Introducing the FOCUS 50 Total Station

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November, 2021

INTRODUCING

FOCUS 50

TOTAL STATION

FOR EVERY WAY YOU WORK

SPECTRA® GEOSPATIAL

FOCUS 50 Total Station
Three New Models:

- FOCUS 50 Autolock
- FOCUS 50 Short Range Robotic
- FOCUS 50 Long Range Robotic

\+ Configurable angular accuracy

Agenda

- Specs & Performance
  - 3 Models of FOCUS 50
  - Specifications
  - System Compatibility: comms, controllers & software
  - Working with Bluetooth
- Key Technologies
  - MagDrive ™
  - SurePoint ™
  - Autolock ™
- Angular Accuracy, Certificates, and Firmware Updates
- FOCUS 50 & Origin Field Software
- Questions

Specs & Performance

3 Models of FOCUS 50

	Autolock	Short Range Robotic	Long Range Robotic
Communication Method	Cabled Connection	Bluetooth (long range)	Bluetooth (short range) & 2.4 GHz Radio
Do you...?	...prefer to work with someone always behind the instrument? e.g. always doing DR shots, or on a 2-person crew	...want to work robotically, but at shorter range? -and/or- ... want to use 3rd party controllers' integrated Bluetooth?	...want to work robotically at maximum range/reliability?

Specifications: EDM

Speed Standard Mode	Prism: 1.2 s DR: 1 - 5 s
Accuracy Standard Mode	Prism: 1+2 ppm DR: 2+2 ppm
Range	Prism: 5500 m DR: 1300 m

Specifications: General

Display	Yes, Face 2 LE-Display
Battery	6.5 h 20 h with multi-battery adapter (external)
Environmental	IP65
Weight	5.9 kg (including battery & tribrach)
Tracklight	Standard on all models
Laser Pointer	Standard on all models
Warranty	2 year factory warranty Extended warranties also available
Service	2 year recommended preventative maintenance

System Compatibility

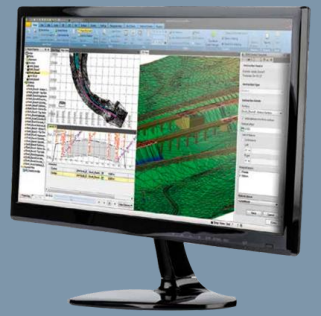
Data Collectors

Field Software

- Origin
- Survey Pro
- Layout Pro
- TPSDK
- Trimble Access

Survey Office Software

Also works with TBC



Connections Comparison by Model

	Autolock	Short Range Robotic	Long Range Robotic
Cabled Connection			
Ranger 5 * Ranger 7 ST10	✓	✓	✓
Wireless Connection			
Ranger 5 Ranger 7	✗	✓ Controller Bluetooth	✓ EM120 module on controller
ST10	✗	✓ Controller Bluetooth	✓ ST10 (Radio model)
3rd party	✗	✓ Controller Bluetooth	✓ SPDL radio paired with controller

*Requires USB A-to-C Adapter

Short Range Robotic Model
Range Expectations over Bluetooth

Controller	Approximate Range (m)
Ranger 5	150 - 550
Ranger 7	100 - 350
ST10	50 - 100

Range can vary widely depending on:

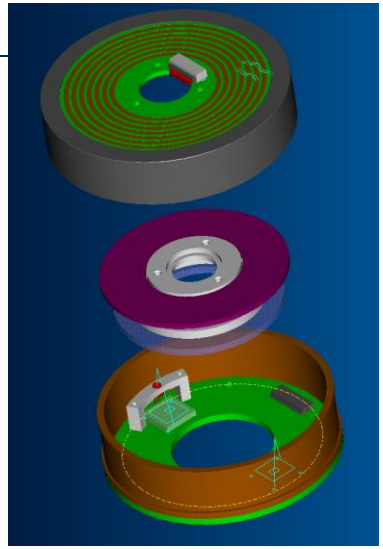
- Radio traffic
  - Bluetooth, WiFi, radio, cell
- Line of Sight
  - If you are walking away from the total station, your body will block part of the signal and shorten the range
  - Holding the controller in your hand instead of using a bracket can also cause this effect
- Bluetooth module and antenna in both the total station and the controller
  - This is why range is controller-dependent
  - Note - as a first step troubleshooting radios, always try a new antenna on both the TS and Controller side

Key Technologies

- MagDrive ™
- SurePoint ™
- Autolock ™

MagDrive™ Technology

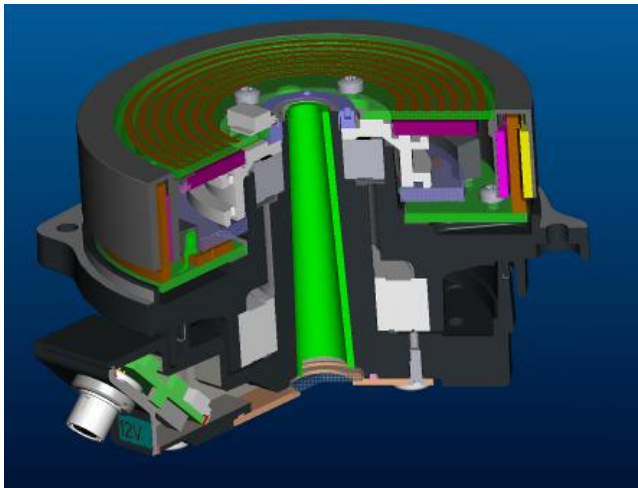
Controls the HA/VA movement electromagnetically



Features

- Brushless, frictionless motor
- Integrated motor with angle sensors
- No gear, no clutch
- Accurate positioning
- Low power consumption

→ Drives are smooth, silent, and accurate!



MagDrive™ Technology

Controls the HA/VA movement electromagnetically

Intuitive Aiming

- Endless fine adjustment
- Multi Speed Tangents with Automatic Gear Changes

→ The slower/faster you turn the knob, the total station movement matches

→ The fine adjustment is really fine, one full turn at lowest speed takes more than a month!

