AN-X3-AMX-DCS

Reliance AutoMax DCSNet

Ethernet/IP & HMI

Gateway

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-DCSNet

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AN-X3-AMX DCSNet Module Overview

The AN-X3-AMX supports several firmware images. This manual focuses on AN-X3-DCS-MAS and AN-X3-DCS-SLV firmware.

Information that applies to both is referred to as AN-X3-DCSNet.

The AN-X3-DCSNet communications module connects a computer or other device to a Reliance DCSNet network, using Ethernet. The module supports DCSNet master or a DCS slave.

As a DCS master, the module:

• Scans up to 55 slave drops

• Transmits 8 words of broadcast data every 2.8 ms.

• Maintains standard DCS diagnostic counters

As a DCS slave, the module:

• Acts as any drop from 1 to 55, with drop depth from 1 to 55. It supports 32 words of input data and 32 words of output data per drop

• Receives 8 words of broadcast data from the master every 2.8 ms.

• Monitors the input and output data on others drops on the network

• Maintains standard DCS diagnostic counters

You can use the AN-X3-DCSNet module to communicate with an AutoMax processor, using AutoMax Programming Executive 3.9A or 4.3A or above. Refer to page 19 for details.

The AN-X3-DCSNet module supports exchanging scheduled data over Ethernet with an Ethernet/IP Originator, including ControlLogix processors, with any available RPI. Refer to page 24 for details.

You can use an HMI, DDE and OPC server such as RSLinx to access the DCS data directly on the AN-X3-DCSNet. The module "emulates" PLC-5 integer files N100-N155. Each file is 64 words and corresponds to DCS drops 0-55. Refer to page 34 for details.

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

 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 47 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 connection to the DCS network

- an Ethernet connector

- a 9-pin D-shell connector to connect to the DCS network

- a power connector

Package Contents

- AN-X3-DCSNet module
- 3 pin Phoenix power connector

Current firmware and documentation are at qtsusa.com/dist

Other Requirements

To use the AN-X3-DCSNet with the AutoMax Programming Executive requires:

- version 3.9A or 4.3A or above of the programming executive
- version 3.1.0.4 or above of the Virtual Device Driver

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-DCSNet supports up to 15 Data – INT connections. DCSNet Data can be mapped to connections 0-14, diagnostic and status information is mapped to connection 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 13 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-X3 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.
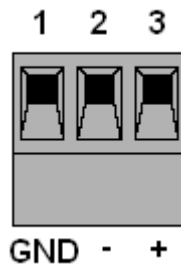
The chassis ground should be connected.

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)

DCSNet Cabling and Termination

Use a DCSNet drop cable (612574-36R or 612403-036R) and passive tap (M/N 57C380) to connect the module to the coaxial network cable.

The drop cable is a 3-foot long multiconductor 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 DCS network cable can be RG-59/U or RG-11/U.

Ethernet Cabling

AN-X3 has a standard RJ-45 connector for connecting to Ethernet.

If you are connecting AN-X3 to an existing network through a router or switch, use a standard Ethernet cable.

If you are connecting a computer or PLC directly to an AN-X3, 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.
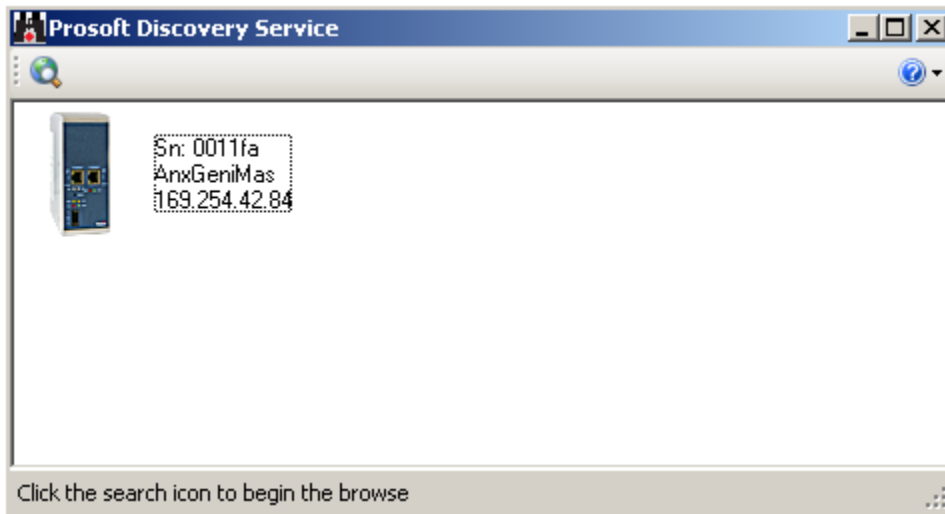
Right click on the module icon and choose "Assign Temporary IP".
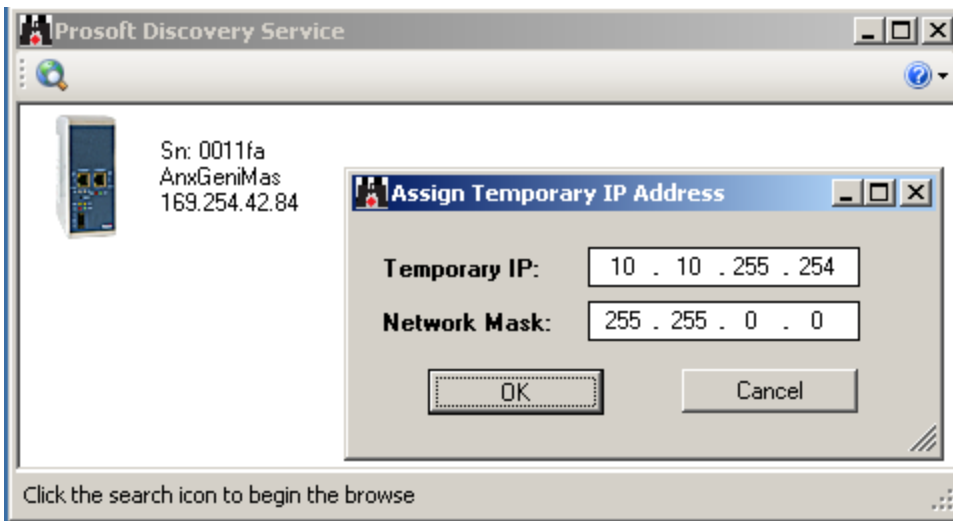
Generally you can just use the default PDS Temporary IP.

