

AN-X2-ABDHRIO
Remote I/O HMI
Interface 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-X2-ABDHRIO gateway

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Module Overview



The RIO-HMI communications module is used to connect HMI, SCADA, or MES systems to data on an Allen-Bradley Remote I/O network. Typical applications for this module include replacing obsolete HMIs with built-in Remote I/O cards with newer HMI terminals that connect to an EtherNet IP network such as a Panelview Plus 6. For applications where multiple HMI terminals exist on a single Remote I/O network a single AN-X2 gateway can be used to provide data to these HMI terminals.

Remote I/O network features:

- emulates up to 16 racks, from 0 to 76 octal, with any combination of partial racks
- supports all remote I/O baud rates
- supports block transfer reads and writes at all possible locations on these racks

IMPORTANT!

Firmware versions prior to 4.2.1 for the AN-X2-ABRIO-HMI supported only racks 1-76 octal. Version 4.2.1 added support for rack 0 and partial racks on rack 0.

The Ethernet IP device(s) access data on the AN-X as PLC-5 input (I), output (O), status (S) and integer (N) files.

The AN-X2-ABRIO-HMI module has a web interface for configuration, for monitoring logs and diagnostic counters, and for performing other administrative functions. You can communicate with the module using any standard web browser such as Internet Explorer.

The module firmware can be updated over Ethernet using the web interface. Refer to page 35 for details.

Hardware Features



The module has:

- LEDs to indicate the status of the connection to the Ethernet (100 and Link/Act)
- a LED to indicate the module's internal state (SYS)
- a LED to indicate the state of communications on the Remote I/O network (NET)
- an Ethernet connector
- a power connector
- a 3-pin Phoenix connector to connect to the remote I/O network

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.

Package Contents

- AN-X2-ABRIO-HMI module
- CD containing software and documentation
- microSD to SD card adapter
- rubber feet for desktop use

Identifying the AN-X2 versus the Original AN-X

The label on the bottom toward the front says AN-X2.

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

When initially powered up:

- AN-X2 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-X2 (both Ethernet LEDs are off for the original AN-X)

Comparisons with the Original AN-X

AN-X2 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-X2 requires firmware version 4 and above.

The AN-X2 uses the same hardware interface to the automation networks.

There are no differences for applications once Ethernet and firmware have been configured.

Using the MicroSD Card

The AN-X2 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.

An adapter is provided so you can insert the microSD card in an SD slot in your computer.

The card must be present while the AN-X2 is running.

WARNING! Do not remove the card while the AN-X2 is powered on!

If the AN-X2 is inaccessible from Ethernet because of its settings, you can remove the card and edit the file config.txt. Refer to page 12 for details.

Insert the card in the slot at the back of the AN-X2, 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-X2 to retrieve it.



AN-X2 Modes of Operation

There are two AN-X2 modes of operation:

- Maintenance mode. The AN-X2 runs the maintenance firmware at startup. It performs diagnostics (memory tests, etc), and copies any changes from the microSD card. If there are no errors, it starts the AN-X2 in production mode.
- Production mode. This is the normal runtime mode of operation.



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Installation

Prevent Electrostatic Discharge

The module is sensitive to electrostatic discharge.

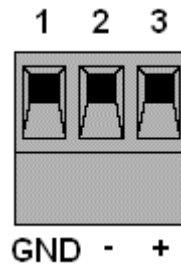
WARNING!

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

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

Power

AN-X requires 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. Pin 1 is closest to the Ethernet connector.

The chassis ground should be connected.

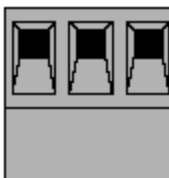
Power consumption internally is 200 mA @ 12VDC or 100 mA @ 24VDC.

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

Cabling and Termination

Follow Allen-Bradley cabling recommendations for remote I/O. Refer to Approved Vendor List for DH, DH+, DH-485, and Remote I/O Cables, publication ICCG-2.2, February 1996.

On the AN-X module, the remote I/O connections should be line 1, shield, line 2.

1 sh 2

Line 1 on the AN-X is closest to the power connector.

Check the wiring to ensure that line 1 on the AN-X is connected to line 1 on the PLC, and so on.

Terminate both ends of a remote I/O network by using external resistors attached to the physical ends of the network. There should be two and only two terminators on the network.

Use 82 ohm resistors if the network operates at 230.4 kbps or if the network operates at 57.6 kbps or 115.2 kbps and none of the devices in the table below are present. The maximum number of physical devices on the network is 32.

Use 150 ohm resistors if the network contains any of the devices in the table below, or if the network operates at 57.6 kbps or 115.2 kbps and you do not require the network to support more than 16 physical devices.

Device Type	Catalog Number	Series
Adapters	1771-AS	All
	1771-ASB	Series A and B
	1771-DCM	All
Miscellaneous	1771-AF	All
	1771-AF1	All

Baud Rate	Maximum Cable Length
57.6 Kbaud	10000 ft
115.2 Kbaud	5000 ft
230.4 Kbaud	2500 ft

The most common causes of connection errors are:

- wiring reversed (lines 1 and 2)
- incorrect baud rate
- other cabling and termination problems
- duplicate or overlapping address

Ethernet Cabling

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

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

If you are connecting directly to the AN-X module, use a crossover cable.

Software Installation

There is no required software installation for the AN-X2-ABDHRIO. All configuration can be done from the web interface.

CE Installations

If you are installing the AN-X2 in a location which requires CE, install the following ferrites or their equivalents on the cables:

Steward 28A2024-0A2 on Ethernet cable close to module, one loop

Steward 28A2024-0A2 on power cable

Steward 28A2025-0A2 on DH+/RIO Cable



Quick Start

Step	Operation	See page
1	Power up the AN-X, connect it to Ethernet and assign it an IP address	9
2	Connect AN-X to the Remote I/O network	5
3	Create a configuration file	16
4	Use the AN-X web interface to download the configuration file and configure the remote I/O network	23
5	Access the remote I/O data from the HMI or other device	19



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Ethernet Configuration

Before you can use the AN-X2-ABDHRIO, you must configure its network properties on Ethernet.

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 each time 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-X2 must be on the same subnet as the computer to use the link-local IP address. It cannot be connected through a router.

