

Measurement and Control Datalogger

# **Compact Datalogger**

Ideal for small applications





#### **Overview**

The CR300 is a multi-purpose, compact, low-cost measurement and control datalogger. This entry level datalogger, with its rich instruction set, can measure most hydrological, meteorological, environmental and industrial sensors. It will concentrate data, making it available

over varied networks and deliver it using your preferred protocol. The CR300 also performs automated on-site or remote decision making for control and M2M communications. The CR300 is ideal for small applications requiring long-term, remote monitoring and control.

#### **Benefits and Features**

- > Setup easily with PC software and USB connectivity
- Measure with confidence, analog and digital sensors
- Internet ready—Email, FTP, HTTP/Web, TCP
- Trust in the Campbell Scientific quality including integral surge and ESD protection
- Network wirelessly to another node or Internet gateway with integrated radio option
- Communicate from anywhere when using a cellular or satellite peripheral

- Save money and space using the integrated 12 V-battery solarcharge regulator
- Measure smart sensors using RS-232 or SDI-12
- Connect with PakBus, Modbus, DNP3, GOES, and other standard communication protocols
- Analyze and control with programmability and multiple general purpose I/O
- Notify with event driven communications and physical outputs

## **General Specifications**

- **CPU:** ARM Cortex M4, running at 144 MHz
- Internal Memory: 10 MB flash for data storage, 5 MB flash for CPU drive / programs, 2 MB flash for operating system
- **Clock Accuracy:** ±1 min per month
- VSB micro B for direct connection to PC (limited power source during configuration), 2.0 full speed, 12 Mbps
- > RS-232 for connecting RS-232 modems or serial sensors
- **> Battery Terminal Pair (-BAT+)** for regulated 12 V power input or rechargeable 12 V VRLA for UPS mode
- Charge Terminal Pair (-CHG+) for 16 to 32 V from dc power converter or 12 or 24 V solar panel (10 W)



## **General Specifications Continued**

- ➤ One Switched 12 V Terminal (SW12V) for powering sensors or communication devices, 500 mA @ 20°C
- Two Sensor Excitation or Continuous 0.15 to 5 V Terminal (VX1, VX2) for sensor excitation or output control
- > Six Multipurpose Analog Input Terminals (SE1 SE6)
  - Analog functions (SE1 SE6)
  - ◆ Analog inputs: 6 single-ended or 3 differential inputs with -100 to +2500 mV and ±34 mV ranges 24 bit ADC
  - 4 to 20 mA or 0 to 20 mA inputs (SE1, SE2 only)
  - o Digital I/O functions (SE1 SE4) consist of 3.3 V logic levels for:
    - High frequency counter (35 kHz)
    - Pulse width modulation
    - Interrupts and timer input
    - Period average (200 kHz, amplitude dependent)
- > Two Pulse Counting Terminals (P\_SW, P\_LL)
  - o P\_SW
    - Switch closure (150 Hz)
    - High frequency counter (35 kHz)
  - o P\_LL
    - ◆ Low level ac (20 kHz)
    - High frequency counter (20 kHz)

- **Two Control Terminals (C1, C2):** C terminals are software configurable for digital functions
  - Digital I/O functions consist of 5 V output and 3.3 V input logic levels for:
    - ◆ SDI-12
    - High frequency counter (3 kHz)
    - Switch closure (150 Hz)
    - General status/control
    - Voltage source 5 V: 10 mA @ 3.5 V
    - Interrupts
    - Serial asynchronous communication Tx/Rx pair
- **Best Analog Accuracy:**  $\pm (0.04\% \text{ of reading } \pm 6 \,\mu\text{V})$ , 0° to 40°C
- Best Effective Resolution: 0.23 μV (±34 mV range, differential measurement, input reversal, 50/60 Hz f<sub>N1</sub>)
- **→ Operating Temperature Range:** -40° to +70°C
- **Weight**

CR300: 242 g (0.53 lb)

CR300-RF407/412/422: 249.5 g (0.55 lb)

- **Dimensions:** 14.0 x 7.6 x 5.1 cm (5.5 x 3.0 x 2.0 in)
- **Compliance Information:** View the CR300 EU Declaration of

Conformity at: <a href="https://www.campbellsci.com/cr300">www.campbellsci.com/cr300</a>

#### **Terminal Functions**

Each terminal may only take on one function.

