

# Argos Satellite Transmitter

## SAT ARGOS

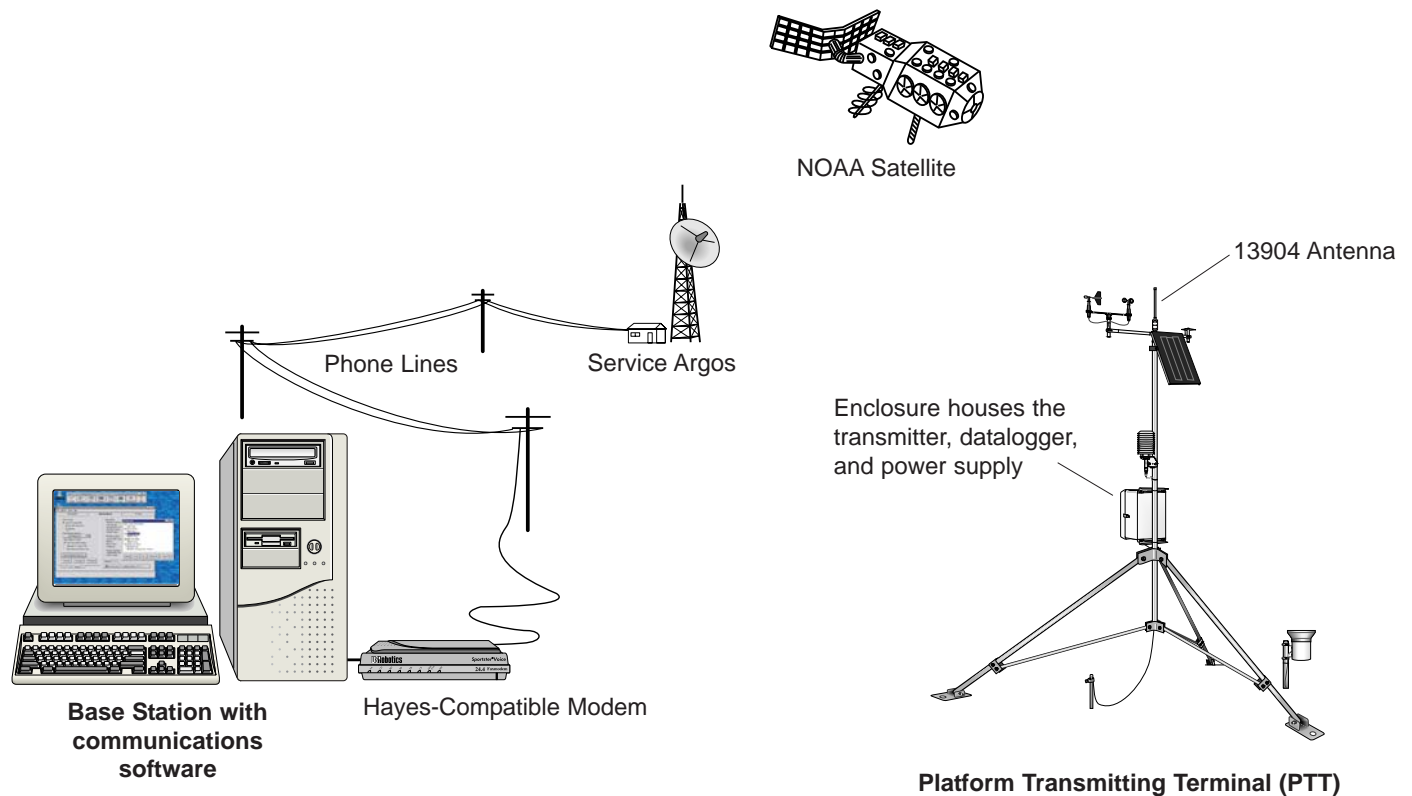
The SAT ARGOS is a Service Argos-certified Platform Transmitter Terminal (PTT) well suited for remote meteorological and environmental data collection applications, including mobile and high-latitude installations. The transmitter, manufactured by Seimac for Campbell Scientific, transmits data collected by our CR10X, CR510, and CR23X dataloggers.



