User Manual

XORAYA Probe B12

high performance automotive datalogger

Version: 1.0.2

Table of contents

1 Introduction

1.1 About this user manual

▶ Read this user manual completely before using the XORAYA Probe B12 for the first time.

▶ Please consider this user manual as part of the product and make sure it is easily accessible.

▶ Provide this user manual upon transfer of the Probe B12 to a third party.

▶ Request a replacement user manual upon loss.

This user manual contains important information for safe, proper and efficient operation of the Probe B12. Following this user manual strictly helps in avoiding dangers, reduces repair costs and downtime, while increasing the reliability and service life of the Probe B12. It should be read, understood and applied by those using the Probe B12 according to the user manual.

Pay particular attention to:

▪ the safety section (➔ Safety and warranty)

▪ the text warnings of each section

Bear in mind that this user manual does not replace your responsibility as a Probe B12 user.

Subject to change without prior notice. This applies especially to changes relating to technical enhancements.

1.2 Validity of the user manual

This user manual applies to X2E's dataloggers of the XORAYA Probe B12 series. The exact type specifications can be found on the nameplate. (➔ Identification)

The following instructions are key to operate the Probe B12 and must be strictly observed under all circumstances.

Information in this user manual is subject to change without prior notice due to further technical developments and subsequent modifications. New features may not be described yet or may be described incompletely. Please ensure that you have the most current and complete user manual.

Users can change certain properties and functions via the included software, so that the Probe B12 behaves differently than described herein. Users may revert to factory defaults at any time by pressing the default button on the front panel or via the supplied software.

1.3 Representation conventions

Representation	Meaning
▶ <Instruction>	User-executed action
▶ <Instruction option 1> *or* ▶ <Instruction option 2>	Instruction options
☑ <Outcome>	Outcome of an action or a series thereof

▪ <Level 1a>
  –   <Level 2a>
  –   <Level 2b>
▪ <Level 1b>
	Maximum two-level enumeration

➔ <Cross-reference>	Clickable cross-reference to a section or heading (In most Windows programs, you can return to the previous position by pressing *ALT + Left arrow*)
<Text>	Housing label, GUI element or other highlighting
#	Placeholder for numbers
(1) or **(A)**	Reference to numbered markers in graphics

1.4   Pictograms

This manual uses pictograms to highlight and ensure faster recognition of important or especially useful information.

Warning:

These types of symbols indicate warnings that must be observed.

The following subsections contain a description of the basic structure and relevance of different warning levels.

General information:

This symbol indicates general information.

General information includes application tips and particularly useful information excluding warnings or hazards.

License information:

This symbol indicates license information.

License information contains either general information about licenses for the Probe B12 or indicates whether a license is required for a particular function.

1.4.1   Meaning of warnings

Warnings are systematized according to the severity and probability of their occurrence.

CAUTION

This pictogram in conjunction with the word *Caution* warns of a potentially dangerous situation, or an unsafe procedure.

Ignoring this warning information could result in injury or property and environmental damage.

WARNING

This pictogram used in conjunction with the word *Warning* warns of a potentially imminent danger to the health and lives of people.

Ignoring this warning could cause serious personal injury, including death in the worst case.

DANGER	This pictogram used in conjunction with the word *Danger* warns of an imminent danger to the health and life of people.
	Ignoring this warning causes serious personal injury, including death in the worst case.

1.4.2 Structure of warnings

Warnings are separated from the surrounding text by lines set above and below.

SIGNAL WORD	**Danger types and sources**
	Explanation and consequence of danger
	▶ Actions to prevent danger

1.5 X2E-Wiki

The X2E-Wiki at *http://wiki.x2e.de* provides the following information:

- Latest software
- Latest firmware
- Latest license file

For access details, please send an email stating your contact data to *wiki@x2e.de*. We will send you the appropriate access data. You may request your access details at any time if necessary.

2 Safety and warranty

The XORAYA Probe B12 was developed according to the latest state of the art and offer outstanding safety levels. During operation, however, this safety level can only be achieved if the user complies with all relevant safety regulations.

Upon measuring, safety regulations of the professional associations must be observed. Please contact an expert or the service of X2E GmbH when in doubt about the operation, safety, or connection of the Probe B12.

2.1 Intended use

The Probe B12 is used for real-time acquisition of data communication in automotive bus systems. You can perform, store and transfer measurements to a PC, where you can analyze them using the GUI of the XORAYASuite.

- The Probe B12 is intended for use only by trained personnel.
- The Probe B12 must not be used in residential or living areas. Its use is strictly limited to industrial environments.
- The Probe B12 must also not be used in outdoor areas or hazardous areas.
- Always operate the Probe B12 within its technical specifications. (➜ Technical data)
- The Probe B12 may only be used under the conditions and for the purposes for which it was designed.
- Repairs may only be carried out by trained personnel of X2E GmbH.
- Operational safety cannot be guaranteed after modifications or conversions.
- Except for data buses, never perform measurements on live parts.
- The 4-mm plug of the power supply cable delivered must never be introduced in low-voltage sockets.
- The data lines may be extended up to a maximum of 30 m provided that they are shielded like the supplied cables.
- The voltage supply may be extended up to a maximum of 3 m with sufficient cross-section.
- Only use USB flash drives on the USB interface and do not connect any cables or other devices.

2.2 Safety label on the device

You find the following safety label on the Probe B12 top side:

Burning hazard due to hot surfaces

Continuous operation can strongly heat up the Probe B12. As a result, it can burn the skin on the hands when touching it.

▶ Wear temperature-resistant ESD gloves when in contact with the Probe B12.

2.3 General safety instructions

DANGER

Electric shock caused by damage to components

Any damage to the Probe B12, power source or connection cable may cause an electric shock.

▶ Switch on the Probe B12 only if all components appear undamaged.

▶ Only commission the Probe B12 after a proper installation or repair.

▶ Check the connecting cable regularly for defects to prevent damage to the power source.

▶ Always install the Probe B12 in de-energized status.

WARNING

Defects influencing the environment

The incorrect Probe B12 configuration can lead to the temporary or permanent functional failure of connected vehicles.

Connected vehicles being operated on public roads bear an increased risk of injury and damage.

▶ If available, use configuration templates provided by the vehicle manufacturer.

▶ Use preferably the passive recording modes of the interfaces.

	Device damage due to short circuit
CAUTION	Bent connector pins pose a short circuit risk. This can lead to abnormal behavior or destruction of the Probe B12.
	Likewise, devices connected to the measurement setup may be also compromised.
	▶ Make sure that connector pins are not bent.
	▶ Check the Probe B12 regularly for any deficiencies.

	Device damage due to electrostatic discharge
CAUTION	Electronic components can be destroyed by electrostatic discharge.
	▶ Avoid touching connectors and connector pins.
	▶ Ground yourself before carrying the Probe B12 in your hands.
	▶ Operate the Probe B12 in an ESD-compliant environment.

	Device damage due to overheating
CAUTION	Overheating can lead to abnormal behavior or destruction of the Probe B12.
	▶ Do not operate the Probe B12 outside the specified temperature range.
	▶ Never operate the Probe B12 near heat sources.
	▶ Please ensure adequate air circulation for operation.
	▶ Do not cover the Probe B12 with other objects.

	Device damage due to shocks
CAUTION	Excessive vibration can lead to abnormal behavior or destruction of the Probe B12.
	▶ Avoid exposing the Probe B12 to excessive vibration.

