

SMART7

Multi-frequency GNSS SMART antenna featuring powerful OEM7 technology



Maximum performance

The OEM7 receiver and VEXXIS antenna inside the SMART7 allow it to receive GPS, GLONASS, BeiDou, Galileo and QZSS signals. Multiple GNSS signals deliver better satellite availability under variable terrain and environmental conditions. The SMART7 also receives L-Band signals providing easy access to the world-wide correction signals provided by TerraStar.

ALIGN

ALIGN technology from Hexagon | NovAtel is optionally supported when combined with a second SMART7 or NovAtel receiver to provide relative heading and position that can be used to guide accessory vehicles. Wi-Fi can also be used to provide a wireless ALIGN solution to simplify communications in implement guiding applications.

Terrain compensation for increased accuracy

With optional integrated terrain compensation, the SMART7 improves guidance and autosteer performance on uneven terrain and slopes by providing positions automatically corrected for vehicle pitch and roll.

Maximum accuracy

The SMART7 can provide a range of performance accuracies from dual-frequency GLIDE to full centimetre-level RTK. TerraStar services provide decimetre or centimetre-level accuracy using globally transmitted satellite corrections.

Maximum connectivity

The SMART7 supports RS-232 and CAN bus communications. Optional 2.4 GHz Wi-Fi and 10/100 Ethernet connectivity allows connection to a vehicle's Wi-Fi network, routers, terminals or other SMART7 antennas. Wi-Fi and Ethernet connectivity can also be used to receive RTK or TerraStar corrections over NTRIP.

Durable, field-ready design

This rugged SMART7 antenna is enclosed in a durable, waterproof housing that meets MIL-STD-810G environmental standards for many years of reliable use in the field. Magnetic and screw mounting is supported.

Benefits

- Centimetre-level accuracy using TerraStar-C PRO, TerraStar-X and RTK
- 15 cm pass-to-pass accuracy using TerraStar-L
- High quality measurements and stable phase centre for precision applications
- Terrain compensation corrects for vehicle roll and pitch to improve performance on uneven ground
- Simplified setup and configuration with optional onboard Setup & Monitor (Web) and wireless connectivity

Features

- GPS, GLONASS, BeiDou, Galileo, QZSS plus TerraStar correction signal reception
- Simultaneously track up to 3 TerraStar Correction Service satellites
- Optional heading and relative positioning using ALIGN
- Integrated NTRIP client using optional Ethernet/Wi-Fi interface
- Advanced ISOBUS-compatible CAN interface supports NMEA2000, NovAtel messages and firmware updates
- Precision Time Protocol (PTP) support using optional Ethernet interface

Performance¹

Signal tracking

GPS	L1 C/A, L1C, L2C, L2P, L5
GLONASS ²	L1 C/A, L2 C/A, L2P, L3, L5
Galileo ³	E1, E5 AltBOC, E5a, E5b, E6
BeiDou	B1I, B1C, B2I, B2a, B2b, B3I
QZSS	L1 C/A, L1C, L1S, L2C, L5, L6
NavIC (IRNSS)	L5
SBAS	L1, L5
L-Band	up to 5 channels

Horizontal position accuracy

	(RMS)
Single point L1/L2	1.2 m
SBAS ⁴	60 cm
DGPS	40 cm
TerraStar-L ^{5,6}	40 cm
TerraStar-C PRO ^{5,6}	2.0 cm
TerraStar-X ^{5,6}	2.0 cm
RTK	1 cm + 1 ppm

(95%)

Single point L1/L2	2.4 m
SBAS ⁴	120 cm
DGPS	80 cm
TerraStar-L ^{5,6}	50 cm
TerraStar-C PRO ^{5,6}	2.5 cm
TerraStar-X ^{5,6}	2.5 cm
RTK	2.5 cm + 1 ppm

Pass-to-pass accuracy (95%)

L1/L2 GLIDE single point	35 cm
TerraStar-L	15 cm
TerraStar-C PRO	2 cm

Maximum data rate

Measurements	up to 20 Hz
Position	up to 20 Hz

Time to first fix⁷

Cold start	<34 s (typical)
Hot start	<20 s (typical)

