



Survey, Construction & GIS Product Catalog



www.spectraprecision.com

Content

SPECTRA PRECISION® PRODUCTS

FOCUS® Motorized Total Stations.....	1-4
EPOCH® GNSS Systems.....	5-6
ProMark® GNSS Systems.....	7-14
ProFlex® GNSS Systems.....	15-16
FOCUS® Mechanical Total Stations.....	17-20
Spectra Precision Data Collectors.....	21-30
Spectra Precision Software.....	31-38
Spectra Precision GIS Mobile Mapping.....	39-44

ACCESSORIES

Spectra Precision Accessories.....	43-44
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PACIFIC CREST RADIO PRODUCTS

Pacific Crest Radios.....	45-46
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FOCUS 30

- 2", 3", and 5" angle accuracy
- Spectra Precision Survey Pro™ or Layout Pro field software
- GeoLock™ GPS assist technology
- StepDrive™ motion technology
- LockNGo™ advanced tracking technology
- Windows CE Touchscreen
- Ultra lightweight at only 5 kg (11 lb)
- 2.4 GHz interference-free radio
- Spectra Precision Ranger 3RC or 3XR data collectors optional



Introducing the powerful Spectra Precision® FOCUS® 30 Total Station. This fully robotic motorized solution provides improved speed, accuracy and precision in measurement. A robotic instrument moves the power of the observer from the instrument to the range pole, improving the quality of your work.

All robotic instruments include:

- a motorized drive system at the instrument
- a tracking sensor to track the range pole and prism
- a communication connection between the instrument and range pole and prism

The speed of observation and precise positioning of the FOCUS 30 robotic total station is provided by patented StepDrive motion technology. Included in all models, the StepDrive motors control the horizontal and vertical motion, so there is no need for traditional motion locks. Using the motorized drives it is possible to precisely turn to, and repeat, angle measurements. This results in quick and reliable measurements which substantially increases your staking productivity.

The Robotic and LockNGo FOCUS 30 models include a tracking sensor that uses LockNGo tracking technology enabling the instrument to constantly lock onto the prism. The benefit of LockNGo is the ability to follow the prism at all times and reduce downtime from not having to re-point the instrument on every observation.

To maintain contact between the FOCUS 30 instrument and the remote observer with the range pole and prism, the robotic solution must include a communication link. The FOCUS 30 uses an integrated 2.4 GHz radio modem, as does the Spectra Precision Ranger data collector. The 2.4 GHz radio modem provides interference-free robotic data communications.

Once your robotic communications have been established you can control all the functions of the FOCUS 30 from the range pole as you move through the jobsite making measurements. This makes it possible for a single surveyor to perform high accuracy stakeout or topographic surveys by themselves. From high-order control surveys to topographic data collection or fast-paced

Total Station

construction stakeout, you can rely on a FOCUS 30, even in harsh outdoor conditions.

The FOCUS 30 total station is combined with Spectra Precision Survey Pro field software, providing you with world class software solutions for any surveying situation. An example of these features includes a unique robotic software technology that can be used when associating the FOCUS 30 with a low-cost GPS receiver and Survey Pro software. This combination of technologies allows the user to take full advantage of the Spectra Precision GeoLock technology to keep locked on target.

The Spectra Precision GeoLock technique allows a robotic total station to perform an aided search for an optical target using an initial GPS position. The remote instrument can then be directed towards the robotic roving operator using the GPS position and a subsequent search is quickly performed to re-acquire the target at the robotic rover. This technique greatly reduces wasted time, improving your field work efficiency.

Spectra Precision Layout Pro software and the FOCUS 30 together offer the convenience of carrying, managing, editing, and laying out your job site blueprint. This combination is a critical tool in the field of construction layout and is designed to make the layout process more productive, accurate and reliable. For example, use Layout Pro to guide the layout of the major points, add string dimensions on the print, as well as calculate diagonals and angles.

The FOCUS 30 robotic solution is best described as Simply Powerful. Packaged in a modern, sleek, and streamlined design, it is easy-to-use, affordable and tough. FOCUS 30 Total Stations are designed to meet all your surveying needs.

MODELS OVERVIEW

	StepDrive motion	LockNGo tracking	GeoLock	2.4 GHz radio
Robotic	Standard	Standard	Standard	Standard
LockNGo	Standard	Standard	N/A	N/A
StepDrive	Standard	N/A	N/A	N/A

FOCUS 30

PERFORMANCE

Angle measurement

Accuracy (Standard deviation based on ISO 17123-3)

2" (0.6 mgon), 3" (1.0 mgon), or 5" (1.5 mgon)

Angle reading (least count display)

Standard

1" (0.1 mgon)

Tracking

1" (0.1 mgon), 2" (0.5 mgon), or 3" (1.0 mgon)

Distance measurement¹

Accuracy to Prisms (Standard deviation based on ISO 17123-4)

Standard

2 mm + 2 ppm (0.007 ft + 2 ppm)

Tracking

5 mm + 2 ppm (0.016 ft + 2 ppm)

Accuracy Reflectorless Mode

Standard < 300 m (984 ft)

3 mm + 2 ppm (0.01 ft + 2 ppm)

Standard > 300 m (984 ft)

5 mm + 2 ppm (0.016 ft + 2 ppm)

Tracking

10 mm + 2 ppm (0.033 ft + 2 ppm)

Measuring time

Prism Standard

2.4 sec.

Prism Tracking

0.5 sec.

Reflectorless Standard

3–15 sec.

Reflectorless Tracking

0.7 sec.

Range Prism Mode

1 prism

4,000 m (13,123 ft)

3 prisms

7,000 m (22,966 ft)

Foil Reflector 60 mm

300 m (984 ft)

Range Reflectorless Mode

	Good ⁴	Normal ⁵	Difficult ⁶
KGC (18%) ²	400 m (1,312 ft)	350 m 1,148 ft	300 m 984 ft
KGC (90%) ²	800 m (2,625 ft)	600 m 1,969 ft	400 m 1,312 ft

Shortest possible range

1.5 m (4.9 ft)

Automatic level compensator

Type

Dual-axis

Accuracy

0.5" (0.15 mgon)

Working Range

± 5.5' (± 100 mgon)

EDM SPECIFICATIONS

EDM Laser and Principle

Light source

Laser Diode 660 nm

Principle

Phase Shift

EDM Beam divergence

Horizontal

4 cm/100 m (0.13 ft/328 ft)

Vertical

3 cm/100 m (0.10 ft/328 ft)

Atmospheric Correction

-150 ppm to 160 ppm continuously

CERTIFICATION

Class B Part 15 FCC certification,

CE Mark approval. C-Tick.

Laser safety IEC 60825-1 am2:2007

Prism Mode: Class 1

Reflectorless/Laser Pointer: Class 3R laser

Bluetooth type approvals are country

specific.

ROBOTIC SURVEYING

Robotic Operation¹

Maximum Robotic Range

300 m to 800 m (984 ft to 2,625 ft)

Point precision at 200 m (656 ft)

<2 mm (0.007 ft)

Maximum Search Distance

300 m to 800 m (984 ft to 2,625 ft)

Search Time (typical)

2–10 sec.

Communications

internal/external

2.4 GHz, frequency hopping, spread spectrum

GPS Search GeoLock3

GPS Search GeoLock

360° (400 gon)

Range

Full robotic operation range

Total Station

GENERAL SPECIFICATIONS

Coarse Leveling

Electronic coarse leveling range
±3° (±3.3 gon)

Circular level in tribrach
8/2 mm (8/0.007 ft)

Drives

Drive system

Spectra Precision StepDrive system

Rotation speed maximum

90°/sec (100 gon/sec)

Rotation time Face 1 to Face 2

3.7 sec.

Positioning speed 180° (200 gon)

3.5 sec.

Clamps and slow motions

StepDrive driven, endless fine adjustment

Centering

Centering system

3-pin

Plummet

Built-in optical plummet

Magnification

2.4 x

Focusing distance

0.5 m to ∞ (1.6 ft to ∞)

Telescope

Magnification

31x

Aperture

50 mm (1.96 in)

Field of view

1°30'

Focusing distance

1.5 m to ∞ (4.9 ft to ∞)

Illuminated crosshair

Standard

Tracklight built-in

Standard

Trunnion axis height

196 mm (7.71 in)

Environmental

Operating temperature

-20 °C to +50 °C (-4 °F to +122 °F)

Dust and water proofing

IP55

Power supply

Internal battery

Li-Ion, 11.1 V/5.0Ah

Operating time with one internal battery

Approx. 6 hours

Communications

External foot connector

USB cable connection and external power supply

Wireless communication

Bluetooth®

Weight

Instrument

5.0 kg (11.0 lb)

Tribrach

0.7 kg (1.54 lb)

Internal battery

0.3 kg (0.66 lb)

DATA COLLECTION

Control Units fixed on alidade

Face 1

Display

3.5" TFT color touch-screen, 320x240 Pixel, backlight

Keyboard

Alphanumeric keypad

Memory (data storage)

128 MB RAM, 128 MB Flash

Field Application Software

Spectra Precision Survey Pro

Face 2

Display

6 lines, monochrome, 96x49 Pixel, backlight

Keyboard

4 keys

Instrument Software Functions

Change Face, Radio and Instrument Settings, Measurement Value Display, Leveling

¹ Standard clear: No haze, overcast or moderate sunlight with very light heat shimmer. Range and accuracy are dependent on atmospheric conditions, size of prism and background radiation.

² Kodak Gray Card, Catalog number E1527795.

³ Spectra Precision GeoLock is available on data collectors after station setup.

⁴ Good conditions (good visibility, overcast, twilight, underground, low ambient light).

⁵ Normal conditions (normal visibility, object in the shadow, moderate ambient light).

⁶ Difficult conditions (haze, object in direct sunlight, high ambient light).

EPOCH 50

- 220 Channels for Multi-Constellation GNSS support
- Integrated Transmit and Receive data link
- RTK, Static, and PPK
- Network RTK positioning
- Spectra Precision Survey Pro field software
- Support for all GNSS data with Spectra Precision Survey Office software



The Spectra Precision EPOCH® 50 GNSS system, with its 220 channels, makes effective use of the GPS L1/L2/L2C/L5 and GLONASS L1/L2 signals – in addition to the BeiDou open service signals – for outstanding satellite coverage and precise positioning. The EPOCH 50 uses proven technologies to provide both an extremely stable phase center and the tracking of the new stronger L2C and L5 signals.

The EPOCH 50 GNSS with Survey Pro provides field crews with the tools and capabilities to get the job done. With maximum stability, precision, quality, and easy to use work flows, the EPOCH 50 GNSS is packed full of proven technologies that you can rely on day-to-day.

The EPOCH 50 GNSS receiver has an internal transmit and receive radio modem so that either receiver may be used as a base or rover. Use the internal radio on a construction site for a quick and easy setup. The EPOCH 50 GNSS also supports external radio and cellular modems for added flexibility and range. In addition communicate cable free with Bluetooth® to your choice of world-class Spectra Precision data collectors.

The EPOCH 50 provides added productivity and cost savings with support of RTK Network technology for single base and NTRIP operations. Connect to networks with Spectra Precision WWAN enabled data collectors for added flexibility.

Designed with greater than 99.9% reliability initializations, the EPOCH 50 GNSS provides fast, high quality results in all supported survey modes. Consistent accurate results, quality construction, and affordable pricing make the EPOCH 50 GNSS the ideal choice for a productive business.

Spectra Precision Survey Office software provides a complete office solution for postprocessing GNSS data and adjusting terrestrial survey data. Export your processed and completed results directly back to the field or design software packages using a variety of file formats.

