

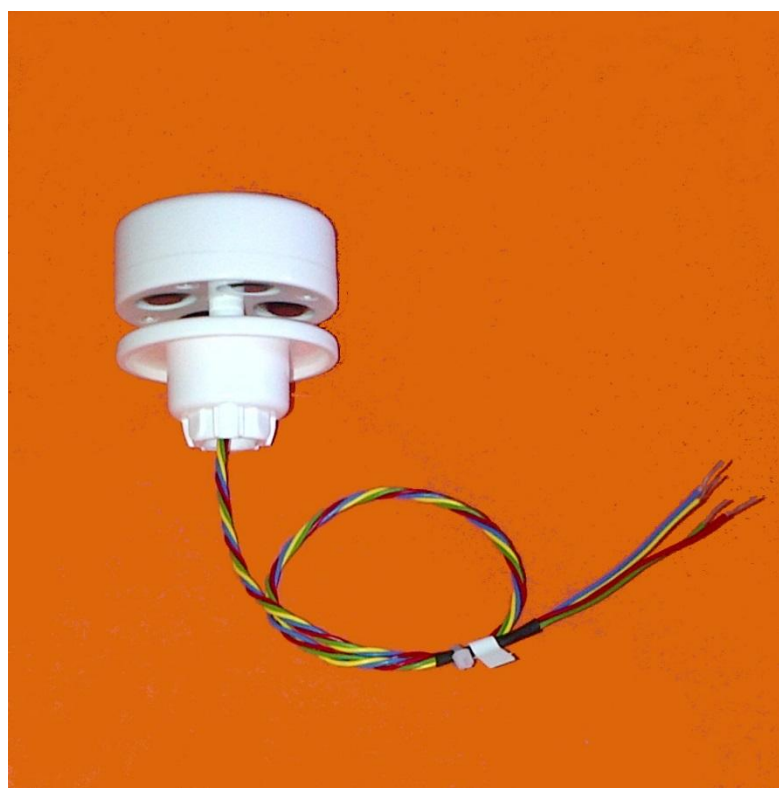
ULTRASONIC  
WIND SENSOR  

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LCJ CAPTEURS

# SONIC-ANEMO-MICRO Ultrasonic Wind Sensor

Operator manual



**SONIC-ANEMO-MICRO Technical Specifications:**

|                            |                                                                 |
|----------------------------|-----------------------------------------------------------------|
| Wind speed range           | 0.12-40 m/s (0.25 – 80 knots)                                   |
| Wind speed resolution      | 0.1 m/s (0.1 knots)                                             |
| Wind speed sensitivity     | 0.12 m/s (0.25 knots)                                           |
| Wind direction range       | 0-359 °                                                         |
| Wind direction resolution  | 1°                                                              |
| Wind direction sensitivity | +/- 1 °                                                         |
| Power requirement          | 3.0 V to 3.6 V DC                                               |
| Power consumption Avg      | < 480 µA                                                        |
| Dimensions / Sensor        | Cylinder Ø 64 mm - height 61 mm                                 |
| Boot up delay              | See Refresh rate table                                          |
| Boot up consumption        | < 90 µA                                                         |
| Cable                      | 1 m standard delivery                                           |
| Cable weight               | 20 gr/m                                                         |
| Weight / Sensor            | 100 gr                                                          |
| Operational temperature    | -15 °C (without icing) to +55°C                                 |
| Environment                | Sensor IP67 - The output of wires should be left at atmospheric |
| CE Mark                    | EN 55022 EN 55024                                               |

**Note:**

- ➔ The wind sensors are mounted on an arm of 16 mm diameter by 150 mm length for factory calibration. It is your responsibility to evaluate the changes in air flow out of these conditions.
- ➔ The sensor head is IP67. Special attention must be paid to the underside of the sensor to ensure continuous sealing. Care must be taken to ensure a pressure balance between the sensor head and atmospheric pressure.

**Power supply:** 3.00 to 3.6 VDC

 Power supply input not protected against reverse polarity.

