HH520

4 Channel Type J, K, T, E Data Logger Thermometer
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1. GENERAL DESCRIPTION

Thank you for choosing our data logger thermometer. To ensure the safety and the best performance of this instrument, we recommend you to read and follow the manual carefully before operation.

Data can be stored in the meter or directly saved on a computer through PC interface. Recorded data can be further processed by PC computer.

2. SAFETY INFORMATION

Read the following safety information carefully before attempting to operate or service the meter. Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

ENVIRONMENT CONDITIONS

- Altitude up to 2000 meters
- Relatively humidity: 90% max
- Operation ambient temperature: 0°C to 50°C

MAINTENANCE & CLEARING

- Repairs or servicing not covered in this manual should only be performed by qualified personnel.
- Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on this instrument.

SAFETY SYMBOLS

Comply with EMC

When servicing, use only specified replacement parts.

3. FEATURES

- Four-channel inputs
- Support K, J, E, T type thermocouple
- Temperature alarm function
- Fast response and sampling rate
- 16,000 data logger records each channel
- Instant recall function
- USB PC interface with Windows software included
- Adjustable auto power off timer
4. SPECIFICATIONS

Measurement range:
K: -200°C ~ 1372°C (-328°F ~ 2501°F)
J: -200°C ~ 1000°C (-328°F ~ 1832°F)
E: -200°C ~ 750°C (-328°F ~ 1382°F)
T: -200°C ~ 400°C (-328°F ~ 752°F)

Resolution:
0.1°C < 600°C / 0.1°F < 1000°F,
1°C ≥ 600°C / 1°F ≥ 1000°F

Accuracy:
Accuracy is specified for ambient temperatures between 18°C (64°F) and 28°C (82°F). The specifications do not include thermocouple sensor error.
±(0.1% of reading + 0.7°C) ±(0.1% of reading + 1.4°F)
below -100°C (-148°F)
±(0.4% of reading + 0.7°C) ±(0.4% of reading + 1.4°F)

Temperature coefficient:
0.01% of reading + 0.05°C per °C (<18°C or >28°C)

Sample rate:
2 time per second

Battery type:
UM-4 or AAA 1.5V battery x 4

Battery lifetime:
Approx. 100 hours (alkaline battery)

Operation temperature:
0°C to 50°C (32°F to 122°F)

Operation humidity:
10 to 90%RH (no condensing)

Storage temperature:
-20°C to 60°C (-4°F to 140°F)

Storage humidity:
10 to 75%RH

Dimensions/ Weight:
187mm(L) × 75mm(W) × 29mm(H) / Approx. 290g

Standard Accessories:
Instruction manual, battery 1.5V AAA x 4 pcs, Windows software, micro USB cable, K type bead probe x 2 pcs, carrying case.
5. SYMBOL DEFINITION & BUTTON LOCATION

- **Battery condition indicator**
- **Minimum indicator**
- **Maximum indicator**
- **Average indicator**
- **Setup option indicator**
- **Auto Power Off enabled indicator**
- **Recording data logger indicator**
- **Memory full indicator**
- **Memory group indicator**
- **Recall Memory group reading indicator**
- **Thermocouple type**
- **Temperature reading**
- **Temperature channel**
- **Temperature subtraction mode**
- **Temperature alarm indicator**
- **Hi Temperature alarm indicator**
- **Lo Temperature alarm indicator**
- **Compensate for probe errors**
- **Temperature measurement units**
- **Data hold indication**
① Thermocouple Input ② Display Screen ③ Power ON/OFF Button ④ Back Light Button ⑤ MAX MIN AVG Button ⑥ DATA HOLD Button ⑦ °C , °F Button ⑧ REC Button ⑨ RECALL Saved Reading Button ⑩ SETUP Button ⑪ MEM Button (Set 100 Memory) ⑫ USB Interface ⑬ Tilt Stand ⑭ Battery Compartment
6. BUTTON INSTRUCTIONS

6.1 Power ON/OFF Button:
Press the \[ \text{power} \] button to turn on the meter. Press and hold \[ \text{power} \] button for 3 seconds to turn off.

6.2 Backlight Button:
Press \[ \text{backlight} \] to turn on the LCD backlight. This makes it easier to read in dark environment. Press \[ \text{backlight} \] again to turn off backlight. The backlight will be automatically turned off after 30 seconds to save battery power.

6.3 Data-Hold Button:
Press \[ \text{data-hold} \] button to freeze the data shown on the LCD screen. Press it again to exit Data-Hold mode.

Note: When the unit is in the Data-Hold mode, \[ \text{max-min} \], \[ \text{avg} \], \[ \text{recall} \], and \[ \text{setup} \] buttons are disabled.

