User manual

Transponder

iPD

For liona online PD spot tester

Table of contents

1 ABOUT THIS MANUAL

1.1 Applicable documents

This user manual applies in conjunction with the following documents:

- User manual for liona

1.2 Validity of the user manual

This user manual applies for devices with the software versions:

- ***Spot Tester***: V3.0
- ***Cable Length***: V3.0
- ***Mapping***: V3.0

Information on the currently installed software is given in the title bar.

1.3 Structure of safety instructions

The safety instructions in this user manual are presented as follows:

Danger symbol 	**SIGNAL WORD**
	Type of danger and its source Possible consequences of violation. ▸ Measure to prevent the danger.

If a dangerous situation could arise at a specific step, the safety instruction is displayed immediately before this dangerous step and is shown as follows:

SIGNAL WORD

Type of danger and its source. Possible consequences of violation.

1. Measure to prevent the danger.

Danger levels

Signal words in the safety instructions specify the danger levels.

DANGER	Will lead to severe injuries or death.
WARNING	May lead to severe injuries or death.
CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

Danger symbols

	**Warning about general danger**
	**Warning about electric voltage**
	**Risk of falling**

1.4 View settings

Symbol	Meaning
▸	You are requested to perform an action.
1. 2. ...	Perform the actions in this sequence.
a. b. ...	If an operation consists of several operating steps, specify these with "a, b, c". Perform the operating steps in this sequence.
1 2 ...	Numbering in the legend
▪	List
	Indicates further information on the topic.

1.5 Note on the screenshots and graphics used

The screenshots and graphics used are intended to illustrate the procedure and may differ from the actual state.

2 FOR YOUR SAFETY

We, the manufacturer, produce our devices and systems according to the latest technological standards and guarantee a high level of operational safety and reliability. However, responsibility for safe use lies with the responsible body[1] and operator[2]. The responsible body and operator of the device or system are responsible for any injuries or damage resulting from non-compliance with this user manual.

This chapter *For your safety* in this user manual is intended to help you implement the required safety measures.

2.1 Intended use

The iPD transponder is a pulse generator that is used in combination with the liona online PD spot tester to measure cable lengths and locate partial discharges.

If the device is not used in accordance with this stipulation, safe operation cannot be guaranteed. The manufacturer cannot be held liable for any damage to persons and property resulting from incorrect operation.

- To ensure safe use as intended, follow the instructions in this user manual.

2.2 Operation by qualified personnel

The device may only be operated by qualified personnel. Qualified personnel are individuals who, thanks to their professional electrical engineering training, are able to identify and prevent dangers, and who are qualified to perform the respective tasks.

Before starting work, the responsible body and persons working with the device must have carefully read through and understood the user manual for the device, as well as the user manuals for all associated devices or systems.

[1] Responsible body is the person or group that is responsible for the safe operation of the device and its maintenance (EN 61010-1, 3.5.12).

[2] Operator is the person who uses the device for its intended purpose (according to the definition of user in compliance with EN 61010-1, 3.5.11).

2.3 Avoiding dangers, taking safety measures

- When erecting the test installations and operating iPD, adhere to the latest applicable version of the following regulations and guidelines:
  - Accident prevention and environmental protection regulations applicable for your country
  - Safety instructions and regulations of the country where iPD is being used
  - EU/CENELEC countries: EN 50191 *Erection and operation of electrical test equipment*

    Other countries: The standard for erection and operation of electrical test equipment applicable for your country
  - EU/CENELEC countries: EN 50110 *Operation of electrical installations*

    Other countries: The standards for operating electrical installations applicable in your country
  - Any other relevant national and international standards and guidelines
  - Local safety and accident prevention regulations
  - Employers' liability insurance association regulations (if any)

- Refer to the user manual for the liona online PD spot tester.

3 PRODUCT INFORMATION

3.1 Available functions

The iPD transponder is a pulse generator that is used in combination with the liona online PD spot tester to measure cable lengths and locate partial discharges. The procedure for cable length measurement and location of partial discharges with the transponder is based on Time Domain Reflectometry (TDR) and can be used without putting the cable system out of operation.

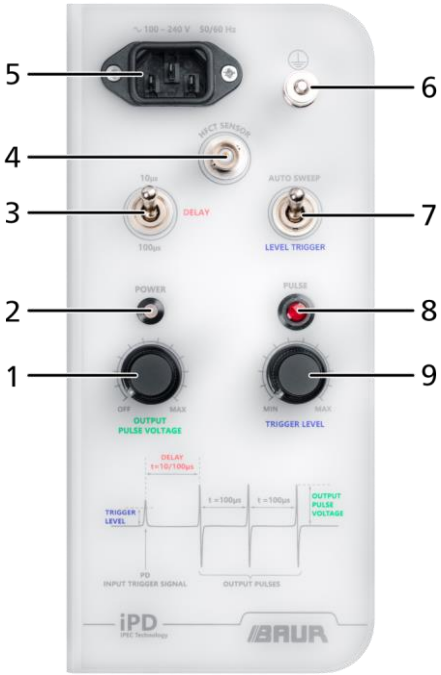
- Online cable length measurement (for cables up to 6 km in length, depending on the measurement conditions)

  To measure the cable length, the liona injects a long pulse at the cable start via an HFCT sensor. This pulse travels at a specified velocity of propagation to the cable end, where it is detected by the iPD transponder. The transponder transmits a definable pulse pattern into the cable, which is recorded by the liona at the cable start. The time difference between the first pulse and the pulse pattern is used to calculate the cable length.

