

## Using the Lantronix UDS-10 Device Server Application Note #14

### Overview

The Lantronix UDS-10 Device Server provides a quick, simple and cost-effective way to bring the advantages of data accessibility and remote management to Campbell Scientific dataloggers. It includes an RS-232 port for direct connection to a single datalogger as well as RS-422 (4-wire) and RS-485 (2-wire) so a single UDS-10 can interface networks of dataloggers using inexpensive 1 or 2 pair cable. This Application Note will provide wiring and configuration information to allow connecting this device to Campbell dataloggers with a standard CSI I/O connector, such as the CR10X, CR510, etc., as well as the Campbell CR2xx dataloggers which include an RS-232 connector. The UDS-10 can be used in place of the Campbell Scientific NL100. Contact Canary Systems for compatibility information with other dataloggers, as well as pricing and delivery.

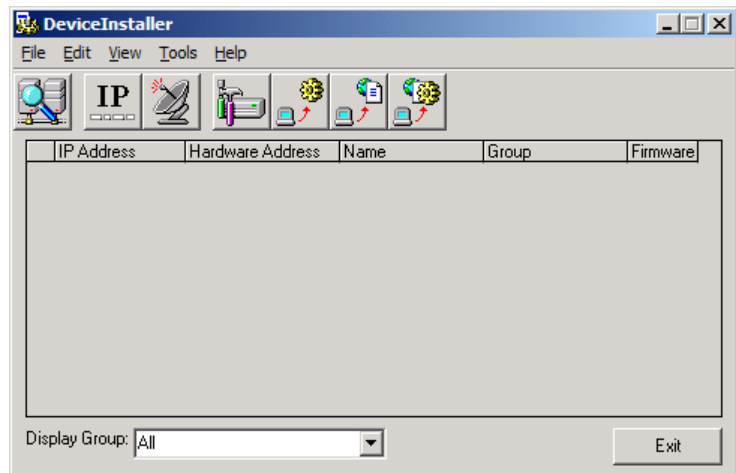


The UDS-10 User Guide is available in the Canary Systems support directory, more information on the product, including latest firmware and other support information is available from the Lantronix website at [www.lantronix.com](http://www.lantronix.com)

### Lantronix DeviceInstaller Software

Before attempting to physically connect the data acquisition hardware it is suggested that the devices be configured and tested over the network to be utilized for access to the data acquisition hardware. Use the supplied Lantronix Installation CD to install the **DeviceInstaller** software. This software is used to locate, configure and manage the UDS-10's used to communicate with your data acquisition hardware.

After installation locate the DeviceInstaller icon and start the software. A screen similar to that depicted at right should display. Make sure power is supplied to the UDS-10 and a network cable is connected and functioning (the **Link** LED on the UDS-10 should be lit, do not proceed if the light is NOT lit). Contact your system administrator for assistance with connecting and configuring the UDS-10.



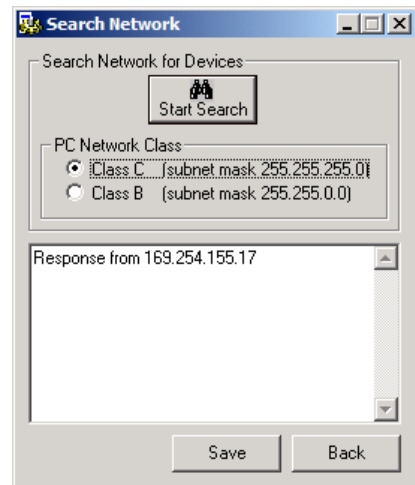
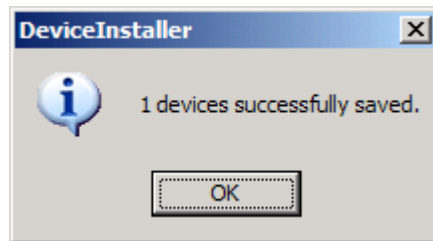
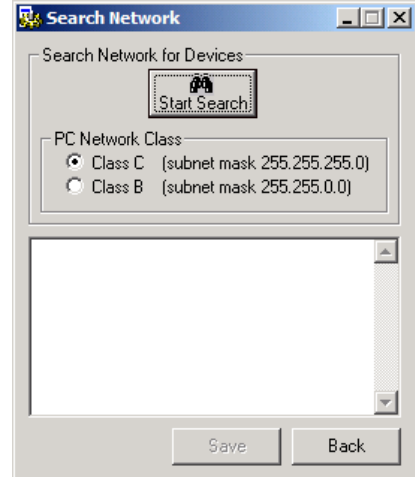
Press the search button, the left most button on the toolbar below the menu. This will allow you to search for all UDS-10 devices. A Search Network form shown at right will display. Generally you should search on Class C networks, these are networks with the 1<sup>st</sup> three numbers of the IP address in common, e.g. 192.168.0.12 and 192.168.0.13 Class B networks have the 1<sup>st</sup> two numbers of the IP address in common, e.g. 192.168.3.40 and 192.168.6.90

