Paperless Recorder

VGR-B100

Operation Manual

RKC® RKC INSTRUMENT INC.

WXPVM70mnAR001E
January, 2021(Rev.15)

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

⚠ WARNING

- An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- Don't use this product in any method not specification by manufacturer. The protective features of this product may be impaired if it is used in a method not specified in the operation manual.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- Do not use in an environment where there is strong electromagnetic interference. May cause the operation to become unstable.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial machines, test and measuring equipment.
  (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
  - If input/output or signal lines within the building are longer than 30 meters.
  - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.
  The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- This instrument is intended to be used under the following environmental conditions.

Installation features:	Indoor
Altitude:	2000 m or less
Ambient temperature:	0-50 °C
Ambient humidity:	20-80 %RH (Non-condensing)
Overvoltage category:	Category II
Allowable pollution degree:	Pollution degree 2

- Power module that is used in the instruments conform to EN60950-1/A12: 2011.

- When installing this instrument, put on a protective gear such as safety shoes, helmet, etc. for your safety.
- Do not put your foot on the installed instrument or get on it, because it is dangerous.
- Only our serviceman or persons authorized by RKC are allowed to remove and take the inner module, the main unit and printed circuit boards apart.
- In case of damage or failure, contacting serviceman of our company, instruments should be against unintended operation.

FOR PROPER DISPOSAL

When disposing of each part used for this instrument, always follows the procedure for disposing of industrial wastes stipulated by the respective local community.

SYMBOLS USED ON THE INSTRUMENT

The symbols below are used on this instrument for the cautioning information.

This shows “Caution for handling”.
This symbol is used on the parts need to reference the instruction manual for saving human body and the instrument.

This shows “Protective grounding”.
Be sure to provide protective grounding prior to operate this instrument.

This shows “Risk of electric shock”.
This symbol is used on the parts, which has a risk of electric shock.

＜CONTENTS＞

1. INTRODUCTION

1.1 Paperless Recorder

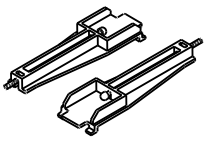
(1) This Recorder displays measured data in real time on the liquid crystal display. It is a paperless type that is also capable of saving the measured data to a SD memory card (hereinafter referred to as SD card). It can operate easily with the liquid crystal with the touch panel.

(2) It can set up to 12 channels for the input types such as thermocouple, resistance bulb, and DC voltage (or current).

(3) It allows the measured data saved to the SD card to be displayed on the display unit.
Use of the support software attached to the Recorder allows the saved data to be displayed on a personal computer.

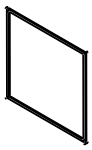
1.2 Accessory check

Upon receiving the Recorder unit, check the appearance for damage, and if the correct quantity of the accessories are supplied. Please contact the shop that purchases it or our salesman when there is a part not suitable by any chance.

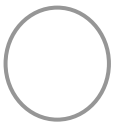


(1) Panel-mounting bracket

(2) CD-ROM
（Operation manual, Support software）



(3) Panel packing



(4) O-ring for waterproof

1.3 When temporarily keeping it

Please keep this Recorder in the following environment. Please keep it in the following environment when it is built in the device.

⚠ CAUTION

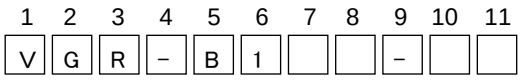
Externals, the function, and the longevity etc. of the product might be ruined when keeping it in poor surroundings.

Environment when keeping it

- Place where dust are little.
- Place that doesn't include flammable gas, firedamp, causticity gas (SO_2, H_2S).
- Place without vibration and impact.
- Place where and where steam is a little. Place where moisture is a little.
- Place where direct sunshine doesn't strike. Place that doesn't become high temperature.
- Place that becomes low temperature too much.

1.4 Confirmation of model number and specification

The marking plate to which the model number has been described is on the case. Please confirm this instrument is a specification the same as the order referring to the table below.



Digit	Specifications	Code
7-8	<Number of input points>	
	03 point	03
	06 point	06
	09 point	09
	12 point	12

【Option】

Digit	Specifications	Code
10	< Communication >	
	Without	0
	RS-485	6
11	< I/O >	
	Without	0
	DI/DO	1
	Relay output	2

1.1 Handling SD card

Correspondence SD card is as follows.

・Panasonic corporation 1～32GB
・SanDisk corporation 1～32GB
・HAGIWARA Solutions corporation 1～32GB

There is no SD card in this equipment. Please buy it in the computer shop etc.

⚠ CAUTION

・SD card on the market is sold having formatted it usually, therefore, it is not necessary to format it again. Please go with this Recorder when formatting it. When formatting it by the format feature of the personal computer standard, it is likely not to operate correctly.
・Please confirm it is a correct direction and the firm insertion when it installs it. The Recorder cannot recognize the SD card when forcibly inserting it in a wrong direction. Moreover, it causes the breakdown of the SD card and the main body of the Recorder. Please note that the damage of the equipment when it reversely inserts it becomes off the subject of the guarantee.
・Please do not turn off power in recording of the SD card, and do not detach the SD card. Data might damage, and delete it.
・When the SD card breaks, important recorded data is lost. The data preserved on the card recommends the backup to be booked once a month.
・MiniSD and the microSD card cannot be used. The use of miniSD and the microSD card adaptor has the possibility that the card doesn't come off, therefore, please do not use it.

● Standard of record

The standard of the record when the SD card of 2GB is used is as follows. Please note that the capacity that can be recorded by the situation of the occurrence of warning and the message is different.

[Condition]

- Number of inputs : 6 point
- Recorded data form : Binary
- Record type : Maximum/minimum value record
- There is no event of the alarm, message etc.

Capacity of SD card	2GB				
File preservation cycle	1 hour			1 day	
Data logging cycle	1 sec	2 sec	5 sec	10 sec	1 min
Capacity that can be recorded	1.0 year	1.4 year	1.8 year	14.0 year	33.7 year

※ The record exceeding the product-life cycle is not guaranteed.

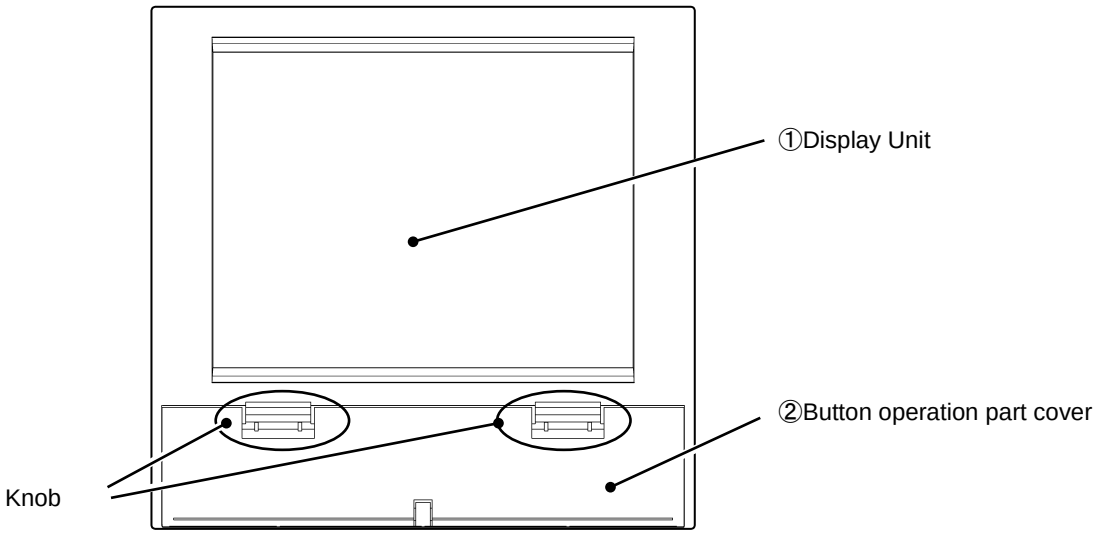
● Timing of data writing

For the timing of outputting recorded data to the SD card, refer to Section 5.3.

For the format of the recording file, refer to Section 10.17.

2. NAMES AND FUNCTIONS OF PARTS

2.1 Names and functions of parts



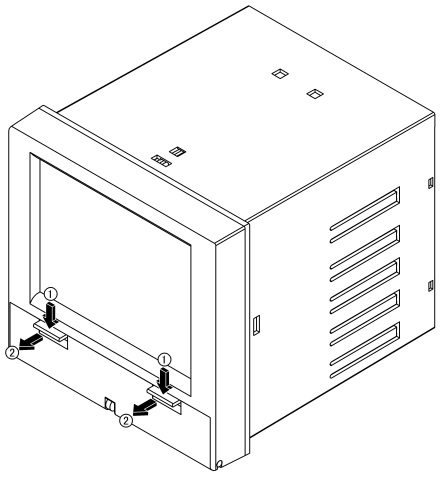
① Display area

The LCD is provided with touch panel. Display the measurement data and other various Parameter set screens. Touch the surface to set data.

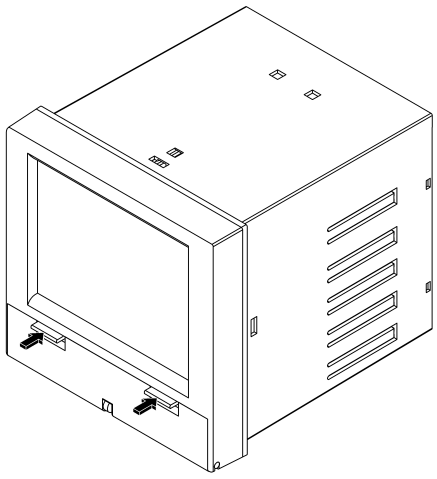
② Button operation part cover

This panel protects the button operation part. It pulls it forward while pushing two knobs below to appear function keyboard.

Note: Please do the both hands to the opening and shutting of cover. It causes damage.



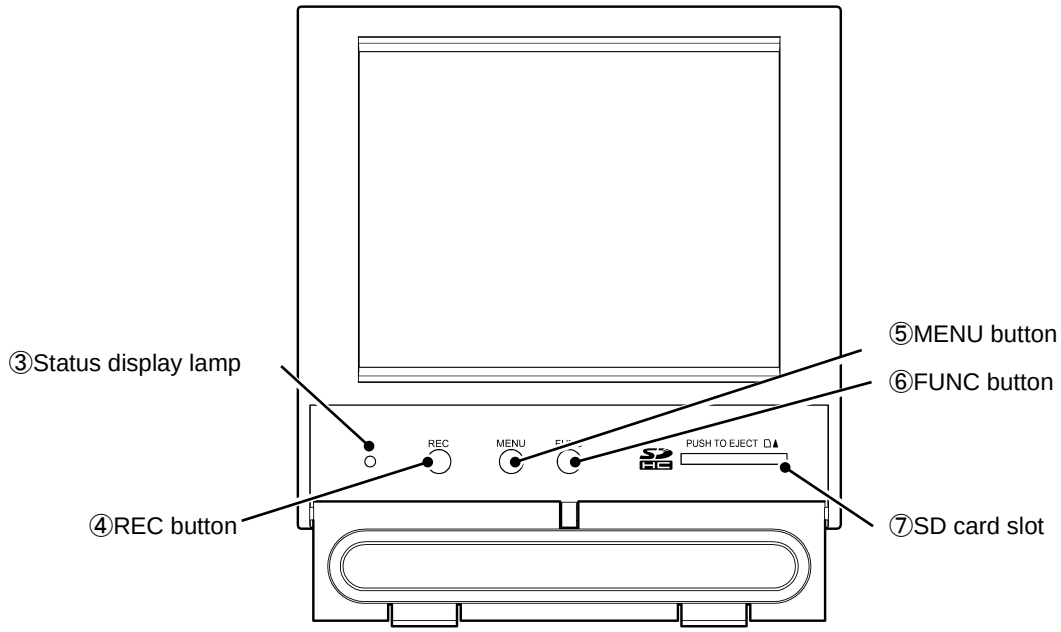
【When opening cover of button operation part】



【When closing cover of button operation part】

⚠ CAUTION **Please be performed in both hands open and close the cover. It causes the damage.**

⚠ CAUTION **During the opening and closing of the cover, please be careful not to pinch your fingers.**



③ Status display lamp

Allow the power ON/OFF, LCD (display) ON/OFF and record status to be displayed.

Lamp ON (highlighted) : Power ON, recording suspended

Lamp blinks(1 sec ON/1 sec OFF) : Power ON, recording in progress

Lamp blinks(high speed) : Power ON, SD card writing

Lamp OFF : Power OFF

④ REC button

Used to start or stop recording.

⑤ MENU button

Display the menu screen.

Used to the continuance of record when check screen of stops recording.

⑥ FUNC button

The content of operation is allocated, and the operation can be done. It can select the “Change display”, “Capture”, “Message” and “Addition reset”.

Select “OFF”, when you use as a start/a stop of Sub record.

(Refer to Section 8.17 for FUNC key.)

⑦ SD card slot

Used for inserting the SD card.

To remove the SD card from the slot, press SD card to insert.

CAUTION

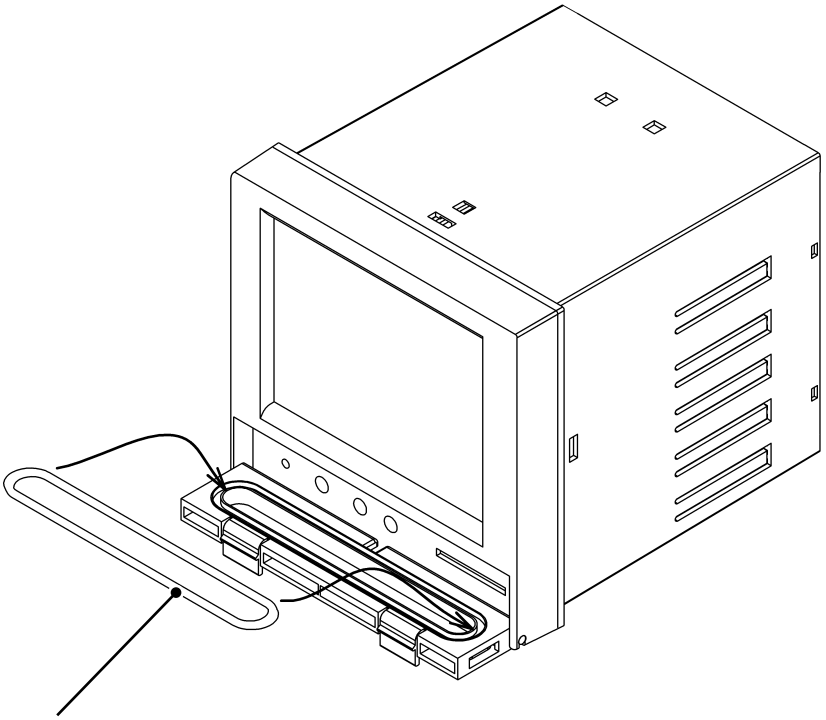
Please confirm the direction to the insertion of SD card. When forcibly inserting it in a wrong direction, SD card and the main body are destroyed.

CAUTION

When you pull out the SD card while recording, it becomes impossible to record data normally and causes past preservation data to destroy. Please pull out the SD card after stopping recording.

2.2 Set of O-ring for waterproof

When the factory is shipped, O-ring for the waterproof is not installed. When the waterproof and dustproof uses it by the necessary environment, please install it according to the figure below.



O-ring for waterproof

CAUTION **It is not abnormal though the opening and shutting operation of the cover becomes very hard if O-ring for the waterproof is installed.**

3. INSTALLATION

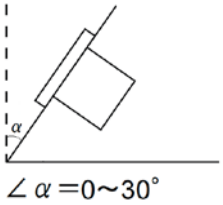
3.1 Installation place

Install place

This equipment is a structure that is installed in the panel and used.

Please choose and install the following places.

- Place without vibration and impact. (Vibration : 10 ～ 60Hz 0.2m/s^2 Impact : The impact is not allowed.)
- Place where dust and oily smoke are few.
- Place where ambient temperature doesn't exceed 0 ～ 50℃, and place where temperature change is a little.
- Place where high radiant heat is not received directly.
- Place where drop of water doesn't hang within the range of humidity 20 ～ 80%RH, and place where dewfall is not done.
- Place where circulation of air is good.
- Place where space to be able to facilitate wiring, maintenance and check, can be taken.
- Place where electromagnetic radiation is not generated.
- Place where doesn't include flammable gas, firedamp, causticity gas (SO_2, H_2S).
- Place where machinery vibration is a little.
- The inclination at the installation must not incline at the right and the left, and it become the horizontal.
  (Inclining forward 0°, Backward tilting 0 ～ 30°)



Install Panel

- The installation panel is recommended to use the steel board whose thickness is 1.2 mm or more.
- Mounting panel can be used up to 7 mm thick at the maximum.

3.2 Installation on panel

Please put and install appended panel packing between the Recorder and the panel.

Refer to Section 10.16 for externals size.

4. WIRING

4.1 Terminal stand array and LAN connector

The terminal stand is one row in the uppermost part, and 4 rows or less are in the lower side for the analog input and option.

The part of "Terminal No.41 ～ 49" becomes a connector for the type that the DI/DO of option is mounted.

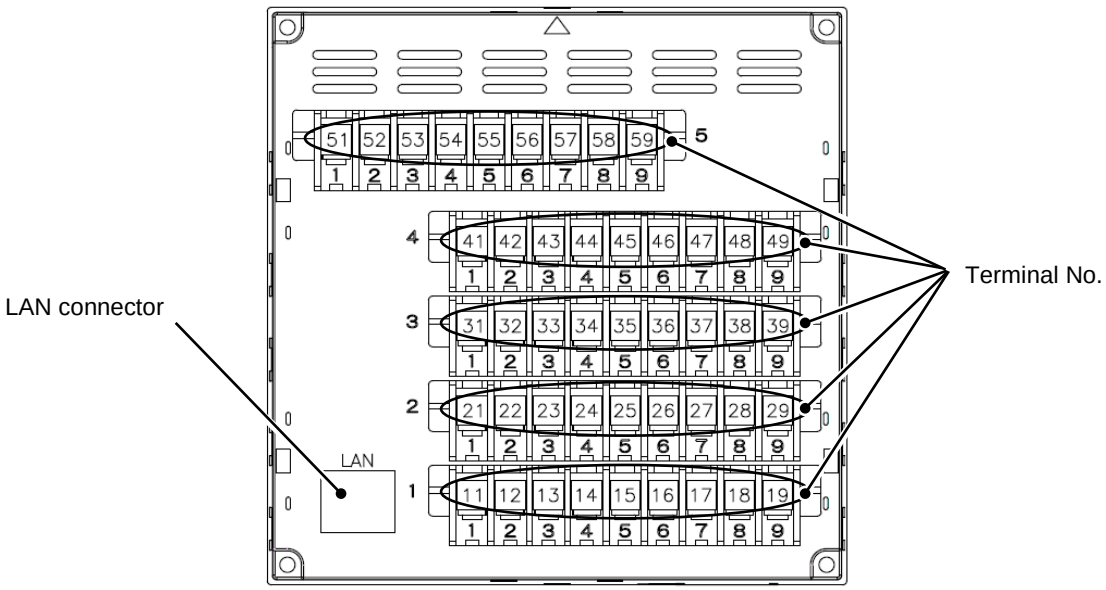


Fig. 4-1 Terminal stand array(The back of recorder)

Terminal No.	51	52	53	54	55	56	57	58	59
Name	POW			NC	COM ALM		NC	RS-485	
Sign	L	N	G		A	C		+	−
Terminal No.	41	42	43	44	45	46	47	48	49
CH.	10			11			12		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B
Terminal No.	31	32	33	34	35	36	37	38	39
CH.	7			8			9		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B
Terminal No.	21	22	23	24	25	26	27	28	29
CH.	4			5			6		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B
Terminal No.	11	12	13	14	15	16	17	18	19
CH.	1			2			3		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B

4.2 Wiring for power supply

Warning

- Please energize to this equipment after doing the protection earth without fail for the electric shock prevention.
- Please do not cut the protective earth, and please do not remove connecting wires of the protective earth.
- Please confirm the power-supply voltage of this equipment is corresponding to the voltage of the power supply.
- Please energize to this equipment after applying the protection cover of the transparency.
- When performing maintenance work, etc. , please start work from after 10 seconds turn off the power.

CAUTION

- Please use the one that corresponds to 600V vinyl insulation electric wire (IEC 60227-3) or it for the electric wire for the power supply.
- Please install round shape pressure connection terminal (for M3.5) to which the insulation sleeve adheres on the electric wire terminal.
- Please connect the protective grounding terminal (resistance:100Ω or lower, minimum diameter of a ground line 1.6 mm) to protective ground.
- When you share the protective earth conductor with other equipment, the influence of the noise from the ground line might be received. Sharing with other equipment is recommended to be avoided.
- For safety, please install the breaker or the switch, that conformed to EN60947-1 and EN60947-3, within easy reach of the operator, and please indicate that these are the breaker or the switch for power supply disconnection of this instrument.
- The voltage rating must use the main source of electrical power in the variation range in ±10%.
- A transitional current might flow to the main source of electrical power when the power supply is turned on.

［Power supply terminal］

Power supply terminal is “Terminal No. 51 ～ 53”.

51	52	53
L	N	G

Rated supply voltage: 100～240V AC

［Wiring procedure］

① The protection cover of the transparency of the terminal stand is removed. It pulls forward while pushing the hook of two places of one side of cover part internally at the same time and it removes.

② The cable is connected with the power supply terminal. The protective grounding is connected with terminal No.53(G). Non-earth side of the power supply is connected with terminal No.51(L), and the earth side of the power supply is connected with terminal No.52(N).

③ The protection cover of the transparency is installed.

④ It is confirmed that the protection earth is correctly done.

4.3 Wiring for analog input

CAUTION

● Notes of input wire

・Please do not mix the noise about the input wiring. Moreover, the use of an effective shield line or twist line is recommended to the noise in the input wiring.

・At the thermo-couple input, please connect thermoelectricity vs. wire directly or use the protective conductor. The use of the input line with the shield is recommended.

・At the resistance temperature sensor input, the difference of the line resistance in three lines is assumed below the following. The use of the input line with the shield is recommended.
Pt100, JPt100: Under 50mΩ.

・When there is a possibility of receiving the influence by the inductive noise, especially, when wiring near the high frequency power supply, the use of the twist line with the shield is recommended.

・Please install round shape pressure connection terminal (for M3.5) to which the insulation sleeve attaches on the electric wire terminal.

・If you want to use by branching the input wiring, please use it with the setting of burnout "OFF". If the setting of burnout "ON", may have influence to equipment.

● Notes in wiring

・Please separate from the power supply circuit (power supply or DO circuit of 25V or more) and use this equipment and wiring between measurement points.

・Please ground the shield of the shield line.

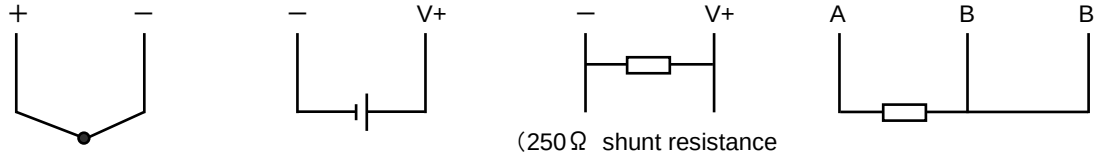
[Analog input terminal]

Analog input terminal is "No.11 ～ 49". The number of terminals is different depending on the number of input channels.

Terminal No.	41	42	43	44	45	46	47	48	49
CH.	10			11			12		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B
Terminal No.	31	32	33	34	35	36	37	38	39
CH.	7			8			9		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B
Terminal No.	21	22	23	24	25	26	27	28	29
CH.	4			5			6		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B
Terminal No.	11	12	13	14	15	16	17	18	19
CH.	1			2			3		
Input	+/A	−/B	V+/B	+/A	−/B	V+/B	+/A	−/B	V+/B

[Details of terminal array of each input of CH.1～12]

<TC・mV> <V> <mA> <RTD>



（250Ω shunt resistance connection）

4.4 Wiring for COM ALM

COM ALM can be used as an alarm output of measurements etc.

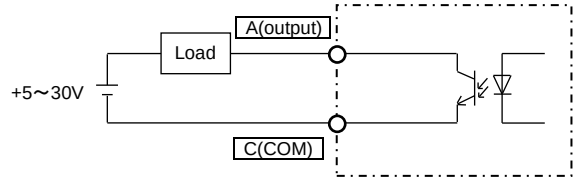
[COM ALM terminal]

COM ALM terminal is “Terminal No. 55 ～ 56”.

55	56
A	C

※ Please connect neither “A terminal (output terminal)” nor “C terminal (COM terminal)” oppositely. The circuit might be damaged when not correctly connected.

[Schematic diagram]



Open collector output (1 point)

Rating：30V DC 20mA/1 point

4.5 Wiring for LAN cable

[Communication specification]

Specification	10BASE-T
Transmission speed	10Mbps
Transmission scheme	Baseband
The maximum network length or The maximum node interval	500m(Cascade 4 steps)
The maximum segment length	100m(Between the node and HUB)
Connecting cable	UTP(Unshielded Twist Pair cable) Category 5
Protocol	TCP/IP

⚠ CAUTION

・To avoid the influence of the inductive noise, LAN cable, please separate from the power supply line and strong electricity line as much as possible.

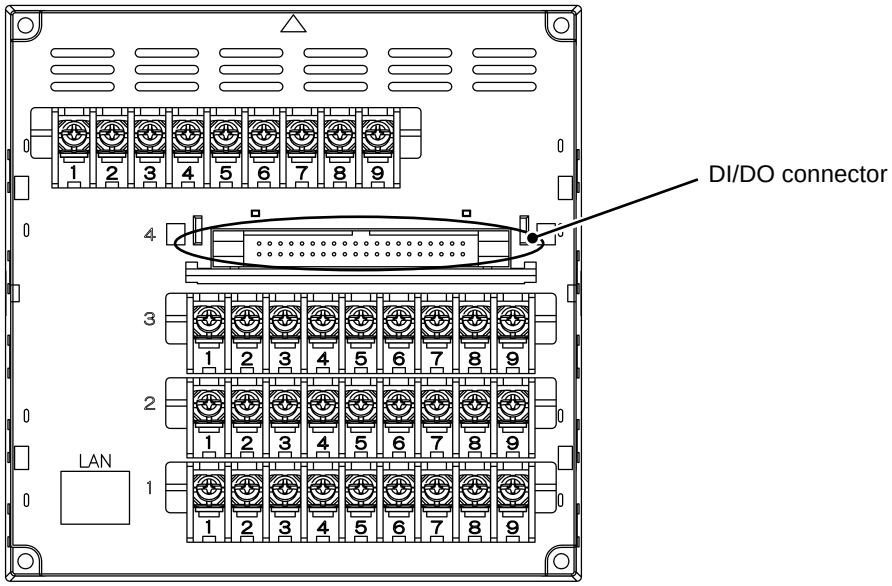
[Connection with personal computer]

Please connect it through HUB.

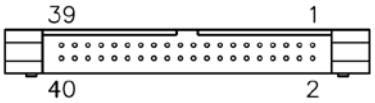
Please use the cross cable when connecting it directly with the personal computer.

4.6 Wiring for DI/DO (Option)

DI/DO becomes a connector joint.



[Pin array]



Pin No.	Signal name	Pin No.	Signal name
1	DI1	21	DO1
2	DI2	22	DO2
3	DI3	23	DO3
4	DI4	24	DO4
5	DI5	25	DO5
6	DI6	26	DO6
7	DI7	27	DO7
8	DI8	28	DO8
9	DI9	29	DO9
10	NC	30	DO10
11	NC	31	DO11
12	NC	32	DO12
13	DI_COM	33	DO_COM
14	DI_COM	34	DO_COM
15	DI_COM	35	DO_COM
16	DI_COM	36	DO_COM
17	DI_COM	37	DO_COM
18	DI_COM	38	DO_COM
19	DI_COM	39	DO_COM
20	DI_COM	40	DO_COM

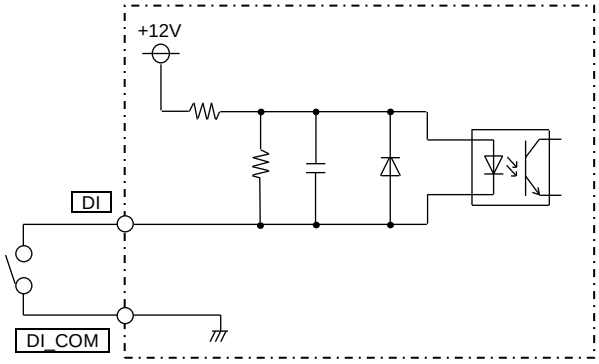
[Connector]
For DIDO, a 40-pin MIL compliant connector plug is used.
Therefore, we recommend the following for the cable side connector.

- HIROSE ELECTRIC CO., LTD
  HIF3BA-40D-2.54R(Socket, Pressure welding) or HIF3BA-40D-2.54C(Socket, Crimping)

The DI/DO cable (WMSU0468A01: cable length 1m, WMSU0468A02: cable length 3m) is available as an option.
For details, please contact to state of the purchase, or our salesperson.
Refer to below table for signal arrangement of the cable.

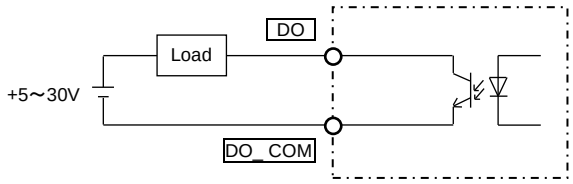
DI cable			DO cable		
Pin No.	Signal name	Cable Color	Pin No.	Signal name	Cable Color
1	DI1	Red	21	DO1	Red
2	DI2	Gray	22	DO2	Gray
3	DI3	Gray	23	DO3	Gray
4	DI4	Gray	24	DO4	Gray
5	DI5	Green	25	DO5	Green
6	DI6	Gray	26	DO6	Gray
7	DI7	Gray	27	DO7	Gray
8	DI8	Gray	28	DO8	Gray
9	DI9	Gray	29	DO9	Gray
10	NC	Green	30	DO10	Green
11	NC	Gray	31	DO11	Gray
12	NC	Gray	32	DO12	Gray
13	DI_COM	Gray	33	DO_COM	Gray
14	DI_COM	Gray	34	DO_COM	Gray
15	DI_COM	Green	35	DO_COM	Green
16	DI_COM	Gray	36	DO_COM	Gray
17	DI_COM	Gray	37	DO_COM	Gray
18	DI_COM	Gray	38	DO_COM	Gray
19	DI_COM	Gray	39	DO_COM	Gray
20	DI_COM	Green	40	DO_COM	Green

[DI schematic diagram]



No-voltage contact input (9 point), terminals (DI_COM) of each channel are common.
Rating：Photo-coupler drive 12V DC about 3mA/1 point

［DO schematic diagram］



Open collector output (12 point) , terminals (DO_COM) of each channel are common.
Rating：30V DC　20mA/1 point

［Reference］

"DI_COM" terminals and "DO_COM" terminals are connected inside the equipment.

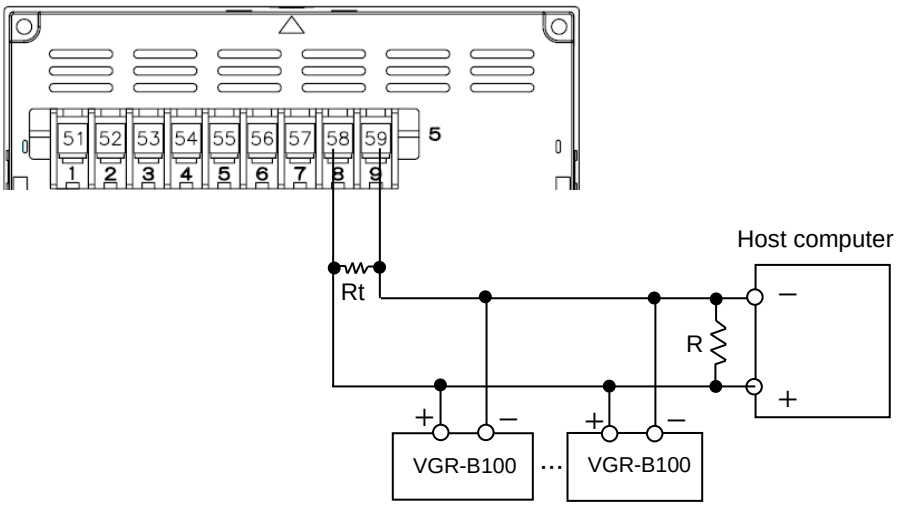
4.7 Wiring for RS-485 (Option)

[RS-485 terminal]

RS-485 terminal is “Terminal No. 58 ～ 59”.

58	59
+	−

It wires for the cable according to the figure below.



※ The terminator for RS-485 (Rt=200Ω) is sold as an option article (Code: WMSU0303A01).

CAUTION

- Please put terminator (Rt=200Ω) on the host side. In view of the host, please install terminator (Rt=200Ω) in VGR-B100 in the distance most.
- The connection is 32 or less including the host computer.
- The length of the cable is 1.2km or less.
- The use of “UL20620-SB(M)(Hitachi-densen corporation)” equivalent goods cable is recommended.

4.8 Wiring for relay output (Option)

Terminal No.	41	42	43	44	45	46	47	48	49
	RL1	RL2	RL3	RL4	RL5	RL6	COM	COM	COM

RL：Relay output (6 points)

Contact rating：3A/250V AC, 3A/30V DC (3A/1 common, Total 9A or less)

5. OPERATION

5.1 Before operating

Please confirm the installation of SD card (Refer to Section 1.5), wiring (Refer to Section 4) before it operates. Afterwards, please confirm the various parameter settings (Refer to Section 7).

5.2 Start and stop of record

The record begins when REC button is pushed.
When the record is stopped, the REC button is pushed again, and it Stop key touches on the confirmation screen.

5.3 Output timing of recorded data to SD card

The timing of output to the SD card depends on the version. The recorded data is erased from the internal memory at the timing when it is output to the SD card. The output timing is shown below.

Less than Version 2.00 : (1) When recording stop (SD card inserted)
(2) When SD card removal operation
(3) When the number of files created for each file recording cycle exceeds 50
(4) When an SD card is inserted (when there is record data in internal memory)

Version 2.00 or later : (1) When recording stop (SD card inserted)
(2) When SD card removal operation(Not possible in extended security mode)
(3) When an SD card is inserted (when there is record data in internal memory)
(4) Per file recording cycle(When the file recording cycle is 1 day, it is output to the SD card at 0:00:00 every day. Also, the sub record is the same)

* From version 2.00 onwards, record data is output every file recording cycle. Therefore, if you move recorded data to the PC during recording, please save the data currently being recorded in the same folder name. If you don't do this operation, you can't read the recorded file when reading the management file.

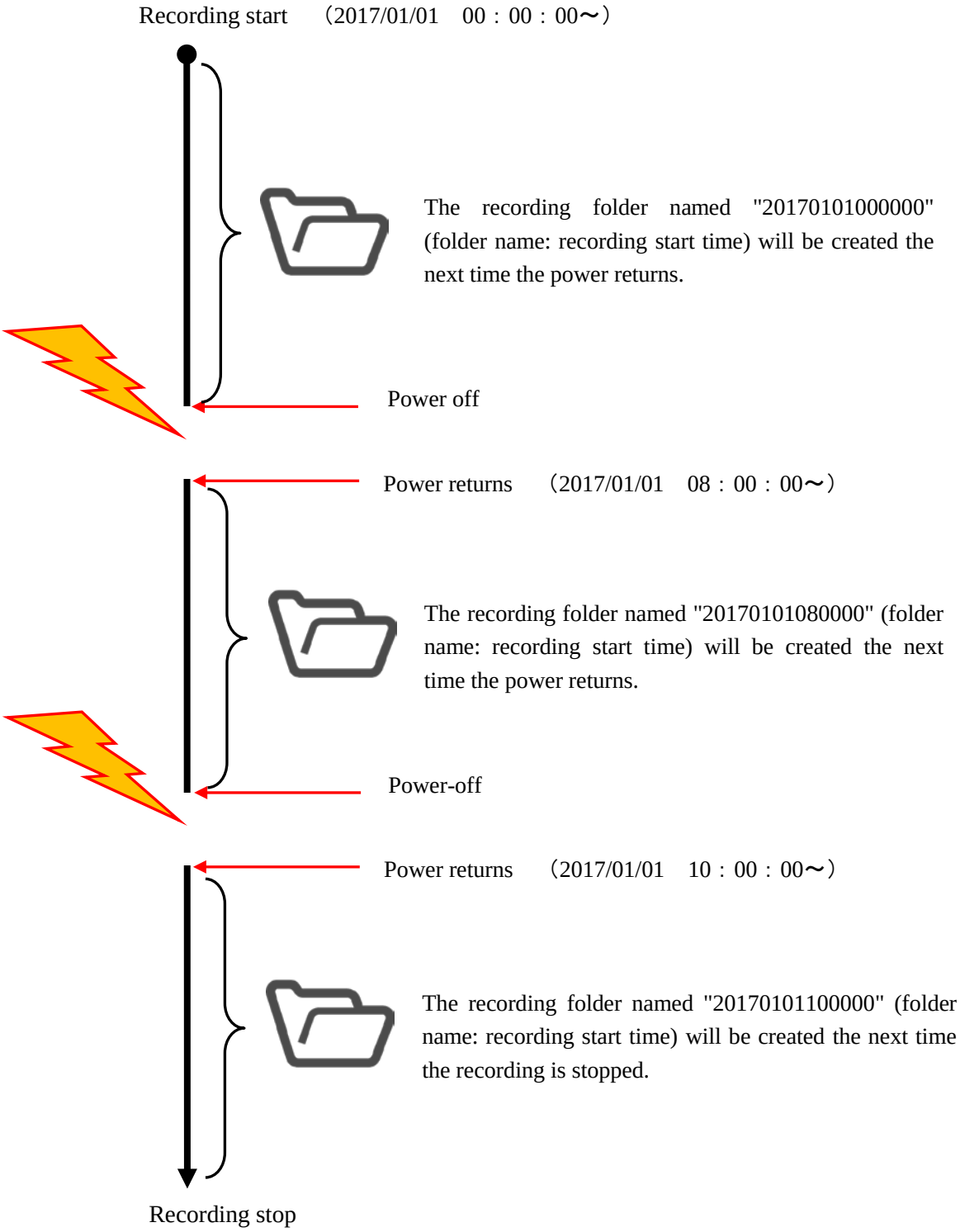
[Caution]

- If the overwrite function is OFF and the SD card is not inserted, there is a possibility that recording may be stopped due to insufficient free space in the internal memory. It is recommended to insert the SD card and record it before the SD card has insufficient free space.
- If SD card capacity display became 10% or less, please perform operation for transferring recorded data. There is a function(internal special relay) to perform DO output when SD card capacity display became 10% or less. For internal special relay, refer to Section 7.27.

5.4 Recording operation at power failure

If the power is turned off during recording, recording will start again the next time the power returns.
The recording operation at power failure shown below.

Example：When power is turned off two times from the start of recording to the end of recording
(Recording cycle：1sec,File recording cycle：1 hour)
Three recorded data will be created. (Recording start to Power-off, Power returns to Power-off, Power returns to Recording stop)

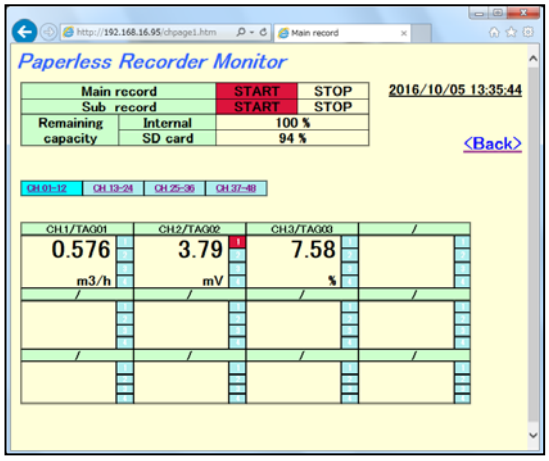


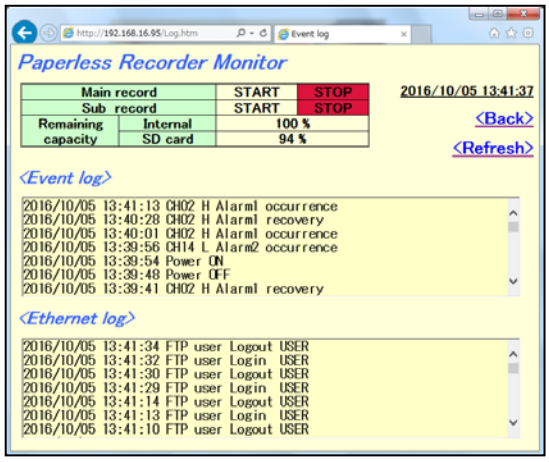
5.5 Web browser function

Simple monitoring using a web browser is possible.
The items that can be monitored are as follows.

1 Recording status, memory information
2 Measured value (only measured value display, no trend information)
3 event, communication log

Data Viewer (provided PC software) enables advanced monitoring (Realtime Trend) that can start / stop trend display and recording. For Data Viewer, refer to the Data Viewer instruction manual.





How to use:

1. Set the IP address of the main unit.

   Operate the screen in the order of the "MENU" button → "System" → "Comm." → "Ethernet 1" and set the IP address. After setting, turn off the power and turn on again.

2. Execute Web browser function on PC.

   Please start any web browser on your PC.

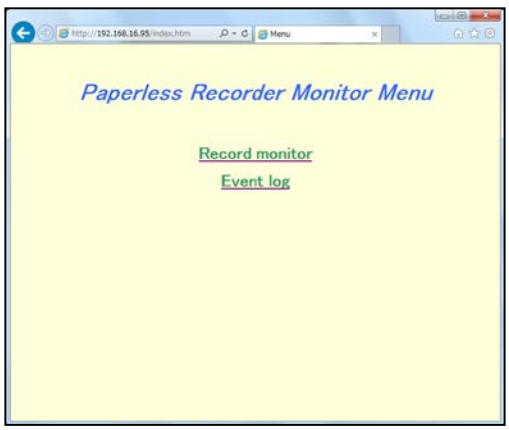
   (Please confirm with the network administrator about the network of PC and the main body.)

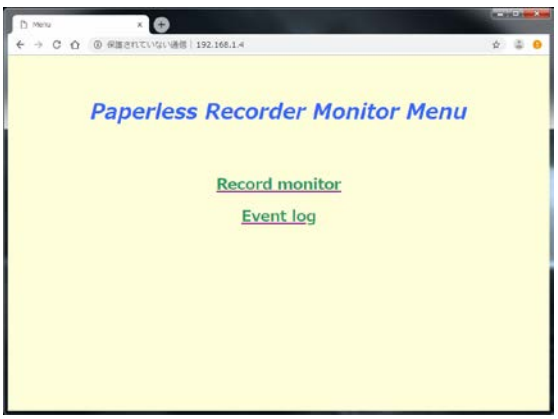
   The following shows the monitoring method when the IP address set on the main unit is "192.168.16.95".

   For Internet Explorer: Enter "http://192.168.16.95/index.htm" in the URL input field.

   For Google Chrome: Enter "192.168.16.15" in the URL input field.

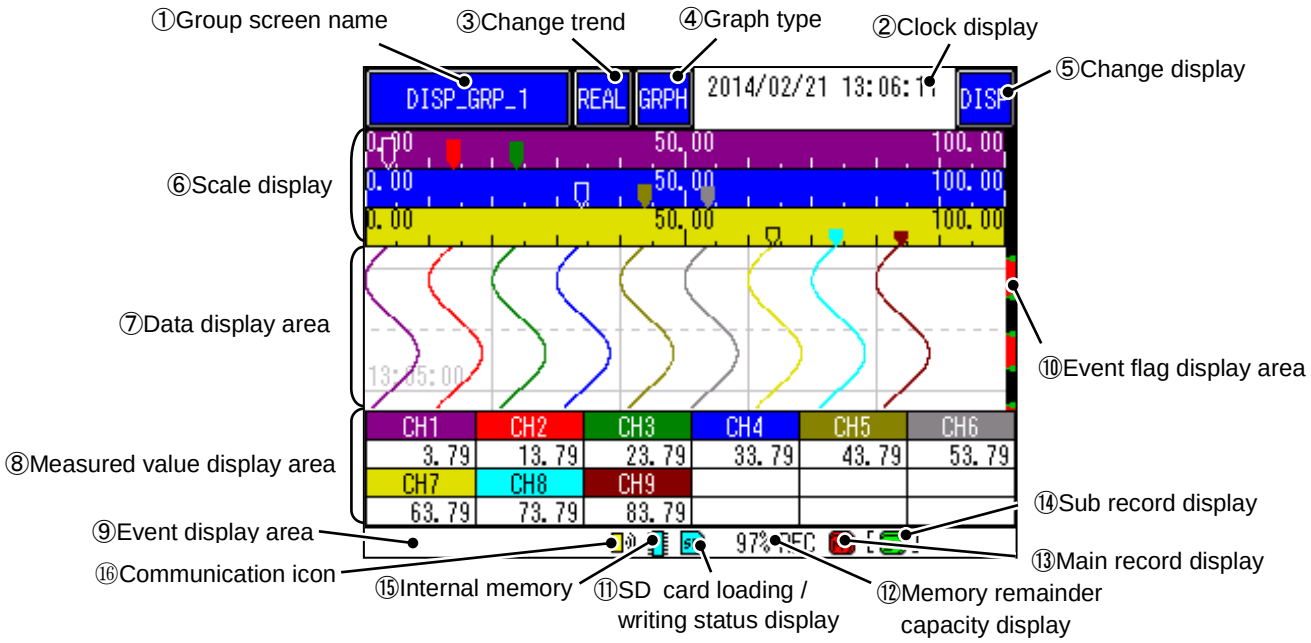
   If the network is properly connected, the monitoring top screen as shown below will be displayed.