- Online PD mapping

  If a discharge takes place, a partial discharge pulse is induced in both directions along the cable. A PD pulse travels towards the cable start, where it is detected by the liona. The other PD pulse travels in the direction of the cable end. As soon as the PD pulse is detected by the iPD transponder at the cable end, the transponder transmits a pulse pattern into the cable in the direction of the cable start where it is recorded by the liona. The time difference between the first PD pulse and the pulse pattern transmitted by the transponder is used to calculate the distance between the fault location and the transponder.

3.2 Full illustration



No.	Element	Function
1	*OUTPUT PULSE VOLTAGE* rotary switch	Is used to switch the device on and off and to set the pulse voltage that the iPD generates
2	*POWER* LED	Displays the charge status of the iPD battery Further information: Chapter *Charging the rechargeable battery* (on page 29)
3	*DELAY* selector switch	Is used to set the time between receiving the PD signal and transmitting the pulse The *10 µs* setting is suitable for most cable lengths. The *100 µs* setting is particularly suitable for shorter cables.

No.	Element	Function
4	*HFCT SENSOR* port	Is used to connect an HFCT sensor
5	Mains connection	Is used to connect the device to the mains voltage
6	⏚ port	Is used to connect the protective earthing
7	Selector switch for trigger mode	Is used to set the trigger mode ▪ *AUTO SWEEP*: The trigger level is based upon the input signal and switches automatically and continuously between a minimum and a maximum value. ▪ *LEVEL TRIGGER*: The transponder is triggered as soon as a signal exceeds a defined threshold value.
8	*PULSE* LED	Turns red when a pulse is triggered
9	*TRIGGER LEVEL* rotary switch	Is used to set the threshold value that a signal needs to exceed to trigger the iPD

3.3 Trigger modes

AUTO SWEEP

The trigger level is based upon the input signal and switches automatically and continuously between a minimum and a maximum value.

This trigger mode is recommended for online PD mapping.

LEVEL TRIGGER

The transponder is triggered as soon as a signal exceeds a defined threshold value. The detected signals can be partial discharges, noise signals or signals induced by liona. After the detection of a signal, the iPD induces a pulse pattern in the earthing of the cable screen with an adjustable delay.

This trigger mode is recommended for the measurement of the cable length.

3.4 Connection cables and accessories

The connection cables and other accessories are located in the cable compartment of the iPD transponder as standard.

Figure	Component	Length	Function
	HFCT sensor 100/50 mm	–	Is used to connect the iPD transponder to the test object screen Further information: ▪ Chapter *Connecting the devices for measurement of the cable length* (on page 17) ▪ Chapter *Connecting the devices for the online PD mapping* (on page 18)
	Protective earthing cable Cross section: 4 mm^2	2 m	Is used to connect the liona to the protective earthing
	BNC cable	4 m	Is used to connect the iPD transponder to the HFCT sensor
	Mains supply cord	2.5 m	Is used to connect the liona to the supply voltage Further information: Chapter *Connecting to the supply voltage* (on page 19)

3.5 Power supply

The power supply of the iPD can be provided either via an on-site mains supply or independently of the mains via the built-in lithium-polymer battery.

Operation with mains voltage

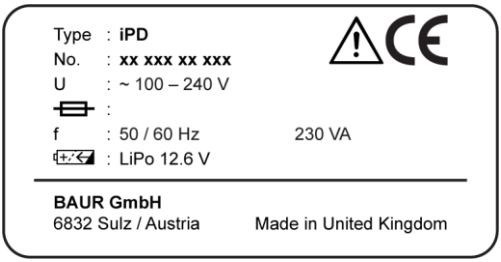
Permissible mains voltage: 90 – 264 V

Permissible mains frequency: 50/60 Hz

Battery mode

If no mains voltage exists, the internal Lithium-polymer battery automatically supplies power to the device. In this case the operating life is at least 15 hours (with fully charged battery).

