

Technical User Manual Avisaro 4.0 Product Series

including "PC Companion" Software

RS232 – CAN – 4..20mA – Analog

Version / Date 2018-03-01



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2 THIS DOCUMENT

2.1 CURRENT DOCUMENT VERSION

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.

2.2 HISTORY

2018-03-06	Added more interfaces
2018-03-01	Initial version

3 GENERAL OPERATIONS

3.1 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 start automatically.

4 USER INTERFACE

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4.1 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

4.2 PUSH BUTTON

Starts / Stops the operation

5 TYPICAL USE CASES

5.1 RS232 DATALOGGER

To record a RS232 data stream, configure the logger as follows:

using the PC companion, navigate to:

General Stetting:

Global function: Generic Device

1st / 2nd RS232:

Protocoll: "Regular RS232"

Stream to "generic RS232"

select the baudrate you like and click "Write config"

Commands

Device Control -> Reboot

Now you are ready to go

Insert a USB Stick. When data are received, the LED is flashing green and data are stored on USB stick. You can stop the logging by pressing the button (and restart with it).

Extract the USB drive to read the data you logged.

5.2 RS232 WIRELESS BRIDGE

6 PRE-DEFINED PROFILES

7 WIRELESS OPTION

Getting started

Basic settings

AvisaroSoftAP

192.168.0.1

7.1.1 WPA Enterprise

The server certificate needs to be updated.

The system clock needs to be up to dated.

8 CLOUD AND WIRELESS ACCESS

8.1 FTP SERVER

There is a build-in FTP Server

Requirements:

- A USB stick needs to be plugged in
- The currently used file can not be uploaded

9 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 site)

There are two version 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.

9.1 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)

9.2 INITIAL SET-UP

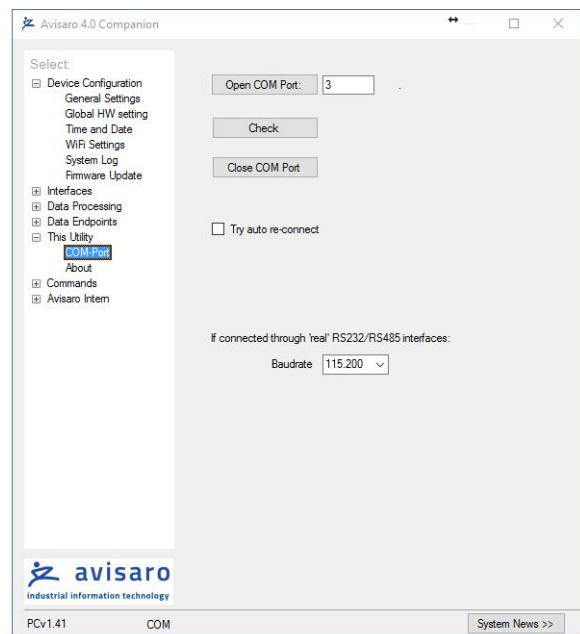
After starting the companion software, the virtual COM port number needs to be entered. You can find this number in the Windows “Device Manager”.

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.



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



9.3 BACKUP AND RECOVER CONFIGURATION

Section: Commands -> Device Control

A complete set of settings can be downloaded and retrieved.

The xml file can be edited manually to remove a block of configuration which should not be restored.

10 INTERFACE DESCRIPTION

10.1 POWER (BARREL)

The matching plug has the following dimensions (which are widely used and very much a 'standard'):

Diameter outside: 5.5 mm, inside: 2.1 mm and a shaft of 9.5 mm.

10.2 RS232

This is an industry standard RS232 connection

10.2.1 Default RS232 settings

Baudrate: 9.600

No of bits: 8

Parity bits: none

Stop bits: 1

Flow control: none

10.2.2 Signal levels

Max Input voltage range on signal pins: -24 to 24 V

10.2.3 D-Sub Connector

Standard SubD-9 connector (male)

- 1.) Data Carrier Detect (DCD)
- 2.) Receive (RxD) Data going to Avisaro Box
- 3.) Transmit (TxD) Data going to device
- 4.) Data Terminal Ready (DTR) Avisaro Box is up
- 5.) Signal Ground GND
- 6.) Data Set Ready (DSR) Client is up and running
- 7.) Request To Send (RTS) Avisaro wants to send data
- 8.) Clear To Send (CTS) Client is ready to receive data
- 9.) Supply voltage input (6 - 32 V) (usually "Ring Indicator")



Supply voltage does not carry an output voltage – thus if the device is powered via barrel connector, Pin 9 does not show the input voltage (internal diode). This is for security reason. If needed, Avisaro can modify the device such that this pin can be used to power other devices.

