SOKKIA

R4S-BT
UHF Radio Transceiver Modem

Operator's Manual

SOKKIA

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Preface

Thank you for purchasing this Sokkia product. The materials available in this Manual (the "Manual") have been prepared by Sokkia Positioning Systems, Inc. ("Sokkia") 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.

Terms and Conditions

Use

This product is designed to be used by a professional. The user should have a good knowledge of the safe use of the product and implement the types of safety procedures recommended by the local government protection agency for both private use and commercial job sites.

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Safety

Improper use of the receiver can lead to injury to persons or property and/or malfunction of the product. The receiver should only be repaired by authorized Sokkia warranty service centers.

Miscellaneous

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Manual Conventions

This manual uses the following conventions:

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

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.

Concerns regarding this Sokkia product may be sent to Service and Repair Department, Topcon Positioning Systems, Inc., 7400 National Drive, Livermore, California 94550

Introduction

The R4S-BT is a UHF radio transceiver modem. It provides a transparent data link with other R4S-BT modems and also with UHF radio modems in SOKKIA integrated GNSS receivers. R4S-BT can be interconnected to a data terminal or similar devices by two different transmission standards; USB or Bluetooth. Data is further transmitted via a UHF data modem.

The R4S-BT contains a circular M12 connector for USB and TNC for UHF radio modem. The Bluetooth antenna is integrated.

The R4S-BT contains an integrated rechargeable Li-Ion battery pack which maintains the operation without external supply. The internal battery is not removable or serviceable by the user.

The R4S-BT is intended to use inside or outside environment and fulfills IP67 ratings (1meter / 30minutes). See a more detailed description in "Specifications" on page 20".
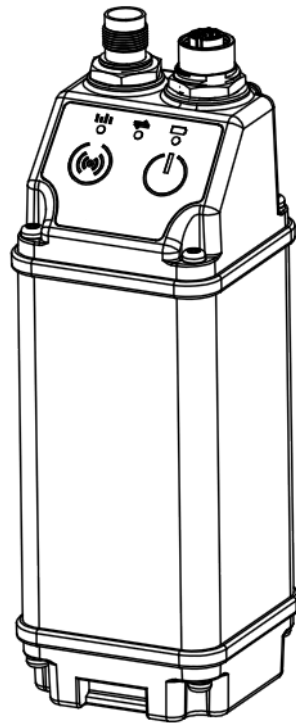
Figure 1: R4S-BT UHF Radio Transceiver Modem

Accessories

The following sections describe the R4S-BT accessories.

Data Cable

The R4S-BT can be connected to a terminal device by the DC/USB cable (p/n 1023896-01) included in the product kit.

The 1023896-01 cable is intended for USB data communication. It allows the interconnection to USB port on your laptop or field computer. On both cables, there is also a DC plug of 5.5 mm / 2.1 mm to the external DC supply.

The M12 cable connector has an alignment notch with the connector on the device.

> Do not turn the connector against the counterpart to find the alignment notch as this might damage the connector.

Find the correct position before trying to mate the connectors. Once they mate, press the connector down and lock it by turning the knurled ring until the connector is fully locked.

D-SUB9 has a securing screws which should be closed for reliable connection.

> The DC-plug does not have a locking mechanism and is based on a friction only.
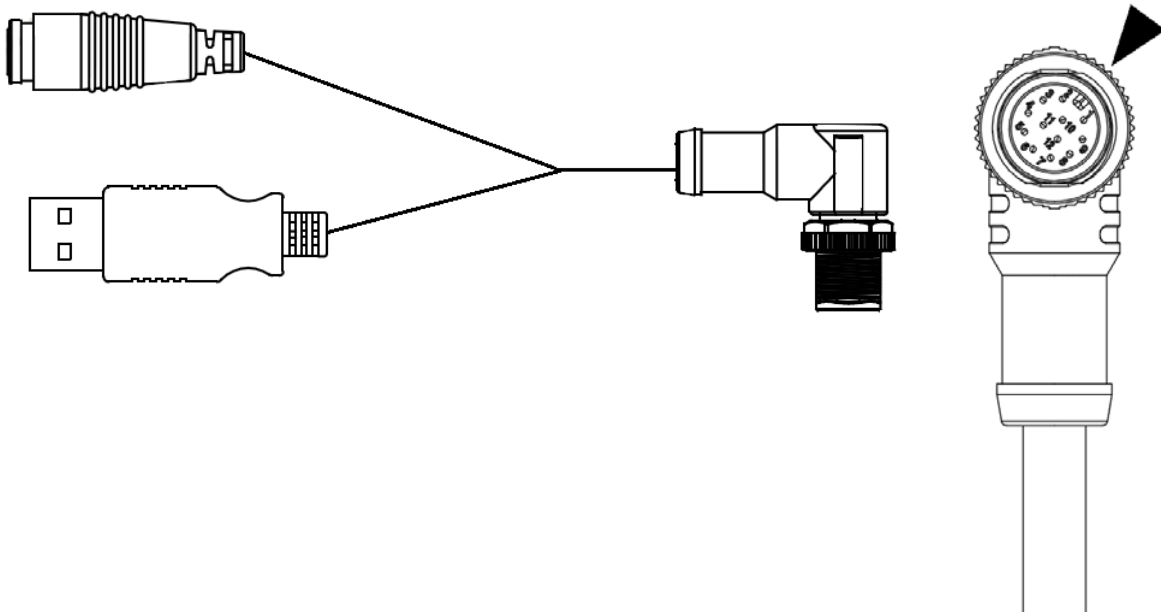

Figure 2: Data Cable

Radio Bracket

The R4S-BT radio kit contains a versatile bracket for easy mounting to a Survey Range Pole or Base Station Tripod. This bracket has two components:

- Quick release pole clamp (P/N: 1024817-01)

- Radio bracket (P/N: 1024421-01)

1. Push and hold the quick release button on the clamp to engage or disengage from the bracket. The bayonet connector and lock pin on the bracket slide into their respective receptors on the clamp.

