TOPCON SURVEY EQUIPMENT INSTRUCTIONS

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Starting a New Survey

GPS with wireless access:

This type of survey is only useful if you are shooting in an area that will not interfere with GPS signal and you have wireless service. It is quick and requires very little instrument setup.

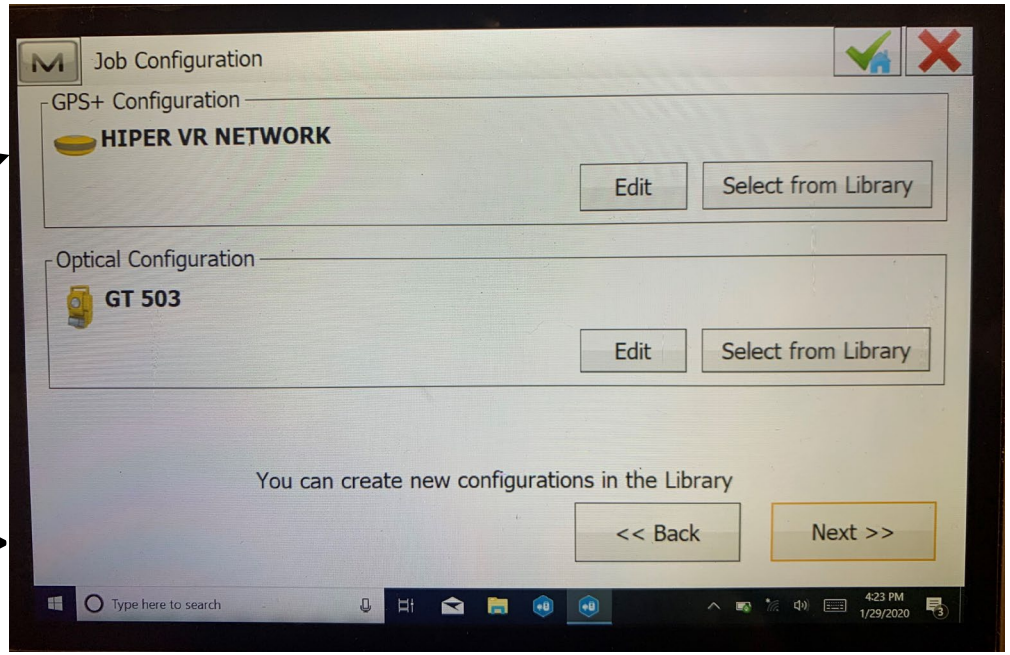
Select Job and then New Job

Name job; Next>>

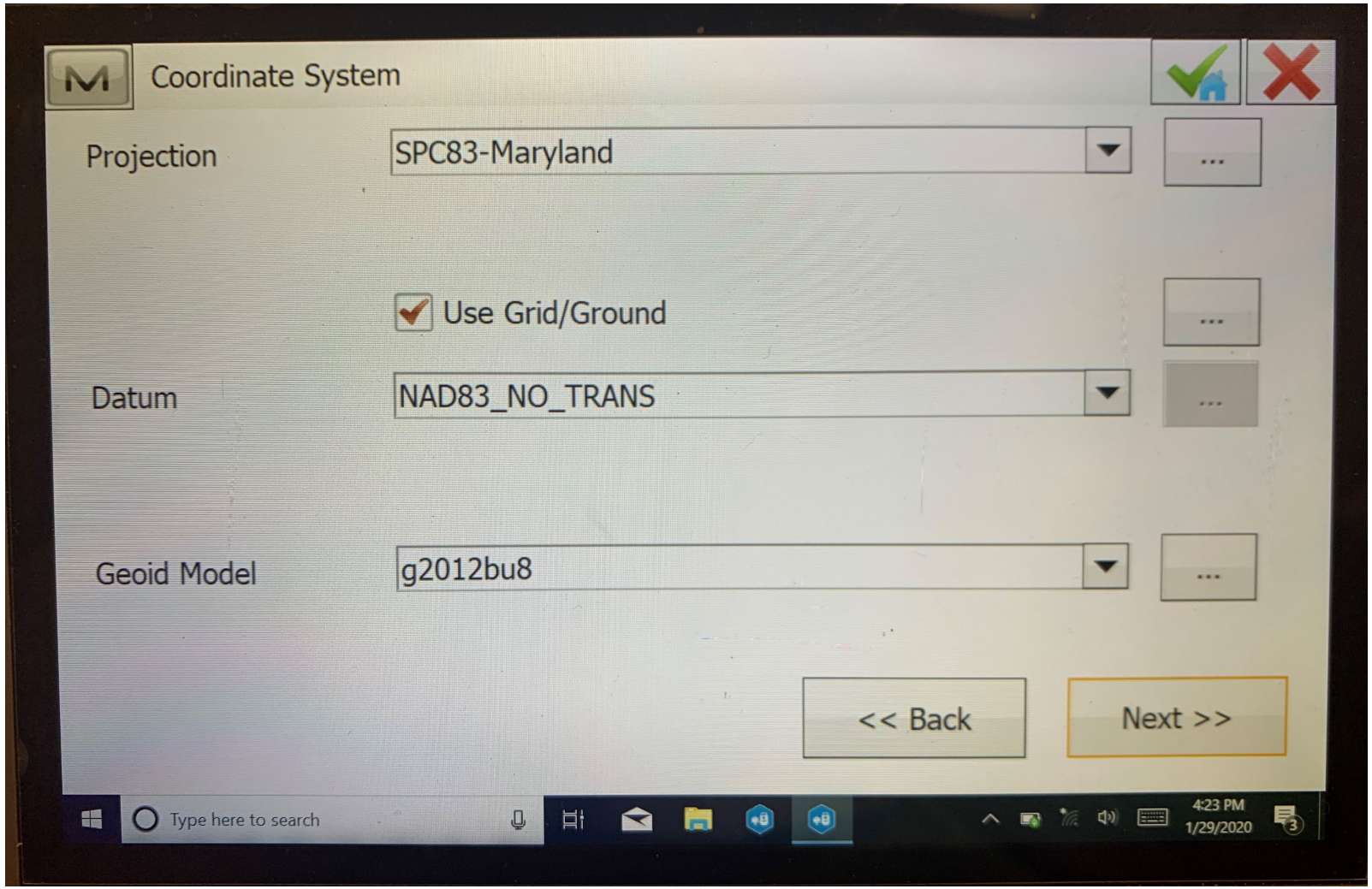
Ensure that your GPS Instruments are loaded

into the Job Configuration

(if not, select from library and create); Next>>



Coordinate System screen should look like this:

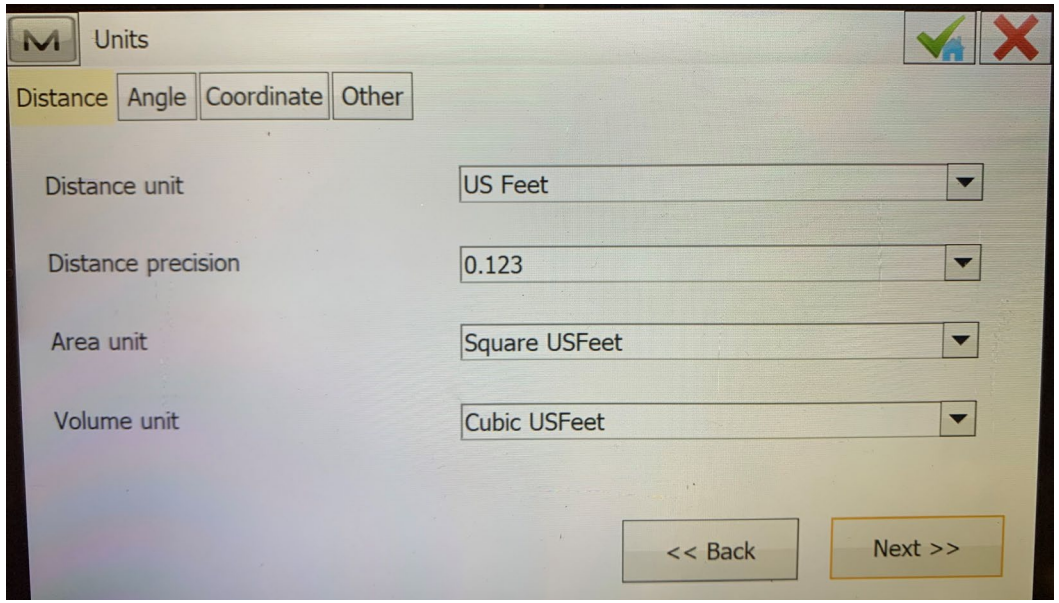


Next:

Assure your distance units look like this:

Click green check at the top right of the screen.

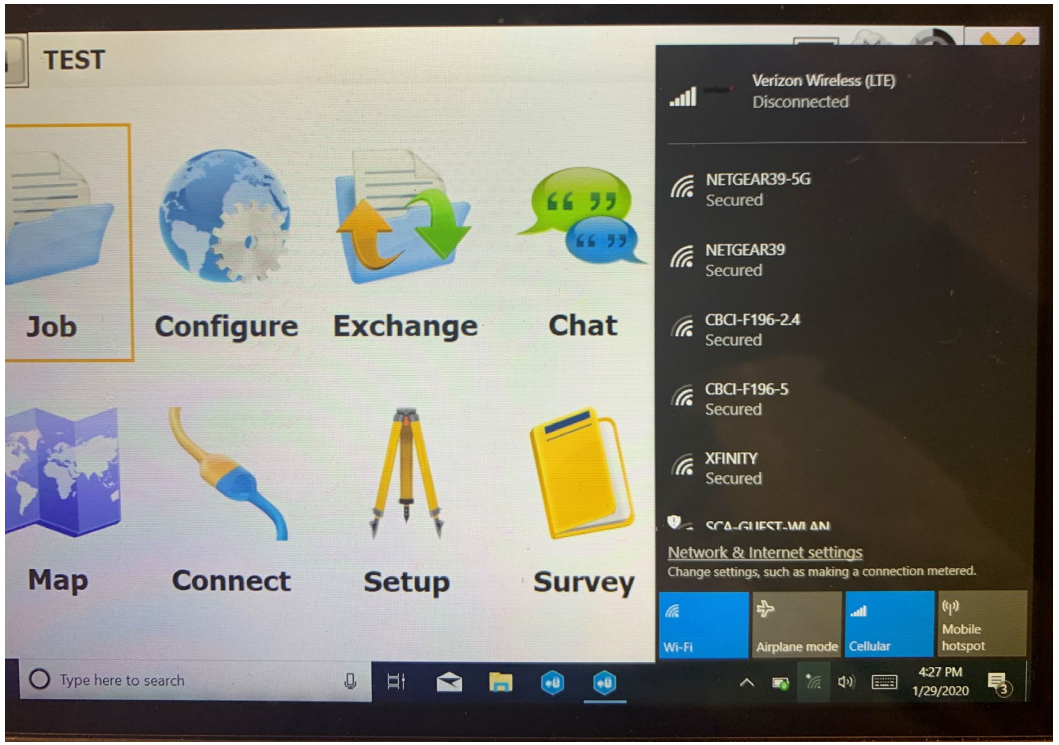
It will automatically take you into your new job.



Choose wi-fi connection button at the bottom right of your screen.

