HydroMet

User Manual

WeatherSens

KISTERS
Empowering decisions of tomorrow

06-2026 – 02-09-004

Table of Contents

I Disclaimer 4

II Scope of Delivery 5

III Safety Instructions 6

Part I Introduction 7

1.1 Product Overview ... 7

1.2 AR Series Anemometer and MP-Series, MPS100 ... 9

1.2.1 Anemometer AR200 ... 10

1.2.2 Anemometer WS200 ... 10

1.2.3 WeatherSens MP Series ... 10

1.2.4 WeatherSens WS Series ... 11

Part II Installation 13

2.1 Select the Location ... 13

2.2 Mounting Kit ... 13

2.2.1 Tube1 Dimensions ... 14

2.2.2 Tube2 Dimensions ... 14

2.3 Mounting Method ... 14

2.3.1 Tube1 ... 15

2.3.2 Tube2 ... 15

2.4 Alignment ... 16

2.4.1 Alignment Method I ... 16

2.5 Sensor Connector, Cable ... 16

2.5.1 M12 plug, 8-pin & cable ... 16

Part III Operation 18

3.1 Communication Protocol ... 18

3.1.1 SDI-12 V1.3 ... 18

3.1.2 ASCII protocol ... 21

3.1.3 MODBUS-RTU Protocol ... 23

3.1.4 NMEA-0183 Protocol ... 25

Part IV Maintenance 27

4.1 Radiation Shield (Passive, No Forced Airflow) ... 27

4.2 Temperature, Relative Humidity and Barometric Pressure Sensor (Inside Shield) ... 27

4.3 Ultrasonic Wind Sensor (Top Unit) ... 28

4.4 Mechanical and Installation Checks (Often Overlooked) ... 28

4.5 Winter / Icing Considerations ... 28

4.6 Simple Field Checklist (Quick Version) ... 28

Part V Troubleshooting 29

5.1 Troubleshooting Measured Parameters ... 29

5.2 Communication ... 30

© 2026 | KISTERS

5.2.1 SDI-12 30
5.2.2 RS-485 / Modbus RTU Communication Issues 31
Part VI Repair 33
Part VII Technical Specifications 34
7.1 Anemometers 34
7.2 WeatherSens MP Series 35
7.3 WeatherSens WS Series 36
7.4 Others 37
Part VIII Obligations of the Operator and Disposal 38
8.1 Obligations of the Operator 38
8.2 Dismantling / Disposal 38

© 2026 | KISTERS

I Disclaimer

The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred.

This manual does not include all of the details of design, production, or variation of the equipment nor does it cover every possible situation which may arise during installation, operation or maintenance. KISTERS shall not be liable for any incidental, indirect, special or consequential damages whatsoever arising out of or related to this documentation and the information contained in it, even if KISTERS has been advised of the possibility of such damages.

Any errors found in any KISTERS product should be reported to KISTERS where every effort will be made to quickly resolve the problem.

Copyright Notice: No parts of this work may be reproduced in any form or by any means without the written permission of the publisher. KISTERS waives copyright for users to print out parts of the documentation in hard copy for their own use only.

Trademark Notice: KISTERS products and services referred to in this document are trademarks or registered trademarks of KISTERS. Other product names used may or may not be the trademarks of their respective owners.

© 2026 | KISTERS. Any rights not expressly granted herein are reserved.

This document is public.

II Scope of Delivery

- One of each sensor model inside an overseas transportation box:
  - Sensor model: WS200, WS500, WS650
  - Sensor model MP-Series: AR200, MP500, MP650, MPS100
- Installation Guide WS or MP-Series
- Factory Acceptance Test Protocol
- 10 m cable M12 SAC 8-pol
- Factory setting: SDI-12 Version 1.3

III Safety Instructions

- Read the user manual including all operating instructions prior to installing, connecting and powering up the KISTERS WeatherSens. The manual provides information on how to operate the product. The manual is intended to be used by qualified personnel, i.e. personnel that have been adequately trained, are sufficiently familiar with installation, mounting, wiring, powering up and operation of the product.
- Keep the user manual on hand for later reference!
- If you encounter problems understanding the information in the manual (or part thereof), please consult the manufacturer or its appointed reseller for further support.
- KISTERS WeatherSens is intended to be used in hydrometeorological or environmental monitoring applications.
- Before starting to work, you have to check the functioning and integrity of the system.
  - Check for visible defects on the WeatherSens, this may or may not include any or all of the following: mounting facilities, connectors and connections, mechanical parts, internal or external communication devices, power supplies or power supply lines, etc.
  - If defects are identified that could compromise operational safety, work must be stopped immediately. This applies to defects detected both before work begins and during operation.
- Do not use the KISTERS WeatherSens in areas where there is a danger of explosion.
- The present user manual specifies environmental/climatic operating conditions as well as mechanical and electrical conditions. Installation, wiring, powering up and operating the KISTERS WeatherSens must strictly comply with these specifications.
- Perform maintenance only when tools or machinery are not in operation.
- If guards are removed to perform maintenance, replace them immediately after servicing.
- Never make any electrical or mechanical diagnostics, inspections or repairs under any circumstances. Return the product to the manufacturer's named repair centre. You can find information on how to return items for repair in the relevant section of the KISTERS website.

Disposal instructions: After taking the KISTERS WeatherSens out of service, it must be disposed of in compliance with local waste and environmental regulations. The KISTERS WeatherSens is never to be disposed of in household waste!

Inputs and outputs of the device are protected against electric discharges and surges (so-called ESD). Do not touch any part of the electronic components! If you need to touch any part, please discharge yourself, i.e. by touching grounded metal parts.

1 Introduction

Thank you for choosing our product. We hope you will enjoy using the device.

KISTERS manufactures, sells, installs and operates quality instrumentation, data loggers and communication technology. Products are designed with passion for environmental monitoring and with a deep understanding of the quality, accuracy and robustness needed to fulfil the requirements of measurement practitioners in the field.

The present User Manual will help you understand, install and deploy the device. If, however, you feel that a particular information is missing, incomplete or confusing, please do not hesitate to contact us for further support!

For more information, see the following subsections:

- Product Overview 7
- AR Series Anemometer and MP-Series, MPS100 9

1.1 Product Overview

The compact weather sensors do provide reliable data for weather monitoring and wide field of applications where efficient deployment costs and compact design and a small installation foot-print is required.

Data Output: The sensor provides one second instantaneous data and does not aggregate further mean values or extended meteorological and statistical calculations:

- **Wind data**: Calculation of wind gusts as 3-second moving averages based on a sampling rate of 4 Hz (4 values per second).
- **All other meteorological parameter**: One second instantaneous output data to be used for the further aggregation into high-quality mean values. For this, permanent power supply is required.

Device overview

Below you will find an overview of all standard devices with SDI-12 interface.

Theta P/N	Description	WS+WD	Multiparameter	45 m/s	60 m/s	75 m/s	Rad	SDI-12	RS485 MODBUS	RS485 NMEA	Heater 24 Watt	Fan	Electric compass
All standard versions with SDI-12, MODBUS/NMEA configurable via KISTERS HyComm													
AR200	Standard anemometer - 60 m/s	x			x			x					
WS200	Compact anemometer - 45 m/s	x		x				x					
Single parameter													
MPS100	Solar radiation meter						x	x					
MP Series - 60 m/s													
MP500	5 parameters standard weather station		x		x			x					
MP650	6 parameters standard weather station		x		x		x	x					
WS Series - 45 m/s													

Theta P/N	Description	WS+WD	Multiparameter	45 m/s	60 m/s	75 m/s	Rad	SDI-12	RS485 MODBUS	RS485 NMEA	Heater 24 Watt	Fan	Electric compass
WS500	5 parameters compact weather station		x	x									
WS650	6 parameters compact weather station		x	x			x	x					

Below are our devices with a wind speed measuring range of up to 75 m/s and heating (heater).

Theta P/N	Description	WS+WD	Multiparameter	75 m/s	Rad	SDI-12	RS485 MODBUS	RS485 NMEA	Heater	Fan	Electric compass
All versions with 75 m/s, heating, SDI-12 or MODBUS or NMEA according to Theta factory setting											
AR200 - Heated - 75 m/s - SDI-12/MODBUS/NMEA											
AR200E-H	Standard anemometer, heated	x		x		x			x	x	x
AR200E-HM	Standard anemometer, heated	x		x			x		x	x	x
AR200E-HN	Standard anemometer, heated	x		x				x	x	x	x
MP series - heated - 75 m/s - SDI-12											
MP500E-H	Standard weather station for five parameters		x	x		x			x	x	x
MP650E-H	Standard weather station for six parameter stations		x	x	x	x			x	x	x
MP series - heated - 75 m/s - MODBUS											
MP500E-HM	Standard weather station for five parameters		x	x			x		x	x	x
MP Series - Heated - 75 m/s - NMEA											
MP500E-HN	5 parameters standard weather station		x	x				x	x	x	x
MP650E-HN	6 parameters standard weather station		x	x	x			x	x	x	x

Explanatory notes:

WS	Wind speed
WD	Wind direction
T	Temperature
RH	Relative humidity
P	Barometric pressure
Rad	Solar radiation

Measured parameters

- Wind speed and direction (WS and WD)
- Temperature (T)
- Relative humidity (RH)
- Barometric pressure (P)
- Global radiation (Rad)

Applications:

- Smart Cities, Urban Areas and Municipalities
- Automatic weather stations, ASOS AWOS
- Offshore platforms and Wind Energy Industry
- Road Weather Monitoring
- Power Grid Transmission stations
- Photovoltaic farms
- Hydro-Meteorological monitoring
- Traffic control on roads, bridge and tunnel
- Navigation on ships, vessels and ferries
- Marine application and harbour monitoring
- Airfield and helicopter platform
- Environmental monitoring
- Agrometeorological stations such as ETo (evapotranspiration) or irrigation stations
- Building Automation

Functions

- All-in-one weather measurements
- Choice of parameters to suit required applications
- Built-in data pre-processing capability
- Selectable interface and output protocols according SDI-12 and MOBBUS standard
- Ease of use, install and integrate into 3rd party systems
- Low power consumption
- Maintenance free instruments without any moving parts

1.2 AR Series Anemometer and MP-Series, MPS100

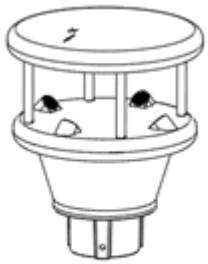
This chapter contains the following subsections:

- Anemometer AR200 10
- Anemometer WS200 10
- WeatherSens MP Series 10
- WeatherSens WS Series 11

1.2.1 Anemometer AR200

The AR200 sensors based on ultrasonic measuring principle by reflection method determines and calculates wind speed and direction with 4 Hz sampling interval to provide floating means on vector and scalar output. This durable metal version of aluminium alloy with teflon coating is corrosion-resistant and complies to the WMO Guide to Instruments and Methods of Observation (WMO), section on wind measurements.

Note: The data logger has to poll in 1 second interval and to aggregate vectorial or scalar mean values or any further meteorological and statistical calculation.

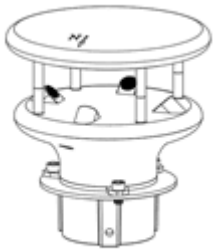


AR200

1.2.2 Anemometer WS200

The WS200 sensors based on ultrasonic measuring principle by reflection method determines and calculates wind speed and direction with 4 Hz sampling interval to provide running means on vector and scalar output. This version is made of corrosion-resistant polycarbonate material according to IP66 and complies to the WMO Guide to Instruments and Methods of Observation (WMO), section on wind measurements.

Note: The data logger must query at 1-second intervals and aggregate vector or scalar mean values or other meteorological and statistical calculations.



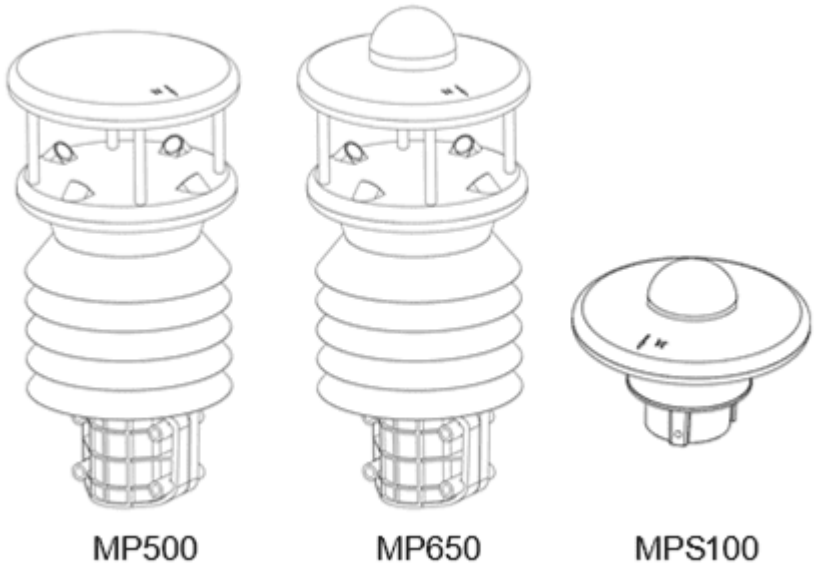
WS200

Model	Wind speed	Wind direction	Remark
AR200	✓	✓	60 m/s / IP66
WS200	✓	✓	45 m/s / IP66

1.2.3 WeatherSens MP Series

The MP Series Compact Weather Sensors are designed for robust and maintenance-free measurements in hydrology, meteorology and weather-critical applications where durability, precision and operations in different climatic conditions are expected.

- Wind speed measuring range up to 60 m/s.
- Housing consisting of Aluminum alloy with Teflon coating.



Not all models are shown in the figure above.

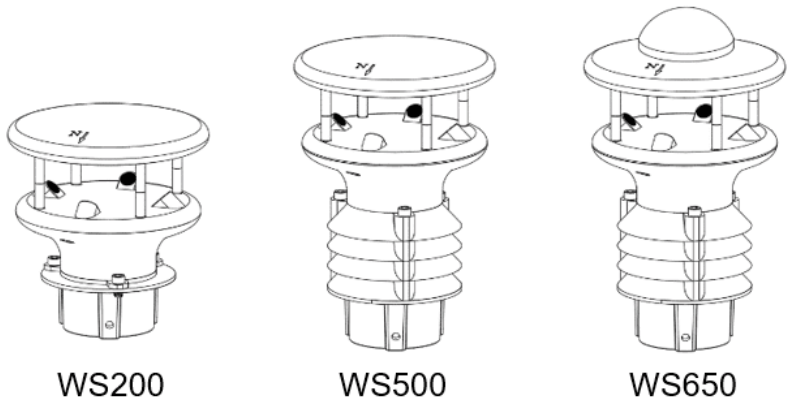
Model	Wind speed	Wind direction	Temperature	Humidity	Pressure	Solar radiation	Remark
MP500	✓	✓	✓	✓	✓		
MP650	✓	✓	✓	✓	✓	✓	
MPS100						✓	

Table 1 – WeatherSens MP-Series Overview

1.2.4 WeatherSens WS Series

The WS-Series Compact Weather Sensors are designed for robust and maintenance-free measurements in hydrology, meteorology and weather-critical applications where durability, precision and operations in different moderate climatic conditions are expected.

- Wind speed measuring range up to 45 m/s.
- Housing consisting of corrosion-resitant polycarbonate material.



Model	Wind speed	Wind direction	Temperature	Humidity	Pressure	Solar radiation
WS200	✓	✓				
WS500	✓	✓	✓	✓	✓	
WS650	✓	✓	✓	✓	✓	✓

Table 2 – WeatherSens WS-Series Overview

AR200, WS200 and MPS sensors are designed as single sensors or incorporated into the compact weather sensors. Typical applications for the sensors are 10 m automatic weather stations according to WMO guide line or compact weather stations for 2" poles.

Environment certificates

The sensors have been tested and are approved for following environment applications and conditions:

- Ingress protection: IP66.
- Temperature from -40 to +70 °C.
- Humidity from 5 to 100 % RH.
- Wind resistibility from 0 to 60 m/s (AR/MP series) or 45 m/s (WS series).
- Vibration resistibility: ---
- Salt spray resistibility: ---
- Solar radiation resistibility from 0 to 2000 W/m^2 according to latest WMO guideline and measuring range.

All sensors are not equipped with heater and can be operated without heater function also down to -40 °C under conditions of non-cumulation of snow and non-icing accretion. The low power consumption in the typical range of 150 to 200 mW is ideal for the supply of solar power packages with typical 50 Watt solar panel size and 50 Ah battery size.

For an individual and precise determination and calculation of panel size and battery size it is required to include the power consumption of the sensor, the connected data logger and of communication devices. You can additionally use commercial solar power calculation tools free of charge, where you enter geo data like longitude and latitude to calculate the solar radiation electrical power.

Note that an intermittent power supply is not applicable due to the fast-changing parameters for wind and precipitation monitoring to require permanent power supply.

Measurements

Principal measurements provided by HS WeatherSens are:

- Wind speed and direction data by measuring interval of 4 Hz to process three second wind gust calculation and output according WMO guide line by factory setting.
- Further mean value aggregation to be proceeded by connected data logger, weather station or SCADA system such as gliding 2 or 10 minutes mean interval.
- 3 seconds Instantaneous data for all met parameters such as temperature, humidity, air-pressure, solar radiation.
- All parameters in metric units according to factory settings or imperial units by command setting.

Interfaces

HS WeatherSens is equipped with the SDI-12 version 1.3 serial interface according to factory settings and with the RS-485 interface. For RS-485, various protocols can be used, e.g. MODBUS RTU or ASCII to be configured by commands. All interfaces are implemented but cannot be operated simultaneously. Only one interface can be configured and operated.

A firmware update can be proceeded at KISTERS authorized and certified Hubs and partners. Usually it is supposed that new firmware versions are developed under maintenance aspects to serve and comply to new and future requirements and features.

The UMB protocol included in the RS-485 interface is implemented in the current firmware release. If you require a separate communication description, please contact your KISTERS partner.

2 Installation

See also HS WeatherSens MP/WS installation guide.

This chapter contains the following subsections:

- Select the Location 13
- Mounting Kit 13
- Mounting Method 14
- Alignment 16
- Sensor Connector, Cable 16

2.1 Select the Location

Warning: To protect the people and the products, a lightning rod should be installed with the tip at least one meter above the sensor. The rod must be properly grounded, compliant with all applicable local safety regulations.

Note: Installations on top of high buildings or masts and in sites on opening grounds are vulnerable to lightning strikes. A nearby lightning strike may induce a high-voltage surge not tolerable by the internal surge suppressors of the instrument.

Additional protection is needed in regions with frequent, severe thunderstorms, especially when long line cables (> 30m) are used.

Finding a right place to install the sensors is important for getting representative ambient measurements. The environmental conditions of the chosen location may influence measurement results. The WMO Guide to Instruments and Methods of Observation (WMO No. 8) contains useful advice on the installation of sensors at suitable measuring sites.

It is important to taking into account the topography and surrounding area to achieve optimum performance. Trees, buildings, or other objects situated in the vicinity of weather sensors disturb free air flow and thus affect the accuracy of the measurement results.

2.2 Mounting Kit

Depending on the different installation location, a variety of mounting options are available. Users can select the appropriate mounting kit according to the location requirements. Mounting of sensor must be placed vertically and fixed firmly.

Mounting Kit Checklist

Mounting Method	Applicable models
Tube1 15, Ø 40 - 50 mm	MPS100, AR200, WS series
Tube2 15, Ø 50 - 60 mm	MP series

2.2.1 Tube1 Dimensions

MPS100, AR200, WS series

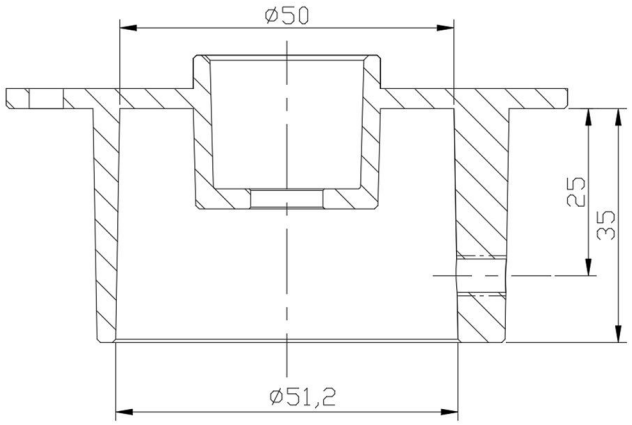
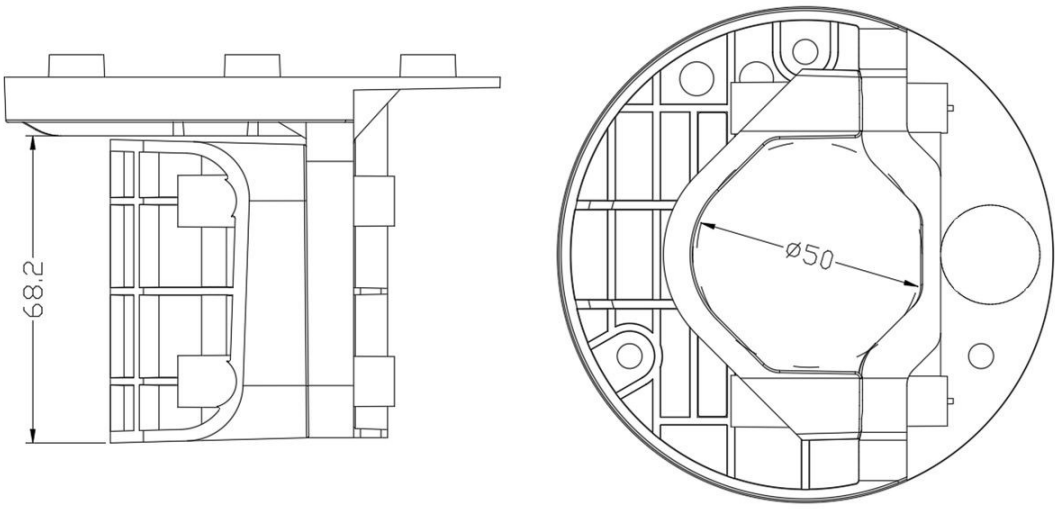


Figure 1 – Dimensional Drawing

2.2.2 Tube2 Dimensions

MP series



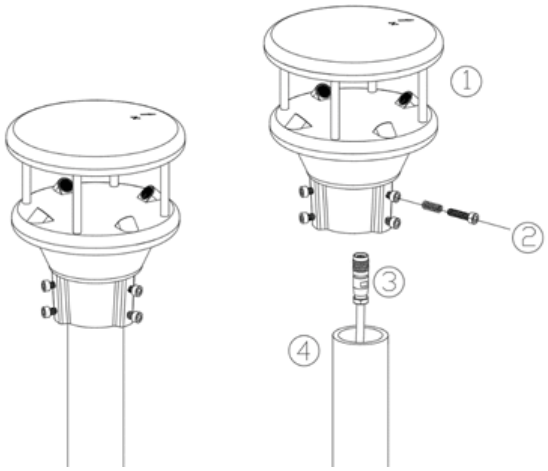
2.3 Mounting Method

This chapter contains the following subsections:

- Tube1 15
- Tube2 15

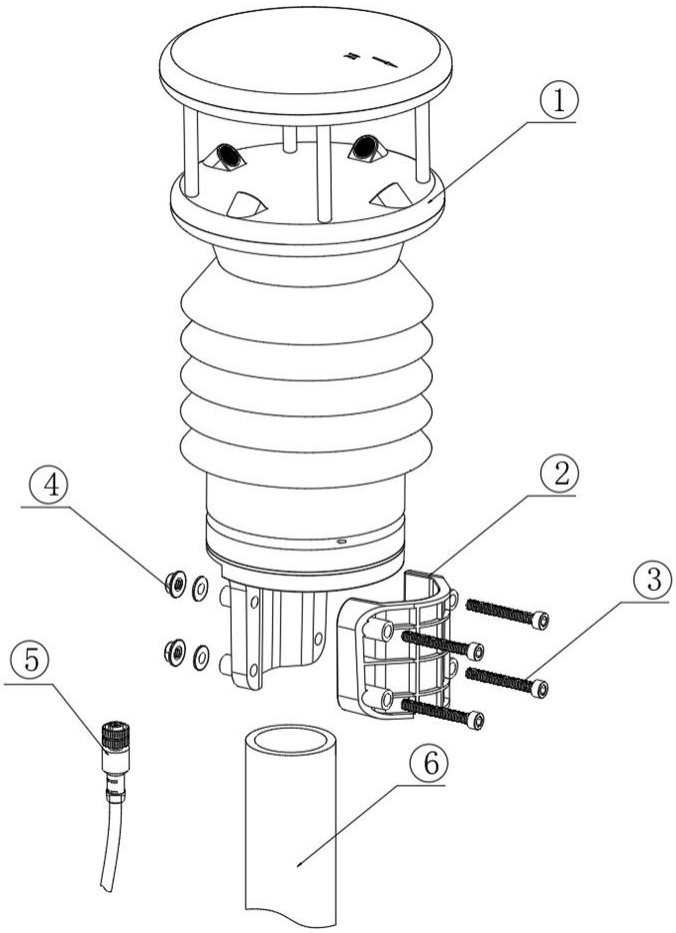
2.3.1 Tube1

1. Sensor
2. M6 screw and spring
3. Cable and plug
4. Fixing rod (OD 50 mm)



2.3.2 Tube2

1. Sensor
2. Bracket
3. Screws
4. Nuts
5. Cable and plug
6. Fixing rod (min OD 50 mm)



2.4 Alignment

Alignment method changes depending on different models.

Model	Alignment
AR200 MP series, WS series	see Method I 16
MPS-100	Alignment is not necessary. Vertical installation is sufficient.

2.4.1 Alignment Method I

The measurement of wind direction is closely related to the mounting position of the weather sensor. Before fixing the instrument, the sensor should be aligned in such a way that the indicator arrow “N” points to the North/South direction of the earth’s geographic meridians.

The North can be referred either to true North, which uses the earth’s geographic meridians, or to the magnetic North, which is read with a magnetic compass. The magnetic declination is the difference in degrees between the true North and magnetic North. When aligning to the magnetic North, the declination (variation) must be taken into account.

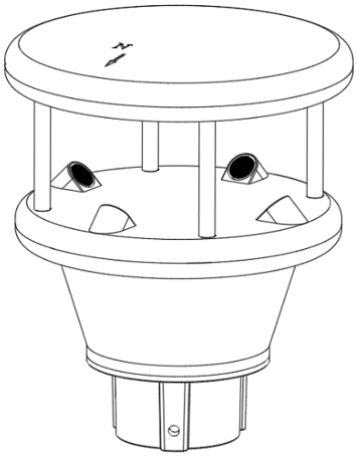


Figure 2 – Applicable on all models with parameter wind-speed and wind-direction

Procedure:

1. If the sensor is already installed, loosen both nuts evenly until you can turn the sensor easily;
2. Using the compass, identify the North and fix a point of reference on the horizon;
3. Position the sensor in such a way that the South and North sensors are in alignment with the fixed point of reference in the North.

2.5 Sensor Connector, Cable

In this manual, one type of connector used is described. Other customized connectors are not included in the manual.

2.5.1 M12 plug, 8-pin & cable

Definition

No.	Colour	RS-485	SDI-12
1	White	VCC	VCC

No.	Colour	RS-485	SDI-12
2	Brown	Power GND	Power GND
3	Green		SDI-12 GND
4	Yellow		SDI-12 Data
5	Grey	485A	
6	Pink	485B	
7	Blue	+ 24 VDC / 1A	+ 24 VDC / 1A
8	Red	- 24 VDC / GND	- 24 VDC / GND

Note:

- The sensor can be used with either SDI-12 or RS-485. The SDI-12 connectors allow 3 or 4 terminal connection.
- When using SDI-12, the RS-485 signals **MUST** remain disconnected.
- When using RS-485, the SDI-12 signal **MUST** remain disconnected.
- Power lines such as Power VCC + and Power GND must be connected. Otherwise, the sensor will not turn on.
- When using the **heating option** , a corresponding power supply unit with 24 V dc/1A must be connected. The sensor and heating supply can be provided with a common 24 VDC or separate power supply units. The heating connection can be operated optionally or on demand.

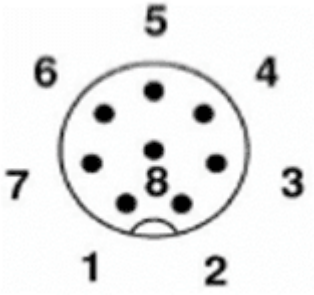


Figure 3 – 8-pin M12 connector from sensor side

Remarks:

1. The interface and protocol are switched through ASCII commands.

3 Operation

This chapter contains the following subsections:

- Communication Protocol 18

3.1 Communication Protocol

Weather sensors supports the following communication protocols:

- SDI-12 (version 1.3) – factory settings
- ASCII protocol
- MODBUS - RTU
- NMEA Extended (version 0183)

The protocol will be preconfigured at the factory according to the requirements specified when ordering the sensors. Standard factory setting is SDI-12 for all published articles and part numbers.

For more information, see the following subsections:

- SDI-12 V1.3 18
- ASCII protocol 21
- MODBUS-RTU Protocol 23
- NMEA-0183 Protocol 25

3.1.1 SDI-12 V1.3

Text-based communication with devices is possible using ASCII protocol.

For more information, see the following subsections:

- Configuration Commands for Users 18
- Command Details 19

3.1.1.1 Configuration Commands for Users

No.	Function	Steps	Commands	Detail
1	Switch to SDI-12 protocol	1	$AACFG 1<CR><LF>	AA: address, Default: 00, 1: Back to ASCII mode.
		2	$AAQ 04<CR><LF>	Select SDI-12 protocol.
2	Switch to MODBUS-RTU Floating protocol	1	$AACFG 1<CR><LF>	AA: address, Default: 00, 1: Back to ASCII mode.
		2	$AAQ 02<CR><LF>	Select MODBUS-RTU Floating protocol.
3	Switch to Lufft UMB protocol	1	$AACFG 2<CR><LF>	AA: address, Default: 00, 2: Back to Lufft setting mode. ** Setting is invalid after power off and needs to be reconfigured after power-on.

No.	Function	Steps	Commands	Detail
4	Enter update mode	1	$AADFU01<CR><LF>	1. ASCII command. 2. Reboot after sensor response.
5	Unit switching of monitor data	1	$AACFG 1<CR><LF>	AA: address, Default: 00, 1: Back to ASCII mode.
		2	$AAX N<CR><LF>	AA: address,N Default: 0, International Unit 1: Imperial Unit.
6	0M! Configuring output monitoring data	1	$AACFG 1<CR><LF>	AA: address, Default: 00, 1: Back to ASCII mode.
		2	$AAJ MSW,LSW<CR><LF>	AA: address, MSW, LSW definition see below

Bits	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
MSW	WIND SPEED	WIND DIRECTION	HUMIDITY	TEMPERATURE	AIR PRESSURE	0	N.A.	0	N.A.	SOLAR RADIATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LSW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Examples																															
MP200	$00J 11000000000000000000000000000000, 00000000000000000000000000000000\r\n																														

3.1.1.2 Command Details

	Identification command Example
	013HYQUEST_MPS100101T1910001<CR><LF>
Remark:	
0	Device address
13	The SDI-12 version number
HYQUEST_	8-character vendor identification

	Identification command Example
MPS100	6 characters specifying the sensor model number
101	3 characters specifying the firmware version
T1910001	8-character serial number
<CR><LF>	Response terminator

Parameter			Start Measurement Command		Measurement Completed	Request measurement data: (NA) = Not applicable	
No.	**Parameter**	**Detail**	**Commands**	**Response**	**Response**	**Commands**	**Response**
0	Composite Measurement		0M!	0ttt<cr><lf>	0<cr><lf>	0D0! 0D1! (if required)	0+WS+WD+TEMP+H+P+RI+RR+RC+SR<cr><lf> (see Note below)
1	Wind	Wind	0M1!	0ttt<cr><lf>	0<cr><lf>	0D0!	0+WS+WD<cr><lf>
2	PTU	Temperature, humidity, and pressure	0M2!	0ttt<cr><lf>	0<cr><lf>	0D0!	0+TEMP+H+P<cr><lf>
4	Solar Radiation	Solar Radiation	0M4!	0ttt<cr><lf>	0<cr><lf>	0D0!	0+SR<cr><lf>
5	All Parameters	All Parameters	0C!	0tttnn<cr><lf>		0D0! 0D1! (if required)	0+WS+WD+TEMP+H+P+SR<cr><lf> (see Note below)
6	Composite Measurement With CRC		0MC!	0ttt<cr><lf>	0<cr><lf>	0D0! 0D1! (if required)	0+WS+WD+TEMP+H+P+SR(CRC)<cr><lf> (see Note below)
7	Wind With CRC	Wind	0MC1!	0ttt<cr><lf>	0<cr><lf>	0D0!	0+WS+WD(CRC)<cr><lf>
8	PTU With CRC	Temperature, humidity, and pressure	0MC2!	0ttt<cr><lf>	0<cr><lf>	0D0!	0+TEMP+H+P(CRC)<cr><lf>
10	Solar Radiation With CRC	Solar Radiation	0MC4!	0ttt<cr><lf>	0<cr><lf>	0D0!	0+SR(CRC)<cr><lf>

Parameter			Start Measurement Command		Measurement Completed	Request measurement data: (NA) = Not applicable	
No.	**Parameter**	**Detail**	**Commands**	**Response**	**Response**	**Commands**	**Response**
11	All Parameters With CRC	All Parameters	0CC!	0ttttnn<cr><lf>		0D0! 0D1! (if required)	0+WS+WD+TEMP+H+P+SR(CRC)<cr><lf> (see Note below)
12	Address Query Command	Address Query Command	?!	0<cr><lf>			
13	Change Address Command	Change Address Command	aAb!	b<cr><lf>	a Device address, b Address change to (Address Range 0 - 9)		
14	Active command	Active command	0!	0<cr><lf>			
15	Identification command	Identification command	0I!	013ccccccccmmmmmmvvvxxxxxxxx<cr><lf>			

Note: The sensor only replies with parameters that are applicable to the corresponding model. e.g., AR200 → WS+WD only

3.1.2 ASCII protocol

Text-based communication with devices is possible using ASCII protocol.

ASCII protocol is network-compatible and serves exclusively for online data requests. The device will not respond to incomprehensible ASCII commands.

For more information, see the following subsections:

- Factory Settings 21
- Command Details 22

3.1.2.1 Factory Settings

The default values for weather sensors are:

- Interface: RS-485
- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None
- Device address: 0x01

3.1.2.2 Command Details

Command	Description	Response	Example
$AANN<CR><LF>	Change the device address AA = the old address. NN = the new address. Default Address : 0x01.	!NN<CR><LF>	Send : $0109<CR><LF> Response : ! 09<CR><LF> 01:Old address 09:New address
$AAM<CR><LF>	Device ID reading AA = the device address.	!ID<CR><LF>	Send : $01M<CR><LF> Response : ! AR200<CR><LF> Device ID:AR200
$AAZBR<CR><LF>	Baud rate setting AA = the device address. Default baud rate = 9600.	! <CR><LF>	Send : $01Z19200<CR><LF> Response : ! <CR><LF> Baud rate:19200
$AAZ<CR><LF>	Baud rate reading AA = the device address.	! BR<CR><LF>	Send : $01Z<CR><LF> Response : ! 19200<CR><LF> Baud rate:19200
#AA0<CR><LF>	Wind speed value reading AA = the device address.	>Value<CR><LF>	Send : #010<CR><LF> Response : >0.1<CR><LF> Unit : m/s
#AA1<CR><LF>	Wind direction value reading AA = the device address.	>Value<CR><LF>	Send : #011<CR><LF> Response : >20.3<CR><LF> Unit : degrees

Command	Description	Response	Example
#AA2<CR><LF>	Relative Humidity value reading AA = the device address.	>Value <CR><LF>	Send: #012<CR><LF> Response: >61.2 <CR><LF> Unit:%
#AA3<CR><LF>	Air Temperature value reading AA = the device address.	>Value<CR><LF>	Send: #013<CR><LF> Response: >27.6<CR><LF> Unit:℃
#AA4<CR><LF>	Barometric Pressure value reading AA = the device address.	>Value<CR><LF>	Send: #014<CR><LF> Response: >997.2<CR><LF> Unit:hPa
#AA<CR><LF>	Five parameters reading AA = the device address.	>Value1, Value2, Value3, Value4, Value5,<CR><LF> Value1:wind speed Value2:wind direction Value3: air humidity Value4: air temperature Value5: barometric pressure	Send: #01<CR><LF> Response: >0.1,20.3,60.5,27.6,997.2<CR><LF> Unit: m/s, degree,%,℃, hPa
#AAAC<CR><LF>	Seven parameters reading AA = the device address.	>Value1, Value2, Value3, Value4, Value5,Value10<CR><LF> Value1:wind speed Value2:wind direction Value3: air humidity Value4: air temperature Value5: barometric pressure Value10:Solar radiation	Send: #01AC<CR><LF> Response: >4.1,97.0, 78.5,29.4,994.3,0<CR><LF> Unit: m/s, degree, %,℃, hPa, W/m^2

3.1.3 MODBUS-RTU Protocol

This chapter contains the following subsections:

- Factory Settings 24
- Transmission Format 24
- Register Definition 24

3.1.3.1 Factory Settings

The default values for sensors are:

- Interface: RS-485
- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None
- Check Mode: CRC-16

3.1.3.2 Transmission Format

Read Data Message

Address: 0x01, Function Code: 0x03

Request Format:

Address	Function code	Register Start Address	Register Numbers	CRC-16
1byte	1byte	2bytes	2bytes	2bytes

Return Format:

Address	Function code	Length of Data	Data	CRC-16
1byte	1byte	1byte	Numbers of Data	2bytes

Write Data Message

Address: 0x01, Function Code: 0x06

Request Format:

Address	Function code	Register Start Address	Register Numbers	CRC-16
1byte	1byte	2bytes	2bytes	2bytes

Return Format:

Address	Function code	Register address	Data	CRC-16
1byte	1byte	2bytes	2bytes	2bytes

3.1.3.3 Register Definition

Register address	Detail	Format	Unit
40001 - 40002	Wind Speed Value	32-bit Floating Value	m/s
40003 - 40004	Wind Angle Value	32-bit Floating Value	Degree

Register address	Detail	Format	Unit
40005 - 40006	Relative Humidity	32-bit Floating Value	%
40007 - 40008	Temperature	32-bit Floating Value	°C
40009 - 40010	Pressure	32-bit Floating Value	hPa
40019 - 40020	Radiation intensity	32-bit Floating Value	W/m^2

When using a Modbus function code 3, 6, or 16, an address base of 40001 is assumed. The Register Address field is an offset from this base.

Examples:

If an address of 40001 needs to be accessed, then a Register Address of 0 is used (40001 - 40001 base = offset address of 0).

Note: Registers are read with the most significant byte (MSB, Most Significant Byte) first. 32-bit floating point values are encoded according to the IEEE 754 standard. For floating-point format variables, each data point appears twice because two 16-bit addresses are required to hold a 32-bit float value. The 16 bit Most Significant Word (MSW) is in the lower address of the register pair, while the least Significant Word (LSW) is in the upper address.

Tx + Rx message example:

WeatherSens AR200 Modbus address 1 – the Tx message requests the return of 0004 x 16-bit registers, starting at register address 0000.

(44 09 at the end of the Tx message is the CRC-16 cyclic redundancy check).

Wind Speed	0.98
Wind Direction	336.41

```
Tx: 01 03 00 00 00 04 44 09
Rx: 01 03 08 E1 48 3F 7A 34 7B 43 A8 00 35
```

The response to the Rx message indicates that 08 data bytes follow (note that 0004 x 16-bit registers in the Tx request = 08 data bytes in the response).

(00 35 at the end of the Rx message is the CRC-16 Cyclic Redundancy Check).

The order of the data bytes in the Rx message is: 'Little Endian Byte Swap'.

Wind speed = E1 48 3F 7A; swap the byte order in 3F 7A E1 48 and convert the hex value to IEEE754 float = 0.98.

Wind angle = 34 7B 43 A8; swap the byte order in 43 A8 34 7B and convert the hex value to IEEE754 float = 336.41.

3.1.4 NMEA-0183 Protocol

The default values for weather sensors are:

- Interface: RS-485 as 2-wire system
- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None
- Transmission interval: 1.0 seconds

For more information, see the following subsections:

- $WIMWV (wind speed and direction for AR200P-HN - factory setting) 26
- $WIXDR (all weather parameters for MP500P-HN, MP601P-HN, MP650P-HN and MP700P-HN - factory setting) 26

3.1.4.1 $WIMWV (wind speed and direction for AR200P-HN - factory setting)

Summary

The NMEA 0183 protocol provides the wind speed and wind direction, in relation to the vessel's bow/center line.

Syntax

$WIMWV,<1>,<2>,<3>,<4>,<5>*hh<CR><LF>

Fields

Field	Description
<1>	Wind direction, 0.0 to 359.9 degrees, in relation to the vessel's bow/center line. If the data for this field is not valid, the field will be blank.
<2>	Reference: R = Relative (apparent wind, as felt when standing on the moving ship) T = Theoretical (calculated actual wind, as though the vessel were stationary)
<3>	Wind speed, to the nearest tenth of a unit. If the data for this field is not valid, the field will be blank.
<4>	Wind speed units: K = km/hr M = m/s N = knots S = statute miles/hr Default: N (knots)
<5>	Status: A = data valid V = data invalid
<CR><LF>	Response terminator

Standard state

Enabled. Transmitted once per second.

3.1.4.2 $WIXDR (all weather parameters for MP500P-HN, MP601P-HN, MP650P-HN and MP700P-HN - factory setting)

Summary

The WIXDR protocol provides all weather parameters that are available for the models. Missing parameters, e.g. for an MP500P-HN, are indicated by not assigning any values to them.

4 Maintenance

This chapter contains the following subsections:

- Radiation Shield (Passive, No Forced Airflow) 27
- Temperature, Relative Humidity and Barometric Pressure Sensor (Inside Shield) 27
- Ultrasonic Wind Sensor (Top Unit) 28
- Mechanical and Installation Checks (Often Overlooked) 28
- Winter / Icing Considerations 28
- Simple Field Checklist (Quick Version) 28

4.1 Radiation Shield (Passive, No Forced Airflow)

This is the main source of errors over time.

What commonly goes wrong

- Dust and pollen accumulate between the plates, not just on the outside.
- Spider webs form vertical 'curtains' that block convective airflow.
- UV ageing causes slight warping of the plate, resulting in uneven airflow.
- Insects nest in the upper cavity, which is located just under the top cap.

Maintenance actions

Frequency: Clean 2–4 times per year (monthly in dusty, agricultural or coastal areas).

Method:

- Remove the shield if possible (this is recommended once a year).
- Use a soft brush on each plate gap.
- Rinse with distilled water (do not use a pressure spray).
- Let the parts dry completely before reassembling.

Do not

- Do not use compressed air, as this can force debris into the sensor cavity.
- Do not use solvents, alcohol or 'plastic restorers'.
- Do not paint or coat the plates, as this will destroy their reflectivity.

Data symptoms pointing to shield issues

- Daytime temperature bias on sunny, low-wind days.
- Delayed evening cooldown.
- The minimum temperature is slightly too high after clear, calm nights.

4.2 Temperature, Relative Humidity and Barometric Pressure Sensor (Inside Shield)

These sensors are usually reliable, provided they are not contaminated.

Typical signs that maintenance is needed

- Relative humidity (RH) becomes sluggish after rain or fog.
- Relative humidity (RH) plateaus (e.g. it never drops below ~40 %).
- Disagreement between temperature and relative humidity readings from nearby stations during stable conditions.

Maintenance guidance

- Do not attempt to open the sensor or radiation shield.
- Main action: Keep the shield clean – this accounts for 90 % of protection.
- Exposure to corrosive air may affect ambient temperature, relative humidity and barometric pressure readings in the long term (3-4 years).

4.3 Ultrasonic Wind Sensor (Top Unit)

There are no moving parts, but it is very sensitive to surface contamination.

Note: The ultrasonic emitter/receiver elements of all WeatherSens All-In-One Sensors are well protected by the roof above them.

Common problems

- Bird droppings on the faces of the transducers.
- Salt crystals (in coastal areas).
- Insects or pollen lodged in the acoustic paths.
- Ice accretion that biases readings without stopping them completely.

Typical signs of need for maintenance

- A constant wind direction for long periods.
- Under-reporting of wind speed during gusty conditions.
- No wind during clearly windy weather.

Maintenance guidance

- Wipe transducer surfaces with a damp microfibre cloth and distilled water.
- Inspect after storms, pollen season or bird activity.
- Check that the unit has not rotated on the mast (use the north reference!).

4.4 Mechanical and Installation Checks (Often Overlooked)

- Ensure the mast is vertical, as tilt affects wind and radiation exposure.
- Confirm there are no new obstructions (vegetation growth is a common issue).
- Verify the cable strain relief and drip loops.
- Check that the mounting hardware hasn't loosened due to freeze–thaw cycles.

4.5 Winter / Icing Considerations

- Rime ice on the shield: false T(min) and RH saturation.
- Ice on the ultrasonic head: muted gusts.

After freezing events:

- Inspect the shield cavities for trapped ice.
- Check the data for prolonged flatlines or slow recovery.

4.6 Simple Field Checklist (Quick Version)

- The shield plates are clean and evenly spaced.
- There are no webs or nests inside the upper cavity.
- The ultrasonic transducers are clean.
- The mast is vertical and the station is aligned.
- The pressure vent is unobstructed.
- The data "looks meteorologically reasonable".

5 Troubleshooting

For measured parameters, the overlap between maintenance and troubleshooting is almost total. Most 'faults' are simply degraded exposure, airflow, contamination or alignment, all of which are already covered in the Maintenance 27 chapter.

Quick decision tree

- Is the data implausible? → Maintenance section.
- No data or intermittent data? → Communication troubleshooting.
- Works with one sensor, but not multiple ones? → SDI-12 address conflict.

General rule of thumb

- Maintenance involves prevention and first-line troubleshooting.
- Troubleshooting (parameters): symptom summary and pointer back to maintenance.
- Troubleshooting (communications): detailed, step-by-step diagnostics.

This chapter contains the following subsections:

- Troubleshooting Measured Parameters 29
- Communication 30

5.1 Troubleshooting Measured Parameters

Most anomalies in measured meteorological parameters are caused by issues relating to installation, exposure, contamination or airflow. Refer to the Maintenance 27 chapter for detailed inspection procedures and corrective actions.

Parameter	Typical Symptom	Most Likely Cause	Primary Action
Temperature	Too high on sunny, calm days	Radiation shield fouling/poor airflow **Note**: Natural ventilation will lead to slight overestimation of temperature in calm, windless conditions.	Clean the shield and verify the exposure (see Maintenance 27)
Temperature	Minimum temperature too high even in strong wind conditions	Heat retention, blocked ventilation	Clean the shield and check the seating.
Relative humidity	Slow recovery after rain/fog	Contaminated or clogged shield; moss or other deposits retaining humidity	Clean shield
Relative humidity	Flat or stuck values	Sensor ageing or chemical exposure	Return the device for inspection. Follow the RMA process 33.
Pressure	Offset compared to nearby stations	Reference mismatch	Check offset settings in sensor or logger
Wind speed	Always low/zero	Contaminated ultrasonic transducers	Clean transducers
Wind direction	Fixed or biased	Station rotated/misalignment	Re-align and secure
Solar radiation	Too low/flat	Dirty or shaded sensor	Clean dome, remove shading

5.2 Communication

Quick communication diagnostic workflow

- First, check the power (voltage at the sensor).
- Test a single sensor with the shortest cable.
- Verify the protocol and parameters.
- Inspect the connectors for moisture.
- Review grounding and EMI sources.
- Only then suspect the sensor electronics.

5.2.1 SDI-12

Although SDI-12 is simple and robust, it is very sensitive to wiring, grounding and moisture.

No response to SDI-12 commands

Likely causes:

- There is no sensor power (which is often shared with communications).
- Incorrect wiring (DATA/GND swapped).
- The SDI-12 line is held low due to moisture or corrosion.
- Address conflict on shared bus.

Corrective actions:

- Re-terminate the wiring.
- Dry and clean the connectors.
- Assign a unique address.
- Replace any water-damaged cables.

Intermittent SDI-12 timeouts or checksum errors

Likely causes:

- Long cable runs (>60 m) without proper routing.
- Ground loops or poor earth reference.
- EMI from radios, solar charge controllers or lightning.
- Moisture ingress increasing line capacitance

Checks:

- Observe whether failures correlate with rainfall, sunrise (radioactivity) or charging cycles.
- Inspect the cable shielding and the grounding of the drain wire.
- Check for splices inside wet enclosures.

Corrective actions:

- Improve grounding (single-point earth).
- Use a shielded twisted-pair cable.
- Add ferrites near the logger end.
- Reroute away from RF transmitters.

SDI-12 address conflict (very common issue)

Multiple sensors connected, but:

- Logger gets no response, or
- Responses are intermittent, or
- Returned data is garbled/incomplete, or
- Only one sensor appears to respond no matter how many are connected.

This usually happens when new sensors are installed, a unit is replaced, or devices are factory reset.

Root cause: Two or more SDI-12 sensors are sharing the same address (the factory default is usually "0").

Because SDI-12 is a **single-wire**, **shared bus**, multiple sensors replying simultaneously cause:

- Bus collisions
- Truncated messages
- Checksum failures
- Apparent 'dead' sensors

How to confirm an address conflict

- Disconnect all but one of the sensors.
  - If it suddenly works, the address conflict is confirmed.
- Send a wildcard address query from either the logger or the terminal:

```
?!
```

  - Multiple responses indicate the presence of multiple sensors.
- Send:

```
0I!
```

  - If more than one sensor responds, the address "0" is duplicated.

Corrective action: assign unique addresses

Note: Only connect one sensor at a time.

- Power up a single sensor.
- Query its current address:

```
?!
```

- Change the address (for example, change from 0 to 1):

```
0A1!
```

- Confirm:

```
1I!
```

- Physically label the sensor with its SDI-12 address.
- Repeat this process for each sensor (2, 3, 4, etc.).

Note: Never attempt to change the address if multiple sensors are connected.

5.2.2 RS-485 / Modbus RTU Communication Issues

Although RS-485 is robust, it is configuration-sensitive.

No Modbus response from sensor

Likely causes:

- Incorrect baud rate, parity and stop bits.
- Wrong client ID.
- A/B lines reversed.
- The sensor is not powered or is in the wrong mode.

Checks:

- Confirm that the Modbus parameters match the sensor defaults.
- Swap the A/B lines if you are unsure.
- Ensure that the sensor is configured for Modbus RTU and not SDI-12.

Corrective actions:

- Set the serial settings correctly.
- Reconfigure the slave ID.
- Fix polarity.

CRC errors or intermittent read failures

Likely causes:

- Incorrect or missing termination
- Long stubs or star topology.
- EMI or poor cable shielding.
- Moisture ingress in connectors.

Checks:

- Check that termination exists at the ends of the bus only.
- Inspect the network topology (it must be a daisy chain).
- Review the frequency of errors based on weather or power cycles.

Corrective actions:

- Add termination resistors to the ends.
- Remove the stubs.
- Use a shielded twisted-pair cable.
- Improve cable routing and grounding.

Multiple sensors respond / bus collision

Likely causes:

- Duplicate Modbus slave IDs.
- The sensor is stuck in broadcast mode.

Checks:

- Disconnect the devices one by one.
- Scan the bus for responding addresses.

Corrective actions:

- Assign a unique ID.
- Reprogram the sensor.

6 Repair

KISTERS precision instruments and data loggers are produced in quality-controlled processes. All KISTERS production and assembly sites in Australia, New Zealand and Europe are ISO 9001 certified. All equipment is factory tested and/or factory calibrated before it is shipped to the client. This ensures that KISTERS products perform to their fullest capacity when delivered.

Despite KISTERS most rigorous quality assurance (QA), malfunction may occur within or outside of the warranty period. In rare cases, a product may not be delivered in accordance with your order.

In such cases KISTERS' return and repair policy applies. For you as a customer, this means the following:

- Contact KISTERS using the Repair Request Form and the Declaration of Contamination made available online:

Region (Language)	Download Link
Asia-Pacific (English)	Repair Request Form (APAC) Declaration of Contamination (APAC)
Europe, the Middle East and Africa (English)	Repair Request Form (EMEA) Declaration of Contamination (EMEA)
Germany (German)	Repair Request Form (DE) Declaration of Contamination (DE)

  In response you will receive a reference number that must be referenced on all further correspondence and on the freight documents accompanying your return shipment.
- Please provide as much information and/or clear instructions within the return paperwork. This will assist our test engineers with their diagnosis.
- Please do not ship the goods prior to obtaining the reference number. KISTERS will not reject any equipment that arrives without reference number; however, it may take us longer to process.

Custom requirements for items sent to KISTERS for warranty or non-warranty repairs: Check with your national customs/tax authorities for details, processes and paperwork regarding tax exempt return of products. Typically, special custom tariff codes are available (such as HS Code = 9802.00) that verify the item is being returned for repair and has no commercial value. Please note that the customs invoice / dispatch documents should also clearly state: "Goods being returned to manufacturer for repair – No Commercial value". It is mandatory to have any returned goods accompanied by a commercial invoice on headed paper. KISTERS reserves the right to charge the customer for time spent rectifying incorrect customs documents.

Note: Please ensure that your goods are packed carefully and securely. Damage that occurs during transit is not covered by our warranty and may be chargeable.

7 Technical Specifications

This chapter contains the following subsections:

- Anemometers 34
- WeatherSens MP Series 35
- WeatherSens WS Series 36
- Others 37

7.1 Anemometers

Parameter	AR200
Wind speed measuring range	0 to 60 m/s
Accuracy	±0,3 m/s or ±3 %
Wind direction measuring range	0 to 360°
Accuracy	±3°
IP Class	IP 66
Dimensions	Height 195 mm Diameter 160 mm
Mass:	1.1 kg
Digital Signal	SDI-12 (Factory setting) RS-485,9600,8,N,1
Supply voltage	10 to 30 V dc
Power consumption	20 mA at 12 V dc
Overall Heating	None
Operating temperature range	-40 … +70 °C
Operation humidity	5 % … 100 % RH
Connector	M12 8 pol
Connection cable (Accessories)	10 m (15”)

7.2 WeatherSens MP Series

Parameters inside MP500; MP600/601; MP650; MP700 (see table WeatherSens MP-Series Overview 11)			
Parameter	**Measurement ranges**	**Accuracies**	**Resolution**
Wind speed	0 to 60/75 m/s	±0,3 m/s or ±3 %	0.1
Wind direction	0 to 360°	±3°	0.1
Temperature	-40 to +80 °C	±0.3 °C; ±0.2 °C at (0 to +40 °C)	0.1
Humidity	0 to 100 % RH	±3 % RH	0.1
Barometric pressure	500 to 11000 hPa	±0,3 hPa	0.1
Solar radiation MPS100	200 to 2100 nm - 0 to 2000 W/m^2	±3 %	0.1

Parameter	**MP500**	**MP650**
IP Class	IP66	IP66
Dimensions	Height 308 mm Width 160 mm	Height 333 mm Width 160 mm
Mass:	1.4 kg	1.4 kg
Digital Interface	SDI12 V 1.3 (Factory setting) or RS-485,9600,8,N,1	SDI12 V 1.3 (Factory setting) or RS-485,9600,8,N,1
Supply voltage	10 to 30 V dc	10 to 30 V dc
Power consumption	23 mA at 12 V dc	27 mA at 12 V dc
Operating temperature range **Note**: Non-heated – without snow cumulation and/or ice accretion.	-40 … +70 °C	-40 … +70 °C
Operation humidity	5 % … 100 % RH	5 % … 100 % RH
Connector	M12 8 pol	M12 8 pol
Connection cable (Accessories)	10 m	10 m

The MPxxxE-Hx versions are equipped with a heater for ultrasonic transmission and thus for the wind parameter. The temperature control covers the range from -10 to +4 °C by connecting an additional supply voltage of 24 V dc/1A.

7.3 WeatherSens WS Series

Parameters inside WS500; WS600/601; WS650; WS200 (see table WeatherSens WS-Series Overview 12)			
Parameter	**Measurement ranges**	**Accuracies**	**Resolution**
Wind speed	0 to 45 m/s	±0,3 m/s or ±3 %	0.1
Wind direction	0 to 360°	±3°	0.1
Temperature	-40 to +80 °C	±0.3 °C; ±0.2 °C at (0 to +40 °C)	0.1
Humidity	0 to 100 % RH	±3 % RH	0.1
Barometric pressure	500 to 11000 hPa	±0,3 hPa	0.1
Solar radiation MPS100	200 to 2100 nm - 0 to 2000 W/m^2	±3 %	0.1

Parameter	**WS500**	**WS650**	**WS200**
IP Class	IP66	IP66	IP66
Dimensions	Height 208 mm Width 126 mm	Height 233 mm Width 126 mm	Height 152 mm Width 126 mm
Mass:	0.6 kg	0.7 kg	0.5 kg
Digital Interface	SDI12 V 1.3 (Factory setting) or RS-485,9600,8,N,1	SDI12 V 1.3 (Factory setting) or RS-485,9600,8,N,1	SDI12 V 1.3 (Factory setting) or RS-485,9600,8,N,1
Supply voltage	10 to 30 V dc	10 to 30 V dc	10 to 30 V dc
Power consumption	23 mA at 12 V dc	27 mA at 12 V dc	20 mA at 12 V dc
Operating temperature range **Note**: Non-heated – without snow cumulation and/or ice accretion.	-40 … +70 °C	-40 … +70 °C	-40 … +70 °C
Operation humidity	5 % … 100 % RH	5 % … 100 % RH	5 % … 100 % RH
Connector	M12 8 pol	M12 8 pol	M12 8 pol
Connection cable (Accessories)	10 m	10 m	10 m

7.4 Others

Parameter	Measurement ranges	Accuracies	Resolution
Solar radiation MPS100	200 to 2100 nm - 0 to 2000 W/m^2	±3 %	0.1

Parameter	MPS100
IP Class	IP66
Dimensions	Height 120 mm Width 160 mm
Mass:	1.2 kg
Digital Interface	SDI12 V 1.3 (Factory setting) or RS-485,9600,8,N,1
Supply voltage	10 to 30 V dc
Power consumption	15 mA at 12 V dc
Operating temperature range **Note**: Non-heated – without snow cumulation and/or ice accretion.	-40 … +70 °C
Operation humidity	5 % … 100 % RH
Connector	M12 8 pol
Connection cable (Accessories)	10 m

8 Obligations of the Operator and Disposal

This chapter contains the following subsections:

- Obligations of the Operator 38
- Dismantling / Disposal 38

8.1 Obligations of the Operator

European Union

In the Single European Market it is the responsibility of the operator to ensure that the following legal regulations are observed and complied with: national implementation of the framework directive (89/391/EEC) and the associated individual directives, in particular 2009/104/EC, on minimum safety and health requirements for the use of work equipment by employees at work.

Worldwide

Regulations: If and where required, operating licences must be obtained by the operator. In addition, national or regional environmental protection requirements must be complied with, regardless of local legal provisions regarding the following topics:

- Occupational safety
- Product disposal

Connections: Local regulations for electrical installation and connections must be observed.

8.2 Dismantling / Disposal

When disposing of the units and their accessories, the applicable local regulations regarding environment, disposal and occupational safety must be observed.

Before dismantling

- Electrical Devices:
  - Switch off the units.
  - Disconnect electrical appliances from the power supply, regardless of whether the appliances are connected to the mains or to another power source.
- Mechanical devices:
  - Fix all loose components. Prevent the device from moving independently or unintentionally.
  - Loosen mechanical fastenings: Please note that appliances can be heavy and that loosening the fastenings may cause them to become mechanically unstable.

Disposal

Operators of old appliances must recycle them separately from unsorted municipal waste. This applies in particular to electrical waste and old electronic equipment.

Electrical waste and electronic equipment must not be disposed of as household waste!

Instead, these old appliances must be collected separately and disposed of via the local collection and return systems.

Integrated or provided batteries and accumulators must be separated from the appliances and disposed of at the designated

collection point. At the end of its service life, the lithium-ion battery must be disposed of according to legal provisions.

EU WEEE Directive

As players in the environmental market, KISTERS AG is committed to supporting efforts to avoid and recycle waste. Please consider:

- Avoidance before recycling!
- Recycling before disposal!

This symbol indicates that the scrapping of the unit must be carried out in accordance with Directive 2012/19/EU. Please observe the local implementation of the directive and any accompanying or supplementary laws and regulations.

Contact Data

Europe	KISTERS Europe	+49 2408 9385 0 hydromet.sales@kisters.eu www.kisters.eu
Australia	KISTERS Australia	+612 9601 2022 sales@kisters.com.au www.kisters.com.au
New Zealand	KISTERS New Zealand	+64 7 857 0810 sales@kisters.co.nz www.kisters.co.nz
Latin America	KISTERS Latin America	+57 350 575 4079 sales@kisters-latam.com www.kisters-latam.com
North America	KISTERS North America	+1 561 459 4876 kna@kisters.net www.kisters.net
Spain	KISTERS Ibérica	info@kisters.es www.kisters.es
France	KISTERS France	+33 1 4120 9200 info@kisters.fr www.kisters.fr
Canada	KISTERS Canada	kna@kisters.net www.kisters.net

© 2026 | KISTERS

www.kisters.eu
© 2026 | KISTERS
01/06/2026

KISTERS
Empowering decisions of tomorrow