3.6 Rating plate



Element	Description
Type	Device designation
No.	Serial number
U	Supply voltage If several supply voltages are possible, these are given consecutively one after another.
	Not applicable here
f	Mains frequency

Element	Description
VA	Max. recorded apparent output
	Integrated rechargeable battery
	General warning sign Indicates that there is a potential risk of danger when using the product and hence the user manual must be observed
	CE mark Indicates that the device or system conforms to CE.
BAUR GmbH 6832 Sulz / Austria	Name and address of the manufacturer
Made in United Kingdom	Indicates the country in which the device was manufactured.

4 TECHNICAL DATA

- Refer to the user manual for the liona online PD spot tester.

5 COMMISSIONING

- Observe the safety instructions in chapter *For your safety* (on page 8).

DANGER

Connection work on live parts

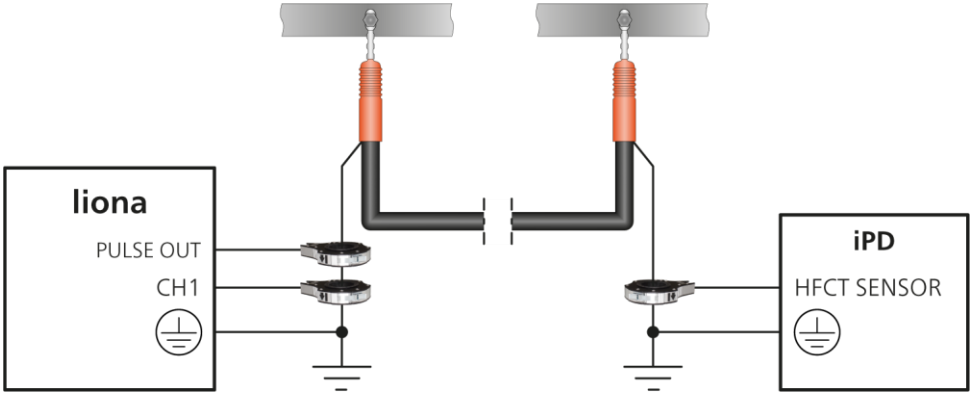
Danger to life or risk of injury due to electric shock.

- Select the sensors and connection technology suitable for the local conditions.
- Only connect the HFCT sensors if the earth connections of the cable screens on the test object are easily accessible and are located at a safe distance from live parts.
- Only attach the sensors to the earthed surfaces of the cabinet housing (TEV sensors) or cable screen (HFCT sensors).
- Never connect the sensors directly to the live terminations of the test object.

5.1 Information for setting up the liona and sensors

- Refer to the user manual for the liona online PD spot tester.

5.2 Connecting the devices for measurement of the cable length



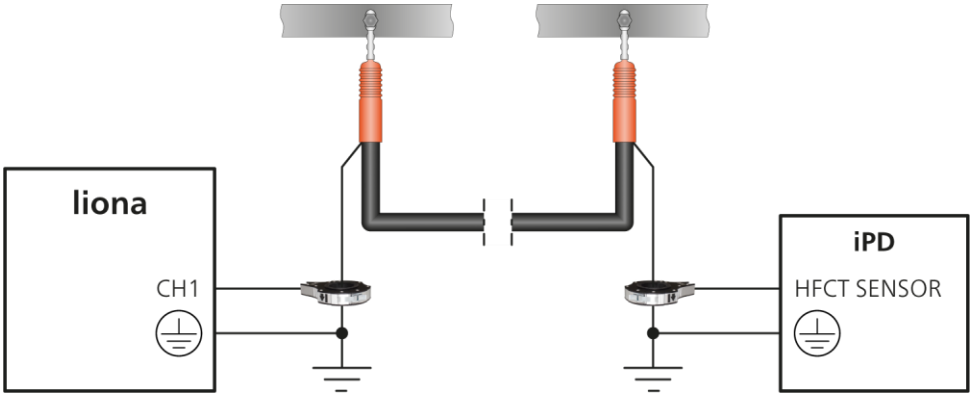
At near end (liona)

1. Earth the liona: use the earth cable to connect the protective earthing connection of the liona to the station earth.
2. Connect an HFCT sensor to the *PULSE OUT* pulse output on the liona connection panel.
3. Connect an HFCT sensor to the *CH1* signal input on the liona connection panel.
4. Place the HFCT sensors around the earth connection of the cable shield.

At far end (iPD)

1. Earth the iPD: use the earth cable to connect the protective earthing connection of the iPD to the station earth.
2. Connect an HFCT sensor to the *HFCT SENSOR* port on the iPD.
3. Place the HFCT sensor around the earth connection of the cable shield.

5.3 Connecting the devices for the online PD mapping



At near end (liona)

1. Earth the liona: use the earth cable to connect the protective earthing connection of the liona to the station earth.
2. Connect an HFCT sensor to the *CH1* signal input on the liona connection panel.
3. Place the HFCT sensor around the earth connection of the cable shield.

