B111 GNSS OEM Board

Reliable, Lightweight Dual-frequency Receiver Board

The B111 GNSS OEM board is a compact positioning engine capable of providing scalable positioning from sub-meter DGPS positioning to sub-centimeter RTK positioning.

Low-power consumption, comprehensive communication interfaces and peripheral support make the B111 extremely flexible and easy to integrate into any precise positioning application.

- 226 Universal Tracking Channels™
- Low-power consumption
- High-performance RTK engine
- Dual-frequency tracking of GPS, GLONASS, BeiDou, Galileo, SBAS and QZSS
- Update rate up to 100 Hz
- Single connector for effective data exchange
- SD card interface support

FEATURES

POSITION

DION™
Active filter reduces disturbances in positional results, leading to smoother, more consistent output in static and dynamic applications; also allows seamless transition between positioning modes

Multipath mitigation
A proprietary signal-processing algorithm mitigates multipath effect on satellite measurements

Quartz-Lock Loop™ (QLL)
Patented technology eliminates satellite tracking failures and positioning degradation caused by vibration and shock

Ion Shield™
Continuously monitor ionospheric conditions and rapidly switch to iono-free combination if ionospheric disturbances have been detected

VELOCITY

Doppler filter
Configure the filter bandwidth to optimize trade-off between noise and dynamic errors, which prevents overshooting velocity output during abrupt changes

Velocity filter
Adaptively reduces noise errors while correcting dynamic errors in raw velocity estimates

HEADING

HD2
The Topcon determination engine allows use of a pair of boards with a pair of antennas to allow a sub-degree 2D attitude determination

Azimuth filter
Kalman-based filtering to deliver smooth heading even for low-speed single antenna vehicles

A development kit is available to help you rapidly explore and evaluate features and performance of B111.

Ordering Information: PN 1021744-01
Description:
- *Evaluation board and B111 board with firmware and OAF*
- *Power supply and communication cables*

Complete documentation and design resources are available to reduce your development costs and time as well as minimize design risks and test time.
Downloads are available at mytopcon.com.

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TRACKING

Channels	226 Universal Tracking Channels™
Signals Tracked	GPS: L1, L2, L2C GLONASS: L1, L2, L2C BeiDou: B1, B2 Galileo: E1 ; SBAS L1 QZSS: L1, L2C

ACCURACY[1] (RMS)

Standalone	H: 1.2 m; V: 1.8 m
DGPS	H: 0.3 m; V: 0.5 m
SBAS	H: 0.8 m; V: 1.2 m
RTK	H: 5 mm + 0.5 ppm x baseline; V: 10 mm + 0.8 ppm x baseline
RTK Initialization	Time: < 10 seconds Reliability: > 99%
HD2	Heading (HD2 mode) 0.2°/D, where D is the inter-antenna distance in meters Inclination (HD2 mode) 0.3°/D, where D is the inter-antenna distance in meters
Velocity	0.02 m/second
Time	30 nsec

ACQUISITION TIME

Hot / Cold Start	< 15 sec / < 44 sec
Reacquisition	< 1 sec

COMMUNICATION INTERFACES

RS232	2x ports up to 460.8 kbps
LVTTL UART	2x ports up to 460.8 kbps
USB 2.0 (client)	1x port up to 480 mbps (High Speed)
CAN	1x port (without transceivers), CAN 2.0 A/B , NMEA2000 compliant

I/O

PPS	1x output with 5 ns resolution, LVTTL, configurable edge, period, offset, and reference time
EVENT	1x input with 5 ns resolution, LVTTL, configurable edge and reference time

DATA AND MEMORY

SD card support	Industrial SLC SD card, 20 Hz writing rate, up to 32GB capacity
Data Update/Output Rate	1 Hz – 100 Hz Selectable
Data Formats	TPS, RTCM SC104 2.x and 3.x, CMR/CMR+[2], BINEX
ASCII Output	NMEA 0183 versions 2.x, 3.x, and 4.x

ENVIRONMENTAL

Temperature	Operating: -40°C to 85°C; Storage: -40°C to 85°C
Vibration	4g Sine Vibe (SAEJ1211); 7.7g Random Vibe (MIL-STD 810F)
Humidity	95%, non-condensing
Shock	Operational IEC68-2-27, 11ms, 40g Survival IEC68-2-27, 11ms, 75g
Acceleration	20g

POWER

Voltage / Power Consumption	3.4 VDC to 4.5 VDC / 1.3 W typical
LNA Power	3.3 V (internal), 5.0 V (external) at 0 – 100 mA

PHYSICAL

Dimensions / Weight	40 x 55 x 10 mm / < 20 g
Main Connector	60-pin Hirose
Antenna Inputs	2 (to connect internal or external antenna) ESD protected
Antenna Connectors	Hirose H.FL

1. These specifications will vary depending on the number of satellites used, obstructions, satellite geometry (PDOP), occupation time, multipath effects, and atmospheric conditions. Performance may be degraded in conditions with high ionospheric activity, extreme multipath, or under dense foliage. For maximum system accuracy, always follow best practices for GNSS data collection.

2. CMR/CMR+ is a third-party proprietary format. Use of this format is not recommended and performance cannot be guaranteed. Use of industry standard RTCM 3.x is always recommended for optimal performance.

www.topconpositioning.com/b111