GRAPHICAL MAILING UNIT
Model: GM30

USERS MANUAL

MG CO., LTD. www.mgco.jp
5-2-55 Minamitsumori, Nishinari-ku, Osaka 557-0063 JAPAN

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1. Introduction

Thank you for choosing us.
Before use, check the following information.

1.1 Before Use....

■ PACKAGE INCLUDES:

- Graphical mailing unit (1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

1.2 Corresponding Versions

This Users Manual corresponds to the following versions of our products.

■ USERS MANUAL

This Users Manual corresponds to model GM30 firmware version 1.0.x.x or later (Refer to "7.1.2 Information (version, MAC address)" on page 57).

Descriptions of this manual are based on the PC Configurator Software GM30CFG Version 1.0.x.
Refer to "6.4.3 Confirm the software version" on page 29 to check your GM30CFG version No.

1.3 Precautions

■ CONFORMITY WITH EU DIRECTIVES

- The equipment must be mounted inside the instrument panel of a metal enclosure.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and input signal for safety.
- Before you remove the terminal block or mount it, turn off the power supply for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within 0 to 50°C (32 to 122°F) with relative humidity within 10 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.
- Max. wiring length for FE terminal should be 3 meters.
- Be sure to attach the terminal cover for safety.

■ CALENDAR CLOCK

- A backup battery is employed for calendar clock IC. Backup period without power supply is approx. 2 years.
- The battery power is not drained while the power is supplied to the unit. If the unit is left without power for approx. 2 years, the battery can no longer keep the backup calendar data, and correct date and time cannot be maintained.
- The battery is not replaceable by customer. When replacement is required, consult us.

■ AND ....

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

1.4 Terms

Table 1. Terms

TERMS	EXPLANATION
Channel CH	3 types of input channels are defined in GM30. All input signals are in the form of encoded digital data. AI: Analog input (16 bit signed integer, unsigned integer) DI: Discrete input (1 bit) PI: Pulse input (32 bit unsigned integer, signed integer, floating point)
Pen	Pens are used for trend graph and status graph. Channels must be assigned to pens in order to plot waveforms on the trend graph or status on the status graph.
Alarm zone transition	For AI and PI, the full-scale input range can be divided into a maximum of 5 zones. The shift between zones caused by a change in the input value is called 'alarm zone transition'. DI can only be ON/OFF, and hence a change in the input signal is equivalent to an alarm zone transition.
Sampling	Means the acquisition of input values of specified channels in the sampling rate.
Sampling data	Indicates the input value acquired by the sampling.
Trend graph	Indicates the waveform data assigned to the pen.
Status graph	Indicates the status of the pen assigned to the pen.
Sampling rate	The time cycles used for acquiring input values of trend graph and status graph by the GM30; fixed at 1 second.
Connection	Indicates the definition of TCP/TP access point with the remote I/O and PLC.
Input data communication	The communication to acquire the data from the remote I/O and PLC based on the connection and the specified channels.
Pause period	Idle time between the cycles of input data acquisition for each connection.
Normal / Abnormal status	Each AI/PI zone and DI status can be defined "Normal" or "Abnormal." Abnormal status is applied to the device when any one or more of the zones/status is abnormal, while normal status is applied when not one of the zone/status is abnormal.
Regular report	Sends mail report based on the schedule.
Event report	Sends mail report based on the GM30's normal status and abnormal status.
Mail queue	Regular report and event report mail contents are registered in the mail queue. Mails are sent in the order of registration in the queue.

1.5 General specifications

Table 2. General specifications

ITEM	DESCRIPTIONS	REMARKS
Power	24 V DC	–
Clock	RTC	Year (4 digits), month, date, day, hour, minute, second
Setting method	GM30CFG (USB connection) Browser (Ethernet connection)	Both method can set all items.
Comm. port	Ethernet 10/100 BASE-T	–
Setting communication	Configuration connector	USB mini-B type
Run contact	ON during operation (WDT)	OFF at CPU error
Indicator	Status indicator LEDs	POWER, GM30 RUN, DHCP, COM, ERROR
Communication	TCP/IP UDP ICMP DHCP Client SNTP Client HTTP Server Modbus/TCP Client SLMP Client SMTP	–

Table 3. Related products

ITEM	REMARKS
Configurator cable	USB 2.0 compatible cable (GM30 connector: mini-B type, 5.0m max.)
Configurator software	GM30CFG

Software downloadable at our web site.

Table 4. Device specifications

ITEM	REMARKS
Power, RUN contact output	M3 separable screw terminal
Ethernet	RJ-45 modular jack
Housing	Flame-resistant resin (gray)
Isolation	Ethernet to power to RUN contact output to FE
Calendar clock	Year (4 digits), month, date, day, hour, minute, second
Status indicator LEDs	POWER, GM30 RUN, DHCP, COM, ERROR
RUN contact output	Rated load: 250 V AC @ 0.5 A ($\cos\phi$=1) 30 V DC @ 0.5 A (resistive load) (Less than 50 V AC to conform with EU Directive) Maximum switching voltage: 250 V AC or 30 V DC Maximum switching power: 250 VA (AC) or 150 W (DC) Minimum load: 5 V DC @ 10 mA Mechanical life: 2 × 107 cycles (rate: 300 cycles/min.) When driving an inductive load, external contact protection and noise quenching recommended.

Table 5. Ethernet Communication

ITEM	REMARKS
Communication Standard	IEEE 802.3u
Transmission	10BASE-T, 100BASE-TX
Baud rate	10/100 Mbps (Auto Negotiation function)
Protocol	TCP/IP, DHCP, SNTP, HTTP, SMTP, Modbus/TCP, SLMP
Transmission media	10BASE-T (STP, Category 5), 100BASE-TX (STP, Category 5e)
Max. segment length	100 meters
Status Indicator LEDs	DPLX, LNK
IP address (factory default)	192.168.0.10

Table 6. Installation

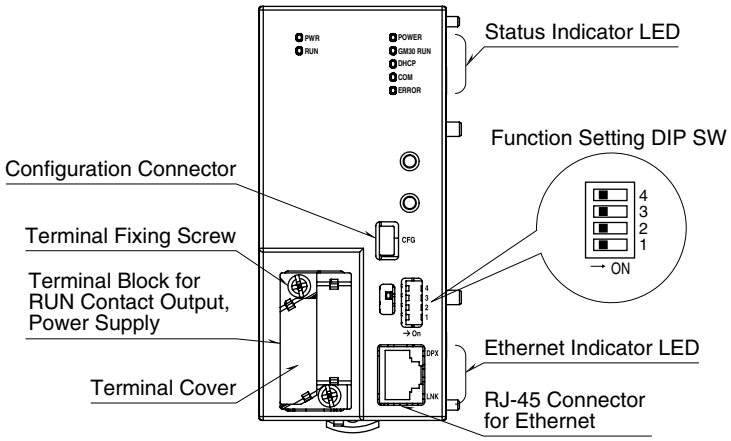
ITEM	REMARKS
Power consumption	Approx. 5 W 24 V DC
Operating temperature	0 to 50°C (32 to 122°F)
Storage temperature	-10 to +60°C (14 to 140°F)
Operating humidity	10 to 90 %RH (non-condensing)
Atmosphere	No corrosive gas or heavy dust
Mounting	Wall or DIN rail
Weight	330 g (0.73 lb)

Table 7. Calendar clock

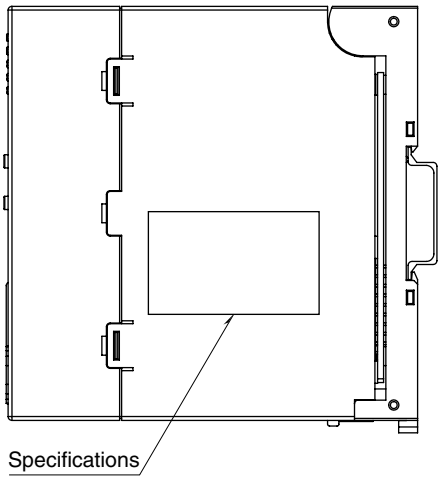
ITEM	REMARKS
Accuracy	Monthly deviation 2 minutes at 25°C
Back up period	Approx. 2 years
Battery	Primary lithium battery (non-removable) Battery backup function is turned off at the factory shipping in order to prevent the battery draining. Turn on the function prior to start the device.

1.6 Component Identification

■ **FRONT VIEW**



■ **SIDE VIEW**



■ **BOTTOM VIEW**

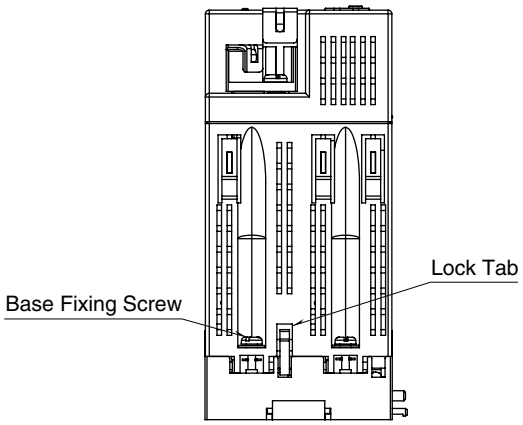


Figure 1. External View

Table 8. Status indicator LED

LED	COLOR	FUNCTION
PWR	Green	ON when powered OFF when not powered
RUN	Green	ON in normal operation OFF in error (CPU error)
Power	Green	ON in normal operating conditions OFF at Ethernet LNK error Blinks at startup failure
GM30 RUN	Green	ON in normal operating conditions Blinks at communication error Blinks when the address is not obtained by DHCP.
DHCP	Green	When DHCP is set: ON When fixed IP is set: OFF
COM	Orange	Blinks during communication (except for Modbus/TCP or SLMP)
ERROR	Red	ON at CPU error

Table 9. Ethernet indicator LED

LED	COLOR	FUNCTION
DPLX	Green	ON during full duplex transmission
LNK	Amber	ON while link is established.

Table 10. DIP SW

SW	FUNCTION
SW1	Configuration USB connection OFF: GM30CFG (*) ON: Terminal software
SW2	Mail reporting function, deleting mail queue OFF: Enable (*) ON: Disable (mailing function disabled, and mail queue deleted)
SW3	DHCP OFF: Unused (*) ON: Used
SW4	RTC backup OFF: Disable (*) ON: Enable (Turn ON by user after purchase)

(*) Factory setting

2. System Configuration

2.1 Basic Configuration

The GM30 generates PNG type graphic files (including graphs, values and texts) using data acquired from remote I/Os, and send e-mails with the files attached to them.

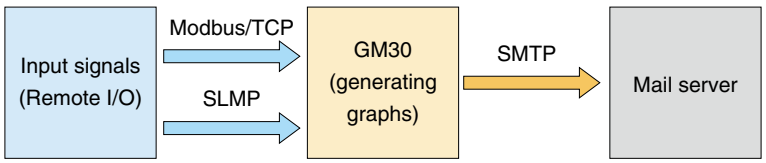


Figure2. Basic Configuration

2.2 Data Type

The following data types are compatible with the GM30 as the input signals.
The input data is internally converted to engineering unit value and processed.

Table 11. Data Type

VARIABLES TYPE	RANGE	APPLICABLE CHANNEL	REMARKS
BIT	0, 1	DI	0 or 1
SHORT	-32,768 to 32,768	AI	16-bit signed integer
USHORT	0 to 65,535	AI	16-bit unsigned integer
LONG	-2,147,483,648 to 2,147,483,648	PI	32-bit signed integer
ULONG	0 to 4,294,967,295	PI	32-bit unsigned integer
FLOAT	±1.175494e-038 to ±3.402823e+038	PI	Compliant to IEEE754

- Range of the engineering unit value is ±10,000,000,000.000. The values out of the range are rounded.

3. Input Data Communication

3.1 Connection

GM30 can have at the maximum of 32 connections (TCP) for input communication.
Refer to "6.6.2 Input Communication Setting" on page 34 for details of setting.

Table 12. Connection

FUNCTION	DESCRIPTION
No. of connection	Max. 32 (C0 - 31)
Protocol	Select from Modbus/TCP and SLMP
Access point	Set IP address and port No.

One sampling of input communication is performed to all channels of each connection.
When a sampling cycle is complete, all the acquired data are updated.
The unit waits for the duration of pause period before starting a next sampling of the same connection.
If a sampling cycle is interrupted by a communication error, only those channels which have been already acquired are updated, and the rest are held at the previous values.

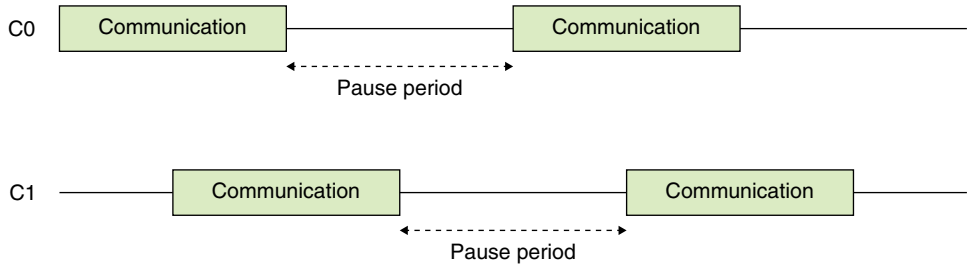


Figure 3. Communication by connection

3.2 Modbus/TCP

Using the Modbus/TCP master function of the GM30 for the data input communication, remote I/O and PLC compatible with Modbus/TCP client function can be connected.

Table 13. Modbus/TCP

ITEM	DESCRIPTIONS	
Request	Types	Operation
	Read Coil Status (01)	Read out Coil Status (0X)
	Read Input Status (02)	Read out Input Status (1X)
	Read Holding Register (03)	Read out Holding Register (4X)
	Read Input Register (04)	Read out Input Register (3X)
Channel	Types	Selectable Modbus Channel Types
	AI	3X, 4X
	DI	0X, 1X
	PI	3X, 4X
Unit identifier	Set a common number for each connection (C), or individual numbers by channels.	

Refer to the web page of Modbus Organization for details of Modbus/TCP.

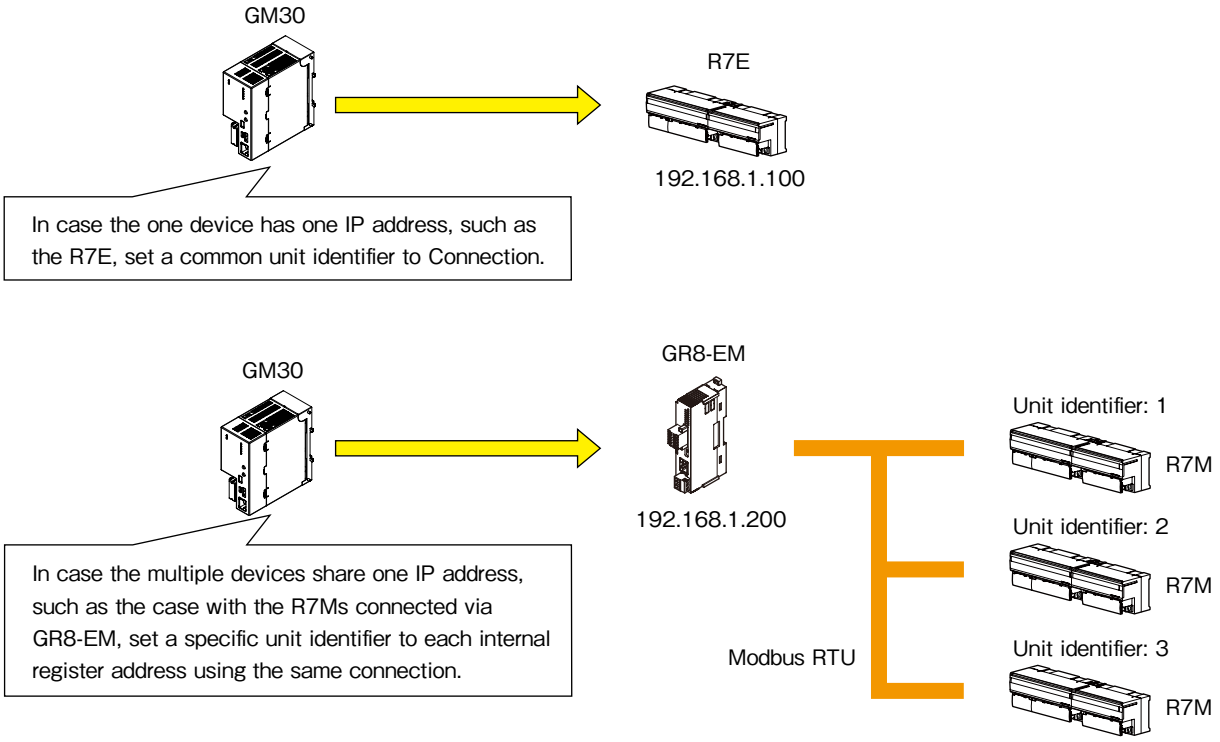


Figure 4. Unit Identifier

3.3 SLMP

GM30 supports SLMP as input communication to communicate with the Mitsubishi programmable-controller. Compatibility is tested and confirmed for 16-bit and 32-bit sub commands of MELSEC iQ-R, Q and IQ-F series.
Refer to the following tables for MELSEC devices compatible with each type of input channels.
*Refer to the web site of CC-link or users manual of each programmable controller for details of SLMP.