GNSS System

GENERAL

When connected to the data collector

- GPS, GLONASS and BeiDou (GNSS) RTK dual frequency with centimeter accuracy
- Ergonomic, light weight and compact design
- Integrated Wireless Bluetooth 2.0 technology
- Access Network RTK with GPRS

TECHNICAL SPECIFICATIONS

Postprocessing Accuracy (RMS)¹

High-accuracy static

Horizontal	3 mm + 0.1 ppm
Vertical	3.5 mm + 0.4 ppm

Static & Fast Static

Horizontal	3 mm + 0.5 ppm
Vertical	5 mm + 0.5 ppm

Real-Time Kinematic surveying¹

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm
Initialization reliability ²	Typically >99.9%
Initialization time	Typically <10 seconds
Start-up	<60 seconds from power on to positioning <30 seconds with recent ephemeris

Code differential GPS positioning¹

Horizontal	0.25 m + 1 ppm
Vertical	0.50 m + 1 ppm
SBAS differential positioning accuracy	Typically <5 m 3DRMS ³

MEASUREMENTS

- Advanced, sixth generation, custom survey GNSS technology
- High-precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurement data for low noise, low multipath error, low time domain correlation and high dynamic response
- Very low noise GNSS carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Proven Spectra Precision low-elevation tracking technology

PHYSICAL

Dimensions (W x H x D)

19.0 cm x 10.7 cm x 20.0 cm
(7.48 in x 4.21 in x 7.87 in)

Weight (with battery)

1.34 kg (2.95 lb)

Ports

I/O Two 7-pin Lemo, RS-232
Bluetooth

Data Link (UHF radio)

TNC

ENVIRONMENTAL

Operating temperature

-40 °C to +65 °C (-40 °F to +149 °F)
-40 °C to +55 °C (-40 °F to +131 °F)
with internal radio transmitting

Storage temperature

-40 °C to +75 °C (-40 °F to +167 °F)

Dust/Water

IP66

Vibration

MIL-STD-810F

ELECTRICAL

- Power 10 V DC to 20 V DC external power input with over-voltage protection on Port 1 and Port 2 (7-pin)
- Rechargeable, 7.4v 2400 mAh Li-Ion internal battery
- Average operating times on internal battery (RTK/Static): 4.0 hours⁴

COMMUNICATIONS AND DATA STORAGE

- Internal post process data storage 64 MB (9 MB reserved)
- Supports external GSM/GPRS/CDMA modems for point to point RTK and Network RTK
- Internal UHF Transceiver: 1 W or 0.5 W.
- Supports external UHF transmit data link for RTK base station operation.
- 1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz positioning when configured.⁶

Correction formats⁵

- sCMRx, CMR, CMR+, RTCM 2.1, RTCM 2.2, RTCM 2.3, RTCM 3.0, RTCM 3.1
- 25 KHz and 12.5 KHz channel spacing
- NMEA-0183 output support on COM2 during Network RTK or autonomous operations

¹ Accuracy and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation times appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hr may be required to achieve the high accuracy static specification.

² May be affected by atmospheric conditions, signal multimath, obstruction, and satellite geometry.

³ Depends on SBAS (WAAS/EGNOS) system performance.

⁴ Three batteries supplied standard.

⁵ Not all protocols will work with all radio baud rates and channel spacing

⁶ When used with Survey Pro, only 1Hz and 5Hz modes are supported.

⁷ Below -20°C, external power must be used.

ProMark 800

- 120 channels for multi-constellation GNSS support
- RTK rover/base, postprocessing
- RTK networks: VRS, FKP, MAC
- Advanced Z-Blade technology
- GNSS-centric signal processing
- Outstanding reliability in urban canyons and under tree canopy
- UHF and GSM/GPRS/3.5G built-in communication modules



The Spectra Precision ProMark™ 800 GNSS system is a powerful solution with ground-breaking new technologies to provide the best possible productivity in the field. With its 120 channels and full spectrum use of L1/L2/L5 GPS+GLONASS+GALILEO, and its new Z-Blade GNSS-centric technology, the ProMark 800 provides reliable, field-proven solutions that can be counted on to produce accurate results in the most demanding conditions.

The Z-Blade GNSS-centric technology makes optimal use of all GNSS signals and takes advantage of each GNSS constellation to deliver fast and stable RTK positions. Because of the Z-Blade GNSS-centric technology even when GPS coverage is insufficient but other constellations like GLONASS are visible, the ProMark 800 will still compute an accurate fix. Dense urban canyons or heavy tree canopy are no longer "no-go" zones for RTK. ProMark 800 with Z-Blade is not GPS dependent (requiring a minimum of 4 to 5 GPS satellites) to acquire and maintain a precise fix unlike all other GNSS receivers which cannot compute a fix without using GPS satellite signals. The Z-Blade GNSS-centric algorithm treats all available satellite signals equally and then combines them for optimal performance.

The mix of exceptional RTK performance and compact design makes the ProMark 800 an extremely powerful and appealing RTK solution for demanding professional land surveyors. Waterproof, shock resistant, cable free, lightweight, and with long battery life, the ProMark 800 offers all-day operations in demanding environmental conditions.

ProMark 800 includes extended wireless network (WWAN) communications modules, for maximum mobility and flexibility in the field. The RTC bridge function enables a network-connected ProMark 800 rover to rebroadcast RTK corrections to multiple rovers. ProMark 800 works with all of the Spectra Precision rugged data collectors with Survey Pro and with Spectra Precision Survey Office comprising a complete set of tools to make your business more productive.

1 Accuracy and TTFF specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality.

2 Performance values assume minimum of five satellites, following the procedures recommended in the product manual. High multi-path areas, high PDOP values and periods of severe atmospheric conditions may degrade performance.

3 Depending on baselines, precise ephemeris and long occupations up to 24 hr may be required to achieve the high precision static specifications.

4 Each GNSS constellation is processed independently, and combined for optimal performance.

5 No BT or WLAN are used, backlight at default setting (50% brightness), varies with temperature.

GNSS System

GENERAL

- 120 channels for multi-constellation GNSS support
- RTK rover/base, postprocessing
- RTK networks: VRS, FKP, MAC
- RTC bridge
- NTRIP protocol

TECHNICAL SPECIFICATIONS

Postprocessing Accuracy (RMS)^{1,2}

Static, Fast Static

Horizontal	3 mm + 0.5 ppm
Vertical	5 mm + 0.5 ppm

High-precision Static³

Horizontal	3 mm + 0.1 ppm
Vertical	3.5 mm + 0.4 ppm

Kinematic

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm

Real-Time GNSS surveying (RMS)^{1,2}

RTK (fine mode)

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm

SBAS (WAAS/EGNOS/MSAS/GAGAN)

Horizontal	<50 cm
Vertical	<1 m

DGPS position

Horizontal	25 cm + 1 ppm
Vertical	50 cm + 1 ppm

Instant-RTK® Initialization

- Typically 2-second initialization for baselines < 20 km
- Up to 99.9% reliability
- RTK Initialization range > 40 km

MEASUREMENTS

Z-Blade technology for optimal GNSS performance

- Ashtech GNSS-centric algorithm: Fully independent GNSS satellites tracking and processing⁴
- Fully independent code and phase measurements
- Quick signal detection engines for fast acquisition and re-acquisition of GNSS signals
- Advanced multi-path mitigation

Satellite signals tracked simultaneously

- GPS L1 C/A L1/L2 P, L2 C, L5
- GLONASS L1 C/A and L2 C/A
- GALILEO E1 and E5
- SBAS: (WAAS/EGNOS/MSAS/GAGAN)

PHYSICAL

Dimensions (W × H × D)

22.8 cm x 8.4 cm x 18.8 cm
(9 in x 3.3 in x 7.4 in)

Weight (with battery)

1.4 kg (3.1 lb)

User interface

Graphical LED display
I/O interface RS232, RS422, USB, Bluetooth, PPS

Size

3.5" portrait

CPU

806 MHz Marvell PXA 320

ENVIRONMENTAL

Operating temperature

-30° to +60°C (-22° to +140°F)

Storage temperature

-40° to +70°C (-40° to +158°F)

Dust/Water

IP67

Humidity

100% condensing

Shock

2 m pole drop

ELECTRICAL

- Rechargeable, 7.4 V 4600 mAh Li-Ion internal battery
- Average operating time on internal battery: 8 hours (GSM and UHF off)⁵
- Power 6 V DC to 28 V DC external power input with over-voltage protection on port PWR (3 pin)

COMMUNICATIONS AND DATA STORAGE

- 128 MB internal memory (expandable through USB)
- Up to 400 hours of 15 sec. raw GNSS data from 18 satellites
- Up to 20 Hz real-time raw data (code and carrier) and position output
- Recording Interval: 0.05–999 seconds
- Internal optional communication modules – Pacific Crest UHF – GSM/GPRS/EDGE/3.5G quad-band
- External optional UHF transmitters – Pacific Crest UHF

Correction formats

- Supported data formats: ATOM (Ashtech Optimized Messaging), RTCM 2.3–3.1, CMR, CMR+, DBEN, LRK
- NMEA-0183 messages output

ProMark 700

- 220 channels RTK network rover
- Reliable and proven technology
- Extremely light and compact
- Comfortable operation in the field
- Ultra-rugged and shock resistant design
- Truly waterproof and dust-proof
- All-day battery life
- Easy-to-use, easy-to-own

The Spectra Precision ProMark™ 700 GNSS receiver is the lightest network RTK rover on the market today. Very compact, slim and cable-free, ProMark 700 is portable, ergonomic and comfortable for all-day use in the field. Its long-lasting battery allows all-day operations without any need for battery recharging or replacing. And thanks to the extremely rugged, shock-proof and waterproof design, ProMark 700 can withstand the most extreme outdoor conditions.



ProMark 700 provides all the necessary features for effective network RTK operation, without the unnecessary complexity of rarely-used modules and options. The dual-frequency, dual-constellation GNSS receiver has 220 channels to ensure that all available satellite signals are tracked. Together with a choice of rugged data collectors and productive field software, ProMark 700 creates a perfect network RTK solution.

The ProMark 700's offer includes Spectra Precision Survey Pro and FAST Survey field software, as well as the Spectra Precision Survey Office software. A large choice of feature-rich data collectors ensures you get a robust, ready-to-use, and cable-free RTK solution.

1 Accuracy and TTFF specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality.

2 Performance values assume minimum of five satellites, following the procedures recommended in the product manual. High multi-path areas, high PDOP values and periods of severe atmospheric conditions may degrade performance.

3 Depending on baselines, precise ephemeris and long occupations up to 24 hr may be required to achieve the high precision static specifications.

4 At very low temperature, the unit will start, and will operate after short warm-up time.

GNSS System

GENERAL

- 220 channels L1/L2 GPS/GLONASS
- Network RTK rover
- RTK networks: VRS, FKP, MAC
- Very lightweight, compact and ergonomic design

TECHNICAL SPECIFICATIONS

Real-Time Kinematic (RMS)^{1, 2}

RTK (fine mode)

Horizontal 10 mm + 1 ppm
Vertical 20 mm + 1 ppm

SBAS (WAAS/EGNOS/MSAS/GAGAN)

Horizontal <50 cm
Vertical <85 cm

DGPS position

Horizontal 25 cm + 1 ppm
Vertical 50 cm + 1 ppm

Real-Time Performance

- Initialization time: typically < 10 sec (for baselines < 20 km)
- Initialization reliability: > 99.9%

Post-processing Accuracy (RMS)^{1, 2}

Static, Fast Static

Horizontal 5 mm + 0.5 ppm
Vertical 10 mm + 0.5 ppm

High-precision Static³

Horizontal 3 mm + 0.5 ppm
Vertical 6 mm + 0.5 ppm

Kinematic

Horizontal 10 mm + 1 ppm
Vertical 20 mm + 1 ppm

MEASUREMENTS

- Proven low elevation tracking technology
- Advanced multi-path mitigation
- RTK network rover: VRS, FKP, MAC
- Point-to-point through Real-Time Data Server (RTDS) software
- NTRIP, Direct IP

Satellite signals tracked simultaneously

- GPS L1 C/A, L2 P and L2 C
- GLONASS L1 C/A and L2 C/A
- SBAS: code and carrier (WAAS/EGNOS/MSAS/GAGAN)

PHYSICAL

Dimensions (W × H × D)

20.5 cm x 20.5 cm x 6.2 cm
(8.1 in x 8.1 in x 2.4 in)

Weight (with battery)

650 g (1.4 lb)

I/O interface

- 9-16 V DC input power
- RS232 serial link
- Bluetooth 2.0 class 2 (SPP profile)

ENVIRONMENTAL

Operating temperature

-30° to +65°C (-22° to +149°F)

Storage temperature

-40° to +70°C (-40° to +158°F)

Dust/Water

IP67

Humidity

100% condensing

Shock

2 m pole drop

ELECTRICAL

- Rechargeable, 33.7 V 5000 mAh Li-Ion internal batteries
- Average operating time on internal battery: 10 hours
- Power 9 V DC to 16 V DC external power input with reverse polarity protection

COMMUNICATIONS AND DATA STORAGE

- 6 MB internal memory (expandable through data collector memory)
- Up to 100 hours of 15 sec. raw GNSS data from 18 satellites
- Up to 5 Hz real-time position output
- Recording Interval: 1-60 seconds

Correction formats

- Supported data formats: RTCM 2.3-3.1, CMR, CMR+

ProMark 220

- All-in-view, dual-frequency rover
- Fast fix with short initialization time
- Built-in wireless connectivity
- Minimal cost for maximum productivity
- Handheld real-time cm-level accuracy
- Versatile handheld for pre-surveys and GIS jobs
- Lightweight and rugged handheld design for comfortable use
- Powerful and complete "Survey Pro and FAST Survey field software



The Spectra Precision ProMark™ 220 GNSS system is the most cost-effective dual-frequency network RTK rover. The ProMark 220 solution includes a rugged GNSS receiver running Windows Embedded Handheld® 6.5 operating system, the comprehensive Survey Pro™ or FAST Survey field software and the ASH-661 (L1/L2 GNSS) antenna.

