ARROW SERIES™
High Accuracy Field Mobility

Submeter with SBAS, 1cm with RTK SafeRTK™ for poor cell coverage areas GPS/Glonass/Galileo/BeiDou, L1/L2/L5 4cm real-time accuracy anywhere in the world

WWW.EOS-GNSS.COM
Made in Canada
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1. Single baseline < 10 km, supports RTK networks

WWW.EOS-GNSS.COM

Terebonne, QC, Canada
Tel: +1 (450) 824-3325

info@eos-gnss.com

Made in Canada
The World's Most Advanced GNSS receiver for Every Mobile Device

The Arrow Gold® is the first high-accuracy iOS, Android, and Windows Bluetooth® GNSS receiver to implement all four global constellations (GPS, GLONASS, Galileo, BeiDou), three frequencies (L1, L2, L5), and satellite-based RTK augmentation. The Arrow Gold works with all apps that run on iOS, Android, and Windows devices. It also supports all planned global satellite constellations, giving it an awesome return on investment that will serve you well into the next decade and beyond.

RTK Everywhere - Even in Poor Cell Coverage Areas

The Arrow Gold offers a new feature called SafeRTK™. There is nothing more frustrating than trying to stay connected to an RTK network in areas with poor cell coverage. This feature is the answer. When the Arrow Gold loses connection to the RTK network, SafeRTK takes over in a few seconds and allows it to maintain RTK-level accuracy for up to 20 minutes (unlimited with Atlas™ subscription), until the Arrow Gold is automatically reconnected to the RTK network. This results in smooth, RTK accuracy even in areas with poor cell coverage.

No RTK Network Access Available? Pioneering Low-Cost Global Satellite

Do you work in an area without an RTK network available? The Arrow Gold features a 4 cm, real-time satellite correction service available anywhere in the world. Using all four constellations and signals, the Arrow Gold offers convergence times as low as 15 minutes anywhere in the world, at a revolutionary price point that works with all iOS, Android, and Windows devices.

Key Features:
- Supports GPS, GLONASS, Galileo, BeiDou, QZSS
- Triple-Frequency support
- 1 cm RTK real-time accuracy
- Long-range RTK baselines up to 50 km
- SafeRTK for poor cell coverage areas
- Worldwide satellite correction service
- 100% iOS, Android, and Windows compatibility

The Ultimate Accuracy for Your iOS, Android, or Windows Device

Of course, iOS, Android, and Windows compatibility is our expertise. Eos has the most advanced connectivity with all mobile devices and free software utilities to ensure compatibility with apps like Esri Collector, Survey123, QuickCapture and many other mobile GIS software apps.
### GPS Sensor

| Receiver Type: | GNSS multi-frequency RTK with carrier phase |
| Signals Received: | GPS: L1CA, L1P, L1C, L2P, L2C, L5, GLONASS: G1, G2, P1, P2, Galileo: E1BC, E5a, E5b, BeiDou: B1, B2, B3 (without L5), QZSS: L1CA, L1C, L2C, L5 |
| Number of Tracked Satellites: | 12 GPS (15 when no SBAS), 12 GLONASS, 22 BeiDou, 15 Galileo, 4 QZSS |
| SBAS Support: | 3-channel, parallel tracking |
| L-Band (Atlas): | 1 |
| Update Rate: | 1 Hz Default, Optional 10 Hz and 20 Hz |
| RTK Accuracy: | 1 cm¹ + 1 ppm Horizontal, 2 cm¹ + 1 ppm Vertical |
| SBAS Accuracy: | < 30 cm HRMS¹, < 60 cm 2dRMS |
| Atlas Accuracy (RMS): | H10: 4 cm, H30: 15 cm, H100: 30 cm |
| Autonomous Accuracy: | 1.2 meters HRMS¹ |
| Cold Start: | < 60 sec typical (no almanac or time) |
| Reacquisition: | < 1 sec |
| Max Speed: | 1,850 kph (1,150 mph / 999 knots) |
| Max Altitude: | 18,288 meters / 60,000 ft |

