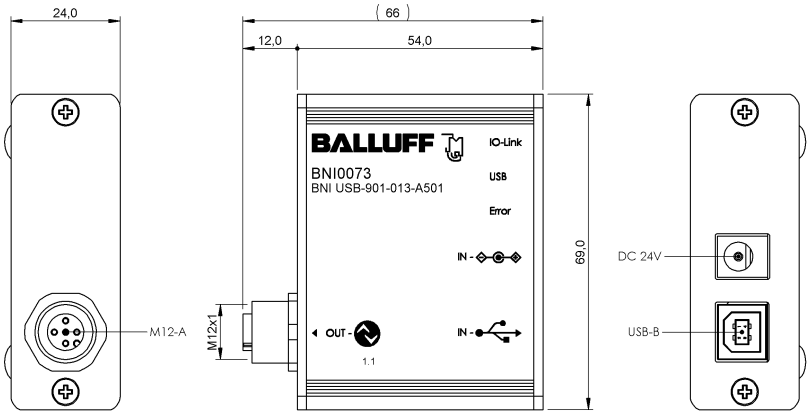
BNI USB-901-013-A501

User´s Guide



Content

1 Notes for the user

1.1 About this guide

This guide describes the Balluff USB IO-Link Master module, which allows you to connect IO-Link devices to the PC, as well as installation of the associated software.

1.2 Structure of the guide

The Guide is organized so that the sections build on one another.
Section 2: Basic safety information
Section 3: Getting started
….

1.3 Typographical conventions

The following typographical conventions are used in this guide.

Enumerations

Enumerations are shown in list form with bullet points.

- Entry 1
- Entry 2

Actions

Action instructions are indicated by a preceding triangle. The result of an action is indicated by an arrow.

➢ Action instruction 1.
↳ Action result.
➢ Action instruction 2.

Syntax

Numbers:

- Decimal numbers are shown without additional indicators (e.g. 123)
- Hexadecimal numbers are shown with the additional indicator hex (e.g. 00hex)

Cross-references

Cross-references indicate where additional information on the topic can be found.

1.4 Symbols

Note
This symbol indicates general notes.

Attention!
This symbol indicates as security notice which most be observed.

1.5 Abbreviations

BNI	Balluff Network Interface
EMC	Electromagnetic Compatibility
FE	Function ground
IOL	IO-Link
USB	Universal Serial Bus

1.6 Deviating views

Product views and illustrations in this user's guide may differ from the actual product. They are intended only as illustrative material.

2 Safety

2.1 Intended use

The BNI USB IO-Link Master is an IO-Link Master module for connecting IO-Link devices to the PC. Used together with the supplied PC software, this unit allows you to configure and test IO-Link devices or demonstrate device functions.
The PC software may not be used while the system is running in production conditions.

2.2 Installation and Startup

Attention!
Installation and startup are to be performed by trained technical personnel only. Skilled specialists are people who are familiar with the work such as installation and the operation of the product and have the necessary qualifications for these tasks. Any damage resulting from unauthorized tampering or improper use shall void warranty and liability claims against the manufacturer. The operator is responsible for ensuring that the valid safety and accident prevention regulations are observed in specific individual cases.

2.3 General safety notes

Commissioning and inspection
Before commissioning, carefully read the User's Guide.
The system must not be used in applications in which the safety of persons depends on the function of the device.
Intended use
Warranty and liability claims against the manufacturer shall be rendered void by damage from:

- Unauthorized tampering
- Improper use
- Use, installation or handling contrary to the instructions provided in this User's Guide.

Obligations of the owner/operator
The device is a piece of equipment in accordance with EMC Class A. This device can produce RF noise. The owner/operator must take appropriate precautionary measures against this for its use. The device may be used only with a power supply approved for this. Only approved cables may be connected.
Malfunctions
In the event of defects and device malfunctions that cannot be rectified, the device must be taken out of operation and protected against unauthorized use.
Intended use is ensured only when the housing is fully installed.

2.4 Resistance to Aggressive Substances

Attention!
The BNI modules always have good chemical and oil resistance. When used in aggressive media (such as chemicals, oils, lubricants and coolants, each in a high concentration (i.e. too little water content)), the material must first be checked for resistance in the particular application. No defect claims may be asserted in the event of a failure or damage to the BNI modules caused by such aggressive media.

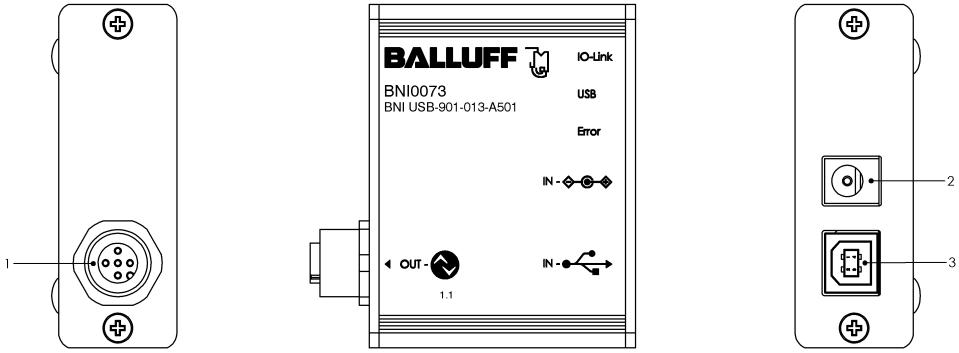
Dangerous Voltage

Attention!
Before working on the device, switch off its power supply.

