C E

User's Guide

T1   T2   T3   T4

HH309
DATA LOGGER THERMOMETER

Shop online at

omega.com®
ΩEOMEGA®

omega.com
e-mail: info@omega.com
For latest product manuals:
omegamanual.info

T1–T2

SETUP

HOLD   MAX MIN

CLOCK   INTV

REC   °C / °F

RANGE   −200 °C ∼ 1370 °C
        −328 °F ∼ 2498 °F

POWER-UP OPTIONS
HOLD + ⊙   Disable AUTO OFF
REC + ⊙   Erase MEMORY

RS-232

Computer Linking Software

HH309
Data Logger Thermometer

omega.com®
ΩEOMEGA®

OMEGAnet® Online Service omega.com	Internet e-mail info@omega.com

Servicing North America:

U.S.A.:
ISO 9001 Certified

One Omega Drive, Box 4047
Stamford, CT 06907-0047
Tel: (203) 359-1660   FAX: (203) 359-7700
e-mail: info@omega.com

Canada:

976 Bergar
Laval (Quebec) H7L 5A1, Canada
Tel: (514) 856-6928   FAX: (514) 856-6886
e-mail: info@omega.ca

For immediate technical or application assistance:

U.S.A. and Canada: Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®
Customer Service: 1-800-622-2378 / 1-800-622-BEST®
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN®

Mexico:

En Español: (001) 203-359-7803   e-mail: espanol@omega.com
FAX: (001) 203-359-7807   info@omega.com.mx

Servicing Europe:

Benelux:

Postbus 8034, 1180 LA Amstelveen, The Netherlands
Tel: +31 (0)20 3472121   FAX: +31 (0)20 6434643
Toll Free in Benelux: 0800 0993344
e-mail: sales@omegaeng.nl

Czech Republic:

Frystatska 184, 733 01 Karviná, Czech Republic
Tel: +420 (0)59 6311899   FAX: +420 (0)59 6311114
Toll Free: 0800-1-66342   e-mail: info@omegashop.cz

France:

11, rue Jacques Cartier, 78280 Guyancourt, France
Tel: +33 (0)1 61 37 2900   FAX: +33 (0)1 30 57 5427
Toll Free in France: 0800 466 342
e-mail: sales@omega.fr

Germany/Austria:

Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Tel: +49 (0)7056 9398-0   FAX: +49 (0)7056 9398-29
Toll Free in Germany: 0800 639 7678
e-mail: info@omega.de

United Kingdom:
ISO 9002 Certified

One Omega Drive, River Bend Technology Centre
Northbank, Irlam, Manchester
M44 5BD United Kingdom
Tel: +44 (0)161 777 6611   FAX: +44 (0)161 777 6622
Toll Free in United Kingdom: 0800-488-488
e-mail: sales@omega.co.uk

CONTENTS

I. Introduction:

This instrument is a four channel digital thermometer for use with any K-type thermocouple as temperature sensor. Temperature indication follows National Bureau of Standards and IEC584 temperature/voltage table for K-type thermocouples. The internal memory can keep up to 16,000 records per channel. (note1.) It uses RS232 interface to perform bi-directional communication with PC.

II. Specifications:

Numerical Display: 4 digital Liquid Crystal Display per channel.

Measurement Range: -200°C ~ 1370°C   -328°F ~ 2498°F

Resolution: -200°C~ 200°C   0.1°C; 200°C ~1370°C   1°C
              -200°F~ 200°F   0.1°F; else   1°F

Input Protection at Thermocouple Input: 60V DC, or 24Vrms AC

Environmental:
❏   Operating Temperature and Humidity: 0°C ~50°C (32°F ~ 122°F) ; 0 ~ 80% RH
❏   Storage Temperature and Humidity: -10°C to 60°C (14°F ~ 140°F); 0 ~ 80% RH
❏   Altitude up to 2000 meters.

Accuracy: at (23 ± 5°C)

Range	Accuracy
-200°C ~ 200°C	±(0.2% reading + 1°C)
200°C ~ 400°C	±(0.5% reading + 1°C)
400°C~1370°C	±(0.2% reading + 1°C)
-328°F ~ -200°F	±(0.5% reading + 2°F)
-200°F ~ 200°F	±(0.2% reading + 2°F)
200°F ~ 2498°F	±(0.3% reading + 2°F)

Temperature Coefficient:

For ambient temperatures from 0°C ~ 18°C and 28°C ~ 50°C, for each °C ambient below 18°C or above 28°C add the following tolerance into the accurac spec.
      0.01% of reading + 0.03°C
    (0.01% of reading + 0.06°F)

⚠ Note:

The basic accuracy Specification does not include the error of the probe. Please refer to the probe accuracy specification for additional details.

Electromagnetic Compatibility: Total accuracy = specified accuracy ±2°C(3.6°F)

Sample Rate: 3 seconds per period

Dimension: 184×64×30mm

Weight: 250g Approx.

