

**AN-X3-AMX-RIO Reliance
AutoMax Remote I/O
Communication Module**

User Manual



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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

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AN-X3-AMX-RIO MODULE OVERVIEW	2
Hardware Features	3
Package Contents	3
Other Requirements	3
Identifying the AN-X3 versus the Original AN-X	4
Differences from the Original AN-X	4
Using the microSD Card	4
AN-X3 Modes of Operation	5
INSTALLATION	6
Prevent Electrostatic Discharge	6
Power	6
Cabling and Termination	6
Ethernet Cabling	7
Initial Ethernet Configuration	8
DHCP	9
Static IP Address	10
Hostname	10
Firmware	10
Submitting the Configuration	10
Reconfiguring an AN-X from an Unknown State	11
The Configuration File	11
If the link-local address is not accessible...	12
AUTOMAX REMOTE I/O CONFIGURATION	15
Configuration Text File	16
SCHEDULED DATA WITH A CONTROLLOGIX	19
Configuring the AN-X in RSLogix 5000	19
Ethernet/IP Log	21

ControlLogix Tags	21
TROUBLESHOOTING	23
LEDs	23
Ethernet LEDs	23
SYS LED	23
“Railroading” – SYS and NET LEDs	24
SYS and NET LEDs: Runtime	24
Fatal Errors	24
UPDATING THE FIRMWARE	26
Obtaining the Latest Software	26
SPECIFICATIONS	27
SUPPORT	28
WARRANTY	29

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 modules micro SD card. Refer to page 26 for details.

Hardware Features



The module has:

- 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

Other Requirements

To exchange scheduled data with a ControlLogix processor over Ethernet requires:

- Version 12 or above of RSLogix 5000
- version 12 or above of the ControlLogix firmware
- 100 Mbit/second Ethernet network and hardware ENBT etc.)

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 slot15.

Using the microSD Card

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

There 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.

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

WARNING!

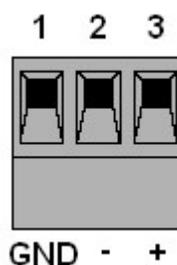
- Touch a grounded object to discharge static potential
- Do not touch the connector pins

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, use a crossover cable.

Initial Ethernet 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

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 when the AN-X powers up, and any software that accesses the AN-X module would have to be reconfigured.

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

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.

You configure the Ethernet properties using the web interface.

Start a web browser and enter the address 169.254.42.84

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.

You configure the Ethernet properties using the web interface.

Start a web browser and enter the address 169.254.42.84

Select *Administration/AN-X IP/FW Configuration*.

The *AN-X3 IP/FW Configuration* page appears.

At the top the screen the serial number and MAC address of the AN-X being configured are shown.

Check either DHCP or Static.

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 DHCP server.

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 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.

This name may be used when configuring Ethernet/IP ControlLogix scheduled connections as well.

TIP

When you configure the AN-X in RSLogix 5000, use this same name for the emulated ENBT. See page 20.

