AN-X3-AMX-RIO

Reliance AutoMax Remote I/O Master Ethernet/IP Gateway

User Manual

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Cautions

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

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

These warnings help to:

- 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-X3-AMX-RIO

AN-X3-AMX-RIO Module Overview

The AN-X3-AMX supports several firmware images. This manual focuses on AN-X3-AMX-RIO-MAS firmware.

The AN-X3-AMX-RIO communications module allows an Ethernet/IP Scheduled Originator, including a ControlLogix processor to control Reliance AutoMax Remote I/O. The module acts as a master on the AutoMax remote I/O network.

The module:

- Scans up to 7 slave drops
- Supports up to 248 words of scheduled output data and up to 250 words of scheduled input data
- Scans AutoMax remote I/O racks and heads
- Maintains diagnostic counters

The AN-X3-AMX-RIO module exchanges scheduled data over Ethernet with a ControlLogix processor, with RPIs from 1 to 750 ms. Refer to page 19 for details.

The AN-X3-AMX-RIO module has a web interface for configuration and for monitoring.

The module can auto-configure the currently connected AutoMax remote I/O network and create a configuration text file.

The module also generates ControlLogix alias tags and diagnostic data descriptions that can be imported to RSLogix.

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.

A jabber inhibit timer is implemented in the module's hardware. If the network transmitter is on longer than 150% of the longest network frame time, the transmitter is forced off and the module is placed into a safe fatal failure state.

The module firmware can be updated from the web interface, or copied to the module's microSD card. Refer to page 32 for details.

Hardware Features

The module has:

- two LEDs to indicate the status of the connection to the Ethernet, its own internal state, and the state of the connection to the remote I/O network
- an Ethernet connector
- a 9-pin D-shell connector to connect to the AutoMax remote I/O network
- a power connector

Package Contents

- AN-X3-AMX-RIO module
- 3 pin Phoenix power connector

Current firmware and documentation are at qtsusa.com/dist

Identifying the AN-X3 versus the Original AN-X

The label on the bottom toward the front says AN-X3.

There is a slot at the back for the microSD card.

When initially powered up:

- AN-X3 railroads (alternates) SYS and NET LEDs green as it starts up
- Without the Ethernet cable attached, the Ethernet 10/100 (upper) LED is on for AN-X3 (both Ethernet LEDs are off for the original AN-X)

Differences from the Original AN-X

AN-X3 modules have a microSD card for storage of firmware and configuration data.

You no longer need AnxInit; everything can be done from the web interface or by editing files on the microSD card.

Operation is simplified, there are production and maintenance modes only.

The AN-X3 requires firmware version 4 and above.

The AN-X3 uses the same hardware interface to the automation networks.

The AN-X3 uses two Data – INT connections. RIO Data in slot 0, diagnostic and status information in slot 15.

Using the microSD Card

The AN-X3 microSD card stores configuration data and firmware.

The are no restrictions on the size or speed of the card. The format must be FAT-16 or FAT-32.

The card must be present while the AN-X3 is running.

WARNING! Do not remove the card while the AN-X3 is powered on!

If the AN-X3 is inaccessible from Ethernet because of its settings, you can remove the card and edit the file config.txt. Refer to page 11 for details.

Reinsert the card in the slot at the back of the AN-X3, with the pins facing up.

WARNING! If you remove the card to edit the configuration file, push the card in straight or the card might fall inside the case and you will have to disassemble the AN-X3 to retrieve it (7/64 Allen wrench).

AN-X3 Modes of Operation

There are two AN-X3 modes of operation:

- Maintenance mode. The AN-X3 runs the maintenance firmware at startup. It performs diagnostics (memory tests, etc), copies any changes from the microSD card. If there are no errors, it starts the AN-X3 in production mode.
- Production mode. This is the normal runtime mode of operation.

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:

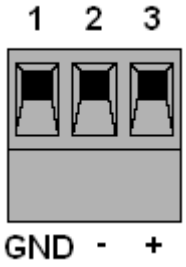
- Touch a grounded object to discharge static potential
- Do not touch the connector pins

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.



Maximum power consumption is 3.6 watts, 300 mA @ 12VDC, 150 mA @ 24VDC.

The part number for the power connector is:

Phoenix 1757022

(Old part number: MSTB 2.5/3-ST-5.08)

Cabling and Termination

Use a standard drop cable and passive tap M/N 57C380 to connect the module to the coaxial network cable. The drop cable is a multi-conductor cable with 9-pin D-shell connectors at each end. Connect one end to the connector on the module and the other end to the passive tap.

The passive tap has two BNC connectors for connection to the coaxial cables and terminating loads.

The network coaxial cable must be terminated with 75 ohm terminating loads attached to the taps at the physical ends of the network. There should be two and only two terminators on the network.

The cable must be RG-59/U.

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 an Ethernet Device and AN-X, you may need a crossover cable.

IP Address Configuration

Before you can use the AN-X3, you must configure its IP address on Ethernet.

For the options and best procedures to configure AN-X3 modules, see:

https://qtsusa.com/dist/AN-X3/AN-X3_ReadMe_and_QuickStart.txt

Initial IP Configuration

AN-X can be configured:

- to use a static (unchanging) IP address
- to obtain its IP address from a DHCP server
- to use the fixed link-local address 169.254.42.84

All AN-X modules are shipped with the link-local address 169.254.42.84.

Unless you have control of the DHCP server, in most applications you will assign the AN-X 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.

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

** Since link-local IP addresses are not always accessible, the recommended method to set the initial IP address is with the Prosoft Discovery Service (PDS).

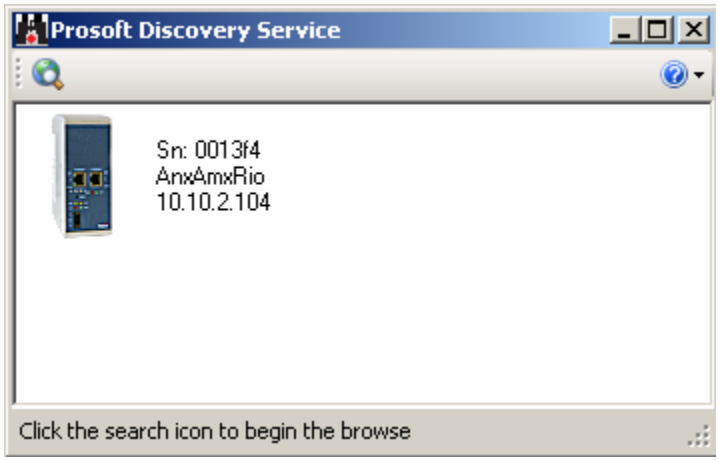
Prosoft Discovery Service

Prosoft Discovery Service (PDS) is a free Windows application available from Prosoft's web page:

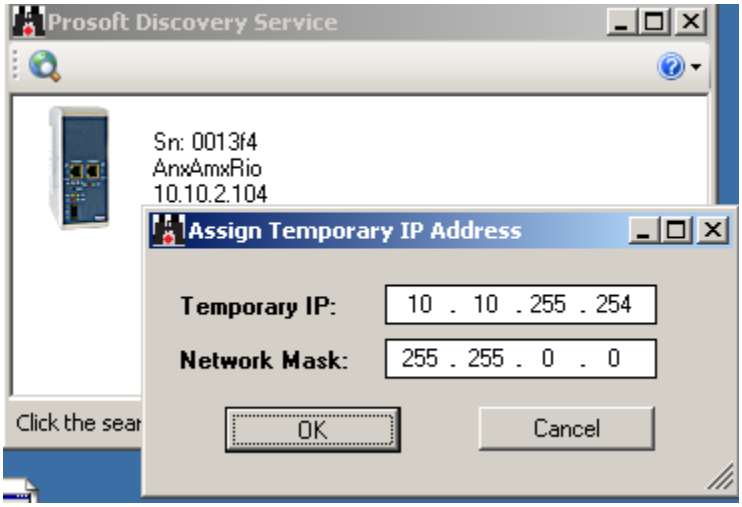
https://www.prosoft-technology.com/Products/ProSoft-Software/ProSoft-Discovery-Service

With the AN-X3 module connected to Ethernet and powered up, run PDS.