Table 14. Input (AI and PI)

DEVICE	DEVICE CODE	16 bits					32 bits				
		COMMAND	SUB COMMAND	Compatible programmable controller			COMMAND	SUB COMMAND	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
D	00A8H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SD	00A9H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
W	00B4H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SW	00B5H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
TN	00C2H	0403H	0000H	✓	✓	✓*	0403H	0002H	✓	×	×
CN	00C5H	0403H	0000H	✓	✓	✓*	0403H	0002H	✓	×	×
STN	00C8H	0403H	0000H	✓	✓	✓*	0403H	0002H	✓	×	×
Z	00CCH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
ZR	00B0H	0403H	0000H	✓	✓	×	0403H	0002H	✓	×	×
R	00AFH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
RD	002CH	0403H	0000H	×	×	×	0403H	0002H	✓	×	×

*Choose "Upper" for the word order of PI channel.

Table 15. Input (DI)

DEVICE	DEVICE CODE	16 bits					32 bits				
		COMMAND	SUB COMMAND	Compatible programmable controller			COMMAND	SUB COMMAND	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
M	0090H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
L	0092H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
F	0093H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
V	0094H	0403H	0000H	✓	✓	×	0403H	0002H	✓	×	×
S	0098H	0403H	0000H	×	×	✓	0403H	0002H	×	×	×
X	009CH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
Y	009DH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
B	00A0H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SB	00A1H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
SM	0091H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
TC	00C0H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
TS	00C1H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
CC	00C3H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
CS	00C4H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
STC	00C6H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
STS	00C7H	0401H	0001H	✓	✓	✓	0401H	0003H	✓	×	×
LTC	0050H	0403H	0000H	×	×	×	0401H	0002H	✓	×	×
LTS	0051H	0403H	0000H	×	×	×	0401H	0002H	✓	×	×
LCC	0054H	0403H	0000H	×	×	✓	0401H	0003H	✓	×	×
LCS	0055H	0403H	0000H	×	×	✓	0401H	0003H	✓	×	×
LSTC	0058H	0403H	0000H	✓	✓	✓	0401H	0002H	✓	×	×
LSTS	0059H	0403H	0000H	✓	✓	✓	0401H	0002H	✓	×	×

Table 16. Input (PI)

DEVICE	DEVICE CODE	16 bits					32 bits				
		COMMAND	SUB COMMAND	Compatible programmable controller			COMMAND	SUB COMMAND	Compatible programmable controller		
				iQ-R	Q	iQ-F			iQ-R	Q	iQ-F
LTN	0052H	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
LCN	0066H	0403H	0000H	✓	✓	×	0403H	0002H	✓	×	×
LSTN	005AH	0403H	0000H	✓	✓	✓	0403H	0002H	✓	×	×
LZ	0062H	0403H	0000H	✓	✓	×	0403H	0002H	✓	×	×

4. Graph

4.1 Trend Graph

The trend graph attached to the mail reporting using the GM30 is as following.
The screen is structured by "Title indication part" that indicates title and the time, "Data indication part" that indicates pen scale, and "Trend indication part" that indicates recorded trend graph.

Figure 5. Trend Graph

Table 17. Trend Graph

ITEM	DESCRIPTION
Max. No. of pens	10 pens (P1 - P10)
Sampling rate	1 sec.
Dot transfer speed	10 - 3600 sec.
Image specifications	Resolution: 1920 × 1080 px (Full HD) Format: PNG (8 bit RGB) Size: 100 KB (approximate value)
Title part	Indicates the title of the trend graph and the time when the file is generated.
Data part	Indicates the present value and the zone of the pen.
Trend graph part	Indicates the recorded trend graph.
No. of data samples	Max. 1620 dots (varies according to the dot transfer speed)

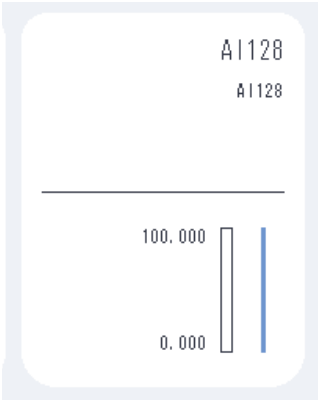
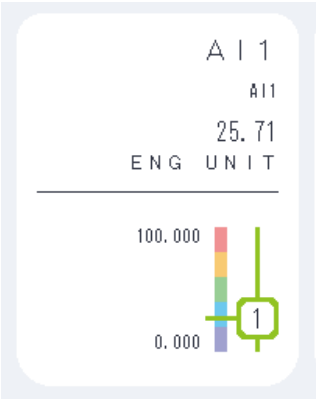
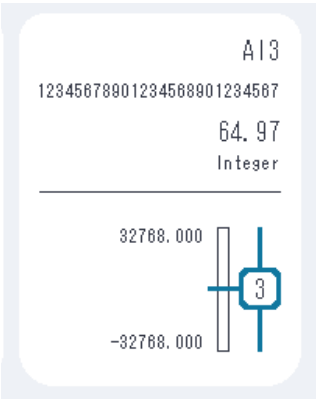
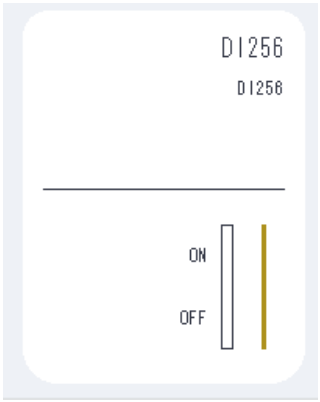
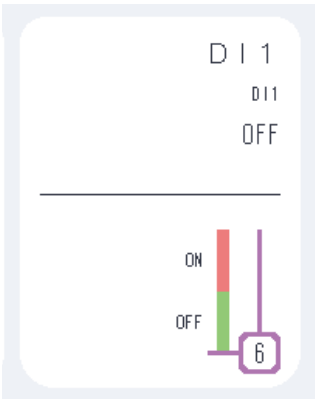
The data indication part is structured by assigned pen indication and scale indication.
When the signal is in abnormal zone/status, the background color turns to the specified zone color or that specified to ON/OFF status.
In case of a communication error, the background color is black.

Figure 6. Data Indication Part

Table 18. Data Indication Part

ITEM		DESCRIPTION
Pen indication	Contents	CH name, CH comment AI and PI: the latest engineering unit value, engineering unit DI: the latest display comment
	No. of displayable characters	CH name: 20 alphanumeric characters CH comment: 26 alphanumeric characters Engineering unit: 16 alphanumeric characters Display comment: 20 alphanumeric characters
	Background color	Normal: white Abnormal: AI and PI: zone color DI: ON/OFF color Communication error: black
Scale indication	Indication contents	Pen scale (pen No., pen color) AI and PI: H/L limit, zone color corresponding to the scale converted zone. DI: ON/OFF display comment, ON/OFF color
	Background color	White

Table 19. Relation Between Pen Assign Assignment Setting and Indication

ITEM	MODE		
	Disabled	Enabled	
		Zone: used	Zone: unused
AI/PI			
DI			

Trend indication part displays trend graph and pen cursor of current value.
The graph position of trend graph can be set for each pen, and the pen scale corresponding to the graph range is displayed.
Background color of the data indication part is used for the background color of the number.

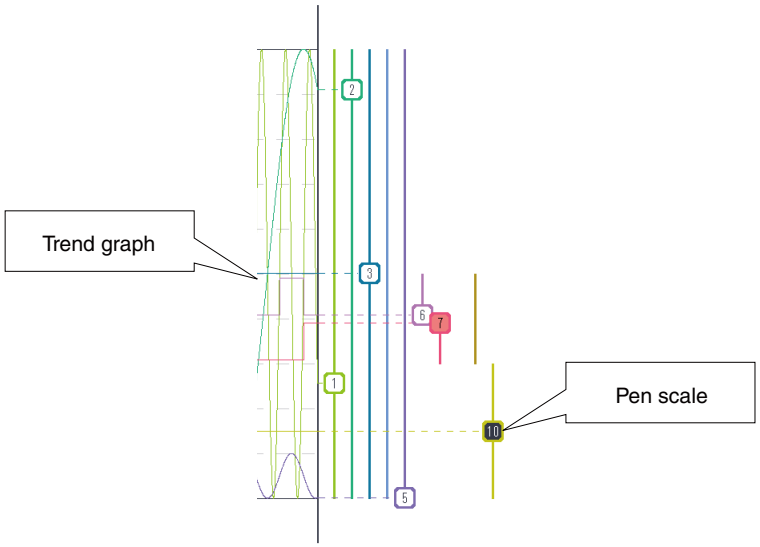


Figure 7. Trend Indication Part

Table 20. Trend Indication Part

ITEM	DESCRIPTION
Plotting area	Each pen's plotting area is selectable of its 0% and 100% positions.
Input range	AI and PI: The graph is plotted according to the graph range with 0% and 100% values in engineering unit selected for each pen. DI: The graph has two positions to identify ON and OFF at the specified graph position.
Graph order	Order of P1 to P10 (Lines drawn later cross over those drawn earlier.)
Pen scale	Set the pen scale at the latest trend position.

4.2 Status graph

The status graph attached to the mail reporting using the GM30 is as following.
The status graph is used to check the status of all assigned pens at once.
It is composed with the "Title indication part" and the "Status indication" part.
Max. 256 pens (16 x 16) can be assigned.

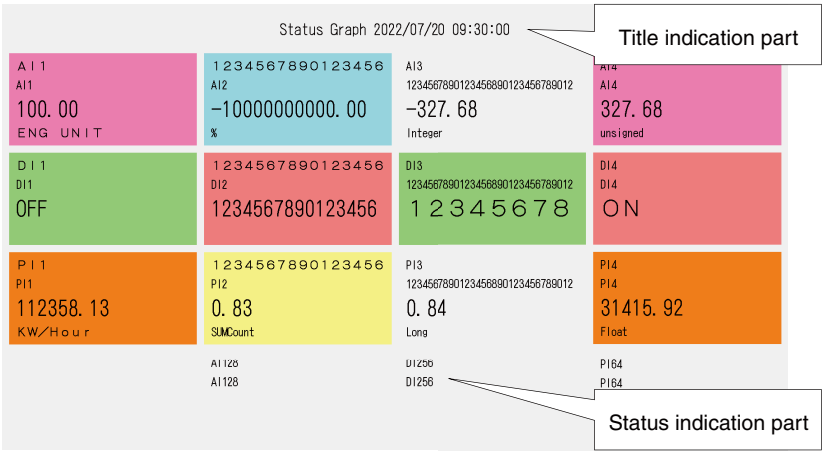


Figure 8. Status Graph (16 pens)

Table 21. Status Graph

ITEM	DESCRIPTION	
Title indication part	Displays the title of status graph and the time when the graph is generated.	
Status indication part	Max. No. of pen	16 / 64 / 144 / 256
	Pen display contents	CH name, CH comment AI and PI: engineering unit value, engineering unit DI: display comment
	Background color	AI and PI: Display color of zone DI: Display color of ON/OFF
	Color of characters	Black or white (Automatically decided by the background color)

Status graph's pen display for AI/PI are "CH name", "CH comment", "Engineering unit value" and "Engineering unit". For DI are "CH name", "CH comment" and "display comment".
The background color changes according to those applied to each zone or to ON and OFF status.
If a communication error occurs, the background color becomes black.

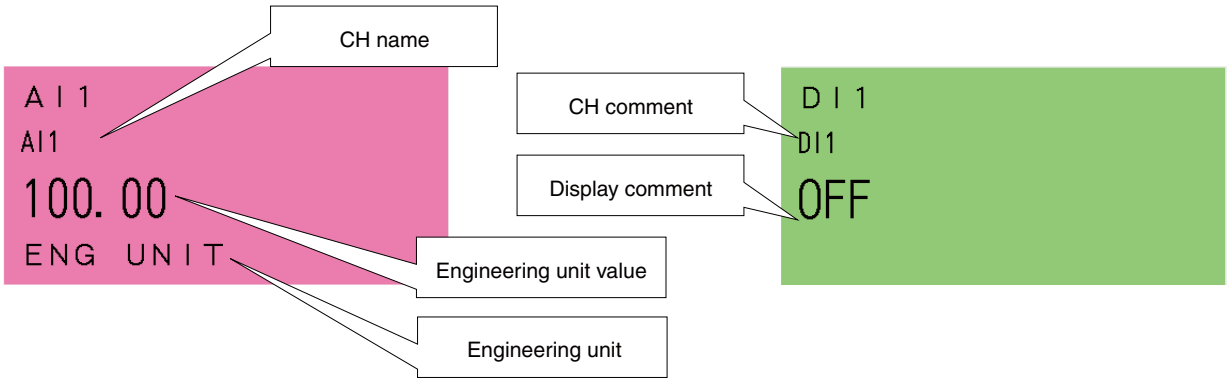


Figure 9. Pen Indication Structure

Status indication part differs depending on setting of pen assignment and maximum number of pens.
Refer to the following table for the status view and setting examples.

Table 22. Setting of pen assignment and the view

ITEM	MODE		
	Disabled	Enabled	
		Zone: Enabled	Zone: Disabled
AI/PI	AI128 AI128	AI1 AI1 100.00 ENG UNIT	PI3 12345678901234568901234567890 12 0.84 Long
DI	DI256 DI256	DI1 DI1 OFF	

Refer to the following table for the relation of maximum number of pens and screen structure.

Table 23. Maximum number of pens and screen structure

MAX. NO. OF PEN	EXAMPLE OF STATUS INDICATION	DISPLAYABLE NO. OF CHARACTERS	IMAGE SPECIFICATION
16	AI1 AI1 100.00 ENG UNIT	CH name: 32 characters CH comment: 32 characters Engineering unit: 16 characters Display characters: 16 characters	Resolution: 1745 × 990 px (416 × 204 px per a pen) Size: 150 KB (approximate value)
64	AI1 AI1 100.00 ENG UNIT	CH name: 32 characters CH comment: 32 characters Engineering unit: 16 characters Display characters: 16 characters	Resolution: 2312 × 1261 px (280 × 140 px per a pen) Size: 220 KB (approximate value)
144	AI1 AI1 100.00 ENG UNIT	CH name: 32 characters CH comment: 32 characters Engineering unit: 16 characters Display characters: 16 characters	Resolution: 2596 × 1409 px (212 × 107 px per a pen) Size: 280 KB (approximate value)
256	AI1 AI1 100.00 ENG UNIT	CH name: 20 characters CH comment: 20 characters Engineering unit: 16 characters Display characters: 20 characters	Resolution: 2052 × 1164 px (128 × 68 px per a pen) Size: 170 KB (approximate value)

Note. Image size differs depending on the contents of graph.

5. Mail Reporting

5.1 Overview

GM30 uses e-mails for reporting. SMTP (Simple Mail Transfer Protocol) is used to send mails to a mail server. Various types of terminals can receive the e-mail from the mail server to confirm an abnormality or the current status.
Four types of mailing are available: regular reporting, event "ON" reporting (when an event occurs), event "OFF" reporting (when an event is canceled) and event "Continued" reporting (when an event is continuing).
Different address list and body text can be set for each mailing type.
Attached files (trend graph and/or status graph) can be also specified.

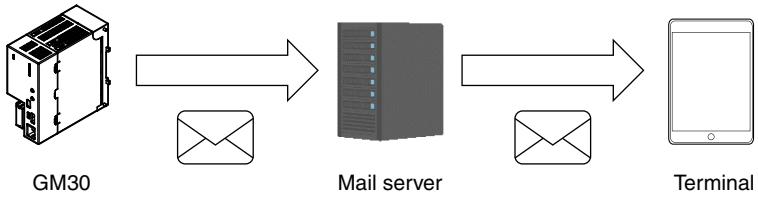


Figure 10. Mail Sending Overview

Refer the following table for general specifications of GM30's mail function.

