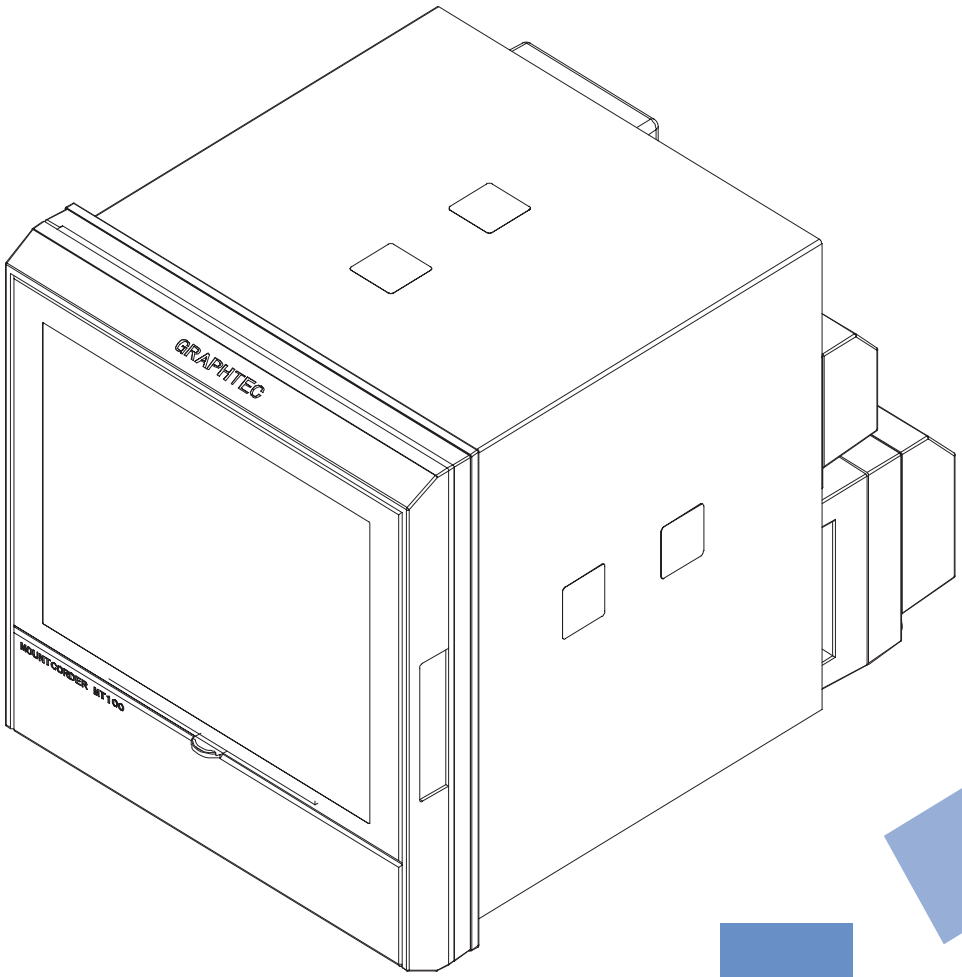
MT100

MOUNTCORDER

Quick Start Guide

MANUAL NO. MT100-UM-851



Quick Start Guide
English

GRAPHTEC

Contents

Introduction

Thank you for purchasing the MOUNTCORDER MT100.
Please read this manual and the User's Manual provided in the supplied CD-ROM thoroughly before attempting to use your new product to ensure that you use it correctly and to its full

To Ensure Safe and Correct Use

- To ensure safe and correct use of the MT100, read this Manual thoroughly before use.
- After having read this Manual, keep it in a handy location for quick reference as needed.
- Do not permit small children to touch the MT100.
- The following describes important points for safe operation. Please be sure to observe them strictly.

Conventions Used in This Manual

To promote safe and accurate use of the MT100 as well as to prevent human injury and property damage, safety precautions provided in this manual are ranked into the five categories described below. Be sure you understand the difference between each of the categories.

⚠ DANGER	This category provides information that, if ignored, is highly likely to cause fatal or serious injury to the operator.
⚠ WARNING	This category provides information that, if ignored, is likely to cause fatal or serious injury to the operator.
⚠ CAUTION	This category provides information that, if ignored, could cause physical damage to the MT100.

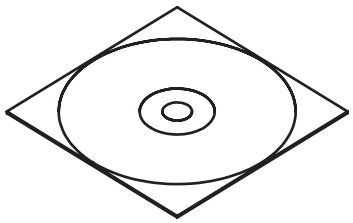
Checking the Outer Casing

After unpacking, check the MT100's outer casing before use. In particular, please check for the following:

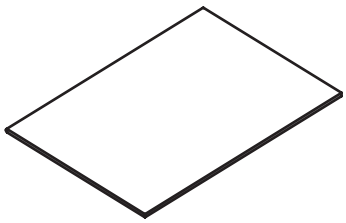
- Surface scratches
- Other flaws such as stains or dirt

Checking the Accessories

After unpacking, check that the following standard accessories are included.



CD-ROM: 1



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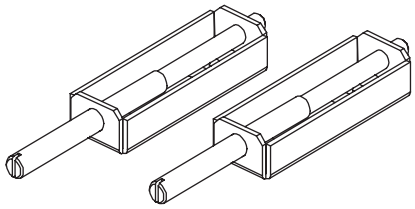
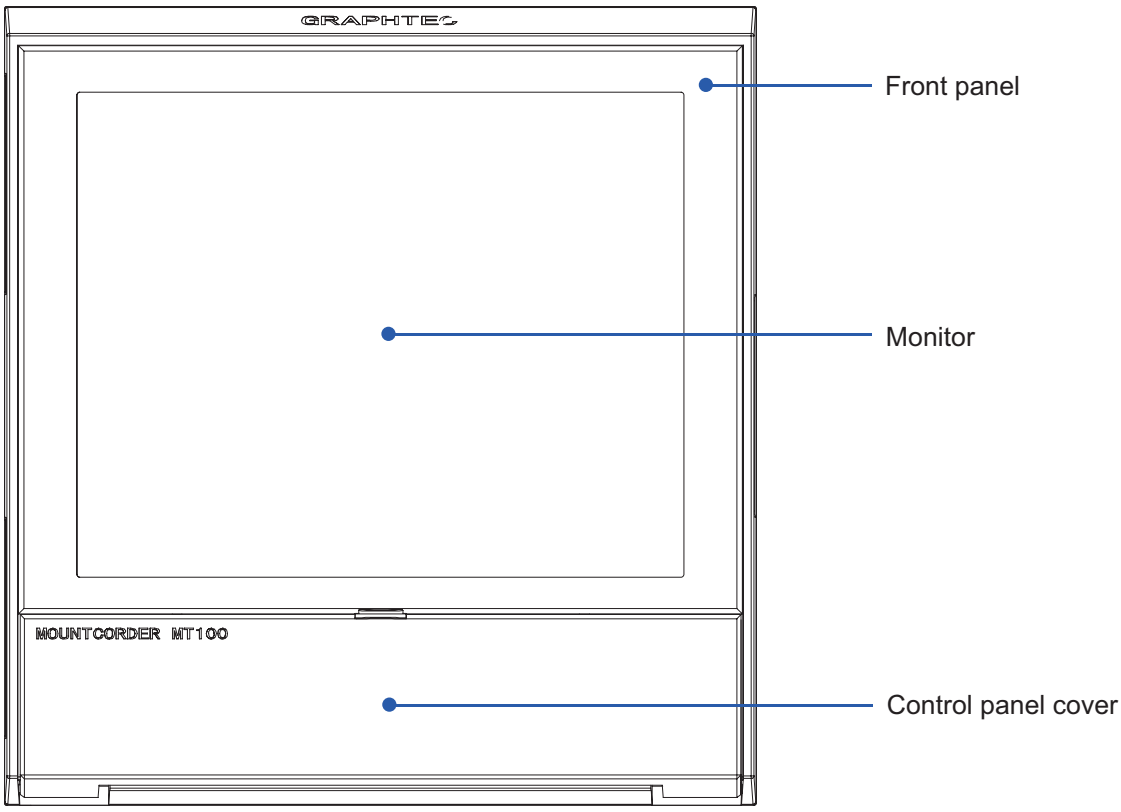


Panel mount bracket: 2

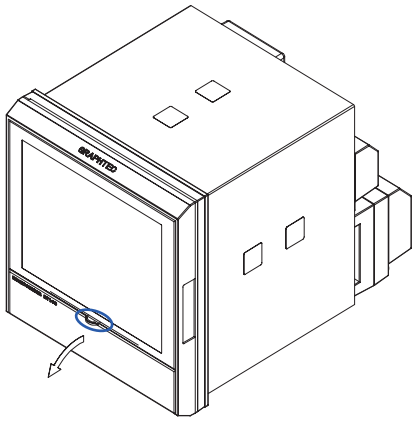
1. MT100 Part Names and Functions

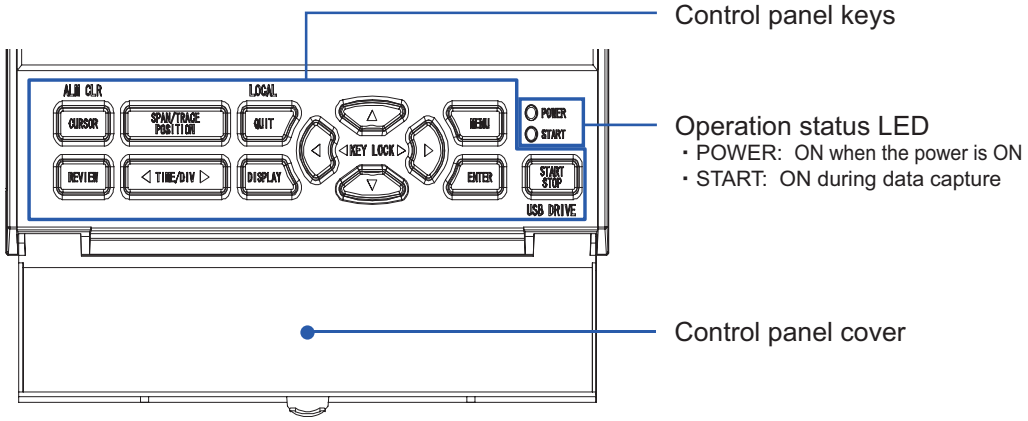
Front



Opening the Control Panel Cover

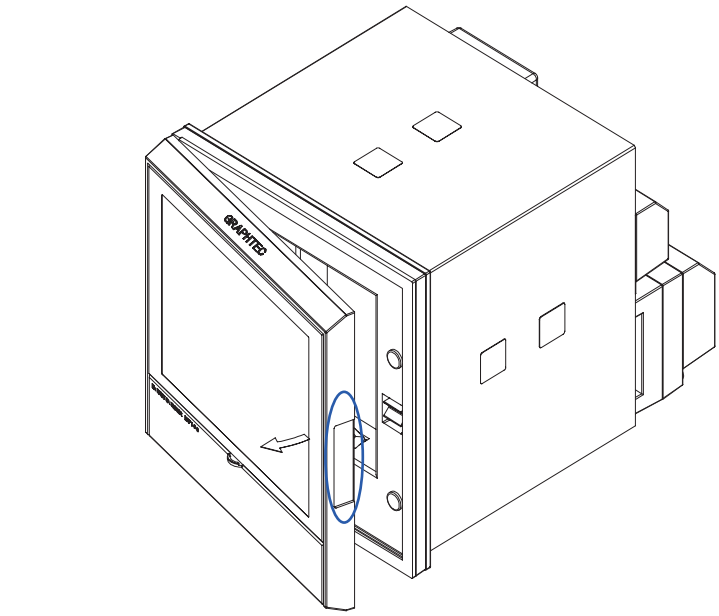
As shown in the following figure, hold the tab in the center of the control panel cover and pull it in the direction indicated by an arrow to open the cover.

