LIBERO Tx PDF Logger

Operation Manual

ELPRO-BUCHS AG

Warranty conditions and liability disclaimer

Liability

- ELPRO-BUCHS AG does not accept any liability for direct, indirect, special, incidentally occurring, randomly occurring or subsequent damage or losses including lost profit or data resulting from the use of their data loggers, sensors, accessories, software products or information from the documentation.
- ELPRO-BUCHS AG does not bear any responsibility for the installation of the software products.
- ELPRO-BUCHS AG does not provide any guarantees, either explicit or implicit, regarding the usability or suitability of their products for a specific purpose.
- In the interest of our customers we reserve the right to make changes and discontinue the product on the basis of technical advancement. For this reason the functionality, diagrams, descriptions and scope of supply can be modified without prior notification!
- As individual countries or states do not permit the concept of an implicit warranty or a liability disclaimer for incidental or subsequent damage, the restrictions and disclaimers may not apply to all customers. If one of the provisions of this warranty is declared by a competent court to be invalid or not enforceable, this does not affect the validity or enforceability of the remaining provisions.
- ELPRO-BUCHS AG does not accept any liability for transport damage.
- In general the statutory regulations of Switzerland apply.

Guarantee

- The guarantee obligations of ELPRO-BUCHS AG are limited to reworking, reimbursement of the purchasing price, repair free of charge or the replacement of a faulty product that is returned within the guarantee period to ELPRO-BUCHS AG or an approved reseller of ELPRO-BUCHS AG.
- There is no obligation to provide on-site customer support by an employee of ELPRO-BUCHS AG.
- The guarantee is only applicable to the original purchaser or end user and customer of an approved reseller of ELPRO-BUCHS AG.
- Resellers approved by ELPRO-BUCHS AG are not authorized to enter into any extended or different guarantee obligations in the name of ELPRO-BUCHS AG.
- ELPRO-BUCHS AG provides a guarantee of 24 months on the following new products:
  - Data logger
  - Brackets
  - Accessories excluding probes and third-party products
- This guarantee is valid for material faults or production faults.
- ELPRO-BUCHS AG provides a guarantee of 6 months for the following products and services:
  - All servicing and repair work
  - Temperature probe
  - Humidity probe
- ELPRO-BUCHS AG provides a 90 day guarantee that the medium on which the software product is supplied is free from material and processing faults under normal conditions. All main items of the software product comply with the operating instructions and the information in the help file.
- The guarantee does not apply to consumables, disposable batteries or any other product that ELPRO-BUCHS AG deems to be:
  - misused
  - modified
  - replaced by an incorrect product
  - damaged as the result of an accident or operational or handling conditions that do not comply with the specifications.
- Wear, cable breakage and corrosion are not covered by the guarantee.
- For third-party products ELPRO-BUCHS AG provides the maximum guarantee period of the manufacturer.
- ELPRO-BUCHS AG only provides a guarantee and customer support for discontinued products for a limited period.
- Repair work covered by the guarantee is solely carried out at the works (ELPRO-BUCHS AG) or by an agent approved by the works.
- ELPRO-BUCHS AG does not offer any guarantee for the standard or SCS calibration of the data loggers and probes. The stated data correspond to the situation during the calibration process.

Software

- The software products of ELPRO-BUCHS AG are subject to internal quality requirements and are validated regularly at the works. In the event of program errors, circumvention of the error is regarded as constituting its elimination.
- Software manuals do not contain either instructions on basic operation of a computer or the basic functions of the Windows® operating system. For information on the operation of the computer or the operating system please refer to the applicable computer manuals.

Data loggers, sensors and accessories

- ELPRO-BUCHS AG applies the highest quality standards during production of the data loggers and their accessories as well as a certified quality management system in compliance with ISO 9001:2008.
- For information on operation of the data loggers and their accessories please refer to the respective product documentation.
- During the installation of data loggers, probes and accessories, compliance with the locally valid installation regulations is mandatory.
- When used in potentially explosive atmospheres, the zone category and the application and safety instructions of ELPRO-BUCHS AG must be complied with.
- In the event of a guarantee claim, customers receive a repair cost estimate from ELPRO-BUCHS AG to obtain the corresponding consent before starting work.
- The customer will bear the transport costs incurred for any repairs carried out by ELPRO-BUCHS AG. The DAP (value added tax) is borne by ELPRO-BUCHS AG.
- ELPRO-BUCHS AG reserves the right to invoice the customer for costs incurred for repair/part replacement.
- After repair work the product is returned to the purchaser, who will be charged with the return shipping costs (FOB shipping point).

Trademarks

All stated company and product names and their trademarks are the protected property of the respective owner.

Table of Contents

Symbols and designations

	Information
ⓘ	

	IMPORTANT INFORMATION AND WARNINGS
⚠	

⇨ Reference to supplementary section [xxx / yyy / zzz; e.g. 3.4.6 *PDF Options* / daylight saving / start date] or document

LIBERO Tx LIBERO THx	Name of the device team Notes which apply to LIBEROs that measure temperature and humidity.
PDF report	Logged transport information is created as ****.pdf file.
liberoCONFIG	Program for the configuration of a LIBERO
LIBERO SmartStart	Program for simple configuration of LIBERO Txs in the shipping department.

	In the interest of our customers we reserve the right to make any changes resulting from technical advancement. For this reason diagrams, descriptions and the extent of delivery are subject to change without any notice!
ⓘ	This manual is valid as of software release 2013.6.1.0

Introduction

LIBERO Tx is used for monitoring temperature and humidity sensitive goods. Temperature and humidity limits may be set as alarm criteria and monitored during data logging. If the LIBERO Tx is connected to any USB port, it automatically generates a PDF report with the logging results. No additional software is required to read out the LIBERO Tx. The PDF report is created in PDF/A format and is compliant with the ISO 19005-1 Document Management Standard which permits long-term archiving of the PDF report without further conversion.

The LIBERO Tx settings are made with the liberoCONFIG configuration software. During configuration not only the device settings such as the logging interval, alarm limits and device behavior can be set, but also the text information and the content of the PDF report can be specified. The selected settings can be saved as a configuration profile and easily transferred to other LIBERO Tx.

If there are several LIBERO Tx that are to be configured with the same settings, previously created profiles can be configured directly with the LIBERO SmartStart application. Transfer is absolutely reliable and safe as no device settings are accessible during this process. When assigning a profile with the LIBERO SmartStart, previously defined fields can be filled with monitoring related information such as the transport number, order number, carrier etc. This permits creation of individual PDF reports.

The data logged with the LIBERO Tx can additionally be analyzed, assessed and commented with the elproVIEWER software.

In addition to the LIBERO Tx that are available for various applications (multiple-use, dry ice and cryo monitoring, temperature and humidity recording, etc.), the LIBERO Cx device family provides data loggers optimized for transport monitoring.

> **ⓘ A LIBERO PDF REPORT IS A PDF/A ISO STANDARD FILE**
> **ONLY OPEN THE FILE WITH A PDF READER**
>
> Always save the LIBERO PDF file directly and without opening it or send it as an e-mail attachment. Opening and saving the PDF file with a PDF editor can make 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 components run this check automatically.

Common LIBERO Tx

Period of use		100 Days	400 Days	3 Years
Sensor position	**Types**	16'000 Temperature values		
internal -35 °C..+70 °C		Ti1-S	Ti1	Ti1-L
-90 °C..+70 °C		Ti1-D down to -90 °C		
external NTC -90 °C..+85 °C		Te1-U	Te1-NY	Te1-N
external Pt100 -200 °C..+200 °C		Te1-PS	Te1-PY	Te1-P
internal Temperature/Humidity -25 °C..+70 °C 0 %rH..100 %rH non condensing		THi1-S	THi1-Y	THi1
		- 8'000 Temperature values - 8'000 Humidity values		

ℹ️ Details about the current models and their data sheets are available on the company homepage: www.elpro.com.

Case elements
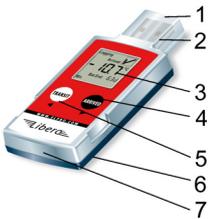
1. Protection cap
2. USB connector
3. Display
4. ARRIVED button
5. TRANSIT button
6. Rear: Space for customer related information, data logger ID number and its bar code.
7. Expiry date: Regardless of the battery condition after this date the LIBERO should no longer be used.

⚠️ **LIBERO USB DEVICE DRIVER REQUIRED**

It is made available during the installation of liberoCONFIG and is activated by plugging in the LIBERO in CONF-Mode on the respective USB interface. Follow the instructions of the Windows hardware installation assistant.

1   LIBERO Tx - safety information

1.1   Influence of temperature

⇨ For the operation range see page 7 or: www.elpro.com.

- There is danger of a gas explosion when the lithium battery heats up to temperatures exceeding 100 °C.

- Do not throw data loggers into fire, the battery could explode.

1.2   Battery

Lithium battery

Material Safety Data Sheet according to EEC Directive 93/112/EC and shipment recommendation are available at ELPRO-BUCHS AG.

- Lithium, Thionyl Chloride (Li-SOCl2)

- non-rechargeable battery

1.3   Disposal

Europe

WEEE

> ℹ This product has to be disposed of according to WEEE (Waste Electrical and Electronic Equipment, 2002/96/EC)!

U.S.A.

Find a drop-off center for electronic waste in your area to dispose of the data logger. In any case it is recommended to contact the local EPA (U.S. Environmental Protection Agency) office. http://www.epa.gov

International

If possible, dispose of the logger in an official drop-off center for electronic waste in your area. Many countries enforce electronic waste recycling.

http://en.wikipedia.org/wiki/Electronic_waste

1.4   Exceptional environmental conditions

Infrared radiation
Microwaves
X-Ray

Pay attention to the following when loggers are used under exceptional environmental conditions:

- IR radiation (warmth) and superheated steam can result in deformation of the housing.

- There is a risk that the battery may explode if the logger is used in conjunction with microwaves.

- X-rays can harm the data logger. The specifications are on file at ELPRO-BUCHS AG.

CE

ℹ This product must be certified with CE

The manufacturer warrants this product is compliant to the following guidelines EN 61000-6-2:2006 and EN 61000-6-4:2006.

EMI

LIBERO Tx PDF loggers meet the requirements regarding electromagnetic interference (EMI) for portable electronic devices for use on airplanes in accordance with the definition in the Advisory Circular 91-21.1B of the Federal Aviation Administration (FAA,) and were tested in accordance with RTCA/DO-160G Environmental Conditions and Test Procedures for Airborne Equipment.

1

2   Configuration of a LIBERO Tx

> 🛈 Do not connect a LIBERO Tx to the USB port until liberoCONFIG is started.

2.1   Configuration at delivery

The display shows ConF

ConF
Bat.End 400d

The configuration mode is used to define all logging parameters (profile). The liberoCON-FIG is used to set or change all logging possibilities.
As soon as the PDF logger is connected to an USB port, it is going to start up in the configuration mode.

⇨ Continue with 3 *Configuration Software*

2.2   Config Mode when running

Display shows data and status information

To configure a PDF logger, liberoCONFIG has to be used. This software may be downloaded free of charge from the support center at elpro.com.

There are two different proceedings:

- Monitoring with previous settings
  LIBERO may be delivered switched ON and with a pre-configured profile, ready for use. Ask your supplier for more details.
  Continue with 5 *Example - Transportation*

- Monitoring needs new settings
  Continue with 2.3 *Start Configuration Mode*

2.3   Start Configuration Mode

TRANSIT- & ARRIVED-Button

To switch the data logger into the configuration mode, simultaneously press the TRANSIT- and ARRIVED-button for at least 3 seconds.

Configuration Mode

As soon as the data logger is put into the configuration mode, it has to be connected to an USB port within 10 seconds.

⇨ Continue with 3 *Configuration Software*

Configuration Mode - Exit

Press one of the buttons prior to connecting the PDF logger to the USB port.

Communication error

ℹ️ **THE FOLLOWING CASES COULD CAUSE COMMUNICATION PROBLEMS:**

- **Bad USB extension cable**
- **Passive USB hub. Please use an active USB hub or connect the LIBERO Tx directly to the PC.**
- **On the used COM port the required USB driver is not available.**

3 Configuration Software

liberoCONFIG is the software to configure LIBERO PDF loggers. The necessary configuration parameters are created and saved as profiles. A profile contains all information regarding the monitored task and is documented in the PDF report. It is also possible to use SmartStart Pack & Go to quickly and safely assign configuration profiles to a large number of LIBEROs.

> In this operation manual the designation: LIBERO Tx represents the whole device team.
>
> Details on the current models and their data sheets are available at www.elpro.com

3.1 Configuration file till SmartStart Pack & Go exe file

The configuration of an individual LIBERO Tx is carried out with liberoCONFIG. This work is simplified considerably if configurations are repeated frequently by the use of SmartStart and Pack & Go.

