comnet
Communication Networks

INSTALLATION AND OPERATION MANUAL

CNFE8(X)COE

CONTACT OVER ETHERNET MODULES

V1.0 – April 2010

The contact-mapping ComNet™ CNFE8(X)COE transmits eight contact closures over an Ethernet network. It is available with a 10/100TX RJ45 Ethernet connector and an SFP fiber optic interface. These units can be one-to-one mapped over Ethernet or controlled via a PC. Included is a driver that allows the CoE to read or write contact information from a PC based application. A software utility allows customers to search for this device that is installed on the network. The CNFE8TCOE transmitter and CNFE8RCOE receiver support Windows® Discovery. Distances depend on which SFP (Small Form Pluggable) module is used. The CNFE8(X)COE is environmentally hardened to operate in extreme temperatures. LED indicators are provided for confirming operating status. Packaged in the ComNet ComFit housing, these units may be either wall, rack, or DIN-rail mounted with the addition of the ComNet DINBKT1 adaptor plate.

Content

Hardware description

The ComNet™ CNFE8TCOE/CNFE8RCOE contact over Ethernet module supports up to 8 uni-directional contact closures over Cat5/6 cable, or 1 or 2 optical fibers. All configurations are done through their web servers. The CNFE8TCOE has eight contact inputs, and the CNFE8RCOE has eight contact outputs, which communicate through the network. Distances depend on which SFP (Small Form Pluggable) module is used. The RJ45 Ethernet connector is included and is automatically disabled if the optical interface is used.
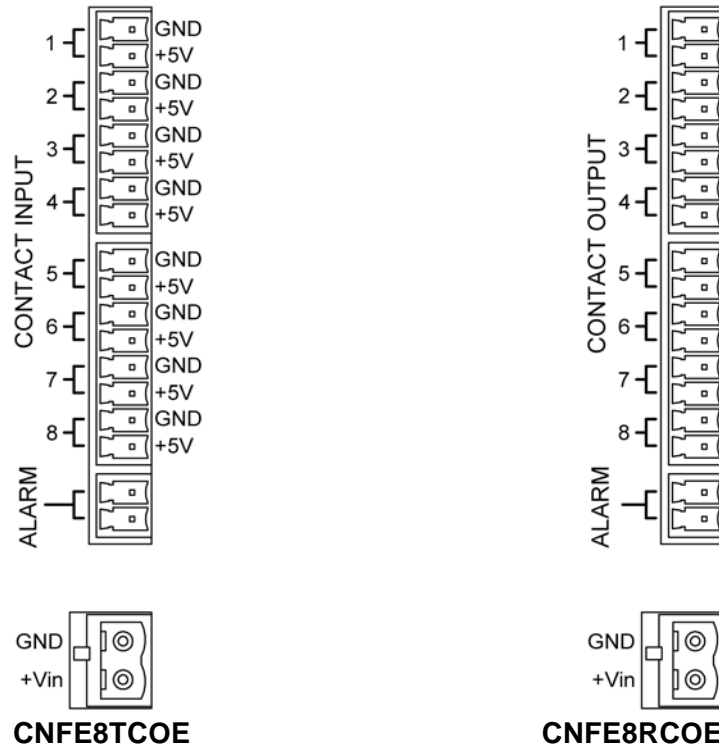
Mechanical Drawing of CNFE8TCOE MODULE

Mechanical Drawing of CNFE8RCOE MODULE

The contact connector pin-out is as below:

CNFE8TCOE   **CNFE8RCOE**

Module Input/Output Mapping

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Assign IP Address to a Module

A unique IP address has to be assigned to each contact over Ethernet module. You can connect one at a time to change the default IP address. The default IP address of the transmitter is: 192.168.12.100.

The default UP address of the receiver is: 192.168.12.101

Connect the module on to your local Ethernet network that your PC is connected to, as Figure 1 below, and power on the unit.

