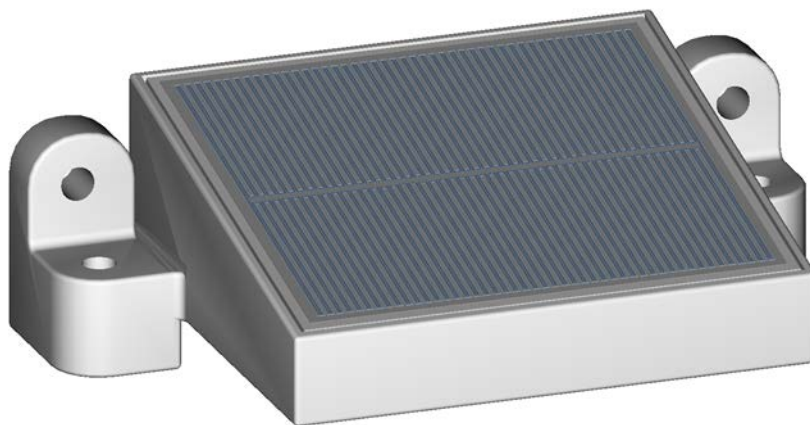


# Rain Monitor

## Instruction for Use

5.4106.0x.x0x



Dok. No. 021708/09/18

THE WORLD OF WEATHER DATA

### Safety Instructions

- Before operating with or at the device/product, read through the operating instructions. This manual contains instructions which should be followed on mounting, start-up, and operation. A non-observance might cause:
  - failure of important functions
  - endangerment of persons by electrical or mechanical effect
  - damage to objects
- Mounting, electrical connection and wiring of the device/product must be carried out only by a qualified technician who is familiar with and observes the engineering regulations, provisions and standards applicable in each case.
- Repairs and maintenance may only be carried out by trained staff or **Adolf Thies GmbH & Co. KG**. Only components and spare parts supplied and/or recommended by **Adolf Thies GmbH & Co. KG** should be used for repairs.
- Electrical devices/products must be mounted and wired only in a voltage-free state.
- **Adolf Thies GmbH & Co KG** guarantees proper functioning of the device/products provided that no modifications have been made to the mechanics, electronics or software, and that the following points are observed:
  - All information, warnings and instructions for use included in these operating instructions must be taken into account and observed as this is essential to ensure trouble-free operation and a safe condition of the measuring system / device / product.
  - The device / product is designed for a specific application as described in these operating instructions.
  - The device / product should be operated with the accessories and consumables supplied and/or recommended by **Adolf Thies GmbH & Co KG** .
  - Recommendation: As it is possible that each measuring system / device / product may, under certain conditions, and in rare cases, may also output erroneous measuring values, it is recommended using redundant systems with plausibility checks for **security-relevant applications**.

### Environment

- As a longstanding manufacturer of sensors Adolf Thies GmbH & Co KG is committed to the objectives of environmental protection and is therefore willing to take back all supplied products governed by the provisions of "*ElektroG*" (German Electrical and Electronic Equipment Act) and to perform environmentally compatible disposal and recycling. We are prepared to take back all Thies products concerned free of charge if returned to Thies by our customers carriage-paid.
- Make sure you retain packaging for storage or transport of products. Should packaging however no longer be required, please arrange for recycling as the packaging materials are designed to be recycled.



### Documentation

- © Copyright **Adolf Thies GmbH & Co KG**, Göttingen / Germany
- Although these operating instructions have been drawn up with due care, **Adolf Thies GmbH & Co KG** can accept no liability whatsoever for any technical and typographical errors or omissions in this document that might remain.
- We can accept no liability whatsoever for any losses arising from the information contained in this document.
- Subject to modification in terms of content.
- The device / product should not be passed on without the/these operating instructions.

