LIBERO CE

Operation Manual

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1 Quick Start

2 System Overview

The LIBERO CE data logger described in this document is a device for temperature monitoring using an external Pt100 probe. LIBERO CE saves the temperature measurements and can generate a PDF report when connected to a USB port on your computer. The PDF report contains all measured values and thus creates visibility and transparency to fulfil GxP requirements. The device is configured using free liberoCONFIG software or by assigning a pre-programmed profile (SmartStart).

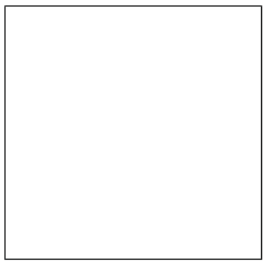
LIBERO CE with bracket and external probe

3 Device - LIBERO CE

3.1 Functionality and Modes

After configuration, the device measures the temperature using the connected external sensor, stores the measured values and evaluates them with regard to the defined alarm criteria. The display indicates the current mode.

In **configuration mode,** the device can be configured with the help of the free software liberoCONFIG. This is visualized on the display as follows:


or

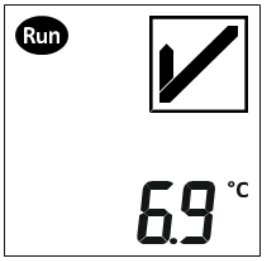
After the device has been configured, the device can be started by pressing the "Start" button for 3 seconds. The **start mode** is indicated on the display. In addition to starting the device, it can also be reconfigured from the start mode. The device is automatically recognized in liberoCONFIG.
Display:

If a temperature-based or time-based delay has been configured, "delay" appears on the display after the device has been started:
- **Temperature-based delay**: the "delay" will be displayed until the configured temperature threshold has been reached. The device will then automatically switch to the measurement mode (see below).

- **Time-based delay**: the display shows the remaining time in minutes, before the device will automatically switch to the measurement mode.

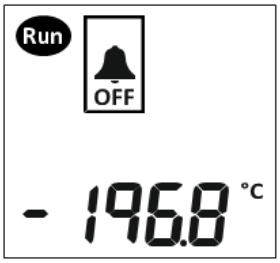
After the delay (if configured) has elapsed, the device switches to **measurement mode**. Depending on the device's configuration, we can distinguish between the following two types of measurement mode.

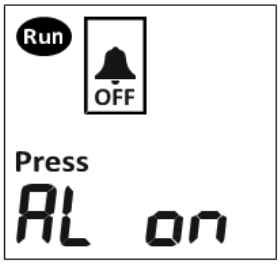
- **Measurement mode without "Alarming ON/OFF" function**: Displays the current temperature value (bottom, if configured), alarm indicator (top right, if configured) and the logging indicator (top left).



- **Measurement mode with "Alarming ON/OFF" function:** displays the current temperature value (bottom, if configured), alarm indicator (top right, if configured), the logging indicator (top left) and the "Alarming ON" status (top center). This state indicates that the measured values are evaluated according to the alarm criteria.

Users who want the benefit of pausing the alarming (e.g. while refilling the liquid nitrogen or while cleaning the refrigerator), can do so by pressing the "Alarming OFF" button on the device. In this case, the display shows the current temperature value (bottom, if configured), alarm indicator (top right, if configured), logging indicator (top left) and the "Alarming OFF" status (top center). Alternating every 2 seconds, the display informs the user that the alarming can be reactivated:





From the measuring mode, without configured "Alarming ON/OFF" function or from the measuring mode with status "Alarming OFF," the device can be stopped by pressing the "Stop" button for 3 seconds.