At far end (iPD)

1. Earth the iPD: use the earth cable to connect the protective earthing connection of the iPD to the station earth.
2. Connect an HFCT sensor to the *HFCT SENSOR* port on the iPD.
3. Place the HFCT sensor around the earth connection of the cable shield.

5.4 Connecting to the supply voltage

1. Connect the iPD to the mains voltage using a mains supply cord. If necessary, use a country-specific adapter.

   Note that the mains supply earth is not isolated from the station earth.

   NOTICE! If the voltage is too low, the system will not work properly; if it is too high it may damage the device.
2. Ensure that the mains voltage matches the specifications on the rating plate.

   The *POWER* LED lights up according to the battery charge status.

   Note: If supply via the mains is not possible, the device can be operated with the internal battery.

	iPD is switched off	**iPD is switched on**
Battery charging	LED lights up red	LED lights up yellow
Battery fully charged	LED is off	LED lights up green
Battery low	–	LED flashes green

5.5 Securing the test area

1. Mark out the path for pedestrians.
2. Secure the connection cables, e.g. with cable bridges or rubber mats. The connction cables must be protected against damage and there must be no danger of people tripping.
3. Mark the test area and terminals clearly. It must be very obvious that a measurement is in progress.
4. Make sure that unauthorised persons cannot access the connection point and the far end of the test object.

6 ONLINE CABLE LENGTH MEASUREMENT (“CABLE LENGTH” SOFTWARE)

Before a partial discharge location, it is recommended to determine the cable length so as to locate the position of the partial discharges as precisely as possible.

6.1 Required equipment

- liona
- iPD
- 3 HFCT sensors
- 3 BNC coaxial cables

6.2 Measure the cable length

- Connect the devices for the measurement of the cable length.

  Further information: Chapter *Connecting the devices for measurement of the cable length* (on page 17)

We recommend that two people carry out the following steps so that the settings at the far and near end can be optimally coordinated.

At the far end (settings on the iPD)

1. Using the iPD rotary switch, switch the *OUTPUT PULSE VOLTAGE* on.

   The *POWER* LED lights up.
2. Select the *LEVEL TRIGGER* trigger mode with the selector switch.
3. Using the *TRIGGER LEVEL* rotary switch, select the threshold value such that the iPD is triggered by the signals from the liona.
4. Using the *DELAY* selector switch, select the time between the receiving of the signal and the transmission of the first pulse from the iPD.

At the near end (settings on the liona)

5. Switch the liona on.
6. Using the *PULSE VOLTAGE* rotary switch, set a low pulse voltage on the liona connection panel.

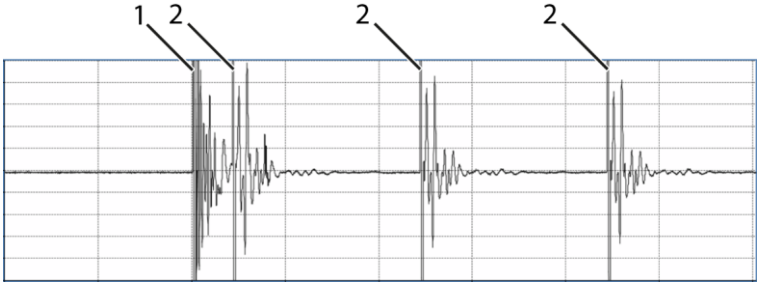
   The *PULSE LED* flashes green.
7. Open the ***Cable Length*** software.

8. In the ***Propagation Speed V/2 (m/µs)*** input field, enter the propagation speed of the pulses inside the cable.

   Standard value: 80 m/µs
9. In the ***iPD Time Delay (µs)*** input field, enter the time between the receiving of the signal and the transmission of the first pulse from the iPD. This time is set using the *DELAY* selector switch on the iPD.
10. In the ***SCOPE*** area, select the channel via which the measurement is to be performed.
11. In the ***Voltage Range*** selection list, select the voltage range of the input signal.

    Standard value: ±200 mV
12. To start the measurement, click on the ⏻ button.

    The measurement is performed. The recorded signal is displayed.



1	Pulse from the liona
2	Pulses from the iPD

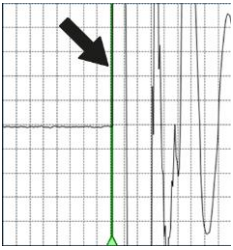
13. Click the ***Single Scan*** button to launch a single measurement.

    Note: A single measurement is helpful for setting the marker, as this stops the display.
14. To zoom into an area of the display, click a position in the display and while holding down the mouse button, drag the mouse pointer over the area that you want to zoom into.

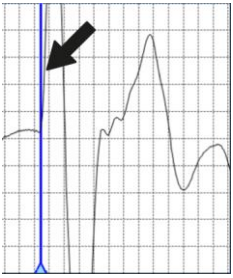
    The display is magnified when you release the mouse button.

    To zoom out of the display again, right-click on the display and select ***Zoom Out*** in the context menu.