Signal reacquisition

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

Velocity accuracy

<0.03 m/s RMS

Time accuracy⁸

<5 ns RMS

Terrain compensation accuracy⁹

Roll/Pitch	0.5 degrees RMS
------------	-----------------

Physical and electrical

Dimensions 220 L x 192 W x 66 H mm

Weight <1.1 kg

Connectors

14-pin Tyco Ampseal
Optional M12 D-Coded

Mounting

4 x M4 screw inserts
Integrated magnetic mount

Power

Input voltage range +7 to +30 VDC
Power consumption¹⁰ 4 W (typical)

Status LEDs

Multi-colored, daylight viewable

Communication ports

RS-232 dedicated ports	3
CAN Bus	1
1 PPS	1
Ground speed output	1
Wi-Fi	optional
Ethernet	optional

Environmental

Temperature

Operating -40°C to +70°C
Storage -45°C to +80°C

Humidity MIL-STD-810G(CH1) Method 507.6

Immersion MIL-STD-810G(CH1) Method 512.6

Shock MIL-STD-810G(CH1) Method 516.7

Solar radiation EN60950-22 8.2
ISO 9022-9, Method 20, Severity Degree 03

Salt fog IEC 60068-2-11

Sand and dust MIL-STD-810G(CH1)
Method 510.5

Vibration random MIL-STD-810G(CH1)
Method 514.7

Ingress protection rating IP67, IP69

Compliance

FCC, ISCED, CE, E-Mark and Global Type Approvals

Standard features

- 20 Hz data rates
- Field upgradable software
- PAC multipath mitigating technology
- Differential correction support for RTCM 2.1, 2.3, 3.0, 3.1, CMR, CMR+ and RTCA
- Navigation output support for NMEA 0183 and detailed NovAtel ASCII and binary logs
- GLIDE smoothing algorithm
- 1 PPS output
- Ground speed output

Correction services

- TerraStar-L
- TerraStar-C PRO
- TerraStar-X
- RTK ASSIST
- RTK ASSIST PRO

Available hardware options

- SMART7
- SMART7-W with Wi-Fi
- SMART7-I with Wi-Fi and Ethernet

Firmware solutions

- GLONASS tracking
- Galileo tracking
- BeiDou tracking
- L-Band tracking
- ALIGN
- RTK
- Terrain compensation
- Precision Time Protocol (PTP) with SMART7-I

Optional accessories

- Mounting plate
- Interface cable
- RELAY7

1. Typical values under ideal, open sky conditions.

2. Hardware ready for L5.

3. E1bc and E6bc support only.

4. GPS only.

5. Requires subscription to TerraStar data service.

6. RMS/95% accuracy under ideal conditions and may vary based upon user's geographic region, ionospheric activity, scintillation levels, GNSS availability and constellation health, multipath conditions and presence

of interference sources.

7. Cold start: no almanac or ephemerides and no approximate position or time.

Hot start: almanac and recent ephemerides saved and approximate position and time entered.

8. Time accuracy does not include biases due to RF or antenna delay.

9. With Terrain Compensation software model installed, requires firmware version 7.06.01 or later.

10. Power consumption values for GPS L1/L2.

Contact Hexagon | NovAtel

sales.nov.ap@hexagon.com 1-800-NOVATEL (U.S. and Canada) or 403-295-4900 | China: 0086-21-68882300 | Europe: 44-1993-848-736 | SE Asia and Australia: 61-400-883-601. For the most recent details of this product: novatel.com

This document and the information contained herein are provided AS IS and without any representation or warranty of any kind. All warranties, express or implied, are hereby disclaimed, including but not limited to any warranties of merchantability, non-infringement, and fitness for a particular purpose. Nothing herein constitutes a binding obligation. The information contained herein is subject to change without notice.

ALIGN, GLIDE, NovAtel, OEM7 RTK ASSIST, TerraStar and VEXXIS are trademarks of Hexagon AB and/or its subsidiaries and affiliates, and/or their licensors. All other trademarks are properties of their respective owners.

© Copyright 2018 – 2024 Hexagon AB and/or its subsidiaries and affiliates. All rights reserved. A list of entities within the Hexagon Autonomy & Positioning division is available at

https://hexagon.com/company/divisions/autonomy-and-positioning.

D22582 Version 6 | 28 February 2024 | Printed in Canada