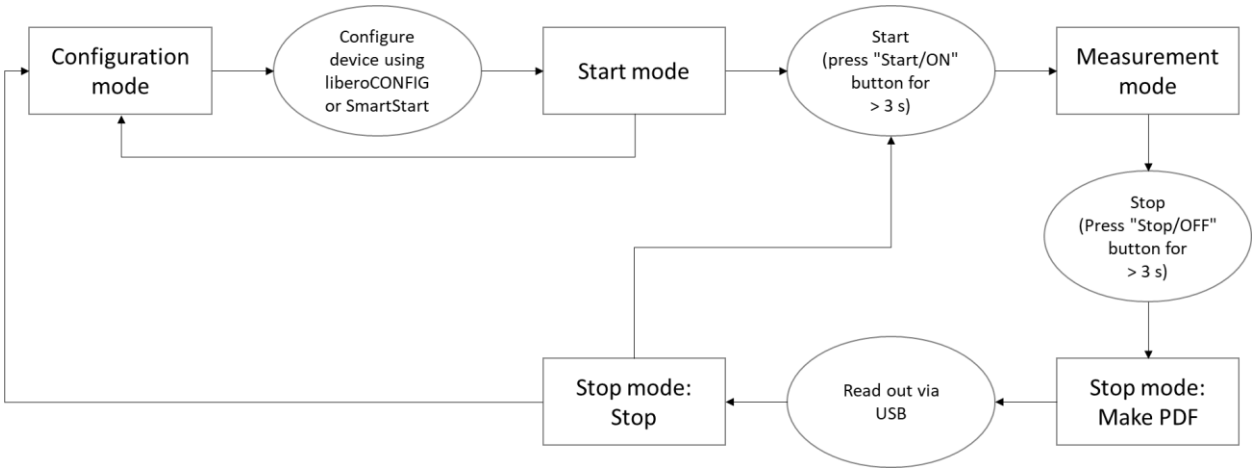
In **stop mode** there can be two different display states as seen below. Immediately after stopping, "Make PDF" appears. This will only disappear after the PDF report has been created by plugging the device into a USB port. This ensures that the user does not forget to read out the device.

After the device has been read out, "Stop" appears on the display. At this point the device can either be started again (with the existing configuration) or reconfigured.

3.2 Workflow

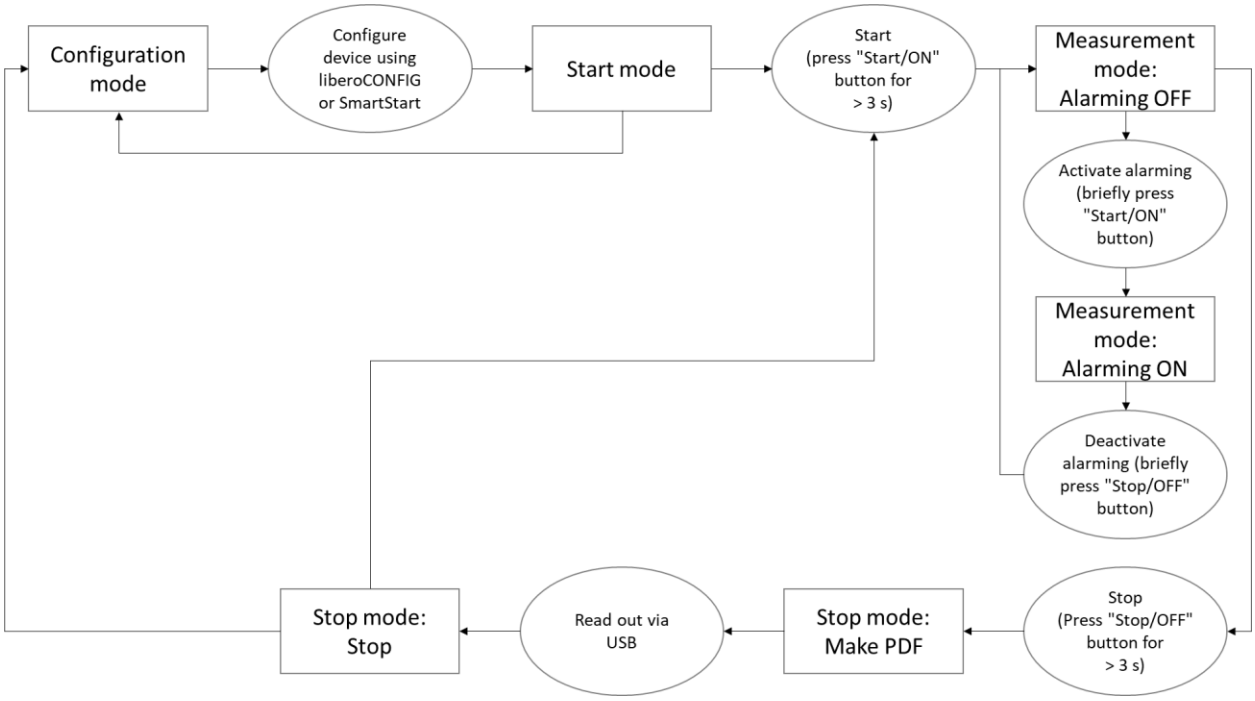
3.2.1 “Alarming ON/OFF” function not configured

The following figure shows the sequence of modes if the "Alarming ON/OFF" function has not been configured (see chapter 5.1, section Alarm Conditions).



