1 YEAR WARRANTY

CE

User's Guide

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K/J/T/E/R/S/N Types

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

Table of Contents

Introduction

Thank you for purchasing model HH147, RS232 Data Logger Thermometer. 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 on how to best operate the meter.
The model HH147 features a microprocessor-rated digital temperature gauge.

HH147
|
Four Channel
|
K/J/T/E/R/S/N Types
|
RS232 + Data Logger (with Back Light)

Features

1. Displays maximum value for four temperatures.
2. Resolution: 0.1°C/0.1°F, 1°C/1°F.
3. Swift response.
4. Alert temperature range, setting.
5. Auto power off function.
6. Low batttery indicator function.
7. Perpetual calendar function.
8. “Count” function.
9. T1-T4 exchange to main display function.
10. T1-T2, T3-T4 function.
11. Additional features: HOLD, °C/°F, REL, CHAN, MAX/MIN/AVG, 1°, TYPE, TIME (CLOCK setting), LIMIT (HiLo setting).
12. CE certified, according to ITS-90.

General Specifications

1. Display Mode: Four-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: "OL" or "-OL" is displayed.
4. Low battery indicator: The symbol "B" is prompted on the LCD when the battery runs low.
5. Power source: Four AAA batteries.
6. Auto power off: The unit powers down after 20 minutes of operation. Press the "Shift" key for 3 seconds, the auto power off will be disabled.
7. Sample rate: 1 time/sec.
8. Battery life: Approx. 550 hours.
9. Operating Temperature and Humidity: 0°~50°C (32°~122°F), 0~80%RH
10. Storage Temperature and Humidity: -20°~60°C (-4~140°F), 0~80%RH.
11. Dimension: 164x76x32mm (LxWxH).
12. Weight: approx. 415g (includes batteries).
13. Accessories:
    (A) AAA Battery (4pcs).
    (B) Housing (1pc).
    (C) K-type thermocouple wire (4pcs).
    (D) Users manual (1pc).
    (E) RS-232 cable (1pc).
    (F) RS-232 software CD (1pc).

■ Electrical Specifications

1. Temp. unit: Celsius temp. (°C). Fahrenheit temp. (°F), Absolute temp. (K).
2. Measurement Range: (At 23±5°C,<80%RH)
   K-type: -100~1300°C (-148~2372°F)
   J-type: -100~1000°C (-148~1832°F)
   T-type: -100~400°C (-148~752°F)
   E-type: -50~800°C (-58~1472°F)
   R&S-type: -0~1700°C (32~3092°F)
   NK-type: -100~1300°C (-149~2372°F)
3. Accuracy: The basic accuracy does not include the error of the thermocouple.
   K/J/T/E/-type:
   ±(0.1% reading +0.7°C) -100°~-1300°C
   ±(0.1% reading +1.4°F) -148°~2372°F
   R/S-type:
   ±(0.1% reading +2°C) 0°~1700°C
   ±(0.1% reading +4°F) 32°~3092°F
   N-type:
   ±(0.1% reading +1.5°C) 100°~1300°C
   ±(0.1% reading +3°F) 148°~2372°F
4. Resolution:

	1°C	0.1°C
K	-100°~1300°C	-100°~200°C
J	-100°~1000°C	-100°~150°C
T	-100°~400°C	-100°~150°C
E	-50°~800°C	-50°~100°C
R	0°~1700°C	
S	0°~1700°C	
N	-100°~1300°C	-100°~150°C

Names Of Parts

1.LCD display

2.Function control key

3.Thermocouple input jack

4.Battery cover

5.RS-232 input jack

6.Shift button

7.Power button

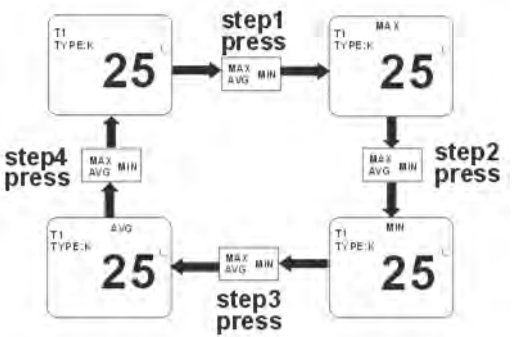
■ Operation

1. ⏻ : Power ON/OFF Key.
Press the power button to turn the power ON or OFF.

2. °C/°F/K: The Temp. Unit Selection Key.
Press the key to sequentially alternate the three temp. units of °C, °F, and K.

