GENERAL®

USB
RH/TEMPERATURE/GPP
DATA LOGGER with
LCD DISPLAY

USER'S MANUAL

HT20

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Please read this manual carefully and thoroughly before using this product.

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INTRODUCTION

Thank you for purchasing General Tools & Instruments'
HT20 USB RH/Temperature/GPP Data Logger with LCD
Display. Please read this user's manual carefully and
thoroughly before using the instrument.

The HT20 is a low-cost, compact, battery-powered thermo-
hygrometer capable of unattended logging (recording) of the
ambient temperature and relative humidity (RH) of an
environment for days, weeks or months. In addition, software
included with the product can also calculate and display
absolute humidity levels in units of grains per pound (GPP) or
g/kg. Also called mixing ratio, GPP is a more useful moisture
metric than RH to water damage remediators. Using RH
alone, a remediator might unknowingly introduce moist air—
with a low RH but a high GPP—during a job's drying phase.

Data logging can be started or stopped by pushing a button
on the unit, eliminating the need to bring a laptop to the job
site. After a data log has been captured and stored, it can be
uploaded as a .txt file to any PC running the Windows®7 or
Windows® XP operating system after plugging the HT20 into
one of the computer's USB ports. The HT20's internal flash
memory is large enough to store 16,300 pairs of RH and
temperature readings.

Included with the product—which is slightly larger than a
thumb drive—is a mini-disc with the drivers needed to
interface the unit to the computer, as well as software that
can display a data log file as a table or graph and/or export it
to Microsoft Excel. Exporting to Excel is recommended for
sophisticated trending and analysis of humidity and
temperature data and easy detection of unexpected
excursions.

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Applications for the HT20 include:

- Water damage remediation—Because the HT20 is designed to be deployed and left in place over the duration of the job, it is always in equilibrium with the environment.

- Process control—The HT20 enables, simplifies and cuts the cost of environmental monitoring of office buildings, greenhouses, food and equipment storage facilities, wineries, freezers, shipping containers, HVAC/R installations, computer rooms, labs, libraries, museums and saunas.

- Electronics manufacturing—Alerts provided by the low-humidity alarm function of the HT20 can mitigate the risk of damaging high-voltage static discharges.

KEY FEATURES

- One button starts/stops data logging without a PC

- Plug-and-play USB 2.0 interface; no need for cables, cradles or docks

- Large storage capacity: 16,300 pairs of RH and temperature readings

- 3-1/2-digit LCD displays real-time temperature and humidity readings; also indicates device working status and "memory full"

- Included software is used to set: Sampling time from 10 seconds to 12 hours; Hi/Lo alarm setpoints for humidity and temperature; Temperature unit (°F or °C)

- Software also calculates and plots GPP and dew point and wet bulb temperatures and displays data logs as time-based graphs synchronized to your PC's clock

- One-click exporting of logs to Excel or Word

- Long battery life (up to one year)

- Includes USB extension cable

- One-year warranty

SAFETY INSTRUCTION

Do not use the HT20 in the presence of flammable or explosive gases.

WHAT'S IN THE BLISTER PACK

The HT20 comes in a blister pack that also contains

- One "1/2 AA" battery. Replacement batteries (Part No. BA10) are available from General.

- A disc with software drivers for Windows7 and Windows XP computers, the ELusb V1.21.3 program for capturing data logs and displaying them as curves, and a PDF of this user's manual

- A USB extension cable

- A hard copy of this user's manual (inside the fold-over card)

PRODUCT OVERVIEW

Fig. 1a below shows the main components, controls and connectors of the HT20. Fig. 1b (on the facing page) shows all possible indications on the HT20's display. Familiarize yourself with their names and functions before moving on to the Setup Instructions.
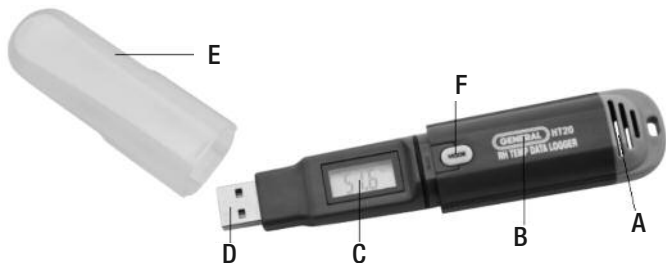

