

ULTRASONIC
WIND SENSOR

LCJ CAPTEURS

USERS MANUAL

CV7

CV7 Standard

CV7-V

CV7-C

CV7SF



LCJ CAPTEURS
29 Allée des Cinq Continents
ZA le Chêne Ferré
44120 VERTOOU – France
Tél : 33(0)2 40 05 08 55
Email : info@lcjcapteurs.com
www.lcjcapteurs.com
SIRET : 42493307500022 / RCS Nantes
VAT : FR17424933075



EN 55022 EN55024

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1 GENERAL INFORMATION AND SAFETY GUIDELINE

1.1 GENERAL RECOMMENDATIONS

The LCJ Capteurs sensors are Ultrasonic wind vanes/anemometers with accurate factory calibration.

Install the sensor in a location free from wind perturbation, usually on the mast head.

Prepare the mast head for the mechanical installation. Align the North mark of the bracket in order to have the CV7 sensor heading to the bow.

The sensor's fine alignment will be obtained with the calibration functions of your instrumentation. Should it be needed LCJ Capteurs can provide a software calibration application upon request.

When necessary, install the interface junction boxes in a protected and dry location.

Run the cable down to the display's interface, avoiding locations where other cables or equipment may produce electromagnetic interferences (pilot's ram, radio...) and cut it to the right length. The cable's length can be adjusted as required providing junctions are made in the state of the art.

Turn the power supply off before processing to any wiring work. You can turn power on again only once all installation and wiring is completed.

We recommend lightly tinning the wires before connecting them to the screw terminals.

Use only genuine accessories supplied by LCJ Capteurs. Do not attempt any modification to the unit.

Never paint any part of the unit or alter its surface in any way.

Warranty is void in case of non-following the instructions of use, repair or maintenance without written authorisation.

1.2 MAINTENANCE AND REPAIR

The CV7 sensors do not require any maintenance. Check the connections on a regular basis and make sure the junction boxes are dry and protected.

If the Wind pages of your instruments do not display the wind data correctly, refer to the manufacturer's manual and check the connections before asking for service to your LCJ Capteurs dealer.

1.3 DISPOSAL

Equipments marked with the recycling symbol should be processed via a recognized recycling agency. By agreement, they may be returned to the manufacturer. Do not mix electronic disposal with domestic or industrial refuse.



1.4 USE OF THIS MANUAL

This manual serves as a guideline for the safe and effective installation, operation and maintenance of the Ultrasonic Wind Sensors of the CV7 range from LCJ Capteurs. It is recommended to follow carefully the instructions contained herein.

Keep this manual in a safe place!

1.5 VALIDITY OF THIS MANUAL

All of the specifications, provisions and instructions contained in this manual apply solely to the following products:

Part	Description
CV7	CV7 standard Ultrasonic Wind Sensor
CV7-V	CV7 Ultrasonic Wind Sensor / Vertical
CV7-C	CV7 high speed Ultrasonic Wind Sensor/ long carbon vertical arm
CV7SF	CV7 / Wireless Ultrasonic Wind Sensor / NMEA0183 receiver
CV7SF USB	CV7 / Wireless Ultrasonic Wind Sensor / receiver for USB
WindyPlug	CV7 to NMEA2000 interface (inc. baro.)
Canbus-RM	CanBus interface for rotating mast (NMEA2000)
Option ST	Interface for Raymarine ST
Option BG	Interface for B&G
Option baro	Junction box with baro sensor
Option USB	Junction box with USB connector
Support Vertical	Bracket for installation on a vertical surface
Adapt 1"	1"standard adapter (VHF or GPS type)

1.6 LIMITED WARRANTY

The LCJ Capteurs are guaranteed against manufacturing defects for a period of two years from the date of purchase. It is limited to the repair and/or replacement of the product. It does not cover installation costs and shipping costs of faulty units. A proof of purchase may be asked when filling the warranty request which must be received by writing. Once the warranty request is accepted by LCJ Capteurs, the unit must be sent to LCJ Capteurs' address in France. LCJ Capteurs guarantees that each of their ultrasonic wind sensors are tested and calibrated before despatch. Operations not in compliance with the instructions described in the present manual may result to damage the unit or alter its performances. In such cases, the warranty is void.

1.7 RESPONSIBILITY

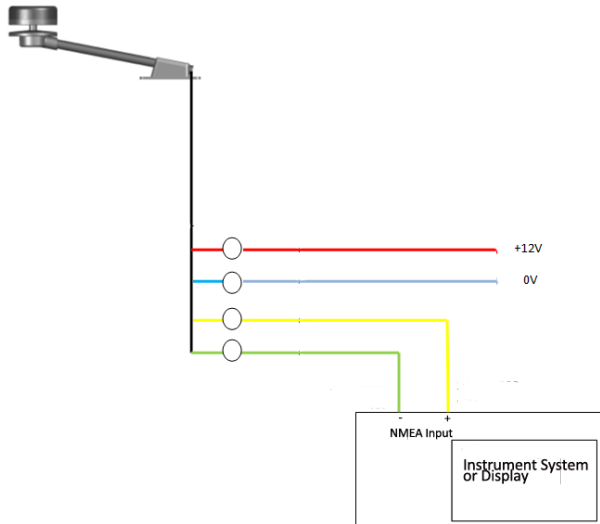
LCJ Capteurs do not accept responsibility for:

- Consequential damage to the use of a CV7 sensor
- Possible errors in the manuals and their results

2 INSTALLATION OF A CV7 WIND SENSOR

2.1 TYPICAL INSTALLATION OVERVIEW

This diagram features a CV7 Standard. The typical installation is the same for CV7-V and CV7-C



2.2 SENSOR ALIGNEMENT

The CV7 sensor must be installed with the “Nord” mark on the bracket aligned to the geographical North for a fix installation on shore and to the bow on a vessel.

Fine alignment can be performed with the application “configuration CV7” available upon request.

2.3 CONNECTIONS

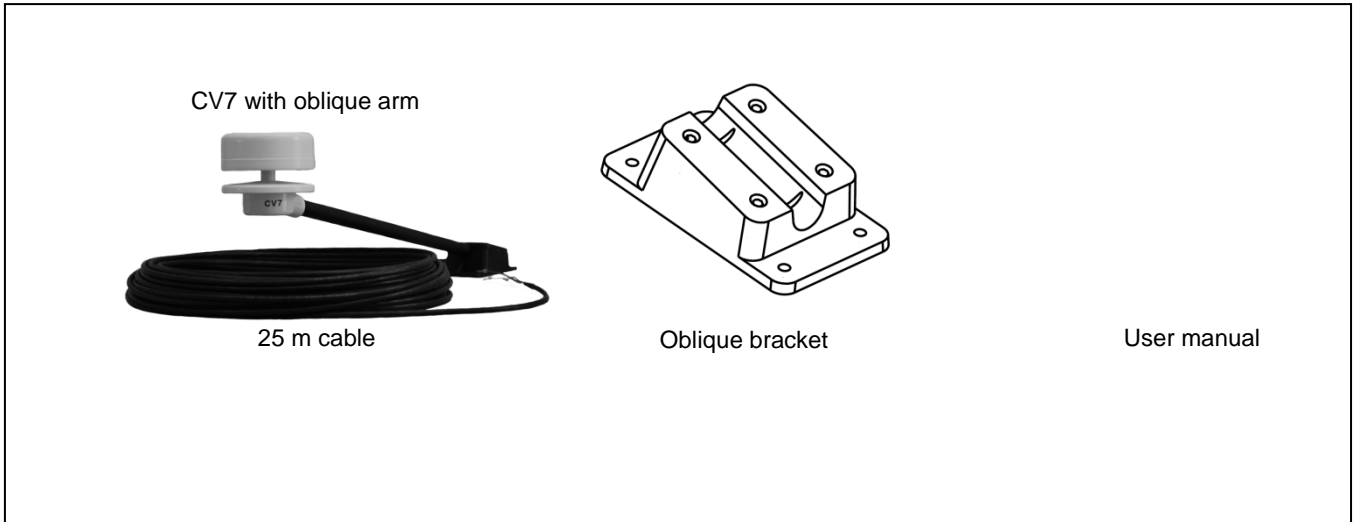
Red wire	+ Power
Blue wire	- Power
Yellow wire	NMEA TX +
Green wire	NMEA RX -

Connect to 12 V power supply (8 - 33 VDC).