TIP

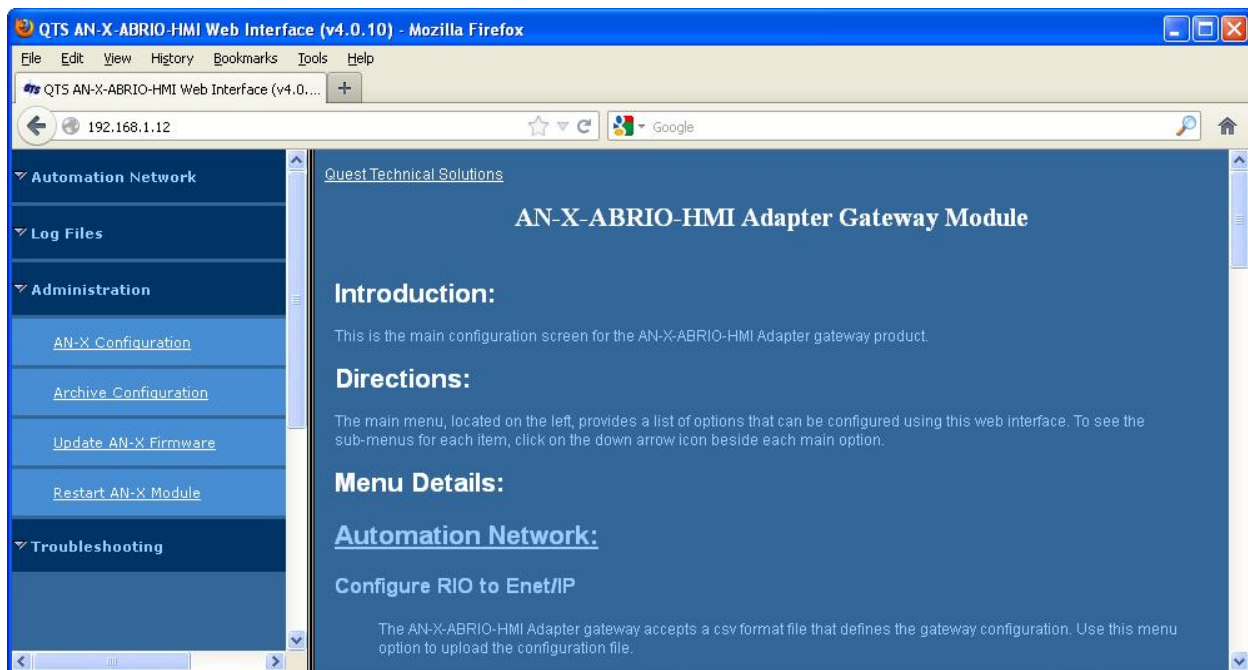
The module is shipped configured for use with the Data Highway Plus firmware. The initial screen you see will be slightly different from that shown below.

Select *Administration/AN-X Configuration*.

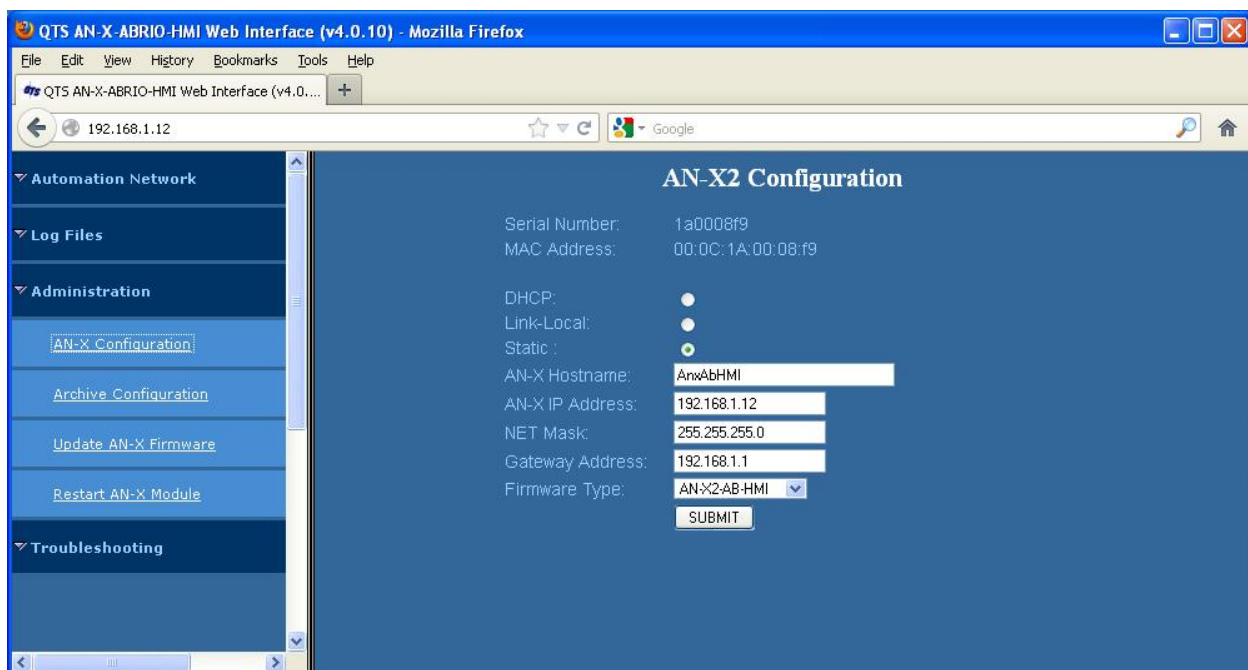


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The AN-X2 Configuration page appears.



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

Check either DHCP or Static.



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DHCP

If the AN-X2 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.

When you submit the changes, if the AN-X2 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-X2. 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

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.

IMPORTANT!

Make sure that the firmware selected is AN-X2-AB-HMI to load the firmware for remote I/O HMI use.

Submitting the Configuration

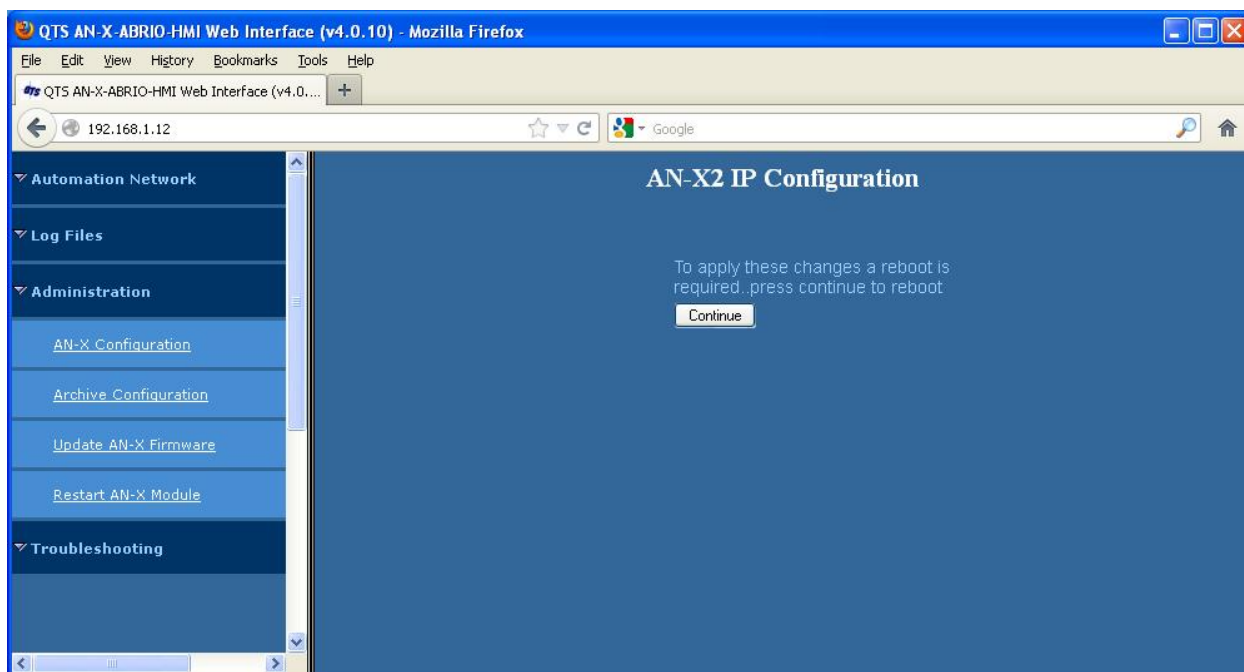
Once you have entered all required parameters, click SUBMIT to write the configuration to the file config.txt on the microSD card. The changes do not take effect until the AN-X restarts.

