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- ※ Please make sure to read the operation manual before using.
- ※ Please use the device correctly on the basis of complete understanding.

■ TX-600N Specifications

| | |
|-----------------------|--|
| Input Types | K, J, E, T, B, R, N, S, C thermocouple types; With Dual-channel input |
| Measurement Range | K: -200.0 ~ +1370.0°C (-328.0~+2498.0°F) J:-200.0 ~ +1200.0°C (-328.0~+2192.0°F) E:-210.0 ~ +1000.0°C (-346.0~+1832.0°F) T:-220.0 ~ +400.0°C (-364.0~+752.0°F) B:+320.0 ~ +1800.0°C (+608.0~+3272.0°F) R:-20.0 ~ +1700.0°C (-4.0~+3092.0°F) N: 200.0 ~ +1300.0°C (-328.0~+2372.0°F) S:-20.0 ~ +1750.0°C (-4.0~+3182.0°F) C:0.0 ~ +2300.0°C (+32.0~+4172.0°F) |
| Accuracy | ± 0.1% of rdg + 0.1°C (In 23±5°C operating environment) ± 0.1% of rdg + 0.2°C (Out off 23±5°C operating environment) ※Built-in cold junction compensation function |
| Resolution | K, J, E, T, N, C Type: 0.1°C/0.1°F; B, R, S Type: 0.5°C/0.5°F |
| Reading Rate | Approx 0.4 sec |
| Logging Sampling Rate | 2 second to 120 minutes (User Selectable) |
| Memory | 16,000 readings x 2CH |
| Baud Rate | 57,600 |
| Main Functions | Switchable 9 kinds of thermocouple type input, Hi/Lo Alarm, T1-T2, Data hold, Max/Min/Avg Functions, USB/RS-232 interface, Perpetual calendar, Data-Logging, Switchable °C/°F, AC/DC power, Battery sign and low battery warning, Auto / Manual shutdown, Calibration function, Large LED back-light, IP66 water and dust proof. |
| Output | Software with USB Interface cable, RS-232 Output |
| Power Source | One 9 V battery or AC Adaptor |
| Dimensions / Weight | 150 x 75 x 28 mm, Approx 320g (battery included) |
| Input Connections | Standard mini thermocouple socket x 2 |
| Operating Environment | -20~+60°C; 0~100%RH |

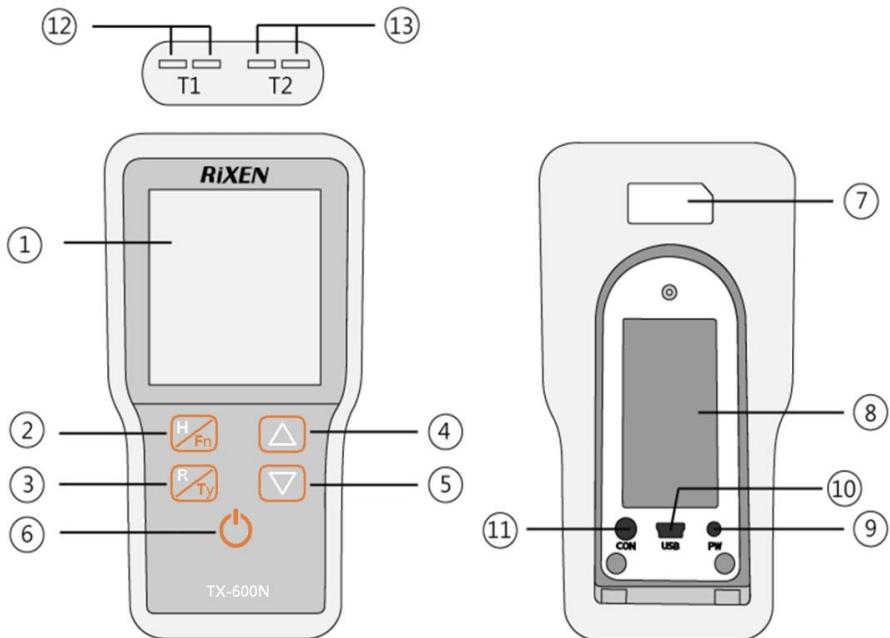
※About accuracy and sampling rate excludes errors generated by temperature probe.

Option Accessories

| | |
|------------------------------|---|
| Temperature Probes LP series | Please select from LP series temperature probe (Customized) |
| TU-RS232-W | RS-232 interface cable |
| TU-USB-W | USB interface cable and WINDOWS software |
| TU-609 | 9 V battery |

※Specifications are subject to change without notice.

