AN-X-GENI
Genius I/O
Communication
Module

User Manual

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Throughout this manual we use notes to make you aware of safety considerations.

Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

These warnings help to:

WARNING!

- identify a hazard

- avoid the hazard

- recognize the consequences

IMPORTANT!   Identifies information that is especially important for successful application and understanding of the product.

TIP   Identifies information that explains the best way to use the AN-X-GENI

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AN-X-GENI Module Overview

The AN-X-GENI communications module connects a ControlLogix PLC or other device to a Genius I/O network, over Ethernet.

The module supports scheduled connections with a ControlLogix processor, over Ethernet, so the ControlLogix processor can read inputs from the Genius network and write outputs.

The AN-X module acts as a scanner on the Genius network. It supports up to 31 Genius blocks.

The AN-X-GENI module has a web interface for configuration. You can communicate with the module using any standard web browser such as Internet Explorer.

A watchdog timer is implemented in the module's hardware. If the firmware does not kick the watchdog within the timeout period the watchdog times out and places the module into a safe fatal failure state.

The module firmware can be updated over Ethernet using the Windows utility supplied. Refer to page 62 for details.

Hardware Features

The module has:

- LEDs to indicate the status of the connection to the Ethernet, the module's internal state, and state of the connection to the Genius I/O network

- an Ethernet connector

- a power connector

- a connector to connect to the Genius network

Package Contents

- AN-X-GENI module

- CD containing software and documentation

- rubber feet for desktop use

Other Requirements

Genius handheld monitor to set the serial bus address for Genius blocks and to configure blocks

Modes of Operation

There are three AN-X modes of operation:

- Boot mode. The AN-X is running its low level startup firmware.

- Configuration mode. This is the mode when you are updating the firmware in the AN-X.

- Production mode. This is the normal runtime mode of operation.

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Installation

Prevent Electrostatic Discharge

The module is sensitive to electrostatic discharge.

WARNING!

Electrostatic discharge can damage integrated circuits or semiconductors. Follow these guidelines when you handle the module:

- Touch a grounded object to discharge static potential
- Do not touch the connector pins

Power

AN-X requires a DC power input of anywhere from 12 to 24 VDC.

Left to right the pins on the power connector are chassis ground, negative voltage and positive voltage.
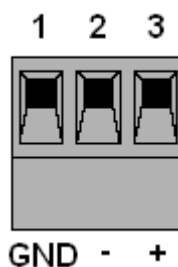
The chassis ground should be connected.

Power consumption internally is 250 mA @ 12VDC or 125 mA @ 24VDC.

The part number for the power connector is Phoenix MSTB 2.5/3-ST-5.08

Contact QTS if you need a suitable wall adapter.

Genius Cabling and Termination

Refer to Genius I/O System and Communications User's Manual, GEK-90486F-1 for detailed information on Genius cabling and installation.

The module has a 5-pin Phoenix connector for connection to the Genius I/O network. The part number for the Genius bus connector is MSTB 2.5/5-ST-5.08

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Pin	Assignment
1	Not used
2	Shield out
3	Shield in
4	Serial 2
5	Serial 1

Ensure that the physical ends of the Genius I/O network are properly terminated. The AN-X module does not have any internal termination.

WARNING!

Set the baud rate and serial bus address for the AN-X-GENI module before connecting it to the Genius network.

Ethernet Cabling

AN-X has a standard RJ-45 connector for connecting to Ethernet.

If you are connecting AN-X to an existing network through a router or switch, use a standard Ethernet cable.

If you are connecting directly between a computer and AN-X, use a crossover cable.

Software Installation

You must uninstall any previous version of the software before you can install a new version. Use the Windows Control Panel Add and Remove Programs to remove the old version.

Insert the CD supplied with the AN-X module and run the program setup.exe on the CD.

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Quick Start

Step		See page
1	Install the AN-X Windows software	5
2	Power up the AN-X, connect it to Ethernet and use AnxInit to assign it an IP address	7
3	(Not needed for existing installations) Use the Genius hand-held monitor to assign serial bus addresses to Genius devices and perform any other necessary configuration.	
4	Use the AN-X web interface to set the baud rate and serial bus address for the AN-X-GENI	17
5	Connect AN-X to the Genius network	4
6	Use the AN-X web interface to autoconfigure the Genius network and ControlLogix configuration	18
7	Configure the AN-X in RSLogix 5000	31
8	Use the web interface to obtain tags for RSLogix 5000	33
9	Import the tags into RSLogix 5000	34
10	Use the tags to access data	

Ethernet Configuration

The AN-X-GENI module connects a computer or other device on Ethernet to a Genius I/O network.
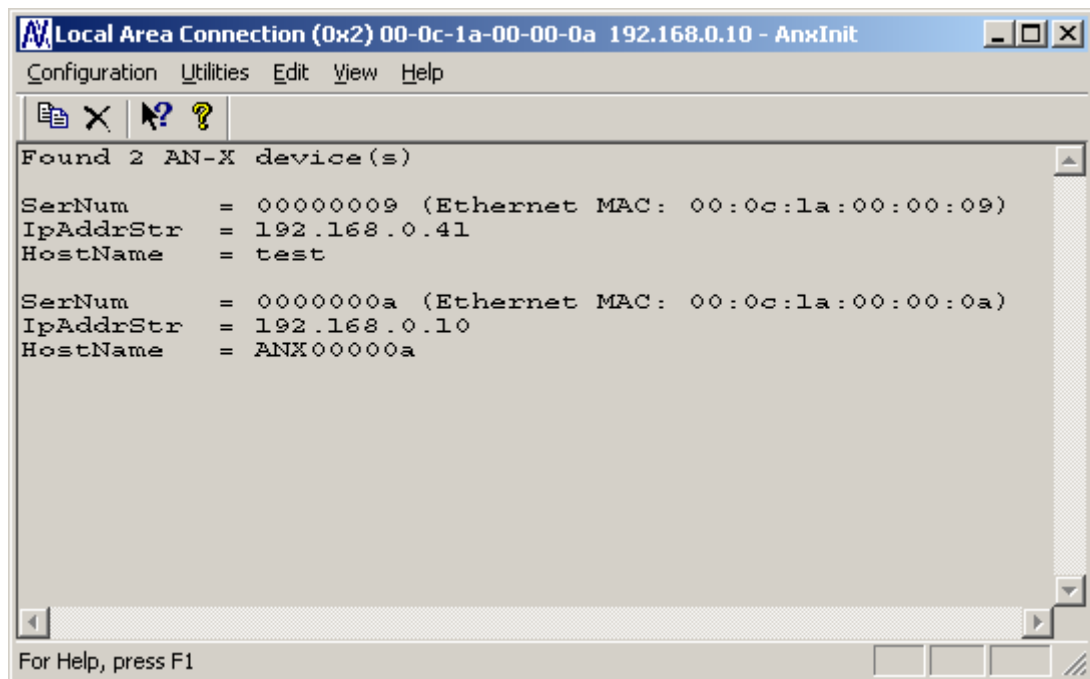
Before you can use the AN-X-GENI, you must configure its network properties on Ethernet.

Ethernet Configuration

AN-X can be configured to use a static (unchanging) IP address or it can be configured to obtain its IP address from a DHCP server.

Unless you have control of the DHCP server, in most applications you will want to configure AN-X to use a static IP address. Otherwise the DHCP server may assign a different IP address each time AN-X powers up, and any software that accesses the AN-X module would have to be reconfigured.

AN-X is shipped with DHCP enabled. If it finds a DHCP server on the network, the DHCP server assigns it an IP address. You can use the utility AnxInit to find the IP address that the DHCP server has assigned. Select *Utilities/Locate All AN-X Modules* and AnxInit will locate the AN-X and display its IP address.

If AN-X does not find a DHCP server within about three minutes of starting up, it reverts to a temporary static IP address of 192.168.0.41 If AN-X is using this temporary IP address, it repeatedly flashes the SYS

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LED three times followed by a pause. If your computer is on the same subnet, you can use the web interface to change the IP address.

IMPORTANT!   Use this temporary IP address only for initial setup of AN-X. AN-X will not function for its intended purpose at the temporary IP address.

If you are using multiple AN-X modules, configure one at a time, especially if there is no DHCP server on the network, since they will all revert to the same temporary IP address when they fail to find a DHCP server.

IMPORTANT!   If you are connecting AN-X to an existing Ethernet network, consult the network administrator to obtain a static IP address for AN-X and to obtain information about how you should configure AN-X.

IMPORTANT!   The AN-X must be on the local Ethernet (same subnet) when you set its IP address.

You configure the Ethernet properties using the Windows utility AnxInit supplied with AN-X or the AN-X web interface.

Use the *Configuration/AN-X IP Settings* command to start the AN-X IP configuration wizard, which takes you step by step through the IP configuration process.

Step 1

In step 1, you identify the AN-X you are configuring.

1. Select the Ethernet adapter that's connected to the AN-X. In most cases there will be just one Ethernet adapter in the computer. The AN-X must be on the same subnet as the computer.

2. Enter the MAC address of the AN-X you are configuring. This is printed on the AN-X label. It consists of six pairs of hexadecimal digits, separated by hyphens. In the example above, it's 00-0c-1a-00-00-09.

If the AN-X is already online, you can obtain its MAC address using the *Utilities/Locate All AN-X Modules* command.

3. Enter the IP address you intend the AN-X to use.

Step 2

In step 2, you choose a method of restarting AN-X to put it in boot mode.
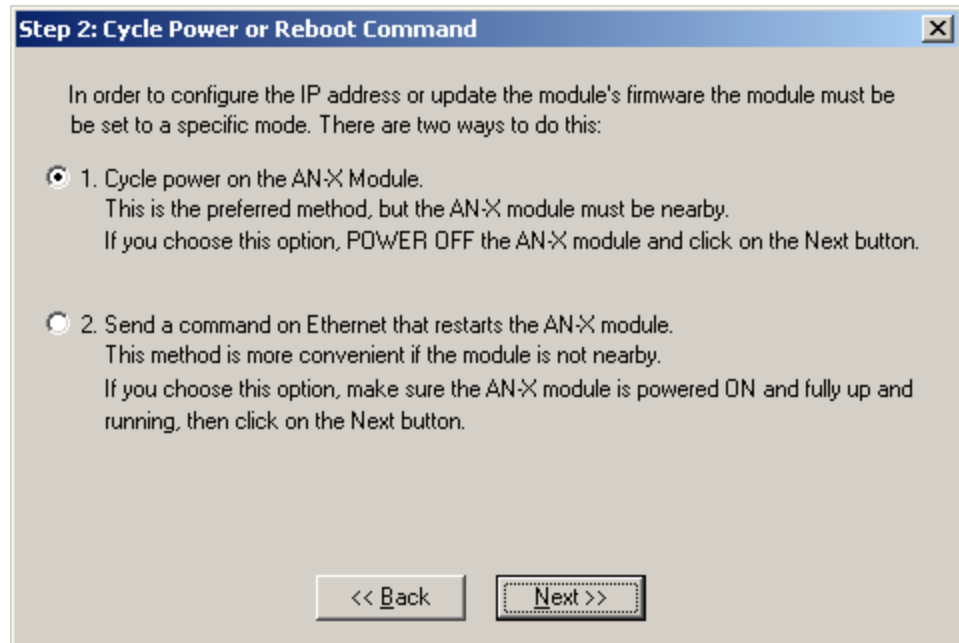
The preferred method is to cycle power on the AN-X. Select the first option on the screen and click the *Next >>* button.

An alternative method, useful if the AN-X in not easily accessible, is to send it a command over Ethernet. The AN-X must be powered on and completely running for this method to work. For example, if this is the first time you are configuring a new AN-X, allow sufficient time for it to acquire an IP address from a DHCP server or to time out and use its default IP address (about 3 minutes). Select the second option on the screen and click the *Next >>* button.

Step 3:

Wait for AN-X to enter boot mode. While AnxInit is waiting, the *Next>>* button is disabled. When AN-X is in boot mode, the *Next>>* button is enabled.
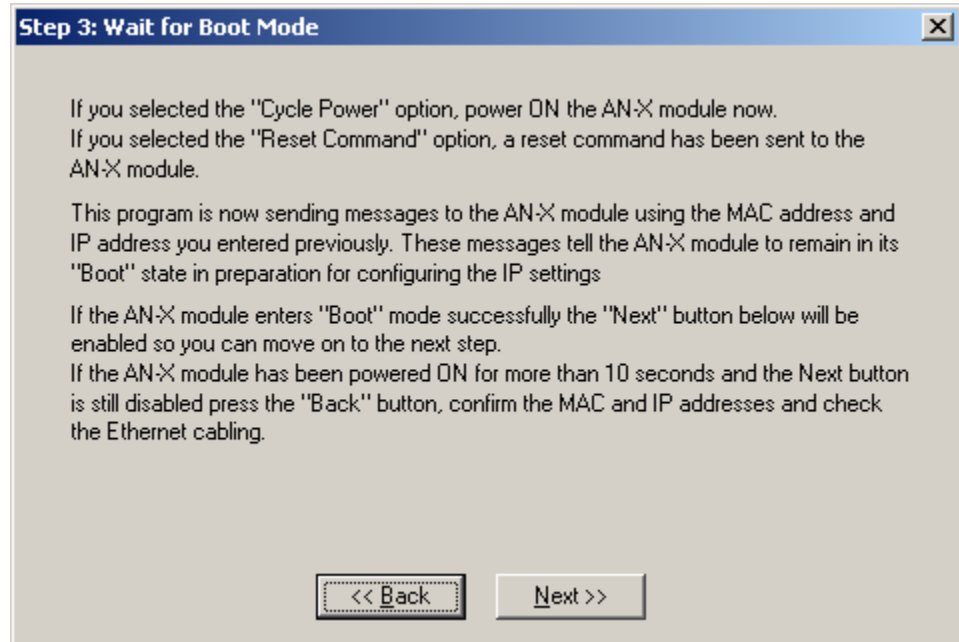
If the AN-X does not enter boot mode within about 10 seconds, return to the previous screens and check the entries.

The *AN-X TCP/IP Configuration* dialog appears.
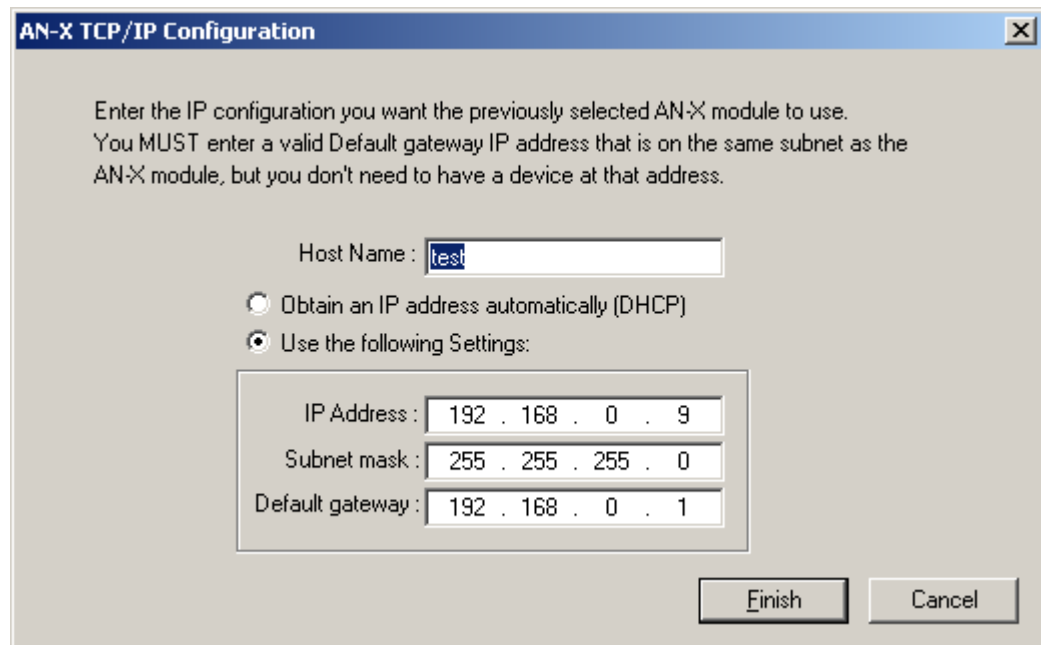
Enter a *Host Name* for the AN-X. AN-X uses this name when it creates tags for RSLogix 5000, so give the AN-X a meaningful name that is unique on your network. This name is also used internally by AN-X and

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may be used to identify the AN-X if you have a DNS server on your network. The name can be from 1 to 31 characters long.

To configure the AN-X to obtain its IP address from a DHCP server on the network, select *Obtain an IP address automatically (DHCP)*

To configure the AN-X to use a static IP address, select *Use the following Settings* and enter:

• the desired IP address for the AN-X.

• the Subnet mask for the AN-X

• the default gateway for your network.

You must enter a default gateway address that is valid for the local subnet even if there is no device at the gateway address on the network.

Click OK to complete the configuration.

If you Cancel the *Configuration/AN-X IP Settings* command, AN-X is left running the boot code. Use the *Utilities/Restart AN-X* command to restart the AN-X.

Example: Standalone Computer

Since you are connecting directly from the computer to AN-X, use a crossover Ethernet cable.

The following instructions assume Windows 2000. The procedure for Windows NT and Windows XP is very similar. They also assume that an Ethernet network card has been installed in the computer and that AnxInit has been installed on the computer.

TIP

The parameters in this example will work when you set up any standalone computer to work with AN-X.