Note
In the interest of continuous improvement of the product,
Balluff GmbH reserves the right to change the technical data of the product and the content of these instructions at any time without notice.

3 Getting Started

3.1 Connection overview BNI USB-901-013-A501



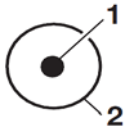
1 IO-Link Port
2 Supply voltage
3 USB Port

3.2 Electrical connection

The USB IO-Link Master module can be operated with or without the included AC adapter. Without the AC adapter the IO-Link Master provides approx. 40 mA at 24 V. This is sufficient for operating IO-Link devices.
If more current, including start-up current, is required for the IO-Link device, the AC adapter must be used.
Some laptops and notebooks are especially sensitive to start-up currents. When in doubt, always use the AC adapter.

Attention!
If the IO-Link device requires more than 40 mA, the AC adapter must be used!

AC adapter

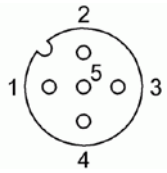


Pin	Function	Description
1	+24 V	Module power supply
2	GND	GND Module power supply

➢ Connect the supply voltage from the included AC adapter to the USB IO-Link Master module.

3.3 IO-Link connection

The IO-Link connection is made using an M12 connector (A-coded, female)



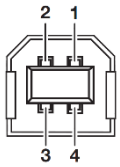
M12
A-coded
female

Pin	Function	Description
1	+24V 1.6A/40mA	Device power supply
2	n.c.	-
3	GND	GND Device power supply
4	C/Q	IO-Link-Data transmission channel
5	n.c.	-

- Connect IO-Link device using standard sensor cable (3-, 4- or 5-conductor, M12 connector).

3.4 USB connection

The USB connection is made using the included USB cable.



USB-port

Pin	Function	Description
1	+5V	Module power supply
2	D-	Data-
3	D+	Data+
4	GND	GND Module power supply

- Connect USB IO-Link Master module to the PC using the included USB cable.

3 Getting Started

3.5 Installing software

System requirements:

- Standard-PC
- Windows operating system
- 500 MB available hard disk space
- USB port

Note
Installation requires administrator rights on the PC.

Installation

Installation is done using an Installation Wizard which guides you through the individual steps.

Note
During the software installation the USB IO-Link Master module may not be connected to the PC.

- ➢ Be sure that the system requirements are met.
- ➢ Insert software CD in the CD drive of the PC or start the downloaded installation file.
- ↳ The installation software starts automatically.
  If the installation does not start automatically, change to the "autorun" directory in the CD and start the application "autorun.exe".
- ↳ The first page of the Installation Wizard is displayed.
- ➢ Start the installation.
- ↳ The Wizard guides you through the remaining installation steps.

After the installation you may connect the USB IO-Link Master to the computer. Note the power supply instructions (see section 3.2 "Electrical connection“).

After first starting up the tool, select the language and refresh the device catalog. Corresponding descriptions are contained in the online Help.

User roles and passwords

The IO-Link Device Tool supports various user roles. The role may be selected at start. For "Maintenance" and "Specialist" roles, a password must be entered.
As a "Specialist" you can set new passwords.

Presetting the passwords:

Role	Password
Operator	No password
Maintenance	maintain
Specialist	special

3.6 Working with the IO-Link Device Tool

A detailed description of the windows, dialogs and individual menu commands is contained in the convenient online Help.
As an aid to using the Point-to-Point Test-Tool between the USB IO-Link Master and the IO-Link device an example follows showing the procedure for connecting the USB IO-Link Master to a Smart Light.

Note
Before starting the IO-Link Device Tool the USB IO-Link Master must be correctly connected to the PC and IO-Link device.
Changing IO-Link devices is permitted only in offline mode.

Starting the application

➢ Start the IO-Link Device Tool by double-clicking on the desktop icon.
↳ The start screen is displayed.
↳ The "User Login" window opens.

Fig. 3-2: Start screen showing version information

3 Getting Started

Entering a password

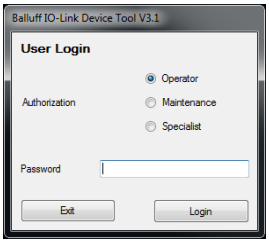


Fig. 3-3: Entering a password in the "User Login" window.

To set configurations and test environments, you must log in as a "Specialist". The preset password for the "Specialist" user role is "special".

- ➢ Select "Specialist" option, enter password and confirm with [Login].
- ↳ The application is started and the main window displayed.

