GRAPHTEC

Paperless Recorder

MOUNTCORDER

MT100

Isolated
10 channels

Multi function input

Voltage Temperature Humidity Logic/Pulse

Long term large size data can be stored directly into the USB memory

Real time data transfer by LAN/USB

[Dust proof, drip proof, vibration proof for use at harsh environment]

[Analog recorder chart paper image for easy-to-read waveform display]

[Compact design 144(W) x 144(H) x 200(D) mm]

Installing to the control system

Installing to the environmental chamber

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Easy-to-view, easy-to-use paperless recorder

Ten isolated channels and multifunction input to accommodate various measurement needs.

An isolated input system has been implemented to enable worry-free measurement. Ten input channels have been provided to meet multichannel needs.

Abundant selection of input types to meet diverse measurement needs

Voltage **Temperature**

Humidity **Logic / Pulse**

Rear panel terminal block

M4 screw terminals have been used for the input terminals to simplify wiring. The terminals can be tightened easily with a screwdriver. If an abnormal value arises, the alarm function informs the operator of the abnormality. Alarm output terminals for four channels are provided as standard.

Two types of humidity measurements are enabled.

Using the dedicated humidity sensor (B-530)

Humidity measurement can be performed by connecting the dedicated humidity sensor to an analog terminal on the MT100 unit.

Operating temperature range:-25°C to +80°C
Operating humidity range:0% RH to 100% RH.
Relative humidity measurement precision:±3% RH (5% RH to 98% RH at 25°C)
External dimensions:Φ14 mm x 80 mm (excluding the cable)
Cable length:3 m

Direct connection of dry-bulb and wet-bulb sensors

Temperature and humidity are calculated from the dry-bulb and wet-bulb temperatures measured by the dry-bulb and wet-bulb sensors and then displayed. The widely used Sprung's formula is employed for these calculations. The dry-bulb sensor is connected to Ch 1, and the wet-bulb sensor is connected to Ch 2. Calculation is performed using data captured by Ch 1 and 2.

Large volumes of data can be directly captured to a USB memory stick over a long period of time.

A USB memory stick is used for the recording medium. A large volume of data measured over a long period of time on the ten available channels can be directly written to and stored on the memory stick. The MT100's internal memory consists of 14-MB flash media.

Data capture time (when measurement is performed on ten channels)

The time is effective when the captured data is saved in the GBD format.

Capture interval (sampling speed)	100ms	1s	10s	1min
14-MB internal flash memory	Approx. 13 hours	Approx. 5 days	Approx. 53 days	Approx. 323 days
4GB USB memory stick	Approx. 82days	Approx. 824 days	Approx. 8,248 days	Approx. 49,490 days

Standard USB memory devices without high-end functions such as fingerprint recognition are required.
The file size of the captured data is limited up to 2GB when data is saved into the USB memory stick.

USB memory stick replaceable even during measurement

The USB memory stick can be removed* even while long-term recording is being performed to enable checking of measurement that is still in progress. If the USB memory stick is removed, data capture is switched to the MT100's internal buffer memory for a period of approximately 10 minutes. When the USB memory stick is reinserted in the MT100, data is once again captured to the memory stick.

*Key operation is required at the time of USB memory stick removal.

Dustproof, moisture-proof, vibration-resistant structure for measurements in severe environments—plus a space-saving design!

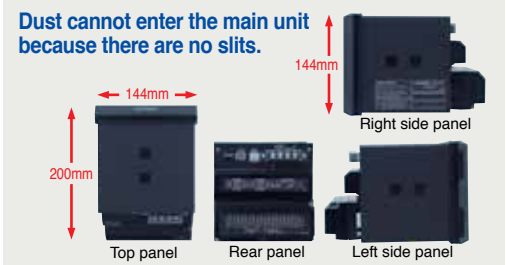
In order to withstand severe field environments, the structure has been designed to be dustproof, moisture-proof, and vibration-resistant. The front panel of the MT100 unit is an IP65-compliant structure that is both dustproof and moisture-proof. To prevent the penetration of dust, there are no slits in the MT100 unit itself. In addition, the unit's vibration-resistant structure complies with the Vibration Testing Methods for Automobile Parts Standard, Type 1 Class A.

The front panel's dustproof and moisture-proof structure complies with IP65 protection standards.

The vibration-resistant structure complies with the [Vibration Testing Methods for Automobile Parts Standard, Type 1 Class A].

Moreover, the space-saving design offers a reduced depth of only 200 mm to enable easy installation in various types of test systems.

