NIC-5 Module Configuration Guide

9.4.2v2

SECURITY MANAGEMENT SYSTEM

9600-0747

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference. In which case, users will be required to correct the interference at their own expense.

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Chapter 1: Introduction

About this Guide

This guide describes how to configure a NIC-5 module (Model Numbers: MN-NIC-5 and MN-NIC-5-ENC) for use with Symmetry M2150 nodes.

It is assumed that readers of this guide understand the architecture of Symmetry security management systems, are competent and understand networking terms such term as IP address, DHCP, MAC address, etc.

About the NIC-5 and LAN Chains

A NIC-5 module allows Symmetry to communicate with Symmetry M2150 nodes over a LAN (Local Area Network). The NIC-5 is the latest-generation Symmetry NIC module, which supersedes the previous-generation NIC-4 module. The NIC-5 supports 10 Mbit and 100 Mbit connection speeds.

The M2150 architecture uses "LAN chains". Each LAN chain consists of one or more nodes (Figure 1). Only the node at the head of the LAN chain requires a NIC module.

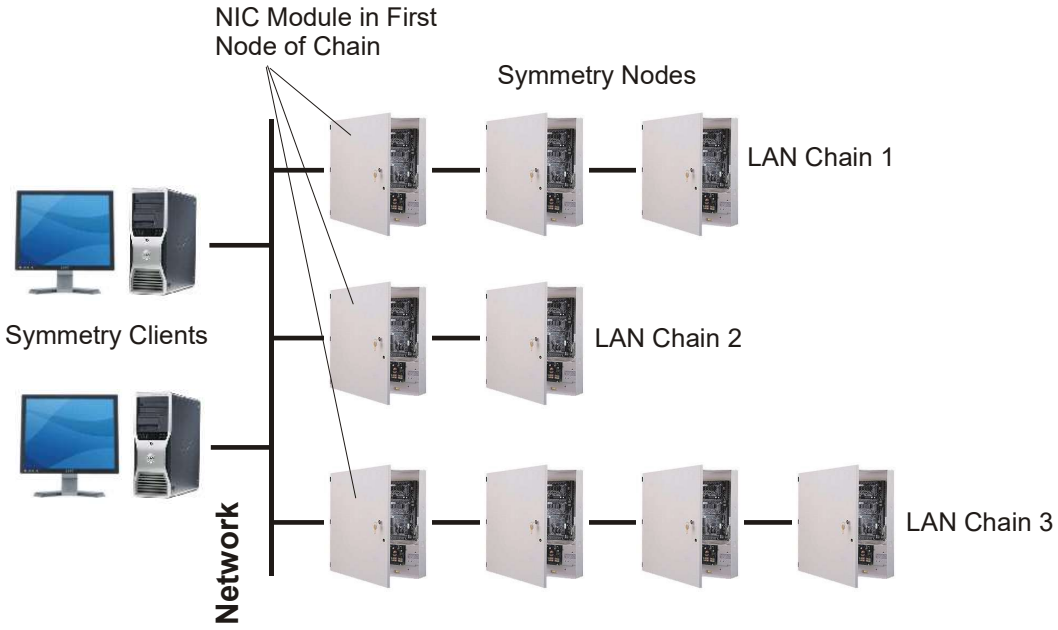


Figure 1 NIC Modules in LAN Chains

There can be multiple LAN chains connected to the same network, and the network can be used for other purposes such as communications between the Symmetry server and clients, or for general office use.

All communication between a NIC module and LAN chain is managed by a nominated Symmetry client PC. For systems that contain a large number of nodes and high-volume transaction activity, this architecture allows load balancing across multiple Symmetry clients.

It is allowable to have more than one LAN chain managed by the same Symmetry client. Depending on the license purchased, each Symmetry client can manage up to 512 LAN chains. There can be a maximum of 1024 LAN chains.

The first node in a LAN chain must have a node address of 001.

The NIC-5 has a built-in web interface, which you must use to set up the module before you configure the LAN chain and node in Symmetry.

Figure 2: NIC-5 Module

IP Addresses and DHCP

You can configure the network settings of the NIC module using the built-in web interface.

Each NIC module must have a unique IP address, which can be static or DHCP-assigned. When the address is DHCP-assigned, Symmetry addresses the NIC module by name rather than by IP address.