It should find any AN-X modules on the network.



Right click on the module icon and choose “Assign Temporary IP”.



Generally you can just use the default PDS Temporary IP.

Select OK, then use the Temporary IP address in your web browser to access the module and configure a permanent IP address.

Link-Local IP Configuration

** Many computers do not allow access to link-local addresses by default.

If you are using link-local IP addresses to configure multiple AN-X3 modules, connect and configure one at a time, since initially they will all be set to the same link-local IP address.

Enter the AN-X3’s link-local IP address (169.254.42.84) in your web browser.

TIP The AN-X3 must be on the same subnet as the computer to use the link-local IP address. It cannot be connected through a router.

If the AN-X3’s web page does not load, it’s likely you computer is not configured to allow access to link-local IP addresses.

You can add a link-local route to your computer or use Prosoft Discovery Service or remove the microSD and edit Config.txt.

microSD Config.txt

The microSD card contains a text configuration file named Config.txt.

Config.txt contains the IP configuration and the name of the firmware file to load.

When you perform the *Administration/AN-X Configuration* command from the web interface, it writes the results to config.txt.

Each line consists of a keyword followed by a colon and then a value.

Example:

```
IP: 192.168.1.12
```

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

Keyword	Possible Values
IP	LOCAL DHCP static IP address
Netmask	Ethernet netmask, used only if IP is a static IP address
DefGtwy	default gateway, used only if IP is a static IP address
Hostname	Ethernet host name, from 1 to 30 characters
Firmware	Firmware file to run at startup, must be present on microSD card

If you edit the file and AN-X3 finds an error during startup, it flashes an error code on the SYS (or MS) LED, see page 30.

Example config.txt files

Example: Link- Local IP address

```
IP: LOCAL
Hostname: AnxDcsMas
Firmware: AN-X3-DCS-MAS
```

Example: DHCP

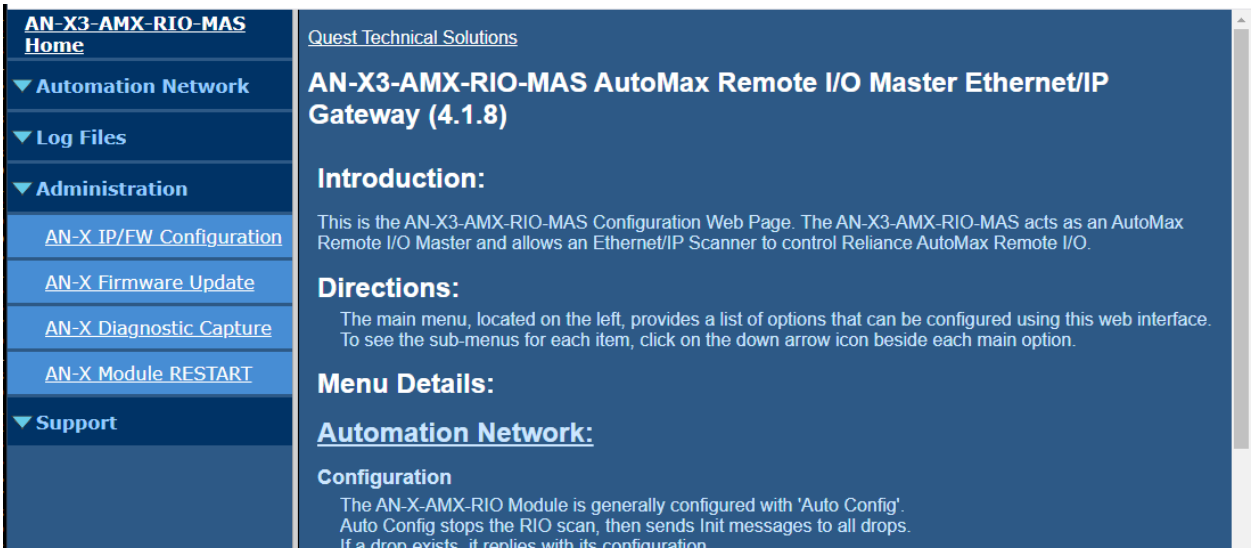
```
IP: DHCP
Hostname: AnxDcsMas
Firmware: AN-X3-DCS-MAS
```

Example: static IP address

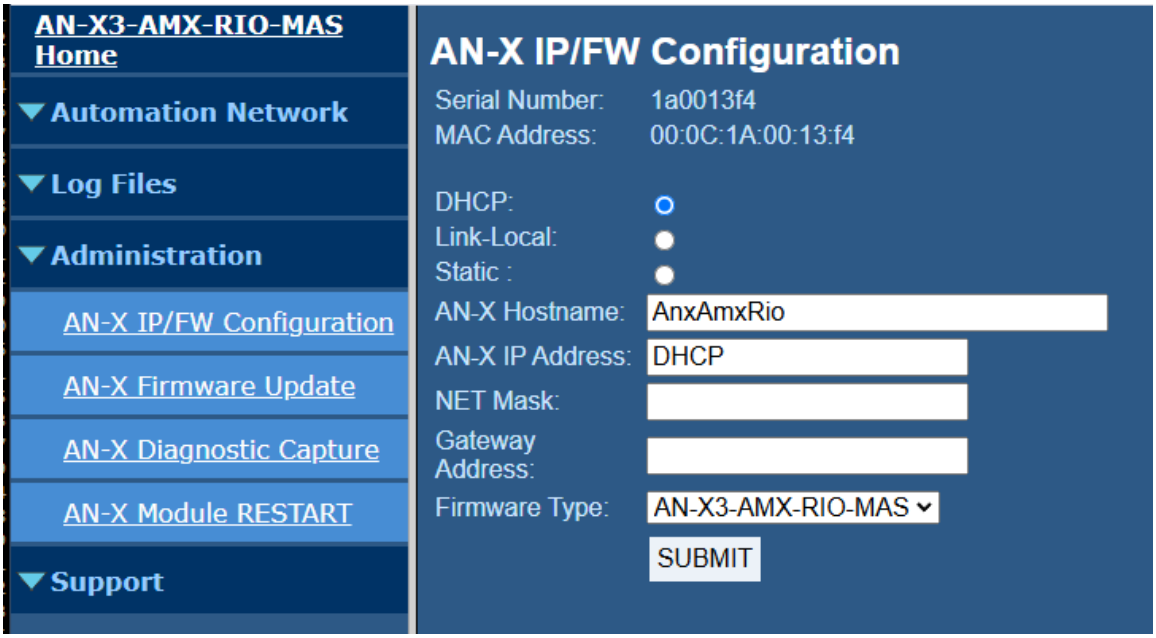
```
IP: 10.10.2.102
NetMask: 255.255.0.0
DefGtwy: 10.10.0.1
HostName: AnxDcsSlv
Firmware: AN-X3-DCS-SLV
```

Web Page IP Configuration

Select *Administration/AN-X Configuration*.



The *AN-X Configuration* page appears.



The serial number and MAC address of the AN-X being configured are shown.

Check either DHCP or Static. If Static, fill in the required fields.

DHCP

If the AN-X3 finds a DHCP server on the network, it obtains an IP address and other network parameters (netmask and default gateway) from the DHCP server.

To find the address assigned, you have to look at the DHCP server log.

When you submit the changes, if the AN-X3 does not find a DHCP server, it reverts to the default link local address 169.254.42.84 and repeatedly flashes the SYS (or MS) LED 3 times red followed by a pause.

Static IP Address

If you select static IP address, enter:

- the IP address for the AN-X.
- the netmask 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.

Hostname

Enter a *Hostname* for the AN-X3. 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 30 characters long.

The hostname assigned is also used as the default ClxName when you autoconfigure.