ProMark 220: a dual-frequency, all-in-view network RTK rover with embedded Z-Blade technology, delivers long-range RTK performance, fast-initialization time, and high-precision. Thanks to the Z-Blade GNSS-centric technology, ProMark 220 makes optimal use of all GNSS signals to deliver fast and stable RTK positions even when GPS coverage is insufficient but other constellations like GLONASS are visible. For a wide range of survey applications it provides outstanding real-time centimeter-level accuracy even when used as a handheld.

Very lightweight, with a compact and rugged design, as well as large memory and autonomy, ProMark 220 has been designed for comfortable and productive field use. Its extended wireless communications (Bluetooth, Wi-Fi) and embedded GSM/GPRS modem make ProMark 220 a powerful solution suitable for any network RTK application.

ProMark 220 is extremely cost-effective, meeting the most demanding requirements for a high-end survey solution. Together with Survey Pro or FAST Survey field software, it enables interoperability with a wide range of survey instruments and accessories to run complete survey jobs, including site calibration, stake out, and optical surveying projects.

¹ Accuracy and initialization specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality. Position accuracy specifications are for horizontal positioning. Vertical error is typically < 2 times horizontal error.

² Performance values assume a minimum of five satellites and following the procedures recommended in the product manual. High multipath areas, high PDOP values and periods of severe atmospheric conditions may degrade performance.

³ Steady state value for baselines < 50 km after sufficient convergence time.

⁴ Each GNSS constellation is processed independently, and combined for optimal performance.

⁵ No BT or WLAN are used, backlight at default setting (50% brightness), varies with temperature.

GENERAL

- 45 all-in-view channels
- L1/L2 GPS & GLONASS network RTK rover
- RTK networks: VRS, FKP, MAC
- Ergonomic, light weight and compact design
- Integrated Bluetooth and GSM/GPRS technology

TECHNICAL SPECIFICATIONS

Postprocessing Accuracy (RMS)^{1, 2, 3}

Static, Rapid Static

Horizontal	5 mm + 0.5 ppm
Vertical	10 mm + 0.5 ppm

Kinematic

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm

Real-Time GNSS surveying (RMS)^{1, 2, 3}

Real-Time Kinematic Position

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm

Initialization time

- < 1 min typical
- Initialization reliability 99.9% reliability

RTK Initialization range

- Up to 40 km typical

SBAS (WAAS/EGNOS/MSAS/GAGAN)

Horizontal	<50 cm
Vertical	<1 m

Real-Time DGPS position

Horizontal	25 cm + 1 ppm in typical conditions ²
Vertical	50 cm + 1 ppm in typical conditions ²

MEASUREMENTS

Z-Blade technology for optimal GNSS performance

- Ashtech GNSS-centric algorithm: Fully independent GNSS satellites tracking and processing⁴
- Fully independent code and phase measurements
- Advanced multi-path mitigation

Satellite signals tracked simultaneously

- GPS L1 C/A, L1/L2 P, L2C
- GLONASS L1/L2 C/A
- SBAS: (WAAS/EGNOS/MSAS/GAGAN)

PHYSICAL

Dimensions (W x H x D)

19.0 cm x 9.0 cm x 4.3 cm
(7.5 in x 3.5 in x 1.7 in)

Weight (with battery)

0.62 kg (1.43 lb)

User interface

Graphical LED display
Color TFT High resolution display sunlight readable with touch screen

Size

3.5" portrait

CPU

806 MHz Marvell PXA 320

ENVIRONMENTAL

Operating temperature

-20° to +60°C (-4° to +140°F)

Storage temperature

-25° to +70°C (-13° to +158°F)

Dust/Water

proof

Shock

free pole drop

ELECTRICAL

- Rechargeable, 6600 mAh Li-Ion internal battery
- Average operating time on internal battery: >8 hours (GNSS on)⁵
- Power 9 V DC to 28 V DC external power input

COMMUNICATIONS AND DATA STORAGE

Cellular

- Built-in GPRS, EDGE class 12 modem
- Quad-band 850/900MHz, 1800/1900 MHz

Bluetooth

- Bluetooth 2.1 (class 2) with DER
- Profiles: SPP, DUN, FTP, OPP, HSP, A2DP

Other

- Wireless LAN 802.11b/g (SDIO slot)

Memory

- 256 MB internal SDRAM memory
- 2 GB internal NAND flash memory
- SDHC memory card slot

Correction formats

- Supported data formats: ATOM (Ashtech Optimized Messaging), RTCM 2.3-3.1, CMR, CMR+, DBEN, LRK
- NMEA-0183 messages output

ProMark 120

- Outstanding GPS & GLONASS performance
- Extended productivity in obstructed conditions
- Unparalleled ease-of-use in the field
- Intuitive ProMark Field software
- Lightweight and rugged handheld design
- Versatile solution: postprocessing, RTK, GIS
- All-day-long operation with extended memory and battery



The Spectra Precision ProMark™ 120 GNSS system is the most versatile postprocessing solution, designed for easy and efficient land survey applications. The ProMark 120 solution includes a rugged GNSS receiver running the Windows® Embedded Handheld 6.5 operating system, ProMark Field software and an ASH-660 (L1 GPS/GLONASS) antenna.

Thanks to the embedded Z-Blade technology as well as GPS and GLONASS signals tracking, ProMark 120 provides high-precision measurements even in very demanding or obstructed environments. Its exceptional postprocessing performance and short occupation time deliver a very productive solution to field users.

The very intuitive ProMark Field software is designed for simple and trouble-free use providing all necessary tools without any unnecessary or complicated features. Lightweight, but rugged and waterproof handheld design, all-day-long autonomy, and large memory make ProMark 120 a perfect solution for easy and efficient surveying.

Designed as a scalable solution, ProMark 120 can be easily upgraded to such capabilities as GLONASS, RTK or GPRS and be used not only in postprocessing but also in RTK or GIS applications. Built on the state-of-the-art Windows Embedded Handheld 6.5 platform with embedded wireless communications, ProMark 120 is a truly versatile and complete offering.

¹ Accuracy and initialization specifications may be affected by atmospheric conditions, signal multipath, satellite geometry and corrections availability and quality. Position accuracy specifications are for horizontal positioning. Vertical error is typically < 2 times horizontal error.

² Performance values assume a minimum of five satellites and following the procedures recommended in the product manual. High multipath areas, high PDOP values and periods of severe atmospheric conditions may degrade performance.

³ Steady state value for baselines < 50 km after sufficient convergence time.

⁴ Each GNSS constellation is processed independently, and combined for optimal performance.

⁵ No BT or WLAN are used, backlight at default setting (50% brightness), varies with temperature.

GENERAL

- 45 all-in-view channels
- L1 GPS & GLONASS solution
- Simple & easy-to-use ProMark Field software
- Extended operating time
- Integrated Bluetooth and GSM/GPRS technology

TECHNICAL SPECIFICATIONS

Static GNSS surveying^{1, 2, 3}

Static, Rapid Static

Horizontal	5 mm + 0.5 ppm
Vertical	10 mm + 0.5 ppm

Kinematic

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm

Real-Time GNSS surveying (RMS)^{1, 2, 3}

Real-Time Kinematic Position

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm

Initialization time

- < 3 min typical (GPS+GLONASS)
 - < 5 min typical (GPS only)
- Initialization reliability: up to 99.9%

RTK Initialization range

- Up to 10 km typical (GPS+GLONASS)
- Up to 7 km typical (GPS only)

SBAS (WAAS/EGNOS/MSAS/GAGAN)

Horizontal	<50 cm
Vertical	<1 m

Real-Time DGPS position

Horizontal	30 cm + 1 ppm in typical conditions ²
Vertical	60 cm + 1 ppm in typical conditions ²

MEASUREMENTS

Z-Blade technology for optimal GNSS performance

- Fully independent code and phase measurements
- Advanced multi-path mitigation

Satellite signals tracked simultaneously

- GPS L1 C/A, L1 P
- GLONASS L1 C/A
- SBAS (WAAS/EGNOS/MSAS/GAGAN)

PHYSICAL

Dimensions (W × H × D)

19.0 cm x 9.0 cm x 4.3 cm
(7.5 in x 3.5 in x 1.7 in)

Weight (with battery)

0.62 kg (1.43 lb)

User interface

Graphical LED display
Color TFT High resolution display sunlight readable with touch screen

Size

3.5" portrait

CPU

806 MHz Marvell PXA 320

ENVIRONMENTAL

Operating temperature

-20° to +60°C (-4° to +140°F)

Storage temperature

-25° to +70°C (-13° to +158°F)

Dust/Water

proof

Shock

free pole drop

ELECTRICAL

- Rechargeable, 6600 mAh Li-Ion internal battery
- Average operating time on internal battery: >8 hours (GNSS on)⁵
- Power 9 V DC to 28 V DC external power input

COMMUNICATIONS AND DATA STORAGE

Cellular

- Built-in GPRS, EDGE class 12 modem
- Quad-band 850/900MHz, 1800/1900 MHz

Bluetooth

- Bluetooth 2.1 (class 2) with DER
- Profiles: SPP, DUN, FTP, OPP, HSP, A2DP

Other

- Wireless LAN 802.11b/g (SDIO slot)

Memory

- 256 MB internal SDRAM memory
- 2 GB internal NAND flash memory
- SDHC memory card slot

Correction formats

- Supported data formats: ATOM (Ashtech Optimized Messaging), RTCM 2.3-3.1, CMR, CMR+, DBEN, LRK
- NMEA-0183 messages output

ProFlex 800

- Z-Blade GNSS-centric technology
- Fast and reliable RTK fix
- Ultra rugged weatherproof design
- Built-in communication features
- Embedded Web Server
- Flexible GNSS receiver for multiple applications



The Spectra Precision ProFlex™ 800 GNSS system is a powerful GNSS positioning solution offering outstanding RTK performance in an ultra-rugged, highly integrated receiver design.

ProFlex 800 with Z-Blade technology is a perfect back-pack rover or reference station solution for precise land surveying. Its innovative design makes it ideal for onboard system integration – it can be mounted easily on a machine or vehicle for land or sea operations.

The weatherproof, high-impact-resistant molded aluminum housing ensures your investment is safe in all conditions.

In addition to 3.5G internal cellular modem ProFlex 800 accommodates a wide variety UHF kits providing stable and reliable wireless communication between receivers. With its built-in Ethernet capability and embedded Web Server, you can access ProFlex 800 from any computer connected to the Internet. Use the capability for instant real-time multi-data streaming over Ethernet, build your own RTK corrections server without any additional software or equipment.

The ProFlex 800 is also available as a CORS (Continuously Operating Reference Station). This configuration is the optimal solution when collecting, storing and transferring high quality GNSS raw data for postprocessing surveys, geodetic and other applications. Automatic sessions programming, user-friendly Web-interface, embedded RINEX converter, FTP push functionality and many other advanced CORS features make ProFlex 800 CORS a powerful, robust and easy-to-use solution.

¹ All the available GNSS signals are processed equally and combined without preference to any particular constellation for optimal performance in harsh environment.

² Accuracy and TTFF specifications may be affected by atmospheric conditions, signal multipath, and satellite geometry.

³ Performance values assume minimum of five satellites, following the procedures recommended in the product manual. High multi-path areas, high PDOP values and periods of severe atmospheric conditions may degrade performance.

⁴ Steady state value for baselines < 50 km after sufficient convergence time.

⁵ Long baselines, long occupations, precise ephemeris used.

