AN-X3-PBS-UDP
Profibus DP
Ethernet UDP
Gateway

User Manual

A product of Quest Technical Solutions

Sold and Supported by
ProSoft Technology Inc.
www.prosoft-technology.com

Cautions

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will Quest Technical Solutions be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Quest Technical Solutions does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

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-PBS

CAUTIONS 2

AN-X-PBS MODULE OVERVIEW 6

Profibus DP 6

Ethernet UDP 7

HARDWARE FEATURES 8

Package Contents 8

Using the MicroSD Card 8

AN-X3 Modes of Operation 8

INSTALLATION 9

Prevent Electrostatic Discharge 9

Power 9

Profibus Cabling and Termination 9

Ethernet Cabling 9

IP ADDRESS CONFIGURATION 10

Initial IP Configuration 10
Prosoft Discovery Service....11
Link-Local IP Configuration....12
microSD Config.txt....13

WEB PAGE IP CONFIGURATION 14

DHCP 14

Static IP Address 15
Hostname....15
Firmware....15
Submitting the Configuration....15

RECONFIGURING AN AN-X FROM AN UNKNOWN STATE 16

Non-Booting AN-X3 or Factory Reinitialize 16

CONFIGURATION 17

Profibus DP Configuration **18**
Profibus DP Auto Config....19

Ethernet UDP Configuration **21**
Ethernet UDP Auto Config....24

Configuration View **25**

Configuration Sample **26**

MONITOR **27**

Monitor Profibus DP **27**

Monitor Ethernet UDP **29**

LOG FILES **30**

Profibus DP Log **30**

Ethernet UDP Log **31**

System Info Log **31**
View All Logs....31

ADMINISTRATION **32**

AN-X IP/FW Configuration **32**

AN-X Firmware Update **32**

Manual Firmware Update **34**

Diagnostic Capture **34**

AN-X Module RESTART **35**

Support Menu **35**
Contact Information....35

TROUBLESHOOTING **36**

LEDs **36**
Ethernet LEDs....36
SYS LED....36

'Railroading' – SYS and NET LEDs **37**

SYS and NET LEDs: Runtime **37**
SYS – AN-X Status....37
NET LED – Network Status....37

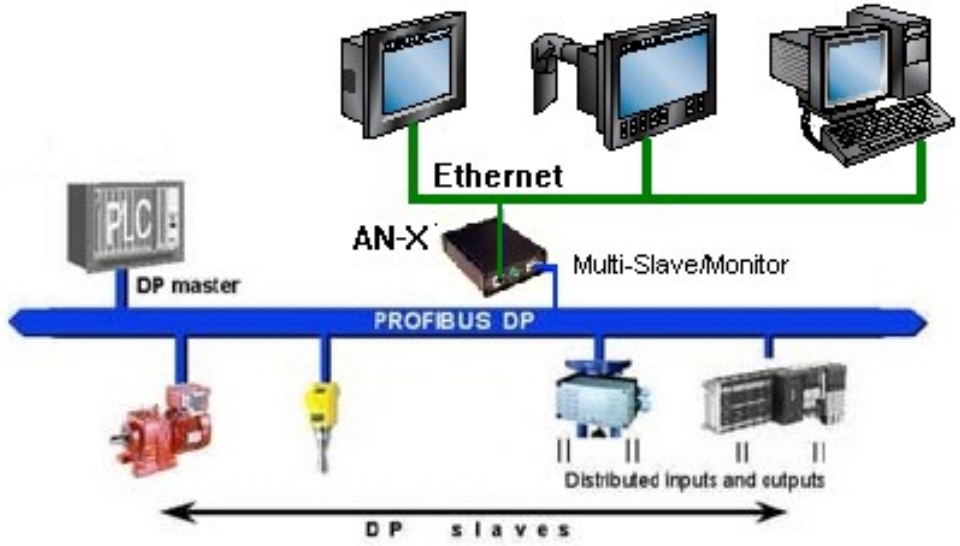
SPECIFICATIONS **38**

SUPPORT **39**

WARRANTY **40**

REVISIONS **41**

AN-X-PBS Module Overview



The AN-X3-PB module running AN-X3-PBS-UDP firmware (referred to hereafter as AN-X) acts as a gateway between a Profibus DP network and an Ethernet network using cyclic UDP messages.

The AN-X module has a web interface for configuration of Profibus and Ethernet properties.

Profibus DP

The AN-X-PBS communications module connects a computer or other device to a Profibus network, using Ethernet.