SurePoint™

Compensator information is used to automatically correct the pointing of the telescope for all mislevelment and trunnion axis errors in real time during operation

Not a problem if instrument is disturbed slightly it will aim itself back at target

- Buttons pushed on instrument
- Contact with instrument when looking through telescope
- Wind
- Tilt of Tripod

How it works

Control loop is active all the time

- Always turns instrument to the current reference angle

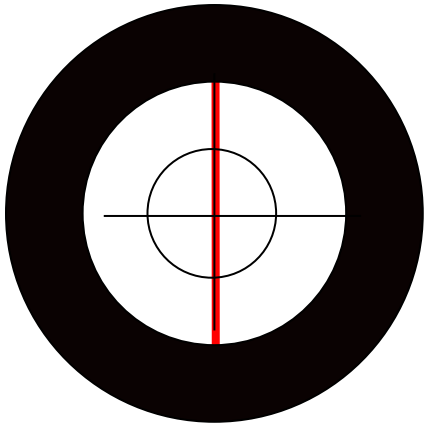
Reference angle only changed when

- Knobs are turned
- Position commands are given
- Instrument is turned firmly so that it enters friction mode

Collimation error the old way

What happens when you aim at a plumb line and turn the vertical knob?

- A old system will only turn the vertical motor
- The aim will not follow the plumb line but the horizontal angle will be compensated for this drift

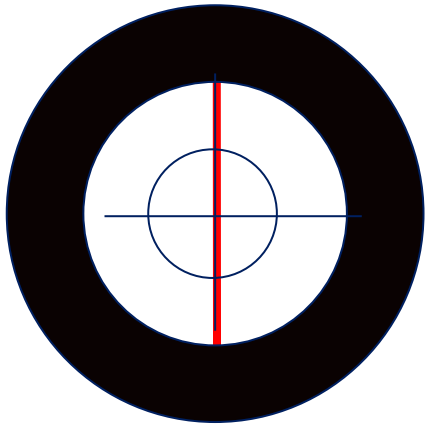


HA: 143.4[illegible]

VA: [illegible]

Collimation error with SurePoint ™

- SurePoint feeds the corrections back into the control loop when the vertical knob is turned
- SurePoint uses both motors and make the instrument follow the plumb line!



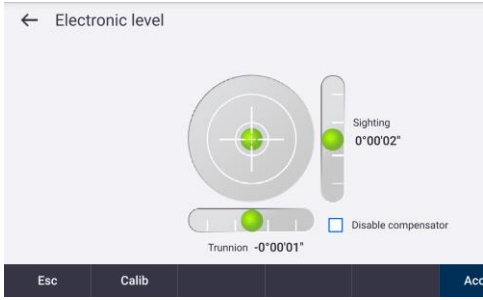
HA: 143.4532

VA: 86.0000

SurePoint™ In Action

The Setup

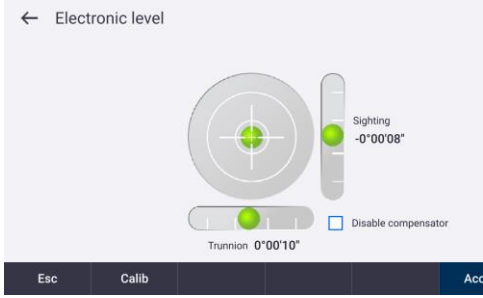
Total Station is levelled and aimed at the B/W target with the laser pointer turned on

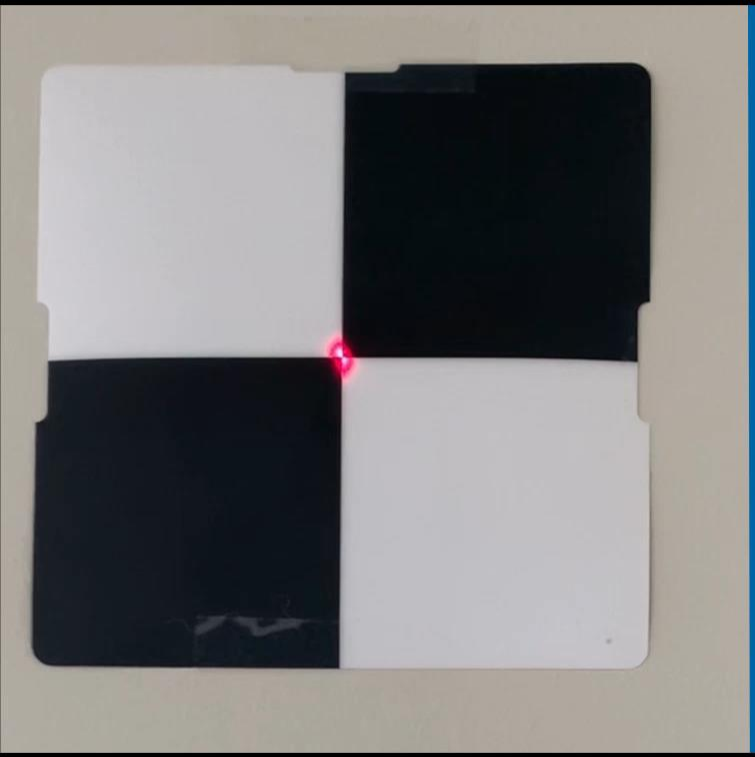


Next Slide

Move tribrach screw / total station out of level (but still in compensator range) ⟶ laser pointer moves off of the target center

⟶ SurePoint automatically moves the laser pointer back to the center





Autolock™

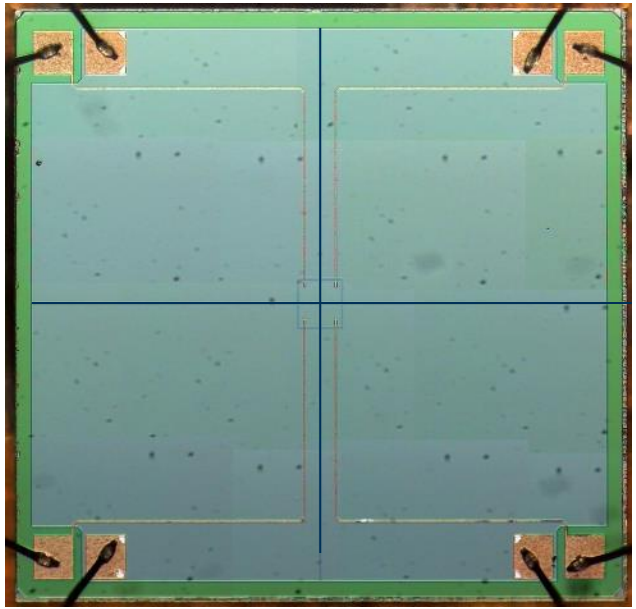
Autolock is the name for the tracking technology