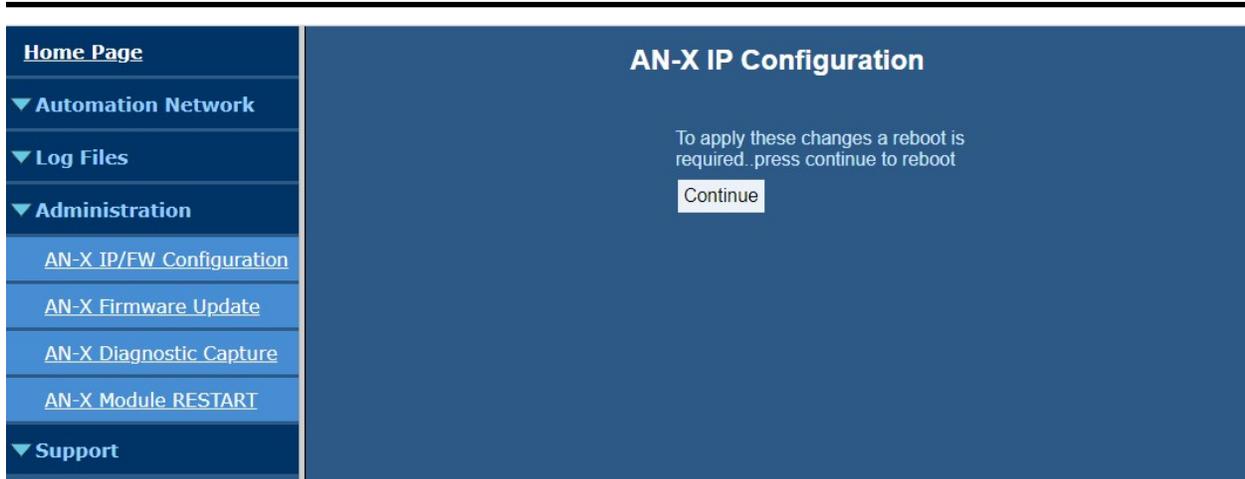
Firmware

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.

Remove the microSD card and edit the file `config.txt` using a text editor such as Windows Notepad to set the AN-X3 to the desired configuration.

The Configuration File

The Ethernet configuration and the name of the production firmware file to load are stored in the text file `config.txt` on the microSD card.

When you perform the *Administration/AN-X IP/FW 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 LED, see page 23.

Example config.txt files

Example: Link- Local IP address

```
IP: LOCAL
Hostname: AnxAmxRioMas
Firmware: AN-X3-AMX-RIO-MAS
```

Example: DHCP

```
IP: DHCP
Hostname: AnxAmxRioMas
Firmware: AN-X3-AMX-RIO-MAS
```

Example: static IP address

```
IP: 192.168.1.14
NetMask: 255.255.255.0
DefGtwy: 192.168.1.1
HostName: AnxAmxRioMas
Firmware: AN-X3-AMX-RIO-MAS
```

If the link-local address is not accessible...

Addresses 169.254.1.0 to 169.254.254.255 are reserved for use on a local network. AN-X3 modules are shipped set to the address 169.254.42.84 for initial configuration. This address is almost always accessible from a computer on the same local Ethernet as the AN-X.

If you cannot access the AN-X3 at address 169.254.42.84 using a web browser, there are two options for setting the AN-X Ethernet parameters.

Option 1: Edit config.txt on the SD card

Turn off power to the AN-X, remove the microSD card, insert it in a card reader in your computer, and edit the file config.txt. Refer to page 11 for details on the file contents.

Replace the microSD card in the AN-X and turn on the power. Confirm that you can access the AN-X at the address you set.

Option 2: Add a route to 169.254.42.84

Open a command prompt window and type

```
route print
```

TIP

It may be necessary to start the command prompt as administrator.

The routing table appears

```
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...00 18 8b c5 9d f7 ..... Broadcom 440x 10/100 Integrated Controller -
Packet Scheduler Miniport
=====
=====

Active Routes:

Network Destination          Netmask          Gateway          Interface        Metric
-----
0.0.0.0                      0.0.0.0          10.10.0.1        10.10.0.20       20
10.10.0.0                    255.255.255.0    10.10.0.20       10.10.0.20       20
10.10.0.20                   255.255.255.255  127.0.0.1        127.0.0.1        20
10.255.255.255               255.255.255.255  10.10.0.20       10.10.0.20       20
64.215.255.122               255.255.255.255  10.10.0.1        10.10.0.20       20
127.0.0.0                    255.0.0.0        127.0.0.1        127.0.0.1        1
169.254.0.0                 255.255.0.0      10.10.0.20       10.10.0.20       20
224.0.0.0                    240.0.0.0        10.10.0.20       10.10.0.20       20
255.255.255.255              255.255.255.255  10.10.0.20       10.10.0.20       1

Default Gateway:            10.10.0.1
=====

Persistent Routes:

None
```

If there is no entry in the network destination column that starts with 169.254.0.0 (highlighted above), add a route using

```
route add 169.254.0.0 mask 255.255.0.0 10.10.0.20 metric 20
```

where 10.10.0.20 is replaced with the IP address of the interface (network card) in your computer that is to communicate with the AN-X3.

