UTREL30-16

30-day Low-Temperature Data Logger with Display

Product User Guide

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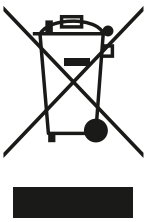
Safety Information

The UTREL30-16 PDF USB temperature logger contains two "AAA" non-rechargeable batteries. These batteries can be replaced as detailed in Replacing the AAA batteries.

The logger also contains a non-rechargeable backup battery ($LiMnO_2$ CR2032 coin cell).

When this battery indicates “LOW” ( ), it can be replaced by a qualified technician. Please contact your distributor for further information and also refer to the section about Powering the UTREL30-16 on page 25.



Keep out of the reach of children!

Do not expose the logger to extreme temperatures as it may lead to the destruction of the battery and may cause injuries.

Empty batteries should be recycled or disposed of according to your local regulations.

Liability

LogTag North America’s standard warranty terms apply. A copy can be requested by emailing support@logtagrecorders.com. In addition, LogTag North America shall not be held liable

- if the device was used beyond LogTag North America’s stated limitations;
- for any claims due to the improper storage and use of the device;
- for any problems with refrigeration units;
- for the bad quality of the monitored goods, if any;
- for incorrect readings if the device was used with a low battery; or
- for consequential loss.

Battery Life

The batteries in the UTREL30-16 designed to power the device for up to 12 months of operation, provided

- fresh batteries from a reputable manufacturer are used;
- the acoustic alarm is not active over long periods;
- the recording interval is not shorter than 5 minutes; and
- the device is stored and operated according to LogTag North America’s recommendations.

Disclaimer

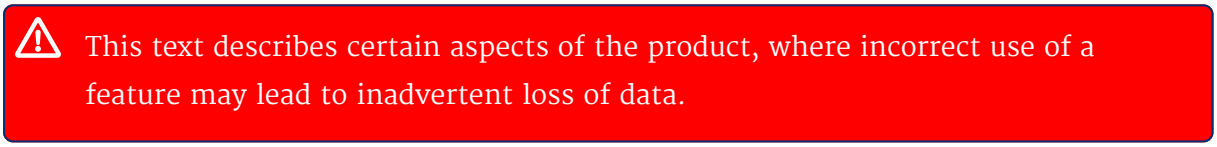
The UTREL30-16 monitors temperature exposure and not the quality of the goods it accompanies. Its purpose is to signal if product quality evaluation/testing is required.

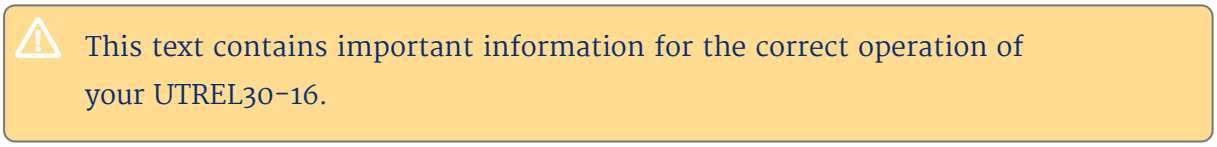
Typographical Conventions

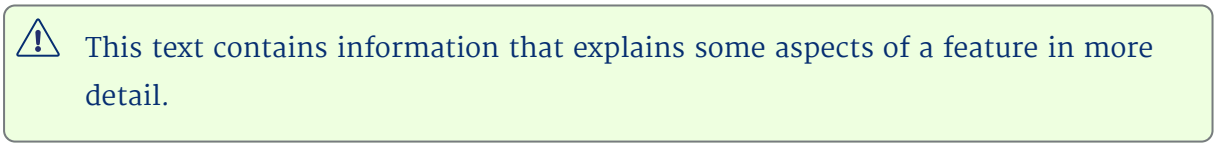
Text **in this font** refers to buttons on the UTREL30-16.

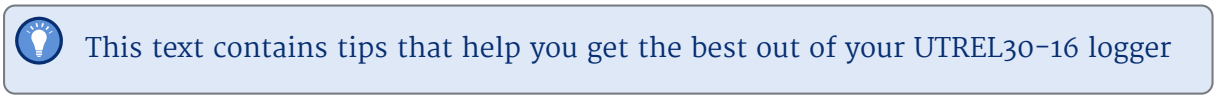
Text in this font refers to option settings, dialogue boxes or actions to be taken in LogTag® Analyzer.

Text in this font describes features of the product.









Introduction

The LogTag® UTREL30-16 30-day Low-Temperature Data Logger with Display features a display, USB connectivity, data logging memory storing up to 16065 temperature readings per channel and a separate statistical memory, storing maximum and minimum reading as well as alarm duration for each of the last 30 days.

During recording the display shows the following, alternating for each channel:

- The current temperature (of the most recent reading)
- The alarm status (within or outside the acceptance range)
- An alarm trigger summary of up to the last 30 days (today and 29 days previous)
- The current time and battery status
- Minimum and maximum temperatures since the start of the trip

Alarm events can be triggered when a number of readings are outside pre-set temperature thresholds, and a “day alarm indicator” appears on the display.

Logged temperature data can be viewed on any PC by plugging the unit into a computer’s USB port via a micro-USB cable. A PDF file is generated, which can be accessed using free PDF software such as Acrobat Reader. The UTREL30-16 can also be downloaded to the free companion software LogTag® Analyzer, where you can display data in chart, list or summary formats. The software also allows electronic archiving and exporting or transmitting data in support of sophisticated data management systems, such as LogTag® Online.

Features

The UTREL30-16 Dual-channel temperature logger features a large display and USB connectivity with a familiar LogTag® feel.

Case

- Mounting lug for secure fastening of logger to fixtures
- Micro-USB socket with attached protective cap
- Gold-plated, high-quality temperature sensor sockets
- Robust polycarbonate case, IP51
- 2 user replaceable AAA batteries, accessible via a compartment at the rear of the product

Buttons

- **START/CLEAR/STOP** button (⟲)

  This is used to start the unit, and clear active alarms. It is also used to exit the statistics review.

- **REVIEW/MARK** button ( )

  This is used to review recorded data the trip directly on the display, to reset the min/max data on the display and to stop the unit.

  It is also used to place an inspection mark in the data.

- **Channel** button ( )

  This button is used to manually switch the channels shown on the display.

Display and LED

The extra large display shows current, minimum and maximum temperatures and if alarm events have occurred for the current day and up to 29 days in the past. Details of any alarm event can be checked by inspecting the statistics history on the logger's display or in more detail via LogTag® Analyzer. In addition, a red Alarm LED shows if an alarm event has occurred.

External Probes

The UTREL30-16 will accept external probes from the ST10 product range.

Power Supply

The same USB socket that is used for communication is also used for providing power to the UTREL30-16, using an external 5V USB power supply. The AAA batteries maintain all functionality when USB power is not connected. A long-life CR2032 lithium backup battery maintains essential functions if the AAA batteries are empty and external power is not supplied.

PDF

The UTREL30-16 will generate a detailed PDF report when plugged into a USB port of a PC. The PDF report shows a summary of the trip, presents the data in chart and list format and also includes a day summary page, showing an overview of the statistics collected. A CSV file of the data list is also available.

What You Need

Required Items

In addition to your LogTag® UTREL30-16 30-day Low-Temperature Data Logger with Display you will need the following:

- a micro-USB cable to connect the UTREL30-16 to your PC (it is recommended that you connect each UTREL30-16 via a permanently plugged in USB cable to protect your computer's USB socket)
- one or two external probes of the ST10 series
- a PC running Windows 7 SP1 or later and LogTag® Analyzer 3 installed if you wish to configure and download the logger
- a PC with PDF reader software installed for viewing the generated PDF files

Optional Items

In addition to the above, following items are useful accessories:

- a 5V/5W USB power supply, if you wish to power the unit permanently via the USB socket

- a wall mount bracket, which can be used, for example, to attach the UTREL30-16 to the side of a fridge

- one or two silica sand temperature buffers, which simulate environmental behavior of a vaccine vial

Preparing a UTREL30-16 for first use

Before your UTREL30-16 can record temperature data you need to perform a few setup steps.

In the Office

These steps are completed in your office, using a PC connected to the internet:

1. Install the batteries into the unit.
2. Download and install the latest version of LogTag® Analyzer 3. You can do this from the LogTag Software Download page.
3. Configure the unit using LogTag® Analyzer software.

On-site

Once you have completed this process, you can take the logger to the location where it will be installed:

1. Connect external power if you use the UTREL30-16 in a stationery application.
2. Connect the probes and place the unit, preferably using a wall mount bracket.
3. Start the logger.

Inserting the Batteries

The UTREL30-16 operates with two AAA batteries:

1. Remove the screw from the rear compartment lid.

2. Remove the lid, exposing the battery compartment.

3. Insert the AAA batteries in the correct orientation, as shown. The polarity is marked inside the battery compartment.

> The battery compartment is a good place to keep the surplus sensor socket covers. You may wish to remove these now for each channel you want to use and add them to the compartment before closing it (see Adding the Probes and the Power Supply).

4. Replace the rear cover and the screw.
5. Press any button to turn on the display.

Configuring the UTREL30-16 for logging

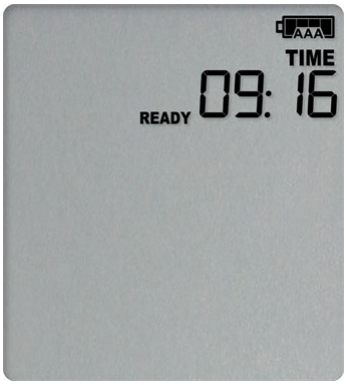
Before a UTREL30-16 logger can be deployed, it must be configured with the parameters required for starting and recording temperature values.

Loggers can be purchased unconfigured, or pre-configured, ready to be started, using one of a number of different profiles that are available.

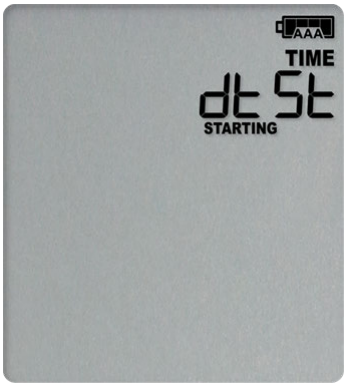
You can check if your logger is already configured or not by briefly pressing the **REVIEW/MARK** button.

The logger is already configured to start

If your logger is configured to start it will show either



if the logger was pre-configured for a push-button start, or

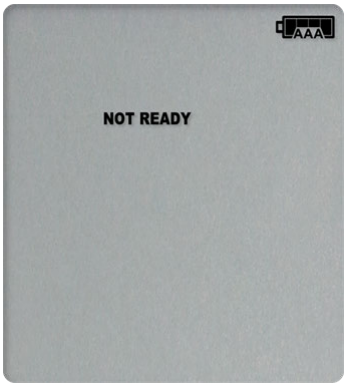


if the logger was pre-configured for a Date/Time start.

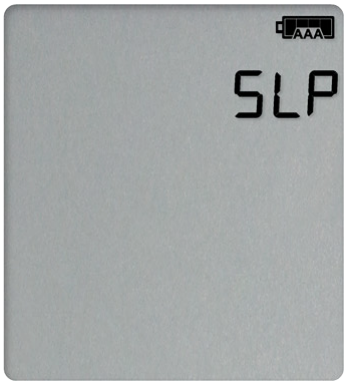
If your logger shows one of these screens you may skip the configuration process.

The logger is unconfigured

An unconfigured UTREL30-16 logger is delivered to you hibernated (i.e. in a state of low power consumption), and pressing the **REVIEW/MARK** button shows:



and then



If your logger is unconfigured you must set it up with the parameters required for

- starting and recording temperature values;
- printing the PDF; and
- triggering alarms.

This is done using LogTag® Analyzer software, which can also be used for downloading and analyzing data:

- Start the LogTag® Analyzer software.
- Remove the protective cap from the logger's USB socket and plug the Micro USB end of the cable into the socket. Plug the other end of the cable into a USB socket on your computer and wait for the drivers to be installed[1].
- From the menu click **LogTag - Configure**; LogTag® Analyzer will display the configuration options for connected loggers.

1 You can configure more than one UTREL30-16 at the same time, however it is practical to limit the number of units to about 6, using a powered USB hub.

Standard Configuration Settings

The standard configuration is similar to those of other LogTag® logger products and includes settings such as User ID, start method, pre-start recording, logging interval and duration, start delay, and password.