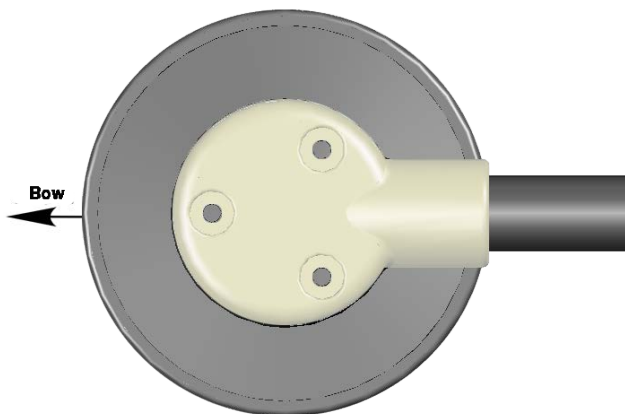
Connect the yellow and green wires to the NMEA input of the instrument.

3 CV7 Standard

3.1 CONTENT OF DELIVERY



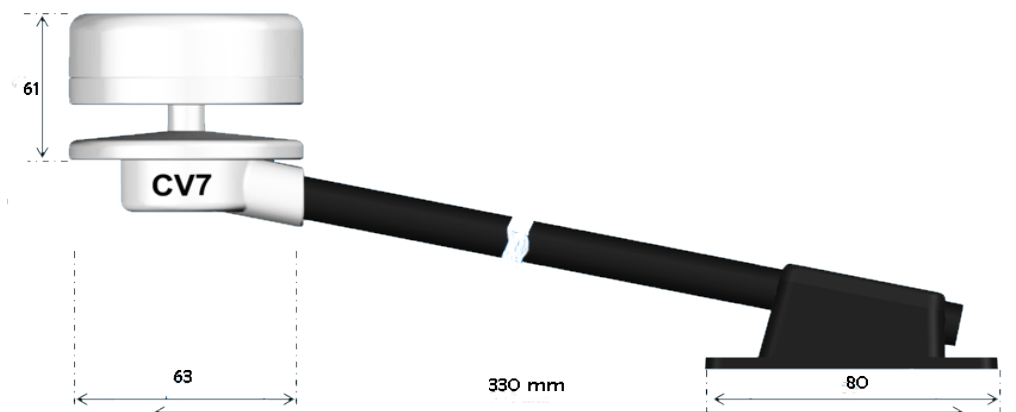
3.2 SENSOR ALIGNMENT



CV7 sensor view from below

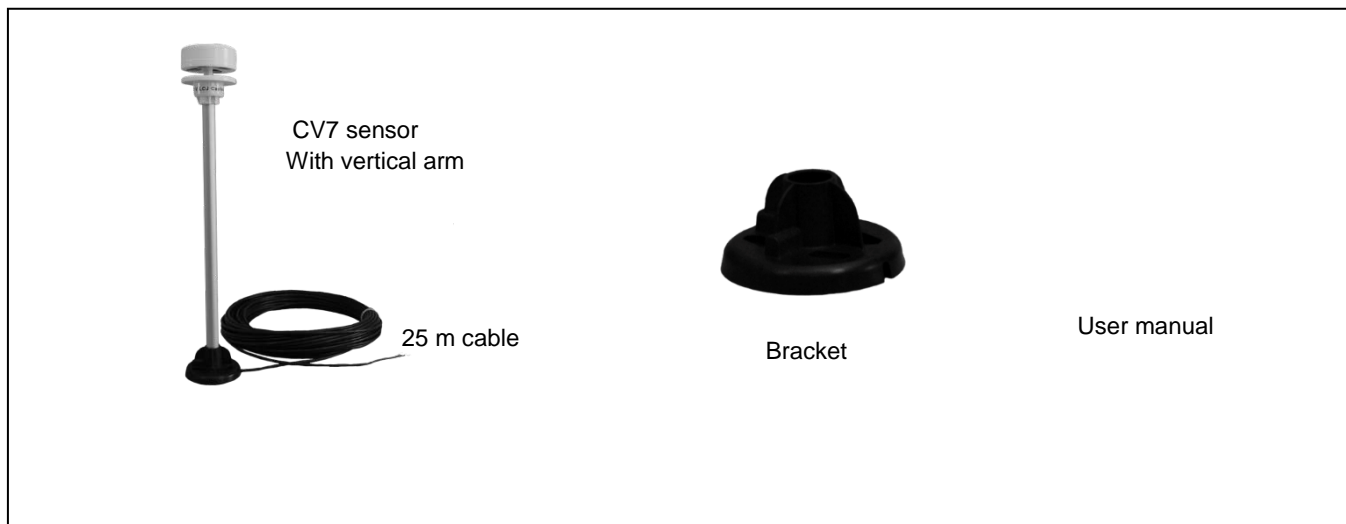
The oblique bracket is meant to be mounted on a horizontal surface. It is usually fixed on the mast head of a sailing boat. The arm points to the bow.

3.3 DIMENSIONS



4 CV7-V

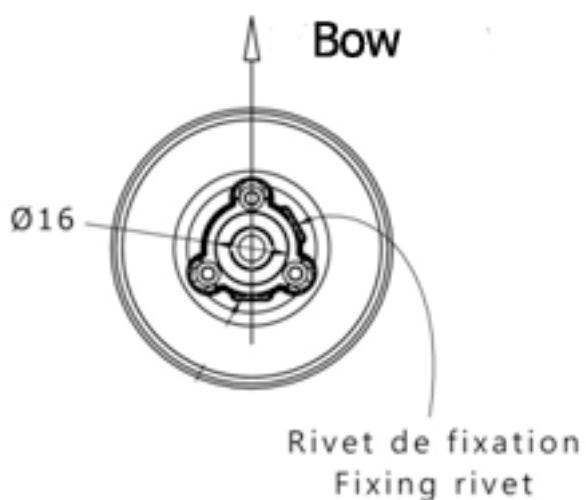
4.1 CONTENT OF DELIVERY



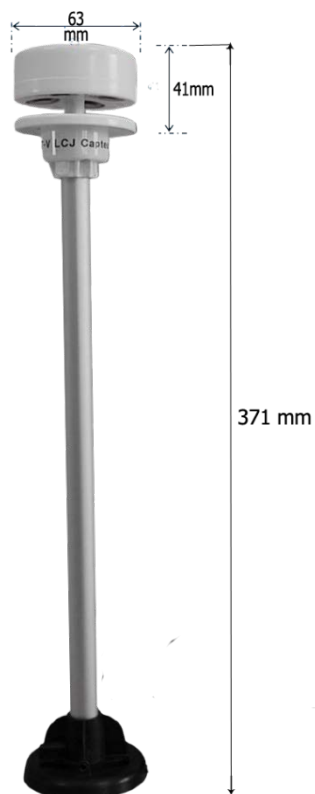
4.2 SENSOR ALIGNMENT

A mark below the sensor indicates the alignment. The vertical bracket is designed for mounting on a horizontal surface, usually the mast head on a sailing boat. For mounting on the side of the mast, an additional bracket is available separately (see section 13.2).

