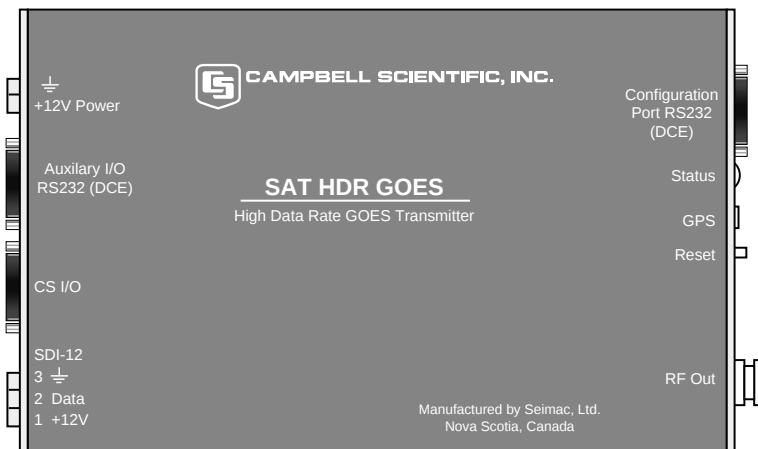


High Data Rate *GOES* Transmitter

SAT HDR GOES

The SAT HDR GOES transmitter complies with the High Data Rate (HDR) specifications. The transmitter supports transmission lengths from one to 120 seconds. Short transmission lengths enable multiple stations to use the same NESDIS-assigned window. A GPS receiver and antenna are included to acquire time and position data. SAT HDR GOES is compatible with most existing Campbell Scientific dataloggers, such as the CR10(X), CR510, CR23X, or CR5000.

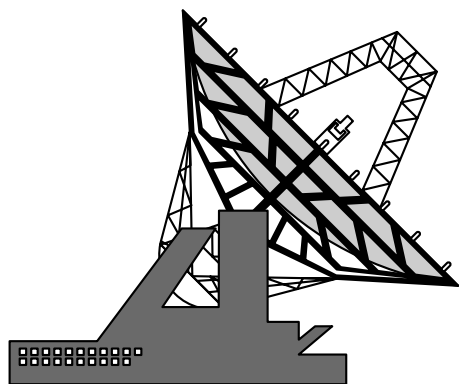


Features

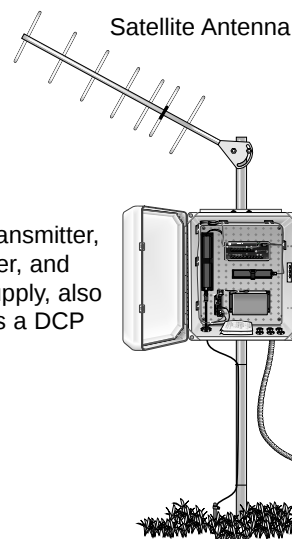
- NESDIS certified (certificate # 1100-001, Nov. 3, 2000) for low and high data rates, including 100, 300, and 1200 bps
- Automatic GPS correction of clock and oscillator drift
- Diagnostics and status information can be sampled by the datalogger and transmitted as part of the data stream
- Available on GSA MAS Contract Number GS-25F-6042D
- Readily added or retrofitted to existing Campbell Scientific systems
- Non-volatile setups configured with Windows-based software
- Independent 16 kbyte self-timed and random data buffers



GOES Satellite



Ground Receiving Station



GOES transmitter, datalogger, and power supply, also known as a DCP

Data Collection Platform (DCP)



CAMPBELL SCIENTIFIC, INC.