The following page appears when you click SUBMIT.



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Click *Continue* to restart the AN-X2, 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-X2 to the desired configuration.

The Configuration File

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

The file config.txt is a text file that contains the Ethernet 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-X2 finds an error during startup, it flashes an error code on the SYS LED, see page 33.

Example config.txt files

Example: Link- Local IP address

```
IP: LOCAL
Hostname: ANX2Hmi
Firmware: AN-X2-AB-HMI
```

Example: DHCP

```
IP: DHCP
Hostname: ANX2Hmi
Firmware: AN-X2-AB-HMI
```

Example: static IP address

```
IP: 192.168.1.14
NetMask: 255.255.255.0
DefGtwy: 192.168.1.1
HostName: ANX2Hmi
Firmware: AN-X2-AB-HMI
```

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-X2 modules are shipped set to the address 169.254.42.84 for initial configuration. This



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address is almost always accessible from a computer on the same local Ethernet as the AN-X.

If you cannot access the AN-X2 at address 169.254.42.84 using a web browser, open a command prompt window and type

route print

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 in your computer that is connected to the AN-X2.

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



Now try pinging the AN-X2 at 169.254.42.84. You should now be able to access it using a browser to set the desired Ethernet configuration.



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Configuring Remote I/O

Configuring a Remote I/O Network

The remote I/O configuration consists of:

1. the baud rate
2. rack definitions
3. block transfer definitions

Configuration File

The remote I/O configuration is defined in a comma-separated values (CSV) text file.

The configuration file starts with a line with just the keyword `RioCfg`.

The configuration ends with a line that contains just the keyword `EndRioCfg`. Anything after the `EndRioCfg` line is ignored

Within the configuration data, anything after a semicolon is treated as a comment. A comment can be inserted at the end of a line or on a separate line.

The file can also contain blank lines.

You download the configuration to the AN-X using the web interface (see page 23)

Baud Rate

The baud rate is defined by a line that consists of the keyword `Baud`, followed by a comma, and then one of 57k, 115k or 230k.

Selection	Baud Rate, kbits/second
57k	57.6
115k	115.2
230k	230.4

The baud rate definition must be included in the configuration file.

Example

`Baud, 57k`

Racks

Racks are defined by line that consist of the keyword `Rack`, followed by a comma, the racknumber in octal in the form `00xx` where `xx` is the rack number from 0 to 76 octal, a comma, the start quarter (1-4), a comma, and the end quarter (1-4).



Examples

Rack, 0o01,1,4

Rack, 0o07,1,1

The end quarter must be greater than or equal to the start quarter.

There can be a maximum of 16 different rack numbers (not 16 separate rack definitions).

There must be at least one rack definition in the configuration file.

Block Transfers

Block transfer definitions contain the block transfer type (read or write), the location (rack, I/O group and slot), the PLC-5 file address (file number and offset) where the HMI can access the data, and the block transfer length. The fields must be separated by commas.

btr, rack, I/O group, slot, PLC-5 integer file, offset, length

btw, rack, I/O group, slot, PLC-5 integer file, offset, length

The rack number is in the form 0oxx where xx is the rack number from 0 to 76 octal.

The rack must have been previously defined in a rack definition.

The I/O group must be in the range 0 to 7.

The slot must be 0 or 1.

The PLC-5 file is always an integer (N) file. The file number can be from 3 to 999. The offset can be from 0 to 999. The offset + length cannot exceed 1000.

The block transfer length can be from 1 to 64.

The rack address must have been previously defined or the block transfer definition will produce an error.

Data mappings for block transfer reads and block transfer writes cannot overlap.

Examples

btr,0o01,0,0,31,0,1

btw,0o01,0,0,32,0,1

Block Transfers by Length

For compatibility with some existing PanelView applications, AN-X2-ABRIO-HMI supports a block transfer by length mode, where multiple block transfers of different lengths are defined at the same I/O location (rack, I/O group and slot). When the remote I/O scanner requests a block transfer at that location, the AN-X uses the requested length to select which data to access.

The block transfer must be at the lowest address in the rack where the block transfer is found. For example, if the rack is a quarter rack, rack 1, starting at I/O group 2 (second quarter), any block transfers must be at rack 1, I/O group 2, slot 0.



If you are using block transfer by length mode, only one rack number can be defined in the configuration.

The configuration file must contain a line with the keyword BtByLen before the rack and block transfer definitions.

Sample Configuration

```
RioCfg, ; start of configuration

Baud, 57k6, ;define baud rate for 1771 IO network (57k6,115k2,230k4)

Rack, 0o01, 1, 4, ;define rack at octal 01, start quarter 1, end quarter 4

btr, 0o01, 0, 0, 31, 0, 64, ;define btr, rack 01, group 0, slot 0 -> N31:0,
length is 64

btw, 0o01, 0, 0, 31, 128, 64, ;define btw, rack 01, group 0, slot 0 -> N31:128,
length is 64

EndRioCfg,
```

Sample Block Transfer by Length Configuration

```
RioCfg, ; start of configuration

Baud, 57k, ;define baud rate for 1771 IO network

BtByLen, ;emulate SRIIO configuration and map BT by len

Rack, 0o01, 1, 1, ;in BtByLen user can define only one rack

btr, 0o01, 0, 0, 31, 0, 1, ; each BTR definition must have a different length

btr, 0o01, 0, 0, 32, 0, 2, ; each BTR definition must have a different length

btw, 0o01, 0, 0, 33, 0, 1, ; each BTW must have a different length

btw, 0o01, 0, 0, 33, 3, 32 ; all BTs use group 0, slot 0

EndRioCfg
```

Downloading Configurations

To download a configuration to the AN-X-AB-RIO, start the web interface and select *Automation Network/Configure RIO to Enet/IP* to download a configuration file to the AN-X.



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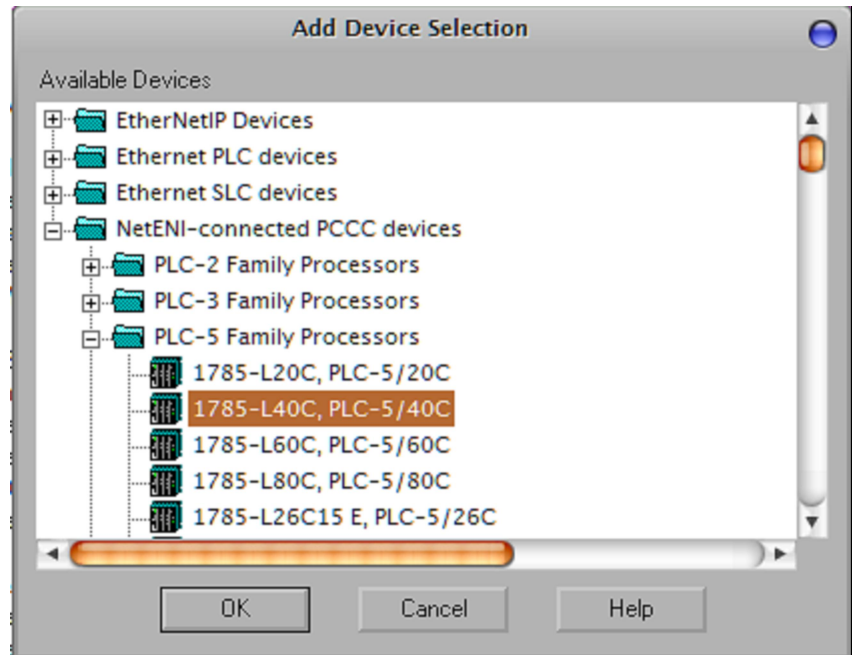


Accessing Data

Configuration

PanelView

Use FactoryTalk View Studio to add the RSLinx Enterprise device shown.