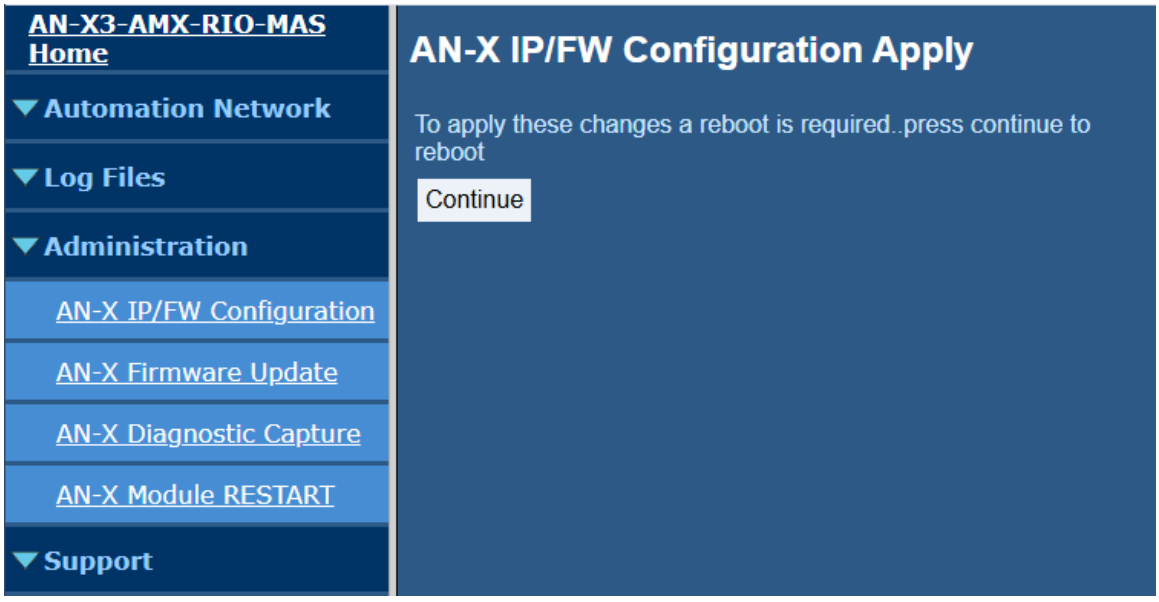
Firmware

Select the firmware the AN-X is to load from the list provided. AN-X builds the list from the firmware files on the microSD card that are compatible with the AN-X hardware.

Submitting the Configuration

Once you have entered all required parameters, click SUBMIT to write the configuration to the file config.txt on the microSD card. The changes do not take effect until the AN-X restarts.

The following page appears when you click SUBMIT.



Click *Continue* to restart the AN-X3, then wait until the AN-X has completely restarted before continuing.

If you have changed the IP address, you will have to enter the new IP address in the browser's address field.

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 or the IP address is unknown.

In most cases, the Prosoft Discovery Service will be able to find the AN-X3 module, even if its IP address is not accessible on the computer's subnet.

If not, remove the microSD card and edit the Config.txt file. See pg 11.

Non-Booting AN-X3 or Factory Reinitialize

If the AN-X3 microSD becomes corrupted and the AN-X3 will no longer boot, or if you want to reinitialize the AN-X3 to factory state:

- Download the appropriate factory image file from the QTS web site.

  qtsusa.com/dist/AN-X3 (AN-X3-AMX-uSD.v4.01.01.img.zip for example).

WARNING: This process will erase all AN-X3 configuration files.

If possible, make copies of any configuration files on the microSD you need to preserve before initializing it.

There are many ways to Flash .img.zip files to the microSD. We recommend Balena Etcher. It's free and seems to work very well.

https://www.balena.io/etcher

This factory image will have the LOCAL IP address.

The individual microSD files are available on qtsusa.com/dist/AN-X3 in the appropriate uSD_Files directory.

AutoMax Remote I/O Configuration

AutoMax Remote I/O is configured using the web interface.

The Module is generally configured using the 'Auto Config' function.

Auto Config stops the RIO scan, then sends Init messages to all drops.

If a drop exists, it replies with it's configuration.

The drop's configuration information is used to build a text configuration file.

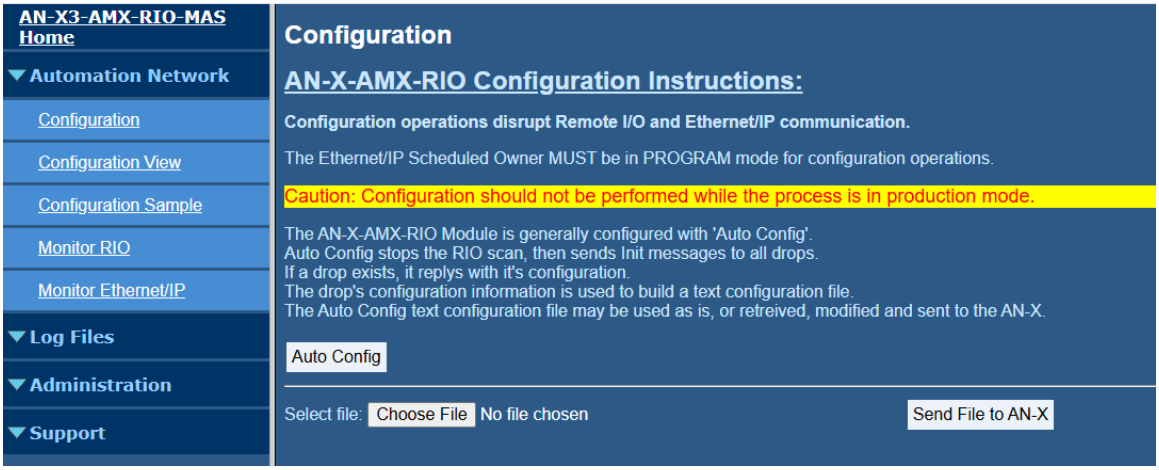
The Auto Config text configuration file may be used as is, or retrieved, modified and sent to the AN-X.

A sample configuration file is available from the web interface. This may be used as a reference, or a starting point for manual configuration.

For Auto-configure, the remote I/O network must be connected to the AN-X3-AMX-RIO and the ControlLogix with the exclusive owner connection must be in PROGRAM mode.

Start your web browser and enter the AN-X IP address as the address.

Select *Automaton Network/Configuration*



If an Ethernet/IP scanner such as ControlLogix is connected, it must be in PROGRAM mode to use the ‘Auto Config’ or ‘Send File to AN-X’ function.

Click on ‘Auto-Config’. The AN-X3-AMX-RIO module reads the current network configuration from each of the drops, creates a text configuration file and stores it.

When the auto-configuration is done, the web interface displays the Configuration File generated, the Configuration Log and the Auto Configuration Log.

Use the *Automation Network/Configuration View* page to view the Configuration File and Configuration Log.

TIP To view the current configuration, it may be necessary to refresh the displayed configuration with Ctrl-F5 as the browser may use a previously cached version of the file.

To retrieve the configuration file from the AN-X, click on the Retrieve Current Configuration link

Use a plain text editor such as Notepad to edit the configuration.

To send the new configuration, on the *Automation Network/Configuration* page, click on ‘Choose File’, browse to your modified configuration text file, then click on ‘Send File to AN-X’.

Configuration Text File

The configuration file is a text file. You can edit or view it with a text editor such as Notepad.

On any line, anything after a semicolon is a comment and is ignored.

