



TREL30-16

Ultra-Low
Temperature
Recorder with
Display

Product User Guide

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Document Release Version: 1.0
Published 27. February 2019
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Safety Information

The TREL30-16 temperature logger contains a user-replaceable Lithium Battery. When the battery indicates "LOW", you can replace it as per the instructions in [Appendix 1 - Battery Replacement on page 30](#). The empty battery should be recycled or disposed of according to your local regulations.

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

Keep out of the reach of children.



Liability

LogTag Recorders' standard warranty terms apply. A copy can be requested by emailing support@logtagrecorders.com. In addition, LogTag Recorders shall not be held liable:

- If the device was used beyond LogTag Recorders' 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.
- For consequential loss.

Battery Life

The main battery in the TREL30-16 is designed to power the device for up to 12 months, provided ...

- ... a fresh battery from a reputable manufacturer is used,
- ... the device is not downloaded excessively (more than once a week),
- ... the recording interval is not shorter than 5 minutes,
- ... the acoustic alarm is not active over long periods
- ... the device is stored and operated according to LogTag Recorders' recommendations.

Disclaimer

The TREL30-16 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 TREL30-16.

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® TREL30-16 low temperature logger features a data logging memory storing up to 15,905 temperature readings 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 temperature of the most recent reading, whether or not this is within or outside the acceptance range, an alarm trigger summary of the last 30 days (today and 29 days previous), the current time and battery status.

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

Logged temperature data can be downloaded via a standard LogTag® Interface 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.

Features

The TREL30-16 temperature logger features the familiar LogTag® case layout.



Figure 1: TREL30-16 features

Case

- Mounting lug for secure fastening of logger to fixtures
- Gold-plated, high-quality temperature sensor socket
- Robust polycarbonate case, IP64
- Durable communications contacts

Buttons

- **START/CLEAR/STOP** button; can be used to start and stop the unit or to clear an alarm. It is also used to exit the statistics review.
- **REVIEW/MARK** button; can be used to enter the statistics review and to scroll through the statistical data directly on the display. It is also used to place an inspection mark in the data listing.

Display

The display shows 'at a glance' if alarm events have occurred for both the current day and up to 29 days in the past. Details of any alarm event can be checked directly on the unit by inspecting the statistics history on the logger's display or in more detail by downloading the logged data.

Sensors

The TREL30-16 will accept any sensor from the ST10 product range.

What You Need

Required Equipment

In addition to your LogTag[®] TREL30-16 temperature logger you will need the following items:

- A USB interface for communication to the PC
- An external probe of the ST10 series
- For configuration - a PC running Windows 7 or later and LogTag[®] Analyzer installed.

Optional Items

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

- A wallmount bracket, which can be used, for example, to attach the TREL30-16 to the side of a cabinet.



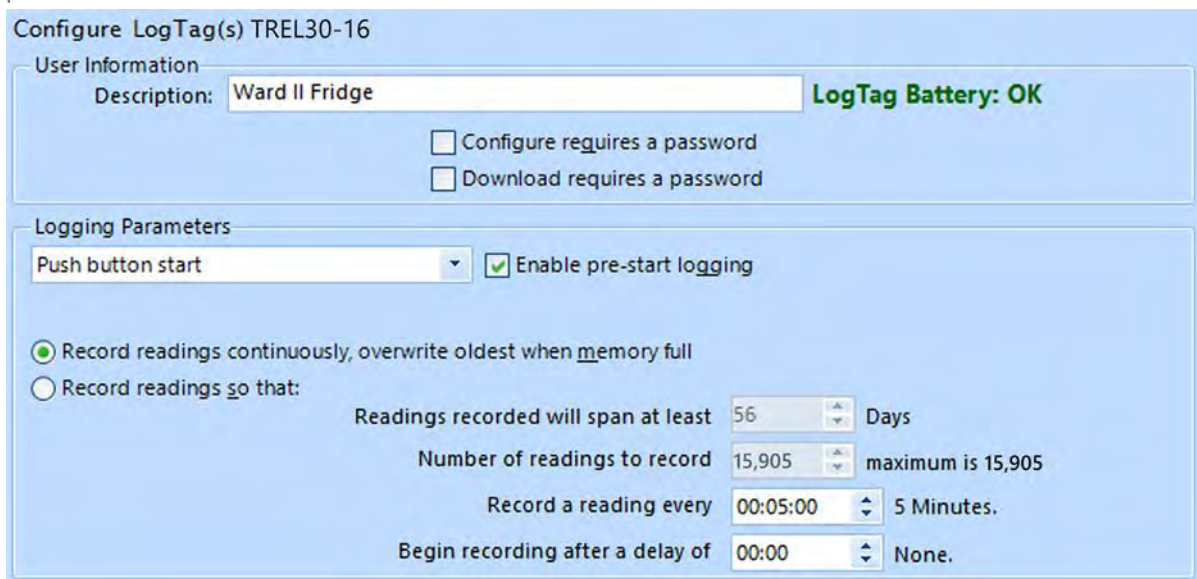
Configuring the TREL30-16

Before a TREL30-16 logger can be used, it must be configured with the parameters required for starting and recording temperature values. This is done using LogTag[®] Analyzer software, which is also used for downloading and analyzing data.

- Start the LogTag[®] Analyzer software.
- Plug a LogTag[®] interface cradle into a USB port and wait for the drivers to be installed. You can use more than one cradle to configure multiple devices at the same time, however it is practical to limit the number of units to about 6, using a powered USB hub.
- Insert the TREL30-16 into the interface with the three contacts towards the back until it clicks in place.
- Select **LogTag - Configure**; LogTag[®] Analyzer will display the configuration options for any connected TREL30-16 loggers.

Standard Configuration Options

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



Configure LogTag(s) TREL30-16

User Information

Description: **LogTag Battery: OK**

Configure requires a password

Download requires a password

Logging Parameters

Enable pre-start logging

Record readings continuously, overwrite oldest when memory full

Record readings go that:

Readings recorded will span at least Days

Number of readings to record maximum is 15,905

Record a reading every 5 Minutes.

Begin recording after a delay of None.