Working consumption: 1.70 mA at 3.3 VDC

Sleep consumption: < 70  $\mu$ A

Working time for 1 measurement: 300 ms

**Connections:**

Blue Wire: 0V

Red Wire: VCC

Yellow Wire: Select

Refresh rate select input 0V or VCC

Internal 1 M $\Omega$  pull down resistor

 input not protected against negative voltage.

The sensor must be started with Select 0V

Green Wire: Data

Data inverted

Output voltage: 0.2V / VCC-0.2V

Internal 1 K $\Omega$  serial resistor

Data can be connected directly to Rx UART  $\mu$ Pross.

With transmitter interface, Data can be connected to RS232 port COM.

**Refresh rate:**

Yellow Wire to 0V: every ~ 1.6 s

Yellow Wire to VCC: every ~ 14 s

Yellow Wire to 0V: time (+/- 1 s) vs temperature

| Boot up delay | 3.0 V  | 3.3 V | 3.6V |
|---------------|--------|-------|------|
| -15 °C        | Note 1 | 35 s  | 37 s |
| -10 °C        | 40 s   | 40 s  | 40 s |
| +20 °C        | 49 s   | 45 s  | 43 s |
| +50°C         | 52 s   | 51 s  | 48 s |

Yellow Wire to VCC: time (+/- 1 s) vs temperature

| Boot up delay | 3.0 V  | 3.3 V  | 3.6V   |
|---------------|--------|--------|--------|
| -15 °C        | Note 2 | Note 2 | Note 2 |
| -10 °C        | Note 2 | Note 2 | Note 2 |
| +20 °C        | Note 2 | Note 2 | Note 2 |
| +50°C         | Note 2 | Note 2 | Note 2 |

| Refresh time | 3.0 V  | 3.3 V | 3.6V  |
|--------------|--------|-------|-------|
| -15 °C       | Note 3 | 1.2 s | 1.2 s |
| -10 °C       | 1.3 s  | 1.3 s | 1.2 s |
| +20 °C       | 1.6 s  | 1.5 s | 1.4 s |
| +50°C        | 1.8 s  | 1.7 s | 1.5 s |

| Refresh time | 3.0 V  | 3.3 V | 3.6V  |
|--------------|--------|-------|-------|
| -15 °C       | Note 3 | 10 s  | 9.5 s |
| -10 °C       | 11 s   | 10 s  | 9.5 s |
| +20 °C       | 12 s   | 12 s  | 12 s  |
| +50°C        | 15 s   | 14 s  | 13 s  |

Note 1:

No start

Note 2: e sensor must be started with Select 0V

Note 3:

To be confirmed

**Communication:**

Baud rate : 4800 bds

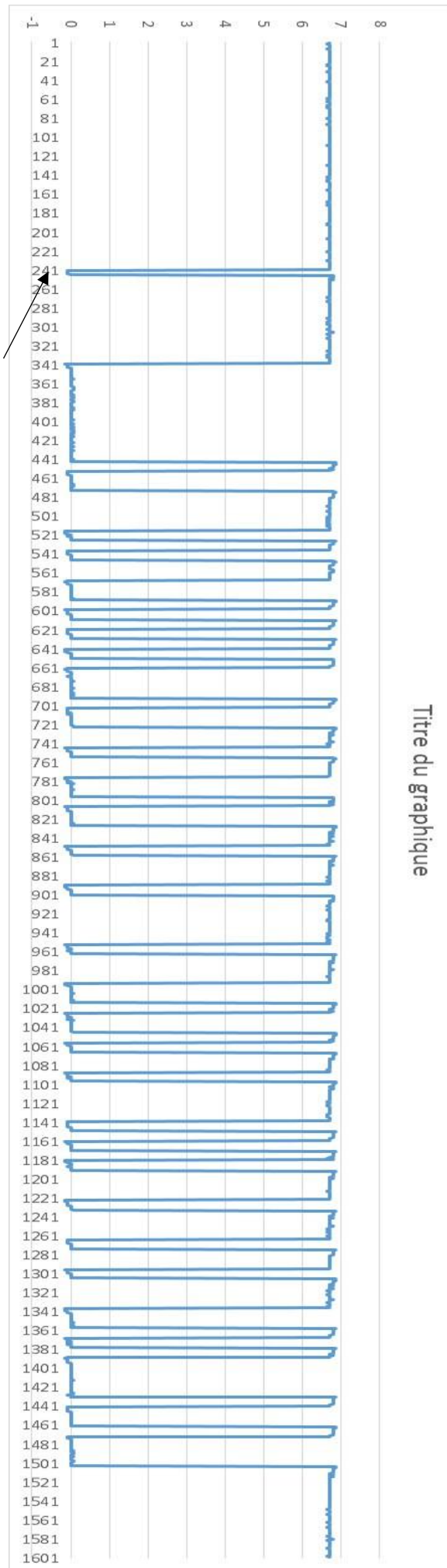
8 Bits

1 Bit stop

0 Bit parity

Note: Reverse bits:

Interrupt  
request



Titre du graphique

**Decoding SONIC-ANEMO-MICRO sentences**

Software:    pi64sanf12\_MICRO\_140215

Measurement values example

|            |         |
|------------|---------|
| Wind Angle | 216°    |
| Wind speed | 15,5Nds |

|         |      |
|---------|------|
| Temp    | 26°C |
| Voltage | 3,5V |

|           |    |
|-----------|----|
| Avg Meas. | 58 |
| Gap Meas. | 7  |

|          |           |           |           |           |            |           |             |            |            |            |             |
|----------|-----------|-----------|-----------|-----------|------------|-----------|-------------|------------|------------|------------|-------------|
|          | P1        | P2        | P3        | P4        | Car0       | Car1      | Car2        | Car3       | Car4       | Car5       | Car6        |
| Sentence | 0<br>\$00 | C<br>\$43 | V<br>\$56 | 7<br>\$37 | 54<br>\$36 | 4<br>\$04 | 108<br>\$6C | 66<br>\$42 | 17<br>\$11 | 98<br>\$62 | 111<br>\$6F |
|          | 000000000 | 010000011 | 010101010 | 00110101  | 001101010  | 00000100  | 01101100    | 01000010   | 0001000    | 01100010   | 011011111   |

|            |          |      |        |           |       |
|------------|----------|------|--------|-----------|-------|
| Angle1     | b6 to b0 | Car0 | 7 bits | 0110110   |       |
| Angle2     | b6 to b5 | Car1 | 2 bits | 00        |       |
| AngleTotal |          |      | 9 bits | 011011000 | 216 ° |

