VM7000A
PAPERLESS RECORDER

OPERATION MANUAL

Ohkura

WXPVM70mnA0001E
March., 2016(Rev.12)

To use this equipment safely

Thank you for purchasing our VM7000A Paperless Recorder.

- Please installs it, operates it and prepares it, after this manual is often read, and it understands enough. There is danger where the accident and the trouble occur when handling is mistaken.
- This specification of Recorder is subject to change without prior notice for product improvement.
- It is prohibited to remodeling this Paperless Recorder without our permission. It doesn't assume the responsibility about the accident caused by having remodeled it without our permission.
- Please keep this manual if you actually use the Recorder.
- After reading this manual, keep it carefully by the instrument.
- Please consider this manual to be sure to extend to the final user.
- 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.

Manufacturer	: Ohkura Electric Co.,Ltd.
Model number	: It is recorded in marking plate on the main body.
Serial number	: It is recorded in marking plate on the main body.
Country of manufacture	: Japan

Note：Windows are registered trademarks of Microsoft Corporation.

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

Symbols used on the instrument

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.

Be sure to observe the following warnings/cautions and those provided in the text in order to secure safety in handling the instrument.

⚠ WARNING

General

- In order to prevent electric shock; be to disconnect this instrument from the main power source when wiring it.
- When the effect on the system is expected by the error occurs due to external factors or failure the instruments, take precautions to ensure the overall safety of your system.
- Take precautions to so that an alien substance does not get into the instruments aperture.
- In case of damage or failure, contacting serviceman of our company, instruments should be against unintended operation.

Protective Grounding

- In order to prevent an electric shock; be sure to provide protective grounding prior to turning on this instrument.
- Do not cut a protective grounding conductor or disconnect protective grounding.

Power Source

- Make sure that the supply voltage for this instrument conforms to the voltage of the supply source.

Rated power voltage range	: 100-240VAC
Working supply voltage range	: 85-264VAC
Rated power frequency	: 50/60Hz
Power consumption	: 25VA max

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

Working Environment

- Please use in an environment that is shown in the following.

Installation features	: Indoor
Altitude	: 2000m or less
Ambient temperature	: 0-50℃
Ambient humidity	: 20-80%RH(Non condensing)
Overvoltage category	: Category Ⅱ
Allowable pollution degree	: Pollution degree 2
Vibration	: 10～60Hz 0.2m/s^2
Impact	: The impact is not allowed.

- Do not operate this instrument in the environment where it is exposed to a combustible / explosive / corrosive gas or water / steam.
- Do not use in an environment where there is strong Electromagnetic wave. May cause the operation to become unstable.

Input and Output Wiring

- Provide input and output wiring after turning off the power.

⚠ CAUTION

Input and Output Wiring

- Do not use empty terminals for other purposes such as relaying, etc.

Reverse-insertion attention

- Please confirm the direction to the insertion of SD card.
  When forcibly inserting it in a wrong direction, SD card and the terminal on the main body side might be destroyed.
  Please mote that the damage of the equipment by the reverse-insertion becomes off the subject of amends.

Inside of Instrument

- Do not replace the main unit or printed circuit boards. When this is neglected, we cannot guarantee functioning of the instrument. Contact our dealer where you purchased the instrument, or our sales representative.

[Note]

Instruction Manual

- Deliver this instruction manual to an end user.
- Prior to handling this instrument, be sure to read this manual.
- If you have any questions on this manual or find any errors or omissions in this manual, contact our sales representative.
- After reading this manual, keep it carefully by the instrument.
- When the manual is lost or stained, contact our sales representative.
- It is prohibited to copy or reproduce this manual without our permission.

Installation

- 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.

Maintenance

- Only our serviceman or persons authorized by OHKURA are allowed to remove and take the inner module, the main unit and printed circuit boards apart.

Cleaning

- Use dry cloth to clean the surface of this instrument.
- Do not use any organic solvent.
- Cleaning the instrument after turning off the power.

Revisions

- This instruction manual is subject to change without prior notice.

＜CONTENTS＞

1. INTRODUCTION

1.1 Paperless Recorder

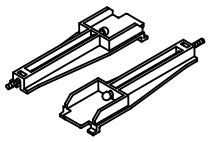
① This Recorder displays measured data in real time on the liquid crystal display. It is a paperless type that is also capable of saving the measured data to a SD memory card (hereinafter referred to as SD card). It can operate easily with the liquid crystal with the touch panel.

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.

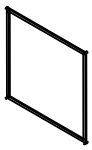
1.2 Accessory check

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.

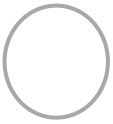


① Panel-mounting bracket

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

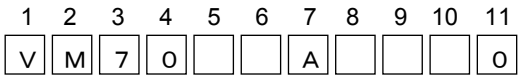
Externals, the function, and the longevity etc. of the product might be ruined when keeping it in poor surroundings.

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
5-6	<Number of input points>	
	03 point	03
	06 point	06
	09 point	09
	12 point	12

【Option】

Digit	Specifications	Code
8	< Communication >	
	Without	0
	RS-485	1
9	< I/O >	
	Without	0
	DI/DO	1
	Relay output	2
10	< Examination result book >	
	Without	0
	With (Japanese)	1
	With (English)	2

1.5 Handling SD card

Correspondence SD card is as follows.

・Panasonic corporation 1～32GB

・SanDisk 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.

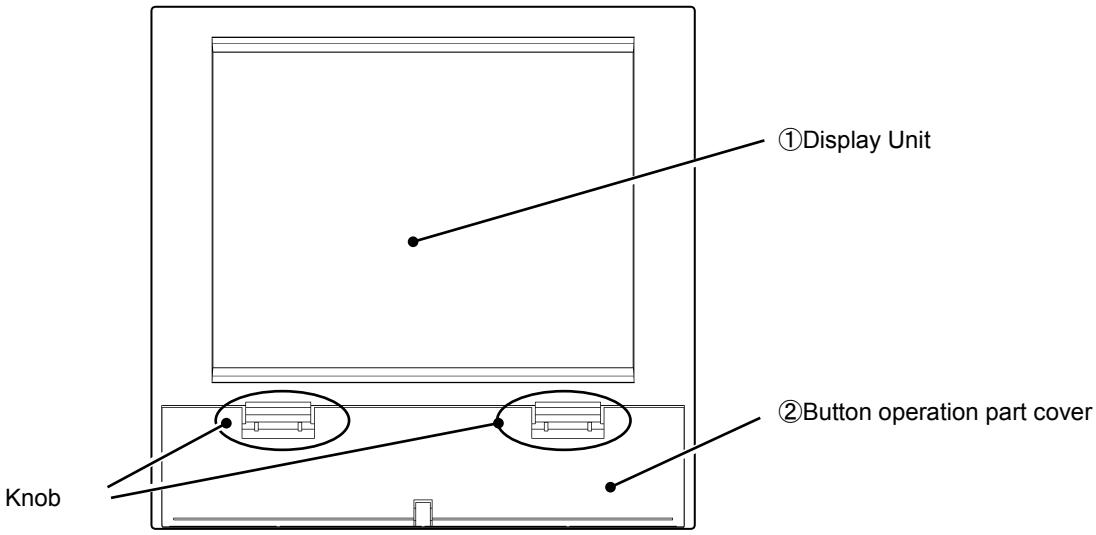
● Timing of data writing

First of all, recorded data is preserved in an internal memory, and it is automatically written on the SD card in the timing of the record stop. Moreover, the file is generated to an internal memory at the file record cycle, and when this file exceeds 50, it is automatically written on the SD card.

(Refer to item 10.17 for format of record file.)

2. NAMES AND FUNCTIONS OF PARTS

2.1 Names and functions of parts



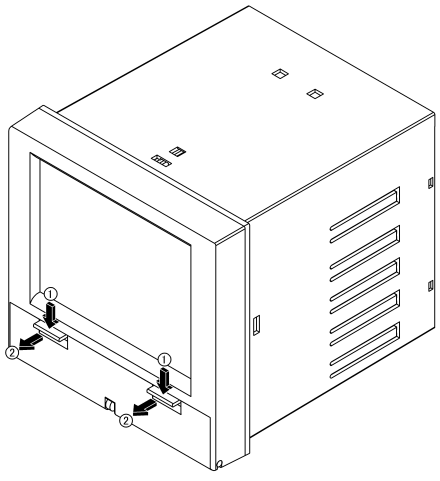
① Display area

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

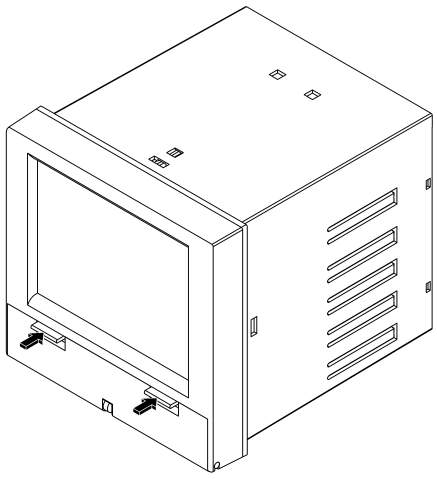
② Button operation part cover

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.



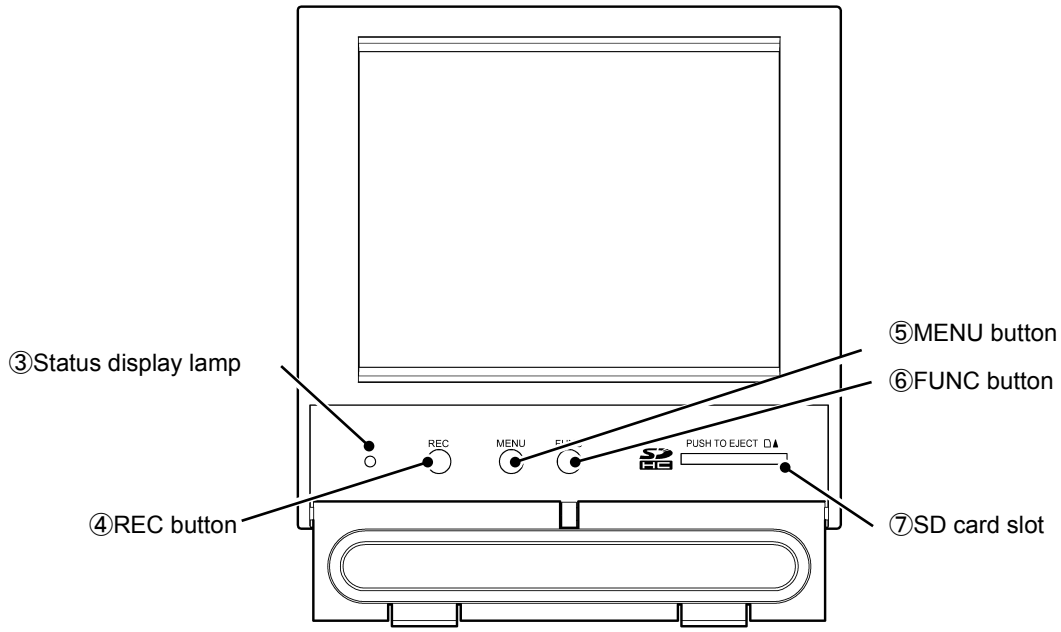
【When opening cover of button operation part】



【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 item 8.17 for FUNC key.)

⑦ SD card slot

Used for inserting the SD card.

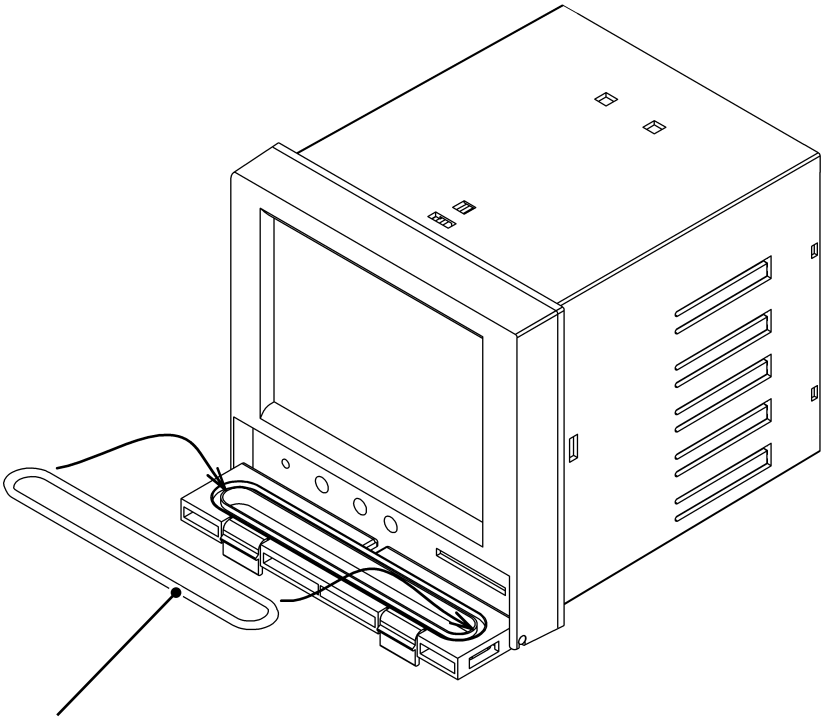
To remove the SD card from the slot, press SD card to insert.

⚠ 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.



⚠ 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

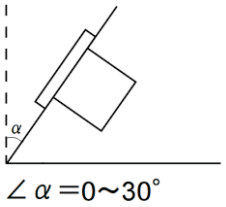
3.1 Installation place

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 item 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.

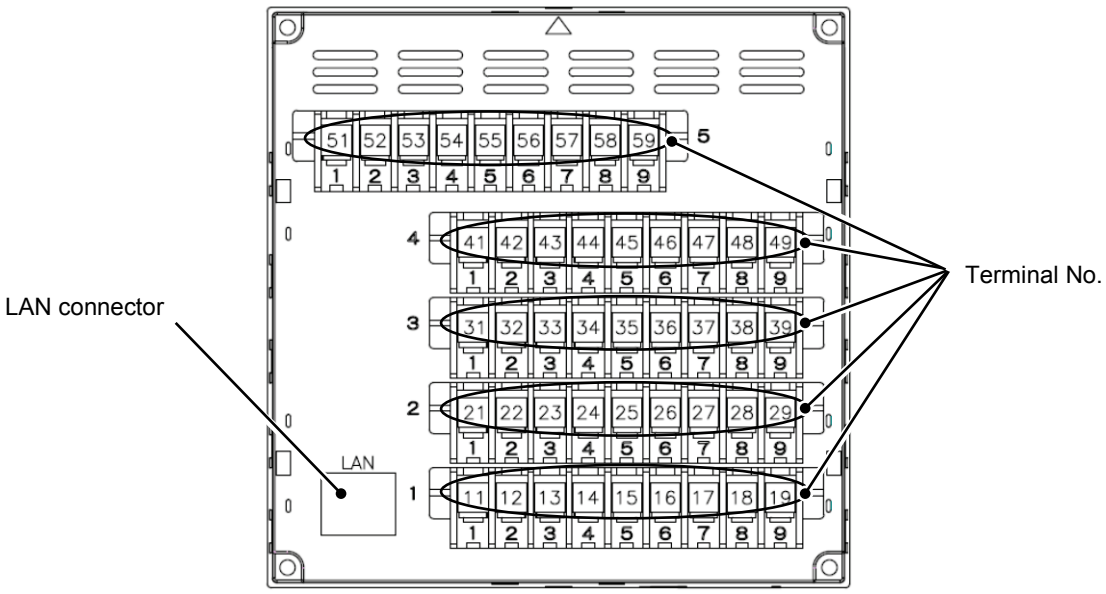


Fig. 4-1 Terminal stand array(The back of recorder)

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.

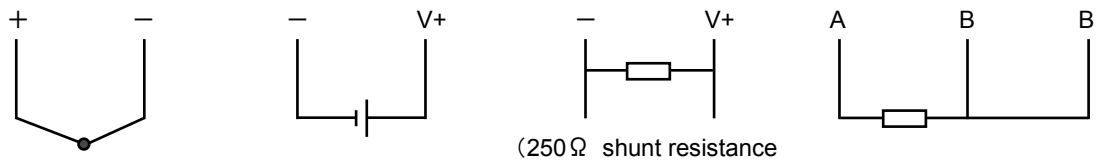
[Analog input terminal]

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.

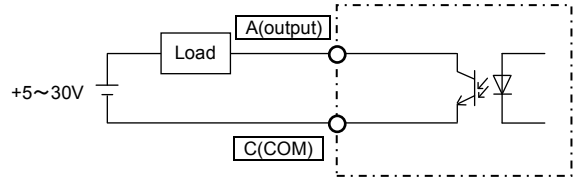
[COM ALM terminal]

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.

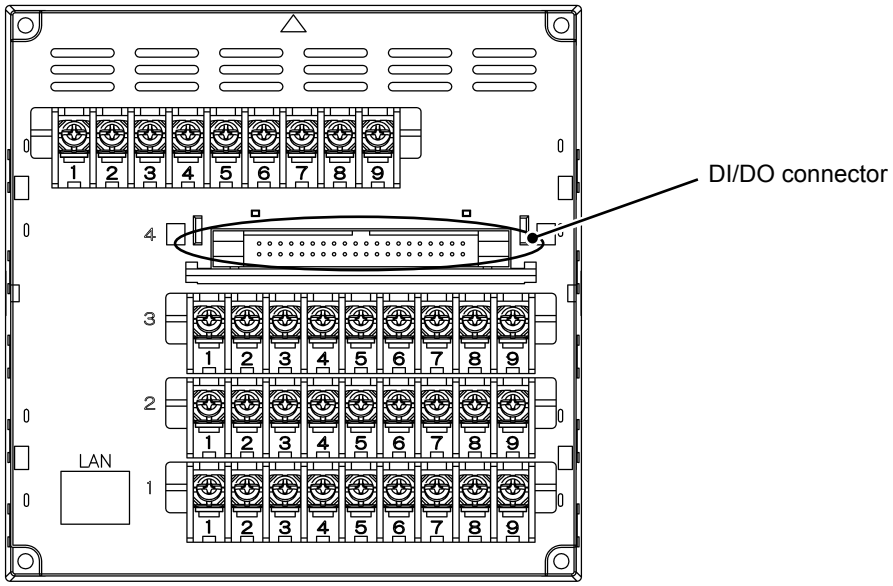
[Connection with personal computer]

Please connect it through HUB.

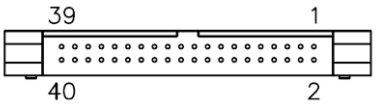
Please use the cross cable when connecting it directly with the personal computer.

4.6 Wiring for DI/DO (Option)

DI/DO becomes a connector joint.



[Pin array]

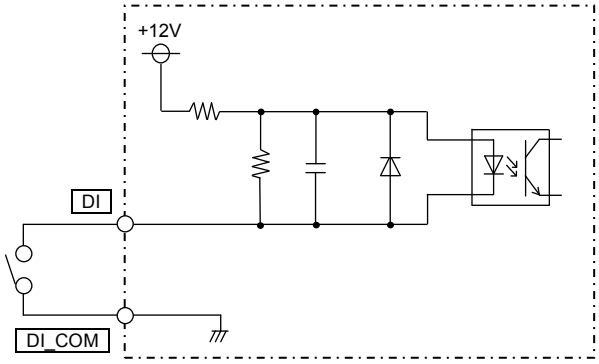


Pin No.	Signal name	Pin No.	Signal name
1	DI1	21	DO1
2	DI2	22	DO2
3	DI3	23	DO3
4	DI4	24	DO4
5	DI5	25	DO5
6	DI6	26	DO6
7	DI7	27	DO7
8	DI8	28	DO8
9	DI9	29	DO9
10	NC	30	DO10
11	NC	31	DO11
12	NC	32	DO12
13	DI_COM	33	DO_COM
14	DI_COM	34	DO_COM
15	DI_COM	35	DO_COM
16	DI_COM	36	DO_COM
17	DI_COM	37	DO_COM
18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

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.

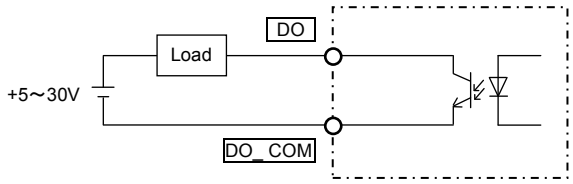
DI cable			DO cable		
Pin No.	Signal name	Cable Color	Pin No.	Signal name	Cable Color
1	DI1	Red	21	DO1	Red
2	DI2	Gray	22	DO2	Gray
3	DI3	Gray	23	DO3	Gray
4	DI4	Gray	24	DO4	Gray
5	DI5	Green	25	DO5	Green
6	DI6	Gray	26	DO6	Gray
7	DI7	Gray	27	DO7	Gray
8	DI8	Gray	28	DO8	Gray
9	DI9	Gray	29	DO9	Gray
10	NC	Green	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.

