

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, then transmits the data to a receiving station via the GOES system.

The DCP200 consists of our CR295 datalogger, TX312 HDR GOES satellite transmitter, ENC16/18 enclosure, power supply, and software. The TX312 transmitter supports data transmission rates of 100, 300, and 1200 bps. Because clock accuracy is critically important for GOES satellite telemetry, the TX312 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
- NESDIS-certified transmitter (on February 15, 2005)
- 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

- CR295 GOES Datalogger
- 10873 serial cable for attaching the transmitter to the datalogger
- TX312 HDR GOES satellite transmitter
- 18134 TX312 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

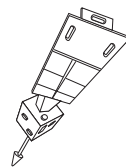
Choose one of the following methods:

- 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)
- Domsat/LRGS
- DRGS (Direct Readout Ground Station)
- Telnet

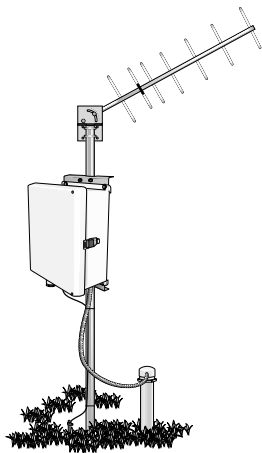


The DCP200's environmental enclosure have six cable entry seals for sensor and power cables and entry seals for the antenna cables. Each entry seal is compressed around one cable to provide an air-tight seal.

GOES Satellite



Residing with the DCP200 are the sensors and the instrument mount



Data Collection Platform (DCP)



Ground Receiving Station

Specifications

TX312 Transmitter

RS-232 Port

Signal Levels: RS232C

Connector: DB9F

Command protocols: ASCII Command Protocol,
Binary Command Protocol (see notes)

SDI-12 Port

Signal Levels: TTL

Connector: 3 terminal Phoenix plug

Protocol: SDI-12 Recorder - version 1.3

Transmission Data Rates: 100, 300, and 1200 bps

Channel Bandwidth:

1.5 kHz @ 100 bps transmission rate

1.5 kHz @ 300 bps transmission rate

3.0 kHz @ 1200 bps transmission rate

Output Power

Complies with NESDIS DCPRS Certification Standards, Section 4. For 1200 bps, it has a nominal EIRP of 51 dBm and a maximum EIRP of 53 dBm, assuming appropriate antenna. For 100/300 bps, it 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

Timekeeping

Setting Accuracy: $\pm 100 \mu\text{s}$ synchronised to GPS

Drift: $\pm 10 \text{ msec/day}$ over -40° to 60°C

GPS Schedule: 1 fix at power up,

1 fix per day afterwards, user adjustable

Transmission Continuation w/o GPS Fix: 28 days

Frequency Range: 401.7 MHz to 402.1 MHz

Frequency Stability

Initial Accuracy: $\pm 20 \text{ Hz}$ disciplined to GPS

Short term drift: $\pm 0.04 \text{ Hz/sec}$

Aging: $\pm 0.1 \text{ PPM/year}$

Vcc + Temperature: $\pm 0.1 \text{ PPM}$

Supply Current (@ 12 Vdc):

5 mA at idle

2.6 A during transmission

Operating Voltage: +10.8 to +16 Vdc

Operating Voltage: +10.8 to +16 Vdc

Temperature Range:

-40° to 60°C operating; -55° to 70°C storage

Weight: 2.1 lbs (0.95 kg)

Dimensions

Height: 6.38" (16.2 cm)

Length: 9.0" (22.86 cm)

Width: 2.0" (5.08 cm)

CR295 Datalogger (see notes)

Temperature Range: -40° to $+50^\circ\text{C}$

Final Storage: 512 kbyte Flash, data format is 4 bytes per data point (table-based)

Program Storage: 6.5 kbyte Flash

Typical Current Drain:

Quiescent: $\sim 0.2 \text{ mA}$

Active: $\sim 3 \text{ mA}$

Available Channels:

5 single-ended analog inputs (SE1-SE5)

2 excitation channels (EX1-EX2)

2 control ports (C1-C2)

4 pulse counters (P_SW, P_LL, C1, C2; P_LL used for low level ac; P_SW used for switch closure; P_LL, C1, and C2 can be used for switch closure using the battery voltage and a 20 kOhm pull-up resistor.)

25316 Antenna

Gain: 11 dBi

Description: Right hand circular polarization

Connector: Type N female

17992 GPS Antenna

Power: 3.3 V active, $< 20 \text{ mA}$

Gain: 30 dBi

Connector: THL connector

Jam resistant

ENC16/18 Enclosure

External dimensions:

17.5" x 22.6" x 12.1" (44 x 57 x 30 cm)

Weight: 17.2 lb (7.8 kg)

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 CR295 is not CE compliant.

Specifications Continued

BP24 Rechargeable Battery

Amp Hour Rating: 24 Ahr

Weight: 22.4 lbs (10.2 kg)

CH100 Regulator

Weight: 5.5 oz (158 g)

SP20 Solar Panel

Current at Peak: 1.19 A

Voltage at Peak: 16.8 V

Dimensions: 20" x 17" x 2" (50.1 x 42.2 x 5.0 cm)

Weight: 6.5 lbs (3.0 kg)

GOES, NESDIS, and Transmit Windows

The TX312 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. 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 form to complete and submit for approval.

DCS Coordinator, NOAA/NESDIS

Federal Office Building

Suitland, Maryland

Phone: (301) 457-5681

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

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