Figure 1

Following the steps below to set up your PC IP address to the same subnet as the modules:
Disable the machine's wireless network connection and any other internet connections that could interfere with the network being created. Select the Internet Protocol (TCP/IP) connection within the Local Area Connection Properties from start, Control Panel, and Network Connections. Then click Properties.
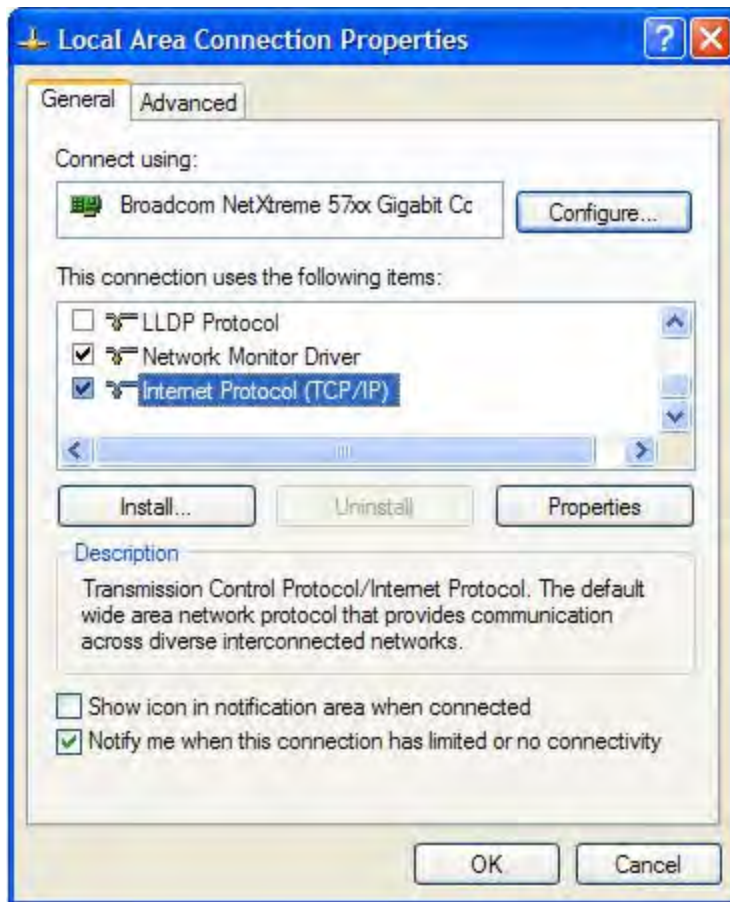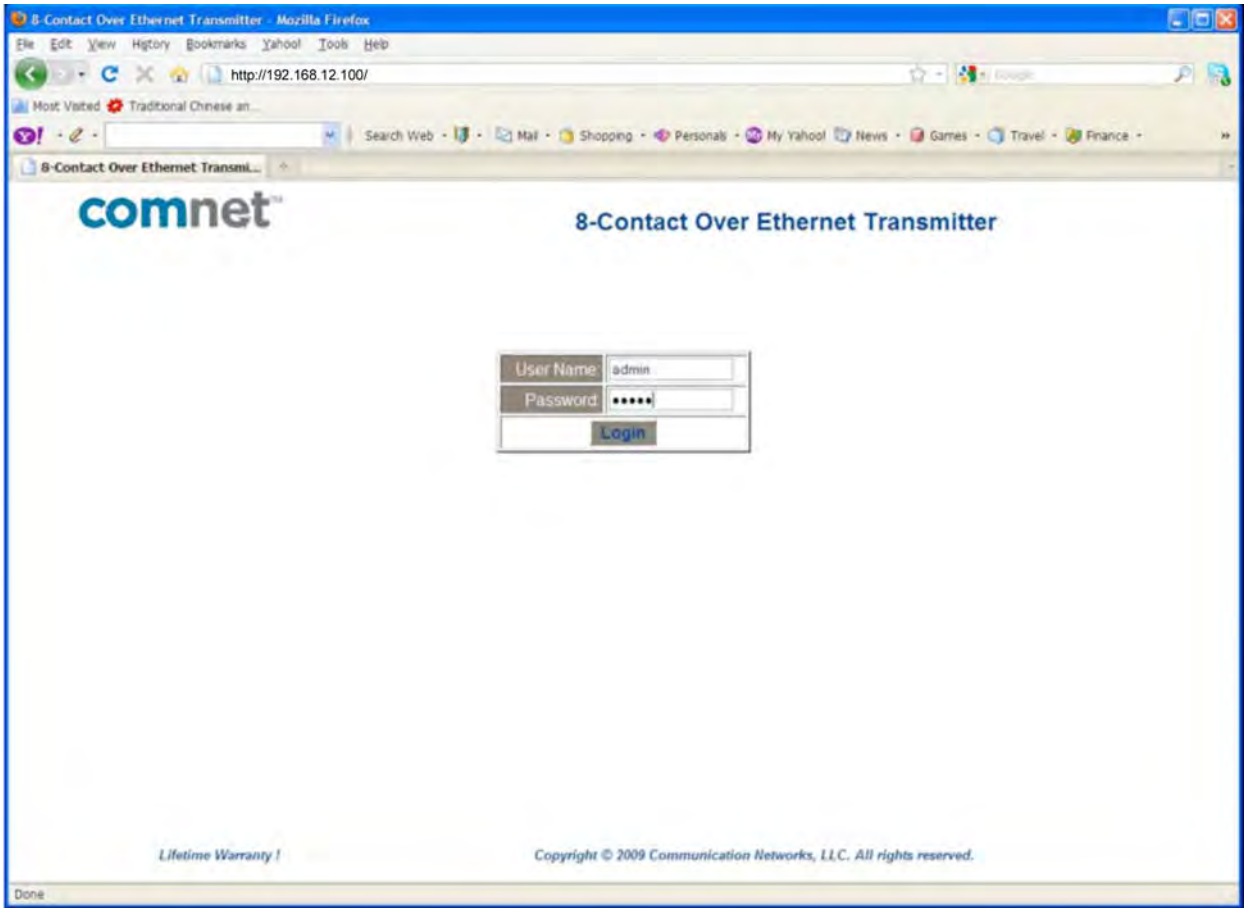
Next, manually set your PC IP address to 192.168.12.2 and your subnet mask to 255.255.255.0, as shown below.
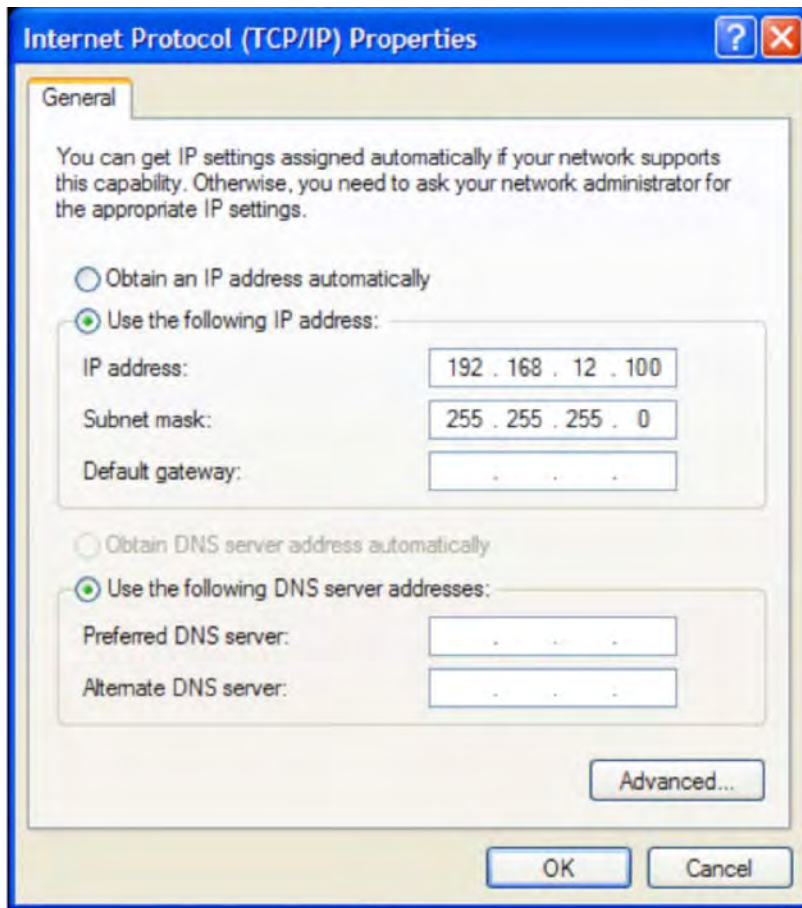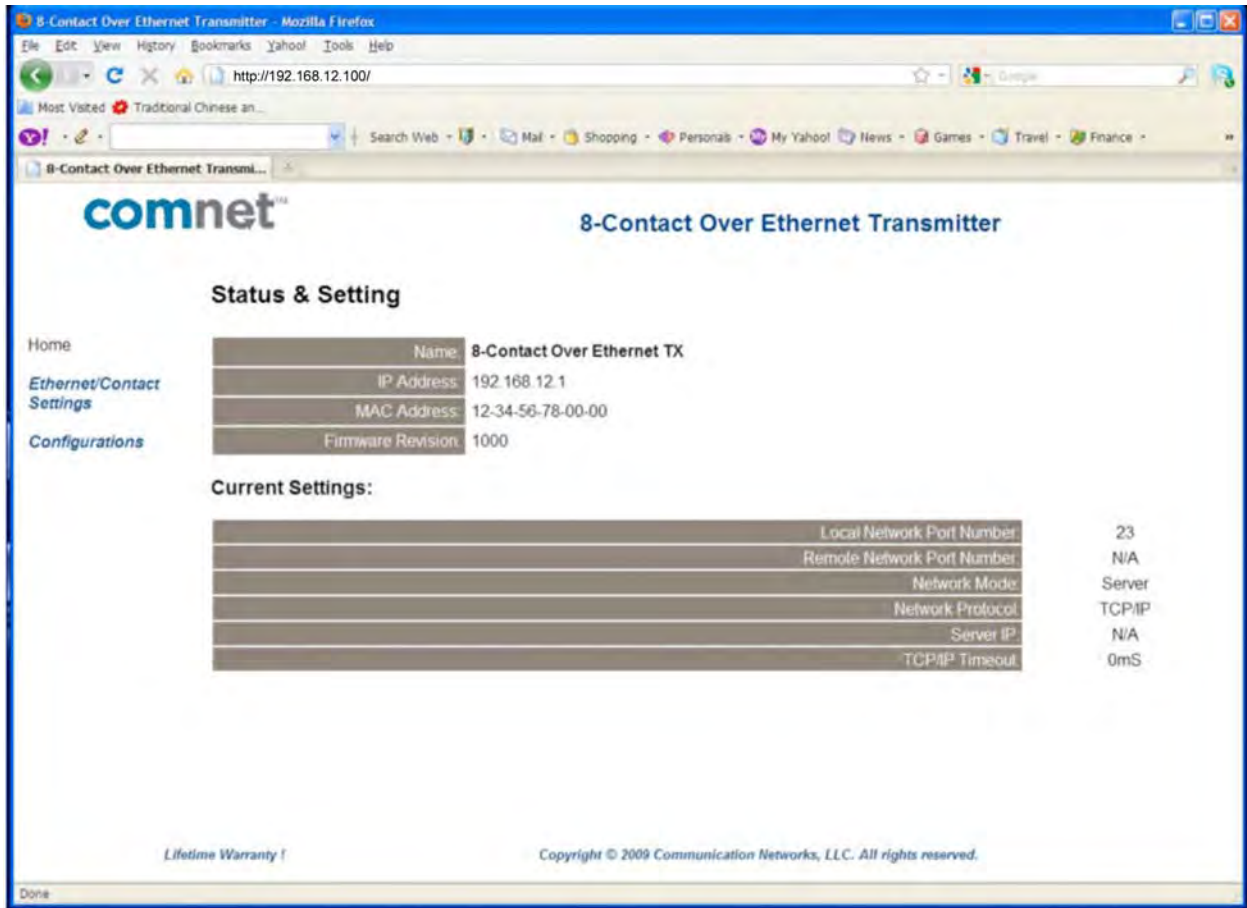
Click OK to finish the setting.

Open the browser on your PC, and type in 192.168.12.100 and open the Contact over Ethernet transmitter module Log in Page as shown.
The default User Name and Password are both "**admin**". Log in the Contact over Ethernet module Home Page as shown.
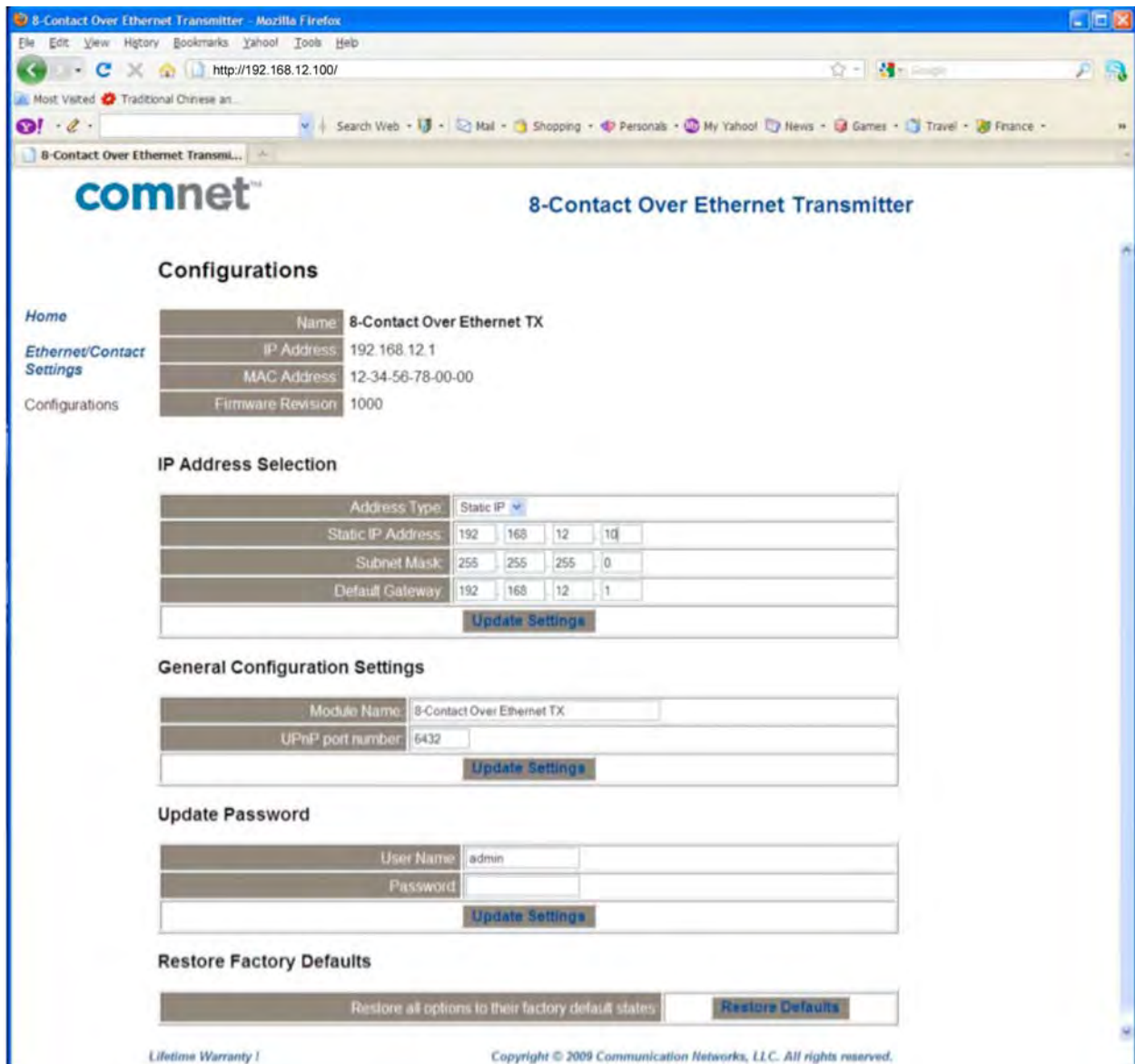
CNFE8TCOE **Log in Page**

