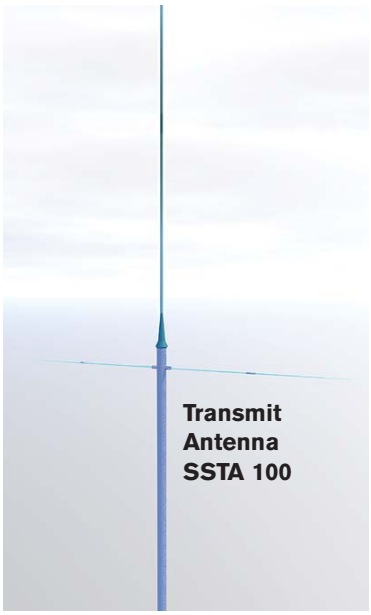
CODAR OCEAN SENSORS

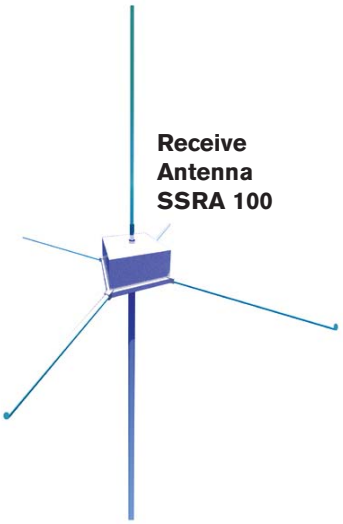
SeaSonde® System Specifications

Radiated Signal Specifications

Operators must adhere to their country's radio communications regulations regarding radiated signal specifications, and receive proper authorizations prior to operation. Consult company.

Output Radiated Power: 80 watts peak, 40 watts average
Operating Frequency Range - One of either: Low Band 11.5 - 14.0 MHz or Mid Band 24 - 27 MHz. Consult company prior to ordering (inquire about other frequencies).
Modulation Format: Pulsed Swept Frequency CW
Pulse Repetition Frequency: 1028 - 8197 Hz
Duty Factor: 50%
Sweep Width: 50 - 150 kHz (typical)
Sweep Repetition Frequency: 2 Hz
Total Radiated Signal Bandwidth: (at - 20 dB level) 65 - 200 kHz
Polarization: vertical





Transmit Antenna: SSTA 100 Whip Antenna

RF Connection (to Transmitter): Low-loss Co-Ax; Type N connectors
Whip Height/Radial Element Lengths for 11.5-14 MHz version: 4.8 m / 2.4 m
Whip Height/Radial Element Lengths for 24-27 MHz version: 2.4m / 1.2 m
Weight: 5 kg
SSTA 100 Whip Transmit Antenna designed for mounting on Antenna Support Post: Height 4m, diameter ~6.5 cm

Transmitter: SSTX 100

Input RF Drive Level: 0 dBm
Output RF Power Level: 100 watts peak, 50 watts average
Required Power: 50-60 Hz, 300 watts; select one of either 120 VAC or 220 VAC (specify when ordering) [New 24-volt DC version is available. Consult factory prior to ordering.]
Design: (gated FET) modular; all solid state
Operation: Class AB
Dimensions: (single chassis) 13H x 49W x 53D cm
Weight: 15 kg

Radial-Site Data Acquisition System: SSDA 100

Computer: Desktop computer, Power Macintosh G5 (Power PC 1.8 GHz) 256 MB RAM; 80 GB H.D.
Laptop computer available; specify when ordering.
Internal Modem (for dial-up only, not leased-line operation): up to 28,800 BPS
Monitor: color TFT
Keyboard: USB, extended
Software: One Radial Site Suite license

SSTX 100

SSRX 100A

SSDA 100

Receive Antenna: SSRA 100

Design: (three element DF) passive vertical monopole, two crossed loops into preamplifiers
RF Connections: (to Receiver) Co-Ax; BNC and TNC end connectors
Whip Height/Radial Element Lengths for 11.5-14 MHz version: 2.4 m / 2.4 m
Whip Height/Radial Element Lengths for 24-27 MHz version: 2.4 m / 1.2 m
Dimensions: (of weatherproof RF box) 13H x 25W x 25D cm
Weight: 4.5 kg
SSRA 100 Receive Antenna designed for mounting on Antenna Support Post: Height 4m, diameter ~6.5 cm

