

# DCP200

## GOES Data Collection Platform



Campbell Scientific's DCP200 is a Data Collection Platform (DCP) designed specifically for stream stage, water quality, and rainfall applications. This system measures the sensors, processes the measurements, and then transmits the data to a receiving station via the GOES system.

The DCP200 consists of our CR295X datalogger, TX320 HDR GOES satellite transmitter, Yagi antenna, GPS antenna, ENC16/18 enclosure, antenna cables, power supply, and software. The TX320 transmitter supports data transmission rates of 100, 300, and 1200 bps. Because clock accuracy is critically important for GOES satellite telemetry, the TX320 includes a robust, TCXO-based real-time clock and a GPS receiver.

### Benefits/Features

- Up to 28 days of operation between GPS fixes
- Every transmitter is tested by Campbell Scientific in an environmental chamber to ensure the unit operates within specifications
- Makes SDI-12, single-ended analog, pulse, switch closure, and bridge measurements
- Complies with the High Data Rate (HDR) specifications
- Automatic GPS correction of clock and oscillator
- Diagnostics and status information that can be sampled by the datalogger and transmitted as part of the data stream
- Independent self-timed and random data buffers



The DCP200 is intended for stream stage, water quality, and rainfall applications. The ENC16/18 environmental enclosure houses the DCP200's transmitter, datalogger and power supply.

## DCP200 Package and Options

- CR295X GOES Datalogger
- 10873 serial cable for attaching the transmitter to the datalogger
- TX320 HDR GOES satellite transmitter
- 18134 TX320 Support Software
- 17992 30 dB GPS antenna
- 18017-L10 GPS cable, 10-ft length
- 12243 ¾" threaded pipe and CM220 Right Angle Mounting Kit for mounting the GPS antenna to a tripod or tower mast or CM202, CM204, or CM206 crossarm
- 25316 11-dBi Right-Hand Circular Polarized (RHCP) Yagi antenna, mounting hardware, and COAXNTN-L12 coaxial antenna cable
- ENC16/18 Environmental Enclosure; choose one of the following mounting bracket options:
  - -MM Tripod Mast Mounting
  - -TM Tower Mounting
- BP24 24-Ahr battery pack
- CH100 regulator
- SP20 20-W solar panel

## Retrieving Data from the Ground Receiving Station

Choose one of the following methods:

- Internet (see NESDIS for requirements)
- Domsat
- LRGS
- DRGS (Direct Readout Ground Station)
- 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).

At right is the 17992 GPS antenna attached to a crossarm via the 7623 threaded pipe and a CM220 Mounting Bracket.

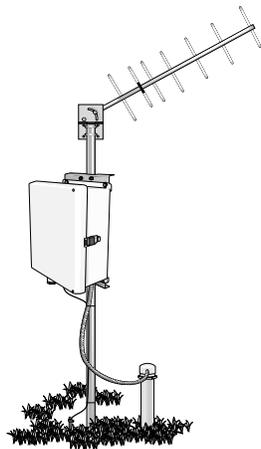


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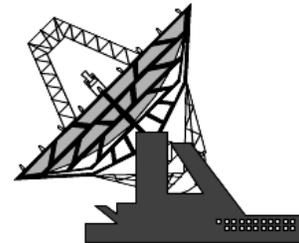
### GOES Satellite