CNFE8TCOE **Home Page**

Click on the "Configuration" on the left of the screen. Change the IP address to an IP address with subnet appropriate for your network. In the following examples an IP address in subnet 192.168.12.xxx will be used. Configure the IP address to 192.168.12.100 as shown in the Module Configuration Page, Click **Update Settings**.
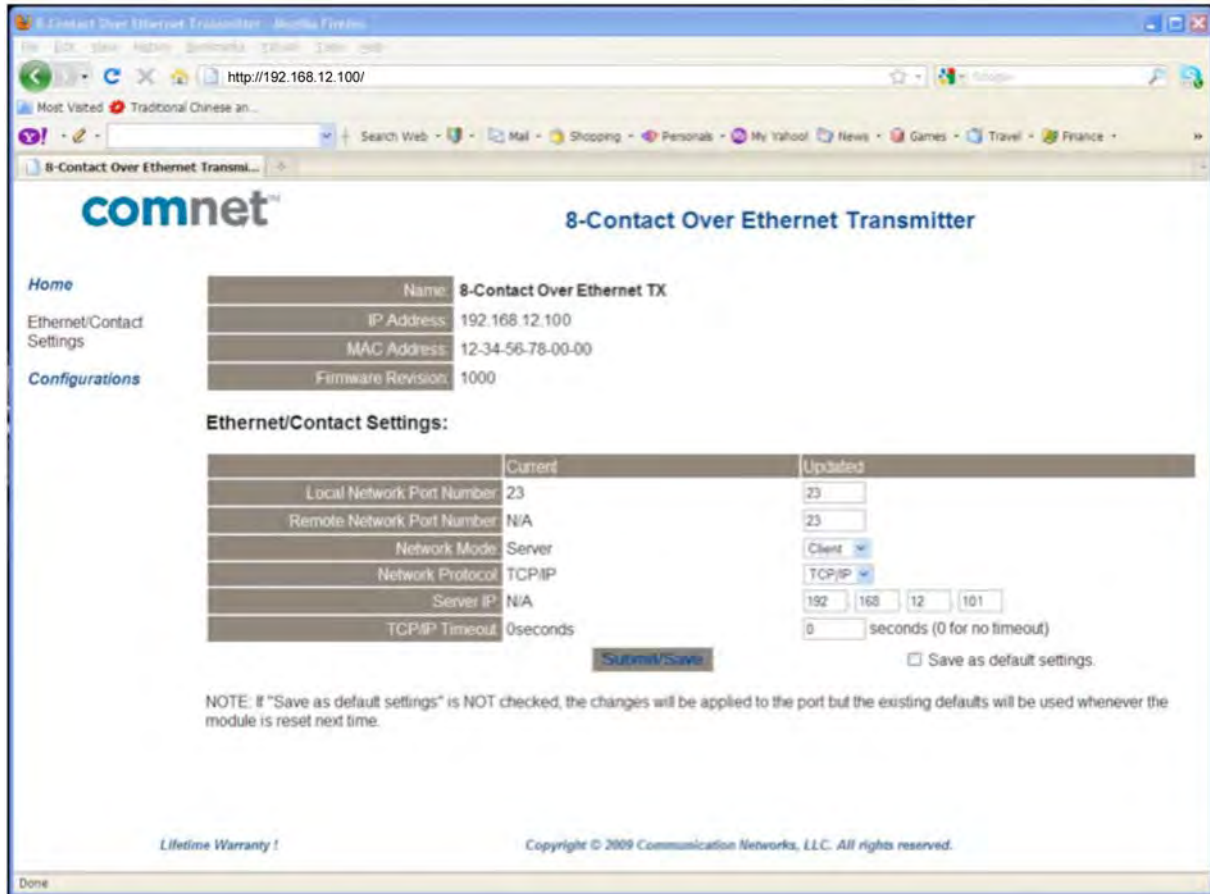
CNFE8TCOE **Configuration Page**

Follow the same steps above to change a receiver CNFE8RCOE module IP address to 192.168.12.101 in this example.

Log in to the module again using the new IP address. If an IP address in a different subnet was used, be sure to change the PC's network address to an IP address in the appropriate subnet.

Using Module as Remote Contact over Ethernet

To use the modules as remote contact over Ethernet, connect a CNFE8TCOE and a CNFE8RCOE to your local Ethernet network as in Figure 2. From the CNFE8TCOE "Ethernet/Contact Setting" page, configure it as a client, and set its server IP address the same as the CNFE8RCOE. It is 192.168.12.101 in this example. Make sure to check "Save as default settings". Click **Submit/Save**.

CNFE8TCOE Settings Page in Client Mode

The point-to-point configuration is complete. Server and client units will pass data across the Ethernet network.


Figure 2

To use the CNFE8TCOE as a remote contact input or CNFE8RCOE as a remote contact output from a PC, some software utilities need to be installed. Refer to following instructions to install all the utilities.

Install ComNet Software Utilities

Following the steps below to install all the utilities from the CD comes with the contact over Ethernet module.

