

LIBERO Gx

Operation Manual



Table of Contents

1	Safety Instructions.....	3
2	Quick Start	4
3	System Overview	5
3.1	LIBERO Gx Types	5
4	Functionality and Modes	6
4.1	Elements	6
4.1.1	Generic elements	6
4.1.2	Specific elements.....	6
4.2	Display	7
4.3	States	8
4.3.1	Shelflife.....	8
4.3.2	Configuration.....	8
4.3.3	Start	8
4.3.4	Delay.....	9
4.3.5	Transit.....	9
4.3.6	Pause	9
4.3.7	Arrived	9
4.3.8	Stop.....	9
4.3.9	Sleep	9
4.4	Menu	10
5	Further instructions.....	11
5.1	Pairing procedure	11
5.2	Start before Date / Expiry Date	11
6	Accessories	12
6.1	Bracket.....	12
6.2	External Pt100 Probes for LIBERO GE.....	13
6.2.1	Cryogenic shipments and storage	13
6.2.2	Dry ice shipments and storage	14
6.2.3	Freezer / fridge / ambient shipments and storage	15
6.3	Extension of sensor cables	16
6.4	M8 connector incl. mounting service on Pt100 probe.....	17
7	Disposal	18
8	Declaration of Conformity.....	19
8.1	EU Declaration.....	19
8.2	FCC/ISED Regulatory notices	20
9	Revision History.....	21



1 Safety Instructions

Intended Use

All electrical devices produced by ELPRO are intended for commercial use („business to business“).

Environmental Conditions

Temperature	Temperatures outside of operation range may damage the battery. For the operation range see specifications on www.elpro.com .
Water/Humidity	Limited protection against dust ingress and protected against splash water from any direction.
Pressure	Overpressure or vacuum can damage the device. Do not vacuum if used for airfreight.
Mechanical Force	Avoid violent knocks and blows. Avoid violent knocks and blows.
IR radiation	Avoid exposure to IR radiation (heat and superheated steam can result in deformation of the case).
Microwave	Do not expose to microwave radiation (risk of battery explosion).
X-ray	Avoid long-term exposure to X-ray (risk of harm to device). Tests of short x-ray exposures as part of transportation processes (airports, customs) have been performed and documented (available at ELPRO).

Battery

Do not remove or exchange battery. Material safety data sheet according to provisions of directive 91/155/EEC and shipping information are available from ELPRO. 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 moisture or it can ignite fire.

Safe Use

Ordinary people may install and operate the device without further safeguards.

Radio Equipment

This equipment emits radiated power: LTE Bands 1, 2, 3, 4, 5, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 28, 66 maximum power: 23 dBm

ELPRO-BUCHS AG

Langaeulistrasse 45
9470 Buchs SG
Switzerland

2 Quick Start

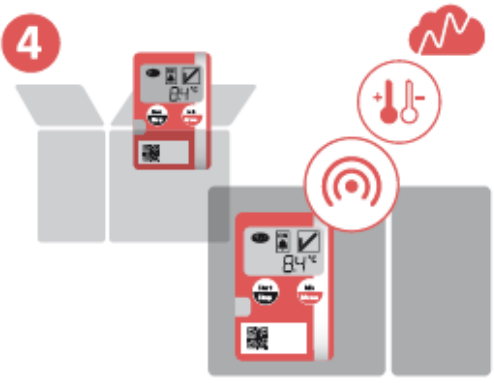
Quick Start LIBERO Gx

1

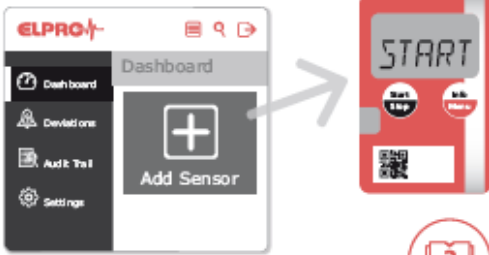


Login ELPRO Cloud
web.elpro.cloud

4



2 Add Sensor and follow instructions



Read instruction manual for help

5



Scan and read out data
liberog.elpro.com

3



6



elpro.com/liberog

elpro.com

1000447_V01

3 System Overview

The LIBERO Gx realtime data logger family described in this document are used for temperature monitoring. The measured values are transmitted via the cellular network to a monitoring software (ELPRO Cloud) which stores and analyzes the data, provides alerts if alarm limits are violated, and generates reports. The system provides superior visibility and transparency in meeting GxP requirements. The sensor-based monitoring software is easily accessible via a web browser and is also used to configure the devices.

