GR200A
Graphic Recorder

Version 3.0.4

Touch-Type Graphic Recorder

USER MANUAL

TREND
TEXT VIEW
GR200A Graphic Recorder
HANYOUNG NUX

HANYOUNG NUX

Notice

The contents of this manual are protected by the copyrights and HANYOUNG NUX exclusively has all the related rights.

Copying or reproducing all or any part of the contents of this manual without the permission of HANYOUNG NUX is strictly prohibited.

The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument’s performance and functions.

HANYOUNG NUX contains tacit guarantee and properness for certain purposes of the manual and does not provide any guarantee which is not mentioned in the manual.

The programs installed in the product are protected by the copyrights.

The software is provided “as is”, without warranty of any kind, express or implied, including but not limited to the warranties of merchantability, fitness for a particular purpose and non infringement. In no event shall the authors or copyright holders be liable for any claim, damages or other liability, whether in an action of contract, tort or otherwise, arising from, out of or in connection with the software or the use of other dealings in the software.

Company and product names that appear in this manual are registered trademarks or trademarks of their respective holders. The company and product names used in this manual are not accompanied by the registered trademark or trademark symbols (® and ™).

HANYOUNG NUX CO., LTD.

28, Gilpa-ro 71beon-gil, Michuhol-gu, Incheon, Korea
TEL : +82-32-876-4697 (Company) E-mail : ovterseas@hynux.com

Before start
Installation
Operation
Screen block diagram
Operating screen
Configuration screen
Specifications

Before start

1. Check the product 2
2. Caution for safety 3
3. Quality warranty 3

Installation

1. Cautions of Installation 4
2. Installation method 4
3. Dimension & Panel cutout 5
4. Wiring 6
5. Terminal wiring diagram 8

Operation

1. Names of each part 9
2. Button operation 9
3. How to operate the number pad 10
4. How to operate the keypad 10

Screen block diagram

1. Screen block diagram 11

Operating screen

1. Start and end of the record 12
2. Printing of list 14
3. Alarm 15
4. Trend screen 16
5. Digital screen 17
6. Bar graph screen 18

Configuration screen

1. Check the save log 19
2. Function configuration 21
3. Date / reservation configuration 24
4. Channel configuration 25
5. Alarm and DI 31
6. History management 34
7. System configuration 37

Specifications

1. Input specification 40
2. Hardware specification 41
3. Display specification 42
4. Communication Specifications 42
4. Memory specification 42
5. Installation environment 42

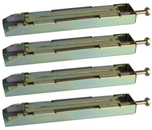
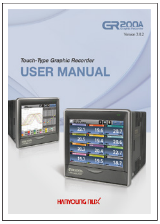
Before start

Thank you for purchasing the graphic recorder of HANYOUNG NUX (Model : GR200A).
The manual specifically explains the functions, how to install, caution and instruction of the product. Please carefully read and fully understand the manual.
In addition, let the manual used by and delivered to the end-user and keep the manual in a place ready to read.
(The contents of the manual may be altered without prior notice depending on the improvement or functional changes of the product.)

1. Check the product

After purchasing the product, please check whether the product meets your desired specification and then check the damages on the exterior or missing parts.

▶ Parts

				
Main body	4 body clamps	250 Ω resistor	SD card	Manual

▶ Suffix code

Model	Code			Content
GR200A -	☐	☐	☐	Touch Screen Graphic Recorder
Input channel	2			2 channel
	4			4 channel
	8			8 channel
	12			12 channel
External contact input & output (DI / DO)		N		None
		1		DI 2 contacts + DO 6 contacts
		2		DI 4 contacts + DO 12 contacts
Communication			C	RS 422/485

2. Caution for safety

Alerts declared in the manual are classified to Danger, Warning and Caution by their criticality

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury

- The contents of the manual may be altered without notification to improve the product.
- Use the product following the instructions on the safety in this manual for the protection and safety of the product and the system connected to the product.
- The company has no responsibilities for the safety issues and following damages caused by negligence or using or handling the product without following the instruction in the manual.
- Please install other additional protection or safety circuits for the protection and safety of the product and the system connected to the product outside the product.
- Do not arbitrarily dissemble, repair or modify the product. This may cause electric shock, fire or malfunction.
- Do not apply strong impact on the product. This may cause product damages or malfunction.
- When installing the product, you must install switch or a circuit breaker in order to separate it from prime power. (Fuse: 250 V, 2 A)

3. Quality warranty

- The company does not take any responsibility and warranty for the product not defined in the quality warranty of the company.
- The company does is not responsible for any damages to the user or the third party due to unexpected faults or the act of God, losses or indirect damages.
- The warranty period is 1 year from the date of purchase and the company provides repair services free of charge only for the cases of failure under normal condition defined in the manual.
- The repair services for failure and others after expiring the warranty period of the product are provided with charges based on the standard by the company.
- The failure below is covered with charges despite the warranty period.
  - Please contact the company or the shop you purchased if you need services (A/S) due to failure and others.
  - Failure due to user's faults (Ex : initialization due to lost password)
  - Failure due to act of God (Ex : fire, flood, etc.)
  - Failure due to moving after the product installation
  - Failure due to arbitrary modification or damages
  - Failure due to power problem including unstable power

Installation

1. Cautions of Installation

- Please use the product with installed on the panel due to the danger of the electric shock.
- Do not install the product in the places below.
  - Place where a person unconsciously touches the terminal
  - Place with strong vibration, impact or electromagnetic field
  - Place with exposed to the abrasive or flammable gases
  - Place with rapid temperature change or much moisture, dust or salt
  - Place with exposed to the direct sunlight or excessively high or low temperature
  - Place with materials easy to be caught by the fire
- The case and the front part of the product are made from the plastic (PC) and equipped with insulators but do not directly install the product on the material with easily burnt.
- Do not place the equipment or wiring which causes the noise near from the product. In particular, sufficiently preheat the product when used at low temperature below 0°C. Also, do not put the equipment with severe heat near from the product.
- Turn all the gauges off and do the wiring.
- The product operates under 100 - 240 V AC / 50 - 60 ㎐ without additional operation. Do not use the power other than the ratings. This may cause the electric shock or the fire.
- Do not operate the product with wet hand. This may cause the electric shock.
- Please follow the existing notice to reduce the danger of the fire, electric shock or damages in use.
- Please refer to how to install for the ground. (Ground resistor: Less than 100 Ω)
- Install the product in a place with sufficient ventilation and do not cover the vent hole of the product.
- The overvoltage protection is included in the category II (IEC 60664-1) and the use environment is the Pollution Degree II .
- Do not use a sharp tool or apply too much power on the touch screen.

2. Installation method

⚠ Danger

Please cut off the power provided to the product before the installation. Take care not to touch the terminal due to the danger of the electric shock under the power application.

- Use the steel plate with the thickness of 2 ~ 5 ㎜ for the panel.
- Slide the product into the panel from the front side of the panel.
- Hook the dedicated clamp to the hole on the product and fix it with bolts (Place first with slightly tightening each clamp and then fix).

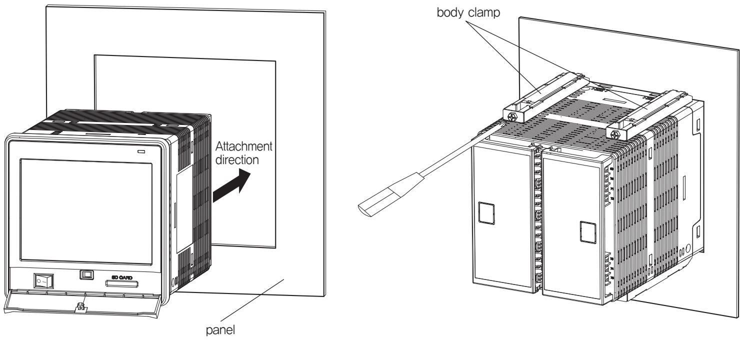

Attachment direction
panel
body clamp

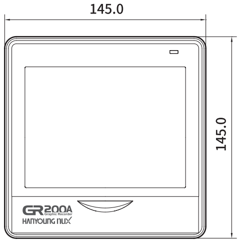
Fig. 1) How to install the panel

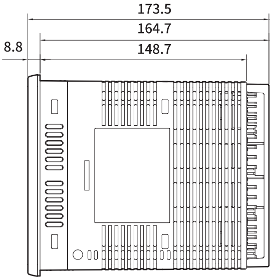
Caution

The tightening torque to fix the clamp is less than 0.5 N·m. Excessive torque may distort or damage the product.

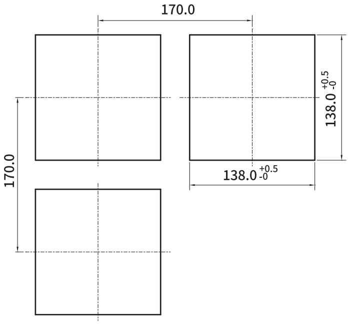
3. Dimension & Panel cutout

▶ Dimension (Unit : mm)


145.0
145.0
GR200A Graphic Recorder
HANYOUNG NUX


173.5
164.7
8.8
148.7

▶ Panel cutout (Unit : mm)


170.0
170.0
138.0 +0.5 -0
138.0 +0.5 -0

4. Wiring

Danger

Please cut off the power provided to the product before the wiring. Take care not to touch the terminal due to the danger of the electric shock under the power application.

▶ Power wiring

Please use the vinyl insulation wire with 0.9 ~ 2.0 ㎟ (KSC 3304).

Caution

Much noise in the power may damage the product or malfunction. Use the line filter to remove the noise.

▶ FG(Frame Ground) wiring

Please use the vinyl insulation wire of 2.0 ㎟ (KSC 3304).

Please wire higher than grade 3 ground with less than 100Ω of the ground resistor.

▶ Wire the relay output

Caution

The inductive loads (L) including the motor, solenoid and external relay cause the malfunction. Connect the CR filters and diodes with the load in parallel in the AC and the DC circuits, respectively.

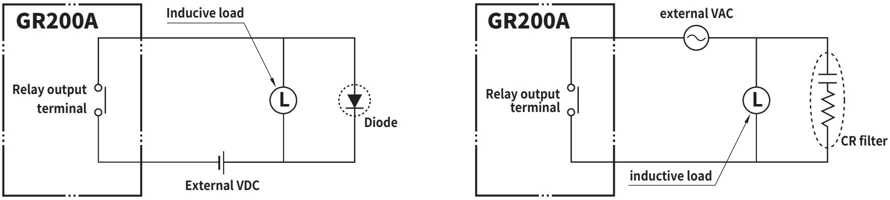

GR200A
Relay output terminal
Inducive load
L
Diode
External VDC
GR200A
Relay output terminal
external VAC
L
CR filter
inductive load

Fig. 2) Relay wiring

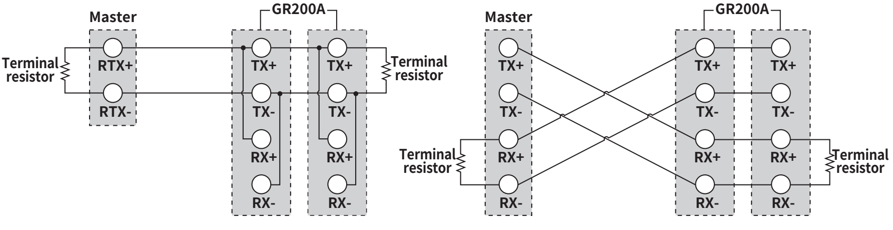
Input wiring

Caution

Use the shield wire for the input wiring and wire with certain intervals from the power and the ground circuits. Use the RTD sensor as the 3-line sensor with the same wiring resistor.

Communication wiring

Connect the terminating resisters (100 - 200 Ω, 0.25 W) at both ends of the communication line.


Master
Terminal resistor
RTX+
RTX-
GR200A
TX+
TX-
RX+
RX-
TX+
TX-
RX+
RX-
Terminal resistor
Master
TX+
TX-
Terminal resistor
RX+
RX-
GR200A
TX+
TX-
RX+
RX-
TX+
TX-
RX+
RX-
Terminal resistor

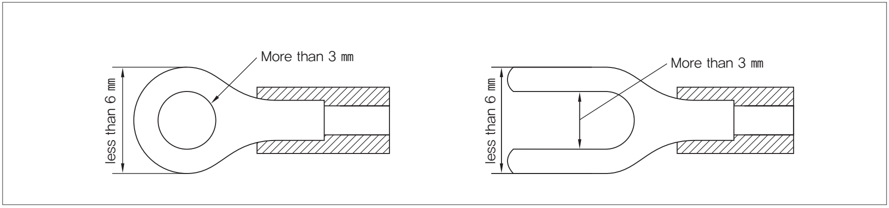
[2-line connection]

[4-line connection]

Fig. 3) Communication wiring

Terminal specification

Input / output - M3 Screw


More than 3 ㎜
less than 6 ㎜
More than 3 ㎜
less than 6 ㎜

Communication / power - M3.5 Screw

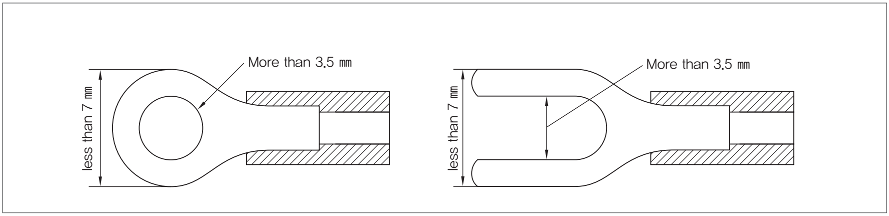

More than 3.5 ㎜
less than 7 ㎜
More than 3.5 ㎜
less than 7 ㎜

Fig. 4) Compressing terminal

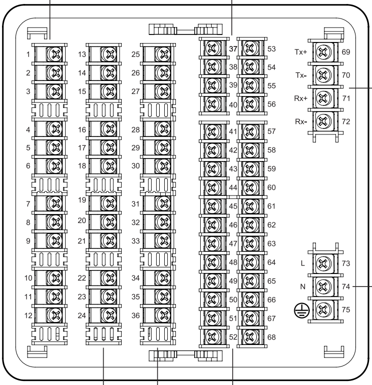
5. Terminal wiring diagram

Terminal number	Sensor input (1) Channel 1 – 4	
1	A + B RTD TC mV/V − B	Channel 1 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
2		
3		
4	A + B RTD TC mV/V − B	Channel 2 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
5		
6		
7	A + B RTD TC mV/V − B	Channel 3 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
8		
9		
10	A + B RTD TC mV/V − B	Channel 4 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
11		
12		