- **Install the com2com**

Com0com is an open source virtual serial port driver for Windows. Once installed it will configure one or more pairs of virtual COM ports each time Windows starts.
Insert the ComNet Contact over Ethernet module Documentation and Software CD into the CD-ROM drive of your computer. Use Windows Explorer or other browser to open directory com0com-2.2.1.0\. Double click on the file setup. This will start the installation process with the following dialog.
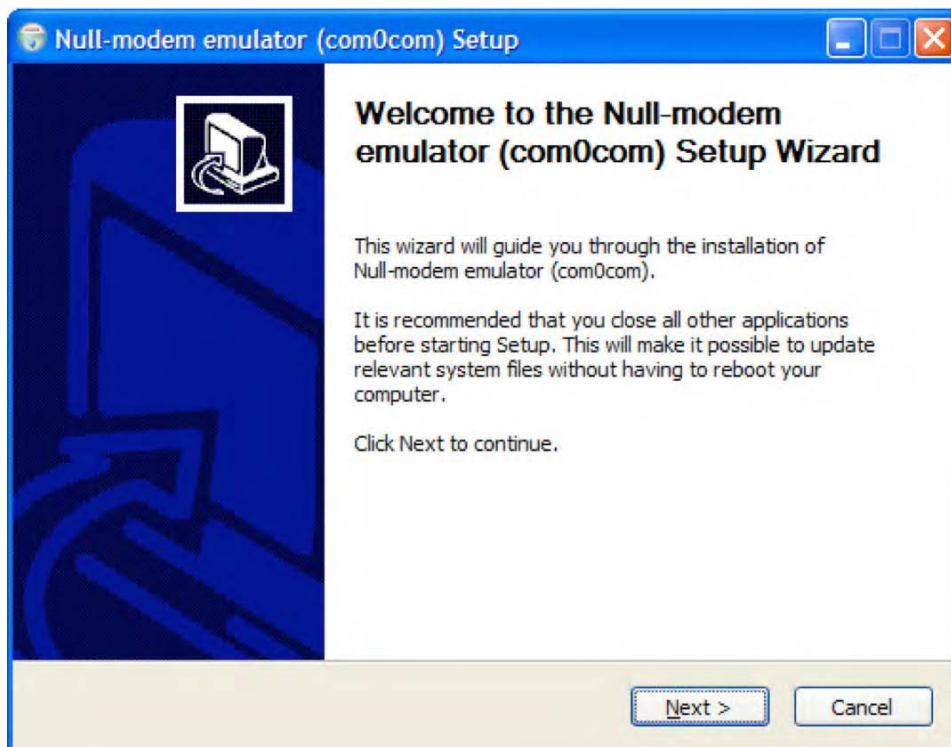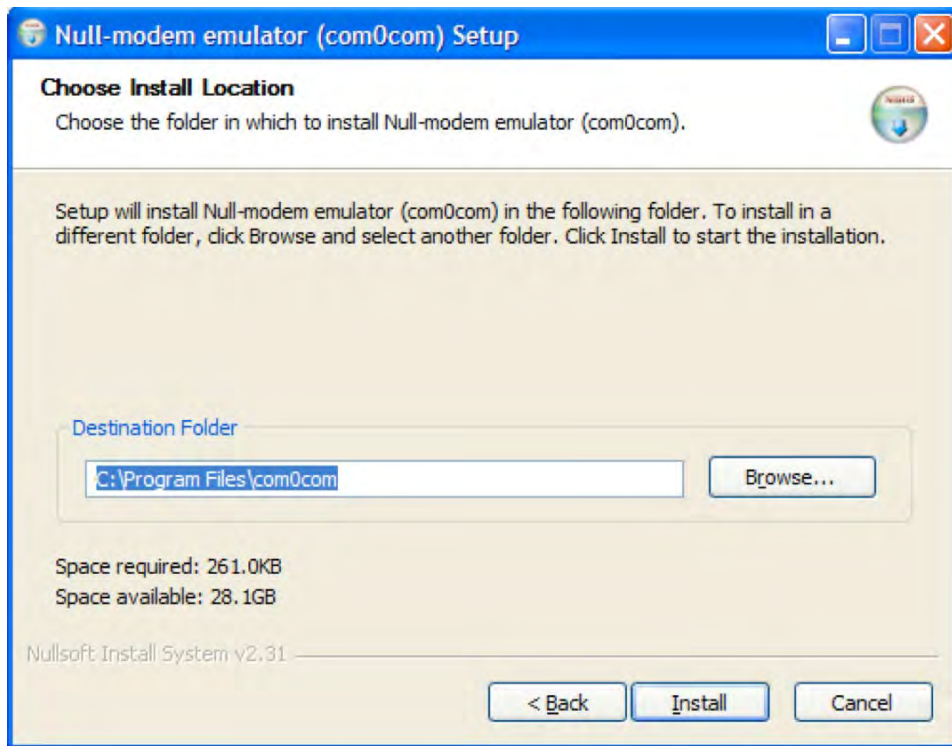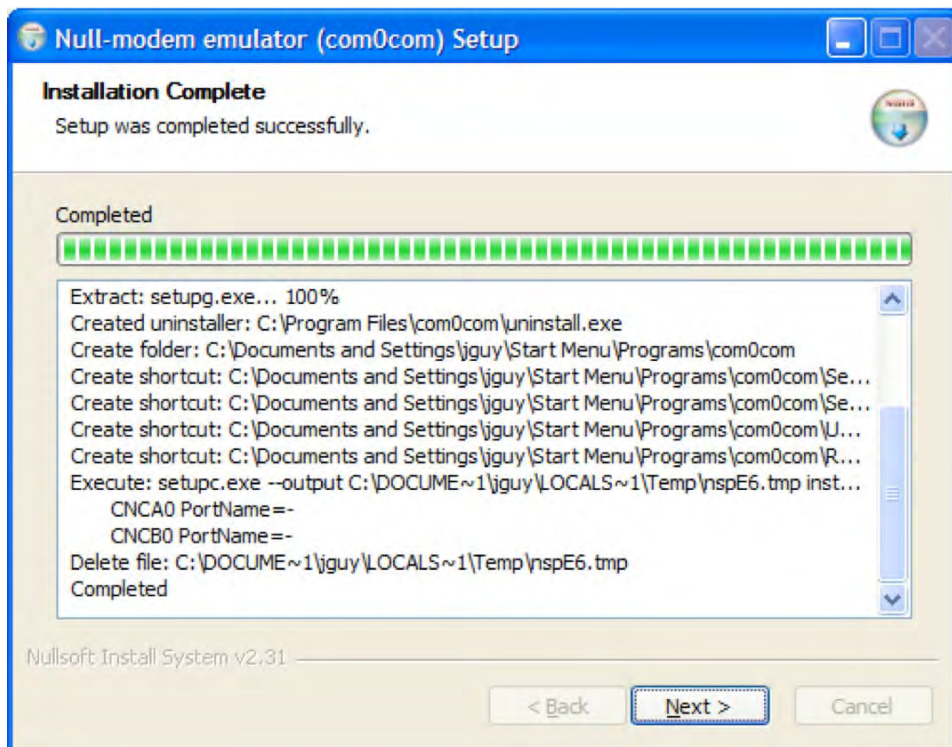

Click **Next**.
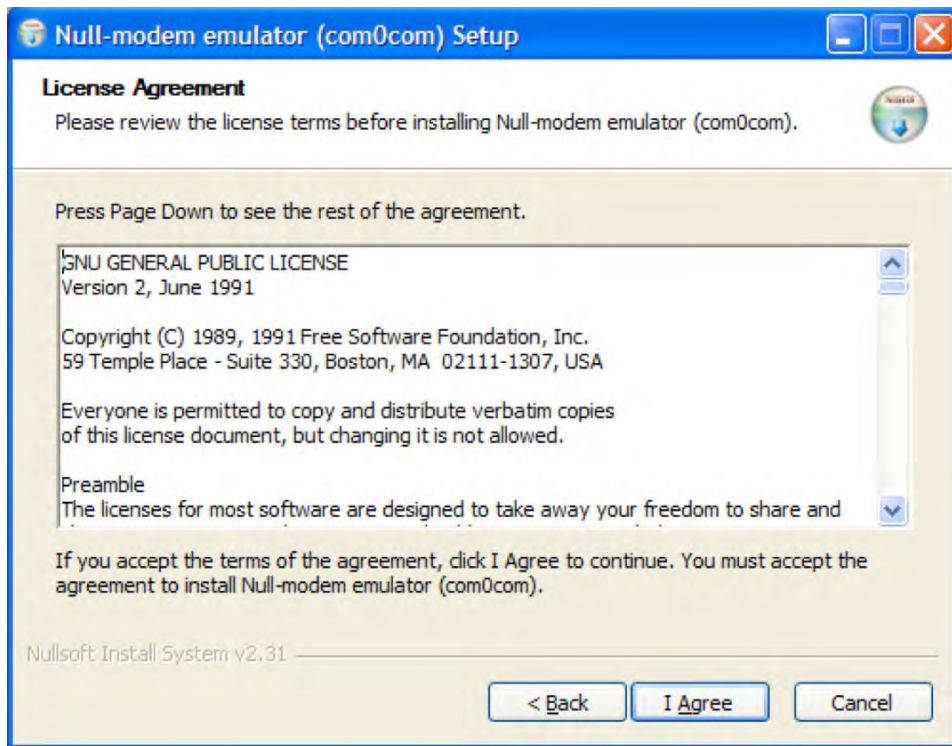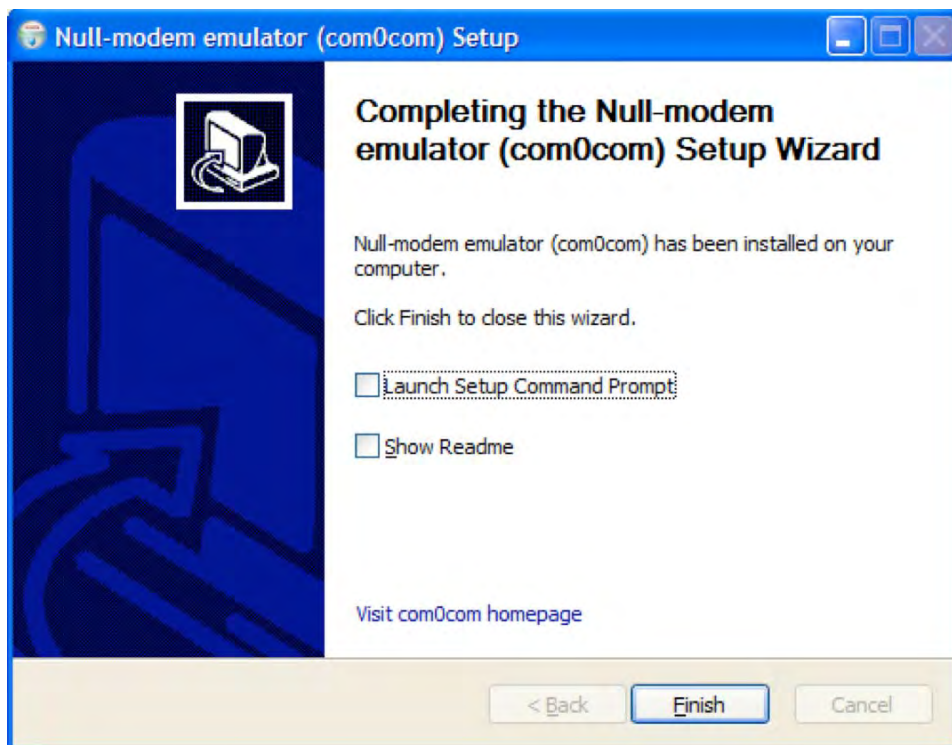
Click **I Agree**.
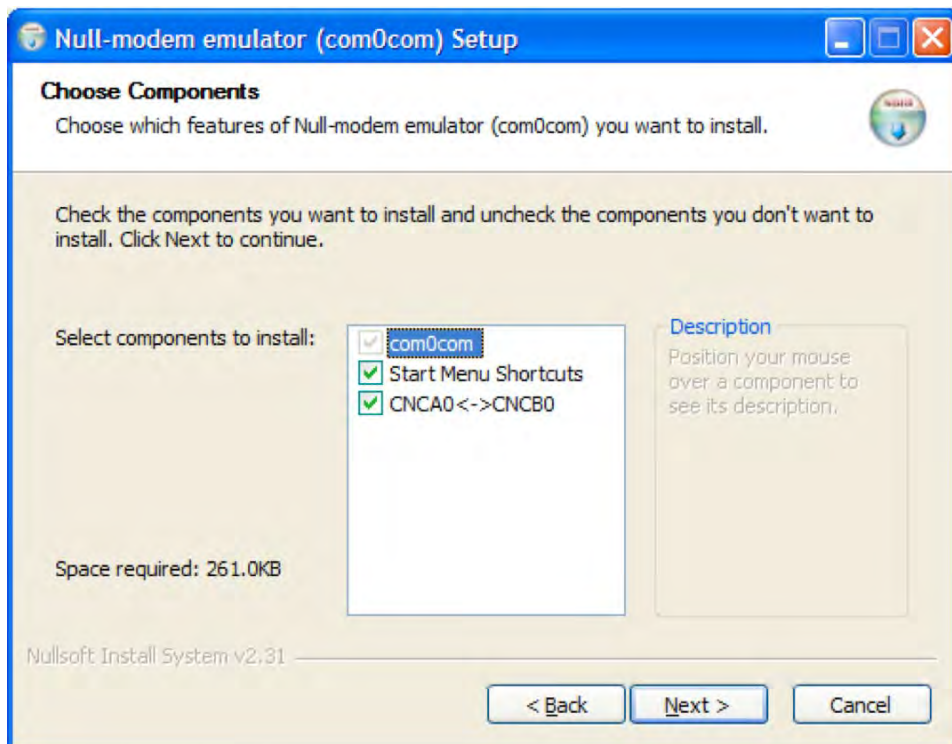
Leave the Component setup at the default settings. Click **Next**.