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.

TREL30-16 Start Options

During configuration with LogTag[®] Analyzer you can decide when the TREL30-16 starts taking temperature readings.

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

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

- If you configure the TREL30-16 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. It will, however, continue to take pre-start readings, if enabled.

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

Audible Alarm

The TREL30-16 is fitted with a buzzer, which can be turned on when an alarm event has been registered to provide extra feedback. This function is enabled or disabled 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. To preserve battery life, the interval at which the alarm sounds will increase to 8 seconds when the clock passes midnight after the initial 24 hour period (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 again, the interval changes to 12 seconds. It will remain at 12 seconds until the alarm is cleared, the unit stops or is re-configured.



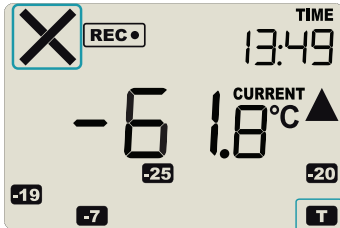
Note: The interval will increase, even if the alarm is re-triggered!
Please see more information about



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

Alarm Configuration Options

The TREL30-16 can display an alarm if either of the configured alarm trigger conditions have been met. This is indicated on the display by showing the Alarm Indicator (X) and the Day Alarm Marker for today (T).



Each alarm trigger condition consists of a threshold temperature value, an activation type (which can be instant, consecutive or accumulative¹) 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 configured in the Alarm Settings tab during configuration of the logger with LogTag[®] Analyzer.

The screen shows an example where:

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

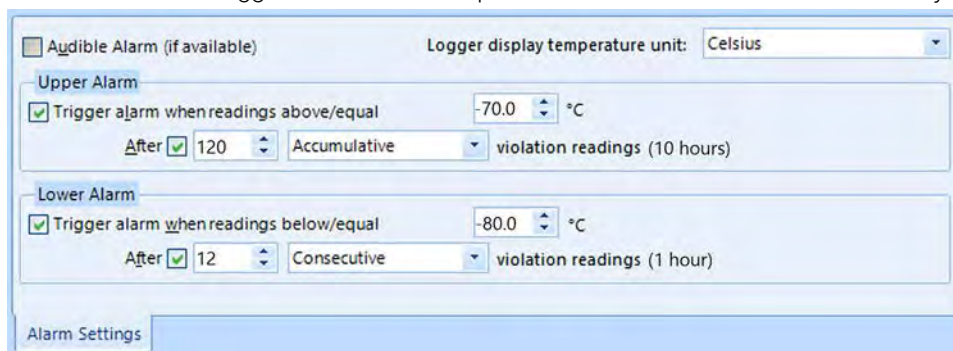


Figure 2: Sample Alarm Configuration Settings for the TREL30-16

Once an alarm has triggered, the alarm indicator (X) remains shown until the alarm is cleared (see [Clearing an Alarm on page 17](#)) 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 (T) 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.



Note: As soon as an alarm is triggered, the corresponding delay time (but not any others) resets to zero and 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 (X) 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.**

1

- 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.

Advanced Configuration Options

Select **Advanced Options** for additional configuration settings. These settings decide how some of the elements are displayed on the screen and set certain options specific to the TREL30-16.

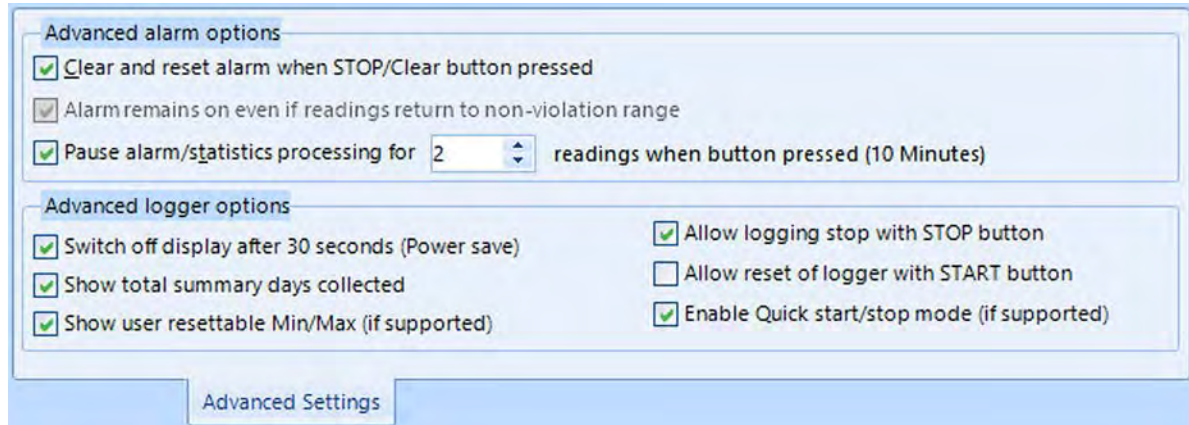


Figure 3: TREL30-16 advanced configuration screen

Parameters that influence the appearance of the display are

- Pause alarm/statistics processing (see [Paused Readings on page 17](#))
- Temperature display unit (see [Display Overview on page 10](#))
- Switch off display after 30 seconds (Power save, see [Power Save on page 18](#))
- showing the number of days on the display, for which statistical data have been collected (see [Total Number of Days Statistics Collected on page 19](#))

Parameters influencing specific behaviour of the TREL30-16 are

- clear and reset alarm 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
- enable or disable the quick start/stop mode (please see [Push button start on page 13](#) and [Push button start, quickstart disabled on page 14](#)).

Enter the desired options and click **OK** to accept the new values. This returns you to the standard configuration dialogue.