	Device damage due to pollution
CAUTION	Avoid any contamination in plugs and sockets to ensure a reliable contact.
	▶ Keep the Probe B12 clean.

⚠ CAUTION	**Device damage due to device opening** Unauthorized opening of the Probe B12 can lead to abnormal behavior or destruction of the device. ▶ Never open the Probe B12. ▶ Contact X2E GmbH should maintenance and repairs be required.
⚠ CAUTION	**Device damage due to penetration of dust or liquids** Dust or moisture inside the Probe B12 may cause abnormal behavior or destruction of the device. ▶ Only operate the Probe B12 with a closed housing. ▶ Do not operate the Probe B12 outdoors. ▶ Do not operate the Probe B12 outside the specified temperature range. ▶ Turn off the Probe B12 and disconnect it from the power supply before you start cleaning.
⚠ CAUTION	**Damage due to improper device shutdown** Disconnecting the power supply during operation may cause data loss and destruction of the Probe B12. ▶ Never disconnect the Probe B12 from the power supply while in operation. ▶ Ensure proper connector seating and tighten the screws if possible. ▶ Only shut down the Probe B12 through the XORAYASuite or the power button on the front panel. ▶ Pull the black plug connected to ground last when disconnecting the Probe B12 from the power supply.

⚠️ CAUTION	**Safety defects due to incorrect accessories and spare parts**

Accessories and spare parts that have not been recommended by X2E GmbH negatively affect the safety, functionality and precision of the Probe B12.

X2E GmbH shall assume no responsibility whatsoever or honor any warranty for damages arising from non-recommended accessories and spare parts or incorrect use.

▶ Use only accessories recommended by X2E GmbH and original spare parts.

2.4   Product liability

In the following cases, the intended protection of the Probe B12 may be adversely affected. The liability is then transferred to the user.

- The Probe B12 is not used according to the manual.
- The Probe B12 is used outside the scope described in this manual.
- The user modifies the Probe B12 without proper authorization.

2.5   Terms of use

If the installation of the Probe B12 in a vehicle is intended for operation on public roads, the user and the X2E GmbH must jointly perform a risk analysis beforehand. This analysis must consider the specific installation requirements and the valid factory standards at the user's site.

Conditions set forth in framework contracts shall apply.

The Probe B12 is continuously developed. The development process relies on the cooperation between the user and X2E GmbH.

2.6   Warranty

The warranty period is 12 months. Device batteries, whether internal or external, are excluded from the warranty. The warranty also excludes damages arising from improper handling.

X2E GmbH guarantees that the media on which the software is located are free of material errors under normal operating conditions. Users can return any defective or materially erroneous media to X2E GmbH within a period of 30 days from date of original purchase. Media shall be replaced immediately at no cost.

X2E GmbH guarantees that the software as described herein is basically usable. X2E GmbH, however, shall assume no liability for the correctness and the continued use of the software, given that the current state of the art prevents the production of software suitable for all combinations of hardware and software.

In particular, X2E GmbH cannot guarantee that the software meets any user requirements, or that it is compatible with any programs the latter may have selected. Responsibility for program selection and the consequences of program use lie entirely with the user.

X2E GmbH shall assume no liability for damages arising from faulty recorded data, as well as damage due to incorrect configuration, data entry and data transfer.

After configuring, we recommend to verify the proper operation and plausibility of each sensor using some manual measurement over the entire measuring range.

X2E GmbH shall assume no further liability. This limitation of liability also applies to the personal liability of employees, representatives and organs of X2E GmbH.

2.7   FCC notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications made to this equipment not expressly approved by X2E GmbH may void the FCC authorization to operate this equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

high performance automotive datalogger

3 Product description

The XORAYA Probe B12 is a compact probe specially designed for recording automotive Ethernet. It extends the existing interfaces of XORAYA dataloggers and enables the use of measuring devices in close proximity to the source.

The data is transferred to a datalogger such as the XORAYA N4000 via GbE or 10 GbE interfaces, synchronized and stored internally or externally. The transmission speed is up to 8 Gbit/s.

3.1 Identification

The top side of the Probe B12 bears a silver nameplate, which contains the following information:

- Type   Product variant
- Config.   First block: Product ID
                        0270   XORAYA Probe

                        Second block: Product variant
                        0141   XORAYA Probe B12

                        Third block: Hardware revision
- Input   Maximum current consumption at given standard input voltage
- S/N   Unique serial number for this Probe B12
- DMF   Date of manufacture
- RAM-Size   Size of the internal RAM

Upon device-specific issues, always provide the serial number and configuration.

3.2 Scope of delivery

The following components are part of the delivery:

- XORAYA Probe B12
- Power supply cable
- Software
- User manual
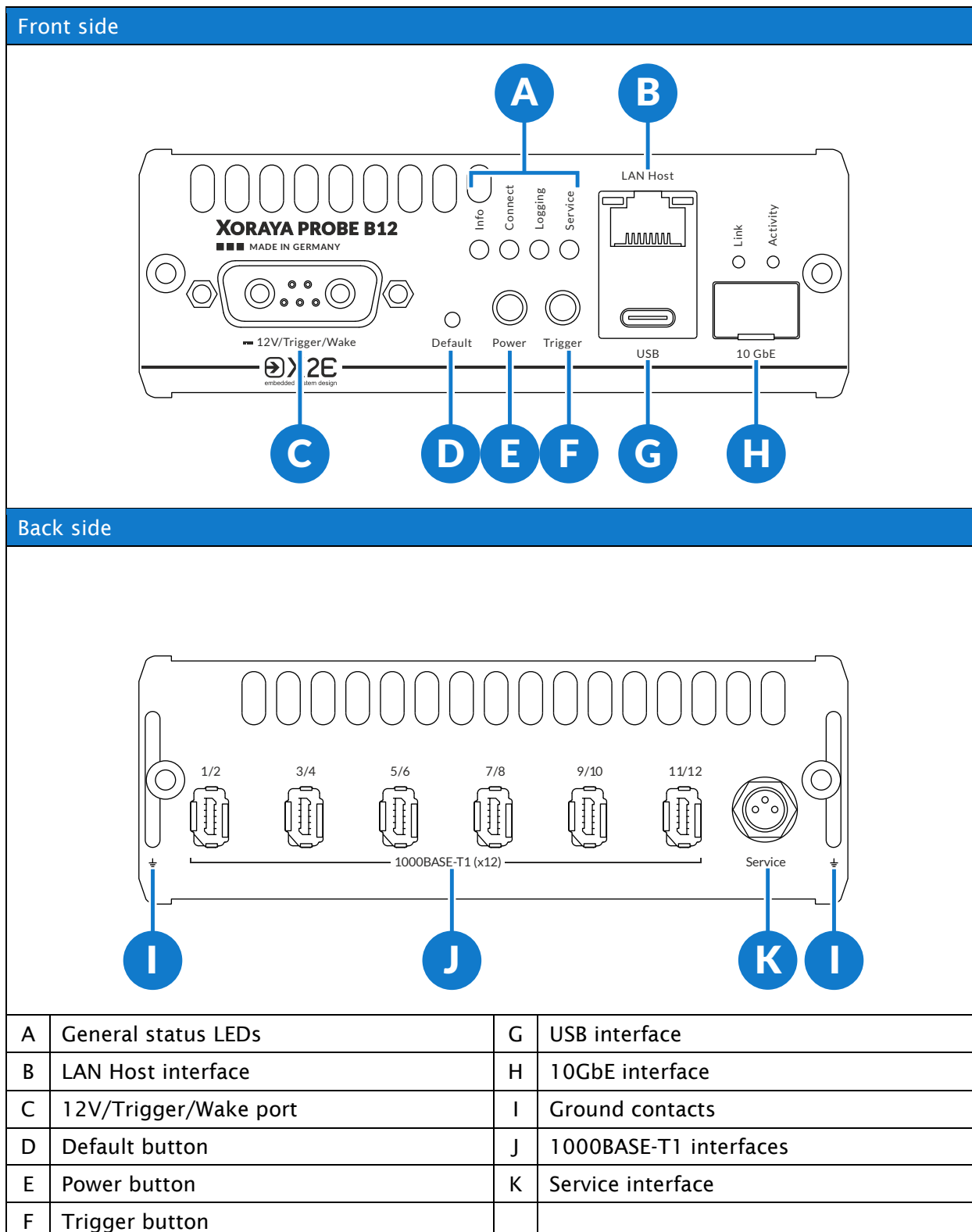
The following accessories are optionally available:

- Labelling foil with color coding for the 1000Base-T1 ports
- 1000Base-T1 connection cable
- Power supply cable with AC adapter (recommended)
- Additional cables
- Mounting material
- Device bag

Additionally, we recommend the following third-party accessories:

- SFP+ module FTLX8573D3BTL from Finisar

3.3 Connections and controls

The front side of the Probe B12 contains ports, buttons and LEDs for operation and elementary functions. The back side contains the log interfaces.

	Front side		

A	General status LEDs	G	USB interface
B	LAN Host interface	H	10GbE interface
C	12V/Trigger/Wake port	I	Ground contacts
D	Default button	J	1000BASE-T1 interfaces
E	Power button	K	Service interface
F	Trigger button		

General status LEDs (A):

These LEDs indicate the operating status of the Probe B12.

LED	Color	Meaning
Info	Yellow	Probe B12 is DHCP server
	Red	Flashes when restarting after the power supply was interrupted and the Probe B12 could not shut down safely
Connect	Green	Connection between Probe B12 and XORAYASuite is established
Logging	Green	Recording in progress, flashes when data is received
Service	Red	Lights up constantly when the Probe B12 is in firmware update or recovery mode
		Displays different error codes by flashing

LAN Host interface (B):

Connect the Probe B12 via this interface to a data sink or master, e.g. a XORAYA N4000, or directly to a PC or a switch.

12V/Trigger/Wake port (C):

By default, the Probe B12 must be supplied with 12 V DC voltage. Optionally, it can also operate with power supplies in a certain specified range. (➔ Technical data)

Trigger input and trigger button offer an analogous operation. A +12 V signal level at the trigger input is equivalent to pressing the trigger button. (➔ Trigger button)

The wake input allows waking up the Probe B12 from sleep. To that end, the wake signal must shift from 0 V to +12 V.

Default button (D):

Press the default button with a pointed object for at least 3 seconds to reset all Probe B12 settings to factory defaults.

Power button (E):

If you press this button while the Probe B12 is operational, the device switches to sleep mode.

If the Probe B12 is operational and this button is pressed together with the trigger button **(F)**, the Probe B12 turns off completely.

You cannot turn off the Probe B12 using this button when the device is connected to a PC and the *Connect* LED is lit.
In this case, you can turn off the Probe B12 via the *Logger* menu of the XORAYASuite. Here, you may choose between two options, i.e. *Shutdown* and *Shutdown (no wake up)*.

Trigger button (F):

The function of this button depends on the Probe B12 state. The following table describes these functions as delivered.

State of the Probe B12	Function
Sleep mode	Probe B12 wakes up
Switched on	Start recording
Switched on, recording active	• Short press: Setting a mark (an event) in the recording • Long press (3 seconds at least): Stop current recording

USB interface (G):

By using a USB flash drive, the following functions are available:

- Updating the firmware

    – Create the folder *xoraya_update* on the USB flash drive and copy the firmware archive there.

    – Connect the drive and the firmware is automatically updated.

- Generating the supportfile

    – The supportfile is a set of files that you can send to X2E support to help solve technical issues.

    – Create the folder *xoraya_supportfile* on the USB flash drive.

    – Connect the drive and the supportfile is automatically generated. The *Info* LED flashes during the process.

10GbE interface (H):

This interface can be used for data recording or as a faster alternative to the 1 Gbit host interface **(B)**. A plugged-in SFP+ module is required. X2E recommends the module FTLX8573D3BTL from Finisar.

Ground contacts (I):

These contacts are suitable for secure grounding in specialized racks.

1000BASE-T1 interfaces (J):

These 12 log interfaces record automotive Ethernet data in the 100BASE-T1 or 1000BASE-T1 standard.

Service interface (K):

In case of errors, this interface is used as a debugging interface by the X2E support team.

4 Commissioning

4.1 Unpacking

Upon unpacking, check whether the delivery is complete and all components appear in perfect condition. (➔ Scope of delivery)

> ▶ Please contact X2E GmbH immediately should the delivery be incomplete or upon damaged components.

> ▶ Do not put any defective component into operation.

X2E GmbH can only accept your complaint and replace the affected component upon prompt notification.

Keep original packaging

Keep the original packaging and packing materials for later storage or further transport.

4.2 Selecting an installation location

The Probe B12 installation location must meet the following criteria:

- Location of the DC power supply (standard: 12 V)
- Distance of at least 4 cm to other devices
- Solid and stable base
- Adequate airflow
- Probe B12 front and back sides must not be covered

4.3 Installing the Probe B12

X2E GmbH provides no special requirements for datalogger installation. Install the datalogger in the vehicle so as to avoid a damage risk at any time.

4.4 Installing the XORAYASuite

Users must install the GUI XORAYASuite on a PC with the following minimum requirements to be able to configure the Probe B12 and analyze the recorded data.

Supported operating systems:

- Microsoft® Windows® 7 (32 Bit or 64 Bit)
- Microsoft® Windows® 8 (32 Bit or 64 Bit)
- Microsoft® Windows® 10 (32 Bit or 64 Bit)

Hardware requirements:

- Processor speed   at least 1 GHz
- RAM   at least 2 GB
- Storage space   approx. 120 MB available

Software requirements:

- Microsoft® .NET Framework Version 4.5 or higher

Installation:

- ▶ Close all open programs.
- ▶ Use the XORAYASuite setup wizard from the supplied data medium.

     or

- ▶ Download the latest version of the XORAYASuite from the X2E-Wiki.
  (➔ X2E-Wiki)

- ▶ Start the setup wizard and follow the instructions.
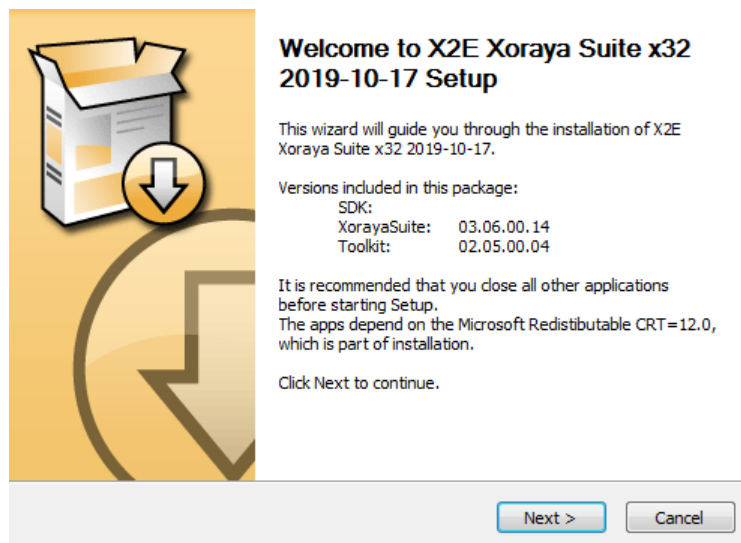
4.5 Connecting the Probe B12 to the measuring environment

This section describes how to connect the Probe B12 to the measuring environment.

