USER GUIDE

HAXO-16U-M

LogTag

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LogTag® North America Inc.

LogTag® HAXO-16U

User Guide

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www.logtag.com

Introduction

The LogTag® HAXO-16U is a fully configurable USB temperature and humidity logger with a built-in display for quick, at-a-glance monitoring. It features an integrated USB connector that generates PDF temperature reports automatically, no proprietary software or hardware required at the destination. With an internal temperature and humidity sensor, the HAXO-16U seamlessly fits into your existing setup. Configuration is done using LogTag® Analyzer before placing the logger with the goods. Upon arrival, users connect the logger directly to a computer's USB port and instantly creates a PDF report, viewable with standard software such as Adobe Acrobat Reader.

Safety Information

The LogTag® HAXO-16U contains a non-rechargeable battery (LiMnO2 CR2450 coin cell). (Fixed Battery).

Avoid exposing the device to extreme temperatures, as this may damage the battery and pose a risk of injury.

Keep out of reach of children.

Liability

LogTag® North America's standard warranty terms apply. A copy can be requested by emailing support@logtagrecorders.com.

Additionally, LogTag® North America shall not be held liable:

- If the HAXO-16U was used beyond LogTag® North America's stated limitations.
- For any claims due to the improper storage or use of the device.
- For any problems with refrigeration units.
- For the quality of the monitored goods, if any.
- For incorrect readings if the device was used with a low battery.
- For any consequential loss.

Disclaimer

The HAXO-16U monitors temperature and humidity exposure and does not assess the quality of the goods it accompanies. Its purpose is to indicate whether further evaluation or testing of the product is necessary.

Battery Life

The battery in the HAXO-16U is designed to power the device for up to 1 year (single use), or 2 years (multi-use) provided:

- The device was not stored for more than 1 year for single-use, 3 years for multi-use; prior to activation
- The recording interval is not shorter than 16 minutes.
- The device is stored and operated according to LogTag® North America's recommendations.

Checklist - Required Equipment

- LogTag® HAXO-16U temperature recorder.
- A computer running Windows 10 or later, Mac OSX or Linux.
- For configuration - a PC running Windows 10 or later and LogTag® Analyzer installed.

Features

The LogTag® HAXO-16U USB PDF temperature logger features the familiar LogTag® case layout with an additional USB plug at the bottom.

Case

- Mounting lug for secure fastening of the logger to fixtures.
- Temperature & Humidity sensor located inside case.
- USB plug with a silicone protective cap.
- Durable polycarbonate case.
- IP61 Rated

Button

START/STOP/Mark/Review button; Used to start and stop logging, place inspection marks, and cycle between temperature, humidity, and minimum/maximum readings on the display.

Display

- Displays the last recorded temperature or humidity readings.
- Cycles between minimum and maximum temperature or humidity recordings.
- Battery Status.
- Recording Indication.
- Alarm OK Indicator.

Sensor

The HAXO-16U contains a digital temperature and humidity sensor. The logger comes standard with a factory calibration certificate but can also be calibrated by third-party laboratories for both temperature and humidity according to your needs.

PDF

The HAXO-16U will generate a detailed PDF report when plugged into a USB port of a PC.
The PDF report shows a summary of the trip and presents the data in chart and list format. A CSV file of the data list is also available.

What You Need

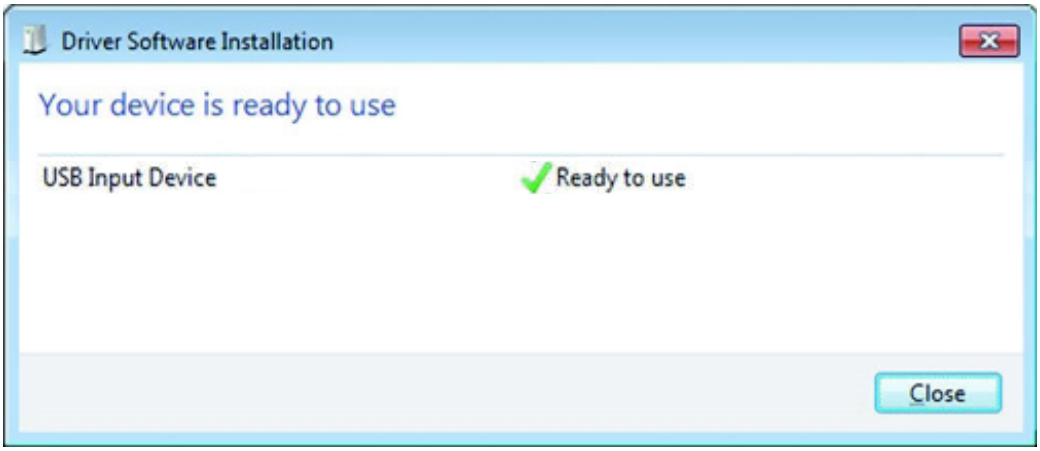
Software requirements vary depending on the type of file you want the HAXO-16U to generate when plugged into a USB port.

- If you wish to configure HAXO-16U products you will need to download the LogTag® Analyzer software from LogTag®'s website at http://www.logtagrecorders.com/software/download.php. Follow the instruction to install and start the software.
- If you only plan on evaluating data, plug the HAXO-16U into a computer's USB socket. Depending on the settings made during configuration, a number of files will be generated and made available to you in a new drive:
    - A PDF file; you can open the file directly from the recorder's USB memory storage with Acrobat Reader 4.0 or later, or any other compatible PDF reader software of your choice.
    - A CSV file; this file can be imported into a spreadsheet program such as Microsoft Excel
    - An LTD file; LTD files are LogTag® Analyzer's native, encrypted data files. You can open this file in LogTag® Analyzer, where you can analyze data in detail and generate report files. Here, you can also combine charts from multiple recorders for comparison.
- You can also download data directly into LogTag® Analyzer without accessing the recorder's USB memory storage

Configuring the HAXO-16U

The HAXO-16U can be ordered pre-configured, ready to start. Different profiles are available; if none of these suit or the logger needs different configuration settings to those already installed, the unit can be configured using LogTag® Analyzer.

- Start the LogTag® Analyzer software.
- Remove the protective cap and insert the HAXO-16U into a USB port. You will receive a message that a new USB device has been found, and a generic driver will be installed.



- Once the driver is installed and the HAXO-16U is ready (indicated by the letters USB blinking on the display), it can receive configuration data.
- Click LogTag® - Configure; LogTag® Analyzer will scan all USB ports and display the configuration options for connected HAXO-16U's.

