User's Manual

10-CH Digital Thermometer Module

WE7241

IM 707241-01E
3rd Edition

YOKOGAWA
Yokogawa Electric Corporation

IM 707241-01E
3rd Edition

Thank you for purchasing the 10-CH Digital Thermometer WE7241 for the PC-based measurement instruments, WE7000.

This User's Manual contains useful information about the function, connection to the measuring station, and troubleshooting of the WE7241. This manual assumes that you will be using the WE7000 Control Software that is included with the measuring station.

For general information about the WE7000 (primarily the operations of the measuring station, the optical interface module, the optical interface card, and the WE7000 Control Software) see the following manual that is included with the measuring station.

Manual Title	Manual No.
WE7000 User's Manual	IM707001-01E

To ensure correct use, please read this manual thoroughly before operation. Keep this manual in a safe place for quick reference in the event a question arises.

Notes

- **The contents of this manual describe WE7000 Control Software Ver. 4.0.2.0 and module software Ver 3.12. If you are using another version of the software, the operating procedures or the figures given in this manual may differ from the actual software.**
- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
- Copying or reproducing any or all of the contents of this manual without YOKOGAWA's permission is strictly prohibited.

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Revisions

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2nd Edition: July 1999
3rd Edition: August 2000

Disk No. WE03
3rd Edition: August 2000 (YK)
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Checking the Contents of the Package

Unpack the box and check the contents before operating the instrument. If the contents are not correct or missing or if there is physical damage, contact the dealer from which you purchased them.

Measurement Module

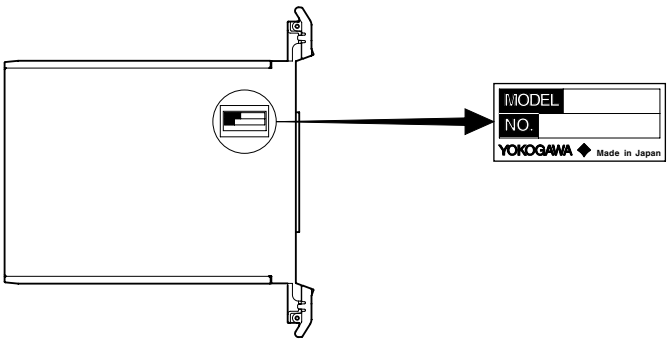
Check that the model name given on the name plate matches those on the order.

MODEL

Model	Suffix Code	Description
707241		WE7241 10-CH Digital Thermometer Module
	/HE	English help message

NO.

When contacting the dealer from which you purchased the instrument, please quote the instrument No.



Standard Accessories

The following standard accessories are supplied with the instrument. Make sure that all items are present and undamaged.

User's Manual (1)
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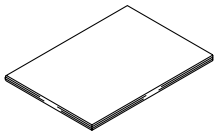
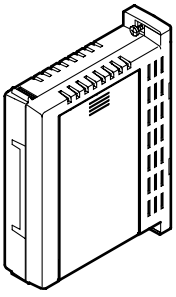


Optional Accessories (Sold Separately)

Name	Model	Description
Input terminal block	707821	10-CH thermocouple/DC voltage input, clamp type terminal



How to Use This Manual

Structure of the Manual

This User's Manual consists of the following four chapters and an index.

Chapter	Title	Description
1	**Explanation of Functions**	Explains the system configuration and functions.
2	**Hardware Preparation**	Explains how to install the module into the measuring station and how to connect the input.
3	**Troubleshooting and Maintenance**	Explains the procedures for troubleshooting and self testing.
4	**Specifications**	Explains the specifications of the module.
Index		Index of contents.

Conventions Used in This Manual

Unit

k ····· Denotes 1000. Example: 100 kHz

K ····· Denotes 1024. Example: 720 KB

Displayed characters

Alphanumeric characters enclosed with [ ] usually refer to characters or settings that are displayed on the screen.

Symbols

The following symbol marks are used to attract the operator's attention.

Affixed to the instrument. Indicates danger to personnel or to the instrument. The operator must refer to the User's Manual. The symbol is used in the User's Manual to indicate the reference.

WARNING Describes precautions that should be observed to prevent injury or death to the user.

CAUTION Describes precautions that should be observed to prevent minor or moderate injury, or damage to the instrument.

Note Provides information that is important for operating the instrument properly.

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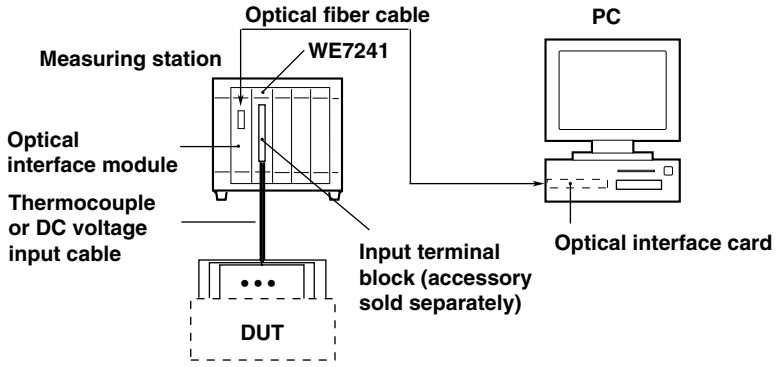
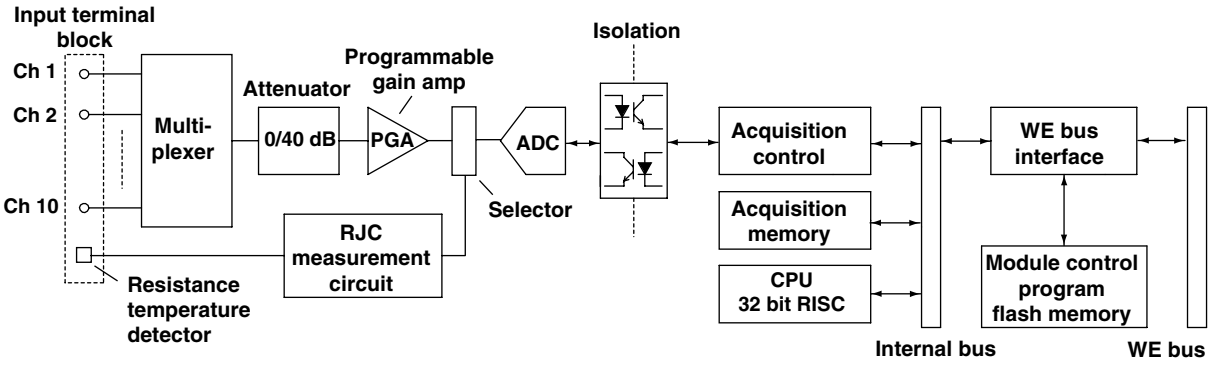
1.1 System Configuration and Block Diagram

