Digi -Sense®

Humidity Data Logger

MODEL NO. 60020-52

Digi -Sense®

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Table of Contents

INTRODUCTION 1
SAFETY PRECAUTIONS 2
SPECIFICATIONS 3
BATTERY INSTALLATION AND REPLACEMENT 5
AC ADAPTER 6
CONNECTING THE PROBE 6
QUICK SETUP 10
RESET FACTORY DEFAULTS 11
COMPLETE SETUP PROCEDURE 12
- SELECTING LOWER DISPLAY MODE 12
- SHOW DEW POINT OR BLANK 12
- DISPLAY RESOLUTION 13
- FILTER RATE 13
- REAL-TIME CLOCK 13
- LOG SETUP 14
- PRINT SETUP 15
- SELECTING INDIVIDUAL PARAMETERS 16

OPERATING PROCEDURES 17
- GENERAL 17
- OPERATION 17
- BASIC MEASUREMENTS 17
- SELECTING THE TEMPERATURE SCALE 18
- MAXIMUM READINGS 18
  - Clearing a Maximum Reading 18
- MINIMUM READINGS 19
  - Clearing a Minimum Reading 19
- HOLD FUNCTION 19
- STORED READINGS 20
- RECALL READINGS 20
- CLEARING STORED OR LOGGED READINGS 21
- LOGGING READINGS 21
- PRINTING 22
  - HP Printer Format for Normal Printing 22
  - HP Printer Format for Log Dump 23

RS-232-C Format for Normal Printing and Log Dump 25
CALIBRATION 26
SINGLE-POINT CALIBRATION PROCEDURES 26
Humidity and Temperature Calibration 26
Temperature Only Calibration 27
DUAL-POINT CALIBRATION PROCEDURES 28
Humidity and Temperature Calibration 28
Temperature Only Calibration 30
FIELD CALIBRATION LOCKOUT AND RE-ENABLE 31
Lockout Procedure 31
Re-Enable Procedure 32
MAINTENANCE AND TROUBLESHOOTING 33
BATTERIES 33
SERVICE 33
TROUBLESHOOTING 35
ACCESSORIES 36
Part Number 36
Calibration Salts 36
Calibration Services 36
WARRANTY 37
PRODUCT RETURN 37
TECHNICAL ASSISTANCE 37

CERTIFICATE OF CONFORMANCE

This thermohygrometer was calibrated using equipment traceable to the National Institute of Standards and Technology (NIST).

Temperature measurements conform to ITS-90.

The accuracy of the thermohygrometer at the time of calibration was within specifications stated in the operating manual.

Model No.: _____

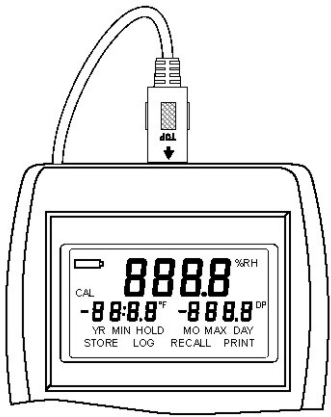
Serial Number: _____

Date placed in service:_____

To purchase an NIST certificate of traceability with test data and test date for meter and probe, please contact your dealer.

INTRODUCTION

This versatile hand-held instrument provides highly accurate relative humidity measurements and temperature with calculated dew point in Celsius or Fahrenheit.



This instrument covers the extended measuring range of 0 to 100% RH, –40 to +140°F (–40 to +60°C) temperature, and –130 to +140°F (–90 to +60°C) for dew point.

The instrument is designed for easy operation and includes the following features:

- Operator selection of temperature scale
- Resolution of 0.1 (% RH, °F, °C, and DP)
- LCD with three four-digit displays
- Six-pin circular DIN connector input for probe
- Hold feature for temporarily retaining a reading
- Two-point field calibration capability for humidity or temperature

- Low-battery warning
- Stores or logs up to 1000 readings with realtime markers
- Scrolls through all stored readings
- Displays MIN and MAX readings
- Interfaces with optional HEWLETT PACKARD® infrared printer or optional RS-232-C adapter
- Prints temperature, humidity, dew point, and time of reading
- Detachable and interchangeable humidity/temperature probe
- Built-in tilt stand for easy hands-free operation

SAFETY PRECAUTIONS

DO NOT USE OR STORE THIS INSTRUMENT IN MICROWAVE OVENS OR ANY ABNORMALLY HOT OR COLD AREAS.

WEAK BATTERIES SHOULD NOT BE LEFT IN THE INSTRUMENT. DEAD BATTERIES CAN LEAK AND CAUSE DAMAGE TO UNIT.

SPECIFICATIONS

HUMIDITY/TEMPERATURE PROBE

Humidity:

Type: Capacitive sensor

Range and Accuracy:

Range	Accuracy
0% to 10%	±4% of reading
10% to 90%	±2% of reading
90% to 100%	±4% of reading

Response Time: 33% to 76% RH, still air at 25°C (77°F): 5 seconds

Temperature

Type: Thermistor Element

Range and Accuracy:

Range	Accuracy
–40 to +60°C	±(0.2% of reading ±0.5°C)
–40 to +140°F	±(0.2% of reading ±0.9°F)

Dew Point:

Range: –90°C to +60°C (–130°F to +140°F)

Accuracy: Accuracy of the calculated dew point depends on the accuracies of the measured temperature and humidity values. The following table reflects dew point accuracy given sensor measurement accuracies of ±0.5°C and ±2% RH.