The module:

- Acts as one or more Active DP Slave Nodes, up to a total of 125
- Monitors the I/O data from all other DP Slave Nodes on the network
- Maintains Profibus DP Slave Node list
- Maintains Profibus Diagnostic Counters
- Supports baud rates from 9600 bps to 12 Mbps (12m 6m 3m 1m5 500k 187k5 93k75 19k2 9k6)

While monitoring other DP Slaves, the AN-X3-PBS is configured with maximum I/O lengths. The AN-X will accept any frame length less than or equal to the maximum length. If a Profibus DP I/O frame is received that is too long, the frame is ignored and the ‘Long Frames’ diagnostic counter is incremented and the ‘Long Node’ value is set to the Node address of Profibus DP Master that sent the frame.

Ethernet UDP

The AN-X supports up to 16 UDP Send blocks and up to 16 UDP Receive blocks.

Each block supports a standard frame size (MTU) of up to 1,500 bytes.

There is an 8 byte QTS header that identifies the data at the start of each UDP frame (see page 21).

With Ethernet, IP, UDP and QTS overhead, there are 1,448 bytes or 362 DWORDS (32 bits) available to map Profibus diagnostics and data.

When receiving Ethernet UDP frames, the minimum receive length is specified. The AN-X will accept frames greater than or equal to the minimum length.

If a UDP frame is received with length that is less than the minimum:

- The UDP frame is ignored
- The PrtErrs diagnostic counter is incremented
- PrtType is set to ‘UDP Short’
- The PrtBlk value is set to the UDP block number received

Both Unicast and Multicast frames are supported.

Hardware Features

The module has:

- LEDs to indicate the status of the connection to the Ethernet, its own internal state, and the state of the Profibus DP Slaves on the network
- An Ethernet RJ45 connector
- A 9-pin D Shell connector to connect to the Profibus network
- A 3-pin Phoenix power connector
- A microSD card for storage of configuration data and firmware

Package Contents

- AN-X3-PB module
- Phoenix Power connector

Using the MicroSD Card

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

There are no restrictions on the size or speed of the card.

The format must be FAT-16 or FAT-32.

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

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

TIP The most recent firmware for the AN-X is available at qtsusa.com/dist

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.

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-X4 to retrieve it (7/64 Allen wrench).

Installation

Prevent Electrostatic Discharge

The module is sensitive to electrostatic discharge.

WARNING!

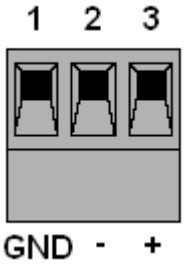
Electrostatic discharge can damage integrated circuits and semiconductors. Follow these guidelines when you handle the module:

- 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.



Power consumption is 160 mA @ 12VDC or 80 mA @ 24VDC.

The part number for the power connector is:

Phoenix 1757022 (Old part number: MSTB 2.5/3-ST-5.08)

Profibus Cabling and Termination

Use a cable with a standard Profibus 9-pin connector to connect the module to the network.

The network must be terminated at the physical ends of the network. There should be two and only two terminators on the network.

Ethernet Cabling

The AN-X has a standard RJ45 connector for connecting to Ethernet.

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

If you are connecting directly between a computer and AN-X, you may need to use 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.

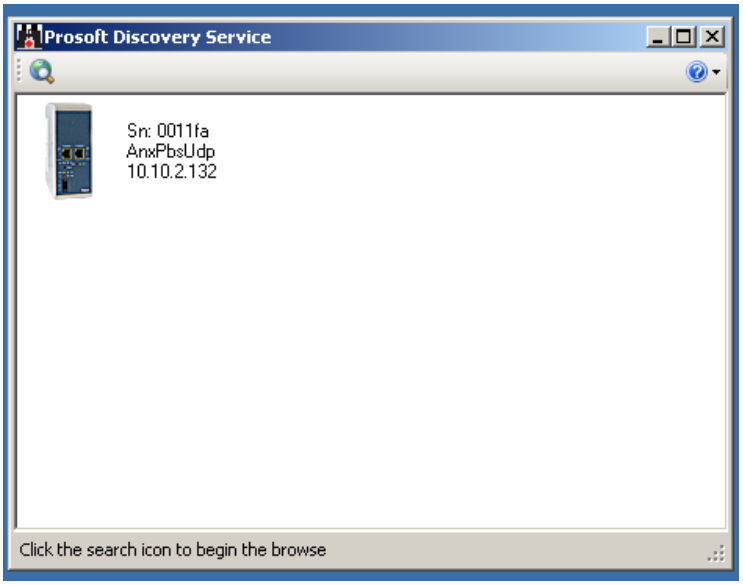
** Since link-local IP addresses are not always accessible, the recommended method to set the initial IP address is with the Prosoft Discovery Service (PDS).