The following pages cover the key functionality of the Wireless data logger (LIBERO GS/GL/GF/GH/GE)

For more detailed software support, please visit our online knowledge base:

<https://www.elpro.cloud/support/elpro-cloud>



Monitoring Software



3.1 LIBERO Gx Types



LIBERO GS



LIBERO GF



LIBERO GL



LIBERO GE



LIBERO GH

Wireless realtime data logger, cellular data transmission (**LTE-M** / NB-IoT).

Data logger has a display and internal memory so that all data is available.

Single-use Shipping 2-8 °C, 15-25 °C	Multi-use Shipping -20 °C	Multi-use Shipping 2-8 °C, 15-25 °C	Multi-use Container, Dry- ice, Cryo	Multi-use Shipping 2-8 °C, 15-25 °C
internal temperature sensor	internal temperature sensor	internal temperature sensor	internal / external temperature sensor	internal temperature / humidity sensor

⇒ For technical specifications: please go to www.elpro.com/liberog

4 Functionality and Modes

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

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

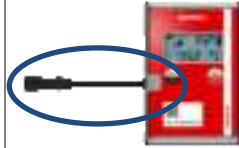
4.1 Elements

4.1.1 Generic elements



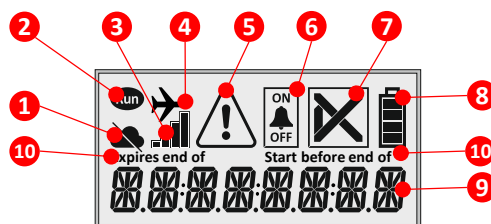
1	Display
2	Start / Stop button ⇒ Press long (> 3 seconds) to start / stop device
3	Light sensor (not configurable in version 1) ❗ if light sensor is configured, make sure it is not dirty or covered
4	QR-Code containing Device ID and weblink to cloud
5	Info / Menu button ⇒ Press short (< 1 second) = <i>Info</i> (toggle display / menu) ⇒ Press long (> 3 seconds) = <i>Menu</i> (open menu / select menu entry)
6	Device type
7	Device ID and Start before date

4.1.2 Specific elements

Logger type	Element	
LIBERO GE	M8 connector for Pt100 probe ⇒ Compare chapter 6.2 - External Pt100 Probes for LIBERO GE for available probes	

LIBERO GS	Peel-off label containing device ID including barcode	
LIBERO GH	Slot for combined temperature / humidity sensor	