6.4 REC Button:
Press \[ \text{rec} \] button to start recording data. The “REC” symbol will display on the screen. To stop recording, press \[ \text{rec} \] button again.

Note: During recording period, most of the buttons are disabled, such as the \[ \text{temp} \], \[ \text{setup} \]. All settings must be made before starting the data logger function.

Note: When the memory is full (16000 recorders), “FULL” symbol will blink on the LCD screen. The data logger stops.

Note: When battery power is low ( “ ” symbol lights up on the screen), data logger cannot be started. If the battery is running low during data logging, it will stop recording automatically.

6.5 MEM Button:
Press \[ \text{mem} \] button to save readings on the LCD screen. The “MEM” symbol lights up on the screen for 2 seconds. Press the \[ \text{mem} \] button again to store next group readings.
The store readings on the LCD screen for 00~99 group.

6.6 RECALL Save Reading Button:
Press the \[ \text{recall} \] button to recall saved readings. The “RECALL” symbol lights up on the screen.

Press the \[ \text{data-hold} \], \[ \text{rec} \], \[ \text{max-min} \], or \[ \text{temp} \] button to select MEM group. The LCD shows “hour:minute:second” on the screen for 2 seconds, and then shows the readings.

Press \[ \text{recall} \] or \[ \text{data-hold} \] button to exit RECALL mode.
6.7 MAX/MIN/AVG Button:
Under this mode, the unit simultaneously monitors and stores the maximum, minimum and average value in the memory. The unit will keep updating/refreshing the data.

To start:
(1) Press \[ \text{MAX/MIN/AVG} \] button. “MAX” symbol lights up on LCD, the reading shows the maximum data.
(2) Press \[ \text{MIN/MAX/AVG} \] button again to show minimum data; the “MIN” symbol lights up on LCD.
(3) Press \[ \text{MIN/MAX/AVG} \] button again to show average data; the “AVG” symbol lights up on LCD.
(4) Press \[ \text{MIN/MAX/AVG} \] button again, the “MAX, MIN and AVG” symbol blinks together, the readings shows real time data.

To exit MAX/MIN/AVG mode:
Press and hold \[ \text{MIN/MAX/AVG} \] button for 2 seconds to exit MAX/MIN/AVG mode.

6.8 Selecting Temperature Units:
Press the \[ \text{°C/°F} \] button to switch between Celsius (°C) and Fahrenheit (°F).

6.9 SETUP Button:
Press the \[ \text{SETUP} \] button to enter setup options. Press \[ \text{SETUP} \] again to exit setup mode anytime.

7. OPERATING INSTRUCTIONS

7.1 Setup Options:
(1) Press the \[ \text{SETUP} \] button to enter setup options. Press it again to exit anytime.
(2) Using the \[ \text{HOLD}, \text{REC}, \text{MIN/MAX/AVG}, \text{°C/°F} \] button to adjust parameters or move setting items.
(3) Press the \[ \text{MEM} \] button to save changes and move to next setting option.

7.2 Menu Item:
(1) Fig.1 Set thermocouple type.
Fig. 2 Set interval time for data logging.

Fig. 3 Set offset to compensate for probe errors.

Fig. 4 Set alarm point.

Fig. 5 Set T1-T2 subtraction mode.

Fig. 6 Set auto power off time.
7.3 Menu Description:

7.3.1 Select thermocouple type: K, J, E, or T
Press the [MIN MAX] or [°C] button to select thermocouple type. (see Fig.8)

7.3.2 Setting interval time for data storing:
(1) Press the [MIN MAX] or [°C] button to set minute or second. (see Fig.9)
(2) Press the [HOLD] / [REC] button to increase / decrease value.

Note:
Set interval time range: 1 Second (00:01) to 60 minutes 59 seconds (60:59)

7.3.3 Set offset to compensate for probe errors:
The user can adjust the readings of thermometer to compensate for the errors against a specific thermocouple.
(1) Press the [MIN MAX] or [°C] button to select thermocouple channel. (see Fig.10)
   Setting thermocouple channel blinks on the LCD screen.
(2) Press the [HOLD] / [REC] button to increase / decrease value.

Note:
The offset to compensate for probe errors range: ±5°C or ±9°F.

7.3.4 Set alarm point (only for channel T1):
Want to set window. (see Fig.11 or Fig.12)
(1) Press the [HOLD] or [REC] button to turn on or off.
(2) When setting on mode, press the [MEM] button to set Hi and Lo limit. (see Fig.13)
Note:
When measuring thermocouple value over alarm point, the symbol will blink “**ALARM Hi**” or “**ALARM Lo**” on the LCD.
The beeper will make “beep-beep-beep” sound.
The Lo alarm set cannot be greater than Hi alarm set.

