Magnescale

Display Unit
LT80-NE

Read all the instructions in the manual carefully before use and strictly follow them.
Keep the manual for future references.
This manual corresponds to the special software Ver 1.02.00.

Operating Manual

Contents

1. Overview

The LT80-NE is a display unit that displays measurement data and makes various function settings for an interface unit consisting of Main Modules MG80-MA, Counter Modules MG80-CM, and I/O Modules LZ80-K.

2. Unit Configuration
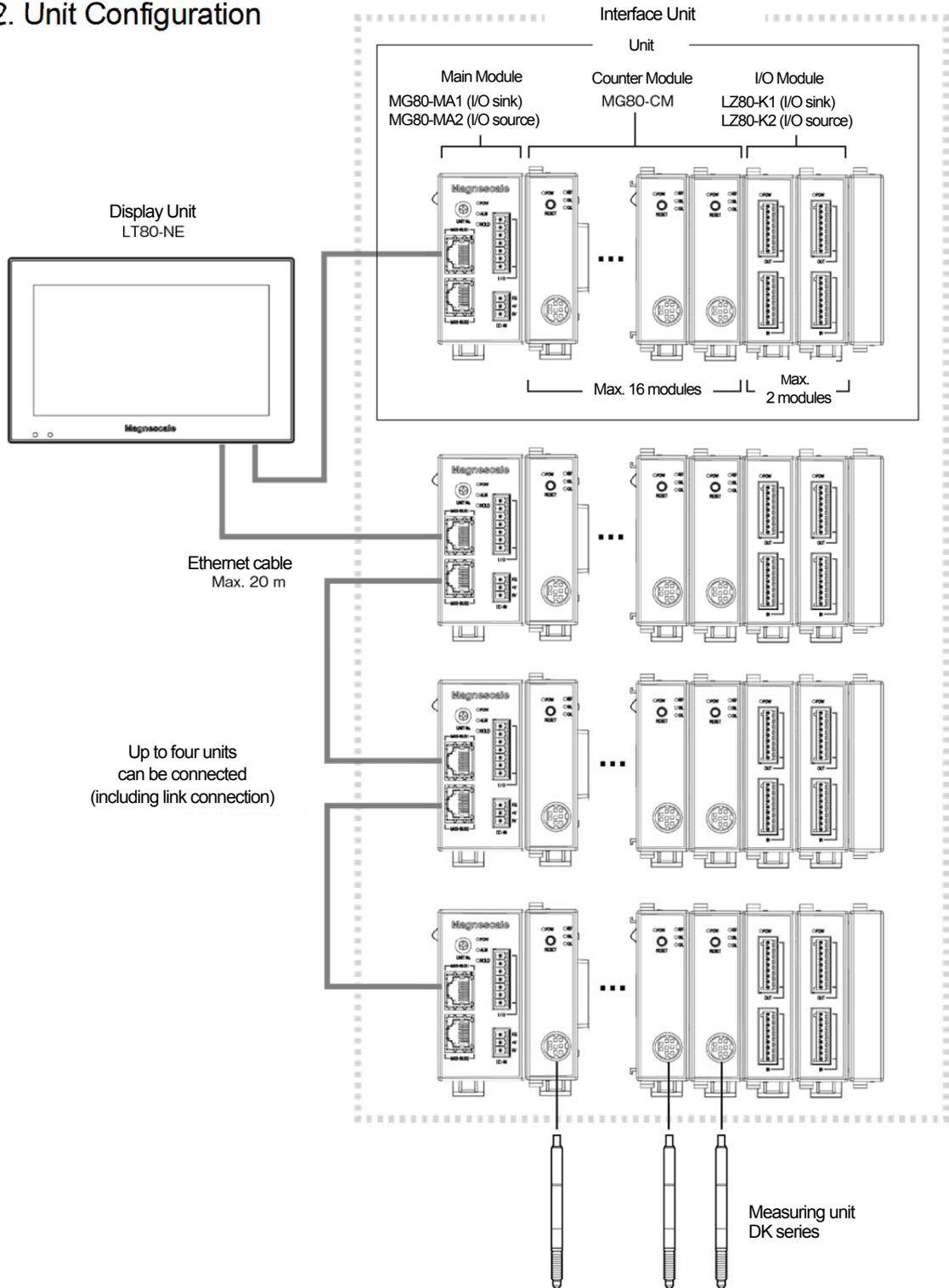
3. Features of this System

• View frame

View frame refers to a measurement value or calculation value frame displayed on the screen.

Up to 16 view frames can be set for one main module.

The current value, MAX, MIN, P-P, and measuring unit addition/subtraction result can be optionally set in each view frame.

Comparator values and measurement mode can also be set for each view frame.

• I/O

I/O modules can be used to switch the measuring mode and the comparator set and to perform comparator output for each view frame.

The function of each I/O terminal can be assigned by operating the display unit.

• Save data

When the Display button of the display unit is pressed or a trigger signal is input, the measurement values at that time are saved in the display unit.

This data can be transferred to a SD memory card or USB memory or obtained via Ethernet.

In addition, setup parameters can be saved to a SD memory card or USB memory, and saved settings can be applied to operation.

4. Main Functions of the LT80-NE

Measurement data display: Up to 16 value can be displayed per unit (When there are more than 16 value, the value is displayed on multiple pages.)

Operations: Reset, preset, measuring mode switching, comparator set switching, reference point setting, start function, pause function, data save trigger

I/O terminal I/O status display: Status of each LT80-NE and LZ80-K terminal block

Number of view frames setting: 2, 4, 8, 16

Measuring unit settings: Input resolution, count direction, reference point used/not used

View frame settings: Measuring unit assignment, preset value, calculation, measuring mode (initial status)

Measuring mode switching: Current value, MAX, MIN, P-P

Comparator value settings: Up to eight sets of four levels each can be set for one view frame.

I/O terminal function assignment: LT80-NE, LZ80-K

Save measurement data: SD memory card, USB memory

Save setup parameters: SD memory card, USB memory

Others: Display language switching, setup parameters export, software update

5. Screen Configuration

Startup screen

Measuring screen

I/O display screen

Main menu

Measuring menu

Measuring unit settings

Data menu

Reference point settings

System settings menu

System clock setting

View frame settings

Display unit information

Software update

Comparator settings

Display settings

Language setting

Module I/O settings

Display I/O settings
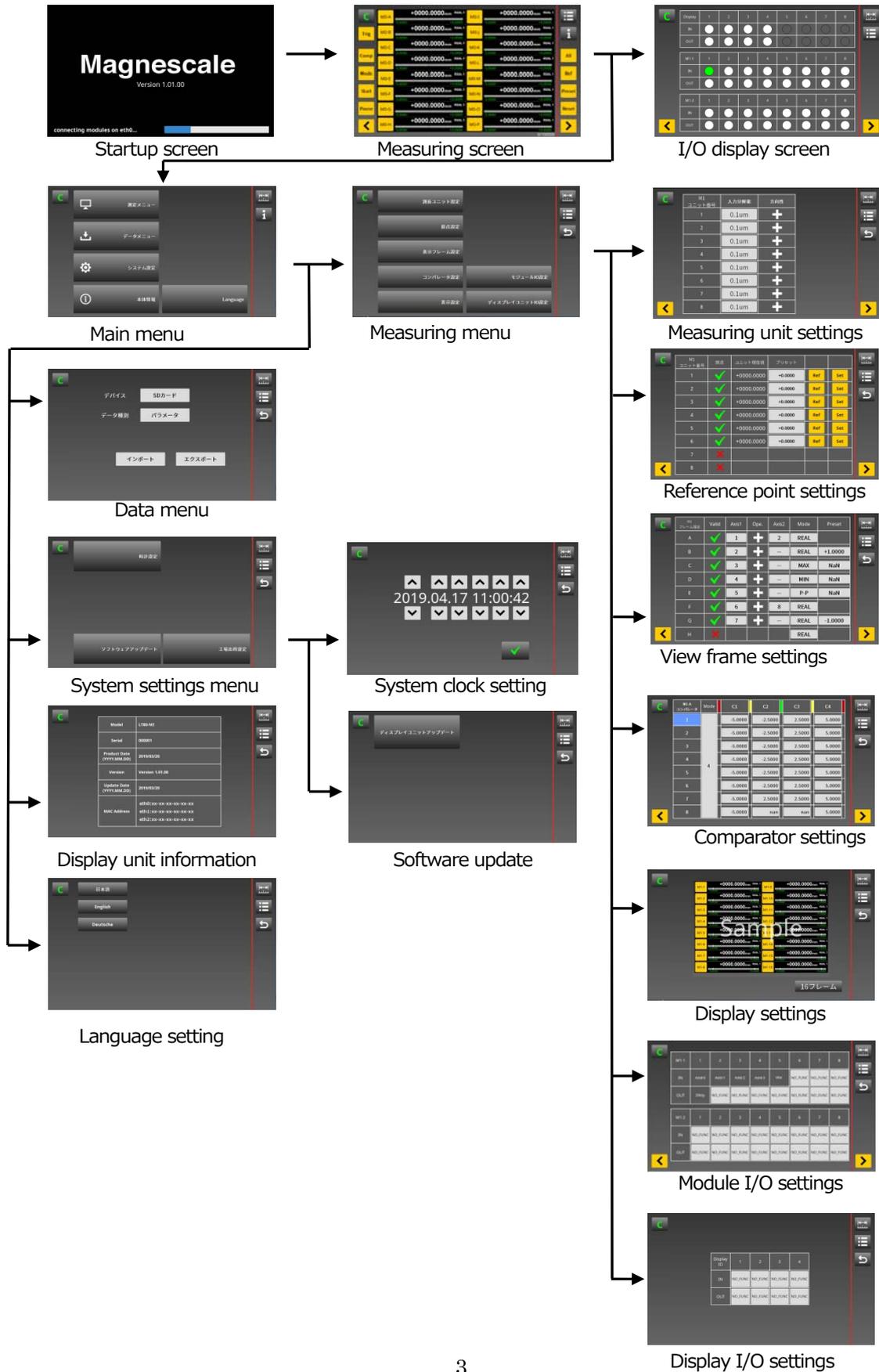
6. System Startup and Checking the Unit Configuration

6-1. Screens during startup

Connect all the units and modules, and supply power to the main modules and the display unit. After the display unit starts up, it checks all the connected units and modules, and then switches to the measuring screen. The startup time from power-on until the measuring screen appears is approximately 50 seconds.

Startup screen
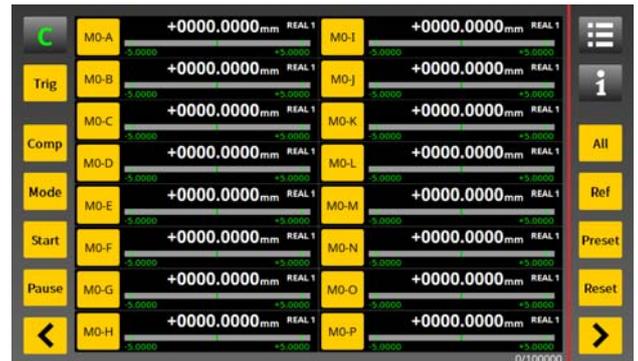
Measuring screen

* If the display does not switch to the measuring screen, communication between the main modules and the display unit is not being performed properly. Check the power supply and the connection status.