Fig. 1a. The components, controls and connector of the HT20

A. Temperature and humidity sensor window

B. Battery compartment (latch is on rear of unit)

C. 3-1/2-digit LCD (displays temperature and humidity readings; also indicates device working status and "memory full")

D. USB plug

E. Protective cap

F. **MODE** button

**Fig. 1b.
All possible
display
indications
on the HT20**

Display Legend

- ▲: indicates reading is higher than high alarm setpoint for that parameter
- ▼: indicates reading is lower than low alarm setpoint for that parameter
- **%RH**: relative humidity unit
- **°C**: Celsius temperature unit
- **°F**: Fahrenheit temperature unit
- **[-]188.8**: Humidity or temperture value or one of the following four working status indications
  - **LOG**: Unit is logging data
  - **- - -**: Unit is in standby mode, ready to log data
  - **FUL**: Internal memory is full (and logging has been stopped)
  - **CON**: Unit needs to be configured by software

SETUP INSTRUCTIONS
INSTALLING/REPLACING THE BATTERY

LATCH

The HT20 uses a 3.6VDC "1/2 AA" Lithium-ion battery.
To open the battery compartment, use a paper clip or a screwdriver with a fine point to push in the silver flange showing through the small square hole in the rear of the unit

(left photo on previous page). Push back the cover (middle photo), remove the old battery (right photo) and insert a fresh battery in the correct orientation. Then replace the cover, pushing it forward until you feel and hear a click.

After you replace the battery, the LCD will "wake up" and begin displaying real-time readings. If the **MODE** button is not pressed within 60 seconds, the LCD will be automatically powered off.

Note: If the battery is removed from a unit before it has been set up from software or while it is recording, the unit must be reconfigured before it can be reactivated. If it is not reconfigured, the unit will remain in standby mode.

INSTALL SOFTWARE AND DRIVERS

1. Place mini-disc in tray of CD/DVD drive, shiny side down. Close tray.

2. When the AutoPlay window appears, click on "Open folder to view files using Windows Explorer."

3. Windows Explorer will indicate that there are two "Files Currently on the Disc". One is actually a folder containing a PDF of the HT20 user's manual (as well as PDFs of the manuals for the HT10 and HT50—versions of the HT20 without an LCD and with an IR thermometer). Copy the HT20 manual to your computer's hard drive for permanent storage. The other file is a Windows Installer Package (.msi file) named "ELusb_V1.23.1.msi". Double-click its 📦 icon.

4. A window titled "Welcome to ELUsb Installation Wizard" will appear. Click **Next** to continue.

5. Within the Software License Agreement window that appears next, click the **I agree (T)** box.

6. The next three windows advise that the ELusb application will be installed in your computer's C:\Program Files (x86) folder in a new subfolder named <ELusb>, and that shortcuts to the program will be created on your desktop and Quick Launch bar. If you want to install the software elsewhere, click **Browse** and choose another location. Within each window, after selecting either the default location or another location, click **Next(N)** to continue.

7. When the "Preparing to Install" window detailing the changes to made appears appears, click **Install (I)** to continue.

8. Before the installation begins, a User Account Control window may appear and ask, "Do you want to allow [ELusb V1.21.3msi] to make changes to this computer?" Click **Yes** to continue.

9. The ELUsb Setup Wizard will now install the program on your computer. On the next window that appears, click the **Completed (F**) box.

10. At the bottom of the Device Driver Installation Wizard that appears next, click **Next** to continue.

11. The next window to appear is a Windows Security window. Click on "Install this driver software anyway" to continue.

12. The next Device Driver Installation Wizard window will advise you that an HT10/20/50 driver from General Tools or Kecheng Laboratories was successfully installed and that your device is now "Ready to use." Click **Finish** to continue.

CONFIGURE THE UNIT

Note that the software installation has added a 🖉 icon to your desktop. To facilitate access to the program, right-click on the icon and pin it to both your Start button and the Quick Start area at the left of your taskbar. You can now eject the installation mini-disc and store it with your other important software.