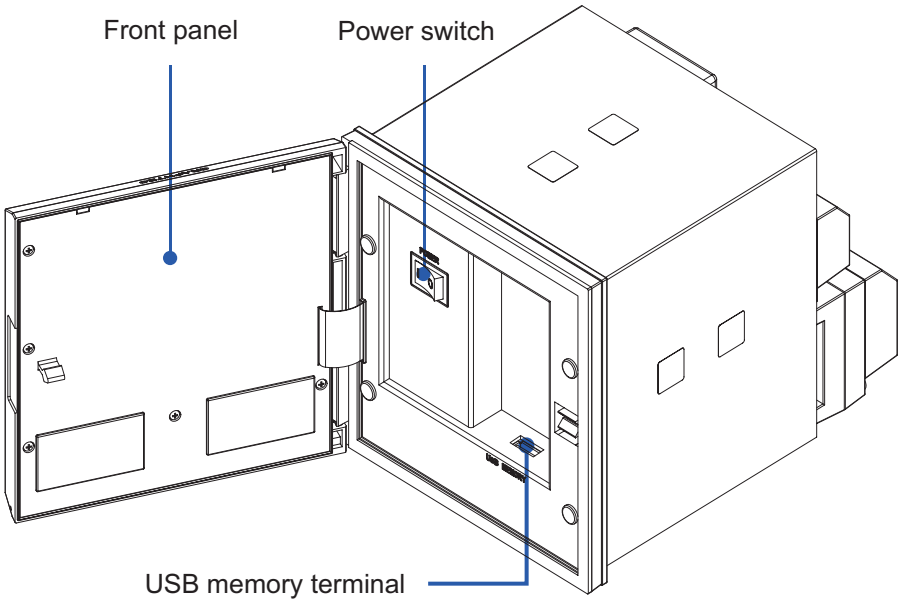




Opening the Front Panel

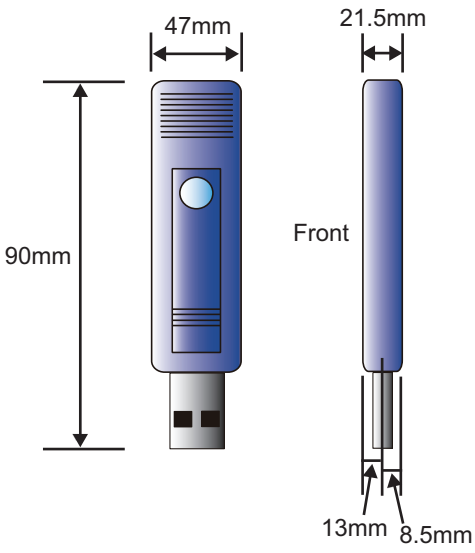
Pull the part indicated by an arrow in the following figure to open the front panel.



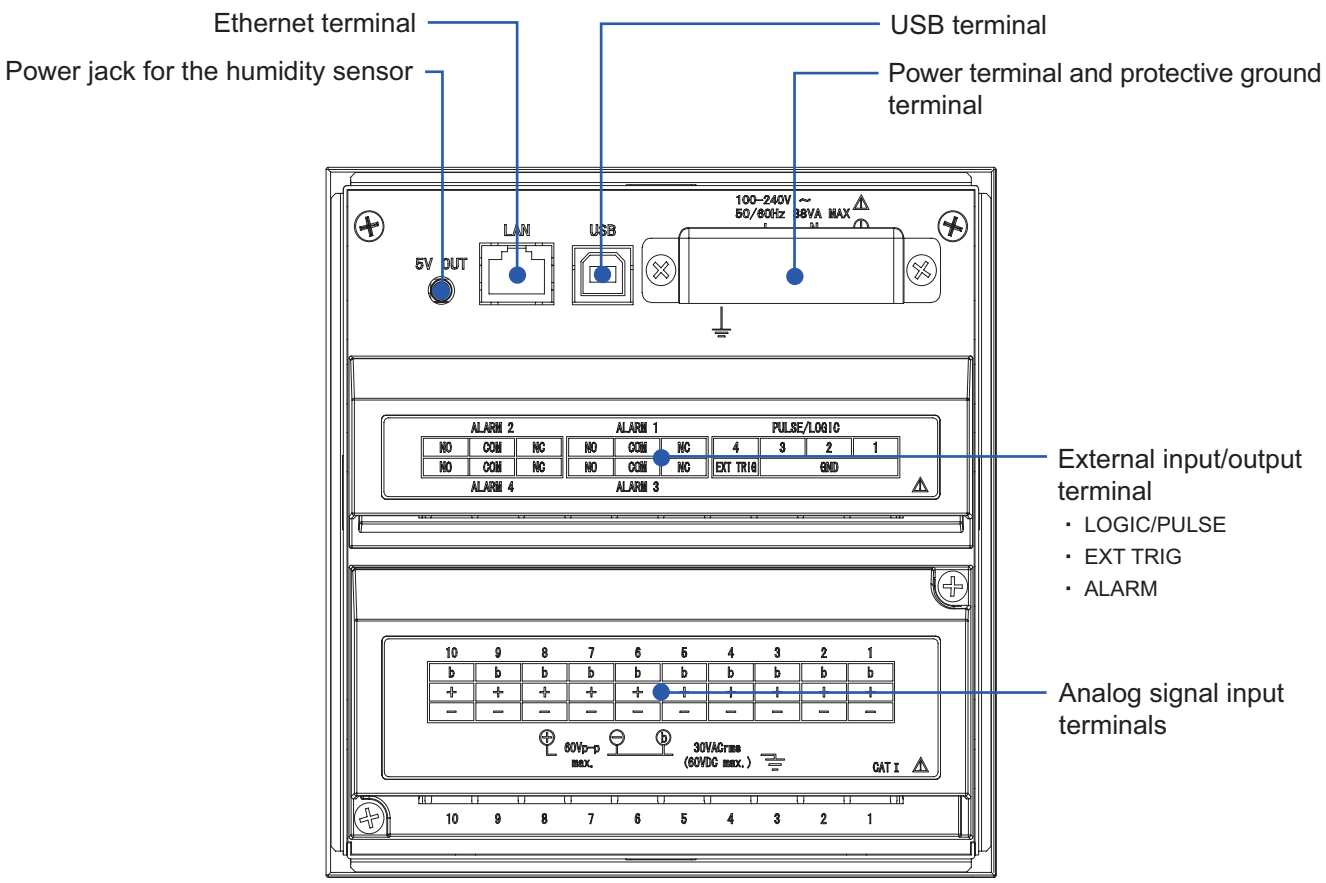


Maximum Dimensions of USB Memory

The maximum dimensions of USB memory that can be attached to the MT100 are shown in the following figure.

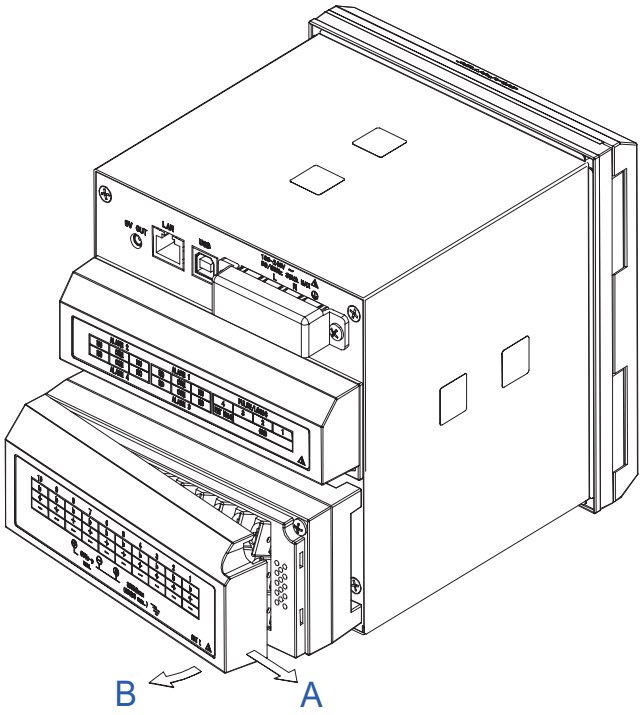


Rear



Removing the Terminal Cover

While applying force in direction A, pull the cover in direction B to remove the cover.
(The external input/output terminal cover can also be removed in the same way.)



2. Installation Procedure

Installation Site

Install the MT100 in an indoor location where:

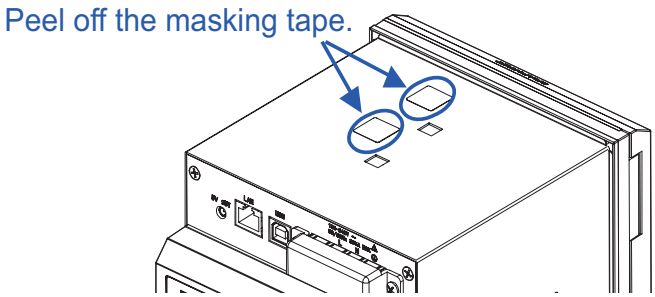
- an instrumentation panel can be attached
  For information on the panel cut dimensions, see the User's Manual in the supplied CD-ROM.
- there is good ventilation
- there is little mechanical vibration
- the floor is level

> ⚠ CAUTION
>
> Do not install the MT100 in a location where:
> - the unit is exposed to direct sunlight or near a heater.
> - there are excessive greasy fumes, steam, humidity, dust, corrosive gas, etc.
> - the unit is near an electromagnetic field source.

Installation Procedure

As the panel, use a steel sheet 2mm to 26mm in thickness. Use the panel mount brackets provided with the MT100 to attach it. There are two panel mount brackets. Be sure to attach them in two opposite locations (up and down or left and right).

① Peel off the masking tape from the surface on which you want to attach a panel mount bracket.

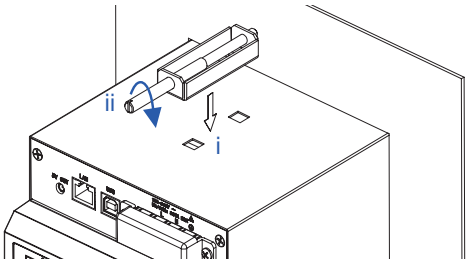


② Insert the MT100 from the front side of the panel.

③ Attach the MT100 to the panel using the provided mount bracket as shown in the figure below.

i. Use two mount brackets on the up and down or left and right of the case.
(Peel off the masking tape on the case that covers the holes for mount brackets beforehand.)