The Main window

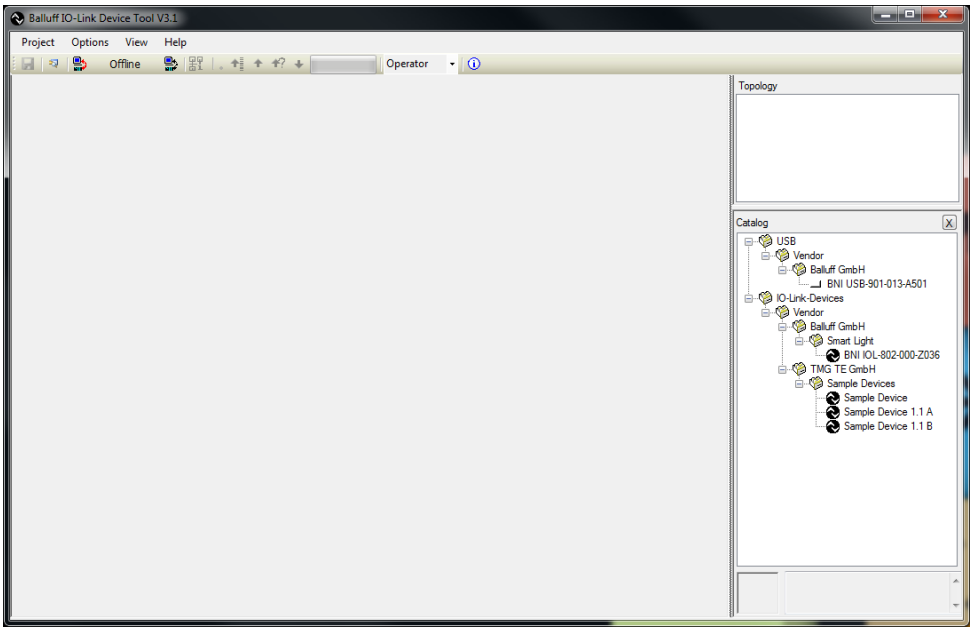


Fig. 3-4: The main window

The menu page is divided into 3 areas:

Topology: Assembling the individual hardware components from the "Catalog" area for a test configuration.

Center Area: Here you can display device data and manipulate them (e.g. process data, parameter data).

Catalog: Listing and selecting the existing devices and components.

Selecting USB IO-Link Master

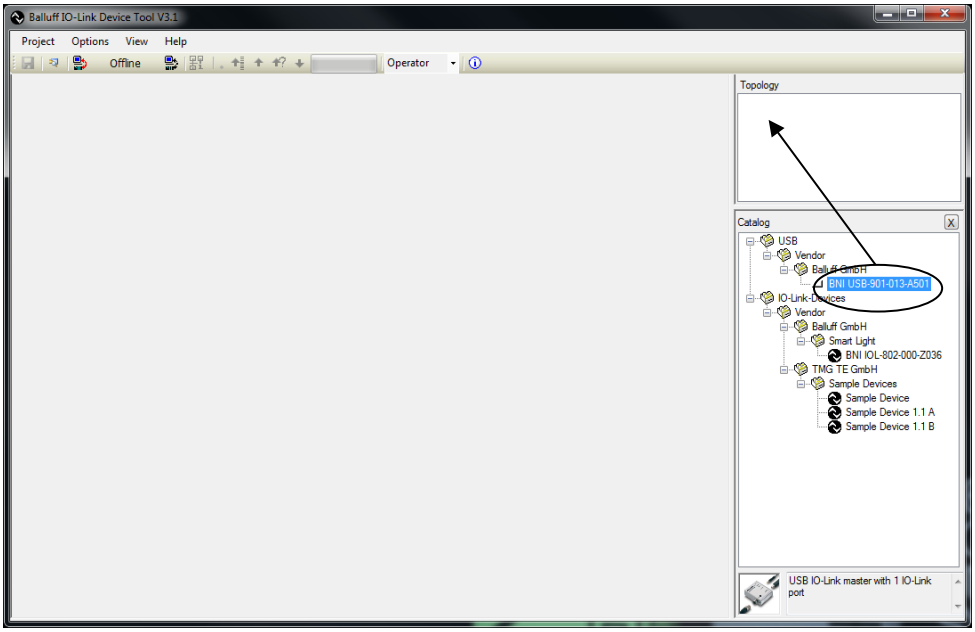


Fig. 3-5: Select IO-Link Master and drag into the "Topology" area.

- ➢ Under "Catalog" select the Balluff USB IO-Link Master module.
- ➢ Drag the module into the "Topology" area.
- ↳ The module is displayed in the "Topology" area.