6. DISPLAY FUNCTION

6.1 Basic composition of data display screen



① Group screen name

Display the screen name (“Display Name”) that was set arbitrarily. The group screen can be changed by touching.

② Clock display

Upper stage：Displays currently date and time.

Lower stage：Displays date and time in cursor area, when Historical trend display.

When the progress time display is set "ON", and displayed a Realtime trend, progress time is displayed.

(Refer to Section 7.25 for progress time. (It supports since recorder version 1.30.))

③ Change trend

The type of trend display can be changed by touching.

The name corresponding to the trend screen displayed now is displayed.

REAL：Real time trend display

HIST：Historical trend display

④ Graph type

The type of graph display can be changed by touching.

(“Horizontal trend display” ⇒ “Vertical trend display” ⇒ “Bar graph display” ⇒ “Digital display” ⇒ “Event log” ⇒ “Horizontal trend display”…)

⑤ Change display

The displaying method of screen can be changed by touching.

(“Display all ON” ⇒ “⑥Scale display OFF” ⇒ “⑥Scale display ON”, “⑧Measured value display area OFF” ⇒ “⑥Scale plate OFF”, “⑧Measured value display area OFF” ⇒ “Display all ON” …)

⑥ Scale display

Display scale on the “⑦Data display area”. The scale width and display color corresponding to the channel is changed, when each channel point of “⑧Measured value display area” is touched.

⑦ Data display area

Allow the Real time trend display, Historical trend display, Bar graph display, Digital display and Event history / communication history display to be displayed. (Refer to Section 6.2 to 6.6)

Display measured data at the position of the cursor when Historical trend display.

⑧ Measured value display area

Display the currently measured value. When abnormally occurred, it becomes the following display.

Alarm occurred：red display

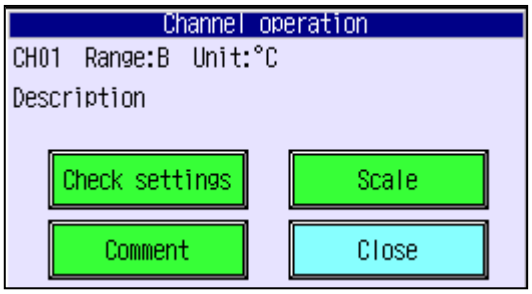
Burnout：B.OUT

Input circuit fault：Fault

When you display Real time trend or Historical trend, the trend corresponding to the channel is displayed by touching channel in the heavy line for 3 second, and displays the currently setting unit on the channel display area.

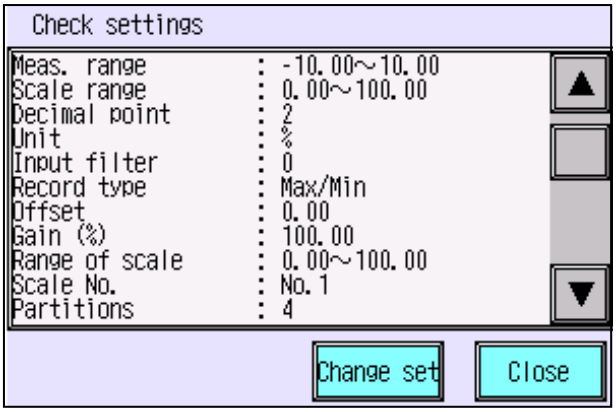
The display color of "⑥Scale display" and the scale width are changed to corresponding what.

When keeps touching channel part for 2 second, the figure below is displayed, and the content of the channel set can be confirmed.



Check settings : The setting status can be verified. And, a set item that becomes an object is selected touching, and Change set key can be moved directly to the selected set screen by touching.

Change set key can only be displayed when the "Mode" is "Advanced". Refer to Section 7.1 for Advanced mode.



Comment : Arbitrary comments can be registered on a trend. (It supports since recorder version 1.20.)
(A comment can be set up only on a historical-trend screen. A comment is not directly displayed on a trend screen. Refer to Section 6.8 for comment function.)

Scale : The scale can temporarily be changed.
※ It will be reset if a power source is turned OFF.

⑨ Event display area
Event information such as beginning to record is displayed.

⑩ Event flag display area
The time when warning has been generated belt is red; the time when the event of the message etc. has been generated belt is displayed in green.

⑪ SD card loading / writing status display
It indicates the loading state of the SD card.
Gray display : shows the state where the SD card is not loaded in the slot.
When the SD card becomes removable even if the SD card is installed, it becomes a gray display.
Aqua display : shows the state where the SD card is loaded in the slot.
Red display : shows the state where the SD card is written.

⑫ Memory remainder capacity display
When the SD card is installed, the remainder capacity for which the SD card can be used is displayed by percent.
When the SD card is non-installed, the remainder capacity for which an internal memory can be used is displayed by percent.

⑬ Main record display
It indicates the state of the main record.
Green display : shows the state where the main record is not started.
Red display : shows the state where the main record is started.

⑭ Sub record display
It indicates the state of the sub record.
Green display : shows the state where the sub record is not started.
Red display : shows the state where the sub record is started.

⑮ Internal memory
It indicates the state of the internal memory.
Aqua display : shows the state where the internal memory is not access.
Red display : shows the state where the internal memory is access.

⑯ Communication icon
Displayed when using Modbus master read or write, the current communication status is displayed.
Green: Communication is normally performed with all slave devices.
Yellow: The status of communication with the target communication ID device is being confirmed.
Red: A communication error has occurred and communication with any or all slave devices is not being performed.

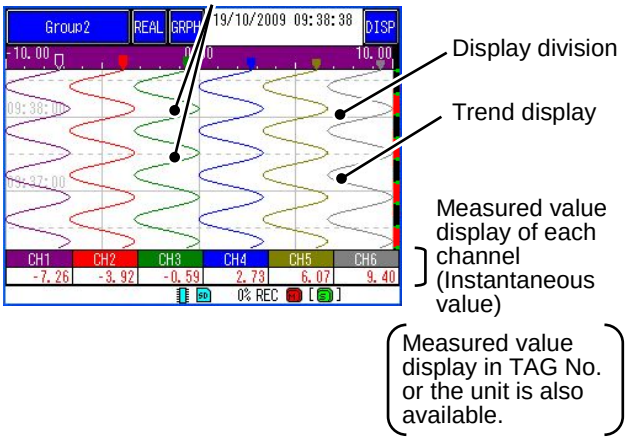
6.2 Real time trend display of measured data

[Explanation]

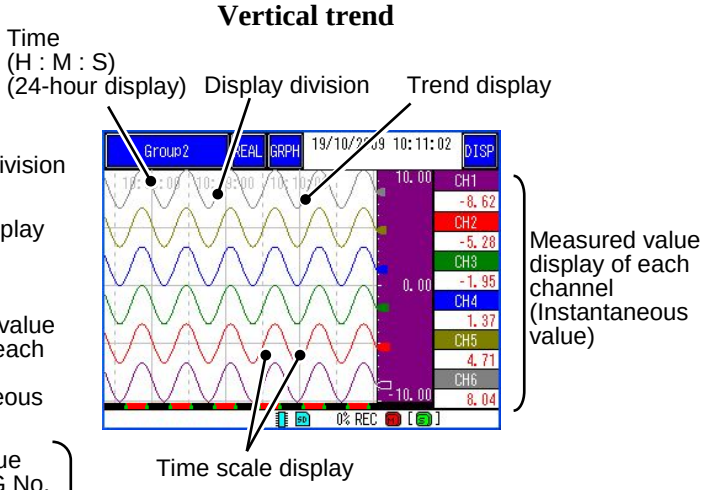
The measured data can be display in graph. The vertical or horizontal trend directions can be selected by touching to GRPH key.

The refreshment cycles of graph synchronizes record cycles.

Horizontal trend



Vertical trend



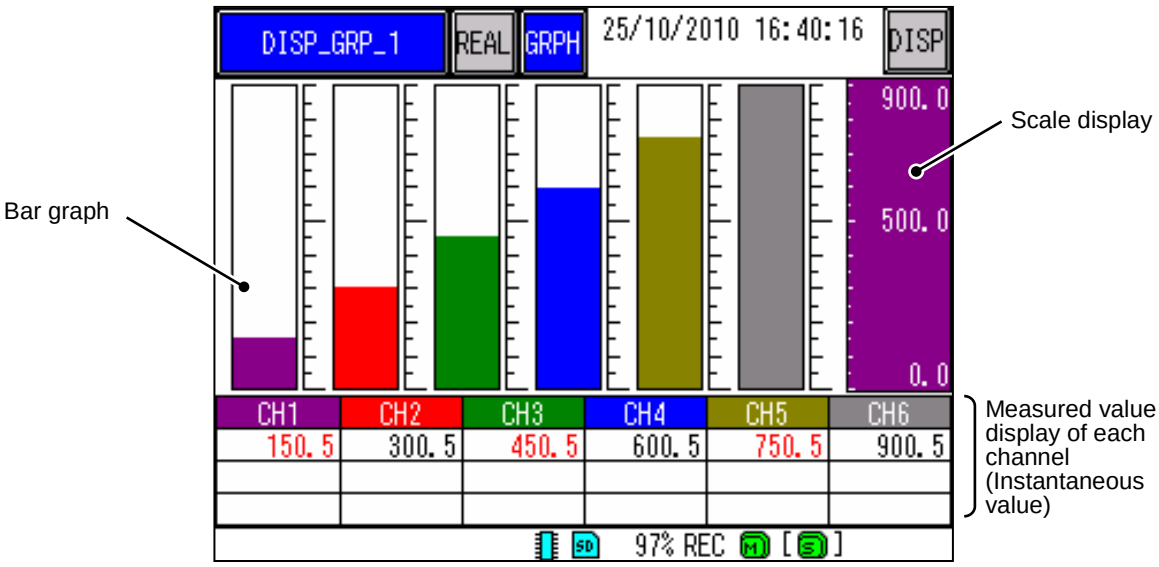
6.3 Display of measured data in bar graphs

[Explanation]

The measured data can be display in bar graph.

[Operation]

The measured data can be changed bar graph by touching the GRPH key several times.



The number of a bar graph changes with the CH number chosen by the group channel.

(Refer to Section 7.16 for Group channel.)

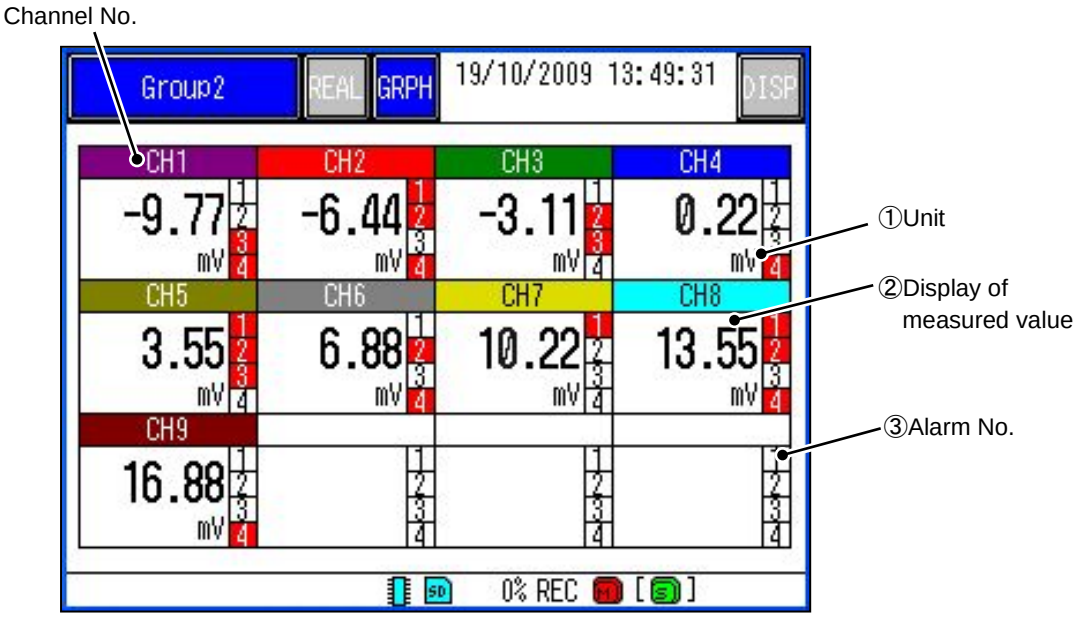
6.4 Digital display of measured data

[Explanation]

The measured data can be display in digital graph.

[Operation]

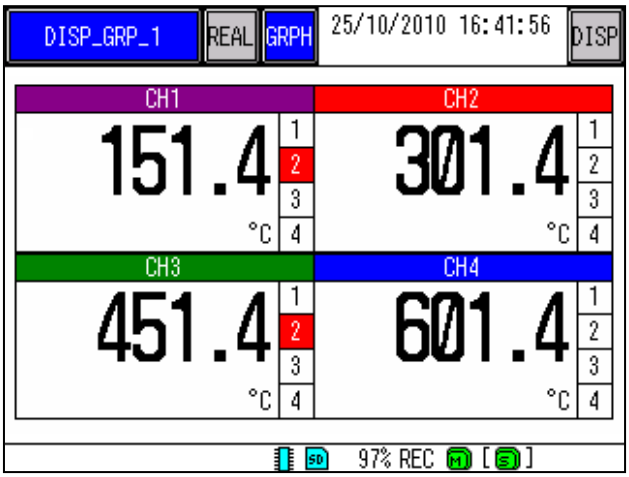
The measured data can be changed digital graph by touching the GRPH key several times.



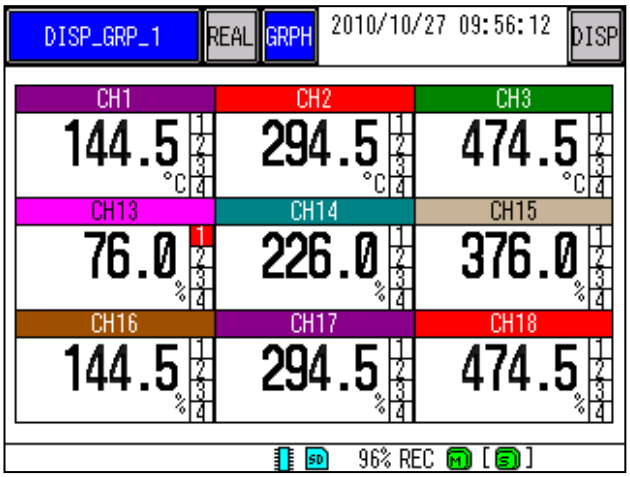
① Unit of each channel is displayed.
② Measured values of each channel are displayed in digital value.
③ When an alarm occurs, Alarm No. at the channel is displayed in red.

A digital display area changes with the CH number chosen by the group channel.
(Refer to Section 7.16 for Group channel.)

[4CH Display]



[9CH Display]



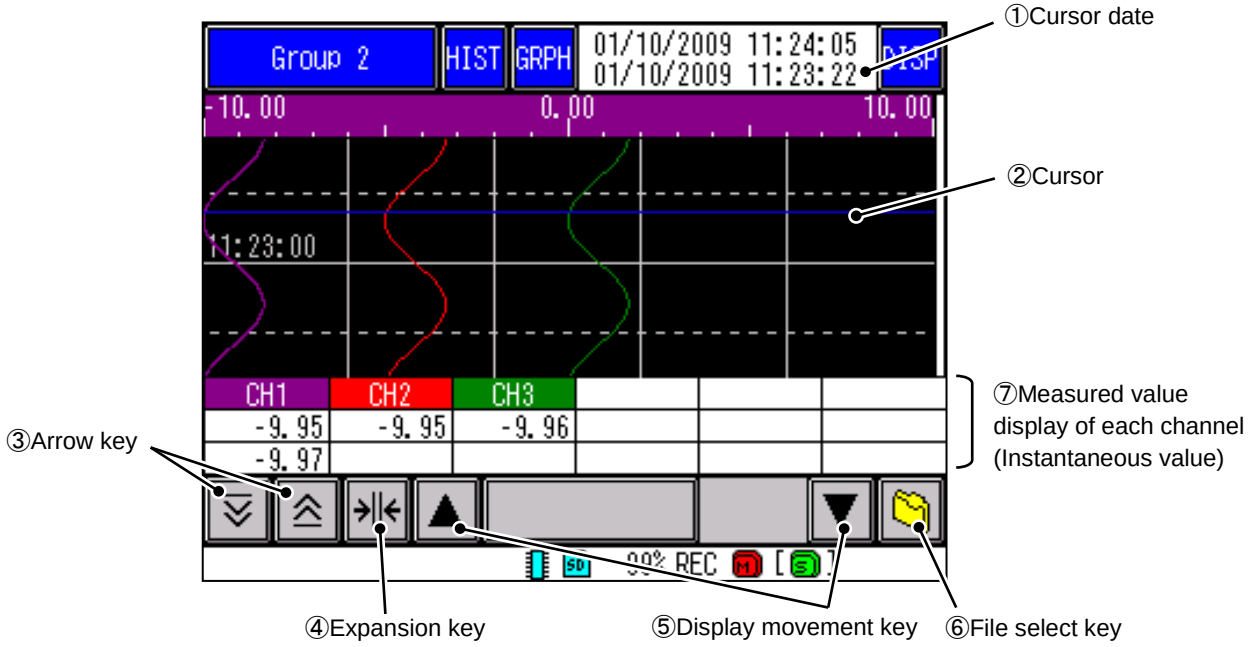
6.5 Historical trend display

[Explanation]

The past data of currently recoding data or the data saved in the past can be read and displayed.

[Operation]

Press the REAL key on the Real time trend display, and the following display appears.



① Cursor date

The date that the "②cursor" indicates is displayed. (Upper stage is currently date)

"①Cursor date" when it touches, and the date is specified, "②Cursor" is moved to an arbitrary position.

② Cursor

This date of line for measured value is displayed on the "⑦Measured value display of each channel".

③ Arrow key

The position of cursor can be moved. The cursor position moves in the graph part even if touching.

④ Expansion key

Select the minimum and the maximum values, and expands graph display area on the range.

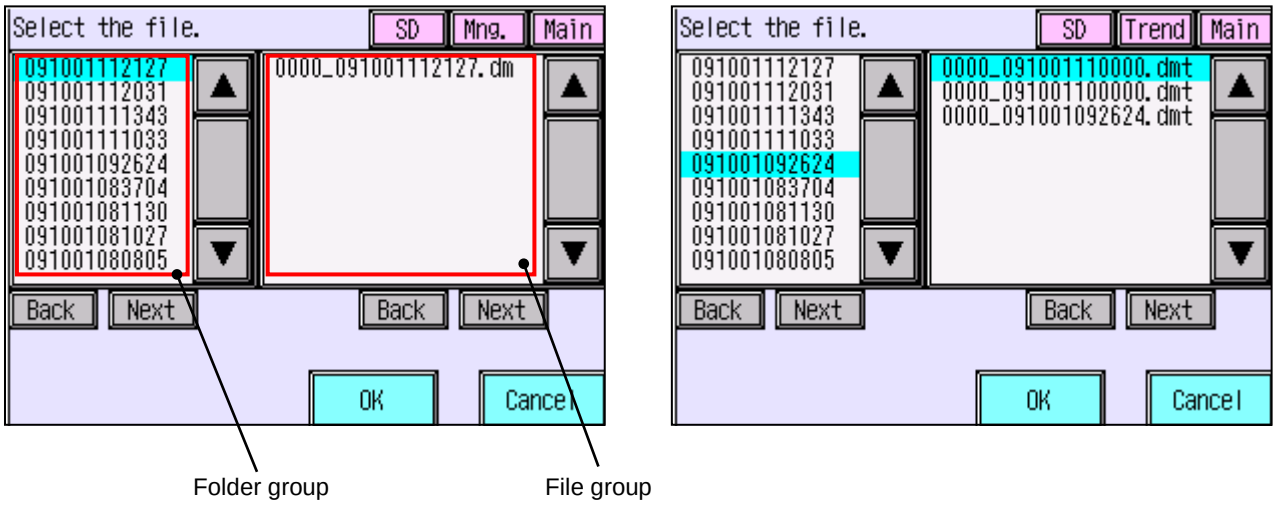
The standard size can be returned by touching again.

⑤ Display movement key

The graph display area can be moved. When keeps touching "⑤Display movement key" for long, a screen is scrolled at high speed. (It supports since recorder version 1.30.)

⑥ File select key

The data saved in the past can be read and displayed.



When you select an arbitrary folder from among the “Folder group”, the file data included in the folder is displayed in the file group. When select an arbitrary file, and touching the OK key, on the historical trend screen, the data preserved in the past is read and displayed.

The SD key when touching, the SD card can be switched to an internal memory.

The Mng. key when touching, the display of administrative file (.dm) and trend file (.dmt) can be switched.

The Main key when touching, the Main record file can be switched to the display of the Sub record file.

(Refer to Section 10.17 for administrative file and trend file.)

⑦ Measured value display of each channel

“①Cursor date” for measured value is displayed.

When you make the item of the record type “Max /Min”, the display becomes 2 steps.

Upper step：The Maximum value

Lower step：The Minimum value

(Refer to Section 7.11 for record type.)

The following items are displayed on the historical trend display based not on the setting of the past recording but on the currently selected values.

- Trend direction
- Number of screen partition
- Trend scale display
- Color bar display selection

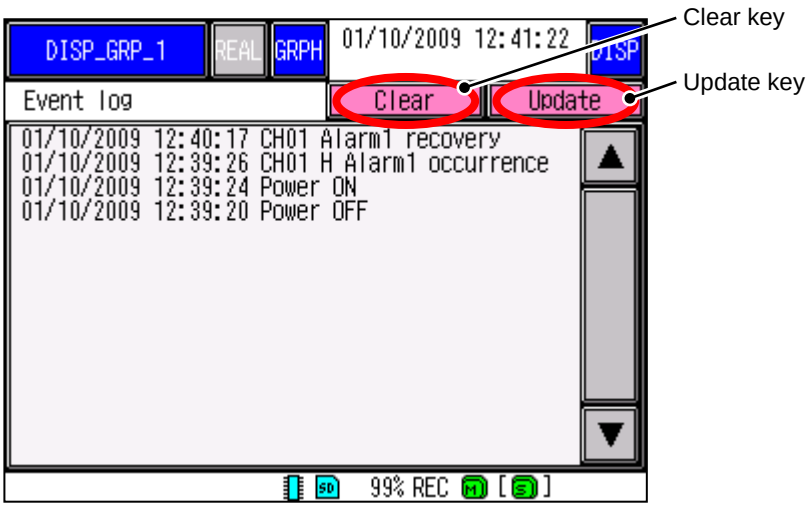
6.6 Event history / communication history display

[Explanation]

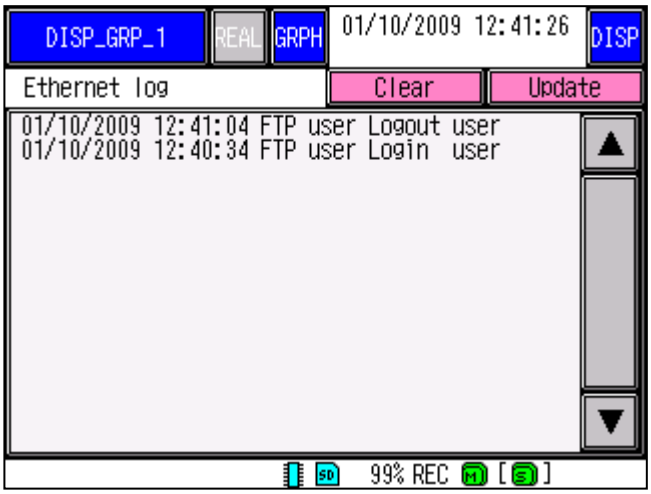
When a specific event is generated in the data recording now, it is possible to make a mark. The history of LAN communication is preserved.

[Operation]

The event history display can be displayed by touching the GRPH key several times. And, the screen can be changed communication history display by touching the DISP key several times.
Clear key when touching, the vita information can be cleared. The Update key when touching, it is updated to the latest vita information.



It is possible to switch to the communication history display with the DISP key.



6.7 Security log display

[Explanation]

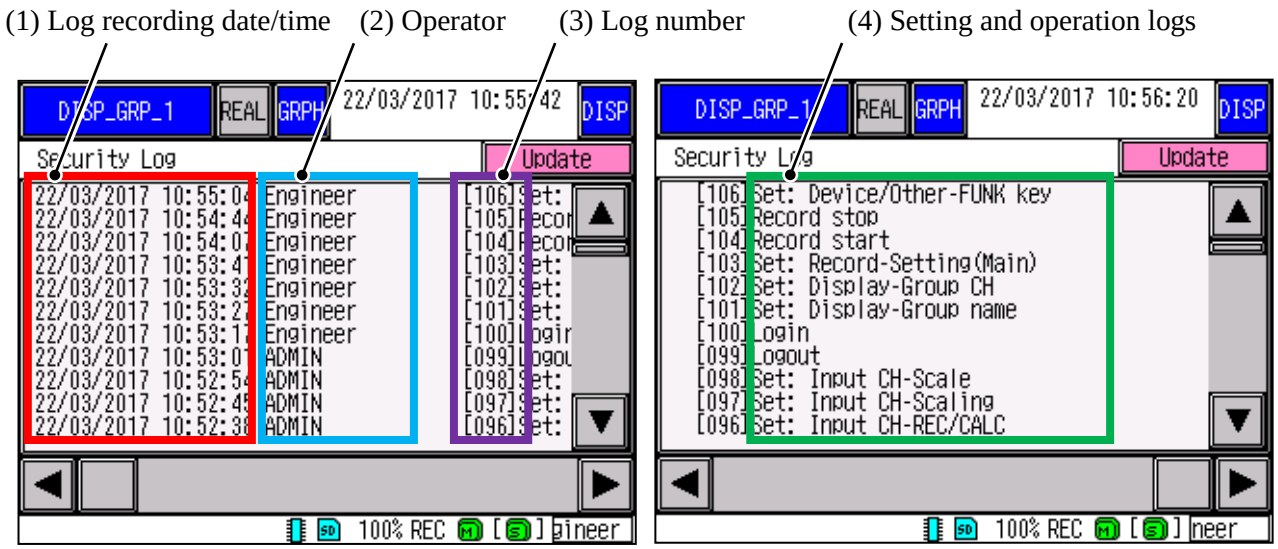
This section describes how to display the logs for each setting or operation. You can record up to 1,000 user operations such as modification of setting values or start/stop of recording as timestamped logs. When the number of log records exceeds 1,000, the oldest log record is overwritten and updated. Note that security logs cannot be deleted.

When you change a setting value, the parameter file immediately after change is saved under the file name synchronized with the log number. The security log and parameter log can be output to the SD card. For details, refer to Section 8.6.

(It supports since recorder version 2.00.)

[Operation]

Touch the GRPH key on the real-time trend screen multiple times and touch the DISP key on the event record screen several times. Touch the Update key to refresh the display with the latest record information. You can check the whole log by using the vertical and horizontal scroll bars.



(1) Log recording date/time

Displays the date/time when the setting or operation is performed.

(2) Operator

Displays the account name used to perform the setting or operation.

(3) Log number

Displays the number for each setting or operation log ([000] to [999]).

The parameter log file corresponding to the log number is generated during setting.

For details about the parameter log file, refer to Section 10.19

(4) Setting and operation logs

Displays the performed setting or operation.

For the list of security logs, refer to Section 10.20.

6.8 Comment list display

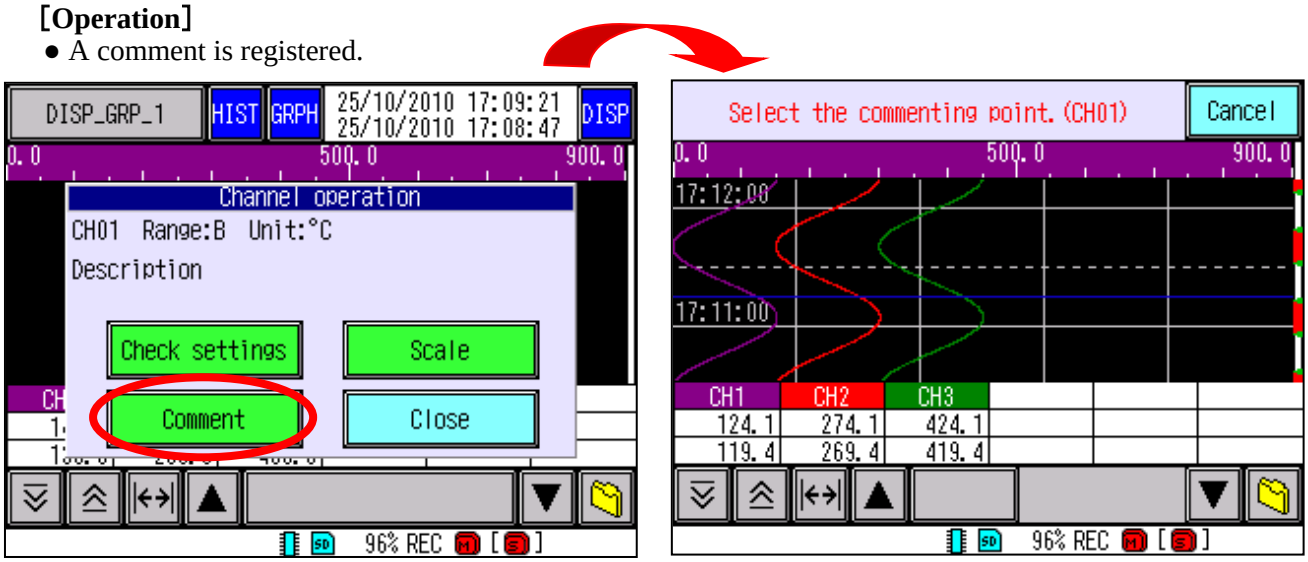
[Explanation]

Arbitrary comments are registered to a trend, and it can jump to the time which registered the comment from the comment list screen. (It supports since recorder version 1.20.)

※ A comment can be registered only on a historical-trend screen. A comment is not directly displayed on a trend screen.
Moreover, a comment cannot be registered to the old record data (before a main version 1.13).

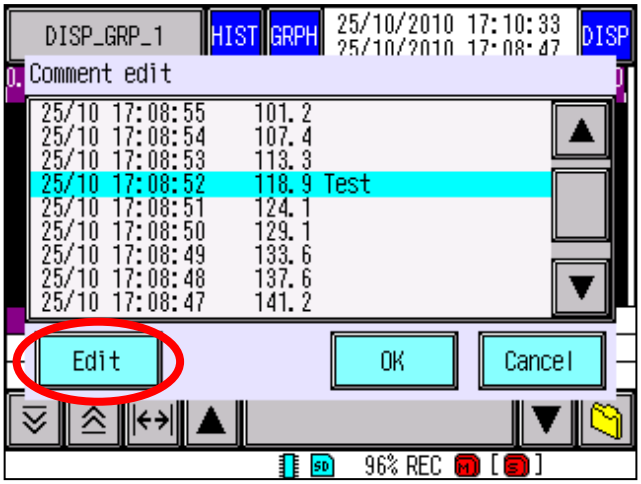
[Operation]

● A comment is registered.



If it continues touching a channel display 2 seconds or more, a channel operation screen (above figure left side) will be displayed. Next, a Comment key is touched.
(Refer to Section 6.1 for channel operation screen)

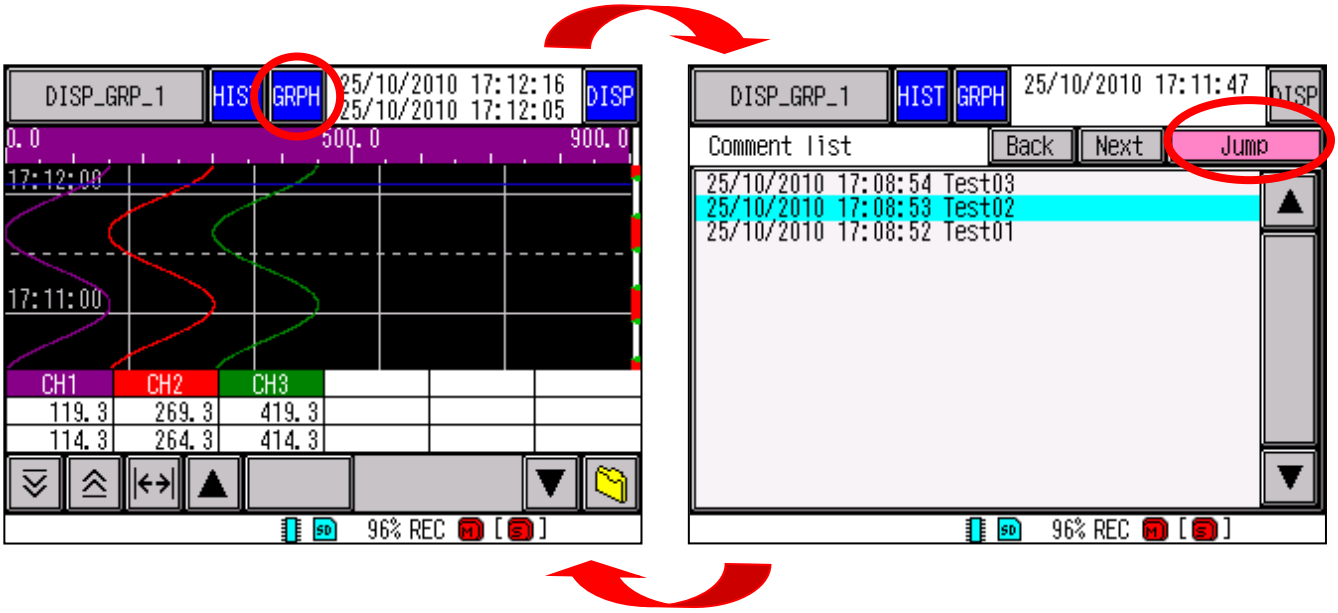
A position to input a comment into is touched in a comment point selection screen (above figure right side).



The Edit key of a "Comment edit" display (above figure) is chosen. And arbitrary comments are inputted from a "Character entry screen".
(A comment is inputted into a light-blue position. The position which inputs a comment can be changed by touching a screen. Refer to Section 7.4 for "Character entry screen".)

Comment that inputted can register by the OK key. Moreover, if a Cancel key is touched, it will return to a historical-trend screen.

● A comment list is referred to, and it jumps to a comment point.



If the GRPH key of a historical-trend screen is touched, it will move to a comment list screen.
The comment displayed on the comment list screen is touched and chosen, and cursor is moved to a comment point by touching a Jump key. (The selected item is displayed at the light-blue.)

※ "Event summary" of Data Viewer can also refer a comment.
(Refer to Section 3.3 of the “DATA VIEWER INSTRUCTION MANUAL” (WXPVM70mnAR101E) for Event summary.)

6.9 Production information display

[Explanation]

Production information can be displayed in the trend display.

The following production information is displayed on the vertical trend and horizontal trend.

(It supports since recorder version 2.00.)

[Operation]

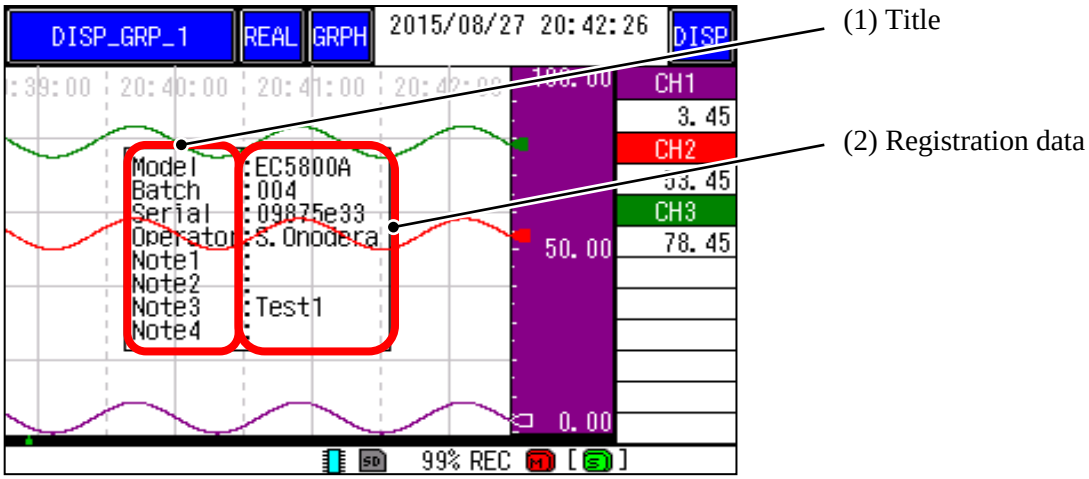
- Initial setting

1. Set “Products display” ON in the production information display setting. (For production information display, refer to Section 7.26.)
2. Set the FUNC key setting to "Product Regist.". (For the setting of FUNC key, refer to Section 8.18.)

- Production information registration

On the trend display screen, press the FUNC key. (For production information registration, refer to Section 8.18.)

* Registration of production information using the network is also possible. For details, refer to the communication instruction manual.



(1) Title

The title for each information No. of the registered production information is displayed.

(2) Registration data

Registered data will be displayed by the production information registration operation.

Registered data is output in the form of "comment" when recording data is output.

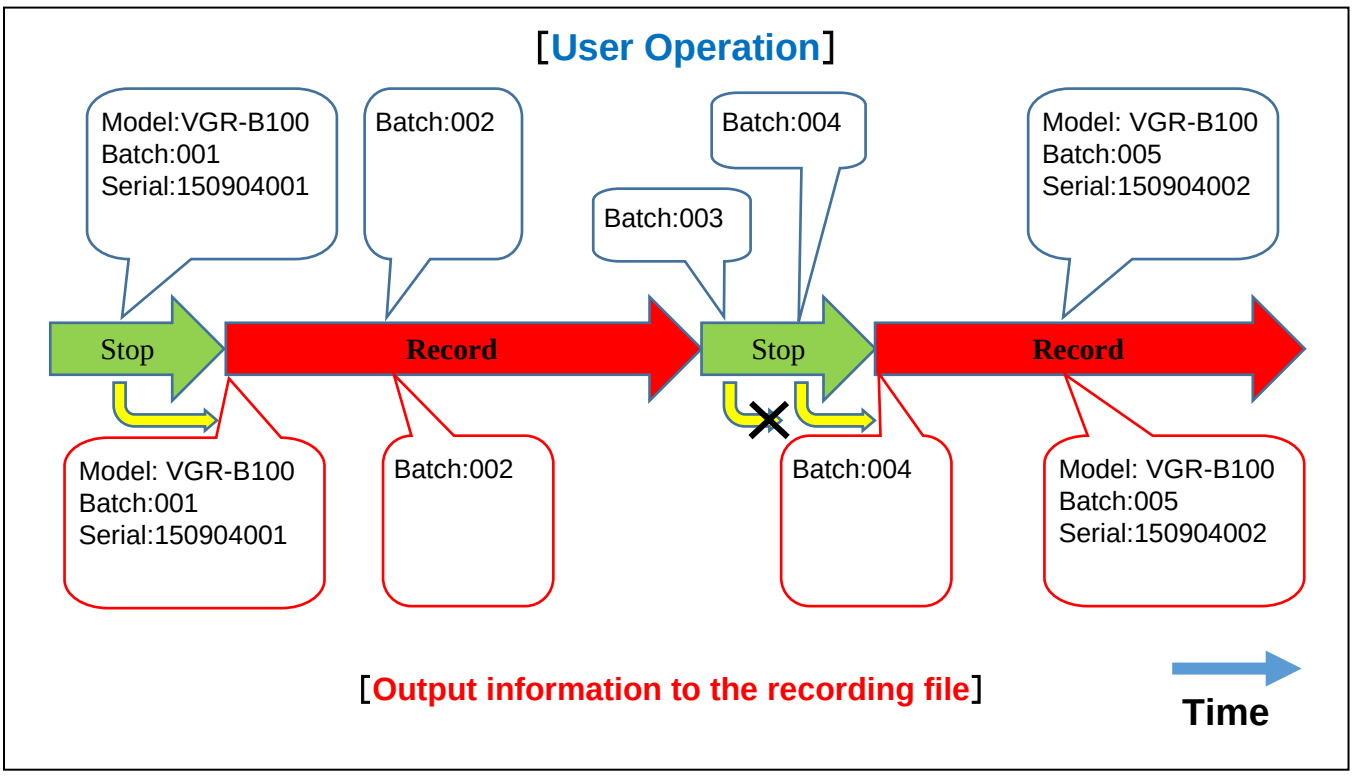
The recorded production information can be confirmed in the event summary of the Data Viewer.

[Caution]

In the historical trend, production information is displayed, but the current production information is displayed.

Past production information is not displayed. When reading the measurement file, the production information will be hidden.

[Relationship between user operation and file registration]



6.10 Communication status

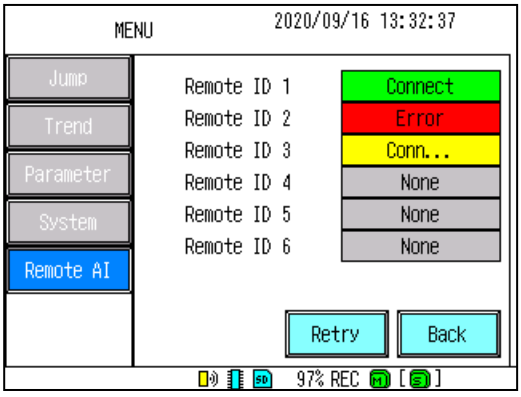
[Explanation]

Section 8.13 Displayed when "Comm. Type" in "Setting Modbus 2 (communication type)" is set to "Modbus TCP + RTU" and “Master / Slave” is set to "Master (Rem. AI)" and "Master (General)". You can check the status of communication between this unit and each of the slave units. This page allows you to check the status of communication between this unit and each slave device. For details on Master (Rem. AI) Status, see section 8.35, and for details on Master (General) Status, see sections 8.32 to 8.34.

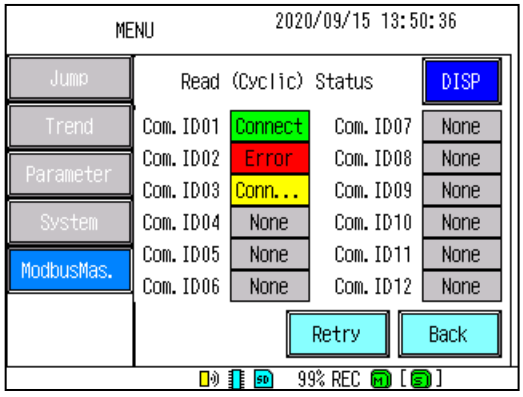
[Operation]

- For Master (Rem. AI) : MENU button > Remote AI
- For Master (General) : MENU button > ModbusMas.

Remote AI
communication status confirmation screen



Modbus Master
communication status confirmation screen



7. SETTING AND CHECKING PARAMETERS

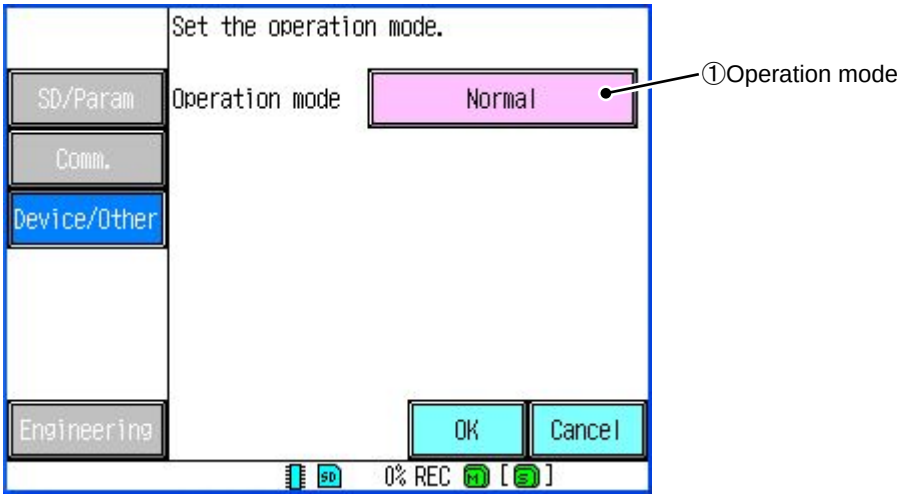
7.1 Operational mode

[Explanation]

This Paperless recorder can do a more detailed setting by setting the "Operation mode" to "Advanced mode" on the parameter setting screen and the system setting screen.

[Operation]

Touch the MENU button ⇒ System key ⇒Device/Other key ⇒Mode key



① Operation mode

Select the "Operation mode" (Initialization is "Normal".)

Normal : Only a minimum set item is displayed in "Parameter" and "System". And, the item of "Wizard" is displayed in "Others" of "Parameter".
(Refer to Section 7.27 for "Wizard".)