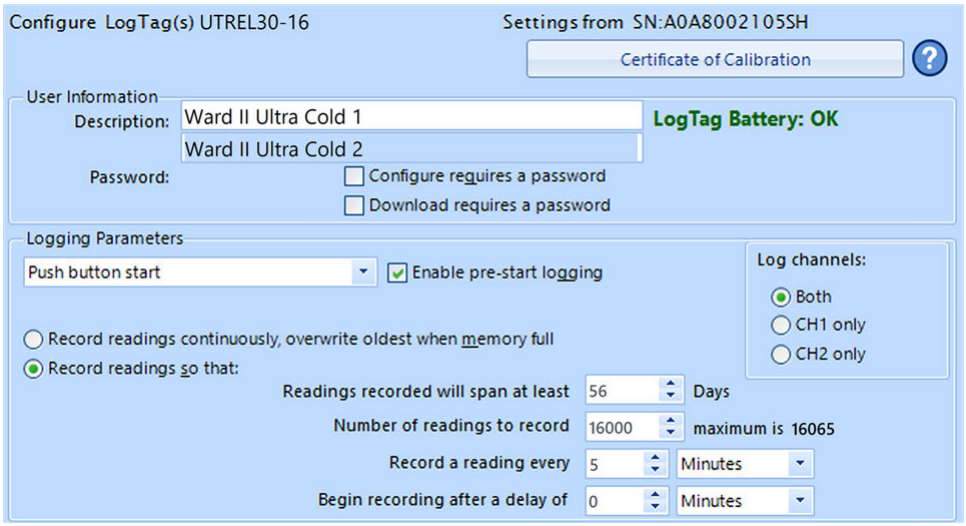


Figure 1: Standard configuration parameters for a UTREL30-16

Adjust the settings as required. 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.

In this section you also decide which channels the UTREL30-16 will record. Select CH1 only or CH2 only if you only wish to record temperatures measured by a single probe (plugged into the corresponding socket marked CH1 or CH2) , or select Both for recording both probes.

UTREL30-16 Start Options

During configuration with LogTag® Analyzer you can decide when the UTREL30-16 starts taking temperature readings:

Push button start

The logger will start taking temperature readings as soon as you have pressed the **START/CLEAR/STOP** button (see Starting the Logger on page 32).

When you choose the push button start option, you can Enable pre-start logging (or disable it) and also Begin recording after a delay.

Pre-start readings

If you enable pre-start readings, the UTREL30-16 starts recording as soon as it is configured and will continue to do so until you start the unit via the button. No alarms are processed while pre-start readings are being taken, pre-start readings will not appear in the PDF file after the logger was started, and no PDF file will be generated if

only pre-start readings are present in the logger. Using pre-start readings is a good way to 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 UTREL30-16 to start after a delay period, the logger will not immediately record temperature readings after you have pressed **START/CLEAR/STOP**, but start a countdown timer instead, and record readings only after the timer has ended. The value for the timer is set during configuration. If pre-start readings are enabled, these will continue to be recorded during the delay period.

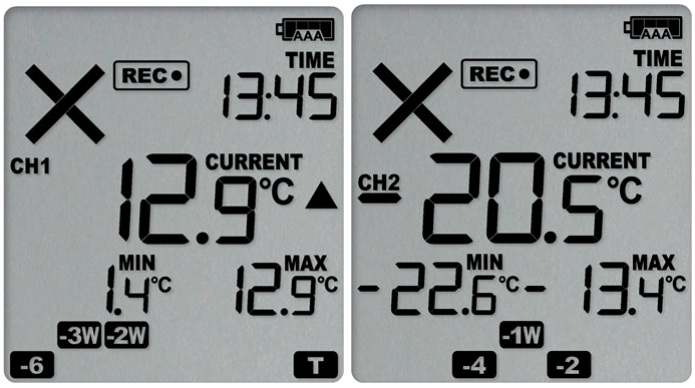
Date/Time start

The logger will start taking temperature readings at the date and time you enter during configuration (local time). You cannot combine a date/time start with pre-start readings or the start delay function.

Alarm Configuration Options

The UTREL30-16 can display an alarm if one or more of the configured alarm trigger conditions have been met. This is indicated on the display by showing the Alarm Indicator × and a Day Alarm Marker.

T is shown for an alarm triggered today, other markers are shown for alarms triggered on previous days, see Day Alarm Matrix Display while recording for details on which marker is displayed for which day. Alarms are registered separately for each channel, and will only be shown on the corresponding channel's screen. Additionally, the red LED will blink every 4 seconds. The LED blinks until active Alarms on both channels are cleared.



Each alarm trigger condition consists of a threshold temperature value, an activation type (which can be instant, consecutive or accumulative[2]) 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 a lower threshold it is called a ***lower alarm***.

All alarm trigger conditions are entered in the Alarm Settings tab during configuration of the logger with LogTag® Analyzer. Alarms are configured separately for each channel. If you have chosen to log only one of the channels, the controls for the other channel are not available.

The screen shows an example where:

- the upper primary alarm for channel 1 is triggered when the temperature is -70.0 °C or above for an accumulative time of 10 hours.
- the lower primary alarm for channel 1 is triggered when the temperature is -80.0 °C or below continuously for 1 hour.

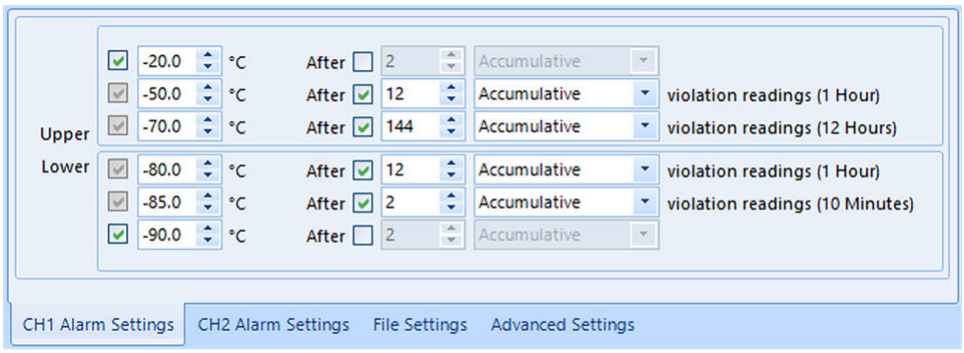


Figure 2: *Sample Alarm Configuration Settings for channel 1 of a UTREL30-16*

- The alarm parameters for the second channel can be entered on the next tab.

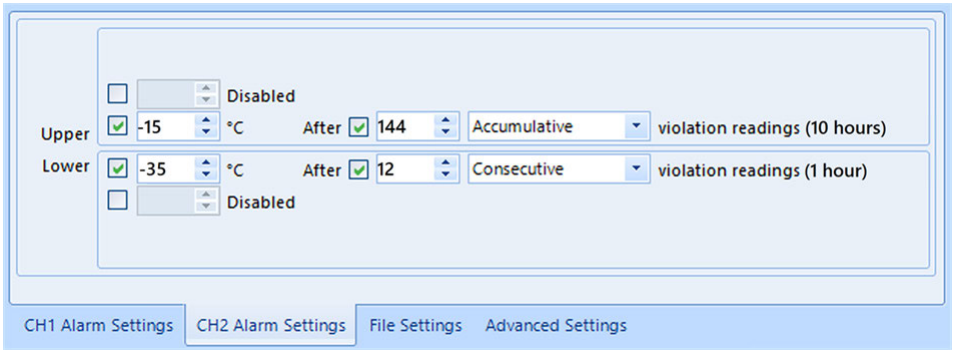


Figure 3: *Sample Alarm Configuration Settings for channel 2*

2
- 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

Once an alarm has triggered, the alarm indicator (×) remains shown until the alarm is cleared (see Clearing an Alarm on page 39) or the unit is reconfigured. The day alarm marker T remains shown until midnight, then it turns off and the marker for the previous day is shown (-1) to indicate the alarm was registered against what is now the previous day. When midnight passes next, this marker will move to -2 and so on.

⚠ A note on alarm re-triggering: As soon as an alarm is triggered, the corresponding delay time (but not any others) resets to zero and alarm processing starts again. The alarm processing for all other alarm delays is not affected. Therefore, accumulative or consecutive alarms will re-trigger, if the alarm conditions are met again, and the Alarm Indicator (×) and the Day Alarm Marker (T) will be shown, even if any previous alarm was cleared. **Clearing an Alarm does not reset any of the delay values.**

File Settings

Click the **File Settings** tab, select which files are generated when the UTREL30-16 is plugged into a computer's USB port, and what information these files contain. Select as many file formats as you wish to generate.

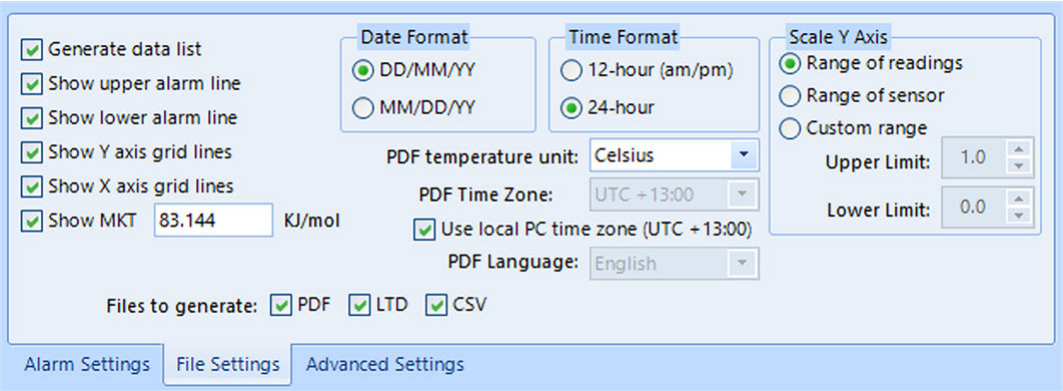


Figure 4: *UTREL30-16 File settings screen in LogTag® Analyzer 3*

These parameters influence the appearance of all files:

- Temperature units

  > ⚠ The temperature unit for the PDF file is also used for all temperature values shown on the display.

  You cannot choose different temperature units for individual channels.
- Date and time format
- Time zone and MKT values

Following specifically influences the appearance of the PDF file:

- Scaling parameters for the chart
- Showing or hiding grid lines
- Showing or hiding alarm threshold lines
- Generating the data list

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.

> The PDF file can not only be viewed in a PDF viewer, but can also be opened with LogTag® Analyzer directly.

Advanced Configuration Settings

Select **Advanced Settings** for additional configuration settings. These settings decide how some of the elements are displayed on the unit's own display and set certain options specific to the UTREL30-16.

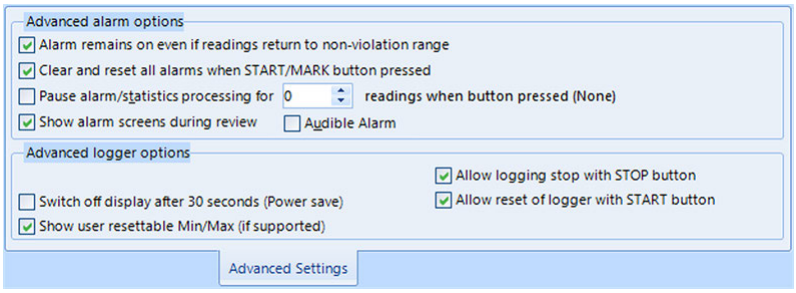


Figure 5: *UTREL30-16 advanced configuration screen in LogTag® Analyzer 3*

These parameters influence what appears on the display:

- Pausing alarm/statistics processing (see Paused Readings on page 40)
- Switching off the display after 30 seconds (Power save, see Power Save on page 42)
- Allowing a user to reset the trip's minimum and maximum values on the display during recording (see Clearing the Min/Max Values on page 43)

Following parameters influence specific behavior of the UTREL30-16:

- Clearing and resetting alarms when the **START/CLEAR/STOP** button is pressed
- Leaving the alarm turned on, even if readings return to the normal temperature range again
- Allowing the user to stop the logger with the **START/CLEAR/STOP** button
- Allowing the user to reset the logger with the **START/CLEAR/STOP** button
- Enabling the buzzer for the audible alarm

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.

Finalizing the configuration

Click **Configure** to upload the configuration data to the UTREL30-16.

When the configuration is complete, unplug the UTREL30-16 from the USB socket and replace the protective seal.

If you wish to configure more UTREL30-16 units with the same configuration, insert the next loggers into USB sockets, wait until they are ready for configuration and click **Repeat Configure**.

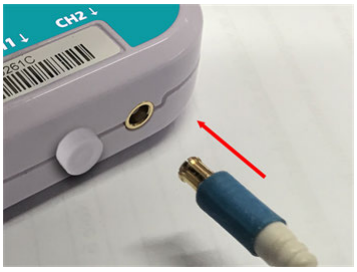
You can upload the configuration to a UTREL30-16 logger as often as required.

Adding the Probes and the Power Supply

Before the UTREL30-16 can record temperature data you will need to connect an external probe. The UTREL30-16 accepts any ST10 probe (including an STX50 extension).

Remove the small round socket protector for the channel you wish to use. The battery compartment is a good place to keep any spare protectors.

Plug the probe's connector into the socket located at the bottom of the device, as shown.