IMPORTANT!

Since the AN-X emulates a PLC-5 in FactoryTalk View Studio, the maximum rack number accessible is 27 octal.

Other HMIs

Access data on the AN-X as you would any other PLC-5. There is no restriction on accessible rack numbers for most HMIs.

I/O Data

Discrete I/O Data

Discrete data is mapped to PLC-5 I (input) and O (output) files, based on the rack and I/O group.

Block Transfer Data

Block transfer data is mapped to PLC-5 integer (N) files and offsets you specified in the remote I/O configuration.

Status File Information

AM-X maps remote I/O diagnostic counters and rack status to a PLC-5 status file. An HMI can access these counters by reading the status file.

The following tables show the contents.

Diagnostic Counters

Counter	Status file	Description
TX PACKETS	S2:0	Transmitted packets
GOOD RX PACKETS	S2:1	Good received packets
RX CRC ERRORs	S2:2	CRC errors
RX ABORT ERRORS	S2:3	Abort errors
RX NOISE ERRORS	S2:4	Noise errors
RX PACKET TIMEOUTS	S2:5	Timeouts, packet sent, no reply
RX PROTOCOL ERRORS	S2:6	Protocol errors
RX PROTOCOL MASK	S2:7	Indicates cause of protocol error

Rack status

Status table element	Contents
S2:8	Status racks 00-03
S2:9	Status racks 04-07
S2:10	Status racks 10-13
S2:11	Status racks 14-17
S2:12	Status racks 20-23
S2:13	Status racks 24-27
S2:14	Status racks 30-33
S2:15	Status racks 34-37
S2:16	Status racks 40-43
S2:17	Status racks 44-47
S2:18	Status racks 50-53



Status table element	Contents
S2:19	Status racks 54-57
S2:20	Status racks 60-63
S2:21	Status racks 64-67
S2:22	Status racks 70-73
S2:23	Status racks 74-76

The rack status contains 4 bits per rack, with the low bit corresponding to a rack starting at I/O group 0, etc. The bit is 1 if the rack is being scanned and is 0 otherwise.



Using the Web Interface

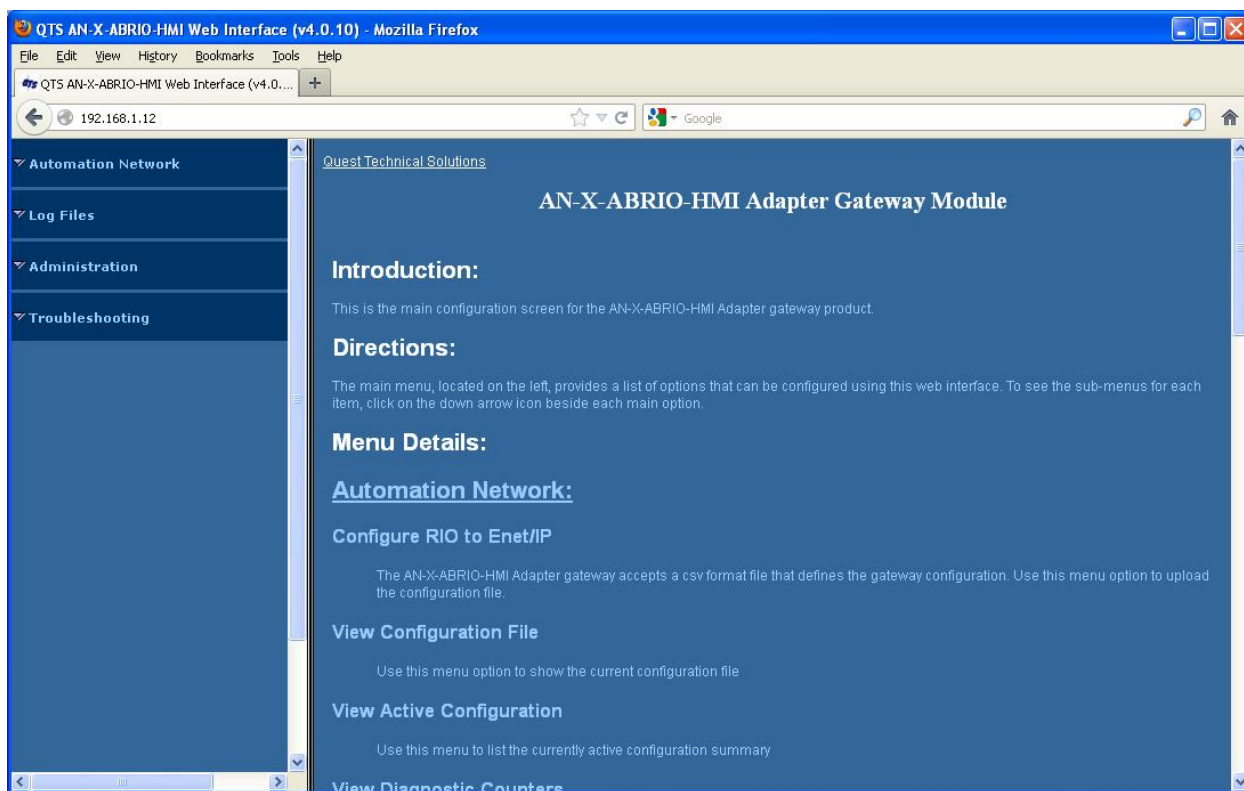
The AN-X module contains a webserver capable of communicating with standard web browsers such as Internet Explorer.

Use the web interface to:

- configure the remote I/O
- view the current configuration
- view diagnostic counters
- view AN-X logs
- perform administrative functions

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.



