Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius
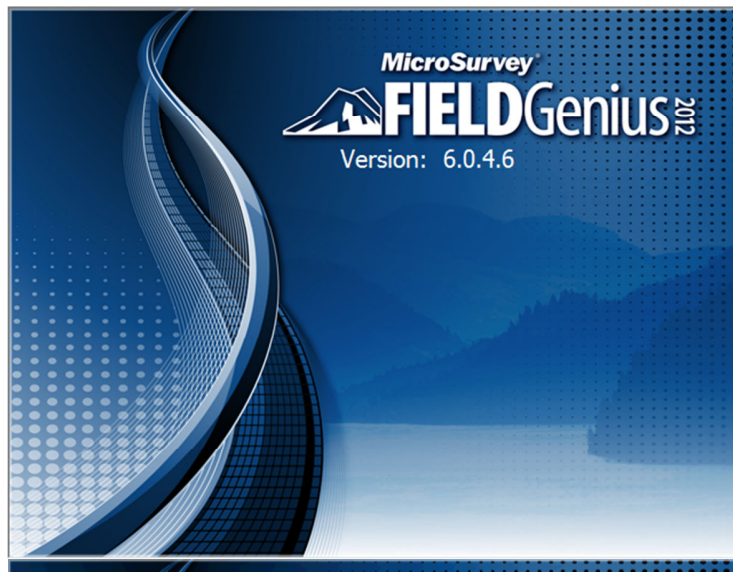
Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius

Introduction

This guide describes how to configure your Leica TS15 to accept a radio connection from a CS15 with MicroSurvey FieldGenius running on it. This guide was written for the RH15 radio handle, but comments have been added to support the CTR16 Bluetooth radio handle.

You will then learn how to create a Leica TS15 robotic total station profile in FieldGenius, and then connect the two devices via their internal radios.

From there you will learn how to connect your CS15 to your TS15 using a cable and then using Bluetooth.

Important Note: You only need to create a particular profile once. After that FieldGenius will preserve and use this already-created profile.

Current Version

This guide was written using FieldGenius Version 6.0.4.2 installed on a Leica CS15 with SmartWorx 4.03 installed. If you are using a different version, your screens may look differently than what is displayed in this guide.

Before you begin

Have your Leica TS15 robotic total station and Leica CS15 data collector with FieldGenius installed on it close by. You will need them to complete this guide.
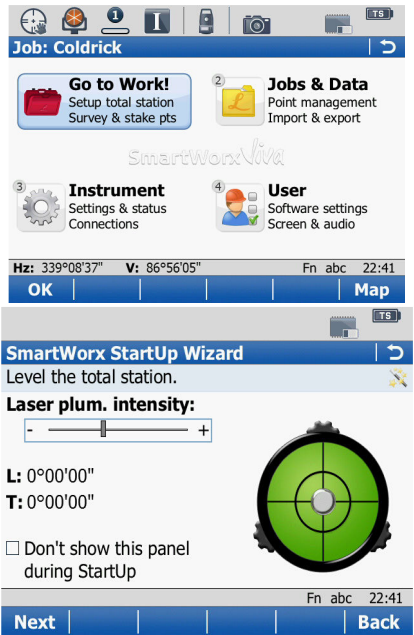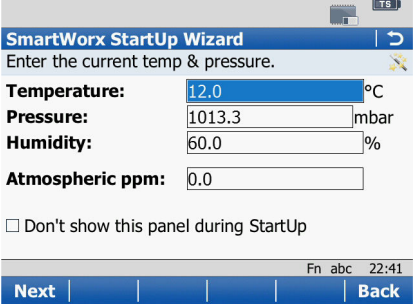
This guide assumes you have already installed FieldGenius onto your CS15.

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*
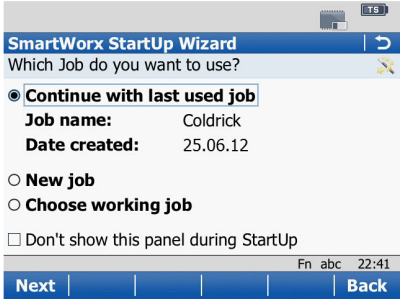
TS15 Onboard Settings	Before we can connect the CS15 to the Leica TS15, we must first configure the TS15 to be able to accept a radio connection from the CS15.

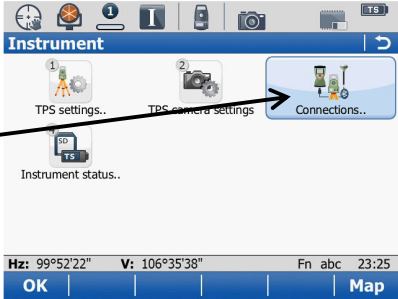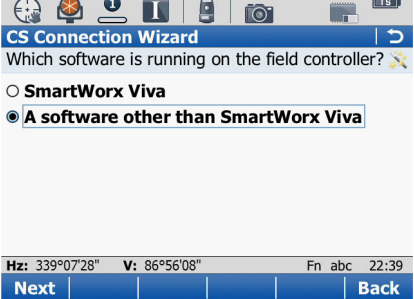| Step	Action	Display
1	• Turn on your **Leica TS15**. This starts up the Windows CE 6.0 operating system, and then starts SmartWorx Viva followed by the SmartWorx Setup Wizard. In the first screen of the SmartWorx Setup Wizard: • Level your instrument and then tap on the **Next** button. This takes us to the Current Temperature and Pressure screen.	
2	In the Current Temperature and Pressure screen: • Make adjustment appropriate to your environment, and then tap on the **Next** button. In this example I will accept the default settings. This takes us to the Job selection screen.	