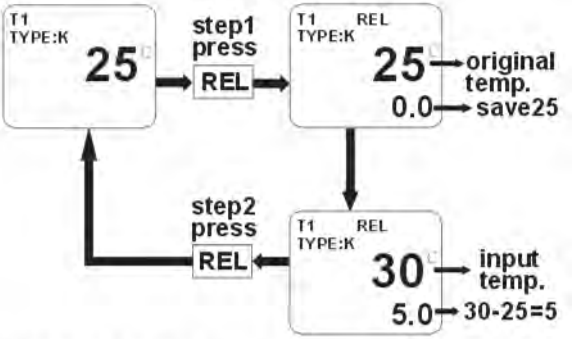
3. HOLD: The Readout Hold Function Key.
Press the "HOLD" key, a "HOLD" icon will display on the LCD and the readout will be held in; press the "HOLD" key once more to cancel the "HOLD" function.

4. MAX/MIN/Avg: The Maximum/Minimum/ Average Readout Function Key



■ Operation

5. REL: The Minus Relative Readout Function Key.
Press the "REL" key, a "REL" icon will display on the LCD and the original temp. will go to 0 and save the original temp. to make a standard value.
Whenever the input temp. shifts, the LCD will show the minus value of the original temp. value and input temp. value.



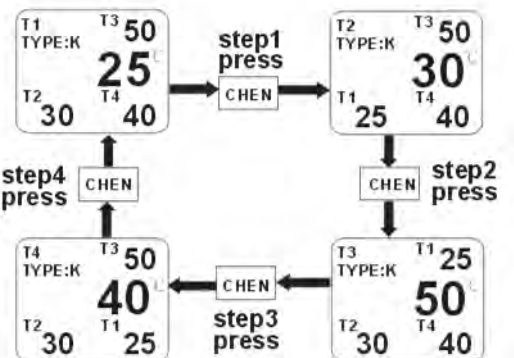
6.1°: 1° or 0.1° Unit Selection Function Key
Press the "1" key, the whole resolution will become 1°C.1°F, and eliminate the dot. Press the key again and the display will be restored to the common state (the resolution will become 0.1°C/0.1°F).

Note: The resolution of the thermocouple types is shown on page 4.

■ Operation

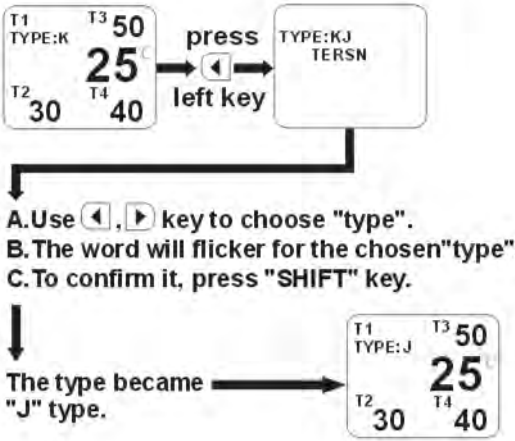
7.CHEN:every input temp. value changed to main display function key.

A.four channel:



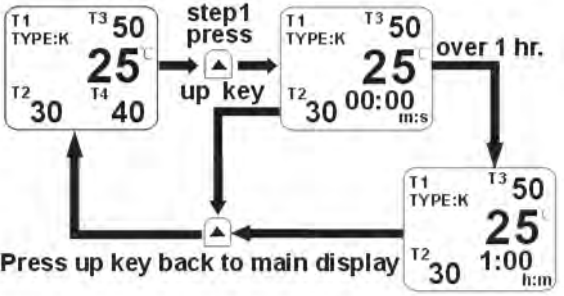
Operation

8. TYPE: Select a thermocouple type function key. HH147 includes seven diffferent thermocouple types. The method of operation:

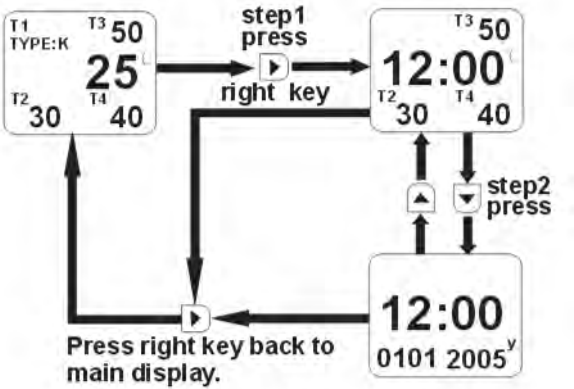


Operation

8. COUNT: The Count Time Setting Function Key. The max count time is 99 hours and 59 minutes.

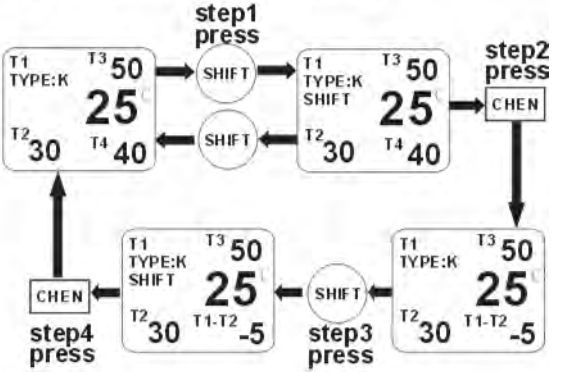


10. TIME: To set the present time function key.

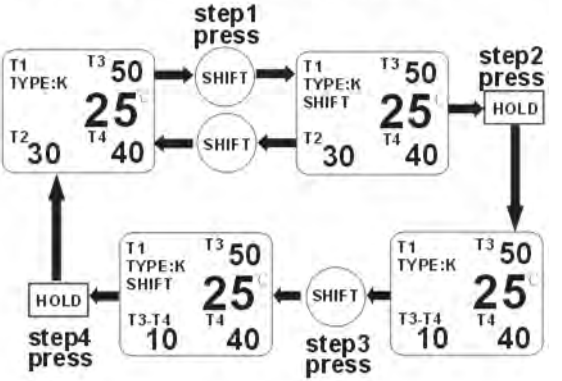


■ Operation

11.T1-T2:With T1-T2 function.

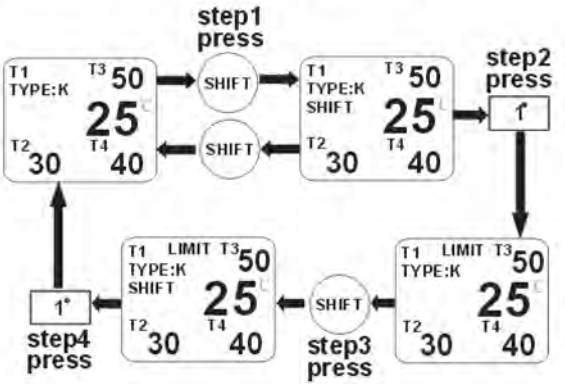


12.T3-T4: for four channel modes.



■ Operation

13. LIMIT: To Enforce Alarm Function Key



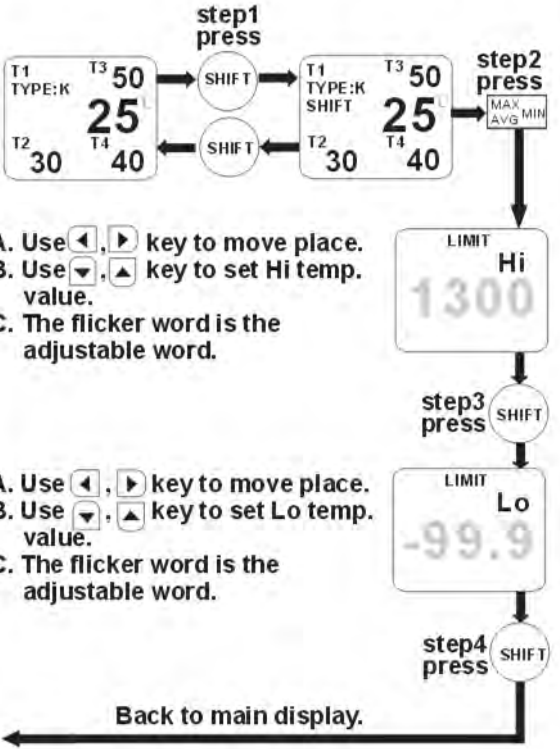
NOTE 1: The alarm will continue to be activated when the main display temp. value is higher than the alarm setting Hi temp. value or lower than the alarm Lo setting value.

2: The Hi/Lo setting temp. values of the thermocouple types vary.

Type \ Hi/Lo	Hi	Lo
K	1300	-99.9
J	1000	-99.9
T	400	-99.9
E	800	-50
R	1700	0
S	1700	0
N	1300	-99.9