Receiver: SSRX 100A

Maximum In-band Input Level: 0 dBm
Impedance: 50 ohm
Sensitivity: (noise level) -160 dBm in 1 Hz BW
Required Power: 50-60 Hz, 100 watts; select one of either 120 VAC or 220 VAC (specify when ordering) [New 24-volt DC version is available. Consult factory prior to ordering.]
Design: modular, all solid state, three-channel
Operation: I/Q homodyne
Output: digital data at 4096 16-bit words/second per channel
Dimensions: (single chassis) 13H x 49W x 53D cm
Weight: 14 kg
[Optional GPS synchronization Feature: GPS Assisted Stability: >.0001 ppm and 50 nsec on PPS]

Combine Station Data Processing System: SSDP 100

Computer: Desktop computer, Power Macintosh G5 (Power PC 1.8 GHz)
256 MB RAM; 80 GB H.D. Laptop computer available; specify when ordering.
Internal Modem: (for dial-up only, not leased-line operation) up to 28,800 BPS
Monitor: 17" color TFT
Keyboard: USB, extended
Software: One central station software license

SSDP 100

Complete 2-Site SeaSonde Monitoring System Consists of:

2 - SSTX 100 Transmitters
2 - SSRX 100A Receivers
2 - SSTA 100 Transmit Antennas
Either: 2 - SSRA-L 100 Low-Band Receive Antennas
Or: 2 - SSRA-M 100 Mid-Band Receive Antennas
2 - SSDA 100 Data Acquisition Systems
1 - SSDP 100 Data Processing System
Software & Licenses All SeaSonde Software Listed Below

***** The basic 2-station system is delivered with either low or mid-band antennas. By purchasing the other antenna band set as an extra item, the radar can be operated in either band by swapping the receive antenna units on the mounting post.

SeaSonde® Software Specifications†

Output Data Product Specifications:

Surface Currents: Maps of surface current vectors created from data taken at two radar sites 10-40 km apart
Map Displays: color monitor screen, archived ASCII vector files
Map Spatial Resolution: (vectors on square grid) 2 x 2 km typical spacing
Map Area Coverage: Mid Band (24-27 MHz) 20-50 km alongshore x 20-35 km offshore. Coverage varies. Depends on radar siting; external noise/interference; sea state.
Map Temporal Interval: hourly; currents averaged over one hour
Map Vector Accuracies: (rms; typical for normal environmental speed: < 7 cm/s conditions, i.e., noise/interference, siting, sea state), direction: < 10 degrees
Wavefield Products:
Local on-shore wave conditions in ring centered 3 km from coast around each radar. (Low band is best for wave data)
Significant Waveheight: typical accuracy: 7-15%
Dominant On-Shore Direction: typical accuracy: 5 degrees -12 degrees
Dominant Wave Period: typical accuracy: 0.6 s
Waveheight Energy vs Frequency: ~0.01 Hz spacing
Dominant Wave Direction vs Frequency: ~0.01 Hz spacing
Spectral Wave Frequency Range: 0.05 Hz - 0.25 Hz (20 s to 4 s periods)
Minimum Detectable Significant Waveheight: 1 m
Data Temporal Interval: hourly; waves averaged over one hour
Wave History Displays: hourly waveheight vs time, hourly wave direction vs time, hourly wave period vs time
(NOTE: Strong alongshore currents can limit spectral resolution and mask long-period waves. Wave information not obtainable if current speed >70 cm/s or when external noise/interference levels are higher than normal.)

Data Communications:

Automatic modem transfer of current and wave data products supported by software for dial-up lines and ethernet connections (recommended).

Radial Site Software Suite*

Program Name… Function… Output
Sentinel… orchestrates control of all operations… logs data events
SeaSonde Acquisition … radar data acquisition/processing… unaveraged cross spectra
CSRAvnn… averages data over one hour… averaged cross spectra
WaitForCSA… detects arrival of averages… triggers hourly processing
Currents… calculates radial surface current map… writes file radial.dat
Waves… inverts echo to get wave information… wave spectral parameters
Archivist… archives data according to user selections… archived data
MacController… housekeeping functions, data transfers upon request

Combine Station Software Suite*

Program Name… Function… Output
MacCentral… retrieves hourly files from remote sites… radial current/wave data
WaitForRadials… detects arrival of radial files… triggers total vector processing
Combine… calculates total currents… total current vectors at map grid
SeaDisplay… prepare current map… current map for monitor or printer
WaveDisplay… prepare wave data displays… wave data plots

*These specifications are for the basic software for typical real-time operational use.
Many more applications are included with the SeaSonde® for offline use.
Last updated December 2003. Specification and component details are subject to change.

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