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 54º45’23”). 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. **Pull down Method = Angles & Distance.**
28. **Click Measure & Click Store.**

**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. **Pull down 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.

**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 Tab, Click Accept.
52. Input the Point Name for IP 2 (e.g. 2), and the Instrument Height (e.g. 5.53) Press Tab, Click Accept.
53. Input the backsight Point Name for TP 1 (e.g. 201) and Target height (e.g. 5.2) Press Tab.
54. Pulldown Method = Angle & Distance.
55. Sight the target.
56. Click Measure & Click Store.

Backsight for Elevation of survey
57. Click on Measure… Station elevation…
58. Verify the Code for IP 2 (e.g. ip 2).
59. Click Accept.
60. Input the Point Name for the TP 1 (e.g. 201), Press Tab Code = tp 1, and Target height (e.g. 5.2) Press Tab.
61. Pulldown Method = Angles and Distance.
62. Click Measure.
63. You will get a tolerance error to review. Pulldown Action = Store Another
64. Click Enter. Click Results. Click Store.
65. Another message appears. Pulldown Action = Overwrite. Click Enter

Conduct Topo Survey
66. Click Measure… Measure Topo.
67. Align on TBM 1 and Click Measure
68. Click on the left side bar triangle to switch the displayed values to North, East, Elevation and check the elevation.
69. Click Store.
70. 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
71. Press Escape 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 Exit. Click Yes to Shut Down General Survey.
75. Click the X to Close Trimble Access. Click OK to confirm Trimble Access shutdown.
76. Press the power button on the S3 to power it off.
**TSC2 Special keys**

- Func + Power to turn TS Ce 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.