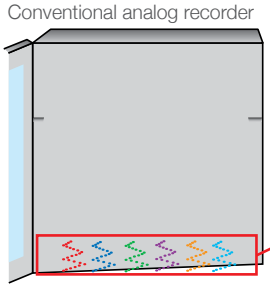
Dust cannot enter the main unit because there are no slits.



Easy-to-view waveform displays presented as if on chart paper used by analog recorders.

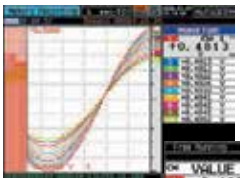
A large-format 5.7-inch color TFT liquid crystal display, bright and easy to read, is built-in. The measurement results are faithfully reproduced in the display formats used by conventional analog recorders. Waveform displays that are similar to those of pen recorders or dot-printing recorders enable the measurement progress to be easily ascertained at a glance. Four display formats are provided to enable the most easy-to-view format to be selected for each measurement application.

Conventional analog recorder



MT100 (Vertical scroll screen)

MT100 display screen
(enlarged screen of compressed data)



Digital display screen

Horizontal scroll screen

Bar graph display screen

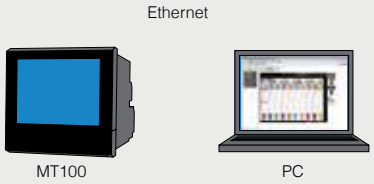
A compressed display of the time axis is provided at the bottom of the screen. As with a pen recorder or a dot-printing recorder, the waveform display enables the measurement progress to be easily ascertained at a glance. The compression ratio can be set in ten increments within the 1/10 to 1/100 TIME/DIV range.

Comprehensive network functions

A diverse range of network functions can be used to suit the measurement application.

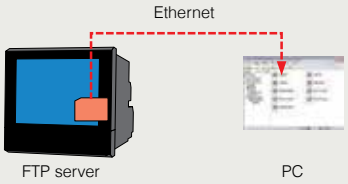
WEB server function

Waveform display and MT100 settings can be made via a web browser such as Internet Explorer.



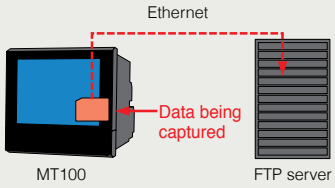
FTP server function

Data stored in the MT100's internal memory or the USB memory stick can be transferred or deleted through operations performed at the computer.



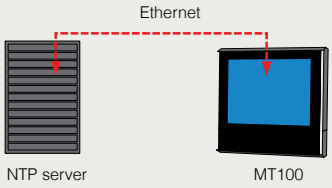
FTP client function

The data captured to the MT100's internal memory or the USB memory stick can be automatically backed up to the FTP server at fixed intervals.



NTP client server function

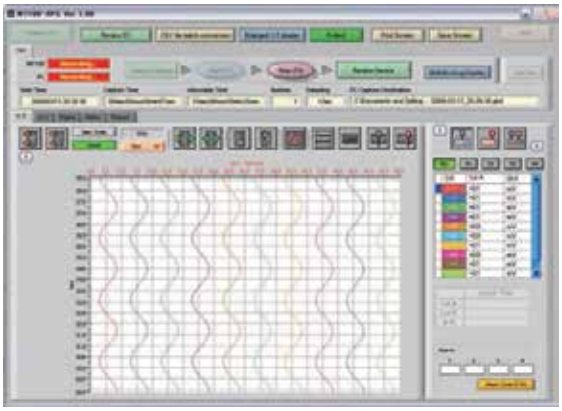
The MT100's time can be synchronized to the NTP server's time at periodic intervals.
(NTP : Network Time Protocol)



MT100 Application Software Included

The application software provided as a standard accessory with the MT100 enables easy online measurement and conversion of the data file format.

Main screen (Y-T)



Easy settings

Icon keys have been provided for intuitive waveform operations.

The number of setting screens has been reduced to only six.
Settings in the amp setting screen and other screens can be performed while viewing the input signals.

Convenient functions

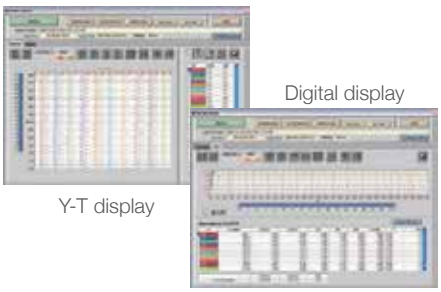
- Statistical calculation/Alarm history
- Password protection function
- Batch conversion of the captured data to CSV format
- Search function for specific points in the captured data
- Direct to Excel function
- Channel group function
- Comment input function

Various screen displays

Y-T, X-Y, Digital display, Meter display, and Report display screens have been provided to suit various measurement applications.
In addition, the Replay display screen can be specified as Y-T, X-Y between cursors or Digital display.

