LIBERO Tx PDF Logger

Operation Manual
ELPRO-BUCHS AG

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  - Brackets
  - Accessories excluding probes and third-party products
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  - Temperature probe
  - Humidity probe
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  - modified
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  - damaged as the result of an accident or operational or handling conditions that do not comply with the specifications.
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- The guarantee does not apply to consumables, disposable batteries or any other product that ELPRO-BUCHS AG deems to be:
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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.
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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

<table>
<thead>
<tr>
<th>LIBERO Tx</th>
<th>Name of the device team</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIBERO THx</td>
<td>Notes which apply to LIBEROS that measure temperature and humidity.</td>
</tr>
</tbody>
</table>

| PDF report | Logged transport information is created as ****.pdf file. |
| liberalOCONFIG | 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.
## 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.

### LIBERO Tx

<table>
<thead>
<tr>
<th>Sensor position</th>
<th>Types</th>
<th>100 Days</th>
<th>400 Days</th>
<th>3 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>internal -35 °C..+70 °C</td>
<td>Ti1-S</td>
<td>Ti1</td>
<td>Ti1-L</td>
<td></td>
</tr>
<tr>
<td>Ti1-D down to -90 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>external NTC -90 °C..+85 °C</td>
<td>Te1-U</td>
<td>Te1-NY</td>
<td>Te1-N</td>
<td></td>
</tr>
<tr>
<td>external Pt100 -200 °C..+200 °C</td>
<td>Te1-PS</td>
<td>Te1-PY</td>
<td>Te1-P</td>
<td></td>
</tr>
<tr>
<td>internal Temperature/Humidity -25 °C..+70 °C 0 %rH..100 %rH non condensing</td>
<td>THi1-S</td>
<td>THi1-Y</td>
<td>THi1</td>
<td></td>
</tr>
<tr>
<td>- 8'000 Temperature values - 8'000 Humidity values</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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.


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**

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.
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

The configuration mode is used to define all logging parameters (profile). The liberoCONFIG 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**

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

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.

The following information 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
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 Options - Additional

Parameters

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

- 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.

View & Print Template for Calibration Data

You may choose between A4 and Letter.
3.3.4 Menus

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
3.4 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 SUFFICIENT FOR THE NEXT MONITORING 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

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.

`Both modes could be delayed. 3.4.8 Handling Options.`
3.4.3 Alarm conditions

Threshold violation

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

AN ALARM CAN BE RESET BY A NEW CONFIGURING!

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.

**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.

Possible for LIBERO Tx only.
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

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

Report Title (60)

Additional Information

Line 1 (60)
- Line 2 (60)
- Line 3 (60)
- Line 4 (60)
- Line 5 (60)
- Line 6 (60)
- Line 7 (60)
- Line 8 (60)

Device Configuration

Type: Libero T1 V1.35
Logger ID: 10072007
Log Interval / Duration: 1 m / 11.1 d
Log Mode: Loop
Start Time Base: GMT +02:00
Converted by: C1351, ECS/Pajubel, Crewe Sep 2013 03:27:24

Alarm Conditions

<table>
<thead>
<tr>
<th>Upper Threshold</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.0 °C</td>
<td>Time above Threshold: 16.1 h ALARM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lower Threshold</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0 °C</td>
<td>Time below Threshold: 0 h OK</td>
</tr>
</tbody>
</table>

Logging Results

- Highest Temperature: 38.2 °C; 23 Aug 2013 17:04:00
- Lowest Temperature: 14.0 °C; 28 Aug 2013 06:40:00
- Average Temperature: 21.1 °C
- MKT: 23.0 °C

Profile ID

- Not shown: Alarm Conditions
- Not shown: Alarm Conditions & Alarm Status
- Not shown: Alarm Condition & Alarm Status & Logging Results
3.4.7 Format Settings

Country-specific settings.

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.


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
LiberoTx 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

LiberoTx 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

Display-Statistics

- Measurement statistics shown on the display
  
  ⇒ 5.3.2 Statistics

Display-Statistics	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.

