LIBERO CE/CL/CH-BLE

Multilevel-PDF-Logger with USB and Bluetooth® interface

Operation Manual

Table of Contents

Version history

Version	Date	Author	Description
V1E	17. February 2021	Armin Feurstein	Document created
V2E	21. March 2022	Armin Feurstein	Update firmware release v9.14
V3E	29. May 2024	Armin Feurstein	Update firmware release v9.21 & App v3.0.0

This actual version of operation manual describes features and functionalities of LIBERO CE/CL/CH-BLE PDF loggers (in all model variants) of firmware version v9.21 (Dec. 2023), in combination with liberoCONFIG configuration software version 2021.11.2.0.
The LIBERO Cx BLE app is available as version v2.6.0.4 for use in Apple iOS operating system environments. A new version v3.0.0 of the app with focus on automation is available for use in Android operating system environments.

1 Safety Instructions

Intended Use
LIBERO CE/CH/CL-BLE data loggers are exclusively for commercial use (“business to business”) in industrial environments, representing monitoring solutions for temperature and humidity measurement with internal and external sensors. LIBERO CE/CH/CL-BLE data loggers are not intended for use with children or in vicinity of children.
If the device is used in a manner not specified by the manufacturer protection provided by the device may be impaired!

Battery
Material safety data sheets according to provisions of directive 91/155/EEC and shipping information are available from ELPRO-BUCHS AG. Do not subject the batteries to mechanical stress nor dismantle them. The leaking battery fluid is highly corrosive and can generate severe heat when it comes into contact with moister or it can ignite fire.

Environmental Conditions

Temperature	Temperatures exceeding 70°C can damage the battery. For the operation range see specifications on www.elpro.com.
Water	Device meets requirements of protection class IP54. Only for use in the specified IP protection class, penetrating water or moister can damage the device. The degrees of protection apply to any position and orientation of the device, regardless of the mounting arrangement.
Humidity	Operation range 0 … 100 %RH
Mechanical Force	Violent shocks and impacts can damage the battery (short circuit).
IR and Steam	Infrared radiation (heat) and superheated steam can damage the surface coating of the casing.
Microwave	There is a risk of battery explosion if the device is exposed to microwave radiation.
UV Radiation	Exposure to UV radiation diminishes the stability of the casing.
Pollution	Pollution of the device can lead to malfunctions. Maximum permissible pollution: Grade 2

Cleaning
For cleaning purpose use a slightly wetted cloth. Do not use thinner, fuel, alcohol or aggressive cleaning detergents, as they can damage the casing.

Bluetooth
The product operates in 2.40-2.48 GHz band with a maximum radiated output power of +3.7 dBm.

Distance to the body
The device should be installed and operated with a minimum distance of 20 cm between the device and your body.

2 Quick Start Guides

LIBERO CE-BLE

LIBERO CL-BLE

LIBERO CH-BLE

3 System overview / models

3.1 LIBERO CE-BLE

LIBERO CE-BLE is a multi-level and multi-use PDF Logger with USB and Bluetooth® interface for external Pt100 probe and the ideal PDF Logger to simplify storage and shipment process for products with known stability data. It covers a wide measurement range from -200 °C to +400 °C and monitors temperature of cell and drug deliveries with cryogenic containers, dry ice or other applications using an external Pt100 probe.
Basically it can be used in all cases where the logger is to be mounted outside, also for equipment, e.g. refrigerators. For easy mounting, a stainless steel bracket can be ordered as an option.
Supporting up to eight temperature alarm zones, MKT and duration as alarm criteria – LIBERO CE-BLE allows you to create temperature profiles for individual products. In addition, you have the option to switch the alarming function off and on again if alarming criteria is required. This can be useful in cases where a transportation box has been cleaned, or liquid nitrogen has been refilled in a cryogenic container.
LIBERO CE-BLE is reconfigurable and reusable for up to 2 years. The external Pt100 probe and M8 connector enables reliable, superior temperature data transfer to the data logger. Up to 75’500 temperature values can be stored on the data logger.
Release products with confidence based on the OK or ALARM status on the display, the PDF report can be easily downloaded via the PC's USB interface or read out to a smart device via the LIBERO Cx BLE app (available for iOS and Android), thanks to the logger's Bluetooth® interface. The app can be used to start/stop the logger and generate a PDF report without having to remove it from your equipment or consignment.

LIBERO CE-BLE
with external probe

3.2 LIBERO CL-BLE

LIBERO CL-BLE is a multi-level and multi-use PDF Logger with USB and Bluetooth® interface with internal temperature sensor for shipment monitoring as well as monitoring of site and storage conditions.
The internal temperature sensor is highly accurate and comes with a 100% sensor calibration. Supporting up to eight temperature alarm zones, MKT and duration as alarm criteria – LIBERO CL-BLE allows you to create temperature profiles for individual products. In addition, you have the option to switch the alarming function off and on again if alarming criteria is required. This can be useful in cases where, for example, a transportation box or refrigerator has to be cleaned.
LIBERO CL-BLE can store up to 75’500 temperature values and has a battery lifetime of up to 2 years.
It can be ordered with an optional stainless steel bracket for easy mounting on your equipment.

LIBERO CL-BLE

Release products with confidence based on the OK or ALARM status on the display, the PDF report can be easily downloaded via the PC's USB interface or read out to a smart device via the LIBERO Cx BLE app (available for iOS and Android), thanks to the logger's Bluetooth® interface. The app can be used to start/stop the logger and generate a PDF report without having to remove it from your equipment or consignment.

3.3 LIBERO CH-BLE

LIBERO CH-BLE is a multi-level and multi-use PDF logger with USB and Bluetooth® interface with internal temperature and relative humidity sensor for shipment monitoring as well as monitoring of site and storage conditions. The internal combined temperature and relative humidity sensor comes with a 100% sensor calibration. Supporting up to eight temperature alarm zones, two humidity thresholds, MKT and duration as alarm criteria – LIBERO CH-BLE allows you to create temperature/humidity profiles for individual products. In addition, you have the option to switch the alarming function off and on again if alarming criteria is required. This can be useful in cases where for example a transportation box or storage container has to be cleaned.
LIBERO CH-BLE can store up to 75’500 measurement values (37’750 values each for temperature and humidity) and has a battery lifetime of up to 2 years. It can be ordered with an optional stainless steel bracket for easy mounting on your equipment.
Release products with confidence based on the OK or ALARM status on the display, the PDF report can be easily downloaded via the PC's USB interface or read out to a smart device via the LIBERO Cx BLE app (available for iOS and Android), thanks to the logger's Bluetooth® interface. The app can be used to start/stop the logger and generate a PDF report without having to remove it from your equipment or consignment.

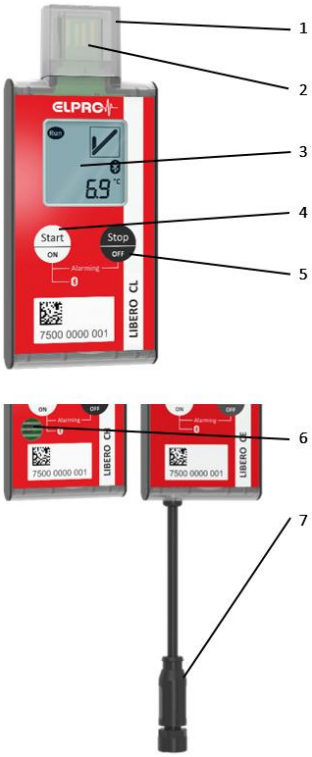
LIBERO CH-BLE

Note: Use in non-condensing environments
The LIBERO CH is designed for use in environments where condensation is unlikely to form on the device and sensor. This means avoiding high humidity conditions (greater than 90%) where small temperature fluctuations can cause temporary condensation. Condensation is especially prevalent in high humidity, low temperature applications. Use of the LIBERO CH in condensing environments increases the risk of damage to the sensor, and therefore errors or breakdowns during use.

4 Devices - LIBERO CE/CL/CH-BLE

Unless otherwise noted the following information applies equally to all three LIBERO Cx-BLE models.

Housing elements



1 Protective cap
2 USB connector
3 Display (in operating/measurement mode)
4 Start/ Alarming ON button
5 Stop / Alarming OFF button
6 Opening for humidity measurement
(LIBERO CH only)
7 Connection to external probe
(LIBERO CE only)

Display

1 Run (in operation)
(flashes when the LIBERO Cx BLE is active,
data logging or delay)
2 Alarming ON/OFF
3 Battery warning symbol
4 Information about delay or instruction
5 Alarm indicator
6 Bluetooth® active
7 Measured value or information
8 Displayed parameters & units
(temperature in °C or °F, relative humidity in %RH)

Alarm status indicator shows that the set limits (temperature profiles, etc.) have been …

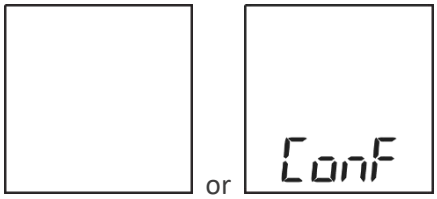
✓ …. maintained to date.
(monitoring successful, no unacceptable deviations)

✗ …. violated to date.
(further use of the monitored goods and necessary measures must be examined)

4.1 Operating modes

After configuration of the PDF logger, measured values for temperature and relative humidity (LIBERO CH-BLE only) are recorded, stored and evaluated with regard to the defined alarm criteria. The display shows the current mode.

In **configuration mode**, the device can be configured using the free liberoCONFIG software, which is available via the download section of the ELPRO website.
In the initial state, the front display of a factory new logger is empty, after briefly pressing the "Start/ON" button, "ConF" is briefly displayed, likewise when plugged into the USB port of a computer.

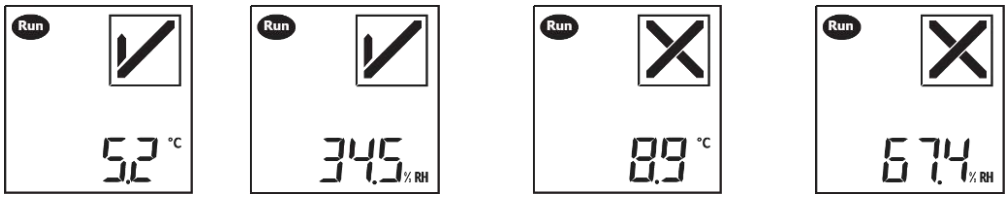


After configuration, the logger is ready to start recording, this is indicated in the display accordingly:

In this **start mode** the configuration of the device can be changed again if required. When plugged into the USB port of a PC, the device is automatically set to configure "ConF"-mode without the need to press any keys, and recognized by the liberoCONFIG software.

There are several ways to start your logger, depending on how you configure the device: immediately upon removal from USP port, by pressing the Start/ON button or with a defined start delay.
This takes you to the **run mode**, where the display may show the following:

- Without selecting the "Alarming ON/OFF" function, the current temperature reading (in the lower section of the display), the alarm status (in the upper right section of the display) and the flashing run mode ("Run") indicator (top left on the display) appear.



  LIBERO CH-BLE alternatively displays the humidity value after briefly pressing the "Stop/OFF" button. Press the button again briefly to display the temperature value again.

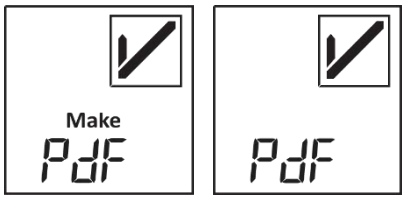
- If the "Alarm ON/OFF" function is selected, this is additionally indicated by the symbol of an alarm bell (top center of the display), and provides information that the logged values are being evaluated according to the defined alarm criteria.
  LIBERO CH-BLE alternatively displays the humidity value after briefly pressing the "Stop/OFF" button. Press the button again briefly to display the temperature value again.

From this mode you get to the **stop mode** at the end of the monitoring period by stopping the logger via the configured stop option (via pressing "Stop/OFF" button for 2 seconds or USB connection).

Note: with the "Start/Stop" logging mode configured, a stop of the logger is triggered when the maximum number of measured values to be stored is reached.

Two different display states are possible in stop mode:
Immediately after stopping the logger "Make PdF" appears on the display. This message on the screen is intended to trigger the end user to read out the device, so that this action is not missed.

Note: If the option "Stop by pressing both buttons while the PDF is being created" was selected during configuration, "PdF" will appear in the display.



It disappears after the PDF report has been created by plugging the device into the USB port of a computer or retrieving the report via the Cx BLE Bluetooth® app. As a result, "StoP" appears on the display.

In this situation, the device can either be restarted (based on the existing configuration) or reconfigured via liberoCONFIG software when connected to a USB port on the computer.
Further details can be found in section 4.3.4 "Restart / Reconfiguration".

Note: The display images shown above are based on factory settings.
You can also choose during the configuration of the device that the measured value and/or alarm indicator are hidden on the display.

4.2 Alarm Conditions

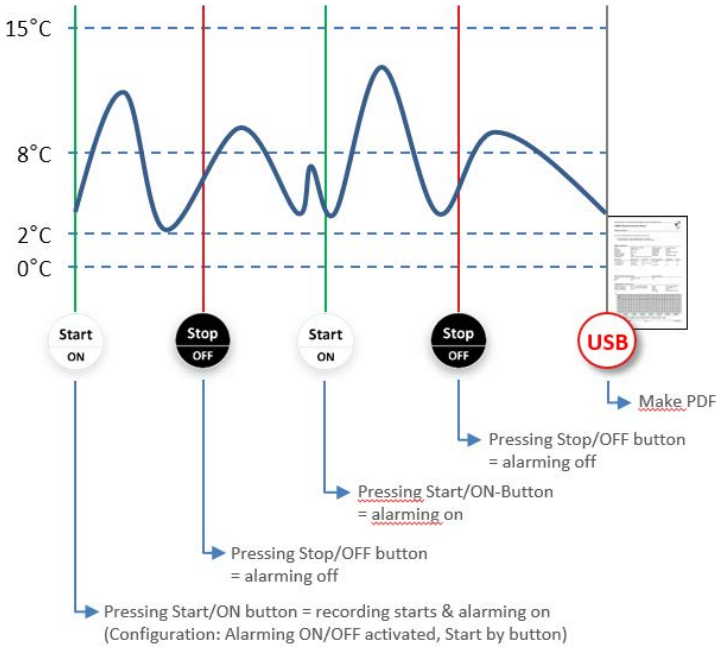
- Alarm conditions not activated

Without activation of alarm conditions (thresholds for temperature or humidity), the logger will log the respective measured values without evaluation against reference values.

- Alarm conditions activated

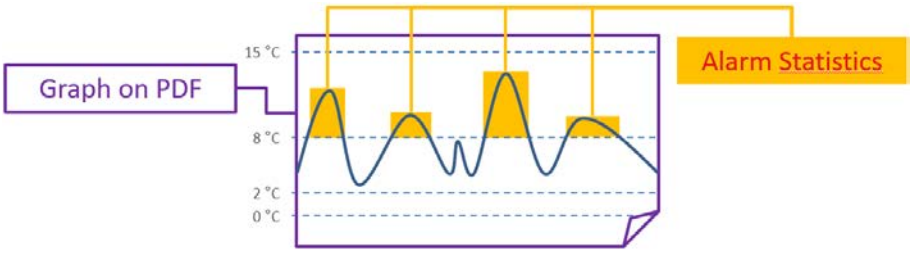
If alarm conditions are activated during configuration: each logged, measured value is individually checked for compliance with or exceeding of the defined alarm threshold(s) within the selected inspection range.

4.2.1 Inspection Range & content of PDF graphic



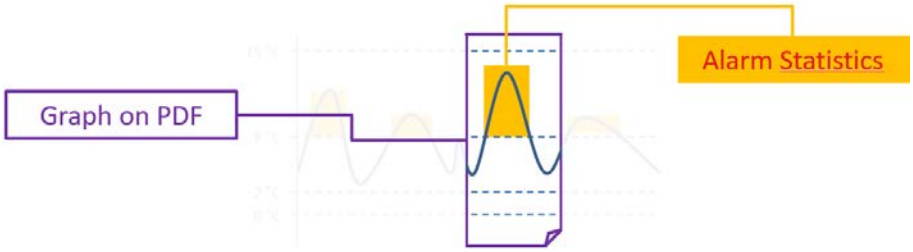
Inspection Range: All data

All data logged during active alarm monitoring will be used for statistical evaluation and fully displayed in the graphic of the PDF report. No pausing of alarm monitoring (Alarming ON/OFF) possible.



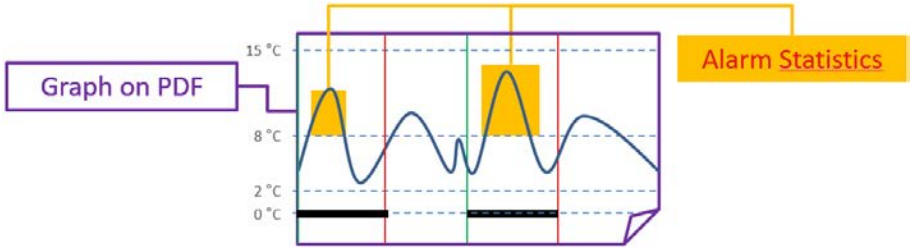
Inspection Range: Last alarming ON period only

Only data and alarm limit excursions logged during the last Alarming ON>OFF period will be used for statistical evaluation. In the graphic of the PDF report only data of this last period will be displayed.



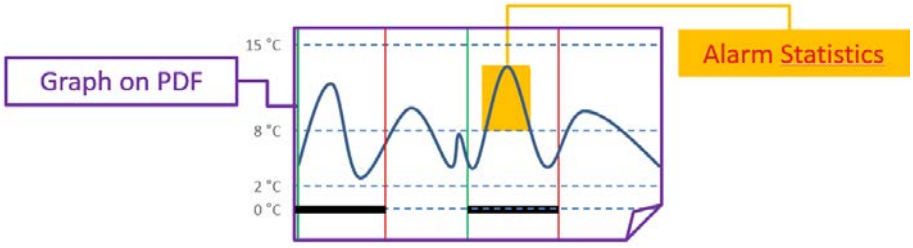
Inspection Range: All alarming ON periods cumulative

All data will be logged and displayed in the graphic of the PDF report, for statistical evaluation only data in the period(s) of Alarming ON is considered cumulatively.

