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User's Guide

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HH66R
Type K/J/T/E/R/S/N Thermometer

Table of Contents

Introduction

Thank you for purchasing the temperature gauge from us. Please take a few minutes to browse through this user manual before you begin to operate the unit to ensure that you are fully familiarized with how best to operate the temperature as accurately and safely as possible.
The HH66R temperature gauge features a microprocessor-based digital temperature gauge.

HH66R
|
Two Channel
|
K/J/T/E/R/S/N Types
|
RS232 Transmission

■ Features

1.Five-digital liquid crystal display.
2.High resolution, swift response.
3.Full range 0.1 resolution.
4.Setting alert temperature range.
5.With T1/T2 switchover display independent.
6.With T1/T2 display simultaneously function. (on dual input modes)
7.Setting power source for "Auto Power Off " or " Never Auto Power Off ".
8.The thermocouple types can be independently under T1 and T2 temperature setting for testing simultaneously differ types of thermocouple.
9.Low battery indicator prompted via a "🔋" icon.
10.An RS-232 interface and for Windows compatible software, with setting transmission timing setting at min. of 1 second and max. up to 59 minutes and 59 seconds.
11.With built-in "Time"function.
12.Additional features include: Maximum (Max).Minimum(Min).readout hold(Hold). relative(REL). And T1-T2.
13.Temperature readout modes include Celsius (℃),Fahrenheit(℉),absolute temperature(K).
14.A lightweight compact unit featuring a full range of comprehensive functions that can be easily maneuvered in one hand.
15.CE certified, according to ITS-90 law.

General Specifications

1.Display Mode:Five-digit liquid crystal display.
2.Polarity indicator:No indicator is shown when readouts are in the positive value, while the symbol"-"is prompted when readouts fall into the negative value.
3.Overload indicator: The overload"OL" indicator.
4.Low-battery indicator: The symbol"🔋"is prompted on the LCD when the battery runs low.
5.Power source: One DC-9 volt battery.
6.Auto power off: The unit no operations over 20 minutes, the battery power will be turned off. Press the "Hold" key for 3 seconds, the auto power off will be cancelled.
7.Battery life: Approximately 200 hours.
8.Operating Temperature and Humidity: 0℃~50℃(32℉~122℉),0~80%RH.
9.Storage Temperature and Humidity: -10℃~60℃(14℉~140℉),0~80%RH.
10.Dimension:130x56x38mm(LxWxH).
11.Weight: Approximately 180g.
12.Accessories:
(A) One DC-9V battery.
(B) One carrying-case.
(C) Two K-type thermocouple wires.
(D) One RS-232 connection cable.
(E) One users manual.

Electrical Specifications

1.Temperature unit: Celsius temperature(℃). Fahrenheit temperature(℉).Absolute temperature(K).

2.Measurement Range:(At 23± 5℃.relative humidity< 80%RH)

K-type:-200℃~1372℃(-328℉~2501℉)
J-type:-210℃~1200℃(-346℉~2192℉)
T-type:-250℃~400℃(-418℉~752℉)
E-type:-210℃~1000℃(-346℉~1832℉)
R&S-type:0℃~1767℃(32℉~ 3212℉)
N-type:-150℃~1300℃(-238℉~2372℉)

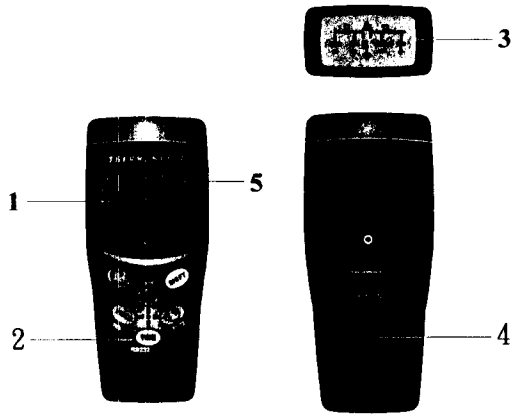
3. Resolution: 0.1.