GNSS System

GENERAL

- 120 channels for multi-constellation GNSS support
- Advanced Z-Blade technology
- Ultra rugged design
- Wide range of communication features
- RTK base/rover, CORS, postprocessing

TECHNICAL SPECIFICATIONS

Postprocessing Accuracy (RMS)^{2, 3}

Static, Fast Static

Horizontal	3 mm + 0.5 ppm
Vertical	5 mm + 0.5 ppm

High-precision Static⁵

Horizontal	3 mm + 0.1 ppm
Vertical	3.5 mm + 0.1 ppm

Kinematic

Horizontal	10 mm + 1 ppm
Vertical	20 mm + 1 ppm

Real-Time GNSS Accuracy (RMS)^{2, 3}

SBAS (WAAS/EGNOS/MSAS/GAGAN)

Horizontal	< 50 cm
Vertical	< 1 m

DGPS

Horizontal	25 cm + 1 ppm ⁴
Vertical	50 cm + 1 ppm ⁴

RTK

Horizontal	1 cm + 1 ppm ⁴
Vertical	2 cm + 1 ppm ⁴

Flying RTK

5 cm + 1 ppm (steady state) horizontal for baselines up to 1000 km

Instant-RTK[®] Initialization

- Typically 2-second initialization for baselines < 20 km
- Up to 99.9% reliability
- RTK Initialization range > 40 km

MEASUREMENTS

Z-Blade technology for optimal GNSS performance

- Ashtech GNSS-centric processing algorithm: Fully independent GNSS satellites tracking and processing¹
- Quick signal detection engines for fast acquisition and re-acquisition of GNSS signals
- Advanced multi-path mitigation
- Fast and stable RTK solution even in harsh environments

Satellite signals tracked simultaneously

- GPS L1 C/A, L1/L2 P, L2C, L5
- GLONASS L1 C/A and L2 C/A
- GALILEO E1 and E5
- SBAS (WAAS/EGNOS/MSAS/GAGAN)

PHYSICAL

Dimensions (W × H × D)

21.5 cm x 20 cm x 7.6 cm
(8.46 in x 7.87 in x 2.99 in)

Weight (with battery)

GNSS receiver from 2.1 kg (4.6 lb)

I/O Interface

- 1 x RS232/RS422 up to 921.6 kbits/sec
- 2 x RS232 up to 115.2 kbits/sec
- USB 2.0 host and device
- Bluetooth 2.0, SPP profile
- Ethernet
- PPS output & Event marker input
- 12V/0.5A (1A peak) output available on serial port A
- Optically isolated I/O interface (except USB)

ENVIRONMENTAL

Operating temperature

-30° to +65°C (-22° to +149°F)

Storage temperature

-40° to +70°C (-40° to +158°F)

Humidity

100% condensing

IP67 (waterproof and dustproof)

Salt mist as defined in EN60945

Shock & Vibration (MIL-STD 810F)

ELECTRICAL

- Li-ion battery, 32.5 Wh (7.4V x 4.4Ah)
- Battery life time: > 6.5 hours (rover, with UHF)
- Typical power consumption with GNSS antenna: < 5W

COMMUNICATIONS AND DATA STORAGE

Internal UHF modules

- Pacific Crest Tx/Rx (both base and rover)

External UHF transceiver modules

- Pacific Crest Tx/Rx

Built-in 3.5 G Modem

- UMTS/HxDPA: 2100, 1900, 850 MHz;
- GSM/GPRS/EDGE: 850, 900, 1800, 1900, 2100 MHz;
- GPRS/EDGE multislots class 12
- 128 MB (8 GB for CORS) internal memory (expandable through USB)

Up to 20 Hz raw data and position output

- Recording Interval: 0.05–999 seconds
- Up to 96 sessions per day
- Embedded RINEX converter

Correction formats

- Supported data formats: ATOM (Ashtech Optimized Messaging), RTCM 2.3–3.1, CMR, CMR+, DBEN, LRK
- NMEA-0183 messages output

FOCUS 8

- 2" and 5" angle accuracy
- Easy to use Survey Basic software on-board
- Full-featured Survey Pro on-board
- Layout Pro license also included
- Up to 500 m (1,640 ft) reflectorless measurement¹
- Windows CE
- Long battery life
- All-weather construction
- Tough and reliable



The Spectra Precision® FOCUS® 8 Total Station offers versatility of three field software options to choose from.

World class advanced Spectra Precision Survey Pro field software, and straight forward easy to use Survey Basic software both come pre-installed. Layout Pro field software can also be loaded for construction based layout work, you choose which software is best for you. Whichever you choose, the FOCUS 8 quality and reliability will ensure the best results.

Touch-screen technology improves data workflow speed to access menus and software modes for fast every day data management. Survey Basic software features on-screen guidance, presenting help when and where it is needed, to keep you focused on the task at hand.

Built tough for use on your every day work site in all degrees of dust, dirt, and weather conditions. The large graphic display uses features such as different font sizes, icons, and pop-up menus to make the on-board software system intuitive and easy to learn for maximum efficiency. Combined with clear-to-view quality optics, smart design, and superior components it's what your surveying jobs demand.

Use the FOCUS 8 to reliably measure and save all your topographic and staking needs. This solution includes key features such as:

- Quick Coding: for lightning fast feature coding
- CoGo: for your in-field calculations
- Fast Measure: configure keys for one touch measurement.

All FOCUS 8 models support Bluetooth communications to external data collectors. In addition, all models come standard with a traditional optical plummet which can be upgraded to a laser plummet. Move your data fast and easily using a USB memory stick.

¹ White objects with high reflectivity (KGC 90%). Measuring distance may vary depending on targets and measuring conditions.

² $\pm(3+3 \text{ ppm} \times D)$ mm -20°C to -10°C , $+40^{\circ}\text{C}$ to $+50^{\circ}\text{C}$ (-4°F to $+14^{\circ}\text{F}$, $+104^{\circ}\text{F}$ to $+122^{\circ}\text{F}$)

³ Measuring time may vary depending on measuring distance and conditions. For the initial measurement, it may take a few more seconds.

⁴ Battery life specification at 25°C (77°F). Operation times may vary depending on the condition and deterioration of the battery.

Total Station

TELESCOPE

Magnification

30x (18x/36x with optional eyepieces)

Effective diameter of objective

2"

40 mm (1.6 in)

2" EDM diameter. 45 mm (1.8 in)

5"

45 mm (1.8 in)

5" EDM diameter. 50 mm (2.0 in)

Minimum focusing distance

1.5 m (4.9 ft)

DISTANCE MEASUREMENT

Reflectorless mode 2"

	Good	Normal	Difficult
KGC (18%)	350 m (1,148 ft)	250 m 820 ft	200 m 656 ft
KGC (90%)	500 m (1,640 ft)	400 m 984 ft	250 m 820 ft

Reflectorless mode 5"

	Good	Normal	Difficult
KGC (18%)	280 m (920 ft)	250 m 820 ft	200 m 656 ft
KGC (90%)	500 m (1,640 ft)	500 m 1,640 ft	300 m 984 ft

With single prism 6.25 cm (2.5 in)

2" 1.5 m to 3,000 m (4.9 ft to 9,843 ft)

5" 1.5 m to 5,000 m (4.9 ft to 16,404 ft)

Accuracy² (Precise mode) ISO 17123-4

Prism $\pm(2+2 \text{ ppm} \times D)$ mm

Reflectorless $\pm(3+2 \text{ ppm} \times D)$ mm

Measuring interval³

Prism mode

2" Precise mode	1.6 sec.
5" Precise mode	1.5 sec.
Normal mode	0.8 sec.

Reflectorless mode

2" Precise mode	2.1 sec.
5" Precise mode	1.8 sec.
2" Normal mode	1.2 sec.
5" Normal mode	1.0 sec.

Least count

Precise mode	1 mm (0.002 ft)
Normal mode	10 mm (0.02 ft)

GENERAL SPECIFICATIONS

Operating temperature range

-20 °C to +50 °C (-4 °F to +122 °F)

Atmospheric correction

-40 °C to +60 °C (-40 °F to +140 °F)

Barometric pressure

400 mmhg to 999 mmhg

533 hPa to 1,332 hPa

15.8 inhg to 39.3 inhg

Minimum increment

Degree: 1/5/10"

Gon: 0.2/1/2 mgon

ISO 17123-3 accuracy (horizontal and vertical)

2" 0.6 mgon

5" 1.5 mgon

Dust & water protection

IP66

Tilt Sensor

Type

Dual axis

Level vials

Sensitivity of Circular level vial

10/2 mm

Optical plummet

Magnification

3x

Display face 1

VGA, 16 bit color, TFT LCD, backlit (320x240 pixel)

Display face 2

Backlit, graphic LCD (128x64 pixel)

Point memory

128 MB RAM, 128 MB Flash memory

Dimensions (W x D x H)

14.9 cm x 14.5 cm x 30.6 cm

(5.8 in x 5.7 in x 12.0 in)

Weight (approx.)

Main unit (without battery)

2" 3.9 kg (8.6 lb)

5" 3.8 kg (8.4 lb)

Battery

0.1 kg (0.2 lb)

Carrying case

2.3 kg (5.1 lb)

Internal Li-ion battery (x2)

Operating time⁴

2"

approx. 12 hours (continuous distance/angle measurement)

approx. 26 hours (distance/angle measurement every 30 seconds)

approx. 28 hours (continuous angle measurement)

5"

approx. 7.5 hours (continuous distance/angle measurement)

approx. 16 hours (distance/angle measurement every 30 seconds)

approx. 20 hours (continuous angle measurement)

Charging time (Full charge)

4 hours

FOCUS 6

- 2" and 5" angle accuracy
- Up to 500 m (1,640 ft) reflectorless measurement¹
- Long Battery life
- All-weather construction
- Tough and reliable
- Affordable Total Station
- Accurate distances and stable angles
- On-board data collection
- Bluetooth communication to data collector



The Spectra Precision® FOCUS® 6 Total Station offers clear-to-view quality optics, smart design, and superior components that your surveying jobs demand. The FOCUS 6 is a fast measuring device in both Prism (0.8 sec) and Reflectorless (1.0 sec) modes for improving your day-to-day field operations.

For most construction and surveying applications the FOCUS 6 total station dual display 2" and or single display 5" accuracy is ideal. Coupled with its quality, you can be confident that you are achieving this level of accuracy with every measurement.

Hot-swappable dual onboard batteries, the FOCUS 6 5" provides full measurement every 30 seconds for 25 hours, and FOCUS 6 2" for 57 hours. It's tough, water resistant, and will continue working no matter what the weather brings. A winterized variant is also available for operation in the most extreme cold temperatures.

The Spectra Precision FOCUS 6 total station has intuitive on-board software that is easy-to-use. Want to make your FOCUS 6 even more powerful? Instead of on-board data collection you can choose to use a Spectra Precision T41 Ranger, Nomad, or Recon data collector powered by Survey Pro to maximize performance in the field.

All Focus 6 models support bluetooth communications to external data collectors. In addition, all models come standard with a traditional optical plummet which can be upgraded to a laser plummet.

The smart small design of the FOCUS 6 is convenient and portable for all occasions.

¹ White objects with high reflectivity (KGC 90%). Measuring distance may vary depending on targets and measuring conditions.

² $\pm(3+3 \text{ ppm} \times D)$ mm -20 °C to -10 °C, +40 °C to +50 °C (-4 °F to +14 °F, +104 °F to +122 °F)

³ Measuring time may vary depending on measuring distance and conditions. For the initial measurement, it may take a few more seconds.

⁴ Battery life specification at 25 °C (77 °F). Operation times may vary depending on the condition and deterioration of the battery.

Total Station

TELESCOPE

Magnification

30x (18x/36x with optional eyepieces)

Effective diameter of objective

2" 40 mm (1.6 in)

2" EDM diameter. 45 mm (1.8 in)

5" 45 mm (1.8 in)

5" EDM diameter. 50 mm (2.0 in)

Minimum focusing distance

1.5 m (4.9 ft)

DISTANCE MEASUREMENT

Reflectorless mode 2"

	Good	Normal	Difficult
KGC (18%)	350 m (1,148 ft)	250 m 820 ft	200 m 656 ft
KGC (90%)	500 m (1,640 ft)	400 m 1,312 ft	250 m 820 ft

Reflectorless mode 5"

	Good	Normal	Difficult
KGC (18%)	280 m (920 ft)	250 m 820 ft	200 m 656 ft
KGC (90%)	500 m (1,640 ft)	500 m 1,640 ft	300 m 984 ft

GENERAL SPECIFICATIONS

Operating temperature range

-20 °C to +50 °C (-4 °F to +122 °F)

5" Winterized

-30 °C to +50 °C (-22 °F to +122 °F)

Atmospheric correction

-40 °C to +60 °C (-40 °F to +140 °F)

Barometric pressure

400 mmHg to 999 mmHg

533 hPa to 1,332 hPa

15.8 inHg to 39.3 inHg

Minimum increment (Degree, Gon, MIL6400)

Degree: 1/5/10"

Gon: 0.2/1/2 mgon

MIL6400: 0.005/0.02/0.05 mil

DIN 18723 accuracy (horizontal and vertical)

2" 0.6 mgon

5" 1.5 mgon

Dust & Water protection

IP66

Tilt sensor

Type

Dual axis

Level vial

Sensitivity of Circular level vial

10/2 mm

Optical plummet

Magnification

3x

Display face 1

Graphic LCD (128 x 64 dot); Single side

Display face 2 (2" only)

backlit, graphic LCD(128x64 pixel)

With single prism 6.25 cm (2.5 in)

2" 1.5m to 3,000 m (4.9 ft to 9,843 ft)

5" 1.5 m to 5,000 m (4.9 ft to 16,404 ft)

Accuracy² (Precise mode) ISO 17123-4

Prism $\pm(2+2 \text{ ppm} \times D)$ mm

Prism $\pm(3+2 \text{ ppm} \times D)$ mm

Measuring interval³

Prism mode

2" Precise mode 1.6 sec.

