User Manual

netFIELD Device Wireless Bridge Class A

NFD-BRIDGE-IOLSA\W

Hilscher Gesellschaft für Systemautomation mbH
www.hilscher.com

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Table of contents

1 Introduction

1.1 About the user manual

This user manual describes the Wireless Bridge NFD-BRIDGE-IOLSA\W.

1.2 List of revisions

Index	Date	Revision
1	2022-02-04	Document created.
2	2022-02-18	Correction in *Device views and location of the connectors* [▷ page 10]: connections (1) and (2) reversed
3	2022-04-06	Positions of reversed connections (1) and (2) in *Connectors* [▷ page 11] corrected

Table 1: List of revisions

1.3 Conventions in this manual

Notes, instructions and results of operating steps are marked as follows:

Notes

Important:
<important note you must follow to avoid malfunction>

Note:
<general note>

<note where to find further information>

Instructions

1. Operation purpose
2. Operation purpose
   ➢ Instruction

Results

Intermediate result

Final result

2 Safety

2.1 General note

2.1.1 Compliance with the legal requirements

Comply with all legal requirements. Observe all relevant regional, national and international standards, accident prevention and mounting instructions as well as the EMC regulations when commissioning and using the product.

2.1.2 Handling the documentation

The documentation (user manual, accompanying texts, etc.) has been created for the use of the product by personnel that is qualified for and skilled in electrical/electronic professions. Observe all safety instructions, warning notes, and applicable regulations when using the product. Technical knowledge is required.

Read the user information completely and carefully before commissioning or using the product. The documentation is part of the product. Therefore, keep the documentation at hand for the entire life cycle of the product. Also give the documentation to subsequent users of the product.

2.1.3 Personnel qualification

Only electrical/electronics personnel qualified according to EN 50110-1/-2 and IEC 60364 is allowed to install, configure, operate or remove the Wireless Bridge.

The personnel must have the following qualifications required for electrical/ electronic professions:

- Health and safety at work
- Installing and connecting electrical equipment
- Measuring and analyzing electrical functions and systems
- Evaluating the safety of electrical installations and equipment
- Installing and configuring IT systems

2.1.4 References safety

[S1] ANSI Z535.6-2006 American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials

[S2] IEC 60950-1, Information technology equipment - Safety - Part 1: General requirements, (IEC 60950-1:2005, modified); German Edition EN 60950-1:2006

[S3] EN 61340-5-1 and EN 61340-5-2 as well as IEC 61340-5-1 and IEC 61340-5-2

2.1.5 Checking for transport damage

Before commissioning, check the Wireless Bridge NFD-BRIDGE-IOLSA\W for possible transport damage. Do not operate the Wireless Bridge if it is damaged.

2.2 Intended use

The Wireless Bridge NFD-BRIDGE-IOLSA\W is used in an IO-Link wireless network to wirelessly

- detect digital field signals from IO-Link sensors,
- control IO-Link actuators via digital field signals, and
- connect an IO-Link hub.

The product has been designed for use in industrial indoor areas without exposure to weathering (e.g. direct sunlight, salt water, and salt spray).

2.3 Safety instructions to avoid personal injury

To avoid personal injury, be sure to read, understand, and observe the following safety instructions and all warnings in this manual regarding hazards that may cause personal injury before installing and operating the Wireless Bridge NFD-BRIDGE-IOLSA\W.

2.3.1 Risk of unsafe plant operation

NOTICE

Risk of unsafe plant operation

To prevent possible personal injury or property damage, do not remove this device from a production plant without ensuring a safe operation of the plant during or after the removal of the device.

2.4 Safety instructions to avoid property damage

To avoid property damage to the NFD-BRIDGE-IOLSA\W Wireless Bridge or your system, be sure to read, understand, and observe the following safety instructions and all warnings in this manual for possible property damage before installing and operating the Wireless Bridge.

2.4.1 Device destruction by exceeding allowed supply voltage

Operate the Wireless Bridge NFD-BRIDGE-IOLSA\W only with the specified supply voltage. Use only 24 V DC PELV (Protective Extra Low voltage) or SELV (Safety Extra Low voltage) voltage sources.

- To avoid damaging or destroying the Wireless Bridge, do not exceed the permitted range of the supply voltage. A supply voltage above the upper limit may damage or destroy the Wireless Bridge!
- To avoid malfunctions of the Wireless Bridge, do not go below the allowed range of the supply voltage. Depending on the type of plant in which the bridge is installed, this my lead to further hazards.

For the permitted tolerance range of the supply voltage of the Wireless Bridge NFD-BRIDGE-IOLSA\W, see section *Technical data NFD-BRIDGE-IOLSA\W* [page 21] of this manual.

2.4.2 Observe the current requirement of the connected IO-Link Device

Important:
The connected IO-Link device takes the supply current it needs from the Wireless Bridge (signal L+ at pin 1 of the M12-socket IO-Link, see *IO-Link Device* [page 11]). In continuous operation, the current draw from the Wireless Bridge must not exceed 1A (at 24 V). This limit value can be exceeded for max. 30 minutes by max. 20%. Exceeding the limit value for more than max. 30 minutes or by more than max. 20% can destroy the bridge.