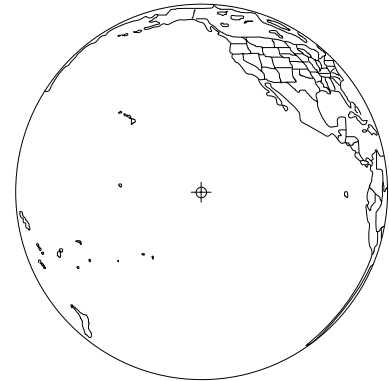
815 W. 1800 N. • Logan, Utah 84321-1784 • (435) 753-2342 • FAX (435) 750-9540 • www.campbellsci.com

GOES, NESDIS, and Transmit Windows

The SAT HDR GOES transmitter sends data via Geostationary Operational Environmental Satellites (GOES). GOES satellites have orbits that coincide with the Earth's rotation, allowing each satellite to remain above a specific region.

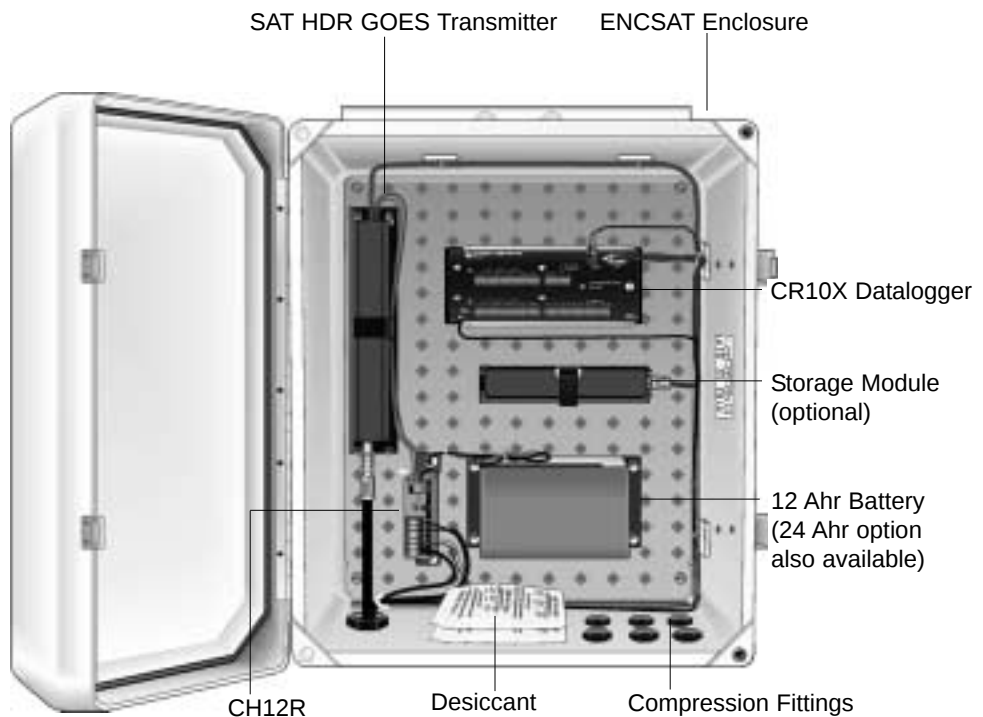
The GOES system is administered by the National Environmental Satellite Data Information Service (NESDIS). NESDIS assigns addresses, uplink channels, and self-timed / random transmit time windows. Self-timed windows allow data transmission only during a predetermined time frame. Random windows are for applications of a critical nature (e.g., flood reporting) and allow transmission immediately after a threshold has been exceeded.

Currently, the GOES system has two satellites in the Americas. The transmitter supports US channels. The coverage of each satellite is shown on the maps (right). The crosshairs indicate a projection of their geostationary positions.