Accuracy of Dew Point Temperature (±°C)											
%	Temperature (°C)										
RH	–40	–30	–20	–10	0	10	20	30	40	50	60
10	2.13	2.29	2.46	2.63	2.82	2.94	3.11	3.28	3.46	3.65	3.84
20	1.31	1.40	1.49	1.58	1.69	1.72	1.81	1.90	2.00	2.10	2.20
30	1.05	1.11	1.18	1.25	1.32	1.33	1.39	1.46	1.53	1.60	1.67
40	0.93	0.98	1.03	1.09	1.15	1.13	1.18	1.24	1.29	1.35	1.40
50	0.85	0.90	0.94	0.99	1.04	1.02	1.06	1.11	1.15	1.20	1.25
60	0.81	0.84	0.88	0.93	0.97	0.95	0.98	1.02	1.06	1.10	1.14
70	0.77	0.81	0.84	0.88	0.93	0.89	0.92	0.96	0.99	1.03	1.07
80	0.75	0.78	0.81	0.85	0.89	0.85	0.88	0.91	0.94	0.98	1.01
90	0.73	0.76	0.79	0.83	0.87	0.82	0.85	0.88	0.91	0.94	0.97
100	0.72	0.74	0.77	0.81	0.84	0.80	0.82	0.85	0.88	0.91	0.93

Dimensions (L × W × H):

21.3 cm × 3.2 cm × 4.4 cm

(8-3/8 in × 1-1/4 in × 1-3/4 in)

Insertion Diameter: 1.64 cm (0.65 in) at 3.30 cm (1.3 in) depth

Compatible with Calibration Salts

(See **ACCESSORIES** on inside back cover.)

Cable Length: 91 cm (3 ft)

Weight: 114 g (4 oz)

Color: Black

LOGGER

Linearization: Temperature measurements conform to ITS-90

Input Protection: 10 V rms

Display Update: 0.6 seconds per update

Connector: Circular 6-pin DIN

Dimensions (D × W × H): 3 cm × 8.4 cm × 15.8 cm (1.2 in × 3.3 in × 6.2 in)

Weight with Batteries: 227 grams (8 ounces)

Ingress Protection: Meets IEC-60529 IP-54 for dust- and water-resistant enclosures.

Compliance: For CE Mark: EN61326-1/A1: 1998 (EU EMC Directive)

Battery

Size: Two AA, 1.5 V alkaline ANSI-L40, IEC-LR6

Life: >200 hours continuous, typical

Display: LCD with 10 mm (0.4 in) high characters main readout and 5 mm (0.2 in) high characters secondary displays, 4 digits each display plus various annunciators.

LOGGER OPERATING HUMIDITY / TEMPERATURE RANGE:

Operating Temperature: 0 to 40°C (32 to 104°F)

Storage Temperature: –40 to 65°C (–40 to 149°F)

Humidity: 10% to 90% (non-condensing)

Altitude: Up to 2000 m (6560 ft)

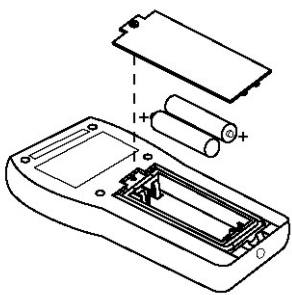
BATTERY INSTALLATION AND REPLACEMENT

CAUTION *WEAK BATTERIES SHOULD NOT BE LEFT IN THE INSTRUMENT. DEAD BATTERIES CAN LEAK AND CAUSE DAMAGE TO UNIT.*

When battery indicator illuminates, battery life is approximately 8 to 10 hours. The battery indicator starts flashing when battery life is less than one hour. **At that point, the battery must be changed. If the battery charge gets too low, the display blanks.**

See **SPECIFICATIONS** for correct battery type.

1) Before changing battery, turn instrument off and disconnect probe.
2) Loosen screw and lift battery cover off back of case.
3) Remove the two AA batteries.
4) Observe polarity, and insert two new batteries.
5) Install cover and tighten screw.



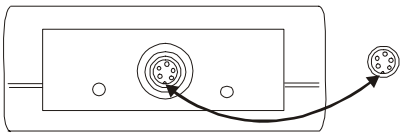
AC ADAPTER

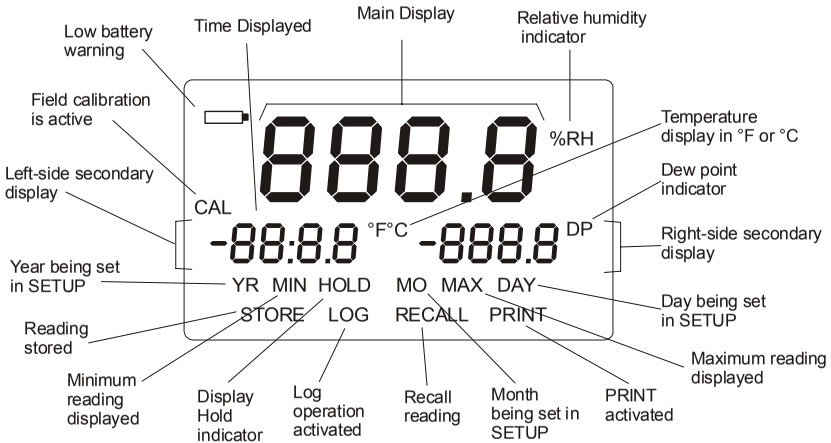
An optional AC adapter can be used for power to conserve batteries. The adapter is not a charger and will not charge batteries. The adapter connects to the bottom of the instrument. When the adapter is connected, the batteries are disconnected.

