



Avisaro 4.0 Product Series

## Quick Guide

# RS485 Data Logger & Gateway

## '4.0 Sky'

( "M42224" / "C42224" )

Version / Date: 2023/05/23



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## 2 THIS DOCUMENT

### 2.1 HISTORY OF CHANGES

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

Version	Description
2023/05/23	Update of links to new website
2023/03/08	More corrections
2022/03/28	Added "configuration via USB stick" / Firmware 2.66 and higher
2021/06/14	Multiple additions and first public release
2021/05/02	Initial version extracted from existing documents

### 2.2 AUDIENCE

The intended reader of this document are technical personnel installing, configuring, and using the Avisaro device.

### 2.3 LOCATION

Check for the latest document version the following link:

Link: [https://www.avisaro.de/files/Avisaro/40\\_Docu/M42224-C42224-QuickGuide.pdf](https://www.avisaro.de/files/Avisaro/40_Docu/M42224-C42224-QuickGuide.pdf)

### 2.4 LANGUAGE VERSIONS

This document is available in English language only.

### 2.5 OTHER DOCUMENTS AND RESOURCES

Other documents and resources can be found in the support area of our website:

English: <https://shop.avisaro.com/en/info/support.html>

German: <https://shop.avisaro.com/de/info/support.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. The disadvantage is that on rare occasions, a paragraph might have comments which do not fit 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)

Email: [info@avisaro.com](mailto:info@avisaro.com)

## 3 ENCLOSURE AND USER CONTROLS

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### 3.1 START AND STOP OPERATION

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

### 3.2 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) <sup>1)</sup>	None
Yello constant	All is fine, USB stick is checked after mounting	None
Red flashing	No USB stick or button was pushed	Insert USB stick Or press button again
Red (about 2sec) than blue (about 2sec)	Logger restarts. This should not happen during normal operation	Check power supply

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

### 3.3 REAL-TIME CLOCK

A battery buffered internal real time clock is available for time stamping data, start and stop network upload and other controls. The battery is a rechargeable “memo-buff” 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 for several month.

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

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

It is possible to define time zones settings.

### 3.4 ENCLOSURE “4.0 SKY” WITH WAGO CONNECTOR

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



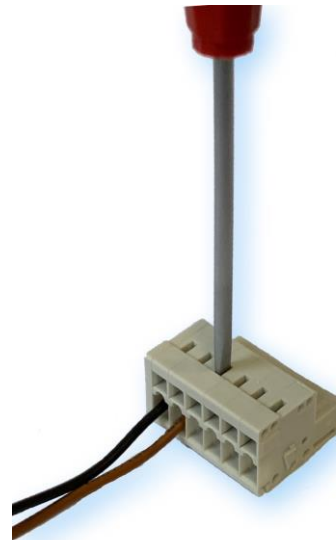
Reverse side shows the two WAGO connectors for data and power:



Optional, a DIN rail fitting is available:



WAGO connector are great with single wires. The Clamps are included in most of our products



## 4 USB STORAGE STICK

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### 4.1 FILESYSTEM AND STORAGE SIZE

Commercially available USB 2.0 / 3.0 memory sticks can be used. It is recommended to exclude branded products - no "promotional items" with your own logo imprint.

There are no speed requirements. Memory sticks that are advertised as particularly fast offer no (!) advantage in the Avisaro data logger. Typically these optimizations are designed for cameras etc..

Memory sizes from 4 to 256 GByte are supported. As file system FAT or FAT32 (preferred) is used. NTFS or others are not supported.

Memory sticks are typically not in the scope of delivery - each application typically has different requirements.

### 4.2 FORMATTING

Usually, sticks come pre-formatted, so you don't have to do anything. Even larger than 32GByte sticks are preformatted with FAT32.

Sticks equal or smaller than 32 GByte can be formatted with Windows Operating system as it is. Use "FAT32" as the desired format.

Windows Operating System does not allow to format sticks larger then 32 GByte with the FAT32 file system. Usually, sticks come pre-formatted, so you don't have to do anything. If there is a need to reformat a stick, the Avisaro Device can be used. Please refer to later chapter "Configuration: PC Companion Software" .. "USB Storage" ether in this document, or in the overall "User Manual Serie 4.0" document.