Terminal number	Digital input (2) DI3 – DI4	
37	DI	DI 3 COM
38		
39	DI	DI 4 COM
40		

Terminal number	Digital input (2) DI1 – DI2	
53	DI	DI 1 COM
54		
55	DI	DI 2 COM
56		

Terminal number	Communication	
69	Tx (+)	RS-485
70	Tx (-)	
71	Rx (+)	
72	Rx (-)	



Terminal number	Sensor input (2) Channel 5 – 8	
13	A + B RTD TC mV/V − B	Channel 5 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
14		
15		
16	A + B RTD TC mV/V − B	Channel 6 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
17		
18		
19	A + B RTD TC mV/V − B	Channel 7 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
20		
21		
22	A + B RTD TC mV/V − B	Channel 8 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
23		
24		

Terminal number	Power	
73	L 100 – 240 V ~ 50 – 60 Hz 25 VA N	100 - 240 V a.c. 50 - 60 Hz 25 VA
74		
75		

Terminal number	Sensor input (3) Channel 9 – 12	
25	A + B RTD TC mV/V − B	Channel 9 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
26		
27		
28	A + B RTD TC mV/V − B	Channel 10 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
29		
30		
31	A + B RTD TC mV/V − B	Channel 11 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
32		
33		
34	A + B RTD TC mV/V − B	Channel 12 RTD : Thermoresistor V d.c. : Votage DC TC : Thermocouple
35		
36		

Terminal number	Contact output(2) Relay 7 - Relay 12	
41		Relay 7
42		
43		Relay 8
44		
45		Relay 9
46		
47		Relay 10
48		
49		Relay 11
50		
51		Relay 12
52		

Terminal number	Contact output(2) Relay 1 - Relay 6	
57		Relay 1
58		
59		Relay 2
60		
61		Relay 3
62		
63		Relay 4
64		
65		Relay 5
66		
67		Relay 6
68		

Fig. 5) Wiring diagram

Operation

1. Names of each part

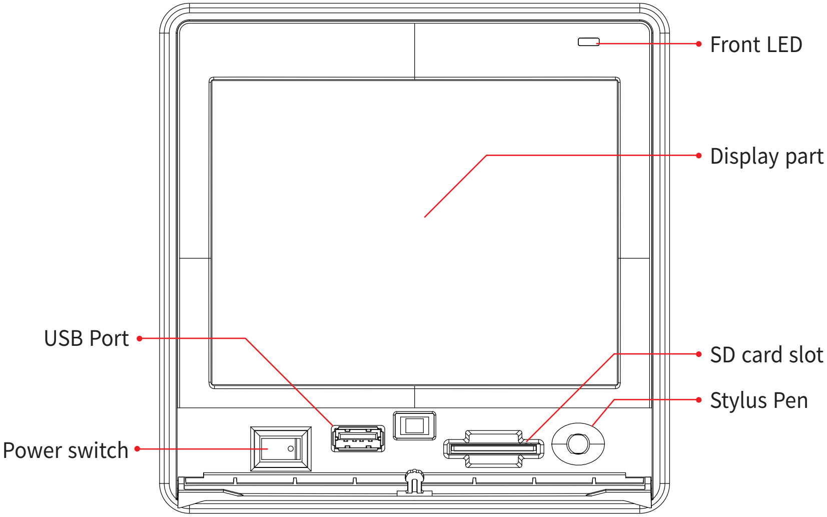
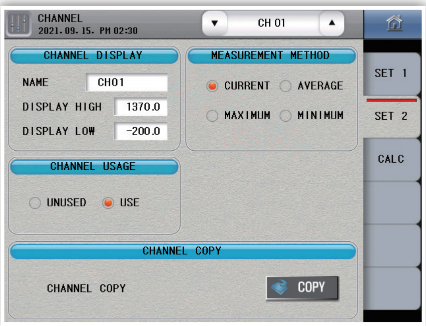

Front LED
Display part
USB Port
SD card slot
Stylus Pen
Power switch

Fig. 6) front drawing

2. Button operation


CH 01
SET 1
SET 2
CALC
COPY

CHANNEL
2021. 09. 15. PM 02:30

CHANNEL DISPLAY
NAME CH01
DISPLAY HIGH 1370.0
DISPLAY LOW -200.0

MEASUREMENT METHOD
● CURRENT ○ AVERAGE
○ MAXIMUM ○ MINIMUM

CHANNEL USAGE
○ UNUSED ● USE

CHANNEL COPY
CHANNEL COPY

Fig. 7) example picture

SAVE COPY	Execution button	Immediately execute the function on the button
○ ●	Select button	Select one on the list
☐	Input box	Display and configure the number or character. The number pad or keypad appears when pressed.

※ The execution is denied with the alarm (beep) when the button is deactivated or the configuration is prohibited.

3. How to operate the number pad

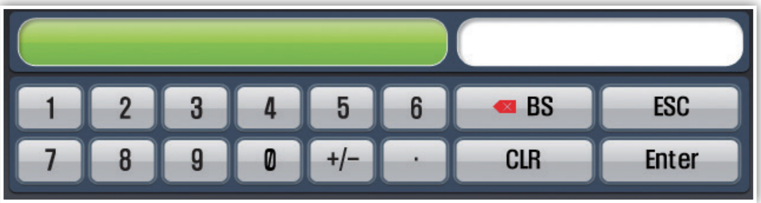

1
2
3
4
5
6
BS
ESC
7
8
9
0
+/-
.
CLR
Enter

Fig. 8) Number pad

🟩	Display the name and the configuration range of the parameter
☐	Display the configured value
Enter	Register the configured value
BS	Delete the last digit of the configured value
CLR	Delete all the configured values
ESC	Cancel the configuration and hide the input pad.

※ The configuration is denied with the alarm (beep) if a value exceeds the configuration range.

4. How to operate the keypad

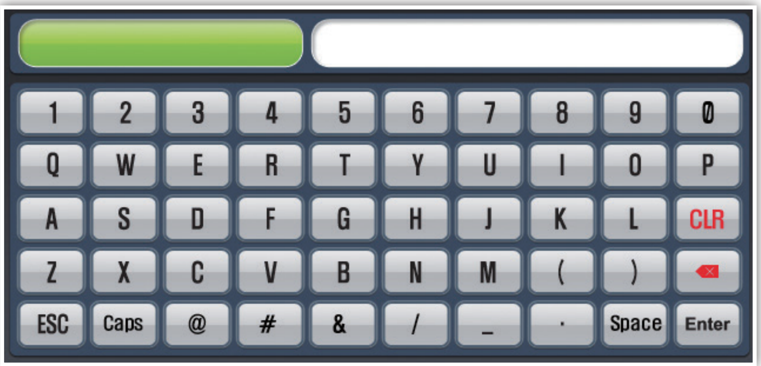

1
2
3
4
5
6
7
8
9
0
Q
W
E
R
T
Y
U
I
O
P
A
S
D
F
G
H
J
K
L
CLR
Z
X
C
V
B
N
M
(
)
ESC
Caps
@
#
&
/
_
.
Space
Enter

Fig. 9) Keypad

🟩	Display the parameter name
☐	Display the configured character
Enter	Register the configured character
⌫	Delete the last digit of the configured character
CLR	Delete all the configured values
ESC	Cancel the configuration and hide the input pad.
Caps	Change the character to capital or small letter
Space	Blank character

Screen block diagram

1. Screen block diagram

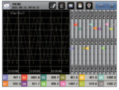
Power

nux HANYOUNG

Logo screen

Trend screen, digital screen, bar graph screen

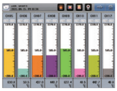
- Save / stop the graph (internal memory, SD card)
- Display the status (internal memory, SD card, alarm)
- Display the list



Trend screen

352.9
940.1
1066.8
358.3
357.5
943.9
1071.5
1060.9
350.1
938.7
1070.5

Digital screen



Bar graph screen

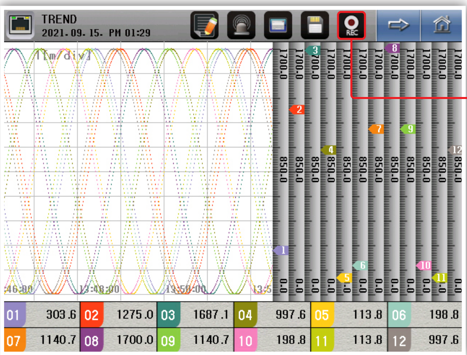
Menu screen

Operating screen	Trend screen, digital screen, bar graph screen
Check the save log	View the saved graph, copy the data from the internal memory to the SD card
Function configuration	**Operation configuration** : Recording interval, screen brightness, power-saving, restoration from the blackout, beep, background color, touch lock **LIST** : Enter the list name **Graph** : Line thickness, how to draw, change the saved file name
Date / reservation configuration	**Current time** : Configure the current time **Reservation time** : Configure the reservation on start and end
Channel configuration	**Basic configuration** : Sensor type, DCV range, use range, decimal point location, input filter, unit **Additional configuration** : Channel name, display range, how to measure, use the channel or not, channel calibration, channel copy **Calculation function** : Calculation configuration, enter the calculation formula, enter the memory formula
Alarm and DI	**Alarm configuration** : Alarm type, Alarm relay, Alarm operation **DI configuration** : Beep time, detection delay time, DI 1 operation, DI relay
History management	**Event** : Display the event history, delete the event history, save to the SD card **Error** : Display the error history, delete the error history, save to the SD card **Output status** : Alarm, DI, display the relay status
System configuration	**System** : Display language, select the logo screen, user password, user logo upload **Product specification** : Enter the information on the initial screen, whether to display the information on the initial screen, product information, parameter initialization **Communication configuration** : Communication protocol, communication speed, stop bit, data length, parity bit, device number, response time **Firmware**: Firmware upgrade, test mode

Operating screen

1. Start and end of the record

Recording start and end can be done in “Trend”, “Text View” or “Bar Graph” screen.
Recording uses internal memory or SD card (or USB stick).



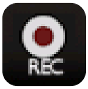
01	303.6	02	1275.0	03	1687.1	04	997.6	05	113.8	06	198.8
07	1140.7	08	1700.0	09	1140.7	10	198.8	11	113.8	12	997.6

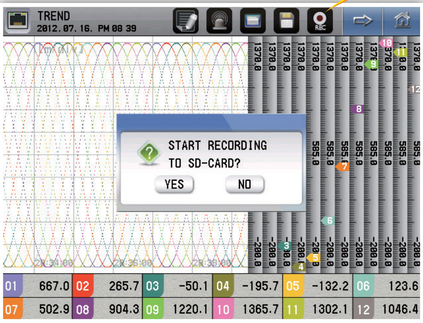
Internal memory and SD card (or USB stick).
You can start or stop recording.

Fig. 10) Trend screen

▶ Record on the internal memory

Press the button to pop up the confirm screen.



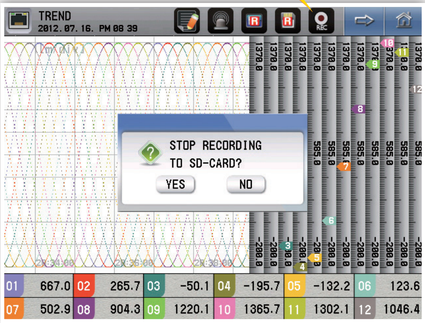


START RECORDING TO SD-CARD?

YES NO

01	667.0	02	265.7	03	-50.1	04	-195.7	05	-132.2	06	123.6
07	502.9	08	904.3	09	1220.1	10	1365.7	11	1302.1	12	1046.4

Fig. 11) Check the record in the internal memory

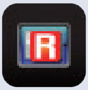
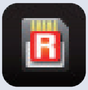
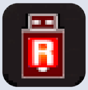


STOP RECORDING TO SD-CARD?

YES NO

01	667.0	02	265.7	03	-50.1	04	-195.7	05	-132.2	06	123.6
07	502.9	08	904.3	09	1220.1	10	1365.7	11	1302.1	12	1046.4

Fig. 12) Check the stop on the internal memory

	Indicates that the internal memory is being written to.		
	A write operation to the SD card is in progress.		A write operation to the USB stick is in progress.

▶ Record to the SD card

Insert the SD card as shown in the picture to record with the SD card.

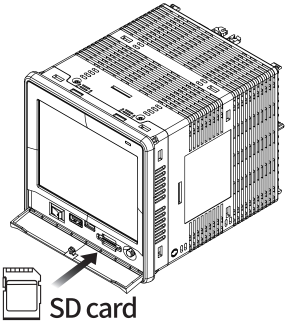
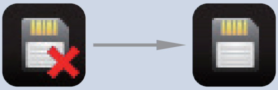


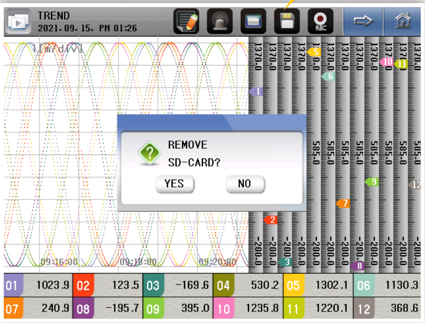
Fig. 13) Insert the SD card



<Before recognizing the SD card> <After recognizing the SD card>

- The picture shows that the SD card is recognized.
- It is not allowed to use and record with the SD card if the recognition fails.

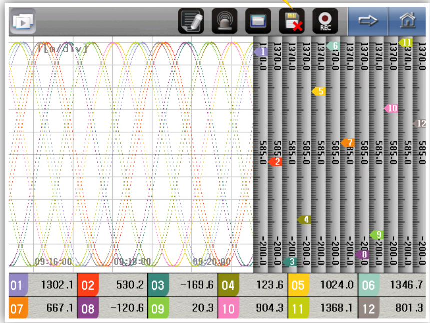
Press the button to pop up the confirm screen.