Choose the Install Location. Click **Install.**

Installation will complete. When installation is done, click **Next**.

Click **Finish.**

The Windows New Hardware Wizard will now run automatically for each of the two new Virtual COM ports. Please complete the following steps twice. Windows will detect the new Com port. When the New Hardware Wizard runs, select **No, not this time** and click **Next**. Select **Install the software automatically**. Click **Next**. When the New Hardware Wizard completes, click **Finish**. Repeat for the second half of the Virtual Com port pair. Com0com has now created virtual Com ports CNCA0 and CNCB0. These ports will be visible to Windows serial applications such as HyperTerminal or TeraTerm, which will be installed later. The port names can be change by running the ComNet Contact over Ethernet module Configuration application, which will be installed next.

- **Install the com2tcp**

Com2tcp is an open-source project used in conjunction with com0com to redirect data traffic from a virtual COM port on the PC to a telnet server or client on the Ethernet network.

To install com2tcp, simply copy com2tcp.exe from CD to the directory of C:\Program Files\com0com.

The application will be linked to ComNet Contact over Ethernet module Configuration application when you start the application the first time.

- **Install the freeware TeraTerm**

Go to directory \TeraTerm on the ComNet Contact over Ethernet module Documentation and Software CD. Double click on the application file setup.exe. Follow the instruction to finish the installation. By default, the application will be installed in the directory "C:\Program Files\TTERMRO\. You can either make a short cut of ttermpro.exe and copy it to your desktop for convenience, or start the application from Windows startup menu.

- **Install ComNet Module Configuration software**

Create a directory "comnet" under your C: drive. Simply copy the application cns2econf.exe on the ComNet Contact over Ethernet module Documentation and Software CD to C:\comnet\. You can make an Windows application shortcut of cns2econf.exe, and move it the your desktop.
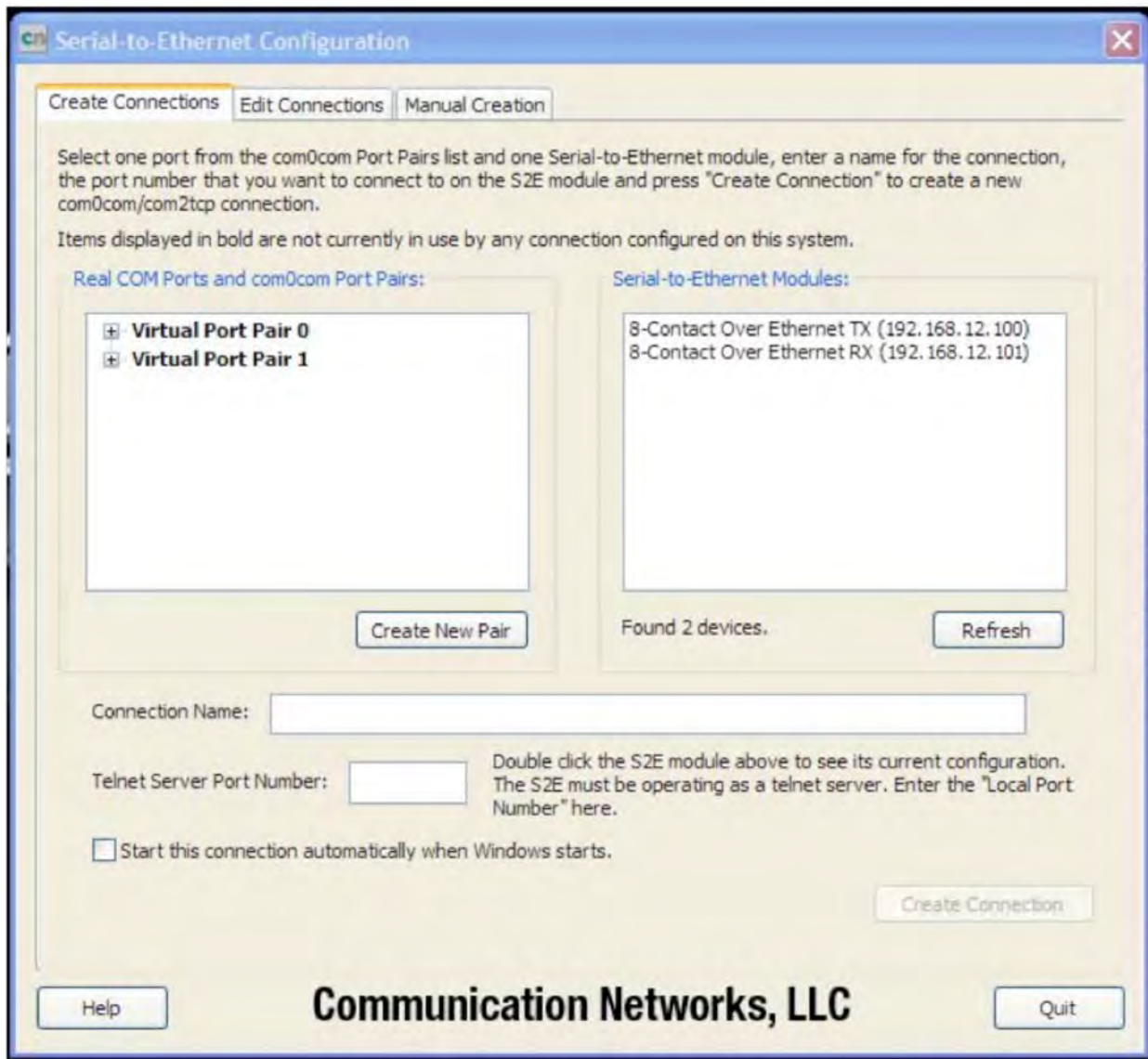
If you start the cns2econf application for first time, the following screen will appear.

