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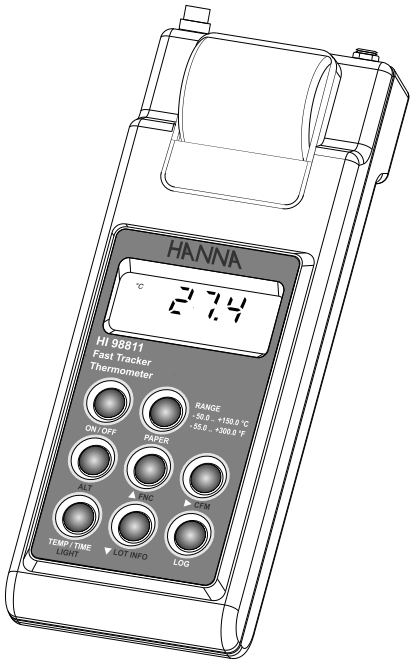
Instruction Manual

HI 98811

Fast Tracker Thermometer



HANNA instruments
www.hannainst.com

Dear Customer,

Thank you for choosing a Hanna Instruments Product.

Please read this instruction manual carefully before using the instrument. This manual will provide you with all the necessary information for the correct use of the instrument, as well as a precise idea of its versatility in a wide range of applications.

If you need additional technical information, do not hesitate to e-mail us at **tech@hannainst.com**.

WARRANTY

HI 98811 is guaranteed for two years against defects in workmanship and materials when used for its intended purpose and maintained according to instructions. Probes are guaranteed for a period of six months. This warranty is limited to repair or replacement free of charge.

Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered.

If service is required, contact the dealer from whom you purchased the instruments. If under warranty, report the model number, date of purchase, serial number and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instruments are to be returned to Hanna Instruments, first obtain a Returned Goods Authorization number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packed for complete protection.

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PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipping. If there is any damage, notify your Dealer.

Each thermometer is supplied complete with:

- HI762BL Temperature Probe
- 1.5V AA Alkaline Batteries (4 pcs)
- Paper rolls (5 pcs)
- Tags with holders (5 pcs)
- Rugged Carrying Case
- Instruction Manual

Note: Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in their original packaging together with the supplied accessories.

GENERAL DESCRIPTION

The Hanna Instruments portable NTC Fast Tracker thermometer with built-in printer enables you to accurately measure and record both temperature and sample identification data.

The instrument housing is made of rugged and lightweight material making it truly portable.

The meter comes equipped with an easy-to-read LCD with backlight feature for comfortable reading even in dark environments.

A user friendly interface provides clear messages regarding errors, functions and more.

The GLP features provide a guarantee of data consistency.

The Sample Identification feature eliminates the necessity of manual identification for different measurement results, reducing the human errors.

Measurements can be performed with lab-grade precision, in the field as well as in the laboratory.

An alarm time-out is available to alert the user if more than one year has elapsed since the last calibration and that recalibration may be required.

The meter provides GLP settings through a password protection method.

The Battery Error Preventing System (BEPS) recognizes batteries levels as they become weaker to prevent erroneous readings.

To prolong battery life, the backlight and printing features are disabled when the batteries are getting low; "LOBAT" indication is displayed on LCD to warn the user of this condition. However, the meter continues to measure correctly even when the low battery indication is displayed. The meter automatically switches itself off when the batteries are too weak to support proper function.

The meter is equipped with an internal lithium battery that powers the clock circuit even in the absence of power supplies.

For long term field and lab applications, this meter can be connected to a 12VDC adapter.

HI 98811 has the capability to store the measurements in memory at a user selectable interval from 1 to 180 minutes. This information can be retrieved at a later time and also printed.

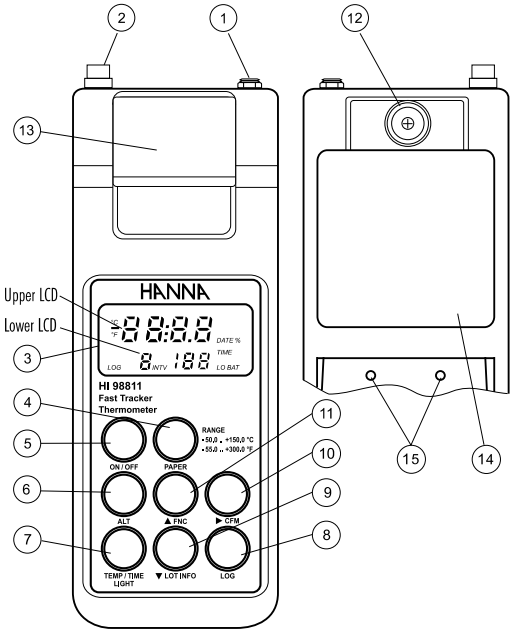
Each measurement/lot can be uniquely identified by assigning a sample ID code obtained by reading from a Dallas i-Button® tag (DS1990A, etc) suitable placed in the field.

HI 98811 also allows the transfer of stored data to a computer via the HI9200 infrared transmitter connected to the computer RS232 port.

Each meter can also be uniquely identified by the user by assigning an instrument ID code.

i-Button® is registered Trademark of "Maxim/Dallas Semiconductor Corp."