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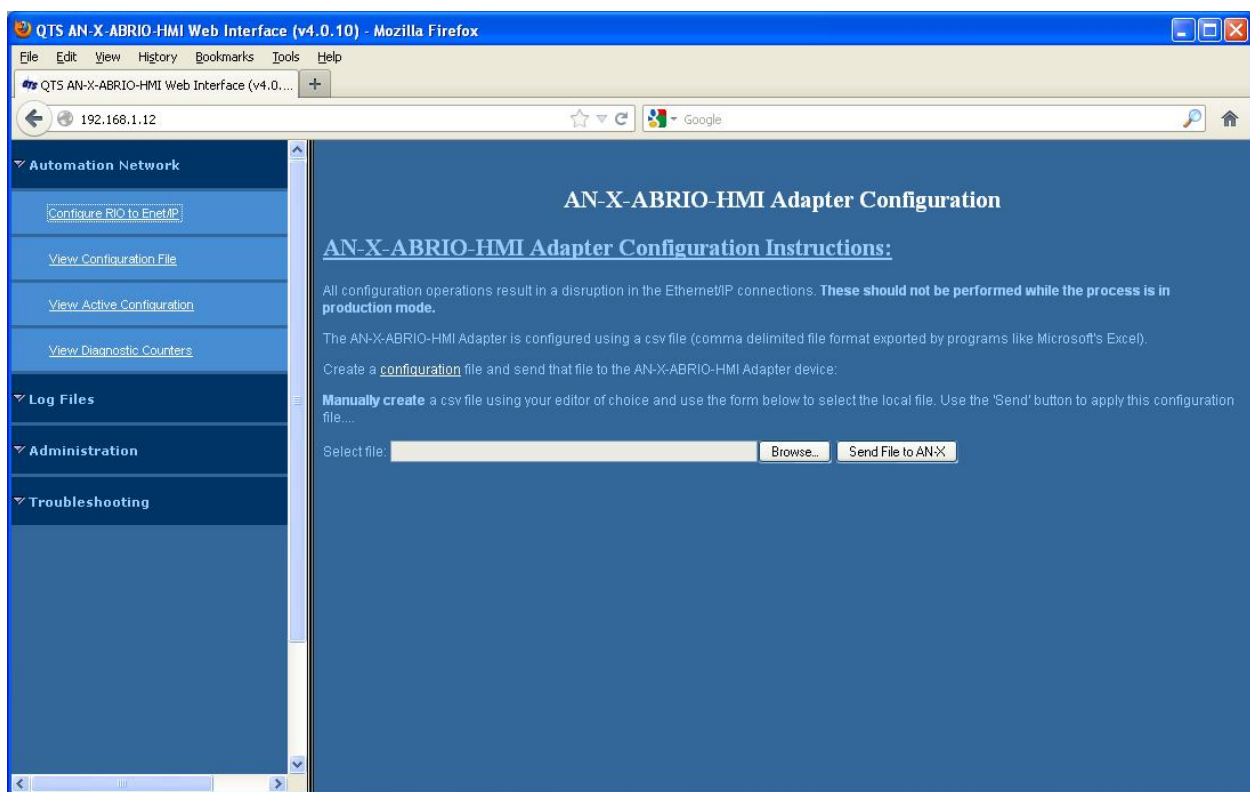


If you run into a problem where data appears not to have changed, flush the cache in the browser or run the browser in the mode where it doesn't cache data (incognito in Chrome, Private browsing in Firefox and Safari, etc.)

Automation Network

Configure RIO to Enet/IP

Select *Automation Network/Configure RIO to Enet/IP* to download a configuration file to the AN-X.



First create a configuration file. Refer to page 16 for details on the file format.

Use the *Browse* or *Choose File* button to select the file.

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

AN-X parses the file and displays either the configuration if it has been successful or a message that indicates the source of the error if it fails.

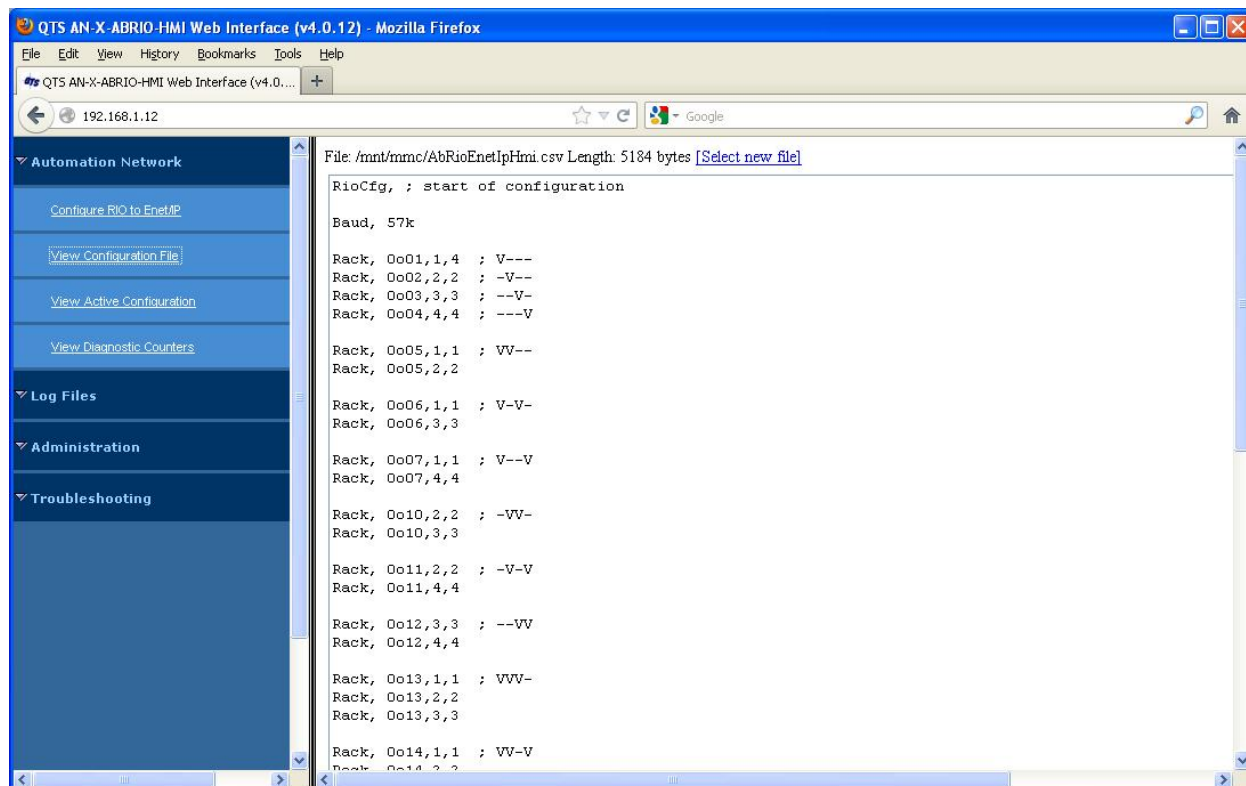
View Configuration File

Select *Automation Network/View Configuration File* to display the configuration file that was sent to the AN-X.



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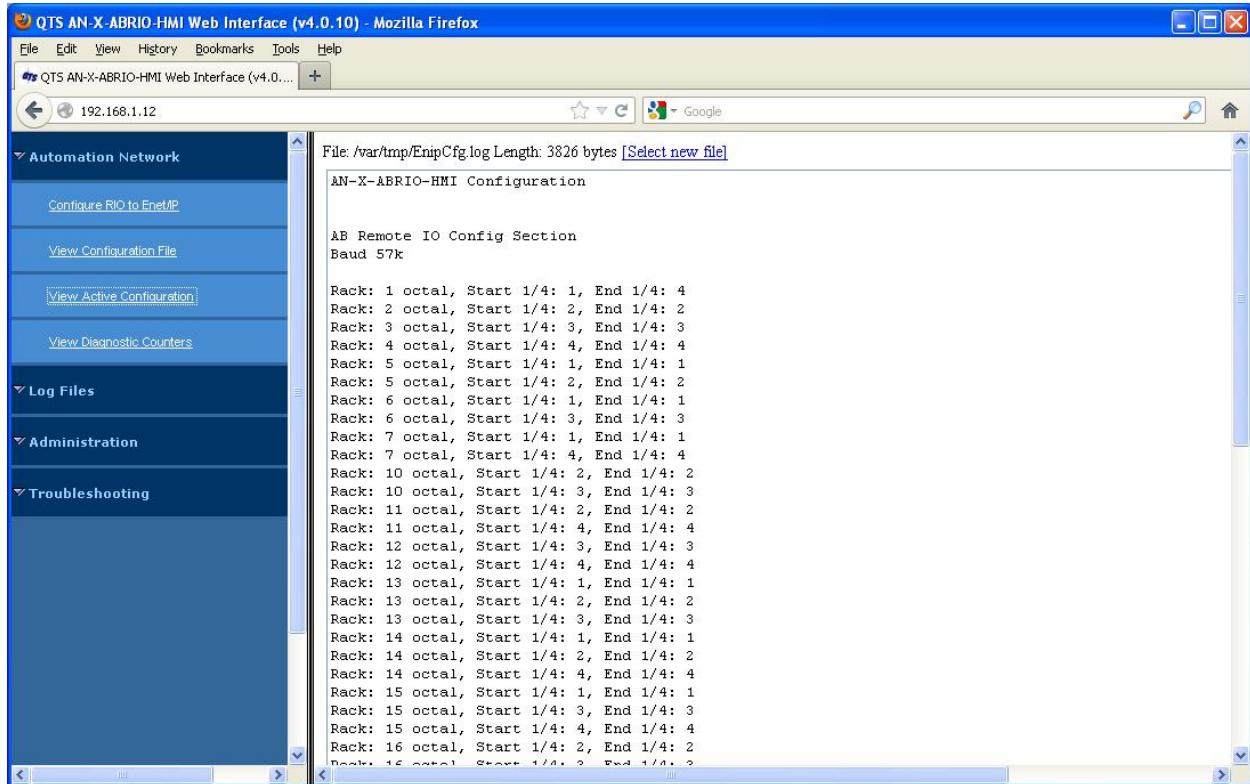




