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CALYPSO
ULTRA-LOW-POWER ULTRASONIC WIRED MINI WIND METER

User manual

English version 1.0
09.8.2023

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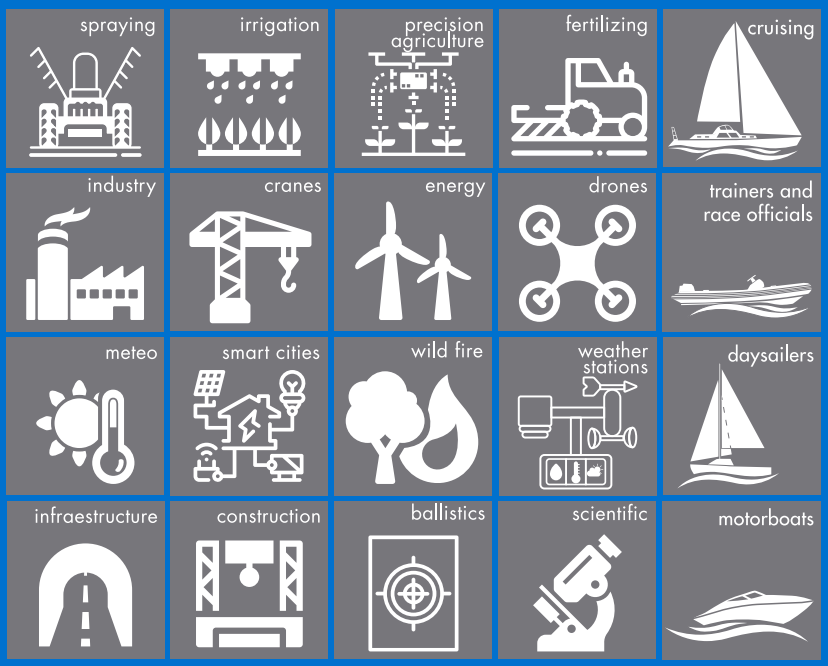

If you want to know more about our new ULP Ultrasonic Wired Mini wind meter, please keep reading or visit our website **www.calypsoinstruments.com**

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1 Product overview

Thank you for choosing the Ultra-Low-Power Ultrasonic Wired Mini wind meter from Calypso Instruments. This wind sensor is the first model or our generation II, representing an important technology breakthrough condensing an extensive R+D investment:

· We feel very proud to release a unit that requires under 0.4 mA of power at 5V, sampling at 1Hz.

· Different output options available: UART/I2C.

2 Package content

The package contains the following:

· ULP Wired Mini Wind Instrument plus 2 meter (6.5 ft) cable for connection.

· Serial number reference on the side of the packaging.