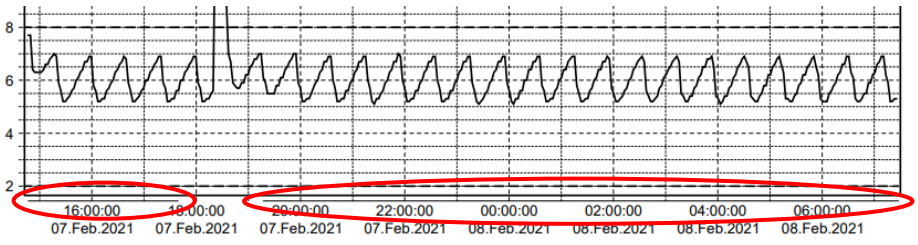


Inspection Range: Last alarming ON period – all data in graph

All data will be logged and displayed in the graphic of the PDF report, but only data and alarm limit excursions logged during the last Alarming ON>OFF period will be used for the statistical calculation.

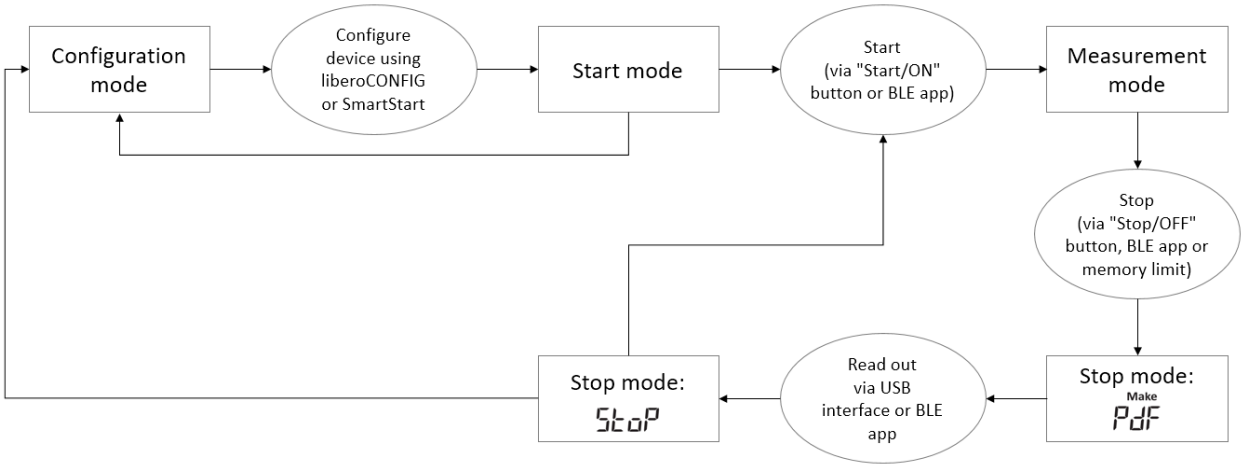


As represented below, you will see thin lines on the bottom of the graph on your PDF report, which indicate "Alarming ON" periods.

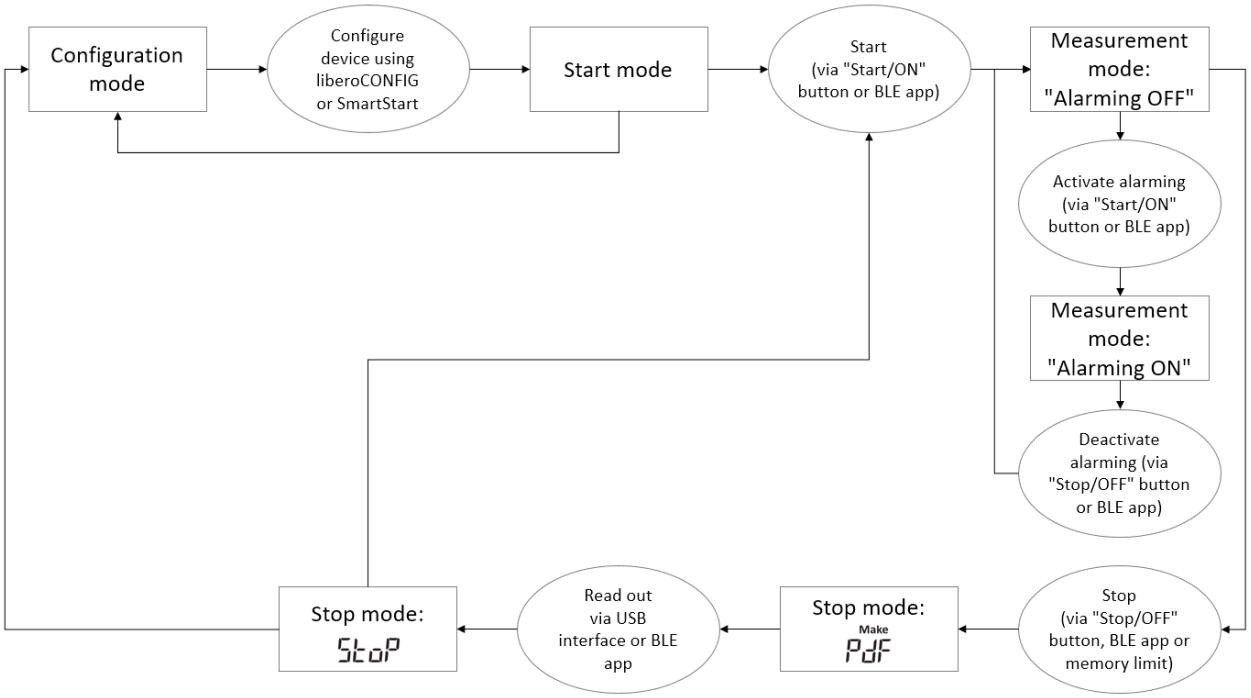


4.2.3 Alarming ON/OFF – Workflow

The following figure shows the sequence of modes if "Alarming ON/OFF" function has **not been configured** (also see chapter 6, section Alarm Conditions).



The following figure shows the sequence of modes if the "Alarming ON/OFF" function has been **configured** (also see chapter 6, section Alarm Conditions).

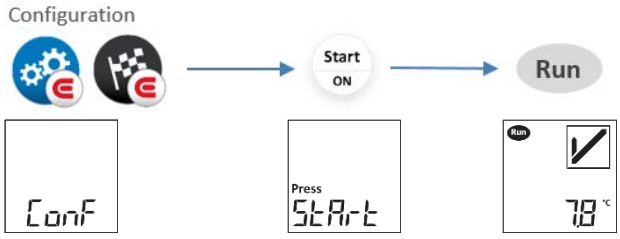


4.3 Operation & options

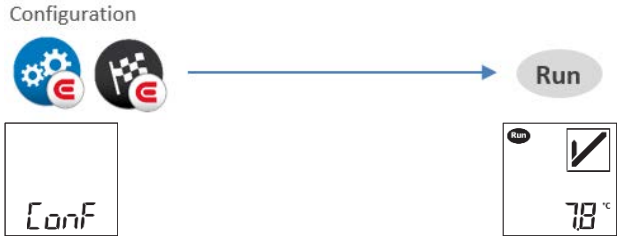
4.3.1 Start options

LIBERO CE/CL/CH-BLE loggers can be started in different ways, depending on the respective application. Via the selected start option, the logger is ready for the logging of measured values.
Depending on the start option you select for your device, it is also possible to configure the device to: pre-log measured values, logging start immediately or only when a condition from the selected alarm activation option is fulfilled (e.g. time- or temperature-based start delay).

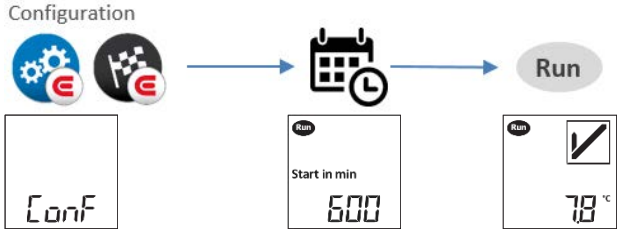
Start after pressing Start button
The logger is started by pressing the "Start/ON" button (indicated by "Run" icon in the upper left corner of the display).



Start immediately
After configuration is complete, the device will start by disconnecting it from the USB port of the computer.

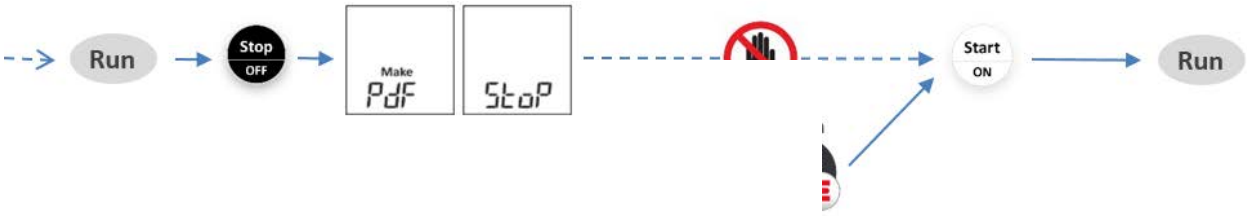


Start at … (according to configured Time Zone)
The logger will start immediately after configuration is completed, the alarm monitored logging will start at the specified time (date and time freely selectable within a future time window of 60 days).
(Note: Logging & alarm activation will start at the same time).



CAUTION! When re-starting or re-configuring from stop mode, **ALL RECORDED DATA** in the logger will be **DELETED** !

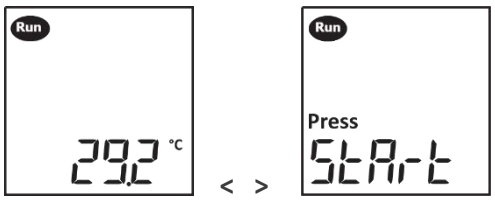
Next Start requires configuration (start/stop ONCE)
This option ensures that it is mandatory to reconfigure the (multi-use) logger before a next use. A re-start without re-configuration is not accepted by the device, and the display will indicate "ConF".
This additional requirement can be combined with all start options described above.



4.3.2 Alarm activation options

When alarm monitoring is activated, measured values are recorded, checked for compliance with any defined alarm limits and stored in the data memory.
Alarm activation can be processed immediately at or after start of the logger and can be done via pressing buttons on the device, or based on a time or temperature related delay.

If alarm activation is configured **at time of start**, each measured value is evaluated with regard to set alarm criteria when the logger is started.
Alarm activation can also be handled manually by pressing the Start/ON button. In this case, the note "Press StArt" is shown in the lower half of the display every 2 seconds, alternating with the current measured value to trigger the user to execute this next step.



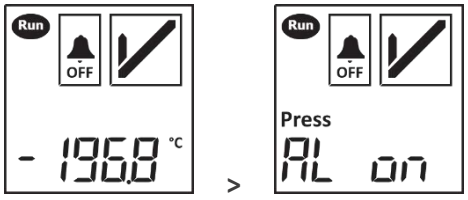
If a **temperature- or time-dependent delayed alarm activation** has been configured, a corresponding message appears in the display after the device is started:

- Temperature-based delay:
The delay until the configured temperature threshold is reached is indicated by "dELAY". Then, the device automatically switches to alarm activated measuring mode (see below).

- Time-based delay:
The display shows the remaining time in minutes before the device automatically switches to alarm activated measuring mode (see below).

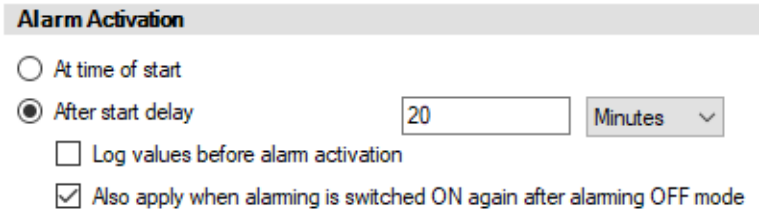
The delay time can be specified as any value (independent of the value of the selected logging interval), up to a maximum of 60 days.
The time delay (rounded to integer values) is counted down to zero in steps of one minute each.

Users who wish to take advantage of **pausing the alarm** (Alarming-OFF followed by Alarming-ON, e.g. when refilling or cleaning packaging or lab equipment) can do so by pressing and holding (2 seconds) the "Stop/OFF" button in measurement mode.
In this case the bell icon in the middle of the display switches to “OFF” and "Press AL on" appears in the lower half of the display, to inform the user that the alarm is paused and can or should be reactivated. This is done very simply by pressing and holding the "Start/ON" button for 2 seconds.



During the phase of "AL ON" on the display, it is possible to display the current measured value for 2 seconds by briefly pressing the "Stop/OFF" button.

During configuration of your device, you can program the LIBERO so that alarm activation is delayed by selecting either temperature or time-dependent. To apply this setting to the alarm pausing feature (Alarming ON/OFF mode) as well, in liberoCONFIG, you must select the option in: “Also apply when alarming is switched ON again after alarming OFF mode” (see also Chapter 6, menu "Logging").

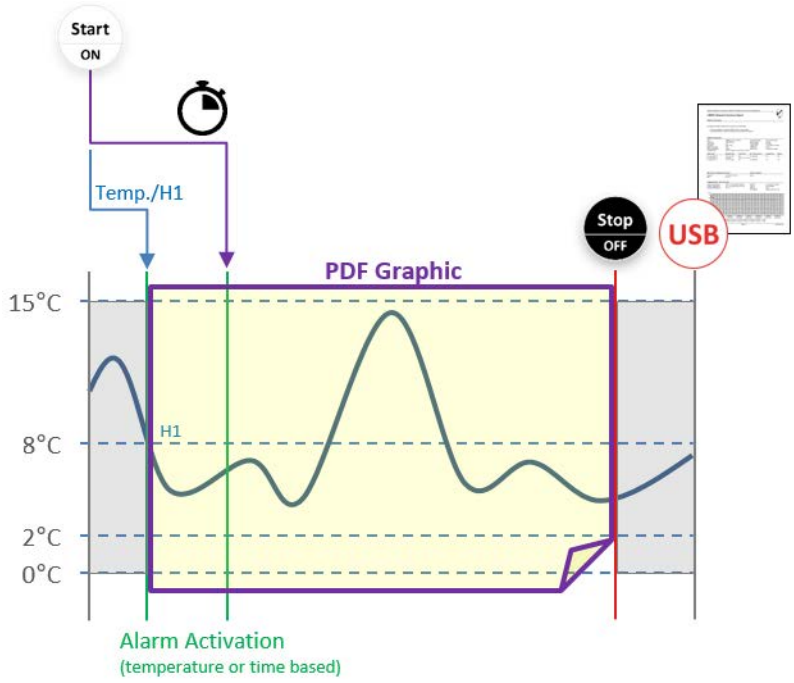


(Screen shot taken from liberoCONFIG software, tab “Logging”, section “Alarm Activation”.)

If the pausing of the alarm is cancelled (by "Alarming ON"), the alarm status indicator is temporarily hidden before it re-appears in the display with the next measured value (after interval time).

From measuring mode, the device can be stopped by pressing and holding (2 seconds) the "Stop/OFF" button or via the LIBERO Cx BLE app.
Note: When configured with the function "Alarming ON/OFF" in measuring mode, the logger can only be stopped in the "Alarming OFF" status!

The PDF report shows logged measurement data during active alarm monitoring (Alarming ON), as well as data during alarm monitoring pauses. If the option “logging before alarm activation” is selected, measurement data can be displayed, extracted and evaluated via the **elproVIEWER** software, which is available via the download section of the ELPRO website.



4.3.3 Stop Options

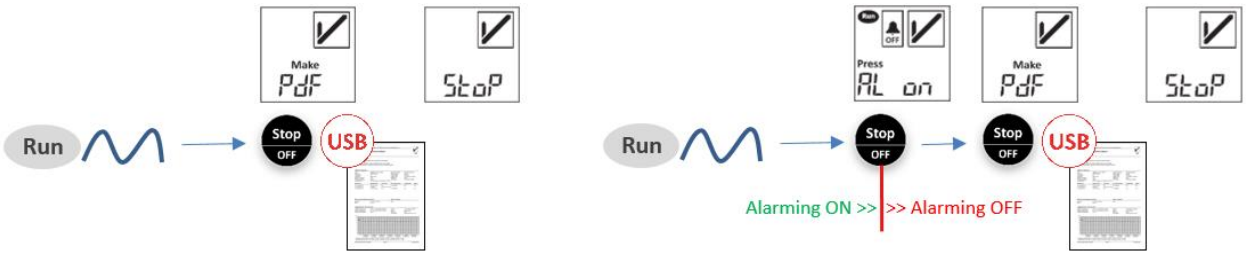
The LIBERO devices will adapt to your specific application, and loggers can be programmed to stop in different ways, even preventing a stop is configurable (in case of handling errors, e.g. accidentally pressing the stop button).
When configuring the possibility of pausing the alarm monitoring ("Alarming ON/OFF"), the logger can be stopped only in "Alarming OFF" status. This requires pressing the Stop/OFF button (alternatively also by "Alarm Off" via the LIBERO Cx BLE app).
While logging in "Alarming ON" status, a PDF report can be generated at any time without stopping the logger.

When stopping the logger, the "Make PdF" or "PdF" message prompts the user to retrieve the PDF report (by plugging it into the USB port of a computer or via the LIBERO Cx BLE app). This ensures that the data is backed up and data loss is prevented. The LIBERO PDF report contains all data.

Stop when generating PDF file
Alarm monitoring and logging of measurement data is stopped at the moment of plugging the LIBERO into the USB port of a computer, the display shows "PdF". After disconnection from the USB port, the logger is in stop mode, the display shows "StoP".

Stop by pressing and holding the Stop button

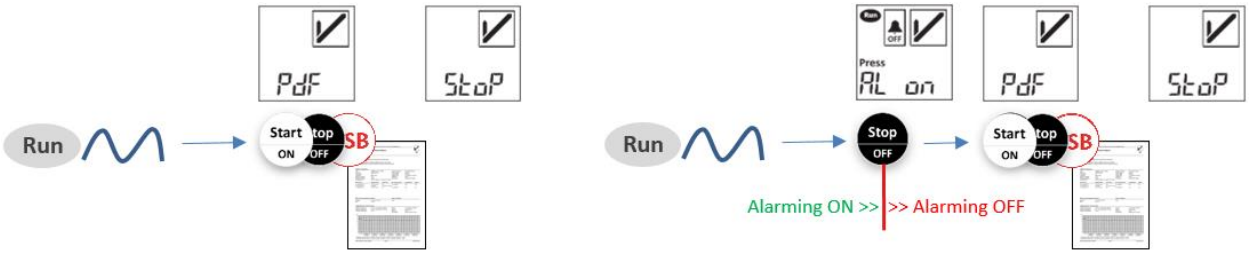
Alarm monitoring and logging of measurement data is stopped by pressing and holding (2 seconds) the "Stop/OFF" button, the display shows "Make PdF". After disconnection from the USB port, the logger is in stop mode, the display shows "StoP".



You can apply the two stop options mentioned above in parallel during the configuration (the logger can be stopped by one or the other method).

