



LAND-PAK™

All-in-One RTK Land Survey Solution

gps products

NavCom's LAND-PAK is a complete NavCom-qualified end-user system designed for land survey applications. The LAND-PAK pairs NavCom products with complementary technologies and solutions, providing land surveyors a complete turn-key system that does everything from field data collection to office processing.

APPLICATIONS

The LAND-PAK is a highly integrated solution designed for productivity with minimal setup time and maximum portability. Covering the entire land survey process, it contains a complete base station and rover setup for field data collection. Optional software for data analysis and processing is also available.

The LAND-PAK delivers precise results by combining NavCom's leading edge dual frequency receiver with radio modems, a rugged data collector and processing software. The rover and base configurations can be powered from portable, rechargeable batteries, which allow for a full day's operation. The rugged controller and fully featured survey software allow you to easily perform everything from stake-out to boundary surveys.

The LAND-PAK supports high precision survey applications providing RTK centimeter-level accuracy for immediate results in the field - great for any application from cadastral to as-built surveys.

FEATURES & BENEFITS

The LAND-PAK system takes the guesswork out of integrating solutions from different vendors. Land-PAK is a robust, easy to use end-user solution integrated, tested and approved by NavCom.

A Solution That Works

The LAND-PAK's controller solution provides cutting edge hardware with the most popular and easy to use software on the market. Powerful radio modems give the LAND-PAK a wider coverage area, allowing longer distances between the stations.

RTK Positioning

The RTK algorithm developed by NavCom provides fast, reliable initialization. The NavCom binary RTK data format ensures robust data throughput. LandPAK's SF-2040 GPS receiver can also utilize RTCM, CMR and CMR+ data streams from other base stations to allow for flexibility integration with pre-existing GPS survey systems.

Proven GPS Performance

Our NCT-2100D Engine utilizing a fourth generation Touchstone™ GPS ASIC powers the Land-PAK SF-2040 GPS receiver. This same technology powers the more than 40,000 GPS receivers sold worldwide. The GPS engine incorporates our patented interference suppression and multi-path mitigation, up to 50Hz raw data rate, and geodetic quality positioning up to 25Hz.

The SF-2040 is a 24-channel dual frequency GPS sensor with two additional channels for receiving Satellite Based Augmentation System (SBAS) signals and an L-Band demodulator for reception of NavCom's StarFire Network correction service.

Utilizing NavCom's StarFire™ service Land-PAK can deliver 10 cm global accuracy without the need of a base station for applications that don't require RTK accuracy. Both the base and the rover can be configured with a StarFire license, allowing them both to be used as StarFire rovers for applications when decimeter level accuracy is sufficient. This provides even more flexibility for customers that perform a variety of survey and mapping work.

RTK Extend™

RTK Extend enables continuous RTK-level positioning accuracy during radio communication outages by utilizing NavCom's global StarFire corrections.

Traditionally, when an RTK rover loses communication with the base station, it is unable to continue to provide position updates for more than a few seconds, resulting in user down-time and reduced productivity. With RTK Extend, Land-PAK maintains centimeter level positioning even during communication outages of up to 15 minutes. RTK Extend allows more efficient and uninterrupted work, enabling focused concentration on the work rather than the tools.

A Complete Portable System

The LAND-PAK is a highly integrated solution designed for productivity with minimal setup time and maximum portability. Covering the entire land survey process, it contains a complete base and rover system for field data collection. Optional software for data analysis and processing is also available.



**Complete Land
Survey System with
RTK Extend™**

EADS
ASTRIUM



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LAND-PAK™

TECHNICAL SPECS

PRODUCT BREAKDOWN

Base Station Transit Case

- SF-2040 GPS Receiver
- Installed Software Options: RTK Software; RTK Extend
- Two Lithium-Ion Battery Packs, 10.8 VDC, 4.4 Ah
- Serial Cable, 6 Ft Coiled
- Tribrach, w/ Optical Plummet, black
- Adaptor, Tribrach, Fixed
- Base Transit Case
- 3ASd EPIC Radio Modem, 10W o/p Power
- Bag for 3ASd EPIC Radio Modem
- 12V 8Ah Bag Battery for 3ASd EPIC Radio Modem
- Antenna, Gainflex 435-470 MHz, TNC
- RG58/U Radio Antenna Cable, 12 ft
- NavCom Base Cable, 3m
- Tape Measure & Pocket Rod Combo, 12ft