6-2. Checking the system configuration

The measuring screen is set to a 16-frame display when shipped from the factory.
Check that all the connected measuring units are displayed.
When the system configuration includes multiple units, switch the measuring screen page and check the display.

Previous page   Next page

6-3. Language setting

Select the language to be displayed in the menus.
Factory setting: 日本語 (Japanese)
Main menu → Language
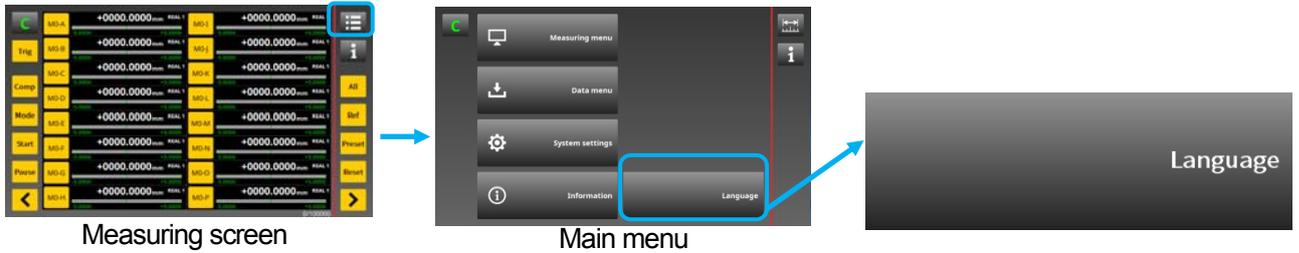
Measuring screen

Main menu

Language selection

• Select the language and follow the instructions in the pop-up message.

* After changing the language setting, it is necessary to reboot the power of the display unit and main module.

7. Setting Procedure

Follow the procedure below and make the system settings.
Main menu → Measuring menu →
Measuring unit settings → Reference point settings → View frame settings → Comparator setting → Display settings → Module I/O settings → Display unit I/O settings

| Measuring screen | Main menu | Measuring menu |
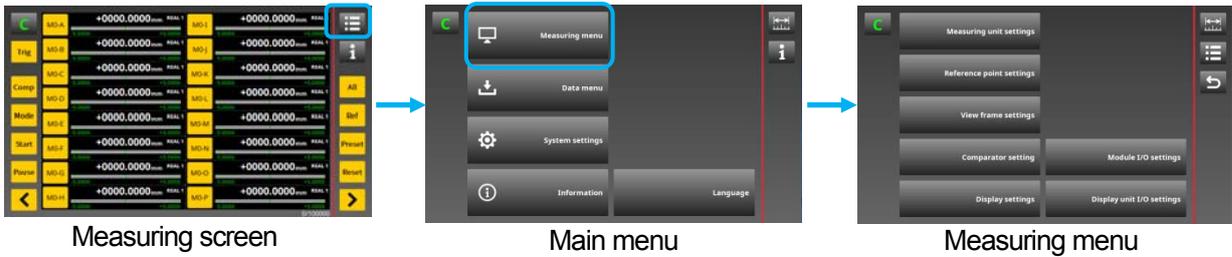
* A pop-up message such as the following is displayed each time when switching to a different screen after settings have been changed within a menu.
Select "✓" to apply the changes.

 = Save the changes in the display unit. (Overwrite the changes and save.)

 = Do not save the changes. (Use the settings prior to the changes.)

Do you want to save the changed parameters?

Parameter saving is complete.

Do you want to restore the saved parameters?
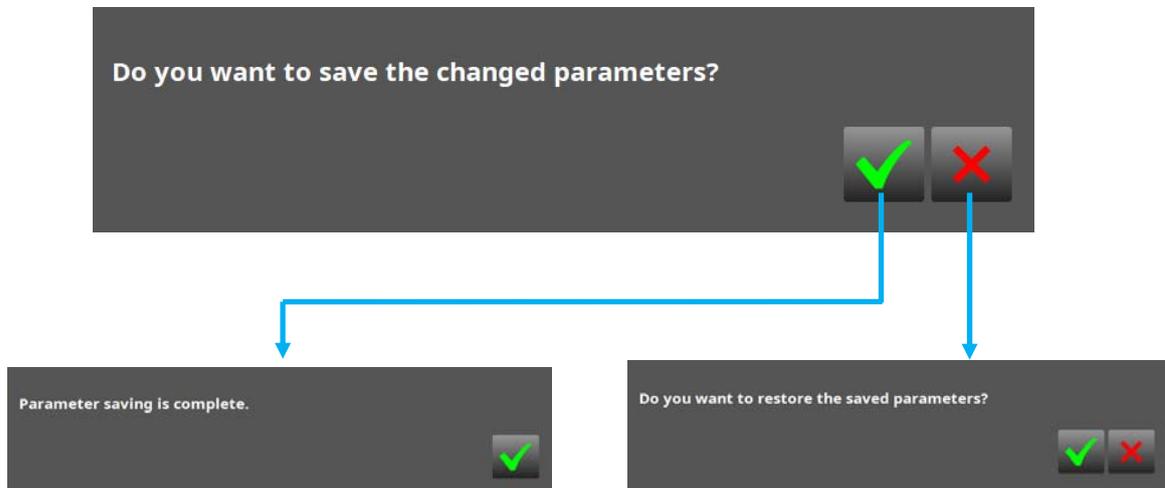
7-1. Measuring unit settings
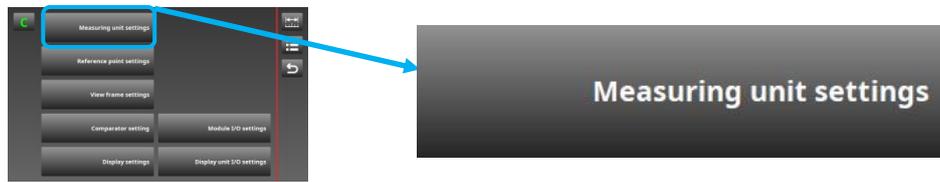
This is used to set the input resolution of the measuring units connected to the counter modules.
Set in accordance with the output resolution of the connected measuring units.
This item is the setting for each module.
Setting contents: Input resolution, count direction
Factory settings: Input resolution 0.1 μm, count direction "+"

Touch an item to select that column and make the same setting for all measuring units.

Module ID

Measuring unit number

Touch inside the frame to cycle through the available selections.
$0.1 \rightarrow 0.5 \rightarrow 1.0$
$2.0 \rightarrow 5.0 \rightarrow 10.0$

Touch inside the frame to set + or -.
When a DK series unit is connected, the + setting corresponds to plus count (count up) when the spindle is pushed in.

When there are more than 9 or more measuring units, switch the page and make the settings.

ID (set by a rotary switch)
M1 = Main module ID

M1   1   2 3 4
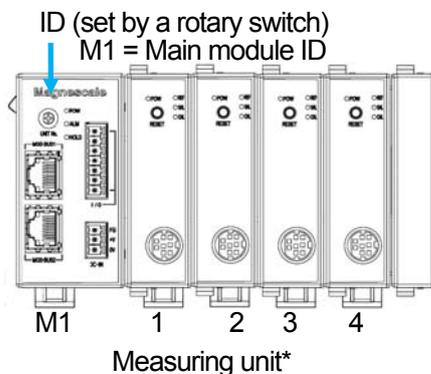
Measuring unit*

  * Measuring unit numbers are automatically assigned in order from the unit closest to the main module.

7-2. Reference point settings
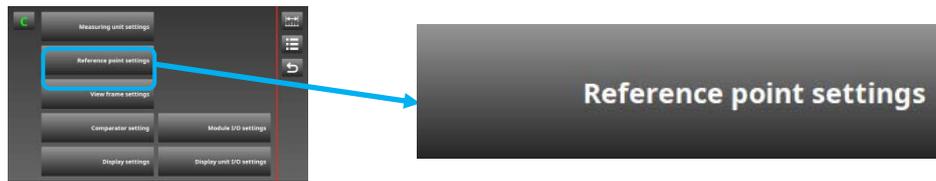
This is used to set the reference points of the measuring units connected to the counter modules.

This item is the settings for each module.

Setting contents: Reference point used/not used, reference point preset value setting, get reference point operation

Factory setting: Reference point not used

Module ID

Current position value

Get reference point button

Set reference point offset button

Measuring unit number

Reference point used/not used setting

Touch inside the frame and use the numerical keypad to enter the preset value. (unit: mm)

When there are more than 9 or more measuring units, switch the page and make the settings.

ID (set by a rotary switch)
M1 = Main module ID

M1   1   2   3   4

BS

Cancel

Enter

* Reference point settings cannot be made for measuring units without reference points, so set "×" in the Reference point check box of those units.

• Reference point setting method

When using a reference point, the Reference point settings menu must be used to save the reference point offset value in the display unit beforehand.
Perform the operations to get the reference point offset values in this menu.
Refer to 8-6 "Reference point usage method" for how to use reference points.

① Set "✓" in the Reference point check box of the unit number that will use the reference point.
(Measuring units with "✓" set enter the standby status for reference point passage after power-on or when the reload reference point operation is performed on the measuring screen.)

② Click the Get reference point button to set the standby status for reference point passage. (The current position display blinks.)

③ Move the spindle of the measuring unit by 1 mm or more so that it passes the reference point. (After passing the reference point, the current position display stops blinking and lights up, and the REF lamp of the counter module lights up.)

1 mm or more
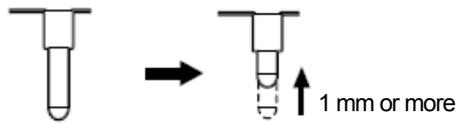
④ Align the measuring unit with the master measuring object.
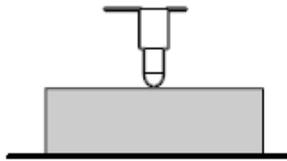
⑤ Enter the master measuring object value to the Preset field and click the Set reference point offset button.
(The reference point offset value is calculated when the Set reference point offset button is clicked.)

* To set the reference point passage position to "0.0000" without setting a reference point offset value, set "NaN" in Preset and click the Set reference point offset button.
Set "NaN" by entering a space with the numerical keypad.

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7-3. View frame settings

View frame settings
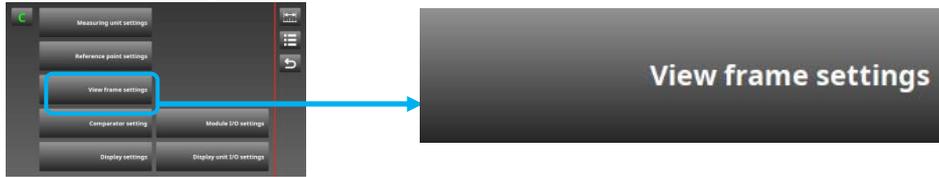
This is used to set the measuring units and calculation displayed in the measuring screen frames.

Up to 16 view frames can be set per main module.

Calculation can be set only for measuring units connected within the unit.