Stop by pressing both buttons while the PDF is being generated

Alarm monitoring and logging of measurement data is stopped by pressing both buttons ("Start/ON" and "Stop/OFF") and then plugging the logger into the USB port of a computer, the display shows "PdF". After disconnection from the USB port, the logger is in stop mode, the display shows "StoP".



Stop disabled (Alarming ON/OFF operation only, no re-start, no re-configuration)

LIBERO Cx-BLE devices are logging measurement data after being started until the device is stopped. On restart, all data in the memory is cleared to allow full memory capacity for the next logging period.
The "Stop disabled" option prevents a stop of the logger, but allows continuous logging with flexible use of alarm activation (Alarming ON/OFF).
When using this option, the device cannot be restarted or reconfigured.

Forced stop when measured value memory is full
With the "Start/Stop" logging mode configured, a stop of the logger is triggered when the maximum number of stored, measured values is reached.

4.3.4 Re-Start / Re-Configuration

From run mode you get to stop mode at the end of the monitoring period by stopping the logger via the configured stop option.
In this situation, the following further actions are possible:

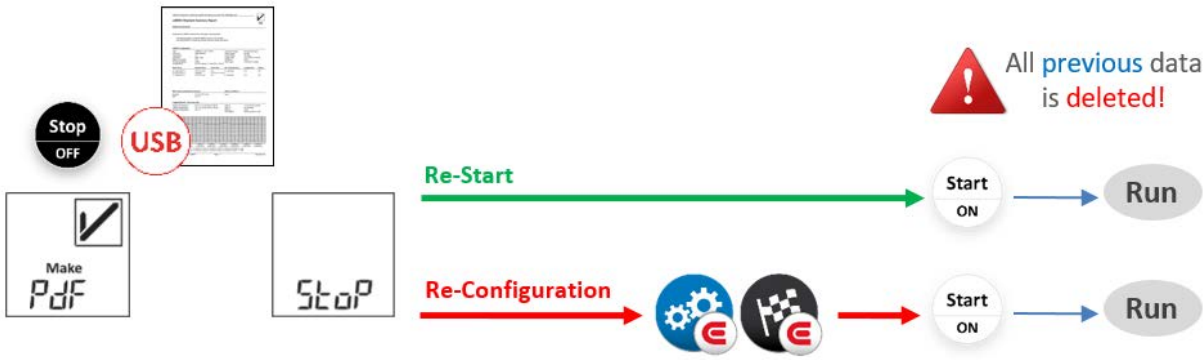
- **Re-Start**

By pressing the "Start/ON" button, the logger can be started for a next monitoring job, based on the configuration currently stored in the logger.

- **Re-Configuration**

By connecting to the USB port of a computer, the logger can be re-configured via liberoCONFIG software or via SmartStart. As a next step, the logger can be started according to the configured start option.

CAUTION! When re-starting or re-configuring from stop mode, **ALL RECORDED DATA** in the logger will be **DELETED** !



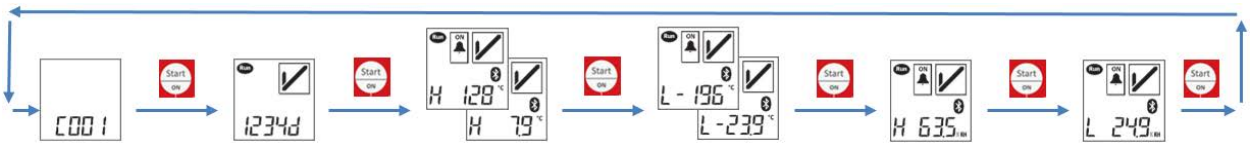
4.3.5 Statistical data

If the logger is in start mode (after configuration) or in stop mode (after recording has been completed), the profile ID entered in the configuration can be called up on the display by briefly pressing the "Start/ON" button.
Toggle through additional parameters on the LIBERO display by repeatedly pressing the button briefly. Information will display in this order:

- Profile ID
- Battery life remaining (in days)
- Measured Temperature maximum value (H …)
- Measured Temperature minimum value (L …)
- Measured Humidity maximum value (H …) > LIBERO CH-BLE only!
- Measured Humidity minimum value (L …) > LIBERO CH-BLE only!

Values for temperature and humidity are displayed, provided that measured values have been logged.

If the logger is in RUN/Measure mode (after recording has started), the statistics functionality can be activated by pressing and holding (2 sec.) BOTH, the "Start/ON" & "Stop/OFF", buttons simultaneously.



This step-by-step mode can be exited by briefly pressing the "Stop/OFF" button. If no button is pressed for 5 seconds, this is done automatically.

4.3.6 Setting & canceling of delay/duration time

In various options of the configuration, time conditions can be defined, such as alarm activation delay, minimum logging duration, etc.. You may enter any integer value (within possible limits), and the value entered is independent of the selected logging interval.

Example:
(Screen shot taken from liberoCONFIG software, tab “Logging”, section “Alarm Activation”.)

During the countdown of specified delay/duration periods, the current status is shown in the logger display. The display values are updated every minute (1 min.).

If a time delay was started, no operation of the logger is possible during this phase, the set delay time must be waited until the end.
In case of a configuration of faulty or excessive time periods, the waiting phase can be interrupted in order to correct the faulty value by simply reconfiguring the LIBERO.

Activation: press Start/ON & Stop/OFF buttons simultaneously
> plug into USB > disconnect from USB

To Stop mode: press Stop/OFF button (2sec.) (within 10 seconds)

> StoP

Re-configuration: plug into USB

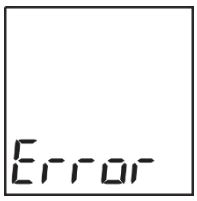
> ConF

Applicable for following situations:

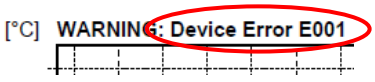
_ Delayed start of the logger at a specified date/time
_ Minimum logging duration
_ Time-dependent delay of alarm activation
_ Temperature (H1) -dependent delay of alarm activation

4.4 Error-Handling

LIBERO CE/CL/CH-BLE loggers have internal diagnostic tools for monitoring process sequences and for detecting unplanned behavior or events.
The occurrence of an error leads to the "Error" display.



An error notification usually refers to a hardware-related problem. As a result, the logger may no longer be usable.
If an error occurs, the logger can no longer be started. If the "Run" symbol is missing from the display, the device is no longer logging.
If a PDF report can be generated, it will contain an error code above the measurement data graph.
For a support request to ELPRO, you must provide the error code for further information in connection with the error.



An occurring error also generates an entry in the list of events on page 2 of the PDF report:

00014	Alarm	ERROR 001	2021-06-29 14:08:36
00013	Information	Report created	2021-06-29 14:08:29

4.5 Logger service life / battery runtime

LIBERO Cx-BLE PDF Loggers are designed for an extended usage period of up to 2 years. The actual service life is reduced by operation at low temperatures (especially below 0 °C).

Note: LIBERO CE-BLE devices are equipped with an external sensor. Placing the external sensor in the environment of very low temperatures will not affect the service life of the device.

Reduction of battery runtime

Depending on the Bluetooth® mode selected, there is a reduction in the service life due to increased energy consumption, according to the following table:

Bluetooth® mode	Runtime
BLE permanently OFF	24 months
BLE temporarily ON (by pressing "Start" button)	24 months
BLE permanently ON	14 months

Conditions: Measuring interval: 10 minutes, over the entire operating temperature range, Customer usage behavior: average assumptions.

Shortening the period of use

Should the period of use for the devices be deliberately limited to exactly 12 or 24 months (EoL/End-of-Life, no restart possible after this point), the user can order this option from ELPRO as a factory-made configuration.

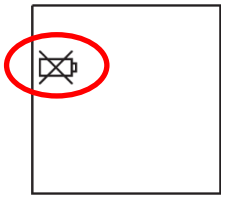
Note: This factory-configured expiry date cannot be reset by the user by reconfiguring with liberoCONFIG.

Reaching the end date is indicated in the display by the message "EoL" (End-of-Life).
In the PDF report, a corresponding line entry is made in the list of events on page 2, and the number of days of the period of use is also replaced by "EoL" in the "LIBERO Configuration" section.
The logger cannot be used for a new logging period from this point on (no restart, no reconfiguration).

If the reaching of the end date occurs during an ongoing logging period ("Run" mode), the logger continues logging until the user deliberately stops it or the generation of a PDF report triggers a stop during this phase.
This ensures that all data of a monitoring period is available.

Battery warning

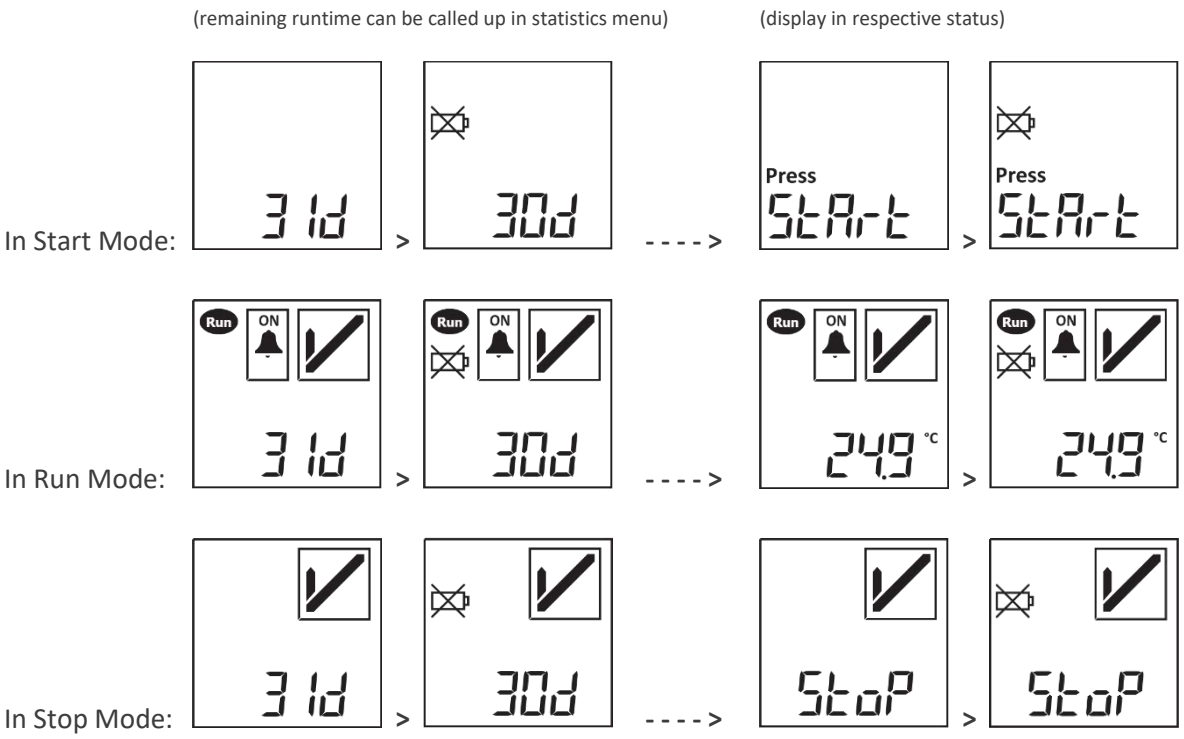
The imminent end of the logger's use (caused by the end of the battery capacity or by the expiry of the shortened period of use) is indicated 30 days in advance by showing the battery warning symbol on the display.



The remaining time until the EoL/End-of-Life is reached can be read out at any time via the statistical data (see section 4.3.5. / "Statistical data").
During this period, the logger can be used without restriction, it can be configured as required and started at any time.

Note: It is recommended to check the remaining useful life (via the statistical data) with regard to the duration of the planned monitoring period, and to decide on the basis of this information whether to continue using the logger.

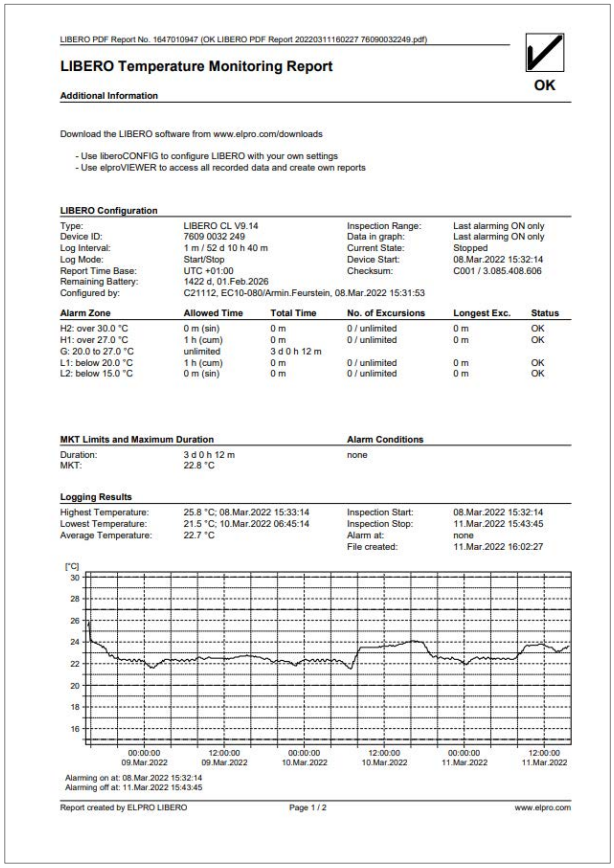
Change of display(s) at the beginning of the warning period (<31 days):



4.6 LIBERO PDF Report

All data logged during a monitoring period is documented in a PDF report.
The report contains the following main parts:

- Text fields for user/application information
- Alarm status indicator (OK or Alarm)
- Configuration of the device
- Alarm conditions and MKT
- Recording results (with graph)
- Event list



LIBERO PDF Report No. 1647010947 (OK LIBERO PDF Report 20220311160227 76090032249.pdf)

LIBERO Temperature Monitoring Report

OK

Additional Information

Download the LIBERO software from www.elpro.com/downloads

- Use liberoCONFIG to configure LIBERO with your own settings
- Use elproVIEWER to access all recorded data and create own reports

LIBERO Configuration

Type:	LIBERO CL V9.14	Inspection Range:	Last alarming ON only
Device ID:	7609 0032 249	Data in graph:	Last alarming ON only
Log Interval:	1 m / 52 d 10 h 40 m	Current State:	Stopped
Log Mode:	Start/Stop	Device Start:	08.Mar.2022 15:32:14
Report Time Base:	UTC +01:00	Checksum:	C001 / 3.085.408.606
Remaining Battery:	1422 d, 01.Feb.2026		
Configured by:	C21112, EC10-080/Armin.Feurstein, 08.Mar.2022 15:31:53		

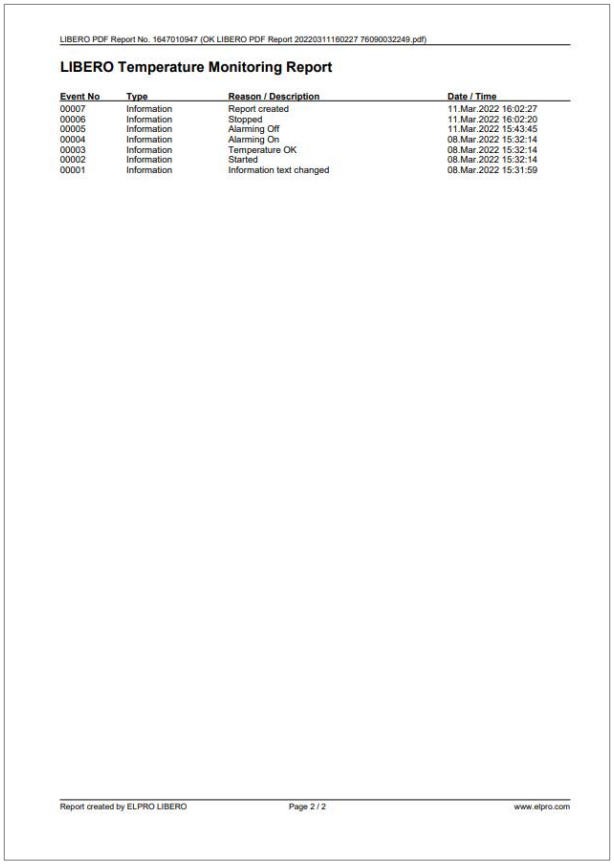
Alarm Zone	Allowed Time	Total Time	No. of Excursions	Longest Exc.	Status
H2: over 30.0 °C	0 m (sin)	0 m	0 / unlimited	0 m	OK
H1: over 27.0 °C	1 h (cum)	0 m	0 / unlimited	0 m	OK
G: 20.0 to 27.0 °C	unlimited	3 d 0 h 12 m			
L1: below 20.0 °C	1 h (cum)	0 m	0 / unlimited	0 m	OK
L2: below 15.0 °C	0 m (sin)	0 m	0 / unlimited	0 m	OK

MKT Limits and Maximum Duration		Alarm Conditions
Duration:	3 d 0 h 12 m	none
MKT:	22.8 °C	

Logging Results

Highest Temperature:	25.8 °C: 08.Mar.2022 15:33:14	Inspection Start:	08.Mar.2022 15:32:14
Lowest Temperature:	21.5 °C: 10.Mar.2022 06:45:14	Inspection Stop:	11.Mar.2022 15:43:45
Average Temperature:	22.7 °C	Alarm at:	none
		File created:	11.Mar.2022 16:02:27

Alarming on at: 08.Mar.2022 15:32:14
Alarming off at: 11.Mar.2022 15:43:45



LIBERO PDF Report No. 1647010947 (OK LIBERO PDF Report 20220311160227 76090032249.pdf)

LIBERO Temperature Monitoring Report

Event No	Type	Reason / Description	Date / Time
00007	Information	Report created	11.Mar.2022 16:02:27
00006	Information	Stopped	11.Mar.2022 16:02:20
00005	Information	Alarming Off	11.Mar.2022 15:43:45
00004	Information	Alarming On	08.Mar.2022 15:32:14
00003	Information	Temperature OK	08.Mar.2022 15:32:14
00002	Information	Started	08.Mar.2022 15:32:14
00001	Information	Information text changed	08.Mar.2022 15:31:59

The list of events includes up to 200 entries, starting from page 2 of the PDF report.
A maximum of 816 events are recorded in the device. If more events occur, the oldest entries are overwritten and the event counter continues to increase to the next highest value.
For evaluation and documentation of >200 events, the use of elproVIEWER analysis software is recommended.

Zoom of the x-axis in the graph: The scaling of the x-axis is zoomed from approx. 400 measured values.

