

## Comnet Support

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# INSTALLATION AND OPERATION MANUAL

# CNFE3DOE2/M

## RS232/422/485 DATA OVER ETHERNET TERMINAL SERVER

The Comnet CNFE3DOE2/M allows any combination of two RS-232, RS-422, or 2 or 4wire RS-485 serial data circuits to be inserted onto any 10/100 Mbps Ethernet-based network. The CNFE3DOE2/M units include two serial data input/output ports, and three Ethernet ports featuring two electrical ports and one SFP port. It may be used to tunnel serial data over an IP network or as a media converter, for converting copper transmission media to fiber. Access one serial device from the Internet and another serial device from a local area network (LAN) using SSH or SSL. The CNFE3DOE2 provides control of the remote hardware, as if it were connected directly to the PC COM port. A USB to serial converter may be required in new PCs without a DB9 serial connection. The CNFE3DOE2 supports SNMP Version 1, RFC1155, RFC1213 & RFC1215.

### Differences between Version 1 and 2:

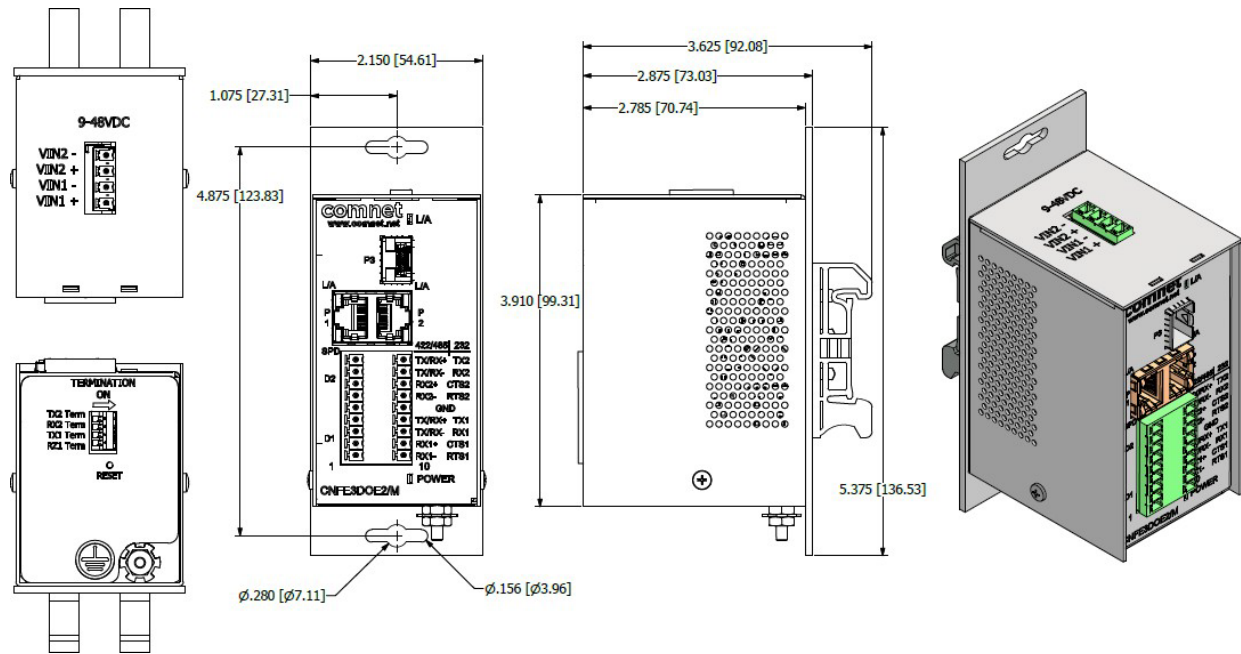
- New connector layout
- Power and L/A LED placement
- Additional EMC hardening

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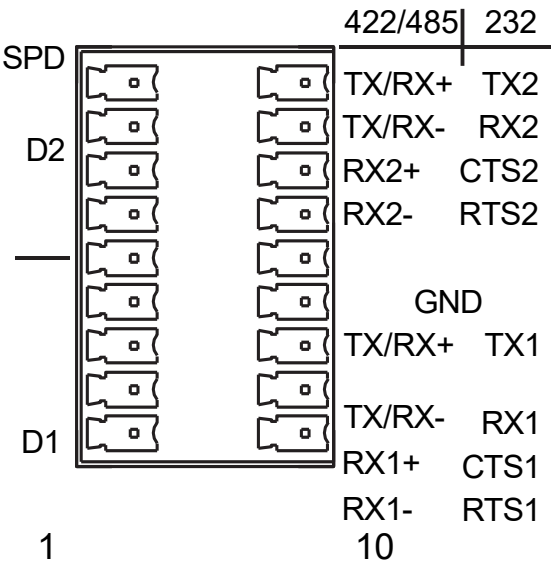
Hardware description

The Comnet CNFE3DOE2/M terminal server supports Ethernet transmission over two copper ports and one fiber port. The server is universally compatible with RS232, RS422, RS485 serial data protocols. All configurations are done through its web server. Distances depend on which SFP (Small Form Pluggable) module is used. The RJ45 Ethernet and SFP interfaces are all enabled. They can function as an Ethernet media converter.

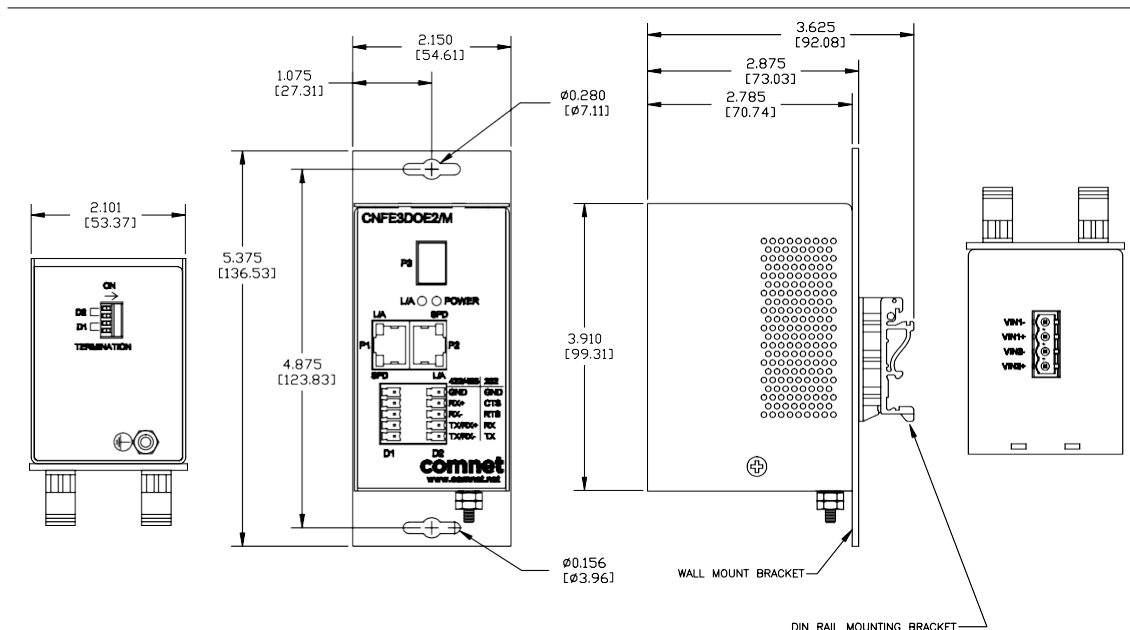


Mechanical Drawing ofCNFE3DOE2/M V2 Unit

Switches are used for RS485 Full Duplex mode to terminate Tx+ & Tx- and Rx+ & Rx- with 120 ohms. Both switches should be in the on position. For all other modes, the switches should be in the off position. The data connector pin-out is as below:



Settings by Data Type (Port 1 or 2) (Version 2)



Mechanical Drawing of CNFE3DOE2/M Version 1 Unit

Switches are used for RS485 Full Duplex mode to terminate Tx+ & Tx- and Rx+ & Rx- with 120 ohms. Both switches should be in the on position. For all other modes, the switches should be in the off position.

The data connector pin-out is as below:

|    | 422/485 | 232 |
|----|---------|-----|
| D1 | GND     | GND |
| D2 | RX+     | CTS |
|    | RX-     | RTS |
|    | TX/RX+  | RX  |
|    | TX/RX-  | TX  |

Settings by Data Type (Port 1 or 2) Version 1

## Reset Switch

The Reset Switch performs two functions, first, to provide a hard Reset to the board, and second, to reset the default configuration to the device. The purpose of defaulting the configuration is to return the device to a known IP address in case the IP address is unknown or corrupted.

### Hardware Reset:

Momentary press of the Reset Switch will force the device to reboot and configure itself with the current configuration stored in FLASH.

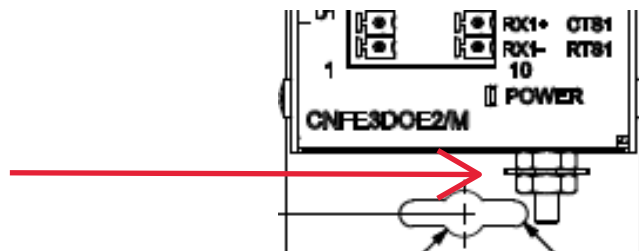
### Configuration Reset:

Two presses of the Reset switch within a window of 5 seconds to 25 seconds will change settings of the device to their default settings.

## Grounding Instructions

Minimum requirements for the grounding wire:

- 14 AWG or larger diameter wire
- 600V
- 105°C

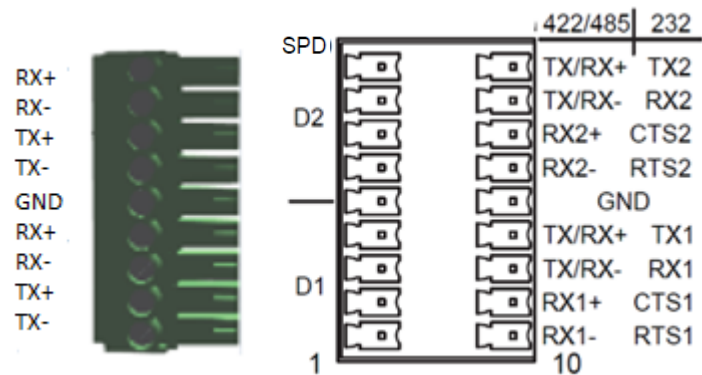


The metal enclosure shall be properly grounded according to local electrical code. The CNFE3DOE2/M's ground lug should be grounded to the metal enclosure via a ground wire with the specifications listed below. The wire shall be crimped with a ring terminal connector, sized according to the grounding wire, and secured to the box with both nuts.

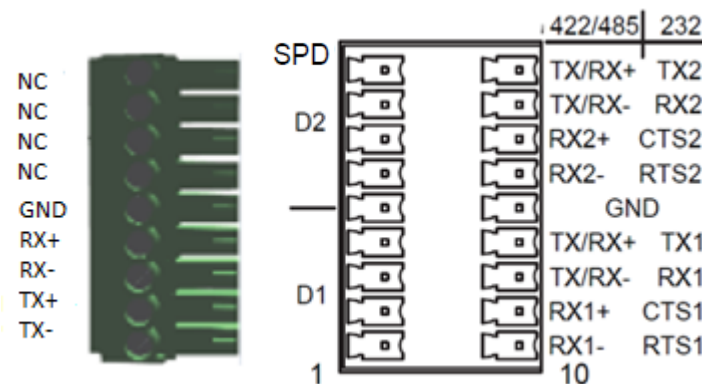
If this unit is not installed within a metal enclosure, appropriate measures shall be taken to ground the unit to Earth according to local electrical code.