Configuration variants
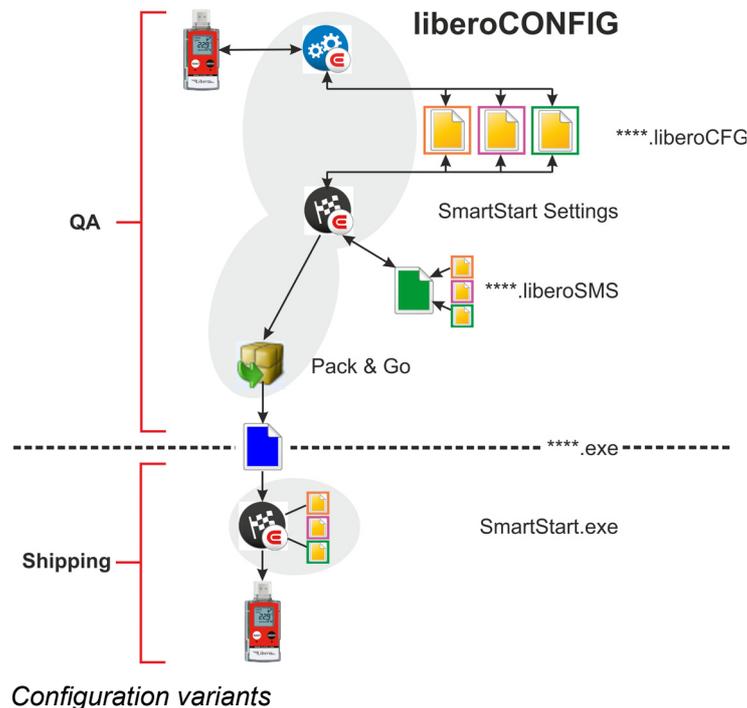
> SmartStart Pack & Go (.exe) file with a LIBERO Tx can be used on any PC, however it requires the LIBERO USB driver.

3.2 System requirements

- Windows XP, 7 or 8

- CPU 1.5GHz

- Memory: 512 MB RAM

- Free hard disk space: 100 MB
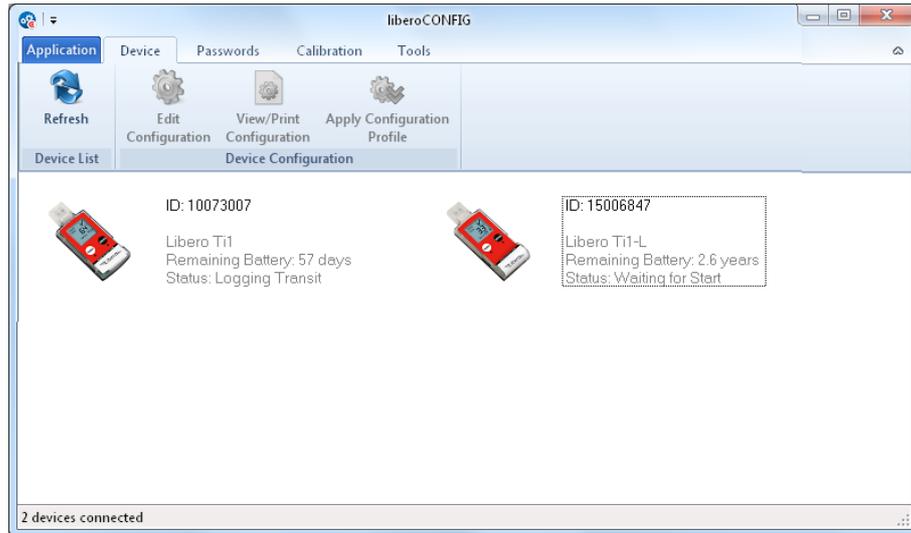
- Monitor: 800 x 600 Pixel

ℹ	Information on the latest functions is given in the "ReadMe" file.

3.3 Common - liberoCONFIG

The following chapter represents a step-by-step procedure for the configuration.

After configuration, continue with 5.2 *Transport Monitoring***.**

3.3.1 Start of liberoCONFIG

On this screen all available LIBERO Txs are visible.

Start window of liberoCONFIG with 2 LIBERO Tx

The following infor-mation is shown

- LIBERO ID No

- Type

- Status

- Remaining battery lifetime

Single / multiple device selection

Except "Device - Configuration" and "Calibration - New Device" all functions described in the following chapters could be applied to the selected data loggers at the same time.

Application

Refresh

Refreshes the start window of liberoCONFIG

Edit configuration

⇨ 2 *Configuration of a LIBERO Tx*

LIBERO SmartStart

⇨ 3.7 *LIBERO SmartStart - Settings*

Check the PDF file integrity

⇨ 3.6.1 *Check PDF Report Integrity*

First-time use

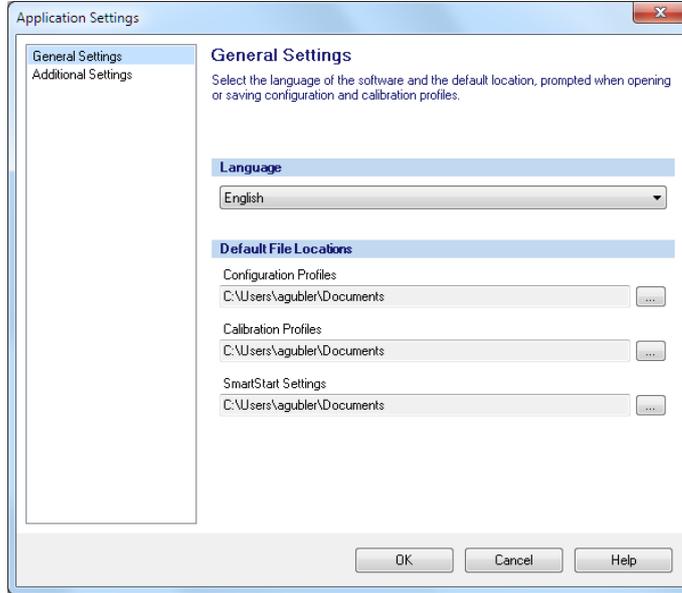Before using the liberoCONFIG for the first time make the following settings:

- Language
- Default file locations
- Password length
- Specify the paper format for the reports

⇨ 3.3.2 *Options - General*

Shows the information about the current program version and license number.

3.3.2 Options - General

In "Options" various general program settings can be made.
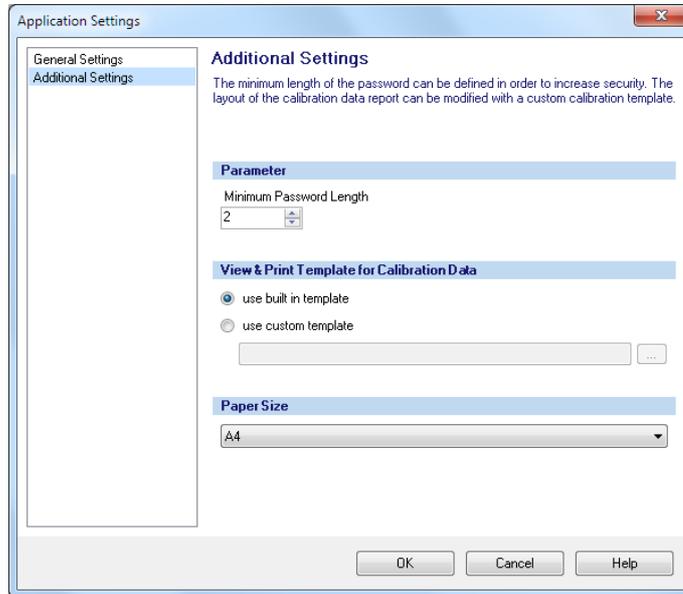

Options - General Settings

Language
- German
- English
- Spanish
- French
- Italian
- Dutch

Default File Locations

For the following profiles, the file location can be defined or selected:

⇨ Configuration profile: 3.4 *Configuring the LIBERO Tx*

⇨ Calibration profile: 6.1 *View/Print Calibration*

⇨ 3.7 *LIBERO SmartStart - Settings*

3

3.3.3   Options - Additional

Options - Additional Settings

Parameters Data entry field used for the definition of the minimum password length.

View & Print Template for Calibration Data

- Use built in template

  The factory defined layout of the calibration document is used for printouts.

- Use custom template

  The customer has the possibility to design his own calibration template.

  Please contact ELPRO-BUCHS AG for further support.

Paper Size You may choose between A4 and Letter.

3.3.4 Menus

Chapter

⇨ 3.4 *Configuring the LIBERO Tx*

⇨ 3.5 *Passwords*

⇨ 6 *Calibration*

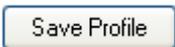⇨ 3.6 *Integrity of the PDF report*

⇨ 3.7 *LIBERO SmartStart - Settings*
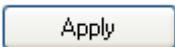
3.3.5 Buttons

The following buttons are used within liberoCONFIG:

- Load Profile
  Used to open a formerly saved profile for setting-up data loggers

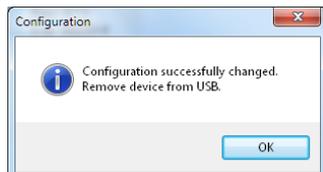

- Save Profile
  Used to save a new profile in a file

- Apply
  The selected data loggers will be configured and started according to the open profile.

3.3.6 Confirmation

All successful actions are confirmed, e.g. changing the password.

3.3.7 Configuration Profiles

A configuration profile represents all set-up information used by the selected LIBERO for a monitoring task and defined by liberoCONFIG such as:

- Description of the PDF report
- Logging functions
- PDF-Options
- Format settings
- Handling options

Configuration profiles are saved as "***. LiberoCFG" files can either be applied to multiple LIBERO Tx or saved for later use.

Profile Checksum 1.204.440.652

The checksum is used to prove the validity of the profile and as reference value for a configuration check.

⇨ 3.4.9 *Profile Information*

3

3.4   Configuring the LIBERO Tx

The following chapter represents a step-by-step procedure for the configuration.

LIBERO Tx selected for configuration

Configuration Mode

Only LIBERO Tx in configuration mode are visible in the start window.

⇨ 2 *Configuration of a LIBERO Tx*

Configuration file

Configuration or creation of a configuration file (****.liberoCFG) is only possible if at least one LIBERO Tx is shown in the start window.

⚠ **IS THE REMAINING BATTERY LIFETIME SUFFICENT FOR THE NEXT MONI-TORING TASK?**

TIME OF CONFIGURATION:
DEPENDING ON THE MODEL, CONFIGURATION IS POSSIBLE DURING THE FIRST 10 DAYS AFTER ACTIVATION (SINGLE USE) OR AT ANY TIME (MULTI USE).

Menu: Device - Edit Configuration

The chapters: 3.4.1 *Description* - 3.4.9 *Profile Information* are related to the functions within the menu: Edit - Configuration

3.4.1 Description
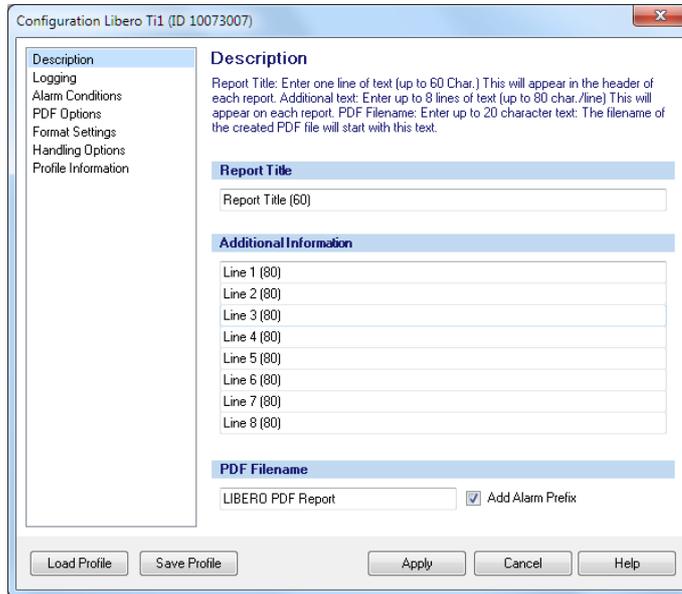
|	
Report Title	Information used as head line on the evaluation report; up to 60 characters
Additional Information	Free text that can be added to the profile to appear on the PDF report; up to 8 lines of 80 characters.
PDF Filename	Specified file name of the PDF report.
Add Alarm Prefix	Depending on the recorded data and the alarm conditions, "ALARM" or "OK" is leading the file name.

3.4.2 Logging

The logging interval and recording time will be displayed. You can adjust settings by clicking on the arrow buttons or by dragging the sliding bar.
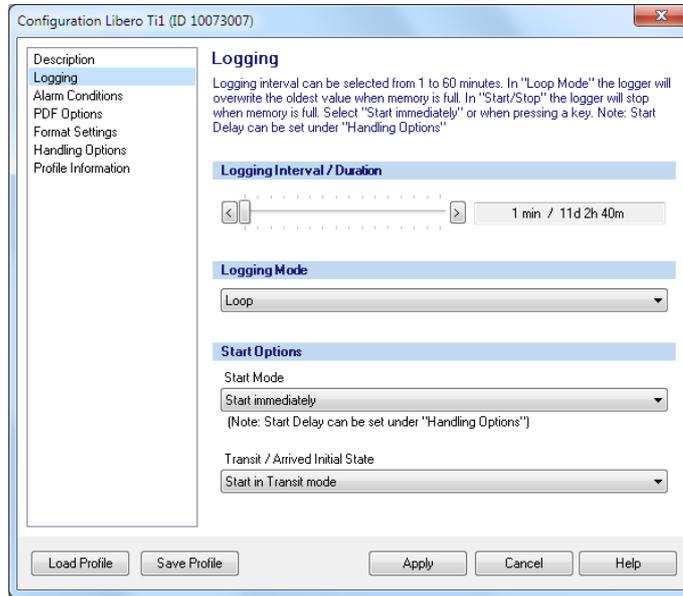
Logging Interval / Duration

Depending on the model the recording interval is between 1 or 5 minutes and up to 60 minutes.

⇨ www.elpro.com

3

Logging Mode

Logging is blinking

- Loop
  Logging is done continuously. If the memory is full (16'000 measuring data points), each further value overwrites the oldest data with the newest one. The oldest value is irretrievably lost.

- Start/Stop
  You have got control over the logging start by pressing a button or a preset delay time has elapsed.

The end of logging is automatically determined by the start time and the selected logging interval.

Start Options

Determines the operating condition of the LIBERO Tx after it has been configured.