IMPORTANT: A LIBERO PDF REPORT IS A PDF/A - ISO STANDARD FILE
ONLY OPEN THE FILE WITH A PDF READER

Always save the PDF file from the LIBERO Cx directly (e.g. drag and drop the file to the desired location) or send it as an e-mail attachment.

NOTE: Do not “save as” with a PDF editor!
Opening and saving of the PDF file with a PDF editor can make additionally embedded data unusable for subsequent processing with elproVIEWER, elproASSISTANT or liberoMANAGER.

The integrity of a PDF report can be checked with the "Check PDF file integrity" function in liberoCONFIG. The mentioned software performs this check automatically.

Important: If it is not possible to generate a PDF report for any reason, we recommend that you stop operating or manipulating the PDF logger from this point onwards and contact ELPRO immediately. If necessary, the device can be sent in to be read out by ELPRO.

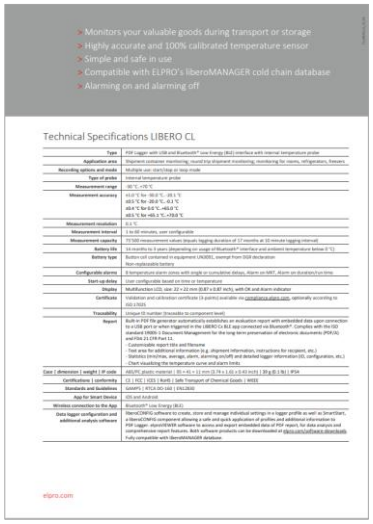
4.7 Technical Specifications

LIBERO CE-BLE

https://shop.elpro.com/daten/img/Documents/TechSpecs/LIBERO/TS_LIBERO_CE_BLE_EN_web.pdf

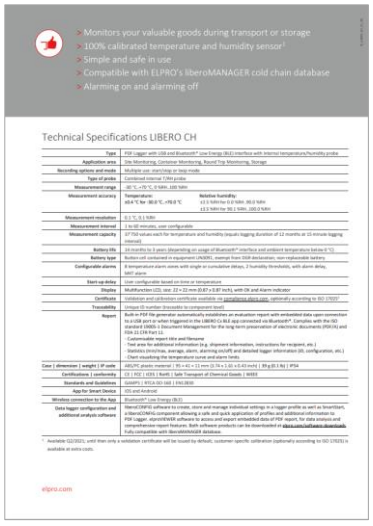
LIBERO CL-BLE

https://shop.elpro.com/daten/img/Documents/TechSpecs/LIBERO/TS_LIBERO_CL_BLE_EN_web.pdf



LIBERO CH-BLE

https://shop.elpro.com/daten/img/Documents/TechSpecs/LIBERO/TS_LIBERO_CH_BLE_EN_web.pdf



5 Accessories

5.1 External Pt100 probes for LIBERO CE-BLE

LIBERO CE-BLE can be used for different applications, depending on the sensor type selected. ELPRO offers standard probes for three main applications:

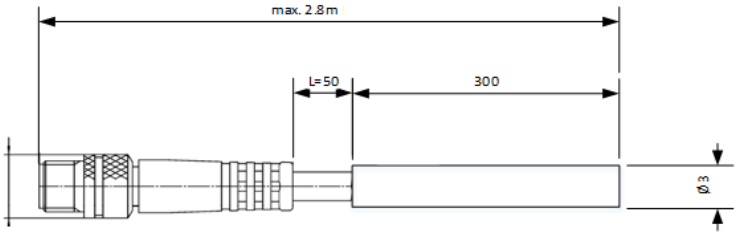
- Cryogenic shipments and storage
- Dry ice shipments and storage
- Equipment / Rooms:
    - Freezer (-25 °C..-15°C, typ.)
    - Fridge (+2 °C..+8 °C)
    - Ambient shipments and storage (+15 °C..+25 °C)

5.1.1 Cryogenic shipments and storage

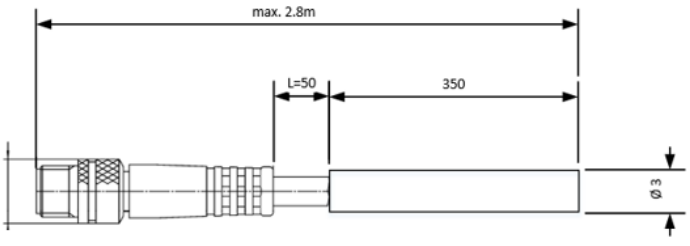
For cryogenic applications the LIBERO CE-BLE logger is usually mounted directly to the container or the container lid, using the optional accessory, our stainless steel bracket, with the sensor leading into the tank. ELPRO offers an easy, turnkey service in our laboratory for mounting the assembly and calibration of the system.

ELPRO offers two Pt100 standard probes for cryogenic applications with M8 connector in different lengths:

PRO_PT100_ST300D3_M8_CRYO (part number 802287)

Note	Cable with mounted M8 plug (male). Probe can be bent (do not kink) once at room temperature, except for the foremost 3 cm.
Probe length	30 cm
Probe diameter	3 mm
Temperature range of probe	-200 °C...+200 °C
- Temperature range Class A	n.a
- Temperature range Class B	-50 °C...+200 °C
Cable length	0.05 m
Cable diameter	4.0 mm
Litz wire	4x AWG 22
Cable material	Silicon
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C
Drawing	

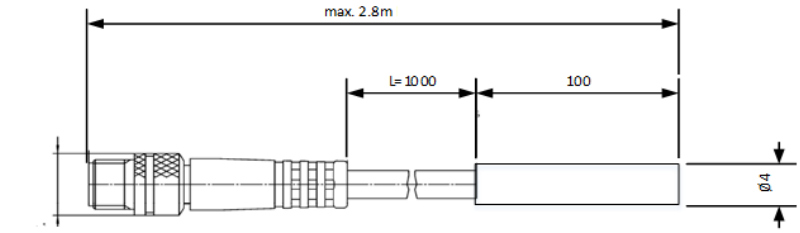
PRO_PT100_ST350D3_M8_CRYO (part number 802288)

Note	Cable with mounted M8 plug (male). Probe can be bent (do not kink) once at room temperature, except for the foremost 3 cm.
Probe length	35 cm
Probe diameter	3 mm
Temperature range of probe	-200 °C...+200 °C
- Temperature range Class A	n.a
- Temperature range Class B	-50 °C...+200 °C
Cable length	0.05 m
Cable diameter	4.0 mm
Litz wire	4x AWG 22
Cable material	Silicon
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C
Drawing	

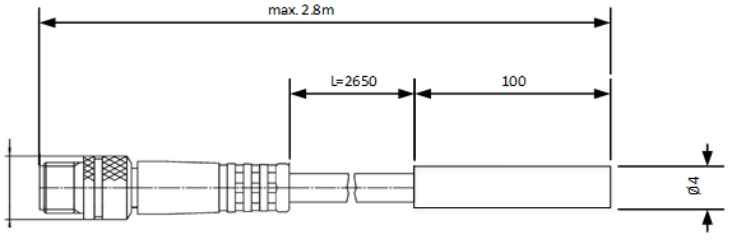
5.1.2 Dry ice shipments and storage

In dry ice applications, the LIBERO CE-BLE is usually attached to the outside of the container using the optional accessory, our stainless steel bracket and the sensor leads into the shipping container.
ELPRO offers an easy, turnkey service for mounting the assembly and calibration.
For this application, ELPRO offers two standard probes with a probe length of 10 cm and Teflon cable in different lengths:

PRO_PT100_ST100D4_PTFE1_M8 (part number 802284)

Note	Cable with mounted M8 plug (male).
Probe length	10 cm
Probe diameter	4 mm
Temperature range of probe	-90 °C...+250 °C
- Temperature range Class A	-30 °C...+250°C
- Temperature range Class B	-50 °C...+250 °C
Cable length	1 m
Cable diameter	3.5 mm
Litz wire	4x AWG 28
Cable material	PTFE
Cable color	white
Temperature range of cable	bendable in the range between -90 °C...+70 °C
Drawing	

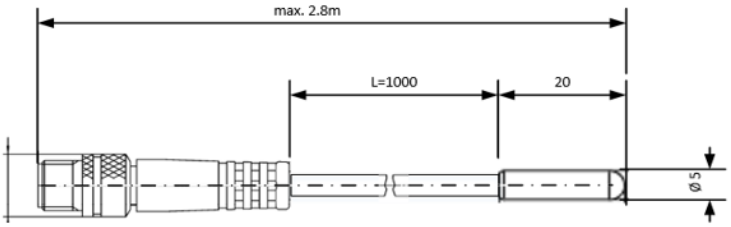
PRO_PT100_ST100D4_PTFE2.65_M8 (part number 802285)

Note	Cable with mounted M8 plug (male).
Probe length	10 cm
Probe diameter	4 mm
Temperature range of probe	-90 °C...+250 °C
- Temperature range Class A	-30 °C...+250°C
- Temperature range Class B	-50 °C...+250 °C
Cable length	2.65 m
Cable diameter	3.5 mm
Litz wire	4x AWG 28
Cable material	PTFE
Cable color	white
Temperature range of cable	bendable in the range between -90 °C...+70 °C
Drawing	

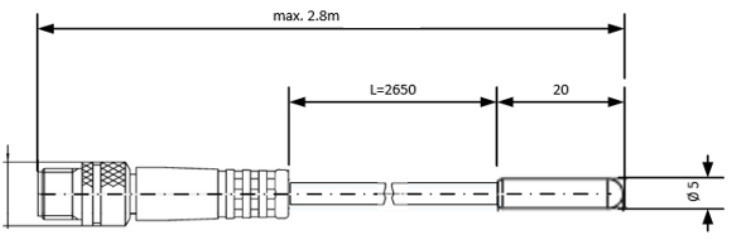
5.1.3 Freezer / fridge / ambient shipments and storage

For temperature monitoring of freezers, refrigerators or rooms, ELPRO offers two waterproof silicon Pt100 probes with different cable lengths as standard part numbers (listed below):

PRO_PT100_P20D5_PLA1_M8 (part number 802290)

Note	Cable with mounted M8 plug (male). Waterproof
Probe length	2 cm
Probe diameter	5 mm
Temperature range of probe	-50 °C...+105 °C
- Temperature range Class A	-30 °C...+105 °C
- Temperature range Class B	-50 °C...+105 °C
Cable length	1 m
Cable diameter	4.0 mm
Litz wire	4x AWG 24
Cable material	Silicon
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C
Drawing	

PRO_PT100_P20D5_PLA2.65_M8 (part number 802291)

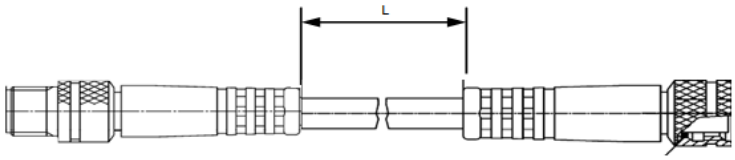
Note	Cable with mounted M8 plug (male). Waterproof
Probe length	2 cm
Probe diameter	5 mm
Temperature range of probe	-50 °C...+105 °C
- Temperature range Class A	-30 °C...+105 °C
- Temperature range Class B	-50 °C...+105 °C
Cable length	2.65 m
Cable diameter	4.0 mm
Litz wire	4x AWG 24
Cable material	Silicon
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C
Drawing	

5.2 Extension of sensor cables

In case you need a longer cable for your application, an extension cable with two M8 connectors at a length of 1m is also available to attach the LIBERO CE BLE PDF data logger and the probe.

ATTENTION:
Total cable length (including sensor and cable tail on the data logger) must not exceed 3 m!

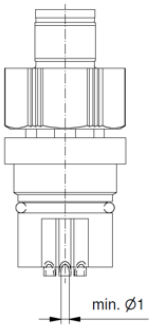
ECA_PLA_1M_M8 (part number 802282)

Note	M8 plugs on both ends (male, female)
Probe length	n.a.
Probe diameter	n.a.
Temperature range of probe	n.a.
- Temperature range Class A	n.a.
- Temperature range Class B	n.a.
Cable length	1 m
Cable diameter	3.5 mm
Litz wire	4x AWG 28
Cable material	PVC
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C
Drawing	

5.3 M8 connector incl. mounting service on Pt100 probe

ELPRO offers a mounting service, adding an M8 connector to a Pt100 temperature sensor in order to use any 4-wire Pt100 probe in combination with LIBERO CE-BLE.

CTR_M8_SER (part number 802289)

Note	M8 connector incl. mounting on any 4-wire Pt100 temperature probe
Probe length	depends on the selected probe
Probe diameter	depends on the selected probe
Temperature range of probe	depends on the selected probe
- Temperature range Class A	n/a
- Temperature range Class B	n/a
Cable length	depends on the selected probe
Cable diameter	depends on the selected probe
Litz wire	must be 4-wire
Cable material	depends on the selected probe
Cable color	depends on the selected probe
Temperature range of cable	depends on the selected probe
Drawing	

5.4 Stainless steel bracket

ELPRO offers an optional stainless steel bracket for mounting of LIBERO CE/CL/CH-BLE loggers if required, i.e. to containers for cryogenic applications.

BRA_LIBERO CE CL CH (part number 802286)

6 Configuration (with liberoCONFIG configuration software)

liberoCONFIG is the free software to configure LIBERO PDF data loggers. It allows users to define all necessary configuration parameters and ~~to~~ save them as profiles. A profile contains all settings for the monitoring task and is summarized in the PDF report generated by the logger or in a special configuration report that can be generated in liberoCONFIG.

The configuration of a single LIBERO PDF logger is done with liberoCONFIG.
With **SmartStart Pack & Go,** a profile can be assigned to a larger number of LIBEROs quickly and safely. SmartStart Pack & Go .exe files can be used on any PC without installation and without special drivers.

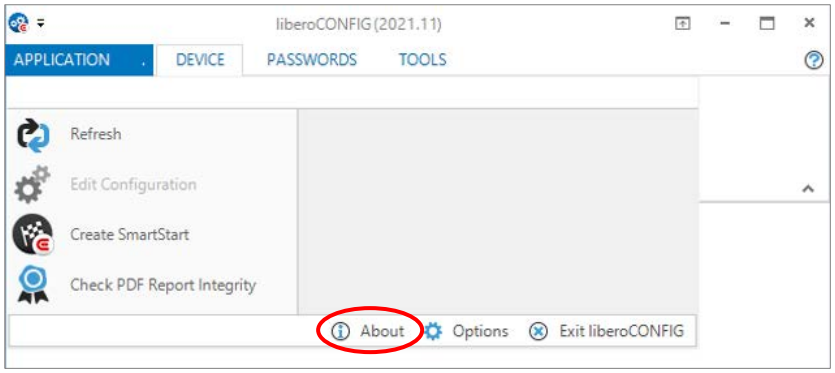
System requirements

- System type:	64-bit operating system, x64-based processor
- Operating system:	Windows 7, 8, 10 or 11
- CPU clock frequency:	1.5 GHz
- Memory/RAM:	512 MB
- Hard disk:	100 MB
- Monitor resolution:	800 x 600 pixel

Details regarding configuration of LIBERO Cx can be found in the corresponding manual (https://shop.elpro.com/daten/img/Documents/Operation%20Manuals/LIBERO/OM_LIBEROC_EN_web.pdf).

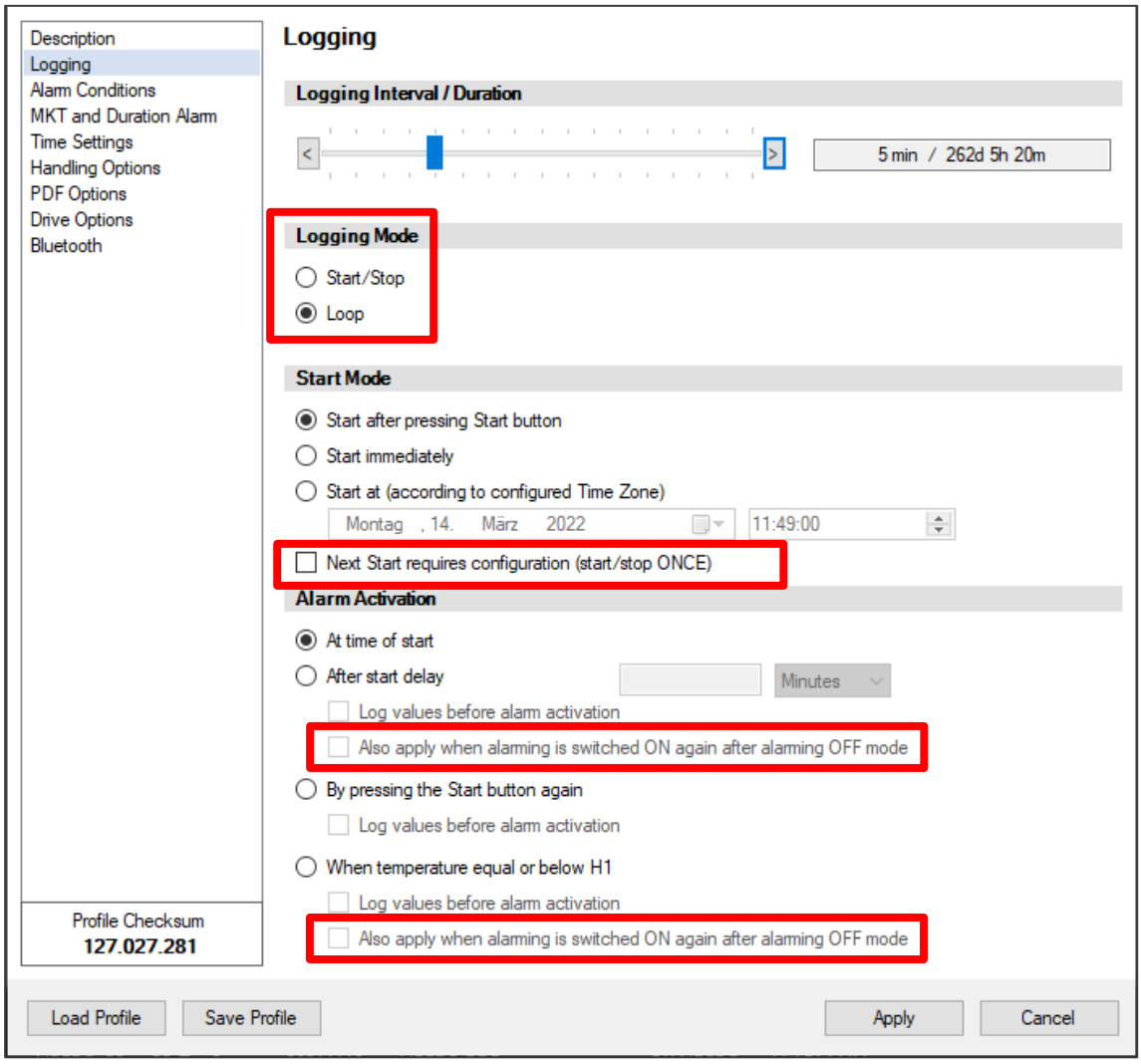
In the following section only differences or additional configuration options for logger models LIBERO CE/CL/CH-BLE are described.