Accessory: K Type Bead Probe×4 , Battery, Carrying Case, Instruction Menu, Software program, RS-232 Connection Cable

Power requirement: 9 Volt Battery

Battery Life: Approx. 100hrs with alkaline battery

AC Adapter: 9VDC ±15%   100mA

Plug Diameter: 3.5mm×1.35mm

Option : AC Adapter Model # HH300-Adapter

note1:
Every time you press "REC" button to start recording data and press "REC" button again to stop recording, there will be a data set in memory, you can store as many data sets as you want until memory is full.

III. Symbol Definition and Button Location:

▊ : This indicates that the minus temperature is sensed.

?? : Centigrade and Fahrenheit indication.

K : Thermocouple Type Indication.

MAX : The Maximum value is now being displayed.

MIN : The Minimum value is now being displayed.

Ø : This indicates auto power off is enabled.

HOLD : This indicates that the display data is being held.

⊞ : The Battery is not sufficient for proper operation.
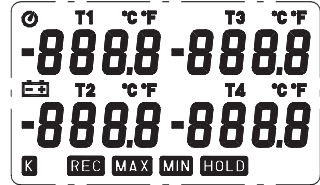
T1,T2,T3,T4 : It indicates the value below is T1, T2, T3, T4 Temperature sensor.

1-2 : It indicates the value below is T1-T2 sensor.

△REL : The reading is now under relative mode.

REC : This indicates that the tester is recording. If it blinks, it indicates the memory is full.
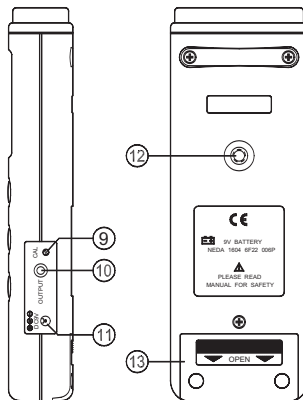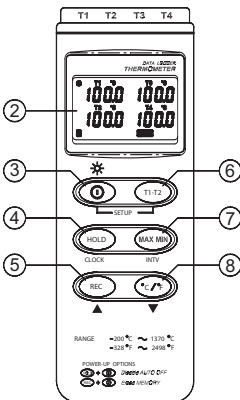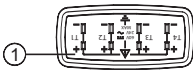
Button Location:

① K type temperature sensor T1 to T4 input connector
② LCD display
③ ON/OFF & Backlight button
④ Holdbutton
⑤ Record button
⑥ T1-T2 button
⑦ MAX MIN function control button
⑧ °C, °F control button
⑨ Offset calibration screw
⑩ Digital output connector
⑪ AC power adapter connector
⑫ Tripod connector
⑬ Battery cabinet cover

2

IV. Operation Instructions:

4.1 Power-Up & Turn ON/OFF backlight
The ?⏻ key turns the Thermometer ON or OFF and backlight ON & OFF.
Press it once to turn on the Thermometer.
Press it again for moment to turn ON or OFF backlight.
Press and hold this button 3 second to turn OFF the power.

4.2 Connection the Thermocouples
For measurement, plug the thermocouple into the input connectors.

4.3 Selecting the Temperature Scale
When the meter was powered on, the user may change it to Fahrenheit (°F) by pressing " °C/°F " button and vice versa to Celsius.

4.4 Data-Hold Operation
The user may hold the present reading and keep it on the display by pressing the "HOLD " button. When the held data is no longer needed, one may release the data-hold operation by pressing "HOLD " button again.
When the meter is under Data Hold operation, the "MAX MIN" ,"T1-T2" and "°C/°F" button are disabled. (when you press " °C/°F " , "T1-T2" and "MAX MIN" button in HOLD mode, there will be two continuous beeps)

4.5 T1-T2 Operation:
When this button is pushed, "$1 - 2$" will be shown on the upper right hand side LCD display to indicate that the tester is under T1 minus T2 mode. The temperature difference is shown on the right hand side display as shown in Fig.

4.6 Record and Erase memory Operation:
When one presses the "REC" button, the meter will start recording, and pressing the "REC" button again will stop recording, If you want to clear the memory, power off the meter, then press and hold "REC" button and then press power button and hold at least 5 seconds, then LCD will show "CLR" "SURE 5", then release all buttons to clear the memory.

4.7 Clock Setup :
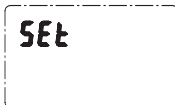
1: press and hold "T1-T2" button and then power on the meter:

2: press "HOLD"(clock):

3: press "REC" ? or "°C/°F" ? to increase or decrease number, press "HOLD"(clock) to adjust next item. The adjusting order is year? month? day? hour? minute, then press "HOLD" (clock) to finish adjusting. If you want abort during a setup process, press power button to cancel.