■Instrument descriptions



① Multi-Function LCD display

② Function key and setting key

③ Record key and thermocouple switch key

④ Movement key

⑤ Movement key

⑥ Power switch

⑦ Model No. and Serial No.

⑧ Battery cover

⑨ AC Adaptor input

⑩ USB Output port

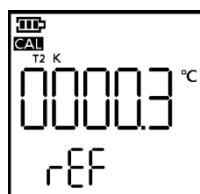
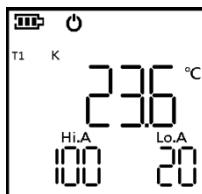
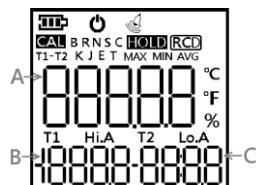
⑪ RS-232 Output connector

⑫ T1 Probe input connector

⑬ T2 Probe input connector

※This instrument is a completely waterproof (IP66), in order to maintain the stability of its characteristic function, please avoid falling, shocking or disassemble.

■Display descriptions



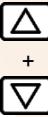
| Display | Descriptions |
|----------------------------|--|
| | Battery power symbol |
| | Manual shut down |
| | Buzzer on |
| | Under calibrating |
| | Data hold |
| | Data-logging |
| | Maximum value |
| | Minimum value |
| | Average value |
| | T1 probe |
| | T2 probe |
| | High point alarm |
| | Low point alarm |
| English words zone | thermocouple types |
| A.B.C. figures zone | Data value display |
| | °C : Celsius units, °F : Fahrenheit |
| Hidden symbols | Appeared when entering the setup mode or unusual condition |

Abnormal displays

- When Area A shows , please release all keys until the device return to normal status
- When Area A shows , the situations may be causes by the following reasons:
 - Exceed the measuring range of this device.
 - The Temperature probe is damaged or not inserted the connector.
 - The probe is abnormal when showing the T1 - T2 real temperature.
 - If it appears when turn on the instrument, please release all keys and tune it on again.

■Key descriptions

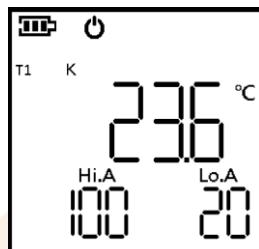
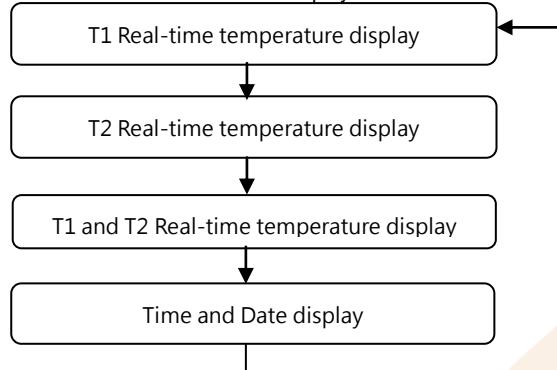
| Key | Function | Descriptions | LCD display |
|----------|--|---|-------------|
| | On/Off | Press one second (Be-) can turn on the power. Press one second (Be---) can turn off the power. If the instrument is left without any operation for five minutes, it will turn off automatically. | |
| | Manual turn off | When the device is on off state, hold ,then press to turn on. When appears, please release this two keys. It is finished to entering the manual turn off mode. | |
| | Hold mode | Under testing mode, press to enter the reading HOLD mode. Use and to change the displayed functions. Press to exit. When MAX and MIN are showed, area B will shows the first occurred data sheet, area C will shows the time (hour : minute). When AVG is showed, area B and area C will shows the total recording time (hour-minute: second) | |
| (2S) | Setting mode (Hi.A/Lo.A Ref.Span, date,time, sampling rate, temperature unit) | Under measurement mode, press and hold more than two seconds, when area A appears , release the to enter the setting mode, there are several selects in the setting mode, press to enter. Hi.A/Lo.A setting: Entering this mode when Hi.A and Lo.A appeared on the screen. Use and to change the data value, values are from 0 to 9 cycles, press to switch to the value, and press the to determine the value. Ref, Span setting: To enter when and appeared on the screen, use and to switching the value, press to switch to the value, and press to determine the value. Date setting: Entering when appears, use and to switching the value, long press can speed up the switch, press to switch to the value, and press to determine the value. Sampling rate setting: Entering when appears, use and to switching it, press to determine the value. Temperature setting: Entering when $^{\circ}\text{C}$ $^{\circ}\text{F}$ appears, use and to switching the value, press to determine the value. Exit: when the screen shows , use to exit. | |