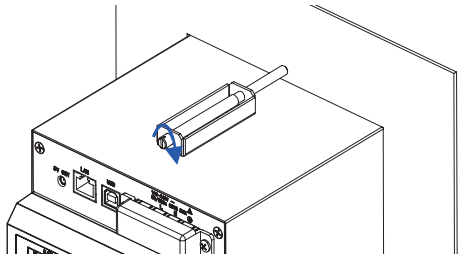
ii. Attach the two brackets first, then temporarily tighten mounting screws on them.



④ Tighten the screws to an appropriate torque.

Next, tighten the mounting screws to an appropriate torque to fix the main unit. While keeping the main unit roughly at right angles to the panel, bring the mounting bracket into close contact with the main unit case and tighten the mounting screws.

* The appropriate tightening torque of panel mounting screws is 10 to 12kgf/cm.



3. Connecting to an AC Power Supply

No power cord is supplied with the MT100.
Be sure to use a power cord supplied with the optional desktop case (B-541).

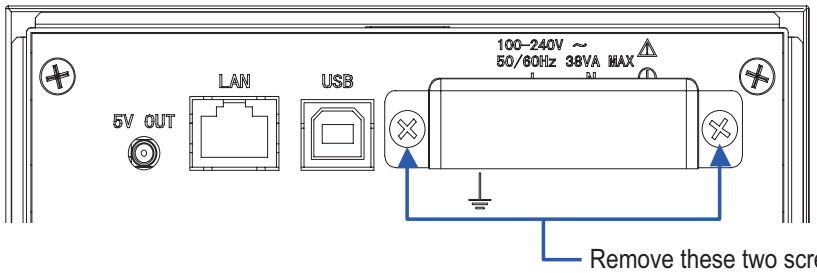
⚠ WARNING

- To avoid electric shocks, check that the AC source for the power supply has been turned off. To prevent fire, use wires or cables with a performance equivalent to or better than 600V insulated wires (AWG 20 to 16).
- Before turning on the power, be sure to connect the protective ground terminal to the ground at a grounding resistance of 50Ω or less.
- For cables to be connected to a power supply and a protective ground terminal, use non-insulated solderless ring terminals (for 4mm screws) inserted in insulation caps.
- In the power line, provide a switch that can cut off the MT100 from the main power source (double-pole type). As specifications of the switch, the rated steady-state current must be 1A or larger and the rated inrush current must be 60A or larger.
- Do not insert a switch or fuse in a grounding line.
- Use a power supply that meets the following conditions.

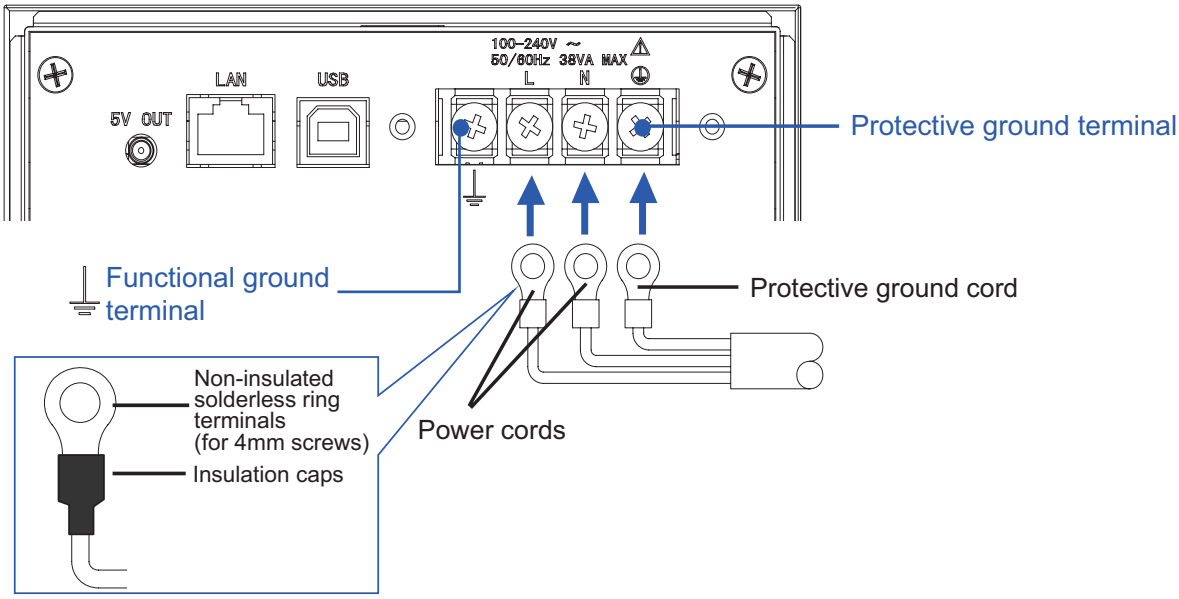
Item	Specification
Rated power voltage	100 to 240VAC
Power supply voltage range	90 to 264VAC
Rated power frequency	50/60Hz
Power frequency tolerance	50/60Hz±2%
Maximum power consumption	38VA

Connecting Cables

① Turn off the power supplied to the MT100 and open the power terminal cover (transparent).



② Connect the power cord and the protective ground cord to the power terminals.
Use non-insulated solderless ring terminals (for 4mm screws) and insulation caps.
The appropriate tightening torque of screws is 12 to 14kgf/cm.



③ Close the power terminal cover (transparent) and fix it with screws.
④ Open the front panel and turn on the power switch to power on the MT100.

4. Connecting Signal Input Cables

This section describes how to connect the signal input cables.

⚠ WARNING

To avoid electric shocks, check that the AC source for the power supply has been turned off before connecting

⚠ CAUTION

- A large pulling force applied to an input/output signal cable connected to the MT100 may damage a terminal or the signal cable. Therefore, fix the wiring cords to the back of the installed panel.
- To prevent fire, use signal cables with a rated temperature of 70°C or higher.
- Do not apply a voltage higher than the following values to input terminals. If you do, the MT100 may suffer damages.
  Maximum input voltage: ±60VDC
  Maximum common-mode voltage: AC33Vrms or ±60VDC

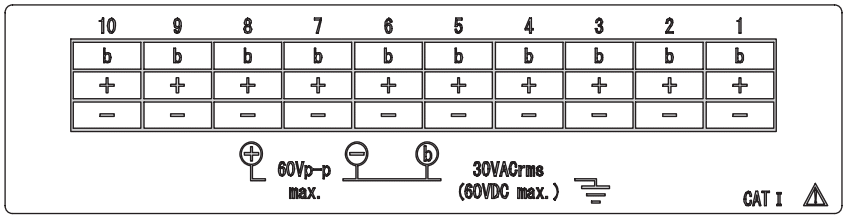
Caution on Connecting Cables

- Connect input signal cables to terminals using insulated solderless terminals (for 4mm screws).
- Keep the measuring circuit away from a power cable (power circuit) or a ground circuit.
- If the measuring target is a noise source, refer to page 29 and take a necessary measure.
- Be sure to connect a protective ground terminal to the ground at a low grounding resistance (50Ω or less).
- Be sure to attach a terminal cover when you measure temperatures using a thermocouple.
- Do not use a thick wire with a high heat radiation effect when you measure a temperature using a thermocouple (a wire having a diameter of 0.65mm or less is recommended).
- Avoid causing changes in the outside air temperature. In particular, turning on and off the fan near the MT100 causes significant temperature changes.
- If an input cable is connected in parallel with another device, the measurement values of both the MT100 and the device may be influenced.
- Do not turn on and off one of the devices during operation. The other device may be adversely influenced.

Connecting Cables

① Remove the terminal cover.

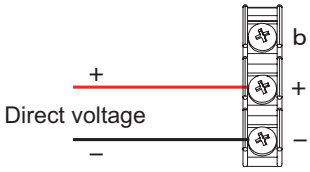
② Connect signal cables to the input terminals.
The appropriate tightening torque of screws is 12 to 14kgf/cm.
Connect wires to terminals as shown in the following figure after checking them.



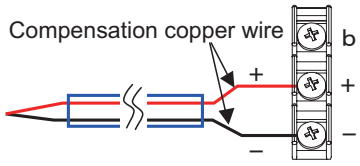
③ Reinstall the terminal cover.

Connection diagram

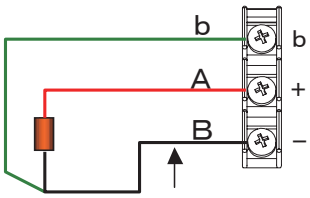
●Direct voltage input



●Thermocouple input

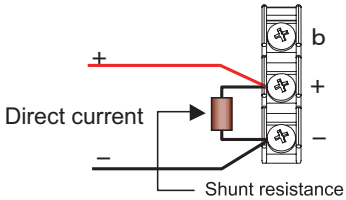


●Resistance temperature detector input



Lead wire resistance should be 10Ω or below per wire, and equivalent among the three wires.

●Direct current input



Shunt resistance
Ex: for current in the 4 to 20mA range, apply a resistance of 250Ω (±0.1%) and perform measurement in the 1 to 5V range.

5. Connecting Cables to Digital Input and Alarm Output Terminals

This section describes how to connect the signal input/output cables.

⚠ WARNING

To avoid electric shocks, check that the AC source for the power supply has been turned off before connecting cables.

⚠ CAUTION

- A large pulling force applied to an input/output signal cable connected to the MT100 may damage a terminal or the signal cable. Therefore, fix the wiring cords to the back of the installed panel.
- To prevent fire, use signal cables with a rated temperature of 70°C or higher.
- Do not apply a voltage higher than the following values to input terminals. If you do, the MT100 may suffer damages.

  Digital signal terminal: +24VDC at the maximum
  Alarm output relay terminal: 250VAC/2A, 30VDC/2A

Caution on Connecting Cables

When you connect digital input and alarm output cables, please note the following:

- Use insulated solderless terminals (for 4mm screws) to connect signal cables to terminals.
- Connect a protective ground terminal to the ground at a low grounding resistance (50Ω or less).

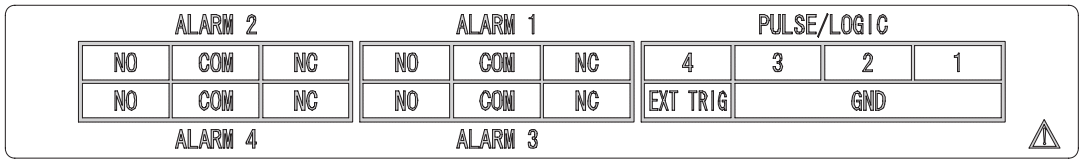
Connecting Cables

① Remove the terminal cover.

② Connect signal cables to the input terminals.

The appropriate tightening torque of screws is 12 to 14kgf/cm.

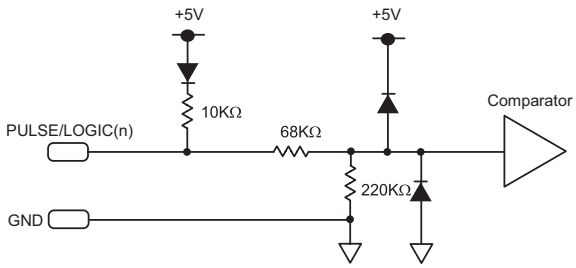
Connect wires to terminals as shown in the following figure after checking them.