FUNCTIONAL DESCRIPTION



1) Power adapter plug
2) Temperature Probe Connector
3) Liquid Crystal Display (LCD)
4) **PAPER** key, to move the paper up
5) **ON/OFF** key, to turn the meter on or off
6) **ALT** key, to alternate key function
7) **TEMP/TIME** key, to select temperature reading, to view date and time, and to enable backlight (with ALT)
8) **LOG** key, to store and/or print measurements
9) â **LOT INFO** key, to move down or view logging information (with **ALT**)
10) à **CFM** key, to move right or confirm values (with ALT)
11) á **FNC** key, to move up or select function codes (with ALT)
12) **Touch probe**, to connect and read the i-Button tag
13) Printer
14) Battery location
15) RS232 - communication infrared leds

SPECIFICATIONS

Range	-50.0 to 150.0 °C ; -55.0 to 300.0 °F
Resolution	0.1 °C (-30 °C to +130 °C); 0.2 °C outside 0.1 °F (-18 °F to 225 °F); 0.2 °F (225°F to 260 °F); 0.3 °F outside
Accuracy (@20°C/68°F)	±0.4 °C (-20 °C to +120°C); ±0.7 °C outside ±0.8 °F (-4 to +248 °F); ±1.3 °F outside for one year (excluding probe error)
Typical EMC Dev.	±0.4 °C; ±0.8 °F
Channels	1 channel
Probe	HI 762 series
Sample Identification tag	Dallas i-Button® family (DS 1990A, etc)
Printer	Low power impact type-belt, 14 characters per line; 38 mm plain paper (HI 710034)
Printing/Logging Interval	1, 2, 5,10, 15, 30, 60, 120 and 180 minutes
Serial interface	Infrared RS232, selectable at 1200, 2400, 4800, 9600 baud.
Auto shut-off	Selectable at 5, 10, 15, 30, 45 or 60 minutes
Power supply	4x1.5V AA alkaline type/350 hours typical life (with 2700mA/h batteries, without printing and backlight). 12 VDC adapter (HI 710005 or HI 710006)
Environment	0 to 50°C (32 to 122°F); 0-95% RH non-condensing
Dimensions	220 x 82 x 66 mm (8.7 x 3.2 x 2.6")
Weight	500 g (18 oz)

INITIAL PREPARATION

Each meter is supplied complete with batteries. Remove the back cover, unwrap the batteries and install them while paying attention to the polarity. Alternatively, connect the HI 710005 or HI 710006 voltage adapter to the power adapter plug.

To prepare the instrument for use, choose the most appropriate temperature probe for your application (see accessories) and connect it to the connector located on the top of the instrument.

All the probes have been factory precalibrated and no calibration is needed.

To turn the meter on, press the ON/OFF key. The batteries charge status or "LINE" message (if external power adapter is connected) will be displayed on the LCD for a few seconds.
The meter is now ready to operate.

To maximize battery life, the meter is automatically turned off after a user selectable period of non-use (this feature is enabled and set to 5 minutes by default; it can be disabled or changed through setup code 40). If in logging mode, after the period of non-use, the meter will continue to monitor the temperature periodically at the end of every logging interval. Only the "LOG" indication will be visible on LCD. While storing data in memory, during the sleep mode, the reading will appear briefly on the LCD.

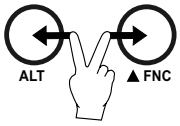
To reactivate the display, press the **ON/OFF** key.

Note: When the use of an alternate function (FNC, CFM and LOT INFO) is requested, press and hold the **ALT** key first and then the second listed key.

SETUP MODE

Setup can be used to view data regarding the instrument status (e.g. battery charge) or GLP data (e.g. calibration date) or to view or print the logged data. It also allows the user to change the meter parameters (e.g. time) and to gain access to stored data.

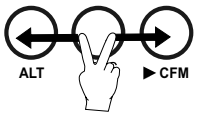
- To enter setup mode, ensure the meter is not logging and then press the **ALT** and **FNC** keys.



- The scrolling message <Insert the function code or press "ALT" - "FNC" to escape> on the upper LCD and the indication "F 00" with the number blinking on the lower LCD will be displayed.

- Choose the parameter code you want to set using the **á** or **â** keys.

- Press **ALT** and **CFM** to confirm the code.

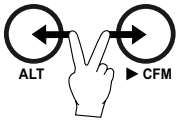


PASSWORD PROTECTION

Setting the GLP parameters (calibration alarm time-out, instrument ID code, time and date) can be password protected. If password is set to a value different from 0000 (factory setting), the user will be asked to enter the password.

- Select the desired GLP parameter code.
- Enter the password using the arrow keys.

- Press the **ALT** and **CFM** keys to confirm.



- If password is incorrect, the meter will return to the function selection mode without any warning message.
- If password is correct, the meter provides access to the GLP parameters.

PARAMETER SETTING

- Once the parameter code has been entered, the appropriate message will scroll across the LCD for a few seconds.
- The current value of the selected parameter on the upper LCD and the parameter code on the lower LCD will be displayed. The first digit will blink if the parameter can assume continuous values. All the digits will blink if the parameter can assume only a fixed set of values.
- Enter the new value using the **Arrow** keys.
- Press **ALT** and **CFM** to confirm the value.