REMOVE
SD-CARD?

```
01  1023.9  02   123.5  03  -169.6  04   530.2  05  1302.1  06  1130.3
07   240.9  08  -195.7  09   395.0  10  1235.8  11  1220.1  12   368.6
```

Fig. 14) Check the record on the SD card



```
01  1302.1  02   530.2  03  -169.6  04   123.6  05  1024.0  06  1346.7
07   667.1  08  -120.6  09    20.3  10   904.3  11  1368.1  12   801.3
```

Fig. 15) Check the stop on the SD card

💾	Indicates that there is an SD card.		
R	A write operation to the SD card is in progress.	R	A write operation to the USB stick is in progress.
💾 ✗	There is no SD card.	✗	There is no USB stick.

Reference

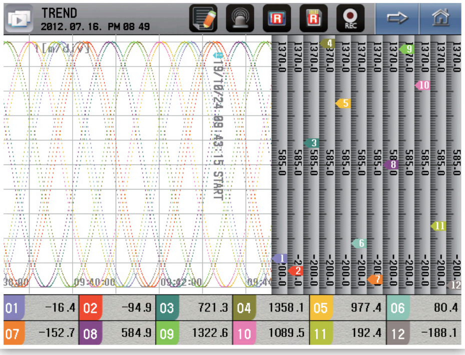
The saved file name has the format of "GR200_yymmdd_hhmmss.GR2" and the first 6 letters may be altered in <Function configuration - Graph screen>. The destination folder is the "GR200_DATA" folder in the root directory of the SD card.

Caution

- If the number of files saved in the SD card or internal memory is more than 512, the record ends automatically
- If the capacity of the SD card or internal memory is exceeded (350 MB) the record ends automatically
- It is recommended to periodically connect the SD card to a PC to back up and manage data.

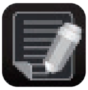
2. Printing of list

The user may print the list on the trend screen during the record.

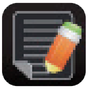

TREND
2012. 07. 16. PM 08 49
1[m/div]
19/10/24 09:43:15 START
09:40:00
09:42:00
1370.0
585.0
-200.0

01	-16.4	02	-94.9	03	721.3	04	1358.1	05	977.4	06	80.4
07	-152.7	08	584.9	09	1322.6	10	1089.5	11	192.4	12	-188.1

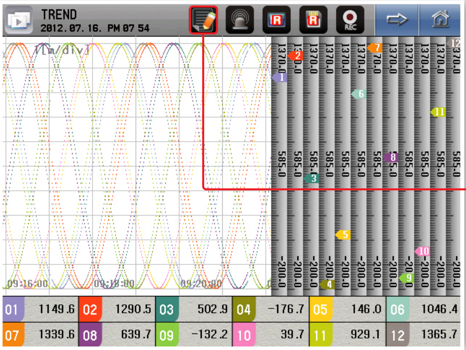
Fig. 16) Trend screen - Printed list



It is not possible to print the list when the record stops.



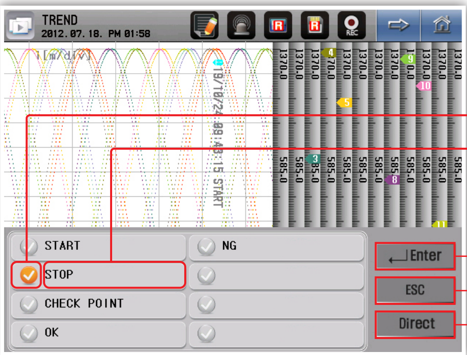
It is possible to print the list during the record.


TREND
2012. 07. 16. PM 07 54
1[m/div]
09:16:00
09:18:00
09:20:00
1370.0
585.0
-200.0

01	1149.6	02	1290.5	03	502.9	04	-176.7	05	146.0	06	1046.4
07	1339.6	08	639.7	09	-132.2	10	39.7	11	929.1	12	1365.7

Press to show the list already recorded.

Fig. 17) Status screen - Recording


TREND
2012. 07. 18. PM 01:58
1[m/div]
19/10/24 09:43:15 START
1370.0
585.0
Enter
ESC
Direct

○ START
● STOP
○ CHECK POINT
○ OK
○ NG

Select the list to print.

Here are the contents to print. The list may be edited in "Functional configuration ⚙ ".

The selected list is printed on the screen.

Cancel to print the list.

Directly enter the list on the input field to print. (Max. 16 characters)

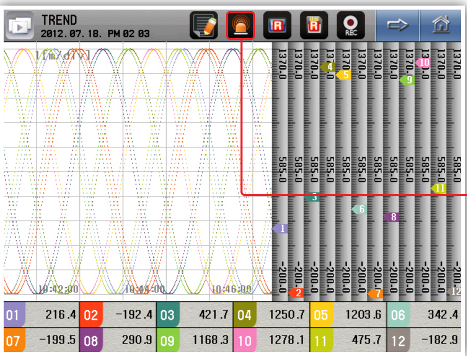
Fig. 18) List selection window

3. Alarm

It is possible to check the alarm on the "Trend", "Digital" or "Bar graph" screen. The alarm is configured in the "Alarm and DI ".

It is the status without the alarm.

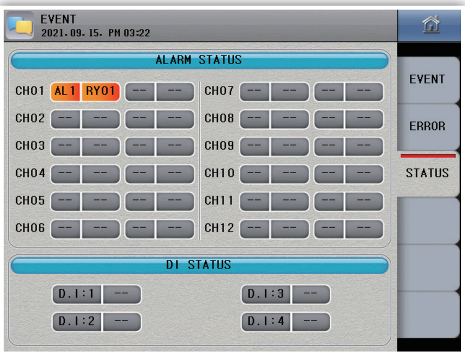
It is the status with the alarm.


TREND
2012. 07. 18. PM 02 03
1370.0
585.0
-200.0
10:42:00
10:44:00
10:46:00
REC

01	216.4	02	-192.4	03	421.7	04	1250.7	05	1203.6	06	342.4
07	-199.5	08	290.9	09	1168.3	10	1278.1	11	475.7	12	-182.9

Go to the print status page to show the activated alarm.

Fig. 19) Status window - Alarming


EVENT
2021. 09. 15. PM 03:22
EVENT
ERROR
STATUS

ALARM STATUS

CH01	AL1	RY01	--	--	CH07	--	--	--	--
CH02	--	--	--	--	CH08	--	--	--	--
CH03	--	--	--	--	CH09	--	--	--	--
CH04	--	--	--	--	CH10	--	--	--	--
CH05	--	--	--	--	CH11	--	--	--	--
CH06	--	--	--	--	CH12	--	--	--	--

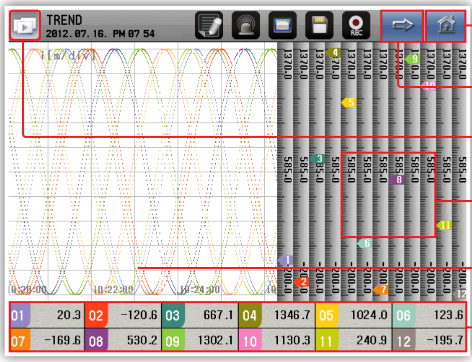
DI STATUS

D.I:1	--	D.I:3	--
D.I:2	--	D.I:4	--

Fig. 20) Print status window

4. Trend screen

The screen shows the channel measurement with the graph. The graph displays the currently measured value and flows regardless of the saving. The flowing speed of the graph depends on the saving period.


TREND
2012. 07. 16. PM 07 54
1[m/div]
10:20:00
10:22:00
10:24:00
1370.0
585.0
-200.0

01	20.3	02	-120.6	03	667.1	04	1346.7	05	1024.0	06	123.6
07	-169.6	08	530.2	09	1302.1	10	1130.3	11	240.9	12	-195.7

Go to the menu screen.

Go to the digital screen.

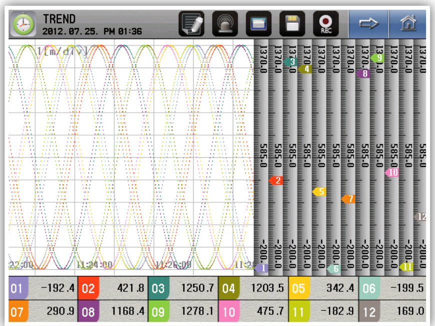
The 🕒 icon blinks when the reserved operation is configured.

Click to show or hide the grid.

Display the measured value with the graph.

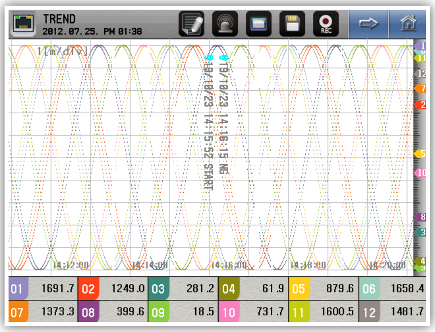
Display the measured value with the figure. Click to hide or show the graphs for each channel. If hidden, the data do not appear but the record keeps going in the internal memory or the SD card.

Fig. 21) Trend screen


TREND
2012. 07. 25. PM 01:36
1[m/div]
11:24:00
11:26:00
1370.0
585.0
-200.0

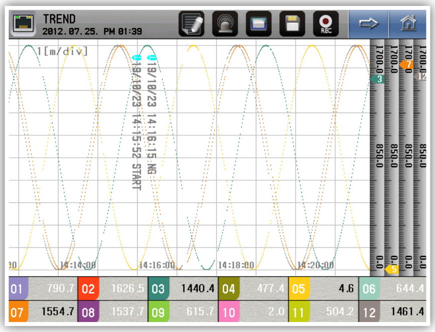
01	-192.4	02	421.8	03	1250.7	04	1203.5	05	342.4	06	-199.5
07	290.9	08	1168.4	09	1278.1	10	475.7	11	-182.9	12	169.0

Fig. 22) Trend screen - Screen during the reservation


TREND
2012. 07. 25. PM 01:38
1[m/div]
19/10/23 14:15:52 START
19/10/23 14:16:15 NG
14:12:00
14:14:00
14:16:00
14:18:00
14:20:00

01	1691.7	02	1249.0	03	281.2	04	61.9	05	879.6	06	1658.4
07	1373.3	08	399.6	09	18.5	10	731.7	11	1600.5	12	1481.7

Fig. 23) Trend screen - Hide the grid


TREND
2012. 07. 25. PM 01:39
1[m/div]
19/10/23 14:15:52 START
19/10/23 14:16:15 NG
14:14:00
14:16:00
14:18:00
14:20:00
1700.0
850.0
0.0

01	790.7	02	1626.5	03	1440.4	04	477.4	05	4.6	06	644.4
07	1554.7	08	1537.7	09	615.7	10	2.0	11	504.2	12	1461.4

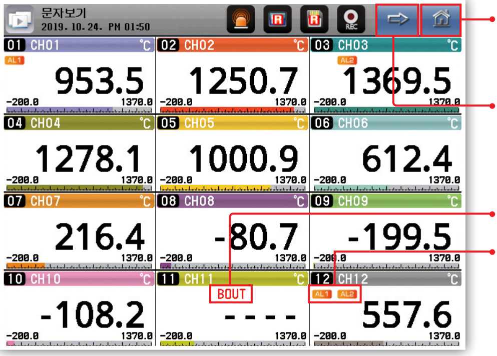
Fig. 24) Trend screen - Hide some channels

[Display the error on the trend screen]

Errors occurred	Display
I/O connection error	"I/O CONNECTION ERROR" blinks on the screen name
Input connection error	Display "----"
AD error	Display "----"
Correction error	Display "----"
Calculation error	Display "----"
User BURN OUT error	Display "----"
BURN OUT error	Display "----"
RJC error	Alternatively display "RJC" and the measured value
Out of the measurement range (-5 ~ 0 %, 100 ~ 105 %)	Alternatively display "----" and the measured value

5. Digital screen

It is the screen which displays the channel measurement with numbers.


문자보기
2019. 10. 24. PM 01:50
01 CH01 ℃ AL1 953.5 -200.0 1370.0
02 CH02 ℃ 1250.7 -200.0 1370.0
03 CH03 ℃ AL2 1369.5 -200.0 1370.0
04 CH04 ℃ 1278.1 -200.0 1370.0
05 CH05 ℃ 1000.9 -200.0 1370.0
06 CH06 ℃ 612.4 -200.0 1370.0
07 CH07 ℃ 216.4 -200.0 1370.0
08 CH08 ℃ -80.7 -200.0 1370.0
09 CH09 ℃ -199.5 -200.0 1370.0
10 CH10 ℃ -108.2 -200.0 1370.0
11 CH11 ℃ BOUT ---- -200.0 1370.0
12 CH12 ℃ AL1 AL2 557.6 -200.0 1370.0

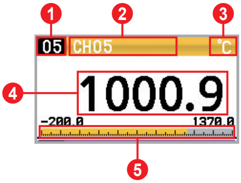
Go to the menu screen.

Go to the bar graph screen.

Display the error from the channel.

The character appears when the alarm is activated. The alarm types may be configured in "Alarm and DI ".

Fig. 25) Digital screen


①
②
③
05 CH05 ℃
④
1000.9
-200.0 1370.0
⑤

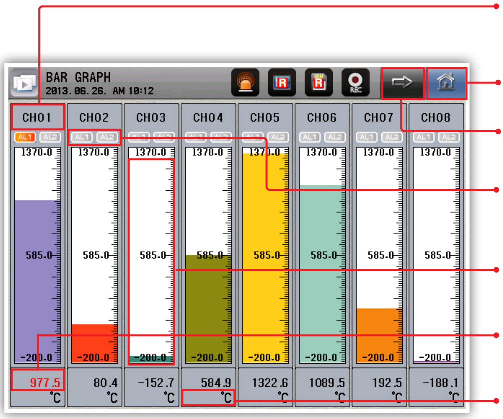
① Display the channel number.
② Display the channel name. The channel name may be edited in the "Channel configuration ".
③ Display the channel unit. The displayed unit may be configured in the "Channel configuration ".
④ Display the measured value.
⑤ Check the measurement level within the display range as the grid.