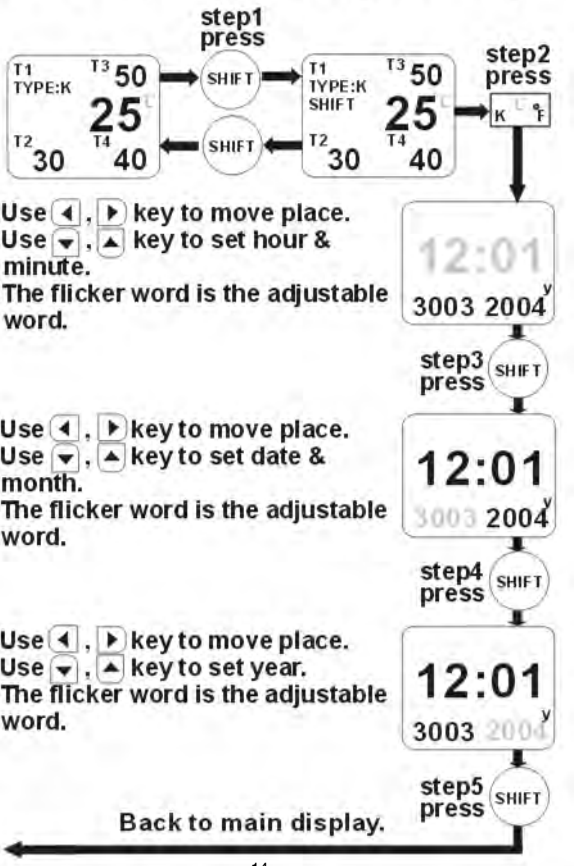
■ Operation

14.Hi/Lo: The alarm Hi/Lo temp.value setting.



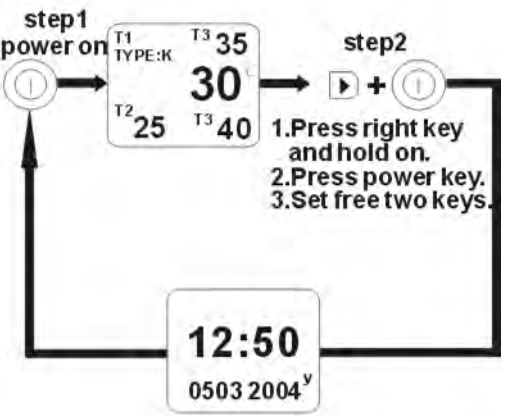
■ Operation

15. CLOCK: To Enforce Date Setting Function Key.



Operation

16. Perpetual Calendar:



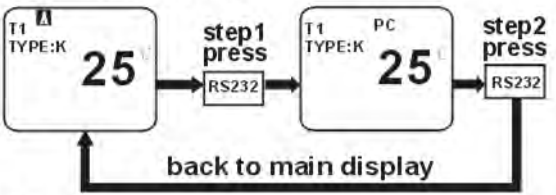
16. Backlight:

A. Press the backlight button to turn the backlight ON or OFF.

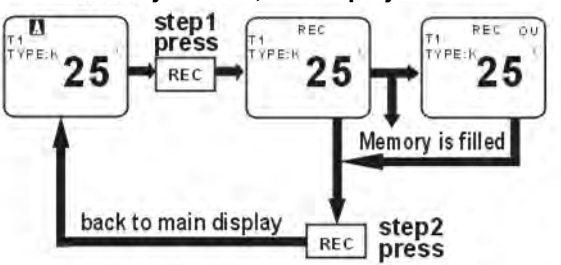
B. If you do not disable the backlight feature, the backlight will stay on for 1 minute.

■ Operation

1. RS-232: When you turn on the "RS-232" function the auto power off and the power off will be cancelled.

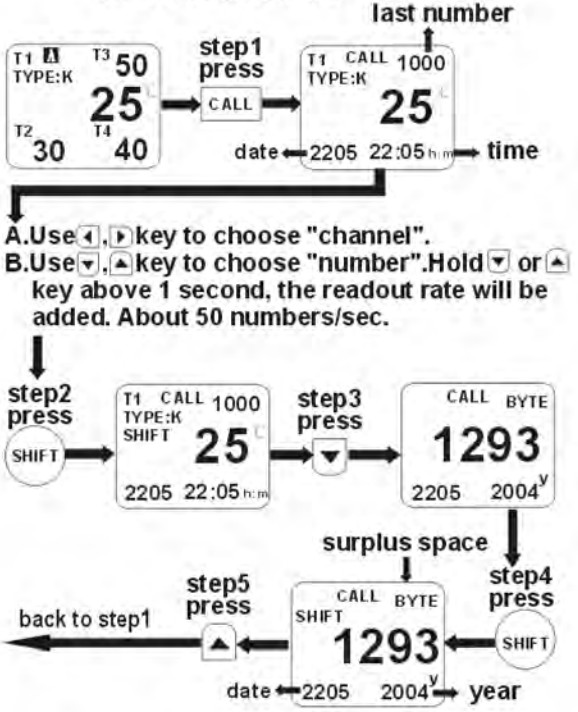


2. REC: When you turn on the "REC" function the reading value of the meter will transmit the settlement of interval in time, and will write down in the memory in real time. The maximum number of records is 10000 records at most. When turning on "REC" function, the auto power off and the power off will be cancelled. When the memory is filled, the display will show "ou".