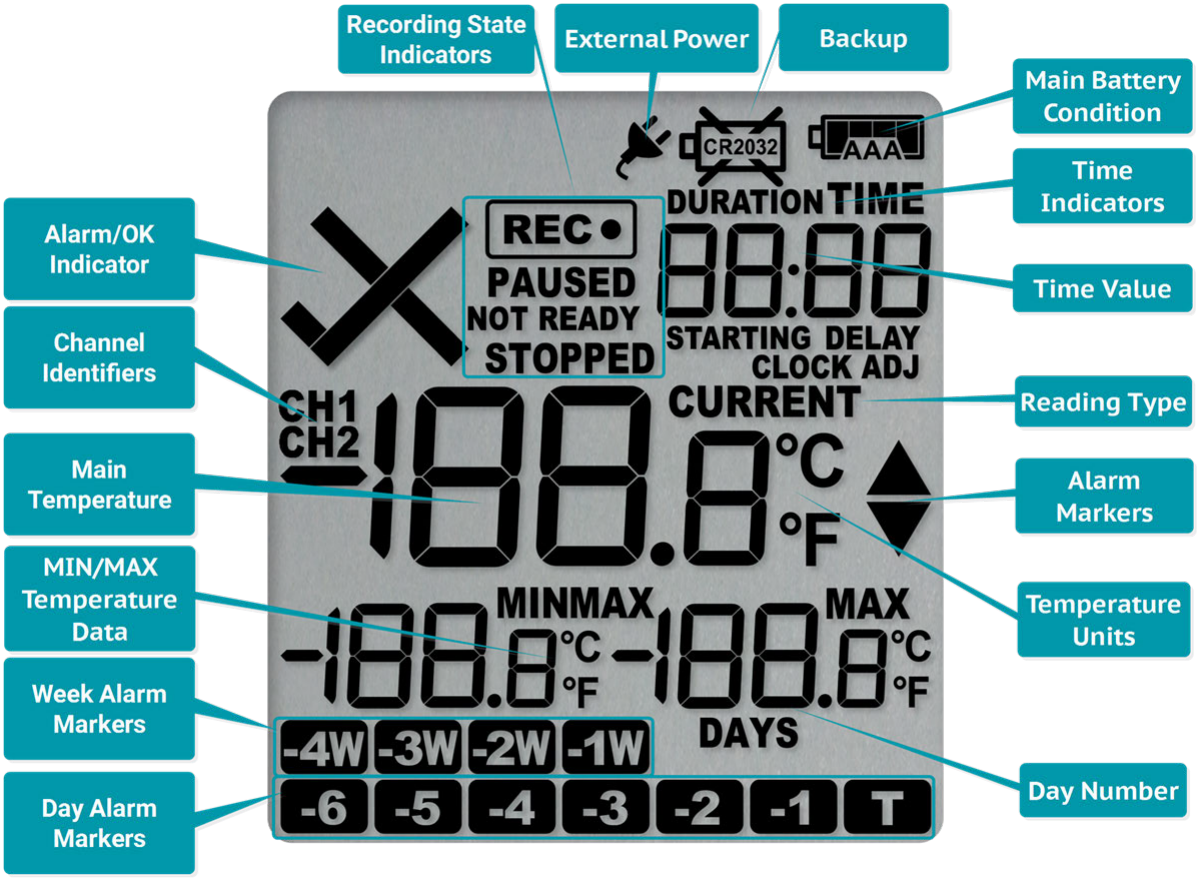
For stationary applications we recommend you connect a power supply (see Powering the UTREL30-16).

Remove the protective cap and insert the USB connector.

Note that the wider part of the connector is oriented towards the rear of the product.

Display Overview

Following image shows the display with all segments turned on.



Day Alarm Markers *

One rows of 7 markers, named *Today* (T) to *Day -6* (-6). A marker is switched on if an alarm event occurred on that day.

Week Alarm Markers *

One row of 4 markers, named last week (-1W) to 4 weeks ago (-4W). A marker is switched on if alarm event occurred during that week.

MIN/MAX Temperature Data *

These two temperatures represent the minimum and maximum since the recording started, or since the values were last manually cleared.

Main Temperature Value *

This shows the most recently recorded temperature while the UTREL30-16 is recording. Once the logger has stopped, nothing will be displayed.

* Marked symbols are displayed individually per channel

CH1/CH2 Channel Identifiers *

CH1 is shown when the data on the screen is representing data from the probe plugged into the socket marked CH1. Similarly, **CH2** is shown for channel 2 data.

Backup Battery Low

A battery test is performed periodically. The battery low symbol will appear if the UTREL30-16's backup battery is low and requires changing. Please discuss this with your distributor, as the battery needs to be changed by a qualified technician.

Main Battery Condition

A battery test is performed periodically. Depending on the condition of the battery, all, some or none of the 4 bars will show. See Powering the UTREL30-16 on page 25 for details.

ALARM/OK indicator *

The ✕ symbol is shown as soon as the UTREL30-16 has registered an alarm event. While there are no alarms, or if a previous alarm has been cleared, the ✓ symbol is shown.

Recording indicators

The recording indicators show what the UTREL30-16 is currently recording.

- If **READY** is shown, the UTREL30-16 is ready to be started with the **START/CLEAR/STOP** button.
- If **REC●** is shown, the UTREL30-16 is recording temperature at the sample interval defined.
- If the word **STOPPED** is shown, the UTREL30-16 has finished recording temperature data.

Time Value and Time Indicators

The time value display is used to show one of the following:

- The current time
- The time remaining until the logger starts recording (for a delayed start)
- A duration, for example of an alarm

The time indicators identify which of those is displayed as follows:

- If **TIME** is shown, the time value represents the current time in hours and minutes (24- hour format).
- If **DELAY** is shown, the time value represents a start delay, or the time remaining until a date/time start will occur.
- If **DURATION** is shown, the time value represents the duration, for example the time above the upper alarm limit.
- If **CLOCKADJ** is shown, the time value represents the current time (blinking), which can be adjusted using the keys.

The word boot appears in place of the clock if new firmware is being uploaded to the UTREL30-16.

The word dtSt appears in place of a time value if the logger is configured for a date/time start, and the start time has not yet passed.

Reading Type

The word **CURRENT** is shown when the temperature on the display represents the last recorded temperature.

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

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

Above/Below Threshold Arrows

The up-arrow ▲ is shown when the temperature displayed (i.e. last recorded) is above the primary upper temperature threshold. The down-arrow ▼ is shown when the temperature displayed is below the primary lower temperature threshold.

Temperature Units

Depending on the selected temperature units, this shows either °F or °C.

Powering the UTREL30-16

The UTREL30-16 can be powered from one of two sources:

- Via two AAA batteries

  The batteries have a life span of approx. 6 to 12 months, depending on the quality of the battery, log interval, frequency of reviewing data on the display and how often an alarm sounds.

  ⚠ The batteries inside the unit will not be charged when external power is supplied.

  A 4-bar battery indicator shows an approximate remaining battery capacity. If the batteries are full, this symbol will be shown:

  When the batteries are empty, this symbol will be shown, and the batteries require replacement.

  Please always replace both batteries with fresh ones at the same time. Replacing only one of the batteries with a partially charged battery will drain the internal backup battery.

  ⚠ It is possible to use rechargeable AAA cells, however, please note that due to the different voltage the battery indicator will not show the correct remaining percentage, and the internal backup battery may drain faster. Rechargeable cells will deplete faster than Alkaline or Lithium batteries.

- Using a commercially available 5V USB power supply (5W)

  When supplied externally, the power symbol shows on the display.

  Supplying the unit with external power allows you to use the internal AAA batteries as a backup should external power be unavailable.

  When you remove the external USB power the display briefly turns off.

  > ⚠ Some low-quality USB power supplies are unable to deliver sufficiently stable power to the UTREL30-16. Please use a power supply from a reputable source that carries a UL or CE marking.
  >
  > If the logger detects an unstable power source, the power symbol will flash and the buzzer will sound.
  >
  > In this case, the logger will not be powered by the external supply, but remain powered by the AAA batteries instead. Please remove the supply and replace it with one of better quality.

Low power operation

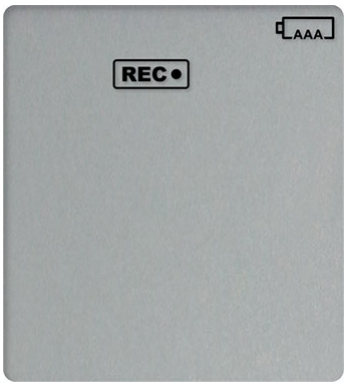
The UTREL30-16 enters low power operation when no external power is supplied, and the AAA batteries are empty.

In low power mode:

- the audible alarm will sound only once, then be silent;
- the display turns off after 30 seconds of inactivity, regardless of the setting made in LogTag® Analyzer;
- reviewing the data is not possible (however a mark will still be placed if the review button is pressed);
- the unit cannot be started via push button start, however, a recording in progress can be stopped, and a scheduled date/time start will proceed; and
- min/max values cannot be cleared.

After pressing any button, following is shown on the display:

- The Recording state indicators, which show if the unit is recording, stopped, ready or configured for a delayed start
- The Battery Empty symbol



The internal secondary backup battery will power the logger's essential functions:

- The internal clock still runs.
- Temperature values are being recorded at the configured intervals.
- The red alert indicator will blink if an alarm is triggered.
- A scheduled recording will still start.

At this time the batteries must be replaced, or external power provided, to activate the suspended functions.

⚠ After battery replacement the display may be blank. To activate it, simply press one of the buttons.

⚠ The internal secondary backup battery (CR2032 $LiMnO_2$ coin cell) should be replaced immediately when the low battery symbol -as shown- appears. This can be done by a qualified technician.

Failing to replace the battery can result in loss of configuration information and loss of recorded data, even when the logger is connected to a power supply.

Audible Alarm

The UTREL30-16 is fitted with a buzzer. You can choose to activate the buzzer when an alarm event has been triggered to provide extra feedback. This is enabled or disabled in the Advanced Settings when configuring the logger with LogTag® Analyzer.

⚠ Please note, that continual activation of the audible alarm will reduce the working life of the battery. When an alarm event is triggered, the alarm should be cleared as soon as possible.

The alarm will sound once every four seconds for the first 24 hours, then sound less frequently to preserve battery life[4] until the alarm is cleared, the unit stops or is re-configured.

The buzzer will temporarily turn off when you are reviewing data.

4 The interval at which the alarm sounds will increase to 8 seconds when the clock passes midnight for a second time (i.e. the alarm will sound every 4 seconds between 24 and 48 hours, depending on when during the day the alarm was first triggered). When the clock passes midnight a third time, the interval changes to 12 seconds until the alarm is cleared.

Real-Time Clock

The time shown on the recording display is linked to the logger's internal real-time clock.

A day change occurs when the display time rolls through midnight (i.e. 00:00), which triggers the statistical data to be finalized for the day, and a new day to be started when the next reading is taken.

Each time the logger is configured with LogTag® Analyzer the display clock value is set to the PC's current local time (or timezone).

> ⚠ Note that the logger's internal real time clock value is only updated when the recorder is configured with LogTag® Analyzer. This prevents the data logging becoming discontinuous, which would be the case if the real time clock were to be changed together with the display clock.

LogTag® Analyzer can display the logged readings in a number of different time zones, regardless of where it was configured.

Manually adjusting the time zone

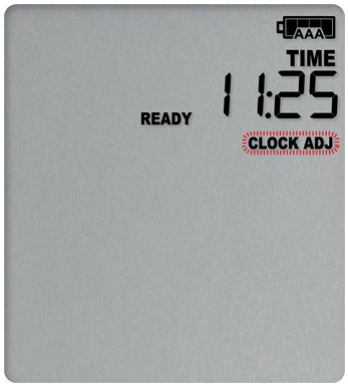
The clock shown on the display of the logger can be adjusted in 15-minute steps so it displays the time in the current local time zone. This can be done directly on the unit, using the buttons. It is particularly useful when you want to adjust the time for daylight saving but you do not wish to re-configure the unit.

You cannot adjust the time zone

- when the logger is **STOPPED**;
- when the logger is connected to a PC via USB;
- when the logger has been started, and is counting down during a delayed start; or
- when the logger has been configured for a date/time start, but has not yet started logging.

If you adjust the time zone, the times that are reported on the PDF and in the software will reflect this change.

To adjust the time, press and hold the **START/CLEAR/STOP** (▶) and **REVIEW/MARK** (⏮) buttons simultaneously. Keep holding both buttons firmly for a period of 8 seconds. During this period the **CLOCKADJ** symbol flashes. Release the buttons within two seconds after the **CLOCKADJ** symbol remains permanently lit, and the time starts blinking. The clock can now be adjusted.



Press the **Channel** button (⏭) to increment the clock in 15-minute intervals.

Press the **REVIEW/MARK** button (⏮) to decrement the clock in 15-minute intervals.

Press the **START/CLEAR/STOP** button to store the value shown on the screen.

To abort adjusting the time zone and return to the original settings, please wait for 30 seconds until the time no longer blinks.

You will need to observe the following rules while adjusting the time:

- Internally, the logger always retains its clock in UTC. You cannot adjust the clock beyond the allowed time zone limit of +15 hours and -12 hours from UTC (these are the same values you see as allowed time zone values in LogTag® Analyzer during configuration).
  For example, if 13:25 is the currently displayed time, and the logger is configured with Hawaiian time zone (-10h when in daylight saving), the earliest time would be 11:25 (-12h).
- You cannot adjust the time across midnight.
- You will hear three short beeps if you try to increase or decrease the time zone beyond the allowed limit.
- An inspection mark is placed in the logged readings, regardless of whether you adjusted the time zone or not.
- You cannot use the time zone adjustment to correct small errors in the displayed time. To do this, please re-configure the unit with LogTag® Analyzer.