⚠️ **CAUTION**	**Device damage due to incorrect connection sequence**

The incorrect connection sequence can lead to abnormal behavior or destruction of the Probe B12.

▶ According to the numbering of the subsections, connect the interfaces first and then the power supply.

▶ Please note the correct connection sequence from top to bottom within the subsection.

4.5.1 Interfaces and sink

Observe pin assignments

Please note the port pin assignments when connecting the Probe B12 with the measuring environment. Wrong pin assignments lead to measurement errors.

Connect as follows:

▶ Connect the data buses to be monitored to the 1000BASE-T1 interfaces **(J)**. (➔ Connections and controls)

▶ Connect the LAN Host interface **(B)** or the 10GbE interface **(H)** to a corresponding host port on a sink, e.g. a XORAYA N4000.

☑ The Probe B12 is connected to the data buses to be monitored and to the sink.

Loss of data due to port disconnections

To avoid data loss, never disconnect the Probe B12 during the current recording from connected data buses.

Furthermore, make sure that all connectors are firmly attached and the screws are tightened if possible.

4.5.2   Power supply

This chapter describes the default connection to a DC power supply via the supplied power cable. If you use the optionally available power cable with AC adapter, please note the specifications on the adapter label.

DANGER

Electric shock due to improper connection of the power supply

Introducing the 4-mm plugs of the supplied power cable into low-voltage sockets can be fatal.

▶ Never introduce the 4-mm plugs into low-voltage sockets.

▶ Connect the supplied power cable only to a power source that meets the prescribed technical conditions.

CAUTION

Damage due to incorrect power supply

Using an incorrect power supply can lead to abnormal behavior or destruction of the Probe B12.

▶ Use only the supplied power cable.

▶ Please ensure correct polarity upon connection.

▶ Make sure that the power supply used meets the prescribed technical conditions.

▶ Make sure that the power supply lies within permissible operating voltage of the Probe B12.

▶ Please note the allowable voltage level when feeding external signals.

▶ Please note the technical specifications on the label when using the optionally available power cable with AC adapter.

CAUTION

Damage due to faulty connection

When connecting with live contacts, transient fault currents with entrained mass may arise on interface connections which have been already connected.

▶ Please ensure contacts are de-energized when connecting the Probe B12 to the power supply.

ⓘ Continuous current of the DC power supply

A 12 V DC power supply must deliver a continuous current of 2.5 A. Use a regulated power supply or a car battery and note the required voltage and current levels.

Connection order:

▶ Connect the power cable to port **(C)**. (➜ Connections and controls)

▶ Tighten the connector screws.

▶ Connect the black plug of the cable to 0 V or ground.

▶ Connect the red plug to the power supply.

☑ The Probe B12 is securely connected to the measuring environment.

Once the supply voltage is established, the Probe B12 turns on and displays its operational status via the power button LED **(E)**.

⚠ Damage due to improper device shutdown

CAUTION

Disconnecting the power supply during operation may cause data loss and the destruction of the Probe B12.

▶ Never disconnect the Probe B12 from the power supply while in operation.

▶ Ensure proper connector seating and tighten the screws if possible.

▶ Only shut down the Probe B12 through the XORAYASuite or the power button on the front panel.

▶ Pull the black plug connected to ground last when disconnecting the Probe B12 from the power supply.

The Probe B12 is equipped with an intelligent energy management system that lowers power consumption to about 1 mA (at 12 V supply voltage) in sleep mode.

The device goes into sleep mode via the following actions or under the following conditions:

- Pressing and holding the power button **(E)** for at least 2 seconds. Current recording stops automatically.

- If no data reach the log interfaces and no connection to the XORAYASuite is established for 10 minutes, the Probe B12 shuts down automatically. This behavior is configured using the main setting *Automatically Switch Off*.

Users can wake up the Probe B12 from sleep mode as follows:

- Pressing the power button **(E)**

- Switching the power supply off and on

- Signal change from 0 V to +12 V at the trigger or wake input **(C)**

- Pressing the trigger button **(F)**

- Activity on a wakeable log interface

4.6 Connecting the Probe B12 to the PC

This chapter describes how to connect the Probe B12 to the PC with or without a sink. To do this you need standard network cables.

Connection alternatives:

▶ Connect the LAN Host interface **(B)** or the 10 GbE interface **(H)** to a PC/switch. (➔ Connections and controls)

  or

▶ Connect the LAN Host interface **(B)** or the 10 GbE interface **(H)** to the host port of a sink, e.g. a XORAYA N4000, which itself is connected to a PC.

☑ The Probe B12 is fully connected.

high performance automotive datalogger

5 XORAYASuite

This chapter describes the characteristic features for the configuration and operation of the probe. For a detailed description of all XORAYASuite tools, refer to the datalogger user manuals.

5.1 Connecting
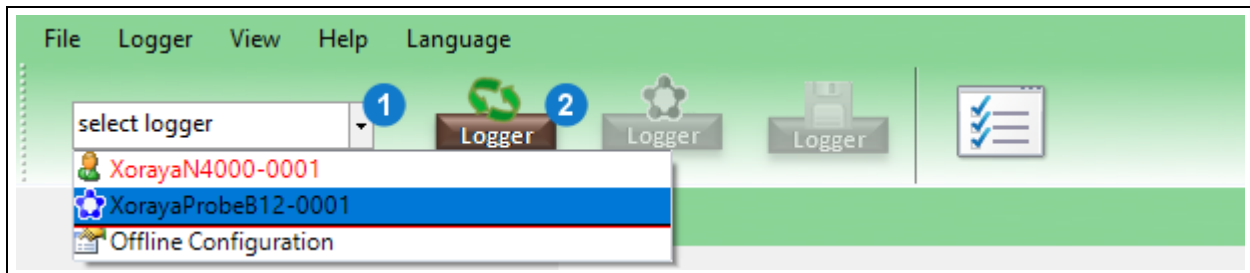
▶ Connect the Probe B12 to sink and PC.
(➜ Connecting the Probe B12 to the PC)

▶ Turn on Probe B12 and sink.

▶ Start the desired XORAYASuite tool.

▶ Click *Display available loggers* **(1)** to start scanning for devices.

▶ Select the desired Probe B12 using the assigned name.

▶ Click *Establish connection to logger* **(2)**.

The Probe B12 is connected to the XORAYASuite.

5.2 Configuration

Because Probe B12 and sink have to be configured accordingly, open the configuration tool twice simultaneously or do one configuration after the other. Select the category *DLN* (Distributed Logging Network) in the system settings.