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 45.

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 IP/FW 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.

AN-X IP/FW Configuration Apply

To apply these changes a reboot is required..press continue to reboot
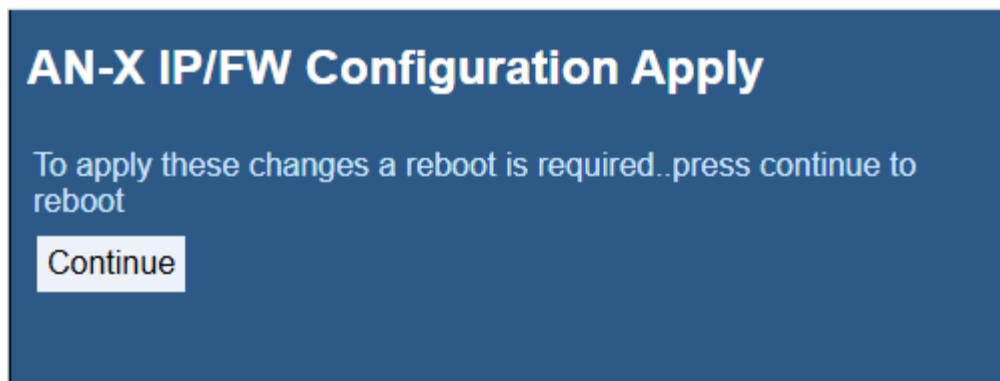
Continue

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 13.

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.

DCSNet Configuration

You set the DCS mode of operation (master or slave) by choosing AN-X3-DCS-MAS or AN-X3-DCS-SLV firmware.

If DCS-MAS firmware is selected, the Drop Number is 0 and there is nothing to configure.

If DCS-SLV firmware is selected, select *Automation Network/Configure DCSNet* to set the DCS drop number and depth.

AN-X3 defaults to DCS slave operation with drop number 55 and drop depth 1.

The DCS-SLV can be configured to "Listen Only Mode" by setting the Drop Number to 254 and the Drop Depth to 0. In this mode, the AN-X is not an active drop and cannot send any registers to the DCSNet Master, but it listens to and makes available register data for all active drops on the DCSNet.

DCS Diagnostic Counters

AN-X3 maintains standard DCS drop 0 diagnostic counters. Use *Automation Network/Monitor DCSNet* in the web interface to view the diagnostic counters.

The counters are:

Register	Meaning
4-7	Drop status table
12	Local station's drop number
14	Messages received
15	Receive timeouts
16	CRC errors
17	Overrun errors
18	Abort errors
19	Messages transmitted
20	Local station's drop depth

In the drop status table, register 4 contains status for drops 0 to 15, bit 0 corresponds to drop 0 (the master), bit 1 corresponds to drop 1, and so on. Register 5 contains the status of drops 16 to 31, register 6 contains the status of drops 32 to 47 and register 7 contains the status of drops 48 to 55.

Using the AutoMax Programming Software

Any computer with Ethernet access can use an AN-X3-DCSNet module to connect to an AutoMax processor over DCSNet.

AN-X3 offers fast access to the DCS network and does not require a specific format (ISA, PCI, etc.) interface card. AN-X3-DCSNet works with any computer than can connect to Ethernet.

A Virtual Device Driver (VDD) is used to support AutoMax programming software. This VDD intercepts programming software access to a virtual PCLink card.

Support for 16 bit VDD's was removed from Windows XP after KB2661254-V2 (and its dependents KB2756822, KB2749655 & KB2724197).

Typically a Virtual Machine (VM) is used for this purpose.

An earlier version of Windows XP that doesn't not include the updates listed above is required.

The following instructions assume that:

•   AN-X3 has been configured and is active on the Ethernet network

•   AN-X3 has been connected to the DCS network

•   the AN-X3 DCS drop number and drop depth have been assigned (see page 18)

To use AN-X3-DCSNet with the AutoMax Programming Executive, you must complete the following steps:

1.   Install and configure the Virtual Device Driver (VDD)

2.   Configure the programming software to use AN-X3

Requirements

•   Virtual Device Driver (VDD) version 3.1.0.4 or above, available on the AN-X3 web distribution (qtsusa.com/dist)

•   AutoMax Programming Executive 3.9 or 4.3 or above

Installing and Configuring the VDD

1.   Install the virtual device driver.

2.   Run the Control Panel Applet (Start/Control Panel/QTS PC Link Card Configuration and set the Port Address and Memory Address. You can leave them at their default values.

