USER GUIDE

Trimble Forensics Capture

Software

Trimble

Legal Information

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Release Notice

This is the October 2020 release (Revision A) of the Trimble Forensics Capture Software User Guide. It applies to version 3.5.0 of the Trimble Capture software.

Contents

Welcome to Capture: first time setup

The first time you run Capture, the **Welcome to Capture** dialog displays and you are prompted to select your preferred distance and angle units.

If you are using Capture on the Universal Windows Platform, tap **Browse** to select the folder that you want to save scenes to.

Folders: Found X scenes to import indicates the number of scenes from the user-defined folder from which scenes are imported.

You can change the distance and angle settings at any time under  / **Options**.

Once you have set your preferred units at first-time setup, when you open Capture, the Scene Manager opens.

Working with scenes

All information and evidence gathered in a real-world scene is stored in a **Capture scene**. Information about a scene is saved in its own file(s) on your data collector.

Using the Scene Manager

The **Scene Manager** is the first window displayed when you start Capture (unless you are running Capture for the first time).

It displays a list of all existing scenes, as well as the date that each was created and its approximate size on disk.

From this window, you can:

- Create a new scene. Tap 

to open the New Scene wizard.
- Open a scene. Tap the scene you want to open. The scene opens in the **Scene Editing** window.

  NOTE – Only one scene can be open at a time. If another scene is currently open, first close it to return to the **Scene Manager**.
- Add notes to a scene.
  - On Windows Universal Platform, tap  next to the scene you want to add notes to.
  - On Android, tap next to the scene you want to add notes to then tap  **Notes**.
- Export a scene to another application on the device, such as an email client, Dropbox, or Google Drive.
  - On Windows Universal Platform, tap  next to the scene you want to export.
  - On Android, tap next to the scene you want to export then tap  **Export**.
- Export to coordinate system. For scenes that have GNSS measurements, you can export the scene grid coordinates in a chosen coordinate system. The measured Lat, Lng, Ht are transformed using the map projection and datum selected in the wizard.

Tap  .

- Delete a scene. NOTE - deleting a scene cannot be undone.
  - On Windows Universal Platform, tap  next to the scene you want to delete.
  - On Android, tap  next to the scene you want to delete then tap  Delete.
- Search the scene list. Tap  .
- Reorder the scene list. Tap the option you want at the top of the list (Date Modified, Newest-Oldest, Oldest-Newest, A-Z, or Z-A).
- Configure total station. Tap  / Configure Total Station. You can test Capture's ability to connect to a total station without creating a scene.
- Configure GNSS. Tap  / Configure GNSS. You can test Capture's ability to connect to your GNSS receiver without creating a scene.
- Define scene options. Tap  / Options.
- Import a scene. Tap  / Import Scene.
- Import a code library. You can import point code libraries from Reveal.
- Export logs. Export Capture log (.txt) files as a zip file that you can send to Technical Support to help diagnose any software issues.
- Access the About page. Tap  / About.

Creating a scene: using the new scene wizard

Only one scene can be open at a time. If an existing scene is currently open in the Scene Editing window, close it to return to the Scene Manager.

To create a new scene:

1. In the Scene Manager, tap  .
2. The New Scene wizard starts, guiding you through the process of creating a new scene. The sequence of steps to create a new scene varies depending on:

- Whether or not you have disabled any of the new scene reminders.
- Whether you are importing points from a JobXML (.jxl) file, or what type of measurement method you want to use.
- Whether or not this is the first time using the selected measurement method.

The steps are:

- Step 1: Scene name, point code library, optionally import JobXML file
- Step 2: Scene walkthrough reminder
- Step 3: Rough sketch reminder
- Step 4: Select measurement method
- Step 5: Reminder to record short term evidence first

New scene wizard: scene name, point code library, import from JobXML

In the first step of the new scene wizard:

1. Enter a name for the new scene. Capture checks that the name is unique. See Saving a scene for more information.
2. Select a point code library to use with the scene, if desired. The point code library defaults to the library that was associated with the last opened scene.
3. If you want to import points from a JobXML (.jxl) file, select **Import Points from File**. See New scene wizard: import points from a JobXML (.jxl) file, page 8 for more information.
4. Tap **Next**.

The Scene walkthrough reminder step opens (unless it has been disabled).

If all reminders have been disabled, the Select Measurement Method step opens, unless you selected **Import Points from File**. See New scene wizard: import points from a JobXML (.jxl) file, page 8 for information on this workflow.

New scene wizard: import points from a JobXML (.jxl) file

When you create a new scene, you can import points from a JobXML (.jxl) file. In the first step of the new scene wizard:

1. Select **Import Points from File** then tap **Choose File**. Browse to and select the file you want to upload. Capture loads the file and provides a summary including:
   - File - the name of the selected file
   - Points - the number of points in the file
   - GNSS - **Yes** if there was a compatible GNSS coordinate system in the file; otherwise, **No**.

2. Tap **Next** to work through the wizard. The sequence of steps to create a new scene varies depending on whether or not you have disabled any of the new scene reminders; see New scene wizard: scene walkthrough reminder, page 9, New scene wizard: rough sketch reminder, page 10, New scene wizard: short term evidence priority reminder, page 11 for more information.
3. At the last step of the wizard, before you tap **Complete**, you have the option to set up an instrument. If you select:
   - **Add Total Station Setup**, then tap **Complete** in the new scene wizard, Capture guides you through adding a Total Station.
   - **Add GNSS Setup**, then tap **Complete** in the new scene wizard, Capture guides you through configuring the GNSS.
     a. Select the GNSS configuration you want to use (tap **Change** if required), then tap **Next**.
     b. Tap **Choose** to select a check point to measure, tap **Next** to shoot the point, then confirm the results of the check point.
     c. Tap **Complete**.

     See Recording points using GNSS for more information.
   - **No, I will do it later**, you can set up an instrument later once you have completed the new scene setup by doing one of the following as required:
     -  / **Add Total Station Setup**. See Recording points using a total station.
     -  / **Add GNSS Setup**. See Recording points using GNSS.

New scene setup is now complete. Tap **Complete**. The scene opens in the Scene editing window.

New scene wizard: scene walkthrough reminder

This step in the new scene wizard reminds you to do a scene walkthrough before beginning to document the evidence at the scene.

This step is skipped if the Scene Walkthrough Reminder has been disabled. There are two ways you can disable this reminder:

- Select **Do not show again** on the screen.
- Disable the reminder from the New Scene Options.

You can re-enable this reminder at any time from the New Scene Options.

Once completed, tap **Next**.

The Rough sketch reminder step opens (unless it has been disabled). If all reminders have been disabled, the Select Measurement Method step opens, unless you selected **Import Points from File** in the first step of the new scene wizard. See New scene wizard: import points from a JobXML (.jxl) file, page 8 for information on this workflow.

New scene wizard: rough sketch reminder

This step in the new scene wizard reminds you to do a rough sketch of the scene before beginning to document the evidence at the scene.

This step is skipped if the Rough Sketch Reminder has been disabled. There are two ways you can disable this reminder:

- Select **Do not show again** on the screen.
- Disable the reminder from the New Scene Options.

You can re-enable this reminder at any time from the New Scene Options.

Once completed, tap **Next**.

If:

- in the the first step of the new scene wizard, you did not import a JobXML file, the Select Measurement Method step opens.
- the Short Term Evidence Priority Reminder has not been disabled, and in the the first step of the new scene wizard, you imported points from a JobXML file, the Short term evidence priority reminder step opens. If the Short Term Evidence Priority Reminder has been disabled, the last wizard screen appears and you have the option to set up an instrument; see New scene wizard: import points from a JobXML (.jxl) file, page 8 for more information. The new scene setup is now complete, and when you tap **Complete**, the scene opens in the Scene editing window.

New scene wizard: select measurement method

NOTE – This step does not appear if in the the first step of the new scene wizard you imported points from a JobXML file.

In this step in the new scene wizard, select and configure the measurement method to be used to create the scene.

- If you have used Capture before, it will display the previously used measurement method and any associated hardware settings.
- If you want to use a different measurement method, select the method from the dropdown. If the selected measurement method has been used in the past, the previously used settings will be displayed. If anything needs changing, select the option to change settings.

- If you are using a tape measure to record points, no configuration is required.
- If you are using a total station, see Using a total station.
- If you are using GNSS, see Using GNSS.
  NOTE – If you configure and save your GNSS settings, and then cancel the new scene creation, your GNSS configuration settings are saved.
- If you are using a Trimble X7 3D Laser Scanner, see Collecting scans with the Trimble X7 3D Laser Scanner, using the Trimble Perspective field software, page 77.

When you have selected the required method and set any required configuration details, tap **Next**.

The Short term evidence priority reminder step opens, unless it has been disabled. If this reminder has been disabled, the new scene setup is now complete.

Tap **Complete**. The scene opens in the Scene editing window.

New scene wizard: short term evidence priority reminder

This step in the new scene wizard reminds you to document any short-term evidence first.

This step is skipped if the Short Term Evidence Priority Reminder has been disabled. There are two ways you can disable this reminder:

- Select **Do not show again** on the screen.
- Disable the reminder from the New Scene Options.

You can re-enable this reminder at any time from the New Scene Options.

Once completed, tap **Next**.

If, in the the first step of the new scene wizard you imported points from a JobXML file, you now have the option to set up an instrument. See New scene wizard: import points from a JobXML (.jxl) file, page 8 for more information.

New scene setup is now complete. Tap **Complete**. The scene opens in the Scene editing window.

Opening a scene: using the Scene Editing window

The **Scene Editing** window gives you a preview of the scene while you shoot it, and is the primary window for working on a scene.

You can interact with the scene preview using different touch controls, depending on the current view type.

Tools to work with the scene are located in the top bar, the bottom bar, and the top left menu.

Use the **Scene Editing** window to:

- See the point code indicator and set the active point code. This is the code that is applied to new points.
- See the number of the next point to be shot, and take a shot.
- See the **Ghost point**—the current location of your prism or GNSS receiver. This is displayed as a blue dot in the scene.
- Set the current shot type if you are measuring with a total station. Different shot types can help take otherwise difficult or impossible measurements, such as the corner of a room out of sight or the center of a tree.
- Draw lines. Shots taken will be added to the end of the selected line.
- See and change the current view type.
  NOTE – **Camera view** is only available if there is a total station connected and it supports streaming video.
- Open the Instrument Control Panel (only available if there is a total station connected).
- Toggle the current grid visibility. Other grid settings such as origin, spacing, and ground plane height are available under  / Grid Settings.
- Remove the most recent point added. For auditing purposes, you can remove only the most recent point shot.

Further options are available from the menu on the **Scene Editing** window. Tap  , then:

- View Point List. View a list of all the points in a scene.
- View Scan Coverage. View the accumulated coverage of all the scans for the current scene.
- Options. Change scene settings.
- Change Code Library. Set the point code library.
- Export Points. Export all points from an open scene to a JobXML file. If required, you can then share the file with others; select the required sharing method when prompted. If you do not want to share the file, tap anywhere outside of the Share window.
- Close Scene. Close the scene.
- Move Total Station. Open the Move total station wizard.
- Check Backsight. Check that the instrument hasn't moved and is still set up correctly.

- Check Point. When using a total station or when using GNSS to measure points, you can check a point's expected location and its measured location.
- Check by Tape Measure. When using a total station or when using GNSS, you can measure the distance between two points to confirm the GNSS measurements are correct.
- Add Total Station Setup ; when using GNSS, you can add a total station to record points. If you have a total station connected already, Configure Total Station shows instead.
- Add GNSS Setup; if you are using a measurement method other than GNSS, you can add a GNSS Setup. If you are already using the GNSS measurement method, this shows Configure GNSS instead so you can configure the GNSS receiver connection settings.
- Add X7 Scanner Setup. When using either a total station or GNSS, you can add Trimble X7 scans to your scene at any time. This option is disabled if you are already using a Trimble X7 scanner.
- Scan for Prism. Perform a target search. This option is only available if the target type is set to prism.
- Layer Settings. Set what is visible in the canvas.
- HUD Settings. View the information displayed in the Head Up display.
- Grid Settings. Adjust the grid settings.
- Target Settings. Adjust the target settings.
- Rover Target Settings. When using GNSS, enter your measured rod height for a GNSS Rover. You can use a GNSS Rover with a standard GNSS rover rod, with the Trimble Telescopic Prism rod, and with the GNSS Rover mounted on top of a total station prism (integrated mapping).
- Help. Open the Capture help in a browser.

When using a total station or GNSS receiver, a red bar may appear across the bottom of the screen if the total station / receiver connection is lost, the total station is tilted too much to take a shot, or the battery on the total station is too low to take shots. If the connection is lost, tap Fix on the red bar attempt to reestablish a connection.

NOTE – When your data collector's battery charge is low (20% charge), an alert message displays. The message will display every time the battery charge drops another percent, until you charge it. This data collector low battery alert does not refer to the battery charge of any connected instrument.

Saving a scene

When you save and name a new scene, you can use the following: letters, numbers, hyphens, underscores, periods, ampersands, and spaces. Capture checks that the name you use hasn't already been used for an existing scene.

Capture uses the name of the scene as the basis for the name of the folder it creates to save all the scene information.

All scene files are saved on your data collector in the Capture scene folder.

> ⚠ CAUTION – Deleting the scene folder will result in the loss of any scenes contained within it and may cause additional problems with future file exporting on Android devices.

Scene autosaving

As you are editing a scene, Capture automatically saves your changes every time a change is made. It also automatically saves the scene when it is closed. If your data collector experiences an unexpected shutdown, you will be able to view the data up to your last change.

In the event of an unexpected shutdown, no special action is required to recover your scene; just select the scene from the Scene Manager and open it as normal.

File location: Scene folder

Capture saves scene information as follows:

- On Android devices, Capture saves scenes to a folder called Capture, in the root directory of the Android device. Navigate to the Capture folder using the built-in Android file browser or by connecting the Android device to a computer and browsing to the folder using the computer's file browser.
- On the Universal Windows Platform, you specify the location of the folder the first time you launch Capture. Capture continues to use that folder unless it is moved, deleted, or renamed, at which point Capture will require you to select a new location to save scene information to.

Files in Capture's 'save' folder are used by Capture; altering any files in the folder may result in Capture being unable to open the scene.

When a scene is exported by Capture, it has a .capture file extension, which you can copy or delete without affecting Capture's ability to open the scene. This .capture file is the file

type that Reveal imports and contains all the scene information, including scan files and images.

> CAUTION – Deleting the scene folder will result in the loss of any scenes contained within it and may cause additional problems with future file exporting on Android devices.

Closing a scene

Capture automatically saves changes as you are working in a scene.

To close a scene, tap  / **Close Scene**.

The Scene Manager screen opens.

Importing a scene

You can import an existing scene into your Capture scene database.

You cannot import a scene if a scene is currently open; in the Scene Editing window, close the open scene to return to the Scene Manager. Tap  / **Import Scene**, then navigate to the .capture file you want to import. Capture imports the scene and renames it as needed.

Deleting a scene

> CAUTION – Deleting a scene cannot be undone.

To delete a scene:

1. If the scene is open, close it to return to the Scene Manager.
2. Do one of the following:
    1. On Windows Universal Platform, tap  next to the scene you want to delete.
    2. On Android, tap  next to the scene you want to delete then tap  **Delete**.

Merging scenes

Usually, you'll create a separate Capture scene for each "real world" scene that you investigate.

However, you can create more than one Capture scene for a single real-world scene, and then merge the data when it has been imported into your desktop reconstruction software, such as Reveal or EdgeFx.

To do this, make sure that each scene contains two points in common with the other scenes. Those common points are used in Reveal or EdgeFx to merge the data.

Exporting a scene

Scenes created using Capture can be exported for use in Reveal or EdgeFx. You can do this in two ways:

- Click the **Export** button in the Scene Manager and select the application on your device that you want to use to export the scene. You can use any application that lets you transfer files. Email, Dropbox, and Google Drive will all allow you to transfer the files to a computer running Reveal or EdgeFx.
- If you are using an Android device, connect it to a computer running Reveal and run the scene import wizard in Reveal, selecting your Android device at the relevant step.

The Export option saves a .capture file to All/Capture/ on Android devices, or the user-defined folder on the Universal Windows Platform. It then gives you the option to email the file.

Viewing scene layers

Use the **Layer Settings** window to choose what is visible in the scene area.

1. With a scene open, tap  / **Layer Settings**.
2. In the **Layer Settings** window, select or deselect as required:
   - **Point IDs**. Show / hide point numbers.
   - **Point codes**. Show / hide the point code.
   - **Lines**. Show / hide lines.
     TIP – Make sure this layer is visible when drawing lines.

- **Grid**. Show / hide the scene grid. You can also turn this on or off using the Grid Visibility button.

3. Tap  .

Viewing the Head Up display

Head up display refers to the on-screen indicators displayed in the top left corner of the scene editing window. You can choose which items show in the Head Up display:

1. With a scene open, tap  / **HUD Settings**.
2. In the **HUD Settings** window, select or deselect as required:
   - live tracking data:
     - HA - Horizontal Angle
     - VA - Vertical Angle
     - SD - Slope Distance
   - setup information:
     - OP - Occupied Point
     - BS - Backsight Point
     - HI - Instrument Height
     - TH - Target Height
   - most recent shot information:
     - HD - Horizontal Distance
     - VD - Vertical Distance
3. Tap  to save your selection.

TIP – Select the **Show All** checkbox to quickly select all options.

If you are using the GNSS measurement method, the Head Up display shows:

- your current X, Y, Z coordinates
- a GOOD/BAD quality indicator for the current GNSS position

Using the scene grid

The scene grid consists of grey gridlines running East-West and North-South. If the X and Y axes are in view, they are drawn in red. It is not possible to rotate the grid.

When viewing the scene from the overhead view, the grid extends infinitely in all directions. When viewing the scene from a custom 3D viewpoint, the size of the grid automatically adjusts so that is encompasses all points in the scene.

There are two ways to set the visibility of the scene grid:

- Tap the **Grid Visibility** button  at the top of the screen.
- Select or deselect the **Grid** option on the Layer Visibility window.

Changing the grid spacing and origin

The grid settings control the settings for the grid that scene points are displayed on. This grid is purely for display in Capture and has no effect on the exported scene. To configure grid settings:

1. With a scene open, tap  / **Grid Settings**.
2. In the **Grid Settings** window, select or deselect as required:
   - **Origin Location**. Sets the location where the X and Y axes of the scene cross. This is the point from which all other point distances are determined.
   - **Spacing**. Sets the distance between the grid lines.
   - **Height**. Sets the height of the ground plane. This only has a noticeable effect in 3D view
3. Tap  .

Setting scene options

To view or change scene options, tap  / **Options**.

- Units. Choose units and decimal values for Distance and Angle.
- SX10. If using a Trimble SX10 Scanning total station as an instrument, choose if it should take photos while using either Reflectorless Targets or Prism Targets.
- Shot. Select what Capture should do when a new point is recorded.

- New Scene. Select which new scene reminders are displayed when creating a new scene.
- Target. For instruments that don't support automatic target type updates, turn this on to remind you to manually update the target type.

Options: units

The first time you run Capture, the **Welcome to Capture** dialog displays and you are prompted to select your preferred distance and angle units. You can also set these or change them at any time under the **Options** menu:

1. Tap  / **Options**.
2. Under **Units**, set your preferences for:
   - **Distance**. Capture can display distance values in Decimal Feet, Fractional feet (feet and inches), and Meters.

     Select your preferred unit from the **Unit** dropdown.

     If the unit is set to Fractional feet, maximum display precision is 1/32 of an inch. That is, distances will be rounded to the closest 1/32 of an inch for display purposes.

     Select the number of decimal places (0 to 6) from the **Decimals** dropdown. Capture rounds distances to the number of selected decimal places for display purposes, but will retain full precision internally.

     TIP – Did you know... Regardless of the distance unit you choose, you can use any distance unit when entering distance values—just append the unit after the number. If you don't explicitly specify a unit, Capture uses the default units set here.

     Some examples of valid distance input value: 7.5 in; 8.9 mm; 4.6 ft; 9.78 cm; 2' 3 5/8"
   - **Angle**. Capture can display angle values in Degrees; Degrees, Minutes, and Seconds; and Gons (gradians). Select your preferred unit from the **Unit** dropdown.

     Here is the same angle expressed using the three different formats, assuming Decimals is set to 3:

     - Degrees/minutes/seconds and decimal seconds: 90°30'15.000"
     - Degrees/minutes and decimal minutes: 90°30.250'
     - Decimal degrees 90.504°

     Select the number of decimal places (0 to 6) from the **Decimals** dropdown to use for angle display. Capture rounds distances to the number of selected decimal places for display purposes, but will retain full precision internally.

3. When you are done, set or change other preferences as required (SX10, Shot, New Scene, Target), or tap  to return to the scene (Scene Manager or Scene editing window).

Options: Trimble SX10 Scanning total station

The first time you run Capture, the **Welcome to Capture** dialog displays and you are prompted to select your preferred distance and angle units. You can also set these or change them at any time under the **Options** menu:

1. Tap  / **Options**.
2. Under **SX10**, set your preferences for:
   - **Reflectorless Targets**. Take photos when you are using the Trimble SX10 Scanning total station in DR or scanning modes.
   - **Prism Targets**. Take photos when you are using the Trimble SX10 Scanning total station with prism targets.
3. When you are done, set or change other preferences as required (see Options for further scene option settings, or tap  to return to the scene (Scene Manager or Scene editing window).

Options: shot preferences

Shot preferences specify what Capture should do each time a new point is added to a scene. To set shot preferences:

1. Tap  / **Options**.
2. Under **Shot**, select as required:
   - **Zoom to extents**. When a point is added to the scene, the current view adjusts automatically so that all points in the scene just fit in the scene area.

     When **Zoom to extents** is **not** selected, the scene map re-centers itself on the last shot without changing zoom level.
   - **Preview point properties**. Capture displays information about the new point in the Add New Point window.
3. When you are done, set or change other preferences as required (see Options for further scene option settings), or tap  to return to the scene (Scene Manager or Scene editing window).

Options: new scene reminders

By default, when creating a new scene, the New Scene wizard displays reminders to:

- Do a scene walkthrough
- Do a rough sketch of the scene
- Document 'short-lived' evidence first
- Show the **Help** button (see below)

These new scene reminders can be turned on or off from the Options menu, or within the New Scene wizard on each of the reminder screens.

To specify preferences for these reminder in the **Options** menu:

1. Tap  / **Options**.
2. Under **Reminders**, select or deselect the reminders you want to show, or not show, as part of the New Scene wizard.
3. You can also choose whether or not the **Help** button shows on screen.
4. When you are done, set or change other preferences as required (see Options for further scene option settings), or tap  to return to the scene (Scene Manager or Scene editing window).

Options: target

This option only applies when using a total station to record points. For most total stations, if you change the target type (prism / no prism), Capture automatically communicates the change to the instrument before taking the next shot.

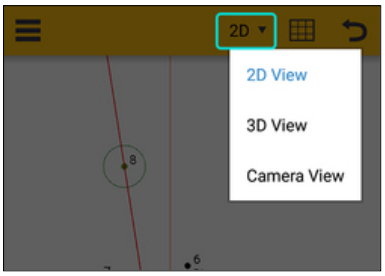
However, some older total stations don't support this automatic update mechanism. For such instruments, you must manually update the target type on the instrument itself. This reminder only displays if the total station in use doesn't support the feature.

To remind you to update the instrument manually any time the target type is changed:

1. Tap  / **Options**.
2. Under **Target**, select the **Show target type update reminders** option.
3. When you are done, set or change other preferences as required (see Options for futher scene option settings), or tap  to return to the scene (Scene Manager or Scene editing window).

Changing the scene's viewpoint

In the scene editing window, use the **Viewpoint** button at the top of the screen to change the view of the scene.



You can use various touch controls to interact with the scene; the available touch controls depend on the current view. The different view types are:

- 2D and 3D
  - Single Finger Tap selects the point you tap. If you tap multiple points, they are displayed as a list for you to select the point you intended to tap.
  - Single Finger Drag pans the screen.
  - Two Finger Pinch zooms the screen out.
  - Two Finger Spread zooms the screen in.
- 3D only:
  - Two Finger Drag rotates the scene.
- Camera View:
  - Single Finger Tap rotates the total station so that the camera is facing the point clicked.
  - Two Finger Pinch zooms the camera out if it is able to.
  - Two Finger Spread zooms the camera in if it is able to.

When you tap the button and the options are displayed, the screen is dimmed. To return to the scene, tap the button again, or tap anywhere on the screen.

Adding notes to a scene

Scene notes are comments about the scene as a whole. For example:

- 8 hours between time of incident and data collection
- Heavy rain at time of data collection

To add or edit scene notes:

1. In **Scene Manager**, tap  for the scene you want to add notes to.
2. In the **Notes** window, enter any required notes and information about the scene.
3. When you are done, tap  to return to **Scene Manager**.

NOTE – You can also add notes to a point. See Adding attachments to points.

Using point codes

Point codes are short text sequences that can be associated with recorded points to indicate what each point represents.

Each **point code** has a short version, usually only a few letters, and a longer text description.

For example, the short form of a code might be **SS**, with a description of **Stop sign**.

Point codes:

- are stored in point code libraries.
- are used to automatically generate line names when drawing lines in Capture.
- can be used to automatically generate complex scene objects when a Capture scene is imported into desktop software such as Reveal or EdgeFx.

See also:

- View the on-screen point code indicator and active point code
- Choose the active point code, create a new code
- Display point codes in the scene area
- Change the point code associated with a point

Using point code libraries

Point code libraries are collections of point codes. Some investigators find it useful to have a different set of codes for different types of scenes.

For example, you might have a library with codes for items that are common to crime scenes (guns, footprints, bullet holes), and another library with codes for evidence that are common to accident scenes (skid, debris, scuff, roadline).

Default point code libraries

Capture comes with three point code libraries:

- **CSI**. Contains some suggestions for codes useful for crime scenes.
- **Crash**. Contains some suggestions for codes useful in vehicle accident scenes.
- **Reveal**. Contains some suggestions for codes useful for creating objects in Reveal.

You can import other point code libraries from Reveal if required.

Importing a point code library

To import a point code library from Reveal:

1. Tap  / Import Code Library.
2. Navigate to where the library (*.pdl) is saved, select it and click Open.

The active point code library

Working with **point codes** is easier if you associate a **point code library** with your scene; any Capture scene can be associated with a point code library. When you associate a **point code library** to a scene, it is called the **active point code library**, and it enables Capture to:

- suggest codes from the active library when you enter a code by typing it.
- provide a dropdown list of the codes in the active library for you to select from, so you don't have to type it.

The **active point code library** is stored with the scene.

When you create a new scene, the first step of the new scene wizard prompts you to select a point code library. You can also select or change the active point code library at any time for the scene you are working in.

When you open a scene, the library associated with the scene becomes the **active point code library**.

Choosing or changing the active point code library

To select or change the **active point code library** for the open scene:

1. Tap  / Change Code Library.
2. In the **Choose Code Library** window, tap the dropdown to select the library you want to use. If you don't want to use a library, choose **<None>**.
3. Tap  .

NOTE – There is an option here to **Clear Quick Codes** (for the active library). When you create Quick Codes (see Shooting points with GNSS or Total station: Quick Codes measurement type for more information), they are added to the active point code library; they are not a global Capture setting or scene setting.

Viewing the on-screen point code indicator and active point code

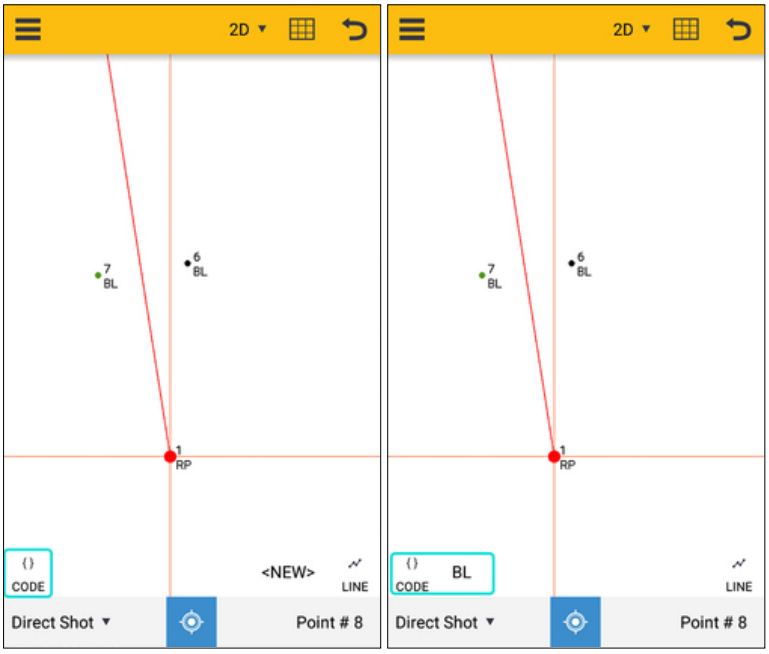
The **point code indicator** displayed to the right of the **Code** button in the lower left corner of the scene editing window shows the **active point code**.

If there is no **active point code**, the **point code indicator** shows no information until you tap the **Code** button to select a point code.

The **active point code** is the point code that is applied to new points that you add to the scene. If no **active point code** is set, new points will not be assigned any point code.

If no point code has yet been used in a scene, when you tap the **Code** button, the Change Point Code window opens prompting you to select a point code. You can then select an existing code or create a new one.

To change the **active point code**, tap the **point code indicator** next to the **Code** button to open the Change Point Code window. You can then select an existing code or create a new one.



Changing the active point code, creating a new code

You can change the active point code in the Add New Point window when you record a new point, if you have enabled the option to preview point properties.

You can also change the active point code by tapping the on-screen point code indicator. The **Change Point Code** window opens.

To change the active point code, do one of the following:

- **Select an existing point code**.
  a. Start to type the code in the **Point Code** field; as you type, suggested codes are listed.

TIP – To clear this field, hit the backspace key to delete any characters.

b. Tap the required code in the list, then tap  to make it the new **active point code**.

TIP – You can edit the current point code's description from here. Before you tap  , tap **Edit Current Point Code** to open the Edit Point Code window.

- **Create a new point code**.
  a. Type a code in the **Point Code** field. The message **Code does not exist. Please add new code** remains displayed. The new code must be unique.
  b. Tap **Add Current Point Code**.
  c. In the **Add New Point Code** window, enter a description for the new point code and if required, select the **Add code to current library** option.
  d. Tap  .
  e. In the **Change Point Code** window, tap  to make the new code the new **active point code**.

Editing a point code

Use the **Edit Point Code** window to change the description of an existing point code.

1. You can access the **Edit Point Code** window in any of the following ways:
   - Tap the point code indicator, which shows the active point code, displayed to the right of the Code button in the lower left corner of the scene editing window. In the **Change Point Code** window, tap **Edit Current Point Code**.
   - When changing the active point code. In the **Change Point Code** window, tap **Edit Current Point Code**.
   - When editing point properties or changing the point code associated with a point in the **Edit Point** window. Tap **Edit Current Point Code**.
2. Enter the required description in the **Description** field then tap  .

Displaying point codes in the scene area

By default, Capture displays the number of each point in the scene area.

You can specify that Capture display the point code of each point, instead of or in addition to, the point ID number.

To change how points are displayed in the scene area, open the Layer Visibility window and turn on the **Point codes** layer.

Working with lines

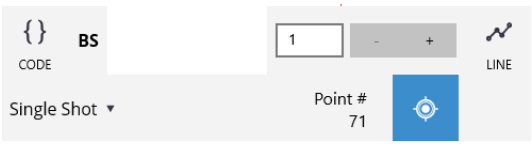
Draw lines as you record new points, or create a line using existing points that have the same point code.

- You must have an active point code to create a line.
- A line name is automatically created using the point code followed by a number, creating a 'line code"; e.g. **EOP(1)**.
- You can create any number of lines with the same point code; each unique line must have a positive number along with the point code; e.g. **EOP(1)**, **EOP(2)**....**EOP(10)** etc.
- You cannot connect two lines with different codes.
- The points in a line are always connected in point order.
- You can draw multiple lines at once, and switch between lines to add points to any required line.
- The current line is shown as a thick green line in the scene editing window; other lines are thinner blue lines.

You can work with lines in a scene while shooting new points, or with existing points.

Working with lines: shooting new points

1. In the scene editing window, make sure you have an active point code.
2. With an active point code selected (on the left side of the screen), the LINE button on the right side of the screen is enabled. Tap it to open the line controls:



   The number shows the current line number, which makes up part of the line code name. Use the + / - buttons to increase / decrease the line number as required.
3. When the line controls are visible, the current code (shown on the left side of the screen) represents a line code (rather than a point code). When you record a new point, a line is drawn and named with the current point code and line number. The points with the same code and line number form the line, connected in point order.

4. To add points with the same code to a different line, change the line number to the one you want to add points to, or create a new line by entering an unused number.
5. To add points with a different code to a line, change the point code, and select the required line number to the one you want to add points to, or create a new line with an unused number.
6. To stop drawing a line, tap 

in the scene editing window to hide the line controls; the current code (shown on the left side of the screen) reverts to representing a point code.

   NOTE – If you have enabled the option to preview point properties, when you add a new point to the scene, Capture displays the **Add New Point** window showing the point's properties.

   - If the line controls are visible in the scene editing window, the new point is automatically added to the current line. You can deselect **LINE** if you do not want to add the new point to a line.
   - If the line controls are hidden in the scene editing window (i.e. the code represents a point code rather than a line code), you can select **LINE** to add the new point to a line in the **Add New Point** window.

   TIP – You can assign line codes to Quick Codes to easily add lines to a scene with a chosen line code. See Total station: Quick Codes measurement type and Shooting points with GNSS for more information.

Working with lines: using existing points

1. In the scene editing window, select the point that you want to add to a line (new or existing), remove from a line, or move to a different line.
2. In the **Edit point x** window, tap **Edit point**.

   NOTE – If two or more points are very close to each other, the **Select a Point** window opens listing all the points in the scene area you tapped. Tap the point you want from the list.
3. In the **Edit Point** window, you can:
   - Create a new line. Select **LINE** then set the line number as required. The line code (point code + line number) must be unique.
   - Add the selected point to an existing line. Select **LINE** then select the required existing line number. You can only add the point to existing lines with the same point code.

- Remove the selected point from a line. Deselect **LINE**.
- Move the selected point to a different line with the same point code. Change the line number to the one you want to add the point to, or create a new line by entering an unused number (for that point code).
- Move the selected point to a different line with a different point code. Change the point's point code, then set the line number to the one you want to add the point to, or create a new line by entering an unused number.

4. Tap  .

Recording points: measurement methods

A measurement method refers to the way that point data is collected and recorded in a scene.

When you create a new scene, the new scene wizard prompts you to select and configure the measurement method to be used to record points in the scene.

Capture supports the following measurement methods:

- Tape measure
- Total station
- GNSS
- Trimble X7 scans

Using the Add New Point window

If you have enabled the option to preview point properties, when you add a new point to the scene, Capture displays the **Add New Point** window showing the point's properties.

Adding a new point to a line

See Drawing lines for more information on working with lines.

Changing the active point code

See Changing the active point code, creating a new code for instructions on how to change the active point code associated with the point.

Adding attachments (notes, images, evidence markers) to a point

See Adding attachments to points for instructions on adding notes, images, and evidence markers to points.

Selecting a point in a scene

To select a point in a scene, tap the point in the scene area.

If two or more points are very close to each other, and you try to select one of the points by tapping it, the **Select a Point** window opens listing all the possible points in the scene area you tapped. Tap the point you want from the list.

The **Edit point x** window opens, with the following options:

- Edit point. After a point has been created, you can change some of its properties. You can also strike a bad point without removing it from the scene.
- Check Point. If you used a total station or GNSS to measure the point, you can check the point's expected location and its measured location to ensure you have a good setup. See Total station Check Point or GNSS Check Point for more information.
- Add to line, if the point is not already part of a line.
- Remove from line, if the point is part of a line.
- Begin new line.
- Add attachments. You can add notes, images, and evidence markers to a point.
- Measure from this point. Use this option to measure the distance between two existing points in the scene.
  a. Select the point to measure from in the scene (the point you measure from is the point you selected to open the **Edit point x** window). A message displays at the bottom of the screen.
  b. Select the point to measure to. The message at the bottom of the screen shows the distance between the two points. Tap  .

TIP – You can pan, zoom, and change the 3D viewpoint to help you see the point you want.

Viewing a list of all the points in a scene

To view the **Point list** for a scene, make sure the scene is open, then tap  / **Point List**.

All the points in the scene are displayed in a grid, in the order that they were recorded. A filter in the top right corner allows you show points for a specific Point Code.

You can view and/or edit any point by tapping its row to select it. This opens the Edit Point window.

Struck points show on the **Point List** with strikethrough text. You can "unstrike" the point from the **Point List** if required; tap it in the list to open the **Edit Point** window then tap **Unstrike Point**. See Editing point properties, page 34 for more information on striking / unstriking points.

NOTE – You can also select and edit a point by tapping it on the map. See Selecting a point in a scene.

Editing point properties

After a point has been created, you can change some of its properties.

1. To edit a point's properties, do one of the following:
   - Tap the point in the scene area. In the **Edit point x** window, tap **Edit point**.
   - Tap  / **View Point List** to see a list of all points in the scene. Tap the point you want to edit.
2. The **Edit Point** window opens. Change the point's properties as required:

   NOTE – The **Point ID** cannot be changed. The first recorded point has an ID of 1, and the ID of each successive point increases by 1.

   - **X,Y,Elevation**. The coordinates (position) of the point in the scene. These values are editable only if the point was manually entered using the tape measure method.
   - **Point Code**. The point code representing the type of evidence being documented by this point. This value is optional. To specify a point code, start typing a code in the **Point Code** field. Capture searches for an existing code already used in the scene or from the active point code library, if it has been set.

     TIP – To clear this field, hit the backspace key to delete what you have typed.

     NOTE – You can also change the description of an existing point code here. Tap Edit Current Point Code.

     If Capture can't find a matching code, the message **Code does not exist** displays. To create a new code:

     a. Tap **Add Current Point Code**

     b. In the **Add New Point Code** window, enter a description for the new point code, and if required, select the **Add code to current library** option. See Point Codes and Point codes: point code libraries for more information.

     c. Tap 

- **Line**. Select this option to add the point to a line, or remove it from a line. See Drawing lines for more information.
- **Add Attachments**, or **Edit Attachments** if the point already has attachments. You can add notes, images, and evidence markers to a point.
- **Strike Point** / **Unstrike Point**. You can strike a point in the event of a bad measurement or other mistake. You must enter a reason for striking the point.
  - You can strike the following point types: None, BacksightCheckPoint, ControlPoint, ControlPointCheckPoint, GnssControlPoint, GnssControlCheckPoint. You cannot strike ReferencePoint, BacksightPoint, GnssReferencePoint point types.
  - Struck points remain on the **Point List** with strikethrough text. You can "unstrike" the point from the **Point List** if required; tap it in the list to open the **Edit Point** window then tap **Unstrike Point**.
  - Struck points do not show on the map or in camera view, and do not appear in renders for the scene view.
  - If a struck point is part of a line, the line behaves as if the point is not included; it connects to the next point (if there is one), ends at the previous point if the struck point was last point, starts at the next point if the struck point was the first point, or the line disappears if the struck point was one of only two points on the line.
  - You cannot select a struck point when selecting a point as part of a workflow, such as when you are measuring to an existing point.
  - A point's "struck" status is included in the scene xml for Reveal to import.
  - When you export to different coordinate system (csv) from Capture, it checks for "Struck" points. If any exist, an extra column is added to the export, which shows “Struck” for the struck points. For all other points it is empty.

    NOTE – The **Strike Point** option is not available in the **Add New Point** window when you are recording new points (i.e. when the **Preview point properties** option is selected; see Options: shot preferences, page 20.)

Removing the last point

You may want to remove one or more points from the scene in the event of a bad measurement or other mistake.

To remove the most recent point, tap the **Remove Last Point** button.

It is possible to remove several points from the scene by repeatedly removing the last point.

Sometimes, the last point can't be removed. For example, when using a total station, it is not possible to remove any point occupied by the instrument. In such a case, the **Remove Last Point** button is disabled.

When removing a point, there is a confirmation required to ensure you do not accidentally remove points.

The **Remove Last Point** button is used to remove the most recent point added to the scene. Clicking this button multiple times will remove multiple points. When clicking this button, you will receive a message asking if you are sure you want to remove the point.

TIP – See Editing point properties, Strike Point for information on striking a bad point without removing the point from the scene.

Adding attachments to points

You can add notes, images/photos to a point as attachments, which shows in the scene as a gray square beside the associated point. You can mark an attachment as an evidence marker, which shows in the scene as a yellow square beside the associated point.

TIP – If a point has any attachments, when you export the scene to Reveal or EdgeFx, any notes, images, and evidence markers are exported as well.

To add photos, you can:

- attach from the gallery
- take a photo with the data collector
- take a photo with the total station (only available on total stations that support this).

Examples of point notes are:

- 9 mm shell casing
- Size 12 footprint
- Stop sign partially obscured by nearby shrub

NOTE – You can also record notes about the scene as a whole.

Adding attachments

To add an attachment to a point:

1. Do one of the following
   - For a **new point**: When you add a new point, and if you have enabled the option to preview point properties, the **Add New Point** window opens. Tap **Add Attachments**.
   - For an **existing point**:
     - Tap the point on the screen, then in the **Edit point x** window, tap **Add attachments**. (Note - If there are already attachments for the selected point, the window shows **Edit attachments** rather than **Add attachments**. See below.

       NOTE – You can also add an attachment from the Edit Point properties window.
     - Select the point from the Point List, then in the **Edit Point** window, tap **Add Attachments**.
2. In the **Add Attachments** window:
   - Select **Attach Evidence Marker Tent** and enter a **Marker Label** to specify that the attachment is an evidence marker.
   - Enter text into the **Notes** section.
   - Attach files or take photos as required.

   NOTE – If there are already attachments for the selected point, the window shows **Edit Attachments** rather than **Add Attachments**. See below.
3. Tap  .

Editing attachments

To edit an attachment:

1. Tap the required point on the screen or select the point from the Point List, then in the **Edit point x** window or **Edit Point** window, tap **Edit Attachments**.

   You can also add an attachment from the Edit Point properties window.
2. In the **Edit Attachments** window:
   - if required, select **Attach Evidence Marker Tent** and enter a **Marker Label** to specify that the attachment is an evidence marker. Or, deselect it.
   - make any changes as required in the **Notes** section.
   - attach files or take photos as required.

   NOTE – This option is only available if there is an item attached to the point.
3. Tap  .

Deleting attachments

To remove attachments from a point:

1. Tap the required point on the screen, then in the **Edit point x** window tap **Delete attachments** .
2. Tap **Yes** to confirm.
   NOTE – This option is only available if the point has attachments.

Recording points using the tape measure method

To add a point to a scene using the **tape measure** method:

1. In the scene editing window, tap  (**Shot** button) at the bottom of the scene window.

   NOTE – Usually, the **Shot** button looks like a cross hair. However, this button changes to  if you are:

   - using a total station to record points and you have selected a multiple-shot total station measurement method or the Scan method or Control Point method.
   - using GNSS and you have selected the average GNSS or Control Point shot type.
2. In the **Add New Point** window, enter the **X**, **Y**, and **Elevation** coordinates for the new point.
3. If required, enter or edit the Point Code.
4. If required, add an attachment.
5. If required, add the point to a line.
6. Tap  .

   TIP – You can change a point's properties after you have recorded it.

Recording points using a total station

When you use a total station to record points, the points are added to the scene by initiating a total station measurement.

To use a total station, you must :

- specify the make and model of the total station
- level the total station
- configure the target settings
- enable target locking, if applicable

Once set up, you may need to:

- check the total station position
- move the instrument

While shooting a scene, you may want to:

- change the total station settings

Adding a point to a scene using the **total station** method will differ according to:

- the input method you selected when you created the new scene:
  - **Control Total Station with Capture** (the first time you use a total station with Capture), or **Use last total station** or **Use a different total station** (when you have previously used a total station with Capture), or
  - **I will manually enter shot data**
- the measurement type you select, using the dropdown at the bottom of the screen:
  - **Direct shot**. This is the default total station measurement type, and the one used most often. See Total station: Direct shot measurement type.
  - **Quick Codes**. Allows you to assign Point codes to buttons to add points to the scene with a chosen point code. See Total station: Quick Codes measurement type. See Using point codes for more information on point codes.
  - **Scan**. This total station measurement type is only available when you are connected to a Trimble SX10 Scanning total station. See Total Station: Scan measurement type.

- Auto Distance. Allows the continuous collection of points with a specified distance interval until intentionally stopped. See Total station: Auto Distance, Auto Time, and Auto Stationary measurement types.
- Auto Time. Allows the continuous collection of points with a specified time interval until intentionally stopped. See Total station: Auto Distance, Auto Time, and Auto Stationary measurement types.
- Auto Stationary. Use this method to store precise measurements with a standard rod. See Total station: Auto Distance, Auto Time, and Auto Stationary measurement types.
- Horizontal angle offset. Use this measurement type when you can't directly shoot the point, but you can shoot a point beside it. This measurement method is often used to record a point at the center of a tree or telephone pole. See Total Station: Horizontal angle offset measurement type.
- Vertical angle offset. Use this measurement type when you can't directly shoot the point, but you can shoot a point directly above or underneath it. For example, this measurement method could be used when shooting with a prism, and you wanted to record a point on the underside of an overpass. See Total Station: Vertical angle offset measurement type.
- Distance offset. Use this measurement type when you can't directly shoot the point, but you can shoot a point that is close by. See Total Station: Distance offset measurement type.
- Two line intersection. Use this measurement type to record a point that is obscured by another object. For example, you might want to shoot the corner of a room when there is something in the way, such as a piece of furniture. See Total Station: Two line intersection measurement type.
- Control Point. Measure high quality points that you can come back to later. For example:
  - Check point on a control point to make sure the scene setup is still good (similar to a total station backsight check).
  - Return to a scene and set up on previously measured control points so everything is correctly oriented.
  - In Reveal, export control points to be used in third-party photogrammetry applications.

TIP – For these measurement types, if you are using a Trimble TSC7 controller, you can use the directional arrow keys and the key in the center of the directional arrow keys on the TSC7 controller's keypad as you would the directional arrows in the Instrument

Control Panel, when the Instrument Control Panel is open, to turn and aim the instrument and to take a shot.

Total station: selecting the make and model

When you create a new scene in Capture, you are prompted to select the measurement method that you will use to record points. If you are using a total station, you must specify the make and model of your total station.

- If you have not used a total station with Capture before, select **Control Total Station with Capture**, then select the make and model of the total station from the dropdown menus.
- If you have used a total station with Capture in the past, Capture shows the previously selected make and model, along with the previous connection settings. If all the existing settings are accurate, leave the selection as **Use last total station** and tap **Next**.
- To use a different total station, select **Use a different total station** and tap **Next**. Select the make and model of the total station from the dropdown menus.
- To edit any of the total station settings, tap **Change connection settings...** then tap **Next**.

Total station: configuring connection settings

Connection settings are used to set up the communication parameters that Capture requires to communicate with a hardware device such as a total station.

When you create a new scene in Capture and you have selected the measurement method **total station** to record points, you are prompted to specify how you will connect to the total station.

NOTE – You can also edit the connection settings for the connected device in an open scene; tap  / **Configure Total Station**.

1. Select the connection option you want: Bluetooth, Radio Bridge, Direct Radio, Wi-Fi, or Cable.

   Not every hardware device supports all connection types. Capture only shows the connection types that are supported by the currently selected hardware.

   NOTE – Capture supports radio connection to the Trimble SX10 Scanning total station with data collectors that have built-in Cirronet radios. The connection must be initiated with Wi-Fi or Cable, and then you can swap to the radio by pressing the Radio/Wi-Fi

toggle button in the navigation bar or with the radio button in the Instrument Control Panel.

NOTE – Capture supports direct radio connection on Windows 10 tablets, e.g. the Trimble T10 tablet, that have an integrated radio (support for the Trimble S7 total station and Spectra Geospatial Focus 35 total station).

2. Capture prompts you to select the device to connect to. You only need to do this the first time you connect to the device; Capture then remembers the settings and connects automatically.
3. Make sure the device you want to connect to is turned on, then tap the **Devices** button to search for devices in range (Bluetooth or Wi-Fi) or connected via cable. The **Devices** button shows **None** when you have not yet connected to a device. After you have connected to a device, the **Devices** button shows the name of the last connected device.
4. The **Choose Connection** window opens, showing a list of devices; select the device you want to connect to. If it is not listed, repeat step 3. Tap  .

   NOTE – When using a cable, the device will have **(cable)** as part of the device name in the list. You may also see the same device listed for a Wi-Fi connection.
5. If you are connecting via Radio, enter the **Channel** and **Network ID** as displayed on the device.
6. Wait for the device to show in the **New Scene** wizard, then tap **Next**.
7. Wait for the device to connect. When the message **Connection established with total station** appears, tap **Next**.

Total station: leveling the total station

When you create a new scene in Capture and you have selected the measurement method **total station** to record points, you are prompted to level the total station.

NOTE – If you are using a Trimble SX10 Scanning total station, the plummet camera is displayed instead of your regular set of cameras.

Level the total station and follow the on-screen indicators to ensure the device is leveled correctly. Tap **Next**.

Total station: target settings

When you create a new scene in Capture and you have selected the measurement method **total station** to record points, you are prompted to specify the target settings.

You can also change target settings when editing a scene: with the scene open, tap  / **Target Settings**.

In the **Change Target Settings** window, you can change:

- the **Target type**. Specify if you are using a prism target, or reflectorless.
- the **Target height**: Height of the target above the actual recorded point.
  - When using a prism target, this represents the pole height.
  - When not using a prism, you can use this setting to vertically offset recorded points from the shot point.

Settings for Prism targets only

- **Prism offset**. A correction value; it is usually printed on the side of the prism.
- **Lock onto target**. Only visible if you are using a total station that supports target locking. When selected, target locking mode is enabled and the next time the total station tries to take a shot, it will prompt you to search for the target so it can lock onto it.
- **Target ID**. Only visible when using a total station that supports target identifiers. Enabling this option and selecting a target ID will prevent the total station from accidentally finding incorrect targets when searching for a target.

Settings for No Prism targets (reflectorless) only

- **Enable laser pointer**. This option is only visible when using a total station that has a laser pointer and supports automatic enabling/disabling of that pointer. Select this option to turn on the laser pointer, a focused beam that projects a dot (usually red) on the surface where the total station is pointed.

Total station: establish the location and orientation

When you create a new scene in Capture and you have selected the measurement method **total station** to record points, you are prompted to specify the location and orientation of the total station.

There are three ways to establish the position and orientation of a total station:

- Enter the coordinates for the position, and then take a shot in a known direction. This method is the only one available if there are not yet any points in the scene.
- Set the instrument up over an existing point, then shoot another existing point.
- Set the instrument up anywhere, then re-shoot two or more existing points.

Using the Instrument Control Panel

To open the **Instrument Control Panel**, tap  . See Instrument Control Panel.

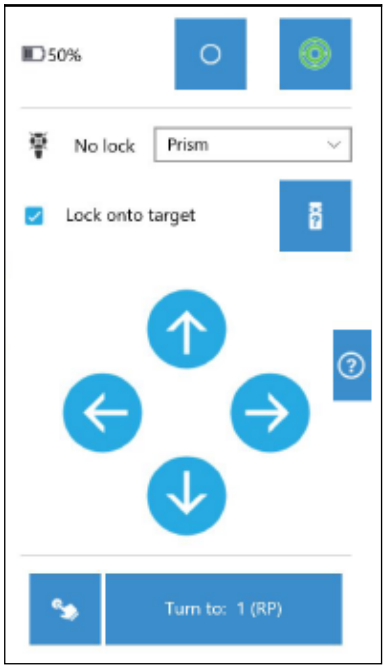
Total station: using the Instrument Control Panel

To change the instrument's settings while shooting a scene, use the **Instrument Control Panel**. To open the **Instrument Control Panel**:

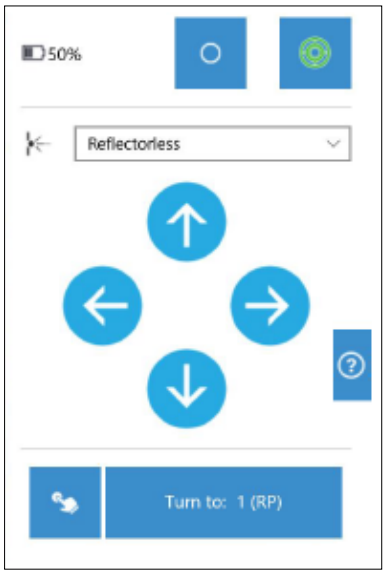
- while setting up a total station when you create a scene, tap  on the **Enter reference heading** screen.
- if you have an existing scene open, and you are connected to a total station, in the Scene Editing window, tap  (top right of the screen).

The **Instrument Control Panel** shows one of the following, depending on the selected target type:

- Prism



- Reflectorless



NOTE – If you are using a Trimble SX10 Scanning total station, the plummet camera is displayed instead of your regular set of cameras.

Use the **Instrument Control Panel** to:

- illuminate your target using the Target Illumination Light on the Trimble SX10 Scanning total station. Tap the button to cycle through on, off, and flashing modes.
- change the brightness of your a total station' crosshair; tap the button to cycle

through 0%, 25%, 50%, 75%, and 100% reticle illumination.

- level the total station.
- if your selected target type is Prism:
  - Lock onto Target.
  - Scan for Prism. See Perform a target search and Locking onto a target.
- use the directional arrows to turn and aim the instrument.
- choose a point, and turn to the selected point.

TIP – If you are using a Trimble TSC7 controller, you can use the directional arrow keys on the TSC7 controller's keypad as you would the directional arrows in the Instrument Control Panel to turn and aim the instrument, when the Instrument Control Panel is open. To take a shot, press the key in the center of the directional arrow keys on the TSC7 controller's keypad; this works like the **Shot** buttons  or  whenever those buttons are available with the Instrument Control Panel open. For more information on taking measurements, see:

- Total station: Direct shot measurement type.
- Total Station: Scan measurement type.
- TotalStation_ShotTypes_QuickCodes.htm.
- Total station: Auto Distance and Auto Time measurement types.
- Total Station: Horizontal angle offset measurement type.
- Total Station: Vertical angle offset measurement type.
- Total Station: Distance offset measurement type.
- Total Station: Two line intersection measurement type.

Performing a target search

A target search is usually done when you want to lock onto a target. This feature is only available on robotic total stations.

There are two ways to perform a target search:

- In the Instrument Control Panel, tap the **Scan for Prism** button  .
- Initiate a total station measurement after target locking has been enabled, but before the total station has successfully locked onto the target. Capture will notice that the

target is not locked, and open the Instrument Control Panel enabling you to do a target search. When the target is found, the **Shot** button  is enabled.

To perform a target search:

1. Aim the instrument in the general direction of the target, using the arrow keys in the Instrument Control Panel.
2. Tap and hold an arrow key to turn the instrument in that direction.
3. Release the key to stop the instrument from moving further.
4. Tap the **Scan for Prism** button  to begin the search.
5. When the target is found, tap  to return to the scene.

Locking onto a target (Robotic total station mode)

The **Lock onto target** option is used with robotic total stations; robotic total stations can lock on to a prism target, enabling you to shoot a scene using a prism target, without the need for a second person holding the target. The total station locks on to the prism target, and then automatically follows the prism as it moves.

There are two ways to enable target locking:

- in the Instrument Control Panel, ensure that **Prism** is selected, and select the **Lock onto target** option.
- with the scene open, tap  / **Target Settings**. In the **Change Target Settings** window, ensure that the **Target type** is set to **Prism**, and select the **Lock onto target** option

To shoot, hold the prism pole and initiate shots wirelessly with a data collector. The total station automatically keeps the prism sighted.

When you have enabling target locking, if you attempt to measure to an unlocked prism, the Instrument Control Panel opens, prompting you to perform a target search. Once the target is found, Capture tells the total station to lock on to the prism.

If the total station loses track of the target, Capture automatically prompts you to perform another target search the next time a shot is taken.

Total station: changing the settings

To edit the total station settings while shooting a scene, tap  / Configure Total Station. You can change:

- the make and model of the total station
- the connection to the total station

Total station: checking the setup

At any time, you can verify that your total station is taking accurate measurements by checking the setup. Use any of the following methods:

- Check Backsight
- Check Point
- Check by Tape Measure

Check Backsight

The backsight point is a point that is used to establish the orientation of the total station, that is, which direction is "up" or North in the scene.

It is also the point that is re-shot when checking the total station setup to make sure the instrument hasn't been bumped or jostled, causing inaccurate measurements. When an instrument is bumped or jostled accidentally, it can result in small changes in its position. Such small changes can cause significant inaccuracies in the position of recorded points.

1. Tap  / Check Backsight.
2. Capture prompts you to shoot to the backsight point; tap Shoot. Capture automatically calculates any error.
3. If you recorded a point during backsight creation, a Backsight Check shows Horizontal Angle, Horizontal Distance, and Vertical Distance deltas. To update the total station setup, tap Yes.
4. Capture prompts you to enter the total station height. Enter the height then tap Next.
5. Re-shoot to the backsight point; tap Shoot.
6. Tap Complete.

Check Point

Use Check Point to check your total station setup by going back to a previously stored control point and remeasuring it. If the errors between the new point and the original point are within tolerances, your setup is good. To check a point:

1. Do one of the following:
   - Tap  / **Check Point** and select an existing point.
   - Select the point in the scene and tap **Check Point** in the **Edit point x** window.
2. Place your rod on the selected point.
3. Tap **Shoot**. Capture automatically calculates any error between the original point and the point you just shot, in X, Y, and Z directions.
4. If the result is acceptable, tap **Complete**. Otherwise tap **Cancel**, or **Back**.

Check by Tape Measure

Use Check by Tape Measure to verify your total station setup by demonstrating that a distance measured on the ground with a tape measure matches the distance between two points measured with a total station.

1. Tap  / **Check by Tape Measure**.
2. Stretch a tape measure out in a straight line on the ground.
3. Capture prompts you to shoot the first point:
   a. Enter a distance close to one end of the tape measure.
   b. Tap **Shoot** to record a point right next to the tape measure at that distance.
4. Capture prompts you to shoot the second point:
   a. Enter a distance close to the other end of the tape measure.
   b. Tap **Shoot** to record a point right next to the tape measure at that distance.
5. Capture automatically calculates any error. The results show:
   - the coordinates for point 1, the coordinates for point 2, and the distance between point 1 and point 2.
   - the tape measure distance at point 1, the tape measure distance at point 2, the tape measure distance between point 1 and point 2.
   - the error between the two distances.
6. If the result is acceptable, tap **Complete**. Otherwise tap **Cancel**, or **Back**.

Moving the total station to shoot points that aren't visible from the current location

If you need to shoot points that aren't visible from the total station's current location, you can move the total station.

To move the total station:

1. Tap  / **Move Total Station**.
2. The **Move Total Station** wizard opens and guides you through the process of moving the instrument. Select the option you want to use:
   - I will shoot it now
   - Over an existing point
   - At known coordinates (X,Y, Elevation)
   - I will measure to existing points and Capture will calculate its position

Moving a total station: shoot now

1. Select **I will shoot it now** from the Move Total Station wizard.
2. Tap **Next**.
3. Tap **Shoot** to shoot the total station's new position.
4. Turn off the total station, move it to the new position then turn it back on.
5. Tap **Connect** to reconnect to the total station.
6. Tap **Level** and then relevel the total station. Tap **Complete**.
   NOTE – If you are using a Trimble SX10 Scanning total station, the plummet camera is displayed instead of your regular set of cameras.
7. Tap **Shoot** to shoot the total station's old position.
8. When the setup is complete, tap **Complete.**

Moving a total station: Over existing point

1. Select **Over an existing point** from the Move Total Station wizard.
2. Tap **Next**.
3. Turn off the total station, move it to the new position then turn it back on. Tap **Next**.
4. Tap **Choose**, select the required point for the new location and tap to accept it.
5. Set the total station height, then tap **Next**.

6. Tap **Connect** to reconnect to the total station.
7. Tap **Level** and then relevel the total station. Tap **Complete**.
   NOTE – If you are using a Trimble SX10 Scanning total station, the plummet camera is displayed instead of your regular set of cameras.
8. Tap **Choose**, select the required point, and tap to accept it. Tap **Next**.
9. Tap **Shoot** to shoot the position.
10. When the setup is complete, tap **Complete**.

Moving a total station: Known coordinates

1. Select **At known coordinates (X, Y, Elevation)** from the Move Total Station wizard.
2. Tap **Next**.
3. Turn off the total station, move it to the new position then turn it back on. Tap **Next**.
4. Enter the required **X**, **Y**, and **Elevation** values of the point over which the total station is set up. Set the total station height. Tap **Next**.
5. Tap **Connect** to reconnect to the total station.
6. Tap **Level** and then relevel the total station. Tap **Complete**.
   NOTE – If you are using a Trimble SX10 Scanning total station, the plummet camera is displayed instead of your regular set of cameras.
7. Tap **Choose**, select the required point, and tap to accept it.
8. Tap **Shoot** to shoot the position.
9. When the setup is complete, tap **Complete**.

Moving a total station: measure to existing points, Capture will calculate

1. Start the move total station process. From the Move Total Station wizard, select the option: **I will measure to existing points and Capture will calculate its position**.
2. Tap **Next**.
3. Select the first point and tap **Shoot** to shoot the position of your backsight.
4. Select the second point and tap **Shoot** to shoot the position of the first common point.
5. Select the third point and tap **Shoot** to shoot the position of the second common point.
6. A new reference point is created for the station location.

Capture does a resection style "move total station" by measuring to three points. Capture will inform you if a good solution cannot be found and ask if you want to remeasure the existing points.

7. Select the second point that you just shot and should still be pointed at.
8. Select **Turn total station to this point**. The instrument turns to this new location.

The last screen of the Move Total Station wizard show residuals for the resection type move.

Configuring a total station

Use the **Configure Total Station** wizard to configure the total station connected to Capture, without having to create a scene.

To start the **Configure Total Station** wizard, make sure no scene is open, then in the Scene Manager, tap **Configure Total Station**. The wizard guides you through the following steps:

1. Select the total station's make and model.
2. Configuring the total station connection settings.
3. Once you are successfully connected, tap **Test Configuration**. The Instrument Control Panel opens.

Total station: Direct shot measurement type

This is the default type of total station measurement, and the one used most often. It is used when a clear line of sight exists from the total station to the desired point.

To perform this type of measurement:

1. In the scene editing window, select the **Direct Shot** total station measurement type from the dropdown to the left of the **Shot** button.
2. Tap  . This **Shot** button is at the bottom of the scene window.
   NOTE – The **Shot** button looks like a cross hair if you are using the tape measure method or the total station Direct Shot measurement type. For all other total station measurement types (multiple-shot), this button changes to  .
3. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Horizontal** and **Vertical** angles, and the **Slope distance**,

then tap  .

4. In the **Add New Point** window:

- the **X**, **Y**, and **Elevation** coordinates for the new point are read-only.
- If required, enter or edit the **Point Code**. See Point codes for more information.
- If required, add an attachment.
- Tap  .

  TIP – You can change a point's properties after you have recorded it.

Total station: Scan measurement type

This total station measurement type is only available when you are connected to a Trimble SX10 Scanning total station.

To perform a scan:

1. Tap the  **Shot** button to start the scan.
2. In the **Setup Scanning Frame** window, select the **Frame Type**, then in **Camera** view, tap on the screen according to the frame type you have selected:

   TIP – A pink circle appears when you have pressed long enough (about 250 ms) during the scan region selection process. Once the pink circle appears, release your finger

   - **Rectangle**: tap to set the upper left corner, then tap to set the lower right corner.

     Navigate with tap and swipe to place a vertex outside of the current view.

     The selected area is defined by a purple rectangle.

     To dismiss the current selection, tap the Clear button.
   - **Polygon**: set each vertex with a tap on the screen; tap as many times as needed to set all the required vertices.

     Navigate with swipe then tap to place a vertex outside of the current view.

     The selected area is defined by a purple polygon.

     To dismiss the current selection, tap the Clear button.
   - **Ring**: This frame type selects an area all the way around the instrument. Tap to set the upper boundary. By default, the lower boundary is automatically set as low as possible. Tap to set the lower boundary.

     To dismiss the current selection, tap the Clear button.

- **Dome**: This frame type selects an area over and around the instrument. Tap to set the lower boundary of the dome. To modify the lower boundary, tap again.

  To dismiss the current selection, tap the Clear button.

- **Full**: The scan will include everything the instrument is able to see in all directions; you do not need to select anything.

3. Tap **Next**.
4. In the **Scan Settings** window:
   a. Select the **Scan Quality.** The finer the scan, the more points will be recorded and the more time it will take.
   b. Select the **Take Panorama** option if you want to enable panorama pictures, which allow colorization of a point cloud.
   c. Select the **Panorama Camera** option. The **Medium** option will take more pictures.
   d. If required, select the **Fixed Exposure** option. The brightness is fixed when you start the scan, so point at a neutrally bright location if you select this option.
   e. The **Estimates** show specifications of scan including Total Time to complete the scan.
5. Tap **Next**.
6. The **Scanning** window shows the progress of the Panorama Camera and then the progress of the scan. During the scan, you can pause and then resume the scan.
   NOTE – If required during the scan, you can cancel it; tap **Cancel**. If you tap **Back**, the scan is also canceled.
7. When the scan is complete, tap **Complete**.

To view the accumulated coverage of all the scans for the current scene, tap  / **View Scan Coverage**. The **Capture Scan Coverage Viewer** opens. This shows coverage, not the actual scans. See Viewing the scan coverage.

Viewing the scan coverage

To view the accumulated coverage (not the actual scans) of all the scans for the current scene, tap  / **View Scan Coverage**. The **Capture Scan Coverage Viewer** opens. In the **Capture Scan Coverage Viewer** you can:

- Zoom in and out, and pan around the coverage area
- Switch between Intensity Mode  and Color Mode 

- Reset the camera 
- Hide  or show  the mini-map
- Hide  or show  the selectable areas
- Change settings for Depth Mask Color and Depth Mask Opacity; tap 
- Stations 
- Back 

Total station: Quick Codes measurement type

Use **Quick Codes** to assign point or line codes to buttons so that you can add points / lines to the scene with a chosen point / line code. See Using point codes for more information on point codes. See Drawing lines for more information on line codes.

1. In the scene editing window, select the **Quick Codes** measurement type from the dropdown to the left of the **Shot** button.
2. A row of buttons displays at the bottom of the screen. Buttons which have not been assigned a point / line code are labeled **Tap and Hold**.
   - To assign a point code to a button, tap-hold a button then select the code from the Point Code list in the **Change Point Code** window.
   - To assign a line code to a button, tap-hold a button then in the **Change Point Code** window, select the point code from the Point Code list, select **LINE**, and make sure the correct line number is selected. A line code name comprises the point code followed by a number, e.g. **EOP(1)**.
   - To change the code that is assigned to a button, tap-hold it then select the code from the Point Code list in the **Change Point Code** window, and if required select or deselect **LINE**.
3. Tap  .

Notice the  and  /  buttons to the left / right of the Quick Code buttons. Tap  to add more empty buttons to assign codes to. Tap  /  to navigate left / right as required to access additional buttons.

When you create Quick Codes, they are added to the active point code library; if you change the active point code library, you will not see Quick Codes you created in a different library.

To take a shot with an assigned code, tap that button.

To remove all Quick Codes (for the active library), tap  / **Change Code Library**. In the **Choose Code Library** window, tap **Clear Quick Codes** then tap **Clear** to confirm.

Total station: Auto Distance, Auto Time, Auto Stationary measurement types

The Auto Distance and Auto Time measurement types allow the continuous collection of points with either a specified distance interval or a specified time interval until intentionally stopped.

The Auto Stationary method allows you to store precise measurements with a standard rod. As long as you are moving, Capture doesn't take any measurements; it detects when you have stopped moving and then stores a point. This method is a useful alternative to the **Auto Time** if you need more time to get to your next location, and the **Auto Distance** method if you need to be properly leveled; it is however a slower shot method.

In the scene editing window, select the required measurement type from the dropdown to the left of the **Shot** button.

- **Auto Distance**. Tap  at the bottom of the scene window, then enter the required distance interval in the **Distance** field that appears. Tap  again to start shooting points. Points are continuous collected at the specified distance interval until you tap  .
  - If required, tap **Settings** / **Layer Settings** to choose what is visible in the scene area.
  - To exit the **Auto Distance** shot type, tap the back arrow (top left of the screen).
- **Auto Time**. Tap  at the bottom of the scene window, then enter the required time interval in the **Time** field that appears. Tap

 again to start shooting points. Points are continuous collected at the specified time interval until you tap  .

- If required, tap **Settings** / **Layer Settings** to choose what is visible in the scene area.
- To exit the **Auto Time** shot type, tap the back arrow (top left of the screen).

- **Auto Stationary**.

  a. Place the tip of the rod on the point you want to shoot, then level it, and hold still for three seconds.

  You can use the data collector's accelerometer data to determine when the rod is level, as determined by the data collector's sensors. If the device is attached to a pole, a level "bubble" displays.

  The level bubble is calibrated automatically; for auto-calibration to succeed, your data collector must be mounted securely to the rod. Capture can tell based on the sensor readings whether it is mounted to the rod or being held in your hand.

  Tap  to start, then tap  again to take your first auto-stationary shot and auto-calibrate the level bubble.

  If auto-calibration is successful, the level bubble displays  just above the line selector, bottom right of the screen.

  NOTE – The calibration is good until you tap  (Pause). You must always recalibrate on the first shot.

  NOTE – If auto-calibration fails, the level bubble does not show and an error message displays **Error! Unable to calibrate the level bubble. To use the level bubble, mount the data collector to the rod and hold still**. You can still use Auto-Stationary without calibrating the level bubble, based on position alone. Alternatively, tap  and try again.

  b. A progress bar in the bottom left fills up for three seconds, then it takes a shot.

  c. Repeat as need.

Total station: Horizontal angle offset measurement type

To perform a horizontal angle offset measurement:

1. Tap the  **Shot** button, then tap  to shoot a point directly beside the location of the point you want.
2. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Horizontal** and **Vertical** angles, and the **Slope distance**, then tap  .
3. Tap  to shoot a second point where the desired point would be if it were not obstructed.
4. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Horizontal** angle, then tap  .
5. At the bottom of the screen, tap  to create the point.

   Capture combines the horizontal angle of the second shot with the first shot to calculate the position of the desired point.
6. In the **Add New Point** window:
   a. the **X**, **Y**, and **Elevation** coordinates for the new point are read-only.
   b. If required, enter or edit the **Point Code**. See Point codes for more information.
   c. If required, add an attachment.
   d. Tap  .

TIP – You can change a point's properties after you have recorded it.

Total station: Vertical angle offset measurement type

To perform a vertical angle offset measurement:

1. Tap the  **Shot** button, then tap  to shoot a point directly directly under or above the location of the point you want.
2. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Horizontal** and **Vertical** angles, and the **Slope distance**, then tap  .

3. Tap  to shoot a second point where the desired point would be if it were not obstructed.
4. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Vertical** angle, then tap  .
5. At the bottom of the screen, tap  to create the point.

   Capture combines the vertical angle of the second shot with the first shot to calculate the position of the desired point.
6. In the **Add New Point** window:
   a. the **X**, **Y**, and **Elevation** coordinates for the new point are read-only.
   b. If required, enter or edit the **Point Code**. See Point codes for more information.
   c. If required, add an attachment.
   d. Tap  .

TIP – You can change a point's properties after you have recorded it.

Total station: Distance offset measurement type

To perform a distance offset measurement, shoot a point near the actual point, then specify any or all of the following offsets to define the location of the desired point:

- **Radial offset**. The horizontal distance further away from (positive offset) or nearer to (negative offset) the total station along the direction of the shot.
- **Right offset**. The distance to the right (positive offset) or left (negative offset) of the shot ray.
- **Vertical offset**. The vertical offset above (positive offset) or below (negative offset) of the desired point from the measured point.

To perform a vertical angle offset measurement:

1. Tap the  **Shot** button, then tap  to shoot the offset point.
2. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Horizontal** and **Vertical** angles, and the **Slope distance**, then tap  .

3. In the **Measurement Offsets** window, enter required values for **Radial offset**, **Right offset**, and **Vertical offset**. Tap  .
4. At the bottom of the screen, tap  to create the point.
5. In the **Add New Point** window:
   a. the **X**, **Y**, and **Elevation** coordinates for the new point are read-only.
   b. If required, enter or edit the **Point Code**. See Point codes for more information.
   c. If required, add an attachment.
   d. Tap  .

TIP – You can change a point's properties after you have recorded it.

Total station: Two line intersection measurement type

A two line intersection measurement involves shooting two points along each of two lines that are known to intersect. For example, you could shoot two points along the base of two intersecting walls. Capture will calculate the intersection point of the two lines, and record a point at that location.

To perform a two line intersection measurement:

1. Tap the  **Shot** button, then tap  to shoot a point directly directly under or above the location of the point you want.
2. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Horizontal** and **Vertical** angles, and the **Slope distance**, then tap  .
3. Tap  to shoot a second point where the desired point would be if it were not obstructed.
4. If you selected **I will manually enter shot data** when you created the scene, the **Manual Shot** window opens. Enter the **Vertical** angle, then tap  .

5. At the bottom of the screen, tap  to create the point.

   Capture combines the vertical angle of the second shot with the first shot to calculate the position of the desired point.

6. In the **Add New Point** window:
   a. the **X**, **Y**, and **Elevation** coordinates for the new point are read-only.
   b. If required, enter or edit the **Point Code**. See Point codes for more information.
   c. If required, add an attachment.
   d. Tap  .

TIP – You can change a point's properties after you have recorded it.

Recording points using GNSS

You can add points to a scene by logging GNSS positions, connected to a GNSS receiver via Bluetooth. Capture supports the following GNSS styles:

- NTRIP or Base and Rover to measure points with up to 1 cm (0.03 ft) accuracy.
- RTX, to measure points with up to 2 cm (0.06 ft) accuracy using corrections delivered via L-Band satellite.

To record points using GNSS:

1. You must first select and configure the GNSS style you want to use. You can do this in several ways:
   - From the main menu (with no scene open), tap  / **Configure GNSS**.
   - When you create a scene and select GNSS as the measurement method.
   - From the scene editing window for an open scene that uses the GNSS measurement method, tap  / **Configure GNSS**. Note that for an existing scene, you cannot switch to a different GNSS style from the style you started the scene with.
2. Then select and configure the required GNSS style: NTRIP, Base and Rover, or RTX.
   TIP – You can also use Demo NTRIP which uses a simulated receiver connection for demonstration purposes. DO NOT map a scene in demo mode
3. You can then shoot GNSS points.

You may also want to:

- Add a Total Station to include total station measurements as well as GNSS positions
- Check the GNSS setup
- Export a coordinate system

Configuring GNSS

The GNSS Style you use will affect the accuracy of the points you measure:

- NTRIP or Base and Rover, with up to 1 cm (0.03 ft) accuracy.
- RTX, with up to 2 cm (0.06 ft) accuracy using corrections delivered via L-Band satellite.
  NOTE – The accuracy of RTX positions is subject to service coverage area.

For details on configuring the GNSS Style you select, see:

- Configuring GNSS: NTRIP, page 64
- Configuring GNSS: Base and Rover, page 66
- Configuring GNSS: RTX, page 69

Configuring GNSS: NTRIP

You can add points to a scene, with approximately centimeter (0.03 ft) accuracy, by logging GNSS positions using NTRIP corrections.

1. In the **Configure GNSS** window, select the **NTRIP** GNSS Style.
2. Make sure Bluetooth is turned on on the receiver. In Capture, tap **Rover Bluetooth** to search for the receiver.
3. Enter your NTRIP Server details. Capture allows you to manage your saved correction sources.
   - If you have already saved NTRIP server information, tap **Manage** and select the correction source you want to use. See Managing correction sources below for more information.
   - If you have no NTRIP server information configured already, tap **New** to create a new correction source.
     a. In the **Edit NTRIP Server** window, enter a name, and the address, port, user name and password for the new correction source.
     b. Tap **Download NTRIP Table**.
     c. Select the required **Mountpoint**—use the dropdown to select the required mountpoint from the list, or select **Choose closest** to automatically use the closest NTRIP mountpoint based on your current location. See below for information on the **Choose closest** option.
     d. In the **Edit NTRIP Server** window, tap  .
4. Tap **Test Configuration**. The **GNSS Control Panel** opens. Check the settings, then tap  .

   NOTE – If you are in Demo mode, you can choose a demo file, and have options to walk between points and dither positions.
5. In the **Configure GNSS** window, tap  .

Managing correction sources

In the **Configure GNSS** window, tap **Manage**. The **Manage NTRIP Servers** window lists the corrections sources you have created. You can:

- Tap a correction source to edit it. The **Edit NTRIP Server** window opens.
- Tap the trash icon next to a correction source to delete it. You are prompted to confirm.
- Tap **New** to create a new correction source. See above for details.
- Tap **Import** to import a list of correction sources from an .xml file.
- Tap **Export** to export all your correction sources to an .xml file.

To exit the **Manage NTRIP Servers** window tap  .

Choose closest mountpoint option

The **Choose Closest** feature works by sorting all mountpoints then choosing the first mountpoint from the sorted list. The mountpoints are sorted as follows:

1. Distance from your current location (VRS and other networked solutions are given a zero distance).
2. Number of navigation systems used (e.g. use GPS+GLONASS before GPS).
3. Correction format:
   a. CMRx
   b. RTCM 3.2
   c. RTCM 3
   d. CMR+
   e. CMR
   f. RTCM 2 FKP
   g. RTCM 2
   h. ATOM
4. Mountpoint name.

The limitations of this functionality are:

- Not all networks provide reference station locations.
- Not all networks provide accurate / valid information.
  - Some mountpoints report (0 lat, 0 long).
  - Some networks put all mountpoints at the same point in the center of the map.

- Some mountpoints have incorrect locations.
- Some mountpoints are incorrectly flagged as Network.

Configuring GNSS: Base and Rover

You can add points to a scene, with approximately centimeter (0.03 ft) accuracy, by logging GNSS positions using RTK (Real-Time Kinematic) positioning with a Base and a Rover receiver and the Trimble R4s LE GNSS system's long-range Bluetooth radio.

Base and Rover RTK is similar to NTRIP RTK, where the base receiver and radio link replace the data from the network base and the Internet.

The Base receiver:

- is set up at an arbitrary location. e.g. on the roof of a vehicle or on a tripod placed at convenient location.
- remains stationary while you measure points with the Rover.
- "talks" to the Rover over a radio link, for example a long-range Bluetooth link.
- transmits information to the Rover about its current location.
- transmits observables about the GNSS satellites it is tracking.

The Rover receiver:

- moves around.
- is used to measure your points.
- receives the information from the receives data from the Base radio link, then calculates its position by combining the Base and Rover GNSS observations to matching satellites.

The Base/Rover concept works like a Total Station and a prism. In this analogy, the Base is like the total station set up over an arbitrary point, and the Rover is like the prism. Just like a total station calculates the position of the prism relative to the total station, the Rover calculates the position relative to the Base.

The main steps in Capture are:

1. Set up the Base on an arbitrary but stable location, e.g. on a tripod or on the roof of a vehicle.

   NOTE – Once set up, it is important that you do not move your base receiver when you are measuring from this setup with the rover. If you need to relocate your base receiver, the procedure is similar to moving your total station setup. If you must move the base for any reason, follow Moving the GNSS Base, page 68.

2. Measure your initial point with the Rover. This establishes your coordinate system. Once you've done this, the actual position if the Base is not important, only that the Base doesn't move from that position.
3. Measure at least two Control Points in case you have to move the Base to a different location, or you have to come back to the scene later.

If you do have to move the Base, Capture uses a GNSS Resection to match the new Base location with the existing scene. To do this you will measure two previously measured control points. From that information Capture calculates an adjustment so points measured from your new Base location match the existing scene.

Configuring the Base and Rover GNSS Style

1. In the **Configure GNSS** window, select the **Base and Rover** GNSS Style.
2. Select the Bluetooth devices for the Rover and the Base receiver.
3. Tap **Test Configuration** to open the **GNSS Control Panel**, which has the following options specific to the **Base and Rover** style:
   - **Bluetooth RTK**, which lets you control the connection between the Rover and the Base receivers via Bluetooth. It shows:
     - a **Status** of Connected (the Rover and the Base are currently connected via the long-range Bluetooth link) or Disconnected (the Rover and the Base are not connected.
     - **Base Receiver**, which is name of the currently selected Base receiver.
     - a **Connect/Disconnect** button, to either connect the Base and Rover, or disconnect them from each other.
   - The **Base Position**, which shows the position status of the current Base receiver. Your data collector will not normally be connected to the Base receiver unless you are shooting GNSS points in a new scene, or you are following the Moving the GNSS Base, page 68 workflow.
     - If the data collector is not currently connected to the Base receiver, the **Base Position** shows **Not Connected to Base**. Tap **Connect** to connect your data collector to the Base receiver.
     - If you are connected to the Base receiver, the **Base Position** shows various position status data for the Base receiver.

       NOTE – If you connected to the Base receiver using the **GNSS Control Panel**, the data collector will automatically disconnect from the Base receiver when you close the **GNSS Control Panel**.
4. When you are satisfied with the configuration, close and save the settings.

Moving the GNSS Base

Once set up, it is important that you do not move the Base receiver when you are measuring from your setup with the Rover. However you may need to move the GNSS Base if:

- You are returning to a previously mapped scene.
- You need to move the Base to a new location if the scene is large and the Bluetooth link between Base and Rover is weak.

The process is similar to measuring control points and then moving your total station with a resection setup. It is important that you have good control points to reference in the new base location you move to.

1. With the scene open, tap  / **Move GNSS Base**.

   NOTE – You can change the GNSS Configuration from here if you need to.
2. Move the Base receiver to its new location. The new location is arbitrary, but should be stable and within range of any points you need to measure. Ideally you have collected control points that surround your new base location on at least three sides.
3. Tap **Next**→ to configure the Base and Rover for Bluetooth RTK and connect the Base and Rover to each other via Bluetooth.
4. Choose the first resection point from the scene; it must be control quality.
5. Move the Rover to the selected resection point.
6. Tap **Next** → to measure the resection point.
7. Hold still for 10 seconds while Capture averages the position. Capture will auto-accept the measurements.
8. Repeat for the second resection point. After measuring the second resection point, the GNSS resection results display.
9. If the GNSS resection is out of tolerance, you are prompted to go back and try again. The resection could be out of tolerance because:
   - One of the resection points is wrong (the point you chose in Capture is not the one you measured on the ground).
   - There was a problem with the GNSS position; open the **GNSS Control Panel** and tap **Reset Position**.

   NOTE – You can store and use the GNSS resection, even if it is out of tolerance.
10. Once you have completed the GNSS resection to your satisfaction, tap **Complete** to apply the resection and record more points.

When you complete a successful GNSS resection:

- The complete resection results are stored in raw data.
- The two resection point measurements are stored as Check Points.
- All points measured from a GNSS resection are marked as such in raw data.

Configuring GNSS: RTX

You can add points to a scene, with approximately 2 cm (0.06 ft) accuracy, by logging GNSS positions using RTX corrections.

1. In the **Configure GNSS** window, select the **RTX** GNSS Style.
2. Make sure Bluetooth is turned on on the receiver. In Capture, tap **Rover Bluetooth** to search for the receiver.
3. Tap **Test Configuration**. The **GNSS Control Panel** opens. Check the settings, then tap  .
4. In the **Configure GNSS** window, tap  .

Shooting points with GNSS

To add points to a scene using GNSS:

1. When you create a scene, select the GNSS measurement mode.
2. If you have not configured GNSS already, or if you want to change the GNSS configuration, tap **Change**. The **Configure GNSS** window opens. See Configuring GNSS: NTRIP, page 64 or Configuring GNSS: Base and Rover, page 66 depending on the GNSS style you are using.
3. When the GNSS connection is properly configured, tap **Next**.
4. In the **Rover Target Settings** screen, enter the measured target height, and select where it is measured to:
   - Bottom of antenna mount
   - Slant measure mark
   - Telescopic Rod. Select this if you mounted the GNSS Rover directly to the Trimble Telescopic Prism Rod. These rods are calibrated to measure to the center of a standard Trimble prism assembly, and Capture must compensate for this for the graduations on the rod to read true.
   - Prism Center. Select this if you mounted the GNSS Rover to the threaded top

mount of a total station prism for an integrated mapping setup. When you measure to Prism Center, you must also select which Prism Type you are using (e.g. Trimble MT1000, Trimble/Spectra Geospatial 360°, Custom). If you select Custom, you must also enter the Top Mount Offset; this is the vertical distance from the prism center to the top mount of the prism assembly.

5. Tap **Next**.
6. Shoot a GNSS reference point, which marks the origin of the scene.
7. Shoot the first GNSS Control Point. Choose a location that can be easily accessed again. Repeat for the second Control Point.

   NOTE – If required, tap  to open the **GNSS Control Panel**.
8. Click **Next** on any scene reminders.
9. Tap  .
10. In the scene editing window, at the bottom left of the screen, choose the shot type.
11. Depending on the shot type you selected, do one of the following:

    - **Single Shot**. When correctly positioned and holding the receiver steady, tap  at the bottom of the scene window to log the point.
    - **Average Shot** and **Control Point**. When correctly positioned and holding the receiver steady, tap  at the bottom of the scene window to log the point. Wait for the average GNSS position to be logged; a countdown displays in the **GNSS Average** window. If required, you can tap  to take the shot before the average GNSS position is calculated, however this may result is a position that does not meet quality standards. If you choose to log the position anyway, tap **Store Point Anyway**.
    - **Quick Codes**. Allows you to assign point or line codes to buttons so that you can add points / lines to the scene with a chosen point / line code. See Using point codes for more information on point codes. See Drawing lines for more information on line codes. When you select Quick Codes, a row of buttons displays at the bottom of the screen. Buttons which have not been assigned a code are labeled **Tap and Hold**.
      - To assign a point code to a button, tap-hold a button then select the code from the Point Code list in the **Change Point Code** window. Tap  .

- To assign a line code to a button, tap-hold a button then in the **Change Point Code** window, select the point code from the Point Code list, select **LINE**, and make sure the correct line number is selected. Tap  .

  NOTE – A line code name comprises the point code followed by a number, e.g. **EOP(1)**.
- To change the code that is assigned to a button, tap-hold it then select the code from the Point Code list in the **Change Point Code** window, and if required select or deselect **LINE**. Tap  .
- To take a shot with an assigned code, tap that Quick Code button.
- Notice the  and  /  buttons to the left / right of the Quick Code buttons. Tap  to add more empty buttons to assign codes to. Tap  /  to navigate left / right as required to access additional buttons.
- To remove all Quick Codes (for the active library), tap  / **Change Code Library**. In the **Choose Code Library** window, tap **Clear Quick Codes** then tap **Clear** to confirm.
- When you create Quick Codes, they are added to the active point code library; if you change the active point code library, you will not see Quick Codes you created in a different library.

- **Auto Distance**. Allows the continuous collection of points with a specified distance interval until intentionally stopped. Tap  at the bottom of the scene window, then enter the required distance interval in the **Distance** field that appears. Tap  again to start shooting points. Points are collected at the specified distance interval until you tap  .
  - If required, tap **Settings** / **Rover Target Settings** to edit the settings if required. See Step 4 above.
  - If required, tap **Settings** / **Layer Settings** to choose what is visible in the scene area.
  - To exit the **Auto Distance** shot type, tap the back arrow (top left of the screen).
- **Auto Time**. Allows the continuous collection of points with a specified time interval until intentionally stopped. Tap

 at the bottom of the scene window, then enter the required time interval in the **Time** field that appears. Tap  again to start shooting points. Points are collected at the specified time interval until you tap  .

- If required, tap **Settings** / **Rover Target Settings** to edit the settings if required. See Step 4 above.
- If required, tap **Settings** / **Layer Settings** to choose what is visible in the scene area.
- To exit the **Auto Time** shot type, tap the back arrow (top left of the screen).

NOTE – A few events, such as poor GNSS accuracy will stop continuous point collection, and require a restart if you want to continue.

- **Auto Stationary**. Use this method to store precise measurements with a standard rod. As long as you are moving, Capture doesn't take any measurements; it detects when you have stopped moving and then stores a point. This method is a useful alternative to the **Auto Time** if you need more time to get to your next location, and the **Auto Distance** method if you need to be properly leveled; it is however a slower shot method.

  a. Place the tip of the rod on the point you want to shoot, then level it, and hold still for three seconds.

  You can use the data collector's accelerometer data to determine when the rod is level, as determined by the data collector's sensors. If the device is attached to a pole, a level bubble displays.

  The level bubble is calibrated automatically; for auto-calibration to succeed, your data collector must be mounted securely to the rod. Capture can tell based on the sensor readings whether it is mounted to the rod or being held in your hand.

  Tap  to start, then tap  again to take your first auto-stationary shot and auto-calibrate the level bubble.

  If auto-calibration is successful, the level bubble displays  just above the line selector, bottom right of the screen.

  NOTE – The calibration is good until you tap  (Pause). You must always recalibrate on the first shot.

NOTE – If auto-calibration fails, the level bubble shows  . You can still use Auto-Stationary based on position alone. Alternatively, tap  and try again.

b. A progress bar in the bottom left fills up for three seconds, then it takes a shot.

c. Repeat as need.

- Intersecting Circles Offset. Takes two GNSS measurements and tape measurements and then solves the intersection of the two resulting circles. You can then choose one of the two possible solutions as the target point.

  a. Tap  .

  b. Pull a tape measure from the target point to a place observable by GNSS.

  c. Choose a point on the tape measure. This is the center point of the first circle.

  d. Enter the horizontal Distance on tape measure at this point, and enter the vertical offset above (positive) or below (negative) the hook end of the tape measure.

  e. Tap  to shoot Center Point 1.

  f. Swing the tape measure approximately 90° from the first center point.

  g. Enter the horizontal Distance on tape measure at this point.

  h. Tap  to shoot Center Point 2.

  i. Select Solution A or Solution B. As you choose either solution, it is displayed on the screen. Tap  to confirm.

  TIP – Shoot reference points left-to-right and Offset A will be the correct choice.

  NOTE – Elevation of the offset point is Center Point 1 Z + Vertical Offset.

- Sight Through Two Points. Calculates a distance based on two reference points measured along a straight tape measure pulled from the target point.

  a. Tap  .

  b. Pull a tape measure from the target point some reasonable distance away.

  c. Choose a front sight point along the tape measure. This point should be as close as you can get to the target point while still maintaining a good quality GNSS solution. Enter the horizontal Distance on tape measure from the front

sight point, then enter the **vertical offset** above (positive) or below (negative) the hook end of the tape measure.

d. Tap  to shoot the front sight point.

e. Move close to the end of the tape measure and tap  to shoot the rear sight point.

f. Tap  to create the point.

NOTE – Elevation of the offset point is Center Point 1 Z + Vertical Offset.

For best results:

- The front sight point should be as close as possible to the offset point
- The distance between the front sight point and the rear sight point (sight radius) should be as large as possible.

NOTES –

– A **Ghost point** (the current location of your Prism or GNSS receiver) displays as a blue dot in the scene.

– In the **GNSS Average** window, you can tap  to open the **GNSS Control Panel** if required.

– In the **GNSS Control Panel**, tap **Reset position** if required to reset the RTK computation. You might want to do this if you have a good connection to the NTRIP server but you aren't achieving a "Good" precision level.

Working with GNSS points

Select a point in the scene to open the **Edit Point x** window.

- **Edit point** to change the point's properties.
- Check Point. Check a point's expected location and its measured location.
- Begin a new line or add the point to an existing line. See Drawing Lines for more information.
- Add attachments
- Measure from this point. Measure the distance between two existing points.

Adding a Total Station when using GNSS

When create a scene using the GNSS measurement method, you may want to also record points by initiating a total station measurement. With the scene open:

1. Tap  / **Add Total Station Setup**.
2. The Total Station wizard opens. Follow the steps described for Recording points using a total station.

GNSS: checking the setup

At any time, you can verify that your GNSS receiver is taking accurate measurements by checking the setup. Use any of the following methods:

- Check Point
- Check by Tape Measure

Check Point

Use Check Point to check your GNSS setup by going back to a previously stored control point and remeasuring it. If the errors between the new point and the original point are within tolerances, your setup is good. To check a point:

1. Do one of the following:
   - Tap  / **Check Point** and select an existing point.
   - Select the point in the scene and tap **Check Point** in the **Edit point x** window.
2. If required, edit the rover target settings.
3. If required, tap  to open the **GNSS Control Panel** and check the GNSS settings.
4. Tap **Shoot**. Capture automatically calculates any error between the original point and the point you just shot, in X, Y, and Z directions..
5. If the result is acceptable, tap **Complete**. Otherwise tap **Cancel**, or **Back**.

Check by Tape Measure

Use Check by Tape Measure to verify your GNSS setup by demonstrating that a distance measured on the ground with a tape measure matches the distance between two points measured by GNSS.

1. Tap  / **Check by Tape Measure**.
2. Stretch a tape measure out in a straight line on the ground.
3. Capture prompts you to shoot the first point:
   a. Enter a distance close to one end of the tape measure.
   b. Tap **Shoot** to record a point right next to the tape measure at that distance.

   NOTE – If required, edit the rover target settings, and / or tap  to open the **GNSS Control Panel** and check the GNSS settings.
4. Capture prompts you to shoot the second point:
   a. Enter a distance close to the other end of the tape measure.
   b. Tap **Shoot** to record a point right next to the tape measure at that distance.
5. Capture automatically calculates any error. The results show:
   - the coordinates for point 1, the coordinates for point 2, and the distance between point 1 and point 2.
   - the tape measure distance at point 1, the tape measure distance at point 2, the tape measure distance between point 1 and point 2.
   - the error between the two distances.
6. If the result is acceptable, tap **Complete**. Otherwise tap **Cancel**, or **Back**.

Exporting a coordinate system

When you have logged points in a scene using GNSS, you can export a coordinate system (.csv) file. Make sure no scene is open, then:

1. On the **Scene Manager** window, tap  next to the scene you want to export the coordinate system from.

   NOTE – This option is only available for scenes that have GNSS measurements.
2. In the **Export to Coordinate System** window, select the Region, Zone, Datum, and Geoid.
3. Tap  .
4. Select where you want to save the file. It is saved as a .csv file.

Collecting scans with the Trimble X7 3D Laser Scanner, using the Trimble Perspective field software

This section covers the basic workflow for starting the Trimble X7 3D Laser Scanner and what needs to be done in the Trimble Perspective field software to store the data back to the Capture scene.

If your device is licensed for the Capture software with Perspective software, both are installed as part of the Capture software installation from Trimble Installation Manager.

The Trimble X7 scanner workflow in the Capture field software is supported on the Trimble T10 tablet.

1. Start the Capture software and create a new scene, selecting X7 Scanner as the measurement method.
2. Tap  to launch the Perspective software and connect to the X7 scanner. Refer to the *Trimble Perspective software Help* (tap  / **Help**) for information on the scanning process.
    a. When scanning is complete, tap  in the top left of the Perspective software screen, and tap **Export to Capture**. As required, select options to **Refine Project**, **Colorize Point Clouds** and if needed **Create High Quality Panorama**.
    b. Tap **Finalize**.
    c. Tap  in the top left of the screen, and tap **Back to Capture** to close the Perspective software.
3. In the Capture software, add other setups (GNSS or Total Station) and carry out any further work if required.

4. Tap  / **Close Scene**, then tap  next to the scene to export it. Select a location to save the scene to.
5. Save the scene to a computer that has the Trimble Forensics Reveal and Trimble RealWorks software installed. Refer to the Trimble Forensics Reveal and Trimble RealWorks software user documentation for further information.

About

To open the **About** window, tap  / **About**. The **About** window displays:

- The version of Capture
- Support contact information
- License information
- Hardware ID