4. Accuracy: The basic accuracy does not include the error of the thermocouple.

K/J/T/E/N-type:
±(0.05% reading+0.7℃)-250℃~-100℃
±(0.05% reading+0.5℃)-100℃~1372℃
±(0.05% reading+1.4℉)-418℉~-148℉
±(0.05% reading+1.0℉)-148℉~2501℉

R/S-type:
±(0.05% reading+2℃) 0℃~1767℃
±(0.05% reading+4℉) 32℉~3212℉

■ Names Of Parts



1.LCD display

2.Function control key

3.Temperature jack

4.Battery cover

5.RS-232 jack

■ Operation

1. ⏻: **Power On/Off switch:**
   Press the power button to turn the thermometer ON or OFF. however, when RS-232 function to start, the power will turned on always.Until the RS-232 function ended .(press once the"Shift" button, then push the " Time" key, as the"RS-232" word disappear on the LCD), The power will turned off.
2. **℃/℉/ K: The temperature unit selection key.**
   Press the key to sequentially alternate the three temperature units of℃,℉ and K
3. **Hold: The readout hold function key.**
   Press the "Hold" key, and a "Hold" icon will display on the LCD and the readout held in; press the "Hold" button once more to cancel the readout "Hold" function.
   For auto power off control, press the "Hold" key for three seconds, and "p-off" icon to disappear on the LCD to undo auto power off.
   Press the"Hold"key for three seconds, and "p-off" icon to appear on the LCD to reactivate the auto power off function.
4. **Max/Min: The maximum/minimum readout function key.**
   Press the "Max/Min" key and "Max" icon will appear on the upper of the LCD, and press the key once more to switch to "Min" setting; press the key once more to disable the "Max/Min" function.

■ Operation

5.Time: The time setting function key.
Press the "Time" key and the time meter "00:00" will appear on the LCD display indicating that the timer has been activated, where the timer runs up to 100 hours, and will reset upon reaching 100 hours; to reset the timer; press the "Time"key once more, the screen will normal.

6.Shift: The function key can setting become "REL"."Limit"."RS232" and "T1-T2".

7.REL: The relative readouts.
Press the "Shift" key, then press the "Hold" key, and the "REL" icon to appear on the LCD to access the "REL" feature.
Upon accessing the REL function, the original of a temperature will become to 0, and save the original temperature value to make a standard relative value. Whenever the input temperature shifts, the LCD will shows the minus value of original temperature value and input temp. value.
For example, an original value of 25.0 is entered and the device is set to REL function, where the LCD will become to 0 and save the 25.0 taken as the standard relative value, when an input temperature 30.0, the LCD will shows 30 minus 25 equals to 5.
To exit from the REL function, press the "Shift" key once, then press the "Hold" key to complete.

■ Operation

8.Limit: Alert temperature range key.
Press the "Shift"key, then press the "℃/℉/ K" key and the "Limit"icon appear to the LCD to access the "Limit" setting function.
When an input temperature exceed the alert temperature range defined, the buzzer will sounded.
To exit the function mode, press the "Shift" key once, then press the "℃/℉/ K" key, and the "Limit" icon disappear from the LCD display to complete the process of exiting from the function mode.

9.T1-T2:The temperature differential function.
Press the "Shift" key, then press the "T1/T2" key, and the "T1-T2" icon appear on the LCD to access the "T1-T2" function.
A T1-T2 temperature differential readout will be show on the LCD. For example: T1 defined at 25.3℃, T2 defined at 25.4℃,When "T1-T2" function is started, The LCD readout display will be show"-0.1℃".
To exit from this function, press the "Shift" key once, then press the "T1/T2" key and the "T1-T2" icon to disappear from the LCD display to complete the progress of exiting from this function mode.

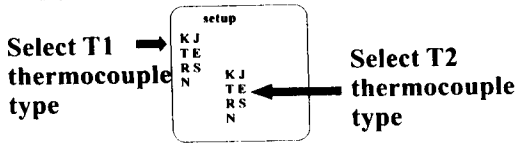
■ Operation

10.RS232: The RS232 interface.
Press the "Shift"key once, then press the "Time"key, and the"RS232" icon to appear on the LCD display to access the RS232 interface feature.
To exit the function, press the "Shift" key once, then press the "Time" key, and the "Rs232" icon to disappear from LCD display to exit the function mode.
Note: Upon accessing the RS232 function, the auto power off function will be disabled, even if you continue to press the power on/off key, until you disengaged the RS232 interface function.