Once you have configured the NIC module through its web interface, you need to define the LAN chain and node in Symmetry. One of the LAN chain settings in Symmetry is the IP address (or name) of the NIC module at the head of the chain.

Encrypted Communications

High-security installations may require encrypted communications between the NIC module and Symmetry. This can be achieved by purchasing the Symmetry Comms Encryption license (available separately). The NIC-5 supports Rijndael AES (the US government-approved encryption standard). 128-bit or 256-bit encryption can be used.

The encryption settings must be configured in the web interface and in Symmetry.

It is possible for a client PC to control any combination of both encrypted and non-encrypted LAN chains.

Continuous and Periodic Polling

When setting up a LAN chain in Symmetry (using the "Install/Access Control/Chains/LAN" screen), you can choose whether to use continuous or periodic polling.

Continuous polling maintains a continuous communications link from the Symmetry client that manages communications with the LAN chain.

Periodic polling causes the nominated Symmetry client to initiate communications at specified intervals and when there is new data to download (e.g. changes to card holder details). However, if a chain detects an alarm, communications are automatically initiated from the chain, and the alarm message is uploaded. The "Maintenance/Access Control/Upload" screen can be used to upload event data at other non-scheduled times.

Dual NIC LAN Communications

M2150 nodes support the use of two NIC modules in a single node. The secondary NIC module is used if the network connection to the primary fails. Each NIC module uses a separate IP address, but only one LAN chain needs to be defined in Symmetry.

Note: An M2150 node requires its DIP switches to be set correctly to enable dual NIC communications. Please refer to the *M2150 Installation Instructions* for details of how to set the DIP switches.

Chapter 2: Configuring the NIC Module

Introduction

Before you can use a NIC module, you must configure it through its built-in web interface, as described next.

Note: Initially, the configuration process requires the use of one of the following applications to determine the default DHCP (or APIPA) IP address assigned to the module:

- The Lantronix Device Installer, which is available from the Lantronix web site:

  https://www.lantronix.com/products/deviceinstaller/

- Cobox.exe, which is available from the Symmetry installation media.

Step 1 – Find the NIC Module on the Network

Note: This step assumes that the module is in its factory-default state. You can reset the module to its factory-default state using the **Factory Defaults** option (page 7).

To find the NIC module:

1. Fit the module to the M2150 board, connect the module to the network and switch on power as described in the *M2150 Installation Instructions.*

2. If you want to use Lantronix Device Installer to find the module:

   a) Download and install the Lantronix Device Installer from the Lantronix web site.

   b) Open the Lantronix Device Installer. You should see the DHCP-assigned IP address and MAC address (**Hardware Address**) of the module:

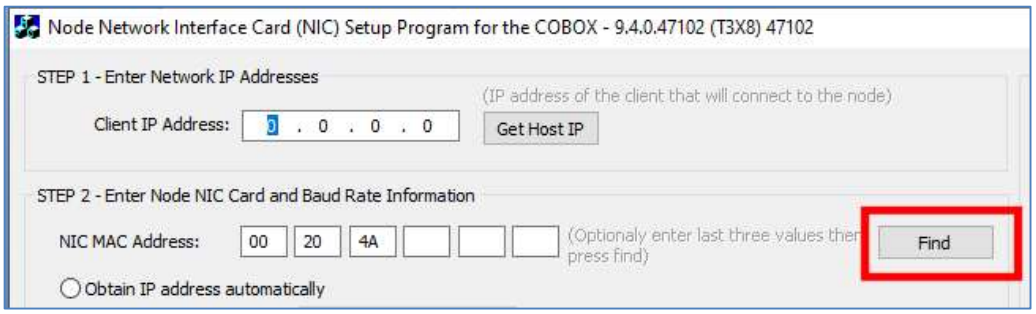
   If there is more than one NIC module connected to the network, you can identify each module in from its unique Hardware (MAC) address, which is printed on a label attached to the network port (shown as "SN" number).