Plug the HT20 into an available USB port of your computer. **If your computer is a laptop and the only available USB jack does not have enough vertical clearance to accommodate the HT20 without mechanically stressing its USB plug, do not plug the HT20 directly into the jack. You do not want the plug of the HT20 to support any of the weight of the laptop**. If that is the case, plug the HT20 into the jack of the included USB extension cable and insert the plug of the extension cable into the computer's USB jack.

The first time you plug the HT20 into your computer, your system tray will notify you that the computer is "Installing Device Driver Software". When the notification disappears, open the ELusb program by selecting it via your Start button, clicking on its icon on your taskbar, or double-clicking its desktop icon.

If the software has installed correctly and you have plugged the HT20 into a working USB port of your computer, the following screen should appear on your computer's display.

**Fig. 2.
The three
options made
available by
plugging the
HT20 into
a USB port**

Note: If you have already used your HT20 to log data
and it is still in recording mode, plugging the unit in
will cause the following window to appear.
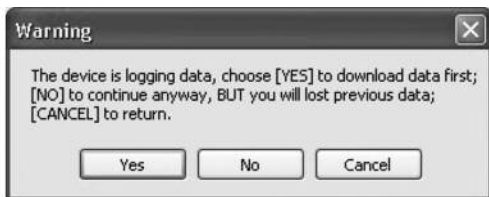
Click **Yes** to stop recording and import all data recorded to
that point in time. Click **No** to continue to Setup without
importing recorded data (meaning it will be lost). Click
Cancel to go back and unplug the unit from the USB port.

You can now use the software to "configure" your HT20. Configuring the device means choosing four key parameters:

- **Sampling time**—How often it makes and stores humidity and temperature measurements.

- **Temperature unit**—degrees Fahrenheit or Celsius (°F or °C).

- **High and low temperature alarm** setpoints

- **High and low humidity alarm** setpoints

To begin, click on "Set up the USB Data Logger" in the window shown in the figure above. Doing so will cause the following window to appear.

Fig. 3. The HT20 configuration (Setup) window
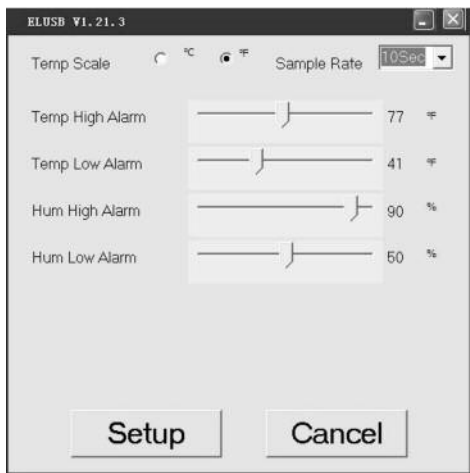
Using your mouse, trackball or touchpad, first choose your Temp Scale and Sample Rate (sampling time). With regard to sampling time, using the shortest setting of 10 seconds may result in too much essentially identical data being stored in memory, potentially limiting its capacity to capture important events such as an unexpected excursion of temperature or

humidity. Conversely, using the longest sampling time setting of 12 hours will likely cause important events to go undetected.

If you are an experienced data logger, you already know how to choose the optimum sampling time for your application. If you are a novice, pick a sampling time closer to the minimum sampling time than the maximum, on the assumption that the HT20 probably has enough memory (16,300 pairs of RH and temperature readings) to store all the data you ask the meter to log—unless you use it to log data for months.

Be aware that if you do manage to fill up the HT20's memory (by logging for a very long time at a very short sampling time, for example), the device will simply stop recording. It will not continue recording by overwriting the oldest saved data with new data.

If you wish, you can also drag the sliders shown in the figure to set high and low alarm setpoints for temperature and RH.

Once you have chosen your data logging parameters, click **Setup**. A window will appear advising that "Setup completed successfully." Clicking **Setup** also synchronizes the HT20's internal clock with your computer's clock, giving all data logs to be captured an absolute time reference.

You can now unplug the HT20 from your computer's USB port. The unit is in "standby" mode, ready to begin logging data.