To save the configuration, copy the contents to a text file.

View Active Configuration

Select *Automation Network/View Active Configuration* to display the result of the last configuration download.



View Diagnostic Counters

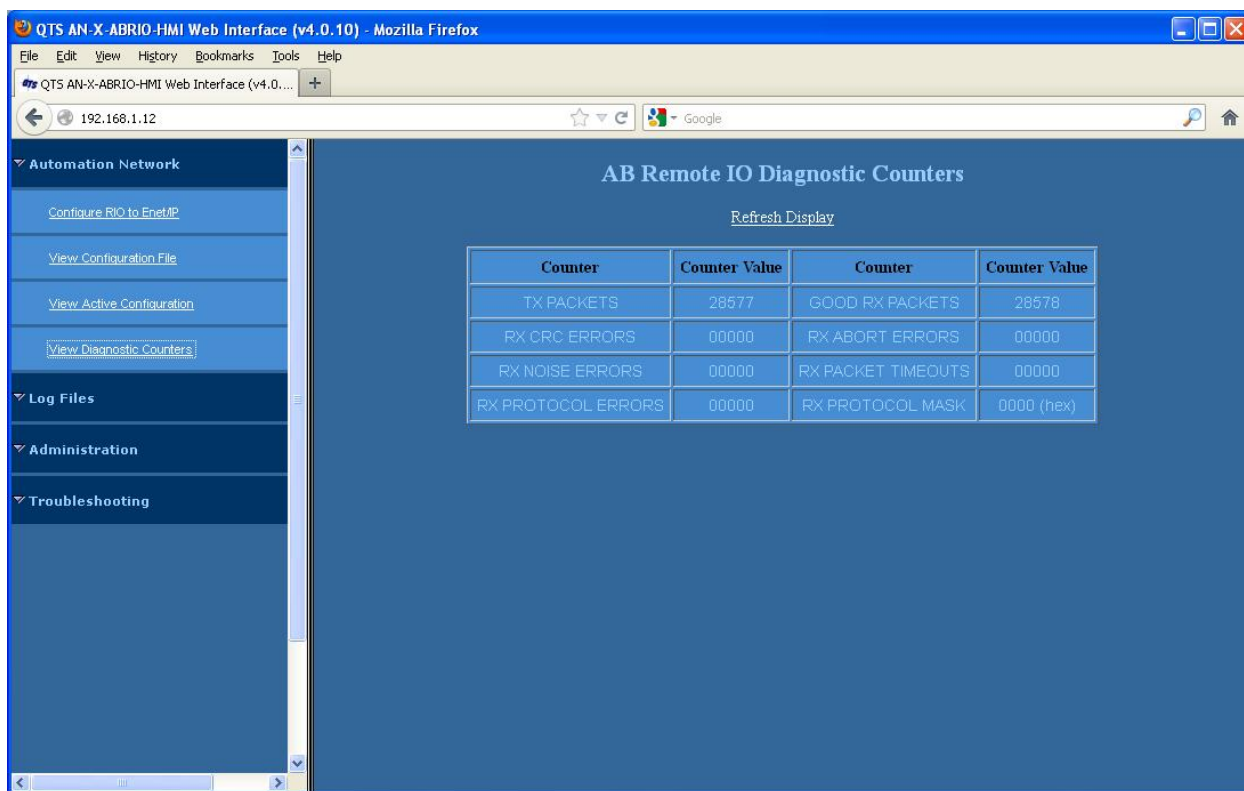
Select *Automation Network/View Diagnostic Counters* to display the remote I/O diagnostic counters.

Refer to page 20 for detailed information on the counters.



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Use the *Refresh Display* button to update the counters.

You can also access the counters from an HMI by reading the status (S) file on the AN-X (see page 20).

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 communication.

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.



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Administration Menu

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

AN-X Configuration

Use *AN-X Configuration* to set the AN-X Ethernet properties and to select the firmware the AN-X is to run.

QTS AN-X-ABRIO-HMI Web Interface (v4.0.10) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

QTS AN-X-ABRIO-HMI Web Interface (v4.0.10) +

192.168.1.12

Google

Automation Network

Log Files

Administration

AN-X Configuration

Archive Configuration

Update AN-X Firmware

Restart AN-X Module

Troubleshooting

AN-X2 Configuration

Serial Number: 1a0008f9
MAC Address: 00:0C:1A:00:08:f9

DHCP: ☐
Link-Local: ☐
Static: ☐

AN-X Hostname: AnxAbHMI

AN-X IP Address: 192.168.1.12

NET Mask: 255.255.255.0

Gateway Address: 192.168.1.1

Firmware Type: AN-X2-AB-HMI

SUBMIT

The top of the screen shows the serial number and MAC Address of the AN-X2 being configured.

Check either DHCP or Static.

DHCP

If the AN-X2 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-X2 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-X2. 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

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.