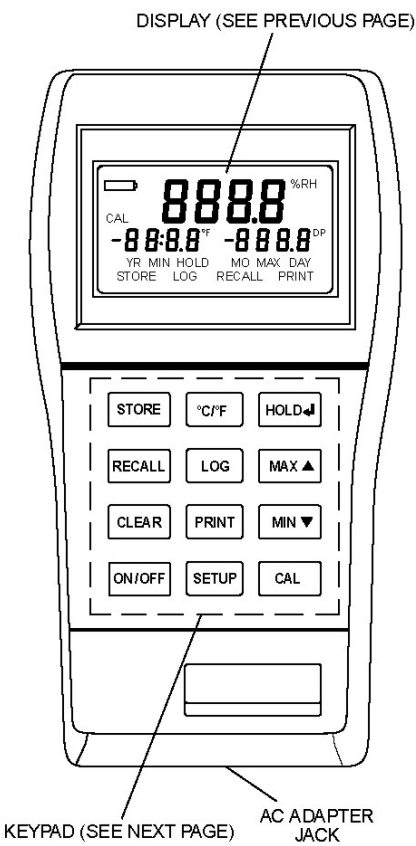
Refer to **ACCESSORIES** for adapter information.

CONNECTING THE PROBE

A five-pin socket is located at the top of the instrument. Align the slot locator in the plug of the probe with the slot in the socket as shown below. Insert the plug fully into the socket and turn the locking ring clockwise to secure the attachment.




Low battery warning
Time Displayed
Main Display
Relative humidity indicator
Field calibration is active
Temperature display in °F or °C
Left-side secondary display
Dew point indicator
CAL
888.8
%RH
-88:8.8
°F°C
-888.8
DP
Right-side secondary display
Year being set in SETUP
YR MIN HOLD
MO MAX DAY
Day being set in SETUP
Reading stored
STORE LOG
RECALL PRINT
Maximum reading displayed
Minimum reading displayed
Display Hold indicator
Log operation activated
Recall reading
Month being set in SETUP
PRINT activated


DISPLAY (SEE PREVIOUS PAGE)
%RH
CAL
°F
DP
YR MIN HOLD
STORE LOG
MO MAX DAY
RECALL PRINT
STORE
°C/°F
HOLD
RECALL
LOG
MAX
CLEAR
PRINT
MIN
ON/OFF
SETUP
CAL
KEYPAD (SEE NEXT PAGE)
AC ADAPTER JACK

Press to store current reading. Up to 1000 readings can be stored with time occurrence.

Press to select °C or °F temperature scales.

Press to freeze reading in display. Press again to unfreeze. (See **CALIBRATION** FOR FUNCTION.)

Press to enter recall mode.

Press to activate and deactivate log function.

Press to see briefly the maximum reading since power up or clear. (See **CALIBRATION**, **SETUP**, and **RECALL for function.**

Press to see initiate clear action. CAL, MAX, MIN, STORE, PRINT, and LOG are prompted to complete.

Press to activate and deactivate infrared output.

Press to see briefly the minimum reading since power up or clear. (See **CALIBRATION**, S**ETUP**, and **RECALL** for x function.

Press to power up or turn off.

Press to select display characteristics, dew point, scale, resolution, filter rate, to set the real-time clock, and access to LOG and PRINT submenus.

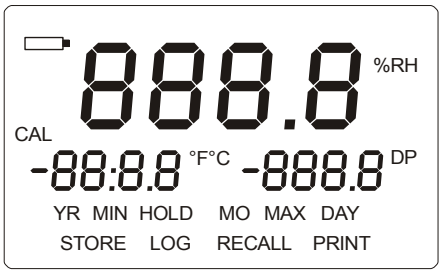
Press to enter field calibration mode. (See **CALIBRATION**.)

QUICK SETUP

NOTE

Review **SAFETY PRECAUTIONS**.

1) Install batteries.
2) Connect probe.
3) Press ON/OFF. The instrument performs a self-test and all display digits and indicators, as shown below, remain on for approximately one second.

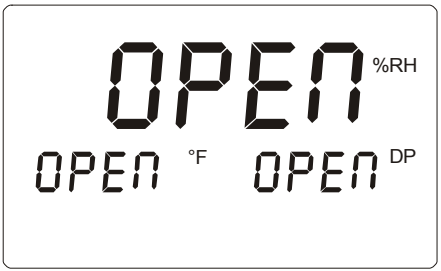


The time and date remain on for about three seconds.

