

# USER MANUAL

## TripMaster GFX v2 Pro



Firmware v2.2

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## Introduction

Welcome to the newest generation of navigation instruments by RNS electronics: the **TripMaster GFX v2 Pro**.

Developed by rally pilots for rally pilots, the TripMaster GFX v2 Pro offers many fresh and innovative features. Special attention was paid to ensure the best possible readability and ease-of-use for the user whilst offering as many functions as possible.

The new TripMaster GFX v2 Pro was designed implementing the feedback from many riders, both professional and amateur, and manufactured using materials and components of the highest qualities.

We hope you enjoy many kilometres of pleasurable rally racing with your new TripMaster GFX v2 Pro guiding you into the right direction.

## Cable Connections

The TripMaster GFX v2 Pro has 4 cables exiting from the rear to allow for the connection of power and accessories including:

- **Red** female 3-pin connector: 12V power supply
- **Grey** male 3-pin connector: MultiSwitch remote
- **Black** male 3-pin connector: wheel sensor
- **Black** female 4-pin connector: external Garmin GPS



**NOTE:** All 4 cables should be connected to their designated peripherals to allow for all the features of the instrument to be used.

**NOTE:** For further information on connecting a Garmin device, please refer to page 18.

## Power Supply

In order to correctly use the instrument, it must be connected to a stable **12V DC** supply on your vehicle. Ideally, the supply should be automatically switched by the vehicle, e.g. through the lighting system when the engine is started.

An inline fuse of no more than **1A** is recommended.

Connect the **BROWN** wire of the included power lead to the positive pole and the **BLACK** wire to the negative pole of your supply.

**NOTE:** Incorrect polarity will not damage the instrument, but it will not function correctly.

## Backup Battery

The instrument is equipped with an internal 320mAh capacity Lithium-Polymer battery as a backup power source for when the 12V supply is disconnected which is able to power the basic functions of the device for many weeks.

Upon correct installation of the power supply, the battery will be monitored and charged.

Neither the LED backlight nor the internal GPS receiver will run from the internal battery. These features will always require the external power supply to be connected!

**NOTE:** The internal Li-Po battery is **NOT** removable or replaceable.

## Current Consumption

The external 12V supply will be used as the main source of power when connected. After 10 minutes of inactivity or movement the device will turn off automatically. Both the LED backlight and internal GPS receiver will also turn off.

It is recommended to connect the instrument to a switched power supply, however it may also be connected to a permanent supply (not recommended).

To awaken the instrument, press any button on the device or the connected MultiSwitch or turn the front wheel to trigger the wheel sensor. The GFX v2 Pro will not wake up from GPS movement since the GPS module is off when sleeping.

The current draw in the different states is as follows:

- 1) LCD On
  - + *GPS reception (cold start)*
  - + *LED backlight on*
  - + *empty backup battery*
  - = ***~100mA MAX***
  