3.   Check *Enable AN-X3-DCSNet Link*

4.   Enter the IP address of the AN-X3 in the *AN-X IP Address* field.

5.   Click OK.
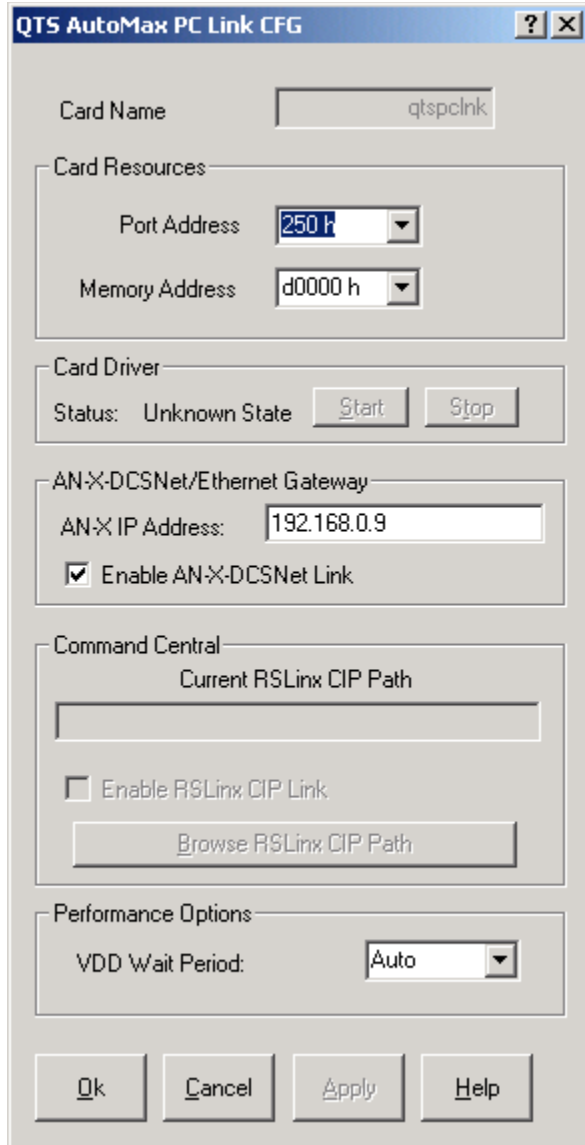
Configuring the Programming Software

To configure the AutoMax Programming Executive to use AN-X3:

1. Run the Programming Executive

2. Select *Setup/Communications*. The Communications Setup dialog appears.
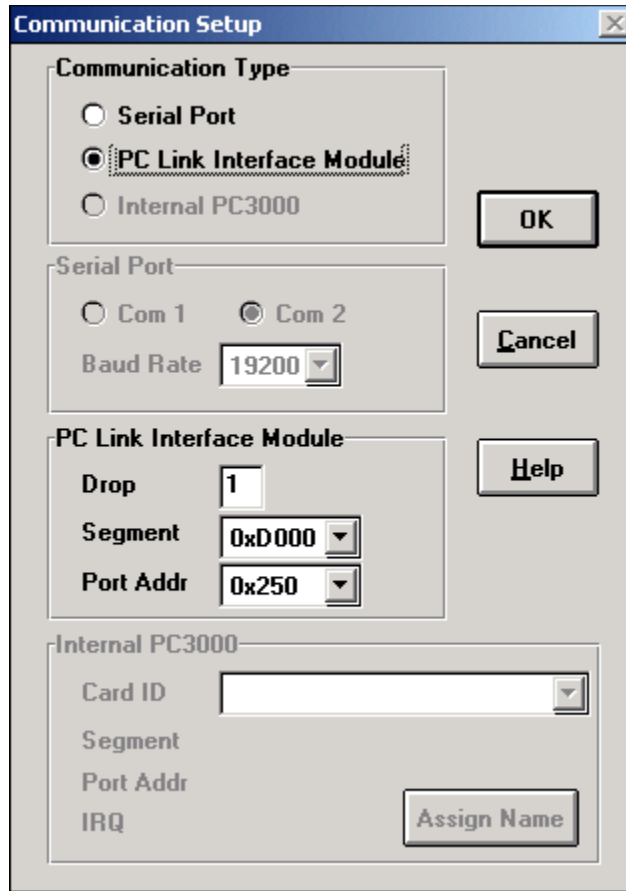
3. Set the *Communications Type* to PC Link Interface Module.

4. Set the *Drop* to match the AN-X3 drop number on DCS

5. Set the *Segment* to match the Memory Address in the VDD Configuration.

6. Set the *Port Addr* to match the Port Address in the VDD configuration.

7. Click *OK* to complete the configuration.

You should now be able to go online with the AutoMax Programming Executive.

Multiple Programmer Access

The AutoMax operating system uses the source of programming messages (direct connection to the serial port or drop number on DCSNet) to distinguish between programmers. It uses the identity of each programmer to manage levels of access (None, Data, Task) and to return requests for data to the programming devices. The AutoMax operating system controls the operations that programming device can perform, depending on their access level.

If multiple copies of the Programming Executive attempt to program an AutoMax through the same AN-X3-DCSNet, the AutoMax sees them as a single user since they are all connected using the drop number of the AN-X3-DCSNet.

This causes the following anomalous behavior in the programming devices:

• variables, I/O and ladder logic may be displayed incorrectly since the same data is sent to all devices connected to the same AN-X3-DCSNet

- each Programming Executive connected through the same AN-X3-DCSNet receives the same access level. If you change the access level on one, the AutoMax operating system changes to the same level on all of them. This defeats the built-in access management in the AutoMax.

Each copy of the Programming Executive should communicate with the AutoMax using a different AN-X3-DCSNet to ensure that the AutoMax operating system can properly detect them as separate copies of the Programming Executive. Multiple copies of the Programming Executive should NOT be connected through the same AN-X3-DCSNet. Each programmer should use a separate AN-X3.

Connecting to a Different AN-X3

If you have more than one AN-X3 on the Ethernet network, each connected to a different DCS network, to change the AN-X3 your programming software is using, run the Control Panel Applet (*Start/Control Panel/QTS PC Link Card Configuration* and change the IP address in the *AN-X3 IP Address* field.

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. In order to be able to exchange all DCSNet data, the AN-X3-AMX-DCS module supports multiple scheduled connections with a ControlLogix processor over Ethernet.

The AN-X3-AMX-DCS module 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 scheduled connections 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 its own RPI, from 1 to 750 ms.

In general, you should try to use as few connections as possible. There is significant overhead in opening and maintaining each connection.

You map DCSNet registers to these scheduled connections.

In addition, the AN-X module has diagnostic data that is mapped to ControlLogix slot 15 scheduled input data.

The mapping file can also contain options that apply to the entire configuration.

Configuring the AN-X in RSLogix 5000

The AN-X3-DCSNet emulates a 17-slot 1756 chassis with an ENBT/A in slot 16 and up to 16 generic modules in slots 0 to 15.

Connections to slots 0 to 14 are used for I/O data; the connection to slot 15 is reserved for diagnostic data (see page 31).