CNFE3DOE2/M Version 2 Connectors

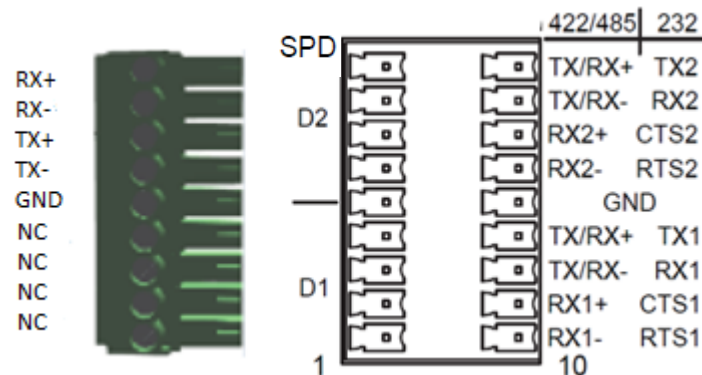
RS422 / RS485 Full Duplex      D1 and D2 Port Connector



RS422 / RS485 Full Duplex      D1 Port Connector

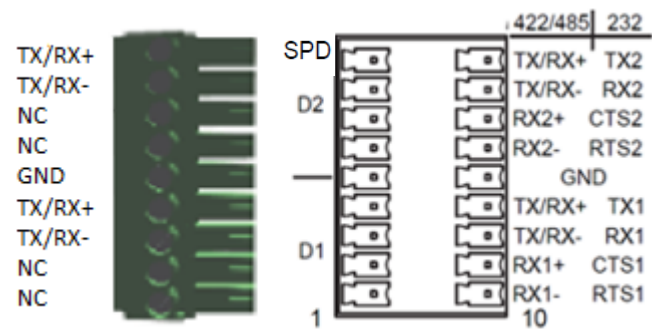


RS422 / RS485 Full Duplex      D2 Port Connector

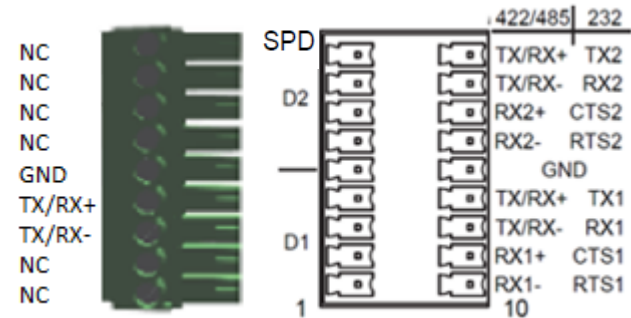


CNFE3DOE2/M Version 2 Connectors

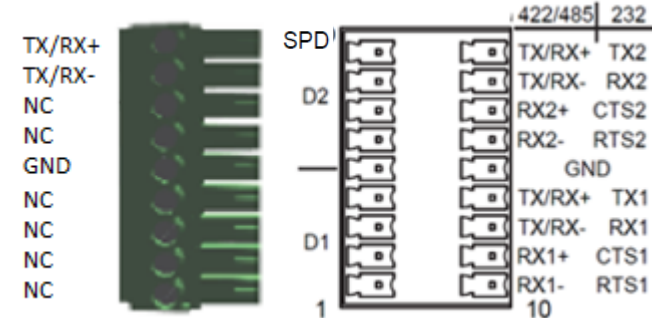
RS485 Half Duplex      D1 and D2 Port Connector



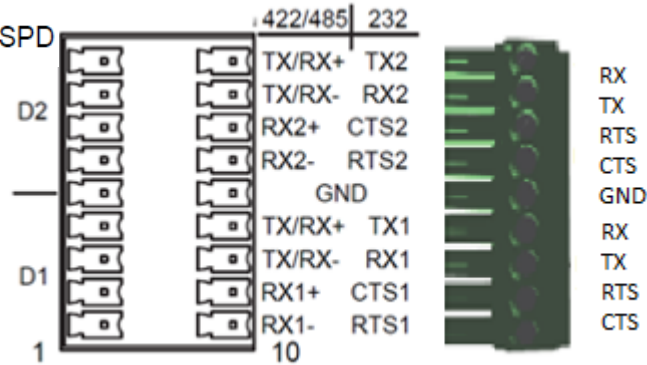
RS485 Half Duplex      D1 Port Connector



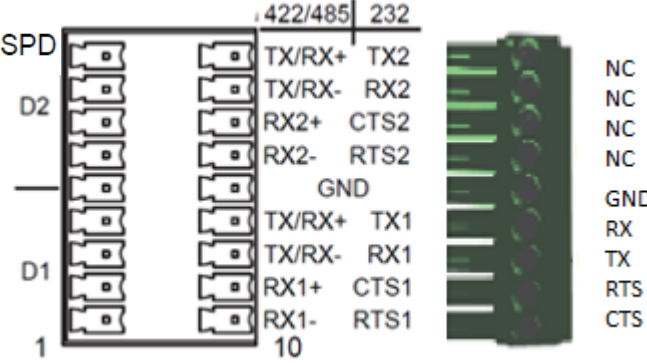
RS485 Half Duplex      D2 Port Connector



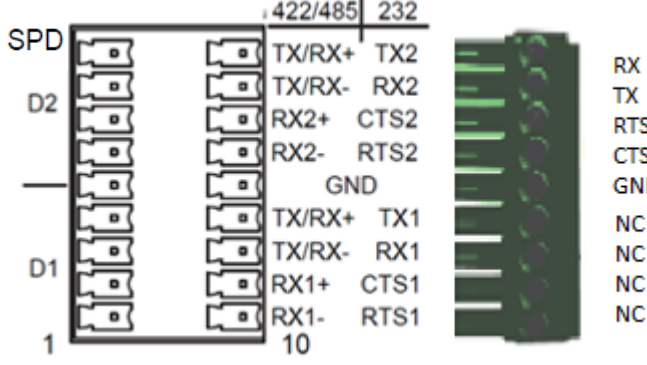
RS232 D1 and D2 Port Connector



RS232 D1 Port Connector

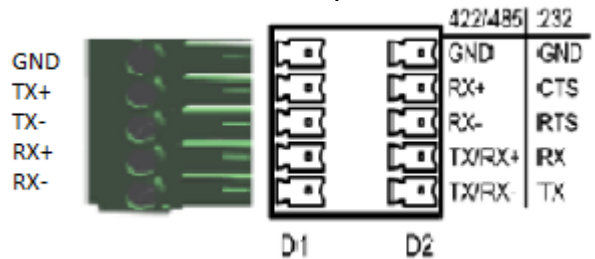


RS232 D2 Port Connector

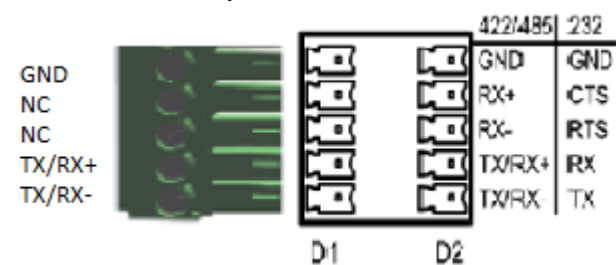


CNFE3DOE2/M Version 1 Connectors

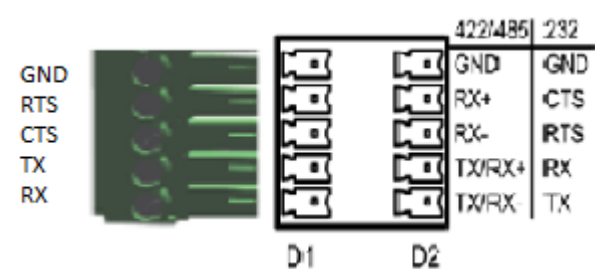
RS422 / RS485 Full Duplex      D1 Port Connector



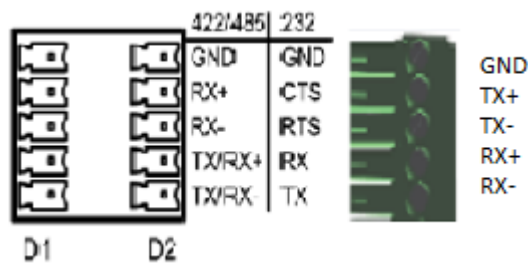
RS485 Half Duplex      D1 Port Connector



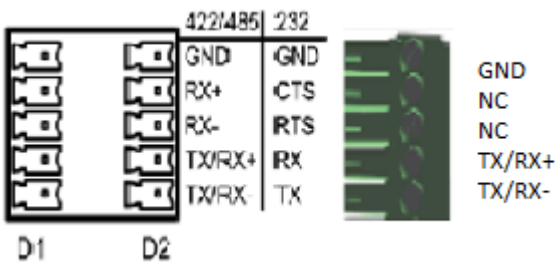
RS232      D1 Port Connector



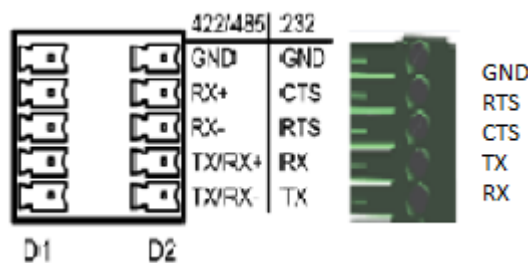
RS422 / RS485 Full Duplex      D2 Port Connector



RS485 Half Duplex      D2 Port Connector



RS232      D2 Port Connector



## Assign IP Address to a Terminal Server

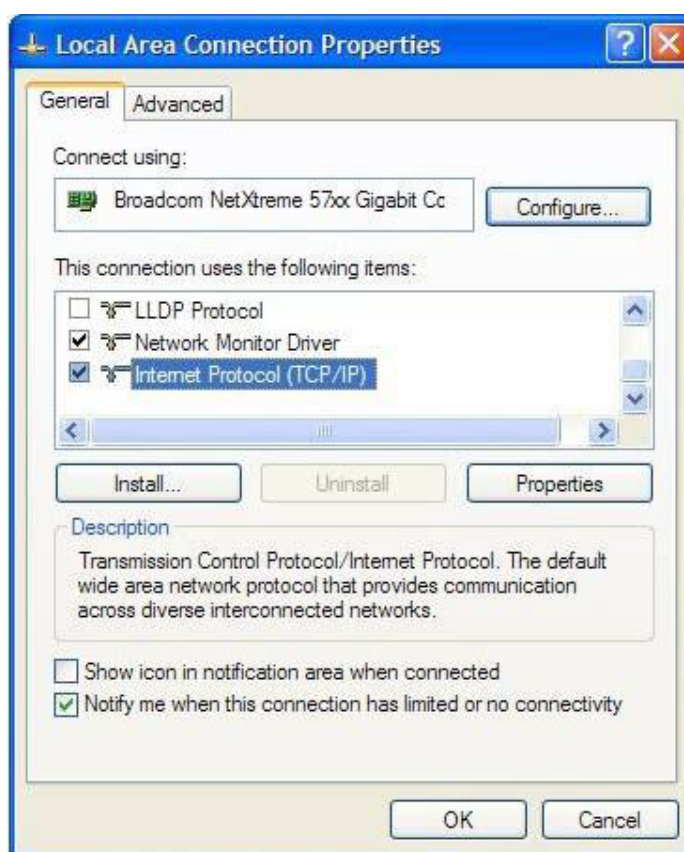
A unique IP address has to be assigned to each terminal server device. You can connect one at a time to change the default IP address. The default IP address of the device is the same: 192.168.10.1.

Connect the terminal server on to your local Ethernet network which your PC is connected to, and power on the unit.

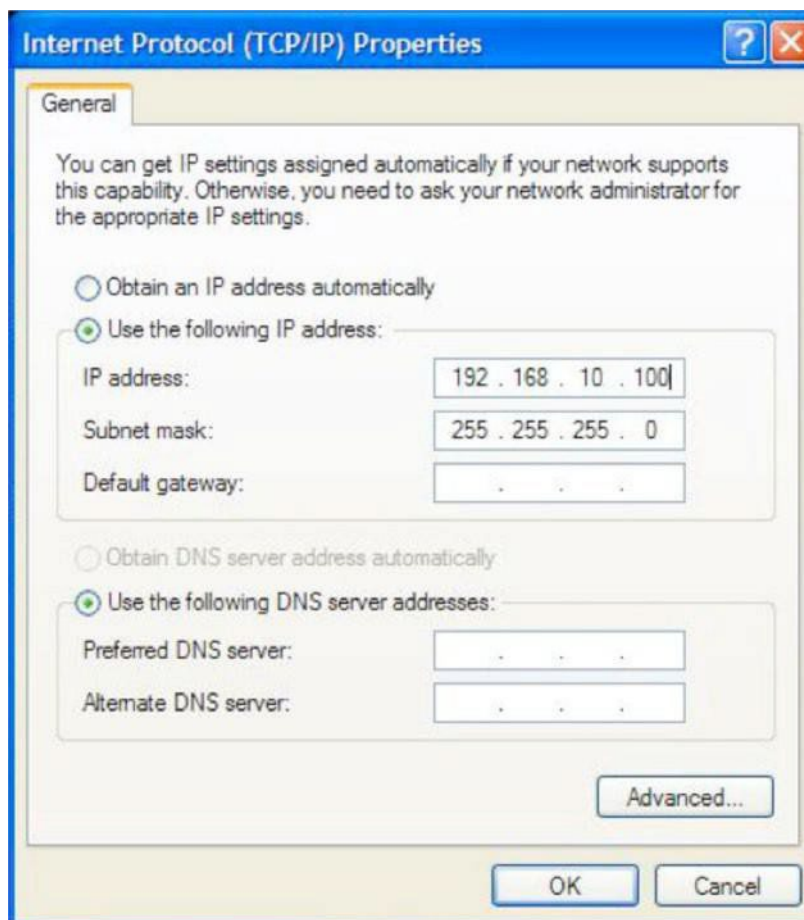
Follow the steps below to set up your PC IP address to the same subnet as the terminal servers.

