Sokkia Atlas
GNSS Receiver

SOKKIA

Operator's Manual

Sokkia Atlas GNSS Receiver Operator's Manual

Part Number 1006148-01

Rev C

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Preface

Thank you for purchasing this Sokkia product. The materials available in this Manual (the “Manual”) have been prepared by Topcon Positioning Systems, Inc. (“TPS”) for owners of Sokkia products, and are designed to assist owners with the use of the receiver and its use is subject to these terms and conditions (the “Terms and Conditions”).

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**)
Bold	Name of a dialog box or screen	From the **Connection** screen...
Bold	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 *Sokkia Online Help.*

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

Supplementary information that can have an adverse affect 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

Sokkia's Atlas receiver is a compact, high-performing, 226 channel GNSS receiver for static and kinematic applications. The receiver design includes the latest GNSS board technology, which provides optimized satellite tracking technology. The Sokkia Atlas delivers world-class positioning and navigation capability to your application by tracking signals with multiple frequencies and multi-constellation satellite systems.

Using full-wave antenna technology, the Sokkia Atlas can receive and process multiple signal types, including the latest GPS L2C and L5, Beidou B1, B2, and other future[1] signals. The Sokkia Atlas receiver includes an enhanced GNSS receiver board that supports 226 channels with universal tracking technology.

GNSS tracking capabilities, multi-frequency RTK, SBAS functionality, extensive communication capabilities, removable memory for files combine to provide a positioning system efficient, secure, and appropriate for any survey.

Several unique features, including advanced multipath mitigation, adjustable Phase-Locked Loop (LLP) and Delay-Locked Loop (DLL), offer a reliable and versatile reception of weak signals even in degraded signal environments. The receiver also supports advanced algorithms for superior GNSS tracking in high-vibration environments.

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

Sokkia Atlas Features

The Sokkia Atlas receiver's advanced design allows for a simplified setup and premium performance. The Sokkia Atlas receiver features the following:

- A premier multi-constellation GNSS board
- Industry leading full-wave antenna technology
- Detachable batteries for extended operation
- Internal radio and cellular (optional) modems
- Integrated Bluetooth® wireless and radio technology
- Optional HSPA (3.5G)[2] cellular technology
- Interface for controlling viewing data logging through the LED display
- External power, USB, and serial-data ports
- External high-capacity memory card support

The Sokkia Atlas is available in the following configurations:

- Digital UHF II radio modem
- Digital UHF II radio modem with HSPA module

Unpacking Your Receiver Kit

This section describes the documentation, standard kit components[3], 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. If any items are missing or damaged, contact your Sokkia dealer or Sokkia technical support. See "Getting Technical Support" on page 3.

1. The Sokkia Atlas receiver is equipped with a GNSS board that is Galileo-ready. Full support of this new constellation and associated signals will be incorporated into the receiver when the constellation is mature, and ready for commercial use.
2. High-Speed Packet Access (HSPA) cellular module supports faster data rate and is backward compatible with GPRS/EDGE (GSM) technology.
3. Components in standard kits may differ based on your region. Contact your local Sokkia dealer to inquire about items included in your regional standard kit and accessories that are available with the receiver.

Standard Kit Components[1]

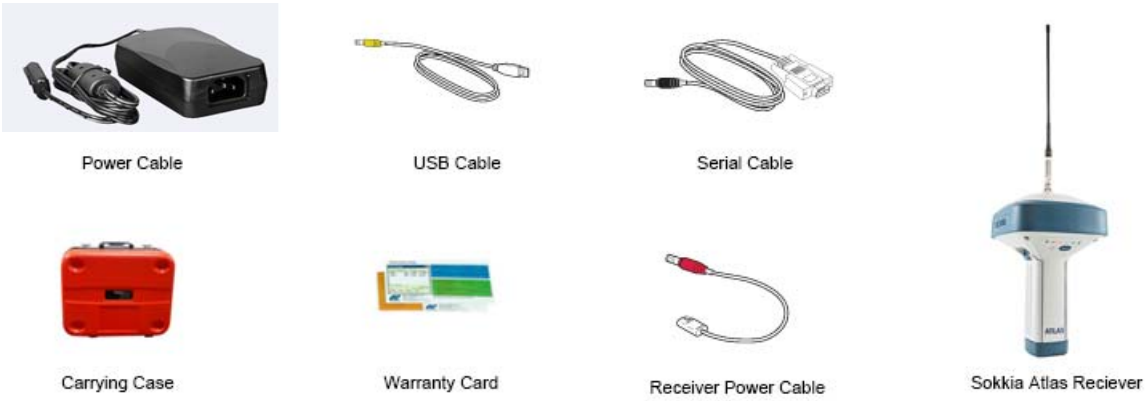


Figure 1: Standard System Components Included with Your Receiver

The Sokkia Receiver Utility (SRU), USB drivers, and Sokkia Atlas Operator's Manual are available on the Sokkia Support website: http://sokkiasupport.com/.

Accessories

Sokkia offers a wide variety of accessories (Figure 2) specially designed to improve system flexibility and job site efficiency. For more details on the optional accessories available for Sokkia Atlas, contact your Sokkia dealer.

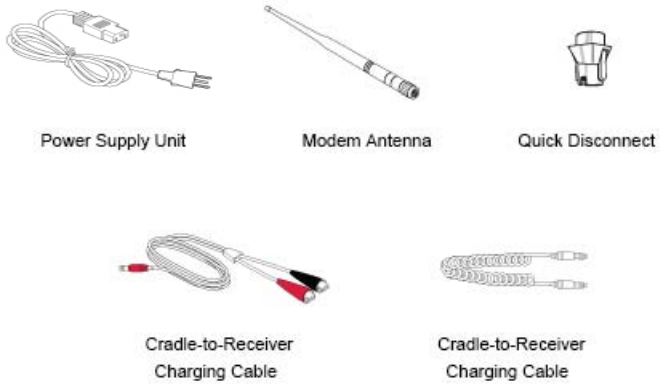


Figure 2: Receiver Accessories

1. Components in standard kits may differ based on your region. Contact your local Sokkia dealer to inquire about items and accessories included in your kit.

Using Sokkia Software With Your Receiver

Use the Sokkia Atlas receiver in conjunction with the Sokkia Receiver Utility (SRU) and MAGNET® Field applications for a precision positioning solution. Sokkia software enables you to 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 for receivers and peripheral devices. You can install it on desktop computers and data controllers, and is available on the Sokkia Support website: http://sokkiasupport.com/.

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.

Getting Technical Support

Before contacting a Sokkia customer representative about any problems with the receiver, see “Troubleshooting” on page 38 for some solutions that may fix the issue.

Contact your local Sokkia dealer or visit the Sokkia Support website (http://sokkiasupport.com/) for technical support.

For quick and effective support, provide a detailed description of the problem.

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

1. A description of the following:
   – Field operation that was being performed when the problem occurred
   – Details of the unexpected behavior, symptoms, and any error messages that precede or follow the problem
   – 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

The Sokkia website provides current information about Sokkia’s line of products. The support area of the website provides access to Sokkia field and office software, manuals, frequently asked questions, and so forth. To access the Sokkia website, visit www.sokkia.com.

The Sokkia Support website also provides complete support, such as news, updates, reminders, training, live Webinars, and customer service to help you get the information you need.
For more information, visit: http://sokkiasupport.com/.

The Sokkia Atlas receiver enclosure is fully sealed and incorporates the GNSS receiver board, antenna, batteries, memory storage, and wireless communication device.

Receiver Overview

The upper portion of the receiver contains the GNSS antenna, which is enclosed by the radome and securely surrounded by a shock-absorbing rubber bumper. The receiver's magnesium alloy lower enclosure features an easy-to-operate display panel, detachable batteries, quick release mounting socket, and data ports.

The Sokkia Atlas receiver has a highly-visible display panel with single-button operation. The display panel enables you to view the receiver's operational status. For more information, see "Display Panel Operations" on page 11.

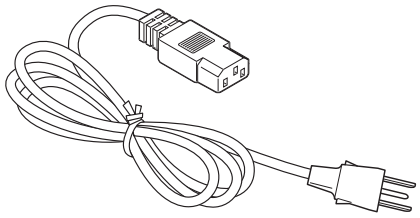
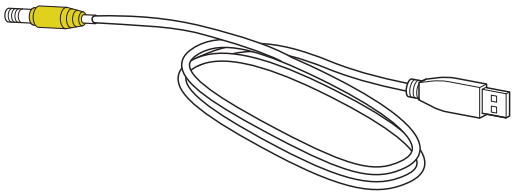
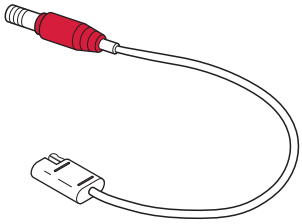
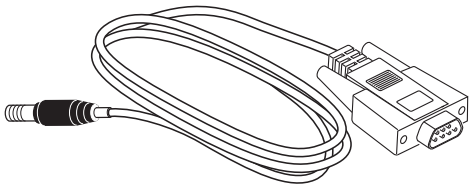
You can locate regulatory and product identification information on the two receiver labels, which are located inside of the battery compartments. The product identification label contains the serial number and part number.

Cables

The Sokkia Atlas[1] package includes a power supply cable, a USB cable, and a power adapter. Table 1 describes the cables included with your receiver, depending on your regional standard kit configuration. Make sure to contact your local Sokkia dealer to inquire about standard items included in your receiver kit.

Align the keyways when connecting the power/serial cable to the receiver port. Turn the cable lock clockwise until it clicks to secure the cable in place. To disconnect the cable, turn the lock counter-clockwise, and then gently remove the cable.

Table 1. Receiver Cables

Cable Description	Cable Illustration
Power Cable Connects the power supply unit to a grounded outlet. U.S.: p/n: 14-008052-01 Europe: p/n: 14-008054-01 Australia: p/n: 14-008053-01 Brazil: p/n:1000475-01	
USB Cable Connects the receiver to an external device (controller or computer) for data transfer and receiver configuration. p/n 14-008070-01	
Receiver Power/Charging Cable Connects the receiver and the power supply unit via SAE connectors for battery charging. p/n 14-008016-03	
Serial Cable Connects the receiver to an external device (controller or computer) for data transfer and receiver configuration. p/n: 14-008005-03	
Power Supple Unit Charges the detachable batteries when connected to a grounded outlet. This unit converts the alternating current (AC) normally supplied from an electrical outlet to a direct current (DC) used to charge the batteries and/or power the receiver. p/n: 22-034101-01	

The power supply unit should only be used for charging the batteries. Do not use as a power source during surveying. The power supply unit can either be connected to the charging cradle or directly to the receiver. For details, see the power related sections in “Power Supply Unit” on page 16.

1. Components in standard kits may differ based on your region. Contact your local Sokkia dealer to inquire about items included in your regional standard kit and accessories that are available with the receiver.

Accessories

Sokkia offers a wide variety of accessories specially designed to improve system flexibility and job site efficiency. For more details about the available accessories, contact your Sokkia dealer.

- **Modem Antenna** (p/n 30-070003-01 UHF 410-440 or p/n 30-050503-01 UHF 450-470): The Digital UHF II antenna is a BNC connection.
- **2m Carbon Fiber Rover Pole** (p/n 808016): A durable lightweight rover pole.
- **Wide Frame Wood Tripod** (p/n 751252): A heavy duty tripod.
- **Tribrach and Tribrach Adapter** (p/n 221470100-SURSK and 210160016): These items level the tripod, and secure the receiver or antenna to the tripod.
- **Bayonet Adapter for Tribrach** (p/n 726036): Precisely centers, aligns, and levels the tripod over a point. The horizontal spacer inserts into the precision tribrach, and allows the receiver to sit securely on the precision tribrach.
- **Quick Disconnect Adapter** (p/n 02-850905-01): Connects to the range pole for the receiver to slip into the top. Using the side clips, the receiver can be quickly connected to/disconnected from the range pole.
- **Hand-held Controller**: Allows the Sokkia Atlas Base and Rover systems to be configured and monitored directly in the field. You can use the Sokkia Receiver Utility (SRU) to configure the receiver and any Sokkia field data collection software.
- **MAGNET and SRU**: Can be used to operate the receiver. See the *SRU Online Help* or field data collection software for details on set up and operation.
- **Alligator Clips-to-SAE Cable** (p/n 14-008025-01): Connects the charging cradle or receiver to an auxiliary battery for powering the receiver during survey operations. Used in conjunction with the Power-to-SAE cable (p/n 14-008016-01).
- **Cradle-to-Receiver Charging Cable** (p/n 14-008072-02LF (0.5 m long): Connects the receiver to the charging cradle for external power.[1]
- **Battery Recharger**: Charges the batteries. See “Charging the Batteries” on page 16. Contact your Sokkia dealer to check for availability.

1. Contact your Sokkia dealer for availability of the cradle which charges the Sokkia Atlas batteries.

Batteries

The receiver comes equipped with two detachable, rechargeable batteries for powering the receiver. For more information about using the batteries, see “Managing Power” on page 16.

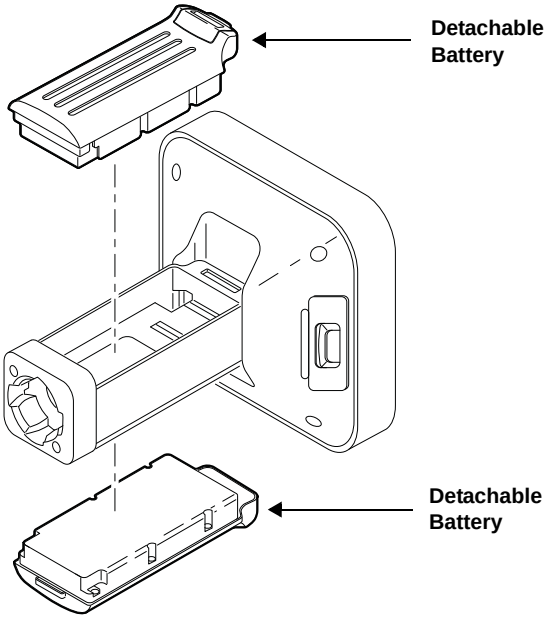
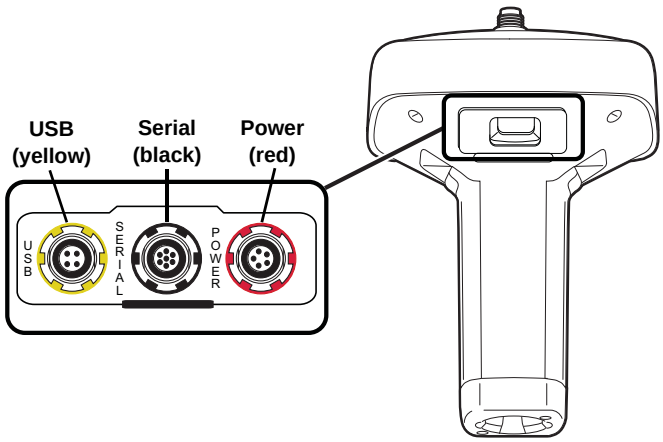


Figure 3: Sokkia Atlas Detachable Batteries

Data and Power Ports

The Sokkia Atlas has the following three ports:

- **USB** – rimmed in yellow; used for high-speed data transfer and communication between the receiver and an external device. The body of the connector on the corresponding cable is yellow.
- **Serial Port** – rimmed in black; used for communication between the receiver and an external device.
- **Power** – rimmed in red; used to connect the receiver to an external power source. This port can also be used to charge the batteries. The body of the connector on the corresponding cable is red.



External Radio Antenna Connector

The radio antenna connects to the external antenna connector on the Sokkia Atlas radome (Figure 4). The radio antenna uses a BNC connection.

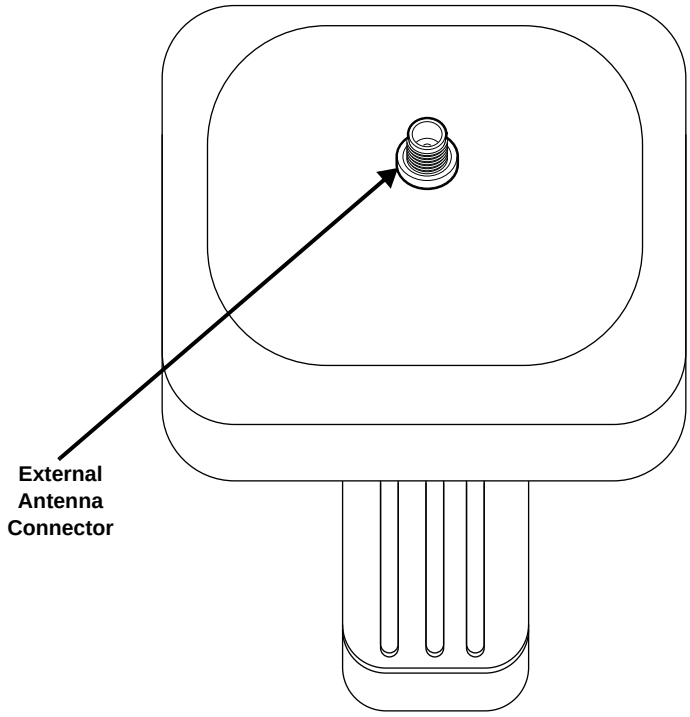


Figure 4:Sokkia Atlas Radome and External Antenna Connector

Bottom Connector

The bottom connector (Figure 5) connects the receiver to either a standard 5/8" thread pole/adapter or the quick disconnect. The quick disconnect adapter (p/n: 02-850905-01) connects to the range pole for the receiver to slip into the top. Using the side clips, the receiver can be quickly connected to/disconnected from the range pole.

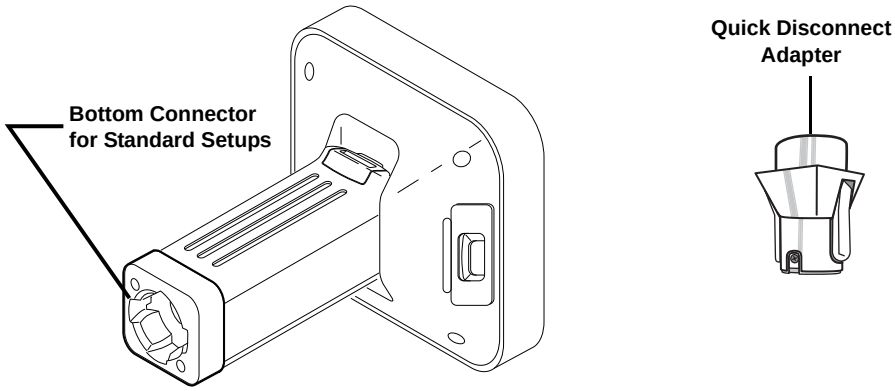


Figure 5: Sokkia Atlas Quick Connector

SD/SDHC and SIM Card Slots

The SD/SDHC and SIM card slots are located under the battery compartments near the base of the dome. For more information about the SD/SDHC card , see “Memory” on page 35. For more information about SIM cards, see “SIM Card Slot” on page 10.

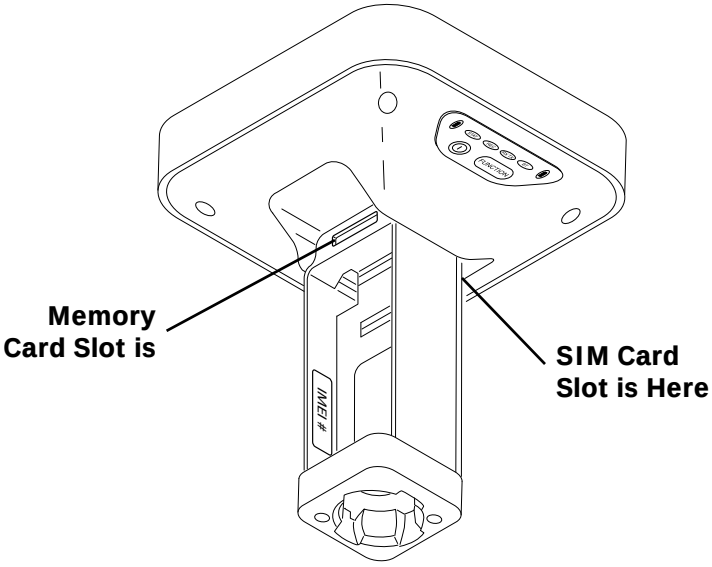


Figure 6:Sokkia Atlas Card Slots

SIM Card Slot

The SIM card slot is located to the right of the LED Display Panel inside the battery compartment. It enables you to install a standard SIM card into the receiver. Once installed, the SIM card provides a unique identification for the receiver's HSPA module and enables the receiver's HSPA functionality based on the subscribed services (the receiver board accesses the HSPA module, which accesses the SIM card). The SIM card usually remains inside the receiver. You can access the HSPA module, with the SIM card installed, via SRU for configuration purposes. A SIM card can be purchased from a local cellular provider.

The Sokkia Atlas receiver, equipped with a CDMA module, does not require a SIM card and is only approved to work on a Verizon® wireless network. Note the MEID# printed on the Sokkia Atlas unit or extracted from SRU, and call Verizon to activate service on the CDMA module installed on the receiver.

The CDMA module is available on-demand in the United States only. Contact your Sokkia dealer for more information.

SIM Cards

The SIM card must have HSPA support to communicate over a TCP/IP network.

Installing the SIM Card

1. Make sure the receiver is turned off.
2. Remove the detachable battery to the right of the LED Display panel.
3. Carefully insert the SIM card, label-side up, into the SIM card slot located at the top of the battery compartment.
   Once the receiver is turned on, the receiver board will detect the SIM card, and it will be ready to use as needed.

Display Panel Operations

The LED display panel (Figure 7) enables you to control receiver power and data recording. The LEDs display the status of the satellite tracking, recording/memory capacity, Bluetooth connections, and batteries. This chapter describes the different LED blink patterns and what they mean.

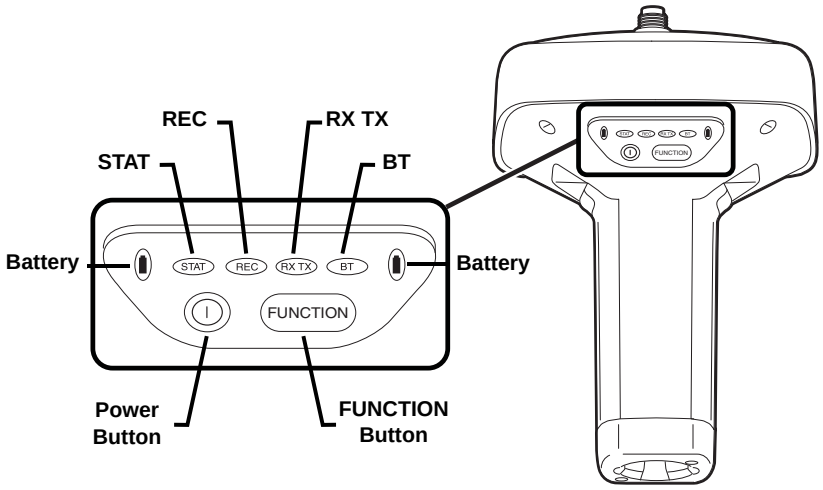


Figure 7: LED Display Panel

Power Button

The power button turns the receiver on and off. When turning the receiver on, press the Power button until the LEDs briefly flash. When turning off the receiver, press the Power button until the LEDs go out.

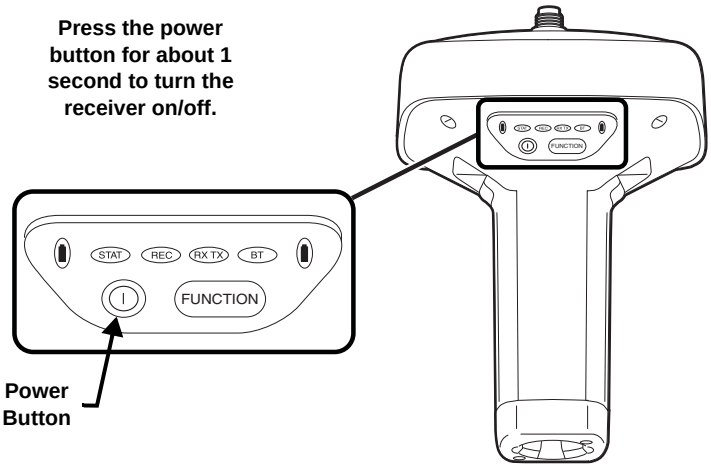


Figure 8: Power Button Functions

Receiver Status LEDs

There are four status LEDs to provide you information about the battery life, tracked satellites, memory capacity, and Bluetooth wireless connectivity. This section describes the color and behavior of each LED.

STAT LED

The tracking status LED displays the status of tracked satellites when the receiver is on.

Table 2. Status LED Patterns

LED Color	Description
	One blink per tracked GPS satellite.
	One blink per tracked GLONASS satellite.
	One blink means no satellite is being tracked.

REC LED

The recording LED indicates if data is being written to memory and warns if memory is available for recording. For a description of the REC LED status when using the FUNCTION button, see Table 7.

Table 3. Recording LED Patterns

Display	Description
	Green Blink: File logging is in progress. Each blink indicates data is being written to the SDHC card.
	Solid Orange: The receiver is changing modes.
	Orange Blink: The file system is not accessible.
	Solid Red: A fault condition with the receiver (no more memory, no SDHC card inserted, a hardware problem, or an improper OAF.

For more information on REC LED patterns, see “FUNCTION Button/Logging Data” on page 14.

RX TX LED

This LED displays the status of the modem. Table 4 describes the LED colors and patterns for the different modems available for the Sokkia Atlas receiver.

Table 4. Sokkia Atlas LEDs

Digital UHF II	
No Light	Modem is turned Off
Green Flashes (green LED, off, green LED)	Modem is in receiver mode
Solid Green	A radio link has been established; modem is ready to receive data
Solid Green plus yellow (green LED, green LED + red LED)	Modem is receiving data (Yellow during actual reception)
Solid Red	Modem is in transmitter mode
Red Flashes (rapid red LED, off, red LED)	A fault condition has been detected

Table 4. Sokkia Atlas LEDs

Red then Green (Red LED, off, green LED, off)	Modem is in command mode
GSM/HSPA	
Solid Yellow (Red LED + Green LED)	Modem is initializing
Green Flashes	The modem is on, registered on the network, and is waiting for incoming calls
Solid Red	A connection had been established
Solid Yellow (Red LED + Green LED) Green Blinks (DUHF II or SpSp)	The modem is in direct control mode (Daisy Chain)
Yellow flashes (green LED + red LED, off)	an error has occurred (initialization error, wrong PIN code etc.)

Bluetooth LED

The Bluetooth LED displays the status of the Bluetooth activity. Table 5 describes the activity.

Table 5. Bluetooth LED Patterns

LED Color	Description
	Blue Blink: Bluetooth is on and waiting for a connection.
	Blue Solid: A single Bluetooth connection is established.
	No light: Bluetooth is turned off.

Battery LED

The Battery LED indicates the remaining charge of each detachable battery. When an external power source is utilized, the Power button LED turns solid green and begins to blink if the batteries begin to charge. See Table 6 for more information.

Table 6. Battery LED Patterns

LED Color	Description
THE RECEIVER IS ON; USING BATTERY POWER	
	Slow Green Blink (5 sec.): The charge is greater than 85 percent.
	Slow Orange Blink (5 sec.): The charge is intermediate.
	Slow Red Blink (5 sec.): The charge is less than 15 percent.
EXTERNAL POWER IN USE(POWER BUTTON LED SOLID GREEN);BATTERIES ATTACHED[a,b]	
	Fast Green Blink (1 Sec.): The internal batteries are at greater than 85% capacity; the batteries are being charged.
	Fast Orange Blink (1 Sec.): The internal batteries are at greater than 15% capacity; the batteries are being charged.
	Fast Red Blink (1 Sec.): The internal batteries are at less than 15% capacity; the batteries are being charged.

a. The receiver is on or off.
b. You can also charge the batteries using the battery charging cradle. See page “Battery Charging Cradle” on page 17.

FUNCTION Button/Logging Data

This button switches the receiver between information modes and post-processing modes, starts/stops data recording, and changes the baud rate of the serial port to 9600. The FUNCTION button enables you to turn data recording on or off. See Table 7 to learn how to use the FUNCTION button.

Each time data recording is turned off or on, either a new file opens or data appends to a particular file.

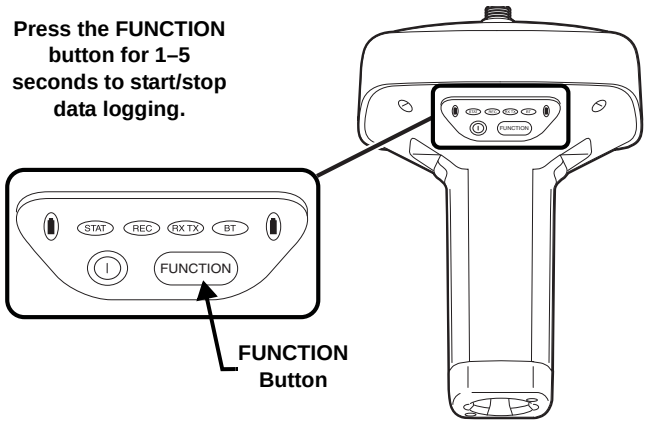


Figure 9: FUNCTION Button

Table 7. FUNCTION Button Operations and REC LED Status

FUNCTION Key	REC LED	Status
When data recording is off, and the FUNCTION key is...		
Not pressed	No light	No data recording.
	Orange blink	Internal file system test in progress.
	Red	No free memory; hardware problem with data recording. No SDHC card.
Pressed for < 1 second	**If FUNCTION key mode is "LED blink mode switch"**	
	Orange	Release to change information mode.
	If FUNCTION key mode is "Occupation mode switch"	
	Orange	No function.
Pressed for 1–5 seconds	**If FUNCTION key mode is "LED blink mode switch"**	
	Green	Release to start data recording (post-processing occupation mode undefined).
	If FUNCTION key mode is "Occupation mode switch"	
	Green	Release to start recording (Kinematic or Static post-processing occupation mode).
Pressed for 5–8 seconds	Red	Release to turn serial port A baud rate to 9600 bps.
Pressed for > 8 seconds	No light	No function.

Table 7. FUNCTION Button Operations and REC LED Status (Continued)

FUNCTION Key	REC LED	Status
When data recording is on, and the FUNCTION key is...		
Not pressed	Red	No free memory; hardware problem with data recording.
	If FUNCTION key mode is "LED blink mode switch"	
	Green	Data recording started (post-processing occupation mode undefined).
	If FUNCTION key mode is "Occupation mode switch"	
	Green	Data recording started (Kinematic post-processing occupation mode).
	Orange	Data recording started (Static post-processing occupation mode).
Pressed for < 1 second	**If FUNCTION key mode is "LED blink mode switch"**	
	Orange	Release to change information mode.
	If FUNCTION key mode is "Occupation mode switch"	
	Orange	Release to toggle between Static and Kinematic post-processing modes.
Pressed for 1–5 seconds	No light	Release to stop data recording.
Pressed for 5–8 seconds	Red	Release to turn serial port A baud rate to 9600 bps.
Pressed for > 8 seconds	No light	No function (data recording still on).

Managing Power

This chapter describes how to power the receiver, charge the detachable batteries, and use an external power source.

Turning On/Off the Receiver

To turn on the receiver, press and hold the power button for more than one second until the LEDs briefly flash. When the receiver is turned on, the receiver's channels initialize and begin tracking satellites from multiple constellations (depending on the receiver's supported features and current OAF).

To turn off the receiver, press and hold the power button for more than one and less than four seconds (until both the STAT and the REC LEDs are off).

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

Powering the Receiver

The receiver is powered by the detachable, rechargeable batteries or an external power source connected to the power port. If an external power source is connected, the receiver draws power from it over the battery.

Detachable External Batteries

Each detachable battery provides between 5 and 10 hours of operation, depending on the receiver mode.

To check the status of the detachable batteries, view the BATT LED or check the status using available Sokkia software.

Charging the Batteries

The batteries are shipped from the factory without power. Fully charge the batteries before surveying. You can use the power supply unit or the battery charging cradle to charge the batteries.

Power Supply Unit

The power supply unit (p/n 22-034101-01) charges the external batteries when connected to a grounded outlet. This unit converts the alternating current (AC) normally supplied from an electrical outlet to a direct current (DC) used to charge the batteries and/or power the receiver.

he power supply unit is designed for indoor use only. Do not use in a damp or a wet environment. Do not expose the power supply to rain or snow. It should only be used for charging the batteries. Do not use as a power source during surveying.

You can connect the power supply unit to the charging cradle or directly to the receiver. See Figure 10 on page 17. The power supply has the following specifications:

- input voltage – between 100 and 240 V AC
- frequency of input power – between 50 Hz and 60 Hz
- output voltage – 12 V DC@2.5 A (30 W)

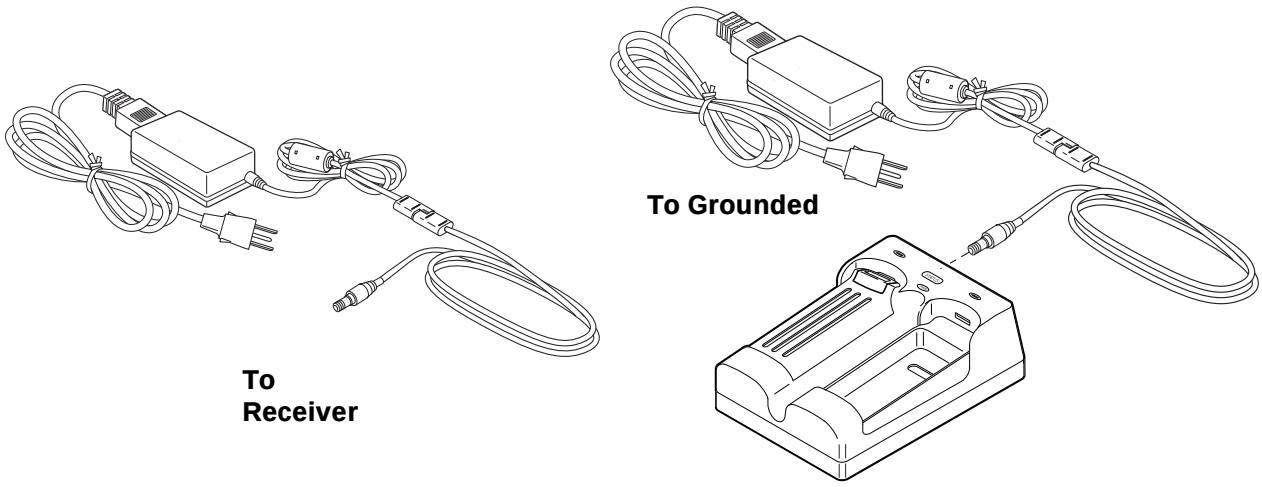


Figure 10:Power Supply Unit

Contact your Sokkia dealer for power supply unit availability.

Battery Charging Cradle

The battery charging cradle (Figure 11) connects to a standard power outlet using the power adapter cable and power cable/power supply unit.

The charger has two ports, one button, and three LEDs.

- The two ports connect the charger to either a receiver or an external power source. The ports charge or drain the batteries simultaneously.
- The STATUS button activates the battery LEDs.
  Press **STATUS** to display the amount of charge for the corresponding battery.
- The two battery LEDs display the percentage of charge in the attached battery:
  – A green light indicates a charge greater than 85%.
  – An orange light indicates an intermediate charge.
  – A red light indicates a charge of less than 15%. Recharge or replace the battery as soon as possible.
- The power LED lights up when the charger is connected to an external power source; such as an electrical outlet or another power source (12 volt battery).

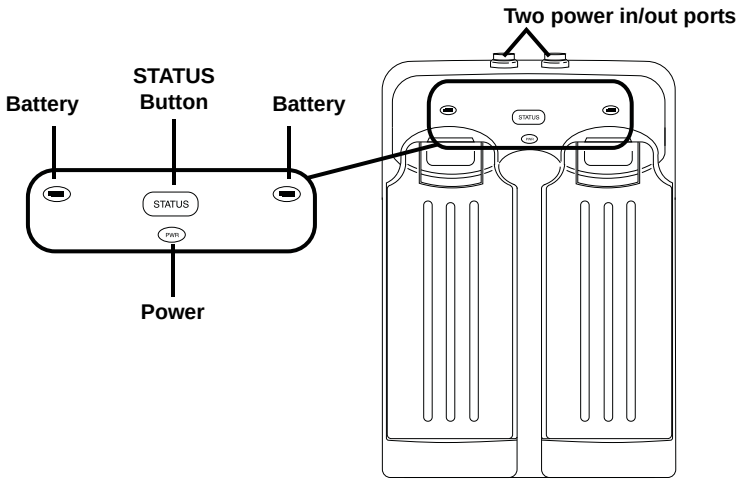


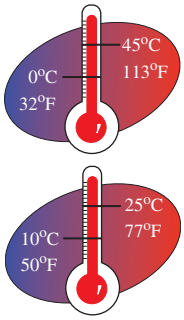
Figure 11: Battery Charger Cradle with Batteries

You can also attach the battery charger to a tripod, a belt, or an RTK pole to provide external power to the base station or rover.

Before using the Sokkia Atlas, fully charge the batteries for maximum operating time.

Battery Charging Temperatures

Charge the batteries only in temperatures between 32°F (0°C) and 113°F (45°C).



An optimal charging temperature is between 50°F (10°C) and 77°F (25°C). If possible, charge the batteries within this temperature range.

Charging Procedure

There are two ways to charge the receiver's detachable batteries:

- while they are attached to the receiver
- while they are attached to the charging cradle

If the batteries are attached to the receiver or to the charging cradle, in approximately six hours the batteries will be simultaneously fully charged.

The Li-Ion batteries used in the battery packs should run at no less than 80% capacity after 500 charging cycles. You do not need to drain these batteries before recharging.

To charge the batteries using the power supply unit:

1. Plug the receiver-to-SAE power cable into the receiver's power input port.
2. Connect the receiver-to-SAE power cable and the power supply-to-outlet cable to the AC adapter.
3. Plug the power supply-to-outlet cable into an available outlet. The batteries are fully charged after approximately 6 hours.

To charge the batteries using the charging cradle:

1. Remove the batteries from the receiver and insert them into the charging cradle.
2. Connect the power cable to the power supply unit.
3. Connect the SAE connectors on the power adapter cable and power supply unit.
4. Connect the power adapter cable to one of the ports on the charging cradle (either port will charge both/either battery).

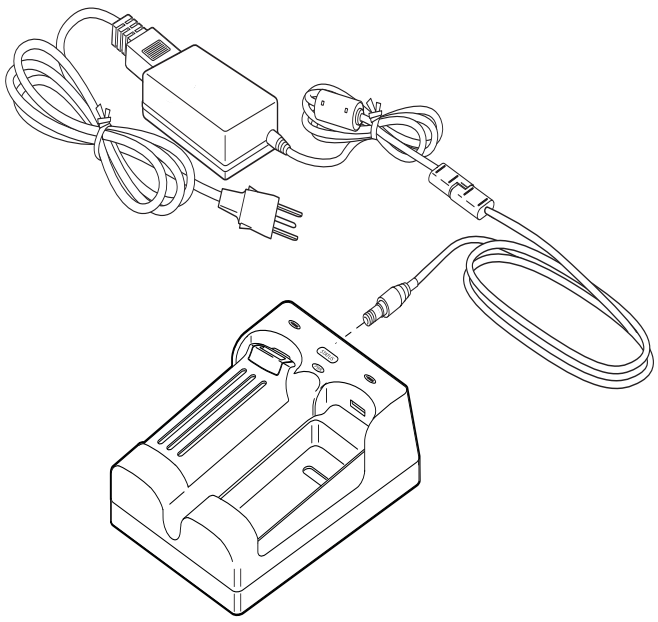


Figure 12: Charging Batteries

5. Plug the power supply to an available outlet. The batteries are fully charged after approximately 6 hours.

Leaving the Batteries on Charge

The batteries can be safely left in the receiver or the charging cradle once charging is complete. Doing so will not overcharge or damage the batteries.

The batteries can also be attached/detached to/from the receiver or charging cradle at any time without harming the batteries, the receiver, or the cradle. When returning the batteries to the receiver or cradle, charging is automatically resumed.

Attaching the Batteries

To attach the batteries to the Sokkia Atlas (Figure 13):

1. With the battery slightly tipped, place the bottom of the battery into the bottom of the battery compartment.
2. Gently push the top of the battery into the battery compartment until it snaps into place. Make sure that the clip at the top of the battery completely snaps into place.

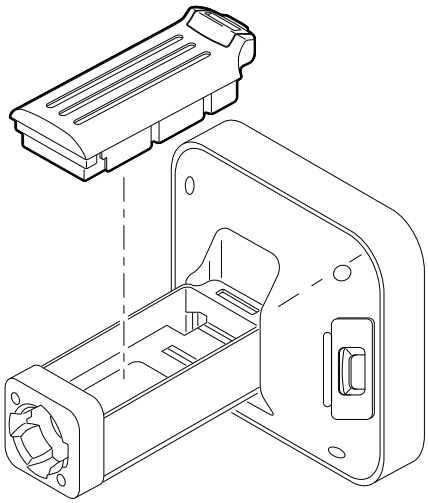


Figure 13: Inserting the Sokkia Atlas Batteries

Detaching the Batteries

To detach the batteries from the Sokkia Atlas, so that they can be charged or replaced:

Using the clip at the top of the battery, gently pull down and out to detach the battery from the receiver (Figure 14).

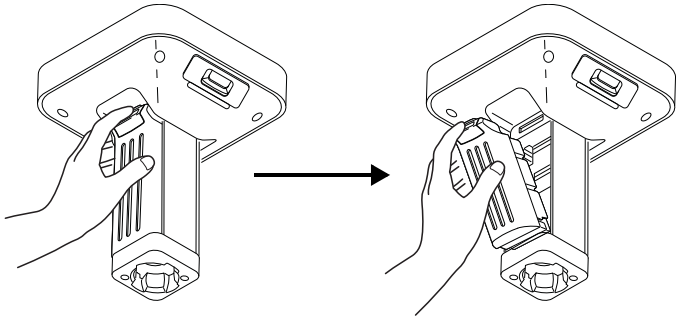


Figure 14: Detach the Sokkia Atlas Batteries

Surveying While Charging

The user can execute any kind of surveying while charging the internal batteries attached to the Sokkia Atlas without degradation of performance.

While charging, make sure the air temperature is between +32 ^{o}F (0 ^{o}C) and +113 ^{o}F (+45 ^{o}C). This is important to prevent serious damage to the batteries, the receiver or injury to persons.

Changing the Batteries while Surveying

It is safe to change a depleted battery with a fully charged one while surveying (i.e., on the fly) without turning off the receiver. Before doing this, make sure the other battery has enough charge to power the receiver while changing the depleted battery. The surveying will not be disrupted. If needed, repeat this procedure for the second battery.

Using an Auxiliary Power Source

In addition to the detachable batteries, you can connect the receiver to an external power source, such as a vehicle battery with 9 to 21 VDC, to operate the receiver and for continuous use of the receiver if the detachable batteries become discharged.

Power input greater than 21 VDC could damage the receiver.

To connect the receiver to an auxiliary battery (Figure 15):

Use the alligator clips-to-SAE cable (p/n 14-008025-01) to directly connect the auxiliary battery and the receiver's power port (without SAE).

When powering the receiver using external batteries, set the charger mode to Off; otherwise, the detachable batteries will also charge, causing operation time to decrease.

1. Connect the alligator clips-to-SAE cable to a 12-volt battery.
2. Connect the alligator clips-to-SAE cable to the receiver's power port.
3. Turn on the receiver.

From Receiver to Auxiliary Battery Using alligator clips-to-SAE cable

Figure 15: Connect an Auxiliary Battery and the Receiver

A single external 12 V, 2.3 A*h battery should run the receiver and modem for about 9 hours and the receiver for 13 hours.

To connect the receiver to the charging cradle (Figure 16 on page 21):

The charging cradle with extra batteries hooks onto a tripod or belt for a convenient power supply for the receiver. The part number for the receiver-to-charger cradle cable is 14-008072-02LF.

1. Connect one end of the cradle-to-receiver cable to the charging cradle.

2. Connect the other end to the power port on the receiver.

The Batteries in the Charging Cradle do not Charge the Internal/Detachable Batteries. The Charging Cradle Powers the Receiver

Figure 16: Connect the Charging Cradle and Receiver

Insufficient Power

If the batteries become fully discharged and an external power supply is not connected, the receiver will shut down and automatically save recorded files. To avoid disruptions, check the BAT LED on the display panel for the battery charge status. See “Battery LED” on page 13 for more information.

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

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

- Recharge the batteries.
- Make sure the power cable is correctly connected to the receiver’s port.
  a. Align the keyways when connecting the power/serial cable to the receiver port.
  b. Turn the cable lock clockwise until it clicks to secure the cable in place.
  c. To disconnect the cable, turn the lock counter-clockwise, and then gently remove the cable.
- 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. See “Specifications” on page 43.

The sections in this chapter describe receiver options, and how to load a new Option Authorization File (OAF), update firmware, and perform a factory reset. To do this, you will need to use the Sokkia Receiver Utility (SRU) software that was supplied from the Sokkia Support website (http://sokkiasupport.com/). For information about installing the software, see the *Sokkia Receiver Utility* (*SRU*) *Online Help*.

Viewing Receiver Information

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

To open the Receiver Info window:

1. Connect the receiver to a computer and open SRU.
2. In SRU, connect to the receiver.
3. Click **Device** ▸ **Application Mode** ▸ **Receiver Managing**.
4. Click **Device** ▸ **Connect.**
5. In the **Connection Parameters** window, select the correct serial port, and click **Connect**.
6. In the SRU main window, click the **Information** icon. The **Receiver Info** window (Figure 17) appears.

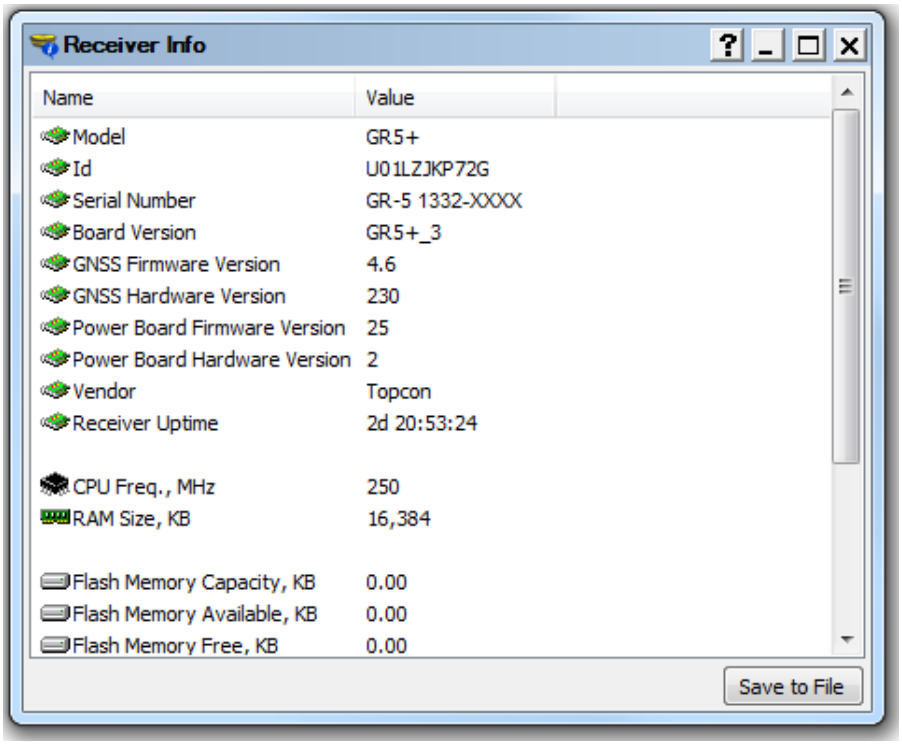


Figure 17: SRU – Receiver Info

Loading New Firmware

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

- ramimage.ldr – the Receiver board RAM file
- main.ldp – the Receiver board Flash file

To upload firmware files to the receiver:

1. Connect the receiver to a computer using the Power and Serial cable receiver accessory (p/n: 100182-01).
2. To connect to the receiver in SRU:
   a. Click **Device** ▸ **Application Mode** ▸ **Firmware Loader**.
   b. Click **Device** ▸ **Connect**.
   c. In the **Connection Parameters** window (Figure 18), select **Serial Port** and the port name, and then click **Connect**.

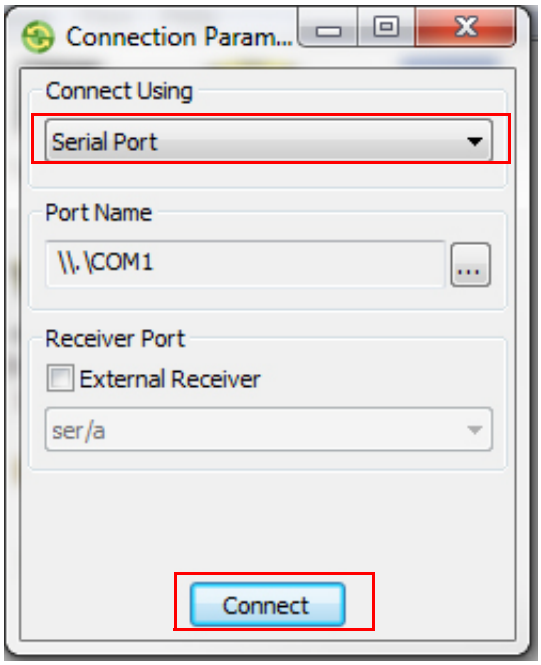


Figure 18: Connection Parameters Window

3. Click the **Firmware Loader** icon in the SRU main window. The **Firmware Loader** window (Figure 19) displays. This window enables you to upload firmware files to the connected receiver.
4. Make sure **Receiver / Modem / Bluetooth** is selected in the **Device** field.
5. (Recommended) Select **Soft Break** as the **Capture Method**.
6. Browse for and select the receiver board's RAM and Flash files (Figure 19 on page 24).

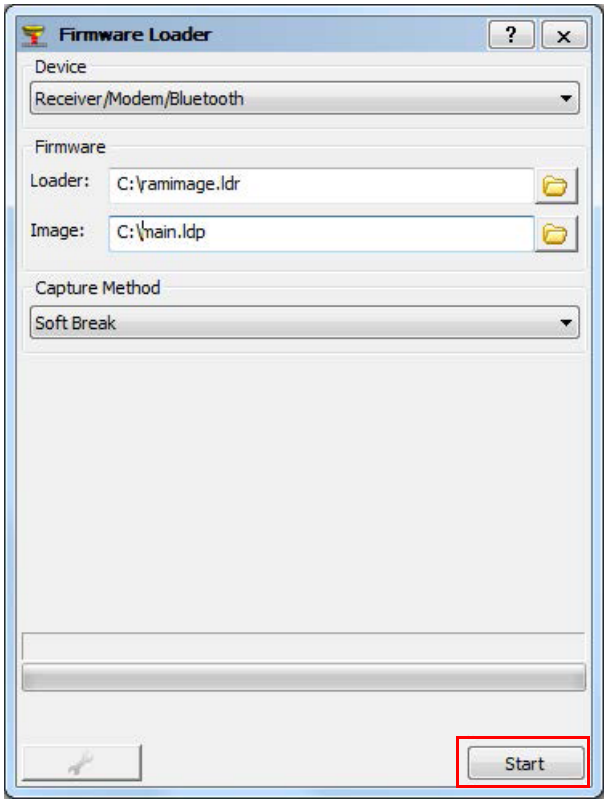


Figure 19: Upload Firmware Window

7. Click **Start** to upload the selected files.
8. Click **OK** to continue uploading new firmware to the receiver (see Figure 20).

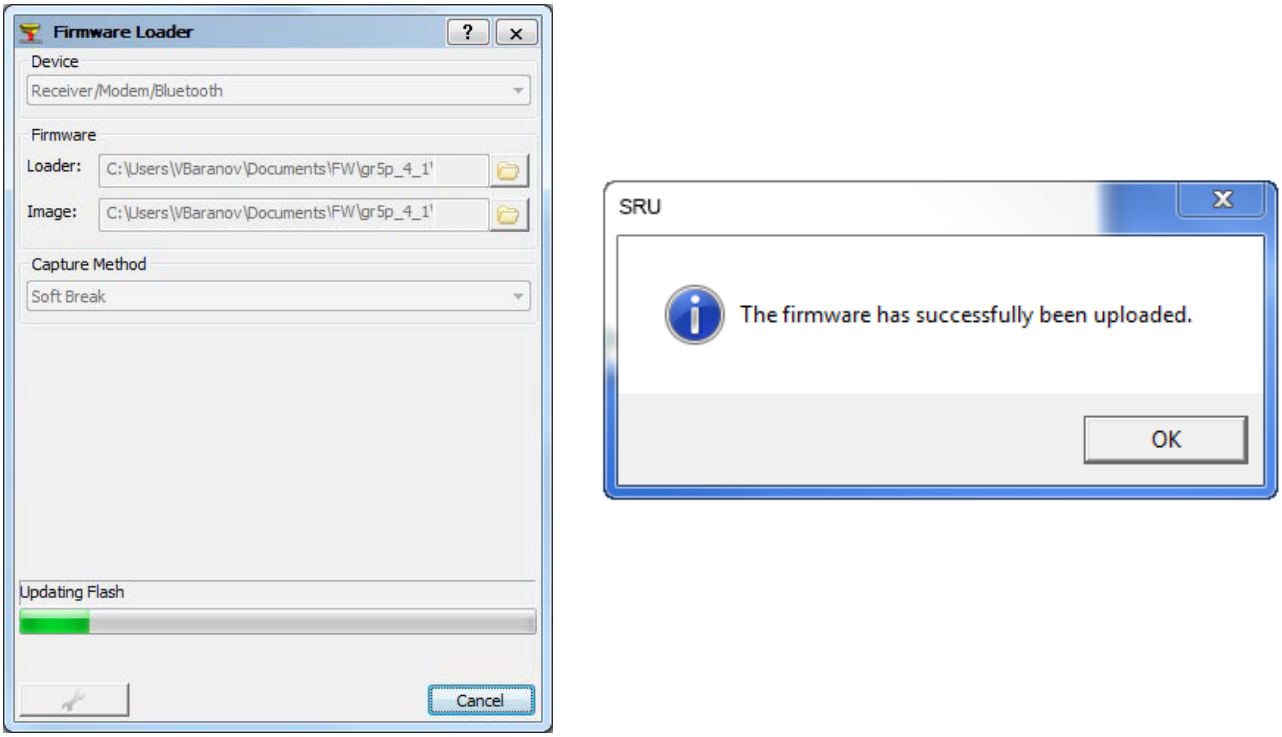


Figure 20: Finishing Firmware Upload

About the OAF

Sokkia issues an Option Authorization File (OAF) to enable the specific options that you purchased. Sokkia's OAF system allows you to customize and configure the receiver according to your particular needs, therefore purchasing only the options you require.

The Sokkia Atlas receiver typically ships with an Option Authorization File (OAF) which allows you to purchase specific options for the receiver kit. The OAF system allows you to customize and configure the receiver according to your particular jobsite needs, thereby purchasing only the options you require. There are several upgrade options available with the receiver that can extend the receiver's functionality to better suit your job requirement. Examples of upgrade options are listed below:

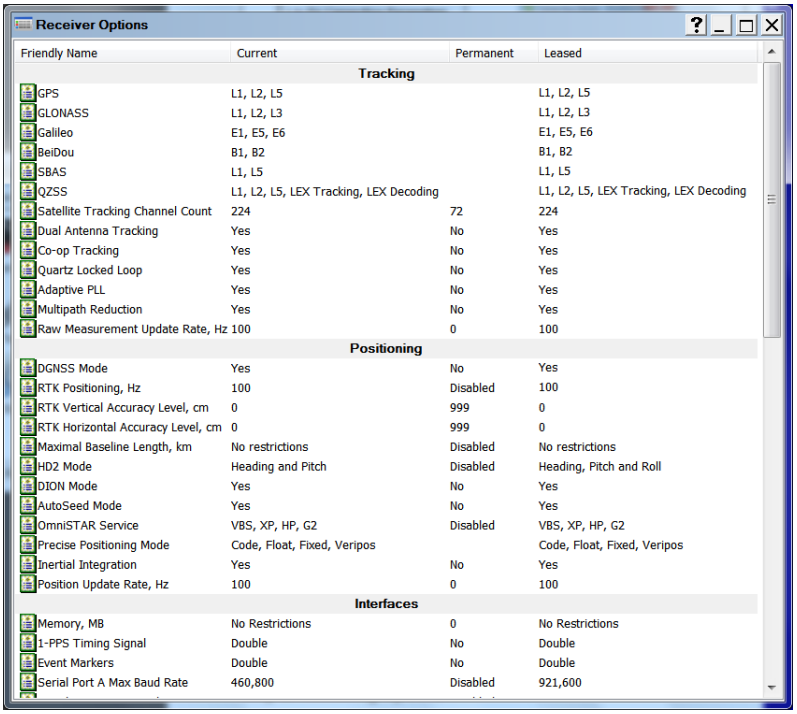
- GLONASS L1, L2 signal tracking
- GPS L5 signal tracking
- RTK and update rate 20, and 50 Hz (10 Hz standard)
- BeiDou B1, B2 signal tracking

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

Checking the Receiver's OAF

To use SRU to view the status of the receiver's options:

1. Connect the receiver to a computer and open SRU. See the *Sokkia Receiver Utility* (*SRU*) *Online Help* for more information about connecting the receiver to a computer.
2. In SRU, connect to the receiver.
3. Click the **Options** icon in the main window. The **Receiver Options** window (Figure 21) displays, so you can view the current authorization options and upload new ones.



Friendly Name	Current	Permanent	Leased
Tracking			
GPS	L1, L2, L5		L1, L2, L5
GLONASS	L1, L2, L3		L1, L2, L3
Galileo	E1, E5, E6		E1, E5, E6
BeiDou	B1, B2		B1, B2
SBAS	L1, L5		L1, L5
QZSS	L1, L2, L5, LEX Tracking, LEX Decoding		L1, L2, L5, LEX Tracking, LEX Decoding
Satellite Tracking Channel Count	224	72	224
Dual Antenna Tracking	Yes	No	Yes
Co-op Tracking	Yes	No	Yes
Quartz Locked Loop	Yes	No	Yes
Adaptive PLL	Yes	No	Yes
Multipath Reduction	Yes	No	Yes
Raw Measurement Update Rate, Hz	100	0	100
Positioning			
DGNSS Mode	Yes	No	Yes
RTK Positioning, Hz	100	Disabled	100
RTK Vertical Accuracy Level, cm	0	999	0
RTK Horizontal Accuracy Level, cm	0	999	0
Maximal Baseline Length, km	No restrictions	Disabled	No restrictions
HD2 Mode	Heading and Pitch	Disabled	Heading, Pitch and Roll
DION Mode	Yes	No	Yes
AutoSeed Mode	Yes	No	Yes
OmniSTAR Service	VBS, XP, HP, G2	Disabled	VBS, XP, HP, G2
Precise Positioning Mode	Code, Float, Fixed, Veripos		Code, Float, Fixed, Veripos
Inertial Integration	Yes	No	Yes
Position Update Rate, Hz	100	0	100
Interfaces			
Memory, MB	No Restrictions	0	No Restrictions
1-PPS Timing Signal	Double	No	Double
Event Markers	Double	No	Double
Serial Port A Max Baud Rate	460,800	Disabled	921,600

Figure 21: Receiver Options

Loading an OAF

Sokkia dealers provide customers with OAF files. For any OAF related questions, e-mail Sokkia at options@sokkia.com and include the receiver's ID and serial number. To obtain these numbers, see "Viewing Receiver Information" on page 22.

When connecting the Sokkia Atlas to the Sokkia Receiver Utility (SRU), some windows will display the receiver as a GR-5 connected to TRU. This will change in future versions of the receiver Firmware.

To load a new OAF:

1. Follow the steps in "Checking the Receiver's OAF" on page 25.
2. Right-click on the Receiver Options window, and select Upload OAF (Figure 22).

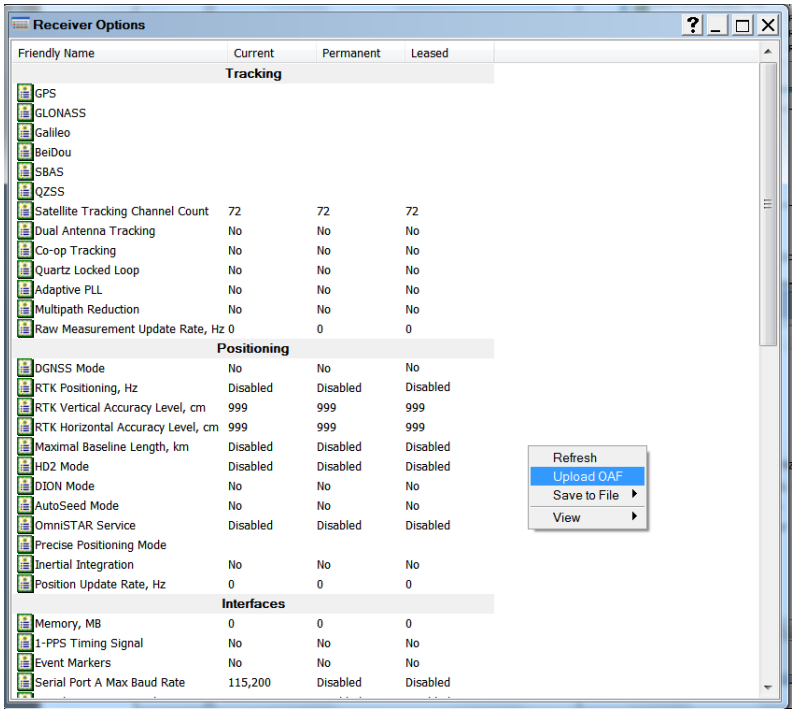


Figure 22: Right-click and Select Upload OAF

3. Navigate to the location of the new Option Authorization File.

4. Select the appropriate file, and click **Open** (Figure 23).

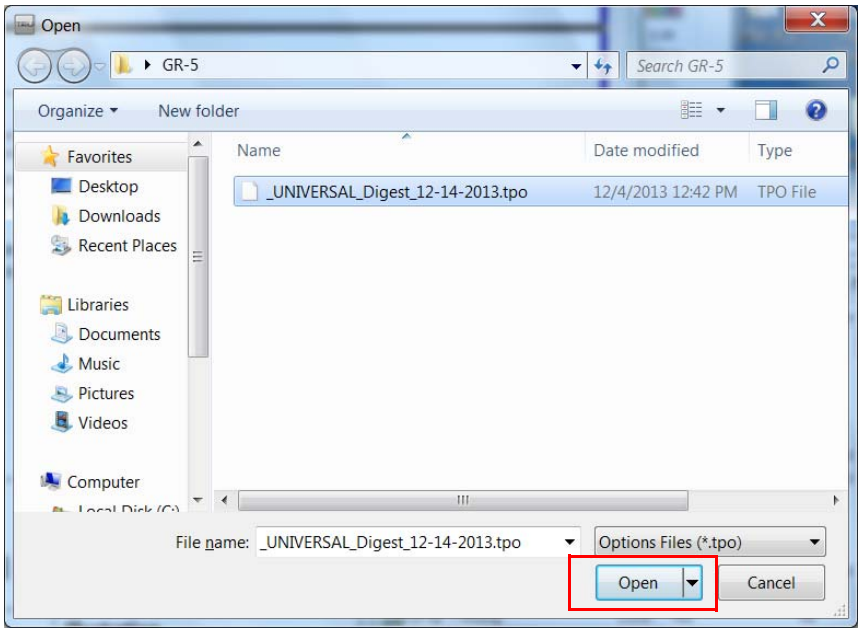


Figure 23: Load OAF

Sokkia's SRU initially checks to see if the selected file is compatible with the currently connected receiver. If you chose a file 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.

5. Click **Upload the File to the Receiver** to start loading the file (Figure 24).

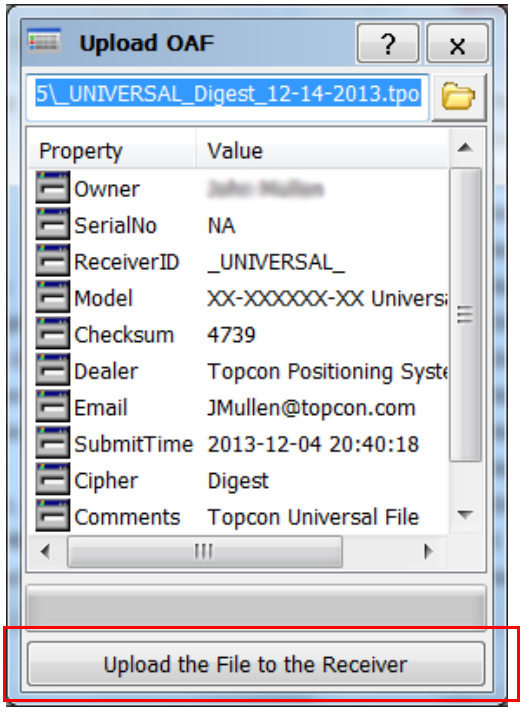


Figure 24: Upload the OAF to the Receiver

6. Click **Yes** at the prompt to reset the receiver (Figure 25).

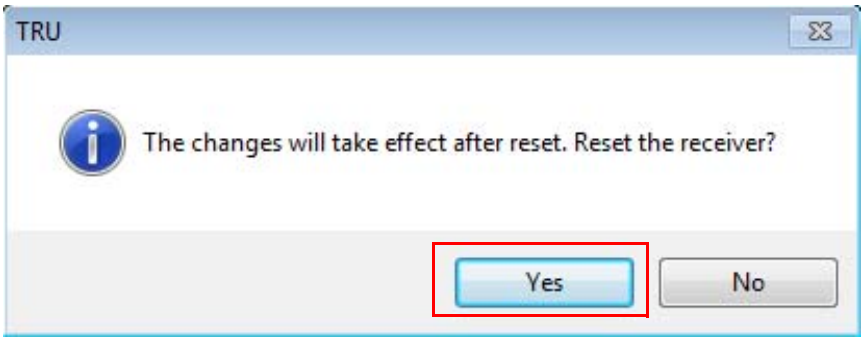


Figure 25:Reset Receiver

When the receiver resets, the **Connection Parameters** window opens.

7. Click **Connect** (Figure 26). The SRU main window opens.

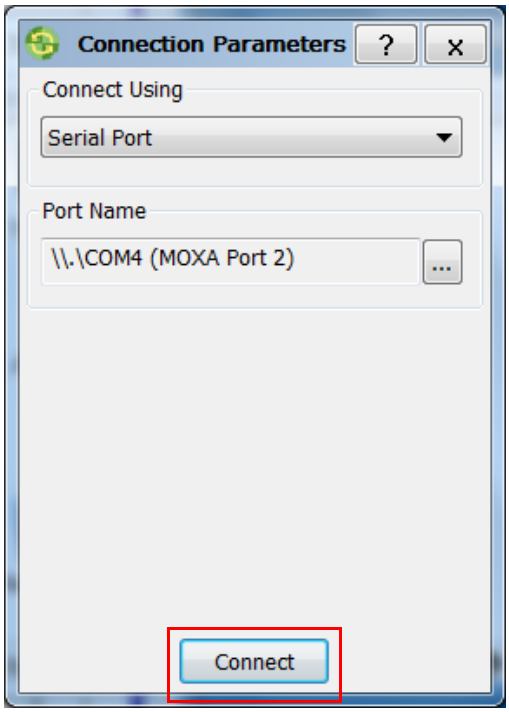


Figure 26:Connect to the Receiver

8. Click **Options** (Figure 27). The **Receiver Options** window displays.

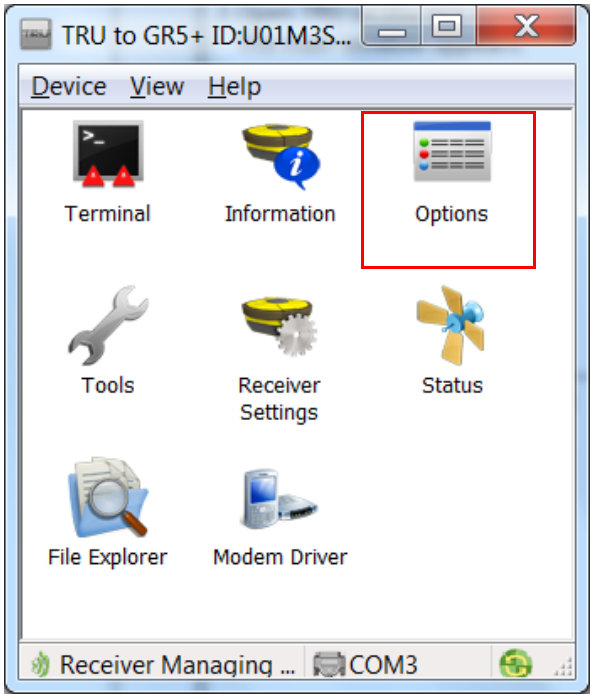
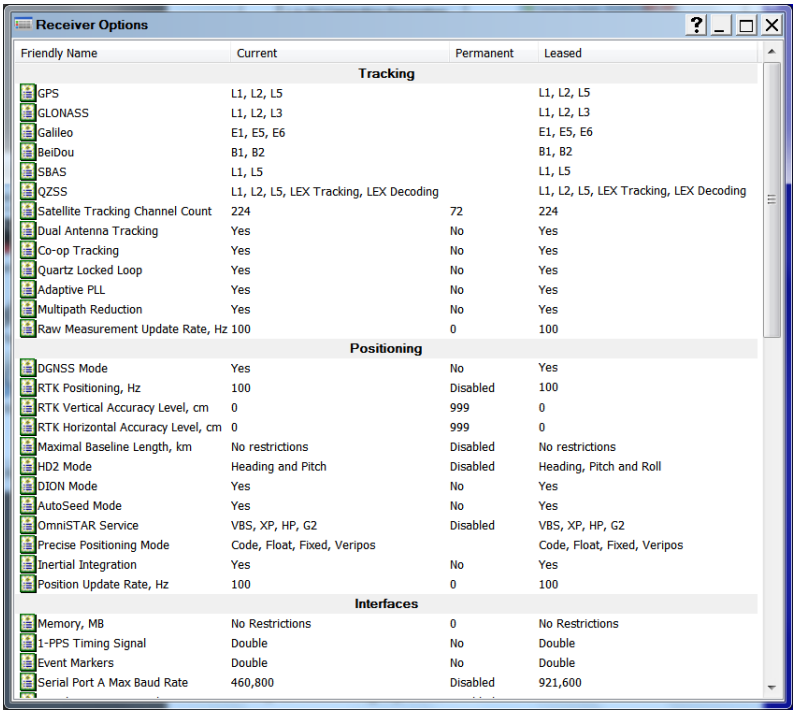


Figure 27:Click Options

In the **Receiver Options** window (Figure 28), ensure the following are correct:

- If you uploaded a universal OAF, make sure the expiration date is still valid.
- If you uploaded a customer OAF, make sure the correct customer file is loaded.



Friendly Name	Current	Permanent	Leased
Tracking			
GPS	L1, L2, L5		L1, L2, L5
GLONASS	L1, L2, L3		L1, L2, L3
Galileo	E1, E5, E6		E1, E5, E6
BeiDou	B1, B2		B1, B2
SBAS	L1, L5		L1, L5
QZSS	L1, L2, L5, LEX Tracking, LEX Decoding		L1, L2, L5, LEX Tracking, LEX Decoding
Satellite Tracking Channel Count	224	72	224
Dual Antenna Tracking	Yes	No	Yes
Co-op Tracking	Yes	No	Yes
Quartz Locked Loop	Yes	No	Yes
Adaptive PLL	Yes	No	Yes
Multipath Reduction	Yes	No	Yes
Raw Measurement Update Rate, Hz	100	0	100
Positioning			
DGNSS Mode	Yes	No	Yes
RTK Positioning, Hz	100	Disabled	100
RTK Vertical Accuracy Level, cm	0	999	0
RTK Horizontal Accuracy Level, cm	0	999	0
Maximal Baseline Length, km	No restrictions	Disabled	No restrictions
HD2 Mode	Heading and Pitch	Disabled	Heading, Pitch and Roll
DION Mode	Yes	No	Yes
AutoSeed Mode	Yes	No	Yes
OmniSTAR Service	VBS, XP, HP, G2	Disabled	VBS, XP, HP, G2
Precise Positioning Mode	Code, Float, Fixed, Veripos		Code, Float, Fixed, Veripos
Inertial Integration	Yes	No	Yes
Position Update Rate, Hz	100	0	100
Interfaces			
Memory, MB	No Restrictions	0	No Restrictions
1-PPS Timing Signal	Double	No	Double
Event Markers	Double	No	Double
Serial Port A Max Baud Rate	460,800	Disabled	921,600

Figure 28:Receiver Options Window

To view additional OAF details, right-click in the **Receiver Options** window and select **View ▸ Details** (Figure 29).

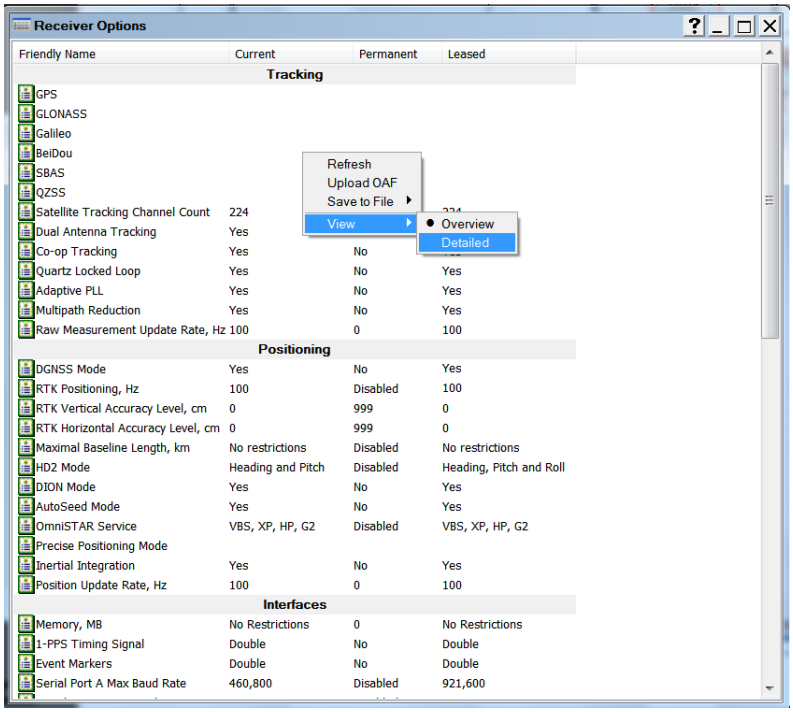


Figure 29:Additional OAF Details

Performing a Factory Reset

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, such as active antenna input, elevation masks and recording interval, and information about the receiver's internal file system. A factory reset clears the receiver's NVRAM and restores the receiver's factory default settings.

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

After a factory reset, the receiver requires time to collect new ephemerides and almanacs (about 15 minutes).

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

There are two ways you can perform a factory reset: using SRU and using the LED display panel.

Using SRU to clear the NVRAM:

1. Connect the receiver to a computer, and open SRU. See the *Sokkia Receiver Utility* (*SRU*) *Online Help* for more information about connecting the receiver to a computer.
2. In SRU, connect to the receiver.

3. Click the **Tools** icon in the main window.
   The **Tools** window appears, enabling you to reset the receiver and clear the NVRAM.

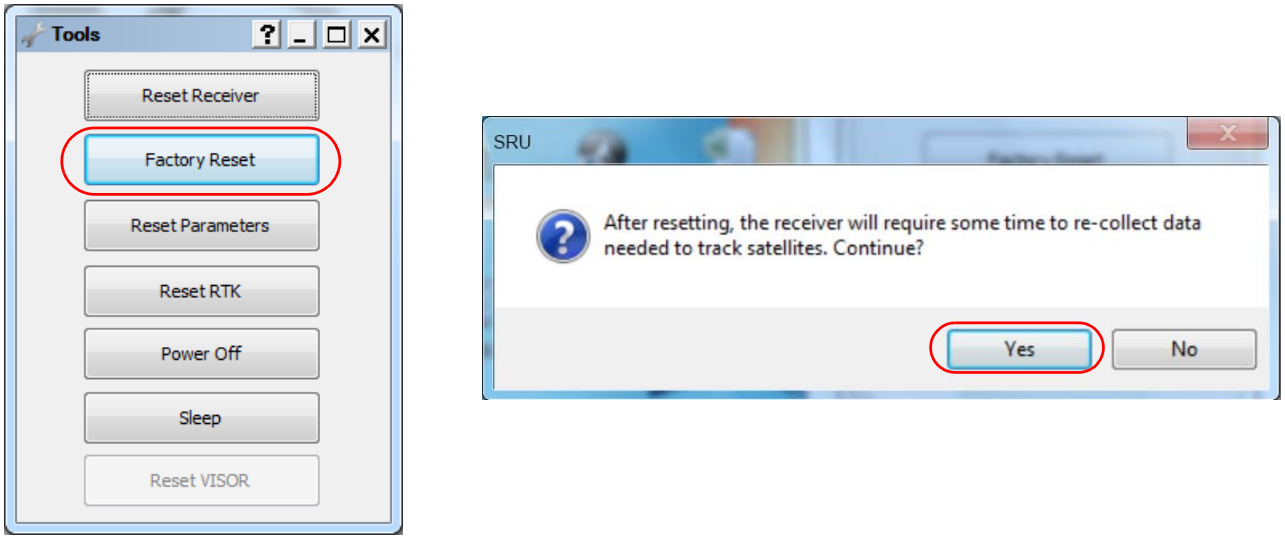


Figure 30:Tools Dialog Box

4. Click **Factory Reset**, and click **Yes** to continue.

Using the LED display panel

1. Press the Power button to turn off the receiver.
2. Press and hold the FUNCTION button.
3. Press and hold the Power button for one second, and then release it while continuing to hold the FUNCTION button.
4. Wait until the STAT and REC LEDs turn green.
5. Wait until the STAT and REC LEDs blink orange.
6. Release the FUNCTION button while the STAT and REC LEDs blink orange.

This chapter describes the field setup of your new receiver, so it is ready for use as a Base, network, RTK Rover, or static data collector.

Setting Up the Base Receiver

1. Install a tripod (p/n: 751252) over a known point.
2. Attach the tribrach, tribrach adapter, and bayonet adapter to the tripod (Figure 31).
3. Attach the antenna to the modem antenna connector.
4. Level the tripod and tighten the screws.
5. Attach any other accessories as needed, such as a back-up power supply.
6. Measure the height of the receiver from the ground using the tape measure. See “Measuring Antenna Height” on page 33.
7. View the LED display panel for the receiver’s current status. See also “Display Panel Operations” on page 11.

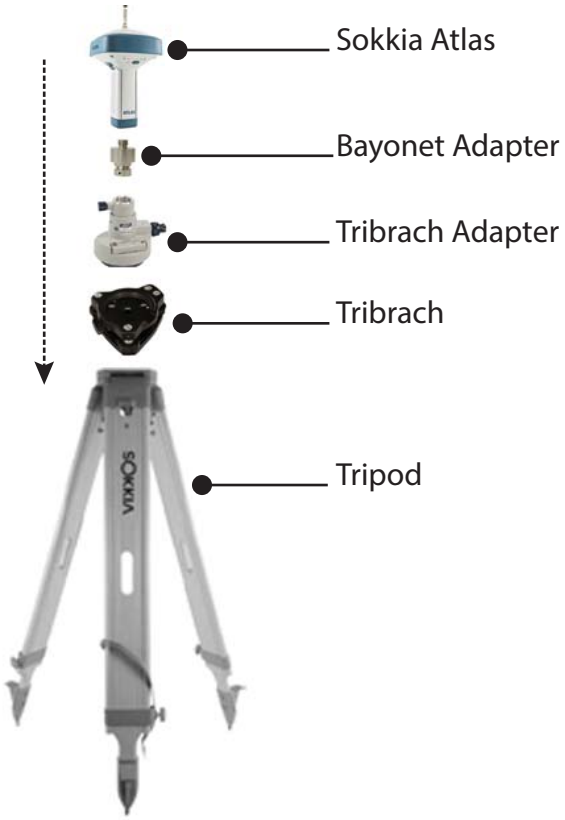


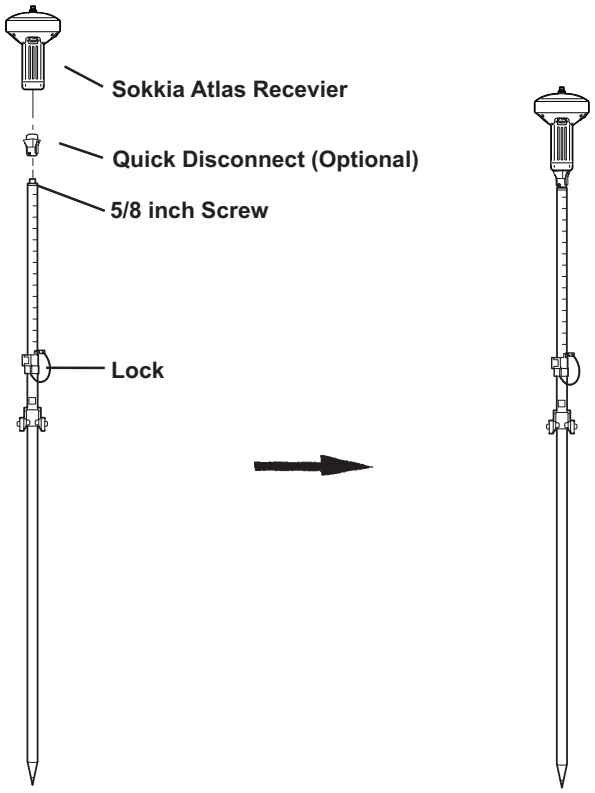
Figure 31:Attach All Components to the Tripod

Setting Up the Rover Receiver

1. If needed, attach the quick disconnect to a bi-pod/range pole.

Use a bi-pod during post-process surveys to ensure the antenna/receiver does not move during data logging.

2. Attach the receiver to the quick disconnect. Make sure the receiver locks into place.
3. If you are not using a fixed height rover pole, measure the height of the receiver from the ground. See “Measuring Antenna Height” on page 33.
4. Attach the antenna to the antenna connector.
5. Press the power button to turn on the receiver. The integrated wireless device in the receiver turns on when the receiver is powered.
6. View the LED display panel for the receiver’s current status. See also “Display Panel Operations” on page 11.



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 of the antenna above the station marker
- Method of measuring the antenna height
- Model of the antenna/receiver 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, allows for correctly computed reference marker coordinates.

To accurately measure the antenna height:

1. Measure the antenna height above the control point or marker, either the slant height or the vertical height.
   You may either measure the vertical height to the Antenna Reference Point (ARP) located at the bottom of the receiver at the base of the mounting threads, or measure the slant height to the Slant Height Measurement Mark (SHMM) on the side of the receiver. For ARP and SHMM marks on the receiver, see Figure 32 on page 34.
2. Record the antenna height, points name, and start time in the field notes.

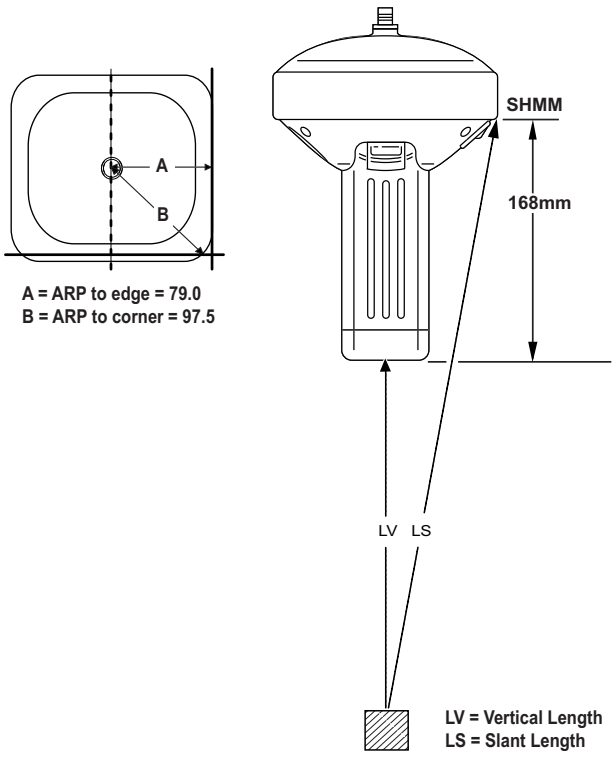


Figure 32: Antenna Height Measurement Points

Collecting Data

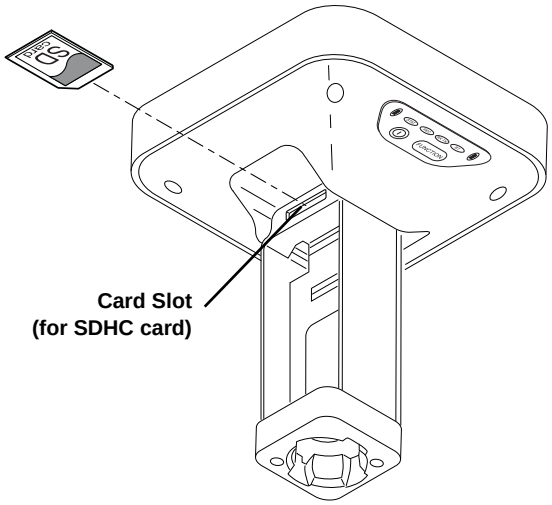
This chapter provides general information about memory, recording data, downloading data, and removing files to free up memory space.

Memory

The Sokkia Atlas is equipped with an external SD/SDHC memory card slot. Although you may install an SD/SDHC card of any memory size into the slot, the receiver recognizes up to 32 GB of memory. For specific information, see “SD/SDHC Card Recommendations” on page 55. It is necessary to use recommended SD/SDHC cards to ensure accurate and reliable data logging and minimize any occurrence of data loss, card initialization, etc. The Optional Authorization File (OAF) controls the receiver’s memory capacity. As data is logged to the card, the REC LED displays the memory capacity status. See “REC LED” on page 12 for more information. To access the raw data files on the memory cards, see “Managing Files” on page 37.

SD/SDHC Card

The SDHC card slot is located to the left of the LED Display Panel inside the battery compartment and connects an optional SD/SDHC card to the receiver board to provide memory. Once installed, the SD/SDHC card usually remains inside the receiver. You can access the data that resides on the SD/SDHC card via the USB or serial port, or Bluetooth wireless technology. See “Managing Files” on page 37. A secure digital card can be purchased at a local computer supply store.



Installing the SD/SDHC Card

1. Make sure the receiver is turned off.
2. Remove the detachable battery to the left of the LED Display panel.
3. Carefully insert the SD/SDHC card, label-side down, into the card slot located at the top of the battery compartment.
   Once the receiver is turned on, the receiver board will detect the SD/SDHC card, and it will be ready to use as needed.

Always initialize the file system on the installed SD/SDHC card before the first use. The Initialization procedure is described below.

Initializing the File System

The Sokkia Atlas supports a removable SDHC memory card to log raw data files. The memory card must be initialized before its first use. Initializing the memory card while in the receiver ensures the card is formatted to the TPS proprietary file system (TPFS). This file system allows the receiver to create, store, retrieve, delete, and restore raw data files.

It is also advisable to re-initialize the memory card periodically (e.g., quarterly). This erases any data on the card, checks for bad blocks, and sets the card up afresh.

The user can use SRU to initialize the file system.

Initializing the File System Using SRU

1. Connect the receiver to a computer and run SRU. See the *Sokkia Receiver Utility* (*SRU*) *Online Help* for more information about connecting the receiver to a computer.
2. Click the **File Explorer** icon to open the **File Explorer** screen.
3. On the **Files** tab, press and hold the right mouse button on the file line.
4. Click **Initialize File System**.

Initializing the file system of a connected receiver will erase all of the receiver's data files. A warning message will appear to confirm the operation.

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. This software is available from http://sokkiasupport.com, and the *SRU Online Help* is available only in the software. See the *SRU Online Help* for more information. The Sokkia Atlas is compatible with any Sokkia field software for configuration and recording raw data.

Logging Rates

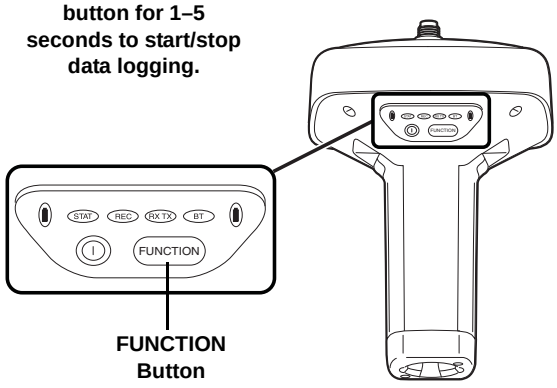
The amount of memory used to log data depends on the logging rate. For more information about setting logging rate parameters, see the *SRU Online Help*.

Recording Data

You can log raw GNSS data to the receiver's SD/SDHC card and use the Sokkia Receiver Utility (SRU) or MAGNET® Office software to download the files to a computer.

To start or stop recording data, use the LED display panel or SRU:

1. Press the Power button to turn on the receiver.
2. Wait for the STAT LED to indicate satellites are being tracked. The STAT LED blinks green for GPS satellites and amber for GLONASS satellites. A short red blink indicates the receiver has not solved a position. Five or more satellites provide optimal positioning.
3. To begin recording, press and hold the FUNCTION button, and then release it (between 1 and 5 seconds) when the REC (Recording) LED turns green.
4. Make sure the REC light blinks green. This indicates that a file has opened and data collection has started. The REC LED blinks each time data is saved to the SD/SDHC memory card. If the REC light blinks red, the receiver has:
   - a hardware problem
   - no SD/SDHC card installed
   - an improper OAF (See "About the OAF" on page 25)
5. You can also select **File Explorer** ▸ **Logs** ▸ **Start** in SRU to begin recording data.
6. When you have finished recording, press and hold the FUNCTION button until the REC LED turns dark. You can also select **File Explorer** ▸ **Logs** ▸ **Stop** in SRU to end data recording.
7. To turn off the receiver, press and hold the Power button until all LEDs turn dark.



You can also log data using MAGNET® Field software.

Managing Files

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

Downloading and Deleting Files

After completing a survey, download data files to a computer or a controller for storage, post-processing, or backup. The SD/SDHC cards hold a finite amount of files, so you will want to delete files to increase memory capacity.

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

To delete raw data files from the receiver, use a USB, serial, 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 the *SRU Online Help* for more information.

Once a connection is established, you can download all or some files to a computer or controller and then 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 the *SRU Online Help* embedded in the software.

Troubleshooting

This chapter will help you diagnose and solve some common problems that may occur with the 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 correct and secure connections. Double check for worn or defective cables.
- Check the receiver's internal batteries for a full charge.
- Check the power source for incorrectly connected cables, and ensure the power source is valid. See "Specifications" on page 43 for external power requirements.
- Check the software. Make sure the most current software version is downloaded onto the computer and the most current firmware is loaded into the receiver. Check the Sokkia website for the latest updates.
- Check Sokkia Technical Support (www.sokkiasupport.com) for the latest updates.

Then, try the following:

- Power on and off the receiver by pressing the Power button or by using SRU (**Tools ▸ Reset receiver**).
- Restore default settings by clearing the NVRAM. See "Performing a Factory Reset" on page 30. 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.

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

Powering Problems

The following are some of the most commonly encountered power problems.

The receiver does not power up

- The battery may be discharged.
  – Charge the battery overnight. See "Charging the Batteries" on page 16.
- If you are using an external power source, the cable may be disconnected or damaged.
  – Make sure 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.

Receiver Problems

The following are some of the most commonly encountered receiver problems.

The receiver cannot establish a connection to a computer or external controller

Cable specific problems:

- 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. Contact a dealer to replace the cable.
- The USB driver is not installed.
  – If you are using a USB cable connection, make sure the USB driver, available from the Sokkia Support website (http://sokkiasupport.com/).

Generic problems:

- The receiver port used for connection is not in Command mode.
  a. Connect the receiver to a computer and open SRU (see the *Sokkia Receiver Utility* (*SRU*) *Online Help*).
  b. Click **Receiver Settings ▸ Ports**.
  c. Change the **Input** Mode for the port used for connection to **cmd**.

The receiver does not lock on to satellites for a long period of time

- 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.
  – Refer to the *Sokkia Receiver Utility* (*SRU*) *Online Help* for a detailed description of options.

The receiver tracks too few satellites

- If the survey is conducted near obstructions (tree canopy, tall buildings, and so forth).
  – Make sure the Multipath Reduction boxes have been enabled in the field data collection software.
  a. Connect the receiver to a computer and open SRU (see the *Sokkia Receiver Utility* (*SRU*) *Online Help*).
  b. In SRU, connect to the receiver.
  c. On the SRU main window, choose **Receiver Settings ▸ Tracking ▸ Adv** tab. Make sure the **C/A code multipath reduction** check box is selected.
- Move to an area free of obstructions, if possible.

The receiver cannot obtain Code Differential and/or RTK solutions

- Incorrect Base coordinates entered.
  – Specify the correct coordinates for the Base station using SRU or another suitable field data collection software.
- There could be some obstruction to the 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.
  – Refer to the *Sokkia Receiver Utility* (*SRU*) *Online Help* for a detailed description of options.

- 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 the *Sokkia Receiver Utility* (*SRU*) *Online Help*).
    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 make sure 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 10 degrees.
  - Increase the PDOP threshold. To do this, on the SRU main window, choose **Receiver Settings ▸ Tracking ▸ Obs**.
- The elevation mask is above 10 degrees.
  - Lower the elevation mask. 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.
- The modem battery is low.
- The specified baud rate is incompatible with the baud rates the modem supports. The baud rate is the rate at which the receiver transmits differential messages to the modem and vice versa.
  - Change the modem's baud rate.
- The Base and Rover modems use different radio link parameters.
  - Configure the Base and Rover radio modems according to the procedures listed in the *SRU Online Help*.
- The distance between the Base and Rover is too far.
  - Close the distance between the Base and Rover.
  - Use repeaters to increase radio coverage.
- 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).

The receiver does not start logging data

- Make sure the recommended SD/SDHC card is being used and that the card is not damaged. See "SD/SDHC Card Recommendations" on page 55.
- Make sure the SD/SDHC card is properly inserted.
- The receiver's memory is disabled or expired.
  - Make sure the memory option is enabled. For details, see the *Sokkia Receiver Utility* (*SRU*) *Online Help*.
- The 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 37.
  - The file system is not initialized. Initialize the File System on the SD card using SRU. To do this, on the SRU main window, choose **File Explorer ▸ Initialize File System**.

Bluetooth Problems

The following are some of the most commonly encountered error messages and other problems.

SRU error message: Can't find receiver

- The receiver is turned off.
  – Ensure the receiver has power and is turned on.
- Bluetooth is not turned on; the BT LED is off.
  – Reset the receiver to the factory default settings by pressing the Power button for 10 to 15 seconds.
  – You can also turn on power to Bluetooth using SRU. To do this, on the SRU main window, choose **Receiver Settings ▸ Bluetooth**.
- 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.
  a. Connect the receiver to a computer and open SRU (see the *Sokkia Receiver Utility* (*SRU*) *Online Help*).
  b. Click **Configuration ▸ Receiver ▸ Ports**.
  c. Change the **Input Mode** for the Bluetooth serial port used for connection to **cmd**.

This is the most common cause for this error message. Use SRU to double check the settings for the connection port.

SRU error message: Open COM# port failed: Access is denied

- Another application uses the computer port dedicated for connection.
  – Close the application, and then re-connect.
  – Connect the receiver via another, unused computer port.

After searching for available devices, none are discovered

- 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 if one is being used.
  – 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.

Can see the icon for the receiver's Bluetooth module on the computer screen, but cannot connect to it

- Device security settings probably differ.
  – Make sure the Bluetooth enabled devices use the same security settings.
- Bluetooth module settings may have changed.
  a. 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).
  b. Repeat the search.

SRU Problems

The following is the most commonly encountered SRU problem.

SRU cannot connect to the receiver

- The receiver is turned off.
  – Ensure the receiver has power and is turned on.
- If using a cable, the cable's connectors are improperly attached.
  – Check that the cable connector is attached to the correct serial port.
  – Unplug the cable, then securely and properly reconnect it to the receiver.
- If using a 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.
  – Make sure the computer and receiver use the correct ports for communication. For the Sokkia Atlas receiver, this is Bluetooth serial port A (btsp\a).

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 make sure 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 Sokkia Customer Support. For contact information, see "Getting Technical Support" on page 3.

Specifications

This chapter provides specifications for the receiver and its internal components.

General Details

Table 8 lists the receiver's general specifications.

Table 8. General Receiver Specifications

Physical	
Enclosure	Dust and water ingress protected magnesium I-Beam housing
Color	Sokkia Grey / Blue bumper
Dimensions (mm)	158.1 (w) x 253 (h) x 158.1 (d)
Weight	1.88 kg with batteries, 1.44 kg without batteries
Antenna Type	Integrated Full Wave Fence Antenna™[a] with Ground Plane and zero center
Battery	Two external, detachable
Controller	External
Mounting	5/8-11, quick disconnect
Seals	Silicon (molding in color)
Keys	Two keys: • Power – On/Off • Function – start/stop data logging; switch information mode
LEDs	Six LEDs: • STAT – satellite and receiver status • REC – record and data status • RX TX – modem status • BT – Bluetooth wireless technology connection status • BATT (x2) – battery status
Environment	
Operating Temperature	• -30°C to +50°C Base* • -30°C to +60°C Rover* • -30°C to +60°C Base** • -30°C to +70°C Rover** • 0° to +45°C Charge mode* * with detachable batteries ** with external power source
Storage Temperature	-20°C to +35°C with batteries -40°C to +75°C without batteries
Humidity	100%
Ingress Protection	Dust and water ingress protection (IP66)

Table 8. General Receiver Specifications

Shock/Bump/Drop Rating	IEC 60068-2-29 IEC 60068-2-27 2 m pole drop to concrete
Vibration	Compliance with MIL-STD 810F - 514.5 - Cat.24
Power	
External Batteries	Li-ion, 3900 mAh, 7.2 V; 2 batteries, detachable
Battery Size	132 x 55 x 35 (mm)
Battery Weight	220 g (1 battery)
Operating Time Average with modem "on" and 20 SVs tracked. Using new, fully-charged batteries, operating at room temperature and transmitting at 1 Hz rate.	**For the Sokkia Atlas with Digital UHF II Modem:** • Receive-only mode – 14 hours • Transmitting at 0.5 W – 10 hours • Transmitting at 1 W – 8 hours • GSM/HSPA in urban areas – 12 hours • Modem off – 20 hours
External Power	1 port
Input Voltage	9 to 21 V DC (for work) 10 to 21 V DC (for charge battery) Maximum Charge Current <=2 Amp
Power Consumption Average with modem "on" and 20 SVs tracked. Using new batteries and operating at room temperature.	• Modem = off – 3.0W **Digital UHF II** • Receive-only mode – 4.3 W • Modem transmitting at 0.5 W – 6.4 W • Modem transmitting at 1 W – 7.8 W
Battery Charge	Connect the AC adapter to charge the internal battery. Available run charge when connected to external battery.
Charging Time	Approx. 6 hours for full charge
On-board	Backup battery for timekeeping and almanac data storage; minimum 10 years of operation
GNSS	
Number of Channels	226 channels[b] with optimized satellite tracking technology
Tracked Signals[c]	GPS: L1/L2 C/A and P(Y), L1C, L2C, L5 GLONASS: L1/L2 C/A and P full wave carrier BeiDou: B1 and B2 full wave carrier QZSS L1 C/A, L1C, L2C, and L5 full wave carrier SBAS (WAAS/EGNOS/MSAS) L1 code and carrier Galileo E1, E5a/b, E5 AltBOC[d]
Tracking	
Multipath Reduction	Yes, code and carrier
PLL/DLL Settings	Bandwidth, order, adjustable

Table 8. General Receiver Specifications

SBAS	WAAS/EGNOS/MSAS
Quartz Lock Loop (QLL)	Protection against vibrations
Data & Memory	
Formats	TPS proprietary, NMEA 0183, RTCM 2.X, RTCM 3.X, RTCM MSM, CMR/CMR+, BINEX
Features	• Up to 20 Hz update rate for full-wave real time position and raw data (10 Hz standard) • 10cm code phase and 0.1mm carrier phase precision • RTCM SC104 version 3.1, 3.0, 2.3, 2.2, and 2.1 I/O
Type of Memory	Removable SD
Capacity	Up to 32 GB[e]
Number of Files	up to 3000
Logging Size	3.5 MB per hour (18 SVs, 1 sec, L1/L2, default message set)
Logging Interval	0.02 to 86400 seconds, depending on purchased options
Output	
Communication Ports	• High-speed RS232 serial port (rimmed in black) • USB port up to 12 Mbps (rimmed in yellow) • Internal Bluetooth (port D)
Serial Port Specifications	RS232 Serial Port: • Baud rate: 460800, 230400, 115200 (default), 57600, 38400, 19200, 9600, 4800, 2400, 1200, 600, 300 • Flow control: RTS/CTS • Length: 7 or 8 (default) • Stop bit: 1 (default), 2 • Parity: None (default), Odd, Even
Connectors	• Modem Antenna (BNC) • PWR • RS232 Serial • USB
MINTER (LED Display)	• 6 external LEDs • ON/OFF control input (power button) • Data logging control (FUNCTION button)
NMEA	
NMEA 0183 Output	Ver. 2.1, 2.2, 2.3, 3.0 output
Messages	GGA, GLL, GMP, GNS, GRS, GSA, GST, GSV, HDT, RMS, ROT, VTG, UID, and ZDA
Output Interval	1Hz standard; 10, 20, 50 Hz optional
DGPS	
Correction Format	RTCM SC104 Ver 2.1, 2.2, 2.3, 3.0, and 3.1
RTCM Message Type	1, 3, 9, 31, 32, 34; user selectable
Process Interval	1Hz standard; 10, 20, 50 Hz optional

Table 8. General Receiver Specifications

Output Interval for RTCM Correction Data	1Hz standard
Elevation Mask	0 to 90 degrees (independent of data logging)
Real-Time Kinematic Mode	
Correction Format[f]	RTCM SC104 Ver 3.1, 3.0, 2.3, 2.2, or 2.1 CMR/CMR+ (Trimble compatible), TPS proprietary
Supported RTK Network Solutions	VRS, MAC, FKP
Ambiguity Initialization	On-The-Fly (OTF): L1, L1/L2
Baseline Length	Up to 50km, depending on atmospheric and multipath conditions
Initialize Time	1 second to 10 min., depending on the baseline length (D) and multipath conditions
Output Interval for CMR/RTCM	1Hz standard
Elevation	0 to 90 degrees (independent of data logging)
Solution Mode	Delay (synchronization) mode: 5 to 10 msec Extrapolation (not synchronized) mode: 10 to 20 msec
Process Interval	1Hz standard; 10, 20, 50 Hz optional
Latency	Delay mode: 5 to 10 msec. Extrapolation mode: 10 to 20 msec.
Status	Fix, float, DOP, data link status, modem latency, common satellites
Results	RTK coordinates, HRMS, VRMS
Survey Modes	
Base or Rover	Autonomous (standalone) DGPS (w/ user base) DGPS (w/ SBAS) Static Kinematic (continuous, stop and go) RTK (delay, extrapolation)
Accuracy (RMS)[g]	
Static/Fast Static	L1 only: H: 3mm + 0.8ppm (x D); V: 5mm + 1.0ppm (x D) L1+L2:[h] H: 3.0mm + 0.1ppm (x D) V: 3.5mm + 0.4ppm (x D)
Kinematic, RTK	L1+L2: H: 8mm + 1.0ppm (x D) V: 15mm + 1.0ppm (x D)

Table 8. General Receiver Specifications

DGPS	User Base: H: 0.4m V: 0.6m SBAS: H: 1.0m V: 1.5m
Autonomous Accuracy	H: 1.5m RMS V: 2.0m RMS
Cold Start Warm Start Hot Start Reacquisition	<60 sec <35 sec <10 sec <1 sec

a. Patent pending. Multiple patents are associated with Fence Antenna™ technology.
b. Includes two dedicated channels for L-Band signal tracking. The Sokkia Atlas receiver does not support L-Band signal tracking.
c. Support for L1C signal for GPS and QZSS is incorporated, and will be available through a firmware upgrade.
d. The Sokkia Atlas is capable of supporting E1, E5a/b and E5 AltBOC signals for Galileo. Full positioning support will be incorporated into Sokkia Atlas when these constellation have matured and are ready for commercial use, and as support is made available in the firmware.
e. For more recommendations, see “SD/SDHC Card Recommendations” on page 55.
f. CMR/CMR+ is a third-party proprietary format. Use of this format is not recommended and performance cannot be guaranteed. Use of industry standard RTCM 3.x is always recommended for optimal performance.
g. Subject to multipath anomalies, interference, atmospheric conditions, and atypical satellite geometry. GNSS survey best practices must always be applied.
h. The stated accuracy and reliability requires nominal observing conditions and strict processing methods. This includes use of dual frequency GPS measurements, precise (final) ephemerides during post-processing, calm ionospheric conditions, unobstructed visibility above 10 degrees, approved antenna calibration parameters, and an observation duration of 3 hours or more (dependent on baseline length). Accuracy and reliability may be subject to multipath anomalies and atypical satellite geometry. GNSS survey best practices must always be applied.

Digital UHF II Internal Modem Board Details (Optional)

Table 9. DUHF II Internal Modem Board Specifications

Operating frequency range	• 410MHz – 470MHz for Rover • 420MHz – 470MHz for Base
Channel spacing	12.5 KHz / 20KHz / 25KHz user selectable
Signal modulation	• 4FSK
Communication mode	Time division duplex
Supported protocol(s)	Proprietary, PDL, Trimble
Transmitter carrier power	10, 20, 50, 100, 200, 500 and 1000 mW, user selectable
Receiver sensitivity	GFSK: -119 dBm at 10^{-4} BER and 12.5 KHz spacing 4FSK: -114 dBm at 10^{-4} BER and 12.5 KHz spacing
Receiver dynamic range	-119 to -1dBm
Serial data rate	1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 bps
Radio data rate	25KHz: 9600 bps for GFSK and 19200 pbs for 4FSK 12.5KHz: 4800 bps for GFSK and 9600 pbs for 4FSK
Antenna type	Whip antenna
Antenna connector	BNC
Error correction	FEC on/off

Optional Cell Module Details

Table 10. Cellular Specifications

Dual Band CDMA 1xRTT Module	
Supported Bands	CDMA 800/1900 MHz
TX Power	800 MHz – Class 3 (24 dBm) 1900 MHz – Class 2 (24 dBm)
Data	1x/QNC/HSPD CSD, *Max BR 14.4 Kbps*
AT Command Set	N/A
Regulatory and Approvals	CDG1, CDG2 FCC, IC, CCC EMC QS9000 manufacturing RoHS/WEEE
3.5G Wireless Module (Quad-band GSM and UMTS/HSPA)	
Supported Bands	GSM 850/900/1800/1900 MHz UMTS/HSPA 850/1900/2100 MHz
TX Power	UMTS/HSPA - Class 3 (0.25 Watt) GSM 850/900 MHz – Class 4 (2 Watt) GSM 1800/1900 MHz – Class 1 (1 Watt) EDGE 850/900 MHz – Class E2 (0.5 Watt) EDGE 1800/1900 MHz – Class E2 (0.4 Watt)
Data Features	UMTS/HSDPA/HSUPA 3GPP, Release 6 GSM/GPRS 3GPP, Release 9 Max uplink 5.76 Mbps, max downlink 7.2 Mbps EDGE, Multi-Slot class 12 CSD, *Max BR 14.4 Kbps GSM, Max BR 14.4 Kbps UMTS*
AT Command Set	GSM 07.05, 07.07
Regulatory and Approvals	FCC, IC ANATEL (Brazil) PTCRB R&TTE/CE GCF RoHS/WEEE ACMA BABT

Bluetooth Module Details

Table 11. Bluetooth Module Specifications

Range	up to 10 m (indoor); up to 20 m (outdoor)
Type	Class 2
Service classes	Miscellaneous
Supported profiles	LM, L2CAP, SDP, SPP
Frequency Country Code	North America and Europe
Frequency Country Code	North America and Europe
Range	up to 10 m (indoor); up to 20 m (outdoor)

Connector Specifications

The Sokkia Atlas has one antenna connector for radio transmission/reception and three port connectors for power and data upload/download.

Radio (Modem) RF Connector

The modem connector (Table 12) is a BNC connector for UHF radios.

Table 12. Modem Connector Specifications

Modem	Type	Signal Type	Dir	Details
DUHFII	BNC	Modem I/O	I/O	RF/GSM output from modem antenna

Power Connector

Rimmed in red, the power connector (Figure 33) is a sealed receptacle, 5 pin, ODU part number G80F1C-T05QF00-0000.

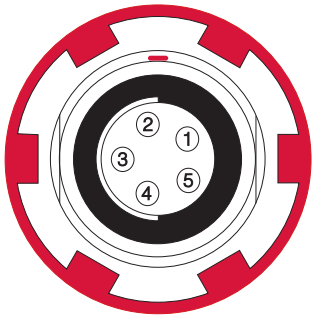


Figure 33:Power Connector

Table 13 describes power connector specifications.

Table 13. Power Connector Specifications

Number	Signal Name	Dir	Details
1	Power_INP	P	9 to 21 volts DC input
2	Power_INP	P	9 to 21 volts DC input
3	Power_GND	P	Ground, power return
4	Power_GND	P	Ground, power return
5	Aux_Power	P	9 to 21 volts DC input

Serial C-RS232 Connector

Rimmed in black, the serial RS232 connector (Figure 34) is a sealed receptacle, 7 pin, ODU part number G80F1C-T07QC00-0000.

Figure 34:Serial RS232 Connector

Table 14 gives the RS232 cable connector specifications.

Table 14. RS232 Connector Specifications

Number	Signal Name	Dir	Details
1			Not used
2	GND	-	Signal ground
3	CTS	I	Clear to send
4	RTS	O	Request to send
5	RXD	I	Receive data
6	TXD	O	Transmit data
7			Not used

USB Connector

Rimmed in yellow, the USB connector is a sealed receptacle, 4 pin TPS cable connector (Figure 35).

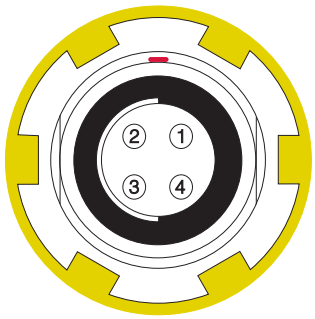


Figure 35:USB Connector for GGD Options

Table 15 gives the USB connector specifications.

Table 15. USB Specifications

Number	Signal Name	Dir	Details
1	USB_PWR	P	Bus power input
2	USB D-	I/O	Data minus
3	USB D+	I/O	Data plus
4	GND	P	Ground

Product Identification

The Sokkia Atlas receiver can be identified by the serial number range shown in Table 16.

Table 16. Product Serial Numbers

Cellular Modem	Serial Number
Sokkia Atlas (With Digital UHF II)	
No cellular modem	1332-xxxx
HSPA modem	1333-xxxx

SD/SDHC Card Recommendations

This section provides a recommended list of SD/SDHC cards that were tested with the receiver. This list of recommendations is based on testing results available to date and should not be considered a comprehensive list. The receiver is capable of working with SD/SDHC cards with a storage capacity of up to 32GB.

For optimal and consistent performance, Sokkia recommends using the SD/SDHC cards listed in this section.

Sokkia recommends using the following list of SD/SDHC cards with your receiver:

- Swissbit® Industrial 2GB
- SanDisk® Ultra II
- Transcends® Ultra Industrial 2 GB
- APRO® Industrial 4 GB

General Warnings

Sokkia receivers are designed for survey/construction and related uses (that is, surveying coordinates, distances, angles and 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 job site.
- Contrary to applicable laws, rules, and regulations.

Battery Warnings

Never attempt to open the casing of the detachable batteries! Lithium-Ion batteries can be dangerous if mishandled!

Do not incinerate or heat the battery above 212 degrees fahrenheit (100 degrees celsius). Excessive heat can cause serious damage and possible explosion.

Tampering with the batteries by end users or non-factory authorized technicians will void the battery's warranty.

- Do not disassemble the batteries.
- 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 TPS immediately if this product does not function properly.

Only allow authorized Sokkia warranty service centers to service or repair this product.

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 30cm 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 A 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 equipment complies with IC radiation exposure limits set forth for uncontrolled equipment and meets RSS-102 of the IC radio frequency (RF) exposure rules. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure elevation (MPE). Bit it is desirable that it should be installed and operated with at least 30 cm or more between the radiator and person's body (excluding extremities: hands, wrists, feet, and ankles).

This class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This device complies with Industry Canada license-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 brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC RF Radiation Exposure Statement

When installing, locate or point this device away from the installer, so it does not emit RF field in excess of Health Canada's limits for the general population. Consult Safety Code 6 from Health Canada's website at www.hc-sc.gc.ca/rpb.

IC Additional Statement with Detachable Antennas

This device (with Digital UHF II modem) has been designated to operate with the antennas listed below and have a maximum gain of 2.4dBi. Antennas not included in this or having a gain greater than 2.4dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Sokkia Atlas Digital UHF II 2.4dBi whip antenna

Manufacture/Type

420-450 MHz LAIRD or ANTENEX/G420BN

450-470 MHz LAIRD or ANTENEX/G450BN

The device has been designated to operate with the antennas listed below and have a maximum gain of 2.1dBi. Antennas not included in this or having a gain greater than 2.1dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

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)

- ETSI EN 300 113-2 v1.5.1(2011-11)
- ETSI EN 301 489-1 v1.9.2(2011-09)
- ETSI EN 301 489-7 v1.3.1(2005-11)
- ETSI EN 300 440-2 v1.4.1(2010-08)
- ETSI EN 300 328 v1.7.1(2006-10)
- ETSI EN 301 489-3 v1.4.1(2002-08)
- ETSI EN 301 908-1 v5.2.1(2011-05)
- ETSI EN 301 489-5 v1.4.1(2002-08)
- ETSI EN 301 489-17 v1.5.1(2010-10)
- ETSI EN 301 511 v9.0.2(2003-03)
- EN 60950-1:2006:+A11:2009 & A1:2010
- EN 55022:2010
- ETSI EN 301 489-24 v1.5.1(2010-10)
- ETSI EN 301 908-2 v5.2.1(2011-07)

This equipment is intended to be marketed in the following countries:

List of National Codes:

- AT DE MT GB
- BE GR NL IS
- CY HU PL LI
- CZ IE PT NO
- DK IT SK CH
- EE LV SI BG
- FILT ES RO
- FR LU SE TR

The equipment is labeled with a CE! mark that informs users the DIG UHFII frequency range 410-470 MHz is not harmonized throughout Europe and the specific country spectrum authority should be notified before a radio modem is used.

	Use of this equipment requires a license.
	L'impiego di questo impianto necessita una concessione.
	Das Betreiben dieser Anlage unterliegt der Konzessionspflicht.
	L'utilisation de cette installation nécessite une concession.

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

esky [Czech]	*(Sokkia)* tímto prohlašuje, že tento *(Sokkia Atlas)* je ve shod se základními požadavky a dalšími píslušnými ustanoveními smrnice 1999/5/ES.
Dansk [Danish]	Undertegnede *(Sokkia)* erklærer herved, at følgende udstyr *(Sokkia Atlas)* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt *(Sokkia)* dass sich das Gerät *(Sokkia Atlas)* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *(Sokkia)* seadme *(Sokkia Atlas)* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *(Sokkia)* declares that this *(Sokkia Atlas)* 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 *(Sokkia Atlas)* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
[Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *(Sokkia)* ΔΗΛΩΝΕΙ ΟΤΙ *(Sokkia Atlas)* 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 *(Sokkia Atlas)* 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 *(Sokkia Atlas)* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *(Sokkia)* deklar, ka *(Sokkia Atlas)* atbilst Direktvas 1999/5/EK btiskajm prasbm un citiem ar to saisttajiem noteikumiem.
Lietuvi [Lithuanian]	Šiuo *(Sokkia)* deklaruoja, kad šis *(Sokkia Atlas)* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart *(Sokkia)* dat het toestel *(Sokkia Atlas)* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, *(Sokkia)*, jiddikjara li dan *(Sokkia Atlas)* jikkonforma mal-tiijiet essenzjali u ma provvedimenti orajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, *(Sokkia)* nyilatkozom, hogy a *(Sokkia Atlas)* megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym, *(Sokkia)* , deklaruj, e *(Sokkia Atlas)* spenia wymagania zasadnicze oraz stosowne postanowienia zawarte Dyrektywie 1999/5/EC.
Português [Portugues]	*(Sokkia)* declara que este *(Sokkia Atlas)* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	*(Sokkia)* izjavlja, da je ta *(Sokkia Atlas)* v skladu z bistvenimi zahtevami in ostalimi relevantnimi doloili direktive 1999/5/ES.
Slovensy [Slovak]	*(Sokkia)* týmto vyhlasuje, že *(Sokkia Atlas)* spa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	*(Sokkia)* vakuuttaa täten että *(Sokkia Atlas)* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar *(Sokkia)* att denna *(Sokkia Atlas)* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

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.

Warranty

Sokkia positioning equipment are 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.[1]

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.

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

Glossary

B

Base Station – A GNSS receiver set up over a known point, which is used to derive correction information for nearby Rover (mobile) GNSS receivers.

BeiDou– BeiDou Navigation Satellite System maintained and operated by China.

Bluetooth® – Often used in place of cables, Bluetooth is open wireless technology for exchanging data over short distances from fixed and mobile devices.

G

GALILEO – The satellite system currently being maintained and operated by the European Union (EU) and European Space Agency (ESA).

GGD – GPS + GLONASS Dual Frequency signal tracking.

GLONASS – The Global Navigation Satellite System maintained and operated by the Russian Federation.

GNSS – Global Navigation Satellite Systems, such as GPS and GLONASS.

GPS – The Global Positioning System maintained and operated by the United States Department of Defense.

L

L1 and L2– For the ranging codes and navigation message to travel from the satellite to the receiver, they must be modulated onto a carrier frequency. In the case of the GPS design, two frequencies are utilized: one at 1575.42 MHz (10.23 MHz x 154) called L1 and the other at 1227.60 MHz (10.23 MHz x 120), called L2.

Light-Emitting Diode (LED) – Used as indicator lights on the receiver to display the status of the receiver's components and control receiver operations.

M

MAGNET® Field – Data controller software that is part of the MAGNET software system.

MAGNET® Office – Post-processing and CAD solution software for surveying and grade application. It is part of the MAGNET® software system.

MINTER – The receiver's Minimum INTERface used to display and control data input and output.

N

Network RTK – Collects satellite observations from the reference stations within the network and sends RTK corrections to the Rover.

O

Option Authorization File (OAF) – This enables specific features for scalable performance of Sokkia GNSS receivers.

P

Phase Center of Antenna – The point from which the electromagnetic radiation spreads spherically outward, with the phase of the signal being equal at any point on the sphere.

R

Real-Time Kinematic (RTK) – A precise method of real-time surveying. RTK enables you to check the measurement quality without having to process the data.

Root Mean Square (RMS) – Statistical measure of the magnitude of a varying quantity.

Rover – A mobile GNSS receiver and data collector used for determining location in the field.

S

Satellite-Based Augmentation Systems (SBAS) – Complements existing global navigation systems. SBAS transmits differential corrections and messages for navigation satellites that are within sight of a network or reference stations in a wide area, such as a continent.

Sokkia Receiver Utility (SRU) – Receiver configuration software for receivers and peripheral devices.

Static Survey – Location determination when the receiver's antenna is stationary. This method provides the highest accuracy and requires the longest observation times.

U

Universal Serial Bus (USB) – A connection standard used by devices, such as a receiver, controller, computer, etc.

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Sokkia Atlas Operator's Manual

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