3.2.2 “Alarming ON/OFF” function configured

The following figure shows the sequence of modes if the "Alarming ON/OFF" function has been configured (see chapter 5.1, section Alarm Conditions).



3.3 Technical Specification

Type	PDF Logger with USB interface for external Pt100 temperature probe (probe not included)
Application area	Site Monitoring, Container Monitoring, Cryo Container Monitoring, Dry-ice Container Monitoring
Recording options and mode	Multiple use: start/stop or loop mode
Type of probe	Pt100 probe (4-wire measuring technique), max. cable length 3 m (118.1 inch), requires M8 connector
Measurement range	Measurement range (depending on probe): -200 °C..+400 °C Operating range of data logger: -30 °C..+70 °C
Measurement accuracy	System accuracy*: ± 1.4 °C in the range of -200.0 °C..-100.1 °C (Class B) ± 1.0 °C in the range of -100.0 °C..-50.1 °C (Class B) ± 0.4 °C in the range of -50.0 °C..-10.1 °C (Class A) ± 0.3 °C in the range of -10.0 °C..+25.0 °C (Class A) ± 0.5 °C in the range of +25.1 °C..+100.0 °C (Class A) ± 0.7 °C in the range of +100.1 °C..+200.0 °C (Class A) ± 1.1 °C in the range of +200.1 °C..+400.0 °C (Class A) *Includes data logger and external Pt100 probe of stated class
Measurement resolution	0.1 °C
Measurement interval	1 to 60 minutes, user configurable
Memory capacity	75'500 measurement values (equals logging duration of 17 months at 10 minute logging interval)
Battery life	3 years
Battery type	Button cell contained in equipment UN3091, exempt from DGR declaration Non-replaceable battery
Configurable alarms	8 temperature alarm zones with single or cumulative delays, Alarm on MKT, Alarm on duration/run time
Start-up delay	User configurable based on time or temperature
Display	Multifunction LCD, size: 22 × 22 mm (0.87 x 0.87 inch), with OK and Alarm indicator
Certificate	Certificate available via compliance.elpro.com Optional: Additional customer-specific calibration points according to ISO 17025 standard
Traceability	Unique ID number (traceable to component level)
Report	Built-in PDF file generator automatically establishes an evaluation report with embedded data upon connection to a USB port. Complies with the ISO standard 19005-1 Document Management for the long-term preservation of electronic documents (PDF/A) and FDA 21 CFR Part 11. - Customizable report title and filename - Text area for additional information (e.g. shipment information, instructions for recipient, etc.) - Statistics (min/max, average, alarm, alarming on/off) and detailed logger information (ID, configuration, etc.) - Chart visualizing the temperature curve and alarm limits
Case | dimension | weight | IP Code	ABS plastic material | 95 × 41 × 11 mm (3.74 x 1.61 x 0.43 inch), cable tail 85 mm (3.35 inch) including M8 connector | 44 g (0.1 lb) | IP54
Accessories	LIBERO CE stainless steel bracket, variety of Pt100 probes, extension cable with M8 connector
Conformity	CE | FCC | RoHS | Safe Transport of Chemical Goods | WEEE
Standards and Guidelines	RTCA DO-160 | GAMP5
Data logger configuration and additional analysis software	liberoCONFIG software to create, store and manage individual settings in a logger profile as well as SmartStart, a liberoCONFIG component allowing a safe and quick application of profiles and additional information to PDF Logger. elproVIEWER software to access and export embedded data of PDF report, for data analysis and comprehensive report features. Both software products can be downloaded at www.elpro.com/downloads. Fully compatible with liberoMANAGER database.