15. Place the liona marker on the rising edge of the pulse from the liona:
    To do this, right-click in the display and select ***Set liona Marker*** in the context menu.



16. To correct the position of the marker, click the arrow keys in the ***liona Marker*** area.
17. Place the iPD marker on the rising edge of the first pulse from the transponder:
    To do this, right-click in the display and select ***Set iPD Marker*** in the context menu.



18. Use the arrow keys in the ***iPD Marker*** area to correct the position of the iPD marker.
    After both markers are set, a third marker is automatically placed. This marker is red and is located on the time axis 10 µs or 100 µs in front of the iPD marker (depending on the time delay selected on the iPD). It displays the position where the transponder is connected.
    Note: If the first pulse from the iPD is too close to the first pulse from the liona, it can be a good idea to change the time delay (*DELAY* selector switch on the iPD).
    The cable length is automatically calculated and displayed in the ***Cable Length (m)*** field. The time between the liona and iPD pulses is likewise calculated automatically and displayed in the ***Time between Pulses (µs)*** field.
    When the markers are moved, the cable length is recalculated automatically.
19. To exit the measurement, click on the ⏻ button.
20. To start the online PD mapping, click the ***Launch*** button in the ***Mapping*** area.
    The ***Mapping*** software opens.
    Further information: Chapter *Performing an online PD mapping* (on page 23)

7 ONLINE PD MAPPING (“MAPPING” SOFTWARE)

7.1 Required equipment

- liona
- iPD
- 2 HFCT sensors
- 2 BNC coaxial cables

7.2 Performing an online PD mapping

Before a partial discharge location, it is recommended to determine the cable length so as to locate the position of the partial discharges as precisely as possible.

Further information: Chapter *Online cable length measurement (“Cable length” software)* (on page 20)

1. Connect the devices for the PD mapping.

   Further information: Chapter *Connecting the devices for the online PD mapping* (on page 18)

At the far end (settings on the iPD)

2. Using the iPD rotary switch, switch the *OUTPUT PULSE VOLTAGE* on.

   The *POWER* LED lights up.
3. Select the *AUTO SWEEP* trigger mode with the selector switch.
4. Using the *OUTPUT PULSE VOLTAGE* rotary switch, set the level of the pulse transmitted by the iPD.
5. Using the *DELAY* selector switch, select the time between the receiving of the signal and the transmission of the first pulse from the iPD.

At the near end (settings on the liona)

6. Switch the liona on.
7. To turn off the pulse generator of the liona, turn the *PULSE VOLTAGE* rotary switch on the connection panel of the liona fully to the left.

   The *PULSE LED* must be off.

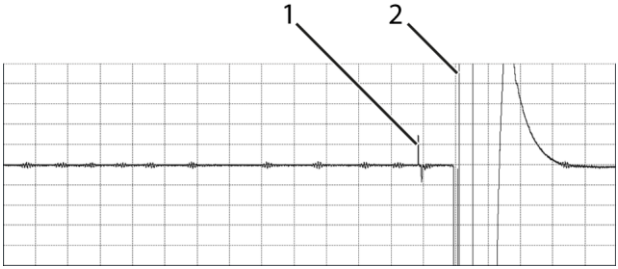
8. Open the ***Mapping*** software.

   If you have measured the cable length and have started the ***Mapping*** software directly from the ***Cable Length*** software, the detected cable data is applied automatically.
9. If you have not performed a cable length measurement, enter the exact cable length in the ***Cable Length (m)*** input field in the ***Setup*** area.
10. In the ***Propagation Speed V/2 (m/µs)*** input field, enter the propagation speed of the pulses inside the cable.

    Standard value: 80 m/µs
11. In the ***iPD Time Delay (µs)*** input field, enter the time between the receiving of the signal and the transmission of the first pulse from the iPD. This time is set using the *DELAY* selector switch on the iPD.
12. In the ***Setup*** area, enter the length of the iPD connection cable and enable the ***Noise rejection*** checkbox.
13. In the ***SCOPE*** area, select the channel via which the measurement is to be performed.
14. To start the measurement, click on the ⏻ button.

    The signal recorded on the selected channel is displayed.
15. If the iPD pulses are not visible on the right-hand side of the display, adjust the trigger level (***Trigger (mV)*** input field).

    The PD pulses (1) that trigger the transponder must be displayed to the left of the iPD pulses (2). There is a time delay between the PD pulse and the iPD pulse that is determined by the propagation of the PD pulse and the delay time set on the iPD.



16. Click the ***Single Scan*** button to launch a single measurement.

    Note: A single measurement is helpful for setting the marker, as this stops the display.

17. To zoom into an area of the display, click a position in the display and while holding down the mouse button, drag the mouse pointer over the area that you want to zoom into.

    The display is magnified when you release the mouse button.