### Features

- Provides a reliable data transmission method from remote or mobile sites
- Supports up to four ID codes for each transmitter
- Supports data delivery from Service Argos to your Base Station computer via Telnet, e-mail, or Internet. For time-sensitive applications. Data are typically available from Service Argos at times ranging from 20 minutes to four hours after successful reception by a satellite
- Operates in harsh environments (-30° to +60°C temperature range)
- Low current drain (<2 mA average)

### System Configuration



**CAMPBELL SCIENTIFIC, INC.**

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## Argos System, Pass Frequency, and Pass Duration

Service Argos data transceivers are aboard two of NOAA's sun-synchronous, polar-orbiting satellites. The polar orbits allow a single satellite to provide coverage of the entire Earth's surface as it rotates through the plane of the orbit. The satellite can receive and decode data from several PTTs simultaneously, removing the timing constraints associated with GOES transmissions. In applications where the PTT is mobile (e.g. drifting oceanographic buoys), Argos can use Doppler shift data gleaned from several received transmissions to locate a PTT to within 150 m. The satellites' relatively low orbit of 850 km permits the PTT to operate with a small antenna and power supply (enabling applications such as tracking migratory birds equipped with transmitters weighing as little as 17 g).

The Service Argos transceiver receives messages from the PTT when passing overhead. Pass duration is 10 minutes on average. The orbital period for each satellite is 1 hour, 42 minutes; passes per day vary from six at the Equator to 28 at the poles. Typical transmissions occur in under 1 second and are spaced at 200 second intervals ( $\pm 6$  seconds). The SAT ARGOS transmitter supports up to four Argos ID numbers, allowing transmission of four unique data sets per expected satellite pass. Because the PTT does not "know" when the satellite is overhead, messages are repeated to ensure reception. Each data transmission includes up to 32 bytes (16 Campbell Scientific low-resolution data points). Datalogger Instruction 125 strips the Array ID from the output data string, allowing all 16 data points to be filled by user-selected data. The maximum number of data points that can be transmitted are listed below:

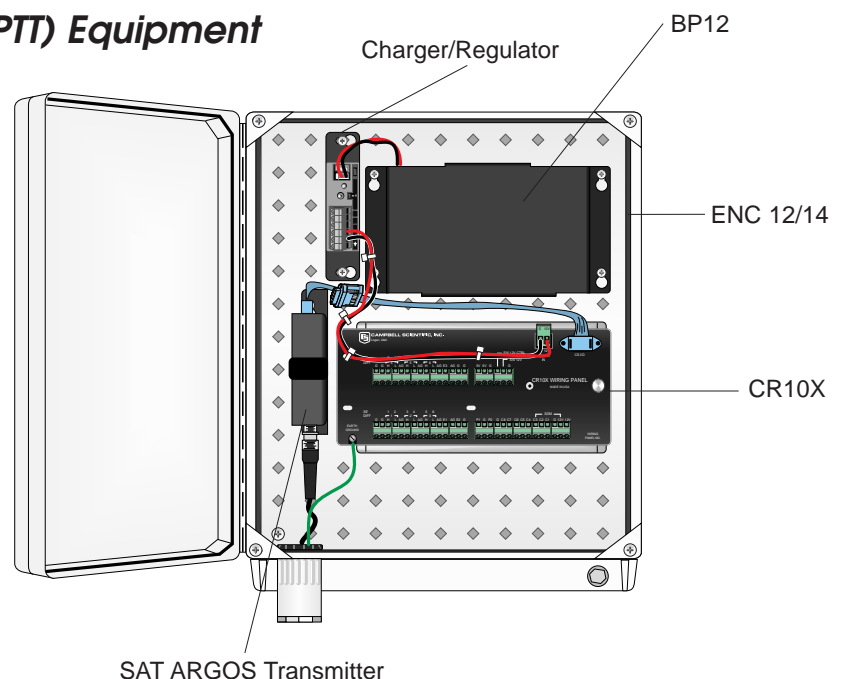
Site Latitude	Cumulative Visibility Over 24 hrs.	Minimum No. of Passes Per 24 hrs.	Mean No. of Passes Per 24 hrs.	Maximum No. of Passes Per 24 hrs.	Maximum Data Points
0°	80 min.	6	7	8	336
15°	88 min.	8	8	9	384
30°	100 min.	8	9	12	432
45°	128 min.	10	11	12	528
55°	170 min.	16	16	18	768
65°	246 min.	21	22	23	1056
75°	322 min.	28	28	28	1344
90°	384 min.	28	28	28	1344

From Argos User's Manual, page 12

Message repeat intervals, Argos ID numbers, and duty cycles are changed using a simple computer-based interface. Data must be decoded by the user, or by Service Argos. The CS I/O port provides power and I/O connections to the transmitter using the standard SC12 cable.

