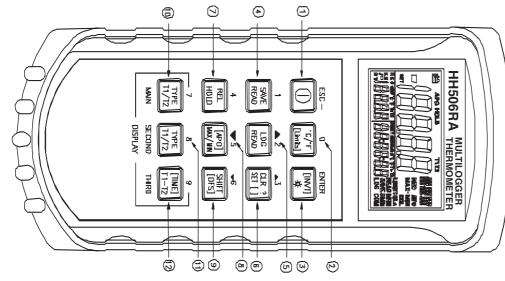
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HH506RA

K, J, T, E, R, S, N Thermometer

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

INTRODUCTION

and N. The thermocouple types comply with the NIST-ITS measures external thermocouples of type K, J, R, S, T, E, to a PC using optional software and cable able T/C offset and an RS-232 interface for uploading data 90 standard reference temperature/voltage tables. The thermometer features a dual thermocouple input, an adjust-The HH506RA is a portable digital thermometer that

SAFETY INFORMATION

especially near the connector. bending of the thermocouple leads to prolong its life the working voltages exceed 24V AC or DC. To avoid make measurements in microwave ovens. Avoid sharp damages to the instrument and/or physical burns, do not To avoid electrical shock do not use the device when

WARNING

To avoid electrical shock, do not use this instrument when working voltages at the measurement surface are over 24V AC or DC

WARNING

R-TYPE (1)

0C to 1767C,

32F to 3212F

To avoid damage or burns, do not take temperature measurements in microwave ovens

CAUTION

Repeated sharp flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads, especially near the connector.

GENERAL

value of T1 to T2. When the input measurement is crystal display (LCD) with maximum reading of 19999 overloaded, the following is displayed "--The Third panel displays the date, time, or the difference These panels are used for displaying the value of T1 or T2The Main and Second display panels are 4 1/2 digit liquid

battery. Battery life is about 100 hours when used with a carbon zinc

Standard 9V battery (NEDA 1604, IEC 6F22 006P)

Dimensions: 192 mm (H) x 91 mm (W) x 52.5 mm (D)

Weight: 365 g

Supplied Wire:

4 feet Type "K" thermocouple beaded wire (teflon tape insulated). Maximum insulation temperature 260C (whichever is greater) from 0C to 800C (500F). Wire accuracy 2.2C or 0.75% of reading

ENVIRONMENTAL

0C to 50C (32F to 122F) <80% R.H. **Ambient Operating Ranges:**

Storage Temperature: -20C to 60C (-4F to 140F) <70% R.H

(flat blades spaced 7.9 mm, center to center). Accepts standard miniature thermocouple connectors Input Connector:

SPECIFICATIONS

ELECTRICAL

Temperature Scale: Celsius or Fahrenheit

J-TYPE (0.1)		K-TYPE (0.1)	Measurement Range:
-210C to 1200C.	-328F to 2501F	-200C to 1372C,	inge:

E-TYPE (0.1) T-TYPE (0.1)-346F to 1832F -210C to 1000C -328F to 752F -200C to 400C -346F to 2192F

N-TYPE (0.1) S-TYPE (1) *Based on the ITS-90 temperature standard. 0C to 1767C, -50C to 1300C -58F to 2372F 32F to 3212F

K/J/T/E-TYPE Accuracy:

According to temperature standard ITS-90.

N-TYPE (0.05% rdg + 0.6F) on -58F to 2501F(0.05% rdg + 0.7C) on -50C to -210C(0.05% rdg + 1.4F) on -58F to -346F(0.05% rdg + 0.3C) on -50C to 1370C

R/S-TYPE (0.05% rdg + 2C) on 0C to 1767C (0.05% rdg + 0.8F) on 32F to 2372F(0.05% rdg + 0.4C) on 0C to 1300C(0.05% rdg + 1.6F) on -58F to 32F(0.05% rdg + 0.8C) on -50C to 0C

Temperature Coefficient:

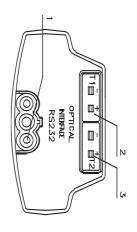
(0.05% rdg + 4F) on 32F to 3212F

from 0C to 18 and 28C to 50C (32F to 64F and 82F 0.1 times the applicable accuracy specification per C

Reading Rate: 2.5 time per second combination of input pins. Input Protection: 24V dc or 24V ac rms maximum input voltage on any

Top Side:

- 1. RS232 (Optical Interfaced) Port
- 2. Sockets of thermocouples T1
- 3. Sockets of thermocouples T2



OPERATING INSTRUCTIONS

Operational Mode

There are three operation modes–Normal, Shift, and Setup Mode.

