Topcon CR-S1

Capture reality with unmatched speed and flexibility.

The Topcon CR-S1 combines MLF-SLAM (multiple localization fusion–SLAM), VSLAM (visual SLAM), and RTK-SLAM technologies. This integrated approach delivers stable, centimeter-level accuracy - even in areas where GNSS signals are weak or unavailable - by leveraging LiDAR, visual, IMU, and RTK data. High-fidelity point clouds and real-time colorized imaging ensure actionable results in a single workflow, minimizing return visits and rework.

» Capture data on the move with a truly portable solution.

» Simplify your workflow from field capture to final processing.

» Achieve survey-grade accuracy without the need for extensive setup.

» Scan diverse environments, from dense forests to urban canyons.

» Integrate seamlessly with Topcon software for a complete solution.

System Parameters

Absolute Accuracy	<3 cm (1.18 in.) [1]
Relative Accuracy	<1 cm (0.39 in.) [2]
Repeat Accuracy	<2 cm (0.79 in.) [3]
Horizontality/Verticality	<0.015° [4]
Power Supply Method	Lithium Battery Powered
Battery Capacity	3450 mAh
Single Battery Life	2 h [5]
Weight	2.2 kg (4.85 lbs) (with base, battery, and RTK module)
Dimensions	345×187×120 mm (13.58x7.36x4.72 in.)
Protection Level	IP64
Storage Capacity	512 GB SSD
Port	USB-C
Control Method	APP, Button
Firmware Upgrade Method	OTA, Offline
Operating Temperature	-20 °C to 40 °C (-4 °F to 104 °F)
Device Storage Temperature	-40 °C to 70 °C (-40 °F to 158 °F)
Battery Storage Temperature	Recommended Storage Temperature: 22 °C to 30 °C (71.6 °F to 86 °F) [6]

LiDAR Sensor Parameters

Laser	XT16
Scan Rate	320,000 pts/s
LiDAR Accuracy	0.5 cm (0.20 in.)
Safety Level	Class 1 (Eye-safe)
Laser Wavelength	905 nm
Detection Range	120 m (393.70 ft)
Field of view	Horizontal 280 ° , Vertical 360°

Camera Parameters

Number of Cameras	5
Visual SLAM camera	1.3MP×2
Panoramic Camera	12MP ×3
Frame Rate	Adjustable

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RTK Parameters

Satellite Systems	BDS B1I, B2I, B3I, B1C, B2b GPS L1C/A, L2C, L2P(Y), L5 GLONASS G1, G2 Galileo E1, E5a, E5b, E6 QZSS L1C/A, L2C, L5 SBAS L1C/A
Channels	1408
RTK Differential Protocol	NTRIP
RTK Accuracy	Horizontal: 0.8 cm (0.31 in.) + 1 ppm Vertical: 1.5 cm (0.59 in.) + 1 ppm
Differential Data	RTCM V3.X
RTK Data Format	.rtk

IMU Parameters

Output Frequency	200 Hz
Post-Processing Attitude Accuracy	Roll/Pitch: 0.003°, Heading: 0.01°
Post-Processing Position Accuracy	Horizontal: 0.005 m (1.97 in.), Vertical: 0.01 m (3.94 in.)

Mapping Method

Mapping Principles	MLF-SLAM, PPK-SLAM, RTK-SLAM, SLAM
Real-Time Colorization	Supported
Real-Time Processing	Supported

Output Specifications

Colored Point Cloud	LAS
MESH	LOD-OSGB
Panoramic Image	JPG

Telescopic Pole Adapter

Weight	300 g (0.66 lbs)
Supported Telescopic Pole Diameter	25-25.5 mm (0.98-1.00 in.) [7]

Frontpack Kit Parameters

Weight	2.1 kg (4.63 lbs)
Outer Packaging Dimensions	560×340×160 mm (22.05x13.39x6.30 in.)

Backpack Kit Parameters

Weight	3.9 kg (8.60 lbs)
Dual battery power display	Supported
Dimensions	580×303×145 mm (22.83x12.99x5.71 in.)
Hot Swap	Supported

[1,2] Deviations may occur in some scenarios.

[3] Two scans with GNSS, with GNSS disconnection not exceeding 100 meters.

[4] Requires measurement of absolutely horizontal and vertical objects such as building walls and interiors.

[5] Battery life tested at 20 °C without camera recording or RTK connection.

[6] -20 °C to 45 °C for <1 month; -20 °C to 35 °C for >1 month.

[7] Only supports the outer diameter of the telescopic part in the range of 25-25.5 mm for RTK telescopic poles; The locking device does not support RTK telescopic poles with a protruding circular ring on the top contact surface.

Learn more at **topconpositioning.com**

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