Step	Action	Display
3	In the Job selection screen: Here you have an opportunity to select a job to use. But we will be storing our data on the CS15 therefore we will not be using a job. In this example I selected the existing job. You can either do the same or create a new job. Either way we will not be using it. • Select **Continue with last used job** (if one exists). • Press the **Next** button. This returns us to the SmartWorx main menu screen.	**SmartWorx StartUp Wizard** Which Job do you want to use? ◉ **Continue with last used job** 　Job name:　　Coldrick 　Date created:　25.06.12 ○ **New job** ○ **Choose working job** ☐ Don't show this panel during StartUp Fn abc 22:41 **Next**　　　　　　　**Back**
4	In the SmartWorx main menu screen: Remember: We still haven't made any communication settings yet. • Tap on the **Instrument** button. This takes us to the Instrument screen.	**Job: Coldrick** ① **Go to Work!** Setup total station Survey & stake pts　② **Jobs & Data** Point management Import & export SmartWorx *viva* **Instrument** Settings & status Connections　④ **User** Software settings Screen & audio **Hz:** 99°52'11"　**V:** 106°35'40"　Fn abc 23:25 **OK**　　　　　　　**Map**
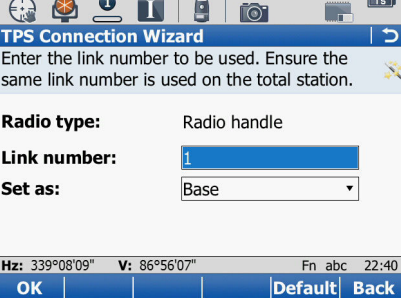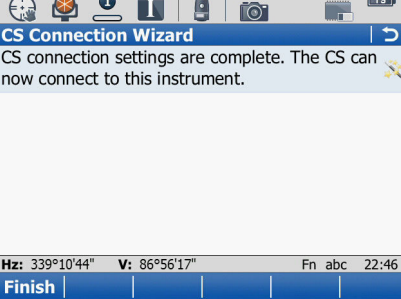
Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

Step	Action	Display
5	In the Instrument screen: • Tap on the **Connections** button. This takes us to the Connections dialog.	
6	In the Connections dialog: • Tap on the **CS connection wizard** button. This takes us to the CS Connection Wizard screen.	
7	In the CS Connection Wizard screen: • Tap on the **A software other than SmartWorx Viva** radio button. This takes us to the next step in the CS Connection Wizard.	

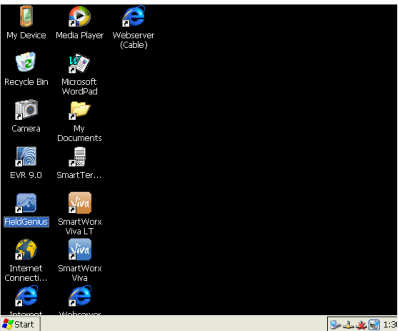| Step	Action	Display
8	In the CS Connection Wizard: • Ensure that the **Connect using** field has **Radio handle** selected. • Tap on the **Next** button. This takes us to the Next page of the CS Connection Wizard. *If you have a CTR16 Radio handle, you will see step 10 next.*	CS Connection Wizard How do you want to connect to the field controller? Connect using: Radio handle RH15 attached Hz: 339°07'19" V: 86°56'06" Fn abc 22:39 Next ... Back
9	In the Link Number page of the CS Connection Wizard: • Set the **Link Number** field to **1**. • Select **Base** in the **Set as** field. • Tap on the **OK** button. This takes us to the Final screen of the CS Connection Wizard screen.	TPS Connection Wizard Enter the link number to be used. Ensure the same link number is used on the total station. Radio type: Radio handle Link number: 1 Set as: Base Hz: 339°08'09" V: 86°56'07" Fn abc 22:40 OK ... Default Back
10	In the Final screen of the CS Connection Wizard screen: We are alerted that the connection settings are completed. • Tap on the **Finish** button. This closes the CS Connection Wizard and returns us to the Main menu.	CS Connection Wizard CS connection settings are complete. The CS can now connect to this instrument. Hz: 339°10'44" V: 86°56'17" Fn abc 22:46 Finish ...

Step	Action	Display
11	In the Main menu: We are now ready to configure FieldGenius on the CS15, so leave the TS15 powered on as we will be attempting to connect to it soon.	

CS15   Congratulations! You have successfully configured the TS15 to accept a radio link. We can now go to the CS15 and start FieldGenius.

