



Avisaro 4.0 Product Series

Quick Guide

0..10V (4x) Data Logger '4.0 Sky' 'M49924' & 'C49924'

Analog 0..10V Data Logger

Version / Date: 2021-05-06



1. THIS DOCUMENT

1.1. PARAGRAPH NUMBERING

This document is an extraction of the “all-in-one” document “Technical User Manual 4.0”. The paragraph numbering is linked to that document - thus it is not consistent in this “quick guide”.

1.2. LOCATION

Check for the latest document version the following link:

http://www.avisaro.de/de/40_Dokumentation.html (German site)

Active links:

This document has active links. Click within the PDF on internal and external references to navigate quickly to the target.

1.3. OTHER DOCUMENTS

“Technical User Manual 4.0” contains all of this and more information.

1.4. LANGUAGE VERSIONS

This document is available in English version only

4. ENCLOSURE AND USER CONTROLS

4.1. ENCLOSURE "4.0 SKY" WITH WAGO CONNECTORS

Front with slot for USB stick. Matches are shown just for size reference:



Reverse side shows the two WAGO connectors for data and power:



Optional, a DIN rail fitting is available:



4.2. START AND STOP OPERATION

The Avisaro 4.0 starts with operation right after power on if an USB stick is inserted. Also, after re-inserting a USB stick, the operation starts automatically.

4.3. LED BLINK-CODES

There is one multicolor LED to signal states of the Avisaro device.

| Code | What is means | Action |
|---------------------|--|---|
| Green & blue fading | All is fine Idle state, no data arriving | None |
| Green flashing | Data are coming in (RS232, CAN interface) ¹⁾ | |
| Red flashing | No USB stick or button was pushed | Insert USB stick Or press button again |

¹⁾ On analog loggers (e.g. 4...20mA) and similar interfaces, data are read continuously, thus no green flashing is shown

4.4. REAL-TIME CLOCK

A battery buffered internal real time clock is available for time stamping data, start and stop network upload and others controls. The battery is a rechargeable “memo-buf” cell - specifically designed for RTC operations. During regular operation, the battery is recharged over a 48h period. During non-operating times (= supply power off) , the date and time settings are maintained.

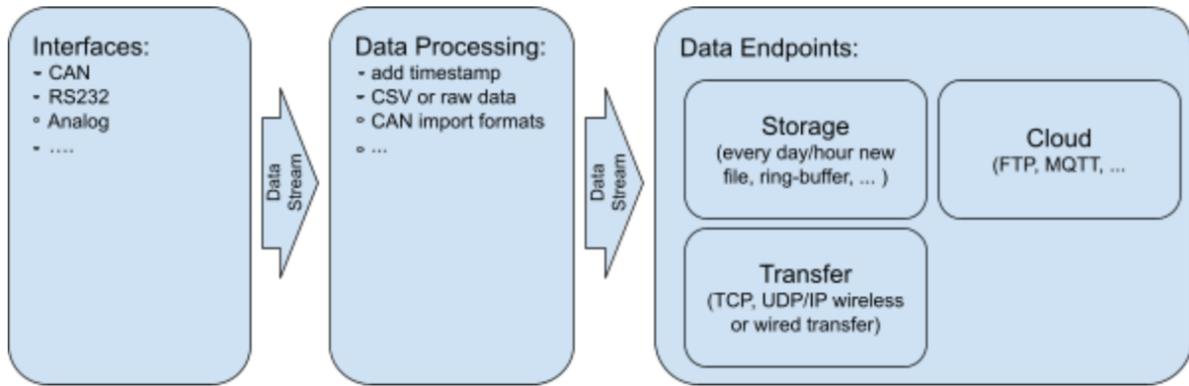
If the Avisaro device is networked, a network time server (SNTP) can be used to set time and date automatically.

If a Avisaro GPS receiver is connected, the RTC can be set using satellite time.

It is possible to define time zones settings.

4.5. CONCEPT OF OPERATION

The Avisaro 4.0 is divided into sections:



Data is received through an “Interface” and then forwarded to the “Data Processing” section. All formatting happens here and then data is forwarded to the “Data Endpoint”.