Repeat the route print command and confirm that the table now has an entry similar to the one shown.

Now try pinging the AN-X3 at 169.254.42.84. You should now be able to access it using a browser to set the desired Ethernet configuration.

When you add a route in Windows and you want it to be 'persistent', use the -p option:

```
route -p add 169.254.0.0 mask 255.255.0.0 10.10.0.20 metric 20
```

That puts the route in the registry and it is added at each start up.

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 *Automatin Network/Configuration*

If a 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 autoconfiguration 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,  0000
; DropOutLen=4 DropInpLen=4

;,          Name,
          Part#(57C328),Out,Inp,OPort0,IPort0,OPort1,IPort1,OPort2,IPort2,OPo
rt3,IPort3
Drop7,      DropName7,      419451-103A, 18, 28,  Oxx0,  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) "
;
; 50 "AnxAmxRioMas CLX -> AN-X Slot 1 Upd Time (*100us, Avg) "
; 52 "AnxAmxRioMas CLX -> AN-X Slot 1 Upd Time (*100us, Min) "
; 54 "AnxAmxRioMas CLX -> AN-X Slot 1 Upd Time (*100us, Max) "
;
; 60 "AnxAmxRioMas CLX -> AN-X Slot 2 Upd Time (*100us, Avg) "
; 62 "AnxAmxRioMas CLX -> AN-X Slot 2 Upd Time (*100us, Min) "
; 64 "AnxAmxRioMas CLX -> AN-X Slot 2 Upd Time (*100us, Max) "
;
; 70 "AnxAmxRioMas CLX -> AN-X Slot 3 Upd Time (*100us, Avg) "
; 72 "AnxAmxRioMas CLX -> AN-X Slot 3 Upd Time (*100us, Min) "
; 74 "AnxAmxRioMas CLX -> AN-X Slot 3 Upd Time (*100us, Max) "
;
; 80 "AnxAmxRioMas CLX -> AN-X Slot 4 Upd Time (*100us, Avg) "
; 82 "AnxAmxRioMas CLX -> AN-X Slot 4 Upd Time (*100us, Min) "
; 84 "AnxAmxRioMas CLX -> AN-X Slot 4 Upd Time (*100us, Max) "
;
; 90 "AnxAmxRioMas CLX -> AN-X Slot 5 Upd Time (*100us, Avg) "
; 92 "AnxAmxRioMas CLX -> AN-X Slot 5 Upd Time (*100us, Min) "
; 94 "AnxAmxRioMas CLX -> AN-X Slot 5 Upd Time (*100us, Max) "
;
; 100 "AnxAmxRioMas CLX -> AN-X Slot 6 Upd Time (*100us, Avg) "
; 102 "AnxAmxRioMas CLX -> AN-X Slot 6 Upd Time (*100us, Min) "
; 104 "AnxAmxRioMas CLX -> AN-X Slot 6 Upd Time (*100us, Max) "
;
; 110 "AnxAmxRioMas CLX -> AN-X Slot 7 Upd Time (*100us, Avg) "
; 112 "AnxAmxRioMas CLX -> AN-X Slot 7 Upd Time (*100us, Min) "
; 114 "AnxAmxRioMas CLX -> AN-X Slot 7 Upd Time (*100us, Max) "
;
; 120 "AnxAmxRioMas CLX -> AN-X Slot 8 Upd Time (*100us, Avg) "
; 122 "AnxAmxRioMas CLX -> AN-X Slot 8 Upd Time (*100us, Min) "
; 124 "AnxAmxRioMas CLX -> AN-X Slot 8 Upd Time (*100us, Max) "
;
; 130 "AnxAmxRioMas CLX -> AN-X Slot 9 Upd Time (*100us, Avg) "
; 132 "AnxAmxRioMas CLX -> AN-X Slot 9 Upd Time (*100us, Min) "
; 134 "AnxAmxRioMas CLX -> AN-X Slot 9 Upd Time (*100us, Max) "
;
; 140 "AnxAmxRioMas CLX -> AN-X Slot 10 Upd Time (*100us, Avg) "
; 142 "AnxAmxRioMas CLX -> AN-X Slot 10 Upd Time (*100us, Min) "
; 144 "AnxAmxRioMas CLX -> AN-X Slot 10 Upd Time (*100us, Max) "
;
; 150 "AnxAmxRioMas CLX -> AN-X Slot 11 Upd Time (*100us, Avg) "
; 152 "AnxAmxRioMas CLX -> AN-X Slot 11 Upd Time (*100us, Min) "
; 154 "AnxAmxRioMas CLX -> AN-X Slot 11 Upd Time (*100us, Max) "
;
; 160 "AnxAmxRioMas CLX -> AN-X Slot 12 Upd Time (*100us, Avg) "
; 162 "AnxAmxRioMas CLX -> AN-X Slot 12 Upd Time (*100us, Min) "
; 164 "AnxAmxRioMas CLX -> AN-X Slot 12 Upd Time (*100us, Max) "
;
; 170 "AnxAmxRioMas CLX -> AN-X Slot 13 Upd Time (*100us, Avg) "
; 172 "AnxAmxRioMas CLX -> AN-X Slot 13 Upd Time (*100us, Min) "
```