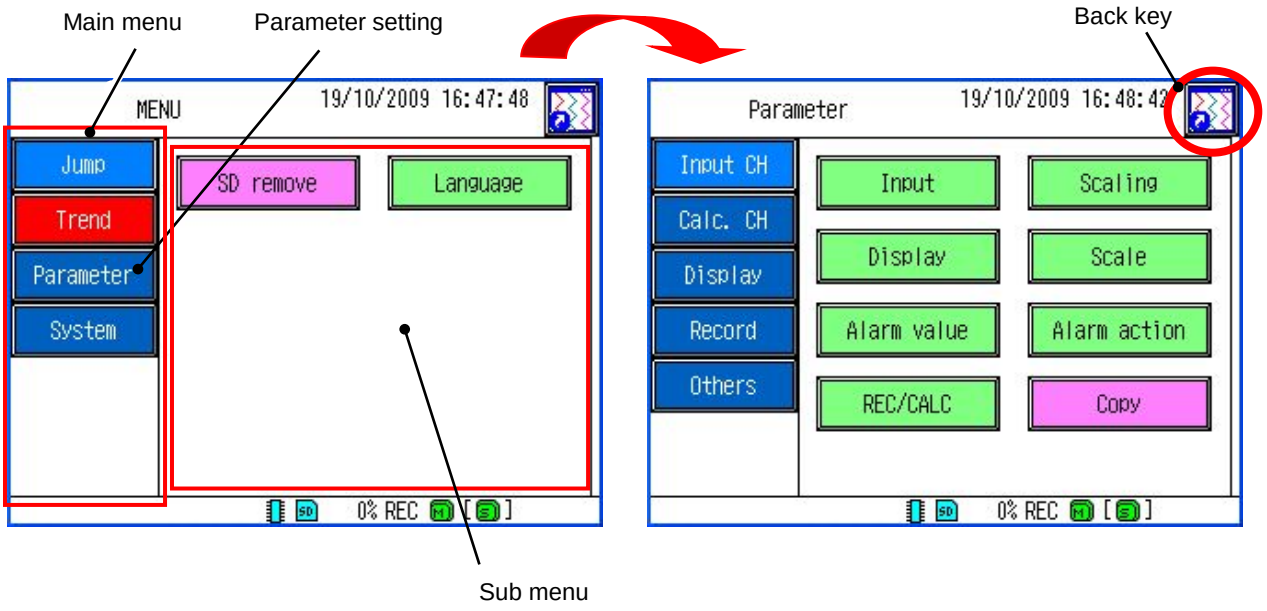
Advanced : All set items are displayed in "Parameter" and "System".

7.2 Setting and checking

① Main menu

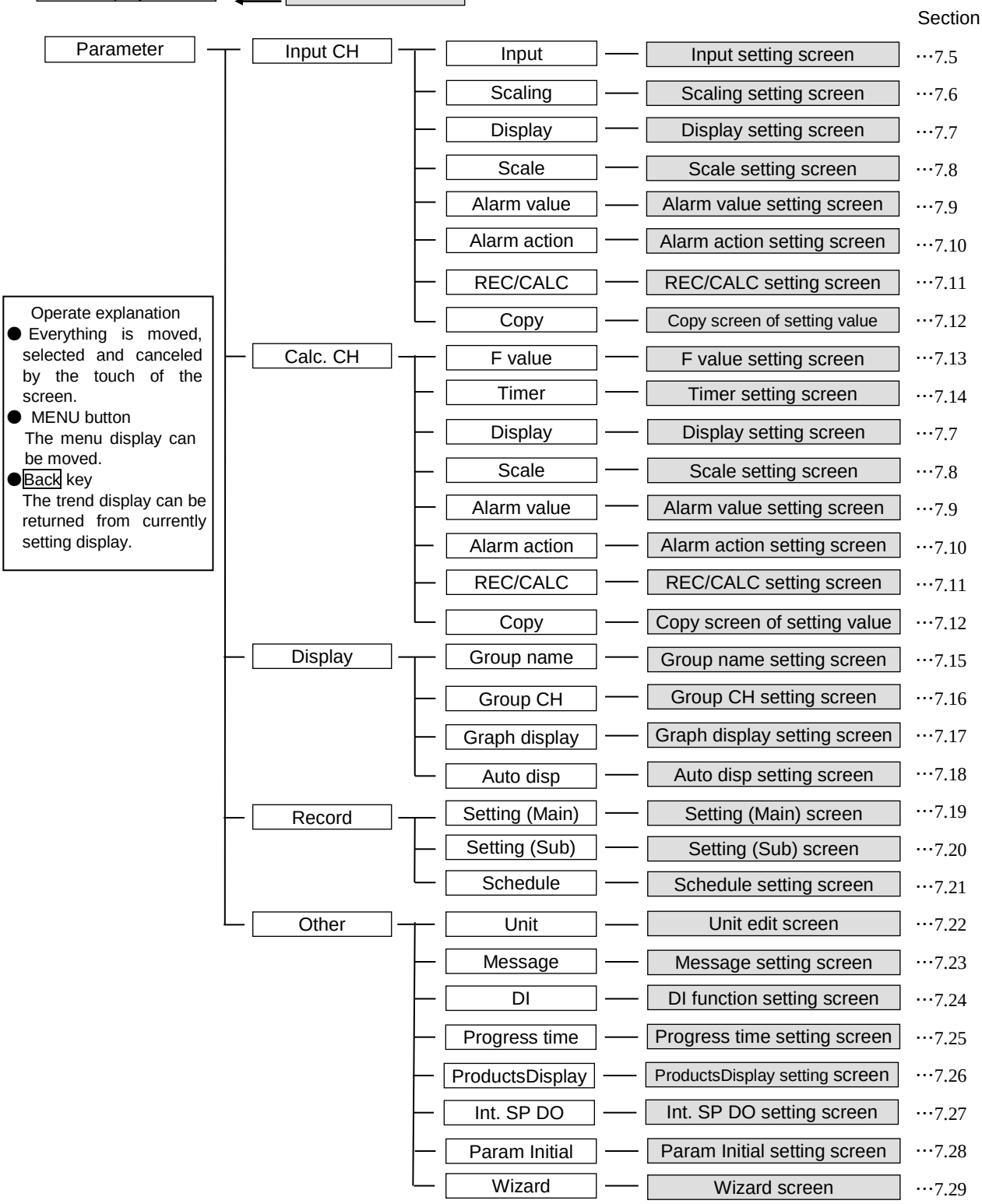
The menu display can be displayed by pressing MENU button. The parameter setting display can be displayed by select “Parameter” touching.

Back key when touching, it returns to the trend screen.



7.3 Outline of parameter setting procedure

Data display screen ⇄ MENU ⇄ Menu screen

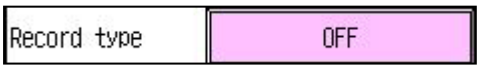


7.4 Basic operation of setting screens

［Explanation］

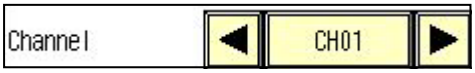
The basic operation of the setting screens is classified in the following methods. To move a set item, the corresponding item is touched.

● Item into which set content whenever touching changes

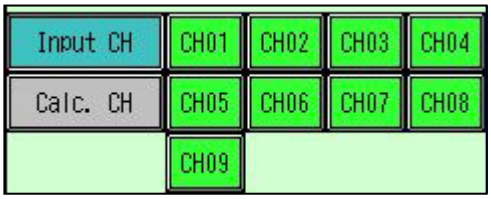


In this case, OFF key when touching, it changes with Instant value key ⇒ Average key ⇒ Max/Min key ⇒ OFF key….
Please display the content to be set by touch the key.

● When selecting contents to set by the menu.



In this case, the channel select display can be changed by selects CH01 key touching. It touches the channel to be selected.



When ◀, ▶ key touching, channel No. can be changed directly without changing into the channel selection screen.

When you can select two or more items, selected items become the luminous colors.

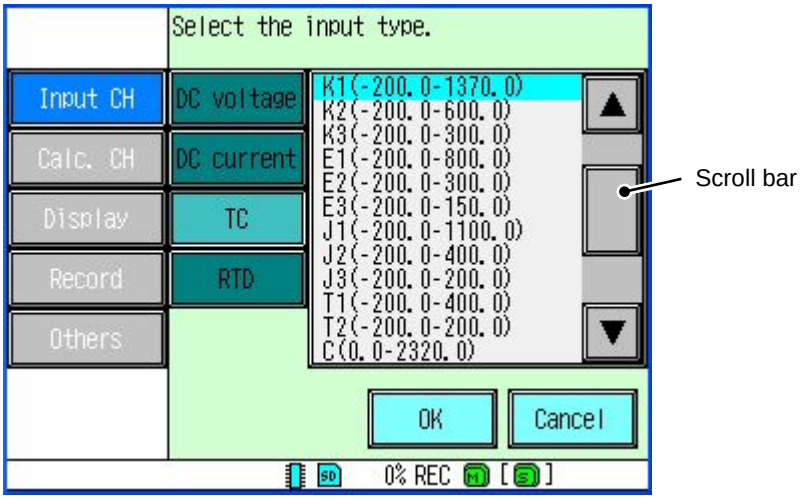
● When selecting contents to set from list.

The item displayed in the list is selected touching.

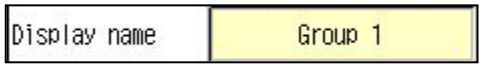
The scroll bar is displayed when there is a selection item that exceeds the size of the screen.

The display can be changed by touching arrow key (▲, ▼) or sliding scroll bar.

When the item is selected, OK key is decided touching.



● When setting contents by entering characters or numerical value.



In this case, touch the Group 1 key to display the character entry display.

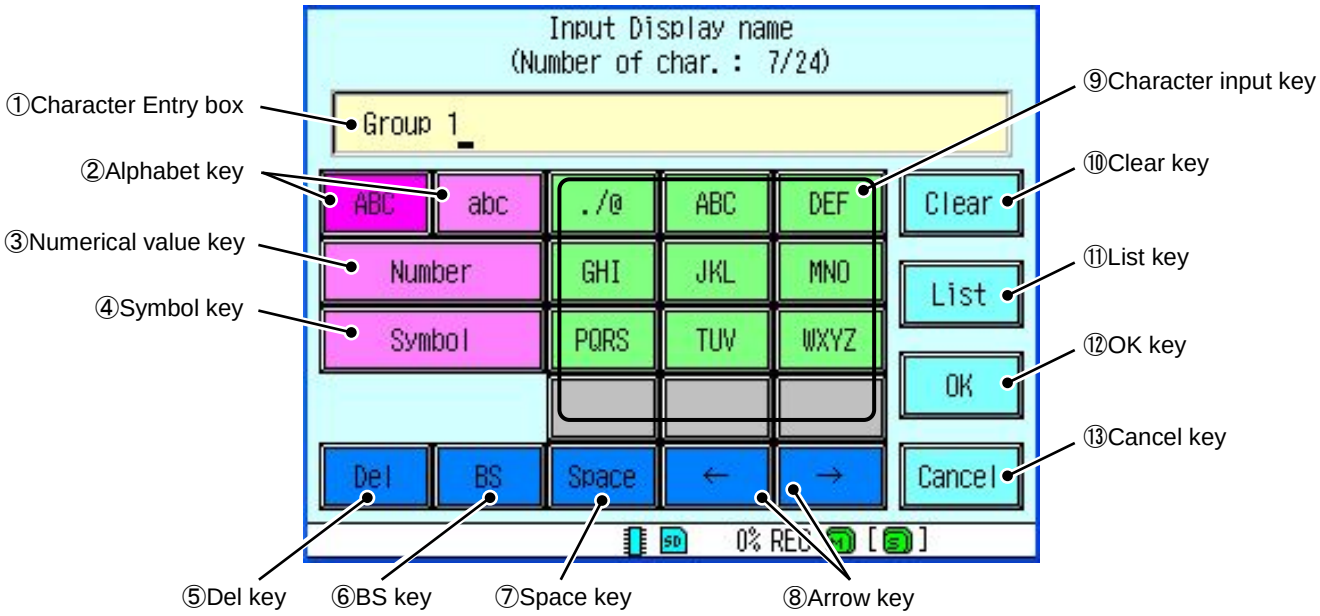
Touch the keys to enter a character one by one, and touch the OK key after entry.

The some characters corresponding to the one key. The character can be changed by touching the same key several times.

Example : In this case, ABC key when touching, it changes with “A” ⇒ “B” ⇒ “C” ⇒ “A” …

［Reference］

Description of Character Entry screen



① Character entry box

The input character is displayed.

By touching the [①Character entry box], an input position is arbitrarily movable.

② Alphabet key

The capital letters and small letters can be changed.

③ Numerical value key

The numerical value input can be changed.

④ Symbol key

The symbol input can be changed.

⑤ Del key

The character or numerical value of the currently cursor position can be deleted.

⑥ BS key

The character or numerical value of the currently cursor position ahead a character can be deleted, and the cursor is moved to the left.

⑦ Space key

The space character can be inputted.

⑧ Arrow key

The arrow key can be moved.

⑨ Character input key

It is a key to input the character.

In case where the character string is filled with blank, delete the blank and then enter characters. You can't enter characters without deleting blank.

The "voice sound symbol" and "semi voiced sound symbol" uses one character's worth of an area. They should advance one character with the "⑧Arrow key (→)", when you continuously input the character allocated in the same button.

⑩ Clear key

It has input character or numerical value can be all deleted.

⑪ List key

The input character can be selected from character string list or input history.

(It supports since recorder version 1.30 for input history function.)

HIST : The inputted character string is registered automatically, and can be used again.
(The history will be initialized if power is OFF.)

List : The character string registered into "String.txt" can be used.
[Char] in a text file means the number of characters which can be inputted. Moreover, [Max] means the number of the character strings which can be registered.
(A part to have exceeded is omitted and displayed.)
("String.txt" can be edited by the text editor of a personal computer.)

The "String.txt" is preserved in the "Etc" folder of the SD card.

Refer to Section 10.17 for "Etc" folder.

⑫ OK key

The input contents can be entered.

⑬ Cancel key

The input contents can be canceled.

7.5 Setting the input spec

[Explanation]

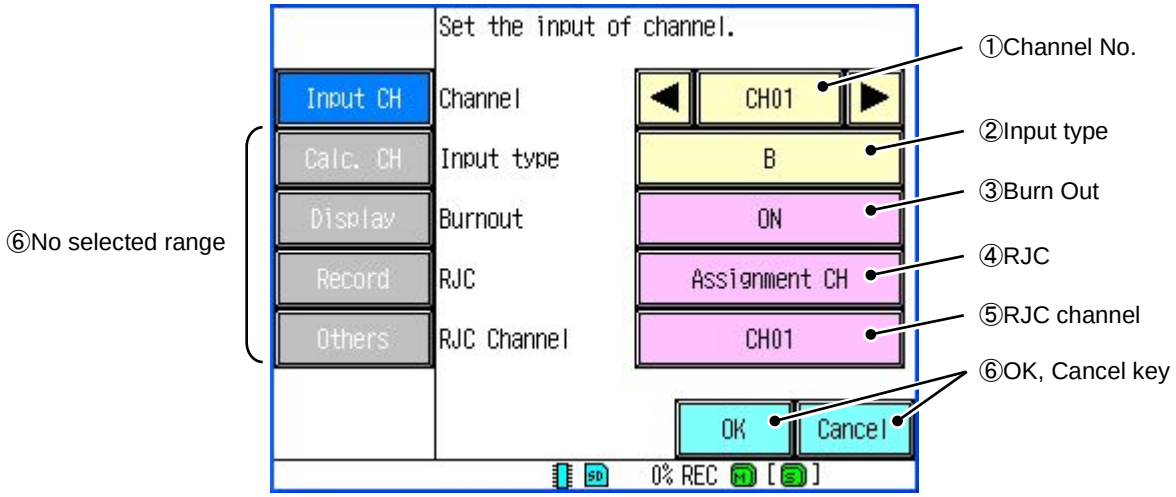
For select of the input types for each channel (thermocouple, resistance bulb and DC voltage input), and the presence of Burn Out function can be set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Input CH key ⇒ Input key on the Parameter.

The content of the display is different according to the input kind of setting.



① Channel No.

The set channel is selected. (The selection range becomes CH13 ～ CH48 in the “Calc. CH.”.)

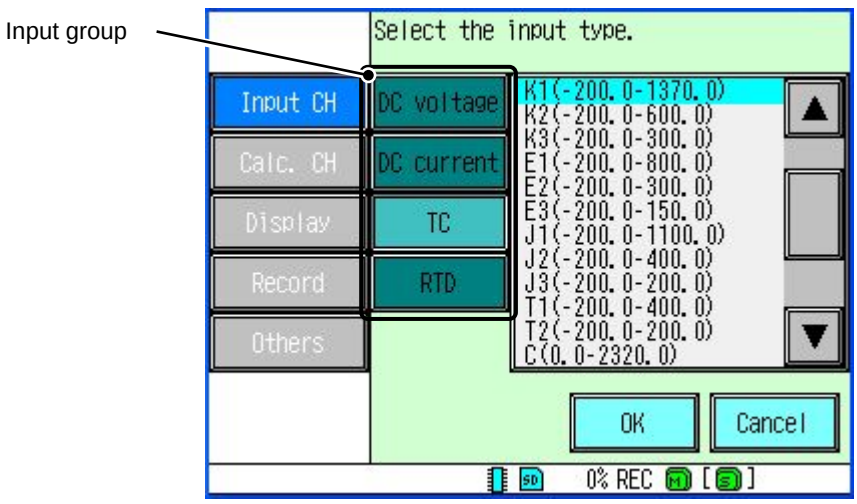
② Input type

The input type select display can be displayed by selects “②Input type” touching.

The list of input type can be displayed by touching input group. Selects the input signal touching, and sets OK key touching. (The selected item is displayed in aqua.)

The display can be changed by touching arrow key (▲, ▼) or sliding scroll bar.

Touch the Chancel key when not changing.



③ Burn Out

Setting the Burn Out function.(The record swings over to the 0% side or the 100% side)

Burn Out function can only be set when the input type is “TC” and “mV”.

④ RJC

The method of making amends for the temperature of the terminal of the thermo-couple range is selected.

Internal：It makes amends with a built-in temperature sensor.

Assignment CH：It makes amends for measurements of the specified channel as a temperature of the terminal.

OFF：It doesn't make amends for the temperature of the terminal.

⑤ RJC channel

RJC channel can only be set when the “④RJC” is “Assignment CH”. The measurement channel of a standard point of contact is specified.

⑥ OK, Cancel key

The each setting for changing contents is saved by the OK key. And, the “Parameter” can be returned not change by the Cancel key.

⑦ No selected range

The gray color is displayed that cannot be selected now. In this case, can be selected by presses OK key (or Cancel key) returning to “Parameter”.

7.6 Setting the scaling

[Explanation]

Set the “scaling” and “Square root” when the input kind is “DC voltage” or “DC current”, and set the “Measure range”, “Scale range”, “Decimal point” and “Unit”.

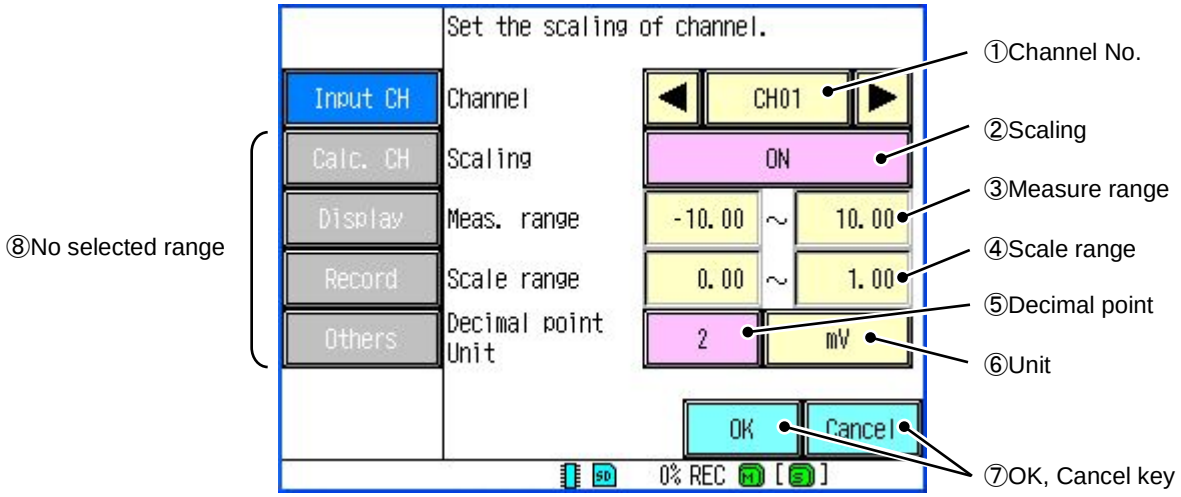
Note: Scaling can only be displayed when the input type is “DC voltage” or “DC current”.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Input CH key ⇒ Scaling key on the Parameter.

The content of the display is different according to the scaling of setting.



① Channel No.

The set channel is selected. (The selection range becomes CH13 ～ CH48 in the “Calc. CH.”.)

② Scaling

ON/OFF of “scaling function” and “Square root function” is set.

When the scaling function or the evolution operation function is turning on, the decimal point position and the unit can be set.

ON : The input of the direct voltage and the current is converted into an arbitrary physical value by using the scaling function.

OFF : The scaling function is not used. (The decimal point position and the unit are automatically set.)

Square root ON : The time base range is assumed to be 0～100%. The input value is % converted, and the value is extracting the square root operated.

When the value is a minus, the square root operated result is assumed to be 0%.

Data (0～100%) that does the square root operated is converted into measurements as “0～100%” of measurements.

The value up to 1% of measurements is connected from 0 by the straight line.

Note: In about 0 points, please note that the digital instruction value might stagger because of the scaling magnification and the display digit.

③ Measure value

This item can only be set when the “②Scaling” is “ON” or “Square root ON”.

The lower bound value (left) and the upper bound value (right) of the measure range are set.

④ Scale range

This item can only be set when the “②Scaling” is “ON” or “Square root ON”.

The lower bound value (left) and the upper bound value (right) of the scaling range to “Measure value” are set. (-32000 to 32000 digit)

⑤ Decimal point

This item can only be set when the “②Scaling” is “ON” or “Square root ON”.

The decimal point position within the range of scaling is set. A set value shows the number of decimals.

※ The decimal point position is automatically set when the “②Scaling” is “OFF”, or “Input type” is “TC”, “RTD”.

［Reference］

The value becomes "-1000.0～1000.0" when the value of scaling range is “-10000～10000”, and the decimal point is “1”.

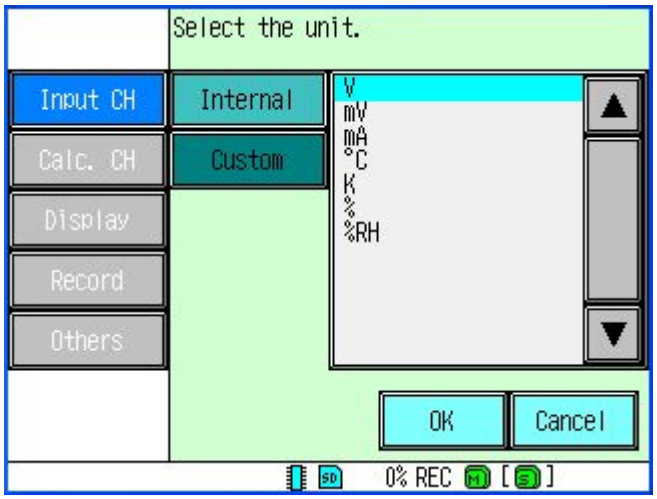
⑥ Unit

This item can only be set when the “②Scaling” is “ON” or “Square root ON”.

The unit of “DC voltage” and “DC current” is set. The set unit is displayed for 3 seconds when you touch the channel display (or, tag) in the measurement display area.

Please select an arbitrary unit from the unit selection screen (figure below), and set it with the OK key. Moreover, the unit made by “Unit” is displayed in “Custom”. (Refer to Section 7.22 for “Unit”.)

※ The unit is automatically set when the “②Scaling” is “OFF”, or “Input type” is “TC”, “RTD”.



⑦ OK, Cancel key

The each setting for changing contents is saved by the OK key. And, the “Parameter” can be returned not change by the Cancel key.

⑧ No selected range

The gray color is displayed that cannot be selected now. In this case, can be selected by presses OK key (or Cancel key) returning to “Parameter”.

7.7 Setting the display method of channel

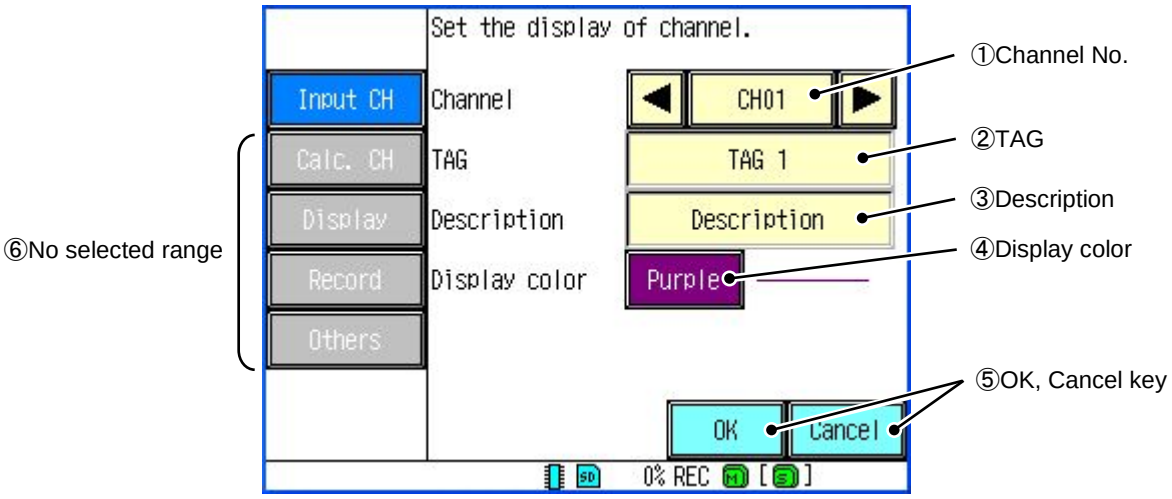
[Explanation]

The tag name, the explanation, and the display color of each channel are set, and a set content is displayed on the trend screen.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Input CH key ⇒ Display key on the Parameter.



① Channel No.

The set channel is selected. (The selection range becomes CH13 ～ CH48 in the “Calc. CH.”.)

② TAG

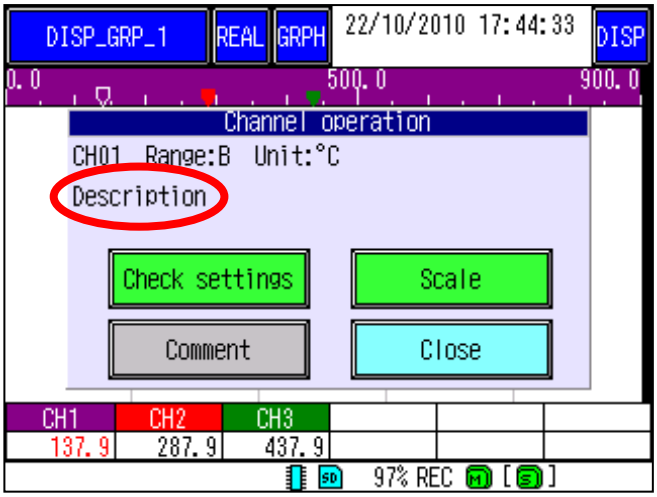
“TAG” is displayed on the trend screen instead of “Channel No.”. (Up to 8 characters can be registered.)

It is necessary to set the item of the TAG display set key to “TAG”, to display the set tag name on the trend screen. (Refer to Section 7.15 for TAG display set key.)

③ Description

The comment on the input channel is set. (Up to 52 characters can be registered.)

The input explanation is displayed on the “Channel operation” of Real time trend display (figure below). (Refer to Section 6.1 for “Channel operation”.)



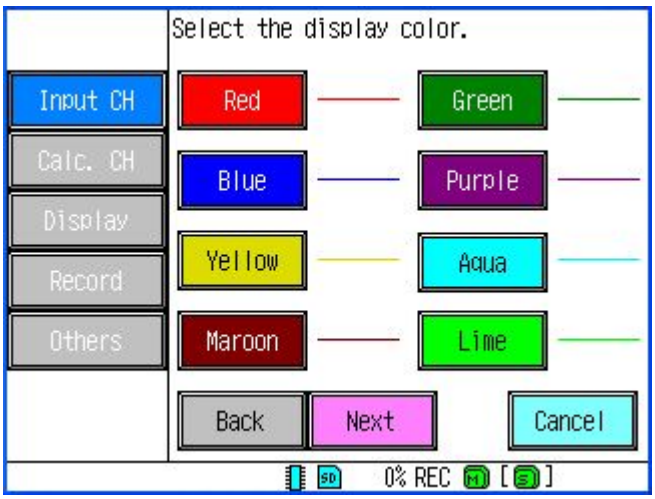
④ Display color

The display color of each channel is set, and displays on the trend screen.

Please select an arbitrary display color from the display color selection screen (figure below).

The part where the setting is reflected becomes “Trend display”, “Scale display”, and “Measurements display area”. (Refer to Section 6.1 ～ 6.2 for each item)

※ The display colors that can be selected are 16 colors. Please switch the page with Back key or Next key.



⑤ OK, Cancel key

The each setting for changing contents is saved by the OK key. And, the “Parameter” can be returned not change by the Cancel key.

⑥ No selected range

The gray color is displayed that cannot be selected now. In this case, can be selected by presses OK key (or Cancel key) returning to “Parameter”.

7.8 Setting the scale of channel

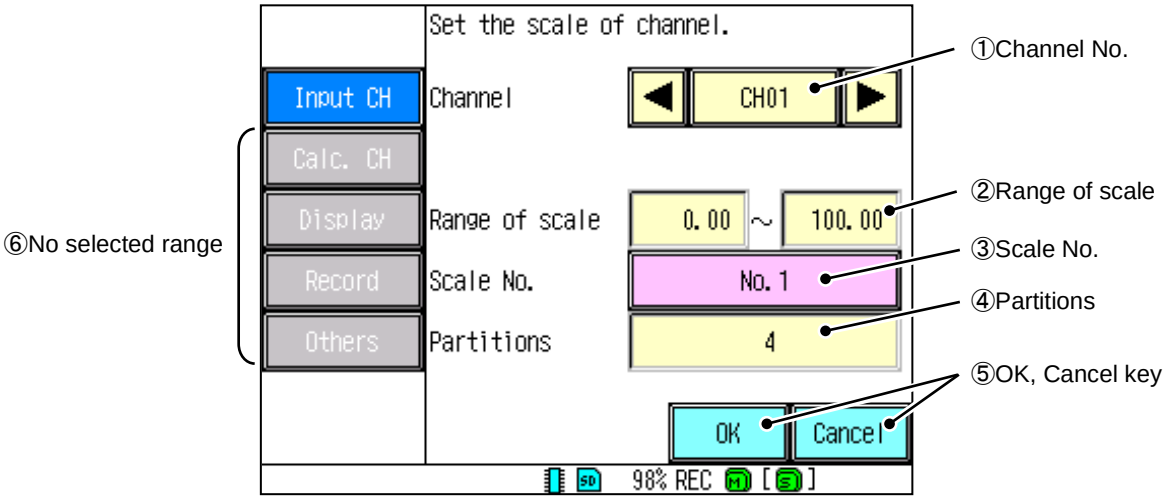
［Explanation］

Range of scale, and Partitions of each channel are set.

Note: When the recorder is in recording, the setting cannot be changed.

［Operation］

Select the Input CH key ⇒ Scale key on the Parameter.



① Channel No.

The set channel is selected. (The selection range becomes CH13 ～ CH48 in the “Calc. CH.”.)

② Range of scale

The lower bound value (left) and the upper bound value (right), displayed on the trend screen is set.

The decimal point position of the scale range can be changed by changing the value of Scaling key ⇒ Decimal point key. (Refer to Section 7.6 for Decimal point key.)

Moreover, the scale range can temporarily be changed from Scale key of “Channel operation”. (Refer to Section 6.1 for “Channel operation”.)

③ Scale No.

You can display up to three scales, each on one level. Configure the scale No. setting to specify which level each channel should be displayed on.

[One-level display]

Scale No. 1: CH01, CH02, CH03, CH04, CH05, CH06, CH07, CH08, and CH09,

Scale No. 2: None

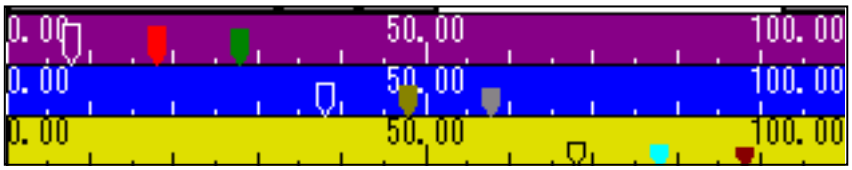
Scale No. 3: None

[3-level display]

Scale No. 1: CH01, CH02, and CH03

Scale No. 2: CH04, CH05, and CH06

Scale No. 3: CH07, CH08, and CH09



④ Partitions

The number of “Partitions” displayed on the trend screen is set. (0 to 20)

If you specify "0" as partition value, the number of partitions is calculated automatically.

⑤ OK, Cancel key

The each setting for changing contents is saved by the OK key. And, the “Parameter” can be returned not change by the Cancel key.

⑥ No selected range

The gray color is displayed that cannot be selected now. In this case, can be selected by presses OK key (or Cancel key) returning to “Parameter”.

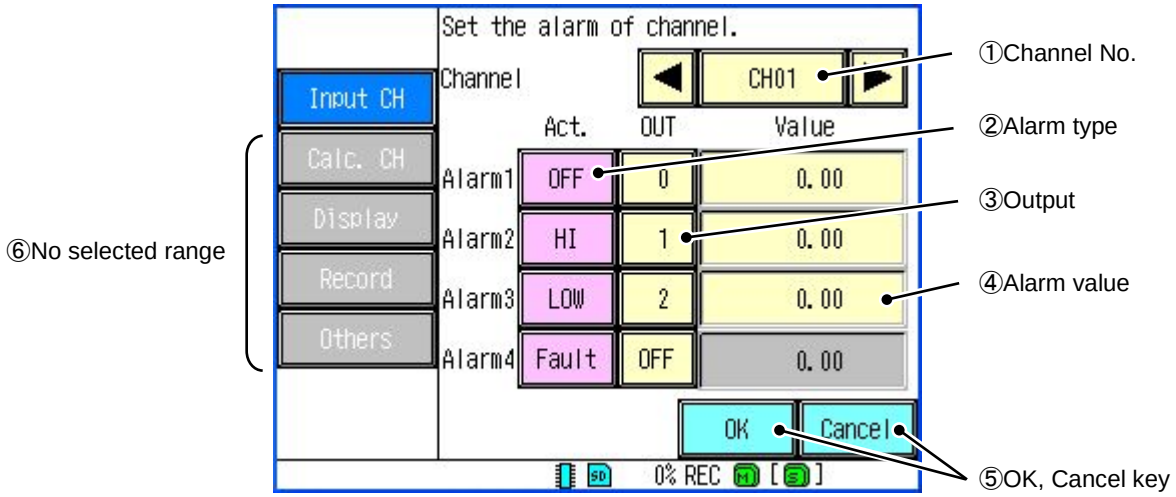
7.9 Setting the alarm value

［Explanation］

When abnormality occurs in measurements recording, warning is occurred. Moreover, the warning units relay number of the option is specified, and the warning output destination is set.

［Operation］

Select the Input CH key ⇒ Alarm value key on the Parameter.



① Channel No.

The set channel is selected. (The selection range becomes CH13 ～ CH48 in the “Calc. CH.”.)

② Alarm type

ON/OFF of the alarm function and the warning type are set.

HI ：When measurements exceed a set value, warning is occurred.

LOW ：When measurements fall below compared with a set value, warning is occurred.

Fault ：Warning is occurred at “H over”, “L over”, “Burn out”, “INVALID”, and “Abnormal input”.

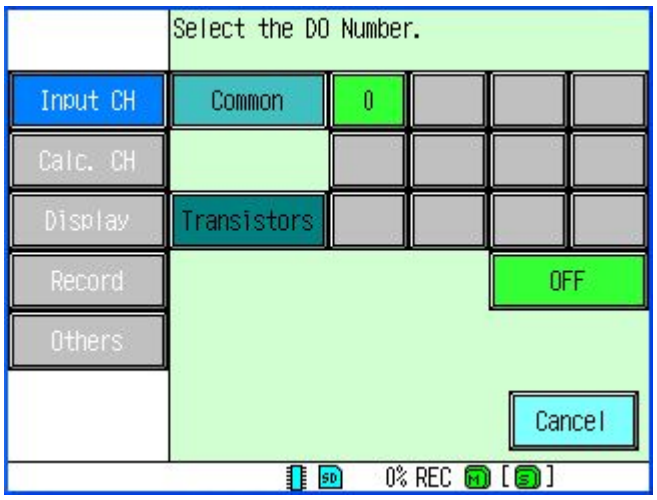
③ Output

The warning units relay number of the option is specified, and the warning output destination is set. The selection item changes by connecting the relay and the transistor.

Common： The main body has been equipped normally.

Relay ： When the “Relay card (Option)” is selected, can be set.

Transistor： When the “DI/DO card (Option)” is selected, can be set.



④ Alarm value

This item cannot only be set when the “②Alarm type” is “Fault”.

The alarm value is set.

The decimal point position of the alarm value can be changed by changing the value of Scaling key ⇒ Decimal point key. (Refer to Section 7.6 for Decimal point key.)

⑤ OK, Cancel key

The each setting for changing contents is saved by the OK key. And, the “Parameter” can be returned not change by the Cancel key.

⑥ No selected range

The gray color is displayed that cannot be selected now. In this case, can be selected by presses OK key (or Cancel key) returning to “Parameter”.

7.10 Setting the alarm action

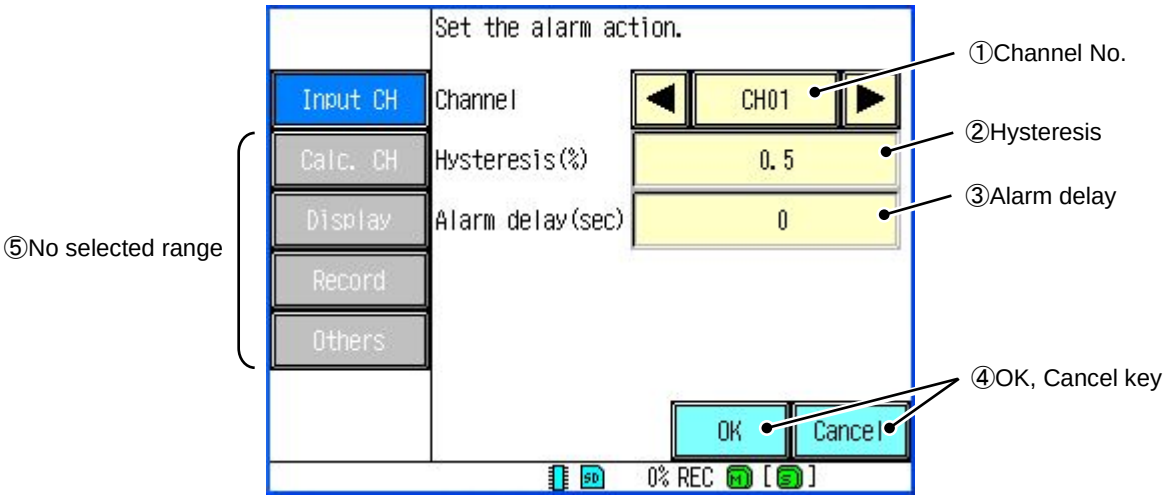
[Explanation]

"Hysteresis" and "Alarm delay" of each channel are set. Then, when measurements stay near the alarm value, occurred/release of alarm is consecutive and it is made not to happen.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Input CH key ⇒ Alarm action key on the Parameter.



① Channel No.

The set channel is selected. (The selection range becomes CH13 ～ CH48 in the "Calc. CH.".)

② Hysteresis

The Hysteresis width from the "Alarm occurred" to the "Alarm release" is set with "%".

(0.0 to 100.0 %)

[Reference]

●Setting: Hysteresis "0.5%", Scaling "0 ～ 10000", Act. "HI", Value "8000".

When measurements become 8000 or more, alarm is occurred. And alarm keeps being occurred in 7950 or less until becoming it.

③ Alarm delay

It sets whether the alarm occurred how many seconds after measurements reach it at the alarm occurred. (0 to 3600 sec)

④ OK, Cancel key

The each setting for changing contents is saved by the OK key. And, the "Parameter" can be returned not change by the Cancel key.

⑤ No selected range

The gray color is displayed that cannot be selected now. In this case, can be selected by presses OK key (or Cancel key) returning to "Parameter".

7.11 Setting the REC/CALC

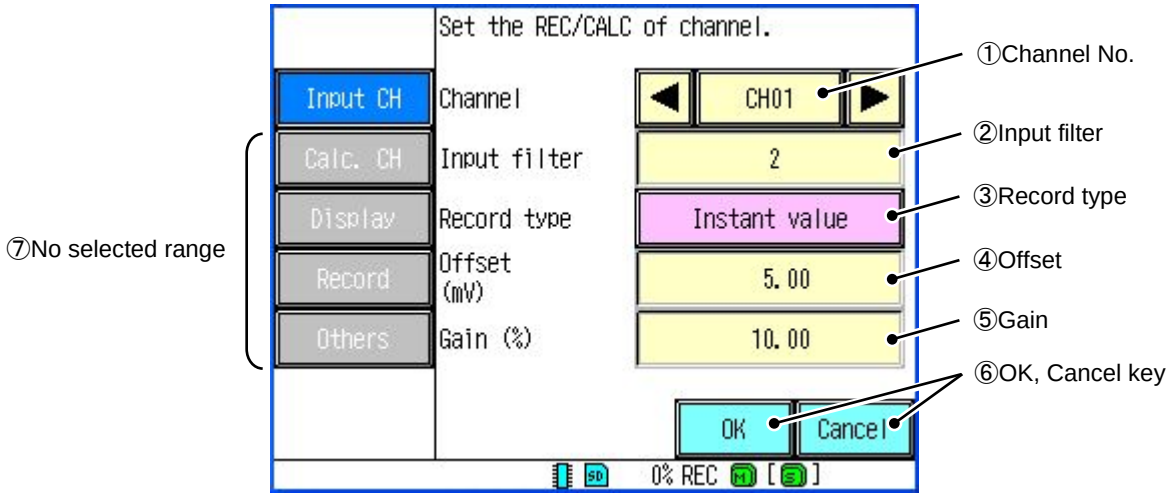
［Explanation］

"Input filter", "Record type", "Offset", and "Gain" of each channel are set.

Note: When the recorder is in recording, the setting cannot be changed.

［Operation］

Select the Input CH key ⇒ REC/CALC key on the Parameter.



① Channel No.

The set channel is selected. (The selection range becomes CH13 ～ CH48 in the "Calc. CH.".)

② Input filter

The time constant of the input filter (the first order filter) is set. (0 to 99 sec)

A time constant expresses the time to reach 63.2% of measured value. If the setting values of an input filter increase, the speed which measured value changes in proportion to it will become loose.

③ Record type

The method of operating measurements is specified for the record cycle, and the operation result is recorded on the SD card.

The record cycle can be set from Record key ⇒ Setting (Main) key of "Parameter".

(Refer to Section 7.19 for Setting (Main) key. Moreover, please refer a next page for the detail of each record type.)

Instant value	: The instant value every record cycle is recorded.
Average value	: The average value is calculated and recorded.
Max/Min	: The Max/Min value is calculated and recorded.
OFF	: It doesn't record on the SD card though the trend is recorded.

※ - Record data is not created if the record type of all the channels is "OFF".

- If Extended Security (option) is selected, selecting record type other than "Max / Min" will make it possible to print the report of the target channel.

④ Offset

The value added (Offset) to the input is set. (-32000 to 32000 digit)

The decimal point position of the "Offset" can be changed by changing the value of Scaling key ⇒ Decimal point key. (Refer to Section 7.6 for Decimal point key.)

⑤ Gain

The ratio of I/O (Gain) is set. (-320.00 to 320.00 %)

(Refer "●The specification of offset and a gain" of page 7-20 for Offset and Gain.)

⑥ OK, Cancel key

The each setting for changing contents is saved by the OK key. And, the “Parameter” can be returned not change by the Cancel key.

⑦ No selected range

The gray color is displayed that cannot be selected now. In this case, can be selected by presses OK key (or Cancel key) returning to “Parameter”.

●The specification of a record type

The following 3 record types can be chosen in this recorder.