First configure the computer to use a static IP address. From the Start menu, select *Start/Settings/Network and Dialup Connections*. Double click on *Local Area Connection*.

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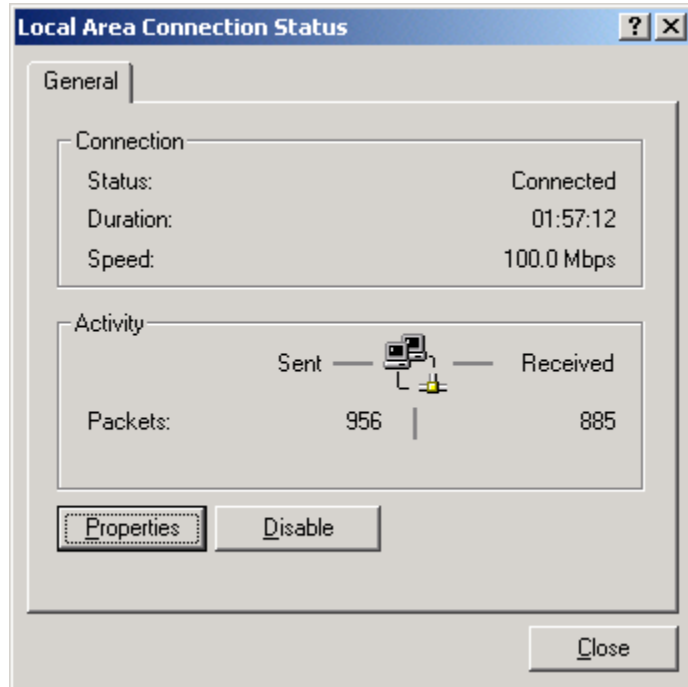
Click the *Properties* button.

Double click on *Internet Protocol (TCP/IP)*.
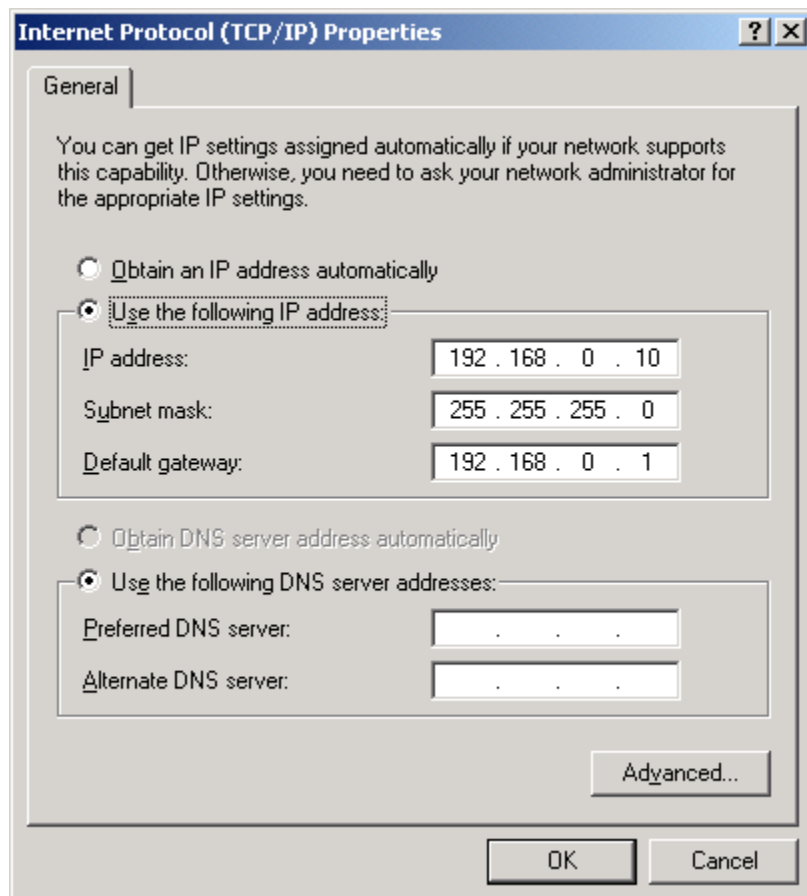
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In this example, we will assign the computer an IP address of 192.168.0.10

Set the Subnet mask to 255.255.255.0 (standard mask for the Class C network address of 192.168.0.x).

Set the Default gateway to 192.168.0.1 (this address does not exist on the Ethernet network but AN-X requires a valid default gateway entry).

Click OK to accept the settings

Connect the computer to AN-X using the crossover cable.

If this is the first time you have used the AN-X module, it will look for a DHCP server on the network. It waits about three minutes, then reverts to a default IP address of 192.168.0.41

Power up the AN-X and wait for the search for a DHCP server to time out. When the search for a DHCP server times out, AN-X will flash the SYS LED red three times followed by a pause repeatedly.

Run AnxInit. Select *Utilities/Locate All AN-X Modules* and confirm that it finds the AN-X.
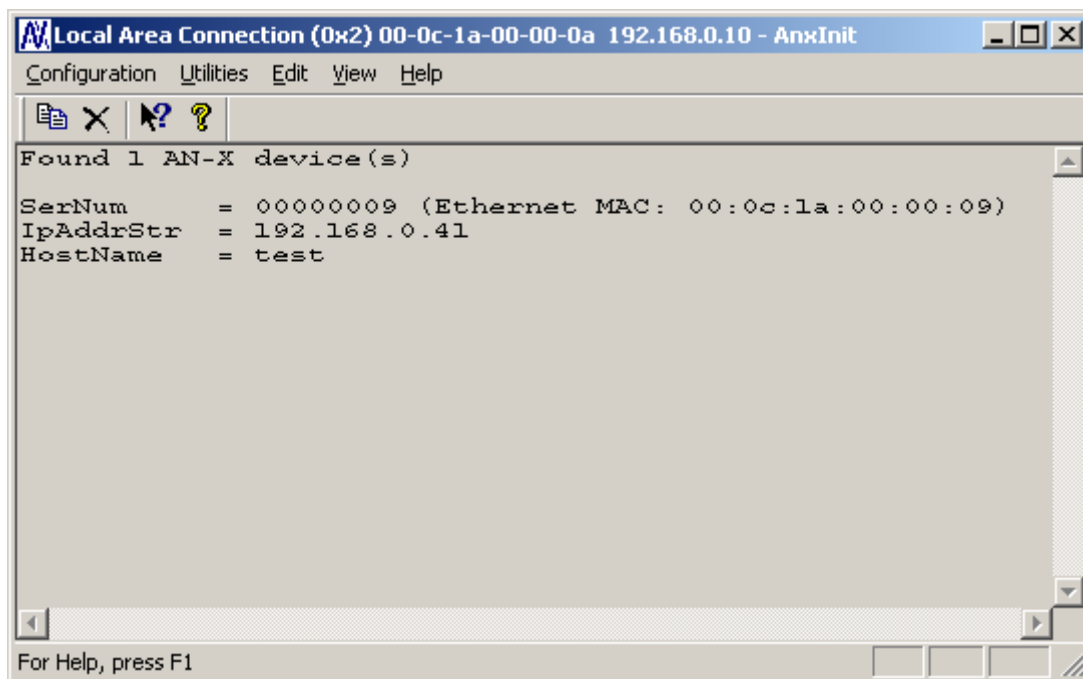
Select *Utilities/Select An AN-X* and enter the MAC Address and IP address.

Click *OK* to accept the setting.

Select *Utilities/AN-X IP Configuration.*

Enter an IP Address. In this case we chose 192.168.0.20

Enter the same Subnet mask and Default gateway that you entered for the computer. The default gateway address does not exist on the network but AN-X requires that the field have a valid entry.

Click *Finish* to accept the settings.

Select *Utilities/Restart AN-X* to restart AN-X with the new parameters.

When the AN-X has restarted (SYS LED is solid green), select *Utilities/Locate All AN-X Modules* and confirm that the AN-X is found with the new parameters.

```
Local Area Connection (0x2) 00-0c-1a-00-00-09  192.168.0.20 - AnxInit   _ □ X

Configuration   Utilities   Edit   View   Help

[icons]

Found 1 AN-X device(s)

SerNum      = 00000009 (Ethernet MAC: 00:0c:1a:00:00:09)
IpAddrStr   = 192.168.0.20
HostName    = test




For Help, press F1
```
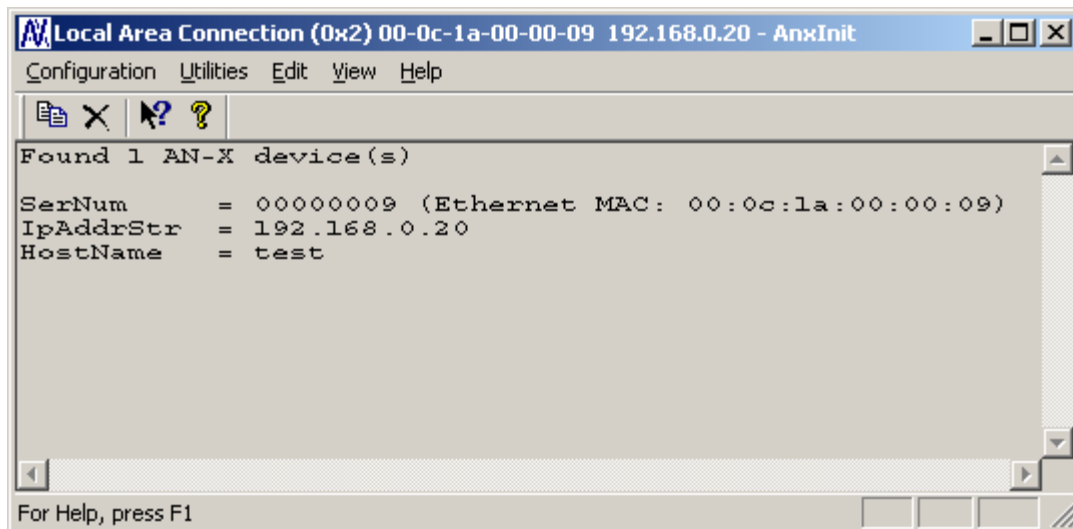
Reconfiguring an AN-X from an Unknown State

It sometimes happens that an AN-X has been previously configured with an IP address that causes it to be inaccessible on the current Ethernet network. To reconfigure it to a known state, run the command *Configuration/AN-X IP Settings* to start the AN-X IP Configuration Wizard and reconfigure AN-X.

Genius Network Configuration

Before you can scan a Genius I/O network, you must set the AN-X module's serial bus address and baud rate and configure the network in the AN-X-GENI.

Set the baud rate and serial bus address before connecting to the Genius network.

Setting the Bus Address and Baud Rate

From the AN-X web interface, select *Automation Network/Genius Baud/Node Settings*.
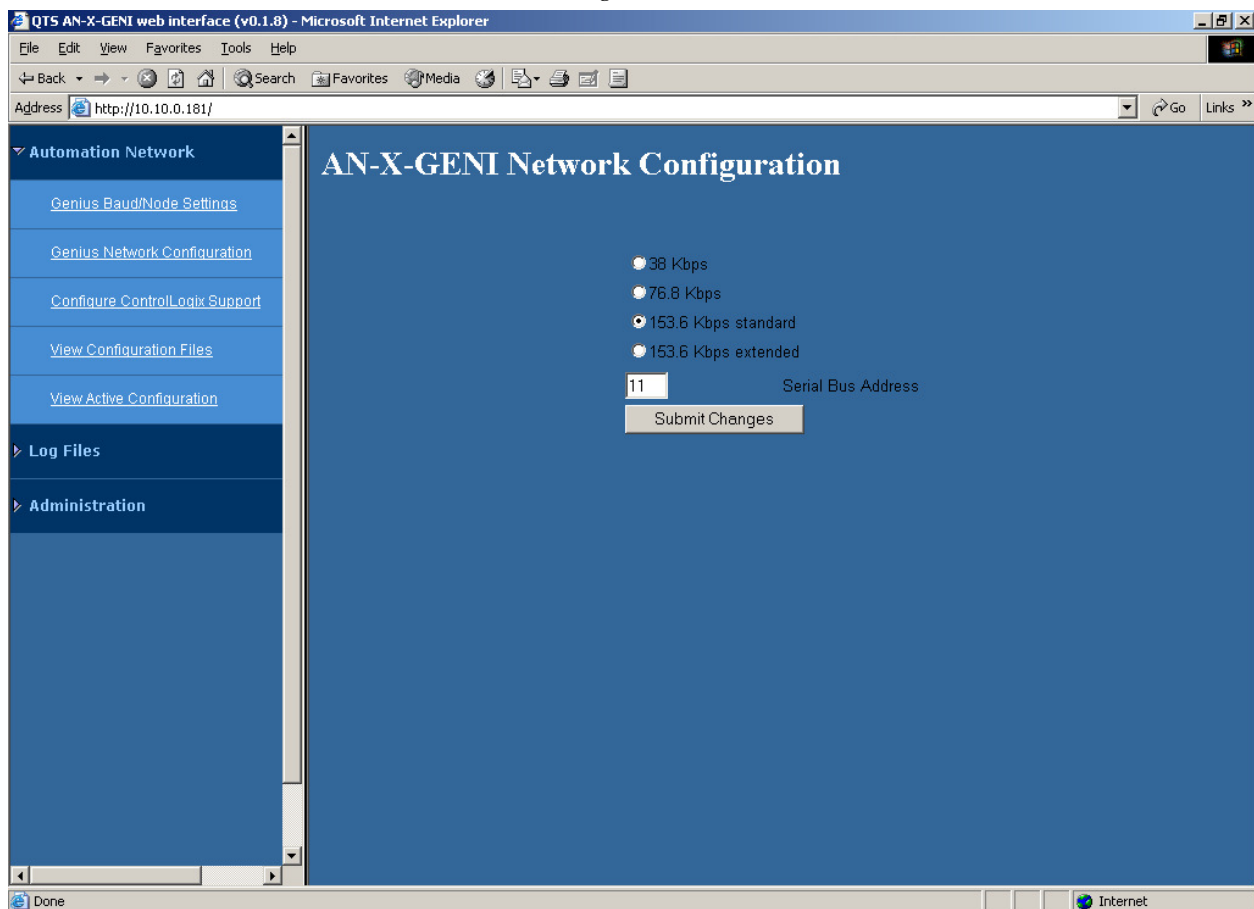
Check the desired baud rate from the four supported baud rates: 38.4Kbps, 76.8 Kbps, 153.6 KBPS standard or 153.6 Kbps extended.

Enter the serial bus address (SBA) for the AN-X, in the range 1 to 31.

Click the Submit Changes button to set the Genius bus properties of the AN-X-GENI.

Configuring the Genius Network

There are two methods of configuring the Genius I/O that the AN-X-GENI is to scan:

- autoconfiguration. The AN-X-GENI reads the network contents by sending messages to the attached network.

- manual configuration. You build a configuration file and send it to the AN-X-GENI.

You can also use autoconfiguration to build an initial configuration file, edit the file to add features, then perform a manual configuration with the modified file.

Autoconfiguration

Before you can perform an autoconfiguration, the Genius network must be connected to the AN-X.

From the AN-X web interface, select *Automation Network/Genius Network Configuration*.

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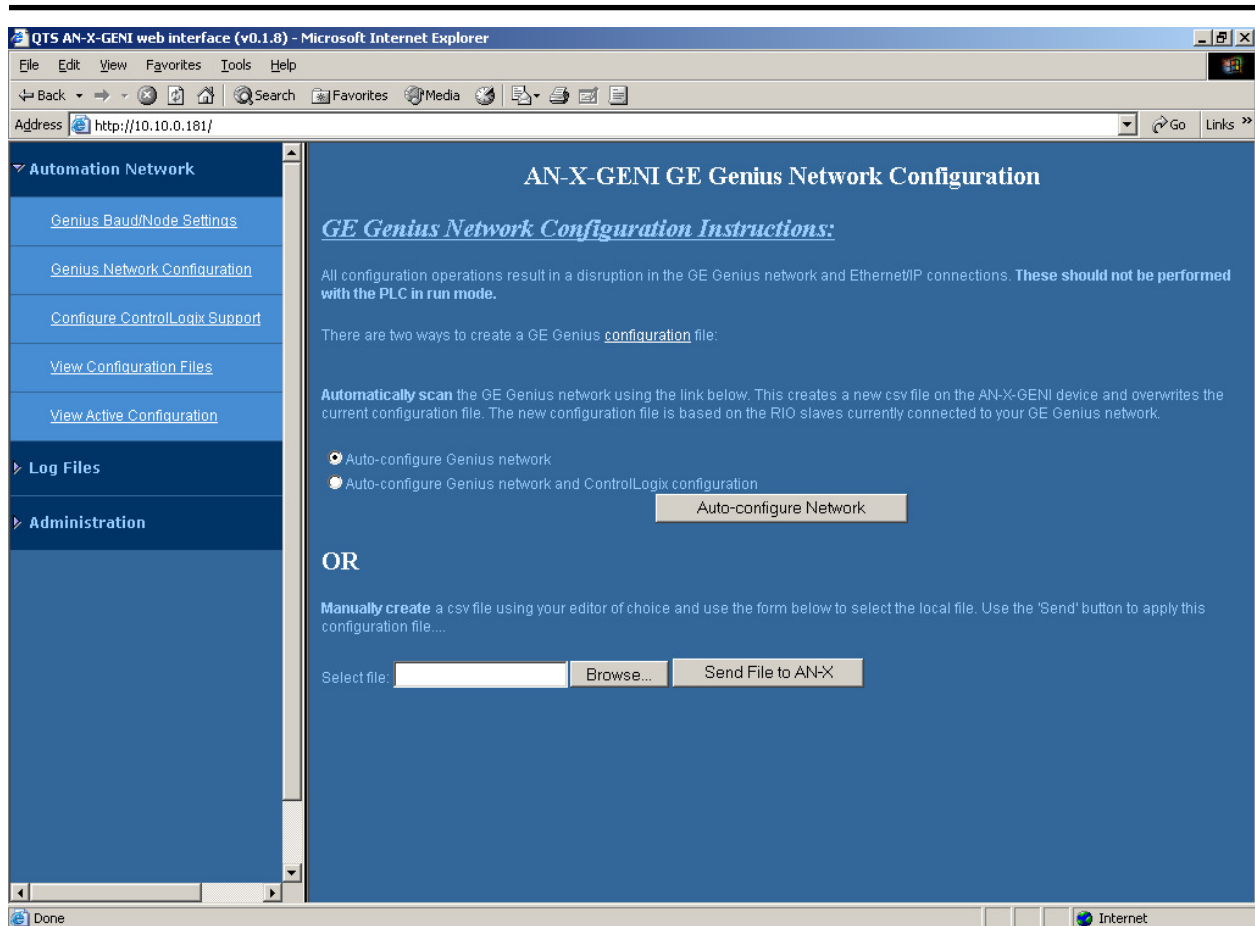
AN-X can generate a default ControlLogix data mapping configuration based on the I/O it finds (see page 23). If you want to have it generate the ControlLogix configuration, check *Auto-configure Genius network and ControlLogix configuration*. Otherwise, check *Auto-configure Genius network* (the default).

