

SeaSonde Bistatic Transmitter Package

CODAR Product Code: SSBT-100- (-0005, or -0012, or -0025, or 0042)

Product Description:

The SeaSonde bistatic transmitter package is a stand-alone, SHARE-enabled transmitter unit for operation inside a SeaSonde network. An Iridium communication device included in package allows for remote transmitter control, including basic functions such as on/off, frequency switch, and modification of waveform parameters. The low-power requirements and built-in communication solution make the bistatic transmitter ideal for even the most remote environments.

Includes:

SeaSonde SHARE-enabled transmitter,
SeaSonde transmit antenna assembly,
RG8 transmit antenna cable (75m),
GPS bullet antenna and cable,
Iridium satellite modem Model 9601-D-I, antenna, and antenna cable,
User Manual (PDF).

1-Year manufacturer warranty

Iridium 1-year subscription service also included.

Note: Subscription service need be renewed and paid by customer upon first year subscription expiry.

SSBT-100 Technical Specifications †

Radiated Signal Specifications

Operators must adhere to local radiated signal regulations and receive proper authorizations prior to operation. Contact company for more information.

Radiated Power: 40-50 watts
Transmit Frequency Range: 4.4 – 50 MHz
Modulation Format: Pulsed, Swept CW
Sweep Widths (Typical): 12-300 kHz
Sweep Repetition Frequency: 1-4 Hz
Polarization: Vertical

Transmitter Chassis: SSTX

Input RF Drive Level: 0 dBm
Output RF Power Level: 50 watts average
Input Requirements: 24 V DC

Transmit Cable

Single RG-8, 75m length

Transmitter electronics work at entire range of SeaSonde frequency bands.

Select Product Code based on the desired antenna operating range:

4.3- 5.6 MHz: CODAR Product Code SSBT-100-0005,
12-14 MHz: CODAR Product Code SSBT-100-0012
24-27 MHz: CODAR Product Code SSBT-100-0025
40-44 MHz: CODAR Product Code SSBT-100-0042



SeaSonde Bistatic Transmit Antenna Dimensions

Note: Antennas for operation at one frequency band and bandpass filters for operation at two frequency bands are included with system purchase. Antennas and filters for operation at additional frequency bands can be purchased separately.

Frequency (MHz)	TX antenna			Horizontal Radial Elements (m)
	Height (m)			
	Mast	Whip	Total	
4.3 - 5.6	None	11	11	8 (G)
12 - 14	4	5	9.1	2.4 (W)
24 - 27	4	2.4	6.5	
40 - 44	4	1.4	5.5	

G) Radial elements are protected wires strung out from antenna base on ground surface

(W) Radial elements are whip antennas extending from base of whip antenna

Transmit Antenna Ground Plane Dimensions

All transmit antenna ground planes (except the Long-Range transmit antenna) have two horizontal whip elements that protrude from antenna just above the 4 m tall mast. Their lengths vary upon frequency. The Long Range SeaSonde Transmit antenna requires a different style of ground plane. If the antenna is attached to a metal structure, such as on an oil platform or metal fence, then that object will act as the grounding device. If it is to be installed on a beach, for example, then grounding elements will need to fan out from the base of the antenna outward towards sea. A minimum of 9 elements (typically 16) need to be placed in a 180° semi-circle on the seaward side of the antenna. Each element is a metal wire encased in plastic (~1/8" diam.), whose length is about 16-20 feet. These elements can be buried under sand or laid above ground.

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System Requirements – Electronics

Environmental

SeaSonde bistatic transmitter electronics (Transmitter chassis, Iridium device) are intended for indoor or properly climate controlled environment only:

- Temperature Range: 0° F (-18° C) to 110°F (45° C)
- Maximum Humidity: 80% non-condensing

Input Power

- SeaSonde Bistatic Transmitter Package Total Power Consumption (including transmitter, and Iridium device)
 - 105 watts, (4A@26V)
- AC Power Conditioning via Uninterruptable Power Supply (UPS) recommended.

System Requirements – SeaSonde Antennas & Cabling

Clear Space Around Bistatic TX Antenna

Objects that interact with or alter the response of the transmit or receive antennas can affect bearing accuracy or create bearing gaps in coverage

- Position SeaSonde transmit antenna one horizontal RADAR wavelength or greater away from tall (one quarter of the RADAR wavelength or taller) objects or obstructions (see chart below). Tree trimming/removal, or relocation of other man made objects may be necessary.
- There should be no obstructions between the receive antenna and the seaward side that may block energy in direction of ocean

Distance (Horizontal) from Water to Antennas

Antennas should be positioned close to the water to prevent propagation loss of energy traveling over ground. Maximum recommended distance from transmit antenna to water is four RADAR wavelengths (see adjacent chart).

SeaSonde Frequency Band (MHz)	RADAR TX wavelength (meters)-	Quarter wavelength (meters)-	Max. Distance to Water: 4xλ (meters)
5	60	15	240
12	25	6	100
25	12	3	48
40	8	2	30

Bases/Mountings for Antennas:

For staying upright, Antennas need to be mounted to concrete concrete pad (~ 1m x 1m 1m) or lashed/guyed to fencing or other solid structure. Read *SeaSonde Antenna Installation User's Guide* for examples.

Cabling Protection

There is 1 RG-8 cable connecting the TX antenna to the electronics. Ideally cables between antenna and electronics are fed through protective conduit (such as 3.5 cm diameter PVC pipe) and buried in trench.

Communications via Iridium satellite modem. Iridium Satellite Modem #9601-D-I, designed to operate with the Iridium network under SBD mode. Iridium Modem Specifications:

Dimensions: 4.16" L x 2.21" W x 0.51" D (106 mm x 56 mm x 13 mm)

Weight ~0.26 pounds (120 g)

I/O Interface: 26-Pin Samtec EHT Series

Antenna connection: SMA Female

Cooling: Convection ; Enclosure: Aluminum/EMI shielding

Antenna height: 78cm ; Antenna cable: 25' length

Duplexing Method: Time Division Duplex

Multiplexing Method: TDMA/FDMA

Link Margin Downlink: 13 dB average

Link Margin Uplink: 7 dB average

Data I/O

SBD Mobile Originated: 340 Bytes/message

SBD Mobile Terminated: 270 Bytes/message

Hardware Interface: RS232

Software Interface: AT Commands

Electrical

Input Voltage Range: 4.5VDC to 5.5VDC

Input Nominal Voltage: 5.0VDC

Input Ripple Voltage: 40mV peak-to-peak

Avg. Standby Current: 66mA @ 5.0VDC

Avg. Transmit Current: 350mA @ 5.0VDC

Peak Power-up Current: ~1.5A @ 5.0VDC

Environmental

Operating Temperature: -22oF to +140oF (-30oC to +60oC)

Operating Humidity: < 75% RH

Storage Temperature: -40oF to +185oF (-40oC to +85oC)

Storage Humidity: < 93% RH

Iridium RF Board

Operating Frequency: 1616 to 1626.5 MHz

†Specifications and appearance are given as guidelines and may change without notice.