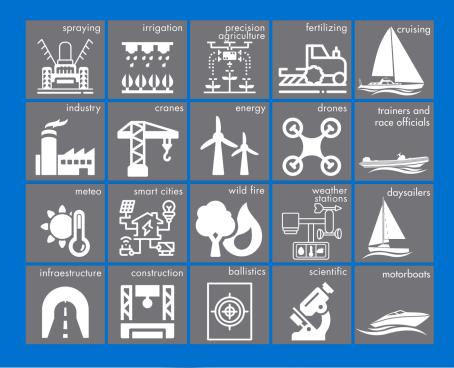




CALYPSO INSTRUMENTS ULTRA-LOW-POWER ULTRASONIC SUMMIT WIND METER User manual









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

Index

01	Product Overview	2
02	Package Content	2
03	Communication Protocols Modbus RTU	3
	RS485 (Further protocols under request)	6

04	Technical Specifications	10
	Dimensions	10
	Weight	10
	Power	10
	Sensors	10
	Wind Information	10
	Easy Mount	10
	Mounting Accessories	11
	Product Material & Quality Control	11
05	Firmware	12
05	Filliwale	12
06	General Information	
00		13
	General Recommendations	13
	Maintenance and Repair	13
	Warranty	13



1 Product Overview

Thank you for choosing the ULP SUMMIT wind meter from Calypso Instruments. This is the first model or our generation II, representing an important technology breakthrough condensing an extensive R+D investment:

· Both shape and firmware have been enhanced for an improved rain performance. This is key for static applications such as weather stations.

· Mechanical design has been revamped making the unit more robust and dependable.

· 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: RS485, MODBUS RTU, UART/I2C (under demand)

Applications for the ULP SUMMIT are the following:

- Weather Stations | Drones •
- Temporary Scaffolding and construction | Infrastructures and building | Cranes
- Spraying | Irrigation | Fertilizing | Precision Agriculture
- Smart Cities | Wild fires | Shooting | Scientific
- Sailing.



2 Package content

- The package contains the following: Ultrasonic ULP SUMMIT 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.

- · M4 headless screw (x6)
- \cdot M4 screw (x3)



3 Communication Protocols

3.1 MODBUS RTU

3.1.1 Modbus Wiring

MODBUS RTU Output:

White	Yellow
GND (Power -)	DATA (B-)
Brown	Green
VCC (Power +)	DATA (A+)

3.1.2 Modbus Configuration

The ULP SUMMIT can be set up by using a special configuration app made by Calypso Instruments.

In order to use the app, you should download the configurator from our website at **www.calypsoinstruments.com**.

The following can be changed with the configurator:

Data Protocol: RS485 to Modbus (or viceversa)

Baudrate: The number of signal units per second that the wind sensor sends. A baud can contain several bits.

Data rate: The number of bits that are transmitted per unit time through a digital transmission system or between two digital devices.

Wind Filter: You can choose between the sensibility of the wind filter.

baudrate:	1200 to 115200 (8n1) bauds
output rate:	0.1 to 10 Hertz (Depends on the filter you select)
output units:	m/s, knots or km/h

Power consumption:

Ultra-Low-Power (MODBUS) : 0.25 mA @5V, 1 Hz standard. Power Consumption will vary depending on the baudrate & output rate chosen



Modbus Configuration Setup

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

For more information, please watch the following video. https://bit.ly/3DuA7IM

*USB converter cables available on calypsoinstruments.com.

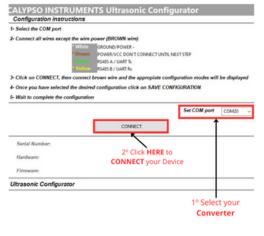
This are the STEPS to FOLLOW to Configurate your DEVICE Successfully:

1.Use a USB to RS485 Converter cable to connect your wind sensor to your computer.

2.Connect all the cables to the USB converter cable EXCEPT for the BROWN cable.



3. Open the Configurator app, select your COM port and Click on Connect button



4. Connect the brown cable when the configurator tells you to.

5. Wait a few seconds and Configure your Anemometer. In this case, select Stream and configure your anemometer. When you ve finished the configuration click on Start Configuration (SAVE Configuration in the image)



Modbus Configuration Setup (II)

Configuration in	structions					
- Select the COM po	ort					
- Connect all wires	except the wire po	ower (BROWN wire)				
	and the second se	GROUND/POWER -				
	* Brown	POWER/VCC DON'T CON R5485 A / UART Tx	NECT UNTIL NE	IT STEP		
	* Yellow	RS485 B / UART Rx				
- Click on CONNEC	T, then connect b	rown wire and the app	opiate configu	uration modes will	l be display	red
- Once you have sel	lected the desired	configuration click on	SAVE CONFIC	GURATION		
5- Wait to complete t	the configuration					
4° Click HERE t	CANE			Set COM port	COM20	~
· cherriene ·			_			
your Configu	ination .	SAVE CONFIGURAT	ON			
			ON			-
Serial Number: 00				Configure	HERE	
	01e00274e3050102		3° (Configure Ir Anemor		
Serial Number: 00	01e00274e3050102		3° (Configure ur Anemor		
Serial Number: 00 Hardware: UAM_3 Firmware: 1.43	01e00274e3050102 3.10		3° (
Serial Number: 00 Hardware: UAM_3 Firmware: 1.43 Ultrasonic Config	01e00274e3050102 3.10		3° (_
Serial Number: 00 Hardware: UAM_3 Firmware: 1.43 Ultrasonic Config	01e00274e3050102 8.10 gurator	00303747	3° (you			_
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Serial Number: 00 Hardware: UAM_3 Firmware: 1.43 Ultrasonic Config	11e00274e3050102 1.10 gurator Stream Baudrate	0303747 O Demand 38400 bauds				
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Serial Number: 00 Hardware: UAM_3 Firmware: 1.43 Ultrasonic Config	21e00274e3050102 2.10 2.10 2.10 2.10 2.10 2.10 2.10	0303747 O Demand 38400 bauds Medium 1Hz> 1 p	3° (you O izc			

6. Wait to complete configuration and when the system advises that it is finished, disconnect the USB and cables.

7. Your unit is now configured.

1- Select the COM port				
2- Connect all wires except i	the wire power (BROWN wire)			
	White GROUND/POWER -			
	Brown POWER/VCC DON'T CONNECT UN	ITIL NEXT STEP		
	Green RS485 A / UART Te			
	Yellow R5485 B / UART Rx			
3- Click on CONNECT, then	connect brown wire and the appropiate of	configuration modes will	I be display	ed
4- Once you have selected th	he desired configuration click on SAVE (CONFIGURATION		
5- Wait to complete the con	figuration			
		Set COM port	COM20	
				1
		our com port		-
	CONNECT			
	CONNECT			
Serial Number: 003b003d				_
Serial Number: 003b003d Hardware: UAR_3.10				
Hardware: UAR_3.10				
Hardware: UAR_3.10 Firmware: 1.42	13830500720333658			_
Hardware: UAR_3.10	13830500720333658			

CONFIGURATION COMPLETE

More info www.calypsoinstruments.com



3.1.3 Modbus Registers

DIR_BASE_LA1 30001 SYSTEM STATUS DIR BASE LA1 + 200 WIND_SPEED DIR_BASE_LA1 + 201 WIND_DIRECTION DIR_BASE_LA1 + 202 TWO_MIN_AVG_WS DIR_BASE_LA1 + 203 TWO_MIN_AVG_WD DIR_BASE_LA1 + 204 TEN_MIN_AVG_WS DIR_BASE_LA1 + 205 TEN_MIN_AVG_WD DIR_BASE_LA1 + 206 WIND_GUST_SPEED DIR_BASE_LA1 + 207 WIND_GUST_DIR DIR_BASE_LA1 + 208 FIVE_MIN_AVG_WS DIR_BASE_LA1 + 210 FIVE_MIN_AVG_WD DIR_BASE_LA1 + 211 FIVE_WIND_GUST_SPEED DIR_BASE_LA1 + 212 FIVE_WIND_GUST_DIR DIR_BASE_LA1 + 213 *See at the end of the manual the table with the MODBUS data requests. 3.2 RS485

3.2.1. RS485 Wiring

RS485 (NMEA 0183) Output:



3.2.2 RS485 Configuration

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

The following can be changed with the configurator:

Data Protocol: RS485 to Modbus (or viceversa)

Baudrate: The number of signal units per second that the wind sensor sends. A baud can contains seve-ral bits.

Data rate: The number of bits that are transmitted per unit time through a digital transmission system or between two digital devices.

Wind Filter: You can choose between the sensibility of the wind filter.

baudrate:1200 to 115200 (8n1) baudsoutput rate:0.1 to 10 Hertz (Depends on the filter you select)output units:m/s, knots or km/h

Power consumption:

Ultra-Low-Power (RS485NMEA0183) : 0,25mA @5V, 1Hz. Power Consumption will vary depending on the baudrate & output rate chosen



RS485 Configuration Setup

The ULP SUMMIT can be set up by using a special configuration app made by Calypso Instruments. In order to use the app, you should download the configurator from our website at

www.calypsoinstruments.com.

For more information, please watch the following video. https://bit.ly/3DuA7IM

*USB converter cables available on calypsoinstruments.com.

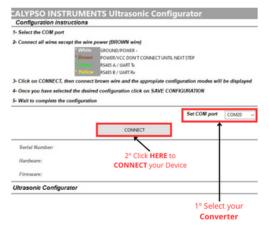
This are the STEPS to FOLLOW to Configurate your DEVICE Successfully:

1.Use a USB to RS485 Converter cable to connect your wind sensor to your computer.

2.Connect all the cables to the USB converter cable EXCEPT for the BROWN cable.



3. Open the Configurator app, select your COM port and Click on Connect button



4. Connect the brown cable when the configurator tells you to.

5. Wait a few seconds and Configure your Anemometer. In this case, select Stream and configure your anemometer. When you ve finished the configuration click on Start Configuration (SAVE Configuration in the image)



RS485 Configuration Setup (II)

Select the COM port			
- Connect all wires except the	wire power (BROWN wire)		
* Br • Co • Ye	hite GROUND/POWER - POWER/VCC DON'T CONNECT U RS485 A / UART Tk RS485 B / UART Tk		
	nect brown wire and the appropiate		II be displayed
	lesired configuration click on SAVE	CONFIGURATION	
5- Wait to complete the configu	ration		
		Set COM port	COM20
4° Click HERE to SAVE			
4° Click HERE to SAVE your Configuration	SAVE CONFIGURATION		
	SAVE CONFIGURATION]	
your Configuration Serial Number: 001e00274e3	SAVE CONFIGURATION	3° Configure	
your Configuration	SAVE CONFIGURATION	3° Configure your Anemo	
your Configuration Serial Number: 001e00274e3	SAVE CONFIGURATION		
your Configuration Serial Number: 001e00274e3 Hardware: UAM_3.10	SAVE CONFIGURATION		
your Configuration Serial Number: 001e00274e3 Hardware: UAM_3.10 Firmware: 1.43	SAVE CONFIGURATION		
your Configuration Serial Number: 001e00274e3 Hardware: UAM_3.10 Firmware: 1.43 Ultrasonic Configurator	SAVE CONFIGURATION SOUTO20303747 O Demand	your Anemo	
your Configuration Serial Number: 001e00274e3 Hardware: UAM_3.10 Firmware: 1.43 Ultrasonic Configurator @ Stream	SAVE CONFIGURATION S501020303747 O Demand (your Anemo	
your Configuration Serial Number: 001e00274e3 Hardware: UAM_3.10 Firmware: 1.43 Ultrasonic Configurator @ Stream Beadrat	SAVE CONFIGURATION SOUTO20303747 O Demand O e 38400 bauds Iter Medium	your Anemor	
your Configuration Serial Number: 001e00274e3 Hardware: UAM_3.10 Firmware: 1.43 Ultrasonic Configurator @ Stream Beadrat Wind Fi	SAVE CONFIGURATION SOSO1020303747 O Demand O e Ber Medium te IHz> 1 per secon	your Anemor	
your Configuration Serial Number: 001e00274e3 Hardware: UAM_3.10 Firmware: 1.43 Ultrasonic Configurator @ Stream Baudrat Wind Fi Data Ra	Save CONFIGURATION Sol020303747 O Demand O Deman	your Anemor	

6. Wait to complete configuration and when the system advises that it is finished, disconnect the USB and cables.

7. Your unit is now configured.

1- Select the COM p	nstructions			
2- Connect all wires		ower (BROWN wire)		
		GROUND/POWER -		
		POWER/VCC DON'T CONNECT UP	NTIL NEXT STEP	
	and the second se	RS485 A / UART Tx		
		RS485 B / UART Rx		
3- Click on CONNEC	T, then connect b	rown wire and the appropiate	configuration modes will	I be displayed
4- Once you have se	lected the desired	configuration click on SAVE	CONFIGURATION	
5- Wait to complete	the configuration			
			Set COM port	COM20 V
				COME? 1
		CONNECT		
Serial Number: 0	036003d38305007			
Serial Number: 0 Hardware: UAR_3				

CONFIGURATION COMPLETE



More info www.calypsoinstruments.com

3.2.3 RS485 Registers

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

By default, the communication parameters are 38400bps, 8N1. Some examples of sentences are:

\$IIMWV,316,R,06.9,N,A*18 \$IIMWV,316,R,06.8,N,A*19

The connection is straightforward with no configuration required in RAW mode configuration.

In case of ON DEMAND configuration mode, the sentence received is almost the same, but there is a need of this sentence for requesting data every time you ask for data:

\$ULPI*00\r\n //I=id node by default \$ULPA*08\r\n \$ULPB*0B\r\n P1*78\r\n

The received sentence has this structure, slightly modified: \$IIMWV,x.x,a,x.x,a*hh, being i the node (I,A,B,C,....) configured.



4. Technical specifications

4.1. Dimensions	• Diameter: 70 mm (2.76 in.) • Height: 65 mm (2.56 in.)
4.2. Weight	340 grams (12 ounces)
4.3 Power	· 3.3 - 18 VDC





4.4. Sensors

Ultrasonic transducers (4x) Sample rate: 0.1 Hz to 10 Hz 4.5 Wind Information · Wind speed · Wind direction

Sample rate: 0.1 Hz to 10 Hz (Configurable)

Wind Speed

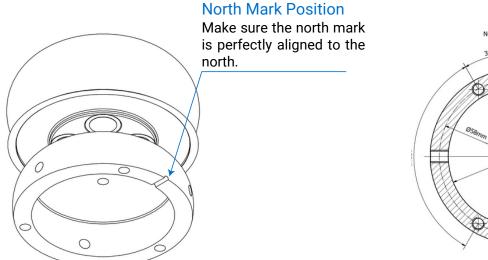
Range: 0.5 to 45 m/s (1.12 to 100 mph) or 0.5 to 25m/s (1.12 to 56 mph) Accuracy: ±0.1 m/s at 10m/s (0.22 at 22. 4 mph) Threshold: 0.5 m/s (1.12 mph) **Wind direction** Range: 0 - 359° Accuracy: ±1°

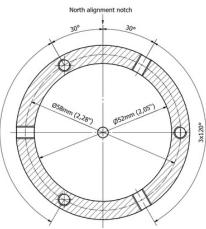


4. Technical specifications (II)

4.6. Easy mount	- 3 x M4 lateral female tripod
, i i i i i i i i i i i i i i i i i i i	thread - 3 x M4 base female tripod
	thread UNC 1/4" - 20

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





4.7. Mounting accessories

A wide range of accessories can be used with the device. The ULP SUMMIT can be mounted on a flat service and screwed on to different sizes of poles. It can also be used with an adaptor for poles of 39 mm.

* Please, visit our website and check all the accessories available and their possible combinations at **www.calypsoinstruments.com.**



Mast Mount



Adapter 39 mm



Pole adapter



4. Technical specifications (III)

4.8. Firmware Upgradable via RS485, MODBUS or UART/TTL

4.9 Product Material

The ULP SUMMIT is engineered to be a robust device with a minimal downtime. This new shape has been designed for optimum water spillage which implies lower probability of ice formation. Frost 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.

4.10 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.

5. Firmware

Firmware upgradable and configurable via cable using the configurator (https://calypsoinstruments.com/technical-information). A USB converter cable is available as an accessory on **calypsoinstruments.com**.

Link to Firmware upgrader:

https://drive.google.com/drive/folders/1jg5BcCEpkXBLXEEYmGXeLNyOimmEb3Sm



6. General information

6.1. General recommendations

Wind Speed Gust is that value that measures abrupt and sudden change in wind speed. Regarding mounting the unit, align the north mark of the ULP towards the natural north, bow of a boat, or the marker used as a reference.

Regarding mounting the unit, the mast head has to be prepared for the mechanical installation. Align the North mark of the Ultrasonic Ultra-Low-Power to the north. Make sure to install the sensor in a location free from wind perturbation, usually on the mast head.

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, for example, the mast head on a boat.

Other important aspects:

- Do not attempt to access the transducers area with your fingers;
- Do not attempt any modification to the unit;
- Never paint any part of the unit or alter its surface in any way.
- NOT allow to be submerged fully or partially in water.

If you have any questions or doubts, please contact us directly.

6.2. Maintenance and repair

The ULP SUMMIT 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 SUMMIT can be wiped clean with a damp cloth being careful to not touch the transducers.

6.3 Warranty

This warranty covers the defects resulting from defective parts, materials and manufacturing, if made known to the manufacturer within 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 by the user will not incur any responsibility on part of Calypso Instruments; therefore, any harm caused to the ULP by a mistake will not be covered by the waranty. Using assembly elements different from those delivered with the product will void the waranty.

Changes on transducers position/alignment will void any warranty.

For further information please contact Calypso Technical Support through **sales@calypsoinstruments.com** or visit **www.calypsoinstruments.com**.



MODBUS Sensor Data Requests

Measurements all have a resolution of 0.1 but are reported as 10*. 8.2 m/s is returned as a value 82. The user must /10 in order to reinsert the decimal precision.

Address	Register	Access Type	Response Range	Data Type	Description
200	201	Read	0 to 15†	16-bit Signed Int	System Status†
201	202	Read	0 to 500*	16-bit Signed Int	Wind speed (m/s) (3 second moving average)
202	203	Read	0 to 3599*	16-bit Signed Int	Wind direction (°) (3 second moving average)
203	204	Read	0 to 500*	16-bit Signed Int	2 min avg wind speed
204	205	Read	0 to 3599*	16-bit Signed Int	2 min avg wind direction
205	206	Read	0 to 500*	16-bit Signed Int	10 min avg wind speed
206	207	Read	0 to 3599*	16-bit Signed Int	10 min avg wind direction
207	208	Read	0 to 500*	16-bit Signed Int	Wind gust speed
208	209	Read	0 to 3599*	16-bit Signed Int	Wind gust direction
210	11	Read	0 to 500*	16-bit Signed Int	5min avg wind speed
211	12	Read	0 to 3599*	16-bit Signed Int	5min avg wind direction
212	13	Read	0 to 500*	16-bit Signed Int	5 min Wind gust speed
213	14	Read	0 to 3599*	16-bit Signed Int	5 min Wind gust direction

† If not applicable to ULP-M, the register should report a value of zero (0). * See Data Format section for numeric conversions.





Ultra-Low-Power Ultrasonic wind meter SUMMIT (ULP SUMMIT) User manual English version 3.0