11.Set: Press the "Shift" key for 3 seconds and
- **the"Setup" icon to appear on the LCD display to access for defining settings.**
- **When you press the "Time" key, then enter the "INTV" setting.**
- **Or press the "Max/Min" key, then enter the "Type" setting.**
  Or press the "C/F/K" Key, then enter the "Hi/Lo" setting.

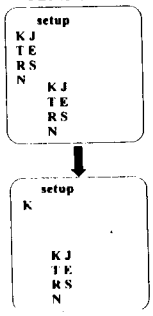
■ Operation

12.Type: The thermocouple type setting
Press "Shift" key for 3 seconds and the "Setup"icon to appear in upper left of the LCD, and then press the "Max/Min" key to enter the thermocouple type setting, where the LCD show as follows:



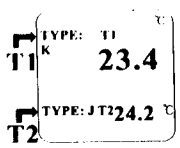
The process for choosing the thermocouple type is as follows:

A. Select T1 thermocouple type:



Upon accessing as T1's "k" icon will begin to flicker, choose a thermocouple by using scrolling keys, i.e. The "Max/Min"key for up, the "Time"key for down; the "Hold" key for left; the "T1,T2" key for right. And then press " Shift"key to complete T1 thermocouple type selection. The LCD shows to left.

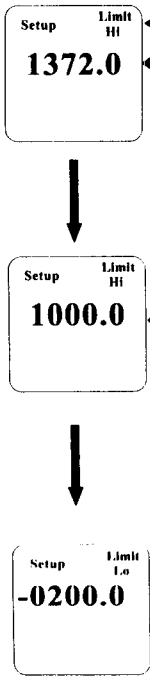
B. Select T2 thermocouple type:



The process for selecting T2 thermocouple type is identical as section A. Where choosing T2 thermocouple type, press the "Shift" key to complete and the LCD will show you choosing.

■ Operation

13.Hi/Lo:The alert temperature range setting. Press the "Shift" key for 3 seconds and the "Set up"icon to appear on upper left of the LCD, and press the "℃/℉/ K"key to enter the"Hi/Lo"parameter setting, where the LCD shows as follows:



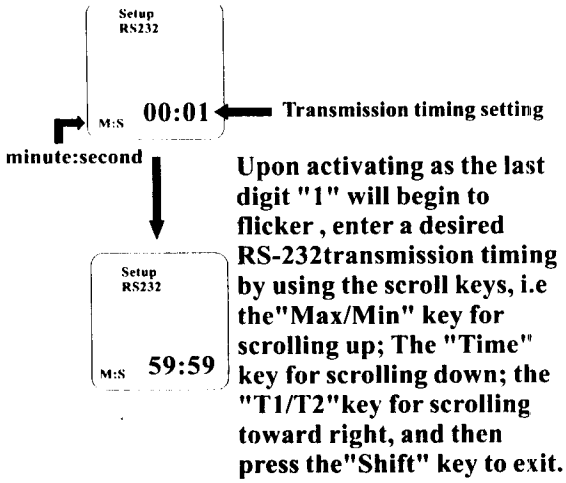
High parameter setting

Choosing on the main menu T1 a desired Hi/ Lo thermocouple model's maximum readout as temperature to be displayed.

Upon accessing the last digit "0"will flicker, enter a max. Temp. Parameter using a scroll keys, i.e "Max/Min" key for up, "Time"key for down,"Hold"key for left; "T1.T2"for right. Then press"Shift"key to exit and ready to set Min. value. Method of defining the low temp. Parameter is identical as the max. Parameter setting ,the main menu T1 desired Hi/Lo the thermocouple model's min. readout as temp to be displayed. Press the "Shift"key to exit.

■ Operation

14.Intv:RS-232 transmission timing setting. Press down the "Shift" button for approx.3 seconds as the wording "Setup" would be prompted on upper left of the LCD, and then press the "Time" key to access the RS-232 transmission timing setting, the screen will show:



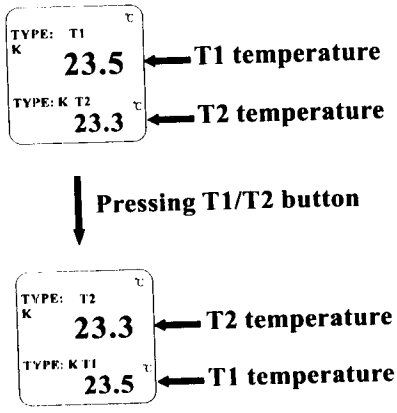
Upon activating as the last digit "1" will begin to flicker , enter a desired RS-232transmission timing by using the scroll keys, i.e the"Max/Min" key for scrolling up; The "Time" key for scrolling down; the "T1/T2"key for scrolling toward right, and then press the"Shift" key to exit.