3. If you want to use Cobox.exe to find the module:

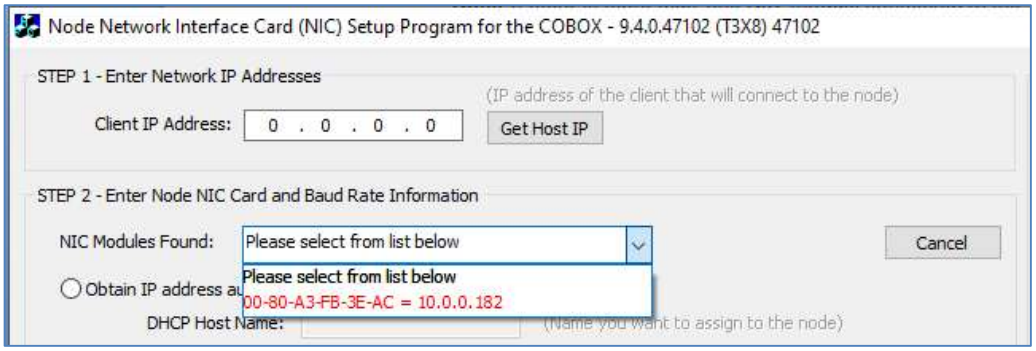
   a) In Windows Explorer, double-click Cobox.exe. This is on the Symmetry server in the Symmetry installation folder (e.g. C:\Program Files (x86)\Security Management System). You can either

run the tool from that location, or copy Cobox.exe and SymmetryCryptographicModule.dll to a folder on another computer and run it from that location.

b) Click the **Find** button:



c) You should be able to see the MAC address and IP address of the NIC module in the **NIC Modules Found** menu:



If there is more than one NIC module connected to the network, you can identify each module in from its unique Hardware (MAC) address, which is printed on a label attached to the network port (shown as "SN" number).

Note: You cannot connect to the module through Cobox.exe.

Step 2 – Open the Web Interface

To open the web interface:

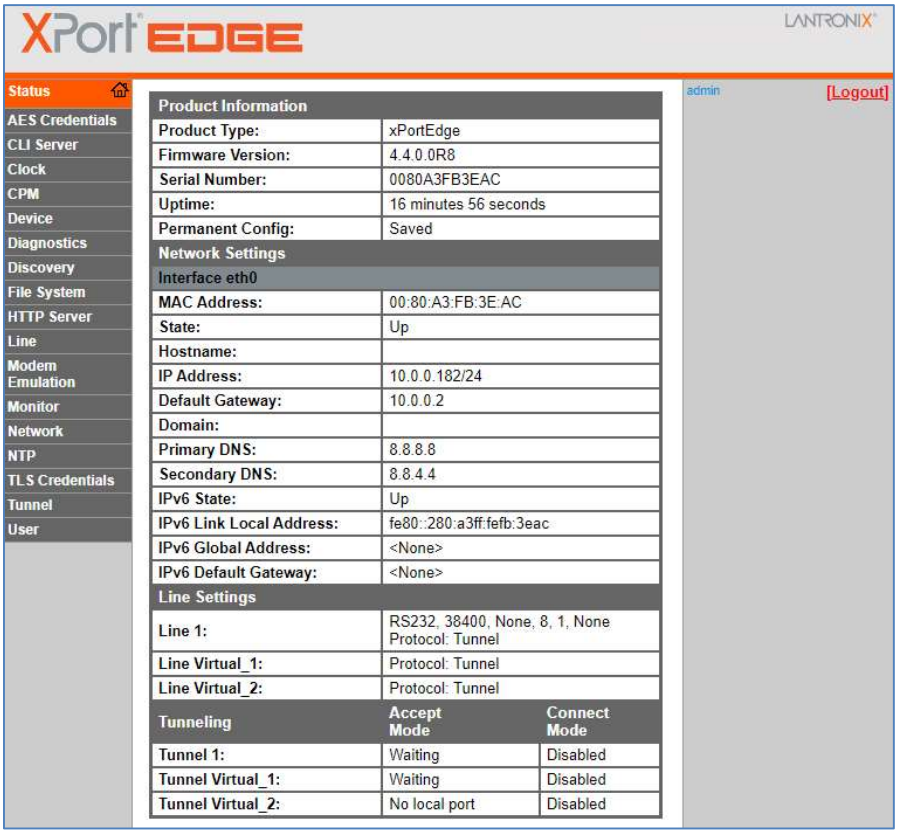
1. Enter the DHCP/APIPA-assigned IP address into the search bar of a browser connected to the same network as the NIC module.