4 External Pt100 Probes

4.1 Areas of Application

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

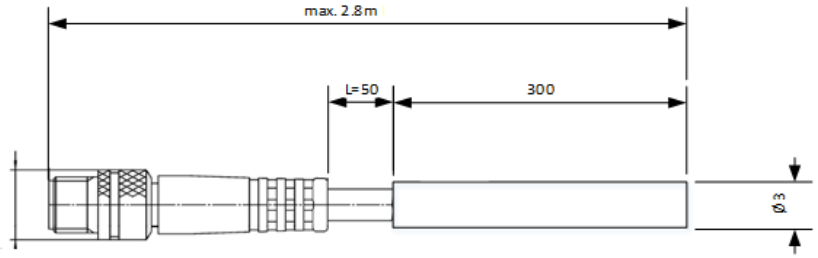
- Cryogenic shipments and storage
- Dry ice shipments and storage
- Freezer (-25 °C..-15°C, typical) / fridge (+2 °C..+8 °C) / ambient (+15 °C..+25 °C) shipments and storage

4.1.1 Cryogenic shipments and storage

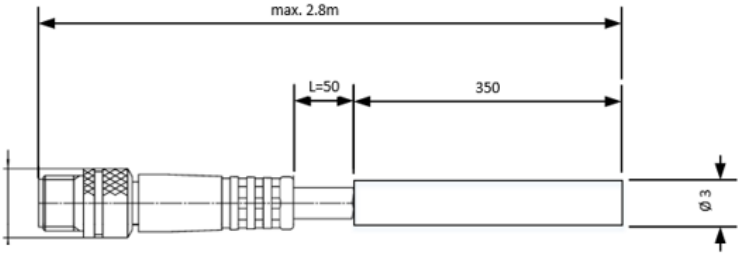
For cryogenic applications the LIBERO CE is usually mounted directly to the container, or the container lid, using the optional bracket with the sensor leading into the tank. ELPRO offers an easy, turnkey service for mounting the assembly and calibration.

ELPRO offers two standard probes with different probe lengths for this application:

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	

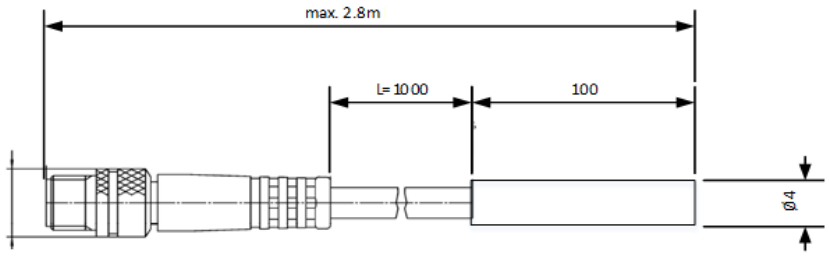
Pt100 probe for cryogenic applications with M8 connector

4.1.2 Dry ice shipments and storage

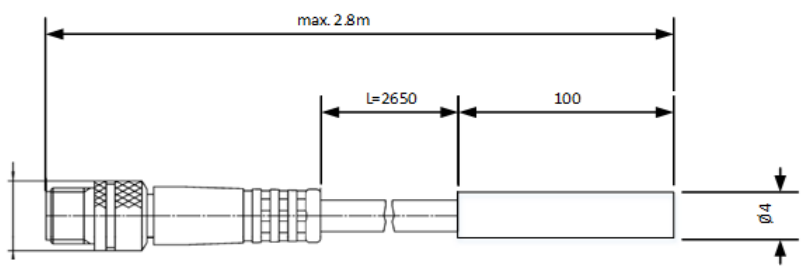
Also in dry ice applications, the LIBERO CE is usually attached to the outside of the container using the optional bracket and the sensor leads into the tank. ELPRO offers an easy, turnkey service for mounting the assembly and calibration.

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)

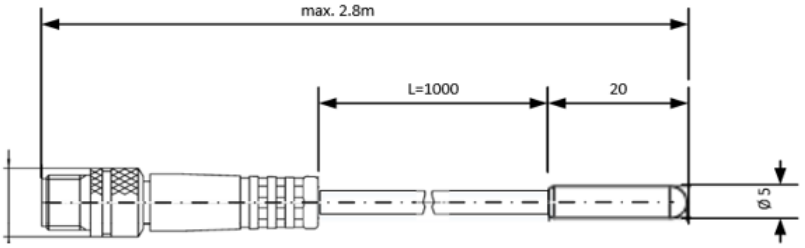
Note	Cable with mounted M8 plug (male).
Probe length	10 cm
Probe diameter	4 mm
Temperature range of probe	-90 °C...+250 °C
- Temperature range Class A	-30 °C...+250°C
- Temperature range Class B	-50 °C...+250 °C
Cable length	2.65 m
Cable diameter	3.5 mm
Litz wire	4x AWG 28
Cable material	PTFE
Cable color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