[Display the error on the digital screen]

Errors occurred	Display
I/O connection error	"I/O CONNECTION ERROR" blinks on the screen name
Input connection error	"----" displays and "CONNECT ERR" blinks
AD error	"----" displays and "ADC" blinks
Correction error	"----" displays and "CAL" blinks
Calculation error	"----" displays and "CALC" blinks
User BURN OUT error	"----" displays and "USER BOUT" blinks
BURN OUT error	"----" displays and "BOUT" blinks
RJC error	The measured value displays and "RJC" blinks
Out of the measurement range (-5 ~ 0 %, 100 ~ 105%)	Display the measured value and "OVER" blinks

6. Bar graph screen

It is the screen which displays the channel measurement with the bar. The user may check the levels of all the channels within the displayed range under current configuration at once. However, the maximum number of displayed channels is 8 and moves each channel to check the 12 channels.


BAR GRAPH
2013. 06. 26. AM 10:12
CH01
CH02
CH03
CH04
CH05
CH06
CH07
CH08
AL1
AL2
1370.0
585.0
-200.0
977.5
80.4
-152.7
584.9
1322.6
1089.5
192.5
-188.1
℃

Display the channel number of each bar graph. The user may not change the channel number.

Go to the menu screen.

Go to the trend screen.

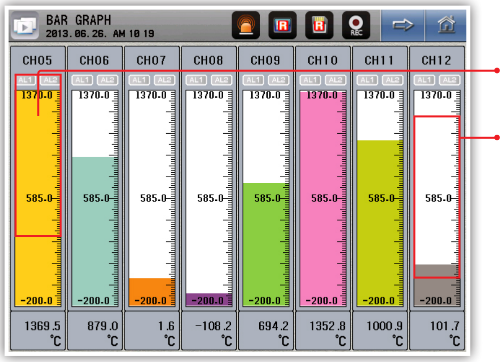
Display the alarm status and the number of each channel.

Display the measurement level of each channel with the bar graph.

Display the measurement of each channel with the number.

Display the unit configured by the user. Display U for the user unit.

Fig. 26) Bar graph screen


BAR GRAPH
2013. 06. 26. AM 10 19
CH05
CH06
CH07
CH08
CH09
CH10
CH11
CH12
AL1
AL2
1370.0
585.0
-200.0
1369.5
879.0
1.6
-108.2
694.2
1352.8
1000.9
101.7
℃

Click to move the bar to the previous channel.

Click to move the bar to the next channel.

Fig. 27) Bar movement screen

Configuration screen

1. Check the save log

It is possible to search up to 4 hours with the period of 1 second of the measurement of lapsed time on the operating screen.
Read the file to check it in the internal memory or the SD card as the graph.

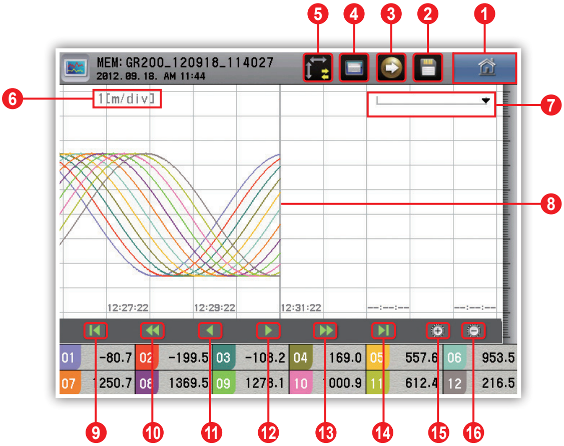

⑤
④
③
②
①
MEM: GR200_120918_114027
2012. 09. 18. AM 11:44
⑥
1[m/div]
⑦
⑧
12:27:22
12:29:22
12:31:22
--:--:--
--:--:--
01
-80.7
02
-199.5
03
04
169.0
05
557.6
06
953.5
07
1250.7
08
1369.5
09
10
11
612.4
12
216.5
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯

Fig. 28) View the history button - Time axis

① Go to the menu screen.

② Display the file recorded in the SD card. It is activated if the file is not being saved to the SD card.

③ Transfer the date recorded in the internal memory to the SD card.
It is activated if the file is not being saved to the SD card.

④ Display the file recorded in the internal memory.
It is activated if the file is not being saved to the internal memory.

⑤ Select the time and the size axes.

⑥ Display the time for each grid.

⑦ Display the data location indicated by the benchmark line.

⑧ It is the benchmark line for the channel display.

⑨ Go to the first part of the data.

⑩ Move to the previous page.

⑪ Move to the previous pixel. Move to every 10 or 20 pixels if long pressed.

⑫ Move to the next pixel. Move to every 10 or 20 pixels if long pressed.

⑬ Move to the next page.

⑭ Go to the end of data.

⑮ Magnify the time axis. It is impossible to magnify more than the saving period.

⑯ Reduce the time axis. The reduction ratios are 1, 2, 4, 8 and 16 times.

Before start
Installation
Operation
Screen block diagram
Operating screen
Configuration screen
Specifications

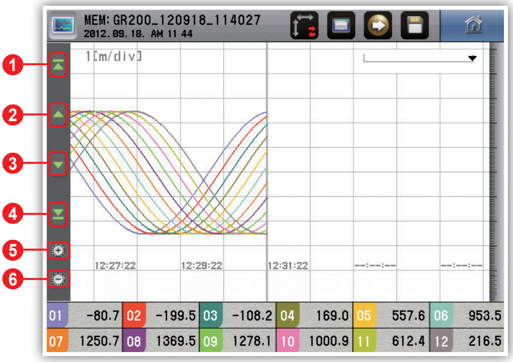
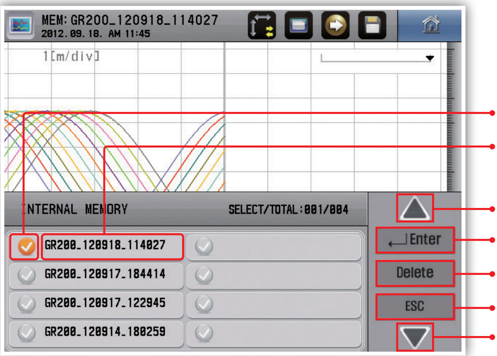

MEM: GR200_120918_114027
2012. 09. 18. AM 11 44
1[m/div]
12:27:22
12:29:22
12:31:22
--:--:--
--:--:--
01 -80.7
02 -199.5
03 -108.2
04 169.0
05 557.6
06 953.5
07 1250.7
08 1369.5
09 1278.1
10 1000.9
11 612.4
12 216.5
1
2
3
4
5
6

Fig. 29) View the history button - Size axis

❶ Go to the maximum value in the data.
❷ Move to the previous pixel. Move to every 10 or 20 pixels if long pressed.
❸ Move to the next pixel. Move to every 10 or 20 pixels if long pressed.
❹ Go to the minimum value in the data.
❺ Magnify the size axis. The magnification ratios are 1, 2, 4, 8 times.
❻ Reduce the size axis. It is impossible to reduce to less than 1.


MEM: GR200_120918_114027
2012. 09. 18. AM 11:45
1[m/div]
INTERNAL MEMORY
SELECT/TOTAL:001/004
GR200_120918_114027
GR200_120917_184414
GR200_120917_122945
GR200_120914_180259
Enter
Delete
ESC

Select the file to read.

Here is the file name to read. "It may be configured at 'Graph' in the 'Functional configuration' ".

Go to the previous page.

The graph of the selected file is displayed on the screen.

Delete the selected file.

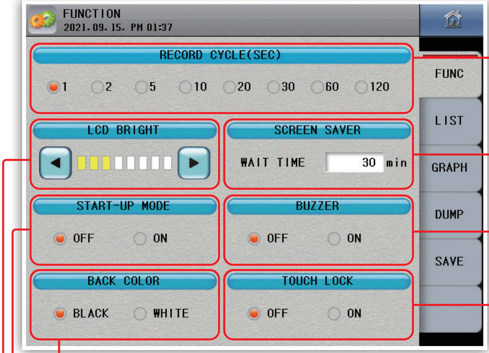
Cancel the selection.

Go to the next page.

Fig. 30) View the history display - File selection window

2. Function configuration

▶ Operating configuration



FUNCTION
2021. 09. 15. PM 01:37

RECORD CYCLE(SEC): ● 1 ○ 2 ○ 5 ○ 10 ○ 20 ○ 30 ○ 60 ○ 120

LCD BRIGHT

SCREEN SAVER: WAIT TIME 30 min

START-UP MODE: ● OFF ○ ON

BUZZER: ● OFF ○ ON

BACK COLOR: ● BLACK ○ WHITE

TOUCH LOCK: ● OFF ○ ON

FUNC
LIST
GRAPH
DUMP
SAVE

Configure the data recording period.
It may not be changed during saving.

Configure to turn off the screen after the configured time. The power-saving function does not work if the time is configured to 0.

Turn on or off buzzer sound.

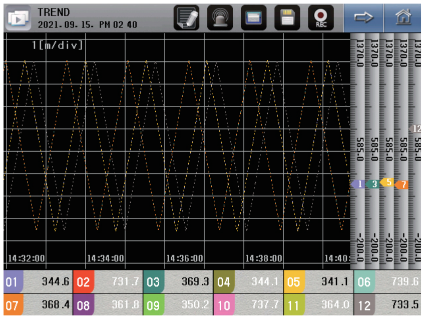
Prevent using the buttons except the trend, digital, bar graph and view history screens. (Except moving the screen)
Enter the user password to change the touch lock parameter. The user password may be changed on the system configuration.

Fig. 31) Operating configuration screen

Select the background color of the trend and the view saved history screens.

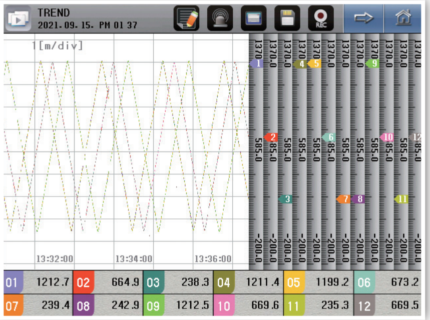
The record keeps when the power turns off and on during the record.

Adjust the background brightness.



TREND
2021. 09. 15. PM 02 40
1[m/div]
1370.0
585.0
-200.0
14:32:00
14:34:00
14:36:00
14:38:00
14:40
01 344.6
02 731.7
03 369.3
04 344.1
05 341.1
06 739.6
07 368.4
08 361.8
09 350.2
10 737.7
11 364.0
12 733.5

Fig. 32) Trend - Black background



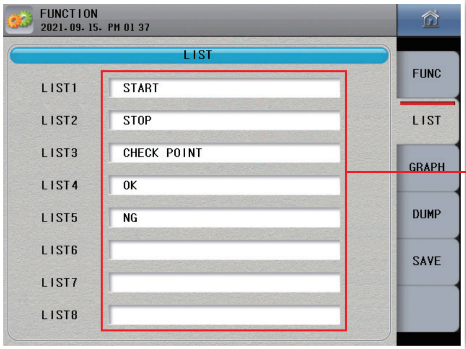
TREND
2021. 09. 15. PM 01 37
1[m/div]
1370.0
585.0
-200.0
13:32:00
13:34:00
13:36:00
01 1212.7
02 664.9
03 238.3
04 1211.4
05 1199.2
06 673.2
07 239.4
08 242.9
09 1212.5
10 669.6
11 235.3
12 669.5

Fig. 33) Trend - White background

[Operation configuration parameter]

Parameter	Initial value	Configuration range
Record interval	1	1, 2, 5, 10, 20, 30, 60, 120 seconds
Adjust the brightness	Level 3	Level 8
Power-saving	30 minutes	0 ~ 99 minutes
Restoration from the blackout	OFF	OFF, ON
Alarm	OFF	OFF, ON
Background color	Black	Black, white
Touch lock	OFF	OFF, ON

▶ LIST



FUNCTION
2021.09.15. PM 01 37

LIST

LIST1 START
LIST2 STOP
LIST3 CHECK POINT
LIST4 OK
LIST5 NG
LIST6
LIST7
LIST8

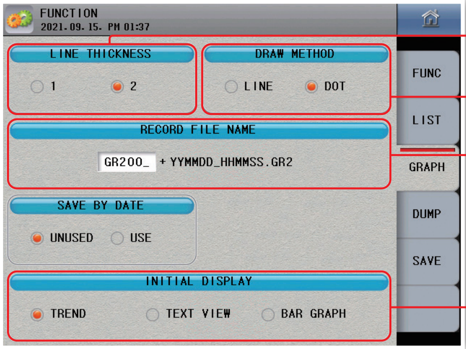
Enter the message frequently used on the trend screen.

Fig. 34) LIST screen

[LIST parameter]

Parameter	Initial value	Configuration range
LIST 1	START	Enter the text (up to 16 characters)
LIST 2	STOP	
LIST 3	CHECK POINT	
LIST 4	OK	
LIST 5	NG	
LIST 6	-	
LIST 7	-	
LIST 8	-	

▶Graph



FUNCTION
2021.09.15. PM 01:37

LINE THICKNESS ○ 1 ● 2

DRAW METHOD ○ LINE ● DOT

RECORD FILE NAME GR200_ + YYMMDD_HHMMSS.GR2

SAVE BY DATE ● UNUSED ○ USE

INITIAL DISPLAY ● TREND ○ TEXT VIEW ○ BAR GRAPH

Configure the line thickness of the graph on the display.

Configure the display method of the graph.

Configure the saved file name.

The screen is shown up firstly by selecting an operating screen which you frequently use.

Fig. 35) Graph screen

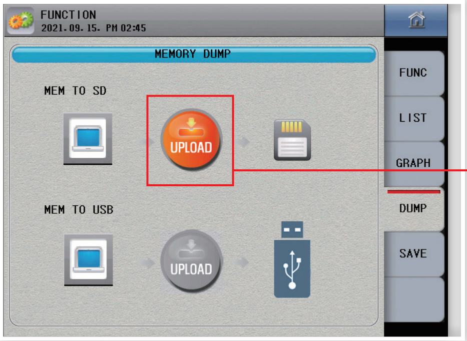
[Graph parameter]

Parameter	Initial value	Configuration range
Line thickness	2 pixel	1 pixel, 2 pixels
Draw method	Dot	Dot, line
Record file name	GR200_	Enter the text (up to 6 characters)
Initial operating screen	Trend screen	Trend screen, See text message, Bar graph

⚠ Caution

The file name goes back to "GR200_" when the leading character is missing or blank. “ / ” may not be used as the file name.