To set the RS-232 transmission timing, the minimum setting time is at one second, and maximum is at 59 minutes and 59 seconds.

■ Operation

15.T1/T2: T1/T2 Temperature exchange function key.

Press the T1/T2 key alternately to flip T1 temperature display into T2 temperature, and T2 will flip into T1.The exchange of T1 and T2 temperature is as follows:

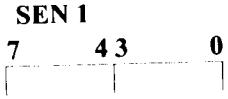


■ RS-232 data form

1.sensor's format

(1)

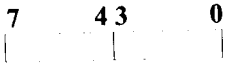
SEN 1



SEN 0

Sensor	K	J	T	E	R	S	N
Date	0	1	2	3	4	5	6

(2)SEN 2



Bit 0~3:can useful sensor's types

0:K
1:KJ
2:KJT
3:KJTE
4:KJTER
5:KJTERS
6:KJTERSN

Bit 4~5:Channel

0:T1

1:T1,T2

2:T1,T2,T3

3:T1,T2,T3,T4

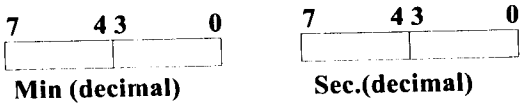
Bit 6:Model(Real data:0,File:1)

Bit 7:Unuse

■ RS-232 data form

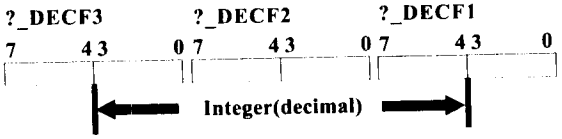
Transmissible time interval: Max. 59 minutes 59 seconds

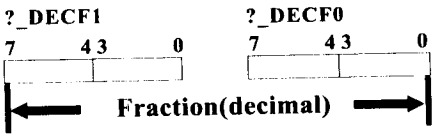
Ti1 **Ti0**



Min (decimal) **Sec.(decimal)**

2.Temperature value's format





Bit 4:positive.negative(positive:0,negative:1)
Bit 5:Overflow

3.transmissible format

L.C.	C.C.	S.C.	Date	E.C.

L.C.	C.C.	S.C.	Flag	E.C.

L.C.:0AA$_H$
E.C.:0AB$_H$

■ RS-232 data form

C.C.:

$0BX_H$:Model-0

$0B1_H$:Sensor,T.I,Temperature(Terminal→PC)

$0B2_H$:Sensor& T.I.(Terminal→PC)

$0B3_H$:Sensor& T.I.(PC→Terminal)

$0B4_H$:Data=10H,on-line confirm(PC→Terminal)

$0B9_H$:Answer"$0B1_H$"(PC→Terminal)

$0BA_H$:Answer"$0B2_H$"(PC→Terminal)

$0BB_H$:Answer"$0B3_H$"(Terminal→PC)

S.C.:

Order code(00_H~$7F_H$).The same data repeat deliver, then the code will constant. On the other hand, different data , the code will plus 1 in turn.

Flag:

"30_H"=Fail,"31_H"=Success

Data:

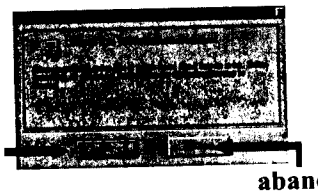
C.C.=$0BX_H$

SEN 0~2,TI0~1,Tn0*

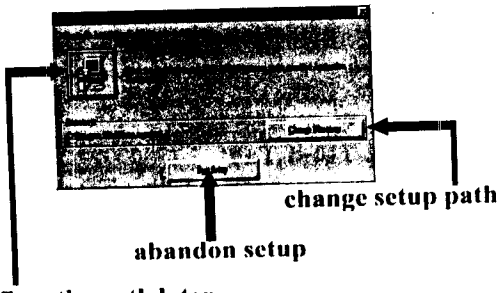
Tn0* : T1_DECF1~3,T1_DECF0,
T2_DECF1~3,T2_DECF0,
T3_DECF1~3,T3_DECF0,T4_DECF1~3,
T4_DECF0.