Contact your system administrator for assistance with the Class selection. Generally speaking local area networks are deployed with a Class C subnet mask.

Press the **Start Search** button to begin searching the network.

After a few moments the edit should update with any UDS-10 devices that have been found, as shown at right.

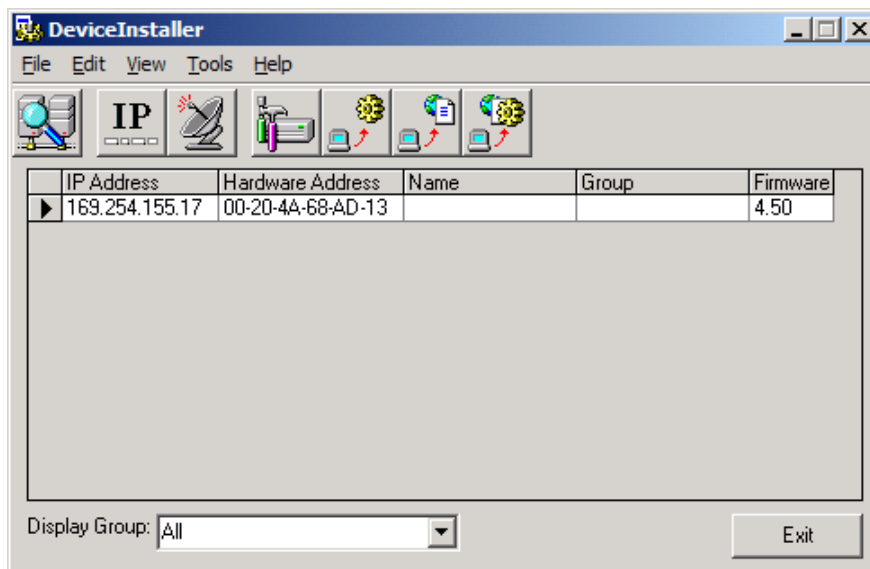
Press **Save** to save this IP address to the **DeviceInstaller** manager.



Press **Back** after saving the IP address.

Note: If no IP's are found in the list then check with your system administrator regarding your network configuration. If the device cannot be found then it cannot be configured for correct operation with your data acquisition system.

The **DeviceInstaller** main form will display, with added device shown.



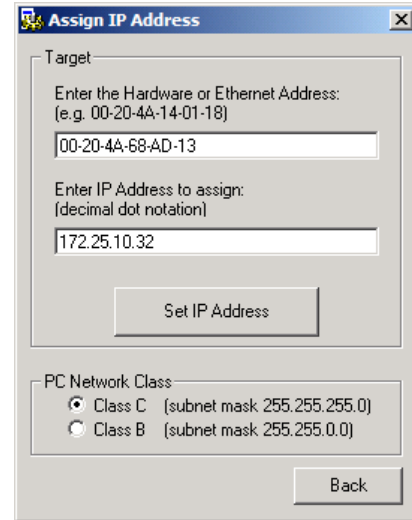
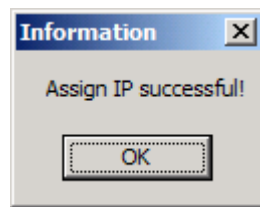
Following are the two minimum configuration items for using the UDS-10 with the Campbell data acquisition hardware, others depending on your network configuration may also require modification.

- **IP address** – To configure the unique address of the UDS-10.
- **Interface Mode** – To configure the RS-232/RS-485 port.