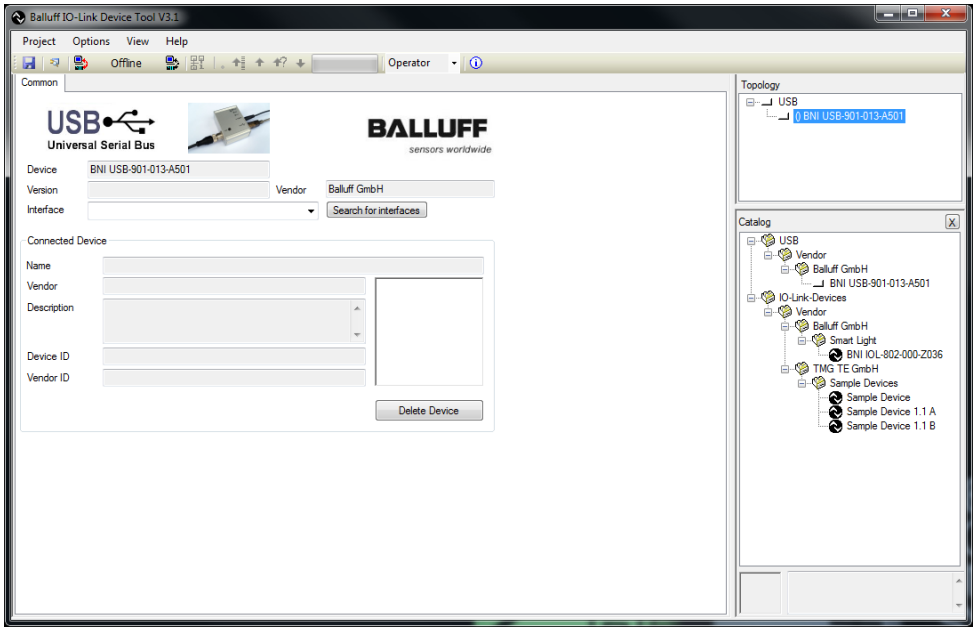


Fig. 3-6: IO-Link Master-Modul im Bereich "Topologie".

3 Getting Started

Opening a data connection

➢ Select the IO-Link Master module in the "Topology" area.
↳ The data are displayed in the center area of the main window on the "Common" tab.

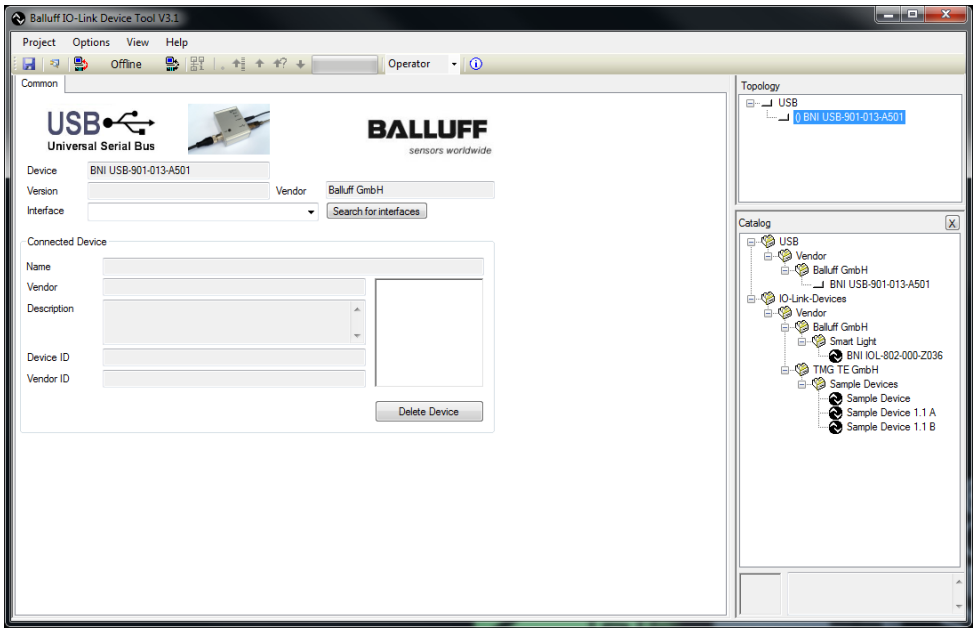


Fig. 3-7: Device data in the "Common" area.

To establish the data connection via IO-Link, the interface must be selected:

➢ Expand the "Interface" selection field.
➢ Select "BNI USB-901-013-A501". The USB IO-Link Master module is automatically entered in the selection list during software installation.

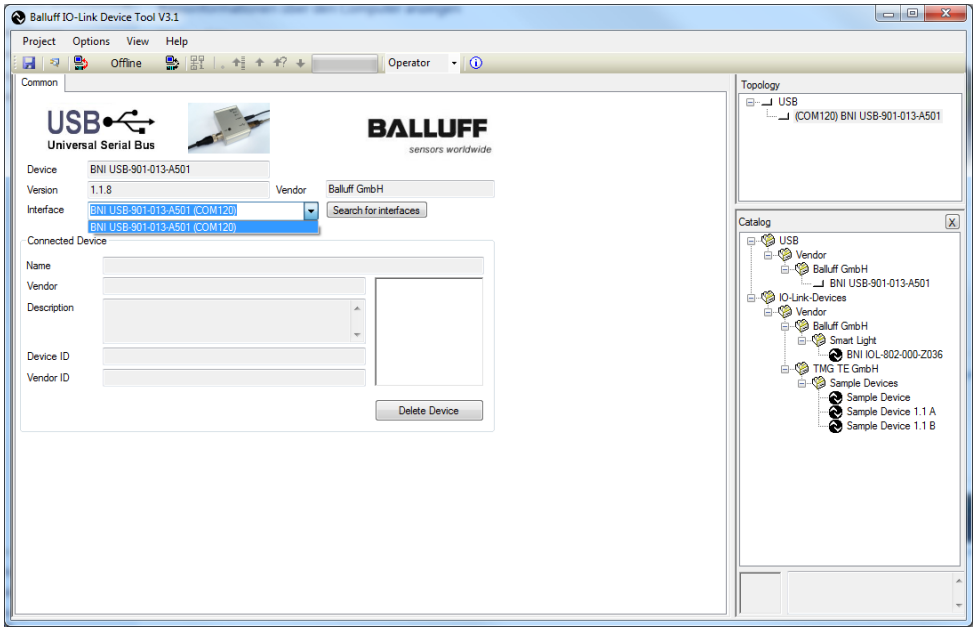


Fig. 3-8: Selecting the interface.