2. Rotate the knob on the bracket until the R4S-BT radio is sufficiently secured. Rubber pads on the bracket provide additional compliance.
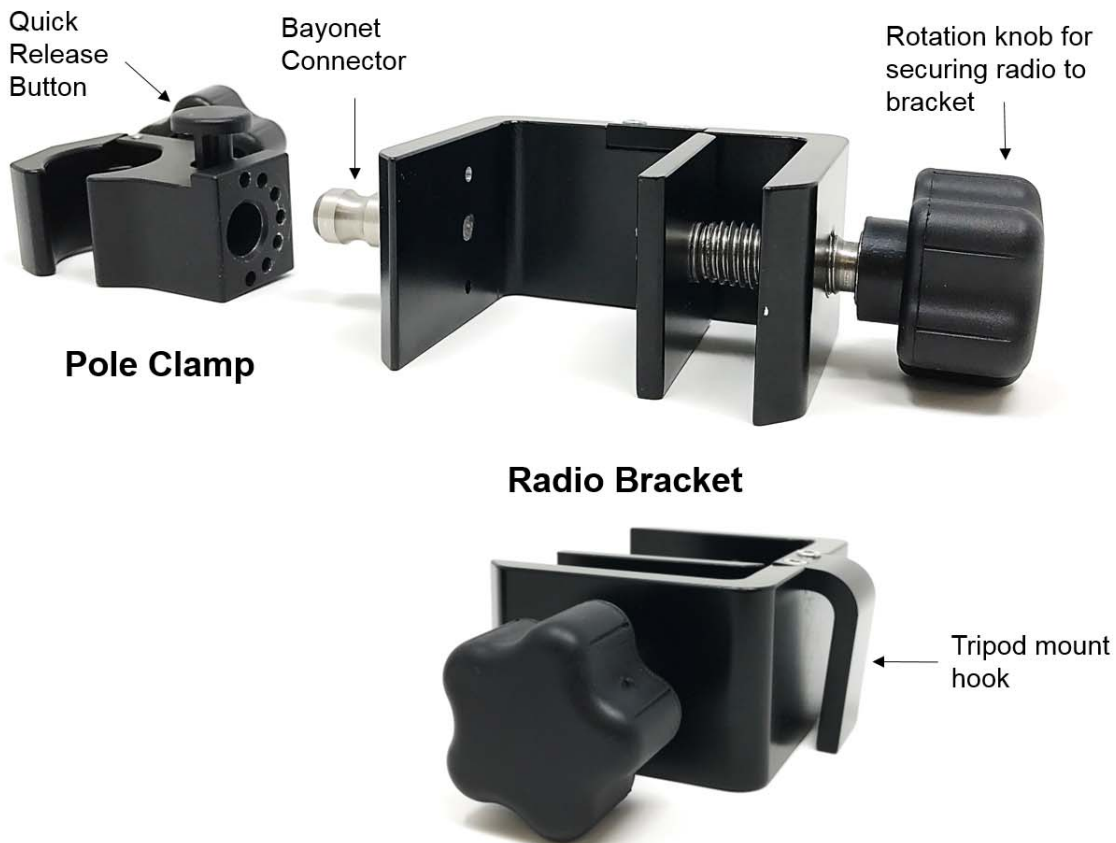

Figure 3: Radio Bracket

Power Supply

To connect the device to an external DC, supply, use AC adapter 40W (Sokkia P/N: 123897-01). Any other power source can be used, as long as it complies with the voltage and current requirements given in this manual. The power supply DC jack is 5.5 mm / 2.1 mm. The inner pin is positive.
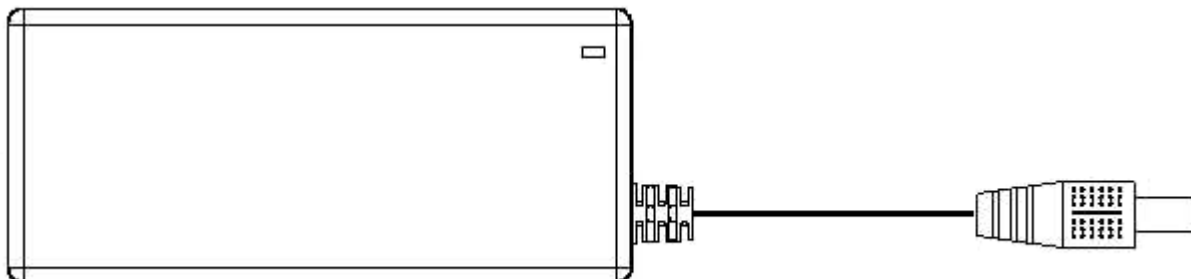
Figure 4: Power Supply

Technical Documentation and Utility Software

On the Sokkia Care website (us.sokkia.com/sokkia-care), you can download manuals, technical documentation, training material, and various utility software to help you set up and use your Sokkia product. The website also offers registration resources, training, and technical assistance.

Operator Interface

The following sections describe the features and functions of the R4S-BT display panel's buttons and LED indicators.

Features

Connector, TNC Radio Antenna

Connector, Programming/Charging Cable

Battery LED

Data/Mode LED

Bluetooth® LED

Bluetooth® Button

Power Button

Figure 1: R4S-BT Features

LED Indicators and Buttons

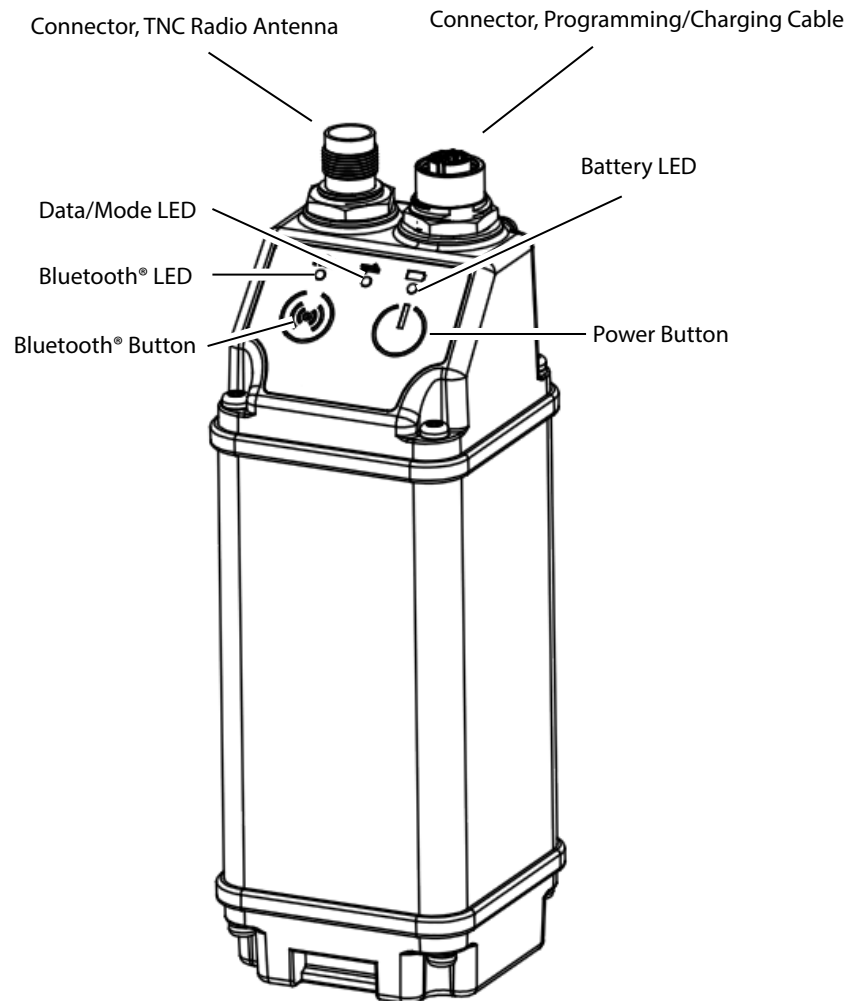Table 1. describes the R4S-BT LED indicators and button functions.

Table 1. R4S-BT LED Display Functions

Symbol	Name	Color	Description
▯▫▯▯	**Bluetooth status**	Blue	All devices can pair and connect
		Red	Only (10 most recent) paired devices can connect
⇌	**Data / Mode**	Green	R4S-BT is on
		Red	Receives or transmits data over the serial interface
🔋	**Battery status (Power supply connected)**	Green blink	Charging ongoing
		Green static	Charging complete
		Red blink	Charging error
	Battery status (During battery operation)	Green	Battery level is full
		Orange	Battery level is fair
		Red	Battery level is low
📶	**Bluetooth button**		Enable / disable Bluetooth
⏻	**Power button**		Power on / off

RF Interface

The R4S-BT has a single TNC female connector with an impedance of 50 Ohm.

The output power of the transmitter is adjustable between 100, 200, 500 and 1000 mW. The greatest allowable power depends on limits set by local authorities, which should not be exceeded under any circumstances. The output power of the transmitter should be set to the smallest possible level, which still ensures error free connections under variable conditions. Large output power levels using short connection distances can, in the worst case, cause disturbances to the overall operation of the system.

⚠️ Setting the radio data modem output power level to that which exceeds the regulations set forth by local authorities is strictly forbidden. The setting and/or using of non-approved power levels may lead to prosecution. SATEL and its distributors are not responsible for any illegal use of its radio equipment, and are not responsible in any way of any claims or penalties arising from the operation of its radio equipment in ways contradictory to local regulations and/or requirements and/or laws.

Modem Start Up

R4S-BT is operated by two push buttons. Operational states are shown with three LEDs and different LED colors.

To turn on R4S-BT, press the Power button continuously for three seconds. The battery LED and DATA/Mode LED will illuminate. To turn off R4S-BT push power button continuously for three seconds.

Pressing the power button continuously for 10 seconds internally resets the R4S-BT.

Bluetooth

To turn on Bluetooth, press the Bluetooth button for three seconds. The Bluetooth LED starts to blink Blue.

To turn off Bluetooth, press the Bluetooth button for three seconds. The Bluetooth LED will go off.

If Bluetooth was enabled when the device was operational, Bluetooth will automatically start the next time the device is switched on. If Bluetooth was disabled when device was operational, Bluetooth will remain off the next time the device is switched on.

After enabling Bluetooth, the Bluetooth LED will blink Blue. During this period, all devices can find, pair and connect. After ten minutes, the LED will switch to Red and no new devices can pair, but the 10 most recent paired devices can connect.

With the R4S-BT, it is possible to set to a Bluetooth remote mode. Remote mode allows users to switch on the device remotely only by creating a connection to Bluetooth. To set the device to a remote mode, Bluetooth should be enabled when the device is off by pressing the Bluetooth button for three seconds.

Notice that Bluetooth uses an internal antenna, therefore no external antenna is required. The Bluetooth antenna is positioned on a bottom of the device. For the best performance, the internal antenna should not be blocked or screened by metal objects set close to the housing.

Data Transfer Via R4S-BT

Data can be sent via Bluetooth or USB, which are ON simultaneously, therefore no extra setting is needed to choose which port shall be opened. The data port is chosen by selecting the dedicated cable.

If the Bluetooth port is used for data transmission, the USB port is also operational. The user should not send data to two different ports simultaneously, as this might corrupt the data.

If Bluetooth data transmission is required, Bluetooth must first pair and connect with the R4S-BT.

Charging the Battery

R4S-BT contains a Li-Ion battery which can be charged from external DC supply. The device can be operated either battery powered or external DC supply powered. During the external DC supply internal battery is charged. This influences the power consumption from the external source up to 2 Amps at 12V.

When external DC supply is connected, all power is drained from that source. After the battery is fully charged, the external DC supply will continue to feed the device, hence not draining the battery. DC supply can be disconnected at any time, or it can be left connected all times.

When the external DC supply is connected, the Battery LED will illuminate Green or blink Green while charging is ongoing.

If during the charging the Red LED begins blinking, there is an internal error in the charging process.

An error can occur in the following circumstances:

- charging temperature is too low or high
- maximum charging time has exceeded
- battery absent or defect

In a case of error occurrence assure that the device is in a proper temperature range. Notice that inner temperature may be different than outside, or the device may take some time to cool down or heat up. If charging takes too long or behaves abnormally, the battery may be defective. In this case contact the manufacturer for further instructions.

Battery Capacity

A good practice is to minimize battery consumption during operation, as this can dramatically extend operational time.

The best way to minimize battery drainage is to use as little Transmit power as possible. If Transmission distances are short, output power of 100 mW may be adequate.

The device should be switched off if not in use.

Table 2. describes the typical operational times in various conditions.

Table 2. Battery Capacity

Condition, +20°C	Operation	Notes
Transmit, 50 % duty cycle, 1 W output	6 hours[a]	
Transmit, 50 % duty cycle, 500 mW output	8 hours	
Receiver	10+ hours	
Bluetooth only	>20 days	discoverable mode
Power off	>1 year	
Charging	4 hours	empty to full
Cycle life	>500[b]	full charge - discharge cycles

a. In -20° Celsius operational times can decrease 40%.

b. Due to the Li-Ion battery technology capacity will slightly decrease after each cycle effecting directly to the operation times.

Configuration

Default Modem Settings

Table 3 describes the R4S-BT's default settings:

Table 3. Default Modem Settings

Setting	Default value	Range
Radio frequency		
Operating TX frequency	438.000 MHz	Range: 403-473 MHz
Operating RX frequency	438.000 MHz	Range: 403-473 MHz
Reference Frequency	438.000 MHz	Range: 403-473 MHz
Channel Spacing	25 kHz	Range: 12.5 kHz or 25 kHz
Radio settings		
TX Power	1000 mW	Range: 100, 200, 500 or 1000 mW
Signal threshold	-115 dBm	- 80 … -118 dBm
TX-Start Delay	0 ms	0-65535 ms
Radio Compatibility	SATELLINE 3AS	SATELLINE 3AS PacCrest-4FSK PacCrest-GMSK TrimTalk450s(P) TrimTalk450s(T) PacCrest-FST SATELLINE 2ASx SATELLINE 3AS-1 SOUTH SATEL 8FSK-1 SATEL 8FSK-2 SATEL 16FSK-1
Addressing		
RX Address	OFF	ON/OFF
TX Address	OFF	ON/OFF
Serial port		
Data speed	115200 bps	1200 – 115200 bps
Data bits	8	8
Parity bits	None	None, Even, Odd.
Stop bits	1	1

Table 3. Default Modem Settings

Handshaking		Handshaking lines apply to the DATA-port.
CTS	TX buffer state	Clear to send, TX buffer state
CD	not supported	RSSI- threshold, Data on channel, Always ON.
RTS	Ignored	Ignored, Flow Control, Reception Control.
Pause length	3 bytes	3….255
Additional setup		
Error correction, FEC	OFF	ON/OFF
Error check	OFF	OFF, CRC8Partial, CRC8Full, CRC16Full
Repeater Mode	OFF	ON/OFF
SL-commands	ON	ON/OFF
TX Delay	0	0 …. 65535 ms
Over-the-Air-Encryption	OFF	ON/OFF
Use Channel List	OFF	ON/OFF
Power Save Mode	OFF	ON/OFF
Add RSSI to Data	OFF	ON/OFF

Configuring your R4S-BT Radio Modem

with Sokkia Receiver Utility (SRU)

Sokkia Receiver Utility is a hardware configuration software for Sokkia GNSS Receivers and Radios. You can install and run the software on desktop and field computers. This software enables you to configure your product for field operation in survey and construction workflows.

You can download this software from https://us.sokkia.com/sokkia-care-products/sru-sokkia-receiver-utility. For use with R4S-BT radio modem; you will need ver. 3.3 or newer.

The help document for SRU is embedded in the software.

You may choose to utilize USB or Bluetooth connection methods. To do so:

1. Load the SRU software onto your computer.

2. Click **Device > Modem Managing.**

3. Select the correct USB port from the list, and click **Connect.**

    If using the Bluetooth method; you will be prompted with a **Bluetooth Search Manager** screen populated with a list of discoverable devices. In this case, select the R4S-BT radio modem from the list and click **Connect**.,

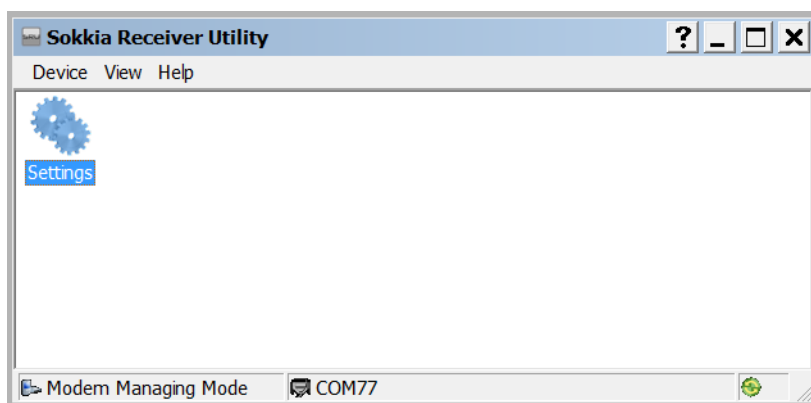4. Once connected to the radio modem, click on the **Settings** icon.

Figure 2: SRU Settings

5. SRU will communicate with the radio modem and query the settings that are currently programmed.
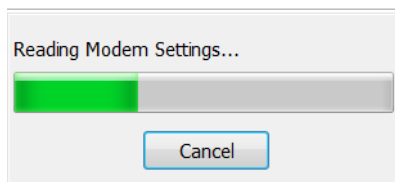

Figure 3: SRU Reading Modem Settings

6. Click on the **Settings** tab (Figure 4) to view these results.

7. You may reprogram the radio modem by modifying the settings presented in this screen. Some of these settings are:

- Protocol
- Channel Frequency
- Output Power (if using radio modem in base station setup)
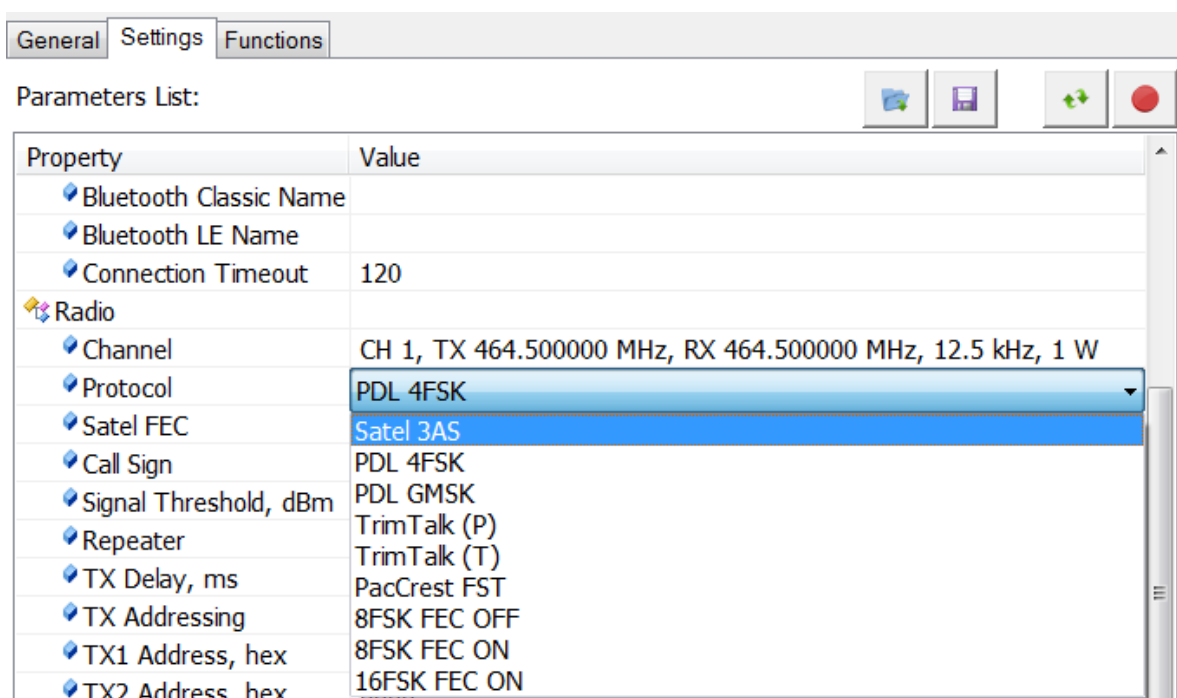- Channel Spacing

Figure 4: SRU Settings Tab

8. Click the **Write Settings** button ⬤ to save any changes that have been made in this screen.

Loading Frequencies/Channels

Channels/Frequencies can be programmed to the R4X-BT radio using the Functions tab under Settings.

Prior to this; you will need to communicate your licensed frequencies to your Sokkia dealer who will supply you with a '.mcf' file. This file contains the channel/frequency information for your R4X-BT radio. Licensed frequencies are obtained from your local radio regulatory authority.

Satel FEC ON/OFF has an effect on Satel-3AS protocol only. It is necessary to make sure that FEC is off for the radio to transmit correctly if using a protocol other than the Satel-3AS

Once you have a '.mcf' file from your dealer, you can load the channels/frequencies to your radio modem using the following steps:

1. Select **UploadMCFFile** from the **Functions** list.

2. Click on the **Value** field next to **File**.

This will load an instance of File Explorer and prompt you to guide to the location of the '.mcf' file on your computer.

3. Select the correct file, and click **Execute**.

SRU will indicate that the file is being uploaded and also when the operation completes.
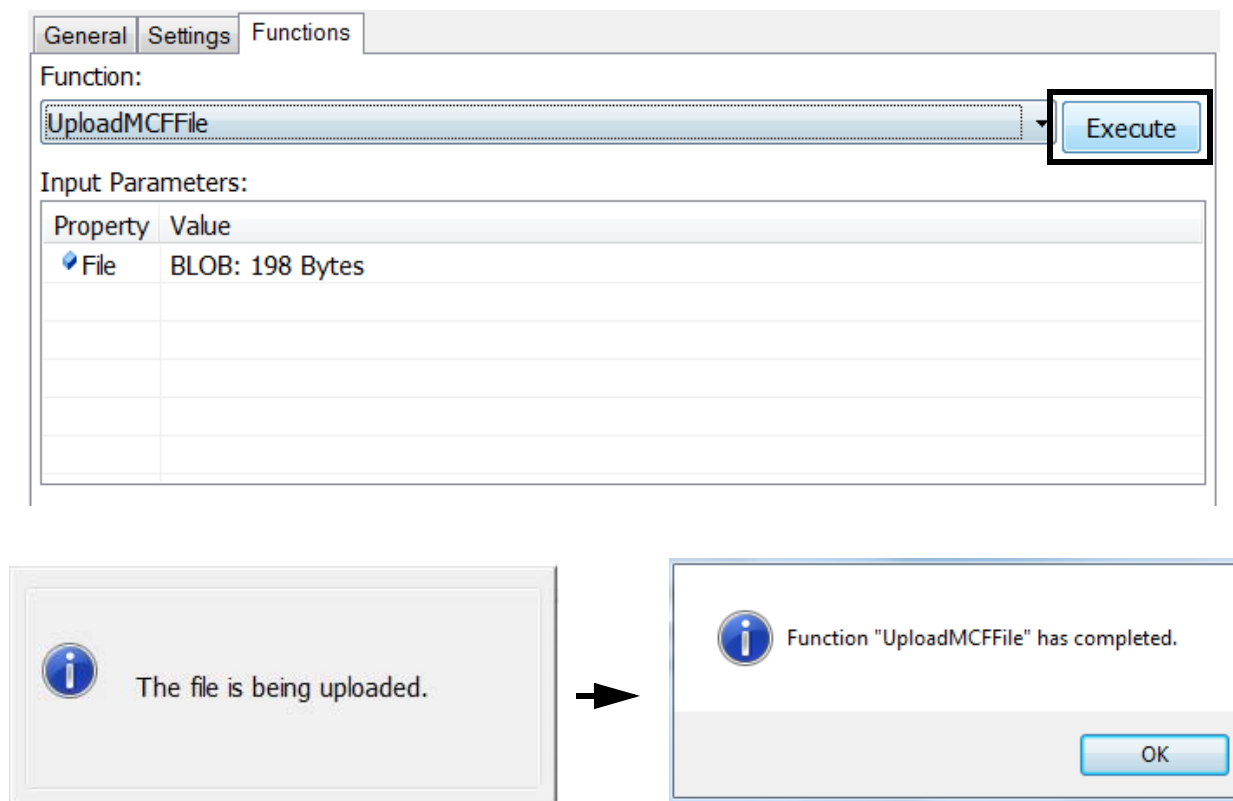
Figure 5: SRU Functions Tab

> **Note for Dealers:** The Advanced version of SRU is only available for dealers and enables creating MCF files for customers.

Creating Frequencies/Channels '.MCF' file

SOKKIA dealers can use the Frequency Editing mode available in the Advanced version of SRU.

One is not required to be connected to the radio modem when creating the '.mcf' file.

1. Select the **Frequency Editing** option from **Application Mode**.
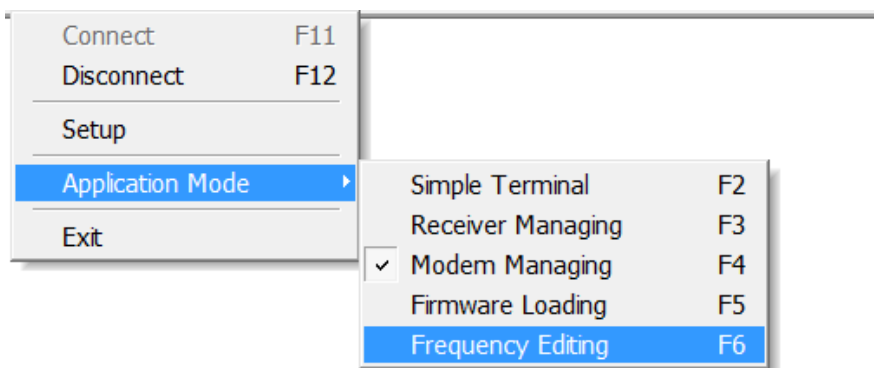
Figure 6: Frequency Editing

2. Click the **M3-TR4/SRL-35** module icon from the options shown in this screen.
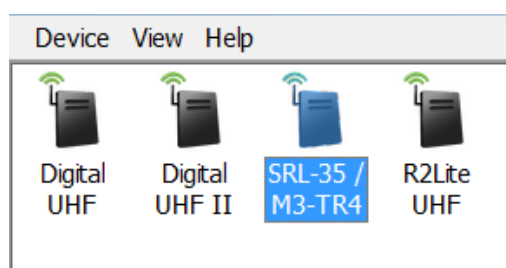
Figure 7: Selecting the SRL-/35/M3-TR4 Icon

3. Click on the **Dealer Configuration (.mcf)** icon
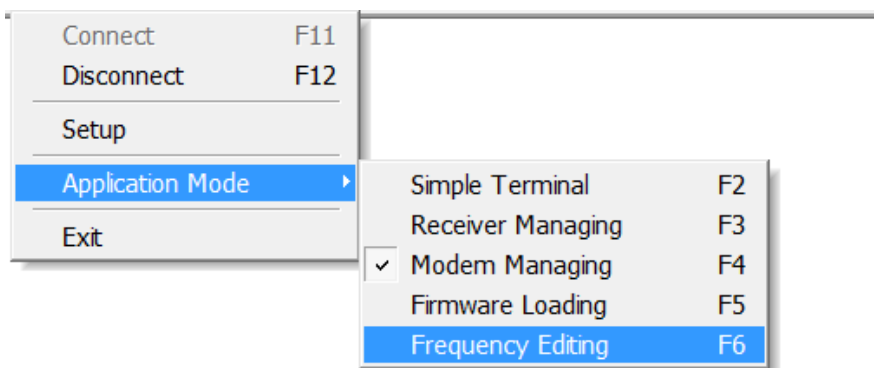
Figure 8: Selecting the Dealer Configuration Icon

4. When the MCF Creator screen has loaded, click on the **Add** button.
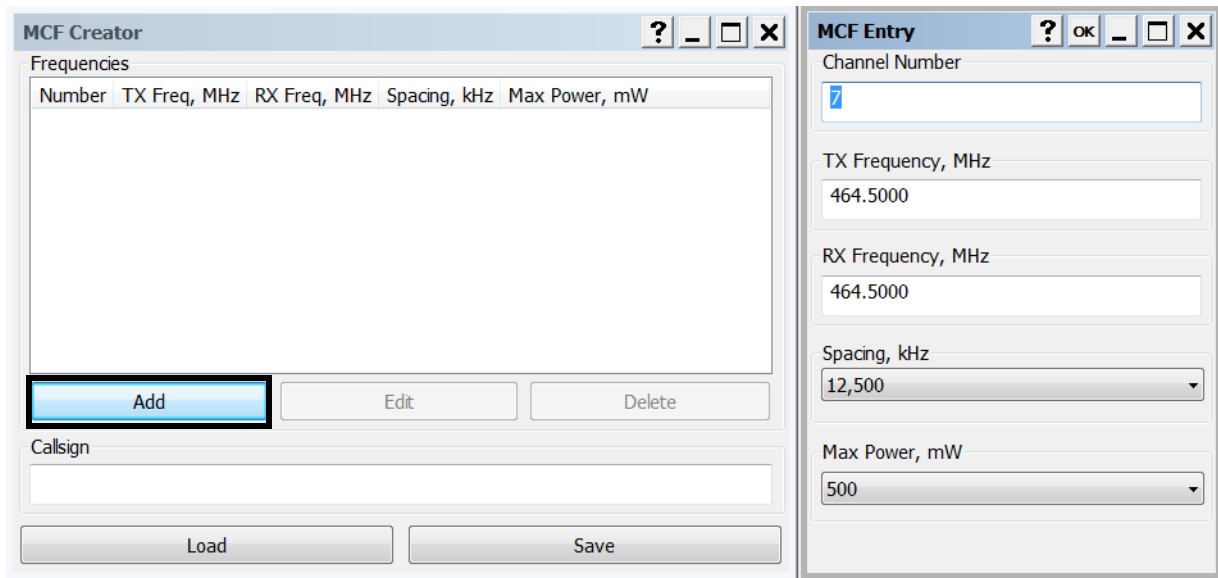
Figure 9: Frequency Editing

5. In the **MCF Entry** screen (Figure 9), you can enter the channel number, TX/RX frequencies, spacing, and Max Transmit Power for the radio modem.

6. To load another frequency/channel in the MCF file, click **Add** again.

7. Once completed with adding channels, click the **OK** button.

8. Click the **Save** button to store the .mcf file created using the steps above to your computer.

    Once saved, the dealer can send MCF file to their customers.

Safety Warnings

Read these safety instructions carefully before using the product:

• The radio modem is only to be operated at frequencies allocated by local authorities, and without exceeding the given maximum allowed output power ratings. Sokkia and its distributors are not responsible, if any products manufactured by it are used in unlawful ways.

• The devices mentioned in this manual are to be used only according to the instructions described in this manual. Faultless and safe operation of the devices can be guaranteed only if the transport, storage, operation and handling of the devices is appropriate. This also applies to the maintenance of the products.

Handling the battery operated device and safety issues

To maximize the device battery life a certain precautions should be noticed. If the device is left unused for a long period of time a charging could take place to prevent battery going totally empty. The best way to determine the battery capacity is to check if the battery indicator LED is Red or if the device won't start normally by pressing the power button. Either of these conditions indicate that the battery is empty or is running empty.

The best temperature for storing the device is the normal room temperature, around +20°C.

If the batteries cannot maintain a charge for long periods of time or they charge in an abnormal way, this may indicate that the battery is defective.

The performance and life expectancy of the battery depends heavily on how the batteries are used. Misusing the battery operated device may cause the battery to get hot, break, or ignite and cause serious injury. Be sure to follow the safety rules listed below:

• Do not place the device in fire or heat the device with external source.

• Do not open or modify the device by any means.

• Do not mechanically abuse the device over its limits or otherwise subject it to strong impacts or shocks.

• Do not use the device to any other purpose that it is intended to.

• Do not use the device if, while using, charging, or storing the device, the device emits an unusual smell, leaks or appears abnormal in any other way.

• Do not place the device in ovens, high-pressure containers, or expose it to high water streams or underwater conditions for long periods.

• In the event that the device leaks battery fluids and the fluid gets into one's eye, do not rub the eye. Rinse well with water and immediately seek medical care. Do not leave it untreated as the fluid could cause damage to the eye.

Be sure to follow the rules listed below while charging the device or operate with the external power supply.

- When charging the device either use a specified cable and power source or otherwise ensure that the charging conditions meet the specifications given in this manual.

- Do not attach the device directly to a mains powered AC supply line. This will cause permanent damage to the device and could lead to an electric shock.

- When the device becomes hot, the built- in safety feature is activated preventing the battery from charging further. If this happens reduce the heat to build up like shutting down the device during charging or placing the device to a cooler place.

- When charging in cold conditions, do not heat up the device to extend its operational temperature range. Bring the device indoors to charge it.

- Do not continue charging the device if it does not recharge within the specified charging time or the charging gives constant error indications. This might indicate that the battery is defective or the charging conditions are out of range.

General Warnings

To comply with RF exposure requirements, maintain at least 25cm between the user and the radio modem.

Sokkia products are designed for survey and survey 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 survey site.

- Contrary to applicable laws, rules, and regulations.

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

Battery Pack Warnings

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

Do not incinerate or heat battery pack 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 attempt to open the battery pack or replace it.

- Do not disassemble the battery pack.

- Do not charge in conditions different than specified.

- Do not use other than the specified battery charger.

- Do not short circuit.

- Do not crush or modify.

Receiver Warnings

Tampering with the receiver by the end users or non-factory authorized technicians will void the receiver's warranty:

- Do not attempt to open the receiver and modify any of its internal components.

- Do not charge in conditions different than specified.

- Do not short circuit.

Usage Warnings

If this product has been dropped, altered, transported or shipped without proper packaging, or otherwise treated without care, erroneous measurements may occur.

The owner should periodically test this product to ensure it provides accurate measurements.

Inform Sokkia immediately if this product does not function properly.

Specifications

The R4S-BT is a UHF radio transceiver modem. This chapter provides specifications for the R4S-BT and its internal components.

The R4S-BT complies with the following international standards:

- EN 300 113
- EN 300 489 (EMC)
- IEC 60950 (safety)
- CFR47 part90

General Details

Table 4 lists the R4S-BT's general specifications.

Table 4. General R4S-BT Specifications

General		
Operating Voltage	+12 ... +30 Vdc +/- 10% Vdc	External DC supply
Temperature Range	Type approval condition: -25 ... +55 °C.	
Battery pack	2S1P, 7.4V 3300 mAh Li-Ion	
Charging condition	0 °C ... +45 °C	
Temperature Ranges	-25 °C ... +60 °C	Battery operated
	-40 °C ... +85 °C	Operational
	-25 °C ... +55 °C	Complies with standards
	-40 °C ... +85 °C	Storage
Antenna Connector	50 Ω, TNC female	
Housing	Shielded / bare PCB inside metal / plastic housing	
UHF Antenna	External	
Bluetooth antenna	Internal	
Size L x W x H	165 mm x 55 mm x 55 mm	overall height

Table 5. Receiver/Transmit Specifications

	Receiver	Transmitter	Note
Frequency Range	403 … 473 MHz		
Tuning range	70 MHz		
Minimum RF Frequency Step	6.25 kHz		
Channel Bandwidth	12.5 kHz / 25 kHz		Programmable
Frequency Stability	<1 kHz		
Maximum Receiver Input Power without Damage	+14 dBm		
Maximum Receiver Input Power without Transmission Errors	-10 dBm		FEC ON
Sensitivity	-112 dBm @ 25 kHz -116 dBm @12.5 kHz		FEC ON
Blocking	> 86 dB @ 25 kHz > 88 dB @ 12.5 kHz		FEC ON
Intermodulation Attenuation	> 61 dB @ 25 kHz > 61 @ 12.5 kHz		FEC ON
CO-Channel Rejection	> -11 dB @ 25 kHz > -10 dB @ 12.5 kHz		FEC ON
Adjacent Channel Selectivity	> 56 dB @ 25 kHz > 51 dB @ 12.5 kHz		FEC ON
Spurious Rejection	> 67 dB		FEC ON
Typical Power Consumption[a] Note 1.	Charging	12 V: 7.4 W	RX-OFF
	Charging + RX	12 V: 8.4 W	RX-mode
	Charging + TX	12 V: 13.2 W @ 1 W RF	TX-mode, Continuous, 50Ω
	Device OFF	12 V: 0.46 W	Not Charging
	RX	12 V: 1.32 W	Not Charging
	TX	12 V: 5.8 W @ 1 W RF	
Transmitter Power (programmable)		0.1, 0.2, 0.5, 1 W	TX-mode, 50Ω load
Communication Mode	Half-Duplex		
Adjacent Channel Power		acc. to EN 300 113	TX-mode

Table 5. Receiver/Transmit Specifications

Transient Adjacent Channel Power		acc. to EN 300 113	TX-mode
Carrier power stability		< ±1.5 dB	

a. Power consumption is measured using an external power source.

Table 6. Data Modem Specifications

	Data Modem	**Note**
Electrical Interface	USB	
Bluetooth	Bluetooth 2.1 / BLE	
Interface Connector	M12 Circular	
Data speed of I/O-interface	9600 – 115200 bps	
Data speed of Radio Interface	<u>4FSK FEC OFF:</u> 19200 bps (25 kHz) 9600 bps (12.5 kHz) <u>4FSK FEC ON:</u> 14400 bps (25 kHz) 7200 bps (12.5 kHz) <u>8FSK FEC OFF:</u> 28800 bps (25 kHz) 14400 bps (12.5 kHz) <u>8FSK FEC ON:</u> 19200 bps (25 kHz) 9600 bps (12.5 kHz) <u>16FSK FEC ON:</u> 28800 bps (25 kHz) 14400 bps (12.5 kHz)	
Data Formats	Asynchronous data	
Air Interface Encryption	AES128	Programmable
Modulation	4FSK, 8FSK, 16FSK, GMSK	

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 20cm and more between the radiator and person's body (excluding extremities: hands, wrists, feet and ankles).

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

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

- Reorient or relocate the receiving antenna.

- Move the equipment away from the receiver.

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

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

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

Industry Canada Compliance

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

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

Community of Europe Compliance

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

European Community Declaration of Conformity with R&TTE Directive 2014/53/EC

The following standards were applied: (R&TTE Directive 2014/53/EEC)

- EN 301 489-1 V1.8.1 (2008-04)

- EN 301 489-17 V2.1.1 (2009-05)

- EN 300 328 V1.7.1 (2006-10)

- EN 60950-1: 2006 + A11:2009/A1:2010

- EN 301 489-3 V1.4.1 (2002-08)

- EN 300 440-2 V1.4.1

The following CE mark is affixed to the device:

$$C\,\epsilon$$

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

Declaration of Conformity (R&TTE Directive 2014/53/E)

esky [Czech]	*(Sokkia)* tímto prohlašuje, že tento *(R4S-BT)* je ve shod se základními požadavky a dalšími píslušnými ustanoveními smrnice 2014/53/ES.
Dansk [Danish]	Undertegnede *(Sokkia)* erklærer herved, at følgende udstyr *(R4S-BT)* overholder de væsentlige krav og øvrige relevante krav i direktiv 2014/53/EF.
Deutsch [German]	Hiermit erklärt *(Sokkia)* dass sich das Gerät *(R4S-BT)* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 2014/53/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *(Sokkia)* seadme *(R4S-BT)* vastavust direktiivi 2014/53/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *(Sokkia)* declares that this *(R4S-BT)* is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EC.

Español [Spanish]	Por medio de la presente *(Sokkia)* declara que el *(R4S-BT)* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/CE.
[Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *(Topcon Positioning Systems, Inc.)* ΔΗΛΩΝΕΙ ΟΤΙ *(GRX1)* 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 *(R4S-BT)* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/CE.
Italiano [Italian]	Con la presente *(Sokkia)* dichiara che questo *(R4S-BT)* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/CE.
Latviski [Latvian]	Ar šo *(Sokkia)* deklar, ka *(R4S-BT)* atbilst Direktvas 2014/53/EK btiskajm prasbm un citiem ar to saisttajiem noteikumiem.
Lietuvi [Lithuanian]	Šiuo *(Sokkia)* deklaruoja, kad šis *(R4S-BT)* atitinka esminius reikalavimus ir kitas 2014/53/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart *(Sokkia)* dat het toestel *(R4S-BT)* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EG.
Malti [Maltese]	Hawnhekk, *(Sokkia)*, jiddikjara li dan *(R4S-BT)* jikkonforma mal-tiijiet essenzjali u ma provvedimenti orajn relevanti li hemm fid-Dirrettiva 2014/53/E.
Magyar [Hungarian]	Alulírott, *(Sokkia)* nyilatkozom, hogy a *(R4S-BT)* megfelel a vonatkozó alapvetõ követelményeknek és az 2014/53/E irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym, *(Sokkia)*, deklaruj, e *(R4S-BT)* spenia wymagania zasadnicze oraz stosowne postanowienia zawarte Dyrektywie 2014/53/E.
Português [Portugues]	*(Sokkia)* declara que este *(R4S-BT)* está conforme com os requisitos essenciais e outras disposições da Directiva 2014/53/CE.
Slovensko [Slovenian]	*(Sokkia)* izjavlja, da je ta *(R4S-BT)* v skladu z bistvenimi zahtevami in ostalimi relevantnimi doloili direktive 2014/53/ES.
Slovensy [Slovak]	*(Sokkia)* týmto vyhlasuje, že *(R4S-BT)* spa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53/ES.
Suomi [Finnish]	*(Sokkia)* vakuuttaa täten että *(R4S-BT)* tyyppinen laite on direktiivin 2014/53/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar *(Sokkia)* att denna *(R4S-BT)* stär I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/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 laser and electronic 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.

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

SOKKIA