①Max / Min

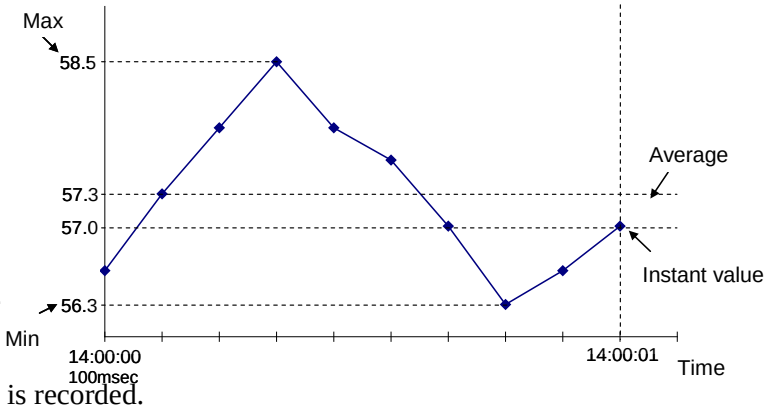
The maximum and the minimum in a "record cycle" are recorded. For example, if a recording cycle is 1 second. The measured value of a total of ten pieces can be measured in 1 second. (Because, the measurement cycle in the interior of this recorder is 100 milliseconds (=msec).)
(Measured value is recorded at the time of 0 millisecond of for 1 second.)

If measured value changes a “lower left table”. It becomes "the maximum is 58.5 and the minimum is 56.3" (lower right table).

Time	msec	Value
14:00:00	100	56.6
14:00:00	200	57.3
14:00:00	300	57.9
14:00:00	400	58.5
14:00:00	500	57.9
14:00:00	600	57.6
14:00:00	700	57.0
14:00:00	800	56.3
14:00:00	900	56.6
14:00:01	0	57.0

It records here.

Record data			
Time	msec	CH01 MAX	CH01 MIN
14:00:01	0	58.5	56.3



②Instant value

The value of the last in a "record cycle" is recorded.

Compared with the Max / Min record, time recordable on an SD card becomes long. (Because, record data decrease in number to one piece from two piece.)

In the case of the above-mentioned example, "the instant value" becomes "57.0". (following table).

Recored data		
Time	msec	CH02 INS
14:00:01	0	57.0

③Average

The average in a "record cycle" is recorded.

Compared with the Max / Min record, time recordable on an SD card becomes long. (Because, record data decrease in number to one piece from two piece.)

In the case of the above-mentioned example, "the average" becomes "57.3". (following table).

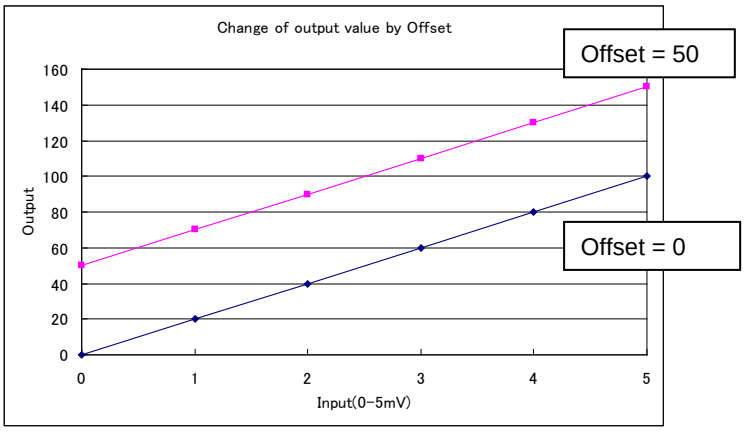
Record data		
Time	msec	CH03 AVG
14:00:01	0	57.3

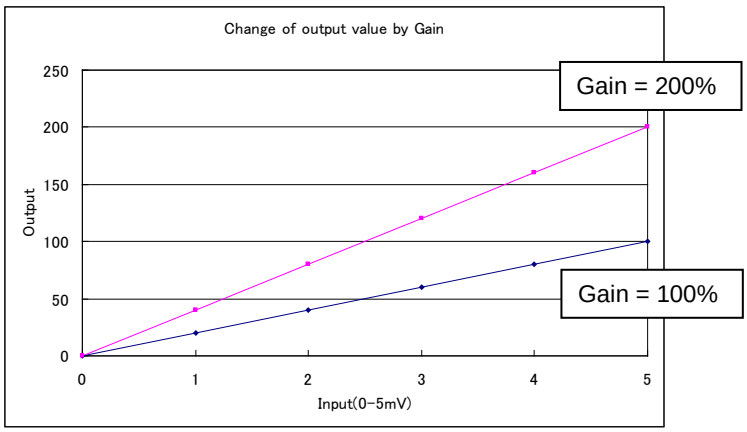
●The specification of offset and gain

This recorder can set offset (shift value) and gain (inclination).

The graph when setting offset and a gain is shown.(following)

Ex) Channel type：0-5mV　　Scaling range：0-100%





The operation expression about Offset and Gain is as follows.

$P' = A * P + B$

P’ = A calculation result of offset and gain ※1

P = Measured value

A = Gain value (inclination) (-320.00～320.00%)

B = Offset value (-32000～32000　It is dependent on the decimal point. ※2)

※1 The judgment of input error (such as Burnout, Error, and L/H Over) is performed against the input and for the result of offset or gain calculation.

※2 Refer to Section 7.6 for Decimal point.

● If input type is changed or the scaling function is turned ON/OFF, the offset and gain set value for the channel is cleared.

7.12 Copy the channel setting

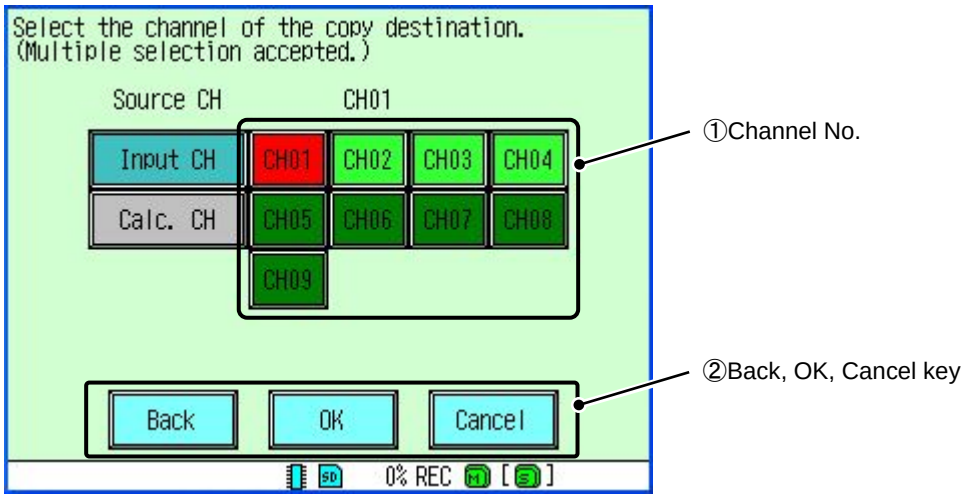
［Explanation］

The setting value of each channel is copied onto another channel.

Note: When the recorder is in recording, cannot be copy of channel.

［Operation］

Select the Input CH key ⇒ Copy key on the Parameter.



① Channel No.

The channel that becomes the copy source of setting value is selected touching. (The selected item is displayed in red.)

The copy destination can be selected by selecting the copy source. (Plurals can be selected. The selected item is displayed in luminous color.)

(The selection range becomes CH13 ～ CH48 in the “Calc. CH.”.)

② Back, OK, Cancel key

The copy of the setting is executed with OK key. Please select the Back key when you want to do the selection at the copy destination try again. (If the channel at a “Copy source” and “Copy destinations” is not selected, Back, OK key cannot be selected.)

Moreover, it returns to the parameter setting screen without changing the setting with the Cancel key.

7.13 Setting the F value

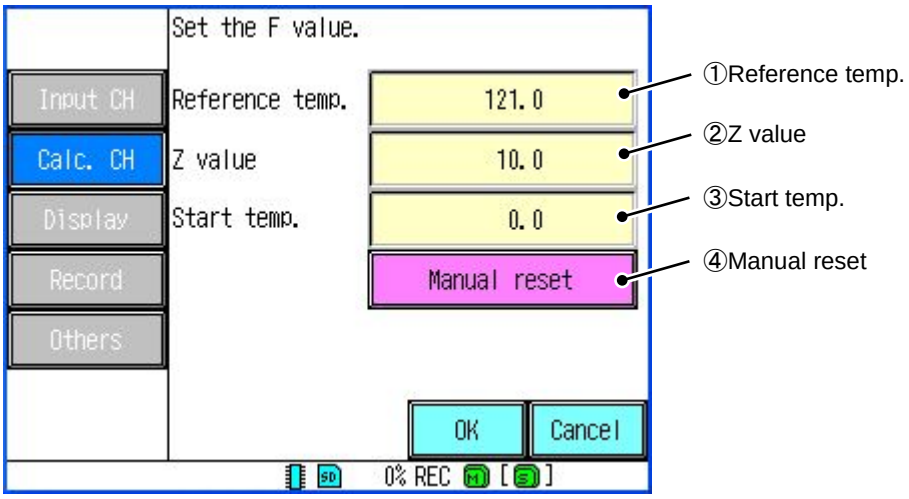
[Explanation]

"Reference temp.", "Z value (Extinction value of bacterium by heating sterilization)" and "Start temp." of each channel are set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Calc. CH key ⇒ F value key on the Parameter.



① Reference temp.

The reference temperature in F value calculation is set. (-3200.0 to 3200.0)

② Z value

The Z value (Extinction value of bacterium by heating sterilization) in F value calculation is set. (-3200.0 to 3200.0)

③ Start temp.

The start temperature in F value operation is set. (-3200.0 to 3200.0)

F value calculation is not done while it falls below the onset temperature.

④ Manual reset

The multiplication data of F value calculation (timer) is reset by manual operation.

Moreover, integrated value can be reset with the "Func button". At the time, the System ⇒ "Device / Other" ⇒ "FUNC key" is "Addition reset."

(Refer to Section 8.18 for "FUNC key".)

[Note]

・In order to use F value operation, it is necessary to set a FCAL function as an calculation channel.

・Setting of a FCAL function and other functions is possible only from a Parameter Loader.

(Refer to Section 2.3 of "PARAMETER LOADER INSTRUCTION MANUAL (WXPVM70mnAR102E)" for detail.)

7.14 Setting the timer of channel

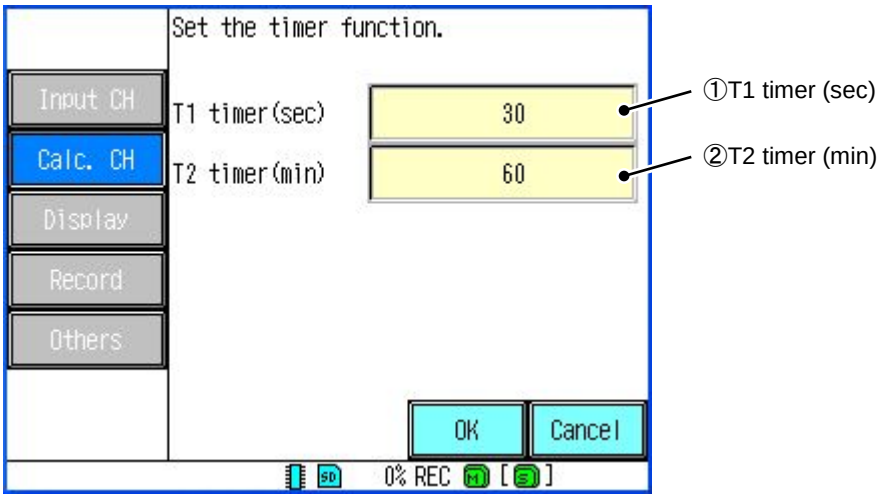
[Explanation]

To execute reset of the input value at the set interval time, “T1 timer (sec)”, “T2 timer (min)” of each channel is set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Calc. CH key ⇒ Timer key on the Parameter.



① T1 timer (sec)

The T1 timer (sec) is set. (1 to 9999)

Please input an arbitrary T1 timer (sec) from the numeric input screen, and set it with the OK key.

② T2 timer (min)

The T2 timer (min) is set. (1 to 9999)

Please input an arbitrary T2 timer (min) from the numeric input screen, and set it with the OK key.

The content of the timer can be selected according to the following 6 kinds besides the above-mentioned.

(A set value is fixation, and not changes. Moreover, a set value is set from the parameter loader. Refer to Section 2.3 of “PARAMETER LOADER INSTRUCTION MANUAL” for details)

Item	Content
T3	Reset is executed at twelve o'clock (midnight) every day.
T4	Reset is executed at twelve o'clock (midnight) of Sunday every week.
T5	Reset is executed at twelve o'clock (midnight) of the first every month.
T6	Reset is executed at every o'clock. (※1)
U1	Reset by DI. (※2)
U2	Reset by DI. (※1) (※2)

※1 (It supports since recorder version 1.30.)

※2 To set it, “U1” or “U2” is selected by Others key ⇒ DI key.

(Refer to Section 7.24 for DI key.)

7.15 Setting the group name

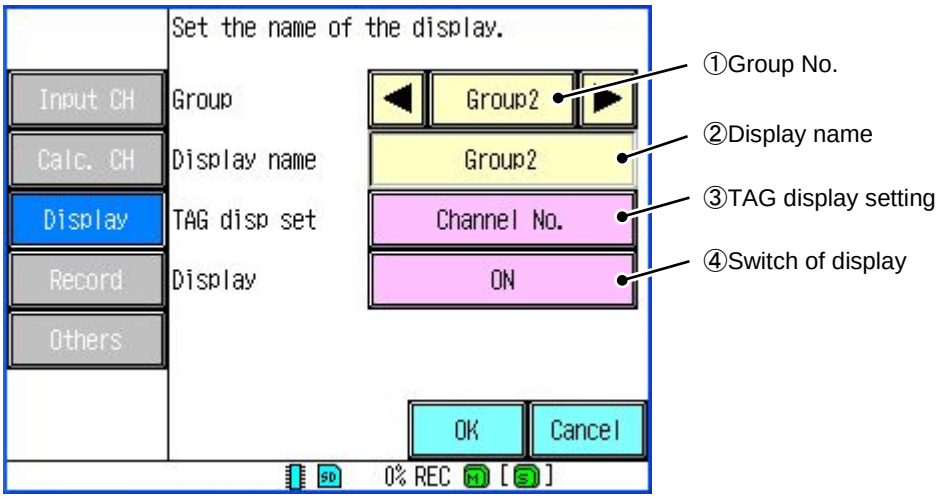
[Explanation]

Name of group that displays it on trend screen, switch of channel No. and tag display, and switch of ON/OFF of group display are set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Display key ⇒ Group name key on the Parameter.



① Group No.

The set group is selected.

② Display name

The group name that displays it on the trend screen is set.

Please input an arbitrary display name from the character input screen, and set it with the OK key.

③ TAG display setting

The display method of measured value display area is selected from “Channel No.” and “Tag”.

Channel No. : Channel No. is displayed on the trend screen.

TAG : The tag name set beforehand is displayed on the trend screen.

The combination of displayed channel No. can be set by Display key ⇒ Group CH key.

(Refer to Section 7.16 for Group CH key)

The character set by Input CH key ⇒ Display key ⇒ TAG key is displayed on the trend screen.

(Refer to Section 7.7 for TAG key.)

④ Switch of display

“Display/non-display” of the group in the trend screen is selected.

The group that makes the setting “OFF” is not displayed on the trend screen. (Group1 and Sub Group cannot switch ON/OFF.)

7.16 Setting the displayed channel

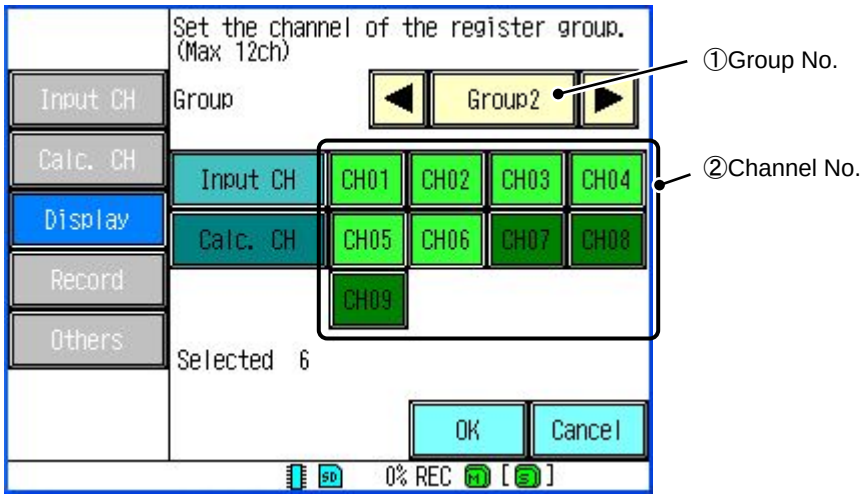
[Explanation]

The combination of channel No. that each group displays in the measured value display area of the trend screen is set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Display key ⇒ Group CH key on the Parameter.



① Group No.

The set group is selected.

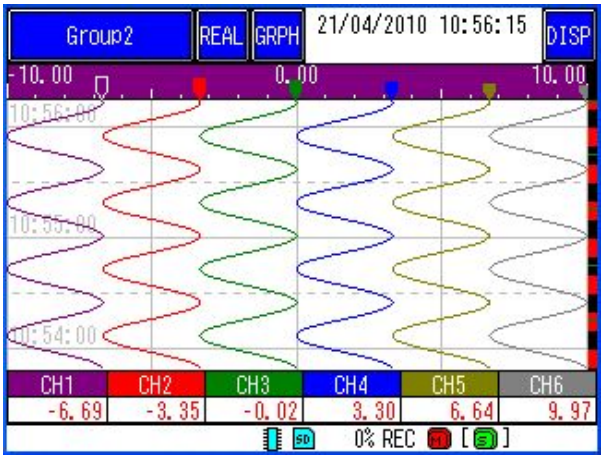
② Channel No.

Selected items are displayed in the measured value display area.

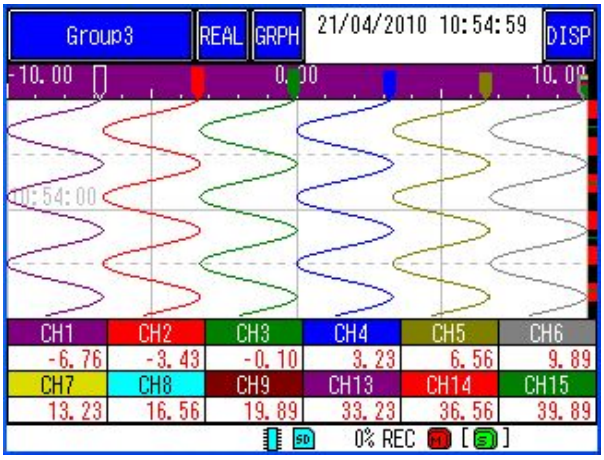
(Plurals can be selected. The selected item is displayed in luminous color.)

When the number of channel selections is 6 or less, the measured value display area is 1 step (left of the figure below). Moreover, when the number of channel selections is 7 or more, the measured value display area is 2 steps (right of the figure below).

[Channel selection number: Or less 6]



[Channel selection number: Or more 7]



7.17 Select the ON/OFF of graph type

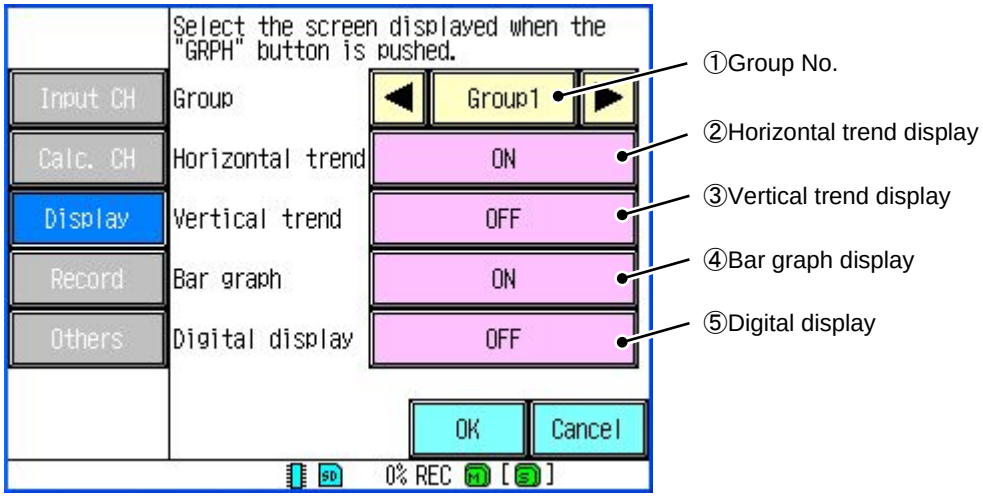
[Explanation]

The switch of display/non-display of “Horizontal trend”, “Vertical trend”, “Bar graph”, and “Digital display” of each group displayed on the trend screen is set. (Refer to Section 6.2 ～ 6.4 for each trend screen.)

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Display key ⇒ Graph display key on the Parameter.



① Group No.
The set group is selected.

② Horizontal trend display
Display/non-display of the “Horizontal trend display” is switched.
When “OFF” is selected, the “Horizontal trend display” is not displayed.

③ Vertical trend display
Display/non-display of the “Vertical trend display” is switched.
When “OFF” is selected, the “Vertical trend display” is not displayed.

④ Bar graph trend display
Display/non-display of the “Bar graph display” is switched.
When “OFF” is selected, the “Bar graph display” is not displayed.

⑤ Digital display
Display/non-display of the “Digital display” is switched.
When “OFF” is selected, the “Digital display” is not displayed.

7.18 Setting the automatic change function of a display group

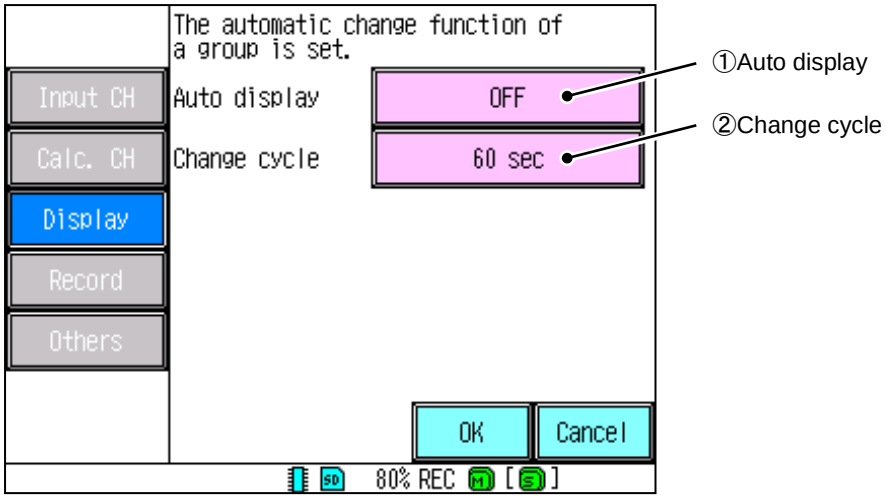
[Explanation]

In a realtime trend screen, a group is automatically switched at a fixed interval.

(It supports since recorder version 1.30.)

[Operation]

Select the Display key ⇒ Auto display key on the Parameter.



① Auto display

ON/OFF of an auto display function is chosen.

Only the group from which the item of the Display key of a Group name key is set to "ON" switches a display. (Refer to Section 7.15 for Display key.)

② Change cycle

The cycle which switches a group is chosen from "5 sec", "10 sec", "15 sec", "30 sec", and "60 sec".

7.19 Setting the record cycle of main record

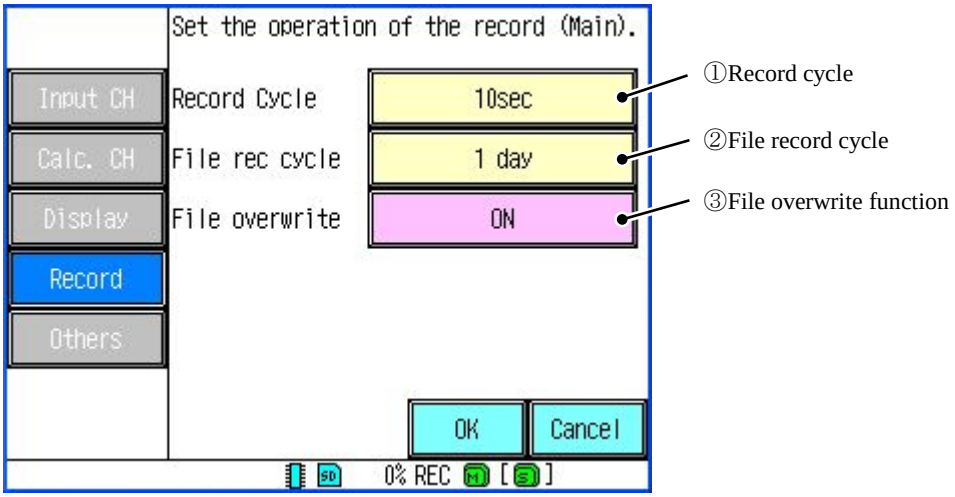
[Explanation]

"Record type of main record", "File record cycle" and "ON/ OFF of file overwrite function" is set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Record key ⇒ Setting (Main) key on the Parameter.



① Record cycle

The update cycle of the trend recording (main) is set.

(Only when the sub record is set, "100 ms" can be selected. Refer to Section 7.20 for sub record.)

② File record cycle

Sets the cycle at which measured values being recorded are saved in a file.

The set file recording cycle is sampled in absolute time rather than relative time.

Example: - File record cycle: 1 hour

- Recording start time: 12:10:20

→ The recorded data is saved at the timing of 13: 00: 00, 14: 00: 00, 15: 00: 00 ....

Definition of file record cycle

File record cycle	Timing of recording file generation
1 hour	At the time 0: 00: 00 to 23: 00: 00 each hour 0 minutes 0 seconds
1 day	When it becomes 0:00:00 of each day
1 week	When it becomes 0:00:00 every Sunday
1 month	When it becomes 0:00:00 on the first day of each month
1 year	When it becomes 0:00:00 on January 1st of each year

The range that can be selected changes according to the setting value of [① record cycle]. (Following table)

But, the range that can be selected depends on the version.

Selectable range with version less than 2.00

Record cycle	Selectable file record cycle
1sec to 5sec	1hour
10sec to 1min	1hour,1day
2min to 3min	1hour,1day,1week
5min to 30min	1hour,1day,1week,1month
60min	1hour,1day,1week,1month,1year

Selectable range in version 2.00 or later

Record cycle	Selectable file record cycle
1sec to 5sec	1hour,1day
10sec to 20sec	1hour,1day,1week
30sec to 5min	1hour,1day,1week,1month
10min to 60min	1hour,1day,1week,1month,1year

* Measurement values being recorded are saved in the internal memory first regardless of whether the SD card is inserted or not inserted.

● Timing of data writing

For the timing of outputting recorded data to the SD card, refer to Section 5.3.

③ File overwrite function

Select ON / OFF of the file overwrite function at memory FULL.

The following shows the recording operation when overwriting function ON / OFF.

But, when the extended security mode is set, the overwrite function is always OFF.

Selectable range with version less than 2.00

SD card	OFF	ON
mount	Recording stops when the remaining memory capacity of the SD card is less than about 20 MB. It does not contribute to the remaining capacity in internal memory. Recording stops even when the internal memory remaining capacity is 100%.	Recording will not stop. *2 Delete and overwrite oldest recorded file.
unmount	Recording stops when the remaining capacity in internal memory reaches 0%.	Recording will not stop. Delete and overwrite oldest recorded file in internal memory.

Selectable range in version 2.00 or later

SD card	OFF	ON
mount	*1 Recording stops when the remaining memory capacity of the SD card is less than about 20 MB. It does not contribute to the remaining capacity in internal memory. Recording stops even when the internal memory remaining capacity is 100%.	Recording will not stop. *2 Delete and overwrite oldest recorded file. Recording currently being recorded is not deleted. If the SD card becomes full with only data currently being recorded, recording stops. *3
unmount	*1 Recording stops when the remaining capacity in internal memory reaches 0%.	Recording will not stop. Delete and overwrite oldest recorded file in internal memory.

∗1 It is the same as less than version 2.00.

*2 If there are a lot of files in a directory other than "SD ¥ Recorder ¥ Data", a deletion error will occur and the recording will stop. Only the record data in "SD ¥ Recorder ¥ Data" can be deleted.

※3 Example when recording stops (when all the following events overlap)

· When there is only one folder in "SD ¥ Recorder ¥ Data"

· When 48 days have elapsed from the start of recording and the remaining capacity of the SD card reaches 0% (Record cycle: 1 sec ,File record cycle:1day)

7.20 Setting the record cycle of sub record

［Explanation］

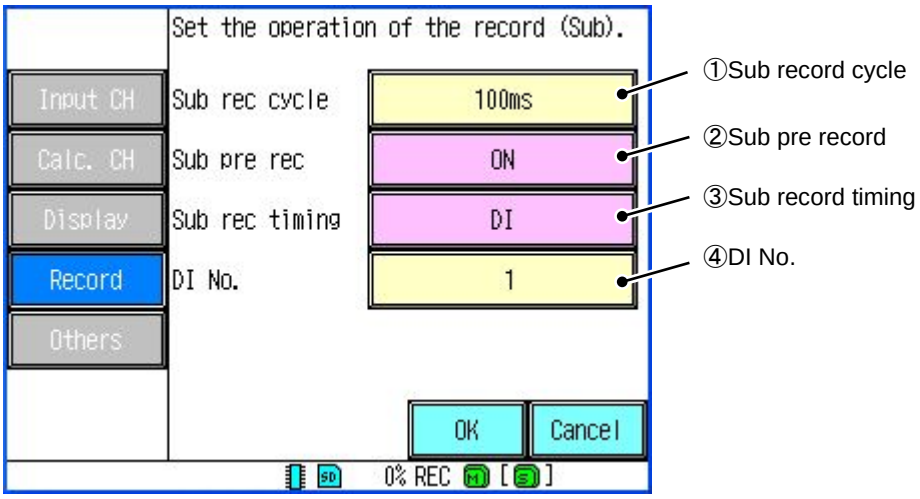
"Record type of sub record", "Sub pre record" and "Sub record timing" is set.

Note: When the recorder is in recording, the setting cannot be changed.

［Operation］

Select the Record key ⇒ Setting (Sub) key on the Parameter.

The content of the display is different according to the "Sub record timing" of setting.



① Sub record cycle

The update cycle of the trend recording (sub) is set.

※ About the file record cycle of the sub record.

The file record cycle of the sub record is automatically set by the record cycle. (Table below)

Sub record cycle	File record cycle
100ms	10min
1～30sec	1hour
1～60min	1day

● Timing of data writing

For the timing of outputting recorded data to the SD card, refer to Section 5.3.

② Sub pre record

ON/OFF of the pre record is selected.

ON ：When the sub record begin, it returns during the time of "half time of file record cycle (sub)" and the record begins. Moreover, it records at the same time when the sub record ends.

OFF：Not pre recorded.

③ Sub record timing

The sub recorded timing is set. (A sub record alone cannot be recorded. Please confirm it is previously recording before it records.)

Func key : The sub record begins when the FUNC button is pushed.

※ System Settings “Device / Other” ⇒ “FUNC key” is “OFF” only when you can choose. (Refer to Section 8.18 for "FUNC key".)

Alarm : The sub record begins when alarm is occurred.

DI : The sub record begins when the DI input is turned on.

Sync. : The sub record begins, too, when main record is begun.

OFF : It doesn't sub record.

④ DI No.

This item can only be set when the “③Sub record timing” is “DI”.

DI No. used for the sub record to begin is set.

Please select arbitrary DI No. from the DI No. selection screen.

7.21 Setting the schedule

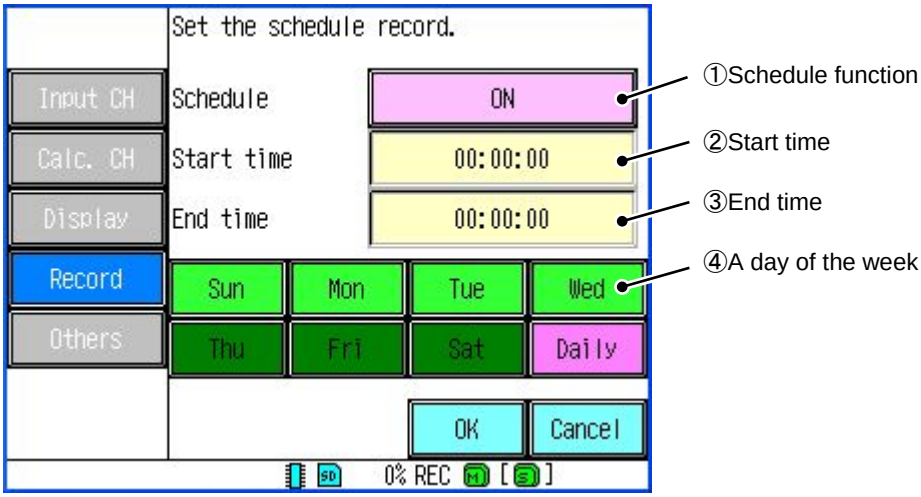
[Explanation]

"ON/OFF of schedule function" (Record is started or stopped periodically.), "Start time", "End time" and "A day of the week" is set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Record key ⇒ Schedule key on the Parameter.



① Schedule function

ON/OFF of schedule function is selected.

② Start time

Time to start the record is set.

Please input an arbitrary start time from the numeric input screen, and set it with the OK key.

③ End time

Time to end the record is set.

Please input an arbitrary end time from the numeric input screen, and set it with the OK key.

④ A day of the week

A recorded day of the week is selected. (Plurals can be selected. The selected item is displayed in luminous color.)

All selections/release on a day of the week can be switched by selecting Daily key.

7.22 Setting the unit

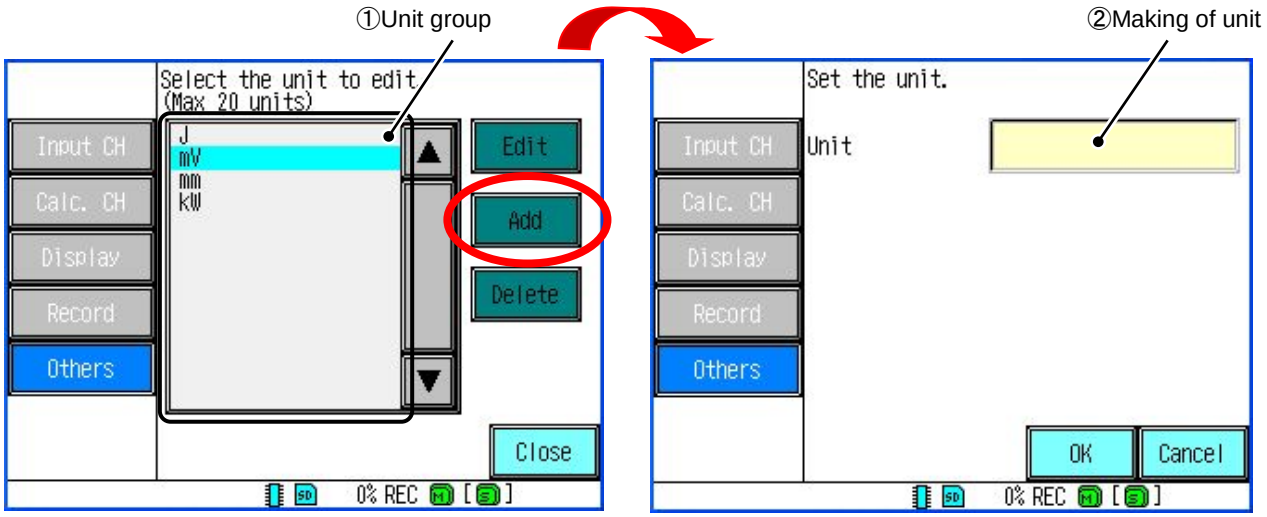
[Explanation]

"Making", "Edit", and "Delete", etc. of the unit displayed on the trend screen are operated.

Note: When the recorder is in recording, the unit cannot be made.

[Operation]

Select the Others key ⇒ Unit key on the Parameter.



① Unit group

The made unit is displayed by the list.

Please select the arbitrary unit from "Unit group" to edit the unit, and select the edit or the delete key. (The selected item is displayed in aqua)

② Making of unit

When an add key is selected touching, an above figure right screen is displayed.

Please input an arbitrary unit from the character input screen, and set it with the OK key.

(Up to 8 characters can be registered.)

The made unit can be set from Scaling key ⇒ Unit key. (Refer to Section 7.6 for Scaling key.)

※ If a unit is set up by Scaling key, compatibility is lost between the set-up unit and the created unit.Even if the unit currently used is edited and deleted, the unit currently used is not changed.

7.23 Setting the message

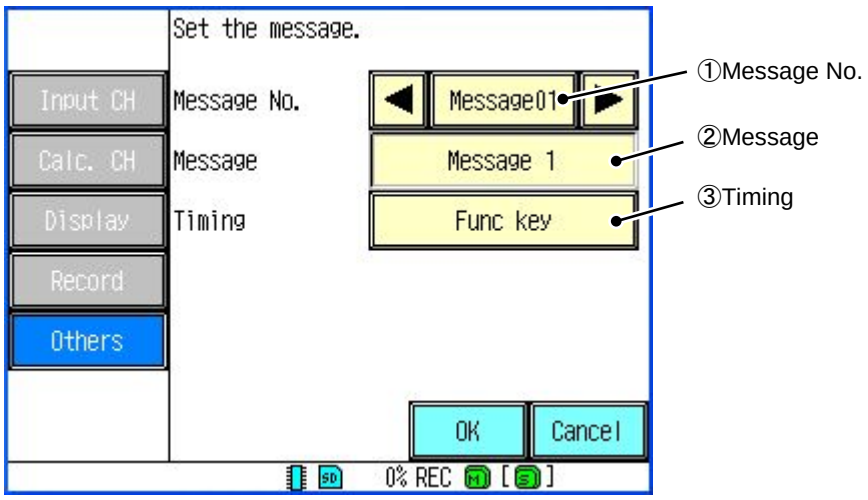
［Explanation］

When “alarm is occurred and cleared” or “DI ON/OFF”, the message is displayed.

Note: When the recorder is in recording, the setting cannot be changed.

［Operation］

Select the Others key ⇒ Message key on the Parameter.



① Message No.

The set message No. is selected.

② Message

The message to display is set. (Up to 16 characters can be registered.)

Please input an arbitrary message from the character input screen, and set it with the OK key.

③ Timing

Timing in which the message is displayed is set.

Func key	:	The message displays when the FUNC button is pushed.
Alarm occurred	:	The message displays when alarm is occurred.
Alarm cleared	:	The message displays when alarm is released.
DI ON	:	The message displays when the DI input is turned on.
DI OFF	:	The message displays when the DI input is turned off.

The set message is displayed in the “Event log”. (Refer to Section 6.6 for “Event log”.)

Moreover, when the message is displayed with the FUNC button, it is necessary to set Device/Other key⇒ FUNC key key of System to “Message”. (Refer to Section 8.18 for FUNC key key.)

7.24 Setting the DI function

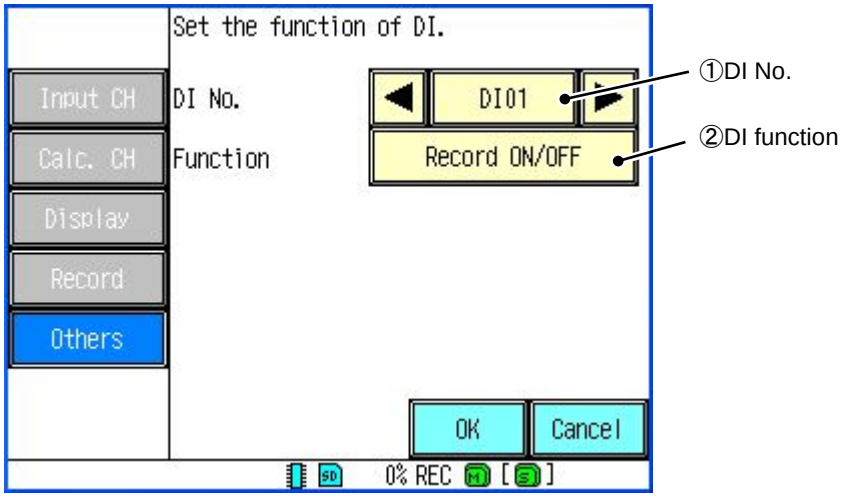
［Explanation］

DI function is set.

Note: When the recorder is in recording, the setting cannot be changed.

［Operation］

Select the Others key ⇒ DI key on the Parameter.



① DI No.

The set DI No. is selected.

② DI function

The DI function is set.

OFF	: The DI function is not used.
Record ON/OFF	: The record begins at DI ON, and the record is stopped at DI OFF.
LCD ON/OFF	: When DI is ON, Regardless of “Sleep time”, “LCD ON” is always used. When DI is OFF, LCD is turned OFF in accordance with setting out of “sleep time”. ※ Even if it turned OFF DI, LCD is not immediately come by OFF. (Refer to Section 8.16 for “Sleep time”.)
U1／U2	: When there is an operation channel by which "U1" and "U2" are set as the timer type, and when the input of DI is set to "ON", timer operation is executed.

※ "U1" and "U2" can be set up with the calculating formula of a Parameter Loader. (Refer to Section 2.3 of “PARAMETER LOADER INSTRUCTION MANUAL” for calculating formula.)

※ The DI function can set one item only to one “DI No.”. The function of DI No. set ahead automatically becomes “OFF”, when you set the same DI function as two or more DI No.

7.25 Counts the progress time

[Explanation]

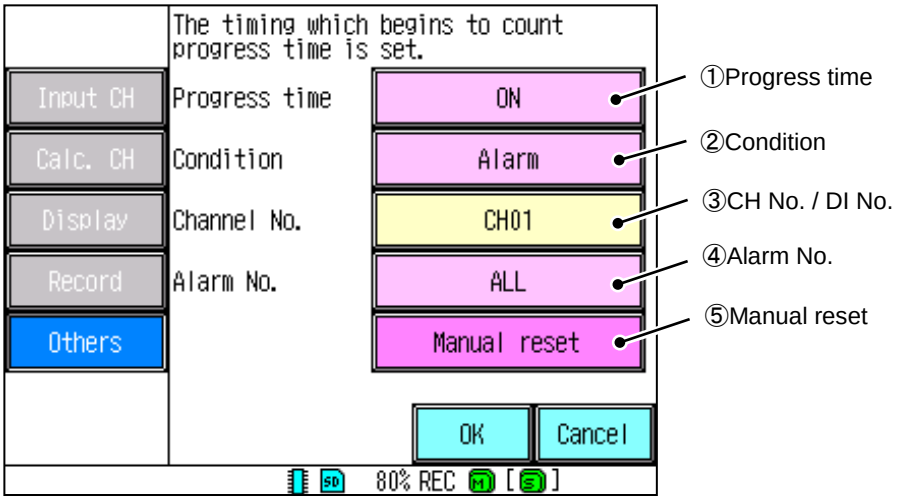
Progress time is counted according to conditions. The counted time can be outputted as a value, if "PASS function" is used.

(Refer to Section 2.3 of “PARAMETER LOADER INSTRUCTION MANUAL” for "PASS function".)

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Others key ⇒ Progress time key on the Parameter.



① Progress time

ON/OFF of a progress time display is chosen. If it selects “ON”, it will be displayed on the lower of the clock display part of a realtime trend screen. (Refer to Section 6.1 for clock display.)

Even if “OFF” is chosen, when conditions are fulfilled, progress time counts.

② Condition

The conditions which start or stop the count of progress time are chosen.

※When a count is stopped and it starts again, a count is started after resetting a value.

Record : A count of progress time is started when record is started, and a count is stopped when record is stopped.

Alarm : A count of progress time is started when alarm occurs, and a count is stopped when alarm recovered.

DI : A count of progress time is started when DI is ON, and a count is stopped when DI is OFF.

③ CH No. / DI No.

This item can only be set when the “②Condition” is “Alarm” or “DI”.

CH number or DI number used for “②Condition” is set up.

④ Alarm No.

This item can only be set when the “②Condition” is “Alarm”.

Alarm number used for “②Condition” is set up.

⑤ Manual reset

The count of progress time is reset by manual operation.

※ "All" in the selection item of CH number and alarm number means the thing of all the CH number and alarm number.

Ex) CH number is "CH01", Alarm number is "All".

A count of progress time is started when an alarm occurs in either of "alarm number 1 ～ 4" of "CH 01". Moreover a count is stopped when an alarm recovered all of "alarm number 1 ～ 4" of "CH 01".

