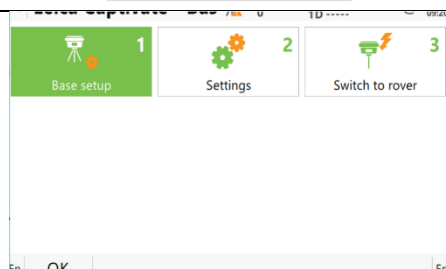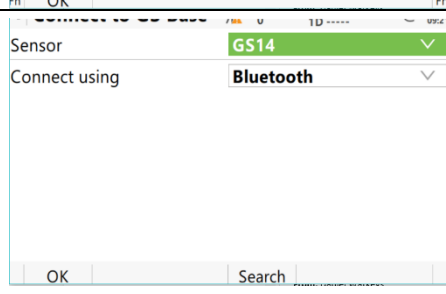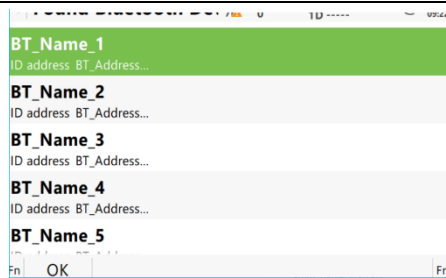# Leica GS16 Base and Rover setup
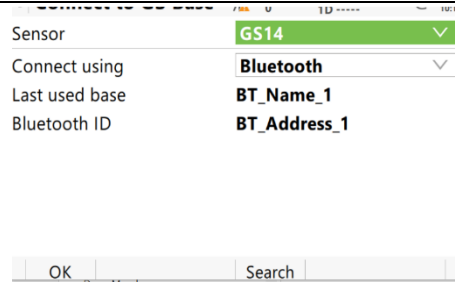
This is the procedure for setting up a base and rover. It assumes that everything has been formatted so may go through some unnecessary stages.

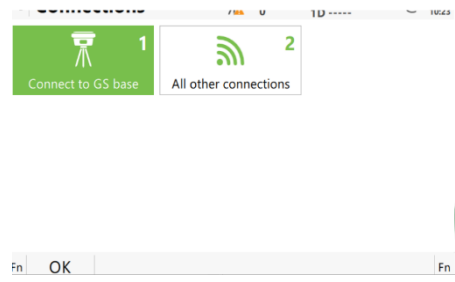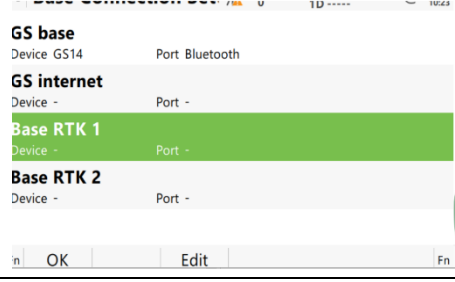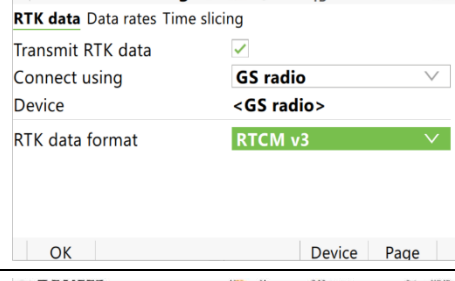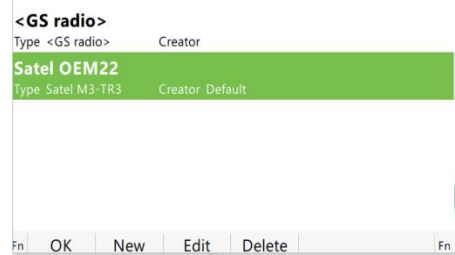| Step	Action	Screen Display
1	Select which dish you want to be your base and which your rover. Take note of the **serial number** and set your "base" on a tripod and power it on.	