Connect to Verizon Wireless (LTE):

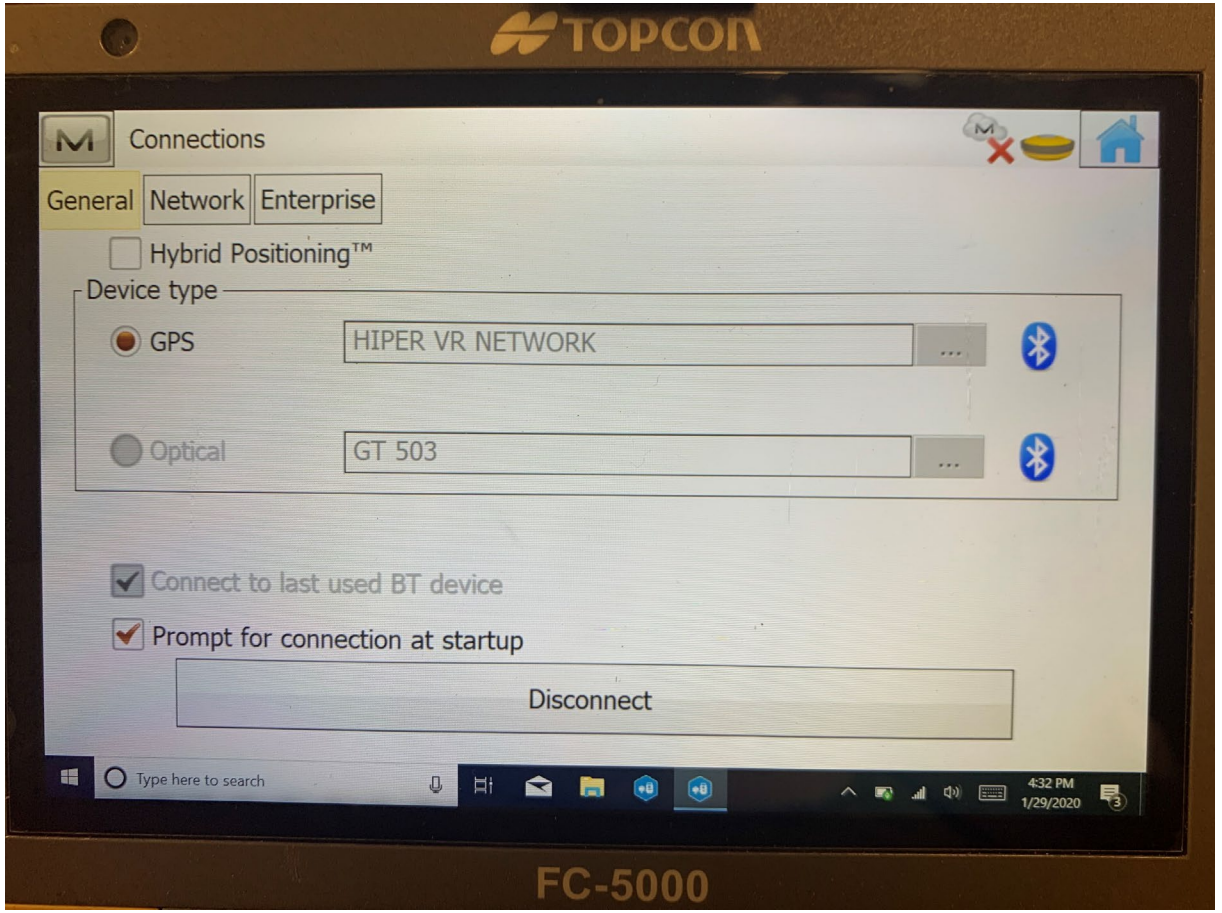
(this could be a different carrier then shown)



Attach GPS Rover to it’s specialized Rod (set Rover height to 2 meters or 6.56). Turn Rover on.

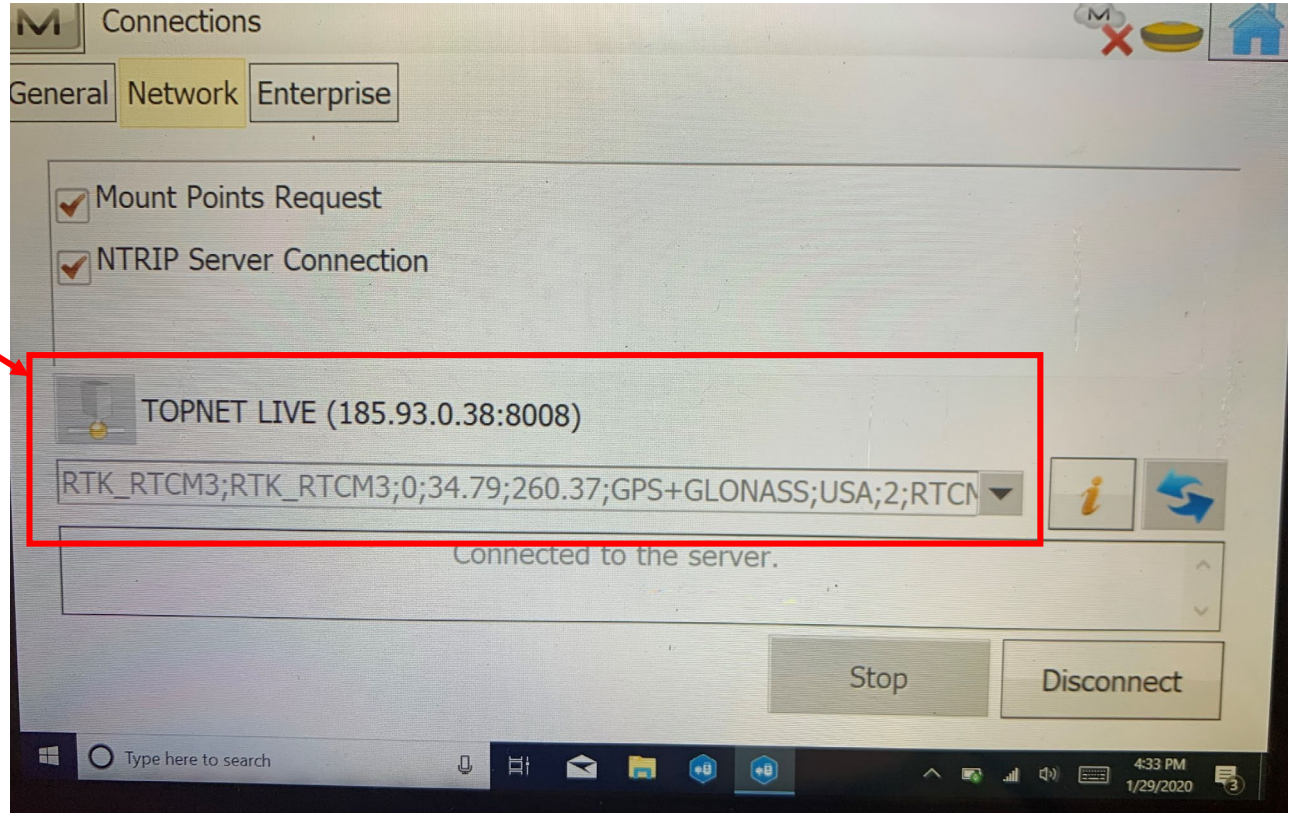
On Job homepage select Connect.

Connect to GPS only:



Once connected, the Network tab should look like this:

This may look different depending on your provider



Return to home screen; Go to Survey; Topo. You can now begin your survey.

GPS with base and rover:

If you are starting a new survey and do not have access to a Wireless connection you can use the GPS Base and rover together.

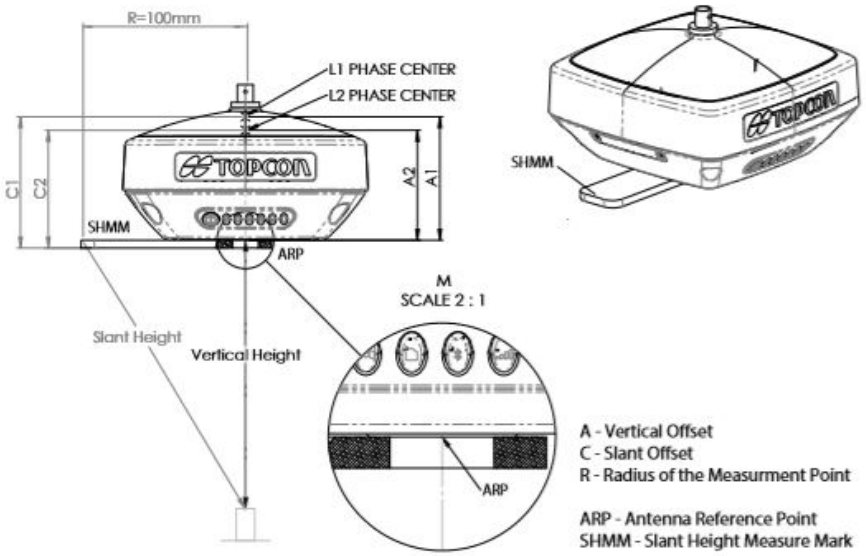
To begin, set the GPS Base on the tripod using the tripod attachment (left) or on the specialized tripod base (right):

If using the specialized base: Turn GPS Base on and allow it to acquire enough satellites (6 minimum). The height will automatically be 2 meters or 6.56 ft.
If using attachment: Place the silver SHMM on tripod attachment and then attach base to top. Follow below instructions:

To accurately measure the antenna height, do the following:

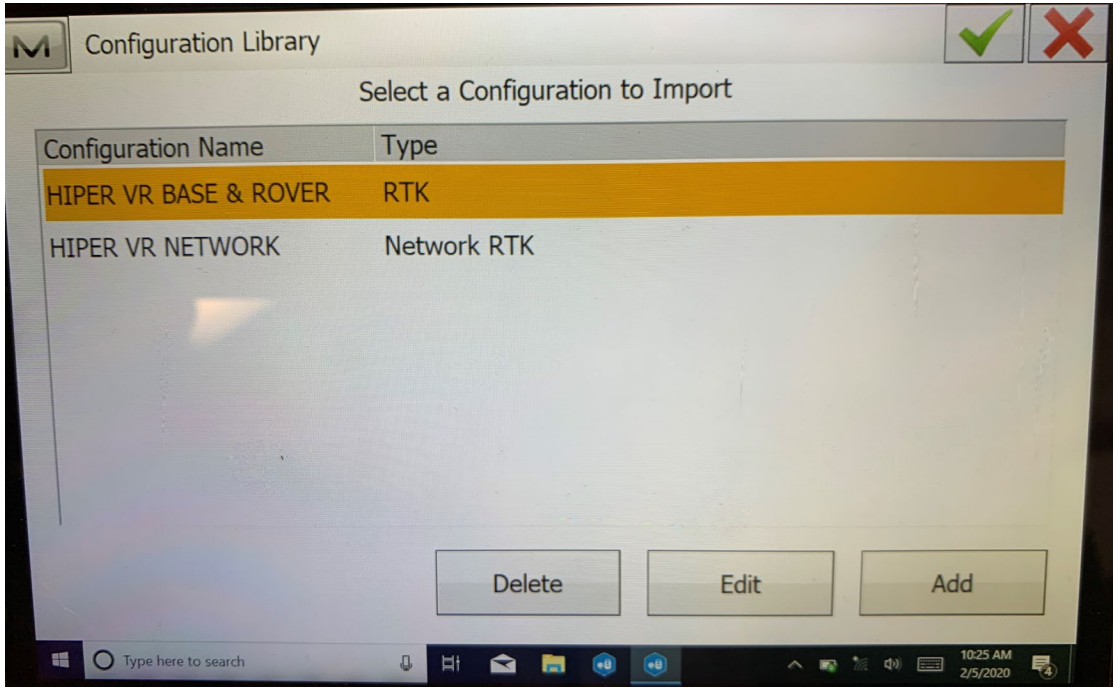
1. Measure the antenna height above the control point or marker, either the slant height or the vertical height. You may either measure the vertical height to the Antenna Reference Point (ARP) located at the bottom of the receiver at the base of the mounting threads or measure the slant height to the Slant Height Measurement Mark (SHMM) on the side of the receiver.