NOTE

If the probe has not been connected to the instrument, **"OPEN"** appears in the display.

"OPEN" also appears if the probe is not functioning. No measurements can be made while this message is displayed.



4) Press **SETUP** to enter the setup sequence.
5) Use **MAX▲** or **MIN▼** to make and enter selections. Press **HOLD** to accept the value and go to the next step.

RESET FACTORY DEFAULTS

With the instrument off, press and hold **CLEAR** and **SETUP**, then press and release ON/OFF.

Hold **CLEAR** and **SETUP** until **CLr** is displayed, then release the two buttons. Press any key to continue.

COMPLETE SETUP PROCEDURE

The setup function scrolls through a series of steps for selecting resolution, filter rate, setting the real-time clock, and accessing the LOG and the PRINT sub-menus. Either the complete setup can be run as described below, or the setup can be terminated at any step. The LOG and PRINT sub-menus can be accessed without going through the complete setup.

NOTE

Settings selected in the Setup procedure are stored in memory and remain even after power is turned off or while batteries are being replaced.

Press **SETUP**. The lower left display flashes **OFF**, the time of day or the selected temperature unit.

Display	Options	Factory Default
Lower Display	Temp/Time/Off	Temp (°F)
Dew Point	On/Off	On
Resolution	0.1/1.0	0.1
Filter Update Rate	Off/Low/High	Off

SELECTING LOWER DISPLAY MODE

Press **MAX▲** or **MIN▼** to toggle the lower display to show the time of day, show minimum and maximum temperature values, or turn off. Press **HOLD** to accept the setting and to advance to the next step.

SHOW DEW POINT OR BLANK

Press **MAX▲** or **MIN▼** to toggle the Dew Point display between on and off. Press **HOLD** to accept the setting and to advance to the next step.

DISPLAY RESOLUTION

There are two choices for display resolution. The default is 0.1 resolution, at which the instrument automatically ranges between 0.1 and 1 as required. The other option is 1 resolution. When set to 1, the display remains in this resolution for all measurements.

When 0.1 resolution is selected, a decimal point appears in the numerical displays. When 1 resolution is selected, no decimal point is present.

The upper display shows a flashing 0.1 or 1. Press **MAX▲** or **MIN▼** to change resolution, then press **HOLD** to accept the setting and to advance to the next step.

FILTER RATE

The filter rate can be set to OFF, Lo or Hi. This rate is changed to smooth out fluctuations in the readings. Normally, the filter rate is set to OFF. If readings are unstable, try changing to Lo or Hi.

The lower left display shows **FILt** and the upper display flashes either OFF, Lo or Hi. Use **MAX▲** or **MIN▼** to change the filter rate, and then press **HOLD** to accept the setting and to advance to the next step.

REAL-TIME CLOCK

1) When setting the real-time clock, the right two digits in the lower left display flash.
2) Use the **MAX▲** or **MIN▼** to adjust the flashing digits to the desired minute setting.
3) Press to store the minutes and advance to the hours setting.

NOTE

Hours are set in the 24-hour time system. Therefore, time after 12:59 PM requires 12 to be added to the time. For example, 3:00 PM is (3+12) = 15:00 hours.

4) The left two digits in the lower left display flash. Use **MAX▲** or **MIN▼** to adjust the flashing digits to the desired hour setting.
5) Press **HOLD** to store the hours and to advance to the month setting.
6) The MO annunciator displays and the right two digits in the lower right display flash. Use **MAX▲** or **MIN▼** to adjust the flashing digits to the desired month setting (1 to 12).
7) Press **HOLD** to store the month and to advance to the day setting.
8) The DAY annunciator displays and the right two digits in the lower right display flash. Use **MAX▲** or **MIN▼** to adjust the flashing digits to the desired day setting (1 to 31).
9) Press **HOLD** to store the day and to advance to the year setting.
10) The YR annunciator displays and the two digits in the lower left display flash. Use **MAX▲** or **MIN▼** to adjust the flashing digits to the desired year setting (2000 to 2063).
11) Press **HOLD** to store the year. To set up the log or print functions, proceed to the following paragraphs.

LOG SETUP

The LOG sub-menu is used to set the time intervals between the logged readings. The time can be set from one second to 60 minutes. Once the log sub-menu is set up, logging can be toggled ON or OFF by

pressing **LOG**. When logging is turned ON, it continues until turned OFF or until 1000 logs have occurred at the entered rate. The first 1000 logs are retained.

1) Press **LOG** anytime during SETUP. The LOG annunciator displays along with the currently set time interval (default is one second). The two right digits, representing seconds, flash.
2) Use **MAX▲** or **MIN▼** to adjust the "seconds" as desired. Press **HOLD** to store the setting and to advance to the "minutes" setting.
3) Use **MAX▲** or **MIN▼** to adjust the "minutes" as desired. Press **HOLD** to store the setting and to complete the Logging setup.

PRINT SETUP

The PRINT sub-menu is used to set the time intervals between the readings being sent to the printer. The default rate is once every four seconds. The time can be set from four seconds to 60 minutes. Once the print sub-menu is set up, printing can be toggled ON or OFF by pressing **PRINT**. In addition, the data rate for the infrared RS-232-C output can be set.

