PC Recorder Series

Model: PC Recorder

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1. Introduction

Thank you for choosing us.

Before using this unit, read the following:

1.1 Versions covered in this instruction manual

This instruction manual is available for the following versions:

- About the version of the PC recorder
- This instruction manual is for version 1.0 or later of the PC Recorder.
- For instructions on confirming the version of the PC Recorder, refer to 2.45. Version (A).
- Supported I/O unit
- This instruction manual is available for the following I/O unit:

Model	Version
R7K4GUS-G16D4	1.0.x

- For instructions on confirming the version of the I/O unit, refer to 2.45. Version (A).

1.2 Precautions

- Precautions for connecting to I/O unit
- Connection to the unit should be established after logging in using a predetermined PC (PC Recorder) and a user account.

If the I/O unit is connected/disconnected while the PC Recorder is running, its operation is not guaranteed.

- Notes on browser-dependent display screens
- PC Recorder uses standard Web technology with a browser to achieve its display function. Therefore, note that it is subject to your browser's operating specifications (the specifications that may be changed, such as for version upgrades).

1.3 Overview of PC Recorder

PC Recorder (model: PC Recorder) is application software that runs on Windows.

1.3.1 Functions of PC Recorder

The functions of PC Recorder can be broadly divided into the following:

- I/O unit client
 Data input/output is available through the US
 - Data input/output is available through the USB connection with our I/O unit.
- Web server
- Web server functions are implemented. Trend and report data can be viewed in a browser.
- Settings for various functions Right-click the task tray icon to display the menu, allowing you to set various functions from the setting display.
- Trend waveform recording Trend waveform data can be saved as binary files.
- Report recording Daily, monthly, and yearly report data can be saved in CSV format.

1.3.2 Communication with I/O unit

Communication with the I/O unit is conducted through the USB connection (CDC).

1.3.3 System requirements

Refer to the table below for PC requirements for PC Recorder operation.

Item	Description
OS	A PC/AT compatible machine on which the
	following operating systems run normally:
	Windows 11
Browser	Chrome, Edge, Firefox
Language	Japanese/English

1.4 Others

1.4.1 Supported browser

The terminal (OS) and browsers on which the operation has been checked using a browser are listed below:

Terminal (OS)	Browser
Windows PC(11)	Microsoft Edge 119
	Mozilla Firefox 120
	Google Chrome 119

Note: Private/Secret mode is not supported.

Note that the operation is subject to change without notice for specification changes of the above terminal (OS) and browsers.

2. Introduction

2.1 What to prepare

In addition to the I/O unit, prepare the following items:

- · A personal computer (a USB port required)
- · A USB cable (Type-C for the I/O unit side. For the PC side, refer to the specifications of your PC.)

2.2 Setup procedure

Set up PC Recorder following the procedure below:



2.3 Settings for PC Recorder

Install PC Recorder on your PC.

2.3.1 Installation of PC Recorder

Download PC Recorder from our website and uncompress it to any folder. Run Setup.msi in the uncompressed folder and follow the dialog to install.

If an earlier version of PC Recorder is installed, uninstall it first and then install the latest version of PC Recorder.

2.3.2 Uninstallation of PC Recorder

From the Control Panel, select "All Control Panel Items" -> "Programs and Features." Select PC Recorder from the list and uninstall it.

2.3.3 Startup of PC Recorder

From the Start menu, select "M-SYSTEM" - "PC Recorder" -> "PC Recorder" and run it.

PC Recorder stays resident in the task tray after startup.

CAUTION

• When PC Recorder starts up for the first time, a Windows Security warning pop-up may displayed. If it is displayed, click "Allow access."

2.3.4 Connection between PC Recorder and I/O unit

The I/O unit and PC Recorder are connected following the procedure below:

- (1) Connect the I/O unit to the PC with a USB cable. When power is supplied from the PC to the I/O unit, the PWR indicator LED on the I/O unit lights in green.
- (2) Check the connection to the I/O unit. When the I/O unit and PC Recorder are connected properly, the RUN indicator LED on the I/O unit lights in green. It does not light up when operating in the Demo mode. ->3.1 I/O connection setting

2.4 Description of PC Recorder parts

PC Recorder stays resident in the task tray after startup. Right-click the "PC Recorder" icon in the task tray to open the menu.



1. View (V)

Starts the default browser and displays the Trend display. For more information, refer to 5. View.

2. Setting (C)

Displays the Setting dialog. For more information, refer to 3. Setting.

3. Adjustment (D)

Adjusts analog input channels 1 to 16. Refer to 6. Adjustment.

4. Language(L)

Switches the language displayed on PC Recorder. Japanese and English are selectable. Click the [OK] button to apply.



5. Version (A)

Displays the format and version of PC Recorder and the I/O unit.



CAUTION

• The model (version) of the I/O unit last recognized by PC Recorder is displayed.

6. Close (X)

Closes PC Recorder.



3. Setting

Right-click the "PC Recorder" icon in the task tray and click "Setting (C)." The Setting dialog is displayed.

3.1 I/O connection setting

The setting for connection with the I/O unit are made as follows:

- (1) In the "Setting" display, click the "Connection" button to show the "Connection" display.
- (2) Select the connection port between the I/O unit and the PC.
- (3) Select the operation mode with the I/O unit.

	Setting display	
Setting		×
I. Click	Web	P
Channel		Connection display
	Connection	
Record	сом	USB Serial Device (COM5)
Trend	1/0	R7K4GUS G16D4
Report		
		OK Cancel

Settings	Description
COM	Select the connection port between the I/O unit and the PC.
I/O	Select "Demo" or "R7K4GUS G16D4" as the I/O unit.

3.2 I/O channels

The I/O unit input/output setting are made as follows:

- (1) In the "Setting" display, click the "Channel" button to show the "Channel" display.
- (2) Clicking a tab for the input/output type to be set shows the corresponding display.

	Setting displa	ay		
Setting		_	×	
1. Click		HTTP Channe	l display	×
	CH name AI1 CH comment AI1		Partitions Zone5 Delay time	5 0 * 0.1[s]
A14 A14 A15	Scaling 100%	100.000	Name	
AI6	0%	0.000	Lower limit	80.000
Rej AI7	Number of decimal places	2	~	(Deadband)
AI9 AI 10	Engineering unit	%	Zone4 Upper limit	80.000
AI11			Delay time	0 * 0.1[s]
AI12 AI13			Name	
AI 14 AI 15			Lower limit	60.000
AI16				(Deadband)
			Zane3 Upper limit	60.000
			Delay time	0 * 0.1[s]
			Name	
			Lower limit	40.000
				(Deadband)
			Zone2 Upper limit	40.000
			Delay time	0 * 0.1[s]
			Name	
			Lower limit	20.000
				(Deadband)
			Zone1 Upper limit	20.000
			Name	0 * 0.1[s]
			pame	
				Alarm zone setting
				OK Cancel

3.2.1 Analog input (AI) setting

Make the analog input (AI) setting. There are 16 analog input channels (AI1 to AI16).

1. Basic setting

Make the basic setting for the analog input (AI).

- (1) Clicking the channel to be set displays the current setting.
- (2) Make the basic setting. In reference to the table below, set the various parameters.

AI setting]			Char	nnel disp	ay		
	hannel	OI DO				2	. Input	
(AI1	CH name	AI1		Partitions		5	~
	AI2 AI3	, CH comment	AI1		Zone5	Delay time	0	* 0.1[s]
	AI4	Scaling	100%	100.000		Name		0.1[0]
	AI5 AI6		0%	0.000		Lower limit	80.000	
	AI7 AI8	, Number of dec	; cimal places	2	~	,	(Deadband)	
1. Click	AI9	Engineering ur	nit	%	Zone4	Upper limit	80.000	
	AI 10 AI 11	,				Delay time	0	* 0.1[s]
	AI 12 AI 13					Name	_	1
	AI14					, Lower limit	60.000	
	AI 15 AI 16					,	(Deadband)	
					Zone3	Upper limit	60.000	
					· · · ·	Delay time	0	* 0.1[s]
						Name		
						Lower limit	40.000	
							(Deadband)	
					Zone2	Upper limit	40.000	
						Delay time	0	* 0, 1[s]
						Name		
						Lower limit	20.000	
							(Deadband)	
					Zone 1	Upper limit	20.000	
						Delay time	0	* 0.1[s]
						Name		
							Alarm zone setting	
							ОК	Cancel

Settings	Description
CH name	Set the name of the channel within 16 characters.
CH comment	Set the tag name or other comments about the channel within 16 characters.
Scaling	For each of 0% and 100%, set the corresponding actual quantity as a numerical value.
Number of decimal places	Set the number of decimal places for numbers displayed such as on the WEB display. Set this in the range of 0 to 3.
Engineering unit	Set the engineering unit that corresponds to the actual quantity set in "Scale." Set this within eight characters.