System Configuration

The following is an example in which the 10-CH Digital Thermometer Module WE7241 is installed into the measuring station and the measuring station is connected to the PC with the optical fiber cable.



Block Diagram



Explanation of the Operation

An input terminal block (sold separately) is connected to the input terminal of the digital thermometer module. Thermocouples or DC voltage input cables are connected to the 10 channels of clamp type terminals on the input terminal block.

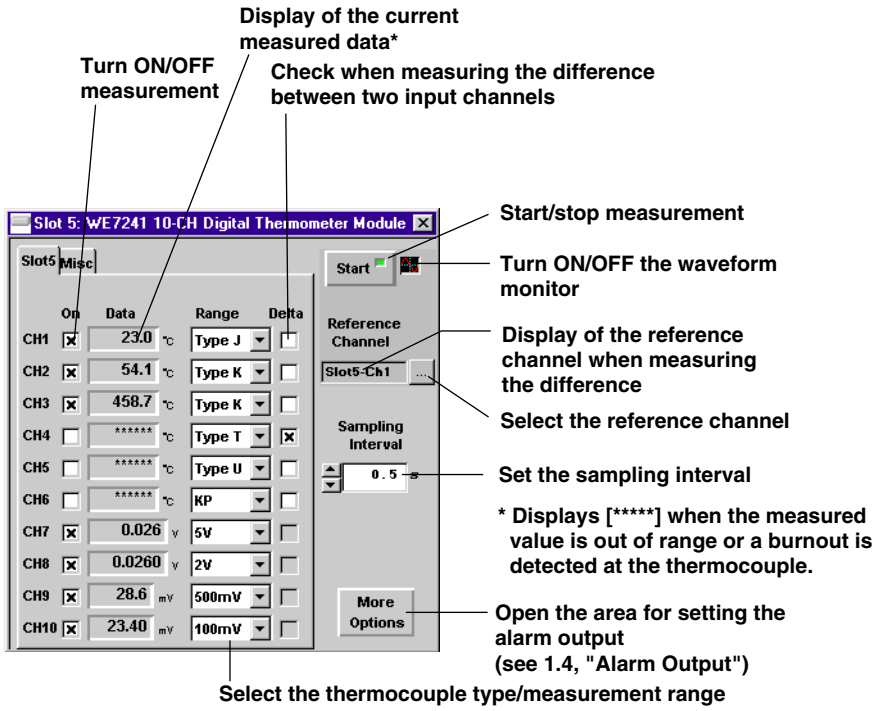
The signal entering through the input terminal block is assigned a channel by the multiplexer. The signal's level is adjusted by the attenuator and the programmable gain amplifier, and then passes through the A/D converter. The converted digital signal is isolated by the photo coupler and the digital data that indicate the measured values are stored in the acquisition memory. During a temperature measurement, the reference junction temperature is measured using the platinum resistance temperature detector that is built into the input terminal block. The CPU performs reference junction compensation (RJC) and voltage-to-temperature conversion on the measured data stored in the acquisition memory. Then, the newly processed data are stored again in the acquisition memory.

The data in the acquisition memory can be read from the computer through the communication interface.

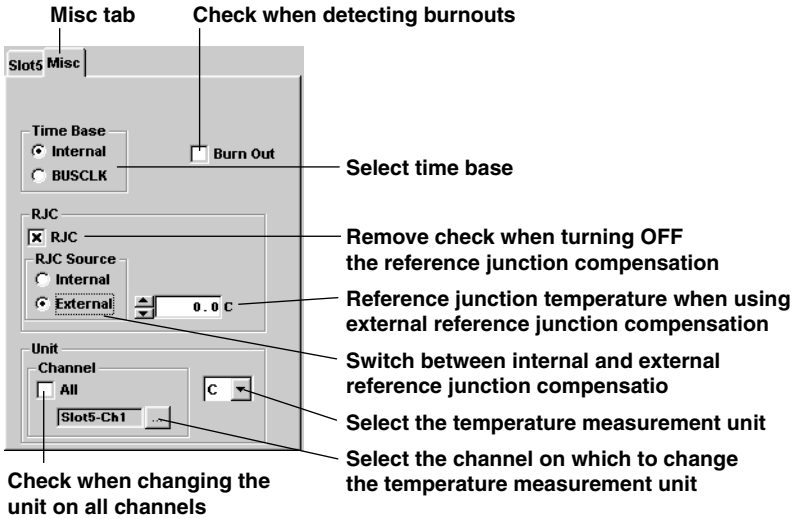
1.2 Operation Panel

The WE7000 Control Software that is installed in the PC is used to control the 10-CH Digital Thermometer WE7241. The WE7000 Control Software displays operation panels similar to those shown in the figure below. This User's Manual does not explain the operations of the operation panel or waveform monitor. For the operations of these items, see the on-line help that is provided with the WE7000 Control Software.