Other system settings and configuration of the interfaces are the same as for XORAYA dataloggers.

5.2.1   Sink
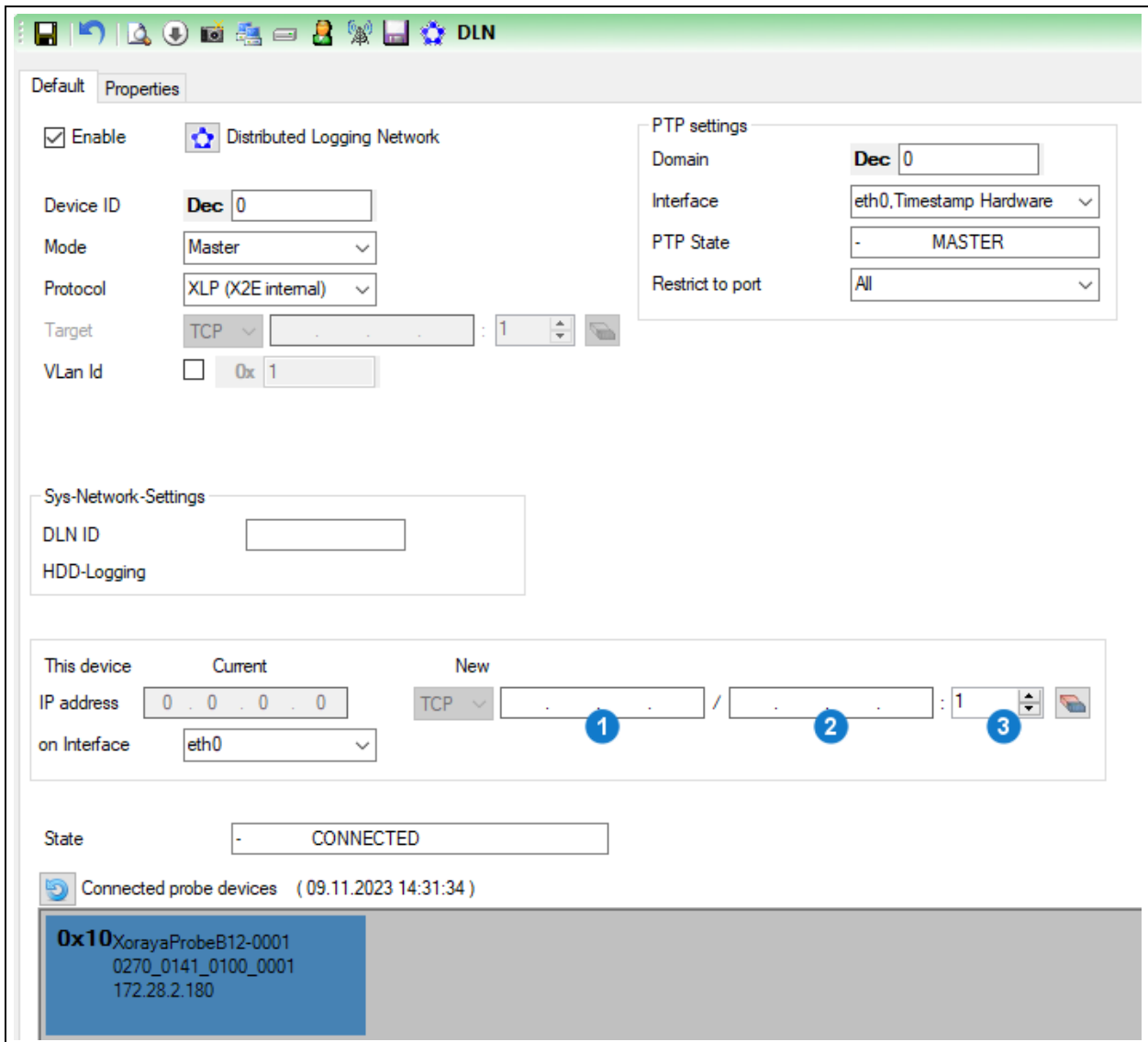
▶ *Enable* the DLN function.

▶ Set a custom *Device ID*.

    ℹ The ID is used when recording to match the data with a device.

▶ Select the *Mode* of the sink: *Master*.

▶ Select the *Protocol*: *XLP (X2E internal)* or *PLP*.

▶ Optionally, set a *VLan Id*.

▶ For time synchronization, set the *PTP settings* (Precision Time Protocol):

Setting	Description
Domain	A unique value for sinks in this network to avoid conflicts
Interface	E.g. for the N4000: *eth0.* for 4x LAN Host, *eth1.* for Ethernet 10 Gbit
Restrict to port	*All*, one of the 4 LAN Host ports or the internal *host* port

▶ Set a port **(3)**.

ⓘ When choosing a port number, avoid conflicts with network services used by the operating system.

Alternative network settings

Because the sink address may be assigned dynamically, it is possible to set a network address **(1)** and a subnet mask **(2)** in addition to the port **(3)**. These static settings apply to the DLN communication with the linked probes and can be entered there as *Target*.

5.2.2 Probe

▶ Set a custom *Device ID*.

▶ Select the *Protocol*: *XLP (X2E internal)* or *PLP*.

▶ As *Target*, set the network address and port of the sink.

   ⓘ If a static network connection for the DLN communication is explicitly set in the sink, then enter this address (category *DLN)*.

   If not, then the statically or dynamically assigned address of the sink is used (category *Network*).

▶ Optionally, set a *VLan Id*.

XORAYA
high performance automotive datalogger

▶ Set the *PTP settings* for *eth0* (LAN Host), *eth1* (10 GbE) and *Global* and click *Apply* for each:

Setting	Description
Enable	Enable PTP for this interface
Domain	Must be the same value as the sink
Master/Slave	This interface is *Master* or *Slave* of the PTP connection
Transport Type	*L2 Ethernet Packets* or *Multicast UDPv4*
Best Master Clock Algorithm	Find the best master clock in the network, depending on e.g. PTP Priority 1 (see below) and other factors
Delay Mechanism	Measures network delay *End-to-End*: between master and slave port on the same communication path, through all switches *Peer-to-Peer*: between directly connected network ports
Sync Interval	Time between sync messages
PTP UTC Offset	Offset between UTC and TAI (in seconds)
PTP Sync Threshold	PTP slave goes into sync status when the offset is below this value (in nanoseconds)
PTP Priority 1	Priority attribute, used by *Best Master Clock Algorithm*
Master wait for Slave	Master port(s) will wait until the slave port is in sync state

ⓘ The *Presets* button provides appropriate settings for master or slave.

▶ If you link another probe, set the port **(3)** for the connection *on Interface eth0* or *eth1*, and optionally static network address **(1)** and subnet mask **(2)**.