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## 1 Device versions

| Article - No. | Measuring value  | Output                                      | Operating-Voltage                | Configuration   |
|---------------|--|---|----------------------------------|---|
| 5.4106.00.000 | Precipitation detected:<br>Yes = contact open<br>No = contact closed | Semiconductor relay;<br>Type: normally open | 11...28V AC<br>or<br>10...32V DC | - 3m cable, 4 pol.<br>- fixing kit  |
| 5.4106.00.010 | Precipitation detected:<br>Yes = contact open<br>No = contact closed | Semiconductor relay;<br>Type: normally open | 11...28V AC<br>or<br>10...32V DC | - 10m cable, 4 pol.<br>- fixing kit   |
| 5.4106.00.011 | Precipitation detected:<br>Yes = contact open<br>No = contact closed | Semiconductor relay;<br>Type: normally open | 11...28V AC<br>or<br>10...32V DC | - 10m cable, 4 pol.,<br>- Cable shielded,<br>- uv-resistant<br>- fixing kit |
| 5.4106.00.100 | Precipitation detected:<br>Yes = contact 5<br>No = contact 3         | Semiconductor relay;<br>Type: Changeover    | 11...28V AC<br>or<br>10...32V DC | - 3m cable, 5 pol.<br>- fixing kit  |
| 5.4106.00.901 | Precipitation detected:<br>Yes = contact closed<br>No = contact open | Semiconductor relay;<br>Type: normally open | 11...28V AC<br>or<br>10...32V DC | - 3m cable, 4 pol.<br>- <u>without</u> fixing kit                           |
| 5.4106.00.001 | Precipitation detected:<br>Yes = contact open<br>No = contact open   | Semiconductor relay;<br>Type: normally open | 11...28V AC<br>or<br>10...32V DC | - 3m cable, 4 pol.<br>- fixing kit  |
| 5.4106.01.011 | Precipitation detected:<br>(5Hz, 10 ...50Hz)                         | Semiconductor relay;<br>Type: normally open | 11...28V AC<br>or<br>10...32V DC | - 10m cable, 4 pol.<br>- Cable shielded<br>- uv-resistant<br>- fixing kit   |

Scope of supply:

- Rain monitor
- Fixing kit (see Model)
- Operating instructions

## 2 Application

The rain monitor is designed to act as a sensor detecting the start and end of precipitation. It is used as a status indicator or sensor for controlling downstream safety devices (control units) protecting windows, ventilation flaps, sunblinds, awnings, etc. The sensor area takes the form of a capacitor on glass-coated ceramic. Glass passivation ensures that the rain monitor is extremely environment-resistant as well as robust while offering good long-term stability and resistance to aggressive media.

### 3 Setup and mode of operation

---

Whenever precipitation strikes the rain monitor and wets the sensor surface, this changes the capacitance of the surface, so triggering a switching signal, i.e. wetting of the sensor surface signals the precipitation status "yes" (5.4106.00.xxx).

Special version 5.4106.01.xxx: Frequency output according to degree of wetting of the sensor surface (5Hz: dry, 10 ... 50Hz: not much wetting ... much wetting)

To protect the sensor surface from bedewing and icing-up, it is heated to an overtemperature of approx. 2K.

When the sensor surface is wetted, it is adjusted to approx. 10K above the ambient temperature, so ensuring fast faster drying. Once it has dried, the device switches to the precipitation status "no".

#### Definition for precipitation status / output:

##### 5.4106.00.000 / 010 / 011 / 100

|                              |                      |
|------------------------------|----------------------|
| Precipitation "yes"          | = contact 3-4 open   |
| Precipitation "no"           | = contact 3-4 closed |
| Power failure (sensor "off") | = contact 3-4 open   |

- In case of interrupted or missing operating voltage (sensor "off") precipitation "yes" is signaled; thus, even in this state the object to be protected is safeguarded.

##### 5.4106.00.901 / 001

|                              |                      |
|------------------------------|----------------------|
| Precipitation "yes"          | = contact 3-4 closed |
| Precipitation "no"           | = contact 3-4 open   |
| Power failure (sensor "off") | = contact 3-4 open   |

- In case of interrupted or missing operating voltage (sensor "off") precipitation "no" is signaled; thus, there is possibly no object protection.

##### 5.4106.01.011

|                              |  |
|------------------------------|--|
| Precipitation "yes"          | = frequency 10 ... 50Hz depending on wetting |
| Precipitation "no"           | = frequency 5Hz                              |
| Power failure (sensor "off") | = contact 3-4 open                           |

- In case of interrupted or missing operating voltage is the output open, but no frequency is output. Because of that is the object protection available is the case.

