Software manual

UK

LR DEVICE

Version 1.7

11326694 / 00 05 / 2020

Contents

1 Preliminary note

This document explains the set-up and use of the LR DEVICE software from ifm.

1.1 Symbols used

► Instructions
> Reaction, result
[…] Designation of keys, buttons or indications
→ Cross-reference

Important note
Non-compliance may result in malfunction or interference.

Information
Supplementary note

2 Safety instructions

Please read the operating instructions before using the software.

Ensure that the software is suitable for your application and the connected sensors without any restrictions.

If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property can occur. That is why installation, set-up and maintenance of the article must only be carried out by qualified personnel authorised by the machine operator.

Non-observance of the instructions, operation which is not in accordance with use as prescribed below, wrong installation or incorrect handling can affect the safety of operators and machinery.

The installation and connection must comply with the applicable national and international standards. Responsibility lies with the person installing the software.

Changes to the source code or to individual components of the software which are not explicitly described in the instructions lead to the loss of the right to benefit from the support provided by ifm electronic gmbh.

3 Functions and features

Using the LR DEVICE software offers the following options:

- Parameter setting of IO-Link masters and devices
  - Via the network
  - Devices "point-to-point" via USB IO-Link master
- Online and offline set-up of ifm IO-Link masters and devices
  - Parameter setting
  - Loading parameters from an IO-Link sensor
  - Saving and loading sets of parameters in / from a file
  - Writing parameters to IO-Link devices
  - Support of IO-Link actuators
- Graphic representation of process values
  - Evaluation of measured values
  - Export of displayed measured values

The LR DEVICE software can be used for simple and efficient parameter setting of IO-Link masters and sensors. The software is designed to reduce set-up costs, increase plant uptime and simplify verification/evaluation of measured value curves during set-up or maintenance.

Parameters of devices and sensors can only be set from an LR DEVICE. Simultaneous parameter setting of devices and sensors with several LR DEVICE instances or other engineering software products is not supported and may cause problems.

During parameter setting, the behaviour of devices and sensors may change. This applies in particular if process values of actuators are changed via LR DEVICE. The user must ensure that no processes that are in operation will be impaired and that there is no risk for people or devices at any time.

4 Installation

4.1 System requirements

4.1.1 PC hardware

- Min. 2 GB working memory
- Min. 5 GB hard disc memory available
- 1 free Ethernet port
- 1 free USB 2.0 port
- Minimum: CPU Intel Dual Core 2.0 GHz

4.1.2 PC software

- Operating system Microsoft Windows 8.1, Windows 10, Windows Server 2012, Windows Server 2012 R2, Windows Server 2016.
- Web browsers Google Chrome, Mozilla Firefox, Microsoft Internet Explorer 11, Microsoft Edge.

4.1.3 Hardware accessories

- IT network and the necessary accessories for the connection of computer and network.
- As an option, ifm USB IO-Link master (incl. plug-in power supply, USB cable and M12 connection cable for IO-Link devices).
- As an option, ifm IO-Link master, e.g. AL11xx, AL12xx, AL13xx, AL19xx (incl. voltage supply, network cable with M12 connector and M12 connection cable for IO-Link devices).

Hardware accessories not supplied.

4.2 Installing the program on the hard disk

Perform data backup on the target system before installation.

The program LR DEVICE is installed on the PC using the file "LR_DEVICE_x.x.x.xxx_INSTALL.exe".

If an LR SENSOR version is installed on the PC, it will be upgraded to LR DEVICE by agreement. Installation of LR SENSOR and LR DEVICE on an operating system is not possible.

Administrator rights are required for set-up and operation of the software. Contact the administrator or IT operator.

► Start the "LR_DEVICE_x.x.x.xxx_INSTALL.exe" file with a double click.

> The setup window opens. The licence conditions are displayed.

► Agree to the licence conditions, click on [Install] and follow the instructions of the installation routine.

> The program is installed.

► Close the setup window after successful installation.

4.3 Software upgrade

► Ask your ifm contract partner for available upgrades.

► Follow the installation routine as in → 4.2.

> The licence key remains valid.

4.4 Language selection

The interface language depends on the language selected in your browser.

► Set the required language in the browser settings for website display.

► Restart or refresh the browser.

Language versions of the software manual → www.ifm.com

5 Program start

5.1 Limited software

The LR DEVICE software can be used in a limited environment without a licence key.

Functions of the limited environment:

- IO-Link masters are displayed with network address via the network.
- Read parameters from the master
- Read the device parameters via "point-to-point" connection
- Edit parameters on the LR DEVICE surface (offline)
- Writing data to a master or device is not possible.
- Cockpit functions for monitoring devices is offered without any restrictions, only when the point-to-point connection is used.

5.2 Licensing procedures

The licence key is checked by clicking on the [LIMITED] information.

The licence key consists of:

– Licence number
– Licence

The licence key is supplied with the device.
It is printed on the inside of the packaging for version QA0011. The licence key of the download version QA0012 is provided by e-mail.

5.3 Functions depending on the licence keys used

Licence	Reading IO-Link files via USB IO-Link master or network	Writing data via network to network IO-Link master	Writing data via USB IO-Link master to IO-Link device	Writing data via network IO-Link master to IO-Link device
LIMITED	YES	YES	NO	NO
LR SENSOR	YES	YES	YES	NO
LR DEVICE	YES	YES	YES	YES

5.4 Connection of the hardware

When the network is used:

► Connect the PC to the network via a suitable network cable.

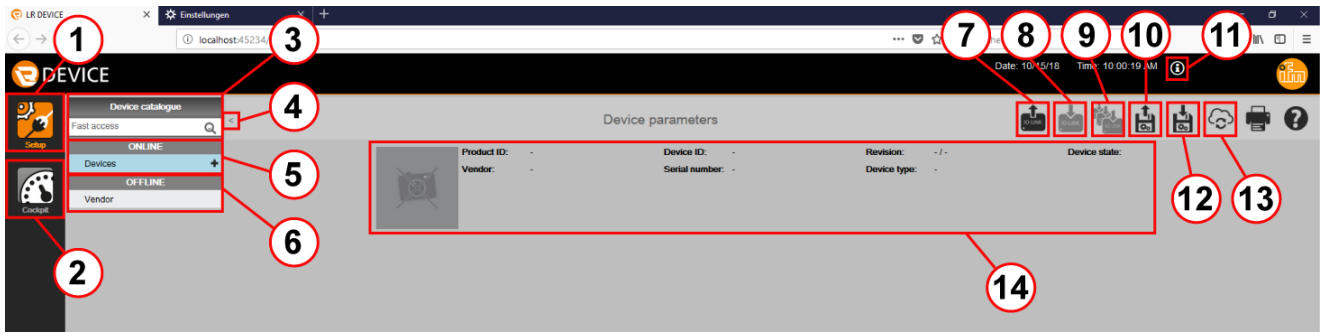
When the USB IO-Link master is used:

► Connect the USB IO-Link master to the PC and the plug-in power supply.
► Connect the USB IO-Link master to the IO-Link sensor via the M12 connection cable.
► For sensors with display or indication of the readiness for operation, check whether the unit is in operation.