The base model of FOCUS 50 is named Autolock after this technology

How it works

- FOCUS 50 sends out a signal (the prism is passive)
- The signal reflects off the prism and goes back to the FOCUS 50
- FOCUS 50 Tracker Sensor looks for the return signal
    - Tracker sensor has 4 quadrants
    - Once the total station detects a prism is within the tracker window, the servos will adjust the aiming until the signal is equally strong in all 4 quadrants

Tracker Sensor



Angular Accuracy, Certificates, and Firmware Updates

Choose the accuracy you need, now or later

All Models of FOCUS 50 are available in 1″, 2″, 3″, or 5″ angular accuracy

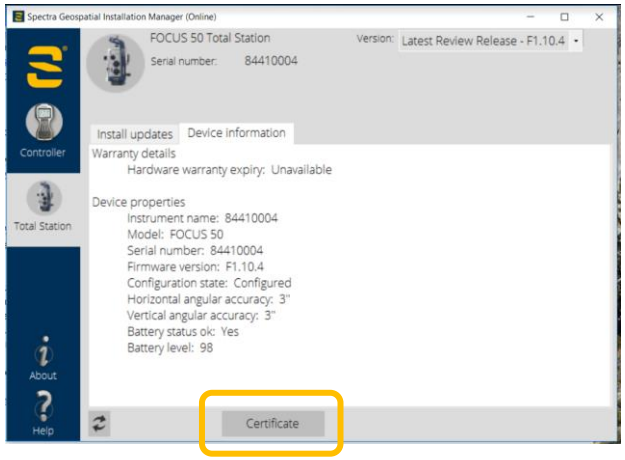
Change your mind? Upgrade at any time

How it works:

- In the factory, all instruments go through extensive testing and calibrations to ensure they achieve 1″ angular accuracy
- Before delivering to you, a Spectra Geospatial Distribution partner applies an electronic configuration (firmware) to set the instrument performance

Certificate Delivery through SGIM

Instrument Certificates are delivered electronically, on demand, through SGIM



Instrument angular accuracy:
Configuration applied date:
Certificate generation date:

Certificate

SPECTRA GEOSPATIAL FOCUS 50 WITH SERIAL NUMBER 84450005 COMPLIES WITH THESE SPECIFICATIONS:

INSTRUMENT CONFIGURATION

Instrument angular accuracy:	3"
Configuration applied date:	15 September 2021
Certificate generation date:	22 September 2021

ANGLE MEASUREMENT

Accuracy (ISO 17123-3)

1" unit accuracy is	0.3 mgon = 3 cc (1")
2" unit accuracy is	0.6 mgon = 6 cc (2")
3" unit accuracy is	0.9 mgon = 9 cc (3")
5" unit accuracy is	1.5 mgon = 15 cc (5")

Automatic Level Compensator
Dual-axis with a working range of: ±5.4' (±100 mgon)

DISTANCE MEASUREMENT

Prism Mode

Accuracy (ISO 17123-4):	1 mm + 2 ppm (0.003 ft + 2 ppm)
Accuracy RMSE:	2 mm + 2 ppm (0.006 ft + 2 ppm)

DR Mode
Accuracy RMSE: 2 mm + 2 ppm (0.0065 ft + 2 ppm)

RANGE

Prism Mode
1 Prism: 0.2 m - 5,500 m (0.65 ft – 18044 ft)

DR Mode
Kodak Grey (18%): 1 m - 600 m (3.28 ft-1969 ft)

For full specifications of this instrument, please refer to the datasheet available on www.SpectraGeospatial.com

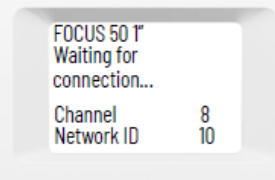
Manufacturing Inspection

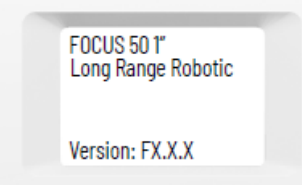
Inspected by:	Jan Friman
Inspection Date:	10 September 2021
Location:	Danderyd, Sweden