Analog Input Function	<b>C1</b>	C2	P_SW	P_LL	VX1	VX2	SE1	SE2	SE3	SE4	SE5	SE6	RS-232	SW12	Max
Single Ended Voltage							✓	✓	✓	✓	✓	✓			6
Differential Voltage							Н	L	Н	L	Н	L			3
4 to 20 or 0 to 20 mA							✓	✓							2
Analog Output Function	<b>C</b> 1	C2	P_SW	P_LL	VX1	VX2	SE1	SE2	SE3	SE4	SE5	SE6	RS-232	SW12	Max
Switched-Voltage Excitation					✓	✓									2
5 V Source	✓	✓			✓	✓									4
12 V Source														✓	1
Digital I/O Function	<b>C</b> 1	C2	P_SW	P_LL	VX1	VX2	SE1	SE2	SE3	SE4	SE5	SE6	RS-232	SW12	Max
RS-232													✓		1
RS-232 0-5V	Tx	Rx													1
SDI-12	✓	✓													2
Pulse-Width Modulation							✓	✓	✓	✓					4
Timer Input							✓	✓	✓	✓					4
Period Average							✓	✓	✓	✓					4
Interrupt	✓	✓					✓	✓	✓	✓					6
General I/O	✓	✓	✓				✓	✓	✓	✓					7
Pulse Counting Function	<b>C</b> 1	C2	P_SW	P_LL	VX1	VX2	SE1	SE2	SE3	SE4	SE5	SE6	RS-232	SW12	Max
Switch Closure	✓	✓	✓												3
High Frequency	✓	✓	✓	✓			✓	✓	✓	✓					8
Low Level AC				✓											1

### CR300-RF407, CR300-RF412 Specifications

#### Frequency Hopping Spread Spectrum Radios (FHSS)

- **>** Transmit
  - o Output Power: 5 to 250 mW, user selectable
  - Frequency
    - ◆ RF407: 902 to 928 MHz (US, Canada)
    - RF412: 915 to 928 MHz (Australia, New Zealand)
  - Channel Capacity
    - RF407: Eight 25-channel hop sequences sharing 64 available channels
    - RF412: Eight 25-channel hop sequences sharing 31 available channels
  - o RF Data Rates: 200 kbps
- > Receive Sensitivity: -101 dBm
- Antenna Connector: RPSMA (external antenna required; see www.campbellsci.com/order/cr300 for Campbell Scientific antennas)

#### Average Additional Current Contribution @ 12 Vdc

Transmit: 45 mAIdle On: 12 mA

Idle 0.5 s Power Mode: 4 mA
Idle 1 s Power Mode: 3 mA
Idle 4 s Power Mode: 1.5 mA

#### Compliance Information

- ) CR300-RF407
  - o United States: FCC Part 15.247: MCQ-XB900HP
- o Industry Canada: IC: 1846A-XB900HP
- CR300-RF412
  - O ACMA RCM
  - o United States: FCC Part 15.247: MCQ-XB900HP
  - o Industry Canada: IC: 1846A-XB900HP

## **CR300-RF422 Specifications**

## F868 MHz SRD 860 Radio with Listen Before Talk (LBT) and Automatic Frequency Agility (AFA)

- **>** Transmit
  - Output Power: 2 to 25 mW, user selectable
  - o Frequency: 863 to 870 MHz (European Union)
  - Channel Capacity: 30 channels (default), software configurable for meeting local regulations; 10 sequences for reducing interference through channel hop
  - o RF Data Rates: 10 kbps
- > Receive Sensitivity: -106 dBm
- Antenna Connector: RPSMA (external antenna required)

#### *Average Additional Current Contribution @ 12 Vdc*

> Transmit: 20 mA > Idle On: 9.5 mA

Idle 0.5 s Power Mode: 3.5 mA
Idle 1 s Power Mode: 2.5 mA
Idle 4 s Power Mode: 1.5 mA

#### Compliance Information

➤ View the CR300-RF422 EU Declaration of Conformity at: www.campbellsci.com/cr300