The CV7-V sensor must be installed with the "Nord" mark on the bracket aligned to the geographical North for a fix installation on shore.

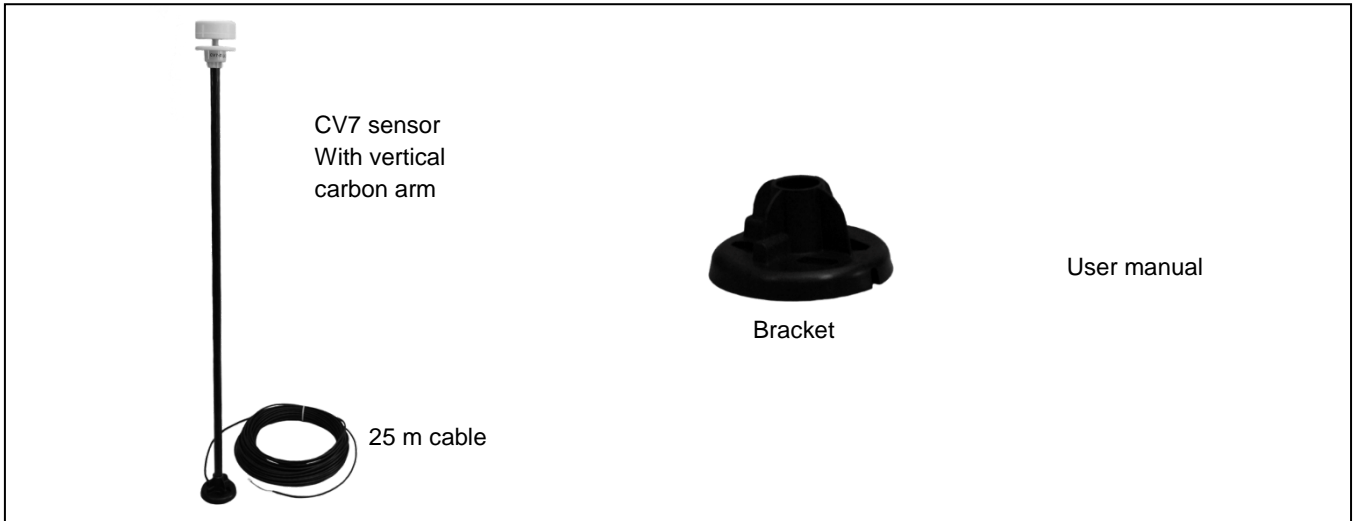


4.3 DIMENSIONS



5 CV7-C

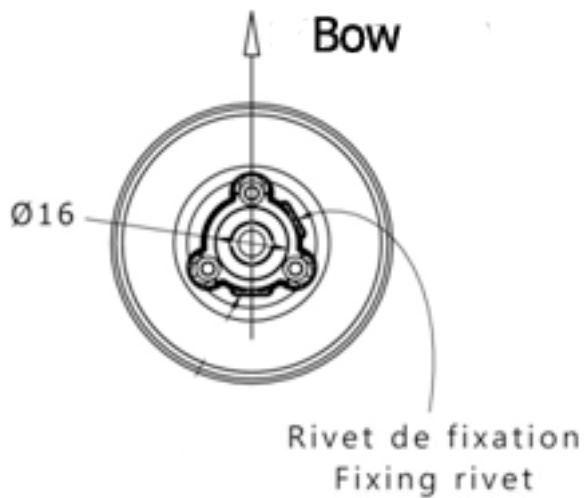
5.1 CONTENT OF DELIVERY



5.2 SENSOR ALIGNEMENT

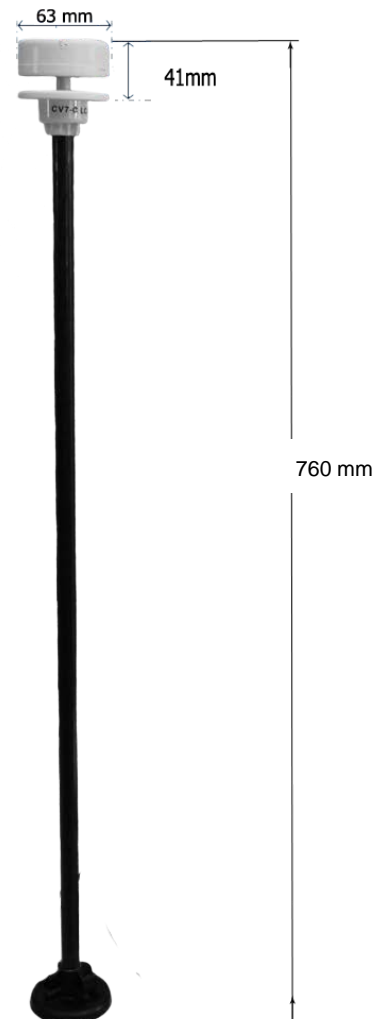
A mark below the sensor indicates the alignment. The vertical bracket is designed for mounting on a horizontal surface, usually the mast head on a sailing boat. For mounting on the side of the mast, an additional bracket is available separately (see section 13.2).

The CV7-C sensor must be installed with the "Nord" mark on the bracket aligned to the geographical North for a fix installation on shore.



5.3 DIMENSIONS

Weight: 200 gr (sensor + arm + bracket)



6 WindyPlug: connecting a CV7 to a NMEA2000 network

6.1 TYPICAL INSTALLATION OVERVIEW



The WindyPlug option is compatible with all CV7 sensors.

6.2 RECOMMENDATIONS

The WindyPlug must be located in a protected area and subject to atmospheric pressure.

Do not attempt any modification to the unit.

Never paint any part of the unit or alter its surface in any way.

Warranty is void in case of non-following the instructions of use, repair or maintenance without written authorisation.

6.3 INSTALLATION

WindyPlug allows connecting a CV7 to NMEA2000 system. It features also an atmospheric pressure and ambient temperature sensor.

Its MICRO C male plug connects directly to the NMEA 2000 backbone.

You may need to add a T connector (not supplied).

6.4 CONNECTIONS

The CV7 comes with a 25 metres cable featuring crimp terminals. If the cable is cut to shorten the length, it is strongly recommended to use new terminals for a proper connection. The CV7 must be connected to the WindyPlug prior to plugging the device to the NMEA2000 backbone.

Open the protective cap and slide the 4 wires through it one after another, and then, the cable's cover.



Insert the wires terminals in the connectors, colour for colour. Just push them, they will be trapped in place.

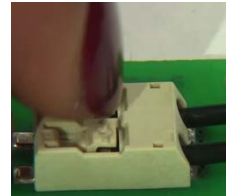
Blue	0V - power supply
Red	12V + power supply
Green	NMEA -
Yellow	NMEA +

Push the protective cap back in place. The hole in the cap must be aligned to the Led indicator.



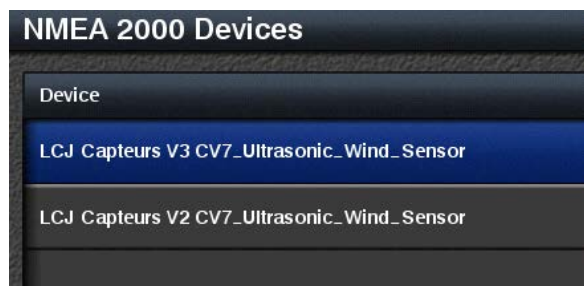
Once the CV7 connection is completed you can plug the WindyPlug to the NMEA2000 backbone.

If it happens that you need to disconnect the CV7 wires, simply press on the push-button for easy release.



6.5 DATA SOURCES

Select the data sources on a multifunction display of your NMEA2000 system. You will be given the choice between V2 and V3 depending of your NMEA2000 system's version.