Alternatively, third party tools for Windows can be used to format large USB sticks. Please note: Avisaro can not support those third party tools within our technical support via telephone or email.

### 4.3 CHOOSING THE RIGHT MEMORY STICK

For **industrial** use, special parameters may have to be observed:

The **temperature** range should be considered. There are "industrial grade" memory sticks available - often designed as "SLC" version - which are also suitable for harsh environments.

The **mechanical dimension** should also be considered. It is disadvantageous if the stick protrudes openly from the housing and could be knocked off. In this case short sticks are recommended. If the logger is installed protected, then a longer stick is easier to use.





The appropriate **memory size** also depends on the intended use. Due to the technology, memory sticks with an extremely high capacity are typically less robust than smaller memory sizes. The loggers have a "ring memory" that can be optionally activated. If the memory stick becomes full (approx. less than 100MB free memory) the oldest files are deleted - this is a useful setting for some applications.





#### 4.4 RECOMMENDED MEMORY STICKS

It is difficult to recommend consumer grade USB sticks as detailed technical information are not published.

Nevertheless, we try (please check for updated documentation often, link found in previous chapters):


Last updated: April 5<sup>th</sup>, 2022

##### 4.4.1 Recommended

Manufacturer	Model	Picture	Capacity	Technology	Remarks
SanDisk	Ultra Fit		16 GB	Consumer	
SanDisk	Ultra		32 GB	Consumer	
Intenso	Slim Line		8 GB	Consumer	
Kingston	Data Traveler 2		16 GB	Consumer	

Innodisk	USB Drive 3SE		4-32 GB	Industrial	SLC Technology
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#### 4.4.2 Not recommended

Manufacturer	Model	Picture	Capacity	Technology	Remarks
Verbatim	Slider Store N Go		8 GB	Consumer	Stick failures after short period of time

## 5 INTERFACE DESCRIPTION AND PIN LAYOUT

### 5.1 MICRO-USB CLIENT

The Micro-USB client interface is used for configuration only.



*USB in "4.0 Sky" products    USB Client in "4.0 Silver" products    USB Client in "4.0 Shell" products*

Most Avisaro devices are powered through the Micro-USB client port, however only for configuration. A stable regular operation is not guaranteed. Use the regular power supply for normal operation.

A "Micro USB" cable is used. As those cables are widely available, this cable is not part of the scope of delivery to avoid electronic waste.

**Heads-up:** There are sometimes Micro USB cable which only do power supply, but not data. Those are used i.e., with mobile phones. If the Avisaro device is powered, but no data connection to the PC – just choose a different USB cable.

### 5.2 RS485 BUS INTERFACE

This is an industry standard RS485 bus connection.

#### 5.2.1 Default RS485 settings

Those are the default settings:

Baudrate	9600
No of bits	8
Parity bits	none
Stop bits	1
Flow control	none

#### 5.2.2 Signal levels

Max Input voltage range on signal pins:

Output level provided: 0V to 5V differential

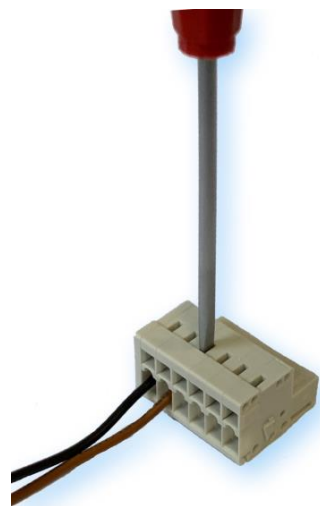
5.2.3 WAGO - 2x RS485 Interface (“M42224” / “C42224”)



Connector	Interface	Pin	Signal	Direction
WAGO A	2 <sup>nd</sup> RS485	1	n.c.	Not connected
		2	n.c.	Not connected
		3	Signal B / D+	RS485 Bus
		4	Signal A / D-	RS485 Bus
		5	VCC (6..32V)	Power
		6	GND	Power & Signal
WAGO B	1 <sup>st</sup> RS485	1	n.c.	Not connected
		2	n.c.	Not connected
		3	Signal B / D+	RS485 Bus
		4	Signal A / D-	RS485 Bus
		5	VCC (6..32V)	Power
		6	GND	Power & Signal

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.

## 5.2.4 Using the WAGO connector



To open the WAGO clamp, insert a screwdriver as shown in the picture to the left. Push down gently – this will open the clamp and you can insert the cable.