■ software installation procedure

1.Insert setup CD-R to CD-ROM driver.
2.The setup mode according to personal software's difference, it can sort of auto-setup and manual-setup.The manual-setup procedure is: A: use a mouse to click "my computer"twice" B: click to CD-ROM driver (E) twice C:use a mouse to click "setup"file twice. Then begin to enter setup procedure.
3.started the setup picture:

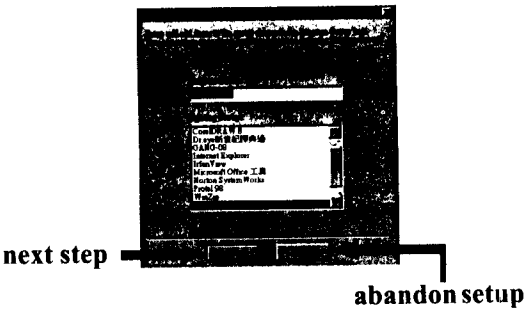


4.select to setup path:

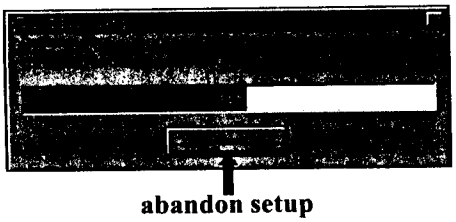


■ software installation procedure

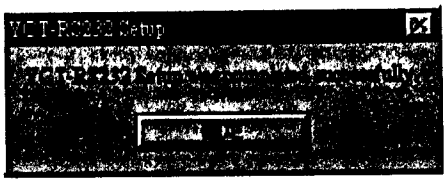
5.select program group



6.setup schedule

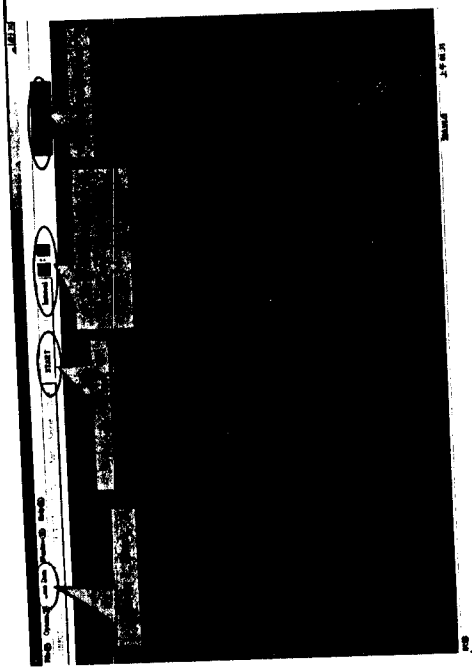


7.setup finished



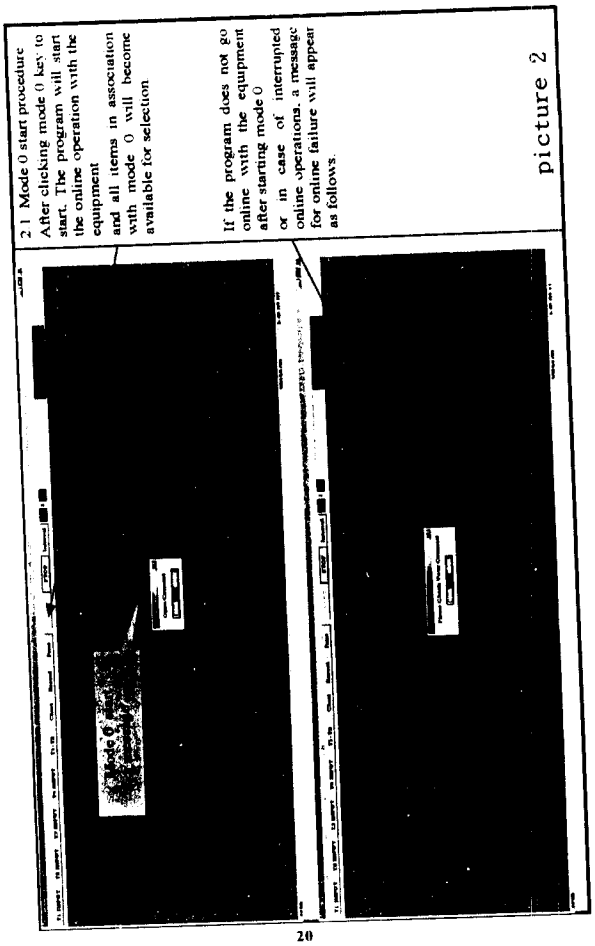
