# REINHARDT
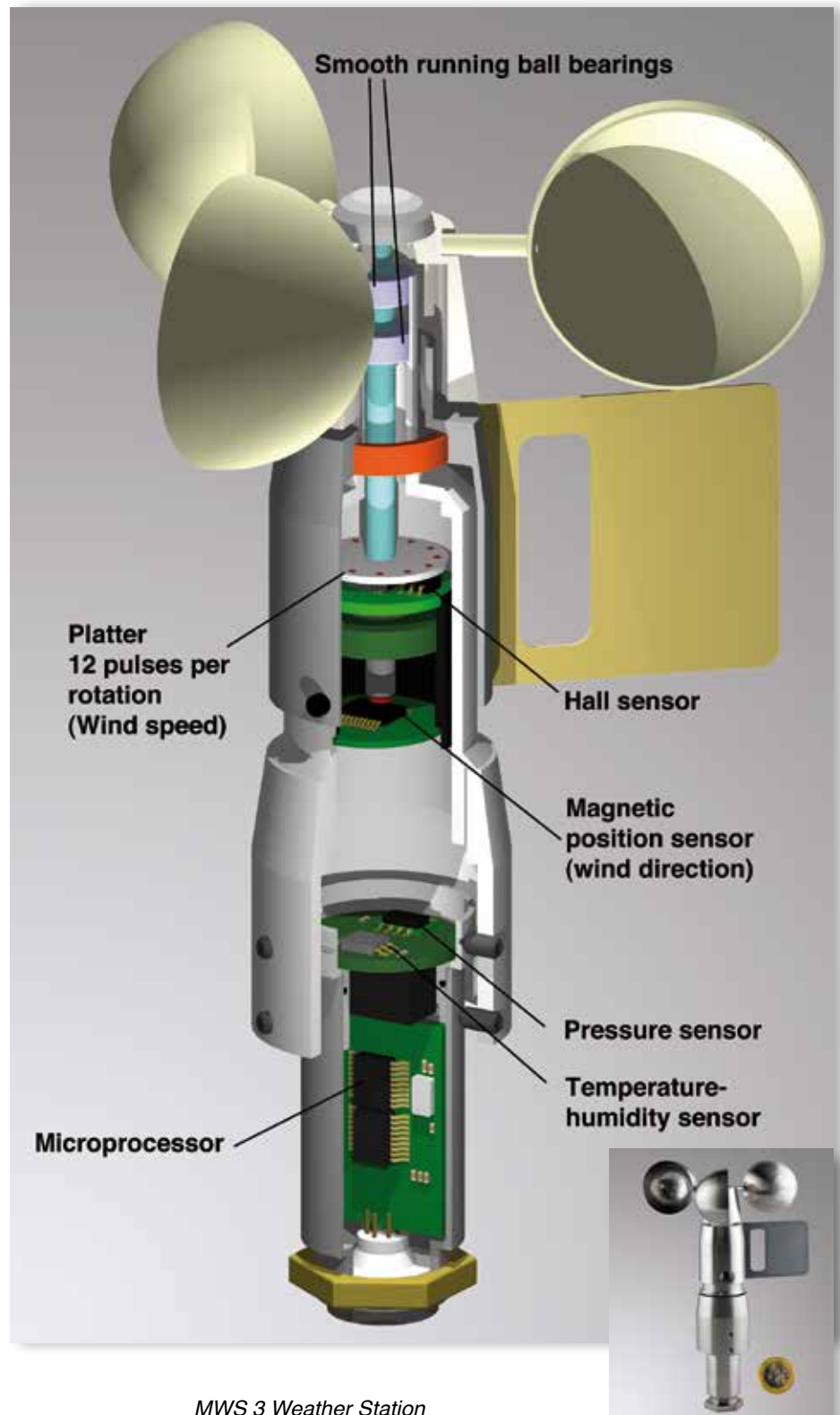## System- und Messelectronic GmbH

## Micro Sensors with RS485-Interface

For 30 years, REINHARDT System- und Messelectronic GmbH have produced, developed and sold sensors for climate and environmental measurements and are one of the leading manufacturers in this market. REINHARDT-products are continuously being developed. This always becomes part of the current production, whereas others mostly introduce a product which remains unchanged until it is replaced by a new product many years later. Our long-time experience, the constant exchange of experience with our customers and market analyses made us miniaturise the sensors and develop them for a market segment that works with the common RS232, RS485 and RS422 data interfaces. Integration in a monitoring and control system is easier therefore. Despite miniaturisation and low cost we use top-quality materials and electronic components as well as finish in order to grant our usual high quality.