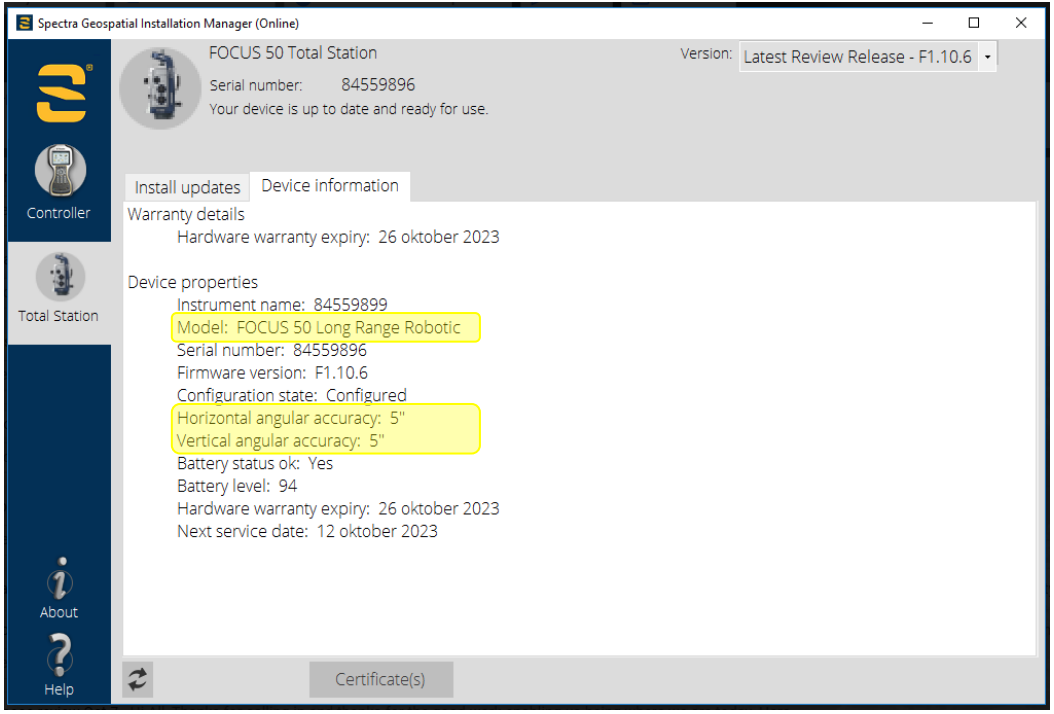
SPECTRA GEOSPATIAL

Where to find an instrument's configuration

- Plug into SGIM > Device Information
- Within Origin > Instrument Settings
- In the Face 2 display
  - Splash Screen
  - Waiting for connection page
  - Firmware Page

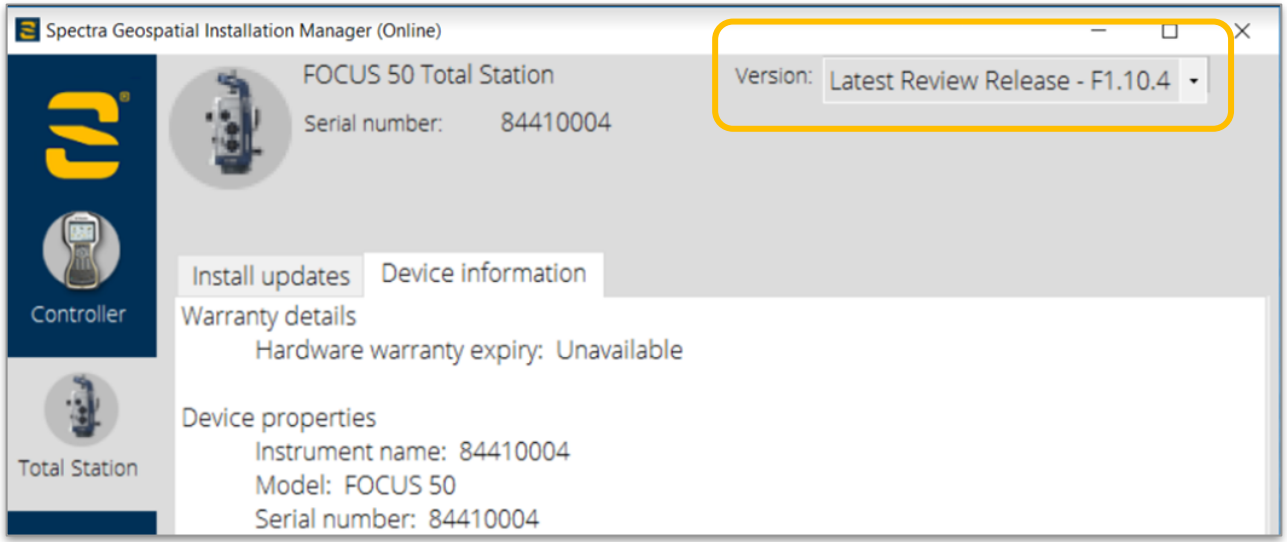






Firmware Updates through SGIM

Firmware updates for the FOCUS 50 are built into SGIM → Easily update the instrument firmware



Service Certificates & Next Service Date

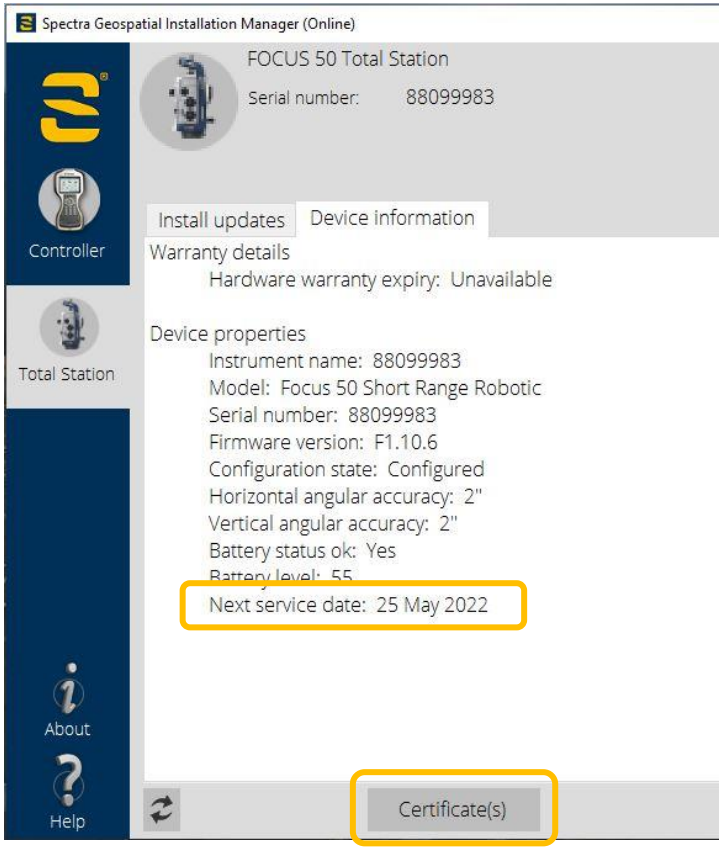
Service certificates also delivered through SGIM

Certificate(s) button will download both:

- Factory Certificate
- Preventative Maintenance certificate (if available)

Next Service Date can be found:

- In SGIM
- Onboard the instrument under “Service Info”