```
; 174 "AnxAmxRioMas CLX -> AN-X Slot 13 Upd Time (*100us, Max)"  
;  
; 180 "AnxAmxRioMas CLX -> AN-X Slot 14 Upd Time (*100us, Avg)"  
; 182 "AnxAmxRioMas CLX -> AN-X Slot 14 Upd Time (*100us, Min)"  
; 184 "AnxAmxRioMas CLX -> AN-X Slot 14 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)"  
;-----
```

Scheduled Data with a ControlLogix

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 for all AutoMax RIO data.

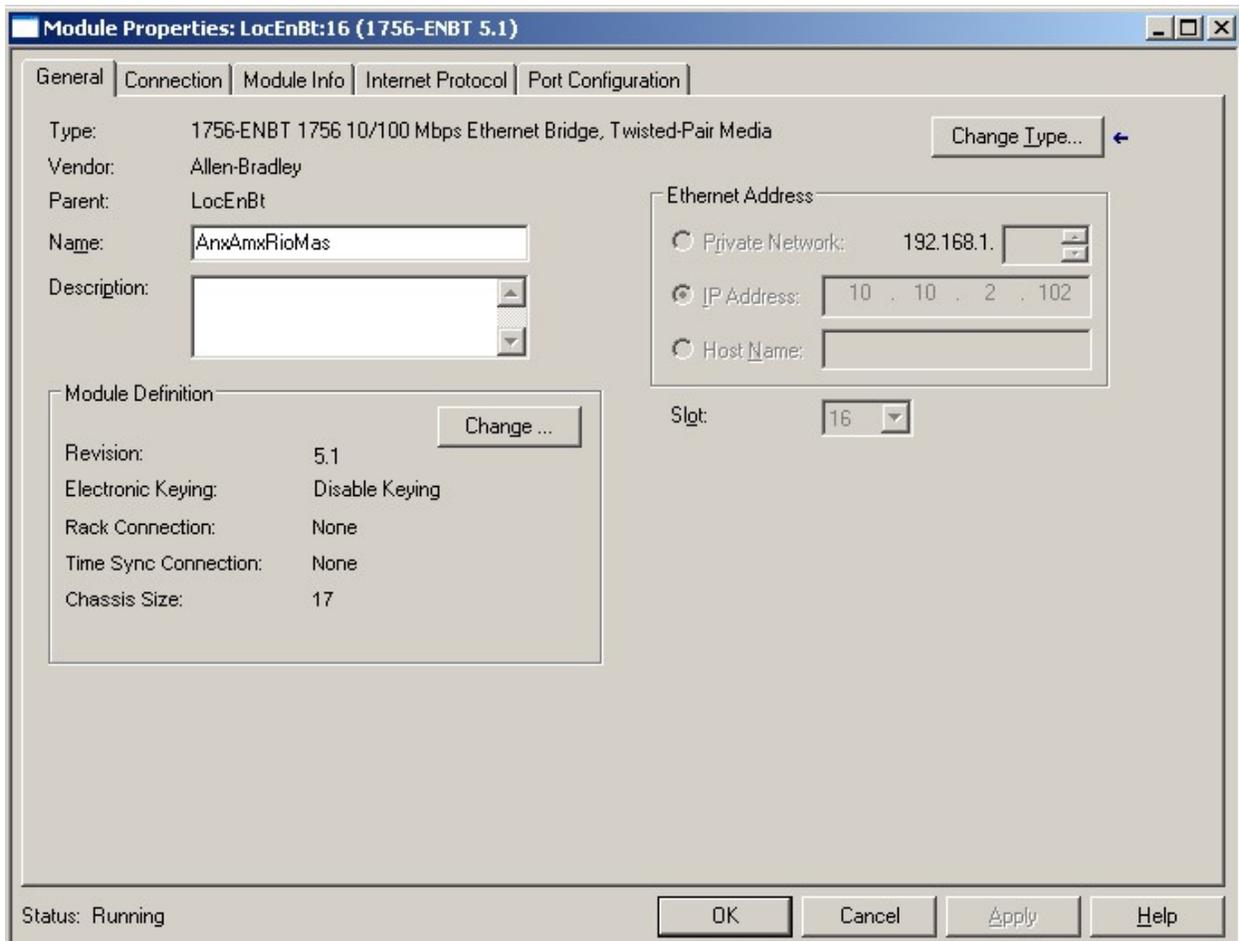
The Slot 15 connection is used for diagnostic information.

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 10)

Set the *Revision* to 1.

Set *Electronic Keying* to *Disable Keying*.

Set the *Rack Connection* to None.

Set the *Time Sync Connection* to None.

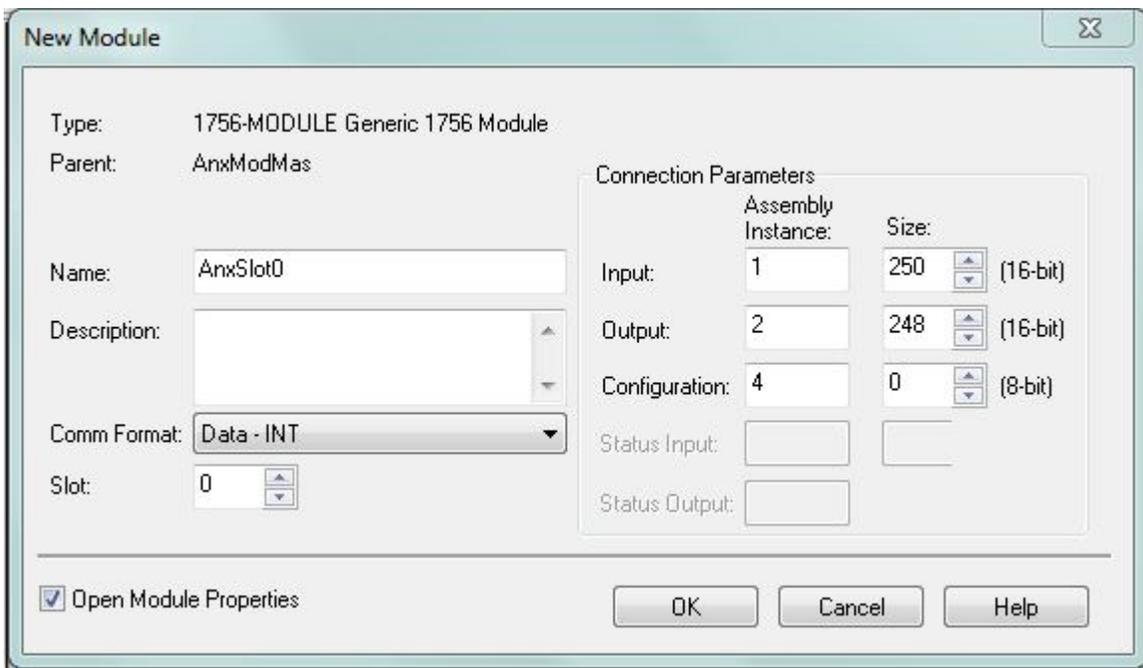
Set the chassis size to 17.

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.