2.4.3 Electrostatic sensitive devices

The Wireless Bridge NFD-BRIDGE-IOLSA\W is sensitive to electrostatic discharge. Electrostatic discharge can damage the inside of the Wireless Bridge or impair normal operation.

Therefore, observe the necessary precautions for electrostatically sensitive components when installing and replacing the Wireless Bridge:

- Before the installion a/o exchange, touch a grounded object to discharge electrostatic potential.
- Wear an approved grounding wrist strap.
- If possible, work at a workplace that is protected against electrostatic charge.
- When the device is not in use, keep it in its protective packaging to avoid electrostatic charging.

References Safety [S3]

2.4.4 No reverse polarity protection

Note that the Wireless Bridge is not protected against reverse polarity (polarity reversal).

3 Functional description and requirements

3.1 Function description

The netFIELD IO-Link Wireless Bridge NFD-BRIDGE-IOLSA\W serves as an IO-Link Wireless Class A bridge in a housing of protection class IP67. The bridge connects a wired IO-Link Device (class A) via radio to an IO-Link Wireless Master and supplies it with power.

- From the perspective of the IO-Link wireless radio network, the NFD-BRIDGE-IOLSA\W represents an IO-Link Wireless Device (slave device). This wireless device provides the entire functionality of the IO-Link Device connected to the bridge.
- From the perspective of the connected wired IO-Link Device, the NFD-BRIDGE-IOLSA\W represents an IO-Link Master.

The Wireless Bridge NFD-BRIDGE-IOLSA\W

- detects the incoming digital field signals of connected sensors and sends them via radio to the superordinate IO-Link Wireless Master.
- controls connected actuators via outgoing digital field signals according to the control commands received via radio from the superior IO-Link Wireless Master.

The NFD-BRIDGE-IOLSA\W Wireless Bridge is parameterized and configured via the configuration tool of the used IO-Link Wireless Master. The bridge stores the configuration parameters internally.

The housing of protection class IP67 protects the NFD-BRIDGE-IOLSA\W against dust and an immersion of max. 30 minutes in water of max. 1 m depth.

3.2 Requirements

3.2.1 Power supply

The Wireless Bridge requires an insulated power source that meets at least one of the following requirements:

- 24 V power supply (SELV or PELV, permissible supply voltage: 18 to 31.2 V)
- Limited Energy Circuit according to UL/CSA 61010-1
- Limited Power Source (LPS) according to (UL/CSA 60950-1 or EN 62368-1, Annex Q)
- Class 2 supply Source according to the National Electrical Code (NEC), NFPA 70, Clause 725.121 and Canadian Electrical Code (CEC), Part I, C22.1)

3.2.2 Hardware

To work with the Wireless Bridge, you need the following hardware:

- The Wireless Bridge NFD-BRIDGE-IOLSA\W
- An IO-Link Device that is to be connected wirelessly via IO-Link Wireless (e.g. a sensor, an actuator or a hub).
- An IO-Link Wireless Master (e.g. Hilscher NFD-3090 series for various Real-Time Ethernet systems)
- An IO-Link cable with M12 connector (A-coded) for connecting the Wireless Bridge to the voltage supply
- If a direct plug connection between Wireless Bridge and IO-Link Device is neither possible nor desired, use another IO-Link cable with an A-coded M12 connector to connect the Wireless Bridge to the IO-Link Device.

3.2.3 Requirements for operation

Moreover, the following requirements must be met:

- The IO-Link Wireless Master is installed and in operation. To start up and administer the IO-Link Wireless Master, you need a PC with a Web browser or a suitable configuration software.
- The Wireless Bridge is located within the radio reception area of the IO-Link Wireless Master.

For information on the extent of the radio reception area, see the documentation of the IO-Link Wireless Master.

4 Device views and connectors

4.1 Device views and location of the connectors

Wireless Bridge, front side

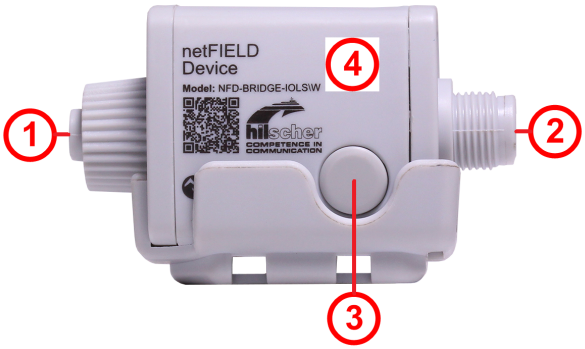


Figure 1: Location of the connections - Wireless Bridge, front side

(1) Connection for IO-Link Device (Class A)
(2) Connection for supply voltage
(3) Pairing push-button
(4) 2.4 GHz IO-Link wireless radio transmitter integrated in the housing

Table 2: Wireless Bridge, front side

The following figures show the Wireless Bridge NFD-BRIDGE-IOLSA\W in oblique view and top view; with mounting bracket (clip), figures on the right, and without clip, figures on the left.