2. Record the antenna height, points name and start time in the field notes.

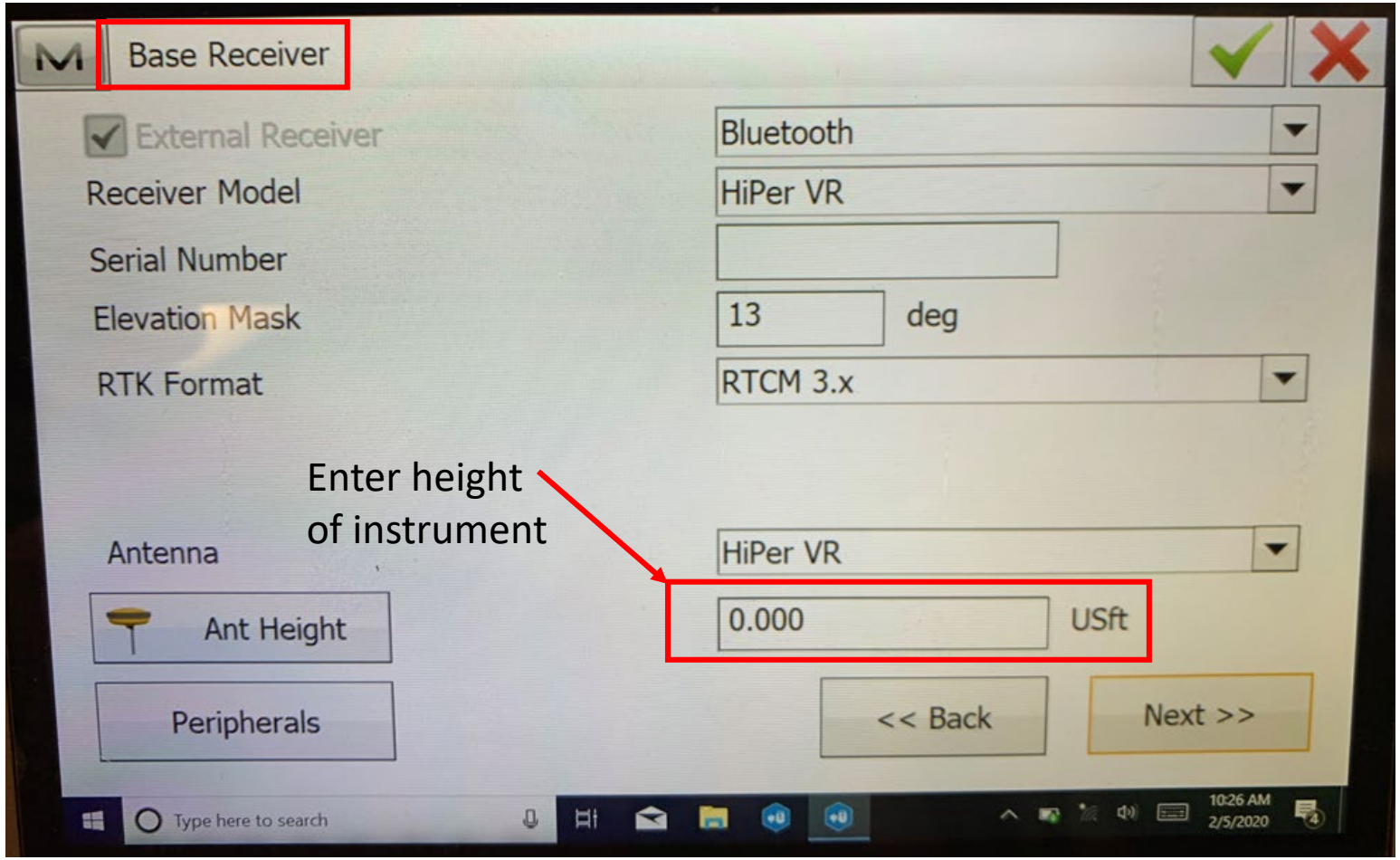


Next:

If you are using the tripod attachment for your base, you must enter the Height of instrument. Go to Configuration Tab on home screen; Survey Tab; Select from Library (GPS); Add: Name Hiper VR Base & Rover; Type: RTK; Next>> (Follow manufactures settings from instruction manual for original set up).



For each survey you will need to select your Configuration Name (GPS Base & Rover) and enter your Height of Instrument:

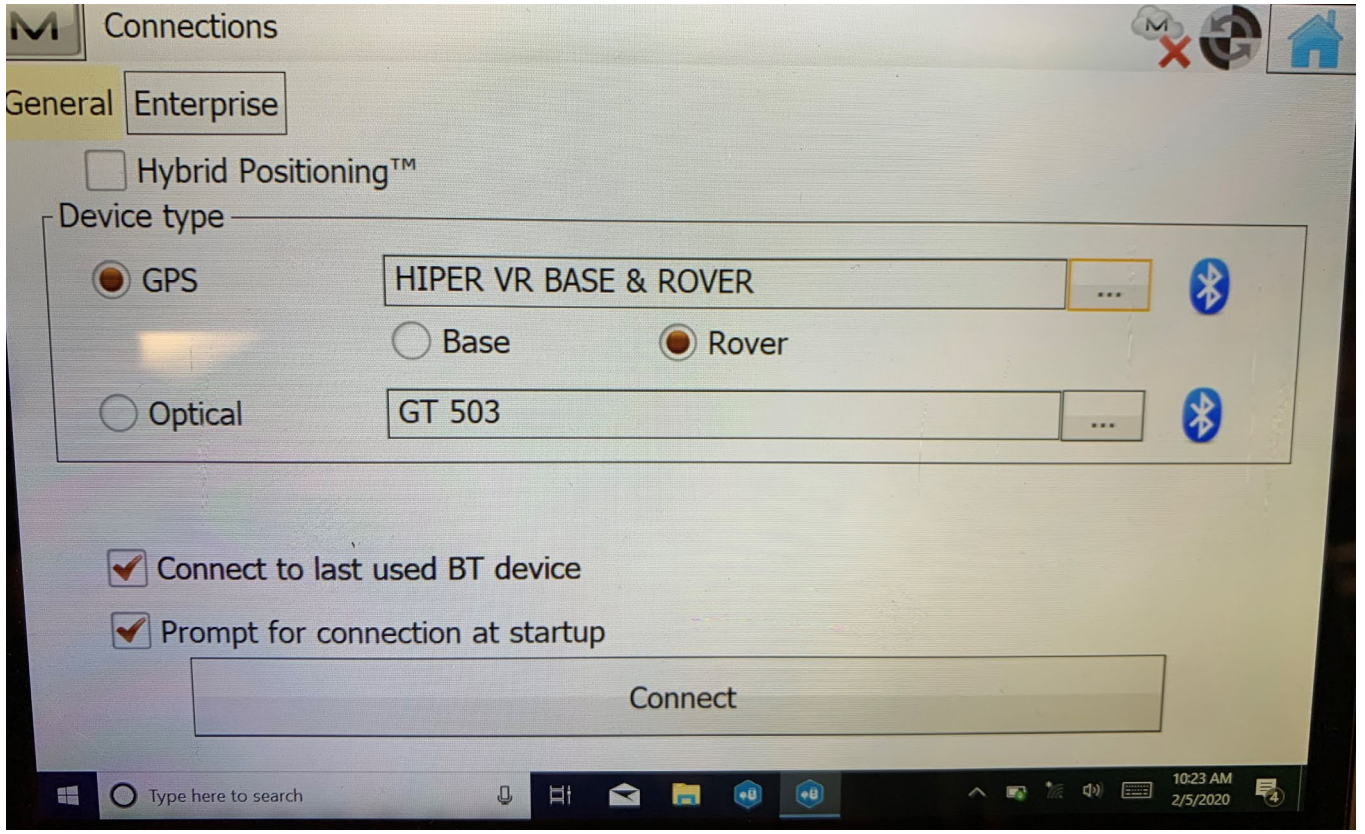


Attach rover to the GPS pole and set at 2 meters.

On Job homepage select Connect.

Connect to GPS only and choose the correct Hiper VR Base & Rover

Enter your Instrument Height as previously instructed. Start Survey, assuring that GPS remains fixed.

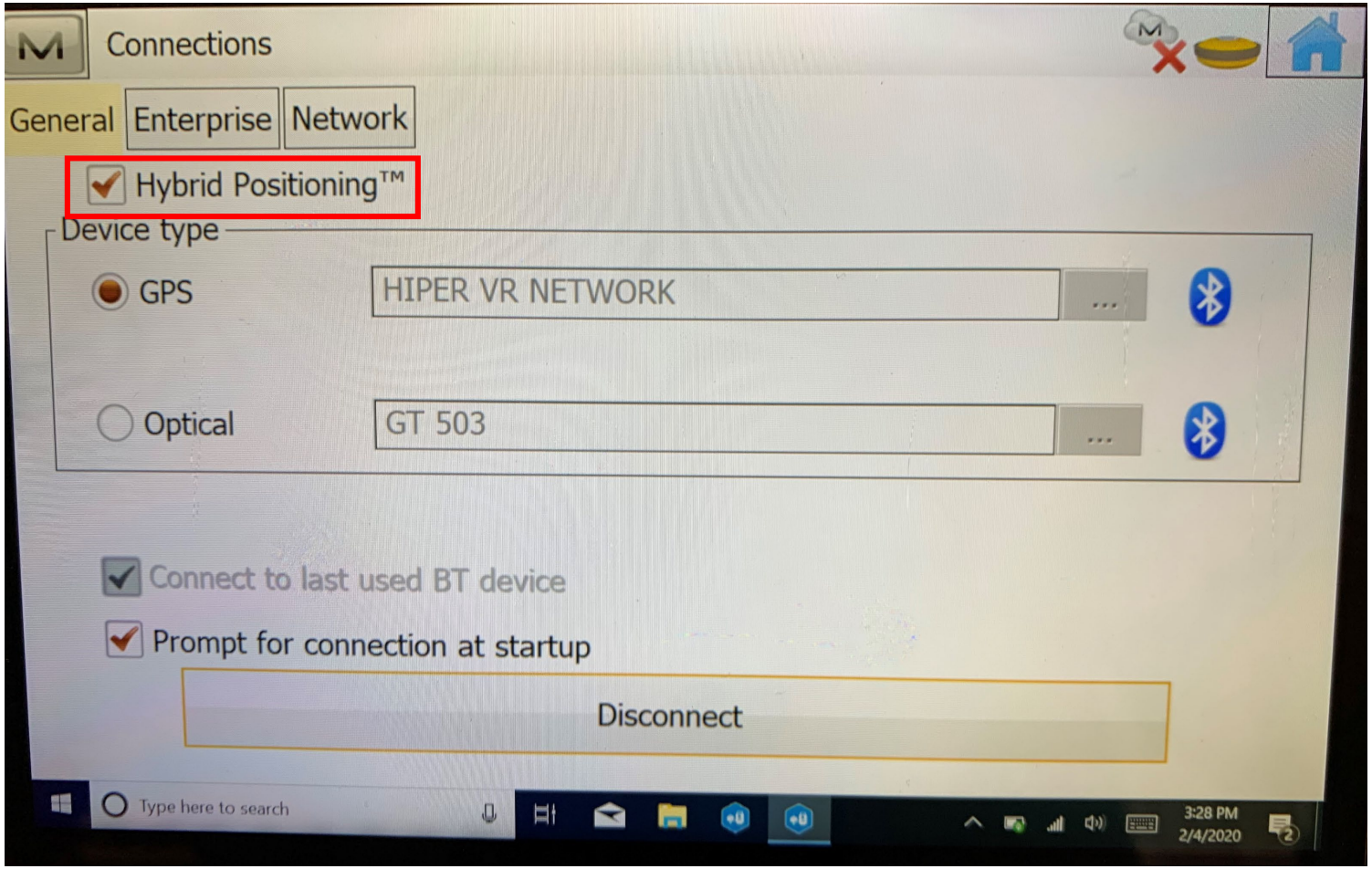


Hybrid Using Resection:

The use of the Hybrid system allows you to start a survey by orienting the Total Station to the State Plane Coordinate System via GPS. This means that once you start your survey you will be able to switch between GPS and line of sight. This is useful if you are surveying a combination of fields, wooded areas, or areas with existing structures.

To begin: Place your tripod and robotics in a place that works best for your survey (consider the shots you will need for line of sight).

When connecting to the equipment, turn Wireless connection on. Ensure that Hybrid Positioning is checked in the Connections Screen:

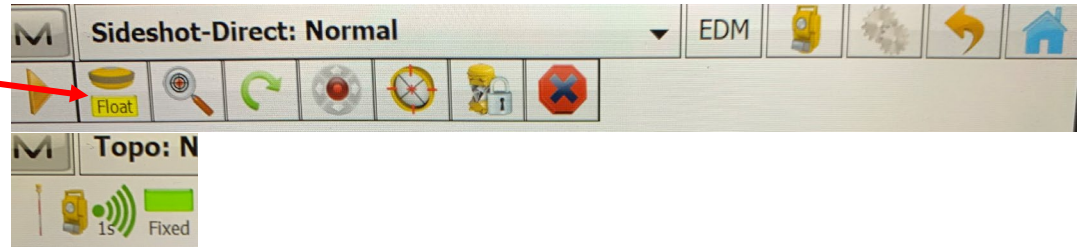


To Set up the rod for Hybrid or optical survey’s:

Attach prism to the top of the rod.
Screw on GPS adapter supplied with equipment.
Attach GPS to the top of the adapter.
The specialized Hybrid rod is marked in feet,
so all you need to do is enter the rod height that you have chosen when prompted.