7.26 Setting the production information

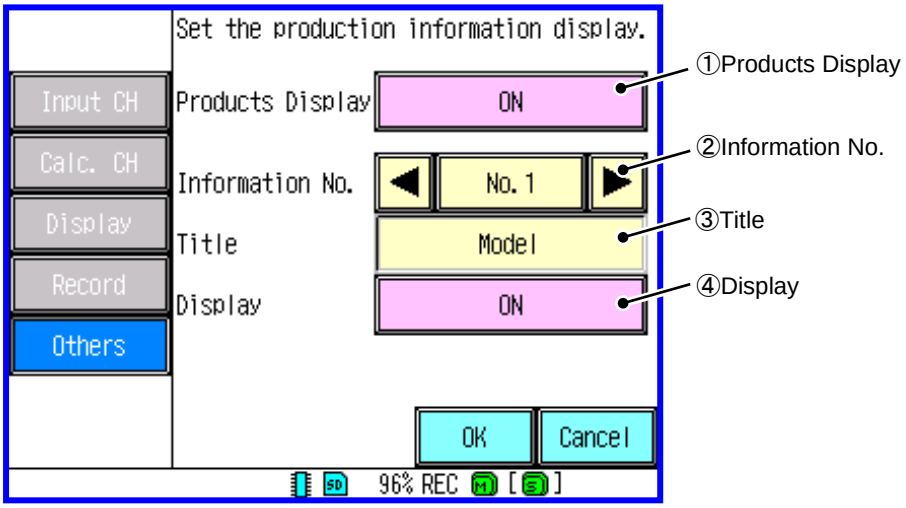
[Explanation]

Sets to display “production information” on the trend display. The recorder record “production information” on comment data.

(It supports since recorder version 2.00.)

[Operation]

Select the Others ⇒ Products Display on the Parameter.



① Products Display

The operator sets to display all “production information” on the trend display.

② Information No.

The operator determines to set information No. among 8 information channels.

③ Title

The operator determines to set title of “production information” .(Up to 8 characters can be registered.)

④ Display

This item become effective to set when the “①Products Display” is “ON”.

The operator sets to display “production information” of Information No. on the trend display.

[Note]

“Production information” set to push the Func key. After Func key’s function set “Product Regist.”. For details, refer to Section 8.18.

7.27 Setting the Int. SP DO

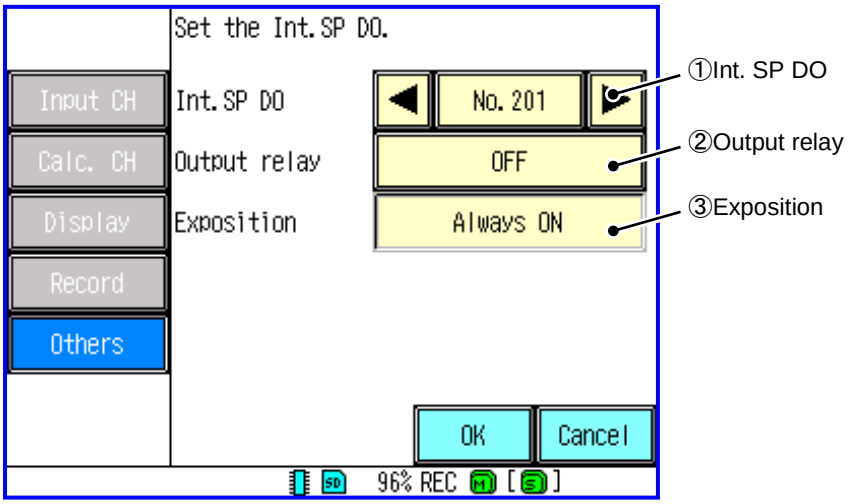
[Explanation]

The operator sets the output relay from “Int. SP DO (=This Paperless recorder output recording state in Inside the virtual area)”.

(It supports since recorder version 2.00.)

[Operation]

Select the Others ⇒ Int. SP DO on the Parameter.



① Int. SP DO

The operator determines function of “Int. SP DO”.

Relay No.	Exposition	Operating Conditions	Operates the relay
201	Always ON	The relay output will be “ON” during turned on the power.	The relay output is on.
202	Always OFF	The relay output will be “OFF” during turned on the power.	The relay output is off.
203	ON for 5s at startup	After turning on the power and shifting to the trend screen, the relay will be "ON" for 5 seconds.	The relay turns "ON" for 5 seconds and "OFF" after 5 seconds.
204	(*)Reserve		
205	SD 10% or less	・SD mount : When the memory remaining capacity indication is 10% or less ・SD unmount : When the memory remaining capacity indication is 50% or less	The relay output is on.
206～209	(*)Reserve		
210	Operates recording main record	During operates recording main record / During stops recording main record	The relay output is on./ The relay output is off.
211	Operates recording sub record	During operates recording sub record / During stops recording sub record	The relay output is on./ The relay output is off.
212	Stops recording main record	During stops recording main record / During operates recording main record	The relay output is on./ The relay output is off.
213	Stops recording sub record	During stops recording sub record / During operates recording sub record	The relay output is on./ The relay output is off.
214～220	(*)Reserve		

(*) System area. It can not be set arbitrarily.

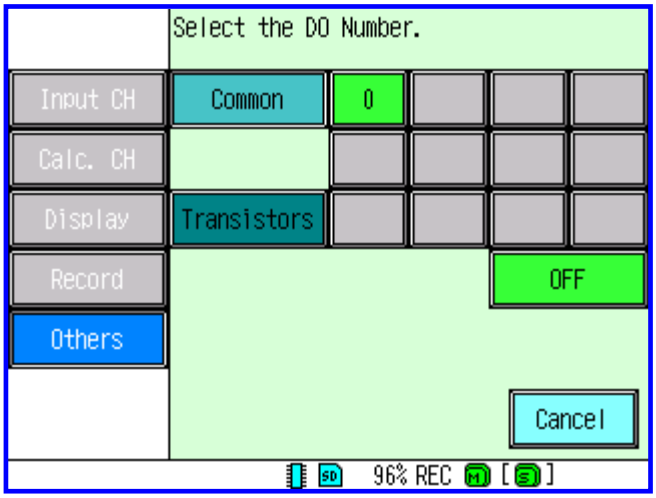
② output relay

The operator sets the output relay.

Common : The main body has been equipped normally.

Relay : When the “Relay card(option)“ is selected, can be set.

Transistors : When the “DI/DO card(option)“ is selected, can be set.



[Note]

The function become OR output when the operator determines same the output relay.

③ Exposition

This Paperless recorder display the Exposition that the operator determines function of “Int. SP DO”.

7.28 Initialization of parameter

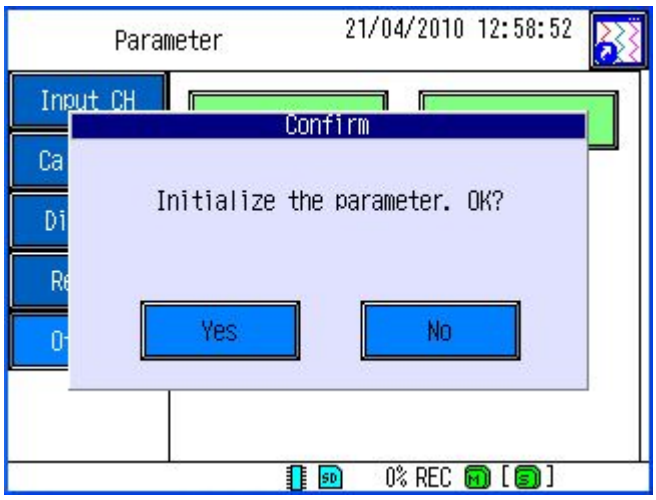
［Explanation］

Parameter data is initialed.

Note: When the recorder is in recording, the parameter cannot be initialized.

［Operation］

Select the Others key ⇒ Param initial key on the Parameter.



When Param initial key is selected, the confirmation screen (above figure) is displayed. The parameter data is initialized when selecting YES key.

Moreover, a set value after the initial becomes it as follows.

●Parameter data initial value list

·Input CH			Group CH	Selected CH	: CH01～12 (All group)
Input	Input type	: ±10V			
Scaling	Scaling	: ON	Graph display	Horizontal trend	: ON
	Meas. range(L)	: -10.00		Vertical trend	: ON
	Meas. range(H)	: 10.00		Bar graph	: ON
	Scale range(L)	: 0.00		Digital display	: ON
	Scale range(H)	: 100.00			
	Decimal point	: 2	Auto display	Auto display	: OFF
	Unit	: %		Change cycle	: 5sec
Display	TAG	: TAGnn (nn=ch)	·Record		
	Description	: Blank	Setting(Main)	Record cycle	: 1sec
	Display color	: Purple(CH01)		File rec cycle	: 1hour
		: Red(CH02)		File overwrite	: OFF
		: Green(CH03)			
			Setting(Sub)	Sub rec cycle	: 100ms
Scale	Range of scale(L)	: 0.00		Sub pre rec	: OFF
	Range of scale(H)	: 100.00		Sub rec timing	: OFF
	Scale No.	: No.1			
	Partitions	: 4	Schedule	Schedule	: OFF
				Start time	: 00:00:00
Alarm value	Act.	: OFF		End time	: 00:00:00
	OUT	: OFF		A day of the week	: All release
	Value	: L1 100.00			
		: L2 100.00	·Others		
		: L3 0.00	Unit	Unit	: Blank
		: L4 0.00			
			Message	Message	: Blank
Alarm action	Hysteresis(%)	: 0.5		Timing	: OFF
	Alarm delay(sec)	: 0	DI	Function	: OFF
			Progress time	Progress time	: OFF
REC/CALC	Input filter	: 0		Condition	: Record
	Record type	: Instant value (CH01～12)	ProductsDisplay	Products Display	: ON
		: OFF(CH13～48)		Information No.	: No.1～8
	Offset	: 0.00		Title	: Model (No.1)
	Gain (%)	: 100.00			: Batch (No.2)
					: Serial (No.3)
·Calc. CH					: Operator (No.4)
F value	Reference temp.	: 0.0			: Note1 (No.5)
	Z value	: 0.0			: Note2 (No.6)
	Start temp.	: 0.0			: Note3 (No.7)
					: Note4 (No.8)
Timer	T1 timer(sec)	: 1		Display	: No.1～8;ON
	T2 timer(min)	: 1			
·Display			Int. SP DO	Int. SP DO	: No.201～220
Group name	Display name	: DISP_GRP_1		Output relay	: All OFF
		: DISP_GRP_2			
		: DISP_GRP_3			
		: DISP_GRP_4			
		: DISP_GRP_5			
		: DISP_GRP_6			
		: DISP_GRP_SUB			
	TAG disp set	: Channel No.			
	Display	: ON (Group1, SUB)			
		: OFF(Group2～6)			

7.29 Using the wizard function

[Explanation]

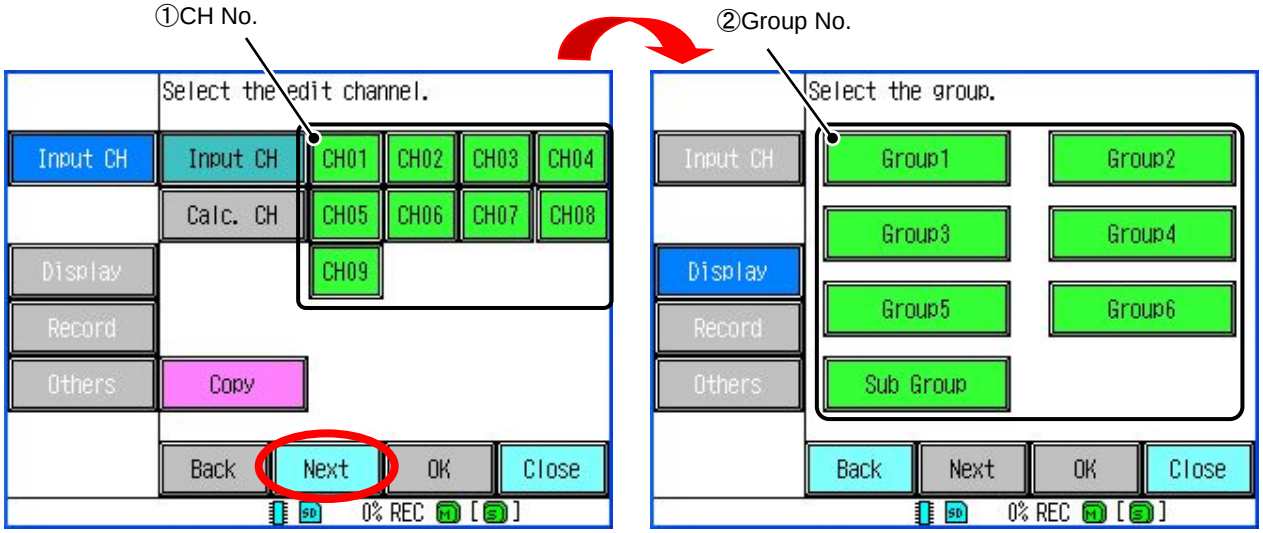
Necessary minimum set item can continuously be set by using the wizard function.

Moreover, when the Mode of the System is only “Normal”, this item is displayed. (Refer to Section 7.1 for Mode key.)

Note: When the recorder is in recording, the wizard function cannot be used.

[Operation]

Select the Others key ⇒ Wizard key on the Parameter.



① CH No.

When “①CH No.” is selected, the “Input setting screen” is displayed.

Moreover, it is possible to switch to “Input setting screen”, “Scaling setting screen”, and “Scale setting screen” by selecting Back and Next key touching.

(Refer to Section 7.5 ～ 7.8 for each setting screen.)

When OK key to the “Scale setting screen” is selected touching, the setting is end.

Moreover, the “copy screen of the channel” is displayed when the Copy key is selected.

(Refer to Section 7.12 for “Copy screen of the channel”.)

② Group No.

When Next key is selected on the “CH No. selection screen” (above figure the left), the “group No. selection screen” (above figure the right) is displayed.

When “②Group No.” is selected, the “Group name setting screen” is displayed.

Moreover, it is possible to switch to “Group name setting screen”, “Group channel setting screen”, and “Graph display setting screen” by selecting Back and Next key touching.

(Refer to Section 7.15 ～ 7.17 for each setting screen.)

When OK key to the “Graph display setting screen” is selected touching, the setting is end.

7.30 “Input CH” list

[Explanation]

Various settings concerning the input channel are done. Refer to Section 7.5 ～ 7.12 for details.

[Reference]

When the operational mode is only an advanced mode, the item that “○” is attached to “Advanced” is displayed. Refer to Section 7.1 for “Mode”.

There are setting and item not displayed according to the number of input channels and set of the other content.

An item not revocable is displayed in the gray.

[Input]

Item	Setting contents	Advanced
Channel	Select the channel number.	
Input type	Set the input type.	
Burnout	Select the Burn Out function when the input kind is “mV” and “TC”	
RJC	Select the RJC function. ※1	○
RJC Channel	Select the RJC channel. ※2	○

※1 RJC can only be displayed when the input type is “TC”.

※2 RJC Channel can only be displayed when the “RJC” is “Assignment channel”.

[Scaling]

Item	Setting contents	Advanced
Channel	Select the channel number.	
Scaling	Set the scaling and square rooter. ※1	
Range	Input the value of range. ※2	
Ind. Value	Input the Ind. value. ※2	
Ind. value DP	Set the Ind. value DP. ※2	
Unit	Set the unit. ※2 It is possible to select it from unit prepared beforehand or the unit that sets the user.	

※1 Scaling can only be displayed when the input type is “DC voltage” or “DC current”.

※2 These items can only be displayed when the “Scaling” is “ON” or “Square root ON”.

[Display]

Item	Setting contents	Advanced
Channel	Select the channel number.	
TAG	Input the TAG. Tag can display it instead of the channel. Display the channel operation screen for item 6.1-⑧.	
Description	Set the comment for input channel.	
Display color	Select the display color. The colors that can be selected are 16 colors.	

［Scale］

Item	Setting contents	Advanced
Channel	Select the channel number.	
Range of scale	Input the range of scale.	
Scale No.	Set the scale No.	
Partitions	Input the value of partitions. When “0” is input, it displays it according to the scale display automatically.	○

［Alarm value］

Item	Setting contents	Advanced
Channel	Select the channel number.	
Act.	Select the action type.	
OUT	Select the DO number.	
Value	Input the alarm value. ※	

※ Value cannot be set when the “Act.” is “Fault”

※ When you select warning kind of “Fault”, warning is generated at “H over”, “L over”, “Burnout”, “Invalid value”, and “abnormal input” etc.

［Alarm action］

Item	Setting contents	Advanced
Channel	Select the channel number.	○
Hysteresis (%)	Input the value of Hysteresis.	○
Alarm delay(sec)	Input the value of Alarm delay.	○

［REC/CALC］

Item	Setting contents	Advanced
Channel	Select the channel number.	
Input filter	Input the value of Input filter (the first order lag filter).	
Record type	Select the Record type. ※	
Offset	Input the value of Offset.	
Gain (%)	Input the value of Gain.	

※ When the record type is “off”, neither the record nor the historical trend display to the SD card are done.

［Copy］

Item	Setting contents	Advanced
Source CH	Select the copy source channel number.	
Destination CH	Select the copy destination channel number. (Plurals can be selected.)	

7.31 “Calc. CH” list

[Explanation]

Various settings concerning the calc. channel are done. Refer to Section 7.5 ～ 7.14 for details.

The operational expression and the more details setting of the operation channel can be set with the parameter loader software. Setting it with the main body of the recorder becomes only the part. Please refer the “PARAMETER LOADER INSTRUCTION MANUAL” for details.

[F value]

Item	Setting contents	Advanced
Reference temp.	Input the value of Reference temp.	○
Z value	Input the Z value.	○
Start temp.	Input the value of start temp.	○
Manual reset	Start the Manual reset.	○

[Timer]

Item	Setting contents	Advanced
T1 timer(sec)	Input the value of T1 timer.	○
T2 timer(min)	Input the value of T2 timer.	○

[Display]

Item	Setting contents	Advanced
Channel	Select the channel number.	○
TAG	Input the TAG. Tag can display it instead of the channel. Display the channel operation screen for item 6.1-⑧.	○
Description	Set the comment for input channel.	○
Display color	Select the display color. The colors that can be selected are 16 colors.	○

[Scale]

Item	Setting contents	Advanced
Channel	Select the channel number.	○
Range of scale	Input the range of scale.	○
Scale No.	Set the scale No.	○
Partitions	Input the value of partitions. When “0” is input, it displays it according to the scale display automatically.	○

[Alarm value]

Item	Setting contents	Advanced
Channel	Select the channel number.	○
Act.	Select the action type.	○
OUT	Select the DO number.	○
Value	Input the alarm value. ※	○

※ Value cannot be set when the “Act.” is “Fault”

※ When you select warning kind of “Fault”, warning is generated at “H over”, “L over”, “Burnout”, “Invalid value”, and “abnormal input” etc.

［Alarm action］

Item	Setting contents	Advanced
Channel	Select the channel number.	○
Hysteresis (%)	Input the value of Hysteresis.	○
Alarm Delay(sec)	Input the value of Alarm delay.	○

［REC/CALC］

Item	Setting contents	Advanced
Channel	Select the channel number.	○
Input filter	Input the value of Input filter (the first order lag filter).	○
Record type	Select the Record type.	○
Offset	Input the value of Offset.	○
Gain (%)	Input the value of Gain.	○

［Copy］

Item	Setting contents	Advanced
Source CH	Select the copy source channel number.	○
Destination CH	Select the copy destination channel number. (Plurals can be selected.)	○

7.32 “Display” list

［Explanation］

In the “Display”, it is possible to set it variously concerning the display of the measuring data.

Refer to Section 7.15 ～ 7.18 for details.

［Group name］

Item	Setting contents	Advanced
Group	Select the group number.	
Display name	Set the display name.	
TAG disp set	Select the TAG display set.	
Display	Select the display “ON”, “OFF”. ※	

※ Display cannot be set when the “Group” is “Group1” and “Sub Group”.

［Group CH］

Item	Setting contents	Advanced
Group	Select the group number.	
Chanel No.	The selected part is brightly, and an arbitrary channel can be set. Only the registered channel is recorded in the sub record.	

［Graph display］

Item	Setting contents	Advanced
Group	Select the group number.	
Horizontal trend	The Horizontal trend display is “ON” and “OFF” is selected.	
Vertical trend	The Vertical trend display is “ON” and “OFF” is selected.	
Bar graph	The Bar graph display is “ON” and “OFF” is selected.	
Digital display	The Digital display is “ON” and “OFF” is selected.	

［Auto change］

Item	Setting contents	Advanced
Auto disp change	ON/OFF of a auto display function is chosen.	○
Change cycle	The cycle which switches a display group is chosen from "5 sec", "10 sec", "15 sec", "30 sec", and "60 sec".	○

7.33 “Record” list

[Explanation]

In the record setting, it is possible to set it variously concerning the record of the measuring data.
Refer to Section 7.19 ～ 7.21 for details.

[Setting(Main)]

Item	Setting contents	Advanced
Record Cycle	Select the record cycle.	
File rec cycle	Select the file rec cycle. ※1	
File overwrite	Select the file overwrite function, when SD card memory full. ※2	

※1 The range that can be selected by the item at the record cycle changes.
“100 ms” cannot be selected by the main record.

Selectable range with version less than 2.00

Record cycle	Selectable file record cycle
1sec to 5sec	1hour
10sec to 1min	1hour,1day
2min to 3min	1hour,1day,1week
5min to 30min	1hour,1day,1week,1month
60min	1hour,1day,1week,1month,1year

Selectable range in version 2.00 or later

Record cycle	Selectable file record cycle
1sec to 5sec	1hour,1day
10sec to 20sec	1hour,1day,1week
30sec to 5min	1hour,1day,1week,1month
10min to 60min	1hour,1day,1week,1month,1year

※2 Old data is deleted and operation is set when select the “ON”.
The record operation is stopped when the amount of the memory remainder is lost when select the “OFF”.

[Setting(Sub)]

Item	Setting contents	Advanced
Sub rec cycle	Select the Sub record cycle.	○
Sub pre rec	Select the Sub pre record.	○
Sub rec timing	Select the Sub record timing. ※1	○
DI No.	Select the DI number. ※2	○

※1 Func key can only be set when the “FUNC key” of “Device/Other” is “OFF”.
※2 “DI No.” can only be displayed when the “Sub rec timing” is “DI”.

・About the file record cycle of sub record.
As for the sub record, the file record cycle is automatically set by the record cycle. It is not possible to select it.

Record cycle	File record cycle
100mm sec	10min
1～30sec	1hour
1～60min	1day

[Schedule]

Item	Setting contents	Advanced
Schedule	Select the schedule.	○
Start time	Input the value of start time.	○
End time	Input the value of end time.	○
Select week	Select the week. (Plurals can be selected.)	○

7.34 “Others” list

[Explanation]

Various settings concerning the others are done. Refer to Section 7.22 ～ 7.29 for details.

[Unit]

Item	Setting contents	Advanced
Unit	The edit display of new unit can be moved by touching “Add”.	

[Message]

Item	Setting contents	Advanced
Message No.	Select the Message number.	○
Message	Input the Message.	○
Timing	Select the timing of message is displayed.	○
Channel No.	Select the channel number. ※1	○
Alarm No.	Select the alarm number. ※1	○
DI No.	Select the DI number. ※2	○

※1 This item can only be displayed when the “Timing” is “Alarm occurred” or “Alarm cleared”.

※2 “DI No.” can only be displayed when the “Timing” is “DI ON” or “DI OFF”.

[DI]

Item	Setting contents	Advanced
DI No.	Select the DI number.	○
Function	Select the DI function.	○

[Progress time]

Item	Setting contents	Advanced
Progress time	ON/OFF of a progress time display is chosen.	○
Condition	The conditions which start or stop the count of progress time are chosen.	○
Channel No.	Select the CH number.	○
Alarm No.	Select the alarm number. ※1	○
DI No.	Select the DI number. ※2	○

※1 This item can only be displayed when the “Condition” is “Alarm”.

※2 “DI No.” can only be displayed when the “Condition” is “DI”.

[ProductsDisplay]

Item	Setting contents	Advanced
Products Display	Select to display all “production information”	○
Information No.	Select to set information No.	○
Title	Select to set title of “production information”.	○
Display	Select to display “production information” of Information No.	○

[Int. SP DO]

Item	Setting contents	Advanced
Int. SP DO	Select function of “Int. SP DO”.	○
Output relay	Select the output relay or DO.	○

［Param initial］

Item	Setting contents	Advanced
Param initial	Initialize the parameter.	

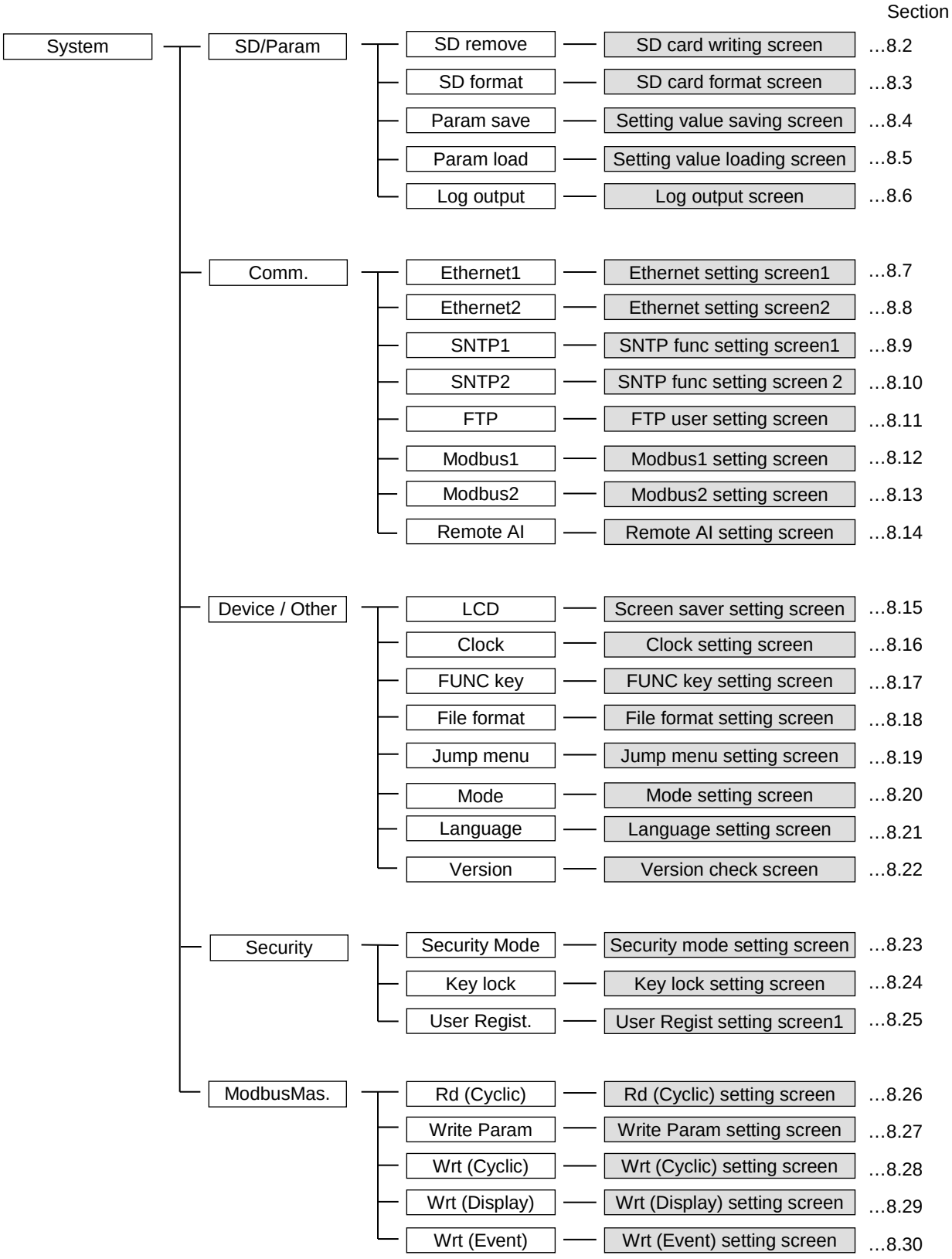
［Wizard］

Item	Setting contents	Advanced
Wizard	An at least necessary set item can continuously be set to each channel.	※

※ Wizard can only be displayed when the “Mode” is “Normal”.

8. SETTING AND CHECKING SYSTEMS

8.1 Outline of system setting procedure



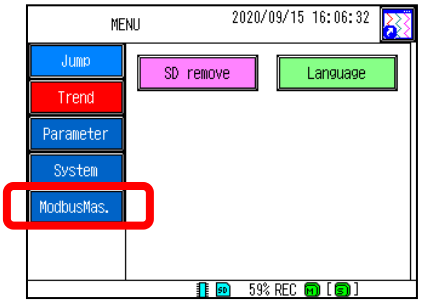
(*) Displayed only when "Master (General)" is selected

MENU Button

ModbusMas. — Read (Cyclic) Status — Read (Cyclic) Status display …8.32項

ModbusMas. — Write(Cyclic) Status — Write (Cyclic) Status display …8.33項

ModbusMas. — Write Operation — Button Write Screen …8.34項

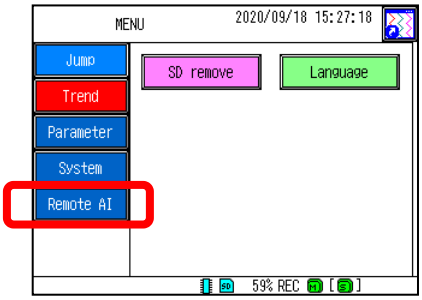


(*) : It is displayed only when "Comm. Type" is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)" in Modbus2.

(*) Displayed only when “Master (Rem. AI)” is selected

MENU Button

Remote AI — Remote AI Status — Remote AI Status display …8.35項



(*) : It is displayed only when "Comm. Type" is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (Rem. AI)" in Modbus2.

8.2 Remove the SD card

[Explanation]

When this operation is performed, the recording is ended and a new recording is started without missing measurements.

Use this when you want to see the current record immediately.

⚠ [Caution]

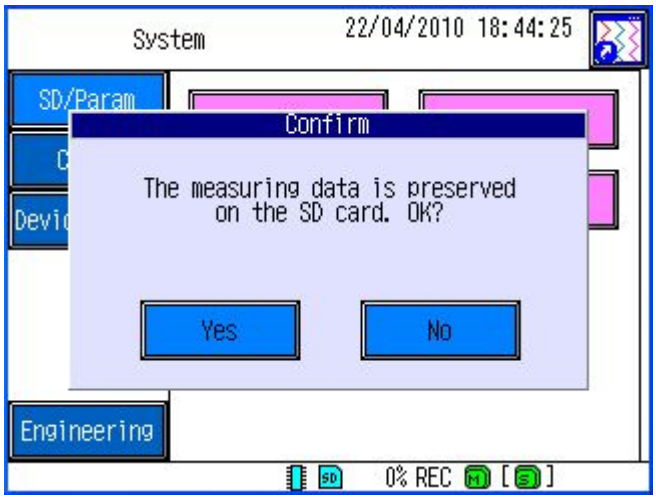
-The recorded data output by this operation and the data currently being recorded cannot be combined.

- This operation is not required when recording is stopped.
- If you only remove the SD card, you do not need to perform this operation.

(* Do not remove the SD card while outputting data.)

[Operation]

Select the SD/Param key ⇒ SD remove key on the System. Moreover, the SD remove key can be selected directly from the MENU.



8.3 Format the SD card

［Explanation］

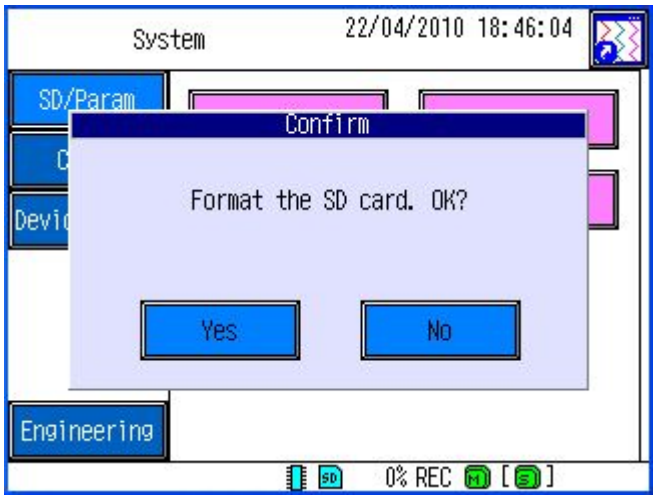
The data of the SD card is formatted.

※ When selecting SD format key with the SD card has not been inserted in the recorder, the error message is displayed. Please select again after inserting the SD card in the recorder.

Note: When the recorder is in recording, the SD card cannot be formatted.

［Operation］

Select the SD/Param key ⇒ SD format key on the System.



8.4 Save the set value

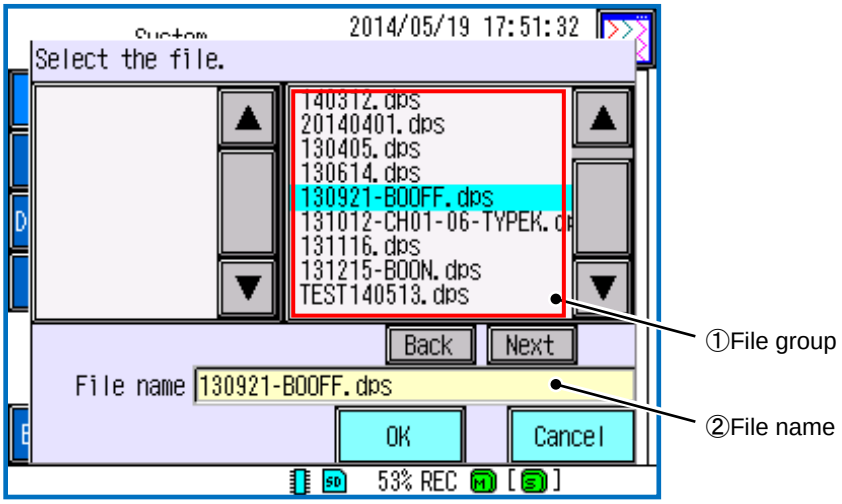
[Explanation]

A set value is preserved on the SD card.

※ When selecting Param save key with the SD card has not been inserted in the recorder, the error message is displayed. Please select again after inserting the SD card in the recorder.

[Operation]

Select the SD/Param key ⇒ Param save key on the System.



① File group

The set value file saved before is displayed by the list.

Files can be displayed up to 100 at a time. Please switch the page by Back and Next key, when there is a file any more.

② File name

The character input screen can be displayed by selects “②File name” touching.

Input an arbitrary file name, and a set value can be newly preserved with the OK key.

※ When the file of same name in “①File group”, the file is overwrite saved. (The confirmation screen is displayed.)

Moreover, (.dps) adheres automatically behind the preserved file name, and it is saved in the “Prm” folder of the SD card. (Refer to Section 10.17 for “Prm” folder.)

8.5 Load the set value

[Explanation]

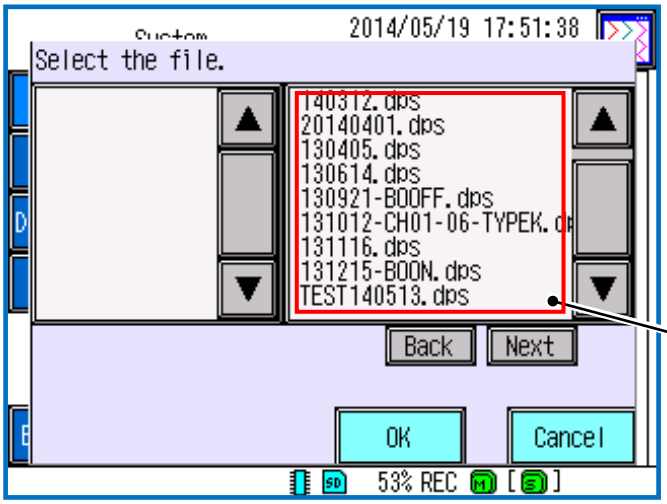
The set value preserved in the past is read from the SD card.

※ When selecting Param load key with the SD card has not been inserted in the recorder, the error message is displayed. Please select again after inserting the SD card in the recorder.

Note: When the recorder is in recording, the set value cannot be loaded.

[Operation]

Select the SD/Param key ⇒ Param load key on the System.



① File group

The set value file saved before is displayed by the list.

Files can be displayed up to 100 at a time. Please switch the page by Back and Next key, when there is a file any more.

The file is selected touching, and a set value is read with the OK key. (The selected item is displayed in aqua.)

※ Only the setting data that exists in “Prm” folder of the SD card can be read.
(Refer to Section 10.17 for “Prm” folder.)

8.6 Output log

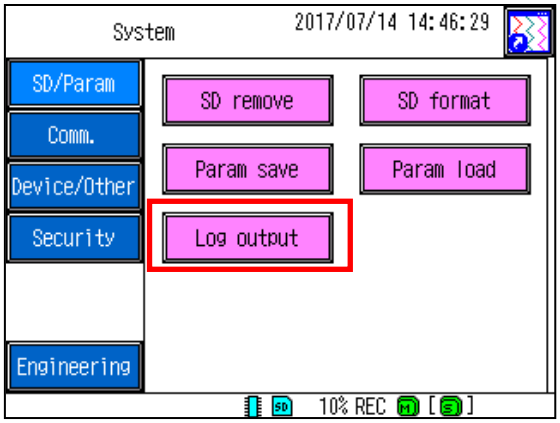
[Explanation]

Output log to SD card. (It supports since recorder version 2.00.)

* If you select without inserting an SD card in the recorder, an error message will be displayed. Please insert the SD card in the recorder and select again.

[Operation]

Select the SD/Param key ⇒ Log output key on the System.



[Output destination]

A log is output to the folder called "Prm_YYMMDD_hhmmss" in the "Recorder" folder on the SD card. The folder name is the time when the log was output.

Prm_YYMMDD_hhmmss : YY(year), MM(month), DD(day), hh(hour), mm(minute), ss(second)

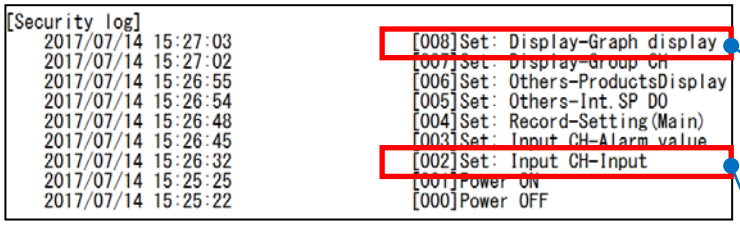
For various logs, refer to Sections 6.6 and 6.7.

[Output file]

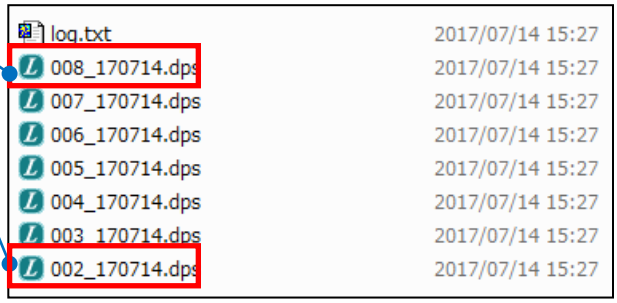
・A text file (file name: log.txt) to which eventlog, communication log, security log is input.
The contents displayed in the log display are output as a text file.

・Parameter log file（File name: nnn_YYMMDD; nnn(Security log number),YY(year), MM(month), DD(day)）
It is a parameter file linkedto the operation log recorded in the security log.
It is generated at the timing when the OK key of Input in Input CH is touched.
The parameter file is outputted in a form linked to the security log number as shown below. The parameter file can be confirmed with the Parameter Loader. For the parameter log file, refer to Section 10.19.

Security log contents in log.txt



Prm_YYMMDD_hhmmss



8.7 Setting the IP address

[Explanation]

IP address etc. necessary for Ethernet are set.

The following can be done by setting “Ethernet and FTP”.

- The record file preserved on the SD card of the recorder can be downloaded directly to the personal computer by using the Viewer software of the attachment. (Network download)
- Realtime trend can be displayed by using the Viewer software of the attachment.

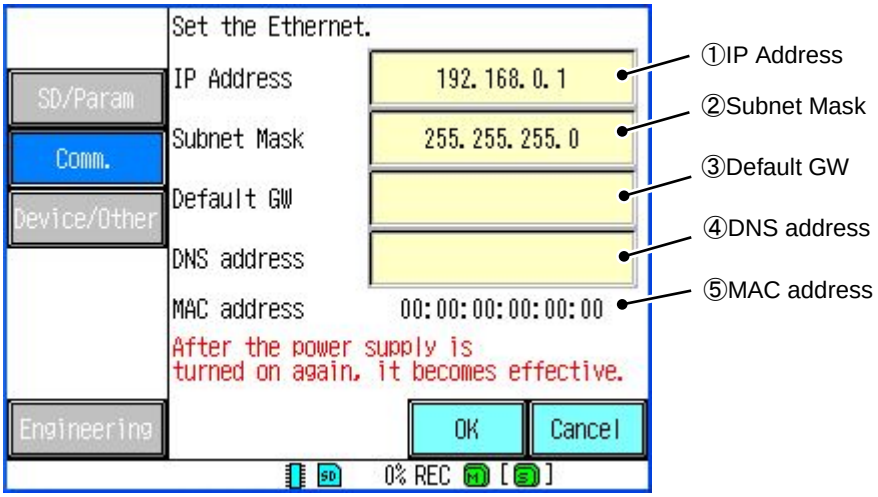
※ It is necessary to change the content of “Realtime trend setting” and “FTP setting” of the Viewer software to use “Network download” and “Realtime trend display function”.

(Refer to Section 5.3 ～ 5.4 of “DATA VIEWER INSTRUCTION MANUAL” for details.)

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Comm. key ⇒ Ethernet1 key on the System.



① IP Address

IP address of the main body is set.

Please input an arbitrary IP address from the numeric input screen, and set it with the OK key.

② Subnet Mask

The Subnet Mask is set.

Please input an arbitrary Subnet Mask from the numeric input screen, and set it with the OK key.

③ Default GW

The Default GW is set.

Please input an arbitrary Default GW from the numeric input screen, and set it with the OK key.

④ DNS address

The DNS address is set.

Please input an arbitrary DNS address from the numeric input screen, and set it with the OK key.

⑤ MAC address

The allocated MAC address of each recorder is displayed.

Please input an arbitrary MAC address from the numeric input screen, and set it with the OK key.

• Example of setting IP Address

The Ethernet setting screen (above figure) is displayed.

Input an arbitrary numerical value to “IP Address” and “Subnet Mask”.

(In this case, IP address is set to “192.168.0.1”, and the Subnet Mask is set to “255.255.255.0”.)

Input an arbitrary numerical value to “Default GW” and “DNS address”.

(The Default GW and the DNS address can be omitted.)

The setting is preserved with an OK key. (After the power supply is turned on again, it becomes effective.)

※ Please inquire of the network administrator before setting “IP Address”, “Subnet mask” and “Default gateway”, “DNS server address”. The trouble might occur in the network when the setting is not correct.

8.8 Setting the keep alive function

[Explanation]

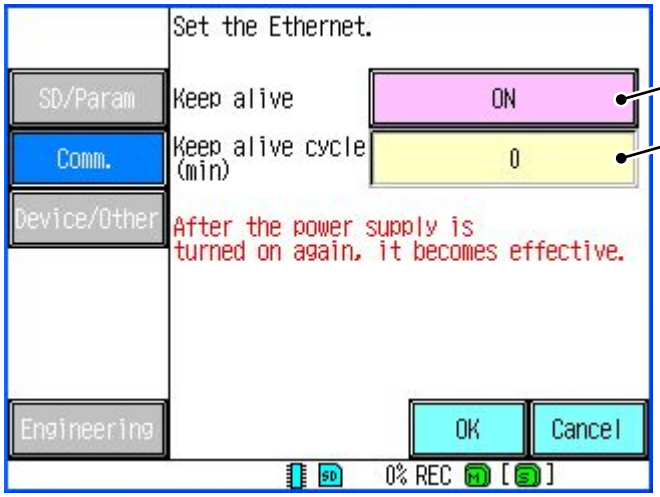
It is regularly confirmed whether the network is connected by setting “Keep alive function”.

Moreover, the cycle when “Keep alive function” is executed is set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Comm. key ⇒ Ethernet2 key on the System.



① Keep alive function

ON/OFF of “Keep alive function” is selected.

② Keep alive cycle

The “Keep alive cycle” is set. (1 to 240 min)

Please input an arbitrary “Keep alive cycle” from the numeric input screen, and set it with the OK key. (After the power supply is turned on again, it becomes effective.)

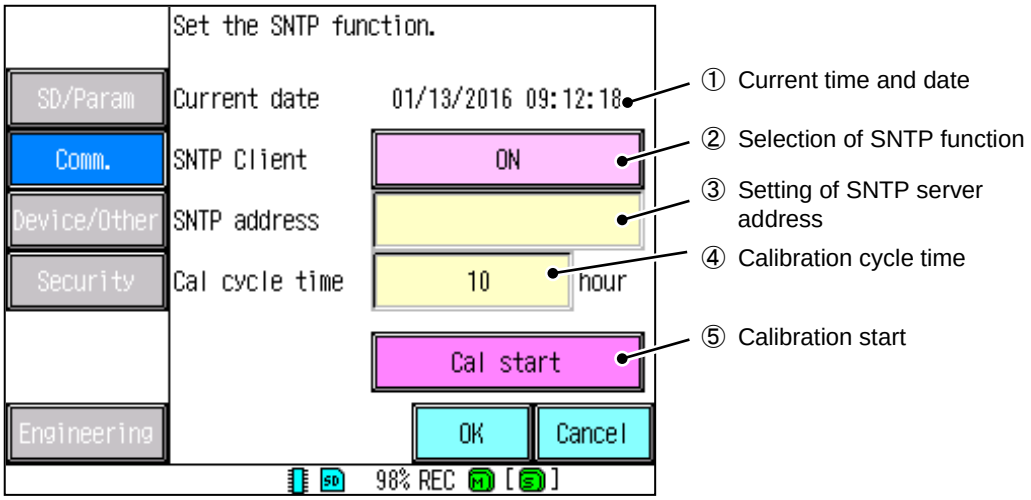
8.9 Setting the SNTP client function

[Description]

Use the SNTP client function to receive the time data from the time server on a regular basis to correct the recorder's time.