Click the *Auto-configure Network* button.

AN-X sends messages to all possible Genius bus addresses and builds a configuration based on the replies it receives. AN-X then displays the configuration it generated.

See page 22 for information on how to upload the configuration from AN-X and save it to a file.

Manual Configuration

Manual configuration is useful when the Genius network is not attached to the AN-X or when you need something other than the default configuration.

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Create the configuration file using a text editor or a spreadsheet such as Excel and save it as a comma separated variable (CSV) file, with extension *csv*. The file format is described on page 20.

To send the configuration to AN-X:

1. From the AN-X web interface, select *Automation Network/Genius Network Configuration*.

2. Type or browse the configuration file name into the *Select file:* area

3. Click the *Send File To AN-X* button to send the file to AN-X.

AN-X parses the file and displays either the current configuration if the configuration was sent successfully or an error message if there was a problem with the file.

Genius Configuration File Format

The Genius I/O configuration file defines the contents of the Genius network to be scanned.

It is a comma-separated variable (csv) text file, which can be created with a text editor or with a spreadsheet such as Excel.

Anything after a semicolon on a line is treated as a comment. Comments can be inserted at the end of a line or on a separate line.

Genius Block Definitions

Each Genius block on the network is defined by a line in the configuration file. The line contains various parameters that describe the block.

Parameters are identified by keywords and are separated by commas.

Each definition begins with the parameter that defines the serial bus address of the block being configured, for example, Block=7. The serial bus address can be from 0 to 31.

The input length is defined by the keyword Inp= and can range from 0 to 128 bytes. If the input length definition is omitted, the input length defaults to a length of 0.

The output length is defined by the keyword Out= and can range from 0 to 128 bytes. If the output length definition is omitted, the output length defaults to a length of 0.

If the AN-X-GENI is to control the outputs on a module, include the keyword Scan. If the AN-X-GENI is only to monitor the inputs on a module, omit the keyword Scan.

The part number for a module is defined by the keyword Part= and can be from 1 to 15 characters long. The part number text must be enclosed in double quotes, for example Part="IC660BBD024".

The description for a module is defined by the keyword Desc= and can be from 1 to 95 characters long. The description text must be enclosed in double quotes, for example Desc="12/24VDC 32 Ckt Source I/O Block".

The part number and description are used for comments only. You can put whatever you want in them.

Each definition ends with the keyword EndBlock, which is required.

Parameter	Keyword	Valid entries
Serial bus address	Block=	0-31
Input length, bytes	Inp=	0-128
Output length, bytes	Out=	0-128
Scan mode	Scan	Scan
Part number	Part=	Maximum 15 characters, enclosed in double quotes
Description	Desc=	Maximum 95 characters, enclosed in double quotes
End of block definition	EndBlock	

Examples:

Block=0,Inp=0,Out=0,,Part="IC660HHM501",Desc="Hand-held Monitor",EndBlock

Block=1,Inp=2,Out=2,Scan,Part="IC660BBR101",Desc="16-Ckt Normally-open Relay Block",EndBlock

When AN-X creates a Genius I/O configuration file after an autoconfiguration, it inserts part numbers and descriptions from its internal module database.

Global Data Sent by AN-X-GENI

If the AN-X-GENI is to send global data on the Genius network, add a line of the form

GlobSend=length

to the configuration file. The length can be from 1 to 64. The length of global data is in 16-bit words, not bytes.

Example:

GlobSend=4

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Sample Genius Configuration File

;QTS AN-X-GENI Scan Configuration Utility

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;Auto Config Geni I/O File

Block=0,Inp=0,Out=0,,Part="IC660HHM501",Desc="Hand-held Monitor",EndBlock

Block=1,Inp=2,Out=2,Scan,Part="IC660BBR101",Desc="16-Ckt Normally-open Relay Block",EndBlock

Block=2,Inp=2,Out=2,Scan,Part="IC660BBD020",Desc="24/48VDC 16 Ckt Source I/O Block",EndBlock

Block=3,Inp=8,Out=4,Scan,Part="IC660BBA020",Desc="24/48VDC 4In/2Out Analog Block",EndBlock

Block=9,Inp=24,Out=24,Scan,Part="IC670GBI001",Desc="Genius Bus Interface Unit",EndBlock

Block=16,Inp=64,Out=0,,Part="IC693BEM331",Desc="Series 90-30 Bus Controller",EndBlock

Block=22,Inp=4,Out=4,Scan,Part="IC660BBD024",Desc="12/24VDC 32 Ckt Source I/O Block",EndBlock

Block=31,Inp=64,Out=0,,Part="IC697BEM731",Desc="Series 90-70 Bus Controller",EndBlock

GlobSend=24,; Global Data Sent by AN-X (16 bit words)

Viewing the Current Configuration

To view the Genius configuration currently in AN-X, access the web interface and select *Automation Network/View Active Configuration*.

You can also view the configuration file by accessing the web interface and selecting *Automation Network/View Configuration Files*. Click on the *AN-X-GENI Genius Network Configuration File* link and select *Open* to open the file in whatever application is associated with CSV files on your computer, usually a spreadsheet or a text editor.

Saving the Current Configuration

To save the configuration currently in AN-X to a file, access the web interface and select *Automation Network/View Configuration Files*.

Right click on the *AN-X-GENI Genius Network Configuration File* link and save the file.

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Exchanging Scheduled Data with a ControlLogix

The AN-X-GENI supports multiple scheduled connections with a ControlLogix processor over Ethernet.

The AN-X-GENI behaves like a 17-slot ControlLogix rack with an ENBT/A module in slot 16 and generic modules in slots 0 to 15.

A ControlLogix processor can open a scheduled connection to each of these 16 generic modules. Each scheduled connection consists of up to 248 words of output data from the ControlLogix processor to the AN-X and up to 250 word of input data from the AN-X to the ControlLogix processor.

Each connection can have a different RPI, from 5 to 750 ms.

In general, keep the number of connections small. There is significant overhead in opening and maintaining each connection.

You map the inputs and outputs for the Genius blocks to these scheduled connections. AN-X can create the mappings automatically or you can create a mapping configuration manually.

You can let AN-X create a mapping file automatically, then edit the file to better suit your application. For example, in order to make the most efficient use of the available Ethernet bandwidth, you can organize the data so that items that must update quickly are mapped to connections with short RPIs and items that are less time critical are mapped to connections with longer RPIs.

In addition, the AN-X module has diagnostic data that can be mapped to ControlLogix scheduled input data.

Mapping I/O Data

You map Genius input and output data to the ControlLogix scheduled data by creating a comma separated variable file that defines the mappings and sending the file to the AN-X.

The file contains sections for each scheduled connection. Within each scheduled connection are the definitions for the input and output data for that connection. These definitions refer to the Genius module where the data is to be found.

When you create a mapping for a Genius module, all the input or output data for the module is mapped; you cannot map individual registers.

The file also contains options that apply to the whole configuration.

AN-X can automatically create a default mapping file when you autoconfigure I/O. See page 18 for details.

Anything after a semicolon on a line is treated as a comment.

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ClxName

The first line in the file identifies the AN-X module. AN-X uses this name in the address portion of the ControlLogix tags for the Genius data.

The ClxName consists of a line with the keyword ClxName, followed by a comma and the name you give the emulated ENBT (see page 31)

Example:

ClxName, AnxGeniMas

ClxPrefix

The ClxPrefix is used in the alias names AN-X creates for import into RSLogix 5000. AN-X prefixes each name with the ClxPrefix. The ClxPrefix can be used to distinguish tags for the same Genius serial bus address on different Genius networks when the ControlLogix processor has connections to more than one AN-X-GENI.

For example, if the ControlLogix has connections to two AN-X-GENI modules, each controlling a different Genius network, each Genius network could have a block with the same serial bus address. Using a different ClxPrefix in the configuration file for each AN-X-GENI makes the tags for the two AN-X modules distinct.

The ClxPrefix consists of a line with the keyword ClxPrefix, followed by a comma and the prefix text.

Example:

ClxPrefix,GENI1_

Scheduled Connections

Each scheduled connection to the AN-X begins with a line that consists of the keyword ClxSlot followed by a comma and then a number from 0 to 15

Example:

ClxSlot, 0

Each scheduled connection consists of output data and input data.

The section that defines the scheduled outputs from the ControlLogix processor for that connection begin with a line with just the keyword DataOutput.

The section that defines the scheduled inputs to the ControlLogix processor for that connection begin with a line with just the keyword DataInput.

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Data definitions consist of lines that define the mapping between the ControlLogix data table and the Genius module.

They consist of lines of the form

CLX_offset (optional), Genius_Location, tagname

The CLX_offset is the offset into the data for the connection. You can select the offset where the data is located or you can leave it blank and AN-X will automatically assign the offset.

The Genius_location consists of an address in the form bSBA where SBA is the 2-digit serial bus address (SBA) of the module on the Genius bus, from 1 to 31.

Example:

To associate ControlLogix offset 27 with the outputs from the Genius module at serial bus address 4 and assign it tagname Block4Outputs, add the following line to the DataOutput section of the connection

27, b4, Block4Outputs

Example:

To map the inputs from the Genius module at address 31 to the next available ControlLogix location and assign it tagname Block31Inputs, add the following line to the DataInput section of the connection

, b31, Block31Inputs

Global Data

To map the Global data sent by AN-X to the output data for a connection, add the following line to the DataOutput section of the connection:

GlobSend

AN-X obtains the length of the global data to map from the Genius I/O configuration file (see page 21).

Program Mode Behaviour

The ControlLogix processor that is the exclusive owner of the connection to the generic module in slot 0 controls how the AN-X-GENI module scans the Genius network. For that reason, when you map the data, you must always include a connection to the generic module in slot 0.

When the ControlLogix processor with the exclusive owner connection to slot 0 on the AN-X is in program mode or the connection to slot 0 is stopped or inhibited, the AN-X stops scanning the Genius network.

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Even if other ControlLogix processors have exclusive owner connections to other slots on the AN-X and are in run mode, AN-X does not scan the network.

You can override this behaviour by including a line with the keyword ScanGeniProg in the configuration file. This causes the AN-X-GENI module to continue to communicate with the Genius network when the ControlLogix processor is in program mode but set all outputs to 0. Similarly ControlLogix processors with exclusive owner connections to other AN-X slots will also update. If the exclusive owner connection to slot 0 stops, AN-X stops all communication with the Genius network.

WARNING!

This option is included for debugging since it allows inputs to update in the ControlLogix. It should NOT be used in normal operation.

Other Mappable Data

In addition to the I/O data, there are other items that can be mapped to connection input data.

If you create the ControlLogix configuration automatically when you autoconfigure the Genius network, these items are mapped by default to ClxSlot 15.

TIP

If you map the diagnostic data to a separate connection, use a long RPI to reduce the Ethernet traffic, since the diagnostics do not need to be updated as frequently as I/O data.

Diagnostic Counters

The AN-X-GENI maintains the following diagnostic counters.

Counter	Offset	Description
TxFrames	0	Transmitted network frames
TxMsgs	1	Transmitted network messages (datagrams)
RxFrames	2	Received network frames
RxMsgs	3	Received network messages (datagrams)
RxDup	4	Received duplicate frames
RxCrcErr	5	Received frames with a CRC error
RxStopErr	6	Received frames with a stop error
RxAbortErr	7	Received frames with an abort error

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Counter	Offset	Description
RxOverrunErr	8	Received frames with an overrun error
NoToken	9	No tokens received from network

To map the diagnostic counters, include a line with just the keyword DiagCtrs in the input section of a connection. This maps all the diagnostic counters (10 words); they cannot be mapped individually.

Block Error Table

The block error table consists of 2 16-bit words, one bit per serial bus address. Bit 0 of the first word corresponds to serial bus address 0, bit 1 corresponds to serial bus address 1, and so on.

If a configured block is not active on the network, the bit is 1. If a configured block is active on the network, the bit is 0. The bit is always 0 for an unconfigured block.

To map the block error table, include a line with just the keyword BlockErr.

Example:

, BlockErr

TIP

Map the block error table to the beginning of input data of each connection. If the connection to the AN-X module is lost, the ControlLogix sets the first 2 words of the connection to FFFF hexadecimal. If your program is monitoring the block error table, it will see all the error bits as set.

Block Fault Table

A Genius block can generate fault messages for a variety of error conditions. If the AN-X-GENI receives a fault message from a Genius block, it sets the corresponding bit in the block fault table.

The block fault table consists to 2 16-bit words, one bit per serial bus address. Bit 0 of the first word corresponds to serial bus address 0, bit 1 corresponds to serial bus address 1, and so on.

To map the block fault table, include a line with the keyword BlockFlt in the input section of a connection.

Example:

,BlockFlt

If the block fault bit is set for a block, use the web interface on the AN-X-GENI to view and clear the fault. Refer to page 56 for details.

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Connection Statistics

The module maintains statistics for each scheduled connection. In the following table, O represents the connection originator (ControlLogix) and T represents the connection target (AN-X).

The statistics for each connection consists of 10 words of data:

Offset	Description
0	Average time for last 100 O=>T updates
1	Minimum time for last 100 O=>T updates
2	Maximum time for last 100 O=>T updates
3	Maximum O=>T time since connection opened
4	Reserved
5	Average time for last 100 T=>O updates
6	Minimum time for last 100 T=>O updates
7	Maximum time for last 100 T=>O updates
8	Maximum T=>O time since connection opened
9	Reserved

The units for the times are 0.1 milliseconds. A value of 87 means 8.7 ms.

To map the statistics for a given connection, include a line with the keyword ConnStatsn, where n is the connection number, from 0 to 16, in the input section of a connection.

Example:

,ConnStats2

Values update at a rate equal to 100 times the RPI for the connection. Averages are calculated for the last 100 updates.

Example Configuration File:

;QTS AN-X-GENI Scan Configuration Utility

;Copyright (c) 2005 Quest Technical Solutions

;Auto Config Ethernet/IP File

;ScanGeniProg

ClxName,AnxGeniMas

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ClxPrefix,GENI_

ClxSlot,0

DataOutput   ; Outputs from ControlLogix

,b1,b01_Out, ; Ofs= 0 Len= 1 IC660BBR101 16-Ckt Normally-open Relay Block

,b2,b02_Out, ; Ofs= 1 Len= 1 IC660BBD020 24/48VDC 16 Ckt Source I/O Block

,b3,b03_Out, ; Ofs= 2 Len= 2 IC660BBA020 24/48VDC 4In/2Out Analog Block

,b9,b09_Out, ; Ofs= 4 Len=12 IC670GBI001 Genius Bus Interface Unit

,b22,b22_Out, ; Ofs= 16 Len= 2 IC660BBD024 12/24VDC 32 Ckt Source I/O Block

,GlobSend; Global Data Sent by AN-X-GENI

DataInput   ; Inputs to ControlLogix

,BlockErr   ; Map BlockErr here since Clx sets to -0xffffffff on Connection Failure

,b1,b01_Inp, ; Ofs= 2 Len= 1 IC660BBR101 16-Ckt Normally-open Relay Block

,b2,b02_Inp, ; Ofs= 3 Len= 1 IC660BBD020 24/48VDC 16 Ckt Source I/O Block

,b3,b03_Inp, ; Ofs= 4 Len= 4 IC660BBA020 24/48VDC 4In/2Out Analog Block

,b9,b09_Inp, ; Ofs= 8 Len=12 IC670GBI001 Genius Bus Interface Unit

,b16,b16_Inp, ; Ofs= 20 Len=32 IC693BEM331 Series 90-30 Bus Controller

,b22,b22_Inp, ; Ofs= 52 Len= 2 IC660BBD024 12/24VDC 32 Ckt Source I/O Block

,b31,b31_Inp, ; Ofs= 54 Len=32 IC697BEM731 Series 90-70 Bus Controller

;The following map 'Ghost Mode' Monitored Outputs to ClxSlot 8

;They must be 'uncommented' for 'Ghost Mode' Monitoring

;ClxSlot,8   ; This maps monitored 'Ghost Mode' outputs to Slot 8

;DataInput   ; Inputs to ControlLogix

;,BlockErr   ; Map BlockErr here since Clx sets to -0xffffffff on Connection Failure

;,m31>1[1],b01_OutMon, ; Ofs= 2 Len= 1 IC660BBR101 16-Ckt Normally-open Relay Block

;,m31>2[1],b02_OutMon, ; Ofs= 3 Len= 1 IC660BBD020 24/48VDC 16 Ckt Source I/O Block

;,m31>3[2],b03_OutMon, ; Ofs= 4 Len= 2 IC660BBA020 24/48VDC 4In/2Out Analog Block

;,m31>9[12],b09_OutMon, ; Ofs= 6 Len=12 IC670GBI001 Genius Bus Interface Unit

;,m31>22[2],b22_OutMon, ; Ofs= 18 Len= 2 IC660BBD024 12/24VDC 32 Ckt Source I/O Block

;The following lines map Diagnostics into ClxSlot 15

ClxSlot,15

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DataInput ; Inputs to ControlLogix

 0,BlockFlt, ; Ofs= 0 Len=2

10,DiagCtrs, ; Ofs= 10 Len=10

;ControlLogix Connection Statistics

,ConnStats0, ; Ofs= 20 Len=10

Viewing the Current Configuration

To view the ControlLogix configuration currently stored in the AN-X, start the web interface and select *View Active Configuration*.