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 -> Network Connections -> Properties**.



Next, manually set your IP address to **192.168.10.100**, for instance, 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 **192.168.10.1** and open the Terminal Server Log in Page as shown.

The default User Name and Password are both **admin**

Log in to the Terminal Server Home Page as shown.

The image shows a web browser's security warning dialog box. At the top, it says "Authentication required". Below that, it shows the URL "http://192.168.10.1" and a message: "Your connection to this site is not private". There are two input fields: "Username" with the text "admin" and "Password" with masked characters "\*\*\*\*\*". At the bottom, there are two buttons: "Log in" (highlighted in blue) and "Cancel".

*Terminal Server Log in Pop-up*

**comnet**

Comnet Terminal Server

**Comnet Terminal server**

**Network**

Protocol:  (Changing will terminate all existing connections)

Device Name (for DHCP):

NetBIOS Name:

Version:

**Static Settings**

Device IP Address:

Device Subnet Mask:

Device Gateway:

DNS Server:

NTP Server:

System Time:

**DHCP Assigned Values**

**Address Mode**

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*Terminal Server Network Page*

Click on the **Device IP Address text box**.

Change the IP address to an IP address with subnet appropriate for your network. In the following examples an IP address in subnet **192.168.10.xxx** will be used.

Configure the IP address to **192.168.10.10** as shown in the Terminal Server Network Page. Click **Submit New Settings**.

# Using Terminal Server as a Serial Extender over Ethernet

## TCP Transport

To use the Terminal Server as a serial extender over Ethernet, connect two terminal servers to your local Ethernet network.

### Configure Server

Configure the first device as a server:

- » Set protocol to TCP/SSL on Network page.

**comnet** Comnet Terminal Server

**Comnet Terminal server**

**Network**

Protocol:  (Changing will terminate all existing connections)

Device Name (for DHCP):

NetBIOS Name:

Version:

**Static Settings**

Device IP Address:

Device Subnet Mask:

Device Gateway:

DNS Server:

NTP Server:

System Time:

**DHCP Assigned Values**

**Address Mode**

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Figure 1 Terminal Server Network Page

- » Click TCP link
- » Configure Port1 to listen for incoming connections on port 24

| TCP                                                                                  | Port0                              | Port1                               |
|--------------------------------------------------------------------------------------|------------------------------------|-------------------------------------|
| <b>Listen for incoming network connections</b>                                       | <input type="checkbox"/>           | <input checked="" type="checkbox"/> |
| Listening network port:                                                              | <input type="text" value="0"/>     | <input type="text" value="24"/>     |
| Timeout and disconnect after this many seconds of inactivity.                        | <input type="text" value="60"/>    | <input type="text" value="60"/>     |
| Allow new connection if the existing connection has been idle for this many seconds. | <input type="text" value="30"/>    | <input type="text" value="30"/>     |
| <b>When to begin making outgoing tcp connections:</b>                                | <input type="text" value="Never"/> | <input type="text" value="Never"/>  |
| Connect on network port:                                                             | <input type="text"/>               | <input type="text"/>                |
| Connect to this address:                                                             | <input type="text"/>               | <input type="text"/>                |
| Alternate address:                                                                   | <input type="text"/>               | <input type="text"/>                |
| Timeout and disconnect after this many seconds of inactivity.                        | <input type="text" value="60"/>    | <input type="text" value="60"/>     |
| Retry failed outgoing connections after this many seconds.                           | <input type="text" value="360"/>   | <input type="text" value="360"/>    |
| Check and maintain valid connection at intervals in seconds.                         | <input type="text" value="0"/>     | <input type="text" value="0"/>      |
| <b>Use custom packetization logic (below)</b>                                        | <input type="checkbox"/>           | <input type="checkbox"/>            |
| Number of characters to accumulate before sending TCP packet:                        | <input type="text" value="32"/>    | <input type="text" value="32"/>     |
| Number of msec to wait for accumulated characters:<br>0 waits forever.               | <input type="text" value="100"/>   | <input type="text" value="100"/>    |
| Flush TCP frame when this character is received (Enter NA to disable):               | <input type="text" value="NA"/>    | <input type="text" value="NA"/>     |
| USE SSL rather than TCP for connections:                                             | <input type="checkbox"/>           | <input type="checkbox"/>            |
| Always Save Serial Chars regardless of connection status:                            | <input type="checkbox"/>           | <input type="checkbox"/>            |
| <b>Network Settings on Serial Port - Advanced Serial Settings</b>                    |                                    |                                     |
| <input type="button" value="Submit New Settings"/>                                   |                                    |                                     |

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Figure 2 Terminal Server TCP Page

- » Click Serial link
- » Configure Port1 for RS422

**comnet** Comnet Terminal Server

| Serial              | Port0                               | Port1                               |
|---------------------|-------------------------------------|-------------------------------------|
| Data Port Settings: | DEBUG                               | RS-422                              |
| Data Baud Rate:     | 115200                              | 115200                              |
| Custom Baud Rate:   | 0                                   | 0                                   |
| Data Bits:          | 8                                   | 8                                   |
| Data Parity:        | None                                | None                                |
| Stop Bits:          | 1                                   | 1                                   |
| Flow Control:       | None                                | None                                |
| AT Commands:        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

Submit New Settings

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Figure 3 Terminal Server Serial Page

## Configure Client

- » Configure the second device as a client.
- » Set protocol to TCP/SSL on Network page.

**comnet** Comnet Terminal Server

**Comnet Terminal server**

**Network**

Protocol: TCP/SSL (Changing will terminate all existing connections)

Device Name (for DHCP): SB70LCSX-6B5C

NetBIOS Name: SB70LCSX-6B5C

Version: 02.07.0000

| Static Settings                                       | DHCP Assigned Values | Address Mode                 |
|-------------------------------------------------------|----------------------|------------------------------|
| Device IP Address: 192.168.10.2                       |                      | Static IP                    |
| Device Subnet Mask: 255.255.255.0                     |                      |                              |
| Device Gateway: 192.168.10.254                        |                      |                              |
| DNS Server: 0.0.0.0                                   |                      |                              |
| NTP Server: pool.ntp.org                              | 0.0.0.0              | No DNS to look up NTP server |
| System Time: No valid time UTC (When page was loaded) |                      |                              |

Reset To Factory Defaults Submit New Settings

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Figure 4 Terminal Client Network Page

- » Click TCP link

» Configure Port1 to connect to 192.168.10.1 port 24

Comnet Terminal Server

|          |     |  |
|----------|-----|--|
| Network  | TCP |  |
| TCP      |     |  |
| Serial   |     |  |
| Password |     |  |
| HTTPS    |     |  |
| CAcerts  |     |  |
| Advanced |     |  |
| Help     |     |  |

| TCP                                                                                  | Port0                              | Port1                                                |
|--------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------|
| <b>Listen for incoming network connections</b>                                       | <input type="checkbox"/>           | <input type="checkbox"/>                             |
| Listening network port:                                                              | <input type="text" value="0"/>     | <input type="text" value="0"/>                       |
| Timeout and disconnect after this many seconds of inactivity.                        | <input type="text" value="60"/>    | <input type="text" value="60"/>                      |
| Allow new connection if the existing connection has been idle for this many seconds. | <input type="text" value="30"/>    | <input type="text" value="30"/>                      |
| <b>When to begin making outgoing tcp connections:</b>                                | <input type="text" value="Never"/> | <input type="text" value="If serial data received"/> |
| Connect on network port:                                                             | <input type="text"/>               | <input type="text" value="24"/>                      |
| Connect to this address:                                                             | <input type="text"/>               | <input type="text" value="192.168.10.1"/>            |
| Alternate address:                                                                   | <input type="text"/>               | <input type="text"/>                                 |
| Timeout and disconnect after this many seconds of inactivity.                        | <input type="text" value="60"/>    | <input type="text" value="60"/>                      |
| Retry failed outgoing connections after this many seconds.                           | <input type="text" value="360"/>   | <input type="text" value="360"/>                     |
| Check and maintain valid connection at intervals in seconds.                         | <input type="text" value="0"/>     | <input type="text" value="0"/>                       |
| <b>Use custom packetization logic (below)</b>                                        | <input type="checkbox"/>           | <input type="checkbox"/>                             |
| Number of characters to accumulate before sending TCP packet:                        | <input type="text" value="32"/>    | <input type="text" value="32"/>                      |
| Number of msec to wait for accumulated characters:<br>0 waits forever.               | <input type="text" value="100"/>   | <input type="text" value="100"/>                     |
| Flush TCP frame when this character is received (Enter NA to disable):               | <input type="text" value="NA"/>    | <input type="text" value="NA"/>                      |
| USE SSL rather than TCP for connections:                                             | <input type="checkbox"/>           | <input type="checkbox"/>                             |
| Always Save Serial Chars regardless of connection status:                            | <input type="checkbox"/>           | <input type="checkbox"/>                             |
| <b>Network Settings on Serial Port - Advanced Serial Settings</b>                    |                                    |                                                      |
| <input type="button" value="Submit New Settings"/>                                   |                                    |                                                      |

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Figure 5 Terminal Client TCP Page

» Click Serial link

» Configure Port1 for RS422

comnet

Comnet Terminal Server

Network

TCP

Serial

Password

HTTPS

CAcerts

Advanced

Help

Serial

Port0

Port1

Data Port Settings:

DEBUG

RS-422

Data Baud Rate:

115200

115200

Custom Baud Rate:

0

0

Data Bits:

8

8

Data Parity:

None

None

Stop Bits:

1

1

Flow Control:

None

None

AT Commands:

☐

☐

Submit New Settings

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Figure 6 Terminal Client Serial Page

## UDP Transport

To use the Terminal Server as a serial extender over Ethernet utilizing UDP, connect two terminal servers to your local Ethernet network and configure devices as a client server connection.

### Configure Server

- » Set protocol to UDP on Network page.

The screenshot displays the 'Comnet Terminal server' configuration interface. On the left is a navigation menu with links: Network, UDP, Serial, Password, HTTPS, CAcerts, Advanced, and Help. The 'Network' tab is selected. The main content area is titled 'Comnet Terminal server' and contains the following settings:

- Protocol:** A dropdown menu set to 'UDP' with a note: '(Changing will terminate all existing connections)'.
- Device Name (for DHCP):** Text input field containing 'SB70LCSX-6B5C'.
- NetBIOS Name:** Text input field containing 'SB70LCSX-6B5C'.
- Version:** Text input field containing '02.07.0000'.
- Static Settings:**
  - Device IP Address:** Text input field containing '192.168.10.2'.
  - Device Subnet Mask:** Text input field containing '255.255.255.0'.
  - Device Gateway:** Text input field containing '192.168.10.254'.
  - DNS Server:** Text input field containing '0.0.0.0'.
- DHCP Assigned Values:**
  - NTP Server:** Text input field containing 'pool.ntp.org'.
  - 0.0.0.0** is displayed next to the NTP Server field.
- Address Mode:** A dropdown menu set to 'Static IP'.
- System Time:** Text input field containing 'No valid time UTC (When page was loaded)'.

At the bottom of the settings area are two buttons: 'Reset To Factory Defaults' and 'Submit New Settings'. The footer of the page reads 'Copyright © 2014 Comnet, LLC.'.