Table 24. General specifications of mailing function

ITEM	DESCRIPTION
Type	Text mail
Protocol	SMTP (over SSL / STARTTLS)
Character code	UTF-8
Authentication	SMTP authentication (Not perform the verification of the server certificate.)
Secure communication	TLS1.2
Address list	Max. 32 addresses can be registered
Report types	Regular report Event report, ON Event report, Continued Event report, OFF
Attached file	Trend graph and status graph PNG format (8 bit RGB)
Account	Account for regular report / account for error report
Resending	Resends at intervals of 1 minute for the first time and 2 minutes for the second time. 1 resending with another mail account (”Retry” is mentioned in the mail subject.).
Mail queue	Max. 8 mails in the queues can be registered

- The DL30-G cannot receive an e-mail.
- SMTP over SSL authorization is intended for encryption only. The certificate issued by the mail server is not verified.
- Many mail servers are provided with measures to block unwanted e-mails. Contact your mail service provider for details.
- This function does not guarantee connection with all mail servers.
- Mail services are subject to the restrictions of each service provider company. In addition, the function may be changed, the authentication method may be changed, or the function may be disabled.
- Checking e-mail communications regularly to ensure proper operation and management in accordance with these revisions and abolishment of the restrictions and functionality is recommended.

5.2 Regular Reporting

GM30 can be set with a schedule of regular reporting. Date, day of the week, hour and minute can be specified.
A regular report mail is registered in the mail queue and sent when all the conditioned are satisfied.
GM30 sends regular report at the minimum of every 10 minutes.
For details, refer to "6.6.4 Settings of mail report" on page 47.

Table 25. Schedule

ITEM	DESCRIPTION
Date	None / 1 to 31 (multiple selections allowed)
Day of week	None / Sunday to Saturday (multiple selections allowed)
Hour	None / 0 to 23 (multiple selections allowed)
Minute	0, 10, 20, 30, 40, 50 (multiple selections allowed) Offset: 0 to 9 (common)

When the time adjustment is made by SNTP or manually, the following conditions apply.
- Adjustment within 0 to -10 seconds
Regular report is held until the time before the adjustment has been reached.
- Adjustment within 0 to +10 seconds
Regular report is sent if the time after the adjustment has passed the scheduled time.
Other than above
Normal operation is performed.

5.3 Event Reporting

GM30 can be set with alarm zones for analog and pulse input, and abnormal/normal status for digital input.
Event report mailing is performed based on these settings.
For details, refer to "6.6.4 Settings of mail report" on page 47.

Table 26. Types of event reporting

REPORT	DESCRIPTION
ON	One or more signal channel shifts from normal status to abnormal status.
Continued	Event status has been continuing for a certain time period.
OFF	All signal channels return from abnormal status to normal status.

5.3.1 Event "ON" report

Event is triggered when one or more channel enters abnormal AI zone, PI zone or DI status.
An event "ON" report is registered to the mail queue and sent.

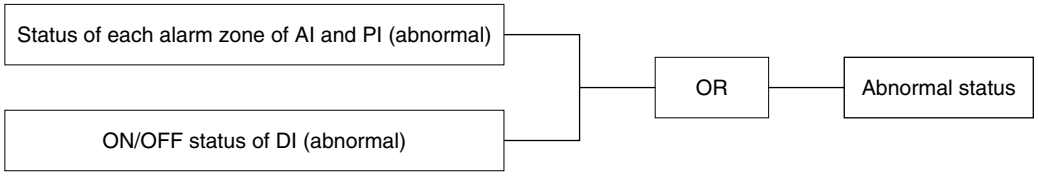


Figure11. Detecting abnormal status

5.3.2 Event "Continued" report

Event "Continued" report mails are registered regularly to the mail queue and sent as long as the event status continues.
A message text specific for the "Continued" status can be used.

5.3.3 Event "OFF" report

Event is canceled when all channels exit abnormal AI zone, PI zone or DI status.
An event "OFF" report is registered to the mail queue and sent.

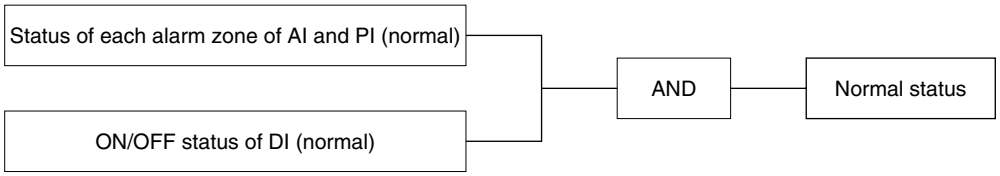


Figure12. Detecting normal status

6. Settings

6.1 Setting flow

Before starting to use the GM30, follow the procedure given below to configure the setting.

Setting operation mode
- Set "6.2.4 Switching calendar clock battery backup" on page 27 to enable
- Set used/unused of "6.2.3 DHCP setting" on page 27

▼

Selecting setting method
- Select either ""6.4 Setting with GM30CFG" on page 28" or ""6.7 Setting From Browser" on page 54".

▼

Setting network

▼

Setting communication (HTTP, SNTP)

▼

Setting input data communication
- Set access point of input data communication and register address.

▼

Setting graph
- Set trend graph and status graph

▼

Setting mail reporting
- Set address list and report mail contents

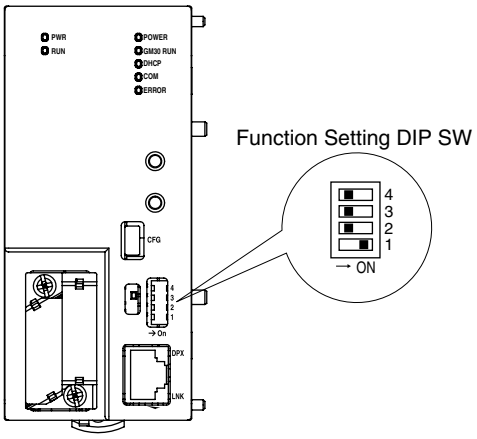
▼

Mail reporting test
- Confirm the address list and report mail contents.

6.2 Function Setting DIP SW

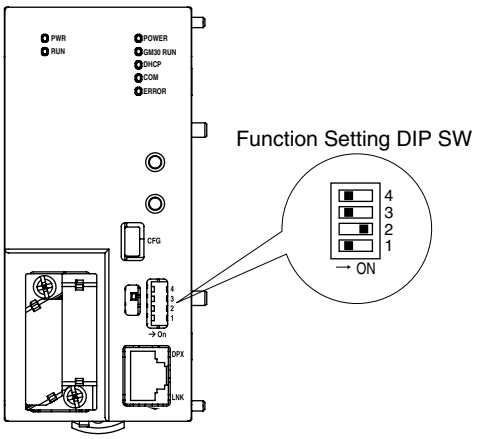
6.2.1 GM30 configuration USB port connection

Turn DIP SW1 ON to assign the USB port for the connection to the communication log terminal with the mail server at the time of mail reporting.
Turn DIP SW1 OFF to connect the port to GM30CFG.



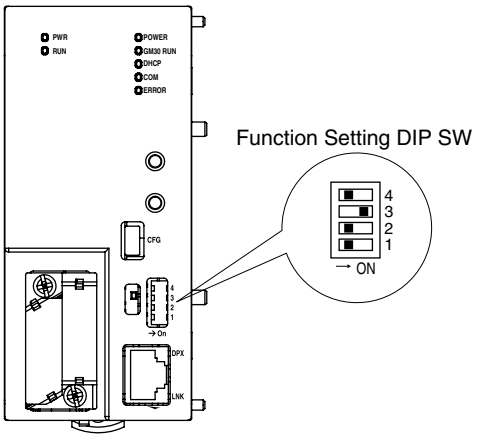
6.2.2 Halting e-mail reporting

Turn DIP SW2 ON when deleting the e-mail reporting queue or disabling the e-mail reporting function.



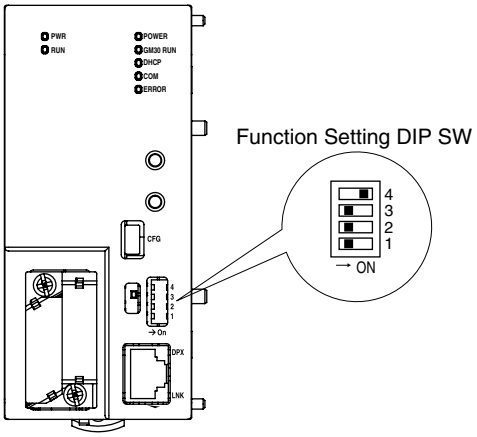
6.2.3 DHCP setting

When setting GM30 automatically acquire information of the unit's IP address and others from the DHCP server, turn DIP SW3 ON and reboot the unit.



6.2.4 Switching calendar clock battery backup

Turn DIP SW4 ON to enable the calendar clock battery backup.



6.3 Selecting Setting Method

GM30 can be programmed via two different connection methods. Refer to the following table for details.

Table 27. Setting methods

SETTING METHOD	DESCRIPTION
GM30CFG	The following settings and maintenance can be performed via USB connection. For details, refer to "6.4 Setting with GM30CFG" on page 28. - Read out setting parameters from the unit. - Save the setting parameters to the file. - Read out setting parameters from the file. - Upload the setting parameters to the unit. - Create new setting parameters and edit. - Maintenance. - Confirm the mail communication log. - Confirm the software version.
Browser	The following settings and maintenance can be performed via Ethernet connection. For details, refer to "6.7 Setting From Browser" on page 54. - Read out setting parameters from the unit. - Upload the setting parameters to the unit. - Edit the setting parameters. - Maintenance. - Confirm the software version.

6.4 Setting with GM30CFG

6.4.1 General specifications

GM30 can be programmed by using GM30CFG software on a PC connected via USB port.
GM30CFG is downloadable at our web site.
For general specifications of GM30CFG, refer to the following table.

Table 28. General specifications of GM30CFG

ITEM	DESCRIPTION
Product name	PC configurator software for GM30
Execution file	GM30CFG.exe (The exe.file functions without needing a DLL.)
Operation environment	Windows 10 (32-bits, 64-bits)
Connection port	USB mini-B type (Use USB2.0 compatible cable)

6.4.2 Initial window

Following window appears when start using the GM30CFG.

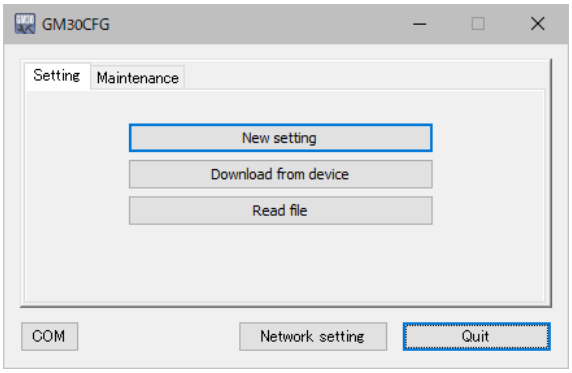


Figure13. Initial window (setting tab)

Table 29. Initial window

ITEM	DESCRIPTION
Setting	Displays setting value tab. For details, refer to "6.6 Unit Setting" on page 32.
Maintenance	Displays maintenance tab. For details, refer to "7.1 Maintenance by GM30CFG" on page 56.
COM	COM port setting
Network setting	Reads out the network setting from the GM30.
Quit	Exits the GM30CFG.

6.4.3 Confirm the software version

Confirm the GM30CFG software version with following procedure.

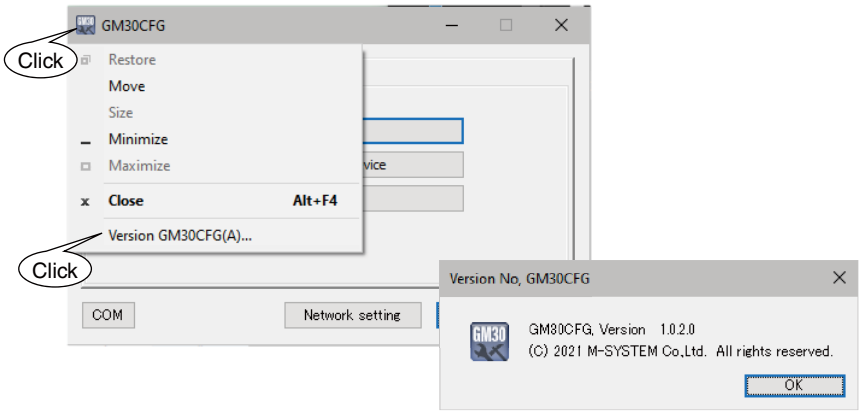


Figure14. Confirm the software version

6.4.4 Connection method

When GM30 is connected to a PC via USB cable, a COM port is automatically assigned.
Set this COM port number on the GM30CFG as shown below.
When the COM port setting is complete, the GM30CFG is ready to communicate with the GM30 unit.

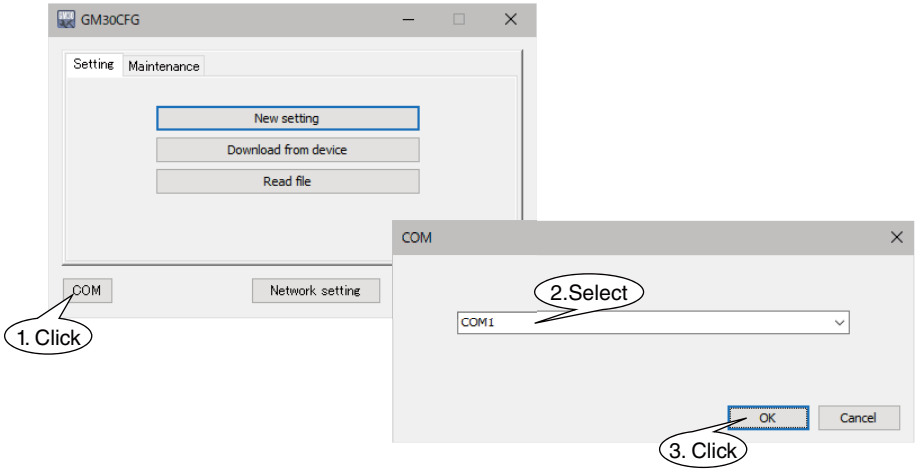


Figure15. COM port setting

6.5 Network Setting

The GM30 can select from two types of network settings; DHCP and IP address.
Select the appropriate settings for your environment.

6.5.1 Use DHCP

For details, refer to "6.2.3 DHCP setting" on page 27.

Consult with your network administrator to configure the settings.
Reboot the unit to apply the settings.

6.5.2 Specify the IP address

When setting the IP address, apply the network setting as Figure 16 shows.
The currently active network setting is displayed as initial values.

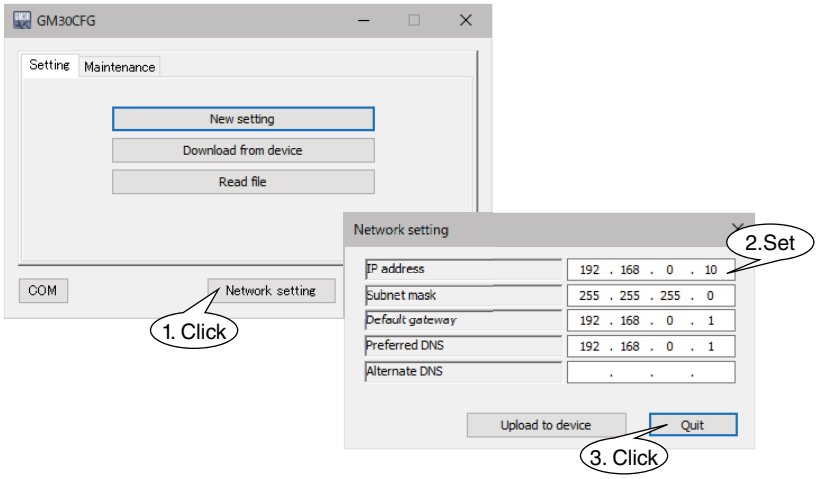


Figure16. Network setting

Consult with your network administrator to configure the settings.
Reboot the unit to apply the settings.

6.6 Unit Setting

Following window appears when startup the GM30CFG.
Setting values can be read out by three methods.