2. When prompted, enter the login details:

The defaults are:

- Username: **admin** (lowercase).
- Password: **PASSWORD** (uppercase).

3. The web interface is displayed:



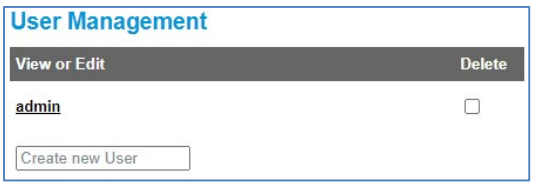
Note: You can factory reset the module at any time by selecting **Device** from the menu on the left side of the window and selecting the **Factory Defaults** option. You may want to use this option if the module has been used on another node.

Step 3 – Change the admin Password

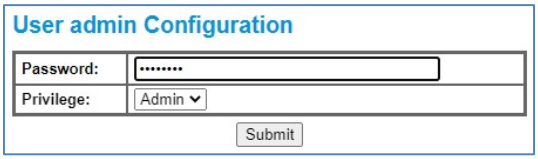
Change the password for the admin user as follows:

1. Select **User** from the bottom of the menu on the left side of the window.

2. Click the **admin** user (the admin user cannot be deleted, and the name cannot be changed):



3. Overtype the existing password with the new password:



Note: It is essential to remember the admin password. If you forget the password, it can be reset only by the manufacturer. **Enter the new password very carefully to avoid any mistake.**

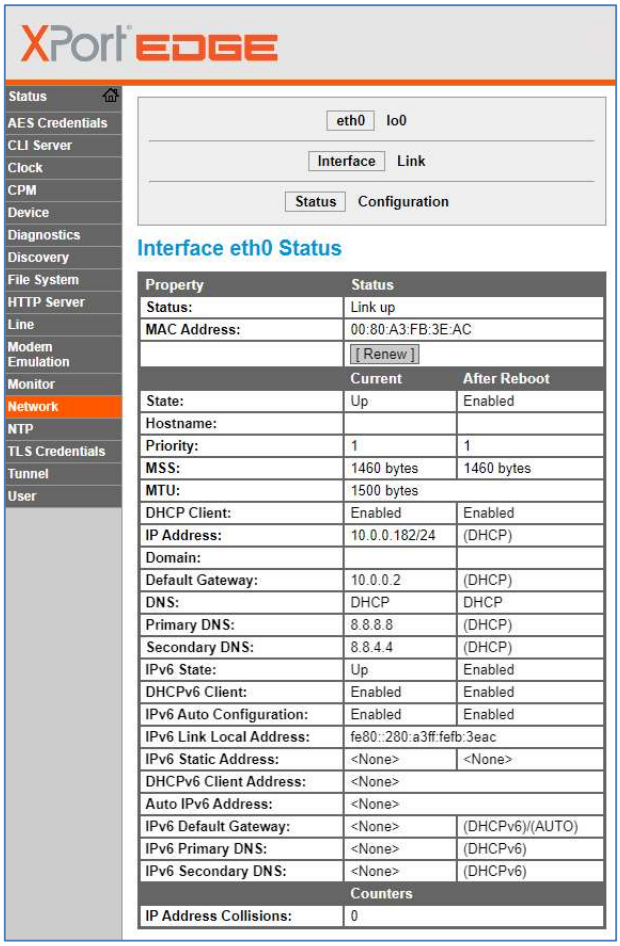
4. Click **Submit**.

