

**DRAFT Version**



Avisaro 4.0 Product Series

# User Application Note

## “Bridge data stream over WiFi or LAN”

Version / Date: 2023/01/30



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## 2 THIS DOCUMENT

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### 2.1 HISTORY OF CHANGES

The document version equals the document date in the format yyyy.mm.dd.

Version	Description
2021/07/05	Multiple additions and first public release
2021/06/11	Initial version extracted from existing documents
2023/02/10	Additions for virtual CAN Bus and some clea-up

### 2.2 AUDIENCE

Intended reader of this document are technical person and system administrators.

### 2.3 LOCATION

Check for the latest document version the following link:

Link: [https://www.avisaro.de/files/Avisaro/40\\_Docu/AppNote-Data/Bridge.pdf](https://www.avisaro.de/files/Avisaro/40_Docu/AppNote-Data/Bridge.pdf)

### 2.4 LANGUAGE VERSIONS

This document is available in English only.

### 2.5 OTHER DOCUMENTS

Helpful documentations are besides others:

- „Avi-Dashboard-Software.pdf“ – Describes the PC software for receiving and processing the data in detail. Please check the Avisaro website.
- “Technical User Manual 4.0” contains all technical details on the products.  
Find the full set of all technical documentation at the following link:
  - German site: [https://www.avisaro.de/de/40\\_Dokumentation.html](https://www.avisaro.de/de/40_Dokumentation.html)
  - English site: <https://www.avisaro.com/en/40-ENG-Documentation.html>

### 2.6 ACTIVE LINKS

This PDF contains active links. By 'clicking', e.g. in the table of contents, you can get to the appropriate paragraph or by 'clicking' on the "Go to:" in the header you can get back.

## 2.7 DOCUMENT CREATION

This document was created using the “Avisaro Document Builder”. Single text blocks are merged into targeted documents. Thus, text blocks can be reused in several places, yet no need to update them manually when changes occur.

We point this out because:

Advantage is that compact and targeted documents are available. Disadvantage is that in rare occasions, a paragraph might have comments which do not fit to 100% in the place it is used.

## 2.8 IMPRINT AND CONTACT

This document is provided by:

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Web: [www.avisaro.com](http://www.avisaro.com)

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## 3 USE CASE: BIDIRECTIONAL DATA BRIDGE OVER WIFI OR LAN

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### 3.1 INTRODUCTION AND GOAL

Running a data cable through a building or outside in the ground is expensive, not flexible and time consuming. Avisaro provides a solution to bridge a data connection (i.e. RS232, CAN, RS485) or a network (i.e. WiFi or LAN). This could span over a company campus or even worldwide.

### 3.2 PREREQUISITES

Most Avisaro products are available with a WiFi networking option, some have a LAN networking option. Make sure you have a product with either one.

Firmware Version:

2.57 or higher	Required. Lower versions had issues
2.64 or higher	Added optional ID transmission (JSON formatted) upon TCP start
2.74 or higher	Fixed issues with CAN bridging

For configuration, use the Avisaro “PC Companion” software, described further below in this document. We assume the software is up and running on your PC and the Avisaro Logger or Gateway is connected via Micro-USB cable.

We assume, the reader of this document has a fundamental understanding of networking, IP addresses and knows the difference between UDP and TCP transmission. Please consult the Internet or other sources to make yourself familiar with those topics.

### 3.3 ‘HOW IT WORKS’ – DETAILS

#### 3.3.1 Configure interface or sensor

Check that the proper interface (i.e. CAN or RS232) is activated in the “Device Configuration -> Global HW setting”. This is usually the case as the products are shipped pre-configured.

Remember, that this is hardware dependent – thus, you can only activate what’s build in.

For details, check the Avisaro “PC Companion” manual as this is not described here.

#### 3.3.2 Configure the interfaces

Check that the interfaces and sensors are configured properly in the “Interfaces ->” section. Typically, you need to configure the baud-rate for the interface or data bus.

For details, check the Avisaro “PC Companion” manual as this is not described here.

If you don’t need local storage, you can set “Storage format” to “Off” in each of the interfaces.