Once connected go to the Setup Screen, make sure you are in Total Station Mode at the top of the screen:

Note: Make sure your GPS is Fixed (not Float)



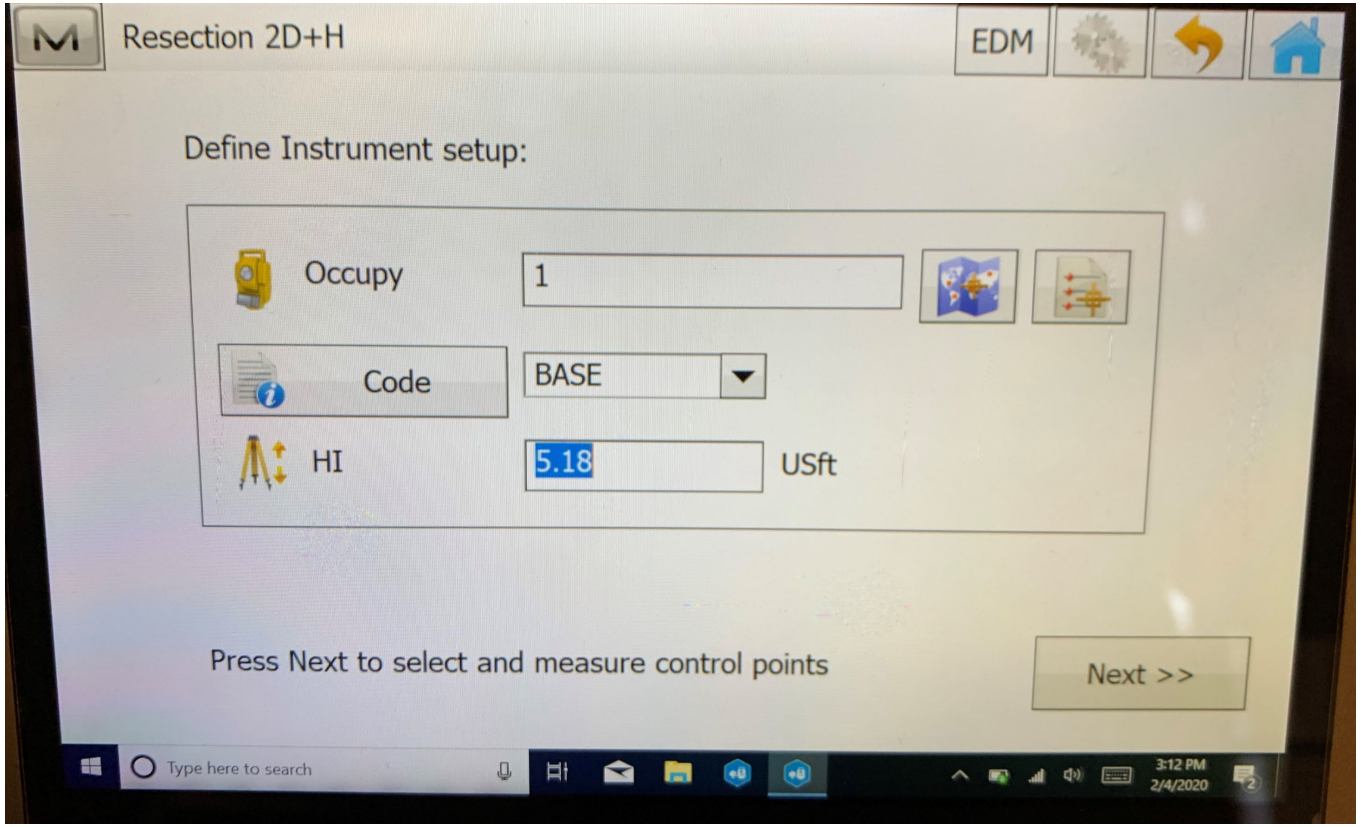
Chose the Resection button

Define Instrument Setup:

Occupy: Type in 1 Code: Base

HI: Height of your instrument

Next>>



Specify Control Point:

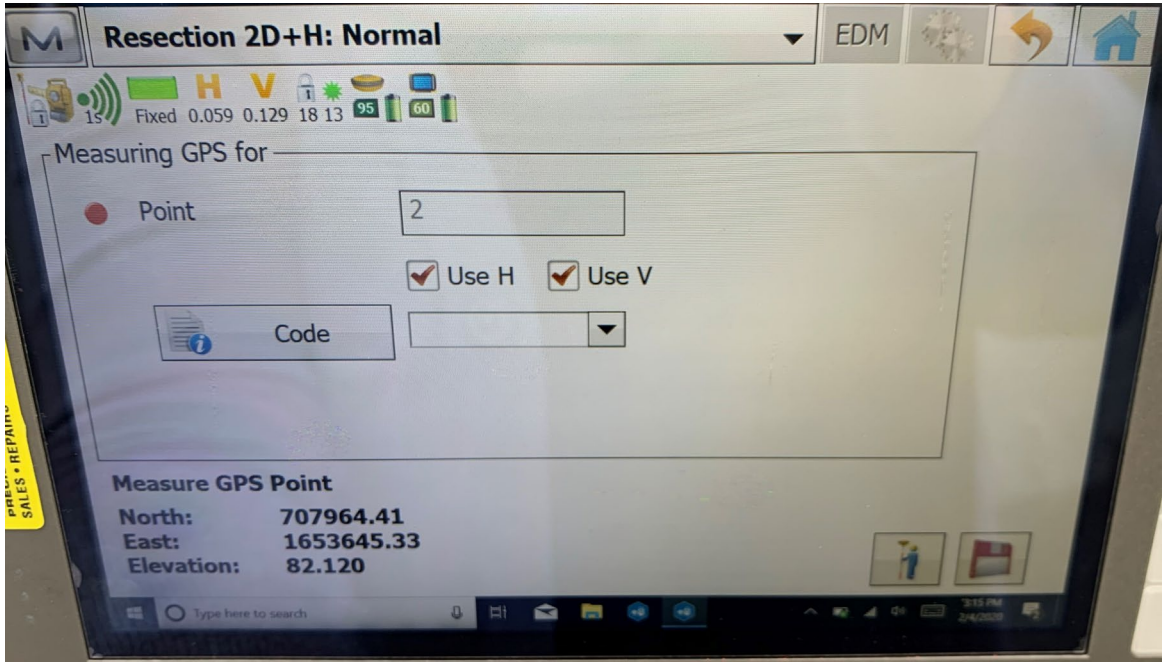
Point: 2 Code: do not need to enter a code

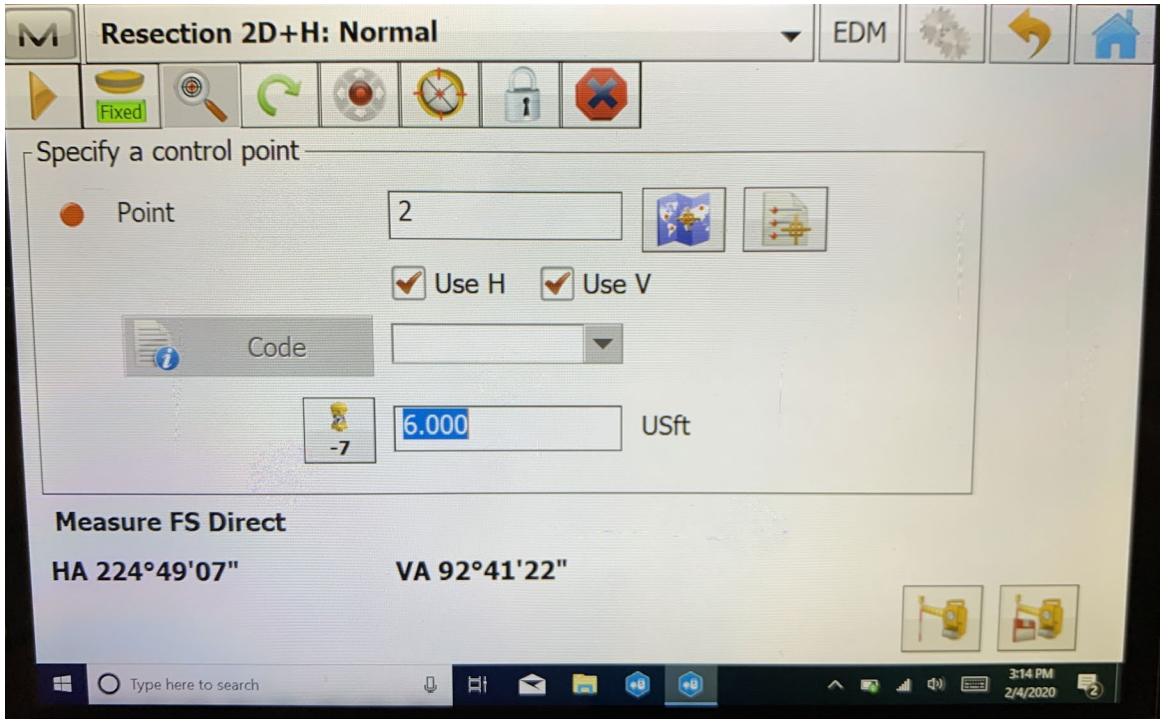
Chose a point away from the TS (20ft +)

Enter your rod height and take the shot:

It will then ask you to measure for

GPS, take another shot:

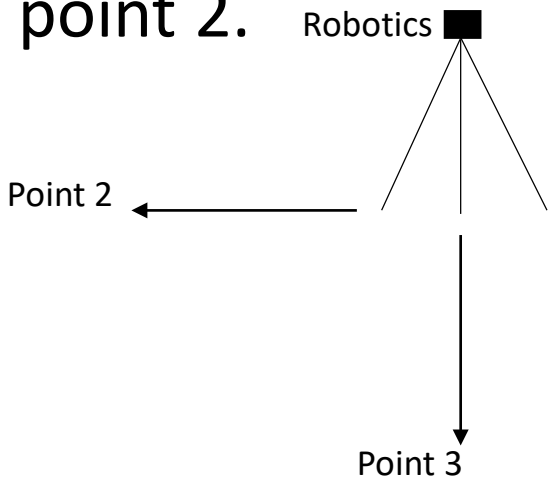


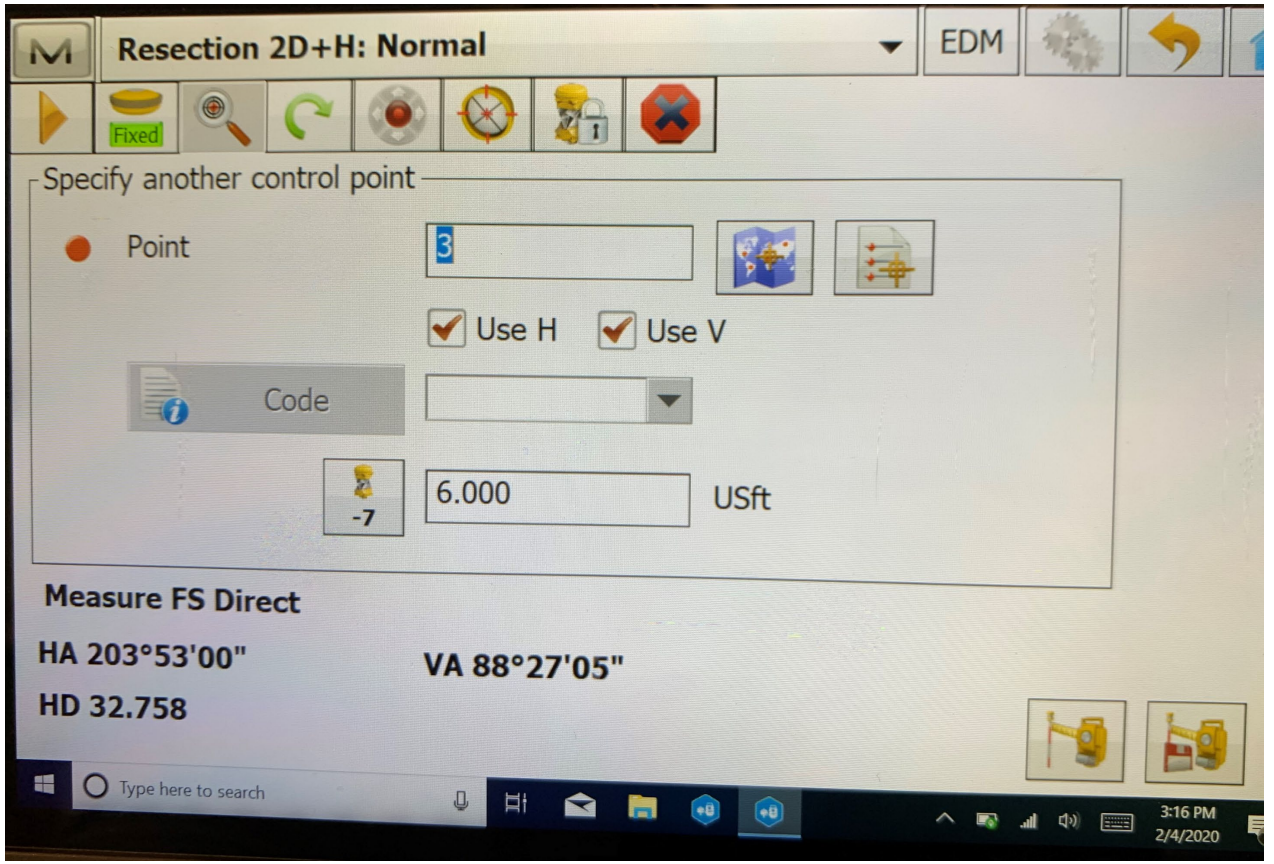


It will then ask you to Specify another control point.

