

G1-LoTus™



PRODUCT DESCRIPTION AND FIELD OPERATION

Quick Guide

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Definition

G1-LoTus™ GNSS System is a differential positioning system utilizing a reference station to yield cm-level positional accuracy.

Purpose

This guide covers basic components and quick operation of the G1-LoTus™ GNSS System to precisely survey and stakeout points in the field. Data collector is optional and is not covered in this guide. Third-party data collector such as Survey-Master and Field-Genius may be used to operate the G1-LoTus™ GNSS system.

Audience

This guide is intended for G1-LoTus™ GNSS system users. Basic knowledge of GPS, GIS, and surveying and mapping terminology is presumed.

1. System Components

A complete G1-LoTus™ GNSS System is composed of the following main components:

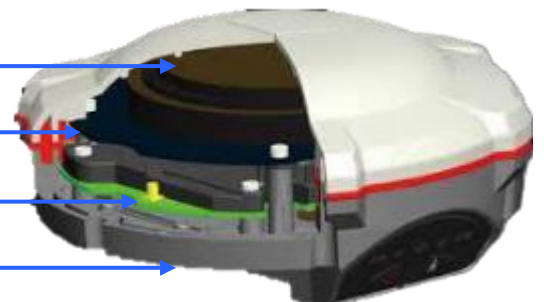


1. GNSS multi-frequency multi-constellation receiver and built-in antenna as a source of satellite signal for positioning and navigation

2. Graduated survey Rod with quick-release bracket, compass, and levelling bubble

3. Data collector communicating with the receiver

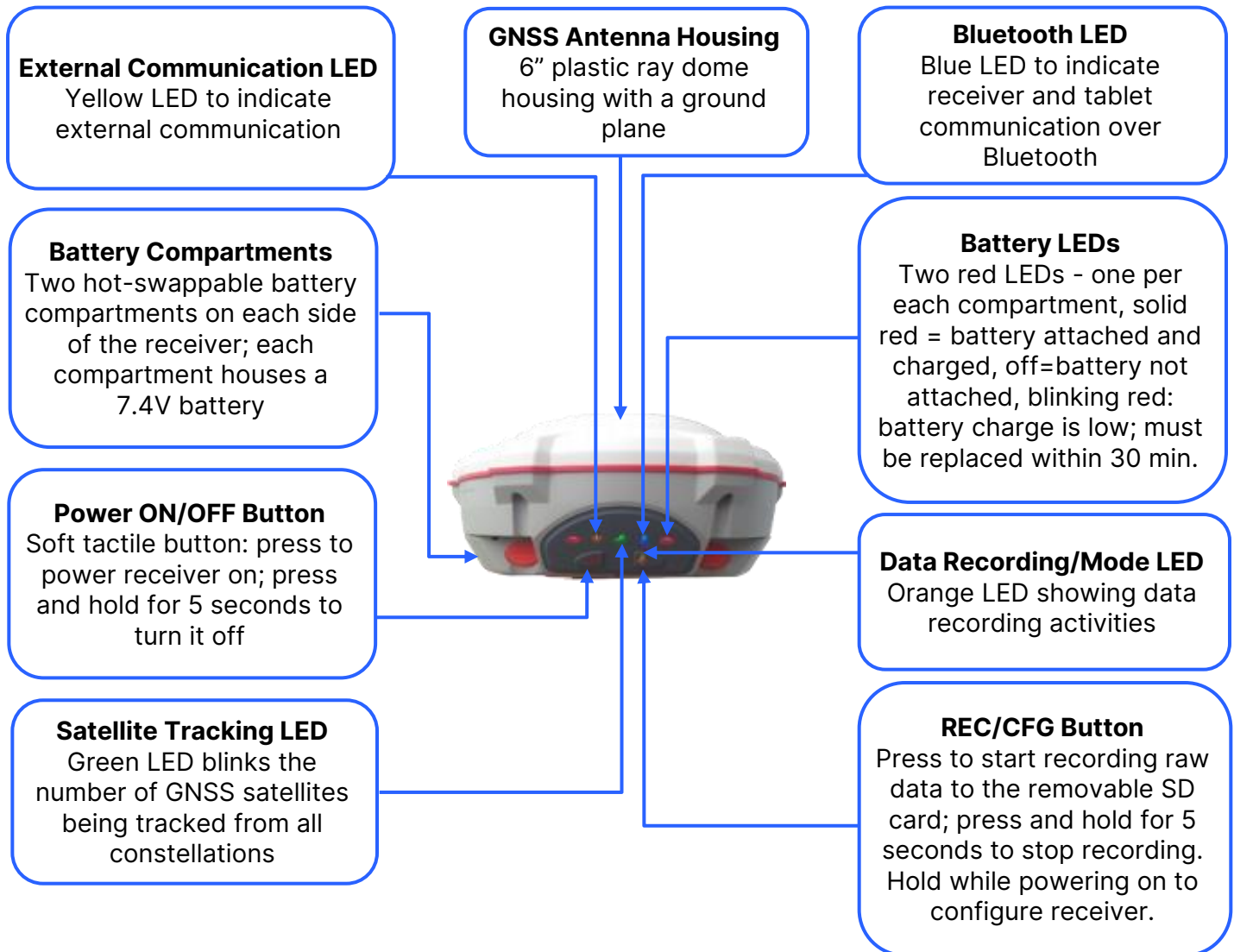
- GNSS OEM Antenna
- EM Shield
- GNSS Receiver
- Power Source (Battery)



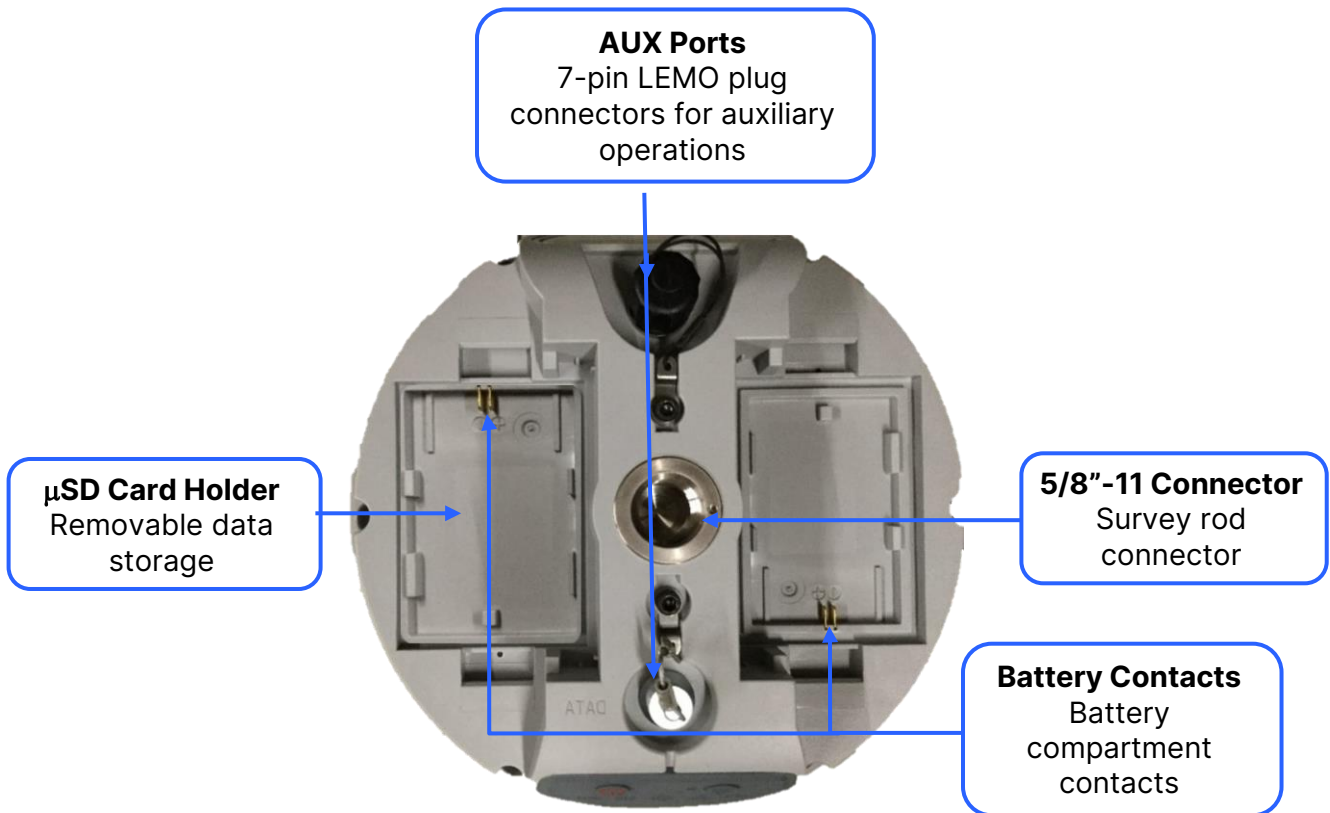
2. System Interface

Five LEDs and two button indicators on the G1-LoTus™ smart antenna cover all system activities.

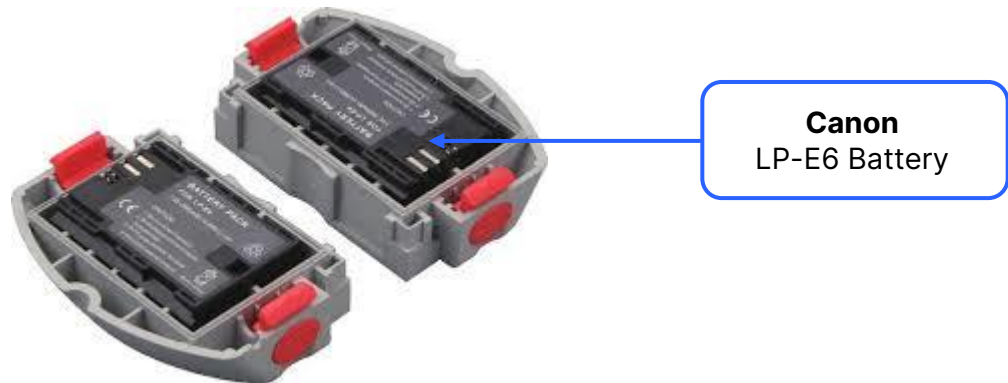
2.1. Smart Antenna Interface











G1-LoTus™ smart antenna Front View



G1-LoTus™ smart antenna Bottom View



G1-LoTus™ smart antenna Battery Compartment

Battery Compartments	Two hot-swappable battery compartments on both sides of the smart antenna; each compartment houses 7.4V battery
 Power ON/OFF Button	Soft tactile button: press to power receiver on; press and hold for 5 seconds to turn it off
 Battery LEDs	Two red LEDs - one per each compartment, solid red = battery attached and healthy, off=battery not attached, blinking red: battery is unhealthy and must be replaced within 30 min.
 External Communication LED	Yellow LED to indicate external communication with outside source
 Satellite LED	Green LED blinks the number of GNSS satellites being tracked from all constellations
 Bluetooth LED	Blue LED to indicate receiver and tablet communication over Bluetooth
 Record Button	Press to start recording raw data to the removable SD card; press and hold for 5 seconds to stop recording
 Data Recording LED	Orange LED showing data recording activities
 AUX Port 5/8"-11 Connector AUX Port	7-pin LEMO plug connector for auxiliary operations 5/8"-11 survey rod connector 7-pin LEMO plug connector for auxiliary operations
GNSS Antenna Housing	6" plastic ray dome housing with a ground plane

3. Operation

The following is a brief description of how to operate the LoTus™ GNSS Base/Rover system.

Note: make sure system batteries are charged before heading out to the field

3.1. Starting and Stopping the G1-LoTus™ System

1. Secure LoTus™ smart antenna to the survey rod using the 5/8"-11 connector either by screwing it directly in or by using the quick release (QR) connector



Rod connected without QR



Rod connected with QR

Note: if used, the QR attachment adds 0.100 m to the overall rod height.

2. Use the tablet QR bracket to attach the data collector to the survey rod



Portrait View



Landscape View

Note: the tablet bracket rotates clockwise about an axis normal to the tablet plane to render a landscape view; counterclockwise rotation will render portrait view back

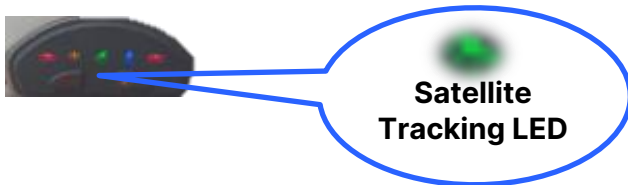
3. Switch receiver power on by tapping on the receiver power button



4. Switch the data collector tablet power on by **pressing and holding** its power button for 5 seconds; watch for the data collector booting

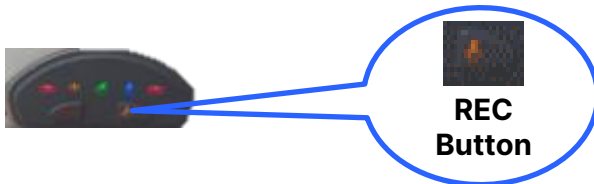


5. Watch the satellite LED on the **receiver interface** as it tracks and blinks the number of GNSS satellites in view



Note: it may take up to 45 seconds to get a full scan of all GNSS satellites in view

6. As the GNSS receiver tracks satellites, the data collector tablet will have booted and the whole system is ready for operation
7. You may also press the "REC" button on the LoTus™ receiver interface to record a backup copy of the rover raw observations on the removable micro-SD card



Bluetooth Pairing

LoTus™ receiver connects to the data collector over Bluetooth. In order to pair the receiver and the data collector over Bluetooth, follow the onscreen instructions.

4. G1-LoTus™ Mode Button Operation

This section describes how to configure the G1-LoTus™ receiver in the field by using the Mode Selection Button (REC Button).

4.1. Mode Selection Button

The REC Button  acts two functions:

a. REC Button

After powering the receiver on and seeing the green tracking LED blink more than four satellites, press the REC Button to start recording raw data to the removable SD card. To stop recording, press and hold the REC Button for 3 seconds until the LED goes off.

Note: The orange LED shows data recording activities in this case

b. Mode Selection Button

To enter to the Mode Selection Mode (receiver configuration mode), press and hold the REC Button while powering the receiver on. Once the orange LED goes on, release the REC Button in which case it blinks several times a second. The receiver is now in configuration mode. To select a mode, do the following:

1. Press and release the REC Button as many times as the mode number, e.g. three presses and releases to select mode number three
2. Wait for about 5 seconds until the orange LED blinks the number you entered; the orange LED blinks three times to announce mode three is entered, indefinitely
3. To **cancel** the mode entered, press and hold the REC Button until it goes back to fast blinking (selection mode)
4. To **accept** the mode entered, press and release the REC Button quickly; the MCU executes the selected mode and then goes back to fast blinking (selection mode)
5. Repeat steps 1 to 4 to execute another mode

Note: *in the mode selection case, the orange LED shows the entered mode; no data recording is possible. Recycle power on the receiver to go to normal operation (as opposed to configuration) mode to collect data*

4.2. Button Selection Modes

a. Mode 1: Save Configuration

Use this mode with the GURU (Geomatics Universal Receiver Utility) utility connected to the receiver over Bluetooth as follows:

- Set the receiver in configuration mode by holding the REC Button while powering on
- Connect the data collector running the GURU software utility to the receiver via Bluetooth
- Pass the configuration parameters to the receiver via GURU

Note: do not power the receiver off before finishing all steps

- Now, press and release the REC Button once to enter mode 1
- After the MCU announce the entered mode, press the REC Button to accept the selection and save the GURU entered configuration parameters into the receiver

b. Mode 2: Set Static Base (1 Hz raw data rate)

Use this mode to set the raw data rate to 1 Hz (once per second). This is useful for static data collection sessions on Ground Control Points (GCPs). It is also useful for Stop-and-Go survey sessions.

c. Mode 3: Set PPK Base (10 Hz raw data rate)

Use this mode to set the raw data rate to 10 Hz (ten times per second). This is useful for data collection on base stations used in UAV PPK sessions.

d. Mode 9: Reset EEPROM for the day

Only 260 files per day can be stored on the micro-SD card. Use this mode to reset the filename counter to start at A1.

e. Mode 13: Execute custom commands in file GUSA.TXT on the micro-SD card

This mode is meant for custom commands. The MCU reads commands inside of file GUSA.TXT on the micro-SD card and executes them one by one.