ⓘ For the Probe B12, *eth0* corresponds to the LAN Host interface and *eth1* to the 10 GbE interface.
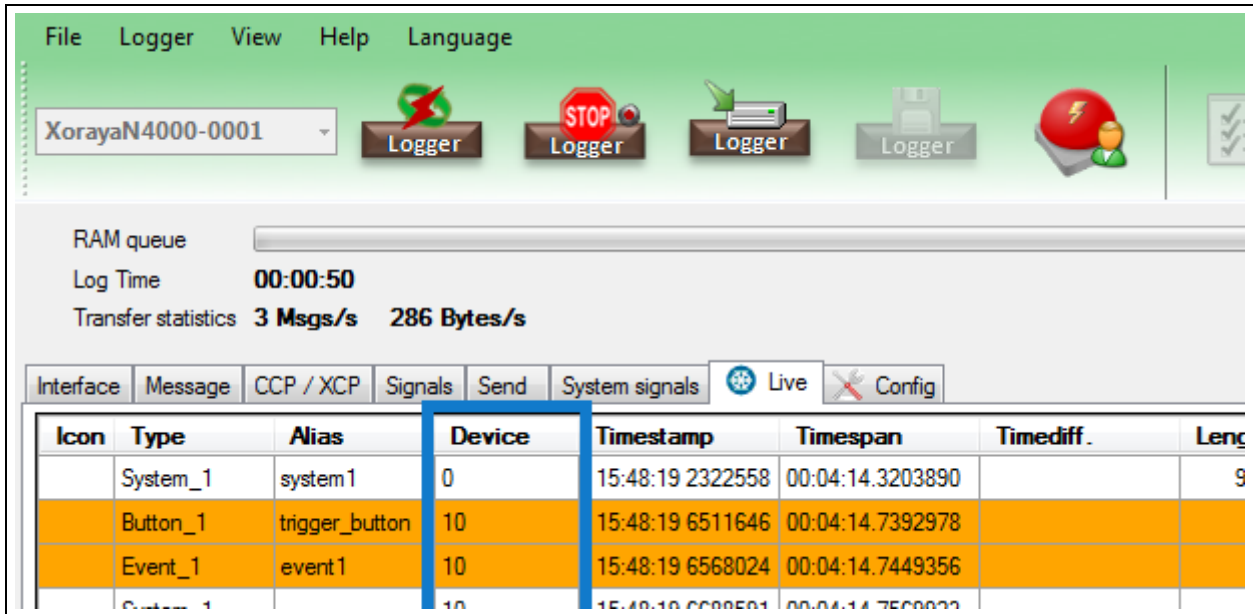
Quick configuration

Alternatively, use the *Distributed Logging Network* button to select a sink in the network, and the relevant settings are applied.

5.3 Data recording

By default, the probe transfers the recorded log data to the sink, where all data of the current measurement received from all connected devices is collected. The data is then either transferred to the PC or directly saved on the storage medium of the sink.

This description shows the recording using the Online-Logging tool.

The device ID set in the DLN configuration serves as an identifier for the source of the log data.
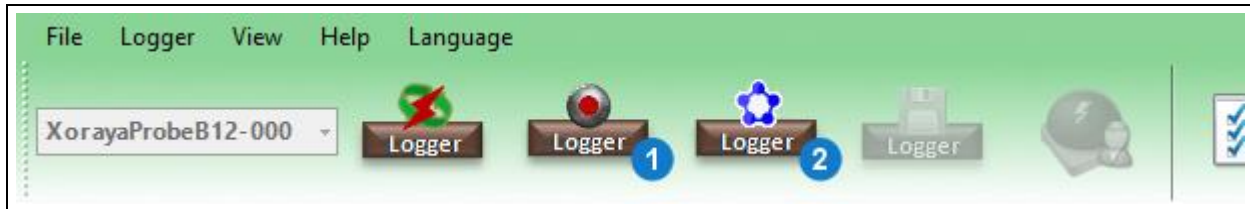
5.3.1 Sink

▶ Connect to the sink.

▶ Click *Start online logging* **(1)** to download the data to the connected PC.

    or

▶ Click *Start Hdd logging* **(2)** or press the trigger button on the datalogger to directly save on the storage medium of the sink.

    ☑ The sink starts data recording and is set to receive log data from the probe.

5.3.2   Probe

Data recording can also be initiated via the probe.

▶ Connect to the probe.

▶ Click *Start Probe logging* **(2)**.

☑ The probe starts data recording (*Logging* LED lights up) and transfers log data to the sink.
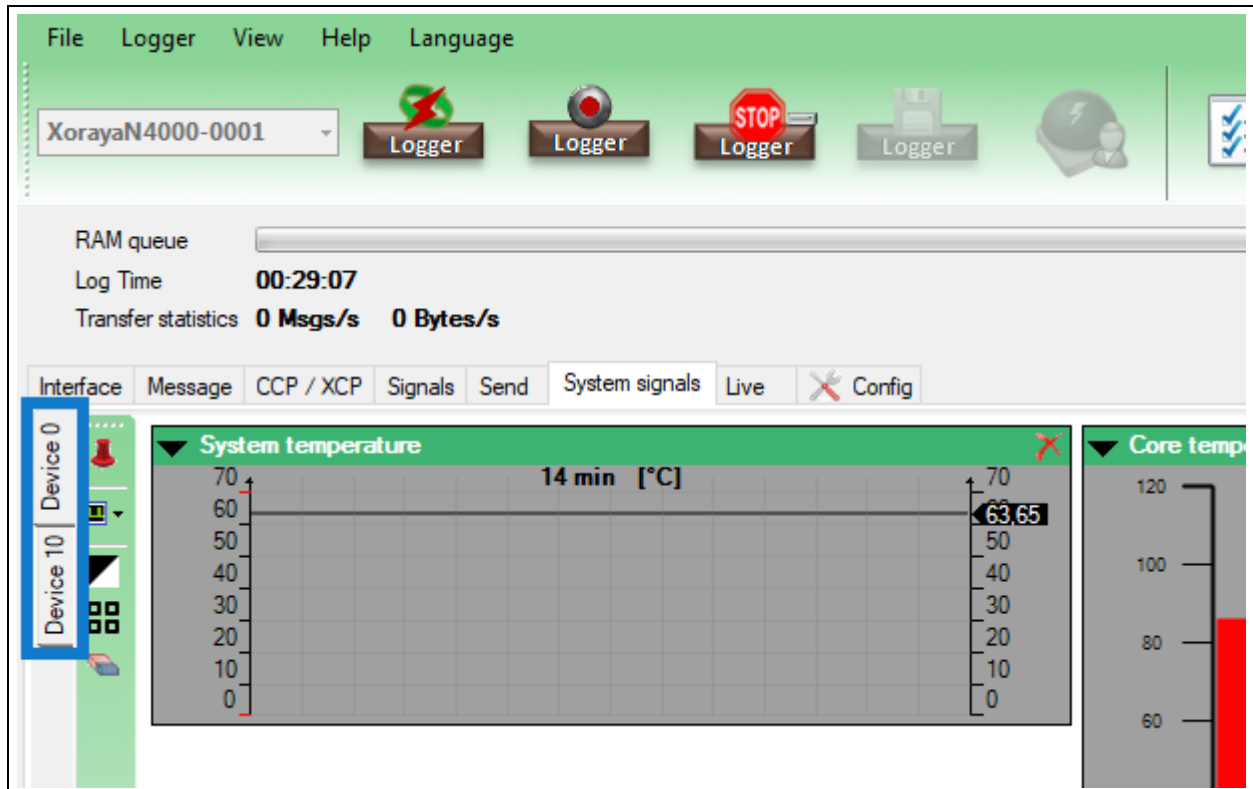
> **ⓘ** **Alternative recording method**
>
> Via button *Start online logging* **(1)**, you transfer the data directly to the connected PC. The data is not collected in the sink beforehand.
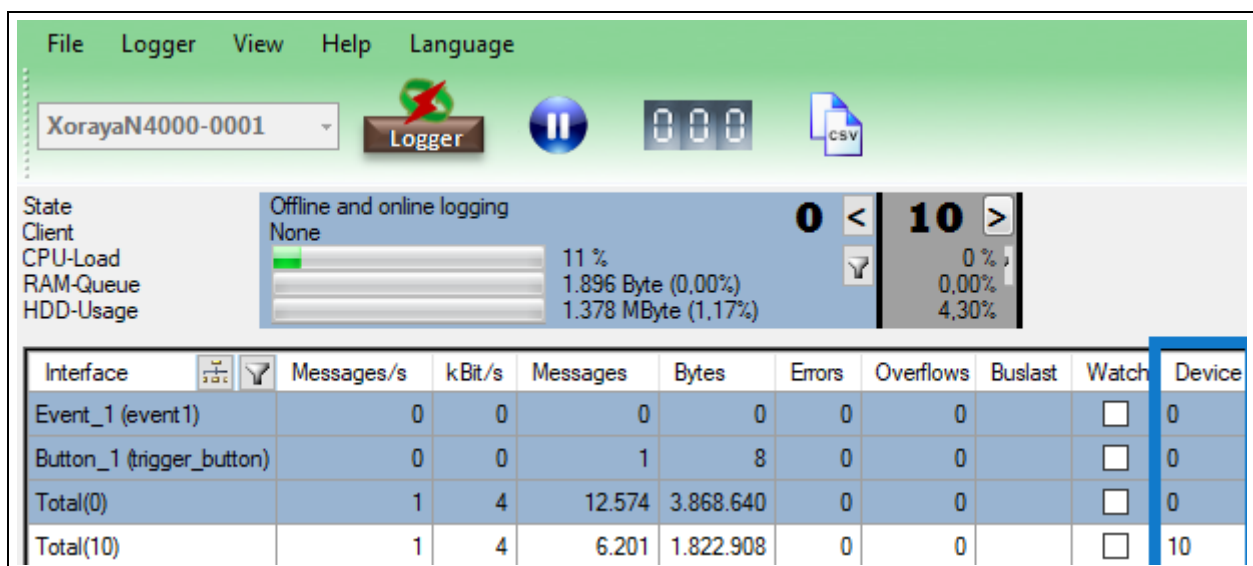
5.4 Statistics