Normal Mode:

This is the default mode; the operating functions for the normal mode are printed on the top of each button in white.

Shift Mode:

The operating functions for the shift mode are printed in yellow on the buttons. While in the normal mode, push the SHIFT button to switch to shift mode. At the lower-righthand corner of the display panel, the word "Shift" is displayed to indicate shift mode. To switch back to normal mode, press the SHIFT button.

Setup Mode:

The operating functions for the setup mode are printed in between two bracket signs "[]" on each button. Press the SET[] button in normal mode to switch to setup mode, the indicator "SET" is shown on the left side of the display panel. To switch back to normal mode, press the SET[] button

Normal Mode:

The following functions can only be used in the normal mode.

(1) 'O" Power Button

The "0" button turns the thermometer on or off. When entering data set mode, the power off function is disabled.

(2)"Limits" Button (only main display)

The limits function will alert the user when a measure ment exceeds a specified limit. To set the limit values, refer to limits function in the setup mode.

Press the [Limits] button to activate the limits function; the word "LIMIT" should be displayed on the LCD.

When the value of the main display exceeds the Hi limit, the word "Hi" will be displayed and the thermometer will beep in an interval frequency. If the value of the main display is lower then the Lo limit, the word "Lo" will be displayed and the thermometer will beep in a continuous frequency. In Limits function, on K or J Type, and with the scale of temperature at °F, the reading counts should be times 10. (ex: 2100°F means 21000 counts)

To exit the Limits function, press the [Limits] button.

(3)"**" button

The backlight function is represented by this button " 夢" Pressing the button will turn the backlight on or off in the LCD.

(4) "SAVE/READ" button

The Read Data function works in conjunction with the Save function in the Shift mode, it is used for reading saved data. The Save function can be activated in Shift mode. Press the SAVE/READ button to activate the Read Data function; the word "READ" should be displayed on the LCD. To navigate around the Saved Data table, press the overlay "SECOND" button until the "#" sign is displayed on the second display panel. The location of the read pointer within the Saved Data table will be displayed. The arrow buttons on the overlay are used for scrolling through the saved data. Pressing the smaller arrow "\rightarrow" retrieves the next saved data. Pressing the larger arrow "\rightarrow" or "\rightarrow" will retrieve the next ten saved data Pressing the overlay "ESC" button deactivates the read data function.

(5) "LOG/READ" button

The Log/Read function works in conjunction with the log function, it is used for reading the log data. The log function can be activated in the shift mode. Press the LOG/READ button to activate the read log function; the word "READ" should be displayed on the LCD. Press the overlay SEC-OND button to rotate through following display menus: T1, T2, GRP, and #.

T1 and T2: Displays the T1 or T2 saved value. GRP: Displays the current group number.

#: Displays the current location of the read pointer within a selected group. The arrow buttons on the overlay are used for scrolling through the data and groups. Press the smaller arrows "> "or "> "or "> "to retrieve the next log data or group. Press the larger arrows "> "or "> "or "> "or to retrieve the next ten log data or groups. To navigate around the log data and groups, press the overlay SECOND button till GRP appears in the second display panel, and then select the group using the arrows, then press the SECOND button again till the "#" sign is displayed. The location of the read pointer in the selected group will be displayed, and then use the arrows to scroll through the data. Pressing the overlay "ESC" button deactivates the read data function.