### 3.3.3 Configure the Data Processing section

Now, those settings are important and are usually not set per default:

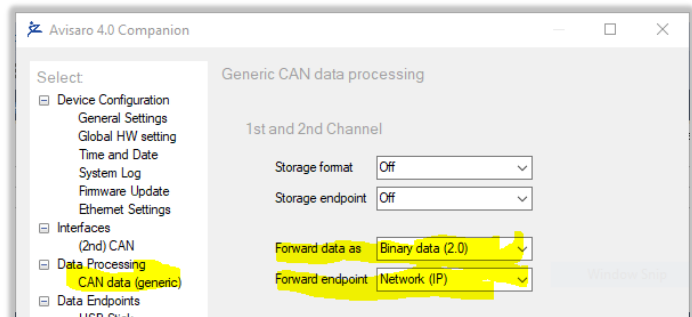
#### For CAN interface:

Configure “CAN data (generic)->Forward data as” to “Binary data (2.0)”.

Configure “CAN data (generic)->Forward endpoint” to “Network IP”.

See paragraph “4.8.3” and “4.8.4” further down in this document.

The CAN messages are packaged into a binary container format. This format is described further down in this document.



Use “UDP/IP” as a preferred protocol. This allows to set up a virtual CAN bus and provides the best performance and low delay.

#### For RS232 with GPS attached:

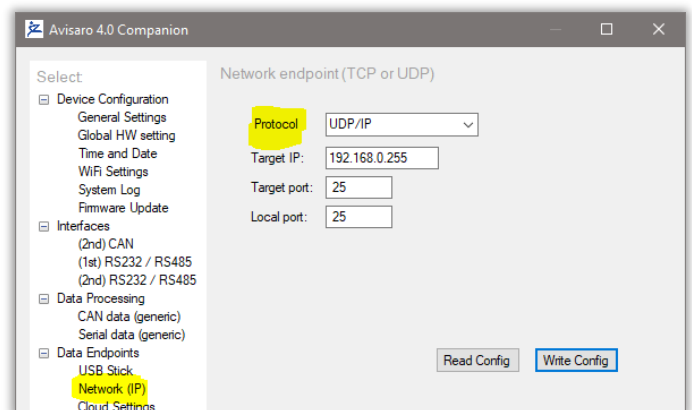
### 3.3.4 Configure network endpoint

This configures where the data are sent to and which protocol is used.

See paragraph “5.9 Data Endpoints-> Network endpoint” further down in the document.

Configure the “Protocol” to either UDP/IP or TCP/IP and make the settings as described.

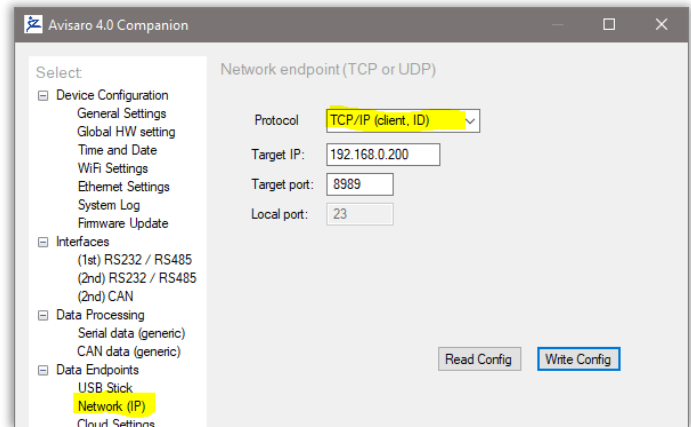
In “Target IP”, you need to enter either a broadcast address (recommended) or the IP address of the other device.



### 3.3.5 Configure “Transmit ID”

With firmware version 2.64 and higher, the feature of transmitting the loggers ID upon TCP connection setup can be activated.

**Motivation:** If multiple Avisaro devices want to connect to the same server, those devices need to be identified. This can be done by choosing a different IP port for each device, or by activating “TCP/IP client, ID” feature.

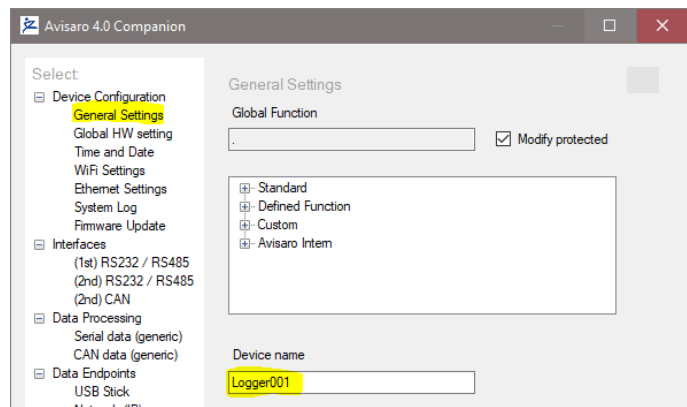


With this activated, the Avisaro device will send its logger name upon connection setup.