The following table lists the setup codes along with the description of the specific setup items, their valid values and the factory settings (default):

Code	Valid values	Default
00 Lot data printing/scrolling	00÷16	00
01 Logging interval	1,2,5,10,15,30,60,120,180 min	1
02 Print lots data summary		
03 Printer enable	On(enabled); Off(disabled)	On
05 Log on demand delete		
06 Timed data delete		

Code	Valid values	Default
10 Show GLP data		
11 Calibration alarm time-out	On(enabled); Off(disabled)	On
20 Instrument ID code	0000÷9999	0000
30 Current time[1]	hh:mm	00:00
31 Current day[1]	dd	01
32 Current month[1]	MM	01
33 Current year[1]	YYYY	2004
40 Auto-Off/Power down time-out	Off,5,10,15,30,45,60 min	5
41 Battery level test		
50 RS232 baud rate	1200, 2400, 4800, 9600	9600
60 Firmware version		
70 Celsius/Fahrenheit selection	°C ; °F	°C
99 Password[2]	0000÷9999	0000

[1] The meter automatically checks for entered time/date accuracy as follows: 0≤hh≤23; 0≤mm≤59; 01≤dd≤28/29/30/31; 1≤MM≤12; 1998≤YYYY≤2097.

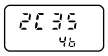
[2] To change the password, the correct code must be entered first. If the password has been forgotten, the password protected features are no longer accessible; in this case, contact your nearest Hanna Service Center.

SETUP MESSAGES LIST

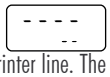
cod. 00: Lot data Printing
cod. 01: Log Interval
cod. 02: Lot table Printing
cod. 03: Printer enable
cod. 05: Press "**ALT CFM**" to delete Lot00 or "**ALT FNC**" to escape
cod. 06: Press "**ALT CFM**" to delete Lot 01-16 or "**ALT FNC**" to escape
cod. 10: GLP
cod. 11: Calibration alarm time-out
cod. 20: Instrument ID Code
cod. 30: Hour - Minute
cod. 31: Day
cod. 32: Month
cod. 33: Year
cod. 40: Auto OFF
cod. 41: Battery test
cod. 50: Baud rate
cod. 60: Release code
cod. 70: Celsius or Fahrenheit
cod. 99: Pass Code

Note: The Sample ID is stored in the log memory as a 14 digit hexadecimal code. Only the last 6 digits will be displayed on the LCD: two (the least significant) on the lower LCD, and the next four on the upper LCD.

Example: If the Sample ID is 010000012C354B:



If the Sample ID code is null:



Also only the last six digits will be printed on a single printer line. The hexadecimal digits '0'-'9' are printed as " 0" and the digits 'A'-'F' are printed as "*1"-"*6".

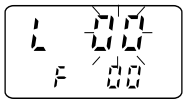
Example: "ID 2*3 9*4 3 6" if the Sample ID is "010000012C9D36", or "ID - - - - - -" if the Sample ID is null.

Some of the most important functions are explained below in a step by step sequence.

SCAN LOGGED DATA RECALL

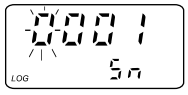
COD. 00 - Lot data Printing / Scrolling

- Select the code 00.
- The message "Lot data Printing" will scroll twice across the LCD.
- The upper LCD will then display L 00 with the 00 blinking.



- Set the desired lot using the **Arrow** keys.

  L 00 is the lot of data of the "log on demand" and L 01 to L 16 are the lots of the "timed log".
- Press **ALT** and **CFM** to confirm the lot number.
- If the lot doesn't contain data, the "no data" message will scroll across the LCD twice and the meter will return to setup mode.
- If the lot (other than L 00) contains one or more data, the LCD will display the Sample ID. Press any key and the LCD will display the sample number on the upper part and "Sn" on the lower part, along with "LOG" symbol.



Note: In the L 00 lot (log on demand) the sample number will be displayed with 3 digits (001).

- Select the sample number to scan using the **Arrow** keys.

Printing logged data

- Press **ALT** and **CFM** to print logged data.
- If the selected sample number is invalid (equal to 0 or bigger than the number of samples), the "Err" message will be displayed for a few seconds.

- If the sample number is correct, the samples starting from the selected one to the last sample of the lot will be printed. To stop printing before the last sample is reached, press and hold down the **ALT** and **PAPER** keys until the printer stops.
- The Sample ID will be printed for each sample of Lot 00, and once per lot for Lot 01 to Lot 16.
- During printout, the LCD will display the sample number that is being printed at that moment. If printout is stopped the LCD will show the last printed sample number. It is then possible to select another sample.
- Press **ALT** and **FNC** to return to setup mode.

Viewing logged data

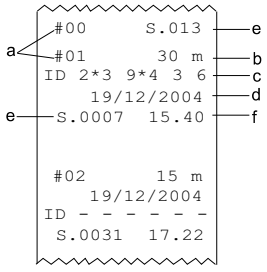
- Press **TEMP/TIME** to view data of the selected sample. Data will be displayed in the following order:
  Sample ID - for Lot 00 only
  temperature value
  date
  time
- If **TEMP/TIME** is pressed when the time is displayed, the LCD will pass to the next sample number.
- It is then possible to scroll the data of the next sample by pressing **TEMP/TIME** or select a different sample using the **Arrow** keys.
- to return to setup mode, press **ALT** and **FNC** when the meter displays the sample number.