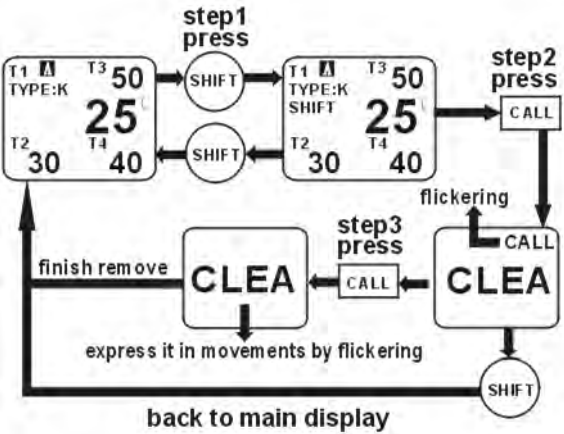
■ Operation

3. CALL: The HH147 can display the data of every channel, and can also inquire about the surplus space of the memory. When the "CALL" function is on, the auto power off will be cancelled.



■ Operation

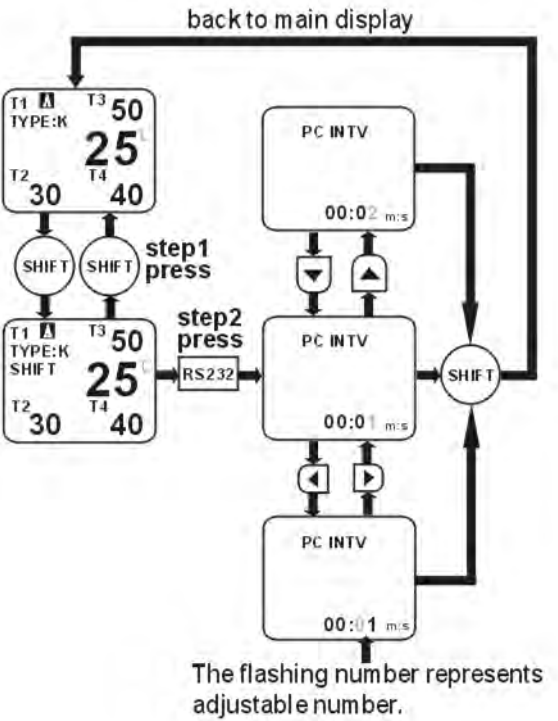
4. (SHIFT) + [CALL] :remove the record of the memory.



5. (SHIFT) + [RS232] : **When the RS-232 function is on the biggest settlement time is 59 minutes and 59 seconds. Minimum set time is one second.**

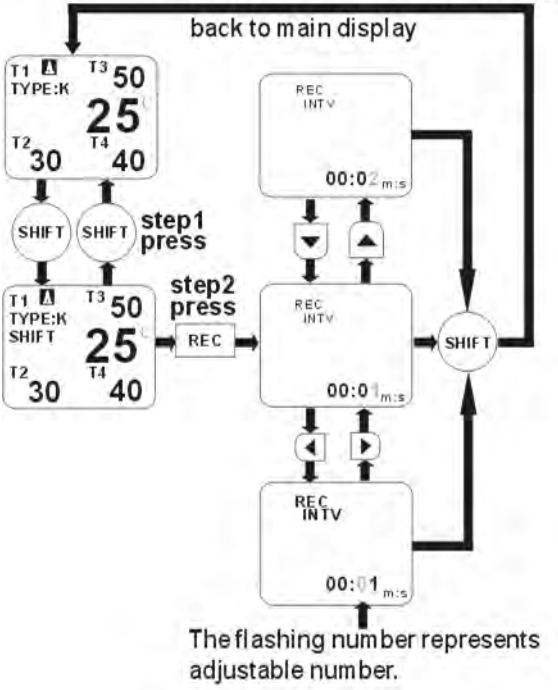
■ Operation

5. (SHIFT) + [RS232] :



■ Operation

4. SHIFT + REC **: When the record interval function is on, the biggest settlement time is 59 minutes 59 seconds. Minimum set time is 1 second.**



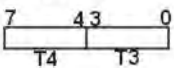
■ RS-232 Data Form

Model-0 Data Form:

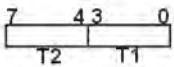
1.Sensor Form:

(1)

SEN 1



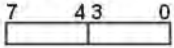
SEN 0



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

(2)

SEN 2



Bit 0~3:sensor type that can be used
- 0:K
- 1:KJ
- 2:KJT
- 3:KJTE
- 4:KJTER
- 5:KJTERS
- 6:KJTERSN

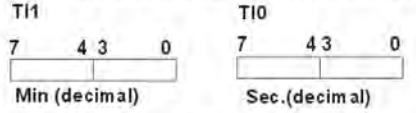
Bit 4~5:Channel
- 0:T1
- 1:T1,T2
- 2:T1,T2,T3
- 3:T1,T2,T3,T4