- 2) LCD Off
  - + *empty backup battery*
  - = ***~30mA***
  
- 3) LCD off
  - + *fully charged backup battery*
  - = ***<5mA***

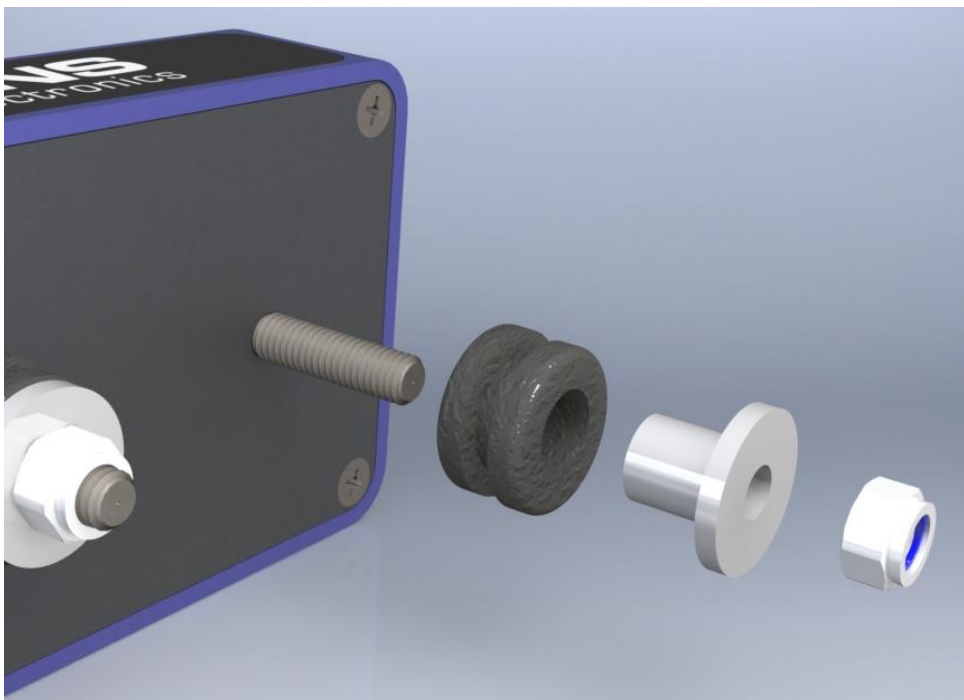
## Mounting Position

Correct mounting of the instrument is crucial to ensure a long lifetime and reliable GPS reception.

A recommended mounting location of the device is on the top of a navigation tower. Ideally, the top black face of the GFX v2 Pro should not be covered by any materials, including metals, plastics and carbon-fibre, ensuring an unobstructed clear view to the sky:



Make sure to install the instrument to the mounting plate with the included rubber grommets, spacers and nuts in the correct order:



## GPS Antenna Reception

After external power has been connected to the GFX v2 Pro, it will start to acquire its signal from satellites orbiting the earth. The GPS icon on the LCD of the instrument will flash in any of the GPS dependent modes:



Please allow for some time during the first use of the device in a new location (up to 10 minutes). Once the antenna starts to acquire a stable signal the icon will no longer flash and become static.

Should at any time the signal become too weak the icon will begin to flash again.

It is also possible to monitor the status of the GPS signal. Please refer to page 13 "GPS Information".

If the external power supply is disconnected the following icon will appear instead:





## Software Functions

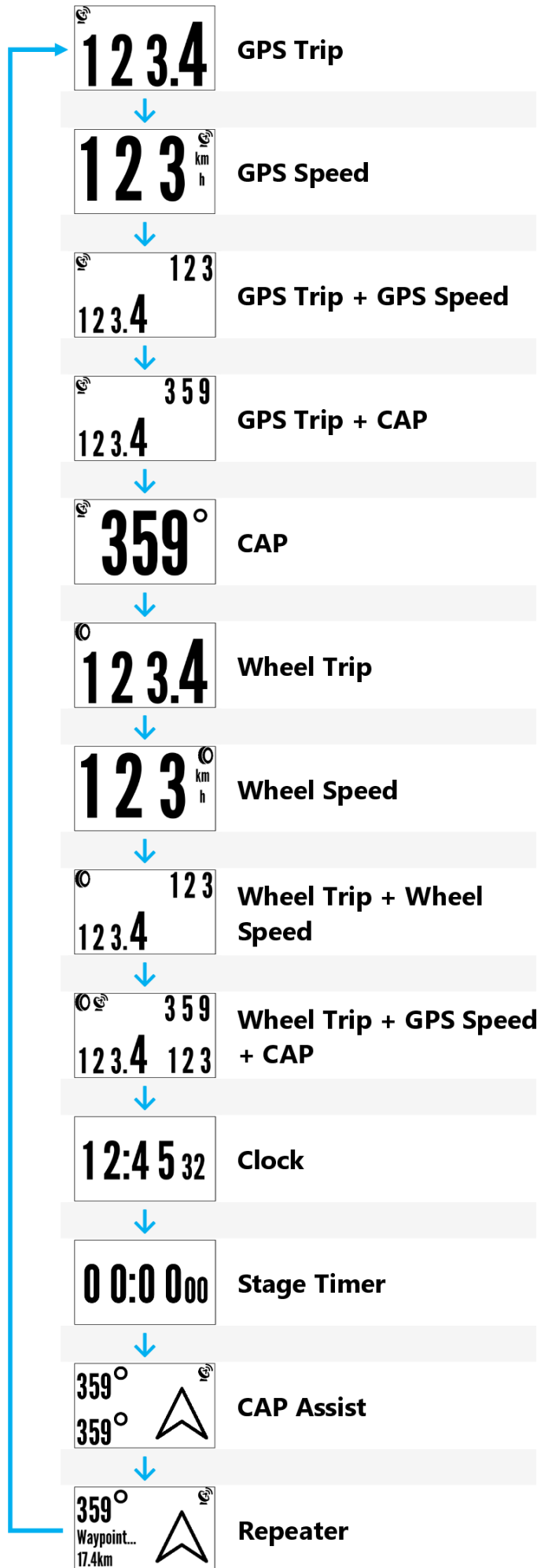
Given the availability of both a wheel sensor and GPS, the GFX v2 Pro is able to offer the rider lots of useful information. For example, it is possible to show the trip distance recorded from the rotation of the wheel or from the movement over ground via GPS. Compass heading (CAP) and speed data from GPS are also available as is an accurate atomic clock signal for the time.