Oblique view without mounting bracket	Oblique view with mounting bracket
	
Front view without mounting bracket	**Front view with mounting bracket**
	

Table 3: Oblique view and front view without and with mounting bracket (clip)

4.2 Connectors

4.2.1 Supply voltage

See position (2) in *Device views and location of the connectors* [page 10].

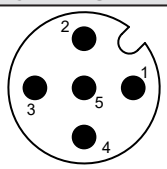
Supply voltage	Pin	Signal	Description
 M12, A-coded, connector, 5-pole	1	L+	24 V DC supply voltage
	2	n.c.	Not connected
	3	L-	Reference potential for L+ (GND)
	4	n.c.	Not connected
	5	n.c.	Not connected

Table 4: Supply voltage and IO-Link

4.2.2 IO-Link Device

See position (1) in *Device views and location of the connectors* [page 10].

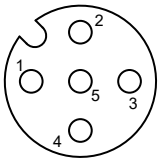
IO-Link port (class A)	Pin	Signal	Description
 M12, A-coded, socket, 5-pole	1	L+	+24 V DC supply voltage for sensor/ actuator
	2	n.c.	Not connected
	3	L-	Reference potential for L+
	4	CQ	IO-Link data
	5	n.c.	Not connected

Table 5: IO-Link port (class A)

4.3 Push-button for pairing function

Before the wireless data exchange is possible, a pairing process must be carried out between the Wireless Bridge and an IO-Link Wireless Master. This coupling process is also called "pairing".

- ➢ Make sure that the Wireless Bridge is located in the radio reception area of the IO-Link Wireless Master.
- ➢ To trigger pairing, press the button **Pairing** (3).
- ⇨ If the pairing is successful, the status LED flash code changes from "flashing purple" to "flashing blue".

4.4 Device label

The device label of each Wireless Bridge NFD-BRIDGE-IOLSA\W contains the following information:

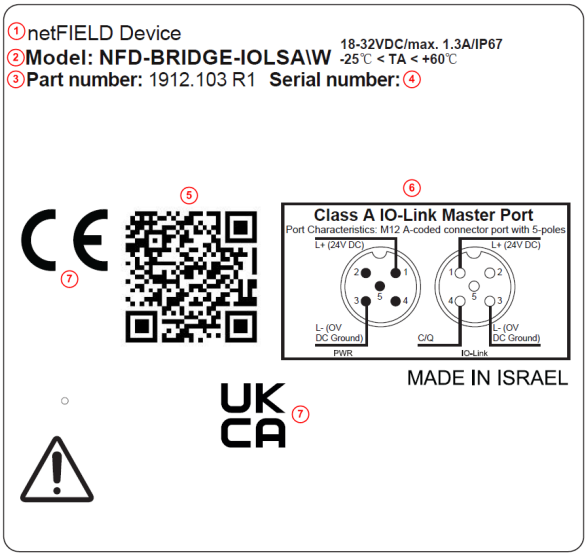


Figure 2: Device label Wireless Bridge NFD-BRIDGE-IOLSA\W

(1) Name of dDevice family (netField device)
(2) Part designation (NFD-BRIDGE-IOLSA\W)
(3) Part number (including hardware revision number)
(4) Individual serial number of the device
(5) Matrix label (QR code)
(6) Sketches for wiring the PWR and IO-Link connections
(7) Symbol area, contains the CE mark and marks of further international approvals

The matrix label on the device label contains a QR code according to ISO/IEC 18004. By scanning this QR code, you get 2 lines of text with the following information:

Line 1: Bridge part number + hardware revision number + individual bridge serial number. Example: `1912.103 R1 20000`

Line 2: URL with a link to the product description in the product knowledge base

5 Diagnosis with LEDs

5.1 Location of the LEDs

The following figure shows the location of the LEDs on the side of the Wireless Bridge:

Figure 3: Side view of the Wireless Bridge with LEDs

(1) Status LED (RGB)
(2) Power LED (green)

5.2 LED descriptions

5.2.1 Power LED

Power LED (1) indicates the status of the power supply.

LED color	Description
● (green)	Supply voltage is applied

Table 6: Power LED (green)

If the Power LED does not light up although a power supply is connected to the Wireless Bridge, this can have two reasons:

- The power supply is not connected correctly, e.g. insufficient contact.
- The power supply delivers a voltage that is not within the permissible voltage range.

5.2.2 Status LED

The color of the status LED (2) indicates the status of the wireless and wired IO-Link communication:

LED color	Description
(purple)	Wireless: Not paired
(blue)	Wireless: Paired
(green)	Wired IO-Link Device: Ready for operation
(yellow)	Wired IO-Link Device: Not ready for operation
(white)	Wireless operation error
(green, blinking)	Device is in the mode "Firmware Update"

Table 7: Status LED (RGB)

By blinking alternately in 2 colors, the status LED indicates the connection status of the connected IO-Link Device as well as the IO-Link wireless communication status with the IO-Link Wireless Master.