Click the *Ethernet/IP* link to view the current ControlLogix scheduled data configuration.

AN-X-GENI ControlLogix Config File /home/axctrl/GeniEnetIpSvr.csv

 5: ;DisOutOnProg

 7: ClxExp: AnxGeniMas

 8: ClxPrefix: GENI_

 9: ClxSlot 0

11: DataOutput

12: 0   1 b01 b01_Out 16-Ckt Normally-open Relay Block

13: 1   1 b02 b02_Out 24/48VDC 16 Ckt Source I/O Block

14: 2   2 b03 b03_Out 24/48VDC 4In/2Out Analog Block

15: 4 12 b09 b09_Out Genius Bus Interface Unit

16: 16   2 b22 b22_Out 12/24VDC 32 Ckt Source I/O Block

21: DataInput

22: 0   2 BlockErr

23: 2   1 b01 b01_Inp 16-Ckt Normally-open Relay Block

24: 3   1 b02 b02_Inp 24/48VDC 16 Ckt Source I/O Block

25: 4   4 b03 b03_Inp 24/48VDC 4In/2Out Analog Block

26: 8 12 b09 b09_Inp Genius Bus Interface Unit

27: 20   8 b16 b16_Inp Series 90-30 Bus Controller

28: 28   2 b22 b22_Inp 12/24VDC 32 Ckt Source I/O Block

29: 30 64 b31 b31_Inp Series 90-70 Bus Controller

48: ClxSlot 15

50: DataInput

51: 0   2 BlockFlt

52: 10 10 DiagCtrs

55: 20 10 ConnStats0

......Parse Successful

Each line begins with a line number, from the original ControlLogix configuration file. Each mapping line shows the offset and length of the data in the ControlLogix data connection.

Saving the Current Configuration

To save the ControlLogix configuration currently stored in the AN-X to a file, start the web interface and select *Automation Network/View Active Configuration*.

Right click the *Ethernet/IP* link and select *Save target* to save the current ControlLogix scheduled data configuration to a file.

You can also save the ControlLogix configuration by selecting *Automation Network/View Configuration Files*. Right click on the AN-X-GENI ControlLogix Configuration File link and select *Save target* to save the current ControlLogix scheduled data configuration to a file.

Configuring the AN-X Module in RSLogix 5000

To configure the AN-X-GENI in RSLogix 5000:

1. Right click on the ControlLogix Ethernet module that will be communicating to the AN-X and select *Add Module*. Add a 1756-ENBT/A module. Set the Major Rev to 1.

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Set the *Name* to match the hostname of the AN-X in the Ethernet configuration.
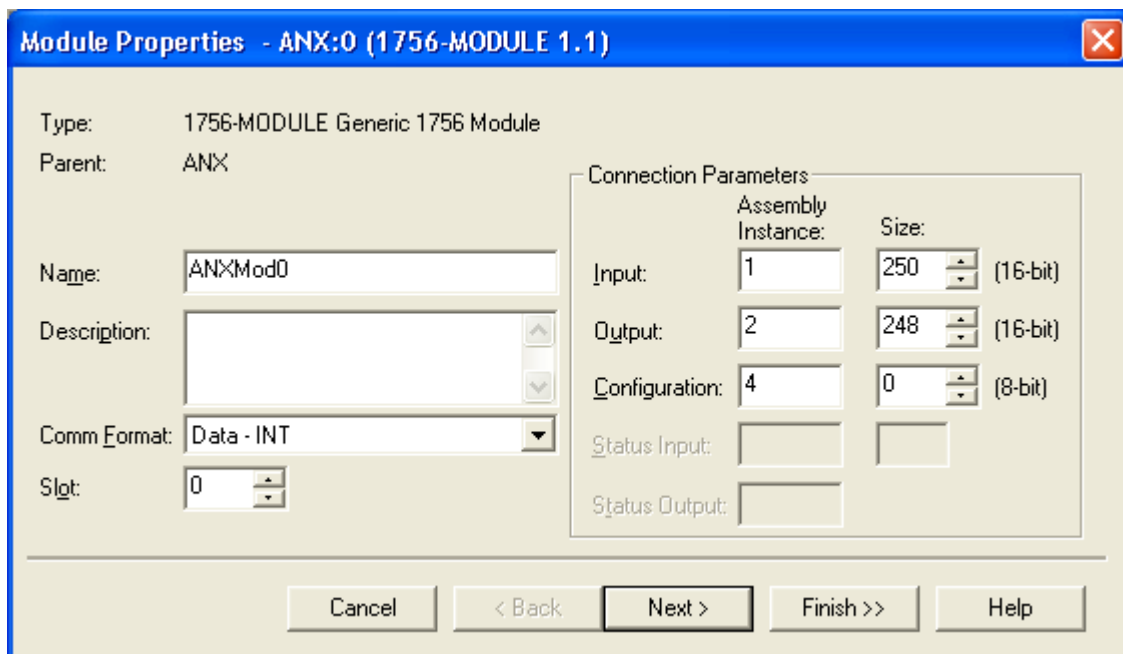
Set the Slot to 16. Set the chassis size to 17.

Set the *Comm Format* to None.

Set the IP address to match the AN-X module.

Set *Electronic Keying* to *Disable Keying*.

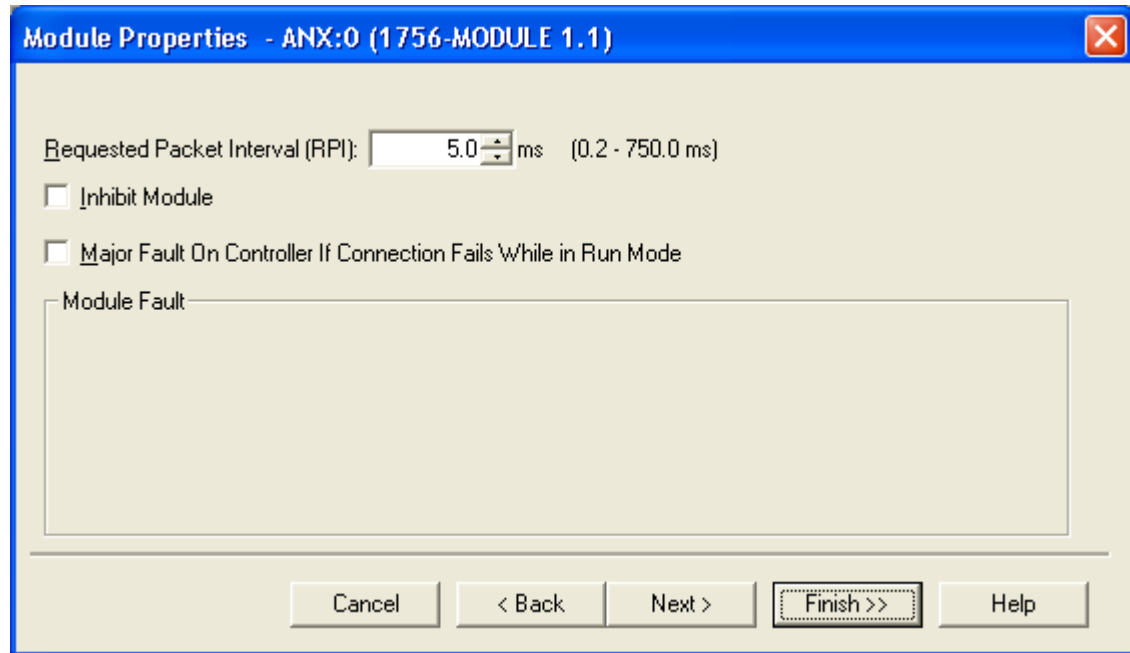2. Add Generic modules for each required connection

Set the parameters as shown. Set the Slot to 0 for the first connection, 1 for the second connection, and so on.

3. Set the RPI for each connection.

IMPORTANT!   Ensure that any check box that refers to Unicast connections is unchecked.

ControlLogix Aliases

AN-X uses the Ethernet/IP configuration to create aliases that can be imported into RSLogix 5000. Use these alias tags in your RSLogix 5000 program to access the data on the AN-X.

There are two sets of tag files, one for exclusive owner connections and one for input only connections.

In the web interface, select *Automation Network/View Configuration Files*.

To view the files, click either *AN-X-GENI Ethernet/IP ControlLogix Exclusive Owner Data Tags* or *AN-X-GENI Ethernet/IP ControlLogix Input Only Data Tags*.
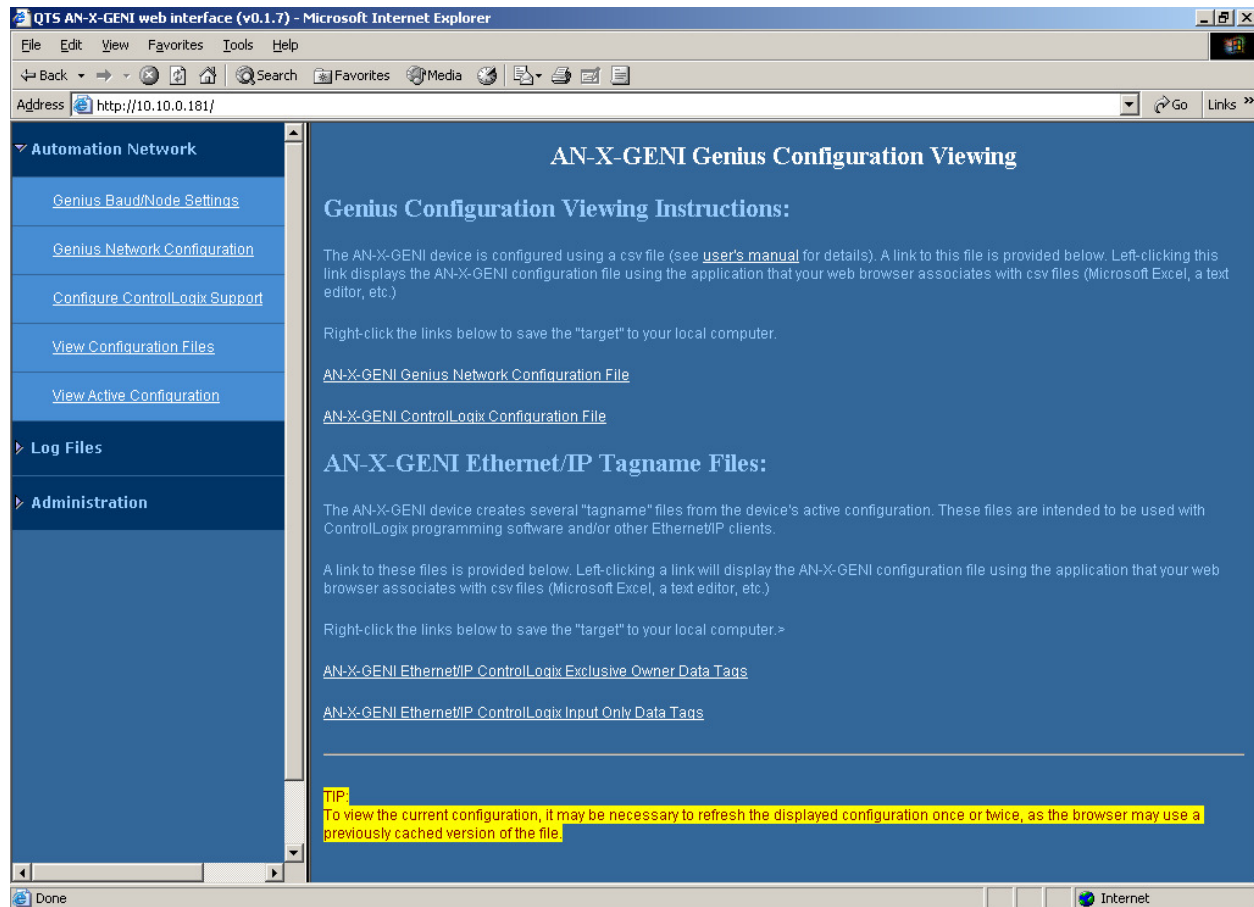
To save the file to your computer, right click on the link and select *Save Target As…*

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Importing Tags in RSLogix 5000

To import the tags into RSLogix 5000, you must be offline. Select *Tools/Import Tags* and import the file.

Using the ControlLogix Log

If there are problems with scheduled connections to the AN-X, use the ControlLogix log to identify the cause.

From the web interface, select *Log Files/ControlLogix Log* to display the log. Look for error messages that describe in detail the cause of any problem with the current configuration.

Using Ghost Mode

In ghost mode, the AN-X-GENI monitors inputs and outputs on an existing Genius network and passes the monitored data to a ControlLogix via scheduled connections.

Ghost mode is useful when the AN-X-GENI and a ControlLogix is to replace an existing control system and you want to verify the data and timing on the existing system before replacing it.

WARNING!

You must be careful in setting up ghost mode that you do not disrupt the existing sytem when you connect and configure the AN-X-GENI

Configuration is best performed when the existing system is connected but is not running.

The AN-X-GENI requires an available serial bus address on the Genius network.

You can use the autoconfiguration feature of the AN-X-GENI to locate all the devices on the network and generate a starting Genius configuration file.

Genius Configuration File

You must configure the Genius I/O on the network being monitored. The configuration file format is the same as described earlier (see page 20). Ensure that the Scan field is removed from all Genius devices so that the AN-X-GENI doesn't write outputs to the network

ControlLogix Configuration File

The output data on the Genius network is mapped to ControlLogix scheduled inputs.

Data definitions for the monitored outputs consist of lines that define the mapping of the Genius output data into the ControlLogix data table.

They consist of lines of the form

CLX_offset (optional), Genius_Location, tagname

The CLX_offset is the offset into the data for the connection. You can select the offset where the data is located or you can leave it blank and AN-X will automatically assign the offset.

The Genius_location consists of an address in the form

msourceSBA>destSBA[length]

where

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sourceSBA is the serial bus address (SBA) of the module on the Genius bus that is sending the data

destSBA is the serial bus address of the destination

length is the length of data in words

Genius bus input data is mapped as before.

Example:

A Genius bus controller at serial bus address 31 is sending 2 words of output data to a Genius block at serial bus address 17. To map this data to a offset 27 in a ControlLogix scheduled connection, and assign it tagname Block17Outputs, add the following line to the DataInput section of the connection

27, m31>17[2], Block17Outputs

ControlLogix Tags

As before, AN-X can create tags that can be imported into RSLogix 5000 to access the data.

Quick Start

Use the following steps to run the AN-X-GENI in ghost mode.

1. Use the web interface to set the baud rate and serial bus address

2. Connect AN-X-GENI to the Genius network.

3. Use the web interface to perform an autoconfiguation and automatically generate a ControlLogix configuration.

4. Save and edit the Genius configuration file. Remove Scan from all network devices.

5. Save and download the modified Genius configuration file to the AN-X-GENI.

6. Save and edit the ControlLogix confguration file the AN-X-GENI created when you performed the autoconfiguration. Comment out all the DataOutput sections. Uncomment the ghost mode entries it created and modify them to suit your application.

7. Save and download the modified ControlLogix configuration file.

8. Use the web interface to view the active configuration and locate the data.

9. Use the web interface to export the tags for the ControlLogix configuration and import them into RSLogix 5000.

10. Use the tags to access the data from RSLogix 5000.

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Using AnxInit

AnxInit is a 32-bit Windows application supplied with AN-X to perform the following functions:

• Locate and identify AN-X modules on the Ethernet network

• Select a specific AN-X for configuration

• Set the IP address and other network parameters for an AN-X

• Restart an AN-X

• Display information about the selected AN-X

• Read the kernel parameters for the selected AN-X

• Update the flash (low level firmware) on the selected AN-X

• Update the firmware on the selected AN-X

• Patch the firmware on the selected AN-X

In addition, it can be used to:

• clear the AnxInit log

• copy the contents of the log to the clipboard for use by another application. This is often useful for technical support

AnxInit Log

AnxInit logs messages in its main window. These messages are often useful for determining the cause of errors or for technical support.