FOCUS 50 &
Origin Field Software

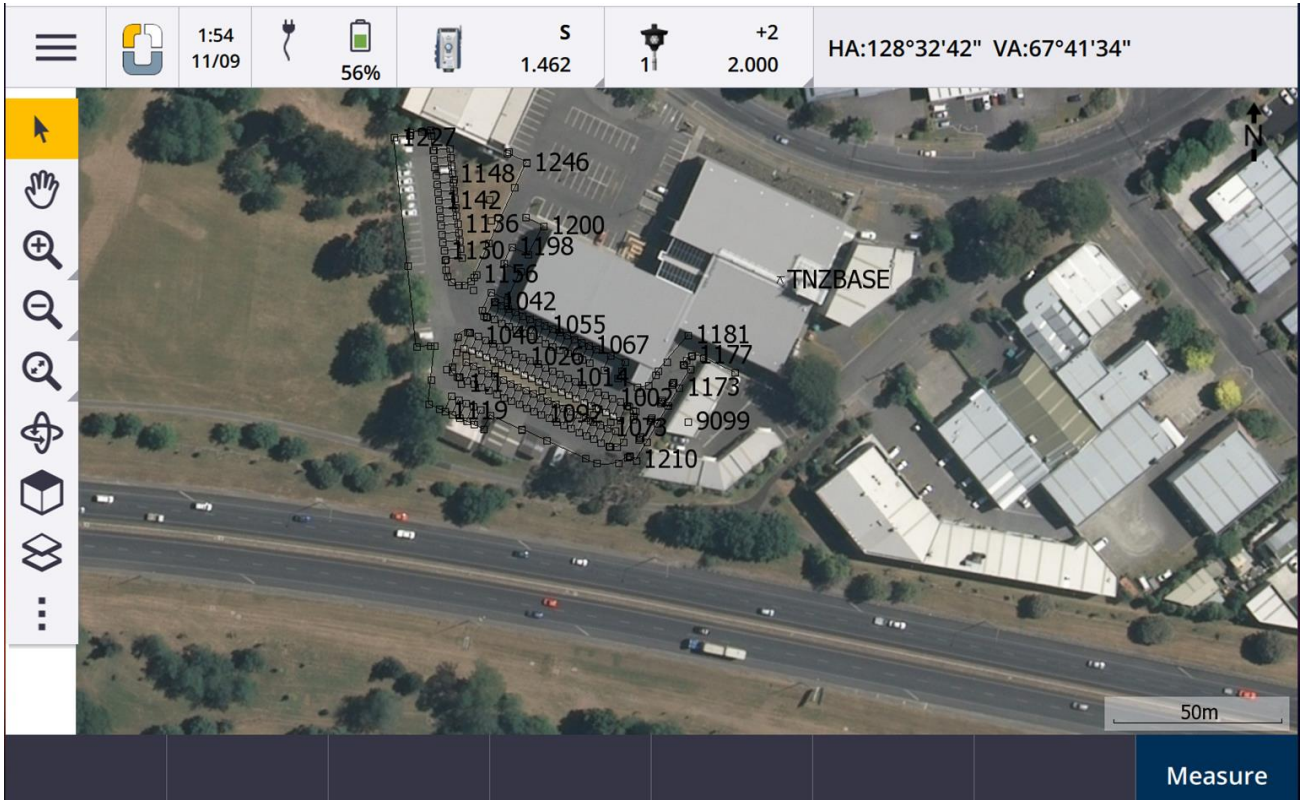
Modern Workflow

Origin increases productivity by:

- Map centric workflows
- Modern UI reducing clicks required to access features and carry out a job
- Auto connect to instruments to get the job started fast

Simple point selection and navigation, including multi-touch (pinch-to-zoom)

You can also add satellite imagery



Simplified Instrument Height

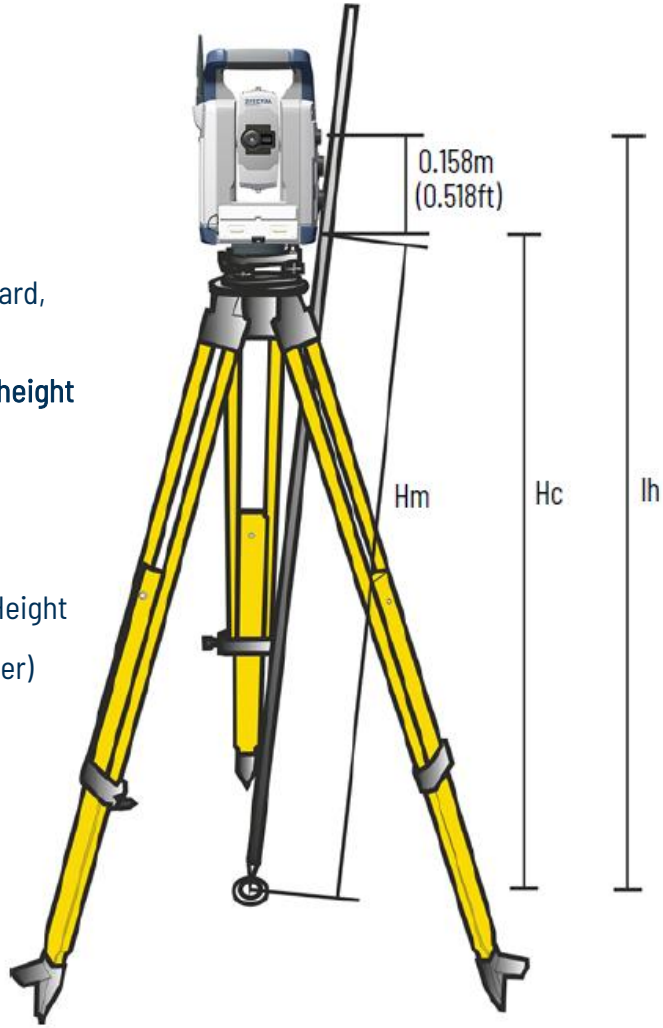
Sometimes measuring instrument true height is a little hard, especially on rough ground

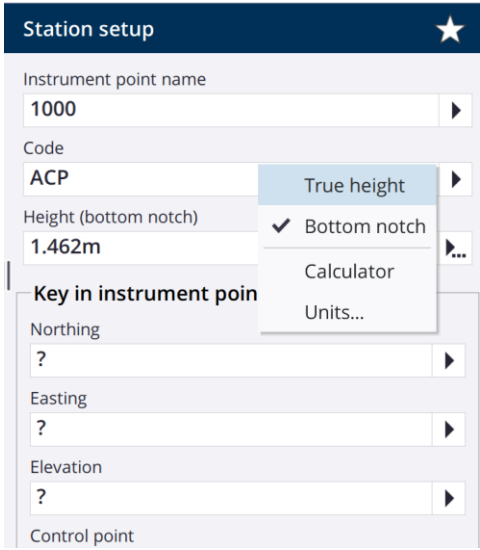
Use the "bottom notch" for an **easier and more accurate height** measurement!

