

# DGPS MAX

- **DGPS MAX** includes everything you need: GPS, WAAS, OmniSTAR, beacon, RTK, and more
- **DGPS MAX** delivers sub-meter 95% horizontal accuracy to meet demanding positioning requirements
- **DGPS MAX** supports position update rates up to 5 Hz for high performance applications
- **New** Real-Time Kinematic positioning achieves superior accuracy to standard C/A code processing
- **New** raw measurement data output provides all information required for post-processing
- **New** COAST™ technology allows DGPS MAX to operate using correction data up to thirty minutes old
- **New** Setup Wizard configures DGPS MAX in as few as three steps
- **New** user-defined profiles save receiver configurations for later use



## ▶ Too much technology?

There's no such thing. DGPS MAX ensures that you have the features you need when you need them. Everything comes standard.

DGPS MAX delivers accurate differential GPS positioning using corrections from WAAS, OmniSTAR, DGPS beacon stations, or directly from an external RTCM SC-104 source. For high-accuracy applications, use the built-in Real-Time Kinematic engine or output raw measurement data for post-processing. Reconfigure the receiver smoothly and efficiently or load previously saved configurations at any stage of operation using the new Setup Wizard.

## ▶ WAAS?

The American Federal Aviation Administration is currently testing its Wide Area Augmentation System (WAAS) in preparation for Initial Operational Capability. WAAS-compatible Space-Based Augmentation Systems are also under development throughout the world, including the European Geostationary Navigation Overlay System (EGNOS) and the Japanese MTSAT Satellite-based Augmentation System (MSAS). DGPS MAX is compatible with each of these **free** correction services.

## ▶ OmniSTAR?

DGPS MAX is also capable of applying high-quality correction data from the OmniSTAR Worldwide DGPS Service. Drawing on information from its global network of reference stations, OmniSTAR uses Virtual Base Station algorithms to ensure that positioning accuracy is independent of distance from a base station. OmniSTAR offers competitive service rates to their subscription-based service.

## ▶ Beacon?

Navigation authorities around the world have installed DGPS radiobeacon networks that broadcast **free** GPS correction information. DGPS MAX applies these differential corrections to deliver accurate, reliable positioning.

## ▶ RTK?

CSI Wireless is proud to introduce our new Real-Time Kinematic positioning engine with the DGPS MAX. This robust L1 RTK solution achieves more consistent, accurate positioning than receivers processing only C/A-code position information. After a short initialization, DGPS MAX can deliver 5-cm horizontal accuracy (95% confidence) in real-time.

## ▶ What is COAST™?

Using our new COAST™ technology, DGPS MAX can apply correction data up to ten minutes old without seriously affecting positioning accuracy. COAST™ ensures that DGPS MAX is less vulnerable to differential signal outages due to blockages, transmission difficulties, or interference. No other product offers this flexibility. None.

## ▶ What's the warranty?

CSI Wireless is committed to our customers and products, and offers a limited one-year warranty on parts and labor.

Contact CSI Wireless today to discover how DGPS MAX will meet your positioning needs.



## GPS Sensor Specifications

|                          |   |
|--------------------------|---|
| Receiver Type:           | L1, C/A code, with carrier phase smoothing                                |
| Channels:                | 12-channel, parallel tracking (10-channel when tracking WAAS)             |
| WAAS Tracking:           | 2-channel, parallel tracking  |
| Update Rate:             | 1 Hz default, 5 Hz max  |
| Horizontal Accuracy:     | 1 m 95% confidence (DGPS*)<br>5 m 95% confidence**<br>(autonomous, no SA) |
| Cold Start:              | 1 min typical   |
| Antenna Input Impedance: | 50 Ω  |

## L-band Sensor Specifications

|                             |  |
|-----------------------------|--|
| Frequency Range:            | 1525 to 1559 MHz                               |
| Sensitivity:                | -120 dBm for <math>10^{-3}</math> BER          |
| Tuning Mode:                | Manual or automatic                            |
| Adjacent Channel Rejection: | 50 kHz spacing >25 dB,<br>1 MHz spacing >60 dB |