7.3.5 Set T1-T2 subtraction mode:
Press the **HOLD** or **REC** button to turn on or off T1-T2 subtraction mode. (see Fig.14 or Fig.15)

Note:
When setting T1-T2 subtraction mode on, T1-T2 will display at the bottom of LCD. (see Fig.16)

7.3.6 Set auto power off time:
Press the **HOLD** or **REC** button to select auto power off option 10, 30 minutes, 1, 2, 4, 8 hours, or off.
(see Fig.17 or Fig.18)

7.3.7 Set system clock:
The unit is built-in a clock so that the data logger function can also record the data and time along with the measurement value.

(1) Press the **MIN MAX** or **℃/F** button to select year, date, or time.
(see Fig.19)

(2) Press the **HOLD** / **REC** button to increase / decrease value.

Note:
Check the clock setting after replacing batteries. If necessary, reset system clock.
7.4 Clearing Data Logger Records:

(1) Turn off the unit.

(2) Press and hold REC button and then press power button to turn on the unit.

(3) Keep holding REC and power button, then LCD will show "REC", "CLR" and "SURE 5, 4...1, 0 " until clean the memory. (To abort, release all buttons in process)

7.5 Clearing Instant Read-out Memory:

(1) Turn off the unit.

(2) Press and hold MEM button and then press power button to turn on the unit.

(3) Keep holding MEM button, then LCD will show "MEM", "CLR" and "SURE 5, 4...1, 0 " until clean the memory. (To abort, release MEM button before "SURE 0 ").

The LCD will show "CLR", "0 " and start erasing group 00 to 99 records.

7.6 Connecting to a computer:

The meter can be connected to PC through a micro USB cable to download recorded data or perform real time monitoring or datalogging in the software interface.

8. POWER PREPARATION

8.1 Battery Replacement:

(1) When the battery voltage drops below proper operation range, the symbol will blink on the LCD display and the battery needs to be replaced.

(2) Before replacing the battery, power off the meter, and disconnect all temperature probes.

Open the cover of the battery cabinet by a screwdriver. Replace the old batteries with four new UM-4 or AAA size batteries.

(3) Close the battery cabinets cover and fasten the screw.
9. Testlink HH520 SOFTWARE

9.1 The HH520 package contains:
- Software CD disk
- Micro USB cable

9.2 System Required:
Windows XP/ VISTA/ Windows 7/ Windows 8/ Windows 10

9.3 Minimum Hardware Required:
- PC or laptop with CD-ROM drive.
- At least 50 MB hard disk space available to install HH520.
- Recommended screen resolution 1024X768 or above.

9.4 Tutorial - Quick Start to Use HH520:
Recording real time data in waveform:
(1) Power on the 4 Channel Thermometer first and connect it to a PC USB port with the cable,
(2) Start HH520 program.
(3) If the connection is successful the panel will display
   the same value as the 4 Channel Thermometer. If fail to connect the meter with PC, it will display "No Connection" on the panel window in HH520.
(4) Select sampling rate from Real-Time Graph window.
(5) When the connection is successful, click “Real Time | run” or from main menu to
   start recording real time data and there will be a waveform on the Real Time Graph Window.
(6) Click “Real Time | Stop” or to stop recording.

9.5 How to save the recorded real time data to a file?
(1) Click the graph window you want to save and the graph window will become active, then
   choose File | Save from main menu or click from the tool bar.
(2) There will be a save dialog window for you to choose the file name and file type to save. There are three types of file format you can choose, binary file(*.ghf), text file(*.txt) and EXCEL format file(*.csv). The *.ghf file use much fewer disk space to save the data than the other two file formats, but it can only be used in HH520. Text file can be opened by HH520 and any other word processor program like word, notepad etc. EXCEL format file can be opened by HH520 and Microsoft EXCEL.

**Note:** If decimal separator is comma in your country, this file format will be disabled, because .CSV file also use comma to be data separator. For example 78,6 will become 78 and 6 in EXCEL.)
9.6 How to load the recorded data from the memory of 4 Channel Thermometer and save it to a file?

(1) Power on the 4 Channel Thermometer.
(2) Press the “REC” button of the meter to start recording data.
(3) After a while, press “REC” button again to stop recording data.
(4) Connect the Meter to PC
(5) Start HH520 program.

(6) Choose Data Logger from main menu or click from tool bar.