6.6 TECHNICAL SPECIFICATIONS

L 81 mm X Ø 17.5 mm

Weight: 35 g

Connector: MICRO C male NMEA2000

Protection: IP66 (WindyPlug connected)

Power supply: via NMEA2000 network. 8V / 28VDC

Consumption: 1 LEN / < 40mA with sensor.

Operation indicator: 1 flashing LED

Pressure sensor: Hydrophobic membrane

Pressure's measure range: 850 hPa / 1150 hPa

Resolution*: 1 hPa with NMEA2000 Version 2 systems

0.1 hPa with NMEA2000 Version 3 systems

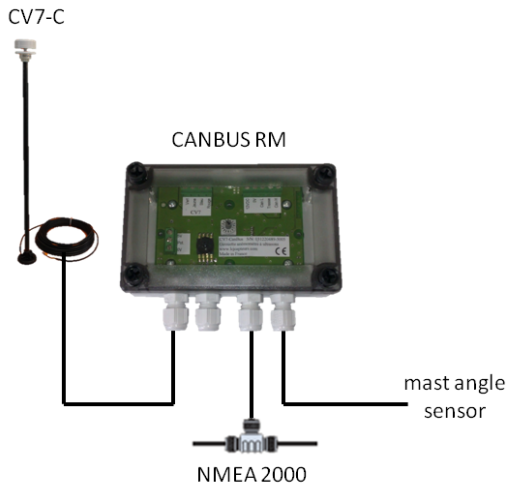
Relative accuracy*: +/- 0.5 hPa @ 20°C

Absolute accuracy*: +/- 1.5 hPa @ 20°C

*1 hPa = 1 mBar = 0.003 inHg / 0 °C = 32 °F

7 OPTION CANBUS-RM

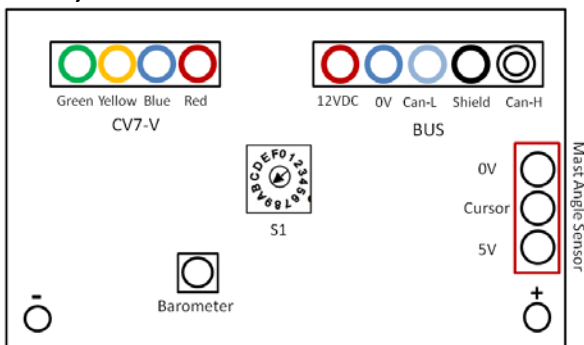
7.1 TYPICAL INSTALLATION OVERVIEW



The CanBus-RM option is compatible with all CV7 sensors. Connectors and mast angle sensor are not supplied.

7.2 CONNECTIONS

Open the junction box to access the connectors



The CanBus-RM junction box features connection terminals for the mast angle sensor (potentiometer), the CV7 and the NMEA2000 network.

7.3 INTERFACE

TX PGNs: 59392, 60928, 126464, 126996, 130306, 130311, 130314

RX PGNs: 59392, 59904; 60928

Consumption: 2 LEN

7.4 COMMISSIONING

Refer to the connected instruments' manual for pages setup and all functions related to wind and atmospheric pressure functions. Once all wiring and connections are completed, turn the power on and check the alignment. It may be adjusted from your instrument's setup menu. Alternatively, this can be done directly from the CanBus.

7.5 CALIBRATING THE MAST ANGLE SENSOR: MID-SHIP AND MAST ANGLE ENDS

Use the «- » and «+» keys to change a value that is previously selected with the switch button "S1".

In positions 3 to 6, the values read on the wind displays are the mast angles measures, used for calibration of the mast angle sensor.

The calibration process is done in the following order:

Position 7: + "S1", reset to factory settings

Position 6: identification of the potentiometer's polarity (port-starboard values)

Position 5: mid-ship. Place mast in mid-ship position and set the angle to 0°

Position 4: port-end. Place the mast in port-end position and set the angle to the relevant value (theoretical or measured)

Position 3: starboard-end. Place the mast in starboard-end position and set the angle to the relevant value (theoretical or measured)

7.6 WIND SENSOR ALIGNEMENT

Fine alignment of the mast sensor can be achieved at sea. Sail on starboard and port to note the correction that needs to be applied from a tack to another.

Place the rotary button (S1) in position 1 and use the "+" and "-" keys to change the value read on the display.

Adjust the value accordingly to the difference measured from a tack to another during sea trials.

The wind angle will correctly read on the display.

7.7 CALIBRATION OF THE BAROMETER

The atmospheric pressure sensor is calibrated against the nearest reference located on the shore level, such as a weather station.

The rotary button (S1) placed on position 2 allows calibrating the atmospheric pressure. Once the button is in position 2, the value on the display can be adjusted using the "+" and "-" keys to match the reference. Make sure your display is set to "mb" unit.

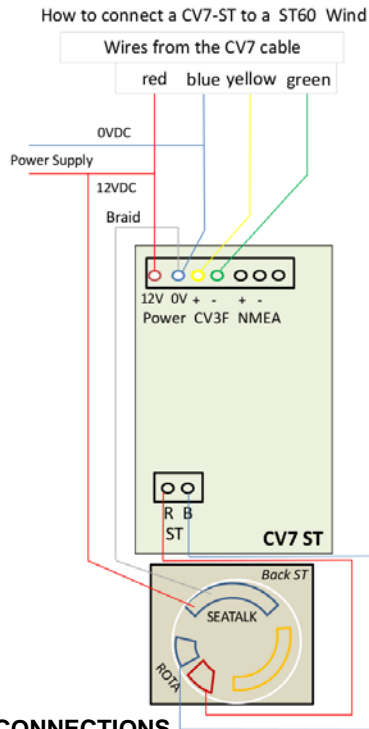
These values are automatically stored in the device's memory. They can be fine adjusted after sea trials.

7.8 DIMENSIONS OF THE CANBUS JUNCTION BOX

130x80x30 mm / 150gr

8 ST OPTION (V3)

8.1 TYPICAL INSTALLATION OVERVIEW



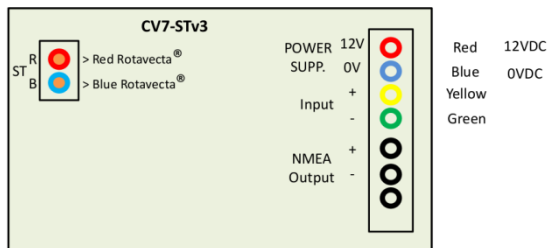
8.2 CONNECTIONS

This option allows the connection of a CV7 directly to the ROTAVECTA® input on your Raymarine instrument (ST40 Wind or ST60 Wind).

Power the junction box and the CV7 sensor as indicated below.

Connect the data wires (yellow and green) colour for colour. The power supply is connected to Red for + 12V and Blue for - 0V.

Open the box to access the terminals:



8.3 COMMISSIONING

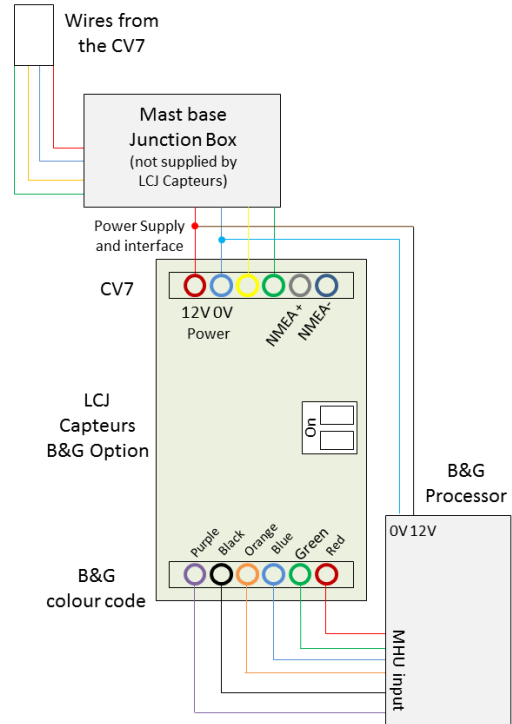
Once all connections are completed, refer to the Raymarine manual for the sensor's alignment.