The following table shows the possible flash code combinations:

	IO-Link wireless, paired	IO-Link wireless, unpaired
IO-Link ready for operation	blue/green alternately	purple/green alternately
IO-Link not ready for operation	blue/yellow alternately	purple/yellow alternately

Table 8: Assignment of the blink codes to the IO-Link states

Blink code	Status of IO-Link Device communication	Status der IO-Link Wireless communikation	Recommended procedure
blue/green alternately	Communication OK	Paired – Successful pairing between Wireless Bridge and IO-Link Wireless Master.	No action required.
purple/green alternately	Communication OK	Not paired – Pairing required between Wireless Bridge and IO-Link Wireless Master.	Use the configuration software of the IO-Link Wireless Master to scan for new devices and to perform a new pairing.
blue/yellow alternately	No communication with the IO-Link Device	Paired – Wireless Bridge and IO-Link Wireless Master paired successfully.	Check the connected IO-Link Device for proper function and correct connection to the Wireless Bridge.
purple/yellow alternately	No communication with the IO-Link Device	Not paired – Pairing required between Wireless Bridge and IO-Link Wireless Master.	Briefly turn off the voltage at the Wireless Bridge, and turn it on again. Use the configuration software of the IO-Link Wireless Master to rescan for new devices and to perform a new pairing.

Table 9: Recommended procedure depending on the indicated blink code

6 Mounting and commissioning

6.1 Mounting

Taking all safety aspects into account, mount the Wireless Bridge as close as possible to the IO-Link Device that is to integrate the bridge into a wireless network via IO-Link wireless.

If required, the Wireless Bridge can be mounted with or without the bracket (clip) which is available from Hilscher as an accessory.

6.1.1 Before mounting

Planning and preparation

Observe the following notes:

- Only electrical/electronics personnel qualified according to EN 50110-1/-2 and IEC 60364 is allowed to mount and commission the Wireless Bridge.
- Before you start mounting the Wireless Bridge, always read and follow all safety instructions in chapter *Safety* [page 5].
- Before you start mounting the Wireless Bridge, check it for damage, e.g. transport damage! Damaged devices must not be commissioned.

Choosing the mounting location

When you choose the mounting location of the Wireless Bridge, pay special attention to the following points:

- The mounting location should be as close as possible to the IO-Link Wireless Master, and it should provide a good reception quality for the IO-Link wireless signals. There should not be any metallic objects in the direct connection line between the Wireless Bridge and the IO-Link Wireless Master. If you mount the Wireless Bridge in a way that allows motion, a reception of sufficient quality must be possible within its entire range of motion.
- Do not mount the Wireless Bridge in the immediate vicinity of objects or devices that may become hot.
- Mount the Wireless Bridge in such a way that it is protected from weathering (e.g. direct sunlight, salt water or salt spray).
- Do not mount the Wireless Bridge in locations above 2000 meters above sea level.
- To protect the Wireless Bridge from mechanical tension, fix its clip with screws on flat surfaces only.
- Comply with the requirements on vibration and shock loads, especially at the mounting point of the Wireless Bridge.
- Leave enough space for an easy replacement of the Wireless Bridge and for connecting the connectors.
- Mount the device in such a way that the diagnostic LEDs of the Wireless Bridge are always visible.

Before and during the mounting, observe the following instructions:

- Before you start the mounting, the **power supply MUST be switched off**.
- Avoid contaminating the connections during the installation. Contamination damages the contacts and reduces contact safety.

Further information

Observe the following notes:

- Do not mount the Wireless Bridge on or near highly flammable materials!
- Provide for an unobstructed air supply.

6.1.2 Mounting without clip

To mount the Wireless Bridge without clip, simply plug it onto the IO-Link Device to be connected. A cable connection from the Wireless Bridge to the IO-Link Device is possible, too. For information on the electrical connection, see section *Commissioning (IO-Link side)* [page 17].

6.1.3 Mounting with clip

With the clip, Hilscher offers an easy-to-use retaining bracket. The clip makes it easier to mount the Wireless Bridge to flanges, machines, equipment, and other flat surfaces. With M3 screws or cable ties it can easily be fixed and, if required, easily be removed again.

The illustrations below show the clip from all sides with the dimensions of the clip.