Setting contents: Measuring unit to be displayed in the view frame, measuring mode, preset value, addition/subtraction

Factory setting: No calculation, measuring mode: current value, no preset value

Touch inside the frame and select the measuring unit number from the selection screen.
When performing a calculation, also set Axis2.

Touch inside the frame and use the numerical keypad to enter the preset value. (unit: mm)

Module ID

View frame setting	Valid	Axis1	Ope.	Axis2	Mode	Preset
A	✔	1	+	2	REAL	
B	✔	2	+	--	REAL	+1.0000
C	✔	3	+	--	MAX	NaN
D	✔	4	+	--	MIN	NaN
E	✔	5	+	--	P-P	NaN
F	✔	6	+	8	REAL	
G	✔	7	+	--	REAL	NaN
H	✗				REAL	

View frame number

Display valid/invalid setting

Touch inside the frame to select addition or subtraction.

Touch inside the frame to cycle through the measurement mode setting at power-on.

When there are more than 9 frames, switch the page and make the settings.

← Frame symbols during 16-frame display

* Preset values cannot be set for frames with a calculation set.

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7-4. Comparator setting
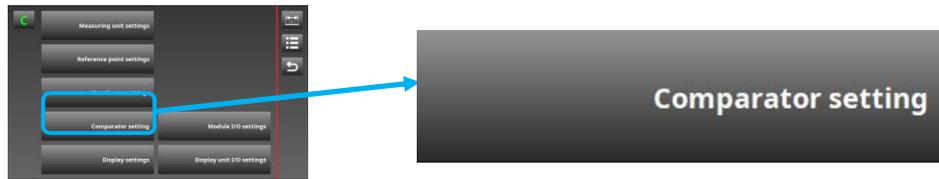
This is used to set the comparator values.
This item is the comparator settings for each view frame.
Up to eight sets with four levels can be set per frame. (The number of levels per frame is fixed.)
Setting contents: Comparator values
Factory setting: 8 sets with 2 levels: -5.0000, +5.0000

Module ID
View frame symbol

Touch inside the frame and select 2 levels or 4 levels.*

Specify the set number at power-on.

	Mode	C1	C2	C3	C4
1		-5.0000	-2.5000	2.5000	5.0000
2		-5.0000	-2.5000	2.5000	5.0000
3		-5.0000	-2.5000	2.5000	5.0000
4		-5.0000	-2.5000	2.5000	5.0000
5	4	-5.0000	-2.5000	2.5000	5.0000
6		-5.0000	-2.5000	2.5000	5.0000
7		-5.0000	-2.5000	2.5000	5.0000
8		-5.0000	nan	nan	5.0000

Comparator set number

Touch inside the frame and use the numerical keypad to enter the comparator values in accordance with the following size relationships.
4 levels: C1 < C2 < C3 < C4
2 levels: C1 < C2
NaN = No setting. Enter a space with the numerical keypad.

Switch the page and make the settings for all frames.

* Comparator sets with two levels and four levels cannot be set in the same view frame.
To mix sets with two levels and four levels, set four levels, and then enter values in C1 and C4 and set "NaN" in the unused fields (C2 and C3) of sets with two levels.

7-5. Display settings
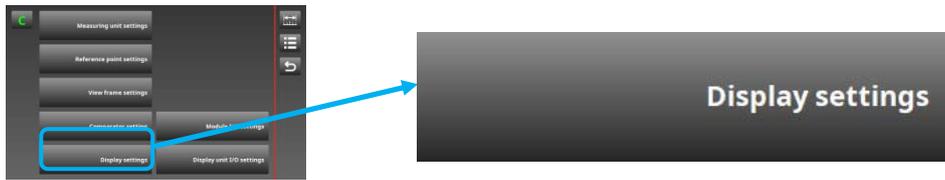
This is used to set the number of view frames displayed in the measuring screen.
Setting contents: Number of view frames (2, 4, 8, 16)
Factory setting: 16

Set the number of view frames with the frame setting button.

2-frame display

8-frame display

4-frame display

16-frame display

7-6. Module I/O settings
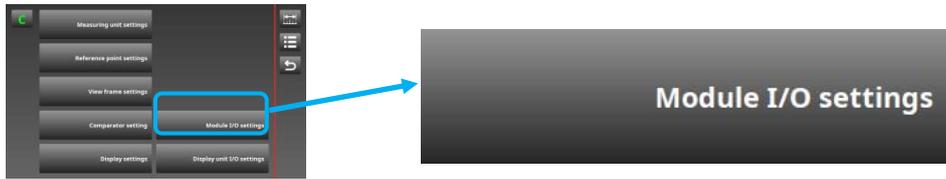
This is used to set the I/O terminals of the I/O modules.
Setting contents: Terminal block input signal and output signal assignments
Factory setting: Not assigned

I/O terminal number

Module ID
I/O module number

Inputs 1 to 5 of I/O module 1 are fixed to the frame address and Vlid.

Output 1 of I/O module 1 is fixed to DRdy.

Switch the page and make the settings for all units.

ID (set by a rotary switch)

Touch inside a frame and select from the selection screen.

M1

1   2

I/O module number
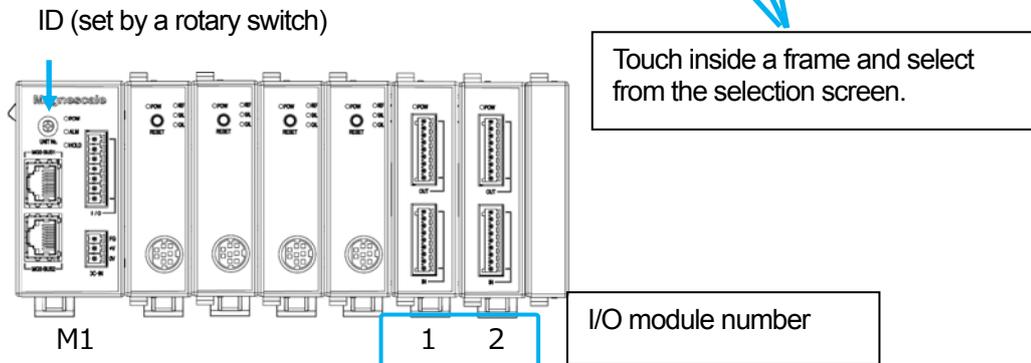
- I/O module input operations are processed successively with display I/O input operations, display key operations, and main module I/O input operations.
- I/O module operations are performed by specifying the frame address and performing each operation separately.
- The functions of input terminals 1 to 5 and output terminal 1 of I/O module 1 are fixed and cannot be changed.
- Up to two I/O modules can be connected to one main module.
- The Vlid signal establishes the input status. When the frame address and the required setting signals are set and Vlid is set to ON, the input signals are established and applied to the output.
- DRdy is output when Vlid is received and the output signals are established.
- Refer to "12. Timing Charts" for the input and output signal timings.
- * Use the main module terminals to perform operations for each unit, and the display unit terminals to perform operations for the entire system.

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• List of setting symbols
  Input

Selected symbol	Description	Function	Terminal logic
Addr3-0	Frame address (4 bits, fixed)	Specifies the frame to be operated. 4 bits	Refer to "List of input logic."
Vlid	Data valid (Fixed)	Address and input status established signal.	ON
Comp2-0	Comparator set number (3 bits)	Sets the comparator set number. 3 bits	Refer to "List of input logic."
Mode1-0	Measuring mode (2 bits)	Switches the measuring mode. 2 bits	Refer to "List of input logic."
Reset	Reset	Performs reset operation for the specified frame.	ON
Preset	Preset	Performs preset operation for the specified frame.	ON
Pause	Pause	Holds the data and judgment results.	Held while ON Released while OFF
Start	Start	Clears the MAX/MIN/P-P values.	ON
OrgReload	Reload reference points	Performs the reload reference point operation.	ON
NO_FUNC	Not assigned		OFF

• List of input logic
0 = ON, 1 = OFF

Frame address	Addr3	Addr2	Addr1	Addr0
A	0	0	0	0
B	0	0	0	1
C	0	0	1	0
D	0	0	1	1
E	0	1	0	0
F	0	1	0	1
G	0	1	1	0
H	0	1	1	1
I	1	0	0	0
J	1	0	0	1
K	1	0	1	0
L	1	0	1	1
M	1	1	0	0
N	1	1	0	1
O	1	1	1	0
P	1	1	1	1

Comparator set	Comp2	Comp1	Comp0
1	0	0	0
2	0	0	1
3	0	1	0
4	0	1	1
5	1	0	0
6	1	0	1
7	1	1	0
8	1	1	1

Measuring mode	Mode1	Mode0
Current value	0	0
MAX	0	1
MIN	1	0
P-P	1	1
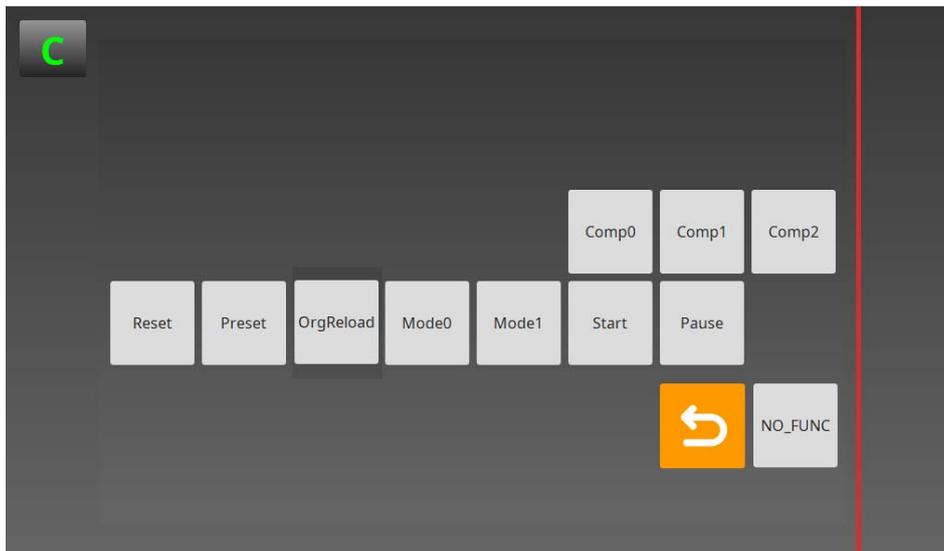
Input terminal selection screen