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

Always 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 Delay

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

**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

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]

*Menu bar*
**Libero Device Configuration**

<table>
<thead>
<tr>
<th>Profile</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile Checksum:</td>
<td>1.294.496.002</td>
</tr>
<tr>
<td>Profile-ID:</td>
<td>P001</td>
</tr>
<tr>
<td>Configuration Password:</td>
<td>No</td>
</tr>
<tr>
<td>Data Access Password:</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>Libero T1-8 (V1.35)</td>
</tr>
<tr>
<td>Logger-ID:</td>
<td>12276032</td>
</tr>
<tr>
<td>Remaining Battery:</td>
<td>105 d</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Report Title:</td>
<td>QA Libero</td>
</tr>
<tr>
<td>Add. Info. Line 1:</td>
<td>AA</td>
</tr>
<tr>
<td>Add. Info. Line 2:</td>
<td>BB</td>
</tr>
<tr>
<td>Add. Info. Line 3:</td>
<td>CC</td>
</tr>
<tr>
<td>Add. Info. Line 4:</td>
<td>DD</td>
</tr>
<tr>
<td>Add. Info. Line 5:</td>
<td>EE</td>
</tr>
<tr>
<td>Add. Info. Line 6:</td>
<td>FF</td>
</tr>
<tr>
<td>Add. Info. Line 7:</td>
<td>GG</td>
</tr>
<tr>
<td>Add. Info. Line 8:</td>
<td>HH</td>
</tr>
<tr>
<td>Filename:</td>
<td>Untitled Libero PDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Logging</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Interval / Duration:</td>
<td>5 min / 55h 13h 20m</td>
</tr>
<tr>
<td>Log Mode:</td>
<td>Start/Stop</td>
</tr>
<tr>
<td>Watch Activation Energy:</td>
<td>83 kJ/mol</td>
</tr>
<tr>
<td>Start Mode:</td>
<td>Start after pressing a key</td>
</tr>
<tr>
<td>Transit Initial State:</td>
<td>Start in Transit mode</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alarm Conditions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Mode:</td>
<td>Single Alarm Thresholds</td>
</tr>
<tr>
<td>Upper Threshold:</td>
<td>8.0 °C</td>
</tr>
<tr>
<td>Lower Threshold:</td>
<td>2.0 °C</td>
</tr>
<tr>
<td>Alarm Delay:</td>
<td>20 s</td>
</tr>
</tbody>
</table>

**PDF Options**
- Inspection Range: Graphics 0, 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
- Data Format: YYYY-MMDD
- Decimal Separator: ,(Point)

**Handling Options**
- Button Mode: Full functionality, Transit - Arrived / Display-Status
- Display Mode: Always show current value
- Show Profile-ID on LCD: Yes
- Start Delay: No
- Transit Delay: No

*Printed: liberoCONFIG 2013.3.10 / agabler / 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

<table>
<thead>
<tr>
<th>Logger ID</th>
<th>12276832</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Libero TH-S</td>
</tr>
</tbody>
</table>

### PDF File

<table>
<thead>
<tr>
<th>Report number</th>
<th>8725081</th>
</tr>
</thead>
<tbody>
<tr>
<td>File created</td>
<td>02.07.2013 12:56:43 (GMT +00:00)</td>
</tr>
<tr>
<td>File name</td>
<td>M:\Entwicklung\Dokumentation\Anleitungen\LI LiberoTest PDF 20130221\Libero3643 12276832.pdf</td>
</tr>
</tbody>
</table>

### Check Results

<table>
<thead>
<tr>
<th>File content</th>
<th>Checked - OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded data</td>
<td>Checked - OK</td>
</tr>
</tbody>
</table>
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.
3.7 LIBERO SmartStart - Settings

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
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
Icons

Use the "Items" function to add, modify or remove new items of the LIBERO SmartStart file. The new entry is added at the end of the list. Up to 500 LIBERO SmartStart-items can be defined.

Typically one item is created per profile, product or study number.

Adds a copy of the selected items to the item list with the name: "Copy of xxxxx". This copy can be used as the basis for another item.

The respective input field is activated by checking the box.

This icon opens a window for the definition of the variable information.

Item Settings

- **Title**
  The title is the designation for the selected item. Enter a short, clear name.

- **Color**
  Each item can be assigned a color. The color serves to identify the item quickly at a later point while working with LIBERO SmartStart.

Start Mode

- **Use existing data logger configuration**
  Is used if it is not necessary to assign a specific profile to the LIBERO Tx. The LIBERO Tx retains the current configuration.

- **Apply configuration profile**
  A profile previously assigned with liberoCONFIG is used.

  **A PROFILE CAN BE ASSIGNED TO ONE DEVICE TEAM (TX OR CX) ONLY.**

Passwords

Configuration and data access passwords can be entered. They will be automatically added to each LIBERO Tx configured with LIBERO SmartStart.

- A checked box opens the window for entering the password.
- An empty field deletes the existing 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.
Commentary

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

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

3.7.2 Configuration Report

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

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.

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

3.7.5 Placeholder Editor

Placeholders are expressions that appear as variable information in the report.