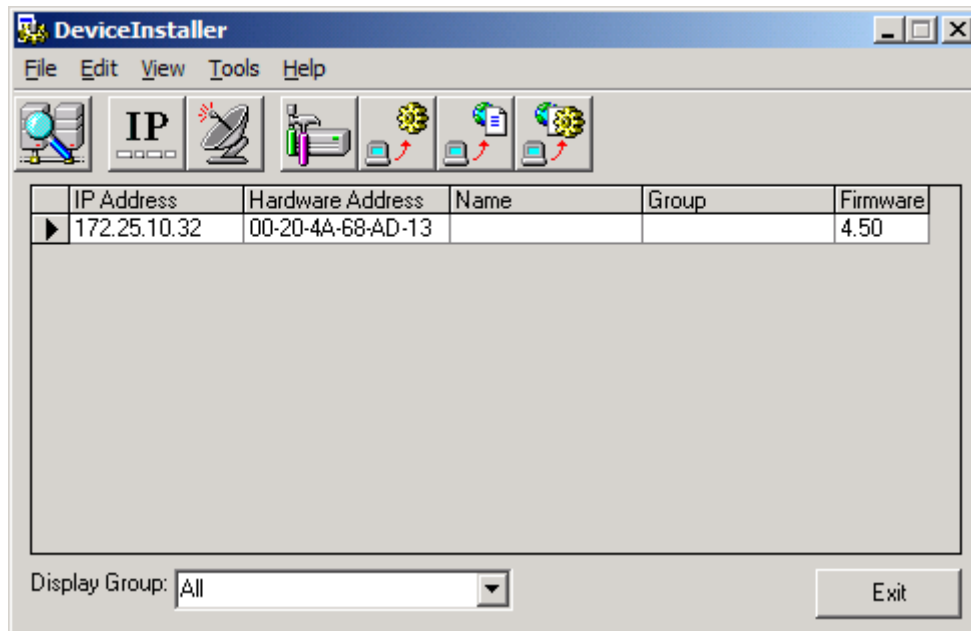
### IP Address

Use the menu item **Tools | Assign IP Address** to display the Assign IP Address form. Enter the IP address to be assigned to this device. Note: This IP Address must be unique to your network, contact your system administrator for assistance with setting the IP Address. Unique addresses for deployment over the Internet must be licensed from an appropriate licensing company.

Press **Set IP Address** to set the address. DeviceInstaller will attempt to verify the unique address, then it will assign the address, then finally it will Ping or test to make sure the address is working correctly. If all these steps complete successfully then the following message will display.




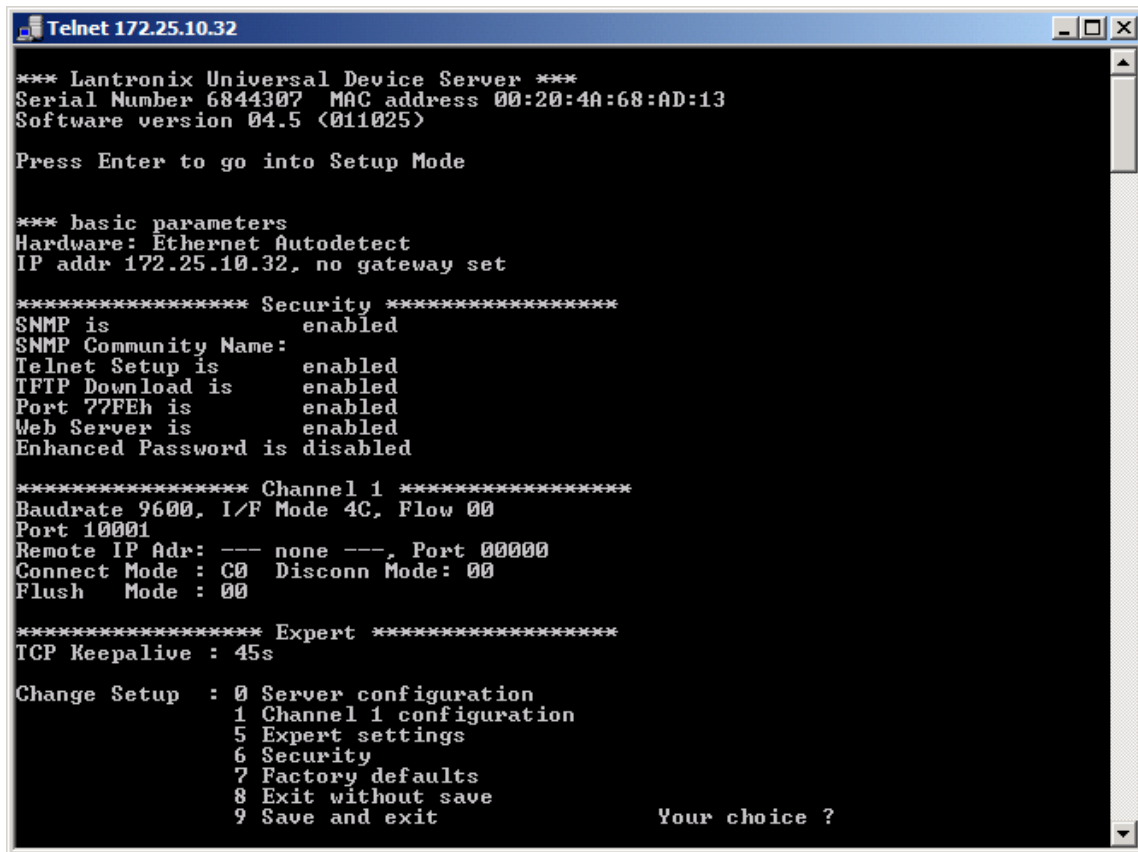
Press **Back** to return to the DeviceInstaller main form.