5. USB STORAGE STICK

5.1. FORMAT AND SIZE

Typically, the USB stick is not included in the scope of delivery. Thi

Regular USB memory sticks can be used:

Size: From 4 to 256 GByte

File system: Formatted as FAT or FAT32 (preferred)



5.2. CHOOSING THE RIGHT TYPE

Make sure to verify whether or not your application needs industrial grade USB storage - this is typically a matter of temperature.

5.3. CHOOSING THE RIGHT SIZE

Larger USB memory sticks tend to become more sensitive to hardware faults. Thus, estimate the amount of data per day, multiply by the number of days between USB stick reads and add some slack.

If using the “ring buffer” setting, old data is deleted when the stick becomes full. “Full” means, if free space drops below 100MB. Please note, that in this configuration, the last two days are not deleted. Therefore, choose an USB stick which holds at least 2 days of data.

12. INTERFACE DESCRIPTION AND PIN LAYOUT

12.6. ANALOG 0..10V INTERFACE

The 0..10V interface can be used for “simple” single-ended voltage measurements, as well as demanding “differential” measurements. The measuring is isolated - thus it can be operated on a different ground reference than the power supply.

12.6.1. Default 0..10V settings

To avoid sensor signal clipping, the voltage levels of analog channels must be kept within the range in reference to the isolated GND :

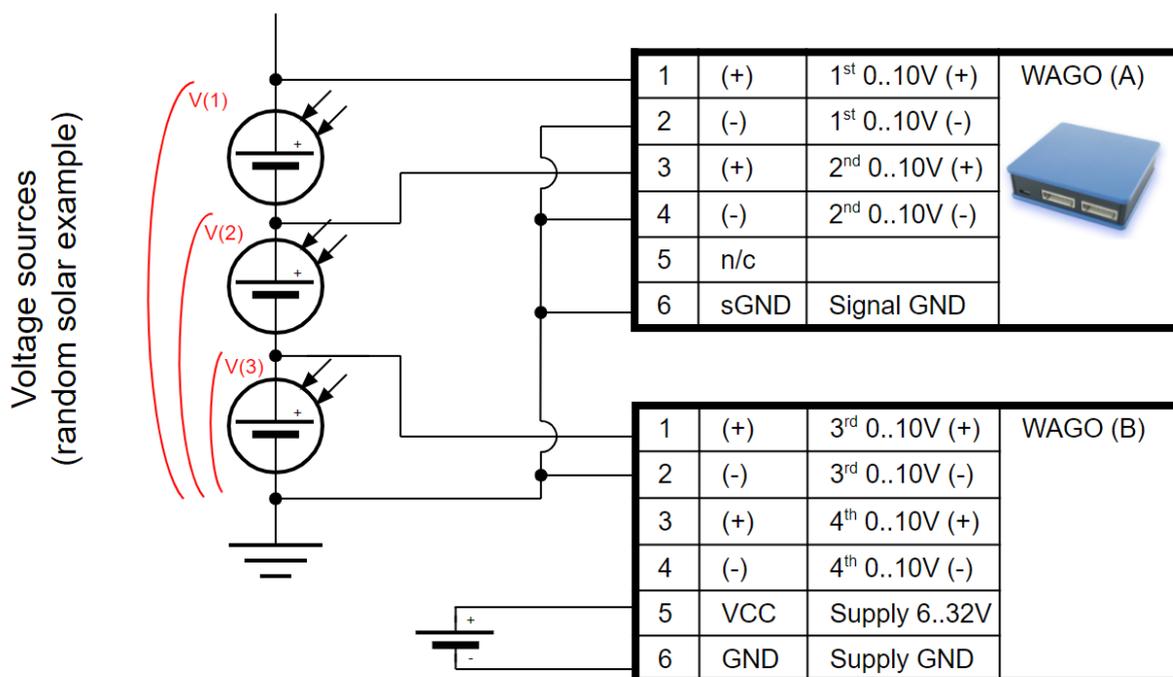
negative Pin Voltage $\geq 0V$ referenced to isolated GND

positive Pin Voltage $\leq 15V$ referenced to isolated GND

The input resistance is 1M Ω .

