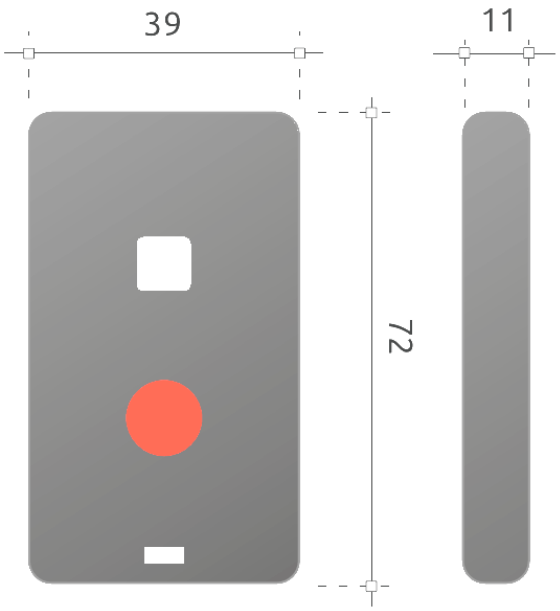
KEYFOB XTR-8LR-SOS



[measures in mm]

Main features

- **LoRa™ radiofrequency modulation**
  long range communication - low power consumption - high sensitivity - high interference immunity
- **Encrypted radiofrequency communication**
- **Automatic alarm transmission triggered by several events**
  immobility – horizontality – freefall
- **Acoustic pre-alarm warnings**
- **Suitable shaped buttons**
  manual alarm signaling - user acknowledgment of danger detection
- **Contactless power off driven by holder**

XTR-8LR-SOS is a 868MHz LoRa™ transmitter purposed to send alarm signals. It can be worn hanging around the neck or fastened to the belt. It is equipped with a red button to manually send the alarms but it can also detect by itself dangerous conditions as falls or fainting.

Coupled with a DEC-8LR-4 SOS, provides a complete solution for a security system and can remotely control loads up to 5A (e.g. horns or flashing lights).

Automatic Alarm Detecting

The device detect by itself conditions of absence of movement, man on the ground and freefall, and send messages to signal the danger situation.

To prevent false alarms there is a pre-alarm phase: during the sound of the buzzer, pressing the light gray square button for 1 second avoids sending the alarm message (a cancellation message is instead sent).

Absence of movement: the device goes in pre-alarm (intermittent sound) when stationary for 120 seconds. In case of non-deactivation, after 30 seconds radio alarm is sent.

Horizontal position detection: the device goes in pre-alarm (intermittent sound) if it remains parallel to the ground for 20 seconds. In case of non-deactivation, after 30 seconds radio alarm is sent.

Figure 1,2 - Examples of device in horizontal position

Freefall detection: the device goes in pre-alarm (continuous sound and red turned-on LED) in case of free fall (Zero-G airplane effect). Press the square button for 2 seconds to de-activate. After 10 seconds radio alarm is sent.

Buttons

Remote control is provided with two buttons:

- Smaller square light-gray - to silence pre-alarms and send an **erase message**: hold for 1 second;
- Bigger circular red - to send a **manual alarm**: hold for for 2 seconds.

Radio trasmission

Each XTR-8LR-SOS keyfob is identified by an unique serial number and, paired with devices equipped with Aurel LoRa™ receivers (XTR-8LR-DEC module), embeds a secure encrypted RF communication (learning procedure is described in each user manual of Aurel LoRa™ receiving devices).
The ideal solution is to associate it with an Aurel DEC-8LR-4 SOS receiving board, which allow to remotely activate loads (such as horns or flashing lights) when an alarm comes (as shown in table).

To ensure that system is working, the device (when not in power-down) send a **keep-alive message** every 10 minutes, the absence of it mean an anomaly to be handled.

The encrypted rolling code packet contains information about the battery level, an identifier for the occurred event, the unique serial number and a packet incremental counter.

MSB LSB

Byte 10	Byte 9	Byte 8	Byte 7	Byte 6	Byte 5	Byte 4	Byte 3	Byte 2	Byte 1
reserved	$V_{Battery}$ [2 bit]	Event [4 bit]	Serial ID [28 bit]			Encrypted counter [32 bit]			

0xE	Freefall alarm	- *Aurel DEC-8LR-4 channel 1 activation*
0xD	Movement alarm	- *Aurel DEC-8LR-4 channel 2 activation*
0xB	Horizontal alarm	- *Aurel DEC-8LR-4 channel 3 activation*
0x7	Manual alarm	- *Aurel DEC-8LR-4 channel 4 activation*
0x3	Device ON	
0x4	Device OFF	
0xA	Keep Alive	
0x8	Pre-alarm delete	

XTR-8LR-SOS is a bidirectional device, so when its RF transmission ends, it wait for an acknowledge packet, then goes back in stand-by mode. If the message has not been correctly received, the device retransmit it up to 3 times (the counter field is increased only before the first RF packet transmission).

Technical Characteristics

	Min	Typical	Max	Unit
Power supply				
Battery model		CR2430		
Supply voltage	2,4	3,0	3,3	V
Supply current: power down		2		µA
Supply current: stand-by		12		µA
Supply current: RX radio		16		mA
Supply current: TX radio		45		mA
Supply current: *average in the 24 hours of a working day**		*29*		*µA*
Supply current: *average after 10 working hours**		*68*		*µA*
Radiofrequency				
RF carrier frequency		868,300		MHz
European ISM band	868,000		868,600	MHz
Modulation type		LoRa™		
ERP: effective radiated power (tx)		6		dBm
Sensitivity (rx)		-126		dBm
Operating temperature range	-10		+55	°C

Technical features are subject to change without notice. AUREL S.p.A. does not assume responsibilities for any damages caused by the device's misuse.

Power consumption and battery replacement

To activate the device remove it from the holder: a **Device ON** radio message is sent. Now is in stand-by mode, current consumption is 4µA and increases only when occur pre-alarm phases or radio transmissions.

**Supposing to detect 3 Movement or Horizontal alarms after 10 working hours, all of them deactivated after 3 seconds of the pre-alarm phase: average consumption is 68uA. For 300 working days per year, a standard CR2430 battery with a capacity of 260mAh needs to be replaced not earlier than every 15 months.*

In the data packet is included the battery charge level, with 2 bits indicating the level below 25% 50% 75% or 100%.

When not used, the remote control must be placed inside the holder: it send a **Device OFF** message and then goes in power down mode.

To replace the battery apply the following procedure:

1. Remove the screw from the rear side of the remote control (Phillips screwdriver needed).
2. Lift up the rear cover and split the two half housing.
3. Pull out the circuit from the lower housing.
4. Pull out the battery.

Figure 2- Disassembled remote control

5. Insert the new battery, taking care to check model (type CR2032) and polarity (the positive pole must be facing up).
6. Insert the circuit from the lower housing
7. Re-join the two half housing.
8. Insert the screw on the rear side.

Firmware version summary

Release date	Firmware version	Changes from the previous version
31/01/19	1.3.8.2	First release version

User manual revision summary

Release date	User manual revision	Changes from the previous revision
01/02/19	Rev.A	Preliminary

Manufacturer's EU Declaration of Conformity

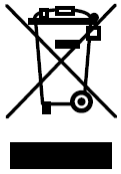
Hereby, Aurel S.p.A. declares that the radio equipment type XTR-8LR-SOS is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
http://www.aurelwireless.com/declaration-of-conformity/

The radio remote control operates at 868.3MHz (ISM frequency band 868 - 868.6 MHz) with maximum radiated power of 6dBm.
The device is a "Class 1" radio equipment as defined in article 1(1) of European Commission Decision No. 2000/299/EC of 06/04/2000. Class 1 radio equipments can be placed on the market and be put into service without restrictions on all EU member states.

CEPT 70-03 Recommendation

The device operates in a harmonized frequency band and therefore, in order to comply with current regulations, the device must be used on the time scale with a maximum duty-cycle time of 1% (equivalent to 36 seconds usage on 60 minutes).

WEEE Marking



Once the product life-span has expired, the product must be disposed of in a different way from other wastes. The user must to put the equipment at the collection points for electronic and electrical waste. Illegal disposing of this product, is punishable by law and will be dealt with according to the laws of the individual member nation of EU.