Selecting the IO-Link device

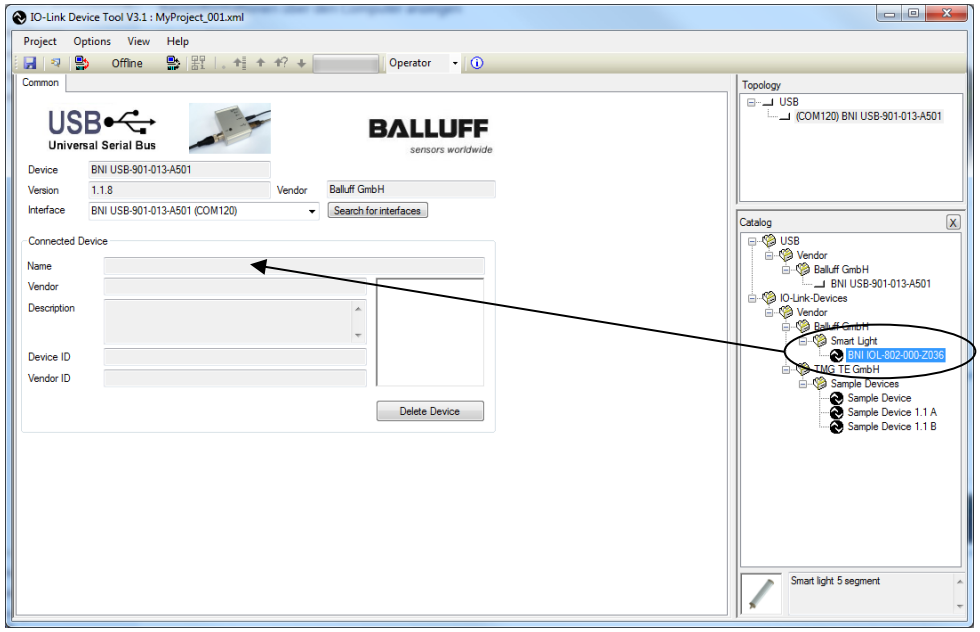


Fig. 3-9: Selecting the IO-Link device.

- ➢ Select the IO-Link device in the "Catalog" area.
- ➢ Drag the selected device into the "Connected Device" area.
- ↳ The IO-Link device data are available in the information field for further analysis and processing.

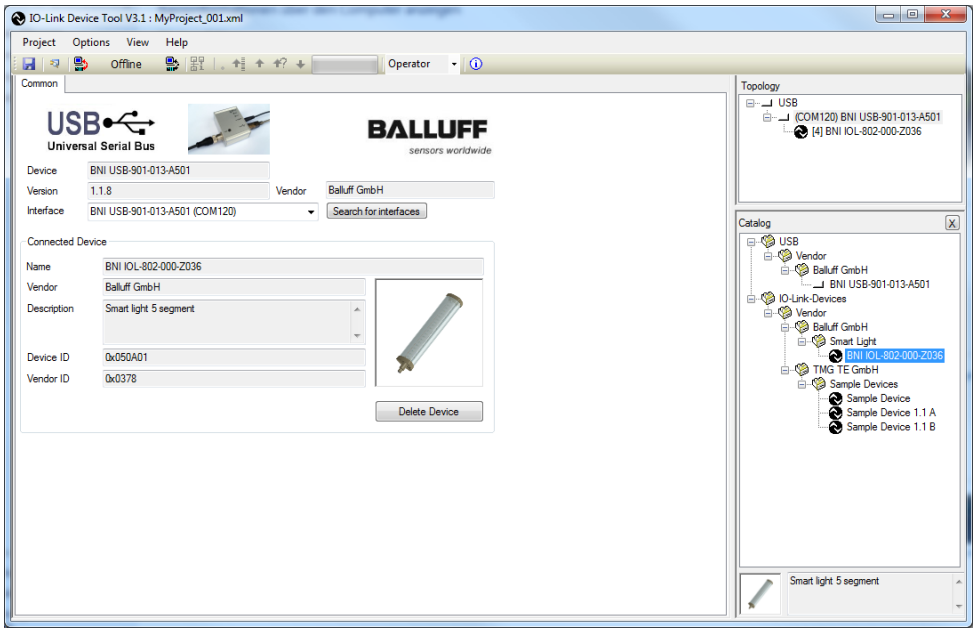


Fig. 3-10: IO-Link device in the "Topology" area.

3 Getting Started

Access to process and parameter data

➢ Select the IO-Link device in the "Topology" area.
↳ The process and parameter data are shown on additional tabs where they can be edited.