Pt100 probe for dry ice applications with M8 connector

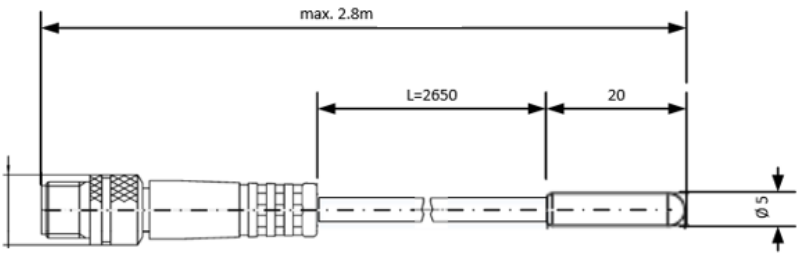
4.1.3 Freezer / fridge / ambient shipments and storage

For temperature monitoring of freezers, refrigerators or rooms, ELPRO offers two waterproof silicon Pt100 probes with different cable lengths as standard articles:

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)

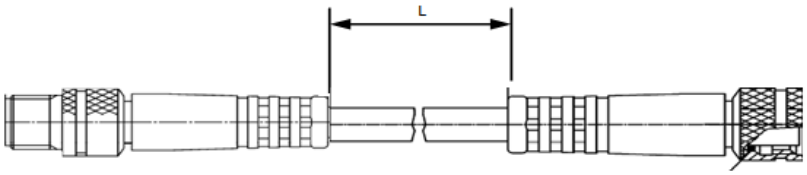
Note	Cable with mounted M8 plug (male). Waterproof
Probe length	2 cm
Probe diameter	5 mm
Temperature range of probe	-50 °C...+105 °C
- Temperature range Class A	-30 °C...+105 °C
- Temperature range Class B	-50 °C...+105 °C
Cable length	2.65 m
Cable diameter	4.0 mm
Litz wire	4x AWG 24
Cable material	Silicon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

Waterproof silicon Pt100 probe for freezer/fridge/ambient temperature monitoring with M8 connector

4.1.4 Extension of sensor cables

An extension cable with a length of 1m is also available.
ATTENTION: The 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	

Extension cable with two M8 connectors to attach the PDF data logger and the probe. The total cable length (including sensor and cable tail) must not exceed 3 m.

5 Configuration of the Logger

5.1 liberoCONFIG

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 documented in the PDF report generated by the logger.

The configuration of a single LIBERO Cx 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.