Standard Configuration Options

The standard configuration options are very similar to those of other LogTag® recorder products and include settings such as User ID, start method, pre-start recording, logging interval and duration, start delay, temperature and humidity alarm parameters and password.

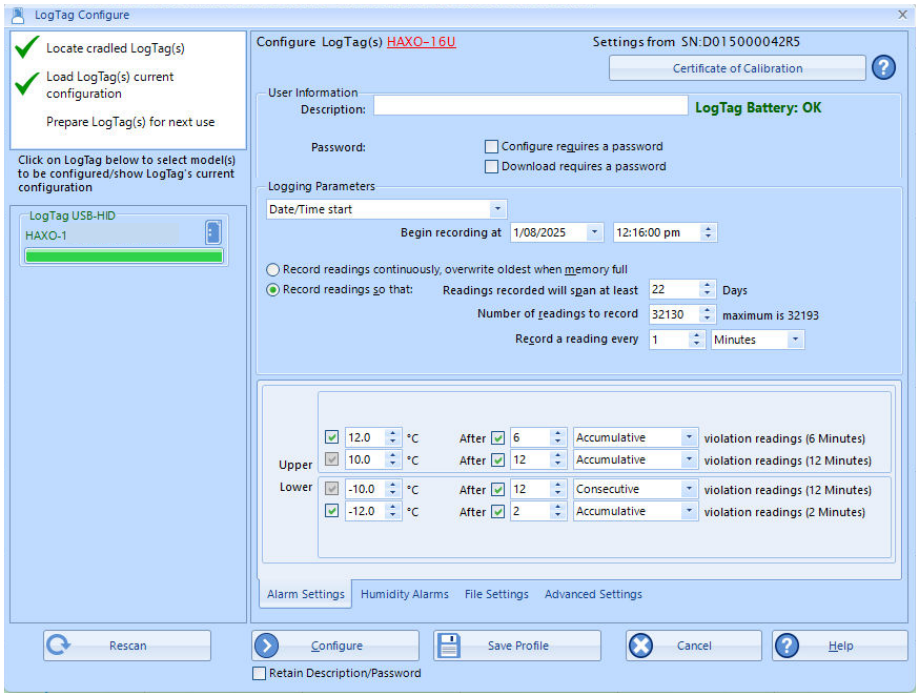


Figure 1: HAXO-16U Standard Configuration Options

For detailed information about each parameter please read the section about configuring a LogTag® for logging in LogTag® Analyzer's User Guide or press F1 for help.

Temperature Alarm Configuration Options

LogTag® Analyzer allows up to 4 different alarm trigger conditions when configuring a HAXO-16U for recording.

Each alarm trigger condition consists of a threshold temperature value, an activation type (which can be instant, consecutive or accumulative) and a delay time, if it is not an instant alarm.
If an alarm trigger condition requires readings to exceed an upper threshold temperature it is called an upper alarm. If an alarm trigger condition requires readings to go below lower thresholds it is called a lower alarm.

An alarm event is generated, when either of the entered alarm conditions is triggered. The HAXO-16U has a primary upper and a primary lower alarm. The HAXO-16U allows two freely configurable alarms in addition to the primary upper and lower alarms.