| | | | |
|--|-----------------------------|---|---|
|  | RCD Recode mode | Under testing mode, and there is no recording data, press  to enter RCD record mode. The  will flash when record. Press  or  to stop recording. | |
| | RCD Reading mode | Under testing mode, press  to enter the data reading hold mode. Use   to switch the displayed record value; long press the can switch quickly. Press and hold  can switch 100 readings at once. Press  to exit. Press and hold  can switch to the RCD clear mode. |  |
| | RCD Clear mode | Under RCD reading mode or RCD hold mode, press and hold  two seconds to enter the RCD Clear mode. It will display  . Use  and  to select options, press  to confirm. The  twinkled means not to clear the data, and the  twinkled means to clear the data. It needs 7 to 10 seconds when processing this instruction. |  |
| | Thermocouple switch mode | Under testing mode, press and hold  more than two seconds to enter the thermocouple switch modes when the 9 type of thermocouple are displayed. Use  and  to select options, press  to confirm. |  |
|  | Change the value | Press  in any mode to change the values | -- |
|  | Change the value | Press  in any mode to change the values | -- |
|  | turn on back light | Under any mode, press  and  simultaneously, the back light will be turned on. Note: When the battery power is under 25%, the LED back light will not be able to function. | |
| | turn on buzzer (2S) | Under any mode, press and hold  and  simultaneously more than 2 seconds. The buzzer will be turned on when  appeared. |  |

■Instructions

A. Testing Mode:

Press and to switch display conditions.



In the testing mode, the display content as below:

| Status | Display contents |
|-------------------------------------|--|
| Normal conditions | Probe condition, Probe type, warning data condition, Power indication |
| T1 Real-time Temperature display | Area A: T1 Measuring data value Area B: High point alert data Area C: Low point alert data |
| T2 Real-time Temperature display | Area A: T2 Measuring data value Area B: High point alert data Area C: Low point alert data |
| T1-T2 Real-time Temperature display | Area A: T1-T2 Temp. data Area B: T1 Measuring data value Area C: T2 Measuring data value |
| Time and Date display | Area A: Year Area B: Month, day Area C: Hour, minute |

※Warning alert

When the temperature is higher than the **HI.A**, the **HI.A** symbol will flash.

When the temperature is lower than the **LO.A**, the **LO.A** symbol will flash.

The buzzer will make the warning sound if is turned on.

※Please let go off all keys, while waiting for the reading test mode and setting mode to return to the testing mode.

B.RCD Record mode:

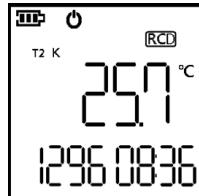
※Please use the AC Adaptor when you need to record for a long time

Under testing mode, press  into the record mode, It will show the sampling rate before starting record. Under the record mode press  and  can switch the display, the  will flashed when recording.

T1 and T2 will show the number of records with the present time, Press 

Or  to stop record. The  will be displayed when there are log data in the internal. The screen will shown FULL when the amount of record are full.

Press  or  to exit. Alarm function cannot be switched on the record mode.



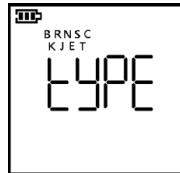
| Status | Display contents |
|-------------------------------------|--|
| Normal conditions | Probe condition, Probe type, warning data condition, Power indication |
| T1 Real-time Temperature display | Area A: T1 Measuring data value Area B: Reading Record Area C: Current time |
| T2 Real-time Temperature display | Area A: T2 Measuring data value Area B: Reading Record Area C: Current time |
| T1-T2 Real-time Temperature display | Area A: T1-T2 Temp. data Area B: T1 Measuring data value Area C: T2 Measuring data value |
| Time and Date display | Area A: Year Area B: Month, day Area C: Hour, minute |

C. Thermocouple switch mode:

Under the testing mode, press and hold  more than two seconds.

Entering the thermocouple switch mode when  appeared, press

 and  to switching the type, press  to finish the switch.