OPERATING INSTRUCTIONS
DEPLOY THE UNIT

The HT20 is particularly easy to deploy on a job site because the unit does not need to be plugged into a computer to be activated (ready to start logging data). Working together, the **MODE** button and the LCD serve as the control and indicators needed to: 1) start and stop data logging and 2) verify and change the unit's working status.

That leaves only two things to be sure of when choosing a place to deploy the HT20:

- The temperature and humidity sensor window (Fig. 1a, Callout A) is not covered
- The humidity and temperature values at the unit's location are "representative" of the room

The HT20—with its protective cap on—can be deployed either by laying it on a horizontal surface or by hanging it vertically within the included plastic mounting bracket. The back of the bracket features both a magnet and a hanger hole.

Once you have deployed the HT20, you can initiate data logging. **To start data logging**, press and hold the **MODE** button for at least 3 seconds. **The LCD will display the word "LOG" to confirm that logging has begun**.

STOP LOGGING AND IMPORT LOGS

To stop data logging, press and hold the **MODE** button for at least 3 seconds. **The LCD will display three dashes (- - -) to confirm that logging has stopped**.

That is how you should stop data logging if you plan to initiate another logging session later without uploading logged data to your computer in the interim. If you allow logging to continue and you do not upload your data to your computer soon, you risk filling up the HT20's memory.

A simpler and safer way to stop data logging is to plug the HT20 into your computer's USB port immediately after completing a logging session and then use the ELUSB software to stop logging.

Each time you plug the HT20 into the USB port, the window shown in Fig. 2 will appear. When you plug in the unit, it makes no difference whether it is still logging; the procedure

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for uploading (importing) data logs is identical. Just click on the middle selection—**Stop the USB Data Logger and download data**—to instantly execute both functions. The data will be imported as a .txt file. A "Save As" window will appear, asking you to name the file and choose where you want it to be stored.

VIEWING, PRINTING AND EXPORTING DATA LOGS

Immediately after you close the "Save As" window by clicking on **Save**, the uploaded data log will automatically be displayed as a set of curves representing all loggable values. Fig. 4 is a typical example. The initial display includes all parameters, including dew point and GPP or g/kg (which the software automatically calculates) and alarm setpoints that you may have entered during Setup. To remove any parameter or horizontal and vertical grid lines from the overall plot, uncheck its box at right.
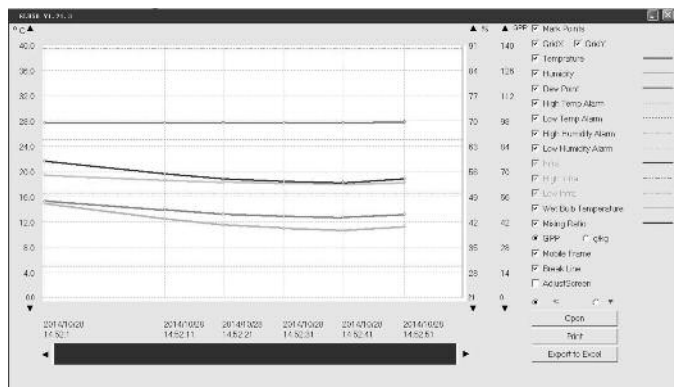

Fig. 4. A typical initial plot of an imported data log

There are several features shown in Fig. 4 worth noting:

- To mark the position of every recorded data point on the curve, check the "Mark Points" box at the top of the sidebar at right.

- To get a higher-resolution view of the data recorded during a specific period of time, scale up and down the curves by dragging the slider at the bottom of the window to the left and right.

- Hovering the cursor over a particular point of the curve displays all data related to this point—including the maximum, minimum and average values of the entire curve—in a shaded box at upper left.

- The dates and times shown on the x-axis scale and in the upper left corner are in sync with your computer's clock.

- **To print** the .txt file of any data log, click the **Print** virtual button.

- **To open** a previously saved data log, click the **Open** button. This function is also available as the "View previously saved data" option shown in Fig. 2.

- **To export** a file to Excel for advanced trending and analysis, click the **Export to Excel** button.

OTHER INDICATIONS

As mentioned earlier, the **MODE** button and the LCD can be used together to display real-time temperature and humidity measurements, and to indicate the current working status of the HT20.

