



# Goes Transmitter

## S1186

- **Low standby power**
- **Tighter control of frequency drift**
- **Self-timed or alarm-state mode**
- **Compact and lightweight**

### The GOES System

GOES is an acronym for Geostationary Operational Environmental Satellite. Managed by the National Environmental Satellite Data and Information Service (NESDIS) of NOAA, its primary function is to provide timely weather information and collection of environmental data on a regional basis, over most of North and South America and the surrounding oceans.

The GOES spacecraft are in geostationary orbit at approximately 22,300 miles above the equator. Because of the great distance to a satellite in geostationary orbit, the DCP's must have a high output power (10 - 40 W) to make the link.

The GOES system provides a total of 232 channels for users to uplink messages; 199 regional and 33 international. The current data transmission rate is 100 bits/sec, although higher data rates are planned. A typical assigned transmit window of 1 minute would allow 355 bytes of data to be sent (allowing for preamble and 15 second guard bands).

### METEOSAT and GMS System

The European METEOSAT satellite is managed by the European Space Agency (ESA). GMS is jointly managed by Japan's National Space Development Agency (NASDA) and the Japanese Meteorological Agency. METEOSAT and GMS are similar systems and part of the joint World Weather Watch.

Both TGT-1 and TGT-2 have 10 watts of output power during transmission, which requires approximately 2.1 Amps input current at 12 VDC and +25°C. They have

been designed for operation over the temperature range of -40°C to +70°C (exceeding both NOAA and ESA requirements). The average quiescent current drain on each unit is approximately 9 mA.

Three transmit modes are available in TGT-1; self-timed, random, or a combination of self-timed and random. In the self-timed mode, the DCP transmitters are programmed to transmit only within specific time windows, usually several times per day. In random mode, which is generally reserved for transmitting data exceeding an "alarm" threshold, the data is transmitted virtually immediately. It is then repeated several times at random intervals to improve the odds of being received. TGT-2 is restricted to self-timed operation only.

The GOES DCP transmitters contain the first implementation of a digitally temperature compensated crystal oscillator (DTCXO) in a GOES transmitter. The high stability oscillator prevents the frequency from drifting into adjacent channels.

Performance of the oscillator is excellent and it typically has less than +/- 0.1 ppm drift over the operating temperature range. The benefits of digital compensation, as opposed to analog (thermistor) compensation, are lower cost, and tighter control of the frequency drift. An ovenized oscillator, while often providing less drift, historically requires substantially more current and is more costly.

Once deployed, TGT-1's clock is capable of running (within GOES specifications) for 420 days without adjustment. TGT-2's time before adjustment is 240 days.



## Technical Specifications

S1186

GOES - NOAA Certified DCP:	Model TGT-1 (U.S. Domestic) Model TGT-2 (International)
Frequency	
Domestic:	401.701-410.998 MHz
International:	402.0025-402.0985 MHz
Temperature Range	
Operating:	-40°C to +50°C
Storage:	-60°C to +80°C
Humidity:	90% non-condensing
Peak Current:	3.0 A maximum (2.2 A typical) during transmission (50 ohms load) at 12 VDC at 25°C
Voltage:	+10.5 VDC to +14.0 VDC
Average Quiescent Current:	< 10 mA maximum (9.0 mA typical)
Power Output:	+40 dbm +/- 1.0 db at 12 VDC with automatic leveling control
<b>PHYSICAL</b>	
Dimensions:	8.9 cm x 18.3 cm x 11.2 cm (3.5" x 7.2" x 4.4")
Weight:	1000 g (2.2 lbs)