CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

CELL220
4G LTE CAT1 Cellular Module for Australia and New Zealand

Simple to Use, Easy to Maintain

Low-power option for use in Australia and New Zealand

Overview

By using Campbell Scientific's external line of cellular modules, system integrators, OEMs, and large end users can avoid costly, time-consuming maintenance visits to remote devices around the world.

The CELL200 series of external cellular modules are 4G LTE cellular devices that provide serial or CS I/O connectivity to a number of cellular networks, including Verizon, AT&T, T-Mobile USA, Rogers, Bell, Telstra, and Telus. The networking and carrier used by the CELL200 series is determined by the model used and the SIM card inserted into the device.

The CELL220 has very low power consumption when compared to other cellular modems: 14 mA at idle, 39 mA when active, and 300 µA when in low power mode.

When coupled with Campbell Scientific data services, these devices are ready for you to use out of the box. There is no need for you to work with cellular carriers for provisioning and experience the accompanying hassle.

The CELL220 is part of the CELL200 series of modems that includes:

❯ CELL205 for use with AT&T

❯ CELL210 for use with Verizon

❯ CELL215 for use in EMEA countries

❯ CELL220 for use in Australia and New Zealand

❯ CELL225 for use in Japan

Note: The CELL220 does not ship with a SIM card unless the cellular modem was provisioned with/for Campbell Scientific cellular data services; the SIM card is provided by the carrier when signing up for service. For more information, visit the Cellular Data Services page.

Benefits and Features

❯ Includes everything needed for use with a Campbell Scientific data logger or smart sensor

❯ Low power consumption for solar-powered sites

❯ Easy integration, setup, and installation

❯ No moving parts and low maintenance

❯ Functionality is fully integrated with data logger when used with modern data loggers (CR300, CR1000X, CR6, GRANITE series)

❯ Compatible with older data loggers in PPP mode (CR800, CR1000, CR3000)

❯ Compatible with Edlog-era data loggers in serial server mode

❯ 4G LTE networking (Including LTE Band 28) with 3G fallback

Detailed Description

The CELL220 is an industrial 4G LTE cellular module. It requires at least one micro-SIM 3FF card (for six position/contacts interface) supplied by your cellular carrier and a suitable 12 or 24 Vdc nominal power source. The CELL220 has an RS-232 serial port and a CS I/O port that can be used for serial server, serial client, and PPP host services. These ports are commonly connected to a data logger RS-232 serial or CS I/O port. The CELL220 has two antenna connectors to be used for primary and diversity antennas, although the unit can operate with only the primary cellular antenna connected.

Internet Connectivity

The CELL220 provides Internet connectivity to any Campbell Scientific data logger located within range of a compatible cellular network. Armed with Internet connectivity, a data logger can remotely connect to Campbell Scientific software on a PC, mobile device, and the cloud. The CELL220 can also enable many data loggers to communicate using other Internet protocols, such as FTP, DNP3, email and web (HTTP).

Device Intelligence

The CELL220 provides highly reliable connectivity and remote device management independent of the device it is connected to. The numerous embedded services include IP serial server and client.

Selecting a Data Service

Before installing a data logging system with telemetry, you will need a SIM card and data plan.

For most applications, Telstra will offer the best coverage, especially in regional areas. Telstra and Optus coverage maps can be found on each provider's respective websites.

The CELL220 will work with standard data plans. No extra steps are necessary because of the complimentary Konect Pakbus Router service.

Configuring the CELL220

The CELL220 is configured using a web-based configuration tool hosted by the cellular module. It can be accessed using Internet Explorer or Firefox remotely over the cellular WAN (when in serial server mode) or via USB.
The CELL220 can also be configured directly from the data logger when used in PPP mode (default mode) using the Device Configuration Utility or CRBasic instructions.

Data Logger Connection

Data loggers can be connected in a variety of ways to suit the needs of the application. Common methods include the use of serial or CS I/O cables. Common methods include the use of serial or CS I/O cables. CS I/O connection powers the modem and allows connection of two peripherals to one data logger e.g. a CELL220 and RF412 radio.

Powering the CELL220

Compared to many other industrial cellular modules, the CELL220 has extremely low power consumption. The average current consumption at 12 Vdc is approximately 14 mA when idle, depending on its configuration. Additionally, the CELL220 can be turned on and off easily using a data logger SW12V port or the **IPNetPower()** instruction (PPP mode for the CR1000X, CR300, and CR6 only). When using the SW12V terminal, the modem can typically be powered with a BP12 battery, a CH150 charging regulator, and an SP10 solar panel.

Antennas

Campbell Scientific offers two antenna options for the CELL220 – an enclosure mounted MIMO antenna and an external whip antenna. For most applications, the enclosure mounted ANT-RV50(X)/CELL220-ENC-0.6M is recommended. This antenna connects directly to the modem. For applications requiring discrete antennas, a pair of ANT 6.5DB-4GX-N antennas can be used. External antennas require surge suppression kits, contact Campbell Scientific for more information.

SMS Functionality (coming soon)

The CELL220 will initially be released without support for SMS functionality and this feature will be added in a future operating system release once suitable for Australia's demanding SMS applications. When SMS becomes available in a future operating system version, any purchased CELL220 will be field upgradeable with SMS functionality. Cellular service and available mobile data is required for over-the-air operating system updates.

Sample Programs

❯ View this sample program for how to use some of the terminal commands with CELL2XX modules.

❯ To use the SetSettings functionality with the CR300, CR310, CR6, and CR1000X dataloggers, view this sample program.

Specifications

Certifications	IC (Industry Canada) 10224A-201611EC21A
Host Interface	❯ USB version 2.0 with micro-B connector ❯ CS I/O communications port, DB9 male

	❯ RS-232 serial port, DB9 female
RF Connectors	2 SMA antenna connectors (primary and diversity)
Operating Temperature Range	-40° to +80°C

SIM Interface	3FF (6 position/contacts) Supports SIMs that require 1.8 or 3 Vdc.
Dimensions	13.46 x 8.1 x 2.86 cm (5.3 x 3.19 x 1.13 in.)
Weight	215.5 g (7.6 oz)

Cellular WAN (EC-21AUT)

Network Technology	4G LTE CAT-1 (with automatic fallback to 3G)
Carrier Approval	Telstra
LTE	2100(B1), 1800(B3), 850(B5), 2600(B7), 700(B28)
WCDMA	1900(B1), 850(B5)

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Network Technology	4G LTE CAT-1 (with automatic fallback to 3G)
Carrier Approval	Telstra
LTE	LTE 2100(B1), 1900(B2), 1800(B3), 1700/2100(B4), 2600(B7), 900(B8), 700(B28)

WCDMA	2100(B1), 1900(B2), 850(B5), 900(B8)

Data Speeds

LTE	❭ Max 10 Mbps (download) ❭ Max 5 Mbps (upload)
WCDMA	❭ Max 384 Kbps (upload) ❭ Max 384 Kbps (download)
GSM EDGE	❭ Max 296 Kbps (download) ❭ Max 236.8 Kbps (upload)
GSM GPRS	❭ Max 85.6 Kbps (upload) ❭ Max 107 Kbps (download)
RS-232 or CS I/O	9600 bps to 460.8 kps

Power Consumption

Low Power Mode	300 µA
Idle	14 mA
Active	39 mA

Radio Output and Sensitivity

Output Power	❭ 23 dBm on LTE ❭ 24 dBm on UMTS
Sensitivity Range	-99.5 to 110.5 dBm (10 M)

For comprehensive details, visit: www.campbellsci.com.au/cell220