Bit 6:Model(0:T1~T4 Type adjustable
1:only T1 Type adjustable)
Bit 7:Unuse

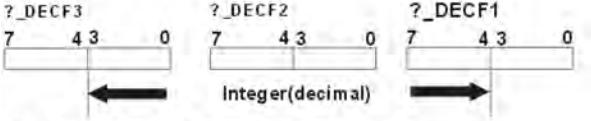
■ RS-232 Data Form

Model-0 Data Form:

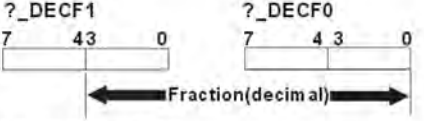
Transmit the time interval: Max. 59 minutes 59 seconds



2. Temperature value form



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



3. Transmit the form

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

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

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

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)

■ RS-232 Data Form

Model-0 Data Form:

S.C.~
Order code(00_H ~$7F_H$).The same data conveyed repeatedly, the code does not change. On the contrary, different data, this code will add one in order.

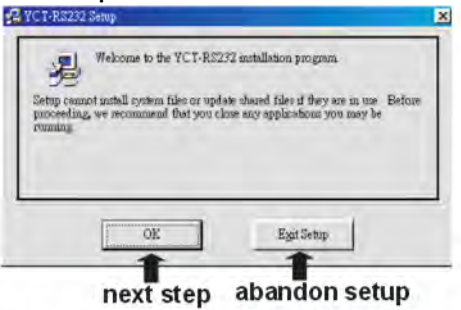
Flag:
"30_H"= fail,"31_H"= success

Data:
C.C.=0BX_H

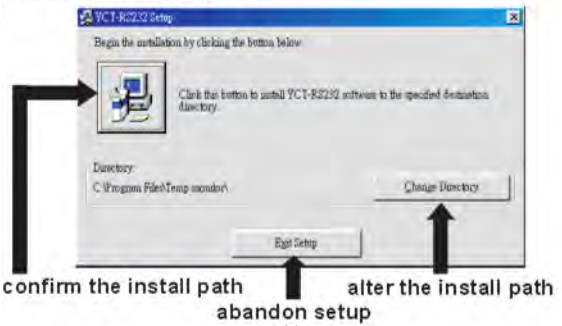
SEN 0~2,TI0~1,Tn0*
Tn0* : T1_DECF1~3,T1_DECF0,T2_DECF1~3,T2_DECF0,
_DECF1~3,T3_DECF0,T4_T3DECF1~3,T4_DECF0.

RS-232 Software Installation Procedure

1. **Place CD-R into the CD-ROM driver.**
2. **Installation may be automatic or manual in accordance with your personal software. The manual installation is: A. Pushing my computer, the mouse clicked two times. B. Pushing the CD-ROM driver, the mouse clicked two times. C. Pushing the "setup" file, the mouse clicked two times. Begin to enter installation procedure.**
3. **Begin to install picture:**

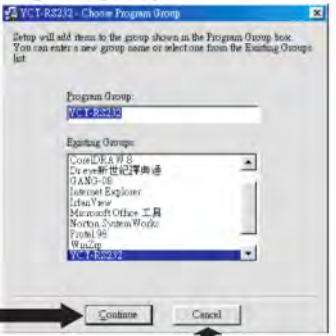


4. Choose to install path:



■ RS-232 Software Installation Procedure

5.Choose program group:



next step

abandon setup

6.install progress:

abandon setup

7.install completed:

Install completed

RS-232 Operation of Software

1. Initial display

This is the initial display after execution of this program

picture 1

RS-232 Operation of Software

2.1 Mode 0 start procedure

After clicking mode 0 key to start. The program will start the online operation with the equipment

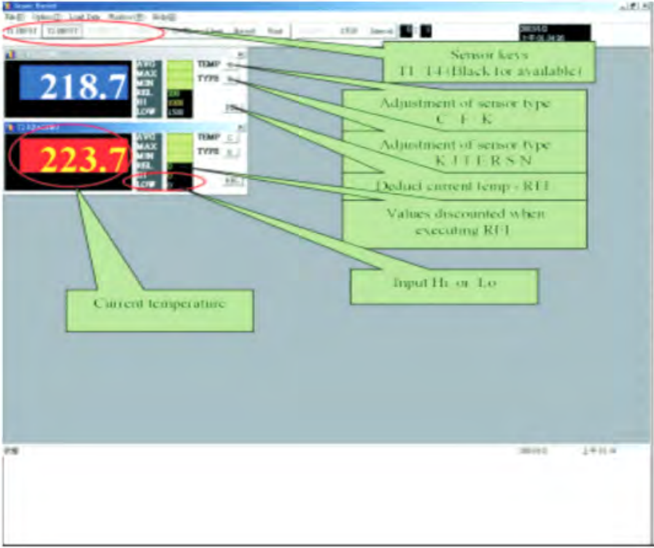
and all items in association with mode 0 will become available for selection.