This will be point 3.

Move to a point that is at a 90 degree angle from point 2.

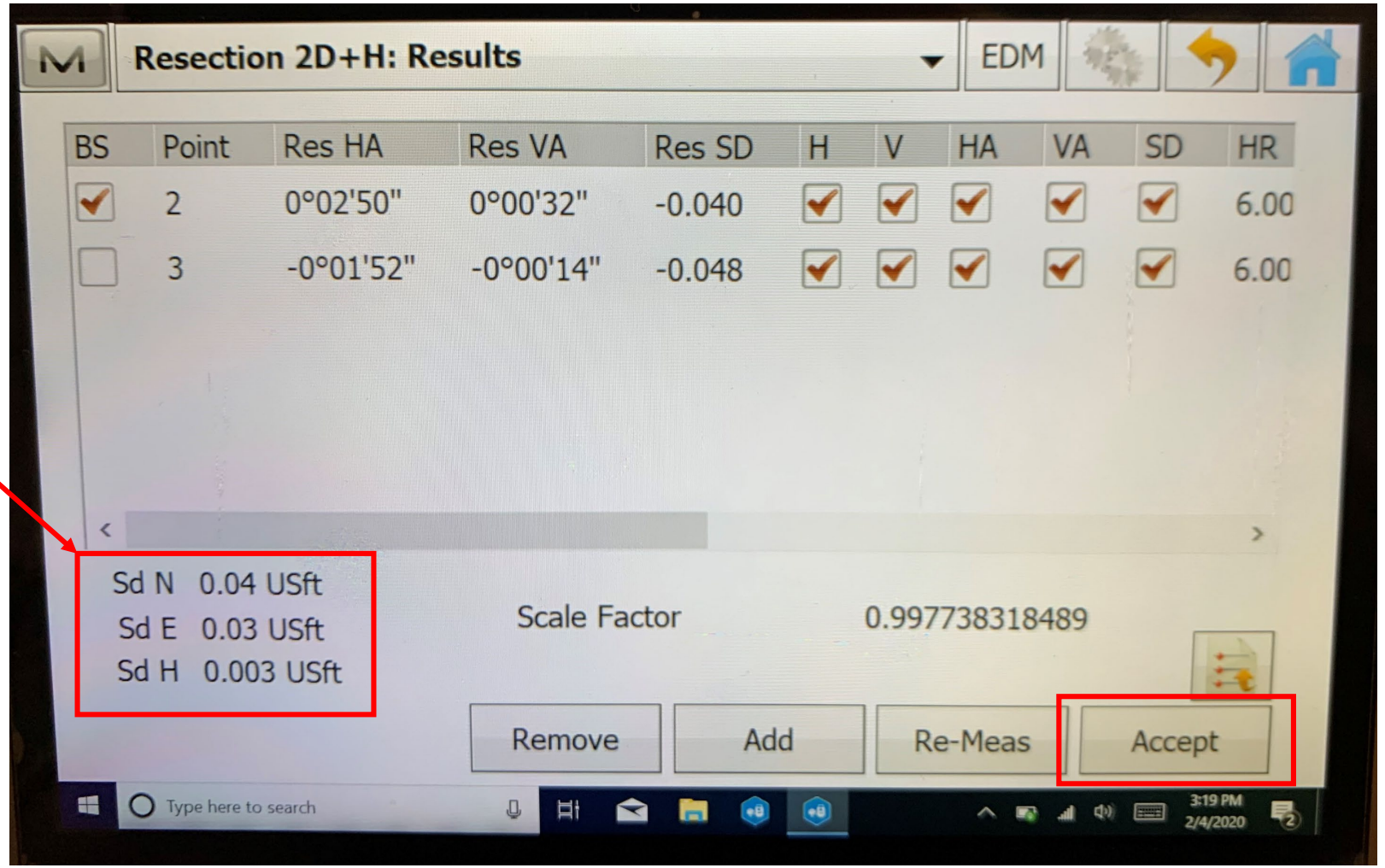




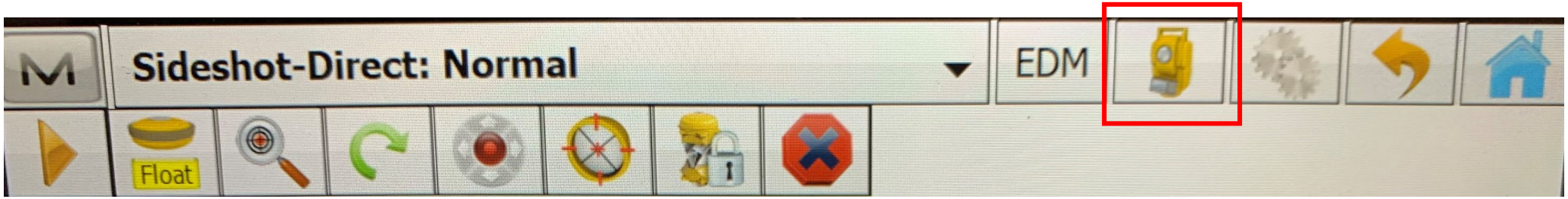
Take shot, will ask again to measure for GPS, take another shot.

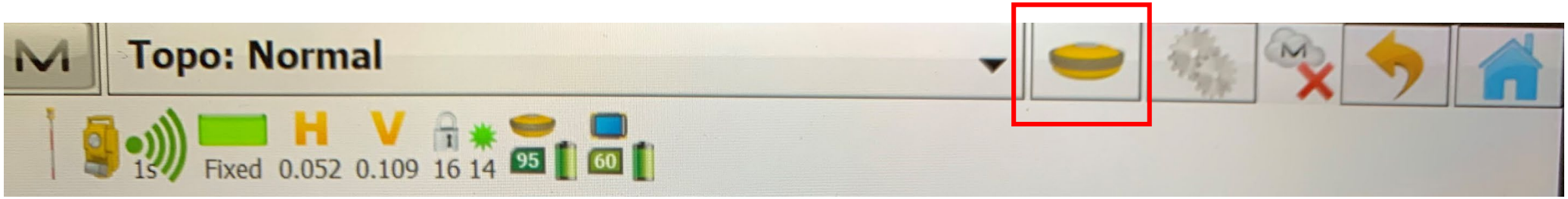
A Result screen will show up. You want to make sure your errors are below .1, the less error the better. Hit Accept.

Error below 0.1



You may now go to your survey screen and begin survey. If you need to switch in between GPS and Line of sight just click the icon at the top of the screen. Be sure to pay attention to your point numbers and codes when switching, as it may automatically switch back to your last shot taken in that particular function:





Tying into an existing survey

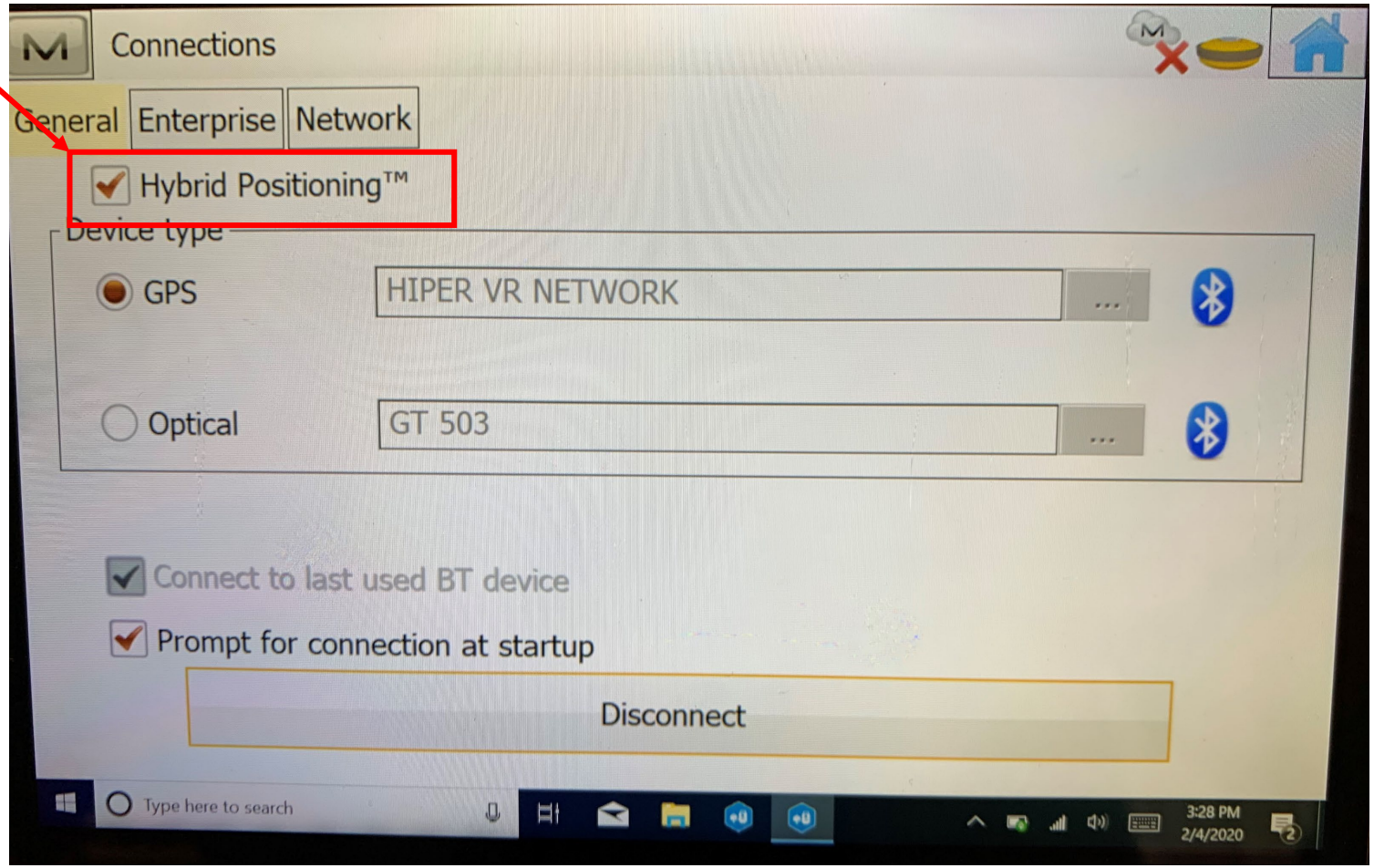
Previous survey was geo-referenced:

If you are tying into a survey that was previously started and was oriented to the State Plane Coordinate System, then the GPS is already on the correct coordinate system. You can continue the survey without making any adjustment.