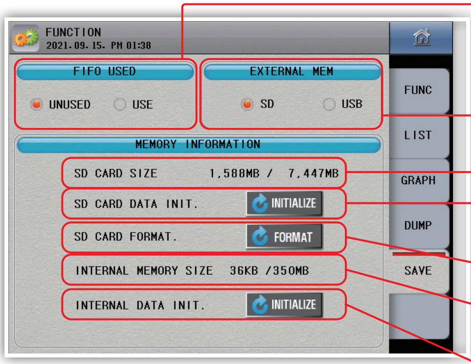
▶Dump


FUNCTION
2021. 09. 15. PM 02:45
MEMORY DUMP
MEM TO SD
UPLOAD
MEM TO USB
UPLOAD
FUNC
LIST
GRAPH
DUMP
SAVE

Press UPLOAD to copy the data stored in the internal memory to the SD card.

Fig. 36) memory dump screen

▶Save Settings


FUNCTION
2021. 09. 15. PM 01:38
FIFO USED
EXTERNAL MEM
MEMORY INFORMATION
INITIALIZE
FORMAT
INITIALIZE
FUNC
LIST
GRAPH
DUMP
SAVE

FIFO USED: ● UNUSED ○ USE

EXTERNAL MEM: ● SD ○ USB

SD CARD SIZE 1,588MB / 7,447MB

SD CARD DATA INIT.

SD CARD FORMAT.

INTERNAL MEMORY SIZE 36KB /350MB

INTERNAL DATA INIT.

If the number of files stored in the internal memory exceeds 512 or exceeds the internal memory capacity of 350M, the recording does not end automatically, and the recording continues by deleting the old data.

Select SD card or USB memory stick (optional).

SD card memory usage/total capacity.

Deletes data stored on the SD card.
(Cannot operate while saving)

Format the SD card.

internal memory
Displays usage/total capacity.

Initialize the internal memory.
(Cannot operate while saving)

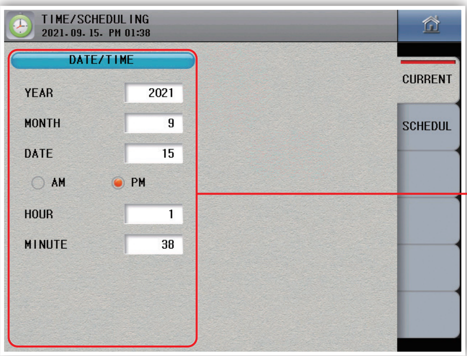
Fig. 37) Save setting screen

CAUTION

Please transfer data to SD card first as data cannot be recovered after reset.

3. Date / reservation configuration

▶ Current time



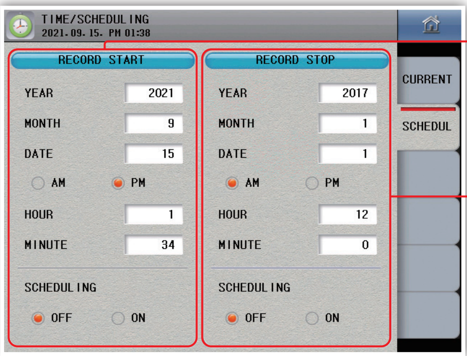
DATE/TIME

YEAR 2021
MONTH 9
DATE 15
○ AM ● PM
HOUR 1
MINUTE 38

Configure the current time.
It may not be changed during recording.

Fig. 38) Current time screen

▶ Reserved time



RECORD START

YEAR 2021
MONTH 9
DATE 15
○ AM ● PM
HOUR 1
MINUTE 34
SCHEDULING
● OFF ○ ON

RECORD STOP

YEAR 2017
MONTH 1
DATE 1
● AM ○ PM
HOUR 12
MINUTE 0
SCHEDULING
● OFF ○ ON

Reserve the time when the record starts. It is impossible to reserve the time if the starting is ahead of the current time. It is impossible to change the reserved time during the reservation.

Reserve the time when the record ends. It is impossible to reserve the time if the ending is ahead of the current time. It is impossible to change the reserved time during the reservation.

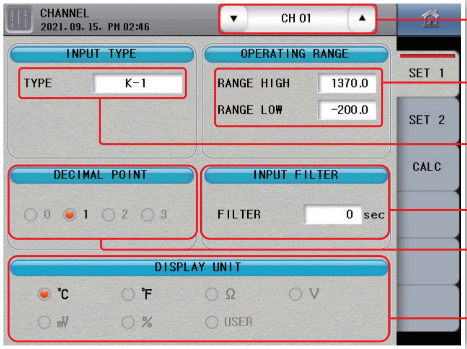
Fig. 39) Reserved time screen

[Time configuration parameter]

Parameter	Configuration range
Year	2000 ~ 2099
Month	1 ~ 12
Date	1 ~ 31
AM/PM	AM, PM
Hour	1 ~ 12
Minute	0 ~ 60
Scheduling	ON, OFF

4. Channel configuration

▶ Basic configuration


CHANNEL
▼ ▲
INPUT TYPE
OPERATING RANGE
SET 1
SET 2
CALC
DECIMAL POINT
INPUT FILTER
DISPLAY UNIT

2021. 09. 15. PM 02:46

CH 01

TYPE K-1

RANGE HIGH 1370.0

RANGE LOW -200.0

○ 0 ● 1 ○ 2 ○ 3

FILTER 0 sec

● ℃ ○ ℉ ○ Ω ○ V

○ mV ○ % ○ USER

Select the channel.

Enter the value of the range to use.
It may not be changed during recording.

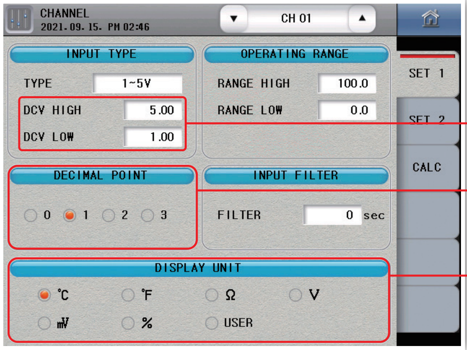
Select the sensor type.
It may not be changed during recording.

Enter the input digital filter.

The decimal point location is fixed if the sensor is the thermoresistor or the thermocouple.

Configure °C or °F.
It may not be changed during recording.

Fig. 40) Basic configuration : RTD, TC


CHANNEL
▼ ▲
INPUT TYPE
OPERATING RANGE
SET 1
SET 2
CALC
DECIMAL POINT
INPUT FILTER
DISPLAY UNIT

2021. 09. 15. PM 02:46

CH 01

TYPE 1~5V

DCV HIGH 5.00

DCV LOW 1.00

RANGE HIGH 100.0

RANGE LOW 0.0

○ 0 ● 1 ○ 2 ○ 3

FILTER 0 sec

● ℃ ○ ℉ ○ Ω ○ V

○ mV ○ % ○ USER

Configure the VDC input value if the sensor is VDC.
It may not be changed during recording.

Configure the decimal point location if the sensor is VDC. It may not be changed during recording.

Configure the display unit. (°C, °F, Ω, V, mV, %, user) Select the user to directly enter the character. It may not be changed during recording.

Fig. 41) Basic configuration : DCV

Caution

The channel configuration and the alarm configuration are initialized if the sensor type, range and display unit change for the thermoresistor and the thermocouple. Change the sensor type and the range to initialize the channel configuration and the alarm configuration for the VDC sensor.

[Basic channel configuration parameter]

(nn : Channel number)

Parameter	Initial value	Configuration range
Sensor type	K-1	Refer to the table of the ranges for sensor types
DCV input upper limit	DCV upper limit	Within the DCV sensor range
DCV input lower limit	DCV lower limit	Within the DCV sensor range
Upper limit of the use range	Use range (100 %)	Use range (0 ~ 100 %)
Lower limit of the use range	Use range (0 %)	Use range (0 ~ 100 %)
Decimal point location	1	0, 1, 2, 3
Input filter	0 second	0 ~ 120 seconds
Displayed unit	°C	°C, °F, Ω, V, mV, %, user
User	UNITnn	Enter the text (up to 6 characters)

[Range for the sensor types - RTD, TC]

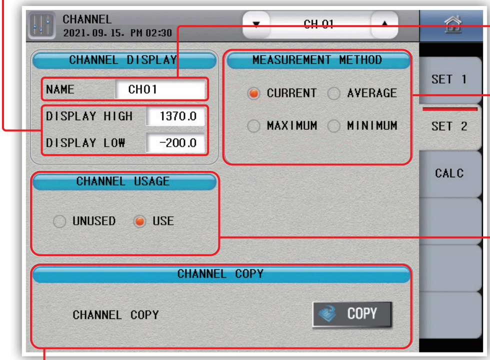
Sensor type			Use range	Decimal point range	Use range	Decimal point range
			°C		°F	
Thermoresistor (R.T.D)	Pt100	Pt - 0	-200 ~ 640	0	-300 ~ 1180	0
		Pt - 1	-200.0 ~ 640.0	1	-300.0 ~ 1180.0	1
		Pt - 2	-100.00 ~ 150.00	2	-300.0 ~ 1180.0	1
	KPt100	KPt - 0	-200 ~ 500	0	-300 ~ 1000	0
		KPt - 1	-200.0 ~ 500.0	1	-300.0 ~ 1000.0	1
		KPT - 2	-100.00 ~ 150.00	2	-300.0 ~ 1000.0	1
Thermocouple (T.C)	K	K - 0	-200 ~ 1370	0	-300 ~ 2500	0
		K - 1	-200.0 ~ 1370.0	1	-300 ~ 2500	0
	J		-200.0 ~ 1200.0	1	-300 ~ 2300	0
	E		-200.0 ~ 1000.0	1	-300 ~ 1800	0
	T		-200.0 ~ 400.0	1	-300 ~ 750	0
	R		0.0 ~ 1700.0	1	0 ~ 3100	0
	B		0.0 ~ 1800.0	1	0 ~ 3300	0
	S		0.0 ~ 1700.0	1	0 ~ 3100	0
	L		-200.0 ~ 900.0	1	-300 ~ 1300	0
	N		-200.0 ~ 1300.0	1	-300 ~ 2400	0
	U		-200.0 ~ 400.0	1	-300 ~ 750	0
	Wre 5 - 26		0.0 ~ 2300.0	1	0 ~ 4200	0
	PL-II		0.0 ~ 1390.0	1	0 ~ 2500	0

[Range for the sensor types - DCmV/DCV]

Classification	Input range	Use range	Decimal point range
DC voltage (mV d.c.)	-10 - 20 mV	Decimal point = 0 : -10000 ~ 20000 Decimal point = 1 : -1000.0 ~ 2000.0 Decimal point = 2 : -100.00 ~ 200.00 Decimal point = 3 : -10.000 ~ 20.000	0 ~ 3
	0 - 100 mV		
DC voltage (V d.c.)	1 - 5 V		
	0 - 30 V		

▶ Additional configuration

Enter the range to be displayed on the operating screen (trend, digital).



CHANNEL
2021. 09. 15. PM 02:30
CH 01

CHANNEL DISPLAY

NAME	CH01
DISPLAY HIGH	1370.0
DISPLAY LOW	-200.0

MEASUREMENT METHOD

● CURRENT ○ AVERAGE
○ MAXIMUM ○ MINIMUM

CHANNEL USAGE

○ UNUSED ● USE

CHANNEL COPY

CHANNEL COPY

Configure the channel name.
It may not be changed during recording.

Configure how to measure the data. The average, minimum and maximum calculation times of the measurement value are the same with the recording period. It may not be changed during recording.

Configure use / not use the channel. The data are not saved to the internal memory or the SD card if not used. It may not be changed during recording.

Fig. 42) Additional configuration screen

Copy the parameter currently configured to one channel and apply the parameter to another channel. The copy affects the following current channel but does not affect the previous channel. Here, the channel name is not copied. In addition, it does not work during recording.

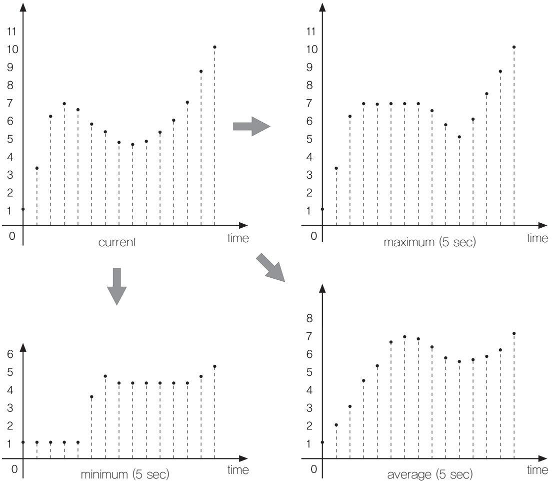


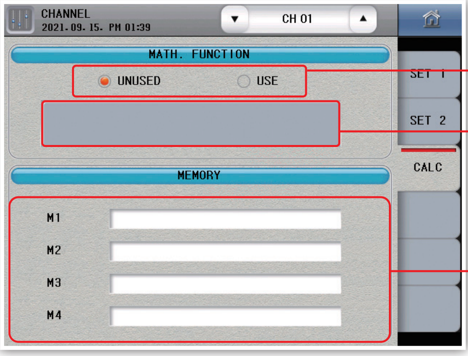
Fig. 43) Example of data collection (current, maximum, minimum, average)

[Basic channel configuration parameter]

(nn : Channel number)

Parameter	Initial value	Configuration range
Name	CHnn	Enter the text (up to 8 characters)
Display high	Use range (100 %)	Use range (0 ~ 100 %)
Display low	Use range (0 %)	Use range (0 ~ 100 %)
Measurement method	Current	Current, average, maximum, minimum
Channel usage	Use	Unused, Use
Adjust offset	Use range (0 %)	Use range (-100 ~ 100 %)

▶ Calculation function


CHANNEL
2021. 09. 15. PM 01:39
CH 01
MATH. FUNCTION
UNUSED
USE
MEMORY
M1
M2
M3
M4
SET 1
SET 2
CALC

Decide whether to use the calculation function.

It is the input window of the calculation formula. (Up to 79 characters)

It is the input window of the memory formula (up to 25 characters). 4 memory variables may be configured and are commonly used in the channels.