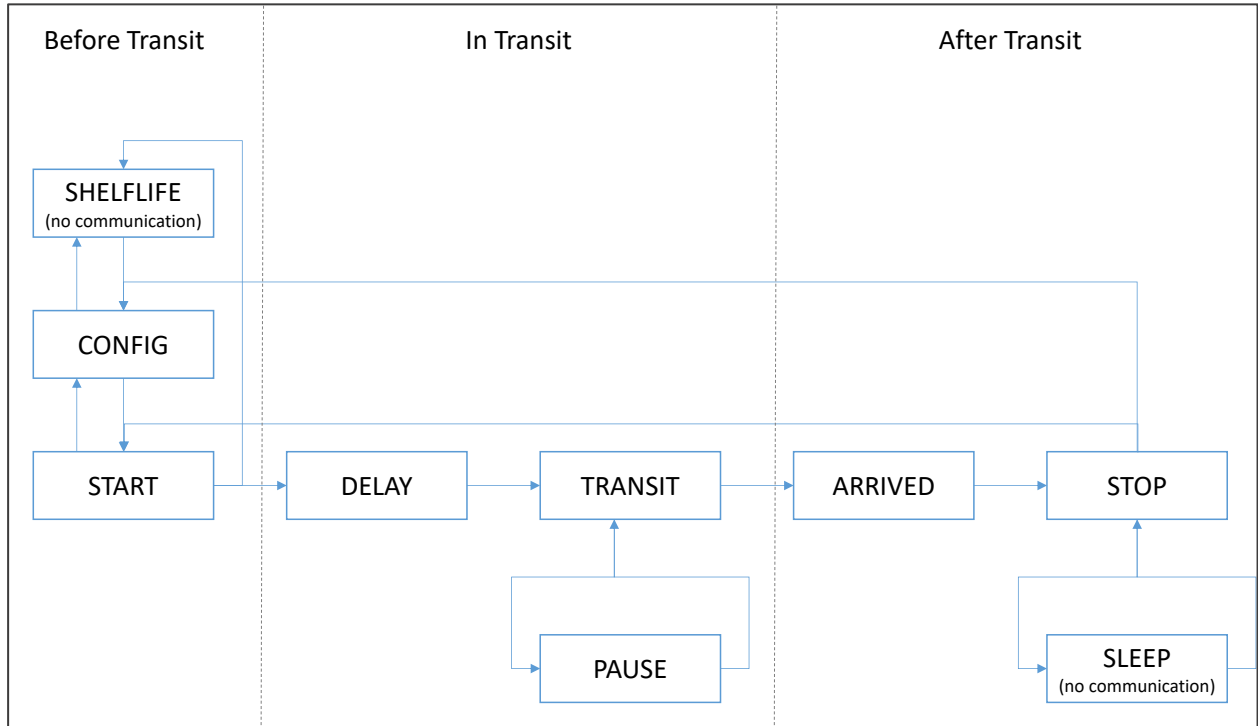
4.2 Display



Icon	Name	Description
1	No connection to Cloud	No connection to Cloud possible
2	Run	Measure and buffer Shown in <i>TRANSIT</i> (including <i>DELAY</i> and <i>PAUSE</i>)
3	Communication strengths	Not visible if radio off / flight-mode
4	Flight-mode	Automated detection (Auto on/off) Manual on/off via Menu > <i>RADIO.ON</i> / <i>RADIO.OFF</i>
5	Warning	Warning (configurable) for - Temperature warning limit - Communication warning - Tilt/light/shock warning (not in version 1) - Low battery warning (not in version 1)
6	Alarm On/Off	Shows if Alarm criteria are active or paused
7	Alarm Status	Display (configurable in future versions) OK or Alarm (pushed from Cloud) After excursion, Alarm will remain on display
8	Battery level	4 battery levels ⓘ Level one: approximately 30 days runtime remaining
9	8 Digit display	Various functions, e.g. - temperature - Status - customer field (e.g. pallet no.)
10	Start before end of / Expires end of	Latest possible start of device / End of runtime

4.3 States

LIBERO Gx devices are mainly used to monitor temperature sensitive products through the entire supply chain. The device has various configuration options available. The device states are visualized below and further described in subsequent chapters. The workflow options may vary depending from configuration and device type (e.g. single use).



4.3.1 Shelflife

When delivered, the device is in SHELFLIFE.

- In this state, the device is not transmitting and the display is switched off.
- By pressing the *Info* button (shortly), the battery level as well as the **Start before Date / Expiry Date** are visible
- By pressing the *Start/Stop* button for 3 seconds, the device will activate communication

4.3.2 Configuration

In the CONFIG mode the device connects immediately to the cloud to retrieve a configuration. The display shows *CONFIG*.

- When entering this state, the device communicates in a higher frequency for the first 30 minutes
- After the receipt of the configuration the device enters START mode immediately
- By pressing the *Info* button the **Start before Date / Expiry Date** are visible

4.3.3 Start

When the display shows START, the device is configured properly and can be started according to the chosen start option.