To configure the AN-X3-DCSNet in RSLogix 5000:

1. Right click on the ControlLogix Ethernet module that will be communicating with the AN-X and select *Add Module*. Add a 1756-ENBT/A module.
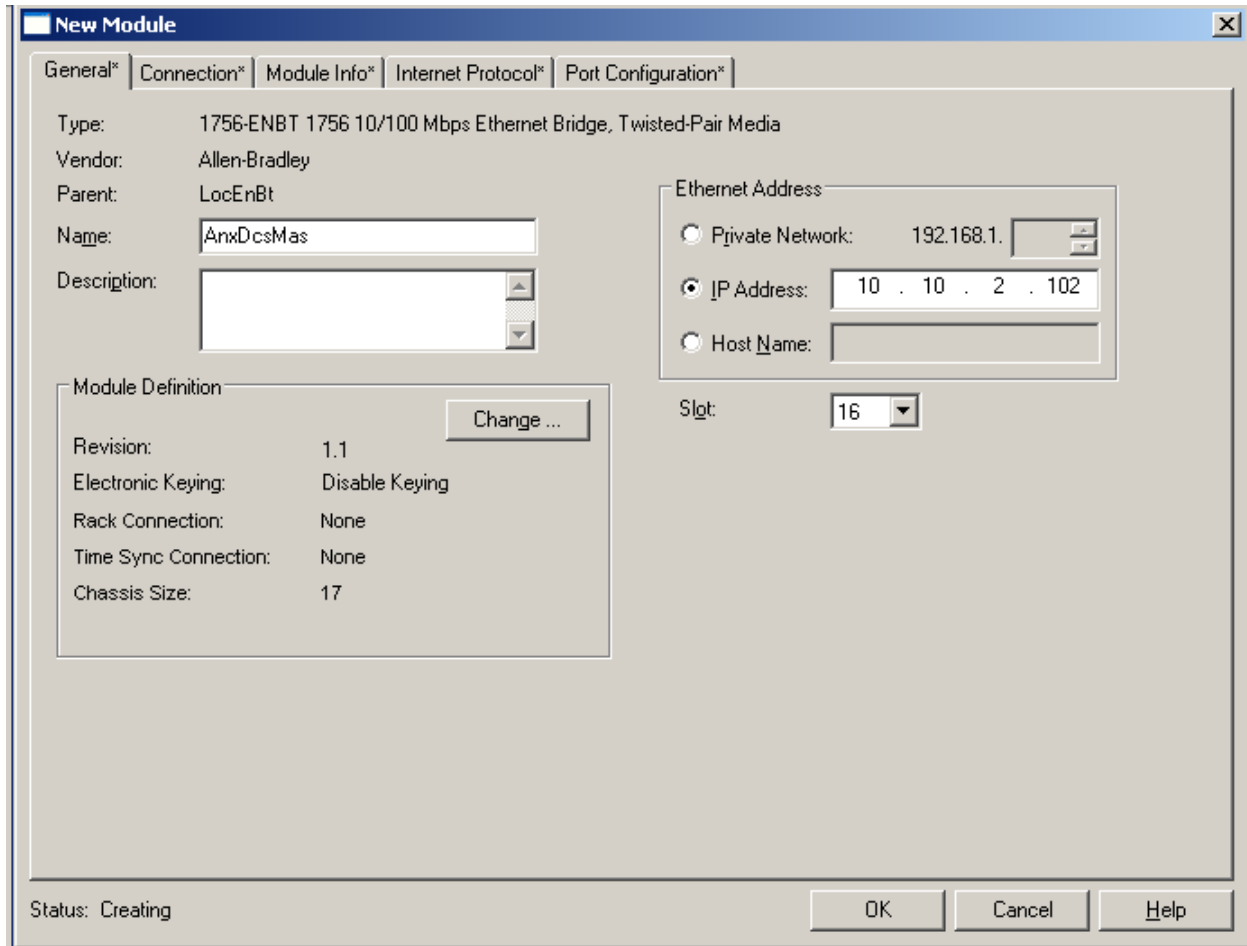
Enter the *Name*. Use the host name you assigned to AN-X when you configured its IP properties. (see page 16)

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 each required connection, at least slot 0 for data and usually slot 15 for diagnostics. Use *Automation Network/Configuration View* in the web interface to determine which connections are mapped. 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.

3. Set the RPI for each connection.
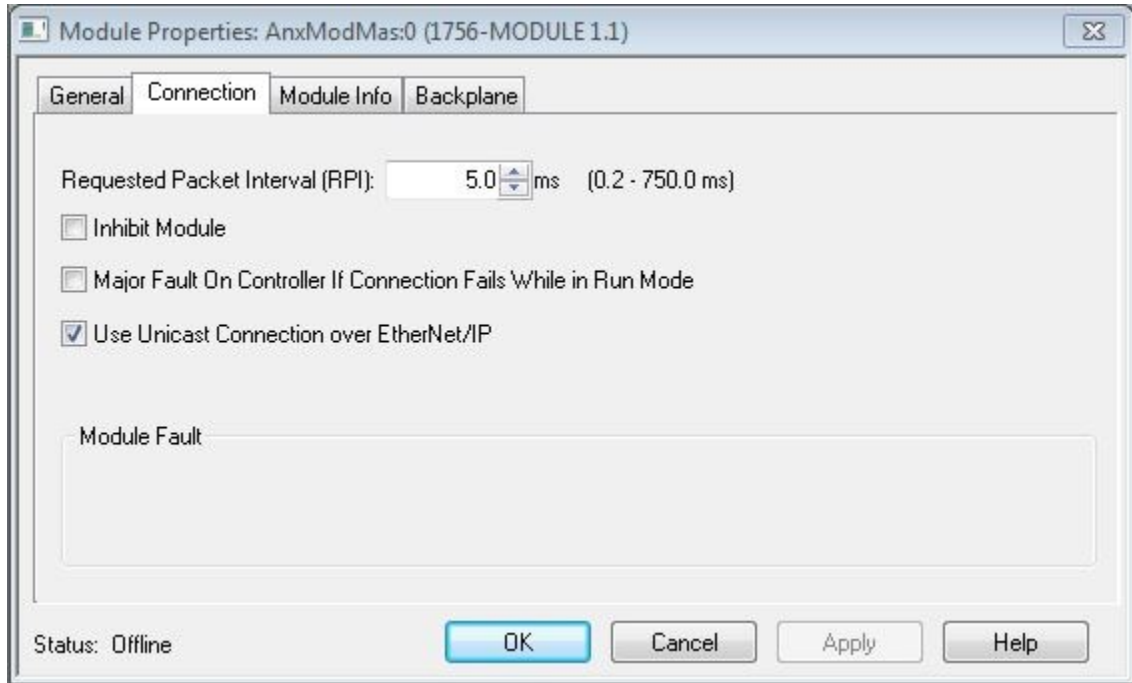
AN-X accepts RPIs from 1 to 750 ms.

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

TIP	The AN-X3-AMX-DCS 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.