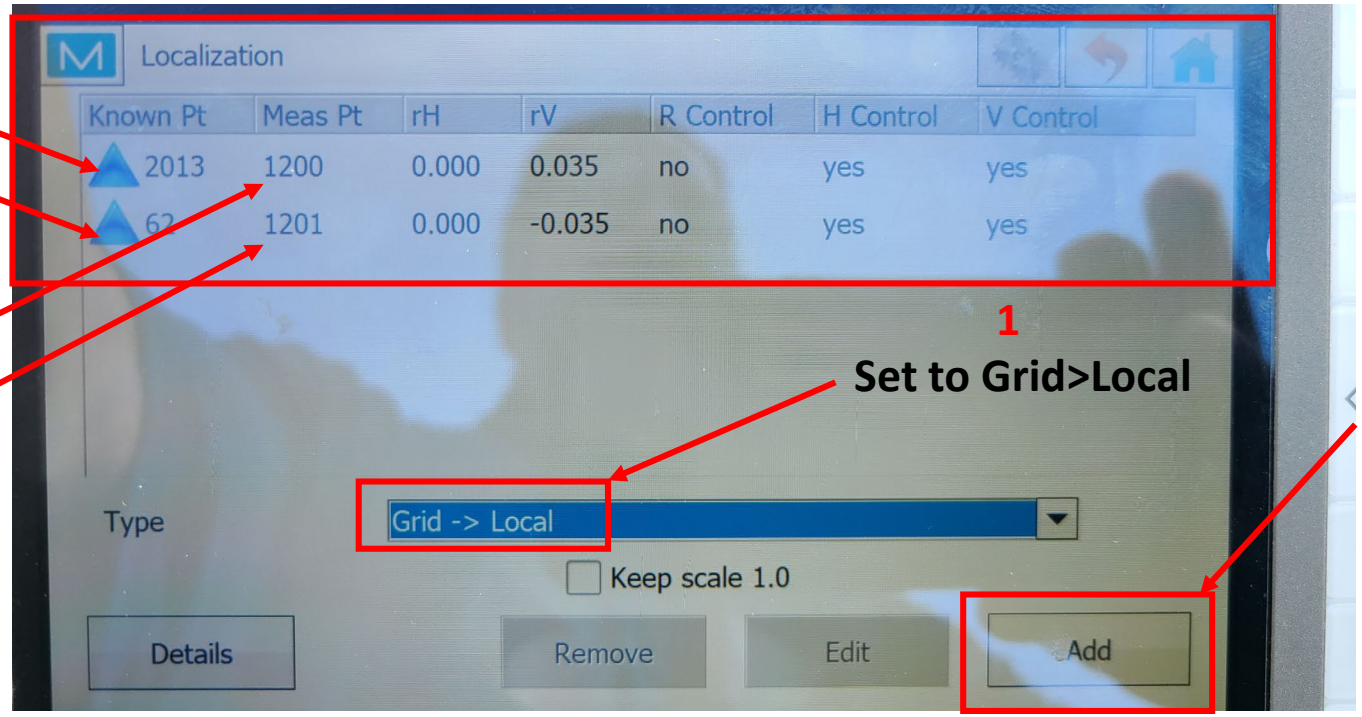
If you have hubs that you can set up on and want to use the **hybrid system**, you will have to localize your survey: (You will have to have a minimum of 2 known points localize to)

Follow the next slide to complete that.

Hybrid Checked



In the GPS mode, click the setup icon then the Localization icon. In GPS mode, Make sure the Type is set as Grid>Local (see screen below). Take a shot using GPS on a know point number and create a point number for the shot you are taking. You will have to do this for at least 2 of your known points. Once you take a minimum of 2 known points in GPS mode, you can know start your survey. Just make sure that your GPS elevations are the same as your Line of Site elevations.

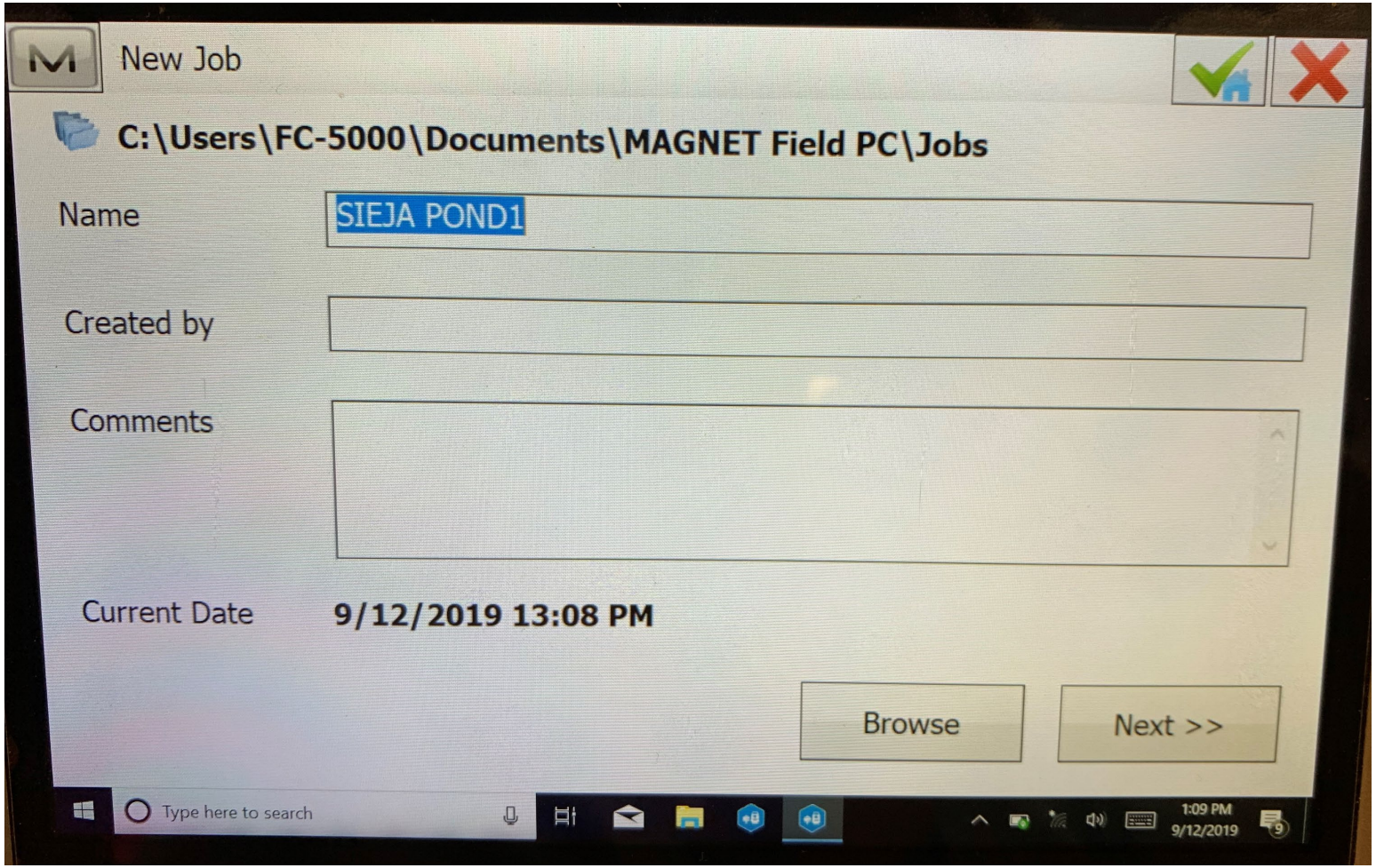


Tying into an existing survey

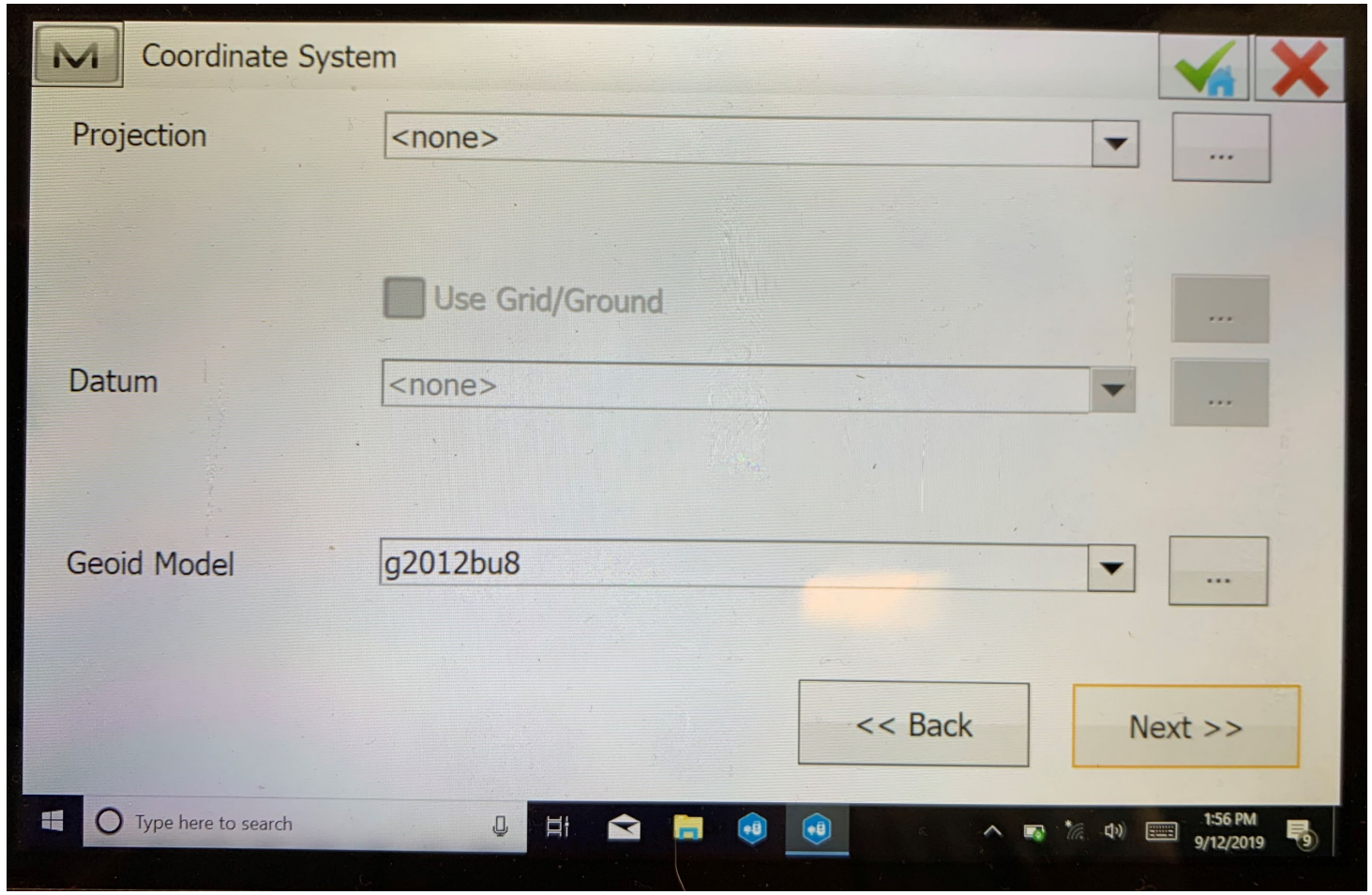
Previous survey was not geo-referenced:

If you are tying into a survey that was previously started and was not oriented to the State Plane Coordinate System or there are no hubs left to set up on and backsight too, then you would need to do a localization. This requires bringing points into a new survey from the original survey.