- By pressing the *Info* button the Profile information / configured info field / **Start before Date / Expiry Date** are visible



- By pressing the *Start/Stop* button, the device starts logging (TRANSIT or DELAY). The **RUN** icon on the display indicates a successful start.
 - ❗ the *Start/Stop* button is inactive for 2 minutes after start
 - ❗ to reconfigure a device, delete the sensor in the cloud and reset the device

4.3.4 Delay

Depending on the activation mode, the device will enter into DELAY or TRANSIT.

- The display indicates the DELAY mode by showing *DELAY*.
 - ❗ if DELAY mode “press button to activate alarm limits” is configured, the display shows *DELAY*
 - ❗ if DELAY mode “time delay” is configured, the display shows the remaining time
- By pressing the *Info* button the actual measurement value / configured info field are visible

4.3.5 Transit

In TRANSIT, the alarm limits are activated (if configured). The Alarm on/off icon appears (Alarm on).

- By pressing the *Start/Stop* button, the device enters ARRIVED mode. The **RUN** icon on the display disappears.
 - ❗ Ensure to pack the device as such that the start / stop button is not pressed accidentally
- By pressing the *Info* button the second measurement value (for LIBERO GH/GE) / configured info field are visible

4.3.6 Pause

When the alarm limits are deactivated, the device will enter PAUSE mode. The Alarm on/off icon changes to *Alarm off*. The device remains logging and transmitting.

- By pressing the *Info* button the second measurement value (for LIBERO GH/GE) / configured info field are visible

4.3.7 Arrived

After terminating the TRANSIT mode, the device will enter ARRIVED mode. The **RUN** icon on the display disappears. The device will still log and communicate (interval 2 hours) for 72 hours or until stopped.

- By pressing the *Start/Stop* button, the device enters STOP mode.
- By pressing the *Info* button the measurement values / configured info field / **Expiry Date** are visible

4.3.8 Stop

In STOP mode, the device will not log any measurement data. The device communicates at a reduced interval (12 hours) for 24 hours.

- By pressing the *Info* button the configured info field / **Expiry Date** are visible
- By pressing the *Menu* button, the following menu options are available (select by pressing *Menu* button):

4.3.9 Sleep

After stop, the device is in SLEEP mode.

- In this state, the device is not transmitting and the display is switched off.
- By pressing the *Info* button (shortly), the battery level as well as the **Expiry Date** are visible
- By pressing the *Start/Stop* button for 3 seconds, the device will activate communication and enter STOP mode.

4.4 Menu

The LIBERO G family feature a menu to operate the device:

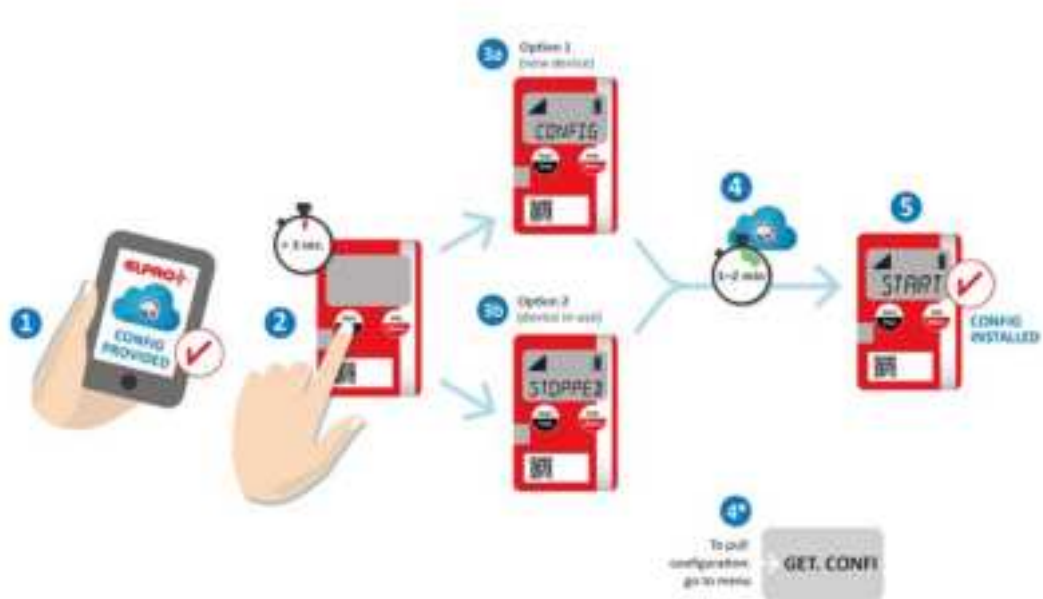
- To enter the menu, press the Menu button for at least three seconds
- To switch between the menu options, press the Info button shortly
- To select a menu item, press the Menu button for at least three seconds. To confirm, a selected menu item blinks once.
 - ① the menu item FCT.RESET has to be confirmed by pressing the Info button again shortly
- to leave the menu
 - wait for 5 seconds
 - press the Start/Stop button
 - select the last menu item EXIT