8.4 DIMENSIONS

Dimensions : 131 x 58 x 37 mm

9 BG OPTION (V2)

9.1 TYPICAL INSTALLATION OVERVIEW



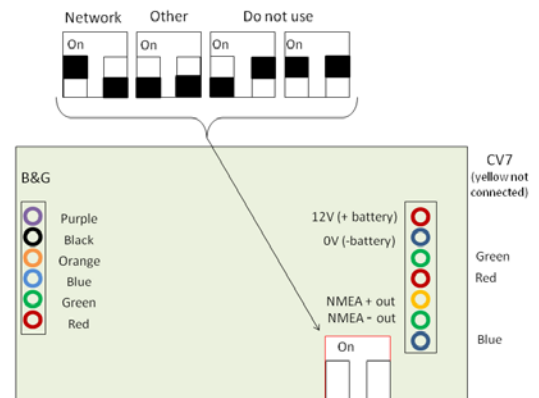
9.2 CONNECTIONS

This option allows the connection of a CV7 directly to the MHU input on your B&G.

Power the junction box and the CV7 sensor as indicated below.

Connect the data wires (yellow and green) colour for colour. The power supply is connected to Red for + 12V and Blue for - 0V.

Open the box to access the terminals:



9.3 COMMISSIONING

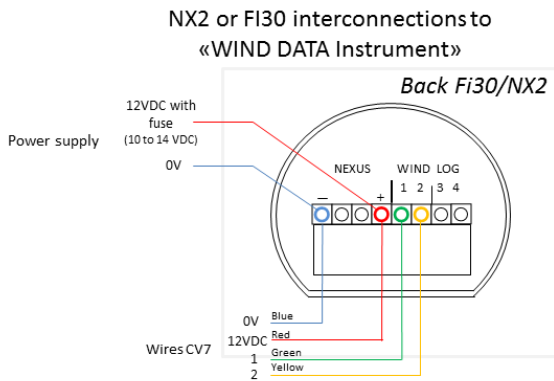
Once all connections are completed, refer to the B&G manual for the sensor's alignment.

9.4 DIMENSIONS

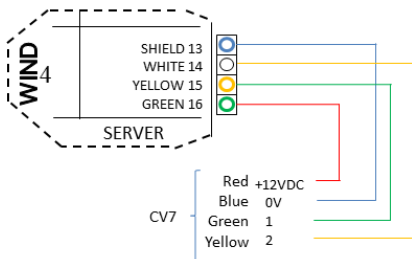
Dimensions : 131 x 58 x 37 mm

10 SIL OPTION (NEXUS NX2, SILVA and FI30)

CV7-Sil is a standard CV7 with a specific configuration
Simply connect your CV7 to the serial port of a PC and
use our configuration software.



Interconnections NX2 or FI30
«SERVER»

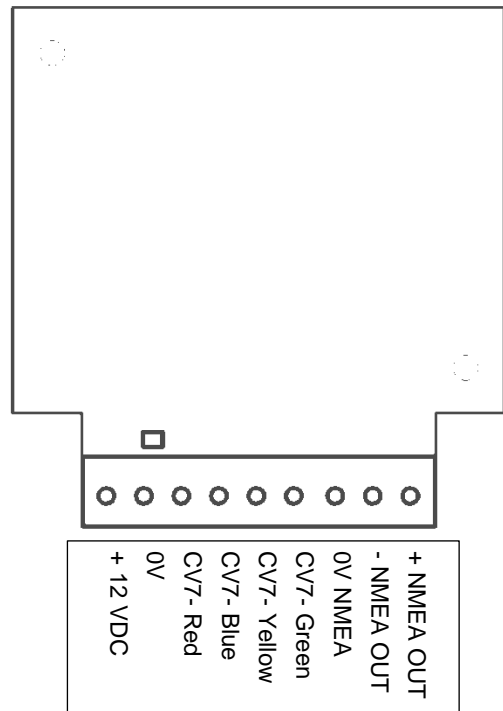


10.1 DIMENSIONS

Dimensions : 131 x 58 x 37 mm

11 BARO OPTION

The BARO OPTION is a junction box that adds the
atmospheric pressure to the NMEA0183 CV7 data.
Connect as follow:



11.1 DIMENSIONS

Dimensions : 68 x 58 x 22 mm

12 USB OPTION

12.1 CONNECTIONS

The junction box features a screw terminal and a standard USB cable. Open the box to complete the connections.

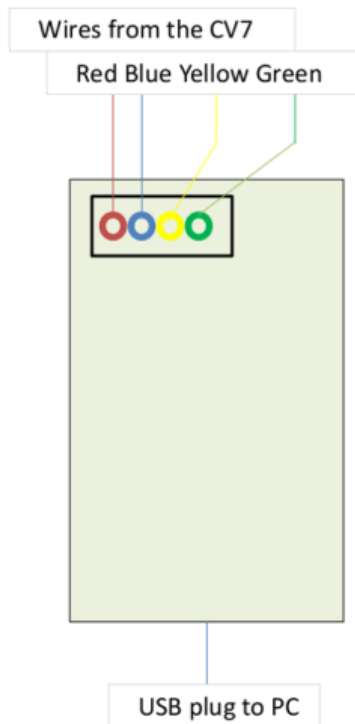
The USB junction box is powered by the USB connection to the PC.

Connect the wire coming from the CV7 as indicated on the diagram above.

Plug the USB cable to the PC. The driver will automatically be installed by the Windows® system (Windows 7® and above). Alternatively, the latest version of the driver can be downloaded from the technical support section of the website (www.lcjcaptours.com). It is an executable file.

Double-click on the file to launch the installation.

Once the CV7 is connected to the USB port, your relevant software will immediately identify the NMEA0183® sentences via an emulated COM port.



12.2 SPECIFICATIONS

Dimensions: 57 x 43 x 24 mm

Weight: 20 g (without cable and connector)

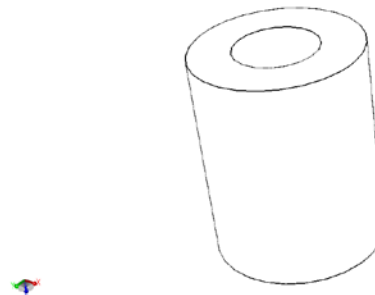
Cable length: 1.50 m

Standard USB type A connector

Screw terminal

13 MOUNT ADAPTERS

13.1 1" ADAPTOR



This optional accessory allows mounting a CV7 sensor on any standard antenna mounting bracket.

External diameter: 40 mm

Height: 50 mm

13.2 MOUNT ON VERTICAL SURFACE

CV7-V base is compatible with standard brackets available on the market, such as the GLOMEX featured on the picture below.