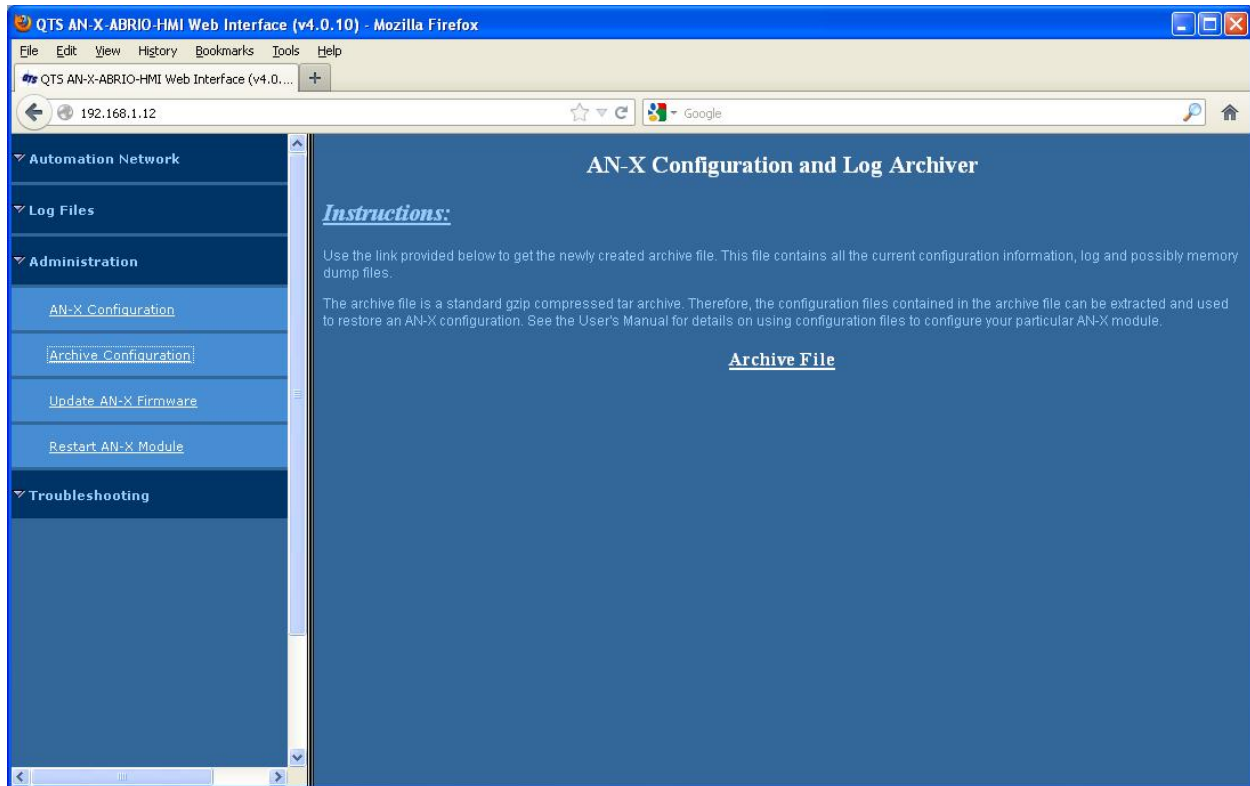
Submitting the Configuration

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.

Archive Configuration

Use *Archive Configuration* to create an archive that contains the current AN-X configuration and logs, for use by technical support.





Click the *Archive File* link and enter a filename and location.

Update AN-X Firmware

Use *Update AN-X Firmware* to download a firmware file to the microSD card on the AN-X. Firmware files for the AN-X2 have names that begin with AN-X2 and have extension *.qtf.

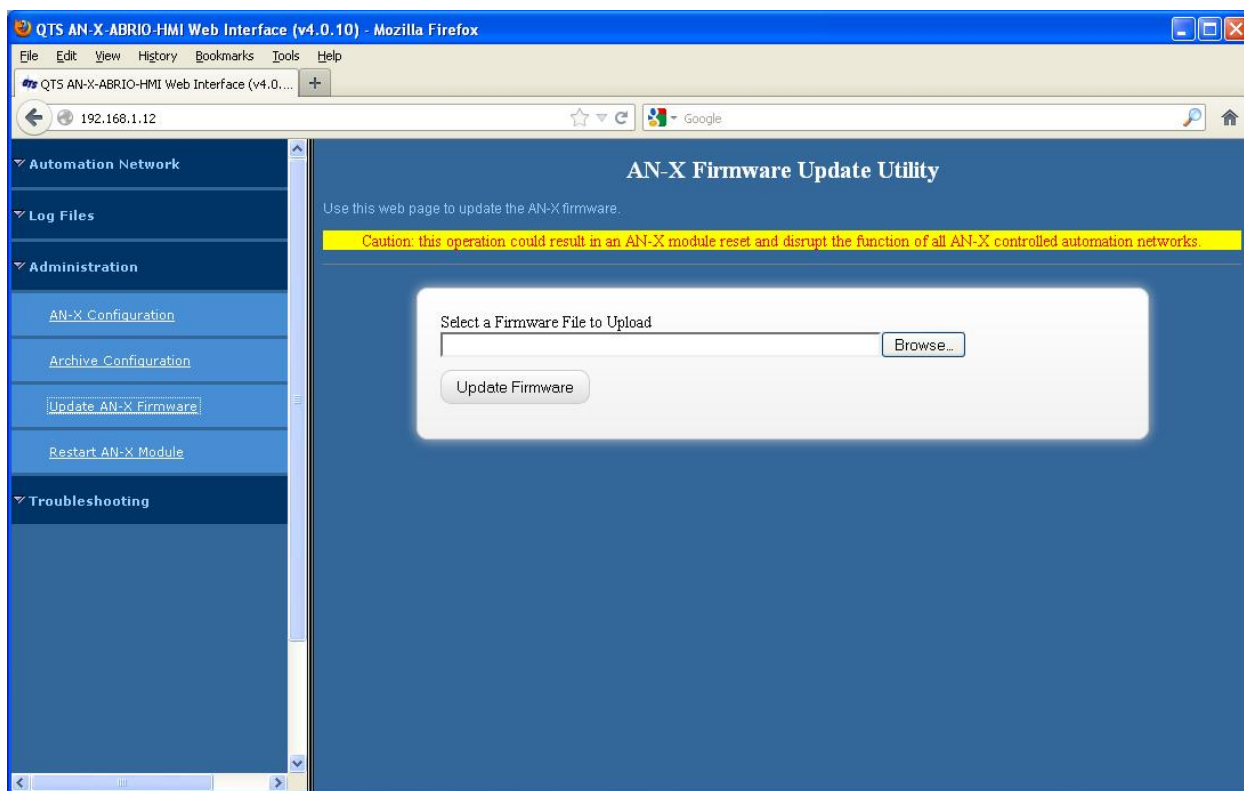
WARNING!

Do not download firmware to the AN-X while applications that use the AN-X are running.