Cod. 02 - Lot summary printout

- Select the code 02.
- The message "Lot table Printing" will scroll twice across LCD.
- The meter will then print a complete set of information based on the data stored in memory:

a - lot number
b - logging interval
c - Sample ID
d - starting date
e - number of samples
f - starting time

Note: For lot 00, only the number of samples will be printed.



DELETE LOGGED DATA

- Select code 05 to delete the Log on Demand data or code 06 to delete the Timed Log Data.
- A scrolling message will be displayed.
- Press **ALT** and **CFM** to confirm deletion.
- It is also possible to escape without data deletion pressing **ALT** and **FNC**.

Note: The associated Sample IDs will be deleted, too.

GLP DATA

Cod. 10 - viewing GLP data

- Select the code 10
- A message will scroll twice across LCD.
- The LCD will then display the instrument identification (ID) code.
- Press **á** to scan remaining data, in the following order:
  last calibration date (DD.MM)
  last calibration year

Note: Data can be viewed in reverse order pressing the **â** key.

- Press **ALT** and **FNC** to return to function selection mode.

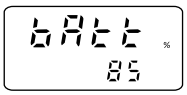
Code 20 - setting the instrument identification (ID) code

When using several identical meters it may be useful to uniquely identify them by assigning an ID code to each meter.

- Select code 20. A message will scroll across LCD.
- Enter a 4-digit value using the arrow keys.
- Press **ALT** and **CFM** to confirm the value.

TESTING BATTERY LEVEL

- Select code 41. The message "Battery test" will scroll across LCD.
- If the meter is connected to an external power adapter, the LCD will display "LINE", otherwise it will display "bAtt" on the upper LCD, and the remaining percentage of battery charge (100% means fully charged battery and 0% corresponds to the minimum battery voltage that allows the meter to operate).



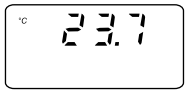
TAKING TEMPERATURE MEASUREMENTS

To prepare the instrument for use, choose the most appropriate temperature probe for your application (see accessories) and connect it to the connector located on the top of the instrument.

All the probes have been factory precalibrated and no calibration is needed.

Press **ON/OFF** to power on the instrument.

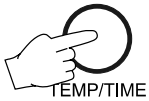
To take temperature measurements, simply insert the probe in the sample to be tested and allow the reading to stabilize. The temperature is displayed on the upper LCD.



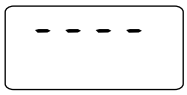
Press **TEMP/TIME** to view the date and time in the following order:

- date
- time

Pressing TEMP/TIME again, the meter returns to temperature reading.

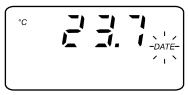


If the reading is out of range or the probe is not connected, the LCD will display a dashed line in place of the reading.



Note: To choose between "°C " and "°F" unit, enter the setup code 70.

Note: The meter is factory calibrated. After 1 year since last calibration the "DATE" symbol starts blinking on the LCD to warn the user that a recalibration is suggested in order to maintain a high accuracy of the meter. It is recommended that recalibration to be performed by authorized technical personnel only. Contact your nearest HANNA service center.



PRINTING/LOGGING FUNCTIONS

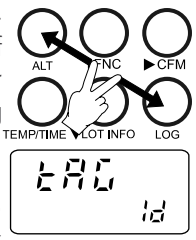
Two different modes to print / log data are available:

1. **Timed Logging**; samples are stored and printed (if print function is active) at fixed time intervals. Data are stored in the lots 01 to 16.
2. **Log on Demand**; samples are stored and printed (if print function is active) when the **LOG** key is pressed. Data are stored in the lot 00. It's possible to perform the Log on Demand either in normal mode or in Timed Logging mode.

It is possible to switch from logging without printing to logging with printing in two ways:

- set the function code 03 to "On" to enable printing, to "Off" to disable printing - while not in timed logging mode.
- press **ALT** and **PAPER** to toggle between printer enabled and printer disabled while in Timed logging mode.

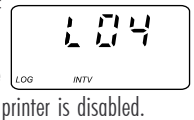
TIMED LOGGING MODE



To start Timed logging, press **ALT** and **LOG**. "tAG" will be displayed on the upper part of the LCD and "Id" on the lower part. For Sample ID code reading an i-Button® tag must be touched by the touch probe on the back of the meter within a 20 second interval. If a tag is recognized the meter will beep once and if the printing is disabled the last six digits of the tag's code will be displayed on the LCD for a few seconds.

Tag reading can be skipped by pressing **LOG** (a null Sample ID will be stored).

Note: Tag reading timeout - after 20 seconds left without reading any tag, the logging operation will be aborted with a longer beep.

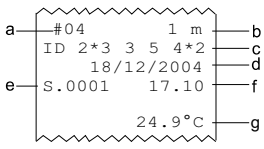


The lot number will be displayed for a few seconds, then the "LOG" "INTV" symbols will appear on LCD and if printer is enabled a first set of data will be printed. The "LOG" "INTV" symbols will be fixed if printer is enabled and will blink if printer is disabled.