14 SPECIFICATIONS

	CV7	CV7-V	CV7-C	CV7SF
Output data signal	NMEA [®] or NEXUS [®]	NMEA [®] or NEXUS [®]	NMEA [®] or NEXUS [®]	NMEA [®]
Output update	2 per second	2 per second	4 per second	1 per sec. In day- light ¹ every 3 seconds at sunrise and sunset,
Wind module sensitivity	0.25 Kt	0.25 Kt	0.25 Kt	0.25 Kt
Wind module resolution	0.1 Kt	0.1 Kt	0.1 Kt	0.1 Kt
Wind module dynamic	0.25 to 80 Kts	0.25 to 80 Kts	0.25 to 80 Kts	0.25 to 80 Kts
Direction sensitivity	+/- 1°	+/- 1°	+/- 1°	+/- 1°
Direction resolution	1°	1°	1°	1°
Power supply	8 to 33 VDC	8 to 33 VDC	8 to 33 VDC	photovoltaic cells for transmitter 6.5 to 27 VDC for receiver
Electrical consumption	9.5 mA	9.5 mA	9.5 mA	autonomous for transmitter 5.8 mA for receiver
Operating temperature range without iceing	-15°C/55°C	-15°C/55°C	-15°C/55°C	-10°C/55°C
Connection line	25 m of cable 4 x 0,22 mm ²	25 m of cable 4 x 0,22 mm ²	25 m of cable 4 x 0,22 mm ²	Radio transmitter 433 MHz Tx power : 10 dbm Message time : 25 ms
Interconnection	Direct +12 V 0 V NMEA [®] + NMEA [®] -	Direct +12 V 0 V NMEA [®] + NMEA [®] -	Direct +12 V 0 V NMEA [®] + NMEA [®] -	Receiver Superheterodyne ASK 433 MHz Sensitivity: -110 dbm Outputs via screw terminal
Weight of the head	100 g	100 g	100 g	100 g
Arm	Oblique 30 cm arm Alu Ø 12 mm	Vertical 30 cm arm Alu Ø 16 mm	Vertical 75 cm carbon arm Ø 16 mm	Vertical 30 cm arm Alu Ø 16 mm
Mounting base	Bracket	Bracket	Bracket	Bracket
Total weight including arm and bracket	200 g	200 g	200 g	200 g

15 ADDENDUM

15.1 NMEA0183 INTERFACES

NMEA0183 :

Output on a 4mA current loop.

4800 Bauds, no parity, 1 stop Bit

Constant flow at 500 milliseconds

(except CV7-C, at 266 milliseconds)

Variable fields lengths, comma separator.

Sentence prefix: \$

End of sentence: CR,LF

Typical sentences output by CV7, CV7-V, CV7-C :

\$IIMWV,225.0,R,000.0,N,A*38

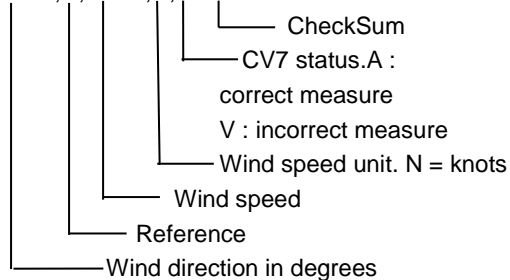
\$WIXDR,C,022.0,C,,*52

\$PLCJ,5801,5F01,AA,4253,3341

\$PLCJEA870,6D98,C500,0056,AC,

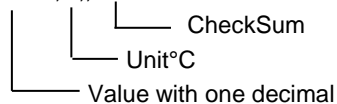
« Wind » sentence:

\$IIMWV,226.0,R,000.0,N,A*0B



« Wind temperature » sentence:

\$WIXDR,C,022.0,C,,*52



Sentences added by the Baro3 option:

\$IIVWR,014.0,R,02.40,N,01.23,M,004.44,K*7E

\$WIMDA,,I,1.0200,B,021.5,C

Sentences for LCJ CAPTEURS technical use only:

\$PLCJ,AAAA,BBBB,CC,,,DDDD,EEEE

\$PLCJEFFFF,GGGG,HHHH,IIII,JJ

15.2 NMEA2000 INTERFACES

NMEA 2000 manufacturer ID: 499

WindyPlug:

NMEA2000 V2 PGNs:

- TX: 59392; 60928; 126464; 126996; 130306; 130311

- RX: 59392, 59904; 60928; 130315

Product ID:

- LCJ Capteurs CV7_Ultrasonic_Wind_SensorV2

NMEA2000 V3 PGNs:

- TX: 59904; 60928; 126464; 126996; 130306; 130312; 130314

- RX: 59392; 59904; 60928; 130315

Product ID:

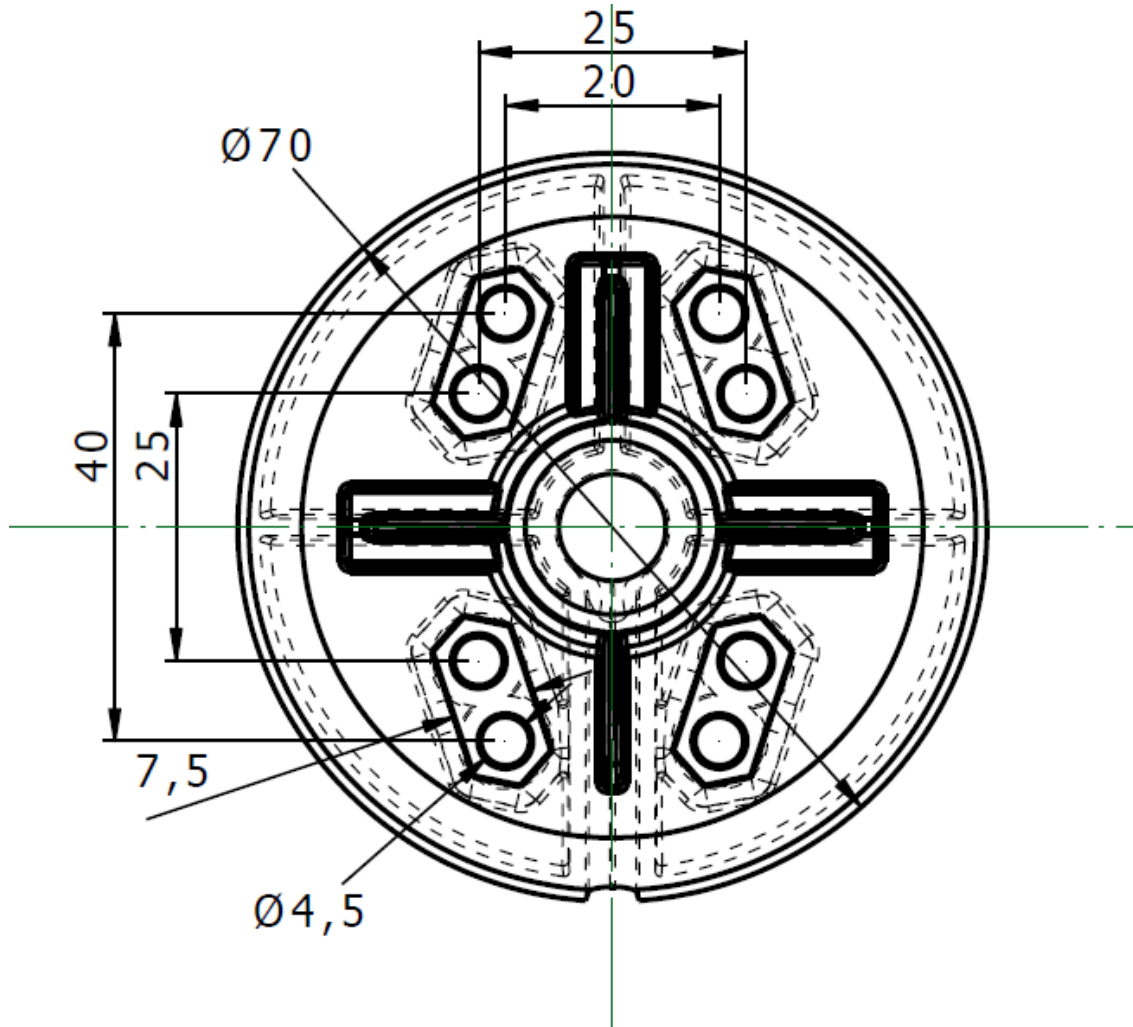
- LCJ Capteurs CV7_Ultrasonic_Wind_SensorV3

Logging two minutes of NMEA sentences flow allows making a proper diagnostic.