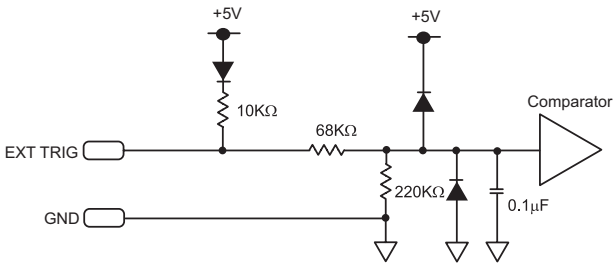
③ Reinstall the terminal cover.

Internal equivalent circuit of input/output circuit

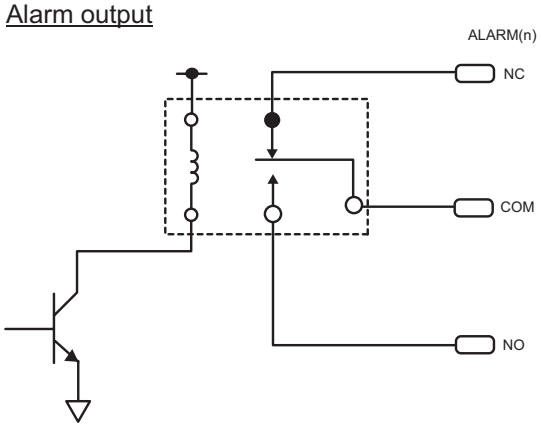
Pulse/logic input



Trigger input



Alarm output



* When an alarm is generated, COM and NO are connected (while COM and NC are open-circuited).

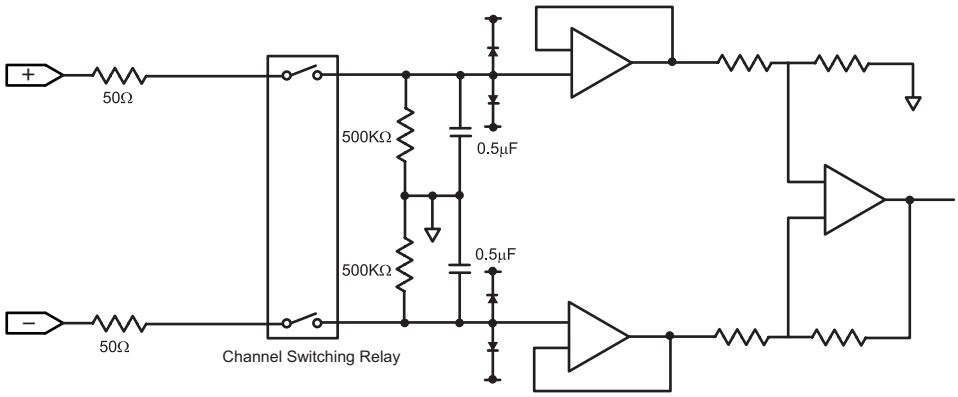
6. Precautions to Observe When Performing Measurement

Please be sure to read the following carefully in order to prevent electric shocks or shorts.

⚠ DANGER

- Do not apply voltage of AC30Vrms or 60VDC or above between the analog input section and main unit (GND terminal), or between each analog input channel.
- Do not apply radio-frequency signals with high voltage (50KHz or above).

Input Circuit Diagram for Analog Input (Voltage, Thermocouples)



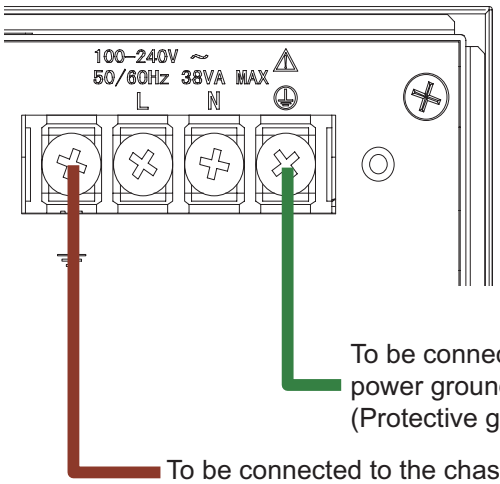
⚠ CAUTION

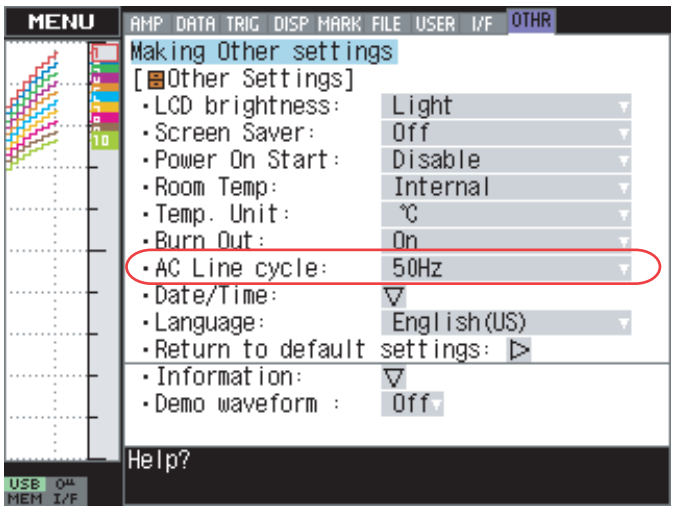
Capacitors have been incorporated into the input circuit to increase the noise elimination capability. After voltage measurement, when the inputs have been disconnected, there will still be some electric charge remaining. Before starting another measurement operation, short-circuit the + and - terminals to enable self-discharge.
The MT100 has a scan system.
While in the status (open) in which signals are not input to the input terminal, measured results may be influenced by signals from other channels.
In such a case, turn OFF the input setting or short circuit +/-.
If signals are input correctly, measured results are not influenced by other channels.

7. Noise Countermeasures

If the measurement values of the MT100 vary due to external noise, the following countermeasure is recommended. (The effect varies depending on the noise type.)

Example 1: Connect the ground terminal of the MT100 to the ground (see the following figure).
Example 2: Connect the ground terminal of the MT100 and the ground terminal of a measurement target (see the following figure).
Example 3: Set the filter to other setting than OFF in the AMP setup menu.
Example 4: Set a sampling interval at which the digital filter of the MT100 is effective (500ms or more).





8. Initial Setup

Language Setting

When you power on the MT100 for the first time after purchase, a language selection menu is displayed. Select a language that you want to use.

The language setting can be changed later.
To change the setting later, open OTHR menu and select Language.

Setting the Date and Time

If you are using the MT100 for the first time, charge the internal rechargeable battery and then make the date and time settings.

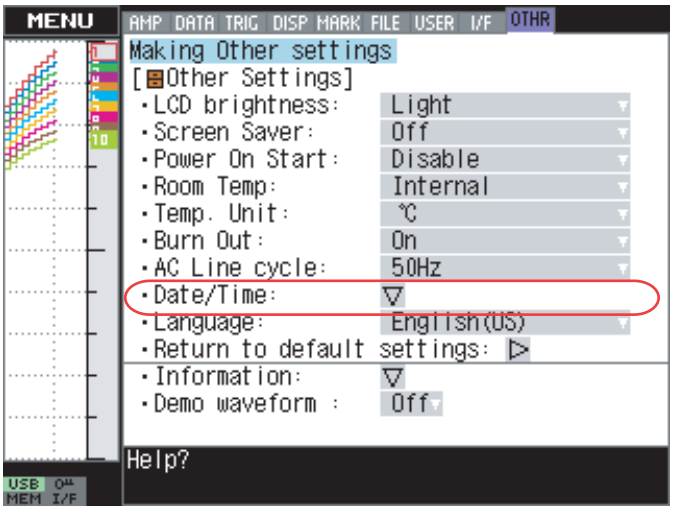
> ⚠ CAUTION
>
> If the MT100 is not used for a period of approximately six months, the internal rechargeable battery may be discharged and the date and time may revert to the initial settings. If this happens, recharge the battery before using the MT100.

How to Recharge the Rechargeable Battery

Turn on the power switch and leave the MT100 connected for at least 24 hours.

How to Set the Date and Time

Press the MENU key, display the OTHR screen, and then set the date and time at the Date/Time Settings sub-menu. Refer to the User's Manual in the supplied CD-ROM for more information on the setting.



9. Window names and functions

Screen

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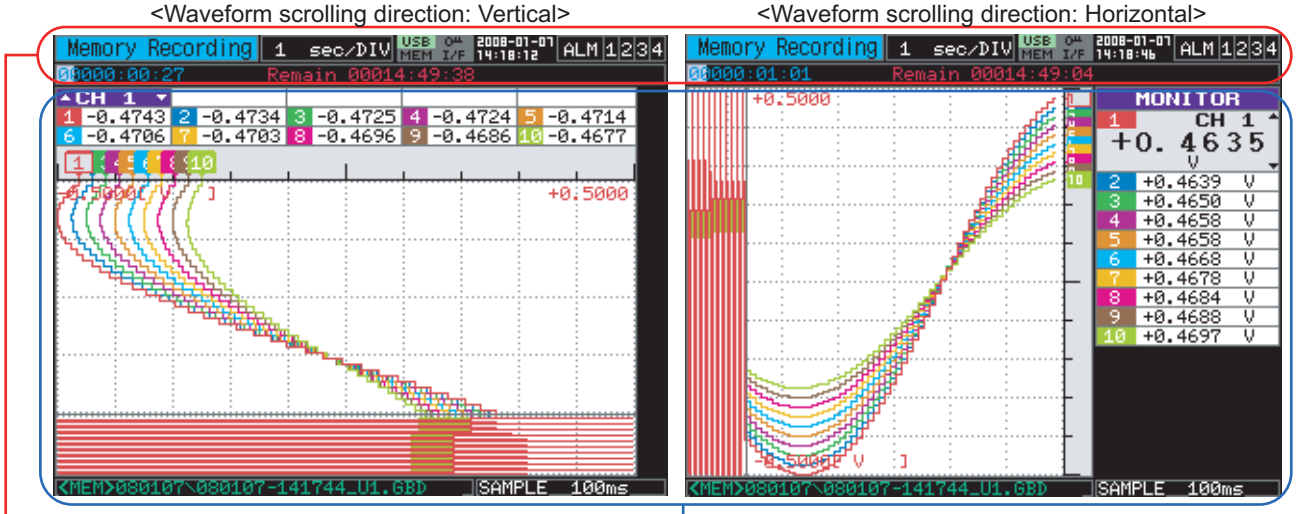
<Waveform scrolling direction: Horizontal>



Status display

Measurement data display

Status display

① Simplified message display ② Time/DIV display ③ Status display ④ Clock display ⑤ Alarm display

① Simplified message display

Displays the operation status of the MT100.