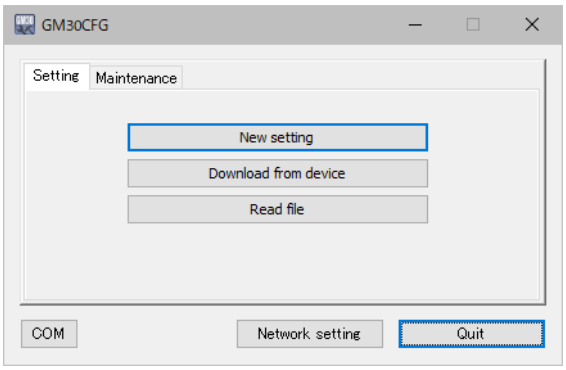


Figure17. Initial window (setting tab)

Table 30. Setting tab

ITEM	DESCRIPTION
New setting	Create new setting parameters. All of setting values are initial value.
Download from device	Read out the setting parameters from the GM30.
Read file	Read out the setting parameters saved in a file.

6.6.1 Communication setting (HTTP/SNTP)

After reading the configurations, following window will appear.
In Communication tab, you can disable the setting via a browser, or set SNTP parameters.

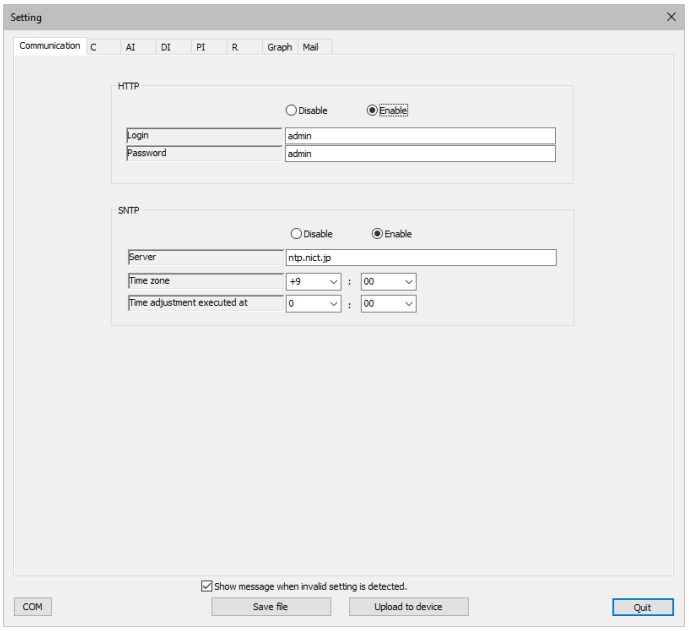


Figure18. Communication setting window

Table 31. Communication setting

ITEM	DESCRIPTION
HTTP	Choose whether the setting via a browser is allowed or not. Set a login ID and password to use the function. Max. 32 alphanumeric characters including underscores can be used for ID and password.
SNTP	Set whether or not to use the automatic time correction function, and set the necessary information when using. Enter the domain name of the SNTP server in 32 characters or less with ASCII characters to the "Server" field. In the Time Zone field, set to +09:00 in case of using in Japan. Start time to correct the time can be set. When multiple GM30 units are connected to a single router, set a few minutes apart for each one.
COM	Change the COM port number.
Save file	Save the current setting parameters to the file.
Upload to device	Upload the current setting parameters to the GM30.
Quit	Quit the configuration and back to the initial starting window.

Consult with your network administrator for details about the setting.
Reboot the unit to apply the settings.

6.6.2 Input Communication Setting

■ Connection (C)

The input connection (devices to be accessed) and the pause period must be set before proceeding to other settings.

Refer to "3.1 Connection" on page 12 for details of the Connection.

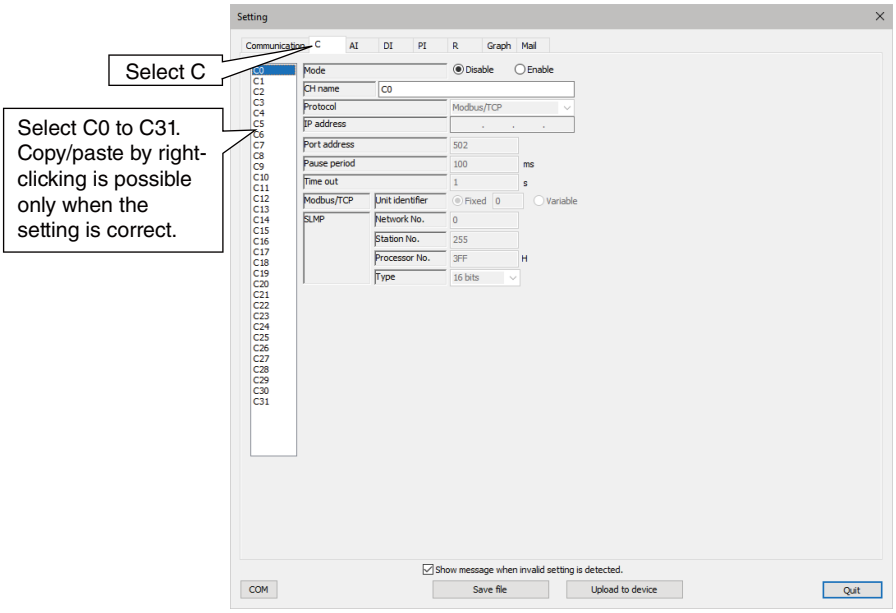


Figure 19. C (Connection) Setting Window

Table 32. Connection (C) setting parameters

ITEM	DESCRIPTION	
Mode	Enable / Disable Connection. Following parameters are configurable when Enable is selected.	
CH name	Enter the Connection name in 32 characters or less.	
Protocol	Select Modbus/TCP or SLMP.	
IP address	Set the IP address of the connecting device.	
Port address	Set the connecting port address from 0 to 65535.	
Pause period	Set an idle time interval between one sampling cycle and another. Selectable between 100 and 1000 milliseconds.	
Timeout	Set the waiting time period for establishing a connection and for a response for a query from 1 to 60 (sec.)	
Modbus/TCP	Unit identifier	Select Fixed / Variable. When Fixed is selected, set an unit identifier common to the Connection (0 to 255). When Variable is selected, individual unit identifiers can be specified for each channel. Refer to 3.2 Modbus/TCP
SLMP	Network No.	Set the network No. of the programmable controller.
	Station No.	Set the station No. of the programmable controller.
	Processor No.	Set the processor no. of the programmable controller in the hexadecimal number from 0x0000 to 0xFFFF.
	Type	Choose either of 16 bits or 32 bits for the SLMP sub-command type. Refer to 3.3 SLMP

■ Analog Input

GM30 can monitor max. 128 points of analog input signals (AI1 to AI128).
After the setting of connection, set analog input.

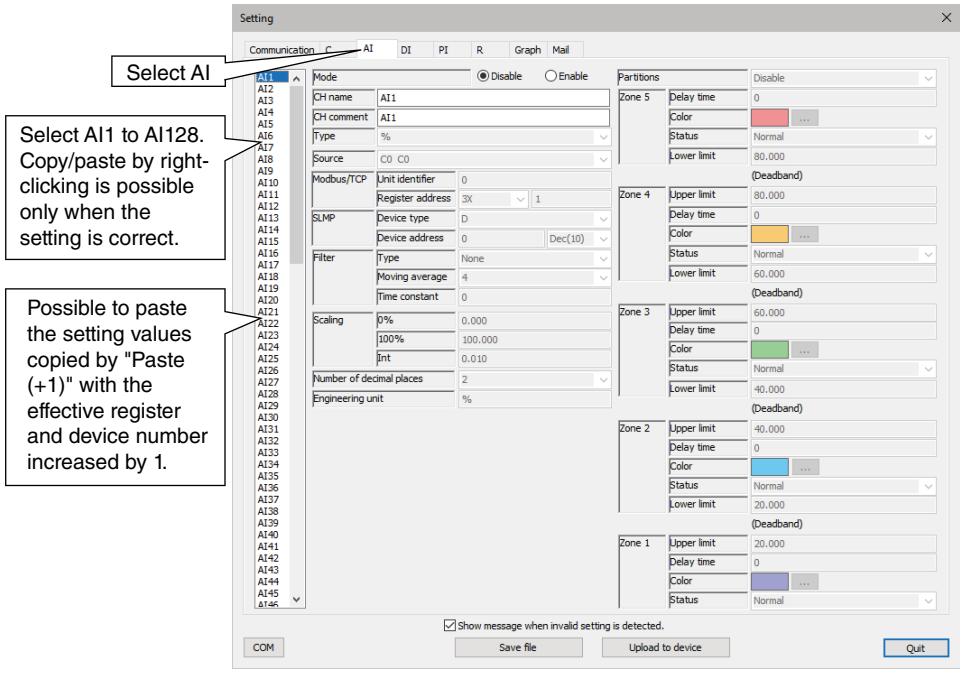


Figure 20. Setting Window

Table 33. AI setting parameters

ITEM	DESCRIPTION	
Mode	Enable / Disable analog input.	
Name and comment	Enter the name and comment in 32 characters or less.	
Data type	Select from %, INT and UINT. - Data type of %: %×100 (-2000 to 12000) (Corresponds to voltage, current data of the Remote I/O) - Data type of INT: 16-bit signed integer (-32768 to 32767) (Corresponds to temperature data of the Remote I/O) - Data type of UINT: 16-bit unsigned integer	
Source	Select from C0 to C31.	
Modbus/TCP	When Modbus/TCP is specified as the protocol of connection for the specified source, set the input register. When the unit identifier is variable, set the unit identifier.	
SLMP	When SLMP is specified as the protocol of connection for the specified source, set the input device. Device No. can switch display type from octal, decimal, and hexadecimal.	
Filter	Mode	Select from none, moving average, and first order lag.
	Moving average	When "moving average" is selected, select number of samples to apply average function from 4, 8, 16, 32, 64 points.
	Time constant	When "delay buffer" is selected, set 0 to 100 points time constant.
Scaling	-When "%" is selected for data type Set the corresponding engineering unit value for each 0% and 100%. - When "INT" and "UINT" are selected for data type Set the multiplication factor to convert to engineering unit value.	
No. of decimal places	Select No. of decimal places of the value used to graph from 0 to 3.	
Engineering unit	Set the engineering unit corresponding to the engineering unit value. Max. 8 alphanumeric characters.	

Table 34. AI zone setting parameters

ITEM	DESCRIPTION
Partitions	Set the number of partitions to be used. Select from: Disable / 2 / 3 / 4 / 5.
Delay time	Set the No. of samples for the delay time at alarm zone transition (Setting range: 0 to 100)
Color	Set a color to represent each zone which will be displayed on the graph.
Status	Select the status of the zone from Normal/Abnormal.
Upper limit : : : Lower limit	Set the upper and lower limits for each zone in engineering unit values. The upper limit value must be greater than the lower limit value. - To set a deadband The gap between the upper limit of the zone 1 and the lower limit of the zone 2 functions as deadband. Set similarly for the other zones as well. - No deadband Set the same value to the upper limit of the zone 1 and the lower limit of the zone 2. Set similarly for the other zones as well.

■ Digital Input (DI)

GM30 can monitor max. 256 points of digital input signals (DI1 to DI256).
After the setting of connection, set digital input.

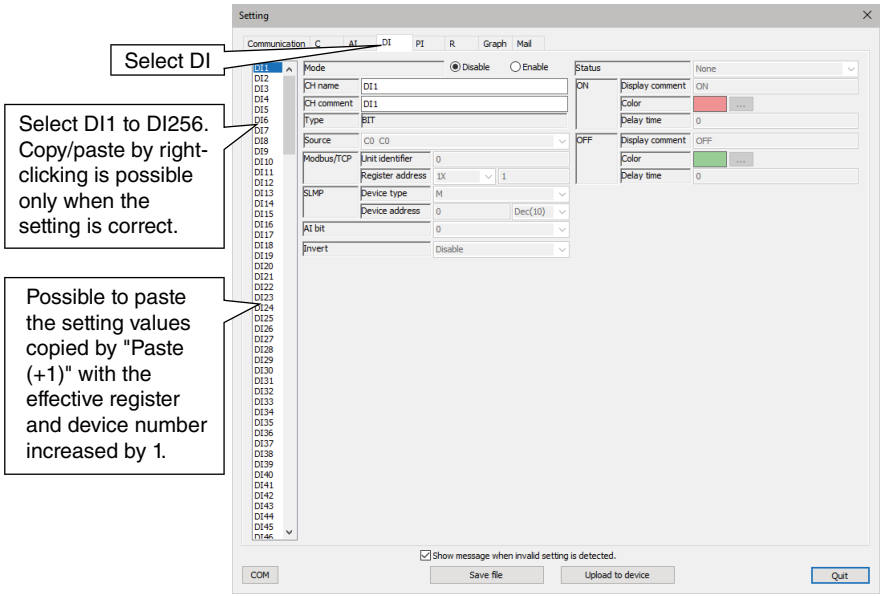


Figure 21. DI (digital input) Setting Window

Table 35. DI setting parameters

ITEM	DESCRIPTION
Mode	Enable / Disable digital input.
Name and comment	Enter the name and comment in 32 characters or less.
Source	Select from C0 to C31, AI1 to 128, and STATUS (C to C31). STATUS is ON when an error occurs during sampling of the specified connection.
Modbus/TCP	When Modbus/TCP is specified as the protocol of connection for the specified source, set the input register. When the unit identifier is variable, set the unit identifier.
SLMP	When SLMP is specified as the protocol of connection for the specified source, set the input device. Device No. can switch display type from octal, decimal, and hexadecimal
AI bit	Specify the bit position between 0 and 15 when the source is an analog signal.
Invert	Choose "Enable" to invert the ON/OFF logic of the input signal. The function is enabled when the logic of the application is reverse from that of the physical signal.

Table 36. DI alarm zone setting parameters

ITEM	DESCRIPTION
Status	Choose a status defined as "abnormal" among None, ON and OFF.
Display comment	Specify comments to apply to ON and OFF status indicated in the graph. Max. 16 alphanumeric characters.
Color	Choose colors to represent ON and OFF status in the graph.
Delay time	Set the number of samples for each of the ON and OFF delay times. (Setting range: 0 to 999) Example: Delay time set to 10 Delay time is calculated as [1 second x 10 = 10 seconds]. A status transition is valid after the signal is in the new status for 10 seconds.

■ Pulse Input (PI)

GM30 can monitor max. 64 points of pulse input signals (PI1 to PI64).
After the setting of connection, set digital input.

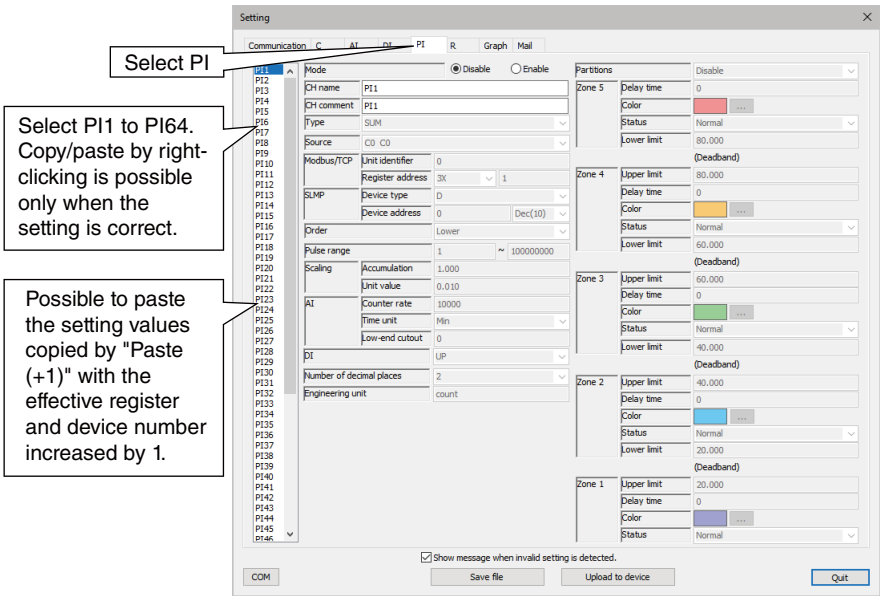


Figure 22. PI (pulse input) Setting Window

Table 37. PI Setting Parameters

ITEM	DESCRIPTION
Mode	Enable / Disable pulse input.
Name and comment	Enter the name and comment in 32 characters or less.
Data type	Select from SUM, LONG, ULONG, and FLOAT. Accumulation - SUM: the deviation of input values is accumulated from the start of accumulation or from the moment of resetting. Engineering unit value - LONG: 32-bit signed integer (-2,147,483,648 to 2,147,483,647) - ULONG: 32-bit unsigned integer (0 to 4,294,967,295) - FLOAT: 32-bit single precision floating point
Source	- SUM Select from C0 to C31, AI1 to 128, and DI1 to 256 - LONG / ULONG / FLOAT Select from C0 to C31.
Modbus/TCP	When Modbus/TCP is specified as the protocol of connection for the specified source, set the input register. When the unit identifier is variable, set the unit identifier.
SLMP	When SLMP is specified as the protocol of connection for the specified source, set the input device. Device No. can switch display type from octal, decimal, and hexadecimal
Order	Choose either "Lower" or "Upper." Modbus/TCP Lower: The lower 16 bits are assigned to the lower address, while the upper 16 bits are assigned to the higher address. Upper: The upper 16 bits are assigned to the lower address, while the lower 16 bits are assigned to the higher address. SLMP Differs by PLC and device. Select upper if necessary by referring to "3.3 SLMP" on page 14.
Pulse range	Match the range values to those set to the connected device.