12.6.2. Example: Wiring “single ended” measurement

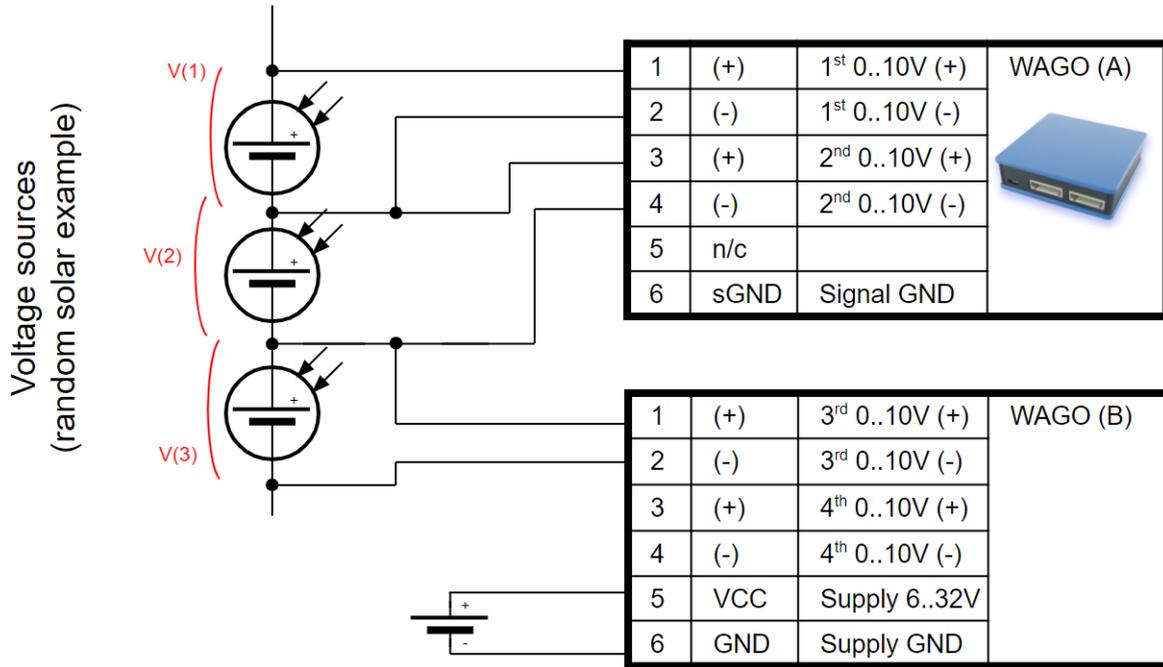
As the data logger allows for advanced differential measurements, single ended measuring needs to have all negative inputs wired to reference ground.



The signal side is isolated from the power side - thus signal ground can be different from supply ground.

12.6.3. Example: Wiring “differential” measurement

The data logger allows for true differential measurement. The following diagram illustrates the wiring.



12.6.4. WAGO - 4x analog 0..10V Signal



| Connector | Interface | Pin | Signal | Direction |
|-----------|--|-----|----------------------------|------------|
| WAGO A | 1 st & 2 nd 0..10V | 1 | 1 st 0..10V (+) | in |
| | | 2 | 1 st 0..10V (-) | in |
| | | 3 | 2 nd 0..10V (+) | in |
| | | 4 | 2 nd 0..10V (-) | in |
| | | 5 | not connected | n/c |
| | | 6 | Signal GND | Signal GND |

| | | | | |
|--------|---|---|----------------------------|--------------|
| WAGO B | 3 rd & 4 th 0..10V | 1 | 3 rd 0..10V (+) | in |
| | | 2 | 3 rd 0..10V (-) | in |
| | | 3 | 4 th 0..10V (+) | in |
| | | 4 | 4 th 0..10V (-) | in |
| | | 5 | VCC (6..32V) | Power Supply |
| | | 6 | GND | Power GND |

11. CONFIGURATION: 'PC COMPANION SOFTWARE'

The "PC Companion Software" is used to configure the Avisaro 4.0 Devices.

The software is available for download from the Avisaro homepage:

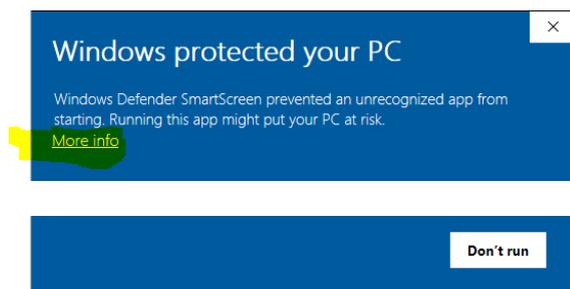
<http://www.avisaro.de/de/40-PC-Software.html> (German)

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

There are two versions to download: "Install" and "Direct start" – the first runs an installer which requires administrative rights on the PC, the second one can be started without an install process. If unsure, check with your IT department which version to download.