Measure the **Hm** (slope to bottom notch)

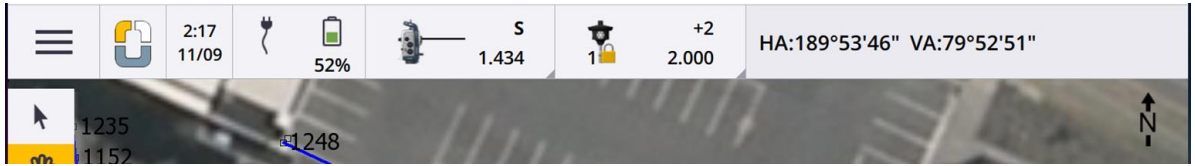
→ Origin software will automatically calculate the True Height

(You can always still measure/input Ih directly if you prefer)





Status Bar

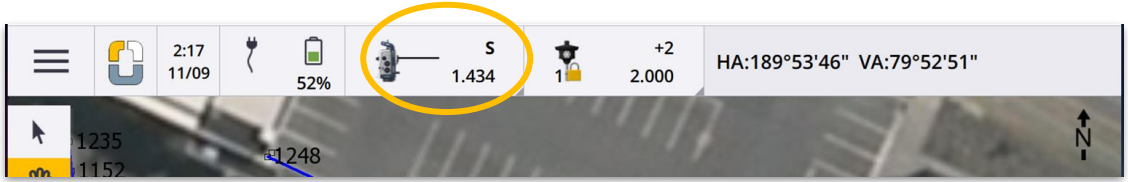


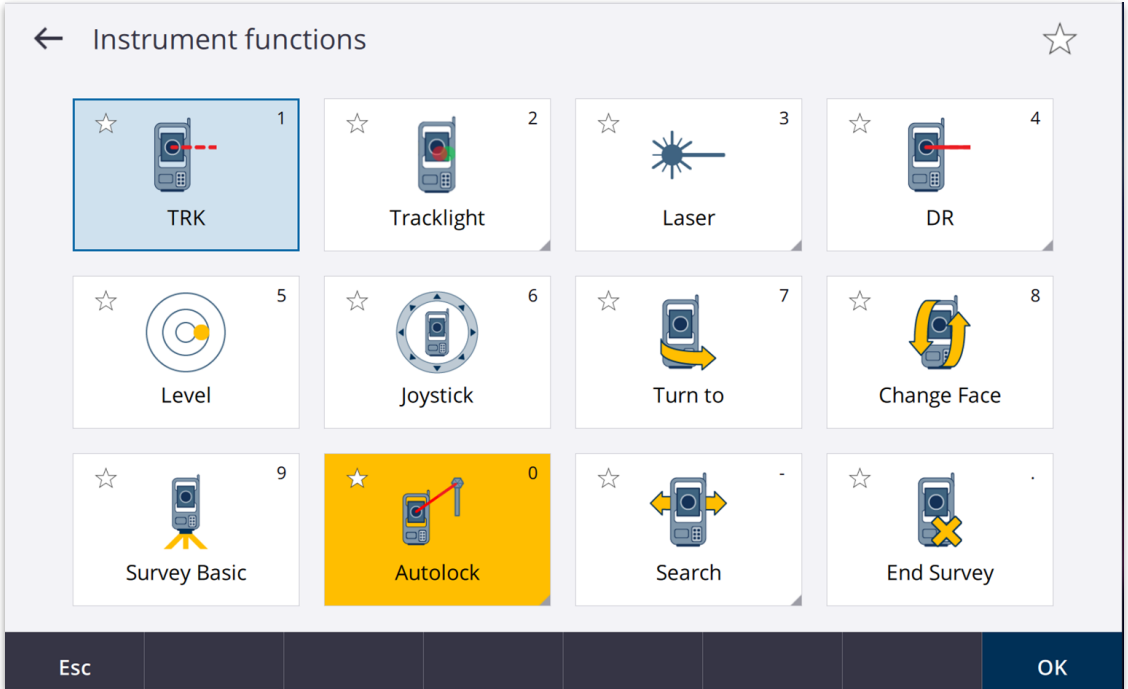
- Data controller & Instrument Battery level (in this case, a controller is plugged in)
- What instrument you are connected to
  - FOCUS 50
  - Solid straight line means you're locked on a prism
  - EDM in Standard mode
  - Instrument height 1.434 m
- Prism you're using
  - Target 1
  - Instrument is locked on (autolock)
  - K value = +2mm
  - Target height = 2m
- Current HA/VA (and SD if your EDM is in tracking mode)

Instrument functions
Easily toggle on/off

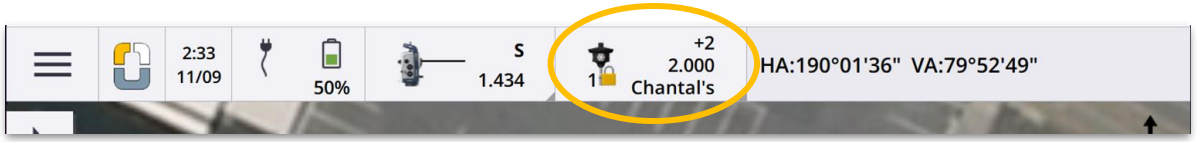
Click the FOCUS 50 icon at anytime to see all the instrument functions