Figure 7 Terminal Server Network Page

- » Click UDP link
- » Configure Port1 to receive on port 24 & to transmit to 192.168.10.2 on port 25

The screenshot shows the 'Comnet Terminal Server' interface with the 'UDP' tab selected in the left sidebar. The main content area is divided into three columns: 'UDP', 'Port0', and 'Port1'. Under the 'UDP' column, there are settings for incoming and outgoing ports, output address, learning from incoming packets, and character accumulation. 'Port0' and 'Port1' have corresponding input fields for these settings. A 'Submit New Settings' button is at the bottom.

| UDP                                                                      | Port0                            | Port1                                     |
|--------------------------------------------------------------------------|----------------------------------|-------------------------------------------|
| Settings:                                                                |                                  |                                           |
| Incoming port:                                                           | <input type="text"/>             | <input type="text" value="24"/>           |
| Outgoing port:                                                           | <input type="text"/>             | <input type="text" value="25"/>           |
| Send output to this address:                                             | <input type="text"/>             | <input type="text" value="192.168.10.2"/> |
| Learn outbound address from last incoming packet                         | <input type="checkbox"/>         | <input type="checkbox"/>                  |
| Number of characters to accumulate before sending UDP packet:            | <input type="text" value="32"/>  | <input type="text" value="32"/>           |
| Number msec to wait for accumulated characters:<br>0 waits forever.      | <input type="text" value="100"/> | <input type="text" value="100"/>          |
| Send UDP frame when this character is received:<br>(Enter NA to disable) | <input type="text" value="NA"/>  | <input type="text" value="NA"/>           |
| <input type="button" value="Submit New Settings"/>                       |                                  |                                           |

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*Figure 8 Terminal Server UDP Page*

- » Click Serial link
- » Configure Port1 for RS422

The screenshot shows the 'Comnet Terminal Server' interface with the 'Serial' tab selected in the left sidebar. The main content area is divided into three columns: 'Serial', 'Port0', and 'Port1'. Under the 'Serial' column, there are settings for data port, baud rate, data bits, parity, stop bits, flow control, and AT commands. 'Port0' and 'Port1' have corresponding dropdown menus and input fields for these settings. A 'Submit New Settings' button is at the bottom.

| Serial                                             | Port0                               | Port1                               |
|----------------------------------------------------|-------------------------------------|-------------------------------------|
| Data Port Settings:                                | <input type="text" value="DEBUG"/>  | <input type="text" value="RS-422"/> |
| Data Baud Rate:                                    | <input type="text" value="115200"/> | <input type="text" value="115200"/> |
| Custom Baud Rate:                                  | <input type="text" value="0"/>      | <input type="text" value="0"/>      |
| Data Bits:                                         | <input type="text" value="8"/>      | <input type="text" value="8"/>      |
| Data Parity:                                       | <input type="text" value="None"/>   | <input type="text" value="None"/>   |
| Stop Bits:                                         | <input type="text" value="1"/>      | <input type="text" value="1"/>      |
| Flow Control:                                      | <input type="text" value="None"/>   | <input type="text" value="None"/>   |
| AT Commands:                                       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="button" value="Submit New Settings"/> |                                     |                                     |

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*Figure 9 Terminal Server Serial Page*

## Configure Client

» Set protocol to UDP on Network page.

**comnet** Comnet Terminal Server

**Comnet Terminal server**

**Network**

Protocol:  (Changing will terminate all existing connections)

Device Name (for DHCP):

NetBIOS Name:

Version:

**Static Settings**

Device IP Address:

Device Subnet Mask:

Device Gateway:

DNS Server:

NTP Server:  0.0.0.0

System Time:

**DHCP Assigned Values**

**Address Mode**

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Figure 10 Terminal Client Network Page

» Click UDP link

» Configure Port1 to receive on port 25 & to transmit to 192.168.10.1 on port 24

**comnet** Comnet Terminal Server

**UDP**

**Settings:**

Incoming port:

Outgoing port:

Send output to this address:

Learn outbound address from last incoming packet: ☐

Number of characters to accumulate before sending UDP packet:

Number msec to wait for accumulated characters:

Send UDP frame when this character is received: (Enter NA to disable)

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Figure 11 Terminal Client UDP Page

- » Click Serial link
- » Configure Port1 for RS422

comnet

Comnet Terminal Server

Network

UDP

Serial

Password

HTTPS

CAcerts

Advanced

Help

Serial

Port0

Port1

Data Port Settings:

DEBUG

RS-422

Data Baud Rate:

115200

115200

Custom Baud Rate:

0

0

Data Bits:

8

8

Data Parity:

None

None

Stop Bits:

1

1

Flow Control:

None

None

AT Commands:

☐

☐

Submit New Settings

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Figure 12 Terminal Client Serial Page

## SSL Transport

To use the Terminal Server as a serial extender over Ethernet utilizing SSL, connect two terminal servers to your local Ethernet network and configure devices as a client server connection.

### Configure Server

- » Set protocol to TCP/SSL on Network page.

Figure 13 Terminal Server Network Page

- » Click TCP link
- » Configure Port1 to listen for incoming connections on port 24
- » Check “USE SSL rather than TCP for connection”


Comnet Terminal Server

| Network         | TCP                                                                                  | Port0                              | Port1                                                               |
|-----------------|--------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------|
| <b>TCP</b>      | <b>Listen for incoming network connections</b>                                       |                                    |                                                                     |
| <b>Serial</b>   | Listening network port:                                                              | <input type="text" value="0"/>     | <input checked="" type="checkbox"/> <input type="text" value="24"/> |
| <b>Password</b> | Timeout and disconnect after this many seconds of inactivity.                        | <input type="text" value="60"/>    | <input type="text" value="60"/>                                     |
| <b>HTTPS</b>    | Allow new connection if the existing connection has been idle for this many seconds. | <input type="text" value="30"/>    | <input type="text" value="30"/>                                     |
| <b>CAcerts</b>  | <b>When to begin making outgoing tcp connections:</b>                                |                                    |                                                                     |
| <b>Advanced</b> |                                                                                      | <input type="text" value="Never"/> | <input type="text" value="Never"/>                                  |
| <b>Help</b>     | Connect on network port:                                                             | <input type="text"/>               | <input type="text" value="1000"/>                                   |
|                 | Connect to this address:                                                             | <input type="text"/>               | <input type="text" value="192.168.10.2"/>                           |
|                 | Alternate address:                                                                   | <input type="text"/>               | <input type="text"/>                                                |
|                 | Timeout and disconnect after this many seconds of inactivity.                        | <input type="text" value="60"/>    | <input type="text" value="60"/>                                     |
|                 | Retry failed outgoing connections after this many seconds.                           | <input type="text" value="360"/>   | <input type="text" value="360"/>                                    |
|                 | Check and maintain valid connection at intervals in seconds.                         | <input type="text" value="0"/>     | <input type="text" value="0"/>                                      |
|                 | <b>Use custom packetization logic (below)</b>                                        |                                    |                                                                     |
|                 | Number of characters to accumulate before sending TCP packet:                        | <input type="text" value="32"/>    | <input type="text" value="32"/>                                     |
|                 | Number of msec to wait for accumulated characters:<br>0 waits forever.               | <input type="text" value="100"/>   | <input type="text" value="100"/>                                    |
|                 | Flush TCP frame when this character is received (Enter NA to disable):               | <input type="text" value="NA"/>    | <input type="text" value="NA"/>                                     |
|                 | USE SSL rather than TCP for connections:                                             | <input type="checkbox"/>           | <input checked="" type="checkbox"/>                                 |
|                 | Always Save Serial Chars regardless of connection status:                            | <input type="checkbox"/>           | <input type="checkbox"/>                                            |
|                 | <b>Network Settings on Serial Port -<br/>Advanced Serial Settings</b>                |                                    |                                                                     |
|                 | <input type="button" value="Submit New Settings"/>                                   |                                    |                                                                     |

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Figure 14 Terminal Server TCP Page

- » Click Serial link
- » Configure Port1 for RS422

The screenshot shows the 'Comnet Terminal Server' web interface. On the left is a navigation menu with links: Network, TCP, Serial, Password, HTTPS, CAcerts, Advanced, and Help. The 'Serial' link is selected. The main content area is titled 'Serial' and contains configuration settings for two ports, Port0 and Port1. The settings include Data Port Settings (DEBUG for Port0, RS-422 for Port1), Data Baud Rate (115200 for both), Custom Baud Rate (0 for both), Data Bits (8 for both), Data Parity (None for both), Stop Bits (1 for both), Flow Control (None for both), and AT Commands (checked for both). A 'Submit New Settings' button is at the bottom. The footer indicates 'Copyright © 2014 Comnet, LLC.'

*Figure 15 Terminal Server Serial Page*

- » Click HTTPS link
- » Select Choose File and load Certificate “device.crt”
- » Select Choose File and load Certificate key “device.key”

The screenshot shows the 'Comnet Terminal Server' web interface with the 'HTTPS' link selected in the navigation menu. The main content area is titled 'HTTPS' and displays the status of SSL and RSA certificates and key pairs. It shows 'User Installed' for both, with a 'Display Public Key' link next to the RSA status. Below this, there are 'Choose File' buttons for 'Certificate File to Install' (device.crt) and 'Key File to Install' (device.key). An 'Install Certificate and Key' button is at the bottom. A note states: 'HTTPS - Hypertext Transfer Protocol over Secure Shell Layer (HTTPS) secure web site settings. Key size must be at least 128 and no more than 1024 and in openssl(openSSH) format.' The footer indicates 'Copyright © 2014 Comnet, LLC.'

*Figure 16 Terminal Server Certificate and key files*

- » Select Install Certificate and Key

## Configure Client

- » Set protocol to TCP/SSL on Network page.

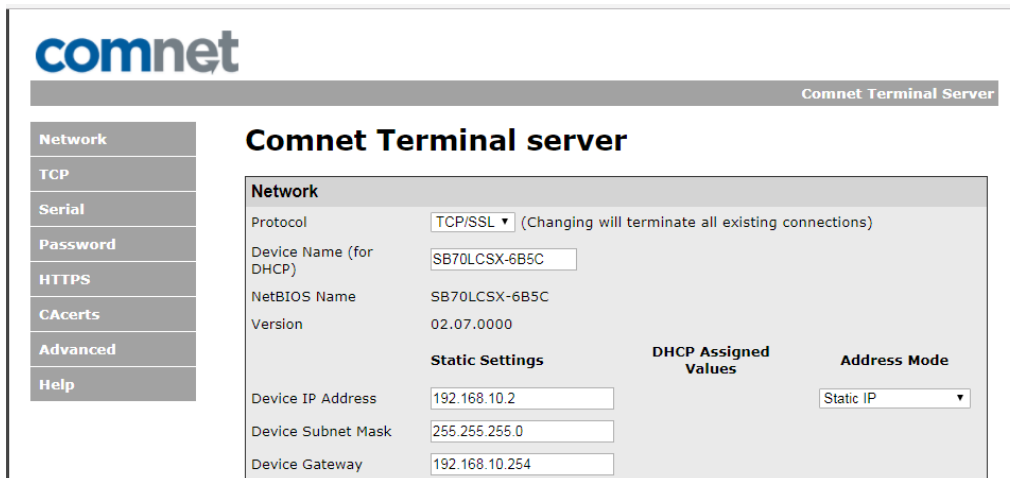


Figure 17 Terminal Client Network Page

- » Click TCP link
- » Configure Port1 to connect to 192.168.10.1 port 24
- » Check “USE SSL rather than TCP for connection”

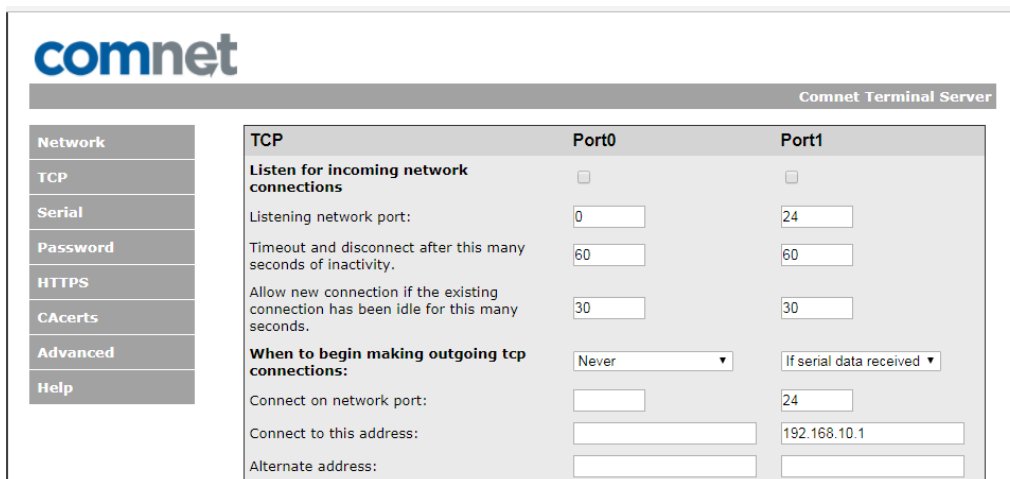


Figure 18 Terminal Client TCP Page

- » Click Serial link
- » Configure Port1 for RS422

The screenshot shows the 'Comnet Terminal Server' interface. On the left is a navigation menu with links: Network, TCP, Serial, Password, HTTPS, CAcerts, Advanced, and Help. The 'Serial' link is selected. The main content area is titled 'Serial' and contains configuration settings for two ports, Port0 and Port1. The settings include Data Port Settings (DEBUG, RS-422), Data Baud Rate (115200), Custom Baud Rate (0), Data Bits (8), Data Parity (None), Stop Bits (1), Flow Control (None), and AT Commands (checkboxes). A 'Submit New Settings' button is at the bottom. The footer indicates 'Copyright © 2014 Comnet, LLC.'