[Operation]

On the system setting screen, select Comm. key ⇒ SNTP1 key to open the SNTP function setting screen.



① Current time and date

Displays the current time and date.

② Selection of SNTP client function

Select ON/OFF of the SNTP client function.

ON: Receives the time data from the SNTP server and calibrates the time.

OFF: The SNTP function is not used.

When the correction of the time is attempted using the SNTP function during the recording process, the correction is not performed if there is a difference of ±5 minutes or more from the current time. If the difference is 5 minutes or less, the correction is performed by reducing the difference little by little so that the time approaches the current time.

③ Setting of SNTP server address

Set the SNTP server address.

Input a SNTP server address on the character input screen, and then touch the OK key to set it.

④ Calibration cycle time

Set the time calibration cycle for the SNTP server. (1 to 200 hours)

Input a time calibration cycle on the numerical value input screen and touch the OK key to set it.

⑤ Calibration start

By touching and selecting the key for ⑤" Calibration start ", the time calibration starts immediately regardless of the setting in ④"Calibration cycle time".

Note) During the recording process, manual calibration cannot be implemented.

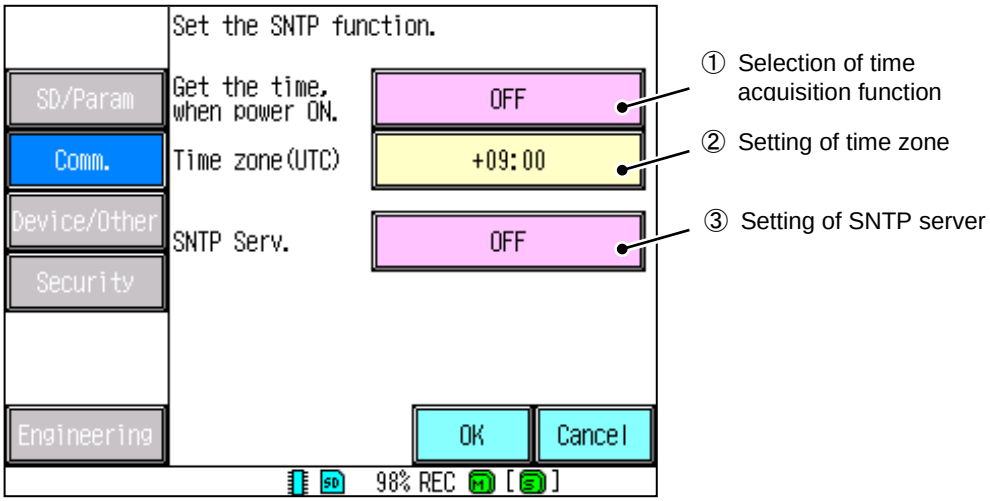
8.10 Setting the time zone and SNTP server function

[Description]

Set the time acquisition function ON/OFF and the time zone (standard time).

[Operation]

On the system setting screen, select Comm. key ⇒ SNTP2 key to open the SNTP function setting screen.



① Selection of time acquisition function

When turning on the power supply, select ON/OFF of the function for acquiring the data from the SNTP server.

(Enabled only when the SNTP function is turned ON. For details about the SNTP function, refer section 8.9)

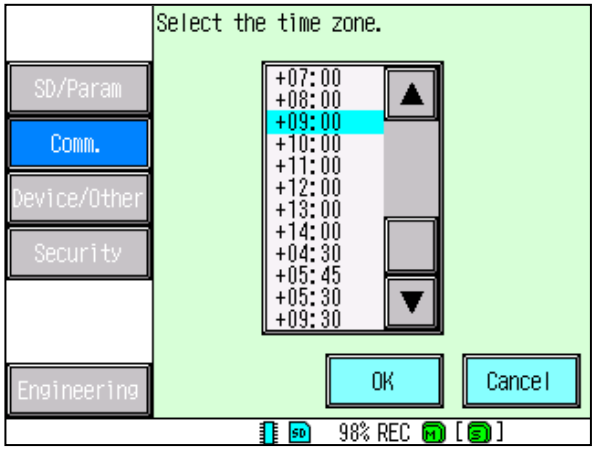
If the power supply is turned on when On is set, the recording process will not be started until the time data is acquired.

② Setting of time zone

Set the time zone (standard time).

By touching and selecting the key for (2) "Setting of time zone", the time zone selection screen (See below) is opened.

Touch and select a time, and then touch the OK key to set it. (The selected item is indicated in light blue.)



③ Setting of SNTP server

Select ON/OFF of the SNTP server function. (Supported in the main unit version 1.60 or later)

8.11 Setting the FTP user

[Explanation]

The FTP user's making, the edit, and the deletion, etc. are operated.

The following can be done by setting “Ethernet and FTP”.

- The record file preserved on the SD card of the recorder can be downloaded directly to the personal computer by using the Viewer software of the attachment. (Network download)
- Realtime trend can be displayed by using the Viewer software of the attachment.

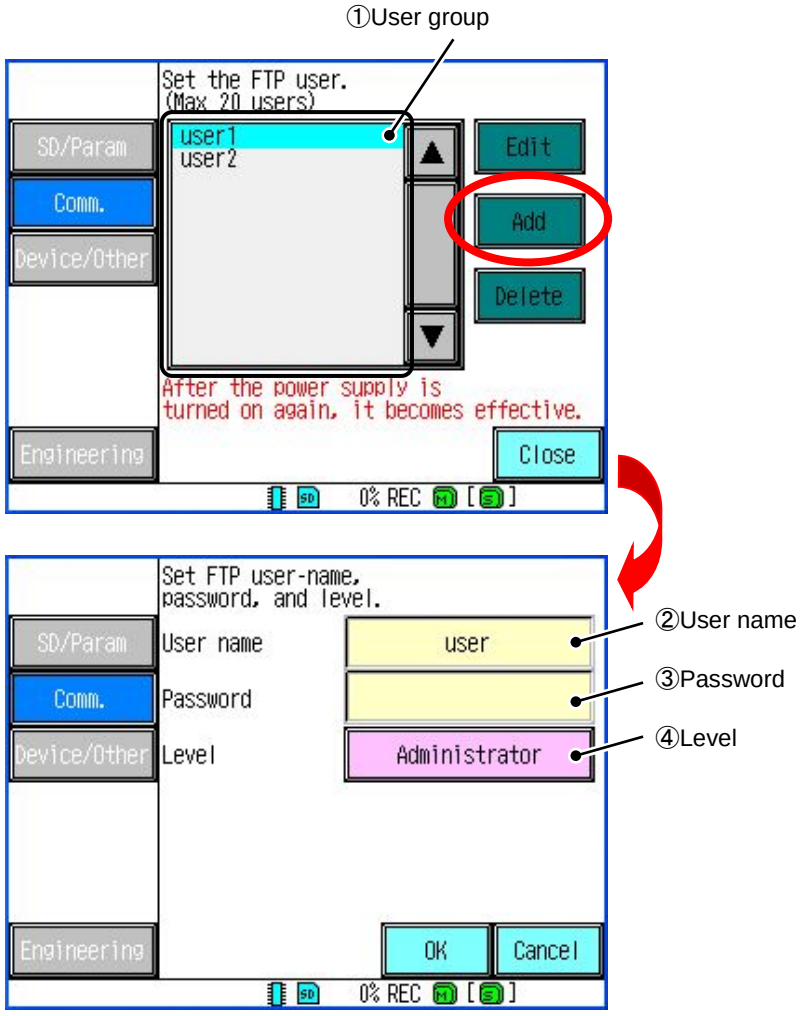
※ It is necessary to change the content of “Realtime trend setting” and “FTP setting” of the Viewer software to use “Network download” and “Realtime trend display function”.

(Refer to Section 5.3 ～ 5.4 of “DATA VIEWER INSTRUCTION MANUAL” for details.)

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Comm. key ⇒ FTP key on the System.



① User group

The made user is displayed by the list.

Please select the arbitrary user from “①User group” to edit and deletion the user, and select the edit or the delete key. (The selected item is displayed in aqua.)

② User name

When an Add key is selected, the FTP user setting screen (above figure) is displayed.

Please input an arbitrary user name from the character input screen, and set it with the OK key.

③ Password

The password is set to the made user name.

(The space character cannot be used for the password. Moreover, the password can be omitted.)

④ Level

The access when the level of the user who made it is set, and general FTP client software is used is limited.

Administrator	:	The file on the SD card can be read, write, and delete.
User	:	Only reading the file on the SD card (download) can be done.

- Example of setting FTP

The FTP setting screen (above figure) is displayed.

An add key is selected, the FTP user setting screen displays, and each item is input arbitrarily.

(In this case, user name is set to “user”, and the password is omitted.)

The level is selected. (In this case, level is set to “Administrator”.)

The setting is preserved with an OK key. (After the power supply is turned on again, it becomes effective.)

8.12 Setting Modbus1 (RS485 communication setting, timeout, etc.)

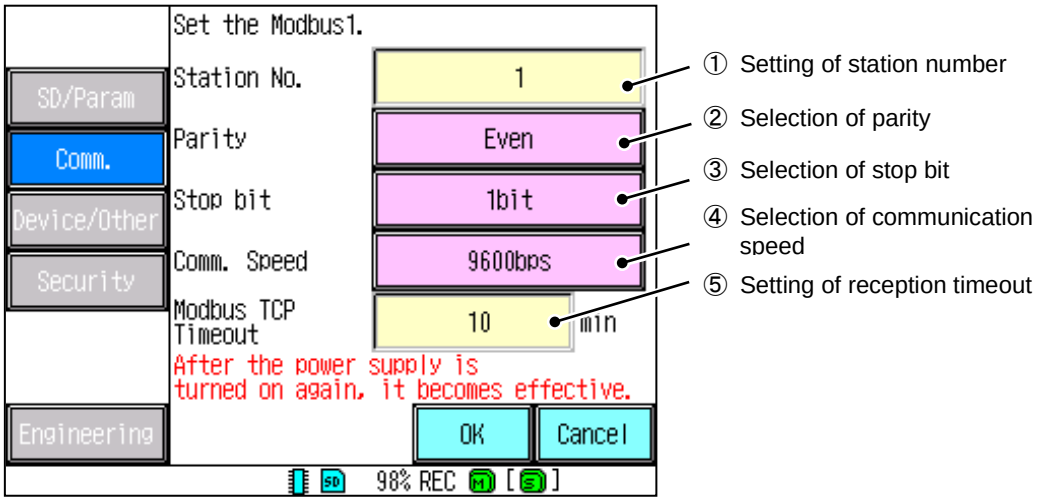
[Description]

Set the Modbus station number, reception timeout function, parity, stop bit and communication speed.

Note) No settings can be changed during the recording process. The power must be turned on again for this setting to take effect.

[Operation]

On the system setting screen, select Comm. key ⇒ Modbus1 key to open the Modbus1 setting screen.



① Setting of station number

Set the device address (station number). (0 to 247)

Input a station number on the numerical value input screen and then touch the OK key to set it.

Communications do not occur if "0" is input.

(Enabled only if the RS-485 option is implemented)

② Parity

Select "Even", "Odd" or "None" as the parity of ModbusRTU.

(Enabled only if the RS-485 option is implemented)

③ Stop bit

Select "1bit" or "2bit" as the stop bit of ModbusRTU.

(Enabled only if the RS-485 option is implemented)

④ Selection of communication speed

Select "9600bps", "19200bps" or "38400bps" as the communication speed of ModbusRTU.

(Enabled only if the RS-485 option is implemented)

⑤ Setting of reception timeout

Set the reception timeout for the TCP communication. (1 to 240 minutes)

Input a timeout period on the numerical value input screen and touch the OK key to set it.

8.13 Setting Modbus2 (communication type)

[Description]

Set the Modbus communication type and master/slave operations. The setting items vary depending on the communication types and “Master/Slave” settings.

To set the Modbus master, perform the following operations.

-Set the operation mode setting to "advanced" in "Operation mode" in Section 8.20.

→By setting to “Advanced” , all setting items will be displayed.

-In "Engineering" in Section 8.41, enter "REMOTE" as the password and enable remote AI.

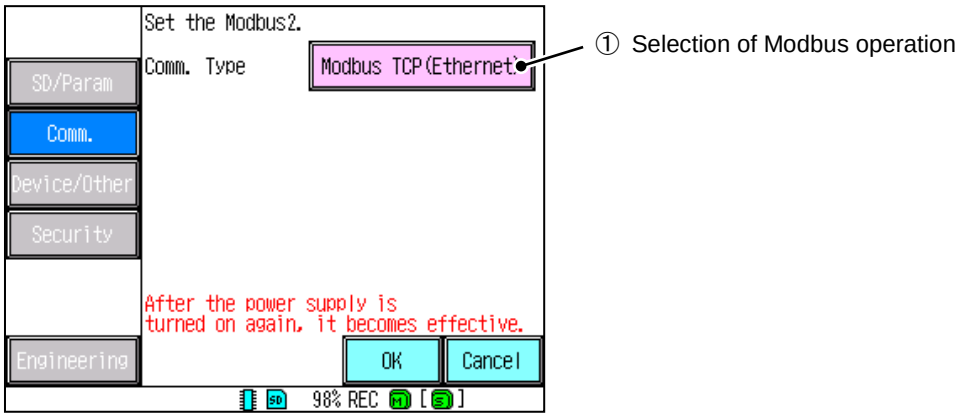
→ By enabling remote AI, the following setting items ② to ⑤ will be displayed and can be set.

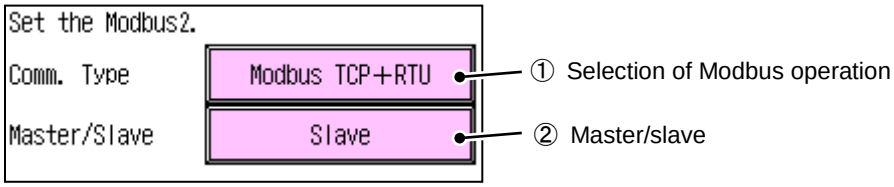
For details about the master functions, see the COMMUNICATION FUNCTION OPERATION MANUAL.

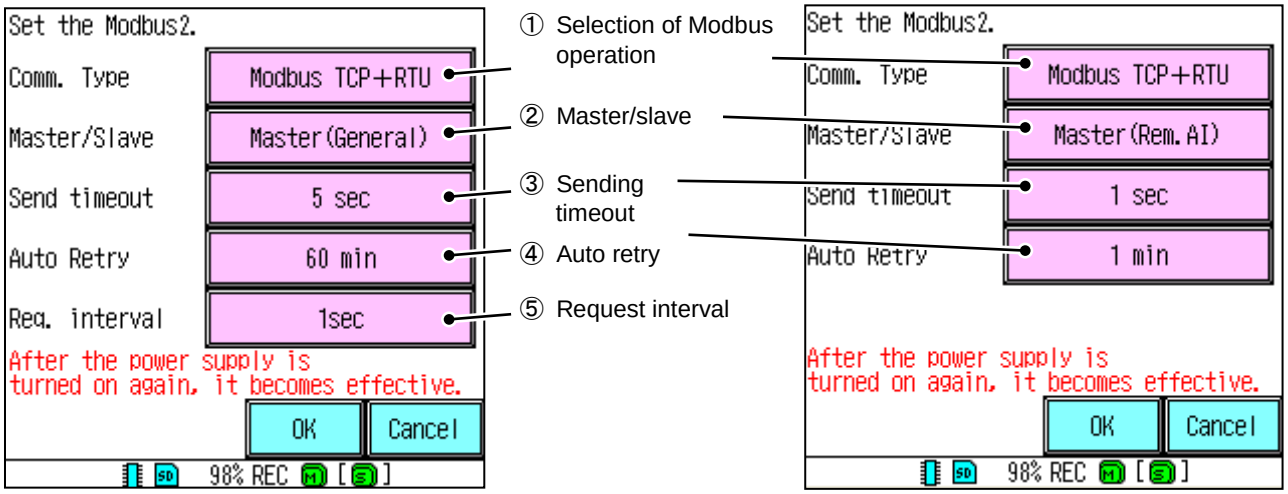
Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select Comm. key ⇒ Modbus2 key to open the Modbus2 setting screen.







① Selection of Modbus operation (* When changing the settings, turn on the power again.)

Select the Modbus operation.

Modbus TCP (Ethernet): Modbus TCP is used for communication protocols.
Only the slave can be selected for the operation.

Modbus TCP+RTU: Add RS-485 to the available communication protocols.
(Enabled only if the RS-485 option is implemented)
For this setting, additionally set the operation on the ModbusRTU side.

② Master/slave (* When changing the settings, turn on the power again.)

Set the ModbusRTU operation mode. This setting is possible only if the communication type is "ModbusTCP+RTU".

Slave: Works as the Modbus slave.

Master (General): Works as the Modbus master and reads or writes values from the general-purpose ModbusRTU device.

Master (Rem. AI): Works as the Modbus master and acquires the value from the separately-sold remote AI.

③ Sending timeout

Set the timeout period for when the master is running. (1, 5 and 10 seconds)

If "no response" state after the elapse of the timeout occurs 3 times, disconnect the target slave devices from the connected network.

④ Auto retry

Set the interval for attempting to reconnect with slave devices if connections with slave devices are lost while the master is running.

(1 minute, 5 minutes, 10 minutes, 30 minutes, 60 minutes and none)

Auto retry is not carried out if "None" is set.

Note) Generally, retrieval cannot be carried out while auto retry is being attempted. If the interval time for auto retry is too short, the retrieval cycle of other slave devices may be affected

⑤ Request interval

Set the interval for communicating with slave devices while the Master (Genera) is working. (1 second, 2 seconds, 5 seconds and 10 seconds)

"1 second" is a standard time. If the responses from the slave devices are slow or 1 second is insufficient due to a huge amount of the acquired data, the time for the interval can be extended.

This setting is used when using Rd (Cyclic) and Wrt (Cyclic).

8.14 Setting the remote AI.

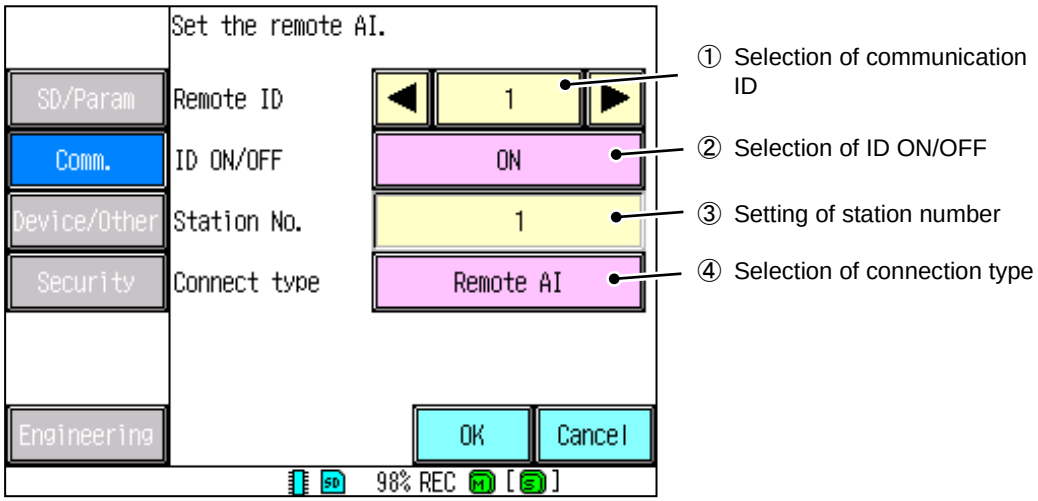
[Description]

With this device as the Modbus master, perform the settings for connecting with a separately-sold remote AI. This is used when the Master (Remote AI) is set for the communication type in section 8.13. For the specifications of the separately-sold remote AI, see the REMOTE AI INSTRUCTION MANUAL.

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select Comm. key ⇒ Remote AI key to open the remote AI setting screen.



① Selection of remote ID

A maximum of 6 remote AI units (or recorders) can be connected under the Modbus master. Select the ID for connection.

② Selection of ID ON/OFF

Set whether ID is used or not. If ON is set, the ID is used to connect with the remote AI.

③ Setting of station number (slave ID).

Set the remote AI's station number. (0 to 247)

"0" refers to "Not connected". If the ID is 0, data acquisition is not carried out.

④ Connection type

Select the device to be connected. Select the remote AI or recorder (this device).

For the recorder, select the channel for acquisition, as well.

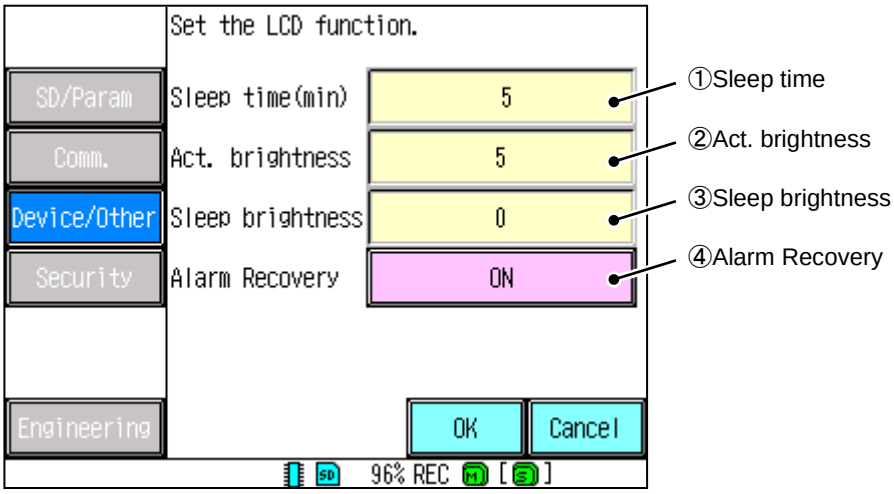
8.15 Setting the LCD sleep time

[Explanation]

LCD is automatically turned off when there is no operation in the main body for a fixed time.

[Operation]

Select the Device/Other key ⇒ LCD key on the System.



① Sleep time

Time until changing to brightness to which LCD is set by "③Sleep brightness" is set.
(0 to 60 min)
Please input an arbitrary "Sleep time" from the numeric input screen, and set it with the OK key.
(When 0 is input, the sleep function is not used.)

② Act. brightness

LCD sets the numerical value of the brightness when it is active. It lightens by the numerical value large.
Please input an arbitrary "Act. brightness (2～5)" from the numeric input screen, and set it with the OK key.

③ Sleep brightness

LCD sets the numerical value of the brightness when it is sleep. It lightens by the numerical value large.
Please input an arbitrary "Sleep brightness (0～4)" from the numeric input screen, and set it with the OK key.

④ Alarm Recovery (It supports since recorder version 1.20.)

If an alarm occurs at the time of LCD OFF, LCD is turned ON automatically.
(While the alarm has occurred, regardless of [①Sleep time], LCD is always ON. LCD becomes "off" when the setup time of [①Sleep time] passes. (Not operating)

8.16 Setting the clock

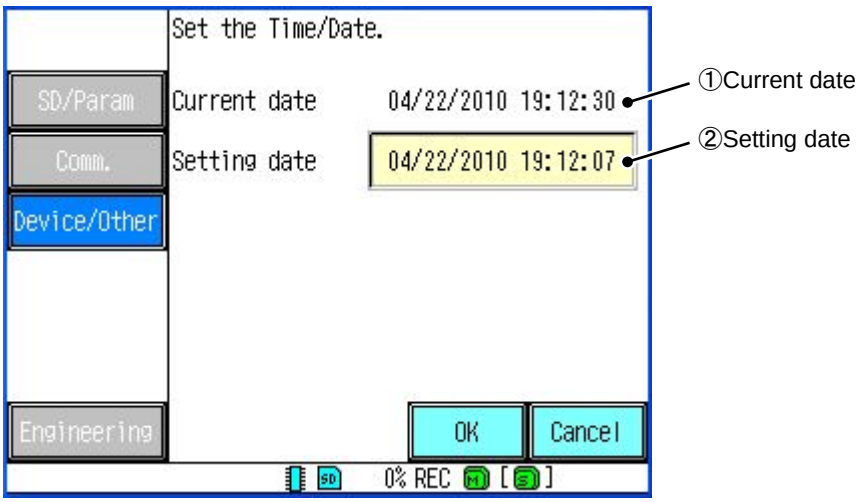
［Explanation］

The date of the recorder is changed by manual operation.

Note: When the recorder is in recording, the setting cannot be changed.

［Operation］

Select the Device/Other key ⇒ Clock key on the System.



① Current date

A current date is displayed.

② Setting date

The date of recorder is set.

Please input an arbitrary date from the numeric input screen, and set it with the OK key.

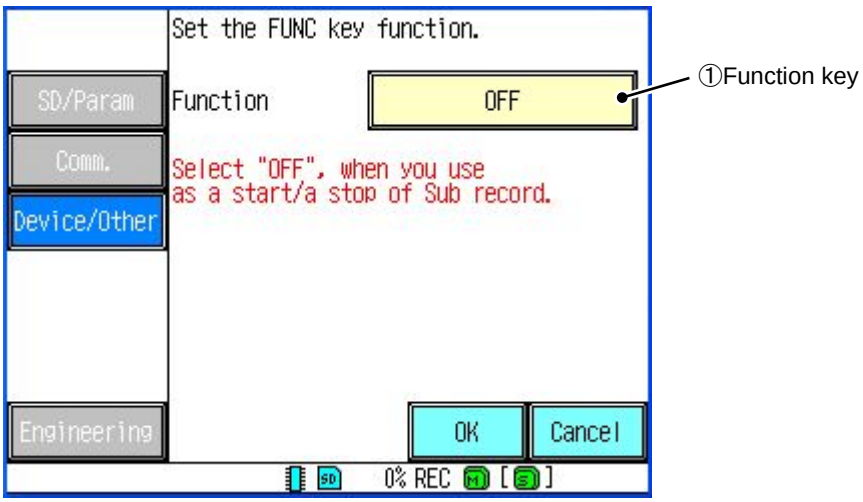
8.17 Setting the FUNC key

[Explanation]

The function of the “Switch of the screen”, “Capture”, “Display of message”, and “ON/OFF of sub record” is allocated in the FUNC button.

[Operation]

Select the Device/Other key ⇒ FUNC key on the System.



① Function key

The function of FUNC key is set.

OFF : The FUNC button is used for “Start/Stop of the sub record”.
(It is necessary to change “Func key” the item of Record key ⇒ Setting (Sub) key ⇒ Sub rec timing key of the Parameter to use sub record. Refer to Section 7.20 for Sub rec timing key.)

Change display : Whenever the FUNC button is pushed once, the display is switched in order such as “Realtime trend screen” ⇒ “Parameter setting screen” ⇒ “System setting screen” ⇒ “Realtime trend screen”.

Capture : The display screen is captured, and Bit map data (.bmp) is saved on the SD card.
(The preserved folder becomes “Cap” folder in “Recorder”. Refer to Section 10.17 for “Cap” folder.)

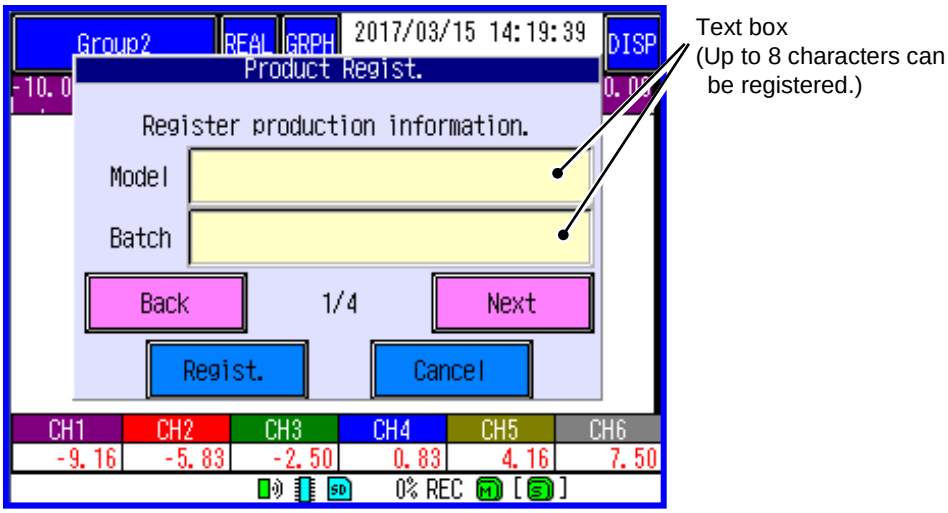
Msg.&EventWrt. : (1)The message is displayed in the event log.
(It is necessary to change “Func key” the item of Others key ⇒ Message key ⇒ Timing key of the Parameter to use sub record. Refer to Section 7.23 for Message key.)

(2) Execute event writing (Modbus Master) using the FUNC key.
If you set the event writing timing of the Modbus master to "FUNC key", set it to "Msg. & Event writing". For event writing, see Section 8.30

Addition reset : The integrated value of an calculation channel is reset. Moreover, it can be reset also by the Parameter ⇒ Calc. CH key ⇒ "Manual reset" of F value key.(It supports since recorder version 1.20.)
(An addition function and an F value operation function can be set up only from a Parameter Loader. Refer to Section 2.3 of “PARAMETER LOADER INSTRUCTION MANUAL” for various functions. Refer to Section 7.13 for Manual reset.)

Product Regist. : The operator register name of “production information” to the recorder.
The operator input information in text box when they changes name of “production information”.
(It supports since recorder version 2.00.)

The operator touch the Back key or Next key when “production information” number is 3 or greater.
The operator touch the Regist. key after the completion of input information in text box.
* Registration of production information using the network is also possible. For details, refer to the communication instruction manual.



8.18 Setting the file format

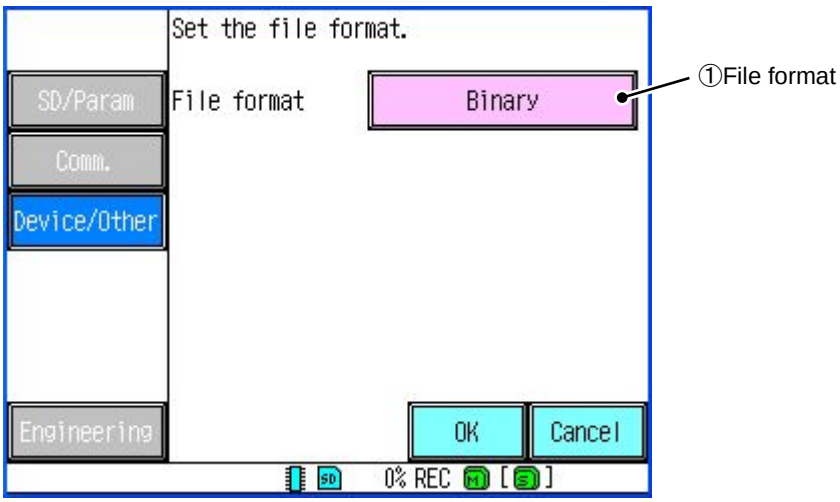
[Explanation]

The file format of record data is set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Device/Other key ⇒ File format key on the System.



① File format

The file format of record data is selected.

Binary : Recorded data is preserved on the SD card by the binary form.

Binary+CSV : Recorded data is preserved on the SD card by the binary form and CSV form.

(A binary file can refer by the historical trend and data viewer of recorder. Moreover, the CSV file can do only writing, it cannot be read by a recorder. A CSV file can be referred to by Excel etc.)

When you convert the folder into the CSV file, the following 2 files are made.

- ***dmt.csv file : Trend file
- ***dme.csv file : Event file

※ The record date is written in the part of "***".

Ex) Record start at 02/19/2011 12:34:56

Record date is "110219123456".

8.19 Setting the jump menu

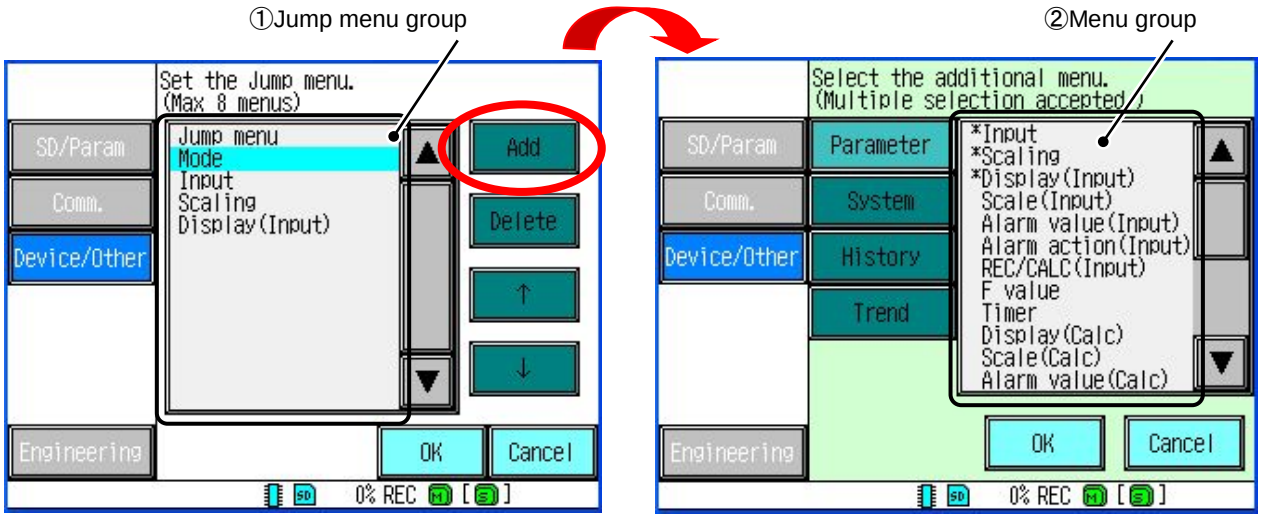
[Explanation]

Shortcut keys are registered up to 8 in the menu screen.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Device/Other key ⇒ Jump menu key on the System.



① Jump menu group

The added jump menu is displayed by the list.

Please select the arbitrary jump menu from "①Jump menu group" to deletion and replacement the jump menu, and select the delete or the ⇑, ⇓ key. (The selected item is displayed in aqua.)

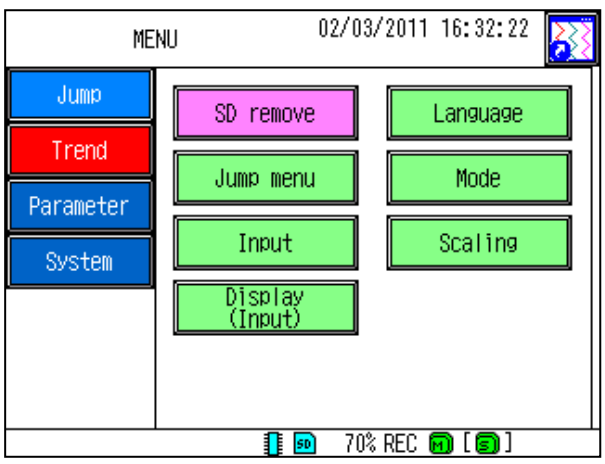
② Menu group

When an Add key is selected, the jump menu addition screen (above figure) is displayed.

Please select the item to be added to menu screen, and set it with the OK key. (* is added to the selected item.)

※ A shortcut key will be created in menu screen if a jump menu is added. (Right figure)

[Jump menu]



8.20 Setting the operation mode

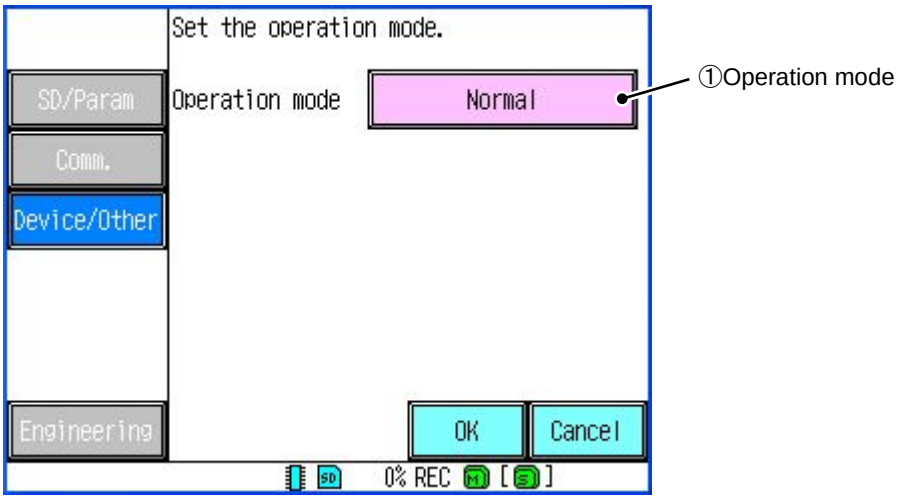
[Explanation]

This Paperless recorder can do a more detailed setting by setting the "Operation mode" to "Advanced mode" on the parameter setting screen and the system setting screen.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Device/Other key ⇒ Mode key on the System.



① Operation mode

Select the "Operation mode" (Initialization is "Normal".)

Normal : Only a minimum set item is displayed in "Parameter" and "System". And, the item of "Wizard" is displayed in "Others" of "Parameter".
(Refer to Section 7.29 for "Wizard".)

Advanced : All set items are displayed in "Parameter" and "System".

8.21 Setting the language

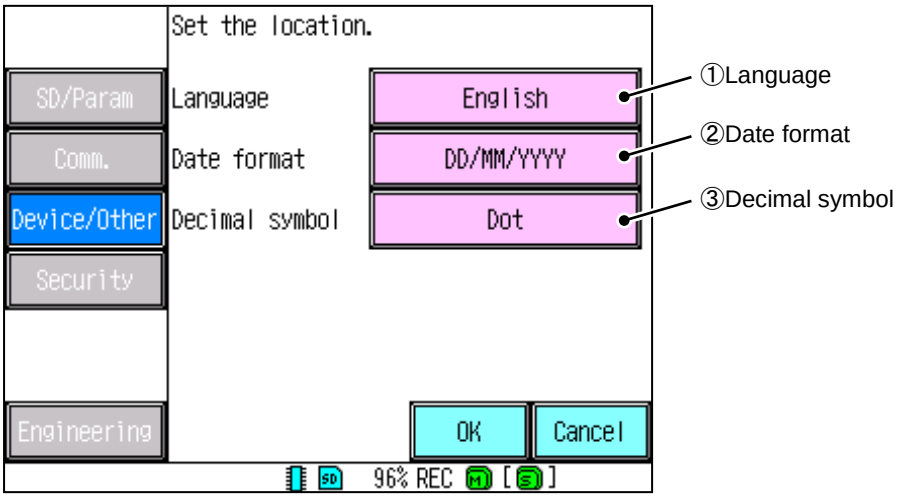
[Explanation]

"Language format" and "Date format" of the recorder are set.

Note: When the recorder is in recording, the setting cannot be changed.

[Operation]

Select the Device/Other key ⇒ Language key ⇒on the System. Moreover, the Language key can be selected directly from the MENU.



① Language

The language format of recorder is set.

Japanese : The language setting is made Japanese.

English : The language setting is made English.

② Date format

The form of the date in the display of the time of the recorder is selected.

The display method in each item is as follows. (In this case, November 15, 2009)

YYYY/MM/DD : 2009/11/15

DD/MM/YYYY : 15/11/2009

DD-MMM-YY : 15-Nov-09

MMM-DD-YY : Nov-15-09

③ Decimal symbol

(It supports since recorder version 1.20.)

The decimal symbol in a recorder is chosen.

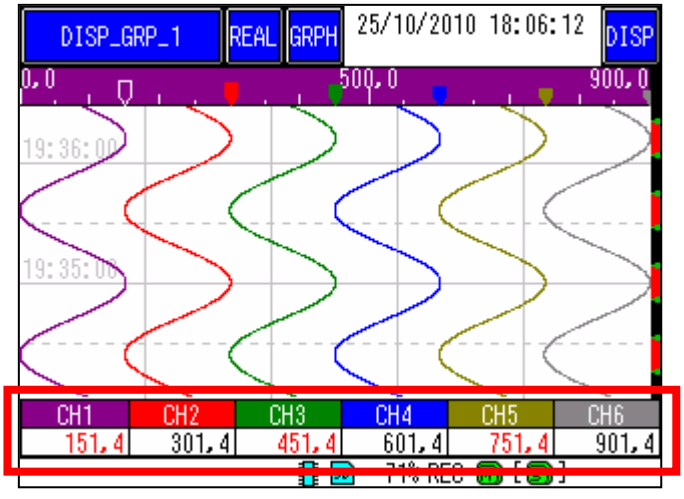
Dot: Use a period for decimal point.

Comma: Use a comma for decimal point.

(Right figure)

(Regardless of setting of a decimal symbol, a period is used for communication setting, such as an IP address. Refer to Section 8.7 for communication setting.)

[③Decimal symbol: Comma select]



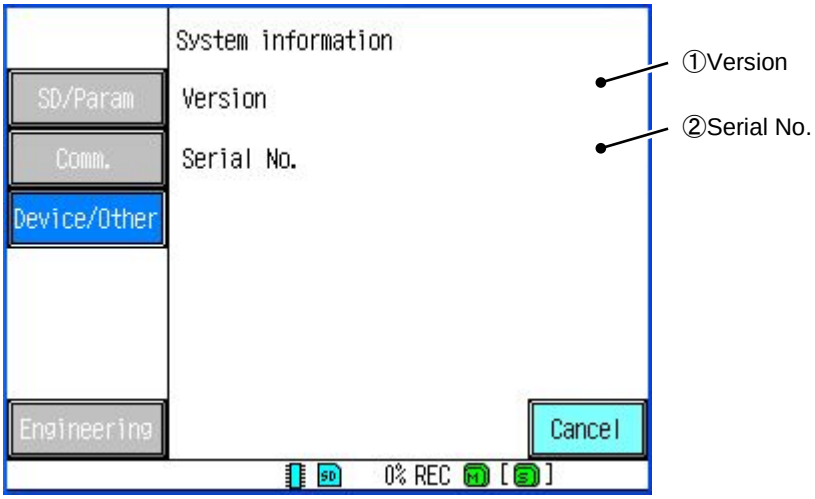
8.22 Display the system information

［Explanation］

The Version and Serial No. of recorder is displayed.

［Operation］

Select the Device/Other key ⇒ Version key on the System.



① Version

The Version of recorder is displayed.

There are two versions to display: MAIN and AI. The version described in the recorder instruction manual indicates the version of MAIN.

② Serial No.

The Serial No. of recorder is displayed.

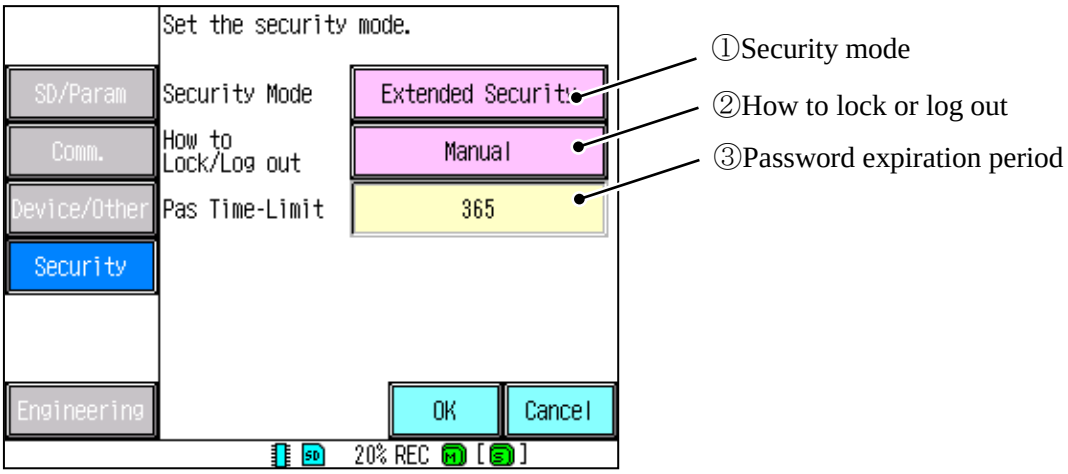
8.23 Setting the security mode

[Explanation]

Set the security mode. (It supports since recorder version 2.00.)

[Operation]

Select the Security key ⇒ Security Mode key on the System.



① Security mode

Set the security mode.

OFF : The security function is not used.

Key Lock : The key lock function is used.

For details about the key lock function, refer to the manual of the recorder.

Extended Security : This function can be used only for customers who purchased the extended security option. Extended security is an optional function corresponding to a function to prevent Falsification of recorded data, a function to sign to recorded data, an unauthorized access prevention function by user name and password, etc. For details, please contact your dealer or agent.

※ When the extended security is set, measurement data is output for the extended security function. The data cannot be checked in the standard support software (Data Viewer). Use the support software dedicated to the extended security function (Ex.Sec Viewer).

② How to lock or log out

Select how to lock or log out.

Manual : The user can only manually lock or log out the device.

