



ANEMOMETER + WINDVANE RF SET: ANEM04403 V3 4-20mA + WV4403 4-20mA SRR2-A (RF TRANSMITTER)

ANEM04403 and WV4403 ranges of IED Electronics.

Wind speed & direction sensors designed for different industries and sectors.

This set is composed by a wind speed and a wind direction sensors. ANEM04403 and WV4403 detects the wind speed and the vane position respectively by using magnetic sensors avoiding wear and tear. The SRR2-A reads the output of the sensors and transmits a RF signal.

High resistance to radio frequency interference (RFI) and electromagnetic interference (EMI)

Digimesh MODBUS RF Signal

Magnetic measuring principle, with no wear and tear or dead zones

Stainless steel bearings

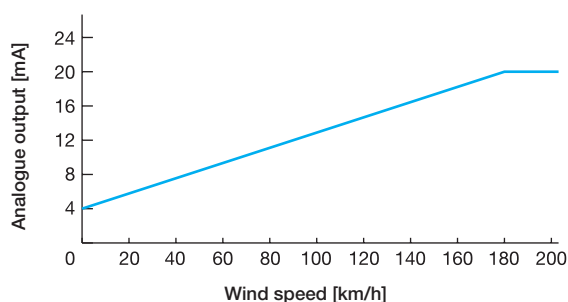
APPLICATIONS

This set has been designed to be used in industrial applications: cranes, solar panels, wind turbines, weather stations, greenhouses, irrigation systems...

It is usually connected to PLCs or dataloggers to display the wind speed and/or set alarms to predefined values or to obtain records during predefined periods of time.

WIND SPEED - OUTPUT RATIO

4...20 mA = 0...180 km/h



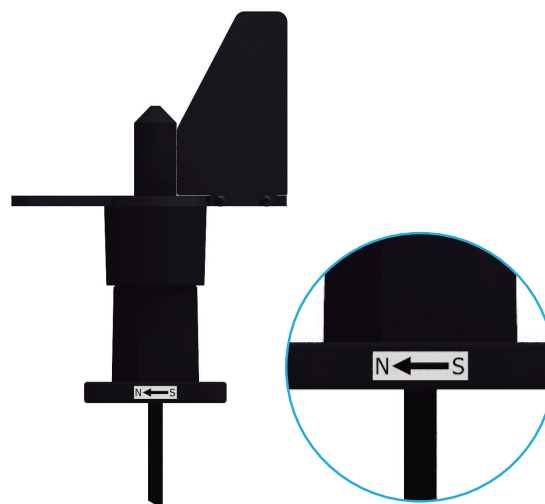
WIND DIRECTION - OUTPUT RATIO TABLE

| Direction | Angle | Analog output (mA) |
|-----------------|---|--------------------|
| North | 0.0 | 4 |
| North-northeast | 22.5 | 5 |
| Northeast | 45.0 | 6 |
| East-northeast | 67.5 | 7 |
| East | 90.0 | 8 |
| East-southeast | 112.5 | 9 |
| Southeast | 135.0 | 10 |
| South-southeast | 157.5 | 11 |
| South | 180.0 | 12 |
| South-southwest | 202.5 | 13 |
| Southwest | 225.0 | 14 |
| West-southwest | 247.5 | 15 |
| West | 270.0 | 16 |
| West-northwest | 292.5 | 17 |
| Northwest | 315.0 | 18 |
| Northwest-North | 337.5 | 19 |
| Static wind | If the wind speed is below 3km/h, the angle will be uncertain | |

OPERATING

- Wind speed reading up to 180 km/h.
- Survival speed of both sensors up to 200 km/h.
- Output is a RF DigiMesh MODBUS communication.
- The sensors must be fixed on a vertical position (the connector pointing to the ground)
- Minimum distance between sensors: 1 meter.