Prosoft Discovery Service

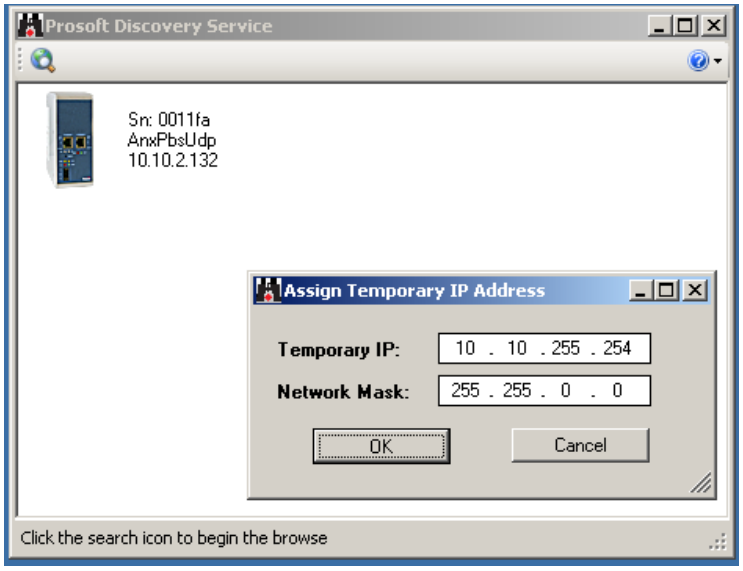
ProSoft Discovery Service (PDS) is a free application available from Prosoft's web page:

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 with the web interface (see page 14).

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 your 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 IP/FW Configuration'* command from the web interface, it writes the results to config.txt.

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

IP: 192.168.1.12

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

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

If you edit the file and AN-X3 finds an error during startup, it flashes an error code on the SYS LED, see page 36.

Sample config.txt files

DHCP

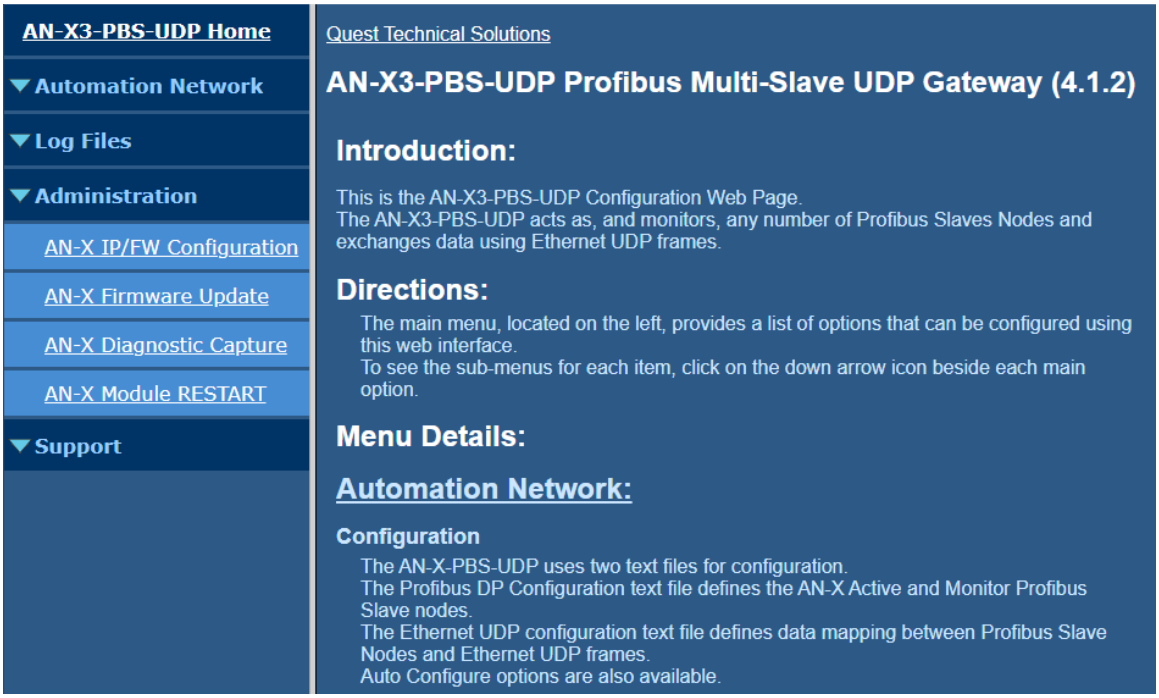
```
IP: DHCP
Hostname: AnxPbsUdp
Firmware: AN-X3-PBS-UDP
```

