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WAC155 Serial Wind Transmitter

The WAC155 is designed to communicate the wind speed and direction data measured over the RS-485 serial bus.

Features/Benefits

- Capable of measuring the wind parameters at a configurable interval (typical 3 seconds) using the instant method according to the WMO standard
- Communication with the host system with NMEA 0183 compliant protocol over RS-485 electrical interface (half-duplex)
- Fail-safe RS-485 operation with configurable baud rate and turnaround delay
- Configurable ID setting
- Adjustable heating control of sensors
- Auto-detection of sensor failure

The Vaisala Serial Wind Transmitter WAC155 converts the digital data supplied by the Vaisala WA15 and WA25 Series wind sensors for use in the RS-485 bus. The electrical connections to the sensors are 6-bit parallel graycode for the direction measurement and up to 750Hz digital pulse for the wind speed measurement (anemometer) . The WAC155 unit is installed underneath the cross arm, and it communicates with the controlling system via a twisted pair RS-485 cable.

The WAC155 consists of a PC board in a junction box , a cross arm for mounting the wind sensors and sensor cables with connector.

Long distance operation

RS-485 communication is half-duplex, and serial bus termination can be selected with the on-board jumper plugs. The transmitter accepts a wide range of input power and the total current consumed is typically less than 10 mA including the sensors. This allows for remote supply of operating power. The actual transmitter distance depends on the selected RS-485 communication speed and is typically several hundreds of meters. Normally, only a 4-wire shielded cable is required for the line between the WAC155 transmitter and the receiving end. Two of the four wires provide the operating power for the system. The other two are for the RS-485 serial bus connection from the WAC155 transmitter.

Flexible communications interface

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 either single or multiple transmitters. In the case of a single transmitter, the transmitter can be configured in auto-transmit mode, ie. The device transmits data messages with a configured interval. If there are several transmitters in the same bus, auto-transmission may not be enabled, but data can only be polled by query. Each device in the same bus has a unique configurable ID, containing 1..5 characters.

Extensive 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. Also NMEA-messages provided by the system carry an 'invalid data' status flag. Input voltage and operating voltages of the sensors are measured by an internal A/D-converter. If the measured value is either below or above defined limits, an alarm is given.

Wind sensors are cross-checked to detect whether either one or both sensors got stuck. If both sensors don't move for long time (one day by default), it is considered as an error situation.

Optional heating power

The WAC155 also provides the sensors for throughput of optional heating power. The heating power connection, if required, calls for an extra pair of wires. Since the heating elements typically consume some 500 mA, the heating power is most conveniently supplied from a local power source. Heating control parameters are user configurable and the default hysteresis limits are +3˚C ON and +5˚C OFF.

Optional TAMI module

The WAC155 transmitter contains a TAMI compliant interface and module slot for various future add-on modules such as an analog output module to replace the RS-485 communication with current loop outputs.

Technical Data

Signal input from sensors

Wind direction	6-bit parallel GRAY code
Wind speed	Pulse frequency 0 ... 750 Hz

Output signals

Digital RS-485 serial bus, NMEA compliant data stream

Output accuracy	Better than 1% full scale
Output range	
For direction	0 ... 360°
For speed	0 ... 76.8 m/s
Signal cable	4 wires minimum (Vin+, Vin–, RS-485 A, RS-485 B)

General

Input operating power	9 ... 15,5 VDC, 9 mA typical incl. sensors (when power-save mode is enabled)
Heating power	20V/40V AC/DC
Temperature range	
operating	–55 ... +55 °C (-67 ... +131 °F)
storage	–60 ... +70 °C (-76 ... +158 °F)
Humidity	0 ... 100 %RH
Material	
Cross arm	AI anodized
Junction box	AI painted grey

Complies with EMC standard EN 61326-1:1997 + Am1:1998 + Am2:2001; Generic Environment

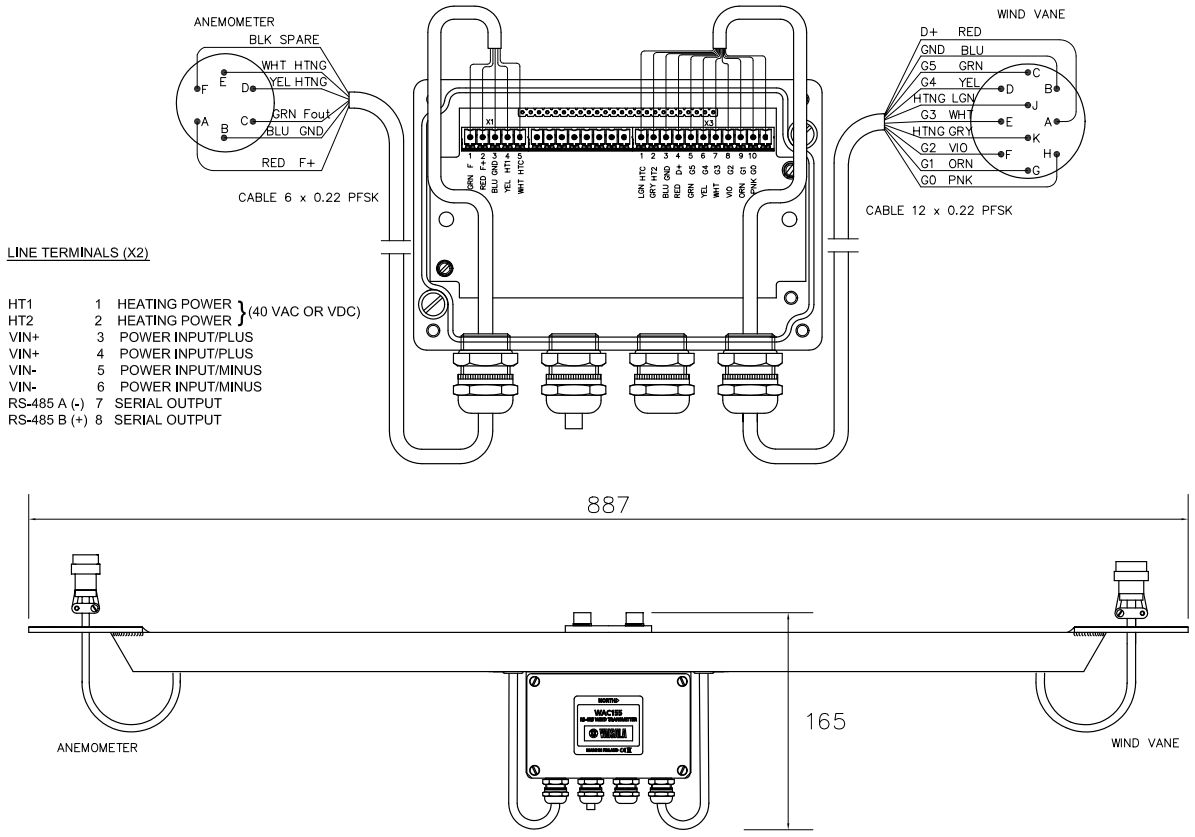
Communication Parameters

Baudrate	300, 600, 1200, 2400, 4800, **9600**, 19200
Databits	7 or **8**
Stopbits	**1** or 2
Parity	ODD, EVEN, **NONE**
TxDelay (ms)	0.0 ... 200.0

Default values in **Bold.**

Dimensions

PC board	114 × 58 mm²
Junction box	125 (w) × 80 (h) × 57 (d) mm
Cross arm length	887 mm
Mounting	to a Ø 60 mm pole mast
Weight	1.5 kg



Specifications subject to change without prior notice.