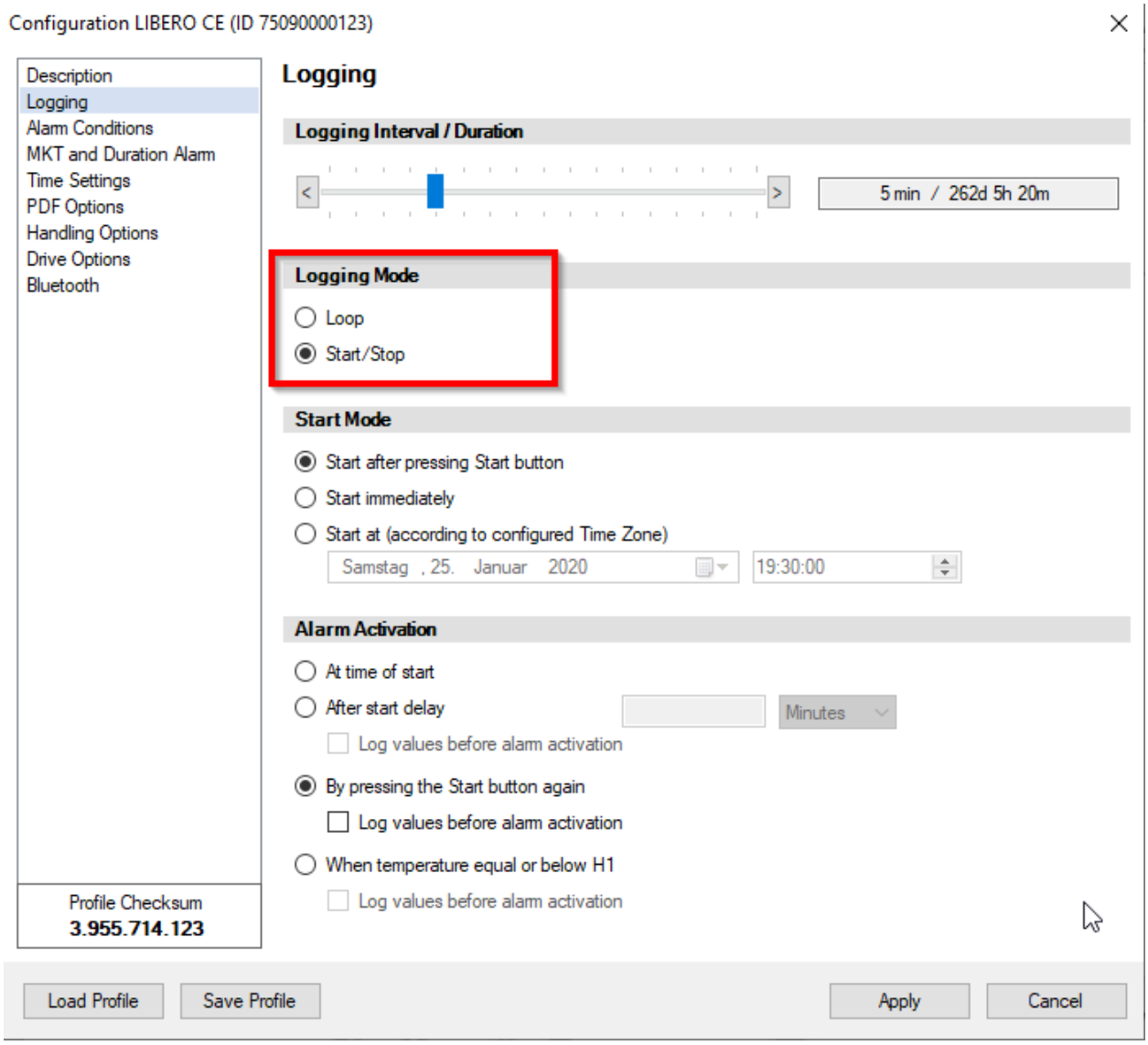
System requirements
- Windows 7, 8 or 10
- CPU 1.5GHz
- Memory: 512 MB RAM
- Hard disk: 100 MB
- Monitor resolution: 800 x 600 Pixel

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, only the differences or additional configuration options for the LIBERO CE are described.

Logging

“Loop” was added as an additional logging mode, as LIBERO CE is a multi-use device.

NOTE: If the memory of the logger is full, newly measured values will continuously overwrite the oldest values.