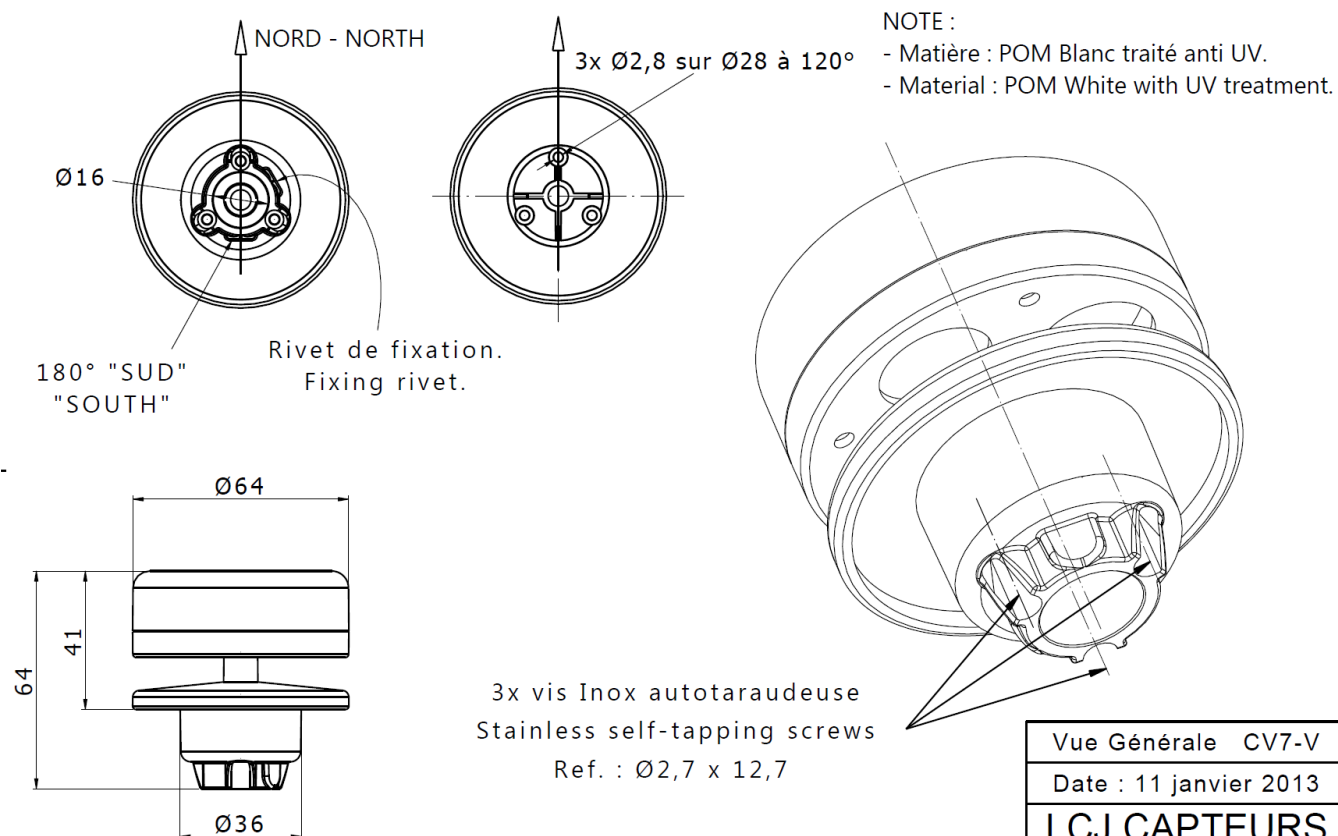
|            |          |      |         |            |             |
|------------|----------|------|---------|------------|-------------|
| Speed1     | b4 to b0 | Car1 | 5 bits  | 00100      |             |
| Speed2     | b6 to b2 | Car2 | 5 bits  | 11011      |             |
| SpeedTotal |          |      | 10 bits | 0010011011 | 155 1/10Kts |

|      |          |      |        |          |                       |
|------|----------|------|--------|----------|-----------------------|
| Alm1 | b1       | Car2 | 1 bit  | 0        | 1 = measurement alarm |
| Alm2 | b0       | Car2 | 1 bit  | 0        | 1 = over range alarm  |
| S/N  | b7 to b0 | Car5 | 8 bits | 01100010 | \$62      98          |

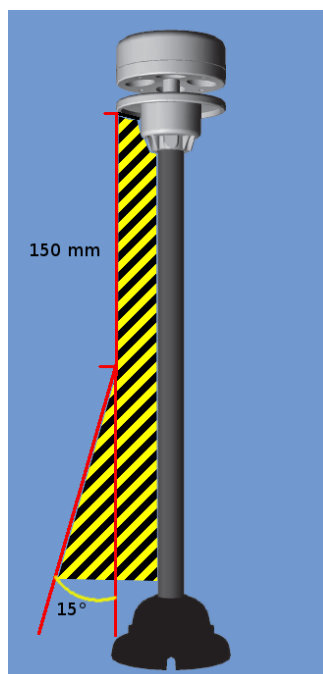
|     |          |      |        |          |                                  |
|-----|----------|------|--------|----------|----------------------------------|
| Par | b7 to b0 | Car6 | 8 bits | 01101111 | \$111 CheckSum, XOR Car0 to Car5 |
|-----|----------|------|--------|----------|----------------------------------|

|         |          |      |        |         |                                     |                                        |
|---------|----------|------|--------|---------|-------------------------------------|----------------------------------------|
| Message | b7       | Car4 | 1 bit  | 0       | 0 = temper. and voltage message     | 1 1 = measurement informations         |
| Temp    | b6 to b0 | Car3 | 7 bits | 1000010 | \$42      66 -40                    | average measurement    1011000    \$58 |
| Voltage | b4 to b0 | Car4 | 5 bits | 10001   | \$11      17 X 0,125V + 1,5V = 3,6V | gap measurement      00111      \$07   |