Static IP Address

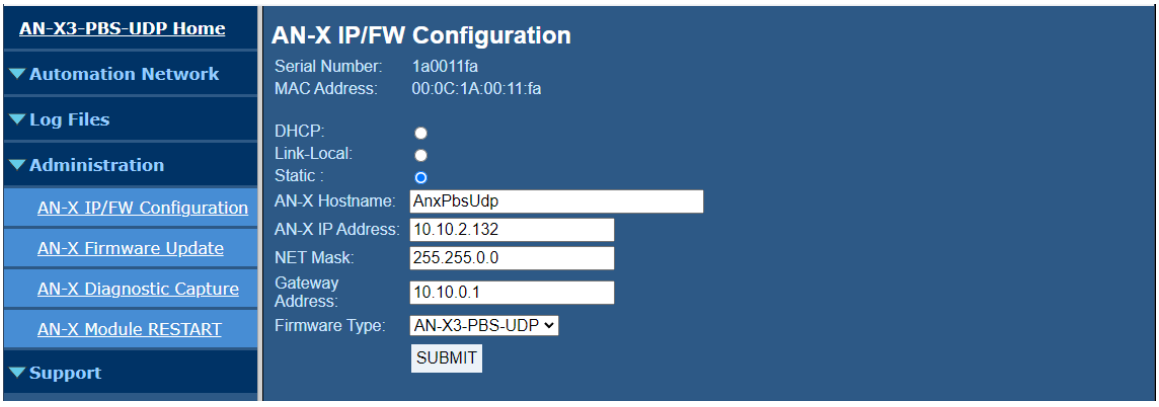
```
IP: 10.10.2.132
NetMask: 255.255.0.0
DefGtwy: 10.10.0.1
HostName: AnxPbsUdp
Firmware: AN-X3-PBS-UDP
```

Web Page IP Configuration

Select ‘Administration/AN-X IP/FW Configuration’.



The AN-X IP/FW 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 LED 3 times red followed by a pause (see page 36).

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.

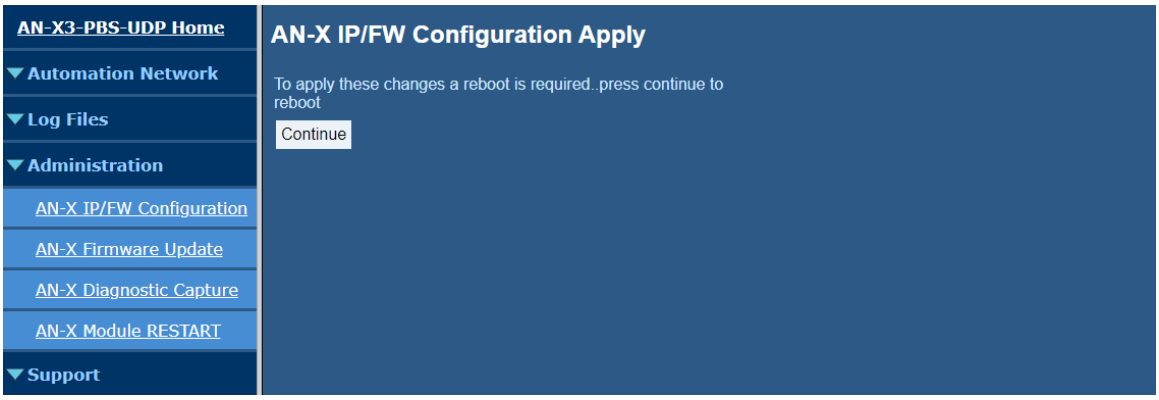
Firmware

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

Submitting the Configuration

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

The following page appears when you click SUBMIT.



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

If you have changed the IP address, you will need 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 page 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-PBS-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.