Start Mode

- Start immediately
  Data recording starts as soon as the LIBERO Tx is configured.

- Start after pressing the TRANSIT-button
  Data recording starts after the TRANSIT-button has been pressed for 2 seconds.

Initial state: Transit / Arrived Initial State

Depending on the transportation cycles, you may switch several times between the two modes:

- Start in Transit mode
 The LIBERO Tx starts recording with consideration of the alarm settings.

- Start in Arrived mode
  The LIBERO Tx starts recording without consideration of the alarm settings.
  This mode is used for transport monitoring where the products are ready for shipment, but the transport starts sometimes later e.g. to respect cool down phase of packaging. Just before the transport starts, press the TRANSIT-button to activate the alarm monitoring.

> ℹ️ Both modes could be delayed.
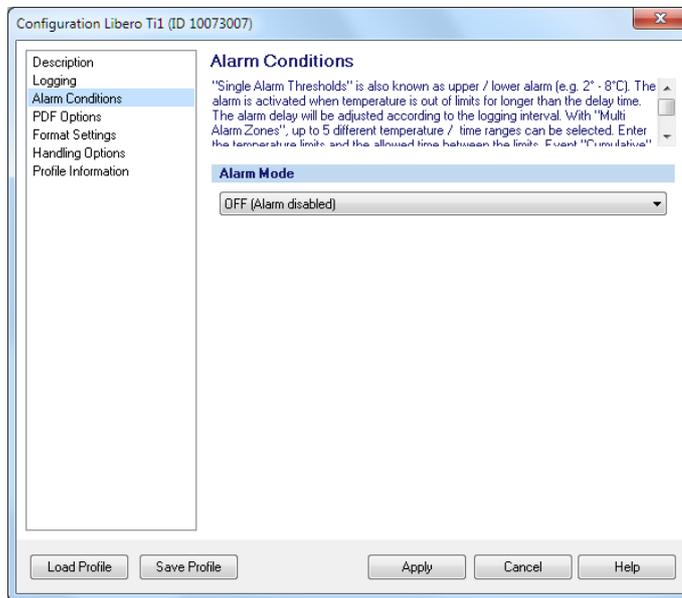> ⇨ 3.4.8 *Handling Options*.

3.4.3 Alarm conditions

Threshold violation
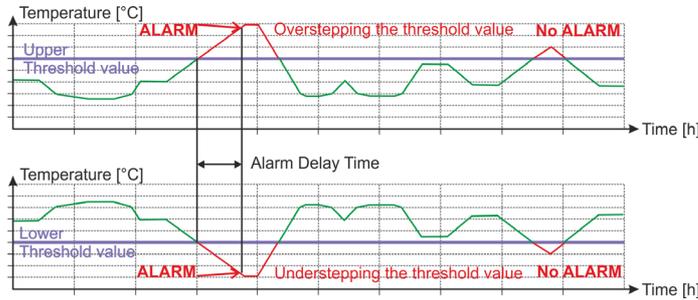
⚠ **AN ALARM CAN BE RESET BY A NEW CONFIGURING!**

There are 3 different alarm conditions, selectable by the Alarm Mode pull down menu
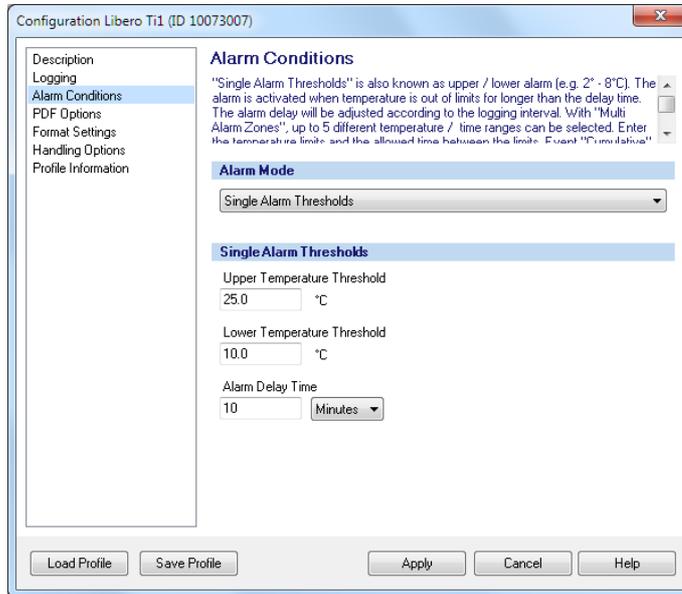

Selection: Alarm disabled
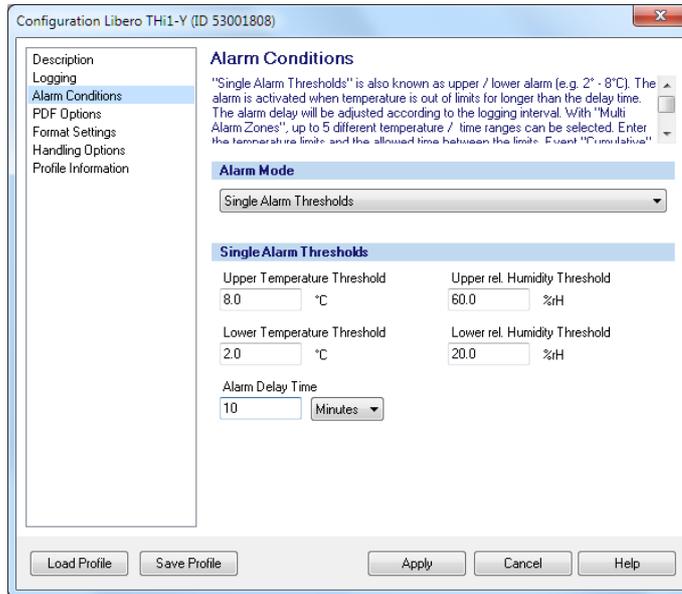
Alarm mode

- OFF (Alarm disabled)   No alarm monitoring takes place.
- 3.4.4 *Single Alarm Thresholds*
- 3.4.5 *Multiple Alarm Zones*   This function is not available on LIBERO THi1-x which record temperature and humidity values.
- 5.3.1 *Alarm Representation*   There are various alarm symbols visible on the display.

3.4.4 Single Alarm Thresholds

LIBERO Tx for temperature recording

LIBERO THi1-x for temperature and humidity recording

**Upper Thresholds / Lower Thresholds**   Data entry fields for the lower and upper thresholds.

| Alarm Delay Time (Minutes, Hours, Days) | An alarm is not triggered until the threshold violation has lasted longer than the specified time. |

3.4.5   Multiple Alarm Zones

The "Multiple Alarm Zones" function splits the alarm condition into 6 independent zones. Zone 4 represents the temperature range where none of the alarm conditions are fulfilled.
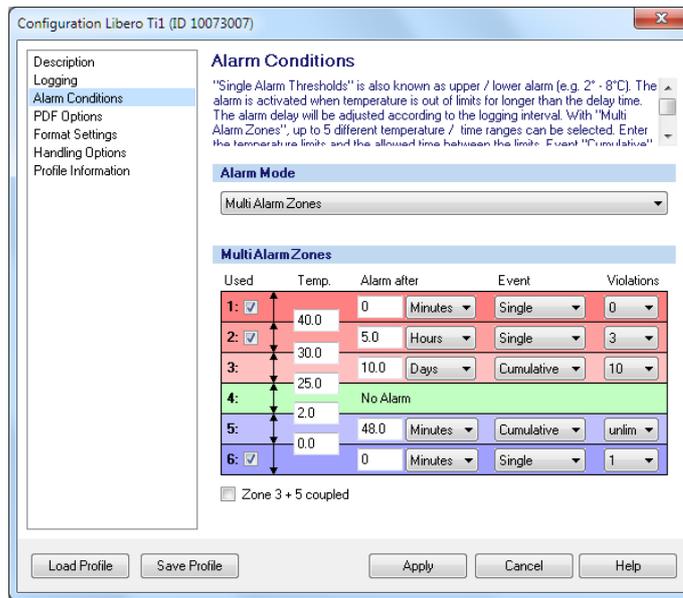
> ℹ️ Possible for LIBERO Tx only.

| Used | These check boxes are used to select the desired alarm zones. |

| Temperature | T[°C] or T[°F]
Data entry fields for the threshold values. |

| Alarm after | An alarm is not triggered until the threshold violation has lasted longer than the specified time. |

| Event | • Single
The delay time restarts for each threshold violation.

• Cumulative
An alarm will be triggered as soon as the elapsed time of all violations together has reached the delay time. |

| Violations | Accepted number of violations, without respect to the set delay time for the past monitoring task. |

Zonen 3 + 5 coupled   If this check box is set, an alarm won't be triggered unless it is outside the threshold defined for zone 3 and 5 (accumulation deviations).

Graphical Representation / Evaluation
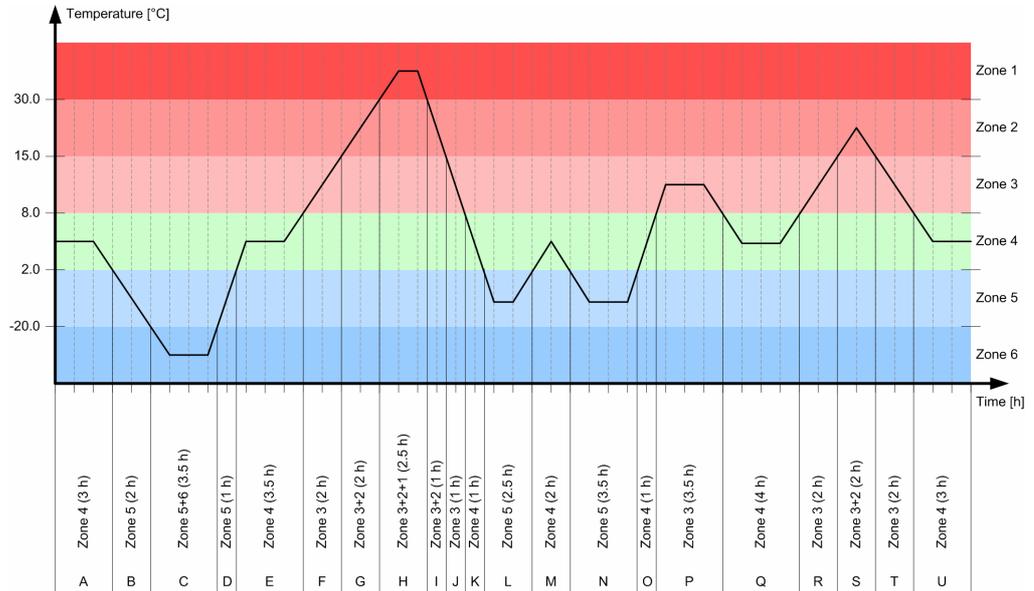
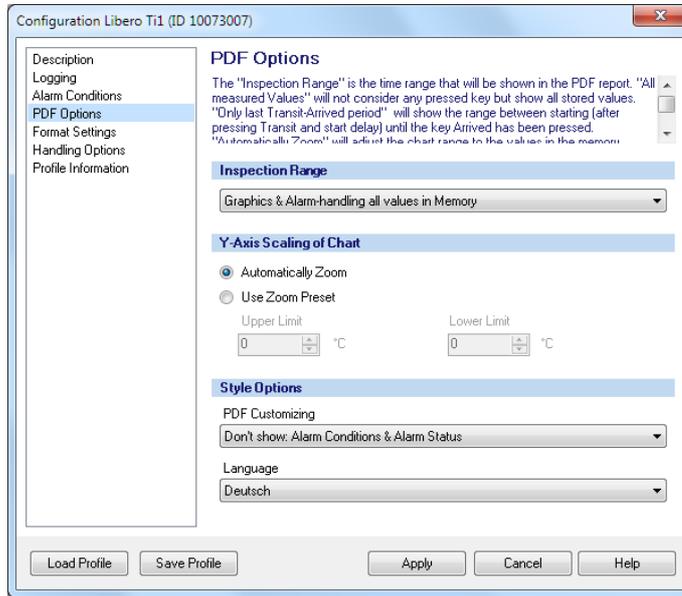*Temperature plot with zones*

Data

Zone	Temperature range [°C]	Add-up time [h]	Number of threshold violations	Plot section used for calculation
1	over 30	2.5	1	H
2	over 15	7.5	2	G+H+I+S
3	over 8	18.0	3	F+G+H+I+J+P+R+S+T
4	2 to 8	17.5	0	A+E+K+O+Q+U
5	below 2	12.5	3	B+C+D+L+N
6	below -20	3.5	1	C

3.4.6 PDF Options

Selection of the information contained in the PDF report

Inspection Range

The inspection range determines the period over which the data shall be evaluated. There are 3 possibilities for the statistic calculation:

- Graphics & Alarm handling all values in Memory
  All data logged will be used for the statistical evaluation.

- Graphics & Alarm handling "Last Transit - Arrived"
  Only data and alarms logged during the last transit - arrived period will be used for the statistical calculation. If the ARRIVED-button was not pressed, all values until the moment of evaluation will be used.

- Graphics all values in Memory & Alarm handling "Last Transit - Arrived"
  All data logged but only alarms during the last transit - arrived periode will be used for the statistical evaluation.

⇨ Show statistic: 5.3.2 *Statistics*

⇨ 3.4.6.2 *Example: PDF report - Transit - Arrived period*

⚠ **THE "INSPECTION RANGE" IS GOING TO INFLUENCE:**

- **Alarm statistics on the display**

- **Alarm representation in the PDF report**

- **All measuring values in memory**

Y-Axis Scaling of Chart

- Automatically Zoom
  The Y-axis will automatically be scaled according to the range of the measured values.