    To zoom out of the display again, right-click on the display and select ***Zoom Out*** in the context menu.
18. Set the iPD marker on the rising edge of the pulse from the transponder.

    To do this, right-click in the display and select ***Set iPD Marker*** in the context menu.
19. Use the arrow keys in the ***iPD Marker*** area to correct the position of the iPD marker.
20. If the PD signals that trigger the transponder are not easily visible, adjust the voltage range (***Voltage range*** selection list).
21. To start the PD mapping, click the  button.

    The system automatically records signals and detects the PD pulses. The PD pulses are shown as points on the diagram. The points specify the position of the partial discharges in the cable. The PD mapping finishes automatically as soon as 999 events have been recorded. You can also end the PD mapping manually at any time.
22. To end the mapping, click the  button.
23. Set a PD marker for the PD pulses:

    To do this, right-click in the display and select ***Set PD Marker*** in the context menu.
24. To correct the position of the marker, click the arrow keys in the ***PD Marker*** area.

    The distance from the partial discharges to the transponder is automatically calculated and displayed in the ***Distance from far cable end (m):*** field.

    Note: Note that the distance to the far end (to the station on which the transponder is installed) is displayed. The report specifies both the distance to the near end and to the far end.
25. Save the PD mapping data (***File*** > ***Save Map***) and/or create a report on the PD mapping.

    Further information: Chapter *Creating the report* (on page 26)

7.3 Creating the report

Creating a report for the current measurement

File > ***Save Report***

1. Enter information for the PD mapping.
2. Click the ***Save*** button.
3. Select the folder in which you want to save the file.
4. To save the file under a different name, enter a name in the ***File name*** input field.
   Note: The file name must not contain the following characters: \ / : * ? "< > |
5. Click the ***OK*** button.
   The report is saved in PDF format in the selected folder.

Creating a report from saved data

File > ***Load Map***

1. Select a file that you want to open.
2. Click the ***OK*** button.
   The file opens and the saved data is displayed.

File > ***Save Report***

1. Enter information for the PD mapping.
2. Click the ***Save*** button.
3. Select the folder in which you want to save the file.
4. To save the file under a different name, enter a name in the ***File name*** input field.
   Note: The file name must not contain the following characters: \ / : * ? "< > |
5. Click the ***OK*** button.
   The report is saved in PDF format in the selected folder.

8 ENDING A MEASUREMENT

- Refer to the user manual for the liona online PD spot tester.

9 MAINTENANCE

NOTICE

Damage to device due to improper handling

The user is liable for damages caused due to improper maintenance or care.

- Never take apart the device. This can lead to device damages. Inside the device there are no components that could be serviced or repaired by the user.
- Maintenance tasks must be carried out only by personnel trained and authorised by BAUR

9.1 Maintenance intervals

Interval	Maintenance work
Before each use	Check the devices and connection cables for physical damage
After each use	Clean the devices and connection cables and check for physical damage
Every 6 months and as required	Charging the rechargeable battery
As required by BAUR After Sales Service	Replace the battery

1. Switch off the device before starting any maintenance tasks.
2. To disconnect the device completely from the supply voltage, pull out the mains plug.

9.2 Cleaning

NOTICE

Damage to the device may be caused by using the wrong cleaning agents

- Do not use any abrasive, corrosive cleaning agents or strong solvents.
- Ensure material compatibility.
- Do not clean the product with acetone or thinner.
- Never clean electrical devices with water.

Required equipment

- Mild detergent for cleaning the surfaces of the device
- Lint-free cleaning cloth

Cleaning the device surfaces and connection cable

1. Clean the device surfaces and connection cable with mild detergent and a lint-free cloth.
2. *NOTICE!* Damage to device due to leaking fluids. Do not allow liquids to leak into devices.

   Note that the splashproof protection is guaranteed only when the device is in a closed state.

9.3 Charging the rechargeable battery

The battery of the iPD starts charging as soon as the iPD is connected to the mains.

- Connect the iPD to the mains voltage using a mains supply cord. If necessary, use a country-specific adapter.

Charge status display

The *POWER* LED indicates the battery charge status.

	iPD is switched off	iPD is switched on
Battery charging	LED lights up red	LED lights up yellow
Battery fully charged	LED is off	LED lights up green
Battery low	–	LED flashes green

10 TRANSPORTATION AND STORAGE

NOTICE

Damage to device due to incorrect transportation and improper storage

- Always transport and store the device with the lid closed.
- Always transport and store the accessories of the device in the cable compartment intended for this purpose.
- Always transport and store the device and its accessories horizontally.
- Protect the device and its accessories against strong vibrations, moisture, and unauthorised access.
- Comply with the ambient conditions specified in the technical data. The technical data can be found in the data sheet for the liona online PD spot tester.