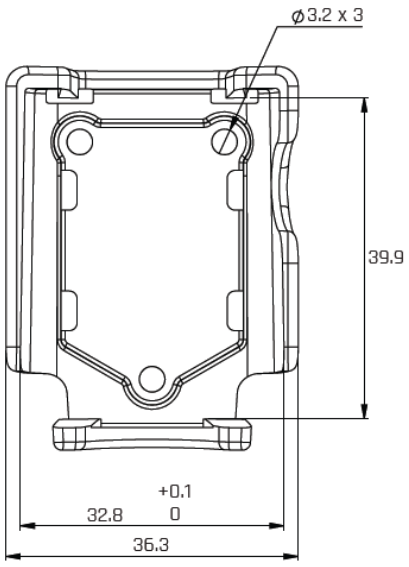


Figure 4: Clip (without device) – front view

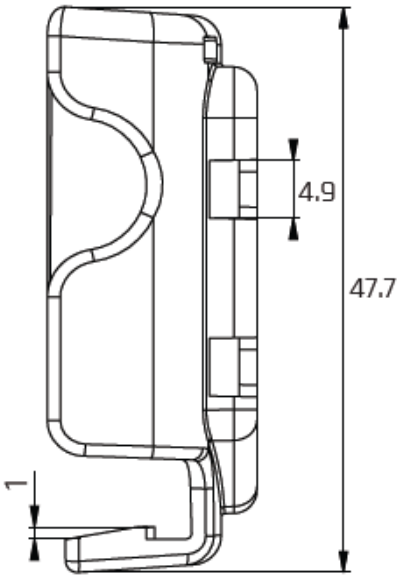


Figure 5: Clip (without device) - side view

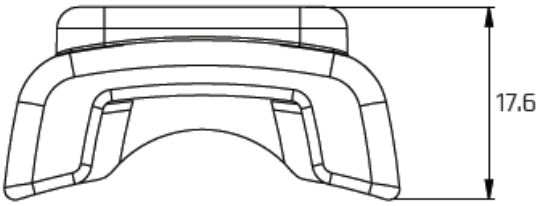


Figure 6: Clip (without device) - top view

For mounting with clip, proceed as follows:

- Use M3 screws or cable ties, e.g., to fix the clip to the flange or mounting surface.
- Attach the Wireless Bridge to the clip.

For removing, proceed as follows:

- Simply pull the Wireless Bridge out of the clip.
- When fixed by screws: Unscrew the clip from the flange or mounting surface.
- When mounted by cable tie: Cut the tie and remove the clip.

6.2 Commissioning (IO-Link side)

The electrical commissioning follows the mounting of the Wireless Bridge. This section describes how to set up the wired IO-Link communication of the bridge.

6.2.1 Commissioning requirements

For commissioning, the following requirements must be met on the side of the IO-Link Wireless Master:

- The IO-Link Wireless Master is connected to the PC.

- On the PC, the configuration software of the IO-Link Wireless Master is installed and ready for operation.
- Alternatively: On the PC, the webserver of the IO-Link Wireless Master is ready for operation.

6.2.2 Step-by-step instructions for commissioning the bridge

To commission an IO-Link Device in an IO-Link wireless radio network using the Wireless Bridge, perform the following steps:

➢ Connect the A-coded M12 supply connector of the Wireless Bridge to the power supply using a suitable M12 cable (24 V SELV/PELV power supply required). Make sure that the cable cross-section of the M12 cable is sufficiently large.

↬ The power LED of the Wireless Bridge emits a green light. If this is not the case, check the power supply.

↬ As soon as the Wireless Bridge is connected to the power supply, a reset cycle occurs. This takes a few seconds. During this period, the status LED shows a signal sequence in red, green, and blue.

↬ As soon as the reset cycle is completed, the status LED starts flashing alternately purple and yellow.

➢ Connect the IO-Link Device (sensor/actuator) as shown in the following figure.

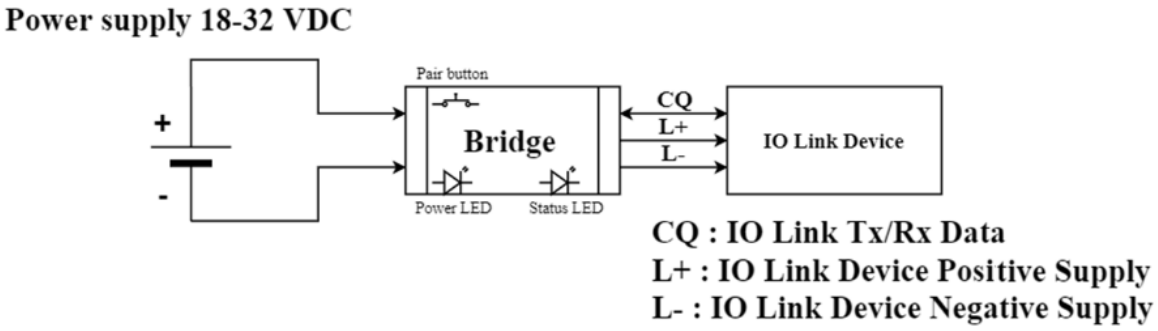


Figure 7: Connection of the IO-Link Device to the Wireless Bridge (block diagram)

⇨ The status LED is flashing alternately purple and green. Now, you can set up and configure the wireless data transfer of the Wireless Bridge.

Note:
Plug the IO-Link Device directly onto the bridge. You can connect, e.g., a sensor, an actuator or an IO-Link hub. You can also use a suitable M12 cable to connect the IO-Link Device to the Wireless Bridge.

Note:
Note Take care that the bridge is always located in the radio range of the IO-Link Wireless Master in whose radio network you want to integrate the IO-Link Device.

6.3 Configuration of the IO-Link wireless operation

This section describes how to set up the wireless data transmission between IO-Link Wireless Master and Wireless Bridge and how to configure the parameters of the Wireless Bridge.

For this purpose, the following requirement must be met:
The connection to the IO-Link Device has been commissioned and the status LED is flashing alternately purple and green.

Specific details of the configuration, depend on the IO-Link Wireless Master used and its configuration software, that are described in the manufacturer's manual.

