SingularXYZ SingularXYZ-E1(1+1)

SingularXYZ E1 RTK GNSS Survey Equipment User Manual

Model: SingularXYZ-E1(1+1)

1. Introduction

The SingularXYZ E1 RTK GNSS Survey Equipment is a high-precision positioning system designed for land surveying, navigation, and various geospatial applications. This manual provides detailed instructions for setting up, operating, and maintaining your E1 system to ensure optimal performance and longevity.

1.1 What's in the Box

The E1 RTK GNSS Survey Equipment package includes the following components:

- E1 GNSS Receiver (x2)
- Transport Case (x2)
- USB-Type C Cable (x2)
- Super Charger (x2)
- Quick Start Guide (x1)
- Quick Start Card (x1)
- SC200 Data Collector (x1)
- USB cable (for SC200) (x1)
- Super Charger (for SC200) (x1)
- Bracket (x1)
- SingularPad Software (x1)
- Whip Antenna (x2)
- Tape Measure (x1)
- 20 cm extension rod plugged on tribrach (x1)
- Tribrach (x1)

Figure 1.1: Overview of the E1 RTK GNSS Survey Equipment and its main components.

Figure 1.2: Detailed breakdown of the E1 Base and Rover components, including adapters, software, and data collector.

2. Product Features

The E1 RTK GNSS Survey Equipment is engineered with advanced features to provide reliable and accurate surveying capabilities:

- **High Precision:** Achieves centimeter-level precision measurement with low power consumption.
- **IMU Integration:** Supports tilt measurements up to 60° with quick initialization (5 seconds).
- **Extended Range:** Radio range between rover and base can reach up to 5 kilometers (3.1 miles).
- **Full-Constellation Tracking:** Supports GPS, GLONASS, Galileo, BDS, QZSS, IRNSS, SBAS for robust signal acquisition in challenging environments.
- **Versatile Connectivity:** Features NFC (Touch connection), Bluetooth, USB Type-C, WiFi, TNC Connector,

and RS232 Serial Port.

- **Long Endurance:** 6700mAh battery provides over 20 hours of continuous operation.
- **Durable Design:** IP68 rated for waterproof and dustproof protection.

