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UMB-Technology

A Passion for Precision

www.umb-technology.info

Lufft

The Sky's the Limit

UMB

- Compact design
- Easy commissioning
- RS232 or RS485 data transfer
- Easy software updates
- Free configuration software

UMB Technology

The UMB (Universal Measurement Bus) system is a new technology for recording environmental data. Whether in the form of a standard weather station or road ice warning equipment, the modular system excels due to easy commissioning, free firmware updates and data transfer over RS232, RS485 or CDMA/GPRS modem. UMB offers flexibility, modularity and web-based visualization and polling software.

The UMB sensor library provides a comprehensive range of environmental sensors for recording temperature, relative humidity, precipitation, visibility and road conditions. The new WS series compact weather stations in particular, are outstanding due to their unrivaled price-performance ratio. The top-of-the-range model, WS600-UMB, incorporates sensors for temperature, humidity, precipitation, air pressure, wind direction and wind speed.

The electrical connection for all UMB sensors is made via a standard plug connector system. This keeps installation and service costs to a minimum. Third party sensors and existing analog sensors can be integrated into the UMB system using the ANACON-UMB module.

All UMB sensors can be polled by means of a standard protocol. Once data polling has been incorporated for one sensor, additional sensors can be added by way of easy parameterization of the data polling system.

Channel-oriented sensor data polling delivers a large number of computed variables in metric and US format, hence there is no need for conversion by the user. Sensors can be configured, equipment tested and firmware updated with the free configuration software (UMBConfig-Tool).

In addition Lufft offers a variety of software packages from data retrieval via weather stations (COLLECTOR) to web visualization (SmartView3).

Third-Party-Sensors: The UMB technology is open and modular. Most of the analog sensor signals and many intelligent sensors of third parties can be integrated into Luffts UMB systems. The Lufft ANACON converts analog signals into UMB output. In case of intelligent (smart) sensors of third party suppliers, we integrate the corresponding sensor protocol into Luffts ISOCON to integrate the sensors into UMB output. Generally, every UMB application herewith can use the best combination of selected sensors.

Lufft UMB Sensor Overview

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UMB-Sensor Overview					
Integrated Sensors	**WS601-UMB**	**WS600-UMB**	**WS502-UMB**	**WS501-UMB**	**WS500-UMB**
Temperature	■	■	■	■	■
Rel. humidity	■	■	■	■	■
Precipitation type		■			
Precipitation intensity		■			
Rain accumulation	■	■			
Leaf wetness	■				
Air pressure	■	■	■	■	■
Wind direction	■	■	■	■	■
Wind speed	■	■	■	■	■
Electronic Compass	■	■	■	■	■
Radiance (solar radiation)			■	■	
Combination Options: as of start of production 2nd quarter 2012. (Either a temperature sensor or rain sensor can be connected)					
External Rain Sensor WTB 100			■	■	■
External Temperature Sensor WTx	■	■	■	■	■
External Leaf Surface Wetness Sensor WLW 100	■				

UMB-Sensor Overview					
Integrated Sensors	**WS300-UMB**	**WS200-UMB**	**WTB100**	**VENTUS-UMB**	**V200A-UMB**
Temperature	■				
Rel. humidity	■				
Precipitation type					
Precipitation intensity			■		
Rain accumulation			■		
Leaf wetness					
Air pressure	■				
Wind direction		■		■	■
Wind speed		■		■	■
Electronic Compass		■			
Radiance (solar radiation)					
Combination Options: as of start of production 2nd quarter 2012. (Either a temperature sensor or rain sensor can be connected)					
External Rain Sensor WTB 100	■	■			
External Temperature Sensor WTx	■	■			
External Leaf Surface Wetness Sensor WLW 100					

WS401-UMB	WS400-UMB	WS302-UMB	WS301-UMB
■	■	■	■
■	■	■	■
	■		
■	■		
■	■		
■			
■	■	■	■
		■	■
		■	■
■	■	■	■
■			

R2S-UMB
■
■
■

Lufft UMB Sensor Overview

UMB-Sensor Overview					
	VS20-UMB	8160.TFF10/ ANACON-UMB	Snow Depth/ ANACON-UMB	CMP3 Pyranometer	ARS31-UMB
Temperature		■			The active sensor calculates the freeze point by means of cooling and heating cycles (PELTIER element built in)
Rel. humidity		■			
Precipitation type					
Precipitation intensity					
Rain accumulation					
Leaf wetness					
Air pressure					
Wind direction					
Wind speed					
Electronic Compass					
Radiance (solar radiation)				■	
Visibility	■				
Snow hight			■		

Protocol Overview: Data Output Standards	
	LCOM
European measurement units	■
American measurement units	■
TLS data types	■
TLS protoccol	■
TLSoIP	■
NTCIP protocol	■
MSSI protocol	■
Synop	in preparation

IRS31-UMB	IRS21 / IRS21 CON	WST1	NIRS31-UMB
Road conditions, surface temperature, 2 depth temperatures, water film, ice %, freezing temperature	Road conditions, surface temperature, 2 depth temperatures, water film, freezing temperature	surface temperature	Road conditions, surface temperature, water film, ice %, freezing temperature, friction




Lufft's high-quality networks for measuring emissions consist of gas measurements, dust particle measurements, as well as meteorological measurements.

Precision with UMB

The WS500-UMB and WS600-UMB deliver all meteorological measured data for Lufft's high-quality measuring networks. By means of the digital interface, they can be perfectly integrated into the measured data architecture of the entire system. When it comes to road traffic meteorology ("Green ITS"), quality is playing a more and more important role: In the future, traffic guidance and air pollution will depend on each other. This can only be realized with precise measured data, especially in large cities.

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Source: Dr. Holger Gerwig Umweltbundesamt Langen

Lufft WS601-UMB – Temperature, Relative Humidity, Precipitation, Air Pressure, Wind, Electronic Compass

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Precipitation
- Air pressure
- Wind direction
- Wind speed

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

Precipitation is measured by a tipping spoon and tipping bucket processes. The flexible tipping bucket allows a 0.2mm or a 0.5mm resolution of the rainfall.

Optionally, the WS601-UMB can be equipped with a leaf wetness sensor in addition.

Ultrasonic sensor technology is used to take wind measurements.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS601-UMB Compact Weather Station			Order No.
WS601-UMB			**8376.U01**
Technical Data	Dimensions	Ø approx. 164 mm, height approx. 445 mm	
	Weight	approx. 1.7 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (>–30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Precipitation	Resolution	0.2mm / 0.5 mm	
	Accuracy	±2 %	
Air pressure	Principle	MEMS capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	±3 °	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 60 m/s	
	Accuracy	± 0.3 m/s or ±3 % (0 … 35 m/s)	
General Information	Heating	20 VA at 24 VDC	
	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24 VDC +/-10 % <0.4 VA (without heating)	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24V/4A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Leaf wetness sensor WLW100		**8342.LEAF**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**

All in One

Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS600-UMB – Temperature, Relative Humidity, Precipitation, Air Pressure, Wind, Electronic Compass

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Precipitation intensity
- Precipitation type
- Precipitation quantity
- Air pressure
- Wind direction
- Wind speed

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

Precipitation is measured by a 24 GHz Doppler radar, which measures the drop speed of an individual drop of rain/snow.

Precipitation quantity and intensity are calculated from the correlation between drop size and speed.

The difference in drop speed determines the type of precipitation (rain/snow).

Maintenance-free measurement offers a major advantage over the common tipping spoon and tipping bucket processes.

Ultrasonic sensor technology is used to take wind measurements.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS600-UMB Compact Weather Station			Order No.
WS600-UMB EU, USA, Canada			**8370.U01**
WS600-UMB UK			**8370.U02**
Technical Data	Dimensions	Ø approx. 150 mm, height approx. 343 mm	
	Weight	approx. 1.5 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (>–30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Precipitation intensity	Resolution	0.01 mm	
	Measuring range	Drop size 0.3 … 5 mm	
	Reproducibility	typ. > 90 %	
Precipitation type	Rain/snow		
Air pressure	Principle	MEMS capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	±3 °	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 60 m/s	
	Accuracy	± 0.3 m/s or ±3 % (0 … 35 m/s)	
General Information	Heating	40 VA at 24 VDC	
	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24 VDC +/-10 %	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24V/4A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**

All in One

Aspirated temperature/humidity measurement

Maintenance-free operation

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS502-UMB – Temperature, Relative Humidity, Radiation, Air Pressure, Wind, Electronic Compass

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Air pressure
- Wind direction
- Wind speed
- Solar Radiation

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

Ultrasonic sensor technology is used to take wind measurements.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS502-UMB Compact Weather Station			Order No.
WS502-UMB			**8375.U10**
Technical Data	Dimensions	Ø approx. 150 mm, height 317 mm	
	Weight	approx. 1.5 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (>–30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Radiation	Response time (95%)	< 1 s	
	Spectral range	300 to 1100 nm	
	Measuring range	1400 W/m²	
Air pressure	Principle	MEMS capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	±3 °	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 60 m/s	
	Accuracy	± 0.3 m/s or ±3 % (0 … 35 m/s)	
General Information	Heating	20 VA at 24 VDC	
	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Operating power consumption	24 VDC +/-10 %	
	Operating humidity range	0 … 100 %	
	Operating temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24V/4A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**
	Rain Sensor WTB100		**8358.10**

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All in One

Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS501-UMB – Temperature, Relative Humidity, Radiation, Air Pressure, Wind, Electronic Compass

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Air pressure
- Wind direction
- Wind speed
- Solar Radiation

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

The world renowned technology of Kipp+Zonen CMP3 is integrated.

Ultrasonic sensor technology is used to take wind measurements.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

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Lufft WS501-UMB Compact Weather Station			Order No.
WS501-UMB EU, USA, Canada			**8375.U01**
Technical Data	Dimensions	Ø approx. 150 mm, height 332 mm	
	Weight	approx. 1.5 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (> –30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Radiation	Response time (95%)	18s	
	Non-stability (change/year)	±1 %	
	Non-linearity (0 to 1,000 W/m²)	±2.5 %	
	Directional error (at 80° with 1,000 W/m²)	±20 W/m²	
	Temperature dependence of sensitivity	±5 % (–10 to +40 °C)	
	Tilt error (at 1000 W/m²)	±3 %	
	Spectral range (50% points)	300 to 2,800 nm	
	Measuring range	1400 W/m²	
Air pressure	Principle	MEMS capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	±3 °	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 60 m/s	
	Accuracy	± 0.3 m/s or ±3 % (0 … 35 m/s)	
General Information	Heating	20 VA at 24 VDC	
	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Operating power consumption	24VDC +/-10%	
	Operating humidity range	0 … 100 %	
	Operating temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24V/4A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**
	Rain Sensor WTB100		**8358.10**

All in One

Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS500-UMB – Temperature, Air Pressure, Relative Humidity, Wind, Electronic Compass

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Air pressure
- Wind direction
- Wind speed

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

Maintenance-free measurement offers a major advantage.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS500-UMB Compact Weather Station			Order No.
WS500-UMB			**8373.U01**
Technical Data	Dimensions	Ø approx. 150 mm, height approx 287 mm	
	Weight	approx. 1.2 kg	
Temperature	Principle	NTC	
	Measuring range	-50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (> -30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	±3 °	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 60 m/s	
	Accuracy	±0.3 m/s or ±3 % (0 … 35 m/s)	
General Information	Heating	20 VA at 24 VDC	
	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24 VDC +/-10 %	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24V/4A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Traverse for R2S-UMB + WS500-UMB		**8367.TRAV**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**
	Rain Sensor WTB100		**8358.10**

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Ultrasonic wind sensor

Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS401-UMB – Temperature, Relative Humidity, Precipitation, Air Pressure

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Precipitation
- Air pressure

Precipitation is measured by tipping spoon and tipping bucket processes. The flexible tipping bucket allows a 0.2mm or a 0.5mm resolution of the rainfall.

Optionally, the WS401-UMB can be equipped with a leaf wetness sensor in addition.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS401-UMB Compact Weather Station			Order No.
WS401-UMB			**8377.U01**
Technical Data	Dimensions	Ø approx. 150 mm, height approx. 380 mm	
	Weight	approx. 1.5 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (> -30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Precipitation	Resolution	0.2 mm / 0.5mm	
	Accuracy	±2 %	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
General Information	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24 VDC +/-10 % < 0.4 VA (without heating)	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24 V/4 A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Leaf wetness sensor WLW100		**8342.LEAF**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**

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Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS400-UMB – Temperature, Relative Humidity, Precipitation, Air Pressure

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Precipitation intensity
- Precipitation type
- Precipitation quantity
- Air pressure

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

Precipitation is measured by a 24 GHz Doppler radar, which measures the drop speed of an individual drop of rain/snow.

Precipitation quantity and intensity are calculated from the correlation between drop size and speed.

The difference in drop speed determines the type of precipitation (rain/snow). Maintenance-free measurement offers a major advantage over the common tipping spoon and tipping bucket processes.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS400-UMB Compact Weather Station			Order No.
WS400-UMB EU, USA, Canada			**8369.U01**
WS400-UMB UK			**8369.U02**
Technical Data	Dimensions	Ø approx. 150 mm, height approx. 280 mm	
	Weight	approx. 1.3 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (> -30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Precipitation intensity	Resolution	0.01 mm	
	Measuring range	Measuring range drop size 0.3 … 5 mm	
	Reproducibility	typ. > 90 %	
Precipitation type	Rain/snow		
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
General Information	Heating	20 VA at 24 VDC	
	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24 VDC +/-10 %	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24 V/4 A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**

Aspirated temperature/humidity measurement

Maintenance-free operation

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS302-UMB – Temperature, Relative Humidity, Radiation, Air Pressure

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Solar radiation
- Air pressure

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS302-UMB Compact Weather Station			Order No.
WS302-UMB			**8374.U10**
Technical Data	Dimensions	Ø approx. 150mm, height 253mm	
	Weight	approx. 1.3 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (> -30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Radiation	Response time (95%)	< 1s	
	Spectral range	300 to 1100 nm	
	Measuring range	1400 W/ m²	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
General Information	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24VDC +/-10%	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24 V/4 A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**
	Rain Sensor WTB100		**8358.10**

Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS301-UMB – Temperature, Relative Humidity, Radiation, Air Pressure

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Solar radiation
- Air pressure

Relative humidity is measured by means of a capacitive sensor element; a precision NTC measuring element is used to measure air temperature.

The world renowned technology of Kipp+Zonen CMP3 is integrated.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS301-UMB Compact Weather Station			Order No.
WS301-UMB			**8374.U01**
Technical Data	Dimensions	Ø approx. 150mm, height 268mm	
	Weight	approx. 1.3 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (> -30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Radiation	Response time (95%)	18s	
	Non-stability (change/year)	±1 %	
	Non-linearity (0 to 1,000 W/m²)	±2.5 %	
	Directional error (at 80 ° with 1,000 W/m²)	±20 W/m²	
	Temperature dependent of sensitivity	±5 % (–10 to +40 °C)	
	Tilt error (at 1000 W/m²)	±3 %	
	Spectral range (50% points)	300 to 2,800 nm	
	Measuring range	1400 W/ m²	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
General Information	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24 VDC +/-10 %	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24 V/4 A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**
	Rain Sensor WTB100		**8358.10**

KIPP & ZONEN
SINCE 1830

Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS300-UMB – Temperature, Air Pressure, Relative Humidity

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design with ventilated radiation protection for measuring:

- Air temperature
- Relative humidity
- Air pressure

Relative humidity is measured by means of a capacitive sensor element;
a precision NTC measuring element is used to measure air temperature.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS300-UMB Compact Weather Station			Order No.
WS300-UMB			**8372.U01**
Technical Data	Dimensions	Ø approx. 150 mm, height approx. 223 mm	
	Weight	approx. 1.0 kg	
Temperature	Principle	NTC	
	Measuring range	–50 … 60 °C	
	Accuracy	±0.2 °C (–20 °C … +50 °C), otherwise ±0.5 °C (>–30 °C)	
Relative humidity	Principle	Capacitive	
	Measuring range	0 … 100 % RH	
	Accuracy	±2 % RH	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
General Information	Interface	RS485, 2-wire, half-duplex	
	Protection type housing	IP65	
	Op. power consumption	24 VDC +/-10 % <0.4VA	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24 V/4 A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**
	Rain Sensor WTB100		**8358.10**

Aspirated temperature/humidity measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft WS200-UMB – Ultrasonic Wind Sensor, Electronic Compass

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications.

Integrated design for measuring:

- Wind direction
- Wind speed

Ultrasonic sensor technology is used to take wind measurements.

Measurement output can be accessed by the following protocolls:
UMB-Binary, UMB-ASCII, SDI-12, MODBUS

Lufft WS200-UMB Compact Weather Station			Order No.
WS200-UMB			**8371.U01**
Technical Data	Dimensions	Ø approx. 150 mm, height approx. 194 mm	
	Weight	approx. 0.8 kg	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	±3 °	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 60 m/s	
	Accuracy	±0.3 m/s or ±3 % (0 … 35 m/s)	
General Information	Heating	20 VA at 24 VDC	
	Protection type housing	IP65	
	Interface	RS485, 2-wire, half-duplex	
	Op. power consumption	24 VDC +/-10 %	
	Operating humidity range	0 … 100 %	
	Op. temperature range	–50 … 60 °C	
Accessories	Surge protection		**8379.USP**
	Power supply 24 V/4 A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**
	Temperature Sensor WT1		**8160.WT1**
	Surface Temperature Sensor WST1		**8160.WST1**
	Rain Sensor WTB100		**8358.10**

Ultrasonic wind measurement

Open communication protocol:
- UMB-ASCII
- UMB-Binary
- SDI-12
- MODBUS
- Analoge outputs in combination with 8160.UDAC

Lufft Snow Depth Sensor

Lufft Snow depth sensor			Bestell-Nr.
A compact laser sensor for determining snow depths			**8365.10**
Technical Data	Dimensions	302mm x 130mm x 234mm	
	Weight	approx. 3.3kg	
	Snow depth	0...15m (0...50ft)	
	Accuracy	< ±5mm	
	Progr. measuring interval	10...600s	
	Time to measure	0.16...6s	
	Distance range	0.1...15m	
	Data interfaces Interfaces modes RS232 analog	RS232, analog output 2.4...38,4kBaud, 8N1 Format 4...20mA	
	Power consumption	0.5...1W (without heating) <12W (with heating,@-40°C)	
	Power supply	10...30VDC (without heating) 15...24VDC (with heating)	
	Laser classification	Class 2 (EN 60825-1:2007)	
	International protection	IP65	
	Temperature range	-40...+50°C	
	Relative humidity	0...100%	
	Heating activity	<0°C programmable	

Lufft WTB100 External Rain Gauge

Lufft WTB100 Rain gauge			Order No.
Rain gauge 0.2 mm unheated			**8353.10**
Technical Data	Dimensions	Ø165 mm, height 255 mm	
	Connection type	Open cable ends	
	Collecting area	200 cm^2	
	Resolution	0.2 mm and 0.5 mm (tipping bucket)	
	Dimensions	380 g	
	Mounting type	On mast, Ø 60-76 mm	

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Passed:

Ice-free test
Jarring test
Corrosion test

A Passion for Precision

Ventus

VENTUS ultrasonic cold weather anemometer was tested under MIL standard-810F method 521.2 proving success in ice free operation.

Ventus is corrosion tested for seawater and vibration resistance. It gives the best accuracy with maintenance free operation.

Lufft VENTUS-UMB– Ultrasonic Wind Sensor Metal Housing, 240 W-Heater

Extremely precise and maintenance-free measurement of wind velocity and wind direction, as well as calculation of acoustic virtual temperature.

Belongs to Lufft's WS family of professional intelligent sensors with digital and analog interfaces.

The ultrasonic wind sensor is designed without mechanical parts as known with traditional "cups and vane".

The digital or analog output delivers instantaneous, average, min or max value with flexible measuring rate. The VENTUS is heated in case of critical ambient conditions. Made for cold climates!

Recommended for:

- Wind turbines
- Marine/ships
- Meteorology
- Building automation

The following outputs/protocols are available:

- NMEA
- UMB-ASCII
- UMB-Binary
- MODBUS (ASCII, RTU)
- SDI12
- 4 … 20 mA, 0...10V, 0…20 mA, 2…10V frequency (analog)

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Lufft VENTUS-UMB Wind Sensor			Order No.
VENTUS-UMB			**8371.UM**
Technical Data	Dimensions	Ø approx. 150 mm, height approx. 170 mm	
	Weight	approx. 1.62 kg	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359,9 °	
	Resolution	0.1 °	
	Accuracy	<2 ° RMSE >1.0 m/s	
	Start-up threshold	0.1 m/s	
	Measuring rate	60 partial measurements/ 15 measurements per second	
	Measurement output rate	1-10 seconds adjustable – default 10 s	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 75 m/s	
	Resolution	0.1 m/s	
	Accuracy	±0.2 m/s or ± 2 % RMS of reading, whichever is greater	
	Start-up threshold	0.1 m/s	
	Measuring rate	60 partial measurements/ 15 measurements per second	
	Measurement output rate	1-10 seconds adjustable – default 10 s	
	Unit	m/s; km/h; mph; kts	
Virtual temperature	Principle	Ultrasonic	
	Measuring range	–50 … +70 °C	
	Resolution	0.1 °K	
	Accuracy	± 2.0 K (without heater and without sun exposure or wind > 4m/s)	
	Measuring rate	60 partial measurements/ 15 measurements per second	
	Measurement output rate	1-10 seconds adjustable – default 10 s	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
Data output digital	Interface	RS485 semi-/full duplex, isolated	
	Baudrate	1200 - 57600	
	Meas. rate instant. value	1-10 s	
	Measuring rate Avg (arithmetic, vector)	1-10 min	
	Status	Heating, sensor failure	
Data output analog	Only semi-duplex mode		
	Output signal	0 …20 mA, 4 …20 mA, 0 …10V, 2 …10V, 2 …2,000 Hz only output 1 (instantaneous, avg, min, max)	
	Load	max. 500 Ohm	
	Resolution	16 Bit	
	Auflösung	16 Bit	
General Information	Operating temperature	-40 … +60 ° C (with heating) -20 … +60 ° C (without heating)	
	Bus operation	Up to 32 devices	
	Operating voltage electronics	24 VDC ±10 % or 24 VDC/1.2 VA without heating 12 VDC	
	with heating	24 VDC, max. 240 VA (140 W + 100 W)	
	Connection	8-pole plug	
	Housing material	Aluminum, seawater-proof	
	Protection	IP65	
	Pole diameter	50 mm/2"	
	Factory certificate	yes	
Accessories	Surge protection		**8379.USP-V**
	Power supply 24 V/10 A		**8366.USV2**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Connection cable, 15 m incl. connector		**8371.UK015**
	Connection cable, 50 m incl. connector		**8371.UK050**
	Connector		**8371.UST1**

Vibration test	According to IEC 60945
Corrosion test	According to MIL-STD-810 Method 509.3
Ice-free test	According to MIL-STD-810F Method 521.2

Lufft V200A-UMB – Ultrasonic Wind Sensor Plastic Housing, 20 W-Heater

Extremely precise and maintenance-free measurement of wind velocity and wind direction as well as calculation of acoustic virtual temperature.

Belongs to Lufft's WS family of professional intelligent sensors with digital and analog interfaces.

The ultrasonic wind sensor is designed without mechanical parts as known with traditional "cups and vanes".

The digital or analog output delivers instantaneous, average, min or max value with flexible measuring rate. The V200A is heated to remove frost and ice formation from the sensor.

Recommended for:

- Meteorology
- Building automation

The following outputs/protocols are available:

- NMEA
- UMB-ASCII
- UMB-Binary
- MODBUS (ASCII, RTU)
- SDI12
- 4…20 mA, 0...10V, 0…20mA, 2…10V frequency (analog)

Lufft V200A-UMB Ultrasonic Wind Sensor			Order No.
V200A-UMB			**8371.UA01**
Technical Data	Dimensions	Ø approx. 150 mm, height approx. 170 mm	
	Weight	approx. 0.8 kg	
Wind direction	Principle	Ultrasonic	
	Measuring range	0…359.9°	
	Resolution	0.1° (standard)	
	Accuracy	< 3° RMSE >1.0 m/s	
	Start-up Threshold	0.3 m/s	
	Measuring rate	60 partial measurements/ 15 measurements per second	
	Measurement output rate	1-10 seconds adjustable – default 10 s	
Wind speed	Principle	Ultrasonic	
	Measuring range	0…75 m/s	
	Resolution	0.1 m/s	
	Accuracy	±0.3 m/s or 3 % (0…35 m/s) RMS of reading, whichever is greater ±5 % (>35 m/s) RMS	
	Start-up threshold	0.3 m/s	
	Measuring rate	60 partial measurements/ 15 measurements per second	
	Measurement output rate	1-10 seconds adjustable – default 10 s	
	Unit	m/s; km/h; mph; kts	
Virtual temperature	Principle	Ultrasonic	
	Measuring range	–50 °C … +70 °C	
	Resolution	0.1 °K	
	Accuracy	± 2.0 K (without heater and without sun exposure or wind >4ms)	
	Measuring rate	60 partial measurements/ 15 measurements per second	
	Measurement output rate	1-10 seconds adjustable – default 10 s	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300…1200 hPa	
	Accuracy	±1.5 hPa	
Data output digital	Interface	RS485 semi-/full duplex, isolated	
	Baudrate	1200 - 57600	
	Meas. rate instant. value	1-10 s	
	Measuring rate Avg (arithmetic, vector), Min, Max	1-10 min	
	Status	Heating, sensor failure	
Data output analog	Only semi-duplex mode		
	Output signal	0…20 mA, 4…20 mA, 0…10V, 2…10V, 2…2,000 Hz only output 1 (instantaneous, avg, min, max)	
	Load	max. 500 Ohm	
	Resolution	16 Bit	
General Information	Operating temperature	–40…+60 °C (with heating)	
	Bus operation	Up to 32 devices	
	Operating voltage electronics	24 VDC ±10 % or 24 VDC/1,2 VA without heating: 12 VDC	
	with heating	24 VDC, max. 20 VA	
	Connection	8-pole plug	
	Housing material	Plastic	
	Protection	IP65	
	Pole diameter	50 mm/2"	
	Factory certificate	yes	
Accessories	Surge protection		**8379.USP-V**
	Power supply 24 V/4 A		**8366.USV1**
	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Connection cable, 15 m incl. connector		**8371.UK015**
	Connection cable, 50 m incl. connector		**8371.UK050**
	Connector		**8371.UST1**

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Lufft R2S-UMB – Precipitation Sensor (Present Weather Detector)

The drop speed is captured with a 24-GHz-Doppler radar.

The precipitation quantity and intensity is calculated from the correlation between drop size and speed.

The type of precipitation (rain, snow, sleet, freezing rain, hail) is detected from the difference in drop speed.

The measurement data is available for further processing in the form of a standard protocol (Lufft UMB protocol).

Lufft R2S-UMB Precipitation Sensor			Order No.
R2S-UMB EU, USA, Canada			**8367.U01**
R2S-UMB UK			**8367.U02**
Technical Data	Resolution liquid precipitation	0.01 … 0.1 … 1.0 mm/m²	
	Power supply	20 … 28 VDC	
	Power consumption without heating	2 VA	
	Heating power/24V	30 VA	
	Op. temperature range	–30 … 70 °C	
	Op. humidity range	0 … 100 %	
	Protection	IP67	
	Interface	RS485 semiduplex wire, UMB protocol, pulse and frequency interface	
	Cable length	10 m	
	Measuring range hail	5.1 … approx. 30 mm	
	Type of precipitation	Rain, snow, sleet, freezing rain, hail	
Precipitation	Principle	Doppler-Radar	
	Reproducibility	typ. > 90 %	
	Measuring range drop size	0.3 … 5 mm	
Accessories	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Power supply 24 V/4 A		**8366.USV1**
	Protection shield for R2S-UMB		**8367.SCHIRM**
	Traverse for R2S-UMB + WS500-UMB		**8367.TRAV**
	Surge protection		**8379.USP**
	Digital-analog-converter DACON8-UMB		**8160.UDAC**

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Maintenance-free
Fast response time
Present weather detector
Resolution 0.01 mm

Lufft Night Vision Camera
High Resolution Color Pictures

Camera = ”Virtual eye on site“ in conjunction with measurement data.

Images of road condition day and night in real time with infrared spotlight (option) and GPRS transmission. Creates trust and visually illustrates measurement data, Recommended especially in conjunction with ice warning systems to limit patrols to the greatest possible extent.

Lufft Night Vision Camera			Order No.
Night Vision Camera, high resolution, 3 Mega pixel			**9983.10**
Night Vision Camera, VGA resolution			**9983.20**
Technical Data	Indoor/Outdoor	Dual lens outdoor, weather-proof (IP65), –30 … +60 °C	
	Lenses	Wide Angle (43 mm, F 2.0	
	Resolution	VGA (1024x768 pixels each), color + B/W	
	Sensitivity Color	1 lux (t=1/60s) 0.05 lux (t=1/1s)	
	Interfaces	Ethernet 10/100 Mbps, RS232	
	Power Supply	PoE or MX30V	
Accessories	Infrared spotlight LED		**9984.00**
	Surge protection		**8379.USP-RJ45**

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Quality

for Long-Term Visibility

In fog, a visibility of more than 500 meters is not a problem as an impact on traffic is not expected. However, extremely precise measurements have to be taken within the low measurement ranges. The level of danger is at its highest when visibility drops below 50 metres, which is why in such cases speed limits of 40-60 km/h are displayed on dynamic or variable message signs. Nevertheless, traffic limitations are imposed as soon as visibility drops to 250 metres. Fog is precisely detected within a range of 10 to 2,000 metres with the visibility sensor VS20.

Lufft VS20-UMB – Visibility Sensor

- Measures visibility up to 2000 m
- Ideal for road traffic applications
- Analog output 4...20 mA
- Digital UMB protocol (RS485 interface)
- Calibration device available (optional)

The VS20 is configured via the software UMB Config Tool:

- **Reading / Changing of the current configuration**
- **Calibration**
- **Polling of the current measurement values**
- **The software allows configurations to be loaded and stored**

The measurement data is available for further processing in the form of a standard protocol (Lufft UMB protocol).

Lufft VS20-UMB Visibility Sensor			Order No.
VS20-UMB	Measuring range 10 … 2000 m		**8366.U50**
VS20-UMB	Measuring range 10 … 3000 m		**8366.U60**
Technical Data	Output signal	4 … 20 mA/20 … 4 mA	
	Interface	RS485 semi-duplex wire, UMB protocol	
	Protection	IP66	
	Weight	approx. 4 kg	
	Dimensions	360 x 180 x 80 mm	
	Op. temperature range	–40 … 60 °C	
	Power supply	typ. 24 VDC (22 … 28 VDC) 3 W	
	Included in delivery	Connection cable	
	Value update	1 minute	
	Cable length	10 m	
Visibility	Principle	Forward scattered light procedure	
	Unit	m	
	Accuracy	±10 m or ±10 %, highest value applies	
Accessories	UMB Interface converter ISOCON-UMB		**8160.UISO**
	Connecting cable		**8366.UKAB10**
	Calibration kit visibility		**8366.UKAL1**
	Power supply 24 V/4 A		**8366.USV1**
	Surge protection		**8379.USP**

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10 … 2000 m measurement range

Calibration kit (optional)

Forward light scattering technique

Wind (Ultrasonic)

Lufft VENTUS-UMB Wind Sensor with factory certificate			Order No.
VENTUS-UMB			**8371.UM**
Technical Data	Dimensions	Ø approx. 150 mm, height app. 170 mm	
	Weight	approx. 1.7 kg	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	± 2 ° RMSE > 1.0 m/s	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 75 m/s	
	Accuracy (0...65m/s)	± 0.2 m/s or ± 2 % RMS, whichever is greater	
Virtual Temperature	Principle	Ultrasonic	
	Measuring range	–50 … +70 °C	
	Resolution	0.1 °K	
	Accuracy	± 2.0 ° (without heater and without sun exposure or wind > 4m/s)	
	Measuring rate	60 partial measurements/ 15 measurements per second	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
General Information	Operating temperature	-40 … +60 °C (with heating) -20 … +60 °C (without heating)	
	Bus operation	Up to 32 devices	
	Operating voltage electronics	24 VDC ±10 % or 24 VDC/1.2 VA 12 VDC without heating	
	with heating	24 VDC, max. 240 VA (140 W + 100 W)	
	Connection	8 pole Plug	
	Housing material	Aluminum, seawater-proof	
	Protection	IP 65	
	Pole diameter	50 mm/2“	
Accessories	see page 13		

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Lufft V200A-UMB Ultrasonic Wind Sensor with factory certificate			Order No.
V200A-UMB			**8371.UA01**
Technical Data	Dimensions	Ø approx. 150 mm, height ap. 170 mm	
	Weight	approx. 0.8 kg	
Wind direction	Principle	Ultrasonic	
	Measuring range	0 … 359.9 °	
	Accuracy	< 3 ° RMSE > 1.0 m/s	
Wind speed	Principle	Ultrasonic	
	Measuring range	0 … 75 m/s	
	Resolution	0.1 m/s	
	Accuracy (0...60m/s)	± 0.3 m/s or 3 % (0 … 35 m/s) RMS of reading, whichever is greater ±5 % (> 35 m/s) RMS	
Virtual Temperature	Principle	Ultrasonic	
	Measuring range	–50 °C … +70 °C	
	Resolution	0.1 °K	
	Accuracy	± 2.0 ° (without heater and without sun exposure)	
	Measuring rate	60 partial measurements/ 15 measurements per second	
	Measurement output rate	1-10 seconds adjustable – default 10 s	
Air pressure	Principle	MEMS Capacitive	
	Measuring range	300 … 1200 hPa	
	Accuracy	±1.5 hPa	
General Information	Operating temperature	–40 … +60 °C (with heating) –20 … +60 °C (without heating)	
	Bus operation	Up to 32 devices	
	Op. voltage electronics	24 VDC ±10 % or 24 VDC/1,2 VA 12 VDC without heating	
	with heating	24 VDC, max. 20 VA	
	Connection	8 pole Plug	
	Housing material	Plastic	
	Protection	IP65	
	Pole diameter	50 mm/2“	
Accessories	see page 15		

Precipitation (Tipping Bucket)

Lufft Rain gauge			Order No.
Rain gauge 0.1 mm unheated			**8353.13**
Rain gauge 0.1 mm heated			**8353.13H**
Technical Data	Dimensions	Ø 190 mm, Height 292 mm	
	Connection type	Open cable ends	
	Collecting area	200 cm^2	
	Resolution	0.1 mm (tipping bucket)	
	Weight	approx. 4 kg	
	Mounting type	On mast, Ø 60 mm	
	Operating temp. range, rain gauge unheated	0 … 70 °C	
	Operating temp. range, rain gauge heated	–30 … 70 °C	
	Heating	42 V/AC, 170 VA	
Accessories	Power supply for heated probe 8353.13H		**8353.SV1**
	Stand, height 1 m for 8353.13		**8353.FUS2**
	Stand, height 1 m for 8353.13H		**8353.FUS3**

Lufft Rain gauge			Order No.
Rain gauge 0.1 mm unheated			**8353.12**
Rain gauge 0.1 mm heated			**8353.12H**
Technical Data	Dimensions	Ø 190 mm, height 292 mm	
	Connection type	Open cable ends	
	Collecting area	200 cm^2	
	Resolution	0,1 mm (tipping bucket)	
	Weight	approx. 3 kg	
	Mounting type	On mast, Ø 60 mm	
	Operating temp. range, rain gauge unheated	0 … 70 °C	
	Operating temp. range, rain gauge heated	–20 … 70 °C	
	Heating	24 VDC 150 W	
Accessories	Power supply for heated probe 8353.12H		**8366.USV2**
	Stand, height 1 m for 8353.12		**8353.FUS2**
	Stand, height 1 m for 8353.12H		**8353.FUS3**

Lufft Rain gauge			Order No.
Rain gauge 0.2 mm unheated			**8353.04**
Technical Data	Dimensions	Ø165 mm, height 255 mm	
	Connection type	Open cable ends	
	Collecting area	200 cm^2	
	Resolution	0.2 mm (tipping bucket)	
	Dimensions	380 g	
	Mounting type	On mast, Ø 50 mm	

Sales & Support
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Inspection certificate
DIN EN 10204/3.1

ZERTIFIZIERT
DIN ISO 9001
NR 70100 222
CERTIFIED

Lufft

Compact Weather Station

Model Type	**WS600-UMB**
Serial Number	**006 0911 0813 025**

This is to certify, that this Lufft product has been tested according to the TQM of the G. LUFFT Mess- und Regeltechnik GmbH manual in accordance with DIN EN ISO 9001. Ordering specifications are complied with. Execution of instruments / systems as well as testing of accuracy was carried out following LUFFT quality assurance procedures. Quality inspection was successfully passed.

Measurements

	Reference Value	*Actual Value*	*Status*
Relative Humidity	54,5%	54,3%	✓
Temperature	5,99 °C	5,75 °C	✓
Air Pressure	979,6 hPa	981,0 hPa	✓

Precipitation

	Reference Value	*Actual Value*	*Status*
Drop Size Small	0,115 mm	0,116 mm	✓
Drop Size Medium	0,670 mm	0,674 mm	✓
Drop Size Large	2,730 mm	2,716 mm	✓

Wind Direction and Speed

Angular Deviation

	2,0 m/s	5,0 m/s	10,0 m/s	20,0 m/s	50,0 m/s	*Status*
RMSE	1,3°	1,0°	0,9°	0,8°	0,7°	✓

Wind Speed

	2,0 m/s	5,0 m/s	10,0 m/s	20,0 m/s	50,0 m/s	*Status*
RMS	2,0 m/s	5,0 m/s	10,0 m/s	20,1 m/s	50,3 m/s	✓

Date	Inspector	Quality Management
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References

Siemens AG, Munich
Weiss Elektronik, Trier
Dambach AG, Gaggenau
North Bavaria Highways Directorate
Schleswig-Holstein State Highways Office
Federal State of Salzburg
Federal State of Upper Austria
Federal State of Carinthia
New York State
Sagem, Hungary
Telvent, Spain

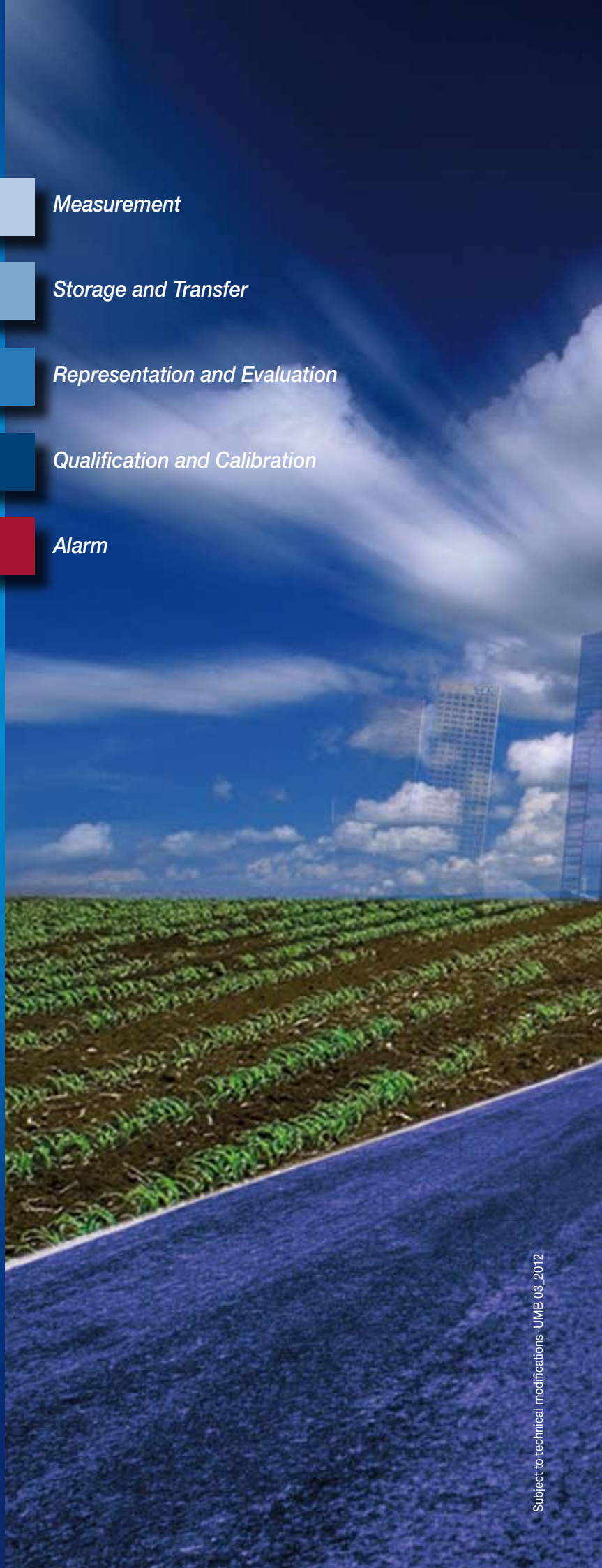
Measurement

Storage and Transfer

Representation and Evaluation

Qualification and Calibration

Alarm



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