If the program does not go online with the equipment after starting mode 0

or in case of interrupted online operations, a message for online failure will appear as follows

picture 2

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)

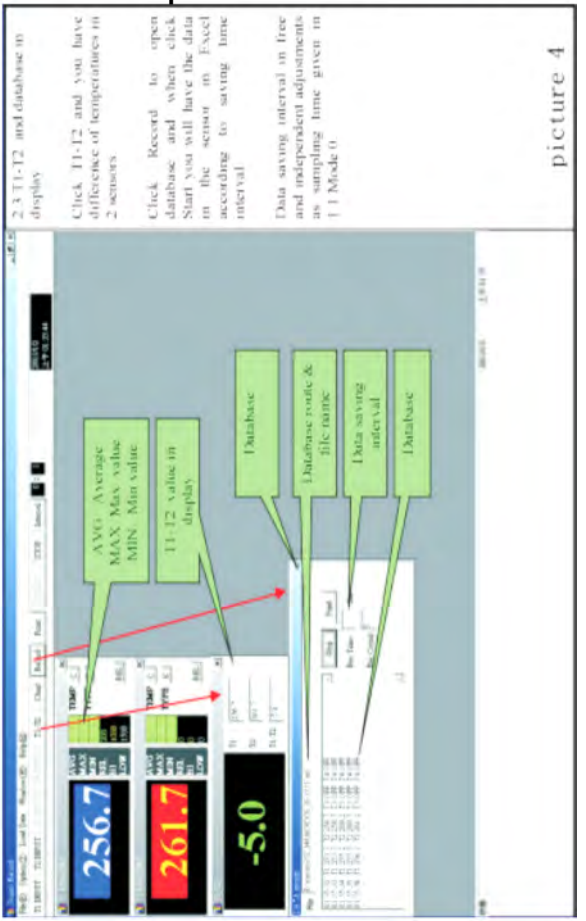
Normal (Green character black background)

Below Lo (White character blue background)

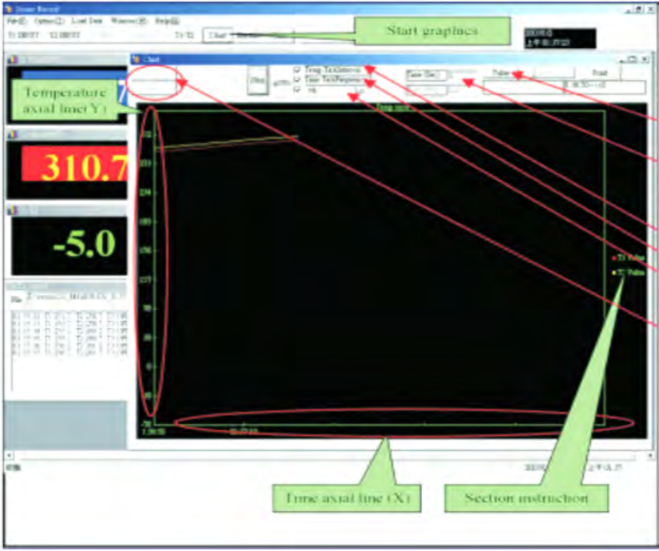
Others as shown

picture 3

RS-232 Operation of Software



RS-232 Operation of Software



2.4.1 Real-time curve in display (all sensors)

click Chart to start real-time curve in display for adjustments as follows

Temp in display in current average value

Sampling time(independent setting)