In total, 13 modes are available that can be individually enabled or disabled to suit the rider's preferences:

1. GPS Trip
2. GPS Speed
3. GPS Trip + GPS Speed
  - a. Statistics for top and average speed
4. GPS Trip + CAP
5. CAP
6. Wheel Trip
7. Wheel Speed
  - a. Statistics for top and average speed
8. Wheel Trip + Wheel Speed
9. Wheel Trip + GPS Speed + CAP
10. Clock (24h)
11. Stage Timer (moving time)
12. CAP Assist
13. Repeater

**NOTE:** To make use of mode 13 (Repeater), a Garmin Device must be connected externally! Please refer to page 18 for detailed information

# Modes



## Button Control Legend

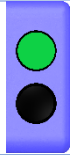
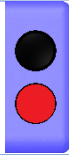
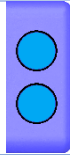
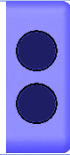
There are two ways to take full control of the instrument:

- 1) Two rubber buttons found on the left side of the unit
- 2) Externally connected RNS MultiSwitch or compatible remote



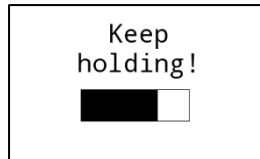
## Mode Controls

The majority of the modes function in a similar way and therefore have similar controls:

Modes				
	<i>Click Up</i>	<i>Click Down</i>	<i>Click Both</i>	<i>Long Hold Both</i>
Stage Timer	Toggle wheel/GPS trip timer (hold button!)	-	Switch to next mode	Enter settings
CAP Assist	Set CAP heading as target (hold button!)	-	Switch to next mode	Enter settings
GPS Speed Wheel Speed	Show statistics (hold button!)	-	Switch to next mode	Enter settings
CAP Clock Repeater	-	-	Switch to next mode	Enter settings
Rest of modes	Increment trip	Decrement trip	Switch to next mode	Reset trip / Enter settings

## Settings

The settings menu can be entered from any mode by pressing and holding both buttons on the instrument or holding the mode button on the MultiSwitch. The LCD will show "Keep holding!" with a loading bar:

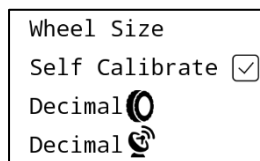


If the settings are being entered from a mode that also shows a trip, the LCD will present the option to reset the trip or enter the settings:



Use the up and down buttons of the GFX or MultiSwitch to move the cursor up and down. Press the two buttons together, or press the mode button on the MultiSwitch, to make your selection.

Once inside the menu, you will be presented various settings that can be modified:



Use the up and down buttons to move the cursor and press both together to make your selection.

To leave the settings menu and to return to the previous active mode, move the cursor to "EXIT" and select it.

**NOTE:** The settings will be automatically exited after 30s of inactivity

## Setting Options

Setting	Description	Options
GPS Decimal	Set trip resolution of GPS trip	100m / 10m
GPS Calibrate	Manually set GPS calibration value	-10% - 10%
GPS Information	Show current reception data	
Wheel Decimal	Set trip resolution of wheel trip	100m / 10m
Wheel Size	Set wheel circumference in millimetres	1000mm - 2999mm
Wheel Calibrate	Self-calibration of wheel trip	On / Off
Units	Set units of measurement	KM / Miles
CAP Flash	CAP will flash when stationary	On / Off
Arrow	Choose radius for the arrow to appear in Repeater Mode	Yes / 500m / 1000m
Set Clock	Manually adjust time (GPS is off)	
Set Time Zone	Adjust time-zone (GPS is on)	UTC Offset
Theme	Day time LCD / Inverted LCD	Day / Night
Transitions	Transitions when switching modes	On / Off
Flip Remote	For remotes mounted upside-down	On / Off
Edit Modes	Enable / disable modes	
User Manual	QR code to the online user manual	
Update SW	Software update through USB cable	Factory Reset!
About GFX	Lifetime Odo, Oil Odo, Serial Number	Reset Oil Odo
Turn Off	Turn off device	
Exit	Exit settings menu	

## Setting Descriptions

### **GPS Calibrate:**

Given that the distance calculated by GPS is dependent on the terrain, i.e. the distance calculated over mountainous terrain is different to that on flat terrain, the user may manually set a compensation factor between -10% and +10% if desired.