11.1. SOFTWARE INSTALLATION ("SECURITY WARNING")

Windows warns the user before installing or using software downloaded from the Internet. So if you click on "Avisaro_40_Companion_v2.31_Setup.exe", the warning will occur:



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



Select "Run anyway" to continue.

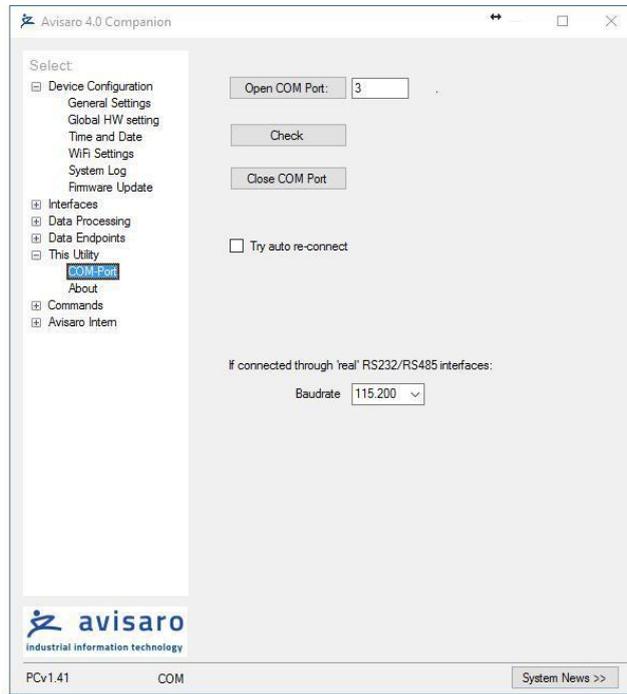
11.2. DRIVER INSTALLATION

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)

11.3. 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.