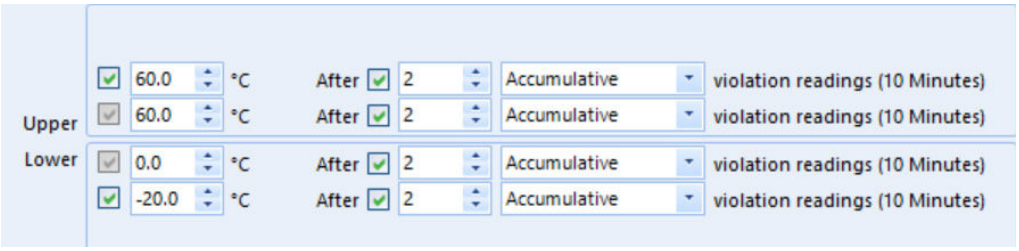


Figure 2: HAXO-16U Temperature Alarm Configuration

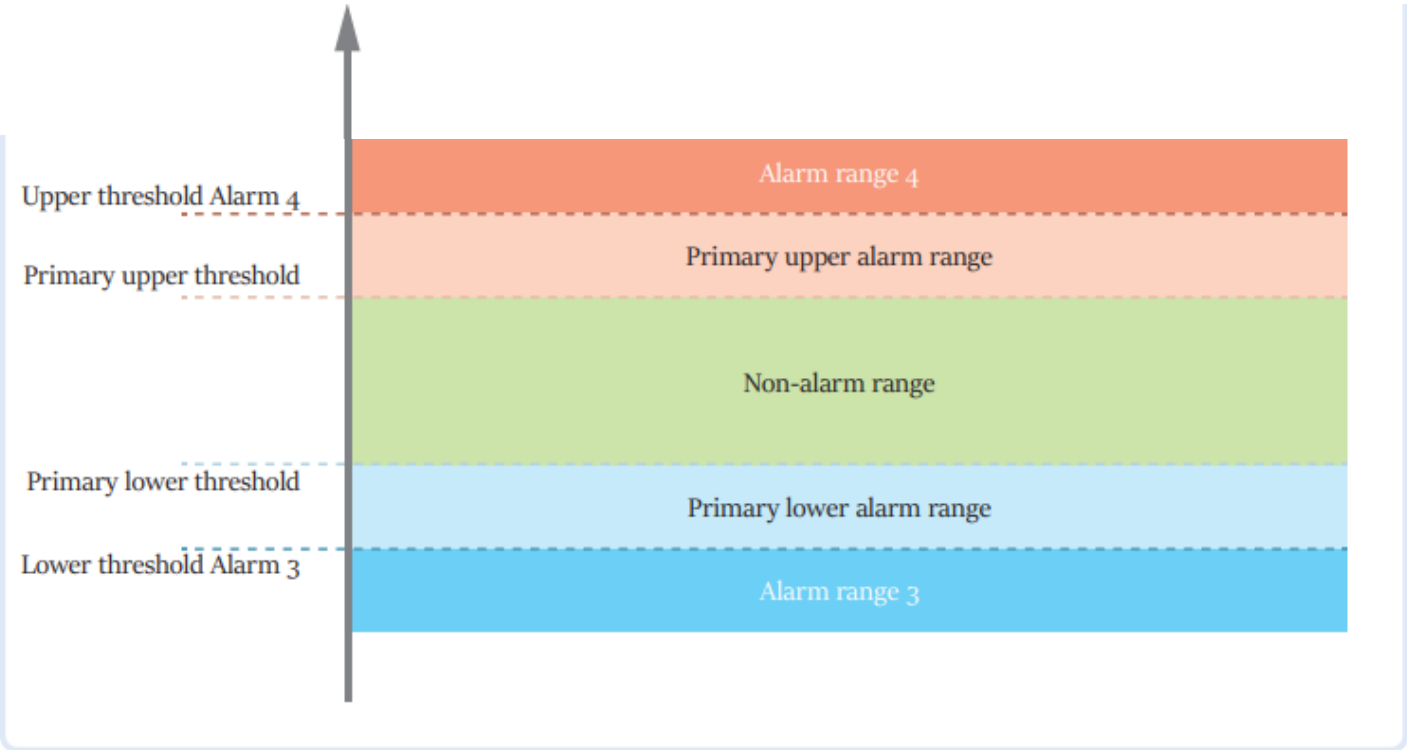


Figure 3: HAXO-16U Upper and Lower alarm range

You need to observe some basic rules when entering alarm conditions into the configuration screen in LogTag® Analyzer:

- A primary upper alarm must be entered before more upper alarms can be entered.
- A primary lower alarm must be entered before more lower alarms can be entered.
- Any additional upper alarms must have higher threshold values than any previously entered alarm.
- Any additional lower alarms must have lower threshold values than any previously entered alarm.
- You can enter a different number of upper and lower conditions, or only upper, or only lower conditions, or none at all. You can, however, not make all alarms upper alarms, and you cannot make all alarms lower alarms either.
- Threshold values for adjacent alarms can be equal and combined with different alarm types and delay time values.

    - Instant = one temperature reading is above (below) the threshold.
    - Consecutive = temperature readings are above (below) the threshold for the time defined in the activation delay without interruption.
    - Accumulative = temperature readings are above (below) the threshold for the total time defined in the activation delay time, but may not necessarily be sequential.

Humidity Alarm Configuration Options

LogTag® Analyzer allows up to 2 different alarm trigger conditions for humidity when configuring a HAXO-16U for recording.

Each alarm trigger condition consists of a threshold humidity value, an activation type (which can be instant, consecutive or accumulative) and a delay time, if it is not an instant alarm.

If an alarm trigger condition requires readings to exceed an upper threshold humidity it is called an upper alarm. If an alarm trigger condition requires readings to go below lower thresholds it is called a lower alarm.

If an alarm trigger condition requires readings to exceed an upper threshold humidity it is called an upper alarm. If an alarm trigger condition requires readings to go below lower thresholds it is called a lower alarm.

An alarm event is generated, when either of the entered alarm conditions is triggered.
When an alarm is triggered, the display will show the alarm symbol (✖) instead of the tick (✔).
The alarms will be shown on the PDF and reported to the software.

The HAXO-16U can have one upper alarm, and one lower alarm.

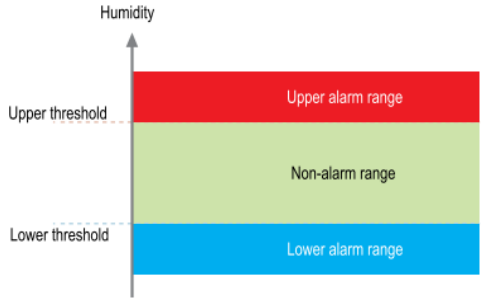


Figure: HAXO-16U Upper & Lower Alarm Configuration

The following rules apply when entering alarm conditions into the configuration screen in LogTag® Analyzer:

- Only one upper and one lower threshold are available.
- You can enable both, just one of them, or none at all.
- For each threshold you can define consecutive and accumulative delay values separately, and enable both, only one of them, or none (instant alarm).

File Configuration Options

Click File Options for additional configuration settings. These settings decide which files -if any- are generated at the end of the trip and also determine the appearance and contents of the generated files.

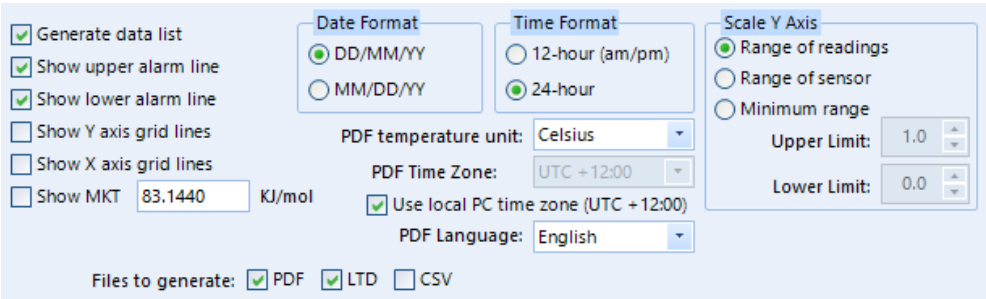


 Figure 4: HAXO-16U File Settings

Parameters that influence the appearance of all files are:

- Setting of the temperature units used in the files.
- Date and time format.
- Time zone and MKT values.

Parameters specifically influencing the appearance of the PDF file are:

- Scaling parameters for the chart.
- Showing or hiding gridlines.
- Showing or hiding alarm threshold lines.
- Creation of the data list.

Advanced Options

Select Advanced Options for additional display configuration settings. These settings determine how some of the elements are displayed on the screen and set certain options specific to the HAXO-16U.

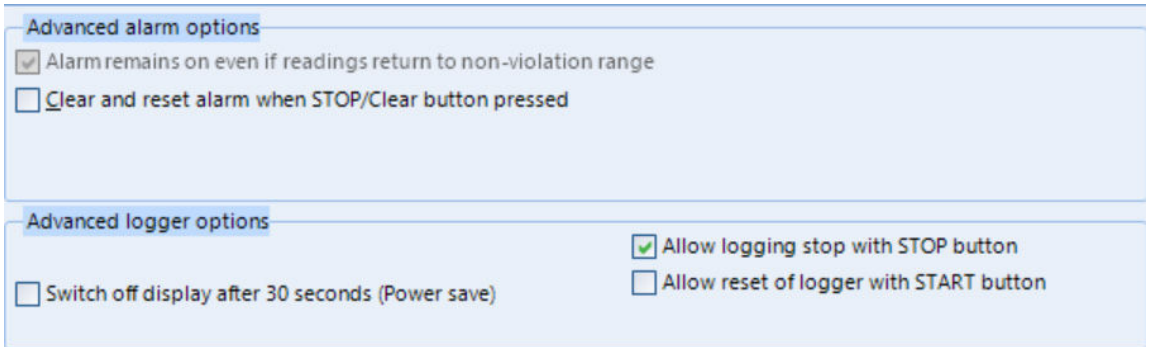


Figure 5: HAXO-16U Advanced Settings

Finalising the Configuration

- Click Configure to upload the configuration data to the HAXO-16U.
- When the configuration is complete, unplug the HAXO-16U from the USB socket and replace the protective cap.