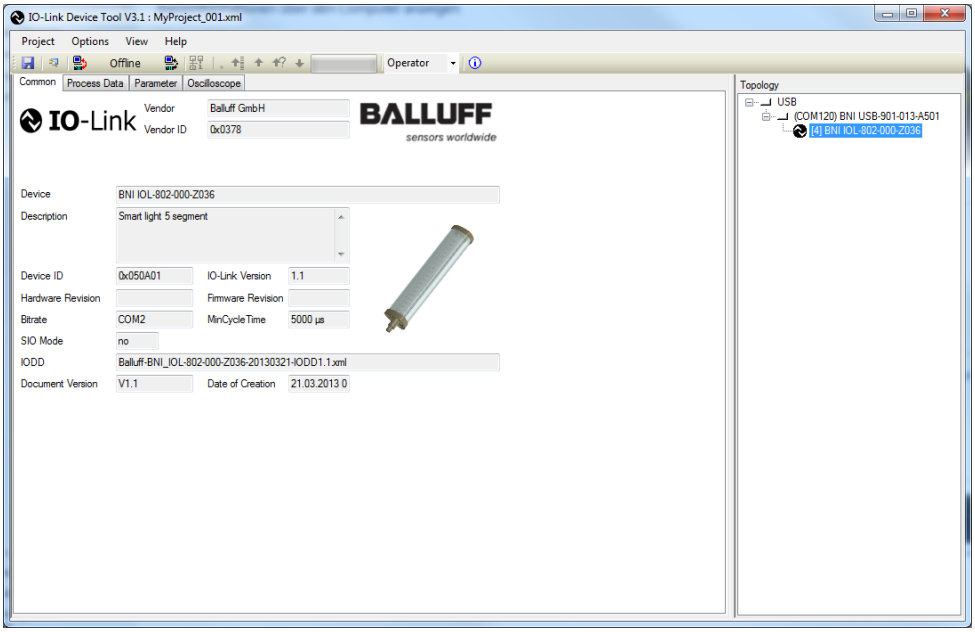


Fig.3-11: The device data are displayed.

Establishing a connection

For communication between the USB IO-Link Master and IO-Link device you must establish a connection. The online connection status is indicated by the flashing "Online" text in the status line.

➢ Click on the "Connect" icon.
↳ The connection is established.

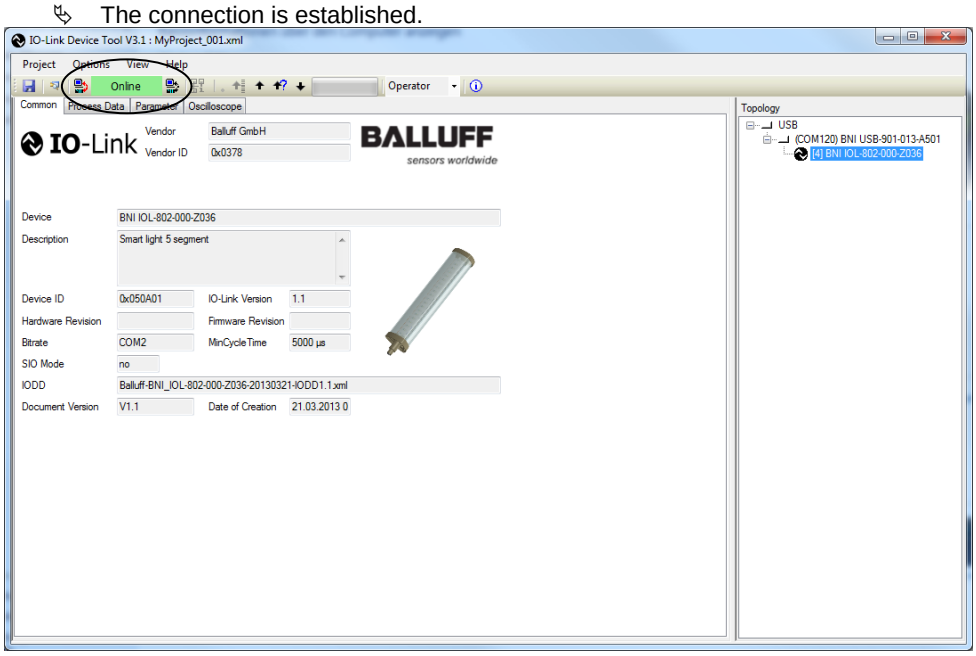


Fig. 3-12: Establishing the online connection to the IO-Link device.

Displaying the process data

Note
Before selecting another IO-Link device, you must switch to offline mode.

The process data shown in the following are an example for Smart Light BNI IOL-802-000-Z036. Process data such as the following are displayed:

- Segment x blinks
- Color of segment x

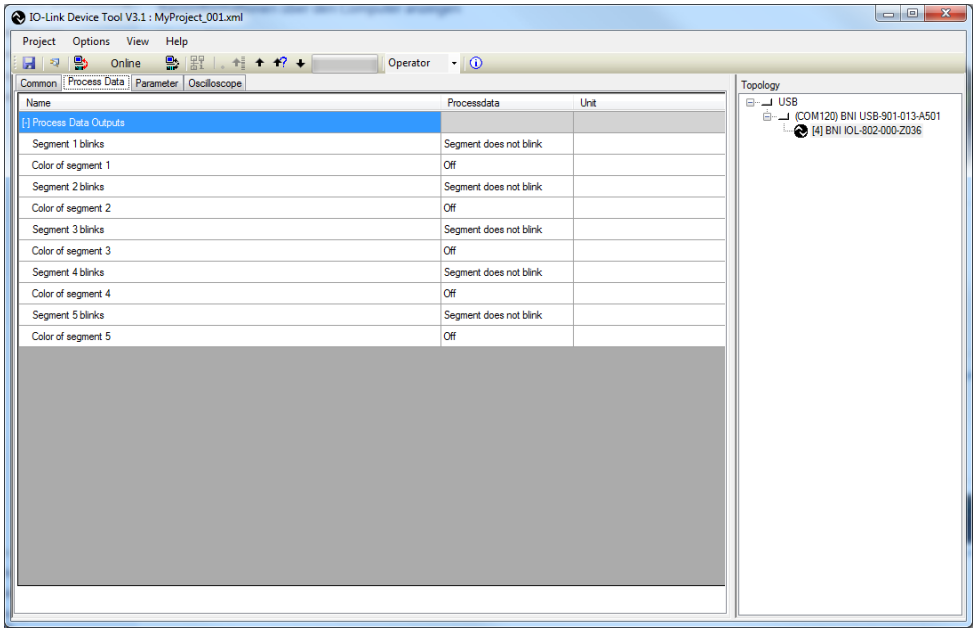


Fig. 3-13: The process data of the IO-Link device.

3 Getting Started

Setting parameters

On the "Parameters" tab the default values of the IO-Link device are displayed. The values can be changed and the IO-Link device can be updated with the modified parameters.

- ➢ Switch to "Parameters" tab
- ↳ The default values for the switching thresholds are displayed.

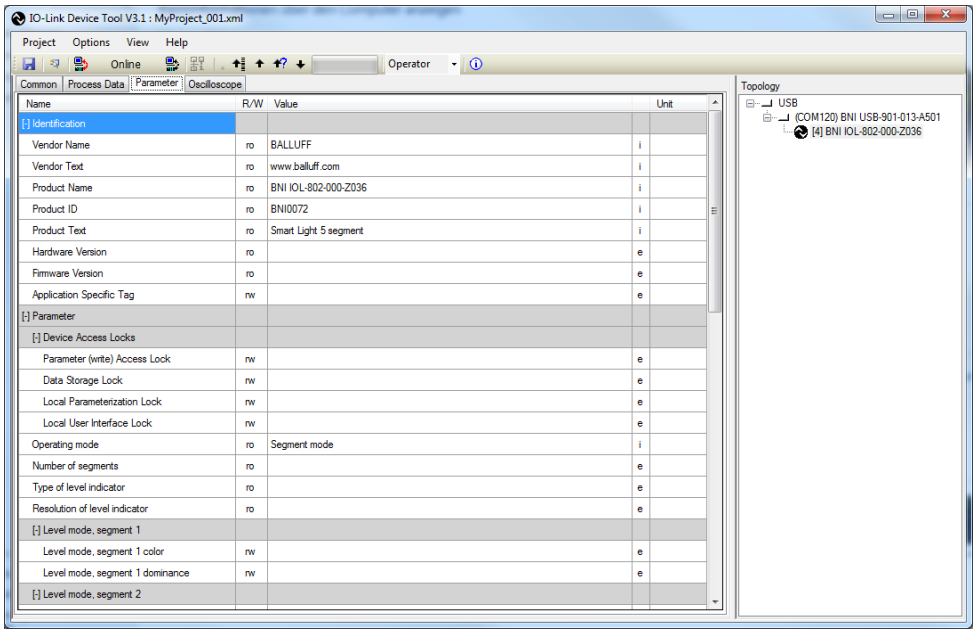


Fig. 3-14: Parameter data for the IO-Link device.

Example: Change a value for the operating mode.

- ➢ Clicking on the specific value with the right mouse button in the "Value" column, example for operating mode.
- ↳ You may enter a new value.

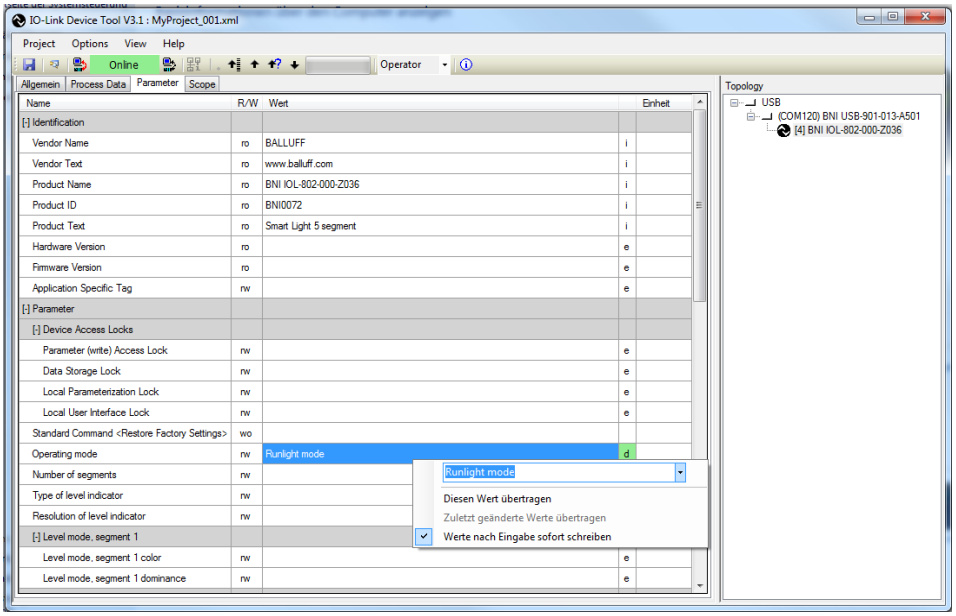


Fig. 3-15: Changing IO-Link device parameters.