- Free Running : Displayed in the start-up status or when no data is being captured.
- Armed : Displayed when the MT100 is waiting for a trigger to be issued after measurement is started (No data is being captured).
- Memory Recording : Displayed when data is being captured to the internal memory of the MT100.
- USB Drv Recording : Displayed when data is being captured to the USB memory.
- Memory Review : Displayed when data is being replayed from the internal memory of the MT100.
- USB Drive Review : Displayed when data is being replayed from the USB memory.

② Time/DIV display

Displays the current time scale.

③ Status display

- USB memory status display

USB : (Gray) No USB memory is attached.
USB : (Green) USB memory is attached but not being accessed.
USB : (Red) USB memory is being accessed.

- Internal memory status

MEM : (Gray) Internal memory is not accessed.
MEM : (Red) Internal memory is being accessed.

⚠ CAUTION

Do not turn off the power of the MT100 while the USB memory or internal memory is being accessed.
If you do, data may be corrupted and you may no longer be able to access the memory.

- Key lock status display

: (Gray) Keys are not locked. Normal operation is enabled.
: (Yellow) Keys are locked. All the keys are locked.
Refer to the User's Manual provided with the MT100 for more information on the key lock statuses.

- Remote mode display

I/F : (Gray) Local mode. The operations on the MT100 are enabled.
I/F : (Yellow) Remote mode. The operations on the PC are enabled except for some operations.
Cancel the PC connection to automatically return from the remote mode to the local mode.
If the local mode is not regained, press the QUIT key.

④ Clock display

Displays the current date and time.

⑤ Alarm display

Displays the alarm output terminal status. The terminal for which an alarm has been generated has a terminal number displayed in red.

Measurement data display

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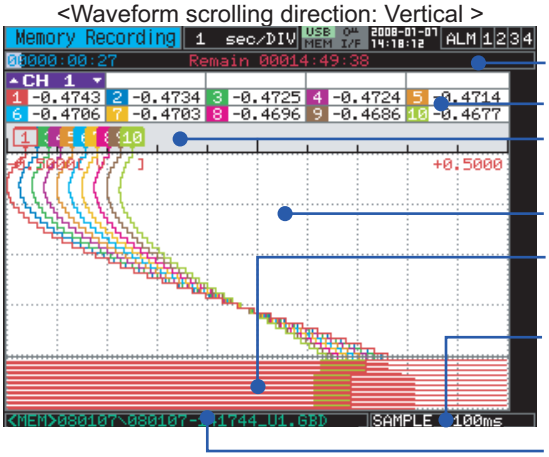

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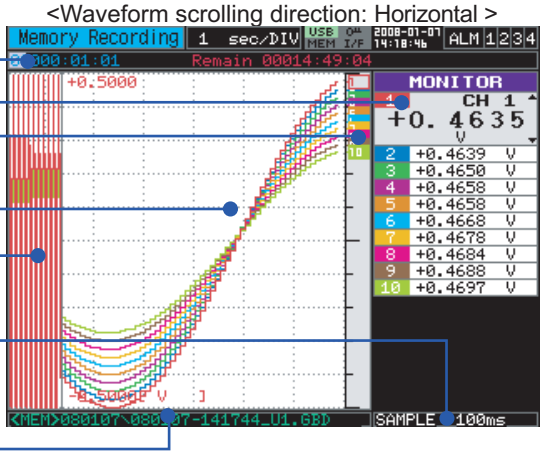


①Data capture bar
②Digital display
③Pen display
④Waveform display (Present)
⑤Compressed waveform display (Past)
⑥Sampling interval display
⑦File name display

① Data capture bar

During data capture, indicates capturing time and the remaining capacity of the capture media.
(When the remaining capacity runs short, the display changes into orange.)
During replay, indicates information about the displayed position.

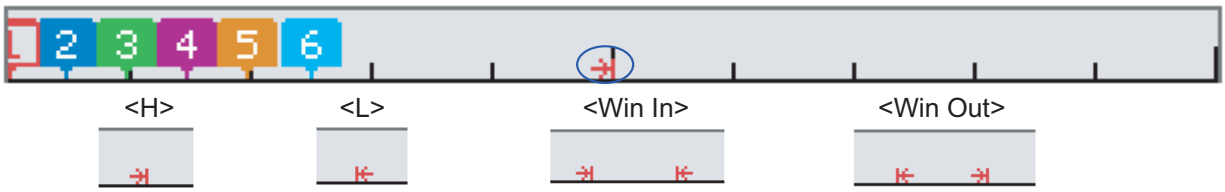
② Digital display

Displays the input value of each channel.
Use the SPAN/TRACE/POSITION key to check the setting value of each channel.

③ Pen display

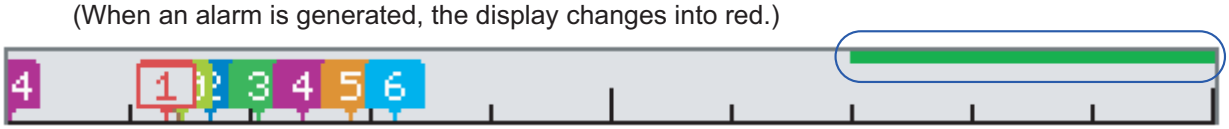
Displays the position of each channel signal with the pen.
In addition, displays the trigger position and the alarm range.

・Trigger level display
Displays the trigger level position and direction.



* Displays the trigger level also in horizontal scrolling.

・Alarm range display
Displays the alarm position and range.
An alarm is generated when a signal enters the green area shown in the following figure.
(When an alarm is generated, the display changes into red.)



* Displays the alarm range also in horizontal scrolling.

④ Waveform display (Present)

Displays measurement signals as waveforms in real time.

⑤ Compressed waveform display (Past)

Displays measurement signals in compressed format.
The compression rate can be set using the menu.
Refer to the User's Manual in the supplied CD-ROM for more information on the setting.

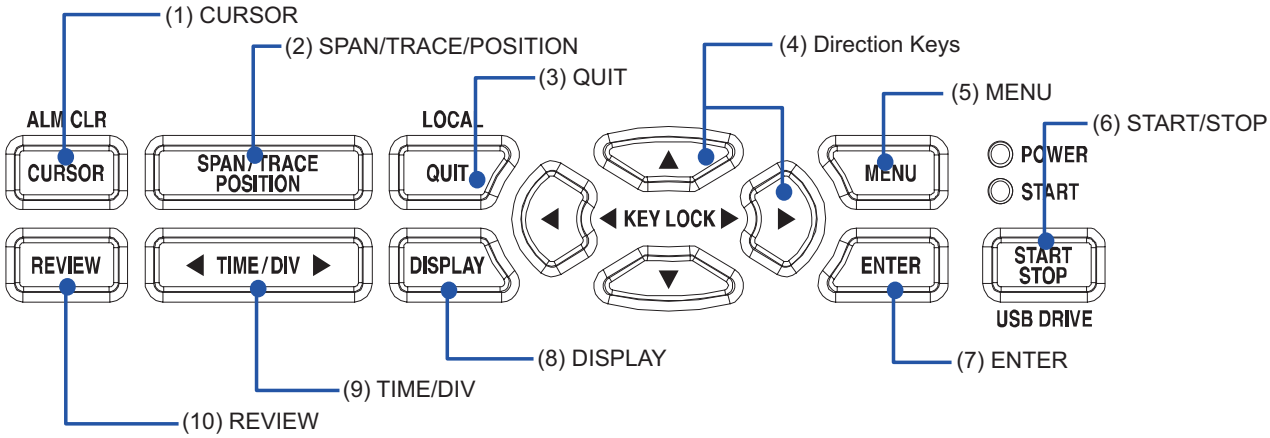
⑥ Sampling interval display

Displays the current sampling interval.

⑦ File name display

Displays the name of the file used to capture data.
(Displayed only while data is being captured.)

10. Key Operation



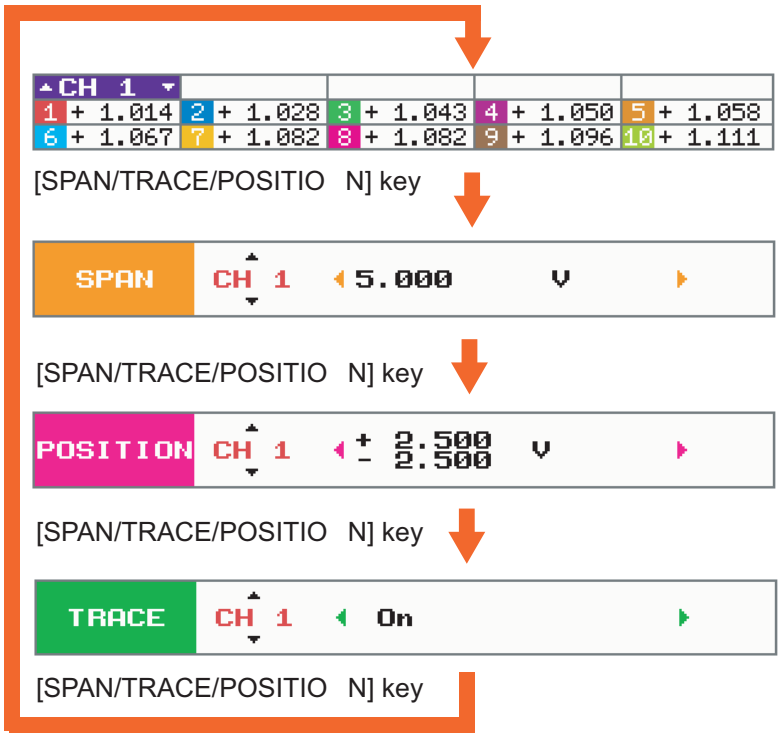
(1) CURSOR (ALM CLR)

This key has different roles according to the operation status.

- During replay: This key is used to toggle between cursors A and B displayed during replay.
- During free-running and data capture: When the alarm setting is “Hold generated Alarm”, the maintained alarm is cleared.

(2) SPAN/TRACE/POSITION

Pressing this key can switch the channels of the digital display area.
Used to change the settings related to waveform display during free running (when stopped), data capture and data replay.



MONITOR

Displays the measurement values of each channel.
(Default)

SPAN

Allows changing of the span value.

- Channel change: △▽ keys
- Span change: ◁▷ keys
- Change range: Eight voltage levels and six temperature levels

POSITION

Allows changing of the waveform position.

- Channel change: △▽ keys
- Position change: ◁▷ keys
- Change range: Range can be changed in units of 10%.

TRACE

Allows turning ON/OFF of the waveform display.

- Channel change: △▽ keys
- Trace change: ◁▷ keys
- Change range: ON/OFF

* Data capture is enabled even with the OFF setting.

(3) QUIT (LOCAL)

This key is primarily used for the following operations.