5" Precise mode 1.5 sec.

Normal mode 0.8 sec.

Reflectorless mode

2" Precise mode 2.1 sec.

5" Precise mode 1.8 sec.

2" Normal mode 1.2 sec.

5" Normal mode 1.0 sec.

Least count

Precise mode 1 mm (0.002 ft)

Normal mode 10 mm (0.02 ft)

Point memory

10,000 records

Dimensions (W x D x H)

14.9 cm x 14.5 cm x 30.6 cm

(5.8 in x 5.7 in x 12.0 in)

Weight (approx.)

Main unit (without battery)

2" 3.8 kg (8.4 lb)

5" 3.6 kg (8.0 lb)

Battery

0.1 kg (0.2 lb)

Carrying case

2.3 kg (5.1 lb)

Internal Li-ion battery (x2)

Operation time⁴

2"

approx. 19 hours (continuous distance/
angle measurement)

approx. 57 hours (distance/angle
measurement every 30 seconds)

approx. 62 hours (continuous angle
measurement)

5"

approx. 10 hours (continuous distance/
angle measurement)

approx. 26 hours (distance/angle
measurement every 30 seconds)

approx. 31 hours (continuous angle
measurement)

Charging time (Full charge)

4 hours

Ranger 3

- Choice of Survey Pro or Layout Pro software
- Large, bright, sunlight- readable color VGA screen
- Meets MIL-STD-810G standards
- IP67 rating
- SDHC card slot and USB connections
- 30+ hour rechargeable battery
- Windows Mobile 6.5
- Integrated Bluetooth, Wi-Fi, Compass and GPS



The third generation Spectra Precision® Ranger™ Data Collector offers a large bright touch-screen, full alpha-numeric, easy to operate, keypad, and is packed with the features surveyors depend on. Built rugged, it meets rigorous MIL-STD-810G military standard for drops, vibration, humidity and extreme temperatures, and with an IP67 rating, it's designed to keep your investment and your data safe. The Ranger features a choice of Survey Pro or Layout Pro, together with Windows Mobile 6.5, so you can run the mobile version of all your favorite programs including Excel and Outlook. Integrated Bluetooth capabilities let you connect to field equipment without cables. The Ranger 3 comes standard with 8 GB of onboard memory for storing data. Move your data fast and easily using a SDHC card, Bluetooth, USB cable, USB memory stick, WiFi, or GSM WWAN. Choose from four different models of the Ranger with the features that best suits your needs and your budget. They're all power-packed, so there's no wrong choice.

MODELS OVERVIEW	3XR	3RC	3XC	3L
Processor/Speed				
ARM® Cortex™-A8	800 MHz	800 MHz	800 MHz	800 MHz
Memory				
SDRAM	256 MB	256 MB	256 MB	256 MB
Data Storage (On-board Flash)	8 G	8 G	8 G	8 G
Wireless				
Integrated Bluetooth	Standard	Standard	Standard	Standard
Wi-Fi (802.11b/g)	Standard	Standard	Standard	Standard
3G GSM WWAN	Standard	N/A	Standard	N/A
2.4 GHz robotic radio Module	Standard	Standard	N/A	N/A
Features				
Compass	Standard	Standard	Standard	Standard
Accelerometer	Standard	Standard	Standard	Standard
5MP Camera with LED flash	Standard	Standard	Standard	N/A
Navigation grade GPS	Standard	Standard	Standard	Standard

Data Collector

STANDARD FEATURES

- Microsoft Windows Mobile 6.5
- "ABCD" style keypad with 10-key number pad, directional buttons, and 4 programmable buttons
- Touch-screen
- Battery life of 30+ hours under normal operating conditions
- Complete recharge in 3 hrs
- Battery charge status LED indicator
- Notification LED
- Integrated speaker and microphone

PHYSICAL

Size

14.1 cm x 27.8 cm x 6.4 cm
(5.6 in x 10.9 in x 2.5 in)

Weight

1.04 kg (2.3 lb) including battery
1.10 kg (2.4 lb) including battery and optional internal radio

ELECTRICAL

Processor

Texas Instrument Sitara™ 3715 series
ARM® Cortex™-A8 Processor (800 MHz)

Expansion

SDHC memory slot, USB host

Display

107 mm (4.2 in) landscape VGA display,
640 x 480 pixels, sunlight-readable
color TFT with LED backlight, resistive
touch-screen

Power

11.1 V, 2500 mAh, Li-Ion rechargeable
pack

ENVIRONMENT

Operating Temperature

-30 °C to 60 °C (-22 °F to 140 °F)

Storage Temperature

-40 °C to 70 °C (-40 °F to 158 °F)

Humidity

90% RH temp cycle,
-20 °C/60 °C (-4 °F/140 °F)

Sand & Dust

IP6x: 8 hours of operation with
blowing talcum powder (IEC-529)

Water

IPx7, sealed against accidental immersion
(1 m for 30 min.)

I/O

Ports

9-pin serial port RS-232 (115 Kbps)
USB client and host
DC power port
Radio antenna for integrated
2.4 GHz radio modem (optional)

STANDARD SOFTWARE

Word Mobile
Excel Mobile
PowerPoint Mobile
Outlook Mobile
Calculator
Microsoft Pictures & Videos
Flashlight mode control application
Calendar / Contacts
Windows Media Player
Messenger
Adobe Acrobat Reader
SatViewer (GPS interface software
application)
Customized Camera and Flash control
including geo-tagging through Microsoft
Pictures & Videos software*
Operating system language options
(customer selection): Simplified Chinese,
English, French, German, Japanese,
Spanish

STANDARD ACCESSORIES

Rechargeable Lithium-Ion battery module
International AC power supply
USB cable (mini)
Stylus with sprint tip (pkg of 2)
Stylus tether
Screen protectors
I/O port dust covers / Audio port dust
cover
Standard soft case
Hand strap

Drop

26 drops at room temperature from
1.22 m (4 ft) onto plywood over concrete
MIL-STD-810G, Method 516.6,
Procedure IV

Vibration

General Minimum Integrity and Loose
Cargo test
MIL-STD 810G, Method 514.6,
Procedures I, II,

Altitude

4,572 m (15,000 ft) at 23 °C (73 °F)
and 12,192m (40,000 ft) at -30 °C
(-22 °F) MIL-STD-810G, Method 500.5,
Procedures I, II, III

* Only available on select models.

T41

The Spectra Precision® T41™ Data Collector is rugged, powerful, connected and compact, offering high performance with a high-resolution outdoor readable display. The slim, ergonomic design is easy to hold and enables all-day use. A new capacitive touch-screen protected by Gorilla® Glass provides intuitive and responsive finger-tip touch capability. The T41 handheld has 3.75G cellular data capabilities for use with VRS networks, plus cellular voice and SMS capabilities. The 8-megapixel camera can be set to automatically include time and location data from the integrated GPS receiver.



Key features include:

- 1 GHz Texas Instruments DM3730 processor with 512 MB RAM and 16 GB Flash storage
- 4.3" WVGA sunlight-readable Gorilla® Glass display
- Light sensor to auto-adjust display brightness
- Capacitive interface
- Integrated 3.75G cellular data, text and voice capability
- 8 megapixel camera with dual LED flash and geo-tagging
- Bluetooth® 2.1 with enhanced data rate
- Wi-Fi 802.11 b/g/n
- GPS receiver with 2 m–4 m meter accuracy (WAAS/SBAS capable)
- MCX port for optional external GPS antenna
- Electronic Compass
- Accelerometer
- Robust custom port with USB 2.0 full speed protocol
- Conversion cables available for 9-pin Serial port or USB host
- MicroSD memory card slot (supports SDHC up to 32GB)
- Integrated speaker and microphone
- 3.5 mm headset jack with audio capability
- Rugged design certified to MIL-STD-810G and IP65
- Windows Embedded Handheld 6.5 operating system

Data Collector

ENVIRONMENTAL SPECIFICATIONS

Water

Survives driving rain and water spray
IEC-60529 IPx5, water jet 12.5 mm dia
@ 2.5–3 m

Dust

Protected against dust, IEC-60529 IP6x,
dust chamber with under-pressure

Drops

Survives multiple drops of 4 ft (1.22 m),
MIL-STD-810G, Method 516.6, Procedure
IV, Transit Drop

Operating Temperature

–22 °F to 144 °F (–30 °C to 60 °C),
MILSTD-810G, Method 502.5,
Procedure I, II, III

(Low Temp Operating –30 °C);
Method 501.5, Procedure I & II
(High Temp Operating 60 °C)

Storage Temperature

–40 °F to 158 °F (–40 °C to 70 °C),
MILSTD-810G, Method 502.5,
Procedure I, II, III

(Low Temp Storage –40 °C);
Method 501.5, Procedure I & II
(High Temp Storage 70 °C)

Temperature Shock

Cycles between –22 °F and 144 °F
(–30 °C and 60 °C), MIL-STD-810G,
Method 503.5, Procedure I-C

Humidity

90% relative humidity with temperatures
between 22 °F and 144 °F (30 °C and
60 °C),
MIL-STD-810G, Method 507.5, Procedure
II

Altitude

15,000 ft (4,572 m) at 73 °F (23 °C)
to 40,000 ft (12,192 m) at –22 °F
(–30 °C),
MIL-STD-810G, Method 500.5, Procedure
I, II & III

Vibration

General minimum integrity and loose
cargo tests, MILSTD-810G, Method 514.6,
Procedure I & II, Category 5

Solar Exposure

Survives prolonged UVB exposure,
MIL-STD-810G, Method 505.5, Procedure
II

Chemical Exposure

Resistant to mild alkaline and
acid cleaning solutions, fuel hydrocarbons,
alcohols
and common vehicle and factory machine
lubricants

PHYSICAL

Size

15.5 cm x 8.2 cm x 2.5 cm
(6.1 in x 3.2 in x .9 in)

Weight

13.5 oz (.4 kg), including battery

ELECTRICAL

Processor

1 GHz, Texas Instruments DM3730

Memory

512 MB

Storage

16 GB, non-volatile

Expansion

microSD card slot, SIM card slot

Display

4.3 in (10.9 cm), 480 x 800 pixel, WVGA
TFT

Battery

3.7 V, 3.3 Ah, 12.2 Wh, Lithium-ion
polymer

I/O

3.5mm audio jack;
Custom Port that supports USB 2.0 Host,
USB Client, 9-pin Serial and 5.6 V (5.0 V
to 5.9 V) DC input power

GPS Receiver

2–4 m accuracy with WAAS/SBAS
correction; MCX port for optional external
antenna

Radios

Bluetooth 2.1 +EDR; Wi-Fi 802.11 b/g/n

WWAN radios

UMTS / HSPA+,
GSM / GPRS/ EDGE, UMTS

Bands (WCDMA/FDD)

800, 850, 1900,
AWS and 2100 MHz

GSM Bands

850, 900, 1800, 1900 MHz

STANDARD ACCESSORIES

International AC charging kit

T41 USB cable

Wrist strap

Ultra clear screen protectors (qty 2) kit

Quick Start Guide

OPTIONAL ACCESSORIES

9-pin serial adapter

USB host adapter

Capacitive stylus with tether

External battery pack

Port cover

Ultra clear screen protectors (qty 10) kit

Anti-reflective screen protectors (qty 2) kit

Vehicle charging kit

Capacitive touchscreen gloves

External GPS antenna

Support for 10 languages: English,
Chinese (simplified), French, German,
Italian, Japanese, Korean, Portuguese,
Russian and Spanish.

Nomad

- Choice of Survey Pro or Layout Pro software
- Full VGA display
- Meets MIL-STD-810F standards, IP68 rating
- 15-hour rechargeable battery
- Windows Mobile 6.1
- Optional integrated GPS, Wi-Fi 802.11g, WWAN, and camera
- Backlit Numeric keypad
- 806 MHz processor
- Bluetooth



The Spectra Precision® Nomad® Data Collector, packed with functionality, is an extremely powerful and full-featured rugged data collector. Start with an 806 MHz processor, a long-life 5000 mAh lithium-ion battery and integrated wireless capabilities like GPS, Wi-Fi 802.11g, and Bluetooth. Then, the Spectra Precision Nomad adds 128 MB RAM and up to 2GB non-volatile Flash storage to manage all the data you can collect.

The Nomad features a high-resolution, sunlight-visible full VGA display that shows graphics and maps in crisp detail plus a backlit numeric keypad.

The Nomad is available in a range of solutions from the powerful 900XC with camera and WWAN, the traditional 900LD and the economical 900B, each packed with features and benefits to suit your specific needs.

MODELS OVERVIEW	900XC	900LD	900B
Processor/Speed			
Marvell PXA320 XScale	806 MHz	806 MHz	806 MHz
Memory			
SDRAM	128 MB	128 MB	128 MB
Data Storage (On-board Flash)	2 GB	1 GB	512 MB
Features			
Integrated Card Slots	SD	SD	SD/CF
Integrated Bluetooth	Standard	Standard	Standard
Integrated GPS, Navigational Grade	Standard	Standard	N/A
Integrated WiFi 802.11g	Standard	Standard	N/A
Integrated WWAN	Standard	N/A	N/A
Integrated Camera	Standard	N/A	N/A

Data Collector

STANDARD FEATURES

- Windows Mobile 6.1
- Numeric keypad with backlight
- Marvell 806 MHz XScale processor
- 128 MB DDR SDRAM
- 512 MB to 2GB Flash storage
- Full VGA display, sunlight-readable color TFT
- Touch-screen
- Rugged submersible design
- Integrated speaker and microphone
- Integrated Bluetooth 2.0
- Secure Digital (SDIO) slot
- Notification LEDs
- 15-hour battery life with active use (default settings)

PHYSICAL

Size

17.6 cm x 10.0 cm x 5.0 cm
(6.92 in x 3.92 in x 1.96 in)

Weight

0.596 kg (21 oz) with rechargeable
Lithium-Ion battery module

ELECTRICAL

Processor

806 MHz Marvell PXA320 XScale CPU

Display

480x640 pixel (full VGA) 16 bit color
TFT with LED backlight, Sunlight
readable color TFT display

Batteries

Internal 5000 mAh Lithium-Ion,
rechargeable battery module, 15 hours
battery life with active use (default
settings)

ENVIRONMENT

Operating Temperature

-30 °C to 60 °C (-22 °F to 140 °F)

Storage Temperature

-40 °C to 70 °C (-40 °F to 158 °F)

Humidity

MIL-STD-810F, Method 507.4

Water

IPX8, protects against long periods of
immersion in liquids
MIL-STD-810F, Method 512.4,
Procedure I, IEC-529

I/O

Standard 9-pin male D-shell RS-232 serial
port (115 kbps)
Mini USB-Guest port
DC power port

STANDARD SOFTWARE

Microsoft® Windows Mobile® 6.1
software programs including:

- Internet Explorer Mobile
- File Explorer
- Word Mobile
- Excel Mobile
- PowerPoint Mobile
- Outlook Mobile
- Microsoft Windows Media Player
- Microsoft ActiveSync
- Microsoft Pictures & Videos
- Calendar, Contacts, Notes, Tasks,
Calculator
- Online Help

STANDARD ACCESSORIES

Rechargeable Lithium-Ion battery module
International AC re-charger (100 V–240 V)
Standard CF-Cap
USB data cable
Hand strap
Stylus pen
Stylus pen lanyard
Screen protectors
Nylon carry case

Drop

MIL-STD-810F, Method 516.5,
Procedure IV;
26 drops from 1.22 m (4 ft) onto plywood
over concrete
6 additional drops at -30 °C (-22 °F)
6 additional drops at +60 °C (+140 °F)

Sand and dust

IP6X, MIL-STD-810F, Method 510.3,
Procedures I & II

Vibration

MIL-STD-810F, Method 514.5,
Procedure I

Altitude

MIL-STD-810F, Method 500.4,
Procedures I, II and III;
4572 m (15,000 ft) at +23 °C (+73 °F)

MM10

- Spectra Precision Survey Pro or FAST Survey software
- Large, bright, sunlight- readable color QVGA screen
- Dust- and waterproof
- Weighs just 380 grams (13 oz.)
- Built-in 3M pixel digital camera
- Windows Mobile 6.5 OS
- Integrated Bluetooth, GSM/GPRS and GPS
- Exceptional battery life: over 20 hours



The Spectra Precision MM10 Data Collector delivers maximum performance and reliability in a lightweight but rugged design. It's dust- and waterproof and weighs just 380g (13 ounces) for effortless operation in the field. Moreover it features extremely long battery life (over 20 hours) making it a perfect tool for long surveying tasks.

The MM10 Data Collector provides wide range of internal wireless capabilities, including Bluetooth, wireless LAN (WiFi), but also built-in GSM/GPRS modem, which make this device very flexible and useful for any surveyors.

It comes equipped with an advanced and powerful Spectra Precision Survey Pro or FAST Survey field software, includes Windows Mobile 6.5 operating system, integrated 3M pixel digital camera, and even internal GPS, offering a very powerful and capable device, yet at a very competitive price

Data Collector

STANDARD FEATURES

- Windows Mobile 6.5
- 600 MHz ARM9 processor
- 128 MB DDR SDRAM
- 256 MB Flash storage
- Sunlight-readable color TFT
- Touch-screen
- Rugged submersible design
- Integrated speaker and microphone
- Integrated Bluetooth 2.0
- Secure Digital (MicroSDHC) slot
- 20-hour battery life with active use

PHYSICAL

Size

16.9 cm x 8.8 cm x 2.5 cm
(6.7 in x 3.5 in x 1.0 in)

Weight

0.38 kg (0.84 lb) with battery

ELECTRICAL

Processor

600 MHz ARM9 CPU

Display

240x320 pixel (QVGA) color TFT with LED
backlight

Sunlight readable color TFT display

Batteries

240x320 pixel (QVGA) color TFT with LED
backlight

Sunlight readable color TFT display

ENVIRONMENT

Operating Temperature

-10 °C to 60 °C (14 °F to 140 °F)

Storage Temperature

-30 °C to 70 °C (-13 °F to 158 °F)

Water & Dust

IP54

Drop

1.2m free drop on concrete

COMMUNICATIONS

Cellular

- Built in GSM/GPRS
- Quad band 850/900MHz,
1800/1900 MHz

Bluetooth

- Bluetooth 2.1 with EDR

WiFi

- Integrated

Interface

- USB

STANDARD SOFTWARE

Microsoft® Windows Mobile 6.5 software
programs including:

- Internet Explorer Mobile
- File Explorer
- Office Mobile
- Microsoft Windows Media Player
- Microsoft ActiveSync
- Microsoft Pictures & Videos
- Calendar, Contacts, Notes, Tasks,
Calculator
- Transcriber (handwriting recognition)
- Online Help

STANDARD ACCESSORIES

- Stylus
- Hand-strap
- A/C charger
- USB cable

ProMark 120

- Spectra Precision Survey Pro or FAST Survey software
- Integrated survey-grade GNSS
- 8-hour rechargeable battery
- Windows Embedded Handheld 6.5
- 806 MHz processor
- 2 GB NAND Flash memory
- Integrated GSM/GPRS/EDGE cellular modem
- Integrated 3M pixel digital camera
- Bluetooth



The Spectra Precision® ProMark™ 120 Data Collector offers a large bright touch-screen, lightweight but rugged housing, large storage capability (2 GB internal memory), internal 3M pixel digital camera and long battery life (over 8 hours). It was built to meet tough drop, dust, humidity and temperature conditions allowing surveyors to work in any environment.

The ProMark 120 Data Collector is equipped with Spectra Precision Survey Pro or FAST Survey field software, Windows Embedded Handheld 6.5 operating system, integrated wireless capabilities (Bluetooth, GSM/GPRS), providing an easy, intuitive and cable-free operation of your field equipment.

In addition, ProMark 120 Data Collector features an integrated professional grade GNSS, which allows this data collector to be used as a standalone GNSS receiver enabling it to be used for additional work such as pre-survey and GIS data collection.

All these features and capabilities make ProMark 120 Data Collector a very versatile and powerful device which suits all surveyors' needs.

Data Collector

STANDARD FEATURES

- Windows Embedded Handheld 6.5
- Marvell 806 MHz PXA 320 processor
- 256 MB DDR SDRAM
- 2 GB Flash storage
- Sunlight-readable color TFT
- Touch-screen
- Rugged submersible design
- Integrated speaker and microphone
- Integrated Bluetooth 2.0
- Secure Digital (SDIO) slot
- 8-hour battery life with active use

PHYSICAL

Size

19 cm x 9 cm x 4.3 cm
(7.5 in x 3.5 in x 1.7 in)

Weight

0.62 kg (1.43 lb) with battery

ELECTRICAL

Processor

806 MHz Marvell PXA320 XScale CPU

Display

240x320 pixel (QVGA) color TFT with LED backlight

Sunlight readable color TFT display

Batteries

Internal 6600 mAh Lithium-Ion, rechargeable battery module
8 hours battery life with active use (default settings)

ENVIRONMENT

Operating Temperature

-20 °C to 60 °C (-4 °F to 140 °F)

Storage Temperature

-25 °C to 70 °C (-13 °F to 158 °F)

Water & Dust

Proof

Drop

1.5m free drop on concrete

I/O

Via docking station

- Unit charging
- RS232 Interface
- USB Host and Device
- Additional battery charging slot

STANDARD SOFTWARE

Microsoft® Windows Embedded Handheld 6.5 software programs including:

- Internet Explorer Mobile
- File Explorer
- Word Mobile
- Excel Mobile
- PowerPoint Mobile
- Outlook Mobile
- Microsoft Windows Media Player
- Microsoft ActiveSync
- Microsoft Pictures & Videos
- Calendar, Contacts, Notes, Tasks, Calculator
- Online Help

STANDARD ACCESSORIES

- Integrated stylus
- Docking station
- Universal A/C adapter
- SB data cable
- Field bracket

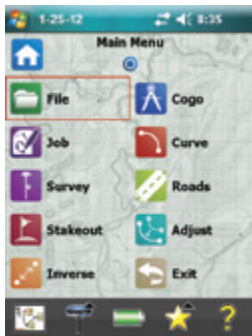
Survey Pro

Spectra Precision® Survey Pro™ Field Software provides you with a complete set of capabilities for all your survey projects. It's fast, reliable, and easy-to-use. Transfer data from Survey Pro to your laptop or PC and manage your jobs using Spectra Precision Survey Office software. Survey Pro software ships on Spectra Precision's rugged line of data collectors providing unparalleled integration, data integrity, efficiency and ease-of-use. The features and functions of Survey Pro have been developed based on feedback from surveyors like you. Each new release of this software incorporates enhancements built on your field experience.

Survey Pro software is offered in different modules so you can pick the one that works best for you today, then quickly and easily add features as you need them. You save money by getting only the software that you need for our business. As your business expands and you need more power, Survey Pro is still there for you with advanced modules readily available and easy to remotely install via electronic "unlock" codes without having to pay a premium.

Survey Pro is offered in multiple languages and on multiple data collector platforms so you can get the right tool for your business. Not only is Survey Pro easy to buy, it really is easy to use. A Surveyor's job is not easy and it takes a real professional to do it well; Survey Pro makes things clear and efficient, freeing you up to do your job. The customizable home screen is just one example of how Survey Pro helps you get the job done. Survey Pro's vast COGO feature set is unmatched in its capabilities and is one of the reasons Survey Pro has been a top choice of surveyors for more than 20 years.

Survey Pro works with all Spectra Precision and Nikon instruments as well as multiple other manufacturers' instruments. Survey Pro is the glue that holds your business together. Of course, if you have a complete line of Spectra Precision and Nikon products, you'll find that Survey Pro's integration with those instruments gives you that extra power and flexibility you need to compete in today's world.



SURVEY STANDARD

- Complete Mechanical Instrument Support
- All data collection features
- Basic point stakeout
- Basic COGO including Inverses, Intersections, Manual Traverse, Area and much more
- Basic Curve Solutions
- All the fundamental features required to properly manage a survey job

SURVEY PRO

- Everything that comes in Survey Standard plus:
- Advanced COGO and Curve Solutions including station offsets, average points, and spiral tools
- Advanced Stakeout including offset staking, slope staking and stake to a DTM
- Road Layout – Complete road layout and staking tool set

SURVEY PRO ROBOTIC

- Everything contained in Survey Pro plus complete Robotic instrument support
- Remote Control, radio configurations and automated repetitions

SURVEY PRO GNSS

- Everything contained in Survey Pro plus complete GPS/GNSS instrument support
- Extensive data collection routines with easy to use, step-by-step setup features
- Extensive support for projections and calibrations
- All GNSS staking routines are supported
- Support for RTK, Network RTK, static and PPK surveys

SURVEY PRO MAX

- Combines Survey Pro Robotics and Survey Pro GNSS: Complete support for all instruments and all features.

FAST Survey

- GNSS Support: configuration, monitoring and control
- Volume computation
- Background raster image
- Network connectivity
- Coordinate System Support: predefined grid systems, predefined datums, projections, Geoids, local grid
- Map view with colored lines
- Geodetic Geometry: intersection, azimuth/distance, offsetting, poly-line, curve, area
- Data import/Export: DXF, SHP, RW5, LandXML ...
- Survey Utilities: calculator, RW5 file viewing
- Optical Surveying Instruments (optional)
- Road Construction (optional)
- Robotic Total Stations (optional)



FAST Survey™ is a graphical field software for topography and construction, fully re-designed to optimize the functionality and performance of Spectra Precision's ProMark and ProFlex GNSS systems. It includes topographic features typically associated with dual-frequency, and provides extensive data formats and local coordinate system support. The ability to collect single coordinate shots, full RTK vectors, raw GNSS data and all data types concurrently, provides a flexible solution for your changing needs and meets the most demanding survey requirements.

FAST Survey also works with your optical equipment allowing you to use one controller for both types of instrument. This option make it possible to interwork with a wide range of survey instruments and accessories to run complete survey jobs, including site calibration, stake out, and survey projects where total stations are used.

FAST Survey is both powerful and easy to use. The scalable map-view screen displays points and lines as they are surveyed, offering large-print controls for rapid, reliable data collection. Rich attributing, full editing in the field and export to industry-standard data formats provides true field-to-finish capability, saving time and effort.

Field Software

EASY DATA COLLECTION

Tab-Based MENU Structure. All commands are visible in each menu, preventing the need for Up-Down Arrow Keying to view options. Collect points in the graphics mode. Points plot as they are shot in the field or entered. There is no need to switch between screens to view your points.

ENHANCED GRAPHICS

FAST Survey has a new colorful look. Icons have been standardized to create continuity throughout the product, while modernizing the user experience. The new Hot List lets users jump to the FAST Survey routines that previously had shortcuts without having to memorize key strokes. It also provides shortcut functionality to devices without keyboards.

SETTINGS AND CONTROL

FAST Survey manages job and antenna settings, network connections, as well as radio configurations. It supports the complete range of Ashtech GNSS receivers as well as multiple survey instruments. FAST Survey keeps track of every device completely separately. This includes all base stations, rovers and total stations, so that mixing equipment is easy.

VOLUMES COMPUTATION

FAST Survey can compute volumes between two surfaces, one surface and an elevation or simple stockpile volumes. Surfaces can be defined by graphical entities and points or by TIN files.

Survey Office

Spectra Precision® Survey Office software is ideal for processing and analyzing GPS and GNSS, and terrestrial (total station and level) survey data recorded in the field, and exporting it to a design package. The software provides numerous innovative and unique features, and it is easy to learn and use.

With Spectra Precision Survey Office software on your PC you have the ability to work with RTK and Static/PPK data to generate reports as well as identify and correct field errors. Import data from existing surveys or directly from the Internet and export data as points, or in CAD or XML format. Rest assured that your data is secure and reliable with built-in quality assurance and quality control features. The intuitive, integrated Spectra Precision Survey Office software saves time with its short learning curve and powerful features.

Survey data acquired in the field using a total station and contained in a data file can be imported into the software and integrated as necessary with other data collected as part of a survey project (for example, GNSS or level data).

The Spectra Precision Survey Office software is powerful and configurable, yet easy-to-use. The user interface features options that are familiar to Microsoft Office users. Drag-and-drop compatible files from your computer directly into an open project and the Spectra Precision Survey Office software analyzes the file to determine its type and how it needs to be processed. Visualization tools such as Plan views, 3D views, time-based data views and session editors help you "see" the data in the context of the entire project.

The Spectra Precision Survey Office software provides surveyors and engineers with advanced technology, integrating common tasks into a single system. Process and review RTK, Static, FastStatic, and stop-and-go Kinematic data. Spectra Precision Survey Office also performs data reduction, computation, QA/QC and network adjustment. Control data can be exported to the field software for use in the field.



SAMPLE FEATURES/FUNCTIONS

OVERVIEW

Core Features

Import/Export (Incl. Survey Pro, FAST Survey)
Project explorer view of data hierarchy
Graphic views (Plan View, 3D View)
Lists of data allowing sorting and selection
Points spreadsheet
Occupation spreadsheet
Reports and quality assurance plots
Internet download – for base stations and precise ephemeris

SOFTWARE FEATURES

File

Project New/Open/Close/Save/Archive
Page Setup
Print Preview/Print
Import/Export
Survey
DC (Survey Data Collector)
Trajectory (CSV)
CAD
DXF
DWG
Construction
LandXML
Custom
Points (user-defined ASCII export format)
Import/Export Format Editor
Internet Download

Edit

Undo/Redo/Delete/Add Point
Explode Blocks
Properties

View

New Plan View/New 3D View
New Spreadsheet Points/Vector/
Occupation
New Time-based View
Toggle Gridlines/Line marking
3D View settings
Project Explorer/Selection Explorer
Device Pane
Command Pane
Flags pane
View Filter Manager
Zoom
Pan/Pan Precise
Float/Unfloat View

Project

Project Settings
Change Coordinate System
Local Site Settings
Datum Gridding
Geoid Sub-Gridding
Compute Project
Snap Mode
Layer Options

Basic module

GNSS L1 postprocessing
Loop closure report
Network adjustment (L1 vectors)

Complete module

GNSS postprocessing
Full network adjustment

Select

Select All
Invert Selection
Select/Duplicate Points
Select Observations
Select Unprocessed Sessions
Select by Elevation Range/Layer
Advanced Select
Selection Set (save, manage, retrieve selection sets)

Point

Create/Merge/Merge Duplicate/Rename

Survey

Feature coding
Process Baselines
Clear Processing Results
Sessions Editor
Adjust Network
Clear Adjustment Results
Site Calibration/Clear Site Calibration
Inverse
Mean Angle/Mean Angle residuals
Level editor
Reports
Baseline Processing Report
Import report
Mean Angle Report
Network Adjustment Report
Point Derivation Report
Point List
Project Computation Report
Site Calibration Report
Vector List
Job Report Generator
Report Options

Tools

Coordinate System Manager
Feature Definition Manager
Planning
External Tools Manager
Measure Angle
Explore Object
Configuration / Data transfer Web page
Customize /Options

Window

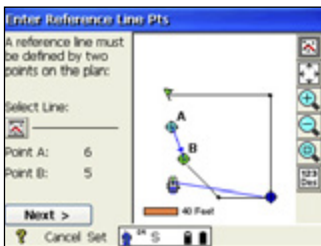
New Horizontal Tab Group
New Vertical Tab Group
Move to Previous Tab Group
Move to Next Tab Group
Close All Windows

Layout Pro

Spectra Precision Layout Pro and Spectra Precision Layout Pro Office construction positioning solutions give contractors more control of their job sites allowing significant improvements in construction accuracy and productivity.

Using the Layout Pro onboard with a Spectra Precision FOCUS 8/Nikon C Series Total Station or with Bluetooth Wireless connection to FOCUS 6/Nikon M Total Stations or directly to a Nikon DTM series and the Layout Pro Office software- you can:

- Take CAD designs and data into the field.
- Lay out complex concrete forms or anchor bolts from any location by referencing any two known points.
- Lay out control points and offset hubs faster and more cost-effectively - work on your schedule.
- Lay out all lines from one reference location with no string lines, transits or theodolites.
- Make minor adjustments to the building position as needed without waiting or paying subcontractor fees.
- Check the work of others and create documentation for change orders when necessary. Reflectorless measurement capabilities make as-built checks a one-person job.
- Lay out control lines for subcontractors faster and more accurately than with tapes and theodolites.
- Easily collect topographical data and import it into third-party software for elevation and cut and fill analysis.



SPECTRA PRECISION LAYOUT PRO OFFICE

Spectra Precision® Layout Pro Office software is designed for the contractor using Spectra Precision® Layout Pro field software for their layout applications. It's the ideal companion for anyone working with large or complex drawings.

Featuring an intuitive graphical user interface, Layout Pro Office software makes it easy to create a digital replica of your construction blueprint in the office before going out on the site to do the layout. While you are still in the office, you can use simple tools to perform distance, angle, area or down-and-out computations. You can also create your construction points from AutoCAD DXF files, and upload them to the Layout Pro. No need to learn a complete engineering CAD program.

- Graphical user interface provides direct access to common functions for a shorter learning curve and minimal self-training.
- Standard view controls offer a common user interface designed for anyone with a limited understanding of CAD for fast, easy operation.
- Multiple point selection in Individual, Window, and Current view point selection techniques give you maximum control to select points.
- Enter Plan and COGO (coordinate geometry) functionality in the office.
- Supports importing AutoCAD DWG and DXF files for creating layout points.
- Import and export text files that contain a list of points and coordinates.

MobileMapper 120

- High-Accuracy Handheld
- Powerful Z-Blade processing technology
- Submeter or decimeter real time accuracy
- Compact & lightweight design for optimal mobility, use and comfort
- Integrated communications for easy data transfer and differential GNSS
- Ruggedized for outdoor use in extreme conditions
- Windows Embedded Handheld for full 3rd party software compatibility
- GNSS scalability: GPS or GPS/GLONASS configurations



MobileMapper® 120 is the newest generation of handheld mapping devices from Spectra Precision. Designed for GIS data collection and mapping, the MobileMapper 120 integrates an open operating system, built-in communications and Ashtech's powerful Z-Blade technology. Z-Blade allows the MobileMapper 120 to operate in extreme GNSS environments while maintaining the high accuracies desired by GIS professionals.

The MobileMapper 120 delivers state-of-the-art features in a smart, compact, and lightweight handheld, giving users the ultimate field experience. Combined with MobileMapper Field proprietary software or our Business partners' offerings, MobileMapper 120 brings the openness, flexibility and scalability needed to answer any mobile GIS requirements.

STANDARD FEATURES

Windows Embedded Handheld 600 MHz

Marvell® PXA 320 processor
256 MB SDRAM
storage: 2 GB Nand Flash
High resolution 3.5" display sunlight
readable with touch screen
Rugged waterproof design
Cellular modem and Bluetooth

GNSS CHARACTERISTICS

45 parallel all-in-view channels GPS
GLONASS
L1 C/A
SBAS: WAAS/EGNOS/MSAS
Z-Blade technology powered by Ashtech
for optimal performance.
DGPS and post processing with
MobileMapper Office software
Up to 20 Hz GPS, GLONASS,
SBAS/GAGAN position output and raw data
(code and carrier)
NMEA 183 messages output
RTCM2.3, RTCM3.1, CMR and CMR+,
ATOM (Ashtech Optimized Messaging)
Real time Network: VRS, FKP, MAC
Accuracy Specifications (Horizontal RMS)¹
Real-time SBAS: < 50 cm typical
Real-time DGPS: < 30 cm typical
Post-processing: < 30 cm down to sub dm

GIS Mobile Mapping

PHYSICAL CHARACTERISTICS

Size

Receiver: 19 cm x 9 cm x 4.3 cm
(7.5 in x 3.5 in x 1.7 in)

Weight

Receiver only: 0,48 kg (1.06 lb)
Receiver with battery: 0,62 kg (1.43 lb)

ELECTRICAL

Processor

Marvell® PXA 320
Frequency clock 806 MHz

Display

Colour TFT High resolution display sunlight readable with touch screen, LED backlight.
Size: 3.5" portrait

Memory

256 MB SDRAM
User data storage: 2 GB Nand Flash (non volatile)
SDHC memory card

Power Characteristics

Removable battery: Li-Ion, 6600mAh
Battery life: > 8 hrs @ 20 °C with GNSS on³
Charging time: 3 hours
External power: 9-28 VDC

OPERATING SYSTEM

Microsoft Windows Embedded Handheld
Languages available: English, French, Spanish, German, Portuguese, Italian, Simplified Chinese, Japanese, Korean²
Software package includes: GNSS Toolbox to control GNSS
Internet Explorer
Microsoft Office Mobile
ActiveSync
Transcriber (handwriting recognition)

ENVIRONMENTAL CHARACTERISTICS

Operating temperature: -20 °C to +60 °C
(-4 °F to 140 °F)
Storage temperature: -25 °C to +70 °C
(-13 °F to 158 °F)
Humidity: 10 to 90% non condensing
Waterproof
Vibration and Shock: ETS300 019,
vibration MIL-STD-810 method 514.5
Free drop: 1.2 m on concrete

COMMUNICATIONS

Cellular

Built in GPRS, EDGE class 12 modem
Cinterion MC 75i
Quad band 850/900 MHz, 1800/1900 MHz

Bluetooth

Bluetooth 2.1 (class 2) with DER
Profiles: SPP, DUN, FTP, OPP, HSP, A2DP
Other
RS232, USB through docking station
Wireless LAN 802.11b/g (SDIO slot)

USER INTERFACE

Keyboard

Alphanumeric virtual keyboard
4 ways navigation, Ok, menu, escape, zoom in/out, contextual keys
Illuminated keyboard

Multimedia & Sensors

Camera 3MPixels, Autofocus
E-Compass
G-Sensor
Speaker
Microphone

SOFTWARE OPTIONS

MobileMapper Field and Office Software
Post-processing feature available for MobileMapper Field software
ESRI® ArcPad® software bundle (USA only)

Standard Accessories

Integrated stylus
Docking station: Unit charging
RS232 Interface
USB Host and Device
Additional battery charging slot
Universal A/C adapter
USB data cable

OPTIONAL ACCESSORIES

ASH-660, L1 GPS/GLONASS external antenna with cable
ASH-661, L1/L2 GNSS external antenna with cable
Pole bracket
Automotive external antenna
Carrying case

MobileMapper 10

- Real-time meter level accuracy
- Ready to use complete mapping
- Solution for field and office
- User friendly Windows® Mobile 6.5
- Compact & lightweight
- Integrated communications
- Several days of battery life
- Ruggedized for outdoor use



Geographical Information Systems and Location Based Services are strongly penetrating a wide range of applications and organizations. The growing need for geo-localization is naturally boosting the demand for efficient and affordable data collection solutions. Ashtech® is leading the GNSS democratization to enable a wider access to professional mapping. Today with MobileMapper 10, Ashtech makes it possible to massively deploy a professional accurate GIS receiver to any field work force. Compact and lightweight, MobileMapper 10 is a complete, easy to use mapping solution for real-time collection of meter accurate data.

With MobileMapper 10, organizations will improve the quality of their georeferenced information and their productivity with direct positive impact on operational costs.

GIS Mobile Mapping

STANDARD FEATURES

Windows Embedded Handheld 600 MHz

ARM9 processor
128 MB SDRAM
256 MB Nand Flash
High resolution 3.5" display sunlight readable with touch screen
Rugged waterproof design
Integrated cellular modem, WiFi and Bluetooth

GNSS CHARACTERISTICS

Internal antenna: 20 channels

- GPS L1 C/A
- SBAS: WAAS/EGNOS/MSAS

External antenna connector
NMEA output

ACCURACY SPECIFICATIONS (HORIZONTAL RMS)

Real-time SBAS: < 2 m typical
Postprocessed: < 50 cm typical

PHYSICAL CHARACTERISTICS

Size

16.9 cm x 8.8 cm x 2.5 cm
(6.7 in x 3.5 in x 1 in)

Weight

380 g with battery (310 g without)

USER INTERFACE

Keyboard

4-way navigation, menu, contextual keys
Illuminated keyboard with touch screen
Virtual keyboard

ELECTRICAL

Processor

ARM9™
Clock frequency: 600 MHz

Display

Color TFT High resolution display sunlight readable with touch screen, LED backlight.
Size: 3.5"

Colours: 262k

Memory

128 MB SDRAM
Storage: 256 MB NAND Flash (non volatile)
MicroSDHC™ memory card (up to 8GB, SanDisk®, Kingston® recommended)

Power Characteristics

Battery life: > 20 hrs @ 20 °C with GPS on 3
Charging time: 4 hours
Removable battery

OPERATING SYSTEM

Microsoft® Windows Mobile 6.5
Languages available: English, French, German, Italian, Japanese, Korean, Portuguese, Spanish, Simplified & Traditional Chinese²

Software package includes:

- Internet Explorer®
- Office Mobile
- ActiveSync®
- Transcriber (handwriting recognition)

ENVIRONMENTAL CHARACTERISTICS

Operating temperature:

-10 °C to +60 °C (14 °F to 140 °F)

Storage temperature:

-30 °C to +70 °C without battery
(-13 °F to 158 °F)

Humidity:

95% non condensing

Waterproof:

IP54

Free drop:

1.2 m on concrete

COMMUNICATIONS

Cellular

Built in GSM/GPRS
Quad band 850/900MHz, 1800/1900 MHz

Bluetooth

Bluetooth 2.1 with EDR

WiFi

Integrated

Interface

USB

MULTIMEDIA & SENSORS

Camera 3M Pixels

E-Compass

G-Sensor

Speaker

Microphone

SOFTWARE OPTIONS

Ashtech MobileMapper Field and Office software
Post-processing
ESRI ArcPad software bundle (USA only)

STANDARD ACCESSORIES

Stylus
Hand-strap
A/C charger
USB cable

OPTIONAL ACCESSORIES

External magnetic GPS antenna
Pole bracket

Spectra Precision

FOCUS 30 Accessories

POWER SUPPLY

Charger
dual battery
Battery
Li-Ion 11.1V

CABLES

Cable 1.5 m data download

MISCELLANEOUS

Transport case
Tribrach

EPOCH 50 Accessories

POWER SUPPLY

Receiver charging bundle
Battery

SOFTWARE

Spectra Precision Survey Office
Complete (GNSS)
Spectra Precision Survey Office
Upgrade to complete module
Spectra Precision Survey Office
no dongle

CABLES

Cable 1.5 m data
Cable for Low Power radio
Cable for High Power radio

MISCELLANEOUS

Transport case
Extension pole

ProMark 800 & ProFlex 800 Accessories

POWER SUPPLY

Power supply kit
Battery
External Power cable

SOFTWARE

Spectra Precision Survey Office

CABLES

USB cable
Cable for ADL Vantage (Pro) UHF radio

MISCELLANEOUS

Universal hard case
GSM antenna

ProMark 120 & ProMark 220 Accessories

POWER SUPPLY

Power supply kit
Battery
Docking station
AC/DC power adaptor

SOFTWARE

Spectra Precision Survey Office

CABLES

PoGo cable
Antenna cable

MISCELLANEOUS

Universal hard case
Field bracket
Kit of 5 stylus
1W TRx UHF radio

FOCUS 8 & FOCUS 6 Accessories

POWER SUPPLY

On-board Li-Ion battery
Dual battery charger
AC adapter for battery charger

MISCELLANEOUS

Transport case

General Accessories – Prisms and Poles

PRISM SYSTEMS

Mini Prism System

Complete tilting mini prism assembly

Premier Prism System

Waterproof canister type prism

Prism System

Waterproof canister type prism

Stakeout Prism Assembly (25 mm)

On-board level vials top and bottom

POLES AND ACCESSORIES

Prism Poles

Prism Pole, 2.6 m (8.5 ft)

Compression Lock

Prism Pole, 2.6 m (8.5 ft)

TLV Lock

Prism Pole, 3.7 m (12 ft)

Compression Lock

Prism Pole, 4 m (13 ft)

TLV Lock

Accessories for Prism Poles

Bipod, Thumb Release

RANGE POLES

- 2.0 m Aluminum Range Pole
- 2.0 m Carbon Fiber Range Pole
- 2.0 m Carbon Fiber Snap-Lock Range Pole

REFLECTOR SHEET TARGETS

Reflector Sheet Target

0 mm offset, built-in level bubble

Adapter for Reflector Sheet Target

For mounting Reflector Sheet Target on prism pole

TRIPODS

- Wooden, Heavy Duty, Round Head Tripod
- Aluminum, Heavy Duty, Quick Clamp Tripod
- Advanced Fiberglass Composite, Heavy Duty Tri-Max Tripod



Pacific Crest

- Configurable transmit power
- Multi-function user interface
- Heavy-duty construction
- Fully water and dustproof
- 19200 over-the-air link rate without range degradation
- Advanced 40 MHz bandwidth
- Software-derived channel bandwidth



ADL Vantage / ADL Vantage Pro is an advanced, high speed, high power, wireless data link built to survive the rigors of GNSS/RTK surveying and precise positioning. This sophisticated radio modem utilizes Pacific Crest's next generation Advanced Data Link (ADL) technology while remaining backward compatible with existing Pacific Crest and other radios. Its full-function user interface streamlines field configuration and troubleshooting so you can maintain maximum productivity. For the most rugged and reliable long-range data link, go with the Geomatics industry's new standard in wireless communications.

OVERVIEW

GENERAL SPECIFICATIONS

Communication User Interface	1 RS-232 port, 115.2 kbps maximum 5 navigation buttons with LCD display LCD display can be set to display 2 rows, 16 characters, English or Cyrillic or 2 rows, 8 characters of Chinese
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POWER

ADL Vantage

- During RX	0.6 Watt s nominal @ 12.0 VDC
- During TX	13.4 Watt s nominal @ 12.0 VDC, 4W RF output 7 Watt s nominal @ 12.0 VDC, 1W RF output

ADL Vantage Pro

- During RX	1.7 Watt s nominal @ 12.0 VDC
- During TX	130 Watt s nominal @ 12.0 VDC, 35W RF output 8 Watt s nominal @ 12.0 VDC, 1W RF output

ADL Vantage / ADL Vantage Pro

OVERVIEW

MODEM SPECIFICATION

Link Rate/Modulation	19,200 bps/4FSK 9600 bps/4FSK 19,200 bps/GMSK 16000 bps/GMSK 9600 bps/GMSK 8000 bps/GMSK 4800 bps/GMSK
Link Protocols	Transparent FST™, Transparent EOT/EOC, Packet-switched, TRIMMARK™, TRIMTALK™, TT450S (HW), SATEL®, South
Forward Error Correction	Yes

RADIO SPECIFICATIONS

Frequency Bands	390–430 MHz, 430–473 MHz
Frequency Control	Synthesized 6.25 kHz tuning resolution Frequency stability: ± 1 ppm @ –40°C to +85°C
Channel Bandwidth	12.5 kHz and 25 kHz, software derived
RF Transmitter Output	
- ADL Vantage	
- ADL Vantage Pro	Programmable to 0.1 - 4 Watts (where permitted)
Sensitivity	Programmable to 2 - 35 Watts (where permitted)
Type Certification	–110 dBm BER 10-5 All models are type accepted and certified for operation in the U.S., Europe, Australia, New Zealand, and Canada

ENVIRONMENTAL SPECIFICATIONS

Enclosure	IP67 (Watertight to depth of 1 meter for 30 minutes)
Operating Temperature	–40° to +65° C (–40° to +149° F)
Storage Temperature (Receiver/Transmitter)	–55° to +85° C (–67° to +185° F)
Vibration Specification	MIL-STD-810F

MECHANICAL SPECIFICATIONS

Dimensions	
- ADL Vantage	11.9 cm L x 8.6 cm W x 21.3 cm H (4.7 in L x 3.4 in W x 8.4 in H) with handle
- ADL Vantage Pro	8.9 cm L x 4.6 cm W x 16.0 cm H (3.5 in L x 1.8 in W x 6.3 in H)
Weight	
- ADL Vantage	567 g (20 oz)
- ADL Vantage Pro	1.95 kg (4.3 lb)
Data/Power Connector	5-pin, #1-shell LEMO-style
RF Connector	50 Ohm, TNC female

AMERICAS

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ASIA-PACIFIC

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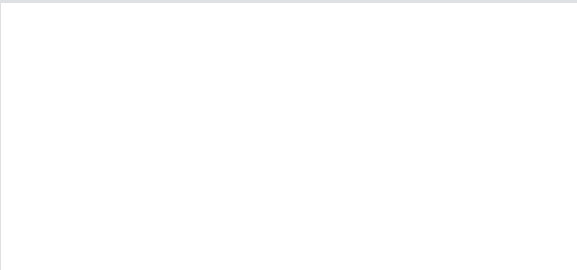
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www.spectraprecision.com

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