The XORAYASuite allows separate monitoring of the sink itself and of all connected probes.

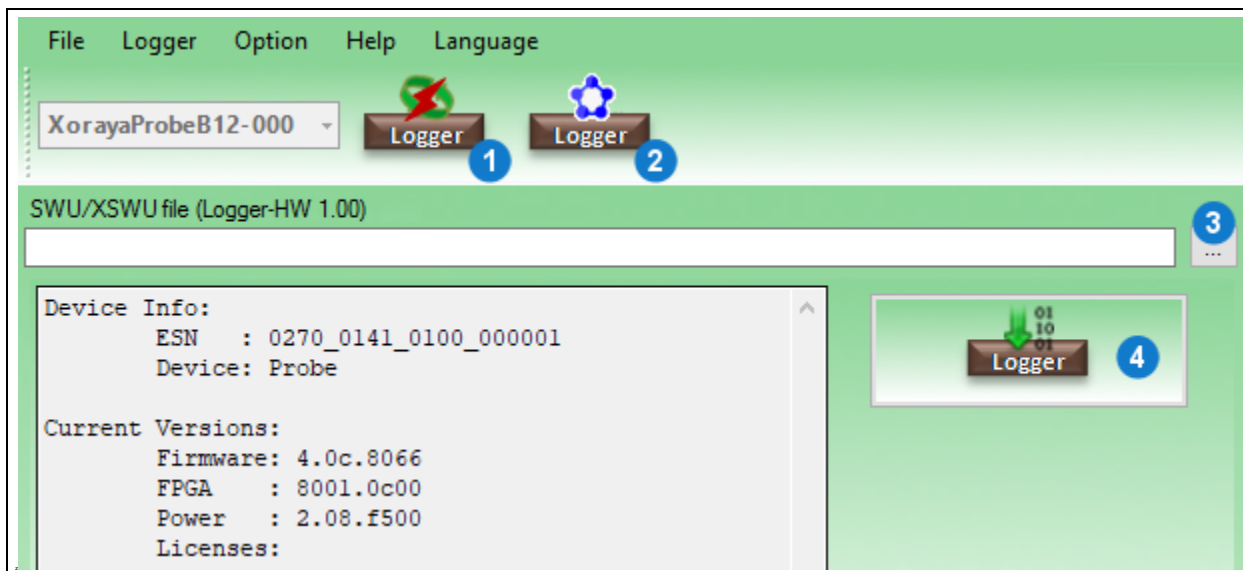### 5.4.1 System signals in online-logging tool

5.4.2 Statistic tool

The assigned ID is used to differentiate devices. By clicking on the panel in the upper area, the statistics for this device are highlighted below.

5.5 Firmware

This tool allows you to update the firmware. This will add new functions to the Probe B12 and possible troubleshooting.

| 1 | Release connection to logger | 3 | Open SWU/XSWU file |
| 2 | Start Probe logging | 4 | Launch firmware update |

Perform firmware update:

▶ Download the latest firmware version from the X2E-Wiki. (➔ X2E-Wiki)

▶ Click *Open SWU/XSWU file* **(3)**.

  or

▶ In the *File* menu, click *Open SWU/XSWU file*.

▶ Select the firmware file.

▶ Make sure that the file corresponds to the Probe B12.

▶ Click *Launch firmware update* **(4)**.

☑ The firmware is updated.

Do not interrupt the update process

Power supply interruptions can destroy the Probe B12.

CAUTION

▶ Do not interrupt the Probe B12 power supply while updating the firmware.

▶ Confirm the Probe B12 restart twice, if *Ask before restart* in the *Option* menu is activated.

☑ If *Skip restoring the configuration* in the *Option* menu is not activated, the tool tries to restore the last Probe B12 configuration.

5	Reset software
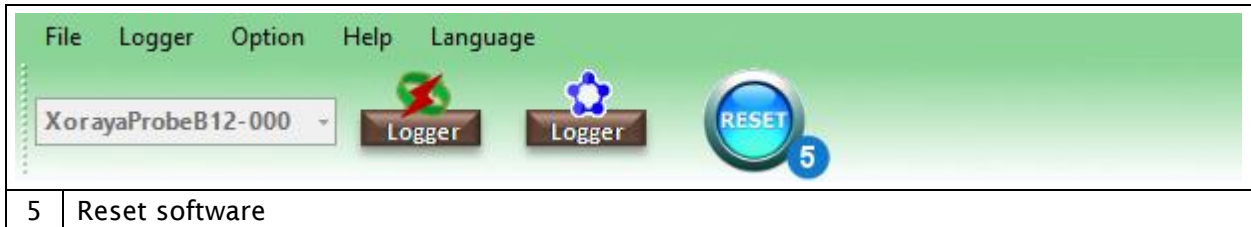
Repeat the firmware update:

▶ If the update fails, click button **(5)** to reset the user interface to the initial state.

Firmware update via USB flash drive

Alternatively, you can also update the Probe B12 firmware without the XORAYASuite. Connect a USB flash drive that contains the firmware archive in the *xoraya_update* folder to the USB interface **(G)**.
(➜ Connections and controls)

The Probe B12 automatically updates the firmware and disconnects the USB flash drive afterwards.