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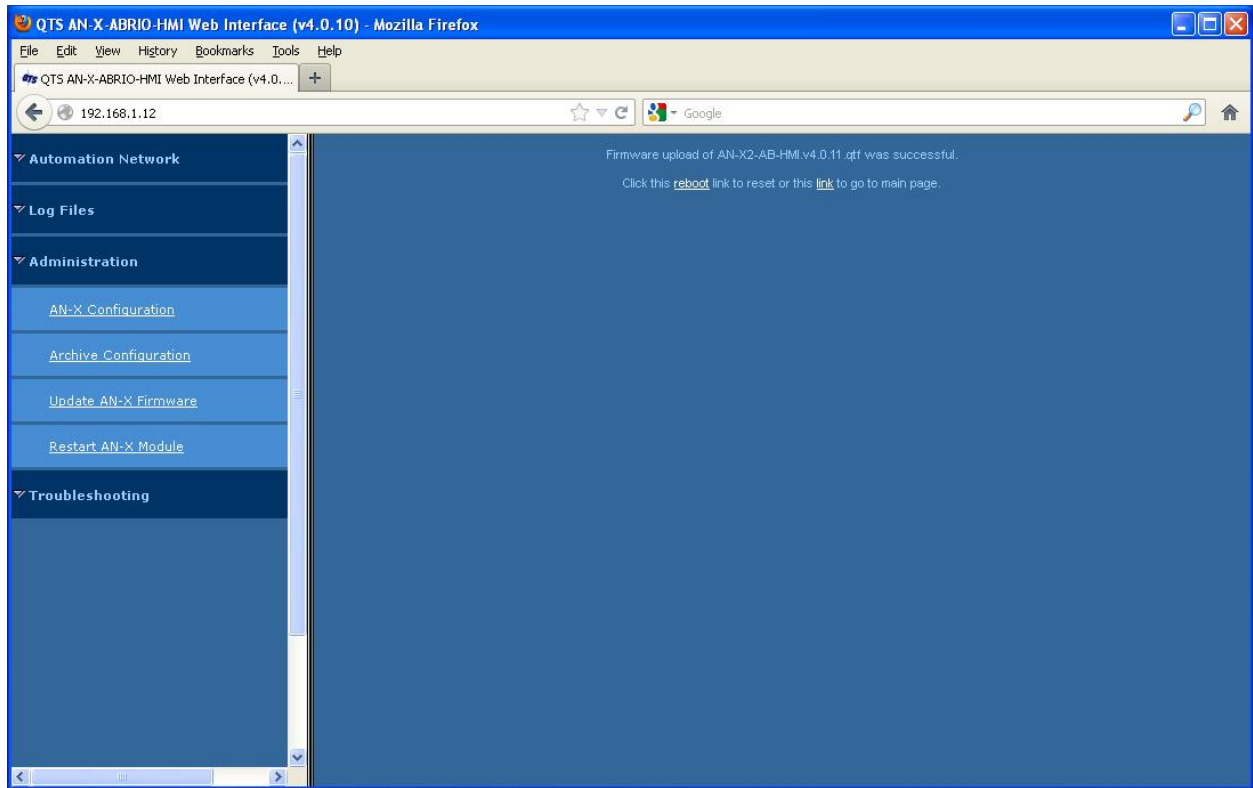
Browse to select the file, then click the *Update Firmware* button to transfer the file.

It is essential that you do not disrupt power while downloading firmware, especially maintenance firmware, to the AN-X2 or while the AN-X2 is restarting following a firmware download.

WARNING!

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.

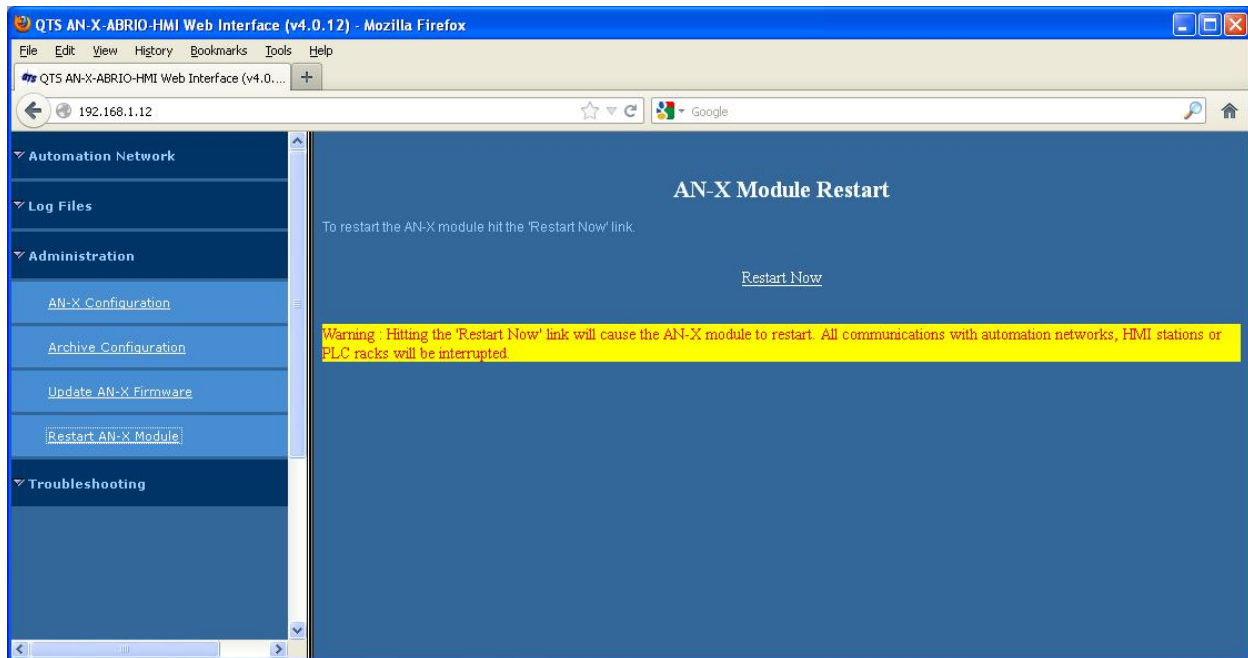
AN-X displays status messages in the lower left corner of the page. When the download is complete, AN-X displays a message that indicates the success or failure of the download.



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

Restart AN-X Module

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



Click the *Restart Now* link to restart the AN-X.

Troubleshooting Menu

The troubleshooting menu contains information that is specific to an automation network, as well as support information.

Troubleshooting

LEDs

The AN-X2-ABRIO-HMI 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 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-X2 is not connected to Ethernet, the 10/100 LED is on.

SYS LED

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

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

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

SYS LED State	Possible cause
Red 3	DHCP configuration failed
Yellow 2	microSD card not present
Yellow 3	AN-X2 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-X2 production firmware file not found on microSD card
Yellow 7	Production firmware file invalid or error programming to flash
Yellow 8	Daughterboard mismatch
Single red flash	Unscheduled messaging, addressing or connection problem
Slow red flash	Configuration file problem

“Railroading” – SYS and NET LEDs

AN-X2 alternates (railroads) flashing the SYS and NET LEDs to indicate its state.

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

It railroads the LEDs green for 20 to 30 seconds as it starts production mode.

NET LED – Network Status

The NET LED shows the status of remote I/O communication.

Color	Meaning
Red	A frame receive error has been received in the last second (CRC error, abort, or timeout), stays red for 1 second after the error occurs One or more racks is in error
Flashing Red/Off	At least one rack which is being scanned is in error
Green	All racks are being scanned with no errors

Startup LED Sequence

At startup, the LED sequence is:

- fast yellow flash as maintenance boot code performs memory tests, other startup diagnostics.
- fast yellow flash as maintenance firmware runs
- railroad yellow if firmware files are being updated
- yellow error code if an error occurred in configuration
- railroad green as production firmware starts
- SYS and NET LEDs green if everything is running and the AN-X2 is active on the network

Fatal Errors

AN-X2 monitors its operation for “impossible” 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 LED sequence and contact technical support.



Updating the Firmware

The AN-X2 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 downloaded, and starts the runtime firmware.

The firmware files are supplied in files that begin with AN-X2 and have extension *qtf*. They are updated using the web interface. Run the command *Administration/Update AN-X Firmware* and select the file you wish to download.

WARNING!

Do not download firmware to the AN-X while applications that use the AN-X are running.

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

You must restart the AN-X2 to run the firmware that you downloaded.

WARNING!

It is essential that you do not disrupt power while downloading firmware, especially maintenance firmware, to the AN-X2 or while the AN-X2 is restarting following a firmware download.

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-X2 is running 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.



Specifications

Parameter	Specification
Function	Bridge between Ethernet and Remote I/O network
Typical Power Consumption	200 mA @ 12 VDC or 100 mA @ 24 VDC
Maximum Power dissipation	2.4W
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



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