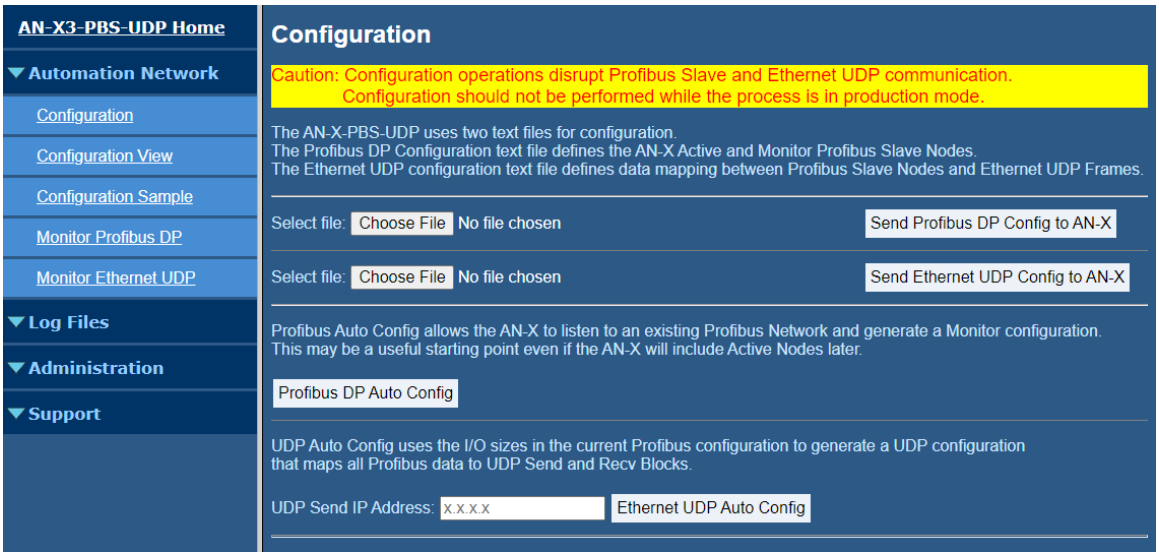
Configuration

The AN-X-PBS-UDP uses two text files for configuration.

The Profibus DP Configuration text file defines the AN-X Active and Monitor Profibus Slave Nodes.

The Ethernet UDP configuration text file defines data mapping between Profibus Slave Nodes and Ethernet UDP Frames.

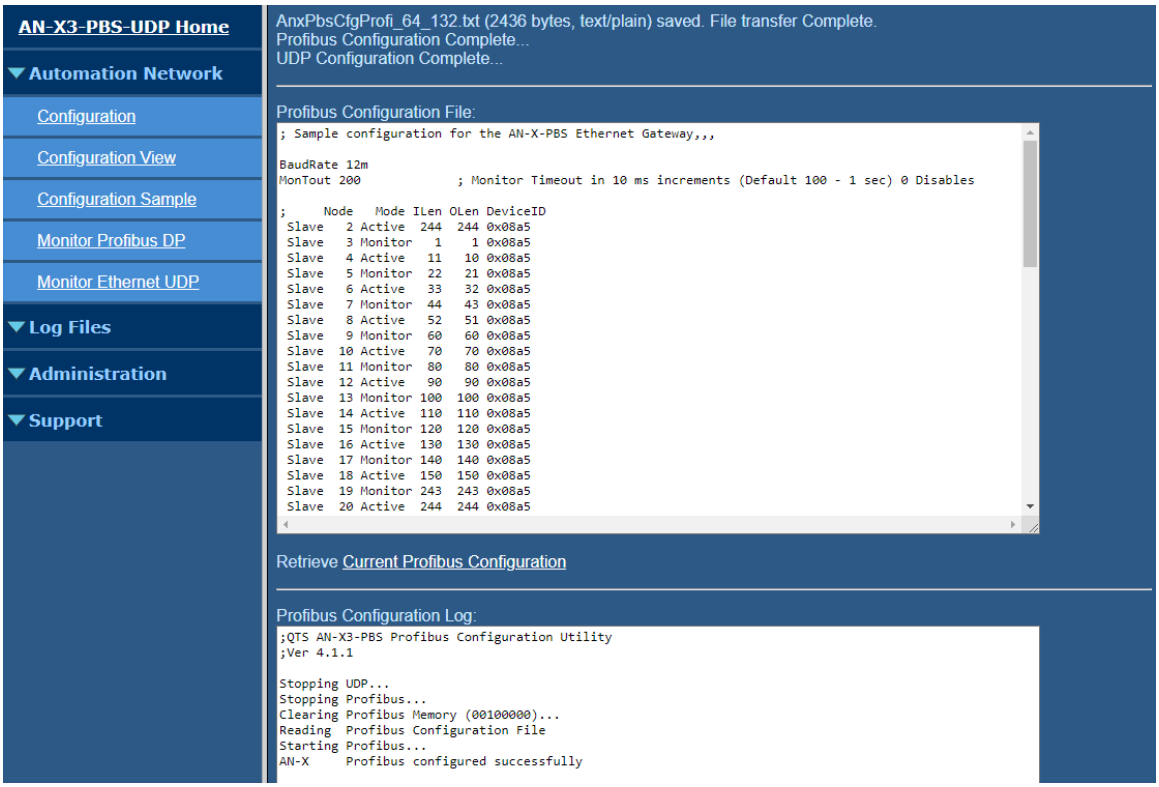
Select '*Automation Network/Configuration*'.