Measurement screens

Replay screens



Main Unit Specifications

Item		Description		
Number of analog input channels		10 channels		
External Input/Output		Trigger input, Logic input 4 ch or Pulse input 4 ch, Alarm output 4 ch		
Sampling interval		100 ms to 1 h (Max:100 ms/10ch)		
TIME/DIV		1 sec/DIV to 72 h/DIV		
Trigger function		Type	Start	Data capture starts when a trigger is generated
			Stop	Data capture stops when a trigger is generated
		Condition	Start	Off, Level, Alarm, Scheduled time, External, Day
			Stop	Off, Level, Alarm, Scheduled time, Time, Day, External
Alarm function		Condition	Analog	H, L, Window In, Window Out, Rate of change
			Logic	H, L
			Pulse	H, L, Window In, Window Out, Rate of change
Alarm output	No. of channels	4		
	Output format	Relay contact output (NO/NC)		
	Output terminal	M4 screw terminal		
	Rating	250 VAC/2A, 30 VDC/2A		
Pulse input range	Count mode	50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S. (max. 50 k/sec)		
	Inst. Mode	50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S. (max. 50 k/sec)		
	RPM mode	50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M RPM/F.S. (max. 50 k/sec)		
Calculation function	Statistics calculation *1	Average, Peak, Maximum, Minimum, RMS (2 calculations can be set simultaneously)		
	Calculation between channels	Addition, Subtraction, Multiplication, Division (for analog input ch1 to ch10)		
Wet-and dry-bulb temperature conversion		Humidity is calculated from the measured temperature of Wet-bulb and Dry-bulb (Dry bulb : fixed to ch1, Wet bulb : fixed to ch2, Range 0 to 100 %)		
Other function		Searching, Annotation input, Message, Marker function		
Interface to PC		Ethernet (10BASE-T / 100BASE-TX), USB (Compatible with full speed)		
Ethernet function		Web server function, FTP server function, FTP client function, NTP client function		
USB function		USB drive mode (File transfer/delete of internal memory)		
Internal storage device		Internal flash memory : 14 Mbyte, USB memory slot (compatible with full speed) *2		
Display	Size	5.7 inch TFT color LCD		
	Displayed items	Waveforms + Digital values (vertical, horizontal), Digital + Calculation, Bar graph (vertical)		
Clock accuracy (23°C environment)		±0.002 % (within approx. 50 sec per month)		
Operating environment		Temperature : 0 to 50 °C, Humidity : 5 to 85 % R.H.		
Power supply		100 to 240 V AC / 50 to 60 Hz, M4 screw terminal (Power cord is not attached)		
Power consumption		38 VA (when LCD is ON)		
External dimensions (W x H x D) (approx.)		144 mm x 144 mm x 200 mm		
Weight (approx.)		2.1 kg		
Vibration resistance		Compatible with JIS Vibration testing methods for automobile Type 1 Class A-equivalent Dust proof, Drip proof: IP65 compatible (for front panel only)		