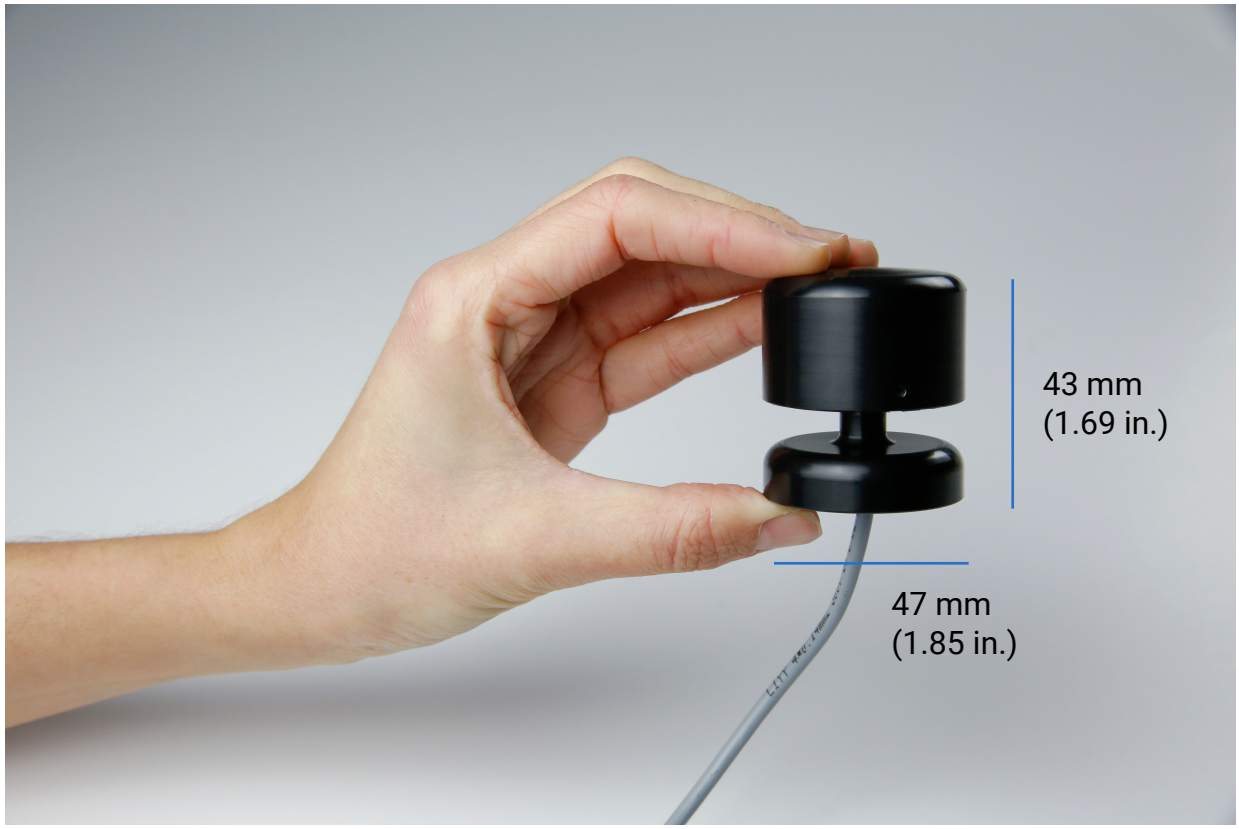
· A quick user guide on the back of the packaging and some more useful information for the customer.

· M3 screw (x3)

3 Technical specifications

The ULP Wired Mini has the following technical specifications:

Dimensions	· Diameter 43 mm (1.69 in.) · Height: 47 mm (1.85 in.)
Weight	·78 grams (2.75 oz.)
Power	· 3.3- 5 DCV



The ULP Wired Mini has to be connected as shown in this section.

White GND (Power -)	Yellow DATA Rx
Brown VCC (Power +)	Green DATA Tx

Data interface	1Autotransmit 2-POLL telegram
Data format	UART
Baudrate	1,200 to 115,200 (8n1) bauds
Voltage range	3.3-5 VDC

Sensors	Ultrasonic transducers (4x) Sample rate: 0.1 Hz to 10 Hz

The ULP Wired Mini has been designed to avoid any mechanical parts to maximize reliability and minimize maintenance.

The transducers communicate between themselves two by two using ultrasonic range waves. Each pair of transductors calculates the signal delay and get information about both wind direction and wind speed.

Wind Information	· Wind Speed	Range:	0.5 - 45 m/s or 0.5 - 25 m/s (1.12 to 56 mph or 1.12 to 100 mph)
		Accuracy:	0.1 m/s at 10 m/s (0.22 in. at 22 mph)
		Threshold:	0.5 m/s (1.12 mph)
	· Wind Direction	Range: 0 - 359º	
		Accuracy: ±1º	
	-Sample Rate	1 Hz	

It can be mounted either on a plate (inferior screws).

Easy mount	- 3 x M3 base female tripod thread

Mounting Instructions:
The ULP Wired Mini has a small circle on the outside of the main body which is called the north mark. The ULP Wired Mini should be mounted with the north mark facing the true north.

Firmware	Upgradable via UART/TTL

Product Material

The ULP Wired Mini is engineered to be a robust device with minimal downtime. Frost, rain or snow might affect measurements if it blocks the wave path. The input wires are protected by Transient Voltage
Suppression (TVS) diodes. The instrument body is built with Polyamide.

Quality Control

Every single unit is calibrated with accuracy, following the same calibration standards for each one in a wind tunnel.

A Q/C report for both wind speed and direction is generated and kept in our files. Standard deviation is checked to guarantee that each unit has been calibrated to the highest standards.

