

RADAR SENSOR CR420/6, CR420/10 et CR420/20



1	SAFETY INSTRUCTIONS.....	2
2	PRESENTATION	2
3	TECHNICAL CHARACTERISTICS	2
3.1	MECHANICAL CHARACTERISTICS	2
3.2	ELECTRICAL CHARACTERISTICS.....	2
4	APPROVALS	2
5	INSTALLATION.....	3
6	CONNECTIONS.....	3
7	CONFIGURATION	4
7.1	SETTINGS.....	4
7.2	TOOLS.....	4
8	IDENTIFICATION.....	4
9	SAFETY SYMBOLS AND MARKINGS.....	4

1 SAFETY INSTRUCTIONS



WARNING: The sensor must be powered by a LIMITED POWER SOURCE.

If the sensor is used in an unspecified manner, the protection provided by the sensor may be compromised.

A suitable cut-off device must be planned outside the equipment.

Details of symbols and safety markings are provided on the last page of this documentation (§9).

2 PRESENTATION

Designed to take measurements in natural environments, PARATRONIC radars are used to monitor the levels of rivers, channels, water bodies, or for sewage applications in pumping stations or combined sewer overflow.

The PARATRONIC CR420 level sensors use pulse radar technology. They are self-stabilizing and automatically correct horizontal alignment faults of 10°. Their neutral color allows them to blend into the natural environment.

Measuring cone and reduced low precision zone facilitate their installation in confined environments.

The design of PARATRONIC radars CR420 enables them to be used under extreme conditions (flood, temperature, wind) without being damaged. The measuring range may vary from 6 to 20 meters depending on requirements and the sensor HMI application allows to change some settings or to use an average of measurements.

3 TECHNICAL CHARACTERISTICS

3.1 MECHANICAL CHARACTERISTICS


Presentation :	Plastic shell
Material :	ABS PC, PETP and PTFE
Mounting :	On a horizontal tubel Ø 40mm max.
Dimensions (mm):	300 x 220 x 85
Weight (g) :	1.800

3.2 ELECTRICAL CHARACTERISTICS

Technology	Pulse radar
Transmission frequency :	24,05 to 26,5GHz
Repetition frequency :	3,57 MHz
Pulse duration:	1,2 ns
Radiated power:	<20 dBm
Beam angle at -3dB :	+/- 4° by +/- 6° (=Beam angle/Vertical)
Power supply :	10 à 33V DC
Measuring range :	CR420/6 : 0m to 6m - CR420/10 : 0m to 10m - CR420/20 : 0m to 20m
Output signal :	4/20mA over 2 wires
Connection :	«+» = brown (or blue), «-» = white (or black), «Terre» = Braid
Cable :	Screened 2 wires, section 0.5mm ² , Ø 5.5mm, 50Ω/Km (protected against polarity inversion)
Cable length :	2 m (other lengths on request)
Resolution :	1 mm (full scale = 1 to 8 m) - 2 µA (full scale = 8 to 20m)
Precision :	Sensor/liquid distance< 20 cm : +-100 mm
(excluding temperature drift) :	20 cm <Sensor/liquid distance< 50 cm : +-20 mm
	50 cm <Sensor/liquid distance< 20 m : +-5 mm (CEM +-10 mm)
Temperature drift :	<0,2µA/°C (-20°C to +60°C)
Warming up time to 22mA :	< 2s (minimum supply time = heating time + smoothing depth)
Warming up time to 4mA :	< 6s (minimum supply time = heating time + smoothing depth)
Fault signal :	configurable 4 to 22mA (default : 22mA)
Fault time out :	configurable 10 to 250s (default : 240s)
Smoothing depth :	configurable 2 to 60s (default 30s)

4 APPROVALS

Maximum altitude :	2000 m above sea level
Protection index :	IP68 (100 days at one meter)
Fire Certifications :	UL94-V2
Storage temperature :	-20 à 60°C
Operating temperature :	-20 à 60°C

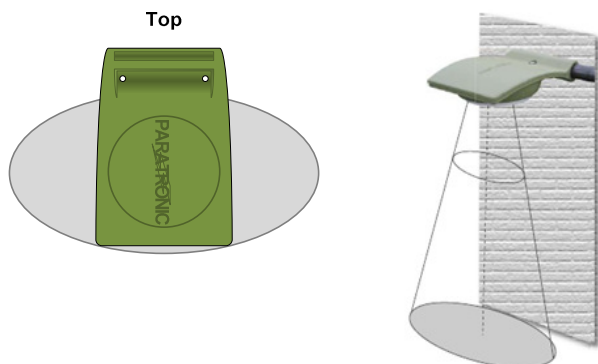
Electromagnetic Compatibility :  EN 302729-1/2 (2011-05) - EN 61326-1 (2013-05) - EN 50581 (2013-01)

Fast transients :	Level 4
Surge immunity, wave 8/20 :	2kV
Electrical safety :	EN 60950-1 (2006-09) + Av. A1, A2, A11, A12
Health :	EN 62479 (2010-11)

According to ISO 4373

Physical principle of the device: radar echolocation
 Maximum variation speed : not applicable
 Response time (with smoothing 2s): 4 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

5 INSTALLATION



The CR420 radar sensor is fixed directly onto a horizontal tube of outside diameter ≤ 40 mm (or by using the optional "Radar bracket"). It is held in position by an 8 mm diameter screw.

To use the self-positioning feature, the shipping seal must be removed from the CR420 Radar (rubber cord [black] inserted between the shell [green] and the aerial [white]).

To prevent interference when operating 2 radars simultaneously, it is recommended not to install them in the immediate proximity of one another. The minimum distance depends on turbulence on the surface of the water and any reflecting surfaces situated above (the underside of a bridge for example) which could require some test. In all cases, the distance between 2 radars must at least be equal to the vertical clearance.

6 CONNECTIONS

Power supply : Type 10 to 33 Vdc limited to 1A.

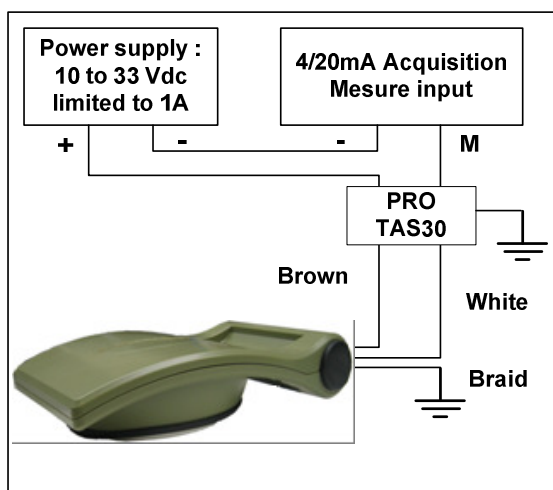
Connection : Power «-» = white (or black)

Power «+» = brown (or blue)

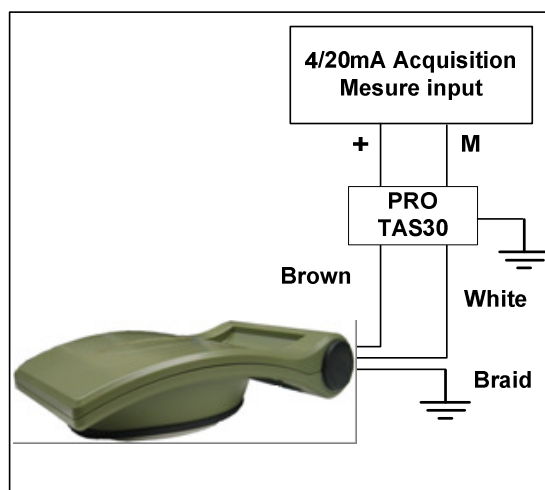
Electric ground = Braid

Examples of connections :

External power supply



Internal power supply



The use of a PRO TAS30 PARATRONIC lightning protection is imperative.

7 CONFIGURATION

7.1 SETTINGS

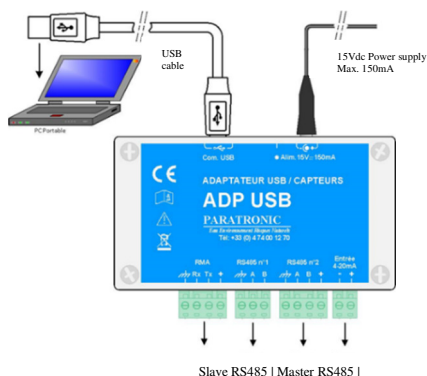
The CR420 Radar does not require configuration. Indeed, the "factory settings" enable it to be used in most hydrological situations or for carrying out measurements in vessels or tanks. In specific cases, or where it is desired to change the configuration, the **PARATRONIC** "Sensor HMI" software application provides access to certain of the CR420 radar settings to carry out the following adjustments:

- Fault time delay (240 secs. by default),
- Fault current (22 mA by default),
- Smoothing depth (30 secs. by default),
- Measurement of the level or the Level/Drawdown (vertical clearance) (Drawdown by default [=vertical clearance])
- Full scale (by default: 6 m, 10 m or 20 m according to model),
- Entry of the "Actual dimension" (application of a correction or scale offset)

7.2 TOOLS

The configuration of the CR420 radar sensor can be changed with:

- The "ADPUSB" adaptor to connect it to your PC. (Refer to dedicated manual I157F).
- The software "sensor HMI" to configure your sensor. (Refer to dedicated manual I158F).



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.pاراتronic.fr/catalogue](http://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 "Sensors HMI". Follow the instructions on the screen and refer to the "Sensor HMI" documentation I158F.

8 IDENTIFICATION



9 SAFETY SYMBOLS AND MARKINGS



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



: Read the instructions.



: 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.