SOKKIA

GCX3

GNSS Receiver

Operator's Manual

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GNSS Receiver
Operator's Manual

Part Number 1016293-01

Revision B

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February, 2017

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Preface

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> ℹ️ Please read the terms and conditions carefully.

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Manual Conventions

This manual uses the following conventions:

Convention	Description	Example
Bold	Menu, or drop-down menu selection	**File ▶ Exit** (Click the **File** menu and click **Exit**)
	Name of a dialog box or screen	From the **Connection** screen...
	Button or key commands	Click **Finish**.
Mono	User supplied text or variable	Type guest, and click **Enter.**
Italic	Reference to another manual or help document	Refer to the *Topcon Reference Manual.*

Further information to note about system configuration, maintenance, or setup.

Supplementary information that can have an adverse effect on system operation, system performance, data integrity, measurements, or personal safety.

Notification that an action has the potential to result in system damage, loss of data, loss of warranty, or personal injury.

Introduction

The Sokkia GCX3 receiver (Figure 1) is a compact, lightweight, and completely integrated GNSS receiver for static and cable-free stop and go/kinematic applications. The integrated receiver design includes a GNSS receiver board, based on industry-leading technology, internal long-life batteries, memory storage, and Long-Range Bluetooth communication technology. The GCX3 delivers world-class positioning and navigation capability to your application by tracking signals from multi-constellation satellite systems, including GPS, GLONASS, Galileo, BeiDou, and SBAS (Table 1).

The GCX3 includes Sokkia's exclusive Long-Range Bluetooth Technology, which provides the perfect solution for short range job sites that require RTK communication. The GCX3 can be paired with a cellular-enabled data collector to receive corrections from an Ntrip Caster for rover operation. This setup can also be used with MAGNET^TM Relay for a cost effective RTK base solution over long distances. The MAGNET Relay configuration enables you to operate up to three (3) GCX3 rovers with a single GCX3 receiver.

The GCX3 offers complete IP67 protection against dust and water ingress, in addition to superior vibration and shock resistance. The Sokkia communication interface enables you to quickly integrate Sokkia's premium GNSS performance within new systems and quickly deliver world-class positioning and navigation support to your applications.

Figure 1: GCX3 Receiver

Acronyms and Terminology Used in this Operator's Manual

Table 1. Acronyms, Terminology and Definitions

Acronym/Terms	Definition/Description
DGPS	Differential Global Positioning System—DGPS augments standalone GPS positioning by using modeled corrections to improve location accuracy.
GNSS	Global Navigation Satellite System
IP67	IEC Standard 60529—describes complete Ingress Protection (IP) against dust and water submersion.
MINTER	A membrane switch overlay with LED indicators and or soft keys. Sometimes referred to as a front panel or an interface.
Ntrip	Networked Transport of RTCM via Internet Protocol (Ntrip)—a protocol for streaming differential GPS (DGPS) data over the Internet in accordance with specification published by RTCM.
OAF	Option Authorization File—An OAF is used in software to lock or unlock features specific features to the user.
RTK	Real Time Kinematic—is a differential GNSS technique that provides high performance positioning in the vicinity of a base station.
SBAS	Satellite-Based Augmentation System—SBAS supports wide-area or regional augmentation through the use of additional satellite-broadcast messages. Such systems are commonly composed of multiple ground stations, located at accurately-surveyed points.
SRU	Sokkia Receiver Utility—SRU software is used to configure GNSS antennas and radios.

GCX3 Features

The GCX3 receiver's advanced design eliminates the need for cables during operation, allowing for a simplified setup and less parts to keep track of. The GCX3 receiver features the following:

- Compact, lightweight, and rugged design

- A premier multi-constellation GNSS board featuring industry leading technology

- Integrated multi-channel Long-Range Bluetooth Technology

- Internal memory for data storage

- One internal battery, providing all day operation under normal operating conditions

- A highly visible display panel with single-button operation

- One USB port for communications and power

You can configure the GCX3 receiver in a variety of ways, depending on your project requirements. Typically, the receiver supports the following operation modes.

- Static/post-processing data collection

- Job site RTK using Long-Range Bluetooth Technology

- Network Rover for DGPS and RTK operation

- MAGNET Relay operation

- SBAS-enabled operation

Unpacking Your Receiver Kit

This section describes the documentation, standard kit components, and accessories (depending on your purchase) that accompany your receiver. When you unpack your receiver kit, verify you received the items listed in this section. Make sure the items do not appear damaged from shipment. If any of the items are missing or damaged, contact your Sokkia dealer or Sokkia technical support. See "Getting Technical Support" on page 4.

- Receiver components are shown in Figure 2.

- Receiver documentation is listed in "Technical Documents" on page 4.

System Components

The items shown Figure 2 in are shipped with your receiver.

| Power Charger | Adapter Wall Folding Clip Kit | GCX3 Receiver | Micro AB USB Cable | GCX3 LED Card |

Figure 2: System Components

Utility software for the GCX3 receiver may be downloaded from the Sokkia support website. Go to http://www.sokkia.com/, select your region, and then select the Sokkia Care tab.

Technical Documents

The *GCX3 GNSS Operator's Manual* —is designed to help you set up and use your new receiver quickly and efficiently. You can download a digital copy of the *GCX3 GNSS Operator's Manual* from the Sokkia support website.

- *GCX3 GNSS Operator's Manual* —An on-screen help document that contains detailed information on how to use your new receiver.

    Go to http://www.sokkia.com, select your country or region, select the Sokkia Care tab. Select your GNSS receiver.

- *Sokkia Receiver Utility Software*—This software contains On-screen help that contains detailed information on how to use the SRU software.

    Go to http://www.sokkia.com, select your region, and then select the Sokkia Care tab. Select SRU - Sokkia Receiver Utility, select Updates for the type of system you have (PC, Mobile).

- *GCX3 Reference Card* —Included in the package, describes the operation and functions of the Display Panel LEDs.

Using Sokkia Receiver Utility Software with Your Receiver

Use the GCX3 receiver in conjunction with the Sokkia Receiver Utility (SRU) Software and the MAGNET Field applications for a cable-free positioning solution. Using Sokkia software, you can configure the receiver and other external devices, manage files, collect data, and perform survey and construction work flows.

The Sokkia Receiver Utility (SRU) is a hardware configuration software utility for receivers and peripheral devices. You can install it on desktop computers and data controllers. You can download the SRU software from the Sokkia support website.

Go to http://www.sokkia.com, select your region, and then select the Sokkia Care tab. Select SRU - Sokkia Receiver Utility, select Updates for the type of system you have (PC, Mobile).

SRU Online Help is also embedded in this software.

Sokkia's MAGNET Field software for data controllers provides real-time communication, cloud storage, data collection and exchange, and field solutions, such as topo, staking, roads, calculations, and more.

MAGNET Relay is a GNSS correction service hosted by the MAGNET Solution. With a subscription to MAGNET Relay, you can connect the GCX3 Cellular receiver to the Relay service (via cellular-enabled data collector) and use it as a Base for up to 10 Rovers. Contact your Sokkia dealer for more information about the Sokkia software described above.

Getting Technical Support

Before contacting a Sokkia customer representative about any problems with the receiver, see "Troubleshooting" on page 35.

For technical support, contact your local Sokkia dealer or Go to http://www.sokkia.com/, select your region, and then select the Contact Us.,

When contacting Sokkia for technical assistance, provide the following information for better and faster service.

1. A description of the following:

    a. Field operation that was being performed when the problem occurred.

    b. Details of the unexpected behavior, symptoms, and any error messages that precede or follow the problem.

    c. Problem occurrence frequency or patterns

2. Receiver information and configuration settings. For receiver information, click **Information in SRU**, select **Save to File**, enter a file name, and save it to the computer.

3. Specifications of mobile devices and computers used in the field or office exhibiting the problem. These specifications should include model information, version number, operating system information, memory and storage capacity, etc.

4. Information about the system software, including the version number and steps to reproduce the problem.

5. A description of the field environment and/or observation conditions when the problem occurred.

Website

On the Sokkia website (www.sokkia.com), you can download manuals, technical documentation, training material, and various other utility software to help you set up and use the GCX3 receiver. The website also offers registration resources, training, and technical assistance.

For additional information go to www.sokkia.com and select Sokkia Care.

Getting Acquainted

Receiver Overview

The GCX3 receiver enclosure is fully sealed and incorporates the GNSS receiver board, innovative POST (Precision Orbital Satellite Technology) antenna element, integrated battery, internal memory storage, and Sokkia's Long-Range Bluetooth Technology.

The upper portion of the receiver contains GNSS antenna and antennas for Long-Range Bluetooth communication enclosed by the radome.

Radome—A structural weatherproof enclosure used to protect radar antenna.

An easy-to-operate display panel, mounting socket, and labels with receiver information are located on the bottom of the receiver's aluminum alloy lower enclosure.

The GCX3 receiver has a highly-visible display panel with single-button operation. The display panel enables you to view the receiver's operational status. See "Display Panel Operations" on page 19.

The mounting socket (Figure 3) connects the receiver to either a standard 5/8"-11 thread pole or adapter.

Locate regulatory and product identification information on the two receiver labels. The product identification label contains the serial number and part number along with a Quick Response (QR) matrix code.

Scan the QR code with any QR code application on a smart phone for product information or go to http://www.sokkia.com, select your country or region, select the Sokkia Care tab.

Cable and Adapters

The GCX3 package includes a Micro-AB USB cable for power and data transfer. Table 2 describes the cable and adapters included with your receiver.

All power related accessories (power adapter, Micro-AB USB cable) with the Product are provided by Topcon. Use of any non-authorized accessories will void the warranty and all service contracts, and transfer all liability to the user.

Table 2. Receiver Cable and Adapters

Descriptions	Illustration
Micro-AB USB Cable P/N: 1013602-01 Connects the receiver to an external device (controller or computer) for data transfer, receiver configuration, and to a power adapter for charging the internal battery. **Note:** Sokkia recommends using this supplied cable with your receiver for more stable communication and charging.	
AC/DC Desktop Wall Adapter P/N: 1005518-01 Charges the receiver when connected to a grounded outlet and the power charger cable.	
Wall Adapter Folding Clip Kit P/N: 1005519-01 Power adapters for use in different countries including the UK, Australia, and Europe. **Note**: Wall adapter folding clip kit is not required to be added on this adapter for use in the USA.	
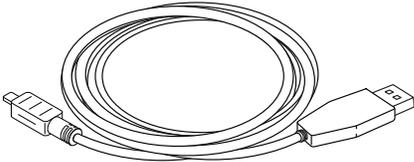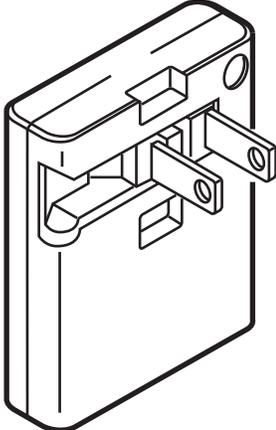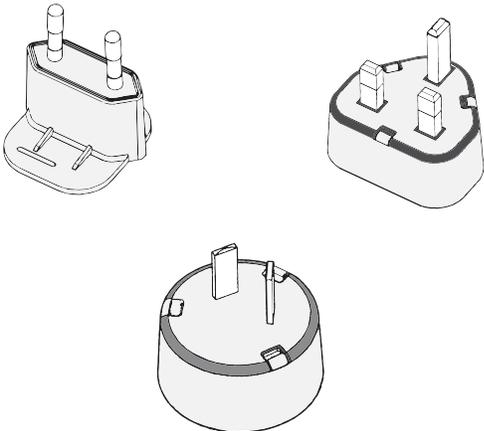
Drivers

A 32-bit or 64-bit Windows driver is required. See "Before You Begin Configuring the Receiver" on page 19.