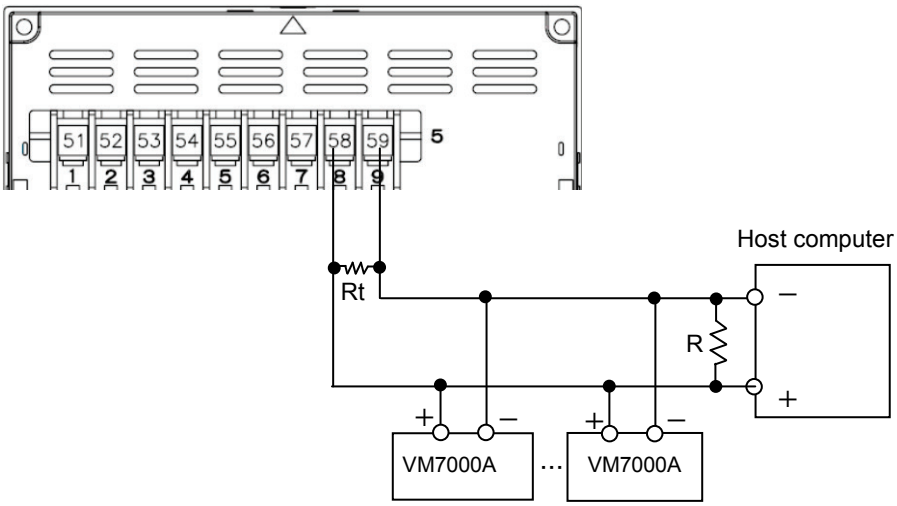
4.7 Wiring for RS-485 (Option)

[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 VM7000A 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

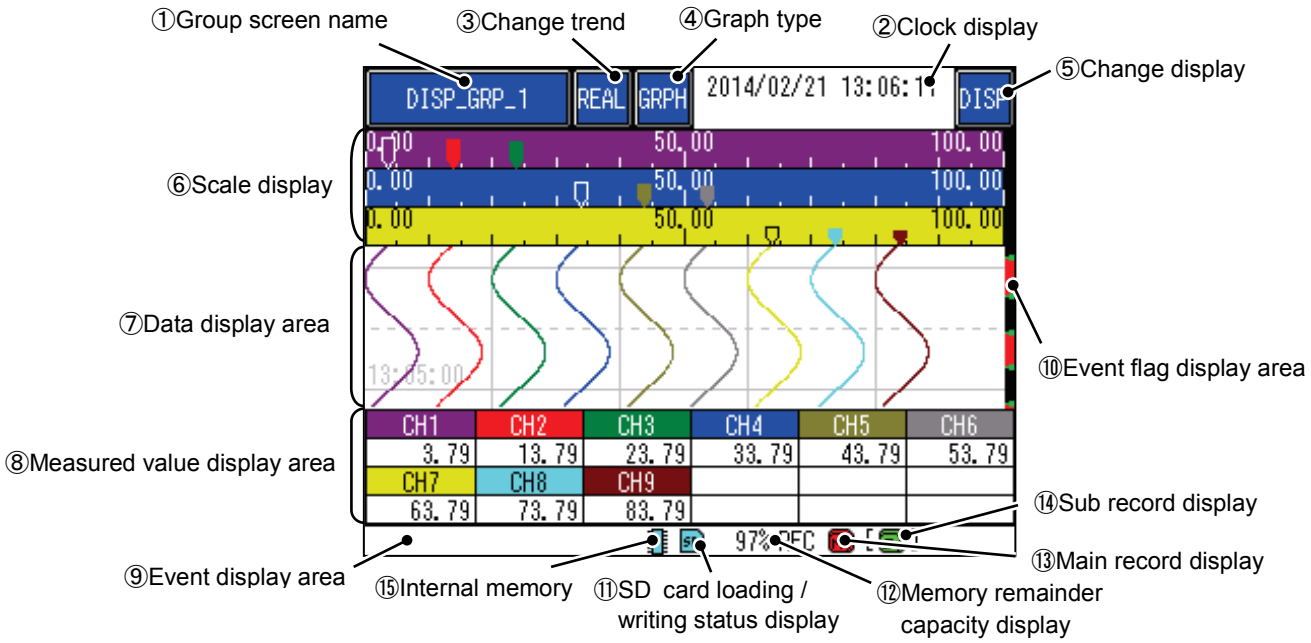
Please confirm the installation of SD card (Refer item 1.5), wiring (Refer item 4) before it operates.
Afterwards, please confirm the various parameter settings (Refer item 7).

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.

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 item 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 item 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

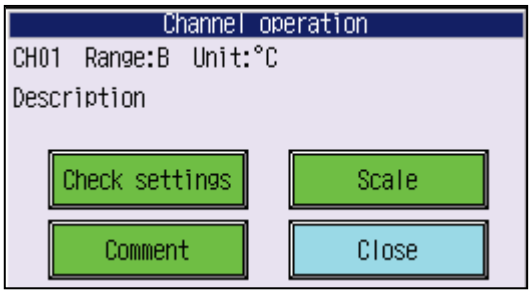
Burnout : B.OUT

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.

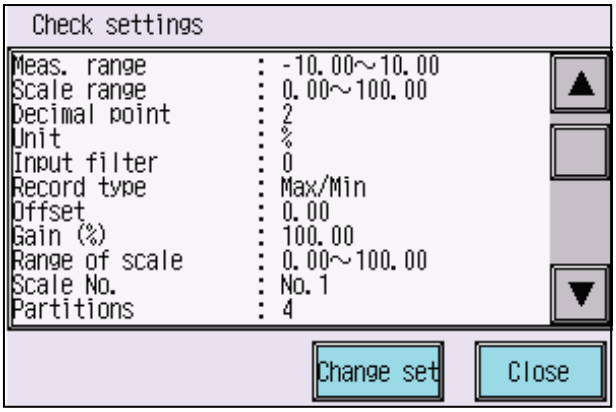
The display color of "⑥Scale display" and the scale width are changed to corresponding what.

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 item 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 item 6.7 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.

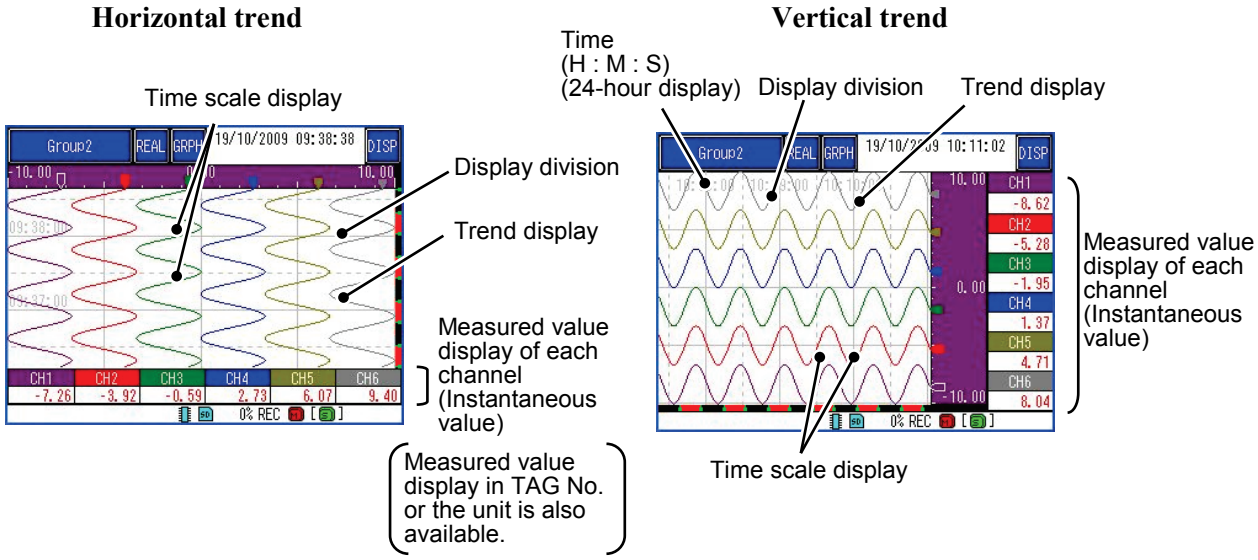
⑮ Internal memory
It indicates the state of the internal memory.
Aqua display : shows the state where the internal memory is not access.
Red display : shows the state where the internal memory is access.

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.



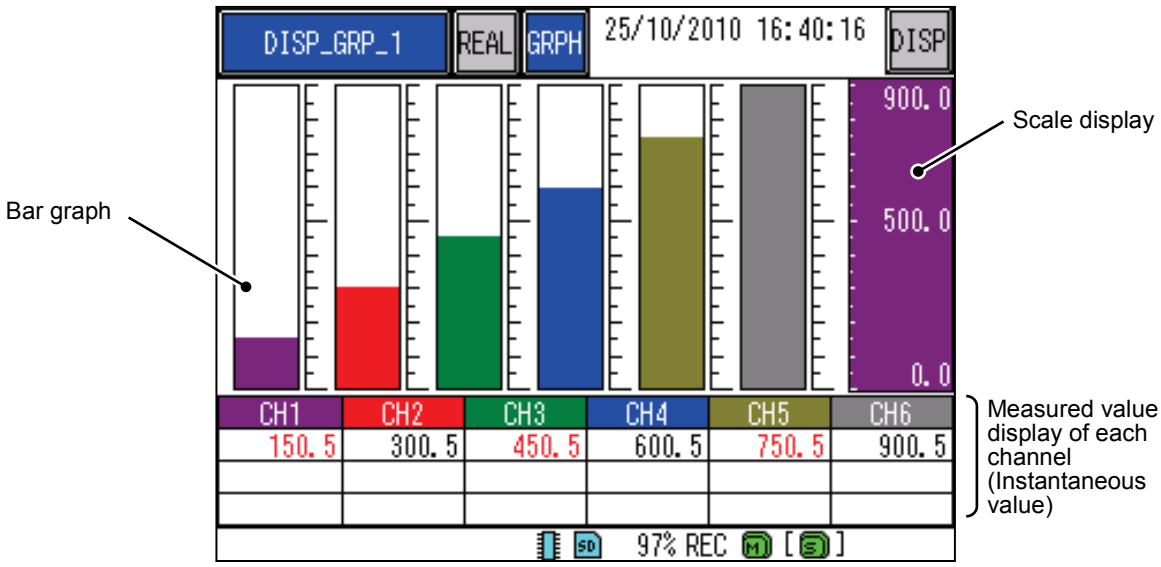
6.3 Display of measured data in bar graphs

[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 item 7.16 for Group channel.)

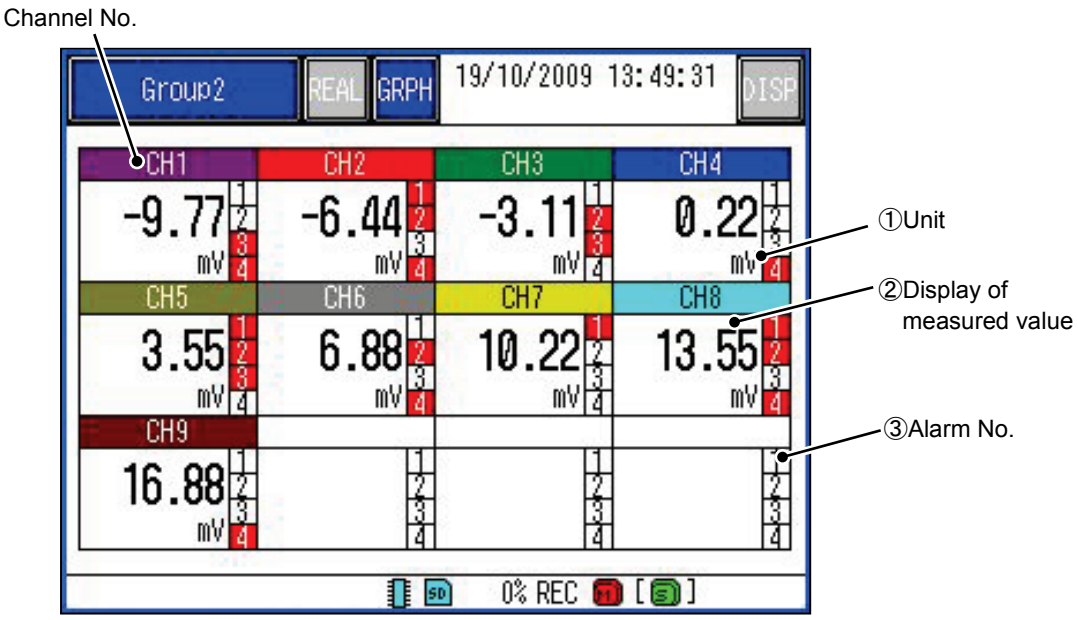
6.4 Digital display of measured data

[Explanation]

The measured data can be display in digital graph.

[Operation]

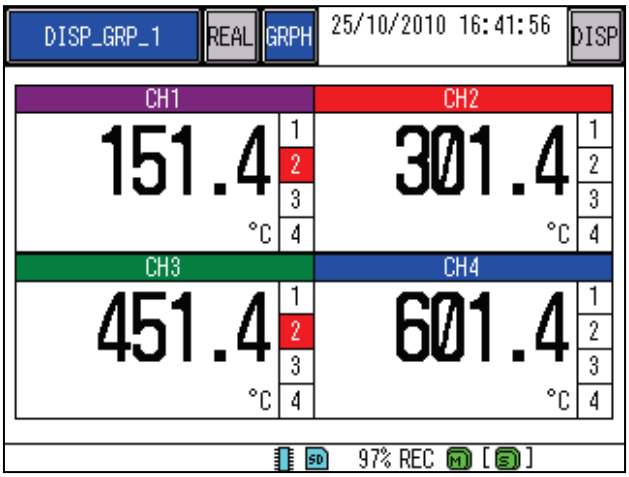
The measured data can be changed digital graph by touching the GRPH key several times.



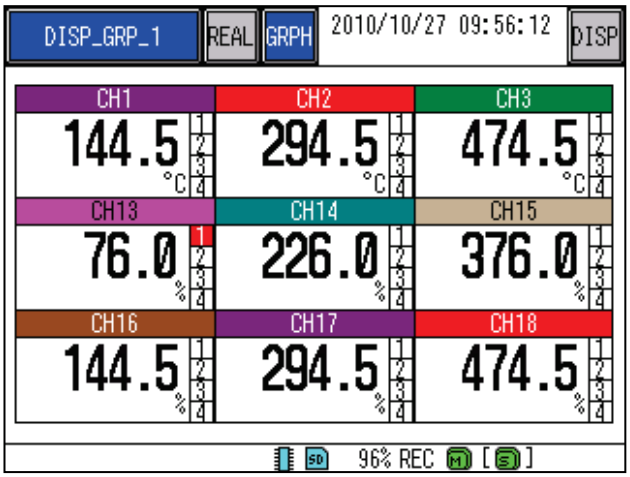
① Unit of each channel is displayed.
② Measured values of each channel are displayed in digital value.
③ When an alarm occurs, Alarm No. at the channel is displayed in red.

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

[4CH Display]



[9CH Display]



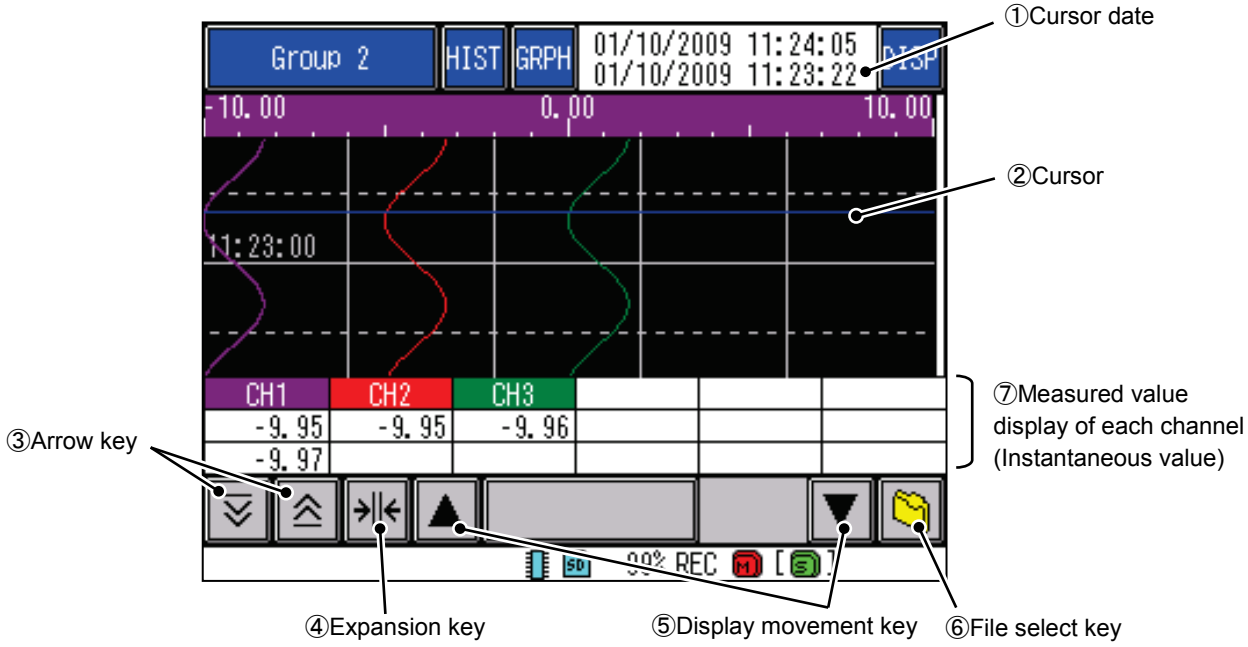
6.5 Historical trend display

[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.

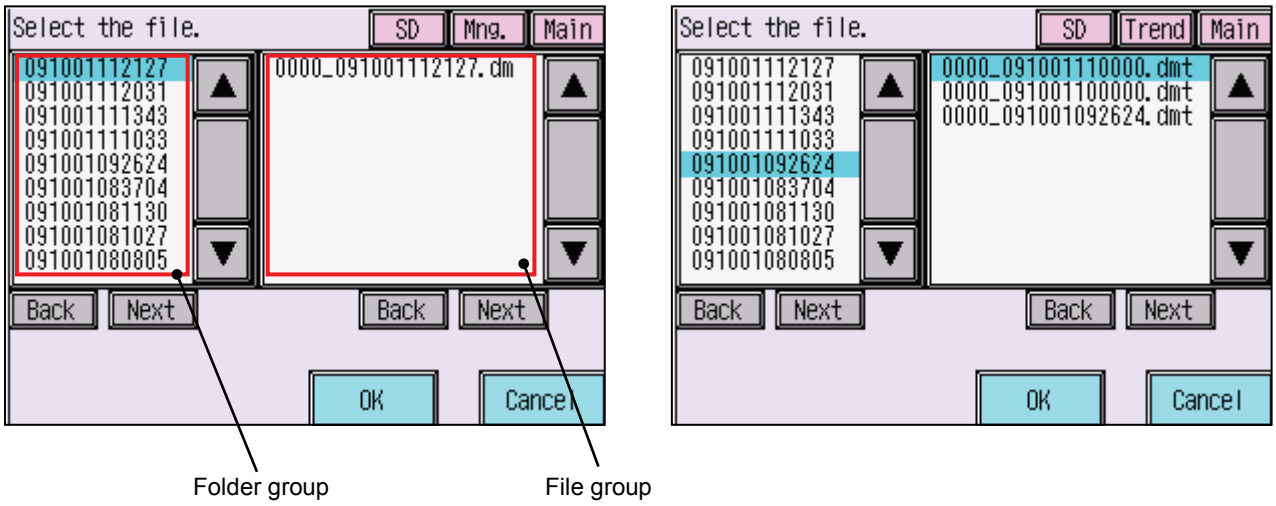
The standard size can be returned by touching again.

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 item 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 item 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

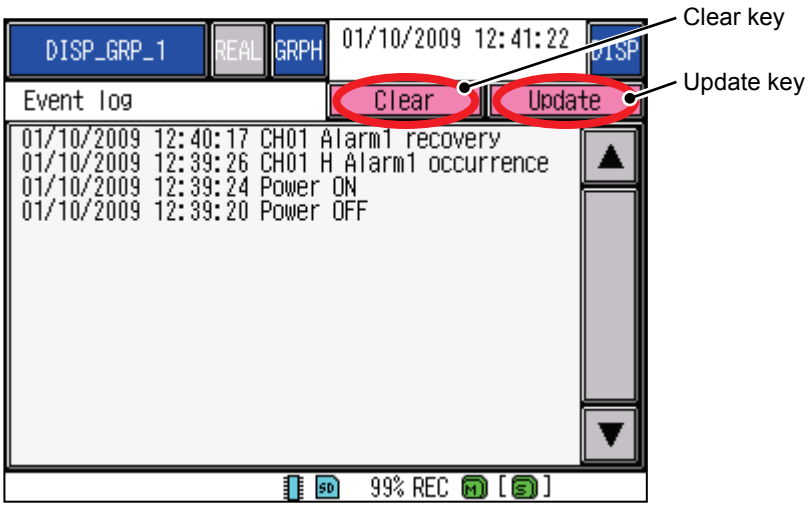
6.6 Event history / communication history display

[Explanation]

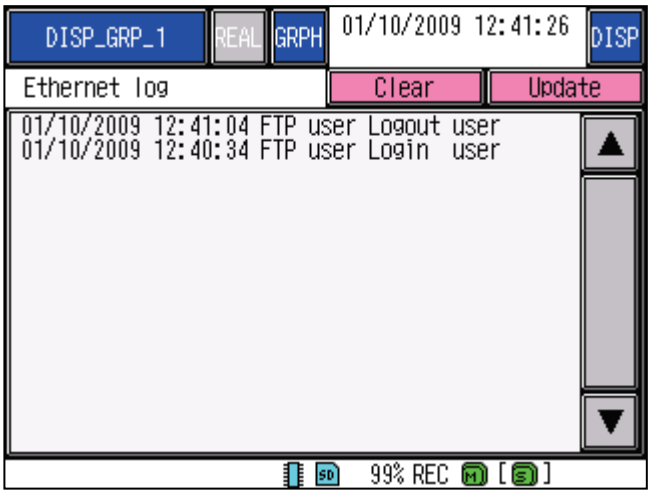
When a specific event is generated in the data recording now, it is possible to make a mark. The history of LAN communication is preserved.