ORIENTATION VANE

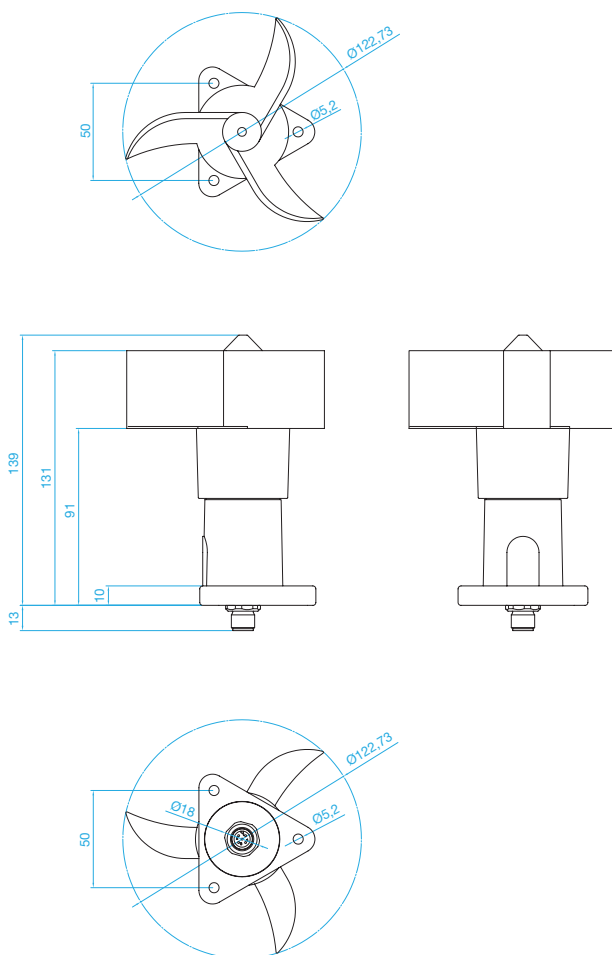


To orientate the vane north, the vane edge must be orientated north as shown in the picture.

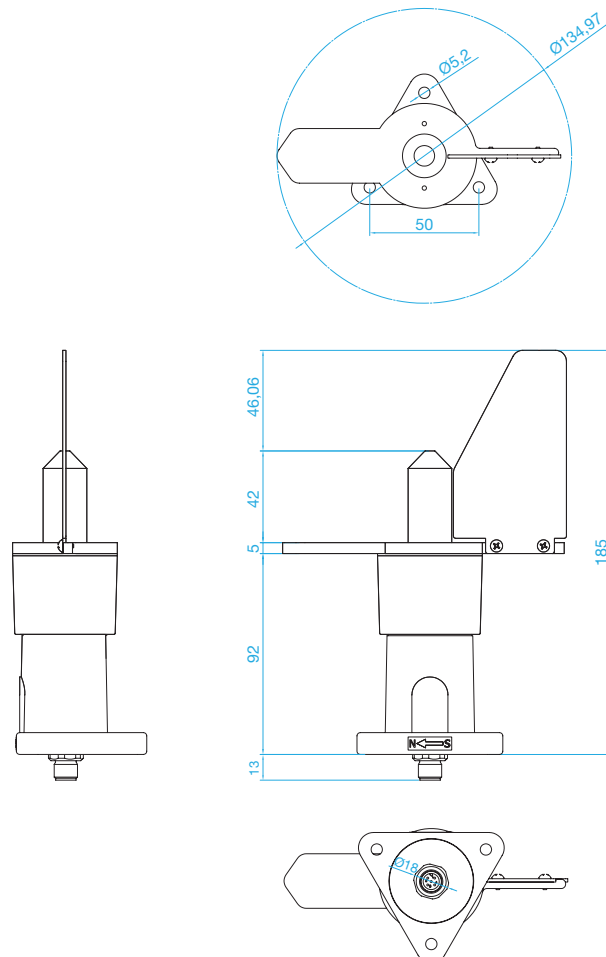
Once the vane has been orientated north, the output signal will correspond to the angles and directions in the table.