All menu items and its availability are described in the table below (now menu available in SHELFLIFE / SLEEP mode)

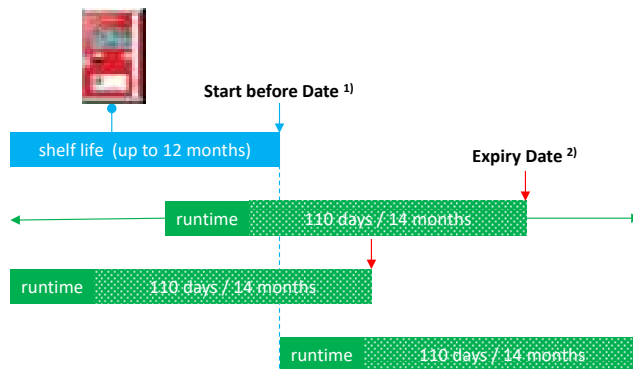
Menu item	State						
	CONFIG	START	DELAY	TRANSIT	PAUSE	ARRIVED	STOP
GET.CONFI trigger communication to pull (new) configuration from cloud	✓	✓					✓
PUSH.DATA trigger communication			✓	✓	✓	✓	✓
RADIO.ON Terminates flight mode (manually)	✓	✓	✓	✓	✓	✓	✓
RADIO.OFF The communication turns off • state changes from CONFIG / START to SHELFLIFE (configuration remains if device started again) • state changes from ARRIVED / STOP to SLEEP (device returns to STOP mode if started again)	✓	✓				✓	✓
LAST COM show last communication time	✓	✓	✓	✓	✓	✓	✓
ALARM.ON activate alarm limits if configured (state changes from PAUSE to TRANSIT)					✓		
ALARM.OFF deactivate alarm limits if active (state changes from TRANSIT to PAUSE)				✓			
MARK set marker (not logged in cloud in version 1)				✓	✓	✓	
EXP DATE show the expiry date of the device	✓	✓	✓	✓	✓	✓	✓
FCT.RESET reset device and confirm by pressing <i>Info</i> button again ⇒ a reset device has to be paired again in cloud	✓	✓					✓