*Figure 19 Terminal Client Serial Page*

» Click CAcerts link

» Select Choose File and load Certificate “CA.crt”

The screenshot shows the 'Comnet Terminal Server' interface with the 'CAcerts' link selected in the navigation menu. The main content area displays a table with columns: CN Name, Public Key Link, and Delete. The table contains one row with 'Show PublicKey' and 'Delete' links. Below the table, there is a 'Certificate File to Install' section with a 'Choose File' button and the text 'CA.crt'. An 'Add New client CA' button is also present. A note states: 'Key size must be at least 128 and no more than 1024 and in openssl(openSSH) format.' The footer indicates 'Copyright © 2014 Comnet, LLC.'

*Figure 20 Terminal Client Certificate Authority certificate file*

» Select Add New client CA

The screenshot displays the Comnet Terminal Server web interface. On the left is a vertical navigation menu with the following items: Network, TCP, Serial, Password, HTTPS, CAcerts, Advanced, and Help. The main content area is titled 'Comnet Terminal Server' and contains a table with three columns: 'CN Name', 'Public Key Link', and 'Delete'. The table has one row with a red 'Show PublicKey' link under 'Public Key Link' and a red 'Delete' link under 'Delete'. Below the table, there is a section titled 'Certificate File to Install' with a 'Choose File' button, the text 'No file chosen', and an 'Add New client CA' button. A note below this section states: 'Key size must be at least 128 and no more than 1024 and in openssl(openSSH) format.' At the bottom of the page, a copyright notice reads: 'Copyright © 2014 Comnet, LLC.'

| CN Name | Public Key Link | Delete |
|---------|-----------------|--------|
|         | Show PublicKey  | Delete |

Certificate File to Install  No file chosen

Key size must be at least 128 and no more than 1024 and in openssl(openSSH) format.

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*Figure 21 Terminal Client CA Certificate add*

## Creating openssl certificates

» Open terminal on a Linux machine

### Client Certificate

```
development@ubuntu:~/ssl$
development@ubuntu:~/ssl$
development@ubuntu:~/ssl$ openssl genrsa -out CA.key 1024
Generating RSA private key, 1024 bit long modulus
.....+++++
.....+++++
e is 65537 (0x10001)
development@ubuntu:~/ssl$ openssl req -new -key CA.key -x509 -days 365 -out CA.crt
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:US
State or Province Name (full name) [Some-State]:California
Locality Name (eg, city) []:SanDiego
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Comnet
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:192.168.10.2
Email Address []:
development@ubuntu:~/ssl$ ls -l
total 8
-rw-rw-r-- 1 development development 940 Feb  6 09:29 CA.crt
-rw-rw-r-- 1 development development 887 Feb  6 09:26 CA.key
development@ubuntu:~/ssl$
```

Figure 22 Client Self Signed Certificate

### Server Certificate

```
development@ubuntu:~/ssl$
development@ubuntu:~/ssl$ openssl genrsa -out device.key 1024
Generating RSA private key, 1024 bit long modulus
.....+++++
.....+++++
e is 65537 (0x10001)
development@ubuntu:~/ssl$
development@ubuntu:~/ssl$ openssl req -new -key device.key -out device.csr
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:US
State or Province Name (full name) [Some-State]:California
Locality Name (eg, city) []:San Diego
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Comnet
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:192.168.10.1
Email Address []:

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:
An optional company name []:
development@ubuntu:~/ssl$
development@ubuntu:~/ssl$ openssl x509 -req -days 365 -in device.csr -CA CA.crt -CAkey CA.key -CAcreateserial -out device.crt
Signature ok
subject=/C=US/ST=California/L=San Diego/O=Comnet/CN=192.168.10.1
Getting CA Private Key
development@ubuntu:~/ssl$
```

Figure 23 Server Self Signed Certificate

```
development@ubuntu:~/ssl$  
development@ubuntu:~/ssl$ ls -l  
total 24  
-rw-rw-r-- 1 development development 940 Feb  6 09:29 CA.crt  
-rw-rw-r-- 1 development development 887 Feb  6 09:26 CA.key  
-rw-rw-r-- 1 development development  17 Feb  6 09:39 CA.srl  
-rw-rw-r-- 1 development development 822 Feb  6 09:39 device.crt  
-rw-rw-r-- 1 development development 639 Feb  6 09:36 device.csr  
-rw-rw-r-- 1 development development 887 Feb  6 09:34 device.key  
development@ubuntu:~/ssl$  
development@ubuntu:~/ssl$
```

*Figure 24 Client and Server Certificates & keys*

## SSH Transport

To use the Terminal Server to connect a serial device over Ethernet utilizing SSH, connect a terminal server and a laptop to your local Ethernet network configuring both devices as a client server connection.

### Configure Server

- » Set protocol to SSH on Network page.

Figure 25 Terminal Server Network Page

- » Click SSH link
- » Configure Port1 to listen for incoming connections on port 22

**comnet** Comnet Terminal Server

**SSH**

**Listen for incoming network connections**

Listening network port: Port0: 0 Port1: 22

Timeout and disconnect after this many seconds of inactivity: Port0: 360 Port1: 360

Allow new connection if the existing connection has been idle for this many seconds: Port0: 180 Port1: 180

**Use custom packetization logic (below)**

Number of characters to accumulate before sending TCP packet: Port0: 32 Port1: 32

Number msec to wait for accumulated characters: 0 waits forever. Port0: 100 Port1: 100

Flush TCP frame when this character is received (Enter NA to disable): Port0: NA Port1: NA

**SSH Keys** [SSH Keys](#)

**Network Settings on Serial Port - Advanced Serial Settings**

[Submit New Settings](#)

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Figure 26 Terminal Server SSH Page

- » Click SSH Keys link
- » Click Choose File and select ssh rsa key pair “id\_rsa”
- » Click Install Key

**comnet** Comnet Terminal Server

**SSH Keys**

| RSA Public/Private Key Pair    | User Installed                     |                                    |
|--------------------------------|------------------------------------|------------------------------------|
| DSA Public/Private Key Pair    | Default                            | <a href="#">Display Public Key</a> |
| RSA or DSA Key File to Install | <a href="#">Choose File</a> id_rsa | <a href="#">Display Public Key</a> |

[Install Key](#)

SSH Keys - Key size must be at least 512 and no more than 4096 and in openSSH(openssl) format.

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Figure 27 Terminal Server Keys Page

- » Click Serial link
- » Configure Port1 for RS422

comnet

Comnet Terminal Server

Network

TCP

Serial

Password

HTTPS

CAcerts

Advanced

Help

Serial

Port0

Port1

Data Port Settings: DEBUG RS-422

Data Baud Rate: 115200 115200

Custom Baud Rate: 0 0

Data Bits: 8 8

Data Parity: None None

Stop Bits: 1 1

Flow Control: None None

AT Commands: ☒ ☒

Submit New Settings

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*Figure 28 Terminal Server Serial Page*

## Configure Client Laptop

» Open Tera Term and select SSH and TCP port 22

Tera Term - [disconnected] VT

File Edit S Tera Term: New connection

TCP/IP

Host: 192.168.10.1

History ☒

Service: ☐ Telnet ☒ SSH ☐ Other

TCP port#: 22

SSH version: SSH2

Protocol: UNSPEC

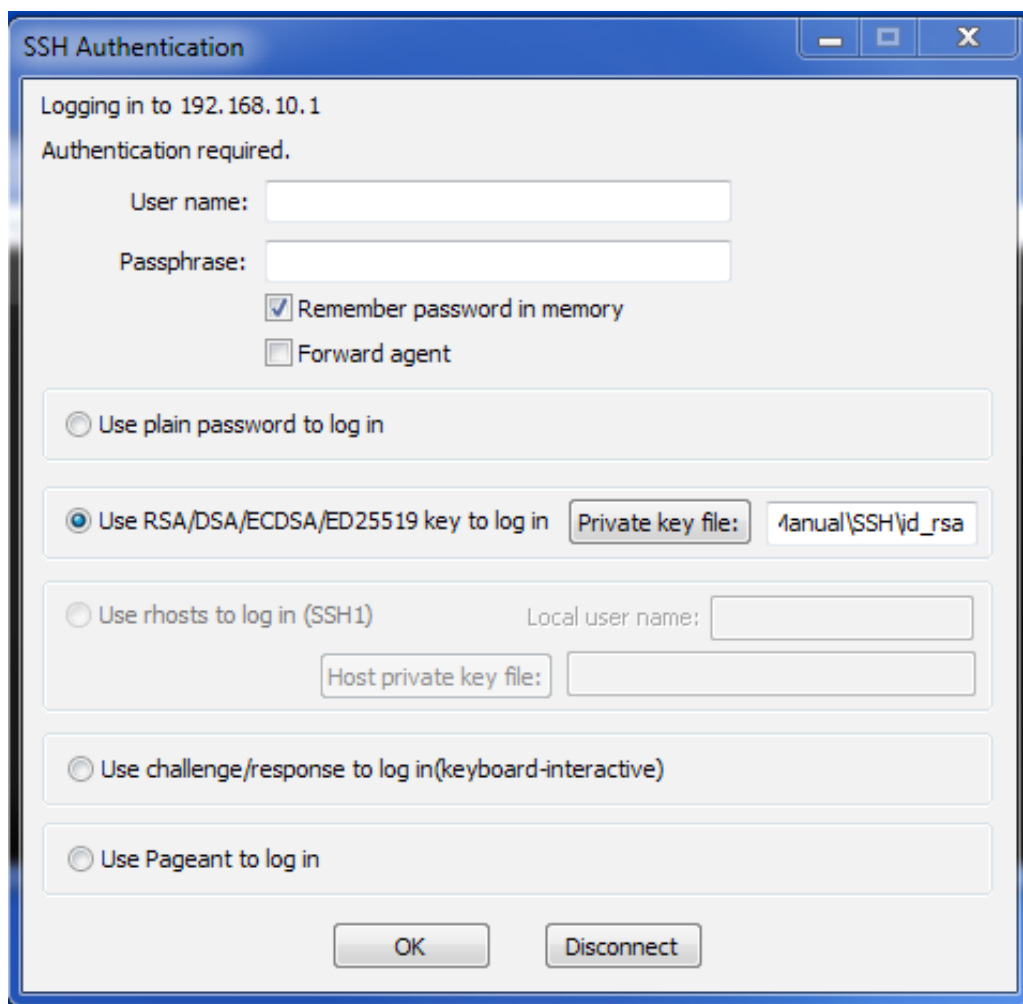
Serial

Port:

OK Cancel Help

*Figure 29 Terminal Client Tera Term*

» On SSH Authentication Pop Up click RSA and select Private key file id\_rsa



The image shows a Windows-style dialog box titled "SSH Authentication". It has a blue title bar with standard minimize, maximize, and close buttons. The main content area is light gray and contains the following elements:

- Text: "Logging in to 192.168.10.1"
- Text: "Authentication required."
- Text: "User name:" followed by a text input field.
- Text: "Passphrase:" followed by a text input field.
- Checkboxes:   
- "Remember password in memory" (checked)   
- "Forward agent" (unchecked)
- Radio buttons for authentication methods:   
- "Use plain password to log in" (unchecked)   
- "Use RSA/DSA/ECDSA/ED25519 key to log in" (checked)   
- "Use rhosts to log in (SSH1)" (unchecked)   
- "Use challenge/response to log in(keyboard-interactive)" (unchecked)   
- "Use Pageant to log in" (unchecked)
- Text: "Private key file:" followed by a text box containing "4anual\SSH\id\_rsa"
- Text: "Local user name:" followed by a text input field (under the "Use rhosts" option).
- Text: "Host private key file:" followed by a text input field (under the "Use rhosts" option).
- Buttons: "OK" and "Disconnect" at the bottom.