If you wish to configure more HAXO-16U units with the same configuration, insert the next recorder into the USB socket, wait until it is ready for configuration and click Again. Alternatively you can use the Profile function to configure multiple units with the same settings.

You can upload the configuration to a HAXO-16U recorder as often as required, however once single use units have been started the unit cannot be configured again.

HAXO-16U Start Options

During configuration with LogTag® Analyzer you can decide when the HAXO-16U starts taking temperature readings.

Push Button Start

The recorder will start taking temperature readings as soon as you have pressed the START/STOP

When you choose the push button start option, you can select to record pre-start readings or Begin recording after a delay.

Pre-Start Delay

- The HAXO-16U starts recording as soon as it is unplugged from the USB port and will continue to do so until you start the unit. No alarms are processed while prestart readings are being taken, pre-start readings will not appear in the PDF file, and no PDF file will be generated. Using pre-start readings is a good way do avoid data loss if you forget to start the unit, as you can still access the data using LogTag® Analyzer.

Start Delay

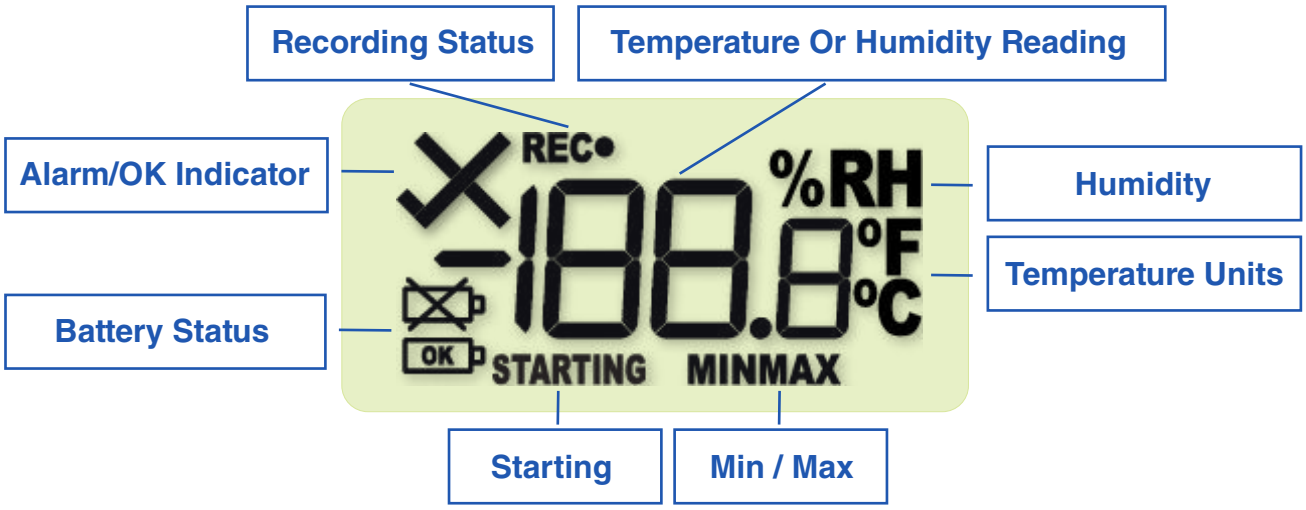
- If you configure the HAXO-16U to start after a delay period, the recorder will not immediately record temperature readings after you have pressed START/STOP, but start a countdown timer instead, and record readings only after the timer has ended. It will, however, continue to take pre-start readings, if enabled.

Date/ Time Start

- via Date/ Time start : The recorder will start taking temperature readings at the date and time you specify (local time).

You cannot combine a date/time start with pre-start readings or the start delay function.

Display Overview:



Temperature Reading

This shows the most recently recorded temperature while the HAXO-16U is recording. Once the logger has stopped, nothing will be displayed. During review, this will show minimum or maximum temperatures.

Humidity Reading

This shows the most recently recorded humidity while the HAXO-16U is recording. Once the logger has stopped, nothing will be displayed. During review, this will show minimum or maximum humidity.

Battery Status

The battery ok symbol will appear if the HAXO-16U's battery is ok.
The battery low symbol will appear if the HAXO-16U's battery is low.

ALARM/OK indicator

The ✗ symbol is shown as soon as the HAXO-16U has registered an alarm event.
While there are no alarms, the symbol ✓ is shown.

Reading Type

The word **MAX** is shown in Review mode, when the Temperature or Humidity on the display represents the maximum recorded temperature for the trip is displayed.

The word **MIN** is shown in Review mode, when the Temperature or Humidity on the display represents the minimum recorded temperature for the trip is displayed.

Recording indicators

The recording indicators show what the HAXO-16U is currently recording.

- If **READY** is shown, the HAXO-16U is ready to be started with the START/STOP button. Depending on the configuration it may already record pre-start readings.
- If **DTS** is shown, the logger will begin recording on the date and time configured.
- If **STARTING** is shown, the logger has been started, and a start delay is active.
- If the word **STOPPED** is shown, the HAXO-16U has finished recording temperature and humidity data.

Operating the Logger

The following sections show how to operate the product, and what information you can expect to see on the display.

Push Button Start

After configuration with LogTag® Analyzer for a push button start the word rdy is shown.

At this stage, you won't be able to determine which additional configuration options have been set, such as start delay or pre-start readings.

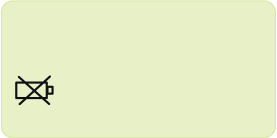
Date and Time Start

The logger can also be configured to start at a specific time and date. You will see the letters dts.

Pre-start readings and start delay options are not available for a date/time start.

Low Battery

If at any time during the operation the logger has a low battery, the low battery symbol is shown.



Starting the Logger

Push Button Start

Press and hold the START/CLEAR/STOP button until STARTING is shown. The HAXO-16U now records temperature and humidity data.