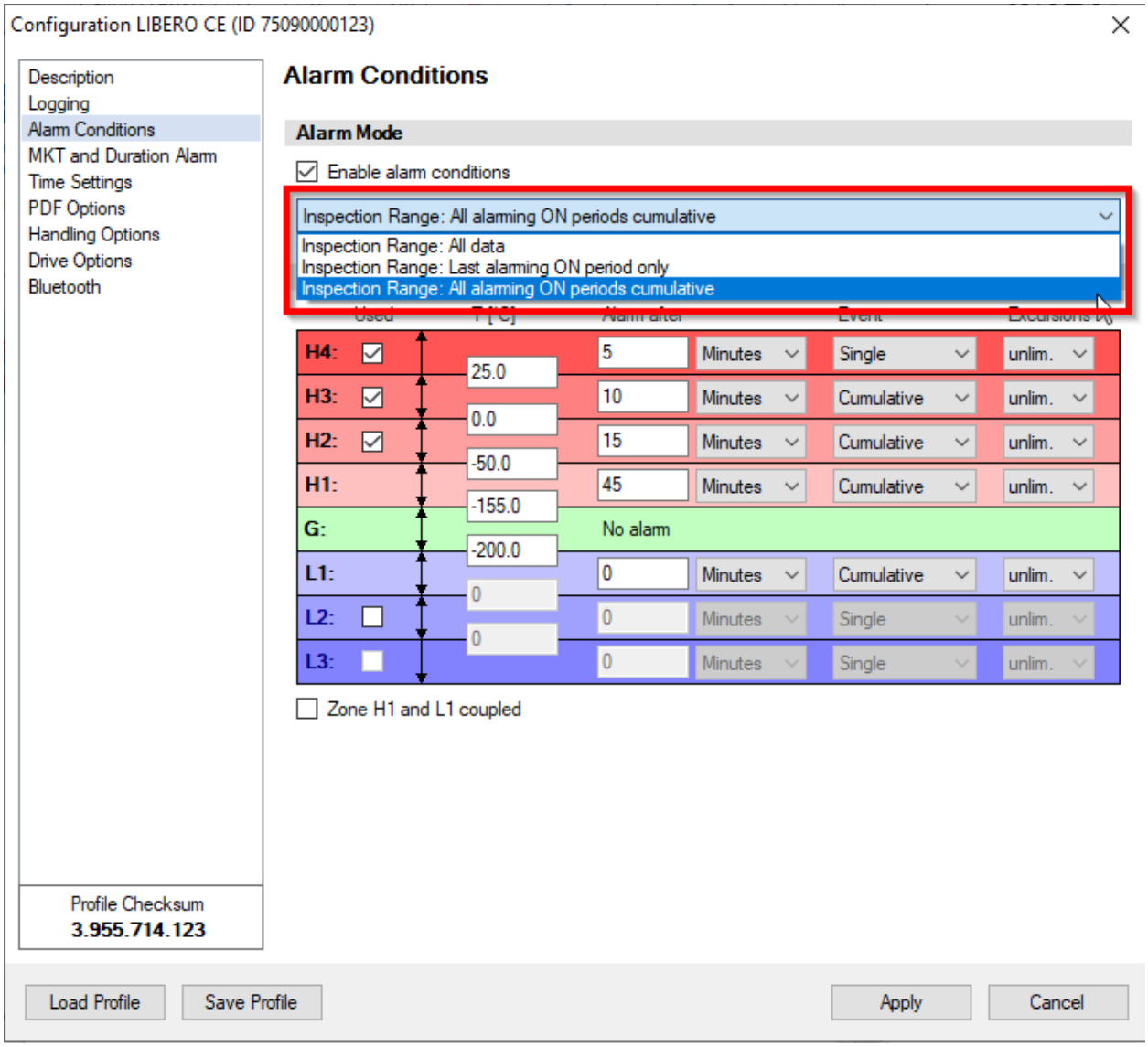
Alarm Conditions

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.