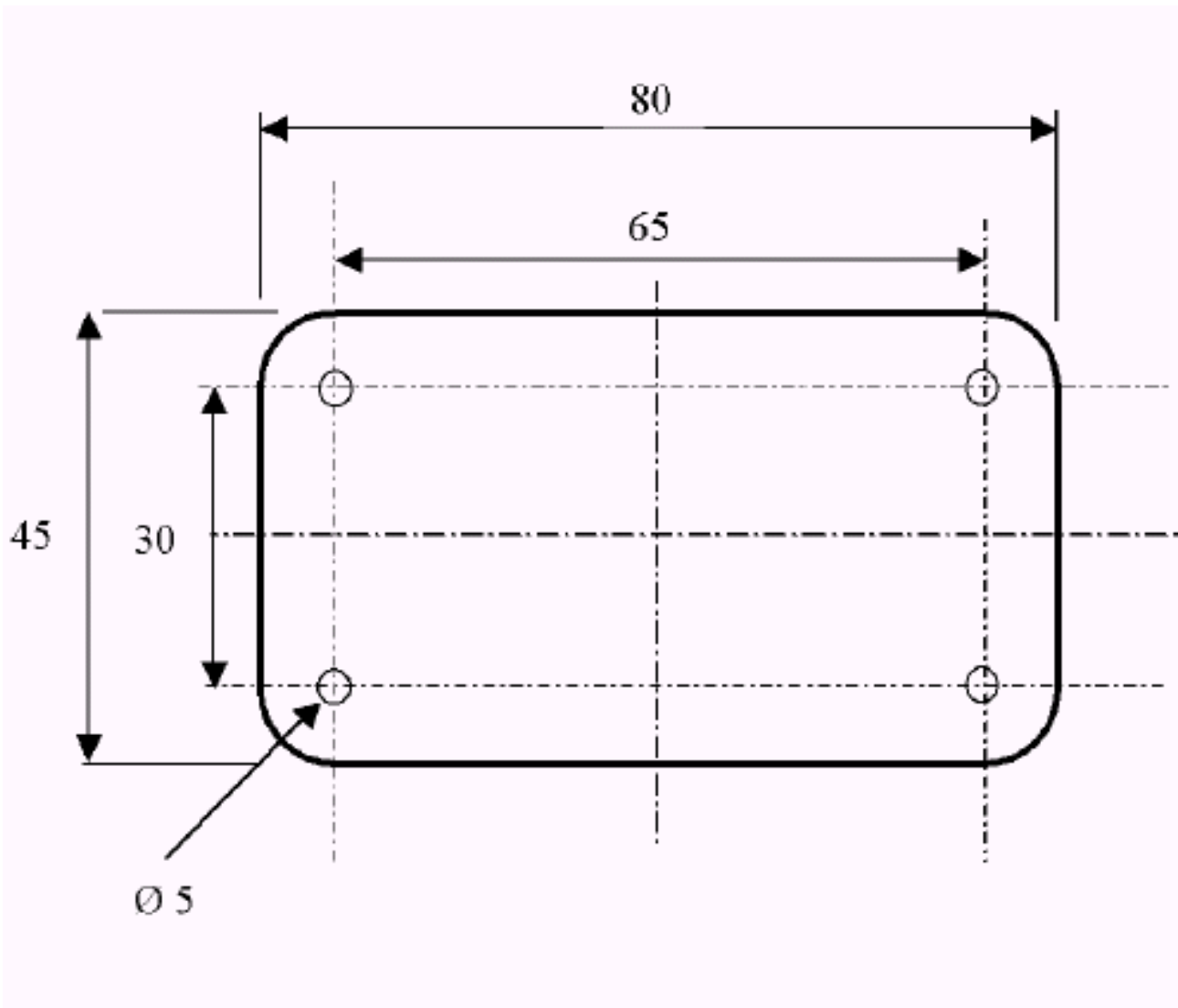
15.3 MOUNTING TEMPLATE

WARNING! Check the scale when printing this document. Measure indications are in millimetres.

Vertical bracket:

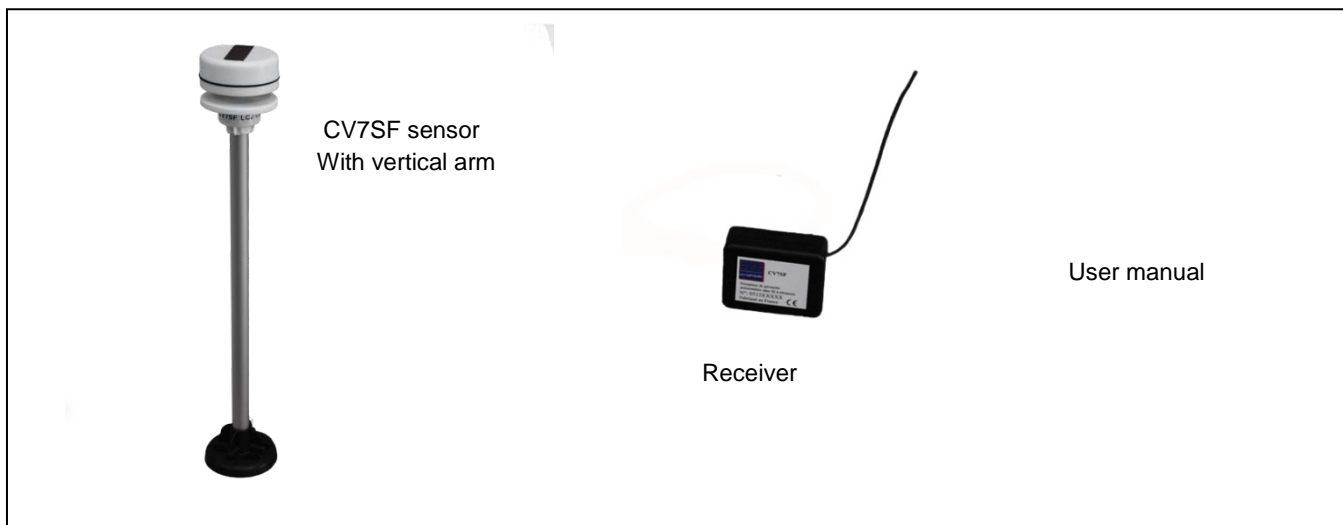


Oblique bracket:



16 CV7SF

16.1 CONTENT OF DELIVERY



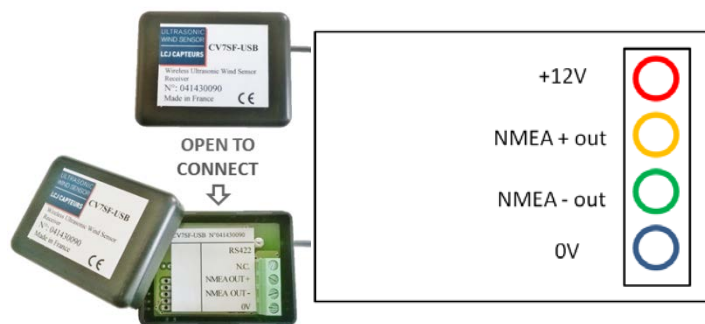
16.2 INSTALLATION

The CV7SF wind sensor is designed for operation outdoor, exposed to natural light. It must be installed in an area free from any air flow perturbation. Choose a location free from any obstacle and situated at least 150 cm from the ground. The radio signal maximum range is 200 meters. Best results are obtained in a 50 meters distance between the sensor and its receiver. The signal can be perturbed by materials such as carbon, aluminium, steel...