Base Bag Parts

- Tripod Bag
- Tripod, Dual Lock, Fiberglass, Waterproof, 72 in Legs
- Bracket, Radio Antenna To Tripod
- Snap-Lock Radio Antenna Pole, 6ft
- Pole Extension, 6 inch: 1 inch diameter
- Antenna Adaptor

Rover Transit Case

- SF-2040 GPS Receiver
- Included and Installed Software Options:
RTK Software
RTK Extend
- Two Lithium-Ion Battery Packs, 10.8 VDC, 4.4 Ah
- Serial Cable, 6 Ft Coiled
- TruBlu™ Module
- Carlson Explorer 600+, Carlson SurvCE w/GPS installed
- Rover Transit Case
- Extra Orange Styli (Set of 3) for Carlson Explorer 600+
- Screen Protectors for Carlson Explorer 600+, Set of 5
- Vehicle Charger for Carlson Explorer 600+
- 3ASd Radio Modem, 1W o/p Power
- Bag for 3ASd Radio Modem
- 9.6V 2Ah NiMH Battery for 3ASd Radio Modem, w/ Switch
- Battery Cradle
- Antenna, Gainflex 435-470 MHz, TNC
- NavCom Cable, DB-9

Rover Bag Parts List

- Rover Bag
- Pole, Carbon Fiber and Aluminum, 8.5'
- Bipod, Carbon Fiber, Open Clamp
- Cradle for Carlson Explorer 600+



SF-2040G SPECIFICATIONS

PHYSICAL/ENVIRONMENTAL

- Size:10.4"W x 5.5"H (264mm x 140mm)
- Weight:5.5lb (2.5kg)
- External Power:
Input Voltage:10 VDC to 30 VDC
Consumption:< 8 W
- Connectors:
I/O:2 x 7 pin Lemo
DC Power:4 pin Lemo
- Temperature (ambient):
Operating:-20° to +50°C (-4° to +122°F)
Storage:-20° to +70°C (-4° to +158°F)
- Humidity:95% non-condensing
- Tested in accordance with MIL-STD-810F for: low pressure, solar radiation, rain, humidity, salt fog, sand & dust, and vibration

PERFORMANCE ¹

- Measurement Precision (RMS):
Raw C/A code:20 cm @ 42 dB-Hz
Raw carrier phase noise:L1: 0.95 mm @ 42 dB-Hz
.....L2: 0.85 mm @ 42 dB-Hz
- Velocity:0.01 m/s
- Real-time StarFire Accuracy (RMS):
Position (H):<10 cm
Position (V):<15cm
- Enhanced SBAS (WAAS/EGNOS) Positioning Accuracy (RMS):
Horizontal:0.5m
Vertical:0.7m
- RTK Positioning <10kms (Software option)(RMS):
Horizontal:1 cm + 1ppm
Vertical:2 cm + 1ppm
- RTK Extend (Software option) (RMS):
Horizontal:2 cm + 1ppm
Vertical:4 cm + 1ppm
- Code Differential GPS Positioning <200kms (RMS):
Horizontal:12 cm + 2ppm
Vertical:25 cm + 2ppm
- User programmable output rates:
Position Velocity Time:5 Hz (10Hz, 25Hz Optional)
Raw measurement data: ..5 Hz (10Hz, 25Hz, 50Hz Optional)
- Data Latency:
Position Velocity Time:< 20 ms at all rates
Raw measurement data:< 20 ms at all rates
- Time-to-first-fix:
Cold Start, Satellite Acquisition:< 60 seconds (typical)
Satellite Reacquisition:< 1 second
- Dynamics: (Speed & Altitude restricted by export laws)
Acceleration:up to 6g
Speed:< 1,000 knots (515 m/s)
Altitude:< 60,000 ft (18.3km)

¹ Performance dependent on location, satellite geometry, atmospheric conditions and GPS corrections.