Display Overview

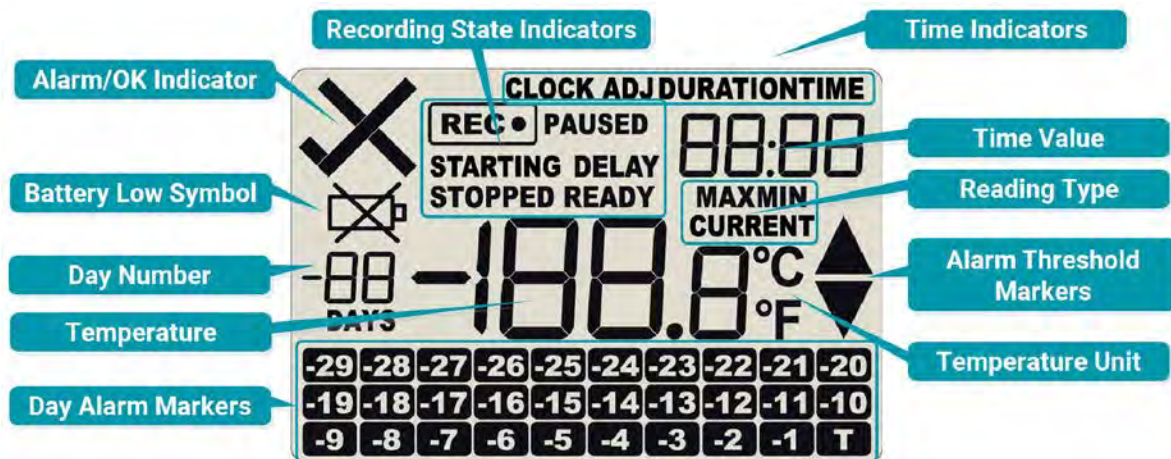


Figure 4: Display Overview with all segments turned on

Day Alarm Markers

This grid shows 3 rows of 10 markers, named **Today (T)** to **Day -29 (-29)**, which are switched on when an alarm event occurred on that day.


Temperature

This shows the last recorded temperature while the TREL30-16 is recording. Once the logger has stopped, nothing will be displayed.

Day Number

During Review, this shows the day number of the currently displayed day statistic. Today is **00 DAYS**, days in the past are represented between yesterday **-01 DAYS** and **-29 DAYS**. During configuration of the logger in LogTag[®] Analyzer you can also enable this to show the total number of days on which data were collected while recording.

Battery Low

A battery test is performed hourly. The battery low symbol  will appear if the TREL30-16's battery is low and requires changing. Please follow the instructions provided in [Appendix 1 - Battery Replacement on page 30](#). If the symbol is not shown while the display is turned on, the battery is still OK.

ALARM/OK indicator

The **X** symbol is shown as soon as the TREL30-16 has registered an alarm event. If no alarms have been registered, or if an existing alarm has been cleared, the **✓** symbol is shown.

Recording state indicators

The recording state indicators show if the TREL30-16 is currently recording data.

- If the **READY** symbol is shown, the TREL30-16 is ready to be started. Depending on the configuration it may already record pre-start readings.
- If the **STARTING** symbol is shown, the logger has been configured with a start delay. The word **DELAY** is also shown, together with the time in hours and minutes until the start.
- If the **REC•** symbol is shown, the TREL30-16 is recording temperatures at the sample interval defined during configuration with LogTag[®] Analyzer.
- If **REC•** is shown together with the word **PAUSED**, the product is also recording, but the recorded values are not taken into account when calculating alarm events and durations.
- If the word **STOPPED** is shown, the TREL30-16 has finished recording temperature data.

Time Value and Time Indicators

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

- a clock with the current time,
- time remaining to start of logging with a delayed start or
- duration, for example of an alarm.

The time indicators identify, which of those is displayed:

- If the word **TIME** is shown, the time value represents the current time in hours and minutes (24- hour format).
- If the word **DELAY** is shown, the time value represents a start delay in hours and minutes.
- If the word **DURATION** is shown, the time value represents the length of time in hours and minutes an alarm threshold was exceeded, for example the time above the upper alarm threshold.

The word **dt5t** 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.

Alarm Threshold Markers

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

Temperature Units

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

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). This is the primary function of the display clock.

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. Please note, however, that the PDF's time zone has to be set at configuration and cannot be changed after the logger has been downloaded.


Adjusting the Display Clock

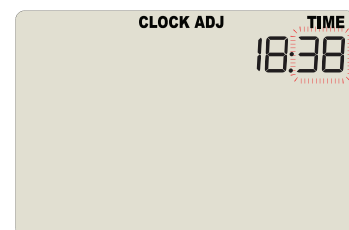
The display clock of the logger can be set to the current local time, either by using LogTag[®] Analyzer software or directly on the unit, using the buttons.


To set the clock, press and hold the  button, then press and hold the  button. Keep holding both buttons together continuously for a period of 8 seconds. **Press the buttons firmly!**


During this period the **CLOCKADJ** icon flashes. Release the buttons when the flashing stops. The clock can now be adjusted.

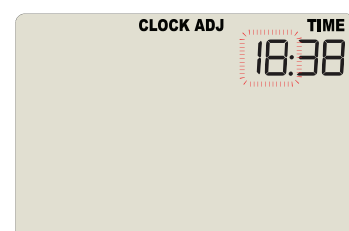
Initially, the minutes digits flash.


Press the  button to increment the minutes digit (once it reaches 59 it rolls back to 00 on the next press).



Accept the minutes value by pressing . The hours value now flashes.

Press the  button to increment the hours digits (once it reaches 23 it rolls back to 00 on the next press).



Accept the hours value by pressing . The new clock value is now stored, and the display shows the normal screen.



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.



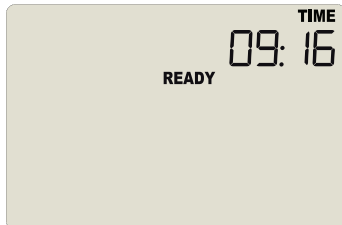
If a display clock adjustment is made while in RECORDING mode, the next log taken will be identified in the downloaded data with a time change mark.

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

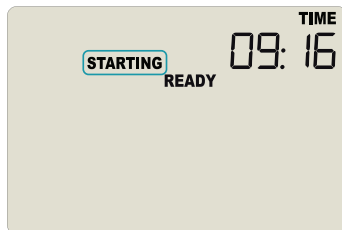
Starting the Logger

Push button start

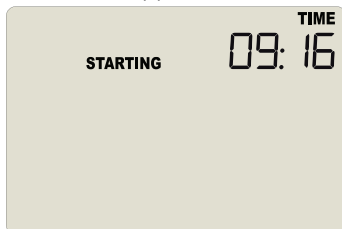
The logger must be in **READY** mode for it to be started. Current time and the **READY** symbol are shown.