4 Configuration Options

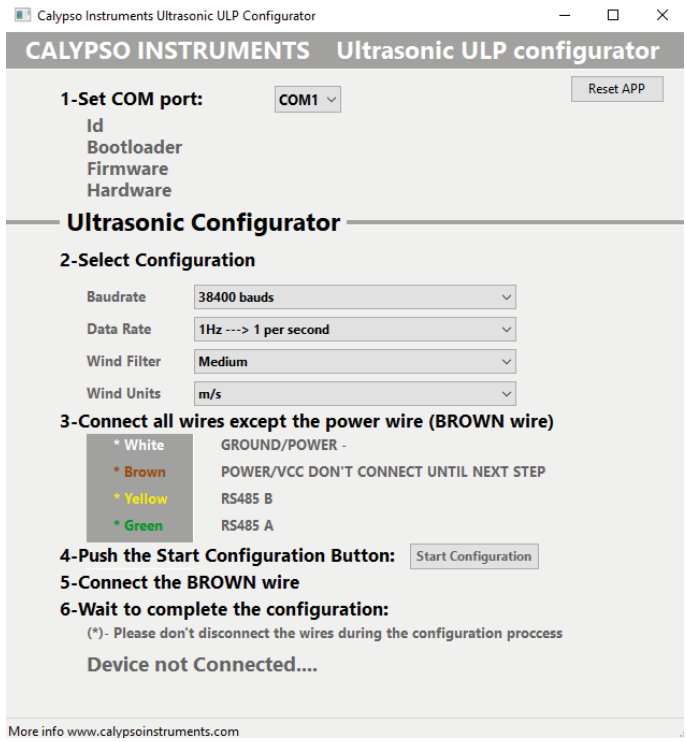
The ULP Wired Mini can be set up by using a special configuration app made by Calypso Instruments.
In order to use the app, you should download theconfigurator from our website at **www.-calypsoinstruments.com**.

To configure your device, connect the ULP Wired Mini via a USB to UART converter cable. Connect all the ULP cables except for the brown cable to the converter. Insert the USB into the computer, open the configurator app, select the configuration wanted and follow the instructions on the screen to finish the configuration. You will be prompted by the app to connect the brown wire at a specific moment of the configuration.

For more information, please watch the following video.
https://bit.ly/3DuA7lM

*USB converter cables available on **calypsoinstruments.com**

Baudrate:	1200 to 115200 (8n1) bauds
Output rate:	0.1 to 10 Hertz
Output units:	m/sec., knots or km/h



5 Communication Protocols

UART Sentences

MWV Wind Speed and Angle
 1 2 3 4 5
 | | | | |
$--MWV,x.x,a,x.x,a*hh
1) Wind Angle, 0 to 360 degrees
2) Reference, R = Relative, T = True
3) Wind Speed
4) Wind Speed Units, K/M/N
5) Status, A = Data Valid
6) Checksum

MWV Sentence 4800bps 8N1

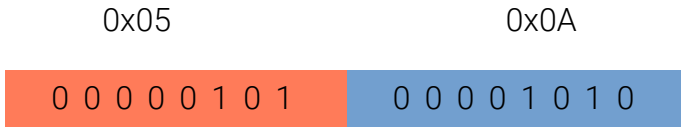
I2C Sentences

General Options
Address I2C- 0x15 (21 decimal)
Frecuency -100kHz – 400kHz
SDA -TX (Yellow)
SCL - RX (Green)

Write Register
In order to write about the register it is necessary to write
2 bytes, the I2C bus direction and the register you need to check.
I2C Address (1 Byte) + Register Address (1 Byte)
Address -0x15 (21 decimal)
Available Registers:
Wind Raw Stat - 0x10
Wind 2 Min Stat - 0x12
Wind 5 Min Stat - 0x15
Wind 10 Min Stat - 0x1A
Wind Full Stats - 0x1F

Read Register
For the read register we need to take into account how many bytes is the system giving us back and what bytes we need to read in order to obtain the value we need.

Data are under big-endian criteria. The first byte, the more valuable one to be represented. E.g. If 2 bytes are read, byte 0 and byte 1, we will read the first byte as 0x05 and second byte 0x0A.



5 Communication Protocols (continued)

The first byte is marked in orange. The more valuable one. The second byte is marked in blue (less significant one LSB).