Example:

```
{<br><lf>
"Device": "Logger001"<br><lf>
"Format": "1.0"<br><lf>
"FW": "2.64"<br><lf>
}
```

- **Details:**  
The message conforms to JSON. It is terminated with a “}” with no additional <br><lf>
- **Device:** this is the device name as entered in the “General Settings” field
- **Format:** this is the version of this defined format
- **FW:** this is the firmware version of the device
- Be aware that this message might be extended in the future with additional JSON items.



### 3.3.6 Receiving data on a PC

To receive the data on a PC, a simple UDP/IP or TCP/IP Terminal program can be used.

As ‘normal’ network protocols are used, it is very easy to also integrate data streaming into custom applications. Regular IP operations apply.

### 3.3.7 The end

Remember to reboot the Avisaro product for all changes to take effect.

Done ! That’s all it takes.



## 4 CONFIGURATION: 'PC COMPANION SOFTWARE'

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### 4.1 DETAILED DOCUMENTATION

This current document shows only selected parts of the full "Avisaro PC Companion Software" user manual. The motivation is to keep this document as compact as possible.

Please find the extensive "Avisaro PC Companion Software" document in the support section of the Avisaro website:

German: [https://www.avisaro.de/de/40\\_Dokumentation.html](https://www.avisaro.de/de/40_Dokumentation.html)

English: <https://www.avisaro.com/en/40-ENG-Documentation.html>

### 4.2 "PC COMPANION SOFTWARE" INSTALLATION

Download the latest version from:

German site: <https://www.avisaro.de/de/40-PC-Software.html>

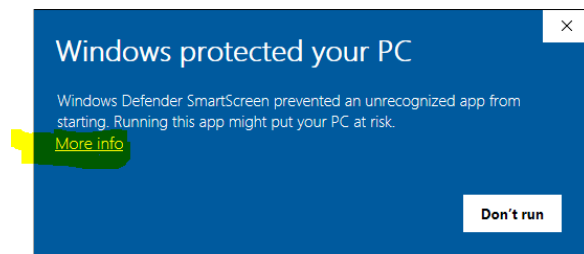
English site: <https://www.avisaro.com/en/40-ENG-PC-Software.html>

Please check the section "DRAFT version" only if advised by Avisaro Support.

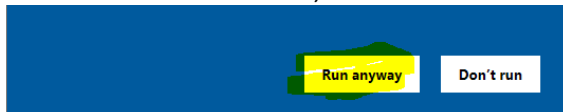
There are two version available:

- Install: this runs a Windows installer. You need admin rights to run.
- Direct: this contains a folder with all files. You can run the \*.exe directly from there.

Windows warns the user before installing or using software downloaded from the Internet. So, if you click on "Avisaro\_40\_Companion\_v2.56\_Setup.exe", the warning will occur:



After a click on "More Info", the box shows:



Select "Run anyway" to continue.

### 4.3 DRIVER INSTALLATION

If you connect the Avisaro Device to the PC using a Micro USB cable, a virtual COM port driver is installed. If this driver does not install automatically, you can download and install this manually:

<http://www.avisaro.de/de/40-PC-Treiber.html> (German site)

<http://www.avisaro.com/en/40-ENG-PC-Driver.html> (English site)

