p or more Pulse width 1μs, 50ns (by noise simulator)
Withstand voltage	AC1500V per minute (between all power supply terminals and the I/O terminal, and between all external terminals and the case)
Insulation resistance	50MΩ or more (between the power supply terminal and the I/O terminal, and between all external terminals and the case by a DC500V megger)
Vibration resistance	5 ～ 9Hz half amplitude 3.5mm 9 ～ 150Hz constant acceleration 9.8m/s^2 10 times in each direction for X, Y, Z (100 minutes) (Compliance with JIS B 3502 and IEC61131-2)
Protection structure	IP64 (only the frontal portion of the front module)
Outside dimension(mm)	117(L)×57(W)×46.5(H), excluding protrusions and mounting bracket
Weight	Approx.160g

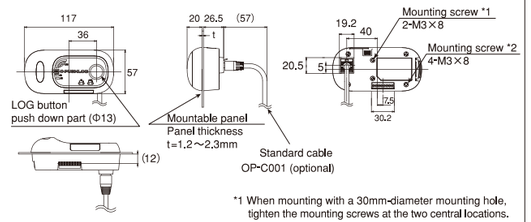
Performance specifications

Item			Specifications	
Model			GW-402, GW-402i	GW-404, GW-404i
Communication system		UMTS	LTE Cat.M1 [LTE-M]	
		Supported frequency bands	Band1(2100MHz)*1*2,Band2(1900MHz)*4, Band3(1800MHz)*3,Band4(1700MHz)*4, Band5(850MHz)*4,Band8(900MHz)*1*3, Band12(700MHz)*4,Band13(700MHz)*4, Band18(850MHz)*1,Band19(850MHz)*1*2, Band25(1900MHz)*4,Band26(850MHz)*1	
		Power class	Class 3 (23 dBm)	
		Built-in cellular module	SARA-R410M-02B	
		Technical standards compliance	Japan * For overseas use, please contact us.	
		SIM	Built-in eSIM	
External device connection interface	Serial communication	Communication standards	RS-232C × 1	RS-485 × 1
		Connection interface	RJ45 connector	
		Transmission rate	9600/19200/38400/ 57600/115200 bps	9600/19200/38400/ 57600/115200/ 230400 bps
		Transmission system	Full-duplex	Half-duplex
		Data format: Start bit	1 bit	
		Data format: Data bit	7/8 bit *5	
		Data format: Stop bit	1/2 bit	
		Data format: Parity	None / Even / Odd *5	
		RS/CS flow control	Available	−
		Communication format	Command-response communication that complies with each company's communication protocol. GW-404 and GW-404i are compliant with Modbus (RTU) protocol.	
		Transmission distance	15m	1200m
		Number of transmittable units	1	Up to 8
	USB communication	Communication standards	USB 2.0	
		Connection interface	Mini-B	
	Location information acquisition	Positioning method	GPS	
	External input	Input point	2 points	
		Input type	Contact input	
		Common method	2 points/1 common (1 terminal)	
		Input current when ON	5mA or less	
		Connection interface	Terminal block	
	External output	Output point	2 points	
		Output element	MOSFET(N-ch) (with overcurrent protection function)	
		Rated load	DC30V, 0.2 A	
		Leakage current when OFF	100μA or less	
		Residual voltage when ON	DC 0.5V or less	
		Common method	2 points/1 common (1 terminal)	
		Connection interface	Terminal block	

*1 These frequency bands are supported by GW-402 and GW-404 in Japan.
*2 These frequency bands are supported by GW-402i and GW-404i in Japan.
*3 These frequency bands are supported by GW-402,GW-404,GW-402i and GW-404i in Thailand.
*4 These frequency bands are supported by GW-402,GW-404,GW-402i and GW-404i in US.
*5 Data bit:7bits and parity:It is not possible to set to none.

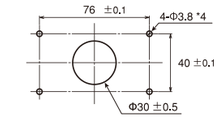
6· Outline Dimensional Drawings

PUSHLOG Gateway GW-402, GW-402i, GW-404, GW-404i <unit：mm>

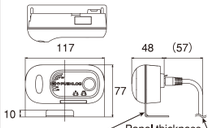


*1 When mounting with a 30mm-diameter mounting hole, tighten the mounting screws at the two central locations.
*2 When mounting with 3.8mm-diameter mounting holes (4 locations), tighten the mounting screws at the four surrounding locations.
*3 Four mounting screws (M3×8) are included with the PUSHLOG main unit.
*4 These mounting holes are only used when tightening the mounting screws at the four surrounding locations. They are not needed when tightening the mounting screws at the two central locations.

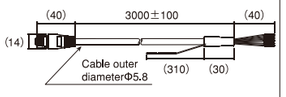
Drawing of mounting holes on the panel



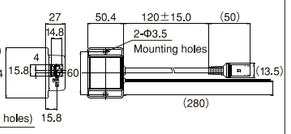
When using the mounting bracket OP-A001



Standard cable OP-C001

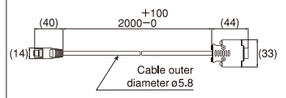


TCmini connection attachment OP-C002

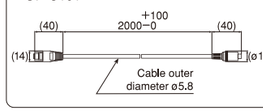


PLC connection cable

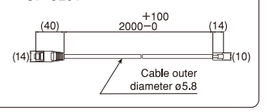
OP-C102, OP-C103, OP-C202, OP-C301



OP-C101



OP-C201



Storage and Transportation Precautions

- Do not disassemble or alter the product. Doing so could result in failure, malfunction, or fire.
- Do not drop the product or subject it to a strong impact. Doing so could result in malfunction.
- Do not store the product in any place where it is exposed to direct sunlight, high temperature, dust, moisture or frequent vibration, or where it is exposed to oil smoke or corrosive gases. Doing so could result in malfunction.

Disposal Precautions

- When disposing of the product, treat it as an industrial waste.

Warranty Information

The warranty period shall be 12 months starting from the date of shipment from our company. If there occurs a malfunction in the product under the environmental conditions that meet the specifications, we will replace the product free of charge. Even during the free warranty period, if the malfunction is attributable to improper use by the customer, we will charge for the replacement.
The warranty covers the delivered product only and does not cover any damage incidental to a malfunction of the delivered product, nor does it cover on-site repair or replacement.

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