■ RS-232 operation of software

1. Intital display
This is the initial display after execution of this program.



picture 1

■ RS-232 operation of software



RS-232 operation of software

2.2 mode 0 sensor display:

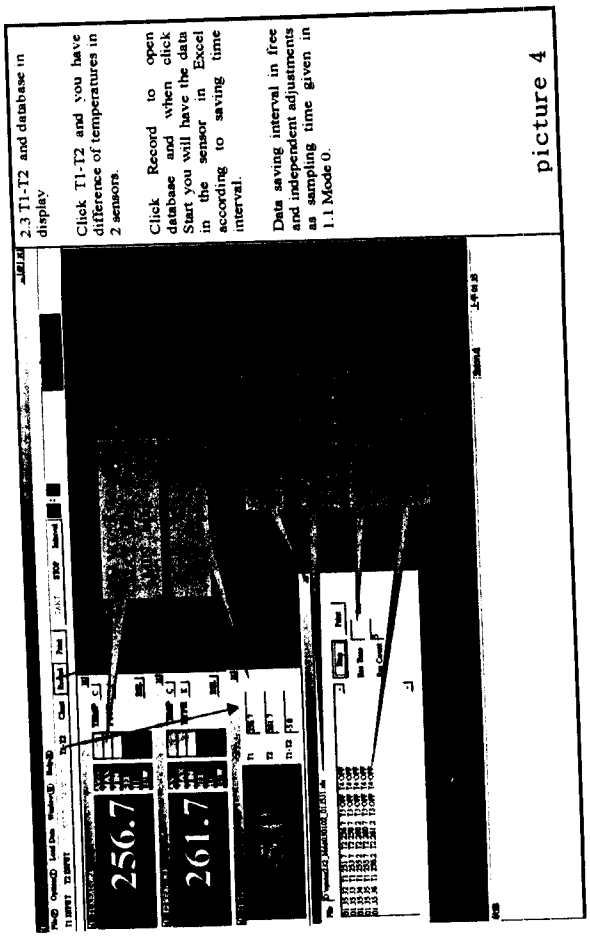
After going online in 2.1, all available keys will appear according to number of sensors currently supported by the equipment.
After clicking the key, the sensor screen will appear, showing current real-time temperature.
The following display will appear according to type of current sensor and the preset Hi and Lo

Current temperature
Higher than Hi (Yellow character red background)
Normal (Green character black background)
Below Lo (White character blue background)