A sample 'Auto Config' generated configuration text file is show below:

```
;QTS AN-X AMX RIO Auto Configuration Utility
;Copyright (c) 2004-2023 Quest Technical Solutions
;Version 3.3.1

ClxExp,AnxAmxRioMas           ; This is the CLX I/O Tree name used to generate tag aliases

;,               Name,  Part#(57C416),Out,Inp,OutSlot 00,InpSlot 00,OutSlot 01,InpSlot 01,OutSlot
                              02,InpSlot 02,OutSlot 03,InpSlot 03,OutSlot 04,InpSlot 04,OutSlot
                              05,InpSlot 05,OutSlot 06,InpSlot 06,OutSlot 07,InpSlot 07,OutSlot
                              08,InpSlot 08,OutSlot 09,InpSlot 09,OutSlot 10,InpSlot 10,OutSlot
                              11,InpSlot 11,OutSlot 12,InpSlot 12,OutSlot 13,InpSlot 13,OutSlot
                              14,InpSlot 14,OutSlot 15,InpSlot 15
Drop1,        Drop416,    419451-001K,  0,
                              0,0x00000000,0x00000000,0x00000000,0x00000000,0x00000000,0x00000000
                              ,0x00000000,0x00000000,0x00000000,0x00000000,0x00000000,0x00000000,
                              0x00000000,0x00000000,0x00000000,0x00000000,0x00000000,0x00000000,0
                              x00000000,0x00000000,0x00000000,0x00000000,0x00000000,0x00000000,0x
                              00000001,0x00000000,0x0000000f,0x00000000,0xff800000,0x007fffff,0x0
                              0000000,0x00000001
; DropOutLen=14 DropInpLen=24

;,               Name,  Part#(57C330),Out,Inp,Port 0,Port 1,Port 2,Port 3
Drop6,      DropName6,    419451-101T, 14, 24,  xxxx,  xxxx,  xxxx,  OOOO
; DropOutLen=4 DropInpLen=4

;,               Name,
                              Part#(57C328),Out,Inp,OPort0,IPort0,OPort1,IPort1,OPort2,IPort2,OPo
                              rt3,IPort3
Drop7,      DropName7,    419451-103A, 18, 28,  OxxO,  IxxI,  xxxx,  xxxx,  xxxx,  xxxx,  xxxx,
                              xxxx
; DropOutLen=2 DropInpLen=2

; ClxOutLen=20 ClxInpLen=30

;--------------------------------------------------------------------------------
; Slot 15 Diagnostics Connection Data Layout
; DataOutput
;   0"AnxAmxRioMas Zero Diagnostic Counters on bit 0 transition to 1"
; DataInput
;   0 "AnxAmxRioMas Tx Frames"
;   1 "AnxAmxRioMas Rx Frames Good"
;   2 "AnxAmxRioMas Rx Protocol Errors"
;   3 "AnxAmxRioMas Rx Noise Errors"
;   4 "AnxAmxRioMas Rx Timeout Errors"
;   5 "AnxAmxRioMas Rx CRC Error"
;   6 "AnxAmxRioMas Rx Overun Errors"
;   7 "AnxAmxRioMas Rx Abort Errors"
;   8 "AnxAmxRioMas Ethernet/IP Slot Connection Status"
;  12 "AnxAmxRioMas Drop All Status Bit1=Drop1, Bit2=Slot2 etc."
;  13 "AnxAmxRioMas Drop   1 Status 0=OK 1=NO_RSP 2=CFG_ERR 3=LEN_ERR 4=MSK_ERR"
;  14 "AnxAmxRioMas Drop   2 Status 0=OK 1=NO_RSP 2=CFG_ERR 3=LEN_ERR 4=MSK_ERR"
;  15 "AnxAmxRioMas Drop   3 Status 0=OK 1=NO_RSP 2=CFG_ERR 3=LEN_ERR 4=MSK_ERR"
;  16 "AnxAmxRioMas Drop   4 Status 0=OK 1=NO_RSP 2=CFG_ERR 3=LEN_ERR 4=MSK_ERR"
;  17 "AnxAmxRioMas Drop   5 Status 0=OK 1=NO_RSP 2=CFG_ERR 3=LEN_ERR 4=MSK_ERR"
;  18 "AnxAmxRioMas Drop   6 Status 0=OK 1=NO_RSP 2=CFG_ERR 3=LEN_ERR 4=MSK_ERR"
;  19 "AnxAmxRioMas Drop   7 Status 0=OK 1=NO_RSP 2=CFG_ERR 3=LEN_ERR 4=MSK_ERR"
;
;  35 "AnxAmxRioMas UDP TX Count"
;  36 "AnxAmxRioMas UDP RX Count"
;  37 "AnxAmxRioMas UDP EthErr Ctr(Lo) Typ(Hi)"
;  38 "AnxAmxRioMas UDP PrtErr Ctr(Lo) Typ/Slt(Hi)"
;
;  40 "AnxAmxRioMas CLX -> AN-X Slot  0 Upd Time (*100us, Avg)"
;  42 "AnxAmxRioMas CLX -> AN-X Slot  0 Upd Time (*100us, Min)"
;  44 "AnxAmxRioMas CLX -> AN-X Slot  0 Upd Time (*100us, Max)"
;
; 190 "AnxAmxRioMas CLX -> AN-X Slot 15 Upd Time (*100us, Avg)"
```

```
; 192 "AnxAmxRioMas CLX -> AN-X Slot 15 Upd Time (*100us, Min)"
; 194 "AnxAmxRioMas CLX -> AN-X Slot 15 Upd Time (*100us, Max)"
;-------------------------------------------------------------------------------
```

Ethernet/IP Scheduled Data

Each scheduled connection with a ControlLogix contains up to 250 words of input data and up to 248 words of output data.

The AN-X3-AMX-RIO module behaves like a 17-slot ControlLogix rack with an ENBT/A module in slot 16 and generic modules in slots 0 and 15.

The Slot 0 connection is used for all AutoMax RIO data.

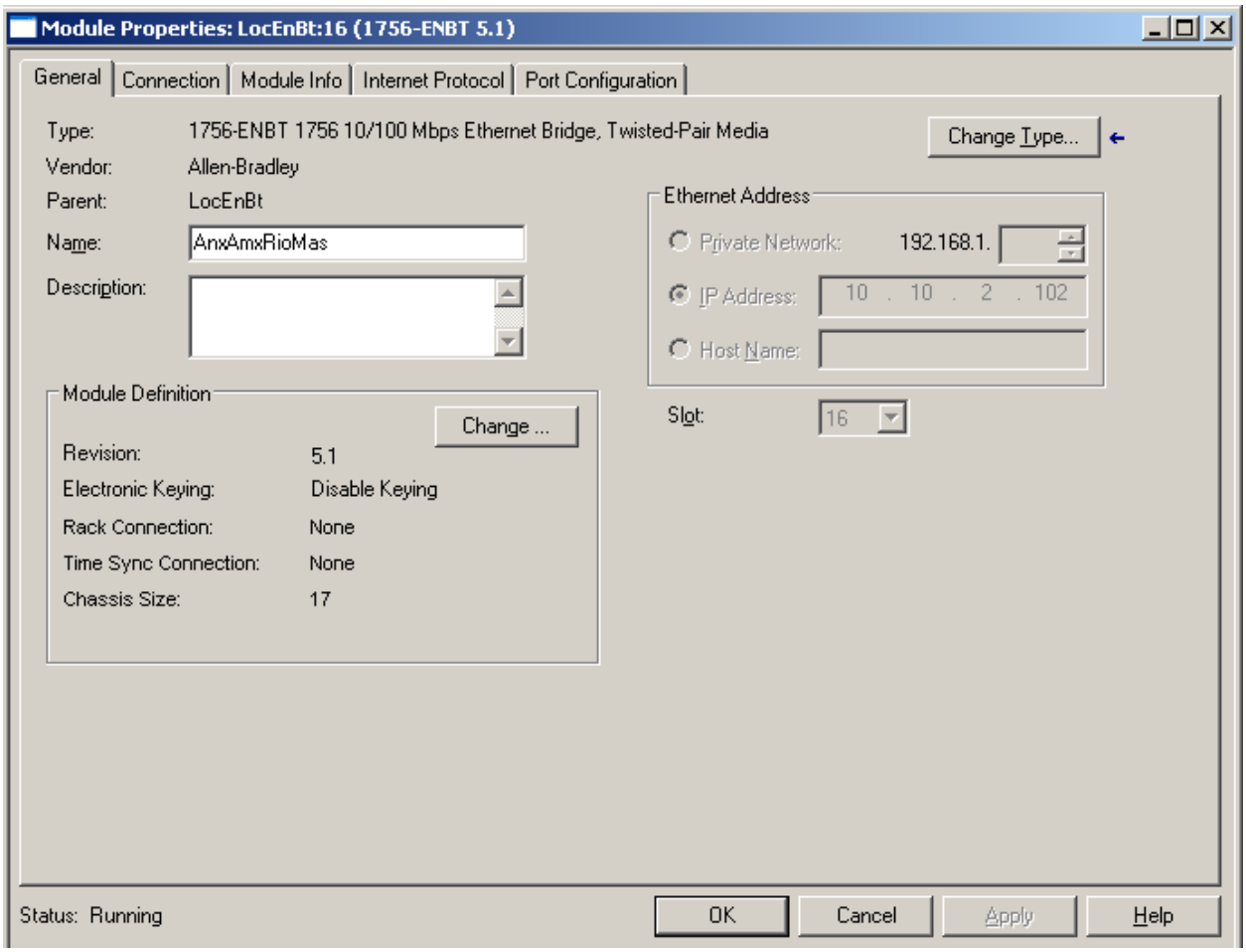
The Slot 15 connection is used for diagnostic information.