Click **Yes**.
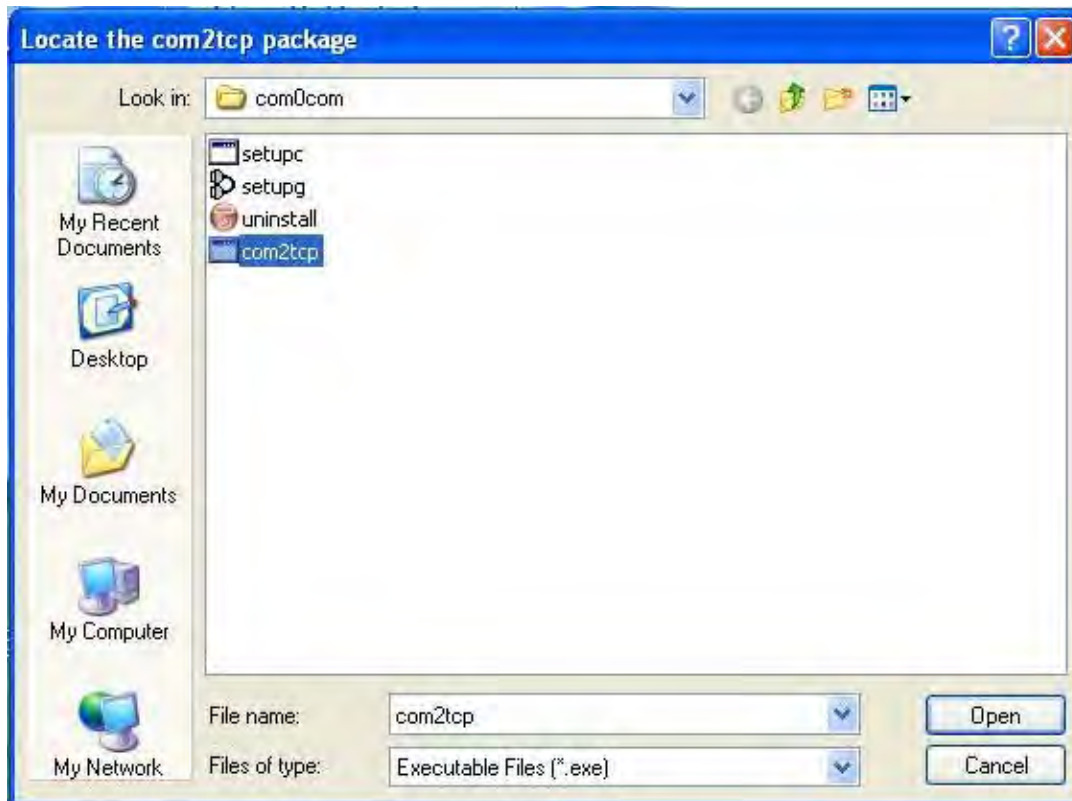
Browse to C:\Program Files\com0com, and select com2tcp.exe Click **Open**.

Main ComNet Contact over Ethernet module Configuration application window

This is the Main ComNet contact over Ethernet module configuration application window you will see when you start the application next time. Wait approximately 30 seconds, the "Contact over Ethernet Modules:" window will list the units you have connected to your local Ethernet network, as shown above. **Make sure every module has been configured with its unique IP address.**

Using the Module through a Virtual COM port (VCP)

The ComNet Contact over Ethernet module Configuration application offers easy creation and modification of VCP connections using a single application. Such connections contain several components:

- The legacy serial application connects to a virtual COM port on the PC. This port is one of a pair created using com0com. From within the ComNet Contact over Ethernet module Configuration application you can create new port pairs and edit the names of existing ports to cater to serial applications that do not understand the default CNCA/CNCB naming convention used by com0com.
- The second port in the pair is opened by com2tcp, which creates a telnet connection to the remote contact over Ethernet module over Ethernet. The Configuration application lists all contact over Ethernet modules it finds and offers a convenient method for accessing their web-based configuration pages.

- The Host PC connects to the remote contact over Ethernet modules, as shown in Figure.
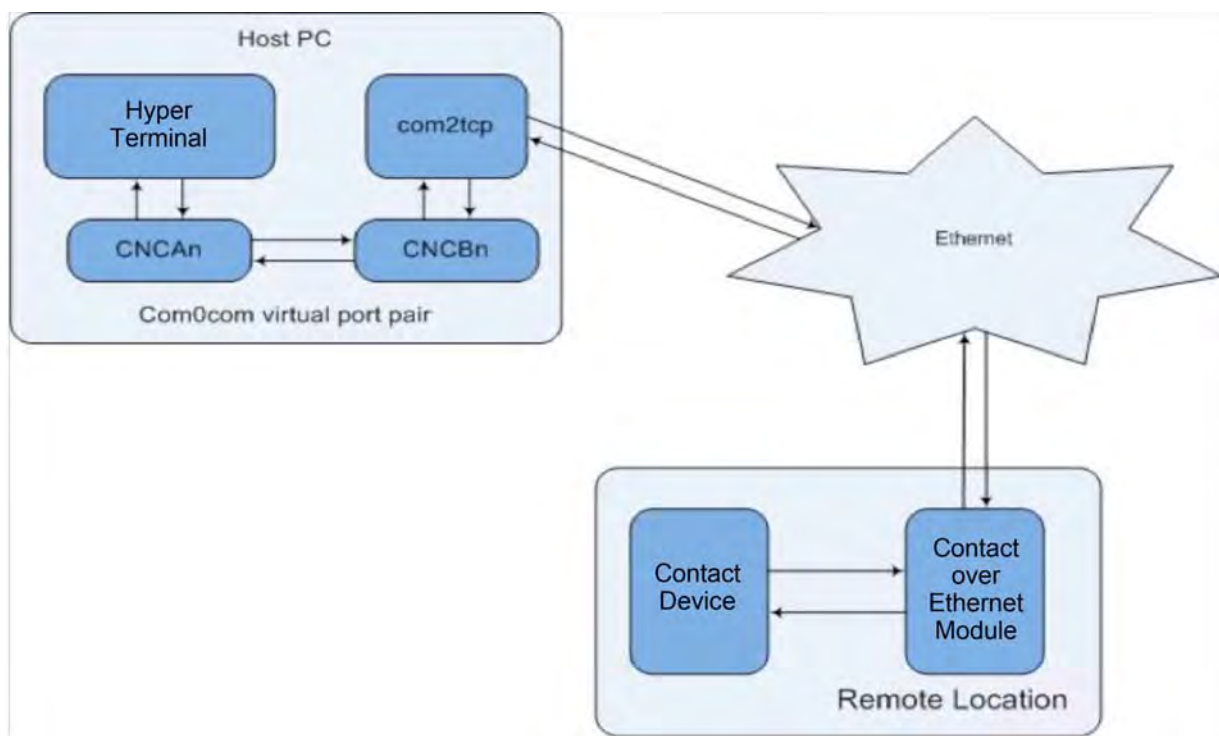
1. Connection creation

The ComNet Contact over Ethernet module Configuration application gathers the information necessary for creating these connections using com0com and UPnP and then saves entries in the system registry.

The connections created here assume that the contact over Ethernet module is running as a telnet server, which is the default for a new unit. To create a new connection between a virtual COM port on the PC and remote device:

- Select **Start** ComNet Contact over Ethernet module Configuration application by double click on the icon cns2econf.exe, The "Main ComNet Contact over Ethernet module Configuration application window" appears as above.

- The application performs an UPnP query to discover all contact over Ethernet modules on the network. Once this query completes, the module pane of the main application window updates to show a complete list of the devices found. Once this list appears, select the device to which you want to set up a connection. Double-click a device to launch its configuration website, and log in.
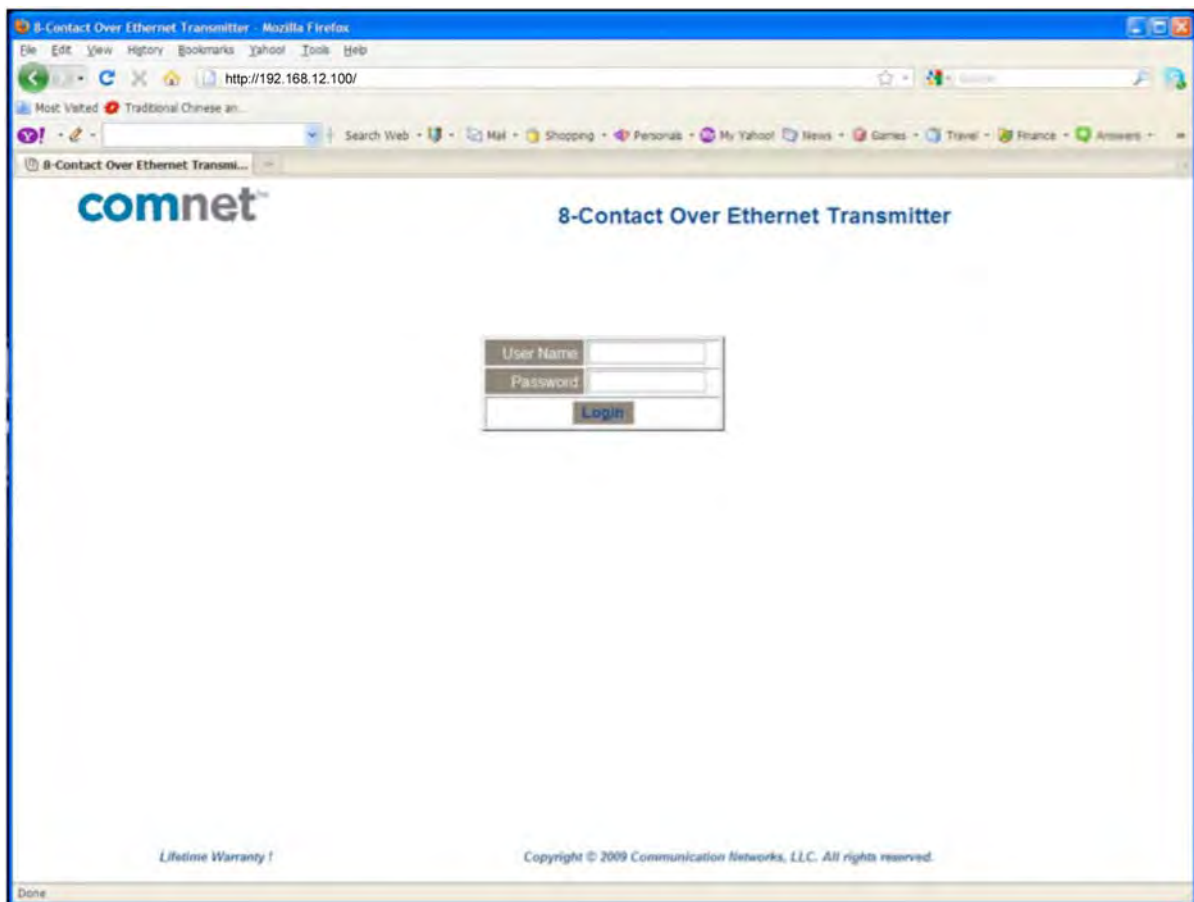
- In the com0com Port Pairs pane, click the **+** to the left of **Virtual Port Pair 0** to expand the listing. Select one of the two virtual COM ports listed. This is the port that com2tcp will use in the connection you are configuring.