Auto + Manual : The device is locked or logged out if not operated for five minutes.

The user can also manually lock or log out the device.

③ Password expiration period

Set password expiration date. This setting item is effective only when security mode is set to "Extended Security". When security mode is "Key Lock", setting is unnecessary item.

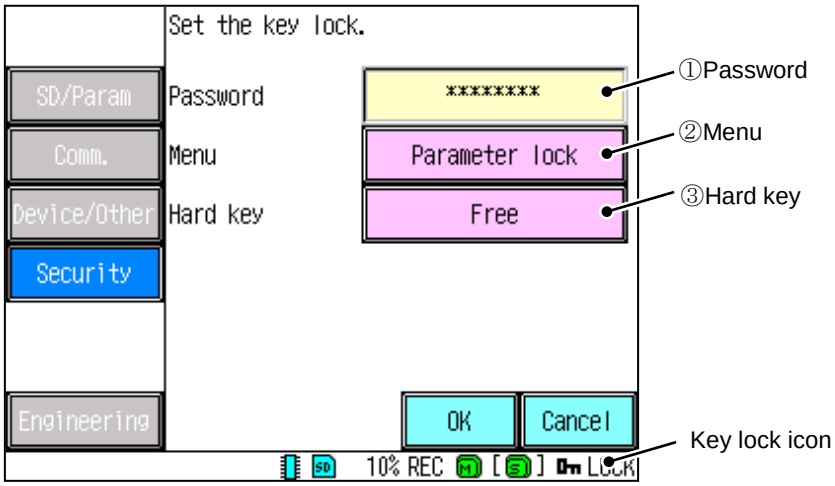
8.24 Setting the key lock function

[Explanation]

The setting change screen and front button of a recorder are locked, and a key can be restricted.
(It supports since recorder version 1.20.)

[Operation]

Set the security mode to "key lock" within the Security Mode setting.
Select the Security key ⇒ Key lock key on the System.



※ Setting or cancellation of a key lock are performed on another screen.
(Refer "●The example of setting of a key lock" of next page for details.)

① Password

A password required for setting or cancellation of a key lock is set up.
(Up to 32 characters can be registered.)
(A space character cannot be used for a password. Moreover, a password is omissible. In that case, it is touching a OK key, without inputting anything at the time of a password input, so setting or cancellation of a key lock can be performed.)
(Regardless of the characters number of a password, the number of the asterisks (*) displayed on [②Password] is set to 8.)

② Menu

The level of the key lock in a menu screen is set up.

Free	: The key lock of a Menu screen is not set up.
Parameter lock	: Setting of a Parameter is locked.
System lock	: Setting of a System is locked.
All lock	: Setting of a Parameter and a System is locked.

※ Even if the key is locked, you can check the settings.

③ Hard key

The level of the key lock in a Hard key is set up.

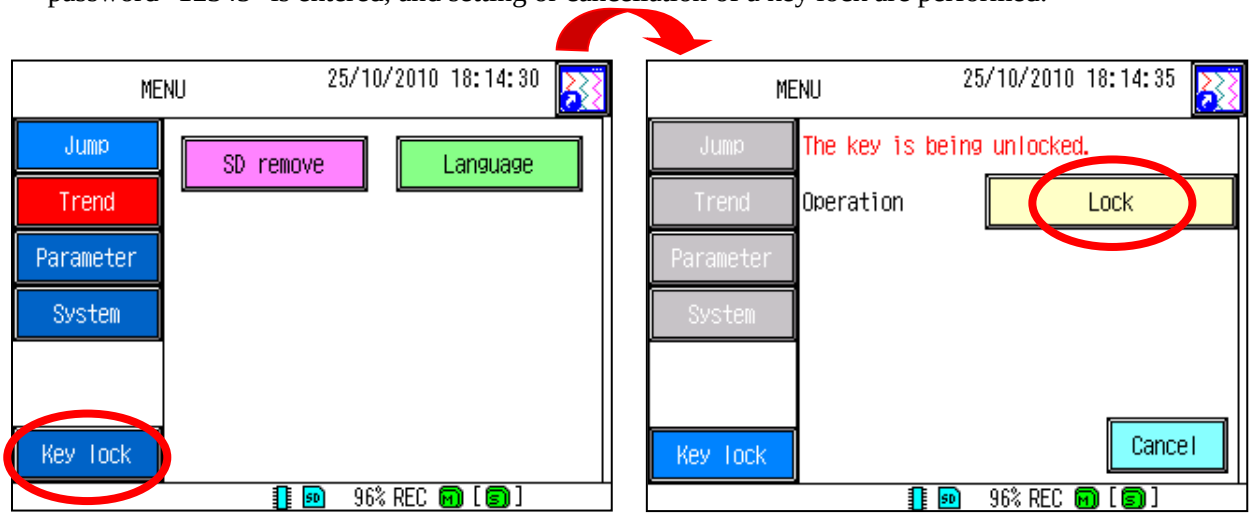
Free	: The key lock of a Hard key is not set up.
REC key lock	: Operation by the REC key is locked.
FUNC key lock	: Operation by the FUNC key is locked.
REC + FUNC key lock	: Operation by the REC key and FUINC key is locked.

●The example of setting of a key lock

A key lock setting screen is displayed.
The setting or cancellation method of a key lock is set up. (In this case, it is set as “Auto + manual”)
A password is set up. (In this case, it is set as “12345”.)
The key lock level in a “Menu” and “Hard key” is set.
(In this case, “Menu” is set as a “Parameter lock” and a “Hard key” is set as the “REC key lock.”)
A OK key is touched and a setup is saved.

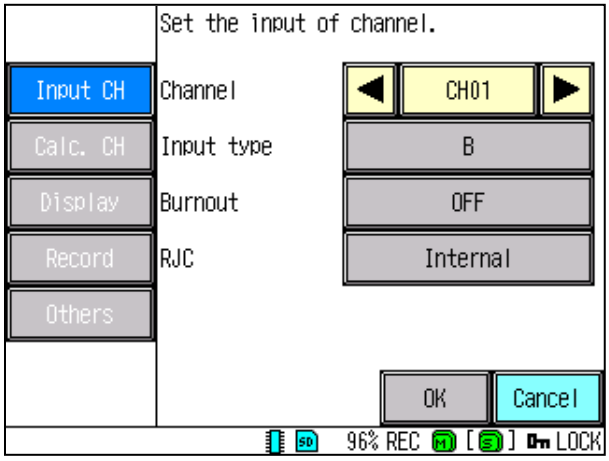
※ If [①Key lock] is set as "Manual operation" or "Auto + manual", a recorder will be locked and a "Key lock icon" will be displayed on the screen lower right. Moreover, it can perform setting or cancellation of a key lock from the Key lock (the following figure left side) of Menu screen. (A Key lock is not displayed if the key lock is not set up.)

The "Lock" of a key lock operation screen (the following figure right side) is touched. The password "12345" is entered, and setting or cancellation of a key lock are performed.

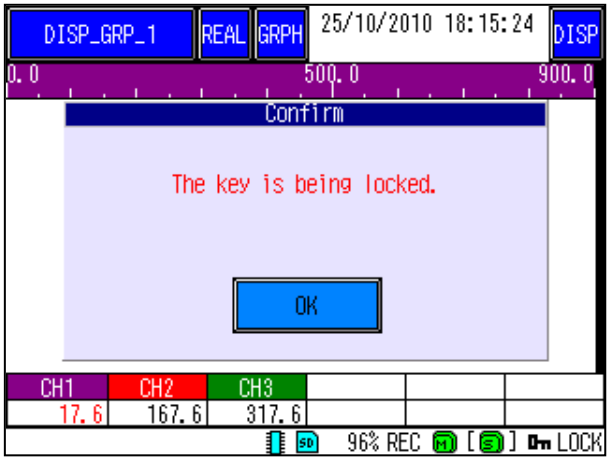


If a key lock is set up, a limit as shown in the following figure is performed to a menu screen and a hard key.

[Menu lock (Can not setting)]



[Hard key lock (Push the REC button)]



[Note]

・Please do not forget the set up password, when you use a key lock function. If you forget a password, a key lock cannot be canceled and trouble may occur in operation of the Recorder.

8.25 Setting the user

[Explanation]

Create, edit, and delete users to use at login. (It supports since recorder version 2.00.)
Up to 20 users can be registered.

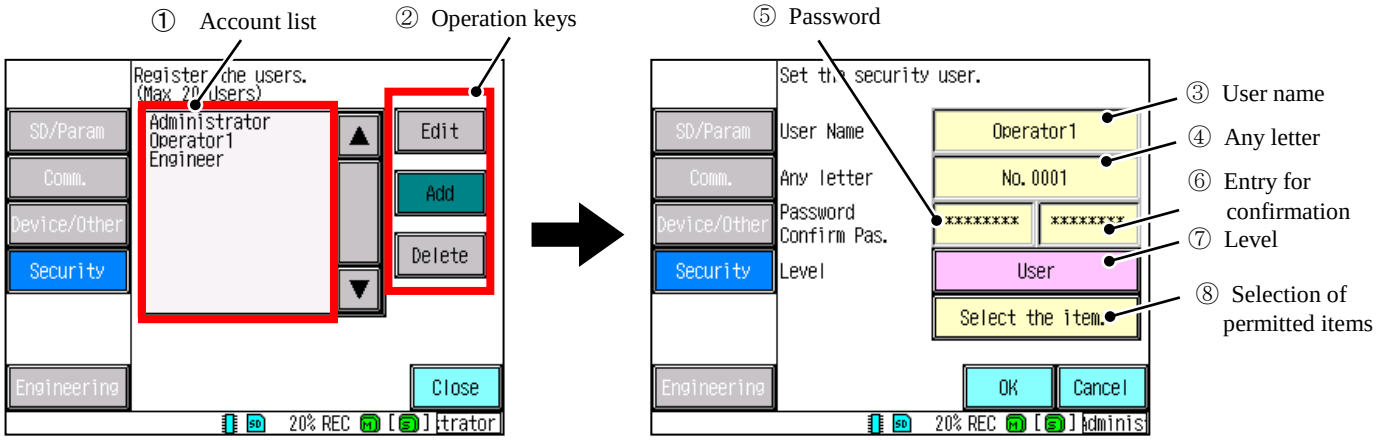
※ This setting item is required only when security mode is set to "Extended Security".
For the extended security function, refer to Section 8.24.

[Operation]

Select the Security key ⇒ User Regist. key on the System

[Caution]

Please keep the password strictly. If you lose your password, you will not be able to log in.



① Account list

Lists created users. Up to 20 users can be registered.

② Operation keys

To edit or delete a user, touch and select the user in [①Account list] and touch and select the Edit or Delete key. (The selected item is indicated in light blue.)
To add a user, touch the Add key. When you touch the Edit or Add key, the security user setting screen (right figure above) appears.

③ Specifying the user name (up to 16 one-byte characters)

Enter an arbitrary user name on the text entry screen and set it with the OK key.

④ Specifying arbitrary text (up to 16 one-byte characters)

Enter an arbitrary user name on the text entry screen and set it with the OK key. (This setting can be omitted.)
This is the description of each user and displayed in support software (Ex.Sec Viewer) as well.

⑤ Password (up to 32 one-byte characters)

Set the account password.

⑥ Entry for confirmation (up to 32 one-byte characters)

Confirm the password. Enter the same character sting as that in [⑤Password].

⑦ Level

Set the account level and restrict each setting and operation.

Administrator : Can perform all the settings and operations. Only the administrator can edit, add, or delete User Regist.

User : Settings and operations can be restricted. Restrictions can be set in [⑧Selection of permitted items].

⑧ Selection of permitted items

Specify settings and operations available to the user account.

When you touch the item you permit, a circle appears next to that setting item.

You can use the All permit or No permit key to specify the setting for Parameter, Systems, Records, Trends, or Hard button, respectively. When you touch the All permit key with Parameter touched, all the settings and operations in Parameter are permitted. The permission status of other items is not changed.

※ By default, it is prohibited to change all the setting values.

[Note]

The following password cannot be set.

1. Same password as the old one (only when resetting the expired password)
2. Same password as the user name
3. Password consisting of four or less than letters

8.26 Setting the cyclic reading (Modbus Master)

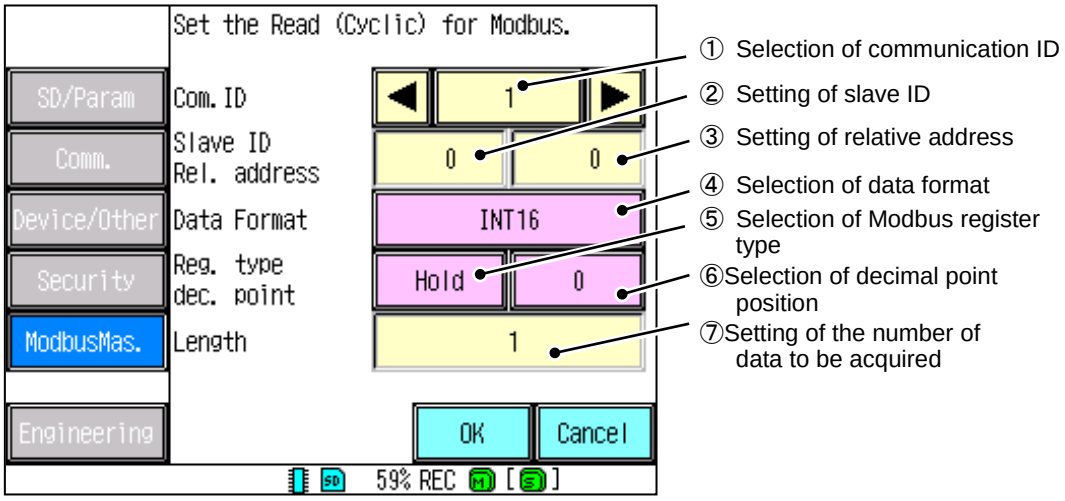
[Description]

Set this device as a Modbus RTU master to acquire data from a general-purpose slave device. It is displayed only when "Comm. Type" in Section 8.13 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)". For details about the “Rd (Cyclic)” specifications, see the COMMUNICATION FUNCTION OPERATION MANUAL.

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Rd (Cyclic) key to open the Modbus cyclic read setting screen.



① Selection of communication ID

The Modbus master can acquire the data for up to 12 types of slaves. Select the ID for connection.

② Setting of slave ID

Set the slave ID for ModbusRTU. (0 to 247)

"0" refers to "Not connected". If the ID is 0, data acquisition is not carried out.

③ Setting of relative address

Set the communication address of a slave device. (0 to 9999)

Acquire data from slave devices in combination of ⑤ “Modbus register type” and an address.

④ Selection of data format

Select how the acquired data is handled.

INT16: Acquired as a signed 2-byte data (-32768 to 32767).

UINT16: Acquired as an unsigned 2-byte data (0 to 65535).

INT32 (BIG): Acquired as a signed 4-byte data (-2147483648 to 2147483647).
The data is recognized as a big endian.

INT32 (LITTLE): Acquired as a signed 4-byte data (-2147483648 to 2147483647).
The data is recognized as a little endian.

UINT32 (BIG): Acquired as an unsigned 4-byte data (0 to 4294967296).
The data is recognized as a big endian.

UINT32 (LITTLE): Acquired as an unsigned 4-byte data (0 to 4294967296).
The data is recognized as a little endian.

FLOAT(BIG): Recognized as a single precision floating point of IEEE754.
The data is recognized as a big endian.

FLOAT(LITTLE): Recognized as a single precision floating point of IEEE754.
The data is recognized as a little endian.

Note) The range which can be acquired in a data type selection is used as internal data. Note that the data which can be actually recorded is from -32000 to 32000 digits.

⑤ Selection of Modbus register type

Select the Modbus register type.

Input register: The data is acquired from the input register. [Function code=04]

Hold register: The data is acquired from the hold register. [Function Code=03]

⑥ Selection of decimal point position

Select the decimal point position of the data acquired.

The setting cannot be made if the data type is FLOAT.

Example) “Data: 12345 and Decimal point position: 2” is recognized internally as "123.45".

⑦ Selection of the number of data

Set the number of data to be acquired from the starting address. (1 to 16)

Enabled if the data to be acquired are sequential.

If the addresses are not sequential or the register types are different even in the same slave device, acquire the data using multiple IDs.

8.27 Setting the Write Parameter (Modbus Master)

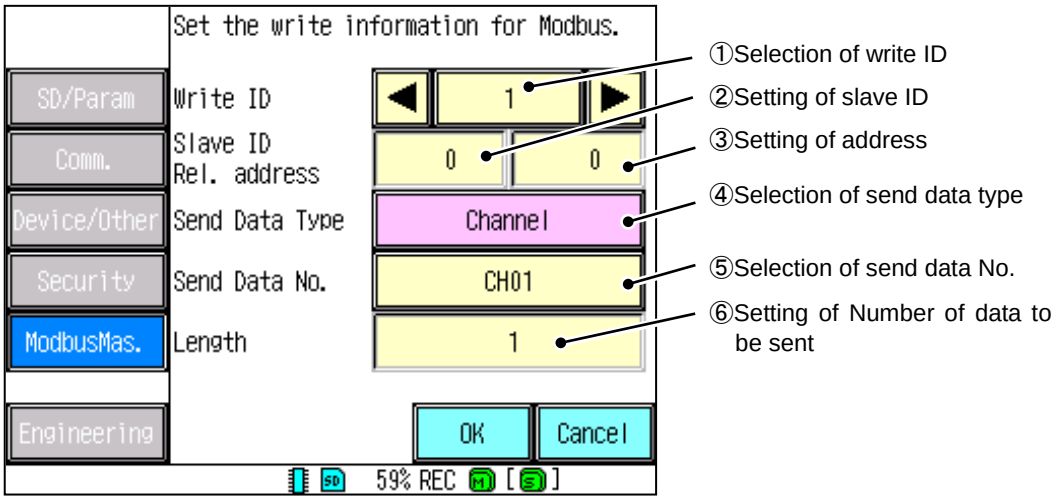
[Description]

Using this device as a Modbus RTU master, make basic settings for setting data in a general-purpose slave connection device. It is displayed only when "Comm. Type" in Section 8.13 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)". For details about the “Write Param” specifications, see the COMMUNICATION FUNCTION OPERATION MANUAL.

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Write Param key to open the Modbus write information setting screen.



① Selection of write ID

It is possible to write data to up to 24 slave devices. Select the ID to be set. (1 - 24)

② Setting of slave ID

Sets the Modbus RTU slave ID. (0-247)

If it is 0, it is recognized as unconnected and no data writing operation is performed.

③ Setting of address

Set the communication address of the slave device. (0-9999)

* The function code is fixed at "0x10".

④ Selection of send data type

Select the type of data to be sent from "Channel" and "Constant".

Set together with the transmission data No. setting in ⑤.

Channel: The measured value of the selected channel No. is used as the send data.

Constant: The value in the constant table is used as the send data.

("Constant table" can be set from the attached PC software "Parameter Loader".)

⑤ Selection of send data No.

The contents change depending on the setting of ④.

Channel: Select any channel number. (CH01-CH48)

Constants: Select any constant number. (K001-K100)

⑥ Setting of Number of data to be sent

Set the number of data to be sent to the slave device.

Setting example 1）

Data send destination (device) : Slave device with slave ID 5

Data send destination (register) : Holding register

Data send destination (address) : 101-103

Send content : Measurement data of CH1 to 3 of this device

Setting items	Setting
Write ID	1(Any)
Slave ID	5
Address	101
Send data type	Channel
Send data No.	1
Length	3

Setting example 2）

Data send destination (device) : Slave device with slave ID 3

Data send destination (register) : Holding register

Data send destination (address) : 51-65

Send content : Constant K005-K015

Setting items	Setting
Write ID	2(Any)
Slave ID	3
Address	51
Send data type	Constant
Send data No.	5
Length	10

8.28 Setting the cyclic writing (Modbus Master)

[Description]

Set the cyclic writing.

Use the writing information set in Section 8.27 as the information to be written.

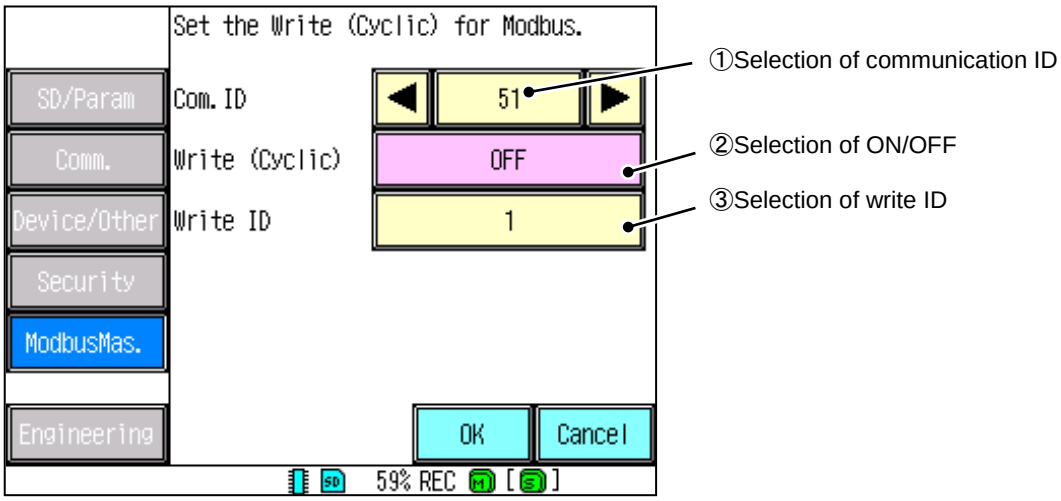
Refer to the write ID set in the write information in Section 8.27, and make the settings for cyclic data writing. It is displayed only when "Comm. Type" in Section 8.13 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)". For details about the “Wrt (Cyclic)” specifications, see the COMMUNICATION FUNCTION OPERATION MANUAL.

Cyclic writing is performed at the cycle set in "Req. interval" in Section 8.13. For the communication status of cyclic writing, refer to Section 8.33.

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Wrt (Cyclic) key to open the Modbus write cyclic setting screen.



① Selection of communication ID

Select the communication ID to be set. (51-62)

It is possible to periodically set data to up to 12 different slaves with communication IDs 51 to 62.

② Selection of ON/OFF

Set ON / OFF for the cyclic write operation of each communication ID.

③ Selection of write ID

Select the write ID set in Section 8.27. (1-24)

Refer to the set write ID and decide the destination and the content of the send data.

8.29 Setting the display writing (Modbus Master)

[Description]

Set the display writing.

Use the writing information set in Section 8.27 as the information to be written.

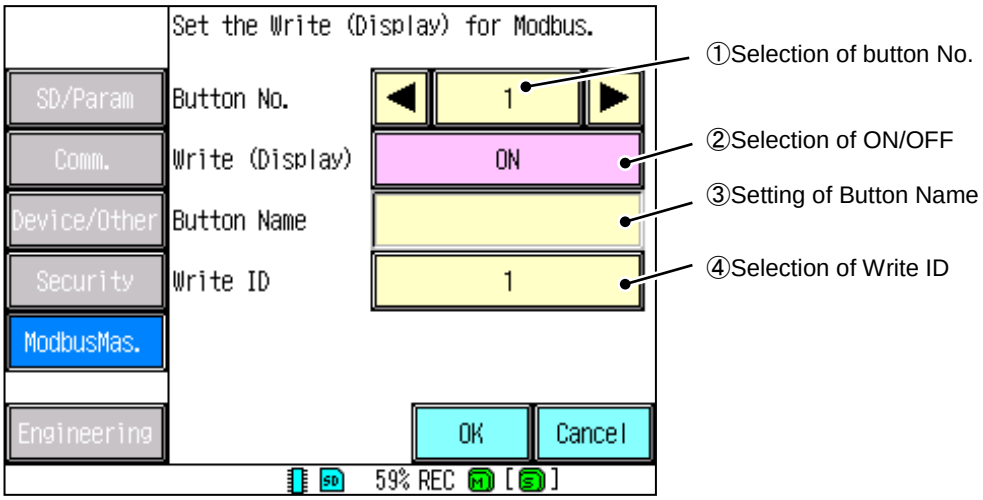
It is displayed only when "Comm. Type" in Section 8.13 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)". For details about the “Wrt (Display)” specifications, see the COMMUNICATION FUNCTION OPERATION MANUAL.

The set button is displayed as described in Section 8.34 "Execute display writing", and the set writing is executed by touching the button.

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Wrt (Display) key to open the Modbus write display setting screen.



① Selection of Button No.

Select the button No. to set. (1-8)

It is possible to set up to 8 buttons.

② Selection of ON/OFF

Set ON / OFF of each write button.

③ Setting of Button Name

Set the name of the button displayed in Section 8.34.（Up to 8 characters can be registered.）

④ Selection of Write ID

Select the write ID set in Section 8.27. (1-24)

Refer to the set write ID and decide the destination and the content of the send data.

8.30 Setting the event writing (Modbus Master)

[Description]

Set the event writing.

Use the writing information set in Section 8.27 as the information to be written.

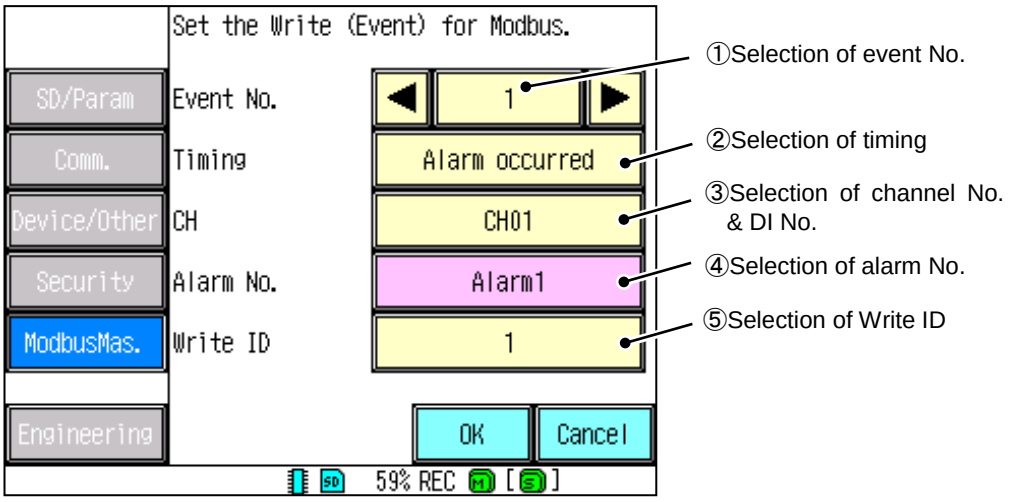
It is displayed only when "Comm. Type" in Section 8.13 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)". For details about the “Wrt (Display)” specifications, see the COMMUNICATION FUNCTION OPERATION MANUAL.

When the event writing is successful, it is recorded in the communication log as "Write success Event No.1".

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Wrt (Event) key to open the Modbus write event setting screen.



① Selection of event No.

Select the event No. to set. (1-24)

It is possible to set for up to 24 events.

② Selection of timing

Select when the event should occur.

OFF	: Event writing is not performed.
FUNC key	: Writes an event triggered by the FUNC key. (* When set to FUNC key, set the function setting of FUNC key in Section 8.17 to "Msg. & Event writing".)
Alarm occurred	: Writing is performed at the timing when the alarm of the set channel number and alarm number occurs.
Alarm cleared	: Writing is performed at the timing when the alarm of the set channel number and alarm number cleared.
DI ON	: Writing is performed when the set DI No. turns from OFF to ON.
DI OFF	: Writing is performed when the set DI No. turns from ON to OFF.

③ Selection of channel No. & DI No.

Select the channel No. or DI No. (CH01-48) (DI1-9)

It is displayed only when the timing setting is "alarm occurred", "alarm cleared", "DI ON", "DI OFF".

④ Selection of alarm No.

Select the alarm No. (1-4)

It is displayed only when the timing setting is "alarm occurred", "alarm cleared"

⑤ Selection of Write ID

Select the write ID set in Section 8.27. (1-24)

Refer to the set write ID and decide the destination and the content of the send data.

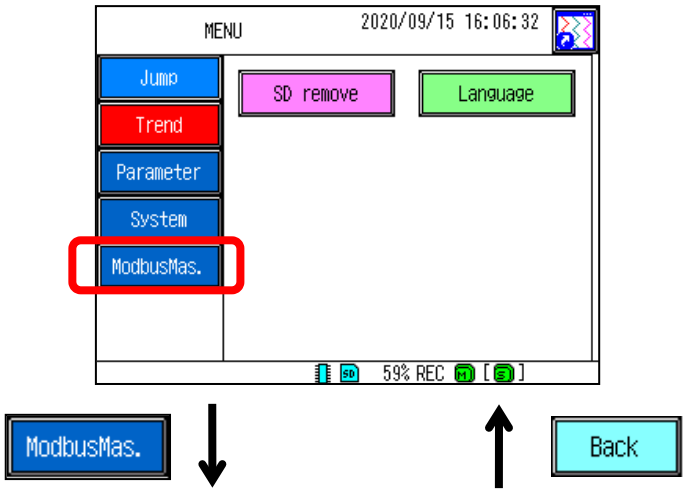
8.31 Communication status confirmation screen list

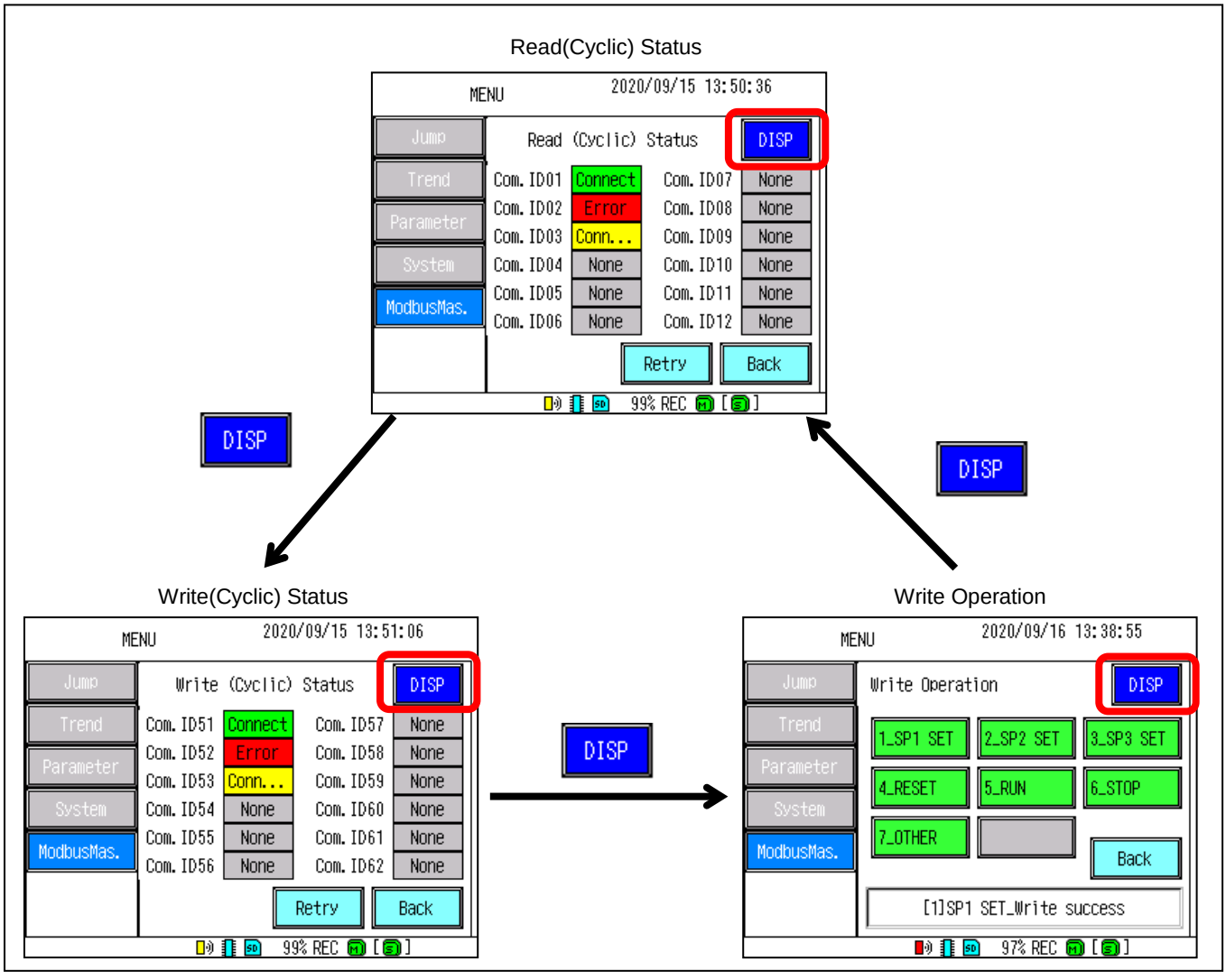
It is displayed only when "Comm. Type" in Section 8.13 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)".

Touch the ModbusMas. key to move to the screen where you can check the communication status of the current Modbus master and execute display writing.

Touch the DISP key to switch the screen.

To return to the menu screen, touch the back key. You cannot return with the MENU button.





8.32 Checking the cyclic read status

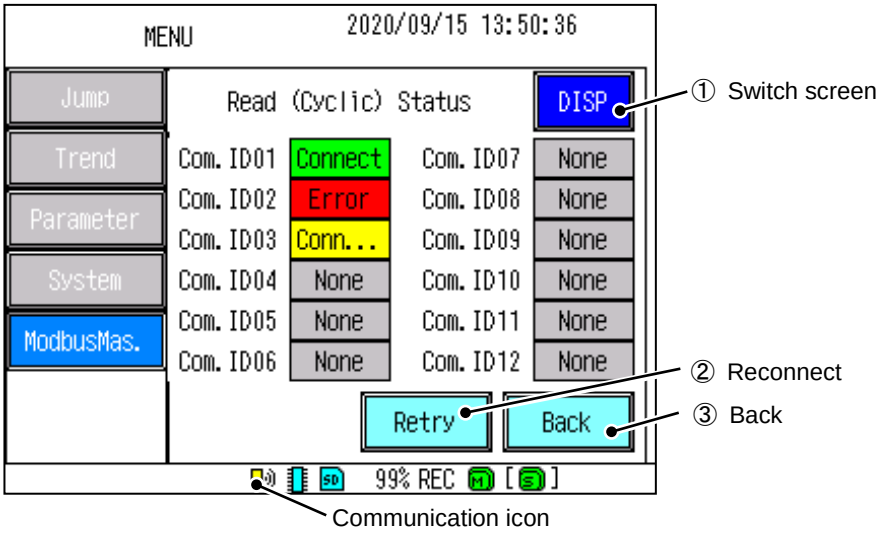
[Description]

This screen confirms the communication status of each communication ID set in the cyclic reading in Section 8.26.

Reconnection processing is possible on this screen. By checking the connection with the communication ID in which the communication error occurred and performing the reconnection process, the cyclic read communication with the purged slave device is resumed.

[Operation]

Touch the ModbusMas. key to display the cyclic read status screen.



The following information is displayed depending on the communication status of the Modbus master.

Connect: The communications with all the slave devices are normal. The icon is indicated in "green".

Conn...: The communications with the slave devices is being checked. Depending on the communication status, the status changes to "Connect:" or "Error". The icon is indicated in "yellow".

Error: Due to a communication error occurrence, communications are not established with a part or all of the slave devices. The icon is indicated in "red".

None: The communication ID is "disabled". The display will be "gray" and the icon will not be displayed.
(The slave ID in Section 8.26 is set to "0" and communication is not being performed.)

① Switch screen

Switch screens. Moves to the cyclic write status screen.

② Reconnect

If there is a slave device in the "error" state, communication retry can be performed.

③ Back

Finish checking the communication status.

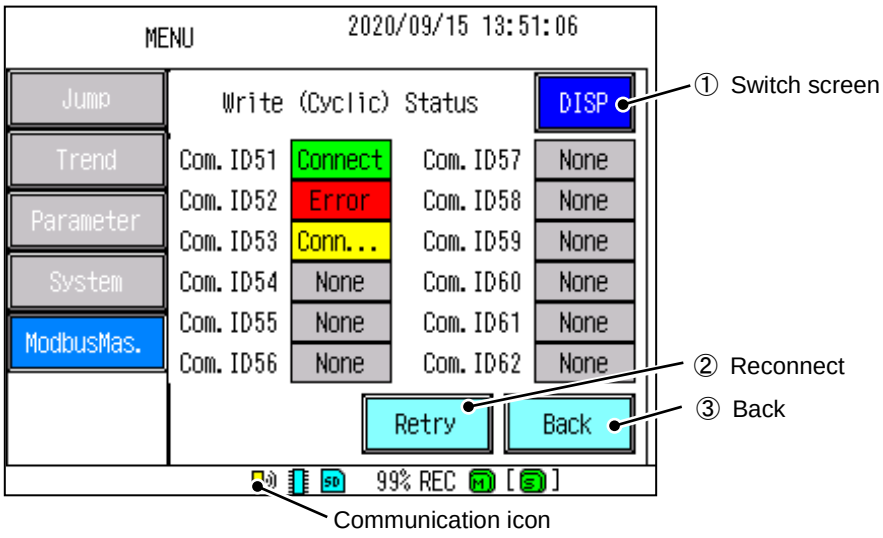
8.33 Checking the cyclic write status

[Description]

This is the screen to check the communication status of each communication ID set in "Write Param" in Section 8.27 and "Wrt(Cyclic)" in Section 8.28. Reconnection processing is possible on this screen. By checking the connection with the communication ID in which the communication error occurred and performing the reconnection process, the cyclic write communication with the purged slave device is resumed.

[Operation]

select ModbusMas key ⇒ DISP key to open the cyclic write status screen.



The following information is displayed depending on the communication status of the Modbus master.

Connect: The communications with all the slave devices are normal. The icon is indicated in "green".

Conn...: The communications with the slave devices is being checked. Depending on the communication status, the status changes to "Connect:" or "Error". The icon is indicated in "yellow".

Error: Due to a communication error occurrence, communications are not established with a part or all of the slave devices. The icon is indicated in "red".

None: The target communication ID for the cyclic writing in Section 8.28 is set to "OFF". The display will be "gray" and the icon will not be displayed.

① Switch screen

Switch screens. Move to display write execution.

② Reconnect

If there is a slave device in the "error" state, communication retry can be performed.

③ Back

Finish checking the communication status.

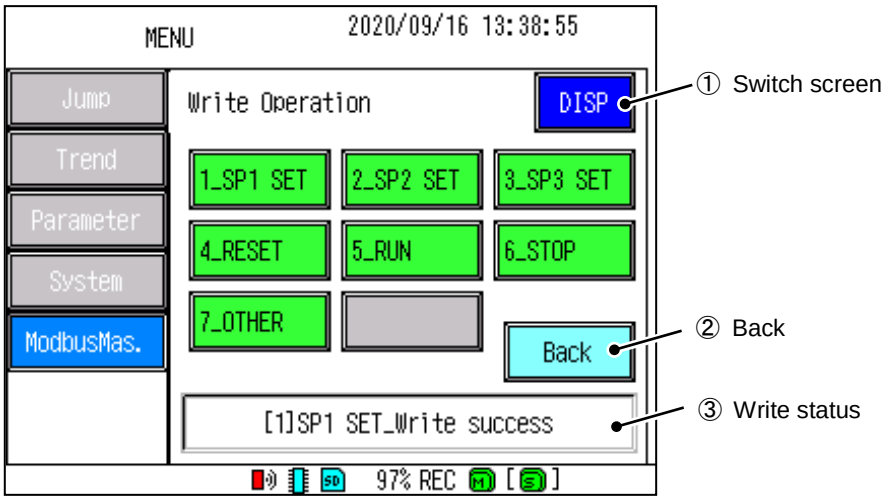
8.34 Execute display writing

[Description]

This screen is for sending data to each slave device using the buttons set in "Write Param" in Section 8.27 and "Wrt (Display)" in Section 8.29.

[Operation]

select ModbusMas key ⇒ DISP key to open the write execution screen.



On this screen, the button with the button name set in "Wrt (Display) " in Section 8.29 is displayed. (Up to 8 buttons)

By touching each button, the data of the write ID assigned to each button will be sent.

The disabled buttons will be grayed out.

① Switch screen

Switch screens. Move to cyclic write screen.

② Back

Finish checking the communication status.

③ Write status

Displays the write status during or after communication is being executed.

[X]YYYYYYYY_Write success : This display indicates that the writing process to the slave device was successful.

[X]YYYYYYYY_ Writing… : This display indicates that writing to the slave device is in progress.

[X]YYYYYYYY_ Write timeout : This display indicates that the writing process to the slave device has failed.

（X: Button No.　　YYYYYYYY: Button Name）

8.35 Checking the remote AI status

[Description]

This screen is a screen for checking the communication status of each remote ID set in "Remote AI" in Section 8.14. Reconnection processing is possible on this screen. By checking the connection with the remote ID in which the communication error occurred and performing the reconnection process, communication with the purged slave device is resumed.

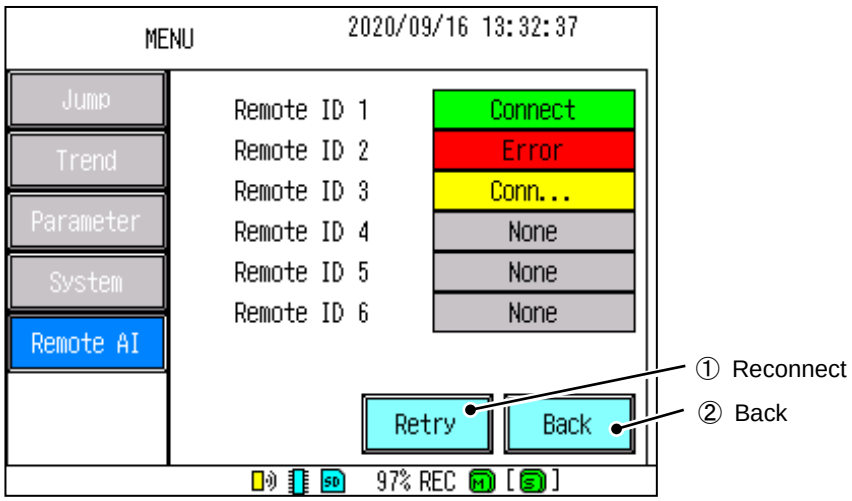
[Operation]

select Remote AI key ⇒ DISP key to open the write execution screen.

［説明］

［操作］

Touch the Remote AI key to the remote AI communication status screen.



The following information is displayed depending on the communication status of the Modbus master.

Connect: The communications with all the remote ID are normal. The icon is indicated in "green".

Conn...: The communications with the remote ID is being checked. Depending on the communication status, the status changes to "Connect:" or "Error". The icon is indicated in "yellow".

Error: Due to a communication error occurrence, communications are not established with a part or all of the remote ID. The icon is indicated in "red".

None: IIn Section 8.14, "Remote AI", the target remote ID is set to "OFF".
(The slave ID in Section 8.26 is set to "0" and communication is not being performed.)

① Reconnect

If there is a remote AI in the "error" state, communication retry can be performed.

② Back

Finish checking the communication status.

8.36 “SD / Param” list

［Explanation］

Various settings concerning the SD card are done. Refer to Section 8.2 ～ 8.6 for details.

［SD remove］

Please execute it before taking out the SD card.

Item	Setting contents	Advanced
SD remove	The current measuring data is written to the SD card while recording and the SD card can be taken out. The record is continued.	

［SD format］

Item	Setting contents	Advanced
SD format	Start the format SD card.	

［Param save］

The parameter setting and the system setting are preserved on the SD card.

Item	Setting contents	Advanced
Param save	Select the saving file.	

［Param load］

Item	Setting contents	Advanced
Param load	Select the loading file.	

［Output log］

Item	Setting contents	Advanced
Output log	Output the log.	○

8.37 “Comm.” list

［Explanation］

Various settings concerning the communication are done. Refer to Section 8.7 ～ 8.15 for details.

Ethernet 1]

Items	Settings	Advanced
IP address	Input the IP address.	
Subnet mask	Input the subnet mask.	
Default gateway	Input the default gateway.	
DNS server address	Input the DNS server address.	
MAC address	Display the MAC address.	

[Ethernet 2]

Items	Settings	Advanced
Keep alive	Select the ON/OFF of the keep alive function.	○
Keep alive interval	Input the keep alive interval value.	○

[SNTP1]

Items	Settings	Advanced
Current time and date	Displays the current time and date.	
SNTP client function	Select ON/OFF of the SNTP client function. If ON is set, time data is received from SNTP server and time calibration is carried out. When the correction of the time is attempted using the SNTP function during the recording process, correction is not performed if there is a difference of ±5 minutes or more from the current time. If the difference is 5 minutes or less, perform correction by reducing the difference little by little so that the time approaches the current time.	
SNTP server address	Input the SNTP server address.	
Time calibration interval	Input the time calibration interval value.	
Execution of calibration	Execute time calibration immediately. However, time calibration cannot be executed during the recording process.	

[SNTP2]

Items	Settings	Advanced
Time acquisition when the power supply is turned on	Select ON/OFF of the function for acquiring the time when turning on the power supply, Enabled only when the SNTP function is turned ON. If the power supply is turned on when On is set, the recording process will not be started until the time data is acquired.	
Time zone (UTC)	Select the time zone.	
SNTP server function	Select ON/OFF of the SNTP server function.	