These sensors can be used on their own and also as an expansion of the REINHARDT-weather stations. Together with an RS485-interface, these sensors can be addressed so that up to 254 sensors can be integrated.

The latest generation of environmental and climate sensors excels by high precision and easy installation. The sensor is fixed with the M18-fine thread at its bottom. At the bottom, the sensors are connected centrally and space-savingly via a multipolar round connector which is secured with a retainer nut. This generation of sensors is equipped with contactless sensors such as e. g. the wind speed



*MWS 3 Weather Station*

RMS 485 — WGS 485 — RDR 485 — UVIS 485 — HKS 485 — WRS 485 — WKS 485 — THS 485 — DFT 485 — GSS 485

sensor with magnetic scanning which proves indestructible. The mechanics is made of anodised aluminium. A microprocessor processes the sensor signals, linearises them and provides them for the interface. REINHARDT can configure the serial interface as RS232, RS422 and RS485. These sensors have a voltage supply input from 6 to 30 VDC and a very low power consumption with typically 700 µA (DFT 485), around 8 mA with WGS 485 and about 15 mA with MWS 3.

## MWS 3 Miniature Microprocessor Weather Station

The MWS 3 miniature-microprocessor weather station measures ambient temperature, relative atmospheric humidity, dewpoint (via its software), barometric pressure, wind direction, wind speed, average wind and wind peak. The WINDOWS-PC-software for display, control and evaluation always comes with MWS 3.

## Temperature-Humidity-Barometric Pressure Sensor

The **DFT 485** measures ambient temperature, relative atmospheric humidity, dewpoint and barometric pressure

The **FTS 485 humidity-temperature sensor** measures ambient temperature and relative atmospheric humidity.

The **DTS 485 barometric pressure-temperature sensor** measures ambient temperature and barometric pressure

## WGS 485 Micro-Wind Speed Sensor (Anemometer)

The WGS 485 wind speed sensor is made of high-quality steel and is based on an anemometer with smooth running ball bearings. The other moveable parts are also weight-optimised and are designed for good responding qualities . Even a 30°-rotation of the cup anemometer is magnetically recorded. No resistance develops in magnetic scanning and therefore no wear.

## WRS 485 Micro-Wind Direction Sensor

measures wind direction from 0–360° with 0.4° resolution.

### GSS 485 Micro-Global Radiation Sensor

measures global radiation from 0–1,500 W/m² in the 305–2800 nm in the spectral range via thermocouple.

### HKS 485 Micro-Light Intensity Sensor

measures light intensity in the range 0–220.000 Lux with 4 Lux resolution (Human Eye Response).

### UVS 485 Micro-UV-Radiation Sensor

measures Ultraviolet radiation as global radiation, 0–15,000 mW, 320–395 nm

### UVIS 485 Micro-UV-Index Sensor

measures the UV-index from 0–12, i. e. UV radiation intensity relevant to sunburn or erythemal action spectrum

### WKS 485 Micro-Clouds Sensor

establishes if there are clouds by day and by night and ascertains the height of cloud base.

### RRS 485 Micro-Radar Precipitation Sensor

establishes precipitation activity and its intensity with a radar sensor.

### RMS 485 Micro-Precipitation Sensor

measures precipitation with a self-emptying bucket and a collector vessel

### THS 485 Micro-Thermal Sensor

ascertains the current intensity of the vertical airstream, peak and average value and differentiates between up-draughts and downdraughts.

### Road Surface Temperature Sensor

The road surface temperature sensor with analog output (33 mV/°, 0–4.095 V) measures the temperature of the road surface from -40 °C to +75 °C.



*Road Surface Temperature Sensor*

### Software

An optional comfortable WINDOWS-software evaluates and displays the data and controls procedures.

### Data Interface

We code the data interface of these sensors RS232 or RS422/RS485. Baud rate can be configured from 1,200 to 38,400.