Memory

The GCX3 is equipped with an internal, non-removable memory card that provides up to 8 GB of data storage. As data is logged to the receiver's memory, the REC LED displays the memory capacity status. See "Recording and Memory LED (REC)" on page 14 for more information.

To access the raw data files in the receiver's internal memory, see "Record Data" on page 33.

Internal Battery

The GCX3 receiver was designed with one internal, non-removable battery. When fully charged, the battery provides all day operation in any job configuration. The battery is easily charged using a Micro-AB USB cable. See "Internal Battery" on page 16.

Long-Range Bluetooth Technology

The GCX3 receiver integrates Long-Range Bluetooth Technology that enables multiple (up to 3) cable-free connections to a single GCX3 receiver. This enables Long-Range Bluetooth Technology operation for base/rover RTK systems. You can also connect the receiver to other Class 1 and Class 2-enabled Bluetooth devices (such as data collectors and computers) using Bluetooth wireless technology concurrently with Long-Range Bluetooth connections.

Sokkia's Long-Range Bluetooth Technology enables communication of RTCM3 differential corrections between two GCX3 receivers over Bluetooth (up to 300 meters), eliminating the need for additional external radios for corrections. See "System Setup" on page 30.

Distance for long-range largely depends upon environmental and field conditions.

Micro-AB USB Port Panel

The receiver is equipped with a Micro-AB USB port for high-speed data transfer and communication between the receiver and an external device, for charging the internal battery, and for powering the receiver with an external power supply. See "Using Internal and External Power Sources" on page 16.
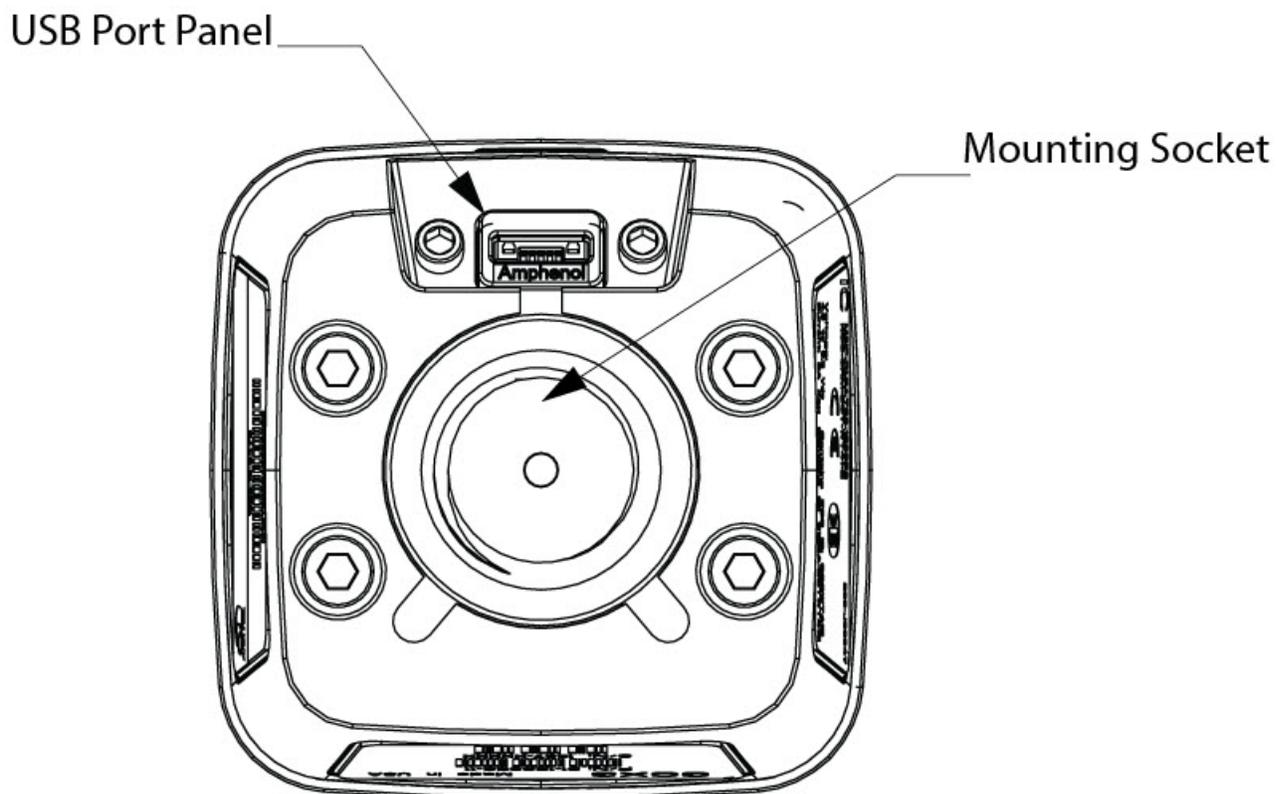

Figure 3: Micro-AB USB Port Panel

Display Panel Operations

The LED display panel provides controls for receiver power and data recording. The LEDs display the status of satellite tracking, recording/memory capacity, Long-Range Bluetooth Technology connections, and battery status.
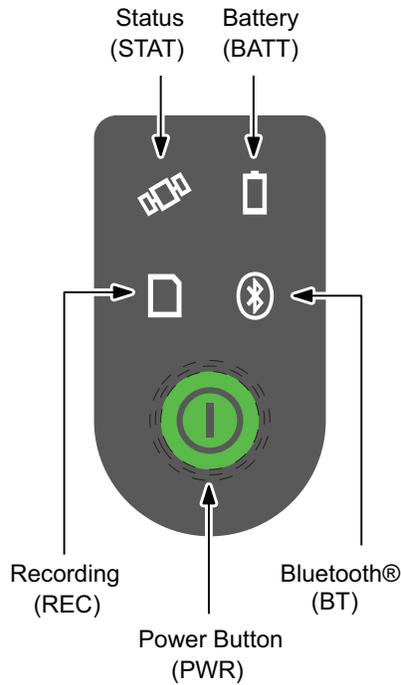

Figure 4: LED Display Panel

LED Icon Key

Table 3. LED Icon Key			
	Solid	**Blinking**	**OFF**
Display			

Power Button (PWR)

The green power button performs multiple functions. The duration in which the button is pressed and held determines how the receiver will function. While pressing the button, the LED Display panel indicates the selected operation for specific LEDs.

Table 4. Power Button Functions

Function	Press and Hold Power Button	Description
Receiver Powered **ON**	2+ seconds	**Battery LED (BATT) Internal Power Only**—solid red, or solid orange, or solid green. The Battery LED is solid red if battery capacity < 15%, solid orange if battery capacity is > 15% but < 50% solid green if the battery capacity > 50%. See Table 8, "Battery LED Blink Patterns—RECEIVER IS POWERED ON/INTERNAL BATTERY IN USE" for additional information. **Recording and Memory LED (REC)**—blinks red, blinks yellow, blinks red, and finally solid green. See Table 6 for additional information. **Satellite Tracking LED (STAT)**—blinks red until a satellite is tracked by the receiver. See Table 5 for additional information. **Bluetooth Communication LED (BT)**—blinks blue until a Bluetooth connection is established. Once a BT connection established, the LED turns solid blue. See Table 7 for additional information.
		Battery LED (BATT) External Power Applied to Receiver—See Table 8, "Battery LED Blink Patterns—RECEIVER IS POWERED ON/EXTERNAL POWER SOURCE CONNECTED TO RECEIVER" for additional information. **Note**: When the battery is at full charge the Battery LED will display a solid green LED. **Recording and Memory LED (REC)**—blinks red, blinks yellow, blinks red, and finally solid green. See Table 6 for additional information. **Satellite Tracking LED (STAT)**—blinks red until a satellite is tracked by the receiver. See Table 5 for additional information. **Bluetooth Communication LED (BT)**—blinks blue until a Bluetooth connection is established. Once a BT connection established, the LED turns solid blue. See Table 7 for additional information.

Table 4. Power Button Functions

Function	Press and Hold Power Button	Description
Receiver **Powered OFF**	3–10 seconds	**Battery LED Internal Power Only**—turns solid red until Power Button is released. Once the Power Button is released the Battery LED is **OFF.** See Table 8, "Battery LED (BATT) Blink Patterns—RECEIVER IS POWERED OFF/INTERNAL BATTERY IN USE" for additional information. **Recording and Memory LED (REC)—OFF**, **Status LED—OFF**, **Bluetooth LED—OFF**
		Battery LED (BATT) External Power Source Connected—if the receiver is powered off and an external power source is applied, the Battery LED **blinks** green and begins charging. **Note**: When the battery is at full charge the Battery LED will display a solid green LED. See Table 8, "Battery LED (BATT) Blink Patterns—RECEIVER IS POWERED OFF/EXTERNAL POWER SOURCE CONNECTED TO RECEIVER" for additional information.
Factory Reset **Clear NVRAM**	10–15 seconds	All LEDs are **OFF**. Release the Power Button when Status LED is solid **red**.
Erase All Files	15–20 seconds	All LEDs are **OFF**. Release the Power Button when Recording LED is solid **red**. **Note:** This action is irreversible. If unsure about these actions, continue to hold down the button until all LEDs return to normal.
Hardware Shutdown/Reset	More than 35–50 seconds	Shuts down power of all internal components of the receiver. This function is only recommended when the receiver goes into **Exception** mode. This operation does not affect internal memory or receiver settings.
Open/Close Data File	Three times in a row within 2 seconds	The data file opens in **Static** mode. While the file is open, press the power button 2 times in a row within 1 second to switch back and forth between **Static** and **Dynamic** modes. To close a data file, press the power button 3 times in a row within 2 seconds. *Refer to the Recording LED description.*

Receiver Status LEDs

There are four receiver LEDs on the Display Panel. These LEDs display information about:

- GCX3 Satellite Tracking Status (STAT)

- GCX3 Recording and Memory (REC) activity and capacity,

- GCX3 Bluetooth (BT) wireless connectivity status activity,

- GCX3 Battery (BATT) charge level

Satellite Tracking Status (STAT) LED

Table 5 below describes the behavior of the Satellite Tracking Status (STAT) LED.

The STAT LED displays number and type of satellites that the receiver is tracking.

Table 5. Satellite Tracking Status (STAT)—LED Blink Patterns

Display		Description
	GREEN	One blink per tracked GPS satellite.
	YELLOW	One blink per tracked GLONASS satellite.
	CYAN	One blink per tracked GALILEO satellite.
	MAGENTA	One blink per tracked BEIDOU satellite.
	BLUE	One blink per tracked QZSS satellite.
	RED	One blink per second when there are no tracked satellites.

Recording and Memory LED (REC)

The recording and memory LED (REC) indicates if data is being written to memory and displays how much memory the receiver has available for recording.