(7) HOLD mode (only main display)

When HOLD mode is selected, the thermometer holds the present readings and stops all further measurements. To activate the data hold mode, press the HOLD button, and "HOLD" is displayed on the LCD. Pressing the HOLD button again cancels the function, and the instrument will automatically resume measurements.

(8) MIN/MAX with time record mode (only main display)

The MIN/MAX function records the highest and lowest value recorded, and it calculates the average reading, and the differences of MAX to MIN. Press MIN/MAX button to enter the MIN/MAX recording mode. The beeper emits a tone when a new minimum or maximum measurement is recorded. Press the MIN/MAX button again to rotate through the current readings:

MAX: The highest measurement recorded. MIN: The lowest measurement recorded.

MAX-MIN: The difference of the highest and the lowest measurement.

AVG: The average values of the measurements. This mode works in conjunction with the hold function, pressing the HOLD button will stop the recording and measurements (Previously recorded readings are noterased). Press HOLD button again to resume recording and measurements. To prevent accidental loss of MIN, MAX and AVG data, the MIN/MAX function can only be cancelled by pressing and holding down the MIN MAX key for more than 2 seconds. The Automatic Power Off function, and the power, C/F, REL, SET, Hi/Lo Limits, TYPE, T1/T2 buttons are also disabled.

(10)",T1/T2" button (MAIN display)

The input selection button [T1/T2] selects the input for the main display panel, T1 thermocouple or T2 thermocouple. Press the T1/T2 button to switch between the two inputs. When meter is turned on, it is set to the display that was last in use.

(11)"T1/T2" button (SECOND display)

The input selection button [T1/T2] selects the input for the second display panel, T1 thermocouple or T2 thermocouple. Press the T1/T2 button to switch between the two inputs. When meter is turned on, it is set to the display that was last in use.

(12)"T1-T2/TIME" button (THIRD display)

The input selection button [T1/T2] selects the system time and date, or the differential between the two thermocouples (T1-T2) for the third display panel. Press the T1/T2 button to switch the display options. When meter is turned on, it is set to the display that was last in use.

SHIFTMODE

The following functions can only be used in the shift mode (2) "C/F" button

Press the C/F button to select the temperature scale, readings can be displayed in Celsius (C) or Fahrenheit (F). When the thermometer is turned on, it is set to the temperature scale that was last in use.

(4)",SAVE" button

The save function stores the T1, T2 data in nonvolatile memory. Press the SAVE button to save the current data. The word SAVE is displayed to indicate the data are saved The build in memory can store up to 128 data. The data can be read using the read function in the normal mode.

(5)"LOG" button

The data log function continuously records the data according to a specified time interval. The time interval can be set using the interval time setup function [INVT] in the setup mode. Press the LOG button to activate the log function; the indicator "LOG" and "MEM" will be displayed on the LCD. There are 16 groups that are used for played on the log data, and each group uses 64 data slots. If the current log session exceeds 64 data, the log function will automatically use the next group to store the following data. A maximum of 1024 data can be saved in one log session. Press the LOG button again to exit the data log function.

(6)"CLR?" button

The CLR function clears all the saved and logged data in memory. When the CLR button is pressed, indicator "MEM" is displayed and the "CLR" word on upper-right of LCD will blink. Pressing "ENTER" button printed on the overlay in white word to clear all saved and logged data or "ESC" button to exit this function.

(7)", REL" button (only main display)

The relative value function can be used for comparing the saved reference value with other measurements. Press the "REL" button to store the current measurement as the reference value, and the "REL" should be displayed on the right part of the LCD. The next measurement will display the relative value compared to the reference value. Press "REL" button again to clear the reference value and deactivate the relative value measurement function.

(8)",[APO]" button

Press the [APO] button to trigger "Auto power off" function on or off. In this function, the indicator "APO" is shown at the upper lefthand panel of the LCD. When APO (Auto power off) is enabled, it will automatically turn the thermometer off if the key switch is inactivated according to to the set time (the default time for APO is 5 minutes). Press the Power button to resume operation.