Setting thermocouple types, measurement range, sampling interval, ON/OFF of measurement



Setting reference junction compensation, burnout, time base, unit of measurement



1.3 Setting the Measurement Conditions

Thermocouple Types/Measurement Range (Range)

Two types of input signals, thermocouple and DC voltage, can be measured. A list of thermocouples types that can be used and a list of DC voltage range settings are shown below.

Thermocouple

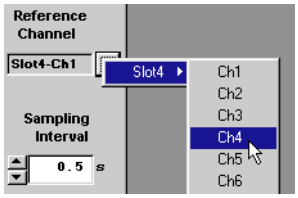
Type	Accuracy Guaranteed Measurement Range	Resolution
K	–200.0 to 1300.0°C	0.1°C
E	–200.0 to 800.0°C	0.1°C
J	–200.0 to 1100.0°C	0.1°C
T	–200.0 to 400.0°C	0.1°C
L	–200.0 to 900.0°C	0.1°C
U	–200.0 to 400.0°C	0.1°C
N	–200.0 to 1300.0°C	0.1°C
R	–50.0 to 1700.0°C	0.1°C
S	–50.0 to 1700.0°C	0.1°C
B	400.0 to 1800.0°C	0.1°C
W	0.0 to 2300.0°C	0.1°C
KPvsAu7Fe	0.0 to 278.0 K	0.1 K

DC voltage input

Range Setting	Measurable Range (Accuracy Guaranteed Measurement Range)	Resolution
50 mV	–50.00 to 50.00 mV	10 µV
100 mV	–100.00 to 100.00 mV	10 µV
200 mV	–200.00 to 200.00 mV	10 µV
500 mV	–500.0 to 500.0 mV	100 µV
1 V	–1.0000 to 1.0000 V	100 µV
2 V	–2.0000 to 2.0000 V	100 µV
5 V	–5.000 to 5.000 V	1 mV
10 V	–10.000 to 10.000 V	1 mV
20 V	–20.000 to 20.000 V	1 mV
50 V	–50.00 to 50.00 V	10 mV

Measuring the difference between two input channels

You can measure the difference between two channels of the same module or of linked digital thermometer modules. To measure the input difference (temperature difference), select the [Delta] check box of the channels to be compared to the reference. Also, click the [Reference Channel] button and select the reference channel from the menu that appears. This function is available only when the input type of the two channels is a thermocouple.



Sampling Interval

The sampling interval setting is common to all channels.

The selectable range is 0.2 to 60 s (in 0.1 s steps). However, if the number of measurement channels is one or two, three to five, or six or seven, the lowest value that you can specify is 0.2 s, 0.3 s, and 0.4 s, respectively. The default is [0.5].

Note

- This setting is invalid when [BUSCLK] is selected for the time base.
- The correct time will not be displayed at “Time since the start of measurement” if you change the sampling rate after starting the measurement.

Turning ON/OFF the Measurement Channel

Measurements are made only on the channels that have their [On] box checked.

Reference Junction Compensation (RJC)

Select whether to compensate internally or externally by selecting [Internal] or [External] with the [RJC Source] option button. If you select external, set the reference junction temperature.

If you are not compensating the thermocouple, such as when checking the thermocouple input, remove the check from the [RJC] box. This setting is common to all channels.

Burn Out

For thermocouple inputs, the detection of thermocouple burn out is activated. If a burn out is detected the measured value is set to a value indicating the burn out ([*****] for cursor measurements). If you select to detect burn outs, a current will run periodically through the connected thermocouple. This setting is common to all channels.

Time Base

You can select whether to sample the input signal with the specified sampling interval based on the module's internal clock or to sample with the time base signal (CMNCLK) of the measuring station (BUSCLK setting). The minimum sampling interval when using the time base signal (CMNCLK) is 2.0 s.

Unit of Temperature Measurement

To change the unit of temperature measurement on all channels, check the [All] box and select [C] (°C) or [K] from the unit list box.

To change the unit of temperature measurement on a specific channel, remove the check from the [All] box, select the channel from the menu that appears by clicking the channel selection button, and then select [C] (°C) or [K] from the unit list box.

1.4 Alarm Output, Waveform Display, Automatic Saving of Waveform Data, Data Conversion, and Other Functions

Alarm Output

You can set upper and lower limits on the measured signal and output a bus trigger signal as an alarm based on those limits to the BUSTRG1 and BUSTRG2 buses in the measuring station.
You can select the alarm output condition from the following six choices.

Rise: The measured value changes from a value below the upper limit to a value greater than or equal to the upper limit.
Fall: The measured value changes from a value above the lower limit to a value less than or equal to the lower limit.
High: When the measured value is greater than or equal to the upper limit.
Low: When the measured value is less than or equal to the lower limit.
In: The measured value changes from a value above the upper limit or below the lower limit to a value between the lower and upper limits.
Out: The measured value changes from a value between the lower and upper limits to a value above the upper limit or below the lower limit.

If you set, in the trigger source/time base/Arming source setting dialog box, the WE7241 to output a bus trigger signal when an alarm occurs, the module sets the bus trigger signal to [True] for approx. 1 μs when the alarm condition changes from an unsatisfied to a satisfied condition. For details on the trigger source/time base source setting dialog box, see section 4.6, "Setting the Trigger Source/Time Base Source/Arming" in the WE7000 User's Manual (IM707001-01E).

Controlling the Timing of the Start of the Measurement (Arming)

You can control the timing of the start of the measurement by using the arming signal which is set in the trigger source/time base source setting dialog box.
When the arming signal (ARM) bus is connected to the measurement module in the trigger source/time base source setting dialog box, clicking the [Start] button on the operation panel causes the module to enter the arming signal wait state. The measurement starts when the arming signal becomes [True]. For details on the trigger source/time base source setting dialog box, see section 4.6, "Setting the Trigger Source/Time Base Source/Arming" in the WE7000 User's Manual (IM707001-01E).

Displaying the Waveform

On the WE7241, you can view the measured data in a waveform. The waveform is displayed in the waveform monitor of the WE7000 Control Software.

Automatic Saving of the Waveform Data

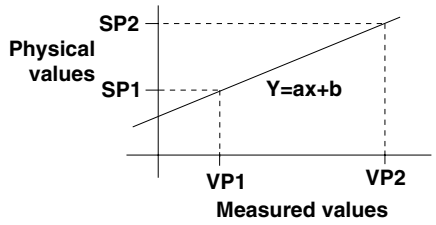
Besides saving the data displayed on the waveform monitor, you can also have the waveform data automatically saved. You can select to save the data to one file or by specifying the number of data points you may save to multiple files.

Converting the Waveform Data

The waveform data that are saved can be converted to ASCII data in CSV format (*.csv) or to physical values in 32-bit floating point format (conforming to IEEE754-1985) (*.wvf).

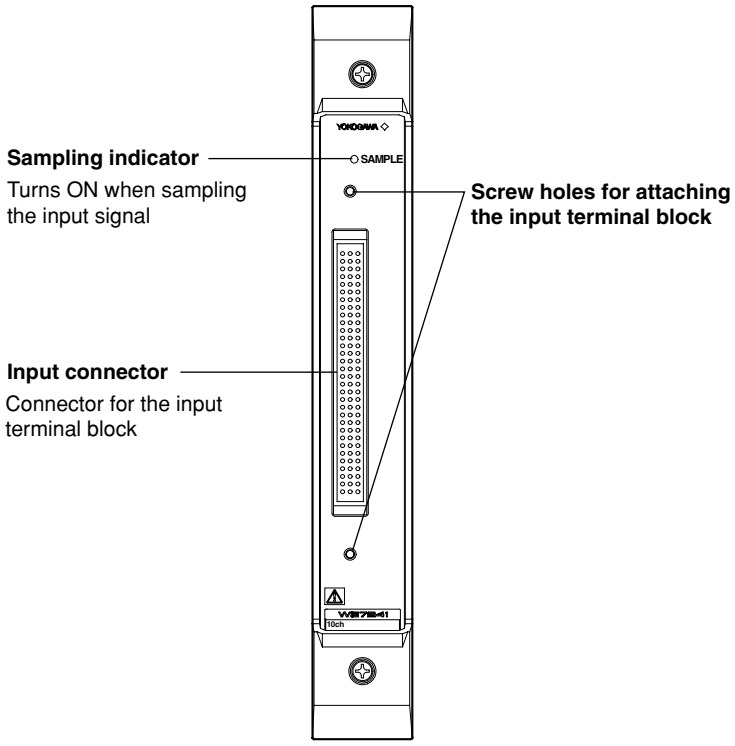
Scaling the Measured Data

Set the measured values at any two points (VP1 and VP2) and their corresponding physical values (SP1 and SP2). The values at these four points define the scale conversion equation (Y=ax+b). The measured values are converted to physical values according to this equation, and the waveform display and saving operations are carried out.



1.5 Names and Functions of Sections

Front Panel

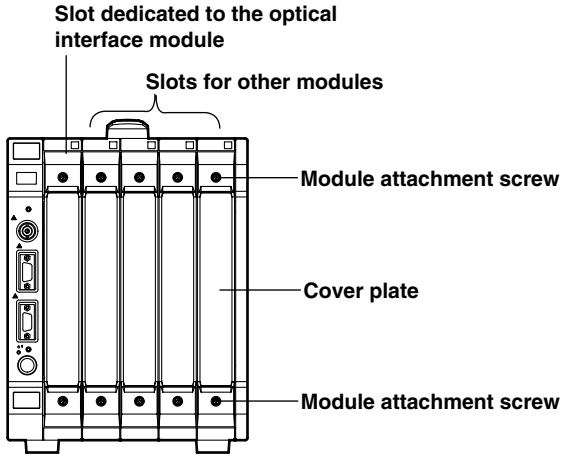


2.1 Installing the Module into the Measuring Station

Preparing to Install the Module

The measuring station comes with each slot covered with a cover plate as shown in the figure below. Verify that the power supply is not connected to the measuring station, then loosen the module attachment screws (2 locations) and remove the cover plate from the slot where the module is going to be installed. Please note that the slot on the left end is dedicated to the communication module and therefore this module cannot be installed there.

* The following figure shows an example of the measuring station WE400.



Installing the Digital Thermometer Module

WARNING

- Make sure to fasten the top and bottom attachment screws. If you connect the input signal cable without fastening the attachment screws, the protective grounding of the measurement module provided by the power cord is compromised and may cause electric shock.

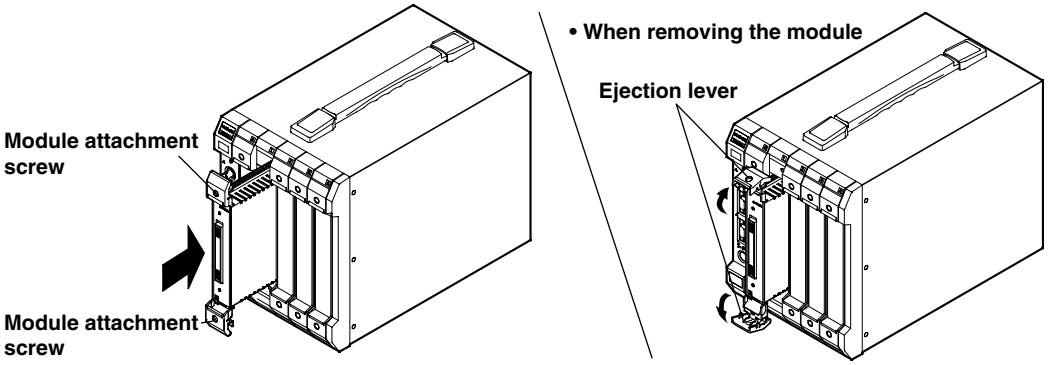
CAUTION

- To avoid damaging the instrument when installing modules, make sure to turn OFF the standby power switch of the measuring station.
- Be careful not to get your fingers caught in the ejection lever when inserting the module. In addition, do not put your hand inside the slot because there are protrusions along the module guide that may injure your fingers.
- Do not remove the cover plates from unused slots. It can cause overheating and malfunction. The cover plates are also needed to minimize the influence of electromagnetic interference.

Insert the module along the guide rail of the slot from which you removed the cover plate. Insert the module until it clicks into the connector. Be careful not to get your fingers caught in the ejection lever while inserting the module. When the module is securely inserted, fasten the module attachment screws (tightening torque: 0.6 to 0.7 N-m).

To remove the module, loosen the module attachment screws and pull the ejection lever from the inside to the outside. This will force the module out of the slot.

<There is an illustration on the next page.>



Note

When synchronization of the measurements of multiple input signals is desired (linking the modules), install the multiple digital thermometer modules in adjacent slots.

2.2 Connecting the Input Terminal Block and the Input Signal Wire

You cannot connect the input signal wires directly to the digital thermometer module. To connect the input signal wires, you need the input terminal block (Model: 707821 sold separately).

Connecting the Signal Wires to the Input Terminal Block

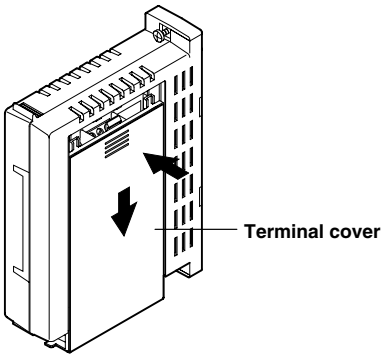
CAUTION

- Do not apply a voltage exceeding the following levels, as it may damage the module.
  - Maximum allowable input range: 30 VAC rms, 42.4 V peak or ±60 VDC (Overvoltage Category: CAT I and II)
  - Maximum common mode voltage: 150 V rms or ±150 VDC between the case and the L terminal
  - Maximum noise across channels: 60 VAC rms, 84.8 V peak or ±100 VDC
- Remove the input terminal block from the module when connecting the signal wires to avoid damaging the module.
- The guard terminal is connected to the L terminal at the input section of the module. Connecting the H side to the guard terminal creates a short circuit and may damage the module.

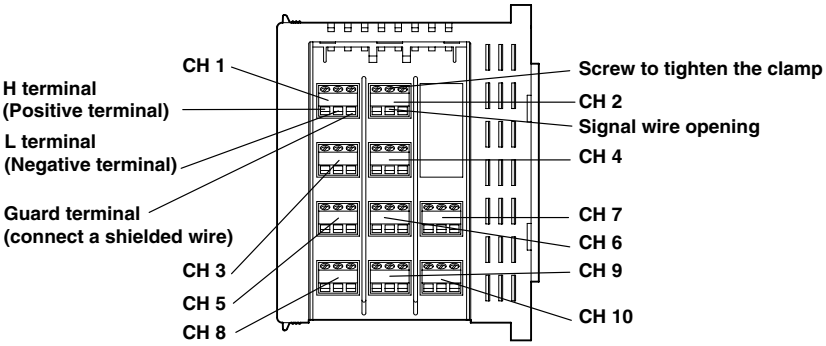
Note

If the input voltage exceeds 10 V when measuring the temperature or measuring the voltage in the 50 mV to 2 V range, the protective circuit is activated and the input impedance is reduced to approximately 10 kΩ.

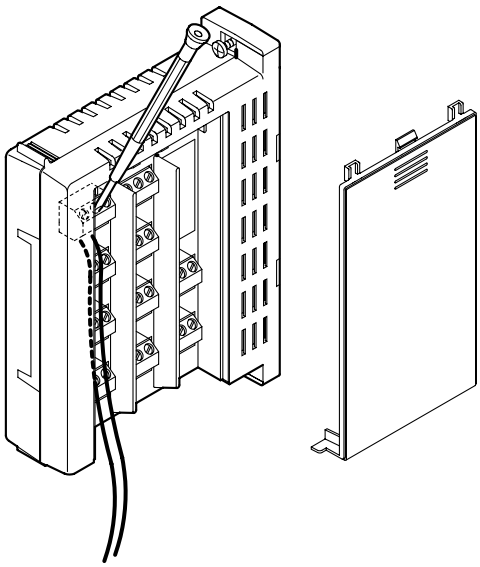
As indicated in the figure below, the terminal cover of the input terminal block can be removed by sliding the terminal cover while depressing the edge of the cover.



The input terminal is a clamp type terminal, and the pin arrangement is as follows. When connecting the thermocouple, connect the + lead to the H terminal and the – lead to the L terminal. If there is no shield, nothing is connected to the guard terminal.



When connecting the input signal wire to the clamp type terminal, loosen the screw holding down the clamp, insert the input signal wire into the opening, and then tighten the screw.

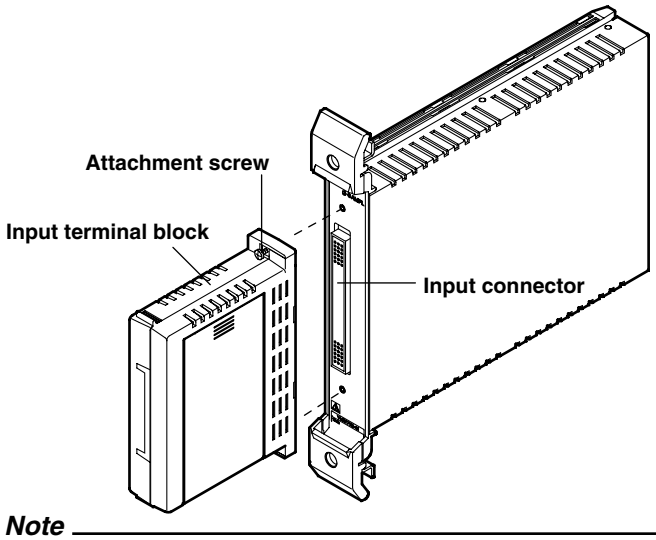


Connecting the Input Terminal Block

CAUTION

- When connecting the input terminal block to the module, make sure to turn OFF the standby power switch on the measuring station.

As illustrated in the figure below, connect the input terminal block (Model: 707821 sold separately) to the input connector of the module. After inserting the connector into the input connector of the module, the input terminal block is screwed in place with the two attachment screws.



Note

- When performing internal reference junction compensation on the thermocouple input, consider the following suggestions for stabilizing the temperature at the terminal section.
  - Make sure the terminal cover is in place.
  - Keep the temperature constant in the area where the instrument is operating.
  - Do not use thick wires (a cross sectional area of 0.5 mm^2 or more) that have large radiation effects.
- To prevent noise, shield the input signal wires, and connect the end of the shielded wire to the guard terminal of the input terminal block.

3.1 Troubleshooting

- If servicing is necessary, or if the instrument is not operating correctly after performing the following corrective actions, contact your nearest YOKOGAWA dealer.
- To verify that the module is operating correctly, perform the self test as described on the next page.

Problem	Probable Cause/Corrective Action	Reference
Module does not operate.	Check to see that the module is installed correctly into the station. Also, install the module into another slot, and check whether it will operate there. If it operates in the other slot, the measuring station is likely to have malfunctioned. If the module is installed correctly and does not operate, the fuse might have melted, the connector might be bad or the IC may have malfunctioned. In any case, contact your nearest YOKOGAWA dealer to have it repaired.	2-1, *
Waveform data cannot be acquired.	Check to see that the input signal wires are connected properly. Also check the terminal box connection.	2-3, 2-4
Noise enters the input signal.	If the signal line and the AC power supply line are close to each other, move them apart. Also make sure that the signal line is away from the noise source. Change to a shielded signal wire if you are not already using one.	2-3
Measured values are not correct.	Check whether the ambient temperature and humidity are within the allowed ranges. If you did not allow a warm-up time of 30 minutes, try measuring again after the warm-up time has passed. Check to see that the input signal level is not exceeding the measurement range.	4-3 4-1
The temperature measurement is not correct.	Check to see that the RJC setting is correct. Check whether the thermocouple type and polarity are set properly. Check to see that the thermocouple is not burnt out by making a measurement after checking the [Burn Out] button. Check whether the terminal block cover is attached. Check to see that there is no drastic change in temperature, such as when wind blows across the terminal block. Check to see that the two types of thermocouple wires are not too far apart, the tip is not touching a metal object, and that the thermocouple is being handled properly.	1-4
The displayed waveform does not get updated.	Check whether the measurement has been started on the operation panel. Check whether the sampling interval is set properly on the operation panel.	1-2 1-3
The waveform is not displayed.	Check whether the measurement has been started on the operation panel. Make sure that the waveform monitor is open. If the time base setting is [BUSCLK], check to see that the time base source is set properly in the trigger source/time base source/arming setting dialog box of the WE7000 Control Software.	1-2 1-4, *
The waveform monitor is not displayed.	Check that the [Waveform monitor ON/OFF] button, that is located to the right of the [Start] button on the operation panel, is turned ON.	1-2

* See the WE7000 User's Manual (IM 707001-01E).

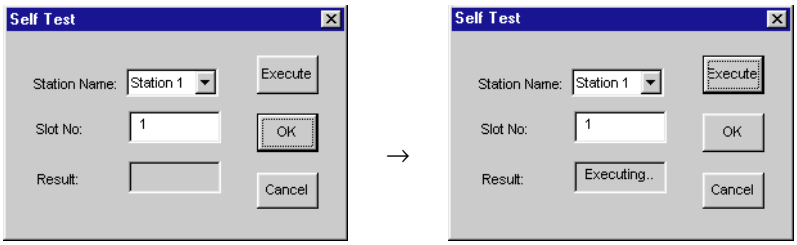
3.2 Self Test

If you believe that the module is not operating correctly, perform the self test according to the following steps.

Executing Self Test

1. Select [Self Test] from the [System] menu of the WE7000 Control Software.

2. In the [Self Test] dialog box that appears, select the station name and enter the slot number corresponding to the module, and click the [Execute] button.
   "Executing..." is displayed in the [Result] display box.



Verifying Test Results

If a value other than "0" is displayed in the [Result] display box of the [Self Test] dialog box, the module is probably malfunctioning. Please contact your nearest YOKOGAWA dealer.

3.3 Maintenance

Maintenance of Parts

There are no parts in this module that require periodic replacement.

Calibration

We recommend that you calibrate the measurement module once a year to assure its measurement accuracy. Please contact your nearest YOKOGAWA dealer.

4.1 Performance Specifications

Number of Input Channels

10

Input Format

Floating unbalanced input (multiplexer format), isolation between channels and between the input and ground

Measurement Range/Accuracy (Ambient Temperature 23 ±5°C, Ambient Humidity 50 ±10% RH, after the Warm-up Time Has Passed)

DC voltage input

Range Setting	Accuracy	Resolution
50 mV	±(0.07% of rdg + 40 mV)	10 μV
100 mV	±(0.06% of rdg + 60 mV)	10 μV
200 mV	±(0.06% of rdg + 80 mV)	10 μV
500 mV	±(0.06% of rdg + 200 mV)	100 μV
1 V	±(0.06% of rdg + 400 mV)	100 μV
2 V	±(0.06% of rdg + 600 mV)	100 μV
5 V	±(0.2% of rdg + 2 mV)	1 mV
10 V	±(0.2% of rdg + 3 mV)	1 mV
20 V	±(0.2% of rdg + 5 mV)	1 mV
50 V	±(0.2% of rdg + 20 mV)	10 mV