### Communication

| Port: | Bluetooth, USB 2.0, Serial (Optional) |
| Bluetooth Transmission: | Class 1, 300 m typical range², up to 1 km |
| Frequency: | 2.400 - 2.485 GHz |
| Fully Bluetooth Pre-Qualified: | Bluetooth 2.1 + EDR |
| Supported Bluetooth Profiles: | SPP and iAP |
| Data I/O formats: | NMEA 0183, RTCM SC-104, Binary |
| Output Datum: | WGS-84 (G1674) Epoch 2005.0, SBAS & Atlas: ITRF08 (current year epoch) |
| RTC: | Same as RTK base |
| Raw Measurement Data: | Binary and RINEX |
| Correction I/O Protocol: | RTCM 2.x, 3.x, CMR, CMR+, proprietary binary |
| GPS Status LEDs: | Power, GNSS, DGNSS, DIFF, Bluetooth |
| Battery Status LED: | 5 LED Indicator |
| Timing Output: | 1PPS, CMOS, active high, rising edge sync, 10 kΩ, 10 pF load |
| Event Marker Input: (with optional serial port) | CMOS, active low, falling edge sync, 10kΩ, 10 pF load |

### Power

| Battery Type: | Field replaceable, rechargeable Lithium-Ion pack (rechargeable inside unit or separately) |
| Battery Autonomy: | 8.5 hrs³ (Atlas™ OFF) - 7+ hrs³ (Atlas™ ON) |
| Charging Time: | 4 hours (vehicle charger available) |

### Environmental

| Operating Temperature: | -40°C to +85°C (-4°F to +185°F)³ |
| Storage Temperature: | -40°C to +85°C (-4°F to +185°F)³ |
| Humidity: | 95% non-condensing |
| Compliance: | FCC, CE, RoHS and Lead-free |

### Mechanical

| Enclosure Material: | Xenoy |
| Enclosure Rating: | Waterproof, IP-67 |
| Immersion: | 30 cm, 30 minutes |
| Dimensions: | 12.5 x 8.4 x 4.2 cm (4.92 x 3.3 x 1.65 in.) |
| Weight: | 372 g (0.82 lbs) |
| Data Connectors: | Mini USB Type B Receptacle |
| Antenna Connector: | SMA Female |

### Antenna

| GPS Freq Range: | 1525 - 1606 MHz, 1164 - 1254 MHz |
| Impedance: | 50 Ohms |
| Gain (no cable): | 30 dB (+ 2 dB) |
| LNA Noise Figure: | 2.5 dB Max at 25°C |
| Voltage: | +2.5 to +16 VDC |
| Connector: | SMA female |
| Dimensions: | 69 mm diam. x 22 mm (2.72 x 0.87 in.) |
| Weight: | 170 g (0.374 lbs) |
| Temperature: | -40°C to +85°C (-4°F to +185°F)³ |
| Humidity: | Waterproof |

### Standard Accessories

| Li-Ion Battery Pack (Field replaceable) | Pole Bracket and Clamp |
| 12VDC Power Supply | Hard Shell Carrying Case |
| USB Cable | Antenna Cable |
| L1/L2/L5, L-Band GNSS Antenna | Antenna Mounting Plate |

### Field Activated Options

| 10 Hz, 20 Hz Output Rates |

NOTES:

1. Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services) and ionospheric activities. Stated accuracies for baseline lengths of up to 50km
2. Transmission in free space
3. Lithium-Ion battery performance degrades below -20°C (-4°F)

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Made in Canada
The World’s First RTK Receiver for Every Mobile Device

The Arrow 200® is the world's first GNSS receiver able to provide 1 cm real-time accuracy on your Android, iOS, and Windows mobile device. Yes, you can enjoy 1 cm accuracy on your iPhone or Samsung Galaxy running Esri Collector for ArcGIS, Survey123, or whatever field data collection software you prefer.

Designed for use with a broad range of mobile devices, from smartphones to tablets and notebook computers, the Arrow 200 incorporates rock-solid, wireless Bluetooth technology that works smoothly with Android, iOS, and Windows devices, making it obsolete-proof and portable across platforms.

Use the Mobile GIS Software of Your Choice

Seems like a new mobile GIS software is being offered each week? With the Arrow 200 you will not be tied to legacy GNSS receiver hardware or GIS software, it will grow with you. The Arrow 200 feeds 1 cm RTK accuracy to every app on your Android or iOS device, even Google or Apple maps! Esri Collector for ArcGIS, Survey123, QuickCapture, AmigoCloud, Mapit, Futura, iCMTiGIS PRO, it works seamlessly with all of them and many more mapping apps.