5 Further instructions

5.1 Pairing procedure



5.2 Start before Date / Expiry Date

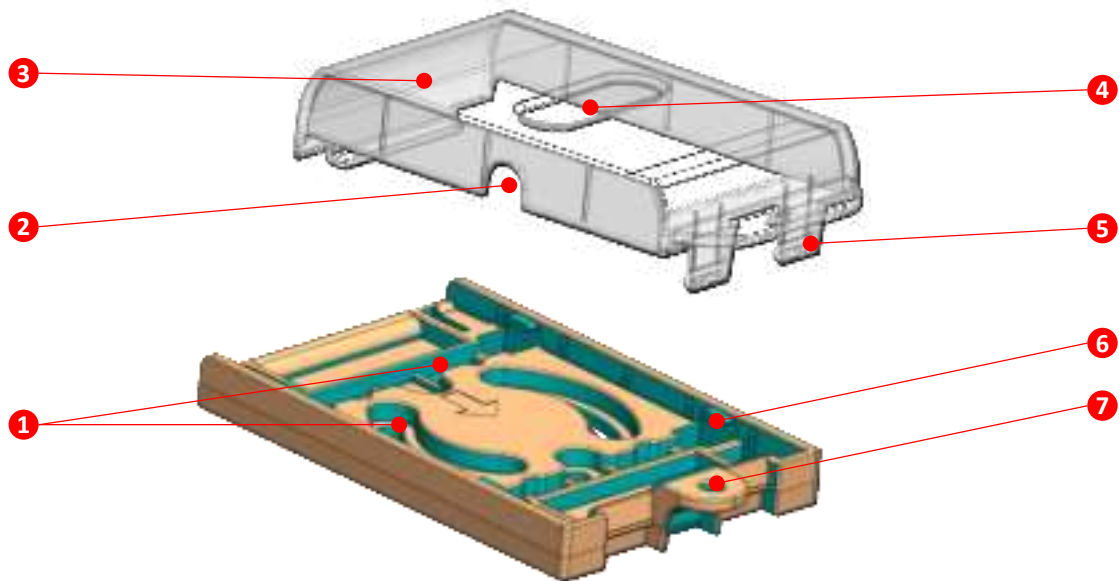


- 1) The **Start before Date** indicates the latest possible start of the device. The date (MMM/yyyy) is visible on the device label or via the display (before first device start)
 ⇒ Device cannot be started afterwards (for Multi use devices: only applicable to initial start)
- 2) The **Expiry Date** indicates the end of the runtime of the device. The date (MMM/yyyy) is visible via the display (> Menu) or in the Cloud. The runtime is calculated from the initial start date.
 ⇒ Device stops automatically (logging and communication)

6 Accessories

6.1 Bracket

ELPRO offers an optional bracket (**BRA_LIBERO Gx (part number 802286)**) for mounting of data loggers if required, i.e. to containers for cryogenic applications. The bracket is made of solid ABS plastic to protect the data logger but not influence the communication. It consists of an upper and a lower part. The LIBERO is inserted into the lower holder from above.



1	Various mounting options • 360° screwing • Adhesive tape • Cable strap
2	Cable wire mouth
3	Transparent cover allows to read display
4	A button slot to operate the device
5	The A snapping mechanism to close the cover
6	Secure fixation for the LIBERO Gx
7	Possibility to lock the cover

6.2 External Pt100 Probes for LIBERO GE

LIBERO GE can be used for different applications, depending on the sensor element. 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

❗ to ensure correct measurement values, do only use external sensor elements provided by ELPRO

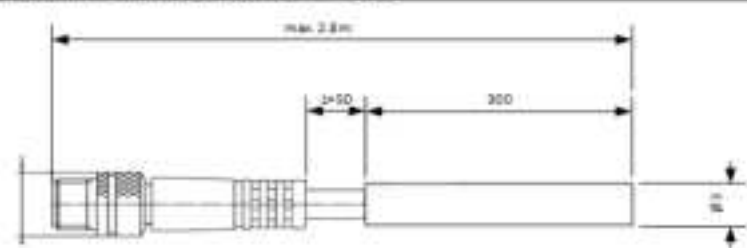
6.2.1 Cryogenic shipments and storage

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

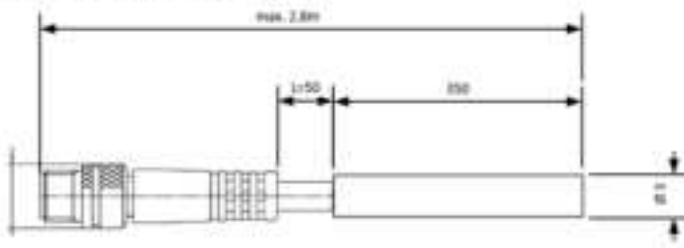
ELPRO offers two Pt100 standard probes for cryogenic applications with M8 connector in different lengths:



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	

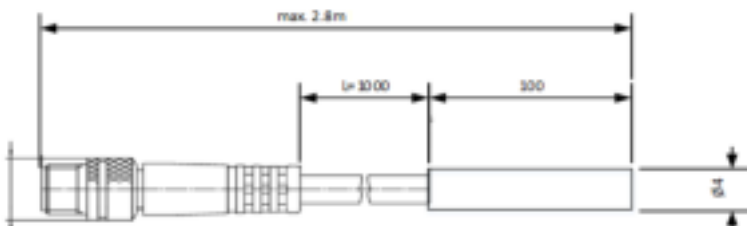
6.2.2 Dry ice shipments and storage

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

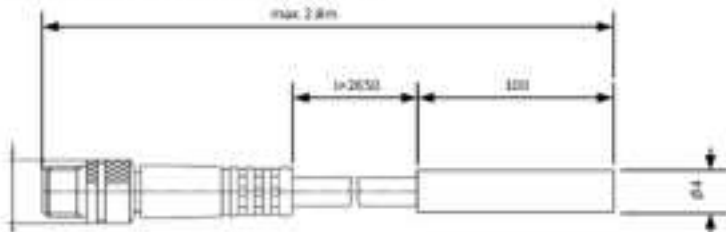
For this application, ELPRO offers two standard probes with a probe length of 10 cm and Teflon cable in different lengths:



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)

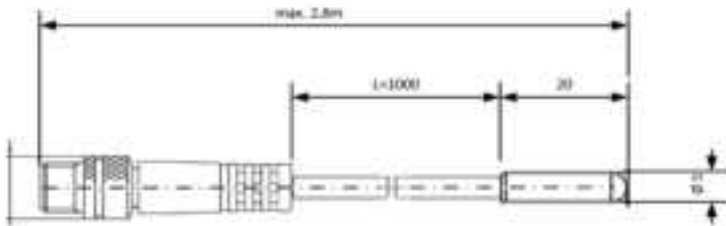
Note	Cable with mounted M8 plug (male).
Probe length	10 cm
Probe diameter	4 mm
Temperature range of probe	-90 °C...+250 °C
- Temperature range Class A	-30 °C...+250 °C
- Temperature range Class B	-50 °C...+250 °C
Cable length	2.65 m
Cable diameter	3.5 mm
Litz wire	4x AWG 28
Cable material	PTFE
Cable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

6.2.3 Freezer / fridge / ambient shipments and storage

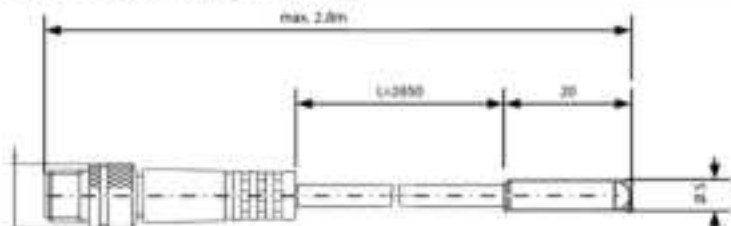
For temperature monitoring of freezers, refrigerators or rooms, ELPRO offers two waterproof silicon Pt100 probes with different cable lengths as standard articles:



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
Uitz wire	4x AWG 24
Cable material	Silicon
Cable color	black
Temperature range of cable	bendable in the range between -60 °C...+90 °C
Drawing	

6.3 Extension of sensor cables

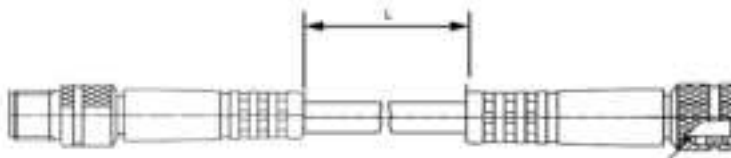
An extension cable with two M8 connectors at a length of 1m is also available to attach the data logger and the probe.

