



## Overview

The TX321 is a GOES and Meteosat satellite data transmitter. It provides an easy and reliable way for Campbell Scientific data collection platforms (DCP) to transmit data over

geostationary satellites. The TX321 is typically used by government agencies and sponsored research organizations for the purpose of collecting environmental data.

## Benefits and Features

- ▶ GOES High Data Rate Version 2, Meteosat SRD, and International DCS operation
- ▶ Very low power consumption when idle (< 5 mA @ 12V)
- ▶ Transmissions continue for 28 days if GPS is lost
- ▶ Configuration and diagnostics easily performed by data logger or computer
- ▶ Drop-in replacement for Campbell Scientific TX320, TX312, and SAT HDR GOES

## Technical Description

The TX321 is designed for use on the [NOAA GOES Data Collection System](#) and the [EUMETSAT Meteosat Data Collection Services](#) satellite networks. These networks use geostationary satellites and ground stations to receive and relay data transmitted from remote data collection platforms (DCP), such as those provided by Campbell Scientific. These DCPs are typically owned and operated by government agencies and sponsored research organizations. Users are given a frequency and time slot for their transmissions.

- ▶ Power supply, such as Campbell Scientific's BP12 or BP24 battery, CH150 or CH200 charge regulator, and SP10 10 W or SP20 20 W solar panel

## Data Collection Platform (DCP) Equipment

- ▶ TX321 Satellite Transmitter
- ▶ 17992 or 31182 GPS antenna and their antenna mounts and coaxial cables
- ▶ 25316 11 dBi Right-Hand Circular Polarized (RHCP) Yagi antenna and coaxial cable
- ▶ Data logger

## GOES System Authorization Procedure

Non-U. S. government agencies and research organizations must have a sponsor from a U.S. government agency. Prospective GOES users must receive formal permission from NESDIS, by doing the following:

1. Fill out the [System Use Agreement \(SUA\) application form](#). The form can be submitted online or sent to:

GOES DCS SUA Processing Unit NOAA,  
Satellite Services Division  
4231 Suitland Road, Rm 1646  
Suitland Federal Center Suitland, MD 20746  
Tel: 301-817-4563

Fax: 301-817-4569

Email: Letecia.Reeves@noaa.gov

- Following approval, NESDIS sends a Memorandum of Agreement (MOA). The MOA must be signed and returned to NESDIS.
- After the MOA is approved, NESDIS will issue a channel assignment and an ID address code.

- NESDIS must be contacted to coordinate a start-up date.

## Meteosat System Authorization Procedure

Complete and submit the [EUMETSAT DCP Admission form](#).

## Specifications

Transmission Distance or Area  
› Meteosat: Europe  
› GOES: North America

Transmissions Supported  
› ASCII and pseudo-binary message  
› Timed and random

Transmit RF Out Connector Type N jack

Radio Module G6 OEM

Operating Temperature Range -40° to +60°C

Storage Temperature Range -55° to +70°C

Case Dimensions 18.54 x 12.7 x 3.81 cm (7.3 x 5 x 1.5 in.)

Maximum Dimensions 20.96 x 13.34 x 4.06 cm (8.25 x 5.25 x 1.6 in.) including connectors

Weight 0.77 kg (1.7 lb)

### Supply Power

Supply Voltage 10.8 to 16 Vdc

Typical Current Drain  
› < 2.6 A (at 12 Vdc during transmit)  
› < 100 mA (at 12 Vdc during GPS fix)  
› < 5 mA (at 12 Vdc when idle)

Connector Removable 2 pin screw terminal, 5 mm pitch

### Satellite GOES

Standards NOAA/NESDIS GOES High Data Rate Certification Standards version 2

Baud Rates 300 and 1200 bps

Transmit Power  
› 31.5 dBm (300 bps default)  
› When transmitting to GOES-13 or later, transmit EIRP shall be 37 to 41 dBm for 300 bps and 43 to 47 dBm for 1200 bps.  
› Settings default for use with 11 dBi YAGI antenna  
› 38 dBm (maximum)  
› 37.5 dBm (1200 bps default)

Frequency Range 401.701 to 402.0985 MHz

Initial Frequency Stability ±20 Hz disciplined to GPS (GPS fix occurs after power up and once per day thereafter.)

Channel Bandwidth  
› 1.5 KHz NOAA/NESDIS GOES High Data Rate Certification Standards version 2 (1200 bps)  
› 3 kHz (300 bps)

### Satellite Meteosat

Operation EUMETSAT Meteosat SRD

Baud Rates 100 bps

Transmit Power  
› Default configuration for use with 11 dBi YAGI antenna  
› Meteosat SRD transmit EIRP should be 43.25 to 52 dBm.  
› 41.5 dBm (maximum)  
› 37.5 dBm (100 bps default)

Frequency Range 402.0355 to 402.4345 MHz

Initial Frequency Stability ±20 Hz disciplined to GPS (GPS fix occurs after power up and once per day thereafter.)

Channel Bandwidth 3 kHz (100 bps)

### GPS Receiver

Receiver Type 3.3 V active

Connector SMA jack

### Timekeeping

Initial Accuracy ±100 µs (synchronized to GPS)

Drift ±10 ms/day (without GPS)

GPS Schedule 1 fix at power up (1 fix per day afterwards)

Transmission Continuation without GPS Fix 28 days

### Interface Connectors

USB Micro B, USB device

RS-232 DB9 F, DCE, 3 wire RS-232

CS I/O DB9 M, SDC 4

Satellite RF Transmit Out Type N jack

GPS SMA jack

Power Removable 2 pin

## Interface Command Protocols

Binary Command Protocol › Available on RS-232 if CS I/O is not connected  
› Available on CS I/O when connected

ASCII Command Protocol Available on all ports

## 25316 Transmit Antenna

Gain	11 dBi
Antenna Type	Right-hand circular polarization Yagi
Connector	Type N female

Wind Load ~100 knots

## 17992 GPS Antenna

Antenna Type	3.3 V active dome, pipe mount
Gain	28 dBi
Connector	TNC jack

## 31182 GPS Antenna

Antenna Type	3.3 V active patch, magnetic mount
Gain	27 dBi
Connector	SMA plug

For comprehensive details, visit: [www.campbellsci.eu/tx321](http://www.campbellsci.eu/tx321) 



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