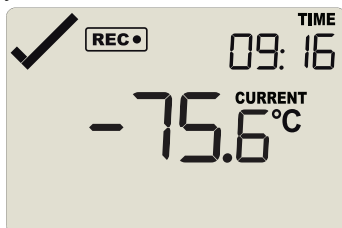
Press and hold the **START/CLEAR/STOP** button. First, **STARTING** is shown in addition to **READY**:



Then **READY** disappears:



Once **READY** disappears, release the button within two seconds. **STARTING** will also disappear, and the **REC•** symbol will be shown. The TREL30-16 now records temperature data.

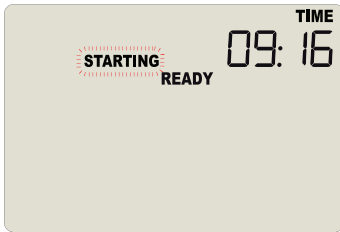


The logger will *not* start if you...

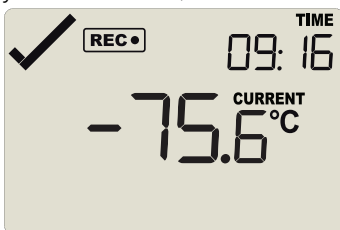
- ... release the button before **READY** disappears
- ... keep holding the button for more than 2 seconds after **READY** disappears.

Push button start, quickstart disabled

Again, the logger must be in **READY** mode for it to be started.



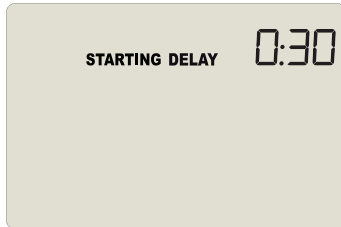
Press and hold the **START/CLEAR/STOP** button. The **STARTING** symbol starts flashing for about 4 seconds. Then the symbol remains on permanently for 2 seconds. If you release the button during this time, The **REC** symbol is shown, the **STARTING** symbol turns off and the logger starts taking temperature readings.



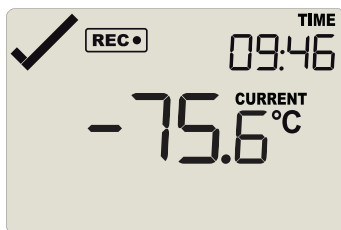
If the button is released earlier than 4 seconds or later than 6 seconds, the display shows **READY** again, and the logger does not start.

Push Button Start with Start Delay

If the logger has been configured for push button start with a start delay (regardless of quickstart settings), the word **DELAY** is shown instead of the **REC** symbol.

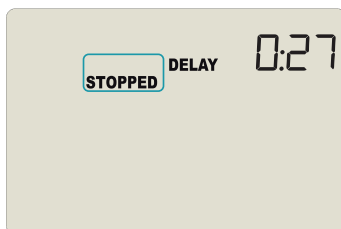


The delay time is shown in hours and minutes. The time counts down and the TREL30-16 starts recording when it reaches **0:00**.



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.



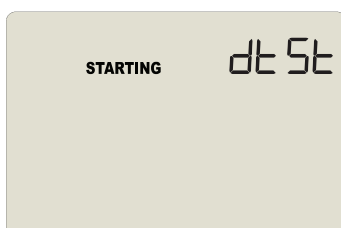
STOPPED and **DELAY** will both disappear, and **READY** will show, together with the current time, and the logger can now be started again as normal.

The TREL30-16 will *not* be reset if you ...

- ... release the button before **STARTING** disappears, or
- ... if you keep holding the button until **STOPPED** disappears.

Automatic date/time start

If you configured the TREL30-16 for a date/time start, it will start recording temperature values as soon as the entered start time is reached. The logger will display the following if a Date/Time Start has been chosen:



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

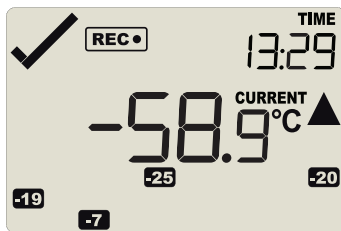
During Recording

During normal operation the display shows the most recently recorded temperature. This temperature is updated at the same rate as the logging interval. The current time is also displayed (in 24 hour format). If an alarm event is registered, .

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

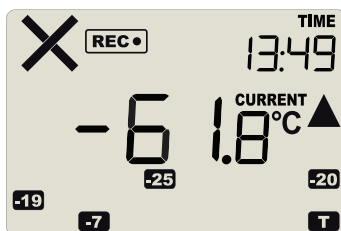
Following are some sample display screens:

At 1:29 pm the display shows the following:



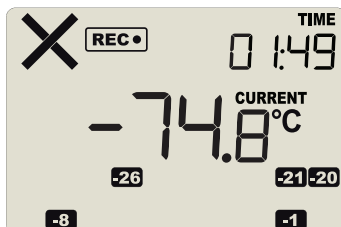
- Alarm events were recorded 7, 19, 20 & 25 days ago
- These alarms were cleared by an inspector, as the display currently shows the OK tick (✓).
- The current temperature is over the upper alarm threshold, as indicated by the upper alarm marker (▲).
- the duration, however, of this temperature excursion has not yet triggered an alarm

At 1:49pm (20 minutes later) the display shows the following:



- The temperature has remained above the upper alarm threshold and has now triggered an alarm event.
- The alarm symbol x 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).

Marking a reading with an inspection mark

When you press the button, the next reading taken by the TREL30-16 will be identified in the downloaded data with an inspection mark.

Clearing an Alarm

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

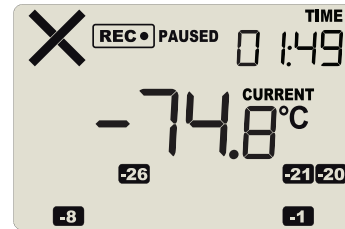
This display screen shows an existing alarm that occurred yesterday, but has not yet been cleared.