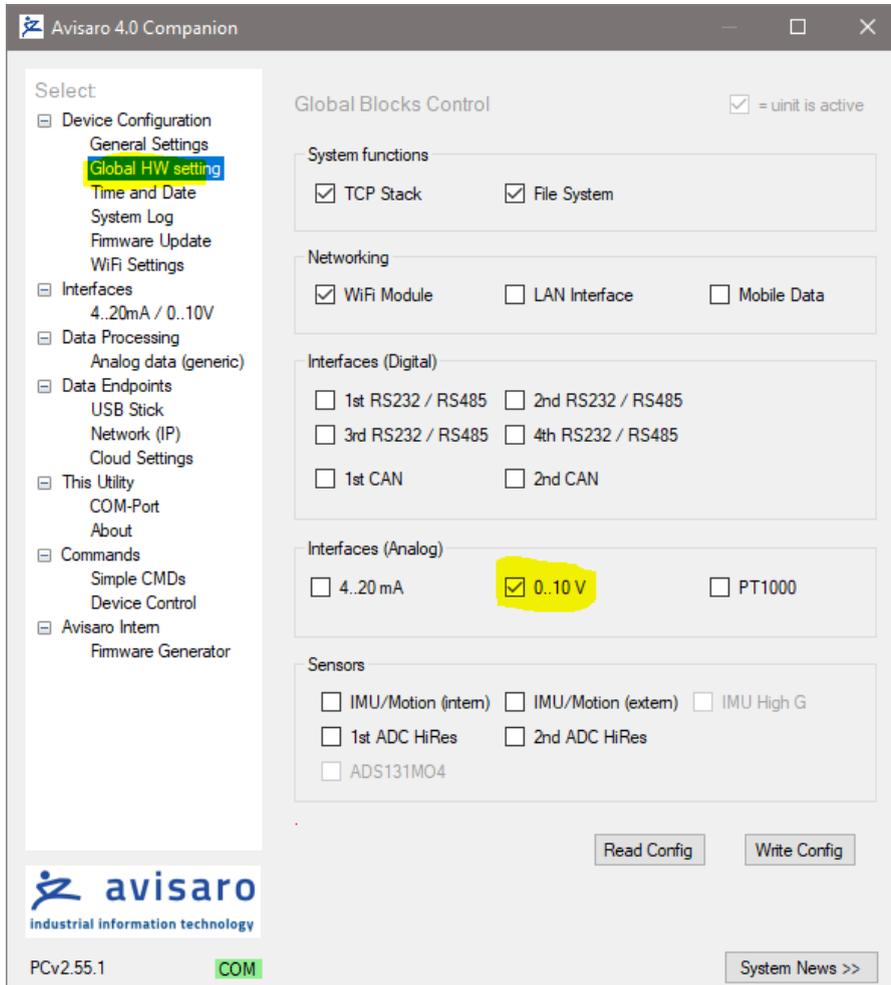
11.4. USING THE PC COMPANION TOOL

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 after reboot. This can be done in Commands ⇨ Device Control: Reboot Device

11.2. DEVICE CONFIGURATION ⇨ GLOBAL HW SETTINGS

All products are pre-configured. Thus, the following setting will be already selected.



Please be advised that the interfaces are hardware dependent - if you didn't purchase a 0..10V, there is no point in activating the interface.

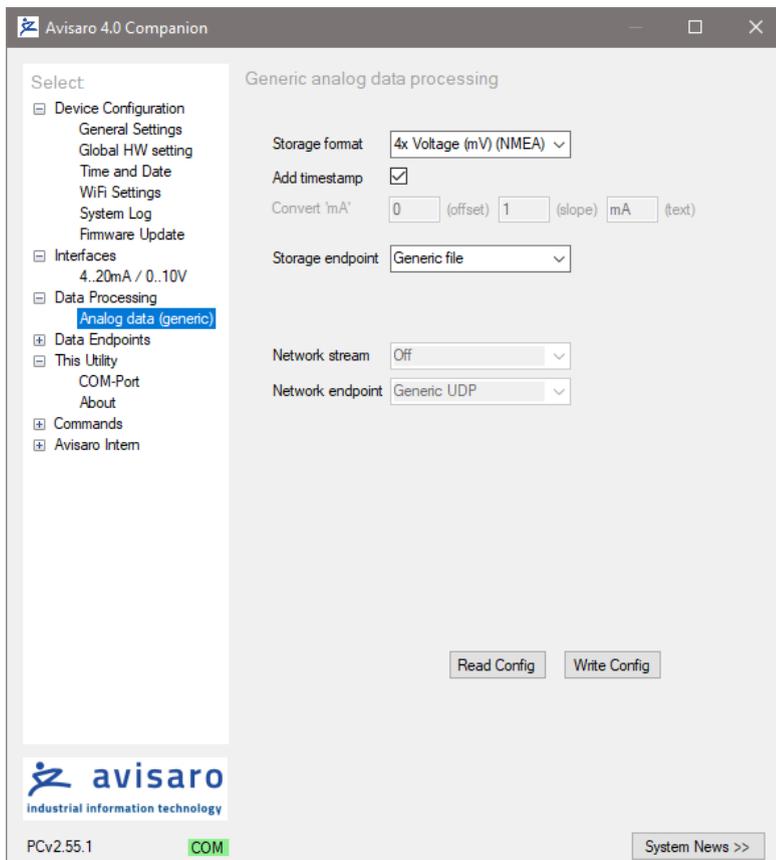
11.8. INTERFACES ⇨ 4..20mA / 0..10V

The screenshot shows the 'Avisaro 4.0 Companion' software window. The title bar reads 'Avisaro 4.0 Companion'. The main window is titled '4..20 mA / 0..10 V Interface'. On the left, there is a 'Select' menu with the following items: Device Configuration (General Settings, Global HW setting, Time and Date, WiFi Settings, System Log, Firmware Update), Interfaces (4..20mA / 0..10V), Data Processing, Data Endpoints, This Utility (COM-Port, About), Commands, and Avisaro Intern. The '4..20mA / 0..10V' interface is selected. The main area shows configuration options: 'Sample rate' is set to '10' Hz, and 'Stream to' is set to 'Analog data (generic)'. There are 'Read Config' and 'Write Config' buttons. Below the configuration is a graph showing ADC data for ADC1, ADC2, ADC3, and ADC4. The y-axis ranges from -20 to 20, and the x-axis ranges from 0 to 100. ADC3 shows a sharp spike at approximately x=35. The status bar at the bottom shows 'PCv2.55.1', a green 'COM' indicator, and a 'System News >>' button.