- Use Preset Zoom
  The Y-axis will be scaled according to the lower and upper limits.

> ⚠️ **THE SETTINGS "INSPECTION RANGE" AND "Y-AXIS SCALING CHART" DO NOT INFLUENCE THE MEASURING RANGE OF THE LIBERO TX AND THE DATA LOGGED!**

Style Options
- Language

  Dansk, German, English, Español, Français, Italiano and Nederlands
- PDF customizing

  ⇨ 3.4.6.3 *Example: PDF report - possible hidden information*

3.4.6.1   Status information in the PDF report

File name

LIBERO PDF Report No 1369985636 (LIBERO PDF Report 20130531073356 71010001770.pdf)

                                  1   2   3   4   5

1. Unique PDF report number comprising the device ID and the time stamp of the PDF report
2. File name specified for the PDF report during configuration
3. Date of report creation
4. Time of report creation
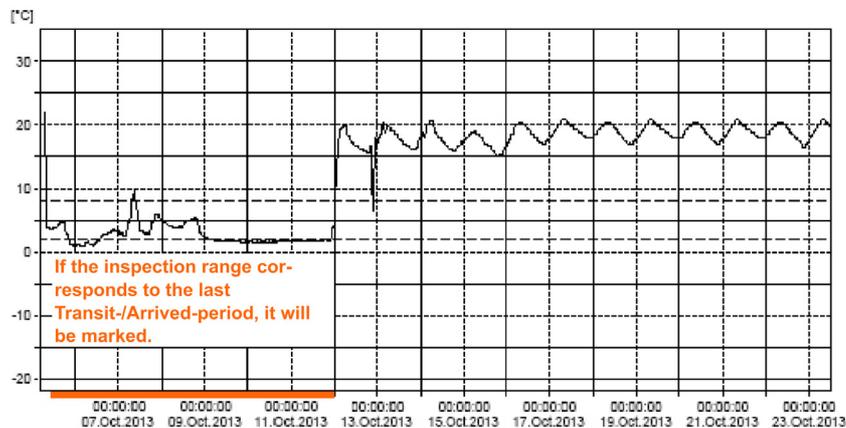5. Device ID

Logging results - File created

This timestamp corresponds to the last point of time at which the LIBERO Tx was evaluated.

Error Messages

⇨ 5.3.4 *Error Messages*

3.4.6.2   Example: PDF report - Transit - Arrived period

3.4.6.3   **Example: PDF report - possible hidden information**

Libero PDF•Bericht•Nr. 12706483 (ALARM LIBERO PDF Report 20130827074052 10073007.pdf)

Report Title (60)

☒ ALARM

Additional Information

Line 1 (80)
Line 2 (80)
Line 3 (80)
Line 4 (80)
Line 5 (80)
Line 6 (80)
Line 7 (80)
Line 8 (80)

Device Configuration

|			
Type:	Libero Ti1 V1.35	Inspection Range:	All data
Logger ID:	10073007	Current State:	not available
Log Interval / Duration:	1 m / 11.1 d	Remaining Battery:	66 d
Log Mode:	Loop	Logger Start:	23.Aug.2013 16:39:06
Report Time Base:	GMT +02:00	Checksum:	P201 3.200.419.739
Configured by:	C1361, EC82/agubler, 05.Sep.2013 08:27:24		

Alarm Conditions   Status

Upper Threshold:	25.0 °C	Time above Threshold:	16.1 h	ALARM
Lower Threshold:	10.0 °C	Time below Threshold:	0 s	OK
Alarm Delay:	10 m			

Logging Results

|			
Highest Temperature:	38.3 °C; 23.Aug.2013 17:04:06	Transit Start at:	23.Aug.2013 16:39:06
Lowest Temperature:	14.6 °C; 26.Aug.2013 06:40:06	Arrived at:	27.Aug.2013 07:39:52
Average Temperature:	21.1 °C	Alarm at:	23.Aug.2013 16:49:06
MKT	23.0 °C	File created:	27.Aug.2013 07:40:52
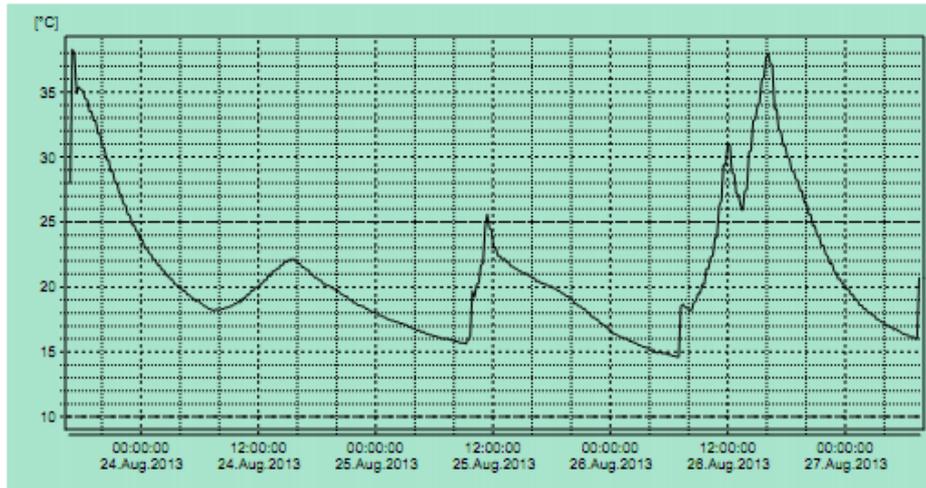
Evaluation report created by Libero, the PDF Logger®

P201	Profile ID
▇ (blue)	Not shown: Alarm Conditions
▇ ▇ (blue, orange)	Not shown: Alarm Conditions & Alarm Status
▇ ▇ ▇ (blue, orange, green)	Not shown: Alarm Condition & Alarm Status & Logging Results

3.4.7 Format Settings

Country-specific set-tings.
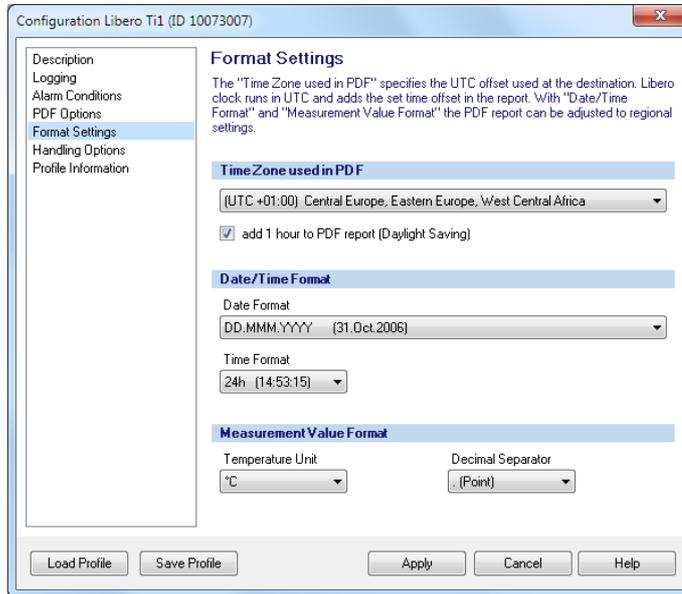
Time Zone used in PDF	Represents the time zone used in the PDF report. This setting is based on UTC.
Daylight Saving Time (1 hour) ✔	A set checkmark adds 1h to the selected time zone.
Default setting	UTC

> ⚠ **DAYLIGHT SAVING TIME: CHANGE IS NOT DONE AUTOMATICALLY**

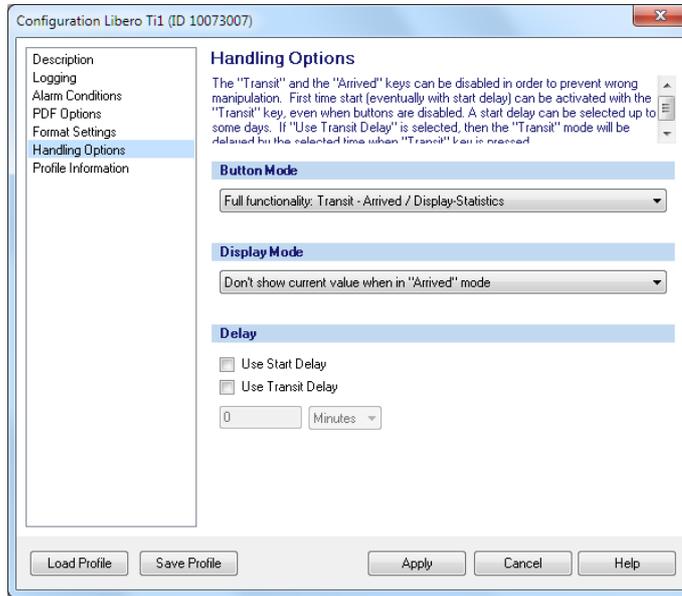|	
Date/Time Format	Choose format settings for date and time.
Default setting	DD.MMM.YYYY (31.Oct.2012)
Measurement Value Format	Selection of various display formats for: - Temperature unit: °C or °F - Decimal separator: xx.yy (point) or xx,yy (comma

3.4.8   Handling Options

Used to determine the button functions and data shown on the display.

Button Mode

Switch to configuration mode for a new setting.

⇨ 2.3 *Start Configuration Mode*

Buttons see Introduction

Full functionality: Transit - Arrived / Display-Statistics

• To start recording, press the TRANSIT-button for 2 seconds.

• Enables the buttons to mark the start and the arrival of the shipment. Those markings are visible in the PDF report.

⇨ 3.4.6.2 *Example: PDF report - Transit - Arrived period*

• Measurement statistics shown on the display

⇨ 5.3.2 *Statistics*

Transit - Arrived / NO Display-Statistics

• To start recording, press the TRANSIT-button for 2 seconds.

• Enables the buttons to mark the start and the end of the monitoring period several times. Those markings are visible in the PDF report.

⇨ 3.4.6.2 *Example: PDF report - Transit - Arrived period*

Transit - Arrived ONCE / Display-Statistics

> ℹ️ LIBERO Tx could be used for one transit - arrived period only!

- To start recording, press the TRANSIT-button for 2 seconds.
- Enables the buttons to mark the start and the arrival of the shipment. Those markings are visible in the PDF report.
  - ⇨ 3.4.6.2 *Example: PDF report - Transit - Arrived period*
- Measurement statistics shown on the display
  - ⇨ 5.3.2 *Statistics*

Transit - Arrived ONCE / NO Display-Statistics

> ℹ️ LIBERO Tx could be used for one transit - arrived period only!

- To start recording, press the TRANSIT-button for 2 seconds.
- Enables the buttons to mark the start and the arrival of the shipment. Those markings are visible in the PDF report.
  - ⇨ 3.4.6.2 *Example: PDF report - Transit - Arrived period*

Display-Statistics ONLY

- Measurement statistics shown on the display
  - ⇨ 5.3.2 *Statistics*

Disabled (Start & Config only)

- To start recording, press the TRANSIT-button for 2 seconds.

Status: The buttons are inactive

Switch to configuration mode for a new setting.
  - ⇨ 2.3 *Start Configuration Mode.*

Data logging

> ℹ️ For any button modes, data recording continues till the memory is full. All recorded data, even the non-visible data in the PDF report, can be evaluated with elproVIEWER or elproLOG ANALYZE.

3.4.8.1   Display mode

Allways show current value

All display possibilities are enabled

Don't show current value when in "Arrived" Mode

Never show current value

- Temperature- or humidity measurement values won't be shown
- Status information is shown

3.4.8.2

Is used for transport monitoring where the products have been packed or stored prior the monitoring starts.

Delay

Use Start Delay

- Loop mode

  The delay time starts immediately after the LIBERO Tx has been configured

- Start/Stop mode

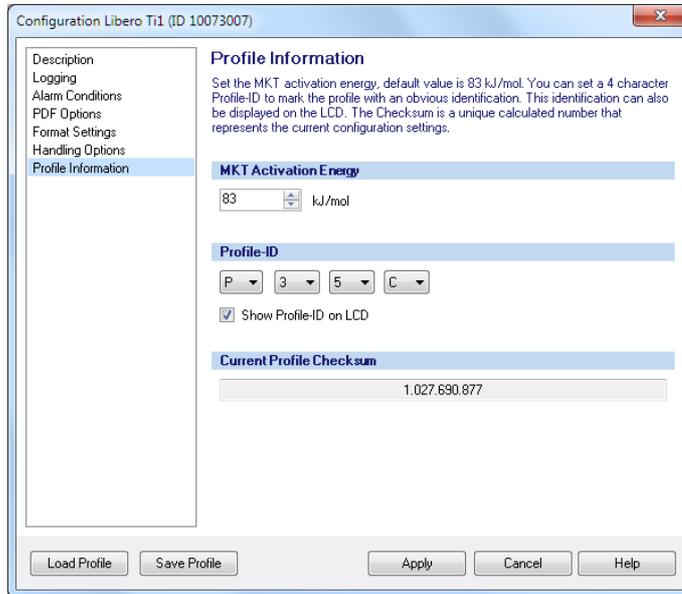 The delay time starts after the LIBERO Tx has been started by keypress.

Use Transit Delay

Delay time starts after the LIBERO Tx mode changed from Arrived mode to Transit mode by keypress.

Minutes / Hours / Days

Data entry field for the delay time

3.4.9   Profile Information

MKT Activation Energy

Possibility to enter a product specific value for the MKT activation energy between 42.... 125 kJ/mol.

Profil-ID

The summarized information in the configuration profile could be assigned with a Profil-ID for easier handling. The character set for the Profil-ID is restricted to the display capability. The Profil-ID is always listed in the "Device Configuration" of the LIBERO PDF report.