(7) In reference to Data Logger, see DataLogger

9.7 Main Menu:

- **File | Open**: Retrieve files from the disk.
- **Save**: Save the active window (when the caption bar is highlighted) data to the disk.
- **Print**: Print the data of the active window (graph or list).
- **Printer Setup**: Select printer.
- **File | Exit**: Terminates program.
- **View | Control Panel**: By opening the Panel Window, the user can control meter via the button in this window.
- **View | Real-Time Graph**: Open Real-Time Graph display to graph the present data.
- **Real Time Data | Run**: Start collecting real time data.
- **Stop**: Stop collecting real time data.
**DataLogger:**

By opening the DataLogger Window, the user can load recorded data of meter to PC in this window.

**Output To Graph** - Graphing tabular data.

### 9.8 DataLogger:

When you have the thermometer connected to PC, select "**DataLogger**" from main menu or click Datalogger icon from tool bar to load recorded data from the meter and there will be a progress indicator to show the loading status. If error occurs, just click "**DataLogger icon**" again.

After the data was downloaded, the left hand side will show how many data sets were loaded and detail information for each data set (start data, start time, recording rate and record numbers).

![DataLogger Window](image)

For examples:

<table>
<thead>
<tr>
<th>Set</th>
<th>DATE</th>
<th>TIME</th>
<th>Rate</th>
<th>Nums</th>
<th>Unit</th>
<th>T1 Offset</th>
<th>T2 Offset</th>
<th>T3 Offset</th>
<th>T4 Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2016/2/2 15:25:12</td>
<td>90:00</td>
<td>6</td>
<td></td>
<td>°C</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2</td>
<td>2016/2/2 16:32:49</td>
<td>90:01</td>
<td>26</td>
<td>°F</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3</td>
<td>2016/2/2 16:37:33</td>
<td>90:01</td>
<td>19</td>
<td>°F</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>4</td>
<td>2016/2/2 16:29:54</td>
<td>90:01</td>
<td>37</td>
<td>°F</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>5</td>
<td>2016/2/2 16:31:49</td>
<td>90:01</td>
<td>24</td>
<td>°F</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>6</td>
<td>2016/2/2 16:32:20</td>
<td>90:01</td>
<td>13</td>
<td>°F</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>7</td>
<td>2016/2/2 16:32:39</td>
<td>90:01</td>
<td>13</td>
<td>°F</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>8</td>
<td>2016/2/2 16:33:59</td>
<td>90:01</td>
<td>7</td>
<td>°F</td>
<td>-</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
It will transfer first data set to graph on the right hand side. The user can also click at any other data set to choose that set for graph.

Graph:

Tool Bar:

- Display or hide Statistic1.
- Display or hide Statistic2.
- Normal cursor.
- When selected, the mouse cursor will become a cross sign when moving to the graph, click on the graph to mark a cross sign on the graph. This is available only when "Split" option is unchecked. And all the mark you make will exist with T1.
- When selected, the mouse cursor will become a "I" sign when moving to the graph, click on the graph to annotate. This is available only when "Split" option is unchecked. And all the text you make will exist with T1.
- Separate the four channel.

- Combine the four channel.

Graph Option - Graph Customization

Y Axis - Change the Y axis extension

Note: When the Split is unchecked, graph will use T1 as the Y axis display range.
To Undo the Zoom

You can Zoom this graph by using mouse:

To Zoom:
(1) Press the left mouse button and drag the cursor to select the new extents.
(2) Release the mouse button.

You can choose channel number showing in the graph.
- Click "Graph Option" to call Customization dialog.
- Select Subsets tab.
- Select a single channel or multiselect (hold Ctrl key, use mouse to choose) channels.

9.9 Frequently Asked Question:

(1) How to uninstall HH520?
Answer: Uninstall HH520 by launching the Add/Remove Programs applet out of the Control Panel, highlighting the HH520, and clicking on the Add/Remove... push button, then it will remove the HH520 folder and files from your computer.

(2) How to zoom the graph?
Answer: Press the left mouse button and drag the cursor to select the new extents, then release the mouse button.

(3) When I setup the real time sampling with a fast rate (e.g. 1 sec), Some of the sampling data might be lost.
Answer: This might be caused by slow response time of the PC interface. For better result, the user may close the panel window.

10. Maintenance

In order to ensure the accuracy of the thermometer for a longer period of time you should calibrate it once a year.

Clean the device and the window of the display with a clean, lint-free, antistatic and dry cleaning cloth.

⚠️ Do no use cleaning agents that contain carbon or benzenes, alcohol or anything similar to clean the product since these substances damage the surface of the measuring instrument. Moreover, these fumes are hazardous to health and explosive. Do not use tools with sharp edges, screwdrivers, metal brushes or anything similar to clean the device.
NOTE:
NOTE:
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: 
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