## Dimensions



Shaded area:  
keep clear of any obstacles



## **Warranty**

Your SONIC-ANEMO-MICRO is warranted against manufacturing defects in materials and workmanship for a period of 2 years from the date of purchase.

LCJ Capteurs will repair or replace, at its discretion, faulty product free of charge excluding shipping costs. Proof of purchase shall be required for a warranty claim. All claims shall be made in writing to LCJ Capteurs and once accepted, the faulty product must be sent to LCJ Capteurs address in Vertou, France.

*For further information, please visit [www.lcjcaptours.com](http://www.lcjcaptours.com) where video presentations are available.*



EN 55022 EN 55024



*Remember to respect the local regulations: dispose non-working electronic equipment to an appropriate waste disposal center.*



## ADDITIONAL INFORMATION

Here are the answers to questions asked by one user. These answers may be useful to everyone.

| QUESTIONS                                                                                                                                                                                                                                                                                                                                     | MORE INFORMATION                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What more is implied if Alm2 is set ?                                                                                                                                                                                                                                                                                                         | There may be wind speeds and directions, but they are not correct.                                                                                                                                                                              |
| Is it only warning of over 40m/s?                                                                                                                                                                                                                                                                                                             | For Alm2, yes                                                                                                                                                                                                                                   |
| How reliable is the wind speed value when Alm2 is set?                                                                                                                                                                                                                                                                                        | Non-compliant values                                                                                                                                                                                                                            |
| Can the accuracy of the value of it be evaluated in some way ?                                                                                                                                                                                                                                                                                | No                                                                                                                                                                                                                                              |
| On what condition is Alm1 set (not described anywhere)?                                                                                                                                                                                                                                                                                       | An ultrasound measurement problem has been detected. This could be a temperature problem, an object obstructing the measurement window, or the supply voltage too low or too high. Water drops on the transducers, a faulty transducer.         |
| What more might be implied/needs consideration when Alm1 is set.                                                                                                                                                                                                                                                                              | Wind speed and direction measurements have a high probability of being wrong.                                                                                                                                                                   |
| S/N seems to be random, I am getting both high and low numbers on different units, but always consistent from each unit.                                                                                                                                                                                                                      | This is a production number in a batch. We use it during the testing process.                                                                                                                                                                   |
| Average measurement, average of what is this value (direction/speed..) and for what period?                                                                                                                                                                                                                                                   | This is for the production testing process only                                                                                                                                                                                                 |
| Gap measurement, gap of what is this value and for what period ?                                                                                                                                                                                                                                                                              | This is for the production testing process only                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                               | For these last two points+Temp+Voltage, if there is any doubt about the operation of a sensor, transmitting these values can help us to disgnosticate it.                                                                                       |
| How can Temp value be used ?<br>In the example it shows 26°C.<br><br>I have not seen temp value to be usable for actual environment temperature.<br><br>Can it be explained in what way this temp value relates to the atmosphere temp ?<br><br>Is there any limits on this value where possibly the wind info accuracy could be questioned ? | Temperature is a measurement made in the sensor. It is not a temperature under shelter. If there's sunshine and no wind, the temperature will rise!<br>It's also data for the production process.<br>There's not much you can do to exploit it. |
| Voltage value, how can it be used ?<br>Does it in any way give indication of accuracy of the data provided (or will Alm1 be set in case of problem)?                                                                                                                                                                                          | Yes, it's an important value. The Alm1 will not trip because of an incorrect voltage. Alm1 will trip due to measurement problems caused by incorrect supply voltage.                                                                            |