- To cancel a setting during menu configuration.
- To return to the MONITOR window when the SPAN/TRACE/POSITION window is displayed.
- To cancel remote status (in which keys are disabled) through interface control.
- To close the menu screen.
- To quit data replay.
- To return from the Digital + Calculation Display or Bar Graph Display to Waveform + Digital Display

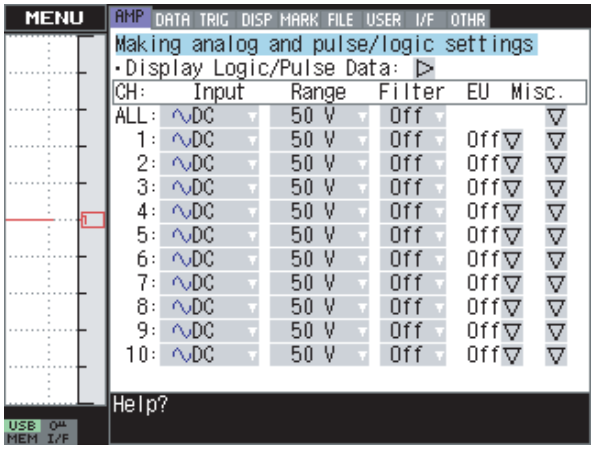
(4) Direction keys

This key is primarily used for the following operations.

- To move a menu or setting item during menu configuration.
- To move the cursor during replay.
- To move the active channel in the Waveform + Digital screen (△▽ keys).
- To change the setting of SPAN/TRACE/POSITION (◁ ▷ keys).

(5) MENU

Open the settings window to capture data. Pressing this key switches the tab on the settings window.
Refer to the User's Manual in the supplied CD-ROM for more information on the setting.

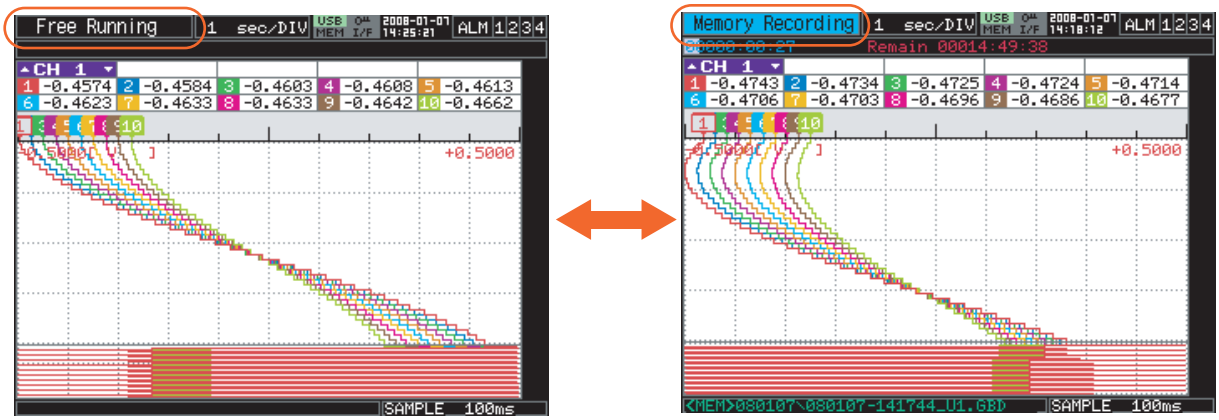


AMP	Specify input signal-related settings. ・Input, range, filter, etc.
DATA	Specify capture-related settings. ・Sampling interval, file name, statistical calculation, etc.
TRIG	Specify trigger and alarm settings. ・Capture start and stop conditions, alarm conditions, etc.
DISP	Specify screen display settings. ・Scrolling direction, waveform color, etc.
MARK	Specify mark-related settings. ・Mark text setting, mark display execution, etc.
FILE	Specify file-related settings. ・Setting conditions, bitmap, file operations, etc.
USER	Specify setting conditions for each user of the MT100. ・User name, user switching, etc.
I/F	Specify interface-related settings. ・USB ID number, LAN IP address, etc.
OTHR	Specify miscellaneous settings. ・LCD brightness, language, AC line frequency, etc.

(6) START/STOP(USB DRIVE)

This key is used in the following two operations:
<Starting or Stopping Measurement>

- Pressing this key during free-running starts capture.
- Pressing this key during capture stops capture.



<USB Drive Mode>

In USB Drive Mode, the internal memory is recognized by the PC as external storage media.
Files on the internal memory, being recognized as a removable disk, can be easily transferred, deleted, or otherwise handled.

① Use a USB cable to connect the MT100 and a PC.
② While pressing the MT100 START/STOP key, turn the power ON.
③ The external storage media is recognized by the PC and data exchange becomes possible.
(The screen is shown in the following figure.)

⚠ CAUTION

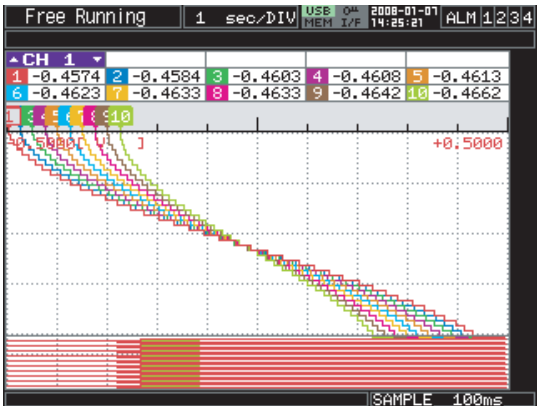
- To exit USB Drive Mode, turn the power off and then on.
- When the MT100 is used in USB Drive Mode, no user operation is allowed, including data capturing and data replay.

(7) ENTER

This key is used to finalize setting items during menu configuration or open submenus.

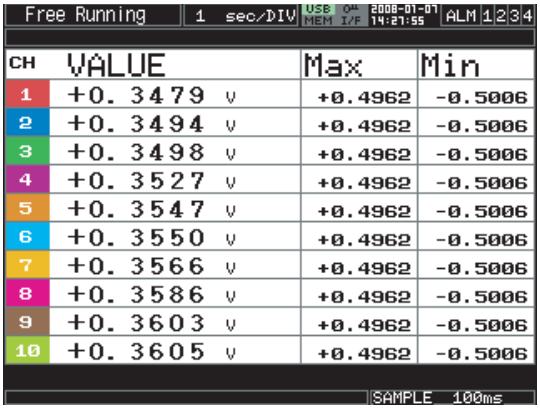
(8) DISPLAY

This key is used to switch the data display mode.
You can switch the display mode during free running (when stopped) and data capturing.
Pressing this key switches the display mode as follows:



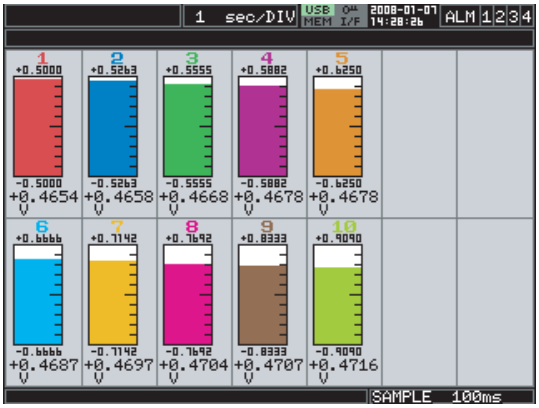
Waveform + Digital Screen

Displays waveforms and digital values.
This is the initial screen at power-on.



Digital + Calculation Display screen

Displays digital values and calculation results in large text.
Calculation results are added up in real time.
Refer to the User's Manual in the supplied CD-ROM for more information on the calculation results.



Bar Graph screen

Displays measurement data in bar graphs.
Allows you to select a reference point of a bar graph.
Refer to the User's Manual in the supplied CD-ROM for more information on the setting.

(9) TIME/DIV

Pressing this key changes the time axis display width.
The following settings are possible.

1, 2, 5, 10, 20, 30sec/DIV
1, 2, 5, 10, 20, 30min/DIV
1, 2, 5, 10, 12, 24, 72 hour/DIV

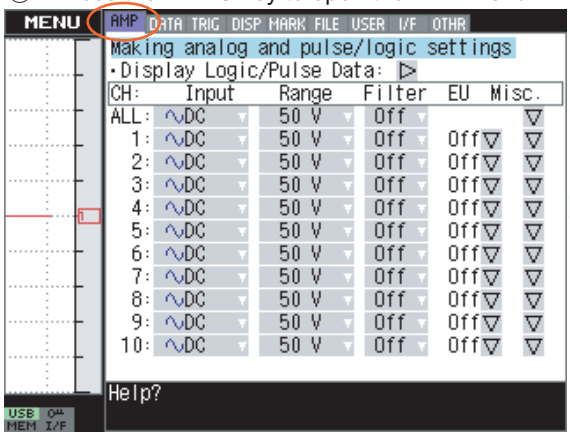
(10) REVIEW

This key is used to replay captured data.

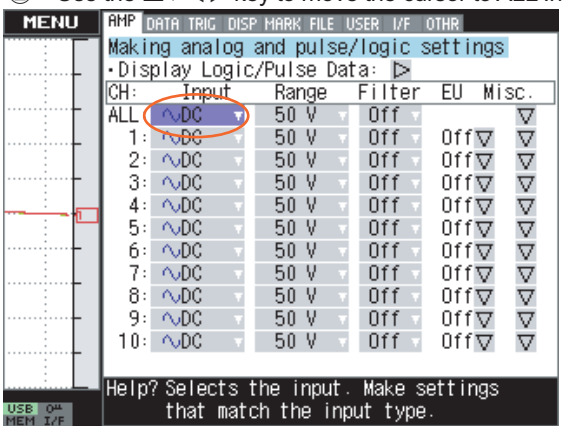
11. Setting Examples

(Example 1) Enabling temperature measurement using thermocouples for all the channels

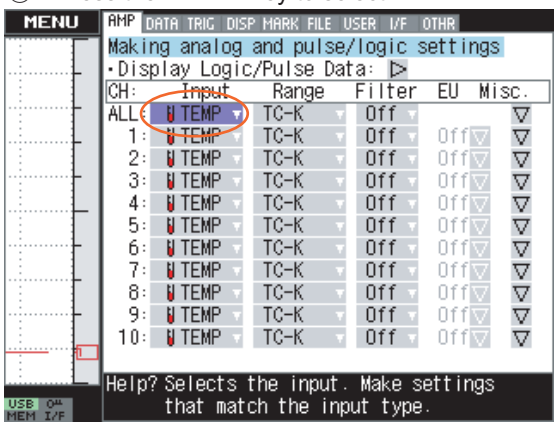
① Press the MENU key to open the AMP menu.



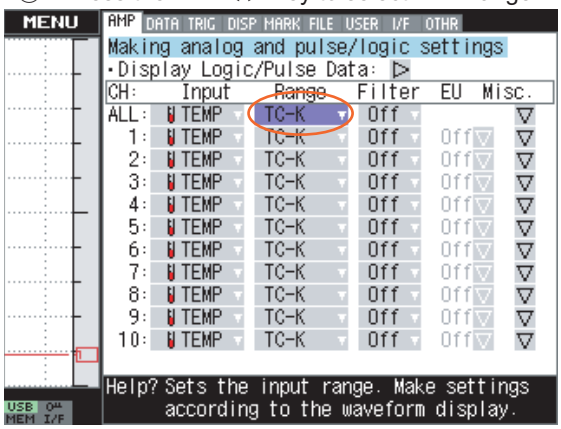
② Use the △▽◁▷ key to move the cursor to ALL Input.



