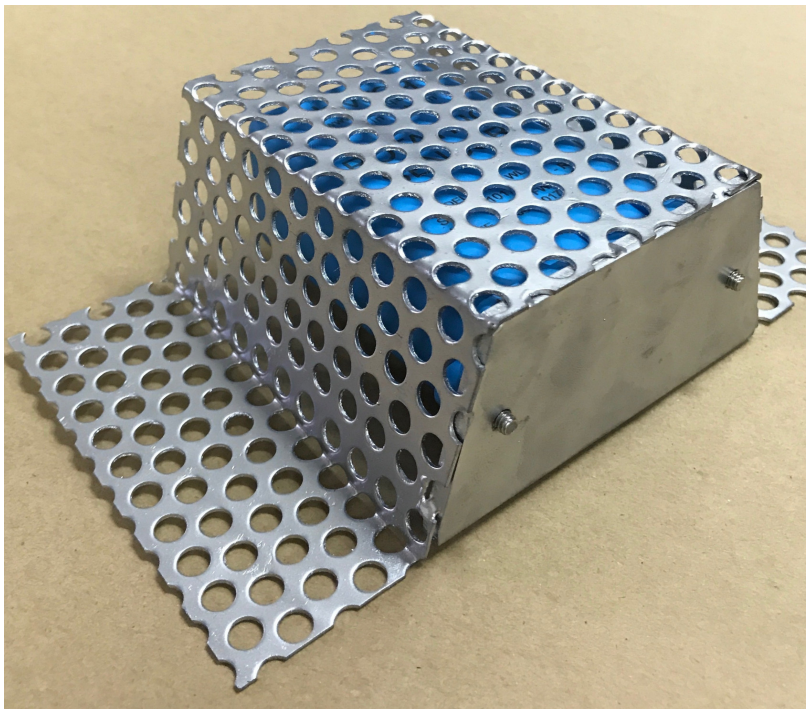
USER GUIDE FOR WIRELESS ROTATING SENSOR ROT-WL

ROT-WL-MN-EN-01	DEC-2020

This document is applied for the following products

ROT-WL

SKU	ROT-WL	**HW Ver.**	1.1	**FW Ver.**	1.0
Item Code	ROT-WL	WIRELESS SENSOR DETECTS ROTATION, AAA 1.5VDC BATTERY, IP67, C/W STEEL BRACKETS			



REC-433

SKU	REC-433	**HW Ver.**	1.1	**FW Ver.**	1.0
Item Code	REC-433	WIRELESS SENSOR RECEIVER RF433, INTERNAL ANTENNA, RS232, S2X PROTOCOL, C/W STEEL BRACKETS			



1. Functions Change Log

HW Ver.	FW Ver.	Release Date	Functions Change
1.1	1.0	DEC-2019	• Running on 2 x AAA batteries

2. Specification of ROT-WL

Data speed	Up to 50kbps
Antenna	Internal Antenna
Battery	02 x AAA 1.5VDC, working time up to 10 years (depends on configuration)
Frequency Band	ISM 433Mhz, Sub-GHz technology from Texas Instrument, USA
International Compliance	ETSI EN 300 220, EN 303 204 (Europe) FCC CFR47 Part15 (US), ARIB STD-T108 (Japan)
Vietnam Type Approval Certification	QCVN 73:2013/BTTTT, QCVN 96:2015/BTTT (EMC Compliance)
Security Standard	AES-128
Operating temperature	-40°C..+60°C
Housing	Poly-carbonate, IP67
Installation method	Welded to the agitator truck

3. Specification of REC-433

Communication	RS232
Data speed	Up to 50kbps
Antenna	Internal Antenna
Power supply	7..48 VDC
Electrical connector	Cable 7m length with PG9 cable gland
RF frequency band	Free license ISM 433.92Mhz (for others 868, 915, 920Mhz, refer related datasheets)
Ready to comply	ETSI EN 300 220, EN 303 204 (Europe) FCC CFR47 Part15 (US), ARIB STD-T108 (Japan)
Vietnam Type Approval Certification	QCVN 73:2013/BTTTT, QCVN 96:2015/BTTTT (DAVITEQ B00122019)
Security Standard	AES-128
Operating temperature	-40oC..+85oC
Housing	Poly-carbonate, IP67
Installation method	Mounted inside car’s cab, near GPS black box

4. Operation Principle of ROT-WL

4.1 Sensor wake-up cycle

- When the sensor wakes up, it will check the direction of rotation of the concrete mixing tank;
- Wake-up cycles: 5, 15, 35, and 65 seconds (depending on configuration).