### **GPS Information:**

This option shows the status of the GPS reception including the device's coordinates, UTC time, signal quality [Bad/Good/Perfect] and the amount of satellites in lock (currently / maximum since power up).

### **Wheel Size:**

Entering this option will open a new page allowing for the adjustment of all 4 digits of the wheel circumference.

The cursor position can be moved with the down button.

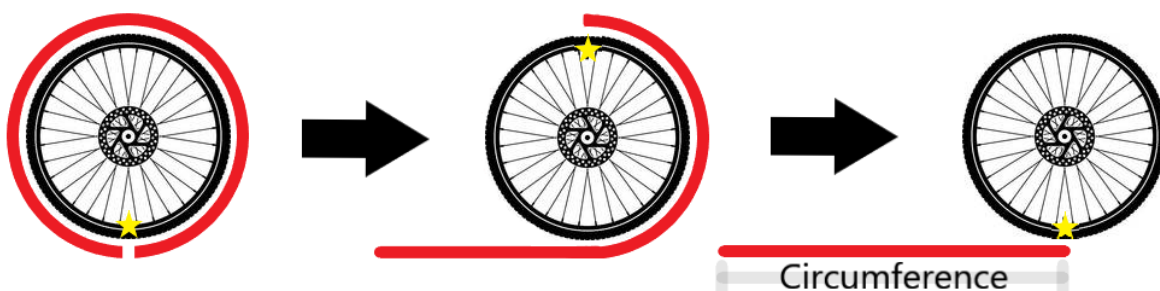
The up button is used to increment the selected position.

Pressing both buttons together or pressing the mode button on the MultiSwitch on "SAVE" will save the new value and return to the setting's main menu.

To ensure accurate readings of all the wheel-dependant functions, it is crucial that the correct wheel circumference is set.

To correctly measure the wheel circumference:

1. Find a flat surface to freely move your vehicle
2. Place a mark on the ground and on the side of the tire which is touching the ground (e.g. with chalk)
3. Move your vehicle in a straight line until one entire revolution of the wheel is complete, i.e. the mark on the tire is touching the ground again
4. Place another mark on the ground
5. Measure the distance between the two markings on the ground with a tape-measure
6. Record the measurement in millimetres
7. Follow the instructions shown later in this manual to enter the recorded wheel size



**NOTE:** Only certain modes will take advantage of the wheel's rotation. These modes are indicated with a wheel icon:





### **Wheel Calibrate:**

With this option enabled the GFX will analyse adjustments made to the wheel trip and accordingly adjust the wheel circumference.

For example, adjusting the trip up means the circumference is too small and it will be increased in steps of 1mm.

The special software algorithm prevents undesirable circumference adjustments when large changes to the trip are made, e.g. readjusting the trip after being lost.

### **Set Clock:**

When the instrument is disconnected from its external 12V supply, i.e. no time is acquired from GPS, the user may set the clock here manually.

### **Set Time Zone:**

When the instrument is connected to its external 12V supply and the GPS reception is stable, the user may set the clock by adjusting the time-zone offset in full hours and 15 minute blocks.

## Update:

Should a software update become available, the user has the opportunity to contact his dealer or RNS electronics directly for assistance in upgrading the firmware.

**CAUTION!:** Pressing the up button on the GFX unit, as advised on the LCD, will trigger a factory reset of the instrument restoring all settings to their default values!  
**To leave the page, press the down button on the GFX.**

If a factory reset was triggered and the LCD screen is blank, press and hold the down button on the GFX to restart the instrument.

## About:

This page shows the serial number, the lifetime odometer of the instrument as well as a resettable oil-change odometer.

This oil-change odometer can be reset by holding both buttons on the instrument or the mode button on the MultiSwitch.

To leave the page, press the down button.