⚠ NOTE: It is advised that the real time clock is only adjusted when the product is not recording (**STOPPED** or **READY**) to avoid large shifts in day boundary data.

If a display clock adjustment is made while recording data, the day summary page will contain a mark for each day on which the time was adjusted.

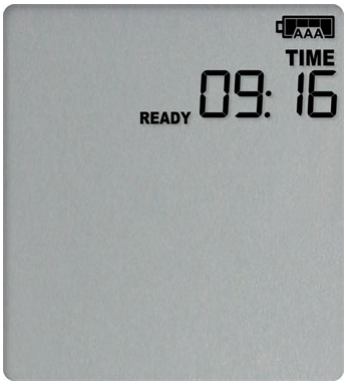
Changes to the display clock do not affect the internal real time clock value, so the logged data does not show time gaps.

Starting the Logger

Push button start

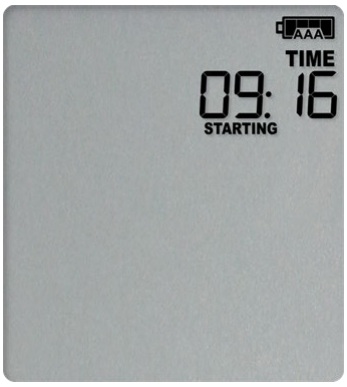
After configuration for a push button start the current time and **READY** are shown, together with the Battery Status symbol.

The power symbol is shown when the unit is connected to a USB power supply.

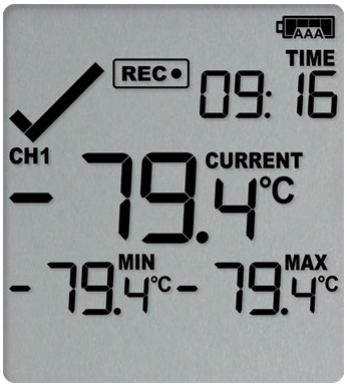


Press the **START**/CLEAR/STOP button. **STARTING** is briefly shown in addition to **READY.**

Then **READY** disappears.



Once **READY** disappears, release the button within two seconds. **STARTING** will now disappear, and the REC● symbol will be shown. The UTREL30-16 now records temperature data.



The logger will ***not*** start if

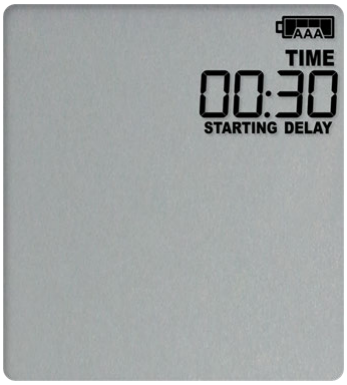
- you release the button before **READY** disappears;

- you keep holding the button for more than 2 seconds after **READY** disappears; or
- the AAA batteries are critically low and the logger is not connected to power.

Push Button Start with Start Delay

If the logger has been configured for a push button start with a start delay, the word **STARTING DELAY** is shown instead of the REC● symbol.

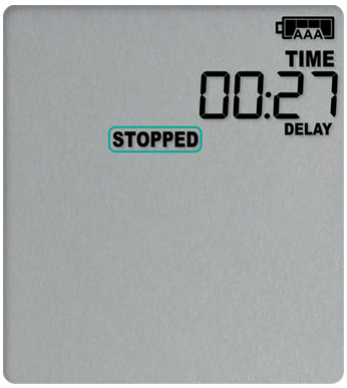
The delay time is shown in hours and minutes. The time counts down and the UTREL30-16 starts recording when it reaches 0:00.



The timer can be cancelled and the logger reset to **READY**.

While **STARTING** and **DELAY** are shown, press and hold the **START**/CLEAR/STOP button. **STOPPED** will now show. Release the button when **STARTING** disappears.

STOPPED and **DELAY** will both disappear, and **READY** will show, together with the current time, and the logger can now be started again as normal.

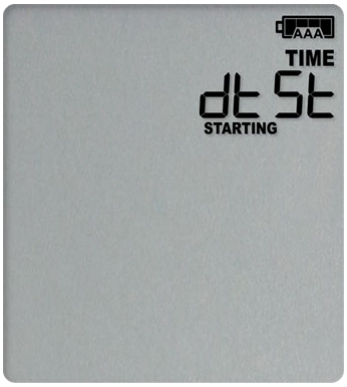


The UTREL30-16 will ***not*** be reset if you

- release the button before **STARTING** disappears; or
- keep holding the button until **STOPPED** disappears.

Automatic date/time start

If you configured the UTREL30-16 for a date/time start, it will start recording temperature values as soon as the entered start time is reached. Until then, the logger will display the screen on the right. Once the configured start time is reached, the logger shows the normal recording display.



⚠ Hibernating the logger using LogTag® Analyzer will abort any previously configured Date/Time start.

During Recording

During normal operation, the display shows the most recently recorded temperature for channel 1 or channel 2. The channel for which the temperature is shown is indicated by the symbols **CH1** or **CH2**.

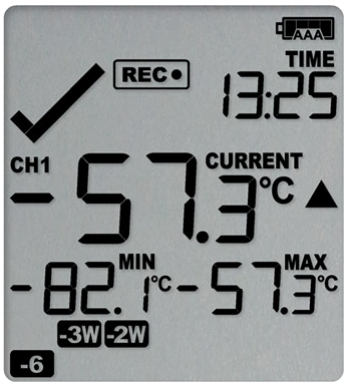
The temperature on the display is updated when the logger takes a reading. The current time is also displayed (in 24 hour format). A tick symbol ✓ is shown as long as no alarm event has occurred on the displayed channel. If an alarm event is registered, a cross symbol ✕ is shown instead of the tick.

Below the main temperature, the display shows the minimum and maximum temperatures recorded for the channel since the beginning of the trip, or since they were last manually reset.

At the bottom of the display you can see an alarm day summary, where any days on which an alarm was recorded are highlighted.

Following are some sample display screens for channel 1:

At 1:25 pm:

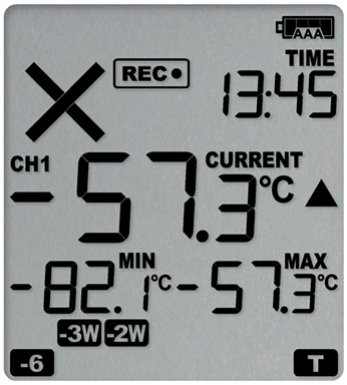


- Alarm events for channel 1 were recorded 6, 18, 19 & 27 days ago.

  The following symbols show on the display:
  - -6 for the alarm that occurred 6 days ago
  - -2W for the alarms that occurred 18 and 19 days ago
  - -3W for the alarm that occurred 27 days ago
- These alarms were cleared by an inspector, as the display currently shows .
- The current temperature shown is for channel 1 and is over the upper alarm threshold, as indicated by the upper alarm marker (▲).
- The duration of this temperature excursion has not yet triggered an alarm.

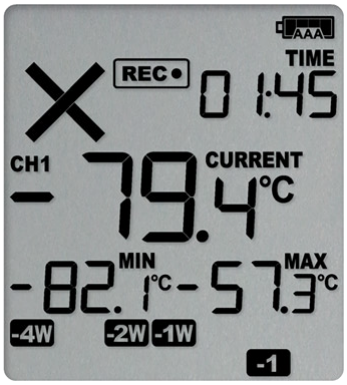
At 1:45pm (20 minutes later)

- The temperature has remained above the upper alarm threshold and has now triggered an alarm event.
- The alarm symbol ✕ is shown to indicate an alarm event occurred.



- The day marker for the current day (T) is shown.

At 1:49am on the next day the display shows the following:



- The temperature has returned to within the accepted range (none of the alarm threshold markers are visible), but the alarm remains present, as it has not been inspected and cleared.
- The day summary has shifted by 1 day as the display time has passed through midnight (00:00). This means some of the week symbols have also changed.

  The following symbols show on the display:
  - -1 for the alarm that shifted from today to yesterday
  - -1W for the alarm that shifted from 6 days ago to 7 days ago
  - -2W for the alarms that shifted from 18 and 19 days ago to 19 and 20 days ago
  - -4W for the alarm that shifted from 27 to 28 days ago

  As a result of the day shifts, the symbols for today and 3 weeks ago no longer show.

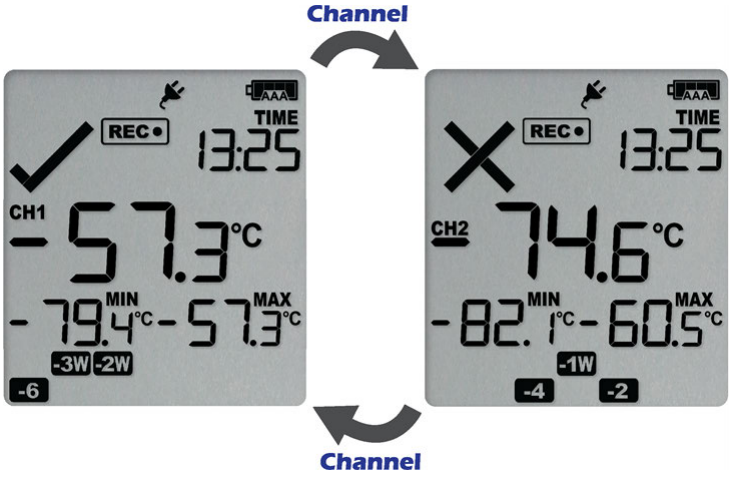
Switching Channels on the Display

Apart from the power symbols, battery status, recording status and the current time, the display only shows data that is associated with a single channel.

To enable users to see all values without having to press any buttons, each channel's data is shown in turns for 8 seconds (Auto Channel Swap).

To see one channel's data for longer, for example, to note down Min/Max values, you can press the **Channel** button. Each time you press this button, the screen will switch to the channel that is currently not displayed and show that channel for 30 seconds. The

Auto Channel Swap starts again if you do not press this button for 30 seconds, or if you press the **START/CLEAR/STOP** button.



> ⚠ The Alarm and OK symbols are independently shown for each channel. The red LED, however, blinks as long as either channel has registered an active alarm, and the buzzer will continue to operate.

The Auto Channel swap function is disabled

- when the logger is stopped;
- when the logger's power save feature is enabled, and it is powered by batteries; or
- during review.

Please see Reviewing Day Statistics on the Display for information about how the **Channel** button operates while reviewing data.

Day Alarm Matrix Display while recording

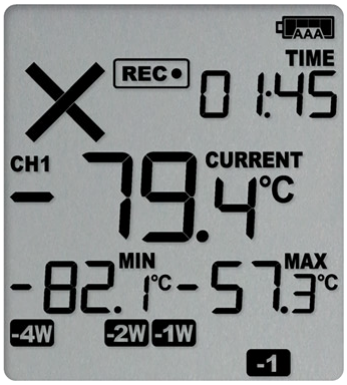
During normal recording, symbols marked with ● are shown if an alarm occurred on that day.

	-6	-5	-4	-3	-2	-1	T	-4W	-3W	-2W	-1W
Today							●				
Day -1						●					
Day -2					●						
Day -3				●							
Day -4			●								
Day -5		●									
Day -6	●										
Day -7 (-1 week)											●
Day -8 (-1 week and 1 day)											●
Day -9 (-1 week and 2 days)											●
Day -10 (-1 week and 3 days)											●
Day -11 (-1 week and 4 days)											●
Day -12 (-1 week and 5 days)											●
Day -13 (-1 week and 6 days)											●
Day -14 (-2 weeks)										●	
Day -15 (-2 weeks and 1 day)										●	
Day -16 (-2 weeks and 2 days)										●	
Day -17 (-2 weeks and 3 days)										●	
Day -18 (-2 weeks and 4 days)										●	
Day -19 (-2 weeks and 5 days)										●	
Day -20 (-2 weeks and 6 days)										●	
Day -21 (-3 weeks)									●		
Day -22 (-3 weeks and 1 day)									●		
Day -23 (-3 weeks and 2 days)									●		
Day -24 (-3 weeks and 3 days)									●		
Day -25 (-3 weeks and 4 days)									●		
Day -26 (-3 weeks and 5 days)									●		
Day -27 (-3 weeks and 6 days)									●		
Day -28 (-4 weeks)								●			
Day -29 (-4 weeks and 1 day)								●			

Clearing an Alarm

During configuration with LogTag® Analyzer, you can allow users to clear an active alarm on the display. This is a useful function for an inspector, so repeated alarms can be recognized easier.

> ⚠ Note: Since each channel tracks alarm conditions independently, alarms must be cleared separately for each channel. Only the alarm for the channel shown when you start the procedure will be cleared.



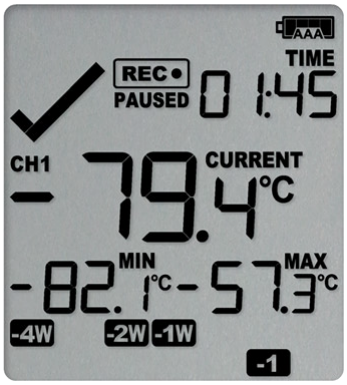
This display screen shows an existing alarm that occurred yesterday, but has not yet been cleared.