[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 Comment list display

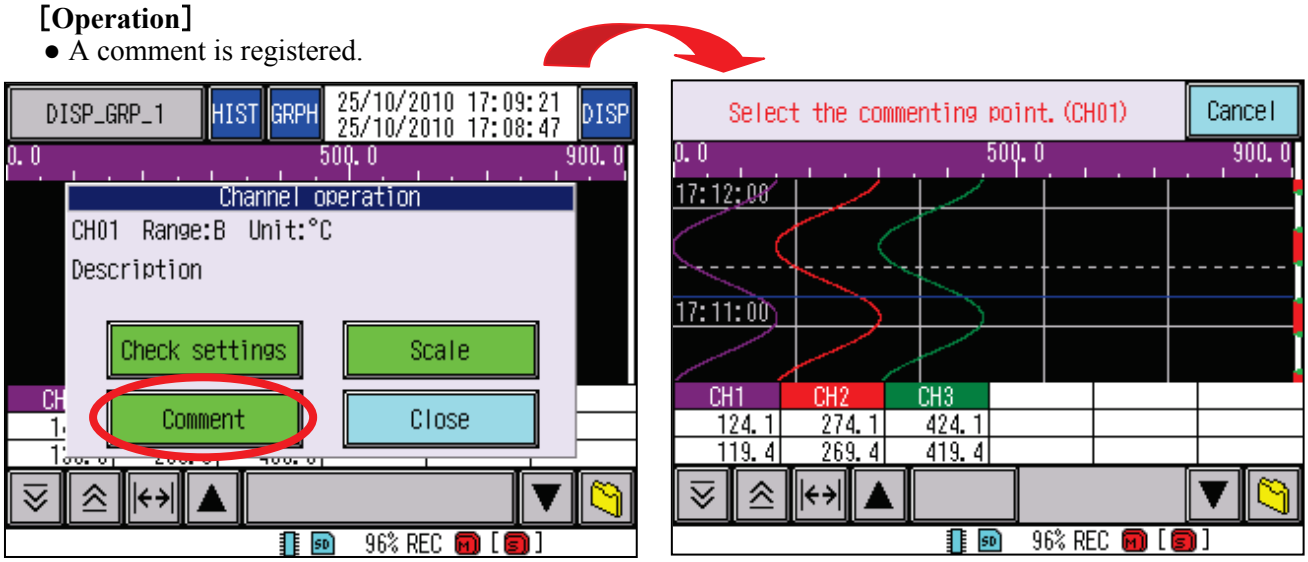
[Explanation]

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).

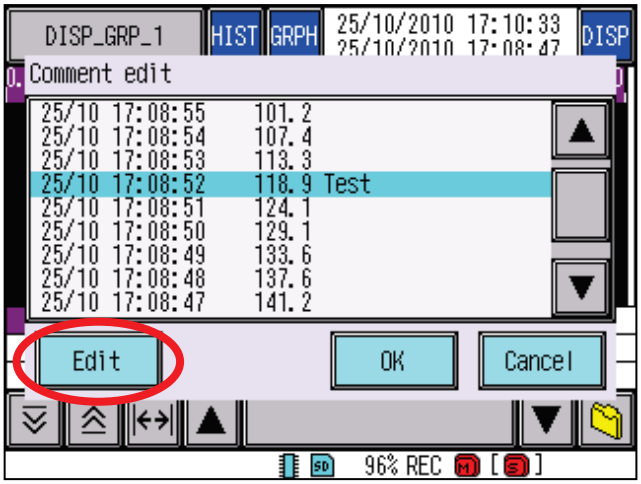
[Operation]

● 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 item 6.1 for channel operation screen)

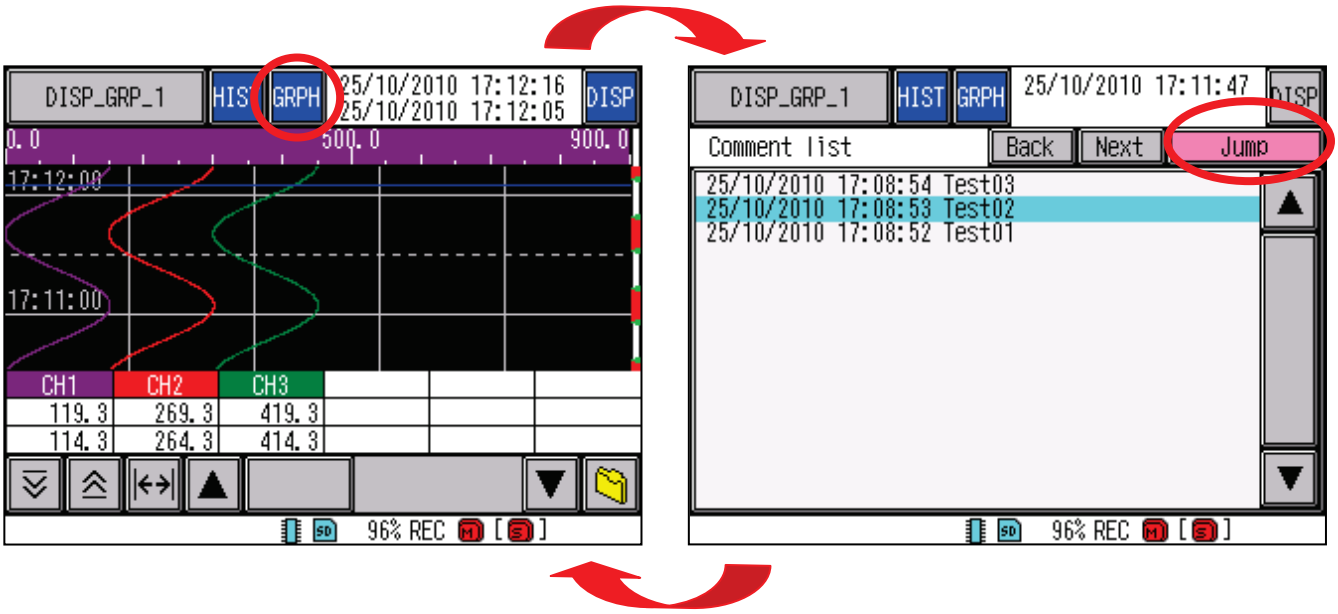
A position to input a comment into is touched in a comment point selection screen (above figure right side).



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 item 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 item 3.3 of the “DATA VIEWER INSTRUCTION MANUAL” (WXPVM70mnA0101E) for Event summary.)

7. SETTING AND CHECKING PARAMETERS

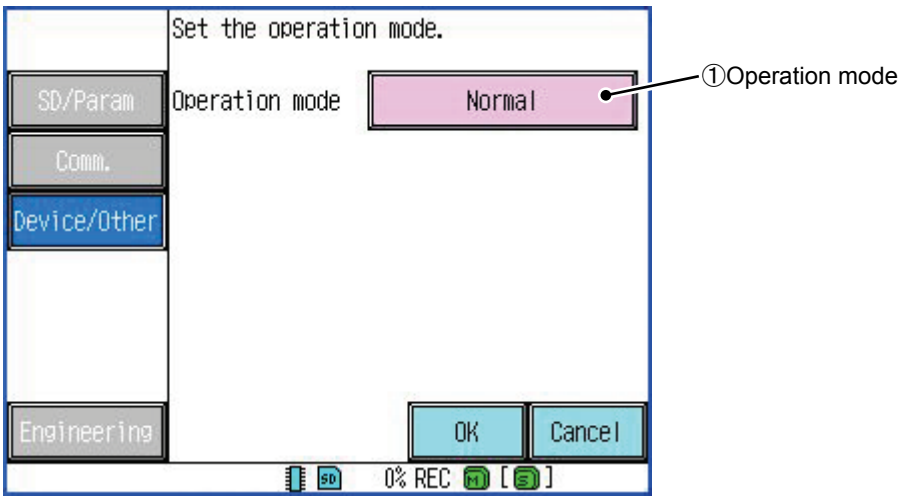
7.1 Operational mode

[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 item 7.27 for "Wizard".)

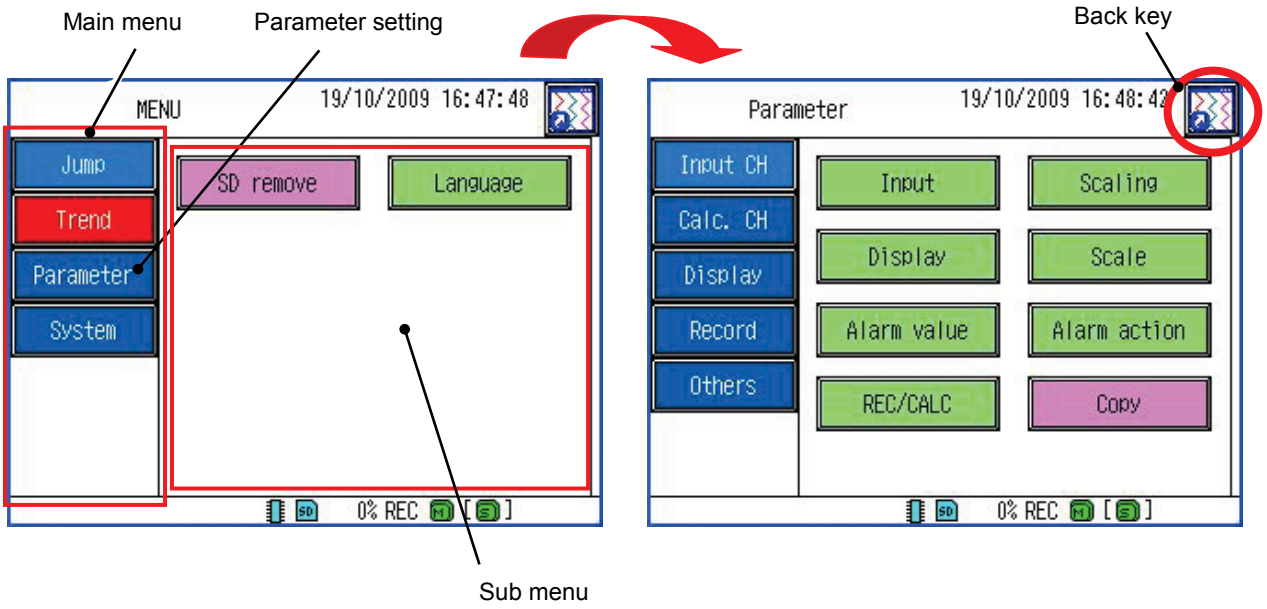
Advanced : All set items are displayed in "Parameter" and "System".

7.2 Setting and checking

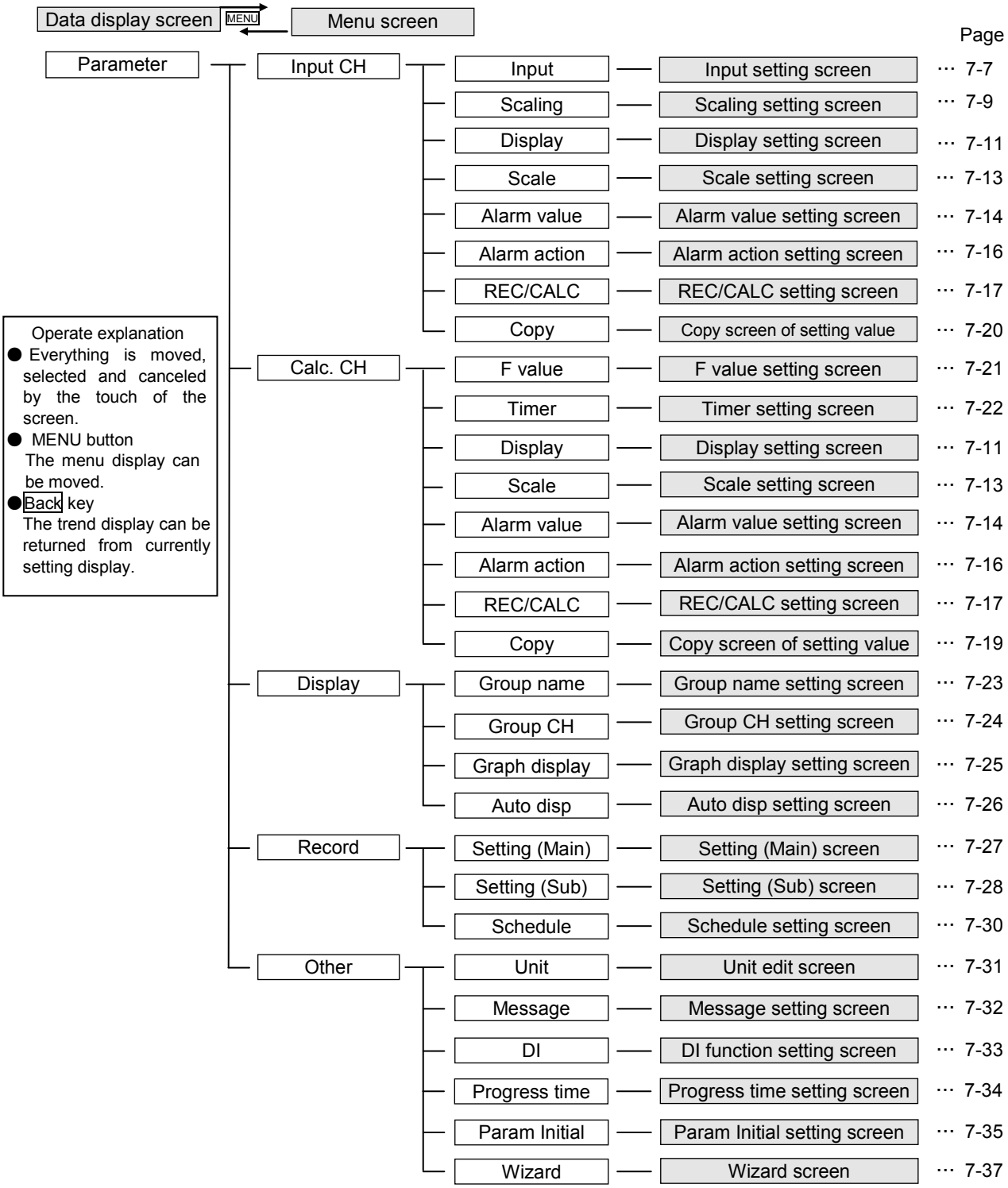
① Main menu

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

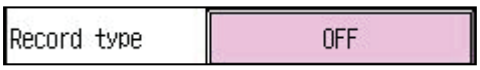


7.4 Basic operation of setting screens

［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



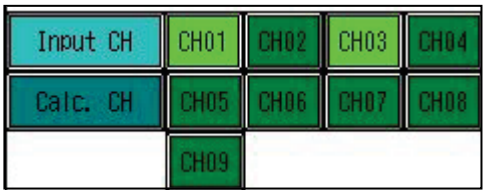
In this case, OFF key when touching, it changes with Instant value key ⇒ Average key ⇒ Max/Min key ⇒ OFF key….
Please display the content to be set by touch the key.

● 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.



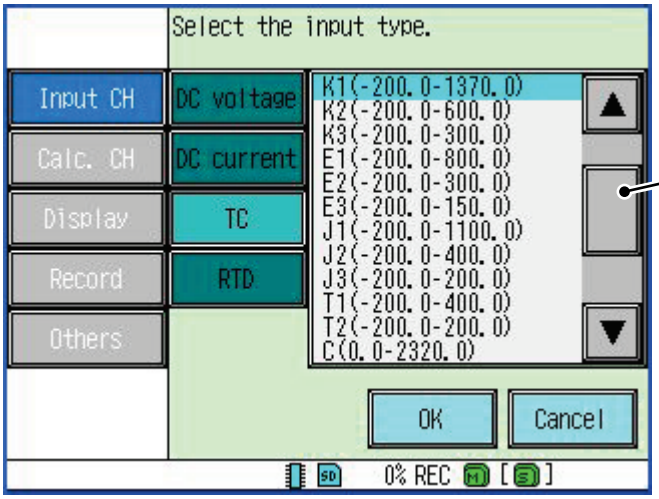
● When selecting contents to set from list.

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.

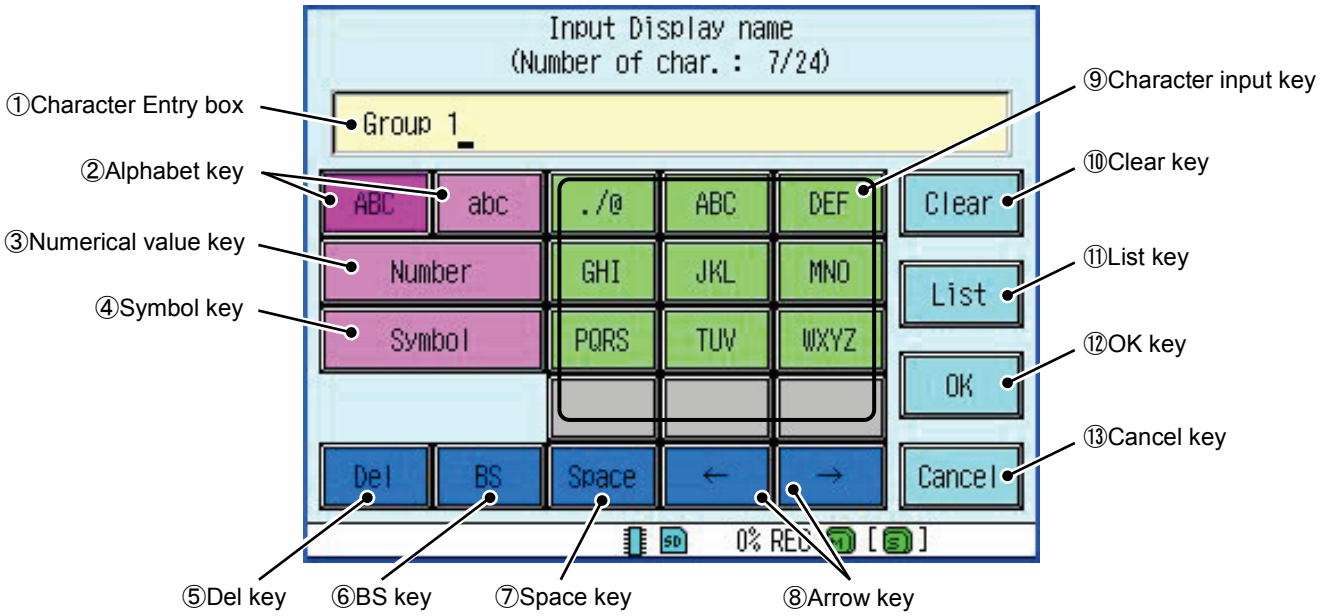
Touch the keys to enter a character one by one, and touch the OK key after entry.

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 item 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]

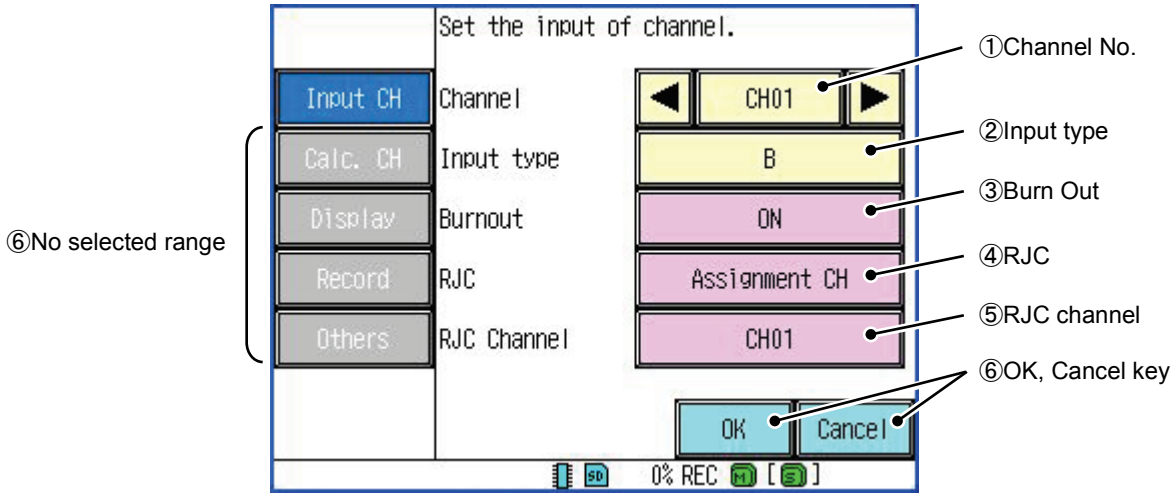
For select of the input types for each channel (thermocouple, resistance bulb and DC voltage input), and the presence of Burn Out function can be set.