3

4.8 Recording Interval Setup :

```
SEE
```

1: press and hold "T1-T2" button and then power on the meter:

2: press "MAXMIN"(INTV)

```
SEE
Int 0001
```

3: press "REC" ? or "°C/°F" ? to increase or decrease number, press "MAXMIN " (INTV) to adjust next item, then press "MAXMIN" (INTV) to finish. If you want abort during a setup process, press power button to cancel.

4.9 MAX/MIN Operation:

When pressing the "MAX MIN" button the meter will enter the MAX/MIN mode. Under this mode the maximum value, minimum value is kept in the memory simultaneously and updated with every new sample of data.

When the MAX symbol is display, the Maximum is shown on the display.

Press "MAX MIN" again, then the MIN symbol is on the display and also the minimum reading.

Press "MAX MIN" again, MAX, and MIN will blink together. This means that all these data is updated in the memory and the reading is the present temperature.

One may press "MAX MIN" to circulate the display mode among these options.

When the meter is under "MAX MIN" operation and " °C/°F " button are disabled.(when you press " °C/°F " button in "MAX MIN" mode, there will be two continuous beep)

To exit the MAX/MIN mode, one may press and hold "MAX MIN" for two seconds.

4.10 Auto Power Off:

By default, when the meter is powered on, it is under auto power off mode. The meter will power itself off after 30 minutes if no key operation and no RS232 communication combination at power on can disable auto power off.

One may press and hold "HOLD " button and then power on the meter and there will be two successive beeps to indicate that auto power off is disabled and the ⏀ will not show up.

4.11 Low Battery Condition

When the battery voltage is under proper operation requirement, the 🔋 symbol will show on the LCD and the battery need to be replaced with new one.

4.12 Calibration Point:

input	Adjust VR	tolerance
0 °C	VR1	± 0.1 °C
190 °C	VR2	± 0.1 °C
1000 °C	VR3	± 1 °C
1900 °F	VR4	± 1 °F

P.S

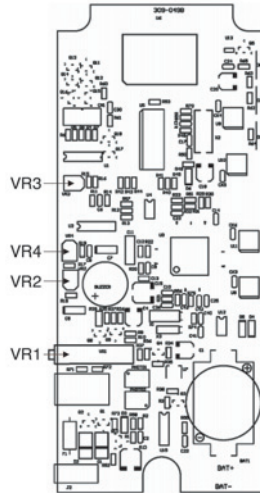Normally, performing offset Calibration with thermal stabled ice water through VR1 will give a very good calibration result.

4.13 Digital Output:
The Digital Output is a 9600bps N 81 serial interface.
The RX is a 5V normal high input port.
The TX is a 5V normal high output port.
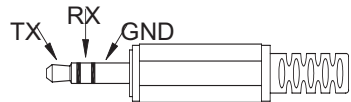
V. Setup TestLink HH309 — RS232 interface software:

• The TestLink package contains:
  1.80mm CD.
  2.Custom designed RS232 cable for TestLink.

• System Required:
  Windows 95, Windows 98, XP, Me, or
  Windows NT 4.0 above.

• Minimum Hardware Required:
  PC or NoteBook with Pentium 90MHz or higher, 32 MB RAM ;
  At least 5 MB byte hard disk space available to install TestLink. Recommended resolution 800X600.
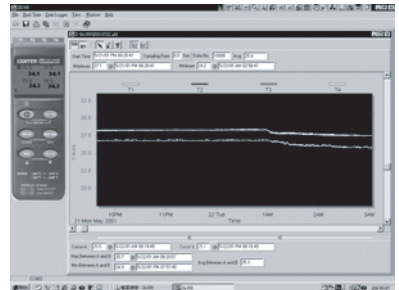
▪ Install TestLink:
  1.We recommend close all other application before installing TestLink.
  2.Insert setup CD disk to CD disk drive.
  3.Choose the Start button on the Taskbar and select Run.
  4.Type E:\SETUP and choose OK, then it will copy SE309.exe (executable file) and help file to your hard disk (default is c:\program files\TestLink\SE309).

  For detailed other operation instruction, please refer to the online help while executing SE309.

5

NOTES:

NOTES:

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.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

Shop online at omega.com

TEMPERATURE
- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

PRESSURE, STRAIN AND FORCE
- ☑ Transducers & Strain Gages
- ☑ Load Cells & Pressure Gages
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

FLOW/LEVEL
- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

pH/CONDUCTIVITY
- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

DATA ACQUISITION
- ☑ Data Acquisition & Engineering Software
- ☑ Communications-Based Acquisition Systems
- ☑ Plug-in Cards for Apple, IBM & Compatibles
- ☑ Datalogging Systems
- ☑ Recorders, Printers & Plotters

HEATERS
- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL
- ☑ Metering & Control Instrumentation
- ☑ Refractometers
- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
- ☑ pH, Conductivity & Dissolved Oxygen Instruments

M4147/0805