NOTICE

Damage to the rechargeable or non-rechargeable batteries due to improper storage

The rechargeable battery used for the iPD is protected against total discharge and overcharge. However, during longer periods of storage, the rechargeable battery may still discharge itself, e.g. due to weak leakage currents.

- To prevent the rechargeable battery from discharging itself, it must be charged fully every 6 months.

  Further information: Chapter *Charging the rechargeable battery* (on page 29)

11 Warranty and After Sales

Warranty

For warranty claims, please contact BAUR GmbH or your local BAUR representative. Improper use will render the warranty null and void. Wear parts are excluded from the warranty.

After Sales

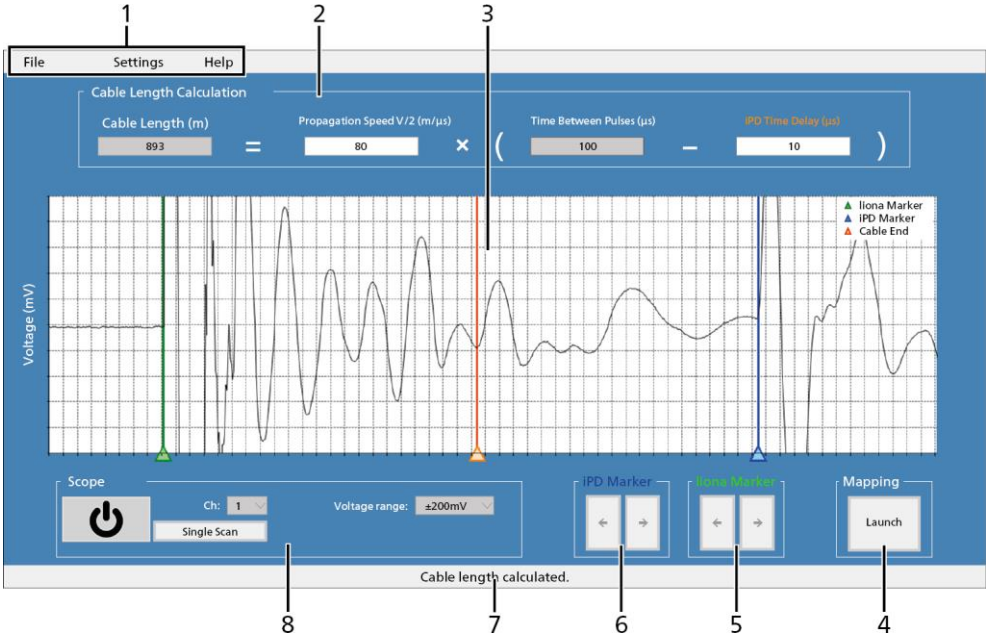
For questions contact BAUR GmbH or your BAUR representative.

BAUR GmbH

Raiffeisenstraße 8
6832 Sulz / Austria
service@baur.eu
https://www.baur.eu

12 DESCRIPTION OF SOFTWARE USER INTERFACES

12.1 “Cable Length” software



No.	Element	Function
1	Upper menu bar	▪ ***File***: Is used to exit the software ▪ ***Settings***: Is used to select the language and to switch between full screen view and normal view ▪ ***Help***: Displays the software version and the manufacturer

No.	Element	Function
2	***Cable Length Calculation*** area	Displays the computed cable length ▪ ***Propagation Speed V/2 (m/µs)***: Is used to enter the velocity (v/2) at which a pulse is propagated in the cable ▪ ***iPD Time Delay (µs)***: Is used to enter the delay with which the transponder signal is transmitted The time between the liona and iPD pulses (***Time between Pulses (µs)***) is calculated automatically.
3	Measurement results	Is used to display the recorded input signal.
4	***Mapping*** area	The ***Mapping*** software for PD mapping starts automatically when you click the ***Launch*** button.
5	***liona Marker*** area	The arrow keys are used for exact positioning of the marker. After repositioning, the cable length is automatically recalculated.
6	***iPD Marker*** area	
7	Information bar	Is used to display information on the recorded data
8	***Scope*** area	Is used to set the input channel, voltage range and trigger level. ▸ To start or end the detection of the input signal, click the ⏻ button. ▸ To record a single pulse signal, click the ***Single Scan*** button.

Zoom in display

▸ To zoom into an area of the display, drag an area of the display with the left mouse button.