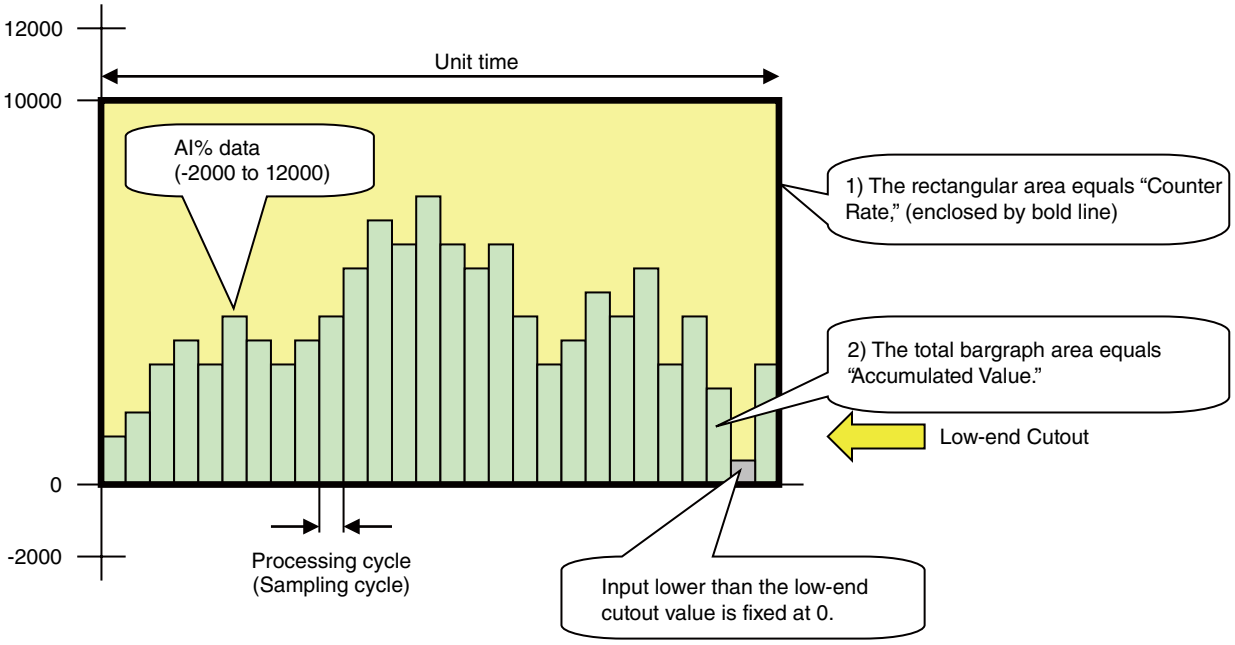
ITEM	DESCRIPTION	
Scaling	- "SUM" Specify a multiplication factor to convert the accumulated values into engineering unit values. - "LONG" or "ULONG" Specify a multiplication factor to convert the data into engineering unit values.	
AI	Configurable when AI is selected for source and "%" is selected for data type.	
	Counter rate	Specify the number of pulses equivalent to 100% analog input continued for the duration of time unit. (1 to 10,000,000,000)
	Time unit	Select the "unit time" used to the accumulation rate from minute, hour, and day.
	Low-end cutout	Specify the lower limit count per sampling. (-2,000 to 120,000).
DI	Configurable when "DI" is selected for source. Select from ON / OFF / UP / DOWN. Input value is decided based on the signal of digital input. ON: ON time (seconds) is used as input value of PI. OFF: OFF time (seconds) is used as input value of PI. UP: Each rising edge of DI is counted as one pulse. DOWN: Each falling edge of DI is counted as one pulse.	
No. of decimal places	Set the number of digits after the decimal point for the values displayed as numeric values on the graph and such. A value among 0, 1, 2 and 3 can be set.	
Engineering unit	Set the engineering unit corresponding to the engineering unit value. Max. 8 alphanumeric characters.	

Table 38. PI Setting Parameters

ITEM	DESCRIPTION
Partitions	Set the number of partitions to be used. Select from: Disable / 2 / 3 / 4 / 5.
Delay timer	Set the No. of samples for the delay time at alarm zone transition (Setting range: 0 to 100) For example, when set to 10, delay time will be 10 seconds (sampling cycle 1 sec. x 10). Thus, the zone transfers to the next one when staying in the same zone for 10 seconds.
Color	Set a color to represent each zone which will be displayed on the graph.
Status	Select the status of the zone from Normal/Abnormal.
Upper limit : : : Lower limit	Set the upper and lower limits for each zone in engineering unit values. The upper limit value must be greater than the lower limit value. - To set a deadband The gap between the upper limit of the zone 1 and the lower limit of the zone 2 functions as deadband. - No deadband Set the same value to the upper limit of the zone 1 and the lower limit of the zone 2. Set similarly for the other zones as well.

AI

* Analog input is treated as pulse input.



1) When the AI% data remains at 100% (10000) for the unit time period, it is converted to a preset number of pulses called "Counter Rate." The rectangular area in the above graphs corresponds to the Counter Rate.

2) Actual AI% value (0 to 10000) is accumulated and converted as "Accumulated Value" into the number of pulses using the Counter Rate. The total graph area in the above graphs corresponds to the Accumulated Value.

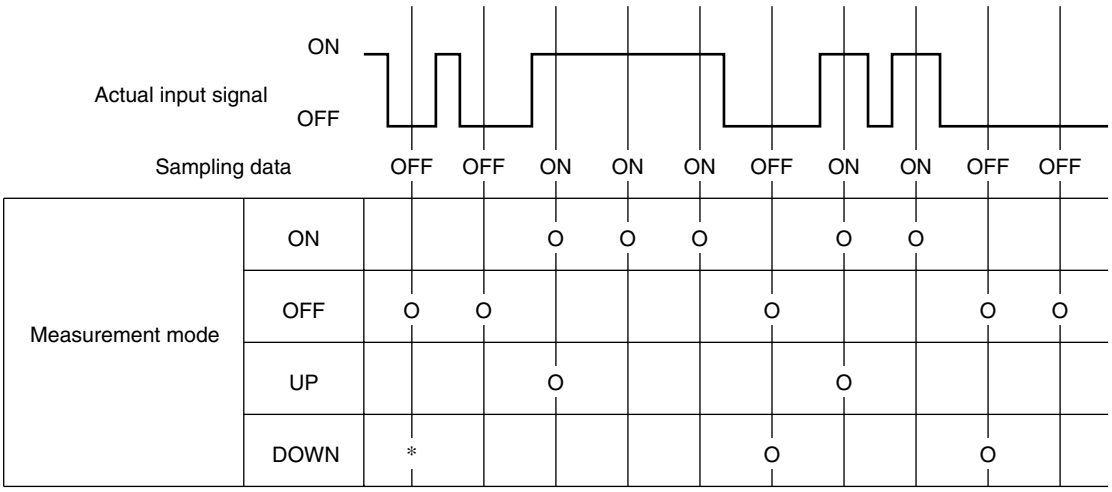
The Accumulated Value is treated just like other pulse inputs, multiplied by "Scaling" into an engineering unit value.

[Example]
Flow value is sent as a voltage signal. 1 V corresponds to 0 t/h, while 5 V corresponds to 30 t/h.
In order to use analog accumulation, choose "%" as "Data Type". 1 V at 0%, 5 V at 100%.
Choose "Hour" as "Time Unit" for the engineering unit t/h.
If "Counter Rate" is set to "30" an accumulated value of 30 is given when AI remains at 100% (5 V) for 1 hour.

DI

* Digital input is treated as pulse input.

Sampling (cycle = 1 sec.)



* Depending upon the previous sampling data.

[ON] : Determined to be [ON for one second] if the sampling data is ON.
[OFF] : Determined to be [OFF for one second] if the sampling data is OFF.
[UP] : Counted as [One pulse] in the condition that the previous sampling data is OFF, and the current sampling data is ON.
[DOWN]: Counted as [One pulse] in the condition that the previous sampling data is ON, and the current sampling data is OFF.

■ Reset (R)

Accumulated pulse input can be automatically reset by predetermined conditions R1 to R4.
Two types of reset timing are available: the scheduled date/time (min. 1-minute cycles) or the ON-to-OFF transition of a specified DI.

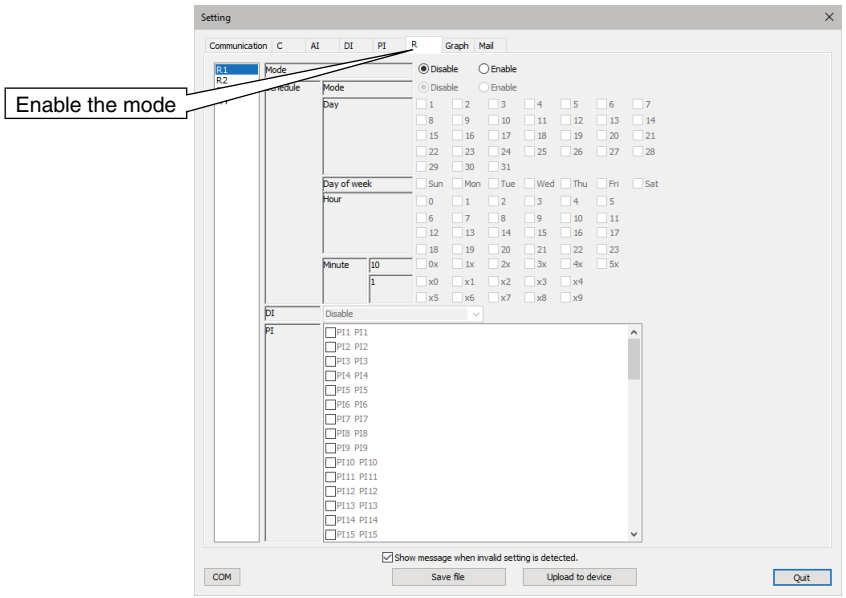


Figure 23. R (Reset) Setting Window

Table 39. R Setting Parameters

ITEM	DESCRIPTION		
Mode	Select Enable / Disable of the reset (R).		
Specifying date	Mode	Select Enable / Disable of the accumulation reset at specified time by specifying date. Performs the accumulation reset on the second of the specified time.	
	Date	1 to 31 (multiple selection allowed)	
	Day	Sunday to Saturday (multiple selection allowed)	
	Hour	0 to 23 (multiple selection allowed)	
	Minute	Specifies each 10th digit and first digit	
		10	0x, 1x, 2x, 3x, 4x, 5x (multiple selection allowed)
		1	x0 to x9 (multiple selection allowed)
DI	Select the DI that triggers the accumulation reset from Disable / DI1~256.		
PI	Select the PI to be performed accumulation reset by specified date or DI from PI1 to PI64 (multiple selection allowed).		

When the time adjustment is made by SNTP or manually, the following conditions apply.
- Adjustment within 0 to -10 seconds
Reset is held until the time before the adjustment has been reached.
- Adjustment within 0 to +10 seconds
Reset is enabled if the time after the adjustment has passed the scheduled time.
-Other than above
Normal operation is performed.

Reset setting examples using the schedule function are as below.

Reset accumulation once at the beginning of the month

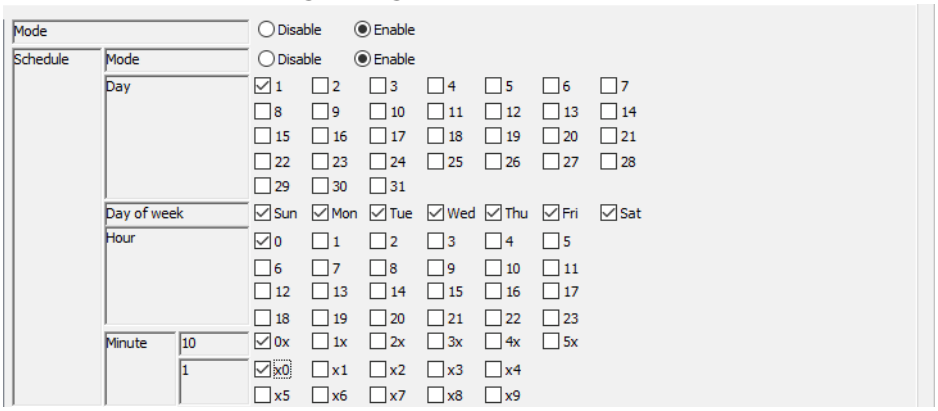


Figure 24. Example of One-time Accumulation Reset at the beginning of the month

Accumulation reset every minute

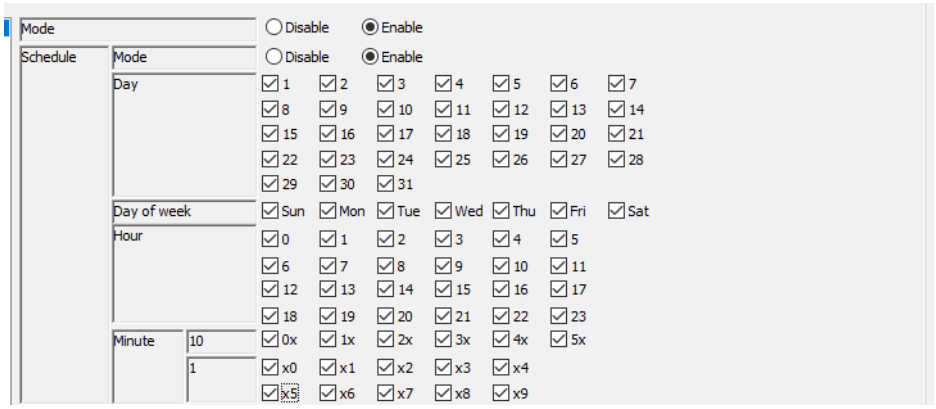


Figure 25. Example of Accumulation Reset every minute

Accumulation reset every hour

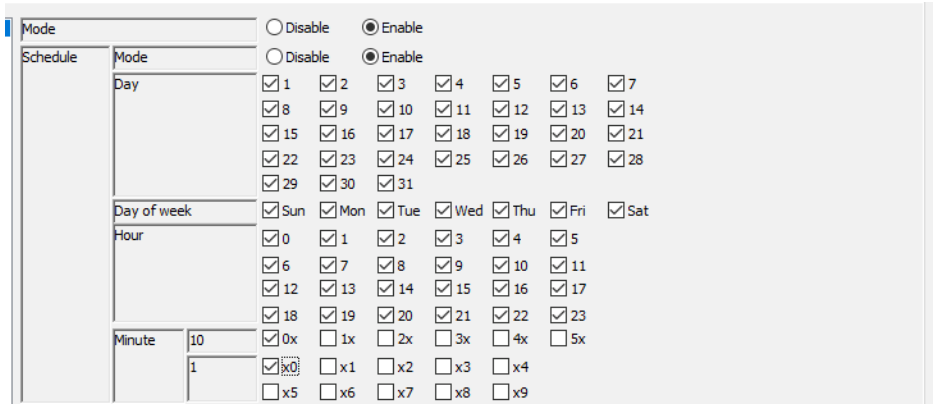


Figure 26. Example of Accumulation Reset every hour

6.6.3 Setting of Graph

■ Trend graph

Set the trend graph to be attached at the mail reporting.
For details, refer to "4.1 Trend Graph" on page 16.