Cancel selection for AUTO adjustment of

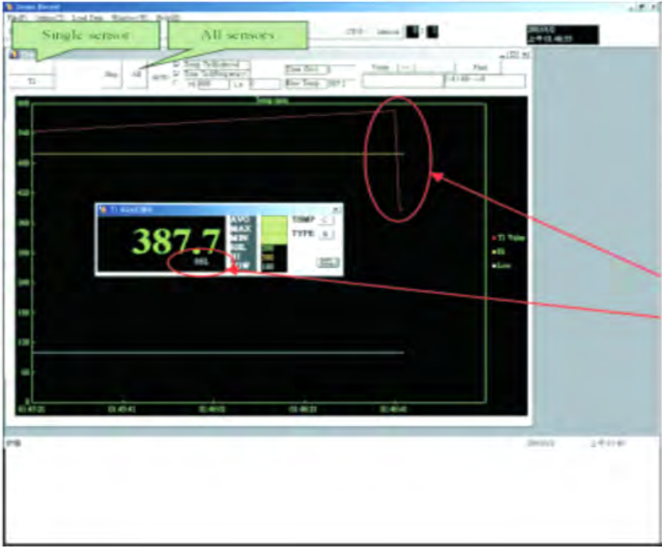
Temp axial interval

Time axial interval max & min of temp

Click single sensor or all sensors for temp curves

picture 5

RS-232 Operation of Software



2.4.2 Real-time curve

(single sensor)
with functions as in 2.4.1

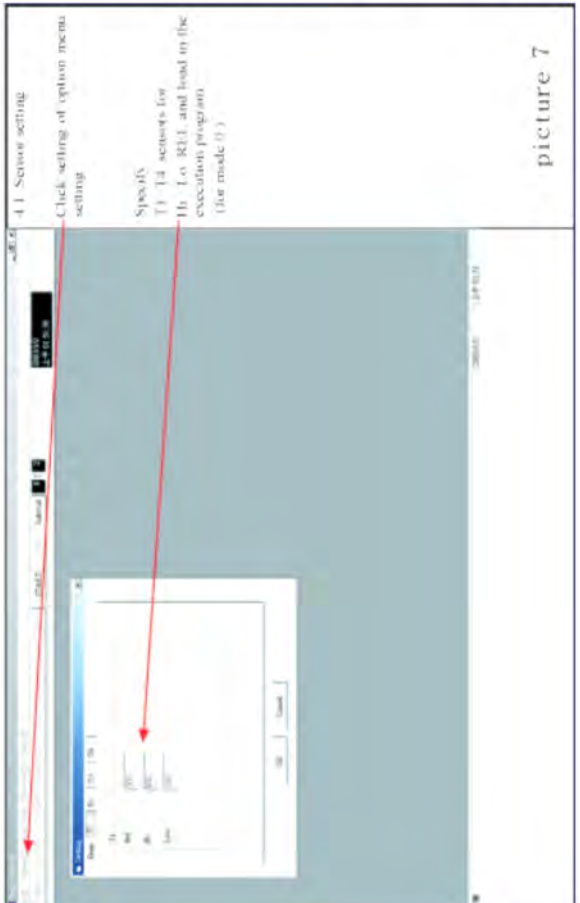
In single sensor, the Hi& Lo values and current temp. will appear as follows:

Current temp: Red line
Hi: Yellow line
Low: White line

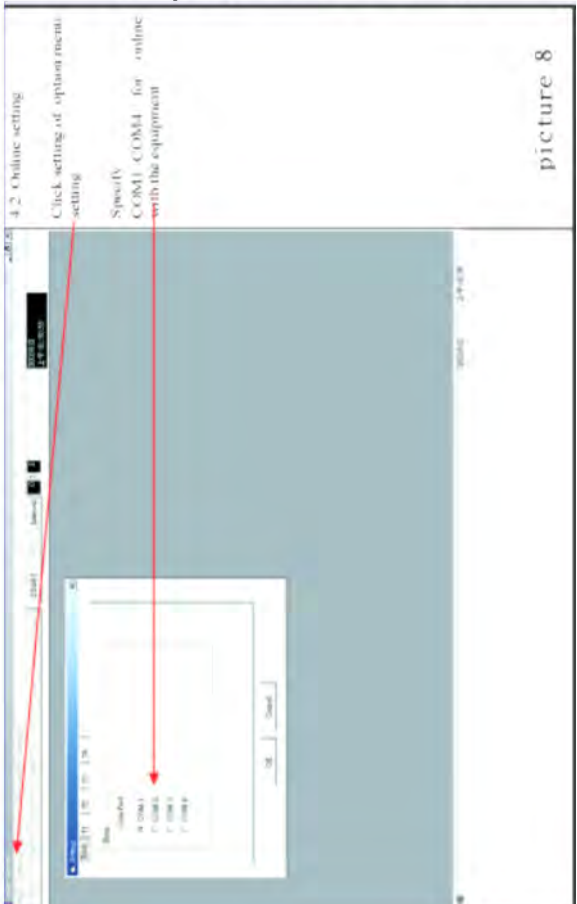
When executing REL, display of graphics may be affected

picture 6

RS-232 Operation of Software



RS-232 Operation of Software



■ Battery Replacement

1. **The symbol "B" that appears in the upper left of the LCD display indicates that the battery is running low. Please replace the AAA battery at once to ensure the test accuracy.**
2. **Remove the battery cover with a screwdriver.**
3. **Replace the old batteries with four new AAA batteries and lock 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 AAA battery from the temperature gauge and store the temperature gauge in a cool and low-humidity setting.**
6. **To avoid combustion, DO NOT dispose of batteries into an open flame.**
7. **Please note the position of 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 carry's a maximum voltage of 34 volts DC or AC.**
2. **Temperature jacks: Designed for insertion of a standard small thermocouple jack which have a center spacing of 7.9 mm between the two prongs.**
3. **Please DO NOT place the HH147 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. Consult Omega Customer Service for repair service at once.**
6. **Please DO NOT attempt to operate the temperature gauge around sites where explosive gases, vapor, or dust particles are present.**

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.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

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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