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.”.)

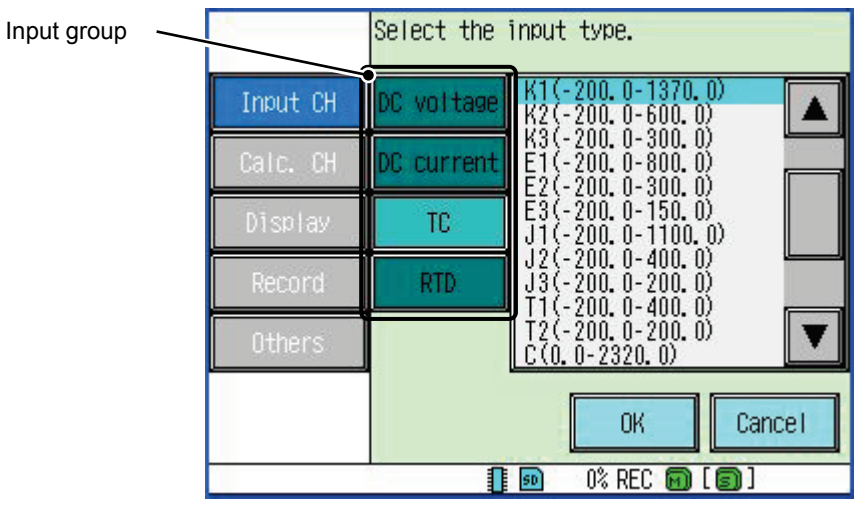
② Input type

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".

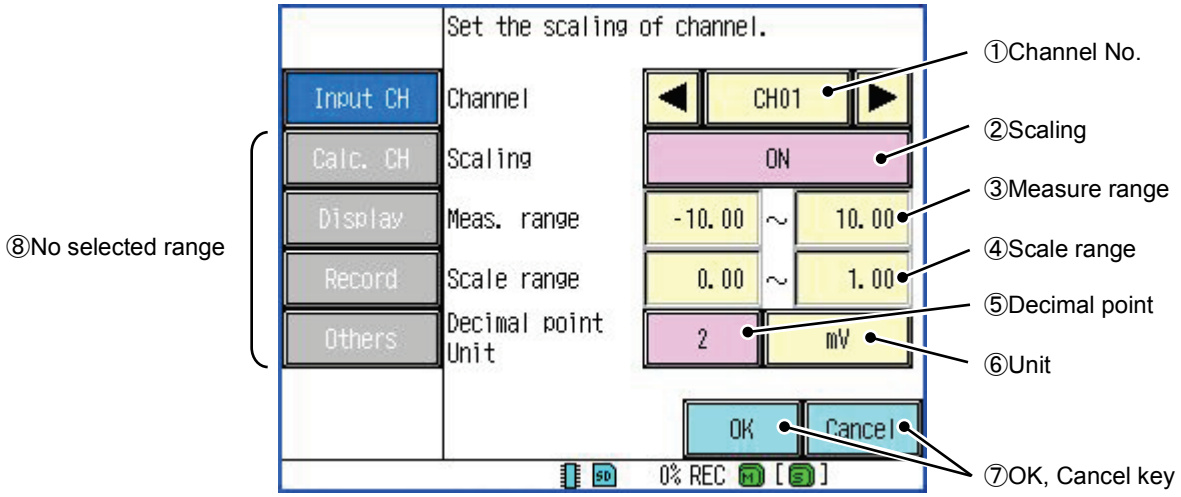
Note: Scaling can only be displayed when the input type is "DC voltage" or "DC current".

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”.

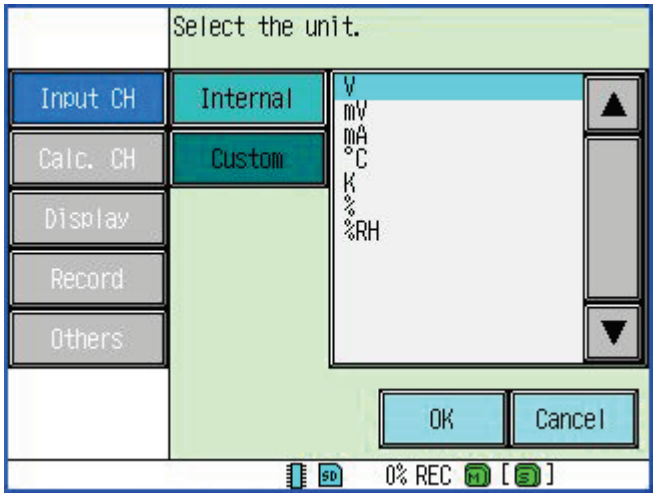
⑥ Unit

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 item 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

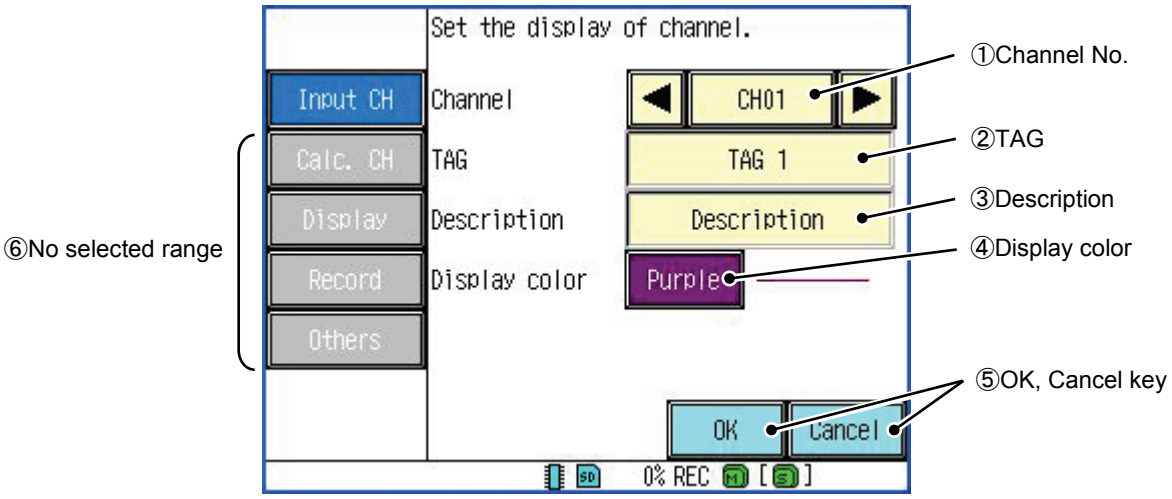
[Explanation]

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

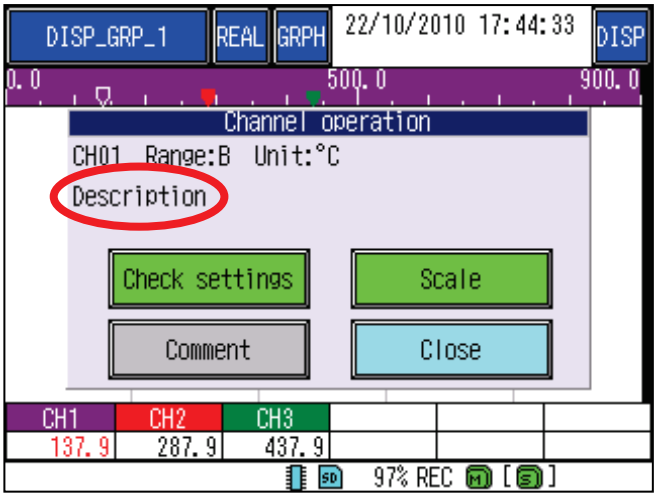
“TAG” is displayed on the trend screen instead of “Channel No.”. (Up to 8 characters can be registered.)

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 item 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 item 6.1 for “Channel operation”.)



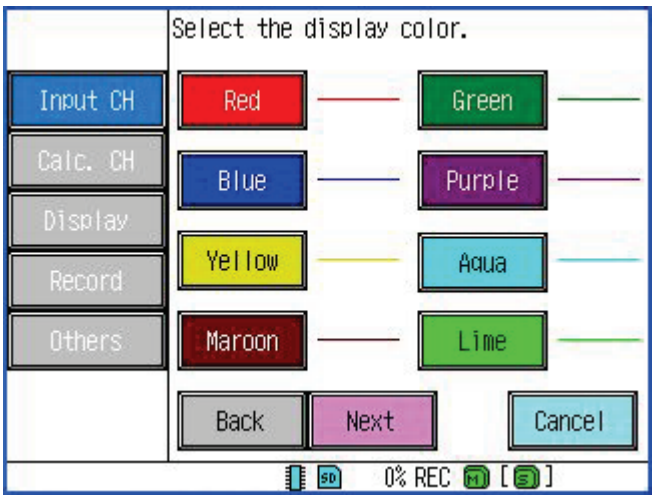
④ Display color

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 item 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

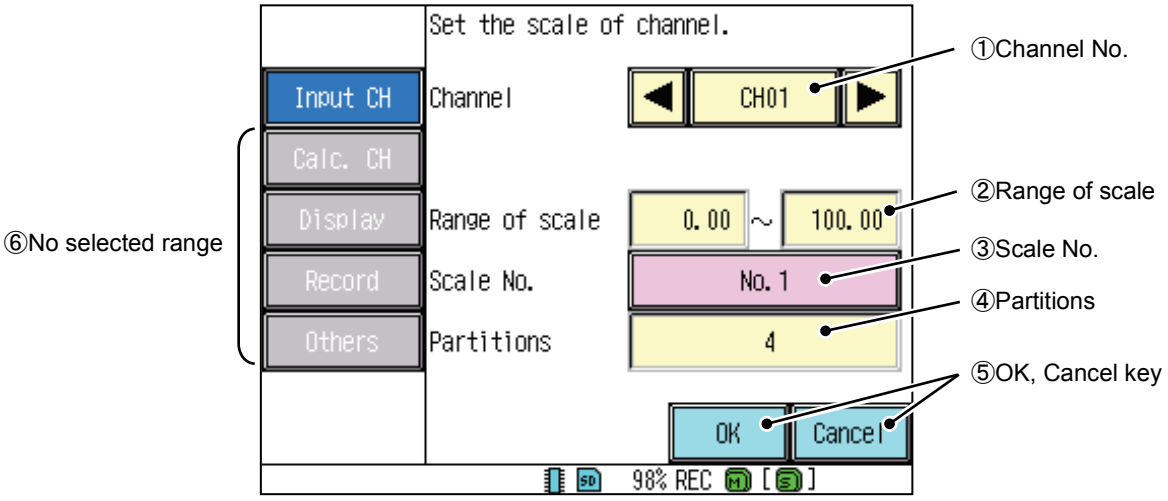
[Explanation]

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 item 7.6 for Decimal point key.)

Moreover, the scale range can temporarily be changed from Scale key of “Channel operation”. (Refer item 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

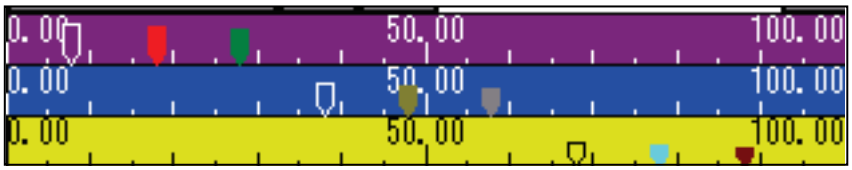
Scale No. 3: None

[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”.

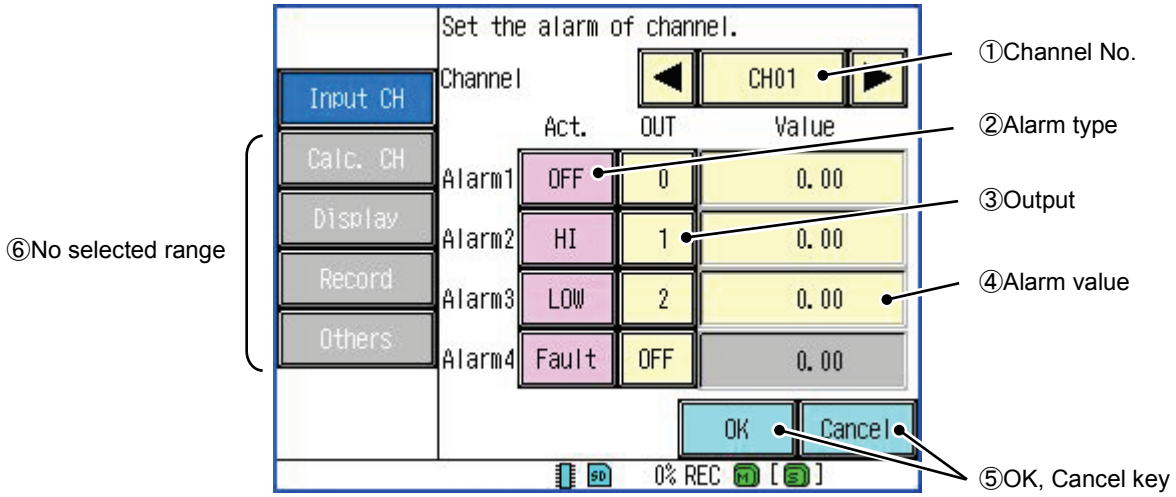
7.9 Setting the alarm value

[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”.

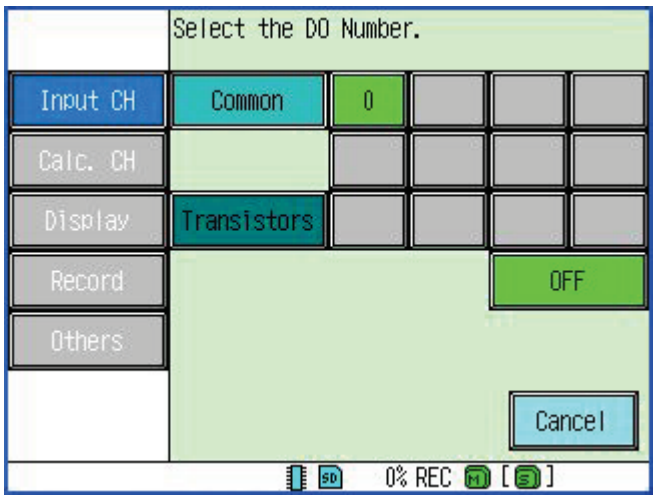
③ Output

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 item 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

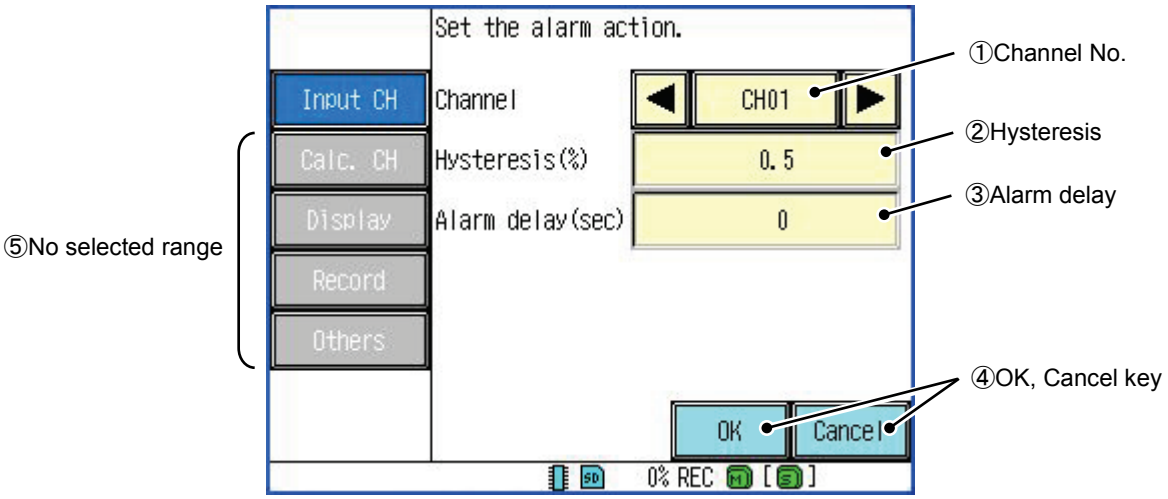
[Explanation]

"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

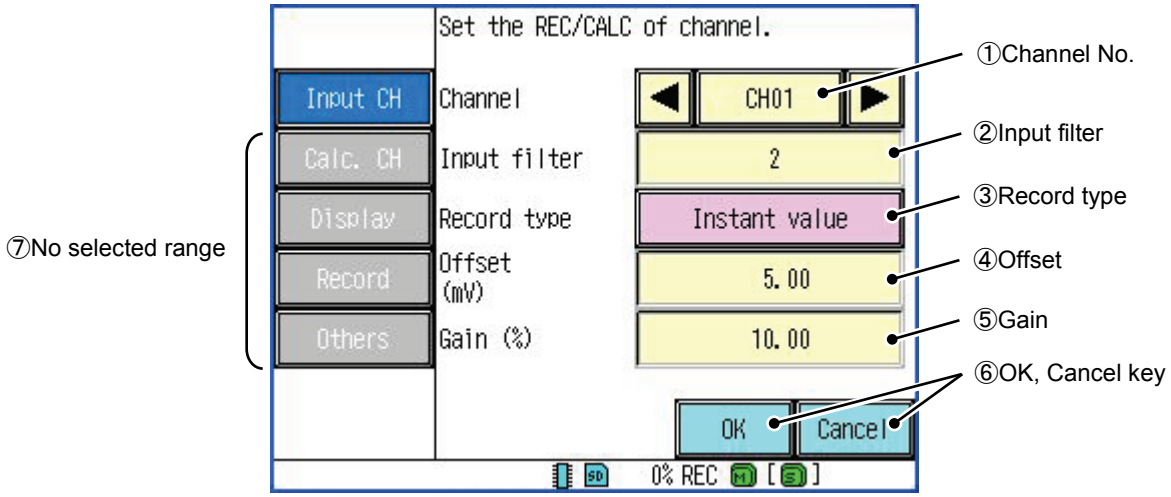
[Explanation]

"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 item 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	: 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".

