Serial Wind Transmitter WAC155



Features

- Measures the wind data at configurable interval and computes wind average values over adjustable period
- Communicates over 2-wire RS-485 line with NMEA 0183 protocol (MWV, MWV query)
- Input voltage range of 9 ... 31.5 V enables use in both 12 V and 24 V systems
- Average power need 0.2 W, including the sensors
- Superior protection against lightning surges allows for installation to high towers
- Marine use can be enabled, with over 500 VAC isolation from system to frame
- Sensor heating control with adjustable temperature limits
- Auto-detection of sensor failure and system error

WAC155 converts the wind speed and direction data for use in the RS-485 bus.

Vaisala Serial Wind Transmitter WAC155 converts the digital data supplied by Vaisala WA15 and WA25 series wind sensors into standard data messages for use in the RS-485 bus. WAC155 consists of a component board in a junction box and a crossarm for mounting the wind sensors.

WAC155 communicates with the host system over 2-wire RS-485 line.
The standard sensor connections are for WA15 or WA25 series anemometers and wind vanes.

Long Distance Operation

Only a 4-wire cable is required for the line between WAC155 and the host. One wire pair provides the operating power. The other pair is for the serial line. For long distances, the RS-485 line terminator can be activated with the onboard jumper plug.

WAC155 accepts 9 ... 31.5 VDC as input power, from which it also generates operating power for the sensors.
The total average current consumed in power-save mode is less than 10 mA. This, along with the good line transient protection, allows for remote supply of the operating power.

A 20 ... 30 V supply is recommended for remote power. This is to minimize the current and the voltage drop in the cable. The allowable transmitter distance depends on the wire gauge of the cable, and is typically several hundreds of meters. It should be noted that the peak operating current can reach 30 mA even in power-save mode.

Flexible Communications

Wind data is provided in standard NMEA messages. In addition, a service connection is available for configuration and status information.

In the same RS-485 bus, there may be one or more transmitters. When WAC155 is alone in the bus, it can work in auto-transmit mode, sending data in pre-configured intervals. When more devices are involved, the host must control the data transit by polling one device at a time with an NMEA query. Each transmitter has a configurable ID for device addressing.

Self-Diagnostics

When the service connection is open or the system has been started recently, the onboard indicator LED flashes red when any error condition is active.

During an error condition NMEA messages also carry a flag for invalid data. The error flag can result from an incorrect system voltage level, absence or failure of a wind sensor, or system memory error. The cause of error is shown in a special error message.

Optional Heating Power

WAC155 also provides the sensors for throughput and control of heating power. The heating power connection, if required, calls for an extra pair of wires. Since a sensor typically requires 0.5 A current for heating, the power is most conveniently supplied from a local power source. By default WAC155 switches heating on in temperatures below +4 °C (+39 °F) (user-adjustable).

Technical Data

WAC155 Measurement Performance

Averaging interval	3 s (selectable range 0.25 ... 5 s)
Updating interval	0.25 s
Wind Speed	
Observation range	0 ... 75 m/s (0 ... 168 mph)
Observation frequency	4 Hz
Resolution	0.1 m/s
Wind Direction	
Observation range	0 ... 360°
Observation frequency	32 Hz
Resolution [1)]	2.0°

1) Gained by averaging the eight samples in each 0.25-second period.

WAC155 Inputs and Outputs

Input operating voltage	9 ... 31.5 V
Input operating current (incl. both sensors)	Power-save enabled: 7 mA typically at 24 V Power save disabled: 37 mA typically at 24 V
Heating control, WA15	On at 3 °C (37 °F) / Off at 5 °C (41 °F), adjustable
Input heating voltage, WA15	16 ... 24 VDC or VACrms with 1 or 2 sensors in parallel 32 ... 48 VDC or 32 ... 43 VACrms with 2 sensors in series
Input heating current	1.0 A typically at 20 V with 1 or 2 sensors in parallel 0.5 A typically at 40 V with 2 sensors in series
Heating for WA25	Passed by w. expansion connector
Signal input	6-bit parallel GRAY code (0.5/10.5 V typical) from wind vane 0 ... 750 Hz square wave (0.5/10.5 V typical) from anemometer
Data output	Two-wire half-duplex RS-485, 9600 8N1 [1)]
Service interface	RS-232 or RS-485
Message protocol	NMEA 0183, MWV, and MWV Query

1) Adjustable rate: 300 ... 19200, 7/8, O/E/N, 1/2.

WAC155 Operating Environment

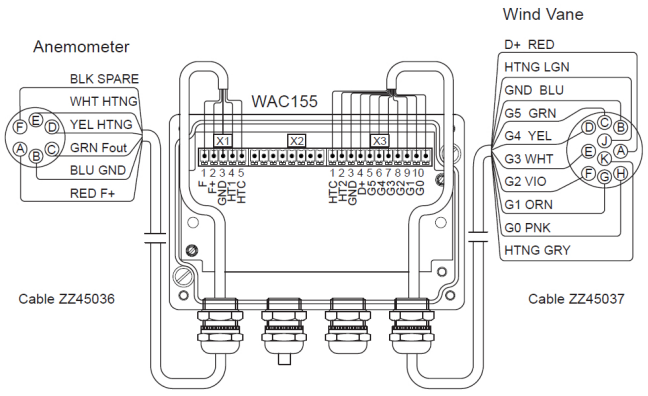
Operating temperature	−55 ... +60 °C (−67 ... +140 °F)
Storage temperature	−60 ... +70 °C (−76 ... +158 °F)
Operating humidity	0 ... 100 %RH

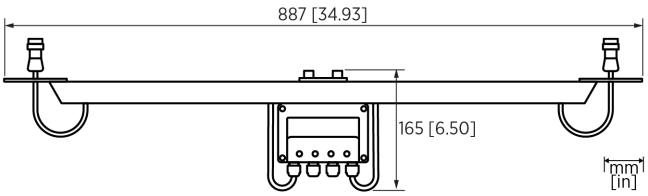
WAC155 Mechanical Specifications

IP rating	IP65
Weight	1.5 kg (3.3 lb)
Material	Aluminum
Mounting	To Ø 60 mm (2.36 in) pole mast
Dimensions	
Crossarm and junction box (W × H × D)	887 × 165 × 157 mm (34.9 × 6.5 × 6.18 in)
Junction box (W × H × D)	Without cable glands: 127 × 82 × 58 mm (5.00 × 3.23 × 2.28 in) With cable glands: 127 × 110 × 58 mm (5.00 × 4.33 × 2.28 in)

WAC155 Spare Parts

Spare Part	Order Code
Component board for WAC155	WAC155CB
Crossarm and serial RS-485 transmitter	WAC155
Sensor cable for WAA151/252 0.8 m (31.5 in), open lead on one end (6 wires), connector 230118 on other end	ZZ45036
Sensor cable for WAV151/252 0.8 m (31.5 in), open lead on one end (10 wires), connector 230119 on other end	ZZ45037
Special length sensor cable for WAA151/252, open lead on one end (6 wires), connector 230118 on other end	ZZ45036SPEC
Special length sensor cable for WAV151/252, open lead in one side (10 wires) and connector 230119 in another side	ZZ45037SPEC
Connector WAA151, WAA252	230118
Connector WAV151, WAV252	230119





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