To commission the Wireless Bridge, perform the following steps in the configuration software of the IO-Link Wireless Master:

- ➢ Open the configuration software or the web server interface of the IO-Link Wireless Master.
- ➢ Scan the network to find the IO-Link Wireless Bridge. Identify the Wireless Bridge by the UID printed on it.
- ➢ Select the IO-Link Wireless Bridge using this UID.
- ➢ Select a free port of the IO-Link Wireless Master.
- ➢ For pairing, click the appropriate button in the configuration software.
- ⇨ Upon completion of the pairing process, at port mode OPERATE should be displayed. The status LED on the Wireless Bridge should now be flashing blue and green alternately.
- ➢ Now, set the parameters for the connected IO-Link Device in the configuration software of the IO-Link master.
- ⇨ The Wireless Bridge startup process is thus completed.

7 Firmware update

The firmware update is performed via the configuration software or the web server of the Hilscher IO-Link Wireless Master devices of the NFD 3090 series using the FOTA technology for wireless updates (FOTA = firmware update over the air).

Note:
For a description of how to perform the update via the master, see the documentation of the master or the associated IO-Link ET configuration software.

8 Technical data

8.1 Technical data NFD-BRIDGE-IOLSA\W

Category	Parameter	Value
Product	Part number	1912.103
	Product name	NFD-BRIDGE-IOLSA\W
	Description	IO-Link Wireless Class A Bridge, protected against dust and moisture.
	Function	The bridge connects a wired IO-Link Device (Class A) via radio to an IO-Link Wireless Master and supplies it with power.
Power supply	Supply voltage	24 V DC, –25%/+30% (18 V DC … 31.2 V DC) SELV/PELV or limited power supply (Class 2, according to IEC 61010-1-2010) Voltages higher than 32 V can damage the device permanently. Voltages below approx. 18 V may cause malfunction.
	Output voltage	Corresponds to the supply voltage (overcurrent protection at signal L+)
	Power consumption (typical)	21 mA (at 24 V , without power consumption of the connected IO-Link Device)
	Maximum input current (continuous)	1.021 A
	Maximum output current (short-term peak current, max. 30 min)	1.221 A
	Connector	M12, A-coded, plug
	Reverse polarity protection	Not present
IO-Link connector	Communication	IO-Link Version 1.1
	IO-Link	Class A
	Transmission types	COM1, COM2, COM3
	Maximum output current (permanent)	1.0 A
	Maximum output current (short-term peak current, max. 30 min)	1.2 A
	Connector	M12, A-coded, socket
IO-Link Wireless	Communication	IO-Link Version 1.1
	Radio connection	1 Wireless point - IO-Link Wireless Device
	Antenna	1, internal, isotropic
	Frequency range	2.4 GHz
	Maximum output power of the radio signal	10 dBm
	Pairing	Push button

Category	Parameter	Value
Bridge	Dimensions with M12 connectors (L x W x H)	66.6 mm x 35.6 mm x 35.6 mm
	Dimensions without M12 connectors (L x W x H)	41.6 mm x 35.6 mm x 35.6 mm
	Weight	Approx. 38 g (without optional bracket)
	Protection class	IP67
	Mounting	Mount (optional) or attach to the IO-Link Device
	Installation location	In the radio range of the IO-Link Wireless Master and close to the connected IO-Link Device The installation location must not be higher than 2000 m above sea level.
Displays	Power LED	Green
	Status LED	RGB
Environmental conditions	Ambient temperature (operation)	–25 °C … +60 °C
	Ambient temperature (storage)	–40 °C … +85 °C
	Relative humidity	5% … 95%
CE	Standards	EN 301489 EN 300328 EN 62479 EN 61326:1
	RoHS	Yes
	Reach	Yes
Compliance	CE marking	Yes
	UKCA marking	Yes
EMV Compliance	Emission EN 61000-6-4	EN 55016-2-3 (Radiated emission)
		EN 55022 (Radio emission)
	Immunity EN 61000-6-2	EN 61000-4-2:2009 (Electrostatic discharge immunity test)
		EN 61000-4-3:2006 + A1:2008 + A2:2010 (Radiated, radio-frequency, electromagnetic field immunity test)
		EN 61000-4-4:2004 + A1:2010 (Electrical fast transient/burst immunity test)
		EN 61000-4-5:2006 (Surge immunity test)
		EN 61000-4-6:2009 (Immunity to conducted disturbances, induced by radio-frequency fields)
Shock and vibration resistance	Vibration resistance against sinusoidal vibrations	IEC 60068-2-6
	Vibration resistance (random broadband noise)	IEC 60068-2-64
	Shock resistance	IEC 60068-2-27

Table 10: Technical data NFD-BRIDGE-IOLSA\W

9 Decommissioning, dismounting and disposal

9.1 Decommissioning the Wireless Bridge

NOTICE

Risk of unsafe plant operation

To prevent possible personal injury or property damage, do not remove this device from a production plant without ensuring a safe operation of the plant during or after the removal of the device.

To decommission the Wireless Bridge, you have to switch off its power supply, but if you do that, you have to be aware that in doing so you also switch off the connected device which depends on the power supplied from the Wireless Bridge.