To use all functions of the current firmware, ensure that a compatible version of liberoCONFIG is used for the configuration of the logger.
Find the version number under "About" in the "APPLICATION" menu.



Menu selection: “Logging”

- "Loop" has been added as an additional recording mode, since LIBERO CE/CL/CH-BLE loggers are for multiple use.
  NOTE: When memory capacity of the logger is reached, newly measured values continuously overwrite the oldest stored values!



- "Next Start requires configuration (start/stop ONCE)" requires mandatory re-configuration before a next use. A re-start without re-configuration is not accepted by the device.
  This additional requirement can be combined with all start options.

- For temperature- or time-delayed alarm activation the option has been added that such activation is also possible in case the alarm is subsequently switched on again after a phase of "alarming OFF" mode.

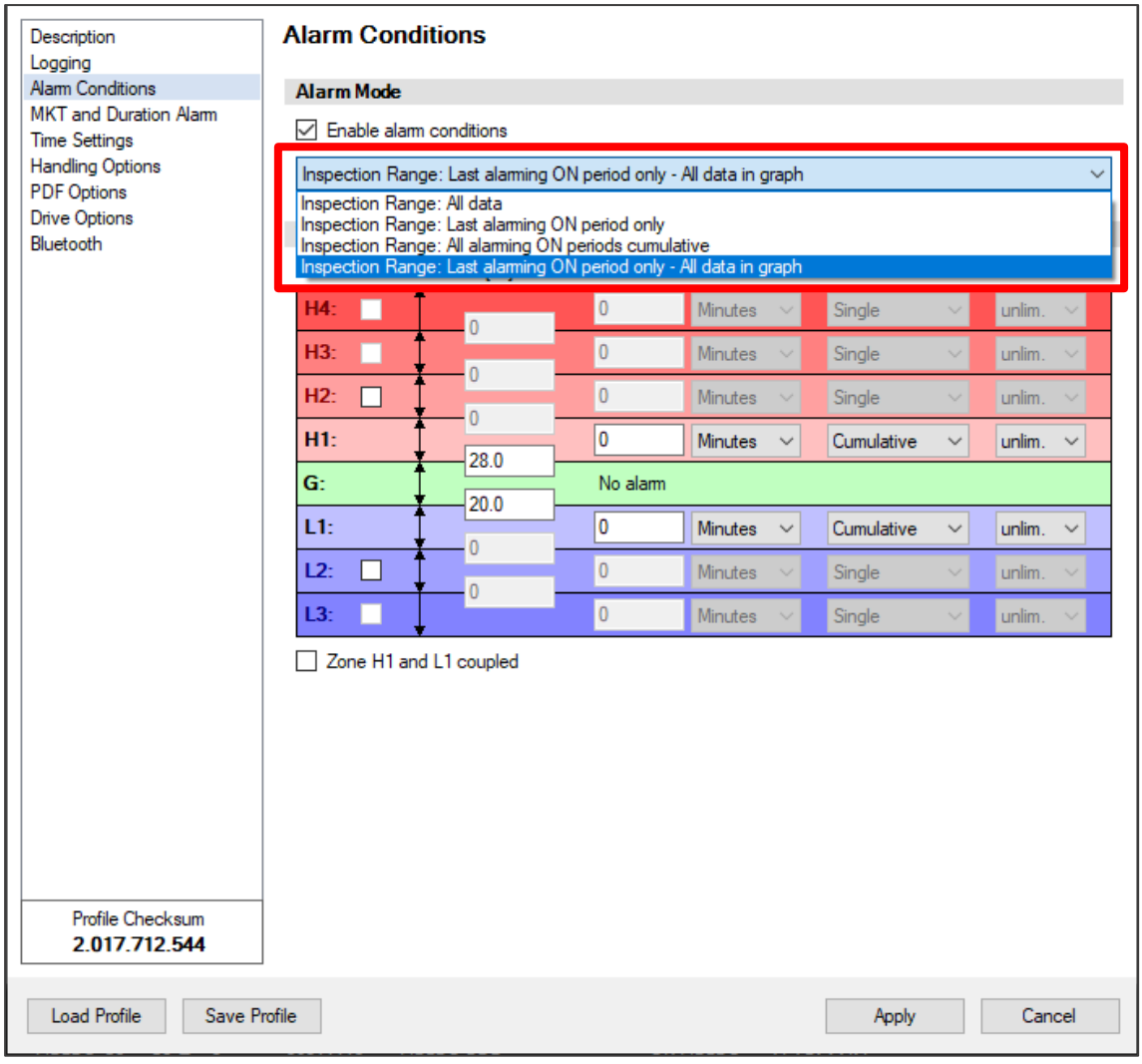
Menu selection: “Alarm Conditions”

In the section "Alarm Mode" the possibility to select the inspection range has been added. The following options are available:

- **All data:** all recorded values are taken into consideration when assessing the alarm status (based on the configured alarm conditions)
- **Last "alarming ON" period only:** only the measured values between the last pressing of the "Alarming ON" button and the last pressing of the "Alarming OFF" button on the device are considered in the assessment. If the "Alarming ON" button was pressed last, i.e. the alarming is still active, all measured values since that time are taken into account.
- **All "alarming ON" periods cumulative:** all measured values recorded in phases with activated alarming are considered in the assessment.
- **Last "alarming ON" period only - All data in graph**: Only measured values of the last phase of activated alarming are considered in the alarm assessment, but all data from all logging periods are shown in the graph.

Alarming ON/OFF

Only if one of the last three options are selected, the alarming can be activated ("Alarming ON") or deactivated ("Alarming OFF") during measurement mode.



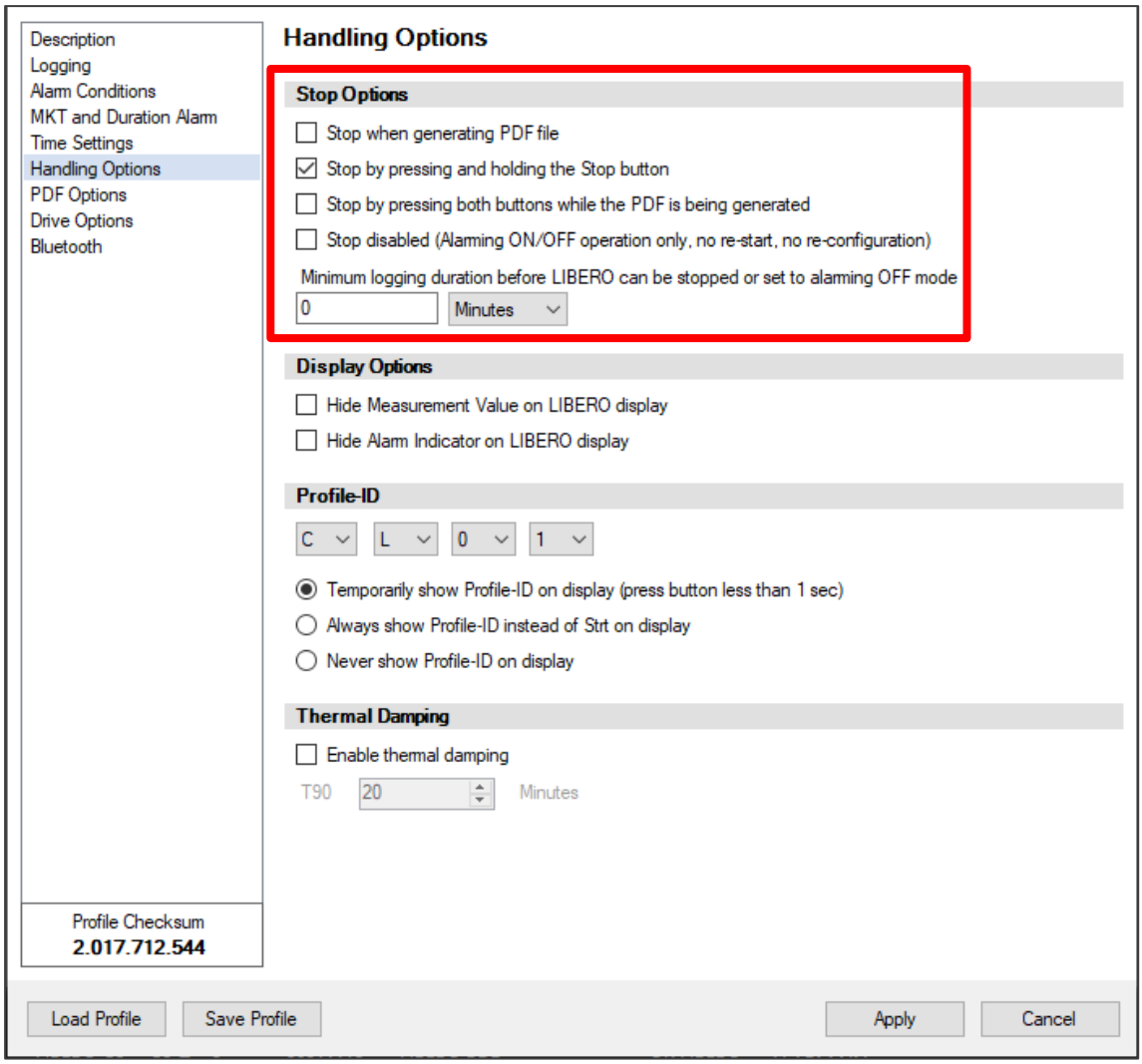
Menu selection: “Handling Options»

Stop Options

There are four options to stop data recording:

- Stop when generating the PDF report *)
- Stop by pressing and holding (> 2 seconds) the Stop button *)
- Stop by pressing both buttons at the same time while the PDF is being generated (so stopping is basically possible, but the logger will hardly ever be stopped accidentally)
- Stop mode disabled: prevents a stop of the logger, allows continuous logging with flexible use of alarm activation (Alarming ON/OFF).
  (ATTENTION: the device cannot be re-started or re-configured!)

*) … these two options can be combined.

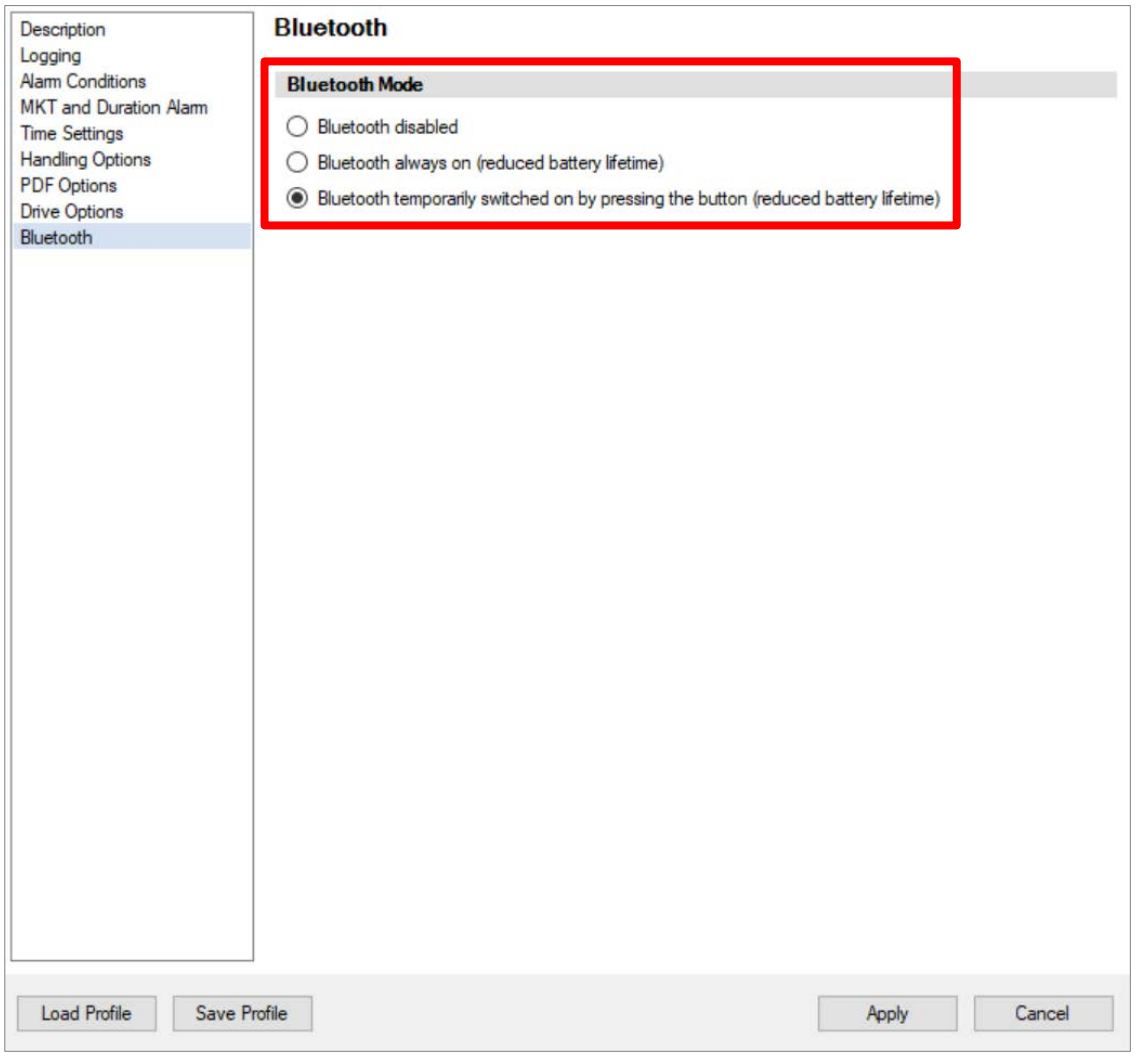


Menu selection: “Bluetooth®”

To enable operation of the logger via LIBERO Cx BLE app, Bluetooth® mode must be selected accordingly when configuring the logger. The following are available for selection:

- Bluetooth® permanently off: there is no communication with the app.
- Bluetooth® permanently switched on: communication with the app is possible at all times.
- Bluetooth® temporarily switched on: the Bluetooth® interface is only activated for a short time (30 seconds) and when required, by briefly pressing the "Start/ON" key.

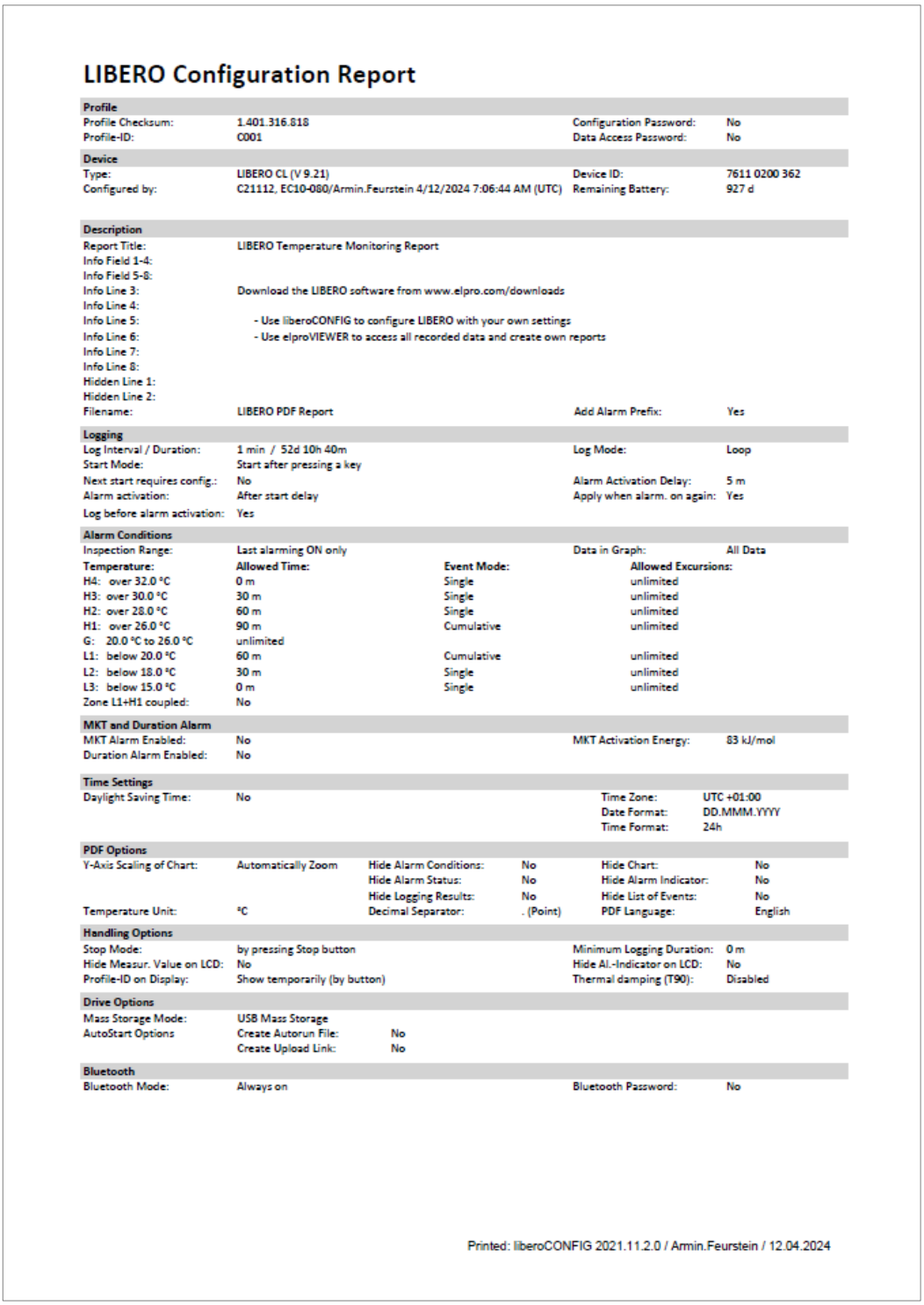
Attention: temporary or permanent activation of Bluetooth® mode leads to a shortening of the battery runtime!