Each connection can have its own RPI, from 1 to 750 ms.

Configuring the AN-X in RSLogix 5000

To configure the AN-X3-AMX-RIO in RSLogix 5000:

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



Enter the *Name*. Use the host name you assigned to AN-X when you configured its IP properties. (see page 14)

Set the *Revision* to 1.

Set *Electronic Keying* to *Disable Keying*.

Set the *Rack Connection* to None.

Set the *Time Sync Connection* to None.

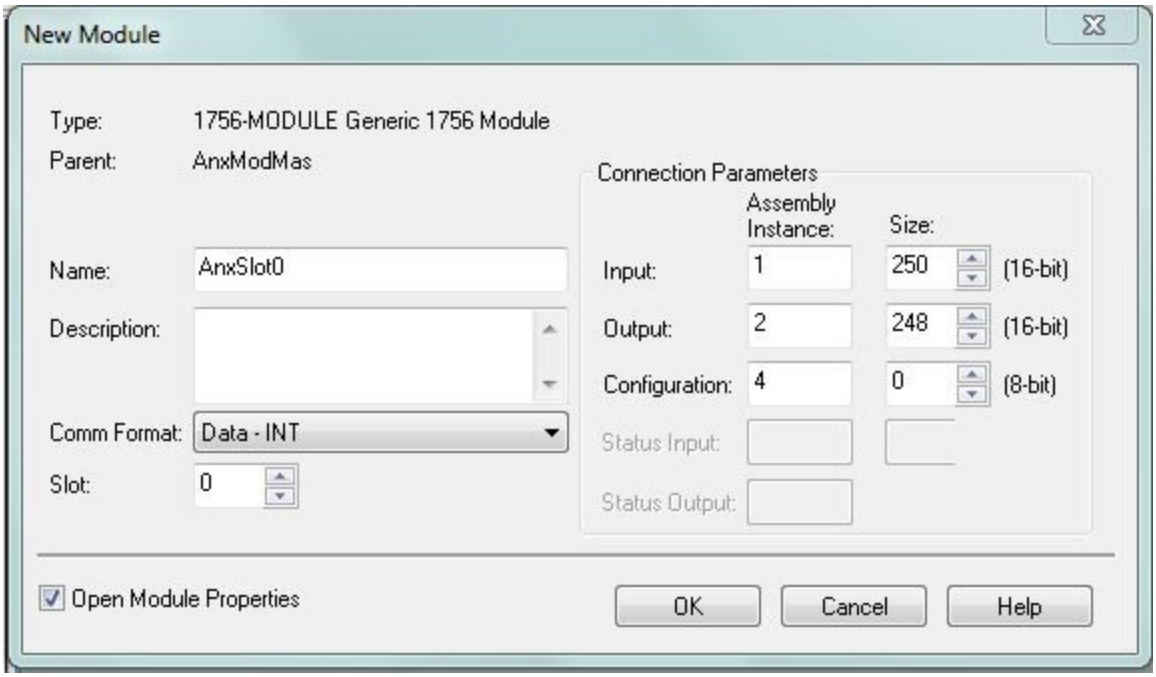
Set the chassis size to 17.

Set the Slot to 16.

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

Click OK to accept the module.

2. Add Generic modules for slot 0 for RIO data, and slot 15 for diagnostics.
3. In RSLogix 5000, right click on the backplane and select *New Module*. From the *Other* category, select 1756-MODULE and click OK.

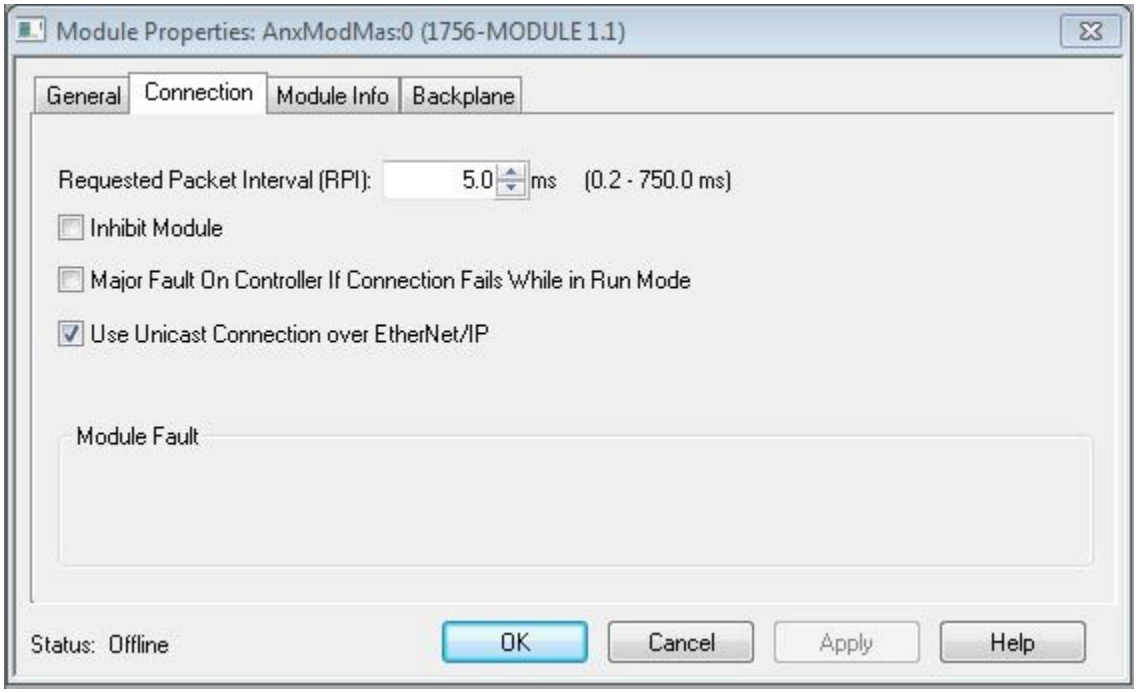


Set the *Name* and *Description* as desired.

Set the *Comm Format* to Data – INT.

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

4. Set the RPI for each connection.



AN-X accepts RPIs from 1 to 750 ms.

Select an RPI appropriate to the remote I/O network scan time and to your application.

TIP The AN-X supports Unicast connections from the ControlLogix.

TIP Use the web interface of the ENBT module that connects to the AN-X to view the communication loading of the ENBT module.

Ethernet/IP Log

Errors that occur during operation of Ethernet/IP are logged in the AN-X3.

You can view the log using the AN-X3 web interface. Select *Log Files/Ethernet/IP Log* to view the log.

ControlLogix Tags

When AN-X3-AMX-RIO is configured, it creates a csv file that can be imported into RSLogix 5000.

This csv file creates tag aliases for access to RIO data in the ControlLogix. The tags alias to I/O tree using the name defined by 'ClxExp' in the configuration file, which defaults to the hostname of the AN-X module.

To retrieve the alias csv file, select *Automation Network/ Configuration View* then Logix Aliases.

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

Using the Web Interface

The AN-X module contains a webserver capable of communicating with standard web browsers such as Chrome or Firefox.

Use the web interface to:

- set the Remote I/O network configuration
- set the Ethernet/IP scheduled data configuration
- view the current configuration
- view AN-X logs

It also contains contact information for support.

To use the web interface, you must know the IP address of the AN-X. 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.

TIP

Browsers may return cached data rather than rereading data that has changed on the AN-X.

Run the browser in a mode where it doesn't cache data (incognito in Chrome, Private browsing in Firefox and Safari, etc.)

