PARATRONIC
Water Environment Natural Hazards

USER MANUAL

Entreprise certitiée
ISO 9001

French manufacturer

RADAR SENSOR « CRUZOE » RS485

1. CHARACTERISTICS

Technology	Pulse radar
Transmission frequency	24,05 to 26,5GHz
Repetition frequency	3,57 MHz
Pulses duration	1,2 ns
Radiated power	<20 Dbm
Beam angle at -3dB	8° / 12°
Power supply	9 to 20V DC
Measuring range	30 meters
Consumption	Standby mode : 100µA
	Permanent mode : 15mA
Output signal	Jbus slave on RS485 including the measurement and quality of the signal
Communication	9600 bauds, 8 bits, parity none, 1 stop
Cable type	4 wires, section 0.5mm², Ø 6mm (length = 2 m)
Connector	Mark N°1: «-» power supply, Mark N°2: «+» power supply
	Mark N°3: RTX- «A», Mark N°4: RTX+ «B»
Resolution	1mm
Accuracy	Air draught < 20 cm : +-100 mm
	From 20 cm to 50 cm : +-20 mm
	From 50 cm to 20 m : +-5 mm (CEM +-10 mm)
Warming-up time:	2s + smoothing depth
Fault signal	Negative distance
Smoothing depth	1, 4, ou 16s
Protecton index	IP68 (100 days at one meter)
Fire Certification	UL94-V2
Storage temperature	-20 to 60°C
Operating temperature	-20 to 50°C
Electromagnetic Compatibility	EN 302729-1/2 (2011-05)
	EN 60950-1 (2006-09) + Av. A1, A2, A11, A12
	EN 61326-1 (2013-05) - EN 62479 (2010-11) - EN 50581 (2013-01)
Fast transients	Level 4
Surge immunity, wave 8/20	1KV
According to ISO 4373	Physical principle of the device: radar echolocation
	Maximum variation speed : not applicable
	Response times (with smoothing 1s): 2 s
	Performance class (air draft > 50cm): 1
	Temperature class : 2
	Relative humidity class : 1
	IP classification: IP68
	Compatibility with drinking water: irrelevant
	Compatibility with explosive environment: no
Material	PETP – PTFE – ABS PC
Dimensions	L 300 mm x W 220 mm x H 85 mm
Weight	1.8 Kg

CE

2. INSTALLATION

The Cruzoé RS485 radar is fixed directly onto a horizontal tube of outside diameter
diameter ≤ 40mm (or by using the optional "Radar bracket").
It is held in position by a 10 mm diamêter screw.

To use the self-positioning feature, the shipping seal must be removed from the Cruzoé Radar (rubber cord [black] inserted between the shell [green] and the antenna [white]).

Top
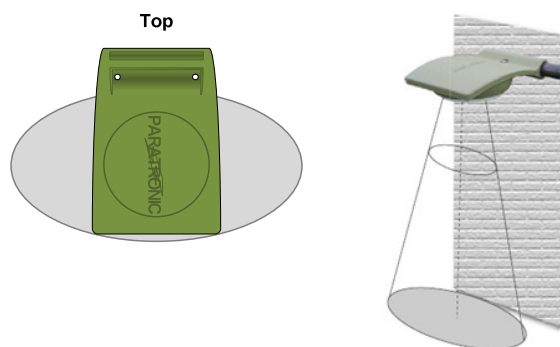
3. CONNECTIONS

Power supply	Type TBT limited to 1A.
Cable	From 0,5 to 0.75 mm²
Connector	Mark N°1: «−» power supply,
	Mark N°2: «+» power supply
	Mark N°3: RTX− «A»
	Mark N°4: RTX+ «B»

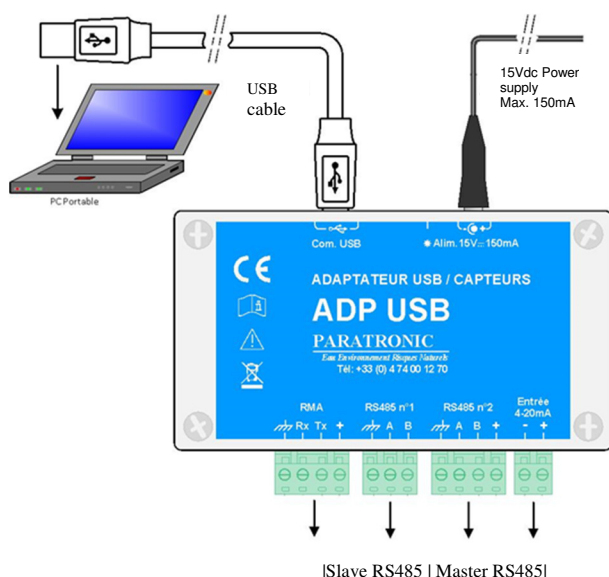The use of a lightning protection of the type PRO SA224 PARATRONIC is imperative.

NB:
The RS485 serial link of the Cruzoé RS485 can be converted to a 4/20mA loop using the "Cruzoé MOD 4/20" interface (see Installation Instructions "Cruzoé MOD 4/20").

Acquisition « LNS » or API with RS485
+
B
A
−

PRO SA224
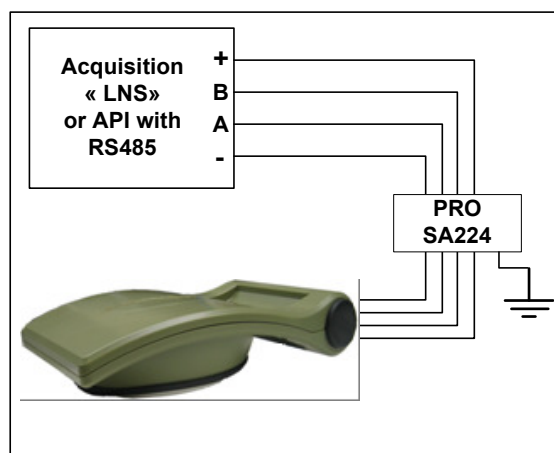
4. CONFIGURATION

➢ The CRUZOE RS485 sensor does not require configuration. Indeed, the "factory settings" enable it to be used in most hydrological situations or for carrying out measurements in vessels or tanks. In specific cases, or where it is desired to change the configuration, the "Sensor HMI" software application provides access to certain of the Cruzoé RS485 radar settings.

➢ The configuration of the Cruzoé RS485 radar sensor can be changed with:
  o The "ADPUSB" adaptor to connect to your sensor. (Refer to dedicated manual I157F).
  o The software "sensor HMI" to configure your sensor. (Refer to dedicated manual I158F).

USB cable

15Vdc Power supply Max. 150mA

PC Portable

CE
ADAPTATEUR USB / CAPTEURS
ADP USB
PARATRONIC
Eau Environnement Risque Naturels
Tel: +33 (0) 4 74 00 12 70

Com. USB ● Alim.15V= 150mA

RMA RS485 n°1 RS485 n°2 Entrée 4-20mA
Rx Tx + A B A B + − +

|Slave RS485 | Master RS485|

Note :
The software and its driver will need to be installed when used for the first time:

Installation of the PARATRONIC "Sensor HMI" software requires Administrator permissions on the computer.

Download the latest version of the software from www.paratronic.fr/catalogue on the pages for the compatible sensors.
Run "setup.exe" to install the software. Follow the instructions on the screen and refer to the "Sensor HMI" documentation I158F.

After having installed "Sensors HMI", you must also install the drivers for the USB port.
To do this, use the "Paratronic_drivers_USB.exe" executable contained in the folder "Sensor HMI". Follow the instructions on the screen and refer to the "Sensor HMI" documentation I158F.

5. <u>JBUS ADRESS TABLE</u>

JBUS Adresses	Data	JBUS Functions	
0	Model = 00C0h	3, 4	**(1)** Detail of the distance measurement quality : - [15-8] = echo amplitude, 0 to 255 - [7-4] = number of parasite echoes deleted over 1s, 0 à 2 - [3-0] = number of valid echoes over 1s, 0 à 15
1	Version	3, 4	
2	Power supply (V/10)	3, 4	
3	Temperature (°C)	3, 4	**(2)** Detail of the distance measurement: 65535 (-1) = current measurement 65534 (-2) = automatic recalibration 65533 (-3) = no echo 65532 (-4) = power supply voltage too low 65530 (-6) = inconsistent echoes 65529 (-7) = bad echo shape 65528 (-8) = echo out of range allowed 0 – 30000 = mesure available (mm)
4	Quality 1s (1) (3)	3, 4	
5	Distance 1s (2) (3)	3, 4	
6	Quality 4s (1) (3)	3, 4	
7	Distance 4s (2) (3)	3, 4	
8	Quality 16s (1) (3)	3, 4	
9	Distance 16s (2) (3)	3, 4	
100	Standby/wake up control (4)	6	
65524	Minimal Sensor/liquid distance (mm)	6	
65525	maximal Sensor/liquid distance (mm)	6	
65529	Default Sensor/liquid distance (mm)	6	
65535	Slave number	6 *	

* If the slave number is not known, use the slave number 0 to rewrite it.

(3) The radar takes several measurements per second and averages them over 1 s, 4 s and 16 s. The 3 "distance" are available in the JBUS addressable space (same for the "quality" values).

(4) On power up, the radar is working. Write value 1 at address 100 to switch it onto standby, 0 to restart it. When the radar is on standby, it is normal that it does not reply to the JBUS query.
Repeat the query within 2 s.

6. <u>SAFETY SYMBOLS AND MARKINGS</u>

⚠ : Risk of danger : Important information. Refer to the instructions.

📖 : Read the instructions.

CE : Complies with the European Union and EFTA directives.

🗑 : European directive 2002/96/CE of 27 January 2003, concerning waste electrical and electronic equipment (WEEE Directive) has been transposed in France by Decree No. 2005-829 of 20 July 2005.
Electrical or electronic appliances, as well as their spare parts and consumables must never be disposed of in domestic waste.
PARATRONIC has undertaken to set up an Individual Collection System.
Customers (end users) are requested to return **PARATRONIC** electrical and electronic equipment waste to the following address:

PARATRONIC - Zone Industrielle - Rue des Genêts, 01600 REYRIEUX, France.
WEEE Recycling Department

The manufacturer reserves the right to modify the characteristics described in this document without notice.