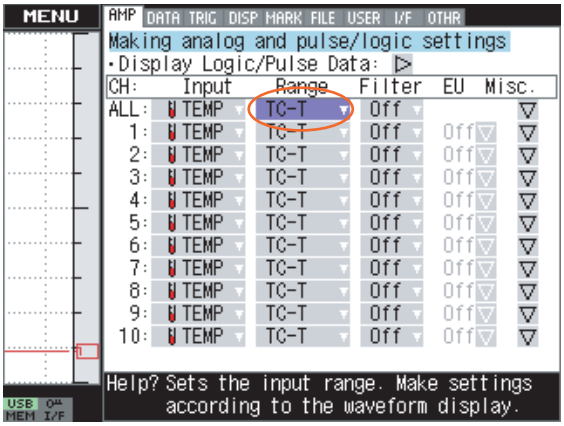
③ Press the ENTER key to select TEMP.



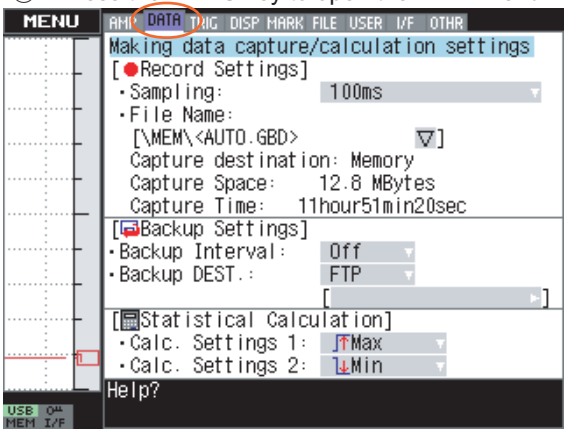
④ Press the △▽◁▷ key to select ALL Range.



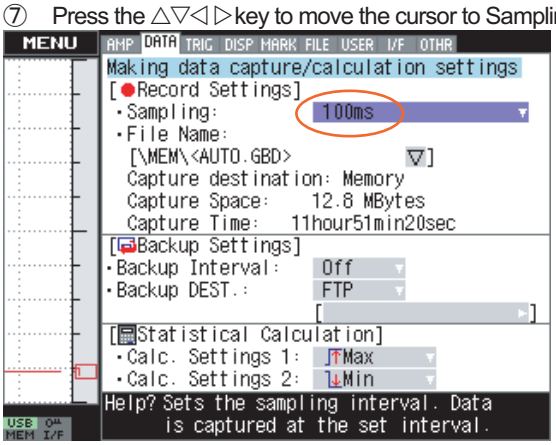
⑤ Press the ENTER key to select a thermocouple type.



⑥ Press the MENU key to open the DATA menu.

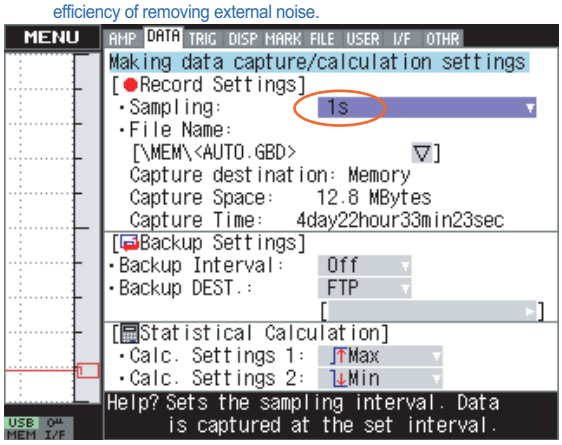


⑦ Press the △▽◁▷key to move the cursor to Sampling.



⑧ Press the ENTER key to set the sampling interval to 1s.

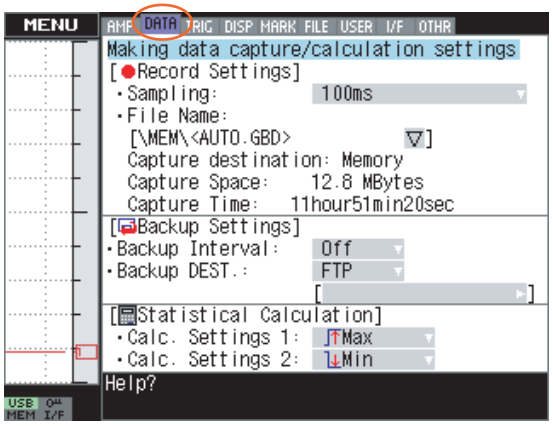
A sampling interval of 1 sec or more is recommended to improve the efficiency of removing external noise.



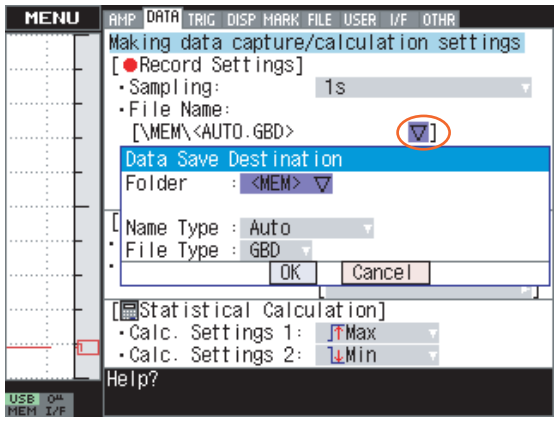
(Example 2) Storing captured data in USB memory

This setting allows you to store captured data with an automatically generated file name in USB memory.
* Attach the USB memory to the MT100 before making this setting.

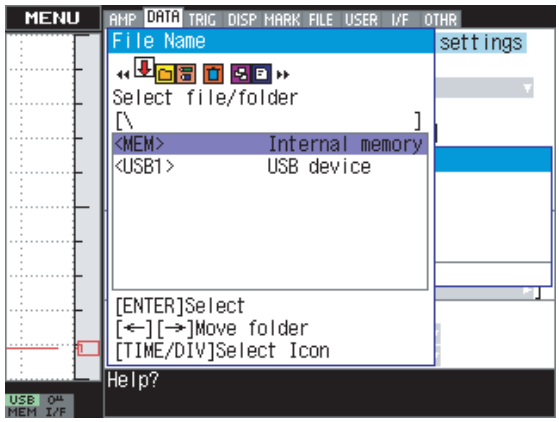
① Press the MENU key to open the DATA menu.



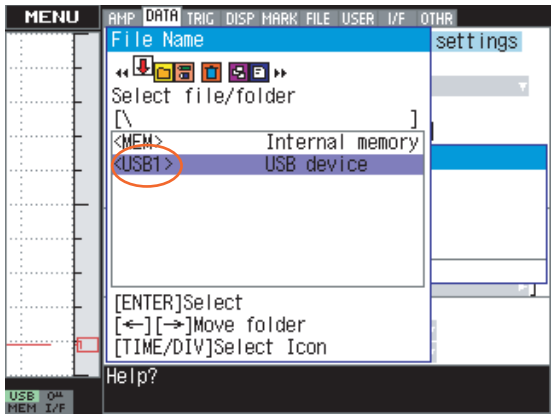
② Use the △▽◁ ▷ key to select File Name and press the ENTER key.



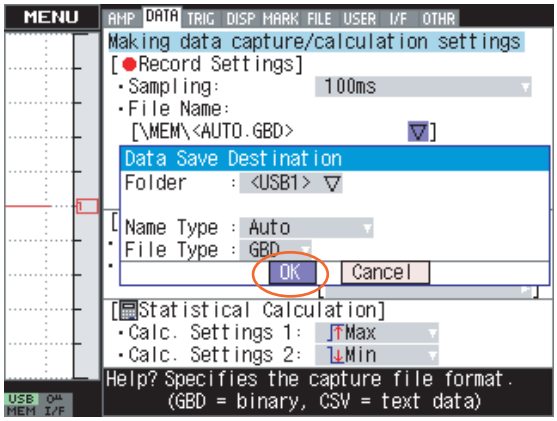
③ Select Folder and press the ENTER key.



④ Use the △▽◁ ▷ key to move the cursor to USB1 and press ENTER.



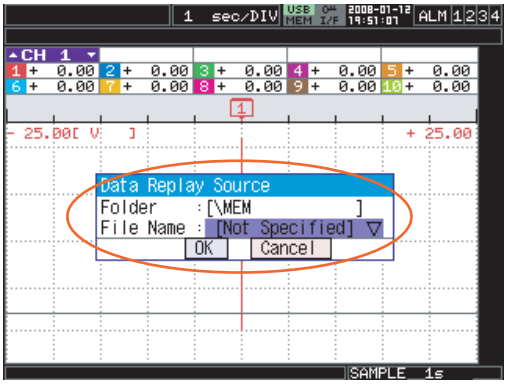
⑤ Use the △▽◁ ▷ key to select OK and press the ENTER key.



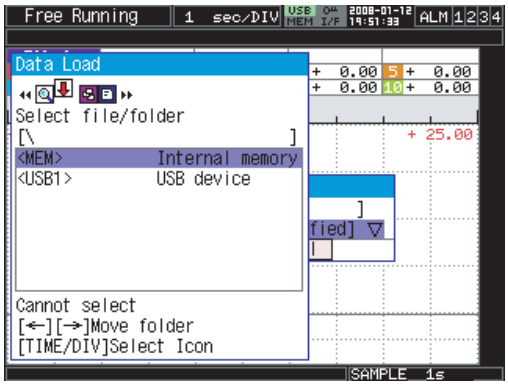
(Example 3) Replaying captured data

This section explains how to replay captured data.

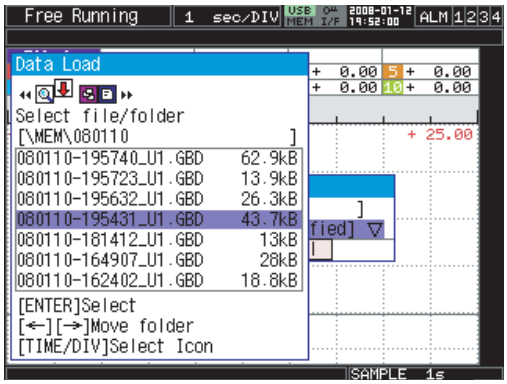
① Press the REVIEW key to open the Data Replay Source menu.



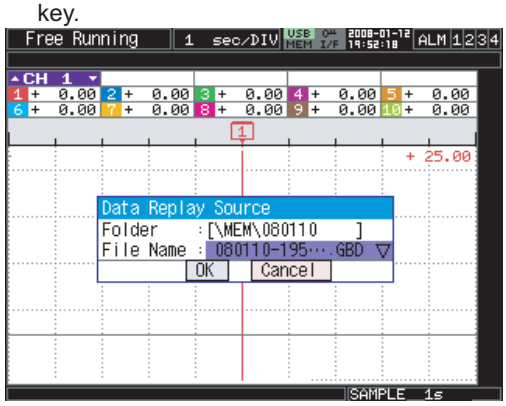
② Select File and press the ENTER key to open the file selection menu.