1) Anytime **PRINT** is pressed during SETUP, the PRINT annunciator displays along with the currently set time interval (default is four seconds). The two right digits, representing seconds, flash.
2) Use **MAX▲** or **MIN▼** to adjust the "seconds" as desired. Press **HOLD** to store the setting and to advance to the "minutes" setting.
3) Use **MAX▲** or **MIN▼** to adjust the "minutes" as desired. Press **HOLD** to

store the setting and to proceed to the data output rate.

4) Use **MAX▲** or **MIN▼** to scroll through the available data output rates of HP, 300, 600, 1200 or 2400 (default). Use HP for the HEWLETT PACKARD infrared printer. The data output rates of 300, 600, 1200 and 2400 are for use with the optional infrared to RS-232-C adapter. Press **HOLD** to store the setting and to end the setup.

SELECTING INDIVIDUAL PARAMETERS

The resolution, filter update rate and real-time clock can be set individually without performing the complete setup. First press **SETUP**, then repeatedly press **HOLD** until the desired function is displayed. Use **MAX▲** or **MIN▼** to change the function and press **HOLD** to store the setting.

OPERATING PROCEDURES

GENERAL

Reaching temperature equilibrium is essential when measuring humidity in calibration. Even a small temperature difference between the sensor and the measured object can cause an error. For example, at a temperature of +20°C (+68°F) with an RH of 50%, a difference of ±1°C between the sensor and the measured object results in an error of ±3% RH. For humidity of 90% RH, the resulting error is ±5.4% RH.

A greater error results when there is high humidity and the sensor is warmer or colder than its surroundings. A difference in temperature of a few degrees can cause water to condense on the sensor's surface. Evaporation can take hours in an unventilated space; good ventilation accelerates evaporation. The humidity sensor resumes normal function as the water evaporates. Contaminated condensed water may shorten the life span of the sensor and change its calibration.

OPERATION

The unit always powers up with the upper display showing humidity. If a probe is not connected at power up, the upper display indicates **OPEN**. For optimum operation, allow about one minute for ambient temperature stabilization. If the unit has been stored at an extreme ambient condition, more time may be needed.

BASIC MEASUREMENTS

Check that the instrument is turned on, the probe is connected, and the desired resolution

(0.1° or 1°) and temperature (°C or °F) scales are selected. If the display is set to factory defaults, the upper display shows relative humidity and the lower display shows temperature and dew point. The lower display may also be set to show time or be off, and the dew point may be set not to display (off). Refer to **SELECTING THE LOWER DISPLAY MODE** for displaying temperature and dew point.

SELECTING THE TEMPERATURE SCALE

Use °C/°F for selection of the Celsius or Fahrenheit scale. The last selection is retained in memory even if the instrument is turned off.

MAXIMUM READINGS

The maximum reading function displays the maximum reading since power up or since the last time the clear function was used. The maximum reading function is ideal for monitoring unattended operations while continually displaying every temperature, humidity, and dew point change that occurs. The maximum and minimum values are sensed and automatically stored until you are ready to observe the reading.

Do not turn off the instrument when a maximum or minimum temperature, humidity, or dew point value may be needed; MAX/MIN memory contents are lost when the instrument is turned off.

Clearing a Maximum Reading

Press CLEAR, then press **MAX▲**. The maximum memory is cleared.

MINIMUM READINGS

The minimum reading function displays the minimum reading since power up or since the last time the clear function was used. While continually displaying every temperature, humidity, and dew point change that occurs, the maximum and minimum values are sensed and automatically stored until you are ready to observe the reading.

Do not turn off the instrument when a maximum or minimum temperature, humidity, or dew point value may be needed; MAX/MIN memory contents are lost when the instrument is turned off.

Clearing a Minimum Reading

Press **CLEAR** then **MIN▼**. The minimum memory is cleared.

HOLD FUNCTION

Press **HOLD** to retain the reading on the display. Press **HOLD** again for normal operation.

Maximum Hold

Press **MAX▲** then press **HOLD**. Press **HOLD** again to turn off the HOLD function and return to normal operation.

To clear the maximum readings, press **CLEAR**, then **MAX▲**.

Minimum Hold

Press **MIN▲** then press **HOLD**. Press **HOLD** again to turn off the HOLD function and return to normal operation.

To clear the minimum readings, press **CLEAR**, then **MIN▼**.

STORED READINGS

The store function allows you to store up to 1000 readings. Each reading is logged with a storage location number and the time of occurrence.

To store readings, proceed as follows:

1) Momentarily press **STORE**. The present humidity, temperature, and dew point are stored. The STORE annunciator displays and the upper main display momentarily shows the storage location number.

   After three seconds, the storage number is replaced with a humidity and temperature reading, and the STORE annunciator remains on to indicate a humidity and temperature reading has been stored. STORE may be pressed as frequently as once per second.
2) Repeat step 1 for all the points to be recorded, up to a maximum of 1000. Each time **STORE** is pressed, the new reading is stored and the upper main display shows the storage location number for about three seconds.
3) After 1000 stored readings, the next time STORE is pressed the main display indicates **FULL**.