WEB display	Trend	disp	olay		CH comment
tố (21 2023	6:00	2028/11/21 2028/11/21 14:26:10 14:26:20	2023/11/21 2023/11/2 14:26:30 14:26:40	All Comment
Over view displ	ay	_	Messa		
All Comment CH cor	nmen		H name	A16 A16	AIT AIB Engineering unit
90.32 [mA]		ĽE	ngineering un	it CH name	CH comment 24.07 Event display
Date	Time	СН	Name	Comment	Message
2023/11/21	14:28:12	AI1	All Name	All Comment	Vessageő
2023/11/21	14:28:07	AI1	All Name	All Comment	Message4
2023/11/21	14:28:03	A/1	All Name	All Comment	Vessage3
2023/11/21	14:27:57	AI1	All Name	All Comment	Wessage2

2. Zone setting

Make the analog input (AI) zone setting.

- (1) Clicking the channel to be set displays the current setting.
- (2) Make the zone setting. In reference to the table below, set the various parameters.



Settings	Description
Partitions	Set the partitions for use. Selectable from 0 (unused)/2/3/4/5.
Name	Set the name of each zone within 32 characters.
Color	Set a color to represent the zone on the WEB display.
	Set the time required for the transition from another zones to the corresponding
	zone to be confirmed in the range of 0.0 to 99.9 (seconds).
Deleytime	When Zone 1 is set to five seconds:
Delay time	The transition to Zone 1 is confirmed five seconds after the input value changes in
	the state of Zone 2 and becomes less than or equal to the upper limit of Zone 1. It
	remains in Zone 2 until five seconds have elapsed.
	The upper and lower limits of the zone are set by the actual quantity. Set the upper
	limit > lower limit in order.
	• When setting a hysteresis zone:
Linnar limit	When setting a hysteresis zone between Zone 1 and Zone 2, set the hysteresis
Upper limit	zone such that it is between the upper limit of Zone 1 and the lower limit of Zone
/ Lower limit	2. Set the other zones in the same way.
Lower IImit	When setting no hysteresis zone:
	When setting no hysteresis zone between Zone 1 and Zone 2, set the same value
	for the upper limit of Zone 1 and the lower limit of Zone 2. Set the other zones in
	the same way.

WEB display	Tuond	مانمه	alay		
	Trend	aisp	2023/11/21 2023/11/21 14:26:10 14:26:20	2023/11/21 2023/11/21 2 14:26:00 14:26:40 1	2023/11/21 14:25:59 Alt National Alt Color
Over view d	lisplay		Messa		
90.32	Name] 99	9.42 [%] AI4 AI5 AI5 [%]	79.57 61.89	417 42.40 30 55 55 54.07 54.07 Event display
Alarm5 Date	Time	СН	Name	Comment	Message
2023/11/21	14:28:12	A 11	All Name	All Comment	Message5
Color 2023/11/21	14:28:07	A 11	All Name	All Comment	Message4
2023/11/21	14:28:03	A11	All Name	All Comment	Color
2023/11/21	14:27:57	A 11	All Name	All Comment	Message?

3. Alarm zone setting

An event occurs when a transition is made to a zone set in the zone setting.

- (1) Clicking the "Alarm zone setting" button on the "Channel" display shows the "Alarm zone setting" dialog. If the partitions is 0 (unused), the click is invalid.
- (2) In reference to the table below, set the various parameters. Click the [OK] button to return to the "Channel" display.

	Channel display
	Channel X
	AL OT OT DO
Basic setting	D21 name A11 Partstons 5 V A12 Q1 comment A11 Zone5 Delay time 0 * 0.1(a) A14 Ecoling 200% 200.000 Fame V
	A16 P% 0.000 Lower Int 80.000
	All Parties of tochnar parties 2 Control (Deadband)
// Alarm zone setti	ng dialog
Alarm zr e setting	Lower limit 60.000 (Deadband)
	User init so oo
Basic Upper Lower	
Zone 5	kover lmt 40.000 (Deadband)
Alarm output Reset function value	Z Trigger
	er/mt 20.000
Zone4 Alarm zone setting	X Parei Uxp (Peadbard)
A Basic Upper Lower	Delay te 0 * 0.1[s]
Zore	/kine
Zone3 M age	Airm zone setting
essage5	Lower setting
7	
Zone2	Alarm zone setting X
Upper setting	Basic Upper Lower
Zone1 Message	Zone 5
Message3	
Zone 2	
Message	Zone4
Message2	Message Message4
Zone 1	Zone3
	Nessage Message3
	Zone2
	Message Message2
	Zone1
	Nessage Message 1
	Tresongle 4
	OK Cancel

Settings	Description
Trigger	Set whether or not to perform trigger recording when the input value changes and enters the corresponding zone. Select the checkbox if you use the trigger
	recording> 3.4.13. Trigger recording
Message	Set the message when the event occurs within 32 characters.

WEB	display									Messa	age		Event	display	
	Date	Time	СН		Name			C	omment		Ĵ	Message	e		
	2023/11/21	14:28:12	A/1	All Name			All Comm	ent		Messa	age5				
Trend of	lisplay (E	vent s	umn	nary)	All Comment					Messa	Vessage4				
		14.10.00			All Comment					Messa	Messare3				
									_		2023/	11/21 14:30:55			
2028/11/21 14:29:50	2028/11/21 14:30:00	2023/11/21 14:30:10	203	28/11/21 30:20	2023/11/21 14:80:80	2	023/11/21 4:30:40		2023/11/21 14:30:50				×		
										2023/11/21 14:30:54	Mossagoõ				
	Message4	Message1 Message5				Message2	Message3	Message4	Nessage5	2023/11/21 14:30:48 2023/11/21 14:30:44	Message4 Message3 Message2	Messa	ige		

4. Alarm output setting

For each zone, specified DOs can be turned ON.

- (1) Clicking the "Alarm zone setting" button on the "Channel" display shows the "Alarm zone setting" dialog. Clicking the "Alarm output" button in the specified zone shows the "Alarm output" dialog.
- (2) Select the checkboxes for the DO channels to be set and click the [OK] button.

		C	hanne	l disp	lay		
	Channel	_					x
	AL DI (DI DO					
	ALL DH	name AE1		Partition	5	5	~
	A12 DH	comment AI1		Zone5	Delay time	0	* 0.1[s]
Alarm zone setting dia		aling 100%	100.000		Name		
Alarni Zone Setting ula	iog _	0% mber of decimal places	2		Lower Imit	80.000	
	Pe			Zone4	Upper limit	(Deadband) 80.000	
Alarm zone setting		2	×	pulet	Delay time	0	* 0.1[8]
					Name		012[0]
Basic Upper Lower					Lower Imit	60.000	
						(Deadband)	
Zone5				Zone3	Upper limit Delay time	60.000	
					Name	0	* 0.1[s]
Alarm output Reset function value Trigger					Lower Imit	40.000	
					_	(Deadband)	
7			1	Click	oper lmit	40.000	
Zone4				CIICK		•	* 0.i[a]
arm output Reset function value Alarm o	utput	dialog			Name Lower Imit	22.024	
	uipui	ulalog			Lower mit	20.000 (Deadband)	
			2	Zone1	per lmit	20.000	
Zon 2 Click Alarmoutput				×	time	0	* 0.1[s]
Zor 2. Click					Plan		
Alarm output	_				1	Alarm zone setting	
	c I						
	<u> </u>					0	Cancel
Zone2							
Alarm output							
Zone 1							
Alarm output							
Alamouyut							
		OK	Cancel				

5. Reset function value setting

The operation of the specified OI can be reset during zone transition.

- (1) Clicking the "Alarm zone setting" button on the "Channel" display shows the "Alarm zone setting" dialog. Clicking the "Reset function value" button in the specified zone shows the "Reset function value" dialog.
- (2) Select the checkboxes for the OI channels to be set and click the [OK] button.

		Chann	el display	
	Channel			×
	AI AI AI	DE DE DO	Partitions	5 ~
Alarm	n zone setting dialog	Crit comment AL1 Scaling 100% 100.000 P% 0.000 Number of decimal places 2	Zone5 Delay time Name Lower Imit	0 *0.1[s] 80.000
Alarm zone setting		Number of decimal places 2	Zone4 Upper limit Pelay time	(Deadband) 80.000 0 * 0.1[8]
Basic Upper Lower		liek	Name Lower Imit	60.000 (Deadband)
Zone 5 Alarm output	Reset function value Trigger	lick	Zone3 Upper limit Deloy time Namo Lower limit	60.000 0 * 0.1(s) 40.000
Zone4			1. Click	40.000 (Deadband) 40.000 0 *0.4(a)
Alarm output		value dialog	Lower Imit	20.000 (Deadband)
Zone3	Reset function value		X Zone1 per limit time Nam	20.000 0 * 0.1[s]
Alarm output	^{⊘011} 3. Click			Alarm zone setting
Zone 2	□ 0I3			
Zone 1				
Alarm output				
	019			
	□ 0I13 □ 0I14			
	□ 0I15 □ 0I16			
		OK Canc	el	

Set each channel following the above procedure.

The channel setting already made in the "Analog Input (AI)" display can be copied to other channels and only the necessary parts can be edited. -> 3.2.5 Copy of I/O channel setting

3.2.2 Digital input (DI) setting

Make the digital input (DI) setting. There are two digital input channels (DI1/DI2).

1. Basic setting

Make the basic setting for the digital input (DI).

(1) Clicking the channel to be set shows the current setting.

DI setting	Channel display	
DI setting	ON Display comment ON Color	× 0.1[s]
		OK Cancel

(2) Make the basic setting.

