

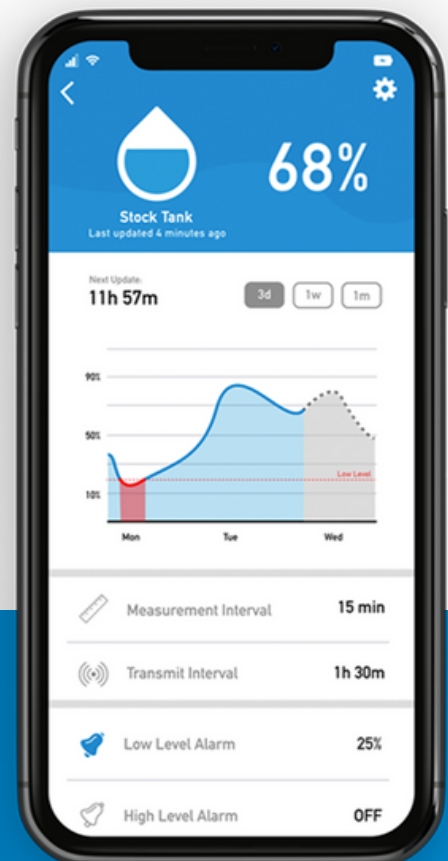


Radar Level Sensor

- Waterwatch's highest accuracy level sensor with built-in telemetry
- Can be used in open or confined spaces
- Temperature, humidity, and foam tolerant
- Reduce wasted time traveling to check or record levels

Internet Connected

- Remote access from your smartphone, tablet, or computer
- Receive notifications for high, low, and rapidly changing levels
- Manage multiple sensors and share access with others