To clear an alarm, press and hold the **START/CLEAR/STOP** button.

After approx. 2 seconds the cross ✕ will be replaced with the tick ✓. Release the button when the tick appears. The normal recording display is shown.

The red LED will stop flashing as soon as none of the channels show an active alarm.

The alarm will ***not*** be cleared if you release the button before the ✓ appears.



In this example the paused function was activated, and the paused symbol is shown on the display. For more information about paused readings please see the section about Paused Readings on the next page.

If required, repeat the procedure for all channels with an active alarm.

> ⚠ Note: Only the Alarm Indicator (✕) can be cleared! The day alarm marker (-1 in the above example) remains shown, as it is part of the statistic summary. Clearing an alarm also does not reset any of the delay values. Please see Alarm Configuration for additional information.

Paused Readings

During configuration of the UTREL30-16 you can set the option to ignore up to 15 readings for alarm and statistics calculations after either button is pressed. The readings are still shown on the graph and in the data listing, but they are marked as paused, and their value is ignored when determining alarm trigger conditions, minimum/maximum values and other statistical calculations.

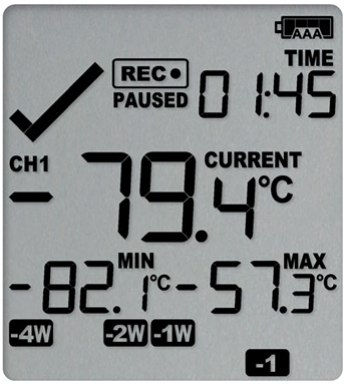
The Paused Readings feature is useful, for example, when you need to temporarily remove the probe from the monitored location to inspect goods, but you do not wish to trigger an alarm as a result of you handling the probe.

It allows the logger to acclimatize to the environment again, before further readings are processed.

After a button press the display shows **PAUSED** next to the symbol. **PAUSED** will turn off as soon as the last ignored reading has been recorded.

The option is set in the Advanced Settings tab during configuration with LogTag® Analyzer and is expressed in number of readings after the last button press.

Paused readings are specially marked in the graph and data listings.



How long **PAUSED** is displayed depends on when between readings you press the button. It will show longer, if the button is pressed just after the logger takes a reading, but shorter if you press the button just before. For example, if you configure a logging interval of 10 minutes and 2 paused readings, the time **PAUSED** is shown could be as short as 10 minutes, but as long as 20 minutes.

Invoking the paused function does not influence the auto-channel swap.

Marking a reading with an inspection mark

When you press the **REVIEW/MARK** button while the UTREL30-16 is recording, the next reading taken will be identified in the downloaded data and on the PDF report with an inspection mark.

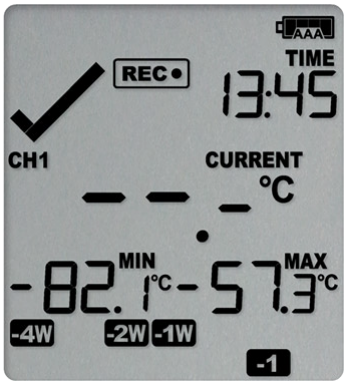
If the Allow stopping with the Stop button feature is enabled, a mark will also be registered when you press the **START/CLEAR/STOP** button, but do not complete the process of stopping the logger. An inspection mark will also be recorded if you clear an alarm. A mark will always be recorded for both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

Probe is disconnected

The display shows ‾ ‾.‾ instead of a temperature value if the logger's remote temperature probe is disconnected. This function is useful if the probe is permanently mounted, but you wish to take the UTREL30-16 to a computer for downloading its data.

Any values recorded during this time will not be taken into account when calculating statistics values or alarms.

If, for example, the temperature was above °C for 12 hours (which would normally trigger an alarm event), but the probe was disconnected for 3 hours during this time, no alarm would be generated.



When evaluating data, any readings taken while the probe is disconnected are shown as --.- in the data list. The chart in LogTag® Analyzer will show a gap during this period. Minimum and Maximum values shown on the display will remain visible and will not be updated until the sensor is plugged back in.

If the probe was disconnected for a complete day, the minimum and maximum statistics for that day will show ‾ ‾.‾ on the display and --- in the list.

Power Save

When Power Save is enabled, the display will automatically switch off if none of the buttons have been pressed for 30 seconds, and the unit is operated by its AAA batteries.

This function is appropriate in applications where you don't need to look at the display frequently, such as in transit monitoring applications, as the logger uses less battery power when the display is not turned on.

Pressing any button will re-activate the display.

Power save is enabled or disabled when configuring the UTREL30-16 via LogTag® Analyzer in the Advanced Settings tab.

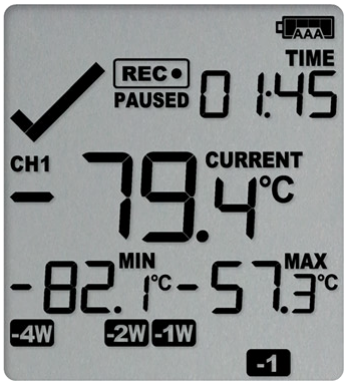
⚠ Note: The display will turn off, even if there is a pending alarm! The Red Alert LED will still blink.

⚠ When the display turns on after a button press, the auto-channel swap function is deactivated. This allows a user sufficient time to evaluate the screen. The **Channel** button can still be used to switch the displayed channel.

Clearing the Min/Max Values

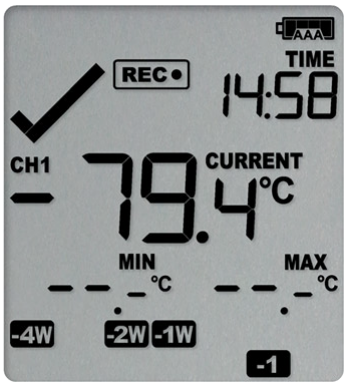
The UTREL30-16 tracks the minimum and maximum temperatures since it started logging, separately for each channel, and displays them below the last recorded temperature.

These values can be reset any time while the unit is recording (but not once the unit has stopped).



> ⚠ Note: Since each channel tracks these values independently, you must perform the procedure separately for each channel. Only the values for the channel shown when you start the procedure will be reset.

To reset the values, follow this procedure:



1. Press and hold the **REVIEW/MARK** button.
2. After 1 second the number values alternate with dashes, after 4 seconds, the dashes remain on.
3. Release the buttons within 2 seconds. The values will be reset and the dashes remain on screen.

The values will not be reset, and the currently stored min/max values will be retained if

- you keep holding the button for more than 2 seconds after the dashes no longer blink; or
- you release the button within the initial 4 second period after the initial press.

In these cases, the display keeps showing the normal recording screen.

If desired, switch to the other channel and repeat the procedure.

The logger will now track new min/max values for each channel that was reset. A min/max reset mark will be recorded in the logged data. As soon as the next reading is taken, both minimum and maximum values will be shown again.

You will be able to see on the PDF and in the summary in LogTag® Analyzer when the min/max values were cleared, but you will not be able to review previous min/max values on screen once they have been cleared.

Reviewing Day Statistics on the Display

Historic day statistics data can be accessed by repeatedly pressing the **REVIEW/MARK** button .

Each of the screens that follow shows:

- the day (relative to today), for which the data is being presented;
- the maximum or minimum temperature on that day;
- an indication which of those (minimum or maximum) is shown;
- a duration, if the temperature was above or below the associated primary threshold; and
- if such a threshold breach resulted in an alarm event.

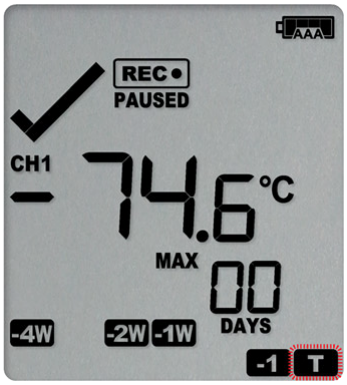
You can review the data regardless of whether the logger is still logging data, or has already stopped.

When you start the review process, the first screen shows the maximum value for “Today”, for the channel that was displayed at the time you started the review process. Pressing the review button again shows the minimum value for "Today", for the same channel. Each time the review button is pressed, you will first see the MAX screen, then the MIN screen for previous days, for the same channel. When the screen with the minimum for "Day -29" has been reached, the next press of the review button shows the initial review screen.

To see the data for the other channel, press the **Channel** button. This will display the MAX screen of the other channel, for the day that you were reviewing. When you now press the review button, you will continue to remain in this channel. It allows you to quickly review all four screens for a single day, for both channels.

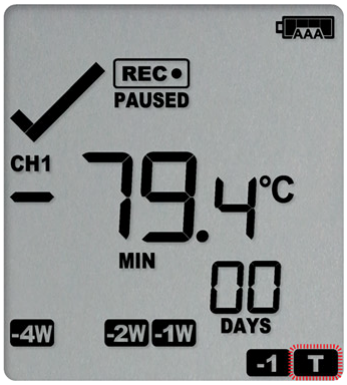
Following are some sample display screens you might see during a statistics review. All display screens are based on the alarm settings made in Alarm Configuration Options on page 16

Today's data



Pressing the button displays the current day's maximum statistic, in this case, the review starts with channel 1:

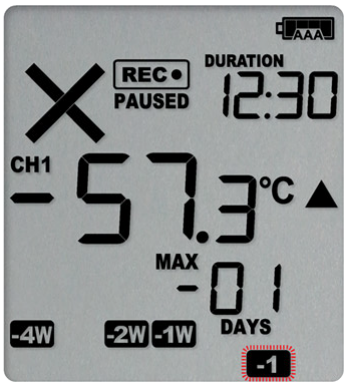
- The Today marker T flashes to indicate that today's data is being displayed.
- Today, no temperature values were recorded above the upper alarm threshold, and no alarm event was generated.
- The maximum temperature recorded today was -74.6 °C.
- The paused function is enabled.



Pressing the button again displays the current day's minimum statistic:

- T still flashes, as the same day's data (today) is being displayed.
- Today, no temperature values were recorded below the lower alarm threshold, and no alarm event was generated.
- The minimum temperature recorded today was -79.4 °C.

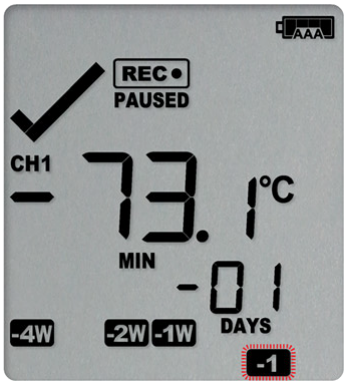
Yesterday's data



Pressing the button now displays yesterday's maximum statistic:

- The -1 marker -1 flashes to indicate that yesterday's data is being displayed.
- Yesterday, recordings above the upper threshold were recorded, indicated by the upper alarm threshold marker ▲.
- The duration value shows the amount of time recorded above the limit yesterday, which was 12 hours 30 minutes.
- An alarm was triggered, indicated by the ×, as this duration was longer than the allowed time above the threshold.
- The maximum temperature recorded yesterday was -57.3 °C.

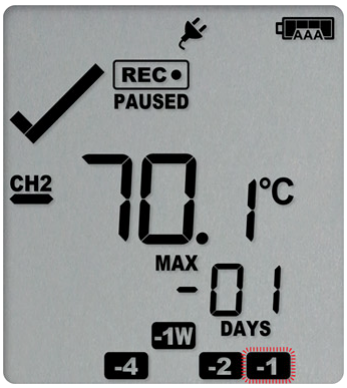
Pressing the button now displays yesterday's minimum statistic:



- -1 flashes, as we are still looking at yesterday's data.
- Yesterday, no temperature values were recorded below the lower alarm threshold. The alarm for the day -1 was generated by the upper alarm, not by the lower alarm, so a ✓ is displayed in the minimum statistics.
- The minimum temperature recorded yesterday was -73.1 °C.

Yesterday's data from the other channel

Pressing the **Channel** button now displays yesterday's maximum statistic from channel 2:



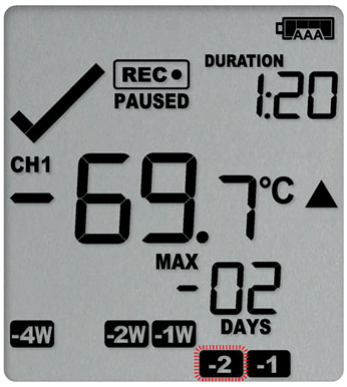
- The -1 marker -1 still flashes to indicate that yesterday's data is being displayed.
- Yesterday, no recordings above the upper threshold were recorded, and no duration value is shown.
- The maximum temperature recorded yesterday was -70.1 °C.

Pressing the button now displays yesterday's minimum statistic from channel 2:

- -1 flashes, as we are still looking at yesterday's data.
- Yesterday, no temperature values were recorded below the lower alarm threshold.
- The minimum temperature recorded yesterday was -75.2 °C.

Pressing the **Channel** button again displays yesterday's maximum statistic from channel 1, with a further press on the button displaying yesterday's minimum statistic from channel 1 once more.