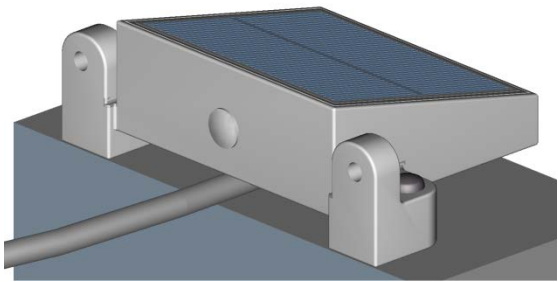
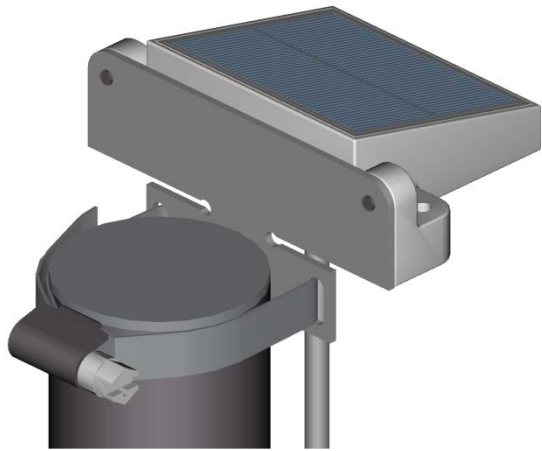
## 4 Installation

**Please Note:**

*The electrical connection is to be carried out by experts only.*

### 4.1 Mechanical Mounting

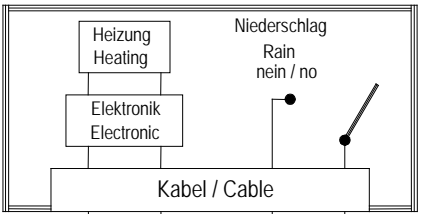
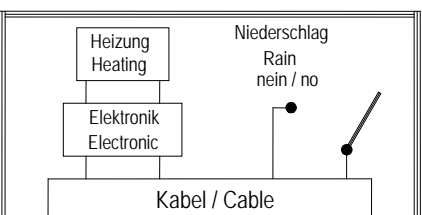
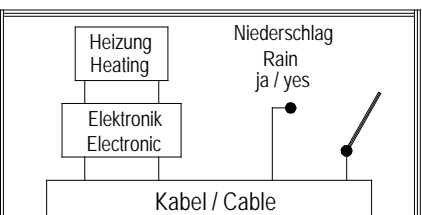
The device should be installed at a location that will result in representative readings and protected from the wind as far as possible. During installation make sure that precipitation can strike the sensor surface unimpeded. For dimensions, see section 8.

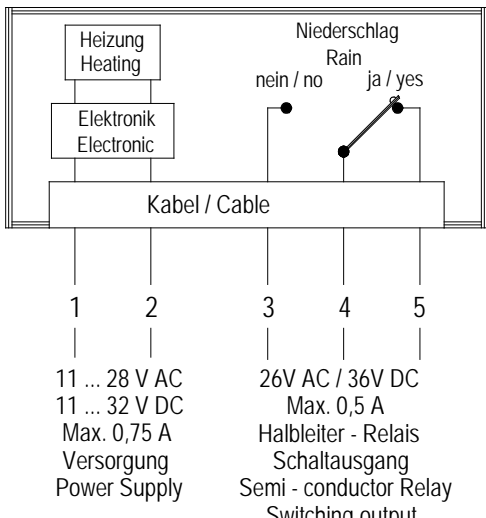
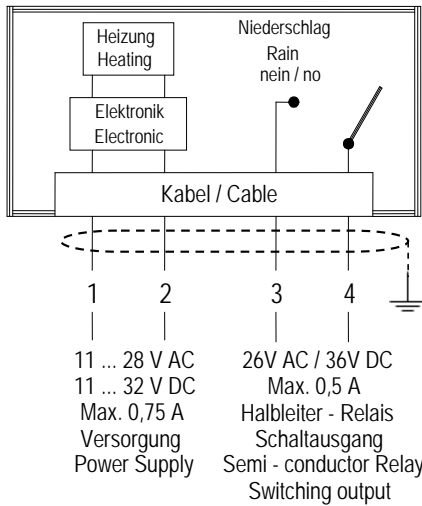
|  |  |
|--|--|
| <p>Instrument without fixing kit<br/>Mounting is possible at an even vertical or horizontal surface.</p> |   |
| <p>Instrument with fixing kit<br/>Mounting can be carried out at the end of a mast tube (Ø 35-50mm).</p> |  |

### 4.2 Electrical Mounting

Either AC or DC can be used as the power supply, with protection from polarity reversal. The output is an isolated electronic relay. A non-detachable cable is used for connection: see connecting diagram, **section 4.2.1**.