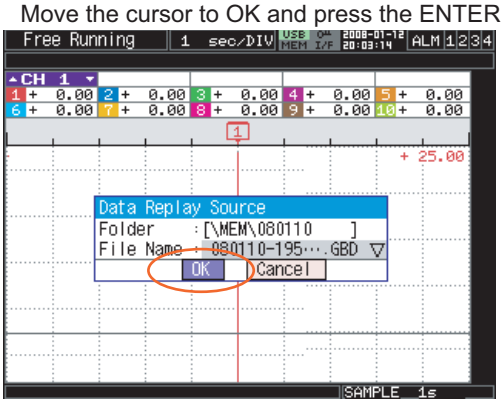
③ Press the ▷ key to go into a folder.

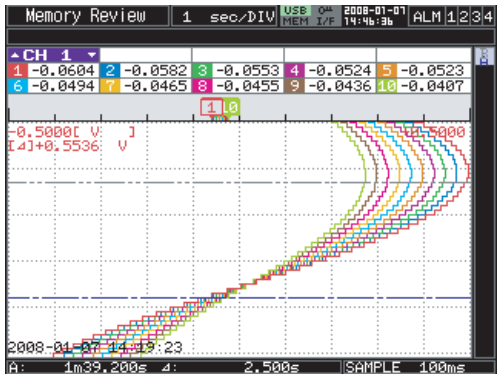


④ Select a file to be replayed and press the ENTER key.



⑤ Move the cursor to OK and press the ENTER key.





Press the △ and ▽ keys to move the cursor and check the measurement values.
Press the CURSOR key to switch between Cursors A and B.

12. Specifications

Standard Specifications

Item	Description
Number of analog input	1 unit (10 channels)
External input/output	Trigger input, Logic input 4 channels or Pulse input 4 channels, Alarm output
PC interface	Ethernet (10BASE-T/100BASE-TX), USB (FullSpeed supported) provided as standard features
Internal memory devices	Internal memory: approx. 14MB USB memory slot (FullSpeed supported) is provided as a standard feature
Sampling interval	100, 125, 200, 250, 500ms, 1, 2, 5, 10, 20, 30sec, 1, 2, 5, 10, 20, 30min, 1 hour
TIME/DIV	1, 2, 5, 10, 20, 30 sec/DIV, 1, 2, 5, 10, 20, 30min/DIV, 1, 2, 5, 10, 12, 24, 72 hour/DIV
Data save functions (internal and USB memory)	Save data: Measurement data, setup data, copy of data screen Backup function: Internal to USB memory; internal to FTP server; USB memory to FTP server * USB memory can be removed during data capture.
Calculation	Types of statistical calculation: Average value, peak value, maximum value, minimum value, RMS
	Calculation between channels: Addition, subtraction, multiplication, and division; calculation of humidity from wet and dry bulb temperature (Channels 1 and 2 only)
Display modes	Waveform + digital (vertical and horizontal scrolling), digital, and bar graph
Message/marker function	Function: Records message/marker at specified timing
	Number of registered messages: 8
	Marker type: Arbitrary message, start/stop, trigger, alarm, power failure
Data backup functions	Setup conditions: EEPROM; Clock: lithium secondary battery
Clock accuracy (23°C environment)	±0.002% (approx. 50 seconds per month)
Operating environment	0 to 50°C, 5 to 85%RH
Withstand voltage	Between AC input and GND: 1 minute at 2000VAC
	Between alarm terminal and GND: 1 minute at 1000VAC
	Between each input channel and GND: 1 minute at 350Vp-p
	Between input terminals: 1 minute at 350Vp-p
Insulation resistance	Between AC input and GND: 20MΩ or higher (500VDC)
	Between alarm terminal and GND: 50MΩ or higher (500VDC)
	Between each input channel and GND: 50MΩ or higher (500VDC)
Power supply	AC input: 100 to 240VAC/50 to 60Hz
	Terminal type: M4 screw type terminals
Power consumption	●AC power consumption

No.	Condition	
1	When the LCD is ON	38VA
2	When the screensaver is operating	30VA

	* Normal status is when LCD brightness is set to MAX.
External dimensions	H144 x W144 x D200mm
Weight	2.1kg
Other	Dust-proof and water-proof: IP-65 compatible (only the front panel)
	Vibration-tested conditions: Equivalent to automobile parts Type 1 Category A classification

Interface specifications

Item	Description
Interface types	Ethernet (10BASE-T/100BASE-TX) USB (FullSpeed)
Ethernet functions (10BASE-T/100BASE-TX)	Web server function: Displays MT100's screen image on Web browser, operation of MT100
	FTP server function: Transfers and deletes files from internal memory and USB memory
	FTP client function: Supports backup of data in internal and USB memory
	NTP client function: Adjusts internal clock
USB functions	USB drive mode: Transfers and deletes files from internal memory
Realtime data transfer speed	100 msec/10 ch maximum

Digital input specifications

Item	Description
Input/output types	• Trigger input (1 ch) • Logic input (4 ch) or Pulse input (4 ch) • Alarm output (4 ch) * Switch between Logic and Pulse
Input specifications	Maximum input voltage: 0 to +24V (single-ended ground input) Input threshold voltage: Approx. +2.5V Hysteresis: Approx. 0.5V (+2.5 to +3V)
Alarm output specifications	Output format: Relay contact output (NO/NC) Rated: 250VAC/2A

Input unit specifications:

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Number of input channels</td><td>10 ch</td></tr>
<tr><td colspan="2">Input terminal type</td><td>M4 screw type terminals</td></tr>
<tr><td colspan="2">Input method</td><td>Photo MOS relay scanning system
All channels isolated, balanced input</td></tr>
<tr><td colspan="2">Scan speed</td><td>0.1s/10 ch maximum</td></tr>
<tr><td rowspan="3">Measurement ranges</td><td>Voltage</td><td>20, 50, 100, 200, 500mV; 1, 2, 5, 10, 20, 50V; 1-5 V F.S.</td></tr>
<tr><td>Temperature</td><td>・Thermocouples: K, J, E, T, R, S, B, N, W (WRe5-26)
・Resistance temperature detector: Pt100, JPt100, Pt1000 (IEC751)</td></tr>
<tr><td>Humidity</td><td>0 to 100% (voltage 0V to 1V scaling conversion) *with B-530 (option)</td></tr>
<tr><td rowspan="2">Measurement accuracy*1 (23°C±5°C)

*1
・When 30 minutes or more have elapsed after power was switched on
・Sampling 1s
・Filter ON (10)
・GND connected</td><td>Voltage</td><td>0.1% of F.S.</td></tr>
<tr><td>Temperature</td><td>●Thermocouple*2
<table>
<tr><th>Type</th><th>Measurement Temperature Range</th><th>Measurement Accuracy</th></tr>
<tr><td rowspan="4">R/S</td><td>0 ≦Ts ≦ 100</td><td>±5.2°C</td></tr>
<tr><td>100 ＜ Ts ≦ 300</td><td>±3.0°C</td></tr>
<tr><td>R: 300 ＜ Ts ≦ 1600</td><td>±(0.05% of rdg +2.0°C)</td></tr>
<tr><td>S: 300 ＜ Ts ≦ 1760</td><td>±(0.05% of rdg +2.0°C)</td></tr>
<tr><td rowspan="2">B</td><td>400 ≦ Ts ≦ 600</td><td>±3.5°C</td></tr>
<tr><td>600 ＜ Ts ≦ 1820</td><td>±(0.05% of rdg +2.0°C)</td></tr>
<tr><td rowspan="2">K</td><td>−200 ≦ Ts ≦ −100</td><td>±(0.05% of rdg +2.0°C)</td></tr>
<tr><td>−100 ＜ Ts ≦ 1370</td><td>±(0.05% of rdg +1.0°C)</td></tr>
<tr><td rowspan="2">E</td><td>−200 ≦ Ts ≦ −100</td><td>±(0.05% of rdg +2.0°C)</td></tr>
<tr><td>−100 ＜ Ts ≦ 800</td><td>±(0.05% of rdg +1.0°C)</td></tr>
<tr><td rowspan="2">T</td><td>−200 ≦ Ts ≦ −100</td><td>±(0.1% of rdg +1.5°C)</td></tr>
<tr><td>−100 ＜ Ts ≦ 400</td><td>±(0.1% of rdg +0.5°C)</td></tr>
<tr><td rowspan="3">J</td><td>−200 ≦ Ts ≦ −100</td><td>±2.7°C</td></tr>
<tr><td>−100 ＜ Ts ≦ 100</td><td>±1.7°C</td></tr>
<tr><td>100 ＜ Ts ≦ 1100</td><td>±(0.05% of rdg +1.0°C)</td></tr>
<tr><td>N</td><td>0 ≦ Ts ≦ 1300</td><td>±(0.1% of rdg +1.0°C)</td></tr>
<tr><td>W</td><td>0 ≦ Ts ≦ 2000</td><td>±(0.1% of rdg +1.5°C)</td></tr>
<tr><td colspan="2">Reference contact compensation accuracy</td><td>±0.5°C</td></tr>
</table>
*2: Thermocouple diameters T: 0.32φ , others: 0.65φ
●Resistance temperature detector
<table>
<tr><th>Type</th><th>Measurement Temperature Range</th><th>Applied current</th><th>Measurement Accuracy</th></tr>
<tr><td>Pt100</td><td>-200 to 850°C (FS=1050°C)</td><td>1mA</td><td>±(0.05% of rdg +0.5°C)</td></tr>
<tr><td>JPt100</td><td>-200 to 500°C (FS=700°C)</td><td>1mA</td><td>±(0.05% of rdg +0.5°C)</td></tr>
<tr><td>Pt1000</td><td>-200 to 500°C (FS=700°C)</td><td>0.2mA</td><td>±(0.05% of rdg +0.5°C)</td></tr>
</table></td></tr>
<tr><td colspan="2">Reference contact compensation accuracy</td><td>Internal/External switching</td></tr>
<tr><td colspan="2">A/D converter</td><td>16 bits (out of which 14 bits are internally acknowledged)</td></tr>
<tr><td colspan="2">Temperature coefficient</td><td>Gain: 0.01% of F.S./°C</td></tr>
<tr><td colspan="2">Input resistance</td><td>1MΩ ±5%</td></tr>
<tr><td colspan="2">Allowable signal source resistance</td><td>Within 300Ω</td></tr>
<tr><td colspan="2" rowspan="3">Maximum permissible input voltage</td><td>Between +/– terminals: 60Vp-p</td></tr>
<tr><td>Between input terminal/input terminal: 60Vp-p</td></tr>
<tr><td>Between input terminal/GND: 60Vp-p</td></tr>
<tr><td colspan="2" rowspan="2">Withstand voltage</td><td>Between input terminal/input terminal: 1 minute at 350Vp-p</td></tr>
<tr><td>Between input terminal/GND: 1 minute at 350Vp-p</td></tr>
<tr><td colspan="2">Insulation resistance</td><td>Between input terminal/GND: At least 50MΩ (at 500VDC)</td></tr>
<tr><td colspan="2">Common mode rejection ratio</td><td>At least 90dB (50/60Hz; signal source 300Ω or less)</td></tr>
<tr><td colspan="2">Noise</td><td>At least 48dB (with +/– terminals shorted)</td></tr>
<tr><td colspan="2">Filter</td><td>Off, 2, 5, 10, 20, 40
Filter operation is on a moving average basis.
The average value of the set sampling count is used.</td></tr>
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