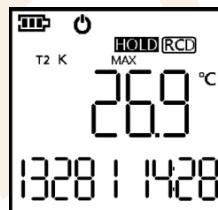
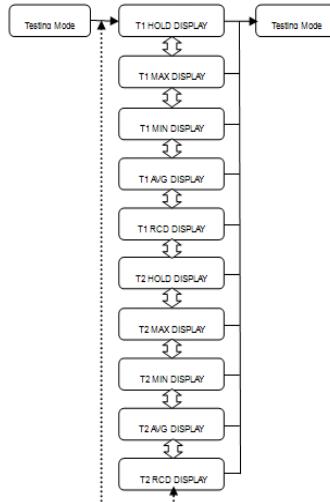


D. Hold Mode:

Under testing mode, press to enter the reading hold mode. Use and to switch the T1 and T2 values, press again to return to the testing mode. If there are data log in internal, the record will show the maximum, minimum, average. Press and hold two seconds to entering the RCD clear mode.

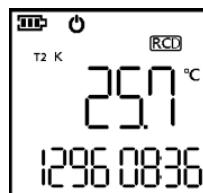
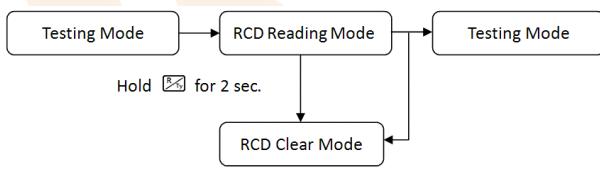
In lock mode, display content as description below:

| Display content | Description (Area A) |
|-----------------|------------------------------|
| T1-HOLD display | Hold the T1 temperature data |
| T1-MAX display | T1 maximum temperature data |
| T1-MIN display | T1 minimum temperature data |
| T1-AVG display | T1 average temperature data |
| T2-HOLD display | Hold the T2 temperature data |
| T2-MAX display | T2 maximum temperature data |
| T2-MIN display | T2 minimum temperature data |
| T2-AVG display | T2 average temperature data |



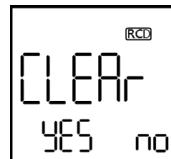
E. RCD Reading Mode:

Under the testing mode, press to enter the RCD clear mode. Use and to switch the displayed record value. Press the again can back to the testing mode. Press and hold the and can speed us the switch. Press and hold than press the and can switch 100 readings at once. Press for 2 seconds to switch to the RCD clear mode.



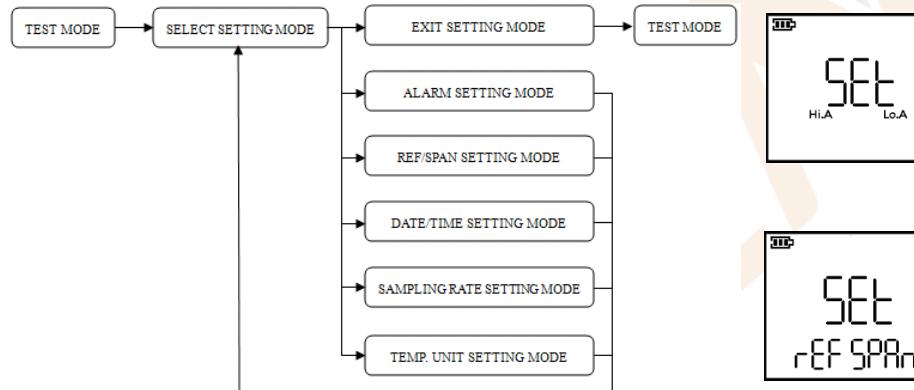
F. RCD Clear Mode:

Under the RCD reading mode or the hold mode, press and hold R_{Ty} to enter the RCD clear mode. Then **CLEAR** will be displayed. Press Δ and ∇ to select and use R_{Ty} to confirm. The **NO** twinkled means not to clear the data, and the **YES** twinkled means to clear the data. When clearing the data, the **CLEAR** will twinkled, please waiting for the – below disappeared.



G. Select Setting Mode:

Under testing mode, press and hold H_{Fn} for more than two seconds, release H_{Fn} when **SET** appears, Use Δ and ∇ to select options, press H_{Fn} to enter that mode. Press H_{Fn} again can exit.