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 item 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 7-19 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

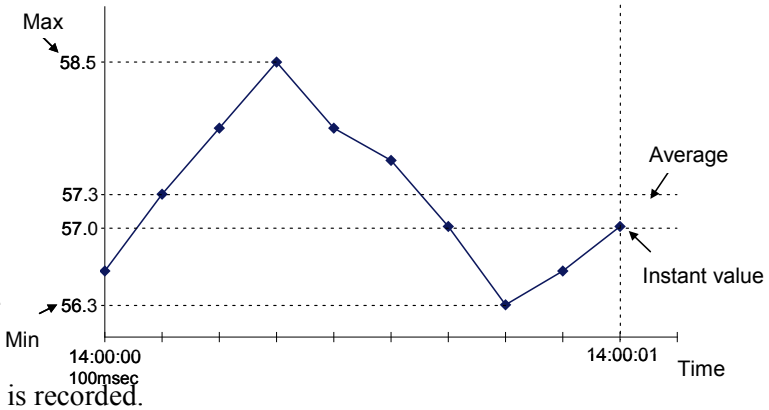
The maximum and the minimum in a "record cycle" are recorded. For example, if a recording cycle is 1 second. The measured value of a total of ten pieces can be measured in 1 second. (Because, the measurement cycle in the interior of this recorder is 100 milliseconds (=msec).)
(Measured value is recorded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

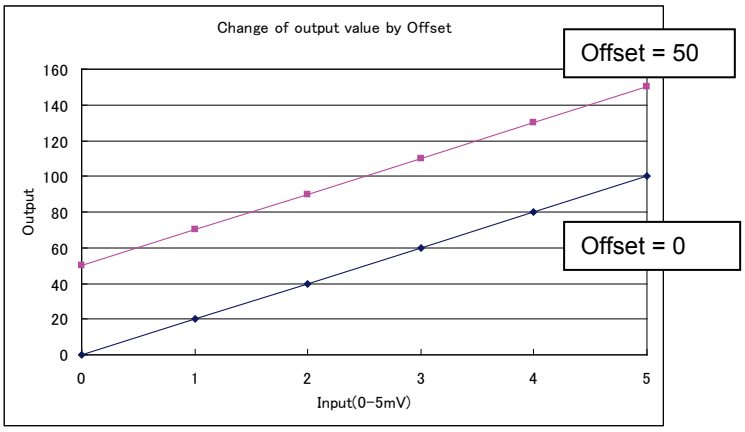
Record data		
Time	msec	CH03 AVG
14:00:01	0	57.3

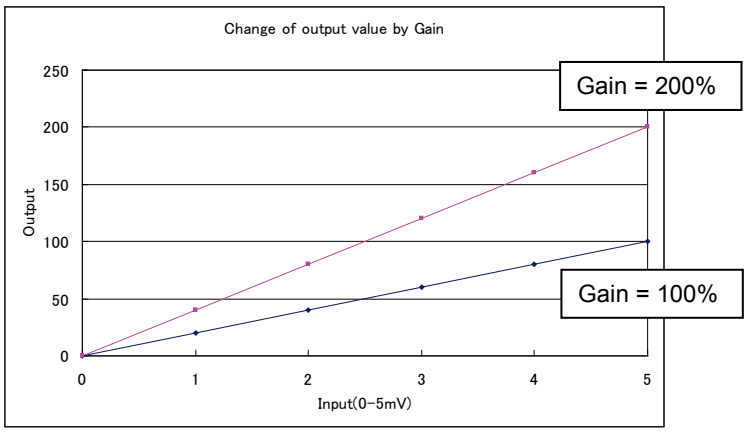
●The specification of offset and gain

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 item 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

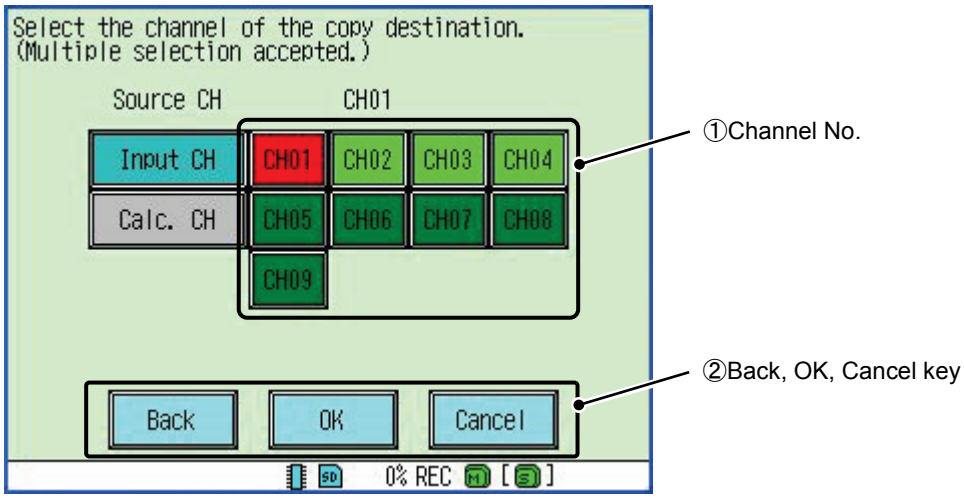
[Explanation]

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

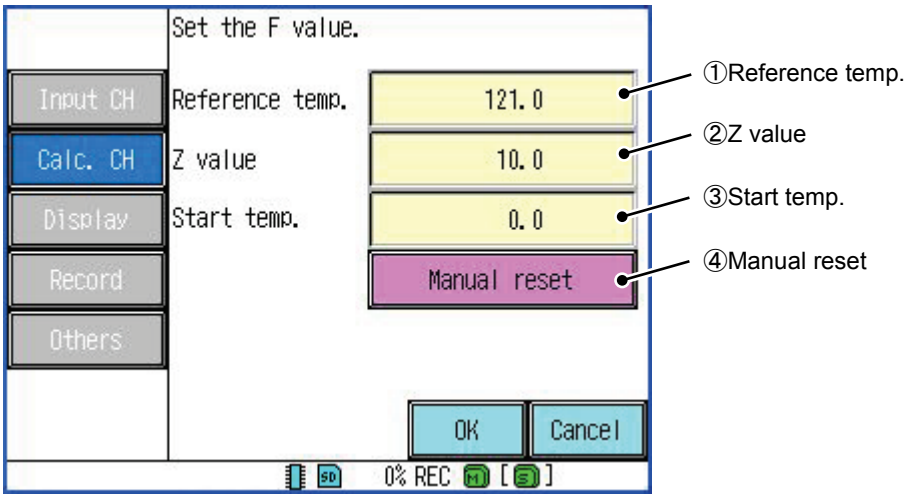
[Explanation]

"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 item 8.17 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 item 2.3 of "PARAMETER LOADER INSTRUCTION MANUAL (WXPVM70mnA0102E)" for detail.)

7.14 Setting the timer of channel

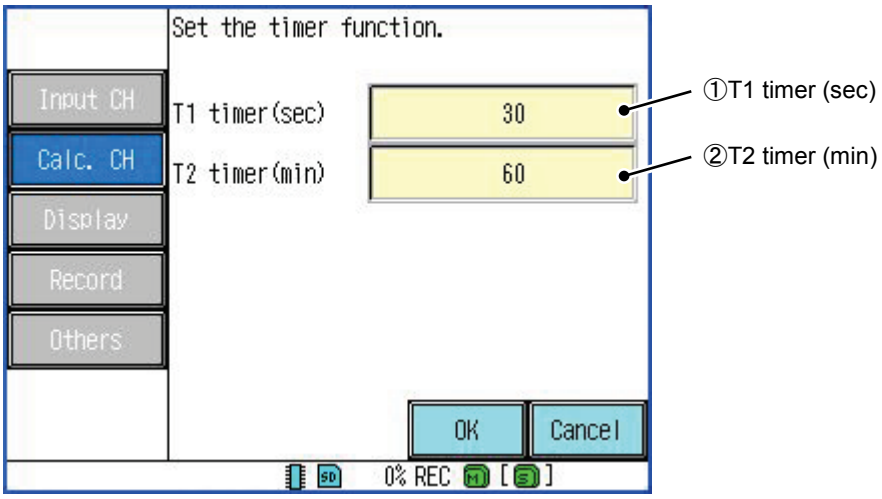
[Explanation]

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 item 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 item 7.24 for DI key.)

7.15 Setting the group name

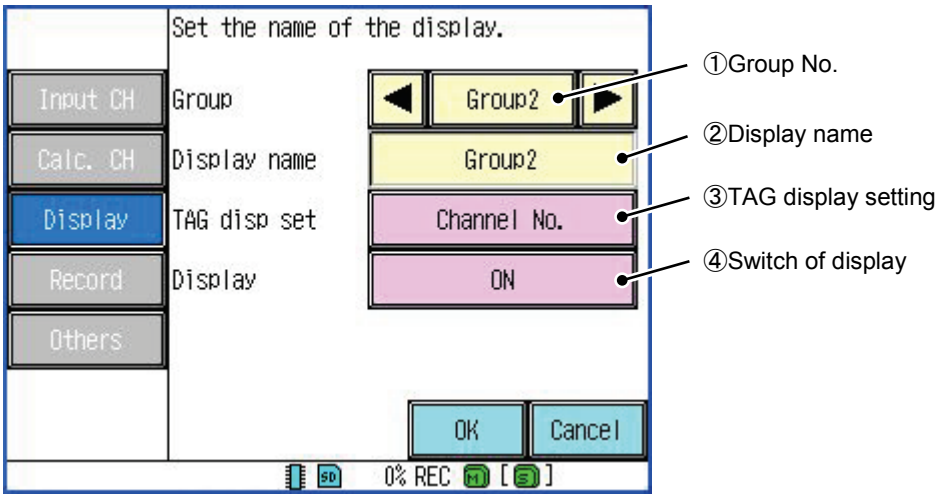
[Explanation]

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 item 7.16 for Group CH key)

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

(Refer item 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

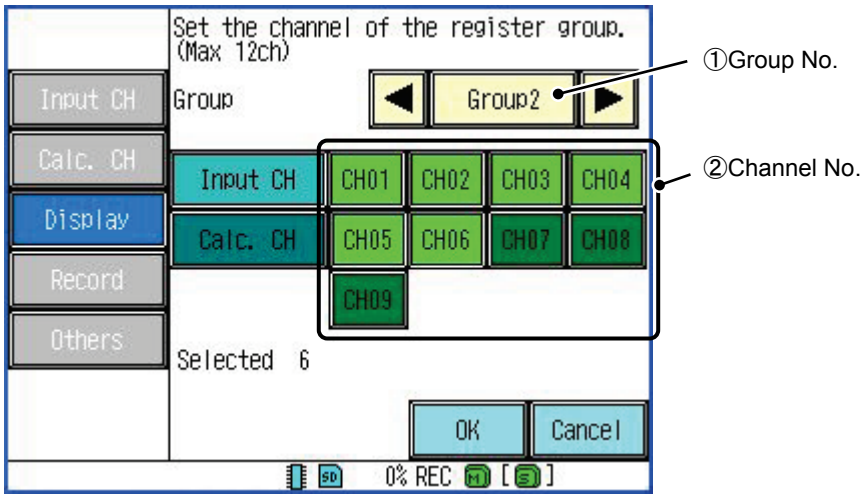
[Explanation]

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.

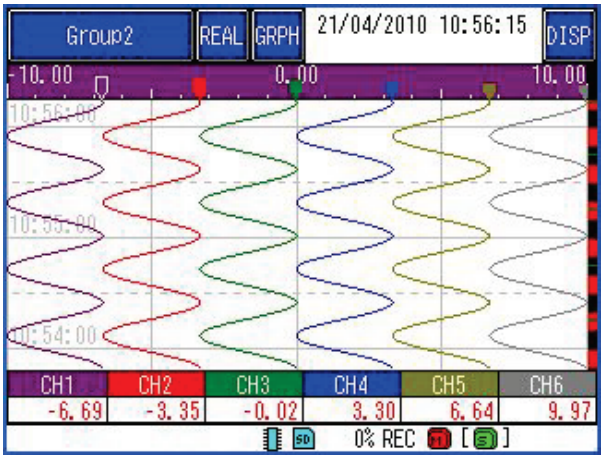
② Channel No.

Selected items are displayed in the measured value display area.

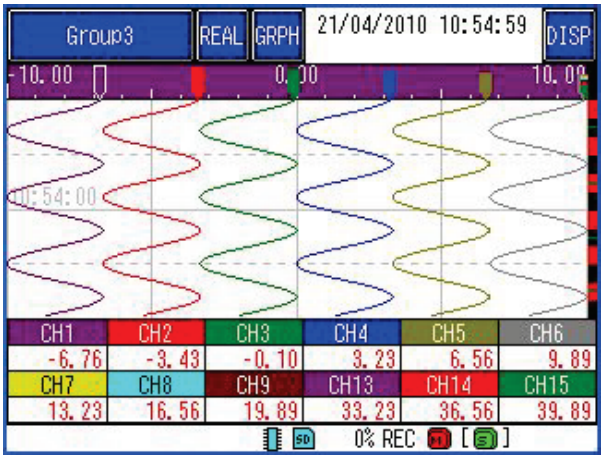
(Plurals can be selected. The selected item is displayed in luminous color.)

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

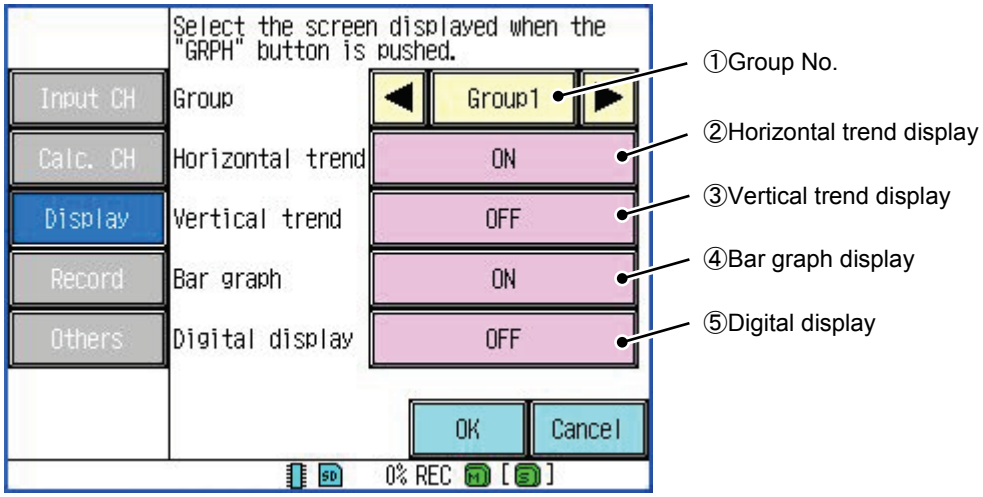
[Explanation]

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 item 6.2 ～ 6.6 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.

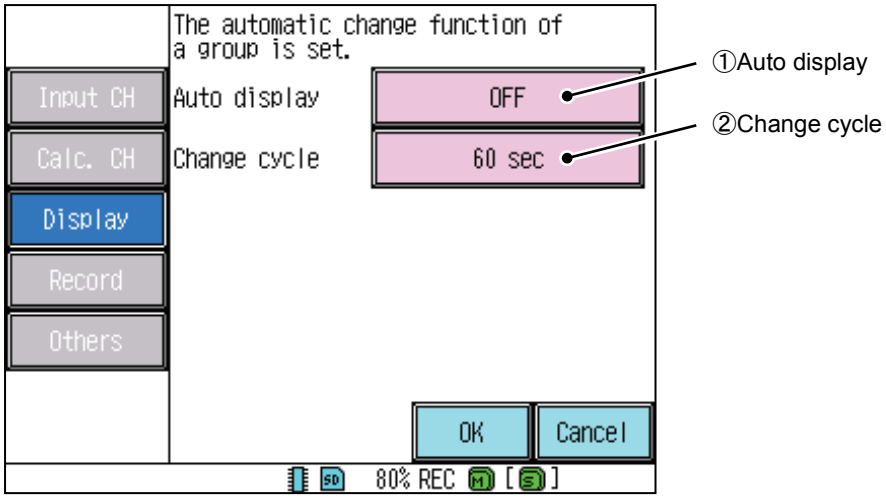
7.18 Setting the automatic change function of a display group

[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 item 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

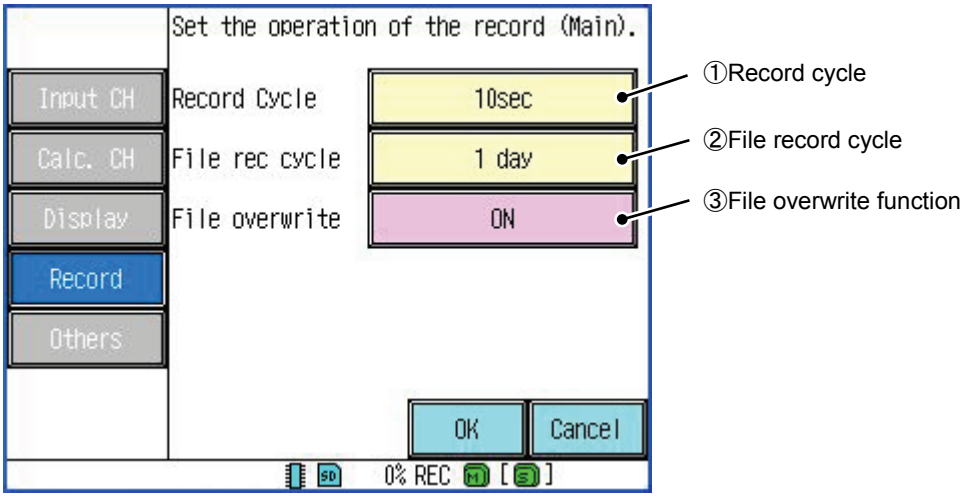
[Explanation]

"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 item 7.20 for sub record.)

② File record cycle

The cycle when recorded measured value is recorded in the file is set.

The range that can be selected changes depending on a set value of "①Record cycle".

(Table below)

Record cycle	File record cycle
1sec ～ 5sec	1hour
10sec ～ 1min	1hour、1day
2min ～ 3min	1hour、1day、1week
5min ～ 30min	1hour、1day、1week、1month
60min	1hour、1day、1week、1month、1year

※Regardless of the insertion of the SD card, the measuring data are stored in the internal memory.

When stopping record or when a recording cycle exceeded 50 times, the measuring data is outputted in the SD card, and is removed from internal memory.

If the SD card is not inserted, the measured data is outputted at the SD card insertion.

③ File overwrite function

The operation of file overwrite function when the SD card memory becomes FULL is selected.

ON ：It deletes from old recorded data when the SD card is filled and the record is continued.

OFF：The record operation is stopped when the amount of the memory remainder is lost.

7.20 Setting the record cycle of sub record

[Explanation]

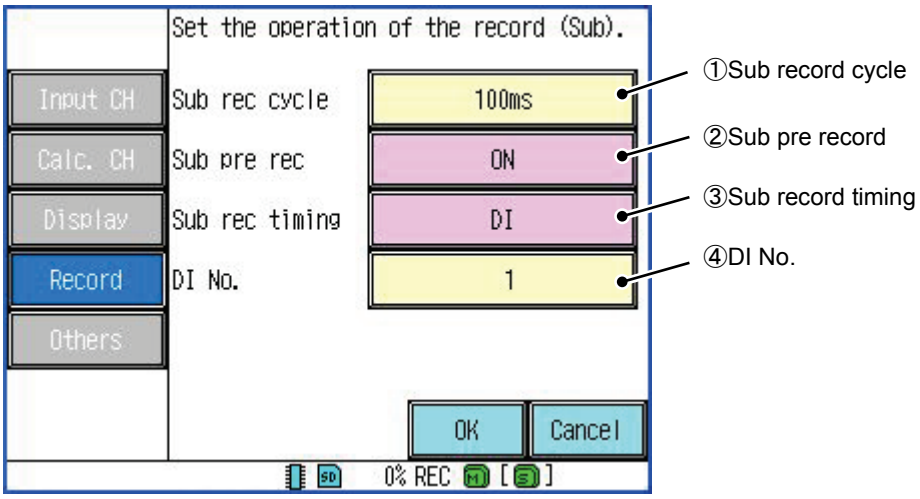
"Record type of sub record", "Sub pre record" and "Sub record timing" is set.

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

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 item 8.17 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

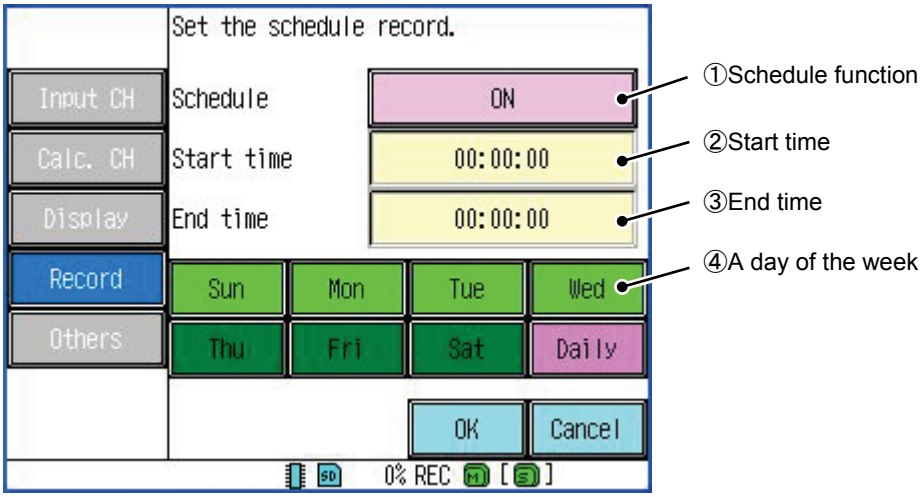
[Explanation]

"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

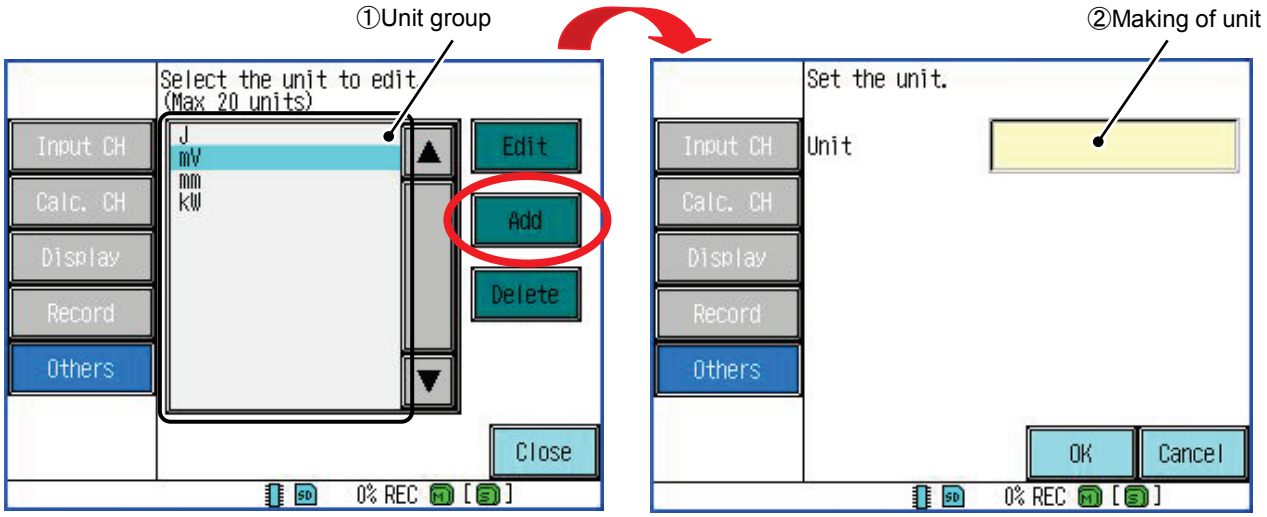
[Explanation]

"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 item 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

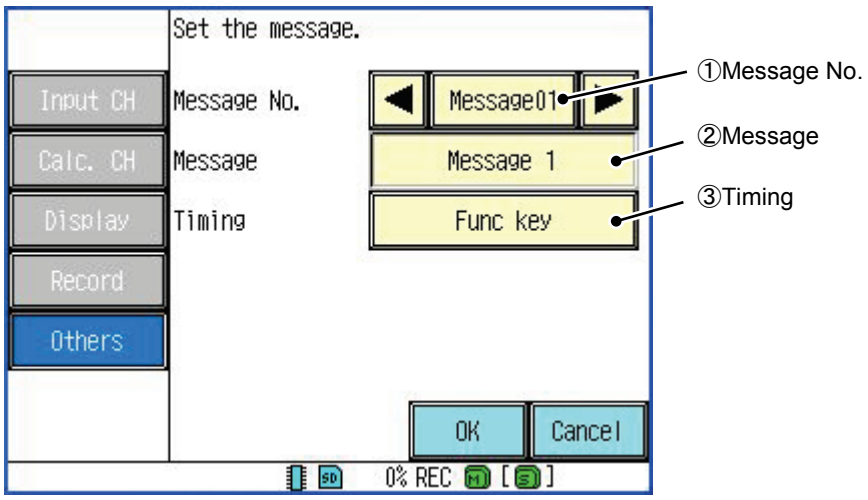
[Explanation]

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 item 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 item 8.17 for FUNC key key.)