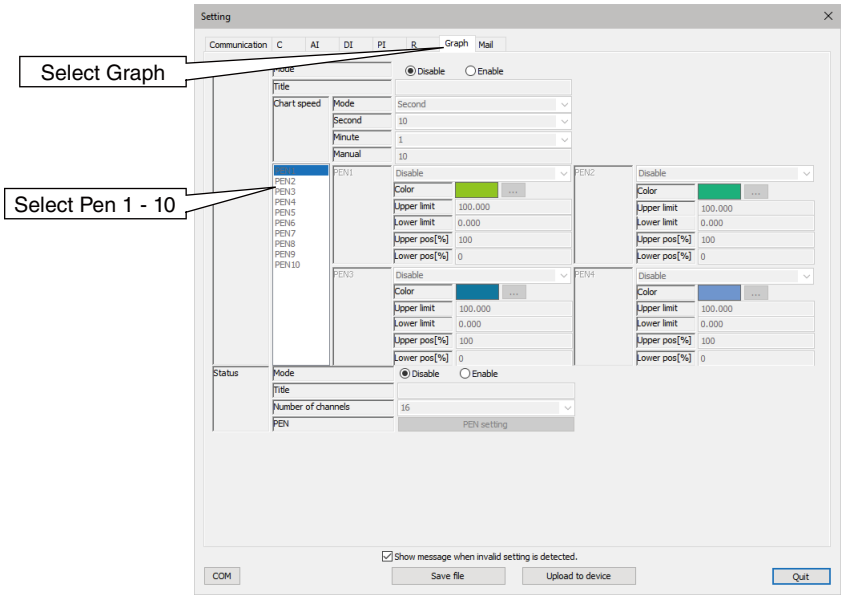


Figure 27. Graph (Trend Graph, Status Graph) Setting Window

Table 40. Graph (trend graph) setting items

ITEM	DESCRIPTION	
Mode *1	Select Enable / Disable of the graph.	
Title	Set the graph title Max. 32 alphanumeric characters	
Chart speed*1	Mode	Select the time unit applied to the plotting cycle among second / minute / manual.
	Second	Select from 10 / 15 / 20 / 30 when "second" is selected for the mode. Synchronizes to the clock and send dot on the second of the specified second.
	Minute	Select from 1 / 2 / 5 / 10 / 15 / 20 / 30 / 60 when "minute" is selected for the mode. Synchronizes to the clock and send dot on the second.
	Manual	Set 10 to 3600 when "manual" is selected for the mode. Time synchronization is not made. The graph plotting will be made per the number of recordings set.
PEN *1	Select from Disable / AI1 to 128 / DI1 to 256 / PI1 to 64.	
Pen color	Select the pen color.	
Upper limit / lower limit*1	Set the upper and lower range values for the pen in engineering unit. - Lower limit value: Set 0% value of the scaling. - Upper limit value: Set 100% value of the scaling.	
Upper limit position (%) / Lower limit position (%) *1	Set the 0 to 100% position of the pen to draw on the trend graph. - Lower limit value: Set the 0% position of the drawing position. - Upper limit value: Set the 100% position of the drawing position.	

*1. Trend graph is initialized when either one of the setting items is changed.

■ Status graph

Set the trend graph to be attached at the mail reporting.
For details, refer to "4.2 Status graph" on page 20.

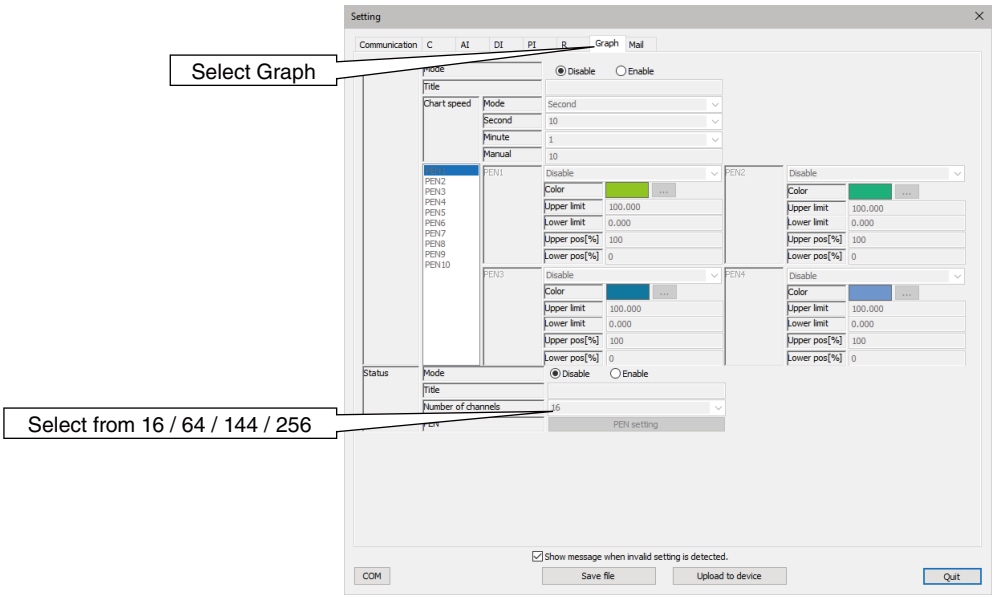


Figure 28. Graph (Trend Graph, Status Graph) Setting Window

Table 41. Graph (status graph) setting items

ITEM	DESCRIPTION
Mode	Select Enable / Disable of the graph.
Title	Set the graph title Max. 32 alphanumeric characters
No. of channels	Select the number of channel to display on the graph from 16 / 64 / 144 / 256.
PEN	Open the status pen dialog and assign signal channels to the pens.

On the pen setting, set the pen to be assigned to the status graph.
Choose a position (pen number) and specify a signal channel to be assigned to the pen.

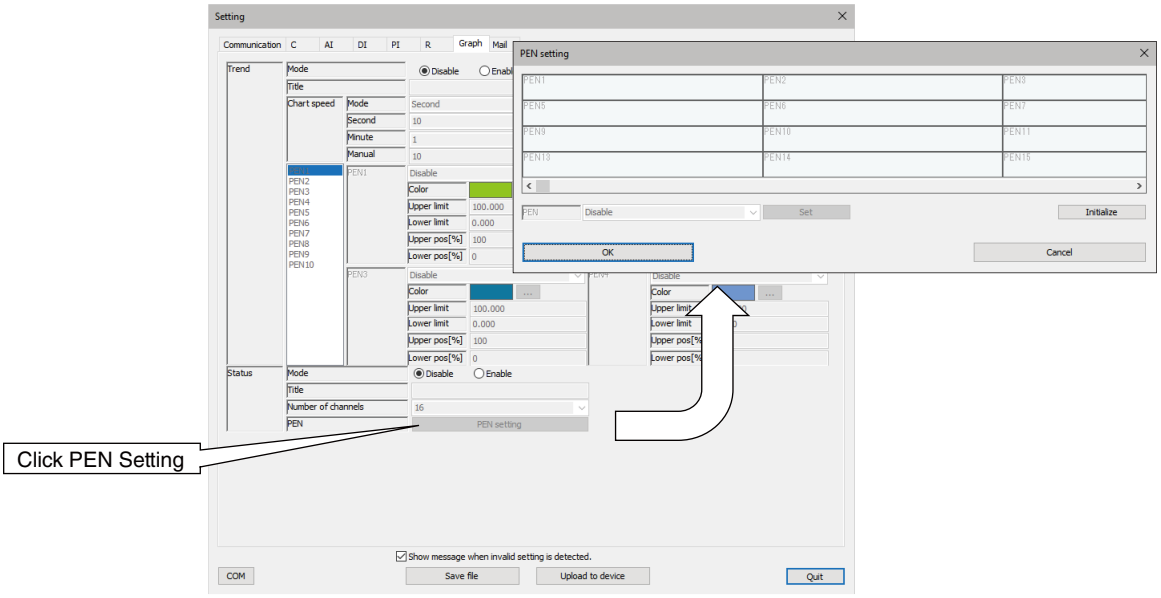


Figure 29. Status Pen Setting Window

Table 42. Status Pen Setting Parameters

ITEM	DESCRIPTION
PEN	Select from Disable / AI1 to 128 / DI1 to 256 / PI1 to PI64.
Set	Apply the pen setting to the specified position.
Initialize	Disable all pen assignment at once.
OK	Applies the settings and returns to Graph (status graph) setting window.
Cancel	Cancels the settings and returns to Graph (status graph) setting window.

6.6.4 Settings of mail report

■ Common settings (address list)

Register the address list to use for both regular report and event report.
Register the Name and Address (mail address). Up to 32 addresses can be registered as the Address list.
Specify the mail receiver addresses in each mail template setting.

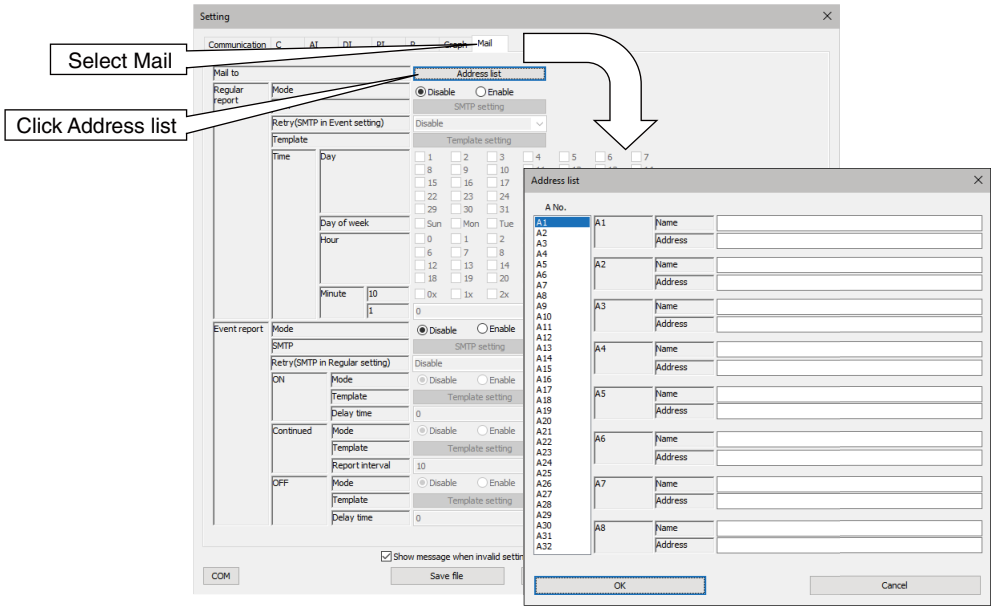


Figure 30. Mail (Address list) Setting Window

Table 43. Mail (common) setting items

ITEM	DESCRIPTION
Name, address	Set the name and address to report to use for mail reporting. Register the Name and Address (mail address). Up to 32 addresses can be registered: A1 to A32 (name and mail address).

■ Common settings (account setting)

Set the login information to connect to SMTP server.
Two separate accounts can be set: "Regular report", and "Event report".

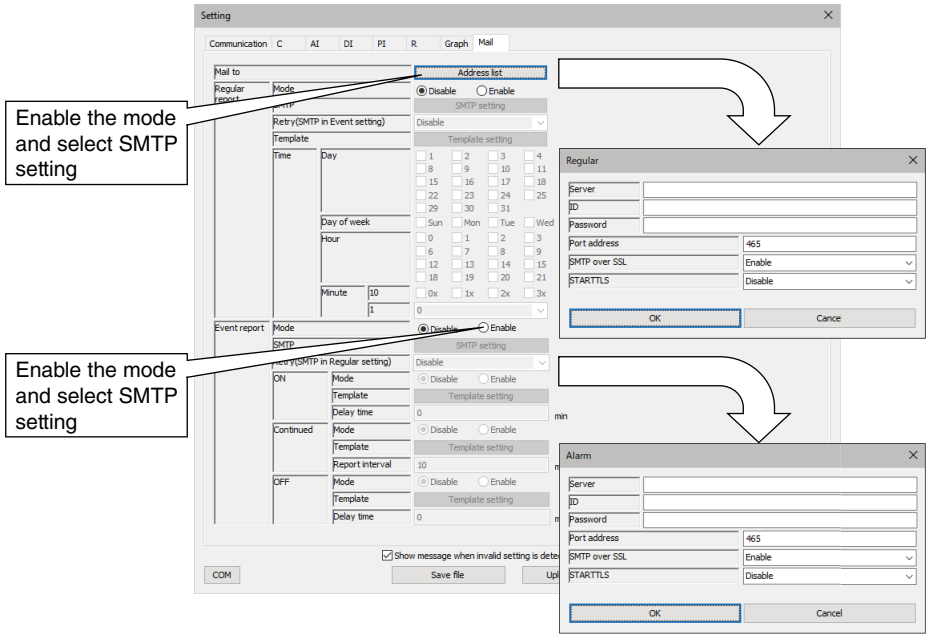


Figure 31. Mail (Account Setting) Setting Window

Table 44. Mail (Account Setting) setting items

ITEM	DESCRIPTION
Server	Set domain name or IP address of SMTP server with 64 or less single byte alphanumeric characters.
User	Set the ID of the account to use for SMTP server with 64 or less single byte alphanumeric characters.
Password	Set the password of the account to use for SMTP server with 64 or less single byte alphanumeric characters.
Port No.	Set the port No. of SMTP server.
SMTP over SSL	Set Enable/ Disable of encrypted communication.
STARTTLS	Set Enable / Disable of STARTTLS when SMTP over SSL is enabled.

The table below shows setting examples for major free e-mail services.

Table 45. Examples of Account Setting

ITEM	Yahoo mail	Gmail
Server	smtp.mail.yahoo.co.jp	smtp.gmail.com
User	Mail address (Ex. gm30@yahoo.co.jp)	Mail address (Eg. gm30)
Password	Registered password (Ex. abcde)	Acquired application password (Ex. abcde...)
Port No.	465	465
SMTP over SSL	Enable	Enable
STARTTLS	Disable	Disable

The above example is based on the information as of March 2022.

■ Common settings (template settings)

Set the sending message and graphs to attach for each report.
An independent mail template can be set for each mailing type (regular report, event ON, continued, and OFF report).

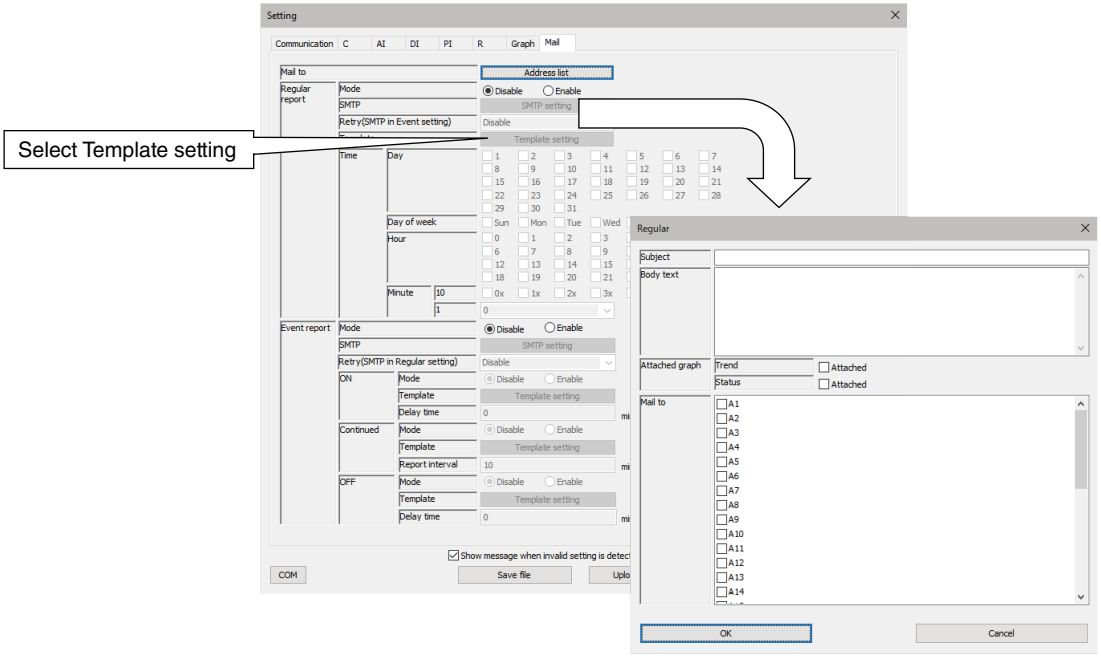


Figure 32. Mail (template settings) Setting Window

Table 46. Mail (template settings) Setting items

ITEM	DESCRIPTION
Subject	Up to 32 characters.
Body text	Up to 256 characters.
Attached graph	Specify the trend graph and/or the status graph to be attached to the mail.
Mail to	Choose one or more mail recipients among 32 registered addresses. If none are selected, no e-mail report will be sent.

