



## NL115 Ethernet Interface and CompactFlash® Module



## Connectivity and Data Storage

Ethernet and memory  
card connections

### Overview

Campbell Scientific's NL115 enables 10baseT Ethernet communications and stores data on a removable CompactFlash® card. This small, rugged communication

device connects to the 40-pin peripheral port on a CR1000 or CR3000 datalogger.

### Benefits and Features

- › Provides Ethernet communications and additional data storage for CR1000 or CR3000 dataloggers
- › Ethernet connection allows for datalogger communications over a local area network or the Internet via TCP/IP
- › Removable CompactFlash cards for long-term data storage
- › Small, lightweight CF cards fit in your pocket for easy transport between the datalogger and PC

### Ethernet Communications

The NL115 allows the datalogger to communicate over a local network or a dedicated Internet connection via TCP/IP. A 10baseT Ethernet straight through cable is used when the cable is run from a hub to the NL115. A 10baseT Ethernet crossover cable is used if the cable is run directly from the computer to the NL115. For cable length longer than 3 m, the 10baseT Ethernet cable must be shielded.

An optional surge protector is available for long cable runs outside.

The NL115 is set up using the Device Configuration Utility (DevConfig). DevConfig is bundled with our PC400 and LoggerNet software and can also be downloaded, at no charge, from: [www.campbellsci.com/downloads](http://www.campbellsci.com/downloads)

### Data Storage on CompactFlash Cards

One Type I or Type II Compact-Flash (CF) card fits in the NL115's card slot. Campbell Scientific recommends and offers industrial-grade CF cards because consumer-grade cards are more susceptible to failure. Industrial-grade cards also function over wider temperature ranges and have longer life spans than consumer-grade cards.

The NL115/CF card combination can be used to expand the datalogger's memory, transport data/programs from the field site(s) to the office, and store JPEG images when the CC640 digital camera is connected to the datalogger. You can retrieve data stored on the card through a communications link with the datalogger or by removing the card and carrying it to a computer. The computer can read the CF card either with the computer's PCMCIA slot and the CF1 adapter or the computer's USB port and suitable CompactFlash card Reader/Writer.

## Data Retrieval

The NL115/CF card combination can be used to expand the datalogger's memory, transport data/programs from the field site(s) to the office, and upload power up functions.

The computer can read the CF card either with the computer's PCMCIA slot and the CF1 adapter or with the computer's USB port and the 010425 Reader/Writer.



## Ordering Information

### Ethernet Interface and CompactFlash® Module

**NL115** Ethernet Interface and CompactFlash Module for CR1000 or CR3000 dataloggers.

### Temperature Range

**-ST** Standard temperature range -25° to +50°C  
**-XT** Extended temperature range -40° to +85°C

### Ethernet Cables

**007006** 10baseT Ethernet straight through cable 2 m (6 ft). Recommended when the cable is run from a hub.  
**007018** 10baseT Ethernet crossover cable 3 m (10 ft). Recommended if the cable is run directly from the computer.

### Surge Suppressor

**009003** Ethernet Surge Protector helps protect device from electrical surges. A straight-through Ethernet cable is used to connect the 009003 to the NL115. Another Ethernet cable (007006 2m) is used to connect the 009003 to the computer or hub.

### Reader/Writer or Adapter

**010425** USB 2.0 Reader/Writer for Memory Cards  
**CF1** SanDisk® CompactFlash Adapter for PCMCIA Slots

### CompactFlash Cards

**CFMC256M** 256 MB Industrial-grade CompactFlash Memory Card. The card is formatted as FAT32.  
**CFMC2G** 2 GB Industrial-grade CompactFlash Memory Card. The card is formatted as FAT32.  
**CFMC16G** 16 GB Industrial-grade CompactFlash Memory Card. The card is formatted as FAT32. The datalogger operating system must be OS 25 or later to read this card.



The CF1 adapter allows data stored on a CF card to be read by a computer's PCMCIA slot.

## Specifications

- › CE Compliant Devices: NL115, 010425 USB Reader/Writer

### **NL115**

- › Typical Access Speed: 200 to 400 kbits s<sup>-1</sup>
- › Memory Configuration: User selectable; ring (default) or fill-and-stop
- › Power Requirements: 12 V supplied through the datalogger's peripheral port
- › CF Card Requirements: Industrial grade
- › Datalogger Operating System (OS): The CR1000 OS must be OS 9 or later. Both the CR1000 and CR3000 need OS 25 or later to read cards with more than 2 GB of storage.
- › Dimensions: 10.2 x 8.9 x 6.4 cm (4.0 x 3.5 x 2.5 in.)
- › Weight: 154 g (5.4 oz)
- › Cable Requirements: Ethernet cable must be shielded if the length is greater than 9 ft

### **Temperature Range**

- › Standard: -25° to +50°C
- › Extended: -40° to +85°C

### **Typical Current Drain**

- › CR1000 w/ NL115, no Ethernet cable attached, not actively communicating over Ethernet nor accessing the CF card: 19 mA
- › CR1000 w/ NL115, Ethernet cable attached: 20 mA
- › CR1000 w/NL115, Ethernet cable attached and communicating over Ethernet: 20 mA
- › CR1000 w/NL115 communicating over Ethernet and accessing CF card: 43 mA
- › CR1000 w/ NL115, Ethernet port has been put to sleep using the IPNetPower() CRBasic Instruction: 2 mA
- › Add 1 mA to current drain if red or green Status LED is continuously on
- › Add 2 mA to current drain if orange Status LED is continuously on

### **EMI and ESD Protection**

- › Meets requirements for a class A device under European Standards
- › Application of Council Directive(s): 89/336/EEC as amended by 89/336/EEC and 93/68/EEC
- › Standards to which Conformity is Declared: EN55022-1; 1995 and EN50082-1: 1992

### **Software Requirements**

- › LoggerNet: Version 3.2 or later
- › PC400: Version 1.3 or later
- › DevConfig: Version 1.5 or later

### **CFMC256M, CFMC2G, and CFMC16G**

- › Manufacturer: FMJ
- › Card Description: Industry standard Type I
- › Storage Capacity: 256 MB, 2 GB, or 16 GB
- › Operating Temperature: -40° to +85°C
- › Storage Temperature:
  - 55° to +125°C (CFMC256M, CFMC2G);
  - 50° to +100°C (CFMC16G)
- › Compliancy: RoHS
- › Card Format: FAT32
- › Dimensions: 4.28 x 3.64 x 0.33 cm (1.69 x 1.43 x 0.13 in.)
- › Weight: 10 g (0.35 oz)

### **010425 USB Reader/Writer**

- › Dimensions: 8.9 x 6.9 x 1.9 cm (3.5 x 2.7 x 0.75 in)
- › Weight: 102 g (3.6 oz)
- › Operating Temperature: 0° to 60°C
- › Storage Temperature: -20° to 85°C

### **Minimum Computer Requirements**

- › Windows 8, 7, Vista (SP1, SP2), XP (SP3) 2000 (SP4); MAC OS X v. 10.6.x+; or Linux v. 2.6.x+
- › USB Port: USB 2.0 or 3.0

### **CF1 Adapter**

- › Manufacturer: SanDisk
- › Dimensions: 8.6 x 5.4 x 0.5 cm (3.4 x 2.1 x 0.2 in.)