To clear the log, select *Edit/ClearLog*.
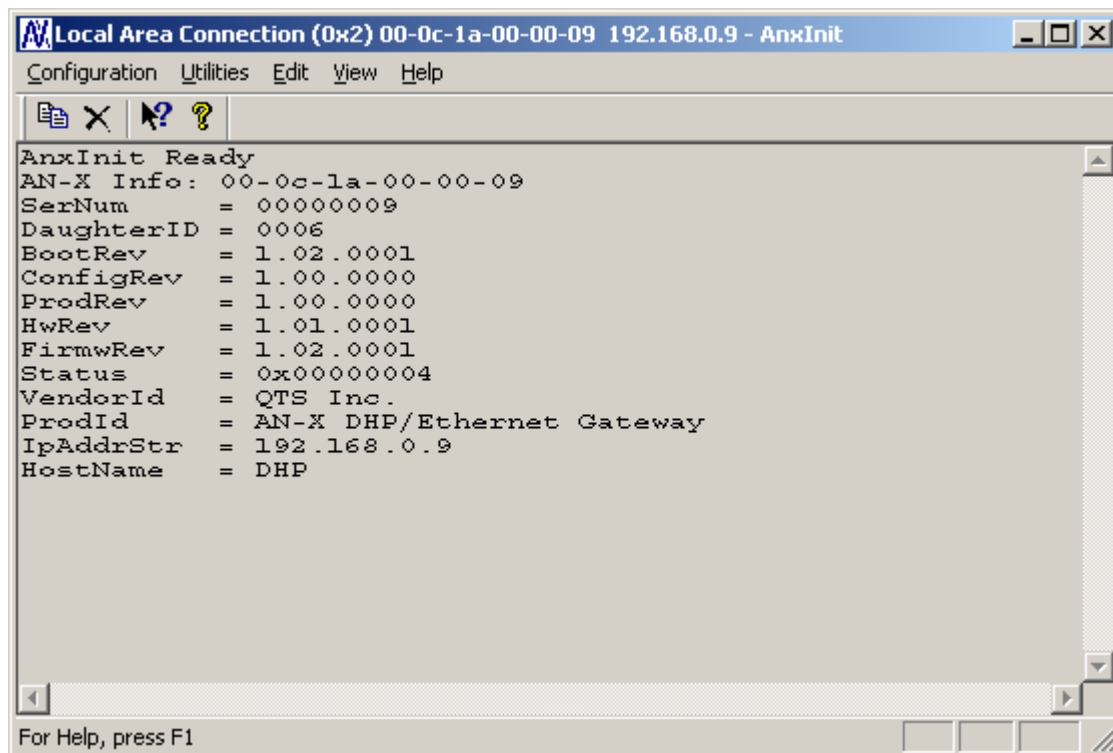
To copy the contents of the Log to the Windows clipboard so that they can be pasted into another application, select *Edit/Copy*.

AN-X Log

Locating Available AN-X Modules

To locate all accessible AN-X modules on the Ethernet network, select *Utilities/Locate All AN-X Modules.*

AnxInit displays a list of the AN-X modules it finds, showing their MAC IDs, IP addresses and host names.
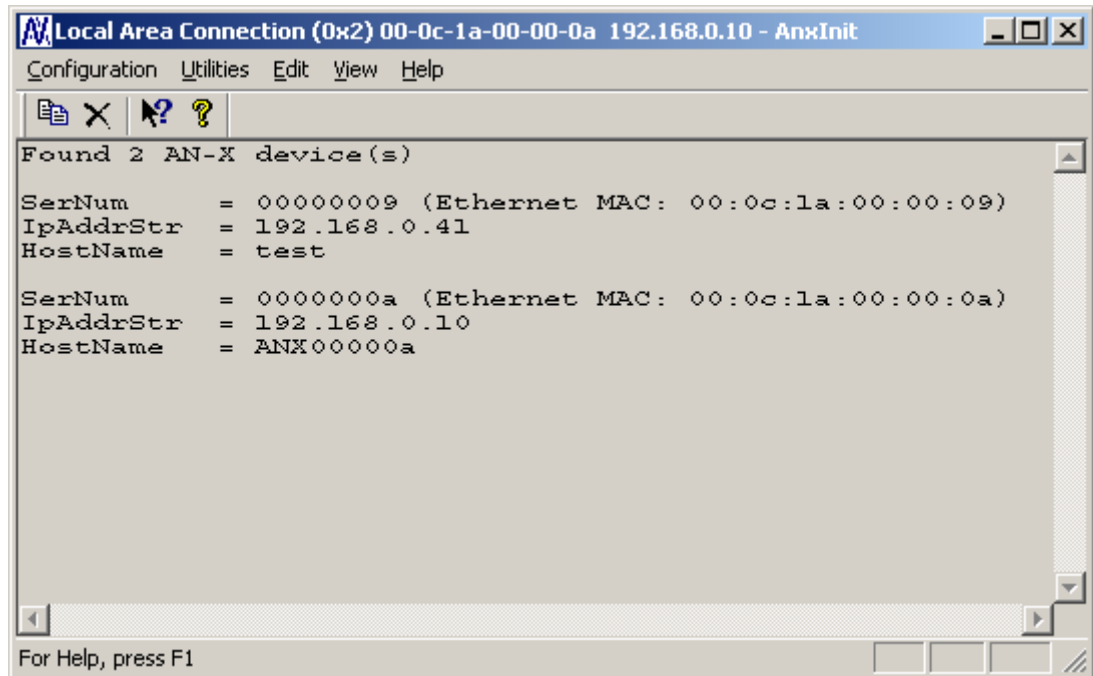
This command is useful for determining IP addresses when they have been set by a DHCP server or for confirming that an AN-X is accessible.

Selecting an AN-X

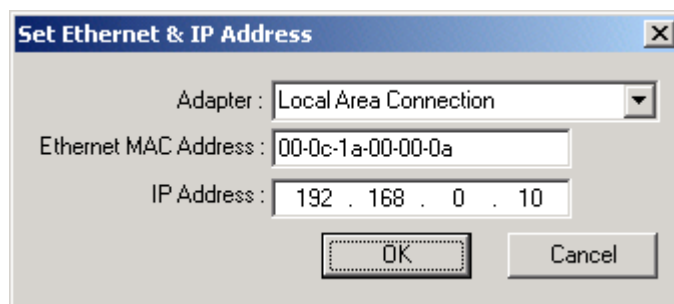Before you can perform an operation on an AN-X, you must select which AN-X you want the operation performed on. Choose *Utilities/Select An AN-X* to select a specific AN-X.

From the Adapter list, select the network adapter that connects to the Ethernet network that contains the AN-X.

In the *Ethernet MAC Address* field, enter the MAC Address of the AN-X you wish to select. It can be found on the AN-X label or using the *Locate All AN-X Modules* command. The format is as shown above, six pairs of hexadecimal digits separated by hyphens.

In the *IP Address* field, enter the Ethernet IP address of the AN-X you wish to select. It can be found using the *Locate All AN-X Modules* command. The format is as shown above, four decimal numbers, each in the range 0 to 255.

Both MAC address and IP address must match the settings on the AN-X in order for communication to occur.

Click OK to select the AN-X.

The title bar of AnxInit shows the MAC Address and IP Address of the currently selected AN-X.

Set AN-X IP Configuration

Utilities/AN-X IP Configuration sets the AN-X IP address and hostname.

The AN-X must be on the local Ethernet to set its IP address.

First select the AN-X using the *Utilities/Select An AN-X command.*

Next select *Utilities/AN-X IP Configuration.* The *AN-X TCP/IP Configuration* dialog appears.

Enter a *Host Name* for the AN-X. This name is used internally by AN-X and may be used to identify the AN-X if you have a DNS server on your network. The name can be from 1 to 31 characters long.

To configure the AN-X to obtain its IP address from a DHCP server on the network, select *Obtain an IP address automatically (DHCP)*

To configure the AN-X to use a static IP address, select *Use the following Settings* and enter the following:

• the desired IP address for the AN-X.

• the Subnet mask for the AN-X

• the default gateway for your network.

You must enter a valid default gateway address even if there is no device at the gateway address on the network.

Click OK to complete the configuration.

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Utilities/AN-X IP Configuration resets the selected AN-X. Use the *Utilities/Restart AN-X* to restart the AN-X in production mode.

If you Cancel the *Utilities/AN-X IP Configuration* command, AN-X is left running the boot code. Use the *Utilities/Restart AN-X* command to restart the AN-X.

Restart an AN-X

Use the *Utilities/Restart AN-X* command to restart the currently selected AN-X.

AN-X Info

The *Utilities/AN-X Info* command provides information about the currently selected AN-X in the log window.

The information shown:

AN-X Info	Ethernet MAC address
SerNum	Serial number
DaughterID	Daughterboard ID, 0b hex for AN-X-GENI
BootRev	Boot code version
ConfigRev	Configuration kernel version
ProdRev	Production kernel version
HwRev	Hardware version
FirmwRev	Firmware release version (depends on current operating mode)
Status	see below
VendorId	Vendor ID
ProdId	Product ID (0E hex, 14 decimal)
IpAddrStr	IP address assigned using Utilities/AN-X IP Configuration
HostName	name assigned using Utilities/AN-X IP Configuration

In boot mode, FirmwRev, Vendor ID and Product ID and not valid, and IpAddrStr and HostName are not shown.

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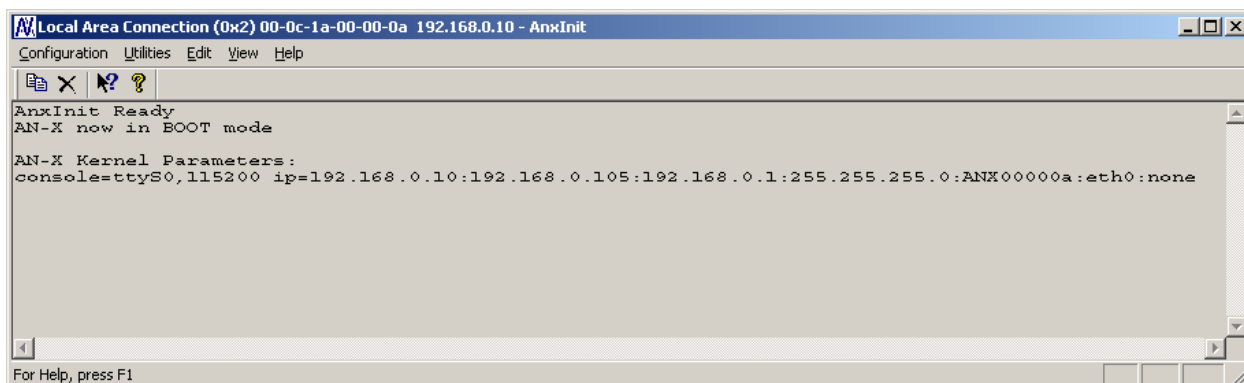www.prosoft-technology.com

Possible status values are:

Value	Meaning
1	Boot mode
2	Configuration mode
4	Production mode

Read Kernel Parameters

The *Utilities/Read Kernel Parameters* command displays various communications parameters for the currently selected AN-X

This command resets the AN-X. You will be warned and given the opportunity to cancel the command.


```
AnxInit Ready
AN-X now in BOOT mode

AN-X Kernel Parameters:
console=ttyS0,115200 ip=192.168.0.10:192.168.0.105:192.168.0.1:255.255.255.0:ANX00000a:eth0:none
```

The *Utilities/Read Kernel Parameters* command leaves the AN-X running the boot code. Use the *Utilities/Restart AN-X* command to restart the AN-X in production mode.

Run Config Mode

The *Utilities/Run Config Mode* command is used to restart the currently selected AN-X in configuration mode (normally used internally for updating firmware).

This command is not used in normal operation but may be required for technical support.

The AN-X is in configuration mode when the SYS LED flashes red twice, followed by a pause.

To exit configuration mode, use the *Utilities/Restart AN-X* command to restart AN-X in production mode.

Update AN-X Flash

The *Utilities/Update AN-X Flash* command updates the low-level firmware (configuration and production kernels).
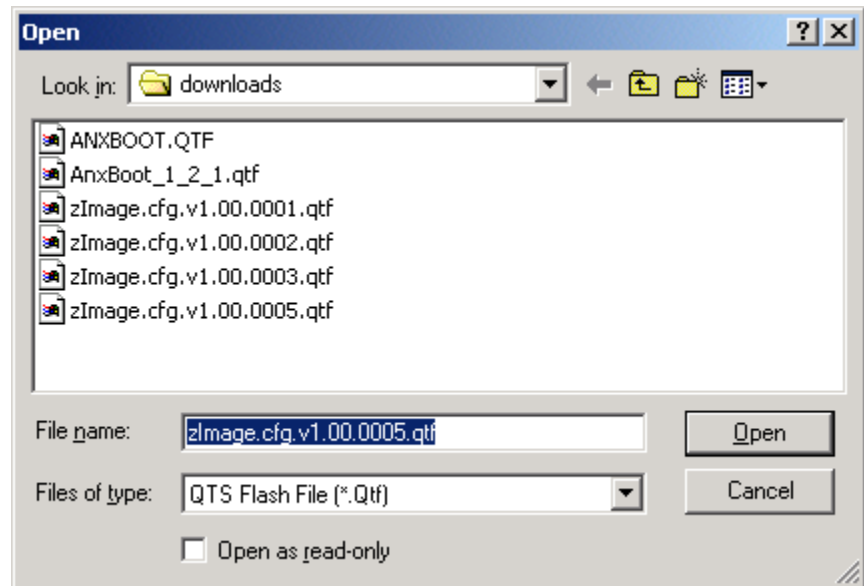
Files have extension qtf.

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This command resets the AN-X. You will receive a warning and be given the opportunity to Cancel the command.

If you cancel at the filename dialog, the AN-X has already been reset and is in boot mode. Use the *Utilities/Restart AN-X* command to restart it in production mode.

Update Firmware

There are two ways to update all the firmware in an AN-X module.

1. The *Configuration/Firmware Update* command starts the firmware update wizard, which takes you step by step through the firmware update process.

2. The *Utilities/Update Firmware* command updates all the firmware on an AN-X you have selected using the *Utilities/Select An AN-X* command.

Firmware files have extension *bin*.

Firmware Update Wizard

Select the *Configuration/Firmware Update* command to start the firmware update wizard.

Step 1:

In step 1, you identify the AN-X you are configuring.

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1. Select the Ethernet adapter that's connected to the AN-X. In most cases there will be just one Ethernet adapter in the computer. The AN-X must be on the same subnet as the computer.

2. Enter the MAC address of the AN-X you are updating. This is printed on the AN-X label. It consists of six pairs of hexadecimal digits, separated by hyphens. In the example above, it's 00-0c-1a-00-00-09.

If the AN-X is already online, you can obtain its MAC address using the *Utilities/Locate All AN-X Modules* command.

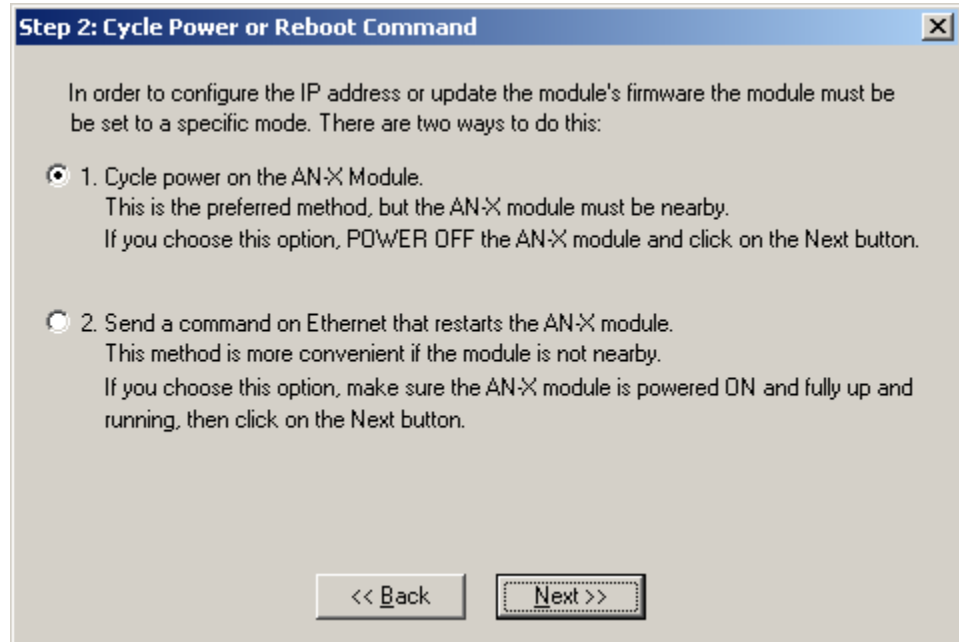3. Enter the IP address of the AN-X you want to update

Step 2

In step 2, you choose a method of restarting AN-X to put it in config mode.

Step 2: Cycle Power or Reboot Command

In order to configure the IP address or update the module's firmware the module must be be set to a specific mode. There are two ways to do this:

○ 1. Cycle power on the AN-X Module.
This is the preferred method, but the AN-X module must be nearby.
If you choose this option, POWER OFF the AN-X module and click on the Next button.

○ 2. Send a command on Ethernet that restarts the AN-X module.
This method is more convenient if the module is not nearby.
If you choose this option, make sure the AN-X module is powered ON and fully up and running, then click on the Next button.

[<< Back] [Next >>]

The preferred method is to cycle power on the AN-X. Select the first option on the screen and click the *Next >>* button.