RECALL READINGS

This function allows the stored readings, the reading sequence number, and the Time/Date of the readings to be recalled. RECALL shows each stored reading individually. When individual readings are recalled, you can toggle between the reading and the sequence number of the reading.

To recall readings:

1) Momentarily press RECALL. The time and date are displayed on the lower displays and the stored sequence number is displayed on the main display. The STORE and RECALL annunciators are shown.
2) To step through the readings, press **MAX▲** or **MIN▼**. Each key press advances to the next reading in sequence. Hold down **MAX▲** or **MIN▼** to advance at an increasing rate through the readings. To increment or decrement by 100, proceed as follows:

   To increment, hold down **MAX▲** then press the **MIN▼** key.

   To decrement, hold down **MIN▼** then press the **MAX▲** key.
3) To toggle between the readings and the reading sequence number, press **RECALL** again.
4) To return to normal operation, press any key other than **ON/OFF**, **MAX▲**, **MIN▼** or **RECALL**.

CLEARING STORED OR LOGGED READINGS

Press **CLEAR**, then either **STORE** or **LOG**. Regardless of which key is pressed, the stored and logged readings in memory are cleared.

LOGGING READINGS

The Logging function is controlled by the **LOG** key. Prior to logging readings, it is necessary to set up the time interval between readings (see **LOG SETUP**) in **COMPLETE SETUP PROCEDURE**.

The time between readings can be set to any value from one second to 60 minutes. Logging

is initiated by pressing **LOG** and continues at the programmed rate until **LOG** is pressed again or 1000 logs have occurred. If 1000 logs have occurred, the display shows FULL.

The STORE function can be used during logging to insert additional measurements by pressing **STORE**.

PRINTING

Printing can output real-time readings or stored readings. The output is sent to the infrared (IR) printer output located at the top of the instrument. The printer output default time period is once every three seconds. This time can be set to any value between three seconds and 60 minutes (see **PRINT SETUP**) in **COMPLETE SETUP PROCEDURE**.

The following sample printouts show the RS-232-C format and the HEWLETT PACKARD (IR) printer in normal and log dump print modes. Note that in log dump print mode the first line specifies the total number of readings.

The print function is controlled by the **PRINT** key.

HP Printer Format for Normal Printing

The information sent as an output to the printer is based on the display settings. Several examples are shown. A new heading appears when the date changes or a new print is started.

NOTE

– – – – in the printout indicates an over range condition.

Both Lower Displays On:

03/02/01	% RH	°F
10:37:26	28.1	74.9
	DP:	39.7
10:37:31	28.1	74.9
	DP:	39.7
10:37:35	28.1	74.9
	DP:	39.7
10:37:39	28.0	74.8
	DP:	39.5
10:37:43	28.0	74.8
	DP:	39.5
10:37:47	27.9	74.8
	DP:	39.4

Dew Point Off:

3/02/01	% RH	°F
10:38:03	28.0	74.8
10:38:07	28.1	74.8
10:38:11	28.0	74.8
10:38:15	27.9	74.8
10:38:19	27.9	74.8
10:38:23	27.9	74.8
10:38:27	27.9	74.8

Dew Point and Degrees Off:

03/02/01	% RH
10:39:17	27.8
10:39:21	27.7
10:39:25	27.7
10:39:29	27.7
10:39:33	27.8

HP Printer Format for Log Dump

The information sent as an output to the printer is based on the display settings. Several examples are shown. A new heading appears when the date changes.

NOTE

– – – – in the printout indicates an over range condition.

Both Lower Displays On:

```
TOTAL READINGS: 20
03/02/01          % RH     °F
10:43:52          27.7     75.0
                  DP:      39.4
10:43:53          27.7     75.0
                  DP:      39.4
10:43:54          27.7     75.0
                  DP:      39.4
10:43:55          27.8     75.0
                  DP:      39.5
10:43:56          27.8     75.0
                  DP:      39.5
10:43:57          27.8     75.0
                  DP:      39.5
10:43:58          27.8     75.0
                  DP:      39.5
10:43:59          27.9     75.0
                  DP:      39.6
10:44:00          27.9     75.0
                  DP:      39.6
10:44:01          27.9     75.0
                  DP:      39.6
10:44:02          27.9     75.0
                  DP:      39.6
```

Dew Point Off:

```
TOTAL READINGS: 20
03/02/01          % RH     °F
10:43:52          27.7     75.0
10:43:53          27.7     75.0
10:43:54          27.7     75.0
10:43:55          27.8     75.0
10:43:56          27.8     75.0
10:43:57          27.8     75.0
10:43:58          27.8     75.0
```

NOTE

Printing 1000 stored sets of readings could take an hour depending on printer model.

RS-232-C Format for Normal Printing and Log Dump

NOTE

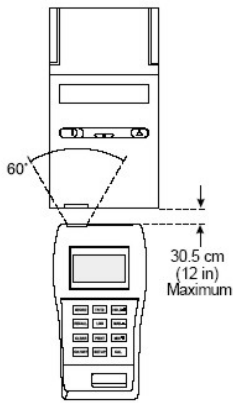
– – – – in the printout indicates an over range condition.

```
"DATE","TIME","% RH","DEGREES F","DEWPT F"
03/02/01,  10:43:52,  27.7,  75.0,  39.4
,10:43:53,          27.7,     75.0,     39.4
,10:43:54,          27.7,     75.0,     39.4
,10:43:55,          27.8,     75.0,     39.5
,10:43:56,          27.8,     75.0,     39.5
,10:43:57,          27.8,     75.0,     39.5
,10:43:58,          27.8,     75.0,     39.5
```

The print function is controlled by the **PRINT** key.