7.24 Setting the DI function

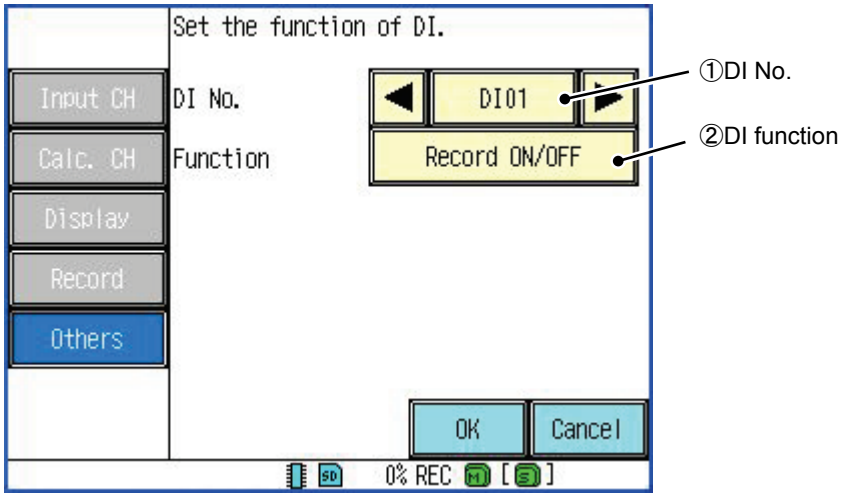
[Explanation]

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 item 8.15 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 item 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.

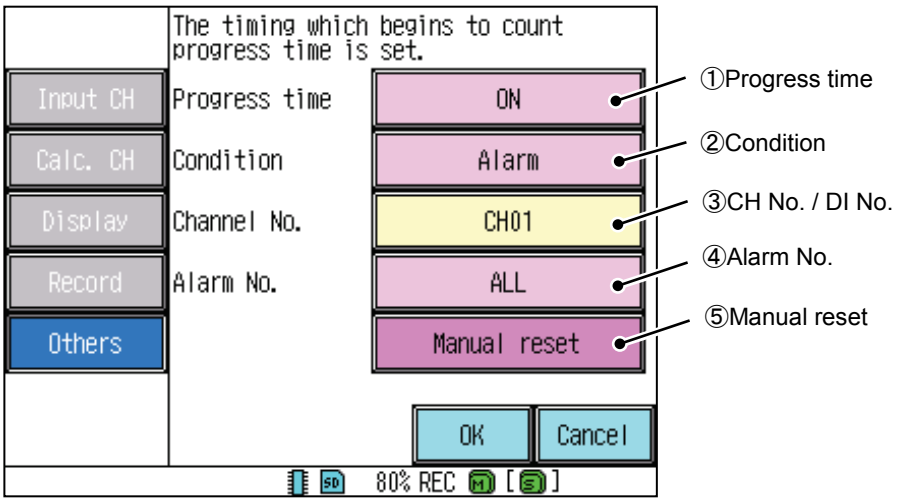
7.25 Counts the progress time

[Explanation]

Progress time is counted according to conditions. The counted time can be outputted as a value, if "PASS function" is used.
(Refer item 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 item 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 Initialization of parameter

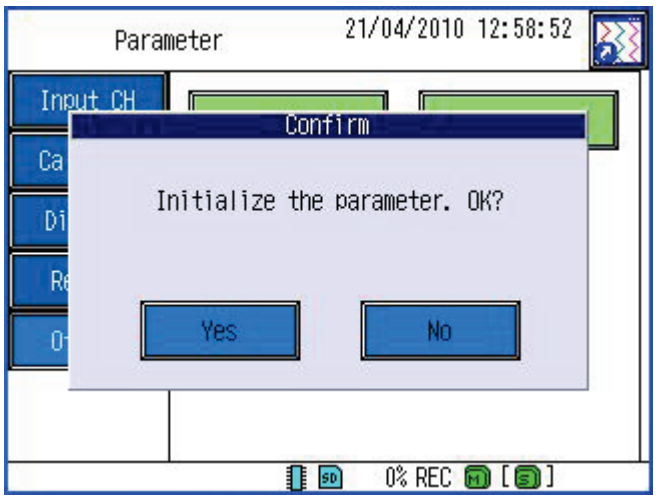
[Explanation]

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

7.27 Using the wizard function

[Explanation]

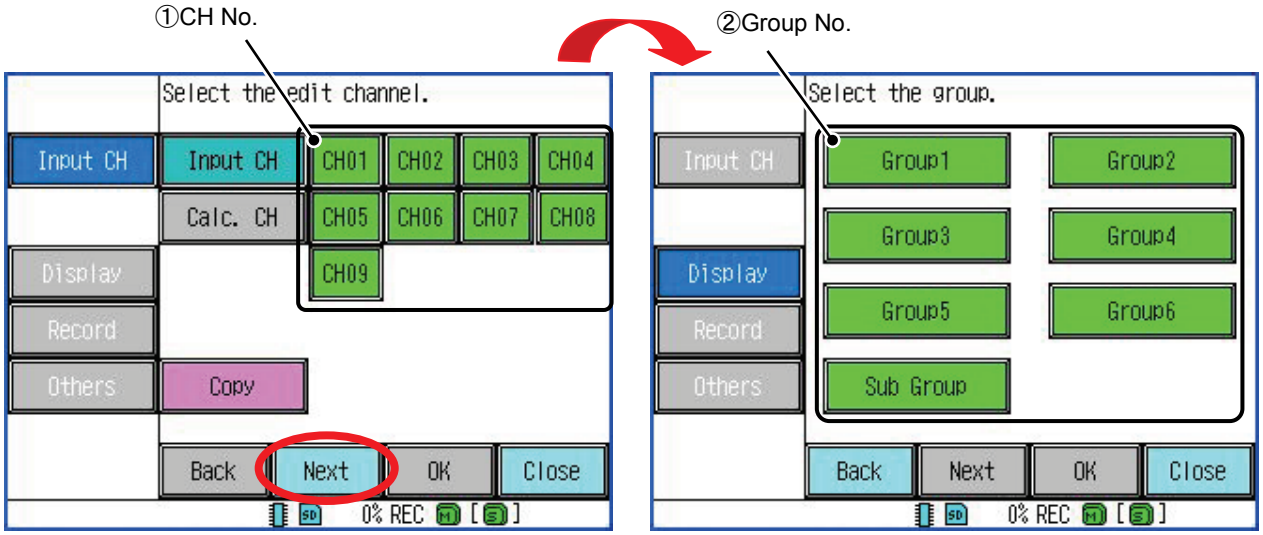
Necessary minimum set item can continuously be set by using the wizard function.

Moreover, when the Mode of the System is only "Normal", this item is displayed. (Refer item 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 item 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 item 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 item 7.15 ～ 7.17 for each setting screen.)

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

7.28 “Input CH” list

[Explanation]

Various settings concerning the input channel are done. Refer item 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 item 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.)	

7.29 “Calc. CH” list

[Explanation]

Various settings concerning the calc. channel are done. Refer item 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.)	○

7.30 “Display” list

[Explanation]

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

Refer item 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".	○

7.31 “Record” list

[Explanation]

In the record setting, it is possible to set it variously concerning the record of the measuring data.
Refer item 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.

Record cycle	File rec cycle
1sec～5sec	1hour
10sec～1min	1hour, 1day
2min～3min	1hour, 1day, 1week
5 min～30 min	1hour, 1day, 1week, 1month
60 min	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.)	○

7.32 “Others” list

[Explanation]

Various settings concerning the others are done. Refer item 7.22 ～ 7.27 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”.

[Param initial]

Item	Setting contents	Advanced
Param initial	Initialize the parameter.	

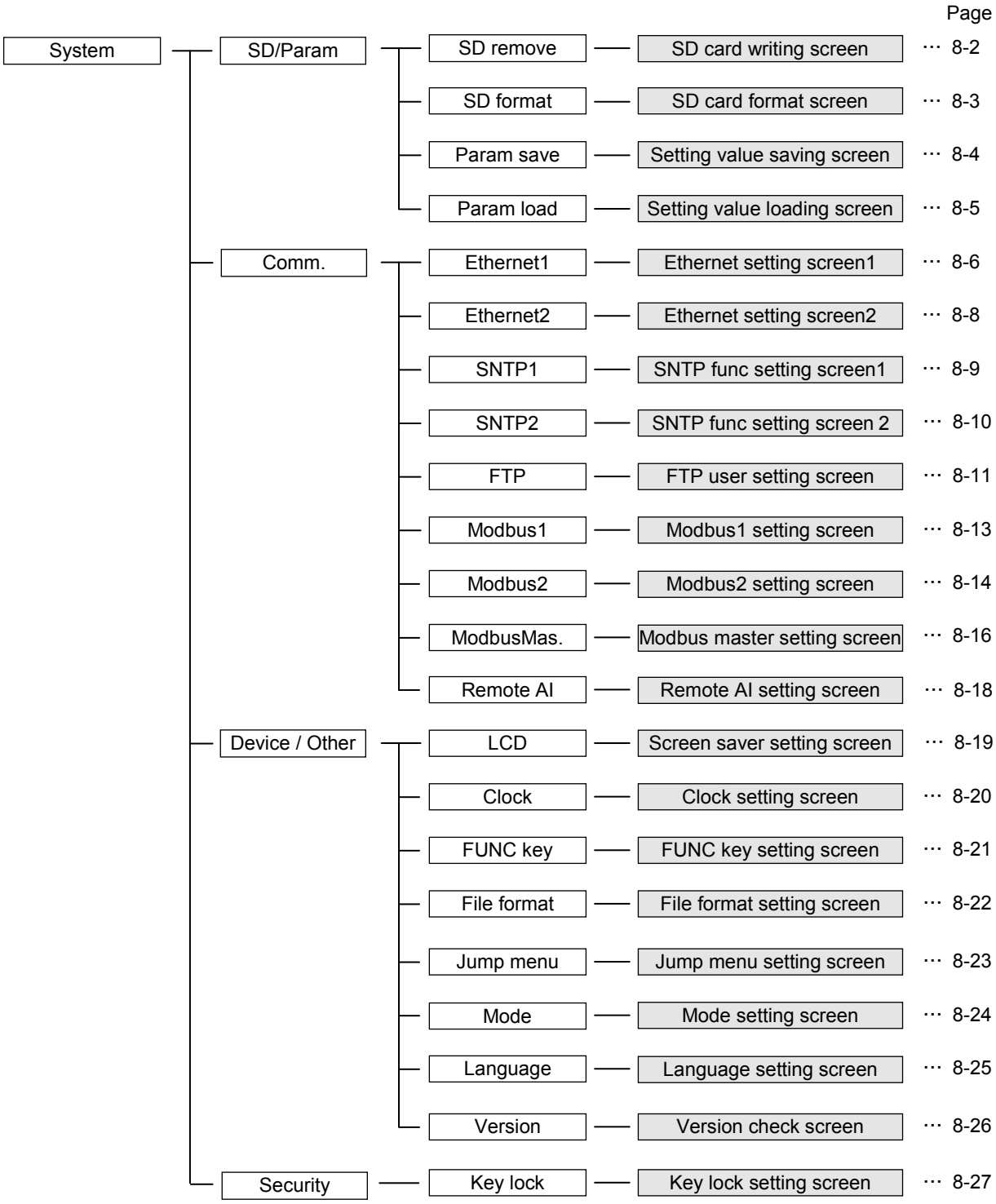
[Wizard]

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



8.2 Remove the SD card

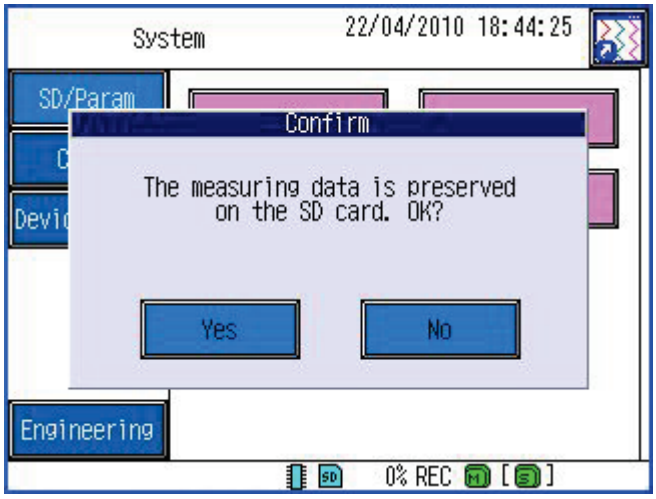
[Explanation]

Data is written to the SD card, and it enters the state that the SD card can be detached.

※ When selecting SD remove 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 ⇒ SD remove key on the System. Moreover, the SD remove key can be selected directly from the MENU.



[Note]

・If it removes an SD card during record, please be sure to perform this operation in order to prevent breakage of data.

8.3 Format the SD card

[Explanation]

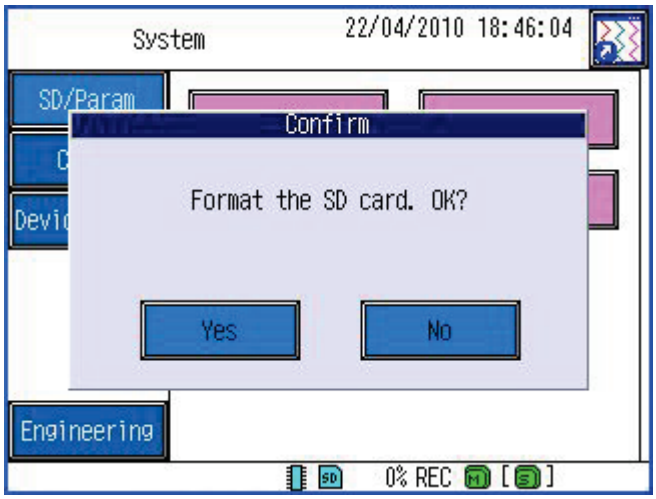
The data of the SD card is formatted.

※ 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

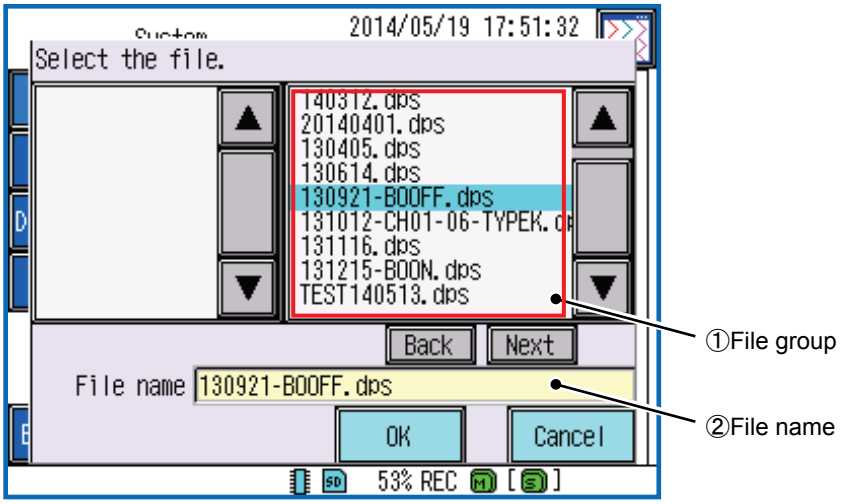
[Explanation]

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 item 10.17 for "Prm" folder.)

8.5 Load the set value

[Explanation]

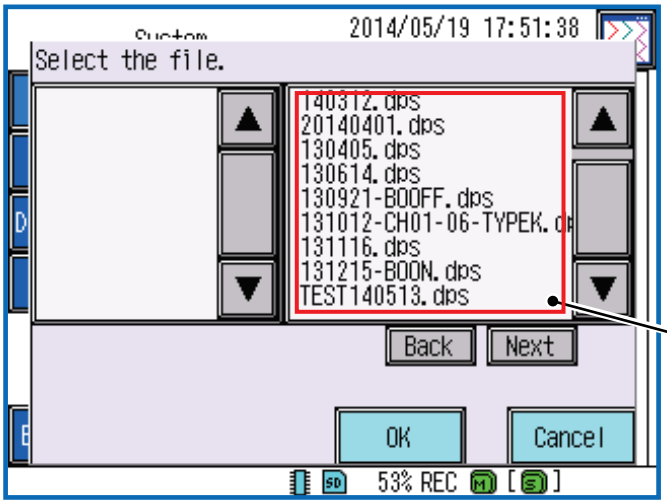
The set value preserved in the past is read from the SD card.

※ 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 item 10.17 for “Prm” folder.)

8.6 Setting the IP address

[Explanation]

IP address etc. necessary for Ethernet are set.

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

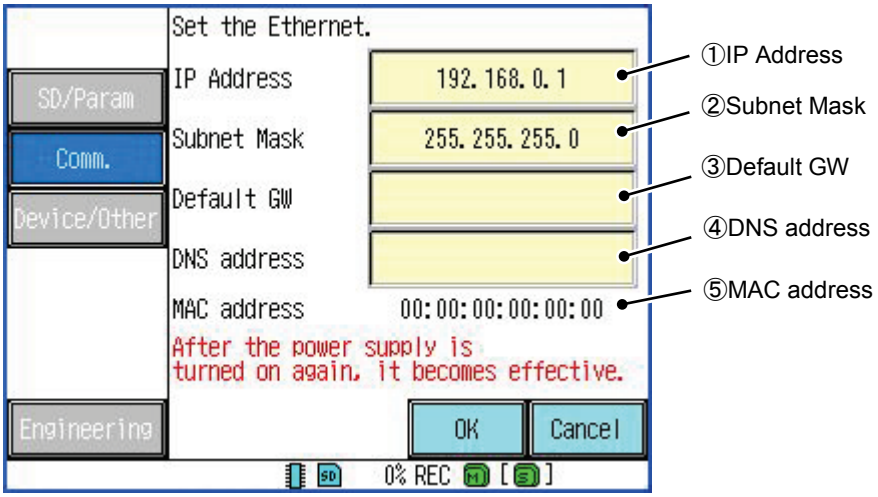
- The record file preserved on the SD card of the recorder can be downloaded directly to the personal computer by using the Viewer software of the attachment. (Network download)
- Realtime trend can be displayed by using the Viewer software of the attachment.

※ 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 item 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.

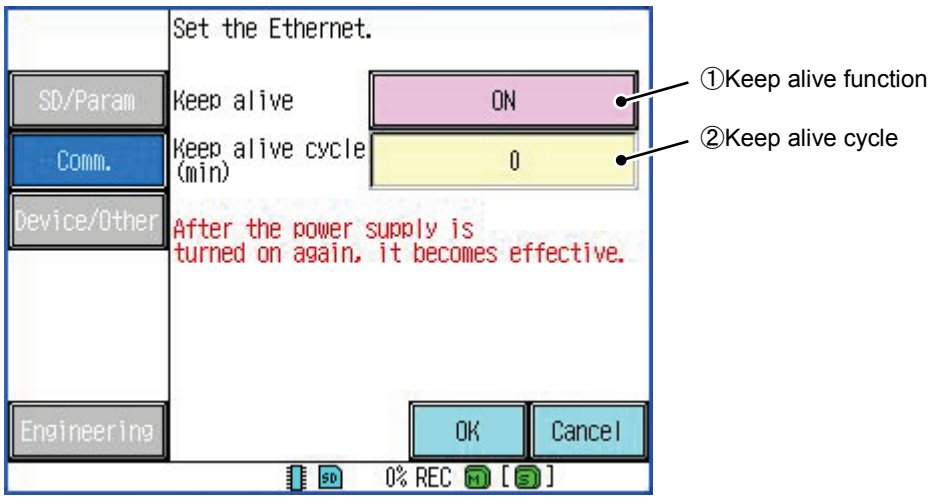
8.7 Setting the keep alive function

[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.)