4 Technical Data

4.1 Dimensions

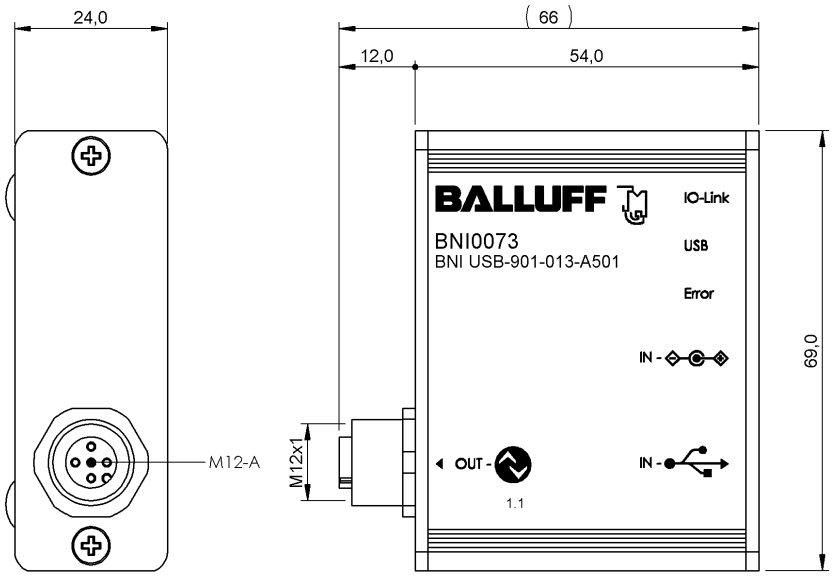


Fig. 4-1: Dimensions in mm

4.2 Mechanical data

Housing material	Anodized aluminum profile housing
IO-Link Port	M12, A-coded, female
Enclosure rating	IP20
Dimensions (L x W x H, excluding connector)	66 x 24 x 69 mm

4.3 Electrical data

Operating voltage	24 V DC, per EN 61131-2
Current draw without load	0.1 mA

4.4 IO-Link data

Baud rate	COM1, COM2
Frame typ	1; 2.x; 3

4.5 Operating conditions

Ambient temperature	-5° C……+55° C
Storage temperature	-25° C……+70° C

4 Technical Data

4.6 Function indicators

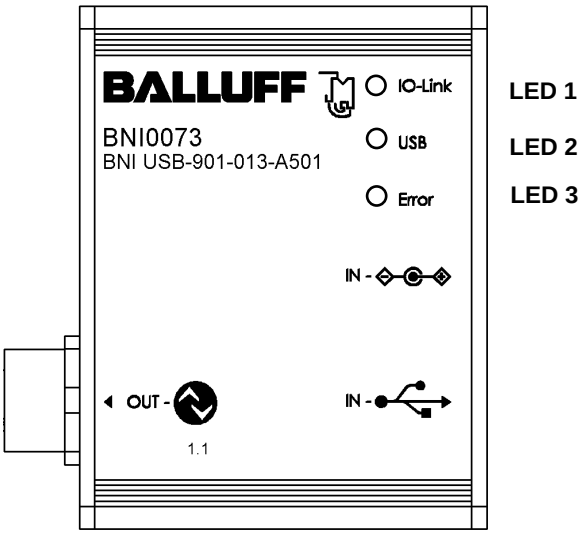
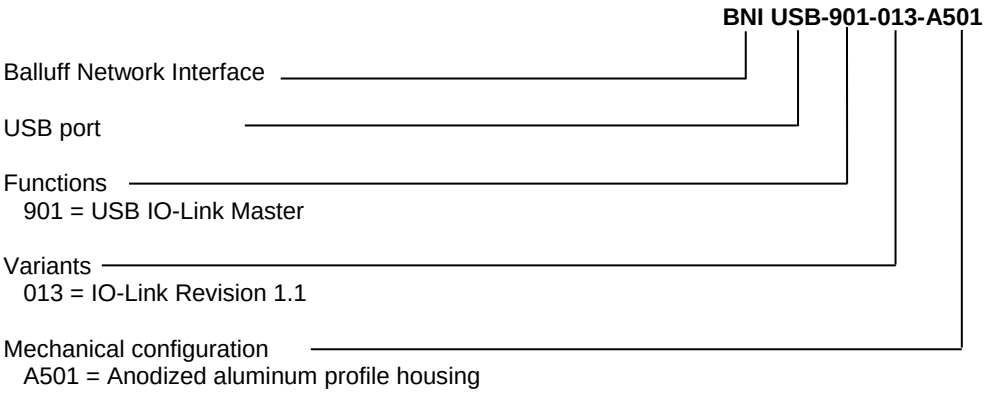


Fig. 4-2: LED indicators

LED	Display	Function
LED 1 IO-Link interface	green	IO-Link connection active.
	green flashing	No IO-Link connection.
LED 2 USB port	yellow	While data are being sent the LED flickers.
LED 3 Error indicator	red	On when an error has occurred (short circuit, data transmission error.)

5 Appendix

Ordering code



Order Information

Product odering code	Ordering code
BNI USB-901-013-A501	BNI0073

www.balluff.com

No. 898562-726 E •02.127248 • Edition I18 • Replaces Edition J15 • Subject to modification

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