Automatic date/time start

If you configured the HAXO-16U for a date/time start, it will record temperature values as soon as the entered date and time have passed.

If the logger is still plugged into a USB port when the start time passes, the recorded readings will show USB Paused on the PDF and in the software's reports.

During Recording

During normal operation the display shows the most recently recorded humidity and temperature values.

A tick symbol is shown as long as no alarm event has occurred.

Temperatures will be shown in Celsius or Fahrenheit.

> The temperature unit on the display is the same as used for the PDF and CSV files.
>
> It is set during configuration.

An alarm was triggered

If an alarm event occurred the alarm indicator ✕ is displayed in the upper left corner of the display.

An alarm was triggered

When you press the START/STOP button while the HAXO-16U is recording, the next reading taken will be identified in the downloaded data and on the PDF report with an inspection mark.

If the Allow stopping with the Stop button feature is enabled, a mark will also be registered when you press the START/STOP button, but do not complete the process of stopping the logger. An inspection mark will also be recorded if you clear an alarm.

Cycle between Temperature and Humidity Display

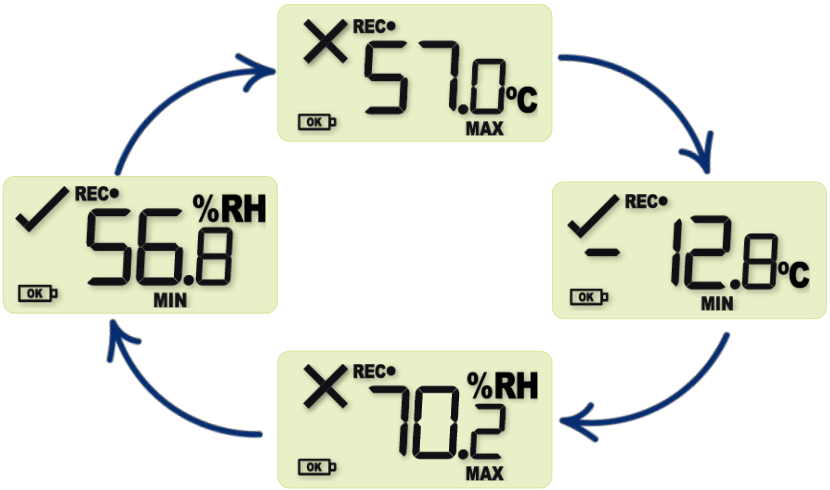
A single press of the Start/Stop button will toggle the display between Temperature and Humidity.

Note: The logger will not start if you release the button before “RDY” disappears.

Reviewing Min/Max values

At any time you can review the recorded minimum and maximum temperature and humidity readings by double clicking the START/STOP button. You can do this while the logger is still taking readings or when it has already stopped, but not when it is plugged into a USB port.

After each subsequent press of the **START/STOP** button, the next review screen is shown.

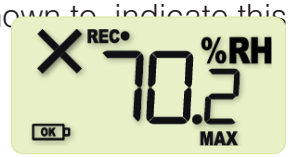


You can exit the review screens at any time by pressing START/STOP button or by waiting 30 seconds without pressing any button. The standard recording screen will be shown.

After the first press of the START/STOP button, the highest recorded humidity during the trip so far is shown, indicated by **MAX** and the %RH unit. If this humidity was above or below one of the alarm thresholds, the corresponding alarm threshold arrow is also shown. If the duration above the threshold was longer than allowed for the alarm trigger condition, the cross is shown to indicate this duration caused an alarm.

The example screen shows the following:

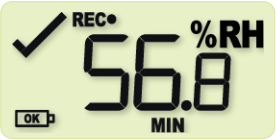
- The maximum humidity recorded was 70.2 %RH, which was above the upper threshold, shown by the upper alarm threshold.



After the second press of the START/STOP button, the lowest recorded humidity during the trip is shown, indicated by **MIN** and the %RH unit. If this humidity was above or below one of the alarm thresholds, the corresponding alarm threshold arrow is also shown. If the duration below the threshold was longer than allowed for the alarm trigger condition, the cross is shown to indicate this duration caused an alarm.

The example screen shows the following:

- The minimum humidity recorded was 56.8 %RH, which was within the allowed thresholds



After the third button press, the highest recorded temperature during the trip so far is shown, indicated by **MAX** and a temperature unit. If this temperature was above or below one of the primary alarm thresholds, the corresponding alarm threshold arrow is also shown. If the duration above the threshold was longer than allowed for the alarm trigger condition, the cross is shown to indicate this duration caused an alarm.

The example screen shows the following:

- The highest recorded temperature was 57.0 °C, which was not within the allowed thresholds.

Pressing START/STOP for a fourth time will show the lowest recorded temperature during the trip so far, indicated by **MIN** and a temperature unit. If this temperature was above or below one of the primary alarm thresholds, the corresponding alarm threshold arrow is also shown. If the duration above the threshold was longer than allowed for the alarm trigger condition, the cross is shown to indicate this duration caused an alarm.

- The minimum temperature recorded was -12.8 °C, which was within the allowed primary threshold.

> The highest temperature or humidity value shown can still be below the lower alarm threshold. Thus, a lower alarm threshold arrow can still show for the highest temperature. Similarly, this applies in reverse to the lowest temperature or humidity.

Battery Low while recording

If the battery is low while the HAXO-16U is still recording, the battery low symbol is shown in addition to any other currently displayed information.

> If you continue to use the HAXO-16U despite a low battery warning you may lose readings, or the readings recorded may be inaccurate.

Stopping the Logger

Automatically

The HAXO-16U automatically stops recording humidity and temperature when the maximum number of readings specified during configuration has been reached. Your unit can also be set up to stop when it is inserted into a USB socket. This option needs to be set up at the factory and cannot be changed during configuration with LogTag® Analyzer. Your distributor can supply more information about this option.

Manually

You can configure a HAXO-16U so it can be stopped with the START/ STOP button. This feature is useful when you take the recorder out of a shipment and don't want to falsify the statistics with readings taken after the shipment completion. The stop function is enabled in the Advanced Options dialogue during configuration.

To stop the logger, press and hold the START/STOP button. After approximately 2 seconds, a "STOPPED" symbol will appear above the temperature or humidity reading.

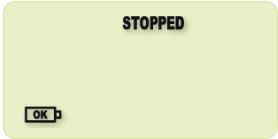
Release the button once the symbol appears. The logger will then stop recording and store its final temperature and humidity readings.

If the button is released too early, the logger will remain active and continue recording data.