Step 4 – Configure the Network Settings

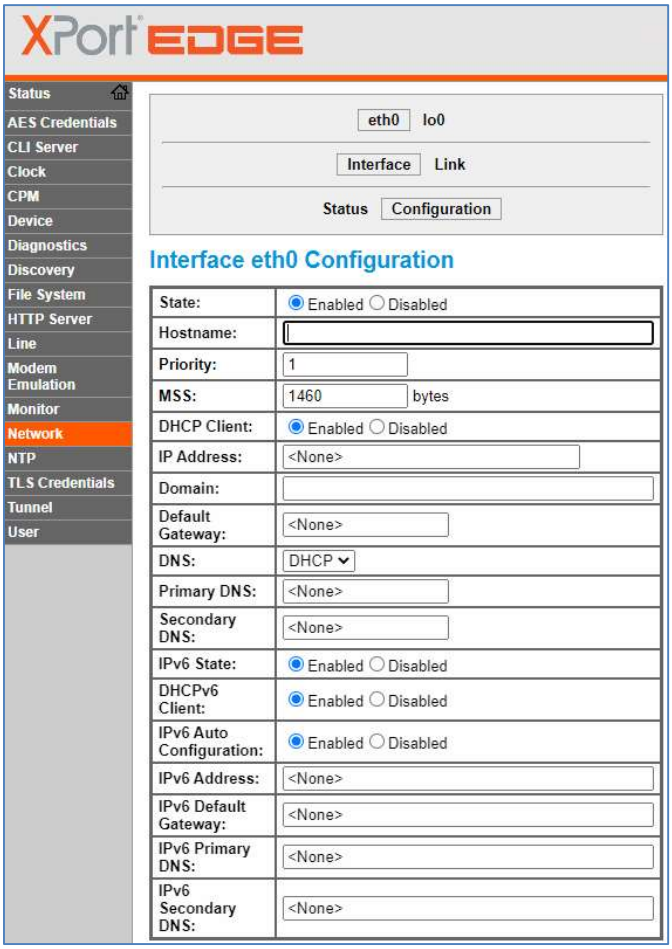
Configure the network settings as follows:

1. Select **Network** from the menu on the left side of the window.

2. When prompted, log back in to the web interface using the new password. The following page is displayed:



3. Select **eth0**, **Interface** and **Configuration** near the top of the page (if they are not already selected):



4. If you want to continue to use DHCP:
   - Make sure that **DHCP Client** remains set to **Enabled**.
   - In the **Hostname** field, enter a unique name for the NIC module (such as the location of its node).

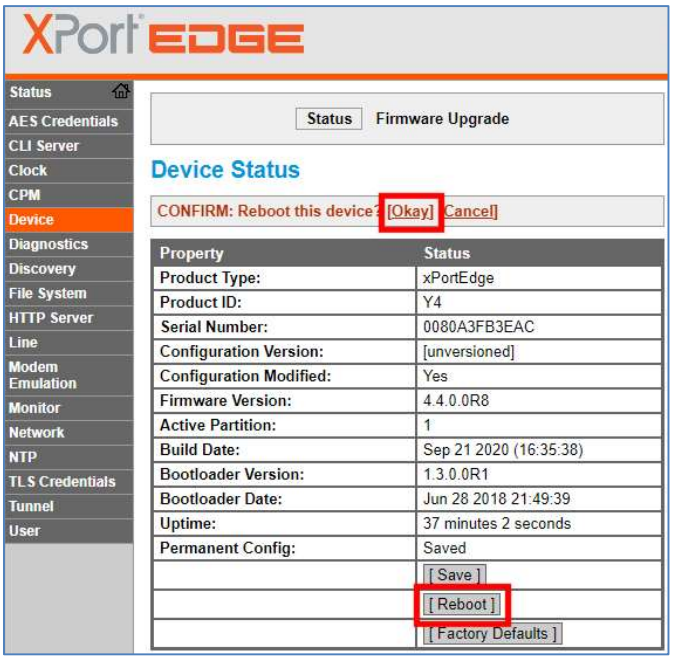
   (The DHCP server will communicate the IP addresses of the default gateway and primary DNS.)

5. If you want to use a fixed IP address:
   - Set **DHCP Client** to **Disabled**.
   - In the **IP Address** field, enter the IP address you want the module to use (in CIDR format).
   - In the **Default Gateway** field, enter the IP address of the default gateway.
   - In the **Primary DNS** field, enter the IP address of the primary DNS server.
   - In the **Secondary DNS** field, enter the IP address of the secondary DNS server (if applicable).

   (The **Hostname** field is not used when a fixed IP address is used.)