Output

Selection symbol	Description	Function	Terminal logic
DRdy	READY (Fixed)	Each output established signal.	ON
CompOut 4-0	Comparator output (5 bits)	Comparator output of the specified comparator set for the specified frame. 5 bits	ON
Alarm	Alarm	Alarm of specified frame	ON
OrgPass	Reference point passage monitor	Monitor for checking reference point acquisition.	ON
NO_FUNC	Not assigned		OFF
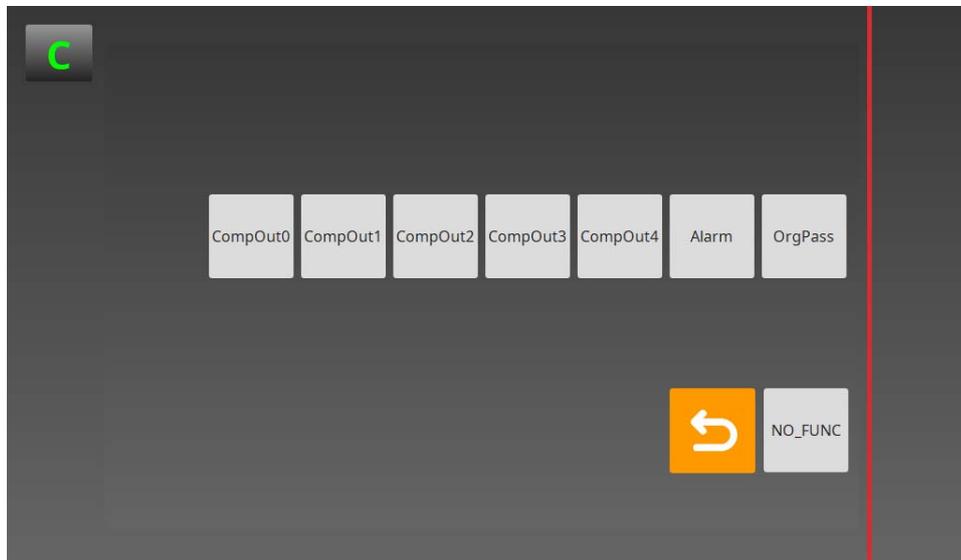
Output terminal selection screen

7-7. Display unit I/O settings
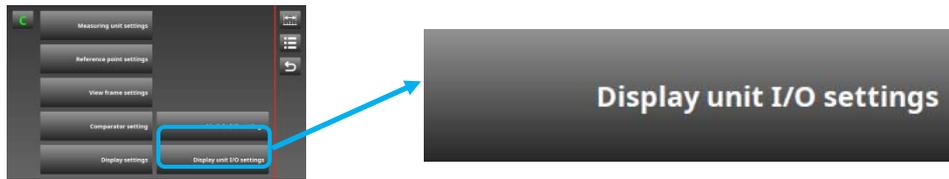
This is used to set the I/O terminals of the display unit.
Setting contents: Terminal block input signal and output signal assignments
Factory setting: Not assigned

Set the I/O terminals of the display unit.
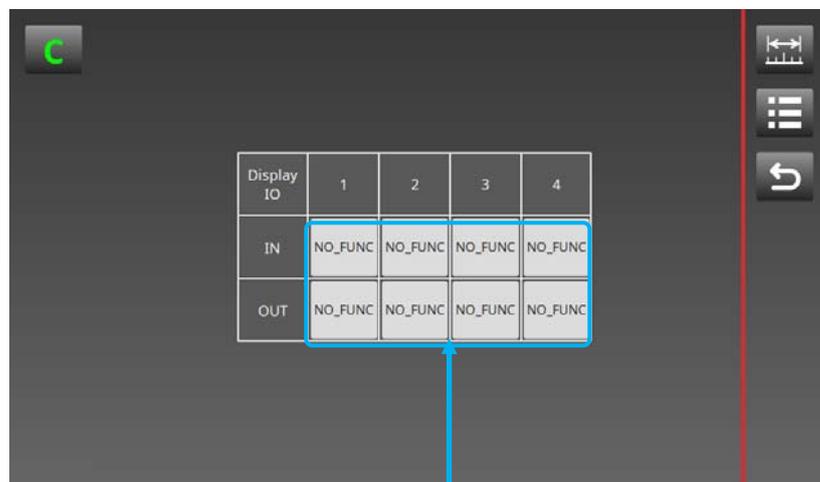
Touch inside a frame and select from the selection screen.

- Display I/O input operations are processed successively with display key operations, main module I/O input operations, and I/O module input operations.
- Use the input terminals of the main modules to perform operations for each unit, and the input terminals of the I/O modules to perform operations for each frame.
- The displays within the frames and the display unit judgment output are held in data hold mode, but these are unrelated to the main module I/O status and I/O module I/O status.
- Refer to "12. Timing Charts" for the input and output signal timings.

* The status monitor output can be assigned to the display I/O.
  This output is pulse output used to check whether the display unit system has stopped, and outputs ON-OFF repeatedly at a 1 s cycle when the status is normal.
  When this pulse output is stopped, this indicates that the system has stopped for some reason.

Input

Selection symbol	Description	Function	Terminal logic
Reset	Reset all	Resets all frames to zero.	ON
Preset	Preset all	Applies the preset values to all frames (except frames with a calculation set).	ON
Pause	Pause	Holds the measurement data and judgment results of all frames.	Held while ON
Start	Start	Clears the MAX/MIN/P-P values.	ON
D-Trig	Data trigger	Saves the data of all frames in the display unit memory.	ON
OrgReload	Reload reference points	Performs the reload reference point operation.	ON
NO_FUNC	Not assigned		OFF
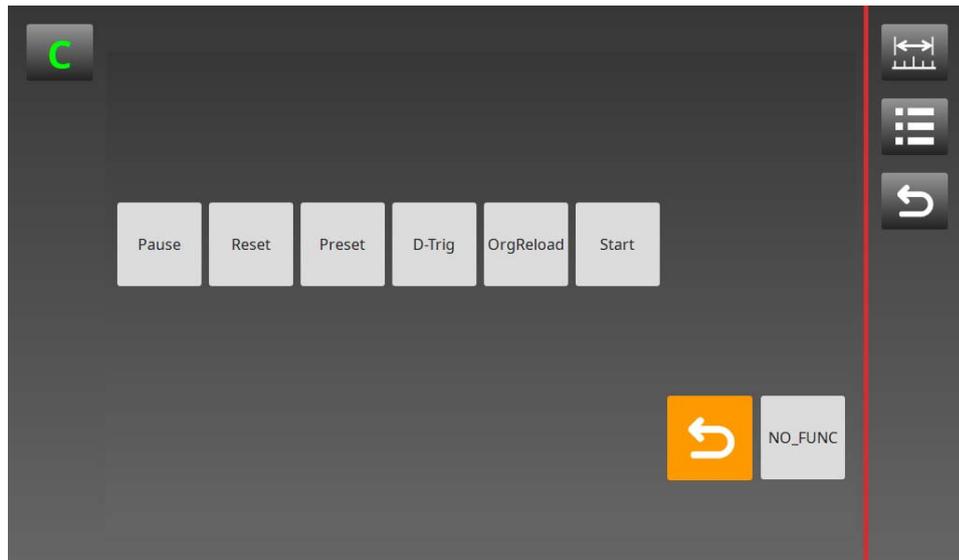
Input terminal selection screen

Output

Selection symbol	Description	Function	Terminal logic
Comp	Comparator output	Performs logical add judgment output of all frames.	ON
SysAlm	System alarm	Output when an error is detected within the system configuration.	ON
OrgPass	Reference point passage monitor	Monitor for checking reference point acquisition of all frames.	ON
StatMon	Status monitor output	Output for checking the display unit operating status.	Normally pulse output. Fixed output when an error occurs.
NO_FUNC	Not assigned		OFF
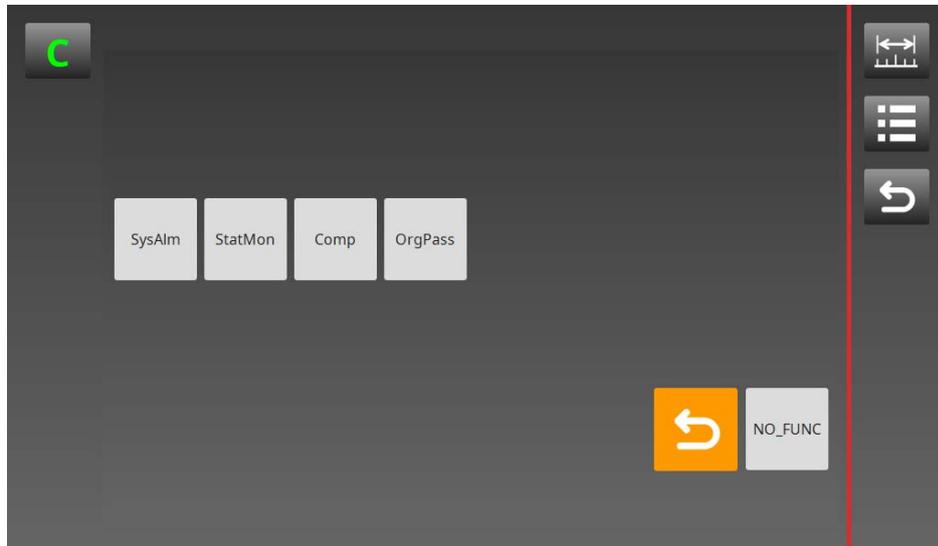
Output terminal selection screen

8. Screen Display Contents and Operation Method

8-1. Description of measuring screen icons

| Communication monitor | Data trigger | Comparator set | Measuring mode | Start | Pause | Previous page |

| Menu | I/O monitor | Select all frames | Reload reference points | Preset | Reset | Next page |

Select individual frame number

Saved data counter
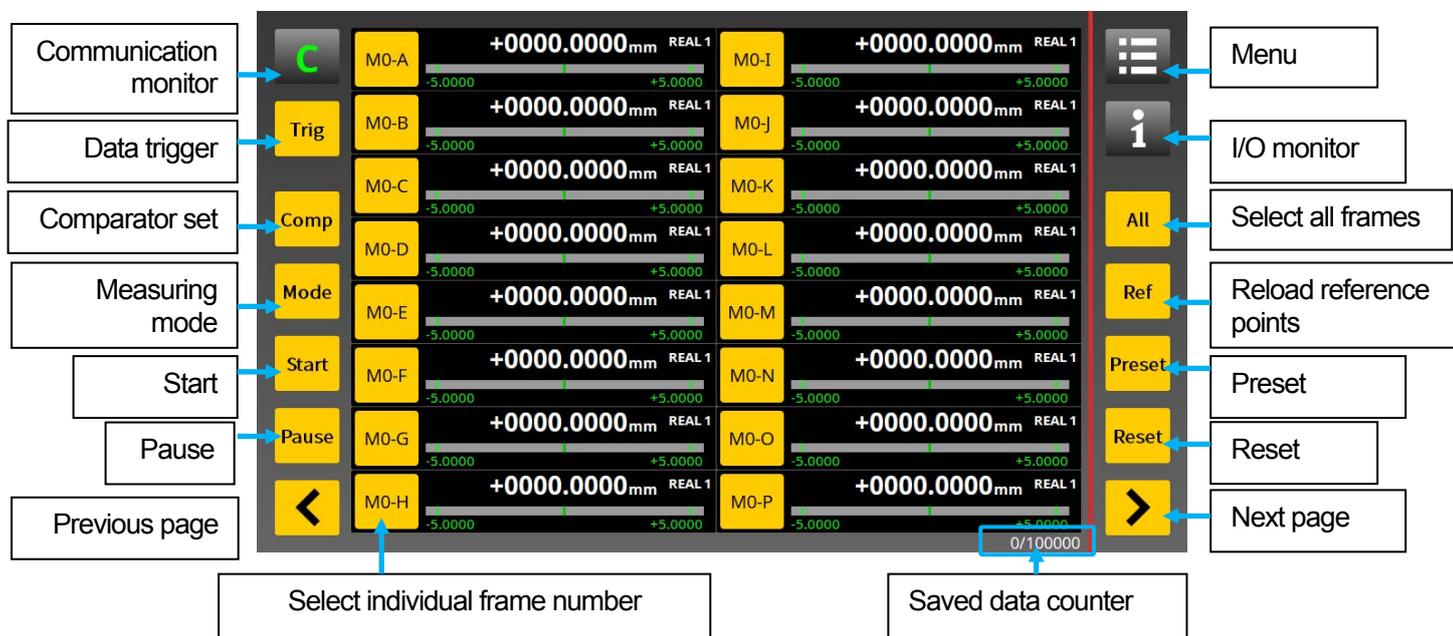
- Communication monitor

    This checks the communication status between the display unit and each main module and retries communication when an error occurs.