• 4 selection windows for defining the Profil-ID

> ℹ The character set for the Profil-ID is restricted to the display capability.

By checking the box, the Profil-ID appears on the display.

⇨ 5.3.2 *Statistics* - Show Profil-ID on LCD

⇨ 3.4.6.3 *Example: PDF report - possible hidden information* - P201

Default setting   P001

Current Profile Checksum

Is documented in the "Device Configuration" part of the LIBERO PDF report.

⇨ 3.3.7 *Configuration Profiles*

⇨ 3.4.6.3 *Example: PDF report - possible hidden information*

3.4.10   Apply Configuration Profile

All selected LIBERO Tx are directly configured with a previously saved profile.

3.4.11   View/Print configuration

Creates a report with all configuration data. This report contains as many pages as LIBERO Tx selected.

3.4.11.1   Example: Configuration Report

Menu bar

Libero Device Configuration

Profile

Profile Checksum:	1.204.440.652	Configuration Password:	No
Profile-ID:	P001	Data Access Password:	No

Device

Type:	Libero Ti1-S (V1.35)	Current State:	Waiting for Start
Logger ID:	12278832	Remaining Battery:	105 d
Configured by:	C202, EC03/agubler 21.02.2013 13:57:13 (GMT)		

Description

Report Title:	QA Libero
Add. Info. Line 1:	AA
Add. Info. Line 2:	BB
Add. Info. Line 3:	CC
Add. Info. Line 4:	DD
Add. Info. Line 5:	EE
Add. Info. Line 6:	FF
Add. Info. Line 7:	GG
Add. Info. Line 8:	HH
Filename:	Untitled Libero PDF

Logging

Log Interval / Duration:	5 min / 55d 13h 20m	Start Mode:	Start after pressing a key
Log Mode:	Start/Stop	Transit Initial State:	Start in Transit mode
MKT Activation Energy:	83 kJ/mol		

Alarm Conditions

Alarm Mode:	Single Alarm Thresholds
Upper Threshold:	8,0 °C
Lower Threshold:	2,0 °C
Alarm Delay:	20 m

PDF Options

Inspection Range:	Graphics & Alarm-handling "Last Transit - Arrived"
PDF Customizing:	Show complete Report (Alarm Condition / Alarm Status / Logging Results)
PDF Language:	Español
Y-Axis Scaling of Chart:	Automatically Zoom

Format Settings

Time Zone:	GMT +00:00	Time Format:	24h
add 1 hour:	No	Temperature Unit:	°C
Date Format:	YYYY-MM-DD	Decimal Separator:	. (Point)

Handling Options

Button Mode:	Full functionality : Transit - Arrived / Display-Statistics		
Display Mode:	Always show current value		
Show Profile-ID on LCD:	Yes		
Start Delay:	No	Transit Delay:	No

Printed: liberoCONFIG 2013.6.1.0 / agubler / 02.07.2013

3.5 Passwords

LIBERO Tx offers 2 different password functions. Both passwords can be set, changed or reset.
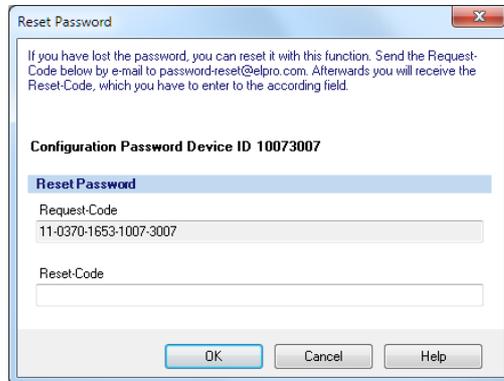
- Configuration password

  It is used to protect the LIBERO Tx against unauthorized configuration.

- Data access password

  If the data access password is set, data transfer into elproVIEWER or elproLOG ANALYZE needs user authorisation.

Set/Change

If "New Password" & "Repeat new Password" are left blank, the password will be reset.

Reset

1. To reset the password the displayed "Request-Code" and the device ID number has to be mailed to ELPRO-BUCHS AG (password-reset@elpro.com).

2. ELPRO-BUCHS AG is going to mail you the "Reset Code" by return.

ⓘ Calculation of the "Reset Code" is possible at ELPRO-BUCHS AG only. This code is just valid for the respective LIBERO Tx.

3.6 Integrity of the PDF report

3.6.1 Check PDF Report Integrity

This function is used to validate a PDF report. If the files have passed, test results will be shown and can be printed or archived.

Procedure: File integrity check

1. Select and open PDF reports that should be checked

2. PDF report check
   A report with the check results will be created. This report contains as many pages as LIBERO Tx selected.

Menu bar

Check Libero PDF File Integrity

Device

Logger ID:	12278832
Type:	Libero Ti1-S

PDF File

Report number:	87250991
File created:	02.07.2013 12:56:43 (GMT +00:00)
File name:	M:\Entwicklung\Dokumentation\Anleitungen\LI Libero\Test_PDF 20130221125643 12278832.pdf

Check Results

File content:	**Checked - OK**
Embedded data:	**Checked - OK**

Printed: liberoCONFIG 2013.6.1.0 / agubler / 02.07.2013

3.6.2   Create PDF from Switched Off Device

This function gives the possibility to read the logged data from an already switched off LIBERO Tx as PDF report. After the file has been read, the LIBERO Tx switches itself off again automatically.

3.6.3   Set Time Zone of Device

For easier data evaluation, the used time zone could be adjusted to local time. Measurement values are not affected at all.

3

3.7   LIBERO SmartStart - Settings

LIBERO SmartStart Create and make settings see 3.3.4 Menus - Extras

The used LIBERO SmartStart application allows a fast and secure configuration of many LIBERO Tx. End users can select from a list of possible pre-defined profiles in the Pack & Go file and have the opportunity to add shipment-specific information that will later appear on the PDF report.

First, the "LIBERO SmartStart Settings" menu is used to select configuration profiles that have already been created and saved. An appropriate title and color are assigned to each profile for easier selection.
Then, the LIBERO SmartStart allows additional information fields to be defined so that shipment-specific information can be easily added (i.e. carrier, tracking number) and viewable on the PDF report. During the final programming process, information can be added either in the form of plain text or dropdown menu. All other critical device settings in the configuration profile, such as handling and alarm settings, are static and cannot be changed. After the initial settings are defined in the LIBERO SmartStart menu, a LIBERO SmartStart Pack & Go (.exe) file is created.

Another feature of the LIBERO SmartStart Pack & Go is the generating of a history log called the SmartStart Configuration Report (SSCR) i.e. settings and the additionally entered information. The SSCR can be processed further and replaces error-prone manual listings of which LIBERO data logger (or indicator) is contained in which shipment.

The basic configuration process using Pack & Go is as follows:

1. Open the Pack & Go Pack & Go file

2. Select the appropriate configuration profile (by name and/or color)

3. Add shipment-specific information manually or from a drop-down menu

3
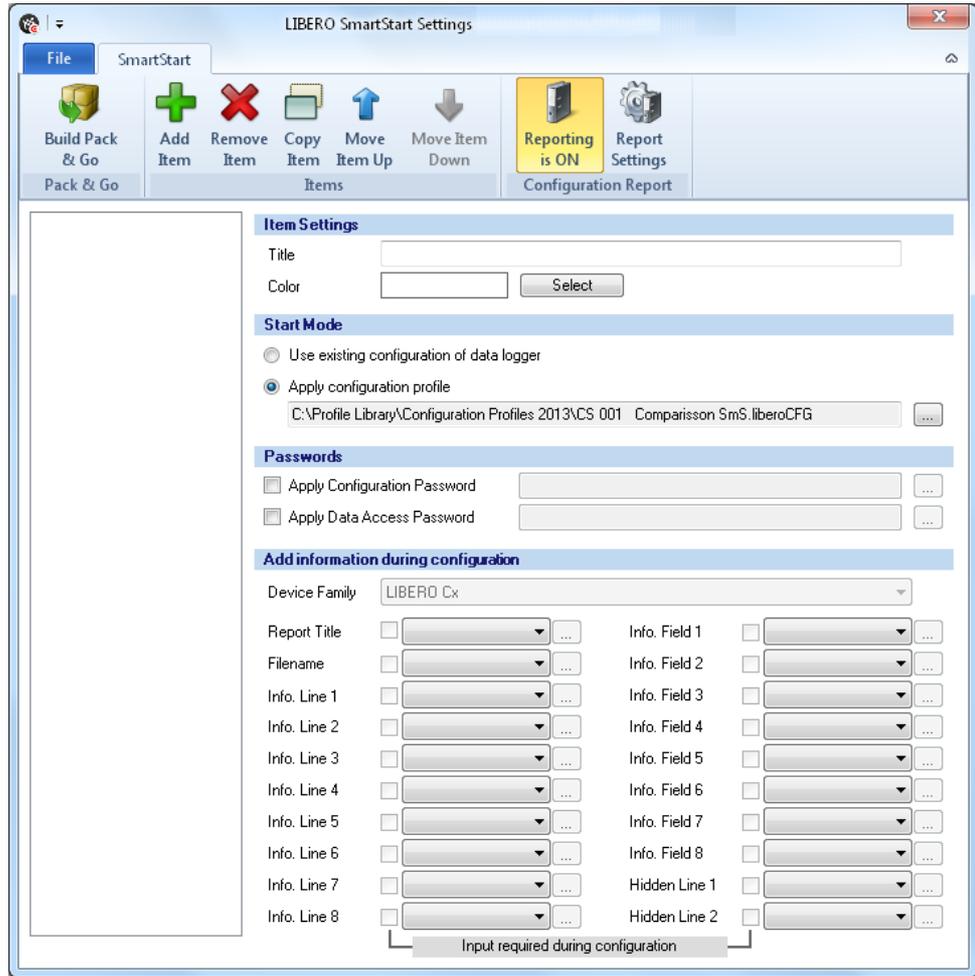
Start

LIBERO SmartStart Settings

⇨ 3.7.1 *Items*

⇨ 3.7.2 *Configuration Report*

⇨ 3.7.7 *Create SmartStart Pack & Go*

File

⇨ Return to liberoCONFIG.

File format ****.liberoSMS

3.7.1 Items

Manage items
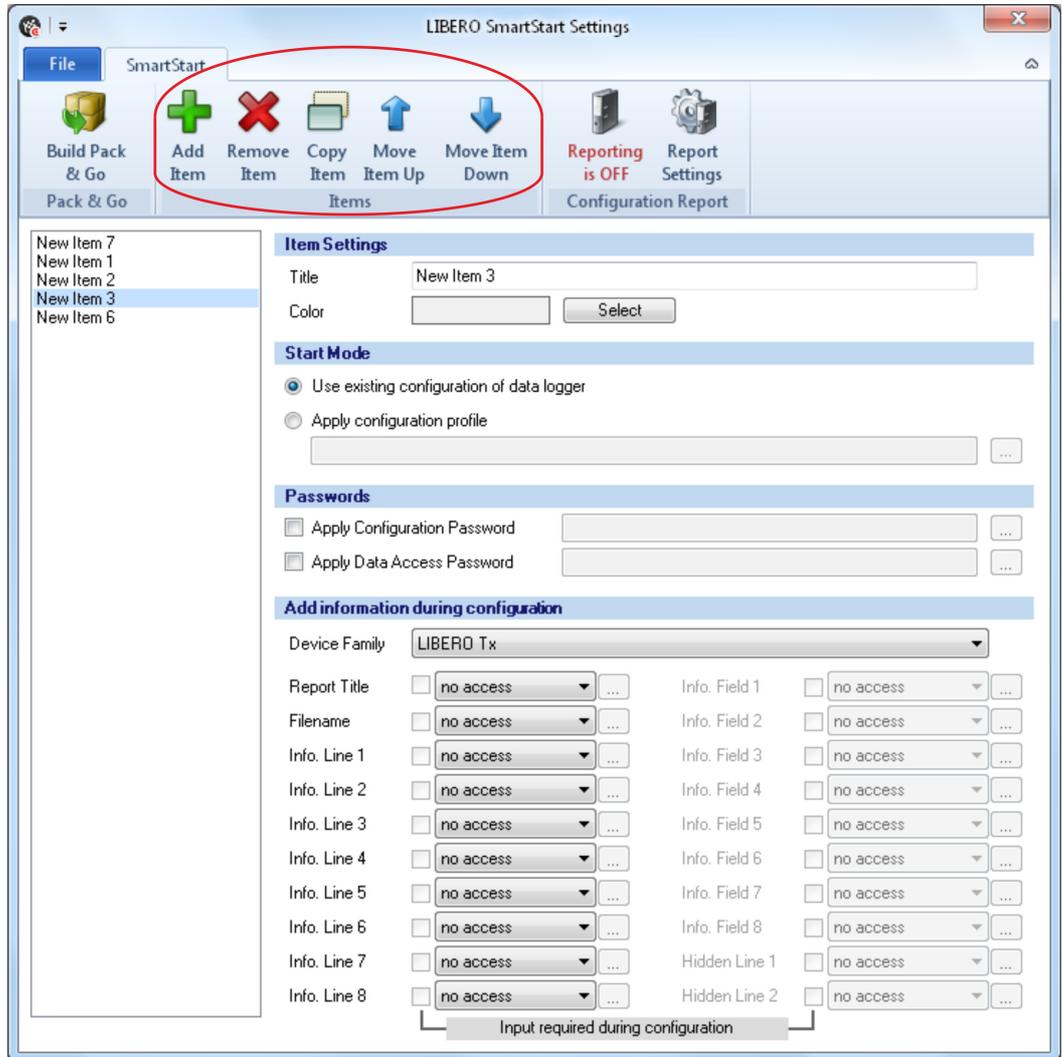
Overview: LIBERO SmartStart Settings

3

Apply password

3.7.1.1   Add information during configuration

Device Family   Manual or automatic recognition of the device team. When the LIBEROs are selected for configuration, SmartStart automatically enables the possible information window.