Mapping the DCS Data

You define the DCS data that is exchanged between the AN-X3 and the ControlLogix processor in a text file, which can be created using a text editor.

Sample MAS and SLV configuration files are available from the web interface.

These sample configurations document the configuration keywords and format. *Automation Network/Configuration Sample.*

Sample DCS-SLV File

```
;-----------------------------------------------------------------------------
; QTS-AN-X-DCS-SLV Sample Configuration File
; Text after a semi-colon is a comment and is ignored

; The layout of the Slot 15 connection is shown at the end of this file

AnxDcsSlvCfgFile     ; Identifies this file as an AN-X-DCS-SLV Configuration file
ClxName AnxDcsSlv    ; Name of module in CLX - defaults to AN-X Hostname
;ClxPrefix  ANX_     ; prefix to all module tagnames - useful for unique aliases for multiple AN-X modules
;ClearOnProgram      ; If the Ethernet/IP scanner is in Program Mode, all data sent on DCSNet will be zero


;-----------------------------------------------------------------------------
; This sample maps the following:
; Monitored Drop  1 Depth 2 (1-2)
; Active     Drop 10 Depth 2 (10-11) (This AN-X Module)
;           Ethernet/IP Run/Idle Header is mapped so DCSNet devices can monitor
; Monitored Drop 40 Depth 1
; Monitored Drop 54 Depth 2 (54-55)
; Broadcast Registers 32-39
; Note that not all 32 registers need to be mapped, so many more drops
; may be mapped into a connection if just the necessary registers are chosen
; Ethernet/IP Run/Idle mapped to Drop 10 Register 0
;
ClxSlot 0 DCS_1_11  ; Slot/Connection Number and optional Name
DataInput           ; Inputs to ControlLogix from DCSNet
;<Ofs>,Drop Reg Length <Ofs> optional - comma if not specified
  0  1  0 32         ; Master from Drop  1 Slave Registers 0-31
 32  1 32 32         ; Master to   Drop  1 Slave Registers 32-63
 64  2  0 32         ; Master from Drop  2 Slave Registers 0-31
 96  2 32 32         ; Master to   Drop  2 Slave Registers 32-63
128 10 32 32         ; Master to   Drop 10 Slave Registers 32-63 (This AN-X module)
160 11 32 32         ; Master to   Drop 11 Slave Registers 32-63 (This AN-X module)
192  0 32  8         ; Master Broadcast Registers 32-39

DataOutput          ; Outputs from ControlLogix to DCSNet
;<Ofs>,Drop Reg Length <Ofs> optional - comma if not specified
Run 10  0  1         ; Master from Drop  10 Slave Register  0 Ethernet/IP Run/Idle
  0 10  1 31         ; Master from Drop  10 Slave Registers 1-31 (This AN-X module)
 32 11  0 32         ; Master from Drop  11 Slave Registers 0-31 (This AN-X module)

ClxSlot 1 DCS_40_55 ; Slot/Connection Number and optional Name
DataInput           ; Inputs to ControlLogix from DCSNet
;<Ofs>,Drop Reg Length <Ofs> optional - comma if not specified
  0 40  0 32         ; Master from Drop 40 Slave Registers 0-31
 32 40 32 32         ; Master to Drop 40 Slave Registers 32-63
 64 54  0 32         ; Master from Drop 54 Slave Registers 0-31
 96 54 32 32         ; Master to Drop 54 Slave Registers 32-63
128 55  0 32         ; Master from Drop 55 Slave Registers 0-31
160 55 32 32         ; Master to Drop 55 Slave Registers 32-63
;-----------------------------------------------------------------------------
```

Sample DCS-MAS File

```
;-------------------------------------------------------------------------------
; QTS-AN-X-DCS-MAS Sample Configuration File
; Text after a semi-colon is a comment and is ignored

; The layout of the Slot 15 connection is shown at the end of this file

AnxDcsMasCfgFile      ; Identifies this file as an AN-X-DCS-MAS Configuration file
ClxName AnxDcsMas     ; Name of module in CLX - defaults to AN-X Hostname
;ClxPrefix  ANX_      ; prefix to all module tagnames - useful for unique aliases for multiple AN-X
                                    modules
;ClearOnProgram       ; If the Ethernet/IP scanner is in Program Mode, all data sent on DCSNet will be
                                    zero


;-------------------------------------------------------------------------------
; This sample maps the following:
; Broadcast Register 32 from Ethernet/IP Run/Idle
; Drop  1 Depth 2 (1-2)
; Drop 10 Depth 2 (10-11)
; Drop 40 Depth 1
; Drop 54 Depth 2 (54-55)
; Broadcast Registers 33-39
; Note that not all 32 registers need to be mapped, so many more drops
; may be mapped into a connection if just the necessary registers are chosen
;
ClxSlot 0 DCS_Data  ; Slot/Connection Number and optional Name
DataOutput          ; Outputs from ControlLogix to DCSNet
;<Ofs>,Drop Reg Length <Ofs> optional - comma if not specified
Run  0 32  1        ; This Master Broadcast Register 32 from Ethernet/IP Run/Idle
  0  1 32 32        ; This Master to Drop  1 Slave Registers 32-63
 32  2 32 32        ; This Master to Drop  2 Slave Registers 32-63
 64 10 32 32        ; This Master to Drop 10 Slave Registers 32-63
 96 11 32 32        ; This Master to Drop 11 Slave Registers 32-63
128 40 32 32        ; This Master to Drop 40 Slave Registers 32-63
160 54 32 32        ; This Master to Drop 54 Slave Registers 32-63
192 55 32 32        ; This Master to Drop 55 Slave Registers 32-63
224  0 33  7        ; This Master Broadcast Registers 33-39

DataInput           ; Inputs to ControlLogix from DCSNet
;<Ofs>,Drop Reg Length <Ofs> optional - comma if not specified
  0  1  0 32        ; This Master from Drop  1 Slave Registers 0-31
 32  2  0 32        ; This Master from Drop  2 Slave Registers 0-31
 64 10  0 32        ; This Master from Drop 10 Slave Registers 0-31
 96 11  0 32        ; This Master from Drop 11 Slave Registers 0-31
128 40  0 32        ; This Master from Drop 40 Slave Registers 0-31
160 54  0 32        ; This Master from Drop 54 Slave Registers 0-31
192 55  0 32        ; This Master from Drop 55 Slave Registers 0-31
;-------------------------------------------------------------------------------
```