You are now ready to complete the configuration.

## Interface Mode

Press the **Manage Device Configuration** button  on the toolbar, or select the menu item **Tools | Device Manager** (or press <F5>). This will display the Device Management form. Press the **Telnet to Device** button at the bottom. This will open 2 forms, one to select the port (default is 9999), the other is the Telnet Window. Telnet is a text based terminal used for connecting to and configuring devices over TCP/IP connections. Press <ENTER> to enter Setup Mode of the UDS-10.



```
Telnet 172.25.10.32
*** Lantronix Universal Device Server ***
Serial Number 6844307  MAC address 00:20:4A:68:AD:13
Software version 04.5 (011025)

Press Enter to go into Setup Mode

*** basic parameters
Hardware: Ethernet Autodetect
IP addr 172.25.10.32, no gateway set

***** Security *****
SNMP is          enabled
SNMP Community Name:
Telnet Setup is  enabled
TFTP Download is enabled
Port 77FEh is    enabled
Web Server is    enabled
Enhanced Password is disabled

***** Channel 1 *****
Baudrate 9600, I/F Mode 4C, Flow 00
Port 10001
Remote IP Addr: --- none ---, Port 00000
Connect Mode : C0  Disconn Mode: 00
Flush  Mode : 00

***** Expert *****
TCP Keepalive : 45s

Change Setup  : 0 Server configuration
                1 Channel 1 configuration
                5 Expert settings
                6 Security
                7 Factory defaults
                8 Exit without save
                9 Save and exit

Your choice ?
```

Press 1 <ENTER> to configure Channel 1, or the serial I/O channel. You will notice various parameters are presented, enter a new value as required and then press <ENTER> to advance to the next parameter, or simply press <ENTER> to advance without making any changes.

The first parameter is the baud rate, press <ENTER> to leave the default of 9600. The second parameter is **I/F Mode (4C)?** This is the configuration for the serial port, the default is code 4C, which specifies RS-232C, 8-bit, No Parity and 1 stop bit. This setting is correct when using the UDS-10 with RS-232 communications, i.e. direct connection to a datalogger. The following table lists other commonly used codes. Consult the UDS-10 Device Server Installation Guide for more information on this setting (see page 4-5).

Code	Configuration
4C	Default. RS-232 communications, 8-bit, No Parity, 1 stop bit.
4D	RS-485 4-wire, 8-bit, No Parity, 1 stop bit.
4F	RS-485 2-wire, 8-bit, No Parity, 1 stop bit.

Advance through the remaining parameters until the main menu appears, press **9** <ENTER> to **Save and exit**.

Close the Telnet window, then close the **Telnet to Device** form. Press **Back** on the Device Management form to return to the **DeviceInstaller** main form.

You are now ready to connect the UDS-10 to your data acquisition hardware and setup MultiLogger.