The printout provides the following information:

a - Lot number

b - Logging interval



c - Sample ID (only for the first sample of the lot)

d - Date (only for the first printed sample of the lot or of the day)

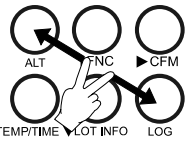
e - Sample number

f - Time

g - Reading ("----" means out of range).

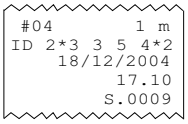
If no keys are pressed, the meter enters sleep mode to prolong the battery life and only the "LOG" "INTV" symbols will be visible on LCD. While logging, during the sleep mode, the last logged reading will appear briefly on the LCD. To reactivate the LCD press **ON/OFF**.

STOP LOGGING



In order to stop the recording mode, press **ALT** and **LOG** (press **ON/OFF** first, if meter is in sleep mode).

A last report containing the number of logged samples (e.g. S.0009) will be printed if printer is enabled.

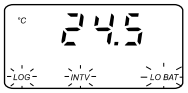


Notes:

- It is recommended to use the adapter during logging in printing mode, especially when many printouts are going to be taken.
- Before proceeding with logging and printing, make sure there is enough paper for your measurements. When the paper is finished, the meter will not advise the operator and the printouts could be lost. If this happens, data will continue to be stored in memory and it is always possible to print the data at a later time through setup code 00.
- It is possible to insert a new paper roll during logging session.
- Once in the logging mode, the interval cannot be changed. Exit the logging mode first (pressing **ALT** and **LOG**) to set a new interval.
- If the **LOG** key is pressed while in logging with printing mode, a printout is produced without affecting the running sample number and the value is stored in Log on Demand area.

LOW BATTERY CONDITION

Printout is automatically disabled when batteries charge weakens. The last message "Stop log" will be printed and data will continue to be stored in memory with the "LOG", "INTV" and "LOBAT" symbols blinking on LCD. If the user attempts to enable the printer while in

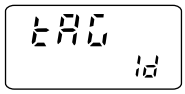


low battery condition, the message "bAtt" will appear for a few seconds on the LCD.

Note: When an external adapter or new batteries are connected, the printing must be manually enabled in order to return to logging with printing mode.

LOG ON DEMAND

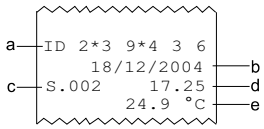
In measuring or timed log mode, press **LOG** to store the current reading. "tAG" will be displayed on the upper part of the LCD and "Id" on the lower part. For Sample ID code reading an i-Button® tag must be touched by the touch probe on the back of the meter within a 20 second interval. If a tag is recognized the meter will beep once and if the printing is disabled the last six digits of the tag's code will be displayed on the LCD for a few seconds. Tag reading can be skipped by pressing **LOG** (a null Sample ID will be stored).



Note: Tag reading timeout - after 20 seconds left without reading any tag, the logging operation will be aborted.

The LCD will display "Stor" and the value will be stored in the lot 00 (log on demand data area). If the print function is enabled, a printout is also produced providing the following information:

a - Sample ID
b - Date
c - Sample number
d - Time
e - Readings ("----" means out of range or probe not connected)

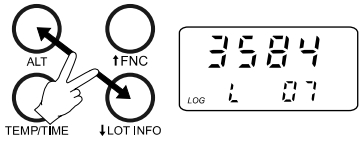


Note: When the Log on demand data area is full (300 samples stored) and the **LOG** key is pressed, the sample will not be stored and the LCD will display "FULL". In this case it is necessary to delete the Log on demand data to free space.

VIEW LOGGING INFORMATION

If **ALT** and **LOT INFO** are pressed during logging, the meter displays for a few seconds the current lot and the number of logged samples. Then the meter returns to normal operational mode automatically.

If **ALT** and **LOT INFO** are pressed while the meter is not logging, the



last logged lot in the lower LCD and the number of logged samples in the upper LCD are displayed. It is then possible to scroll through the following lot information with the à key:

- Sample ID
- lot starting date (dd.mm)
- lot starting year
- lot starting time (hh.mm)
- lot logging interval

By pressing the à key again, the meter displays the number of logged samples again.

When the number of logged samples is displayed, it is possible to pass to another lot with the á and â keys. Press â to view older lots or á to view more recent ones.

If á is pressed when the last lot is displayed, the meter displays the lot 00 (log on demand). By pressing the á key again, the meter will pass to the oldest lot.

Note For lot 00, only the number of samples will be displayed.

To exit from the logging info viewing mode, press **ALT** and **LOT INFO** again or **TEMP/TIME**.

RETRIEVE LOGGED DATA

Logged data can be viewed on LCD or printed. To view or print logged data see "TO SCAN LOGGED DATA" in the "SETUP MODE" section. Logging meter also allows downloading the logged data to a PC. To download data to a PC see "DATA TRANSFER TO PC" section.

GOOD LABORATORY PRACTICE (GLP)

GLP is a set of functions that allows the storage or retrieval (when necessary) of data regarding the maintenance and status of the meter.

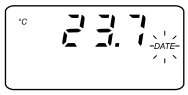
LAST CALIBRATION DATE

Last calibration date is stored automatically after a successful calibration. The last calibration date can be displayed through setup code 10 (see "SETUP MODE" section).