Temperature coefficient (at 5 to 18°C or 28 to 40°C):
±70 ppm/°C of rdg at 50 mV to 2 V range ±80 ppm of rdg)/°C at 5 V to 50 V range

Thermocouple input

Type	Accuracy Guaranteed Measurement Range	Accuracy	Resolution
K	–200.0 to 1300.0°C	±(0.1% of rdg + 1°C), except –200°C to 0°C: ±(0.6% of rdg + 1°C)	0.1°C
E	–200.0 to 800.0°C	±(0.05% of rdg + 1°C), except –200°C to 0°C: ±(0.3% of rdg + 1°C)	0.1°C
J	–200.0 to 1100.0°C	±(0.1% of rdg + 1°C), except –200°C to 0°C: ±(0.4% of rdg + 1°C)	0.1°C
T	–200.0 to 400.0°C	±(0.01% of rdg + 1°C), except –200°C to 0°C: ±(0.4% of rdg + 1°C)	0.1°C
L	–200.0 to 900.0°C	±(0.1% of rdg + 1°C), except –200°C to 0°C: ±(0.3% of rdg + 1°C)	0.1°C
U	–200.0 to 400.0°C	±(0.1% of rdg + 1.5°C), except –200°C to 0°C: ±(0.5% of rdg + 1.5°C)	0.1°C
N	–200.0 to 1300.0°C	±(0.05% of rdg + 1.5°C), except –200°C to 0°C: ±(1% of rdg + 1.5°C)	0.1°C
R	–50.0 to 1700.0°C	±(0.1%of rdg + 3°C), except –50°C to 200°C: ±8°C, 200°C to 800°C: ±4°C	0.1°C
S	–50.0 to 1700.0°C	±(0.1% of rdg + 3°C), except –50°C to 200°C: ±8°C, 200°C to 800°C: ±4°C	0.1°C
B	400.0 to 1800.0°C	±(0.1% of rdg + 4°C), except 400°C to 700°C: ±7°C	0.1°C
W	0.0 to 2300.0°C	±(0.2% of rdg + 3°C), except 400°C to 700°C: ±7°C	0.1°C
KPvs Au7Fe	0.0 to 278.0 K	0 to 23 K: ±(2.5 K), 23 K to 278: ±(0.5 K)	0.1 K

- Temperature coefficient (at 5 to 18°C or 28 to 40°C): ±(200 ppm of rdg)/°C
- K, E, J, T, N, R, S, B: JIS C1602-1995
- L, U: DIN 43710
- W: ASTM 988-84
- KPvsAu7Fe: ASTM SPT430

Reference Junction Compensation Accuracy (Using 707821, When the Temperature of the Input Terminal Is Balanced, Excluding Noise Components)

When measuring above 0: ±1°C when measuring below 0: ±1.5°C
No guarantees on accuracy during KPVsAu7Fe measurement
For Type-W when measuring up to 200°C ±1°C, when measuring above 200°C ±1.5°C
No reference junction compensation for Type-B

Input Coupling Method

DC

Input Resistance

1 MΩ or more

Maximum Source Resistance

1 kΩ or less

Normal Mode Rejection Ratio (When the Frequency Is 50/60 Hz ±0.1 Hz)

50 dB or more

Common Mode Rejection Ratio (When the Frequency Is 50/60 Hz ±0.1 Hz)

120 dB or more (when using the guard)

A/D Resolution

Equivalent to 14 bits (when applying DC voltage)

Time Base

Module's internal clock, or the time base (CMNCLK) signal of the measuring station

Sampling Interval

When using the internal time base
1, 2 CH : 0.2 s to 60 s
3, 5 CH : 0.3 s to 60 s
6, 7 CH : 0.4 s to 60 s
8 CH or longer : 0.5 s to 60 s
When using the time base (CMNCLK) signal of the measuring station: 2.0 s or longer

Alarm Output

Monitors the upper and lower limits of the measured value and outputs trigger signals to the WE Bus (BUSTRIG1/BUSTIG2).

Connector Type

DIN connector (96-pin, male)

4.2 Default Values (Factory Default Settings)

On (measurement ON or OFF): On
Range (measurement range): Type K
Delta (measurement of difference): Off
Alarm (alarm output): Off
Reference Channel: Ch1 of its own module
Sampling Interval: 0.5 s

Misc setting
Time Base: Internal
Burn out (detection of burn out): Off
RJC (reference junction compensation): On
RJC Source (Internal/External switch for the reference junction compensation): Internal
Unit (unit of temperature measurement): °C

4.3 General Specifications

Safety Standards

Complies with CSA C22.2 No.1010.1 and EN61010-1, conforms to JIS C1010-1.

- Overvoltage category CAT I and II[*1]
- Pollution degree 1 and 2[*2]

EMC Standards

Emission

Complying standard

EN55011 Group 1 Class A

This product is a Class A (for commercial environment) product. Operation of this product in a residential area may cause radio interference in which case the user is required to correct the interference.

Immunity

Complying standard

EN50082-2

Influence in the immunity environment

Noise increase: ≤ ±1 mV (DC voltage input)
≤ ±2% of FULL SPAN (measurement range) with the thermocouple K, E, J, L, N or W.
≤ ±5% of FULL SPAN (measurement range) with the thermocouple T, U, R or S.
≤ ±10% of FULL SPAN (measurement range) with the thermocouple B or KPvsAu7Fe.

Testing condition

- Connect with the Input Terminal Block (Model 707821).
- 0.5 s Sampling Interval; Type W Range; Input 3 m flat cable with 1 kΩ terminated.