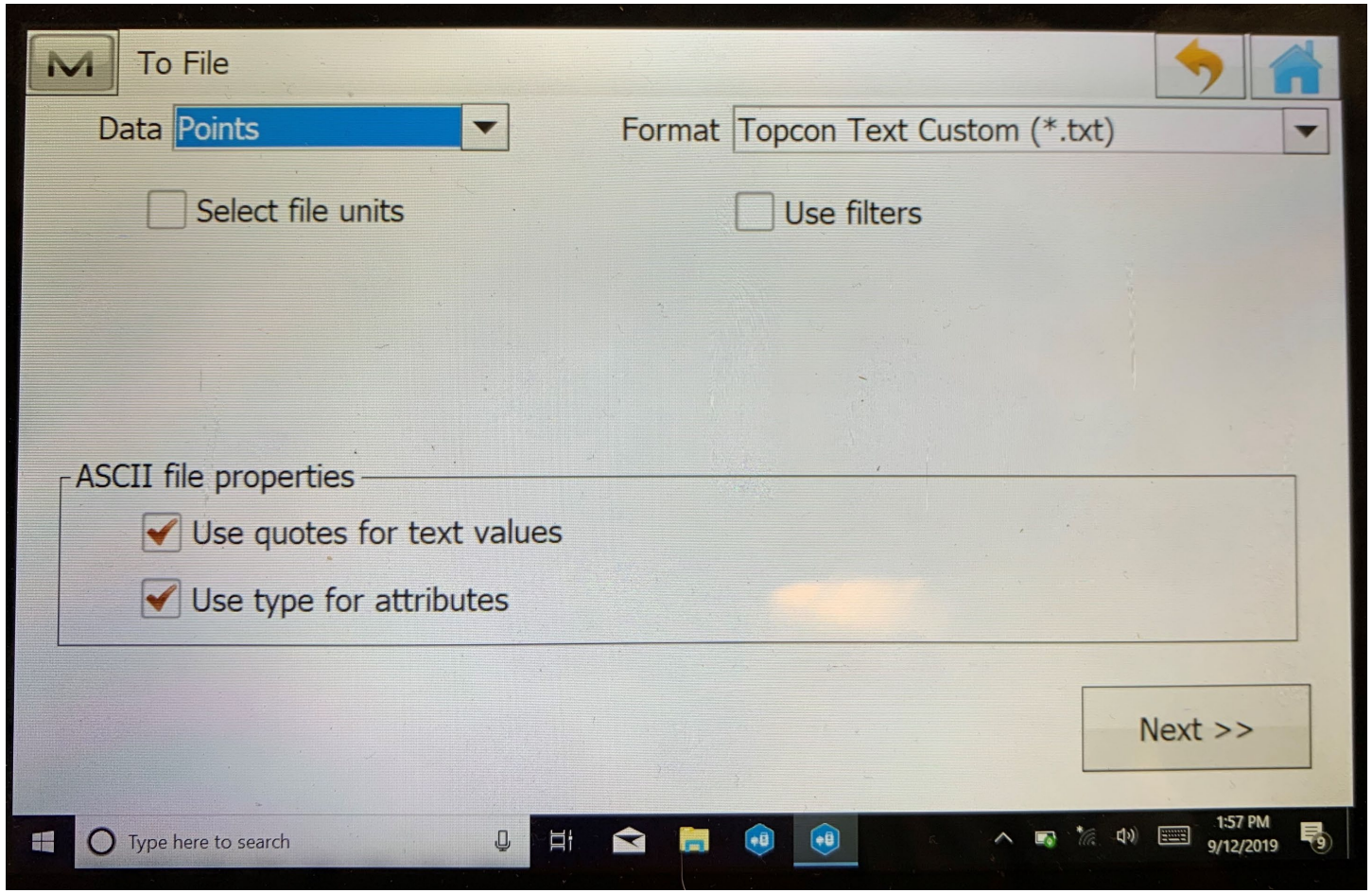
Open a new job and name (ex. Original survey name: Sieja Pond; New job: Sieja Pond1)



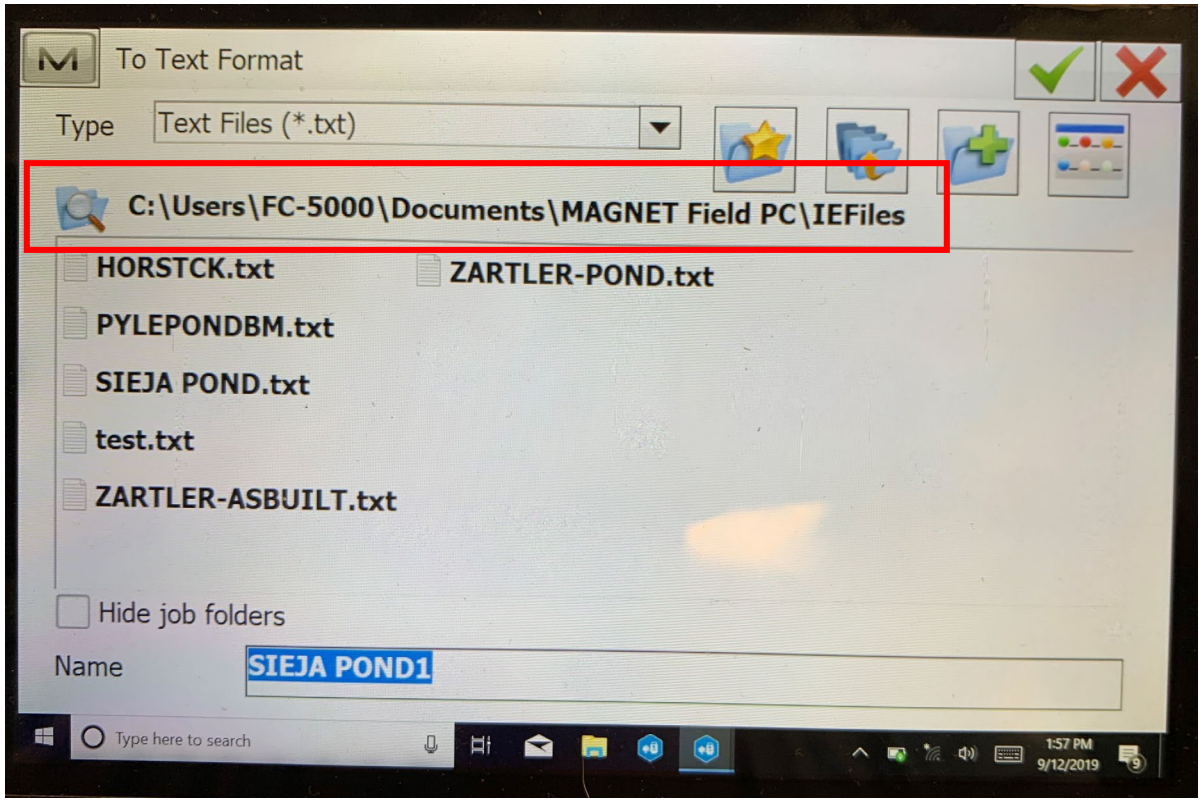
Go to Configure, then Coord Sys, Set “Projection” to None.
Return to the main screen and hit “Job”.
Go back to the original job (ex. Sieja Pond).

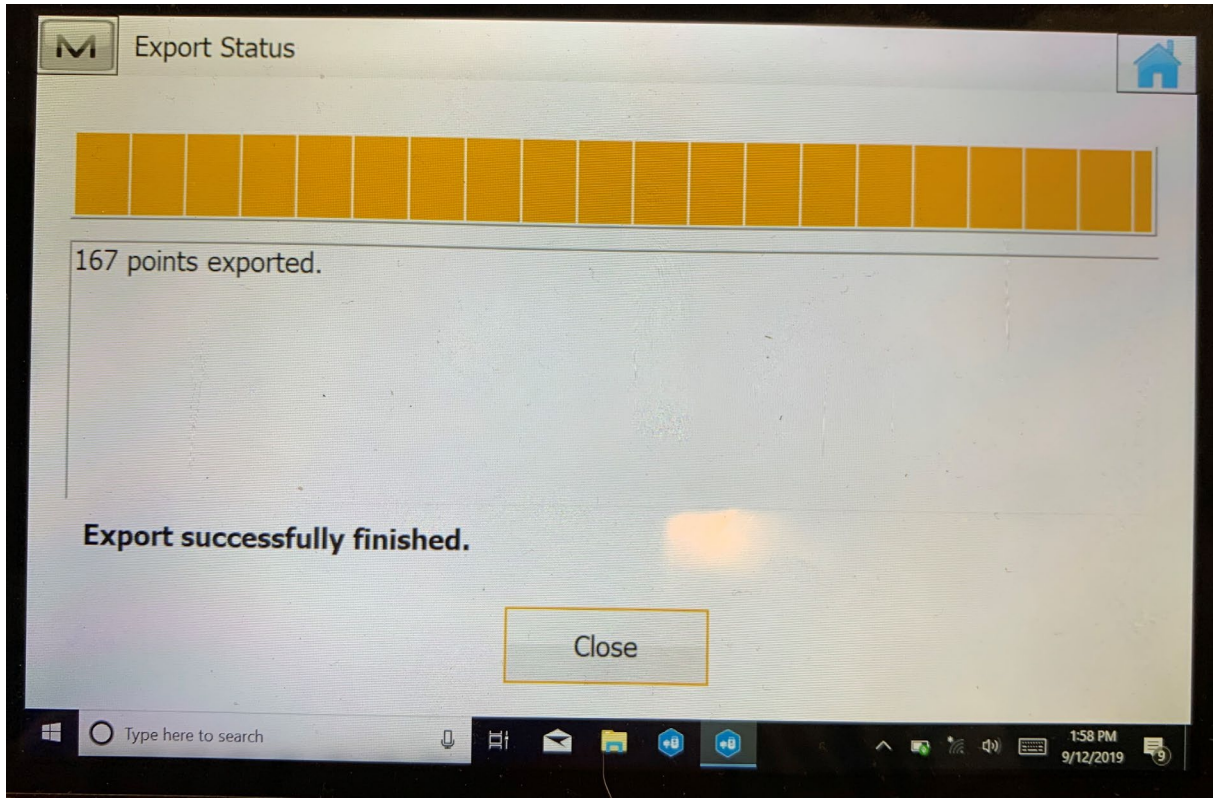


Hit “Exchange” and then “To File”
Make sure the Format is set to “Topcon Text Custom (*.txt)
You can check the box “Use Filters” if you only want to bring certain points into the new job (Sieja Pond1), otherwise all points will be transferred. Then hit “Next”.

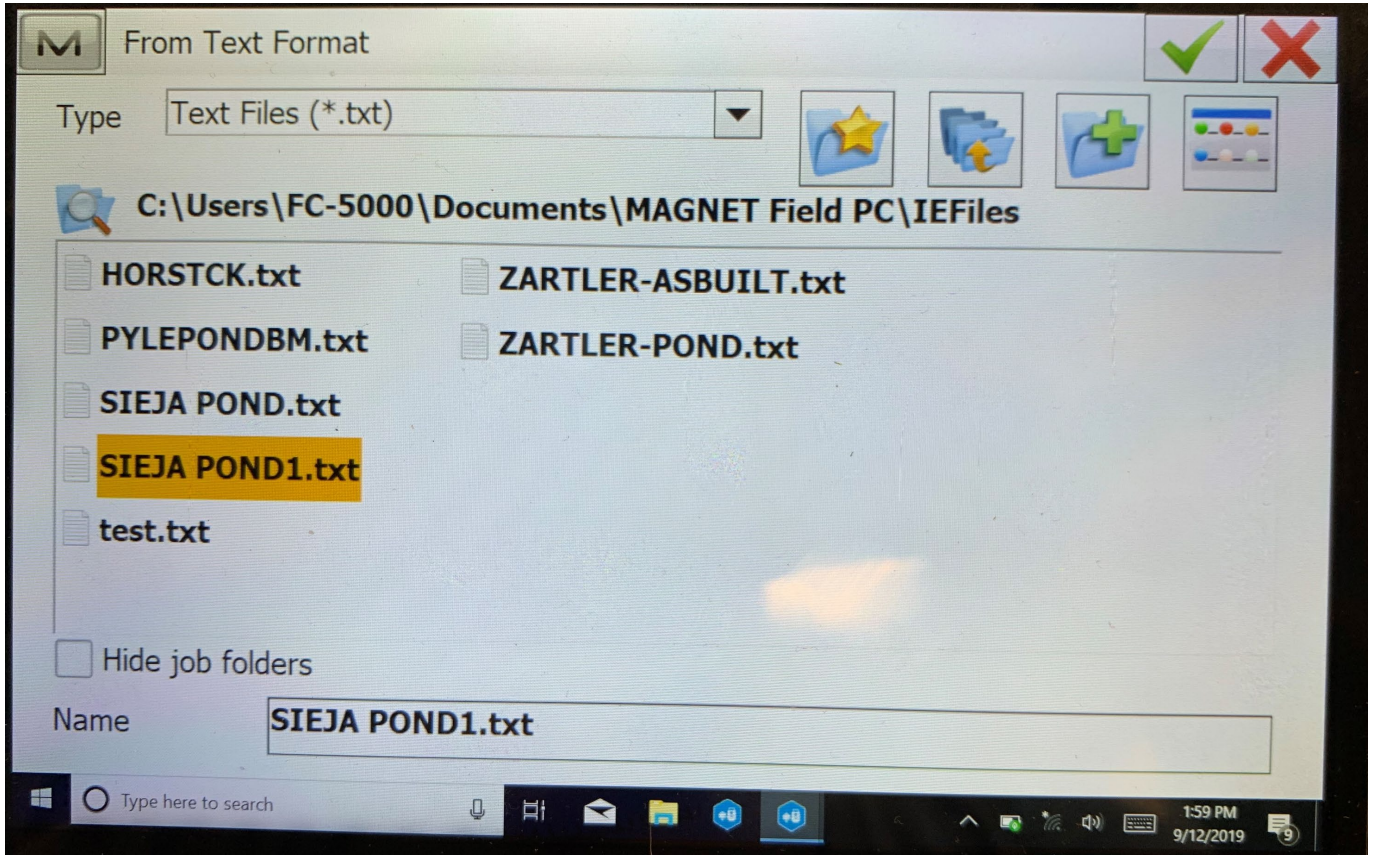


Make sure File location is set to
C:\Users\FC-5000\Documents\MAGNET Field PC\IEFiles
Name the txt. File (ex. Sieja Pond1), hit Green check.
Leave the coordinate System the Same, hit Next.
Leave Units Format the same, hit green check.