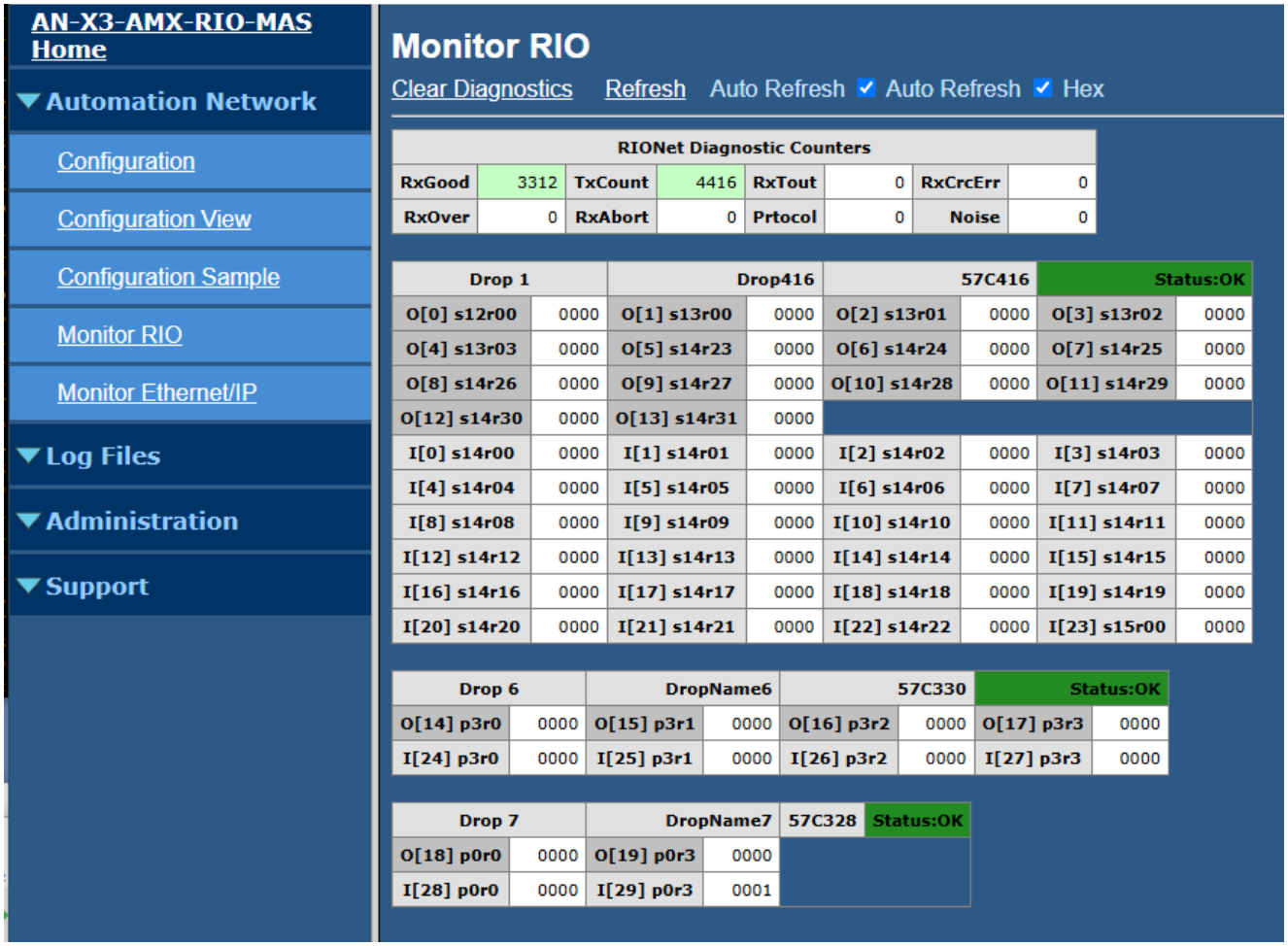
In addition, in most browsers you can reload a page while overriding the cache. For example, you can use Ctrl-F5 in Firefox or Internet Explorer, or Shift-F5 in Google Chrome.

Automation Network

The Automation Network Configuration functions are described previously in this document.

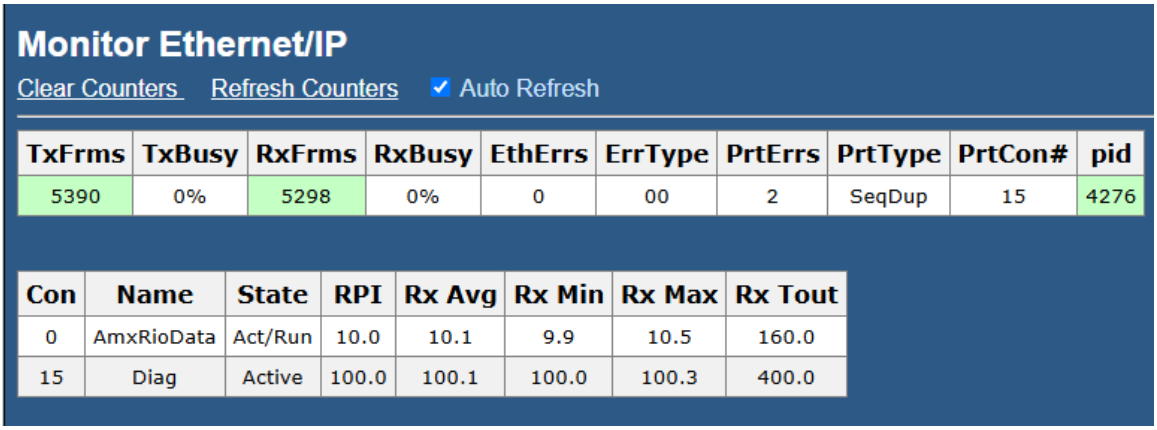
Monitor RIO

Select *Automation Network/Monitor RIO* to display I/O scanner status, diagnostic counters and I/O data.



Monitor Ethernet/IP

Select *Automation Network/Monitor Ethernet/IP* to display Ethernet/IP status and diagnostic counters.



Ethernet/IP UDP Statistics

The Ethernet/IP Statistics consist of two portions:

- Global counters
- Statistics for each connection

The Global Counters consist of:

Counter	Description
TxFrms	Count of transmitted frames
TxBusy	Percentage of time the transmitter is not idle
RxFrms	Count of received frames
RxBusy	Percentage of time the receiver is not idle
EthErrs	Count of Ethernet errors
EthType	Type of last error
PrtErrs	Count of Ethernet protocol errors
PrtType	Type of last protocol error
PrtCon#	Connection number of last protocol error

The global counters cannot be cleared.

The Connection Statistics consist of:

Counter	Description
Connection number	0 to 15
Name	Name on Connection
State	Active or Idle
RPI	Requested Packet Interval

Counter	Description
Rx Avg	The average of the last 32 update times, in ms.
Rx Min	The minimum update time since the last counter reset, in ms.
Rx Max	The maximum update time since the last counter reset, in ms
Rx Tout	The receive timeout, calculated from the RPI

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.

Ethernet/IP Log

The Ethernet/IP log shows messages and errors associated with the Ethernet/IP communication, both scheduled and unscheduled.

System Info Log

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

View All Logs

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

Administration Menu

The *Administration* menu contains items used to configure, control and update the AN-X.

