MarinePak7

Marine-certified enclosure delivers scalable positioning solutions

OEM7 GNSS technology

Based on proven OEM7 technology by Hexagon | NovAtel, the MarinePak7 can receive GPS, GLONASS, BeiDou, Galileo and QZSS signals. Multiple GNSS signals deliver better satellite availability and reduce the impact of satellite masking or blockage which can affect positioning. It also receives L-Band signals on multiple channels providing access to the world-wide corrections provided by Oceanix.

Simple to configure and operate

The color display and intuitive navigation menu makes setup, configuration and system status monitoring simple. The display also helps troubleshoot issues with the MarinePak7 allowing faults to be quickly diagnosed and resolved. Users can also connect to the receiver using the on-board Wi-Fi and use the Web UI to configure and monitor the system.

GNSS+INS integration

SPAN GNSS+INS technology combines GNSS positioning with inertial navigation system (INS) measurements including velocity, attitude and heave. In a solution optimized for hydrographic survey applications, the 3D positioning provides accurate measurements even through extended GNSS outages.

Scalable solution

As your requirements change, the MarinePak7 provides a scalable solution to enable additional features when you need them. ALIGN technology by NovAtel is optionally supported when combined with a second antenna to provide a GNSS heading solution. The removable battery option allows users to work anywhere without a direct power supply connection or it can be used to bridge power outages. The UHF model can be used as a data link to receive RTK corrections which can also be received via the GSM/GPRS modem. For more demanding applications, data logged on the receiver can be downloaded for post-processing using NovAtel's GrafNav software.

Maximum accuracy

The MarinePak7 can provide a range of performance accuracies from single-frequency DGPS using MSK Beacon for safe navigation of vessels to full centimeter-level RTK for marine construction activities. Oceanix Nearshore correction service provides centimeter-level accuracy using globally transmitted corrections.

Designed for marine operations

This receiver is designed specifically for marine professionals requiring safe navigation for vessels or high-accuracy positioning. Markets include nearshore hydrographic survey, dredging, marine construction and vessels working in the renewables industry.

Benefits

- Complete positioning solution providing flexibility and scalability to maximize your investment
- Supports centimeter-level Oceanix PPP and RTK position accuracy
- Supports NovAtel SPAN GNSS+INS functionality
- For use in hydrographic survey, dredging, renewables, research and navigation applications

Features

- All-constellation, multi-frequency GNSS plus Oceanix Nearshore correction service
- Simultaneously track up to 3 Oceanix correction service satellites
- Optional GNSS heading using ALIGN
- Integrated MSK Beacon receives corrections from the marine radio beacon network
- Receive RTK corrections via integrated GSM/GPRS modem or UHF module Model dependant
- Multiple communication options for easy interfacing to marine equipment
- Easy-to-use, intuitive, color display and Web UI for simple configuration and monitoring
- Built in Wi-Fi support
- Removable internal battery allows the receiver to be used anywhere

GNSS Module[1]

Channel Configuration
555 Channels

Signal Tracking
Primary RF[2]

GPS	L1 C/A, L1C, L2C, L2P, L5
GLONASS[3]	L1 C/A, L2 C/A, L2P, L3, L5
Galileo	E1, E5 AltBOC, E5a, E5b
BeiDou[4]	B1I, B1C, B2I, B2a
QZSS	L1 C/A, L1C, L2C, L5
NavIC (IRNSS)	L5
SBAS	L1, L5
L-Band	up to 5 channels

Secondary RF[2]

GPS	L1 C/A, L1C, L2C, L2P, L5
GLONASS[3]	L1 C/A, L2 C/A, L2P L3, L5
Galileo	E1, E5 AltBOC, E5a, E5b
BeiDou[4]	B1I, B1C, B2I, B2a
QZSS	L1 C/A, L1C, L2C, L5
NavIC (IRNSS)	L5

Horizontal Position Accuracy (RMS)

Single point L1	1.5 m
Single point L1/L2	1.2 m
SBAS[5]	60 cm
DGPS	40 cm
Oceanix[6]	3 cm (95%)
RTK	1 cm + 1 ppm
Initialization time	<10 s
Initialization reliability	>99.9%

ALIGN GNSS Heading Accuracy

Baseline	Accuracy (RMS)
2m	0.08 degrees
4m	0.05 degree

Maximum Data Rate

Measurements	up to 20 Hz
Position	up to 20 Hz

Time to First Fix

Cold start[7]	<40 s
Hot start[8]	<19 s

Signal Reacquisition

L1	<0.5 s (typical)
L2	<1.0 s (typical)