■ Regular report setting

Set the mail recipients, message and sending schedule for regular report.
Regular report can be sent in the minimum of 10-minute intervals.

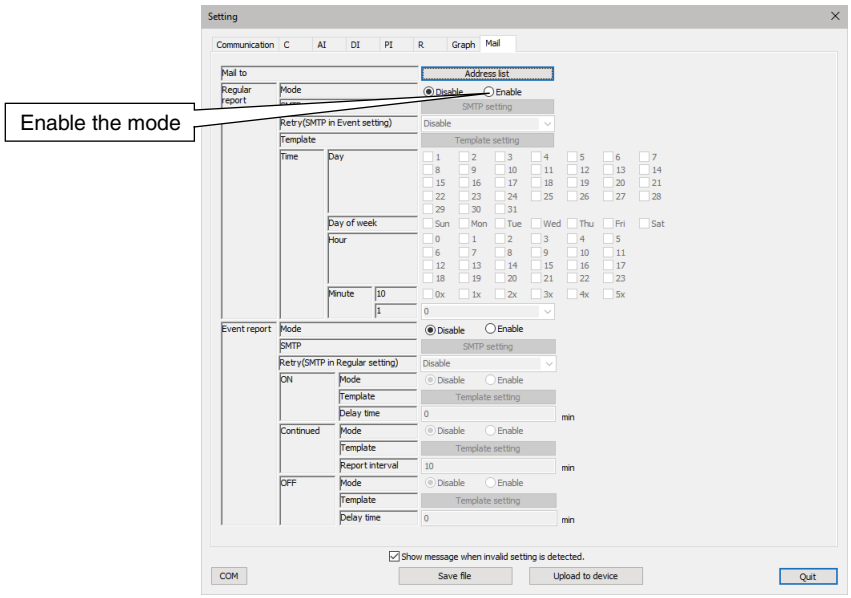


Figure 33. Mail (regular report) Setting Window

Table 47. Mail (regular report) setting items

ITEM	DESCRIPTION		
Mode	Select Enable / Disable of regular report.		
SMTP	Set the account to use for regular report.		
Retry (SMTP in Event setting)	Retrying the regular mail report via the Event mail account if GM30 fails in sending a regular mail report. Select Enable / Disable.		
Template	Set the mail template to use for regular report.		
Time	Regular report will be sent at the regular time when all the conditions are met.		
	Day	1 to 31 (multiple selection allowed)	
	Day of week	Sunday to Saturday (multiple selection allowed)	
	Hour	0 to 23 (multiple selection allowed)	
	Minute	Specify both tens place and ones place.	
		10	0x, 1x, 2x, 3x, 4x, 5x (multiple selection allowed)
		1	0 to 9

When the time adjustment is made by SNTP or manually, the following conditions apply.
- Adjustment within 0 to -10 seconds
Regular report is held until the time before the adjustment has been reached.
- Adjustment within 0 to +10 seconds
Regular report is sent if the time after the adjustment has passed the scheduled time.
- Other than above
Normal operation is performed.

Configuration example of regular report to select checkboxes using the schedule function as below.

17:35, Monday through Friday

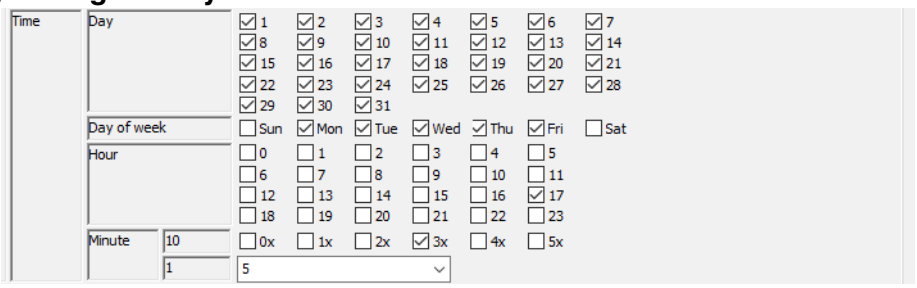


Figure 34. Setting Example of Regular Report

Once at the beginning of the month

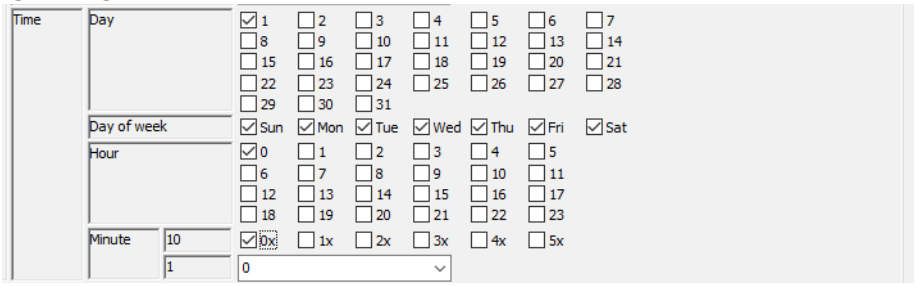


Figure 35. Setting Example of Regular Report

Every 10 minutes

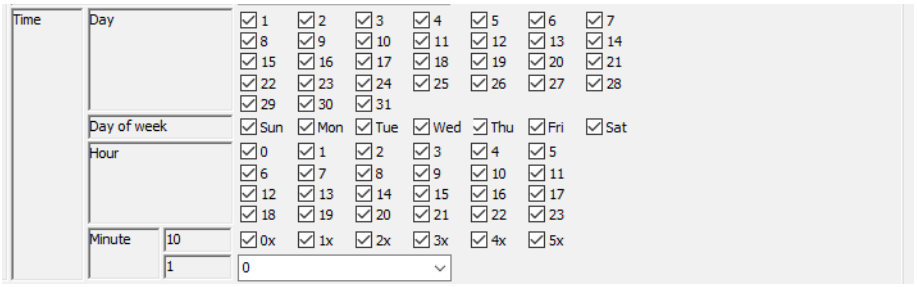


Figure 36. Setting Example of Regular Report

■ Event Report Setting

Set the mail recipients and message for event report.
An independent mail template can be set for each mailing type (regular report, event ON, continued, and OFF report).

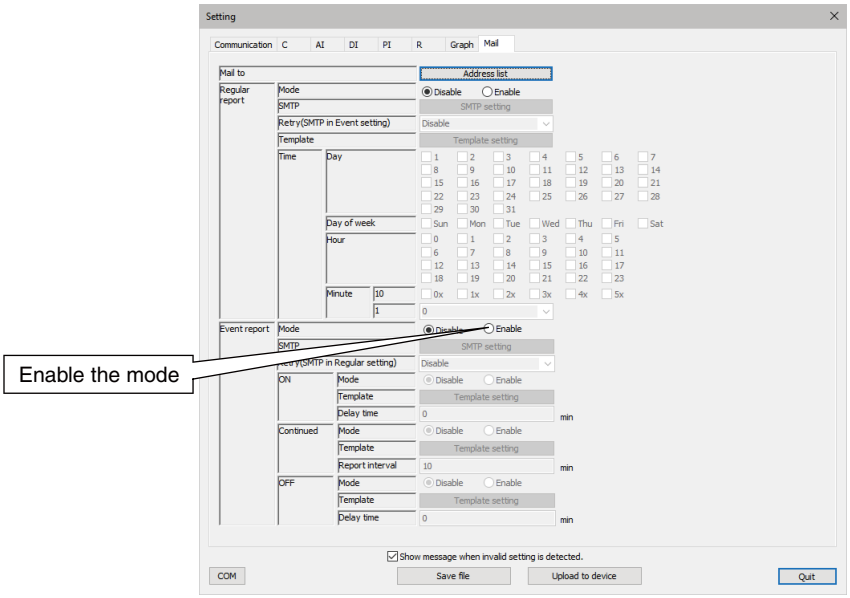


Figure 37. Mail Setting Window

Table 48. Mail (event report) setting items

ITEM	DESCRIPTION	
Mode	Select Enable / Disable of event report.	
SMTP	Set the account to use to event report.	
Retry (SMTP in Regular setting)	Retrying the event mail report via the Regular mail account if GM30 fails in sending an event mail report. Select Enable / Disable.	
ON	Mode	Select Enable / Disable of report when an event occurs.
	Template	Set the mailing form to use to report when an event occurs.
	Delay time	Set the time to suppress the triggering of an event, between 0 and 120 minutes. If the event condition is canceled during the delay time, the time count is reset.
Continued	Mode	Select Enable / Disable of report when an event continues.
	Template	Set the mailing form to use to report when an event continues.
	Report interval	Set the time interval to send mails between 10 and 120 minutes while an event continues. Mails are sent if the timing comes during the delay time of "OFF" report.
OFF	Mode	Select Enable / Disable of report when an event continues.
	Template	Set the mailing form to use to report when returning from event.
	Delay time	Set the time to suppress the canceling of an event, between 0 and 120 minutes. If the event condition is triggered during the delay time, the time count is reset.

Relations are shown as below: Alarm zone status of AI and PI, DI status, abnormal status and "ON" report delay time, reporting interval, and "OFF" report delay time.
If both "Continued" report and "OFF" report occur at the same time, "OFF" report has a priority.

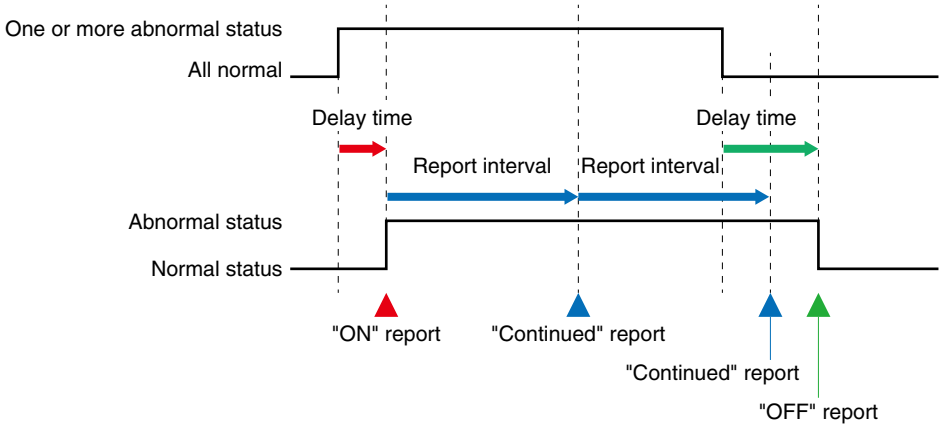


Figure 38. Relationship of Event Reporting and Delay Times

■ Resending the mail report

Basic operation in case of mailing failure (regular or event) is explained in the figure below.
When a mailing failure is detected, the GM30 retries sending another mail after 1 minute.
If this fails again, it retries after 2 minutes after the first resending.
If the second resending fails, the mail is discarded.
In case the retrying from another mail account (regular mailing account against event mailing account) is enabled, the GM30 retries after 1 second one the second resending fails.
The use of another mail account is only for once.
One mailing operation is repeated for 4 times in total.

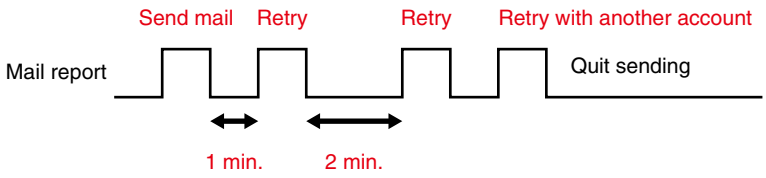


Figure 39. Operation at Failure of Report

6.7 Setting From Browser

6.7.1 Setting Procedure

GM30 can be set from the browser on a PC via LAN connection.
Enter the following URL to the browser's address field to open either English or Japanese version setting window.
If only the part "192.168.0.10" is specified, the Japanese version initial window will appear.

Table 49. Connecting URL

LANGUAGE	URL
Japanese	http://192.168.0.10/ja/index.html
English	http://192.168.0.10/en/index.html

The initial setting of default login ID and password are as below.
Enter them to the input dialog which appears at the connection.

Table 50. Default Login and Password

ITEM	DEFAULT SETTING
Login	admin
Password	admin

Be sure to change the login ID and password for your own use.
For details, refer to "6.6.1 Communication setting (HTTP/SNTP)" on page 33.
The setting can be made in the LAN environment only.
Do not access via internet.

6.7.2 Initial Screen

The following initial screen appears after entering the login ID and password.
The initial screen shows of "Setting" and "Maintenance".
If the initial screen has been displayed before, the last displayed screen will be displayed.

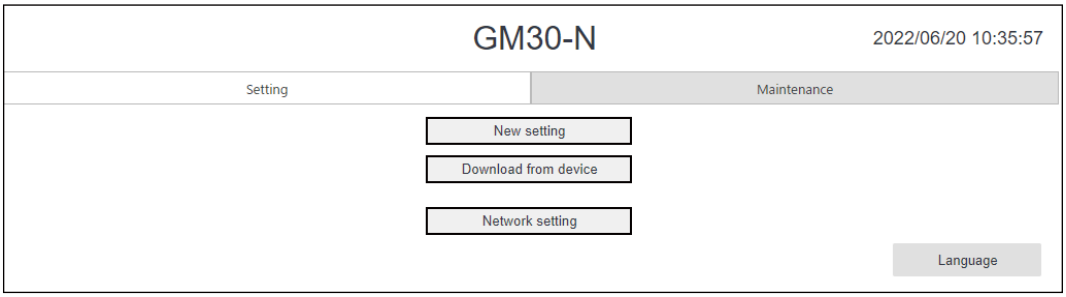


Figure 40. Initial Screen (Setting Tab)

Table 51. Initial Screen

ITEM	DESCRIPTION
Setting	Configure the unit setting and network setting.
Maintenance	Perform maintenance. For details, refer to "7.2 Maintenance By Browser" on page 60.
Language	English or Japanese can be selected. The setting is not saved.

Access to the GM30 via browser and click "setting" to the display tab.
On the setting tab, unit setting and network setting are configurable.

Table 52. Setting tab

ITEM	DESCRIPTION
New setting	Setting screen is displayed with initial setting.
Download from device	Setting screen is displayed with the value read out from the GM30.
Network setting	Network setting screen is displayed with the values read out from the GM30.

6.7.3 Network Setting

Click "Network setting" on the setting tab to display network setting screen.
Network setting with specifying IP address can be performed on the network setting screen.
Network setting configuration is the same as that for the GM30CFG.
For details, refer to "6.5.2 Specify the IP address" on page 31.
Click "Upload" to apply the setting to the GM30.

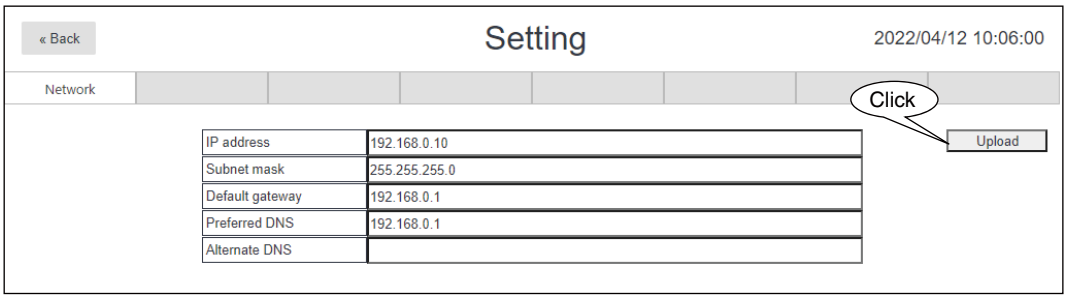


Figure 41. Network Setting Screen

6.7.4 Unit Setting

Click "New setting" or "Download from device" on the setting tab to show the setting screen.
Unit setting can be configured on the setting window.
Setting parameters are the same as those shown in the GM30CFG.
For details, refer to "6.6 Unit Setting" on page 32.
Click "Upload" to apply the settings to the GM30.