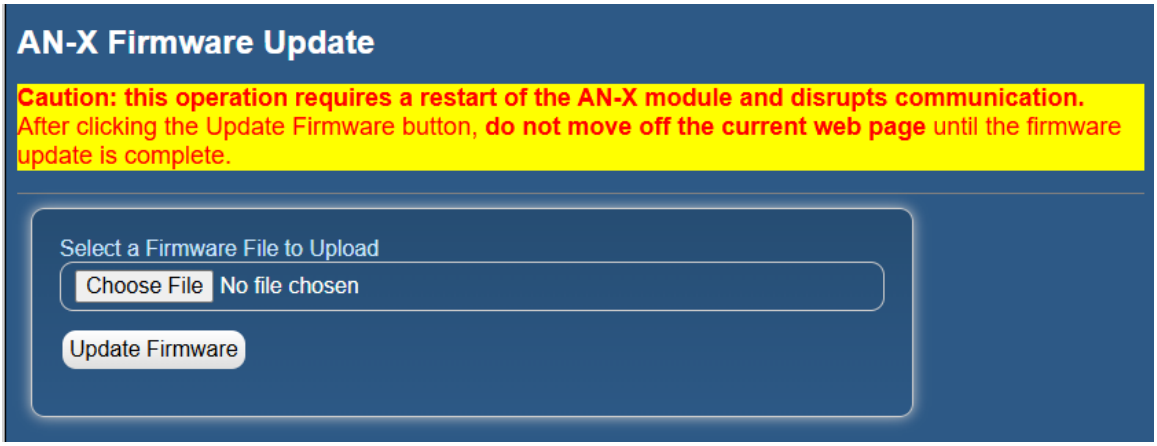
AN-X IP/FW Configuration

See page 13 for details.

AN-X Firmware Update

Use *AN-X Firmware Update* to transfer a firmware file to the microSD card on the AN-X. Firmware files for the AN-X3 have names that begin with AN-X3 and have extension *.qtf.

WARNING! Do not update firmware in the AN-X while applications that use the AN-X are running.



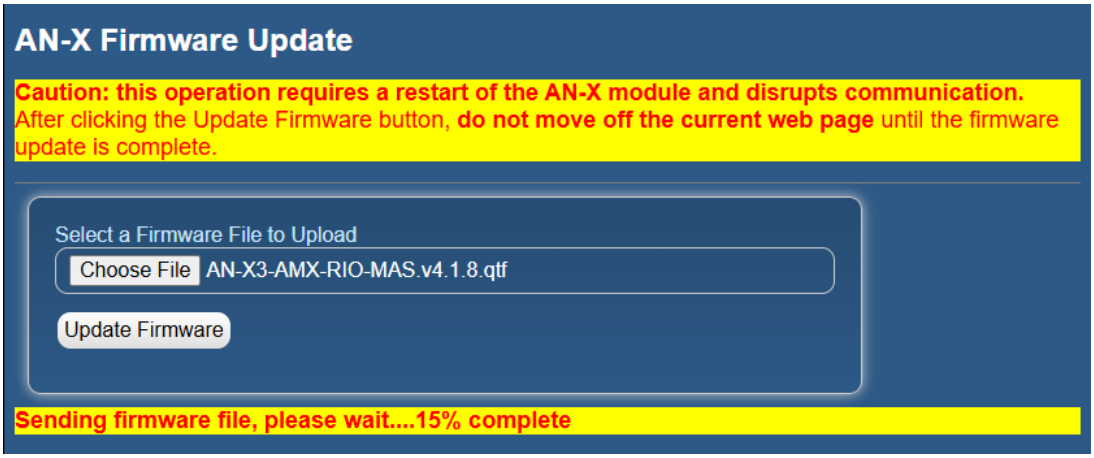
Browse to select the file, then click the *Update Firmware* button to transfer the file.

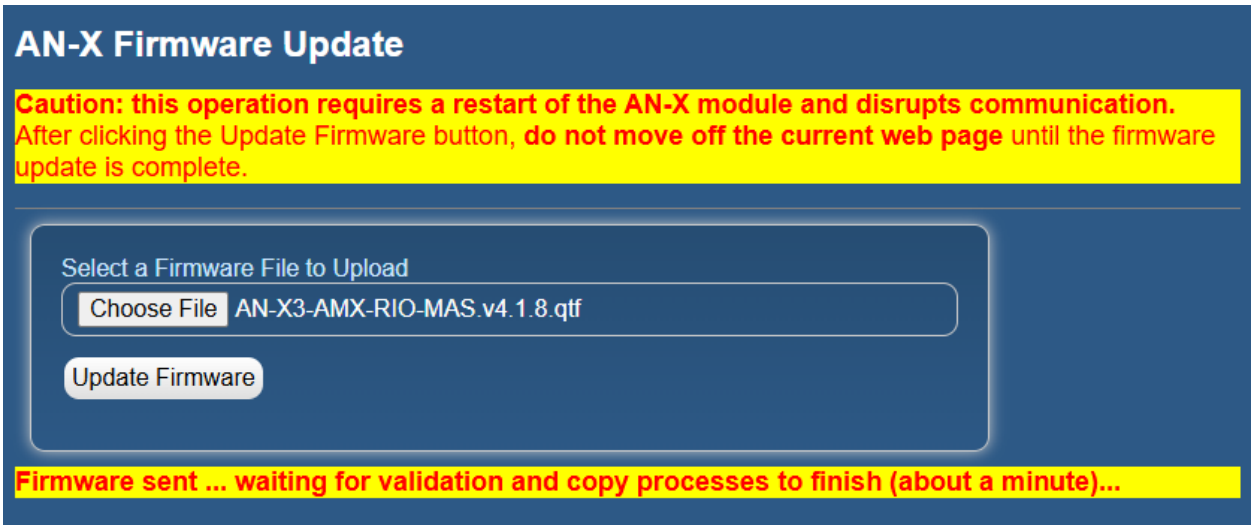
WARNING!

It is essential that you do not disrupt power while updating firmware, especially maintenance firmware, to the AN-X3 or while the AN-X3 is restarting following a firmware update.

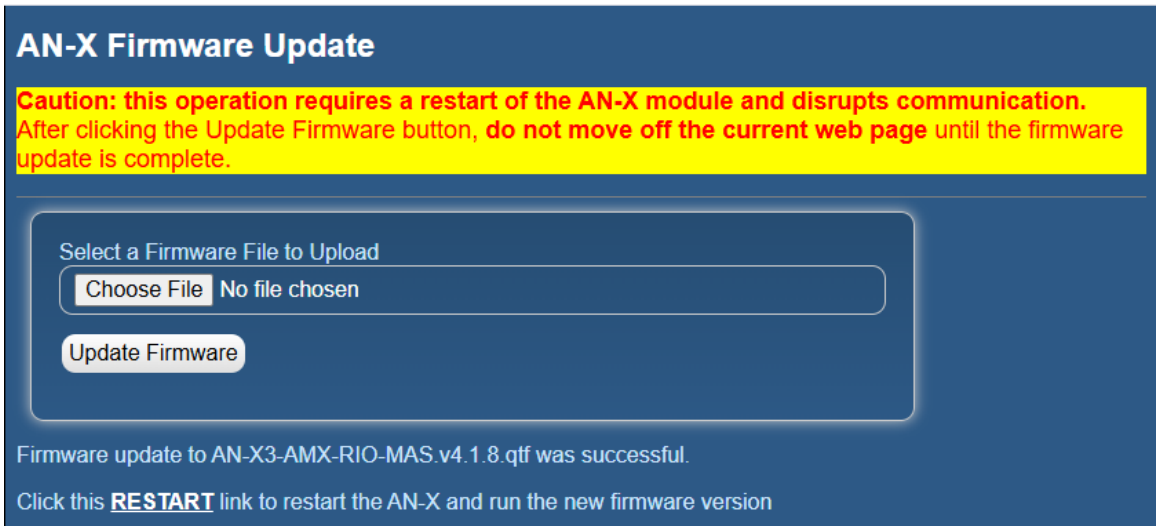
Interrupting power at some points in the update process could render the AN-X inoperative and it will have to be returned to the factory for reinitialization.

AN-X displays progress and status information as the firmware is updated.





When the update is complete, AN-X displays a message that indicates the success or failure of the update.