- Enter a **Connection Name** for this connection.

- Enter the **Telnet Server Port Number** (TCP/IP port number) for the module. To find the **Telnet Server Port Number**, double-click the configuration device's

listing to go to its website. Then, go to the Status & Configuration page and locate the Local Telnet Port Number row, and select the number that you wish to use with this connection.

- Select "**Start this connection automatically when Windows starts**".
  If you do not select this option, the connections will not been made unless you provide the –a command line option that instructs the launcher to start all connections.

- Click **Create Connection** to save the information on the newly configured connection.
  Notice that **Virtual Port Pair 0** is no longer bolded, indicating that the port pair is already in use and you cannot configure another connection using the same pair. To create another VCP pair for use by your second (or subsequent) connection, click **Create New Pair** and repeat the above process.

- You can now start your legacy serial application and open virtual COM port CNCA0 and communicate with the remote contact device attached to the module.

- Contact Comnet for the command sets to communicate to the modules

2. **Edit port names**

Some serial applications are unable to connect to a serial port named using a form other than COMm, where m is the port number. Since com0com ports are named CNCAn and CNCBn by default, this can cause problems. If you encounter this problem, ComNet Contact over Ethernet module Configuration application allows you to change the names of virtual COM ports, as long as neither port in the pair is currently part of a configured connection. To edit the port name, expand the virtual port pair listing that contains the port you want to change. Double-click the port name, edit the connection name, and press ENTER.

Manual VCP Configuration

If you do not want to install the ComNet Contact over Ethernet module Configuration application, you can manually configure and start com0com and com2tcp connections. To manually create a virtual port pair, first select **All Programs > com0com > setup**. Once you create a virtual port pair, com2tcp establishes a link between one of the two ports in the pair and the contact over Ethernet module. You can select either port for use with com2tcp. You must also know the following:

- The contact over Ethernet module IP address

- The contact over Ethernet module telnet port number
  The default telnet port numbers is 23. The process for manual VCP configuration shown here assumes the creation of a com0com port pair with the default name,

as occurs with initial installation of the com0com package, and that com2tcp will use CNCB0 and the legacy serial application will use CNCA0.

- Open a command prompt window; to do this, select **Start > All Programs > Accessories > Command Prompt**.

- Change to the installation location for com2tcp.
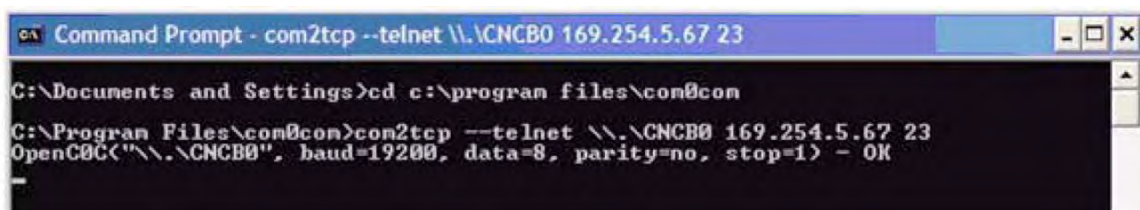
- At the command prompt, enter

com2tcp --telnet \\.\<CNCB0> <IP address> <telnet port> where
– <CNCB0> is the name of the VCP used by com2tcp, for which CNCB0 is the default name
– <IP address> is the actual module IP address; for example, 169.254.5.67
– <telnet port> is the actual telnet port number; for example, 23
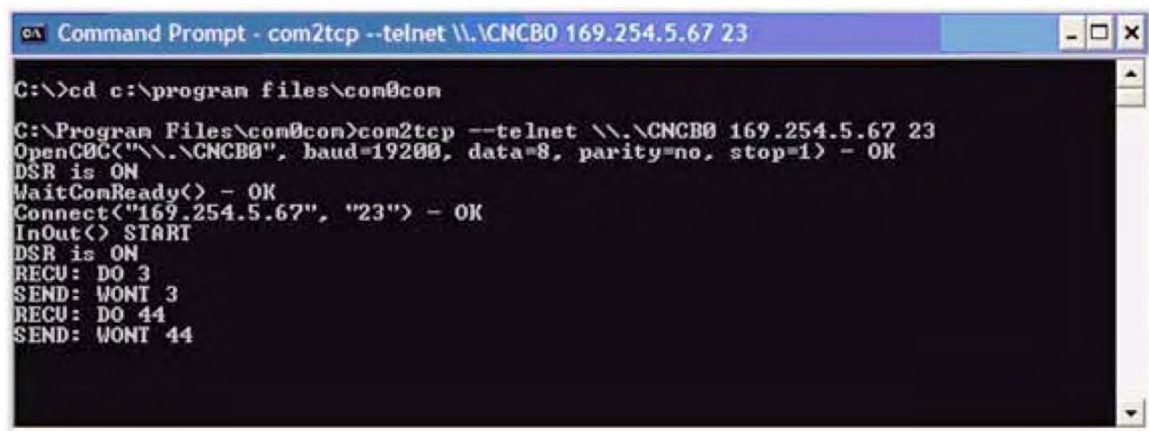
For an example of this command string and the module response, see Manual VCP configuration window below.

Manual VCP configuration window

Com0com now has established a link between the contact over Ethernet module and virtual COM port CNCB0, allowing Windows applications to connect to the either CNFE8TCOE or CNFE8RCOE through the virtual COM port CNCA0. When communication occurs, com2tcp provides status information in the command prompt window, as shown in Com2tcp communication shown in the command prompt window below.

Com2tcp communication shown in the command prompt window

If you need to end com2tcp, click the command prompt window to be sure it is the active window and press CTRL+C.

Verify VCP Operation

Connect the CNFE8TCOE or CNFE8RCOE module to your network as figures shown earlier. In this case, both modules should be configured as a server. Open a HyperTerminal windows, select a Virtual COM port which is connected to the module, as follows:

1. Open one HyperTerminal window. In Windows XP, HyperTerminal can be found by clicking:
   Start, **Programs**, **Accessories**, and then **Communications**.

2. Enter a name for the terminal window and click **OK**.

3. In the **Connect Using** pull-down menu, select **CNCA0**. Then click **OK**.

4. Now you can type in the command sets from Comnet in HyperTerminal windows. The command will be sent to the CNFE8RCOE/CNFE8RCOE over the Ethernet network. The contacts will open and close according the commands.

5. Or, you can close and open the contact input on the CNFE8TCOE module, and see the corresponding messages in the terminal windows.

As an alternative, the "Telnet" connection of TeraTerm can be used to verify the VCP operation.

Com0com and com2tcp are open-source (GPL) projects. For additional information and source code for the com0com and com2tcp, refer to the contact over Ethernet module documentation and source code CD or search the Internet for the respective project name.