Settings	Description
CH name	Set the name of the channel within 16 characters.
CH comment	Set the tag name or other comments about the channel within 16 characters.
lass and	If ON/OFF of the input signal and ON/OFF as an application signal are reversed,
Invert	select Enabled.

(3) Make the settings for each of ON and OFF.

Settings	Description			
Display comment	Set the comment for each of ON and OFF. Set this within eight characters.			
Color	Set a color to represent the status on the WEB display for each of ON and OFF.			
Deleystime	Set the delay time for each of ON and OFF.			
Delay time	(Setting range: 0.0 to 99.9 seconds)			
Message	Set the message when the event occurs within 32 characters.			
	Set whether or not to perform trigger recording when the input value changes and			
Trigger	enters the corresponding zone. Select the checkbox if you use the trigger			
	recording> 3.4.13. Trigger recording			

WEB display Trend display Over view display CH name DL Name DL Name DL Name DL CH name	CH comment Display comment E
Color 2003/11/21 15:09:06 D11 D11 Name D11 formment	Comment Message Event display
Image: Source of the	DIL OFF DIL ON DIL OFF 2023/11/21 15:12:07
	Message × 003/11/21 01.0N 1000 01.0FF 1010 01.0FF

2. Reset function value setting

The operation of the specified OI can be reset by turning DI ON -> OFF, OFF ->ON.

- (1) Clicking the "Reset function value" button on the "Channel" display show the "Reset function value" dialog.
- (2) Select the checkboxes for the OI channels to be set and click the [OK] button.

	Channel	disp	lay	
Channel				X
AI DI OI DO DI		ON	Display comment	ON
Reset function value dialog]	~	Color Delay time Message Trigger	0 * 0.1[s]
Reset function value	×		Reset function val	lue
 ✓ 01 2. Click ○ 012 ✓ 013 ○ 014 ○ 015 ○ 016 ○ 017 ○ 018 ○ 019 ○ 010 ○ 0110 ○ 0111 ○ 012 ○ 013 ○ 014 ○ 015 ○ 016 		OFF	Display comment Color Delay time Message Trigger Reset function val	OFF 0 * 0.1[s] DI1_OFF 1. Click
ОК	Cancel			

Set each channel following the above procedure.

The channel setting already made in the "Digital Input (DI)" display can be copied to other channels and only the necessary parts can be edited. -> 3.2.5 Copy of I/O channel setting

3.2.3 Operation input (OI) setting

Make the operation input (OI) setting. There are 16 operation input channels (OI1 to OI16).

1. Basic setting

Make the basic setting for the operation input (OI).

- (1) Clicking the channel to be set displays the current setting.
- (2) Make the basic setting. In reference to the table below, set the various parameters.

OI setting	g	Channel	displ	ay		
Channel AI DI	OI DO		_	2	2. Input	
(OI1	CH name OI 1		Partitions	3	3	~
OI2 OI3	CH comment OI1		Zone5	Delay time	0	* 0.1[s]
OI4	Number of decimal places	2		Name		
OI5 OI6	, Engineering unit	%		Lower limit	80.000	
OI7 OI8	CH setting Addition/Subtrac	tion V	í l	,	(Deadband)	
OI9			Zone4	Upper limit	80.000	
OI 10 OI 11				Delay time	0	* 0.1[s]
OI12 OI13	$K1 \cdot X1 + K2 \cdot X$	$X2 + K3 \cdot X3 + A0$		Name		011[0]
OI14				Lower limit	60.000	
OI 15 OI 16	K1 Const v 1	V 0.000	1	,	(Deadband)	
	X1 AI V 1	V 0.000	Zone3	Upper limit	60.000	
Λ				Delay time	0	* 0.1[s]
	K2 Const v 1	 ✓ 0.000 		Name	Upper Err	
	X2 AI ~ 2	✓ 0.000		Lower limit	40.000	
/ 1	K3 Const v 1	 ✓ 0.000 			(Deadband)	
/ 1	X3 AI ~ 3	✓ 0.000	Zone2	Upper limit	40.000	
	A0 Const v 1	√ 0.000		Delay time	0	* 0.1[s]
				Name	Normal	
. Click				Lower limit	20.000	
					(Deadband)	
			Zone 1	Upper limit	20.000	
				Delay time	0	* 0.1[s]
				Name	Lower Err	
					Alarm zone setting	
					0	K Cancel

Settings	Description			
CH name	Set the name of the channel within 16 characters.			
CH comments	Set the tag name or other comments about the channel within 16 characters.			
	Set the number of decimal places for numbers displayed such as on the WEB			
Number of decimal places	display.			
	Set this in the range of 0 to 3.			
	Set the engineering unit.			
Engineering unit	Set this within eight characters.			
	Select from the following: Unused/ Addition/Subtraction / Multiplication / Division /			
CH setting	Extraction of square root / Moving average / First order lag / exp / Common			
	logarithm / Natural logarithm / Peak hold (maximum) / Peak hold (minimum) /			
	Power / Analog integration / F-value operation / antilogarithm / Scaling / Time.			

Operation specifications

Operation name	Expression	Parameter			
Addition/Subtraction	K1X1+K2X2+ K3X3+A0	K1, K2, K3, A0, X1, X2, X3:*1			
Multiplication	(K1X1+A1)(K2X2+A2)+A0	K1, K2, A0, A1, A2, X1, X2:*1			
Division	(K1X1+A <u>1)/(</u> K2X2+A2)+A0	K1, K2, A0, A1, A2, X1, X2:*1			
Extraction of square root	$10K1\sqrt{X1}$	K1, X1:*1			
Moving average	$\frac{\sum_{n=0}^{N-1} x_n}{N}$	X:*1 N: Moving average value (4/8/16/32/64) RST: Initialization			
First order lag	$G(s) = \frac{K}{1 + T_s}$	G:*1 T: Time constant (0 to 100 seconds) K: Gain (Constant) RST: Reset			
exp	e^{X1_n}	X1:*1			
Common logarithm	logX1	X1:*1			
Natural logarithm	InX1	X1:*1			
Peak hold (Maximum)	MAX(X1)	X1:*1 RST: Initialization (MAX=X1)			
Peak hold (Minimum)	MIN(X1)	X1:*1 RST: Initialization (MIN=X1)			
Analog integration	$\sum_{n=0}^{N} x_n$	 X1: Al1 to 16, Ol1 to 16 (Actual quantity (0 to 100%)) K1: Integration rate K2: Unit (M/H/D) K3: Dropout (0.000 to 120.000%) RST: Initialization 			
Power	$X1^{K1}$	X1, K1:*1			
F-value operation	$\sum 10^{\frac{X1-K1}{K2}}$	X1:*1 K1: Reference temperature (°C) K2: Z-value (Positive real number) RST: Initialization			
Antilogarithm	10^{X1}	X1:*1			
Scaling	K3+(K4-K3)*(X1-K1)/(K2-K1)	X1:*1 K1: Zero (Input) *2 K2: Span (Input) *2 K3: Zero (Output) *2 K4: Span (Output) *2			
Time	MM/DD hh::mm::ss	K4: Span (Output) *2K1 - 0: month, 1: day, 2: hour, 3: minute, 4: second, 5: day of weekDay of week - 0: Sunday, 1: Monday, 2: Tuesday, 3:Wednesday, 4: Thursday, 5: Friday, 6: Saturday			

*1: constants, Al1 to 16, Dl1 and 2, and Ol1 to 16 can be set. It can also be operated with DI: ON -> 1.0, OFF -> 0.0.

*2: The same value cannot be set for zero and span.

WEB dis	splay	Trend	dier	hav		СН	comment
2023 15:87	/11/21 20	028/11/21 5:87:10			/11/21 2028/11/21 7:40 15:37:50	2023/11/21	Oli Al1+Al2 CH name
Over vi	ew disp	olay		Mes		Mes	¹⁰⁰ 29.96 [mA]
011 A(1+A)2	CH cor	nment		H name		5 017	Engineering unit
71.68	[mA]		ĽΕ	ngineering unit	CH name	CH comm	Event display
	Date	Time	СН	Name	Comment		Message
	2023/11/21	15:39:25	011	011	AI1+AI2	Message3	
	2023/11/21	15:39:15	011	011	A11+A12	Message2	
	2023/11/21	15:39:01	011	011	AI1+AI2	Message1	
	2023/11/21	15:38:47	011	011	A.11+A12	Message2	

2. Zone setting

Make the zone setting for operation input (OI).

- (1) Clicking the channel to be set displays the current setting.
- (2) Make the zone setting. In reference to the table below, set the various parameters.