Residing with the DCP200 are the sensors and the instrument mount



*Data Collection Platform (DCP)*



*Ground Receiving Station*

# Specifications

## *TX320 Transmitter*

<b>Operating Voltage:</b>	+10.8 to +16 Vdc
<b>Supply Current @ 12 Vdc</b>	
Idle or Sleep:	5 mA
During GPS Fix:	80 mA for 15 minutes/day
Transmission:	2.6 A
<b>Channel Bandwidth</b>	
100 bps Transmission Rate:	1.5 kHz
300 bps Transmission Rate:	1.5 kHz
1200 bps Transmission Rate:	3.0 kHz
<b>USB Port</b>	
Connector:	USB type B
Command Protocols:	ASCII Command Protocol <sup>1</sup>
<b>CS I/O Port</b>	
Signal Levels:	TTL
Interface Protocol:	Campbell Scientific Synchronous Device Communication (SDC)
Command Protocol:	ASCII Command Protocol <sup>1</sup> or Binary Command Protocol <sup>2</sup>
<b>RS-232 Port</b>	
Signal Levels:	RS232C
Connector:	DB9F
Command Protocols:	ASCII Command Protocol <sup>1</sup> or Binary Command Protocol <sup>2</sup>
<b>Transmission Data Rates:</b>	100, 300, and 1200 bps
<b>Output Power:</b>	Complies with NESDIS DCPRS Certification Standards, Section 4.
For 1200 bps:	Has a nominal EIRP of 51 dBm and a maximum EIRP of 53 dBm, assuming appropriate antenna.
For 100/300 bps:	Has a nominal EIRP of 48 dBm and a maximum EIRP of 50 dBm, assuming appropriate antenna.
Example output power:	11.2 W @ 1200 bps transmission rate
<b>Timekeeping</b>	
Setting Accuracy:	±100 µs synchronised to GPS
Drift:	±10 msec/day over -40° to 60°C
GPS Schedule:	1 fix on power up, 1 fix per day afterwards
Transmission Continuation without GPS Fix:	28 days
<b>Frequency Range:</b>	401.7 MHz to 402.1 MHz

<b>Frequency Stability</b>	
Initial Accuracy:	±20 Hz disciplined to GPS
Short Term Drift:	±0.04 Hz/seconds
Aging:	±0.1 PPM/year
Vcc + Temperature:	±0.1 PPM
<b>Operating Temperature:</b>	-40° to 60°C
<b>Weight:</b>	1.02 kg (2.25 lb)
<b>Dimensions</b>	
Height:	15.8 cm (6.2 in.)
Length:	24.9 cm (9.8 in.)
Width:	5.3 cm (2.1 in.)

## *CR295X Datalogger (see Notes)*

<b>Temperature Range:</b>	-40° to +50°C
<b>Memory:</b>	up to 19.6 kB (compiled program), 512 kB (data storage), 106 kB (operating system)
<b>Current Drain:</b>	~0.2 mA quiescent, ~3 mA active
<b>Available Channels:</b>	5 single-ended inputs; 2 excitation channel; 2 control ports 4 pulse counters

## *25316 Antenna*

<b>Gain:</b>	11 dBi
<b>Type:</b>	Right hand circular polarization Yagi
<b>Connector:</b>	Type N female
<b>Wind Load:</b>	~100 knots

## *17992 GPS Antenna*

<b>Description:</b>	3.3 V active, <20 mA, jam resistant
<b>Gain:</b>	30 dBi
<b>Connector:</b>	TNC

## *ENC16/18 Enclosure*

<b>External Dimensions:</b>	44 x 57 x 30 cm, (17.5 x 22.6 x 12.1 in)
<b>Weight:</b>	7.8 kg (17.2 lb)

### Notes:

- (1) ASCII command protocol is described in "G5 ASCII Command Protocol (Doc # 700-G5-CMND-ASCII)".
- (2) Binary packet protocol is described in "G5 Binary Command Protocol (Doc # 700-G5-CMND-BIN)".
- (3) The CR295X is not CE compliant.

## Specifications Continued

### *BP24 Rechargeable Battery*

<b>Amp Hour Rating:</b>	24 Ahr
<b>Weight:</b>	10.2 kg (22.4 lb)

### *CH100 Regulator*

<b>Weight:</b>	158 g (5.5 oz)
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### *SP20 Solar Panel*

<b>Current at Peak:</b>	1.19 A
<b>Voltage at at Peak:</b>	16.8 A
<b>Dimensions:</b>	50.1 x 42.2 x 5.0 cm, (20 x 17 x 2 in)
<b>Weight:</b>	3.0 kg (6.5 lb)

## GOES, NESDIS, and Transmit Windows

The TX320 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.

## GOES System Authorization Procedure

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, which is available at:

<http://noaasis.noaa.gov/DCS/htmlfiles/appnewsua.html>

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](mailto:Letecia.Reeves@noaa.gov)

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

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### Notes:

- (1) For applications outside GOES coverage area or users who don't qualify for using the GOES system, transmitters that support METEOSAT, Argos, and INMARSAT 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 product literature. For a more thorough explanation, request the Power Supplies Application Note 5-F. The product literature and application note can be downloaded from our Website: [www.campbellsci.com](http://www.campbellsci.com)