Typically, WAGO clamp is included in the scope of delivery.

Type of connector: WAGO 734

## 6 CONFIGURATION: 'PC COMPANION SOFTWARE'

### 6.1 HOW TO CONFIGURE AVISARO "SERIES 4.0" PRODUCTS

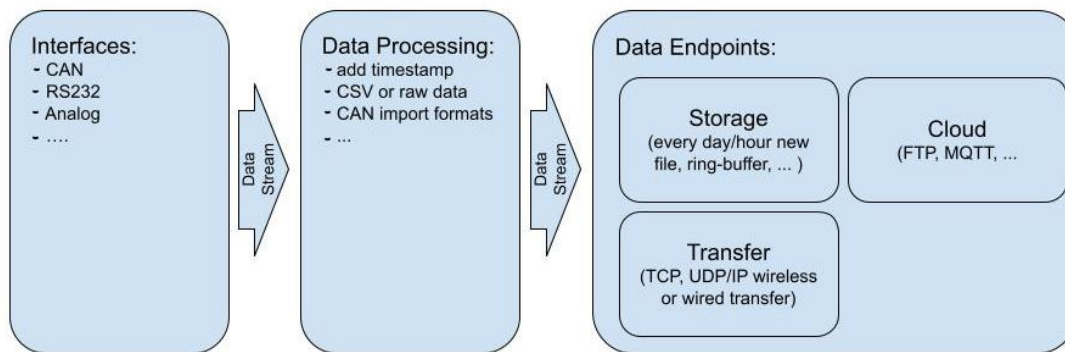
The basic principle of how to configure the Avisaro "Series 4.0" products is:

- 1) Download and install the "Avisaro PC Companion Software".
- 2) Connect the Avisaro device via USB cable.
- 3) Choose the correct COM port and click on "connect".
- 4) The software presents all the settings you can make and guides you to avoid conflicting configurations.
- 5) Click on "save configuration" to store changes in the Avisaro device.
- 6) Reboot the Avisaro Device so that the new configuration takes effect.

Details are described further down in this document.

### 6.2 CONCEPT OF OPERATION

The Avisaro 4.0 is divided into sections:



Data are 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".

### 6.3 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-Dokumentation.html>

## 6.4 “PC COMPANION SOFTWARE” INSTALLATION

Download the latest version from:

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

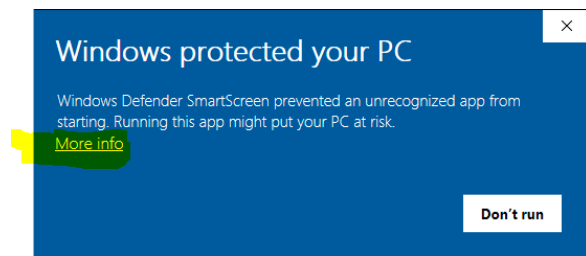
English site: <https://www.avisaro.com/en/40-ENG-PC-Software.html>

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

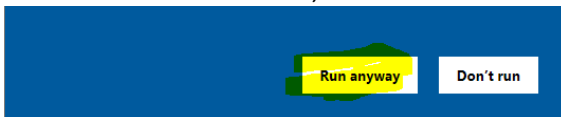
There are two version available:

- 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.

## 6.5 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)

## 6.6 INITIAL SET-UP

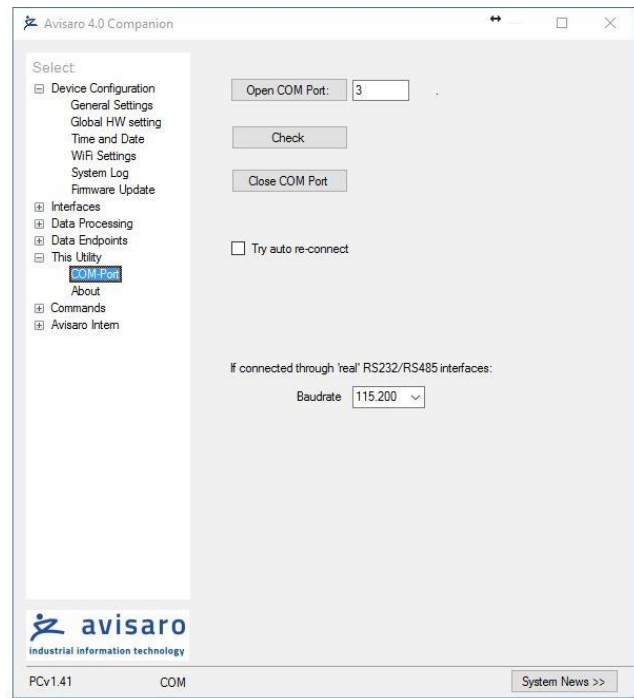
After starting the companion software, the virtual COM port number needs to be entered. You can find this number in the Windows “Device Manager”.