4.2 Operation of sensor

If the direction of rotation changes, the sensor sends data to the RF433 Receiver. When the mixing tank stops, within **70 seconds** (maximum) the sensor sends data to the RF433 Receiver.

If the direction of rotation does not change, the sensor does not send data to the RF433 Receiver.

However, when it came to the 5-10 minutes (depending on configuration) time cycle, the direction of rotation remained unchanged. The sensor must still send data to the RF433 Receiver to ensure that it is still connected to the RF433 Receiver.

During a cycle time of 5 to 10 minutes, if the RF433 Receiver does not receive a new data packet, the RF433 Receiver will report disconnection with the sensor.

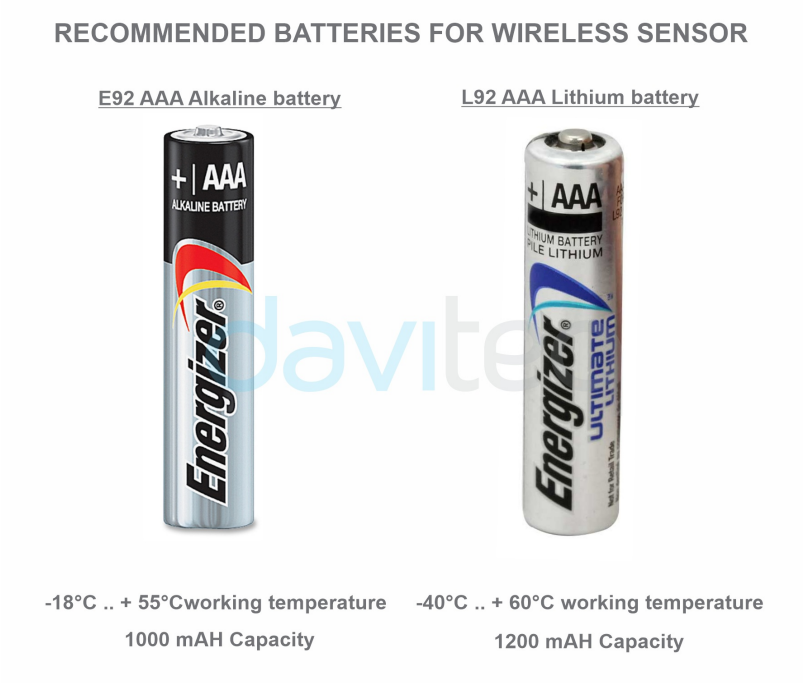
Sensor data package sent to the RF433 Receiver:

- Rotation status: stand still, turn left, right rotation
- The battery capacity of the sensor mounted on the concrete mixing tank
- Sensor board temperature
- Concussions: concussion, no concussion

> **The sensor can only accurately detect the mixing tank state of the concrete mixer**

4.3 Insert the battery

The following batteries can be used for this sensor tag.



- **Step 1:** Using L hex key to unscrew M4 screws at the side of the housing and carefully pull out the top plastic housing in the vertical direction;
- **Step 2:** Insert 02 x AAA 1.5VDC battery, please take note of the poles of the battery;

ATTENTION: REVERSED POLARITY OF BATTERY IN 10 SECONDS CAN DAMAGE THE SENSOR CIRCUIT!!!



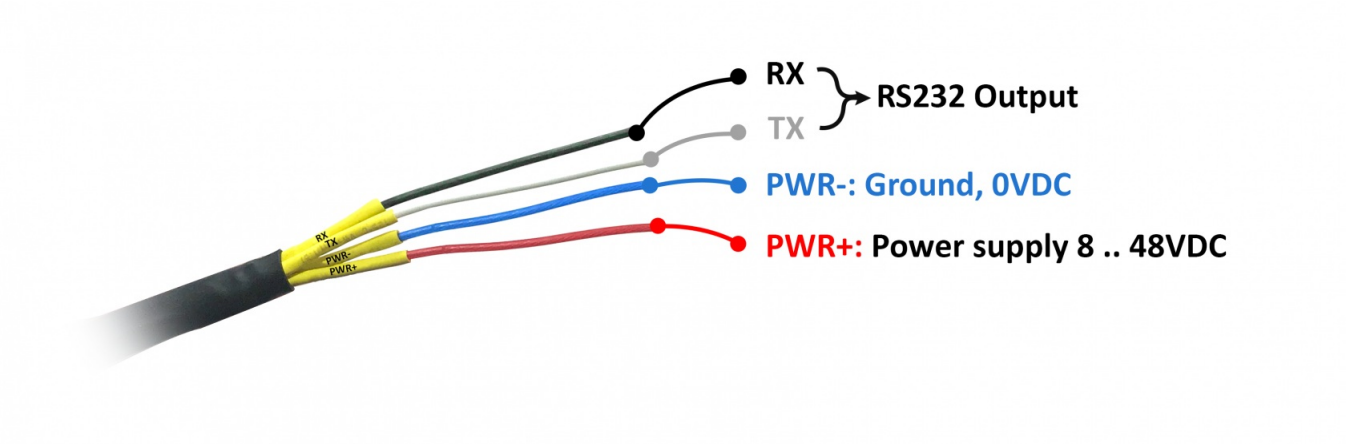
- **Step 3:** Insert the top plastic housing and locking by L hex key

5. Operation Principle of REC-433

5.1 Modbus Communication

- 01 RS232 channel, Modbus RTU protocol
- Modbus Memory Map table: READ uses command 03, WRITE uses command 16
- Address: 1 - 247, 0 is the broadcast address
- Baud rate: 9600, 19200
- Parity: none, odd, even
- Default configuration: Address 1, Baud rate 9600, Parity none, Data bit 8, Stop bit 1
- Function:
  - Configure operation parameters (for internal use)
  - Analog output S2 connected to black box

5.2 IO Wiring



Each cable includes wires which are marked labels according to types of connection. (user should not cut these labels before installation to avoid confusion).

The signal wire **Tx (REC-433)** will connect to the **Rx (Black box)** wire and vice versa.

- **Red:** PWR+(8...48VDC)
- **Blue:** PWR-(0VDC)
- **Black:** RX
- **White:** TX

The signal cable from the sensor should be protected by a corrugated hose or the Φ16 protection tube, keep the cable avoid high-temperature areas.

5.3 Datagram from Tx pin of RS232 port:

R	S	t	B
x	x	xx	xx

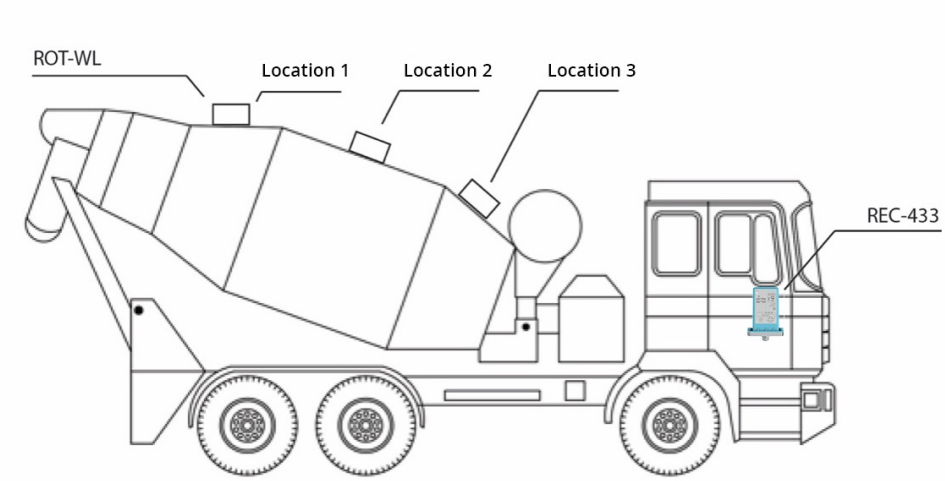
Description		Explain
R	x	Determine the three states of the mixing tank • **x = 0**: the mixing tank stands still • **x = 1** , **x = 2**: the mixing tank rotates left or right
S	x	Strong concussion detection on mixing tank used to determine sabotage • **x = 0**: no concussions • **x = 1**: concussion
t	x x	Circuit board temperature
B	x x	Sensor battery voltage

6. Installation

6.1 Installation Location

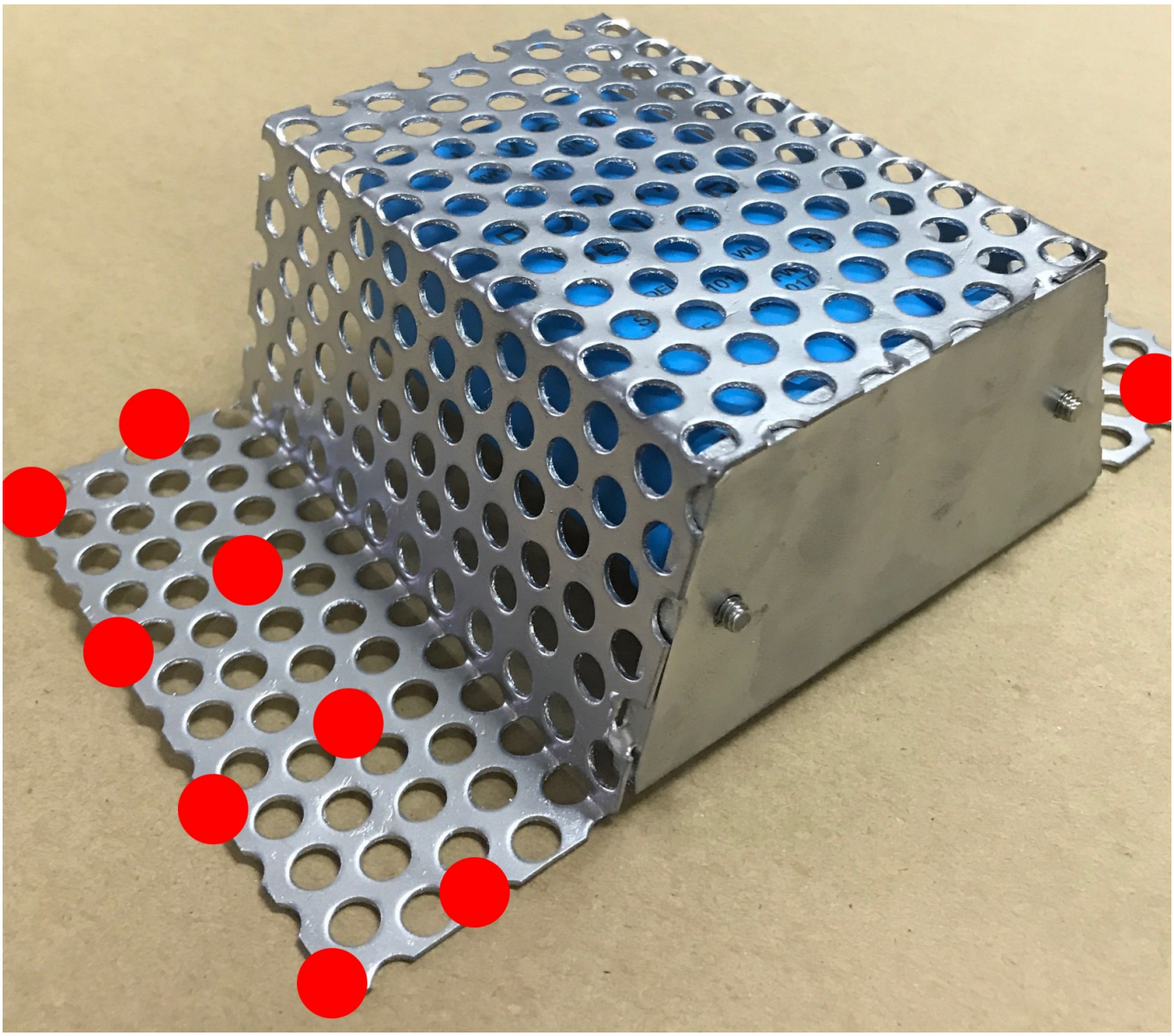
The rotary sensor is installed on the body on agitator truck. The sensor has to be installed in the right position to detect the rotation. There are three (3) ways to install as shown below:

The stainless steel base has to face to the truck's rear, all the body of the sensor has to be parallel with the truck



6.2 Installation method

- Prepare: **TIG welding machine** with accessories.
- Install: Use the welding machine to weld at points shown in the picture below. Weld on both sides of the cover.



7. Troubleshooting

No.	Phenomena	Reason	Solutions
1	Wireless sensor ROT-WL not connected to REC-433	• No power supply;	• Check that the battery is empty or not installed correctly; • Reconnect the power cord
2	Can't read Tx signal from REC-433	• No power supply; • Wrong connection of signal wire Tx and Rx.	• Check the power supply; • Reconnect the Tx and Rx wires as instructed.

8. Support contacts

Manufacturer

Daviteq Technologies Inc
No.11 Street 2G, Nam Hung Vuong Res., An Lac Ward, Binh Tan Dist., Ho Chi Minh City, Vietnam.
Tel: +84-28-6268.2523/4 (ext.122)
Email: info@daviteq.com | www.daviteq.com

Distributor in **Australia** and **New Zealand**

Templogger Pty Ltd
Tel: 1800 LOGGER
Email: contact@templogger.net

Revision #9
Created Tue, Dec 29, 2020 12:56 AM by Kiệt Anh Nguyễn
Updated Mon, Aug 30, 2021 1:40 AM by Kiệt Anh Nguyễn