OI setting	9		Channel	displ	ay		
Channel AI DI	OI DO					2.	Input ×
OII	CH name OI 1			Partitions	;	3	~
OI2 OI3	CH comment OI1			Zone5	Delay time	0	* 0.1[s]
OI4	Number of decimal place	es 2	~		Name	-	0.12[0]
OI5 OI6	, Engineering unit	%			Lower limit	80.000	
OI7 OI8	CH setting Additio	n/Subtraction	~		,	(Deadband)	
OI9 OI 10	,			Zone4	Upper limit	80.000	
OI11					Delay time	0	* 0.1[s]
OI12 OI13	$K1 \cdot X1 +$	$K2 \cdot X2 +$	$K3 \cdot X3 + A0$		Name		
OI14 OI15					Lower limit	60.000	
OI 16	K1 Const ~	1 ~	0.000			(Deadband)	
	X1 AI V	1 ~	0.000	Zone3	Upper limit	60.000	
Λ	K2 Const V	1 ~	0.000		Delay time	0	* 0.1[s]
	X2 AI V	2 ~	0.000		Name	Upper Err	
	K3 Const V	1 ~	0.000		Lower limit	40.000	
	X3 AI V	3 ~	0.000		_	(Deadband)	
				Zone2	Upper limit	40.000	
	A0 Const ~	1 ~	0.000		Delay time	0	* 0.1[s]
1. Click					Name Lower limit		
					Lower milit	(Deadband)	
				Zone 1	Upper limit	20.000	I
					Delay time	0	* 0.1[s]
					Name	Lower Err	x[0]
					,		
					А	larm zone setting	
						OK	Cancel

Settings	Description
Partitions	Set the partitions for use. Selectable from 0 (unused)/2/3/4/5.
Name	Set the name of each zone within 32 characters.
Display color	Set a color to represent the zone on the WEB display.
	Set the time required for the transition from another zones to the corresponding
	zone to be confirmed in the range of 0.0 to 99.9 (seconds).
Delaytime	When Zone 1 is set to five seconds:
Delay time	The transition to Zone 1 is confirmed five seconds after the input value changes in
	the state of Zone 2 and becomes less than or equal to the upper limit of Zone 1. It
	remains in Zone 2 until five seconds have elapsed.
	The upper and lower limits of the zone are set by the engineering unit value. Set
	the upper limit > lower limit in order.
	When setting a hysteresis zone:
l Innor limit	When setting a hysteresis zone between Zone 1 and Zone 2, set the hysteresis
Upper limit	zone such that it is between the upper limit of Zone 1 and the lower limit of Zone
/ Lower limit	2. Set the other zones in the same way.
Lower IIIII	When setting no hysteresis zone:
	When setting no hysteresis zone between Zone 1 and Zone 2, set the same value
	for the upper limit of Zone 1 and the lower limit of Zone 2. Set the other zones in
	the same way.

WEB di	splay	. .										
		Trend								20	23/11/21	15:38:05
15:	23/11/21 2 37:00 1	023/11/21 5:37:10	2:02:8	/11/21 20: 15:	23/11/21 2023 37:30 15:37	/11/21 7:40	2023/11/21 15:37:50	20	28/11/21 :38:00		OI1 All+/	AI2 Color
Ove	r view d	isplay		N C C C C C C C C C C C C C C C C C C C	Mes				Mes	100	[∞] 29.	96
011. A11 + A12	0,0	Name	013 013		014 014	015 015		016 016		017 017	018 018	
71.6	imA]	[96]		0.00	0.00	96]	0.00	().00 [%]	0.00	[%]	Event display
A	Date	Time	СН	N	ame		Comment				Message	
	2023/11/21	15:39:25	011	011		AI1+AI2			Message3			
Color	2023/11/21	15:39:15	011	011		AI1+AI2			Message2	Coloi		
Color	2023/11/21	15:39:01	011	011		AI1+AI2			Message1			
	2023/11/21	15:38:47	011	011		AI1+AI2			Message2			

3. Alarm zone setting

- An event occurs when a transition is made to a zone set in the zone setting.
- (1) Clicking the "Alarm zone setting" button on the "Channel" display show the "Alarm zone setting" dialog. If the partitions is 0 (unused), the click is invalid.
- (2) In reference to the table below, set the various parameters. Click the [OK] button to return to the "Channel" display.

	Channel display
	Channel X
	At or 01 00 011 Printer 013 Partitions 3 v
Basic setting	012 013 014 014 014 011 011 011 011 011
	010 Engineering unt 9% Lower limit 00.000 [017 Disetting Additor/Subiration V (Deadsend)
Alarm zone setting dia	parter parter<
Alarm zr e setting	0.000 [0eedsand]
Basic Upper Lower	0.000 Click Reger Int 00.000 + 0.1(a)
Zone 5	0.000 Cover Imt 40.000 (Deadoend)
Alarm output Reset function value 🗸 Trigger	Zora kicper Init a0.000 a * 0.4(a)
Zone4 Alarm zone setting	er imt 20.000 (beadbend)
A Basic Upper Lower	Zone1 ktor mit 20.000 Palay p 0 *0.1(p)
Zone	Name Lower Bor Alam zone setting
Zone3 N age essage5	OK Cancel
	Lower setting
Zone2 Alarm zon	ne setting X
Upper setting Basic	Lpper Lower
Zone3 Zone5	5
A Message3	
Zone2 Zone4	4
	ssage Message4
Zone 1 Zone 3	2
Mes	ssage
	Message3
Zone2	2 ssage
	Message2
-Zone 1	1
	ssage Message 1

Settings	Description					
	Set whether or not to perform trigger recording when the input value changes and					
Trigger	enters the corresponding zone. To use the trigger recording, select the checkbox.					
	-> 3.4.13. Trigger recording					
Message	Set the message when the event occurs within 32 characters.					

WEB	display					Γ	Message	Event display
	Date	Time (CH	Name		Comment		Message
	2023/11/21	15:39:25 DI1		1	A11+A12		Mesisage3	
Trend of	display (E	vent sur	nmary)		AI1+AI2		Mesisage2	
					A 1+A 2		Messarel 2023/11/2	21 15:42:05
2023/11/21 15:41:00	20/23/11/21 15:41:10	2023/11/21 15:41:20	2023/11/21 15:41:30	2023/11/21 15:41:40	2023/11/21 15:41:50	202:3/11/2 15:42:00	2023/11/21 Message3	
	X	Message		Message1	Message2	Message	2023/11/21 Message2 15:41:52 2023/11/21 Message1 15:41:39 2023/11/21 Message2 15:41:25	Message

4. Alarm output setting

For each zone, specified DOs can be turned ON.

- (1) Clicking the "Alarm zone setting" button on the "Channel" display show the "Alarm zone setting" dialog. Clicking the "Alarm output" button in the specified zone show the "Alarm output" dialog.
- (2) Select the checkboxes for the DO channels to be set and click the [OK] button.

		Ch	annel di	sp	lay		
	Channel						×
	AI DI	OI DO					
	OI1 OI2	CH name OI1		Partitions		3	~
		Cri comment OI1		Zone5		0	* 0.1[s]
Alarm zone setting dia	log	Number of decimal places 2 Engineering unit 9			Name Lower Imit	80.000	
Alarni Zone Setting dia	log	Of setting Addition/Subtraction		1	conci ante	(Deadband)	
				Zone4	Upper limit	80.000	
Alarm zone setting		×			Delay time	0	• 0.1[8]
			$+K3 \cdot X3 + A0$		Name		
Basic Upper Lower					Lower Imit	60.000	
			0.000	Zone3	Allowed both	(Deadband)	
Zone 5			0.000	pones	Upper limit Delay time	60.000 0	* 0.1[5]
			0.000		Name	Upper Err	0.4[3]
Alarm output Reset function value 🗹 Trigger			0.000		Lower limit	40.000	
			0.000		<u> </u>	(Deadband)	
Zone4			🛗 1. Cl	ick	oper limit	40.000	
Zone4					-	•	* 0.i[a]
arm output Reset function value	uto	ut dialog		7 /	Lower Imit	20.000	
	uipi	at ulalog			Lower Inte	(Deadband)	
				Zone1	per lmit	20.000	
Zon 2 Click			×		time	0	* 0.1[s]
Zor 2. Click					Han	Lower Err	
Alarm output	_					Alarm zone setting	
			_		-		
	•					0	K Cancel
Zone2			-				
Alarm output							
Zone 1							
Alarm output							
		OK	Cancel				

5. Reset function value setting

The operation of the specified OI can be reset during zone transition.

- Clicking the "Alarm zone setting" button on the "Channel" display show the "Alarm zone setting" dialog.
 Clicking the "Reset function value" button in the specified zone show the "Reset function value" dialog.
- (2) Select the checkboxes for the OI channels to be set and click the [OK] button.

			С	hannel d	isp	lay 🛛		
	c	hannel						×
	5	AI DI	00 10					
		0[1	OH name OI1		Partition	15	3	~
		OI2	Cri comment OI1		Zone5	Delay time	0	* 0.1[s]
Alorm	zono ootting diale		Number of decimal places	2	¥ 📃	Name		
Alarin	zone setting dialo	^y g	Engineering unit	%	_	Lower Imit	80.000	
			Of setting Addition/Subtrac		Zone4	Noper limit	(Deadband) 80.000	
Alarm zone setting			>		COLEY	Delay time	0	• 0.1[8]
				$+ K3 \cdot X3 + A0$		Name		012[0]
Basic Upper Lower						Lower limit	60.000	
opper conce			1	0.000			(Deadband)	
Zone 5	2.	Clic	CK	0.000	Zone3		60.000	
				0.000		Delay time Name	0 Upper Err	* 0.1[s]
Alarm output	Reset function value Trigger			0.000		Lower Imit	40.000	
				0.000			(Deadband)	
				0.000	Cli	~k	40.000	
Zone4				I.	CII	CK	0	* 0.i[s]
	Deast function		alua dial		7 1	rene	Normal	
Alarm output	Reset func Reset function	SU V	alue dia	og		Lower Imit	20.000 (Deadband)	
					Zone1	per lmit	(Deadband) 20.000	
Zone3	Reset function value			×	por ca	time	0	* 0.1[s]
Zoneo						Plan	Lower Err	
Alarm output		-						
	3. Click					•	Alarm zone setting	
							G	K Cancel
Zone2	✓ 013			-				
	014							
Alarm output								
	OI5							
	016							
Zone 1	017							
Alarm output	018							
	019							
	 OI 10							
	OI11							
	OI12							
	 0I13							
	OI14							
	OI 15							
	OI 16							
			ОК	Cancel				

Set each channel following the above procedure.

