

# Carlson Machine Control Pro Base Station



*Multi-frequency, multi-constellation GNSS positioning together with GNSS, L-Band positioning and wireless communications within a rugged IP67 housing.*

## KEY FEATURES

- 544 channels for tracking all known and planned signals from GPS, GLONASS, Galileo, BeiDou, IRNSS, QZSS and SBAS on both antennas
- Precise and solid heading
- Centimetre-level (RTK) and sub decimetre-level (PPP) position accuracy
- Dual L-band channel with support for SECORX corrections
- GNSS+ algorithms for reliable performance
- Integrated cellular modem, Bluetooth and WiFi optional UHF radio

## Consistently accurate now and into the future

The Carlson Machine Control Pro Base Station is powered by the receiver from Carlson. Its engine can track all current and planned Global Navigation Satellite System (GNSS) constellations: GPS, GLONASS, Galileo, BeiDou, IRNSS and QZSS.

## Centimetre scalable accuracy

Carlson's knowledge and experience in the GNSS industry ensures that the Pro Base Station offers you the highest possible accuracy. LOCK+ technology maintains tracking during heavy vibration and IONO+ ensures position accuracy even under periods of elevated ionospheric activity. The Pro Base Station offers the very latest in special interference mitigation technology which filters out ambient intentional and unintentional RF interference.

## Any device, any platform

Use any device with a web browser to operate the Pro Base Station without any special configuration software via the Web UI accessible over WiFi network or USB connection.



Learn more: [www.carlsonmachinecontrol.com](http://www.carlsonmachinecontrol.com)  
or contact at: [info@carlsonmachinecontrol.com](mailto:info@carlsonmachinecontrol.com)

**B R E A K   N E W   G R O U N D**

## FEATURES

### GNSS Technology

544 Hardware channels for simultaneous tracking of all visible satellite signals

**Supported signals:** GPS: L1, L2, L5  
 GLONASS: L1, L2, L3  
 Galileo: E1, E5ab, AltBoc, E61  
 BeiDou: B1, B2, B31  
 SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)  
 IRNSS: L51  
 QZSS: L1, L2, L5, L6

#### Carlson's GNSS+ technologies:

- **AIM+** interference mitigation unit against narrow system against narrow and wideband interference with spectrum analyser
- **IONO+** advanced scintillation mitigation
- **APME+** a posteriori multipath estimator for code and phase multipath mitigation.
- **RAIM** (Receiver Autonomous Integrity Monitoring) RTK (base and rover)<sup>1</sup>

Integrated dual-channel L-band receiver  
 Support for PPP (SeCoRx-60)<sup>1,2</sup>  
 Moving base<sup>1,3</sup>  
 GNSS attitude<sup>1</sup>  
 8 GB internal memory

### Formats

RTCM v2x and 3x (MSM included)  
 CMR 2.0 and CMR+ (CMR+ input only)  
 NMEA 0183, v2.3, v3.01, v4.0 (output only)  
 UHF1: Satel, Trimtalk (450S\_P, 450S\_T) Pacific Crest (GMSK, 4FSK, FST)

### Connectivity

3 Hi-speed serial ports (RS232)  
 Ethernet port (TCP/IP and UDP)  
 Full-speed USB  
 2 Event markers  
 xPPS output (max. 100 Hz)  
 Integrated Bluetooth (2.1 + EDR/4.0)  
 Integrated Quadband Cellular Modem (EDGE, 2G, 3G, 3.5G)  
 Integrated WiFi (802.11 b/g/n)  
 Integrated UHF (406-470 MHz)<sup>1</sup>

## PERFORMANCE

### Position Accuracy<sup>4,5</sup>

	Horizontal	Vertical
<b>Standalone</b>	1.2 m	1.9 m
<b>SBAS</b>	0.6 m	0.8 m
<b>DGNSS</b>	0.4 m	0.7 m
<b>SECORX-D<sup>6</sup> (PPP)</b>	4 cm	9 cm
<b>SECORX-C<sup>6</sup> (PPP)</b>	4 cm	6 cm
<b>SECORX-60<sup>2,6</sup> (PPP)</b>	4 cm	6 cm

### RTK Performance<sup>4,5,7,8</sup>

**Horizontal accuracy** 0.6 cm + 0.5 ppm

- 1 Optional feature
- 2 Service subscription required
- 3 Maximum output rate is 20 Hz
- 4 Open sky conditions
- 5 RMS levels

- 6 After convergence
- 7 RTK fixed ambiguities
- 8 Baseline < 40 Km
- 9 99.9%
- 10 Incl. software compensation of sawtooth effect

**Vertical accuracy** 1 cm + 1 ppm  
**Initialisation** 7 s

### GNSS attitude accuracy<sup>4,5</sup>

**Antenna separation** Pitch/Roll  
**1 m** 0.25°  
**5 m** 0.05°

### Velocity accuracy<sup>4,5</sup>

0.03 m/s

### Maximum Update Rate

**Position** 50 Hz  
**Position and attitude** 20 Hz  
**Measurements** 100 Hz

### Latecy<sup>9</sup>

<20 ms

### Time accuracy

**xPPS Out<sup>10</sup>** 10 ns  
**Event accuracy** < 20 ns

### Time to first fix

**Cold Start<sup>11</sup>** < 45 s  
**Warm Start<sup>12</sup>** < 20 s  
**Re-acquisition avg.** 1 s

### Tracking performance (C/N0 threshold)<sup>13</sup>

**Tracking** 20 dB-Hz  
**Acquisition** 33 dB-Hz

## PHYSICAL AND ENVIRONMENTAL

**Size** 174 x 166 x 53 mm / 6.85 x 6.54 x 2.09 in  
**Weight** 1.5 kg / 3.30 lb  
**Input Voltage** 9-36 VDC  
**Power Consumption** 7 W typical  
**Operating temperature** -30° C to +65° C / -22° F to 149° F  
**Storage temperature** -40° C to +75° C / -40° F to 167° F  
**Humidity** MIL-STD810G, Method 507.5, Procedure I  
**Dust** MIL-STD-810G, Method 510.5, Procedure I  
**Shock** MIL-STD-810G, Method 516.6, Procedure I/II  
**Vibration** MIL-STD-810G, Method 514.6, Procedure I

### Connectors

**Antennas** TNC female  
**Power** LEMO 4 pins female  
**USB/ETH** LEMO 16 pins female  
**PPS OUT** LEMO 5 pins female  
**Serial 2** LEMO 9 pins female  
**Serial 1 & 3 USB Host** LEMO 14 pins female  
**Events/GPIO** LEMO 7 pins female

### Antenna LNA Power Output

**Output voltage** 5 VDC  
**Maximum current** 200 mA

### Certification

IP67, RoHS, WEEE, CE / FCC Class B Part 15 / IEC 60945

- 11 No information available (no almanac, no approximate position)
- 12 Ephemeris and approximate position known
- 13 Max. speed 600 m/s