Warm-up Time

At least 30 minutes

Operating Conditions

Same as those of the measuring station

Storage Conditions

Temperature: –20 to 60°C

Humidity: 20 to 80% RH (no condensation)

Maximum Allowable Input Voltage

30 VAC rms, 42.4 V peak or ±60 VDC

(Overvoltage Category: CAT I and II)

Maximum Common Mode Voltage

150 V rms or ±150 VDC between the L terminal and ground

Maximum Noise between Channels

60 VAC rms, 84.8 V peak or ±100 VDC

Insulation Withstand Voltage

Between input terminals: 60 Hz 1000 VAC rms for one minute

Between input terminal and ground: 60 Hz 1500 VAC rms for one minute

Insulation Resistance

Between input terminal and ground, between input terminals: 500 VDC, 10 MΩ or more

Power Consumption

7 VA (typical value[*3] at 100 V/50 Hz)

Weight

Approx. 0.8 kg

External Dimensions

Approx. 33(W) × 243(H) × 232(D) mm (projections excluded)

Number of Used Slots

1

Standard Accessories

User's Manual (1)

Optional Accessories

707821 Input terminal block

*1 Overvoltage Categories define transient overvoltage levels, including impulse withstand voltage levels.

Overvoltage Category I: Applies to equipment supplied with electricity from a circuit containing an overvoltage control device.

Overvoltage Category II: Applies to equipment supplied with electricity from fixed installations like a distribution board.

*2 Pollution Degree: Applies to the degree of adhesion of a solid, liquid, or gas which deteriorates withstand voltage or surface resistivity.

Pollution Degree 1: Applies to closed atmospheres (with no, or only dry, non-conductive pollution).

Pollution Degree 2: Applies to normal indoor atmospheres (with only non-conductive pollution).

*3 Typical value represents a typical or average value. It is not strictly guaranteed.

4.4 Specifications of the Input Terminal Block

Number of Input Channels

10 (The H, L, and G of each input channel are independent)

Input Format

Each input channel is floating*

Temperature Measurement Element

100 Ω Platinum resistance temperature detector class A

* This is the specification for the input terminal block by itself. Actually, the value depends on the specifications of the Measurement module to which it is connected.

General Specifications

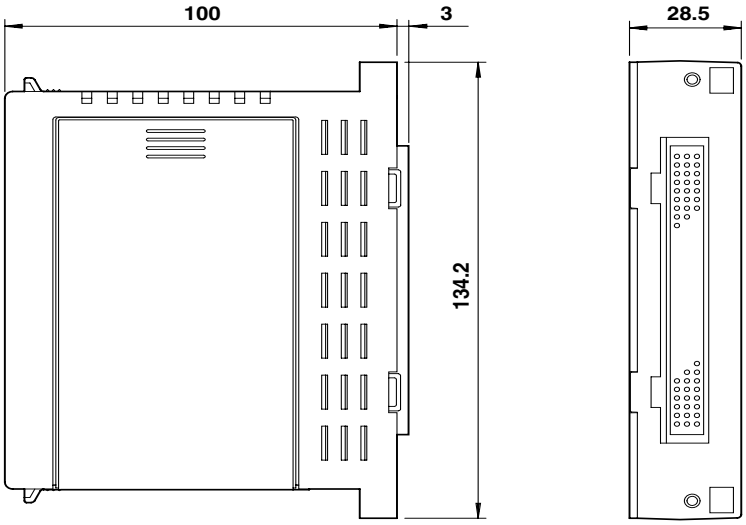
Operating conditions
Temperature: 5°C to 40°C
Humidity: 20% to 80% RH (except maximum wet bulb temperature of 29°C, no condensation)
Storage conditions
Temperature: –20°C to 60°C
Humidity: 20% to 80% RH
Maximum allowable input voltage*
30 VAC rms, 42.4 V peak or ±60 VDC (Overvoltage category: CAT I and II)
Maximum voltage between channels*
60 VAC rms or ±100 VDC
Maximum allowable input current*
0.3 A
Insulating withstand voltage*
Between channels and between input terminal and case: 60 Hz 1500 VAC rms for one minute
Insulation resistance*
Between channels and between input terminal and case: 500 VDC, 10 MΩ or more
Diameter of the cable that can be connected
0.14 to 1.38 mm^2
Recommended length of stripped wire
6 mm
Modules to which the input terminal block can connect
707241 (10-CH Thermometer module)
707251 (10-CH 100 kS/s Digitizer module)
Weight
Approx. 0.22 kg
External dimensions
Approx. 29(W) × 135(H) × 103(D) mm (protrusions excluded)

* This is the specification for the input terminal block by itself. Actually, the value depends on the specifications of the measurement module to which it is connected.

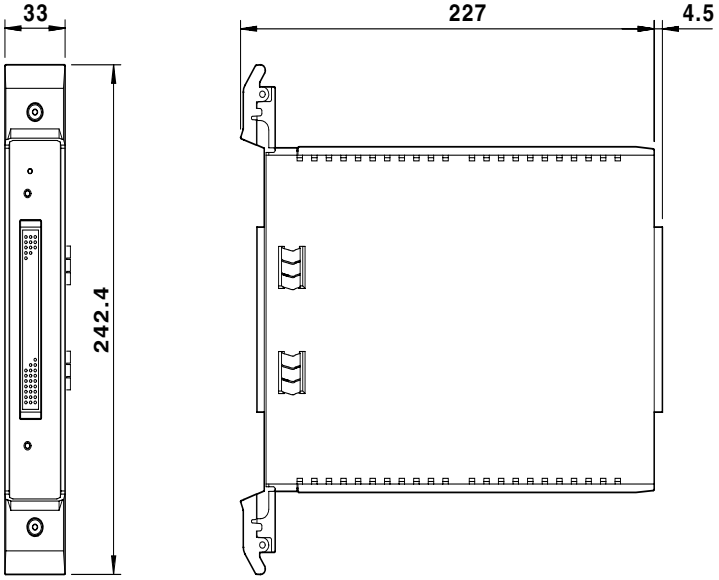
4.5 Dimensional Drawings

Unit: mm

10-CH Digital Thermometer Module (WE7241)



Input Terminal Block (707821)



If not specified, the tolerance is ±3%. However, in cases of less than 10 mm, the tolerance is ±0.3 mm.

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