### Data Format

One feature why our products are so successful is that the sensor identification is continuously transferred together with the measured value. Other systems provide it in the header only. This is why our weather and climate sensors can easily be integrated in complex systems. The measured values are linearised within the sensor and transferred via a RS232/422/485-interface. For signal transmission, there is a number of different expansions such as a converter from RS232 to USB, modem or radio transmission paths with RS232-input. The data of the weather station are transmitted as ASCII-data, separated by comma (E.g.: TE17.7,DR946.9,FE70.8, – TE17.7 stands for +17,7 °C.), to other devices for data processing or PCs.

### Mounting the Sensors and Power Supply

All sensors are mounted with a M18x1.5 thread (incl. nut) which is also used as an outlet for the cable connection. . 6–30 VDC (Connection cable and power supply are options.)

### Applications:

Mobile environmental measuring stations – weather services – acoustics – Formula1 Team courses – test courses of renowned tyre and car producers – building instrumentation and control – weather data for satellite navigation – military – cable TV – power plants – airports – yachting clubs – hang glider clubs – insurance companies – road service – dumping sites – petrochemical plants – food industry – market gardens – agriculture – schools and universities – research institutes

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# REINHARDT
## System- und Messelectronic GmbH

**Expansions of the Sensor Systems**

**Technical Data Basic Sensors**

| | RS23/RS422-/RS485-interface optional | USB-interface | WLAN | TCP/IP-converter | GSM-module | GSM-remote query | Cabling confectioned, 10 m cable and PSU 18VDC, 1.33A | Comfortable PC-software | Various digital displays (with RS232-operation) | Solar option (RS232-operation) | Heating |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MWS 3 Wetterstation**<br>Temperature -40 to +60 °C resolution 0.01 °C tolerance 0.5 °C at 25 °C, humidity 10 % to 100 % rel. F, resolution 0.01 % tolerance 2.5 % RF barometric/absolute pressure 300 to 1,100 hPa resolution 0.03 hPa, accuracy 1 hPa at 0–50 °C, wind direction 0–360 °, resolution 0.4 °, windspeed 0–150 km/h, resolution 0.05 km/h, average wind, wind peak, optionally RS232-/RS422-/RS485-interface; 163 mm high, diameter cup anemometer 120 mm | ● | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | – |
| **DFT 485 Combined Sensor Temperature/Pressure/Humidity***<br>Temperature -40 to +60 °C resolution 0.01 °C tolerance 0.5 °C at 25 °C, humidity 10 % to 100 % rel. F, resolution 0.01 % tolerance 2.5 % RF barometric/absolute pressure 300 to 1,100 hPa resolution 0.03 hPa, accuracy 1 hPa at 0–50 °C, optionally RS232-/RS422-/RS485-interface; 55 mm high, 35 mm diameter | ● | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | – |
| **WGS 485 Wind Speed Sensor ***<br>0–150 km/h, resolution 0.05 km/h, average wind, wind peak, response from 0.5 m/s, optionally RS232-/RS422-/RS485-interface; 105 mm high, diameter anemometer 120 mm | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **WRS 485 Wind Direction Sensor ***<br>Measuring range 0–360 °, resolution 0.4 ° response from 0.5 m/s, accuracy ±5 °, optionally RS232-/RS422-/RS485-interface; 108 mm high | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **GSS 485 Global Radiation Sensor**<br>0 to 1,500 W/m², resolution 1.5 W, accuracy ±40 W, spectral range 305–2800 nm optionally RS232-/RS422-/RS485-interface; 65 mm high | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **HKS 485 Light Intensity Sensor**<br>0 to 220.000 Lux, resolution 4 Lux (Human Eye Response) optionally RS232-/RS422-/RS485-interface; 65 mm high | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **UVIS 485 UV Index Sensor**<br>0 to 12, (radiation intensity, relevant to sunburn – erythemal action spectrum optionally RS232-/RS422-/RS485-interface; 50 mm high, diameter 25 mm | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **WKS 485 Clouds Sensor**<br>establishes if there are clouds and calculates the height of the cloud base optionally RS232-/RS422-/RS485-interface; 50 mm high | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **RMS 485 Precipitation Sensor ***<br>establishes precipitation and its intensity optionally RS232-/RS422-/RS485-interface; about 90 mm high | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **RRS 485 Radar Precipitation Sensor ***<br>measures precipitation with a radar sensor optionally RS232-/RS422-/RS485-interface; 170 mm high | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |
| **THS 485 Thermal Sensor ***<br>measures the vertical airstream optionally RS232-/RS422-/RS485-interface; 125 mm high | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | – |

**Legend:** ● = Series ○ = Option – = not available

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