Fig. 44) Calculation function screen

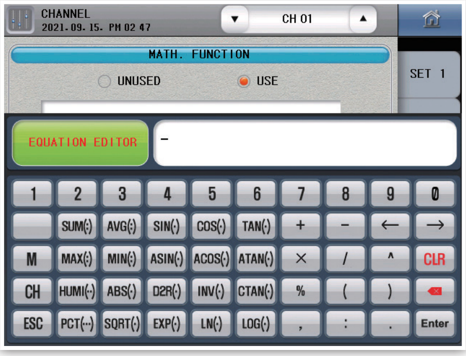

CHANNEL
2021. 09. 15. PM 02 47
CH 01
MATH. FUNCTION
UNUSED
USE
SET 1
EQUATION EDITOR
1 2 3 4 5 6 7 8 9 0
SUM(·) AVG(·) SIN(·) COS(·) TAN(·) + − ← →
M MAX(:) MIN(:) ASIN(·) ACOS(·) ATAN(·) × / ^ CLR
CH HUMI(·) ABS(·) D2R(·) INV(·) CTAN(·) % ( )
ESC PCT(···) SQRT(·) EXP(·) LN(·) LOG(·) , : . Enter

Fig. 45) Calculation input screen

[Calculation function]

Formula	Caution	Function	Description
+ - x /	(Caution 1)	4 fundamental arithmetic calculations	-
^	-	Involution	-
%	(Caution 2)	Remaining calculations	-
←	-	Move one space to the left	-
→	-	Move one space to the right	-
CLR	-	Clear all	-
BS	-	Delete the left character from the cursor	-
ENTER	-	Confirm	-
ESC	-	Cancel	-
M	-	Select the memory variable	M2
CH	-	Select the channel value	CH2
SIN (·)	-	Sine value	SIN (CH2) → The sine value of the CH2
COS (·)	-	Cosine value	COS (CH2) → The cosine value of the CH2
TAN (·)	(Caution 3)	Tangent value	TAN (CH2) → The tangent value of the CH2
MAX (:)	-	Maximum value	MAX (CH1, CH4) → Maximum value of the CH1 and the CH4 MAX (CH1 : CH4) → The maximum value between the CH1, CH2, CH3 and CH4

Formula	Caution	Function	Description
MIN (:)	-	Minimum value	MIN (CH1, CH4) → Minimum value of the CH1 and the CH4 MIN (CH1 : CH4) → The minimum value between the CH1, CH2, CH3 and CH4
ASIN (·)	(Caution 4)	Inverse value of the sine	ASIN (CH2) → The inverse sine value of the CH2
ACOS (·)	(Caution 4)	Inverse value of the cosine	ACOS (CH2) → Inverse value of the cosine CH2
ATAN (·)	-	Inverse value of the tangent	ATAN (CH2) → Inverse value of the tangent CH2
HUMI (· ·)	(Caution 5)	Conversion value of the relative humidity	HUMI (CH1, CH2) → The relative humidity with the dry bulb temperature of the CH1 and the wet bulb temperature of the CH2
ABS (·)	-	Absolute value	ABS (CH2) → The absolute value of the CH2
D2R (·)	-	Convert the degree to the radian	D2R (CH2) → Convert the CH2 to the radian
INV (·)	(Caution 6)	Inverse value	INV (CH2) → Inverse value of the CH2
CTAN (·)	(Caution 7)	Inverse value of the tangent	CTAN (CH2) → The inverse tangent value of the CH2
PCT (· · ·)	-	x / (Hi – Lo)	PCT (x, HI, Low) → x: Target value, Hi: Maximum value, Lo: Minimum value
SQRT (·)	(Caution 8)	Square root value	SQRT (CH2) → The square root of the CH2
EXP (·)	(Caution 9)	Involution of e	EXP (CH2) → The value of involution of e to the CH1
LN (·)	(Caution 10)	Natural log value	LN (CH2) → The natural value with e and the antilogarithm of the CH2
LOG (·)	(Caution 10)	Commercial log	LOG (CH2) → The natural value with e and the antilogarithm of the CH2

※ (·) : Single variable
(:) : 2 variables with the calculation of ",", ":"Calculation of continuous values
(· ·) : 2 variables with the separation of ","
(· · ·) : 3 variables with the separation of ","

(Caution 1) The calculation error occurs when divided with "0".

(Caution 2) The error occurs when the calculation is done with "0" or minus value.

(Caution 3) The error occurs when the tangent value is calculated with ±(2n-1) x (π/2).

(Caution 4) The inverse sine and cosine functions show calculation errors either below "-1" or over "1".

(Caution 5) The result is effective in 0 < wet bulb < dry bulb < 100 based on the theory of the relative humidity.

(Caution 6) The calculation error occurs if the denominator is "0".

(Caution 7) The calculation error occurs at ±n x π.

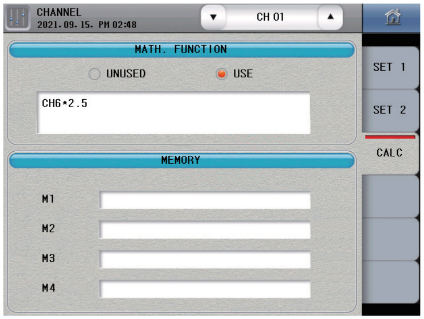
(Caution 8) The imaginary number is not supported and the calculation error occurs if the value in the root is below 0.

(Caution 9) The involution of e is limited from -9 to 9 due to the digit display.

(Caution 10) The calculation error occurs if the antilogarithm of the log is less than 0.

⚠ Caution

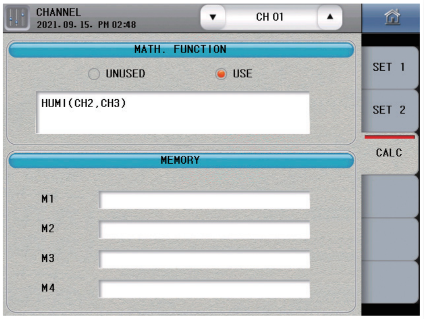
The calculation error occurs if the calculation formula referring to the channel is referred.
EX) CH1 calculation formula : SIN(CH2), CH2 calculation formula : For COS(CH1)



○ UNUSED ● USE

CH6*2.5

Fig. 46) Example of using the calculation formula 1



○ UNUSED ● USE

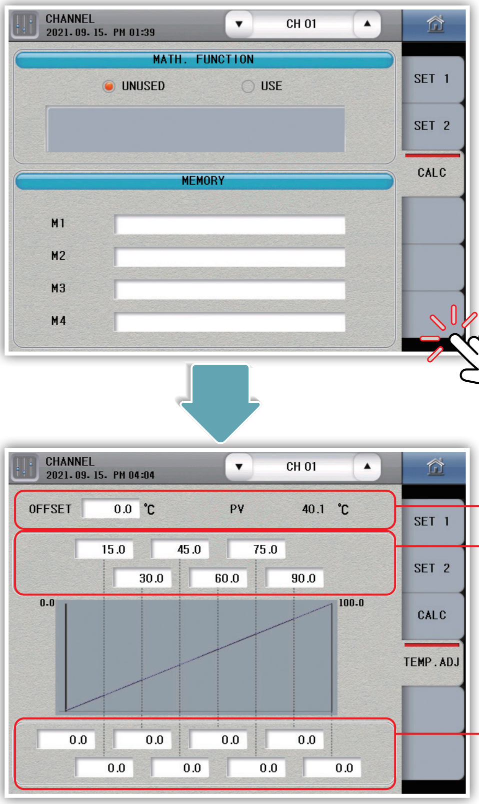
HUMI(CH2,CH3)

Fig. 47) Example of using the calculation formula 2

(Fig. 46) is the example of the configuration as an example of using the calculation formula which displays the multiplication of the CH6 with 2.5 to the channel 1.

(Fig. 47) is the example of the configuration as an example of receiving the temperature from the channel 2 and channel 3 as the dry bulb temperature and the wet bulb temperature, respectively.

▶temperature compensation


CHANNEL
CH 01
SET 1
SET 2
CALC
MATH. FUNCTION
MEMORY
M1
M2
M3
M4
TEMP.ADJ
0.0
100.0

2021.09.15. PM 01:39

● UNUSED ○ USE

2021.09.15. PM 04:04

OFFSET 0.0 ℃ PV 40.1 ℃

15.0 45.0 75.0
30.0 60.0 90.0

0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0

CAUTION

Temperature compensation can only be entered with a hidden button.
(Select the arithmetic function tab →
Touch the lower right corner of the screen)

Enter temperature compensation

Calibrates the overall input value of the channel.

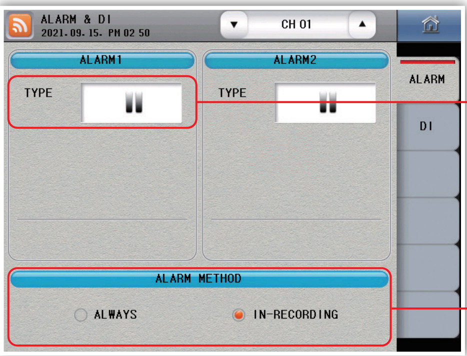
Set the boundary value (1 to 6) of partial correction.

Set the partial correction value (1~8) in the boundary value.

Fig. 48) Temperature calibration screen

5. Alarm and DI

▶ Alarm configuration


ALARM & DI
2021.09.15. PM 02 50
CH 01
ALARM1
ALARM2
TYPE
TYPE
ALARM
DI
ALARM METHOD

○ ALWAYS ● IN-RECORDING

Configure the alarm type.

Configure the operating condition of the alarm.

Fig. 49) Alarm configuration screen

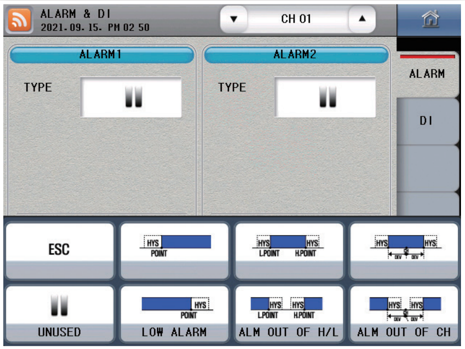
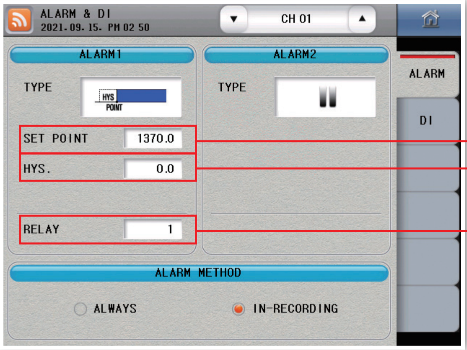

ALARM & DI
2021.09.15. PM 02 50
CH 01
ALARM1
ALARM2
TYPE
TYPE
ALARM
DI
ESC
HYS
POINT
HYS
HYS
L.POINT
H.POINT
HYS
HYS
DEV
DEV
UNUSED
HYS
POINT
LOW ALARM
HYS
HYS
L.POINT
H.POINT
ALM OUT OF H/L
HYS
HYS
DEV
DEV
ALM OUT OF CH

Fig. 50) Alarm selection screen


ALARM & DI
2021.09.15. PM 02 50
CH 01
ALARM1
ALARM2
TYPE
HYS
POINT
TYPE
ALARM
DI
ALARM METHOD

SET POINT 1370.0

HYS. 0.0

RELAY 1

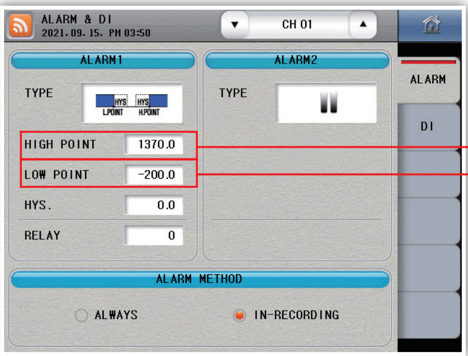
○ ALWAYS ● IN-RECORDING

Enter the alarm configuration value.

Enter the hysteresis.

Configure the relay operated under the alarm.

Fig. 51) Select the alarm 1 : Upper limit / lower limit



ALARM & DI
2021. 09. 15. PM 03:50
CH 01

ALARM1
ALARM2
ALARM
DI
HYS
HYS
L.POINT
H.POINT

ALARM1

TYPE

HIGH POINT 1370.0

LOW POINT -200.0

HYS. 0.0

RELAY 0

ALARM2

TYPE

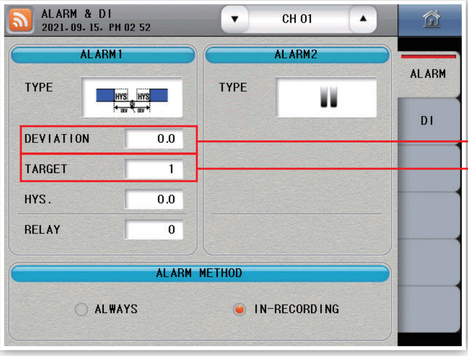
ALARM METHOD

○ ALWAYS ● IN-RECORDING

Enter the upper limit of the alarm operation.

Enter the lower limit of the alarm operation.

Fig. 52) Select the alarm 1 - Within the range / out of the range of the upper and the lower limits



ALARM & DI
2021. 09. 15. PM 02 52
CH 01

ALARM1
ALARM2
ALARM
DI
HYS
HYS

ALARM1

TYPE

DEVIATION 0.0

TARGET 1

HYS. 0.0

RELAY 0

ALARM2

TYPE

ALARM METHOD

○ ALWAYS ● IN-RECORDING

Enter the deviation with the channel for comparison.

Enter the channel for comparison.

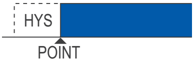
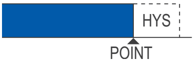
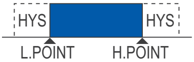
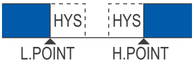
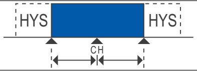
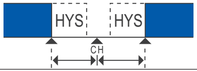
Fig. 53) Select the alarm 1 - Within / out of the range among channels

Caution

The operation point may differ from the configuration value for different sensors among the comparison channels.

※ The alarm 2 is the same with the alarm 1.