- Data trigger

    When this button is clicked, the measurement data at that time is saved in the display unit.

- Comparator set

    This switches the comparator sets specified by the comparator settings in order and applies the respective values to the display.

- Measuring mode

    This switches the measuring mode display of the selected frame(s) in order of REAL→MAX→MIN→P-P.

    REAL: current value, MAX: maximum value, MIN: minimum value, P-P: absolute value obtained by subtracting the minimum value from the maximum value

- Start

    This clears the MAX, MIN and P-P values of the selected frame(s) and performs measurement again.

- Pause

    This holds the measurement values and judgment results of the selected frame(s). When clicked again, the display returns to the current status.

- Reset

    This resets the measurement values of the selected frames to zero.

- Preset

    This sets the preset values in the selected frame(s). (Except frames with a calculation set)

- Reload reference points

    This reloads the reference points of the selected frame(s). (Frames with Reference point set to used)

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• Select all frames
    This enables to specify all the displayed slots and perform reset, preset, pause, start, comparator, measuring mode, and reload reference point operations.
• Select individual frame number
    Reset, preset, pause, start, comparator, measuring mode, and reload reference point operations can be performed for the frame(s) specified by the individual select buttons.
• Saved data counter
    This displays the number of data saved by the trigger button and I/O.
     (Current number saved/Maximum number that can be saved)
• Previous/Next page
    These switch to the previous or next page when there are multiple measuring screens.
• Menu
    This switches to the main menu.
• I/O monitor
    This switches to the I/O monitor.

* To perform operations on measurement value, select the frame(s) and then perform the operations.
* The preset operation applies the preset values set using the View frame settings menu.
* The preset operation is not available for frames with a calculation set.
* The reload reference point operation can be performed only for frames with Reference point set to used ("✓") in the Reference point settings menu.
* When functions overlap with I/O terminals as a result of key operations, the operations are processed and applied to the display successively with the input operations of the I/O terminals within the system configuration.

8-2. View frame contents

| Comparator set number |

| Module ID | Preset indicator | Measurement value | Measuring mode |

Pre
R P
M1-A
+0002.4324mm   REAL 1
-5.0000   +5.0000

| View frame symbol | Reference point indicator | Pause indicator | Comparator bar display |
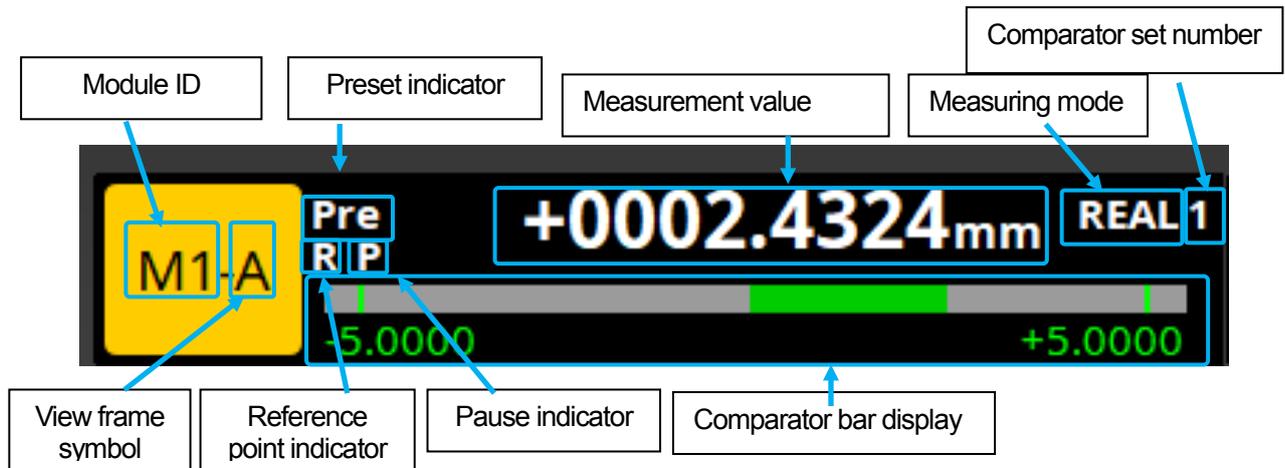
- Measurement data and measuring mode
    These display the selected measuring mode and the measurement value at that time.
    REAL: current value, MAX: maximum value, MIN: minimum value, P-P: absolute value
    obtained by subtracting the minimum value from the maximum value
- Comparator bar display and comparator set number
    These display the selected comparator set number and a bar display with the values for
    that comparator set applied.
    The bar display shows the minimum and maximum comparator values set by the
    comparator settings on the left and right ends, respectively. The center value is the center
    of the bar, and the bar shows the displacement from the center.
- Preset indicator
    This is displayed for a frame with a preset value set.
- Pause indicator
    This is displayed for a paused frame.
- Reference point indicator
    This is displayed for a frame with a reference point set.
    The text color changes as follows according to the reference point processing status.
    White: Reference point not acquired, Orange: Reference point acquired
- Module ID
    This displays the value set by the rotary switch of the main module.
- View frame symbol
    This is the view frame symbol.
    The measuring unit to be displayed in the view frame is set using the View frame settings
    menu.

8-3. Error display

When an error occurs in a measuring unit or a counter module, an error message such as the following is displayed in the view frame:

• S-Error
  Sensor error: Measuring unit error or cable disconnection, etc.

• C-Error
  Counter error: Counter module response frequency exceeded

• M-Error
  Module communication error: Inter-module communication error, module trouble,
                                        faulty module connector connection, etc.

* The display when multiple errors occur is as follows:
Example) When a S-error and C-error occur simultaneously
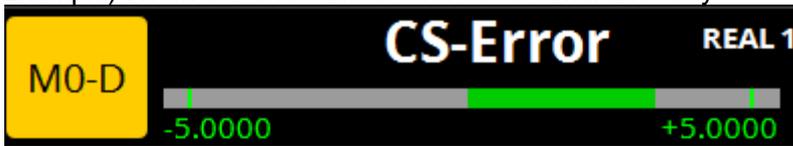
* S-Error and C-Error can be canceled by removing the cause of the error and then performing reset operation.
* To cancel M-Error, check the module installation status and then turn the power supply off and then on again.

8-4. I/O display screen

This displays the status of the I/O terminals within the system configuration.

I/O terminal number

Not set

ON

OFF

I/O monitor
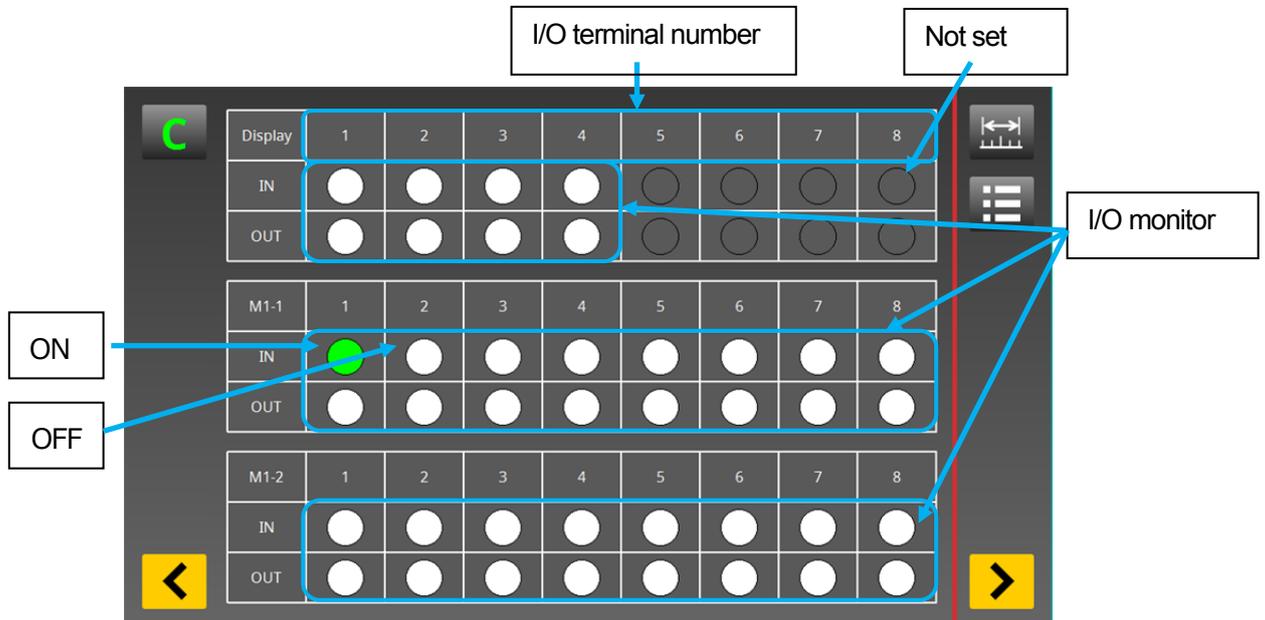
• Indicators (same for input and output)
  ON: green, OFF: white, Signal not assigned: No display

* The screen refresh interval of the display unit is approximately 30 ms. When the status changes between ON and OFF faster than this screen refresh interval, the status may not be displayed correctly.

8-5. Communication monitor button

A communication monitor button used to check the communication status between the display unit and each unit is displayed on all screens.
When the button text is green, communication between the display unit and each unit is being performed normally.
When an error occurs in communication, the pop-up message shown below appears and the color of the communication monitor button text changes to red.
In addition, when there is no response from a unit during startup, the color of the communication monitor button text changes to orange.
Press the communication monitor button at this time to return the display unit to the startup screen and retry communication.
If the error is not resolved even after retrying communication, check the power supply and cable connection status of each unit, and turn all power supply off and then on again.

Communication monitor button
(Green text when normal)

Communication monitor button
(Orange or red text when a communication error occurs)

Module has been disconnected(ID:1)

Displays the ID of the module with which communication has been lost

* After retrying communication, check that all units and modules are recognized.

8-6. Reference point usage method

After the system power supply is turned on, or when the reload reference point operation is performed with the measuring screen or the I/O terminals, frames with Reference point set to used ("✓") in the Reference point settings menu are set to the standby status for reference point passage. When the reference points are passed, the reference point offset values saved in the display unit are applied, and subsequent operation is performed based on those offset values.

* The reset and preset operations are not available for frames with Reference point set to used ("✓").
* When an alarm occurs in a frame with Reference point set to used ("✓"), the alarm can be canceled by the reset operation. However, the offset value will be cleared, so it is necessary to perform the reload reference point operation.