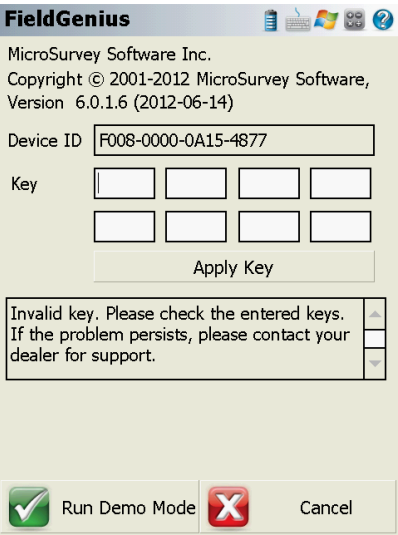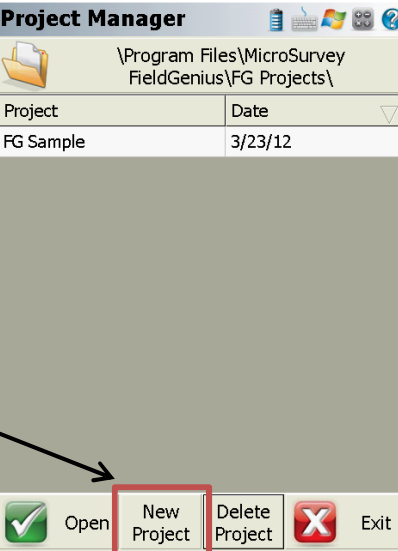## Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

Connecting via a radio	The first section of this guide explains how to configure the TS15 to accept a radio communication from a CS15 controller.
	We will now go to the controller and configure FieldGenius to connect to a TS15 via a radio.

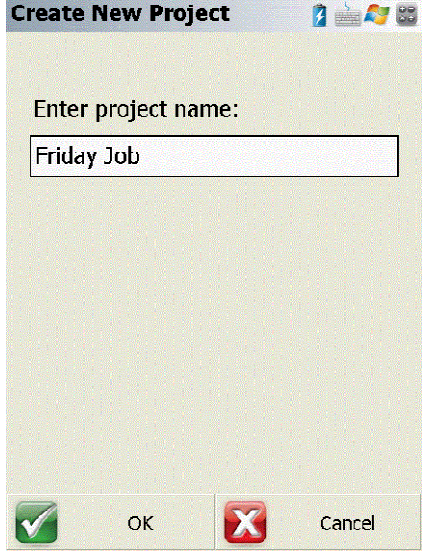| Step	Action	Display
1	• Turn on your **Leica CS15**. This starts up the Windows CE6.0 Operating system. **Note**: Don't be alarmed if your display is slightly different from the image on the right. We may have configured our display differently to yours. • Tap on the ![FieldGenius] icon. This takes us to the Device ID screen.	

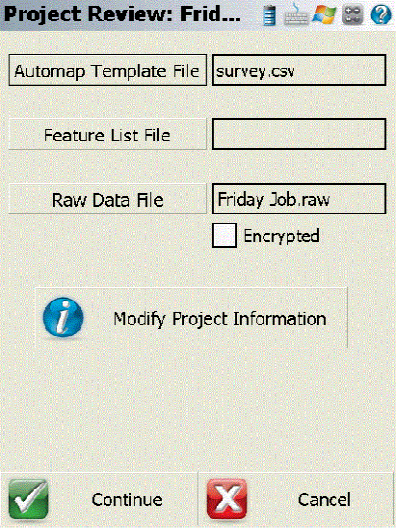| Step	Action	Display
2	In the Device ID screen: • Enter your license key in the **Key** field. • Press the **Apply Key** button when finished. **Important Note**: FieldGenius will remember your key; therefore, you will only have to enter your key once. Once a correct key is entered, you will not see this screen again. This takes us to the Project Manager screen after we accept the tip of the day.	**FieldGenius** MicroSurvey Software Inc. Copyright © 2001-2012 MicroSurvey Software, Version 6.0.1.6 (2012-06-14) Device ID F008-0000-0A15-4877 Key [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Apply Key Invalid key. Please check the entered keys. If the problem persists, please contact your dealer for support. ✔ Run Demo Mode ✖ Cancel *License Keys are provided by our internet registration portal or your dealer.* *Please contact your dealer for information on License Keys and how to register your new software.*
3	In the Project Manager screen: Since this is a new installation, we only see the sample project that comes included with FieldGenius. We will create a new project. • Tap on the **New Project** button. This takes us to the Create New Project screen.	**Project Manager** \Program Files\MicroSurvey FieldGenius\FG Projects\ Project	Date FG Sample	3/23/12 ✔ Open New Project Delete Project ✖ Exit

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

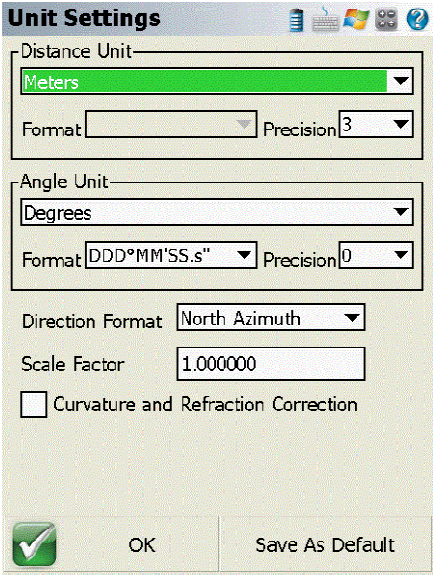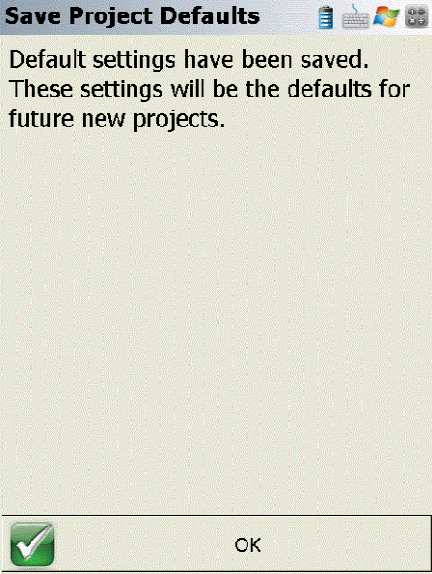| Step	Action	Display
4	In the Create New Project screen: • Enter a name for your new project. In this example, we are calling the project "*Friday Job*". You should enter a more appropriate name. • Press the **OK** button when finished. This opens the Project Review screen.	

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

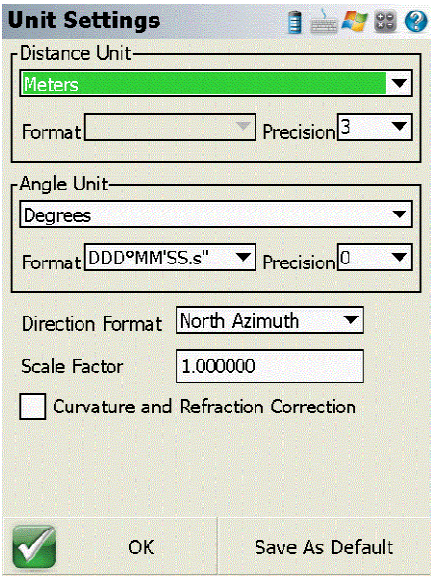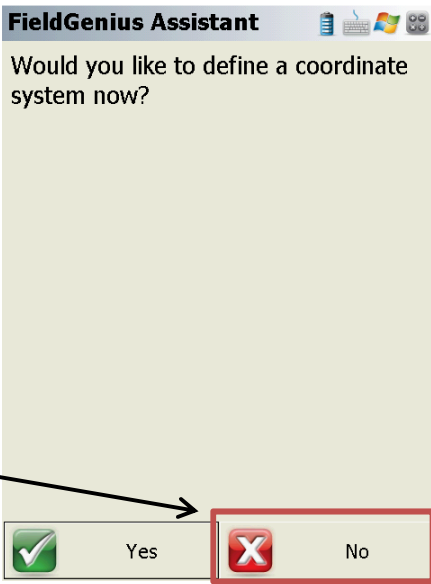| Step	Action	Display
5	In the Project Review screen: **Automap files** contain pre-defined descriptions that can be used in FieldGenius. The template library that you select will be copied into the project's folder with a name of *yourprojectname_*automap.csv, and any changes that you make to the Automap Library will affect only the project library, not the template library. Use the **Feature List** field to select a feature list that you want to use with the project, for collecting GIS point attributes. The **Raw Data File** field indicates the name of the raw file that is going to be recorded. You can select a different one by pressing the button and either creating a new raw file or choosing an existing one to open. The **Modify Project Information** button will take you directly to the Project Information screen. There you can enter notes about the project. • Leave these fields as they are. • Press the **Continue** button. This takes us to the Unit Settings screen.	

Step	Action	Display
6	In the Unit Settings screen: • Select which units you wish to use. **Important Note**: Once this has been set, you cannot change this project's units again. Since we typically prefer to work in these same units, we will press the **Save As Default** button. This will make whatever we select here the future default unit setting. • Press the **Save As Default** button. This takes us to the Save Project Defaults screen.	
7	In the Save Project Defaults screen: • Press the **OK** button. This returns us to the Unit Settings screen.	