(10) "TYPE" button (MAIN)

will change the thermocouple type for both displays. and second displays are the same, then pressing this button the main display (K/J/T/E/R/S/N). If the inputs of the main Press this button to change the type of thermocouple in

(11)"TYPE" button (SECOND)

main and second display are the same, then pressing this button will change the thermocouple type for both displays. the second display (K/J/T/E/R/S/N). If the inputs of the Press this button to change the type of thermocouple in

SETUP MODE

The following functions can only be used in the setup

Mini DIN output (2)"[Limits]" button (Hi/Lo limit setting) and

used to set negative values. Setting is from left to right digit is 1 count. The button "-" (same button as the ESC) can be set Hi or Lo limit value. the resolution of Hi/Lo limit setup the number button printed on the overlay in white to on the LCD, and the previous settings are displayed. Press function, the "LIMIT", "HI", and main display will blink Press the "ENTER" button to confirm each setting. Press the LIMITS button to enter the Hi/Lo Limit setup

3)"(INVT]" button (Interval time setting)

overlay "ENTER" button to confirm. To exit this function, left to right of the following format (HH:MM:SS). Press the overlay in white to change the time interval. Setting is from press the ESC button. will be displayed. Press the number button printed on the blinking on the topright of the LCD and the previous settings [INVT] button to set the time. The indicator "INV" will be To setup the time interval for the log function, press the

MM: Interval Minute (0~59) HH: Interval Hour (0~23)

SS: Interval Second (0~59)

MIN:00:00:01 MAX: 23:59:59

min. 5 minutes) (8) "[APO]" button (Auto power off/time setting,

Press the overlay "ENTER" button to confirm. To exit this printed on the overlay in white to set the APO time. default time for APO is 5 minutes. Press the Number button indicator "APO" and the main display will blink on the Off (APO) function. Press the [APO] in setup mode, and the tunction without changing the setting, press the ESC LCD, and the previous setting will be displayed. The Use this function to change the time for the Auto Power

MIN: 0005 minutes MAX: 19999 minutes

(9)",[OFS]" button (Thermocouple offset adjust)

value. Press the overlay "ENTER" button to confirm. the setup is 0.1. Press the "-" button to set the negative or set the offset of the thermocouple. The resolution of blinks. While the previous setting is displayed, press the MAX: 1999.9 C/F Number button printed on the overlay in white to change the top righthand corner of the LCD while the main display press this button to enter the thermocouple Offset Setup the thermocouple or vice-versa for T2. In the setup mode, couple is connected, the instrument can adjust the offset of Function (OFS) and the indicator CAL should be displayed on When the main display input is T1 and socket thermo-

(12)"[TIME]" button (System date and time setting)

to confirm. Exit this function by pressing the ESC button set the system date and time. Press the "ENTER" button display panel should blink. Enter from left to right in the the Number button printed on the overlay in white word to following format: YY:MM:DD and HH:MM:SS. Press button in the setup mode. The time and date on the third To set or change the system time, press the [TIME]

PROCEDURE OF CALIBRATION

- Make ADJ pin short.
- 2. T2 input for a voltage of 70mV will show a value press "set[]" key in the next step. higher than 28000 2dgts at the third display and then
- 3. T1 input for a temperature of 0C will show a value to complete the calibration. 5C at the main display. Press "set[]" key
- 4. Take off the short pin.

OPERATOR MAINTENANCE

WARNING

To avoid possible electrical shock, disconnect the thermocouple connectors from the thermometer before removing the cover.

Battery Replacement

contacts. tery, remove the two screws from the back of the meter and (NEDA 1604, IEC 6F22). The "appears on the LCD lift off the battery cover. Remove the battery from battery display when replacement is needed. To replace the bat-Power is supplied by a 9 volt "transistor" battery

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please have the following information available BEFORE FOR WARRANTY RETURNS,

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- 2. Model and serial number of the

2. Model and serial number of

- product under warranty, and 3. Repair instructions and/or specific problems relative to
- 1. Purchase Order number to cover the COST of the repair. current repair charges. Have the following information available BEFORE contacting OMEGA: FOR **NON-WARRANTY**REPAIRS, consult OMEGA for
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