### 4.4 INITIAL SET-UP

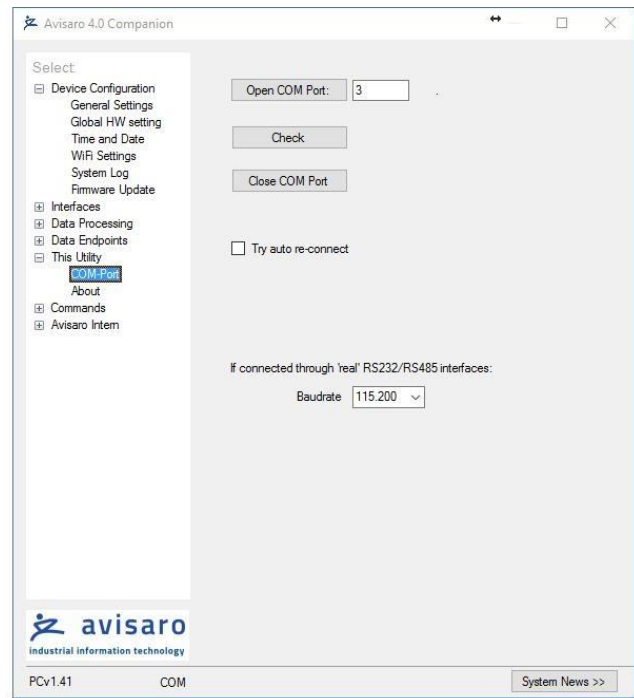
After starting the companion software, the virtual COM port number needs to be entered. You can find this number in the Windows “Device Manager”.

This setting is stored for future use.

Click on ‘open COM port’ – which will turn green if successful. You can use the “check” button to verify that the connection is alive.

You can use the “Check” button to verify the connection to the Avisaro Device. It should light up green when clicked.

The baudrate setting for “if connected through real RS22..” can be ignored. This setting is used only in special projects and not scope of this document.



All settings are deactivated if there is no Avisaro Device attached.

### 4.5 USING THE PC COMPANION TOOL

Click on “Write Config” to transmit changes in the PC tool to the Avisaro device. Click on “Read Config” to display the currently stored values (if you navigate between options, the latest settings are read of course automatically).

Most settings become active only after reboot. This can be done in Commands ⇒ Device Control: Reboot Device.

## 5 FIRMWARE AND CONFIGURATION UPDATE

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### 5.1 CONFIGURATION UPDATE

#### 5.1.1 Introduction

The configuration of the Avisaro 4.0 defines how the devices behave. Settings like baud rate, time and date, Internet access parameter, etc. are variable and can be defined by the user.

There are two ways to configure the Avisaro 4.0 devices:

- 1) Connect the device to a PC using a Micro-USB cable. On the PC, configuration software can be used to make all the settings via user-friendly drop-down menus. The software ("PC Companion") is provided by Avisaro free of charge.
- 2) The configuration can also be applied by USB stick. Once a valid configuration is made using the PC Companion software, a configuration file can be created. This configuration file is placed on a USB stick and automatically loaded by the device.

#### 5.1.2 Via "PC Companion" Software

Configuration via the "PC Companion" software is the most user-friendly way to configure the Avisaro devices. Use this as your preferred method.

See paragraph "PC Companion Software" for details on where to get and how to operate the software.

Find the complete reference manual for the PC Companion Software here:

[https://www.avisaro.de/files/Avisaro/40\\_Docu/Avisaro-PC-Companion-Manual.pdf](https://www.avisaro.de/files/Avisaro/40_Docu/Avisaro-PC-Companion-Manual.pdf)

#### 5.1.3 Via USB Stick

Firmware requirements: 2.66 or larger (2022/03/28 or newer)

To configure devices within the application or without the usage of a PC/Notebook, a USB stick with a configuration file can be used. This configuration file is generated using the PC Companion tool.

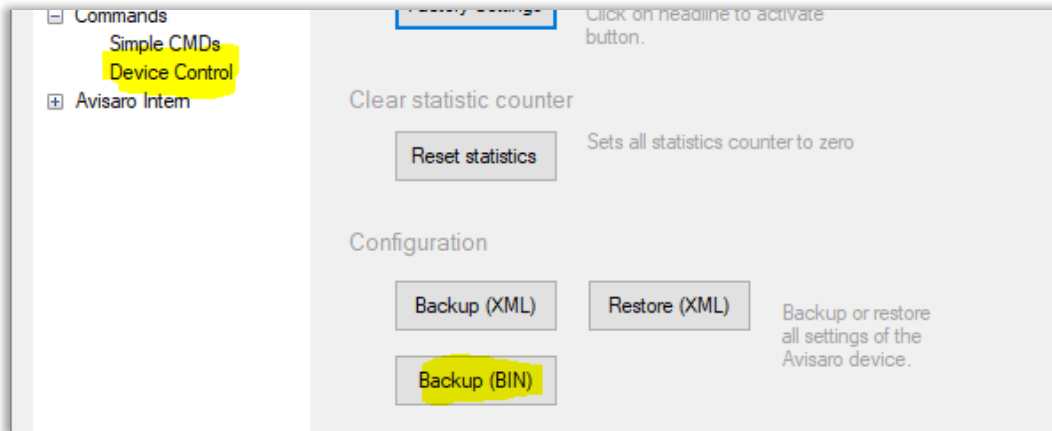
**Please note:** The PC Companion Tool needs a connected device to operate. Thus, one device 'on your desk' is needed to generate this update file.