DCP (Data Collection Platform) Equipment

- SAT HDR GOES satellite transmitter (includes an SC12 ribbon cable, power cable, mounting kit, GPS antenna, and DCPcomm software). SAT HDR GOES transmitter is manufactured for Campbell Scientific by Seimac Ltd., Dartmouth, Nova Scotia, Canada.
- Datalogger (CR510, CR10(X), CR23X, or CR5000): a simple firmware update, shipped with the SAT HDR GOES, may be required. The CR10 requires a special PROM (item #14150).
- RHCP (crossed) Yagi Antenna, mounting bracket, and cable.
- ENC 12/14, ENC 16/18, or ENCSAT 16" x 18" enclosure. The ENCSAT includes the power supply listed below. If using a CR23X or BP24 battery, an ENC 16/18 or ENCSAT is required.
- Power supply consisting of Campbell Scientific's BP12 12 Ahr or BP24 24 Ahr battery pack, CH12R Charger/Regulator, and MSX10 10-Watt Solar Panel.
- Optional storage module to backup data and store raw or processed data not earmarked for GOES transmission. Requires on-site visit for data retrieval. Campbell Scientific has storage modules available that store up to 8 million low-resolution data points.

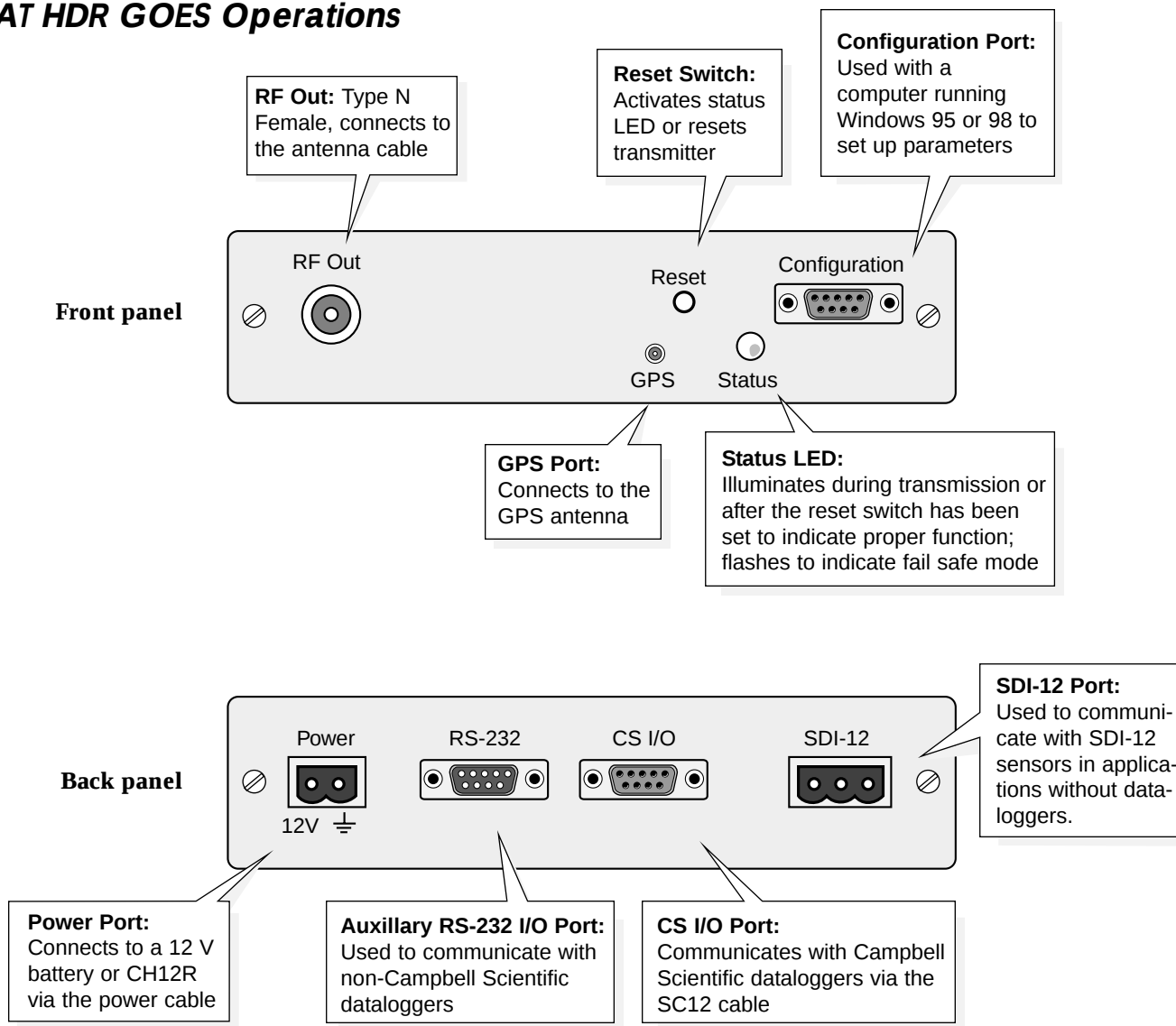


The ENCSAT protects system components in an environmentally sealed enclosure. The MSX10 Solar Panel is not shown.

Computer Base Station Equipment

- Phone modem with MNP level 4 error correction (most Hayes-compatible modems contain this error-checking protocol; check the operator's manual for your modem) and user-supplied communication software (e.g., Procomm Plus, Crosstalk).
- Internet: See NESDIS for requirements.

SAT HDR GOES Operations



Diagnostics, transmission status, and self-test information can be sampled by the datalogger and transmitted over the GOES system as part of the data stream.

Diagnostic information:

- Time of day (GMT)
- Power supply voltage under transmit load
- Location (latitude and longitude)
- Bytes in self-timed buffer
- Time until next self-timed transmission
- Bytes in random buffer
- Time until next random transmission

Last transmission status:

- Forward and reflected power
- Transmit time (GMT)
- Message length
- GPS acquisition time

Self-test results:

- Watch dog time outs
- GPS misses
- Power supply dropouts

GOES System Authorization Procedure