The second method, useful if the AN-X in not easily accessible, is to send it a command over Ethernet. The AN-X must be powered on and completely running for this method to work. For example, if this is the first time you are configuring a new AN-X, allow sufficient time for it to acquire an IP address from a DHCP server or to time out and use its default IP address (about 3 minutes). Select the second option on the screen and click the *Next >>* button.
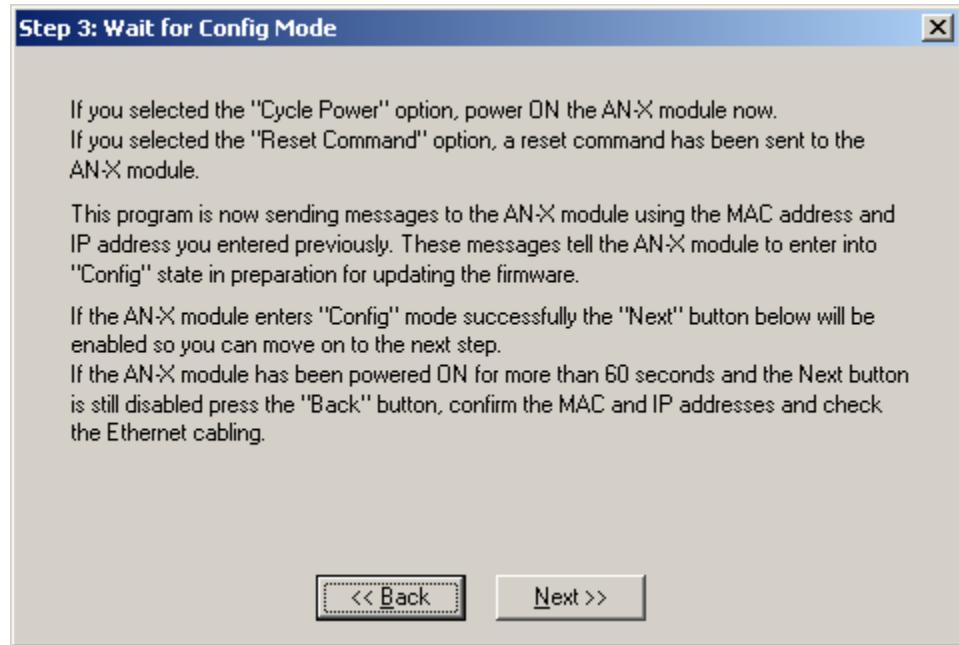
Step 3:

Wait for AN-X to enter config mode. While AnxInit is waiting, the *Next>>* button is disabled. When AN-X is in boot mode, the *Next>>* button is enabled.
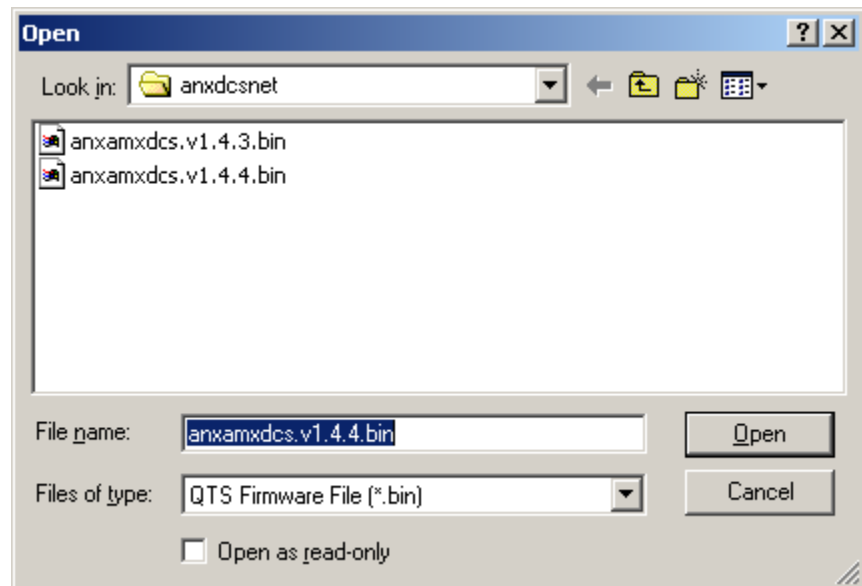
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Step 3: Wait for Config Mode

If you selected the "Cycle Power" option, power ON the AN-X module now.
If you selected the "Reset Command" option, a reset command has been sent to the AN-X module.

This program is now sending messages to the AN-X module using the MAC address and IP address you entered previously. These messages tell the AN-X module to enter into "Config" state in preparation for updating the firmware.

If the AN-X module enters "Config" mode successfully the "Next" button below will be enabled so you can move on to the next step.
If the AN-X module has been powered ON for more than 60 seconds and the Next button is still disabled press the "Back" button, confirm the MAC and IP addresses and check the Ethernet cabling.

[<< Back]   [Next >>]

If the AN-X does not enter config mode within about 60 seconds, return to the previous screens and check the entries.

Click the *Next>>* button, and select the firmware file you want to download and click *Open*.

Open

Look in: anxdcsnet

anxamxdcs.v1.4.3.bin
anxamxdcs.v1.4.4.bin

File name: anxamxdcs.v1.4.4.bin   [Open]

Files of type: QTS Firmware File (*.bin)   [Cancel]

☐ Open as read-only

AnxInit transfers the firmware file and restarts the AN-X.

After you update the firmware, you must reconfigure the AN-X.

Update Firmware Command

The *Utilities/Update Firmware* command updates all the firmware on an AN-X you have previously selected using the *Utilities/Select An AN-X* command.

This command resets the AN-X. You will receive a warning and be given the opportunity to Cancel the command.

If you cancel at the filename dialog, the AN-X has already been reset and is in configuration mode. Use the *Utilities/Restart AN-X* command to restart it in production mode.

Click the *Next>>* button, and select the firmware file you want to download and click *Open*.
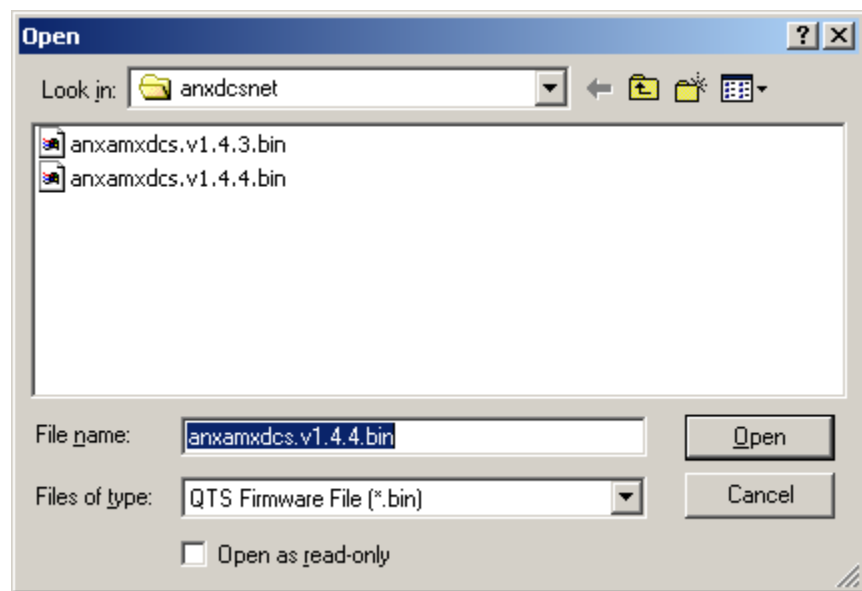
AnxInit transfers the firmware file and restarts the AN-X.

After you run update the firmware, you must reconfigure the AN-X.

Patch Firmware

The *Utilities/Patch Firmware* command applies small patches to the firmware running on the AN-X.

These patch files files have extension *pch*.

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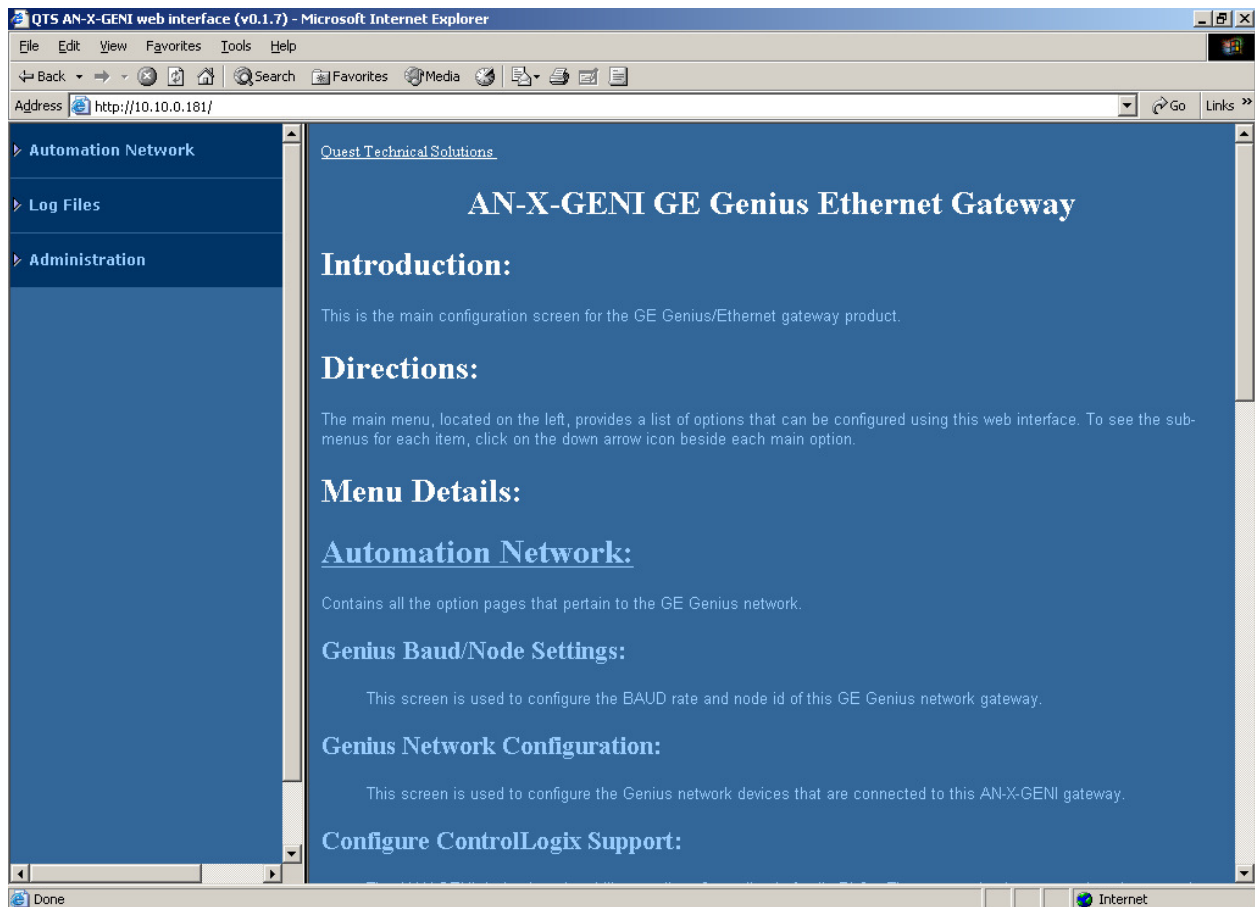ProSoft Technology Inc.
www.prosoft-technology.com
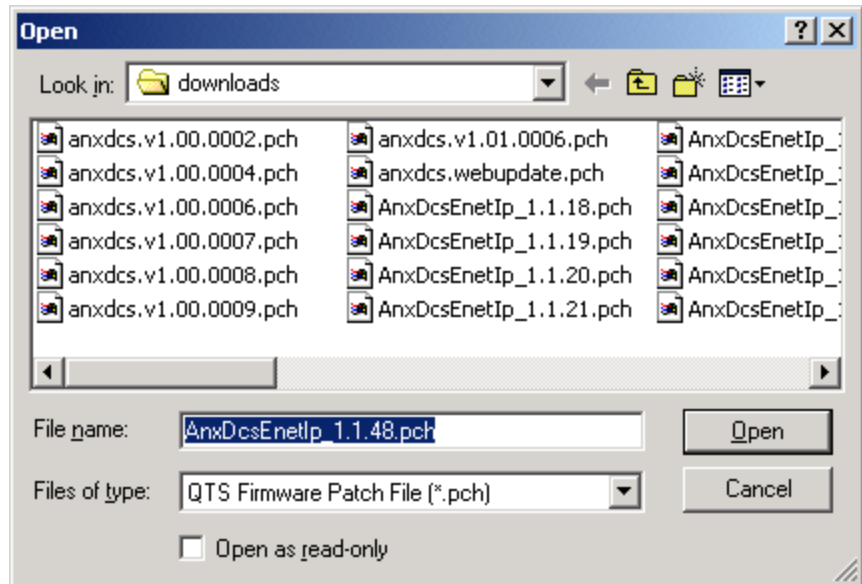
This command resets the AN-X. You will receive a warning and be given the opportunity to Cancel the command.

You do not have to reconfigure the AN-X after applying a patch. All configuration information will be left intact.

When the patch has been applied, AnxInit restarts the AN-X in production mode.

If you cancel at the filename dialog, the AN-X has already been reset and is in configuration mode. Use the *Utilities/Restart AN-X* command to restart it in production mode.

Using the Web Interface

The AN-X module contains a webserver capable of communicating with standard web browsers such as Internet Explorer.

Use the web interface to:

- set the baud rate and serial bus address for the AN-X-GENI
- set the Genius bus I/O network configuration
- set the ControlLogix scheduled data configuration
- view the current configuration
- view AN-X logs
- view and clear faults from Genius blocks

To use the web interface, you need to know the IP address of the AN-X. Use the *Utilities/Locate All AN-X Modules* command in AnxInit to find all AN-X modules on the Ethernet network.

To access the web interface, start your web browser and type the AN-X IP address where you normally enter web addresses in the browser.

The left pane contains commands. Click on the arrows at the left of the main headings to expand or contract the sections.

The contents of the right pane depend on the current command being executed.

Baud Rate and Serial Bus Address

Select *Automation Network/Genius Baud/Node Settings* to set the Genius network baud rate and the serial bus address of the AN-X-GENI.
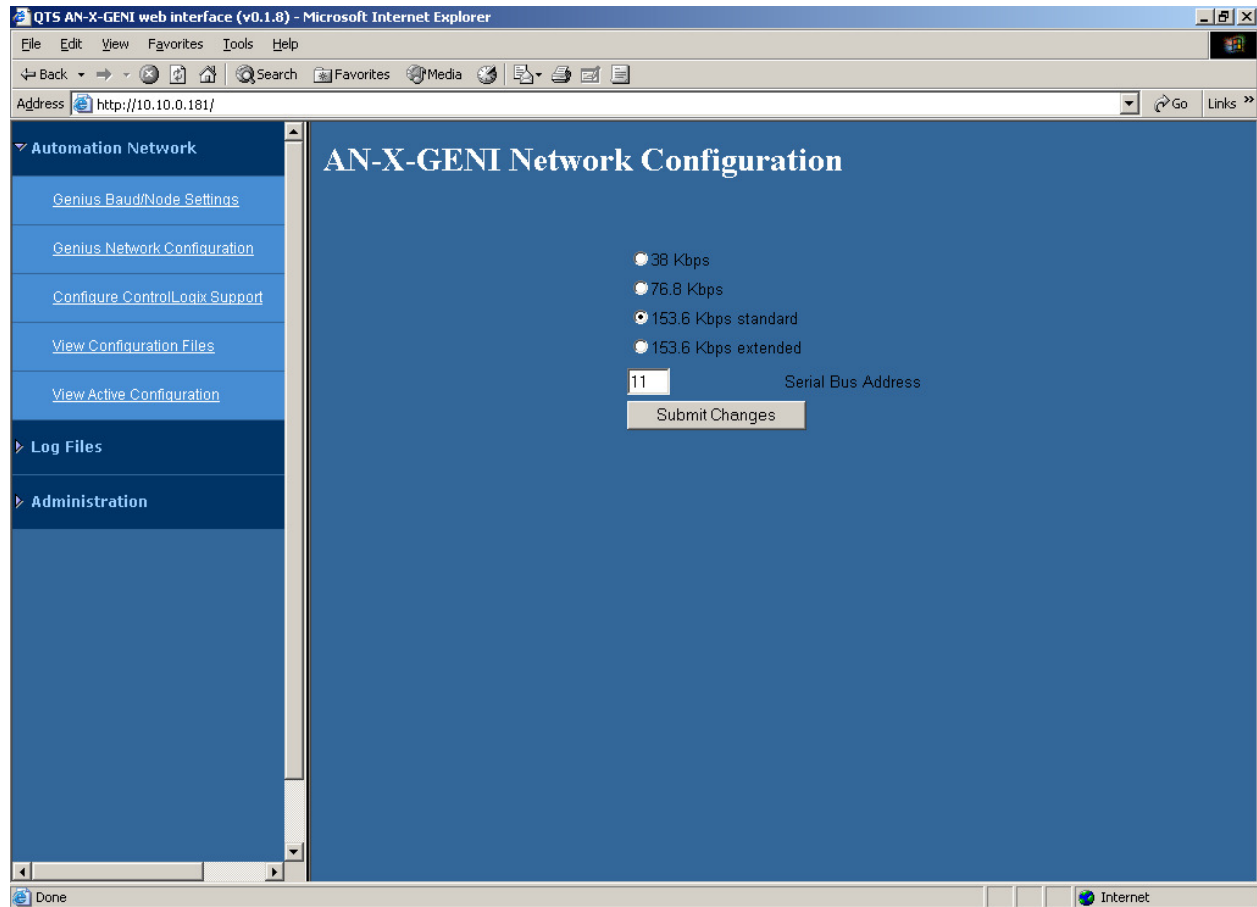
To select the baud rate, check the radio button for the desired baud rate, either 38.4 Kbps, 76.8 Kbps, 153.6 Kbps Standard or 153.6 Kbps extended.