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

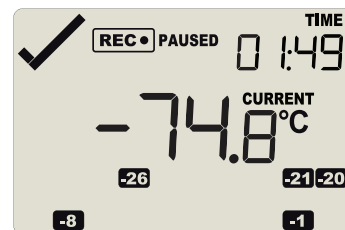
If the quickstart option is disabled, the **x** symbol will flash for approx. 6 seconds. When the **x** symbol remains permanently on, release the button within 2 seconds. The **x** symbol now turns off, and the alarm is cleared.

The alarm will **not** be cleared if you ...

- ... release the button before the **x** symbol remains permanently on, or
- ... if you keep holding the button after the **x** symbol remains permanently on for more than 2 seconds.



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 below](#).



Note: Only the Alarm Indicator (**x**) 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 TREL30-16 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 labelled as **paused**, and their value is ignored when determining alarm trigger conditions, minimum/maximum values and other statistical calculations.



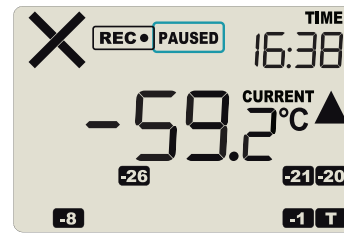
This function is useful, for example, when you wish to temporarily remove the sensor from the monitored location to inspect goods, but you do not wish to trigger an alarm due to your handling.

It also allows the logger to acclimatise to the environmental conditions again, before further readings are processed.

After a button press the display shows the word **PAUSED** next to the **REC** symbol.

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.



PAUSED will turn off as soon as the last ignored reading has been recorded. It will show longer, if your last button press was just after the logger took a temperature reading, but will be displayed for a shorter period if you pressed the button just before a reading is taken. For example, if you configure a logging interval of 10 minutes and 2 paused readings, the time for **PAUSED** to show could be as short as 10 minutes, but as long as 20 minutes.

Sensor is disconnected

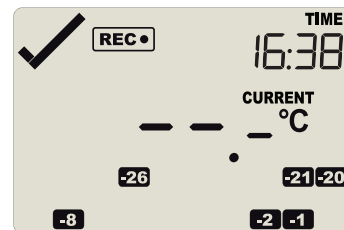
The display shows **--.-**, if the external sensor of the TREL30-16 is disconnected. This function is useful if the sensor is permanently mounted, but you wish to take the TREL30-16 to a computer for downloading its data.

Any values recorded during the time the sensor is disconnected will not be taken into account when calculating statistics values or alarms.

If, for example, the temperature was above 10 °C for 12 hours (which would normally trigger an alarm event), but the sensor was disconnected for 3 hours during this time, no alarm would be generated.

, any readings taken while the sensor is disconnected are shown as **--.-** in the data list. The graph will show a gap during this period.

If the sensor was disconnected for a complete day, the minimum and maximum statistics for that day will show **--.-** on the display and **--.-** on 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.

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 TREL30-16 via LogTag[®] Analyzer in the [Advanced Settings](#) tab.

Total Number of Days Statistics Collected

The logger can be configured to show the total number of days for which statistics data was collected. This feature is enabled when configuring the TREL30-16 via LogTag[®] Analyzer and can be located in the **Advanced Options** dialogue (see [Advanced Configuration Options on page 9](#)).

When enabled, the total number of days for which statistics data was collected are shown on both the **Recording Display** and the **Stopped Display**.

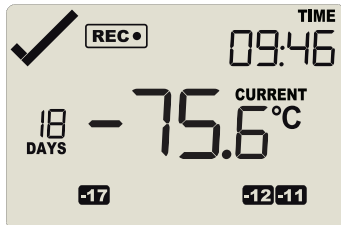


Figure 5: TREL30-16 recording, showing '18' days of data has been collected.

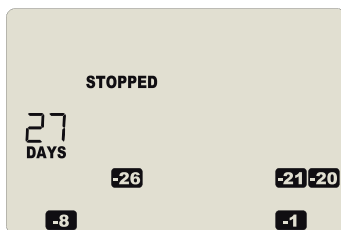


Figure 6: TREL30-16 stopped, showing '27' days of data has been collected.



Note, this is not always the number of days the logger has collected data. Depending on the sampling interval the logger can hold more than 30 days of temperature readings, but since the maximum number of days for which statistics can be collected is 30, the highest number that can be shown here is 30.

Reviewing Day Statistics directly on the TREL30-16

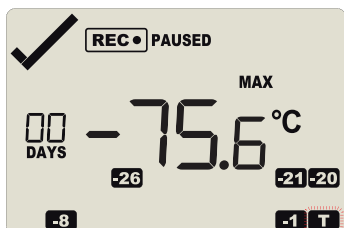
The review of day statistics history is accessed by pressing the **REVIEW/MARK** button .

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


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 8](#):

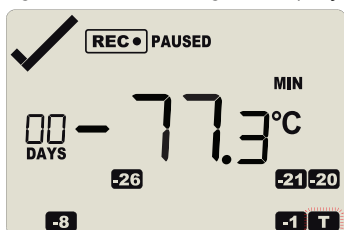
Today's data

Pressing the  button displays the current day's maximum statistic:



- The Today marker **T** flashes and **00 DAYS** is shown to indicate that today's data are 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 -75.6 °C.
- The paused function is enabled

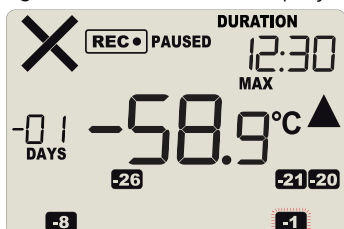
Pressing the  button again displays the current day's minimum statistic:



- **T** still flashes and **00 DAYS** is still shown, 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 -77.3 °C.

Yesterday's data

Pressing the  button now displays yesterday's maximum statistic:



- The -1 marker **-1** flashes and **-01 DAYS** is shown 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 **x**, as this duration was longer than the allowed time above the threshold
- The maximum temperature recorded yesterday was -58.9 °C.