LAND-PAK™

TECHNICAL SPECS

SF-2040G COMMUNICATIONS

- Messages:
 - Data/Control:NCT Binary Messages
 - NMEA:ALM, GGA, GLL, GSA, GST, GSV, RMC, VTG, ZDA
- Corrections:RTCM Code (Msg. 1, 3 & 9)
 - SBAS (WAAS/EGNOS)
 - StarFire™
- RTK Corrections:NCT Proprietary (Optional)
 - RTCM (Msg. 18/19 or 20/21)
 - CMR (Msg. 0, 1, 2)
 - CMR+

CARLSON EXPLORER 600+ SPECIFICATIONS:

- Power:
 - Nickel Metal Hydride rechargeable batteries:(2500 mAh, 7.2V)
 - AA Alkaline batteries:6
 - Recharge/Line Power:11 to 18 VDC, 1.5A
 - 8 hours minimum operating time
- Display:
 - QVGA-TFT color sunlight readable display, with white LED Backlight
 - Resolution:320 x 240 pixels color
 - Touch Screen
- Environmental:
 - Operating temperature:-20 to +50°C (-4 to 122°F)
 - Storage temperature:-20 to +70°C (-4 to 158°F)
 - Charging Temperature:-20 to +40°C (-4 to 104°F)
 - Humidity:5% - 95% Non-condensing
 - IP65 ingress protection
- CPU:
 - Type:Intel PXA270 processor with Xscale technology
 - Speed:624 MHz
 - Operating System:Windows CE .NET 4.2 or 5.0 professional
- Memory and Mass Storage:
 - SDRAM:128MB
 - Internal Compact Flash:512MB
 - Compact flash card slot
- Connectivity:
 - WirelessBluetooth®
 - USB Client (mini USB A/B Connector)
 - RS-232 Serial Port
- User Input:Touch screen, Full function alpha numeric elastomeric keyboard
- Indicators:5 programmable LED Indicators including Charge/Low Battery Indicator
- Physical:
 - Size:4.75"W x 9.84"H x 1.83"D (120.7mm x 250mm x 46.5mm)
 - Weight with NiMH Batteries:1.81lb (0.82kg)

SATELLINE-3AS(d) EPIC SPECIFICATIONS ²

- Transceiver:
 - Frequency range:400 to 470 MHz ³
 - Channel spacing:12.5 / 25 kHz
 - Communication mode:Half-duplex
- Transmitter:
 - Carrier power:1 W to 10 W / 50 ohm
- Receiver:
 - Sensitivity:-116 to -110 dBm (BER < 10 E-3)

Adjacent channel selectivity:> 60 dB /> 70 dB
 Diversity scheme:Space diversity, selection combining

- Data Modem:
 - Interface:RS-232 or RS-422. RS-485
 - Interface connector:D 15, female
 - Data speed of RS interface:300 - 38400 bps
 - Data speed of radio interface: 9600 bps (12,5 kHz channel)
 - Data formats:Asynchronous data
- General:
 - Operating voltage:+11.8 to + 30 Vdc
 - Power consumption:3 VA typical (receive)
 - 25 VA typical (transmit)
 - 0.05 VA typical (when DTR is "0")
 - Temperature range:-25 to +55°C (-13 to 131°F)
 - Antenna connector:TNC, 50 ohm, female
 - Construction:Aluminum enclosure
 - Size:4.84"W x 5.94"H x 1.22"D (123mm x 151mm x 31mm)
 - Weight:1.21lb (0.55kg)

² Compliance with broadcast requirements and licensing are the responsibility of the user.

³ User to specify 20 MHz band within frequency range.

SATELLINE-3AS(d) SPECIFICATIONS ⁴

- Transceiver:
 - Frequency range:380 to 470 MHz ⁵
 - Channel spacing:12.5 / 25 kHz
 - Communication mode:Half-duplex
- Transmitter:
 - Carrier power:10 mW to 1 W / 50 ohm
- Receiver:
 - Sensitivity:-116 to -110 dBm (BER < 10 E-3)
- Adjacent channel selectivity:> 60 dB /> 70 dB
- Data Modem:
 - Interface:RS-232 or RS-422. RS-485
 - Interface connector:D 15, female
 - Data speed of RS interface:300 - 38400 bps
 - Data speed of radio interface: 9600 bps (12,5 kHz channel)
 - Data formats:Asynchronous data
- General:
 - Operating voltage:+9 to + 30 Vdc
 - Power consumption:1.8 VA typical (receive)
 - 6.0 VA typical (transmit)
 - 0.05 VA typical (when DTR is "0")
 - Temperature range:-25 to +55°C (-13 to 151°F)
 - Antenna connector:TNC, 50 ohm, female
 - Construction:Aluminum enclosure
 - Size:2.64"W x 5.39"H x 1.14"D (67mm x 137mm x 29mm)
 - Weight:0.55lb (0.25kg)

⁴ Compliance with broadcast requirements and licensing are the responsibility of the user.

⁵ User to specify 20 MHz band within frequency range.