Figure 30 Terminal Client Tera Term SSH Authentication

## Creating SSH key pairs

Open terminal on a linux machine

```
RStrempe1@8257RSTREMP1 /c/nburn/pctools/BatchUpdateOne/SSL Certs
$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/y/.ssh/id_rsa): id_rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in id_rsa.
Your public key has been saved in id_rsa.pub.
The key fingerprint is:
21:f6:cb:ed:63:28:89:40:18:08:af:36:7e:1a:df:e2 RStrempe1@8257RSTREMP1
The key's randomart image is:
+--[ RSA 2048 ]-----+
|
|+.
|o.
|o. o.
|... o.
|.+. S
|o o .o
|o o .o..
|=.o o ..o
|..E.. .
+-----+

RStrempe1@8257RSTREMP1 /c/nburn/pctools/BatchUpdateOne/SSL Certs
$ ls -l
total 12
-rw-r--r-- 1 RStrempe Administ 940 Feb 6 09:29 CA.crt
-rw-r--r-- 1 RStrempe Administ 887 Feb 6 09:26 CA.key
-rw-r--r-- 1 RStrempe Administ 17 Feb 6 09:39 CA.srl
-rw-r--r-- 1 RStrempe Administ 205 Feb 6 13:00 Self Signed Certs.txt
-rw-r--r-- 1 RStrempe Administ 822 Feb 6 09:39 device.crt
-rw-r--r-- 1 RStrempe Administ 639 Feb 6 09:36 device.csr
-rw-r--r-- 1 RStrempe Administ 887 Feb 6 09:34 device.key
-rw-r--r-- 1 RStrempe Administ 1675 Feb 6 13:01 id_rsa
-rw-r--r-- 1 RStrempe Administ 405 Feb 6 13:01 id_rsa.pub
-rw-r--r-- 1 RStrempe Administ 13044 Feb 6 12:42 ssh2connect.log

RStrempe1@8257RSTREMP1 /c/nburn/pctools/BatchUpdateOne/SSL Certs
$
```

Figure 31 Creating SSH key pairs

## Telnet Transport

To use the Terminal Server to connect a serial device over Ethernet utilizing Telnet, connect a terminal server and a laptop to your local Ethernet network configuring both devices as a client server connection.

### Configure Server

- » Set protocol to TCP on Network page.

**comnet**

Comnet Terminal Server

**Comnet Terminal server**

**Network**

Protocol: TCP/SSL (Changing will terminate all existing connections)

Device Name (for DHCP): SB70LCSX-6B52

NetBIOS Name: SB70LCSX-6B52

Version: 02.07.0000

**Static Settings**

Device IP Address: 192.168.10.1

Device Subnet Mask: 255.255.255.0

Device Gateway: 192.168.10.254

DNS Server: 0.0.0.0

**DHCP Assigned Values**

**Address Mode**: Static IP

NTP Server: pool.ntp.org

System Time: No valid time UTC (When page was loaded)

0.0.0.0 No DNS to look up NTP server

Reset To Factory Defaults Submit New Settings

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*Figure 32 Terminal Server Network Page*

» Click TCP link

» Configure Port1 to listen for incoming connections on port 24


Comnet Terminal Server

|                 | TCP                                                                                  | Port0                    | Port1                               |
|-----------------|--------------------------------------------------------------------------------------|--------------------------|-------------------------------------|
| <b>Network</b>  |                                                                                      |                          |                                     |
| <b>TCP</b>      |                                                                                      |                          |                                     |
| <b>Serial</b>   |                                                                                      |                          |                                     |
| <b>Password</b> |                                                                                      |                          |                                     |
| <b>HTTPS</b>    |                                                                                      |                          |                                     |
| <b>CAcerts</b>  |                                                                                      |                          |                                     |
| <b>Advanced</b> |                                                                                      |                          |                                     |
| <b>Help</b>     |                                                                                      |                          |                                     |
|                 | <b>Listen for incoming network connections</b><br><input type="checkbox"/>           |                          | <input checked="" type="checkbox"/> |
|                 | Listening network port:                                                              | 0                        | 24                                  |
|                 | Timeout and disconnect after this many seconds of inactivity.                        | 60                       | 60                                  |
|                 | Allow new connection if the existing connection has been idle for this many seconds. | 30                       | 30                                  |
|                 | <b>When to begin making outgoing tcp connections:</b>                                | Never                    | Never                               |
|                 | Connect on network port:                                                             | 1000                     | 1000                                |
|                 | Connect to this address:                                                             | 192.168.10.4             | 192.168.10.2                        |
|                 | Alternate address:                                                                   | (Enter IP Address)       | 192.168.10.2                        |
|                 | Timeout and disconnect after this many seconds of inactivity.                        | 60                       | 60                                  |
|                 | Retry failed outgoing connections after this many seconds.                           | 360                      | 360                                 |
|                 | Check and maintain valid connection at intervals in seconds.                         | 0                        | 0                                   |
|                 | <b>Use custom packetization logic (below)</b>                                        | <input type="checkbox"/> | <input type="checkbox"/>            |
|                 | Number of characters to accumulate before sending TCP packet:                        | 32                       | 32                                  |
|                 | Number of msec to wait for accumulated characters:<br>0 waits forever.               | 100                      | 100                                 |
|                 | Flush TCP frame when this character is received (Enter NA to disable):               | NA                       | NA                                  |
|                 | USE SSL rather than TCP for connections:                                             | <input type="checkbox"/> | <input type="checkbox"/>            |
|                 | Always Save Serial Chars regardless of connection status:                            | <input type="checkbox"/> | <input type="checkbox"/>            |
|                 | <b>Network Settings on Serial Port -</b><br><a href="#">Advanced Serial Settings</a> |                          |                                     |
|                 | <input type="button" value="Submit New Settings"/>                                   |                          |                                     |

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Figure 33 Terminal Server TCP Page

- » Click Serial link
- » Configure Port1 for RS422

The screenshot shows the 'Comnet Terminal Server' web interface. On the left is a navigation menu with options: Network, TCP, Serial, Password, HTTPS, CAcerts, Advanced, and Help. The 'Serial' option is selected. The main area is titled 'Serial' and contains configuration settings for two ports, Port0 and Port1. The settings include Data Port Settings (DEBUG and RS-422), Data Baud Rate (115200), Custom Baud Rate (0), Data Bits (8), Data Parity (None), Stop Bits (1), Flow Control (None), and AT Commands (checked). A 'Submit New Settings' button is at the bottom. The footer indicates 'Copyright © 2014 Comnet, LLC.'

| Serial              | Port0                               | Port1                               |
|---------------------|-------------------------------------|-------------------------------------|
| Data Port Settings: | DEBUG                               | RS-422                              |
| Data Baud Rate:     | 115200                              | 115200                              |
| Custom Baud Rate:   | 0                                   | 0                                   |
| Data Bits:          | 8                                   | 8                                   |
| Data Parity:        | None                                | None                                |
| Stop Bits:          | 1                                   | 1                                   |
| Flow Control:       | None                                | None                                |
| AT Commands:        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

*Figure 34 Terminal Server Serial Page*

## Configure Client Laptop

» Open Tera Term and select Telnet and TCP port 24

The screenshot shows the 'Tera Term: New connection' dialog box. The 'TCP/IP' radio button is selected. The 'Host' field contains '192.168.10.1'. The 'History' checkbox is checked. The 'Service' section has 'Telnet' selected. The 'TCP port#' field contains '24'. The 'SSH version' dropdown is set to 'SSH2'. The 'Protocol' dropdown is set to 'UNSPEC'. The 'Serial' radio button is unselected. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

*Figure 35 Terminal Client Tera Term*

# HTTPS Configuration

- » Click HTTPS
- » Select Certificate File to Install Choose File “device.crt”
- » Select Key File to Install. Choose File “device.key”
- » Click Install Certificate and Key

The screenshot shows the Comnet Terminal Server web interface. On the left is a navigation menu with the following items: Network, TCP, Serial, Password, HTTPS (which is highlighted), CAcerts, Advanced, and Help. The main content area is titled 'HTTPS' and contains the following configuration options:

| Setting                     | Value                                                 |
|-----------------------------|-------------------------------------------------------|
| SSL Public Key Certificate  | User Installed                                        |
| RSA Public/Private Key Pair | User Installed <a href="#">Display Public Key</a>     |
| Certificate File to Install | <input type="button" value="Choose File"/> device.crt |
| Key File to Install         | <input type="button" value="Choose File"/> device.key |

At the bottom of the configuration area is an  button.

Below the configuration area, there is explanatory text: "HTTPS - Hypertext Transfer Protocol over Secure Shell Layer (HTTPS) secure web site settings. Key size must be at least 128 and no more than 1024 and in openssl(openSSH) format."

The footer of the page reads: "Copyright © 2014 Comnet, LLC."