The corresponding device is supplied with voltage via the USB IO-Link master.

5.5 Start screen

> The start screen is displayed in the language that is set in the browser (→ 4.4 Language selection).



①	Setup:	Parameter setting of IO-Link masters and IO-Link devices.
②	Cockpit:	Display mode of all measured values available online.
③	Device catalogue:	Quick access to IODD files for offline parameter setting via article no.
④	< : >:	Hide menu catalogue, ONLINE and OFFLINE Show menu catalogue, ONLINE and OFFLINE
⑤	ONLINE:	Detected interface / detected device is displayed.
⑥	OFFLINE:	Selection list from manufacturer to article no. Activate IODD file for offline parameter setting.
⑦	Read IO-Link parameters from the device:	Read parameters from the master or device.
⑧	Write IO-Link parameters to the device:	Write set parameter values to the master or device.
⑨	Write IO-Link parameters to selected devices:	Function like (8), in addition writing to several detected, selected devices in offline mode possible.
⑩	Load parameters from a file:	Upload stored parameter settings (lrp file) from a directory.
⑪	Company details	Show company details.
⑫	Save parameters to a file:	Save parameter values in an lrp file.
⑬	Search for updates of IODD files:	New IODD files can be downloaded from the internet. Installed IODD files can be deleted.
⑭	Header with information and a photo of the read device:	Device name; vendor; device ID; serial number; device type; hardware / firmware revision (internal version ID); device status (only for online parameter setting).

General icons:

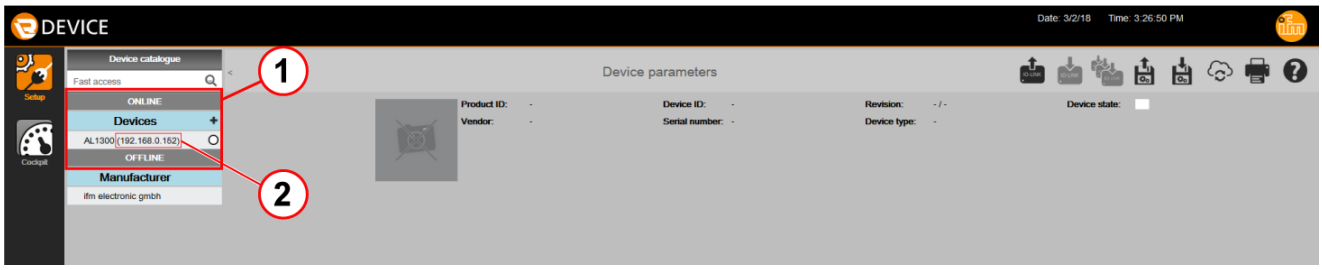
	A print preview of the displayed parameters is opened in a separate browser window. It contains parameter names, the current and the preset parameter value (factory setting), max. and min. setting values of the parameter and the short description of the parameter. In the print preview, remarks can be added and printed.
	Open software manual in a separate browser window.

6 Online parameter setting via the network

> PC is connected to the network.

► Click on [ ] .

> Parameters of the connected IO-Link master are loaded into the software.



If, in addition, there is an IO-Link device connected via a USB IO-Link master, this device will be displayed under [USB] first. To additionally display the IO-Link masters in the connected network:

► Click on [Devices].

► Click on [ ] again.

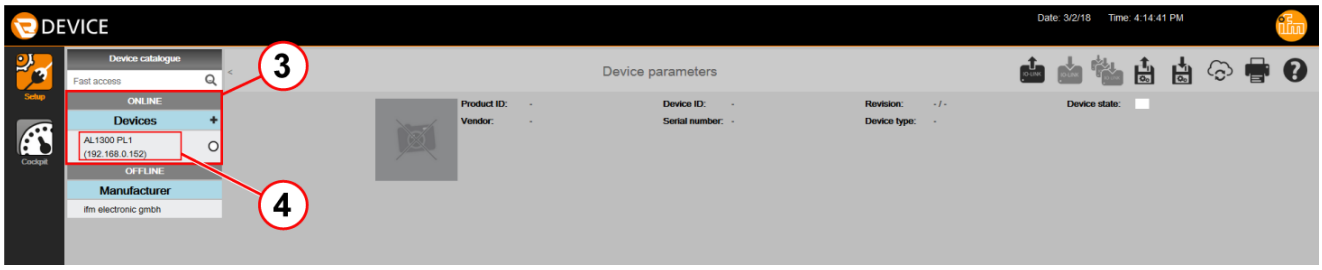
> ONLINE ① shows all detected IO-Link masters.

> In this case the network address ② of the IO-Link masters is shown.

► Adapt the network address of the PC in the network and sharing center.

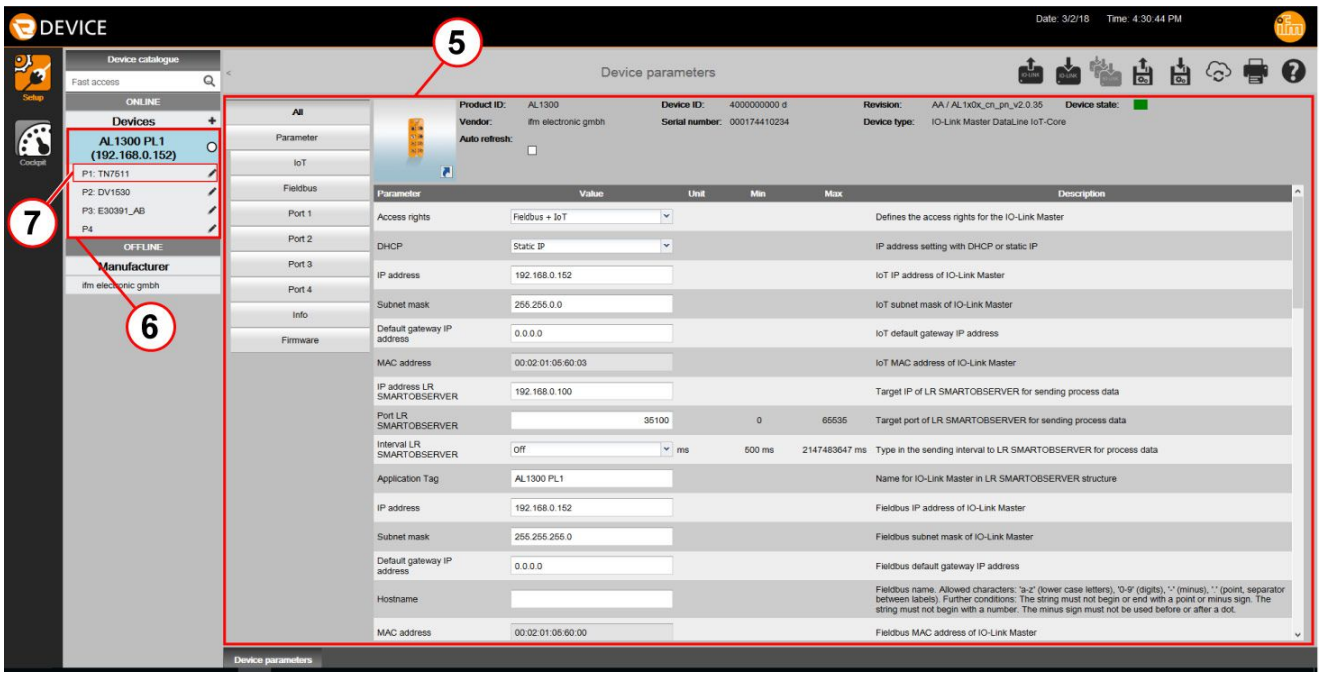
LR DEVICE detects IO-Link masters with network addresses deviating from the PC network address in the networks. The parameters cannot be changed in this case.