Add information during configuration   It is possible to make entries for all variable information of the PDF report during profile assignment.
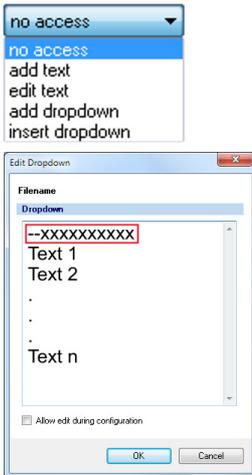
	no access	There are no entries possible
		If all entries are set to "no access", no entry prompts appear during profile assignment with SmartStart Pack & Go. In all other cases an entry window is opened to enter text with a barcode reader or with the keyboard.
	Add text	Entries can be added to the existing text.
	Edit text	The existing text can be supplemented and changed.
	Add dropdown	Opens the "Edit Dropdown" window for selection of predefined information. The existing line content is supplemented.
	Insert dropdown	Opens the "Edit Dropdown" window for selecting pre-defined information. The existing line content is always overwritten.

3

Commentary

--xxxxxxxxxx   Two minus signs in front of the text are treated as a comment in the dropdown and cannot be added or inserted in a mandatory field.

A checked box permits editing of the text in the "Dropdown" list during configuration.

Input required during configuration

ℹ Successful configuration is only possible when all activated fields are filled out.

3.7.2   Configuration Report

ℹ The configuration report is an option and not required for LIBERO SmartStart Pack & Go.
If no automatic reporting of the configured LIBERO Tx is needed, skip this section and continue with 3.7.7 *Create SmartStart Pack & Go*.
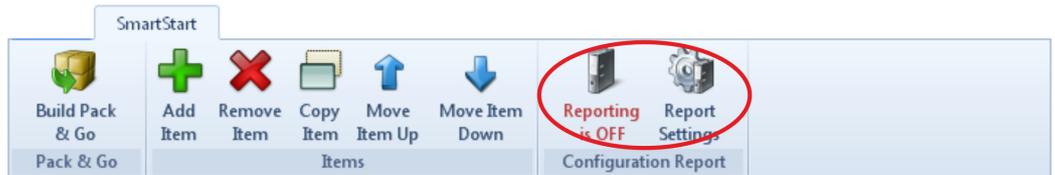
Menu bar - configuration report

The configuration report documents all configurations done by LIBERO SmartStart. With the aid of the "Placeholder Editor", the used file name, path and the parameters documented may be customized.
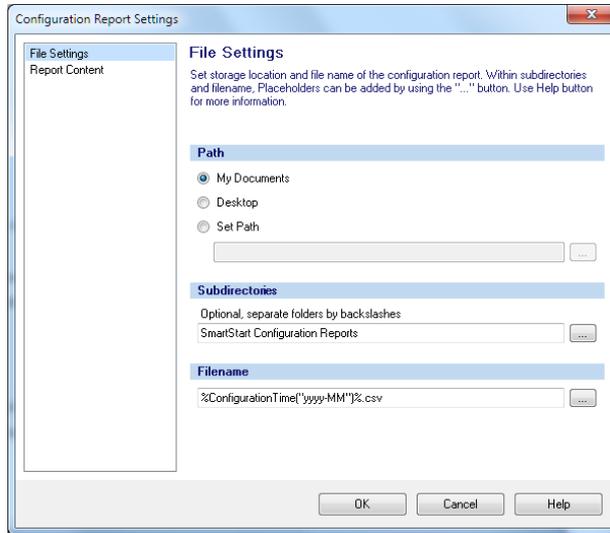
Reporting ON / OFF

Configuration report ON   The history log of the protocolled settings is switched ON/OFF.

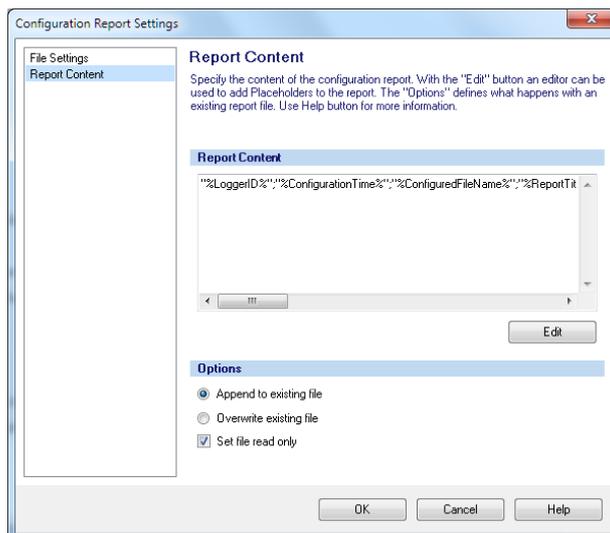### 3.7.3 Report Settings

File settings

Path Default setting for saving the configuration report.

Subdirectories & Filename

  This button is used to insert placeholders for the designation of subdirectories and file names.

3.7.4 Report Content

Report Content This window is used to define the placeholders and the formats used to create the report.

Options
The current report can be added as an extension to the existing one or the existing report replaced by the new one.

Edit
This button starts the „Placeholder Editor". The selected placeholders determine the content of the PDF report.

3.7.5 Placeholder Editor

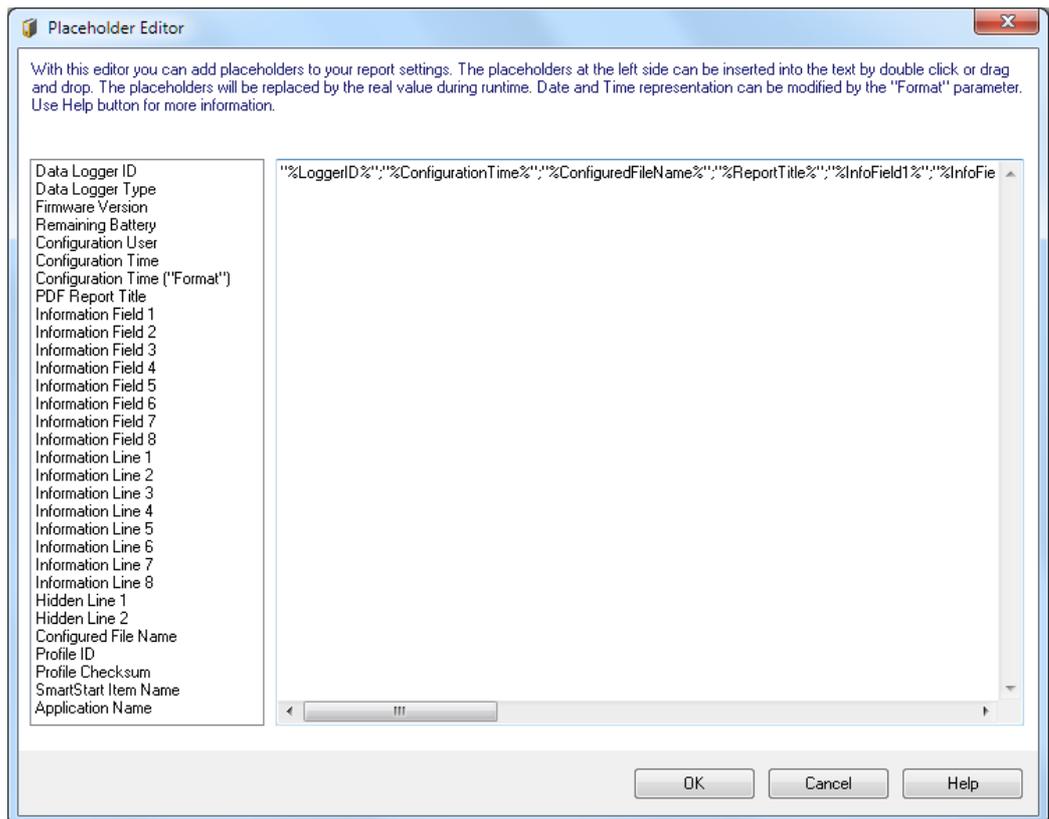|	Example
Placeholders are expressions that appear as variable information in the report.	Data logger ID
This is the syntax of the placeholder "Data logger ID" as shown in the window.	%Logger ID%
During the creation of the PDF report the placeholder is replaced by the current information, of the LIBERO configured with LIBERO SmartStart.	71010001789

Placeholder Editor

With this editor you can add placeholders to your report settings. The placeholders at the left side can be inserted into the text by double click or drag and drop. The placeholders will be replaced by the real value during runtime. Date and Time representation can be modified by the "Format" parameter. Use Help button for more information.

Data Logger ID
Data Logger Type
Firmware Version
Remaining Battery
Configuration User
Configuration Time
Configuration Time ("Format")
PDF Report Title
Information Field 1
Information Field 2
Information Field 3
Information Field 4
Information Field 5
Information Field 6
Information Field 7
Information Field 8
Information Line 1
Information Line 2
Information Line 3
Information Line 4
Information Line 5
Information Line 6
Information Line 7
Information Line 8
Hidden Line 1
Hidden Line 2
Configured File Name
Profile ID
Profile Checksum
SmartStart Item Name
Application Name

"%LoggerID%";"%ConfigurationTime%";"%ConfiguredFileName%";"%ReportTitle%";"%InfoField1%";"%InfoFie

OK   Cancel   Help

Description	Syntax	Function
Data Logger ID	%LoggerID%	ID of the data logger configured with SmartStart.
Data Logger Type	%LoggerType%	Type of the LIBERO Tx e.g. Ti1-S, configured with LIBERO SmartStart.
Firmware Version	%FirmwareVersion%	Firmware version of the LIBERO Tx configured with LIBERO SmartStart.
Remaining Battery	%RemainingBattery%	Current battery level of the LIBERO Tx at the time of configuration with SmartStart.
Configuration User	%ConfigurationBy%	Computer and user name
Configuration Time	%ConfigurationTime%	Point of time of the data logger configuration. Format settings according to regional settings of the computer. Time zone corresponds to settings in the PDF report.
Configuration Time ("Format")	%Configuration-Time("Format")%	Time of the configuration of the LIBERO Tx with user-defined date-time format
PDF Report Title	%ReportTitle%	Title of the PDF report ⇨ 3.4.1 *Description*
Information Field 1 ... 8	%InfoField1% ... %InfoField8%	Field 1 to 8 of the additional information in the PDF report ⇨ 3.4.1 *Description*
Information Line 1 ... 8	%InfoLine1% ... %InfoLine8%	Line 1 to 8 of the additional information in the PDF report ⇨ 3.4.1 *Description*
Hidden Line 1... 2	%HiddenLine1% %HiddenLine2%	Hidden line 1 and 2 of the additional information in the PDF report ⇨ 3.4.1 *Description*
Configured File Name	%ConfiguredFile-Name%	Configured PDF file name ⇨ 3.4.1 *Description*
Profile-ID	%ProfileID%	User defined Profile-ID ⇨ 3.4.9 *Profile Information* - Profile-ID

3

Description	Syntax	Function
Profile Checksum	%ProfileChecksum%	Automatically calculated checksum
SmartStart Item Name	%SmartStartItem-Name%	Name of the selected LIBERO SmartStart item
Application Name	%ApplicationName%	Corresponds to the "Window Title"
		⇨ 3.7.7 *Create SmartStart Pack & Go*

**Placeholder:
Configuration Time
("Format")**

This placeholder allows a customized date and time format.

Place-holder	Function
dd	Day with leading zero
MM	Month with leading zero
MMM	Shortcut month (Jan, Feb, Mar. ..)
MMMM	Name of month not abbreviated
yyyy	Year with four digits
hh	Time in 12-hour format with leading zero
HH	Time in 24-hour format with leading zero
mm	Minutes with leading zero
ss	Seconds with leading zero
tt	AM/PM designator
zzz	UTC Offset in format hh:mm

Examples   **("Format")**

yyyy MMM dd hh:mm:ss	2013 Jul. 17 16:23:12
dd MMM. yyyy	17 Jul. 2013
yyyy-MM	2013-07
dd/MM/yyyy	17/07/2013

CONFIGURATION SOFTWARE

3.7.6 Example of a configuration report

The following line numbers refer to the line of text in the "Placeholder Editor"

The used control characters quotation marks ("...") and semicolon (;) are interpreted according to the country settings of MS Excel. Depending on the country settings different characters for the described functions have to be used.

Notes

Line	Description
1	Date and time configured with the placeholder: Configuration time ("Format") configured.
2	Text
3	- Always use placeholder with quotation marks. In this case a semicolon (;) used within the text of the placeholder, will not be interpreted as column formatting. - Semicolon (;) between placeholders are used for column formatting. - Control characters have no effect on reports opened with an editor.
4	Entire line in quotes - Text and parameters are not separated into different columns. - Control characters have no effect on reports opened with an editor.