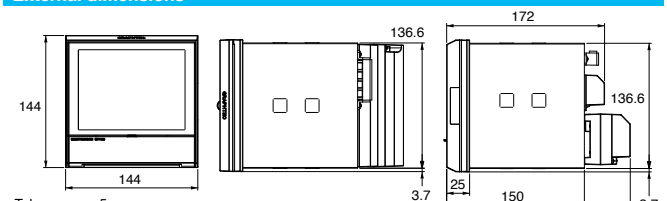
Analog input Specifications

Item			Description	
Type of input terminal			M4 screw type terminal	
Measurement range	Voltage		20, 50, 100, 200, 500 mV, 1, 2, 5, 10, 20, 50, V, 1-5 V F.S.	
	Temperature		Thermocouple : K, J, E, T, R, S, B, N, W (WRe5-26)	
			R.T.D. : Pt100, JPt100, Pt1000 (IEC751)	
	Humidity		0 to 100 % RH (Voltage 0 to 1 V conversion, when using optional B-530 humidity sensor is used)	
Input filter			Off, 2, 5, 10, 20, 40 (Moving average)	
Measurement accuracy *3	Voltage		±0.1 % of F.S.	
	Thermocouple		Measurement range	Accuracy
	R/S		0 ≤ TS ≤ 100 °C 100 < TS ≤ 300 °C R : 300 < TS ≤ 1600 °C S : 300 < TS ≤ 1760 °C	± 5.2 °C ± 3.0 °C ± (0.05 % of rdg + 2.0 °C) ± (0.05 % of rdg + 2.0 °C)
	B		400 ≤ TS ≤ 600 °C 600 < TS ≤ 1820 °C	± 3.5 °C ± (0.05 % of rdg + 2.0 °C)
	K		−200 ≤ TS ≤ −100 °C −100 < TS ≤ 1370 °C	± (0.05 % of rdg + 2.0 °C) ± (0.05 % of rdg + 1.0 °C)
	E		−200 ≤ TS ≤ −100 °C −100 < TS ≤ 800 °C	± (0.05 % of rdg + 2.0 °C) ± (0.05 % of rdg + 1.0 °C)
	T		−200 ≤ TS ≤ −100 °C −100 < TS ≤ 400 °C	± (0.1 % of rdg + 1.5 °C) ± (0.1 % of rdg + 0.5 °C)
	J		−200 ≤ TS ≤ -100 °C −100 < TS ≤ 100 °C 100 < TS ≤ 1100 °C	± 2.7 °C ± 1.7 °C ± (0.05 % of rdg + 1.0 °C)
	N		-200 ≤ TS < 0 °C 0 ≤ TS ≤ 1300 °C	± (0.1 % of rdg + 2.0 °C) ± (0.1 % of rdg + 1.0 °C)
	W		0 ≤ TS ≤ 2000 °C	± (0.1 % of rdg + 1.5 °C)
	* If the reference junction compensation is internal, add ± 0.5 °C to each of the above values.			
	R.T.D.	Pt100	−200 to 850 °C (FS = 1050 °C)	± (0.05 % of rdg + 0.5 °C)
		JPt100	−200 to 500 °C (FS = 700 °C)	± (0.05 % of rdg + 0.5 °C)
		Pt1000	−200 to 500 °C (FS = 700 °C)	± (0.05 % of rdg + 0.5 °C)
A/D converter			16 bit (out of which 14 are Effective)	
Maximum input voltage			60 Vp-p (Between ± terminals)	
			60 Vp-p (Between input terminals)	
			60 Vp-p (Between input terminal and GND)	
Withstand voltage			Between each input channel and GND: 1 minute at 350 Vp-p	
			Between input terminals: 1 minute at 350 Vp-p	

PC software specifications

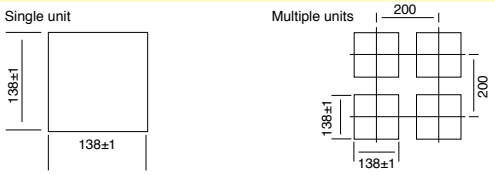
Item	Description
Compatible OS	Windows 8 / 7 / Vista / XP (32bit, 64bit)
Function	Control of main unit, Realtime data capture, File conversion
Max. number of controlable units	10 units
Max. number of controlable channels	100 channels
Settable items	AMP settings, Capture settings, Trigger/Alarm settings, Report settings, Other
Captured data	Realtime data, Internal memory data, USB memory data (CSV and Binary data)
Display	Analog waveforms, Logic waveforms, Pulse waveforms, Digital values
File conversion	Data conversion between cursors or all
Monitor functions	Alarm monitor enables sending of email to the specified address
Dual display function	Current/previous data display
Statistics calculation, report	Maximum, minimum, average data during measurement
Report function	Automatic creation of daily or monthly files

External dimensions



Tolerance : ± 5 mm
Unit : mm

Panel cut size



Unit : mm

Accessories

Item	Model	Remark
Humidity sensor	B-530	Cable length : 3 m
Rod-shaped thermocouple K type	RIC-410	Cable length : 1.1 m
Thermocouple K type for static surface	RIC-420	Cable length : 1.1 m
L-shaped thermocouple K type for static surface	RIC-430	Cable length : 1.1 m

*1 for realtime and between cursors (when data replaying)
*2 1 file 2 GB (it depends on used USB memory)
*3 Subject to the following conditions ;
Room Temperature is 23°C ± 5°C
When 30 minutes or more have elapsed after power was turned on.
Filter is set to 10.
Sampling rate is set to 1 sec.
GND terminal is connected to ground.
Thermocouple (0.32φ for T type, 0.65φ for other types) is used.

- Due to the possibility of equipment or PC failure, the data files on the instrument will not be guaranteed to be held on the memory. Please make a backup of data whenever possible to avoid data loss.
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For using equipment in correctly and safely

- Before using, please read the user manual and then please use it properly in accordance with the description.
- To avoid malfunction or an electric shock by current leakage or voltage, please ensure a ground connection and use according to the specification.

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