Sending the Configuration to AN-X3

To send the configuration to the AN-X:

1. Start your web browser

2. Enter the AN-X3 IP address as the address, for example, 192.168.0.10

3. Select *Automation Network/Configure Ethernet/IP*

4. Browse or type in the configuration file name

5. Click '*Send File to AN-X*'

The web interface displays the result of the upload, the Configuration File uploaded and the Configuration Log.

The configuration log shows any errors encountered, or a Success Message at the bottom.

Viewing the Current Configuration

To view the configuration in an AN-X3 module, access the AN-X3 using the web interface, and select *Automation Network/Configuration View.*

Use *Retrieve Current Configuration* to save the current configuration on the AN-X to your computer.

Ethernet/IP Log

Errors that occur during operation of Ethernet/IP scheduled data or unscheduled messaging 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-DCSNet Ethernet/IP scheduled connections are configured, the AN-X3 creates a csv file that can be imported into RSLogix 5000.

This csv file creates tag aliases for access to DCSNet data in the ControlLogix. The tags alias to I/O tree using the name defined by 'ClxName' 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.

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

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

Diagnostic Data – Connection 15

```
;----------------------------------------------------------------------------
; Slot 15 Diagnostics Connection Data Layout
; DataOutput
;    0"AnxAmxDcs Zero Diagnostic Counters on bit 0 transition to 1"
; DataInput
;    4 "AnxAmxDcs Drop List  0-15"
;    5 "AnxAmxDcs Drop List 16-31"
;    6 "AnxAmxDcs Drop List 32-47"
;    7 "AnxAmxDcs Drop List 48-55"
;
;    8 "AnxAmxDcs Ethernet/IP Slot Connection Status"
;   10 "AnxAmxDcs Rx Protocol Errors/Type"
;   11 "AnxAmxDcs Rx Noise Errors/Type"
;   12 "AnxAmxDcs Drop Number/Type"
;   14 "AnxAmxDcs Rx Frames Good"
;   15 "AnxAmxDcs Rx Timeout Errors"
;   16 "AnxAmxDcs Rx CRC Error"
;   17 "AnxAmxDcs Rx Overrun Errors"
;   18 "AnxAmxDcs Rx Abort Errors"
;   19 "AnxAmxDcs Tx Frames"
;   20 "AnxAmxDcs Drop Depth/Type"
;
;   24 "AnxAmxDcs Primary Drop List  0-15"
;   25 "AnxAmxDcs Primary Drop List 16-31"
;   26 "AnxAmxDcs Primary Drop List 32-47"
;   27 "AnxAmxDcs Primary Drop List 48-55"
;
;   35 "AnxAmxDcs UDP TX Count"
;   36 "AnxAmxDcs UDP RX Count"
;   37 "AnxAmxDcs UDP EthErr Ctr(Lo) Typ(Hi)"
;   38 "AnxAmxDcs UDP PrtErr Ctr(Lo) Typ/Slt(Hi)"
;
;   40 "AnxAmxDcs CLX -> AN-X Slot  0 Upd Time (*100us, Avg)"
;   42 "AnxAmxDcs CLX -> AN-X Slot  0 Upd Time (*100us, Min)"
;   44 "AnxAmxDcs CLX -> AN-X Slot  0 Upd Time (*100us, Max)"
;
;   50 "AnxAmxDcs CLX -> AN-X Slot  1 Upd Time (*100us, Avg)"
;   52 "AnxAmxDcs CLX -> AN-X Slot  1 Upd Time (*100us, Min)"
;   54 "AnxAmxDcs CLX -> AN-X Slot  1 Upd Time (*100us, Max)"
;
;   60 "AnxAmxDcs CLX -> AN-X Slot  2 Upd Time (*100us, Avg)"
;   62 "AnxAmxDcs CLX -> AN-X Slot  2 Upd Time (*100us, Min)"
;   64 "AnxAmxDcs CLX -> AN-X Slot  2 Upd Time (*100us, Max)"
;
;   70 "AnxAmxDcs CLX -> AN-X Slot  3 Upd Time (*100us, Avg)"
;   72 "AnxAmxDcs CLX -> AN-X Slot  3 Upd Time (*100us, Min)"
;   74 "AnxAmxDcs CLX -> AN-X Slot  3 Upd Time (*100us, Max)"
;
;   80 "AnxAmxDcs CLX -> AN-X Slot  4 Upd Time (*100us, Avg)"
;   82 "AnxAmxDcs CLX -> AN-X Slot  4 Upd Time (*100us, Min)"
;   84 "AnxAmxDcs CLX -> AN-X Slot  4 Upd Time (*100us, Max)"
;
;   90 "AnxAmxDcs CLX -> AN-X Slot  5 Upd Time (*100us, Avg)"
;   92 "AnxAmxDcs CLX -> AN-X Slot  5 Upd Time (*100us, Min)"
;   94 "AnxAmxDcs CLX -> AN-X Slot  5 Upd Time (*100us, Max)"
;
;  100 "AnxAmxDcs CLX -> AN-X Slot  6 Upd Time (*100us, Avg)"
;  102 "AnxAmxDcs CLX -> AN-X Slot  6 Upd Time (*100us, Min)"
;  104 "AnxAmxDcs CLX -> AN-X Slot  6 Upd Time (*100us, Max)"
;
;  110 "AnxAmxDcs CLX -> AN-X Slot  7 Upd Time (*100us, Avg)"
;  112 "AnxAmxDcs CLX -> AN-X Slot  7 Upd Time (*100us, Min)"
;  114 "AnxAmxDcs CLX -> AN-X Slot  7 Upd Time (*100us, Max)"
;
;  120 "AnxAmxDcs CLX -> AN-X Slot  8 Upd Time (*100us, Avg)"
;  122 "AnxAmxDcs CLX -> AN-X Slot  8 Upd Time (*100us, Min)"
;  124 "AnxAmxDcs CLX -> AN-X Slot  8 Upd Time (*100us, Max)"
;
;  130 "AnxAmxDcs CLX -> AN-X Slot  9 Upd Time (*100us, Avg)"
;  132 "AnxAmxDcs CLX -> AN-X Slot  9 Upd Time (*100us, Min)"
;  134 "AnxAmxDcs CLX -> AN-X Slot  9 Upd Time (*100us, Max)"
;
```

```
; 140 "AnxAmxDcs CLX -> AN-X Slot 10 Upd Time (*100us, Avg)"
; 142 "AnxAmxDcs CLX -> AN-X Slot 10 Upd Time (*100us, Min)"
; 144 "AnxAmxDcs CLX -> AN-X Slot 10 Upd Time (*100us, Max)"
;
; 150 "AnxAmxDcs CLX -> AN-X Slot 11 Upd Time (*100us, Avg)"
; 152 "AnxAmxDcs CLX -> AN-X Slot 11 Upd Time (*100us, Min)"
; 154 "AnxAmxDcs CLX -> AN-X Slot 11 Upd Time (*100us, Max)"
;
; 160 "AnxAmxDcs CLX -> AN-X Slot 12 Upd Time (*100us, Avg)"
; 162 "AnxAmxDcs CLX -> AN-X Slot 12 Upd Time (*100us, Min)"
; 164 "AnxAmxDcs CLX -> AN-X Slot 12 Upd Time (*100us, Max)"
;
; 170 "AnxAmxDcs CLX -> AN-X Slot 13 Upd Time (*100us, Avg)"
; 172 "AnxAmxDcs CLX -> AN-X Slot 13 Upd Time (*100us, Min)"
; 174 "AnxAmxDcs CLX -> AN-X Slot 13 Upd Time (*100us, Max)"
;
; 180 "AnxAmxDcs CLX -> AN-X Slot 14 Upd Time (*100us, Avg)"
; 182 "AnxAmxDcs CLX -> AN-X Slot 14 Upd Time (*100us, Min)"
; 184 "AnxAmxDcs CLX -> AN-X Slot 14 Upd Time (*100us, Max)"
;
; 190 "AnxAmxDcs CLX -> AN-X Slot 15 Upd Time (*100us, Avg)"
; 192 "AnxAmxDcs CLX -> AN-X Slot 15 Upd Time (*100us, Min)"
; 194 "AnxAmxDcs CLX -> AN-X Slot 15 Upd Time (*100us, Max)"
;-------------------------------------------------------------------------
```