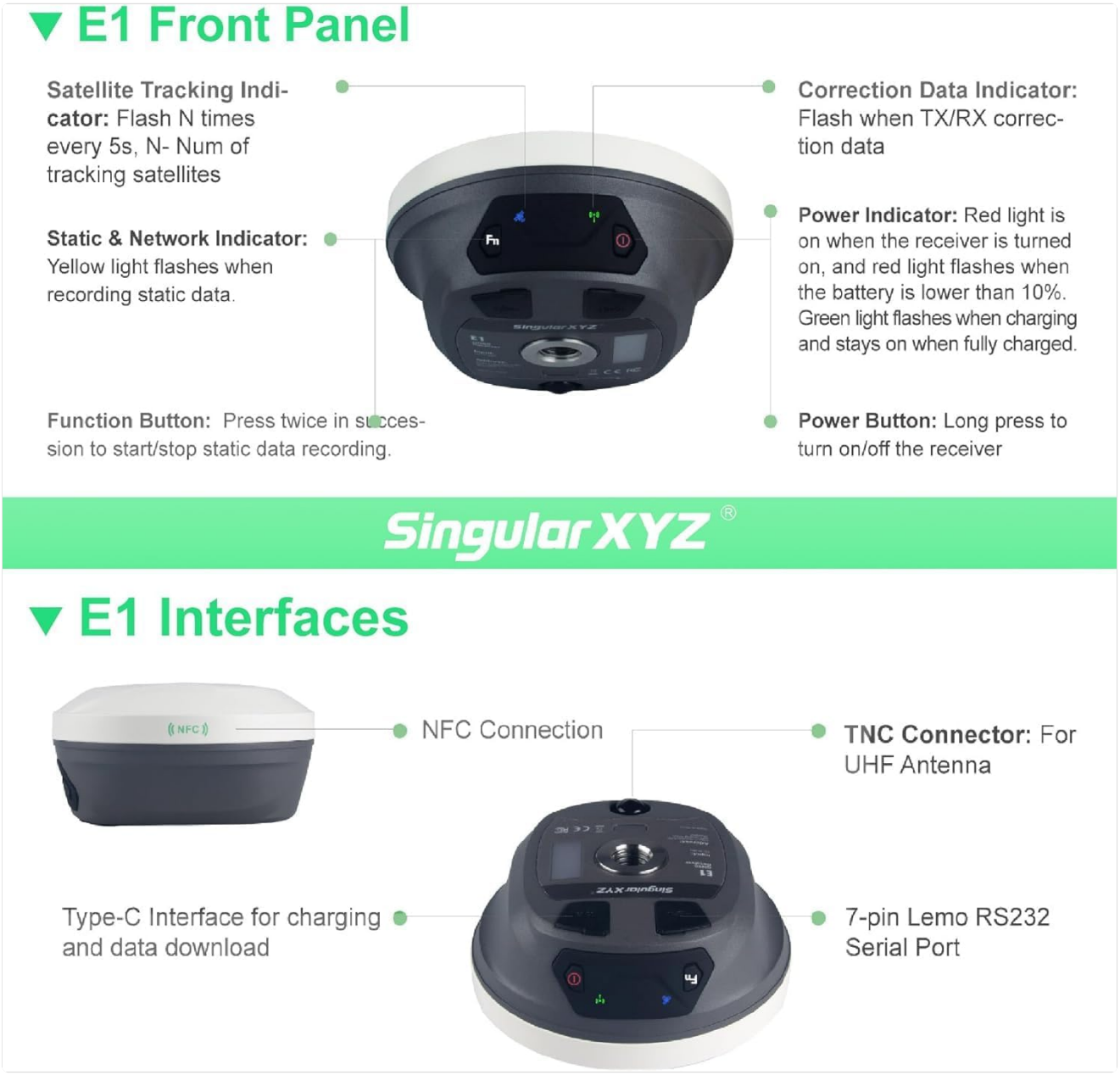


Figure 2.1: Key features of the E1 receiver, including NFC one-touch connection, compact size, easy data download via Web UI, and fast charging capabilities.

Figure 2.2: Detailed view of the E1 receiver's front panel indicators (Satellite Tracking, Static & Network, Correction Data, Power) and various interfaces (NFC, Type-C, TNC, RS232).

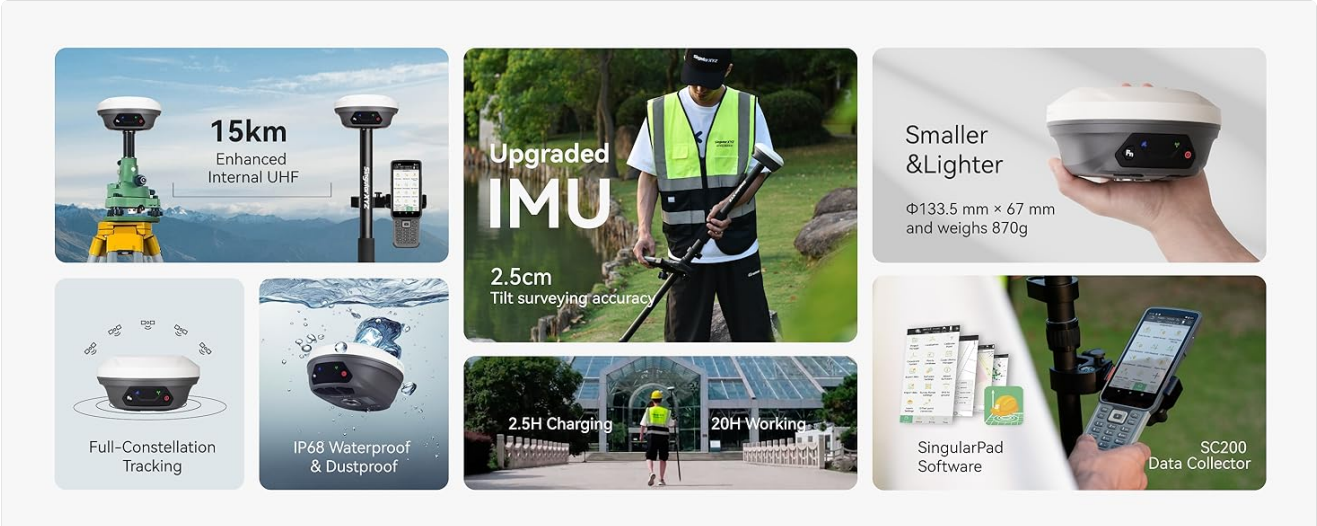


Figure 2.3: Information on the SC200 Data Collector, highlighting its Android OS, processor, RAM, storage, sunlight-readable screen, and integrated connectivity.