Profibus DP Configuration

Choose your Profibus Configuration text file then select:

'*Send Profibus DP Config to AN-X*'.



The Profibus DP Configuration File sent is shown along with the Profibus DP Configuration Log that shows the results of the configuration.

The Ethernet UDP Configuration File and Log are also shown. If changes have been made to the Profibus DP configuration, the Ethernet UDP configuration may fail if changes need to be made to match the Profibus DP configuration.

The format of the Profibus DP Configuration file is documented in the 'Configuration Sample' files (see page 25).

```
; Sample Profibus Configuration File for the AN-X-PBS Ethernet Gateway

; MonTout <tme> - Monitor Timeout in 10ms increments, default 100 (1 sec)

BaudRate 12m   ; 12m 6m 3m 1m5 500k 187k5 93k75 19k2 9k6

;     Node   Mode ILen OLen DeviceID
Slave   2 Active  244  244 0x08a5
Slave   3 Monitor   1    1 0x08a5
Slave   4 Active   11   10 0x08a5
Slave   5 Monitor  22   21 0x08a5
```

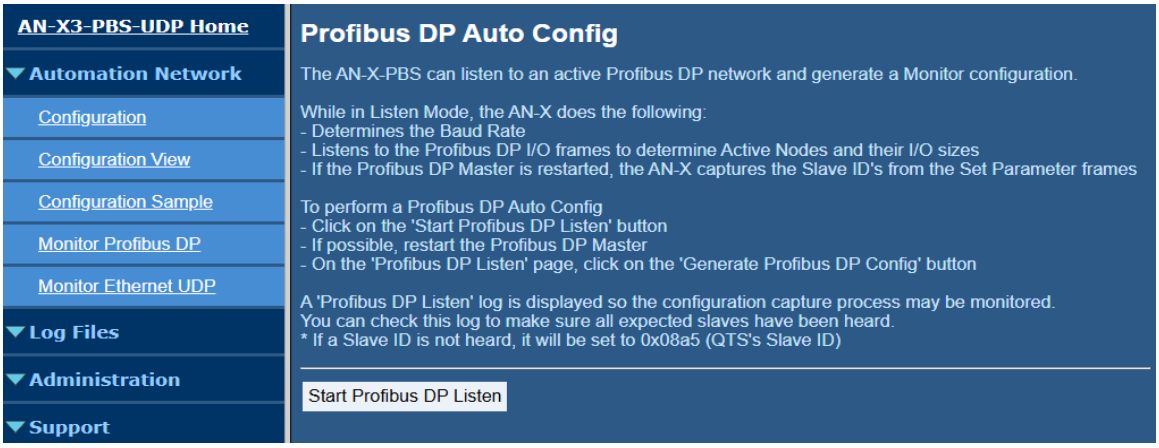
Profibus DP Auto Config

The AN-X-PBS can listen to an active Profibus DP network and generate a Monitor configuration.

While in Listen Mode, the AN-X does the following:

- Determines the Baud Rate
- Listens to the Profibus DP I/O frames to determine DP Slave Nodes and their I/O sizes
- If the Profibus DP Master is restarted, the AN-X captures the Slave ID's from the Set Parameter frames

On the '*Automation Network/Configuration*' page select the '*Profibus DP Auto Config*' button.