So, before switching off the power supply, consider the consequences of a switching-off of the connected device for your plant and, if necessary, consider appropriate precautions and countermeasures.

- ➢ Do not switch off the operating voltage supply of the Wireless Bridge before you have taken all necessary precautions, observing the above note.

9.2 Removing the Wireless Bridge

To remove the Wireless Bridge, proceed as follows:

- ➢ Switch off the power supply of the Wireless Bridge.
- ➢ Only then, disconnect the plug of the connecting cable from the power supply unit.
- ➢ Disconnect the power supply cable from the Wireless Bridge.
- ➢ Disconnect the Wireless Bridge from the IO-Link Device.
- ⇨ The device is now completely removed.
- ⇨ Unless there is a warranty case, dispose of a defective device as described in the next section.

9.3 Disposal of waste electronic equipment

Important information from the EU Directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE):

Waste electronic equipment

This product must not be disposed of with household waste.

Dispose of the device at a collection point for waste electronic equipment.

10 Appendix

10.1 Legal notes

Copyright

Important notes

Utmost care was/is given in the preparation of the documentation at hand consisting of a user's manual, operating manual and any other document type and accompanying texts. However, errors cannot be ruled out. Therefore, we cannot assume any guarantee or legal responsibility for erroneous information or liability of any kind. You are hereby made aware that descriptions found in the user's manual, the accompanying texts and the documentation neither represent a guarantee nor any indication on proper use as stipulated in the agreement or a promised attribute. It cannot be ruled out that the user's manual, the accompanying texts and the documentation do not completely match the described attributes, standards or any other data for the delivered product. A warranty or guarantee with respect to the correctness or accuracy of the information is not assumed.

We reserve the right to modify our products and the specifications for such as well as the corresponding documentation in the form of a user's manual, operating manual and/or any other document types and accompanying texts at any time and without notice without being required to notify of said modification. Changes shall be taken into account in future manuals and do not represent an obligation of any kind, in particular there shall be no right to have delivered documents revised. The manual delivered with the product shall apply.

Under no circumstances shall Hilscher Gesellschaft für Systemautomation mbH be liable for direct, indirect, ancillary or subsequent damage, or for any loss of income, which may arise after use of the information contained herein.

Liability disclaimer

The hardware and/or software was created and tested by Hilscher Gesellschaft für Systemautomation mbH with utmost care and is made available as is. No warranty can be assumed for the performance or flawlessness of the hardware and/or software under all application conditions and scenarios and the work results achieved by the user when using the hardware and/or software. Liability for any damage that may have occurred as a result of using the hardware and/or software or the corresponding documents shall be limited to an event involving willful intent or a grossly negligent violation of a fundamental contractual obligation. However, the right to assert damages due to a violation of a fundamental contractual obligation shall be limited to contract-typical foreseeable damage.

It is hereby expressly agreed upon in particular that any use or utilization of the hardware and/or software in connection with

- Flight control systems in aviation and aerospace;
- Nuclear fission processes in nuclear power plants;
- Medical devices used for life support and
- Vehicle control systems used in passenger transport

shall be excluded. Use of the hardware and/or software in any of the following areas is strictly prohibited:

- For military purposes or in weaponry;
- For designing, engineering, maintaining or operating nuclear systems;
- In flight safety systems, aviation and flight telecommunications systems;
- In life-support systems;
- In systems in which any malfunction in the hardware and/or software may result in physical injuries or fatalities.

You are hereby made aware that the hardware and/or software was not created for use in hazardous environments, which require fail-safe control mechanisms. Use of the hardware and/or software in this kind of environment shall be at your own risk; any liability for damage or loss due to impermissible use shall be excluded.

Warranty

Hilscher Gesellschaft für Systemautomation mbH hereby guarantees that the software shall run without errors in accordance with the requirements listed in the specifications and that there were no defects on the date of acceptance. The warranty period shall be 12 months commencing as of the date of acceptance or purchase (with express declaration or implied, by customer's conclusive behavior, e.g. putting into operation permanently).

The warranty obligation for equipment (hardware) we produce is 36 months, calculated as of the date of delivery ex works. The aforementioned provisions shall not apply if longer warranty periods are mandatory by law pursuant to Section 438 (1.2) BGB, Section 479 (1) BGB and Section 634a (1) BGB [Bürgerliches Gesetzbuch; German Civil Code] If, despite of all due care taken, the delivered product should have a defect, which already

existed at the time of the transfer of risk, it shall be at our discretion to either repair the product or to deliver a replacement product, subject to timely notification of defect.

The warranty obligation shall not apply if the notification of defect is not asserted promptly, if the purchaser or third party has tampered with the products, if the defect is the result of natural wear, was caused by unfavorable operating conditions or is due to violations against our operating regulations or against rules of good electrical engineering practice, or if our request to return the defective object is not promptly complied with.

Costs of support, maintenance, customization and product care

Please be advised that any subsequent improvement shall only be free of charge if a defect is found. Any form of technical support, maintenance and customization is not a warranty service, but instead shall be charged extra.