## Beacon Sensor Specifications

|                             |                                   |
|-----------------------------|-----------------------------------|
| Channels:                   | 2-channel, parallel tracking      |
| Frequency Range:            | 283.5 to 325 kHz                  |
| Channel Spacing:            | 500 Hz                            |
| MSK Bit Rates:              | 50, 100, and 200 bps              |
| Operating Modes:            | Manual, automatic, semi-automatic |
| Cold Start Time:            | < 1 minute typical                |
| Reacquisition Time:         | < 2 seconds typical               |
| Demodulation:               | Minimum shift keying (MSK)        |
| Sensitivity:                | 1.5 μV/m for 6 dB SNR @ 200 bps   |
| Dynamic Range:              | 100 dB                            |
| Frequency Offset:           | ± 10 Hz (~ 30 ppm)                |
| Adjacent Channel Rejection: | 65 dB ± 1 dB @ $f_0$ ± 400 Hz     |

## Communications

|                                     |   |
|-------------------------------------|---|
| Serial ports:                       | 1 full duplex, 1 RTCM input                                     |
| Interface Level:                    | RS-232C   |
| Baud Rates:                         | 4800, 9600, 19200   |
| CAN Bus:                            | CAN 2.0B  |
| Correction Input / Output Protocol: | RTCM SC-104   |
| Data Input / Output Protocol:       | NMEA 0183   |
| Raw Measurement Data:               | Proprietary binary (RINEX utility available)                    |
| Timing Output:                      | 1 PPS (HCMOS, active high, rising edge sync, 10 kΩ, 10 pF load) |
| Event Marker Input:                 | HCMOS, active low, falling edge sync, 10 kΩ, 10 pF load         |

## Environmental

|                        |   |
|------------------------|---|
| Operating Temperature: | -32°C to +74°C                              |
| Storage Temperature:   | -40°C to +85°C                              |
| Humidity:              | 95% non-condensing                          |
| EMC:                   | FCC Part 15, Subpart B, Class B<br>CISPR 22 |

## Power

|                                   |                  |
|-----------------------------------|------------------|
| Input Voltage Range:              | 9.2 to 48VDC     |
| Reverse Polarity Protection:      | Yes              |
| Power Consumption:                | < 6.5 W          |
| Current Consumption:              | < 550 mA @ 12VDC |
| Load Dump Protection:             | Up to 86VDC      |
| Antenna Voltage Output:           | 5VDC             |
| Antenna Short Circuit Protection: | Yes              |

## Mechanical

|                    |   |
|--------------------|---|
| Enclosure:         | Powder-coated aluminum                                      |
| Dimensions:        | 203 mm L x 125 mm W x 51 mm H<br>(8.0" L x 4.9" W x 2.0" H) |
| Weight:            | 0.80 kg (1.76 lb)   |
| Display:           | 2-line x 16-character LCD                                   |
| Keypad:            | 3-button  |
| Power Switch:      | Push-button   |
| Power Connector:   | 2-pin miniature   |
| Data Connector:    | DB9-socket  |
| Antenna Connector: | TNC-socket  |

## Pin-out

|                 |                       |
|-----------------|-----------------------|
| Main Port       |                       |
| Pin 2           | T Transmit data (TXD) |
| Pin 3           | Receive data (RXD)    |
| Pin 5           | Signal ground         |
| RTCM Input Port |                       |
| Pin 2           | T Transmit data (TXD) |
| Pin 3           | Receive data (RXD)    |
| Pin 5           | Signal ground         |
| Pin 6           | E Event marker input  |
| Pin 9           | 1 PPS                 |

## CDA-2 Antenna

|                     |                        |
|---------------------|------------------------|
| GPS Freq. Range:    | L1 (1575 MHz ± 10 MHz) |
| GPS LNA Gain:       | 28 dB                  |
| L-band Freq. Range: | 1525 to 1560 MHz       |
| L-band LNA Gain:    | 28 dB                  |
| Beacon Freq. Range: | 283.5 to 325 kHz       |
| Beacon LNA Gain:    | 34 dB                  |

|                    |  |
|--------------------|--|
| Dimensions:        | 129 mm dia x 98 mm H<br>(5.08" dia 3.85" H)        |
| Weight:            | 0.456 kg (1.0 lb)                                  |
| Antenna Connector: | TNC-socket   |
| Enclosure:         | Powder-coated aluminum base,<br>polycarbonate dome |
| Mounting Thread:   | 1-14-UNS-2B  |
| Input Voltage:     | 4.85 to 15.0VDC                                    |
| Input Current:     | 50 to 60 mA  |
| Operating Temp.:   | -40°C to +85°C                                     |
| Storage Temp.:     | -40°C to +85°C                                     |
| Relative Humidity: | 100% condensing                                    |

\* SVs > 5, HDOP < 2, RTCM SC-104 correction data from a dual frequency reference station, short baseline, and low multipath environment.

\*\* Dependent upon ionospheric activity and multipath

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