**Note: There are other settings in the UDS-10 that may need to be configured for operation in more complex networking/Internet environment. The default passwords and port settings may also be changed to increase security. Review the supplied documentation for the UDS-10 or contact Canary Systems for assistance with your application.**

### Wiring

The DB-25 connector on the UDS-10 supports standard RS-232C communications, RS-485 (2-wire) or RS-422 (4-wire) communications. In addition the UDS-10 can be powered using a regulated (5VDC) or unregulated source (9-30VDC) by accessing the appropriate connections on the DB-25 connector.

Pin Male DB-25	Name	Description	CR2xx Male DB-9	CSI I/O Male DB-9
2	TX (in)	Transmit Data	2 (White)	9 (White)
3	RX (out)	Receive Data	3 (Green)	4 (Green)
4	RTS (in)	Request to Send		
5	CTS (out)	Clear to Send		
6	DSR (out)	Data Set Ready	4 (Red)	3 (Red)
7	GND	Ground	5 (Black)	2 (Black)
8	DCD (out)	Data Carrier Detect		
9	+5VDV	Regulated power in		
12	+9-30VDC	Unregulated power in		
14	TX+ (TXB)	RS-422/485 Transmit +		
15	TX- (TXA)	RS-422/485 Transmit -		
20	DTR (in)	Data Terminal Ready		
21	RX+ (RXB)	RS-422/485 Receive +		
22	RX- (RXA)	RS-422/485 Receive -		

#### Notes:

1. Connector type and sex is specified for the interconnecting cables.
2. DTR handling on the UDS-10 is set to Ignore by default.
3. For RS-232 operation jumper pins 4 & 5 together.
4. For 2-wire RS-485 operation wire pins 14 (TX+) and 21 (RX+) together and pins 15 (TX-) and 22 (RX-) together.

Power must also be supplied to the UDS-10 using the supplied AC adaptor or via the connections on the DB-25 connector. The UDS-10 may require up to 250mA from the unregulated power input, with a nominal 12VDC supply typical quiescent current drain is 60mA, typical operating current is 85mA.

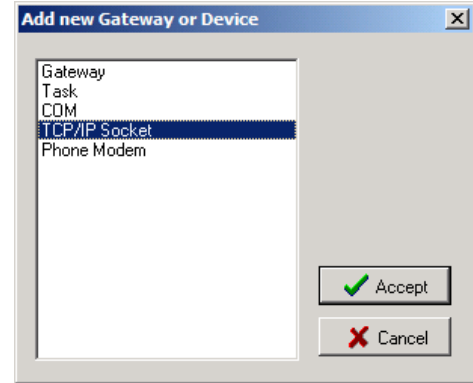
## **MultiLogger Software Configuration**

NOTE: The following configuration guidelines require MultiLogger version 2.2 or higher! Contact Canary Systems to obtain upgrade information if you have an older version of the software. Software updates are available without charge to registered users via the Canary Systems website.