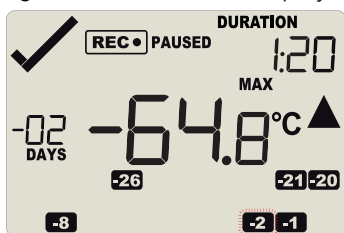
Pressing the  button now displays yesterday's minimum statistic:



- **-1** still flashes and **-01 DAYS** still shows, 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 .
- The minimum temperature recorded yesterday was -74.8 °C.

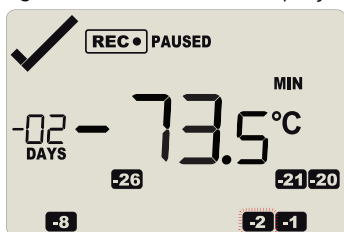
Data from the day before yesterday

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




- The **-2** flashes and **-02 DAYS** is shown 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 -64.8 °C.

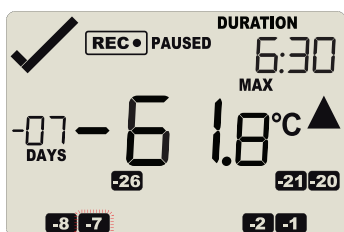
Pressing the  button now displays the minimum statistic from two days ago:



- **-2** still flashes and **-02 DAYS** still shows, 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 -73.5 °C.


Data from 7 days ago

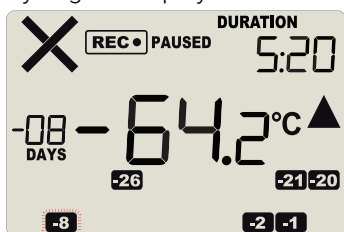
After pressing the  button for a few times (skipping days -3 to -6) the maximum statistic from seven days ago is displayed:



- The flashes and **-07 DAYS** is shown 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 6 hour 30 minutes, which was shorter than the allowed period, so no alarm event was generated
- The maximum temperature recorded seven days ago was -61.8 °C.


Data from 8 days ago

After pressing the  button twice (skipping the minimum statistics for day -7) the maximum statistic from eight days ago is displayed:




- The flashes and **-08 DAYS** is shown to indicate that the data being displayed is from eight days ago.
- Eight days ago recordings above the upper threshold were recorded, indicated by the upper alarm threshold marker
- The duration was 5 hour 30 minutes
- An alarm event was generated **x**. Neither duration from day -7 or -8 by itself would cause an alarm event, however the combined duration is 10 hours 50 minutes, which is more than the allowed 10 accumulative hours.
- The maximum temperature recorded eight days ago was -64.2 °C.

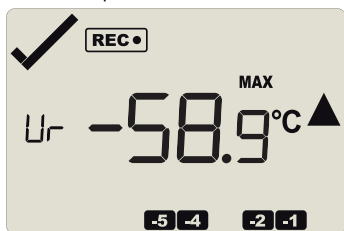



Tip: Pressing and holding the  button will get you back to the previous screen, rather than advancing one screen.

Trip Minimum/Maximum Temperatures


You can configure the TREL30-16 so it tracks the minimum and maximum temperatures since it started logging. This feature needs to be enabled during configuration of the logger in the [Advanced Configuration Options on page 9](#). Once enabled, the minimum and maximum values will be shown when the [statistics data](#) are reviewed, before any of the day statistic are shown.

Press the **REVIEW/MARK** button . Instead of today's statistic data, the first screen shows the maximum temperature recorded during the trip to date, identified by the symbol **Ur** (User resettable):



Pressing the **REVIEW/MARK** button  again shows a screen with the minimum temperature recorded during the trip to date.



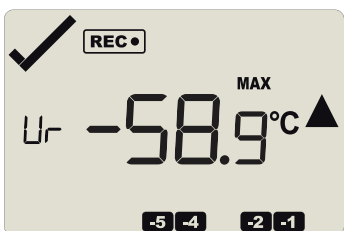
Pressing the **REVIEW/MARK** button  again will then show the first day summary screen, and you can continue to review the remaining screens.

Resetting the Trip Minimum/Maximum Temperatures

The currently stored Min/Max temperature values can be reset at any time while the unit is recording, but not once the unit has been stopped.


To reset the values, follow this procedure:

- press **REVIEW/MARK** to display the trip maximum value

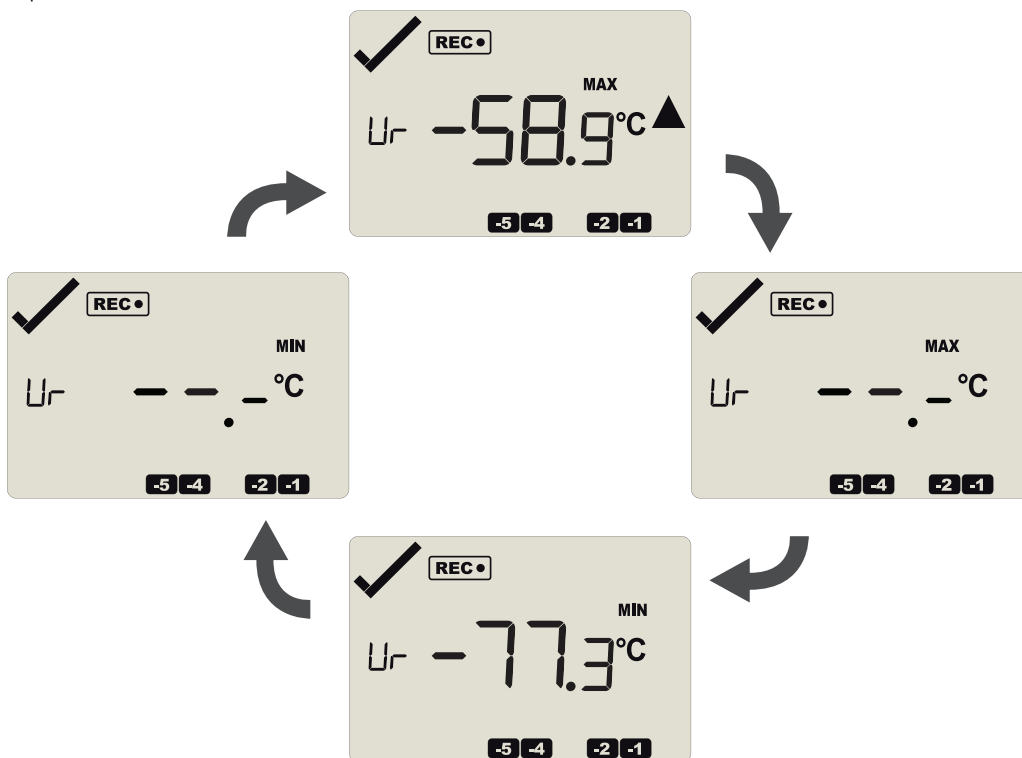


- press **REVIEW/MARK** again to display the trip minimum value



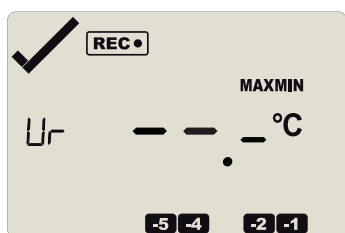
 You can only complete the next steps if you are viewing the Minimum temperature screen!

- press and hold **REVIEW/MARK** . After 1 second the following screen sequence will show, and then repeat:



During the cycle, the buzzer will sound a series of short beeps.

- After approx. 6 seconds, following screen will show:



Release the **REVIEW/MARK** button within 2 seconds. The values will be reset and the normal recording screen will be shown.

- if you keep holding the **REVIEW/MARK** button beyond the 2 seconds, the currently stored min/max values will be retained.
- releasing the button within the 4 second period after the initial press switches to the first review screen.

The logger will now track new min/max values. 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 updated.

You will be able to see in the chart 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.

Stopping the TREL30-16

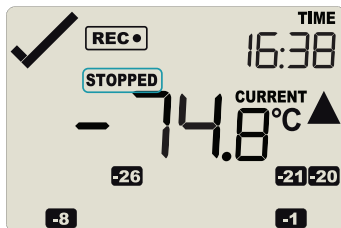
Automatically

The TREL30-16 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.

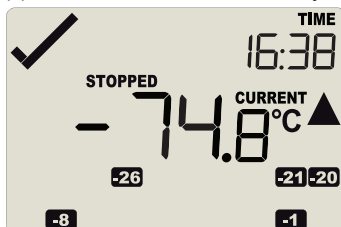
Push-button stop

You can configure a TREL30-16 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 Options](#) dialogue during configuration. When enabled, following will stop the unit:

Press and hold the **START/CLEAR/STOP** button. The **STOPPED** symbol shows.



After approx 2 seconds the **REC** symbol turns off.



Release the button within 2 seconds. The logger will now stop taking readings.



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

- ... release the button before the **STOPPED** symbol remains permanently on, or
- ... keep holding the button for more than 2 seconds after the **STOPPED** symbol remains permanently on.



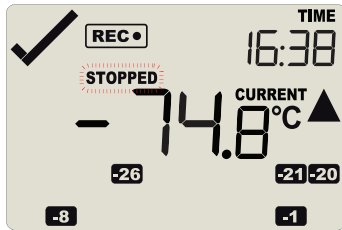
If an ALARM is present (x) and the Clear alarm by pressing STOP button function is enabled, you will need to clear the alarm first before you can stop the logger. Please see [Clearing an Alarm on page 17](#) for more information on how to clear an alarm.



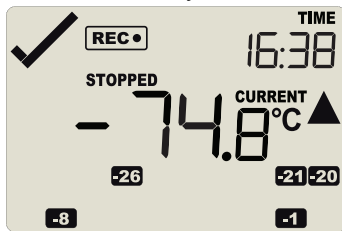
Once the logger has stopped, the alarm status will no longer be indicated with a cross or a tick symbol, and the audible alarm will turn off.

Push-button stop, quick stop disabled

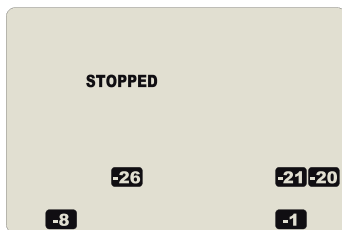
Press and hold the **START/CLEAR/STOP** button. The **STOPPED** symbol starts flashing for 4 seconds.



Then the **STOPPED** symbol turn on permanently:



Release the button within 2 seconds. The logger will now stop taking readings.



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

- ... release the button before the **STOPPED** symbol remains permanently on, or
- ... keep holding the button for more than 2 seconds after the **STOPPED** symbol remains permanently on.

Resetting the Logger

You can reset a logger back to its original **READY** state.

Once reset, recording can be started again as described in [Starting the Logger on page 13](#).



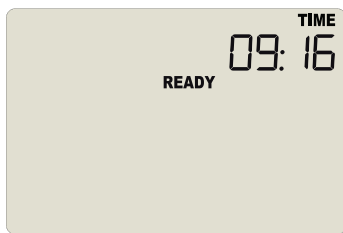
Warning: When performing this procedure all recordings and statistics stored in the logger are deleted and cannot be recovered. Please ensure your data have been saved!

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

- Press and hold the  button. The **READY** symbol will flash.



- When the **READY** symbol remains permanently on, release the button within 2 seconds. The logger is now ready to be started again.



The ability to reset a logger is enabled or disabled in the **Advanced Options** dialogue when configuring the TREL30-16 via LogTag[®] Analyzer (see [Advanced Configuration Options on page 9](#)).

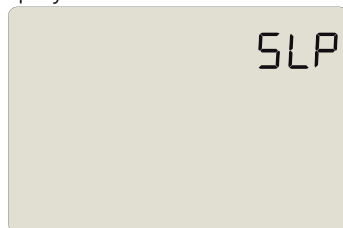
Hibernating a TREL30-16

When hibernated, the logger's power consumption is near zero and the life of the battery approaches its shelf life (typ. 5 or more years).