DIMENSIONS

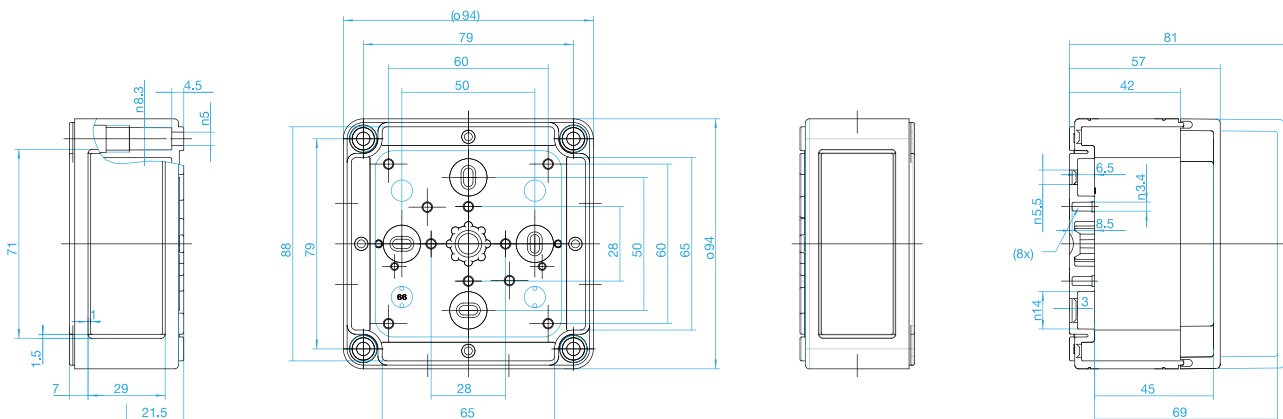
ANEM04403 V3 4-20mA



WV4403 4-20mA



SRR2-A

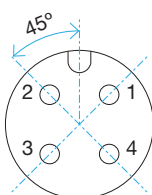


CONNECTION

Sensors are provided with a male M12 connector and pre-wired forming a set.

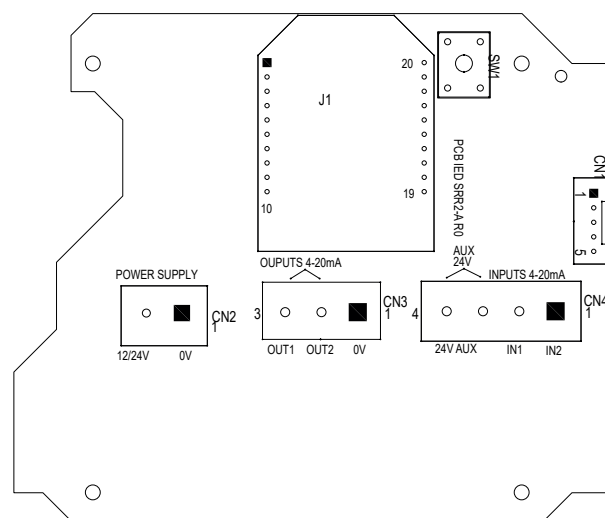
Anemo and Wind Vane Male M12 Connector pinout

| | |
|-------|---------------|
| Pin 1 | +Vcc |
| Pin 2 | analog output |
| Pin 3 | NC |
| Pin 4 | NC |



SRR2-A Connection (remove cover)

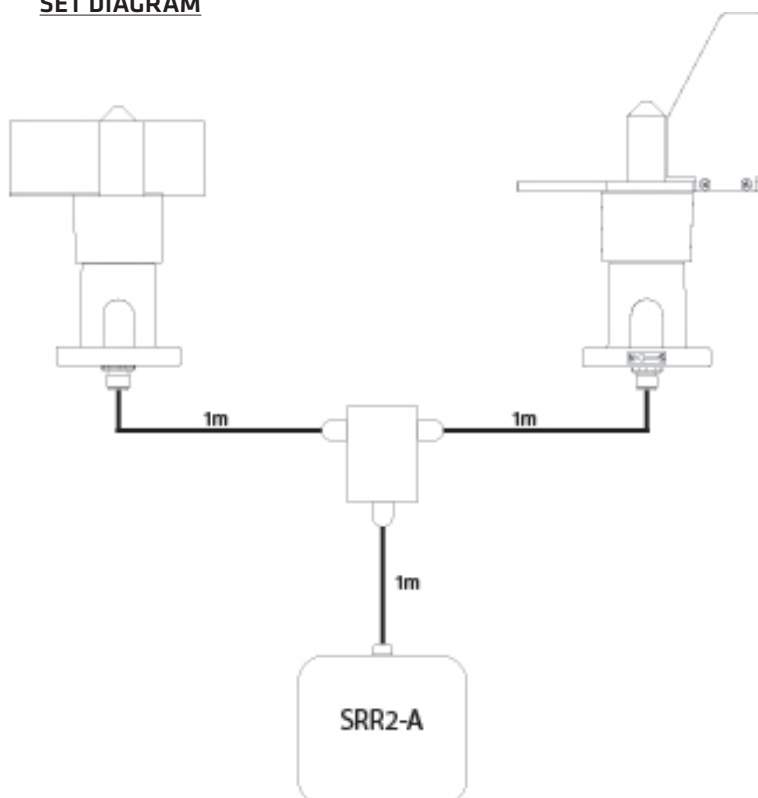
| | |
|-----------------------|--|
| CN2 (2-way connector) | Power supply: 9...28 Vdc |
| CN3 (3-way connector) | NC |
| CN4 (4-way connector) | Analog inputs: IN1: Wind Speed (anemo, black wire) IN2: Wind Direction (windvane, yellow wire) |