Sample rate:

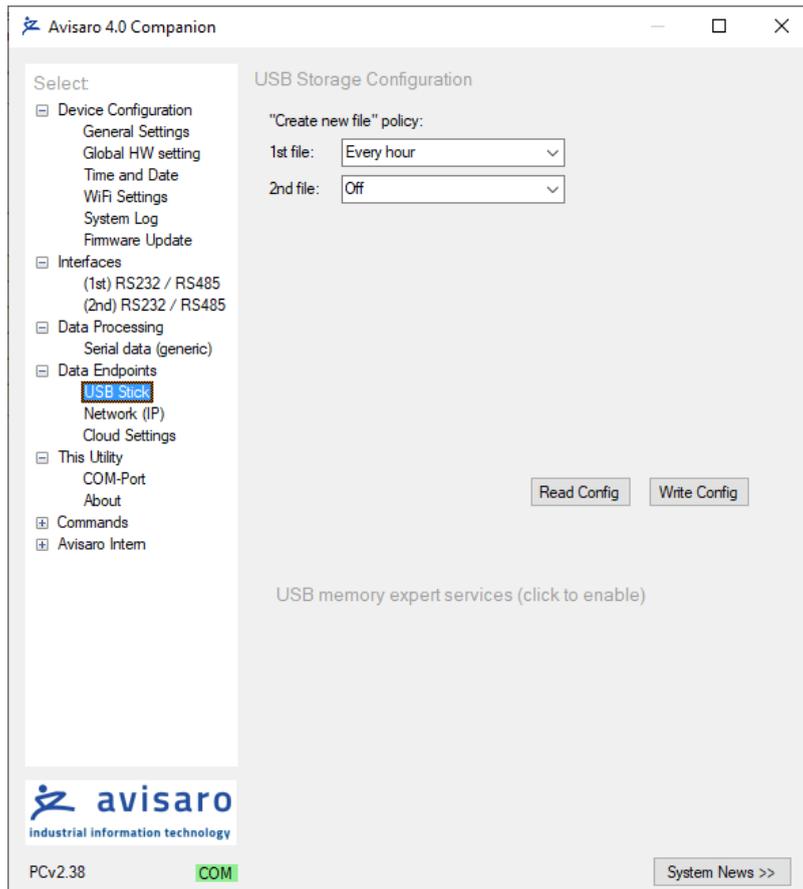
Stream to: "Analog data"

11.10. DATA PROCESSING ⇨ ANALOG DATA (GENERIC)



11.12. DATA ENDPOINTS ⇨ USB STICK

This setting controls the file handling on the USB memory stick.



“Create new file policy”: “1st file”

| | |
|----------------------------|--|
| Off | No data storage, all data are discarded |
| One file | All data are stored in one big file. |
| Every new start | |
| Every hour | A new file is created every hour. The files are named “yymmddhh.txt” |
| Every hour with ringbuffer | A new file is created every hour. If storage space is consumed, the oldest file is deleted. Note: <ul style="list-style-type: none"> • There is a hysteresis: if free storage drops below 100 MB, old files are deleted until 500 MB are free again • The last two days from today backward are not deleted. This is for malfunction security: This assumes that the stick could hold at least 2 days of data - if not, this is a configuration error. |
| Every day | A new file is created day at midnight. The files are named “yyyymmdd.txt” |

14. FIRMWARE UPDATE



We strongly recommend to do a firmware update only if needed. There is a potential risk of a failed update process to cause a dead device which can only be recovered by sending it to Avisaro service. Good reason for an update is a known bug repair or an additional feature.

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>

14.1. FIRMWARE UPDATE 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 need to be sent 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

14.2. FIRMWARE UPDATE VIA PC SOFTWARE

See paragraph "[PC Companion Software](#)" for details.

14.3. FIRMWARE UPDATE VIA FTP SERVER / INTERNET

See paragraph "[Remote Firmware Update](#)" for details.