#### 4.2.1 Pin Assignment and Precipitation Status

|   |        |             |  |  |
|---|--------|-------------|--|--|
| <b>5.4106.00.000</b><br><b>5.4106.00.010</b>                    |        |             |  |  <p>1 2 3 4</p> <p>11 ... 28 V AC<br/>11 ... 32 V DC<br/>Max. 0,75 A<br/>Versorgung<br/>Power Supply</p> <p>26V AC / 36V DC<br/>Max. 0,5 A<br/>Halbleiter - Relais<br/>Schaltausgang<br/>Semi - conductor Relay<br/>Switching output</p>   |
|   | Supply | Output      |  |  |
|   | 1-2    | Contact 3-4 |  |  |
| Sensor surface wet  | on     | open        |  |  |
| Sensor surface dry  | on     | closed      |  |  |
| Figure state: - instrument power-off or<br>- sensor surface wet |        |             |  |  |
| <b>5.4106.00.011</b>  |        |             |  |  <p>1 2 3 4</p> <p>11 ... 28 V AC<br/>11 ... 32 V DC<br/>Max. 0,75 A<br/>Versorgung<br/>Power Supply</p> <p>26V AC / 36V DC<br/>Max. 0,5 A<br/>Halbleiter - Relais<br/>Schaltausgang<br/>Semi - conductor Relay<br/>Switching output</p>  |
|   | Supply | Output      |  |  |
|   | 1-2    | Contact 3-4 |  |  |
| Sensor surface wet  | on     | open        |  |  |
| Sensor surface dry  | on     | closed      |  |  |
| Figure state: - instrument power-off or<br>- sensor surface wet |        |             |  |  |
| <b>5.4106.00.901</b><br><b>5.4106.00.001</b>                    |        |             |  |  <p>1 2 3 4</p> <p>11 ... 28 V AC<br/>11 ... 32 V DC<br/>Max. 0,75 A<br/>Versorgung<br/>Power Supply</p> <p>26V AC / 36V DC<br/>Max. 0,5 A<br/>Halbleiter - Relais<br/>Schaltausgang<br/>Semi - conductor Relay<br/>Switching output</p> |
|   | Supply | Output      |  |  |
|   | 1-2    | Contact 3-4 |  |  |
| Sensor surface wet  | on     | closed      |  |  |
| Sensor surface dry  | on     | open        |  |  |
| Figure state: - instrument power-off or<br>- sensor surface dry |        |             |  |  |

|   |        |                     |                         |
|---|--------|---------------------|-------------------------|
| <b>5.4106.00.100</b>  |        |                     |                         |
|   | Supply | Output              | Output                  |
|   | 1-2    | Contact 3-4         | Contact 4-5             |
| Sensor surface wet  | on     | open                | closed                  |
| Sensor surface dry  | on     | closed              | open                    |
| Sensor surface wet or dry   | off    | open                | closed                  |
| Figure state: - instrument power-off or<br>- sensor surface wet                     |        |                     |                         |
|   |        |                     |                         |
| <b>5.4106.01.011</b>  |        |                     |                         |
|   | Supply | Output              |                         |
|   | 1-2    | Contact 3-4         |                         |
| Sensor surface wet  | on     | Frequence (Wetting) | 10 ... 50Hz (few a lot) |
| Sensor surface dry  | on     | Frequence           | 5Hz                     |
| Sensor surface wet or dry   | off    | open                |                         |
| Figure state: - instrument power-off  |        |                     |                         |
|  |        |                     |                         |

## 5 Taking into Operation

The operating voltage can be switched on once the electrical connection has been made.

## 6 Maintenance

The device is maintenance free.

Cleaning:

Depending on the installation location and the associated type/degree of soiling occurring there, we recommend checking the sensor surface of the device at suitable intervals and cleaning it as required.