This is useful for conserving battery life when the logger is not used for extended periods .



TREL30-16 loggers are placed into Hibernation using LogTag[®] Analyzer by clicking **Hibernate** on the **LogTag** menu.

The display shows **SLP** for a few seconds, before turning itself off.



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

- the low battery symbol if the battery requires replacing.

A hibernated logger can be activated again by pressing and holding the  and  buttons together for a period of 6 seconds. During this time the **READY** symbol flashes. Release the buttons when the flashing stops.

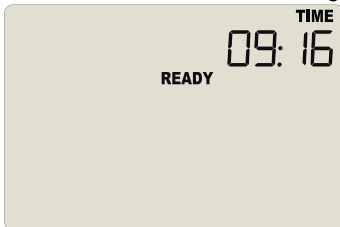


You can re-activate a logger with a low battery, however it is not recommended to commence another trip.



Note: The real time clock is not running in a hibernated logger and must be set up if the logger is manually activated. Therefore, the **CLOCKADJ** procedure is automatically invoked (see [Adjusting the Display Clock on page 12](#)).

Once the clock has been set, the logger is ready to be started again.



Technical Specifications

Model Number

Temperature Sensor Measurement Range

-80 °C to +40 °C (-112 °F to +104 °F)

Logger Operating Temperature Range

-30 °C to +60 °C (-22 °F to +140 °F)

Storage Temperature Range

-10 °C to +40 °C (14 °F to +104 °F)

Ambient humidity range during transport and use

0 to 95%RH

Rated Temperature Resolution

- 0.1 °C (0.2 °F) for measurements from -80 °C to 0 °C (-112 °F to 32 °F)
- 0.2 °C (0.4 °F) for measurements from 0 °C to +18 °C (32 °F to 64.4 °F)
- 0.3 °C (0.5 °F) for measurements from +18 °C to +30 °C (64.4 °F to 86 °F)
- 0.5 °C (0.9 °F) for measurements from +30 °C to +40 °C (86 °F to 104 °F)

For more detailed information please refer to the published resolution charts

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 (± 1.4 °F) for -50 °C to -20 °C (-40 °F to -4 °F) and +10 °C to +30 °C (50 °F to 86 °F)
- Better than ± 1.0 °C (± 1.8 °F) for -80 °C to -50 °C (-112 °F to -58 °F) and +30 °C to +40 °C (86 °F to 104 °F)

For more detailed information please refer to the published accuracy charts

Sensor Compatibility

All ST10 precision thermistor external probes can be interchangeably connected to the TREL30-16. Please refer to the dedicated sensor page on the LogTag Recorders website.

Clock accuracy

Quartz crystal locked real time clock, rated accuracy ± 25 ppm @ 25 °C (equiv to 2.5 seconds/day)

Rated temperature coefficient is -0.034 ± 0.006 ppm/°C (i.e. typically +/- 0.00294seconds/day/°C)

Recording Capacity

15,905 real time temperature values, giving

- 66 days @ 6 minute logging interval or
- 110 days @ 10 minute logging interval
- 165 days @ 15 minute logging interval.

Supports continuous logging ("wrap-around") or specific recording period.

Statistics memory

for displaying statistics on LCD

- Max/Min values for the past 30 days
- Alarm duration values for the past 30 days.
- Min/Max trip temperature

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 18 hours
- Push button start with quick start option
- Date/time start up to 180 days in the future

Alarm functions

- one configurable upper alarm
- one configurable lower alarm
- OK tick and Alarm cross on display, linked to alarms

Vibration

Withstands vibration specification as detailed in EN12830:1999

Shock

- Withstands shock specification as detailed in EN12830:1999
- Withstands 5 drops from 1m onto smooth concrete floor without loss of function or calibration

EMC compliance

- EC EMC directives (EN 61000-6-1:2005 & EN 61000-6-3:2006)
- Includes electrostatic discharge as prescribed in EN 61000-4-2
- Complies with FCC Part 15 Subparts A and B

Environmental

IP61

Case Material

Polycarbonate

Power source

CR2032 3V Li-MnO₂ battery with extended temperature Chemistry – User replaceable, non-rechargeable

Battery life

Typically 1 year of operation with normal use (6 minute logging, statistics reviewed on the display no more than once daily for no longer than 30 seconds each time, download data monthly) provided recorder is kept within the storage temperature range when not in use.

The audible alarm reduces battery life significantly.

Size

93mm(H) x 54.5mm (W) x 8.6mm (T) (excluding probe)

Weight

43g (excluding probe)

Calibration

Calibration traceable to an ISO/IEC 17025 accredited testing laboratory

Download time

- Typically with full memory (15,905 readings) less than 10 seconds, depending on computer or readout device used

Software requirements

- LogTag[®] Analyzer version 2.7 release 6 or later to configure and download

Accessories

- Wall holder 200-000010
- LTI/USB Interface Cradle
- Glycol Buffer Bottle

Appendix 1 - Battery Replacement

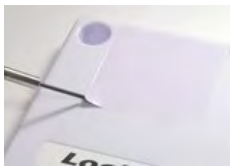
Prepare the Logger

- Download the unit to save any recorded data.
- Hibernate the unit using LogTag[®] Analyzer.

Failing to hibernate the logger may result in serious memory corruption. As a result you may no longer be able to use this product.

Remove the old battery

- Carefully remove the rear label covering the battery door using a small-bladed screwdriver or knife:



- Use a coin to turn the battery door anti-clockwise; remove it from the case:



- Remove the battery using a small-bladed screwdriver, as shown:



Insert the new battery

Only use batteries from a reputable manufacturer! Check the operational temperature range of the battery and make sure it covers the range of the TREL30-16.

- Put a new CR2032 cell into the battery compartment as shown; the right hand edge of the battery is inserted first against the contact:



- Press firmly down on the left hand side of the battery to click the battery into place:



- Replace the battery door; turn clockwise to lock it into place.



- Cover the battery door with either a new label (Part # 100-000502) or reuse the old one.



- Re-configure the logger with LogTag[®] Analyzer.

Please recycle or dispose of the old battery according to your local environmental regulations.