► Click on [ ].



> If the IO-Link masters are displayed with [Application Tag] ③, the network settings are OK.

► Click on IO-Link master ④.



> Parameter settings for the IO-Link master are displayed ⑤.

> The network address [IP address], [Application Tag] and other parameters can be set. For further information see the respective operating instructions of the IO-Link master.

> [Devices] shows the used ports of the IO-Link master ⑥.

► To identify the physical device displayed in LR DEVICE, click on [○] on the right next to the displayed IO-Link master. (The symbol [○] is only displayed if the device supports this function).

> For some seconds,
- the LED RDY on the IO-Link master flashes
- the symbol [○] in LR DEVICE flashes orange

► While they do so, click on [○] again.

> The LED on the device and the symbol [○] in LR DEVICE flash permanently.

► Click on [○] again.

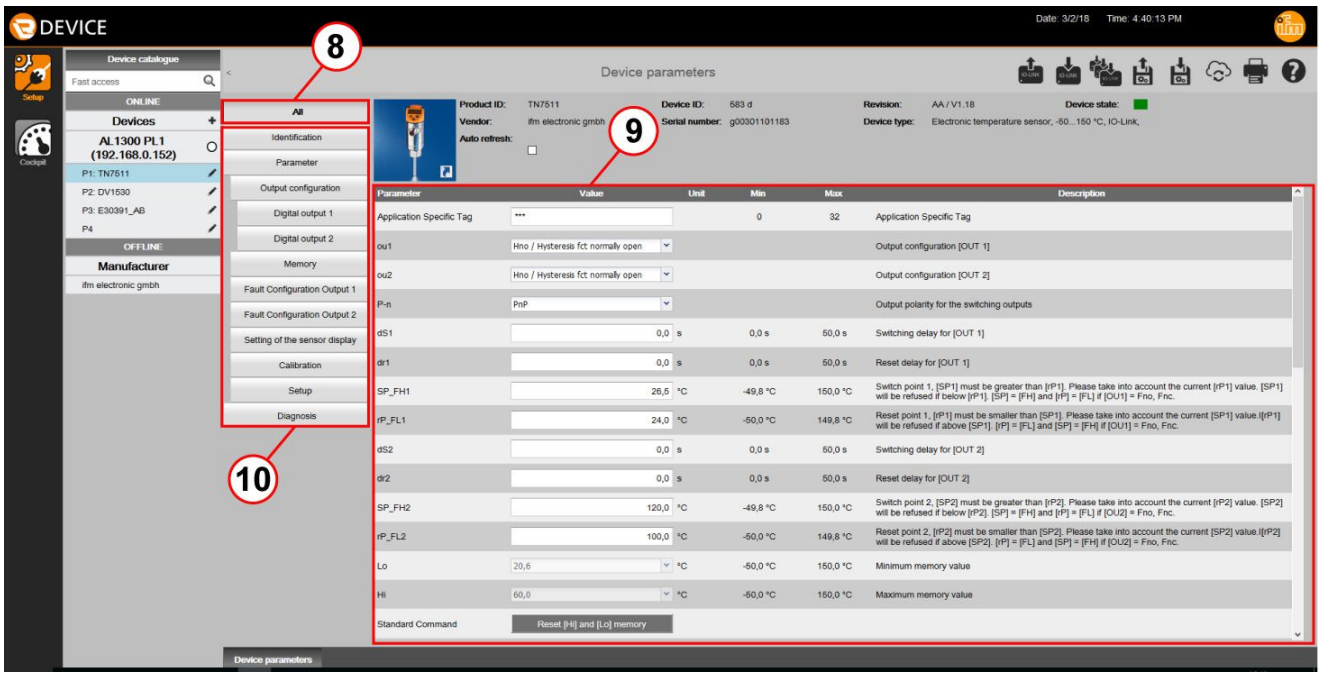
> The flashing of the LED on the device and the symbol [○] in LR DEVICE is stopped.Refreshing or closing the browser window will stop the flashing as well.

From version 1.5 or higher, LR DEVICE supports the safety function of IO-Link masters, provided that the devices are equipped with this function.

The safety function allows for the access to the device via the IoT interface to be password-protected (parameter [Security mode HTTPS] and [Security password]; for configuration, see the operating instructions of the IO-Link master).

► Click on [P1] ⑦ to show the device on port 1.

> The parameters of the connected IO-Link device open.



> The setting [All] ⑧ is preset.

> All parameters ⑨ are displayed and can be edited.

► For a targeted input of parameters, select the requested category ⑩ and edit the parameters.

► Click on [ ] to write parameters to the device.

The function [Auto refresh] allows to display the parameter values available in the device in an additional column [Device value]. Writing to the device is always via [ ].

6.1 Search for missing IODD

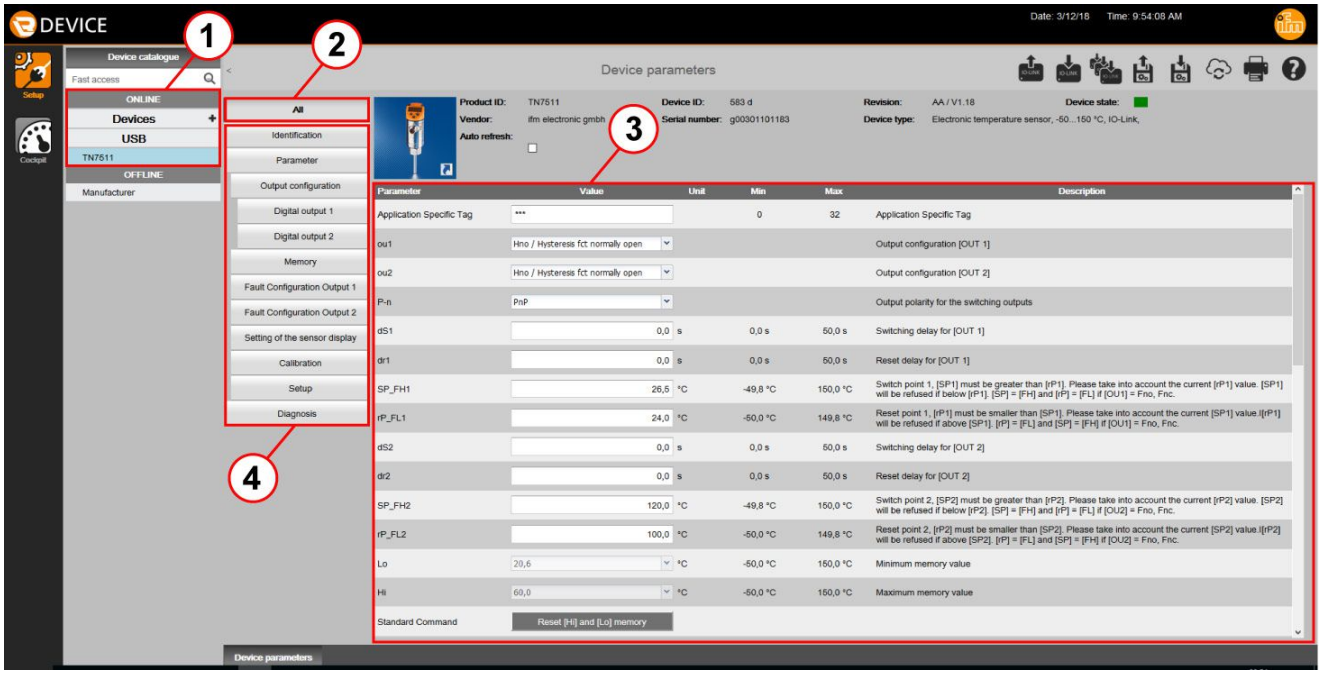
If no IODD is yet installed for a connected device that has been found, LR DEVICE enquires if a corresponding IODD is to be searched on the internet. The user can start the search with [Yes], provided that there is an internet connection.