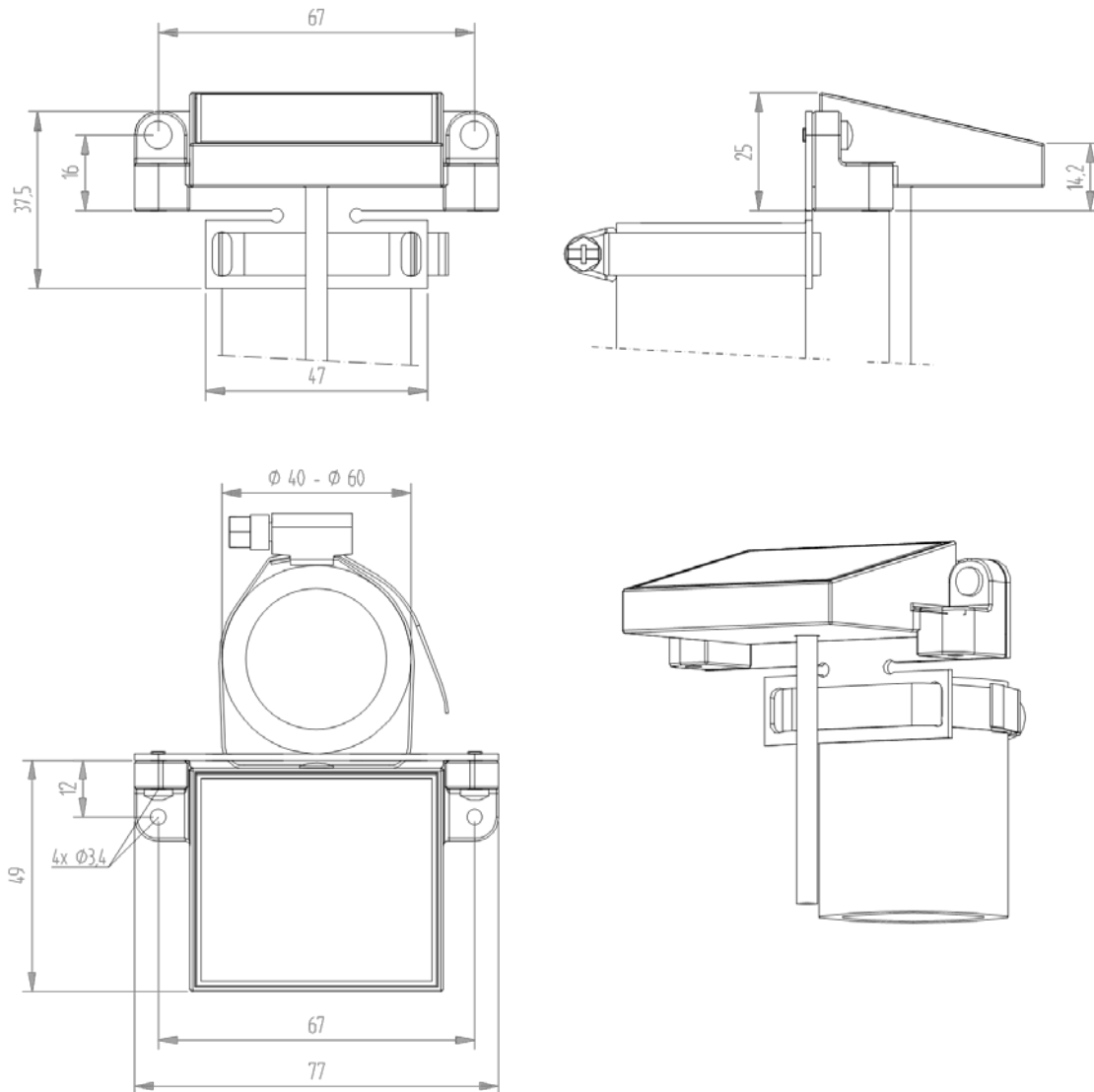
For cleaning a damp cloth without chemical cleaning agents should be used.