6. Click **Submit**.

7. Select **Device** from the menu on the left side of the window.
8. Select **Status** near the top of the page (if it is not already selected).
9. Click **Reboot** near the bottom of the page, followed by **Okay**:



10. When prompted, log back in to the web interface.

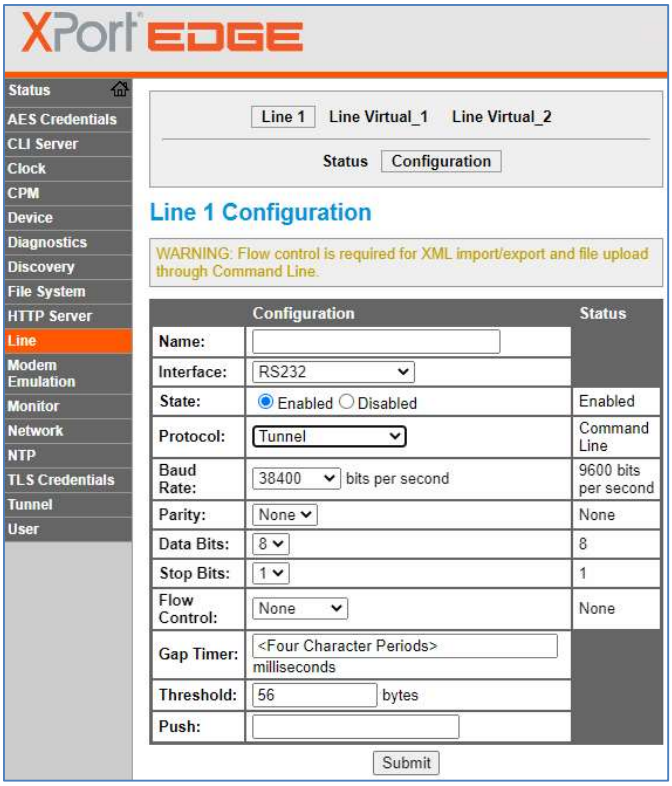
Step 5 – Configure the Baud Rate (optional)

Carry out this step only if the node is using a baud rate other than the default of 38400.

To configure the baud rate:

1. Select **Line** from the menu on the left side of the window.
2. Select **Line 1** and **Configuration** near the top of the page (if they are not already selected).

   The following is displayed.



3. Set **Baud Rate** to match the baud rate of the node (set using DIP switches on the PCB). The default setting of the DIP switches is **38400**.

4. Click **Submit**.

If you do not want to use encrypted communications between the M2150 nodes and Symmetry, configuration of the NIC module is now complete and you can click **Logout** near the top-right corner of the window to exit the web interface.

Step 6 – Configure Encryption (optional)

Follow this step if you want to use encrypted communications between the M2150 nodes and Symmetry.

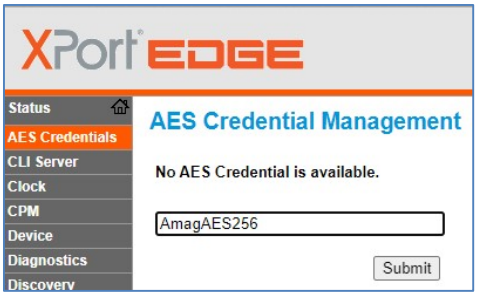
Note: You should carry out the configuration procedure on an isolated network. This is to ensure that there is no chance of the encryption key being intercepted during the programming process.

Note: You will also need the Symmetry Comms Encryption license (available separately) to configure encryption in Symmetry.

To configure encryption:

1. Select **AES Credentials** from the menu on the left side of the window.

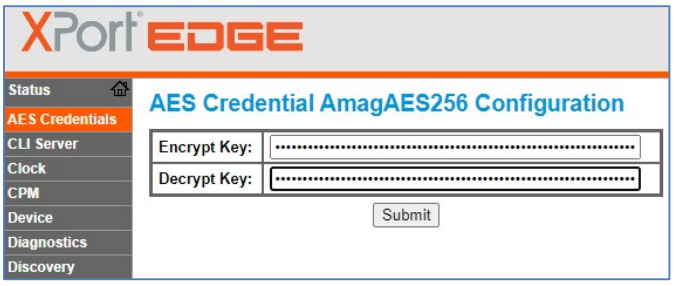
2. Enter any name for the AES credential (e.g. "AmagAES256"):



3. Click **Submit**.

4. Select the AES credential you have just created.

5. Enter any 64-character (256-bit encryption) or 32-character (128-bit encryption) hexadecimal string into the **Encrypt Key** and **Decrypt Key** fields:



You need to enter the same key in both fields, and also in the Symmetry "Install/System/Client Ports" screen. You may find it easier to copy and paste the string from a text editor.