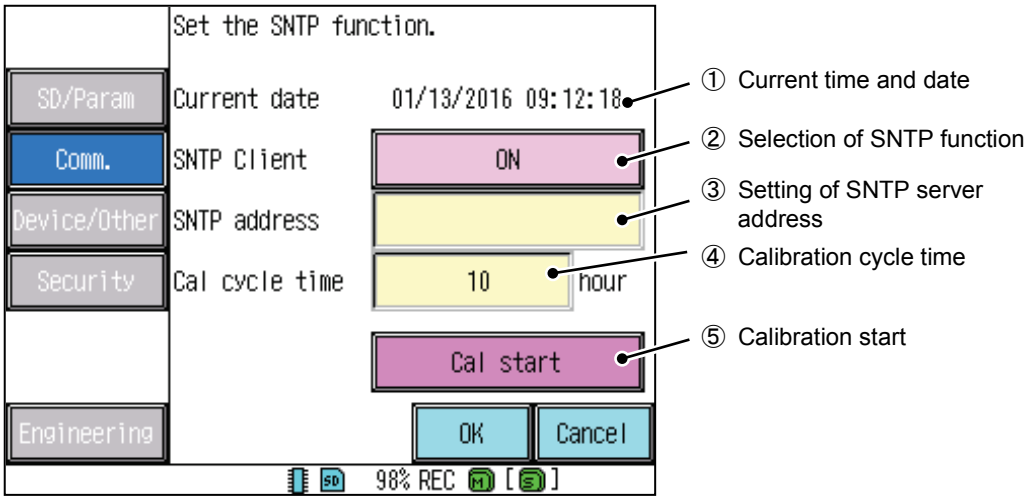
8.8 Setting the SNTP client function

[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.

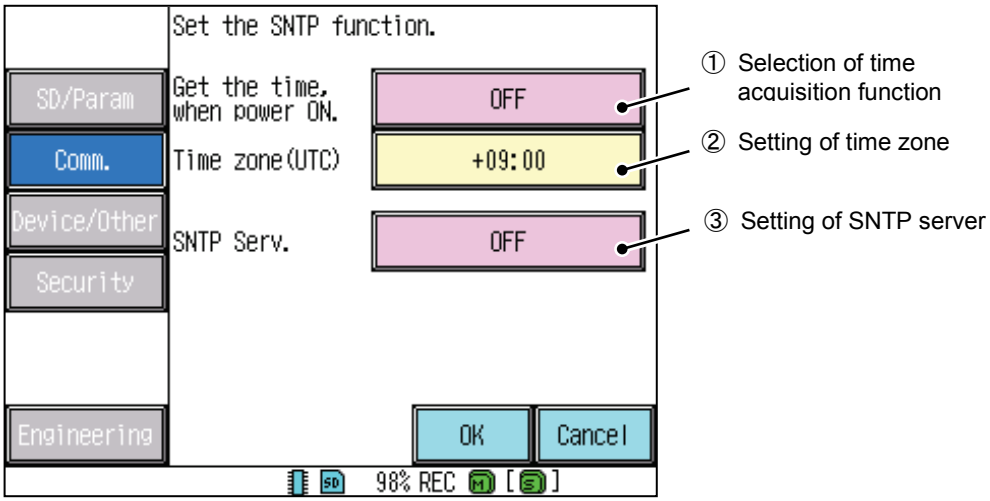
8.9 Setting the time zone and SNTP server function

[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, see section 8.8.)

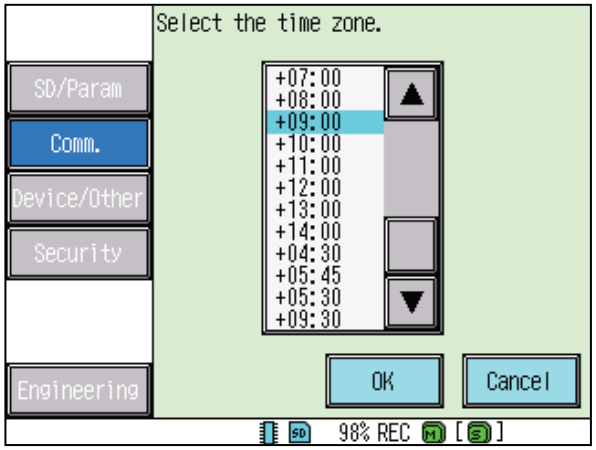
If the power supply is turned on when On is set, the recording process will not be started until the time data is acquired.

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)

8.10 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”.

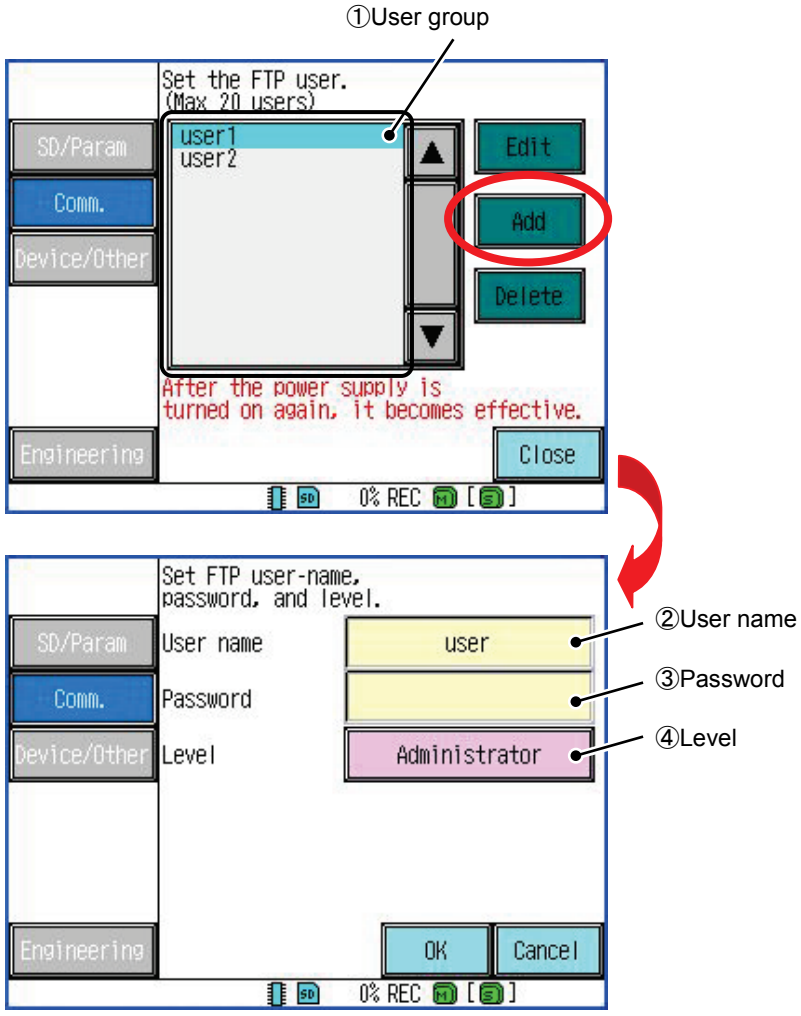
- The record file preserved on the SD card of the recorder can be downloaded directly to the personal computer by using the Viewer software of the attachment. (Network download)
- Realtime trend can be displayed by using the Viewer software of the attachment.

※ 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 item 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.)

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

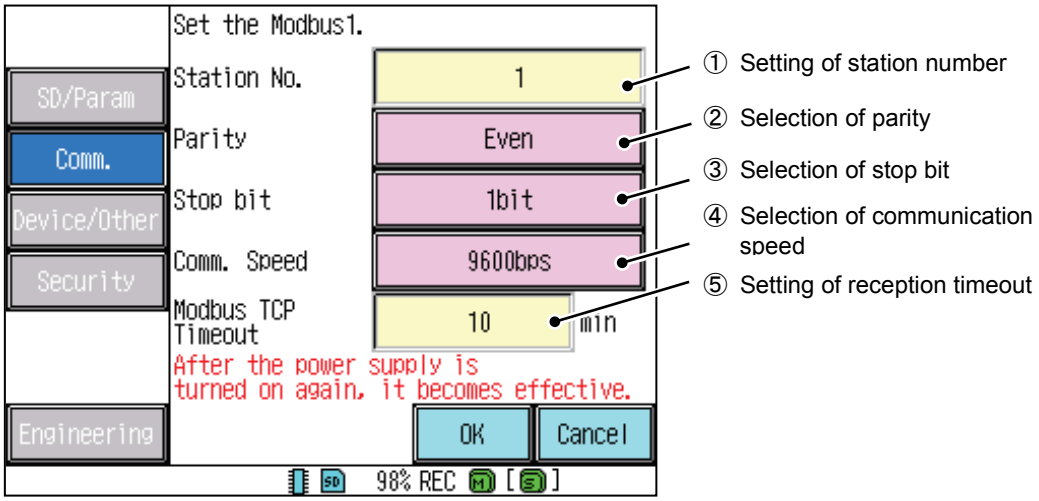
[Description]

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

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

[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.

8.12 Setting Modbus2 (communication type)

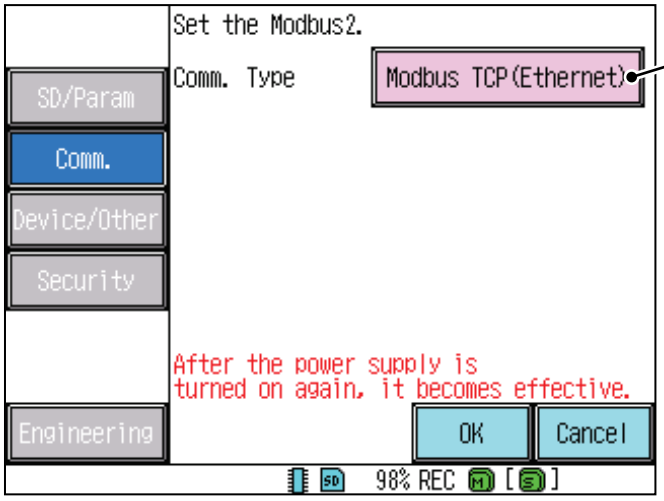
[Description]

Set the Modbus communication type and master/slave operations. The setting items vary depending on the communication types and master/slave settings. For details about the master functions, see the COMMUNICATION FUNCTION OPERATION MANUAL.

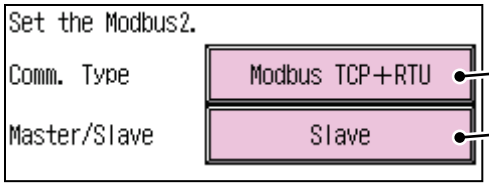
Note) No settings can be changed during the recording process.

[Operation]

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

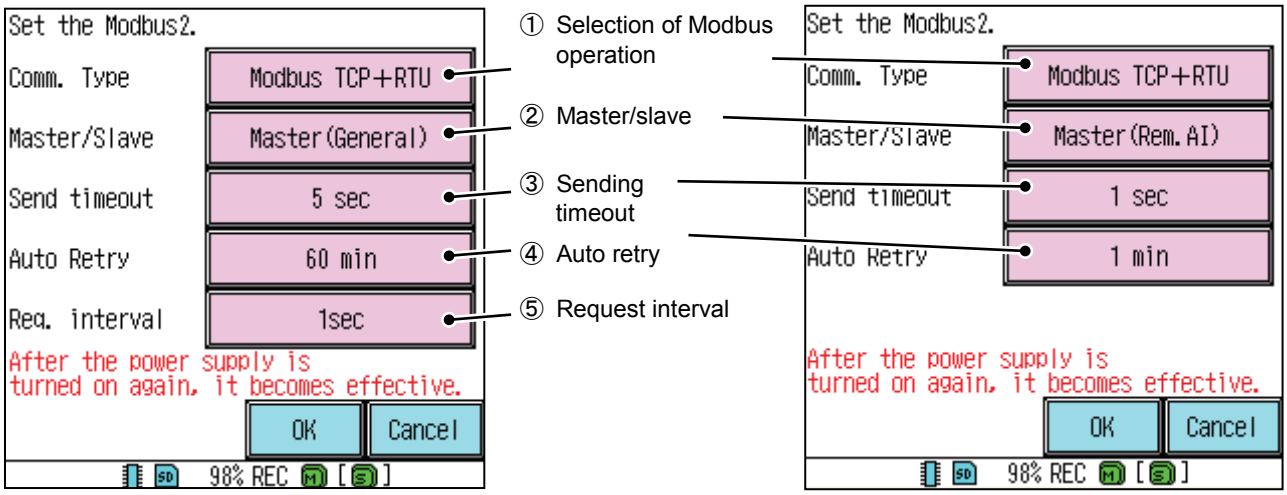


① Selection of Modbus operation



① Selection of Modbus operation

② Master/slave



① Selection of Modbus operation

② Master/slave

③ Sending timeout

④ Auto retry

⑤ Request interval

① Selection of Modbus operation

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

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 acquires 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.

8.13 Setting the Modbus master

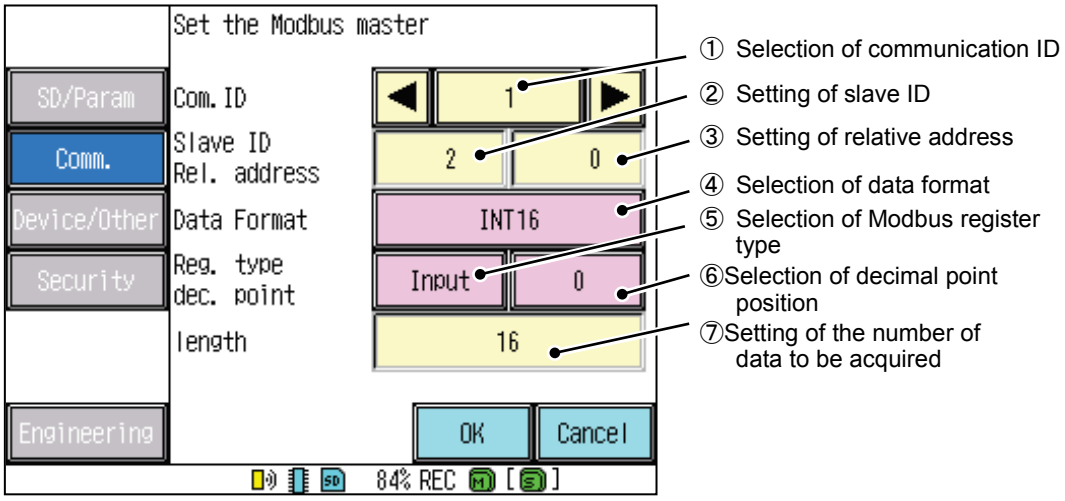
[Description]

With this device as the Modbus master, carry out the settings of the device to be connected with the general-purpose Modbus slave. This is used when the communication type in section 8.12 is Master (General). For details about the Modbus master specifications, 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 ⇒ ModbusMas. key to open the Modbus master 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.

8.14 Setting the remote AI.

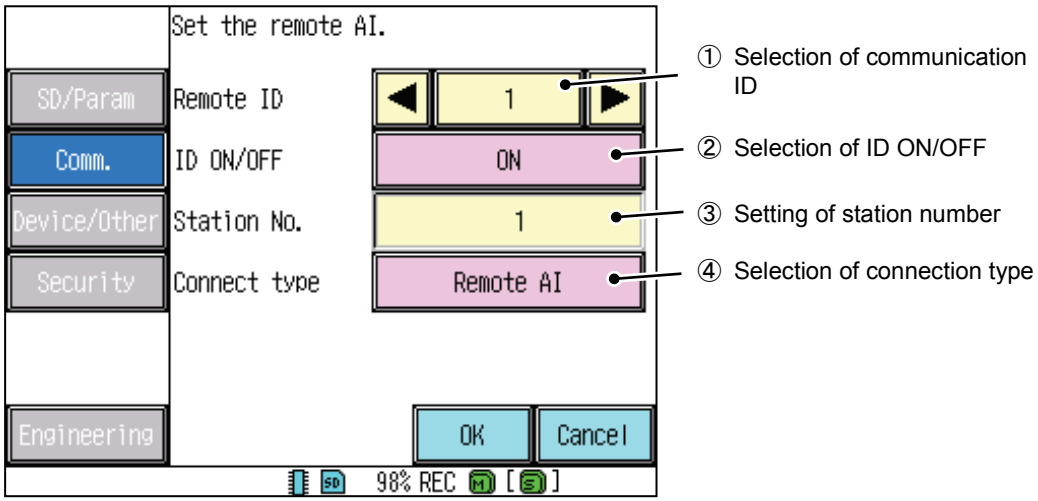
[Description]

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 8.12. 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.

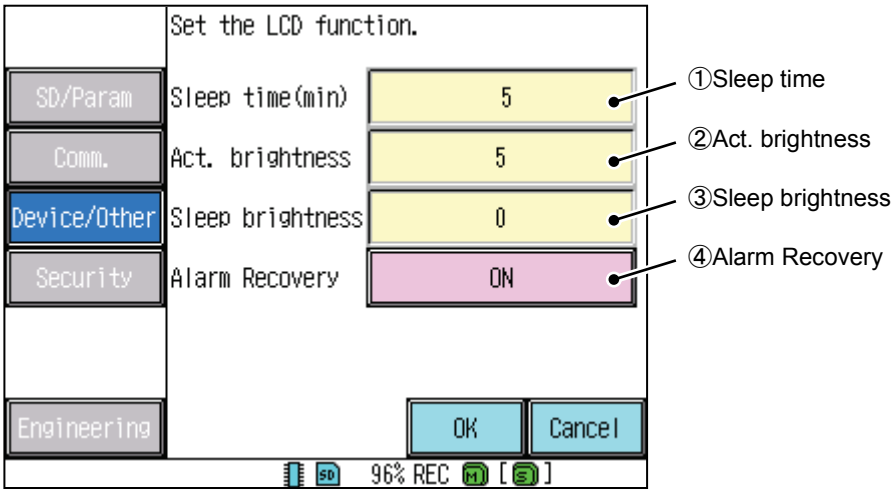
8.15 Setting the LCD sleep time

[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

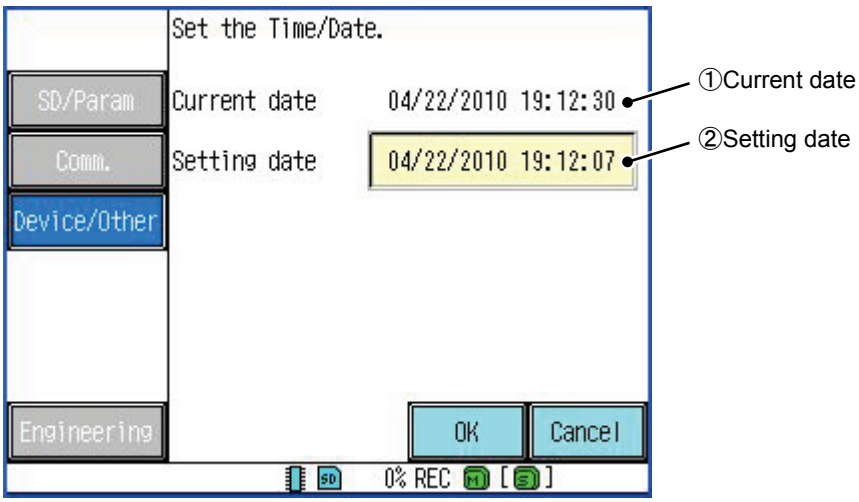
[Explanation]

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.

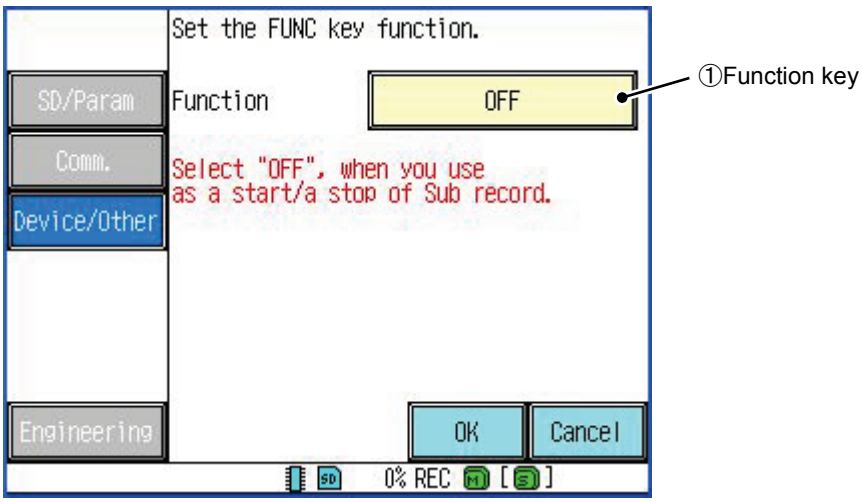
8.17 Setting the FUNC key

[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 item 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 item 10.17 for “Cap” folder.)