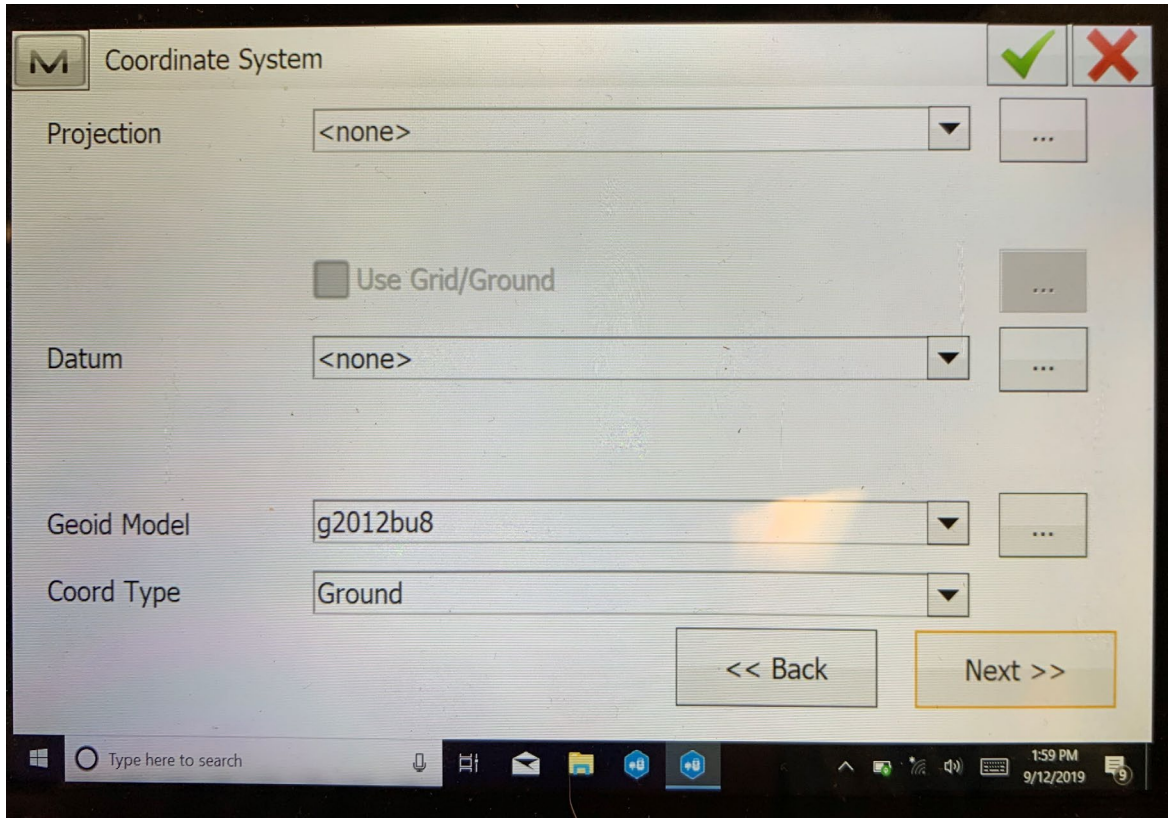


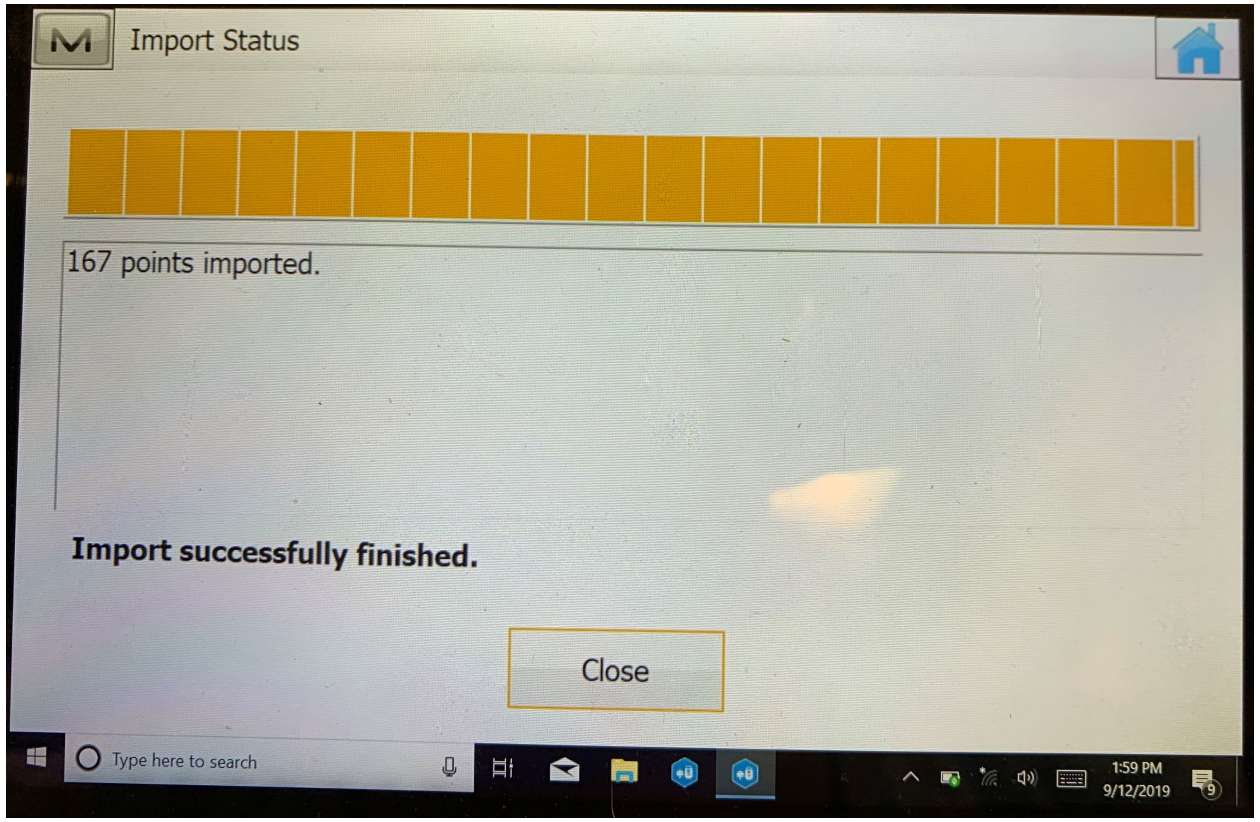


Return to the main screen and hit “Job”
Choose the new job you created “Sieja Pond1”
Hit “Exchange” and then “From File”, hit Next.
Choose the txt. file that you created (Sieja Pond1), hit the green check, click Next.

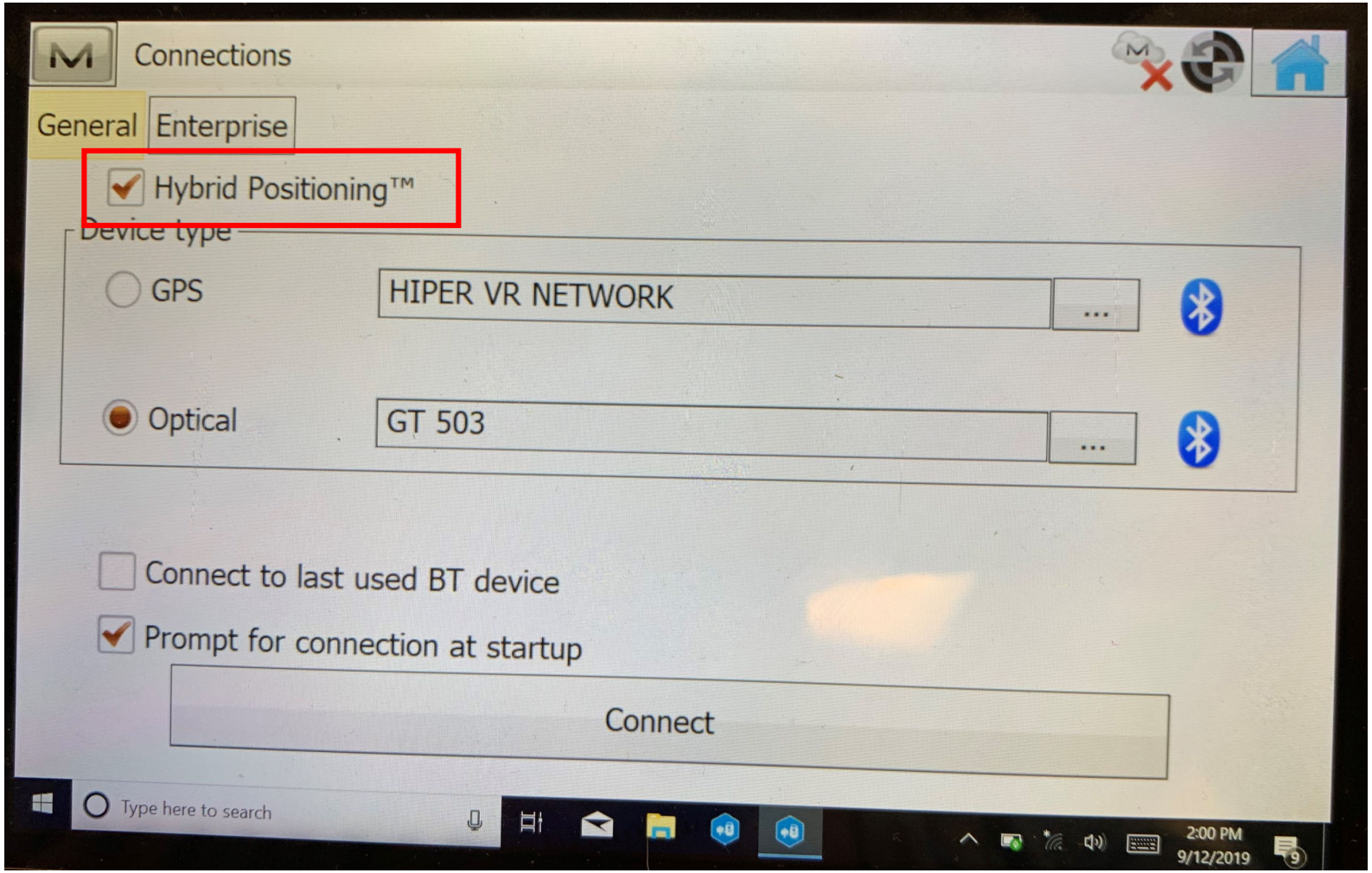


Leave the Coordinate system the same, hit Next, points will be imported into job.





Hit “Connect”, make sure Hybrid Positioning is checked, click optical, then “Connect”.
Select the Robotics System you are currently using



NEXT:

Hit “**Setup**” and “**Backsight**” as you normally would on two known points that you imported(make sure GPS is fixed)
Return to home screen, Hit “**Survey**” then “**Topo**”
Make sure **GPS is fixed**, **however you will stay in optical**.

Take Ground Shots around the base (in a circular or square pattern) at a distance of 40 ft or more (the further the better). *The more diversity in your shots (pattern and elevation) the more accurate your GPS localization will be.*

After 3-10 shots, you will get the message **“Hybrid localization acquired”.**
Compare the GPS and optical elevations to ensure that are the same.
Now you can start taking whatever shots you need for your survey and toggle between Optical and GPS.

Note: The following happens when switching from Optical to GPS
**** Point numbers will start at 100***
**** The last stored code in GPS will be the default***
Make sure you are on the correct point and code!