SET DIAGRAM

INSTALLATION NOTES:

- The sensors must be fixed on a vertical position (the connector pointing to the ground)
- Minimum distance between sensors: 1 meter.
- The WindVane must be oriented to north.
- The SRR2-A transmitter should have direct line of sight with the receiver. If not, the range will be lower.



PROTOCOL v1.3

Protocol type: **MODBUS RTU**

| | | | | | | | |
|------|----|----|----|----|----|------|------|
| Addr | 04 | 00 | 00 | 00 | 02 | CRCH | CRCL |
|------|----|----|----|----|----|------|------|

Features:

- First register: wind speed in km/h (0-180). Registers @30001 & @40001
- Second register: wind direction in degrees (0-359). Registers @30002 & @40002
- The user can read this values by any of the 2 available functions: *Read Input Register* and *Read Holding Register*
- The SRR2-A default address is 244 <=> 0xF4. This value is stored in the *Holding Register* @40003 and can be edited by the user. The user can configure any address in the range 1 (0x01) to 255 (0xFF).
- A minimum 200ms gap between frames of the Master is recommended.
- If SRR2-A detects a gap of at least 100ms, it assumes that a new message is coming and the receive buffer is cleared. As a consequence of the previous feature frames are processed after 100ms of silence.

Example: If Addr =F4

READING METHOD 1

Read request of wind speed and direction from master by *Read Input Register* (function 0x04):

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| F4 | 04 | 00 | 00 | 00 | 02 | 65 | 6E |
|----|----|----|----|----|----|----|----|

Slave answer (SRR2-A):

| | | | | | | | | |
|----|----|----|----|----|----|----|------|------|
| F4 | 04 | 04 | SH | SL | DH | DL | CRCH | CRCL |
|----|----|----|----|----|----|----|------|------|

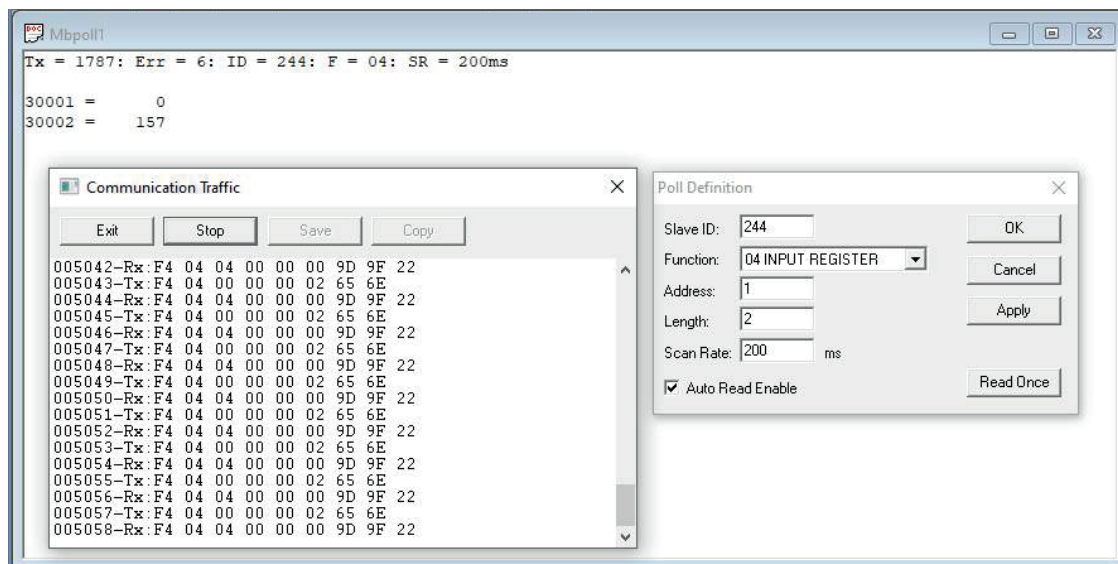
SHSL is the wind speed value in km/h. (0-180)