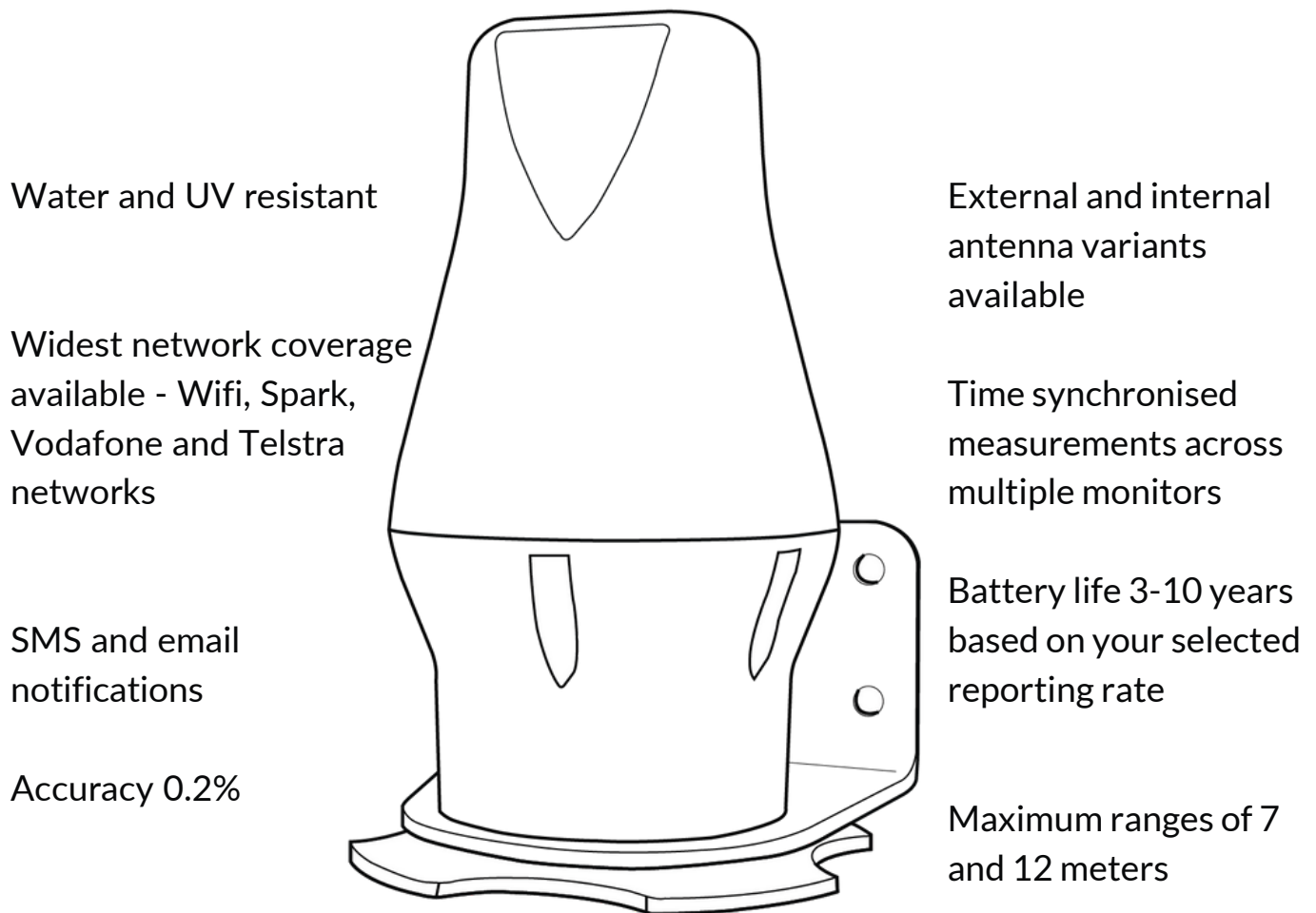


Easy installation using the handy Waterwatch mobile app



Radar Level Sensor Features

The LS1-R is a highly configurable radar-based level sensor. Designed for remote installation the LS1-R is ideal for open-channel measurements. Trusted by water utilities, city councils, regional governments, and homeowners around the world. The LS1-R is Waterwatch's flagship high-accuracy sensor designed to effortlessly monitor rivers and streams ensuring your property is protected from the unpredictability of these natural waterways.



<http://waterwatch.io>

info@waterwatch.io

Waterwatch is a Tussock Innovation brand.
Tussock Innovation 2013 Ltd,
94 Crawford St, Dunedin, 9016, New Zealand.
Tel: +64 3 477 2779

Technical Specifications

CONNECTION OPTIONS

Bluetooth Low Energy	2.4/2.483GHz:0dB
WiFi	2.4GHz:<19dB
LTE Cat M/NB-IoT	LTE Bands 3,5,8,28:<24dB ¹

ENVIRONMENT

Water and UV resistance	IP68 ⁴
Operation temperature	-20°C to +65°C ²
Recommended storage temperature	+15°C to +25°C

BATTERY

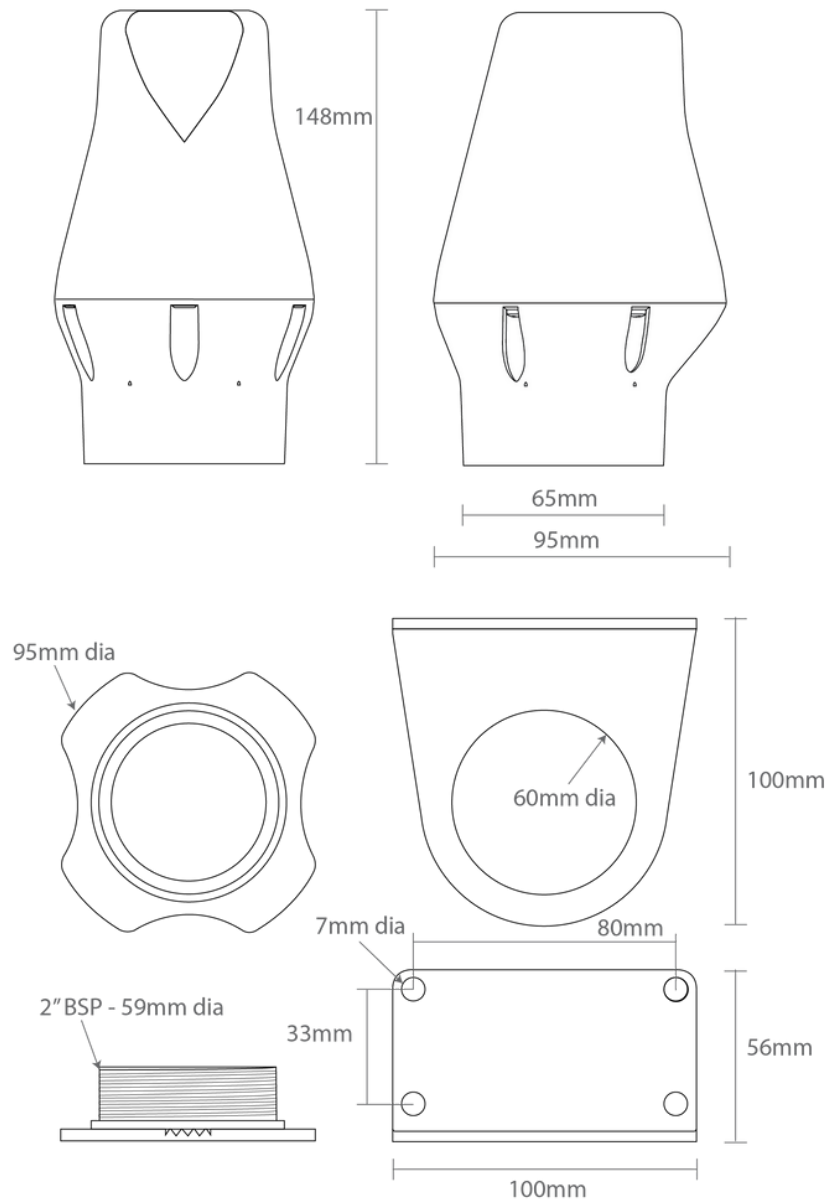
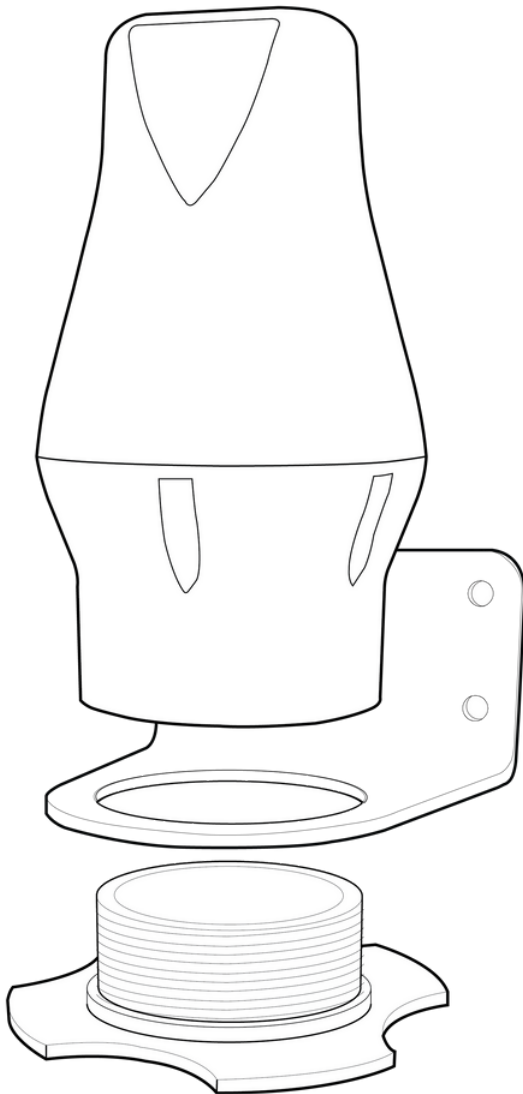
Life	3-10 years ³
Type	3.6v Lithium primary
Capacity	19Ah

MEASUREMENT

Technology	60GHz pulsed radar
Measurement range	7 or 12m
Accuracy	0.2%
Resolution	1mm
Beam pattern	10° HPBW

PHYSICAL CHARACTERISTICS

Dimensions	134x76x105mm
Weight	470g
Enclosure material	Polycarbonate + PBT
Mounting	M4 screw



PART ASSEMBLY FEATURES

Hand removable 2 inch BSP mount

Replaceable battery using screwdriver

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PART NUMBER DESCRIPTOR

LS1-CEL-EXT-R

Model [LS1]

Radio option [CEL]

External antenna option [EXT]

Sensor technology and range [R7]

level sensor

Cellular LTE M1/NB1

external antenna mount (SMA)⁴

60GHz radar 7m range

AVAILABLE PART VARIANTS

LS1-CEL-R7

cellular 7 meter range

LS1-CEL-EXT-R7

external antenna cellular 7 meter range

LS1-WIFI-R7

WiFi 7 meter range

LS1-WIFI-R12

WiFi 12 meter range

LS1-CEL-R12

cellular 12 meter range

LS1-CEL-EXT-R12

external antenna cellular 12 meter range

DATASHEET HISTORY

	DATE
Initial release	10/09/19
Update to production	15/03/20
Introduce document history	18/06/20
Branding document update	11/10/21
Increased battery capacity, changes to enclosure volume	05/05/21
Sigfox variant removed, R12 and footnotes added	31/05/22
Updated product enclosure and introduce external antenna variant	01/11/22
Update to IP68 rating	23/05/23

PART HISTORY

	VARIANT/DATE
engineering release	LS1-CEL-R-PRE 10/09/19
R7 production release	LS1-xxx-R7 15/03/20
Sigfox production halted	LS1-RCZ4-Rx 20/12/21
R12 production release	LS1-CEL-R12 05/12/21
External antenna version and WiFi product release	LS1-CEL-EXT-Rx 1/11/22

FOOTNOTES

- 1: NB-IoT restricted to band 28 in APAC countries where available.
- 2: Battery life varies based on the coverage signal strength and user-programmed device settings.
- 3: Temperatures outside of this range will reduce battery life and system performance and may damage the product.
- 4: Tested to IP68 at 4m for 4 days. Includes both internal and external antenna variants.



ABOUT WATERWATCH

Waterwatch is a Tussock Innovation brand dedicated to providing tools for better management of precious water resources and helping society adapt to a changing environment. The Waterwatch system generates insights for scientists, farmers, and municipalities via a blend of elegant, functional, and robust hardware and software.

Launched in September 2019 the LS1-R radar level sensor is the most recent product in the Waterwatch portfolio and is the first IoT-based product of its type globally. Designed for long-term field deployment the LS1-R tracks level changes with a highly accurate 60GHz radar. This non-invasive, non-corrodible sensor allows the LS1-R to be deployed in a broad range of installation types from water and other liquids to solids. User control of the LS1-R is provided via native iOS, Android, and Web apps. Sensor data is communicated directly to the web and used to provide time-critical alerts and level storage information. The Waterwatch system enables third-party vendors to provide value-added insights like delivery requests and vehicle route optimisation via secure third-party API and Webhook access.