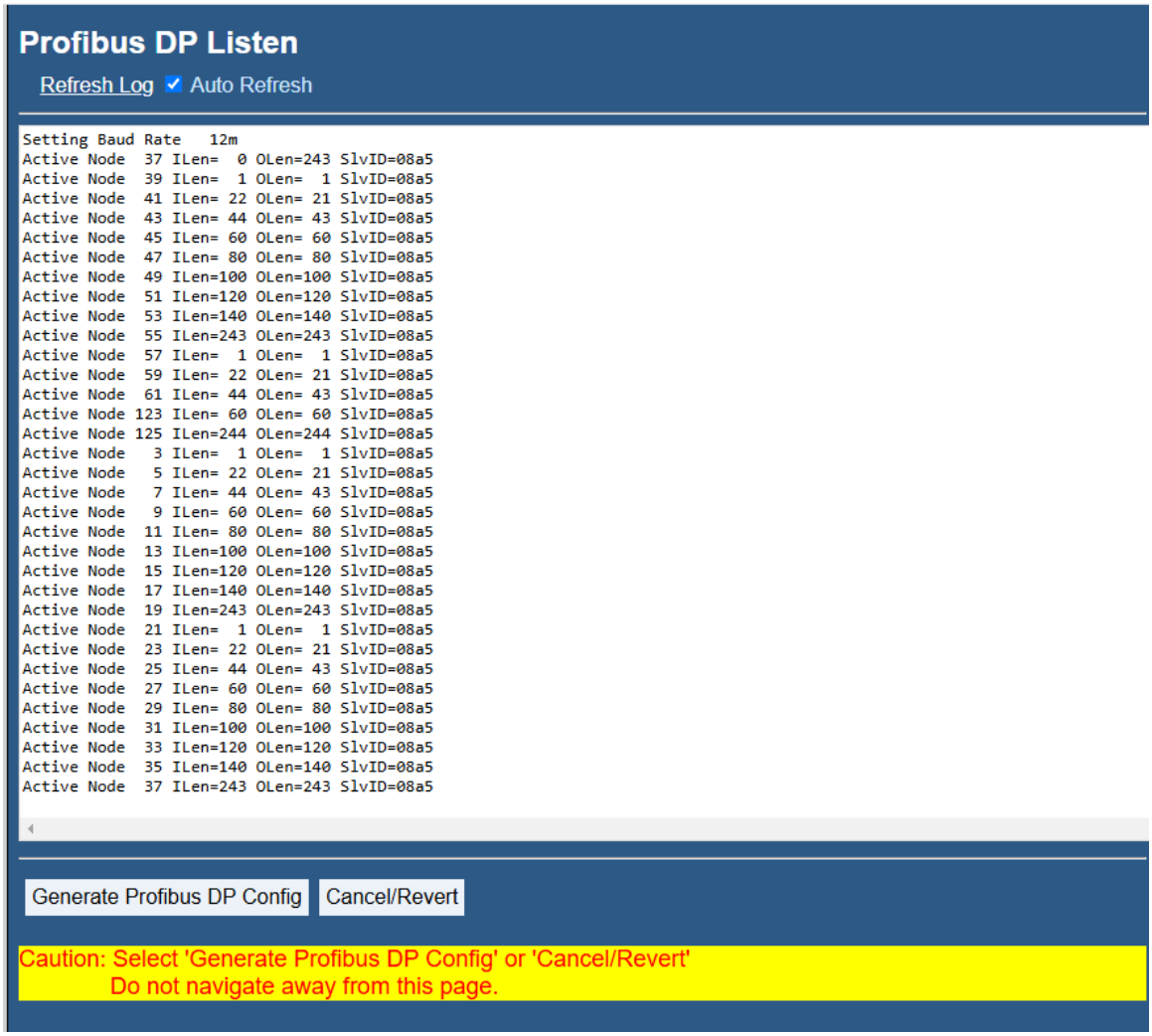


To perform a Profibus DP Auto Config:

- Click on the 'Start Profibus DP Listen' button
- If possible, restart the Profibus DP Master
- On the 'Profibus DP Listen' page, click on the '*Generate Profibus DP Config*' button

A 'Profibus DP Listen' log is displayed so the configuration capture process may be monitored.

You can check this log to make sure all expected slaves have been heard.



* If a Slave ID is not heard, it will be set to 0x08a5 (QTS's Slave ID)

If capturing configurations in a lab to emulate a bigger system, Profibus DP Listen may be left running as DP Slave Node(s) are modified and restarted and added to the AN-X configuration.