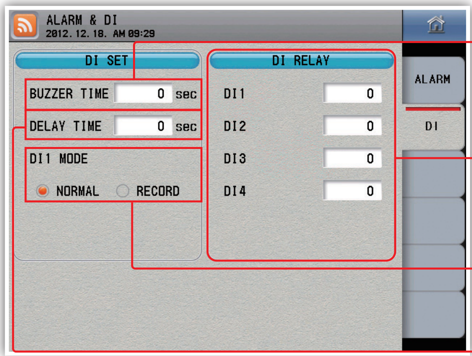
[Alarm type]

Alarm type （□ : Deviation, ▲alarm SV)	Description
	Upper limit alarm
	Lower limit alarm
 HYS HYS L.POINT H.POINT	Alarm within the upper and the lower limits
 HYS HYS L.POINT H.POINT	Alarm out of the upper and the lower limits
	Alarm within the deviation among the channels
	Alarm out of the deviation among the channels

[Alarm configuration parameter]

Parameter	Initial value	Configuration range
Alarm type	Not use	Not use, upper limit, lower limit, within the range, out of the range, within the deviation among the channels, out of the deviation among the channels
Configuration	High point : Use range (100 %), Low point : Use range (0 %)	Use range (0 ~ 100 %)
High point	Within : Use range (0 %), out of : Use range (100 %)	
Low point	Use range (0 %)	
Deviation	Use range (0 %)	
Target	Own channel	1 ~ 12
HYS	Use range (0 %)	Use range (0 ~ 100 %)
Relay	0	0 ~ 12 (depending on the specification)
Alarm method	In recording	Always, In recording

▶DI configuration



BUZZER TIME 0 sec
DELAY TIME 0 sec
DI1 MODE ● NORMAL ○ RECORD
DI1 0
DI2 0
DI3 0
DI4 0

Enter the time of keeping the alarm for the external contact input (DI).

Configure the relay operating under the external contact input (DI). The DI 1 relay is deactivated if the operation method is configured to save.

Configure the functions of the DI 1 operation. (General, save) The saving works during the DI 1 input when configured to the save.

Enter the time delay after the external contact input (DI).

Fig. 54) Di configuration screen

[DI configuration parameter]

Parameter	Initial value	Configuration range
Buzzer Time	0 second	0 ~ 9999 seconds
Delay time	0 second	
DI operation mode	Normal	Normal, Record
DI 1	0	0 ~ 12 (depending on the specification)
DI 2	0	
DI 3	0	
DI 4	0	

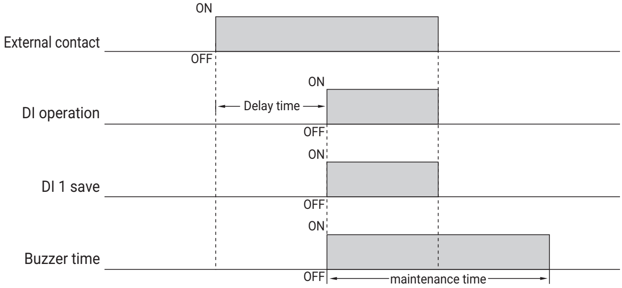
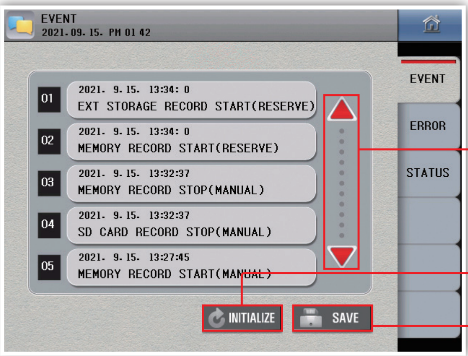


Fig. 55) Operation depending on the DI configuration

Reference
The alarm from the operation of the DI turns off regardless of the maintenance time when the screen is touched.

6. History management

▶ Event



EVENT
2021. 09. 15. PM 01 42

01 2021. 9. 15. 13:34: 0
EXT STORAGE RECORD START(RESERVE)

02 2021. 9. 15. 13:34: 0
MEMORY RECORD START(RESERVE)

03 2021. 9. 15. 13:32:37
MEMORY RECORD STOP(MANUAL)

04 2021. 9. 15. 13:32:37
SD CARD RECORD STOP(MANUAL)

05 2021. 9. 15. 13:27:45
MEMORY RECORD START(MANUAL)

Reference

The saved file name has the format of "EVT_yymmdd.TXT". The destination folder is the "GR200_EVNT" folder in the root directory of the SD card.

Check by circulating a total of 80 event histories.

Initialize the event history.
(Not work during recording)

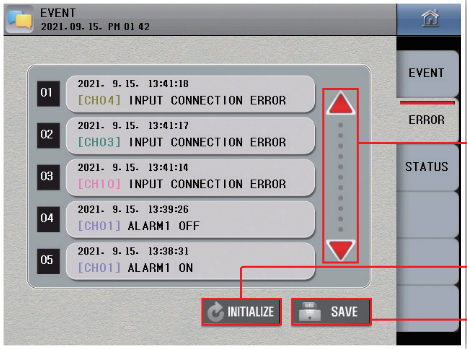
Save the event history to the SD card.
(Not work during recording)

Fig. 56) Event screen

[Event message]

Event message	Description
POWER ON	-
POWER OFF	-
SD CARD RECORD START(MANUAL)	Start saving to the SD card by touching the screen
SD CARD RECORD STOP(MANUAL)	Stop saving to the SD card by touching the screen
MEMORY RECORD START(MANUAL)	Start saving to the internal memory by touching the screen
MEMORY RECORD STOP(MANUAL)	Stop saving to the internal memory by touching the screen
SD CARD INSERT	-
SD CARD EJECT	-
SD CARD RECORD START(DI1)	Save the DI operation method and start saving to the SD card as a contact
SD CARD RECORD STOP(DI1)	Save the DI operation method and stop saving to the SD card as a contact
MEMORY RECORD START(DI1)	Save the DI operation method and start saving to the internal memory as a contact
MEMORY RECORD STOP(DI1)	Stop the DI operation method and start saving to the internal memory as a contact
SD CARD RECORD START(RESERVE)	Start the saving to the SD card with starting the reservation function
SD CARD RECORD STOP(RESERVE)	Stop the saving to the SD card with ending the reservation function
MEMORY RECORD START(RESERVE)	Start the saving to the internal memory with starting the reservation function
MEMORY RECORD STOP(RESERVE)	Stop the saving to the internal memory with ending the reservation function
SD CARD RECORD START(COMM)	Start saving to the SD card with the communication program
SD CARD RECORD STOP(COMM)	Stop saving to the SD card with the communication program
MEMORY RECORD START(COMM)	Start saving to the internal memory with the communication program
MEMORY RECORD STOP(COMM)	Stop saving to the internal memory with the communication program
SD CARD RECORD START(BOOT)	Start saving to the SD card with the blackout restoration
MEMORY RECORD START(BOOT)	Start the saving to the internal memory with the blackout restoration function
SD CARD RECORD STOP(NO MEMORY)	Terminate the saving to the SD card due to abnormal situation
SD CARD RECORD STOP(MEM_FULL)	Terminate the saving to the SD card due to insufficient capacity
MEMORY RECORD STOP(MEM_FULL)	Terminate saving to the internal memory due to excessive capacity (80MB)
SD CARD RECORD STOP(FILE_FULL)	Terminate saving to the SD card due to excessive number of files (512)
MEMORY RECORD STOP(FILE_FULL)	Terminate saving to the internal memory due to excessive number of files (512)
INTERNAL MEMORY INITIALIZE	Initialize the data files stored to the internal memory
PARAMETER INITIALIZE	Initialize the parameter configuration (including sensor type)
SD CARD PARAMETER UPLOAD	Upload the parameter to the SD card
PARAMETER INITIALIZE(SUM ERROR)	Initialize the parameter to the SUM ERROR when booted

▶ Error


EVENT
2021.09.15. PM 01 42

01 2021. 9. 15. 13:41:18
[CH04] INPUT CONNECTION ERROR

02 2021. 9. 15. 13:41:17
[CH03] INPUT CONNECTION ERROR

03 2021. 9. 15. 13:41:14
[CH10] INPUT CONNECTION ERROR

04 2021. 9. 15. 13:39:26
[CH01] ALARM1 OFF

05 2021. 9. 15. 13:38:31
[CH01] ALARM1 ON

Check by circulating a total of 40 error histories.

Initialize the error history.
(Not work during recording)

Save the error history to the SD card.
(Not work during recording)

Fig. 57) Error screen

Reference

The saved file name has the format of "ERR_yymmdd.TXT". The destination folder is the "GR200_EVNT" folder in the root directory of the SD card.

[Error message]

(nn : Channel number)

Error message	Description
[Channel nn] ALARM1 ON	-
[Channel nn] ALARM1 OFF	-
[Channel nn] ALARM2 ON	-
[Channel nn] ALARM2 OFF	-
DI1 ON	External contact input 1 (DI 1) contact ON
DI1 OFF	External contact input 1 (DI 1) contact OFF
DI2 ON	External contact input 2 (DI 2) contact ON
DI2 OFF	External contact input 2 (DI 2) contact OFF
DI3 ON	External contact input 3 (DI 3) contact ON
DI3 OFF	External contact input 3 (DI 3) contact OFF
DI4 ON	External contact input 4 (DI 4) contact ON
DI4 OFF	External contact input 4 (DI 4) contact OFF
[Channel nn] SENSOR BURNOUT	-
[Channel nn] RJC ERROR	Inferior input of the reference junction compensation (RJC) for the channel
[Channel nn] ADC ERROR	Inferior AD input of the channel
[Channel nn] CAL ERROR	The channel is not corrected
[Channel nn] INPUT CONNECTION ERROR	Not communication with the input board on the channel
I/O CONNECTION ERROR	Fail communication with the input/output board (DI/DO)

▶ Output status

It is the screen which shows the alarm status and the external contact input/output for each channel.

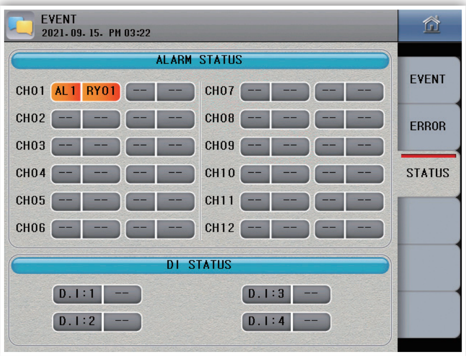

EVENT
2021. 09. 15. PM 03:22
ALARM STATUS
CH01 AL1 RY01 -- --
CH02 -- -- -- --
CH03 -- -- -- --
CH04 -- -- -- --
CH05 -- -- -- --
CH06 -- -- -- --
CH07 -- -- -- --
CH08 -- -- -- --
CH09 -- -- -- --
CH10 -- -- -- --
CH11 -- -- -- --
CH12 -- -- -- --
DI STATUS
D.I:1 --
D.I:2 --
D.I:3 --
D.I:4 --
EVENT
ERROR
STATUS

Fig. 58) Output status window

It shows the alarm status.

--	No alarm configuration
AL1 AL2	Alarm configuration + no alarm activated
AL1 AL2	Alarm configuration + alarm activated

It shows the relay status.

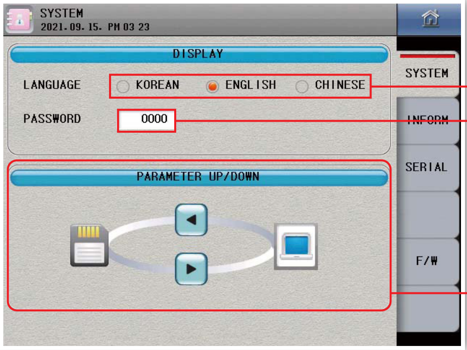
--	Not configure the relay
RY01	Configure the relay + no relay activated
RY01	Configure the relay + relay activated

It shows the status of the DI.

D. I: 1	No DI
D. I: 1	With DI

7. System configuration

▶ System


SYSTEM
2021. 09. 15. PM 03 23
DISPLAY
PARAMETER UP/DOWN
SYSTEM
INFORM
SERIAL
F/W

LANGUAGE ○ KOREAN ● ENGLISH ○ CHINESE

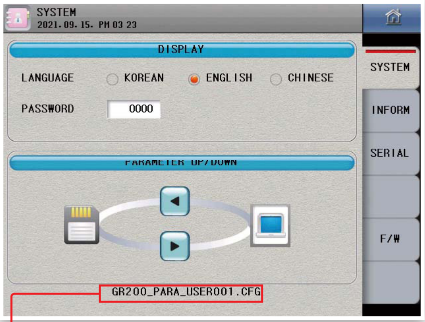
PASSWORD 0000

- Select the language (Korean / English / Chinese).
- Configure the user password to check the password to change the touch lock function or to enter the system configuration window. (However, the system does not check the password to enter the system configuration window if the user password is "0".)
- Upload the user logo using the SD card. (Not work during recording)

Fig. 59) System window

[System parameter]

Parameter	Initial value	Configuration range
Language	English	Korean, English, Chinese (simplified/traditional)
Password	0000	0 ~ 9999

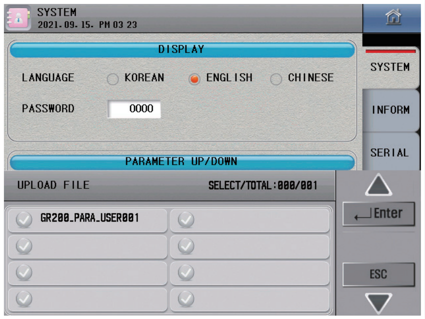

SYSTEM
2021. 09. 15. PM 03 23
DISPLAY
PARAMETER UP/DOWN
SYSTEM
INFORM
SERIAL
F/W

LANGUAGE ○ KOREAN ● ENGLISH ○ CHINESE

PASSWORD 0000

GR200_PARA_USER001.CFG

Fig. 60) Parameter download window


SYSTEM
2021. 09. 15. PM 03 23
DISPLAY
PARAMETER UP/DOWN
SYSTEM
INFORM
SERIAL
Enter
ESC

LANGUAGE ○ KOREAN ● ENGLISH ○ CHINESE

PASSWORD 0000

UPLOAD FILE SELECT/TOTAL:000/001

GR200_PARA_USER001

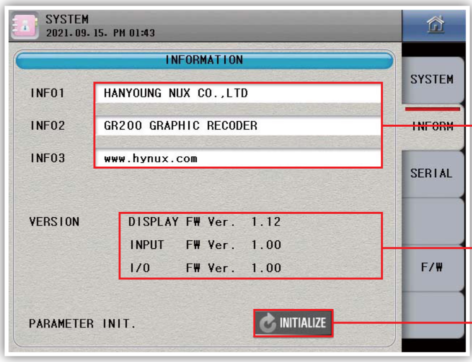
Fig. 61) Parameter upload window

- Display the parameter file name created when the parameter is downloaded.