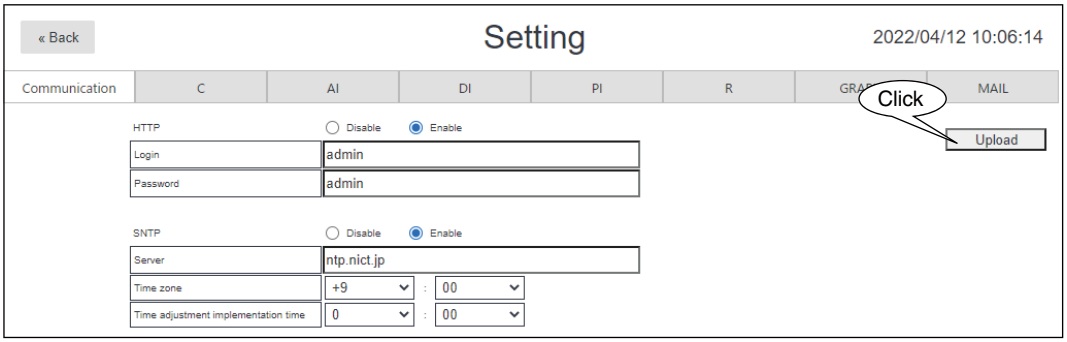


Figure 42. Setting Screen

7. Maintenance

7.1 Maintenance by GM30CFG

GM30's system log check, test mail and others can be made from the Maintenance window.
Refer to the functions list below.

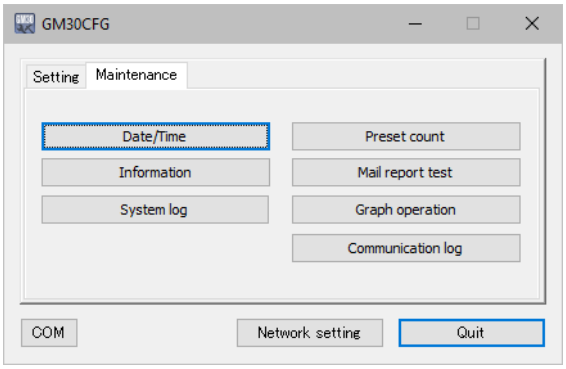


Figure 43. Initial Window (Maintenance Tab)

Table 53. Maintenance tab

ITEM	DESCRIPTION
Date/Time	Used to adjust the calendar clock.
Information	Displays the version information and MAC address.
System log	Displays the system log.
Preset count	Used to reset the PI accumulation value and set a preset value.
Mail report test	Used to perform mail reporting.
Graph operation	Used to initialize the trend graph.
Communication log	Displays the communication log with mail servers during mail reporting process.

7.1.1 Calendar clock

Set the local clock to use for recording the trend and system log.
The current local time in the PC which is being used is initially displayed.

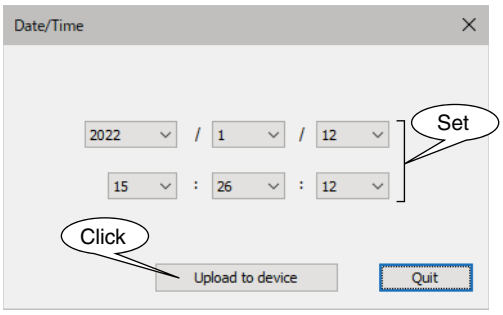


Figure 44. Calendar Clock Setting Window

7.1.2 Information (version, MAC address)

Firmware version of the GM30 and MAC address of Ethernet can be checked.

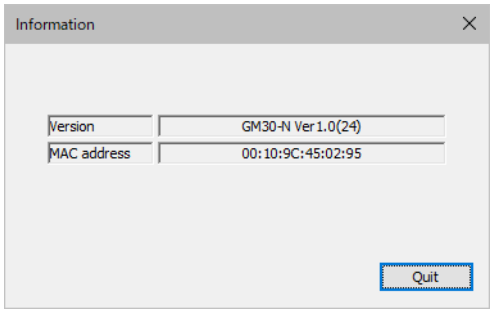


Figure 45. Information

7.1.3 System Log

System log of the GM30 can be checked. Click "Reset system log" to clear the logs.

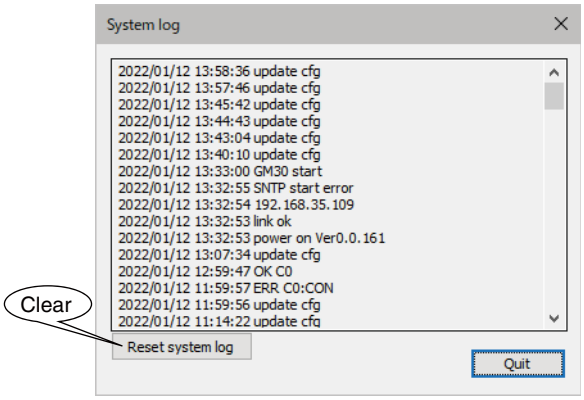


Figure 46. System Log

Table 54. System Log Message (excerpt)

ITEM	DESCRIPTION
power on VerX.X.X	Power ON firmware version
link ok	Ethernet LINK normal
Mail: Mainte	Mail report queue is discarded due to maintenance.
ERR MAIL[REGULAR][1]: xx	Regular report (first time) is failed with the following reason. FUNC: Failed by error response from the mail server. CON: Unable to connect to the mail server. etc.

When a problem occurs, our service staff may check the contents of the system log for analysis. Details of system log messages are not described in this manual as the contents of these messages are related to the internal processing original to us.

7.1.4 Accumulation Preset

Preset value of the PI accumulation data can be set.
Select the PI channel to configure.
A preset count value can be set and applied to the unit only when the function is usable to the selected channel.

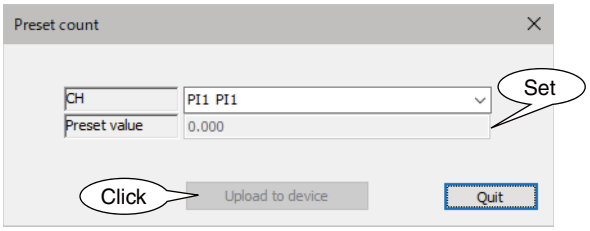


Figure 47. Accumulation Preset

7.1.5 Test Mail

Test mails can be sent with "Test" mentioned at the head of the mail subject. The test function is not usable if the relevant mailing function is disabled.
"Test:" is added to the beginning of the subject for the test mail.

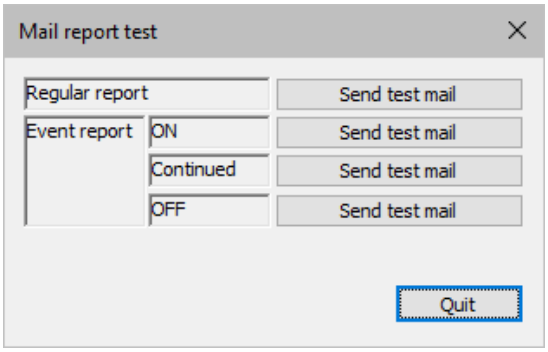


Figure 48. Test mail

If the mail is not sent correct, refer to "8.1 Troubleshooting" on page 61.

7.1.6 Graph Operation

The trend graph in recording can be initialized.
The function is usable only when the trend graph is enabled.

Figure 49. Graph Operation

7.1.7 Communication Log

Communication status can be monitored while e-mails are sent.
Connect the GM30 and the PC with USB cable, and turn on the setting DIP SW1.
When the e-mail transmission is started, the window shows its communication log.
Check the log and confirm the settings until the transmission is successfully complete.

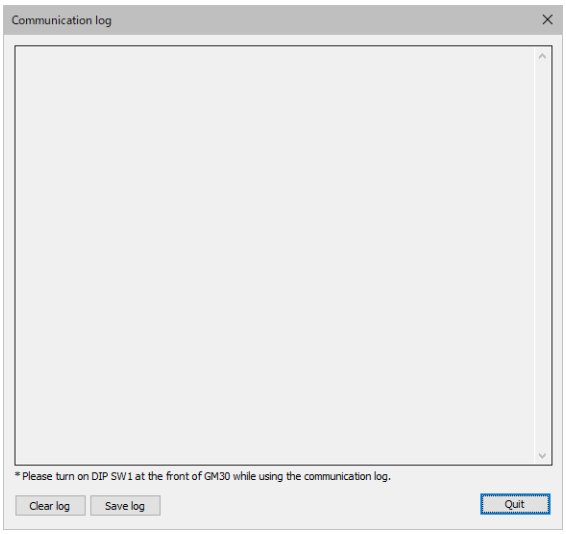


Figure 50. Information

Details of communication log messages are not described in this manual as the contents of these messages are related to the internal processing original to us and e-mail service providers.

7.2 Maintenance By Browser

By enabling the browser to access GM30 and click "Maintenance", the maintenance screen will be displayed. The maintenance screen configuration is the same as that of GM30CFG.

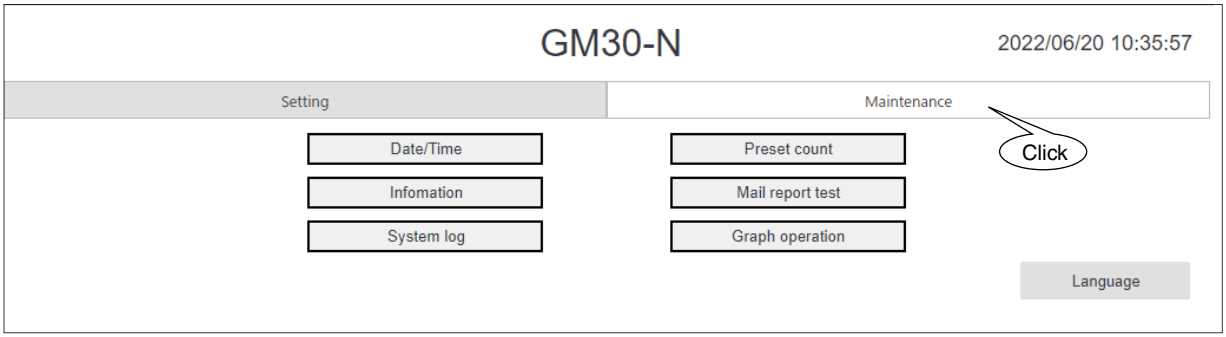


Figure 51. Maintenance Screen

Table 55. Maintenance Window

ITEM	DESCRIPTION
Date/Time	Used to adjust the calendar clock. For details, refer to "7.1.1 Calendar clock" on page 56.
Information	Displays the version information and MAC address. For details, refer to "7.1.2 Information (version, MAC address)" on page 57.
System log	Displays the system log. For details, refer to "7.1.3 System Log" on page 57.
Preset count	Used to reset the PI accumulation value and set a preset value. For details, refer to "7.1.4 Accumulation Preset" on page 58.
Mail report test	Used to perform mail reporting. For details, refer to "7.1.5 Test Mail" on page 58.
Graph operation	Used to initialize the trend graph. For details, refer to "7.1.6 Graph Operation" on page 58.

”Communication log" function requires the USB connection with the GM30 unit and therefore is not available on the browser.

8. Appendix

8.1 Troubleshooting

Refer to the "Frequently Asked Question (FAQ)" on our web site web site.

8.1.1 GM30CFG

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
GM30CFG does not connect to the GM30.	Is COM port correct?	Select the correct COM port No. (Refer to 6.4.4 Connection method)
	Is configuration USB connection (SW1) OFF?	Turn the SW1 to OFF.

8.1.2 LED Indication

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
The LED does not come on.	Is the GM30 powered ON?	Check the power supply (24 V DC).
The POWER LED is blinking.	Is the LAN cable connected to the GM30?	Connect the LAN cable securely to the HUB and router.
	Is the GM30 turned OFF and ON after setting IP address to the GM30?	Turn OFF and ON the power of the GM30.
	Is the IP address allocated from the router such as DHCP server when the GM30 is in auto IP address setting mode?	Confirm the setting of the using router. (Refer to the users manual of the router.)
The RUN LED is blinking	Is the GM30 connected to the Modbus/TCP server and SLMP device registered by C (Connection) of GM30CFG?	Confirm the setting of the C (Connection) and the system log of the GM-30CFG. (Refer to 6.6.2 Input Communication Setting)

8.1.3 LAN Connection

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unable to display the Web browser view.	Is the URL correct?	Check the URL (Refer to 6.7.1 Setting Procedure).
	Is the IP address correct?	Connect using a COP-US, and check the IP address.
	Is the LAN cable breakdown or disconnected from the HUB?	Connect the LAN cable securely. Check the connecting LED of the HUB.
	Is the POWER LED of the GM30 ON?	Refer to 1.6 Component Identification.
	Is the IP address overlapping with the PC and the GM30?	Check the IP address of the PC and the GM30.
	Has the same network address been specified in the IP address of the GM30 and PC?	Check the IP address. Issue the ping command from the PC and check whether there is a response. [Example] GM30 : 192.168.0.1 PC : 192.168.0.2 Subnet mask: 255.255.255.0
	Have firewall or proxy server setting been configured on the PC?	Check the contents of the firewall and proxy server setting with the network administrator.
	Is there a problem with the terminal or PC being used?	Check the version of the terminal/ browser software. Use a different terminal/PC.

8.1.4 Modbus/TCP

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unable to connect to the Modbus/ TCP server device from the GM30.	Is the LAN cable breakdown or disconnected from the HUB?	Connect the LAN cable securely. Check the connecting LED of the HUB.
	Has the IP address of the GM30 been set by manually?	Set the IP address manually. (Refer to 6.5 Network Setting)
	Has the same network address been specified in the IP address of the GM30 and Modbus/TCP server device?	Check the network address. [Example] Gm30: 192.168.0.1 PC: 192.168.0.2 Subnet mask: 255.255.255.0
	Does the IP address of the server device match with the one saved in the GM30?	Check the IP address. (Refer to 6.6.2 Input Communication Setting
	Has the IP address been set for the server device?	Set the IP address for server device. When using the Remote I/O as server device, turn OFF and ON the power after setting IP address. (Refer to the users manual of each Remote I/O for setting of IP address.)

8.1.5 SLMP

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unable to connect to the SLMP device from the GM30.	Is the LAN cable breakdown or disconnected from the HUB.	Connect the LAN cable securely. Check the connecting LED of the HUB.
	Has the IP address been set by manually?	Set the IP address manually. (Refer to 4.3.2 Network Setting)
	Has the same network address been specified in the IP address of the GM30 and SLMP device?	Check the network address. [Example] GM30: 192.168.0.1 PC: 192.168.0.2 Subnet mask: 255.255.255.0
	Does the network address of the SLMP device match with the one saved in the GM30?	Check the IP address. (Refer to 4.4.3 C (Connection))
	Has the server function been enabled for the SLMP device?	Enable the server function of the SLMP device.

8.1.6 Mail Reporting

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unable to send e-mail.	Is the GM30 connected to the Internet?	Confirm that the GM30 can connect to the Internet from the PC.
	Are the IP addresses of GM30 including the default gateway set correctly?	Check the settings of IP address and default gateway. (Refer to 6.5 Network Setting)
	Is the recipient e-mail address correct?	Check the mail recipients' addresses. Pay attention to "_" (underscore) and "-" (hyphen) for instance.
	Settings on e-mailing - Mail account - IP address or domain name of SMTP server - IP address or domain name of POP3 server - Mail password Are the above settings correct?	Check the settings on e-mailing the provider supplies. Make sure that an e-mail can be sent to the recipient address with mail software of the PC.
	Are the e-mail addresses registered correctly in the template?	Check the setting of the template. (Refer to 6.6.4 Settings of mail report)
	Does the mail server need authentication (SMTP, SSL, etc) in sending an e-mail?	Confirm the authentication the provider requires and configure the e-mail settings. (Refer to 6.6.4 Settings of mail report)
	With POP before SMTP, is the specified port address of the router open?	Settings on e-mailing - Mail account - IP address or domain name of SMTP server Are the above settings correct?
	Does the mail service provider offer the function to block nuisance e-mails?	Settings on e-mailing - Mail account - IP address or domain name of SMTP server - IP address or domain name of POP3 server - Mail password Are the above settings correct?

PROBLEM FACED	CHECKS TO BE DONE	METHOD OF HANDLING
Unable to attach the graph.	Are trend graph / status graph enabled?	Set the graph enable. (Refer to 6.6.3 Setting of Graph)
	Is the graph subjected to attachment?	Place a check mark to "attach" in the template setting.

9. License

GM30 and GM30CFG incorporate the software subject to the terms and conditions of Expat license below.