U.S. Federal, State, or local government agencies or users sponsored by one of those agencies may use GOES. Potential GOES users **MUST** receive formal permission from NESDIS. The following four steps are required:

1. The user contacts NESDIS at the following address and submits a formal request to transmit data via GOES. Non-U.S. or private users must also submit a written statement indicating that their sponsor requires all or part of the transmitted data. NESDIS will fax or mail the user a question form to complete and submit for approval.

DCS Coordinator
NOAA / NESDIS
E/SP3, Room 3320
4700 Silver Hill Road
Stop 9909
Washington, D.C. 20233-9909

Phone (301) 457-5681
FAX (301) 457-5620
Web <http://dcs.noaa.gov/contact.htm>
2. Following approval, NESDIS sends a Memorandum of Agreement (MOA). The MOA must be signed and returned to NESDIS.
3. After the MOA is approved, NESDIS will issue a channel assignment and an ID address code. The user must then submit Application Form 442 and Form 159/159-C to the Federal Communications Commission (FCC) to acquire an FCC license. To order these forms, call (800) 418-3676, or access their web site, <http://www.fcc.gov>.
4. After an FCC license is acquired, NESDIS must be contacted to coordinate a "start-up" date.

Specifications

On-board memory:	Non-volatile flash for setup parameters. 16 kbytes for self-timed data and 16 kbytes for random data
Power requirements:	9.6 to 16 Vdc, 1 mA quiescent, 350 mA during GPS acquisition, and less than 4 A during transmission
Transmit power:	15.9 W maximum
Environmental:	-40° to 50°C; 0 to 99% RH, non-condensing
Dimensions:	8.2" x 5.5" x 1.5"; 9.0" x 5.5" x 1.5" with connectors
Weight:	< 2 lbs

Notes:

- (1) For applications outside GOES coverage area or users who don't qualify for the GOES system, transmitters that support INMARSAT-C and Argos are available; contact Campbell Scientific for more information.
- (2) Information on analyzing your system's power requirements is provided in Campbell Scientific's Power Supply brochure. For a more thorough explanation, request the Power Supplies Application Note 5-F. The brochure and application note can be downloaded from our Website: www.campbellsci.com
- (3) For alternate methods of data retrieval from the NESDIS ground station, please contact NESDIS.



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