7 Online parameter setting via USB IO-Link master

> The IO-Link device is connected to the PC via the USB IO-Link master.

► Click on [ ] .

> Parameters of the connected sensor are loaded into the software.



> ONLINE ① shows the used interface and the detected sensor.

> The setting [All] ② is always preset.

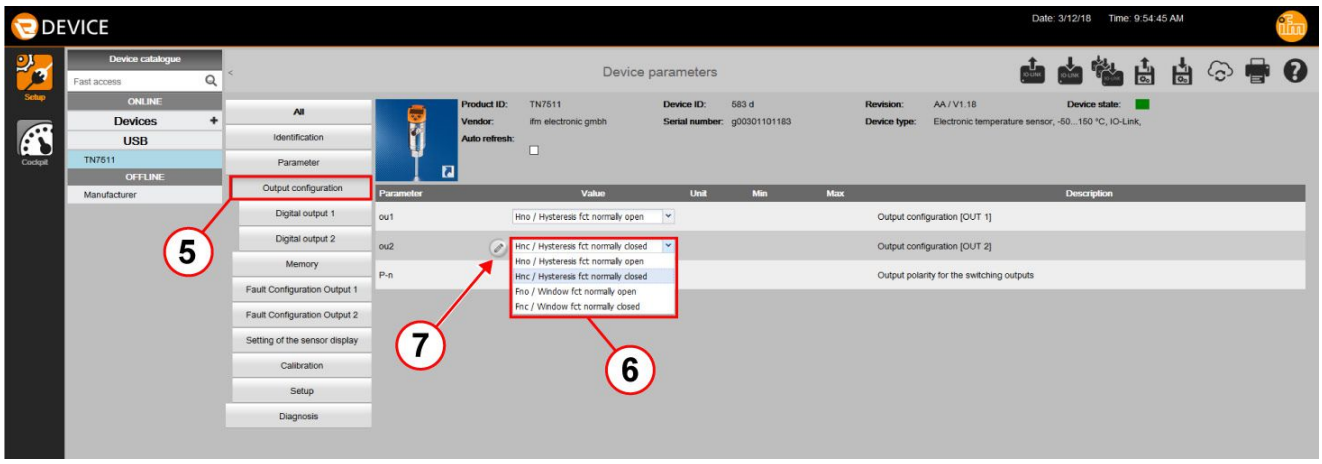
> All parameters ③ are displayed and can be edited.

► For a targeted input of parameters, select the requested category ④ and edit the parameter.

Example:

► Select [Output configuration] ⑤.

> Parameters in the category [Output configuration] are shown and can be edited.



► Select [ou2] parameter from the list ⑥ (other parameters are changed via input fields).

> The pen icon ⑦ indicates a changed parameter which has not yet been transferred to the device.

► Click on [ ] to write parameters to the device.

7.1 Memory plug parameter setting

A memory plug (E30398) can be used to store and transfer parameter values of various devices. The parameter values can be directly copied from the sensor to the memory plug, or written to it by the LR DEVICE. For further details refer to the operating instructions of the memory plug.

If a memory plug is connected, the following additional information is shown in the header:

	No parameters are stored on the memory plug, no write protection activated. or Parameters are stored on the memory plug, they can be edited, no write protection activated. Attention! Inconsistent data may be generated!
	Parameters are stored on the memory plug, they cannot be edited, write protection is activated.
	When a memory plug containing data is read, appears. By clicking on the icon, the parameters of the stored device are displayed (→ 7.2 Display of the data stored on the memory plug).
	appears when has been clicked. By clicking on the parameter list of the memory plug is displayed again. The icon changes again to (→ 7.2).

The memory plug only provides memory space for the parameters of one device.

Writing to the memory plug:

► Read IO-Link parameters from a device using the LR DEVICE software or select offline parameter setting.

► Edit parameters.

► Connect the memory plug to the USB IO-Link master.

► Click on [ ] to save data on the memory plug.

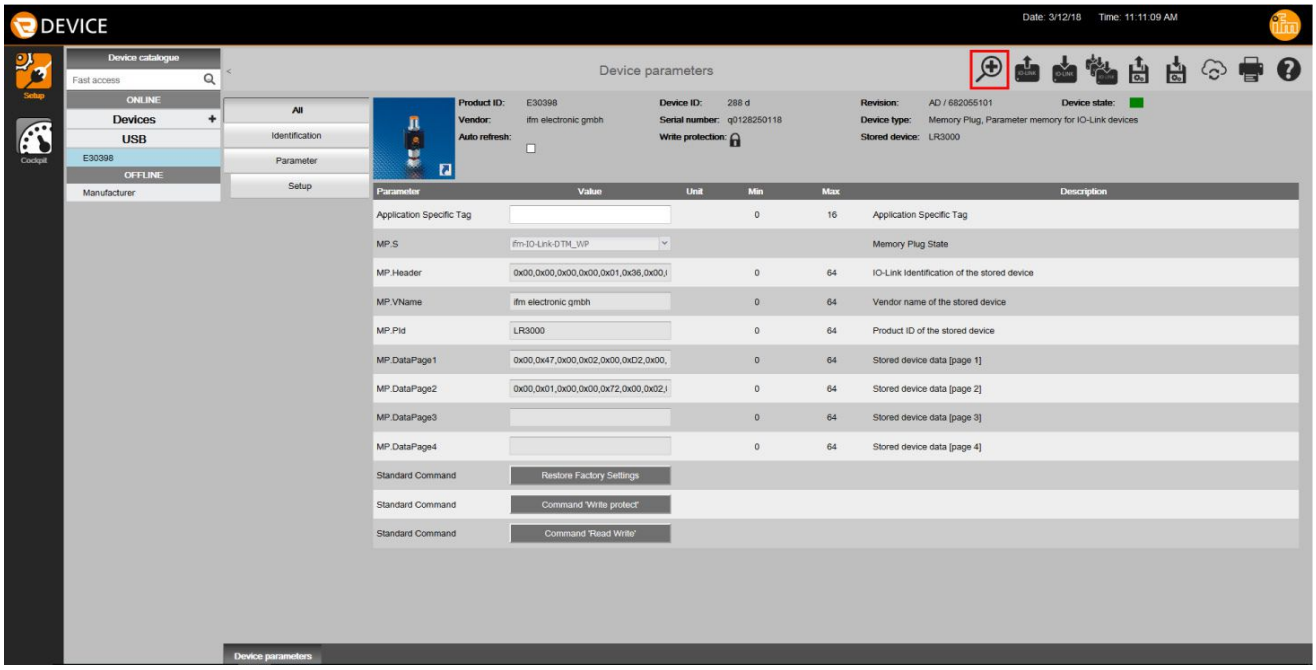
The write protection is activated via the system command [Write protect]. The system command [Read Write] deactivates the write protection.