Toggle them on/off as needed



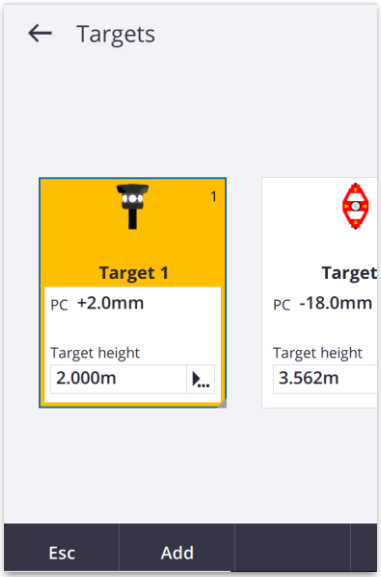


Targets

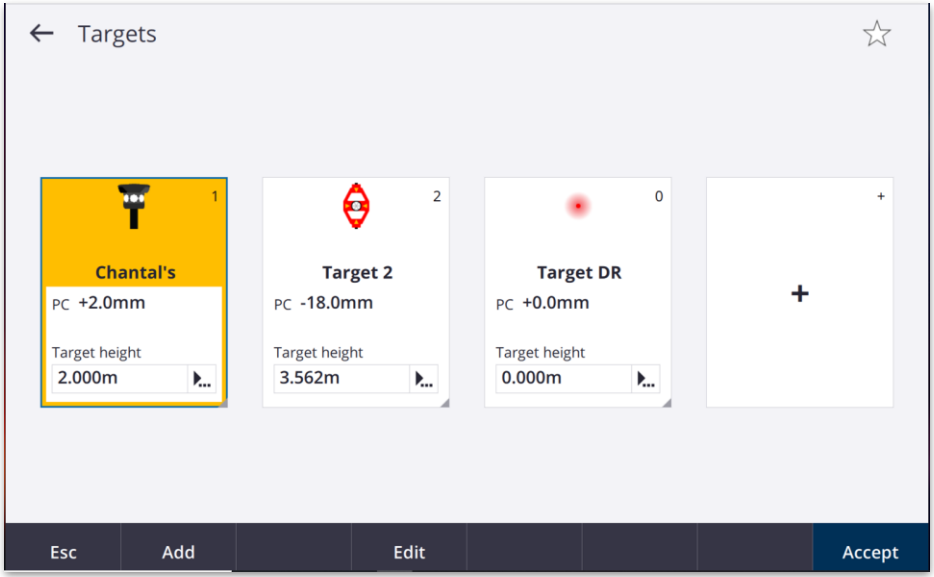


Click on the prism icon at the top to jump into your Targets

Default named Target 1, 2, ...



Can also add nicknames, I named mine “Chantal’s”

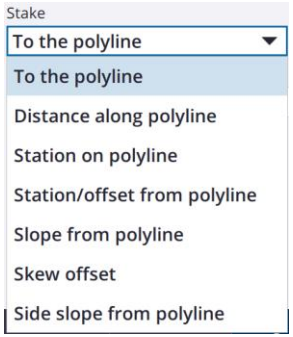


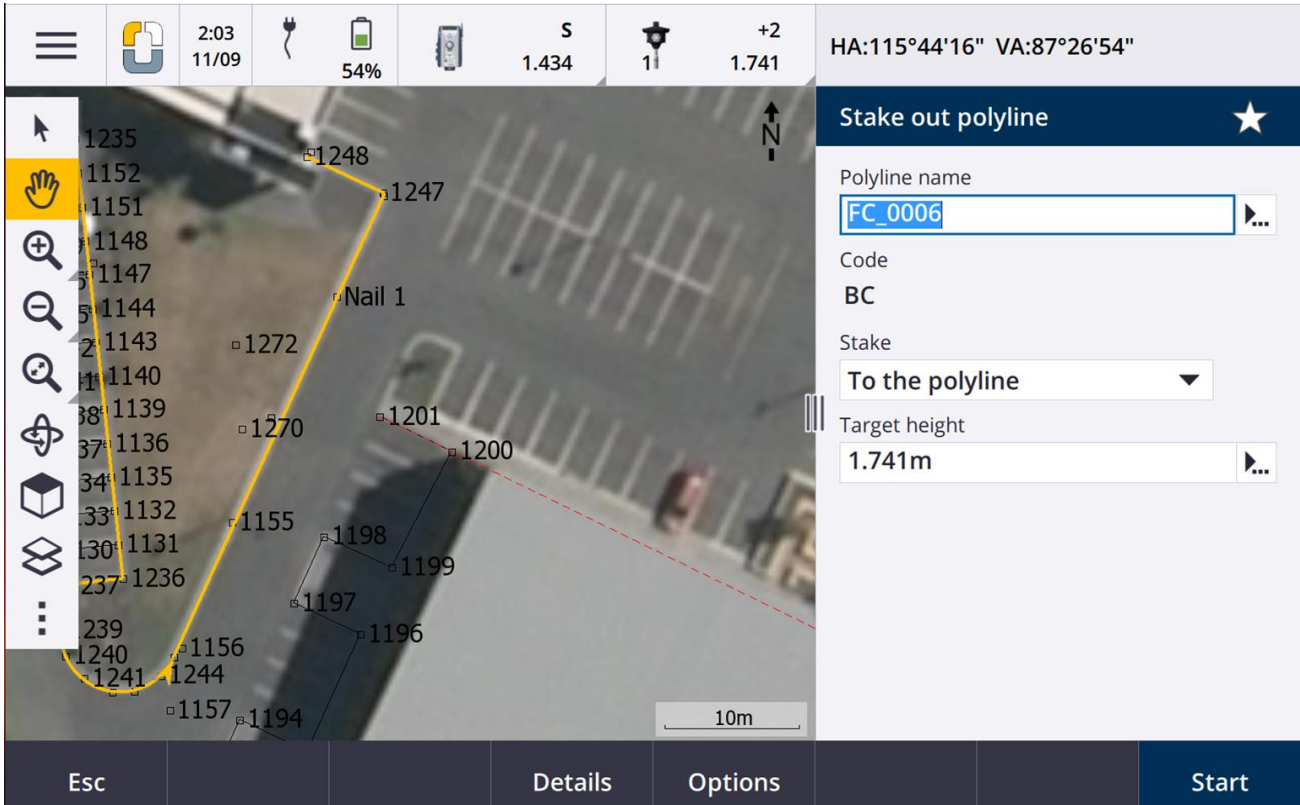
Stakeout (1/2)