This is the syntax of the placeholder "Data logger ID" as shown in the window.

During the creation of the PDF report the placeholder is replaced by the current information, of the LIBERO configured with LIBERO SmartStart.
<table>
<thead>
<tr>
<th>Description</th>
<th>Syntax</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Logger ID</td>
<td>%LoggerID%</td>
<td>ID of the data logger configured with SmartStart.</td>
</tr>
<tr>
<td>Data Logger Type</td>
<td>%LoggerType%</td>
<td>Type of the LIBERO Tx e.g. Ti1-S, configured with LIBERO SmartStart.</td>
</tr>
<tr>
<td>Firmware Version</td>
<td>%FirmwareVersion%</td>
<td>Firmware version of the LIBERO Tx configured with LIBERO SmartStart.</td>
</tr>
<tr>
<td>Remaining Battery</td>
<td>%RemainingBattery%</td>
<td>Current battery level of the LIBERO Tx at the time of configuration with SmartStart.</td>
</tr>
<tr>
<td>Configuration User</td>
<td>%ConfigurationBy%</td>
<td>Computer and user name</td>
</tr>
<tr>
<td>Configuration Time</td>
<td>%ConfigurationTime%</td>
<td>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.</td>
</tr>
<tr>
<td>Configuration Time (&quot;Format&quot;)</td>
<td>%Configuration-Time(&quot;Format&quot;)%</td>
<td>Time of the configuration of the LIBERO Tx with user-defined date-time format</td>
</tr>
<tr>
<td>PDF Report Title</td>
<td>%ReportTitle%</td>
<td>Title of the PDF report</td>
</tr>
<tr>
<td>Information Field 1 ... 8</td>
<td>%InfoField1% ... %InfoField8%</td>
<td>Field 1 to 8 of the additional information in the PDF report</td>
</tr>
<tr>
<td>Information Line 1 ... 8</td>
<td>%InfoLine1% ... %InfoLine8%</td>
<td>Line 1 to 8 of the additional information in the PDF report</td>
</tr>
<tr>
<td>Hidden Line 1... 2</td>
<td>%HiddenLine1% ... %HiddenLine2%</td>
<td>Hidden line 1 and 2 of the additional information in the PDF report</td>
</tr>
<tr>
<td>Configured File Name</td>
<td>%ConfiguredFileName%</td>
<td>Configured PDF file name</td>
</tr>
<tr>
<td>Profile-ID</td>
<td>%ProfileID%</td>
<td>User defined Profile-ID</td>
</tr>
</tbody>
</table>

3.4.1 Description

3.4.9 Profile Information - Profile-ID
### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Syntax</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile Checksum</td>
<td>%ProfileChecksum%</td>
<td>Automatically calculated checksum</td>
</tr>
<tr>
<td>SmartStart Item Name</td>
<td>%SmartStartItemName%</td>
<td>Name of the selected LIBERO SmartStart item</td>
</tr>
<tr>
<td>Application Name</td>
<td>%ApplicationName%</td>
<td>Corresponds to the &quot;Window Title&quot;</td>
</tr>
</tbody>
</table>

#### Placeholder:

**Configuration Time**  
("Format")

This placeholder allows a customized date and time format.

#### Examples

("Format")

<table>
<thead>
<tr>
<th>yyyy MMM dd hh:mm:ss</th>
<th>2013 Jul. 17 16:23:12</th>
</tr>
</thead>
<tbody>
<tr>
<td>dd MMM. yyyy</td>
<td>17 Jul. 2013</td>
</tr>
<tr>
<td>yyy-MM</td>
<td>2013-07</td>
</tr>
<tr>
<td>dd/MM/yyyy</td>
<td>17/07/2013</td>
</tr>
</tbody>
</table>

- **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

**3.7.7 Create SmartStart Pack & Go**
### 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.

<table>
<thead>
<tr>
<th>Notes</th>
<th>Line</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Date and time configured with the placeholder: Configuration time (&quot;Format&quot;) configured.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Text</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>- 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Semicolon (;) between placeholders are used for column formatting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Control characters have no effect on reports opened with an editor.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Entire line in quotes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Text and parameters are not separated into different columns.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Control characters have no effect on reports opened with an editor.</td>
</tr>
</tbody>
</table>

**Placeholder Editor examples**

1) `%ConfigurationTime("yyyy MMM dd hh:mm")`%
2) DatLogger Type and ID
3) "DatLogger Type and ID;16002844";"Te1-N"
4) "DatLogger Type and ID;16002844;Tel-N"