Alarming ON/OFF

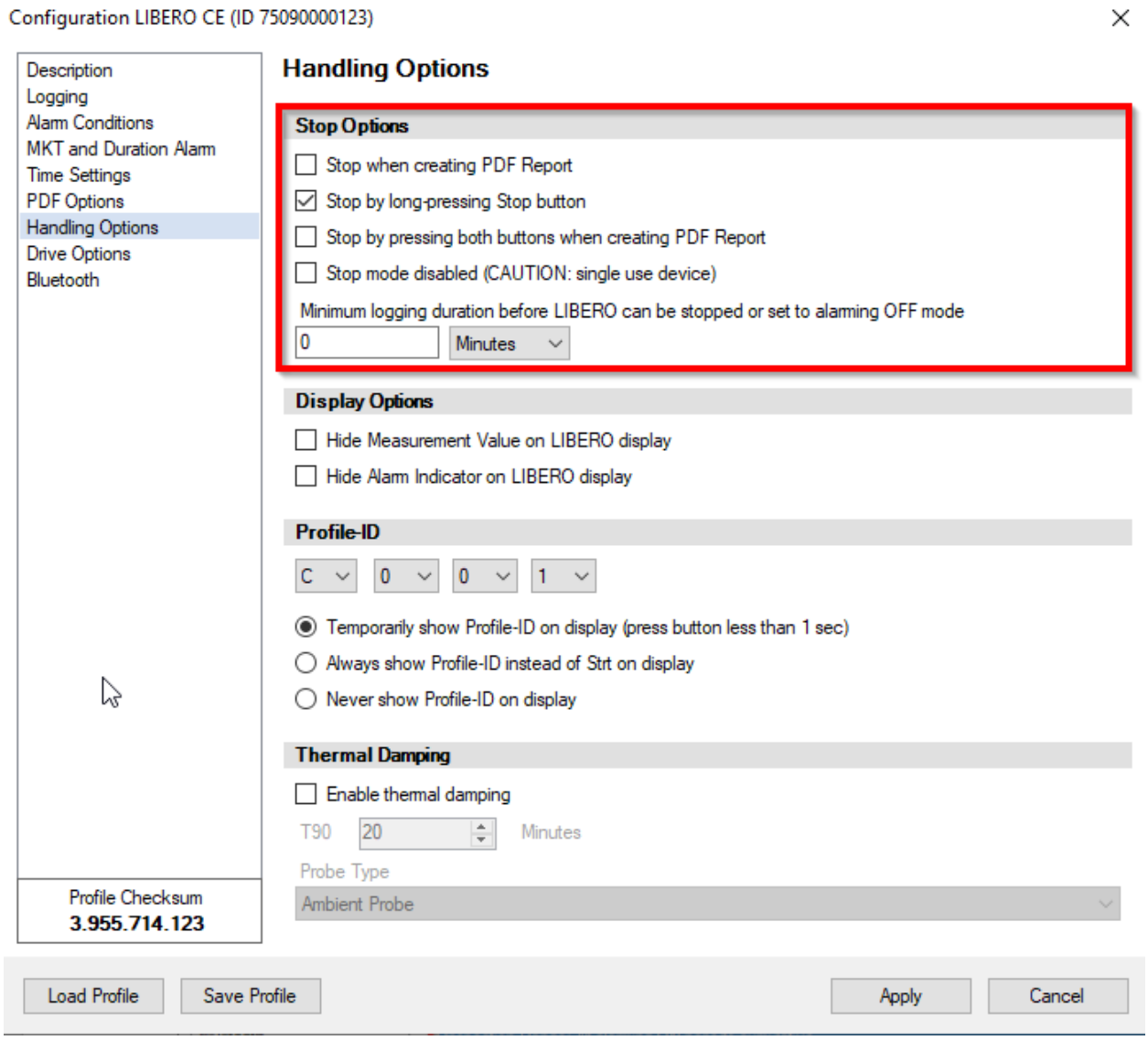
Only if one of the last two options are selected, the alarming can be activated (Alarming ON) or deactivated (Alarming OFF) during measurement mode.



Stop Options

There are four options for LIBERO CE to stop data recording:

- Stop when creating PDF report
- Stop by long-pressing (> 3 seconds) the Stop button
- Stop when the PDF is generated and both buttons on the device are pressed at the same time (so stopping is basically possible, but the logger will hardly ever be stopped accidentally)
- Stop mode disabled (CAUTION: This turns LIBERO CE into a 3-year single-use device, as it cannot be stopped and therefore the configuration cannot be changed!)



6 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. Remove any batteries and dispose of them separately from the product.

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.

7 Declaration of Conformity

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**

Produktname | Nom du produit | Product name	**LIBERO CE**
Produkt Nr. | No de produit | Product no.	**802279**

Beschreibung | Description | Description:

LIBERO CE ist ein PDF Logger zur kontinuierlichen Temperaturüberwachung und Alarmierung, mit externem Pt100 Fühler, bis zu einer Kabellänge von 3m. | LIBERO CE est un enregistreur PDF pour la surveillance de température en continu et l'alarme, avec sonde externe Pt100, longueur maximale du câble 3m.| LIBERO CE is a PDF Logger for continuous temperature monitoring and alarming, with external Pt100 probe, maximum cable length 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:

EMV Richtlinie 2014/30/EU | Directive compatibilité électromagnétique 2014/30/UE | Electromagnetic compatibility Directive 2014/30/EU
RoHS - Richtlinie 2011/65/EU | Directive RoHS 2011/65/UE | RoHS Directive 2011/65/EU

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

EMV | Compatibilité électromagnétique | Electromagnetic compatibility	**EN 61326-1 : 2012-02**

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 25. November 2019
Buchs, le 25 novembre 2019
Buchs, November 25, 2019

ELPRO-BUCHS AG
Dirk Neumann
Leiter der Entwicklung
Chef du développement
Head of Development

we prove it

CE

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