The channel setting already made in the "Operation Input (OI)" display can be copied to other channels and only the necessary parts can be edited. -> 3.2.5 Copy of I/O channel setting

3.2.4 Digital output (DO) settings

Make the digital output (DO) setting. There are two digital output channels (DO1/DO2).

1. Basic setting

Make the basic setting for the digital output (DO).

(1) Clicking the channel to be set displays the current setting.

DO setting	Channel display	
Channel		×
AI DI OI DO CH name DO1 CH comment DO1 Invert Disal 1. Click 2. Input	DN Display comment Color Die V DFF Display comment Color	
		OK Cancel

(2) Make the basic setting.

Settings	Description				
CH name Set the name of the channel within 16 characters.					
CH comments	Set the tag name or other comments about the channel within 16 characters.				
lux cant	If ON/OFF of the output signal and ON/OFF as an application signal are reversed,				
Invert	select Enabled.				

(3) Make the settings for each of ON and OFF.

Settings	Description						
Display comment	Set the comment for each of ON and OFF. Set this within eight characters.						
Color	Set a color to represent the status on the WEB display for each of ON and OFF.						


Set each channel following the above procedure.

The channel setting already made in the "Digital Output (DO)" display can be copied to other channels and only the necessary parts can be edited. -> 3.2.5 Copy of I/O channel setting

3.2.5 Copy of I/O channel setting

It is possible to select the channel number on the left of the display (e.g., Analog Input (AI) setting) and copy the already set channel setting to another channel to edit only the necessary parts. Example: Copy of AI1 to AI16.



3.3 Web HTTP

Set up a simple Web server for PC Recorder.

- (1) In the "Setting" display, click the "HTTP" button to show the "HTTP" display.
- (2) Set the port number for the simple Web server.
- (3) Set the login name and password for the simple Web server.



Settings	Description	
Port	Set the HTTP connection port number for the I/O unit and the PC. (0 to 65535)	
Login	et a login name within 32 characters (alphanumeric characters and "_").	
Password	Set a password within 32 characters (alphanumeric characters and "_").	

CAUTION

- The login ID and password for the simple Web server are simple functions. They do not guarantee complete security.
- After changing your login ID or password, refresh the cache by clicking the refresh button on your browser.
- Do not use the default login ID and password.
- We recommend that you change your password on a regular basis.

3.4 Recording trend

Assign any channels of the I/O unit to the pen and set the pen's waveform to be recorded and showed on the WEB display.

In the "Setting" display, click the "Trend" button to show the "Trend" display.

Settir	ng display			
Setting			×	
I/O	Web	Tre	end display	
Connection	Trend			×
Channel	Basic PEN			
Click	Auto star	t	Normal start	~
Record	Storing ra		100ms	~
Trend	Normal reco	ording		
	Storing m	ode	Samples	~
Report	Samples		2000	
	Time	Interval	10min	~
		Hour	0	~
		Day of week	Sun	×
	Trigger reco	ording		
	Mode		Level	~
	Pre trigge	r samples	1000 (0-5000)	
	Post trigg	er samples	1000 (1-5000)	
			OK	Cancel

3.4.1 Basic setting

Make the setting to record pen waveforms to a trend file.

When recording pen's waveforms, event data and comment data during the recording period are recorded in the same file.

1. Recording setting

Set the recording conditions for the trend.

Setting displa	ay			
Setting			×	
I/O Basic setting		Tre	end display	1. Input
Connection Channel	sic PEN			
Click	Auto start Storing rat		Normal start 100ms	<u> </u>
Trend	Normal reco	-		
Report	Storing mo Samples	ode	Samples 2000	~
	Time	Interval	10min	~
		Hour	0	~
2. Input	(I	Day of week	Sun	~
	Trigger reco	ording		
	Mode		Level	~
	Pre trigger		1000 (0-5000)	
	Post trigge	er samples	1000 (1-5000)	
			3. Input]
			OK	Cancel

(1) Make the common setting. In reference to the table below, set the various parameters.

Settings	Description	
Auto start	elect from Stop / Normal start / Trigger start.	
Storing rate	Select from 100 ms / 500 ms / 1 sec / 2 sec / 5 sec / 10 sec / 1 min / 2 min / 5 min /	
Storing rate	10 min / 30 min / 1 hour.	

(2) Make the settings for normal recording. In reference to the table below, set the various parameters.

Settings	Description	
Storing mode	Select from Samples / Time.	
Samples	When "Samples" is selected in String mode, the samples can be set. Set this in the range of 1000 to 50000.	
Time	 When "Time" is selected in Storing mode, the time can be set. The settable interval depends on the storing rate. Refer to the table below. When "1 day" is selected for the interval, set "Hour." Select from 0 to 23 (hours). When "1 week" is selected for the interval, set "Hour" and "Day of week." Select from 0 to 23 (hours), Sun / Mon / Tue / Wed / Thu / Fri / Sat. When "1 month" is selected for the interval, set "Hour." Select from 0 to 23 (hours). 	

Correspondence table storing rate and interval (•: selectable)

Interval								
	10	30	1	6	12	1	1	1
Storing	min	min	hour	hours	hours	day	week	month
rate								
100 ms	•	•	•	_	_	—	—	—
500 ms	—	•	•	•	_	—	—	—
1 sec	_	_	•	•	•	—	—	—
2 sec	_	_	•	•	•	•	—	—
5 sec	_	_	_	•	٠	•	_	—
10 sec	_	_	_	•	٠	•	_	—
1 min	_	_	_	_	_	•	•	—
2 min	_	_	_	_	_	•	•	—
5 min	_	_	_	_	_	•	•	•
10 min	_	_	_	_	_	•	•	•
30 min	_	_	_	_	_	•	•	•
1 hour	_	_	_	_	_	_	•	•

(3) Make the settings for trigger recording. In reference to the table below, set the various parameters.

Settings	Description	
Mode	elect from Level / Edge.	
Pre trigger samples	et this in the range of 0 to 5000.	
Post trigger samples	Set this in the range of 1 to 5000.	

2. Normal recording

When Normal start is set in [Auto start] on the "Trend" display, trend recording starts upon PC Recorder startup.

(1) Storing mode: Samples

When Samples is set in [Storing mode], the recorded data are saved to a trend file by samples.

(2) Storing mode: Time

When Time is set in [Storing mode], the recorded data are saved to a trend file at the time set in [Time]. For storage timing, refer to the table below.

Interval	Timing	
10 min	0, 10, 20, 30, 40, 50 minutes and 0 seconds past the hour	
30 min	0, 30 minutes and 0 seconds past the hour	
1 hour	0 minutes and 0 seconds every hour	
6 hours	0, 6, 12, 18 hours, 0 minutes, and 0 seconds	
12 hours	0, 12 hours, 0 minutes, and 0 seconds	
1 day	0 minutes and 0 seconds when set in [Hour]	
1 week	0 minutes and 0 seconds when set in [Hour] on the day of the week set in	
1 week	[Day of week]	
1 month	0 minutes and 0 seconds when set in [Hour] on the first day of every	
1 month	month.	

3. Trigger recording

When trigger recording is set in [Auto Start] on the "Trend" display, the trend is recorded for each channel of AI, DI, and OI according to the conditions set for the trigger.

(1) Mode: Level

When Level is set in [Mode] of the trigger recording on the "Trend" display, the trend is recorded as long as one or more of the AI, DI, or OI channels with trigger settings satisfy the trigger conditions. The data samples to be saved in the trend file should be set in [Pre trigger samples] and [Post trigger samples]. The data sample interval is determined by the [Common] storing rate. For details, refer to the following:



(2) Mode: Edge

When Edge is set in [Mode] of the trigger recording on the "Trend" display, trends are recorded with reference to the change point where one or more channels satisfy the trigger conditions from the non-trigger state of all channels among the trigger settings for AI, DI, and OI channels. The data samples to be saved in the file should be set in [Pre trigger samples] and [Post trigger samples]. The data sample interval is determined by the [Common] storing rate. For details, refer to the following:



3.4.2 Pen setting

Make the setting for pen assignments and colors for trends recorded to trend files and show on the WEB display.

For trend pens show on the WEB display, 16 pens in total can be displayed on four pages: pens 1 to 4 on page 1, pens 5 to 8 on page 2.

Setting di	isplay
Setting	Pen setting
I/O Connection Channel Click Record Trend Report 1. Select	b Trend display 2. Input 2. In
	OK Cancel

- (1) Select the pen to be set. The current setting data for the selected pen is displayed.
- (2) Make pen assignments. Set the pen in reference to the table below and click the [OK] button.