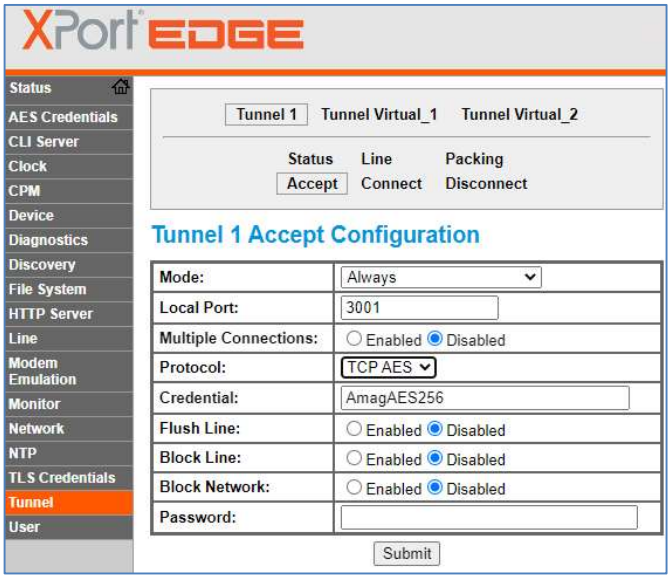
256-bit encryption is preferable.

6. Click **Submit**.

7. Select **Tunnel** from the menu on the left side of the window.

8. Select **Tunnel 1** and **Accept** near the top of the page (if they are not already selected).

9. For the **Protocol** option, select **TCP AES**:



10. In the **Credential** field, enter the credential name you entered in the AES Credentials page. You can view the AES Credentials page to see the name you used.

11. Click **Submit**.

12. If you see a prompt near the top of the page to kill an active connection, click **Okay**.

That completes the configuration of the NIC module. You can click **Logout** near the top-right corner of the window to exit the web interface.

Chapter 3: Configuring Symmetry

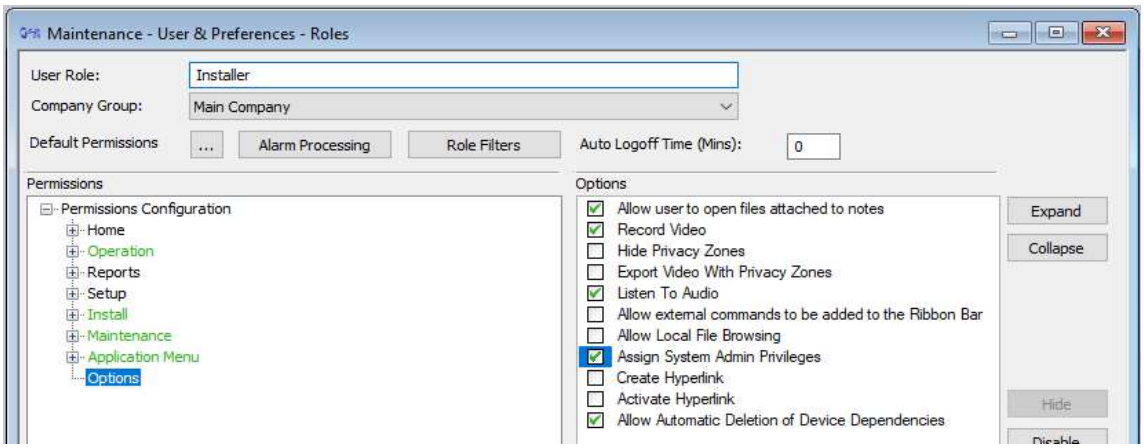
The following provides an overview of the steps you need to take to configure Symmetry when using a NIC-5 module.

Step 1 – Add an Encryption License and Privileges (optional)

If you want to use encrypted communications between the M2150 nodes and Symmetry, a Symmetry user with appropriate privileges needs to:

1. Open the "Maintenance/Licensing/System Licenses" screen and add the Comms Encryption license.

2. Open the "Maintenance/User & Preferences/Roles" screen and select the **Assign System Admin Privileges** permission to your user role (under **Options**):



Note: You need to log back in to action the change to your role privileges.

The encryption options in Symmetry are available only if you have carried out the above.