LIBERO Configuration Report

The LIBERO configuration report fully documents the configuration created for a LIBERO PDF data logger. The configuration report contains the following:

- Device and configured profile details
- Text fields for user/application information
- Logging and alarm conditions
- PDF report content & presentation
- Handling options



LIBERO Configuration Report

Profile			
Profile Checksum:	1.401.316.818	Configuration Password:	No
Profile-ID:	C001	Data Access Password:	No
Device			
Type:	LIBERO CL (V 9.21)	Device ID:	7611 0200 362
Configured by:	C21112, EC10-080/Armin.Feurstein 4/12/2024 7:06:44 AM (UTC)	Remaining Battery:	927 d
Description			
Report Title:	LIBERO Temperature Monitoring Report		
Info Field 1-4:			
Info Field 5-8:			
Info Line 3:	Download the LIBERO software from www.elpro.com/downloads		
Info Line 4:			
Info Line 5:	- Use liberoCONFIG to configure LIBERO with your own settings		
Info Line 6:	- Use elproVIEWER to access all recorded data and create own reports		
Info Line 7:			
Info Line 8:			
Hidden Line 1:			
Hidden Line 2:			
Filename:	LIBERO PDF Report	Add Alarm Prefix:	Yes
Logging			
Log Interval / Duration:	1 min / 52d 10h 40m	Log Mode:	Loop
Start Mode:	Start after pressing a key		
Next start requires config.:	No	Alarm Activation Delay:	5 m
Alarm activation:	After start delay	Apply when alarm. on again:	Yes
Log before alarm activation:	Yes		

Alarm Conditions

Inspection Range:	Last alarming ON only	Data in Graph:	All Data

Temperature:	Allowed Time:	Event Mode:	Allowed Excursions:
H4: over 32.0 °C	0 m	Single	unlimited
H3: over 30.0 °C	30 m	Single	unlimited
H2: over 28.0 °C	60 m	Single	unlimited
H1: over 26.0 °C	90 m	Cumulative	unlimited
G: 20.0 °C to 26.0 °C	unlimited		
L1: below 20.0 °C	60 m	Cumulative	unlimited
L2: below 18.0 °C	30 m	Single	unlimited
L3: below 15.0 °C	0 m	Single	unlimited
Zone L1+H1 coupled:	No		

MKT and Duration Alarm			
MKT Alarm Enabled:	No	MKT Activation Energy:	83 kJ/mol
Duration Alarm Enabled:	No		
Time Settings			
Daylight Saving Time:	No	Time Zone:	UTC +01:00
		Date Format:	DD.MMM.YYYY
		Time Format:	24h

PDF Options					
Y-Axis Scaling of Chart:	Automatically Zoom	Hide Alarm Conditions:	No	Hide Chart:	No
		Hide Alarm Status:	No	Hide Alarm Indicator:	No
		Hide Logging Results:	No	Hide List of Events:	No
Temperature Unit:	°C	Decimal Separator:	. (Point)	PDF Language:	English
Handling Options					
Stop Mode:	by pressing Stop button			Minimum Logging Duration:	0 m
Hide Measur. Value on LCD:	No			Hide Al.-Indicator on LCD:	No
Profile-ID on Display:	Show temporarily (by button)			Thermal damping (T90):	Disabled
Drive Options					
Mass Storage Mode:	USB Mass Storage				
AutoStart Options	Create Autorun File:	No			
	Create Upload Link:	No			
Bluetooth					
Bluetooth Mode:	Always on			Bluetooth Password:	No

Printed: liberoCONFIG 2021.11.2.0 / Armin.Feurstein / 12.04.2024

7 Operation via LIBERO Cx BLE App (operating system Apple iOS)

The ELPRO LIBERO Cx BLE app is a mobile app available for smart devices with iOS and Android operating systems. LIBERO data loggers with Bluetooth® Low Energy (BLE) interface are able to connect wirelessly to the app once installed on smartphones or tablets.

Download and use of the app

The LIBERO Cx BLE app is available for iOS and Android operating systems and can be downloaded from the Apple App Store or Google Play Store.
After downloading, opening and closing the app is done in the conventional way.

The ELPRO LIBERO Cx BLE app in the version for the Apple iOS operating system helps to start/stop, monitor and read out the PDF reports of LIBERO CE/CL/CH data loggers in the nearby proximity. The app also allows quick download of PDF reports without direct physical contact to the data logger and without connecting to the USB port of a computer. Measured values and alarms can be monitored via the app and it is possible to add individual information/notification lines prior to generating the final PDF report.

Prerequisites for trouble-free operation:

_ Activation of Bluetooth® - on the smart device and on the logger.
_ sufficient signal strength and uninterrupted connection between logger and smart device, depending on the distance and ambient conditions.
_ on the smart phone or tablet, allow access to camera, location and memory (see Settings/Apps/Permissions, as of Android 10.0 also activate options in “Improve accuracy" sub-menu).
_ Operating systems minimum requirements: iOS 9.0 or higher

Main screen

The main screen of the app shows all loggers located in the vicinity and detected by the app. The following information is displayed for each logger:

- Logger-ID (serial number)
- Operating status (e.g. running, stop, …)
- Actual temperature value
- Actual relative humidity value (LIBERO CH only)
- Alarm mode (ON/OFF)
- Alarm status (OK/Alarm)
- Battery life time (in days)
- Signal strength of Bluetooth® connection
- Bluetooth® connection update time

Main menu

By selecting the menu icon the main menu is displayed.

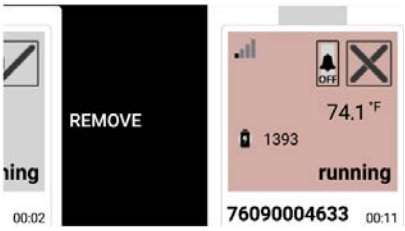
_ *LIBERO within reach*	leads to the main screen
_ *Last LIBERO actions*	displays a list of the last operations performed via the app
_ *Security settings*	edit app and logger password
_ *General settings*	define settings for date and temperature display and editing of predefined email addresses
_ *Privacy policy*	statements on privacy policy
_ *Quick Start Guide*	Quick Start Guide reference
_ *Support*	link to ELPRO product support page
_ About	information about ELPRO and app version

Displaying loggers

The smart device displays all loggers that are in the immediate vicinity and to which a Bluetooth® Low Energy (BLE) connection can be established.
Devices are not displayed if loggers are out of range, Bluetooth® functionality has not been configured accordingly or individual loggers do not meet any filter criteria that may have been set.
Loggers are displayed in ascending order, based on their serial number.

Tapping "**Refresh**" identifies any loggers that have been added and includes them in the overall display.

A logger can be removed from the main display by touching the symbol display and then swiping to the left.



The selection of loggers to be displayed is simplified by using the **filter function**.

Tapping the filter icon opens a screen where the filter function can be activated and you can choose from a variety of criteria for filtering.

Filtering is possible according to following criteria:

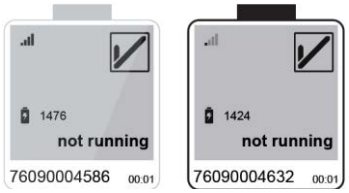
- LIBERO serial number (edit or scan)
- Signal strength of Bluetooth® connection
- Battery level (remaining days)
- Temperature value
- Relative humidity value (LIBERO CH only)
- Alarm mode
- Alarm status
- Info fields 1…6

Acceptance of the set filter criteria must be confirmed by tapping "APPLY".

Selection of loggers

The loggers shown on the display of the smart device can be selected for further operating steps by tapping the logger display symbol.

- The selection of a logger is visually recognizable by a black border line and a black bar above the logger display symbol.



- Tapping "Select all" selects all loggers displayed in the main display. Tapping again cancels the selection.

Operating steps / Actions

Operating steps (actions) can be performed for a single logger or for all loggers.
If one or more loggers have been selected, confirmation is in the information bar of the screen.

Tapping the arrow key opens a control panel which allows for the following actions:

- Start
- Stop
- Alarm On
- Alarm Off
- PDF Report Download
- Show Info Fields
- Set/Add Info Fields

The execution of each action must be confirmed immediately after the selection in order to exclude unintentional operating errors.

Starting a logger is done by tapping "Start" in the control panel.
On the display of the logger you will see a flashing “Run” symbol confirming that the logger has started logging.

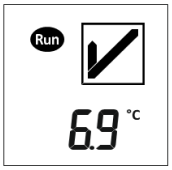
Stopping a logger is done by tapping "Stop" in the control panel.
On the display of the logger you will see "Make PdF" confirming that the logger has stopped logging and that it is now possible to download the PDF report.

Alarm monitoring is **activated** by tapping "Alarm On" in the control panel.
The logger display will show the alarm bell icon with the "ON" status message above it.

Alarm monitoring is **deactivated** by tapping "Alarm Off".
On the logger display the status message under the alarm bell icon changes to "OFF".
At the same time, the measured temperature value and the note for reactivating the alarm monitoring "AL on" are displayed underneath in alternating cycles.

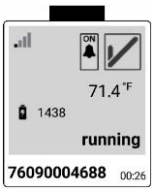
A **PDF report** is generated and downloaded to the smart device by tapping «PDF Export».

After this action has been executed, the logger will display "Stop" if the logger was stopped before the download command was issued.
If a download is requested during operation ("Run Mode") the logger continues to run without any change in recording mode.



As part of configuring the logger using liberoCONFIG, information can be edited in predefined fields (Info Fields).

Displaying Info Fields is done by tapping "Info Fields" in the control panel.
On the screen of the smart device, the logger icon is extended downwards, and the contents of the six Info Fields are displayed.



It is possible to **create new entries in Info Fields** by tapping "Set Info Fields" in the control panel.

Entry of data into the six item lines is completed by "START".
The updated content of the Info Fields will be exported into the PDF report and listed accordingly.

Note: Existing entries in info lines (created during configuration using liberoCONFIG) will be overwritten by newly edited entries.

Last LIBERO actions

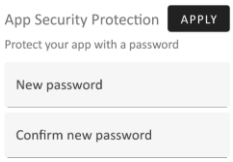
All executed operations are recorded chronologically in an event list. This event list can be accessed via this main menu item or the icon in the upper right corner of the screen; in addition, tapping on an entry can call up further details about the executed operation (e.g. serial number of the logger concerned, re-reading/forwarding of created PDF reports, etc.).

Security settings

The use of LIBERO Cx BLE app can be protected by a password, just as the LIBERO CE/CL/CH-BLE loggers themselves can be provided with appropriate security measures as part of the configuration (password protection for configuration, data access and Bluetooth® connection).

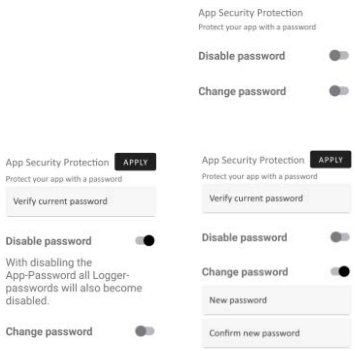
Notice:
Setting, changing and deleting logger passwords is only done via the liberoCONFIG configuration software!
In the app, entries are stored in a password list and are matched when requested (when access to the logger is desired).
This has the advantage that the respective password does not have to be entered individually for each password-protected access.

Via the "**App Security Protection**" selection field, a password for the use of the app can be set in the next window ~~appearing next~~.



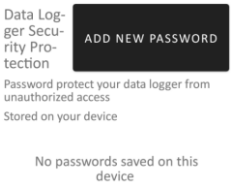
This password is requested each time the app is opened.

The password can be changed or disabled.



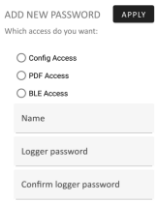
Attention:
When deactivating the app password, all entries in the password list are deactivated at the same time!

Via the "**Data Logger Security Protection**" selection field entries in the password list stored on the app can be created in the next window, to prevent unauthorized access to the configuration, the data and the Bluetooth® usage.

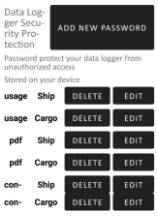


Passwords can be created individually for each area to be protected.

- Configuration Access
- PDF (Data) Access
- BLE Access

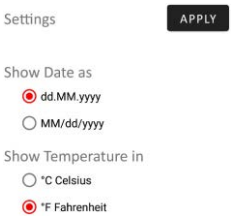


For a better overview, a description can be added to each of the entered passwords, which is displayed in the list in a shortened scope of 6 characters. The entries made can be edited or deleted from the list at any time.



General settings

In the general settings, the date format and the units of temperature values can be selected.



In addition, it is possible to enter predefined email addresses for the distribution of PDF reports.

About

This menu item contains a link for more details about the company ELPRO ("ABOUT US") and provides information about the version of the currently used app software.

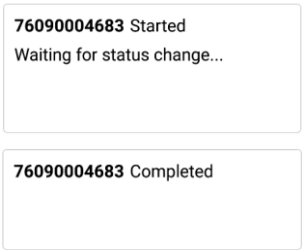
Processing speed and functionality of Bluetooth® Low Energy (BLE) connection

With the aim of optimizing battery life an active connection between the logger and the smart device is only established for the time it takes to execute a specific action. Apart from that, only basic information of presence and actual status is exchanged.

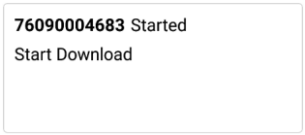
Repeated reset of a displayed counter in the logger icon reflects the frequent communication dialog between a logger and the smart device.

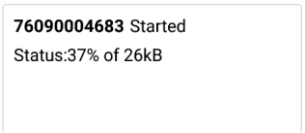
The user is continuously informed via the app about any communication between the smart device and the logger. Below are two examples of dialog information for clarification:

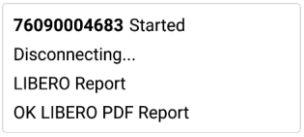
Action: Start



Action: PDF Export







8 Operation via LIBERO Cx BLE App (operating system Android)

The ELPRO LIBERO Cx BLE app is a mobile app available for smart devices with iOS and Android operating systems. LIBERO data loggers with Bluetooth® Low Energy (BLE) interface are able to connect wirelessly to the app once installed on smartphones or tablets.

Download and use of the app

The LIBERO Cx BLE app is available for iOS and Android operating systems and can be downloaded from the Apple App Store or Google Play Store.
After downloading, opening and closing the app is done in the conventional way.

The ELPRO LIBERO Cx BLE app in the version for Android operating system helps to start/stop, monitor and read out the PDF reports of LIBERO CE/CL/CH data loggers in the nearby proximity.
The app also allows quick download of PDF reports without direct physical contact to the data logger and without connecting to the USB port of a computer.

This version of the app also has a functionality for the automated read-out and forwarding of PDF reports. In contrast to single-step operation, the logger to be processed is selected fully automatically according to defined filter criteria and processed according to a pre-defined sequence of work steps. The aim of this automation is the fully automated generation and forwarding of temperature monitoring data to a target recipient.

Prerequisites for trouble-free operation:

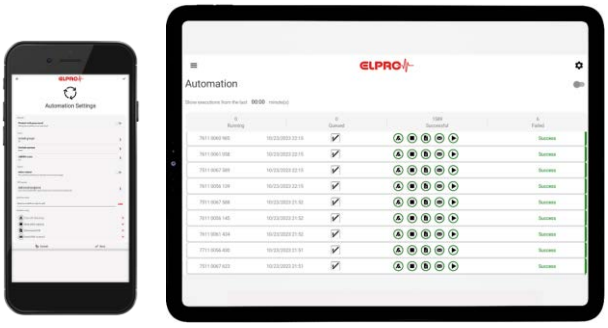
_ Activation of Bluetooth® - on the smart device and on the logger.

_ sufficient signal strength and uninterrupted connection between logger and smart device, depending on the distance and ambient conditions.

_ on the smart phone or tablet, allow access to camera, location and memory (see Settings/Apps/Permissions, as of Android 10.0 also activate options in “Improve accuracy" sub-menu).

_ Operating systems minimum requirements: Android version 13 or higher

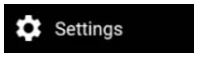
The LIBERO Cx BLE app can be used on any smart device (mobile phones & tablets), the display is oriented accordingly in portrait or landscape format.
With a focus on the use of automation, the use of a smart tablet in landscape format is recommended.



How to design & set up an automation?

- **Identify application & environment**
  (transport loggers arriving, distinguish from stationary loggers, repeated runs, etc.)
- **Consider logger configuration (operating commands)**
  (active alarming-ON, stop before readout, readout while logging, etc.)
- **Define filters & create groups**
  (utilize known device IDs, need for device-independent identifier, etc.)

- **Settings (operation & security)**
  (SMTP/email, passwords for app & devices, units & formats, etc.)

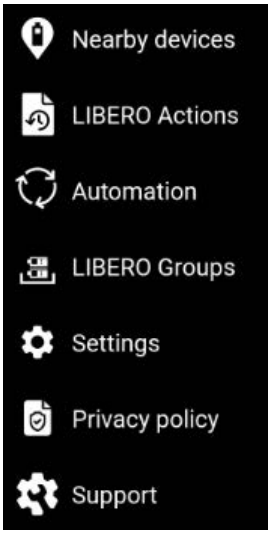


- **Set up automation**
  (groups include/exclude, device state filters, repeat, email recipients, workflow steps, etc.)

Main menu

By selecting the menu icon the main menu is displayed.

_ *Nearby devices*	displays devices detected via BLE in the vicinity
_ *LIBERO Actions*	displays a list of the last operations executed via the app
_ *Automation*	creation and execution of an automation
_ *LIBERO Groups*	creation of groups for identification
_ *Settings*	settings for security and operation
_ *Privacy policy*	information on privacy policy
_ *Support*	information about ELPRO support



The smart device displays all loggers that are in the immediate vicinity and to which a Bluetooth® Low Energy (BLE) connection can be established.
Devices are not displayed if loggers are out of range, Bluetooth® functionality has not been configured accordingly or individual loggers do not meet any filter criteria that may have been set.
Loggers are displayed in ascending order, based on their serial number. The following information is displayed for each logger:

- Logger-ID (serial number)
- Operating status (e.g. Run, Start, Stop, Make PDF, …)
- Actual temperature value
- Actual relative humidity value (LIBERO CH only)
- Alarm mode (ON/OFF)
- Alarm status (OK/Alarm)
- Battery status
- Signal strength of Bluetooth® connection
- Bluetooth® connection update time

Using the **filter function** simplifies the selection of loggers for display on the screen of the smart device and reduces the time required.

Tapping the filter icon opens a screen where the filter function can be activated and you can choose from a variety of criteria for filtering.

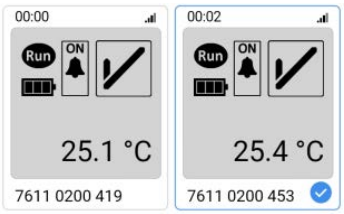
Filtering is possible according to following criteria:

- Created Groups
- Alarm status
- Signal strength of Bluetooth® connection
- LIBERO serial number (edit)

Selection of loggers

The loggers shown on the display of the smart device can be selected for further operating steps by tapping the logger display symbol.