Data from the day before yesterday



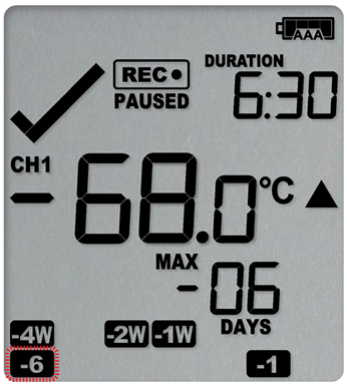
Pressing the button now displays the maximum statistic from two days ago:

- The -2 flashes to indicate that the data being displayed is from two days ago.
- Two days ago recordings above the upper threshold were recorded, indicated by the upper alarm threshold marker ▲.
- The duration was 1 hour 20 minutes, which was shorter than the allowed period, so no alarm event was generated.
- The maximum temperature recorded on the day before yesterday was -69.7 °C.

Pressing the button now displays the minimum statistic from two days ago:

- -2 flashes, as we are still looking at the data from 2 days ago.
- Yesterday, no temperature values were recorded below the lower alarm threshold, and no alarm event was generated.
- The minimum temperature recorded on the day before yesterday was -74.8 °C.

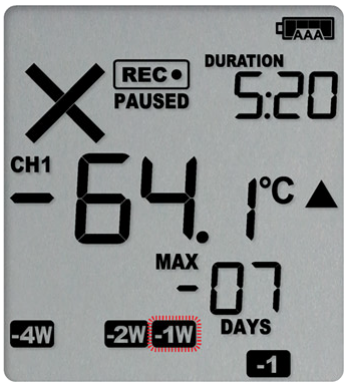
Data from 6 days ago



After pressing the button for a few times (skipping days -3 to -5) the maximum statistic from six days ago is displayed:

- The flashes to indicate that the data being displayed is from six days ago.
- Six days ago, recordings above the upper threshold were recorded, indicated by the upper alarm threshold marker ▲.
- The duration was 6 hour 30 minutes, which was shorter than the allowed period, so no alarm event was generated.
- The maximum temperature recorded six days ago was -68.0 °C.

Data from 7 days ago



After pressing the ⏮ button twice (skipping the minimum statistics for day -6) the maximum statistic from seven days ago is displayed:

- The -1W flashes to indicate that the data being displayed is from seven days ago.
- Seven days ago recordings above the upper threshold were recorded, indicated by the upper alarm threshold marker ▲.
- The duration was 5 hours 20 minutes.
- An alarm event was generated, indicated by the × symbol. Neither duration from day -6 or day -7 alone would cause an alarm event, however the combined duration is 11 hours 50 minutes, which is more than the allowed 10 accumulative hours.
- The maximum temperature recorded seven days ago was -64.1 °C.

Tip: Pressing and holding the ⏮ button will get you back to the previous screen for the same channel, rather than advancing one screen.

Day Alarm Matrix Display while reviewing

During review, symbols marked with ● are shown to indicate for which day review data is being displayed on screen.

	-6	-5	-4	-3	-2	-1	T	-4W	-3W	-2W	-1W
Today							●				
Day -1						●					
Day -2					●						
Day -3				●							
Day -4			●								
Day -5		●									
Day -6	●										
Day -7 (-1 week)											●
Day -8 (-1 week and 1 day)						●					●
Day -9 (-1 week and 2 days)					●						●
Day -10 (-1 week and 3 days)				●							●
Day -11 (-1 week and 4 days)			●								●
Day -12 (-1 week and 5 days)		●									●
Day -13 (-1 week and 6 days)	●										●
Day -14 (-2 weeks)										●	
Day -15 (-2 weeks and 1 day)						●				●	
Day -16 (-2 weeks and 2 days)					●					●	
Day -17 (-2 weeks and 3 days)				●						●	
Day -18 (-2 weeks and 4 days)			●							●	
Day -19 (-2 weeks and 5 days)		●								●	
Day -20 (-2 weeks and 6 days)	●									●	
Day -21 (-3 weeks)									●		
Day -22 (-3 weeks and 1 day)						●			●		
Day -23 (-3 weeks and 2 days)					●				●		
Day -24 (-3 weeks and 3 days)				●					●		
Day -25 (-3 weeks and 4 days)			●						●		
Day -26 (-3 weeks and 5 days)		●							●		
Day -27 (-3 weeks and 6 days)	●								●		
Day -28 (-4 weeks)								●			
Day -29 (-4 weeks and 1 day)						●		●			

Stopping the UTREL30-16

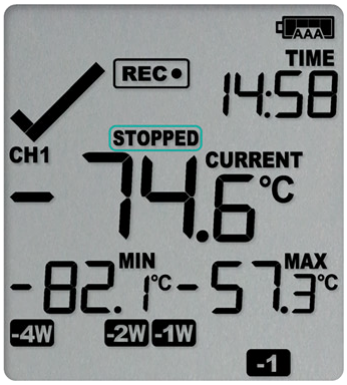
Automatically

The UTREL30-16 automatically stops recording temperature when the maximum number of readings specified during configuration has been reached. Your unit can also be set up to stop automatically when it is downloaded. 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.

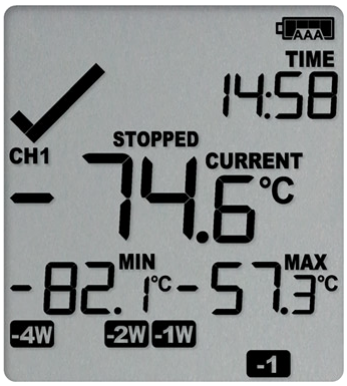
Manually

You can configure a UTREL30-16 so it can be stopped with the **START/CLEAR/STOP** button. This feature is useful when you take the logger 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 Settings tab during configuration. When enabled, following will stop the unit:

Press and hold the **START/CLEAR/STOP** button.
STOPPED is shown in addition to the REC● symbol.



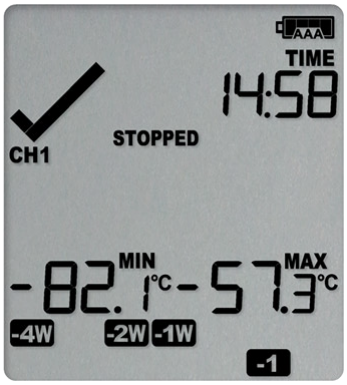
Keep holding the button until the REC● symbol disappears, then release the button within 2 seconds.
STOPPED is shown permanently on the display and the logger will no longer take readings.



The last recorded temperature is now no longer shown, but minimum and maximum trip values remain.

The logger will ***not*** stop if you

- release the button before the REC● symbol disappears; or
- keep holding the button after **STOPPED** remains permanently on until the REC● symbol reappears.



⚠ Once the logger has stopped, the last alarm status before the logger stopped will continue to be indicated with a cross or a tick symbol on the display, for each channel, but the audible alarm and the alarm LED will turn off (see exception below).

⚠ If an ALARM is present (×) and the **Clear alarm by pressing STOP button** function is enabled, you will need to clear the alarm first before you can stop the logger. Please see Clearing an Alarm for more information. In this case, a tick will be shown for the alarm status once the logger has stopped.

Plugging the UTREL30-16 into a USB port

What happens when you plug your UTREL30-16 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

Several drivers will now be installed, depending on the UTREL30-16's configuration.

All drivers are part of the operating system and will typically not require administrator privileges for your computer. During driver installation you will see the familiar Windows notification.

Drivers that are installed may include the following:

- Mass Storage Device Driver
- 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 UTREL30-16 does not generate files.
- 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.
- USB Composite Device Driver

  This driver signals that multiple devices are involved when plugging in a UTREL30-16.

If you have configured the UTREL30-16 to generate files, these will be created every time you plug the logger into the USB port. While the file creation takes place, the display shows **bUSY** instead of the current time.

Once the files are generated, a new drive or mounted device will appear. The device name will be created from the serial number of the UTREL30-16.

If you have disabled file generation during configuration, no drive will appear.

⚠ USB communication can interfere with temperature measurement. While a UTREL30-16 is plugged into a PC's USB port, occasionally a scheduled temperature reading is not taken. The graph will display a gap and the data list will show `---` followed by the `#` symbol. This does not apply when the logger is connected to a USB power supply.

macOS, OSX and 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 UTREL30-16 using either of these operating systems, unless you use virtualization software such as VMWare Fusion, Parallels Desktop or Virtualbox to create a hosted Windows environment. You need to discuss these options with your network administrator. Virtualbox is free, while VMWare and Parallels are offered as paid subscriptions.

Accessing the files

If the logger was configured to generate files, a new drive letter or mounted device will appear. The device name will be created from the serial number of the UTREL30-16. You can access the files by browsing to the newly created drive and double-clicking the PDF, CSV or LTD files:

- If you have selected PDF as one of the files to be generated, you will find a single file with the .pdf extension, containing the data for both channels. For PDF files, you need Adobe Acrobat Reader or a similar PDF viewer.
- If you have selected LTD as one of the file types, you will find a single file with the ltd extension, containing the data for both channels. To open the LTD file you need to install the free LogTag® Analyzer software.
- If you have selected CSV as one of the file types, you will find two files with the *.csv extension, one for each channel. CSV files can be opened with a text editor, or imported into a spreadsheet program such as Microsoft® Excel.

⚠ To retain the logger-generated files, copy them to a permanent storage location on your computer, such as the Documents folder, as they are not automatically copied.

The data on the logger is retained. Each time you plug the UTREL30-16 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. You will, however, still be able to access the last trip's data.

Downloading the UTREL30-16 to LogTag® Analyzer

Occasionally, you will want to download the recorded data to LogTag® Analyzer for additional analysis.

You can either do this by opening the on-board file that was generated when you connected the unit to your PC, or by directly downloading the unit while it is connected to your computer.

> ⚠ Note that LogTag® Analyzer only works on computers using a Windows OS, but not on macOS or Linux.

To view the data on your PC, do the following steps:

- Start LogTag® Analyzer.
- Click **Download** from the **LogTag** menu. The data from the logger is now saved to your computer as a *.ltd, and a chart with the readings will be presented.
- You can switch the way the data is displayed using the tabs at the bottom of the window, upload them to LogTag Online or export the data to different file formats. For more information about using LogTag® Analyzer please see the section about Analyzing Data in the LogTag® Analyzer User Guide.

Re-deploying the UTREL30-16

Once you have finished analyzing the data, re-deploy the logger to the installation site:

- If the logger is already configured for continuous logging, no further configuration is required. If you wish to start a new trip, re-configure the device by following the instructions in the section about Configuring the UTREL30-16 for logging, and treat the logger the same as if it were unconfigured.
- Once the unit is configured, continue the steps in the On-site section of the logger preparation.

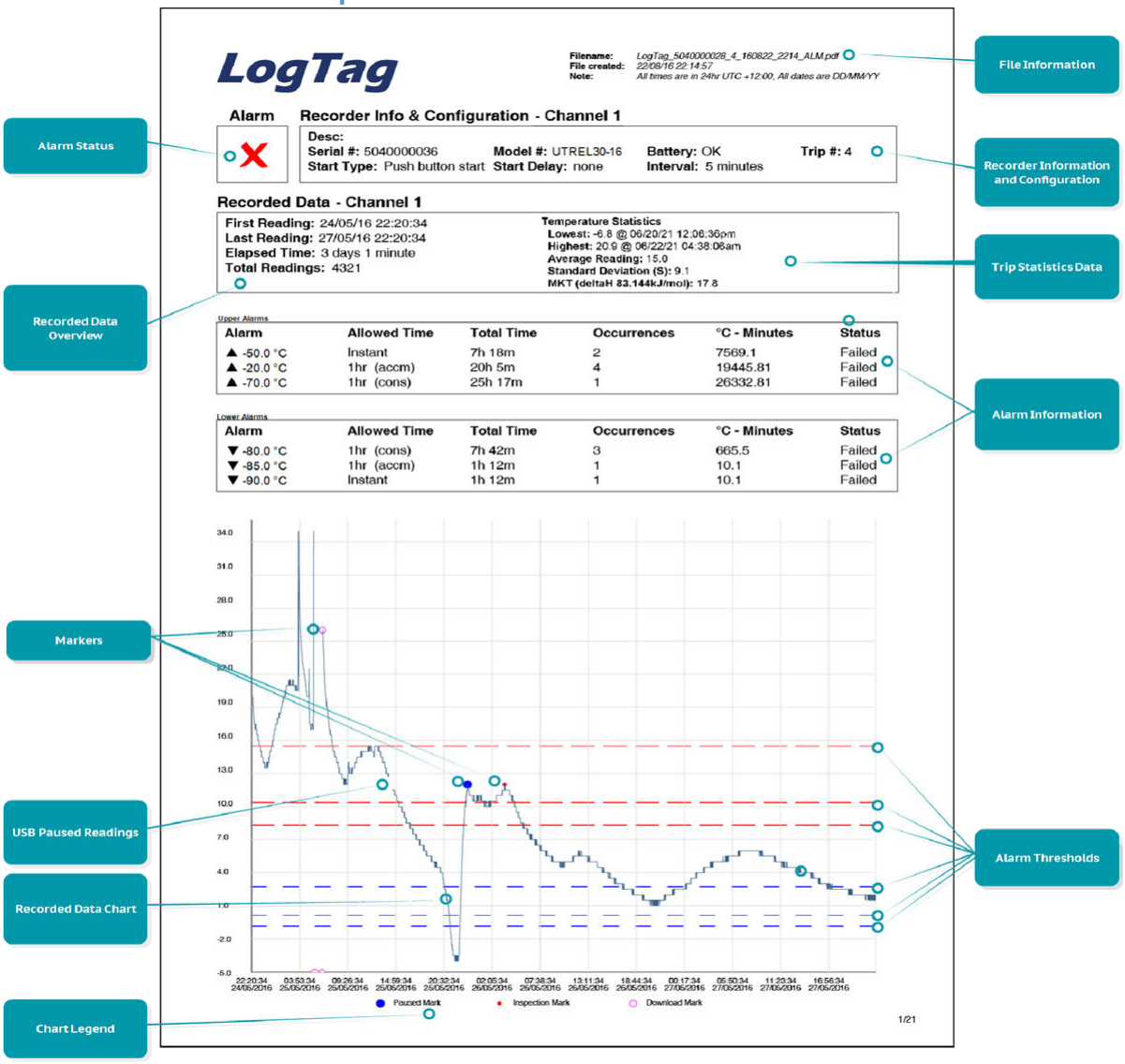
LogTag® Analyzer can be set up so these steps are automated. Please refer to the LogTag® Analyzer User Guide, specifically to the section about Automation.