Message : 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 item 7.23 for Message key.)

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 item 2.3 of “PARAMETER LOADER INSTRUCTION MANUAL” for various functions. Refer item 7.13 for Manual reset.)

8.18 Setting the file format

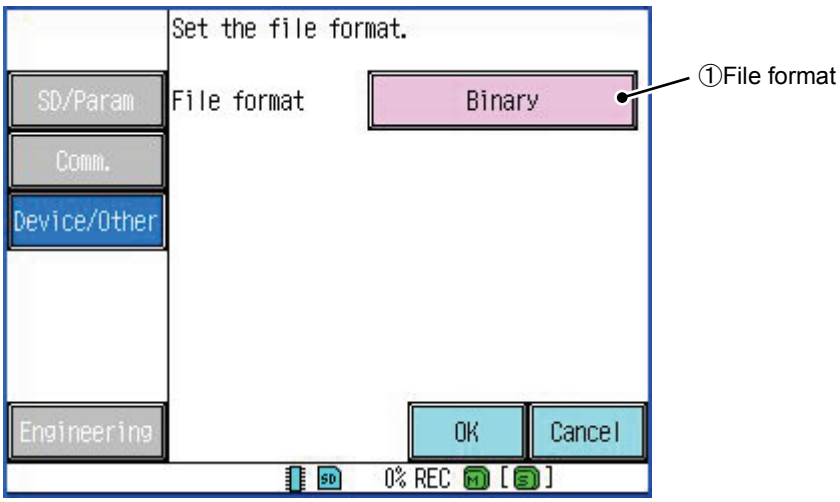
[Explanation]

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

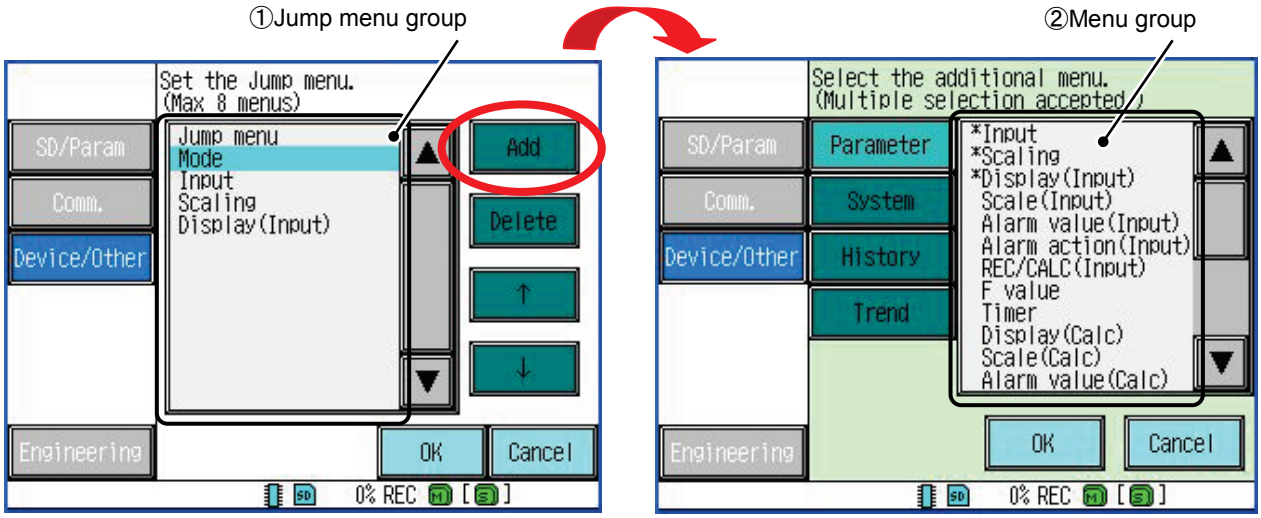
[Explanation]

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.)

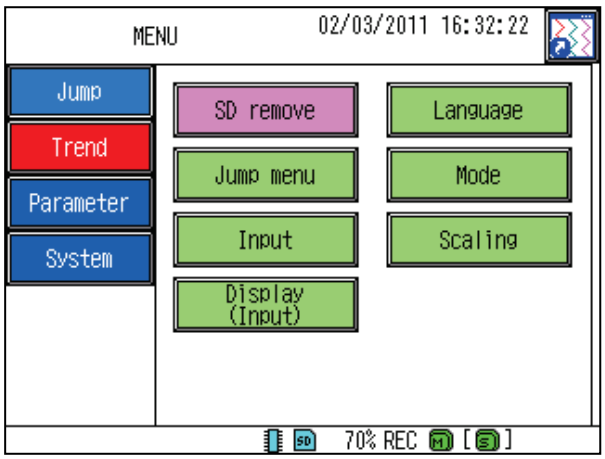
② Menu group

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

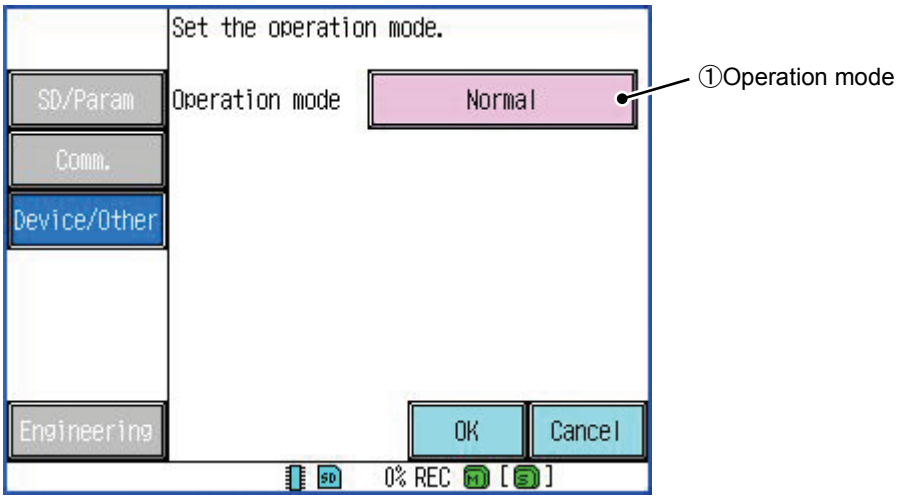
[Explanation]

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 item 7.27 for "Wizard".)

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

8.21 Setting the language

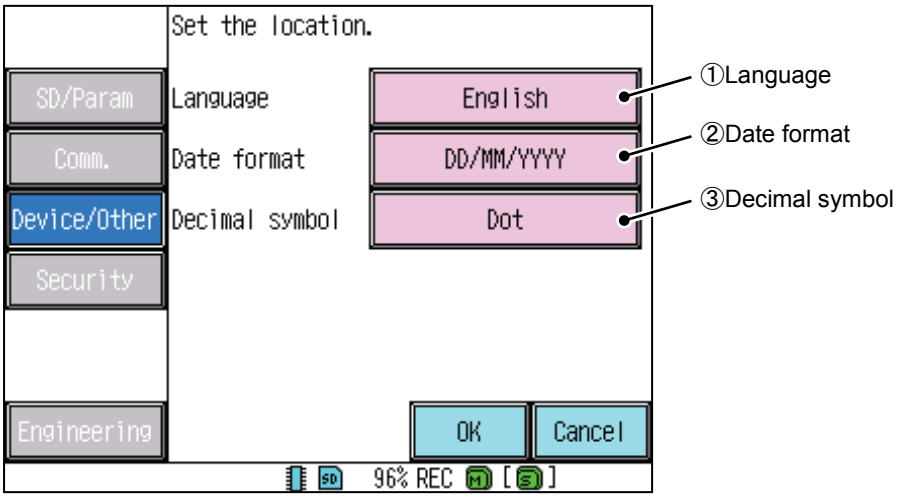
[Explanation]

"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.

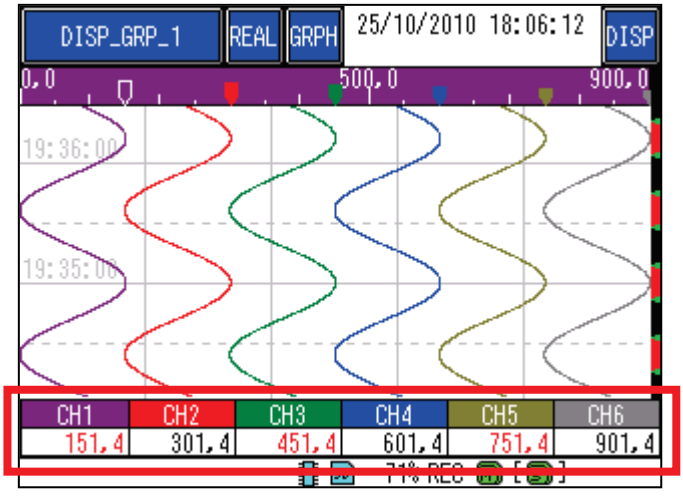
Dot: Use a period for decimal point.

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 item 8.6 for communication setting.)

[③Decimal symbol: Comma select]



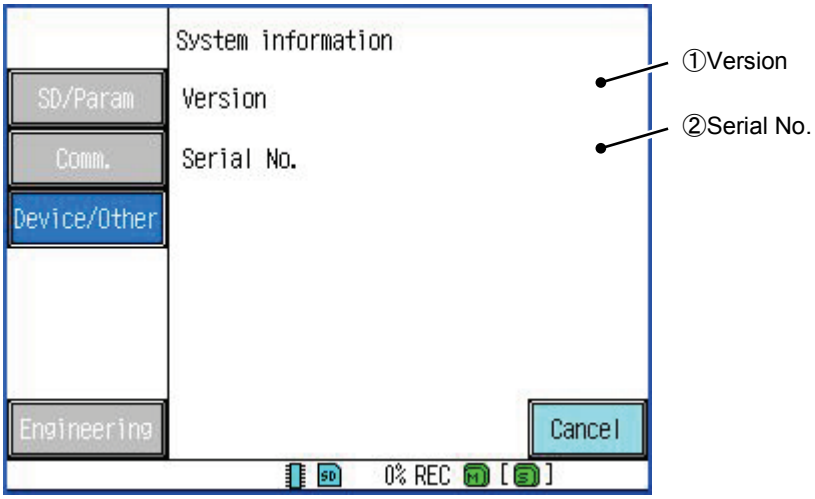
8.22 Display the system information

[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.

② Serial No.

The Serial No. of recorder is displayed.

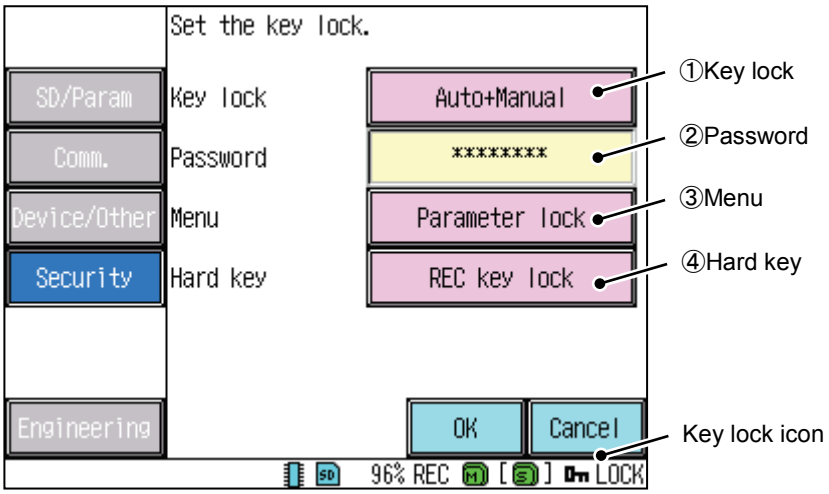
8.23 Setting the key lock function

[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]

Select the Security key ⇒ Key lock key on the System.



① Key lock

Manual and Automatic ON/OFF of a key lock is set up.

OFF	: A key lock function is not used.
Manual	: ON/OFF of a key lock is switched only manually.
Auto + manual	: If there is no operation in a body for 5 minutes, lock. The key lock operation in Manual is also possible.

※ 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.)

② 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.)

③ 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.

④ Hard key

The level of the key lock in a Hard key is set up.

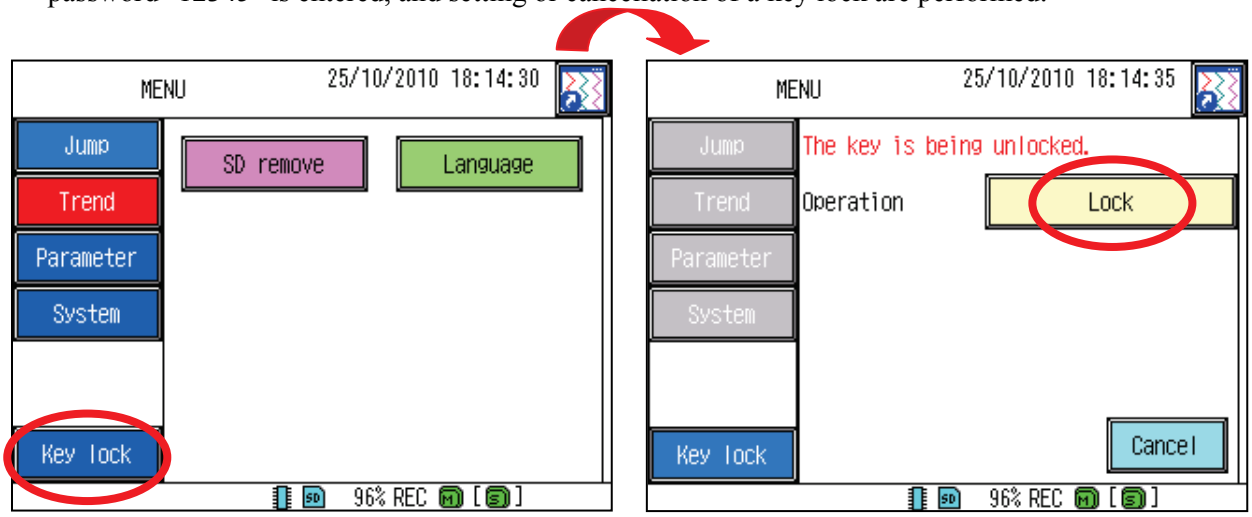
Free	: The key lock of a Hard key is not set up.
REC key lock	: Operation by the REC key is locked.
FUNC key lock	: Operation by the FUNC key is locked.
REC + FUNC key lock	: Operation by the REC key and FUINC key is locked.

●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.

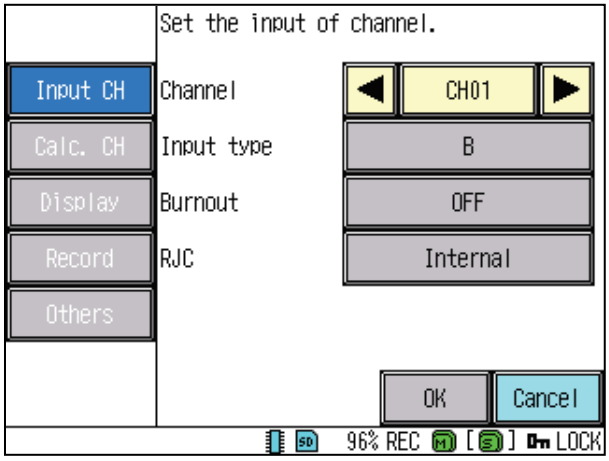
※ If [①Key lock] is set as "Manual operation" or "Auto + manual", a recorder will be locked and a "Key lock icon" will be displayed on the screen lower right. Moreover, it can perform setting or cancellation of a key lock from the Key lock (the following figure left side) of Menu screen. (A Key lock 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.

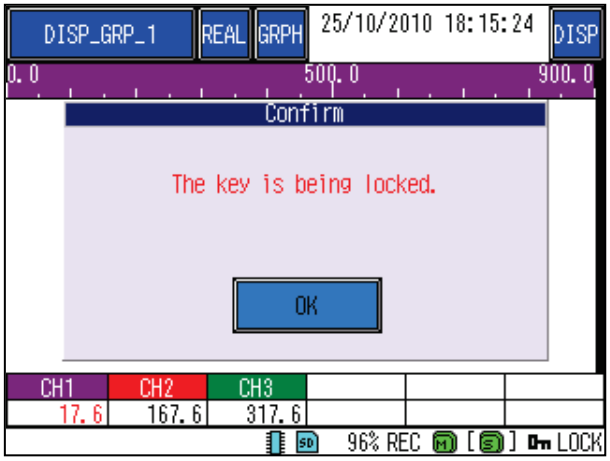


If a key lock is set up, a limit as shown in the following figure is performed to a menu screen and a hard key.

[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.

8.24 “SD / Param” list

［Explanation］

Various settings concerning the SD card are done. Refer item 8.2 ～ 8.5 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.	

8.25 “Comm.” list

［Explanation］

Various settings concerning the communication are done. Refer item 8.6 ～ 8.14 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).	○

[ModbusMas.] * Enabled only when the Master (General) is set for the master/slave setting.

Items	Settings	Advanced
Communication ID	Select the ID for connection.	
Slave ID	Set the slave ID for ModbusRTU.	
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.	

[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.	

8.26 “Device / Other” list

[Explanation]

Various settings concerning the others of system are done. Refer item 8.15 ～ 8.22 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.	

8.27 "Security" list

[Explanation]

Various settings security of system is done. Refer item 8.23 for details.

[Key lock]

Item	Setting contents	Advanced
Key lock	The setting method of a key lock is set up.	
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.	

8.28 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	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.

•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”.

•Data 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 preservation 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 company 1～32GB

・Sandisk company 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
• 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 8th form digit code "1")
• 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 9th 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.

■Relay output (The 9th 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.

• 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)

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 XP / Vista / 7 / 8 / 8.1 (32bit, 64bit)

• Capacity of hard disk：
The lowest remainder capacity：Over 500MB

• OS：Windows XP / Vista / 7 / 8 / 8.1(32bit, 64bit)

• Printer：
Printer and printer driver corresponding to Windows XP / Vista / 7 / 8 / 8.1 (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.

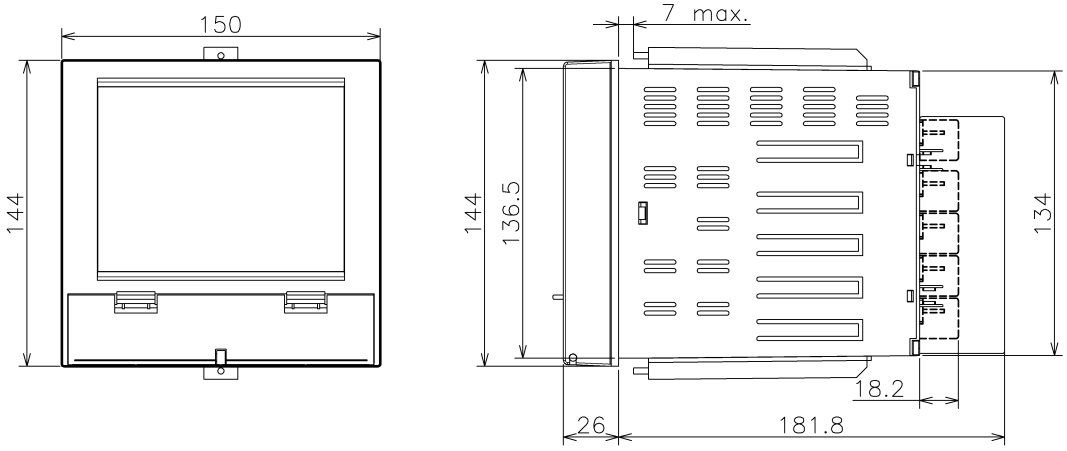
■Data Viewer software

• 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.

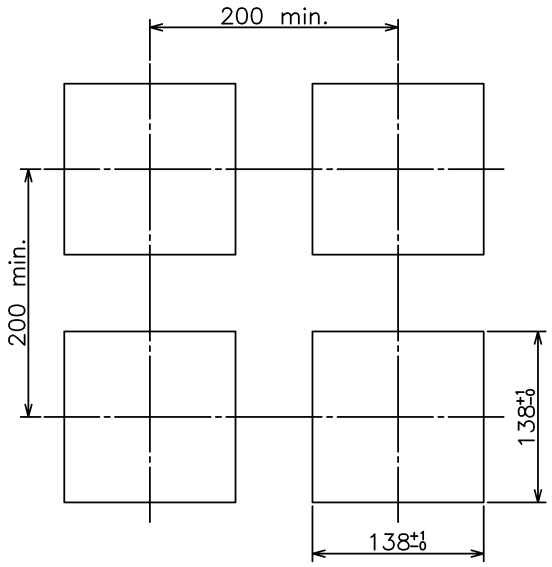
10.16 Dimension

unit: mm



＜Panel cutting＞

unit: mm



10.17 Folder composition of SD card

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]

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)
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.dmt
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.

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.

10.18 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
SD card High reliability type 2GB (with the case)	WMSU0607A01
SD card Normal type 2GB (with the case)	WMSU0607A02
Carrying case	WMSU0490A