8-7. Start function and pause function

• Start
This clears the peak hold values of frames with the peak hold function (MAX, MIN, P-P) set and restarts peak hold operation. (The current values are held.)

• Pause
When pause is set to ON, peak value updating stops for frames with the peak hold function (MAX, MIN, P-P) set, and the measurement values and judgment results at that time are held. (The current values are constantly updated.)
Peak value updating restarts when Pause is set to OFF.

Maximum value

Pause ON   Pause OFF   Current value
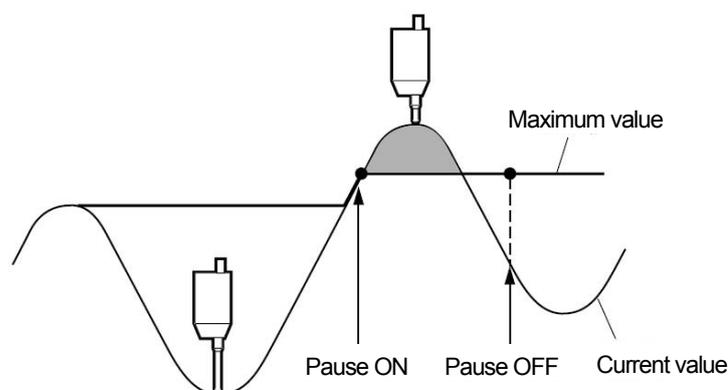
8-9. Data trigger

When the data trigger operation is performed using the data trigger button or the I/O terminals, the measurement data at that time is saved in the display unit.
Up to 100,000 data can be saved, and the number of saved data is displayed by the saved data counter in the lower right corner of the measuring screen.
This data can be transferred to a USB memory or SD memory card or exported via Ethernet.
Refer to "10-1. Data menu" for transfer to a USB memory or SD memory card, or "11. Data Export Method Using Ethernet" for export via Ethernet.

9. Measurement Data Save and Output Format

When the data trigger operation is performed using the display screen or the I/O terminals, the measurement data at that time is saved in frame units in the display unit.
To output measurement data to an external memory or via Ethernet, it is necessary to perform the data export operation using the Data menu.
Refer to "10-1. Data menu" for details.

• Data saved
  Count, measurement time, module ID, frame number, measuring mode, measurement value, judgment results, status

• File name
  Measurement data is csv format, and is saved in the external memory with the following file name:

    File name: measdata_YYYYMMDDhhmmss.csv
    Example: 2019, May 13, 10:15:27
              measdata_20190513101527.csv

• Data format
  The data is separated by commas, and the measurement data and statuses of all view frames are output on a single line.

①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑤, ⑥, ⑦, ⑧, ·········|③, ④, ⑤, ·······

Header	Frame A	Frame B

①: Count	1 to 100000
②: Time stamp	YYYYMMDD hhmmss Example: 2019/05/13 10:14:30
③: Module ID	Module ID
④: Reserved	Reserved (equivalent to two data)
⑤: Measurement value	-9999.9999 to 9999.9999
⑥: Display mode	REAL = 0, MAX = 1, MIN = 2, P-P = 3
⑦: Comparator	< C1 = 0, C1 < C2 = 1, C2 < C3 = 2, C3 < C4 = 3, C4 < = 4

⑧: Status (1 byte)	bit7	CRC error = 1
	bit6	Pause ON = 1, Pause OFF = 0
	bit5	Reserved = 0
	bit4	Reserved = 0
	bit3	Reference point passed = 1, Reference point not passed = 0
	bit2	Reserved = 0
	bit1	Counter error = 1
	bit0	Measuring unit error = 1
|: Module separator	Module separation signal	

* When there are multiple units, each module ID and subsequent data are output in order following the module separation symbol.

 • Number of data that can be saved
   The display unit can save up to 100,000 data.
   When the number of data exceeds 100,000 pieces of data, the data is cleared in order from the oldest data.

* The display unit cannot monitor the data saved in the display unit.
* To externally output data saved in the display unit, it is necessary to export the data to an external memory.
* The data saved in the display unit is cleared when power supply to the display unit is cut off. When it is necessary to save the data, export the data to an external memory before cutting off the power supply.

10. Main Menu

This is used to save data, update the software, and restore the factory settings.
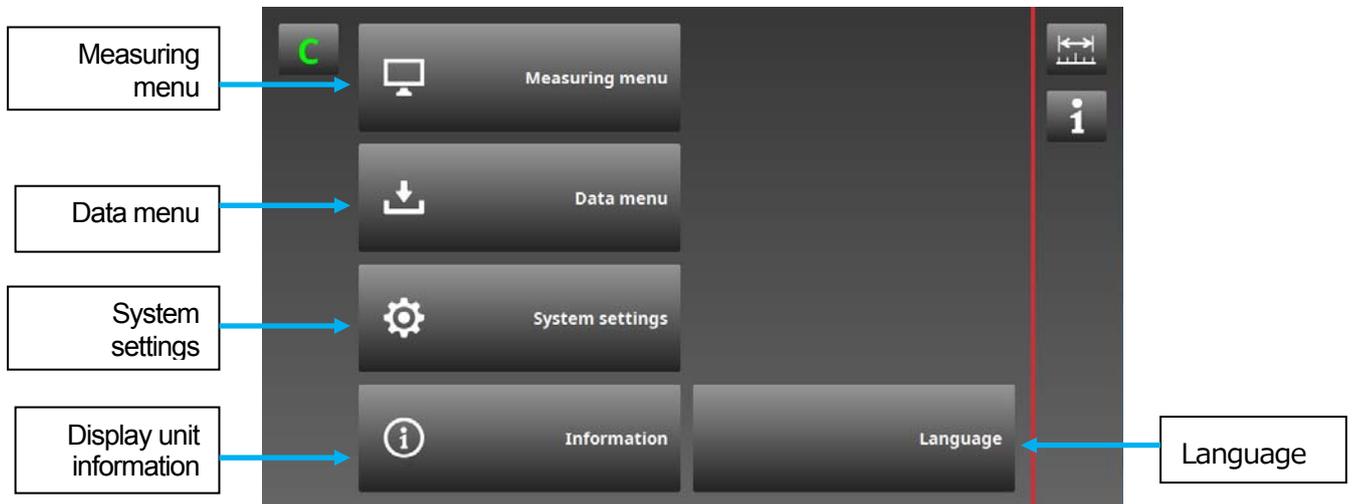
- Measuring menu
  This is used to make the measuring unit and view frame settings.
  Refer to "7. Setting Procedure."

- Data menu
  This is used to export measurement data and setup parameters to a USB memory or SD memory card and to import setup parameters.

- System settings
  This is used to set the system clock, update the software, and restore the factory settings.

- Display unit information
  This is used to check the display unit information.

- Language
  This is used to set the menu language. Refer to "6-3. Language setting."

10-1. Data menu
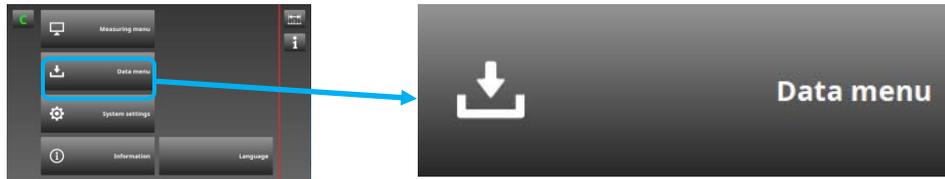
Setting contents: Import setup parameters from external memory
Export setup parameters and measurement data to external memory
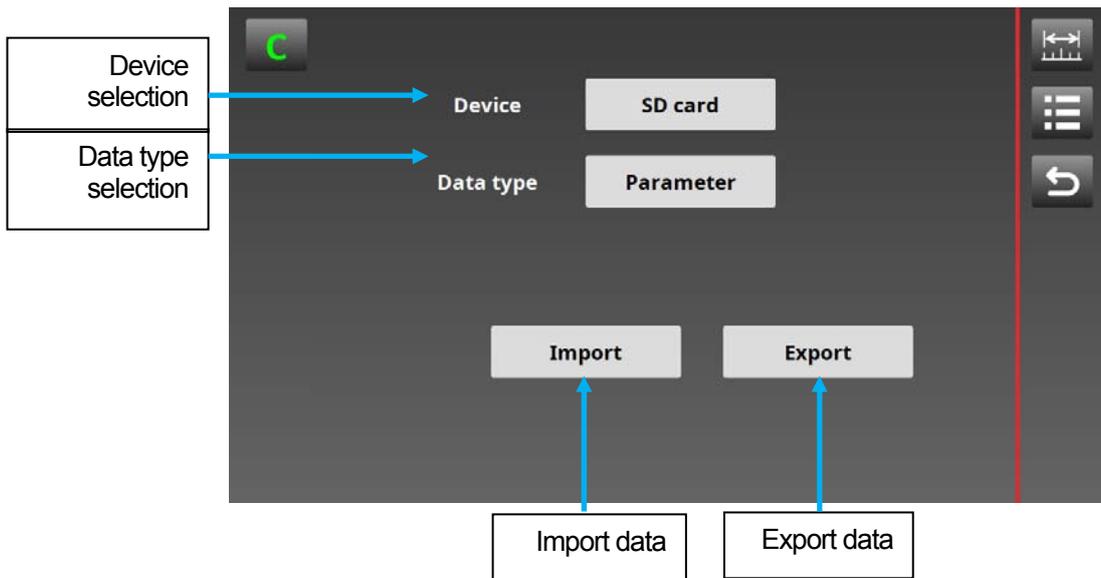
• Device selection
　　Click this button to select the external device for import and export operation.

• Data type selection
　　Click this button to select the type of data to be imported or exported.

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• Import/Export data
  These buttons are used to import and export data from and to an external memory.
  Import: Imports setup parameters from an external memory to the display unit.
  Export: Exports setup parameters and measurement data from the display unit to an
          external memory.

  Follow the instructions in the pop-up message to perform import and export operation.