Figure 36 Terminal Server Certificate and Key files

## Internet Explorer Configuration

» Click on tools and select Internet options

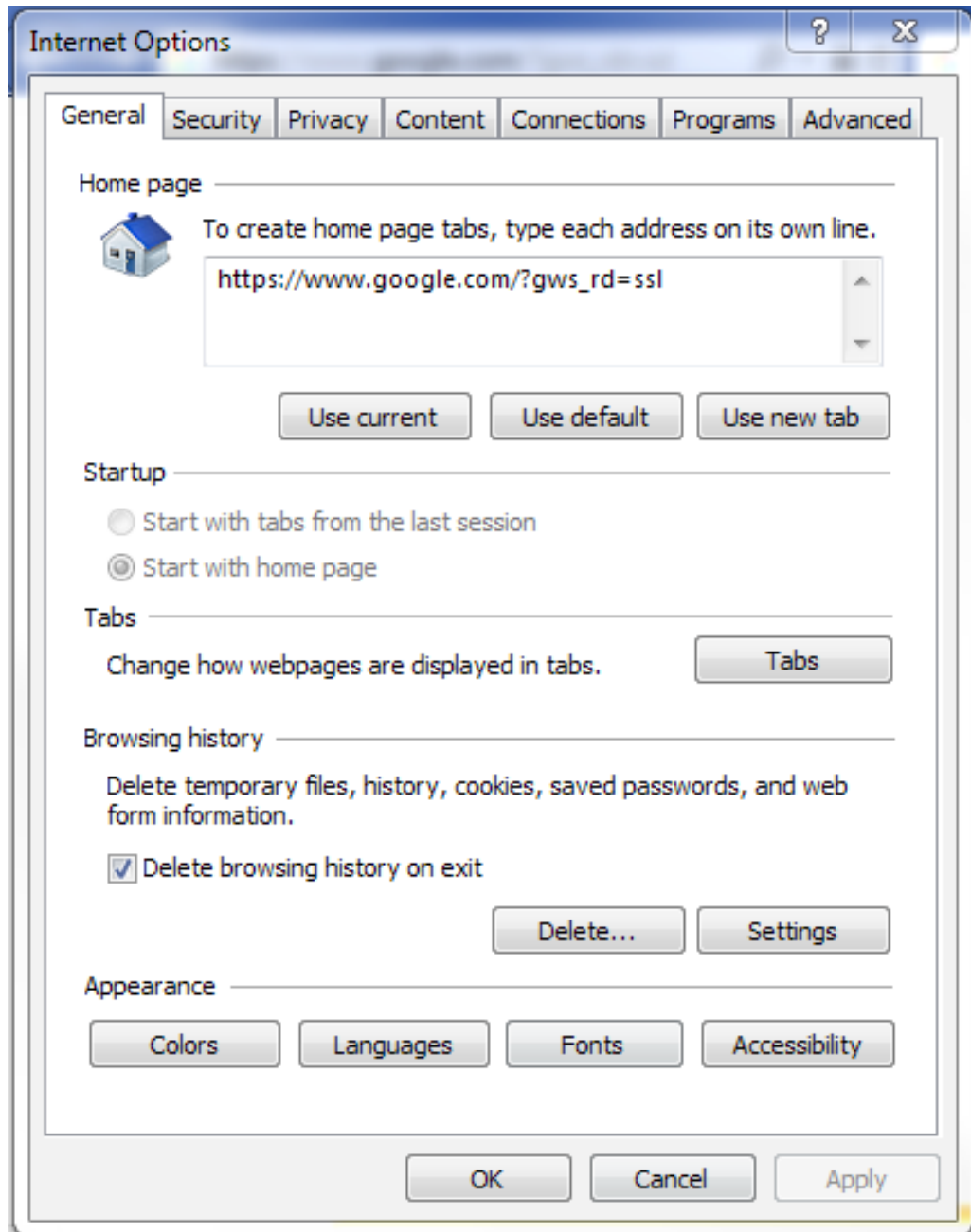


Figure 37 Terminal Client IE Options

» Click Content tab and click Certificates

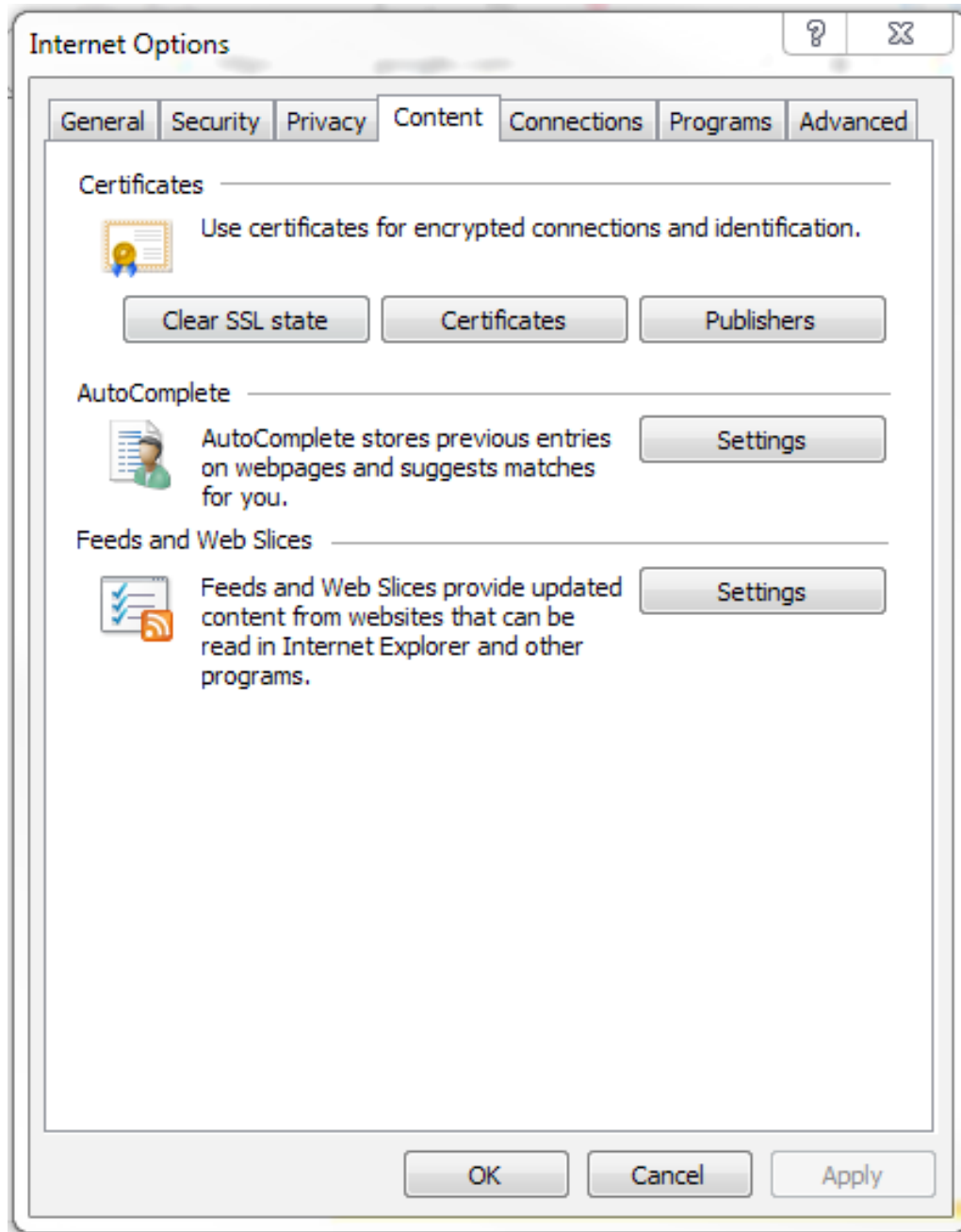


Figure 38 Terminal Client IE Certificates

» Click Trusted Root Certifications Authority tab

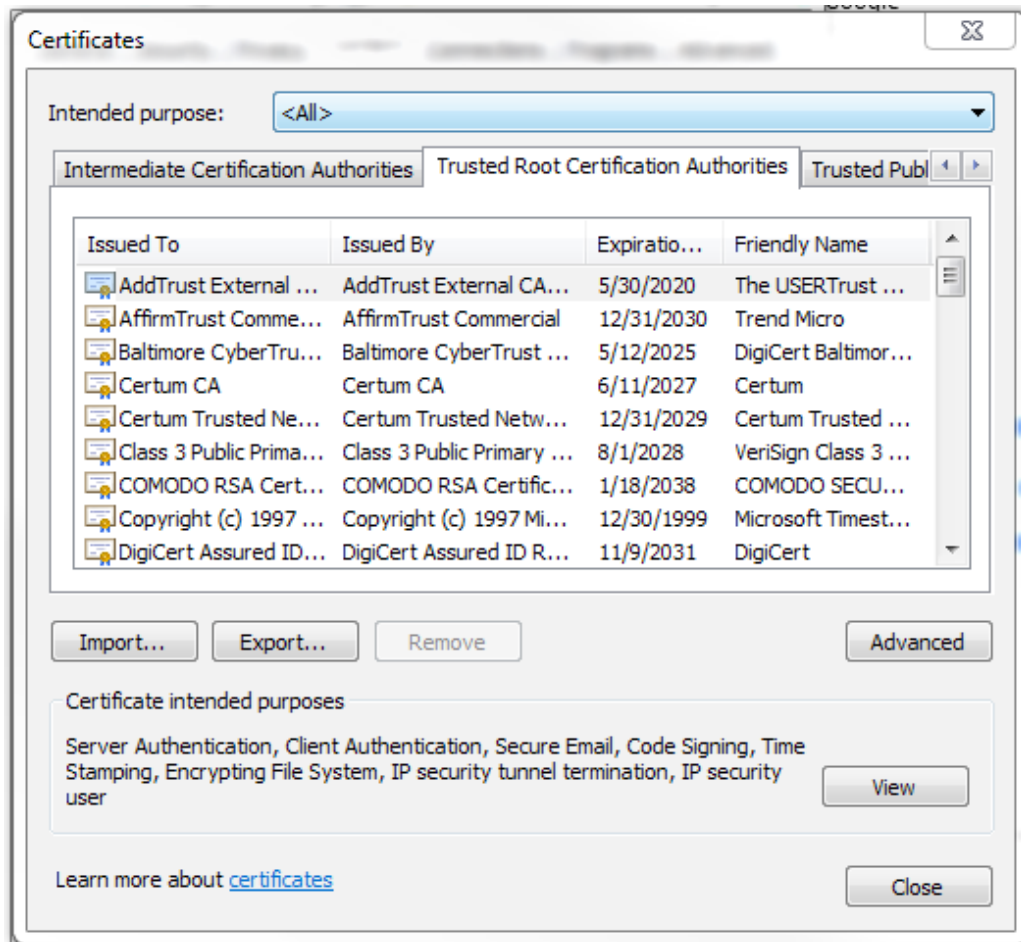


Figure 39 Terminal Client IE Root CA

- » Click Import...
- » Use wizard to load CA certificate "CA.crt"
- » Place in Trusted Root Certification Authorities

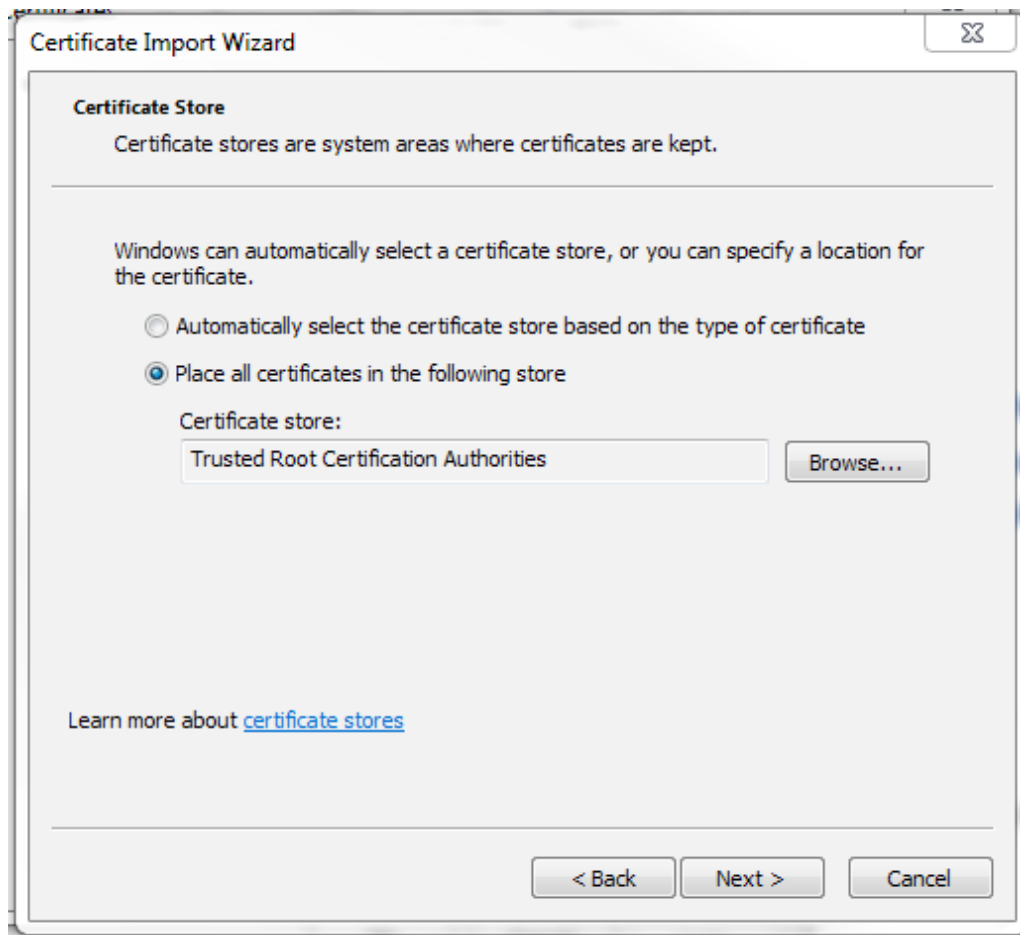


Figure 40 Terminal Client IE Certificate Store

- » Finish wizard and close Internet Explorer
- » Terminal Server is now accessible using HTTPS with Internet Explorer