Table 6. Recording and Memory LED (REC) Blink Patterns

Display	Function	Description
GREEN	Greater than 50%	File logging is in progress
ORANGE	Greater than 10%	Each blink indicates that data is being written to memory.
RED	Less than 10%	
GREEN	Greater than 50%	The file is closed. A solid light indicates no data is being recorded.
ORANGE	Greater than 10%	
RED	Less than 10%	
GREEN and RED	Erase all memory	Alternating green and red LEDs indicate all files are being deleted.
ORANGE and RED	Formatting memory	Alternating orange and red LEDs indicate the memory card is being initialized or formatted.
LED OFF	Missing or faulty memory	The LED is **OFF**.

Bluetooth Communication LED (BT)

The Bluetooth (BT) Communication LED displays Bluetooth status activity.

Table 7. Bluetooth LED (BT) Blink Patterns

Display		Description
	BLUE	Bluetooth is **ON**. Waiting for a connection.
	BLUE	Single Bluetooth connection is established.
	BLUE	LongLink connections are established. LED blinks for each connection every 5 seconds.
	Bluetooth LED OFF	Bluetooth is **OFF**.

Battery LED (BATT)

The Battery (BATT) LED indicates the remaining charge of the internal battery. When an external power source is connected to the receiver the LED turns **green** and begins to blink when the battery is charging.

Table 8. Battery LED (BATT) Blink Patterns

Display		Description
RECEIVER IS POWERED ON/INTERNAL BATTERY IN USE		
	GREEN	The charge is greater than 50%.
	ORANGE	The charge is greater than 15%.
	RED	The charge is less than 15%.
RECEIVER IS POWERED ON/EXTERNAL POWER SOURCE CONNECTED		
	GREEN	The battery LED blinks green and the internal battery is greater than 50% charged. The battery is charging. **Note**: When the receiver is powered on—the battery LED will always blink green when an external power source is connected—until the battery is fully charged.
	ORANGE	The battery LED is blinks orange. The internal battery is greater than 15% charged. The battery is charging.
	RED	The battery LED is blinks red. The internal battery is less than 15% charged. The battery is charging.
RECEIVER IS POWERED OFF/INTERNAL BATTERY IN USE		
	Battery LED is OFF	Battery LED is **OFF**
RECEIVER IS POWERED OFF/EXTERNAL POWER SOURCE CONNECTED		
	GREEN	The battery LED blinks green. The internal battery is charging. **Note**: When the receiver is powered off—the battery LED will always blink green when an external power source is connected—until the battery is fully charged.

Managing Power

Turning the Receiver ON/OFF

To turn on the receiver, press and hold the power button until the LEDs briefly flash. When the receiver is turned ON, the receiver's channels initialize and begin tracking all visible satellites at any time and location.

To turn OFF the receiver, press and hold the power button for more than three and less than 10 seconds (release the power button when the BATT LED blinks solid red). This delay prevents the receiver from being turned OFF by mistake.

The receiver will draw a small amount of power from the battery when it is turned off. If the receiver is placed in storage for a long period, such as a few months, the battery may become fully discharged. You will need to use an external power supply or recharge the battery before use.

Using Internal and External Power Sources

The receiver is powered by the internal battery or an external power source connected to the Micro-AB USB port. If an external power source is connected, the receiver draws power from it in preference to the battery.

Using a standard Micro-AB USB cable, you can connect the receiver to an external power source with 4.5–5.5 VDC to operate the receiver. See "Specifications" on page 45.

Power input greater than 6 VDC could damage the receiver.

Internal Battery

The receiver first draws power from a connected external power source. When there is no valid external power source connected or if the source has discharged to a voltage value less than 4.5V, the receiver will draw its power from one high-capacity internal battery (non-removable).

Depending on use, the hours of operation provided by the internal battery varies. See Table 9.

The GCX3 internal battery will slowly discharge over time, even if the receiver is powered off. It is highly recommended that the GCX3 be fully charged shortly before each use.

Table 9. Operation Hours

Use	Description	Approximate Hours of Operation
MAGNET Relay Base	Base sending RTCM 3 differential corrections to MAGNET Relay Service.	Up to 10
Long-Range Bluetooth Technology RTK Base	Base sending RTCM 3 differential corrections to one Rover.	Up to 10
Long-Range Bluetooth Technology RTK or Network RTK Rover	Rover receiving RTCM 3 differential corrections over Long-Range Bluetooth Technology or from a Network site, and corrected through Bluetooth to a data collector.	Up to 10
Static Survey	Static setup logging raw GNSS data at 1 Hz.	Up to 10

Approximate hours of operation listed are when operated at 20° C.

Charging the Battery

When the battery charge is low, the BAT LED changes from solid green, to yellow, and then red—depending on the amount of remaining charge. See "Battery LED (BATT)" on page 15.

When the receiver is connected to an external power source, the battery charges whether the receiver is turned ON or OFF.

Procedure for charging the battery

1. Connect the supplied Micro-AB USB cable to the receiver's Micro-AB USB port.

2. Connect the Micro-AB USB cable to the Micro-AB USB port of the power adapter.

3. Plug the power adapter into an available outlet to fully charge the battery. The time to charge the battery depends on whether the unit is ON or OFF, and if current is supplied from an external charger. The BAT LED blinks as the battery charges.

The battery will stop charging when it is at full capacity.

Use a grounded wall outlet or grounded surge protector while charging. The socket should be located near the equipment and easily accessible.

Power Accessories

The Micro-AB USB port of the GCX3 powers and charges the internal battery. The GCX3 is compatible with standard Micro-AB USB power accessories used with consumer electronic devices. Micro-AB USB power accessories can be sourced locally as long as Micro-AB USB power standards are met.

Insufficient Power

If the battery becomes fully discharged and an external power supply is not connected, the receiver will shut down and automatically save the recorded files. To avoid disruptions, check the BAT LED on the display panel for the battery charge status. See "Battery LED (BATT)" on page 15 for more information.

If the receiver shuts down due to insufficient power, the receiver and all communication ports become deactivated.

To restore power to your receiver and turn it back on, do one or all of the following:

- Recharge the battery.

- Make sure the Micro-AB USB cable is correctly connected to the receiver's port.

- Connect the receiver to a different power source.

Power supplied to the receiver should match the specifications provided by Sokkia on the product. Failure to comply with these specifications may damage the receiver.

Configuring the Receiver

The sections in this chapter describe receiver options—how to load a new Optional Authorization File (OAF), update firmware, and perform a factory reset. Download the Sokkia Receiver Utility (SRU) software from the Sokkia support website.

Go to http://www.sokkia.com, select your region, and then select the Sokkia Care tab. Select SRU - Sokkia Receiver Utility, select Updates for the type of system you have (PC, Mobile).

For information about installing the software, see *SRU Online Help*.

Before You Begin Configuring the Receiver

A USB driver is required to connect the GCX3 to a computer. Determine whether your Windows operating system is 32-bit or 64-bit, and download the appropriate driver from the Sokkia support website.

Go to http://www.sokkia.com, select your country or region, select the Sokkia Care tab.

When the GCX3 is connected to a computer for the first time, a driver update will occur on the computer.

Viewing Receiver Information

In the Sokkia Receiver Utility (SRU), the **Receiver Info** window displays basic Receiver information, such as hardware, firmware versions, RAM size, Receiver ID, serial number, and so forth.

Open the Receiver Info Window

1. Connect the receiver to a computer and open the SRU.

2. In the SRU, connect to the receiver.

3. Click **Device ▸ Application Mode ▸ Receiver Managing**.

4. Click **Device ▸ Connect**.

5. In the **Connection Parameters** window, USB in the connect using the drop down list and click **Connect**.

6. In the SRU main window, click the **Information** icon. The **Receiver Info** window appears.

Figure 5: SRU—Receiver Info Window

Loading New Firmware

Receiver board firmware is released as a compressed file that you download and decompress. This file contains the following files:

- **ramimage.ldr** – receiver board RAM file

- **main.ldp** – receiver board Flash file

Uploading Firmware Files to the Receiver

1. Using a Micro-AB USB or Bluetooth connection, connect the receiver to a computer.

Upload firmware to the receiver using a Bluetooth or Micro-AB USB connection. To connect the receiver to a computer using a Micro-AB USB connection, you will need to install a USB driver. USB drivers and firmware are available from the Sokkia support website.
Go to http://www.sokkia.com, select your country or region, select the Sokkia Care tab.

2. Click **Device ▸ Application Mode ▸ Firmware Loading**.

3. Click the **Firmware Loading** icon.
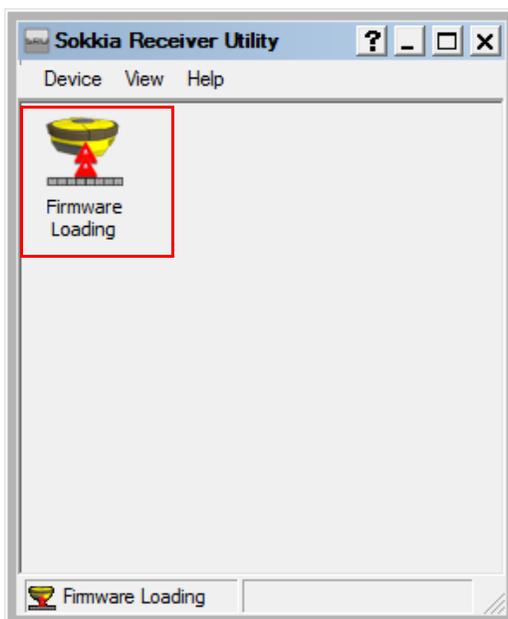
Figure 6: SRU—Firmware Loading

4. Click **Device ▸ Connect**. The **Connection Parameters** window appears.

Figure 7: Connection Parameters Window

5. Select **USB** from the **Connect Using** drop-down list, now click **Connect**.

6. The **Select Device** window appears. Select **Receiver** in the **Device Type** field, now click **Next**.
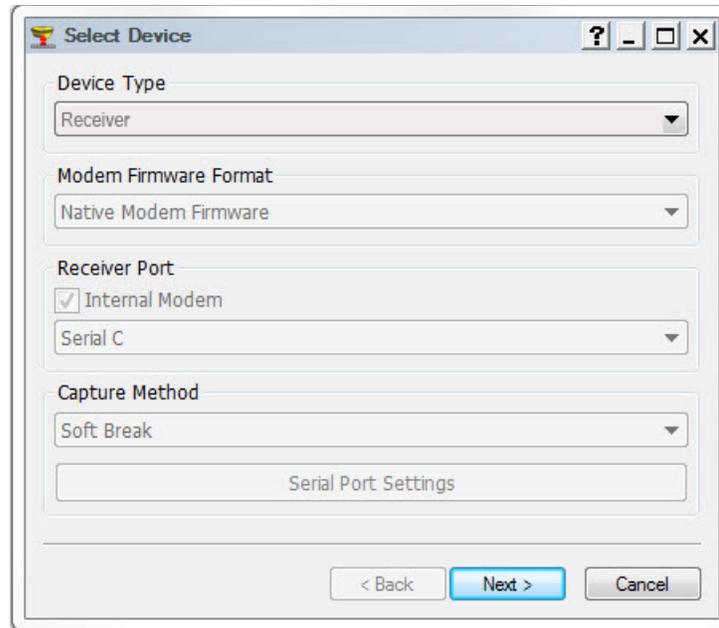
Figure 8: SRU—Select Device

7. The **Information** window appears, now click **Next**.
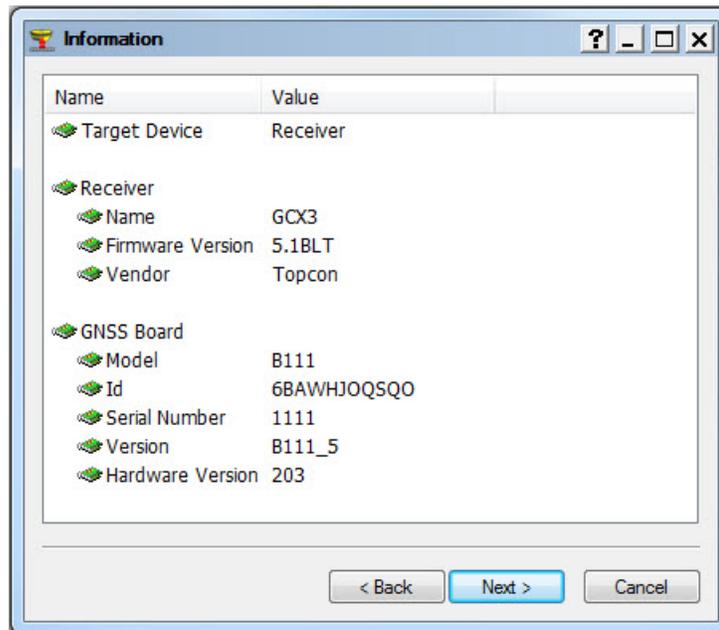
Figure 9: Information Window

8. The **Select Files** screen appears, now click the **Browse** icon 📁 next to the **Image** field, and select the receiver board's main file. Click **Next** to upload the firmware.
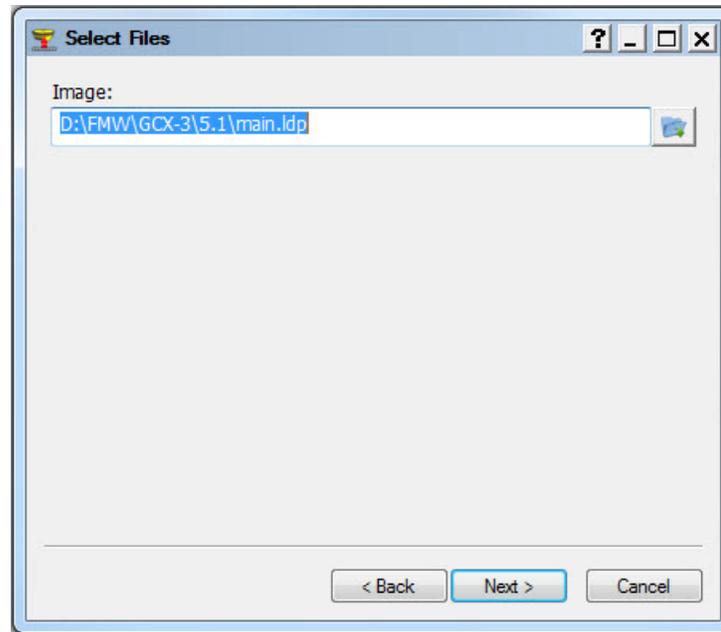
Figure 10: Selecting the Receiver Board's Main File

9. During the firmware update the following message may appear.
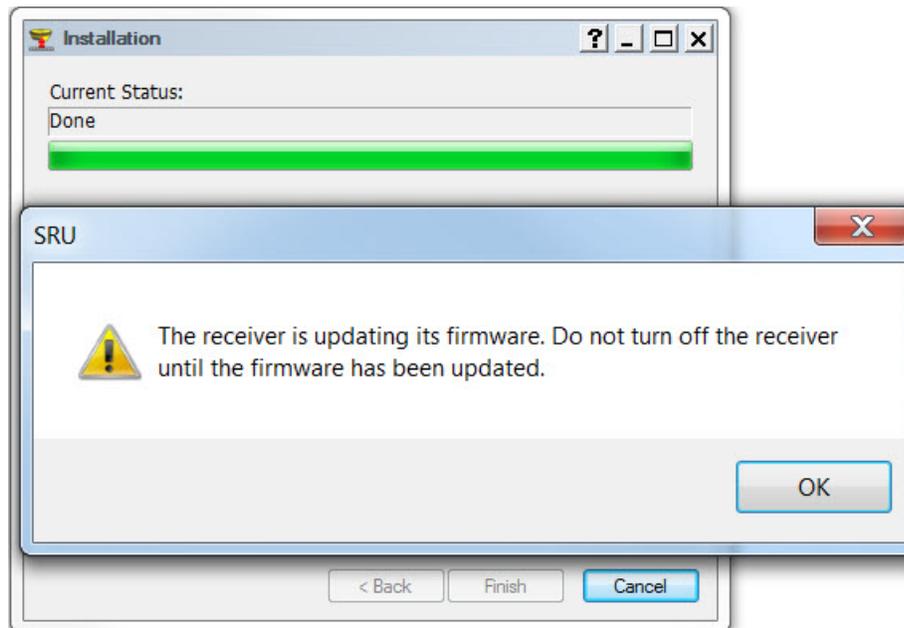
Figure 11: SRU Firmware Update Confirmation

10. After the firmware has been successfully updated, the receiver automatically performs the reset receiver procedure. The receiver is then disconnected from the Sokkia Receiver Utility (SRU). To continue work on the receiver click OK.

Optional Authorization Files (OAFs)

Sokkia issues an Optional Authorization File (OAF) to enable the specific options purchased. Sokkia's OAF system enables you to customize and configure the receiver according to your particular needs. This allows you to purchase only the options you require.

The GCX3 receiver ships with standard GPS/GLONASS L1, 1-Hz Static OAF option. Upgrade OAFs are available for purchase. Contact your local dealer for more information about available receiver options for the GCX3.

> The GCX3 receiver is capable of Dual Frequency Static, Long Range, Network RTK, and MAGNET Relay operation.

Contact your Sokkia dealer or a representative for a complete listing of available options and pricing information.

Checking the Receiver's OAFs

Viewing Receiver Options Using the Sokkia Receiver Utility (SRU)

1. Connect the receiver to a computer and open SRU. See *SRU Online Help* for more information.

2. In SRU, connect to the receiver.

3. From the main window, click the **Options** icon.

4. The **Receiver Options** window appears. View the current authorization options.

Figure 12: Receiver Options

Loading an OAF

Sokkia dealers provide customers with OAF files. For OAF related questions, e-mail Sokkia at options@sokkia.com. Include the Receiver's ID and serial number. See "Viewing Receiver Information" on page 19.

Loading a New OAF

1. Check the receiver's OAF. See "Checking the Receiver's OAFs" on page 24.

2. Right-click on the **Receiver Options** window, and select **Upload OAF**.
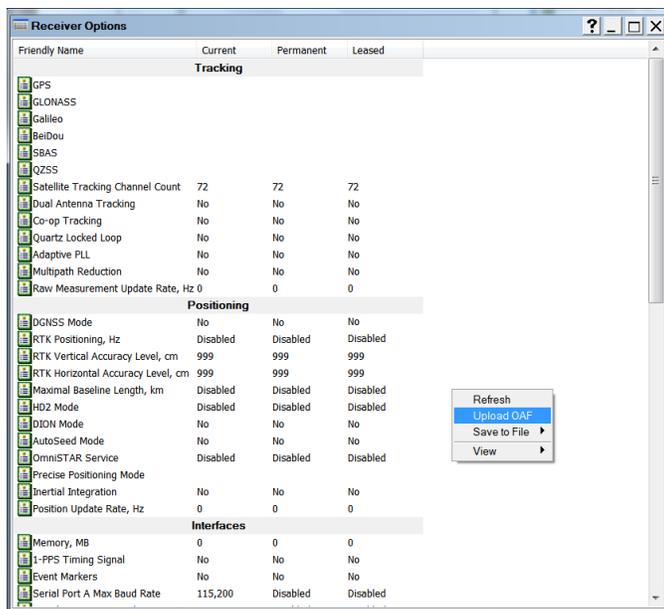
Figure 13: Select Upload OAF

3. Navigate to the location of the new **OAF**.

4. Select the appropriate file, and click **Open**.
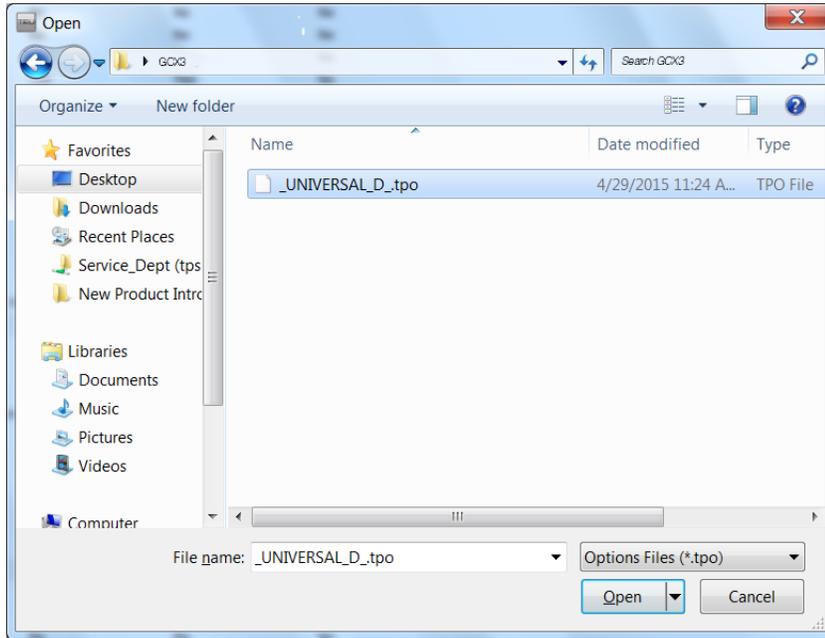
Figure 14: Loading an OAF

The SRU initially checks to see if the selected file is compatible with the current connected receiver. If a file is chosen that is not intended for this receiver, the **Upload OAF** window displays an error icon next to the Receiver ID and disables the **Upload the File to the Receiver** button (Figure 15).

5. The **Upload OAF** window appears. Click **Upload the File to the Receiver** to start loading the file.
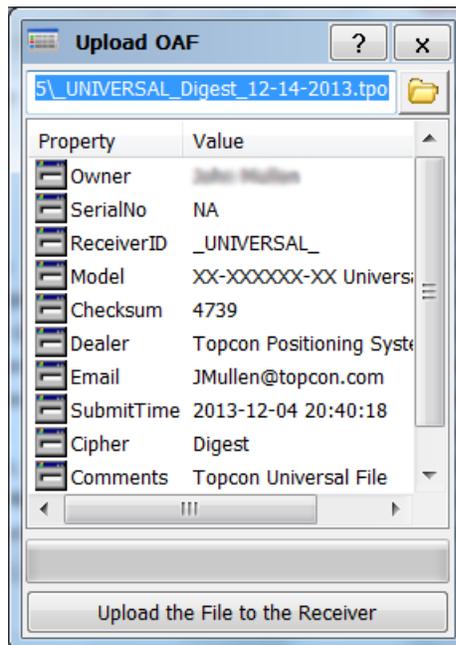
Figure 15: Upload the OAF to the Receiver

6. At the SRU Window, click **Yes** to reset the receiver.
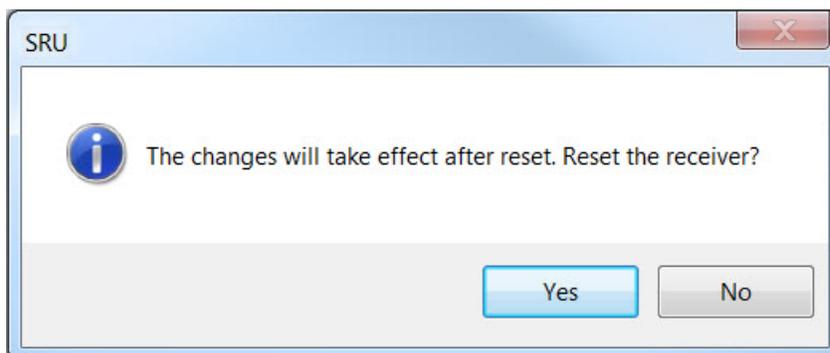
Figure 16: SRU Window—Reset Receiver

7. When the receiver resets, the **Connection Parameters** window opens. Click **Connect**.

Figure 17: Connection Parameters Window—Connect to the Receiver

8. The **Sokkia Receiver Utility** main window appears. Click **Options**.
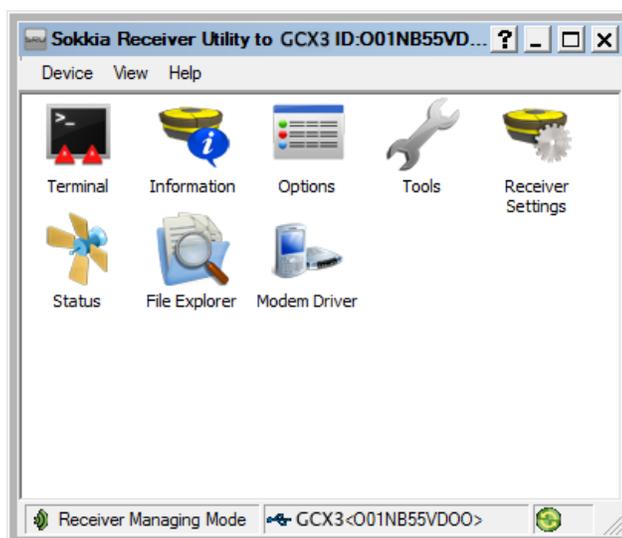
Figure 18: Click Options

9. The **Receiver Options** window displays. Ensure the following are correct:

- If a leased OAF was uploaded—the expiration dated is still valid

- If a permanent OAF was uploaded the correct options are loaded.
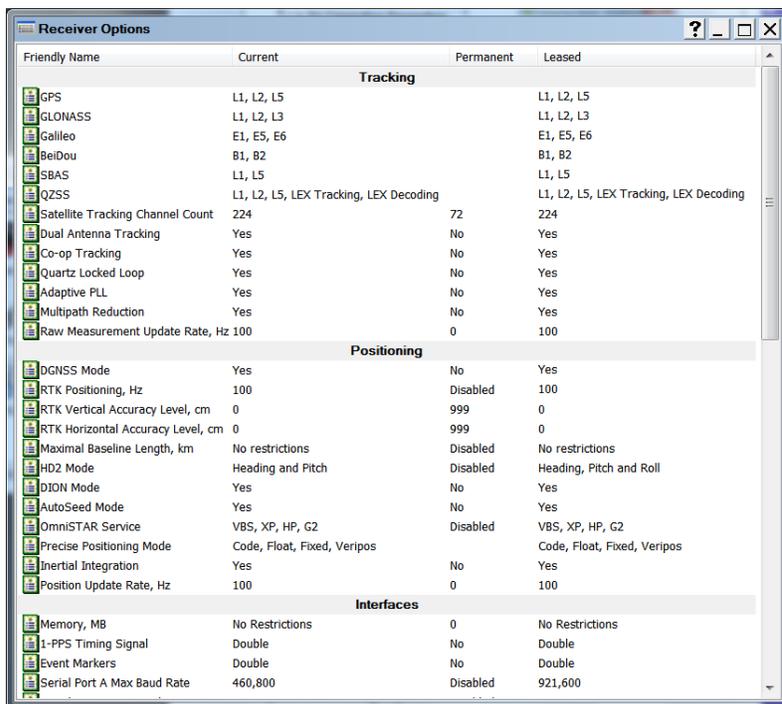
Figure 19: Receiver Options Window

10. To view additional OAF details, right-click in the **Receiver Options** window and select **View Details**.
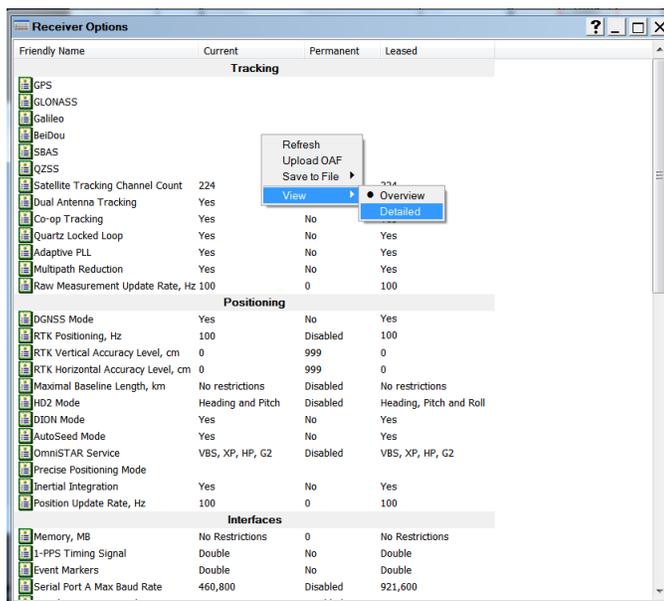
Figure 20: Receiver Options Window—Additional OAF Details

Resetting the Receiving (Clearing) NVRAM

The receiver's Non-Volatile Random Access Memory (NVRAM) holds data required for satellite tracking, such as ephemeris data and receiver position. The NVRAM also keeps the current receiver's settings, elevation masks, recording interval, and information about the receiver's internal file system. Clearing the receiver's NVRAM resets the receiver and restores the receiver to factory default settings.

Although performing a factory reset of the receiver is not recommended as a common practice, there are times when it can eliminate communication or tracking problems.

After performing a reset, the receiver requires about 15 minutes to collect new ephemeris and almanacs.

Ephemeris—A table giving the coordinates of a celestial body at a number of specific times during a specific period.

Resetting the receiver will not delete any files already recorded in the receiver's memory, and the NVRAM keeps information about the receiver file system.

Clearing NVRAM Using Sokkia Receiving Utility (SRU)

1. Connect the receiver to a computer, and open SRU. See *SRU Online Help* for more information.

2. In SRU, connect to the receiver.

3. From the main window, click the **Tools** icon .

4. The **Tools** window appears. Click **Factory Reset**, and then click **Yes** to continue.
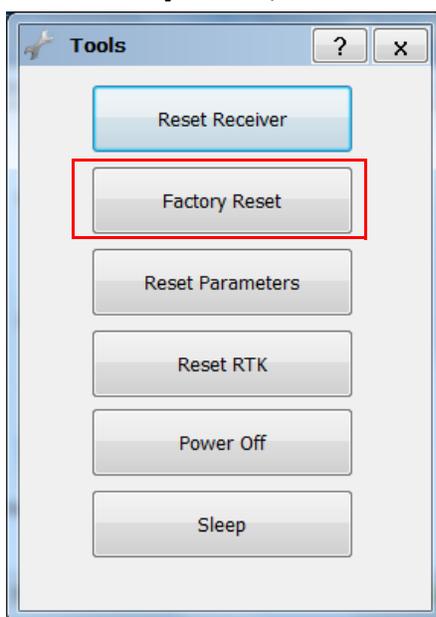
Figure 21: Tools Dialog Box

System Setup

The GCX3 receiver's advanced design eliminates the need for cables during operation, enabling for a simplified setup with less parts to keep track of.

You can set up the GCX3 receiver in static or RTK configurations in the field and transmit RTK corrections from the Base to the Rover receiver using Long-Range Bluetooth Technology. You can use Bluetooth to connect to a controller running Sokkia Receiver Utility (SRU) and MAGNET^{TM} Field to configure the instrument and to collect and manage data.

Setting Up the Base Receiver

1. Mount the receiver on a tripod with a **Tribrach Adapter**.
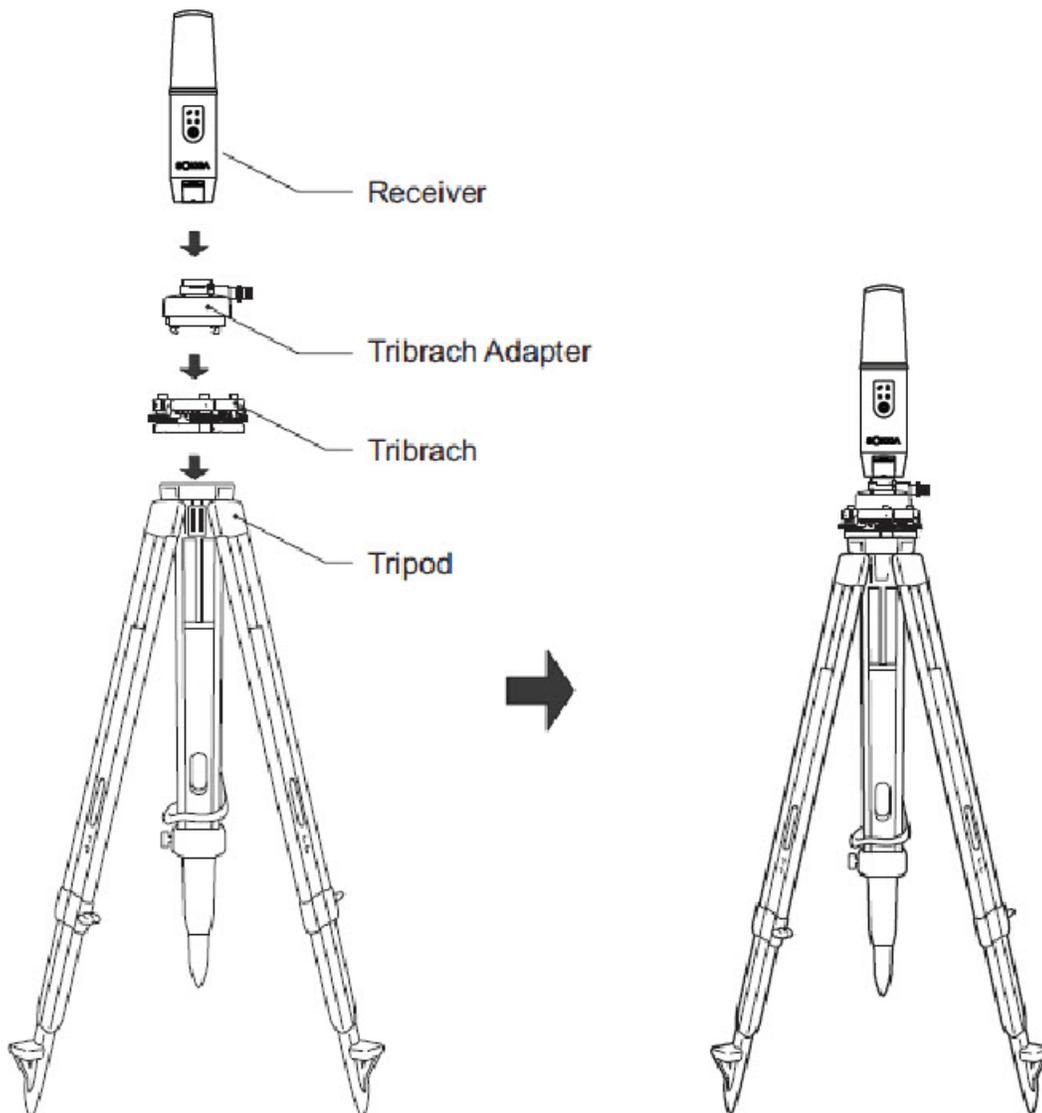
Figure 22: Base Receiver

2. Position the base system over a known point.

3. Level the tripod and measure the height of the receiver from the ground using the tape measure. See "Measuring Antenna Height" on page 32.

4. Press the power button to turn the receiver ON. The integrated wireless device in the receiver turns on when the receiver is powered.

5. Connect the receiver to the Bluetooth-enabled data collector, running Sokkia Field software, to configure and start the base GCX3 receiver.

6. View the LED display panel for the receiver's current status. See "Display Panel Operations" on page 10.

Setting Up the Rover Receiver

1. Mount the receiver on the Range Pole.

Receiver

Range Pole

Controller Bracket
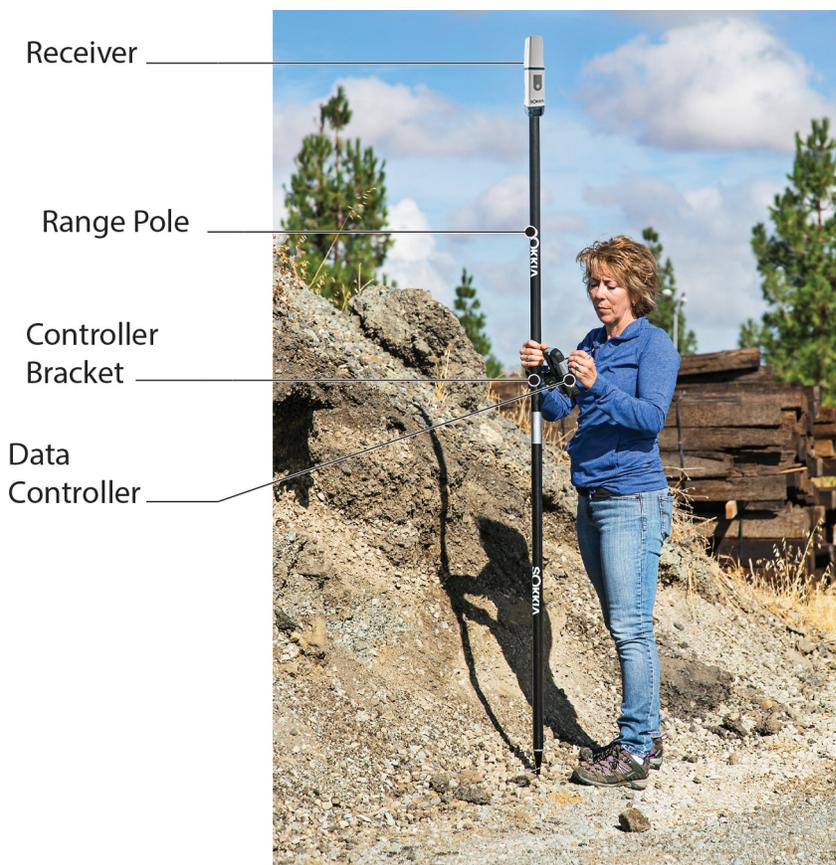
Data Controller

Figure 23: RTK Rover

2. Attach a Sokkia controller to the pole using a mounting bracket.

3. If you are not using a fixed height Range Pole, measure the height of the receiver from the ground. See "Measuring Antenna Height" on page 32.

4. Press the power button to turn the receiver ON. The integrated wireless device in the receiver turns on when the receiver is powered.

5. Connect the receiver to the Bluetooth-enabled data collector that is running Sokkia Field software, to configure the GCX3 as a rover receiver.

6. View the LED display panel for the receiver's current status. See "Display Panel Operations" on page 10.

Measuring Antenna Height

The receiver calculates the coordinates of the antenna's phase center. To determine the coordinates of the station marker, specify the following:

- measured height (H) of the bottom of the receiver above the station marker (see Figure 24)

- model of the receiver (GCX3) used

Any necessary antenna phase center adjustments, based on the antenna model, is automatically applied. This adjustment, when combined with accurately measured height and measurement methods, enables correctly computed reference marker coordinates.

Obtaining Accurate Antenna Height

1. Measure the height of the bottom of the receiver or Antenna Reference Point (ARP) above the control point or marker.

Topcon software only requires input of measured height (H) to compute coordinates of the Antenna phase center of the receiver. For precise antenna height, it is recommended that you use the vertical measurement method shown in Figure 24.
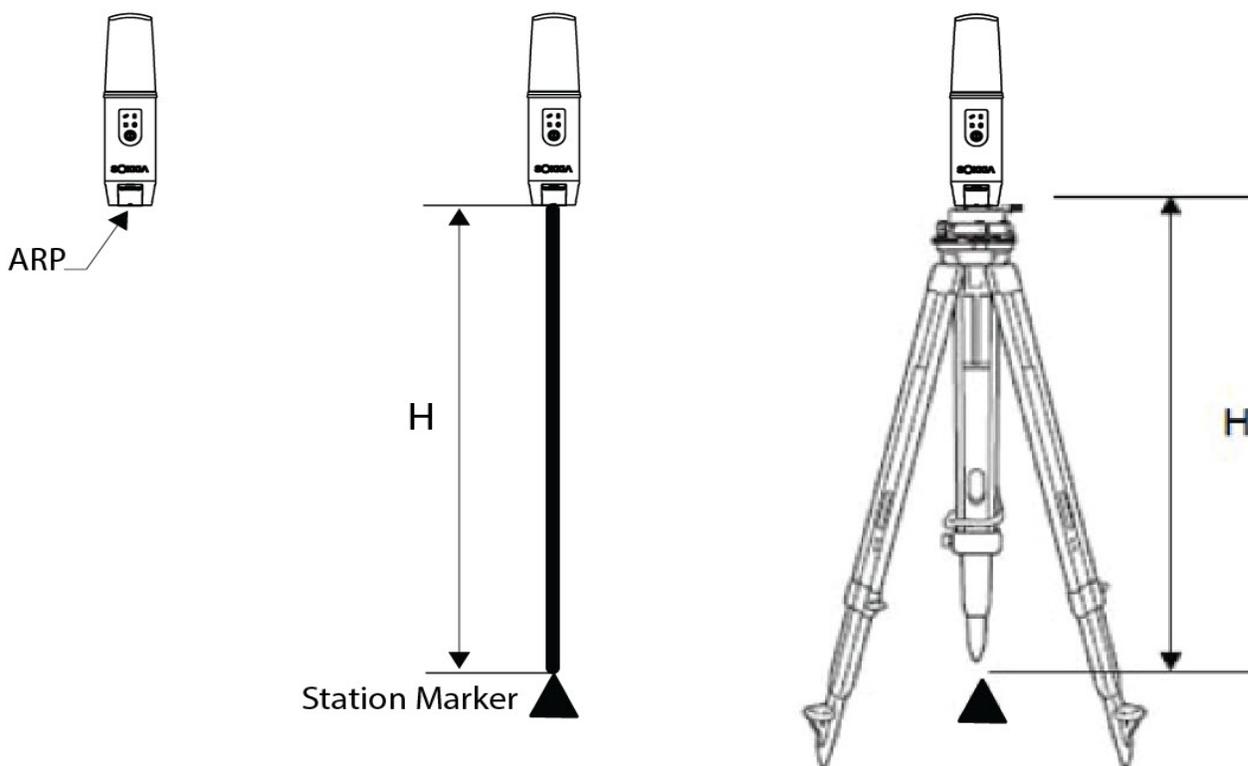
Figure 24: Obtaining Accurate Antenna Height

Collecting Data

This chapter provides general information about recording data, downloading it, and removing files to free up internal receiver memory.

Setting Recording Parameters

The Sokkia Receiver Utility (SRU) software enables you to set logging parameters, such as logging rate and types of messages—in which to record data. See *SRU Online Help* for more information.

The GCX3 is compatible with any Sokkia field software used for configuration and recording raw data.

Log Rates

The receiver provides up to 8 GB of file space on the internal (non-removable) memory card. The amount of memory used to log data depends on the logging rate. See *SRU Online Help* for more information.

Record Data

Log raw GNSS data to the receiver's internal memory and use the Sokkia Receiver Utility (SRU) or MAGNET Office software to download the files to a computer.

Start/Stop Recording Using LED Display Panel or SRU

1. Press the power button to turn the receiver ON.

2. Wait for the Status (STAT) LED to indicate that the satellites are being tracked.

The Status (STAT) LED blinks **green** for GPS satellites and **amber** for GLONASS satellites. A short **red** blink indicates the receiver has not resolved its position location. Five or more satellites provide optimal positioning.

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3. Press the Power (PWR) button three times within two seconds to begin recording. To begin recording data, in the Sokkia Receiver Utility select, **File Explorer ▸ Logs ▸ Start**.

4. Ensure that the Recording and Memory (REC) LED blinks **green**—this is an indication that a file has opened and that data collection is occurring. The (REC) LED blinks when raw data is being logged to internal memory.

5. Recording and Memory (REC) LED is blinking **green**. This indicates that a file has opened and data collection has started. The REC LED blinks each time data is saved to the internal memory.

6. When finished recording, press the Power button three times within two seconds. Ensure that the REC LED is dark. To end data recording, in SRU select **File Explorer ▸ Logs ▸ Stop**.

7. To turn the receiver OFF, press and hold the power button for 3–10 seconds until all LEDs power OFF and the BAT LED is solid **red**.

You can also log data using MAGNET Field software.

File Management

Raw data is recorded as time-tagged measurements in a single raw data file. Each file is recorded to the receiver's internal memory, automatically given a name, and a ***.tps** file extension. You can then transfer a file of collected data to a computer with file managing software, such as the Sokkia Receiver Utility (SRU). This program enables you to use an automatic naming feature, enter file names, and delete files as necessary.

See *SRU Online Help* for more information.

Downloading and Deleting Files

After completing a survey, download data files to a computer or a controller for storage, post-processing, or backup. The receiver's internal memory holds a finite amount of files, so you will want to delete files to restore memory capacity.

When the internal memory is full, the receiver stops logging data, and the REC LED turns dark/off, indicating an error condition. Existing data is not overwritten, unless **AFRM** mode is enabled.

There are two options for deleting raw data files from the receiver:

- Delete all of the files using the LED display panel.

Pressing and holding the Power button for 15–20 seconds erases all of the files in the receiver's internal memory.

- Use a Micro-AB USB or Bluetooth connection to download the files to a computer. In SRU, you can select the files you want to delete from the receiver. See *SRU Online Help* for more information.

Once a connection is established, you can download all or some files to a computer or controller and use the File Explorer feature in Sokkia Receiver Utility (SRU) to manage the raw data files.

For more information about using SRU to download or delete files, see *SRU Online Help*.

Troubleshooting

This chapter will help you diagnose and solve some common problems that may occur with the GCX3 receiver.

Do not attempt to repair equipment yourself. Doing so will void the warranty and may damage the hardware.

Check this First

Before contacting your local dealer or Sokkia Technical Support, check the following:

- Check all external receiver connections carefully to ensure that the connectors are correctly seated and secure.

- Check for worn or defective cables.

- Check that the receiver's internal battery is fully charged.

- Check the power source for incorrectly connected cables, and ensure that the power source is valid. See "General GCX3 Specifications" on page 45 for external power requirements.

- Verify that he most current software version is downloaded on to the computer and the most current firmware is loaded onto the receiver. For the latest updates, go to:

  http://www.sokkia.com, select your region, and then select the Sokkia Care tab. Select SRU - Sokkia Receiver Utility, select Updates for the type of system you have (PC, Mobile).

- Check Sokkia Technical Support.

  Go to http://www.sokkia.com/, select your region, and then select the Contact Us for the latest updates.

Now, do the following:

- Power cycle OFF/ON the receiver by pressing the Power button or by using SRU (**Tools▸Reset receiver**). See "Power Button Functions" on page 11.

- Restore default settings by pressing holding the Power button for 10–15 seconds or using SRU (**Tools▸Factory Reset**). This restores the receiver's parameters to the factory default settings and erases the almanac and ephemeris files. This action does not delete data files from the receiver memory. See "Power Button Functions" on page 11.

- Erase all files by pressing and holding the Power button for 15–20 seconds or by using **File Explorer▸Delete All Files** in SRU. This will delete all files stored in the receiver's non-removable memory (NVRAM) card. See "Power Button Functions" on page 11.

If the problem persists, see the following sections for other solutions.

Powering Problems

The following table describes some commonly encountered power problems.

Receiver Does Not Power Up

Cause	Solution
The battery may be discharged.	• Charge the battery overnight. See "Charging the Battery" on page 17
If an external power source is being used, the cable may be disconnected or damaged.	• Ensure the cable is securely connected and undamaged.
The receiver may have a defective charger or defective battery.	• If, after changing the battery or connecting an external power source, the receiver still does not power up, contact your local dealer or Sokkia Technical Support for advice.

Additional Receiver Problems

The following table describes some commonly encountered receiver problems. Such as:

- No Connection to Computer or External Controller

- Cable Specific Problems

Cause	Solution
The cable is not properly plugged in.	• Unplug the cable, then securely and properly reconnect it to the receiver.
The cable is damaged.	• Use an undamaged cable. If necessary, contact a dealer to replace the cable.
The USB driver is not installed.	• If a Micro-AB USB cable connector is being used, ensure that the Micro-AB USB driver is correctly installed on the computer. The driver may be downloaded from the Sokkia website: http://sokkiasupport.com.
The cable is damaged.	• Use an undamaged cable. If necessary, contact a dealer to replace the cable.

Generic Problems

The following table describes some commonly encountered Generic Problems.

Cause	Solution
The receiver port used for connection is not in Command mode.	• Use Bluetooth to connect the receiver to a computer and then open SRU See *SRU Online Help* for additional information.
	• Click **Receiver Settings ▸ Ports**.
	• Change the **Input** mode for the port used for connection to **cmd**.
The receiver goes into **Exception** mode and/or is non-responsive or frozen and can not be recovered by reloading firmware.	• Hardware Shutdown/Reset by pressing power button for more than 35–50 seconds. This shuts down power to all internal components of the receiver. This operation does not affect internal memory or receiver settings.

No Long Term Lock on Satellites

The following table describes some commonly encountered satellite problems.

Cause	Solution
The corresponding receiver options may be disabled or expired (L1/L2, GPS/GLONASS must be on to track satellites).	• Order a new OAF with the desired options activated to enable or extend validity of the corresponding receiver options. Contact a dealer or visit the Sokkia website for details.
	• For a detailed description of options, see *SRU Online Help* for additional information.

Too Few Satellites Tracked

The following table describes some commonly encountered satellite tracking problems.

Cause	Solution

The survey is conducted near obstructions (tree canopy, tall buildings).	• Ensure the **Multipath Reduction** boxes have been enabled.
	
	  a. Connect the receiver to a computer and open the SRU
	    See *SRU Online Help* for additional information.
	
	  b. In the SRU, connect to the receiver.
	
	  c. On the SRU main window, choose **Receiver Settings ▸ Tracking ▸ Adv** tab. Ensure that the C/A code multipath reduction check box is selected.

	• Move to an area free of obstructions, if applicable.

No Code Differential and/or Real Time Kinematic (RTK) Solutions Obtained

Cause	Solution
Incorrect Base coordinates entered.	• Specify the correct coordinates for the Base station using SRU or other suitable field data collection software.
Obstruction between the Long-Range Bluetooth Technology connection	• Clear all possible obstructions or relocate the Base so there is a "line-of-sight" path to the Rover.
The corresponding receiver options may be disabled or expired.	• Order a new OAF with the required options activated to enable or extend validity of the corresponding receiver options. • See *SRU Online Help* for additional information.
There are not enough common satellites. In order to obtain a fixed solution, the Base and Rover should track at least five common satellites.	• Check the elevation masks of the Rover and Base receivers; they should be the same. To do this, on the SRU main window, choose **Receiver Settings ▸ Tracking ▸ Obs**. • Verify there is a clear view of the sky to allow sufficient satellite tracking.

A discrepancy exists between the differential standards used at the Base and Rover receivers.	• Ensure the Base and Rover receivers use the same corrections input/output format:
	  a. Connect the receiver to a computer and open SRU
	    See *SRU Online Help* for additional information.
	  b. In SRU, connect to the receiver.
	  c. On the SRU main window, choose **Receiver Settings ▸ Ports**.
	  d. Double-click on the port to be configured and Ensure the input mode of the Rover matches the format of the Base output mode (i.e. RTCM3).

Poor satellite geometry (PDOP/GDOP values are too high)	• Conduct the survey where satellite visibility is better (low PDOP value). • Ensure the elevation mask is less than 15 degrees.
The elevation mask is above 15 degrees.	• Lower the elevation mask. To do this, on the SRU main window, choose **Receiver Settings ▸ Tracking ▸ Obs**. • Verify that there is a clear view of the sky to allow sufficient satellite tracking.
There may be a source of radio interference that disrupts radio communications.	• Change the RF channel (if possible). • Removing the source of the jamming signal or relocate the radio antennas (if possible).

Receiver Does Not Log Data

Cause	Solution
The receiver's memory is disabled or expired.	• The receiver's memory is disabled or expired. • Ensure that the memory option is enabled. See *SRU Online Help* for additional information. • The receiver's internal memory card does not have free space. • Download and/or delete data files to free up space for new files. See "Downloading and Deleting Files" on page 34. • Use the SRU to re-initialize the file system, this may resolve SD Card memory issues.

Bluetooth Problems

The following table describes some commonly encountered error messages and other Bluetooth problems.

SRU Error Message—Can't Find Receiver

Cause	Solution
The receiver is turned OFF.	• Ensure the receiver has power and is turned on.
Bluetooth is not turned on; the Bluetooth (BT) LED is OFF.	• Reset the receiver to the factory default settings by pressing the Power button for 10 to 15 seconds.
There is interference	• Move the receiver, controller, or computer to an unobstructed location.
The receiver is too far away.	• Move the devices closer together.
The receiver is already connected via Bluetooth to another device.	• Disconnect the receiver from the other controller or computer.
The receiver port used for connection is not in Command mode.	• Connect the receiver to a computer and open SRU See *SRU Online Help* for additional information. • Click **Configuration ▸ Receiver ▸ Ports**. • Change the **Input Mode** for the Bluetooth or Micro-AB USB port used for connection to **cmd**

Long-Range Bluetooth Technology connections will not interfere with Bluetooth connections to computers or controllers.

Use the SRU to double verify that the settings for the connection port are correct.

No Available Devices Discovered

Cause	Solution
The receiver is not receiving power.	• Check that the receiver is getting power and is turned ON. • Check that the power cable is correctly attached to the port. • Unplug the cable, then securely and properly reconnect it to the receiver. • If the power cable is damaged, contact a Dealer to purchase a new cable.

Receiver Bluetooth Icon Visible—Cannot Establish Connection

Cause	Solution
Device security settings probably differ	• Ensure that the Bluetooth enabled devices use the same security settings.
Bluetooth module settings may have changed.	• If the settings are changed for the Bluetooth module, remove it from the list of discovered Bluetooth devices using the Bluetooth manager program (supplied with the device used to manage the receiver). • Repeat the search.

Long-Range Connection Problems

The following tables (2) describe commonly encountered Base Receiver and Bluetooth connection problems.

Long-Range Connections—Cannot Discover the Base Receiver

Cause	Solution
The Base is out of range.	Ensure the Base receiver is within 300 meters of the Rover. Distance for Long-Range largely depends upon environmental and field conditions.
The Base is not responding.	• Ensure that the Base is turned ON. • Ensure Bluetooth is turned ON for the Base and Rover **Note**: The Bluetooth LEDs are blue ON both receivers. • Ensure that there are no obstructions or interference. • Ensure that the Bluetooth pin code is correctly entered.

Cannot Establish a Bluetooth Connection

Cause	Solution
A Long-Range Bluetooth connection is not available at the Base. (for example, three connections are already established.)	• Ensure that there are no obstructions or interference between the Base and the Rover.

Sokkia Receiver Utility (SRU) Problems

The following table describes some commonly encountered Sokkia Receiver Utility problems.

SRU Cannot Connect to Receiver

Cause	Solution
The receiver is turned OFF.	• Ensure the receiver has power and is turned ON.
If using a Micro-AB USB cable, the cable's connectors are improperly attached.	• Unplug the cable, then securely and properly reconnect it to the receiver.
If using a Micro-AB USB cable, the cable is damaged.	• Use an undamaged cable. • Contact a dealer to purchase a new cable.
If using Bluetooth wireless technology, the incorrect port is selected.	• Use a computer or receiver that has Bluetooth wireless technology enabled/installed. • Ensure the computer and receiver use the correct ports for communication. For the GCX3 receiver, this is Bluetooth or Micro-AB USB.

Cleaning and Storing the Receiver

- Use a clean cloth moistened with neutral detergent or water.

- Never use an abrasive cleaner, ether, thinner benzene, or other solvents.

- Always ensure the receiver is completely dry before storing it. Dry any moisture with a soft, clean cloth.

Getting Customer Support

If the troubleshooting hints and tips in this operator's manual fail to remedy the problem, contact a Sokkia Customer Representative. For contact information, see "Getting Technical Support" on page 4.

Specifications

The GCX3 is a GNSS receiver featuring 226 channels and Long-Range Bluetooth Technology for small job site operations and cable-free network solutions.

General Details

Table 10 is a list of the general specifications for the GCX3.

Table 10. General GCX3 Specifications

Physical	
Enclosure	Aluminum alloy with Lexan cap
Color	Sokkia Gray and Blue (base)
Dimensions (mm)	47 (w) x 47 (d) x 197.0 (h) mm
Weight (g) including battery	Up to 440 g, depending on the configuration
Status display/panel	MINTER (Minimum Interface), 4 LEDs + 1 power button)
Micro-AB USB/Power	Micro-AB USB (for communications and power)
Bluetooth antenna	Fully integrated, high-sensitivity
Tracking	
Number of Channels	226 channels with optimized satellite tracking technology
Tracked Signals	GPS: L1 C/A, L2P, L2C code and carrier GLONASS: L1 C/A, L1P, L2 C/A, L2P code and carrier SBAS: L1 C/A, WAAS/MSAS/EGNOS/GAGAN QZSS: L1 C/A, L1-SAIF, L1C, L2C Galileo E1 BeiDou B1, B2 **Note:** Support for L1C signal for QZSS is incorporated and will be available through firmware upgrade.
Multipath reduction	Yes, code and carrier
PLL/DLL setting	Adjustable bandwidth and order
Smoothing interval	Pseudo-range smoothing: Adjustable
Data Output	

Table 10. General GCX3 Specifications

RTK corrections	TPS, RTCM SC104 v 2.x, 3.x (including MSM); CMR/CMR+
ASCII output	NMEA 0183 version 2.x and 3.0
RTK position data rate	10 Hz
Measurement data rate	10 Hz
Real time data output	TPS; RTCM SC104 v 2.x and 3.x; GCX3 **Note**: CMR/CMR+ is a third-party proprietary format. Use of this format is not recommended and performance is not guaranteed. Use of industry standard RTCM 3.x is always recommended for optimal performance.
Data and Memory	
Removable media	None
Internal memory	Internal up to 8 GB pre-installed
Message storage rate (maximum)	10 Hz; up to 3,000 files
Environment	
Operating temperature	Battery Charging: -0° C to +45° C Battery Operation: -20° C to +63° C (with internal batteries) Cable Operation: -40° C to +63° C (with external power)
Storage temperature	-40°C to +85°C
Humidity	100%, condensing
Waterproof rating	IPX7 (1 meter submersion)
Dust rating	IP6X (Fully dust proof)
Random vibration	MIL-STD 810G, Method 514.6, Broad band noise (random vibration), along each of 3 axes, Category 4, Table 514.6C-IV
Shock	MIL-STD 810G Method 516.6. Table 516.6-I Alternate Test Method of Classical Pulse; 40 grams, 11 milliseconds duration.
Topple	2.0 meter pole drop—1.0 meter handling drop
Technology	
Long-Range Bluetooth Technology Optimized Satellite Tracking Technology Precision Orbital Satellite Technology (POST) integrated antenna	
Power	

Table 10. General GCX3 Specifications

Internal Battery (non-removable)	3.6 V, 5800 mAh
Battery charging time	<5 hours if unit is OFF and using external 2A power source. **Note:** Charging time depends on external charger and cable used.
Battery charging method	Connect to a Micro-AB USB power adapter to charge the internal battery. Available run charge when connected to an external power adapter. Charging of internal battery when power input is greater than 4.5 V.
Operating time	Up to 10 hours

Table 10. General GCX3 Specifications

External power input	4.5–5.5 VDC USB standard, normal ambient conditions **Note:** 4.5–5.5 VDC is the operating range of the external power source when the receiver is on. To turn the receiver on, the power input must be between 4.5 and 5.5 VDC. To charge the internal battery, the external power input must be greater than 4.5 VDC.
Power consumption	1.5 W (RTK Rover with Long-Range Bluetooth Technology, using the internal battery at 20° C)
External power supply adapter rating	Input: 100–240 VAC, 50–60 Hz, 0.8 A Output: +5 VDC/2 A
Communication	
USB	1 port; Micro-AB USB (client)
Long-Range Bluetooth Technology	300 meter range with up to 3 simultaneous rovers. Typical long-range distance with clear line of sight. Distance for long-range largely depends upon environmental and field conditions.
Bluetooth	v2.1 + EDR
Survey Accuracy	

Static, fast-static (post-processed)	L1+L2:
	    H: 3.0 mm + 0.4 ppm
	    V: 5.0 mm + 0.6 ppm

Kinematic, RTK	L1+L2:
	    H: 10 mm + 0.8 ppm
	    V: 15 mm + 1.0 ppm

DGPS	H: 0.4 meters, V: 0.6 meters
SBAS	H: 1.0 meters, V: 1.5 meters
Maximum data rate	10 Hz
Cold start Warm start Reacquisition	<60 seconds <35 seconds <1 second
RTK Time-to-First-Fix (TTFF)	2–8 seconds

Safety Warnings

General Warnings

To comply with RF exposure requirements, maintain at least 25 cm between the user and the receiver when operating Long-Range Bluetooth Technology.

Sokkia receivers are designed for survey and survey related uses (that is, surveying coordinates, distances, angles, depths, and recording such measurements). This product should never be used:
- Without the user thoroughly understanding this manual.
- After disabling safety systems or altering the product.
- With unauthorized accessories.
- Without proper safeguards at the survey site.
- Contrary to applicable laws, rules, and regulations.

Sokkia receivers should never be used in dangerous environments. Use in rain or snow for a limited period is permitted.

Battery Warnings

Tampering with the battery by end users or non-factory authorized technicians will void the battery's warranty.
- Do not charge in conditions different than specified.
- Do not use other than the specified battery charger.
- Do not short circuit.
- Do not crush or modify.

Receiver Warnings

Tampering with the receiver by the end users or non-factory authorized technicians will void the receiver's warranty:
- Do not attempt to open the receiver and modify any of its internal components.
- Do not charge in conditions different than specified.
- Do not short circuit.

Usage Warnings

If this product has been dropped, altered, transported or shipped without proper packaging, or otherwise treated without care, erroneous measurements may occur.
The owner should periodically test this product to ensure it provides accurate measurements. Inform Sokkia immediately if this product does not function properly.

Regulatory

The following sections provide information on this product's compliance with government regulations for use.

FCC Compliance

This equipment complies with FCC radiation exposure limits set forth for uncontrolled equipment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation (MPE). But it is desirable that it should be installed and operated with at least 20 cm and more between the radiator and person's body (excluding extremities: hands, wrists, feet and ankles).

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Move the equipment away from the receiver.

- Plug the equipment into an outlet on a circuit different from that to which the receiver is powered.

- Consult the dealer or an experienced radio/television technician for additional suggestions.

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void your authority to operate such equipment.

Industry Canada Compliance

This class B digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouilage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Community of Europe Compliance

The product described in this manual is in compliance with the R&TTE and EMC directives from the European Community.

European Community Declaration of Conformity with R&TTE Directive 1999/5/EC

The following standards were applied: (R&TTE Directive 1999/5/EEC)

- EN 301 489-1 V1.9.2
- EN 301 489-3 V1.6.1
- EN 301 489-17 V2.2.1
- EN 300 328 V1.8.1
- EN 300 440-2 V1.4.1
- EN 55022:210/AC:2011
- EN 55024:2010
- EN 60950-1:2006+A2:2013

The following CE mark is affixed to the device:

CE

> This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Declaration of Conformity (R&TTE Directive 1999/5/EC)

esky [Czech]	*(Sokkia)* tímto prohlašuje, že tento *(GCX3)* je ve shod se základními požadavky a dalšími píslušnými ustanoveními smrnice 1999/5/ES.
Dansk [Danish]	Undertegnede *(Sokkia)* erklærer herved, at følgende udstyr *(GCX3)* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt *(Sokkia)* dass sich das Gerät *(GCX3)* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *(Sokkia)* seadme *(GCX3)* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *(Sokkia)* declares that this *(GCX3)* is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente *(Sokkia)* declara que el *(GCX3)* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
[Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *(Topcon Positioning Systems, Inc.)* ΔΗΛΩΝΕΙ ΟΤΙ (GCX2) ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente *(Sokkia)* déclare que l'appareil *(GCX3)* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente *(Sokkia)* dichiara che questo *(GCX3)* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *(Sokkia)* deklar, ka *(GCX3)* atbilst Direktvas 1999/5/EK btiskajm prasbm un citiem ar to saisttajiem noteikumiem.
Lietuvi [Lithuanian]	Šiuo *(Sokkia)* deklaruoja, kad šis *(GCX3)* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart *(Sokkia)* dat het toestel *(GCX3)* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, *(Sokkia)*, jiddikjara li dan *(GCX3)* jikkonforma mal-tiijiet essenzjali u ma provvedimenti orajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, *(Sokkia)* nyilatkozom, hogy a *(GCX3)* megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym, *(Sokkia)*, deklaruj, e *(GCX3)* spenia wymagania zasadnicze oraz stosowne postanowienia zawarte Dyrektywie 1999/5/EC.
Português [Portugues]	*(Sokkia)* declara que este *(GCX3)* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	*(Sokkia)* izjavlja, da je ta *(GCX3)* v skladu z bistvenimi zahtevami in ostalimi relevantnimi doloili direktive 1999/5/ES.

Slovensy [Slovak]	*(Sokkia)* týmto vyhlasuje, že *(GCX3)* spa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	*(Sokkia)* vakuuttaa täten että *(GCX3)* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar *(Sokkia)* att denna *(GCX3)* stǎr I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Waste Electrical and Electronic Equipment (WEEE) Directive

Following information is for EU-member states only:

The use of the symbol below indicates that this product may not be treated as household waste. By ensuring this product is disposed of correctly, to help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about the take-back and recycling of this product, please contact a supplier where you purchased the product or consult.

Bluetooth Transmission Statements/Compliance

This Bluetooth device is compliant to the following profiles of the core spec version 2.1/2.1+EDR:

- Baseband
- HCI
- Link Manager
- Radio

The radio has been tested using the maximum antenna gain of 2.3 dBi and the Bluetooth qualification is valid for any antenna with the same or less gain.

Korean KC-RF Compliance

Trade Name or Application Name: Topcon Positioning Systems, Inc.
Equipment Name: GNSS Receiver
Basic Model Name: GCX3
Certificate Number: MSIP-RMM-T8S-126650-1
Manufacturer/Country of Origin: Topcon Positioning Systems, Inc./U.S.A.
Approval Issue Date: 2016-11-18

Korean KC-EMC Class B Statement
이 기기는 가정용 (B 급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며 ,
모든 지역에서 사용할 수 있습니다 .

Japan Radio Law and Telecommunications Business Law Compliance

Bluetooth Module Compliance

The integrated Bluetooth module WT-41 reference application described on page 72 (General Details - Communication) complies in accordance with the provisions of Article 38-24 paragraph 1 of Japan Radio Law. The certificate granted in accordance with Japan Radio Law has the following:

Certification Number: ATCB013105

Identifier: R 209-J00047

Warranty

Sokkia[1] positioning equipment is guaranteed against defective material and workmanship under normal use and application consistent with this Manual. The equipment is guaranteed for the period indicated, on the warranty card accompanying the product, starting from the date that the product is sold to the original purchaser by Sokkia's Authorized Dealers.

During the warranty period, Sokkia will, at its option, repair or replace this product at no additional charge. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. This limited warranty does not include service to repair damage to the product resulting from an accident, disaster, misuses, abuse or modification of the product.

Warranty service may be obtained from an authorized Sokkia warranty service dealer. If this product is delivered by mail, purchaser agrees to insure the product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location and to use the original shipping container or equivalent. A letter should accompany the package furnishing a description of the problem and/or defect.

The purchaser's sole remedy shall be replacement as provided above. In no event shall Sokkia be liable for any damages or other claim including any claim for lost profits, lost savings or other incidental or consequential damages arising out of the use of, or inability to use, the product.

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1. The warranty against defects in a Sokkia battery, charger, or cable is 90 days.

SOKKIA