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.

## 6.7 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.



## 7 FIRMWARE AND CONFIGURATION UPDATE

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### 7.1 CONFIGURATION UPDATE

#### 7.1.1 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.

#### 7.1.2 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)

#### 7.1.3 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.

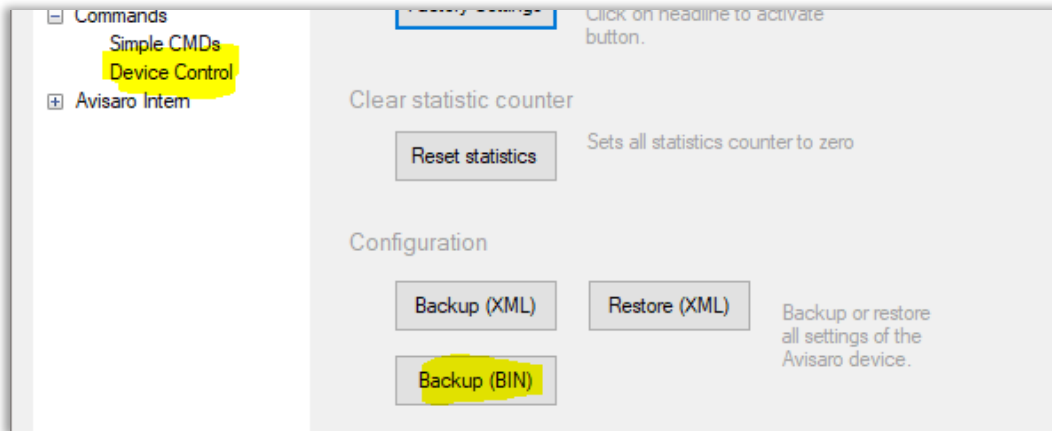
**Please note:** The PC Companion Tool needs a connected device to operate. Thus, one device 'on your desk' is needed to generate this update file.

**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.

## 7.2 FIRMWARE UPDATE

### 7.2.1 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>

### 7.2.2 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

### 7.2.3 Via “PC Companion” Software

See paragraph “PC Companion Software” for details.

### 7.2.4 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.

## 8 DECLARATIONS

### 8.1 EC/EU DECLARATION OF CONFORMITY


  
 industrial information technology

**EG/EU Konformitätserklärung**  
*EC/EU Declaration of Conformity*

Name des Herstellers **Avisaro AG**  
*Manufacturer Name* **Grosser Kolonnenweg 18 E**  
**30163 Hannover**  
**Germany**

erklärt in alleiniger Verantwortung, dass das Produkt  
*declares in its sole responsibility, that the product*

Bezeichnung des Produkts **Datenlogger 4.0 „Sky“**  
*Description of Product*

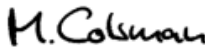
Type(n) **Serie M4xxx**  
*Type(s)*

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.  
*is in conformity with the requirements of the following directives and standards.*

<u>Richtlinie(n)</u> <i>Directive(s)</i>	<u>Norm(en)</u> <i>Standard(s)</i>
Bis / <u>until</u> 2016-04-19: 2004/108/EG  Ab / <u>from</u> 2016-04-20: 2014/30/EU	EN 55022 : 2010 EN 55024 : 2010
Sonstige Normen: <i>Other <u>normes</u>:</i>	EN 60950-1 : 2006 EN 60529 + A1 2000 (Cube IP 66)

Hannover, 08.03.2016

Ort, Datum  
*Place, date*

  
 Matthias Colsmann  
Leitung Entwicklung  
*Head of development*

## 9 CONTACT AND SUPPORT

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Please contact Avisaro if there are any questions:

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Germany

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End of this documentation