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)

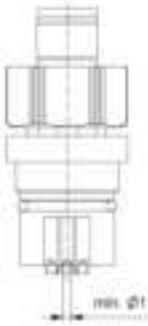
Note	M8 plugs on both ends (male, female)
Probe length	n.a.
Probe diameter	n.a.
Temperature range of probe	n.a.
- Temperature range Class A	n.a.
- Temperature range Class B	n.a.
Cable length	1 m
Cable diameter	3.5 mm
Uitz wire	4x AWG 28
Cable material	PVC
Cable color	black
Temperature range of cable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

6.4 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.



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
Wt2 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	

7 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.

8 Declaration of Conformity

8.1 EU Declaration



EU Konformitätserklärung Déclaration UE de conformité EU Declaration of conformity

Hersteller Fabricant Manufacturer	ELPRO-BUCHS AG
Adresse Adresse postale Postal address	Langgüllstrasse 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 GE, LIBERO GS, LIBERO GL, LIBERO GH, LIBERO GF ECOLOG-PRO 1TGI, ECOLOG-PRO 1THGI
Produkt Nr. No de produit Product no.	802325, 802326, 802327, 802328, 802331, 802332, 802333

Beschreibung | Description | Description:

LIBERO Gx und ECOLOG-PRO 1T(H)Gi sind Geräte zur kontinuierlichen Temperatur- oder Feuchtigkeitsüberwachung mit internem Funkmodul für das zellulare Funknetz. LIBERO GE wird betrieben mit externem Pt100 Fühler, bis zu einer Kabellänge von 3m. | LIBERO Gx et ECOLOG-PRO 1T(H)Gi sont des appareils pour la surveillance en continu de température ou de l'humidité avec un module radio interne pour le réseau radio cellulaire. LIBERO GE fonctionne avec une sonde externe Pt100, longueur maximale du câble 3m. | LIBERO Gx and ECOLOG-PRO 1T(H)Gi are devices for continuous temperature or humidity monitoring including an internal radio module for the cellular network. LIBERO GE is operated with an 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:

Funkanlagen - Richtlinie 2014/53/EU | Directive sur l'équipement radio 2014/53/UE | Radio Equipment Directive 2014/53/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:

Elektromagnetische Verträglichkeit Compatibilité électromagnétique Electromagnetic compatibility	EN 301 489-01:2019 (v2.2.3) EN 301 489-52:2016 (v1.1.0) EN 61326-1:2012
Funk Radio Radio	EN 301 908-1:2019 (v13.1.1)
Elektrische Sicherheit Sécurité électrique Electrical security	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 29. September 2020
Buchs, le 29 septembre 2020
Buchs, September 29, 2020

ELPRO-BUCHS AG

Dirk Neumann
Leiter der Entwicklung
Chef du développement
Head of Development

we prove it





8.2 FCC/ISED Regulatory notices



Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information

Unique Identifiers	LIBERO GS (Part number: 802326)
	LIBERO GL (802327)
	LIBERO GE (802325)
	LIBERO GH (802328)
	LIBERO GF (802331)
	ECOLOG-PRO 1TGI (802332)
	ECOLOG-PRO 1THGI (802333)
Responsible Party -U.S. Contact information	ELPRO Services, Inc.
Address	210 Mill Creek Road
Postal code	45750
City	Marietta
Country	USA
Phone	+1 740 568 9900
E-mail	usa@elpro.com

FCC Compliance Statement: 47 CFR FCC Part 15 Subpart B

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

Marietta, 19th August, 2019

ELPRO Services, Inc.
Micalyn Harris
Micalyn Harris
CEO

we prove it



9 Revision History

Date	Version	Author	Description
04. March 2021	01	SIKAUF	Initial Version



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