SC200 Data Collector

Android 11 OS, 8-core 2.0GHz CPU, 4GB RAM, and 64GB internal storage, compatible with third-party field software.

Featuring a 5.5” sunlight-readable touch screen and integrated 4G/WiFi/Bluetooth.

*This product don't include a pole, tribrach, or tripod.

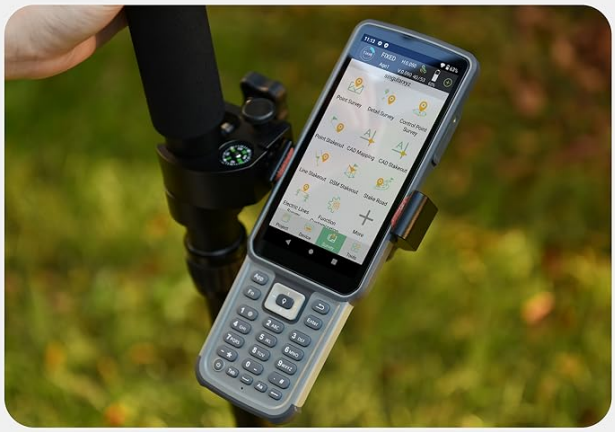


Figure 2.4: The E1's Web UI allows for easy static data download, firmware upgrades, and configuration via WiFi.

Figure 2.5: A comparative overview of the E1's specifications against typical industry alternatives, highlighting its advantages in channels, trans-range, IMU, battery life, and material protection.

3. Setup

3.1 Device Connection

Connecting your GNSS device to the SingularPad software is crucial for operation. Follow these steps:

1. Turn on your GNSS device.
2. On the data collector, navigate to**Device >> Communication**.
3. Select the appropriate device manufacturer and type (e.g., SingularXYZ >> RTK >> Bluetooth for SingularXYZ RTK Receivers, or Other >> RTK(NMEA0183) >> Bluetooth for other brands, or Other >> Internal GPS for SingularXYZ GNSS Tablets).
4. Search for your device's serial number (SN) and connect.
5. After connection, you can view current device information by going to**Device >> Device Information**.

Your browser does not support the video tag.

Video 3.1: Singular Software Tutorial - Device Connection. This video demonstrates the process of connecting your GNSS device to the SingularPad software.

3.2 Working Modes

The E1 system supports two primary working modes:

- **Base + Rover (Radio/UHF):** This mode is compatible with base stations from other brands and is not subject to network and regional restrictions.
- **Rover + CORS (NTRIP):** This mode requires a CORS account (purchased from your local CORS provider) and a network signal.

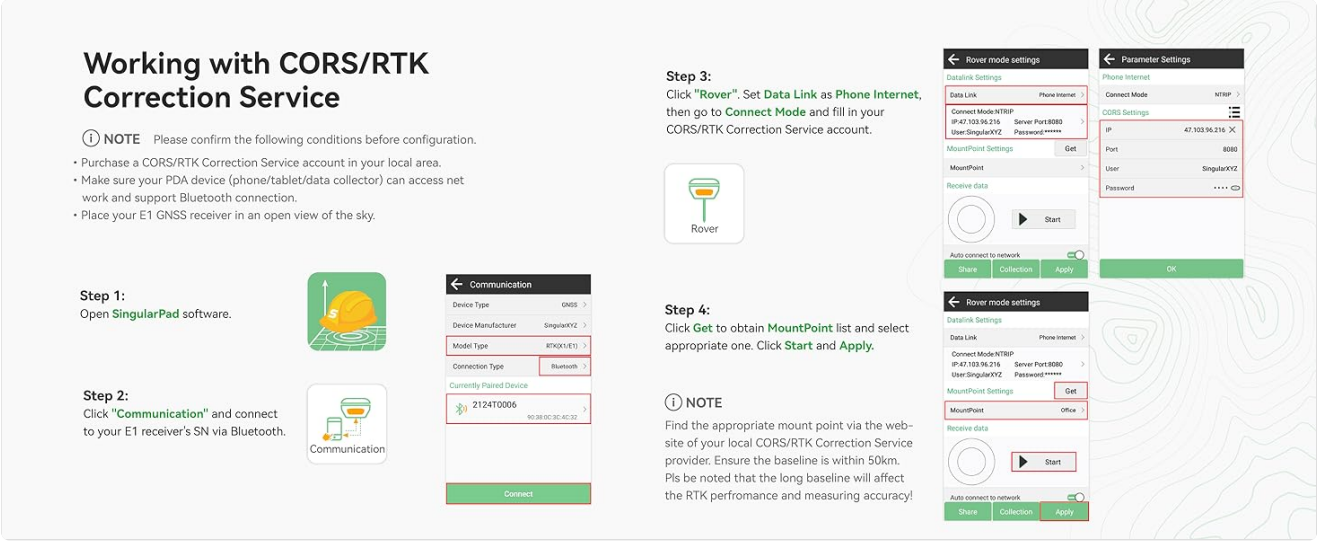


Figure 3.1: Illustration of the two main working modes for the E1 RTK GNSS system: Base + Rover using radio/UHF and Rover + CORS using NTRIP.

4. Operating Instructions

4.1 SingularPad Software Usage

The SingularPad software provides a comprehensive interface for managing projects, collecting data, and performing various surveying tasks. It offers features like project management, coordinate system settings, point database, and various survey methods.

Figure 4.1: The SingularPad software interface, designed for ease of use with functions like one-click fixation, road stakeout, and power line survey.

Figure 4.2: A flowchart illustrating the quick start workflow for E1 surveying, from creating a new project to exporting data.

4.2 Tilt Surveying

The E1 system features IMU technology allowing for tilt surveying up to 60 degrees with high accuracy and fast initialization.

Figure 4.3: The E1's capability for tilt surveying, showing measurements at various angles up to 60 degrees with 1cm accuracy and 5-second fast initialization.

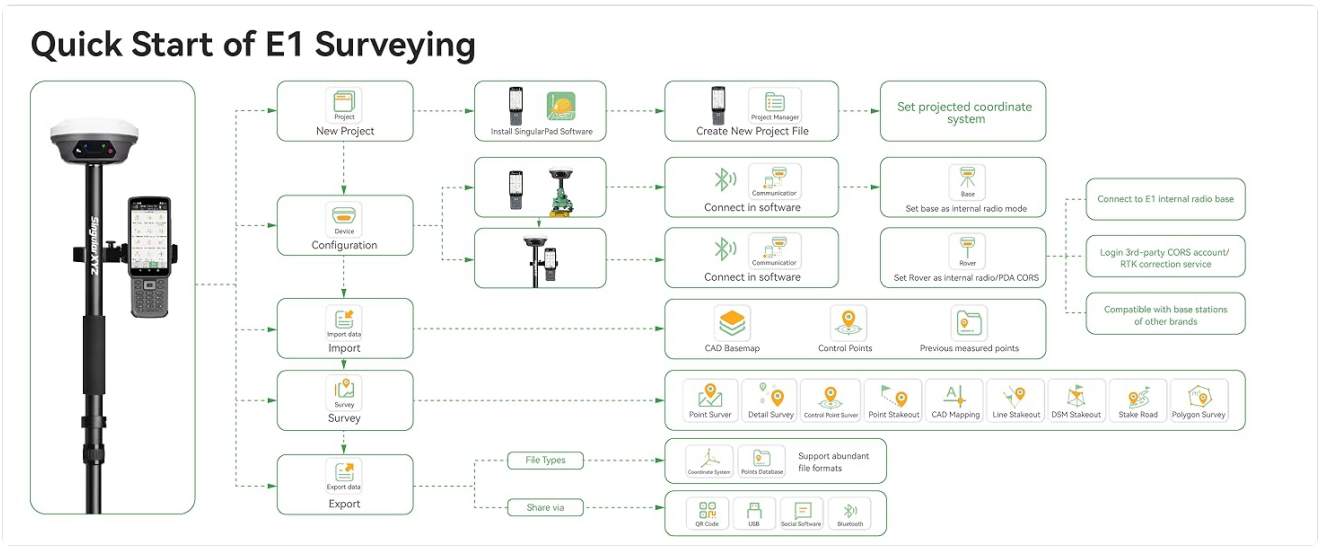


Figure 4.4: The E1 system's ability to measure with up to 60° tilt, providing ±2.5cm accuracy for tilt surveying.

4.3 Working with E1 Rover + Base

To configure the E1 system for Rover + Base operation:

- Ensure you have two E1 GNSS receivers, designating one as the base and the other as the rover.
- Connect them separately to your PDA device via Bluetooth.
- Place both your E1 base and rover in an open view of the sky.
- Connect the whip antenna to both E1 base and rover.

Setting up the Base:

1. Connect E1 base to your PDA, go to **Device >> Base**.
2. For **Base Startup Mode**, you can input known point coordinates to setup, or select **Single Point** mode for automatic setup.
3. Set **Datalink** as Internal Radio, and customize radio channels, frequency, and protocol according to your needs.
4. Save settings and **Start Base**. The status bar will become Base.

Setting up the Rover:

1. Connect E1 base to your PDA and connect to the rover in the software.
2. Go to **Device >> Rover, set Data Link** as Internal Radio.
3. Match and set the same protocol and frequency as the base setting.
4. Click **Collection** to save settings and click **Apply**.

Figure 4.5: Step-by-step guide for setting up the E1 as a Rover and Base, including software interface screenshots for configuration.

4.4 Working with CORS/RTK Correction Service

To use the E1 system with a CORS/RTK Correction Service:

- Purchase a CORS/RTK Correction Service account in your local area.
- Ensure your PDA device (phone/tablet/data collector) can access network and support Bluetooth connection.
- Place your E1 GNSS receiver in an open view of the sky.

Steps:

1. Open SingularPad software.
2. Click "Communication" and connect to your E1 receiver's SN via Bluetooth.
3. Click "Rover" >> Set Data Link as Phone Internet, then go to **Connect Mode** and fill in your CORS/RTK

Correction Service account details.

4. Click **Get** to obtain MountPoint list and select appropriate one. Click **Start** and **Apply**.

Note: Find the appropriate mount point via the website of your local CORS/RTK Correction Service provider. Ensure the baseline is within 50km. Be noted that the long baseline will affect the RTK performance and measuring accuracy.

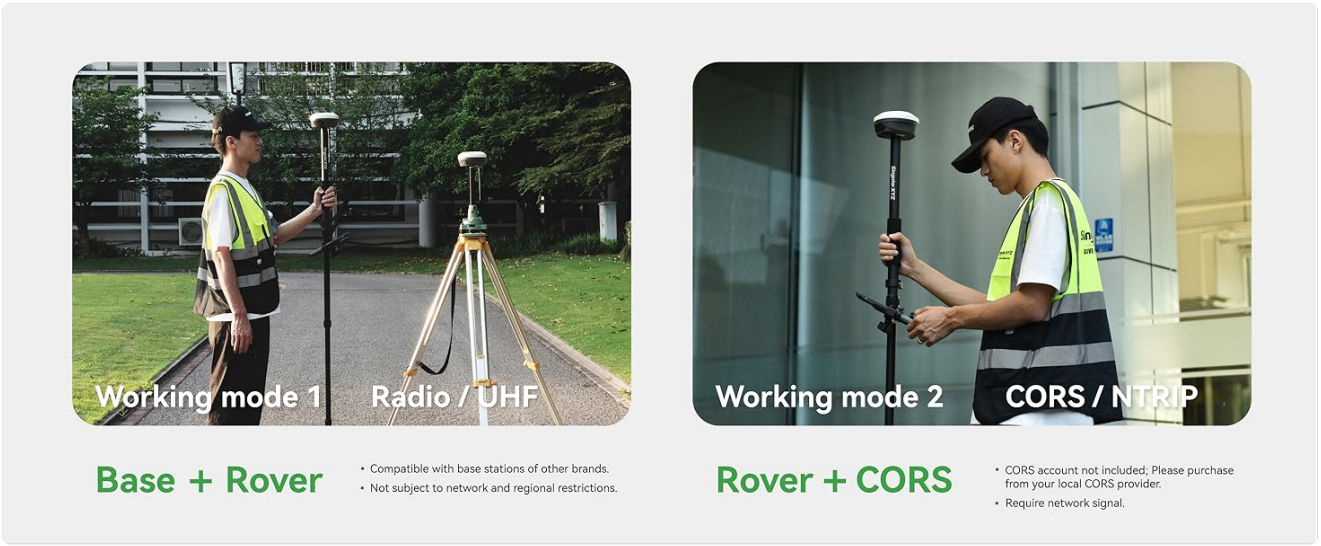


Figure 4.6: Guide for configuring the E1 system to work with a CORS/RTK Correction Service, including software interface screenshots for connection and settings.

5. Maintenance

5.1 Battery and Charging

The E1 RTK GNSS receiver is equipped with a 6700mAh battery, providing over 20 hours of continuous operation. It supports fast charging via its Type-C port.

- **Charging Time:** Approximately 3.5-4 hours for a full charge.
- **Operating Time:** Over 20 hours on a single charge.

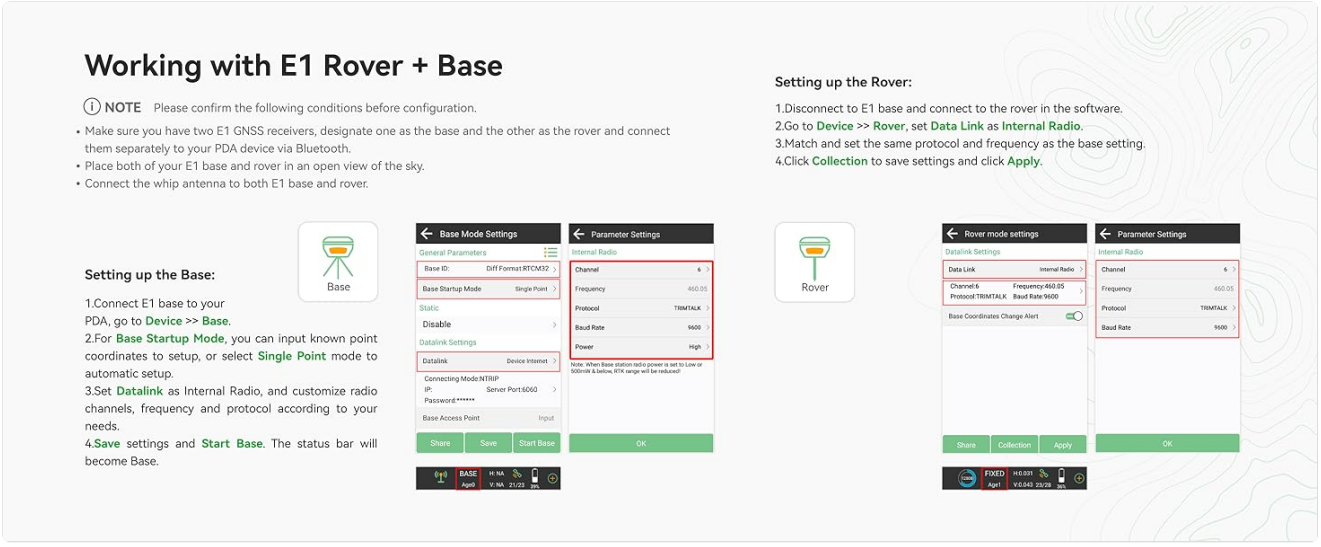


Figure 5.1: Information on the E1's battery performance, indicating 3.5-4 hours for fast charging and over 20 hours of continuous working time.

5.2 Cleaning and Storage

To maintain the device's performance and extend its lifespan:

- Regularly clean the device with a soft, damp cloth. Avoid harsh chemicals.
- Ensure all ports are free from dust and debris.
- Store the equipment in its transport case in a dry, cool place when not in use.
- The E1 is IP68 waterproof and dustproof, but avoid prolonged submersion or exposure to extreme conditions.

6. Troubleshooting

This section addresses common issues you might encounter with your E1 RTK GNSS Survey Equipment. For more complex problems, please refer to the support section.

6.1 Common Issues and Solutions

Problem	Possible Cause	Solution
Device not connecting via Bluetooth	Bluetooth is off; device not discoverable; incorrect device selected.	Ensure Bluetooth is enabled on both devices. Make sure the E1 is in pairing mode. Select the correct device SN from the list.
No RTK fixed solution	Poor satellite visibility; incorrect base/rover setup; no correction data.	Move to an open area with clear sky view. Verify base and rover settings (frequency, protocol). Check CORS connection or radio link.
Short battery life	Battery not fully charged; old battery; extreme temperatures.	Ensure full charge before use. Consider battery replacement if old. Operate within recommended temperature ranges.

7. Specifications

Detailed technical specifications for the SingularXYZ E1 RTK GNSS Survey Equipment:

Specification	Value
Item Weight	18.3 pounds
Product Dimensions	2.64 x 2.64 x 5.26 inches
Item Model Number	SingularXYZ-E1(1+1)
Batteries	3 Lithium Ion batteries required (included)
Display Size (SC200)	1 Inches (for E1 receiver indicators), 5.5 inches (SC200)
Battery Life	20 Hours

Specification	Value
Voice Command	Keyboard
Model Name	E1 GNSS RECEIVER (IMU)
Special Feature	Bluetooth, NFC, Waterproof (IP68)
Connectivity Technology	Bluetooth, Ethernet, USB, Wi-Fi
Map Type	Worldwide
Audio Output Mode	Digital
Mounting Type	Handlebar Mount (for data collector)

8. Warranty and Support

SingularXYZ is committed to providing excellent customer service and support for your E1 RTK GNSS Survey Equipment.

8.1 Warranty Information

The E1 RTK GNSS Survey Equipment comes with a**one-year warranty** from the date of purchase.

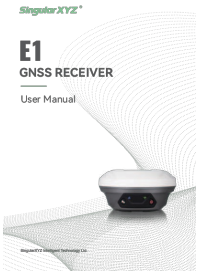
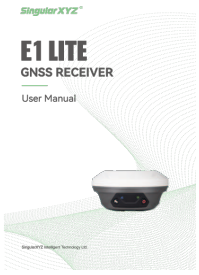
8.2 Technical Support

SingularXYZ offers **lifetime technical support** for the E1 system. Our skilled and professional after-sales team is available to help you resolve any issues promptly and effectively. We provide complete user manuals and video tutorials to assist you in getting started and troubleshooting.

Figure 8.1: The SingularXYZ after-sales technical support team, dedicated to providing professional assistance.

For support, please visit the official SingularXYZ website or contact our customer service team through the provided channels in your product documentation.

Related Documents - SingularXYZ-E1(1+1)

	SingularXYZ E1 GNSS Receiver User Manual Comprehensive user manual for the SingularXYZ E1 GNSS Receiver, detailing setup, RTK and static survey workflows, data collection, calibration, and export features for professional surveying applications.
	SingularXYZ E1-Series GNSS Receiver: Quick Start Guide A concise guide to setting up and using the SingularXYZ E1-Series GNSS Receiver, covering package contents, product features, workflow, and warranty information for high-precision surveying tasks.
	SingularXYZ L1 Laser GNSS Receiver Quick Start Guide Comprehensive quick start guide for the SingularXYZ L1 Laser GNSS Receiver, detailing package contents, product features, software integration, RTK and static surveying methods, and warranty information for surveyors.
	SingularXYZ Sfaira ONE GNSS Receiver User Manual This user manual provides comprehensive instructions for the SingularXYZ Sfaira ONE GNSS Receiver. It covers setup, connection via SingularPad and SingularSurv, surveying techniques, stake-out procedures, and integration with GIS software like Qfield. Learn to maximize the performance of your GNSS RTK rover.
	ORION ONE GNSS Receiver User Manual User manual for the SingularXYZ ORION ONE GNSS Receiver, detailing its features, setup, RTK workflow, surveying, and stakeout procedures using SingularPad software.
	SingularXYZ E1 Lite GNSS Receiver User Manual User manual for the SingularXYZ E1 Lite GNSS Receiver, detailing its features, RTK workflow, data collection, static survey, web UI, and troubleshooting for surveyors.