  Example: Operation to import setup parameters from a SD memory card to the display unit
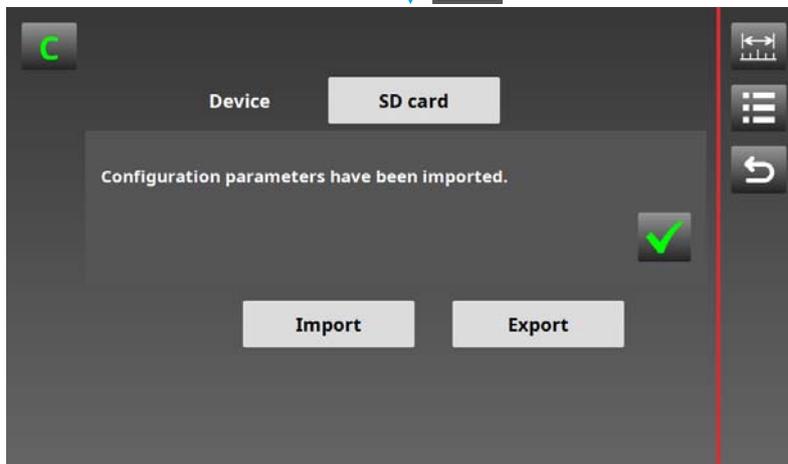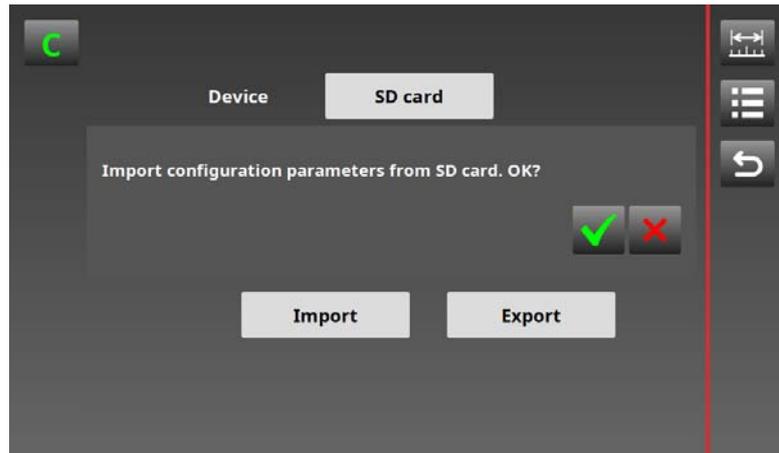
* Do not cut off power supply to the display unit while data import or export is in progress.
Doing so may corrupt the data.

• About setup parameters
Other display units with the same settings can easily be prepared by exporting the setup parameters and then importing them to the other display units.
Setup parameters can also be saved and copied in a computer.

• Folder name and file names in export mode
Configuration parameter data are saved for the display unit and each unit using the file extension .ini within the folder named param.

Folder name and file names when exporting from the display unit
Example) When there are four main modules

Folder name: File name within the folder
paramYYYYMMDDhhmmss: display_setting.ini
(Display unit setting file)
module1_setting.ini
(Main module setting file: ID = 1)
module2_setting.ini
(Main module setting file: ID = 2)
module3_setting.ini
(Main module setting file: ID = 3)
module4_setting.ini
(Main module setting file: ID = 4)

• Folder name and file names in import mode
To import setup parameters to the display unit, delete the YYYYMMDDhhmmss part from the folder name of the exported folder, import the folder and files to an external memory, and then set the external memory in the display unit.

Folder name and file names when importing from an external memory
Example) Folder name and file names when importing the above exported data

Folder name: File name within the folder
param: display_setting.ini
(Display unit setting file)
module1_setting.ini
(Main module setting file: ID = 1)
module2_setting.ini
(Main module setting file: ID = 2)
module3_setting.ini
(Main module setting file: ID = 3)
module4_setting.ini
(Main module setting file: ID = 4)

* The configuration parameter folder name and file names are fixed.
  Note that if the names are changed, the display unit will be unable to recognize the files.
* After importing setup parameters from an external memory to the display unit, check that
  the setting contents are correct.

• About measurement data
  Measurement data is saved in csv format.
  Refer to "9. Measurement Data Save and Output Format" for the data format.

10-2. System settings
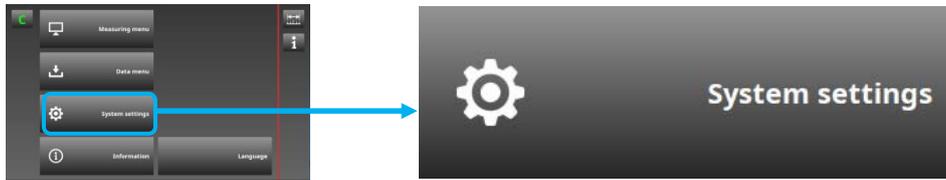
Setting contents: System clock setting, software update, factory settings

System clock setting

Software update
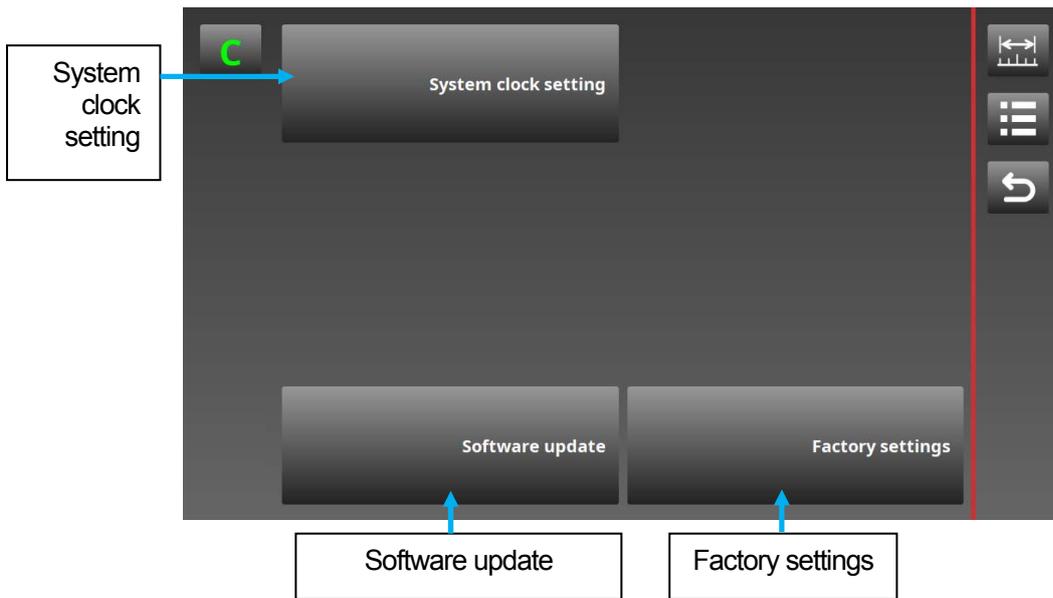
Factory settings

- System clock setting
  This is used to set the system clock of the display unit.
  This clock is used when acquiring measurement data.

- Software update
  This is used to update the display unit software.

- Factory settings
  This is used to restore the display unit to the factory settings.

• System clock setting
 This is used to set the system clock of the display unit.
 The setting contents are year, month, day, hour, minutes, and seconds.
 Click the ↑↓ buttons to set each item.
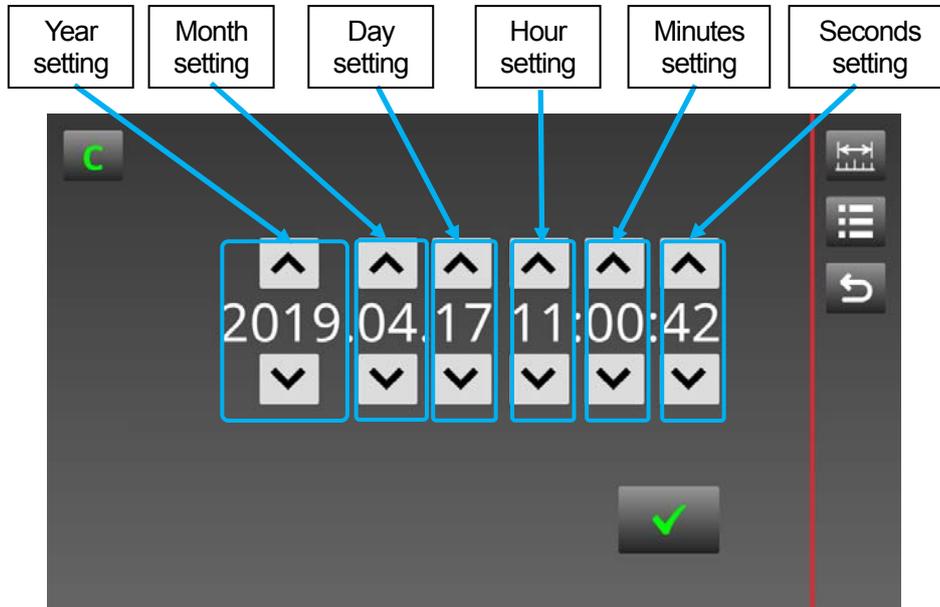
* The clock setting is a 24-hour display.
* An error will occur in the clock, so periodically check and correct the clock setting.

• Software update
  This is used to update the display unit software.
  The latest software can be downloaded from the Magnescale website.
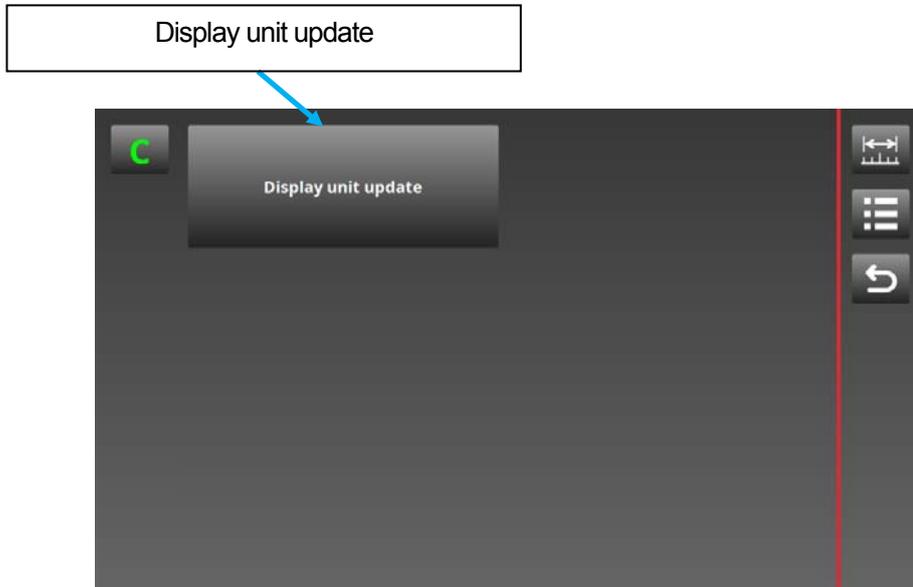
Insert the USB memory or SD memory card containing the update software into the display unit, and click the Display unit update button.
The display unit automatically recognizes the external memory and executes the update.
Follow the instructions in the pop-up message.

• Software folder name and file name
          Folder name: File name:
          Update: DisplayUnit.tar
                              update_allow

  * A notice is posted on the Magnescale website whenever software is newly updated.
  * The software file name is fixed, so the software version cannot be recognized from the file name.
  * Restart the display unit after performing the software update operation.
  * The software cannot be exported from the display unit.
  * Do not cut off power supply to the display unit while the software update is in progress.
    Doing so may corrupt the data and prevent display unit startup.