Placeholder Editor examples

```
1) %ConfigurationTime("yyyy MMM dd hh:mm")%
2) Datlogger Type and ID
3) "Datlogger Type and ID";"%LoggerID%";"%LoggerType%"
4) "Datlogger Type and ID;%LoggerID%;%LoggerType%"
```

Report opened with MS Excel

	A	B	C
1) 1	2013 Jan 19 01:23		
2) 2	Datlogger Type and ID		
3) 3	Datlogger Type and ID	16002844	Te1-N
4) 4	Datlogger Type and ID;16002844;Te1-N		

Report opened with an editor

```
1) 2013 Jan 19 01:23
2) Datlogger Type and ID
3) "Datlogger Type and ID";"16002844";"Te1-N"
4) "Datlogger Type and ID;16002844;Te1-N"
```

Example of a report

	A	B	C	D	E	F
1	18.01.2013 11:56	S1903, EC50/ameier	2-8°C non freezing products	Delivery No: 12345678	Shipping Box No: 080_2	Buenos Aires
2	18.01.2013 11:56	S1903, EC50/ameier	2-8°C may freeze products	Delivery No: 12345679	Shipping Box No: 120_6	New York
3	18.01.2013 11:57	S1903, EC50/ameier	15-25°C products	Delivery N: 12345680	Shipping Box No: 140_5	Singapore

3

3.7.7 Create SmartStart Pack & Go

Menu bar - Pack & Go

This is a function to set up an executable file of LIBERO SmartStart including all required settings and configuration profiles.

⚠	**LIBERO USB DEVICE DRIVER REQUIRED**

File format   (.exe)

Pack & Go runs:
- on any PC
- from a WEB, FTP or file server
- or from the Internet

3.7.7.1 SmartStart Pack & Go Settings

Settings

Program Window
- Window Title
  Window title bar of the executable (.exe) file. This title can provide information such as: Service provider, location or version.

- Language
  - English   - Italian
  - German   - Spanish
  - French   - Dutch

Pack & Go Security

- Start Password - only authorized staff is permitted to run SmartStart Pack & Go.

- Expiry Date - the program is going to run until this date only.

Workflow of Pack & Go

1. Define profiles and LIBERO SmartStart settings:
   ⇨ 3.4 *Configuring the LIBERO Tx*
   ⇨ 3.5 *Passwords*

2. Create an (.exe) file which includes the following information:
   - Defined profiles and LIBERO SmartStart settings
   - File name and title of the window
   - Optionally: Password and expiry date

3. Send the (.exe) file to the respective department.
4. The recipient runs the (.exe) file and configures the LIBERO Txs.
   ⇨ 4 *Using SmartStart Pack & Go*

3.8 Help

Help

Used to search for a specific help topic.

3

4   Using SmartStart Pack & Go

When starting the SmartStart Pack & Go (.exe) file created with liberoCONFIG, a window with predefined settings appears. The window text and the respective color code is defined in the LIBERO SmartStart settings.

⇨ *3.7 LIBERO SmartStart - Settings*

Mode

The LIBERO Tx must be in OFF or ConF mode! If the modes are not set properly, a PDF report will be shown!
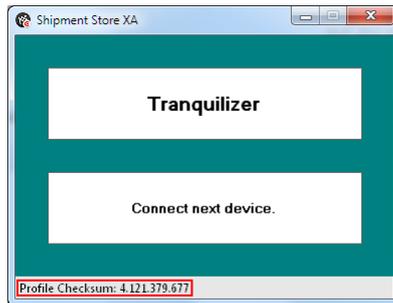
In the window, the first item from the list is shown with a color code and name tag.

4

⚠ **THE PROFILE CHECKSUM CORRESPONDS TO THE PROFILE CHECKSUM OF THE CONFIGURATION!**

⇨ *3.3.7 Configuration Profiles*

Now the LIBERO can be plugged into the USB port.
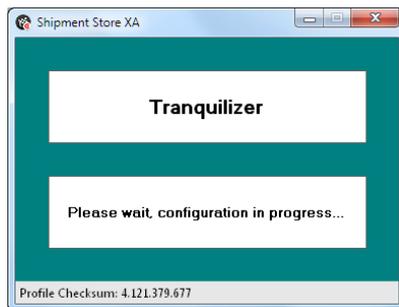
SmartStart Pack & Go then automatically sends the selected profile to the LIBERO.
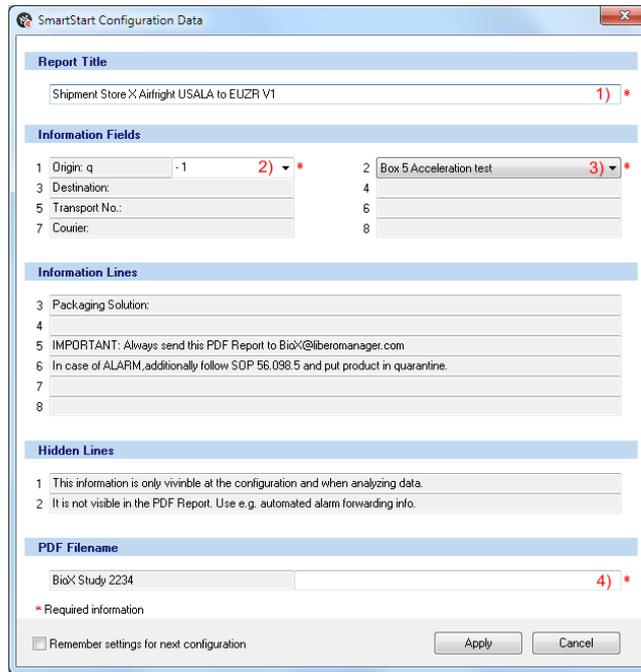
If various variable entries are defined during creation of the SmartStart Pack & Go, the window for entering the free configuration data is opened. The data can be entered with the keyboard or with the Barcode reader.

Key to entries

1. Edit text

2. Add dropdown

3. Insert dropdown

4. Add text

⇨ 3.7.1 *Items*

ℹ️ Gray shaded fields could be declared as not configurable during the creation of LIBERO SmartStart.

Missing variable

* Required information
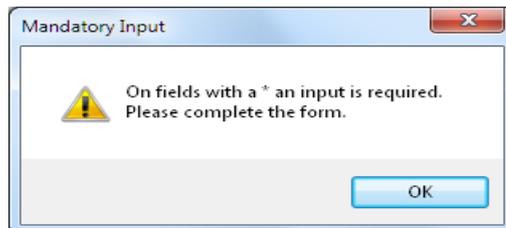
Error message

When all entries have done, the profile settings and the variable entries are applied to the LIBERO.

Now disconnect the LIBERO from the USB port and continue with the next LIBERO.

4.1 Change of Settings

A SmartStart Pack & Go can contain several items / profiles. Click the setting window with the right mouse button and select the desired profile, for example: "Antiallergics".
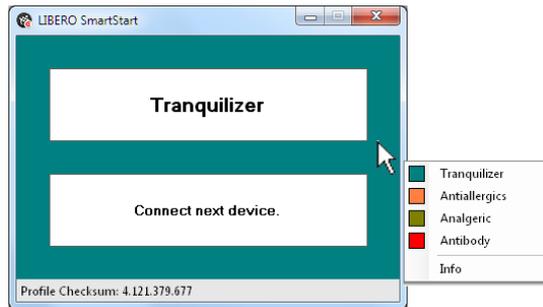
After changing the profile you can proceed with the next LIBERO.

4.2   Error Messages

In case of an error, a message will be displayed.
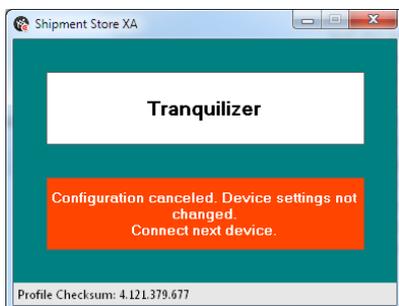
Reasons for error massages:

- Profile incompatible

- "Cancel" has been during data configuration problems

- LIBERO has been disconnected during configuration.

4

5 Example - Transportation

5.1 Battery Lifetime - Display

Bat.End xxx

The value shown is the remaining battery lifetime in days.

Depending on the model, the maximum operation period is between 100 days and 3 years.

⇨ www.elpro.com

Bat.End is blinking

Remaining lifetime < 30 days

If no lifetime for "Bat. End" is displayed, change LIBERO Tx at your next possibility (as soon as possible).

Battery operation time has been expired.

After 20 days in this mode, the display changes to "EoL" - End of Life
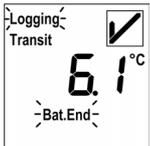
The display shows EoL

Recorded data are still available for evaluation.

⇨ 3.6.2 *Create PDF from Switched Off Device*

LIBERO Tx is turned off.

⚠ **DATA EVALUATION IS STILL POSSIBLE, SEE 3.6.2 *CREATE PDF FROM SWITCHED OFF DEVICE***

5.2 Transport Monitoring

Packing

For transport monitoring, the LIBERO Tx data logger has to be placed according to the product related transportation SOP.

Data logging

LIBERO Tx have several possibilities to start/stop a recording.

⇨ 3.4.2 *Logging*

5.3 Data Evaluation

5.3.1 Alarm Representation

To enable this function

⇨ 3.4.3 *Alarm conditions*

Indicators

☑ ☒

ALARM: Pass / Fail indicator

Threshold values

- Limit value overstepping

- Limit value understepping

⚠ **AN ALARM COULD BE RESET BY A NEW CONFIGURING!**

5.3.2   Statistics

LIBERO Tx have the capabilities to calculate and display statistical data.

Data logging continu-ous during the evalua-tion.

There are 3 possibilities for the statistic calculation:

- Graphics & Alarmhandling all values in Memory
- Graphics & Alarm handling "Last Transit - Arrived"
- Graphics all values in Memory & Alarmhandling "Last Transit - Arrived" period

     ⇨ 3.4.6 *PDF Options* - Inspection Range

> ℹ️ If for the "Last Transit - Arrived" periode, the ARRIVED-button was not pressed, all values until the moment of evaluation will be used.

5.3.2.1   Display of statistical data

- To access the statistical data, press the TRANSIT-button. Hold down the button while you briefly press the ARRIVED-button. The status change is confirmed by the display test.
- After the release of the buttons, the statistical data are shown.
- For an immediate exit, press the TRANSIT-button again or wait approximately 10 seconds till the LIBERO Tx displays measurement values again.

P-Id
Depending on the pro-file settings, the Profil-ID will be shown as first statistic value.

Browse

The buttons allow to scroll through the statistical data:

- Step forward - press ARRIVED-button
- Step backward - press TRANSIT-button

Evaluation Modes

There are two different evaluation modes available. Depending on the selected mode, con-tinue with:

     ⇨ 5.3.2.2 *Single Alarm Thresholds* or

     ⇨ 5.3.2.3 *Multiple Alarm Zones*

To enable this function:

     ⇨ 3.4.3 *Alarm conditions*

5.3.2.2   Single Alarm Thresholds

Profile-ID
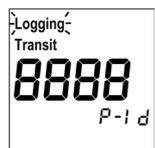
If "Show Profil-ID on LCD" is selected, the ID will be shown after the display test.

     ⇨ 3.4.9 *Profile Information*

P-Id	Abbrevation for: Profil-ID

Display

Min	Minimum value
Max	Maximum value
Avg	Average value

xxx Time

Total time above / below set limit values

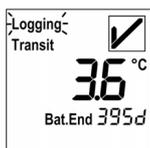| xx		
nn	0 ... 179	Minutes
h	3.0 ... 71.9	Hours
d	3.0 ... 729.9	Days
y	2.0 ... n	Years

None

Will be shown as long as no data were logged

- After the status has been change from Arrived to Transit
- After a restart of the LIBERO Tx

Exit statistic display

If the last statistic display has been reached ▼, return to standard display by pressing the ARRIVED-button or wait approximately 10 seconds till the device displays measurement values again.

5.3.2.3   **Multiple Alarm Zones**

Profile-ID

If "Show Profil-ID on LCD" is selected, the ID will be shown after the display test.

⇨ 3.4.9 *Profile Information*

P-Id	Abbrevation for: Profil-ID

Start Display

Alarm zones

ZZ	
1 to 5	Time within temperature zone 1 to 5
35	Zone 3 and 5 are coupled
4	Represents the zone within the limit values - no alarm will be shown.

Total time within an alarm zone

TT		
nn	0 ... 179	Minutes
h	3.0 ... 71.9	Hours
d	3.0 ... 729.9	Days
y	2.0 ... n	Years

⚠ **ONLY ALARM ZONES WHICH ARE USED WILL BE DISPLAYED.**

Exit statistic display

• By pressing the TRANSIT- or ARRIVED-button until the end of the menu.

• or wait approximately 10 seconds till the device displays measurement values again.

5.3.3 PDF report at any USB port

ℹ️
- LIBERO Tx have the feature to create a, PDF report which could be printed out on any printer.
- Data logging continuous during the creation of the PDF report.

5.3.3.1 Start - PDF

As soon as the data logger is connected to an USB-port, the PDF report will be created.

5.3.3.2 End - PDF

After the PDF report has been created, LIBERO Tx returns to normal data logging.

ℹ️ **A LIBERO PDF REPORT IS A PDF/A ISO STANDARD FILE
ONLY OPEN THE FILE WITH A PDF READER**

Always save the LIBERO PDF file directly and without opening it or send it as an e-mail attachment. Opening and saving the PDF file with a PDF editor can make 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 components run this check automatically.

5.3.4 Error Messages

5.3.4.1 On the display

s.e.   Sensor input temporarily short-circuited

n.c.   Sensor temporarily disconnected or there is a bad connection (loose contact) between the data logger and the sensor.

5.3.4.2 In the PDF-Report

WARNING: Device error   Has an error occurred during logging and the data logger did reset, this warning is printed above the graphic in bold.

WARNING: Sensor error   If a sensor short circuit or disconnection was detected this warning is printed above the graphic in bold.

| WARNING: All Data n.c. | If no sensor is connected and the curve is made of nc values only, this warning is printed above the graphic in bold. |

⇨ 3.4.6 *PDF Options*

5.3.5　Further options

PDF File Integrity　The software liberoCONFIG has the capability to check the integrity of the logged data.

⇨ 3.6.1 *Check PDF Report Integrity*

USB-Device　A LIBERO Tx data logger could be treated as any other USB device. Start of data evaluation

⇨ 2.3 *Start Configuration Mode*.