Time Accuracy[9] 20 ns RMS

Velocity Accuracy 0.03 m/s RMS

Velocity Limit[10] 515 m/s

SPAN Technology

GNSS+INS integration with marine profile

Supported IMUs

- IMU-ISA-100C
- IMU-uIMU-IC

Attitude & Velocity Performance
Refer to IMU product sheets for values

Heave Performance[11]

Instantaneous Heave	5 cm or 5%
Delayed Heave	3.5 cm or 3.5%
Post-Processed Heave	2.5 cm or 2.5%[12]

MSK Beacon Module

2-channel parallel tracking

Frequency range
283.5 to 325.0 kHz

Channel spacing 500 Hz

Demodulation
Minimum Shift Keying (MSK)

GSM/GPRS Module

Frequency band Quad Band (850/900/1800/1900 MHz)

Data GPRS Class 12 (max 85.6 kbps uplink & downlink)

Sensitivity

GSM850	-109dBm
GSM900	-109dBm
DCS1800	-109dBm
PCS1900	-109dBm

UHF Module (model dependant[13])

Dual band multi-mode UHF transceiver

Radio options

400 MHz
Frequency band: 410 to 475 MHz

900 MHz
Frequency Band: 902 to 928 MHz

Modulation 4-GFSK, GMSK

Communication Ports

3 RS-232/RS-422 selectable up to 460,800 bps
1 USB 2.0 (host) HS
1 Ethernet 10/100 Mbps
1 Wi-Fi
1 Event inputs
1 Event outputs
1 Pulse Per Second output

Physical and Electrical

Dimensions

Without shroud	198 x 199.5 x 80 mm
With shroud	198 x 254 x 80 mm

Weight 3 kg

Power

Input voltage	+12 to +24 VDC
Power consumption[14]	12 W

Battery (option)
Removable Smart Li-ION

Capacity:	6.8 Ah @ 7.2 V
Typical Duration:	4 hours

2 Antenna LNA Power Outputs

Output voltage	5 VDC ±5%
Maximum current	200 mA

Connectors

2 GNSS antenna	TNC
GSM/GPRS	SMA
UHF	TNC
Wi-Fi	SMA
USB host	Type A
Serial	DB9
Ethernet	RJ45
PPS	SMA
Expansion	12 pin Lemo
Power	4 pin Lemo

Color Display
Sunlight readable TFT
320 x 240 pixels
24-bit True Color

Environmental

Temperature

Operating	-15°C to +55°C
Storage	-25°C to +70°C

Humidity 95% non-condensing

Waterproof IEC 60529 IPX7

Dust IEC 60529 IP6X

Vibration (operating) IEC 60945

Compliance

FCC, CE, IEC 60945 (Exposed), AS/NSZ

Features

- NovAtel OEM7 positioning engine
- Standard 16 GB internal storage
- Built-in Wi-Fi support
- Web GUI

Firmware Solutions

- ALIGN
- SPAN
- RTK
- RTK ASSIST™
- Oceanix PPP

Included Accessories

- 3 DB9 to DB9 serial data cable
- 1 RJ45 Ethernet cable
- 1 Power Supply
- 1 UK power supply cable
- 1 EU power supply cable
- 1 US power supply cable

Optional Accessories

- Li-ion battery
- PPS cable (SMA to BNC)
- High Density serial port expansion cable
- External DC power cable
- V560 Marine GNSS-LBand-MSK antenna
- GrafNav/GrafNet
- Inertial Explorer

1. Typical values. Performance specifications subject to GNSS system characteristics, Signal-in-Space (SIS) operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources. 2. Model-configurable to track L5/E5a (all / Galileo) through L2 (GPS) or L3/E5b/B2 (GLONASS / Galileo / BeiDou) through L2 (GLONASS). See manual for details. 3. Hardware ready for L3 and L5. 4. Designed for BeiDou Phase 2 and 3, B1 and, B2 compatibility. 5. GPS only. 6. Requires a subscription to Oceanix data service. Subscriptions available from NovAtel. 7. Typical value. No almanac or ephemerides and no approximate position or time. 8. Typical value. Almanac and recent ephemerides saved and approximate position and time entered. 9. Time accuracy does not include biases due to RF or antenna delay. 10. Export licensing restricts operation to a maximum of 515 meters per second, message output impacted above 500 m/s. 11. Requires SPAN Marine Profile. 12. Post-processing results using Waypoint Inertial Explorer. 13. Available on MP7720U model. 14. Typical value. Consult the MarinePak7 User Documentation for power supply considerations.

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