### Platform Transmitting Terminal (PTT) Equipment

- SAT ARGOS Satellite transmitter
- CR10X with an operating system that includes Instruction 125. Call for CR23X or CR510 datalogger applications
- 13904 antenna (includes antenna cable and mounting bracket)
- ENC 12/14 or ENCSAT 16" x 18" enclosure (the larger enclosure is required when a CR23X or BP24 is used)
- Power supply\* consisting of Campbell Scientific's BP12 12 Ahr or BP24 24 Ahr Battery Pack, CH100 Charger/Regulator, and MSX20 20 Watt Solar Panel



\*Using a 200 second repetition rate, the satellite power budget is approximately 0.6 Ahr day<sup>-1</sup>.

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## **Base Station Equipment**

- Hayes-compatible modem
- Computer with user-supplied communication software (e.g., Procomm Plus, Crosstalk). Telnet and Tymnet sessions are supported.

## **Subscribing to Argos**

To use the Argos system, you must receive formal permission from Service Argos and pay a fee. If your Platform Transmitting Terminal (PTT) is in the U.S., you also need an FCC license. The data must be used for meteorological purposes. Examples include meteorological/hydrological stations, ship tracking, volcano monitoring, and seismic data. To subscribe to Argos, the following steps must be completed:

1. Obtain a Program Application Form from the Service Argos Web site (<http://www.argosinc.com>) or from one of the following offices:

### ***North America -- East***

Service Argos, Inc.  
1801 McCormick Drive, Suite 10  
Largo, MD 20774  
Tel (301) 925-4411  
FAX (301) 925-8995  
E-mail: DUS@argosinc.com

### ***North America -- West***

Service Argos, Inc.  
4210, 198th Street S.W., Suite 202  
Lynnwood, WA 98036  
Tel (425) 672-4699  
FAX (425) 672-8926  
E-mail: DUS@argosinc.com

### ***Europe***

CLS/Service Argos  
8-10, rue Hermes  
Parc Technologique du Canal  
31526 Ramonville Cedex, France  
Tel (330) 5-61-39-47-00  
FAX (330) 5-61-75-10-14  
E-mail: monsaingeon@cls.fr

### ***Australia***

SIT  
GPO BOX 1289K  
150 Lonsdale Street - 27th Floor  
Melbourne, Victoria 3001  
Australia  
Tel (61) (3) 9669 4650  
FAX (61) (3) 9669 4675  
E-mail: clsargos@bom.gov.au

### ***Japan***

CUBIC-I, Ltd.  
Bluebird Building 7F  
2-15-9 Nishi-Gotanda  
Shinagawa-Ku, Tokyo 141-0031  
Japan  
Tel (81) (3) 3779 55 06  
FAX (81) (3) 3779 57 83  
E-mail: argos@cubic-i.co.jp

2. Fill out and submit the application form to the appropriate Service Argos office. Service Argos will send you a program review stating whether your program has been approved.
  3. Following approval, send a Technical File that describes the required data processing and type of results to the appropriate Service Argos office.
  4. Complete and return a Service Agreement to the appropriate Service Argos office.
  5. If the Platform Transmitting Terminal is in the U.S., submit Application Forms 442 and 159 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>). International users should contact their local agencies to determine their country's requirements.
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## Specifications

Frequency:	401.650 MHz per Argos specifications
Maximum Bytes Each Transmission:	32 (16 low resolution data points)
Operating Temperature:	-30° to +60°C
Humidity Range:	0 to 95% noncondensing
Supply Voltage Range:	5.5 to 16 Vdc (power supplied by datalogger's 12 Vdc supply)
Power Output:	0.75 W minimum, 1 W typical
Typical Current Drain:	<90 $\mu$ A quiescent, 15 mA active, <700 mA transmitting (data transmission requires less than one second)
Dimensions:	3.0" x 2.75" x 1.0" (7.62 x 6.98 x 2.54 cm)
Weight:	6.2 oz
Case Polarity:	negative (-) ground
RF Output Impedance:	50 Ohm
RF Connector:	SMA female
Antenna:	full-wave, unity-gain, omnidirectional collinear



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