7.2 Display of the data stored on the memory plug

► Connect the memory plug to the USB IO-Link master.

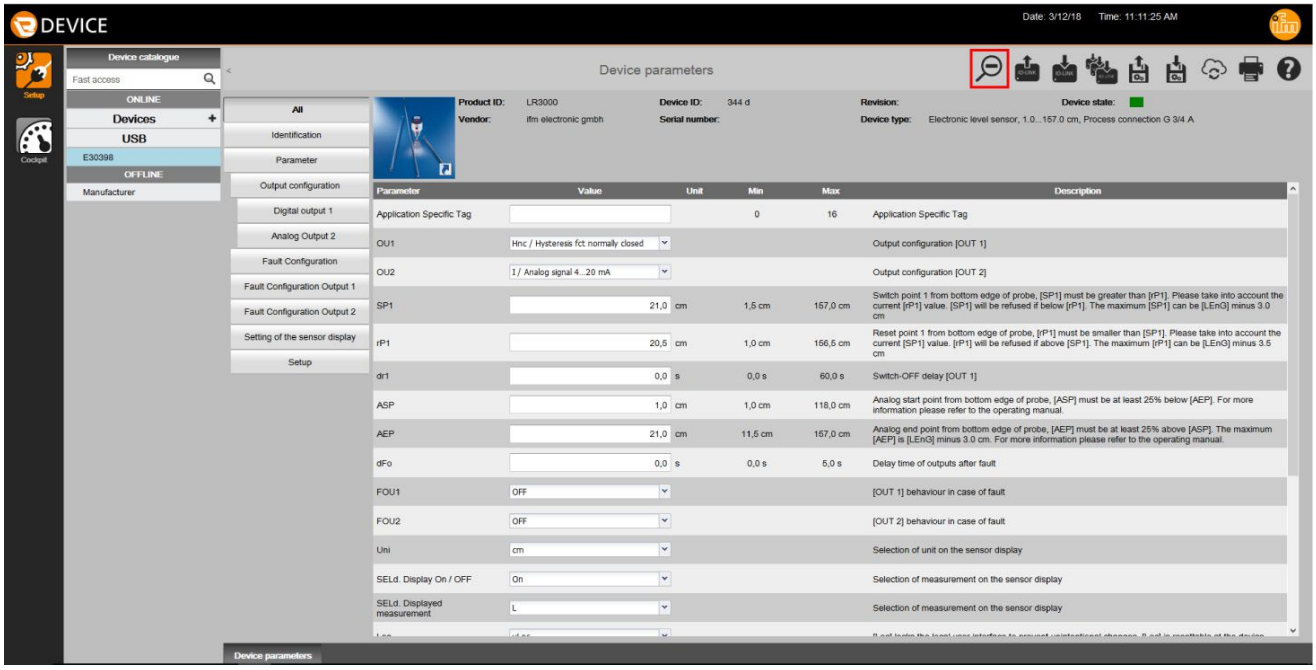
► Click on [ ] .

> The parameter list of the connected memory plug is loaded into the software.



► Click on [ ] .

> All stored parameters are displayed and can be edited.

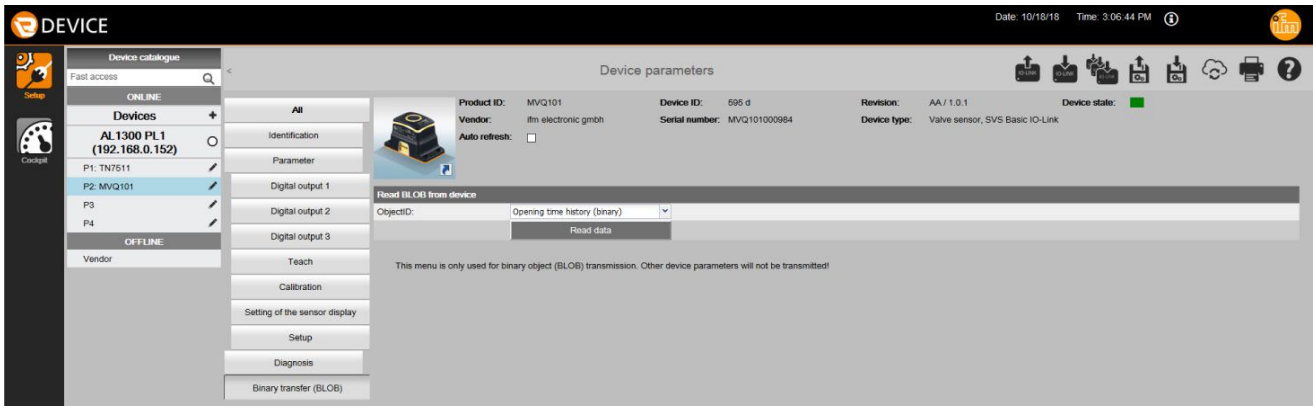


► Click on [ ].

> The parameter list of the connected memory plug is displayed.

8 Binary file transfer (BLOB)

For devices supporting the transfer of binary files, LR DEVICE displays the category [Binary transfer (BLOB)] in the [Setup] menu.



► Click on [Binary transfer (BLOB)].

► Select the requested value from the [ObjectID] list.

► Click on [Read data].

► Assign a file name and save the file.

> LR DEVICE saves the bin file in the default download directory of the logged-in user.