• Factory settings
    This is used to restore the display unit to the factory settings.
    Follow the instructions in the pop-up message.
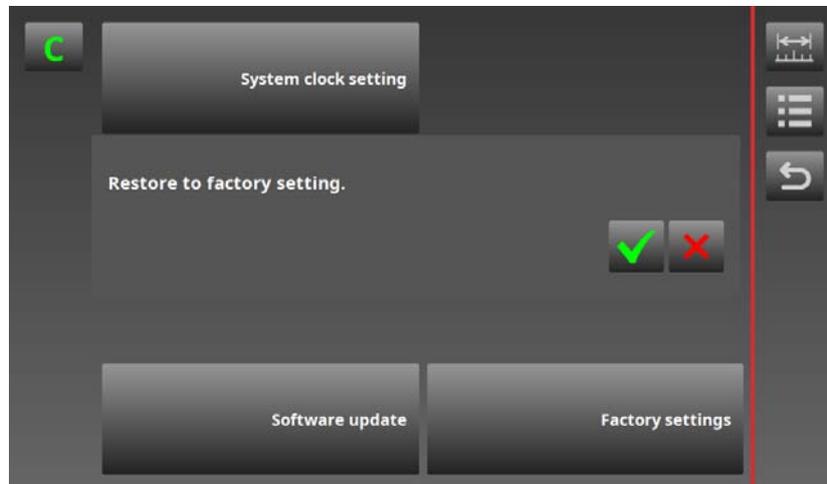
* When the Factory settings button is pressed, the set parameters and saved measurement
  data are all cleared.
* Restart the display unit after performing the factory setting operation.

10-3. Display unit information

This is used to check the display unit information.

Model	LT80-NE
Serial	000001
Product Date (YYYY.MM.DD)	2019/03/20
Version	Version 1.01.00
Update Date (YYYY.MM.DD)	2019/03/20
MAC Address	eth0:xx-xx-xx-xx-xx-xx eth1:xx-xx-xx-xx-xx-xx eth2:xx-xx-xx-xx-xx-xx

Model: Product name
Serial: Serial number
Product Date: Manufacture date
Version: Software version
Update Date: Software update date
MAC Address: MAC addresses

11. Data Export Method Using Ethernet

Measurement data and setup parameters saved in an external memory can be exported via Ethernet.

* Data export using Ethernet is available only for data saved on a USB memory or SD memory card.
* The general purpose LAN port of the display unit can be accessed from a computer or other device using the SFTP protocol (SSH File Transfer Protocol).

11-1. Required software

The following environment and software are required for Ethernet connection:

Equipment name	Qty.	Remarks 1	Remarks 2
LT80-NE	1	Version 1.01.00 or later	A SD memory card or USB memory, in which measurement data and setup parameters are saved, must be connected to the LT80-NE.
Computer, etc.	1	SFTP communication software must be installed.	The device must have a LAN port with a 100Base-TX RJ-45 connector.
LAN cable	1	This LAN cable is used to connect the computer and the LT80-NE.	A cable with CAT.5e or higher shielding is recommended.

Computer

LAN cable

LT80-NE
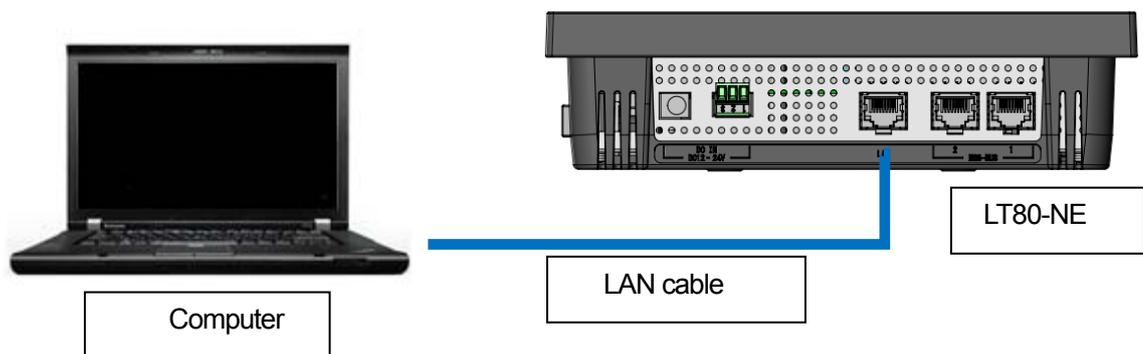
11-2. File access method

The IP address of the general purpose LAN port of the display unit is fixed to "192.168.3.100."
The USB memory or SD memory card connected to the display unit can be accessed by specifying this IP address and the login name (server name) and password in the SFTP client software used by the connected computer.

• List of required setting items

Setting item	Setting value	Remarks
IP address of the computer or other device (IPv4 address)	192.168.3.xx	xx: Arbitrary value from 1 to 254 (except 100)
Computer subnet mask	255.255.255.0	
Host name specified by the SFTP client software or SFTP command (LT80-NE IP address)	192.168.3.100	
User name specified by the SFTP client software or SFTP command (Login name)	root	
Password specified by the SFTP client software or SFTP command	●●●●●●●●●●	●: Enter a 10-character alphanumeric. The password is included with the display unit.
Port number specified by the SFTP client software or SFTP command	22	This can be omitted depending on the software used.
USB memory and SD memory card file paths as viewed from the SFTP client	USB memory: /run/media/sda1 SD memory card: /run/media/mmcblk1p1	

* Refer to the supplemental manual included with the display unit for the password.
* Be careful not to access any files other than those saved in the USB memory or SD memory card connected to the display unit.
  If other files are moved, copied or edited, the display unit may not operate properly.

12. Timing Charts

The timing charts for each I/O terminal are shown below.

12-1. Display unit

• Input signal (ON time)

MIN. 2ms

• Data hold input

Data hold

Output

MIN. 2ms   MIN. 8ms
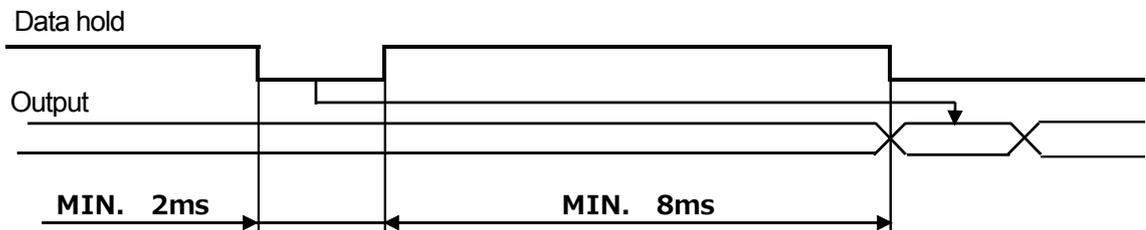
• System alarm output
  (Factor occurs)

Alarm

MAX. 15ms

• Status monitor output

1s   1s   1s   1s

Error occurs
* Thereafter, the signal status at the time
  the error occurred is held.

12-2. I/O module

Frame Address

VLID

MIN. 2ms | MIN. 2ms

MAX. 7ms

READY

(Data)

MIN. 2ms | MIN. 2ms
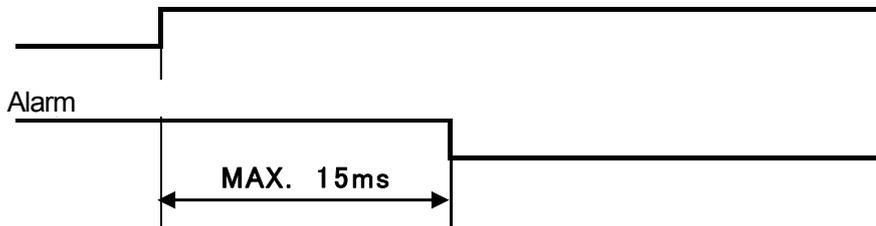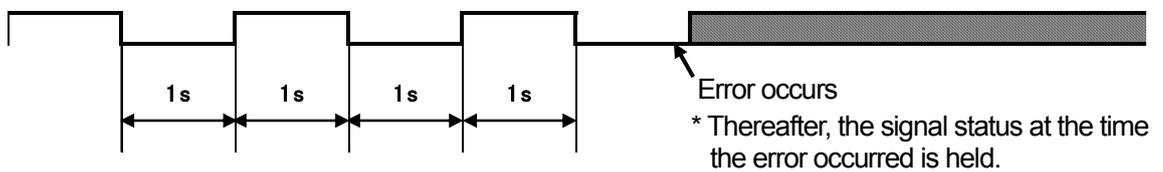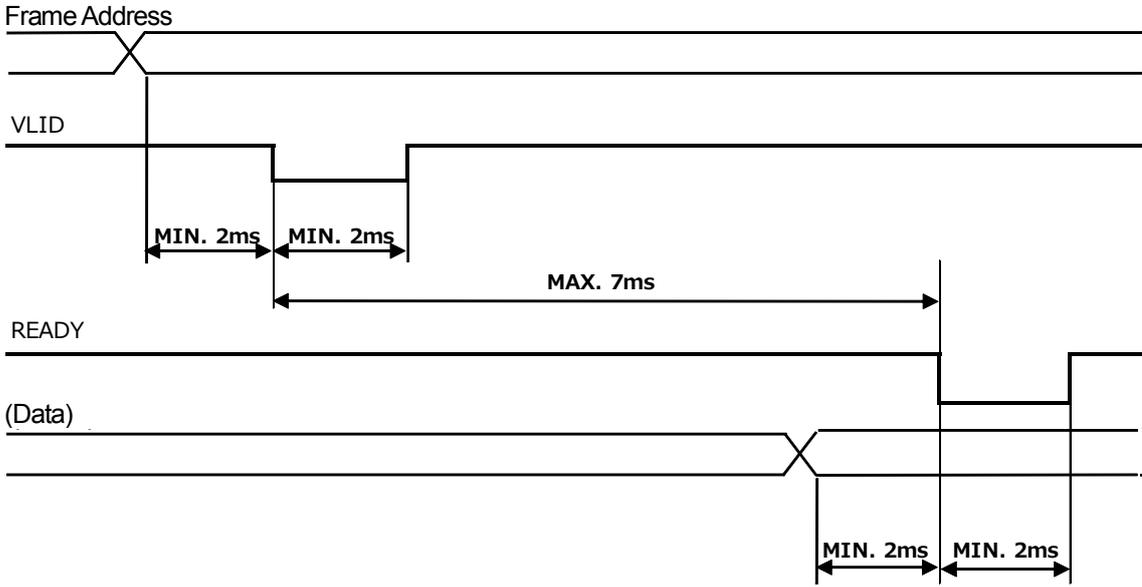
13. Precautions

For the connection method, power supply method, and electrical specifications of each module, refer to the Instruction Manual supplied with each product.

Use your finger or a stylus pen to operate the touch panel of the display unit.
Do not use a sharp tool such as a screwdriver or ballpoint pen. Doing so may damage the surface and result in malfunction.

The display area of the display unit uses a liquid crystal panel.
Do not bump or apply a strong impact to the panel. Doing so may damage the panel.
Also, do not press strongly on the display area, or use the display unit in a manner that applies an excessive load to the display area.

Do not expose the display area or the body of the display unit to oils or solvents.

If the body or display area becomes dirty, wipe with a soft, clean cloth.
Do not use solvents such as benzine or thinner.

The backlight used in the display unit has a service life.
Replace the product when the display area becomes dark or when it no longer blinks or lights.
(Replacement of only the backlight and liquid crystal panel is not performed.)

Color shading or other abnormalities may occur depending on the viewing angle and the surrounding brightness.

Do not use a damaged SD memory card or USB memory. Doing so may adversely affect the display unit system and prevent startup.

Do not allow oil or dust to enter the interior of the display unit.

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