CALIBRATION ALARM TIME-OUT

Every time it is turned on, the meter checks if the time-out time, fixed at 1 year, has expired. It is possible to enable/disable this feature through setup code 11. The default value is "On".

If the time has expired, the message "Cal date" scrolls across the LCD. The "DATE" symbol will blink to remind the user to perform a new calibration as soon as possible.



GLP AND RS232

GLP data (instrument ID code and last calibration date) can be retrieved from a PC through the RS232 communication feature (see "Data transfer to PC").

OTHER FEATURES

LCD BACKLIGHT

The LCD can be illuminated to allow the user to see the readings even in dark environments. This feature can be enabled/disabled pressing the **ALT** and **LIGHT** keys. If the LCD backlight feature is enabled, the LCD remains illuminated until the feature is disabled by pressing the **ALT** and **LIGHT** keys. The LCD backlight can be disabled in order to save power and it is automatically disabled when battery charge weakens.

Note: When an external power supply is connected to the instrument, the backlight is not automatically enabled.

Note: When "LOBAT" appears on LCD it is not possible to enable backlight. If the user attempts to enable the LCD backlight in low battery condition, the meter will show "bAtt" on LCD.

Real Time Clock (RTC)

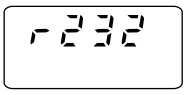
The instrument has an internal Real Time Clock (RTC) circuit with a backup lithium battery. This allows the meter to update time and date even when both batteries and external power adapter are disconnected.

DATA TRANSFER TO PC

HI 98811 contains infrared transmitting circuitry.

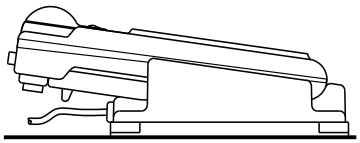
Ensure there isn't any logging process active.

Press **TEMP/TIME** to set the meter to time or date mode and simply place your data-logger on a **HI 9200** Infrared Transmitter (ensuring that the two infrared LEDs are placed on top of each other) and the memory content can then be downloaded to your PC through the **HI 9200**'s RS232 port. Just ensure that baud rate on instrument (setup code 50) and on PC downloading program are set to the same value.



During data transfer the instrument displays the message "r 232".

To stop communication, press **TEMP/TIME** to display the temperature reading or take the meter out of the transmitter when it's not displaying "r232".



Using the **HI 9200** Infrared Transmitter, all recorded data can be uploaded to your PC for easy reproduction, storage or elaboration without the need of cables between the meter and the transmitter. Data transmission from the instrument to the PC is supported by the **HI 92000** Windows® compatible application software offered by Hanna Instruments.

HI 92000 allows you to memorize in a database the downloaded data from different instruments, for different periods of time and for different reading locations. The records will contain the date and time, specific reading, the place of reading and the logging way (Log on demand or Auto logging). **HI 92000** offers support for database data management by applying different selection criteria: period of time, reading location, logging way. With the results of selection it is possible to make graphics, statistic analysis or to export data into Excel format file.

User friendly, **HI 92000** offers a variety of features and has an online help to support you throughout any situation.

To install **HI 92000** you need a 3.5" drive and a few minutes to follow the instructions conveniently printed on the disk label.

MEMORY ORGANIZATION

Logged data are stored in the internal EEPROM and are retained even if batteries and external power are disconnected.

MEMORY CAPACITY

- 12900 data samples divided into 16 lots (lots 01 to 16)
- 9999 data samples maximum in one single lot
- 300 data samples for the Log on demand (lot 00).

TIMED LOG (lots 01 to 16)

Each time a new logging period starts, it automatically starts from the next available lot. If the last lot was the 16th, the new logging period restarts from lot 01 overwriting previously logged data.

When Timed logging memory is full, the meter overwrites the oldest lot data reducing progressively the old lots. In this case the starting time, date and the dimension of the old lot are updated.

Note: The oldest lot data are erased without any warning message.

Note: Timed logging memory can be entirely erased through the setup code 06.

If the meter is powered only by the external power supply and there is a temporary power blackout during logging, when power returns, the logging continues normally if no sample has been lost, otherwise the current lot is ended and a new lot starts with the same sample ID. If the printer is enabled, the "...Stop..." message will be printed. In any case, during scrolling the former lot will be preceded by the "Interrupted Lot" message and the latter by "Continuation Lot" to indicate the interruption.

LOG ON DEMAND (Lot 00)

When Log on demand data area is full the meter shows the "FULL" message to warn the user that data are not stored in memory. Erase the memory area through setup code 05 to continue logging data on demand.

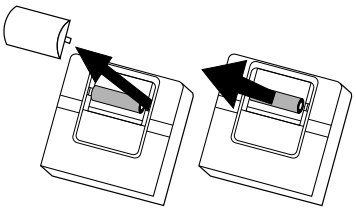
PRINTER MAINTENANCE

CHANGE THE INK CARTRIDGE

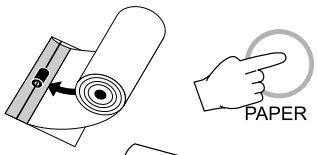
When printouts become faint, it might be necessary to change the ink cartridge. Contact your Hanna authorized center.