Easily select points, lines, or even polylines to stake out

- Click polyline FC_0006
- Click “Stakeout”
- Side menu opens (shown)
- Click “Start”

Other Stake Options:





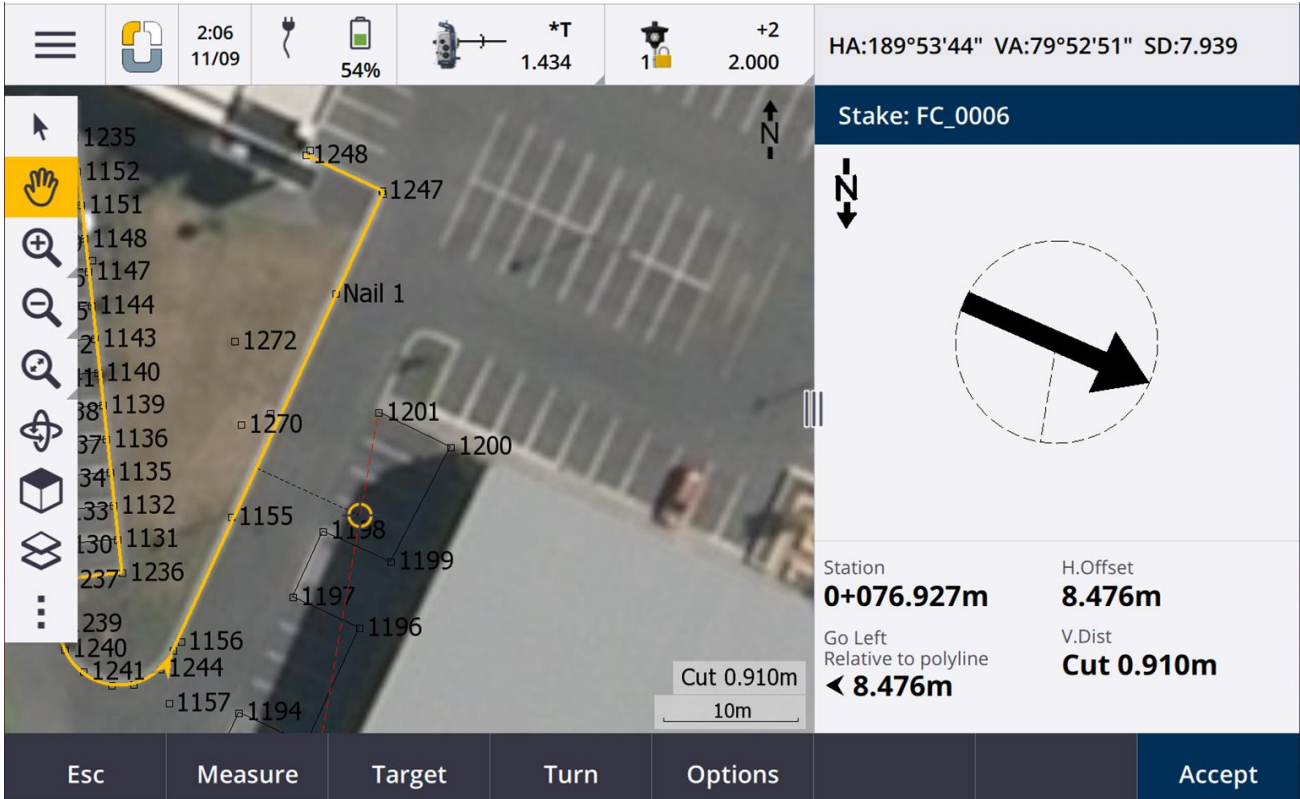
Stakeout (2/2)

Simply follow the arrow!

Note-the top status bar changed

The total station automatically entered tracking mode (EDM constantly streaming a distance)

The lock symbol next to the prism means we're tracking the prism using Autolock

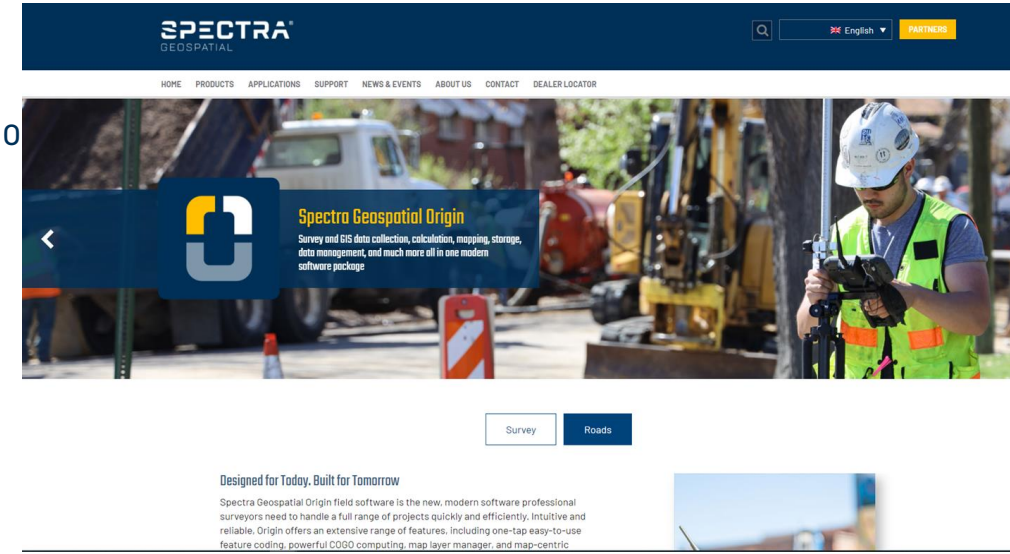


...and lots more!

Roads, feature coding and automated linework, integrated surveying with GNSS...

To learn more about Origin, please visit spectrageospatial.com/origin/

Or reach out to your local Distribution Partner for a demo of Origin and the FOCUS 50 together



Origin incentive for Survey Pro, Survey Mobile users:

- All Survey Pro and Survey Mobile users can try one year of Origin subscription for free. This includes:
  - Origin Max, GNSS, & Total Station
  - Origin Roads
  - Origin LT
- Incentive to end on December 31st

Thank You

Time for Questions