## 7 Specifications

|                        |  |
|------------------------|--|
| Measuring value        | Precipitation (yes / no)   |
| Signal output          | Semiconductor relay, Potential-free / electrically isolated / metallicly separated   |
| Relay- contact voltage | Max. 26V AC / 36V DC,<br>max. 0.5A (cos $\varphi$ > 0.9), 0.2A (cos $\varphi$ = 0.4).  |
| Switch-on delay        | < 0.5s Signal- Output<br>15s Heating   |
| Operating voltage      | 11...28VAC or 11...32VDC (max. 0,75A)<br>Protected against polarity reversal   |
| Current consumption    | Heating off:<br>< 12mA   |
|                        | Heating on:<br>Max. 0.35A (@ 11...12VAC operating voltage).<br>Max. 0.75A (@ 12...27VAC operating voltage).<br>Max. 0.3A (@ 27...32VAC operating voltage). |
| Sensor area            | 18cm <sup>2</sup>  |
| Sensitivity            | Approx. 0.2mm/h  |
| Ambient temperature    | -30...+60°C  |
| Protection             | IP 66 acc. to DIN 40050  |
| Dimension              | See dimension diagram (section 8).   |
| Weight                 | 160g with fixing kit<br>100g without fixing kit  |
| Material               | Housing: Polycarbonate (PC), UV-stabilised, white (RAL 9010).  |
|                        | Sensor: Ceramic (aluminum oxide AL <sub>2</sub> O <sub>3</sub> ), glass-coated.<br>Fixing kit: Stainless steel 1.4301.                                     |
| <b>Connection</b>      |  |
| <b>5.4106.00.000</b>   | <b>Cable, non-detachable, type: LiYY 4 x 0.25mm<sup>2</sup>, 3m long</b>   |
| <b>5.4106.00.010</b>   | <b>Cable, non-detachable, type: LiYY 4 x 0.25mm<sup>2</sup>, 10m long</b>  |
| <b>5.4106.0x.011</b>   | <b>Cable, non-detachable, type: Li9YFC11Y 4 x 0.25mm<sup>2</sup>, 10m long</b>   |
| <b>5.4106.00.011</b>   | <b>Cable, non-detachable, type: LiYY 5 x 0.14mm<sup>2</sup>, 3m long</b>   |
| <b>5.4106.00.100</b>   | <b>Cable, non-detachable, type: LiYY 4 x 0.25mm<sup>2</sup>, 3m long</b>   |
| <b>5.4106.00.901</b>   | <b>Cable, non-detachable, type: LiYY 4 x 0.25mm<sup>2</sup>, 3m long</b>   |
| <b>5.4106.00.001</b>   |  |

## 8 Dimensional Drawing



**Figure 1: Rain monitor with fixing kit**

## 9 EC-Declaration of Conformity

Document-No.: 000903

Month: 09 Year: 18

Manufacturer: **ADOLF THIES GmbH & Co. KG**

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D-37083 Göttingen  
Tel.: (0551) 79001-0  
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email: [Info@ThiesClima.com](mailto:Info@ThiesClima.com)

This declaration of conformity is issued under the sole responsibility of the manufacturer

Description of Product: **Precipitation Monitor**

|             |                      |                      |                      |                      |
|-------------|----------------------|----------------------|----------------------|----------------------|
| Article No. | <b>5.4105.00.000</b> | <b>5.4105.00.010</b> | <b>5.4105.00.020</b> | <b>5.4106.00.000</b> |
|             | <b>5.4106.00.001</b> | <b>5.4106.00.010</b> | <b>5.4106.00.011</b> | <b>5.4106.00.100</b> |
|             | <b>5.4106.00.901</b> | <b>5.4106.01.011</b> |                      |                      |

specified technical data in the document: **021012/08/08; 021707/09/18**

The indicated products correspond to the essential requirement of the following European Directives and Regulations:

|             |  |
|-------------|--|
| 2014/30/EU  | 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   |
| 2014/35/EU  | DIRECTIVE 2014/35/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 the making available on the market of electrical equipment designed for use within certain voltage limits |
| 552/2004/EC | Regulation (EC) No 552/2004 of the European Parliament and the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation)   |
| 2011/65/EU  | DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment   |
| 2012/19/EU  | DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)  |

The indicated products comply with the regulations of the directives. This is proved by the compliance with the following standards:

|              |  |
|--------------|--|
| EN 61000-6-2 | Electromagnetic compatibility<br>Immunity for industrial environment   |
| EN 61000-6-3 | Electromagnetic compatibility<br>Emission standard for residential, commercial and light industrial environments                         |
| EN 61010-1   | Safety requirements for electrical equipment for measurement, control, and laboratory use.<br>Part 1: General requirements               |
| EN 50581     | Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances |

Place: Göttingen  
Signed for and on behalf of:

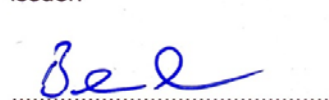
Date: 13.09.2018

Legally binding signature:



Thomas Stadie, General Manager

issuer:



Joachim Beinhorn, Development Manager

This declaration certifies the compliance with the mentioned directives, however does not include any warranty of characteristics. Please pay attention to the security advises of the provided instructions for use.

**Please contact us for your system requirements.  
We advise you gladly.**

**ADOLF THIES GMBH & CO. KG**

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