Logger has stopped

Once the logger has stopped, the display will show:

- the **STOPPED** symbol.
- the battery low symbol (⊠) if the battery is low.
- The battery ok symbol (OK) if the battery is ok.

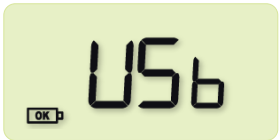


Plugging the logger into a USB port

As soon as you plug the HAXO-16U into a USB port, the word **USB** appears. If you have configured the logger to generate files, **USB** remains turned on until all files have been generated.

During the file generation a small animation will play on the display.

As soon as the file generation is finished, **USB** will blink every second to indicate these files can now be accessed.

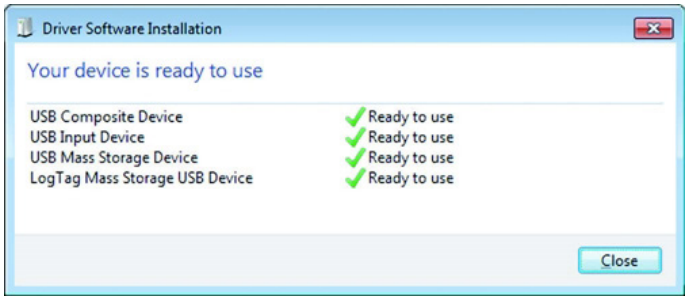


> These files are re-generated each time you plug the logger into the USB port, regardless of whether the logger is still recording readings or not.

What happens when you plug your HAXO-16U into a USB port depends on the operating system of the computer, the settings made during configuration and whether or not LogTag® Analyzer is running.

Microsoft Windows

Up to four drivers will now be installed, depending on the HAXO-16U's configuration.



All drivers are part of the operating system and will typically not require administrator privileges for your computer.

1. **Mass Storage Device Driver**
2. **LogTag® Mass Storage USB Device Driver**

These two devices are required so you can access the data files in the same way as a USB memory stick. These drivers will not be installed if the HAXO-16U does not generate files.

3. **USB Input Device (HID) Driver**

This device is used for communication to LogTag® Analyzer and its driver will always be installed, even if LogTag® Analyzer is not present on the computer.

4. **USB Composite Device Driver**

This driver signals that multiple devices are involved when plugging in a HAXO-16U.

OSX & Linux

Typically in these operating systems a new drive will be mounted, from which you can open the PDF file. You will not be able to configure the HAXO-16U using either of these operating systems, unless you use virtualization software such as Fusion or Virtualbox to create a hosted Windows environment. You need to discuss these options with your network administrator.

> While a HAXO-16U is plugged into USB, no temperature or humidity readings are taken. The graph will display a gap and the data list will show --- followed by the # symbol.

Accessing the files

If the recorder was configured to generate files, a new drive or mounted device will appear. The device name will be created from the serial number of the HAXO-16U. You can access the files by browsing to the newly created drive and double-clicking the PDF, CSV or LTD files. For PDF files you need Adobe Acrobat Reader or a similar PDF viewer. To open the LTD file you need to install the free LogTag® Analyzer software. CSV files can be opened with a text editor, or imported into a spreadsheet program such as Microsoft Excel™.

The file names contain information about the recorded data, which is detailed in the section about Interpreting the Data on page 17. If a recorder has only taken pre-start readings, PDF and CSV files will not be created.

If a logger has only taken pre-start readings, PDF and CSV files will not be available.

To retain the logger-generated files please copy them to a permanent storage location on your computer, such as the Documents folder (they are not automatically copied).
The data on the logger are retained, so each time you plug the HAXO-16U back into the computer the files are re-generated, until the device is re-configured.
Once the battery is exhausted, the real time clock on the unit stops and dates and times for the retained data may no longer be accurate.

Tips and Tricks

Configuration

When configuring a USB recorder, allow enough time for the unit to acclimatise to the target environment, particularly if you have configured an upper alarm. This can be best achieved with a start delay, or a date/time start if you know when the shipment takes place.
Make sure you remove your HAXO-16U from the USB socket when you use a date/time start, so it starts at the time you want, rather than when unplugged from the port.

During the trip

Always replace the USB protective cap before placing the HAXO-16U with the goods. While recording, make sure the HAXO-16U's protective cap is facing down. The protection rating can only be achieved when used in this orientation. For applications requiring a higher IP rating the unit should be used in the protective case, available as an accessory.

Getting Help

If after studying this Product User Guide and the relevant Quick Start Guide you still need further information, please visit the support section of the LogTag® Recorders website at:
http://www.logtagrecorders.com/support/support.html .