Step 2 – Set up the Client Ports

For each Symmetry client that is to communicate with a LAN chain:

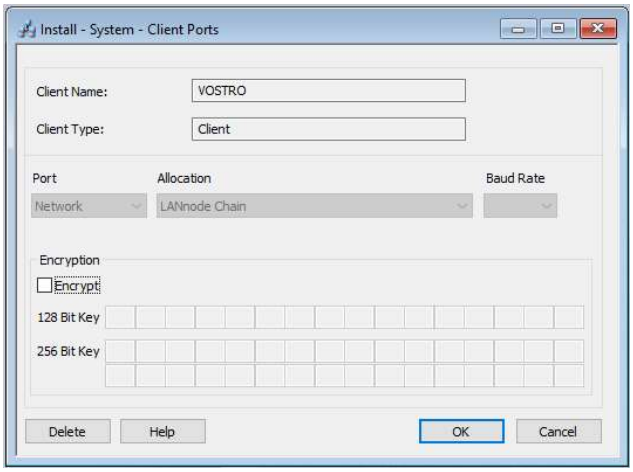
1. Open the "Install/System/Client Ports" screen.

2. In the Selection screen, select the client from the **Client Name** menu.

3. Click **New**.

4. In the **Port** menu, select **Network**.

5. In the **Allocation** menu, select **LANnode Chain**:



6. If you are using encrypted communications, select **Encrypt** and enter the 128-bit or 256-bit key you entered into the NIC module's web interface.

7. Click **OK**.

Step 3 – Set up the LAN Chains

For each LAN chain:

1. Open the "Install/Access Control/Chains/LAN" screen.

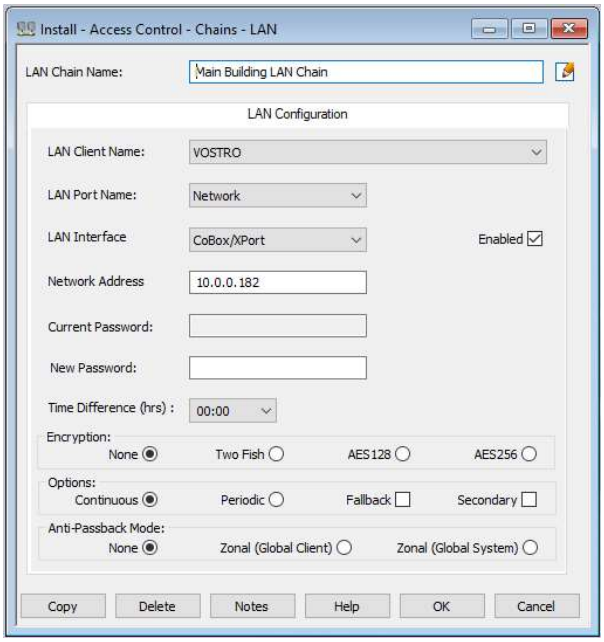
2. Click **New**.

3. In the **LAN Chain Name** field, specify a unique name for the LAN chain.

4. Set **LAN Port Name** to **Network**.

5. Set **LAN Interface** to **CoBox/XPort**.

6. In the **Network Address** field, enter the IP address of the NIC module (if a fixed IP address is used) or the hostname of the NIC module (if a DHCP server is used).



7. If you are using encrypted communications, select **AES128** or **AES256** (depending on whether you are using 128-bit or 256-bit encrypted communications), and reselect the **LAN Interface**.

8. If dual NIC communications is used, select **Secondary** (under **Options**), then in the Secondary Connection tab displayed, configure the IP address or hostname of the secondary module.

9. Configure any other options as required (if necessary, please refer to the *Online Help*).

10. Click **OK**.

Step 4 – Define the Nodes

For each node:

1. Open the "Install/Access Control/Node" screen.

2. Click **New**.

3. In the **Node Description** field, specify a unique name for the node.

4. From the **Chain Name** menu, select the LAN chain.

5. From the **Node Type** menu, select the M2150 node type you are using.

6. From the **Node Address** menu, select address of the node, as set using the DIP switches on the PCB. The address must be 1 if the node is the first in the chain (i.e. is fitted with a NIC module).

7. In the LAN tab, set **LAN Chain First Node** to **Yes** if the node is the first in the chain.

8. Configure any other options as required (if necessary, please refer to the *Online Help*).

9. Click **OK**.

That completes the configuration of the NIC module in Symmetry. The NIC module should now be fully operational and communicating with the Symmetry nodes.