Settings	Description	
Туре	Select the type to be assigned. Selectable from None / AI / DI / OI / DO.	
СН	Set the channel to be assigned. It can be selected from a list of the input/output channels selected in the type.	
Color	Set the color of the pen.	
Upper limit	Set the scaling value of 0% in the trend graph.	
Lower limit	Set the scaling value of 100% in the trend graph.	

(3) In the same way, set all pens that are recorded to trend files and showed on the WEB display. It is also possible to copy the settings of a pen that has already been set and then edit only the changes.

Example: Copy of PEN1 to PEN16.



3.5 Recording report

Make the report setting. PC Recorder has the function to generate daily, monthly, and yearly reports. Al and OI data can be recorded for 16 channels.

Daily report data for one hour is generated by sampling from data per second as "Momentary value," "Average value," "Maximum value (peak value (high)," or "Minimum value (peak value (low))." Monthly report data are generated from daily report data and yearly report data from monthly report data.

3.5.1 Basic setting

Make the basic setting for daily, monthly, and yearly reports. In reference to the table below, set the following parameters:

Setting dis	splay
Setting	×
Basic setting	Trend display
Connection	Report X
Channel	Basic CH Yearly report
Record	Page title Start month 1
Trend	Monthly report
Report	Page title Start date 1
	Daily report
Click	Page title Start time 1
	\ Input
	Input
	OK Cancel

Settings	Description	
Page title	et the report title within 32 characters for each of daily, monthly, and yearly report.	
Yearly report / Start month	Select the start month of the yearly report from January to December.	
Monthly report / Start date	Select the start date of the monthly report from 1st to 28th.	
Daily report / Start time	Select the start time of the daily report from 1 to 24 (o'clock).	

3.5.2 Channel setting

Make the setting for the content of recording.

(1) Select the channel to be set and, in reference to the table below, set the various parameters.

	Setting display			
Setting			\times	
I/O	Web Report	Tr	end displa	ay X
Connection	Basic CH	Туре	AI	~)
Record	CH2 CH3 CH4 CH5 CH6 CH7	CH Sampling method	AI1 AI1 Yearly report / Mo Sum	∼ nthly report ∼
Trend	CH8 CH9 CH10 CH11 CH11	Data range	Daily report Momentary value	: v
Click	CH13 CH14 CH15 CH16	Error mode	Upper limit Lower limit Mode	100.000 0.000 Previous value
	1. Select		Fixed value Fixed characters	100,000
				2. Input
				OK Cancel

Settings	Description
Туре	Select the type of the channel to be assigned from None / AI / OI.
СН	Select the channel to be assigned.
Sampling method	Select the sampling method for the "daily/monthly data" to be recorded in the
Yearly report / Monthly report	yearly / monthly report from Total / Average / Maximum / Minimum.
Sampling method	Select the sampling method for the "hourly data" to be recorded in the daily report
Daily report	from Momentary value / Average / Maximum / Minimum. ¹
Data range	 To set an effective range for data to be recorded on the reports, check the "Enable" check box. Upper limit: Set the upper limit when "Enable" is checked. Lower limit: Set the lower limit when "Enable" is checked.
Error mode	 Mode: Select the value to be recorded in the report data when data could not be obtained or when data outside the range set in the data range is obtained from Previous value / Fixed value / Fixed characters. Fixed value: Set a value when set to "Fixed value." Fixed characters: Set a character string within 24 characters when set to "Fixed characters."

Special note

- When "Momentary value" is selected as the sampling method, data is recorded at 0 minutes and 0 seconds of every hour.
- When the sampling method is other than "Momentary value," the "Fixed character" set in the "error mode" is recorded in the "hourly data" to be recorded in the daily report if the sampling data recorded for an hour is all an error. If even one piece of data can be obtained during one hour, the operation set in the sampling method is performed from the obtained data.
 - *1: Description of sampling method



Momentary value : Records momentary value at the timing to confirm 1H data Average value : Records average value of sampling data among sampling intarval Peak value : Records maximum/minimum value of sampling data among sampling interval (2) In the same way, set all channels to be desirably recorded in the reports. It is also possible to copy the settings of a channel that has already been set and then edit only the changes.

Example: Copy of CH1 to CH16.



4. Recording data

PC Recorder stores three types of data files: trend files, report files, and system log files.

The data to be saved in the trend files and the report files should be set in 3.4 Recording trend and the 3.5 Recording report.

The system log is automatically saved by PC Recorder.

4.1 Trend file

Trend files are saved in binary format (extension: TRD).

1. File name

A file is created with a name consisting of the year, month, day, hour, minute, second, and millisecond (yyyymmddhhmmss///) of the first sample.

(e.g. 20231025103010500.TRD for October 25, 2023, 10:30:10, and 500 milliseconds with daylight saving time not used)

For details on trend files, refer to the table below. Also, for the folder structure, refer to 4.4 Folder structure.

Item	Description
	File names depend on whether or not to use in daylight saving time. In daylight saving
	time, recording is performed with "S" added to the end of the file name for the "Standard,"
	or "D" for "DST."
	- When daylight saving time is not used:
Record file	YYYYMMDDhhmmsslll.TRD
	- When daylight saving time (Standard) is used:
	YYYYMMDDhhmmssll/S.TRD
	- When daylight saving time (DST) is used:
	YYYYMMDDhhmmsslllD.TRD
Records	Setting information, trend data, event data, comment data
	Right-click the "PC Recorder" icon in the task tray and click "View (V)." Data can be
Data view	viewed using a Web browser>5.2 Trend
Data view	Data can be viewed with the waveform viewer software for TR30 (model: TRViewer).
	TRViewer can be downloaded from our website.
Beenrying equation	- Trend data: 50000 samples × 16 pen-points
Recording capacity (per file)	- Event data: 3000 events
	- Comment data: 1000 comments
	- To prevent the creation of fragmented files due to short-term continuous triggering, it is
CAUTION	prohibited to create a file again within one second after another file is created.
	- Actual quantity may differ slightly between PC Recorder and TRViewer.

2. Time correction

If the PC time is corrected during trend data recording, the time is corrected at regular intervals for a fixed period of time to ensure time continuity. During the time correction process, the time on the WEB display is showed in yellow. -> 5.1 Description of

Range of correction	Process
Within -180 to 0 sec.	The recording cycle is extended until the corrected current time catches up with the time
within - roo to o sec.	in the process of trend data recording. After catching up, the recording cycle is restored.
	Complements data for missing recording cycles. In addition, the recording cycle is
Within 0 to 180 sec.	shortened until the time in the process of trend data recording catches up with the
	corrected current time. After catching up, the recording cycle is restored.
Other than those above	The time change is applied immediately and is not equalized.

Special note

If time is corrected again during the equalization process, it works as follows:
 If the change reduces the difference between the current time after the correction and the current time before the correction, the equalization process continues.
 Otherwise, the change is applied immediately.

4.2 Report file

Report files are saved in CSV format.

1. File name

Daily report files are created with a name consisting of the year, month, and day (yyyymmdd) of the first sample, monthly report files with a name consisting of the year and month (yyyymm) of the first sample, and yearly report files with a name consisting of the year (yyyy) of the first sample. Also. for the folder structure, refer to 4.4 Folder structure.

When the settings are changed, it is recorded with "_X" added to the end of the file name. The previously recorded reports are confirmed at the time of change.

If the file in which the report data is saved is opened in Excel or another application and cannot be saved, "_S" is added to the end of the file name and the file is temporarily saved.

Report	How to name a file	Example:	
Deily report	Very merthe and day fallowed by "DDT"	RPT20231025.CSV, RPT20231025_X.CSV,	
Daily report	Year, month, and day followed by "RPT"	RPT20231025_S.CSV	
Manthly nament	Very and month fallowed by "DDT"	RPT202310.CSV, RPT202310_X.CSV,	
wontniy report	Year and month followed by "RPT"	RPT202310_S.CSV	
Yearly report	Year followed by "RPT"	RPT2023.CSV, RPT2023_X.CSV, RPT2023_S.CSV	

The format of each CSV file is as follows (when 16 channels are assigned):

2. Daily report

	Row 1	Row 2	Row 3		Row 17
Line 1	Title of daily				
	report				
Line 2	(Blank)	CH1 name	CH2 name	•••	CH16 name
Line 3	A.D. year/month/day	CH1 comment	CH2 comment	•••	CH16 comment
Line 4	(Blank)	CH1 engineering unit	CH2 engineering unit	•••	CH16 engineering unit
Line 5	1 o'clock	CH1 data	CH2 data	•••	CH16 data
Line 6	2 o'clock	CH1 data	CH2 data	•••	CH16 data
	•••			•••	
Line 28	24 o'clock	CH1 data	CH2 data	•••	CH16 data
Line 29	Total	CH1 total value	CH2 total value	•••	CH16 total value
Line 30	Average	CH1 average value	CH2 average value	•••	CH16 average value
Line 31	Maximum	CH1 maximum value	CH2 maximum value	•••	CH16 maximum value
Line 32	Minimum	CH1 minimum value	CH2 minimum value	•••	CH16 minimum value