Interpreting the Data

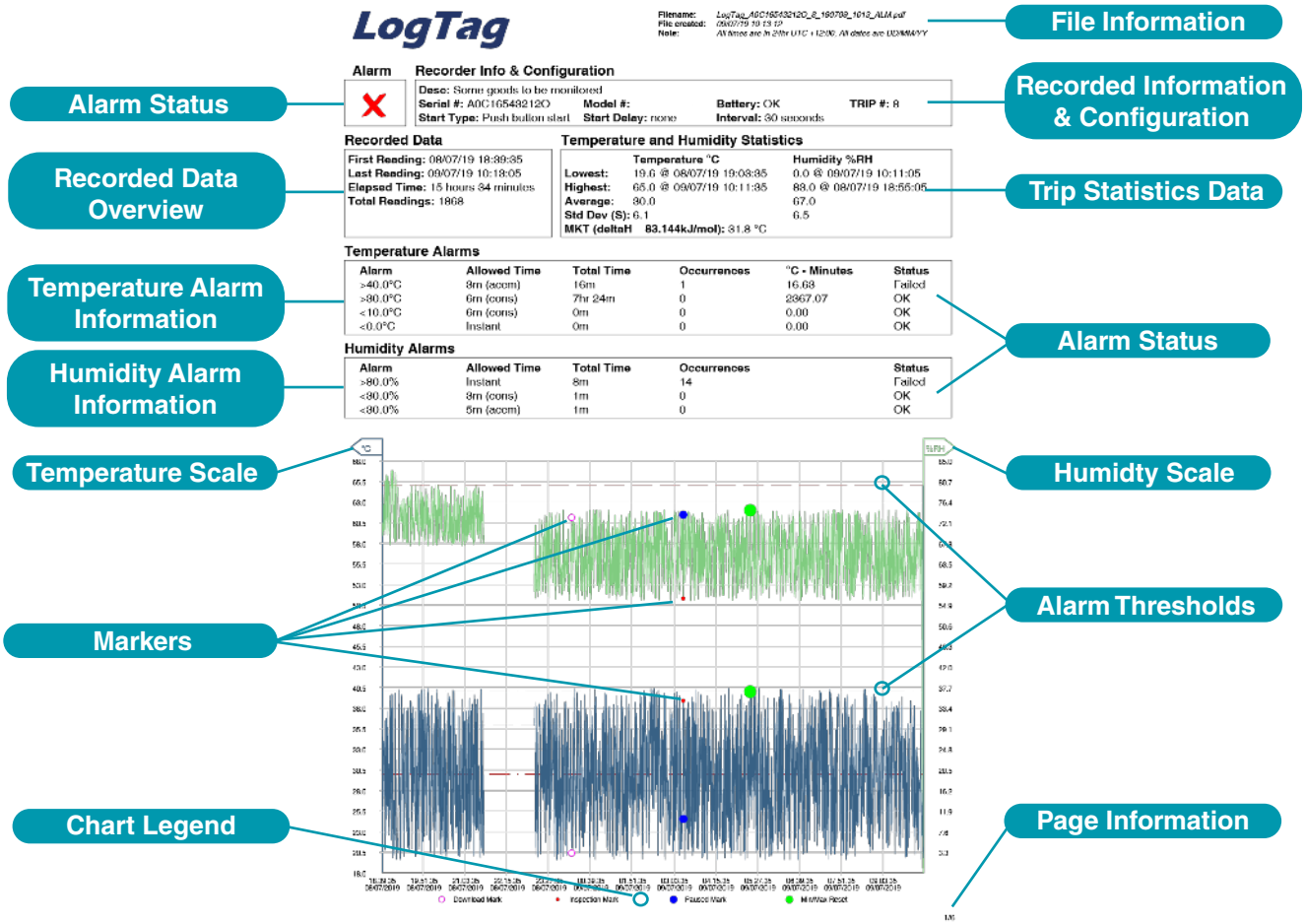


Figure 7: HAXO-16U Sample report page with Multiple Alarm Thresholds

Data Evaluation - Report with multiple alarms

Alarm Status

This shows at a glance if the TRIL-16U/SRIL-16U recorded alarm conditions during the trip (showing a red ✗) or if no alarms were recorded (green ✓)

Recorded Data Overview

This section shows at what time the logger started to record data, when it finished, how many readings were recorded and how long that took.

Temperature Alarms

This section summarizes the alarm trigger conditions and occurrences during the trip, including:

- direction (whether it is an upper or lower alarm)
- alarm threshold temperature value
- any delay value for consecutive or accumulative alarms
- the total time above or below a threshold
- how often an alarm occurred
- whether or not an alarm was generated for this alarm trigger

Up to 4 alarms will be shown here, as configured with LogTag® Analyzer.

Humidity Alarms

This section summarizes the alarm trigger conditions and occurrences during the trip, including:

- direction (whether it is an upper or lower alarm)
- alarm threshold humidity value
- any delay value for consecutive or accumulative alarms
- the total time above or below a threshold
- how often an alarm occurred
- whether or not an alarm was generated for this alarm trigger

Up to 4 alarms will be shown here, as configured with LogTag® Analyzer.

Temperature Scale

A temperature scale is shown, which adjusts dynamically depending on the settings made during configuration of the logger with LogTag® Analyzer.

Humidity Scale

A humidity scale is shown, which adjusts dynamically depending on the settings made during configuration of the logger with LogTag® Analyzer.

Markers

The chart will show marks where the UHADO-16 has been downloaded (°) or where an inspection mark has been placed with the START/CLEAR/STOP or REVIEW/MARK button (•). It also shows Paused marks (•) where a button press has prevented readings from being used for statistics and alarm calculations.

USB Paused Readings

USB loggers cannot take a reading while plugged into a USB port. A gap is shown in the graph or list where the UHADO-16 was plugged in at the time it would otherwise have taken a reading.

File Information

This section shows general information about the PDF file, such as generation time, date and time formats used in the chart and the data list as well as the file name, which is compiled from information about the data it contains:

LogTag_[serial_number]_[trip number]_[file creation date]_file creation time]_[OK or ALM].pdf

Other files that may be generated have the extensions *.csv and *.ltd.

Logger Information and Configuration

This section shows general information such as serial and model name, trip number, battery status and description. It shows how the logger was started, if a start delay was active and the interval used for taking readings.

Logger Statistics Overview

This section gives a brief overview of the temperature and humidity data collected during the trip. It shows minimum and maximum values, when these occurred and also shows average, standard deviation and MKT values.

Recorded Data Chart

The chart shows a graphical representation of the data during the trip. As part of the UHADO-16 configuration process you set the parameters that influence how the chart is presented.

Upper Threshold values

Upper alarm thresholds are shown with red dashed lines --- so you can see at a glance where temperatures went above set limits. You may see up to three lines depending on configuration and zoom settings.

Lower Threshold values

Shows the symbols for download marks, inspections marks, min/max reset marks and paused marks if they appear in the readings.

File Information

Lower alarm thresholds are shown with blue dashed lines --- so you can see at a glance where temperatures went below set limits. You may see up to three lines depending on configuration and zoom settings.

Page information

The current page number and the total number of pages appear on every page.