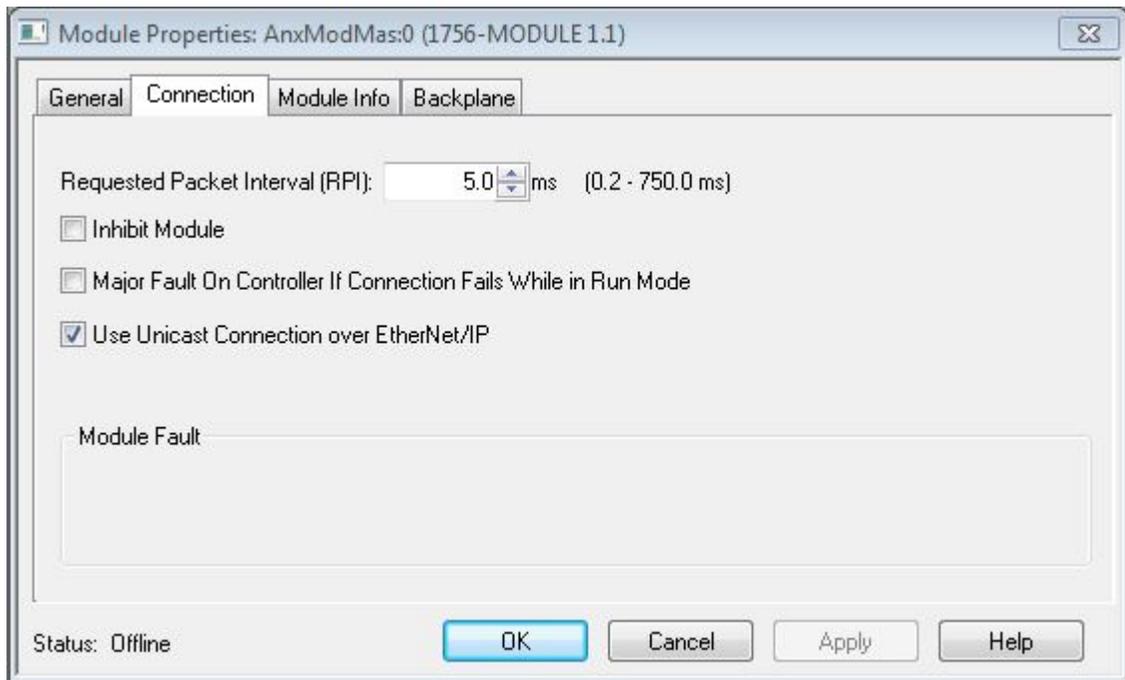


Set the *Name* and *Description* as desired.

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.

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, labelled 100, is on if the link is running at 100 Mb/s 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

SYS LED State	Possible cause
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:

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