Enter the serial bus address (SBA) for the AN-X-GENI, from 1 to 31.

Click the SUBMIT button to send the values to the AN-X.

Genius Network

Select *Automation Network/Genius I/O Network Configuration* to configure the I/O the AN-X-GENI is to scan.
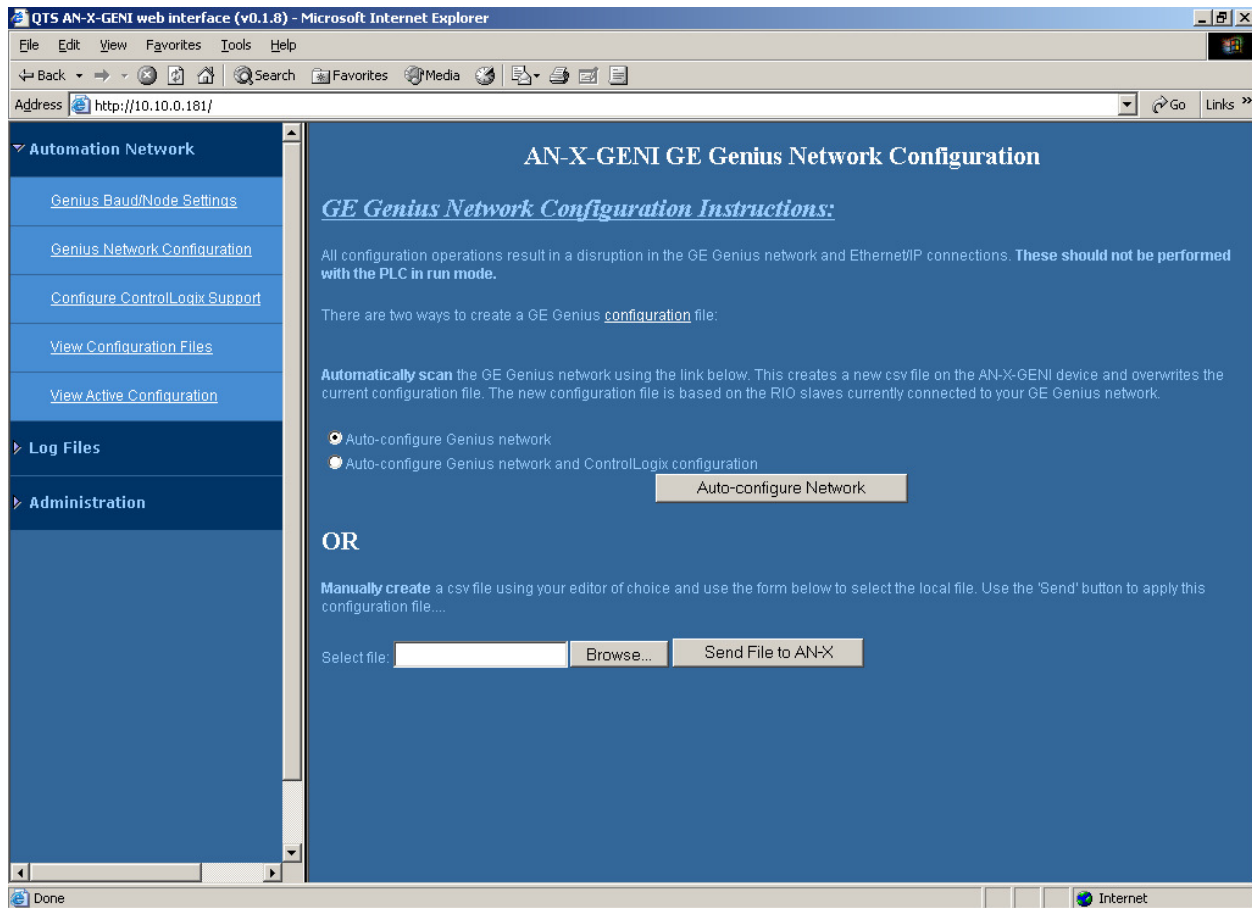
Autoconfiguration

If you are autoconfiguring the Genius network, connect the Genius network to the AN-X-GENI.

To configure just the I/O, check *Auto-configure Genius network*.

To configure the Genius network and also generate a default ControlLogix configuration on the AN-X, check *Auto-configure Genius network and ControlLogix configuration*

Click the *Auto-configure Network* button.

Manual Configuration

Manual configuration does not require that the network be online.

Create a configuration file. Refer to page 23 for details on the file format.

Browse or type the file name.

Click the *Send File to AN-X* button to send the values to AN-X.

Configure ControlLogix Support

AN-X exchanges scheduled data with a ControlLogix processor over Ethernet. Refer to section Exchanging Scheduled Data with a ControlLogix on page 23 for information on configuring scheduled data exchange.

Select *Automation Network/Configure ControlLogix Support* in the web interface to upload the configuration.
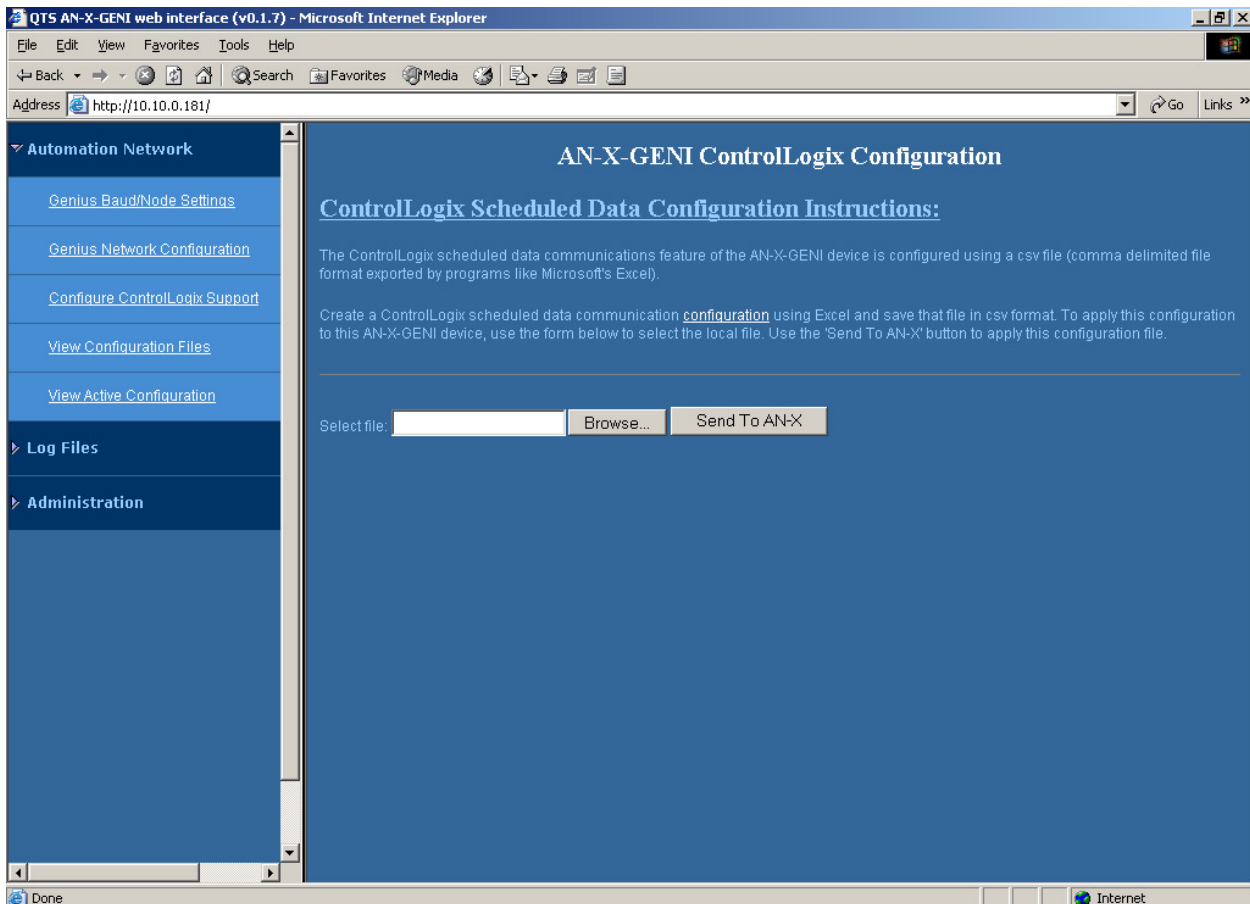
Type or browse the configuration file name into the *Select file:* area. Then click the *Send To AN-X* button to send the file to AN-X.

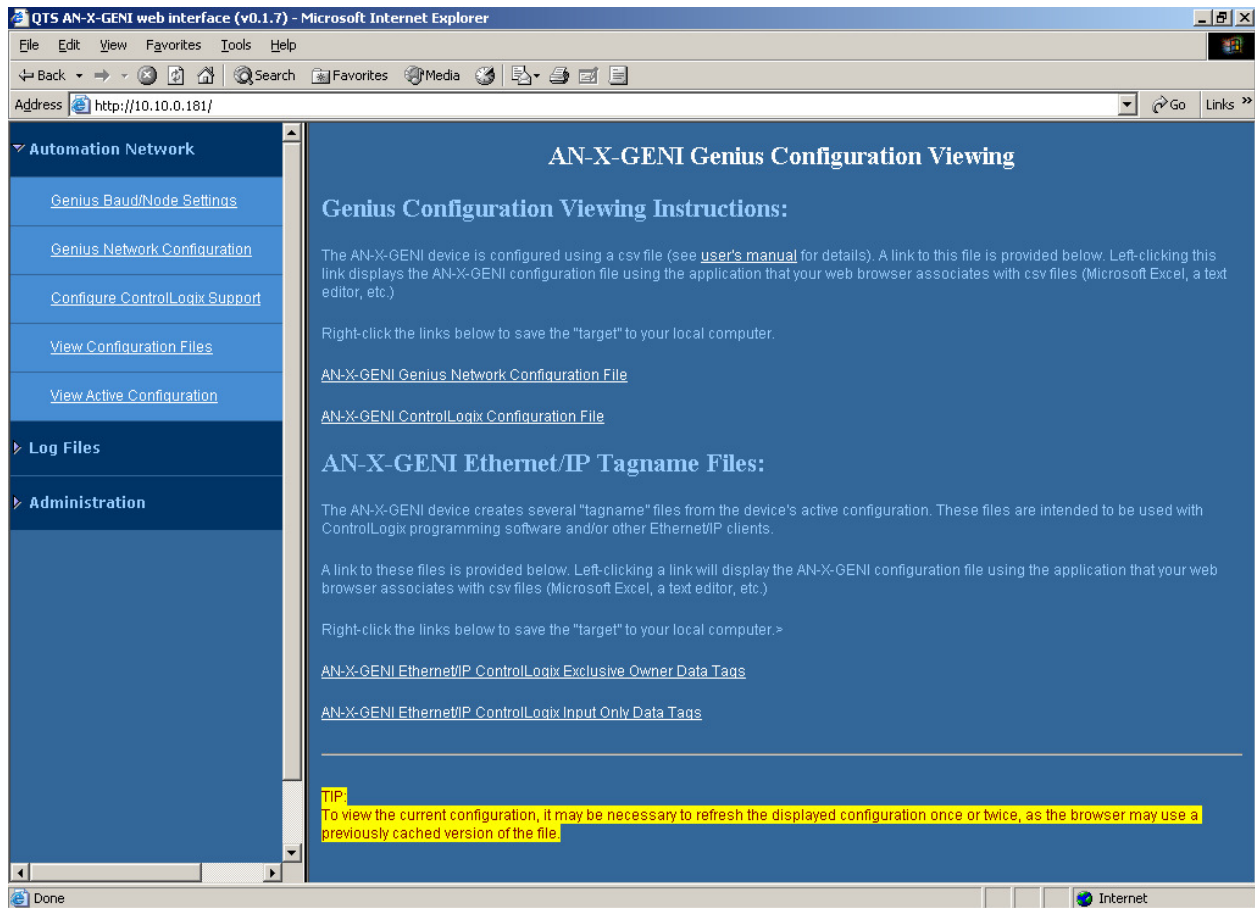Check the ControlLogix Log to determine if there have been any errors with the upload.

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View Configuration Files

Select *View Configuration Files* to view the Genius and ControlLogix configuration files.

Click on the links to view the files using the application that is associated with CSV files.

Right click on the links to retrieve the files from AN-X and store them on your computer.

View Active Configuration

Select *View Active Configuration* to view the Genius or ControlLogix configuration file in the web browser.
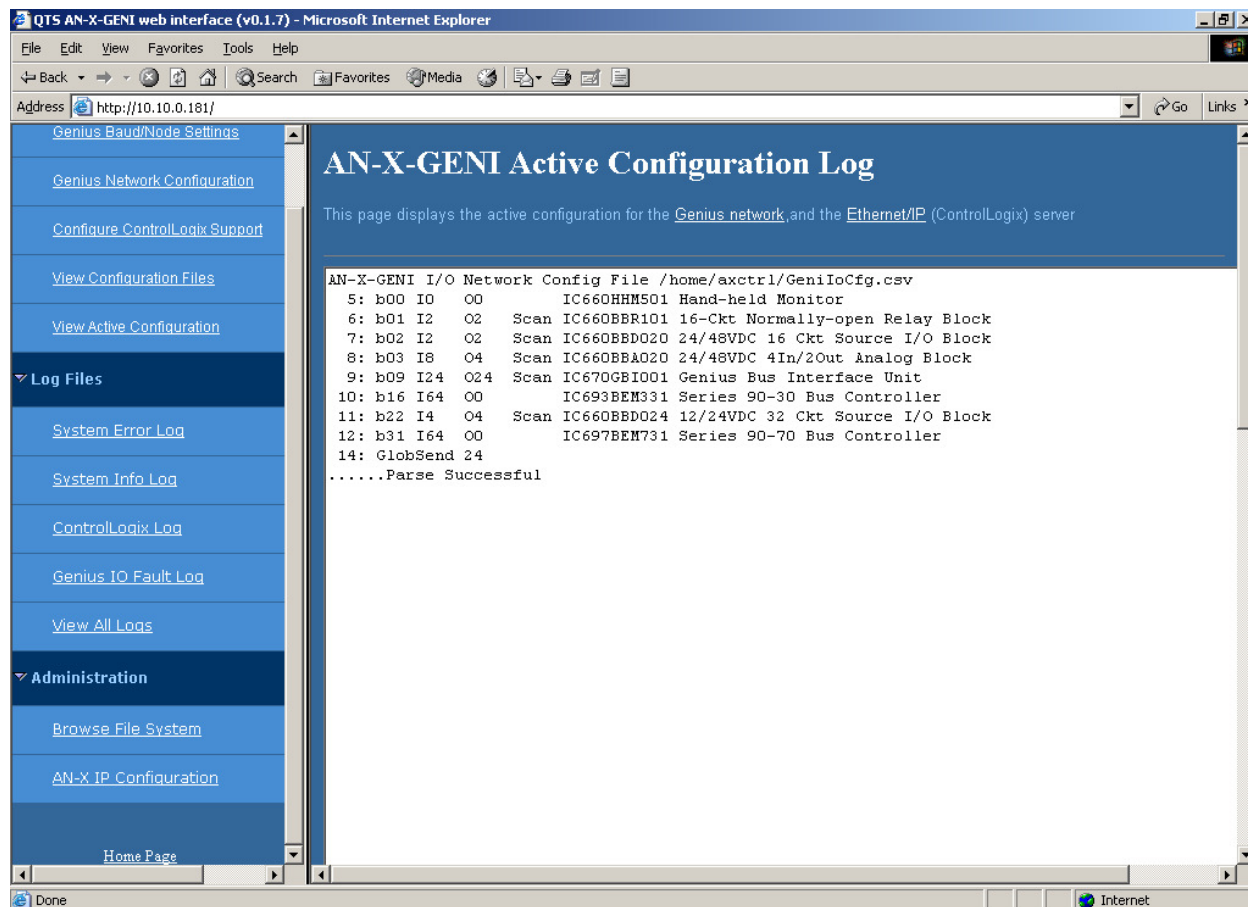
Click the *Genius network* link to view the current Genius network configuration.

Click the *Ethernet/IP* link to view the current ControlLogix configuration.