AN-X to AN-X Communication

The AN-X3-DCSNet module does not support AN-X to AN-X communication.

Ethernet "HMI" PLC-5 File Emulation

You can use a DDE or OPC server, such as RSLinx, or an Allen-Bradley PLC etc. to access DCS data registers directly on the AN-X3-DCSNet. The module "emulates" PLC-5 integer files N100 to N155. Each file corresponds to a DCS drop. For example, if you access N102:32 this corresponds to Drop 2 Register 32.

The AN-X3-DCSNet supports Word Range read/write, Typed read/write, Read/Modify/Write, and PLC-3 Bit Write messages, with both logical ASCII and logical binary addressing.

To configure a topic in RSLinx to access data on the AN-X3-DCSNet:

1. Create a new topic. From the main menu select *DDE/OPC/Topic Configuration*. Click *New* and give the topic a name.

2. For the Data source, browse the path to the AN-X3 module and click Apply.

3. On the *Data Collection* tab, set the *Processor Type* to *PLC-5*. Check *Polled Messages* and select an appropriate update rate. Leave everything else unchecked. Click *Apply*

4. You do not need to set anything on the Advanced Communication tab.

5. Click *Done* to complete the topic configuration.

You can now access data using any DDE or OPC client capable of communicating with RSLinx.

Using RSLinx to View Data

AN-X3 appears to RSLinx to be an Ethernet PLC-5, specifically a PLC-5/20E.
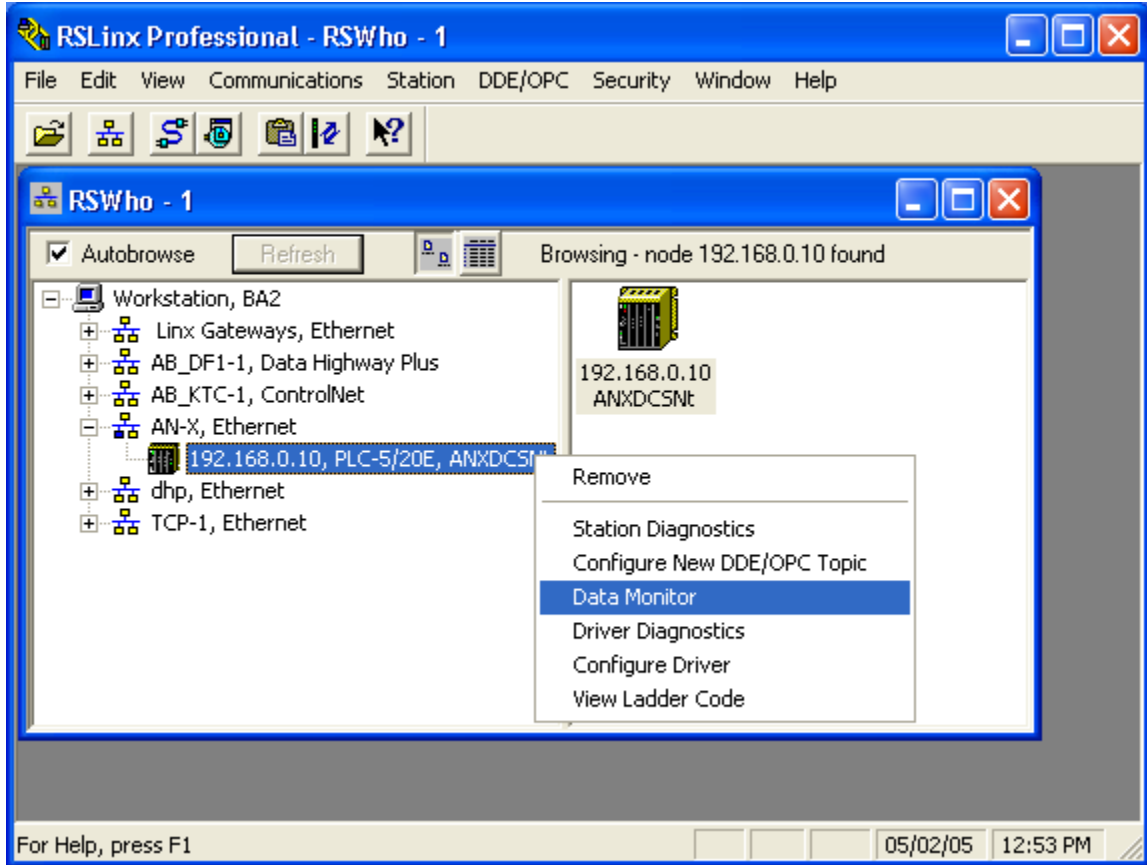
First create an Ethernet driver to communicate with the AN-X3.