[FTP]

Items	Settings	Advanced
User name	Input the user name.	
Password	Set the password. (No space can be used for the password.)	
Level	Select "Administrator" or "User" as the access level.	

[Modbus1]

Items	Settings	Advanced
Station number	Input the station number.	
Parity	Select "None", "Even" or "Odd" for the parity function.	○
Stop bit	Select "1bit" or "2bit" as the stop bit.	○
Communication speed	Select "9600bps", "19200bps" or "38400bps" as the communication speed.	○
Modbus TCP Reception timeout	Input the duration until the reception timeout occurs.	

[Modbus2]

Items	Settings	Advanced
Communication type	Select "Modbus TCP(Ethernet)" or "Modbus TCP + RTU" as the Modbus operation.	○
Master/slave	Select "Slave" "Master (Rem. AI)" or "Master (General)" as the Modbus RTU operation.	○
Sending timeout	Set the timeout for when the master is working.	○
Auto retry	Set the auto retry time for when the slave is disconnected.	○
Acquisition interval	Set the interval for acquisition from slave devices in case of the Master (General).	○

[Remote AI] * Enabled only when the Master (Remote AI) is set for the master/slave setting.

Items	Settings	Advanced
Remote ID	Select the ID for connection.	
ID ON/OFF	Select whether the ID is used or not.	
Station number	Set the remote AI's station number.	
Connection type	Select the device to be connected.	

8.38 “Device / Other” list

[Explanation]

Various settings concerning the others of system are done. Refer to Section 8.16 ～ 8.23 for details.

[LCD]

Item	Setting contents	Advanced
Sleep time(min)	Input the value of sleep time.	
Act. brightness	Input the value of LCD active brightness. It lightens by the numerical value large.	
Sleep brightness	Input the value of LCD sleep brightness. It lightens by the numerical value large.	
Alarm Recovery	If an alarm occurs at the time of LCD OFF, LCD is turned ON automatically.	

[Clock]

Item	Setting contents	Advanced
Current date	Display the current date.	
Setting date	Input the value of setting date.	

[FUNC key]

Item	Setting contents	Advanced
Function	Set the function key.	

[File format]

Item	Setting contents	Advanced
File format	Select the file format.	

[Jump menu]

Item	Setting contents	Advanced
Add	The item added to the menu display is selected.	

[Mode]

Item	Setting contents	Advanced
Operation mode	Select the operation mode.	

[Language]

Item	Setting contents	Advanced
Language	Select the language.	
Date format	Select the date format.	
Decimal symbol	Select the decimal symbol.	

［Version］

Item	Setting contents	Advanced
Version	Display the Version.	
Serial No.	Display the Serial number.	

8.39 "Security" list

[Explanation]

Various settings security of system is done. Refer to Section 8.24 ~ 8.26 for details.

[Security Mode]

Item	Setting contents	Advanced
Security Mode	Set the security mode.	○
How to Lock/ Log out	Set lock / logout method.	○
Pas Time-Limit	Set password expiration date.	○

[Key lock]

Item	Setting contents	Advanced
Password	A password is set up.(A blank character can't be used for a password)	○
Menu	The level of the key lock in Menu screen is set up.	○
Hard key	The level of the key lock in a Hard key is set up.	○

[User Regist.]

Item	Setting contents	Advanced
User Name	Enter the user name.	○
Any letter	Set any character.	○
Password	Set the password. (The password can not contain spaces)	○
Level	Select the access level from the administrator or user.	○
Select the item	Set user-level operation permission items.	○

8.40 "Modbus Master" list

[Explanation]

Various settings modbus master are done. Refer to Section 8.26 - 8.30 for details.

It is displayed only when "Comm. Type" in Section 8.13 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)".

[Rd (Cyclic)]

Items	Settings	Advanced
Communication ID	Select the ID for connection.	○
Slave ID	Set the slave ID for Modbus RTU.	○
Relative Address	Set the communication address of a slave device.	○
Data format	Select how the acquired data is handled.	○
Register type	Select the Modbus register type.	○
Decimal point position	Select the decimal point position of the data acquired.	○
Number of data	Set the number of data to be acquired from the starting address.	○

［Write Param］

Item	Setting contents	Advanced
Write ID	Select the ID to be set.	○
Slave ID	Sets the Modbus RTU slave ID.	○
Rel. address	Set the communication address of the slave device.	○
Send Data Type	Select the type of data to be sent	○
Send Data No.	Set the data No. of the selected send data type.	○
Length	Set the number of data to be sent to the slave device.	○

［Write (Cyclic)］

Item	Setting contents	Advanced
Comm. ID	Select the communication ID to be set.	○
Write(Cyclic)	Set ON / OFF of the selected communication ID.	○
Write ID	Set the write ID to be assigned to the selected communication ID.	○

［Wrt (Display)］

Item	Setting contents	Advanced
Button No.	Select the button number to set.	○
Write (Display)	Set the ON/OFF of the selected button No..	○
Button Name	Set the button name of the selected button No..	○
Write ID	Set the write ID to be assigned to the selected button No.	○

［Wrt (Event)］

Item	Setting contents	Advanced
Event No.	Select the event No. to set.	○
Timing	Set the event occurrence timing of the selected event No..	○
CH DI	Set the channel No. or DI No. that triggers the event occurrence of the selected event No.	○
Alarm No.	Set the alarm No. that triggers the event occurrence of the selected event No..	○
Write ID	Sets the write ID assigned to the selected event No..	○

8.41 Engineering

［Explanation］

This item is for the factory coordination. Please do not change the setting.

9. MAINTENANCE

9.1 Inspection

In order to effectively use the instrument, please inspect periodically.

Inspection item	Inspection description	Remark
Measurement value	- Correct measurement value has been displayed?	
Display	- The brightness of the backlight appropriate? - Is there lack and blur on the display?	
Recording data	- Measurement value indication and data storing have been correctly?	
clock	- Is the clock display view the correct time?	
Installation condition	- Is there looseness or damage in mounting bracket?	
Wiring condition	- Is there looseness or damage in terminal screw?	

9.2 Recommended replacement cycle of parts

Names of parts	Cycle	Remark
Lithium Battery	5 years (20°C without being used.)	A user cannot replace the battery. Contact our dealer where you purchased the instrument, or our sales representative.

9.3 Troubleshooting

While in using this instrument, an error message may be displayed on event display area of the bottom of a screen, and the event history.

The table below lists error messages and steps to be taken.

● Error messages

If one of the errors listed below occurs, an error message is displayed in the event message display area of the bottom of a screen. After that it will be registered in the event history.

（In the table, "n" denotes a number.）

History type	Error message	part	Steps to be taken
Event	Backup SRAM Error	Non-volatile internal memory	Contact your dealer or our sales representative.
Event	Battery power down	Lithium Battery	
Event	Parameter Data Failed	Internal memory	
Event	System Data Failed		
Event	Internal memory read error		
Event	Internal memory write error		
Event	Internal memory error		
Event	Security log reading error		
Event	Param. log read error		
Event	Int. memory read error (1)		
Event	Int. memory read error (2)		
Event	Int. memory read error (3)		
Event	Int. memory read error (4)		
Event	CHnnAD Error	Input circuit	
Event	CHnn mV/TC Adjust data error		
Event	CHnn VOLT Adjust data error		
Event	CHnn RTD Adjust data error		
Event	CHnn RJC Adjust data error		
Event	RTC H/W Error	IC for clock	
Event	System Error (nnn)	Other	
Event	SD card is not recognized.	SD card	The SD card in use may be damaged. Replace the SD card and retry.
Event	SD card read error		
Event	SD card write error		

10. SPECIFICATION

10.1 Basic specification

•Number of inputs：Selection from 6,9,12 points.(Immediately after purchase)

•Input circuit：Inputting mutual insulation.

•Measuring period：100mm sec

•Input type：

Direct voltage, direct current (shunt resistance of necessity), TC and RTD

•Changing of input type：

Setting from set menu displayed with front side MENU button.

•Burnout function：

"TC" and "mV (scale OFF)"is equipped normally. ON/OFF of the function use can be set.

When the input is disconnected, the record is shaken off on 100% side.

•CMRR：Over 140dB

•NMRR：Over 60dB

•Allowable signal source resistance：

When the burnout is "ON", the influence like 0.18μV/Ω is exerted on resistance.

Lead wire resistance of RTD is under 5Ω.

•Input filter function：

It is possible to set it to each channel.(The first delay filter)

The time constant can be set within the range of 0～99 sec.

•Scaling function：

It is possible by direct voltage (current) input.

Range that can be scaled：±32000

Decimal point position：It is possible to set it arbitrarily.

Unit sign：It is possible to select it from unit that is preset inside or 20 units (each unit eight characters or less) that can be made.

•Square root function：

The input value of each channel is square (root) calculated.

•Calculation function：

Number of operation channels：36 points

Arithmetic, general, multiplication and F value calculation can be calculated with each calculation channel.

The content of the calculation can be set and be confirmed only with the Parameter Loader (Personal computer software appended by standard).

•F value calculation function：

F value of each channel (fatal value of the bacterium by the heating sterilization) is calculated from the measurement temperature.

The content of the calculation can be set and be confirmed only with the Parameter Loader (Personal computer software appended by standard).

10.2 Measurement range

Code	Type	Measuring range	Max. resolution	Measurement accuracy	Notes
000	mV	-10.00 ～ +10.00	10μV	±(0.1% F.S.+1digit)	*1 0～400℃: ±4% F.S. 400～800℃±(0.15% F.S.+1digit) *2 0～200℃: ±(0.15% F.S.+1digit)
001	mV	0.00 ～ +20.00	10μV		
002	mV	0.00 ～ +50.00	10μV		
003	V	-0.200 ～ +0.200	1mV		
004	V	-1.000 ～ +1.000	1mV		
005	V	-10.00 ～ +10.00	10mV		
006	V	0.000 ～ +5.000	1mV		
007	mA	4.00 ～ 20.00	0.01mA		
008	B *1	0.0 ～ 1820.0	0.1℃		
009	R1 *2	0.0 ～ 1760.0	0.1℃		
010	R2 *2	0.0 ～ 1200.0	0.1℃		
011	S *2	0.0 ～ 1760.0	0.1℃		
012	K1	-200.0 ～ 1370.0	0.1℃	±(0.1% F.S.+1digit) However, -200.0 to 0.0 ℃ is ± (0.15% F.S.+1digit).	
013	K2	-200.0 ～ 600.0	0.1℃		
014	K3	-200.0 ～ 300.0	0.1℃		
015	E1	-200.0 ～ 800.0	0.1℃		
016	E2	-200.0 ～ 300.0	0.1℃		
017	E3	-200.0 ～ 150.0	0.1℃		
018	J1	-200.0 ～ 1100.0	0.1℃		
019	J2	-200.0 ～ 400.0	0.1℃		
020	J3	-200.0 ～ 200.0	0.1℃		
021	T1	-200.0 ～ 400.0	0.1℃		
022	T2	-200.0 ～ 200.0	0.1℃		
023	C	0.0 ～ 2320.0	0.1℃	±(0.1% F.S.+1digit)	*3 1～20K: ±(0.5% F.S.+1digit) 20～50K: ±(0.3% F.S.+1digit) *4 0～300℃: ±(1.5% F.S.+1digit) 300～800℃: ±(0.8% F.S.+1digit)
024	Au-Fe *3	1.0 ～ 300.0	0.1K	±(0.2% F.S.+1digit)	
025	N	0.0 ～ 1300.0	0.1℃	±(0.1% F.S.+1digit)	
026	PR40-20 *4	0.0 ～ 1880.0	0.1℃	±(0.2% F.S.+1digit)	
027	PL Ⅱ	0.0 ～ 1390.0	0.1℃	±(0.1% F.S.+1digit)	
028	U	-200.0 ～ 400.0	0.1℃	±(0.1% F.S.+1digit) However, -200.0 to 0.0℃ is ±(0.15% F.S.+1digit)	
029	L	-200.0 ～ 900.0	0.1℃		
030	Pt100-1	-200.0 ～ 650.0	0.1℃	±(0.1% F.S.+1digit)	
031	Pt100-2	-200.0 ～ 200.0	0.1℃		
032	JPt100-1	-200.0 ～ 630.0	0.1℃		
033	JPt100-2	-200.0 ～ 200.0	0.1℃		

Note: C: W5Re－W26Re(Hoskins Mfg. Co. USA)

[Caution] Accuracy in reference condition. Reference junction compensation accuracy is not included in digital display accuracy.

- Reference junction compensation accuracy :
  R,S,PR40-20,Au-Fe : ±1℃
  K,E,J,T,C,N,PL Ⅱ,U,L : ±0.5℃

- Reference condition :
  Ambient temperature : 23 ± 2 ℃
  Ambient humidity : 55 ± 10 %RH
  Supply voltage : 85 to 264 VAC
  Power supply frequency : 50/60 Hz ± 1 %
  Warm up time : 30 min or more after power on

10.3 Display part

•Indicator：

5.7 inch TFT color LCD(320×240 dot)

The touch panel, back light is applied.The brilliance control is possible.

The pixel that always lights partially or doesn't light the liquid crystal display might exist. And, it is not a breakdown though the irregularity of brightness might be caused. Please acknowledge it beforehand.

•Display color：16 color

•Display language：Japanese/English is selected from a set screen.(Initialization is English)

•Backlight longevity：

50,000 hour (When the LCD sleep function is used, it is possible to prolong the life span.)

•Display group：

Number of groups ：Main record 6, Sub record 1

Number of channel：The display setting of 12 channels or less is possible by each channel.

•Real time trend display：

A present measuring data is displayed in the graph.

Scale display：Non display, single, double, or triple can be selected.

Direction：Vertical or Horizontal

Numeric display/non-display, Scale display/non-display is possible to select it.

Display updates cycle 1 sec

•Historical trend display：

A past measuring data is displayed in the graph.

Scale display：Non display, single, double, or triple can be selected.

Direction：Vertical or Horizontal

Numeric display/non-display, Scale display/non-display is possible to select it.

•Bar graph display：

A present measuring data is displayed in the vertical direction bar graph.

Scale display：Single only.

Display updates cycle 1 sec

•Digital display：

A present measuring data is zooming displayed. Alarm occurred No. is displayed.

Display updates cycle 1 sec

•Event history：

Alarm history, Message data, Self-diagnosis information is displayed.

•Communication history：

Communication history is displayed.

•Security log:

Display the log of each setting and each operation.

•Parameter display/setting：

The set data screen is displayed with front side MENU button.

•TAG display：

Number of characters that can be displayed：8 characters or less

10.4 Operation Button

•Number of button： 3(It is possible to operate it by opening the cover under the front side.)

•Function ：

REC ：Record start/Stop

MENU ：Various set screens are displayed.

FUNC ：The function to allocate beforehand is executed.

10.5 Record function

•External recording medium：
SD memory card(It corresponds to the SD/SDHC standard)

•Internal memory：About 100MB

•Record capacity：
SD standard：2GB or less
SDHC standard：32GB or less

•Record method：
The record begins by turning on the REC button. It records by the new file name at the time of each record beginning.

•Main record：
Each channel data of 6 main record groups set in the display group is recorded. The content of the record is trend data, event data, and message data.

•Sub record：
Each channel data of 1 sub record groups set in the display group is recorded. The content of the record is trend data only.
The record condition can be selected from “sync.”, “Alarm”, “DI”.

•Record cycle：
The cycle when data is recorded can be selected from “1 sec ～ 60 min”.(Only the sub record can select the data logging cycle of 100 milliseconds)

•File record cycle：
First of all, recorded data is preserved in an internal memory. And, when the memory is filled or the record stops, it is written in the SD memory card.
The preservation period of the data of one record file can be selected from “1 hour ～ 1 year”.

•Trend data：
Either minimum value or the maximum value of the mean value, the instantaneous value or measurements is preserved from among the measuring data sampled at the measuring period.

•Other recorded data：
Alarm information, Message record

•Preservation capacity：
At the following condition, it is possible to record at the time of the table below.
［Condition］
－Number of inputs：6 points
－Record data format：Binary
－Record type：Max/Min record
－Event none of alarm and message, etc.

SD card capacity	2GB				
File pre cycle	1 hour			1 day	
Data rec cycle	1 sec	2 sec	5 sec	10 sec	1 min
Record capacity	1.0 year	1.4 year	1.8 year	14.0 year	33.7 year

※The record exceeding the product-life cycle is not guaranteed.

•The memory remainder capacity display：
The internal memory or the remainder capacity of SD memory card is percent displayed on the screen of this machine. When the recording area of the SD memory card disappears, is the record stopped or whether it deletes from old data and the record continuance is done can be set.

•SD memory card：

Confirmed operation SD memory card：

・Panasonic corporation 1～32GB

・Sandisk corporation 1～32GB

・HAGIWARA Solutions corporation 1～32GB

Please buy it in the computer shop etc.

•Data format：

It is possible to select it from either of method of the binary or binary + CSV.(It is not possible to change while recording. Comma Separated Value is directory readable in Excel etc. Reading of the data recorded by the binary form is improper)

CSV format：About 120 bytes by 1 sampling.(6 channel input, when Max/Min record)

Binary format：About 30 bytes.(6 channel input, when Max/Min record)

10.6 Alarm function

•Number of setting：It is possible to set it up to four points or less by each channels.

•Alarm type：HI, LOW, Fault data

•Display：

When warning is occurred, it displays in a digital display.

It displays right frame of horizontal trend display, and under frame of the vertical trend graph in red.

•Hysteresis：

It is possible to set it with 0 ～ 100% of the range.

•Alarm output：

Common alarm output ：1 point(Open collector output)

Point of contact ratings ：30V DC 20mA/1 point

10.7 Ethernet(10BASE-T)

■HTTP server

• Measurements display：

Measurements of each channel and the alarm situation are displayed by a digital value.

■FTP server

• File download：

The record file preserved on the SD memory card can be downloaded.

• File delete：

The record file preserved on the SD memory card can be deleted.

• Access attestation：The right of access is attested to the FTP server.

■Modbus TCP

•Data reading：

Reading measurements and the setting is possible in the Modbus TCP protocol.

•Data writing：

The setting can be written in the Modbus TCP protocol.

■SNTP

• SNTP client function：

Present time can be synchronized with at the time of the SNTP server.

• SNTP server function：

SNTP server can notify the time information to the SNTP client.

10.8 Power supply part

- Rated supply voltage : 100～240V AC
- Range of use voltage : 85～264V AC
- Power supply frequency : 50/60Hz(Sharing)
- Power consumption :

Power-supply voltage	Power consumption	
	Usually	LCD OFF ※
100V AC	Under 15VA	Under 12VA
240V AC	Under 25VA	Under 22VA

※ When you "OFF" the backlight by the LCD sleep function.

10.9 Structure

- Installation method : Panel burial installation(Vertical panel)
- Installation posture : The rear side 0～30°, The right and left horizontal
- The installation panel thickness : 2～7mm
- Material : Polycarbonate, glass10%, UL94-V0
- Color : Black
- Externals size : 150(W)×144(H)×181.8(D)mm
- Mass : About 1.0kg(Input 3 channel, option none)
- External terminal stand : M3.5 screw terminal

10.10 Normal operating condition

- Power-supply voltage : 100～240V AC
- Ambient temperature : 0～50℃
- Surrounding humidity : 20～80%RH(Non condensing)
- Vibration : 10～60Hz 0.2m/s^2
- Impact : The impact is not allowed.
- Warm-up time : 30 min or more after power supply is turned on.

10.11 Others

- Clock :
  With calendar function (Christian era)
  Accuracy ±50ppm or less (About 2 min / month difference)
  However, it doesn't contain the error margin at power supply ON / OFF.
- Memory backup :
  The parameter is preserved in an internal flash memory.
  The clock backup with the built-in lithium battery.
  (Battery life when no energizing, about 5 year)
- Insulation resistance : Over 500V DC 20MΩ(Between each terminal－G terminals)
- Electric strength :
  Between input terminals … 500V AC / 1 min
  Between power supply terminal－G terminals … 2000V AC / 1 min
  Between input terminal－G terminals … 500V AC / 1 min

10.12 Compatible specification

• CE：

EMC instruction ：EN61326-1 compatible
Low Voltage Directive：EN61010-1 agreement
RoHS Directive ：EN50581 agreement

• Dustproof and waterproof standard：
IEC60529 IP65 conforming (Front Panel only)

10.13 Transportation and storage conditions

• Temperature：－10～60℃
• Humidity：5～90%RH
• Vibration：Under 10～60Hz 2.45m/s^2
• Impact：Under 249m/s^2(State of packing)

10.14 Optional function (Option)

■Communication

RS-485 communication module can be mounted. (The 10th form digit code “6”)

• Telecommunication facility ：
Electric specification：EIA RS-485 conforming
Protocol：Modbus RTU
Communication method：2-wire system half duplex：Start-stop synchronization
Data form：Data length：8 bit
Stop bit：1 bit, 2bit
Parity：Even, Odd, OFF
Transmission rate：9600, 19200, or 38400 bps
Max connected number：The master includes 32 stand(Multi drop)
Communication distance：Max 1.2km(Total extension)
Slave function： can connect from other Modbus master as a Modbus slave.
Master function： possible acquisition of data from other Modbus slave as a Modbus master.
Remote AI：Connect an optionally available remote AI, range setting, and the measured value can be acquired.

■DI/DO (The 11th form digit code “1”)

Only one card with “the DI input in 9 points” and “the DO output in 12 points” can be mounted. However, when the number of inputs is 12 points or relay output card selection, it is not possible to mount.

•Connected method：Connector(40 pin, DI/DO mixture)
•Insulation resistance：500V DC over 20MΩ(Between each terminal－G terminals)
•Electric strength：500V AC 10mA 1min(Between each terminal－G terminals)

•DI input：

Dry contact input (9 points), Common terminal is shared.

Ratings：Photo-coupler drive 12V DC about 3mA/1 point

The following control is possible according to the contact input.(ON/OFF pulse time over 0.5 sec)

①Start/stop of main and sub record operation

②Message setting

③Multiplication value reset

④LCD backlight ON/OFF control

•DO output ：

Open collector output (12 points), Common terminal is shared.

Point of contact ratings：30V DC 20mA/1 point

It is possible to specify it for an alarm output. It can be specified as Int. SP DO.

■Relay output (The 11th form digit code “2”)

Only one card with the output of the relay of 6 points can be mounted. However, when the number of inputs is 12 points or DI / DO card selection, it is not possible to mount. It is possible to specify it for an alarm output. It can be specified as Int. SP DO.

• Connected method：Terminal stand(M3.5 screw)

• Contact rating：
3A/250V AC, 3A/30V DC
However 3A/1 common Total under 9A

• Insulation resistance：500V DC Over 20MΩ(Between relay terminal－G terminal)

• Electric strength：2000V AC 10mA 1 min(Between relay terminal－G terminal)

■Extended Security(Option item:WMSU1109B04)

A function to support operation in 21 CFR Part 11 established by the Food and Drug Administration (FDA). It is a software option that enables secure recording and operation using user name and password. It is also possible to sign recorded data by support software.

10.15 Support software

Two kinds of support software are appended by the standard.

- The corresponding model is PC / AT compatible.
- Operation by the home-made PC and the shop brand personal computer cannot be guaranteed.
- Disk device：
  CD-ROM drive corresponding to Windows 7(SP1 or later) / 8.1/10 (32bit, 64bit)
- Capacity of hard disk：
  The lowest remainder capacity：Over 500MB
- OS：Windows7(SP1 or later) / 8.1/10 (32bit, 64bit)
- Printer：
  Printer and printer driver corresponding to Windows 7(SP1 or later) / 8.1/10 (32bit, 64bit)

■Parameter Loader software

- The main function：
  It is software to do the setting and the edit in various parameters of the main body on the personal computer. A set content is preserved on the SD memory card, and it is possible to read with the Recorder.

■Data Viewer software

- The main function：
  It is software that reproduces the recorded data preserved on the SD memory card on the personal computer. It equips it with the historical trend display and the event display function. Data can be output to the CSV file.

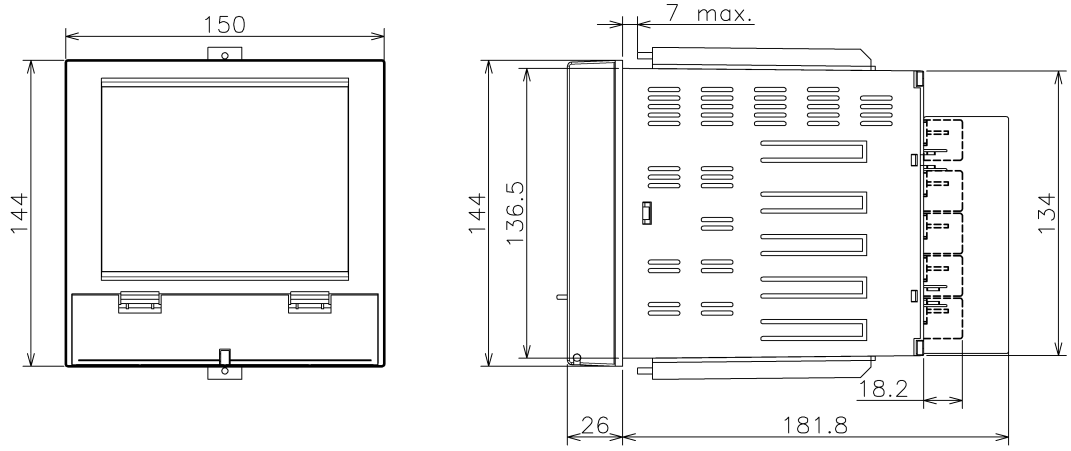
The following support software can also be used if you purchase the extended security option.

■Ex.Sec Viewer(Extended security option special support software)

- The main function ：
  It is software which confirms the record data for the extended security function on the PC. It is a software that can sign the recorded data, check recorded data and audit trail (security log) recorded on the recorder, and print recorded data. It is also possible to output the data to a CSV file.

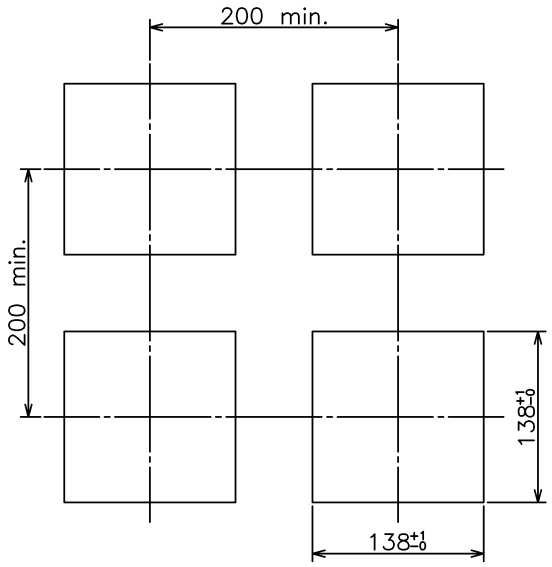
10.16 Dimension

unit: mm



＜Panel cutting＞

unit: mm



10.17 Folder composition of SD card(Standard)

When the SD card is inserted in the main body of the Recorder, the “Recorder” folder is automatically made. “Recorder” folder contents are as follows.

［SD card folder composition］

[Recorder]-+-[Cap]
+-[Data]
+-[Etc]
+-[Prm]
+-[Prm_YYMMDD_hhmmss]

(1) Cap

The image taken by capture is preserved by bmp. The max preservation number is 100.

(2) Data

The trend file measured with the main body is preserved. When the record begins, one new folder is made, and a new folder is made while recording whenever 50 dm files are created.

※ Naming rule of folder name

Folder name：YYMMDDhhmmss

※ Naming rule

YY：year 2 digit (00～99)
MM：month 2 digit (01～12)
DD：day 2 digit (01～31)
hh：hour 2 digit (00～23)
mm：minute 2 digit (00～59)
ss：second 2 digit (00～59)
xxxx：Record management file numbering 4 digit (0000～0999)

Moreover, the content and the naming rule of the preserved file of each folder are as follows.

・Main record management file

It is a file that records “Trend data (main) record start time”, “Stop time”, and “Link information”.
By one "dm file", a "dmt file" manages to 50 file.
(If 50 or more "dmt files" are created, "dm file" is created newly.)
File name：xxxx_YYMMDDhhmm.dm
Extension：dm

・Main record trend file

It is a measurement data file divided at the file record cycle (main).
File name：xxxx_YYMMDDhhmm.dmt
Extension：dmt

・Main record event file

They are the history files of warning and the message, etc.
File name：xxxx_YYMMDDhhmm.dme
Extension：dme

・Main record comment file

Data file of comment function. (It supports since recorder version 1.20.)
File name：xxxx_YYMMDDhhmm.dmc
Extension：dmc

・Sub record management file

It is a file that records “Trend data (sub) record start time”, “Stop time”, and “Link information”.

File name：xxxx_YYMMDDhhmm.ds

Extension：ds

・Sub record trend file

It is a measurement data file divided at the file record cycle (sub).

File name：xxxx_YYMMDDhhmm.dst

Extension：dst

(3) Etc

The data of the character string table is preserved. (.txt)

The character string table can be used with the list key to the character input screen.

(For the character input screen, refer to section 7.4.)

(4) Prm

Parameter configuration file (.dps) set with the main body of the Recorder is preserved.

The “dps” file preserved in this folder can be read and written with the main body of the Recorder.

Please put the file generated with the parameter loader in this folder.

(5) Prm_YYMMDD_hhmmss

This folder is generated when log output is executed. It is generated every time log output is executed.

For log output, refer to Section 8.6.

In the folder, a text file in which event log, communication log, security log are described, and dps file which can check parameters with parameter loader are stored. For the parameter log file, refer to Section 10.19.

10.18 Folder composition of SD card (Extended security)

This section is the folder composition when the extended security function is enabled. If you have enabled the extended security function, you can check recorded data only if you purchased the extended security option. For details of options, please contact the dealer you purchased.
When the SD card is inserted in the main body of the Recorder, the “Recorder” folder is automatically made. Describes the folder composition when the extended security function is enabled. When you start / stop recording, a folder specialized for extended security is created. Folder composition is shown below.

※ The extended security function is compatible with version 2.00 or later.

[Example folder composition]

```
[Recorder]--+--(1) [Data]
            +--(2) [Cap]----Capture_0000.bmp
            +--(3) [Etc]----String_List.txt
            +--(4) [Prm]----Setup.dps
            +--(5) [EXSEC_XXXXXXXXXX(Serial number)]
            +--(6) [Prm_YYMMDD_hhmmss]
```

```
[EXSEC_ XXXXXXXXXX(Serial number)]--+--(7)[YYMMDDhhmmss]--+-- xxxx_YYMMDDhhmm.secm
                                    |                      +-- xxxx_YYMMDDhhmm.dmt
                                    |                      +-- xxxx_YYMMDDhhmm.dme
                                    |                      +-- xxxx_YYMMDDhhmm.dmc
                                    |                      +-- xxxx_YYMMDDhhmm.secs
                                    |                      +-- xxxx_YYMMDDhhmm.dst
                                    |                      +-- user.dat
                                    |                      +-- security_log.dat
                                    |
                                    +--(8) [Prm]--+-- nnn_YYMMDD.dps
                                                  +-- nnn_YYMMDD.dps
```

※ Naming rule of folder name
Folder name：YYMMDDhhmmss

※ Naming rule
YY：year 2 digit (00～99)
MM：month 2 digit (01～12)
DD：day 2 digit (01～31)
hh：hour 2 digit (00～23)
mm：minute 2 digit (00～59)
ss：second 2 digit (00～59)
xxxx：Record management file numbering 4 digit (0000～0999)

(1) [Data]

Measurement data is stored only when the extended security function is disabled.

For the folder composition when extended security is disabled, refer to Section 10.17.

(2) [Cap]

The image taken by capture is preserved by bmp. The max preservation number is 100.

(3) [Etc]

The data of the character string table is preserved. (.txt)

The character string table can be used with the list key to the character input screen.

(For the character input screen, refer to section 7.4.)

(4) [Prm]

Parameter configuration file (.dps) set with the main body of the Recorder is preserved.

The “dps” file preserved in this folder can be read and written with the main body of the Recorder.Please put the file generated with the parameter loader in this folder.

(5) [EXSEC_ XXXXXXXXXX(Serial number)]

It is a folder specialized for extended security.

In the folder name, the serial number is attached and it is created in a format that can distinguish the recorder.

A record data folder and a parameter log folder are created under this folder.

(6) [Prm_YYMMDD_hhmmss]

This folder is generated when log output is executed. It is generated every time log output is executed.For log output, refer to Section 8.6.

In the folder, a text file in which event log, communication log, security log are described, and dps file which can check parameters with parameter loader are stored.

For the parameter log file, refer to Section 10.19.

(7) [YYMMDDhhmmss]

It is a record data folder. Measurement data files, user information files, and security log files are stored in the measurement data folder. For details of each file, refer to "VGR-B100 Extended security function Paperless recorder & Ex.Sec Viewer Instruction manual" (option). The folder name is named by the recording start time. Folder naming conventions are shown below.

(8) [Prm]

This is a parameter log folder.

A parameter log file is created under this folder.

For the parameter log file, see Section 10.19.

10.19 Parameter log file

File that contains information about parameters set in the past. This file is internally generated for example when you select the input type. The parameter log file is not generated when an operation not related to parameters (such as start of recording) is performed.
The recorder contains information about up to 50 past parameters. When 50 or more parameter log files are recorded, the oldest file is overwritten and updated.
When you setting parameter, a parameter file associated with security logs is recorded. This parameter file is output to the SD card with measurement data when recording stops. When the SD card contains the same parameter file, that parameter file is neither saved nor overwritten. The created parameter file can be checked using the support software (parameter loader).

[Output method]

When extended security mode is disabled : ・Touch the Log output key. (For log output, see Section 8.6)
When extended security mode is enabled : ・Touch the Log output key. (For log output, see Section 8.6)
・When recording stops. It is output at the same timing as the recording data.

[Output destination]

・When the Log output key is touched
The log is output to the "Prm_YYMMDD_hhmmss" folder in the "Recorder" folder.

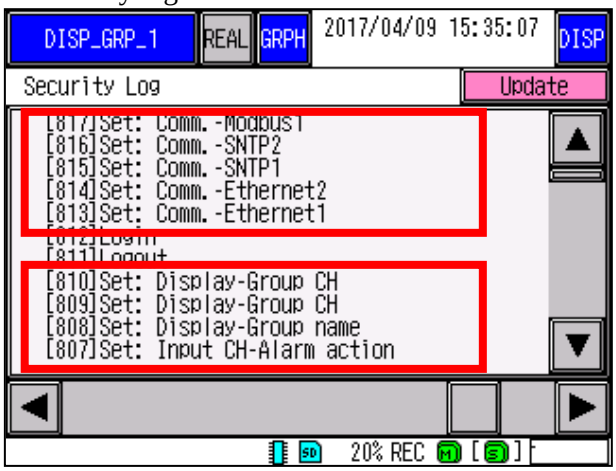
・When recording stop (only when extended security mode is enabled)
The log is output to the "Prm" folder in "Recorder / EXSEC_ XXXXXXXXXX (Serial number)".

File name: nnn_YYMMDD.dps
Extension: dps

Naming conventions of parameter log file
Folder name: nnn_YYMMDD (when recording the parameter file)
YY: Two-digit year (00 to 99)
MM: Two-digit month (01 to 12)
DD: Two-digit day (01 to 31)
nnn: Three-digit security logs number (000 to 999)

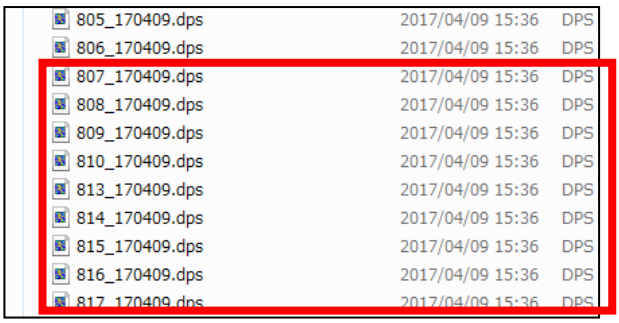
The relationship between the security log and the parameter log file is shown below.
For the security log, refer to Section 6.7.

・Security log



Parameter log files are created under the names that contain the set log numbers [807] to [810], [813] to [817] as the first three letters.

・Parameter log file in the SD card folder



10.20 List of Security Logs

No.	Log	When logs are generated
1	Power ON	When the power is turned on
2	Power OFF	When the power is turned off
3	Record start	When recording starts
4	Record stop	When recording ends
5	Login	When the user logs in
6	Logout	When the user logs out
7	fail: Login	When login fails
8	Clear: Event log	When the event history is cleared
9	Clear: Ethernet log	When the transmission history is cleared
10	Add: Comment	When a comment is added to the historical trend
11	Edit: Comment	When an existing comment is edited in the historical trend
12	Delete: Comment	When a comment is deleted from the historical trend
13	Execute: mV Calibration	When mV is calibrated (setting not released to users)
14	Execute: Volt Calibration	When V is calibrated (setting not released to users)
15	Execute: RTD Calibration	When RTD is calibrated (setting not released to users)
16	Execute: RJC Calibration	When RJC is calibrated (setting not released to users)
17	Set: Input CH-Input	When the OK key on the "Input" setting screen in the Input CH is touched
18	Set: Input CH-Scaling	When the OK key on the " Scaling " setting screen in the Input CH is touched
19	Set: Input CH-Display	When the OK key on the " Display " setting screen in the Input CH is touched
20	Set: Input CH-Scale	When the OK key on the " Scale " setting screen in the Input CH is touched
21	Set: Input CH-Alarm value	When the OK key on the " Alarm value " setting screen in the Input CH is touched
22	Set: Input CH-Alarm action	When the OK key on the " Alarm action " setting screen in the Input CH is touched
23	Set: Input CH-REC/CALC	When the OK key on the " REC/CALC " setting screen in the Input CH is touched
24	Execute: Input CH-Copy	When "Copy" in the Input CH is executed
25	Set: Calc. CH-F value	When the OK key on the " F value " setting screen in the Calc.CH is touched
26	Set: Calc. CH-Timer	When the OK key on the " Timer " setting screen in the Calc.CH is touched
27	Set: Calc. CH-Display	When the OK key on the " Display " setting screen in the Calc.CH is touched
28	Set: Calc. CH-Scale	When the OK key on the " Scale " setting screen in the Calc.CH is touched
29	Set: Calc. CH-Alarm value	When the OK key on the " Alarm value " setting screen in the Calc.CH is touched
30	Set: Calc. CH-Alarm action	When the OK key on the " Alarm action " setting screen in the Calc.CH is touched
31	Set: Calc. CH-REC/CALC	When the OK key on the " REC/CALC " setting screen in the Calc.CH is touched
32	Execute: Calc. CH-Copy	When "Copy" in the Calc.CH is executed
33	Set: Display-Group name	When the OK key on the " Group name " setting screen in the Display is touched
34	Set: Display-Group CH	When the OK key on the " Group CH " setting screen in the Display is touched
35	Set: Display-Graph display	When the OK key on the " Graph display " setting screen in the Display is touched
36	Set: Display-Auto display	When the OK key on the " Auto display " setting screen in the Display is touched

No.	Log	When logs are generated
37	Set: Record-Setting(Main)	When the OK key on the " Setting(Main) " setting screen in the Record is touched
38	Set: Record-Setting(Sub)	When the OK key on the " Setting(Sub)" setting screen in the Record is touched
39	Set: Record-Schedule	When the OK key on the " Schedule " setting screen in the Record is touched
40	Add: Others-Unit	When a new unit is added in the "Unit" setting in Others
41	Edit: Others-Unit	When an existing unit is edited in the " Unit" setting in Others
42	Delete: Others-Unit	When an existing unit is deleted in the " Unit " setting in Others
43	Set: Others-Message	When the OK key on the " Message " setting screen in the Others is touched
44	Set: Others-DI	When the OK key on the " DI " setting screen in the Others is touched
45	Set: Others-ProductsDisplay	When the OK key on the " ProductsDisplay " setting screen in the Others is touched
46	Set: Others-Int.SP DO	When the OK key on the " Int.SP DO " setting screen in the Others is touched
47	Set: Others-Progress time	When the OK key on the " Progress time " setting screen in the Others is touched
48	Execute: Others-Progress Time-Manual reset	When " Manual reset " in the Progress Time is executed
49	Execute: Others-Param initial	When " Param initial " in the Others is executed
50	Execute: SD/Param-SD remove	When " SD remove " in the SD/Param is executed
51	Execute: SD/Param-SD format	When " SD format " in the SD/Param is executed
52	Execute: SD/Param-Param save	When " Param save " in the SD/Param is executed
53	Execute: SD/Param-Param load	When " Param load " in the SD/Param is executed
54	Execute: Log output	When " Log output " is executed
55	Set: Comm.-Ethernet1	When the OK key on the " Ethernet1 " setting screen in the Comm. is touched
56	Set: Comm.-Ethernet2	When the OK key on the " Ethernet2 " setting screen in the Comm. is touched
57	Set: Comm.-SNTP1	When the OK key on the " SNTP1 " setting screen in the Comm. is touched
58	Execute: Comm.-SNTP1 Cal Start	When " Cal Start " in the SNTP1is executed
59	Set: Comm.-SNTP2	When the OK key on the " SNTP2 " setting screen in the Comm. is touched
60	Add: Comm.-FTP user	When a new FTP user is added in the "FTP" setting in Comm.
61	Edit: Comm.-FTP user	When an existing FTP user is edited in the "FTP" setting in Comm.
62	Delete: Comm.-FTP user	When an existing FTP user is deleted in the "FTP" setting in Comm.
63	Set: Comm.-Remote AI	When the OK key on the " Remote AI " setting screen in the Comm. is touched
64	Set: Comm.-Modbus1	When the OK key on the " Modbus1" setting screen in the Comm.i s touched
65	Set: Comm.-Modbus2	When the OK key on the " Modbus2" setting screen in the Comm. is touched
66	Set: Device/Other-LCD	When the OK key on the " LCD " setting screen in the Device/Other is touched
67	Set: Device/Other-Clock	When the OK key on the " Clock " setting screen in the Device/Other is touched
68	Set: Device/Other-FUNK key	When the OK key on the " FUNK key " setting screen in the Device/Other is touched
69	Set: Device/Other-File format	When the OK key on the " File format " setting screen in the Device/Other is touched
70	Add: Device/Other-Jump menu	When a new jump menu is added in the "Jump menu" setting in Device/Others
71	Delete: Device/Other-Jump menu	When an existing jump menu is deleted in the "Jump menu" setting in Device/Others
72	Set: Device/Other-Mode	When the OK key on the " Mode " setting screen in the Device/Other is touched
73	Set: Device/Other-Language	When the OK key on the " Language " setting screen in the Device/Other is touched

No.	Log	When logs are generated
74	Set: Security-Security Mode	When the OK key on the " Security Mode " setting screen in the Security is touched
75	Set: Security-Key lock	When the OK key on the " Key lock " setting screen in the Security is touched
76	Add: Security-User Regist	When a new user is added in the " user Regist." setting in Security
77	Edit: Security-User Regist	When an existing user is edited in the "user Regist." setting in Security
78	Delete: Security-User Regist	When an existing user is deleted in the " user Regist." setting in Security
79	Execute: Remote AI Retry	When the remote AI is reconnected
80	Execute: ModbusMas Retry	When the Modbus master is reconnected
81	Execute: Addition reset	When accumulation is reset with the FUNC button
82	Auto Logout	When no operations are performed for five minutes (only when "Auto + Manual" is set to the logout setting in the extended security mode)
83	Execute: Register production information.	Setting in production information setting by FUNC button When key is touched
84	Set: ModbusMas.-Rd(Cyclic)	When the OK key on the " Rd (Cyclic)" setting screen in the ModbusMas. is touched
85	Set: ModbusMas.-Write Param	When the OK key on the " Write Param" setting screen in the ModbusMas. is touched
86	Set: ModbusMas.-Wrt (Cyclic)	When the OK key on the " Wrt (Cyclic)" setting screen in the ModbusMas. is touched
87	Set: ModbusMas.-Wrt (Display)	When the OK key on the " Wrt (Display)" setting screen in the ModbusMas. is touched
88	Set: ModbusMas.-Wrt (Event)	When the OK key on the " Wrt (Event)" setting screen in the ModbusMas. is touched
89	Execute: Button1 (Write Operation)	When "Button 1" is touched on the write operation screen
90	Execute: Button2 (Write Operation)	When "Button 2" is touched on the write operation screen
91	Execute: Button3 (Write Operation)	When "Button 3" is touched on the write operation screen
92	Execute: Button4 (Write Operation)	When "Button 4" is touched on the write operation screen
93	Execute: Button5 (Write Operation)	When "Button 5" is touched on the write operation screen
94	Execute: Button6 (Write Operation)	When "Button 6" is touched on the write operation screen
95	Execute: Button7 (Write Operation)	When "Button 7" is touched on the write operation screen
96	Execute: Button8 (Write Operation)	When "Button 8" is touched on the write operation screen

10.21 Option item

■Option

Item	Code
Shunt resistance for a direct-current input (250Ω±0.1%)	HMSU3081A11
The terminator for RS-485 (200Ω)	WMSU0303A01
DI/DO cable (1m)	WMSU0468A01
DI/DO cable (3m)	WMSU0468A02
Extended Security	WMSU1109B04