6   Maintenance

6.1   Safety measures

DANGER	**Electric shock caused by damage to components** Any damage to the Probe B12, power source or power supply cable may cause an electric shock. ▶ Switch on the Probe B12 only if all components appear undamaged. ▶ Only commission the Probe B12 after a proper installation or repair. ▶ Check the power cable regularly for defects to prevent damage to the power source. ▶ Always install the Probe B12 in de-energized status.
CAUTION	**Device damage due to short circuit** Bent connector pins pose a short circuit risk. This can lead to abnormal behavior or destruction of the Probe B12. Likewise, devices connected to the measurement setup may be also compromised. ▶ Make sure that connector pins are not bent. ▶ Check the Probe B12 regularly for any deficiencies.
CAUTION	**Safety defects due to incorrect accessories and spare parts** Accessories and spare parts that have not been recommended by X2E GmbH negatively affect the safety, functionality and precision of the Probe B12. X2E GmbH shall assume no responsibility whatsoever or honor any warranty for damages arising from non-recommended accessories and spare parts or incorrect use. ▶ Use only accessories recommended by X2E GmbH and original spare parts.

6.2 Cleaning

⚠ CAUTION	**Device damage due to pollution** Avoid any contamination in plugs and sockets to ensure a reliable contact. ▶ Keep the Probe B12 clean.
⚠ CAUTION	**Device damage due to penetration of dust or liquids** Dust or moisture inside the Probe B12 may cause abnormal behavior or destruction of the device. ▶ Only operate the Probe B12 with a closed housing. ▶ Do not operate the Probe B12 outdoors. ▶ Do not operate the Probe B12 outside the specified temperature range. ▶ Turn off the Probe B12 and disconnect it from the power supply before you start cleaning.

Observe the following instructions to prevent damage to the Probe B12:

▶ If necessary, clean the Probe B12 with a damp, soft, lint-free cloth.

▶ Make sure that no moisture penetrates into the housing.

▶ Use only clear water and a mild detergent to moisten the cloth. Avoid sprays, solvents, alcohol or abrasive cleaners.

▶ Only reconnect the Probe B12 to the power supply if the housing appears completely dry.

6.3 Repair

⚠ CAUTION	**Device damage due to device opening**
	Unauthorized opening of the Probe B12 can lead to abnormal behavior or destruction of the device.
	▶ Never open the Probe B12.
	▶ Contact X2E GmbH should maintenance and repairs be required.

Upon malfunction or defect, return the Probe B12 without any accessories to X2E GmbH.

Please take the following measures:

▶ Clean the Probe B12. (➜ Cleaning)

▶ Pack the Probe B12 safely in its original packaging.

▶ Include the completed return form. You can download this form from the X2E Wiki or receive via email upon request to xoraya-return@x2e.de.

7 Storage, transport and disposal

7.1 Storage

If the Probe B12 will remain unused for an extended time, we recommend storing it in the original packaging.

Adopt the following precautions to avoid damage to the Probe B12:

▶ Protect the Probe B12 from intense sun, heat, as well as from severe shocks.

▶ Do not place heavy objects on the Probe B12.

▶ Store the Probe B12 in a dry, dust-free and ESD safe area.

7.2 Transport

Transport the Probe B12 only in the original packaging.

7.3 Disposal

The Electrical and Electronic Equipment Act (ElektroG), which applies in Germany, obliges every manufacturer to create a reasonable option for returning old B2B devices.

X2E cannot take back so-called historical devices that were placed on the market before August 15th, 2018. In this case, the customer is responsible for professional disposal.

Return of old X2E devices

Old devices can be returned at the customer's expense to the following address:

X2E GmbH
Grosse Ahlmuehle 19
76865 Rohrbach
Germany
Phone: +49 6349 99599 211
E-mail: sales@x2e.de

If more than 10 devices are returned at the same time, X2E must be informed in advance by the customer via the above e-mail address.

Old devices to be returned must be clearly marked by the customer with the words "Disposal" or "Entsorgung".

Disposal of batteries

If the products contain batteries or lamps that can be removed from the old device without destroying them, you as the end user are legally obliged to remove them before disposal and dispose of them separately.

Deletion of personal data

X2E expressly points out that the customer is responsible for deleting personal data on the devices to be disposed of.

Meaning of the symbol on the device

The crossed-out wheeled bin symbol on the device means that it must not be disposed of with household waste.

8 Appendix

8.1 Technical data

| Property	Value
Timestamp resolution	100 ns for all interfaces
Operating ambient temperature	-40 to +65 °C
Operating air humidity	10 to 95 % (non-condensing)
Supply voltage	12 V DC (temporarily from 6 to 32 V)
Current consumption	Max. 2.5 A (at 12 V)
Standby current consumption	Max. 1 mA (at 12 V)
Dimensions (H x W x D)	42 x 120 x 224 mm
Weight	1.1 kg
Housing protection type	IP 20, NEMA Type 1
Pollution degree	3
Altitude	Max. 2000 m

8.2   Pin assignments

The following tables show the pin assignments of the Base-T1 interface and of the 12V/Trigger/Wake port. Figures show the external view of the Probe B12 contacts.

8.2.1   1000Base-T1 (x12)

HARTING ix Industrial type A (x6)
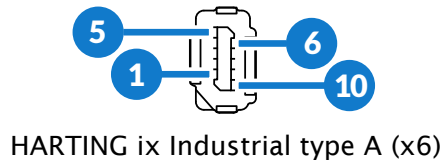
Pin	Function
1	CH 2 P
2	CH 2 N
3	GND
4	-
5	-
6	CH 1 P
7	CH 1 N
8	GND
9	-
10	-

8.2.2   12V/Trigger/Wake

Conec D-SUB Combination, M
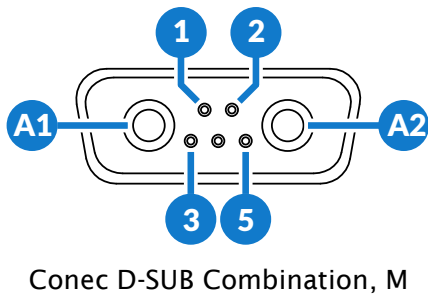
Pin	Function
A1	GND
A2	VIN
1	-
2	Wake
3	Trigger/Wake GND
4	Trigger
5	-

Declaration of conformity

$\mathsf{C}\,\mathsf{\epsilon}$

X2E

embedded system design

X2E GmbH
Entwicklungszentrum
Große Ahlmühle 19
76865 Rohrbach
Tel. +49 6349 99599 100
Fax +49 6349 99599 109

Declares the conformity for the product

Product name:

DATENLOGGER XORAYA PROBE-B12

According to the following requirements:

EMC Directive 2014/30/EU

OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 26 February 2014 on the harmonisation of the laws of the Member States relating to
electromagnetic compatibility and repealing Directive 2004/108/EC.

The following standards have been applied:

IEC EN 61326-1 :2012-10 :2022-11

DIN EN 55011 :2016 + A1:2017

DIN EN 61000-4-2 :2009

DIN EN 61000-4-3 :2006 + A1:2008 + A2:2010

DIN EN 61000-4-4 :2012

DIN EN 61000-4-6 :2009

IEC 61010-1 :2010/AMD1 :2016

K. Weiß / CEO

Signature: / Position in company:

Rohrbach, 22.01.2024

Place and date: