

# Trimble TerraFlex Training Guide (Last updated March 23<sup>rd</sup> 2020)

## Creating a project in Connect

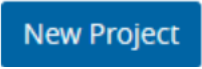
This documents describes how to create a project in Trimble Connect, and how TerraFlex users can use Connect projects to structure their data collection projects. This document is intended for TerraFlex users who are getting started in Trimble Connect.

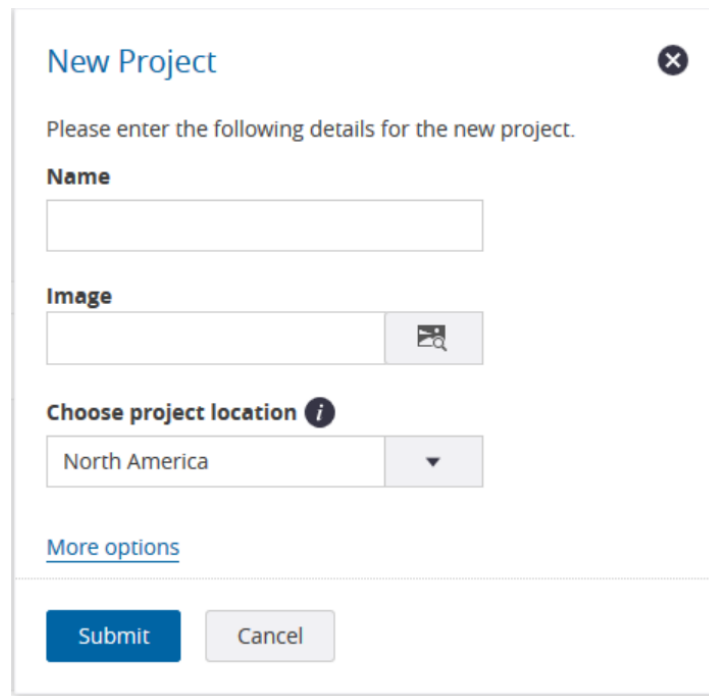
### What is a Connect project?

When you first sign in to Connect you will land on the **Projects** page. Projects act as a container for all the data and files you bring in to Trimble Connect. You can also [invite other users to collaborate on your Connect projects](#). While there is no limit on the number of Connect projects you can create, for most TerraFlex users we recommend setting up one Connect project for your company or organization and conducting all your TerraFlex work within that project.

### Creating a Connect project

To create a new project in Connect:

1. Once you have signed in to Trimble Connect, click the  button in the top left of the screen
2. After clicking on the button, you'll be prompted to enter the **Project Name**, **Project Image**, **Project Location**, and other optional details.
  - a. The **Project Location** setting controls where the data you bring in to your Connect project will be stored. We recommend choosing the location closest to you for best performance.




**New Project** ✕

Please enter the following details for the new project.

**Name**

**Image**

**Choose project location** i

North America ▼

[More options](#)

**Submit** **Cancel**

1. Once you've entered this information click the **Submit** button

### **Can't see your project after it has been created?**

If you can't see your project listed after it has been created, ensure you have selected the correct **Project Server Location** on the left hand side of the screen

### **Creating multiple Connect projects**

There are some scenarios in which it might make sense for a TerraFlex user to use multiple Connect projects:

- If your organization uses a 3rd-party or contractors to do data collection work using TerraFlex and you want to maintain strict controls on data sharing, then we recommend setting up one Connect project for your internal users, and another for your external users. While forms and templates can not be shared between projects, this set up will provide the strongest controls on data access and sharing.

# Creating TerraFlex projects

In the previous document we talked about how to create a Connect project and how they act as a container for all your TerraFlex work ([Getting Started #1 - Creating a project in Connect](#)). In this document we will talk about how to create individual TerraFlex projects.

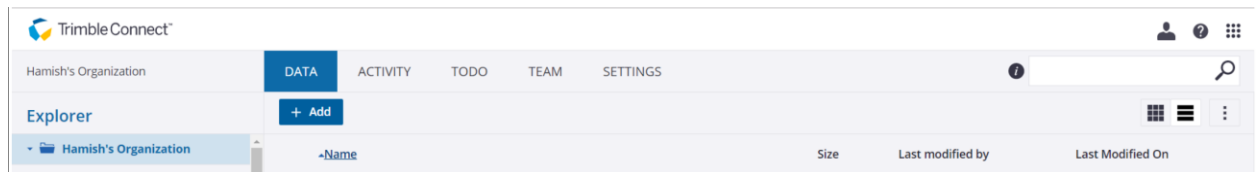
## What is a TerraFlex project?

Projects in TerraFlex are used to help structure and manage your data collection work. Templates you create and forms you collect will be contained within a TerraFlex project, and you can assign different TerraFlex projects to your field crews to work on.

## Creating a TerraFlex project:

A project in TerraFlex is based on a Map Workspace in Connect. Each Map Workspace in your Connect project will appear in TerraFlex as a TerraFlex project. To create a new map workspace:

1. Once you have opened your Connect project, click the  button



2. From the drop-down menu select **Map Workspace**
3. This will launch the Connect Map Viewer in a new browser tab where you can enter the **Map Workspace Name** and **Description**
4. Once you have entered a name and description click the **Save** button
5. You can now create templates and import layers for use in your TerraFlex project

**N.B.** If a new browser tab doesn't open when you click the Map Workspace button, check your browser is not automatically blocking pop ups

## Map Workspace files in Connect:

When you create a new map workspace, a file with the same name will be automatically created inside your Connect project. Map workspace files can be identified by the file extension **.tmap**

When you click on a map workspace file in Connect it will automatically launch the **Connect Map Viewer** and load the layers and data within your map workspace. You can bookmark individual map workspace's to make it easier to access your TerraFlex projects


# Navigating the Map Viewer

In the previous document we talked about how to use a map workspace in Connect to create a TerraFlex project ([Getting Started #2 - Creating TerraFlex projects](#)). The Connect Map Viewer is the central place for managing and viewing the data collected within your TerraFlex projects. In this document we will cover how to navigate the different functions within the map viewer

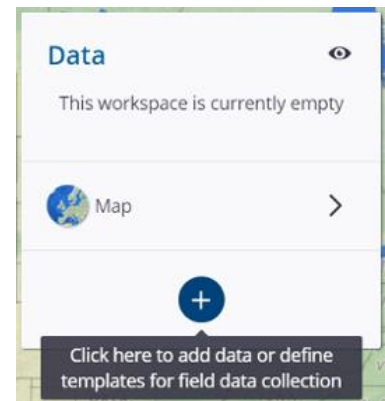
## The Data List

On the left hand side of the map viewer screen is the **Data** list. This shows all the different layers that are contained within your map workspace



When you first create a map workspace the **Data** list will be empty. To

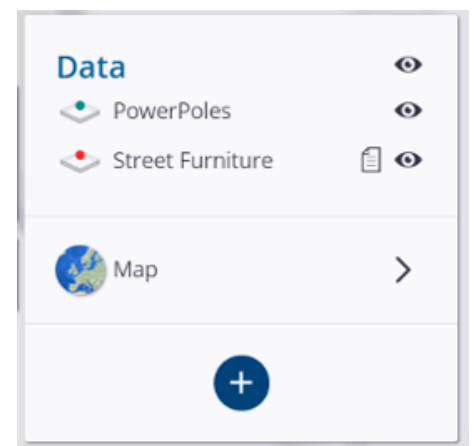
add a layer click the  button at the bottom of the **Datalist**. This will provide a range of different options for adding layers to your map workspace:

- Add New Template
- Add Existing Template
- [Getting Started #5 - Importing Data into a Map Workspace](#)
- Link to Existing Layer
- [Getting Started #6 - Caching Background Maps for Offline Use](#)



Once you have added a template or layer it will be shown in the **Data** list

- The  icon lets you toggle visibility of the layer in the map
- The  icon indicates there is a template associated with the layer. Clicking the icon will launch the template editor
- Layers in the **Data** list also have additional actions when you right click on them:
  - Zoom to Layer - zoom the map to show all data in the layer
  - Edit Layer - edit the layer name and colour
  - Duplicate Template <add link>
  - Edit Template <add link>
  - Lock Layer <add link>
  - Remove Layer - remove the layer and template from the workspace



## Top Toolbar



The selection tools provide different ways to select forms on the map.

- The Arrow lets you select a single form
- The Rectangle lets you draw a box around forms you want to select
- The Polygon lets you draw a free-form polygon around forms you want to select



The ToDo icon opens the panel for creating Tasks in TerraFlex. This topic is covered more in [<add link>](#)



The Export icon opens the panel for exporting forms from the map viewer. This topic is covered more in [<add link>](#)

# Creating a form template

In an earlier document we talked about how to use a map workspace in Connect to create a TerraFlex project ([Getting Started #2 - Creating TerraFlex projects](#)). In this document we will cover how to create a form template within a TerraFlex project that can be used to collect data in TerraFlex.

## What is a form template?

Form templates are used to define the information you want to collect in your form using TerraFlex. Typically templates are set up to capture information about real world objects or assets, or to capture information about locations that have been investigated or inspected.

## Creating a form template



1. In the map viewer click the button at the bottom of the **Data** list and select **Add New Template**
2. This will launch the **Template Editor**
3. **The Template Editor**
4. In the template editor there are three different tabs on the left hand side which control different options
5. On the **Template** tab you can configure the template name, geometry type, and accuracy based logging settings
6. From the **Fields** tab you can drag and drop different field types into your form template
7. On the **Rules** tab you can set up conditional behavior for enabling and disabling fields in your form template

## Building your template

Once you have set the name and geometry type for your template, the next step is to start adding in the fields for the information you want to capture.

The template editor allows you to drag different field types from the **Fields** tab and drop them into your template. The template editor supports the following field types:

**Text** - Text fields can store standard text and numeric values

**Number** - Number fields can store numeric values. You can set the number of decimal places to be stored, and a range that values must be between

**Length** - The Length field is similar to the Number field, except a label will be shown beside values entered into the field based on the unit selected. This helps inform users what unit the value should be entered in as. On a Trimble Geo7X with rangefinder this field will enable users to collect values using the rangefinder

**Angle** - The Angle field is similar to the Number field, except a ° label will be shown beside values entered into the field. This helps inform users what unit the value should be entered in as. On a Trimble Geo7X with rangefinder this field will enable users to collect values using the rangefinder

# Template Sample

## Point Feature

Temaplate name = Utility Pole

Type = Point

Attributes:

- ID
  - Type = Text
- Material
  - Type = Choice
  - Choice List Values
    - Concrete, Metal, Wood, Other
- Height
  - Type = Numeric
- Condition
  - Type = Choice
  - Choice Values
    - Good, Repair, Replace
- Comment
  - Add Rule based on Condition of the pole
- Date Inspected
  - Type = Date
- Photo
  - Type = Image
- GNSS Metadata files

## Line Feature

Template Name = Sidewalk

Type = Line

Attributes:

- Condition = CChoice
  - Good
  - Repair
  - Replace
- Width
- Material
  - Concrete
  - etc
- Photo

**Area Feature** - Input as needed using examples learned above

# Importing Data into a Map Workspace

With the Connect Map Viewer you can import existing GIS data into a map workspace for use in TerraFlex.

## Supported File Formats

The Map Viewer is able to import data from Shapefile and Esri File Geodatabase formats.


- Shapefiles must be zipped before uploading to the map viewer and must contain files with SHP, SHX, DBF, and PRJ file extensions.
  - Multiple shapefiles can be uploaded in a single zip file.
- File Geodatabases need to be zipped before being uploaded to the map viewer.
- Only a single file geodatabase can be included in a single zip file
- Multiple feature classes can be contained in the fgdb
- The importer does not support Feature Data set hierarchy

*Note - we recommend not exceeding 40mb for import files - this will be reviewed and guidance provided in the near future. Connect converts all files to WGS84 on import so it is recommended (although not essential) for reasons of speed, that you use files projected in WGS84*

## Uploading to the Map Viewer

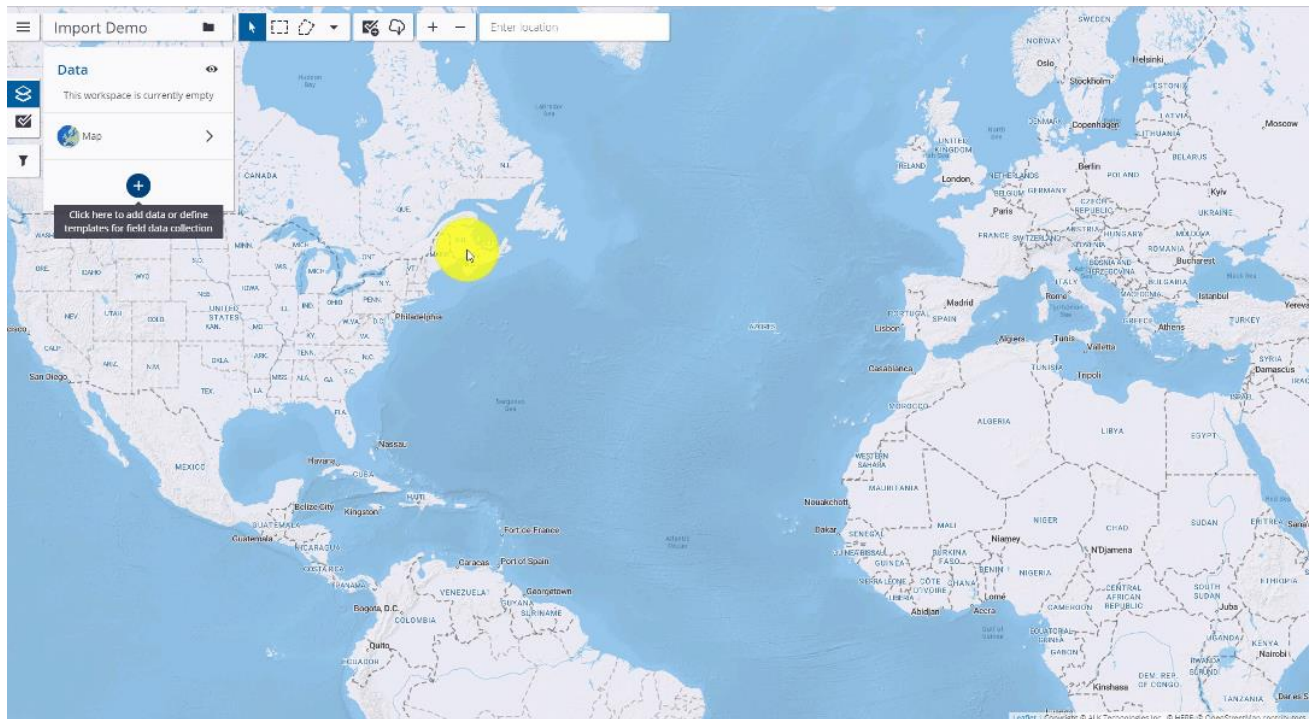
Uploading files to the Map Viewer is completed through your web browser in the Connect Map Workspace

1. Log in to [Connect.Trimble.com](https://connect.trimble.com) and browse to your *Project folder > open your Map Workspace*

2. Once you have opened your map workspace select the  button at the bottom of the **Data** menu
3. From the menu select **Import from file**
4. This will open the Import File window from which you can either drag and drop, or browse to the file on your PC that you want to import



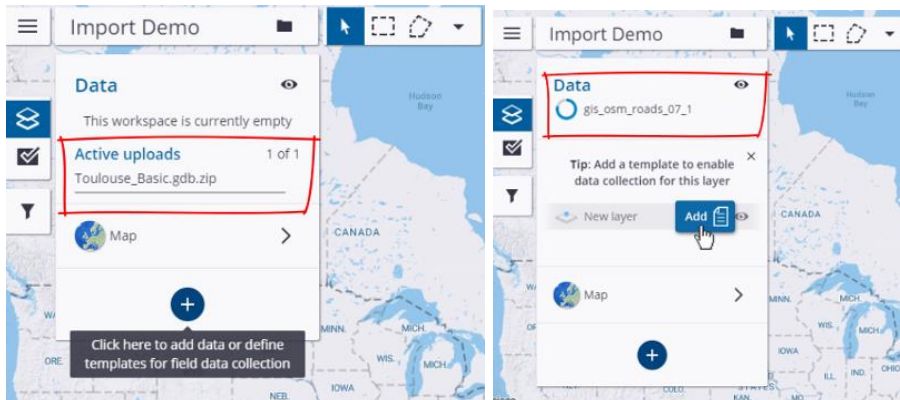
1.



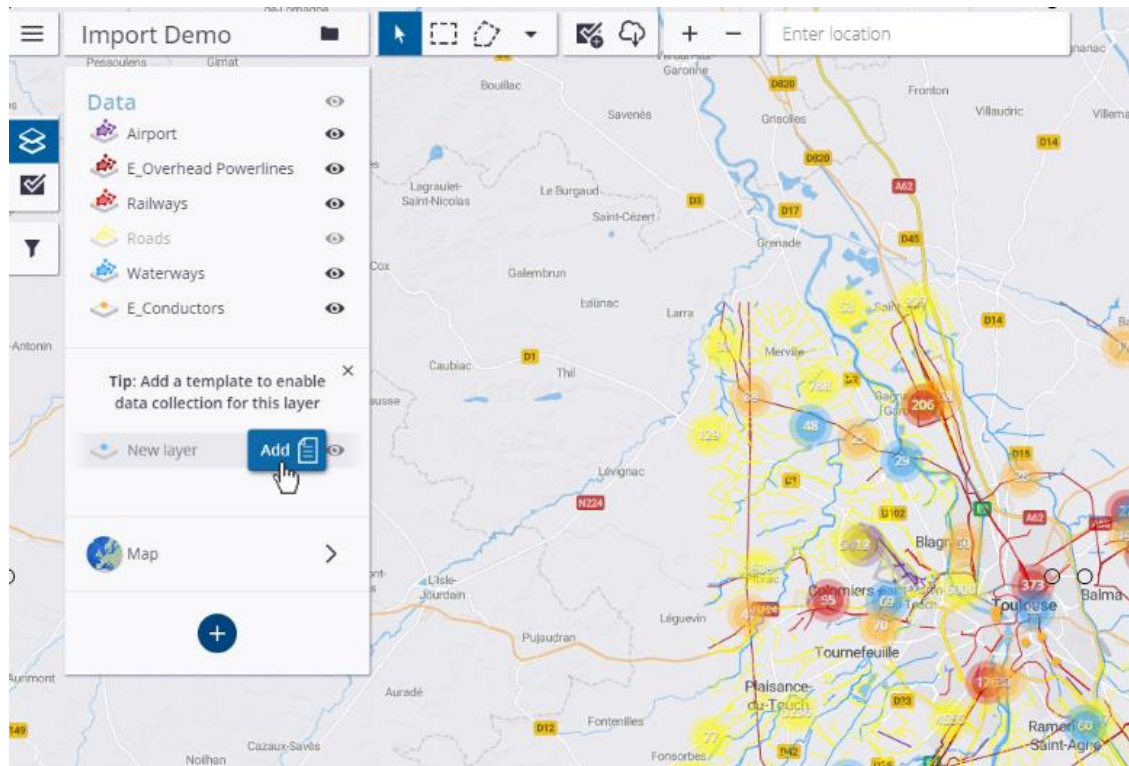
The file will go through a 2 stage upload process first uploading the file to the Connect environment then processing the data:

- **Data upload** (which is as fast as your data connection allows)
- **Data Processing** which takes longer and is based on the complexity and size of the data-set

*Note - once the first Data upload stage is complete you can close down the map page and the file will continue to process. Larger files may take some time to completely process and display so this is advised*



2. Once the file has been uploaded the data will be processed and will appear in the **Data** list as layers in your map workspace



## Caching Background Maps for Offline Use

Trimble TerraFlex supports caching background tiles for display on the map when you are working in an area without cellular or WiFi connectivity. Tile caching can be done automatically on the mobile device, or a cache can be created from the map viewer in Trimble Connect and downloaded to the device for use offline.

### Automatic tile caching on the mobile device

As you pan and zoom around the map in TerraFlex, the map tiles will be automatically cached and stored on your device. Next time you pan the map to that area, the locally stored tiles will be used instead of new ones being downloaded

### Creating a map cache in the map viewer

Using the Trimble Connect map viewer you can create a cache of map tiles for use in TerraFlex when offline.


Once the cache has been created the next time you sign in to TerraFlex the cache will be automatically downloaded and available for use

The cache uses the Trimble Map and not Satellite layer

Trimble

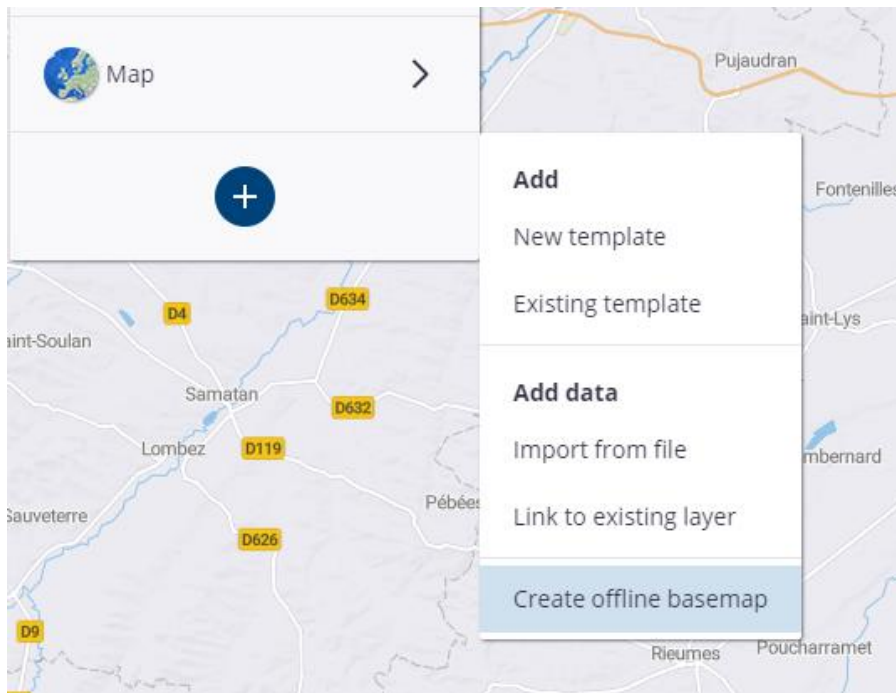


To create a cache in the map viewer:

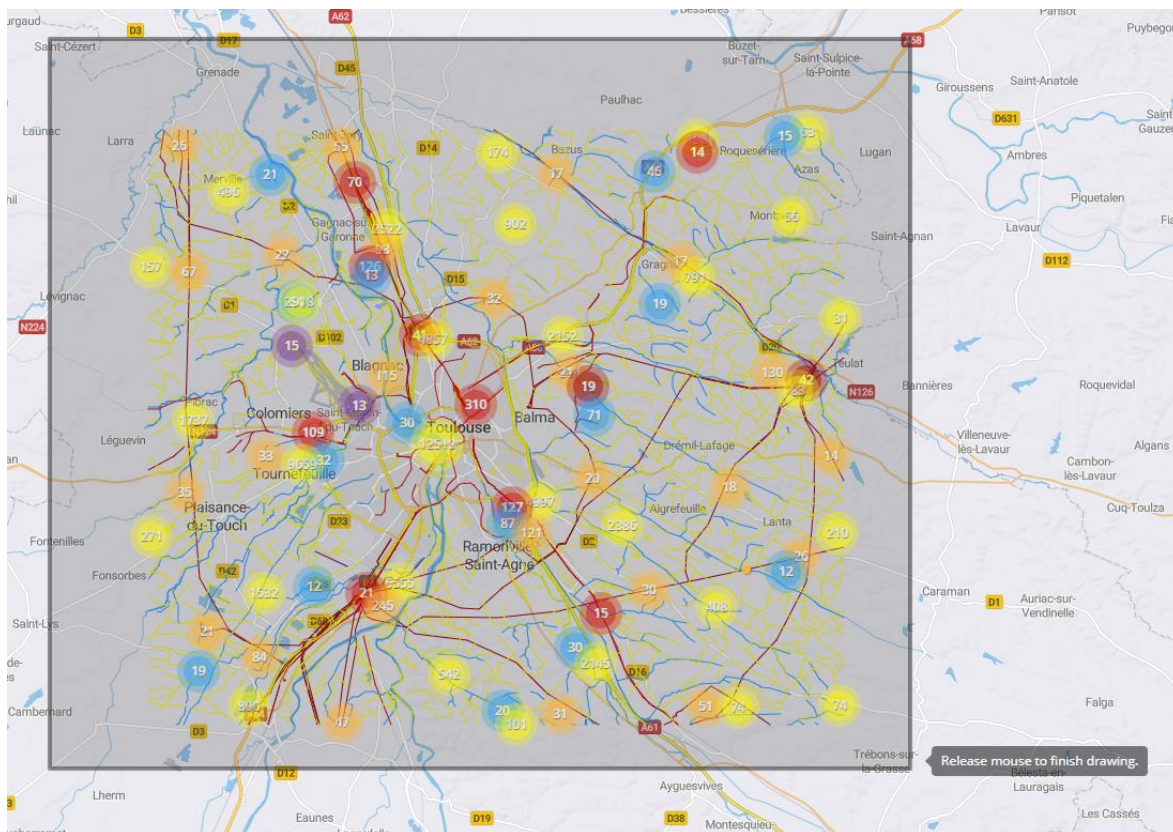
1. Open the TerraFlex project in Connect that you want to create the map cache for
2. Click the  icon at the bottom of the layer list



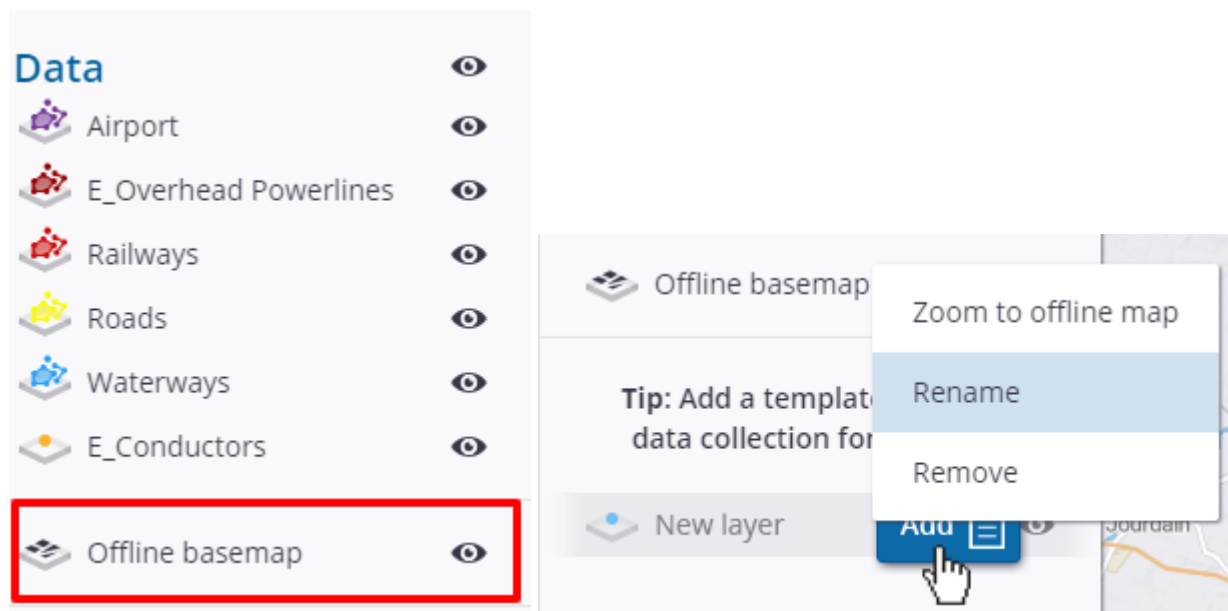
1. Choose **Create Offline Basemap** from the menu



2. Draw a rectangle around the area you want to cache and make available offline



3. Once the cache has been created, it will be listed at the bottom of the Layer menu
4. To give the map cache a name, right click and select '**Rename**'



## TerraFlex Beta - Vector Reference Layers

- **Only works with TerraFlex using TFDex Production (Trimble Connect)**
- **You have to enable the feature at login one time**

The recently released version of TerraFlex (v4.1) contains beta support for downloading and display non-editable vector reference layers on the map. This functionality is disabled by default but can be enabled for Trimble dealers and customers who are interested in providing feedback.

### How vector reference layers are supported in TerraFlex

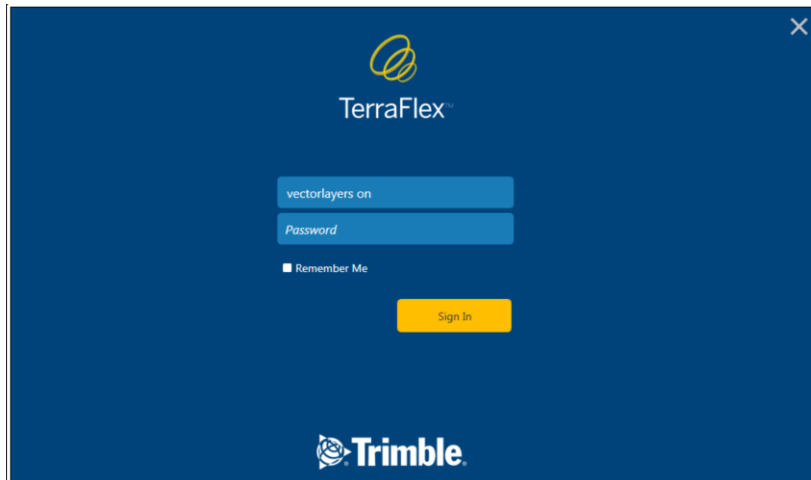
This functionality enables users to download, store, and display non-editable vector layers on the map in TerraFlex. This provides additional information and context to field users as they do their data collection activities. This functionality is only available when using TerraFlex with Trimble Connect using the TFDex Production server, and is not available on Windows Embedded Handheld devices.

When a project is selected in TerraFlex the application will query the layers within the associated map workspace in Connect. For layers that do not have a template it will download and store the features on the device. Once complete these layers will be available for display on the map, even if the user is working offline.

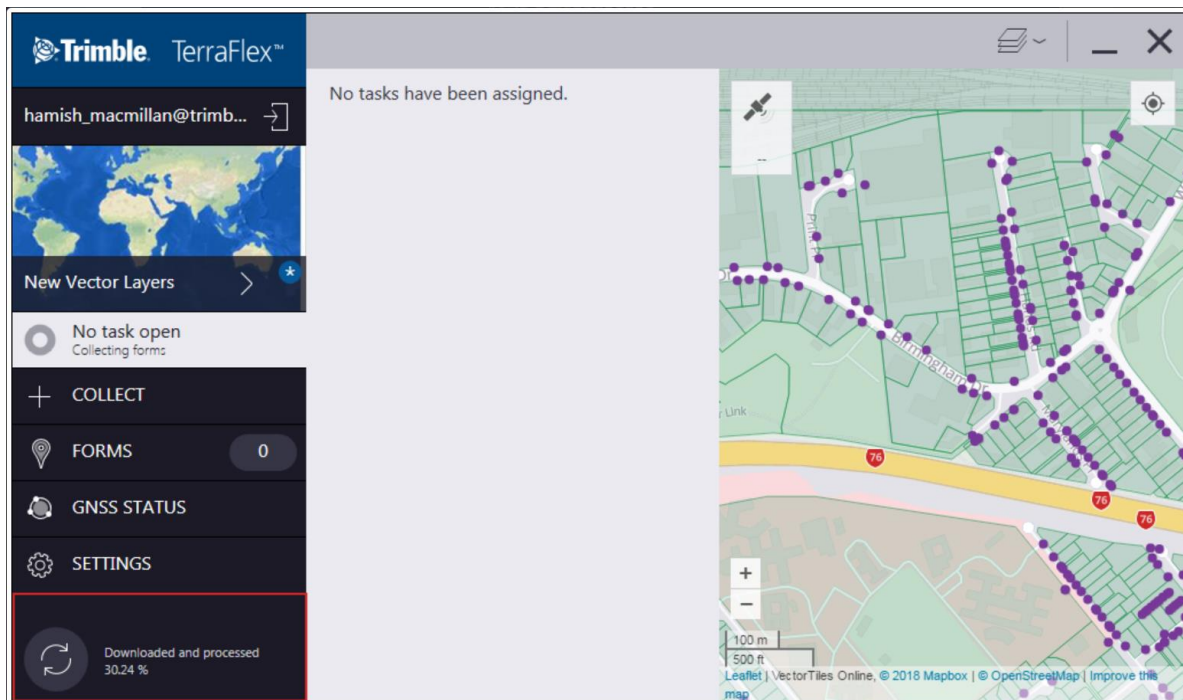
### How to enable vector reference layers for the beta

As mentioned above this functionality is only available with v4.1 of TerraFlex on Android, iOS, or Windows, and only available for users who are using TerraFlex with Trimble Connect.

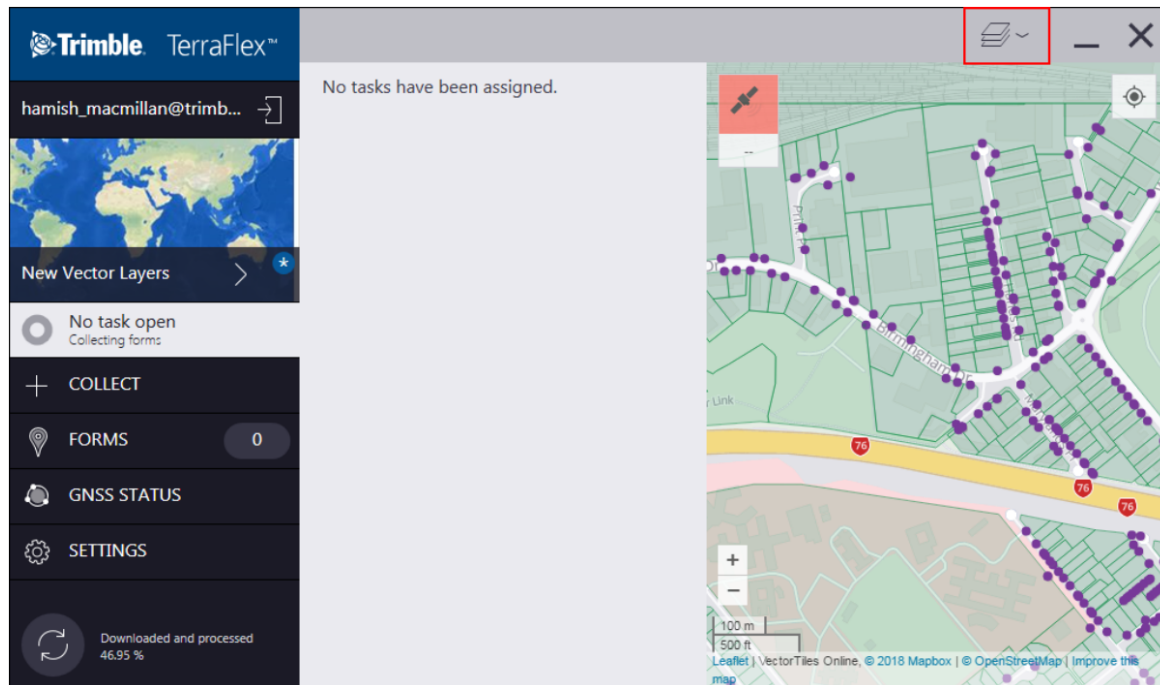
To enable vector reference layers, navigate to the Sign In screen in TerraFlex, select the *Email* field and type in 'vectorlayers on'. Then click the **Sign In** button. If successful the *Email* field should revert to the previously entered email address and vector reference layers should be enabled



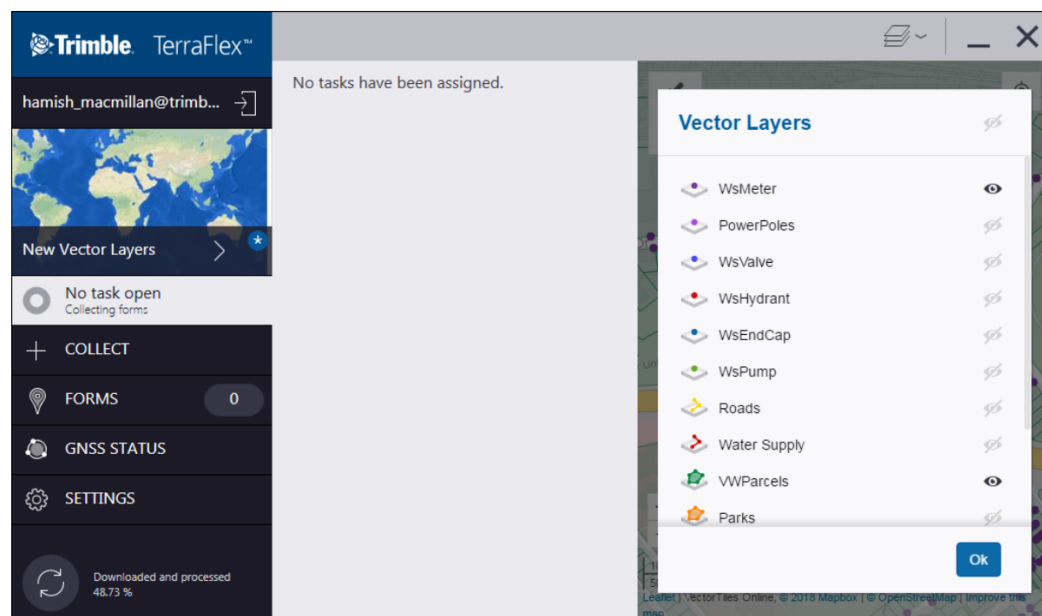
Once you have completed this step sign in to TerraFlex using your Trimble ID email and password. When you have signed in and selected a TerraFlex project the download of vector reference layers for that project will automatically begin. Download progress is shown by the sync button



To see what layers have been downloaded and to control layer visibility click on the Map Layer icon, and select **Vector Layers**



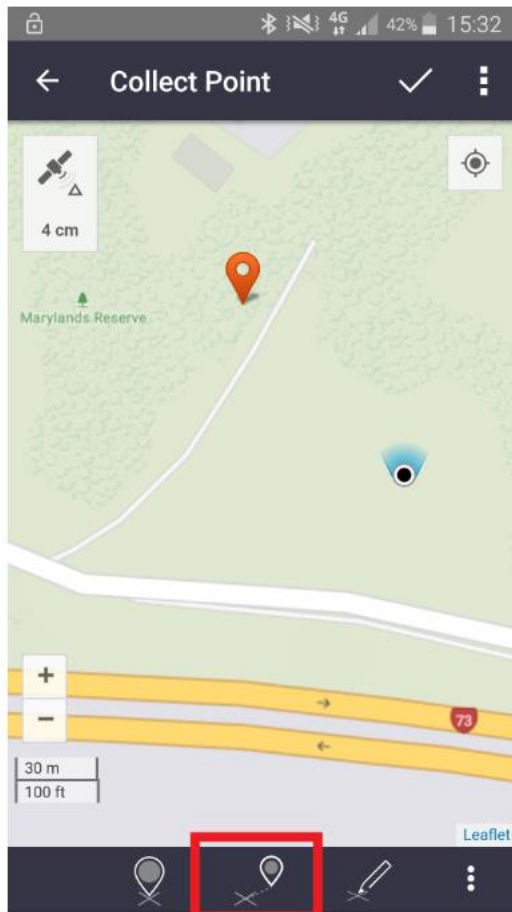
From here you can see the vector layers available, their symbology, and a toggle to control visibility





# TerraFlex Remote Feature Capture Beta

The new versions of TerraFlex with the remote capture workflow enabled. Once you have installed the new version you will need to pair your LTI TruPulse laser rangefinder to your mobile device via the OS, then choose the laser in the new Laser Rangefinder option in the Settings screen. Then when you go to collect a form the new Offset button will be available



The other change in this version is the additional of the 'Navigate to Coordinate' option in the Map screen. This allows a user to enter a coordinate and the app will guide them to it

**Note. Trimble webinar coming soon**

## Adjusting for Magnetic Declination when Capturing Offsets in TerraFlex

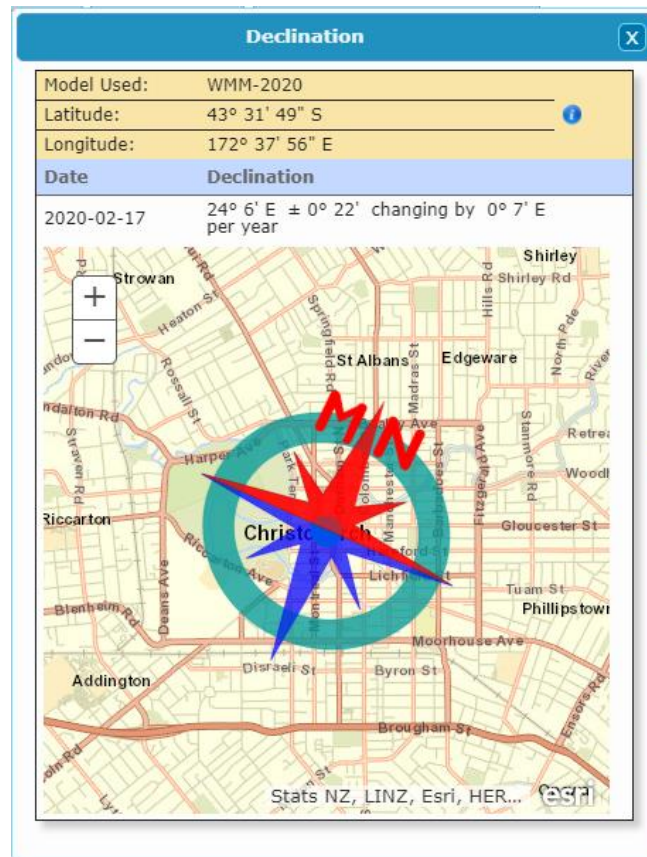
Since the release of TerraFlex v4.6 we have had a few questions from users about how to adjust for magnetic declination when capturing offsets in TerraFlex. If an adjustment is not made for magnetic declination, it can cause the location of features as measured by the laser to be incorrect.

### What is Magnetic Declination?

Magnetic declination refers to the offset between True North (geographic North Pole) and Magnetic North (the direction the North end of a compass will point based on the Earth's magnetic field). This offset will vary based on your location and will change over time. Wikipedia has a good article on magnetic declination [here](#) if you want to learn more

### How do I calculate magnetic declination for my area?

NOAA's National Center for Environmental Information has published a tool [here](#) that allows you to calculate the magnetic declination for your area. Here in Christchurch, New Zealand the offset between True North and Magnetic North is 24° 6' East



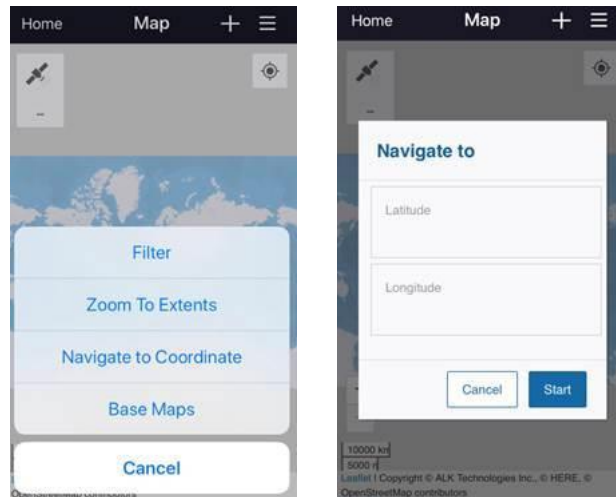
### Configuring magnetic declination for a LTI TruPulse 360 Series laser rangefinder

TerraFlex expects the azimuth/bearing reading that is output by the TruPulse 360 to be True North, so to get the right offset results in TerraFlex you need to set the magnetic declination in your TruPulse 360 laser rangefinder. The magnetic declination can not be set in TerraFlex. The [TruPulse 360 User Manual](#) has instructions for setting magnetic declination, starting on Page 24.

# Waypoint Entry in Trimble TerraFlex Field App

The latest version of TerraFlex (4.60.4.0) that was recently published (Jan 2020) now supports waypoint entry and the tool is called “Navigate to Coordinate”.

- Navigate to Coordinate is located under the TerraFlex Map window.
- Click on 3 horizontal lines and choose Navigate to Coordinate



- Enter your coordinate
  - Remember to enter negative (-) sign or W for Longitude
  - The Latitude & Longitude format will be set to Decimal Degrees. You can see what this format looks like in the TerraFlex Location status screen. You can click on the word **POSITION** to change between DMS, DD, DMS:

## Degrees Minutes Seconds (DMS)

Home Location Status	
Internal	
 65 m	 10 m
POSITION	
Latitude	29°59'52.773"N
Longitude	90°8'25.973"W
Height	0.48 m

## Degrees Minutes (DM)

Home Location Status	
Internal	
 65 m	 10 m
POSITION	
Latitude	29°59.86961"N
Longitude	90°8.43870"W
Height	0.96 m

## Decimal Degrees (DD)

Home Location Status	
Internal	
 65 m	 10 m
POSITION	
Latitude	29.997739°N
Longitude	90.140620°W
Height	0.52 m

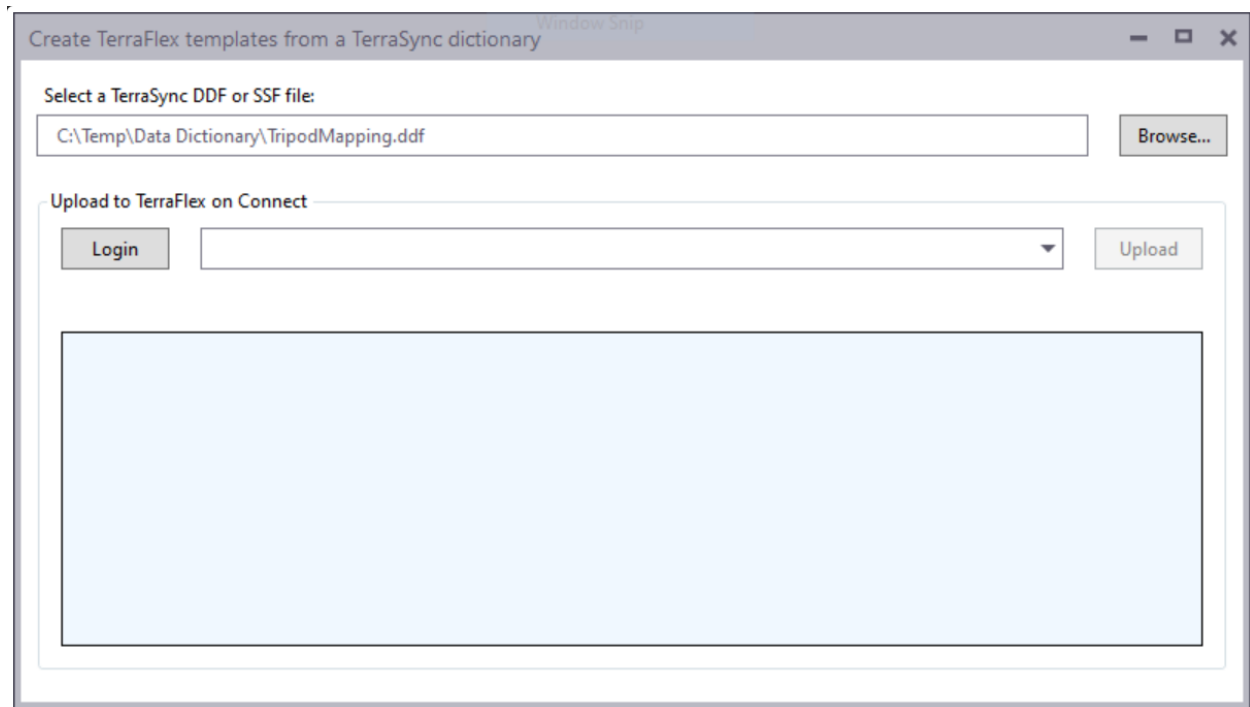
# Announcing the TerraSync2TerraFlex App

The TerraSync2TerraFlex application is now available to download. The installer for the app can be found attached to the bottom of this blog post, once installed you'll be able to run the TerraSync2TerraFlex app from Start -> Trimble -> TerraSync2TerraFlex

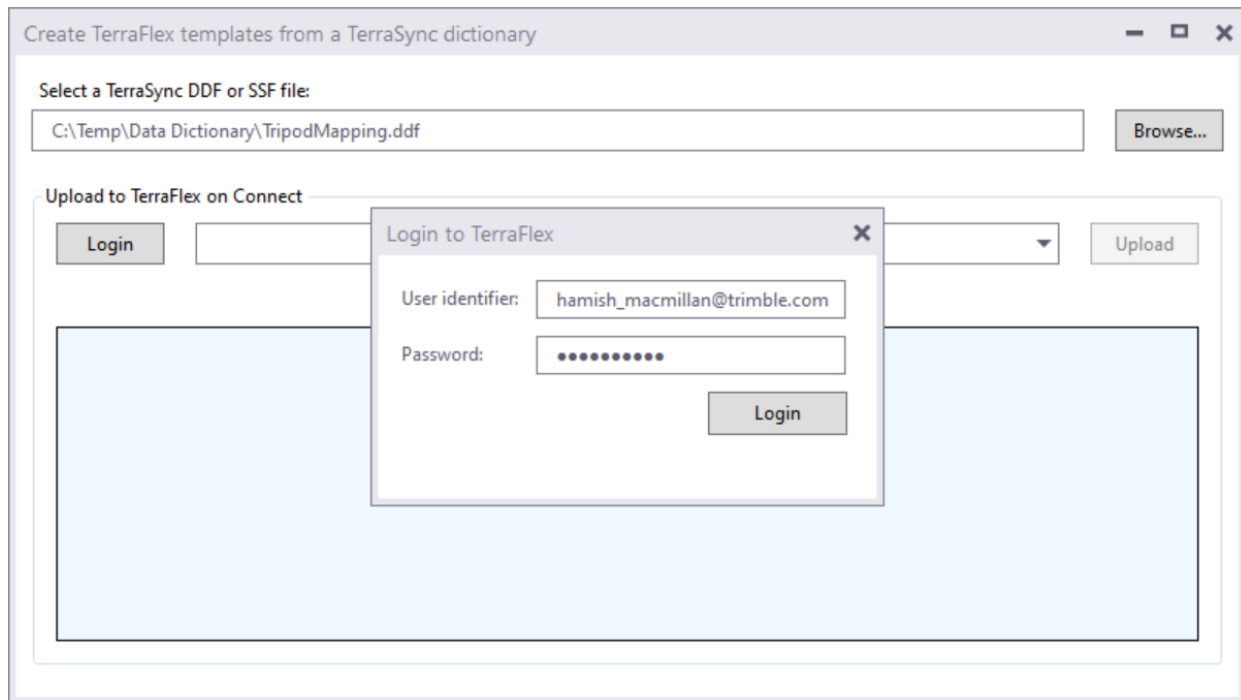
This application was developed to help users who are transitioning from TerraSync to TerraFlex by enabling them to convert their existing TerraSync Data Dictionary Files into a set of TerraFlex templates. For users who are starting to look at updating their software they can get started with TerraFlex using a set of templates they are already familiar with, and for users who are moving to TerraFlex they can continue to capture data using their existing data dictionaries

## Using the TerraSync2TerraFlex App

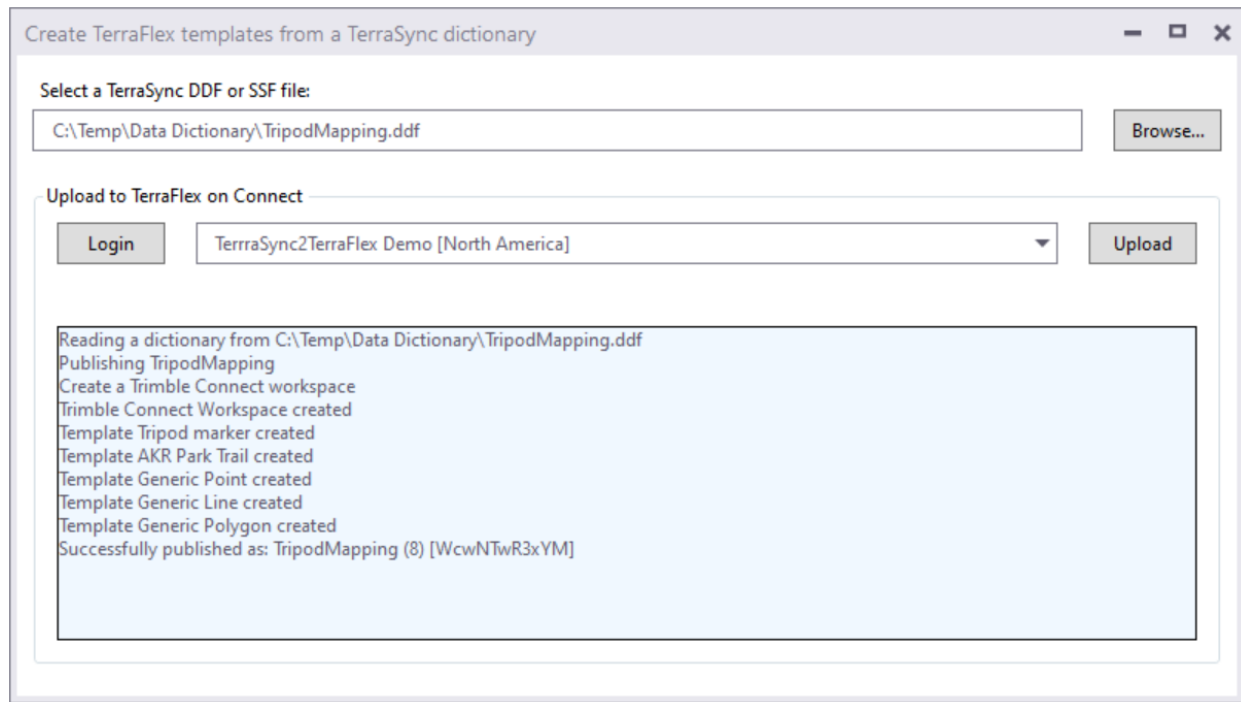
The app is reasonably simple to use. The first step is to select the DDF you want to create templates from (this needs to be a data dictionary compatible with TerraSync v5.x)



Once you've select your DDF file, the next step is to sign in using your Trimble ID



Once you've signed in the drop-down will show all the Trimble Connect projects you have access to. Select the one you want to create the workspace in and hit Publish. The app will then start creating the workspace and templates



### **What DDF elements are transferred to TerraFlex templates?**

The first version of the TerraSync2TerraFlex app will read features and attributes from the DDF file and re-create them in TerraFlex templates. This includes field names, lengths and ranges, default values, menu items, and required flag.

It will not transfer conditions from the DDF and re-create rules in the templates. At this stage the rules will need to be manually created

We are looking for feedback about what additional functionality this app could have to help users who are migrating from TerraSync to TerraFlex. If you have any comments or questions please post them below

[TerraSync2TerraFlex exe download](#)

# Getting Started: TerraFlex Offline Workflow with Trimble Positions

## Introduction

When used with TerraFlex v4.4, Trimble Positions Desktop add-in v10.7.1.1 opens up a new workflow - **TerraFlex with Offline Data Transfer and Post-Processing**. While we work to provide all-new Trimble Positions Desktop add-in documentation on the [Trimble Geospatial Help Portal](#), we hope that this Getting Started document will get you up and running. For detailed information on installation, the [Administration Guide](#) from v10.5.0.1 can still be used. For more information on post-processing, the [User Guide](#) from v10.3.0.1 can still be used. We have also recently added a [FAQ](#) document on Trimble Community that is accessible to our distribution channel.

This guide presumes you have performed the following steps, all of which are required for full operation:

1. Installed the [v4.4](#) version of TerraFlex on your Android or Windows device.
2. Procured a subscription (license) for TerraFlex.
3. Installed the [v10.7.1.1](#) version of the Trimble Positions Desktop add-in on your desktop machine ([release notes](#)) where ArcGIS Desktop (10.1 - 10.7.1) is installed.
4. Licensed Trimble Positions Desktop add-in using the *Trimble Positions License Administrator* application.
5. Configured an office database for Trimble Positions using the *Desktop Configuration* application.
6. Enabled the “extension” portion of the Trimble Positions Desktop add-in by using ArcMap’s *Customize...Extensions...* menu.

## Creating a Project

The workflow in Trimble Positions Desktop add-in always starts with creating a project from your map document. Your map document should be authored with the layers you want to use for data collection and maintenance. All “constraints” such as data type, required/not-required, domains, default values and subtypes defined in the underlying feature classes will be respected in the project. Display settings such as layer and field names (aliases) and display fields set through the layer properties of the map document will also be used. If you want to collect photos with your features, enable the appropriate feature class(es) for attachments. All layers to be used for data collection in the project must be in the same underlying workspace (geodatabase).

To create a project:

1. From the *Trimble Positions* toolbar in ArcMap, click the “Trimble icon” button - this is the *Show Trimble Positions Desktop Administration Window* button.
2. In the *Desktop Administration* window, click the *Projects* button. This will open the list of projects stored in your Trimble Positions database. Projects highlighted in blue can be opened with the current map document (i.e., they reference the same workspace). A project highlighted in green is currently loaded in the *Dockable Window* for current work.
3. In the *Projects* screen, click the *Create...* button. This will launch the *Project Wizard*.
4. In the *Project Type* (first) page of the *Project Wizard*, select the type of project to create: **TerraFlex Offline**

The screen will display any errors or warnings based on the current map document. Click *Start* to continue.

5. In the *Layers* page of the *Project Wizard*, select the layers you want to use for data collection and maintenance. Click *Next* to continue.
6. In the *Layer Settings* page of the *Project Wizard*, click a layer to specify which existing attributes should be used for TerraFlex autofields. For file and personal geodatabases, you also have the option to specify “new” fields that will be created in the geodatabase when the project is saved. Scroll to the bottom to see metadata fields that only get populated in the office after check-in (e.g., they won’t be included in the field data collection form). To set all of the “common” autofields for a layer, click the *Add all autofields* link at the top of the section. Use the *Accuracy Threshold* section to specify the required accuracy for the feature. This can be set for multiple layers at the same time. Click *Next* to continue.
7. In the *Correction Settings* page of the *Project Wizard*, select one or more field configurations to include with the project. These are the settings for the correction sources. They will be the ones available in the *Settings...Real-time Configuration* select list in TerraFlex. To create a new field configuration, click the *Create...* button.
  1. In the *General* page of the *Field Configuration Wizard*, provide a name and description for the field configuration. Only the name will be visible from within TerraFlex.
  2. In the *Real-time Settings* page of the *Field Configuration Wizard*, specify the first and second choices for the correction source. Use the “wrench icon” button to configure *Internet* (NTRIP or direct) sources - type, address (IP or URL), port, mountpoint (use the “...” icon to populate and select), username, password, and correction datum (use the “...” icon to select).
  3. In the *Logging Settings* page of the *Field Configuration Wizard*, provide information about the base station(s) you intend to use for post-processing data collected in this project - distance to the base station from data collection and GNSS constellations supported by the base station. These are only used to help calculate the *estimated* post-processed accuracy (PPA) in the field and are not used during actual post-processing. If you are unsure of what to use here, the default selections are appropriate in most cases. Click *Finish* to store the field configuration.
8. In the *Project Settings* page of the *Project Wizard*, provide a project name (must be unique within the Trimble Positions database), select the accuracy reporting setting (default is RMS - 68%), and specify how you want feature heights handled - use ellipsoidal heights, apply fixed geoid separation, or calculate heights (typically orthometric) using one of the installed geoid grid files. The project will also be associated with the current map document. Click *Finish* to store the project.

You should now have a TerraFlex Offline project created and set for use.

## Checking Out Data

Once you’ve created the project, all day-to-day work of managing data going to and from the field is done using the *Trimble Positions Dockable Window* in the add-in (typically docked at the bottom of the ArcMap window). The *Dockable Window* only works with the currently open project. By default, the last used project (for the current map document) will be opened when you start ArcMap and open a map document but you can use the *Projects* area of the *Desktop Administration* window to open a different project (select and click *Set Current*).

To check-out the project for sending to TerraFlex:



1. Confirm that the desired TerraFlex Offline project is open and visible in the *Dockable Window*. If the *Dockable Window* is not visible, click the “Geo icon” button in the toolbar - this is the *Toggle Trimble Positions Desktop Dockable Window Visibility* button and can be used to hide or show the window.
2. If you only need to take empty schema to the field for new data collection, clear the feature selections in ArcMap and click the *Handle Sessions* button and select the *Check-out to a TerraFlex database* context menu item. To check-out existing features for data maintenance (the layers must be included in the project), use your choice of ArcMap selection tools (spatial, by attribute, etc.) to first select the desired features prior to clicking the button.
3. In the *Check-out Window*, select an existing TerraFlex database (.tfm) or specify a filename to create a new one. This is the file that you will need to transfer to the field. If you had selected features prior to check-out, a task will be created - provide the name and notes for this task. You can check-out multiple projects and tasks into a single file by repeating this step. Use the *Show contents...* link to see what’s already in an existing database. It is recommended to use a descriptive name for the database file - it will default to the name of the current project (minus spaces and illegal characters). The name is not visible within the TerraFlex field application. Click *Check-Out* to complete this step.
4. Locate the .tfm file you created or used and transfer it to the TerraFlex field device. This can be done by any variety of methods such as USB transfer, email, mobile device management software, or cloud sharing (e.g., Google Drive, Microsoft OneDrive, Dropbox, etc.). Although users are likely already comfortable transferring files to and from Windows computers, it may require a few new skills to do the same with Android devices where the operating system typically hides some of that experience. With some Android devices, directories do not refresh their contents until the USB is disconnected and reconnected.
5. From the Android or Windows device running TerraFlex v4.4, use the appropriate mechanism (matching whatever you used in the office) to locate the .tfm file. Both Android and Windows have the concept of a “downloads” (technically \Download on Android) folder which is used by default when downloading files from email or cloud sharing apps. Various file manager applications are available through the Google Play store including Google’s own *Files* application.
6. **The most important step in the process:** The .tfm file must be placed into a sub-folder of the common TerraFlex folder based on the username of the TerraFlex user with the “-offline” suffix, as below:  
 On Android: (Internal Storage)\TerraFlex\[sampleuser@sampledomain.com-offline](#)  
 On Windows: (Windows Drive)\Users\<windowsuser>\Document\TerraFlex\[tfuser@tfdomain.com-offline](#)  
 ...where [tfuser@tfdomain.com](#) is the email address of the TerraFlex user who will be logging in.
7. You are now ready to login to TerraFlex. If you performed step 6) while TerraFlex was open, you should logout, close it, re-open it, and sign-in again.

## Field Data Collection & Maintenance

Once the check-out data (.tfm file) has been put into the appropriate offline user folder on the TerraFlex device, you are ready to begin using TerraFlex for data collection and maintenance activities. After logging in to TerraFlex using the Internet (login can be cached for up to 30 days), the operation of TerraFlex is nearly identical to the traditional, cloud workflow with a few differences:

- If you stored multiple projects in the check-out file, you will be able to switch between them the same way you would with the traditional TerraFlex cloud workflow.
- If you checked-out existing features as tasks, you can use them the same way you would with the traditional TerraFlex workflow.

- To select a real-time correction source, use the *Settings...Real-time Configuration* application menu item to select one of the configurations you stored with the project.
- To view the predicted post-processed values (PPA) alongside the real-time estimated accuracy (CEA), use the *Location Status* application menu item. These will be reported based on the accuracy reporting setting of the project (68% or 95%) and the best of CEA/PPA will be used to drive accuracy based logging.
- During feature geometry collection, all point and line/polygon vertex geometries will log 10 positions and calculate a weighted average (based on the accuracy of each position).
- When you are done collecting data, use the *Extract Forms* project menu item (in lieu of the *Remove Forms* menu item in the traditional cloud workflow). This will extract any new or updated forms into a .tfout package that can be transferred back to the office using the reverse mechanism as before. This will create a .tfout file in the common \TerraFlex folder with the project name and a timestamp. On Android, you will also be prompted to *Share* the file when the process completes - this is built-in Android functionality that can be used to easily send the file to email or a cloud sharing app. Alternatively, you can always locate the file on disk in the common \TerraFlex folder.
- You can use *Extract Forms* any time you are ready to send data back to the office. There is no explicit limit on how many forms can be included in one extraction. In addition to the forms, this extracted file will include the GNSS measurements and feature constructions (i.e., "sessions") necessary for post-processing.
- You do not need to transfer a new .tfout file to the field every time you want to collect data - only when sending new projects, tasks, or changes to an existing project.
- Once the data has been transferred off the device, you are ready for check-in on the desktop.

## Setting Up Post-Processing

Prior to check-in and post-processing of data, you will need to setup one or more *Processing Profiles* in the Trimble Positions Desktop add-in. These profiles are shared between projects.

1. From the *Desktop Administration* window, click the *Processing Profiles* button. This will open a list of existing profiles that have been created.
2. From the *Processing Profiles* list screen, click the *Create...* button to start creating a new profile.
3. From the *Edit Profile* window, provide a name and choose a method for base data usage:  
*Using a single base station:* this is the traditional method using the Trimble Community Base Station (CBS) list  
*Using a folder or specific base files:* this is for when you download base data manually  
 Use the *Processing Options* area for specifying detailed post-processing behavior.  
 You will most likely use the defaults on this screen. Click *Select...* to pick a base station from the CBS list.
4. From the *Select Base Station* window, use the radio buttons at the top to find base stations closest to a selected city or the *Current map center* (best to do this while you have your map document open). The list will indicate whether the base station has dual frequency and GLONASS data and will be sorted by distance to the city or map center. The *Update List* button can be used to download a new CBS list from Trimble (can also be done using the *Desktop Configuration* app). You can also use the functionality in the *Base Station* area at the bottom to create new "user base station" entries in the list. Click *OK* (on two screens) to complete the process. You should now see the profile in the list.
5. As data is checked-in, Trimble Positions will keep track of the unique usernames used in TerraFlex Offline (or in other workflows, unique devices). From the *Desktop Administration* window, click the *Devices* button to open this list. Here, you can select an entry

and use the *Set Profile...* button to assign a default processing profile for this user or device. This can simplify the post-processing user experience a bit (covered below).

## Checking In Data

With the collected data in the .tfout file being available back in the office, you are ready to use ArcMap and the Trimble Positions Desktop add-in for check-in.

1. Confirm that the desired TerraFlex Offline project is open and visible in the *Dockable Window*. If the *Dockable Window* is not visible, click the “Geo icon” button in the toolbar - this is the *Toggle Trimble Positions Desktop Dockable Window Visibility* button and can be used to hide or show the window.
2. From the *Dockable Window*, click the *Handle Sessions* button and choose the *Check-in from a TerraFlex database* context menu item.
3. In the *Check-in Window*, use the “...” button to select the .tfout file you got back from the field. This will display summary information about the database and enumerate the data that can be checked-in.  
Data will be summarized by task with new data collection being categorized under the *New Data Collection* header. You will likely notice that data has been automatically been broken into sessions depending on the usage pattern in the field - this is expected.
4. Select the desired sessions and click the *Check-In* button to complete the process. This will bring the sessions into the Trimble Positions database and will also store the features (with their current geometries and accuracies) in the geodatabase. You will be notified of any problems in the check-in.
5. You are now ready for post-processing and QA/QC.

## Post-Processing & QA/QC

After check-in, you will see one or more sessions of data in the *Dockable Window*. You should also see graphic outlines displayed on the map - these are an indication of session extents and are color coded by status of the session. At this point, the workflow is identical to any other post-processing workflow in the Trimble Positions Desktop add-in (TerraSync, ArcPad + Positions). The sessions are stored in the Trimble Positions database and include the feature geometries and constructions - more granularity than can be stored in the geodatabase. At check-in, features in the Trimble Positions database get linked to the features stored in the geodatabase.

1. From the *Session List* (default) panel in the *Dockable Window*, use the *View Features* button to see the list of features in a selected session. This switches to the *Edit Session* panel of the *Dockable Window*. From here you can view (sortable) feature details including accuracy and antenna type as well as *Zoom To* the feature. You will also see features flagged as not meeting the specified accuracy threshold (can be marked as an *Exception* or *Unlinked* from the feature in the geodatabase). Use the *Display estimated accuracy outlines* checkbox to turn on a visual indicator of feature accuracies. Right-click in the feature table and choose the *Export features to Excel...* context menu item to generate data for Excel. If you made changes to features, click *Apply* (stays on this panel) or just *Finish*. Remember that at this point, you have only changed the Trimble Positions representation of the feature geometry - these have not yet been applied to the geodatabase.
2. Continuing on to more granularity, use the *View Positions* button to see the list of positions in a selected feature. This switches to the *Edit Feature* panel of the *Dockable Window*. From here you can view (sortable and groupable) position details including construction hierarchy, observation

time, status, and accuracy. To view even more detail, use the *Show Extended Data* checkbox at the top - this adds vertical accuracy, correction type, PDOP, satellites, and antenna height. Use the *List View* or *Tree View* radio buttons to choose the desired layout (only really useful for line and polygon features with a mix of construction types). Use the *Display estimated accuracy outlines* checkbox to turn on a visual indicator of position accuracies. Right-click in the position table and choose the *Export positions to Excel...* context menu item to generate data for Excel. To remove (or re-add later) specific positions from the geometry construction, use the checkboxes in the list or the *Use All* button to include all of them. The *Edit...* button is only used with offset construction types. Click the *Finish* button to return to the previous *Edit Session* panel where you will need to use *Apply* (stays on the *Edit Session* panel) or *Finish* (returns to the *Session List* panel).

3. From the *Session List* panel, select one or more sessions and click the *Correct...* button to begin post-processing. This will open the *Correct Sessions* window.
4. In the *Correct Sessions* window, you'll see the list of sessions that you selected for post-processing. Use the *Processing Profile to Use* list to choose a profile to use for post-processing. They will be sorted by distance from the session and any default profile (for the user/device) will be the first choice in the list. Click the *Correct* button to begin processing. Detailed status and progress messages will be displayed in the large area to the right. These messages will also be saved to the Trimble Positions Desktop add-in log file. You can also use the *Save to file...* link to store just those messages to a new file. Close the window when the screen indicates that processing is complete (a summary will be presented at the bottom of the progress notification area).
5. At this point, you will see the updated status of the session(s) in the list. You can also use the functionality described in 1) and 2) above to view the *new* feature geometries and positions which will reflect the post-processed accuracies. The feature graphics displayed on the map will indicate the new (pending) feature geometries which still have not yet been applied to the geodatabase (see 6) below).
6. From the *Session List* panel, select one or more sessions and use the *Update Features* button to apply the new feature geometries to the geodatabase. This will also update all relevant autofields and metadata attributes as well.
7. For additional QA/QC functionality in the *Session List* panel of the *Dockable Window*, right-click a session entry in the table and choose one of the context menu items:
  - Zoom to*: zooms to the selected session (same as the *Zoom To* button)
  - Restore to original*: restores all feature geometries and accuracies to their original state (before post-processing and editing); useful for re-doing the processing step#
  - Show troubleshooting info*: opens a window showing graphs of satellite count and average signal-to-noise ratios (SNR) for the session
  - Properties*: opens a list of technical properties of the session
8. Once you are done with a session (they do take up some space in the Trimble Positions database) and have already updated the geodatabase with the results of post-processing, you can use the *Remove* button on the *Session List* panel to delete sessions from the Trimble Positions database.

# TerraFlex Offline Data Transfer Frequently Asked Questions

If you have any questions about the TerraFlex Offline Data Transfer workflow please ask them in the Comments section below and we can add them to this list

- [Supported Platforms](#)
- [What platforms are supported in the initial release?](#)
- [Will the iOS version of TerraFlex support the offline data transfer workflow?](#)
- [Will Trimble Catalyst be supported in the post-processing workflow?](#)
- [Will this workflow be supported in the Trimble TerraFlex add-in for ArcMap?](#)
- [Offline Data Transfer Workflow](#)
- [What are the .tfin and .tfout files?](#)
- [What options does a user have to transfer .tfin and .tfout files between field devices and their office PCs?](#)
- [Where on the device does the .tfin file need to be placed for TerraFlex to load it?](#)
- [Where does the .tfout file go when the user extracts it?](#)
- [Can you add multiple tasks to a single .tfin file?](#)
- [I can't see my .tfout file on the TDC100 or TDC150 when plugged in via USB](#)
- [Post-processing Workflow](#)
- [Do I need to manually start the logging of measurement data for post-processing?](#)
- [Is there a 7 day limit on data collected for post-processing, similar to TerraSync?](#)
- [What are sessions in Trimble Positions? How are they created in TerraFlex?](#)
- [What is the PPA value?](#)
- [Licensing](#)
- [What TerraFlex license is required for the Offline Data Transfer workflow?](#)

## Supported Platforms

### **What platforms are supported in the initial release?**

The TerraFlex offline data transfer workflow will be supported in the Android and Windows versions of TerraFlex. Post-processing in this workflow is supported using the Trimble R2 GNSS Receiver, Trimble R1 GNSS Receiver, Trimble TDC150 handheld, and the EM100 GNSS module on Android and Windows platforms

### **Will the iOS version of TerraFlex support the offline data transfer workflow?**

The offline data transfer workflow isn't supported in the iOS version of TerraFlex

### **Will Trimble Catalyst be supported in the post-processing workflow?**

Our goal is to support Trimble Catalyst in a future release

### **Will this workflow be supported in the Trimble TerraFlex add-in for ArcMap?**

The offline data transfer workflow will only be available in Trimble Positions Desktop add-in. The TerraFlex add-in for ArcMap that we provide free to users will only support cloud based workflows

# **Offline Data Transfer Workflow**

## **What are the .tfin and .tfout files?**

The .tfin file is created in Trimble Positions and contains the TerraFlex projects, templates, forms, and tasks. The .tfin file is the one which is copied onto the users device and imported in to TerraFlex

The .tfout file is created in TerraFlex when a user extracts their new and edited forms and includes raw GNSS measurement data required for post-processing and any images captured in forms. The .tfout file is the one which is copied from the users device and imported in to Trimble Positions

## **What options does a user have to transfer .tfin and .tfout files between field devices and their office PCs?**

The offline data transfer workflow was originally designed for users who can not have their feature data stored or transferred through public cloud services. For these users the best method for transferring files is via USB. Users can plug their device in to a PC and transfer the .tfin and .tfout files

Some organizations might have their own private data sharing platforms, like email or a VPN, which can also be used to transfer files between the field and the office.

Alternatively public data sharing platforms like DropBox and Google Drive can also be used to transfer files

## **Where on the device does the .tfin file need to be placed for TerraFlex to load it?**

### **On Android:**

TerraFlex expects the .tfin file to be located in a folder like "[ericb@trimble.com](mailto:ericb@trimble.com)-offline". The email address in the folder name needs to match the email address the user will use to sign in to TerraFlex. This folder needs to be located within the TerraFlex folder on the Android device  
Then when I sign in to TerraFlex using my [ericb@trimble.com](mailto:ericb@trimble.com) account TerraFlex will load the .tfin file located in there

### **On Windows:**

## **Where does the .tfout file go when the user extracts it?**

### **On Android:**

The Extract Forms action in TerraFlex will give the user the option to either save the file locally on the device, or share the .tfout file using sharing apps on their Android device (email, Google Drive, etc.). If the .tfout file is not shared then it will be located in the TerraFlex folder on the device

### **On Windows:**

## **Can you add multiple tasks to a single .tfin file?**

Yes!

You can use the check-out option in Trimble Positions with different sets of features selected and add a new task to a previously created .tfin file

## **I can't see my .tfout file on the TDC100 or TDC150 when plugged in via USB**

On the TDC100 and TDC150 you may need to restart the device before .tfout files created from TerraFlex will be visible when plugged in to a PC via USB

## **Post-processing Workflow**

### **Do I need to manually start the logging of measurement data for post-processing?**

Measurement logging will start automatically when TerraFlex connects to the GNSS receiver and will continue as long as the connection is maintained

### **Is there a 7 day limit on data collected for post-processing, similar to TerraSync?**

In TerraSync you could only collect seven days of raw GNSS measurement for post-processing before needing to start a new SSF file. There is no limitation like this in TerraFlex, users can collect data for an unlimited amount of time before needing to extract forms, although we recommend extracting forms regularly

### **What are sessions in Trimble Positions? How are they created in TerraFlex?**

When a .tfout file is checked in to Trimble Positions from TerraFlex it's likely several sessions will be added to the dockable window. In TerraFlex and Trimble Positions a session represents a continuous period of data collection activities. When TerraFlex first starts up and connects to a GNSS receiver it will start a session, that session will continue until one of the following happens:

- User closes TerraFlex
- User selects a different project
- User selects a different task
- User disconnects from the GNSS receiver
- User changes the antenna type

### **What is the PPA value?**

PPA stands for **P**redicted **P**ost-processed **A**ccuracy and represents an estimate of what the post-processed error will be for that position or form. The PPA calculator uses the raw GNSS measurements being logged by TerraFlex and combines that with the base station distance and GNSS constellations set in the field config to produce the estimate. This is the same process that is used in TerraSync.

The PPA estimate will not be perfectly reliable - the algorithm that calculates the PPA value can only use the information it has available to it at that time, plus some historic information about GNSS measurement quality. i.e. it knows that you are getting degraded GNSS

measurements at the current time, because you are standing under a tree, and so shows a higher PPA estimate

What it doesn't know is what your GNSS measurement quality will be like in the future. The post-processing engine running inside Trimble Positions is able to use GNSS measurements both before and after the current position to calculate the best position. This is referred to forward and backward processing in GPS Pathfinder Office and Trimble Positions

Using the previous example, if the user moves from under the tree to open skies then the post-processing engine can use the higher quality GNSS measurements from open skies to improve the result it generates for positions under the tree. The PPA algorithm can not account for this

## **Licensing**

### **What TerraFlex license is required for the Offline Data Transfer workflow?**

Users will require a standard TerraFlex Basic or Advanced license, same that is used for the Connect workflow



## Resources

[Trimble GeoSpatial Help portal](#)

[Trimble Community](#)

[NEIGPS Youtube](#)

## TerraFlex Topics:

### Offsets:

- [TerraFlex Remote Feature Capture Frequently Asked Questions](#)
- [Capture Features Remotely Using Trimble TerraFlex and LTI TruPulse Laser Rangefinders\](#)
- [Adjusting for Magnetic Declination when Capturing Offsets in TerraFlex](#)

### Post Processing

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