- The selection of a logger is visually recognizable by a blue border line and a black bar above the logger display symbol.



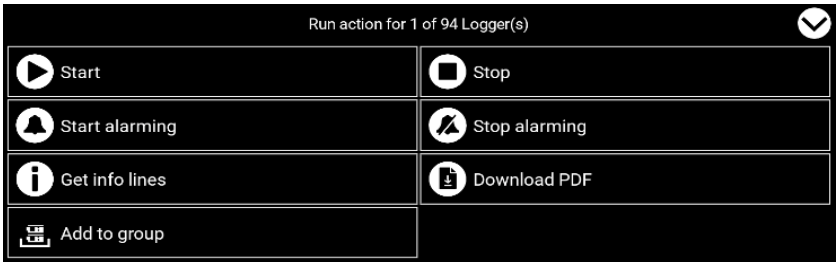
- Tapping "Select all" selects all loggers displayed in the main display. Tapping again cancels the selection.

Operating steps / Actions

Operating steps (actions) can be performed for a single logger or for all loggers.
If one or more loggers have been selected, confirmation is in the information bar of the screen.

Tapping the arrow key opens a control panel which allows for the following actions:

- Start
- Stop
- Start alarming
- Stop alarming
- Get info lines
- Download PDF
- Add to group



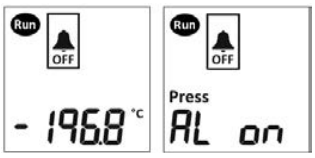
The execution of each action requires a confirmation (“Yes” or “Cancel”) in order to prevent unintentional operating errors.

Starting a logger is done by tapping "Start" in the control panel.
On the display of the logger you will see a flashing “Run” symbol confirming that the logger has started logging.

Stopping a logger is done by tapping "Stop" in the control panel.
On the display of the logger you will see "Make PdF" confirming that the logger has stopped logging and that it is now possible to download the PDF report.

Alarm monitoring is **activated** by tapping "Start alarming" in the control panel. The logger display will show the alarm bell icon with the "ON" status message above it.

Alarm monitoring is **deactivated** by tapping "Stop alarming". On the logger display, the status message under the alarm bell icon changes to "OFF".
At the same time, the note for reactivating the alarm monitoring "AL on" is displayed underneath.

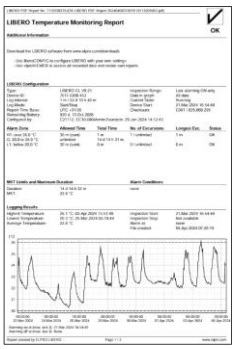


A **PDF report** is generated and downloaded to the smart device by tapping «Download PDF».
After this action has been executed, the logger will display "Stop" if the logger was stopped before the download command was issued.
If a download is requested during operation ("Run Mode") the logger continues to run without any change in recording mode.

The PDF report is available in the main menu under "LIBERO Actions".

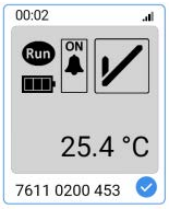
After tapping on the "Share" symbol, a menu bar appears at the bottom edge.

You can select whether the PDF report should be opened for viewing, shared with others or sent by email.
The desired functionality is then executed by applications installed on the smart device.

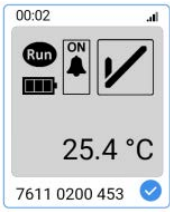


As part of configuring the logger using liberoCONFIG, information can be edited in predefined fields (Info Lines).
Displaying Info Lines is done by tapping "Get info lines" in the control panel.

After closing the control panel, double-tapping the logger symbol takes you to a detail page with further details on the selected device, including the contents of the Info Lines 3…8.



Individual loggers can be selected and **added to a group** for later use as a filter criterion when creating an automation process.
After selecting one or more loggers from the overview list and tapping this menu item, a list of already created groups appears in a new window.



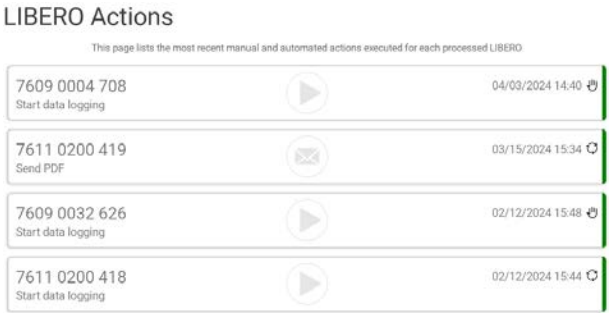
Tapping on the group name selects the group and assigns the selected logger(s) to this group.

Bluetooth® Low Energy (BLE) connection update time

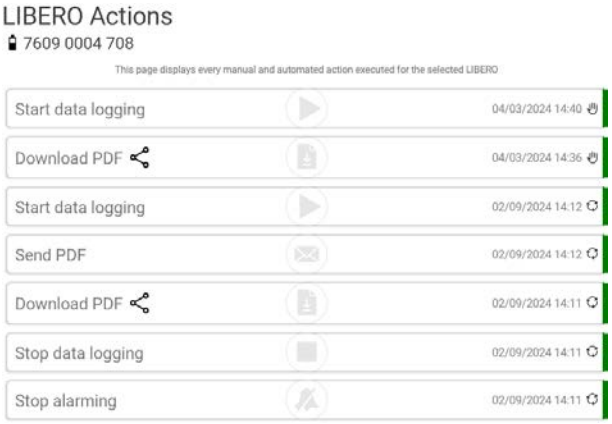
With the aim of optimizing battery life, an active connection between the logger and the smart device is only established for the time it takes to execute a specific action. Apart from that, only basic information of presence and actual status is exchanged.

Repeated reset (00:00) of a displayed counter in the logger icon reflects when status information was last exchanged or an active connection was established.

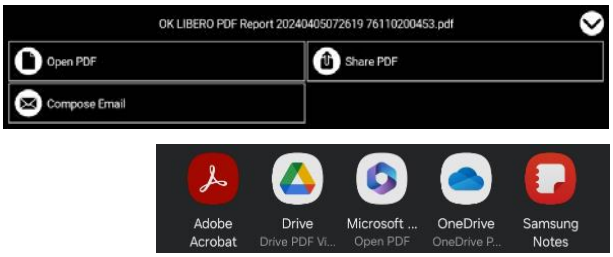
All executed operations are recorded chronologically in an event list, which can be called up via this main menu item.

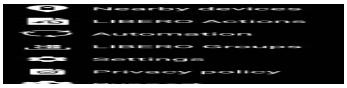


The list shows entries of logger serial numbers, sorted chronologically according to the last actions performed.
Tapping on a serial number leads to the next display, in which all recently executed actions for this selected device are listed chronologically.



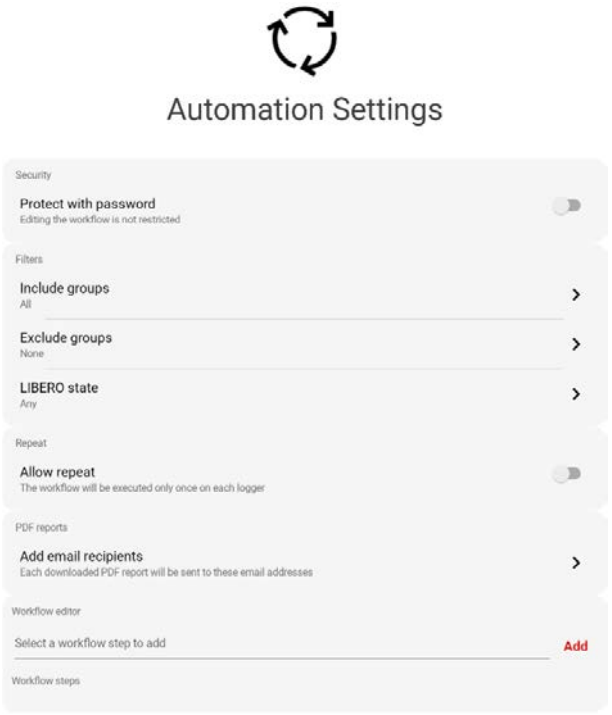
For "Download PDF" entries, the PDF reports can be called up by tapping on the "Share" symbol and displayed using an installed PDF reader.





Nach Auswahl dieser Option im Hauptmenü gelangt man auf die Seite zur Einrichtung und Ausführung eines Automatisierungs-Ablaufes.

Selecting the cogwheel symbol in the top right-hand corner takes the user to the settings described below



Security

If password protection is not activated, the processing of automation steps is permitted without restriction and therefore not protected.

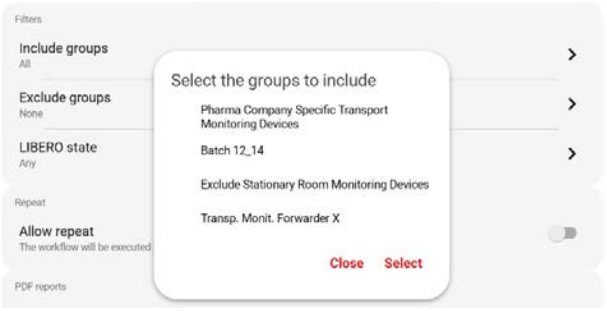
Password protection is activated by tapping the slide switch on the right-hand side.
The app password is set up in the main "Settings" menu under "Security".

Filters

If a LIBERO Cx BLE logger is detected via the received Bluetooth® BLE signal, the device is checked for compliance with predefined criteria.

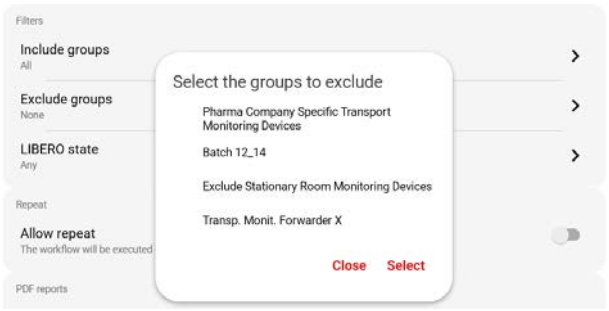
_ *Include groups*

Definition of groups to be involved in the identification.



_ *Exclude groups*

Definition of groups that should be excluded from identification.



_ *LIBERO state*

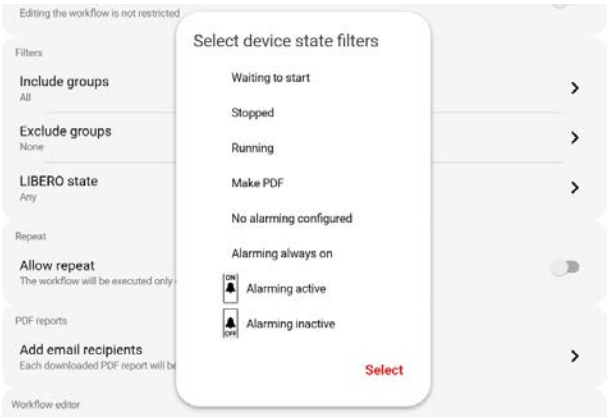
Definition of the operating status in which a device should be at the time of identification. (multiple selection possible)

Waiting to start: LIBERO configured, not yet started.

Make PDF: LIBERO stopped, PDF not yet generated.

No alarming configured: no alarm conditions configured.

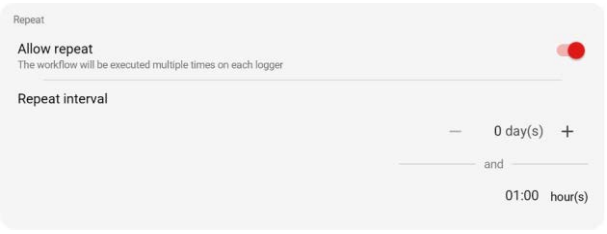
Alarming always on: Inspection Range: All Data configured



Repeat

A predefined sequence of work steps (workflow) is only applied once to each identified LIBERO Cx BLE logger.
If this device is to be included in the sequence of work steps a second time, this repeat function must be activated by tapping the slide switch on the right-hand side of the page.

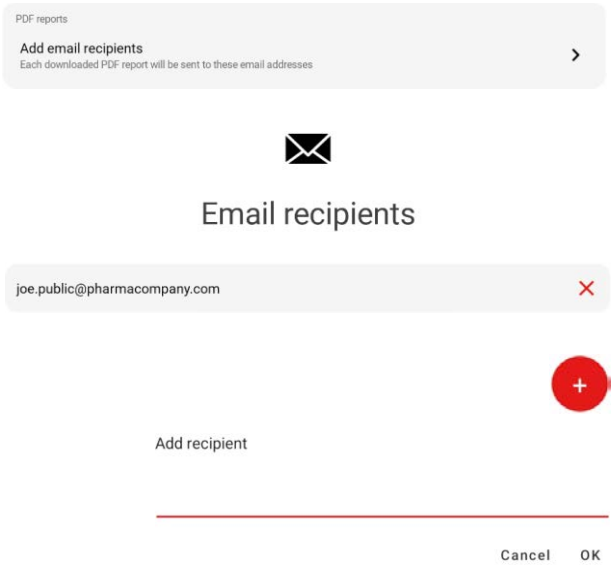
After activation, a time period is set that the app will wait for before applying the sequence of steps again on a device that has already been processed before.



The repetition interval can be set in a range from a minimum of 1 hour to a maximum of 999 days.
The setting is made using the "+ / -" buttons or by tapping the numerical value directly using the keyboard that then appears.

PDF reports

A PDF report generated from the LIBERO Cx BLE logger can be forwarded to one or more recipients by email in the next step. Possible recipients can be email addresses of individuals as well as cloud/database platforms, such as ELPRO's liberoMANAGER.



Recipients are entered by tapping on the red circle symbol and then entering the email addresses.

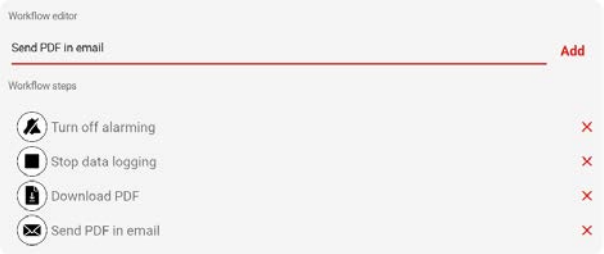
Workflow editor

If a LIBERO Cx BLE PDF logger meets the set filter criteria, it is processed according to a predefined sequence of work steps (workflow).
The work steps are essentially the operating options of the logger, supplemented by the function of forwarding to selected email recipients.

A workflow step is selected by tapping on the field above the line (labeled "Select a workflow step to add") and then selecting the desired operation.

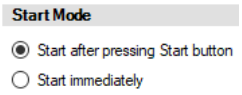
- Start the logger
- Stop the logger
- Start alarm activation
- Stop alarm activation
- Downloading the PDF report
- Forwarding the PDF report via email

Then tap on "Add" on the right-hand side to add the selected option to the list of work steps shown below it.
An erroneously accepted entry can be deleted by tapping on the red X on the right-hand side.

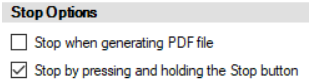


Important:
- The selected work steps are carried out in the order in which they are entered!
- After this last step, the automation setup must be saved in any case!
- To carry out the "Start Data Logging" and "Stop Data Logging" steps, the LIBEROs must be configured for button operation.

> in liberoCONFIG, section «Logging»:



> in liberoCONFIG, section «Handling Options»:



Executing an automation

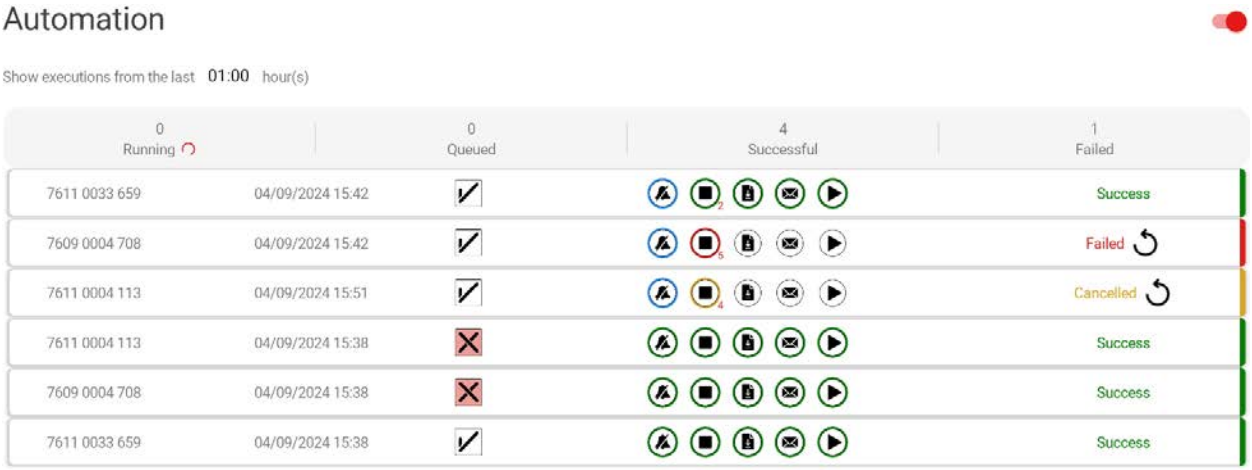
The automation previously set up in the respective parameters is activated by tapping the slide switch visible on the right-hand edge.

A list view of all LIBERO Cx BLE PDF loggers currently being processed then appears. The header of the display shows:

- Number of devices currently being processed
- Number of devices in queue for delayed processing
- Number of devices with successful processing
- Number of devices with unsuccessful processing

The individual line entries in the display provide information about:

- the serial number (ID) of the processed logger
- the time of initial detection (receipt of BLE signal)
- the alarm status of the device (OK or alarm)
- the scope and execution status of the work steps
- the success of the execution of the automation on this device



The status of the processing of work steps is shown by a circular progress indicator and colored markings.

- red Work step in progress
- green Work step successfully completed
- orange Processing aborted
- blue Work step not applicable (logger configuration not corresponding or device not in expected status)

If problems occur during the execution of the work steps, the relevant work step is repeated. This is indicated by a red counter display.

If the work steps cannot be carried out successfully even if they are repeated, this is displayed accordingly in the right-hand margin.
Tapping on the arrow symbol starts a repeat attempt.

