

QUICK-START GUIDE FOR THE TRIMBLE TSC2 DATA COLLECTOR

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1. Power GPS Receiver and attach TSC2 Data Collector.

During the survey the TSC2 will draw power from the receiver's battery, however the TSC2 should also be fully charged using its own 5V DC charger.

Connect an external battery to either port 2 or port 3 on the GPS receiver using the procedure below. The 7-pin LEMO connector can easily be inserted the wrong way, causing breakage of the pins. The correct way to use this connector is:

- a. Align the red dot on the connector with the red mark on the port. This ensures that the key on the plug will slide into the slot on the jack. If there is no red dot, align the connector key with the slot inside the port.
- b. Push firmly but do not force the connector. If resistance is felt, remove the connector and check for debris inside and/or crooked pins. Realign the connector and reinsert.
- c. Give a slight tug on the cable itself to make sure the connector doesn't pull out. If properly connected, a mechanism will lock the connector in place to prevent the cable from inadvertently detaching if the cable is pulled.
- d. To remove the cable, pull back on the connector collar. This action retracts the two small "ears" and allows the connector to slide out.

Connect the TSC2 data collector to receiver port 1 using a controller cable (7-pin LEMO to 9-pin serial) If a controller cable is not available, use a power/download cable (7-pin LEMO to 9-pin serial to coax power). Tighten the thumbscrews on the serial connector.

2. Configure Receiver and Data Collector

Turn on the TSC2 by pushing the green button. The TSC2 is powered off by holding this button firmly for one second. Holding this button longer will cause the TSC2 to reset.

The TSC2 has a touch screen operated by the stylus stored in the top of its casing. A pen or pencil will also work. If the Survey Controller program is not already running, touch "Start" -> "Survey Controller" from the Windows CE menu. A screen with six selections appears, with a bar on the right hand side containing receiver status information. This main menu can always be reached by touching the "Menu" button on the right hand side.

Create a new Job, or return to an existing job if you want to add more data to it. A Job can contain multiple RTK and/or PPK surveys performed over multiple days.

- a. Touch "Files" -> "New Job". Type in the job name and touch "Enter".
- b. Under "Coord. sys.", select "No Projection / No Datum" for PPK and most RTK surveys. For RTK surveys where you wish to navigate to points, you must select a projection. Here, choose "Select from library". In either case enter 0 for "Project height". The "Units (Dist.)" should be meters. Other fields are accessed by touching the "1/2" box to scroll down, however there is no need to change any other parameter in this menu. Hit "Accept" to return to the main menu.

- c. For PPK surveys, configure and/or verify configuration of the PPK survey style. From the main menu: “Configuration” -> “Survey Styles” -> “PPK”. Under “Rover Options”, verify the following:

Survey Type:	PP kinematic
Logging interval:	select your measurement interval
Elevation mask:	10 degrees
PDOP mask:	6.0
Logging device:	Controller
Auto file names:	box checked
Antenna Type:	select your antenna type
Measured to:	Bottom of antenna mount
Antenna Height:	Enter in the vertical distance between the ground and the bottom plane of the antenna.

Touch “Accept” to return to the Survey Style menu, then “Topo Point” to verify:

Auto point step size:	1
Auto store point:	box checked
Number measurements:	15 seconds divided by “Logging interval”
Quality control:	QC1
Occupation time:	0m15s

Touch “Accept” to return to the PPK Survey Style menu then “Store” -> “Escape” to save settings and return to main menu.

- d. For RTK surveys, configure and/or verify configuration of the RTK survey style. Main menu: “Configuration” -> “Survey Styles” -> “RTK”. Under “Rover Options”, verify the following:

Survey Type:	RTK
Broadcast format:	CMR+
Use station index:	Any
Prompt station index:	box not checked
Satellite differential:	Off
Ignore health:	N/A
Elevation mask:	10 degrees
PDOP mask:	6.0
Antenna type:	select your antenna type
Measured to:	Bottom of antenna mount
Antenna height:	Enter in the vertical distance between the ground and the bottom plane of the antenna.
Serial number:	not necessary
Tracking Use L2e:	Yes
Tracking L2C:	box not checked
Tracking GLONASS:	box not checked

Touch “Accept” to return to the RTK Survey Style menu. Under “Rover radio”, verify:

Type:	Trimble internal
Method:	Trimble 450/900

If using a receiver with an internal radio, in the same “Rover radio” screen, touch “Connect” to access the receiver’s internal radio. It may not connect, but if it does, verify:

Frequency:	same frequency as base radio
Base radio mode:	TT450s at 9600 bps

Touch “Accept” to return to the RTK Survey Style menu. Under “Topo Point”, check the following:

Auto point step size:	1
Auto store point:	box checked
Number measurements:	15
Precision/Auto tolerance:	box checked
Quality control:	QC1
Occupation time:	0m15s

Touch “Accept” to return to the RTK Survey Style menu, then “Store” -> “Escape” to save settings and return to main menu.

3. Measure Points and/or Contours

- a. For PPK, “Survey” -> “PPK” -> “Start Survey”. The main screen will reappear, with “PPK:Float” and “PDOP:X.X” at the bottom of the screen. The first field will change to “PPK:Fixed” once the initialization timers have elapsed
- b. For RTK, verify the receiver’s radio is receiving RTK broadcasts. A small icon should be present in the upper right hand corner of the display which looks like a box with an antenna. Then, “Survey” -> “RTK” -> “Start Survey”. The main screen will reappear, with “RTK:Float”, “H:1.9m”, and “V3.2m” (or some numbers like these) at the bottom of the screen. After a short while the display should read “RTK:Fixed”, the “H:” and “V:” precision numbers will be a few centimeters, and an additional “RMS” field will appear.
- c. To measure a Topo Point, “Survey” -> “Measure Points”, then verify:

Point name:	enter name here and touch “Enter”
Method:	Topo point
Antenna height:	verify the correct antenna height
Measured to:	Bottom of antenna mount
Code:	enter extra text in this field if you wish

Position the antenna directly above the desired point. Touch “Measure”. During the next 15 seconds, keep the antenna as straight as possible (to keep the antenna level), and as still as possible. The “Time so far” timer will count up to 15 seconds, and the “Epochs remaining” will count down to zero. At the end of 15 seconds, the data collector will say “Observation Stored” and you are ready to measure another point. When finished measuring points hit “Escape” to return to the main menu.

- d. To measure a Continuous Topo, from the main screen, “Survey” -> “Continuous Topo”, then verify:

Method:	Fixed time
Antenna Height:	verify the correct antenna height
Measured to:	Bottom of antenna mount
Time interval:	For PPK this is your "Logging Interval". For RTK, select an interval.
Code:	enter extra text in this field if you wish
Start point name:	enter start point name

Position the antenna directly above the desired start point. Touch "Start" and begin traversing your path. Once you are done, touch "End".

- e. Once you have finished surveying your topo points and/or continuous segments, go back to the main screen and touch "Survey" then "End Survey". Touch "Yes" when asked to power down the receiver and then disconnect the cable from the data collector.

D. Navigating to a Point with (RTK only)

With RTK you can either navigate back to a point you just measured in the current survey, or navigate to coordinates that you entered into the data collector prior to the survey.

- a. To load coordinates one by one into the data collector, from the main menu: "Key in" -> "Points". Touch "Options" to choose to enter "Grid" coordinates (projected coordinates, i.e. northing, easting, elevation) or WGS-84 coordinates (geodetic coordinates, i.e. latitude, longitude, height). The points you enter will become part of the current job.
- b. To load a file containing coordinates into the data collector, follow steps 5a and 5b below to connect the TSC2 to a computer. Then:
 - i. First enter your points into an ASCII text file on your computer. These points can be projected coordinates or geographic coordinates, however they must be saved in an ASCII text comma-separated-value file with a .csv extension. Also, the coordinate fields on each line must be NAME,LAT,LON,HEIGHT,CODE for geographic coordinates or NAME,NORTHING,EASTING,ELEVATION,CODE for projected coordinates (northing and easting may be reversed). Example geographic coordinates would be:

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POINT1, -77.034438833, 163.190107944, -41.602,
POINT2, -77.235729490, 163.501280309, -45.646,
POINT3, -77.234520797, 163.508676286, -52.691,
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where negative latitude is south and negative longitude is west. There is no CODE field here but the last comma is still present on each line.

- ii. Copy the .csv file to the "Trimble Data" folder on the TSC2 (most likely named "Mobile Device" under "My Computer" in Windows Explorer).
- iii. Open or create the desired Job on the TSC2. From the main menu, "Files" -> "Import/Export" -> "Import custom format files". Under "File format" choose the coordinate format contained in the .csv file, then select the "File name" and hit "Accept". You can now see the imported points under "File" -> "Review current job".

- c. To navigate to any point in the current job, from the main menu “Instrument” -> “Navigate to Point”. From the “Find a Point” screen, touch the arrow to the right of the “Point name” box and choose “List”. Select the desired point and then verify:

Navigate:	To the point
Antenna Height:	verify this is what you previously entered during PPK Survey Style configuration
Measured to:	Bottom of antenna mount
Code:	N/A unless you typed in a code when this point was entered or surveyed

- d. Touch “Start”. A screen will appear which gives distance to the point and arrow which indicates the direction of the desired point. When you get close enough the display shifts from “coarse” to “fine” mode. Here, the point will appear as a bullseye and the arrow will shift to a crosshair.

5. Downloading data from TSC2 Collector

The Microsoft ActiveSync and Trimble Data Transfer programs are needed to download data from the TSC2. Both programs are available online from Microsoft and Trimble.

- a. Turn on the TSC2 and use the flat-to-square connector USB cable to attach the data collector to the computer.
- b. When you hook up the TSC2, ActiveSync should start up and read “Connected”. Don’t set up a “partnership”, just close that window if it appears. Also, you may get a MS Outlook error message along the way. If ActiveSync doesn’t start up automatically, try starting it. If it doesn’t automatically say “Connected”, try turning the TSC2 on and off, and disconnecting/reconnecting the USB cable. Eventually it will work.
- c. Open Trimble Data Transfer. If the top right-hand display doesn’t automatically say “Connected”, select “Survey Controller on ActiveSync” from the “Device” window at the top left. Click the Green button to connect, and the top right display should tell you that you are connected.
- d. Click “Add” and then select the Job file you want to download. In this window you can also browse to select the directory to which the files will be downloaded.
- e. Once the Job file is selected, click “Transfer All”. You should see a “Receiving” window appear, followed by a “Converting” window with little gears turning. The “Converting” window indicates the compressed .T00 files are being uncompressed to .dat files. A “Transfer Completed” window will then appear, signaling the download is finished.