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

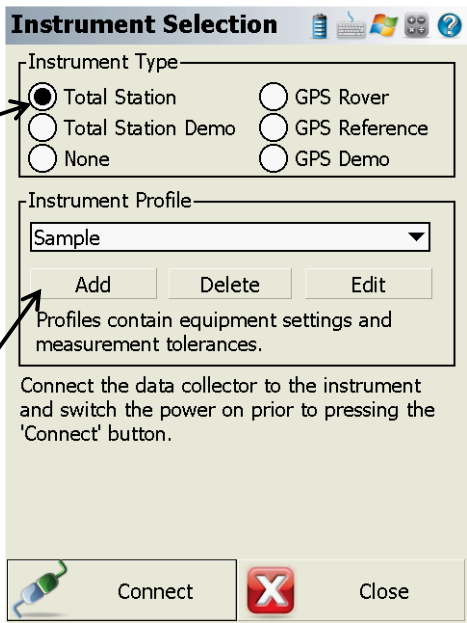| Step	Action	Display
8	In the Unit Settings screen: • Press the **OK** button. This takes us to the FieldGenius Assistant screen.	**Unit Settings** Distance Unit Meters Format [ ] Precision 3 Angle Unit Degrees Format DDD°MM'SS.s" Precision 0 Direction Format North Azimuth Scale Factor 1.000000 ☐ Curvature and Refraction Correction ✓ OK Save As Default
9	In the FieldGenius Assistant screen: We are prompted to select a coordinate system. Since we are not using GPS in this project and will not be working in a geodetic coordinate system, we will not select a coordinate system. • Tap on the **No** button**.** This takes us to the Instrument Selection screen.	**FieldGenius Assistant** Would you like to define a coordinate system now? ✓ Yes ✗ No

Continued on the following page

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Creating an Instrument Profile	Instrument profiles contains settings specific to the particular instrument you are attempting to connect to. Once you have created a profile, you can then select it when creating a new project and all of that particular instrument's settings will be used. This becomes especially useful when you have multiple instruments. Selecting a profile vs. having to enter settings every time significantly speeds up you day. We will create an instrument profile for the Leica TS15.

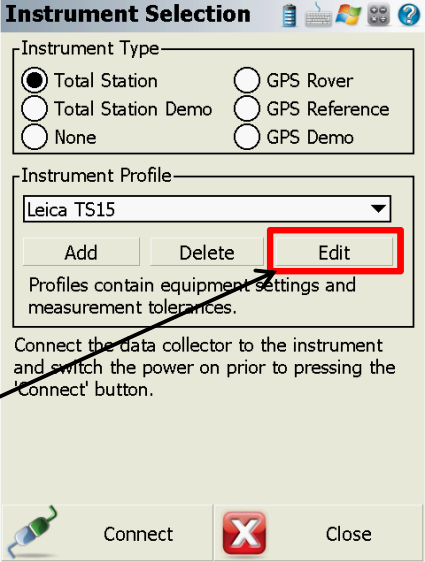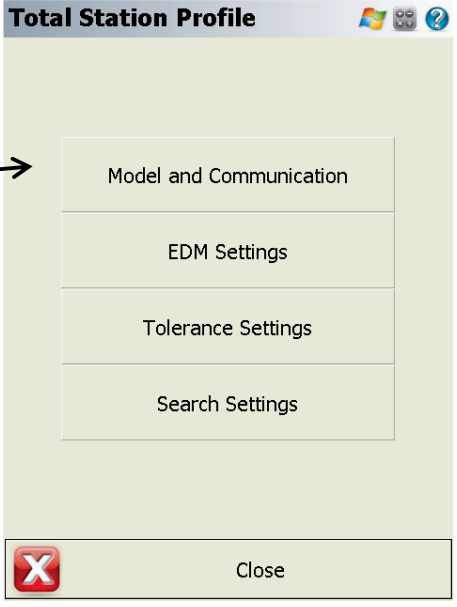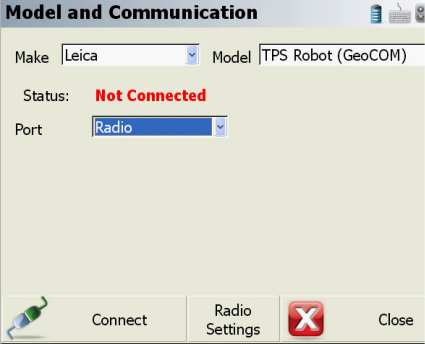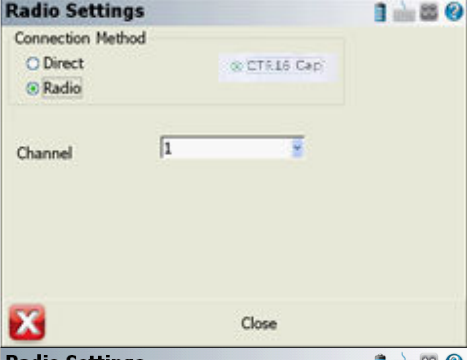| Step	Action	Display
10	In the Instrument Selection screen: • Tap on the **Total Station** radio button. **Note**: This is the screen where you can create new instrument profiles, delete existing profiles, or select previously created profiles. • Press the **Add** button. This takes us to the New Instrument Profile screen.	**Instrument Selection** Instrument Type ● Total Station ○ GPS Rover ○ Total Station Demo ○ GPS Reference ○ None ○ GPS Demo Instrument Profile Sample ▼ [Add] [Delete] [Edit] Profiles contain equipment settings and measurement tolerances. Connect the data collector to the instrument and switch the power on prior to pressing the 'Connect' button. Connect ☒ Close

Step	Action	Display
11	In the New Instrument Profile screen: • Enter a name for your instrument profile in the **Profile Name** field. In this example, we will call it *Leica TS15*. Instrument profiles are used to save your particular instrument's settings so that you don't have to remember them or have to set them each time you create a new project or select an instrument to use. • Press the **Save** button. This saves the profile name and returns us to the Instrument Selection screen.	**New Instrument Profile** Profile Name: Leica TS15 ✓ Save ✗ Cancel

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

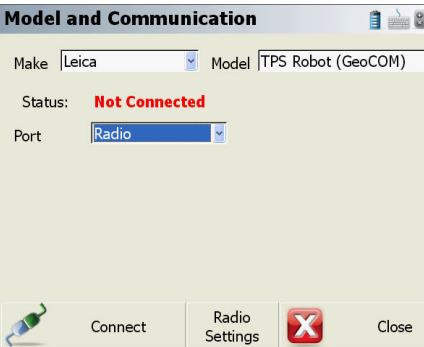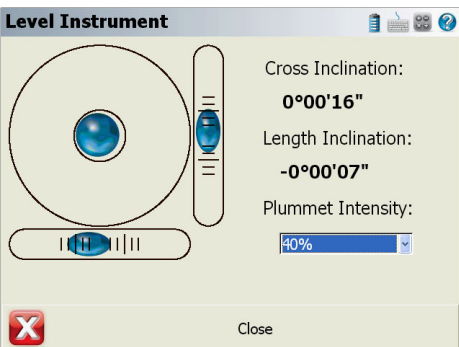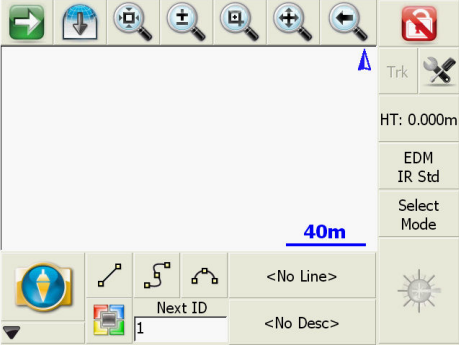| Step	Action	Display
12	In the Instrument Selection screen: With your newly created instrument profile name in the **Instrument Profile** field, we will now edit that profile and configure it to the specific settings necessary for the TS15. • Press the **Edit** button. This takes us to the Total Station Profile screen.	**Instrument Selection** Instrument Type ◉ Total Station ○ GPS Rover ○ Total Station Demo ○ GPS Reference ○ None ○ GPS Demo Instrument Profile Leica TS15 Add Delete **Edit** Profiles contain equipment settings and measurement tolerances. Connect the data collector to the instrument and switch the power on prior to pressing the 'Connect' button. Connect ✖ Close

13	In the Total Station Profile screen:
	
	    • Tap on the **Model and Communication** button.
	
	    • Ensure that your TS15 is turned on.
	
	This takes us to the Model and Communication screen.
		Total Station Profile
		
		Model and Communication
		
		EDM Settings
		
		Tolerance Settings
		
		Search Settings
		
		✖ Close

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

Step	Action	Display
14	In the Model and Communication screen: • Ensure that the **Make** field has **Leica** selected. • Ensure that the **Model** field has **TPS Robot (GeoCOM)** selected. • Ensure that the **Port** field is set to *Radio*. • Tap on the **Radio Settings** button. This takes us to the Radio Settings screen.	
15	In the Radio Settings screen: • Ensure that you select the **Connection Method** Option for your equipment. • Ensure that the **Channel** field matches the entry we set back in *Step 9* if you are using the RH15 radio. No option will appear if you are using the CTR16 bluetooth radio. • Press the **Close** button. This returns us to the Model and Communication screen.	

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*
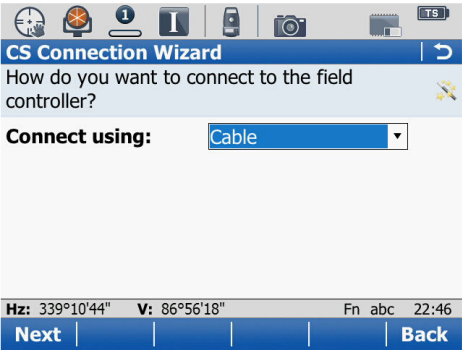
Step	Action	Display
16	In the Model and Communication screen: • Tap on the **Connect** button. This takes us to the Level Instrument screen.	
17	In the Level Instrument screen: We watch the CS15 connect to the TS15. When the connection is succesfull you will be automatically taken to the Level Instrument screen. • Tap on the **Close** button. This takes you to the Map screen of FieldGenius. You are now ready to create a set up.	
18	In the Map screen: You are now ready to set up your instrument over a point and start measuring.	

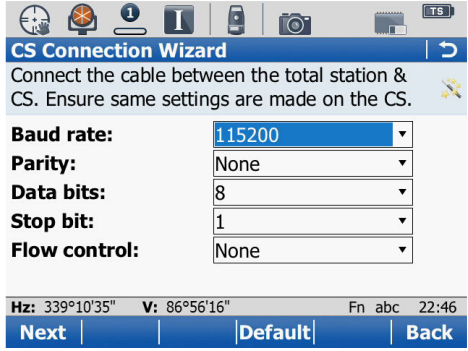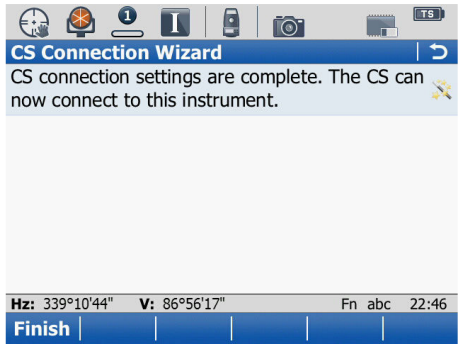| **Connecting your CS15 Via a cable** | The previous section explained how to connect to your robotic total station using the internal radios of the CS15 and TS15. There may be times when you will want to work behind the total station in a non-robotic mode, and connect your data collector to the instrument either via a cable or wirelessly via Bluetooth. This section describes how to connect using a cable. The following section describes how to connect via Bluetooth.

First we must go back to the TS15 and configure it to accept a cable connection. |

Step	Action	Display
1	From the SmartWorx main menu:

• Follow *Steps 1-8* in the first section of this guide.

At *Step 8* you will arrive at the **Connect using** screen of the CS Connection Wizard:

• Ensure the **Connect using** field is set to **Cable**.

• Press the **Next** button.

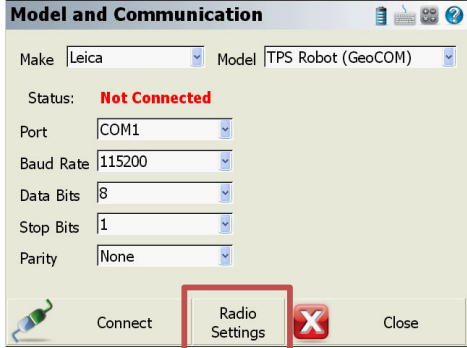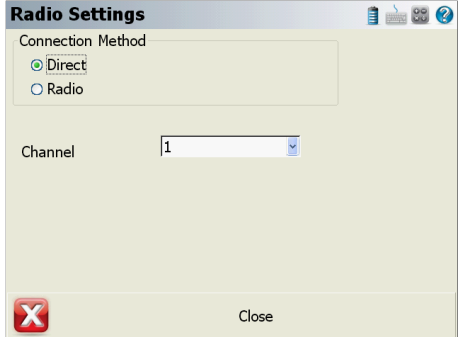This takes us to the communication parameters page of the CS Connection Wizard. | **CS Connection Wizard**
How do you want to connect to the field controller?

Connect using: Cable

Hz: 339°10'44" V: 86°56'18" Fn abc 22:46
Next **Back** |

Step	Action	Display

2	In the communication parameters page of the CS Connection Wizard:
	
	    • Ensure you have entered the same parameters described in the image on the right.
	
	    • Press the **Next** button.
	
	This takes us to the final page of the CS Connection Wizard.
		CS Connection Wizard
		Connect the cable between the total station & CS. Ensure same settings are made on the CS.
		
		Baud rate: 115200
		Parity: None
		Data bits: 8
		Stop bit: 1
		Flow control: None
		
		Hz: 339°10'35" V: 86°56'16" Fn abc 22:46
		Next | |Default| **Back**

3	In the final page of the CS Connection Wizard: • Press the **Finish** button. This completes what we needed to set on the TS15. Now let's go back to the CS15 and FieldGenius.	**CS Connection Wizard** CS connection settings are complete. The CS can now connect to this instrument. Hz: 339°10'44" V: 86°56'17" Fn abc 22:46 **Finish** |

Step	Action	Display
4	In FieldGenius: • Follow *Steps 1-14* in the **Connecting via a radio** section. This takes you to the Model and Communication screen. • Ensure that the settings in this screen match what you set in *Step 2* of this section. • Press the **Radio Settings** button. This takes us to the Radio Settings screen.	
5	In the Radio Settings screen: • Ensure the **Direct** radio button is selected. • Press the **Close** button. This returns us to the Model and Communication screen.	

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

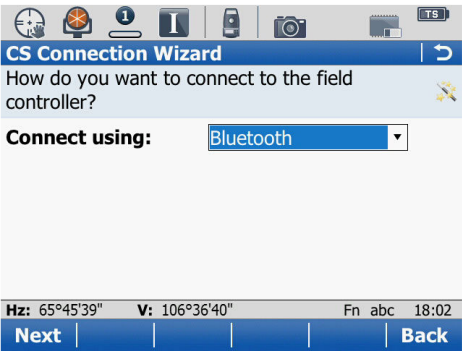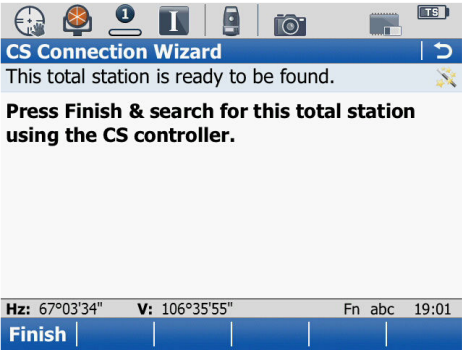| Step	Action	Display
6	In the Model and Communication screen: • Press the **Connect** button. This connects the two devices and you will now see the Level Instrument dialog. The Level Instrument dial is an excellent incator that you have sucessfully connected to the TS15.	

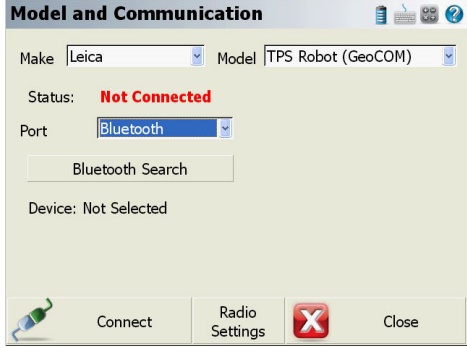|	
Connecting your CS15 Via Bluetooth	The previous section explained how to connect to your robotic total station to your CS15 using a cable. Now we will do the same but using Bluetooth wireless communication instead. First we must go back to the TS15 and configure it to accept a Bluetooth connection.

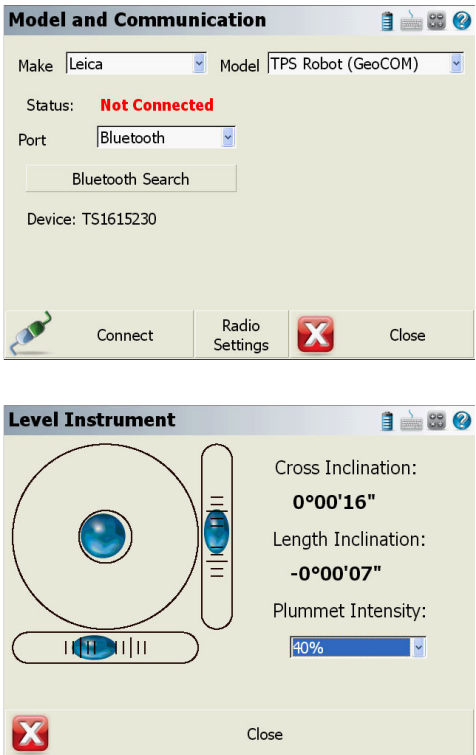| Step	Action	Display
1	From the SmartWorx main menu: • Follow *steps 1-8* in the first section of this guide. At *Step 8* you will arrive at the **Connect using** screen of the CS Connection Wizard: • Ensure the **Connect using** field is set to **Bluetooth**. • Press the **Next** button. This takes us to the final page of the CS Connection Wizard.	**CS Connection Wizard** How do you want to connect to the field controller? **Connect using:** Bluetooth Hz: 65°45'39" V: 106°36'40" Fn abc 18:02 **Next** **Back**
2	In the final page of the CS Connection Wizard: • Press the **Finish** button. This returns us to the SmartWorx main menu. Now lets' go back to the CS15 and FieldGenius.	**CS Connection Wizard** This total station is ready to be found. **Press Finish & search for this total station using the CS controller.** Hz: 67°03'34" V: 106°35'55" Fn abc 19:01 **Finish**

Continued on the following page

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

Step	Action	Display
3	In FieldGenius: • Follow *Steps 1-14* in the **Connecting via a radio** section. This takes you to the Model and Communication screen. • Change the **Port** field to **Bluetooth**. • Press the **Bluetooth Search** button. This takes us to the Select Bluetooth Device screen.	
4	In the Select Bluetooth Device screen: • Tap on your instrument's button. In this example we will select *TS1615230*. **Note**: Don't be alarmed if your device has found different devices then what my CS15 found. This returns us to the Bluetooth screen.	

Step	Action	Display
5	In the Bluetooth screen: • Enter a PIN if your device has one. In this example our instrument will connect without a PIN so we will leave this field blank. • Press the **OK** button. This returns us to the Model and Communication screen.	**Bluetooth** If the device 'TS1615230' requires a Bluetooth PIN, please input the code, otherwise select 'OK'. OK Cancel
6	In the Model and Communication screen: We now see our instrument listed below the **Bluetooth Search** button. • Tap the **Connect** button. This connects the two devices and you will now see the Level Instrument dialog. The Level Instrument dial is an excellent incator that you have sucessfully connected to the TS15.	**Model and Communication** Make Leica Model TPS Robot (GeoCOM) Status: **Not Connected** Port Bluetooth Bluetooth Search Device: TS1615230 Connect Radio Settings Close **Level Instrument** Cross Inclination: 0°00'16" Length Inclination: -0°00'07" Plummet Intensity: 40% Close

Connecting a Leica CS15 to a Leica TS15 using MicroSurvey FieldGenius, *continued*

Congratulations   You have successfully configured SmartWorx to accept an incoming radio signal on the TS15.

You then went over to the CS15 and successfully created a Leica TS15 Total Station profile.

You then made a successful connection between your CS15 and TS15.

You then repeated the above sections but this time configuring the system to connect via a cable between the CS15 and TS15.

Then you repeated this but used Bluetooth as a connection method.

Remember, FieldGenius will preserve these settings in your instrument profile. You only have to create this profile once. In other words, you don't have to follow these steps each and every time you want to survey using this total station and data collector.