**Please note:** It is important the firmware versions match. The device from which the configuration is extracted must have the same firmware as the device the configuration is applied to.

How it works:

- 1) Connect to the local Avisaro 4.0 device which contains the configuration to be extracted.
- 2) Use the "PC Companion" software and navigate to "Commands->Device Control"

- 3) Click on “Backup (BIN) to generate a binary copy of the configuration:



The generated file is usually named like “20220328 configuration” for better documentation.

- 4) Copy the configuration file on a USB Stick and **rename it to “avi40cnf.bin”** and insert the USB stick in the Avisaro 4.0 device.
- 5) ... the update is performed and the Avisaro device reboots ... this takes roughly 30sec to 1 minute
- 6) The **“avi40cnf.bin” file is deleted** from the USB stick once the configuration update was successful.

**Please note:** A firmware update and a configuration update can be done in one sequence. Thus, place both files on the same USB stick. The SET PC\_Headline\_DataEndp TO \$""%RootDir%\\Kapitel - Companion\\Kapitel PC Headline DataEnd.docx"" order is: first, the firmware update is performed, second, the configuration update is performed.

## 5.2 FIRMWARE UPDATE

### 5.2.1 Introduction

There are three ways to update the firmware of the Avisaro 4.0 family:

1. Via USB Stick  
If the Avisaro 4.0 product has a USB Host port, a new firmware can be uploaded using a USB stick. See details below.
2. Via PC Companion software  
If the Avisaro 4.0 product is connected to a PC via USB cable, the firmware can be updated using the PC companion software. See details below.
3. Via Remote Update  
For selected products, a remote firmware update via FTP server / Internet is provided. See paragraph “Remote Firmware Update” for details.

The latest firmware version can be found online: <http://www.avisaro.de/de/40-Firmware.html>

### 5.2.2 Via USB stick

Instructions:

- Download the latest version of the firmware from the link posted above
- Unpack the \*.zip file to retrieve the “avi40up.bin” file
- Copy the file onto a USB stick in the root directory
- Power up the Avisaro data logger
- Insert the USB stick
  - After a few seconds, the LED flashes red (the firmware is loaded)
  - After about 30 seconds, the LED flashes white (critical update phase, to not interrupt)
  - The logger reboots and starts again to show a green LED
- The firmware update file is deleted from the USB stick when finished - this is to avoid accidentally a restart of the process.
- Done !

#### **Warning:**

- Ensure stable and sufficient power supply during this process. There is a risk that the device becomes unusable if there is a power failure during the process. Those broken devices needs to be send in to Avisaro for repair.

Background:

- The configuration remains - if not stated otherwise - the same. Thus, all settings stay the same after a firmware update

### 5.2.3 Via “PC Companion” Software

See paragraph “PC Companion Software” for details.

### 5.2.4 Via FTP server / internet

Avisaro Devices can be updated remotely. This is a powerful service feature. To enable, navigate to “Data Endpoints”->“Cloud setting” and activate “Remote firmware update”. Please refer to the document “PC Companion” for details, chapter “Data Endpoints-> Cloud Settings”.

The update procedure is as follows:

- Place the new firmware file - usually called “avi40up.bin” on the FTP server
- Rename the file into “avi40up.xin
- The data logger, if enabled, searches every hour the directory. If an update file is found, it is downloaded and executed automatically.

Important note:

- Make sure that the data logger has sufficient and stable power supply during the update procedure. If power fails, the device can be left non-operational and needs service attention.

(To be precise: the download is not critical, but when the update is executed, there is a window of 30 seconds which is sensitive to power failure)

Recommendations:

- It is highly recommended to create a different user pointing to a different subdirectory for each Avisaro Data logger. This way, a firmware update can be directed to each.

## 6 CONTACT AND SUPPORT

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Please contact Avisaro if there are any questions:

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End of this documentation