DHDL is the wind direction value in degrees. (0-359)

Slave answer example for 100km/h (0x0064) and 90° (0x005A):

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| F4 | 04 | 04 | 00 | 64 | 00 | 5A | 9F | 6F |
|----|----|----|----|----|----|----|----|----|

Slave answer example for 0km/h (0x0000) and 157° (0x009D):



READING. METHOD 2

Read request of wind speed and direction from master by *Read Holding Register* (función 0x03):

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| F4 | 03 | 00 | 00 | 00 | 02 | D0 | AE |
|----|----|----|----|----|----|----|----|

Slave answer (SRR2-A):

| | | | | | | | | |
|----|----|----|----|----|----|----|------|------|
| F4 | 03 | 04 | SH | SL | DH | DL | CRCH | CRCL |
|----|----|----|----|----|----|----|------|------|

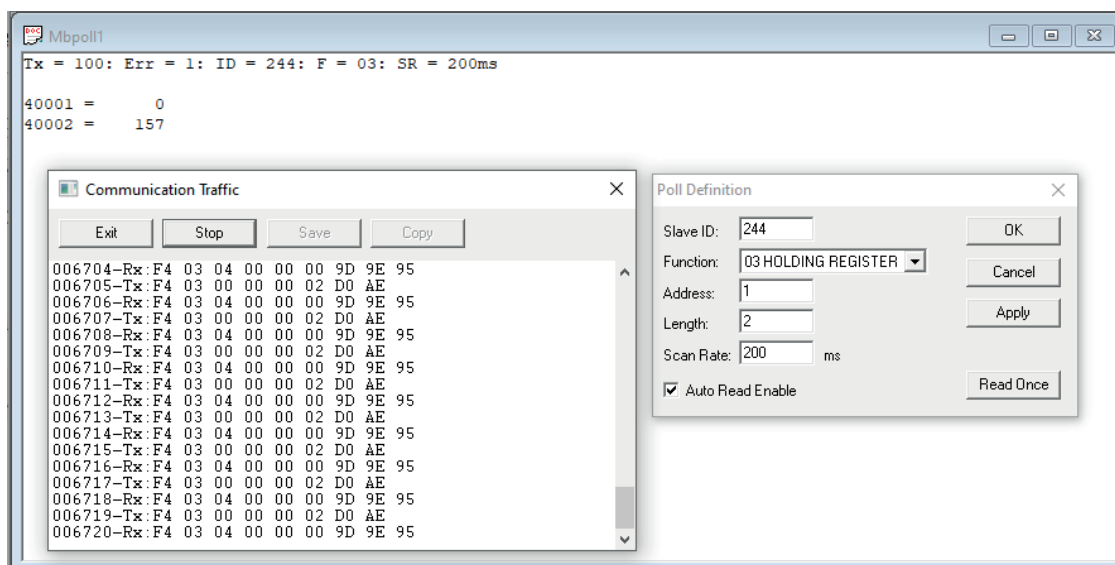
SHSL is the wind speed value in km/h. (0-180)

DHDL is the wind direction value in degrees. (0-359)

Slave answer example for 100km/h (0x0064) and 90° (0x005A):

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| F4 | 03 | 04 | 00 | 64 | 00 | 5A | 9E | D8 |
|----|----|----|----|----|----|----|----|----|

Slave answer example for 0km/h (0x0000) and 157° (0x009D):