Interpreting the Data

The PDF contains the combined information for both channels. You will find

- two report pages, each with a chart;
- a single list (if configured), containing a column for each channel; and
- two day summary pages, one for each channel.

Data Evaluation - Report



Alarm Status

This shows at a glance if the UTREL30-16 recorded alarm conditions for this channel during the trip (showing a red ✘) or if no alarms were recorded (showing a green ✔).

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 number, model number, 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. This section is identical for both channels with the exception of the description.

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.

Logger Statistics Overview

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

Upper and Lower Alarm Information

These two sections summarize the alarm trigger conditions and occurrences during the trip:

- 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

You may see up to three alarms for each direction, depending on the logger's configuration.

Recorded Data Chart

The chart shows a graphical representation of the data during the trip. As part of the UTREL30-16 configuration process you set the parameters that influence how the chart is presented.

Markers

On the chart, special symbols will mark the readings at which certain events took place:

- A ᵒ symbol will be shown, if the UTREL30-16 was downloaded with LogTag® Analyzer.
- A • symbol will be shown if an inspection mark was placed with the **REVIEW/MARK** button.
- A • symbol will be shown where a reading could not be taken due to USB communication with a PC.

USB Paused Readings

USB loggers cannot take a reading while plugged into a USB port. A gap is shown in the graph where the UTREL30-16 was plugged in at the time it would otherwise have taken a reading. The list shows `---` instead of the reading.

Probe Disconnected

A gap is shown in the graph where the UTREL30-16's probe was not plugged in at the time it took a reading. The list shows `---` instead of the reading.

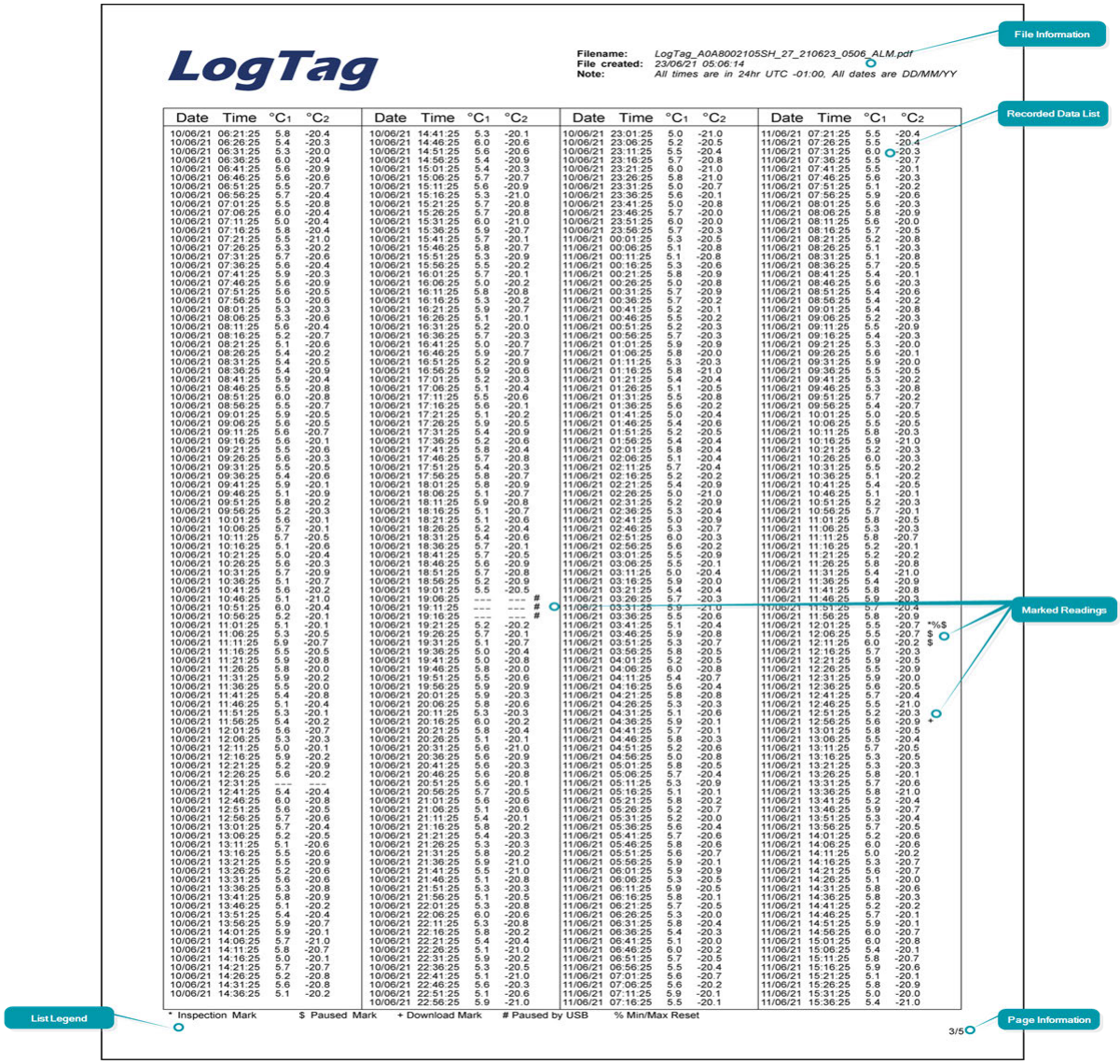
Alarm Thresholds

The alarm thresholds are shown with red and blue dashed lines (`----` for upper, `----` for lower) so you can see at a glance where temperatures went outside these limits.

Legend

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

Data Evaluation - Data List



File Information

The information from the report page is repeated here.

Recorded Data list

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

Marked readings

In the data list, each entry may be marked with one or more of the following symbols:

- A **+** symbol will be shown, if the UTREL30-16 was downloaded with LogTag® Analyzer.
- A ***** symbol will be shown if an inspection mark was placed with the **REVIEW/MARK** button.
- A **$** symbol will be shown when the Paused feature was enabled, and any button was pressed during recording.
- A **#** symbol will be shown where a reading could not be taken due to USB communication with a PC.
- A % symbol will be shown when the min/max readings of either channel were reset. You will need to identify the channel that was reset in the chart.

Symbols are shown against the reading following the event.

Legend

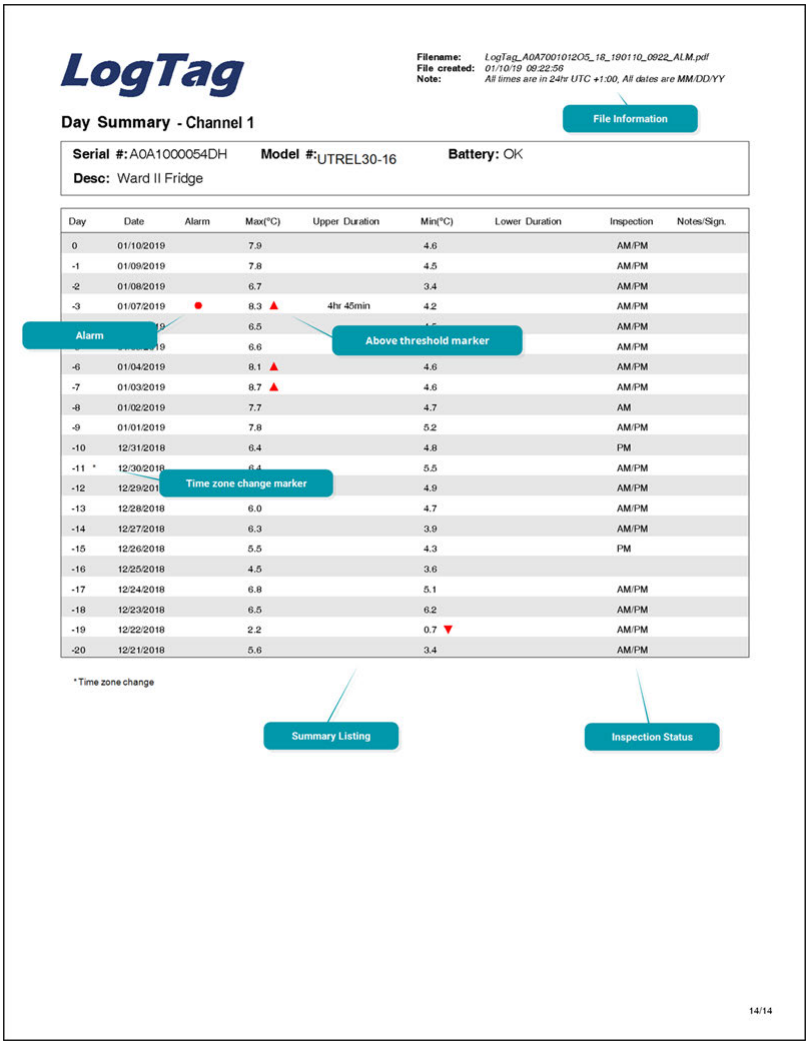
Shows the symbols for **download marks**, **inspections marks** and **paused marks** if they appear in the readings.

Page information

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

Data Evaluation - Day Summary

For each channel, a separate day summary page is included in the PDF.



File Information

The information from the report page is repeated here.

Day Summary

The Day summary shows a single row for each day for which readings were recorded. Each row contains the following information:

- Minimum and maximum for the day
- Whether or not an alarm was recorded for that day
- If the minimum and maximum temperatures were above or below the thresholds
- How long temperatures were outside the specifications (even if no alarm was recorded)
- If the logger was inspected in the morning and in the afternoon

If the clock was adjusted on one of the days, a special marker (*) will be displayed for that day.

Page information

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

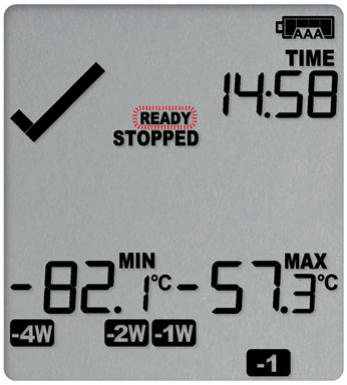
Resetting the Logger

You can reset a UTREL30-16 back to its original **READY** state. Once reset, recording can be started again.

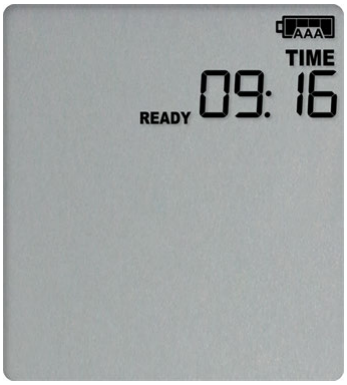
> ⚠ When performing this procedure all recordings and statistics stored in the logger are irrevocably deleted and cannot be recovered. Please ensure your data has been saved!
>
> All configuration settings in the logger are retained.

For this process to work, the logger must be **STOPPED**.

Press and hold the **START**/CLEAR/STOP button. The **READY** symbol will turn on.



When the **STOPPED** symbol turns off, release the button within 2 seconds. The logger is now ready to be started again.



If the button is released while **STOPPED** is still , or you wait until the **READY** symbol disappears, the display shows **STOPPED** again, and the logger remains stopped. This means, the data from the previous trip is still accessible.

The ability to reset a logger is enabled or disabled in the Advanced Settings tab when configuring the UTREL30-16 via LogTag® Analyzer.

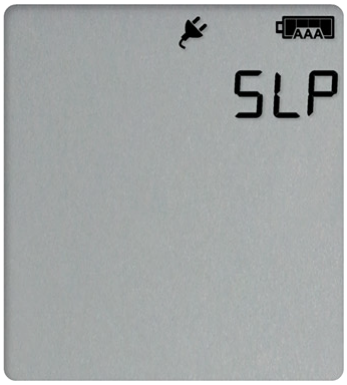
Hibernating a UTREL30-16

When hibernated, the logger's power consumption is near zero. Hibernating a logger is useful for conserving battery life when the logger is not used for extended periods.