## FireFox Configuration

» Click on tools and select options

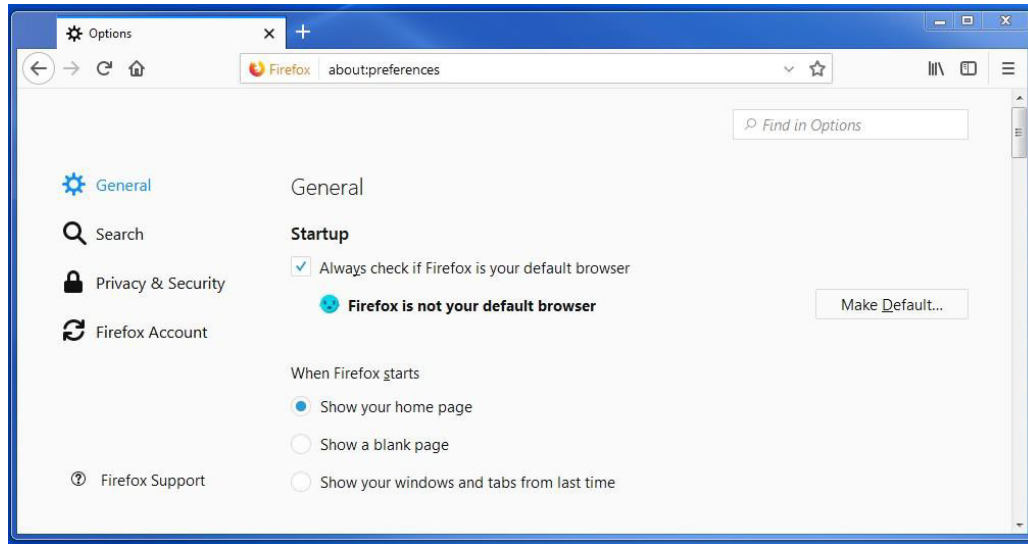


Figure 41 Terminal Client FireFox Options

» Click Privacy & Security

» Click View Certificates

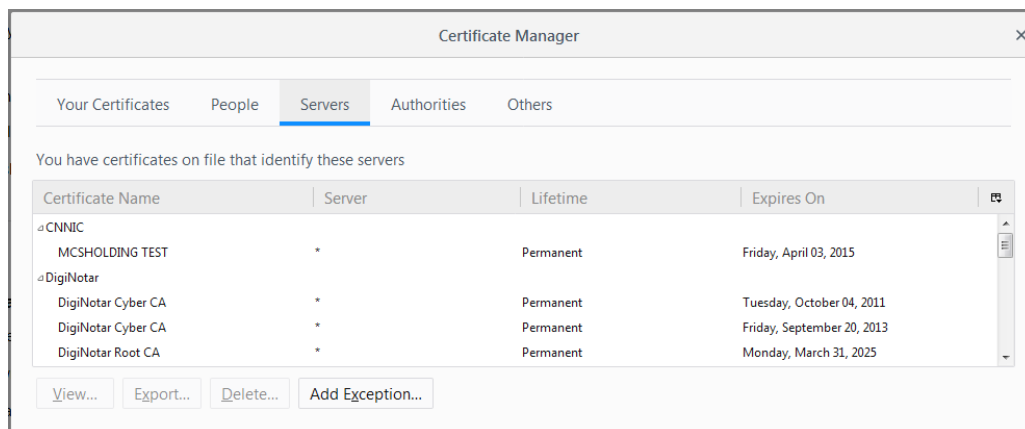


Figure 42 Terminal Client FireFox Certificate MGR

» Click Servers and Add Exception

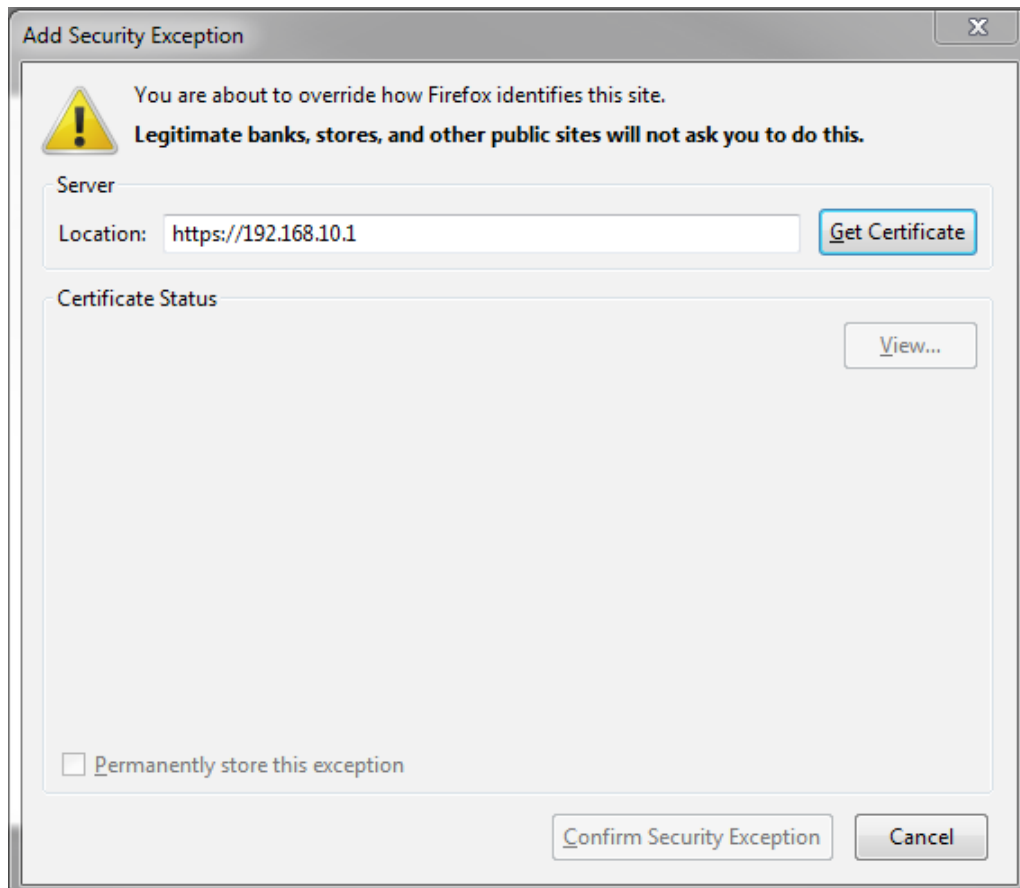


Figure 43 Terminal Client FireFox Exception

- » Click Get Certificate
- » Click Confirm Security Exception
- » Close FireFox
- » Terminal Server is now accessible using HTTPS with FireFox

## OpenSSL Certificate, key and CA for HTTPS

- » Use same SSL certificates

## Console Port Access

One serial port may be designated as a console port using USB to RS232 cable. The console port may be used to view and change the IP address as well as access other system information. Debug mode will not forward any serial data but is only used to access the terminal server host.

- » Click Serial Link
- » Configure Port0 for Debug

The screenshot displays the 'Comnet Terminal Server' configuration interface. On the left is a navigation menu with options: Network, TCP, Serial, Password, HTTPS, CAcerts, Advanced, and Help. The 'Serial' option is selected. The main area is titled 'Serial' and contains two columns for 'Port0' and 'Port1'. The settings for both ports are identical: Data Port Settings is set to 'DEBUG' for Port0 and 'RS-422' for Port1; Data Baud Rate is '115200'; Custom Baud Rate is '0'; Data Bits is '8'; Data Parity is 'None'; Stop Bits is '1'; Flow Control is 'None'; and AT Commands are checked. A 'Submit New Settings' button is located at the bottom of the configuration area. The footer indicates 'Copyright © 2014 Comnet, LLC.'

| Serial              | Port0                               | Port1                               |
|---------------------|-------------------------------------|-------------------------------------|
| Data Port Settings: | DEBUG                               | RS-422                              |
| Data Baud Rate:     | 115200                              | 115200                              |
| Custom Baud Rate:   | 0                                   | 0                                   |
| Data Bits:          | 8                                   | 8                                   |
| Data Parity:        | None                                | None                                |
| Stop Bits:          | 1                                   | 1                                   |
| Flow Control:       | None                                | None                                |
| AT Commands:        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

Submit New Settings

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Figure 44 Terminal Server Serial Page

## Network Statistics

This page displays information on network statistics and TCP states. Each counter can be set by entering a value in the box and selecting “Submit New Settings”. All the counters can be cleared by selecting “Clear All Stats”. A page refresh will update the counters and TCP states.

|                    |                                                                                      |
|--------------------|--------------------------------------------------------------------------------------|
| TX & RX frames     | - total frames                                                                       |
| UDP TX & RX frames | - UDP protocol frames                                                                |
| TCP TX & RX frames | - TCP protocol frames                                                                |
| D1                 | - Serial data characters on Port D1                                                  |
| D2                 | - Serial data characters on Port D2                                                  |
| D1 TCP State       | States<br>Idle<br>Listening on Port 23 state<br>Connected to IP 192.168.10.200 state |
| D2 TCP State       | States<br>Idle<br>Listening on Port 24 state<br>Connected to IP 192.168.10.201 state |

**comnet** Comnet Terminal Server

**Comnet Terminal server**

**NetworkStats**

|               |                                   |
|---------------|-----------------------------------|
| TX Frames     | <input type="text" value="4880"/> |
| RX Frames     | <input type="text" value="4446"/> |
| UDP TX Frames | <input type="text" value="0"/>    |
| UDP RX Frames | <input type="text" value="24"/>   |
| TCP TX Frames | <input type="text" value="1173"/> |
| TCP RX Frames | <input type="text" value="984"/>  |
| D1 TCP State  | Idle                              |
| D2 TCP State  | Listening on Port 24              |
| D1 Tx Chars   | <input type="text" value="0"/>    |
| D1 Rx Chars   | <input type="text" value="0"/>    |
| D2 Tx Chars   | <input type="text" value="0"/>    |
| D2 Rx Chars   | <input type="text" value="0"/>    |

Figure 45 Terminal Server Network Statistics

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Figure 45 Terminal Server Network Statistics Page

## Factory Defaults

There are two methods to set the terminal server back to factory defaults.

- » Select “Reset to Factory Defaults” on the Network page.
- » Press the reset button on the device twice. The second press should be after at least 5 seconds and less than 20 seconds after pressing the reset button the first time.

Factory defaults are

- » IP address 192.168.10.1/24
- » No gateway
- » D1 TCP port is configured for listening on port 23
- » D2 TCP port is configured for listening on port 24
- » D1 serial port is configured as a Debug console port 115200 baud 8 bit/no parity/1 stop
- » D2 serial port is configured for RS-232 115200 baud 8 bit/no parity/1 stop

The screenshot displays the Comnet Terminal Server web interface. On the left is a navigation menu with options: Network, NetworkStats, TCP, Serial, Password, HTTPS, CAcerts, Advanced, and Help. The main content area is titled "Comnet Terminal server" and shows the "Network" configuration page. The "Protocol" is set to "TCP/SSL" with a note that changing it will terminate existing connections. The "Device Name (for DHCP)" is "SB70LCSX-6B54", which also appears as the "NetBIOS Name". The "MAC Address" is "00:03:F4:0A:6B:54", "NB Version" is "02.07.0000", and "Comnet Version" is "2.0.0". Below these, there are three columns: "Static Settings", "DHCP Assigned Values", and "Address Mode". The "Static Settings" column contains fields for "Device IP Address" (192.168.10.1), "Device Subnet Mask" (255.255.255.0), "Device Gateway" (0.0.0.0), "DNS Server" (0.0.0.0), "NTP Server" (pool.ntp.org), and "System Time" (No valid time UTC). The "DHCP Assigned Values" column shows "0.0.0.0". The "Address Mode" column shows "Static IP" and a note "No network gateway to get time". At the bottom of the form are two buttons: "Reset To Factory Defaults" and "Submit New Settings".

Figure 46 Terminal Server Factory Defaults

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Figure 46 Terminal Server Factory Defaults Page Factory Defaults

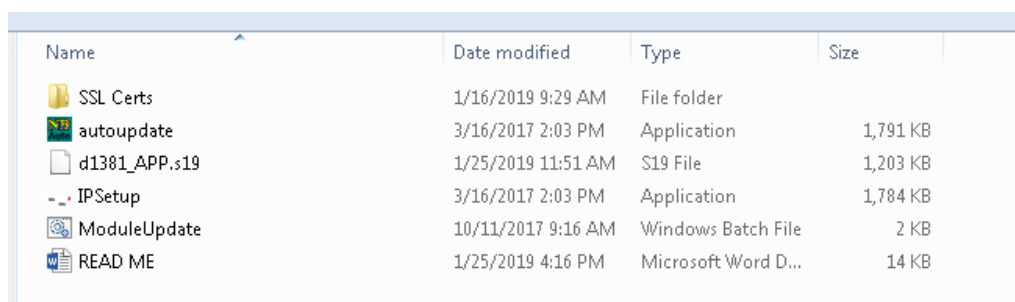
## Upgrading Firmware

There are four files used to upgrade firmware on the terminal server.

|               |                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------|
| IPSetup       | Discovers terminal server on the local network and configures its IP Address.                                                 |
| Autoupdate    | Loads the application using UDP.                                                                                              |
| ModuleUpdate  | Batch file that invokes IPSetup & Autoupdate to configure terminal server with IP address 192.168.10.1 and loads application. |
| D1381_APP.s19 | Application In s-record format.                                                                                               |

### Module Update

- » Setup a local area network with laptop and module (terminal server) on the 192.168.10.0/24 subnet.
- » Install ModuleUpdate, IPSetup, Autoupdate & d1381\_APP.s19 in same directory.
- » Run ModuleUpdate batch file from command prompt where files reside.
- » Program will prompt “Connect Module to the network Press any to continue . . .”
- » Press any key, program will configure module
  - with: IP address: “192.168.10.1”
  - Subnet Mask: “255.255.255.0”
  - Gateway: “192.168.10.254”
  - Flash: d1381\_APP.s19



| Name          | Date modified      | Type                | Size     |
|---------------|--------------------|---------------------|----------|
| SSL Certs     | 1/16/2019 9:29 AM  | File folder         |          |
| autoupdate    | 3/16/2017 2:03 PM  | Application         | 1,791 KB |
| d1381_APP.s19 | 1/25/2019 11:51 AM | S19 File            | 1,203 KB |
| IPSetup       | 3/16/2017 2:03 PM  | Application         | 1,784 KB |
| ModuleUpdate  | 10/11/2017 9:16 AM | Windows Batch File  | 2 KB     |
| READ ME       | 1/25/2019 4:16 PM  | Microsoft Word D... | 14 KB    |

Figure 47 Upgrade Firmware Directory

Figure 47 Terminal Server Upgrade Firmware Director