Others as shown

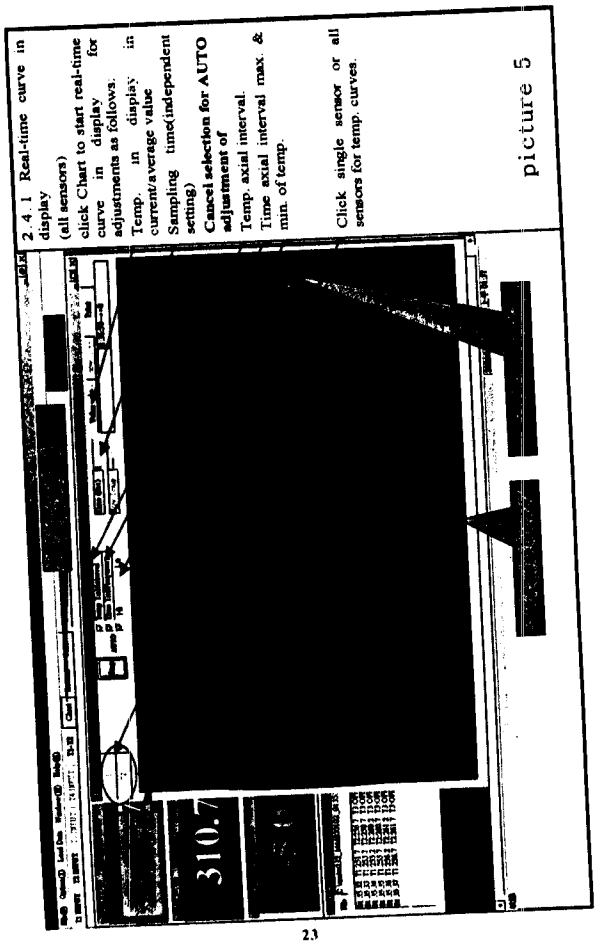
picture 3

RS-232 operation of software

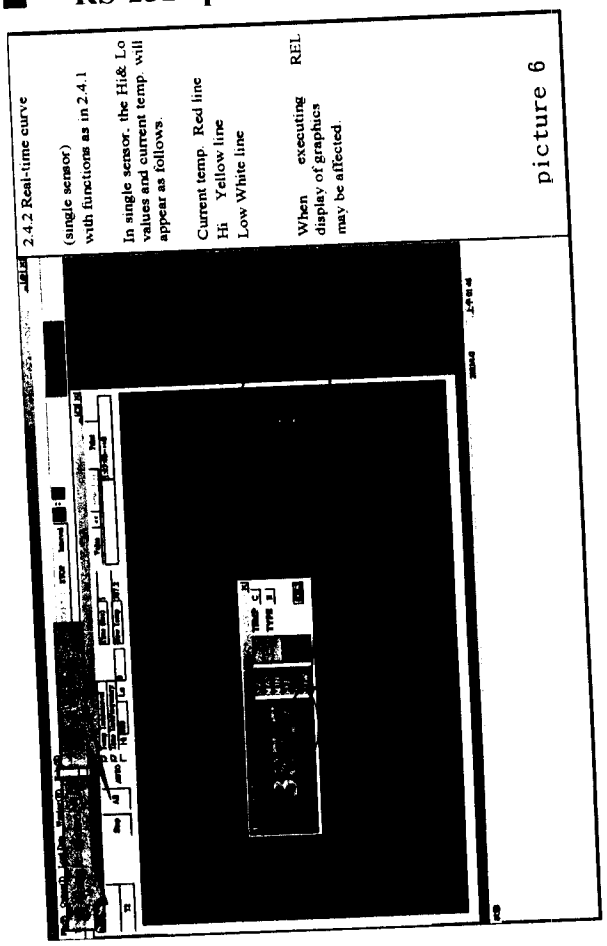


picture 4

■ RS-232 operation of software



RS-232 operation of software



2.4.2 Real-time curve

(single sensor)
with functions as in 2.4.1

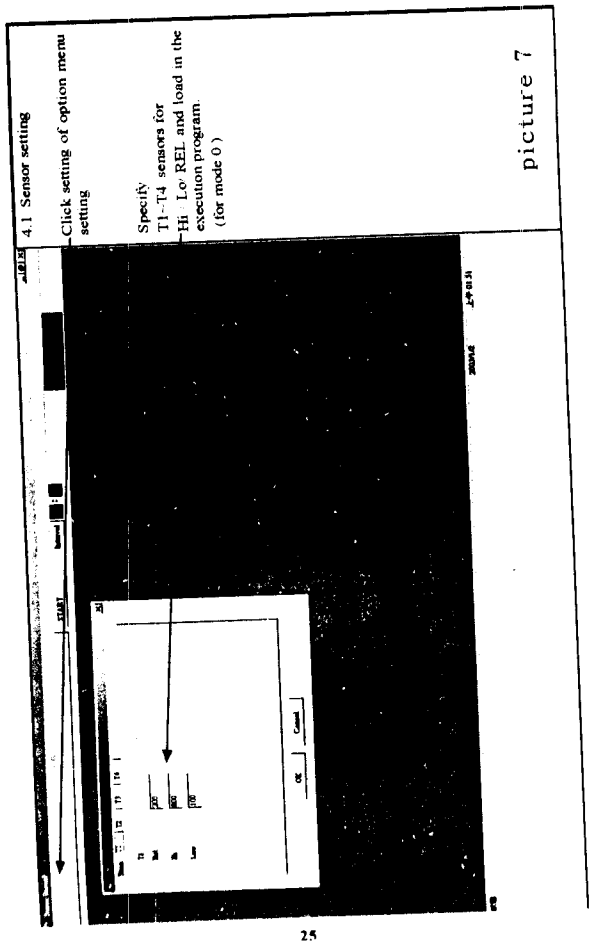
In single sensor, the Hi& Lo values and current temp will appear as follows.