- File from a switched off device

  ⇨ 3.6.2 *Create PDF from Switched Off Device*

- For data archiving or later evaluation, the PDF file may be copied to any desired drive.

- elproVIEWER and elproLOG ANALYZE
  For further evaluation LIBERO PDF files can be imported into elproVIEWER or elproLOG ANALYZE (Version 3.41 R2 or higher).

5　5.4　Preparation for the next monitoring task

Depending on the next task, continue with one of the following 3 cases:

Case 1　**No further configuration is required**

Step 1:　⇨ 5.1 *Battery Lifetime - Display*

Step 2:　⇨ 5.2 *Transport Monitoring*

Case 2　**Data logger has to be configured for the next monitoring task**

⇨ 3 *Configuration Software* or

⇨ 4 *Using SmartStart Pack & Go*

Case 3　**Data logger needs a calibration according to your SOPs**

⇨ 6 *Calibration*

6   Calibration

The following chapter describes the set-up and procedure to calibrate a LIBERO Tx.

Process
1. Launch the configuration utility and choose calibration.
   ⇨ 3.3.4 *Menus*
2. Set LIBERO Tx into the configuration mode.
   ⇨ 2.3 *Start Configuration Mode*.
3. Carry out the calibration.

6.1   View/Print Calibration

Shows a calibration report. This report contains as many pages as data loggers selected. There are 3 different types of reports possible: Case 1 to Case 3

Case 1, standard calibration

A new device is provided with a validation certificate from ELPRO-BUCHS AG.

Menu bar

Documentation of Validation

Device

Logger ID: 12278832
Type: Libero Ti1-S (V 1.35)

Validation

This Libero PDF Logger has been factory tested upon specifications of ELPRO-BUCHS AG
Switzerland, using standards having traceability to international standards.

Measuring range:
-35.0 °C to 70.0 °C

Accuracy:
+/- 0.2 °C from -10.0 °C to 25.0 °C
+/- 0.5 °C from -35.0 °C to -10.1 °C and from 25.1 °C to 70.0 °C

Temperature Validation Points

-25.0 °C   o.k. within Tolerance of +/-0.5 °C
-5.0 °C   o.k. within Tolerance of +/-0.2 °C
0.0 °C   o.k. within Tolerance of +/-0.2 °C
25.0 °C   o.k. within Tolerance of +/-0.2 °C
40.0 °C   o.k. within Tolerance of +/-0.5 °C
60.0 °C   o.k. within Tolerance of +/-0.5 °C

Printed: liberoCONFIG 2013.6.1.0 / agubler / 02.07.2013

Case 2, single-point
Case 3, multi-point

The LIBERO Tx has been calibrated according to the requirements of a single or multi point calibration procedure. (Document: Calibration Certificate). After the calibration, the document shows true and rated values instead of system test values. This document may be printed out and signed or archived for inspection purpose.

6.2 New Calibration

Starts the process for calibrating a LIBERO Tx.

6.2.1 Calibration points

Used to determine the number of calibration points and the calibration values.

LIBERO Tx for temperature recording

LIBERO THi1 for temperature and humidity recording

Number of used Calibration Points   There are up to 4 calibration points selectable.

Calibration values   Data entry fields for each calibration value, "Rated Value" and the "Allowed Tolerance". Calibration data could be saved as a calibration profile. To prevent the profile from unauthorized manipulations, the data logger may be protected by a configuration password.

⇨ 3.5 *Passwords* & 3.3.2 *Options - General*

6.2.2   Calibration Process
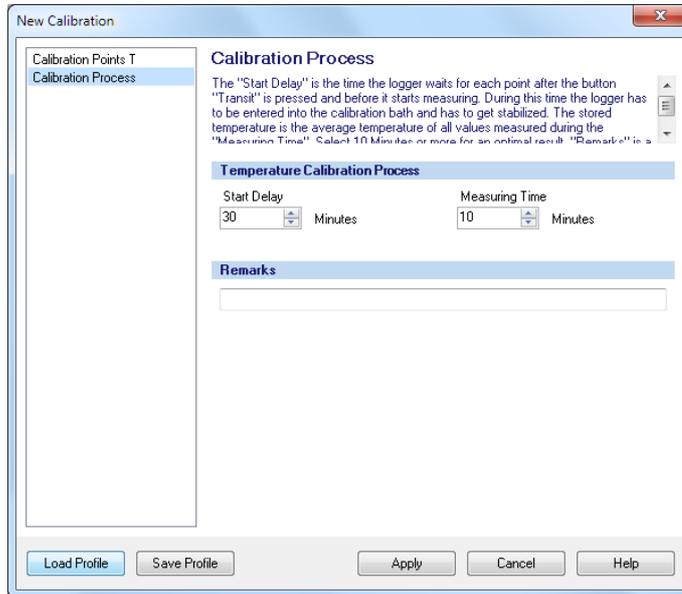
LIBERO Tx for temperature recording
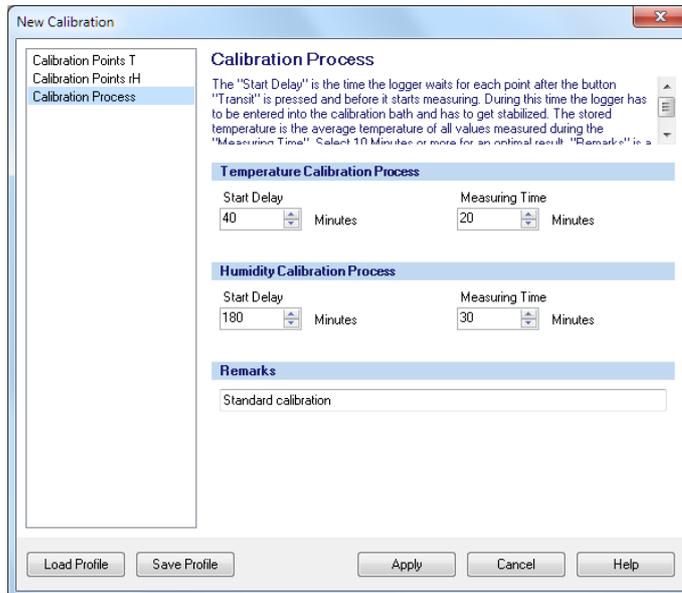
LIBERO THi1 for temperature and humidity recording

Process

- Start-up delay
  Data entry field for the desired delay time between manual calibration start and start of data logging. The "Start Delay" depends on the time required to reach the "Rated Value" after the data logger has been submerged into the bath. Please be aware to have as less air as possible in the packaging.

- Measuring Time
Data entry field for the determined measurement period. This value depends on accept-able temperature deviation within the evaluated data, e.g. 10 minutes returns an average value measured over the last 10 minutes.

Remarks Additional comment about the calibration, e.g. 2 Point Calibration.

6.2.3 Start of Calibration
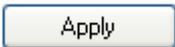
To start to calibration press "Apply"

> 6.3 *Methods for Temperature Calibration* several details about the calibration pro-cess.

Waiting for start

After the data logger has been configured, it is waiting for the start of the calibration.

CAL x: Calibration point (1-4) under process

Delay of the calibra-tion

The calibration starts after pressing the TRANSIT-button. The data logger is waiting until the "Start Delay" time has elapsed.

Data logging

The data logger is recording in a 1 minute interval.

Evaluation

At the end of the "Measuring Time", the average value of the logged data will be calculated and displayed. Additionally, the indicator shows "pass" or "fail" according to the "Allowed Tolerance".

For the next calibration point, press the TRANSIT- or ARRIVED-button.

⇨ 6.2.1 *Calibration points*

⚠	**TO COMPLETE THE CALIBRATION PROCESS, PRESS THE ARRIVED-BUTTON.**

End of calibration

The display changes to ConF-Mode. To print the calibration document,

⇨ 6.1 *View/Print Calibration*

6.2.4   Assign calibration profiles

Assigns an already created or saved calibration profile to selected LIBERO Tx.

6.3　　Methods for Temperature Calibration

- 0°C Ice-water
  Calibration, which uses the triple point of ice-water (0°C) as reference temperature. You can expect an accuracy of approx. 0°C ±0.1K.

- Calibration bath
  If a calibration bath is used (-35°C .. 70°C), the reference sensor should be fastened to the data logger under calibration. This ensures, there is no temperature difference between the data logger and reference sensor. The watertight packed data logger should be immersed completely and the bath should be stable. Also make sure that the data loggers do reach the reference temperature. Repeated measuring and averaging can improve the measured values.

6.3.1　　Ice Water Calibration Procedure

1. Fill up an insulated container, e.g. a camping coolbox with ice cubes. Use ice from an ice machine (-1°C) and not from the freezer (-20°C). Fill the coolbox with cold water up to the filling height of the ice. In order to mix it well, stir the contents.

2. The "Logging Interval" is factory set to 1 minute, the "Start Delay" to 50 minutes and the "Measuring Time" to 10 minutes.

3. Wrap up the data logger in watertight packaging material, e.g. latex glove.

4. Submerge the data logger completely in the ice water.

5. Carry out the calibration.

6. Evaluate the calibration.
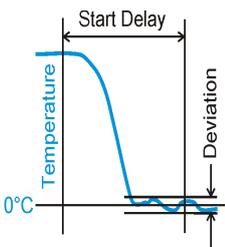
   ⇨　6.1 *View/Print Calibration*

> ℹ️　The calibration process lasts as long as the total time required for "Start Delay" + "Measuring Time" for each calibration point.

7 Miscellaneous

7.1 What if... ?

Display

LIBERO Te1-N	Shows a random value or n.c.
LIBERO Te1-P	Shows any value and then remains at S.E. or n.c during shut-down of the PC.
Reason	This behavior is caused by connecting a LIBERO Te1 to a switched off PC.

Alarm

Set	⇨ 3.4.2 *Logging* & 3.4.3 *Alarm conditions*
Reset / Confirm	⇨ 5.3.1 *Alarm Representation*
No display - The alarm mode is deactivated	⇨ 3.4.3 *Alarm conditions*

COM port busy

The used COM port is occupied by another program. Close all applications and restart liberoCONFIG again.

PdF and not ConF on display

The LIBERO Tx buttons were not pressed long enough.

⇨ 2.3 *Start Configuration Mode*

Download not possible

exe.-file is classified as spam or is blocked by the firewall. To solve the problem, get in touch with your IT.

Change of language

Change of application language

⇨ 3.3.2 *Options - General*

7.2 ELPRO Customer Service Information

If you need any assistance from the ELPRO Customer Center, please make sure you can provide the following information:

- Software version; Select "About.." in the menu option "Help"

- Device type used

- Which were the preceding actions, before problems arose (exact description of the data loggers deployment: time, temperature, shock etc.)

- Specification of the error, error codes, original LIBERO PDF report

7.2.1   Software license

This license information is sent in the email

======================================

User name: xxxxxx xxxxxx

Company name: zzzzzz

serial number: yyyy-yyyy-yyyy

======================================

7.3   Revision History

Author	Date	Version	Description
AG	13.12.2007	-	first edition
AG	15.01.2008	a	New functions added see: Handling options
AG	05.11.2008	b	New types added; Ti1-D, Ti1-L, Te1-N
AG	25.06.2009	c	New data logger type: Te1-U, Pack & Go
AG	21.10.2009	d	Data logger models replaced by reference to homepage, new layout, A4
AG	20.01.2011	e	New data logger type: TH, new function: Report
AG	16.02.2012	f	Various corrections
AG	25.09.2013	g	New layout, elproVIEWER for data analysis

Index

A
Actions - confirmed 19
Activation energy 36
Alarm 29
Alarm - Off 25
Alarm delay time 27
Alarm mode 26, 27
Alarm reset 25, 61
Alarm thresholds 26, 61
Alarm zones 28
All data n.c. 66
Allowed tolerance 73
Application language 30
Apply 19
Archiving 66
Arrived 12
Arrived mode 24
Available Liberos 15

B
Battery 9, 15
Battery life time 60
Button mode 33
Buttons 12, 19

C
Calibration 74
Calibration - Humidity recording 70, 71
Calibration - Logging Interval 74
Calibration - Measuring Time 74
Calibration - Measuring time 72
Calibration - Start Delay 71, 74
Calibration - Temperature recording 71
Calibration certificate 68
Calibration data 18
Calibration points 70
Calibration report 67
Case 8, 9
CE 10
Checksum 20, 36
Color 46
Configuration Mode 12
Configuration Mode - Exit 12
Configuration password 39
Configuration report 37
Copy 46
Cumulative events 27

D
Data access password 39
Data evaluation 29

Date 52
Date / Time 32
Daylight saving time 32
Decimal separator 32
Default file location 17
Delay time 35
Device 21
Device error 65
Device family 47
Device selection 15
Display 75
Display - Statistics 33
Display EoL 60
Display mode 34
Display test 62
Disposal 9

E
Edit dropdown 47
elproLOG ANALYZE 34
elproVIEWER 34, 66
EMI 10
Evaluation 62
Exceptional environmental conditions 9
Expiry date 55

F
File format 20, 44, 54
File location 17
File name 30
Format 18

G
Graphic 29

H
Humidity recording 25, 26

I
Ice water 74
Indicators 61
Influence of temperature 9
Infrared radiation 9
Inspection range 29
Integrity 66

L
Language 17
Libero Configuration Utility 11
License 76
Lifetime 15
Lithium 9
Load Profile 19

7

7

7

ELPRO-BUCHS AG
Langäulistrasse 62
CH-9470 Buchs SG
Switzerland
E-Mail: swiss@elpro.com

For local agencies see:
www.elpro.com

Operation Manual
liberoCONFIG
LI6002Eg 09.2013