Select the setting mode to view the content as described below:

| Display content | Description |
|------------------|---|
| Hi.A Lo.A | Enter the alarm setting mode |
| rEF SPAn | Enter the REF/SPAN setting mode |
| DATE | Enter the DATE/TIME setting mode |
| SP-t | Enter the sampling rate setting mode |
| °C °F | Enter the temperature unit setting mode |
| End | Exit the setting mode |

Setting mode instructions

1. Alarm setting mode

This mode is for setting the Hi.A and Lo.A, press  to change the digit you want to change, and press  and  to select the circulation figures from 0 to 9. It's thousands of bits can be switched to the negative sign. Press  to confirm the setting. Setting range: 2300 °C ~ -220 °C (4172 °F ~ -364 °F)



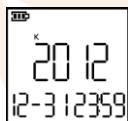
2. REF/SPAN setting mode

This mode is for setting the REF and SPAN, press  to change the digit you want to change, and press  and  to select the circulation figures from 0 to 9. it's thousands of bits can be switched to the negative sign. Press  to confirm the setting. REF setting range: 100.0°C~ -100.0 °C (180.0°F~ -180.0°F); SPAN setting range: 200.00%~ 0.00%



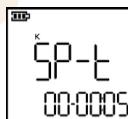
3. DATE/TIME setting mode

This mode is for setting the date and time, press  to change the digit you want to change, and press  and  to select the circulation figures. Press and hold  and  can accelerate switching. The number of seconds cannot be set, the maximum of year is set to 2099. Press  to confirm the setting.



4. Sampling rate setting mode

This mode is used to setting the sampling rate, press  and  to switch the rate. Display format: hour- min: sec; Press  to confirm the setting. Sampling rate setting: 2 seconds, 5 seconds, 10 seconds, 20 seconds, 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes, 30 minutes, 1 hour, 2 hours



5. Temperature unit setting mode

This mode is for setting the temperature unit, press  and  to switch the unit. Press  to confirm the setting.



6. Exit the setting mode

Use this option when you finish your setting.



■ RS-232 Transmission Agreements

※Please connect the AC Adaptor if it required a long time to transfer the data.
RS-232 is for one-way data transfer, receive and input the signal by three
grounded wires. Recommending using the transmission line which is
manufacture by OE factory or shorter than 10 meters of cable to connect the
computer and the instrument.

Transfer rate: 57600

Transfer Status: /8 / N / 1

Transmission Content: (8 BIT)

Read instructions: by function 03H (Read Holding Registers)

Modbus RTU CRC16 check

A. Request Data Frame

Ex: Read the data from address 00h (Read 1-byte of data from address 0000H)

| Slave address | Function | Starting address Hi | Starting address Lo | No. of Word Hi | No. of Word Lo | CRC Lo | CRC Hi |
|---------------|----------|---------------------|---------------------|----------------|----------------|--------|--------|
| 03H | 03H | 00H | 00H | 00H | 01H | 85H | E8H |

Response Data Frame

Ex: response data 2-Byte = 0x109D

| Slave address | Function | Byte count | Data Hi | Data Lo | CRC Lo | CRC Hi |
|---------------|----------|------------|---------|---------|--------|--------|
| 03H | 03H | 02H | 10H | 9DH | 0DH | EDH |

0x109D=4253 · actual value =(Data-4000)/10=25.3

B. Request Data Frame

Ex: Read the data from address 00h (Read 2-byte of data from address 0000H)

| Slave address | Function | Starting address Hi | Starting address Lo | No. of Word Hi | No. of Word Lo | CRC Lo | CRC Hi |
|---------------|----------|---------------------|---------------------|----------------|----------------|--------|--------|
| 03H | 03H | 00H | 00H | 00H | 02H | C5H | E9H |

Response Data Frame

Ex. response data 4-Byte =0x109C and 0x109D

| Slave address | Function | Byte count | Data(1) Hi | Data(1) Lo |
|---------------|----------|------------|------------|------------|
| 03H | 03H | 04H | 10H | 9CH |

| Data(2) Hi | Data (2) Lo | CRC Lo | CRC Hi |
|------------|-------------|--------|--------|
| 10H | 9DH | D1H | 74H |

0x109C=4252 · actual value =(Data-4000)/10=25.2

0x109D=4253 · actual value = (Data-4000)/10=25.3

C. Request Data Frame

Ex: Read the data from address 02h (Read 5-byte of data from address 0002H)

| Slave address | Function | Starting address Hi | Starting address Lo | No. of Word Hi | No. of Word Lo | CRC Lo | CRC Hi |
|---------------|----------|---------------------|---------------------|----------------|----------------|--------|--------|
| 03H | 03H | 00H | 02H | 00H | 05H | 25H | EBH |

Response Data Frame

Ex. response data =10-byte

| Slave address | Function | Byte count | Data(1) Hi | Data(1) Lo | Data(2) Hi | Data(2) Lo |
|---------------|----------|------------|------------|------------|------------|------------|
| 03H | 03H | 0AH | 08H | FCH | FFH | 24H |

| Data(3) Hi | Data (3) Lo | Data(4) Hi | Data (4) Lo | Data(5) Hi | Data(5) Lo | CRC Lo | CRC Hi |
|------------|-------------|------------|-------------|------------|------------|--------|--------|
| 08H | FCH | FFH | 24H | 00H | 01H | 38H | 9FH |