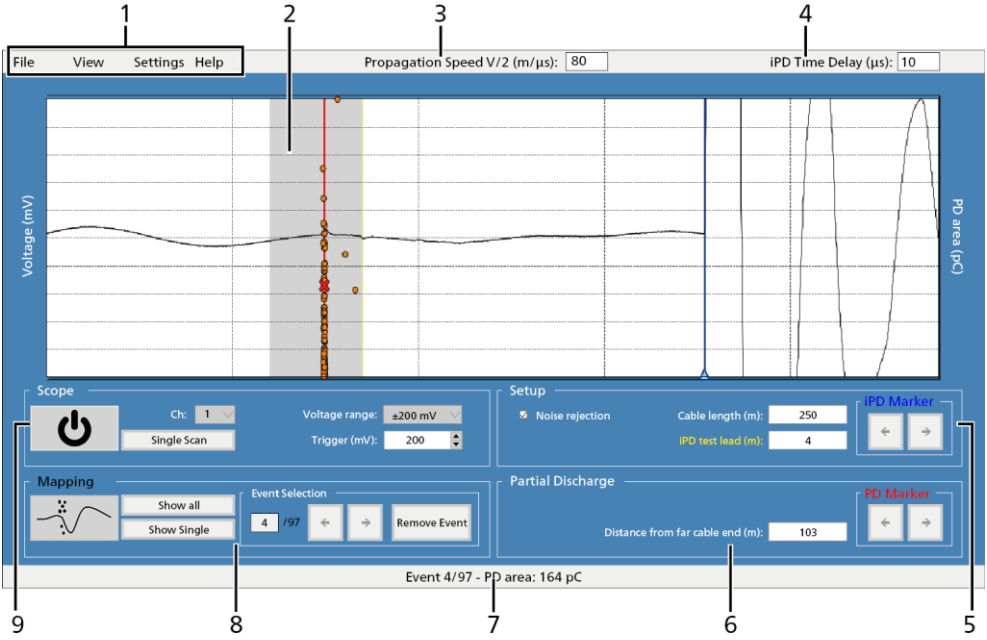
Zoom out display

▸ Right-click in the display and select ***Zoom Out*** in the context menu.

Delete markers

▸ Right-click in the display and select ***Clear Markers*** in the context menu.

12.2 “Mapping” software



No.	Element	Function
1	Upper menu bar	▪ ***File***: Is used to load and save mapping data, create the report and exit the software ▪ ***View***: Is used to show and hide the report data ▪ ***Settings***: Is used to select the language and to switch between full screen view and normal view ▪ ***Help***: Displays the software version, the DeCIFer® algorithm version and the manufacturer

No.	Element	Function
2	Measurement results	Is used to display the recorded input signal as well as the partial discharges The grey area shows the total cable length. The partial discharges are shown as individual points. If you click on a point in the display, the relevant data is shown in the information bar. If the length of the iPD connection cable is entered, the yellow marker shows the position of the iPD connection cable.
3	***Propagation Speed V/2 (m/µs)*** input field	Is used to enter the velocity (v/2) at which a pulse is propagated in the cable
4	***iPD Time Delay (µs)*** input field	Is used to enter the delay with which the transponder signal is transmitted
5	***Setup*** area	▪ ***Noise rejection***: If you enable the checkbox, noise signals are automatically filtered out when recording partial discharges. ▪ ***Cable Length (m)***: Displays the cable length calculated in the ***Cable Length*** software If the cable length is known, you can enter it directly in the field. ▪ ***iPD test lead (m)***: Is used to enter the length of the iPD connection cable ▪ ***iPD Marker***: The arrow keys are used for exact positioning of the marker.
6	***Partial Discharge*** area	▪ ***Distance from far cable end (m):***: Displays the distance of the partial discharges from the iPD. ▪ ***PD Marker***: The arrow keys are used for exact positioning of the marker.
7	Information bar	Is used to display information on the recorded data

No.	Element	Function
8	***Mapping*** area	▪  button: Is used to start and exit online PD mapping ▪ ***Show All***: Displays all recorded partial discharges The partial discharge selected in the ***Events*** area is marked by a red X. ▪ ***Show Single***: Only shows the partial discharge selected in the ***Events*** area ▪ ***Events***: Is used to switch between and delete the partial discharges
9	***SCOPE*** area	Is used to set the input channel, voltage range and trigger level. ▸ To start or end the detection of the input signal, click the  button. ▸ To record a single pulse signal, click the ***Single Scan*** button.

Zoom in display

▸ To zoom into an area of the display, drag an area of the display with the left mouse button.

Zoom out display

▸ Right-click in the display and select ***Zoom Out*** in the context menu.

Deleting multiple partial discharges at the same time

1. In the measurement results display, press the SHIFT key on your keyboard.
   The mouse pointer changes to a crosshair.
2. Holding down the SHIFT key, use the left mouse button to drag a rectangle over the partial discharges you want to delete.
   The selected partial discharges are marked by a red X.
3. In the ***Event Selection*** area click the ***Remove Event*** button.
   The selected partial discharges are deleted without any further confirmation message.

Delete markers

▸ Right-click in the display and select ***Clear Markers*** in the context menu.

13 INDEX

BAUR GmbH

Raiffeisenstr. 8
6832 Sulz / Austria
T +43 (0)5522 4941-0
F +43 (0)5522 4941-3
headoffice@baur.eu
https://www.baur.eu

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