**Report opened with MS Excel**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2013 Jan 19 01:23</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>DatLogger Type and ID</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>DatLogger Type and ID</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>DatLogger Type and ID;16002844;Tel-N</td>
<td></td>
</tr>
</tbody>
</table>

**Report opened with an editor**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2013 Jan 19 01:23</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>DatLogger Type and ID</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>DatLogger Type and ID</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>DatLogger Type and ID;16002844;Tel-N</td>
<td></td>
</tr>
</tbody>
</table>

**Example of a report**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>18.01.2013 11:56 S1903</td>
<td>EC50/ameliar 1-2°C non freezing products</td>
<td>Delivery No: 12345678</td>
<td>Shipping Box No: 080_2</td>
<td>Buenos Aires</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>18.01.2013 11:56 S1903</td>
<td>EC50/ameliar 1-2°C may freeze products</td>
<td>Delivery No: 12345679</td>
<td>Shipping Box No: 120_6</td>
<td>New York</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>18.01.2013 11:57 S1903</td>
<td>EC50/ameliar 15-23°C products</td>
<td>Delivery No: 12345680</td>
<td>Shipping Box No: 140_5</td>
<td>Singapore</td>
</tr>
</tbody>
</table>
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.

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
  - German
  - French
  - Italian
  - Spanish
  - 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.
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.

Profile Checksum: 42137657

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.

Profile Checksum: 42137657

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
5. 3.7.1 *Items*

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 messages:
- Profile incompatible
- "Cancel" has been during data configuration problems
- LIBERO has been disconnected during configuration.
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.

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

If for the "Last Transit - Arrived" period, 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.

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, continue 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

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

⇒ 3.4.9 Profile Information

P-Id Abbreviation for: Profil-ID
Display

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>Minimum value</td>
</tr>
<tr>
<td>Max</td>
<td>Maximum value</td>
</tr>
<tr>
<td>Avg</td>
<td>Average value</td>
</tr>
</tbody>
</table>

xxx Time

Total time above / below set limit values

<table>
<thead>
<tr>
<th>xx</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nn</td>
<td>0 ... 179 Minutes</td>
</tr>
<tr>
<td>h</td>
<td>3.0 ... 71.9 Hours</td>
</tr>
<tr>
<td>d</td>
<td>3.0 ... 729.9 Days</td>
</tr>
<tr>
<td>y</td>
<td>2.0 ... n Years</td>
</tr>
</tbody>
</table>

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 | Abbreviation for: Profil-ID

Start Display

Alarm zones

<table>
<thead>
<tr>
<th>ZZ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 5</td>
<td>Time within temperature zone 1 to 5</td>
</tr>
<tr>
<td>35</td>
<td>Zone 3 and 5 are coupled</td>
</tr>
<tr>
<td>4</td>
<td>Represents the zone within the limit values - no alarm will be shown.</td>
</tr>
</tbody>
</table>

Total time within an alarm zone

<table>
<thead>
<tr>
<th>TT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>nn</td>
<td>0 ... 179 Minutes</td>
</tr>
<tr>
<td>h</td>
<td>3.0 ... 71.9 Hours</td>
</tr>
<tr>
<td>d</td>
<td>3.0 ... 729.9 Days</td>
</tr>
<tr>
<td>y</td>
<td>2.0 ... n Years</td>
</tr>
</tbody>
</table>

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

- 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.

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).

5.4 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.
**Documentation of Validation**

<table>
<thead>
<tr>
<th>Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logger ID: 12278852</td>
</tr>
<tr>
<td>Type: Libero TII-S (V 1.35)</td>
</tr>
</tbody>
</table>

**Validation**

The 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**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Validation</th>
</tr>
</thead>
<tbody>
<tr>
<td>-25.0 °C</td>
<td>±0.5 °C</td>
</tr>
<tr>
<td>-5.0 °C</td>
<td>±0.2 °C</td>
</tr>
<tr>
<td>3.0 °C</td>
<td>±0.2 °C</td>
</tr>
<tr>
<td>25.0 °C</td>
<td>±0.2 °C</td>
</tr>
<tr>
<td>40.0 °C</td>
<td>±0.5 °C</td>
</tr>
<tr>
<td>50.0 °C</td>
<td>±0.5 °C</td>
</tr>
</tbody>
</table>

**Case 2, single-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.

![Calibration Points Interface](image)

**LIBERO Tx for temperature 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 acceptable 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 process.

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 calibration

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

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

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 shutdown of the PC.

Reason  This behavior is caused by connecting a LIBERO Te1 to a switched off PC.

Alarm

Set
Reset / Confirm
No display - The alarm mode is deactivated

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.

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

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

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