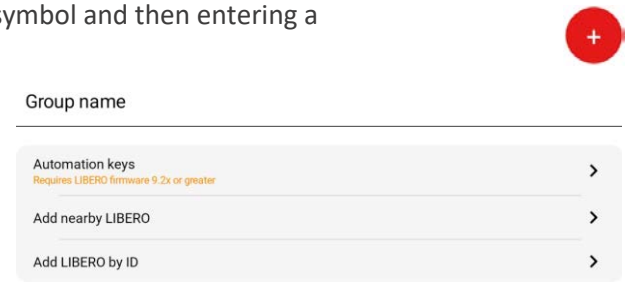
During the ongoing automation process, the execution of the work steps can also be canceled individually for a logger; this is also displayed accordingly.

Set up groups

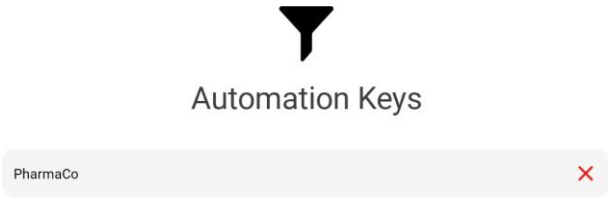
LIBERO Groups

Groups are used to identify LIBERO Cx BLE PDF loggers that are recognized via Bluetooth® BLE radio signals.
When setting up an automation, groups are included in or excluded from the subsequent execution of the automation.
Groups can be created with any name and contain either known serial numbers of devices or a defined identifier to identify devices.

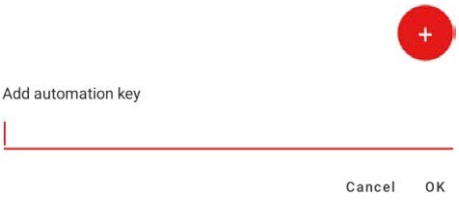
A new group is created by tapping on the red circle symbol and then entering a group name.



If a newly created group is to identify all those LIBERO Cx BLE PDF loggers that contain a defined identifier, the "Automation keys" selection must be made.



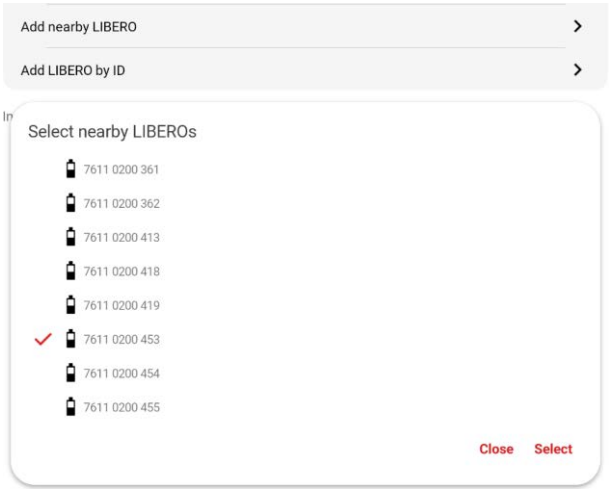
A new "Automation Key" identifier is created by tapping on the red circle symbol and then entering a group name.



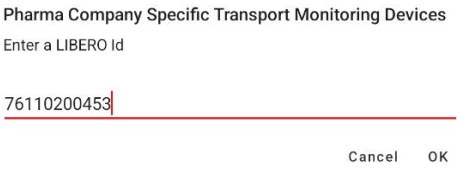
Note:
_ A LIBERO Cx BLE PDF logger is assigned an "Automation Key" identifier as part of the device configuration. This is entered via the liberoCONFIG configuration software, in the first menu item "Description", under "Hidden information" in line 2(!), by entering the identifier between two square brackets, e.g. [[PharmaCo]].
_ The identifier can be up to 8 characters long and consist of numbers, letters and special characters.

If a newly created group is to identify all LIBERO Cx BLE PDF loggers on the basis of known serial numbers, select "Add nearby LIBERO" or "Add LIBERO by ID".

When "Add nearby LIBERO" is selected, a list of serial numbers of all devices currently recognized via Bluetooth® BLE signal appears. The selection is made by tapping the serial number.



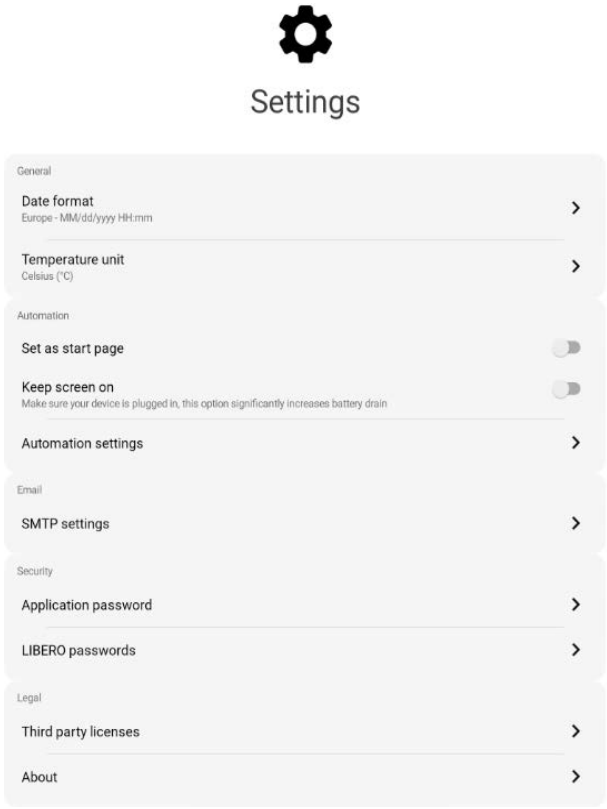
If "Add LIBERO by ID" is selected, the serial number is entered manually.



Selected or edited serial numbers are added to the group and displayed in a list.

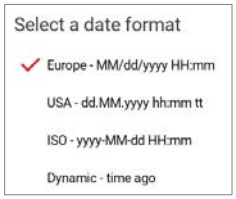
All entries must be saved at the end.

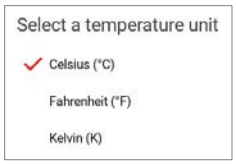
Settings for various parameters can be made in this section.



General

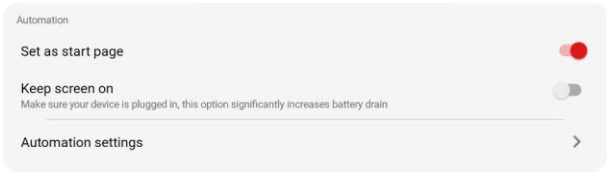
The date format and the units of temperature values can be selected in the general settings.



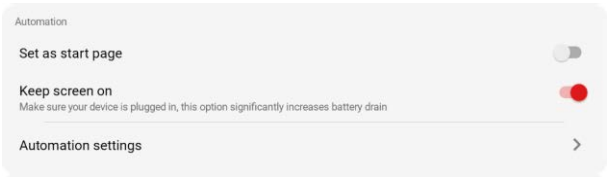


Automation

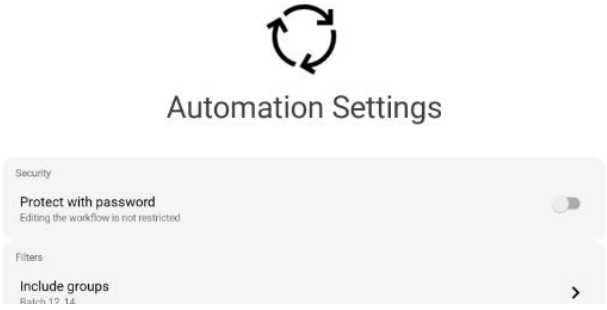
If desired, the menu page of the automation can be set as the start page.



If required, the display can be prevented from switching off.
(this requires a connection to the permanent power supply)

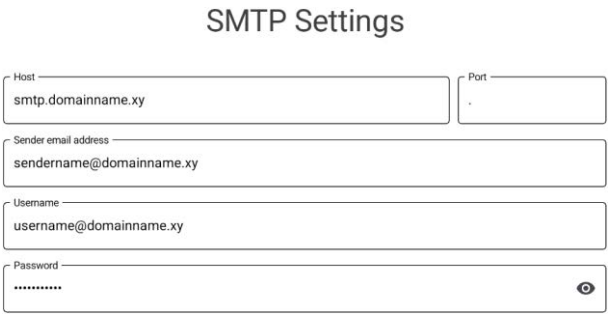


It is possible to switch directly from the settings menu to the automation setup page.



Email

In this section, the settings of the outgoing email server are recorded.
To ensure the correctness of the entries, we recommend contacting the internal IT department or the external Internet service provider.



Security

The use of the LIBERO Cx BLE app can be protected by a password, just as the LIBERO CE/CL/CH-BLE PDF loggers themselves can be provided with appropriate security measures as part of the configuration (password protection for configuration, data access and Bluetooth® connection).
Note:
Logger passwords can only be set, changed and deleted using the liberoCONFIG configuration software!

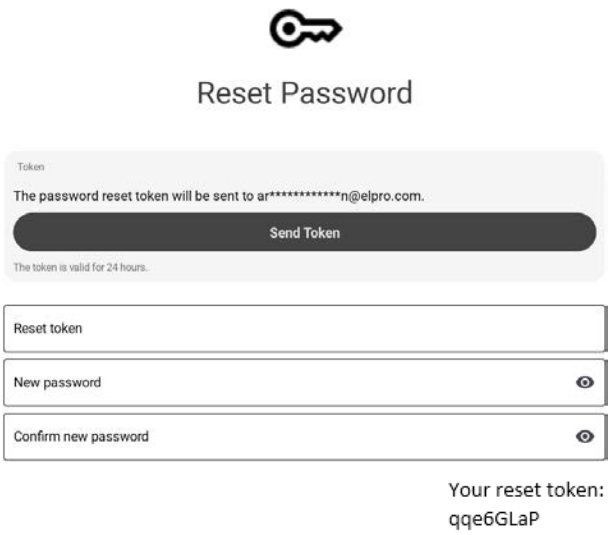
A password for using the app can be set via the "Application password" selection field in the following window.
(the entry of an e-mail address is used for any necessary recovery of the password)

This means that the set app password must be entered when opening the LIBERO Cx BLE app in future.

If the password is not (or no longer) known, a recovery can be requested by selecting "I forgot my password".

By tapping on the black bar, a key (token) is sent to the email address specified for this purpose.

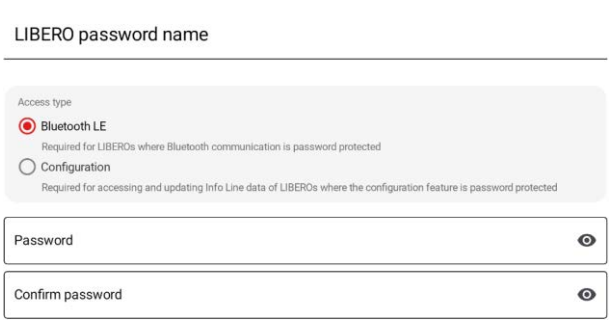
After receipt by email, this key can be entered in the field below, together with a new password.



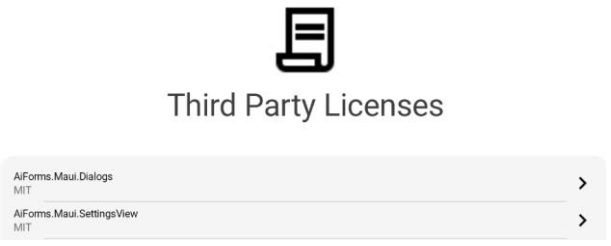
You can use the "LIBERO passwords" selection field to create a list of passwords.
Communication with a recognized logger is only enabled if a listed password matches the configured password of the LIBERO data logger.

A new password is created by tapping on the red circle symbol and then entering a password name and the password ID.

_ A Bluetooth® BLE password is required if BLE communication is password-protected on the corresponding LIBERO data logger.
_ A configuration password is required to access and update info line data of LIBEROs where the configuration function is password protected.

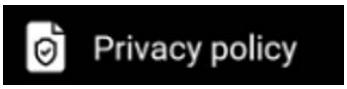


Legal
List of third-party licenses.

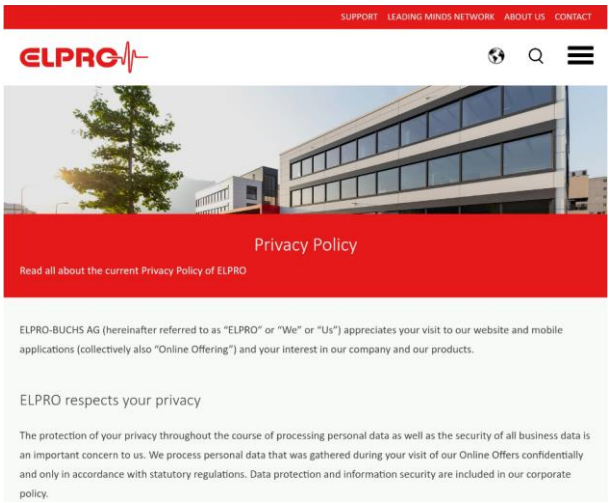


The "About" menu item provides information on the version of the app software currently in use and contains a link for further information on the company ELPRO.

Privacy Policy

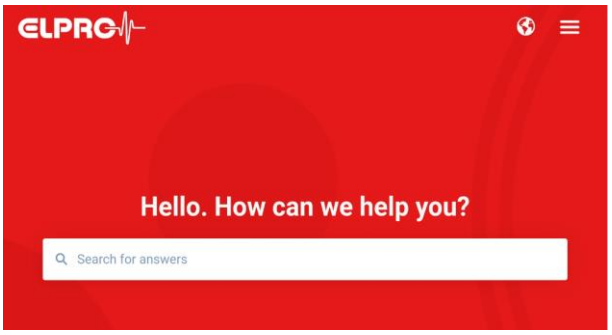


Link to ELPRO's Privacy Policy Webpage.



Support

Link to ELPRO's Support Webpage.



9 Disposal

a) Device

Electronic devices are recyclable and do not belong in the household waste. Dispose of the product at the end of its service life in accordance with applicable laws.

b) Batteries

You are legally obliged to dispose of all used batteries according to applicable laws; disposal via household waste is prohibited. Batteries are marked with the adjacent symbol, under which is printed the chemical symbol for the heavy metal (Cd = cadmium, Hg = mercury, Pb = lead). This indicates the battery contains hazardous material. You can dispose of used batteries at collection points in your local community. Please help protect our environment and dispose of batteries properly.

10 Declaration of Conformity

10.1 EU Declaration

EU Konformitätserklärung
Déclaration UE de conformité
EU Declaration of conformity

Hersteller | Fabricant | Manufacturer	**ELPRO-BUCHS AG**
Adresse | Adresse postale | Postal address	**Langäulistrasse 45**
PLZ | Code postal | Postcode	**9470**
Stadt | Ville | City	**Buchs**
Land | Pays | Country	**Schweiz** | Suisse | Switzerland
Telefon | Téléphone | Phone	**T +41 81 552 08 08**
E-Mail | E-mail | E-mail	**swiss@elpro.com**

Produktnamen | Noms du Produit| Product names	**LIBERO CE, LIBERO CL, LIBERO CH**
Produkt Nr. | No. de produit | **Product no.**	**802279, 802280, 802281**

Beschreibung | Description | Description:

LIBERO Cx sind Geräte zur kontinuierlichen Temperatur- oder Feuchtigkeitsüberwachung mit Bluetooth Funktionalität. LIBERO CE wird betrieben mit externem Pt100 Fühler bis zu einer Kabellänge von 3m. | LIBERO Cx sont des appareils de surveillance continue de la température ou de l'humidité avec fonctionnalité Bluetooth. Le LIBERO CE fonctionne avec un capteur Pt100 externe jusqu'à une longueur de câble de 3m. | LIBERO Cx are devices for continuous temperature or humidity monitoring with Bluetooth functionality. LIBERO CE is operated with external Pt100 sensor up to a cable length of 3m.

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union. | L'objet de la déclaration décrit ci-dessus est conforme à la législation d'harmonisation de l'Union applicable. | The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Funkanlagen - Richtlinie 2014/53/EU | Directive sur l'équipement radio 2014/53/UE | Radio Equipment Directive 2014/53/EU
RoHS - Richtlinie 2011/65/EU und ihre Änderungsrichtlinie (EU) - Richtlinie 2015/863 | Directive RoHS 2011/65/UE et sa directive modificative (UE) 2015/863 | RoHS Directive 2011/65/EU and its amending Directive (EU) 2015/863

Harmonisierte Normen und Spezifikationen | Normes harmonisées et spécifications | Harmonized standards and specifications:

Elektromagnetische Verträglichkeit | Compatibilité électromagnétique | Electromagnetic compatibility	Draft EN 301 489-1 V2.2.3 Draft EN 301 489-17 V3.2.2
Funk | Radio | Radio	EN 300 328 V2.2.2
Elektrische Sicherheit | Sécurité électrique | Electrical security	EN 62311:2008 EN 62368-1:2014 + AC:2015 + A11:2017

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. | La présente déclaration de conformité est établie sous la seule responsabilité du fabricant. | This declaration of conformity is issued under the sole responsibility of the manufacturer.

Buchs, den 9. Dezember 2020
Buchs, le 9 décembre 2020
Buchs, December 9th, 2020

ELPRO-BUCHS AG

Dirk Neumann
Leiter der Entwicklung
Chef du développement
Head of Development

ELPRO-BUCHS AG | Langaeulistrasse 45
9470 Buchs SG | Switzerland
T + 41 81 552 08 08 | www.elpro.com

we prove it

10.2 FCC/ISED Regulatory notices

Modification statement
ELPRO-Buchs AG has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

ELPRO-Buchs AG n'approuve aucune modification apportée à l'appareil par l'utilisateur, quelle qu'en soit la nature. Tout changement ou modification peuvent annuler le droit d'utilisation de l'appareil par l'utilisateur.

Interference statement
This device complies with Part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Wireless notice
This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet appareil est conforme aux limites d'exposition aux rayonnements de l'ISDE pour un environnement non contrôlé. L'antenne doit être installée de façon à garder une distance minimale de 20 centimètres entre la source de rayonnements et votre corps. L'émetteur ne doit pas être colocalisé ni fonctionner conjointement avec à autre antenne ou autre émetteur.

FCC Class B digital device notice
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC (USA) ID: Z45LIBEROCEHL

CAN ICES-3 (B) / NMB-3 (B)
This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de classe B est conforme à la norme canadienne NMB-003.

IC (CAN) ID: 9954A-LIBEROCEHL

ELPRO-BUCHS AG
Langaeulistrasse 45
9470 Buchs SG
Switzerland