Uses All Four Global Constellations

The Arrow 200 incorporates premium features that place it among the highest performing receivers in the world. It takes advantage of all existing satellite constellations: GPS, GLONASS, Galileo, BeiDou, and free SBAS corrections, to deliver top-notch, 1 cm RTK performance anywhere in the world when connected to an RTK network or base station.

Key Features:

- Supports existing GNSS (GPS, GLONASS, Galileo, BeiDou)
- Dual-Frequency support
- 100% Android, iOS, Windows compatibility
- 1 cm RTK real-time accuracy
- Supports all mobile GIS software

The Ultimate in Worldwide High-Precision GNSS Technology

The Arrow 200 provides the ultimate in flexibility. Using your smartphone, tablet, or notebook computer, it can deliver 1 cm real-time accuracy when connected to an RTK network or RTK base.

For more details, www.eos-gnss.com
### GPS Sensor

**Receiver Type:** GNSS dual-frequency RTK with carrier phase

**Signals Received:**
- GPS, GLONASS, Galileo, BeiDou

**Channels:**
- 372-channel, parallel tracking

**Number of Tracked Satellites:**
- 12 GPS (15 when no SBAS)
- 12 GLONASS
- 15 Galileo
- 22 BeiDou

**SBAS Support:**
- 3-channel, parallel tracking

- WAAS/EGNOS/MSAS/GAGAN (with SBAS ranging)

**Update Rate:**
- 1 Hz Default, optional 10 Hz and 20 Hz

**RTK Accuracy:**
- 1 cm + 1 ppm Horizontal
- 2 cm + 1 ppm Vertical

**SBAS Accuracy:**
- <30 cm HRMS

**Autonomous Accuracy:**
- < 60 sec typical (no almanac or time)

**Max Speed:**
- 1,850 kph (1,150 mph / 999 knots)

**Max Altitude:**
- 18,288 m (60,000 ft)

### Communication

**Bluetooth Transmission:**
- Class 1, 300 m typical range², up to 1 km

**Frequency:**
- 2.400 - 2.485 GHz

**Supported Bluetooth Profiles:**
- SPP and iAP

**Data I/O formats:**
- NMEA 0183, RTCM 104, Binary

**Output Datum:**
- Autonomous: WGS-84 (G1674) Epoch 2005.0
- SBAS: ITRF08 (current year epoch)

**RTK: Same as RTK base**

**Raw Measurement Data:**
- Binary and RINEX

**Correction I/O Protocol:**
- RTCM 2.x, 3.x, CMR, CMR+, proprietary binary

**GNSS Status LEDs:**
- Power, GNSS, DGNSS, DIFF, Bluetooth

**Battery Status LED:**
- 5 LED Indicator

**Timing Output:**
- 1PPS, CMOS, active high, rising edge sync.
- 10 kΩ, 10 pF load (with optional serial port)

**Event Marker Input:**
- 10 kΩ, 10 pF load (with optional serial port)

### Power

**Battery Type:** Field replaceable, rechargeable Lithium-Ion pack.

**Battery Life:** Battery operating time 9+ hours¹

**Charging Time:** 4 hours (vehicle charger available)

### Environmental

**Operating Temperature:** -40°C to +85°C (-40°F to +185°F)³

**Storage Temperature:** -40°C to +85°C (-40°F to +185°F)

**Humidity:** 95% non-condensing

**Compliance:** FCC, CE, RoHS and Lead-free

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**Mechanical**

**Enclosure Material:** Xenoy

**Enclosure Rating:** Waterproof, IP-67

**Immersion:** 30 cm, 3 minutes

**Dimensions:** 12.5 x 8.4 x 4.2 cm (4.92 x 3.3 x 1.65 in.)

**Weight:** 372 g (0.82 lbs)

**Data Connectors:** Mini USB Type B Receptacle

**Antenna Connector:** SMA Female

### Antenna

**GPS Freq Range:** 1525 - 1606 MHz, 1164 - 1254 MHz

**Impedance:** 50 Ohms

**Gain (no cable):** 30 dB ±2dB

**Noise Figure:** 2.5 dB Max at 25°C

**Voltage:** +2.5 to +16 VDC

**Connector:** SMA female

**Dimensions:** 69 mm diam. x 22 mm (2.72 x 0.87 in.)

**Weight:** 170 g (0.374 lbs)

**Temperature:** -40°C to +85°C (-40°F to +185°F)

**Humidity:** Waterproof

### Standard Accessories

- Li-Ion Battery Pack (Field replaceable)
- 12VDC Power Supply
- Hard Shell Carrying Case
- USB Cable
- Multi-Frequency GNSS Antenna
- Pole Bracket and Clamp
- Antenna Cable
- Antenna Mounting Plate

### Field Activated Options

10Hz, 20Hz Output Rates

- **NOTES:**

  1. Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services) and ionospheric activities. Stated accuracies for baseline lengths of up to 30 km
  2. Transmission in free space
  3. Lithium-ion battery performance degrades below -20°C (-4°F)

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Made in Canada 🇨🇦
High-Accuracy GNSS Receiver for Your Smartphone, Tablet, or Notebook Computer

The Arrow 100® is designed specifically to use with a variety of mobile devices, including your smartphone, tablet, or notebook computer. It incorporates rock-solid, wireless Bluetooth® technology that works with Android, iOS, and Windows® devices, making it obsolete-proof. Contemplating switching from an iPhone to an Android phone or vice-versa? No problem, the Arrow 100 works smoothly with both.

Use the Mobile GIS Software of Your Choice

Seems like a new mobile GIS software is being offered each week? With the Arrow 100 you will not be tied to legacy GNSS receiver hardware or GIS software, it will grow with you. The Arrow 100 feeds submeter accuracy to every app on your Android or iOS device, even Google or Apple maps! Esri Collector, Survey123 and QuickCapture, Futura, AmigoCloud, MapIt, GeoJot, iCMTGIS, it works seamlessly with all of them and many more mapping apps.

Real-time, Worldwide Accuracy

The Arrow 100 takes advantage of GPS, GLONASS, Galileo, BeIDou, and free SBAS corrections in most regions of the world. For SBAS, North America is covered by WAAS, Europe and North Africa by EGNOS, India is covered by GAGAN, Japan by MSAS, and Australasia by their own system. With the above-mentioned free SBAS the Arrow 100 provides 30 to 60 cm real-time accuracy.

Key Features:

- Full GNSS (GPS, GLONASS, Galileo, BeIDou)
- 100 % Android, iOS, Windows compatible
- 30 to 60 cm real-time accuracy using free SBAS
- Supports all mobile GIS software

Works Where Other Receivers Can’t

The Arrow 100 was designed specifically with GIS users in mind. It squeezes more accuracy from SBAS corrections than any other receiver in the world. With its patented technology, you can use it under trees, around buildings, and in rugged terrain where other receivers will fail to deliver. Where having GPS is just not enough, the Arrow 100 uses GLONASS, Galileo, and BeIDou signals from at least 100 satellites. Real-time results in the field optimize your efficiency with no post-processing required!

For more details, www.eos-gnss.com
### Specifications

#### GPS Sensor

**Receiver Type:** L1/G1/E1/B1, GPS, GLONASS, Galileo, BeiDou with carrier smoothing

**Channels:**
- 12 GPS (15 when no SBAS)
- 15 Galileo
- 22 BeiDou

**Number of Tracked Satellites:**
- 12 GPS
- 15 Galileo

**SBAS Support:**
- 3-channel, parallel tracking
- WAAS, EGNOS, MSAS, GAGAN (SBAS ranging where supported)

**Update Rate:**
- 1 Hz Default, optional 10 Hz and 20 Hz

**DGNSS Horizontal Accuracy:**< 30 cm HRMS

**SBAS Accuracy:**
- < 60 cm 2dRMS, 95% confidence\(^1\)
- (< 30 cm HRMS, < 25 cm CEP)

**Horizontal Accuracy:**
- < 2.5 m 2dRMS, 95% confidence\(^1\)
  - (autonomous, no SA)

**Optional Proprietary RTCM:**
- < 20 cm 2dRMS, 95% confidence\(^1\)

**Cold Start:**
- < 60 sec typical (no almanac or time)

**Reacquisition:**
- < 1 sec

**Maximum Speed:**
- 1,850 kph / 1,150 mph / 999 knots

**Maximum Altitude:**
- 18,288 m (60 000 ft)

#### Communication

**Port:**
- Bluetooth, USB 2.0, serial (optional)

**Bluetooth Transmission:**
- Class 1, 300 m typical range\(^2\), up to 1 km
  - 2.400 - 2.485 GHz
- Bluetooth 2.1 + EDR
- SPP and iAP

**Supported bluetooth Profiles:**
- NMEA-0183, RTCM SC-104, Binary
- Binary and RINEX

**Data I/O Protocol:**
- RTCM, Optional Proprietary format

**Raw Measurement Data:**
- Power, GNSS, DGNSS, DIFF, Bluetooth

**Correction I/O Protocol:**
- 5 LED Indicator

**Battery Status Indicator:**
- Power, GNSS, DGNSS, DIFF, Bluetooth

**Battery Status LED:**
- 5 LED Indicator

#### Power

**Battery Type:**
- Field replaceable, rechargeable
- Lithium-Ion pack (rechargeable inside unit or separately)

**Battery Capacity:**
- Battery Operating Time: 12+ hours\(^3\)

**Charging Time:**
- 4 hours (vehicle charger available)

**Antenna Voltage Output:**
- 5 VDC

**Antenna Input Impedance:**
- 50 Ohms

#### Environmental

**Operating Temperature:**
- -40°C to +85°C (-40°F to +185°F)\(^3\)

**Storage Temperature:**
- -40°C to +85°C (-40°F to +185°F)

**Humidity:**
- 95% non-condensing

**Compliance:**
- FCC, CE, RoHS and Lead-free

#### Mechanical

**Enclosure Material:**
- Xenoy

**Enclosure Rating:**
- Waterproof, IP-67

**Immersion:**
- 30 cm, 30 minutes

**Dimensions:**
- 12.5 x 8.4 x 4.2 cm (4.92 x 3.3 x 1.65 in.)

**Weight:**
- 372 g (0.82 lbs)

**Data Connectors:**
- Mini USB Type B Receptacle

**Antenna Connector:**
- SMA Female

#### Antenna

**Frequency Range:**
- L1, G1, E1, B1

**Gain (without cable):**
- 26 dB (+/- 2 dB), 35 mA

**Voltage:**
- +4.5 to +15 VDC

**Impedance:**
- 50 Ohms

**Dimensions:**
- 6.6 diam. x 2.7 cm (2.61 x 1.05 in.)

**Weight (without cable):**
- 114 g (0.25 lbs)
  - with removable magnet mount

**Antenna Connector:**
- SMA Female

**Finish:**
- Fluid Resistant

**Temperature:**
- -55°C to +70°C (-67°F to +158°F)

**Immersion:**
- 30 cm, 30 minutes

#### Standard Accessories

**Li-ion Battery Pack (Field replaceable):**
- 12VDC Power Supply
- Belt/Shoulder Carrying Case
- Precision Antenna with 1.5 m cable
- Soft Hat for Antenna
- USB Cable

#### Field Activated Options

**10 Hz, 20 Hz Output Rate**
- Base Station RTCM Output
- Single Frequency RTK for 1-3 cm

**Note:**
1. Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services) and ionospheric activities.
2. Transmission in free space
3. Lithium-ion battery performance degrades below -20°C (-4°F)

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“Authorized Distributor”

Ref: 2020-06-07
High-Accuracy GPS Receiver for Your Smartphone, Tablet, or Notebook Computer

The Arrow Lite® is designed specifically to use with a variety of mobile devices, including your smartphone, tablet, or notebook computer. It incorporates rock-solid, wireless Bluetooth® technology that works with Android, iOS, and Windows® devices, making it obsolete-proof. Contemplating switching from an iPhone to an Android phone or vice-versa? No problem, the Arrow Lite works smoothly with both.

Use the Mobile GIS Software of Your Choice

Seems like a new mobile GIS software is being offered each week? With the Arrow Lite you will not be tied to legacy GPS receiver hardware or GIS software, it will grow with you. The Arrow Lite feeds submeter accuracy to every app on your Android or iOS device, even Google or Apple maps! Esri Collector, AmigoCloud, Mapit, GeoLot, iCMTGIS, it works seamlessly with all of them and many more mapping apps.

Real-time, Worldwide Accuracy

The Arrow Lite takes advantage of free GPS SBAS corrections in most regions of the world. North America is covered by WAAS, Europe and North Africa by EGNOS, India is covered by GAGAN, and Japan by MSAS. The above-mentioned free SBAS services provide 60 cm real-time accuracy.

Key Features:
- Submeter GPS
- 100% Android, iOS, Windows compatible
- 60 cm real-time accuracy using free SBAS
- Supports all mobile GIS softwares

Works Where Other Receivers Can’t

The Arrow Lite was designed specifically with GIS users in mind. It squeezes more accuracy from SBAS corrections than any other receiver in the world. With its patented technology, you can use it under trees, around buildings, and in rugged terrain where other receivers will fail to deliver. Your efficiency will be optimized because you will get real-time results in the field! No post-processing is required.

For more details, www.eos-gnss.com
GPS Sensor
Receiver Type: L1, C/A code, with carrier phase smoothing
Channels: 12-channel, parallel tracking
SBAS Support: 2-channel, parallel tracking
WAAS, EGNOS, MSAS, GAGAN, and compatible
Update Rate: 1 Hz Default, optional 10 Hz, 20 Hz
DGPS Horizontal Accuracy: < 60 cm 2rdRMS, 95% confidence
Horizontal Accuracy: < 2.5 m 2rdRMS, 95% confidence
Optional Proprietary RTCM: < 20 cm 2rdRMS, 95% confidence
Optional Proprietary L1 RTK: < 5 cm 2rdRMS, 95% confidence
Cold Start: 60 sec (no almanac or RTC)
Reacquisition: < 1 sec
Maximum Speed: 1607 kph (999 mph)
Maximum Altitude: 18,288 m (60,000 ft)

Communication
Ports: Bluetooth, USB 2.0, serial (optional)
Bluetooth Transmission: Class 1, 300 m typical range, up to 1 km
Bluetooth Frequency: 2.400 – 2.485 GHz
Fully Bluetooth Pre-Qualified: Bluetooth 2.1 + EDR
Supported Bluetooth Profiles: SPP and IAP
Data I/O Protocol: NMEA 0183, Binary
Data Output Datum (SBAS): ITRF08 (current year epoch)
Raw Measurement Data: Binary and RINEX
Correction I/O Protocol: RTCM SC-104, Optional Proprietary format
Status LED: Power, GPS, DGPS, DIFF, Bluetooth
Battery Gas Gauge: 5 LED Indicators

Power
Battery Type: Field replaceable Lithium-Ion pack
Battery Operating Time: 15+ hours
Charging Time: 4 hours (vehicle charger available)
Antenna Voltage Output: 5 VDC
Antenna Input Impedance: 50 Ohms

Environmental
Operating Temperature: -40°C to +85°C (-40°F to +185°F)
Storage Temperature: -40°C to +85°C (-40°F to +185°F)
Humidity: 95% non-condensing
Compliance: FCC, CE, RoHS and Lead-free

Mechanical
Enclosure Material: Xenoy
Enclosure Rating: Waterproof, IP-67
Dimensions: 12.5 x 8.4 x 4.2 cm (4.92 x 3.3 x 1.65 in.)
Weight: 372 g (0.82 lbs)
Data Connectors: Mini USB Type B Receptacle
Antenna Connector: SMA Female

Antenna
GPS Frequency Range: L1 (1575 MHz +/- 10 MHz)
Gain (without cable): 26.5 dB (+/- 2 dB), 35mA
Voltage: +4.5 to + 15 VDC
Impedance: 50 Ohms
Dimensions: 6.6 diam. x 2.7 cm (2.61 x 1.05 in.)
Weight (without cable): 114 g (0.25 lbs)
Finish: Fluid Resistant
Temperature: -55°C to +70°C (-67°F to +158°F)
Humidity: Immersion 30 cm, 30 minutes

Standard Accessories
Li-Ion Battery Pack (Field replaceable)
12VDC Power Supply
Belt/Shoulder Carrying Case
Precision Antenna with 1.5 m cable
Soft Hat for antenna
USB cable

Field Activated Options
10 Hz or 20 Hz Output rate

NOTES:
1. Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services) and ionospheric activities
2. Option required on both base and rover. Also requires communication link between base and rover
3. Transmission in free space
4. Lithium-Ion battery performance degrades below -20°C (-4°F)

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