Proceed as follows:

1) Perform the PRINT Setup procedure to set the desired print rate.
2) Check that the IR printer input is properly aligned with the IR output at the top of the instrument.



Printer output occurs in real-time when the instrument is operating in normal mode. When the instrument is in RECALL mode, printing of the stored information occurs.

3) Press **PRINT** to start printing. Printing continues at the programmed print rate until **PRINT** is pressed again, or if stored data is being printed and all data has been transferred to the printer. When printing stored data, the temperature, humidity, dew point, and times of occurrence are output.

CALIBRATION

The calibration function allows both single-point and dual-point calibration of the instrument. Single-point calibrates the offset only. Dual-point calibrates the offset first then calibrates the slope.

It is not necessary to perform a field calibration to obtain specified accuracies. Use the field calibration feature to improve instrument/probe accuracy or to compensate for probe calibration drift.

The instrument has a memory retention capability to hold calibration values even while the power is off or the batteries are removed.

When you restart, there is no need to recalibrate.

SINGLE-POINT CALIBRATION PROCEDURES

Humidity and Temperature Calibration

1) Momentarily press **CAL** to enter the CALIBRATION mode. The CAL annunciator flashes. The relative humidity is displayed on the main display

and “Lo” is displayed on the lower left display. “Lo” signifies the offset point.

2) Insert the probe into controlled humidity at the calibration point.
3) Allow the reading to stabilize. If the displayed humidity is higher or lower than the reference humidity, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed reading until the reference humidity is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.
4) Press **CAL**. The main display shows temperature.
5) Insert the probe into controlled temperature at the calibration point.
6) Allow the reading to stabilize. If the displayed temperature is higher or lower than the reference temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed reading until the reference temperature is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.
7) Press CAL to store the calibration.

Temperature Only Calibration

1) Momentarily press **CAL** to enter the CALIBRATION mode. The CAL annunciator flashes. The relative humidity is displayed on the main display and **LO** is displayed on the lower left display signifying the offset point.
2) Press **CAL** again. The main display changes to temperature.
3) Insert the probe into controlled temperature at the calibration point.

4) Allow the reading to stabilize. If the displayed temperature is higher or lower than the reference temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed reading until the reference temperature is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.
5) Press CAL to store the calibration.

DUAL-POINT CALIBRATION PROCEDURES

This calibration function provides both for offset and slope field calibrations. For proper calibration, the following conditions must be observed:

- The slope point must be a higher temperature or humidity than the offset point.
- The difference must be at least 20°C (36°F) or 20% RH.
- Use two points based on the expected high and low humidity and temperatures. Humidity and temperatures measured outside of these limits may no longer meet specifications.
- Resolution is based on the selected display resolution.

Humidity and Temperature Calibration

1) **Humidity Offset Calibration**: Momentarily press **CAL** to enter the CALIBRATION mode. The CAL annunciator flashes. The relative humidity is displayed on the main display and “Lo” is displayed on the lower left display. “Lo” signifies the offset point.

2) Insert the probe into controlled humidity at the lower calibration point.
3) Allow the reading to stabilize. If the displayed humidity and temperature are higher or lower than the reference temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed reading until the reference humidity and temperature are displayed.

   MIN▼ or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.
4) Press **HOLD** to store the humidity offset calibration and advance to the slope calibration.
5) **Humidity Slope Calibration:** Place the probe at the higher reference humidity and temperature.
6) Allow the reading to stabilize. If the displayed humidity and temperature are higher or lower than the reference humidity and temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed reading until the reference temperature is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.
7) Press **HOLD** to store the humidity slope calibration and proceed to the temperature calibration.
8) **Temperature Offset Calibration:** Insert the probe into controlled temperature at the lower calibration point.
9) Allow the reading to stabilize. If the displayed temperature is higher or lower than the reference temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed

reading until the reference temperature is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.

10) Press **HOLD** to store the temperature offset calibration and advance to the slope calibration. To return to normal operation, press any key except **CAL** or **HOLD.**

11) **Temperature Slope Calibration:** Place the probe at the higher reference temperature.

12) Allow the reading to stabilize. If the displayed temperature is higher or lower than the reference temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed reading until the reference temperature is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.

13) Press **HOLD** to store the temperature calibration.

Temperature Only Calibration

1) **Offset Calibration:** Momentarily press **CAL** to enter the CALIBRATION mode. The CAL annunciator flashes. The relative humidity is displayed on the main display and "Lo" is displayed on the lower left display. "Lo" signifies the offset point.

2) Press **CAL** again. The main display changes to temperature.

3) Insert the probe into controlled temperature at the lower calibration point.

4) Allow the reading to stabilize. If the displayed temperature is higher or lower than the reference temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed

reading until the reference temperature is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.