WRITING

Write request of Address by *Write Single Register* (función 0x06):

| | | | | | | | |
|----|----|----|----|----|----------|------|------|
| F4 | 06 | 00 | 02 | 00 | NEW_ADDR | CRCH | CRCL |
|----|----|----|----|----|----------|------|------|

Note: The unit address (*Addr*) is stored in the *Holding Register* @40003

Slave answer (SRR2-A):

| | | | | | | | |
|----|----|----|----|----|----------|------|------|
| F4 | 06 | 00 | 02 | 00 | NEW_ADDR | CRCH | CRCL |
|----|----|----|----|----|----------|------|------|

NEW_ADDR is the new unit address. It must be in the range from 1 (0x01) to 255 (0xFF).

Example for NEW-ADDR 0x02:

Write request:

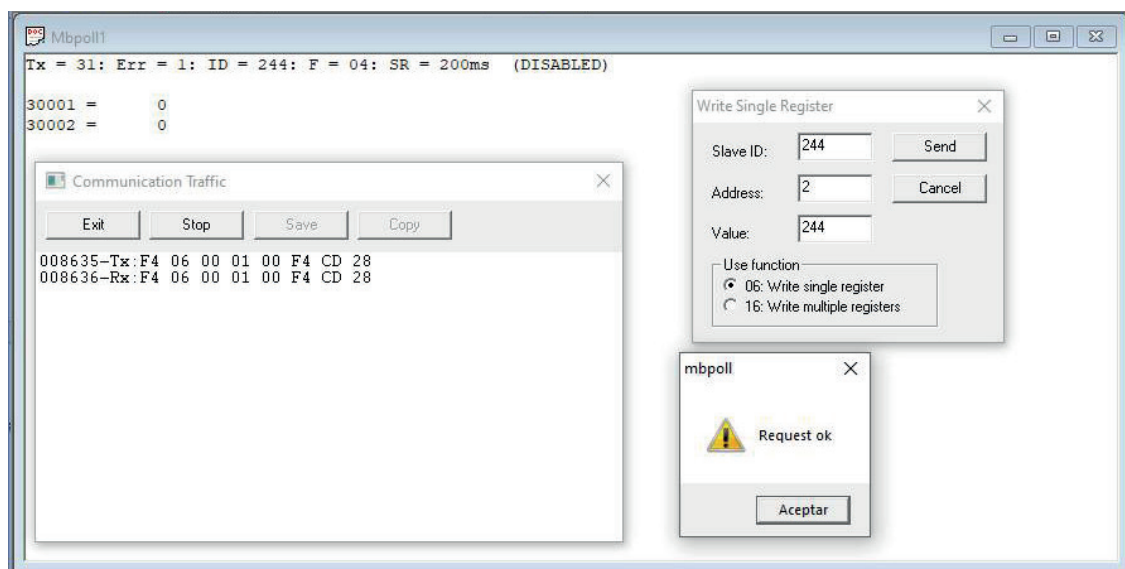
| | | | | | | | |
|----|----|----|----|----|----|----|----|
| F4 | 06 | 00 | 02 | 00 | 02 | BD | 6E |
|----|----|----|----|----|----|----|----|

Slave answer:

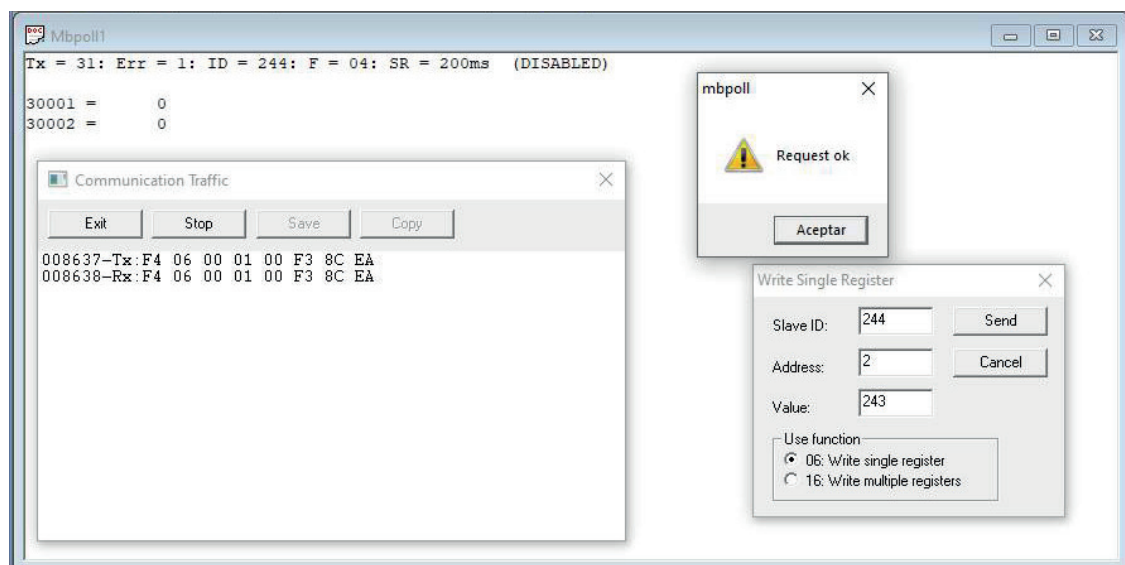
| | | | | | | | |
|----|----|----|----|----|----|----|----|
| F4 | 06 | 00 | 02 | 00 | 02 | BD | 6E |
|----|----|----|----|----|----|----|----|

NOTE: the slave address changes its value immediately after the answer message.

New direction write example (244=0xF4, the same one that it had):



New direction write example (243=0xF3):



TECHNICAL FEATURES

Electrical features

Anemo & WindVane

| | |
|-------------------------------|---|
| Power supply | 12...30 Vdc |
| Maximum current | <20 mA |
| Type of output | Analogue (4-20 mA, 2 wires) |
| Maximum connectable impedance | $R_L < \frac{V_{CC} - 8V}{0.02 A} \Omega$ |

SRR2-A

| | |
|-------------------------|------------------------|
| Power supply | 9...28 Vdc |
| Power consumption | <1 W (without sensors) |
| Analog inputs impedance | 150 Ω |

Measurements

Anemo

| | |
|----------------|---------------------------------------|
| Range | 3-180 km/h |
| Starting speed | 8 km/h |
| Survival speed | 200 km/h |
| Accuracy | 1km/h (3-15 km/h) 3% (15-180 km/h) |

Wind Vane

| | |
|----------------|----------|
| Range | 0-360° |
| Starting speed | 3 km/h |
| Survival speed | 200 km/h |
| Resolution | 22.5° |
| Accuracy | +/-3° |

General features

Anemo

| | |
|------------------------|---|
| Material | PA + FV |
| Bearings | Stainless steel X65Cr13 |
| Weight (without cable) | 135 g |
| Dimensions | 125x139 mm |
| Storage temperature | -35°C +80°C |
| Working temperature | -20°C +70°C |
| EMC | EN 61000-6-2:2001 EN 55022:2001, Class B |
| Protection | IP65 (UNE 20324:1993) |

SRR2-A

| | |
|---------------------|-------------|
| Dimensions | 94x94x81 mm |
| Weight | 200 g |
| Storage temperature | -35°C +70°C |
| Working temperature | -20°C +70°C |
| Protection | IP65 |

Non-condensing relative humidity in accordance with IEC 68-2-3 and IEC 68-2-27

Impact resistance in accordance with IEC 68-2-27

Vibrations in accordance with IEC 68-2-6

Wind vane

| | |
|----------------------------------|---|
| Material | PA+FV / Aluminium |
| Bearings | Stainless steel X65Cr13 |
| Weight (without cable) | 170 g |
| Dimensions | 129x190 mm |
| Storage temperature | -35°C +80°C |
| Operating temperature (ice free) | -20°C +60°C |
| EMC | EN 61000-6-2:2001 EN 55022:2001, Class B |
| Protection | IP65 (UNE 20324:1993) |

Communication

| | |
|-----------------------|---|
| Type of communication | 802.15.4 at 2.4GHz DigiMesh protocol |
| Transmit power | 6.3 mW (+8 dBm) |
| Receiver Sensitivity | -102 dBm |
| Range | Indoor/urban: 60 m max., 30 m typically Outdoor/direct line of sight: 750 m max, 200 m typically |



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