10.2.4 WAGO Connector

Pin layout:

- 1.) Clear To Send (CTS): Client is ready to receive data
- 2.) Request To Send (RTS) Avisaro wants to send data
- 3.) Receive (RxD) Data going to Avisaro Box
- 4.) Transmit (TxD) Data going to device
- 5.) Supply voltage (6 - 32 V)
- 6.) Supply and Signal Ground (GND)



Cables are connected with the WAGO 734 series connectors. In most product configurations, those adapters are shipped with the box. Check the 'scope of delivery' list.

10.3 RS485

This is an industry standard RS485 bus interface

10.4 CAN

This is an industry standard CAN bus interface

10.4.1 CAN default settings

Baudrate: 125 kbits/s

10.4.2 Signal Levels

Voltage range on CAN-H / CAN-L: 4 - 16V

Transceiver used: SN65HVD family by Texas Instruments. Other transceivers upon request.

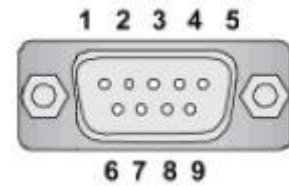
10.4.3 D-Sub Connector

Standard SubD-9 connector (male)

- 1) not connected (optional: VCC)
- 2) CAN-L (Dominant Low)
- 3) GND
- 4) not connected
- 5) not connected



- 6) GND
- 7) CAN-H (Dominant High) / Single Wire CAN
- 8) not connected
- 9) VCC



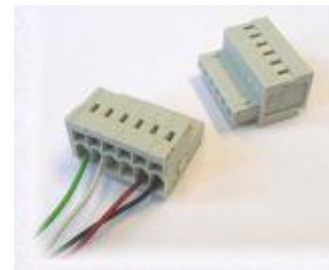
10.4.4 WAGO Connector

Pin layout:

- 1) Signal Ground (GND)
- 2) CAN-L
- 3) CAN-H
- 4) Single Wire CAN (Optional)
- 5) Supply voltage (6 - 32 V)
- 6) Supply and Signal Ground (GND)



Cable are connected with the WAGO 734 series connectors. In most product configurations, those adapters are shipped with the box. Check the 'scope of delivery' list.

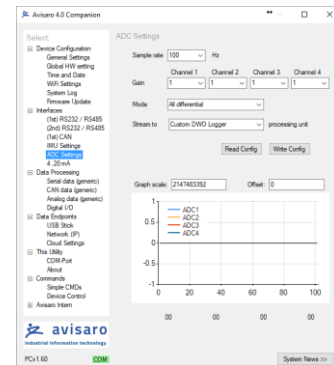


10.5 ANALOG 4..20 MA

The analog 20mA Interface is a differential current input with an internal resistance of 49.9 Ohms. This allows to interface industrial standard 4...20mA sensors to the data logger.

Measuring other currents in general is possible by changing the gain settings. To cover the full range from 0 to +/- 40mA, the gain needs to be set to 1 with the PC companion software.

Gain 1	Current Input Range	0...+/- 40 mA
Gain 2	Current Input Range	0...+/- 20 mA
Gain 4	Current Input Range	0...+/- 10 mA
Gain 8	Current Input Range	0...+/- 5 mA
Gain 16	Current Input Range	0...+/- 2.5 mA
Gain 32	Current Input Range	0...+/- 1.25 mA



10.6 ANALOG RESISTIVE SENSOR INPUT

The Analog Resistive Sensor Input is an interface for directly connecting resistive Sensors to the Data Logger. A constant current source of 0.1mA is connected to the sensor lines in the data logger.

The input range for resistive sensors is from 0 to 20kOhms (gain set to 1).

To allow best accuracy, the gain setting needs to match the sensor resistance range. This allows to directly interface e.g. resistive temperature sensors like KTY81, Pt100, Pt1000 or resistive pressure sensors to the data logger.

Gain 1	Resistance Input	0...20 kOhms
Gain 2	Resistance Input	0...10 kOhms
Gain 4	Resistance Input	0...50 kOhms
Gain 8	Resistance Input	0...2 kOhms
Gain 16	Resistance Input	0...1 kOhms
Gain 32	Resistance Input	0...500 Ohms

Pin layout:

- 1) First Sensor (Constant Current Output)
- 2) First Sensor (Return Line)
- 3) Second Sensor (Constant Current Output)
- 4) Second Sensor (Return Line)
- 5) Supply Voltage (6 – 32 V)
- 6) Supply Ground (GND)

10.7 ANALOG 2V INTERFACE

The analog 2V Interface is a differential voltage input with an input voltage range of +/- 2V. By changing the Gain settings, the voltage range can be set to lower values.

Gain 1	Voltage Input Range	+/- 2V
Gain 2	Voltage Input Range	+/- 1V
Gain 4	Voltage Input Range	+/- 0.5V
Gain 8	Voltage Input Range	+/- 0.25V
Gain 16	Voltage Input Range	+/- 125 mV
Gain 32	Voltage Input Range	+/- 62.5 mV

10.8 ANALOG 10V INTERFACE

The analog 10V Interface is a differential voltage input with an input voltage range of +/- 10V (at gain 1). The input resistance is 1M Ω .

11 INTERFACE PIN LAYOUTS



11.1 2X RS232 INTERFACE (“M41124” / “C41124”)

	WAGO (A)						WAGO (B)					
	1	2	3	4	5	6	1	2	3	4	5	6
Interface	2 nd RS232						1 st RS232					
Signal	CTS	RTC	RxD	TxD	VCC Supply 6..32V	GND Supply	CTS	RTC	RxD	TxD	VCC Supply 6..32V	GND Supply
Direction	IN	OUT	IN	OUT	Power	Power	IN	OUT	IN	OUT	Power	Power

See details for the RS232 interface in paragraph “10.2 RS232” on page 11.



11.2 2X CAN INTERFACE (“M43324” / “C43324”)

	WAGO (A)						WAGO (B)					
	1	2	3	4	5	6	1	2	3	4	5	6
Interface	1 st CAN						2 nd CAN					
Signal	Ground (Signal)	CAN-L	CAN-H	Future Use (Not connected)	VCC 6..32V	GND	Ground (Signal)	CAN-L	CAN-H	Future Use Not connected	VCC 6..32V	GND
Direction		BUS	BUS					BUS	BUS			

See details for the CAN interface in paragraph “10.4 CAN” on page 12.

11.3 4X ANALOG BOARD INTERFACE (“M4AB24”)

	WAGO (A)						WAGO (B)					
	1	2	3	4	5	6	1	2	3	4	5	6
Interface	4..20 mA and Resistive Sensor						2x Resistive Sensor					
Signal	A1 4..20mA	A2 4..20mA	A3 Analog resistive	A4 Analog resistive	VCC 6..32V	GND	A5 Analog resistive	A6 Analog resistive	A7 Analog resistive	A8 Analog resistive	VCC 6..32V	GND
Direction	IN	IN	IN	IN			IN	IN	IN	IN		

For details for the 4..20mA interface see: “10.5 Analog 4..20 mA” on page 14

For details for the Resistive Sensor interface see: “10.6 Analog Resistive Sensor Input” on page 14

VCC and GND are the same across the two ports.

Supply voltage is 6..32 V DC.

12 FIRMWARE UPDATE

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 Internet is provided.
This feature is **not** available for off-the-shelf products.

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

13 APPENDIX

13.1 UNDERSTANDING PRODUCT SERIAL NUMBERS

This is to explain the product serial numbers. Not all combinations are possible.

Function	Series	Interface 1	Interface 2	Connector	Housing
M = Logger	4 = 4.0 Family	0 = none	Same numbering as Interface 1, only if 'P' than:	1 = SubD	1 = raw PCB
W = WiFi		1 = RS232		2 = WAGO	3 = Standard 2.0
C = Wifi + Logger		2 = RS485		3 = RJ45 + WAGO	4 = Standard 4.0
E = Extension		3 = CAN		4 = RJ45 + Barrel	6 = Cube
		4 = Ethernet	1 = IMU (intern)	7 = Screw Type	
		7 = 2x 4..20 mA	2 = GPS (intern)	A = Internal AEB	
		9 = 2x 0..10V			
		A = 4..20mA+Resist			
		B = 2x Resistive			
		C = 2x 0..2V			
		P = I2C (intern)			
		S = digital I/O			