Data(1) =T1-Hi.A 0x08FC=2300

Data(2) =T1-Lo.A 0xFF24=-220

Data(3) =T2-Hi.A 0x08FC=2300

Data(4) =T2-Lo.A 0xFF24=-220

Data(5) Hi and Data(5) Lo of MOD = 0x0001

1. Data(5) Hi =Thermocouple type >>> Value=0 represent K type thermocouple
2. Data(5) Lo bit 05=°F/°C Judgment >>> Value =0 represent °C
>>> Value =1 represent °F
3. Data(5) Lo bit 04 No value
4. Data(5) Lo bit 03=T2>Error judgment >>> Value =1 represent T2>Error
5. Data(5) Lo bit 02=T1>Error judgment >>> Value =1 represent T1>Error
6. Data(5) Lo bit 01~00=Power gauge >>> Value =1 represent battery power of 50~25%

【Example】 Set mode:

1. K Type thermocouple
 2. Temperature unit=°C
 3. T1 no ERROR
 4. T2 no ERROR
 5. Power74~50%

MOD setting mode

0=K Type thermocouple, 1= J Type thermocouple, 2= E Type thermocouple,
3= T Type thermocouple, 4= B Type thermocouple, 5=R Type thermocouple,
6=N Type thermocouple, 7= S Type thermocouple, 8= C Type thermocouple.

| Bit 07 | Bit 06 | Bit 05 | Bit 04 | Bit 03 | Bit 02 | Bit 01~ Bit 00 |
|--------|--------|--|--------|---------------|---------------|----------------|
| X | X | $^{\circ}\text{F}=1$ $^{\circ}\text{C}=0$ | X | T2 Error=1 | T1 Error=1 | Power |

★Power Meter is divided into 4 parts 11=100~75% 10=74~50%
01=49~25% 00=24~0%

Interpretation of data:

The data value read only observed in the real-time testing mode

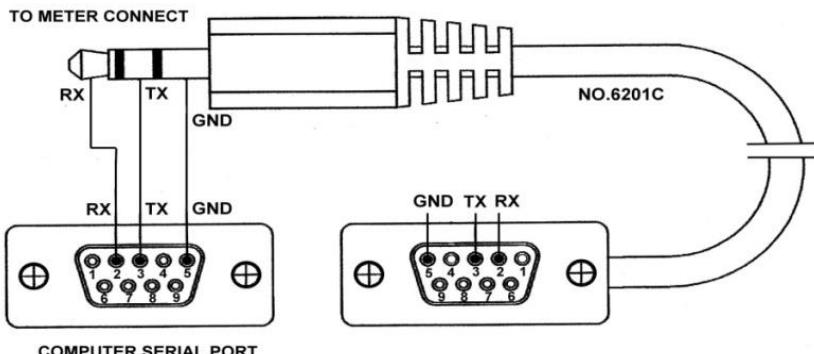
The actual value of T1-real-time and T2-real-time is $(\text{Data} - 4000) / 10$

The actual value of T1-Hi.A, T1-Lo.A, T2-Hi.A, and T2-Lo.A is read data value

Address/ Data name Comparison Table

| Address | Data name |
|---------|-------------------------------------|
| 0000h | T1 Real-Time Data |
| 0001h | T2 Real-Time Data |
| 0002h | T1 Hi.A |
| 0003h | T1 Lo.A |
| 0004h | T2 Hi.A |
| 0005h | T2 Lo.A |
| 0006h | T1 T2 status (Type, °C/°F ,Battery) |
| 0007h | Record amount |

D. Cable illustrated



■ Precautions

1. This instrument has a waterproof function; please do not use it in a high temperature environment or with corrosive materials to avoid leakage or damage.
2. Proposed to use the company's original signal cable (sold separately) to avoid the instrument inability to communicate to computer.
3. If you want to get a more accurate measurement value, keep a moment to let the temperature uniform and steady when measuring.
4. When the instrument shows power shortages, please replace the battery immediately.
5. When the device will not be used in a long time, please set the device and all accessories into the protective case, stored in a dry place, and avoid exposure to sunlight directly.
6. If there are any operation questions or malfunction, please contact your local distributor or our service department.

MEMO