3. Monthly report

	Row 1	Row 2	Row 3		Row 17
Line 1	Title of monthly				
	report				
Line 2	(Blank)	CH1 name	CH2 name	•••	CH16 name
Line 3	A.D. year/month	CH1 comment	CH2 comment	•••	CH16 comment
Line 4	(Blank)	CH1 engineering unit	CH2 engineering unit	•••	CH16 engineering unit
Line 5	Day 1	CH1 data	CH2 data	•••	CH16 data
Line 6	Days 2	CH1 data	CH2 data	•••	CH16 data
	•••			•••	
Line 35	Day 31	CH1 data	CH2 data	•••	CH16 data
Line 36	Total	CH1 total value	CH2 total value	•••	CH16 total value
Line 37	Average	CH1 average value	CH2 average value	•••	CH16 average value
Line 38	Maximum	CH1 maximum value	CH2 maximum value	•••	CH16 maximum value
Line 39	Minimum	CH1 minimum value	CH2 minimum value	•••	CH16 minimum value

4. Yearly report

	Row 1	Row 2	Row 3		Row 17
Line 1	Title of yearly				
	report				
Line 2	(Blank)	CH1 name	CH2 name	•••	CH16 name
Line 3	A.D. year	CH1 comment	CH2 comment	•••	CH16 comment
Line 4	(Blank)	CH1 engineering unit	CH2 engineering unit	•••	CH16 engineering unit
Line 5	January	CH1 data	CH2 data	•••	CH16 data
Line 6	February	CH1 data	CH2 data	•••	CH16 data
	•••			•••	
Line 16	December	CH1 data	CH2 data	•••	CH16 data
Line 17	Total	CH1 total value	CH2 total value	•••	CH16 total value
Line 18	Average	CH1 average value	CH2 average value	•••	CH16 average value
Line 19	Maximum	CH1 maximum value	CH2 maximum value	•••	CH16 maximum value
Line 20	Minimum	CH1 minimum value	CH2 minimum value	•••	CH16 minimum value

4.3 System log file

The system log file is saved in text file format (filename: Log.txt).

The date/time of occurrence and details of the operations listed in the table below are additionally saved in the system log file.

(Example: When PC Recorder started at 10:30:50 on October 25, 2023, the log file of "2023/10/25 10:30:50 Start PC Recorder" was added.)

System log	Operation
Start PC Recorder	PC Recorder started.
Close PC Recorder	PC Recorder closed.
I/O ERROR	I/O communication failure
I/O OK	I/O communication recovery

4.4 Folder structure

Each file is saved based on the Windows "Documents" folder "C:¥Users¥[USERNAME]M-System¥PC Recorder."

([USERNAME] depends on the account.)

The folder structure under PC Recorder is shown in the figure below. Year/Month/Day folders are automatically created as more files are saved.



CAUTION

• When the trend data recording speed is set to 10 s, 1 m, 2 m, 5 m, 10 m, 30 m, or 1 h, trend files are saved in the month folders.

5. View

Right-click the "PC Recorder" icon in the task tray and click on "View (View (V)." The Trend display is showed as the initial screen on the Web browser.

5.1 Description of display

The shared content is always showed at the top of each display.



2. Current time

Displays the current time. During the time correction, this is displayed in yellow (________). -> 4.12 Time

correction

3. Menu button

Clicking the Menu button displays the menu dialog.

-npi				2023/11/21 13:34:5 Ali	
Trend view	Event view	Over view		E ¹⁰⁰ ⁰¹ 50.00	D
					В
-Nr					sł
Trend file	Report file			Language	di
-~~~			;-) 		
Compress Time	Expand Time Axis	Event summary	Comment	Write Comment	0
Axis			summary	03 55.00	0
					a١
				Olara	W
				Al4	

Display switching button

Button for the currently showing display appears dimmed

Operation Icons

Operation icons that available on the display will appear

4. Trend status display

Displays the recording status of trend data. This lights in green (Q Rec) during recording and goes off

(O^{Rec}) when recording is stopped. When waiting for a trigger, it blinks.

5. Error display

If communication with PC Recorder is lost, an error is displayed.

6. Screen lock display

If the screen scroll is not locked, the open key icon is displayed; if it is locked, the closed key icon is displayed. Click to toggle the screen lock status.

To print the "Trend" or "Event view" display, "screen-lock" the display to be printed, and then print it.

7. Trend start button

By clicking the "Trend Start" button, you can switch between Normal start Start, Trigger recording

Trigger, and Stop trend recording Stop

5.2 Trend display

Click the "Menu button and select "Trend"" to go to the "Trend" display.

5.2.1 Display items

The "Trend" display largely consists of the "Menu bar," "Page switching button," and "Trend area."



1. Numerical display

Black text indicates the current value.

Scrolling the trend graph shows the values on the right end of the graph and the text turns blue. Clicking the "numerical display area" selects the pen and deepens the background color. To deselect the pen, click "Scale display area."



For items that are displayed differently depending on the type of input/output, refer to the table below.

Item	Туре	Description
	AI	Displays the % value or the actual quantity value.
Digital diaplay	DI	Displays the display comment corresponding to ON/OFF
Digital display	DO	Displays the display comment corresponding to ON/OFF.
	OI	Displays the numerical value of the actual quantity.
		When a zone is used, the current display color is shown.
	AI	When a zone is not used, the pen color is shown.
Status	OI	This is displayed in a simple bar graph manner. The display color
Sidius		corresponding to the whole status is shown.
	DI	Display color corresponding to ON/OFF as a bar.
	DO	Display color corresponding to ON/OFF as a bar.
	AI	Displays the specified unit
Engineering unit	OI	Displays the specified unit.
Engineering unit	DI	Blank.
	DO	

2. Graph display

- (1) When the trend status display is "Recording" or "Waiting for trigger," the latest data is displayed at the right end of the trend graph.
- (2) When the trend status display is "Waiting for trigger," the latest data of the samples specified in "Pre trigger samples" is displayed. -> 3.4.11 Recording setting
- (3) When the trend status display transitions from "Waiting for trigger" to "Recording," the data of the samples specified in "Post trigger samples" is displayed following Step (2) above. -> 3.4.13 Trigger recording



5.2.2 Operation

1. Switch between pages

The pages can be switched by clicking the "Page Switch" button. The maximum number of pages is four.



2. Expand/compress the time axis

The time axis of the trend graph can be expand/compress. The expansion and compression ratios are the settings shared among all pages.

- (1) Clicking the "Menu Menu" button displays the "menu" dialog.
- (2) Click "Compress Time Axis are" or "Expand Time Axis are" of the operation icons.

Each time the button is clicked, the time axis of the trend graph compress/expand.



Special note

• The time axis can be switched between four levels: 100% (unity magnification), 50%, 20%, and 10%.

3. Changing the maximum/minimum value of the scale

The maximum and minimum values of the scale can be changed.

- (1) Click the "Digital display area" of the pen to be changed to select it.
- (2) To change the maximum value, click on the blank area to the right of the scale; to change the minimum value, click the blank area to the left of the scale. The Change maximum/minimum value dialog is displayed.
- (3) Enter the desired value and click the [OK] button to change the maximum/minimum value of the scale.
- (4) To deselect the pen, click "Scale display area."



View

4. Write of comments

Comments can be written in the trend graph. Comments are shared and displayed on all pages. The list of comments written can be viewed on the "Trend" display (Comments summary). ->5.4 Trend display (Comments summary)

(1) Click the "Menu Menu" button.



- (3) Specify the text color of comments. Specify it from the color palette.
- (4) Write comments and click the [OK] button. The comments are written to the point on the time axis where the [OK] button is pressed.



CAUTION

- Comments are recorded when the [OK] button click is successfully accepted.
- The color palette display depends on the browser.

5.3 Trend display (Event summary)

With the Trend display showed, click the "Menu ^{Menu}" button and select "Event Summary ²⁰." Then the event summary information is showed on the Trend display.

5.3.1 Display content

Event summary information is showed in the "Trend area" of the "Trend" display, where the digital display area, scale display area, and pen mark are showed. The event summary information is shared and showed on all pages. Clicking the [Close] button closes the event summary information and returns to the normal "Trend" display.



5.3.2 Operation

Clicking the "event summary" highlights the clicked summary and displays the data starting from the point where the event occurred.

When the right end of the trend graph is past data, the time display is blue. At this time, the event summary information is not updated.



5.4 Trend display (Comments summary)

With the Trend display showed, click the "Menu ^{Menu}" button and select "Comments Summary"." Then the comments summary information is showed on the Trend display.

5.4.1 Display content

Comments summary information is showed in the "Trend area" of the "Trend" display, where the digital display area, scale display area, and pen mark are showed. The comments summary information is shared and showed on all pages. Clicking the [Close] button closes the comments summary information and returns to the normal "Trend" display.



5.4.2 Operation

Clicking the "comments summary" highlights the clicked comments and displays the trend data starting from the point of recording.

When the right end of the trend graph is past data, the time display is blue.



5.5 Event view

Click the "Menu Menu" button and select "Event view 1111" to go to the "Event view" display.

5.5.1 Display content

A list of Event view is displayed.

When an event that has been set for each channel by right clicking the "PC Recorder" icon in the task tray and selecting "Setting (C)" occurs, the event information is showed on this display.

On the Event view display, the event information on the 500 most recent events is displayed. It is also updated even when recording is suspended.