Current temp. Red line
Hi Yellow line
Low White line

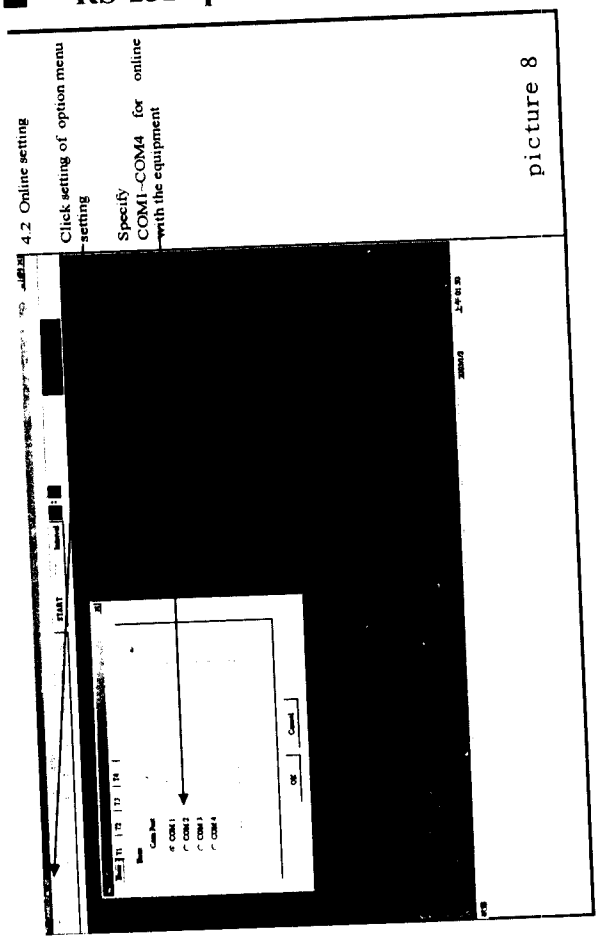
When executing REL display of graphics may be affected.

picture 6

RS-232 operation of software



RS-232 operation of software



■ Battery replacement

1.The symbol "▭" that appears in the upper left of the LCD display indicates that the unit's battery is running low. Please replace the 9V battery at once to ensure the test accuracy.

2.Remove the battery cover by following the direction marked "OPEN" to slide down the cover, and remove the cover accordingly.

3.Replace the old battery with a new 9V battery and reinsert the battery cover.

4.Prior to replacing the battery, please make certain to remove the thermocouple from the temperature gauge as a safety precaution.

5.When in extended idle, please remove the 9V battery from the temperature gauge and store the temperature gauge only in a cool and low-humidity setting.

6.To avoid combustion, DO NOT dispose of batteries in general into an open flame.

7.Caution the positive and negative polarity when loading battery.

8.Please abide by pertinent laws and regulations when disposing of used batteries.

■ Caution

1.Input protection: The temperature jack carried a maximum voltage of 24 volts DC or AC , with a maximum surge-attenuated voltage rating-the maximum surge-attenuated voltage ratings on terminals T1 and T2 temperature input jack rated at 1 volt.
2.Temperature jacks: Design for the insertion of a standard small thermocouple jacks, which has a center spacing of 7.9mm between the two prongs.
3.Please DO NOT placed inside a microwave for temperature testing.
4.A correct thermocouple slot should be chosen when operating the temperature gauge.
5.Please DO NOT attempt to use a temperature gauge that is not working properly, for this may result in physical harms, send for repair service at once.
6.Please DO NOT attempt to operate the temperature gauge in the around sites where explosive gases, vapor or dust particles are present.
7.Please refrain from subject the paired thermocouple or the grounding between the thermocouples to a voltage exceeding what has been marked on the unit.

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WARNING: These products are not designed for use in, and should not be used for, human applications.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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