If you right click on the AN-X3 module in RSLinx and select Data Monitor, a list of files appears.

Each file corresponds to the data for one DCS drop. File N100 corresponds to drop 0, N101 corresponds to drop 1 and so on.

To view the drop data, double click on the appropriate file.

To change the display format, right click on the data display and select *Properties*, then select the format you want.

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 Drop Number and Drop Depth (DCS-SLV)
- 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 DCSNet

Select *Automation Network/Monitor DCSNet* to display DCSNet status, diagnostic counters and data.

Monitor DCSNet

Clear Diagnostics   Refresh   ☑ Auto Refresh ☑ Hex ■ WrtEna

Drop	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
20	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
40	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☐ All		☐ None	

DCSNet Diagnostic Counters

DropAct[4-5]	fffffc01	DropAct[6-7]	00ffffff				
DropNum[12]	10	DropDpth[20]	46	TxCount[19]	31013	RxGood[14]	23137
RxTout[15]	0	RxCrcErr[16]	0	RxOver[17]	0	RxAbort[18]	0
Prtocol{10}	0	Noise{11}	0	PLC5 Good{21}	0	PLC5 Errs{22}	0

Broadcast to All Drops from Master

32	33	34	35	36	37	38	39
0000	0000	0000	0000	0000	0000	0000	0000

Drop 10								This Drop 10 to Master		
Reg	0	1	2	3	4	5	6	7	8	9
0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
10	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
20	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
30	0000	0000					This Drop 10 from Master			
30			0000	0000	0000	0000	0000	0000	0000	0000
40	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
50	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
60	0000	0000	0000	0000						

Drop 11								This Drop 11 to Master		
Reg	0	1	2	3	4	5	6	7	8	9
0	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
10	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
20	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
30	0000	0000					This Drop 11 from Master			
30			0000	0000	0000	0000	0000	0000	0000	0000

Check boxes may be used to choose which nodes to display.

See page 18 for diagnostic counter descriptions.

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
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 15 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.

AN-X Firmware Update

Caution: this operation requires a restart of the AN-X module and disrupts communication. After clicking the Update Firmware button, **do not move off the current web page** until the firmware update is complete.

Select a Firmware File to Upload

[Choose File] AN-X3-DCS-SLV.v4.1.7.qtf

[Update Firmware]

Firmware sent ... waiting for validation and copy processes to finish (about a minute)...

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

AN-X Firmware Update

Caution: this operation requires a restart of the AN-X module and disrupts communication. After clicking the Update Firmware button, **do not move off the current web page** until the firmware update is complete.

Select a Firmware File to Upload

[Choose File] No file chosen

[Update Firmware]

Firmware update to AN-X3-DCS-SLV.v4.1.7.qtf was successful.

Click this **RESTART** link to restart the AN-X and run the new firmware version

Manual Firmware Update

AN-X Firmware qtf files can be copied and updated on the microSD manually.

- Remove the microSD and insert it into your computer. You should see the current qtf file (AN-X3-DCS-SLV.v4.1.7.qtf for example).

- Delete or change the name of the current qtf file (zzAN-X3-DCS-SLV.v4.1.6.qtf for example). Renaming may be useful in case we need to revert back to the previous version.

- Copy the new qtf file to the microSD.

- Remove the microSD from your computer and insert it back into the AN-X. Be careful not to insert it above the connector (see page 13).

TIP	The most recent firmware for the AN-X is available at qtsusa.com/dist
IMPORTANT!	Make sure there is only one qtf filename that starts with the '*Firmware Type:*' specified. If not, the AN-X may use the wrong one.

Diagnostic Capture

Use '*Administration/AN-X Diagnostic Capture*' to create an archive tar file that contains the current AN-X configuration and logs, for use by technical support. There may be a slight delay while AN-X builds the archive file.

AN-X Diagnostic Capture

Instructions:

Use the link provided below to retrieve the newly created diagnostic capture file. This file contains all the current configuration information, logs etc.

The archive file is a standard tar file.

This file contains the current configuration, logs and other diagnostic information which is useful for troubleshooting by technical support staff.

Archive File

Click the Archive File link.

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-DCSNet 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.

Powerup/Reboot

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. * Make sure power is not removed while railroading red.

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 DCS network connection.

DCS Master

All drops operating correctly	Solid green
No other drops	Yellow
Network error	Flashes red

DCS Slave

All drops operating correctly	Solid green
No other drops	Solid red
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	Gateway between Ethernet and Reliance AutoMax DCSNet 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

+33 (0) 5.34.36.87.20, support.EMEA@prosoft-technology.com

North America

Languages Spoken: English, Spanish

+1.661.716.5100, support@prosoft-technology.com

Latin America (Brazil)

Languages Spoken: Portuguese, English

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

Latin America (Spanish Speaking Countries)

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