INSERT THE PAPER ROLL

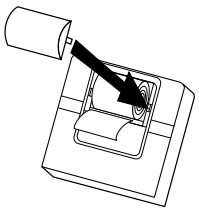
The meters use plain paper rolls, 38 mm width. To insert a new roll open the paper cover pulling it gently and take the cylinder away.



Insert the paper edge in the printer slot and feed the printer by pressing the **PAPER** key.



Allow about 5 cm (2") of paper to exit from the printer and replace the paper cover.



FAULT CONDITIONS

The printing/logging thermometer is factory programmed to automatically diagnose a fault and to display error codes on the LCD.

PRINTER ERROR

Whenever a printer fault condition is detected, the printer stops and the message "Printer error" scrolls across the upper LCD with the error code (see below) fixed on the secondary one.

1 = Motor locked
2 = Printer clutch jammed
3 = Selection lever fault

I^2C BUS ERROR

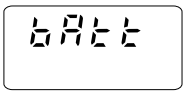
In case of an I^2C bus fatal error due for example to a defective EEPROM or RTC, the message "Serial bus error" keeps scrolling across the LCD from right to left indefinitely. Meter should be returned for repair (see warranty section).

BATTERY REPLACEMENT

When the batteries are inserted and no power adapter is connected, the meter can recognize different batteries charge levels.

1. **Fully charged batteries**. The backlight and printer can be enabled.
2. **Weakening batteries** - "LOBAT" symbol blinks on LCD. The backlight and printer are automatically disabled and it is not possible to enable them until new batteries are inserted or an external power adapter is connected.
3. **Weak batteries** - "LOBAT" symbol stays still on the lower LCD. Backlight and printer are disabled and the meter can work for about 20 hours. If in Timed logging mode with the power down function enabled, this time can be longer.
4. **Dead batteries** - LCD shuts off. The instrument stops working to avoid erroneous readings.

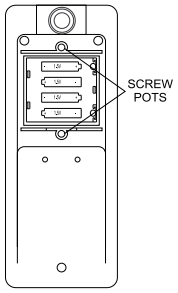
Note It is not possible to activate backlight and printer when the instrument is in a low battery condition. If the user attempts to enable these functions without replacing the batteries or connecting the external power adapter, the meter will show "bAtt" on LCD.



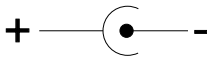
Battery replacement must take place only in a non hazardous area using 1.5V alkaline AA type batteries.

In order to replace run down batteries, simply remove the two screws on the rear cover of the instrument and replace the four 1.5V AA batteries with new ones, paying attention to the correct polarity.

A 12VDC power adapter can also be used to power the unit (see the accessories section).



Note: The instrument uses the following configuration.

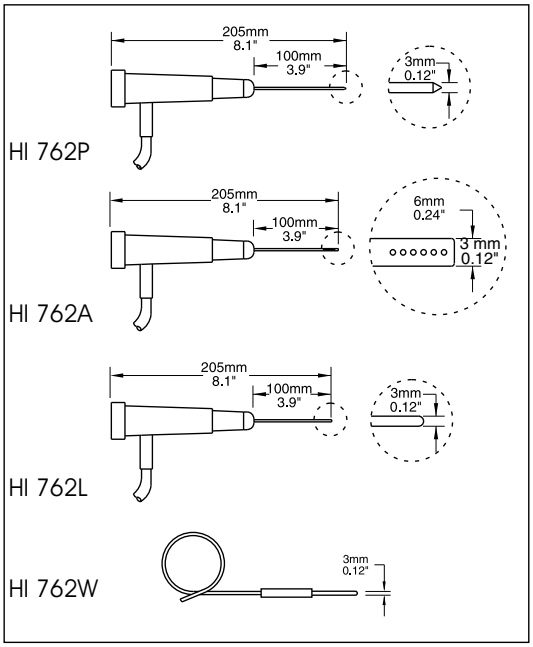


It is recommendable to purchase the Hanna **HI 710005** and **HI 710006** voltage adapters that use the proper polarity configuration.

However, the meters can be used with other adapters. In this case, remember to check the correct polarity of your adapter before connecting it to the meter.

TEMPERATURE PROBES

HI 762A	**Air** probe, 1 m (3.3') cable and **white** handle
HI 762A/10	**Air** probe, 10 m (33') cable and **white** handle
HI 762BL	General purpose **liquid** probe, 1m (3.3') cable, **black** handle
HI 762L	General purpose **liquid** probe, 1m (3.3') cable, **white** handle
HI 762L/2	General purpose **liquid** probe, 2m (6.6') cable, **white** handle
HI 762L/10	General purpose **liquid** probe, 10m (33') cable, **white** handle
HI 762PBL	**Penetration** probe, 1 m (3.3') cable, **blue** handle
HI 762PBL/10	**Penetration** probe, 10 m (33') cable, **blue** handle
HI 762PG	**Penetration** probe with 1 m (3.3') cable, **green** handle
HI 762PG/10	**Penetration** probe, 10 m (33') cable, **green** handle
HI 762PR	**Penetration** probe, 1 m (3.3') cable, **red** handle
HI 762PR/10	**Penetration** probe, 10 m (33') cable, **red** handle
HI 762PW	**Penetration** probe, 1 m (3.3') cable, **white** handle
HI 762PW/10	**Penetration** probe, 10 m (33') cable, **white** handle
HI 762W	**Wire** probe, 1m cable without handle (hard-to-reach places)
HI 762W/10	**Wire** probe, 10m cable without handle (hard-to-reach places)