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```
AN-X-GENI ControlLogix Config File /home/axctrl/GeniEnetIpSvr.csv
   7: ClxExp: AnxGeniMas
   8: ClxPrefix: GENI_
   9: ClxSlot 0
  11: DataOutput
  12:    0    1 b01 b01_Out 16-Ckt Normally-open Relay Block
  13:    1    1 b02 b02_Out 24/48VDC 16 Ckt Source I/O Block
  14:    2    2 b03 b03_Out 24/48VDC 4In/2Out Analog Block
  15:    4   12 b09 b09_Out Genius Bus Interface Unit
  16:   16    2 b22 b22_Out 12/24VDC 32 Ckt Source I/O Block
  18:   18   24 GlobSend
  21: DataInput
  22:    0    2 BlockErr
  23:    2    1 b01 b01_Inp 16-Ckt Normally-open Relay Block
  24:    3    1 b02 b02_Inp 24/48VDC 16 Ckt Source I/O Block
  25:    4    4 b03 b03_Inp 24/48VDC 4In/2Out Analog Block
  26:    8   12 b09 b09_Inp Genius Bus Interface Unit
  27:   20   32 b16 b16_Inp Series 90-30 Bus Controller
  28:   52    2 b22 b22_Inp 12/24VDC 32 Ckt Source I/O Block
  29:   54   32 b31 b31_Inp Series 90-70 Bus Controller
  48: ClxSlot 15
  50: DataInput
  51:    0    2 BlockFlt
  52:   10   10 DiagCtrs
  55:   20   10 ConnStats0
......Parse Successful
```

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Log Files

AN-X maintains various logs to record diagnostic and error messages. Use the Log Files menu in the web interface to view these logs.

System Error Log

The System Error log records errors that occur during AN-X operation. This log is normally empty.
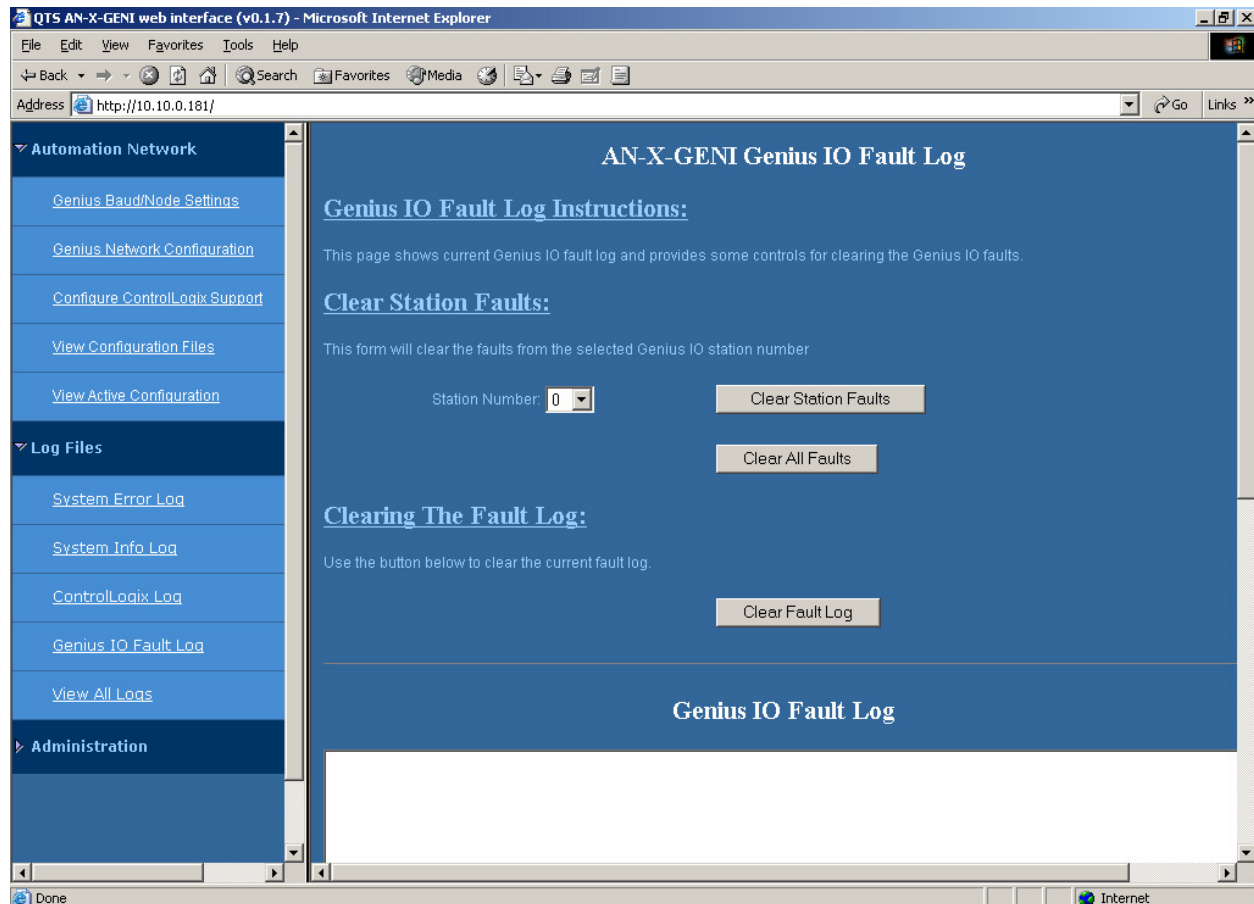
System Info Log

The System Info Log records informational messages during startup and normal operation.

ControlLogix Log

The Ethernet/IP log shows messages and errors associated with the ControlLogix scheduled data operation.

Genius IO Fault Log

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Genius bus modules can return fault information. If a module that is being controlled by the AN-X-GENI returns a fault, you can use the web interface to view and clear the fault.

Select *Log Files/Genius IO Fault Log*. The web interface displays the faults in the Fault Log are of the screen. To clear faults for a specific Genius block, select the serial bus address of the module from the *Station Number* list, then click the *Clear Station Faults* button.

To clear the faults on all modules, click the *Clear All Faults* button.

If there is a problem clearing faults, an error message will be displayed in the Fault Log area.

To clear the fault log, click the *Clear Fault Log* button.

See also page 27 for information on how you can monitor faults in your ControlLogix program.

View All Logs

Use *View All Logs* to list and view all the AN-X logs. To view a log file, double click on the file name.

Administration Menu

The Administration Menu is used to set the AN-X IP address and to view and edit files on AN-X. The file edit function is password protected and is used only for AN-X technical support.

Browse File System

If you are required by technical support to examine files on the AN-X, select *Administration/Browse File System*.

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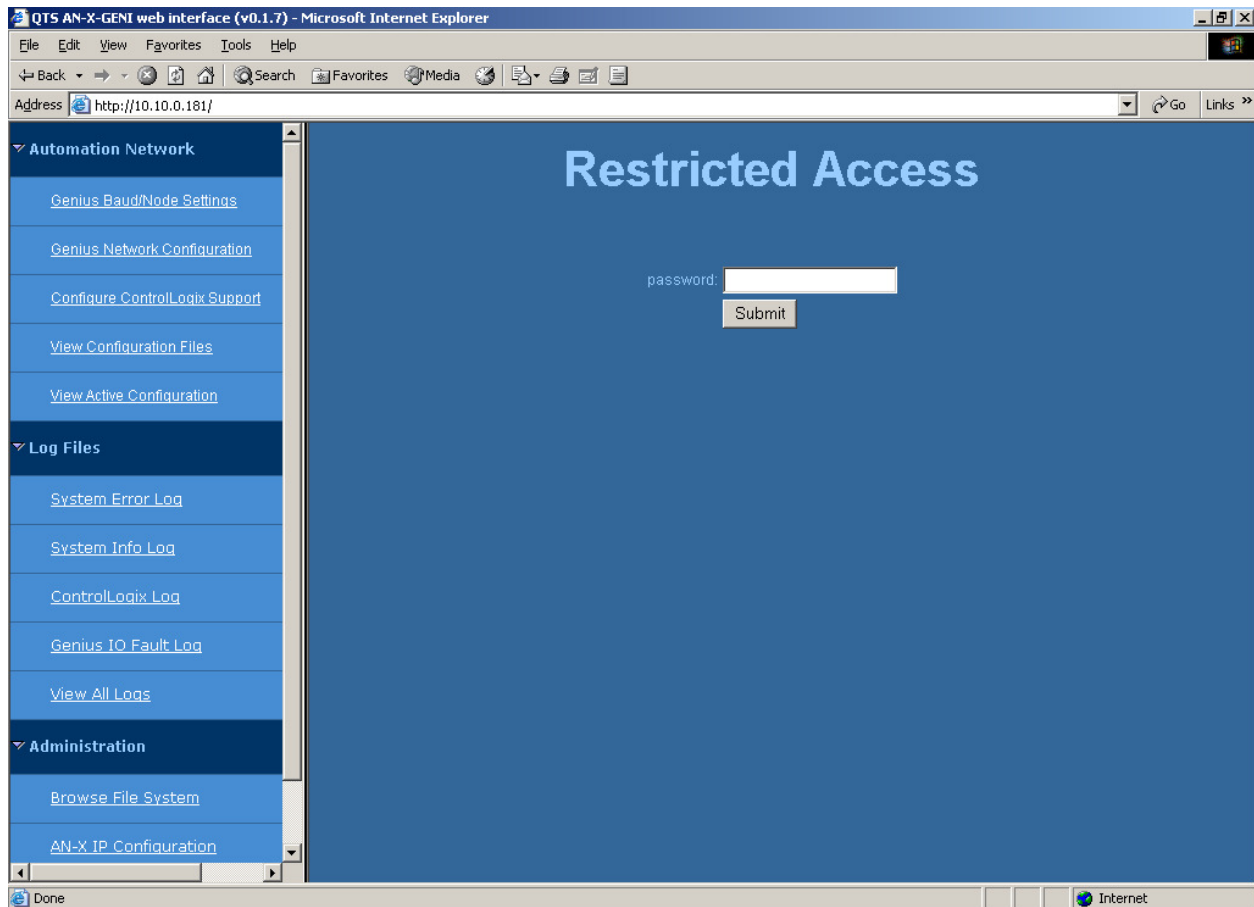
Technical support will provide the password and supply detailed information on any further steps.

AN-X IP Configuration

You can change the AN-X IP configuration from the web interface. This requires that you already know the currect IP address and can use it to access the web interface.

Select *Administration/AN-X IP Configuration*.
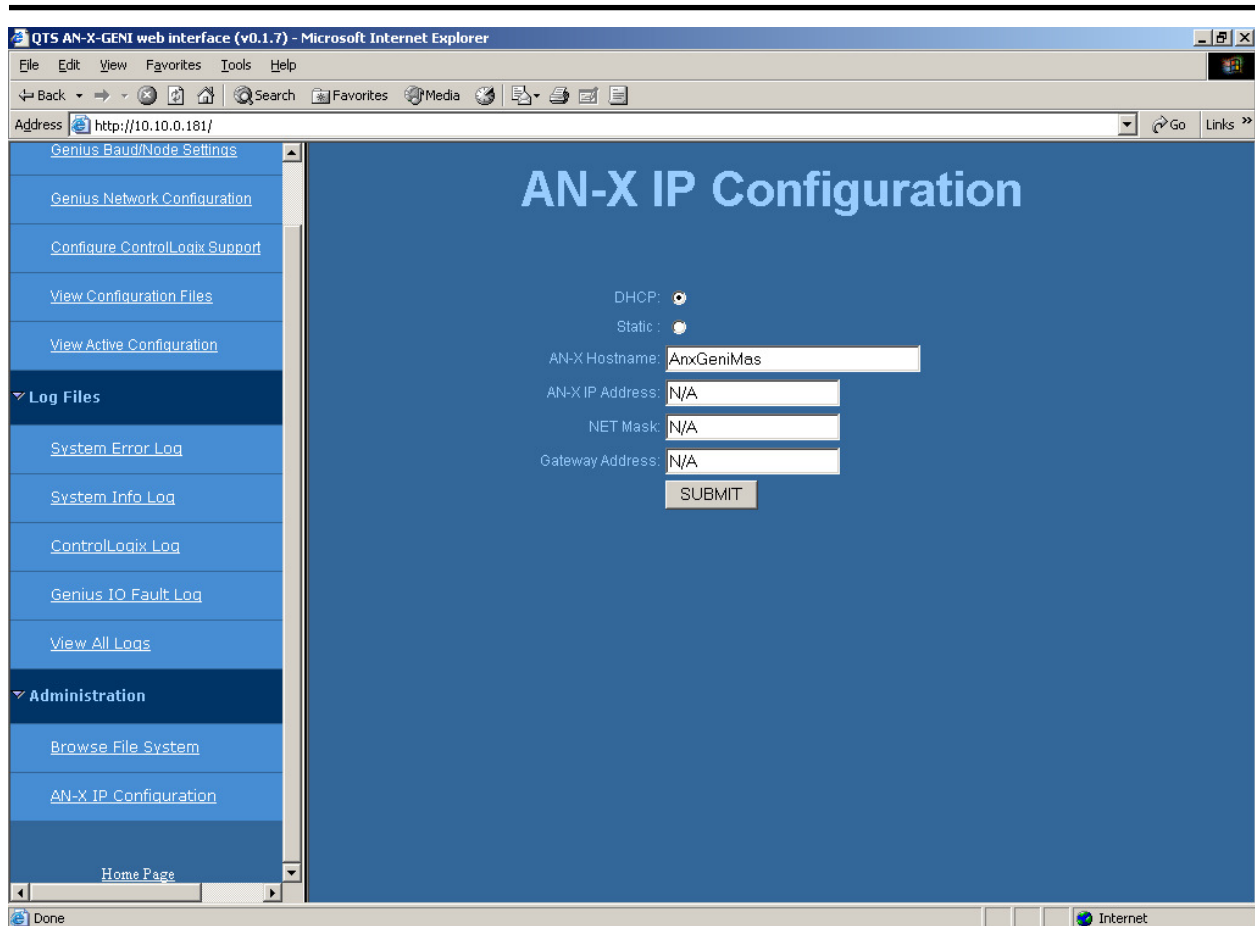
You can configure the AN-X to use DHCP or to use a static IP address.

Click SUBMIT to set the parameters.

When prompted, click CONTINUE to reboot the AN-X with the new parameters.

Archive Configuration

You can archive all the current AN-X configuration files and log files from the web interface. The archive file is a standard gzip compressed tar archive.

Select *Administration/Archive configuration.*

Click on the *Archive File* link and save the file. Select the destination where the file will be stored.

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Troubleshooting

LEDs

The AN-X-GENI has LEDs that indicate the state of the Ethernet connection, the overall module state and the connection to the Genius network.

Ethernet LEDs

There are two LEDs that indicate the state of the Ethernet connection.

The orange LED, labelled 100, is on if the link is running at 100 Mbits/second and is off otherwise.

The green Link/Act LED is off if the link is inactive and is on if the link is active. If activity is detected, the link blinks at 30 ms intervals and continues blinking as long as activity is present.

SYS LED

The SYS LED is used by the AN-X operating system and software to indicate the state of operations and errors. Errors or status indication in boot mode cause the LED to flash yellow. In the other modes, the LED flashes red.

The SYS LED should be used in conjunction with the logs to locate the cause of problems.

In the following, red 3 means three red flashes followed by a pause, and so on.

SYS LED State	Possible cause
Red 2	AN-X is in config mode
Red 3	DHCP configuration failed
Red 4	Fatal application error, check logs for cause
Red 5	Application memory access violation, check logs
Red 6	Application failed, illegal instruction, check logs
Red 7	Application crashed, unknown cause, check logs
Fast red flash	Reconfiguration (set station number and baud rate) failed
Single red flash	Unscheduled messaging, addressing or connection problem
Slow red flash	Script or application problem during startup

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At startup, the SYS LED sequence is:

- boot code starts – fast flashing red

- boot code loads a kernel – solid red

- if the configuration kernel is loaded, 2 red flashes followed by a pause

- if the production kernel loads with no errors, solid green

NET LED – Network Status

The NET LED indicates the status of the Genius network connection.

Solid green	All configured blocks are active on the Genius bus
	Some blocks may be in error
Yellow	No configured Genius I/O, and no Genius network activity
Flashing or solid red	One or more configured Genius blocks is not active on the network
	Network error (CRC, stop, abort, etc.)
	Baud rate mismatch

Diagnostic Counters

Map the diagnostic counters to the ControlLogix data and check the error counters.

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Updating the Firmware

The AN-X operating software consists of several parts:

*   boot code, runs at startup

*   configuration kernel, runs when you update firmware

*   production kernel, runs in normal operation

*   application software, for Genius network communication and scheduled messaging

The kernels are supplied in files with extension *qtf* and are updated using the AnxInit utility. Run the command *Utilities/Update AN-X Flash* and select the file you wish to download. Refer to page 42 for details.

Firmware files contain the application programs for AN-X and have extension *bin.* They are downloaded using the command *Configuration/Firmware Update* or *Utilities/Update Firmware* in AnxInit. Refer to page 43 for details.

Occasionally individual patch files are released. They have extension *pch* and are downloaded using the *Utilities/Patch Firmware* command in AnxInit. Refer to page 47 for details.

Reading Version Numbers

To read the version numbers of the various software components:

Boot code	AnxInit – AN-X Info
Configuration kernel	AnxInit – AN-X Info
Production kernel	AnxInit – AN-X Info
Firmware	AnxInit – AN-X Info (version depends on current mode, boot, configuration or production)
Individual applications	
	Web interface, System Info Log

Specifications

Parameter	Specification
Function	Bridge between Ethernet/IP and Genius network
Typical Power Consumption	250 mA @ 12 VDC or 125 mA @ 24 VDC
Maximum Power dissipation	3.0W
Environmental Conditions:	
Operational Temperature	0-50°C (32-122°F)
Storage Temperature	–40 to 85°C (–40 to 185°F)
Relative Humidity	5-95% without condensation

Support

How to Contact Us: Sales and Support

Sales and Technical Support for this product are provided by ProSoft Technology. Contact our worldwide Sales or Technical Support teams directly by phone or email:

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All warranties hereunder are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without Quest Technical Solutions approval or which have been subjected to accident, improper maintenance, installation or application, or on which original identification marks have been removed or altered. This Limited Warranty also will not apply to interconnecting cables or wires, consumables nor to any damage resulting from battery leakage.

In all cases Quest Technical Solutions' responsibility and liability under this warranty shall be limited to the cost of the equipment. The purchaser must obtain shipping instructions for the prepaid return of any item under this Warranty provision and compliance with such instruction shall be a condition of this warranty.

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