Circuitry inside the HT20 automatically shuts down the LCD (to conserve battery life) if the **MODE** button has not been pressed within the past 60 seconds. That is the case even

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when the unit is logging data. In other words, the LCD is normally "asleep".

To wake up the LCD, briefly press the **MODE** button. This first press of the button will cause the LCD to resume displaying the same indication that was on-screen when the LCD was last put to sleep.

There are four possible display indications: (1) current temperature in Celsius, (2) current temperature in Fahrenheit, (3) current relative humidity (in %), and (4) current working status. Each press of the **MODE** button changes the display to the next indication in the sequence; pressing the **MODE** button when the LCD is displaying the unit's current working status (4) resets the cycle to (1).

There are four possible working status indications:

• **LOG**: The unit is currently logging data

• **- - -**: The unit is in standby mode, ready to log data

• **FUL**: The unit's internal memory is full and logging has been stopped

• **CON**: The unit needs to be configured by software

When the LCD is displaying a temperature or humidity reading, it also gives an indication if the reading is outside the "acceptable" range of readings for that parameter— assuming that high and/or low alarm setpoints were entered during the Setup procedure. If an "up" arrow appears at the left of the reading (see Fig. 1b on p. 7), the measured value of that parameter is higher than its high alarm setpoint. If a "down" arrow appears at the left of the reading, it is lower than the low alarm setpoint for that parameter.

SPECIFICATIONS

Temperature Measurement Range	-4° to 158°F (-20° to 70°C)
Temperature Measurement Accuracy	±1.8°F (1°C) from 14° to 104°F (-10° to 40°C); ±3.6°F (2°C) elsewhere in range
Temperature Measurement Resolution and Repeatability	±0.2°F (0.1°C)
Relative Humidity (RH) Measurement Range	0 to 100%
RH Measurement Accuracy	±3% from 20 to 80%RH, ±3.5% elsewhere
RH Measurement Resolution and Repeatability	±0.1%
Internal Storage Capacity	16,300 pairs of RH/Temp readings
Display	3-1/2-digit LCD with 60 second auto power off
Temperature Response Time	0.5 seconds
Humidity Response Time	5 seconds
Interface	USB 1.0/2.0
Length of USB Extension Cable	7.9 in. (200mm)
Dimensions	4.96 x 1.10 x 2.01 in. (126 x 28 x 51 mm)
Weight	<7 oz. (<200g)
Power Source	3.6V non-rechargeable (1/2 AA) 1200mAh Lithium-ion battery
Current Consumption	<0.2mA
Battery Life (typical)	1 year

MAINTENANCE TIPS

- Avoid dropping the unit. Do not subject it to violent shock or vibration or expose it to strong electromagnetic fields (for example, near arc welders or induction heaters).
- Keep the unit out of direct sunlight.
- Do not use chemicals or abrasive cloth to clean the display window or housing.
- Before storing the HT20 for an extended period of time (several months or more), remove the battery to avoid having it leak and damage the unit.

WARRANTY INFORMATION

General Tools & Instruments' (General's) HT20 USB RH/Temperature/GPP Data Logger with LCD Display is warranted to the original purchaser to be free from defects in material and workmanship for a period of one year. Subject to certain restrictions, General will repair or replace this instrument if, after examination, the company determines it to be defective in material or workmanship.

This warranty does not apply to damages that General determines to be from an attempted repair by non-authorized personnel or misuse, alterations, normal wear and tear, or accidental damage—including dropping the unit. The defective unit must be returned to General Tools & Instruments or to a General-authorized service center, freight prepaid and insured.

Acceptance of the exclusive repair and replacement remedies described herein is a condition of the contract for purchase of this product. In no event shall General be liable for any incidental, special, consequential or punitive damages, or for any cost, attorneys' fees, expenses, or losses alleged to be a consequence of damage due to failure of, or defect in any product including, but not limited to, any claims for loss of profits.

RETURN FOR REPAIR POLICY

Every effort has been made to provide you with a reliable product of superior quality. However, in the event your instrument requires repair, please contact our Customer Service to obtain an RGA (Return Goods Authorization) number before forwarding the unit via prepaid freight to the attention of our Service Center at this address:

Remember to include a copy of your proof of purchase, your return address, and your phone number and/or e-mail address.

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