If you hibernate the logger for longer than a week, please remove the AAA batteries from the logger to avoid them leaking.

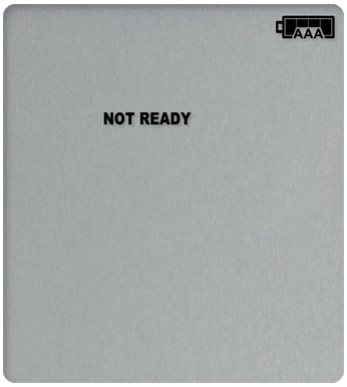
UTREL30-16 loggers are placed into Hibernation using LogTag® Analyzer by clicking **Hibernate** from the **LogTag** menu.

Initially, the display shows SLP on the display until you remove the logger from the USB port.



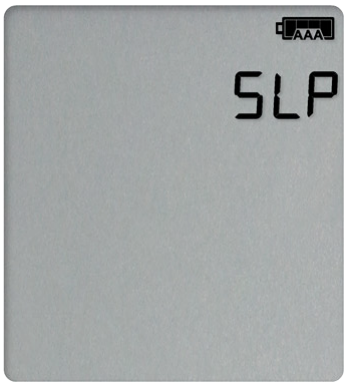
A hibernated logger has no active display, however a button press will wake the logger up briefly. The display will show

- the text **NOT READY**; and
- the battery capacity of the AAA batteries (if the batteries have been removed, the empty symbol AAA will be shown).



After a few seonds SLP will be shown on the display, and the display will turn off.

The logger reverts to being hibernated.



⚠ A hibernated logger cannot be reactivated via the buttons - it must be reconfigured with LogTag® Analyzer.

Replacing the Batteries

When the display shows that the battery is almost empty (

) new batteries should be fitted. Open the case as described in Inserting the Batteries on page 12. Remove the old batteries and complete the remainder of the procedure.

Technical Specifications

Model Number	UTREL30-16
Temperature Sensor Measurement Range	-90 °C to +40 °C (-130 °F to +104 °F)
Operating Temperature Range	-30 °C to +70 °C (-22 °F to +158 °F)
Storage Temperature Range	-10 °C to +40 °C (32 °F to +104 °F)
Ambient humidity range during transport, storage and use	0 to 95 %RH
Rated Temperature Resolution	0.1 °C (0.2 °F) for measurements -85 °C to 0 °C (-121 °F to +32 °F) 0.2 °C (0.4 °F) for measurements 0 °C to +18 °C (+32 °F to +64 °F) and -90 °C to -85 °C (-130 °F to -121 °F) 0.3 °C (0.5 °F) for measurements +18 °C to +30 °C (+64 °F to +86 °F) 0.5 °C (0.9 °F) for measurements +30 °C to +40 °C (+86 °F to +104 °F) Please see resolution chart in Accuracy and ResolutionTemperature Resolution
Rated Temperature Accuracy	Better than ±0.5 °C (±0.9 °F) for -20 °C to +10 °C (-4 °F to 50 °F) Better than ±0.7 °C (±1.3 °F) for -50 °C to -20 °C (-58 °F to -4 °F) and +10 °C to +30 °C (+50 °F to +86 °F) Better than ±1.0 °C (±1.8 °F) for -85 °C to -50 °C (-121 °F +-58 °F) and +30 °C to +40 °C (+86 °F to +104 °F) Better than ±1.8 °C (±3.2 °F) for -90 °C to -85 °C (-130 °F to -121 °F) Please see accuracy chart in Accuracy and Resolution
Probe Connectivity	Up to 2
Probe Compatibility	All ST10 precision thermistor external probes can be interchangeably connected to the UTREL30-16. Please refer to the page for External Probes on the LogTag North America website. Different probe models can be used for each channel. Not compatible with ST100 sensors.
Sensor Technology	Precision electronic thermistor
Sensor Reaction Time	According to Probe. Please refer to the page for External Probes on the LogTag North America website.
Clock accuracy	Quartz crystal-locked real time clock, typical accuracy ±25ppm @ 25 °C (equiv to 2.5 seconds/day) Typical temperature coefficient is -0.034±0.006ppm/°C (i.e. typically +/-0.00294seconds/day/°C)
Recording Capacity	16065 real time temperature values per channel[1], giving • 6 days @ 6 min logging; • 112 days @ 10 min logging; or • 168 days @ 15 min logging Supports continuous logging ("wrap-around") or specific recording period
Statistics memory	For displaying statistics on the LCD • Trip min/max values, per channel • Max/Min values for the past 30 days, per channel • Alarm duration values for the past 30 days, per channel • AM/PM Inspections for the past 30 days, per channel • Total time above/below alarm thresholds, per channel
Memory type	Non volatile
Sampling Interval	Configurable from 30 seconds to 18 hours
Start options	• Push button start with optional configurable start delay from 1 minute to 72 hours • Date/time start up to 180 days in the future

Alarm functions	• Total of 6 alarms per channel
	  • Up to 5 configurable upper alarms
	  • Up to 5 configurable lower alarms
	• ✕ indicator on display, linked to alarms
	• Alarm arrows linked to thresholds
	• Red Alert LED
	• Audible alarm

Vibration	Withstands vibration specification as detailed in EN12830:2018

[1] Recording capacity is independent of the number of active channels

Shock	• Withstands shock specification as detailed in EN12830:2018 • Withstands 5 drops from 1m onto smooth concrete floor without loss of function or calibration
EMC compliance	• EC EMC directives for Emission (IEC/CISPR 32: 2015) • RTCA DO-160G:2010, section 21 • Electrostatic discharge/Immunity (IEC/CISPR 24 Ed. 2.1: 2015) • Complies with FCC Part 15 Subparts A and B
Environmental	IEC 60529: IP61 with USB cap fitted and hung vertically
Case Material	Polycarbonate, with ABS clear window
Power source	• 2 x 1.5V AAA alkaline batteries, user replaceable • 1 x 5V power input from commercial 5V USB power supply with Micro-USB plug (optional) • 1 x CR2032 3V Li-MnO_2 coin cell backup battery, non-user replaceable, non-rechargeable
Battery life	• AAA batteries Up to 12 month if the unit is operated without power supply, provided that a normal use pattern is followed (6 minute logging, statistics reviewed on the display no more than once daily for no longer than 30 seconds each time, download data monthly) and the unit is kept within the storage temperature range • CR2032 Up to 10 years , provided the unit is operated permanently from AAA batteries or external power[2]
Size	141 mm (H) x 72 mm (W) x 18 mm (T)
Weight (without probe)	132 g without batteries, approx. 156 g with 2 x AAA batteries
Calibration	Factory calibration using instruments traceable to an ISO/IEC 17025 accredited testing laboratory
PDF features	• compliant with standard 1.6 and later • Single page report with trip and alarm summary • Single page day summary with Min/Max report • Multi page report with list of readings including date/time
Download time	• Typically with full memory (16065 readings) less than 30 seconds from time of insertion to availability of PDF report. • Typically less than 10 seconds from time of insertion to availability of LTD file in LogTag® Analyzer (if configured)
Software requirements	• LogTag® Analyzer version 3.1r12 or later to configure and download • PDF reader software to access onboard PDF files
USB compatibility	USB 2.0, micro USB plug
Accessories	• Wall holder • Silica sand buffer

[2] The audible alarm reduces battery life.

Appendix 1 - Accuracy and Resolution

Temperature Accuracy

The following graph shows the typical rated temperature accuracy of a UTREL30-16, for either channel:

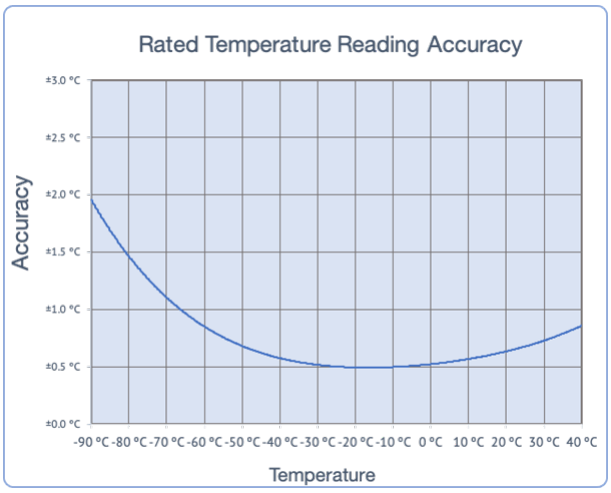


Figure 6: *Rated Temperature Accuracy Chart*

Temperature Resolution

The following graph shows the typical rated native temperature resolution of a UTREL30-16, for either channel:

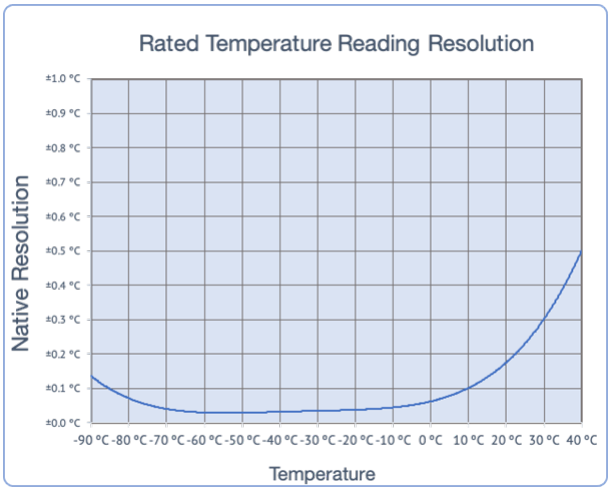


Figure 7: *Rated Temperature Resolution Chart*

Appendix 2 - Glossary

A

Accumulative Alarm
Temperature or humidity readings are above or below the configured threshold for the total of time defined, but readings may not necessarily be sequential.

Active Alarm
An Alarm/Alert that has triggered, but has not been cleared.

Active Alert
An Alarm/Alert that has triggered, but has not been cleared.

Alarm
An alarm is an automatically generated event warning a user that environmental conditions are no longer deemed safe for the monitored location. Alarms are generated by the device based on alarm trigger conditions, such as thresholds, direction and delays. If an alarm trigger condition is met, the device displays an alert and the software reports an alarm event has taken place.

Alarm Activation Delay
This value is used for consecutive and accumulative alarms and defines the number of recorded values that need to be alarm readings for the trigger condition to be met.

Alarm Event
Single occurrence of an alarm

Alarm Range
Temperature/humidity range that is outside the -> Non-Alarm range

Alarm Reading
Temperature or Humidity value that lies above the upper or below the lower alarm threshold value

Alarm Threshold Value
The temperature or humidity value at which a reading is regarded as an alarm reading. This can be an upper threshold or a lower threshold

Alarm Trigger Condition
Set of conditions that cause an alarm to be triggered. This requires a -> threshold value, a -> direction, an -> activation type and a -> delay value.

Alarm Trigger Time
The time at which all conditions of an alarm were met

Alarm triggered

One of the alarm trigger conditions has been met, the device displays an alert and the software reports an alarm event has taken place.

Alert

Visual or audible representation of an alarm on a device

C

Consecutive Alarm

Temperature or Humidity readings are above or below the configured threshold for the time defined without interruption.

Cumulative Alarm

Temperature or humidity readings are above or below the configured threshold for the total of time defined, but readings may not necessarily be sequential.

D

Delay Value

Number of logs that have to be in an -> alarm range to trigger an alarm event

Direction

Whether an alarm is a lower or upper alarm

I

Inspection

Pressing the Mark button on a logging device

Inspection Event

Pressing the Mark button on a logging device

Instant Alarm

One single temperature or humidity reading is above or below the configured threshold.

L

Latched Alert

An Alert that remains active even if the alarm trigger conditions are no longer met

Lower Alarm

An alarm is called a lower alarm if the alarm trigger condition requires readings to go below a low threshold temperature.

Lower Alarm Threshold

If a recorded temperature or humidity value is equal to or below this value it is regarded to be an alarm reading.

N

Non-Alarm Range

Target temperature/humidity range where the readings are regarded as acceptable/within specification

Non-Alert Range

Target temperature/humidity range where the readings are regarded as acceptable/within specification

P

Primary Alarm

The alarm threshold closest to the non-alarm range in a multi-alarm device

S

Secondary Alarm

The alarm threshold second closest to the non-alarm range

Single Event Alarm

Temperature or Humidity readings are above or below the configured threshold for the time defined without interruption.

T

Tertiary Alarm

The alarm threshold third closest to the non-alarm range

Trip

Readings taken sequentially from starting a unit until it has been re-configured or stopped.

Trip number

The number of times a unit has been started.

U

Upper Alarm

An alarm is called an Upper Alarm if the alarm trigger condition requires readings to exceed an upper threshold temperature/humidity.

Upper Alarm Threshold

If a recorded temperature or humidity value is equal to or above this value it is regarded to be an alarm reading.