Using TeraTerm Telnet Connection

As an easier solution, Telnet support of Teraterm can be used to connect a terminal window direct to the contact over Ethernet module.
Start the TeraTerm application. Check TCP/IP box, and type in the contact over Ethernet module IP address 192.168.12.101. Click **OK**. The TeraTerm terminal window works similar to windows terminal window. Refer to **Help** of the TeraTerm for its configuration details.
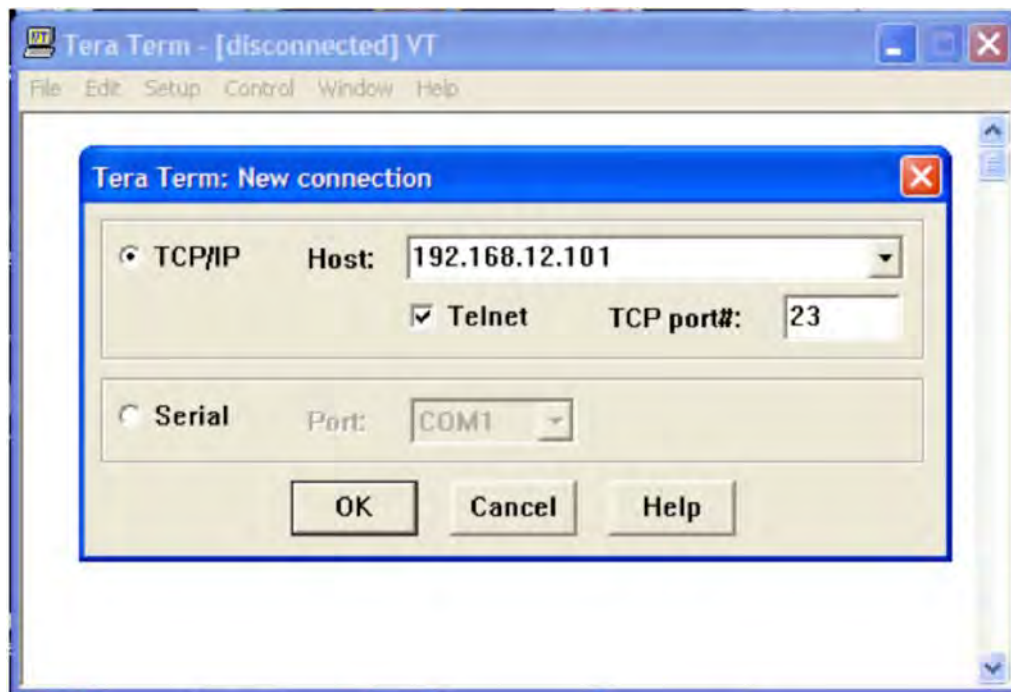
Using Windows UPnP to Discover Your Contact over Ethernet modules

Universal Plug and Play (UPnP) support is provided by default in Windows XP and Windows Vista, but must be enabled. All the contact over Ethernet modules **MUST** be assigned with different IP address. See below for details on enabling UPnP on Windows XP.
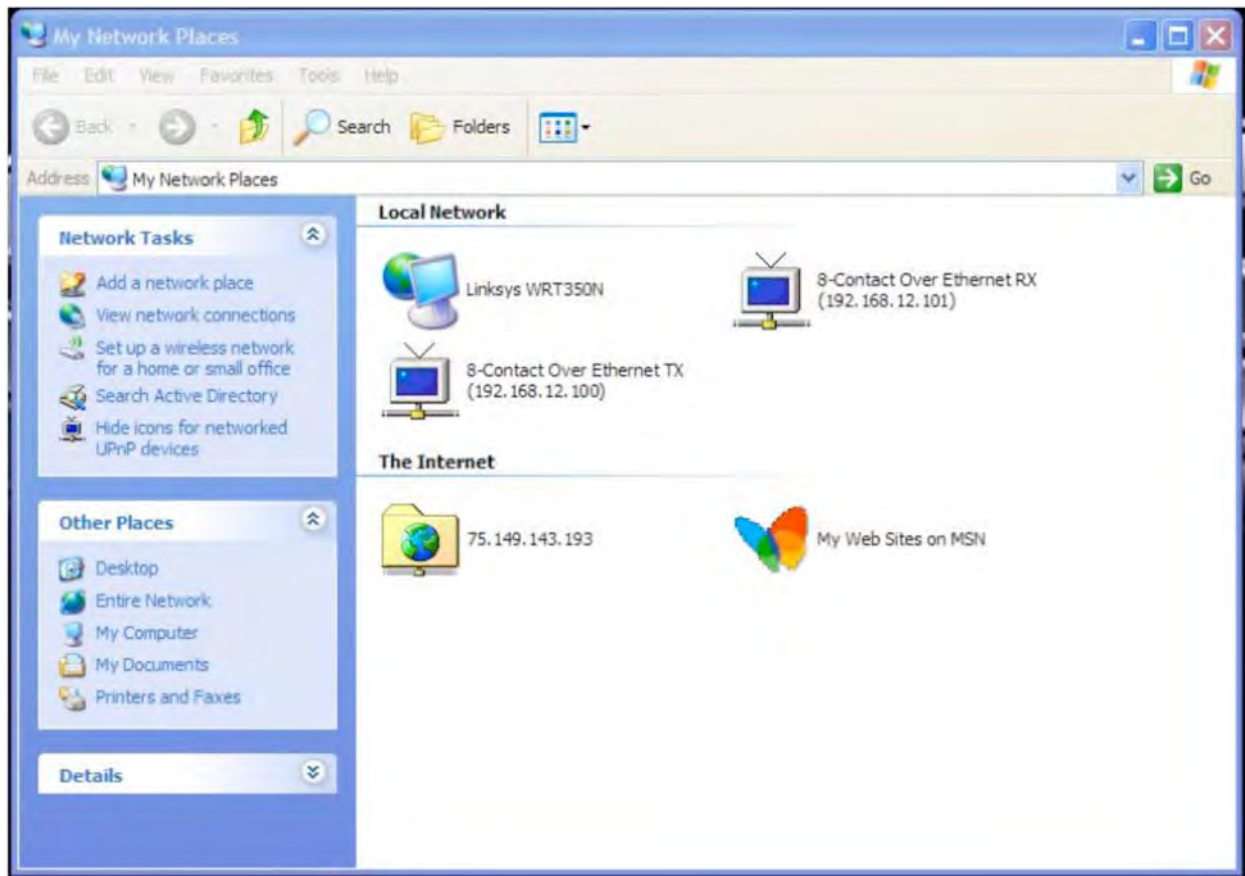
Open "Windows Firewall" from **start** -> **Control Panel**
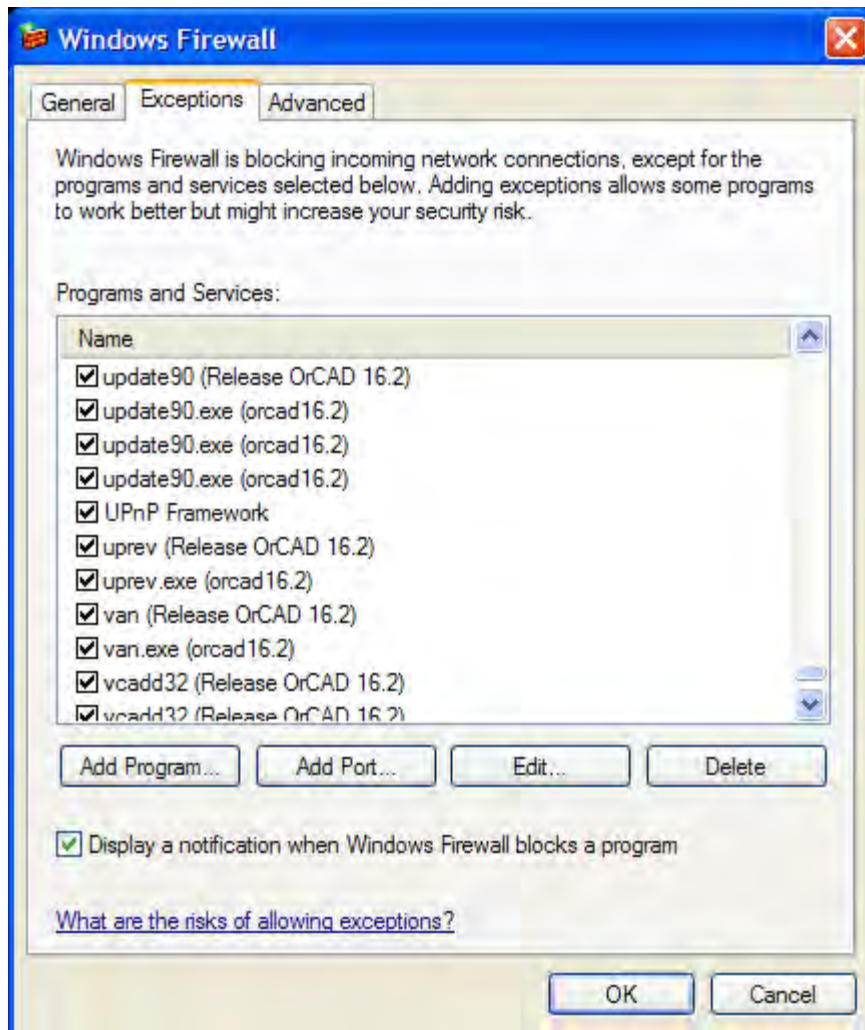
Windows Firewall

To enable the UPnP, make sure the "UPnP Framework" box is checked. Click **OK**.

In above example, go to Start -> My Network Places. "8-Contact over Ethernet (192.168.12.100)" and "8-Contact over Ethernet (192.168.12.101)" appear.

Windows My Network Places

Contact information

For technical support, please call 1-888-678-9427 for US and +44 (0)113 307 6400 for UK, or email at support@comnet.net.

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