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9 Cockpit

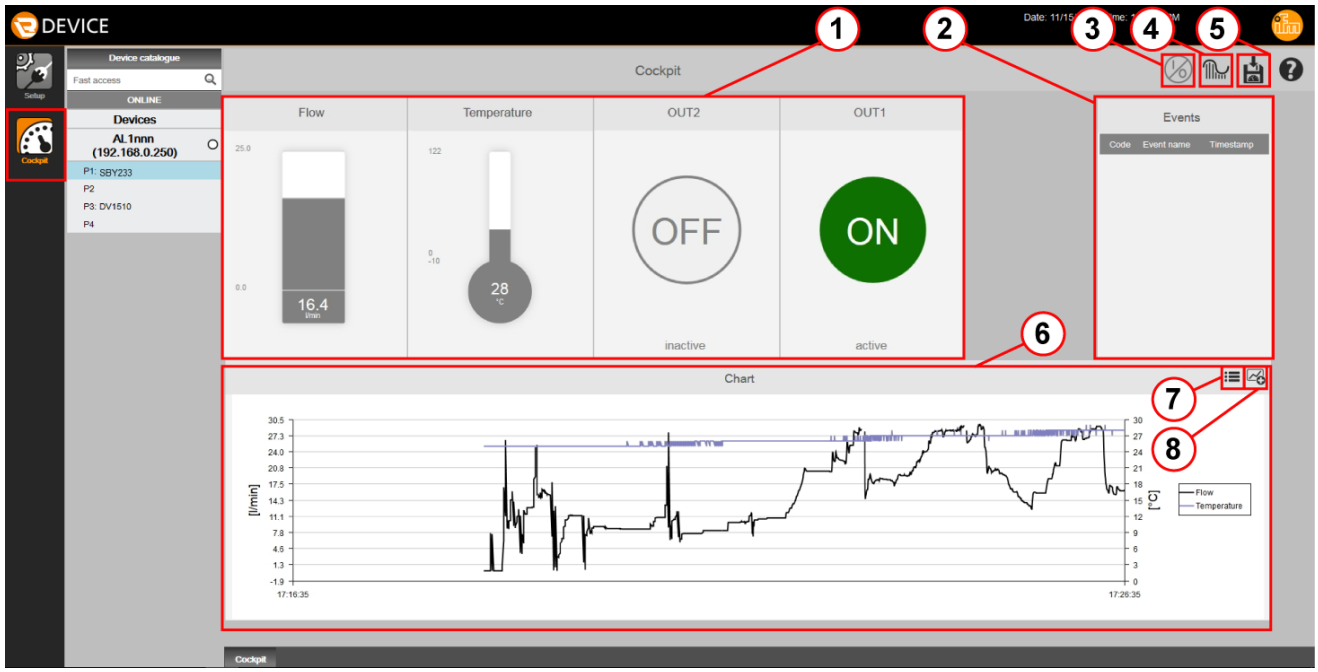
The cockpit offers the following options:

– Display instruments: Measured values and switching states are displayed in the form of display instruments in the respective current condition.

– Chart: Representation of the measured values / switching states in a time diagram.

► Click on [Cockpit].

> The cockpit is displayed with current measured values and output response.



①	Display instruments	Simplified graphical representation of the outputs.
②	Events	Events are displayed with code, name and time. A tool tip shows further detailed information about the event.
③	Process data output	Status / values of the process data outputs are displayed. Outputs can be set.
④	Set the device sampling rate	Setting of the transmission rate of new measured values (number of measured values detected per time unit).
⑤	Export measured values	Measured values of the chart are stored in a csv file.
⑥	Chart	The measured values and switching states over a defined period of time are visualised. The legend illustrates which characteristic curve refers to which measured value.
⑦	Edit / Configuration	Editing of the diagram labelling. Definition of the time range of the X axis. Activation or deactivation of the legend.
⑧	Add / delete data sources	The display of detected data sources in the chart can be activated or deactivated.

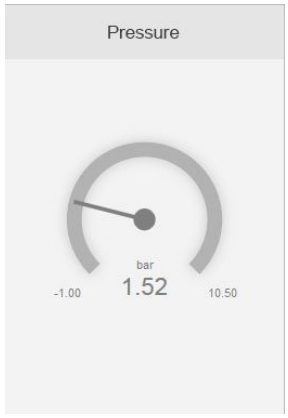
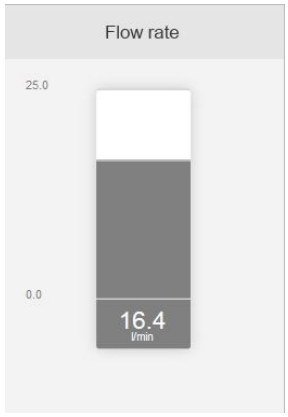
Information concerning the export of measured values:

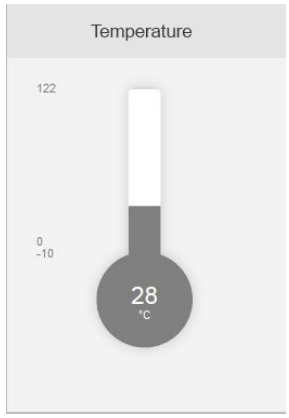
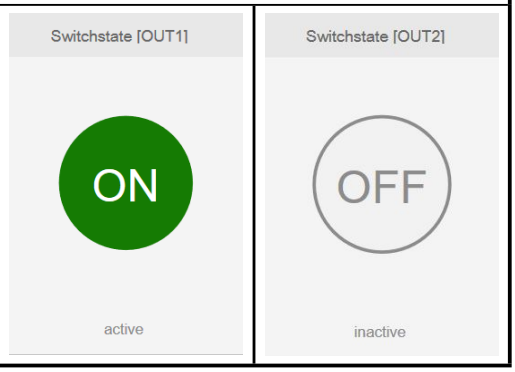
The maximum recording time for capturing process data via the cockpit is 60 min. The possible recording time, however, may vary and depends on the set time range of the x axis (standard value: 10 min.)

LR DEVICE only records the measured values of the device selected in the cockpit: As soon as a device is selected in the cockpit that provides process values, LR DEVICE starts to record the measured values. Selecting another device interrupts the recording of the measured values of this device. When the first device is selected again, the recording is continued with a time gap. This gap in the measured values will also be present in the exported CVS file.

LR DEVICE only exports the recorded measured values of the device selected at the time of the export.

9.1 Indicators used for measuring points / data sources

Indicator type	Description	Symbol
Pointer instrument	This display format is typically used for pressure measurements in bar / psi / MPa ... It is inspired by manometers.	
Bar graph	This indicator is used for process values typically not displayed as a manometer or thermometer.	

Indicator type	Description	Symbol
Thermometer	This display format is typically used for temperature measurements in °C / °F / ... Based on measurement equipment in thermometer design.	
Switching status	This indicator is used to display digital I/O signals. Only one display format is indicated ● Display "ON" = active / output "high" or ● Display "OFF" = inactive / output "low"	

9.2 Set process data outputs

For some IO-Link devices it is possible to set the outputs.

The process data outputs are set in the cockpit. The window for the process data outputs is shown/hidden via [⅒].

The following operating elements are available to change the outputs:

- Switch
- Input field
- Slider bar
- List

The setting options and operating elements available depend on the connected device and possibly on the configured operating mode. If the operating mode can be set, it can be changed in the "Setup" menu.

Change outputs via switch:

► Click on [⅒].