Write Wind Raw Register Return 7 Bytes
Bytes 0 – 1 - Unused
Bytes 2 – 3 - Wind Speed * 100
Bytes 4 – 5 - Wind Direction * 100
Byte 6 - Checksum

Write Wind 2 Min Stat Register Return 11 Bytes
Bytes 0 – 1 - Unused
Bytes 2 – 3 - Wind Speed * 100
Bytes 4 – 5 - Wind Direction * 100
Bytes 6 – 7 - Wind Speed Gust * 100
Bytes 8 – 9 - Wind Direction Gust * 100
Byte 10 - Checksum
Write Wind 2 Min Stat Register Return 11 Bytes
Bytes 0 – 1 - Unused
Bytes 2 – 3 - Wind Speed * 100
Bytes 4 – 5 - Wind Direction * 100
Bytes 6 – 7 - Wind Speed Gust * 100
Bytes 8 – 9 - Wind Direction Gust * 100
Byte 10 - Checksum

Write Wind 5 Min Stat Register Return 11 Bytes
Bytes 0 – 1 - Unused
Bytes 2 – 3 - Wind Speed * 100
Bytes 4 – 5 - Wind Direction * 100
Bytes 6 – 7 - Wind Speed Gust * 100
Bytes 8 – 9 - Wind Direction Gust * 100
Byte 10 - Checksum

Write Wind 10 Min Stat Register Return 11 Bytes
Bytes 0 – 1 - Unused
Bytes 2 – 3 - Wind Speed * 100
Bytes 4 – 5 - Wind Direction * 100
Bytes 6 – 7 - Wind Speed Gust * 100
Bytes 8 – 9 - Wind Direction Gust * 100
Byte 10 - Checksum

5 Communication Protocols (continued)

Write Wind Full Stat Register Return 31 Bytes
Bytes 0 – 1 - Unused
Bytes 2 – 3 - Wind Speed Raw * 100
Bytes 4 – 5 - Wind Direction Raw * 100
Bytes 6 – 7 - Wind Speed 2 Min Stat * 100
Bytes 8 – 9 - Wind Direction 2 Min Stat * 100
Bytes 10 – 11 - Wind Speed Gust 2 Min Stat * 100
Bytes 12 – 13 - Wind Direction Gust 2 Min Stat * 100
Bytes 14 – 15 - Wind Speed 5 Min Stat * 100
Bytes 16 – 17 - Wind Direction 5 Min Stat * 100
Bytes 18 – 19 - Wind Speed Gust 5 Min Stat * 100
Bytes 20 – 21 - Wind Direction Gust 5 Min Stat * 100
Bytes 22 – 23 - Wind Speed 10 Min Stat * 100
Bytes 24 – 25 - Wind Direction 10 Min Stat * 100
Bytes 26 – 27 - Wind Speed Gust 10 Min Stat * 100
Bytes 28 – 29 - Wind Direction Gust 10 Min Stat * 100
Byte 30 - Checksum

6 General information

General recommendations

Regarding mounting the unit, align the north mark (the circle on the side) of the ULP Wired Mini towards the north. Make sure to install the sensor in a location **free from anything that obstructs the flow of wind to the sensors within a 2 meter radius**.

Maintenance and repair

The ULP Wired Mini does not require great maintenance thanks to the lack of the moving parts in this new design.Transducers must be kept clean and aligned. Impacts or incorrect impulsive handling may lead to transducers misalignment. The space around the transducers must be empty and clean. Dust, frost, water, etc... will make the unit stop working. The ULP Wired Mini can be wiped clean with a damp cloth being careful to not touch the transducers.

Warranty

This warranty covers the defects resulting from defective parts, materials and manufacturing, if such defects are revealed during the 24 months after the purchase date. Warranty is void in case of non-following the instructions of use, repair or maintenance without written authorisation.

Any wrongful use given by the user will not incur in any responsibility on part of Calypso Instruments. Therefore, any harm caused to the ULP Wired Mini by a mistake will not be covered by the waranty. Using assembly elements different from those delivered with the product will void the warranty. Changes on transducers position/alignment will void any warranty. For further information please contact Calypso Technical Support through **aftersales@calypsoinstruments.com** or visit **www.calypsoinstruments.com**.

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