Event view data is cleared by right clicking the "PC Recorder" icon and clicking "Close (X)" to close.

Date 2	2023/11/2	22	Time 11:46:59	Menu	Rec ‡	Scroll (Max. 500)
	_			-		
Date	Time	СН	Name	Comment	Message	
2023/11/22	11:46:54	A11	All Name	All Comment	Messegel	^ Y
2023/11/22	11:46:51	011	011	A11+A12	Nessagel	
2023/11/22	11:46:50		All Name	All Comment	Vessage2	
2023/11/22	11:46:50		All Name	All Comment	Vessige3	
2022/11/22	11-46-42	Δ11	All Name	All Comment	Vacesgad	
2023/11/22	11:46:42	011	011	AIL+A/2	Message2	
2023/11/22	11:46:23		All Name	All Comment	Vessige5	
2023/11/22	11:46:19	011	011	A11+A/2	Vessige3	
2023/11/22	11:46:18	AI1	All Name	All Comment	Vessige4	
2023/11/22	11:46:10	A11	All Name	All Comment	Nessge3	
2023/11/22	11:46:01	A11	All Name	All Comment	Message2	
2023/11/22	11:45:59	011	011	A11+A/2	Vessage2	
2023/11/22	11:45:23	A11	All Name	All Comment	Vessagel	
2023/11/22	11:45:17	011	011	A11+A/2	Vessagel	
2023/11/22	11:45:14	A11	All Name	All Comment	Message2	
2023/11/22	11:45:14	AI1	All Name	All Comment	Vessige3	
2023/11/22	11:44:57	AI1	All Name	All Comment	Vessage4	
2023/11/22	11:44:55	011	011	AIL+AI2	Message2	
2023/11/22	11:44:19	AI1	All Name	All Comment	Vessize5	
2023/11/22	11:44:13	011	011	A/1+A/2	Vessage3	
2023/11/22	11:44:10	AI1	All Name	All Comment	Vessage4	
2023/11/22	11:44:02	A11	All Name	All Comment	Vessige3	
2023/11/22	11:43:53	A11	All Name	All Comment	Vessige2	
2023/11/22	11:43:51	011	011	A/1+A/2	Vessage2	
2023/11/22	11:43:15	A11	All Name	All Comment	Vessigel	
2023/11/22	11:43:09	011	011	A11+A12	Vessigel	
2023/11/22	11:43:06	AI1	All Name	All Comment	Vessige2	- J

5.6 Overview

Click the "Menu Menu" button and select "Overview ? to go to the "Overview" display.

5.6.1 Display content

The current values and alarm generation status of all channels are displayed. It is updated even when recording is suspended.

Date 2023/	11/22		Time	11:46:	59	l	-	М	enu	-	ł	-	Rec Start		т	riggo		0) of
_			_		_								Start			riggeı			Stop	_
All Name All Comment 41.30 [mA] Alarm4		3.12 N	A13 A13	9.03		A14 A14	1.18		A15 A15	0.76	[%]	A16 A16	7.84	[%]	A17 A17	21.34	[%]	AIS AIS	39.20	[%]
A19 A19 58.70 [%]		5 .88 (%)	A111 A111	90.97		A/12 A/12	98.82	[%]	A113 A113	99.24	[%]	A114 A114	92.16	[%]	AI15 AI15	78.66	[%]	A116 A116	60.80	[%]
DI1 Name DI1 Comment OFF	DI2 DI2	FF						1												
011 A11+A12 32.21 [mA] Normal		7.00	013 013	0.00		014 014	0.00		O15 O15	0.00	[%]	016 016	0.00	[%]	017 017	0.00	[%]	018	0.00	[%]
019 019 0.000 [%]		.00	0111	0.00		0112 0112	0.00		0113 0113	0.00	[%]	0114	0.00	[%]	0115 0115	0.00	[%]	0116 0116	0.00	[%]
DO1 DO1 Comment DO1 OFF	DO2 DO2 Comm DO2	ont 2 OFF																		
			С	H na	m	e	СН	co	mr	nent	1									



For items that are displayed differently depending on the type of input/output, refer to the table below.

Item	Туре	Display content				
	AI	Displays the % value or the actual quantity value.				
Digital display	DI	Displays the character string corresponding to ON/OFF.				
	DO					
	OI	Displays the numerical value of the actual quantity.				
		When a zone is used, the current zone color is shown.				
	AI	When a zone is not used, blue is shown.				
	OI	This is displayed in a simple bar graph manner. The display color				
Status	01	corresponding to the whole status is shown.				
		The name corresponding to the whole status is shown.				
	DI	Display color corresponding to ON/OFE as a bar				
	DO	Display color corresponding to ON/OFF as a bar.				
	AI	Blank.				
Engineering unit	OI					
	DI	Diaplayo the energified unit				
	DO	Displays the specified unit.				

5.7 Trend file

Click the "Menu Menu" button and select "Trend file" to go to the "Trend file" display.

5.7.1 Display content

A list of trend files stored in the PC is displayed.

Click on the "Year/Month/Day" folder and select the trend file to view.

The content and operation of the displayed trend file are the same as in "5.2 Trend ".



5.8 Report file " button and select "Report file 🕮" to go to the "Report file" display. Click the "Menu Menu 5.8.1 Display content A list of report files stored in the PC is displayed. Click the "Year/Month/Day" folder and select the report file to view. Date 2023/11/22 Time 10:45:09 Menu î d RPT_JSON Trigger Stop Click Î d Date 2023/11/22 ime 10:46:13 RPT_JSON 2023 Click Stop 2023 Trigger RPT202311.json 2023/11 RPT20231121.json 2023/11/21 RPT20231121_X.json 2023/11/21 File select RPT20231122.json 2023/11/22 P2 RPT_JSON¥2023¥11¥RPT20231122.json ily Report Al1 Nam AI2 AI3 AI4 AIS AI6 AI7 AI2 AI3 AI4 2023/11/22 Al1 Con AI6 AI7 AI8 3.51 52.83 87.12 52.56 33.26 71.48 99.95 84.00 48.42 52.10 86.65 70.85 99.96 95.44 67.67 96.77 99.97 95.56 84.22 29.42 13.55 48.62 67.84 13.68 13.89 15.41 29.88 3.40 4.22 3.56 31.4 50.26 95.41 14.83 69.38 85.54 86.71 12 14 18 19 24 57.76 473.68 493.62 33.16 553.27 514.49 Average 45.77 47.36 49.36 51.44 99.96 Maximum 96.88 Mi 3.56 3.40 Special note • If the settings are changed during the recording of report data, new report data is created and

an "X" is added to the end of the data name.

5.9 Language

Click the "Menu Menu" button and select "Language^X" to go to the "Language" display.

Display content 5.9.1

The currently used language is displayed as selected.



5.9.2 Operation

Select the language to be used from "Japanese" or "English," and click the [OK] button to switch the language.



6. Adjustment

Adjust analog input channels 1 to 16.

Right-click the "PC Recorder" icon in the task tray and click "Adjustment (D)." The Adjustment dialog is displayed.



- (1) Select the analog input channel to be adjusted.
- (2) Enter Offset and Gain.
- (3) Click the "Apply" button to apply the settings.

7. License

Below are the licenses for the functions used by PC Recorder.

7.1 License

This software incorporates expat (http://expat.sourceforge.net/).

This expat is distributed under the MIT License.

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8. Appendix

8.1 Troubleshooting

Also refer to the "Frequently Asked Questions (FAQ)" on our Website.

https://www.mgco.jp/

8.1.1 I/O unit : lamp indication

Phenomenon	Check item	Measure				
	Is the I/O unit turned on?	Check the connection to the PC.				
The PWR indicator lamp	Is the I/O unit turned on?	Check the connection to the PC.				
does not light up.						
The RUN indicator lamp	Is the I/O unit set in the	Right-click the "PC Recorder" icon in the task				
does not light up.	connection settings?	tray to open the menu. Click [Settings] to show				
		the "Settings" display and then click [Connect].				
		Show the "Connection" display and check the				
		[I/O] settings>3.1 I/O connection setting				

8.1.2 PC Recorder

Phenomenon	Check items	Measure				
Unable to connect to the I/O	Is the I/O unit set in the	Right-click the "PC Recorder" icon in the task				
unit.	connection settings?	tray to open the menu. Click [Settings] to show				
		the "Settings" display and then click [Connect].				
		Show the "Connection" display and check the				
		[I/O] settings>3.1 I/O connection setting				
Unable to display the screen	Is the port number used by PC	Check the firewall settings on the PC.				
on the Web browser.	Recorder (default: 38080) open?					
Trend data is not displayed.	Are the trend settings correct?	Right-click the "PC Recorder" icon in the task				
		tray to open the menu. Click [Settings] to show				
		the "Settings" display and then click [Trend].				
		Show the "Trend" display and check the				
		settings>3.4 Recording trend				
Reports are not recorded.	Are the report settings correct?	Right-click the "PC Recorder" icon in the task				
		tray to open the menu. Click [Settings] to show				
		the "Settings" display and then click [Report].				
		Show the "Report" display and check the				
		settings>3.5 Recording report				
Trend and report data are	Is PC Recorder started?	Even if the PC and the I/O unit are connected,				
not recorded.		the data are not recorded if PC Recorder is not				
		started up.				