2	Power on the controller. When you reach the home screen hit the **Switch to base** menu panel.	Switch to base
3	The first thing to do is to connect to the "base" sensor. Head into **Settings\Connections\Connect to GS Base**	Base setup 1 / Settings 2 / Switch to rover 3 / Fn OK Fn
4	Select the model of sensor you wish to connect to and select **Bluetooth** as the method. Hit **Search** at the bottom of the screen.	Sensor GS14 / Connect using Bluetooth / OK Search
5	A list of all the Bluetooth devices in the vicinity will appear. The GS will appear as GS16_followed by its serial number. Highlight the correct device then hit **OK**.	BT_Name_1 ID address BT_Address... / BT_Name_2 ID address BT_Address... / BT_Name_3 ID address BT_Address... / BT_Name_4 ID address BT_Address... / BT_Name_5 / Fn OK Fn
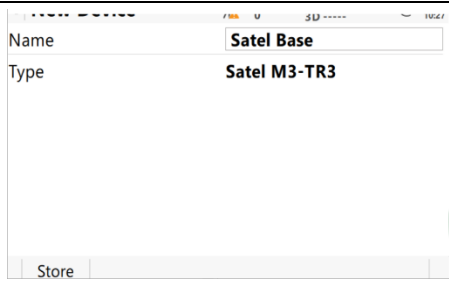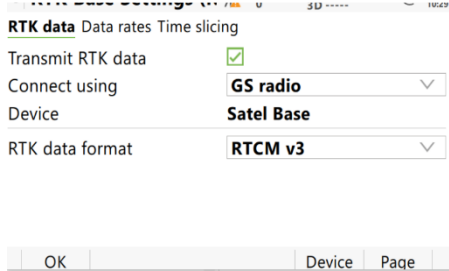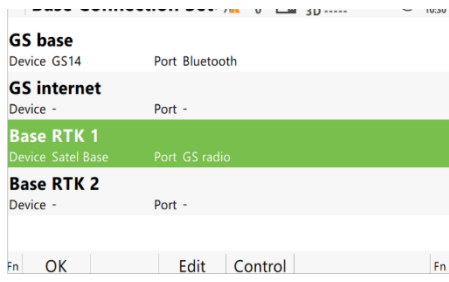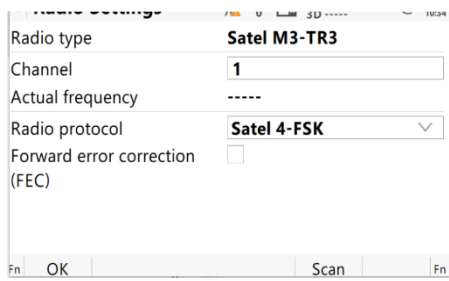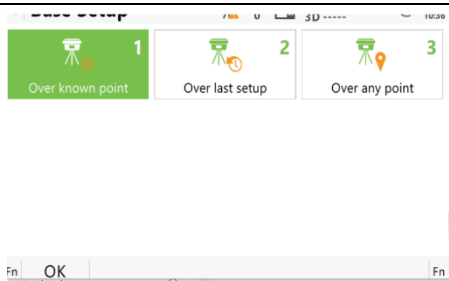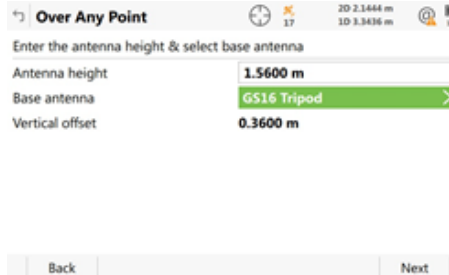
6	The instrument will appear along with its Bluetooth ID. Hit **OK** again.	
7	A message will appear stating that the "GS sensor is not suitable etc. etc." This is to advise you that the unit is changing the default antenna to the GS16. **OK** the message	
8	Now we must set up the outgoing RTK stream. Head back into **Settings\Connections\All other connections**	
9	Highlight the Base RTK1 line and hit **Edit**	
10	Tick the box to **Transmit RTK data** and select **GS Radio** from the drop down beneath it. Hit **Device** at the bottom of the screen.	
11	Select the **Satel TR4(GS16)** and Tap **New**	
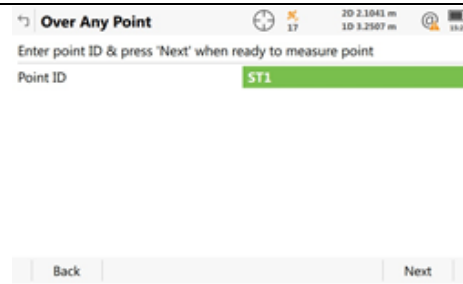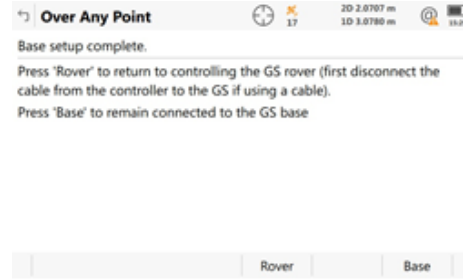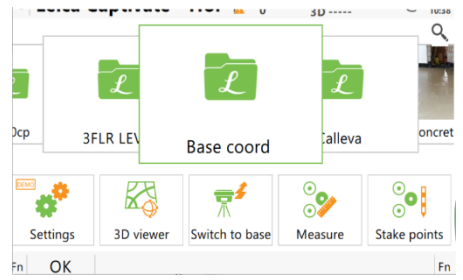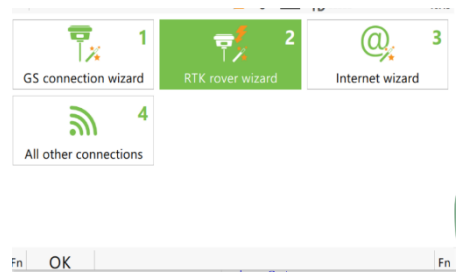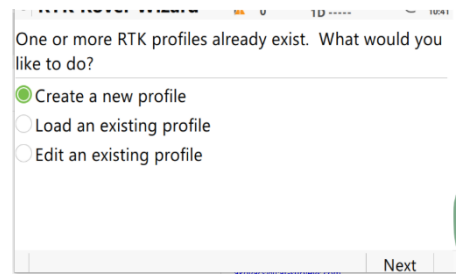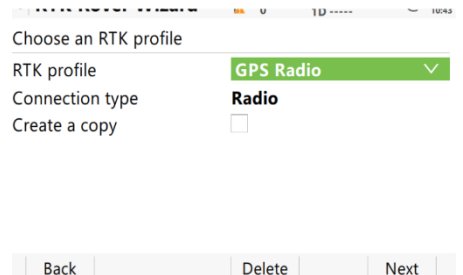
12	Change the name of the device and hit **store**. Then **OK** that selection in the next screen. (because of a quirk of the programming – you cannot use the same device twice, once for the base and again for the rover. This is the way around it)	Name **Satel Base** Type **Satel M3-TR3** Store
13	Select the RTK data format you want to use. RCTMv3_MSM is fine then hit **OK**. (there are several different formats here and they all have slightly different properties. RTCMv3_MSM and Leica4G will let you take advantage of all the current satellite constellations).	**RTK data** Data rates Time slicing Transmit RTK data ☑ Connect using **GS radio** ⌄ Device **Satel Base** RTK data format **RTCM v3** ⌄ OK Device Page
14	The Base RTK line should be highlighted. Tap **Control** on the bottom of the screen.	**GS base** Device GS14 Port Bluetooth **GS internet** Device - Port - **Base RTK 1** Device Satel Base Port GS radio **Base RTK 2** Device - Port - Fn OK Edit Control Fn
15	You should see the radio channel the radio is set to, the actual frequency and the protocol. **Take a note of these** and hit **OK**. Then hit **OK** again to get back to the base menu. (If it's the first time a radio has been used you may have to pick a frequency – any from the list is fine but the base and rover settings need to match).	Radio type **Satel M3-TR3** Channel **1** Actual frequency ----- Radio protocol **Satel 4-FSK** ⌄ Forward error correction (FEC) ☐ Fn OK Scan Fn
16	Now we can go into the Base setup. Pick the option you require. Over any point will accept the uncorrected base coordinates it generates, over a known point allows you to enter an accurate coordinate.	🔭 1 Over known point 🔭 2 Over last setup 🔭 3 Over any point Fn OK Fn
17	Enter an antenna height (it can be 0.00, it doesn't matter for our purposes), and select the base antenna as GS16 Tripod. This will automatically include a vertical offset of 360mm as it will assume you are using a height hook.	**Over Any Point** Enter the antenna height & select base antenna Antenna height **1.5600 m** Base antenna **GS16 Tripod** ❯ Vertical offset **0.3600 m** Back Next
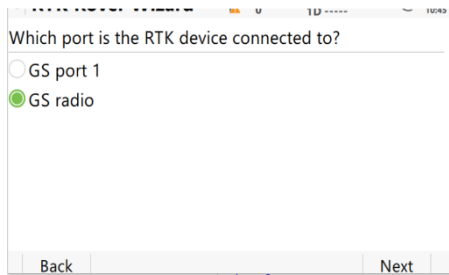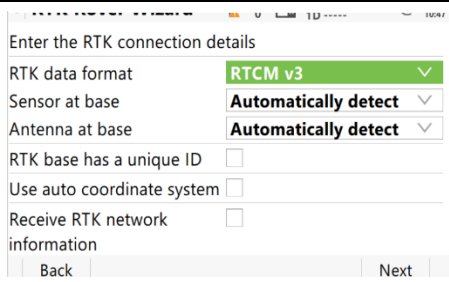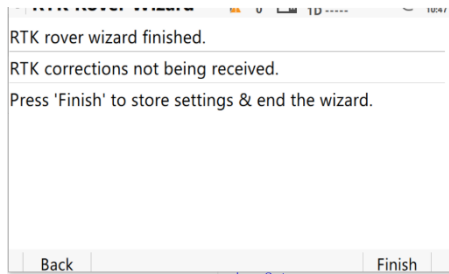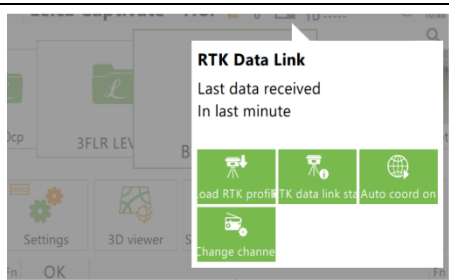
18	Assign a point ID to your base position (this can be anything), then hit **Next**.	
19	The base setup is finished, and you're asked whether you want to go to the Rover menu. Select **Rover**.	
20	And we should jump back to the Rover menu. Turn on the rover dish.	
21	There should already be a Radio profile stored in the controller. To access it go to **Settings\Connections\RTK rover wizard**	
22	Select **edit an existing profile** and hit **Next** (if there is no profile create a new radio connection)	
23	Select the GPS radio profile and hit **Next**	
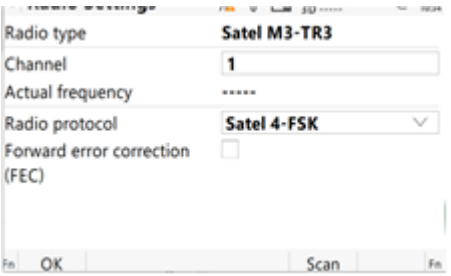
24	Skip the next screen by hitting **Next**	Enter a name for the new RTK profile Name **GPS Radio** Description ----- Back Next
25	GS radio should be selected – hit **Next**	Which port is the RTK device connected to? ○ GS port 1 ◉ GS radio Back Next
26	The name of device should be filled in already – hit **Next**	Which RTK device is being used? Name of device **Satel TR4(GS16)** ∨ Back Next
27	Match the RTK data format to that selected on the Base then hit **Next**	Enter the RTK connection details RTK data format **RTCM v3** ∨ Sensor at base **Automatically detect** ∨ Antenna at base **Automatically detect** ∨ RTK base has a unique ID ☐ Use auto coordinate system ☐ Receive RTK network information ☐ Back Next
28	Likely as not you will see this screen. Finish the wizard.	RTK rover wizard finished. RTK corrections not being received. Press 'Finish' to store settings & end the wizard. Back Finish
29	Back on the home screen. Tap on the radio symbol on the top of the controller and you'll get a drop down. Hit **Change Channel** from the options.	RTK Data Link Last data received In last minute oad RTK profil / TK data link sta / Auto coord on Change channe

30	And match the channel and radio protocol set on the base. Hit **OK**	Radio type **Satel M3-TR3** Channel **1** Actual frequency ------ Radio protocol **Satel 4-FSK** Forward error correction (FEC) OK Scan
31	You should now be receiving corrections from the base.	