Data Evaluation - Data List

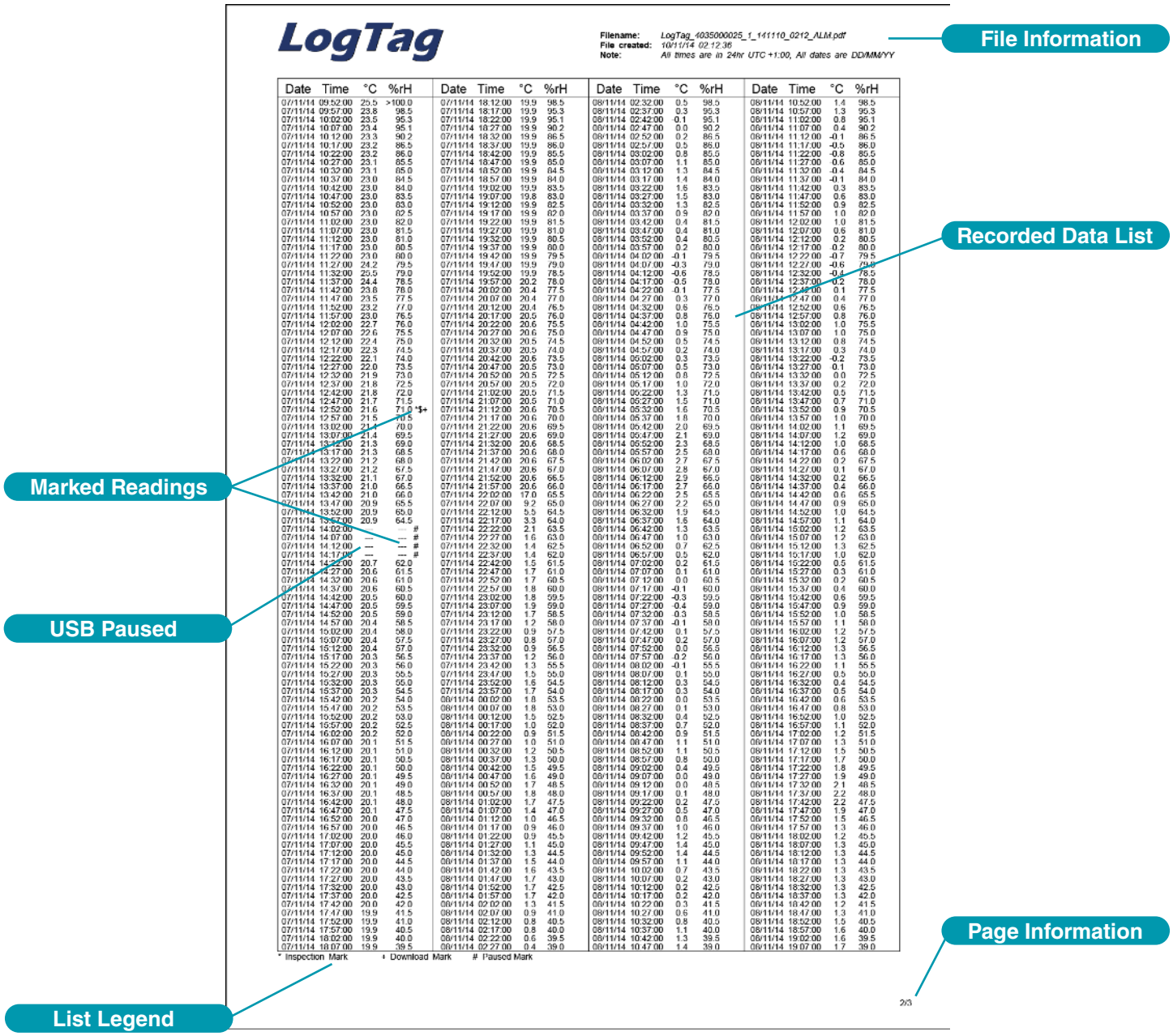


Figure 7: HAXO-16U Sample report page with Multiple Alarm Thresholds

File Information

This section shows general information about the PDF file, such as generation time, date and time formats used in the chart and the data list as well as the file name, which is compiled from information about the data it contains:

LogTag_[serial_number]_[trip number]_[file creation date]_file creation time]_[OK or ALM].pdf

Other files that may be generated have the extensions *.csv and *.ltd.

r started to record data, when it finished, how many readings were recorded and how long that took.

Recorded Data list

The Data list shows a single row for each recorded reading, along with the date, time and temperature & humidity values, plus any special events that were recorded against this reading.

Page information

The current page number and the total number of pages appear on every page.

Marked readings

In the data list, each entry may be marked with one or more of the following symbols, depending on which event occurred when the reading was taken:

- A + symbol will be shown, if the UHADO-16 was downloaded with LogTag® Analyzer just prior to the reading being taken.
- A * symbol will be shown where an inspection mark has been placed.
- A $ symbol will be shown where readings were paused as a result of a button press.
- A # symbol will be shown where the logger was plugged into a USB port at the time it would otherwise have taken a reading.

USB Paused Readings

USB loggers cannot take a reading while plugged into a USB port. A gap is shown in the graph or list where the UHADO-16 was plugged in at the time it would otherwise have taken a reading.

Legend

Shows the symbols for download marks, inspections marks, min/max reset marks and paused marks if they appear in the readings.

Technical Specifications

Product Model	HAXO-16U (single-use and multi-use options available)
Sensor Measurement Range	-30 °C to +70 °C (-22 °F to +158 °F)
Operating Temperature Range	-30 °C to +70 °C (-22 °F to +158 °F)
Storage Temperature Range	0 °C to +40 °C (+32 °F to +104 °F)
Humidity Measurement Range	0 %RH to 100 %RH (non-condensing), with limitations
Humidity Operating Range	0 %RH to 100 %RH (non-condensing), with limitations
Humidity Storage Range	20 %RH to 60 %RH*
Rated Temperature Reading Accuracy	Better than ±0.45 °C (±0.8 °F) for +0 °C to +50 °C (+32 °F to +122 °F), typically ±0.3 °C (±0.6 °F) Better than ±0.8 °C (±1.4 °F) for +50 °C to +70 °C (+122 °F to +158 °F), typically ±0.5 °C (±0.9 °F) Better than ±0.95 °C (±1.7 °F) for -30 °C to +0 °C (-22 °F to +32 °F), typically ±0.6 °C (±1.1 °F) Actual performance is typically much better than the rated values. Accuracy figures can be improved by recalibration.
Rated Humidity Reading Accuracy	Better than ±3 %RH for 20 %RH to 80 %RH, typically ±2 %RH Better than ±5 %RH for 0 %RH to 20 %RH, typically ±4 %RH Better than ±5 %RH for 80 %RH to 100 %RH, typically ±4 %RH Actual performance is typically much better than the rated values. Accuracy figures can be improved by recalibration
Humidity Resolution	Better than 0.1 %RH
Temperature Resolution	Better than 0.1 °C or 0.1 °F
Recording Capacity	32,000 logs, up to 365 days @ 16 min logging
Sampling Interval	Configurable from 10 seconds to 18 hours
Logging Start Options	Push button start or date and time start
Environmental	IP61 with USB cap fitted
Power Source	CR2450 3V Li-MnO2 UN38.3 compliant coin cell, non-rechargeable, non-replaceable
Battery Life	Multi-Use: 3 years storage, 2 years of operational life (based on 5 minute logging) Single-Use: 1 year storage, 1 year of operational life
Connection Interface	Built-in USB 2.0
Size	107 mm (H) x 54.5 mm (W) x 8.6 mm (T) including USB cap
Size	86mm(H) x 54.5mm(W) x 8.6mm(T).
Weight	46.8g
Case Material	Polycarbonate