A minimum distance of 10 meters between the arm and any conductive material is recommended. Specific environments may cause bad reception. Please contact our technical support in that case.

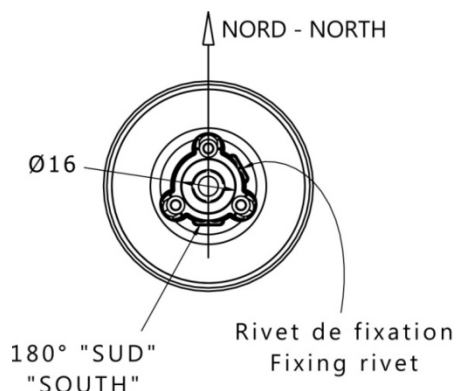
16.4 CONNECTIONS

Open the receiver to access the connection terminal. The NMEA0183 data output is connected as shown below:



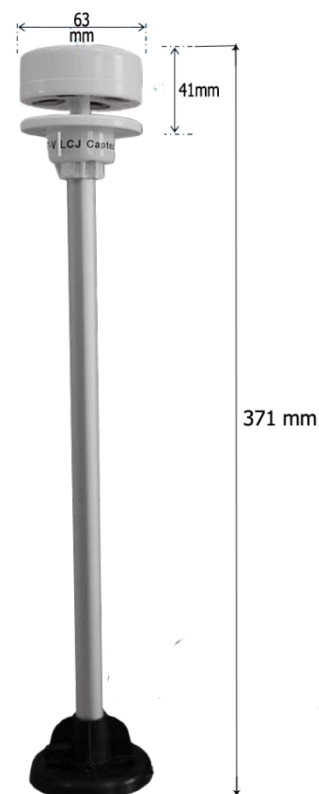
16.3 SENSOR ALIGNEMENT

A mark below the sensor indicates the alignment. The vertical bracket is designed for mounting on a horizontal surface, usually the mast head on a sailing boat. For mounting on the side of the mast, an additional bracket is available separately (see section 13.2). The CV7 sensor must be installed with the "Nord" mark on the bracket aligned to the geographical North for a fix installation on shore. Use a compass, taking the deviation in account.



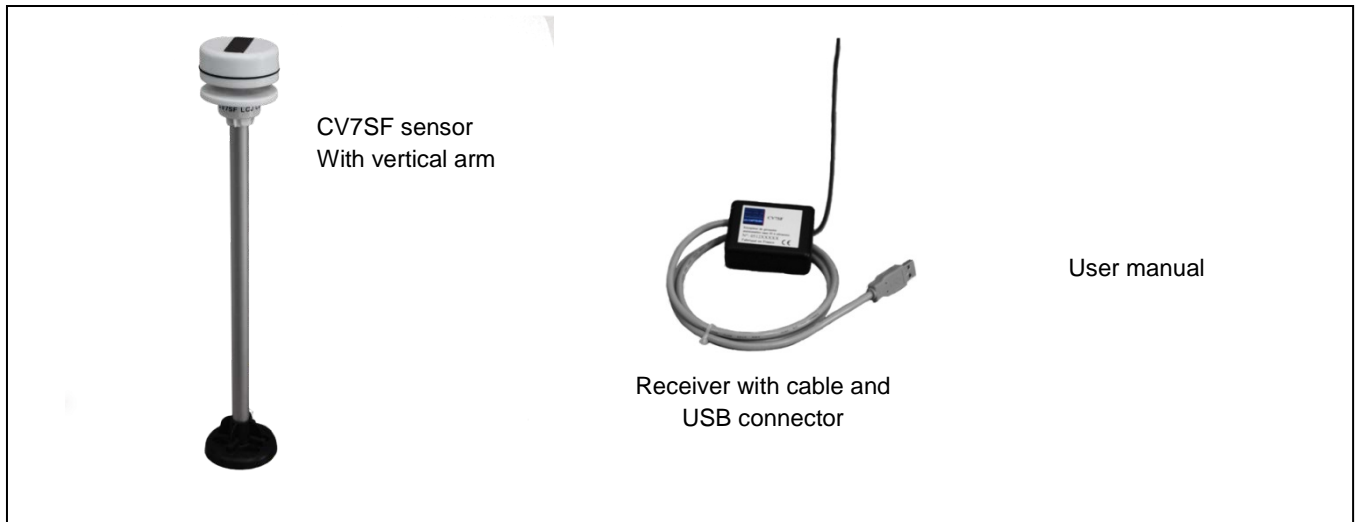
The CV7SF is compatible with the Directive 1999/5/CE "R&TTE"

16.5 DIMENSIONS



17 CV7SF-USB

17.1 CONTENT OF DELIVERY



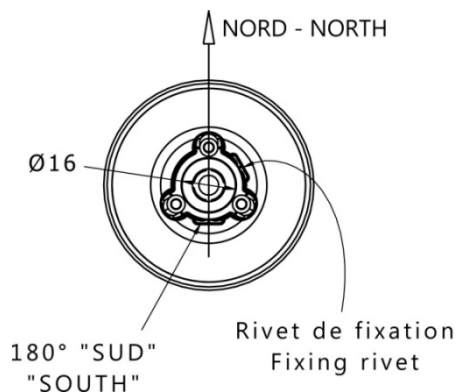
17.2 INSTALLATION

The CV7SF wind sensor is designed for operation outdoor, exposed to natural light. It must be installed in an area free from any air flow perturbation. Choose a location free from any obstacle and situated at least 150 cm from the ground. The radio signal maximum range is 200 meters. Best results are obtained in a 50 meters distance between the sensor and its receiver. The signal can be perturbed by materials such as carbon, aluminium, steel...

A minimum distance of 10 meters between the arm and any conductive material is recommended. Specific environments may cause bad reception. Please contact our technical support in that case.

17.3 SENSOR ALIGNEMENT

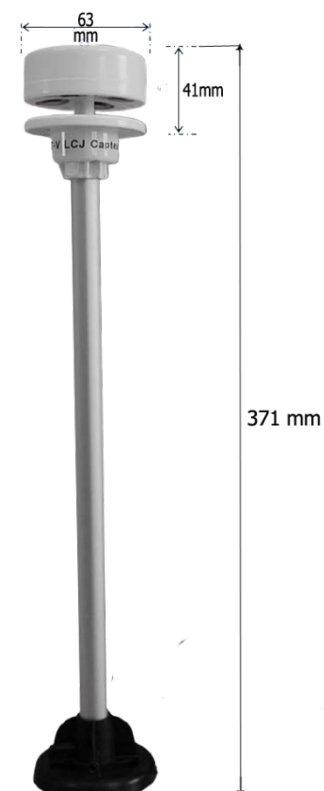
A mark below the sensor indicates the alignment. The vertical bracket is designed for mounting on a horizontal surface, usually the mast head on a sailing boat. For mounting on the side of the mast, an additional bracket is available separately (see section 13.2). The CV7 sensor must be installed with the "Nord" mark on the bracket aligned to the geographical North for a fix installation on shore. Use a compass, taking the deviation in account.



17.4 USB CONNECTION

Plug the USB cable to the PC. The driver will automatically be installed by the Windows® system (Windows 7® and above). Alternatively, the latest version of the driver can be downloaded from the technical support section of the website (www.lcjcpteurs.com). It is an executable file. Double-click on the file to launch the installation. Once the CV7 is connected to the USB port, your relevant software will immediately identify the NMEA0183® sentences via an emulated COM port.

17.5 DIMENSIONS



The CV7SF is compatible with the Directive 1999/5/CE "R&TTE"