


TRIMBLE Total Station Surveying

TSC2 Access & S3/S6

Setting up & Surveying

Set up Instrument

1. Set up instrument centered over IP #1 and level the tri-brach.
2. Turn on Total Station with grey button on side cover. (green light will illuminate)
3. Instrument will start up.
4. Connect antenna to TSC2 and turn the controller on by pressing the green power button.
5. Press the **Trimble** button  or Click Start... Trimble Access.
6. Click General Survey
7. Wait 2 to 20 seconds for Robotic connection to occur. Otherwise see **Setting the Radio**.
8. Click Instrument... Survey Basic...
9. Electronic level bubble screen comes up for fine leveling. Level the instrument with leveling screws, click Accept.
10. Input the *Pressure* (i.e. 29.5), & Input the *Temperature* (i.e. 40 degrees Fahrenheit), click Enter, & then click Accept.
11. If orienting the instrument to Mag N: At Survey Controller Basic screen, Orient the instrument to the desired direction (e.g. Mag N or CL of dam). Click Set and input the *Horizontal angle* that you want for this reference using spaces. (e.g. 0 for Mag N or 90 for CL of dam) (e.g. 54 45 23 is 54°45'23"). Press Tab, Click Accept.
12. Click ESC.

Start a New Job

(This can be done prior to setting up the survey equipment.)

13. Click on *Jobs... New Job*
14. Set the Template as *nrcs-tsta*
Template defaults are:
Coordinate System= *Scale 0.9996*,
Units = International Feet, & Cogo = Ground.
15. Click *Linked Files* if you want to select coordinate files that have existing points to be referenced into this project.
16. Press Tab multiple times to get to the 2nd screen and input *operator name* & any other *notes*
17. Click Accept.

Input Assumed Instrument Point & TBM Elevation.

18. Click *Key In... Points...*
19. For Instrument Point #1 use: *Pt. Name=1, Code=ip 1, N=1000, E=1000, Elev.=?* (Null),
Checkmark *Control Pt.*, click Store.
20. For Benchmark use: *Pt. Name=500, Code=tbm 1, N=?* (Null), *E=?* (Null), *Elev.=100.00*,
Checkmark *Control Pt.*, Click Enter, click Store, & click ESC.

Backsight for Orientation of Survey

21. Click on *Measure... Vx & S Series... Station Setup...*
22. Input the correct *Pressure & Temperature*. Press Tab, Click Accept.
23. Input the *Point Name* for IP 1 (e.g. 1), and the *Instrument Height* (e.g. 5.43) Press Tab, Click Accept

24. Input the backsight *Point Name* for TBM 1 (e.g. 500) and *Target height* (e.g. 5.2)
25. Sight the target.##
26. Input the displayed HA value into the *Amizuth* (*Keyed In*) using spaces (e.g. 54 45 23 is 54°45'23"). Click Enter.
27. Pulldown *Method* = **Angles & Distance**.
28. Click Measure, & Click Store.

##If the instrument is not in Autolock mode:
Click on the **Instrument icon**
Click on the **Autolock Icon**.

Backsight for Elevation

29. Click on *Measure... Station elevation...*
30. Input the *Code* for IP 1 (e.g. ip 1).
31. Click Accept.
32. Input the *Point Name* for the TBM 1 (e.g. 500), *Code* = tbm 1 ,and *Target height* (e.g. 5.2)
33. Pulldown *Method* = **Angles & Distance**.
34. Click Measure. Click Results. Click Store.

Conduct Topo Survey

35. Click *Measure... Measure Topo*.
36. Align on TBM 1 and Click Measure
37. Click on the **left side bar triangle** to switch the displayed values to North, East, Elevation and check the elevation.
38. Click Store.
39. Take normal topo shots:
 Click Measure,
Input the correct *Code* (e.g. G for Ground) Press Tab.
Change the target height if needed. Press Tab. Click Store
40. Press Escape when done collecting points.


Point Names for Survey Shots
 Instrument Points use 1, 2, 3 ...
 Benchmarks use 501, 501, 503 ...
 Turning Points use 201, 202, 203 ...

 Topog shots – start at 1000

Make a note of the Point Names of any Control Points that you will need for a turn.

Job & Point Information (Optional but helpful)

41. To review point coordinates, click *Jobs... Point Manager*. Press ESC when done.
42. To review Map of job, click *Jobs... Map*. Press ESC when done.
43. To review job details in the order of work done, click *Jobs... Review Job*. Rod Height errors can be corrected or Notes can be added here. Press ESC when done.
44. To review or change linked files, units, or coordinate system, click *Jobs... Properties of Job*. Press ESC when done.

Note: Using the Trimble Globe Key  allows the user to keep multiple items open and allows switching among tasks.

Note: Check out the Favorites button at the right side of the screen.

Quit out of Survey

45. When survey is completed click *Measure... End Conventional Survey*
46. Click Exit. Click Yes to Shut Down General Survey.
47. Click the X to Close Trimble Access. Click OK to confirm Trimble Access shutdown.
48. Press the power button on the S3/S6 to power it off.

Setting up & Surveying after a making Turn

(or when both the backsight & instrument points have known positions)

Set up Instrument – Use the steps 1 through 10 plus 12 as for original setup.

49. Set the current job. Click *Jobs...* Open Job... and select the correct project

Backsight for Orientation of Survey

50. Click on *Measure... Vx & S Series... Station Setup...*

51. Input the correct *Pressure & Temperature*. Press Click .

52. Input the *Point Name* for IP 2 (e.g. 2), and the *Instrument Height* (e.g. 5.53) Press Click .

53. Input the backsight *Point Name* for TP 1 (e.g. 201) and *Target height* (e.g. 5.2) Press .

54. Pulldown *Method* = **Angle & Distance**.

55. Sight the target.

56. Click , & Click .

Backsight for Elevation of survey

57. Click on *Measure... Station elevation...*

58. Verify the *Code* for IP 2 (e.g. ip 2).

59. Click .

60. Input the *Point Name* for the TP 1 (e.g. 201), Press *Code* = tp 1, and *Target height* (e.g. 5.2) Press .

61. Pulldown *Method* = **Angles and Distance**.

62. Click .

63. You will get a tolerance error to review. Pulldown *Action* = **Store Another**

64. Click Click . Click .

65. Another message appears. Pulldown *Action* = **Overwrite**. Click

Conduct Topo Survey

66. Click *Measure... Measure Topo*.

67. Align on TBM 1 and Click

68. Click on the **left side bar triangle** to switch the displayed values to North, East, Elevation and check the elevation.

69. Click .

70. Take normal topo shots:

Click ,

Input the correct *Code* (e.g. G for Ground) Press .

Change the target height if needed. Press Click

71. Press when done collecting points.

Recheck Control Points

72. Before ending the survey, **return to the control points** and take a 2nd shot on those points.
Compare the coordinates to the earlier results.

Quit out of Survey

73. When survey is completed click *Measure... End Conventional Survey*


74. Click . Click to Shut Down General Survey.

75. Click the X to Close Trimble Access. Click to confirm Trimble Access shutdown.

76. Press the power button on the S3 to power it off.

TSC2 Special keys

Func + **Power** to turn TSCe backlight on/off

Func + **Trimble Globe**  to disable or enable touch screen

Soft reset

Hold **Power** for ~3 secs, Then menu appears:




Reset: Restarts a running program that is locked up. Unsaved files will be lost.

Shutdown: Closes all running applications and powers down to lowest power mode.


Setting the Radio

(Only necessary if instrument has not been paired w/ controller or is not communicating).

Set Radio for S3 Total Station

- a) Connect long grey cable w/ USB port and collared end to the S3 robotic Total Station on the **COM port**. (Do not connect to TSC2 until step c)
- b) Press the **Trimble** button  and click *General Survey...Measure... VX & S Series...Station Setup*.
- c) Connect cable to TSC2. Once connected the instrument should be identified.
- d) Select *Settings...Connect...Radio Settings...* and set to desired Radio Channel and Network ID.
- e) Press **Accept**, **ESC** to quit out of Settings.
- f) Disconnect cable. Wait several seconds for the connection to be restored.

Set Radio for S6 Total Station

- a) Turn on S6 Total Station with grey button on side cover.
- b) The mini screen on the S6 will display Select Mode... Setup/Level and begin a 10 second countdown.
- c) Press the **Enter** button (rightmost) on the S6 to go into *Setup/Level* mode.
- d) Press the **Enter** button (rightmost) on the S6 to go into *Setup* mode.
- e) Press the **Down** button (middle) and highlight *Radio Settings*, then Press **Enter**.
- f) Press the **Down** button (middle) and highlight *Set Radio Channel*, then Press **Enter**.
- g) The current channel is displayed. Press **Enter** to increase the channel and then press **Down** when you've selected the desired channel.
- h) Once *Set* is highlighted press **Enter**.
- i) Press the **Down** button (middle) and highlight *Set network ID*, then Press **Enter**.
- j) The current Network ID is displayed. Press **Enter** to increase the ID and then press **Down** when you've selected the desired ID.
- k) Once *Set* is highlighted press **Enter**.
- l) Press the **Down** button and highlight *Back*, then Press **Enter**.
- m) Press the **Down** button and highlight *Exit (to Level)*, then Press **Enter**.
- n) Press the **Rotate** button (leftmost) to Exit out of setup.
- o) Radio channel & Network ID will be displayed on the mini screen.
- p) Turn the TSC2 controller on by pressing the green power button.
- q) Press the **Trimble** button  to open Trimble Access
- r) Click *Select Settings...Connect...Radio Settings...*
- s) Set radio channel and Network ID to match the S6.
- t) Press **Accept**, **ESC** to quit out of Settings.
- u) Wait several seconds for the connection to be restored.