5) Press **HOLD** to store the temperature offset calibration and advance to the slope calibration. To return to normal operation, press any key except **CAL** or **HOLD**.

6) **Slope Calibration:** Place the probe at the higher reference temperature.

7) Allow the reading to stabilize. If the displayed temperature is higher or lower than the reference temperature, use **MAX▲** to increase the displayed reading or **MIN▼** to decrease the displayed reading until the reference temperature is displayed. **MIN▼** or **MAX▲** must be pressed at least once. The CAL annunciator flashes during this procedure.

8) Press **HOLD** to store the temperature slope calibration.

Clearing Cal Point: Press **CLEAR,** then **CAL**. The instrument reverts to the factory calibration with no offset or slope compensation.

FIELD CALIBRATION LOCKOUT AND RE-ENABLE

The calibration lockout feature prevents any field calibration changes. The lockout remains in effect until a lockout re-enable has been performed. Use the following procedures to lockout or re-enable the field calibration operation.

Lockout Procedure

1) Turn off the instrument.

2) Simultaneously press and hold **CAL** and **CLEAR**, and momentarily press **ON/OFF**. Continue to hold **CAL** and **CLEAR** for at least five seconds.

Re-Enable Procedure

1) Turn off the instrument.
2) Simultaneously press and hold **CAL** and **HOLD**, and momentarily press **ON/OFF**. Continue to hold **CAL** and **HOLD** until the display blanks.

MAINTENANCE AND TROUBLESHOOTING

Properly used, the instrument should maintain calibration indefinitely and not require service other than occasional cleaning of the housing and changing of the batteries.

Do not clean with abrasives or solvents. Use mild detergents; never immerse nor use excessive fluid.

BATTERIES

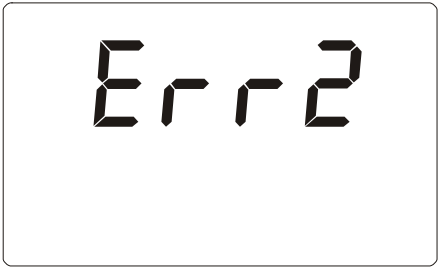
If there is no display when the instrument is turned on, check the condition of the two AA batteries. Check that the battery terminals are clean and batteries are properly installed. If replacement is necessary, refer to **BATTERY INSTALLATION AND REPLACEMENT** for the replacement procedure.

The real-time clock keeps time for up to one minute with the batteries removed. To minimize the need for resetting the clock, either remove and replace one battery at a time, or connect the AC adapter while changing the batteries. All stored/logged readings are retained until cleared, even if the batteries are removed for long periods.

SERVICE

There are no internal adjustments or user replaceable parts.

If “Err” followed by the numbers “1” through :9” is displayed (see example below), return unit for service. “Err” alone may be displayed during improper field calibration.



NOTE

The serial number label is located inside the battery compartment.

TROUBLESHOOTING

The following chart lists the most probable faults. There are no internal adjustments or user replaceable parts. If this does not solve the problem, refer service to your dealer.

FAULT	ACTION
No display when turned on	Check condition of batteries.
	Check that batteries are inserted properly.
	Check operation using AC adapter.
Display shows - - - -	Out of range indication.
Display shows “OPEN”	Open probe connection
Display shows “Err”	If displayed at any time other than during field calibration, return instrument for service.

If “Err 1” through: Err 9” remains on the display, return instrument for service.

ACCESSORIES

Part Number	
60000-80	Infrared printer, includes one roll of paper and four AA batteries
37455-82	Replacement printer paper, pack of three rolls
60000-82	AC Adapter for IR Printer, 110 VAC
60000-92	RS-232-C interface connects to computer's 9-pin serial port for easy uploading of data. Use with most popular RS-232-C programs.
60020-62	Replacement Relative Humidity probe
60000-70	AC Adapter for Thermohygrometer, 110 VAC
60000-75	AC Adapter for Thermohygrometer, 220 VAC
61100-90	Carrying case for meter

Calibration Salts

37950-60	Calibration Salt, 33% RH
37950-61	Calibration Salt, 75% RH

Calibration Services

69702-28	NIST-traceable calibration with test data after calibration at 30%, 60%, and 80% RH; 30°C (86°F)

WARRANTY

The Manufacturer warrants this product to be free from significant deviations from published specifications.

If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part as determined by the Manufacturer.

Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.

This product comes with a 3-year meter warranty and 6-month Humidity / Temperature probe warranty.

PRODUCT RETURN

To limit charges and delays, contact the seller or Manufacturer for authorization and shipping instructions before returning the product, either within or outside of the warranty period. When returning the product, please state the reason for the return. For your protection, pack the product carefully and insure it against possible damage or loss. Any damages resulting from improper packaging are your responsibility.

TECHNICAL ASSISTANCE

If you have any questions about the use of this product, contact the Manufacturer or authorized seller.

For more information on Eutech Instruments' products, contact your nearest distributor or visit our website listed below:

Eutech Instruments Pte Ltd. Blk 55, Ayer Rajah Crescent, #04-16/24 Singapore 139949 Tel: (65) 6778 6876 Fax: (65) 6773 0836 E-mail: marketing@eutechinst.com Web-site: www.eutechinst.com	Distributed by: