Champion Instruments PRO GNSS Receiver

Trademarks
All product and brand names mentioned in this publication are trademarks of their respective holders.

Safety Warnings
The Global Positioning System (GPS) is operated by the U.S. Government, which is solely responsible for the accuracy and maintenance of the GPS network. Accuracy can also be affected by poor satellite geometry and obstructions, like buildings and heavy canopies.

FCC interference statement
This equipment has been designed to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules in Portable Mode. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CE FC

CONTENTS

1. INTRODUCTION

The Champion PRO GNSS Receiver user guide describes how to set up and use the Champion PRO GNSS receiver.

"The receiver" refers to the Champion PRO GNSS receiver unless otherwise stated.

Even if you have used other Global Navigation Satellite Systems (GNSS) products before, Champion Instruments recommends that you spend some time reading this manual to learn about the special features of this product.

1.1. SAFETY INFORMATION

1.1.1. WARNINGS AND CAUTIONS

An absence of specific alerts does not mean that there are no safety risks involved.

A Warning or Caution information is intended to minimize the risk of personal injury and/or damage to the equipment.

WARNING - A Warning alerts you to a potential misuse or wrong setting of the equipment.

CAUTION - A Caution alerts you to a possible risk of serious injury to your person and/or damage to the equipment.

1.1.2. REGULATIONS AND SAFETY

The receivers contain a built-in wireless modem for signal communication through Bluetooth® wireless technology or through an external communication datalink. Regulations regarding the use of the wireless modem vary greatly from country to country. In some countries the unit can be used without obtaining an end-user license. However, in some countries, administrative permissions are required. For license information, consult your local dealer. Bluetooth® operates in license-free bands.

Before operating a Champion PRO GNSS receiver, determine if authorization or a license to operate the unit is required in your country. It is the responsibility of the end-user to obtain an operator's permit or license for the receiver for the location or country of use.

1.1.3. USE AND CARE

This receiver is ruggedized to withstand tough environmental conditions that occur in the field. However, the receiver is a high-precision electronic instrument and should be treated with reasonable care.

CAUTION - Operating or storing the receiver outside the specified temperature range will cause irreversible damage.

1.2. TECHNICAL SUPPORT

If you have a problem and cannot find the information you need in this manual or Champion Instruments website www.ChampionInstruments.com, contact your local Champion Instruments dealer from which you purchased the receiver(s).

If you need to contact Champion Instruments technical support please call (678) 386-2208.

1.3. DISCLAIMER

Before using the receiver, please make sure that you have read and understood this User Guide, as well as the safety information. Champion Instruments holds no responsibility for the incorrect operation by users and for the losses incurred by misunderstanding this guide. However, Champion Instruments reserves the right to update and optimize the contents in this guide regularly. Please contact your local Champion Instruments dealer for new information.

1.4. YOUR COMMENTS

Your feedback about this user guide will help us to improve it in the future. Please email your comments to office@championinstruments.com

2. GETTING STARTED WITH THE CHAMPION PRO

2.1. ABOUT THE RECEIVER

The Champion PRO GNSS receiver incorporates a GNSS engine, GNSS antenna, internal radio, 3G cellular modem, Bluetooth, Wi-Fi and battery in a ruggedized and miniature unit. Either unit may be a base, rover or used without other devices for static collection.

The receiver can be used as the part of a Network RTK GNSS system with Carlson SurvCE, MicroSurvey Field Genius or CHC LansStar7 Android software. Static positions can be stored in Rinex 2.11 format for easy OPUS submittal using only the receiver. The Static data can be stored in internal memory, a USB flash drive using the optional OTG cable or sent to your FTP using the internal 3G GSM modem!

When using the Champion Pro without additional equipment configuration of the many features is accomplished through a web browser. CHC LandStar7 may also be downloaded from the android app store. Static positions can be taken by pressing the function button for 5 seconds.

2.2. PARTS OF THE RECEIVER

The operating controls are all located on the front panel. Battery compartment, SIM card slot, serial ports and connectors are located on the bottom of the unit.

2.2.1. FRONT PANEL

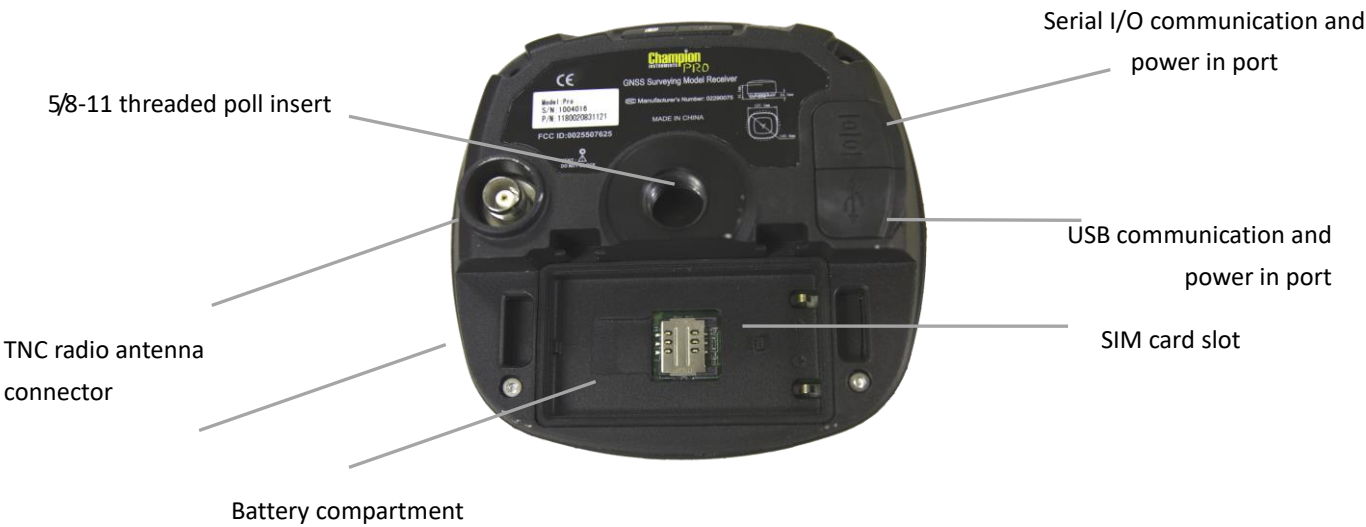The following figure shows a front view of the receiver.

Front panel

1. Power	Red	Power on – on
		Battery has less than 30% remained – flash
2. Satellites	Green	Satellites found – flash every second
3. Corrections	Yellow	Base is transmitting the corrections – flash every second
	Green	Rover is receiving the corrections – flash every second
		Rover is in RTK float status – flash
		Rover is in RTK fixed status – on
4. Wi-Fi	Orange	Wi-Fi on – on
		Wi-Fi off – off
5. File recording	Yellow	Static data is logging – flash according to static sample interval

Name	Description

| Function button   Power button | • Press and hold for 5 seconds to start and stop static sessions. Works as a Power button: • Press and hold this button for 3 seconds to turn on or turn off the receiver. Works as a Reset button: • Hold Function button and press this button for 5 times to reset the mainboard. |

2.2.2. LOWER HOUSING

The lower housing contains one SIM card slot, battery compartment, one TNC radio antenna connector, two communication and power ports, one 5/8-11 threaded insert and nameplate.

2.2.3. RECEIVER PORTS

Serial I/O communication and power in port

5/8-11 threaded poll insert

USB communication and power in port

TNC radio antenna connector

SIM card slot

Battery compartment

Port	Name	Description
	IO port	• This port is a 7-pin Lemo connector that supports RS-232 communications and external power. • Users can use the optional GPS to PC Data Cable to realize RS-232 communications between the receiver and computer or controller. Also, users can use the 7-pin cable to transmit differential data to an external radio.
	USB port	• This port is a 7-pin Lemo connector that supports USB communications and external power. • Users can use the USB Cable supplied with the system to download the logged data to a computer. • The optional OTG Cable can be used to upgrade the receiver firmware by connecting the receiver to a USB flash disk or directly log the static data to a USB flash disk.
	Radio antenna connector	Connect the UHF radio antenna to the internal radio of the receiver. This connector is not used if you are using an external radio.

2.3. BATTERIES AND POWER

2.3.1. INTERNAL BATTERY

The receiver comes with two rechargeable Lithium-ion batteries.

2.3.1.1. Charging the battery

The rechargeable Lithium-ion batteries are supplied partially charged. Charge the batteries completely before using for the first time. To charge the batteries place them in the supplied charger and wait until the green light at each battery stops flashing and remains solid green.

WARNING - Charge and use the rechargeable Lithium-ion batteries only in strict accordance with the instructions. Charging or using the batteries in unauthorized equipment can cause an explosion or fire and can result in personal injury and/or equipment damage.

To prevent injury or damage:

• Do not charge or use the battery if it appears to be damaged or leaking.
• Charge the Lithium-ion battery only in a Champion Pro charger that is specified to charge it. Be sure to follow all instructions that are provided with the battery charger.
• Discontinue charging a battery that gives off extreme heat or a burning odor.
• Use the battery only in Champion Pro equipment.
• Use the battery only for its intended use and according to the instructions in the product documentation.

2.3.1.2. Battery safety

WARNING - Do not damage the rechargeable Lithium-ion batteries. A damaged battery can cause an explosion or fire and can result in personal injury and/or property damage.

To prevent injury or damage:

• Do not use or charge the battery if it appears to be damaged. Signs of damage include but are not limited to discoloration, warping and leakage of battery fluid.
• Do not expose the battery to fire, high temperature or direct sunlight.
• Do not immerse the battery in water.
• Do not use or store the battery inside a vehicle during hot weather.

- Do not drop or puncture the battery.
- Do not open the battery or short-circuit its contacts.

WARNING - Avoid contact with the rechargeable Lithium-ion battery if it appears to be leaking. Battery fluid is corrosive and contact with it can result in personal injury and/or property damage.

To prevent injury or damage:

- If the battery leaks avoid the battery fluid.
- If battery fluid gets into your eyes immediately rinse your eyes with clean water and seek medical attention. Please do not rub your eyes!
- If battery fluid gets onto your skin or clothing immediately use clean water to wash off the battery fluid.

2.3.2. EXTERNAL POWER SUPPLY

Two methods are available for providing external power to the receiver. Use the included GPS to USB PC Data Cable with Power Adapter and either the wall charging adapter or the optional 12 volt battery cable.

In the office:

The Power Adapter is connected with AC power of 100-240V and the output port of the Power Adapter connects to the Power Port of the GPS to USB PC Data Cable.
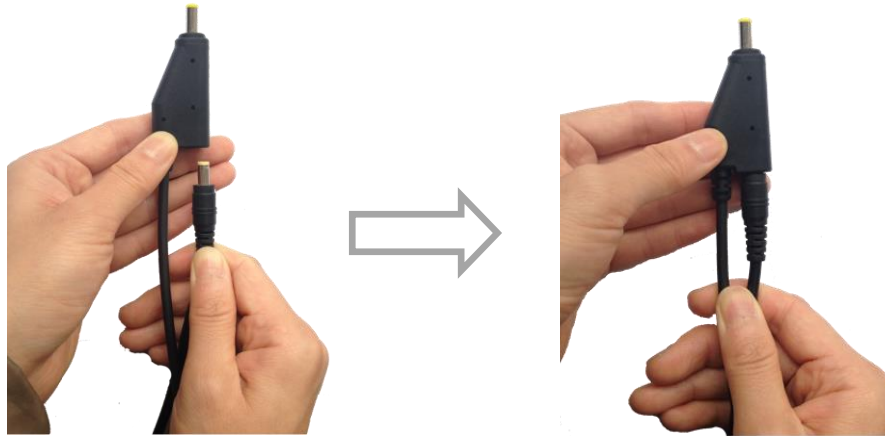
In the field:

The external power cable is connected with a vehicle battery and the output port of the external power cable connects with the Power Port of the GPS to USB PC Data Cable.

WARNING - Use caution when connecting external power cable's clip leads to a vehicle battery. Do not allow any metal object to connect (short) the battery's positive (+) terminal to either the negative (-) terminal or the metal part of the vehicle battery. This could result in high current, arcing, and high temperatures, exposing the user to possible injury.

2.4. INSERTING BATTERY AND SIM CARD

Press in the spring-loaded buttons on the battery cover to open the cover.

Align the connector of the battery with the connections on the receiver and snap the batter in place. Replace the battery cover when finished.

To remove the battery press in the spring-loaded buttons and remove the cover.

**Press Buttons
and lift**

Battery cover

Insert the SIM card with the contacts facing down while the battery is removed, the notched end of the SIM card does NOT go into the slot.

To remove the SIM card, lightly press down on the end not under the holder and slide the card out of the socket.

Tip – The SIM card is provided by your GSM cellular network service provider.

2.5. PRODUCT WITH ACCESSORIES

Item	Picture
Champion PRO GNSS Receiver	

|	
UHF Bar Antenna (450-470 MHz)	
Optional OTG Cable	
USB Cable with power socket	
Optional serial cable with power socket	
Lithium Batteries	
Auxiliary H.I. Tool	
Tribrach adaptor	
Hard Case	

2.6. CONNECTING TO AN OFFICE COMPUTER

The receiver can be connected to an office computer for serial data transfer or settings via a GPS to PC Data Cable. Before you connect to the office computer, ensure that the receiver is powered on by the internal battery or external power.

The following figure shows how to connect to the computer for serial data transfer or settings:

GPS to PC Data Cable
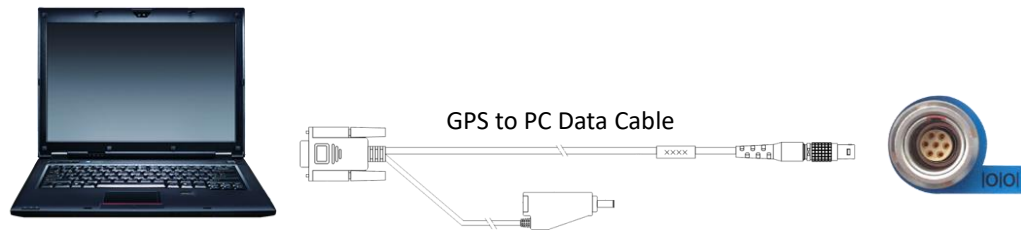
2.7. CONNECTING TO CARLSON SURVCE AS A NETWORK ROVER

1. Turn on the controller → run SurvCE → tap the **Equip** tab in the main menu.
2. In the **Equip** screen, select the **GPS Rover** button. For the *Manufacture* field select **Champion Instruments** and **Pro** for the *Model* field.
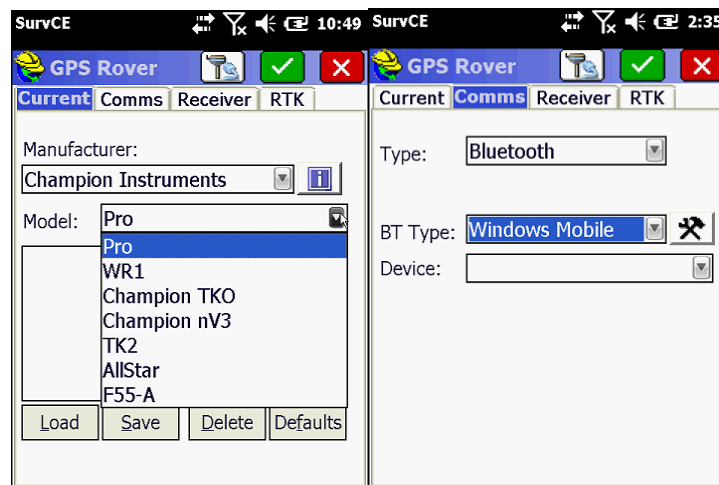
3. Tap the **Comms** Tab next to the **Current** tab then select **Bluetooth** for the communication Type and **Windows Mobile** for the BT Type. Press the hammer and wrench button to search for Bluetooth devices.
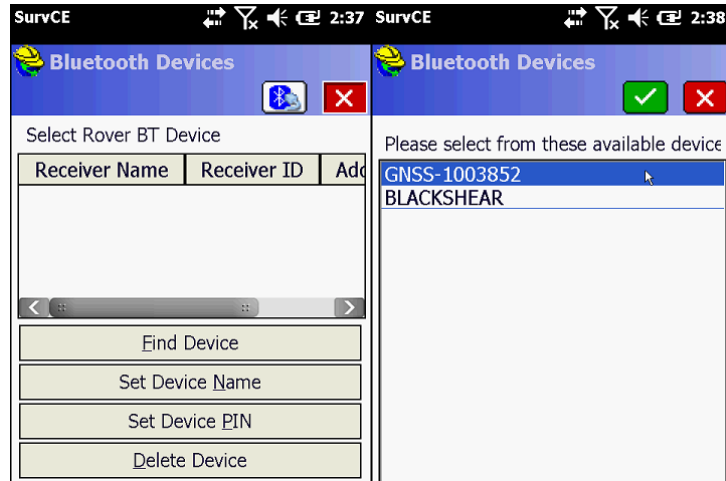
4. Press the **Find Device** button to search for devices. Pick your receiver from the list of devices found, the format is GNSS-???????.

5. After selecting your receiver press the **Set Device PIN** button and enter **1234** for the device pin. Press the green check mark and then the Bluetooth button to the left of the Red X. Before moving to the **Receiver** tab press the ![icon] button to connect to the receiver and wait for a successful connection.
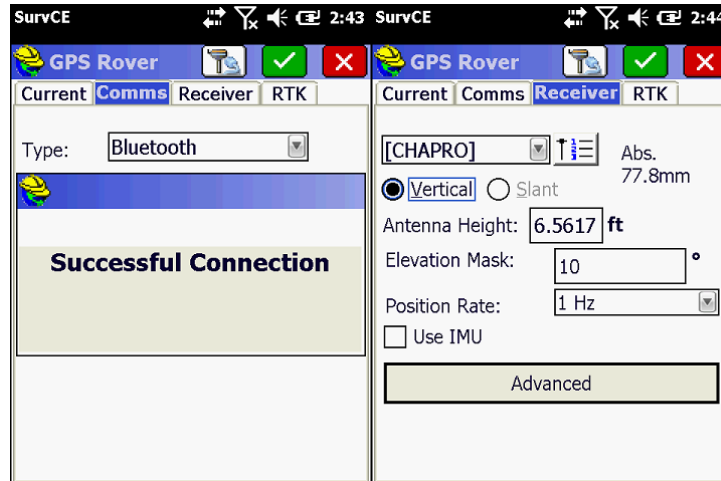
6. The **Receiver** tab should show **CHAPRO** in the antenna selection window, the Abs. value should be 77.8mm and the **Vertical** radio button should be selected. The elevation mask should be at least 10 if not higher depending on site conditions. Check the **IMU** (Inertial Measurement Unit) check box if you intend to use automatic level checking (additional configuration and settings required).
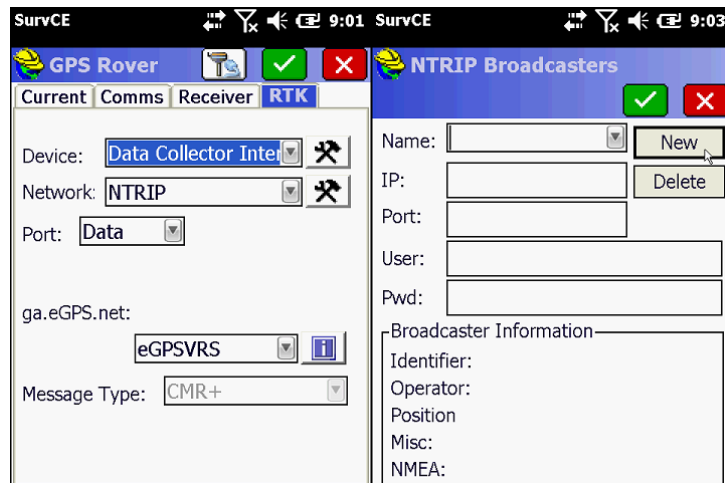
7. To configure the Pro as a network rover select **Data Collector Internet** for the *Device* field and **NTRIP** for the *Network* field. Press the Hammer and wrench icon to add NTRIP broadcasters to the list of selectable broadcasters.

8. On the *NTRIP Broadcasters* screen enter an arbitrary name to identify the broadcaster account in the *Name* field, eGPS Solutions for example. Next enter the IP address for the broadcaster in the *IP* field, for example 107.7.166.152. Next enter the Port number in the *Port* field, for example 8080. Next enter your broadcaster account username and password, you should be connected to the internet <u>BEFORE</u> starting SurvCE so the collector can connect to the broadcaster and download the base station mount points

when you press the green check mark to save the new broadcaster account.

9. After selecting the base or virtual base (eGPSVRS) in this case the information about the base will be filled in and you can press the green check mark to return to the **RTK** tab. Pressing the green check mark from the **RTK** tab will activate the connection and you should be on your way to a FIXED position!

A. COMMUNICATION PORTS DEFINITION
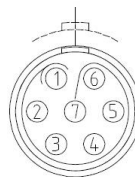
A.I. CHAMPION PRO RECEIVER IO PORT (7-PIN LEMO PORT)

DEFINITION

PIN	FUNCTION
1	Ground (-)
2	Ground (-)
3	RS232-TX (Output)
4	Not Used
5	Not Used
6	VIN
7	RS232-RX (Input)

A.II. CHAMPION PRO RECEIVER USB PORT (7-PIN LEMO PORT)

DEFINITION

PIN	FUNCTION
1	Ground (-)
2	Ground (-)
3	VBUS
4	DM
5	DP
6	VIN
7	ID

Champion Instruments

4317 Park Drive

Norcross, GA 30093