Reference

The name of the file to be saved is saved in the format “GR200_PARAMETER00.CFG”. If there is a file in the folder, the file number increases as GR200_PARAMETER01.CFG, GR200_PARAMETER02.CFG, and the file is created. The saved folder is the "GR200/CNFG" folder in the root directory of the SD card.

▶ Product specification



SYSTEM
2021.09.15. PM 01:43

INFO1 HANYOUNG NUX CO.,LTD
INFO2 GR200 GRAPHIC RECODER
INFO3 www.hynux.com

VERSION
DISPLAY FW Ver. 1.12
INPUT FW Ver. 1.00
I/O FW Ver. 1.00

PARAMETER INIT. INITIALIZE

Enter the information displayed for the booting.

Display the product version information.

⚠ Caution

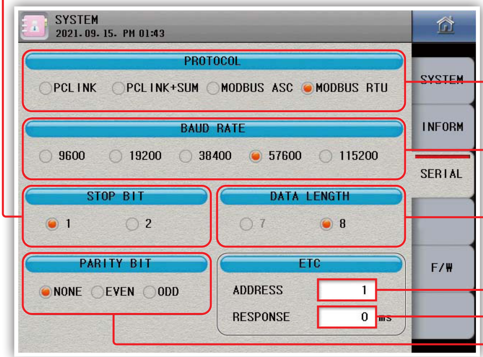
Initialize the parameters. Events or error history is not initialized.
(Not work during recording)

Fig. 62) Product specification screen

[Product specification parameter]

Parameter	Initial value	Configuration range
Info 1	HANYOUNG NUX CO.,LTD.	Enter the text (up to 30 characters)
Info 2	GR200 GRAPHIC RECODER	Enter the text (up to 30 characters)
Info 3	www.hanyoungnux.com	Enter the text (up to 30 characters)

▶Communication configuration



SYSTEM
2021.09.15. PM 01:43

PROTOCOL
○ PCLINK ○ PCLINK+SUM ○ MODBUS ASC ● MODBUS RTU

BAUD RATE
○ 9600 ○ 19200 ○ 38400 ● 57600 ○ 115200

STOP BIT
● 1 ○ 2

DATA LENGTH
○ 7 ● 8

PARITY BIT
● NONE ○ EVEN ○ ODD

ETC
ADDRESS 1
RESPONSE 0 ms

Select the stop bit.

Select the communication protocol.

Select the communication speed.

Select the data length.

Enter the device number.

Enter the response time.

Select the parity bit.

Fig. 63) Communication configuration window

[Communication configuration parameter]

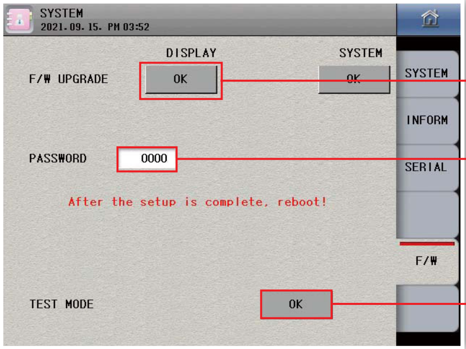
Parameter	Initial value	Configuration range
Protocol	MODBUS ASC	PCLINK, PCLINK+SUM, MODBUS ASC, MODBUS RTU
Baud rate	115200	9600, 19200, 38400, 57600, 115200
Stop bit	1	1, 2
Data length	7	7, 8
Parity bit	NONE	NONE, EVEN, ODD
Address	1	1 ~ 99 (However, up to 32 including the master)
Response	0 ms	0 ~ 100 ms

▶Firmware upgrade

It is the screen to enter the firmware upgrade and the test mode. It is impossible to enter the screen during the operation. It is required to enter the password to enter the screen. (Initial password : 0)

Caution

- The user may not exit the screen if the user enters the screen. Please reboot the system.
- Firmware upgrade requires the user's attention, so be sure to set a password before use. The initial value is "0". Please download the upgrade file from the website of "HANYOUNG NUX". Do not change the file name and take care to move the file to the GR200_FWUP directory, the root directory of the SD file. The parameters are initialized after the firmware upgrade.


SYSTEM
2021.09.15. PM 03:52
DISPLAY
SYSTEM
F/W UPGRADE
OK
OK
SYSTEM
INFORM
SERIAL
F/W
TEST MODE
OK

PASSWORD 0000

After the setup is complete, reboot!

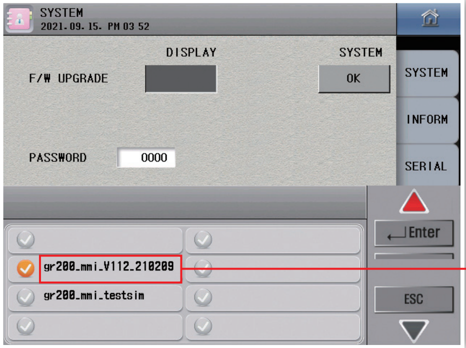
Enter the firmware upgrade window.

Configure the password to enter the F/W window.

Caution

The test mode is one for the calibration test before release.

Fig. 67) F/W screen


SYSTEM
2021.09.15. PM 03 52
DISPLAY
SYSTEM
F/W UPGRADE
OK
SYSTEM
INFORM
SERIAL
Enter
ESC

PASSWORD 0000

gr200_mmi_V112_210209

gr200_mmi_testsim

Display the upgrade file name.

Fig. 68) Input screen for the firmware upgrade

Specifications

1. Input specification

[Range configuration for the input types]

Input type			Measurement range (°C)	Measurement range (°F)	Degree
Thermoresistor (RTD)	Pt100 Ω	Pt-0	-200 ~ 640	-300 ~ 1180	±0.15 % of F.S ±1digit
		Pt-1	-200.0 ~ 640.0	-300.0 ~ 1180.0	
		Pt-2	-100.00 ~ 150.00	-300.0 ~ 1180.0	
	KPt100 Ω	KPt-0	-200 ~ 500	-300 ~ 1000	
		KPt-1	-200.0 ~ 500.0	-300.0 ~ 1000.0	
		KPt-2	-100.00 ~ 150.00	-300.0 ~ 1000.0	
Thermocouple (TC)	K	K-0	-200 ~ 1370	-300 ~ 2500	±0.15% of F.S ± 1digit
		K-1	-200.0 ~ 1370.0	-300 ~ 2500	±0.15% of F.S ± 1digit(*2)
	J		-200.0 ~ 1200.0	-300 ~ 2300	±0.15% of F.S ± 1digit(*2)
	E		-200.0 ~ 1000.0	-300 ~ 1800	±0.15% of F.S ± 1digit(*2)
	T		-200.0 ~ 400.0	-300 ~ 750	±0.15% of F.S ± 1digit(*3)
	R		0.0 ~ 1700.0	-0 ~ 3100	±0.15% of F.S ± 1digit(*4)
	B		0.0 ~ 1800.0	-0 ~ 3300	±0.15% of F.S ± 1digit(*1)
	S		0.0 ~ 1700.0	-0 ~ 3100	±0.15% of F.S ± 1digit(*4)
	L		-200.0 ~ 900.0	-300 ~ 1300	±0.15% of F.S ± 1digit(*2)
	N		-200.0 ~ 1300.0	-300 ~ 2400	±0.15% of F.S ± 1digit(*3)
	U		-200.0 ~ 400.0	-300 ~ 750	±0.15% of F.S ± 1digit(*3)
	Wre 5-26		0.0 ~ 2300.0	-0 ~ 4200	±0.15% of F.S ± 1digit(*4)
	PL-Ⅱ		0.0 ~ 1390.0	-0 ~ 2500	±0.15% of F.S ± 1digit
VDC	-10 - 20 ㎷		-10.00 ~ 20.00		±0.15 % of F.S ±1digit ※ The current input (4 - 20 ㎃ DC) is available when you use resistance 250 Ω (0.5 W / 0.1 %) on input terminals.
	0 - 100 ㎷		0.00 ~ 100.00		
	1 - 5 V		1.00 ~ 5.00		
	0 - 30 V		0.00 ~ 30.00		

(*1) 0 ~ 400°C : ±5% of F.S ± 1digit
(*2) -200 ~ -150°C : ±0.2% of F.S ± 1digit
(*3) -200 ~ -150°C : ±0.4% of F.S ± 1digit
-150 ~ -100°C : ±0.2% of F.S ± 1digit
(*4) 0 ~ 200°C : ±0.2% of F.S ± 1digit

[Specification for the input]

VDC	Thermocouple (TC)	K, J, E, T, R, S, B, N	IEC 584
		PL-Ⅱ, Wre 5-26	ASTM E988
		U, L	DIN 43710, IEC 751
	Thermoresistor (RTD)	Pt100 Ω	DIN IEC 751
		KPt100 Ω	JIS C1604-1989 (OLD)

2. Hardware specification

▶ Power input

Power voltage	100 – 240 V a.c. Voltage fluctuation rate ±10 %
Power frequency	50 – 60 Hz
Power consumption	25 VA max
Maximum internal fuse ratings	250 V a.c.
Internal voltage	Primary terminal* and secondary terminal** : Minimum 1500 V a.c. for 1 minute Primary terminal* and FG terminal : Minimum 1500 V a.c. for 1 minute Secondary terminal** and FG terminal : Minimum 1500 V a.c. for 1 minute Secondary terminal** and secondary terminal** : Minimum 500 V a.c. for 1 minute * Primary terminal : Power terminal (except the FG terminal) and the relay output terminal ** Secondary terminal : Sensor input terminal, contact input terminal, communication terminal
Insulation resistor	20 MΩ between the power terminal and the FG terminal or 500 V d.c.

▶ Sensor input

Number of channels	2, 4, 8, 12 (Refer to the type configuration)
Input type	2 thermoresistors (Pt-100, KPt-100) 12 thermocouples (K, J, E, T, R, B, S, L, N, U, Wre 5-26, PL-II) DC voltage 4 types (-10 - 20 mV, 0 - 100 mV, 1 - 5V, 0 - 30 V) ※ The current input (4 - 20 mA d.c.) is available when you use resistance 250 Ω (0.5 W / 0.1 %) on input terminals.
Sampling cycle	250 ms
Current to measure the thermoresistor (RTD)	About 0.21 mA
Input resistor	Thermocouple : More than 1 MΩ, VDC : More than 1 MΩ
Allowable wiring resistor	Thermoresistor : Maximum 100 Ω/wire (The RTD is up to 10 Ω/wire for the range of -100.00 - .150.00) Thermocouple : Less than 200 Ω VDC : Less than 2 kΩ
Impact of the wiring resistor	Thermoresistor : ±0.3 °C/10 Ω (The 3 lines have the same wiring resistors)
Allowable input voltage	Thermocouple : Less than ±10 V d.c., VDC : Less than ±33 V d.c.
Accuracy	±0.15 % of F.S, ±1 digit (Except the RJC temperature error) ※ Refer to the input table
RJC temperature error	±1.5 °C (0 ~ 50 °C)
Sensor short detection (Burn-out)	UP-Scale during disconnection

▶ Contact input

Maximum input	4
Input method	No voltage contact input
On/Off detection resistor	Consider on less than 1 kΩ minimum and off larger than 10 kΩ
Minimum detection time	0.25 second

▶ Alarm output

Maximum number of outputs	12
Output type	Relay output
Maximum ratings	5 A 250 V a.c., 5 A 30 V d.c.
Recommended ratings	2 A 250 V a.c., 2 A 30 V d.c.
Relay life	50,000 times at the maximum ratings, 100,000 times at the recommended ratings

Reference

- The sensor input terminal is insulated among the input channels. It is insulated with the relay output terminal, the contact input terminal and the communication terminal.
- The relay output terminal is not insulated among the output terminals. It is insulated with the contact input terminal and the communication terminal.
- The contact input terminal is not insulated among the input terminals. In addition, it is not insulated with the communication terminal.
- The power terminal is insulated with other input and output terminals and the internal circuit.
- The FG terminal is insulated with other input and output terminals and the internal circuit.

3. Display specification

Display	TFT color LCD (115.2 × 86.4 ㎜, resolution : 640 × 480 pixel, LED Backlight)
Backlight life	40,000 hours
Language in use	Korean, English, Chinese (simplified/traditional)

4. Communication Specifications

RS-422/485 communication	communication speed: 9600 bps ~ 115200 bps
	protocol: PCLINK, PCLINK+SUM, MODBUS ASCII, MODBUS RTU

5. Memory specification

Save function	Internal	Non-Volatile Memory: 350 MB - 64 days of storage per second cycle (using 5.4 MB per day)
	External	SD card: 8GB - Saves up to 512 files
Save period		User configuration (1, 2, 5, 10, 20, 30, 60, 120 seconds)
Memory information		Measurement from each channel, Burn-out, DI (contact input), ALARM, relay output status

6. Installation environment

▶ Use environment

Ambient temperature	0 ~ 50 °C
Temperature change	10 °C/h or below
Ambient humidity	20 ~ 90 % RH (no condensation)
Magnetic field	400 A/m or less
Altitude	Less than 2,000 m above the sea level
Weight	About 1.32 kg

▶ Storage environment

Ambient temperature	-20 ~ 70 °C
Temperature change	Less than 20 °C/h
Ambient humidity	5 - 95 % RH (no condensation)

▶ Impact from the ambient temperature

VDC, thermocouple sensor	±0.003 % of F.S / °C
Thermoresistor sensor	±0.03 °C/°C

GR200
Graphic Recorder

GR200
Graphic Recorder

MA0506E220315

GR200A
Graphic Recorder

www.hanyoungnux.com
HANYOUNG NUX

HANYOUNG NUX CO., LTD.
28, Gilpa-ro 71beon-gil, Michuhol-gu, Incheon, Korea
Tel : +82-32-876-4697 E-mail : ovterseas@hynux.com