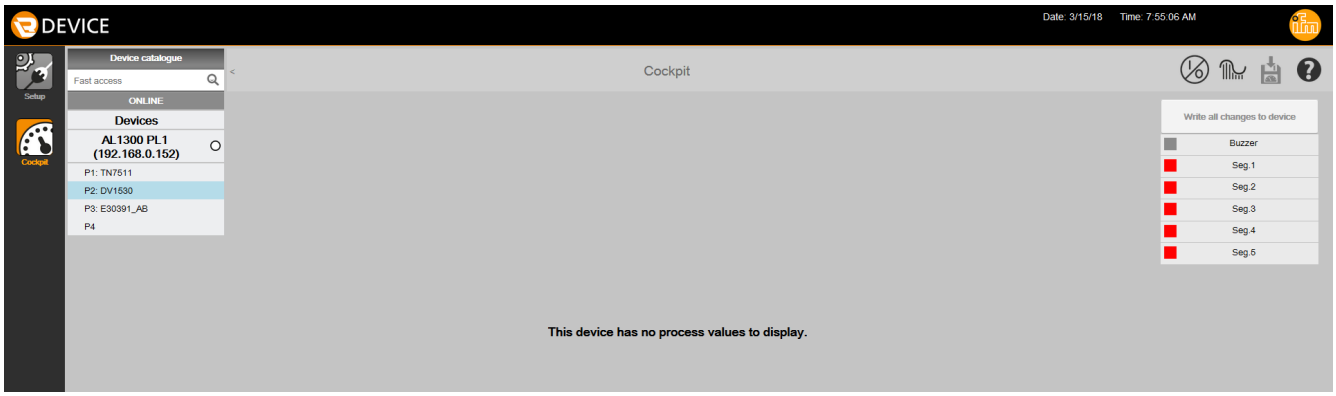
> A window with all process data outputs that can be changed is displayed (in the example via switches as operating elements).

> Activated outputs are marked with a red square, deactivated with a grey square.

► Activate / deactivate the requested outputs by clicking.

► Click on [Write all changes to device] to set all changed outputs with the displayed values.

> All changed outputs are set with the configured values.



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Change outputs via other operating elements:

► Enter the requested values in the input fields ① and confirm with Enter.

> The respective sliders are adapted accordingly.

► Use the mouse to move the slider ② to the required positions.

> The values in the corresponding input fields adapt accordingly.

► Select the required values from the lists ③.

The total number of changed parameters is indicated in the 2nd line of the window ⑤.

Changed values are marked with the pen icon ⑥.

► Click on the pen icon to set only this output with the displayed value.

> The output is set with the configured value.

> The pen icon disappears.

> The number of changed parameters is reduced by 1.

► Click on [Write all changes to device] ④ to set all changed outputs with the displayed values.

> All changed outputs are set with the configured values.

> All pen icons disappear.

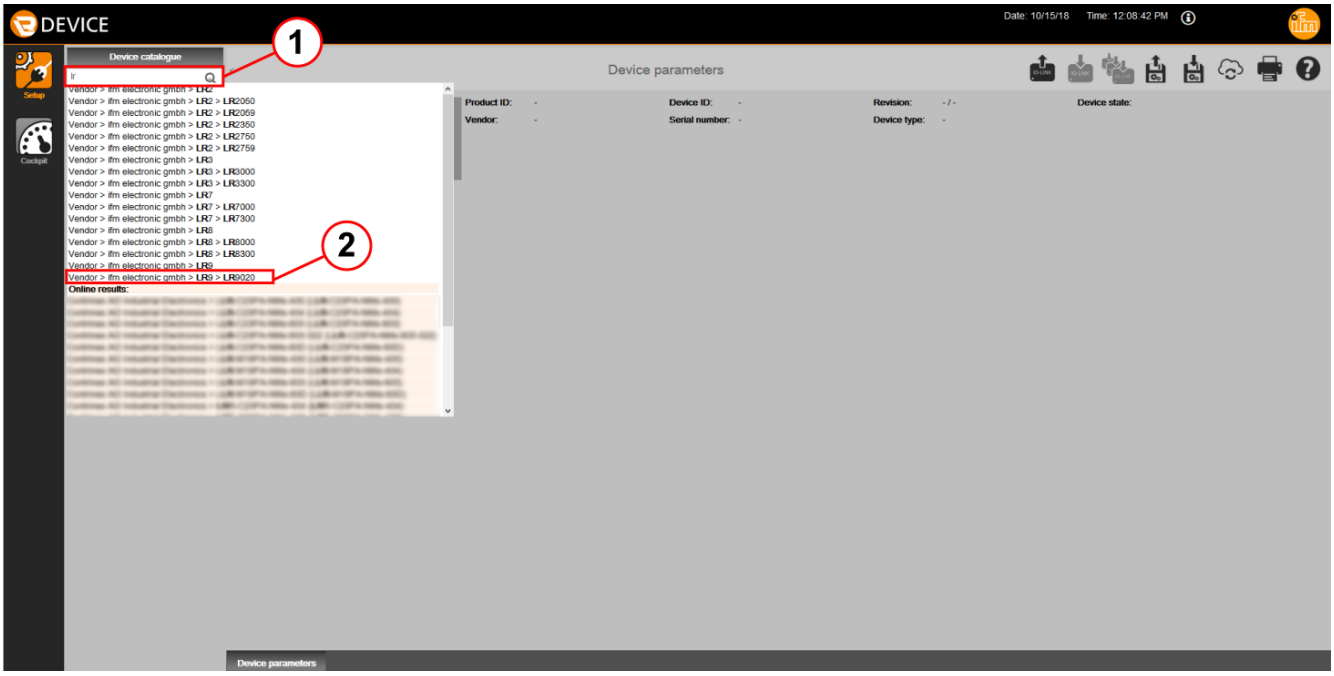
> The number of changed parameters is set to 0.

10 Offline parameter setting

Offline parameter setting allows editing of a set of parameters without connecting a corresponding device. Only the IODD is required for the device to be set. For ifm devices, the IODD is stored in LR DEVICE. For devices from other manufacturers, the corresponding IODDs can be downloaded and installed from the internet.

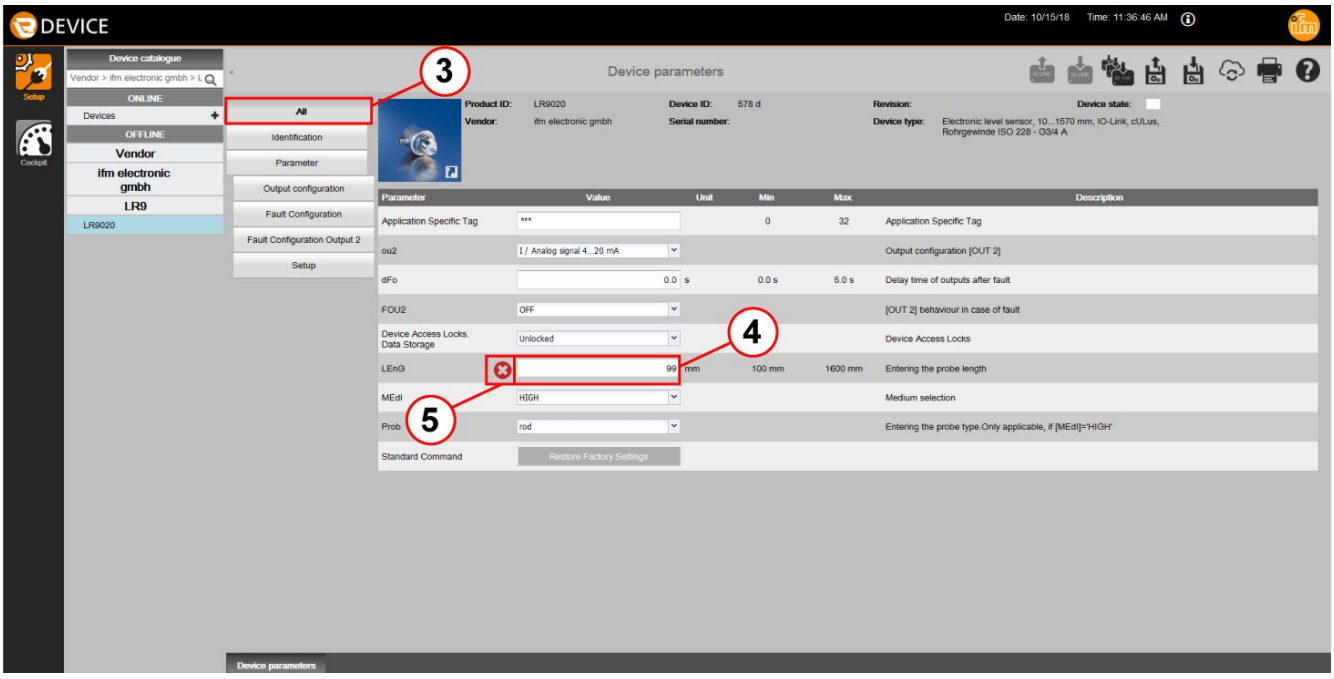
► Under [Device catalogue], enter the requested article no. in the quick access ①, e.g. [LR], to access the group of LRxxxx level sensors.

