Hemisphere®

SBX-4 DGPS Beacon OEM Board

WORLD'S MOST POPULAR DGPS BEACON MODULE

Provide a reliable source of differential corrections with the SBX-4 radiobeacon board that augments a separate GPS receiver with free accuracy-improving correction data from networks of beacon stations located throughout the world.

With dual-channel architecture to ensure the best station is always being decoded, the SBX-4 delivers high performance reception and a wide range of functionality including the capability to be tuned to signal strength or station distance.

The SBX-4 outputs the industry standard RTCM SC-104 format accepted by differential-ready GPS receivers and can also be configured and monitored with NMEA 0183 protocol.

Key Features

- Certified IEC 61108-4 compliant
- Dual-channel design allows strongest signal or closest station tracking
- Dual serial ports accommodate separate RTCM and NMEA communications
- Patented ceramic filter blocks out-of-band signals, optimizing reception
- Low power consumption extends battery life
- Power and signal lock LEDs permit visual verification of receiver status
- Reverse-compatibility ensures operation in existing SBX–2 and SBX–3 integrations
- Boot loader provides firmware upgrade reliability

Operating Specifications

Channels:	2-channel parallel tracking
Frequency Range:	283.5 to 325.0 kHz
Channel Spacing:	500 Hz
MSK Bit Rates:	50, 100, and 200 bps
Operating Modes:	Manual, automatic and database
Cold Start Time:	< 1 minute typical
Reacquisition Time:	< 2 seconds typical
Demodulation:	Minimum shift keying (MSK)
Sensitivity:	2.5 µV/m for 6 dB SNR @ 200 bps
Out-of-Band Rejection:	60 dB < 204 kHz and > 404 kHz
Spurious Response:	< -55 dB (0.1 MHz to 1.6 MHz)
Ripple (In-band):	3 dB
Dynamic Range:	100 dB
Frequency Offset:	± 8 Hz (~ 27 ppm)
Adjacent Channel Rejection:	61 dB ± 1 dB @ fo ± 400 Hz
Antenna Input Impedance:	50 Ω

Communications

Ports:	2x full-duplex
Interface Level:	HCMOS, tracks input voltage
Baud Rates:	4800, 9600, 19200, 38400, and 57600
Correction I/O Protocol:	RTCM SC-104, NMEA 0183

Environmental

Operating Temperature:	-30°C to +70°C (-22°F to +158°F)
Storage Temperature:	-40°C to +85°C (-40°F to +185°F)
Humidity:	95% non-condensing
EMC:	EN50081-4-2 ESD

Power

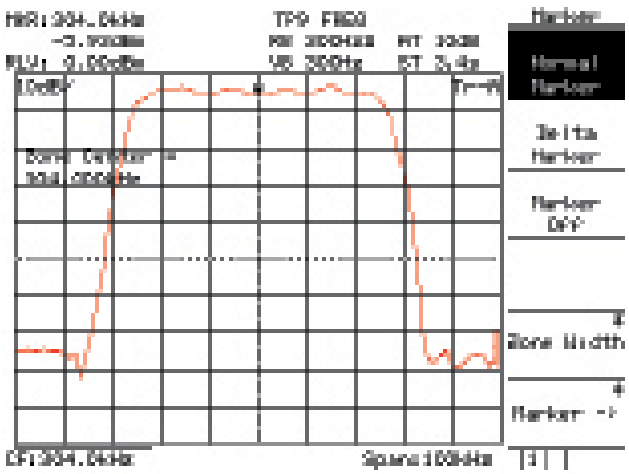
Input Voltage:	3.3 to 5.5 VDC
Power Consumption:	< 0.25 W @ 3.3 VDC (no antenna)
Current Consumption:	< 70 mA @ 3.3 VDC (no antenna)
Antenna Voltage:	5 VDC applied externally

Mechanical

Dimensions:	7.6 L x 5.1 W x 1.4 H (cm) 3.0 L x 2.0 W x 0.54 H (in)
Weight:	30 g (1.1 oz)
Connector (J1):	1x 4 pin header, 0.1" spacing
Connector (J2):	2x 12 pin header, 0.1" spacing

Patented Front-End Filter Response

The front-end filter in the SBX-4 passes beacon frequencies at a consistent strength while blocking out-of band signals. The result is low-noise, high performance beacon reception. The following figure illustrates the frequency response of this filter.



Proprietary Commands

- Select operating mode
- Query receiver performance and operating status
- Specify communication baud rate up to 57600 bps
- Reset receiver from operation to simulate a cold start
- Tabulate and output results of frequency scan

Pin-Out

J200 Connector:

Pin(s):	Signal
1, 3:	Analog ground
2:	Antenna input
4:	Antenna power output

J300 Connector:

Pin(s):	Signal
1, 2:	Antenna power input
3, 4:	Power supply input
14:	TXD0, output
15:	TXD1, output
16:	Lock indicator (active high)
17:	RXD0, input
18:	RXD1, input
19:	External reset input (active low)
21, 22, 23, 24:	Digital ground

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