## CAP Assist Function

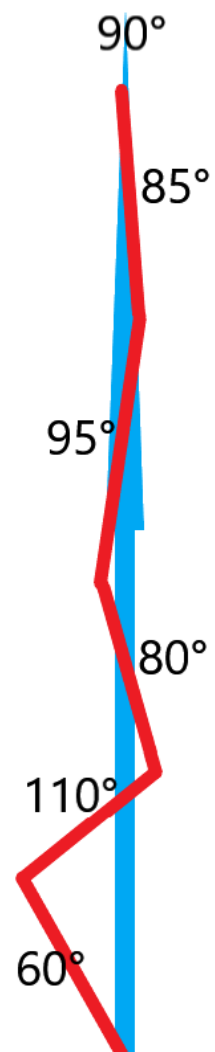
The mode "CAP Assist" is a helpful tool when riding through off-piste sections where the rider must follow a single CAP heading for a longer distance.

To make use of the function, make sure you have proper GPS reception. Then start riding towards the desired CAP as shown in the top left hand corner of the LCD. Once you are heading in the desired direction, press and hold the upper button of the GFX or the connected remote to set the currently shown CAP value as the target CAP which is then saved and shown in the bottom left hand corner. This projects an endless virtual line to the horizon to which the arrow of the GFX will now point to.

### Example scenario:

- 1) Desired CAP heading set to 90°
- 2) Rider steers away (left) from the blue virtual line in direction 60°
- 3) Rider steers back right towards the blue virtual line at 110°
- 4) The rider continues to follow the arrow on the GFX that continues to point to the blue virtual line

**NOTE:** Do not deviate too far away from the virtual line. Even a small deviation of 100m from the virtual line can cause inaccuracies in guiding the rider to the desired target!





## Garmin Repeater Function

The mode "Repeater" is a helpful tool for navigation training. In connection with an external Garmin, the GFX is able to show waypoint information including the name, the distance and the arrow direction of the next waypoint.

The waypoints on the Garmin device may be from a route (multiple waypoints) or a single waypoint (e.g. POI).

To make use of this function, your Garmin device must be connected with an appropriate cable available from Garmin:

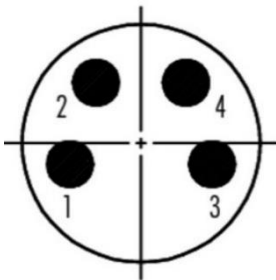
Garmin Model	Connection	Part Number
Montana 600, 610, 650(t), 680(t)  GPSMAP 276CX	 A black plastic Garmin Repeater Module with a USB connector at the bottom and a multi-pin connector at the top.	010-11654-01
Montana 600, 610, 650(t), 680(t)  Oregon 450(t), 550(t)  GPSMAP 64(S,ST,SX,X), 65(S), 78(S), 276CX	 A black cable with a USB connector on one end and a multi-pin connector on the other, with several colored wires (red, green, blue, yellow) exposed at the end.	010-11131-00

The wires of the each cable are to be connected to an additionally required M8 4-pin male connector as follows:

010-11654-01 (CRADLE)		
M8 Male Pin	Wire Colour	Function
1	Red	+12V
3	Blue	Signal
4	Black	GND

010-11131-00 (MINI-USB CABLE)		
M8 Male Pin	Wire Colour	Function
1	Red	+12V
3	Yellow	Signal
4	Black	GND

*Male insert M8*



**NOTE:** These cables/cradles are also available for purchase as a finished set. Please contact us or your reseller for more details!

After completing the physical connection, it's also important to enable the correct data output type by setting the "INTERFACE" option on your Garmin to "NMEA IN/OUT". Depending on your device, the baud-rate should also be set to "9600".

## [FAQs](#)

### **How do I reset the trip?**

Press and hold both buttons or the mode button of the MultiSwitch in any mode that shows a trip (wheel or GPS based) until the question whether you would like to reset the trip is presented to you.

### **How do I start the stage timer?**

The stage timer is automatically started once you start moving after having reset the trip.

### **How do I reset the recorded max and average speed?**

These values are reset once the trip is reset. The stage timer will also be reset.

### **Is the GPS trip as accurate as the wheel trip?**

There are many external factors involved concerning the accuracy of the GPS signal acquired by the antenna. An obstructed view to the sky, like from trees in a forest or even clouds, can severely weaken the GPS signal and interfere with the accuracy of the calculated trip.

The topography of the ridden terrain can also have an impact where riding on hilly and mountainous terrain can give a different reading than when riding on flat terrain.

It is therefore recommended to give priority to the wheel sensor-based trip.

When using the GPS trip, it can be helpful to manually adjust the "GPS factor" in the settings to compensate for errors depending on where you are riding.

## Software Revisions

Version	Released	Details
v2.1	August, 2020	Initial Release
v2.2	February, 2021	Bug fix: serial number display Add Mode "GPS Trip + CAP"

## Technical Dimensions