> A preselection with product IDs is shown in the device catalogue.



► Click on [LR9020] ② for example.

> The set of device parameters for LR9020 is displayed for editing.



> [All] ③ parameters are activated and can be edited.

► Edit [LEnG] ④ for example. (In the example an invalid value was entered.)

> Invalid values are marked with [] ⑤. The value must be selected from the range between min value and max value.

► Correct the value [LEnG] ④, observe the min / max limits!

► Click on [] to save the parameter set as an lrp file.

> The lrp file is saved in the download directory.
If only 1 parameter contains an invalid value, the lrp file cannot be saved. A corresponding message is provided.

In the offline mode, reading of [] or writing to [] a connected device is not possible. The saved file with the parameters can only be accessed in the online mode and then be written to the device.

[] (→ 5.5) allows to write to a connected and detected device in the offline mode.

11 Update IODD / device catalogue

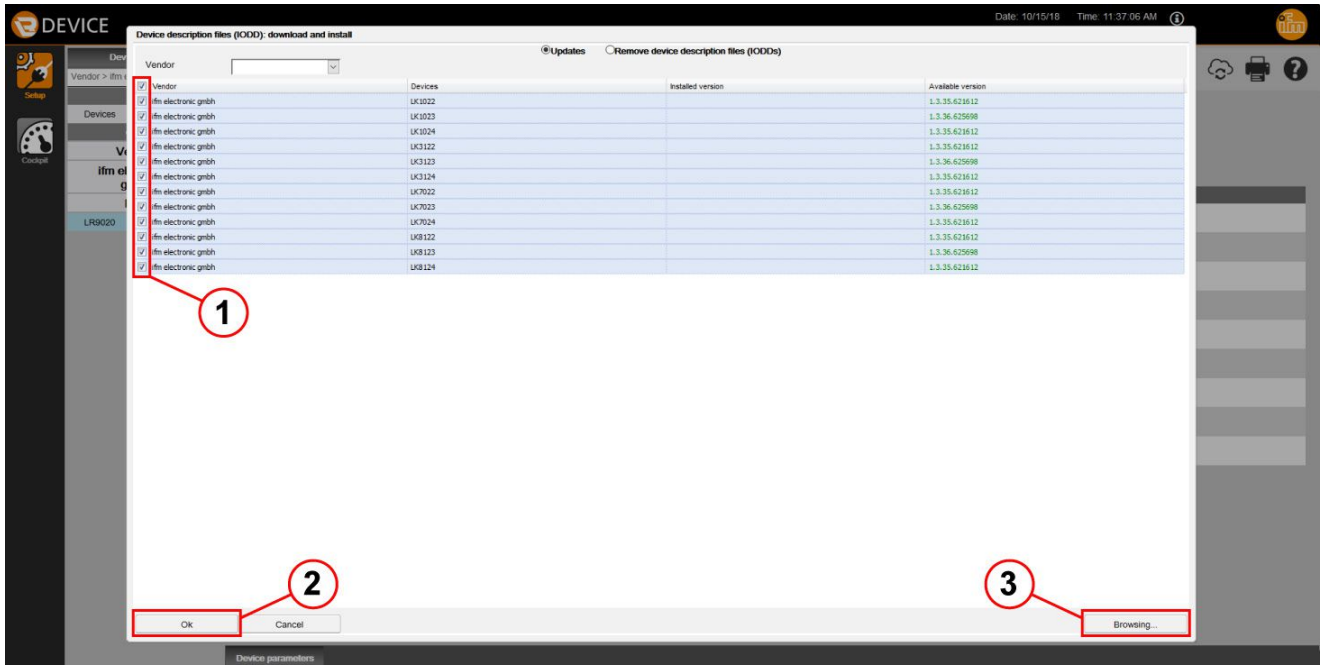
The LR DEVICE software provides an easy way to keep the IODDs / the device catalogue up to date. For an online update, an internet connection is required.

11.1 Download and install IODDS

► Click on [ ].

> The window [Device description files (IODD): download and install] opens.

> It is checked by default whether new versions of installed IODDs are available. The option [Updates] is selected.



► If necessary, select another manufacturer to download new IODDs.

► Mark IODDs ① which are to be installed / updated.

► Click on [OK] ②.

> A window with information about the update of the device definitions (IODDs) appears.

As an alternative, IODDs can be saved as a file on a storage medium and imported later.

► Click on [ ].

► Click on [Browsing...] ③ .

► Select the storage medium and highlight the file.

► Click on [Open].

> A window with information about the update of the device definitions (IODDs) appears.

11.2 Delete IODDS

► Click on [ ].

> The window [Device description files (IODD): download and install] opens.

► Select [Remove device description files (IODDs)].

► Mark the IODDS to be deleted.

► Click on [OK].

► Acknowledge the confirmation prompt whether the selected IODDs are to be deleted.

> A window with information about the update of the device definitions (IODDs) appears.

12 Troubleshooting

List of frequently asked questions and their solutions
(FAQ and Troubleshooting)

Question	Solution
Software does not start	► Reboot the computer
Sensor is not detected. Error message "No connected device was found!" appears	► Disconnect USB connection PC / USB IO-Link master. ► Reconnect after a waiting time of about 30 s. ► Restart the procedure. ► Enter the LR DEVICE licence key. ► Check the network connection. ► Check the network settings. ► Check IP address of the computer, and, if necessary, assign a static IP address. ► Check the firewall settings. If necessary, deactivate firewall.
The installation routine is not completed	A module may not have been detected correctly, or a wrong driver may have been selected. ► End the installation ► Start deinstallation. ► Reboot the computer. ► Restart the installation process.
Poor display in the web browser.	► Refresh browser window (key F5). ► Use an alternative browser (→ 4.1.2 PC software). > A poor display does not have any impact on the function.