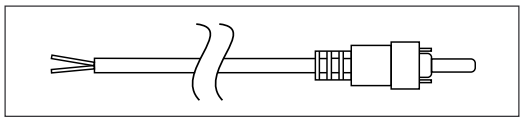


UN-HOUSED NTC SENSORS

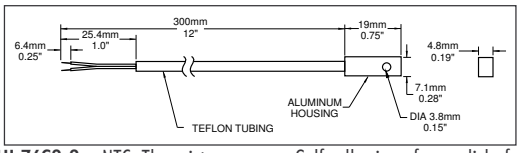
Often it is necessary to "customize" testing to meet specific criteria in the laboratory. For this reason, Hanna offers a wide line of NTC Thermistor sensors that can be custom mounted in almost any situation. Select the sensor that matches your application, attach it to the RCA adaptor and plug it into the meter. You have now a temperature sensor that is custom fit to your requirements.

The following is a list of the NTC Thermistor sensors and plug available:

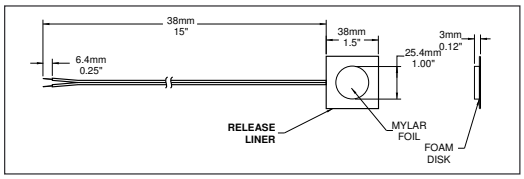
HI 76P2-1 RCA plug with 1 meter (3 .3') cord.



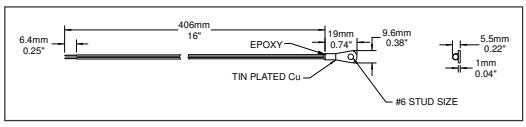
HI 76S2-1 NTC Thermistor sensor. Teflon® coated with hole for mounting.



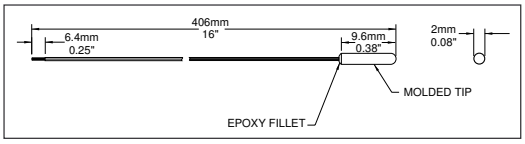
HI 76S2-2 NTC Thermistor sensor. Self-adhesive, foam disk for mounting.



HI 76S2-3 NTC Thermistor sensor. Eye-connector for mounting.

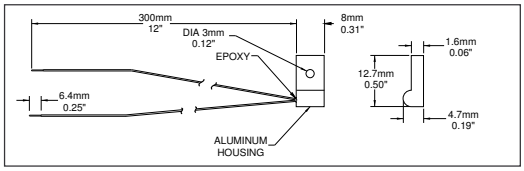


HI 76S2-4 NTC Thermistor sensor. Molded tip with epoxy seal for aggressive environments.

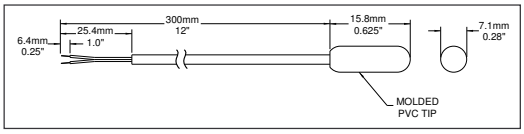


Teflon® is registered Trademark of "du Pont de Nemours & Co."

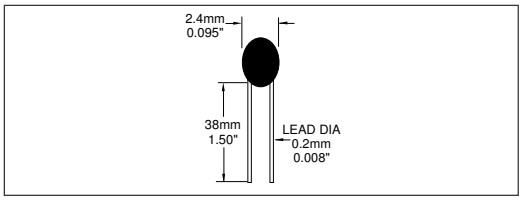
HI 76S2-5 NTC Thermistor sensor. Aluminum tab with mounting hole.



HI 76S2-6 NTC Thermistor sensor. PVC encapsulated tip for protection in aggressive environments.

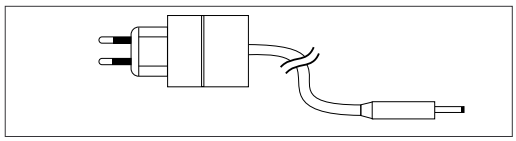


HI 76S2-7 NTC Thermistor sensor. Can be housed and used in any custom application.



ACCESSORIES

HI710005 Voltage adapter from 115 VAC to 12 VDC
HI710006 Voltage adapter from 230 VAC to 12 VDC



HI 710031 Rugged carrying case
HI 710034 Plain Paper Spare Rolls (10 pcs)
HI 710035 Spare Ink Cartridge (1 pc)
HI 740027P 1.5V AA batteries (12 pcs)
HI 9200 Infrared Transmitter
HI 92000 Windows® compatible software for data transfer to PC
HI 920005 Tags with holders (5 pcs)

RECOMMENDATIONS FOR USERS

Before using this product, make sure it is entirely suitable for the environment in which it is used.

Operation of this instrument in residential areas could cause unacceptable interferences to radio and TV equipment, requiring the operator to follow all necessary steps to correct interferences.

Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance.

To avoid electrical shock, do not use this instrument when voltages at the measurement surface exceed 24 VAC or 60 VDC.

To avoid damage or burns, do not perform any measurements in microwave ovens.