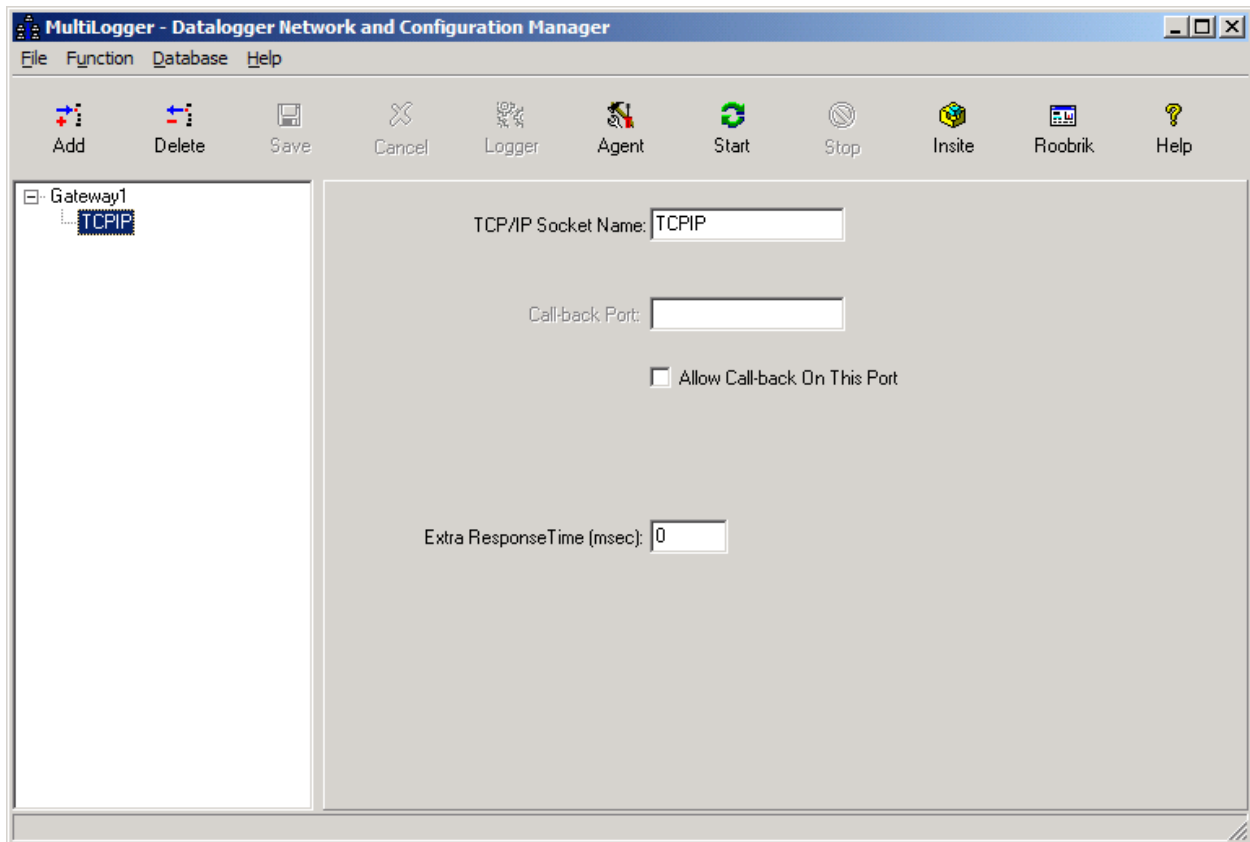
Beginning with MultiLogger version 2.2 TCP/IP socket devices are natively supported.

Notice at the **Gateway** level that when you click **Add**, a **TCP/IP Socket** device will be listed, as shown.

Select **TCP/IP Socket** then click **Accept** to add the device to your selected Gateway.



Rename the device as desired, the example below shows the TCP/IP Device renamed to TCPIP.



Be sure to save changes after adding the device and renaming.

Select the **TCPIP** device, click **Add** again. You are now ready to add your data acquisition hardware.

## Adding non-CR2xx Hardware

To add a non-CR2xx type datalogger simply select the type from the list, for example **CR10X Datalogger** is shown below. Enter the IP address previously set in the UDS-10 in the datalogger configuration panel, with the default port number, in the format shown. It is usually recommended to include some **Extra Response Time**, more or less depending on the anticipated network traffic delays, the example shown depicts 0.5 seconds of possible delay.

**Note: If you changed the default port setting of the UDS-10 be sure to use that setting in the configuration.**

MultiLogger - Datalogger Network and Configuration Manager

File Function Database Help

Add Delete Save Cancel Logger Agent Start Stop Insite Roobrik Help

Gateway1  
TCPIP  
CR10X1

CR10X Datalogger Name: CR10X1

IP Address, Port (xxx.xxx.xxx.xxx:port): 172.25.10.32:10001

Security Code: 0  Agent Collects Data

Extra Response Time (msec): 500  Automatic Database Import

Set Clock If More Than 0 Seconds Off. Clock Offset (hrs): 0

Maximum Time On-line (sec): 7200

Maximum Packet Size: 2048

Configuration File: CR10X1.cfg

Project Path: C:\Program Files\Borland\Delphi5\Bin\TCP\

Description:

Datalogger ID: 1

Last Updated:

Last Data Collection:

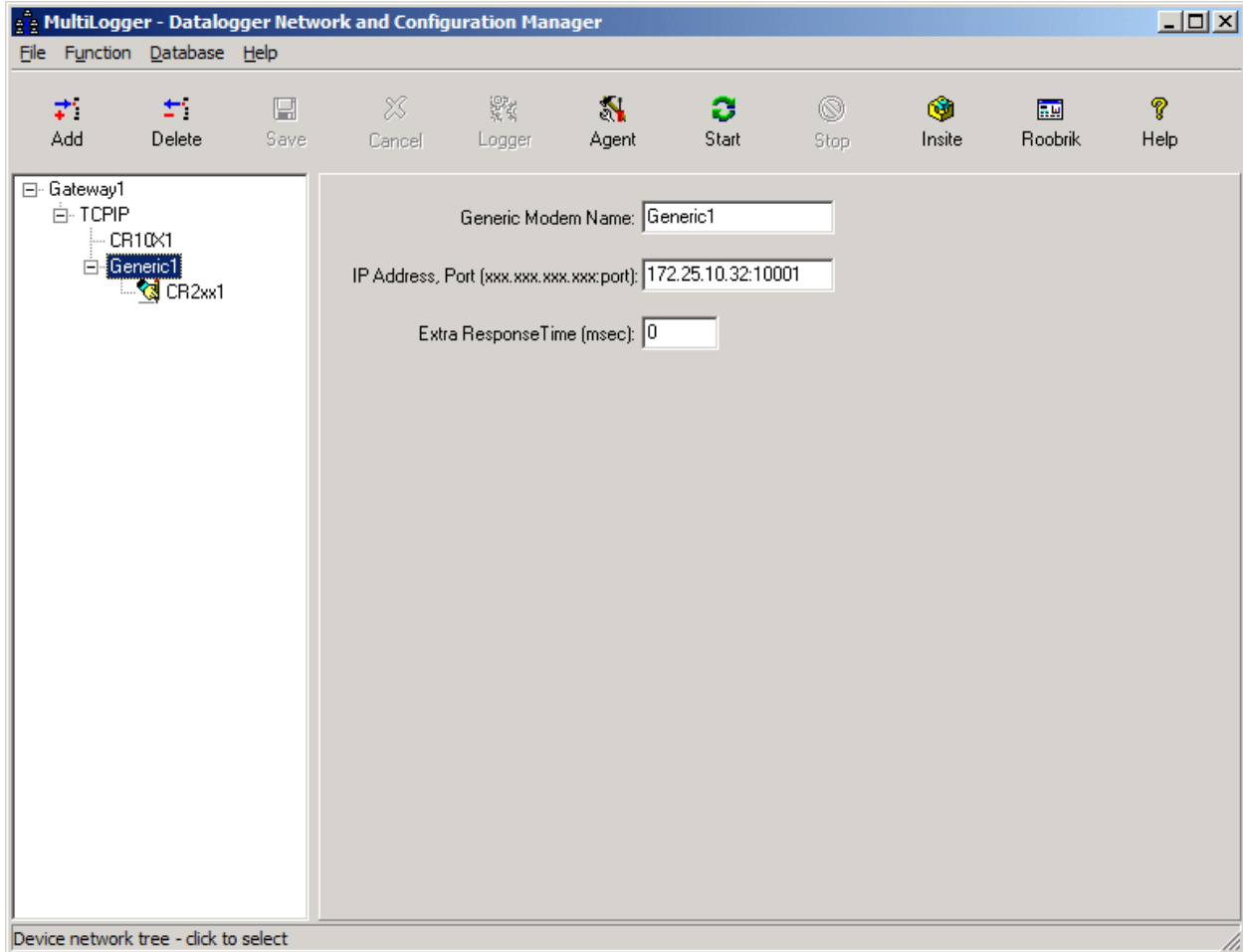
Last Battery Voltage:

After Call-back Do: <none>

You may also enter this **Extra Response Time** on the TCPIP device.

## Adding CR2xx Hardware

You will need to add an additional device, a **Generic Modem**, between the TCPIP device and the CR2xx dataloggers, this is required because the CR2xx utilizes an addressable protocol called PakBus, the CR2xx configuration panel is used to specify the address of the datalogger. CR2xx addresses are set using the Campbell Scientific PakCom software.



If a single UDS-10 is being used to access a network of CR2xx dataloggers, networked together using any type of commercially available RS-232 to RS-422/485 converter, then simply add the CR2xx devices to the **Generic Modem** shown above, with each CR2xx node specifying its unique address. You cannot have multiple CR2xx dataloggers networked together sharing the same datalogger address.



The CR2xx configuration is shown below. Note the CR2xx address in the address field of the CR2xx configuration panel.