Additional guarantees

Although the hardware and software was developed and tested in-depth with greatest care, Hilscher Gesellschaft für Systemautomation mbH shall not assume any guarantee for the suitability thereof for any purpose that was not confirmed in writing. No guarantee can be granted whereby the hardware and software satisfies your requirements, or the use of the hardware and/or software is uninterruptable or the hardware and/or software is fault-free.

It cannot be guaranteed that patents and/or ownership privileges have not been infringed upon or violated or that the products are free from third-party influence. No additional guarantees or promises shall be made as to whether the product is market current, free from deficiency in title, or can be integrated or is usable for specific purposes, unless such guarantees or promises are required under existing law and cannot be restricted.

Confidentiality

The customer hereby expressly acknowledges that this document contains trade secrets, information protected by copyright and other patent and ownership privileges as well as any related rights of Hilscher Gesellschaft für Systemautomation mbH. The customer agrees to treat as confidential all of the information made available to customer by Hilscher Gesellschaft für Systemautomation mbH and rights, which were disclosed by Hilscher Gesellschaft für Systemautomation mbH and that were made accessible as well as the terms and conditions of this agreement itself.

The parties hereby agree to one another that the information that each party receives from the other party respectively is and shall remain the intellectual property of said other party, unless provided for otherwise in a contractual agreement.

The customer must not allow any third party to become knowledgeable of this expertise and shall only provide knowledge thereof to authorized users as appropriate and necessary. Companies associated with the customer shall not be deemed third parties. The customer must obligate authorized

users to confidentiality. The customer should only use the confidential information in connection with the performances specified in this agreement.

The customer must not use this confidential information to his own advantage or for his own purposes or rather to the advantage or for the purpose of a third party, nor must it be used for commercial purposes and this confidential information must only be used to the extent provided for in this agreement or otherwise to the extent as expressly authorized by the disclosing party in written form. The customer has the right, subject to the obligation to confidentiality, to disclose the terms and conditions of this agreement directly to his legal and financial consultants as would be required for the customer's normal business operation.

Export provisions

The delivered product (including technical data) is subject to the legal export and/or import laws as well as any associated regulations of various countries, especially such laws applicable in Germany and in the United States. The products / hardware / software must not be exported into such countries for which export is prohibited under US American export control laws and its supplementary provisions. You hereby agree to strictly follow the regulations and to yourself be responsible for observing them. You are hereby made aware that you may be required to obtain governmental approval to export, reexport or import the product.

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Contacts

HEADQUARTER

Germany

Hilscher Gesellschaft für
Systemautomation mbH
Rheinstraße 15
65795 Hattersheim
Phone: +49 (0) 6190 9907-0
Fax: +49 (0) 6190 9907-50
E-mail: info@hilscher.com

Support

Phone: +49 (0) 6190 9907-990
E-mail: hotline@hilscher.com

SUBSIDIARIES

China

Hilscher Systemautomation (Shanghai) Co. Ltd.
200010 Shanghai
Phone: +86 (0) 21-6355-5161
E-mail: info@hilscher.cn

Support

Phone: +86 (0) 21-6355-5161
E-mail: cn.support@hilscher.com

France

Hilscher France S.a.r.l.
69800 Saint Priest
Phone: +33 (0) 4 72 37 98 40
E-mail: info@hilscher.fr

Support

Phone: +33 (0) 4 72 37 98 40
E-mail: fr.support@hilscher.com

India

Hilscher India Pvt. Ltd.
Pune, Delhi, Mumbai, Bangalore
Phone: +91 8888 750 777
E-mail: info@hilscher.in

Support

Phone: +91 8108884011
E-mail: info@hilscher.in

Italy

Hilscher Italia S.r.l.
20090 Vimodrone (MI)
Phone: +39 02 25007068
E-mail: info@hilscher.it

Support

Phone: +39 02 25007068
E-mail: it.support@hilscher.com

Japan

Hilscher Japan KK
Tokyo, 160-0022
Phone: +81 (0) 3-5362-0521
E-mail: info@hilscher.jp

Support

Phone: +81 (0) 3-5362-0521
E-mail: jp.support@hilscher.com

Republic of Korea

Hilscher Korea Inc.
13494, Seongnam, Gyeonggi
Phone: +82 (0) 31-739-8361
E-mail: info@hilscher.kr

Support

Phone: +82 (0) 31-739-8363
E-mail: kr.support@hilscher.com

Austria

Hilscher Austria GmbH
4020 Linz
Phone: +43 732 931 675-0
E-mail: sales.at@hilscher.com

Support

Phone: +43 732 931 675-0
E-mail: at.support@hilscher.com

Switzerland

Hilscher Swiss GmbH
4500 Solothurn
Phone: +41 (0) 32 623 6633
E-mail: info@hilscher.ch

Support

Phone: +41 (0) 32 623 6633
E-mail: support.swiss@hilscher.com

USA

Hilscher North America, Inc.
Lisle, IL 60532
Phone: +1 630-505-5301
E-mail: info@hilscher.us

Support

Phone: +1 630-505-5301
E-mail: us.support@hilscher.com