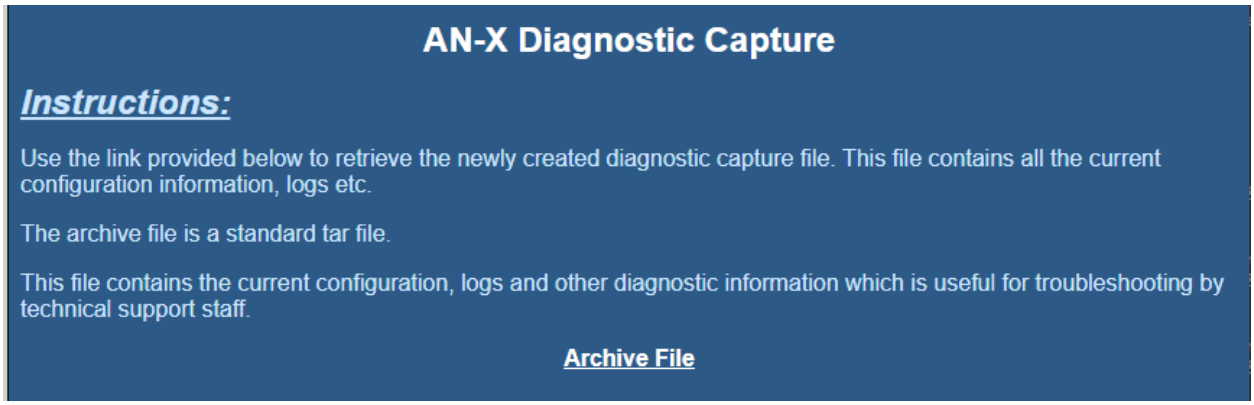


If you have other files to transfer, return to the main page and continue. Otherwise, restart the AN-X in order to run the updated firmware.

Diagnostic Capture

You can archive all the current AN-X configuration files and log files from the web interface. The archive file is a standard tar archive. It intended for technical support only.

Select *Administration/Archive Configuration.*

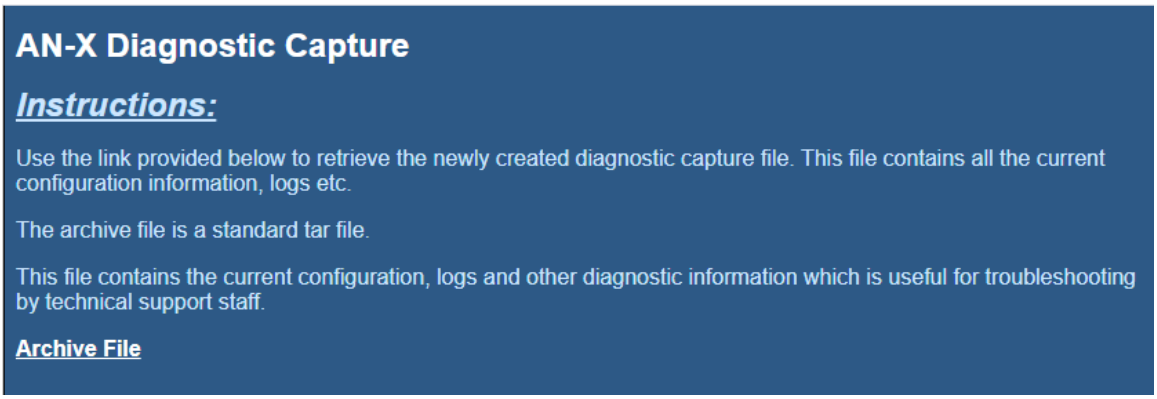


Click the *Archive File* link. There may be a slight delay while AN-X builds the archive file.

Select the destination where the file will be stored and save the file.

AN-X Module Restart

Use the *AN-X Module Restart* command to restart the AN-X module, for example, after changing Ethernet parameters or after updating firmware.



Support Menu

The Support menu contains Contact Information.

Troubleshooting

LEDs

The AN-X3-AMX-RIO has LEDs that indicate the state of the Ethernet connection, the overall module state and the connection to the remote I/O network.

Ethernet LEDs

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

The upper, yellow LED, labeled 100, is on if the link is running at 100 Mbits/second and is off otherwise.

The lower 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.

If the AN-X3 is not connected to Ethernet, the 10/100 LED is on.

SYS LED

The SYS 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. Otherwise, the LED flashes red.

The SYS 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 3	DHCP configuration failed
Yellow 2	microSD card not present
Yellow 3	AN-X3 Maintenance firmware file not found on microSD card
Yellow 4	config.txt file not found on microSD card or error parsing file
Yellow 5	Production firmware filename was not specified in config.txt
Yellow 6	AN-X3 production firmware file not found on microSD card
Yellow 7	Production firmware file invalid or error programming to flash
Yellow 8	Daughterboard mismatch
Yellow 9	Error processing option file or file not found
Yellow 10	Option file mismatch
Flashing red/green	Unscheduled messaging, addressing or connection problem
Flashing red/off	Configuration file problem

“Railroading” – SYS and NET LEDs

AN-X3 alternates (railroads) flashing the SYS and NET LEDs to indicate its state.

It railroads the LEDs red while it is copying new maintenance firmware files from the microSD card to flash memory.

It railroads the LEDs yellow while it is copying new production firmware files from the microSD card to flash memory.

It railroads the LEDs green for 15 to 20 seconds as it starts production mode.

SYS and NET LEDs: Runtime

SYS

The SYS is used by the AN-X operating system and software to indicate the state of operations and errors.

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

SYS LED State	Possible cause
Flashing red/green	Unscheduled messaging, addressing or connection problem
Flashing red/off	Configuration file problem
Flashing green/off	Not all required connections open

NET LED – Network Status

The NET LED indicates the status of the AutoMax RIO network connection.

Solid green	All drops operating correctly
Solid red	One or more drops in error
Network error	Flashes red

Fatal Errors

AN-X3 monitors its operation for “unrecoverable” conditions and generates a fatal error if it detects one. It generates a fatal error code on the SYS LED by flashing 8 bits followed by a pause. The least significant bit is first, with green for 1 and red for 0.

If a fatal error occurs, record the SYS sequence and contact technical support.

Updating the Firmware

The AN-X3 operating software consists of the maintenance firmware and the runtime firmware.

The maintenance firmware runs at startup. It performs diagnostics, updates any firmware that has been transferred to the AN-X, and starts the runtime firmware.

The firmware files are supplied in files that begin with AN-X3 and have extension *qtf*. They are updated using the web interface. Run the command *Administration/AN-X Firmware Update* and select the file you wish to transfer.

WARNING! Do not update firmware on the AN-X while applications that use the AN-X are running.

The web page displays the update progress at the bottom left of the page.

You must restart the AN-X3 to run the firmware that you transferred.

WARNING!

It is essential that you do not disrupt power while updating firmware, especially maintenance firmware, to the AN-X3 or while the AN-X3 is restarting following a firmware update.

Interrupting power at some points in the update process could render the AN-X inoperative and it would have to be returned to the factory for reinitialization.

The web interface displays the version of the firmware the AN-X3 is running on the home page and on the tab at the top of the page.

You can also update the firmware by copying qtf files to the microSD card from a computer. If you do, make sure that there is only one version of each qtf file on the microSD card, the one you want AN-X to use.

Obtaining the Latest Software

Version numbers and software for the most recent AN-X3 releases are available from the QTS website, qtsusa.com/dist

Specifications

Parameter	Specification
Function	Bridge between Ethernet and Reliance AutoMax Remote I/O network
Maximum Power Consumption	300 mA @ 12 VDC or 150 mA @ 24 VDC
Maximum Power dissipation	3.6W
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:

Asia Pacific

Languages Spoken: Chinese, English

+603.7724.2080, support.AP@prosoft-technology.com

Europe – Middle East – Africa

Languages Spoken: French, English

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Languages Spoken: Portuguese, English

+55.11.5083.3776, support.brazil@prosoft-technology.com

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Languages Spoken: Spanish, English

+52.222.399.6565, latinam@prosoft-technology.com

Warranty

Quest Technical Solutions warrants its products to be free from defects in workmanship or material under normal use and service for three years after date of shipment. Quest Technical Solutions will repair or replace without charge any equipment found to be defective during the warranty period. Final determination of the nature and responsibility for defective or damaged equipment will be made by Quest Technical Solutions personnel.

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.

Except for the express warranty stated above Quest Technical Solutions disclaims all warranties with regard to the products sold hereunder including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of Quest Technical Solutions for damages including, but not limited to, consequential damages arising out of/or in connection with the use or performance of the Product.

Revisions

Version	Date	Changes
1.1	Jan 21/24	Initial Release
1.2	Feb 18/25	Fixed Typos and screen captures
		Standard Format