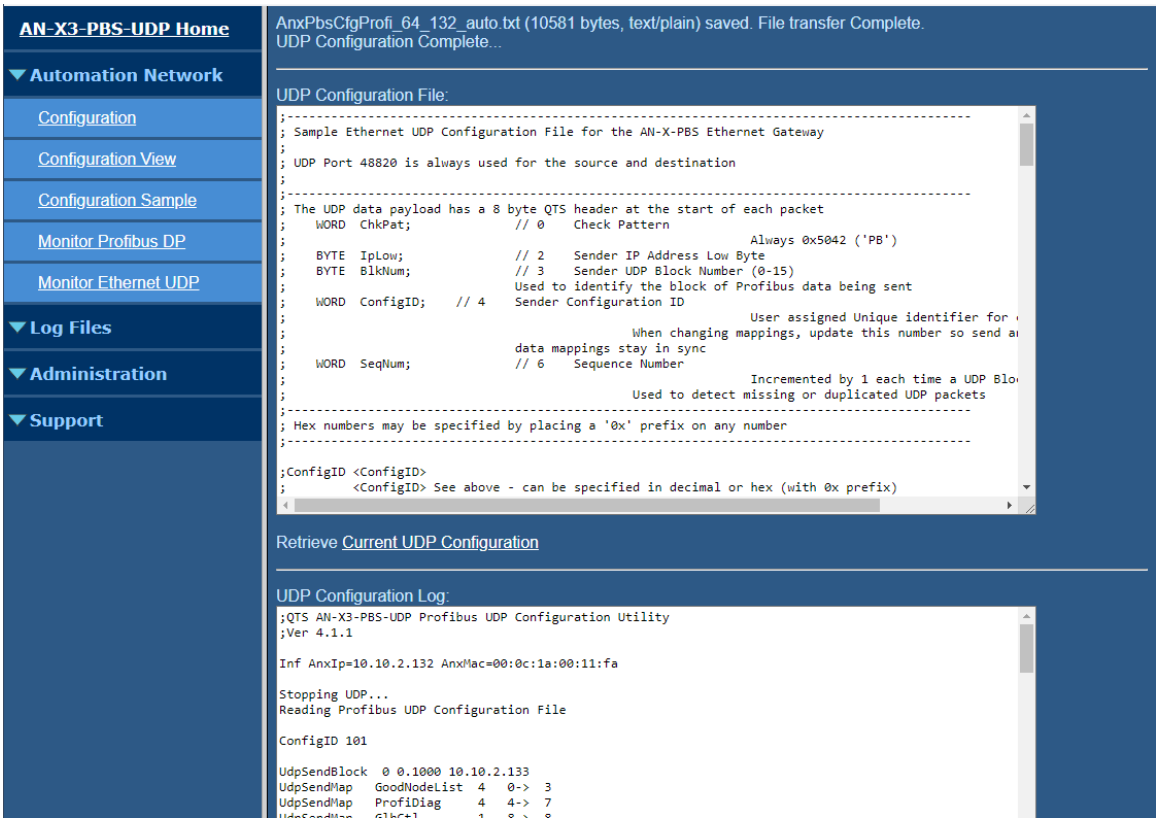
The Cancel/Revert button Cancels the 'Profibus DP Auto Config' operation and reverts to the configuration currently loaded.

IMPORTANT! Select '*Generate Profibus DP Config*' or '*Cancel/Revert*'.
Do not navigate away from this page.

Ethernet UDP Configuration

Choose your Ethernet UDP Configuration text file then select:

'*Send Ethernet UDP Config to AN-X*'.



The Ethernet UDP Configuration File sent is shown along with the Ethernet UDP Configuration Log that shows the results of the configuration.

The format of the Ethernet UDP configuration file is documented in the 'Configuration Sample' files (see page 25).

```
;-------------------------------------------------------------------------------------------
; Sample Ethernet UDP Configuration File for the AN-X-PBS Ethernet Gateway
;
; UDP Port 48820 is always used for the source and destination
;
;-------------------------------------------------------------------------------------------
; The UDP data payload has a 8 byte QTS header at the start of each packet
;    WORD  ChkPat;       // 0    Check Pattern
;                                 Always 0x5042 ('PB')
;    BYTE  IpLow;        // 2    Sender IP Address Low Byte
;    BYTE  BlkNum;       // 3    Sender UDP Block Number (0-15)
;                                 Used to identify the block of Profibus data being sent
;    WORD  ConfigID;     // 4    Sender Configuration ID
;                                 User assigned Unique identifier for current configuration
;                                 When changing mappings, update this number so send and receive
;                                 data mappings stay in sync
;    WORD  SeqNum;       // 6    Sequence Number
;                                 Incremented by 1 each time a UDP Block packet is sent
;                                 Used to detect missing or duplicated UDP packets
```

```
;-------------------------------------------------------------------------------------------------
; Hex numbers may be specified by placing a '0x' prefix on any number
;-------------------------------------------------------------------------------------------------

;ConfigID <ConfigID>
;         <ConfigID> See above - can be specified in decimal or hex (with 0x prefix)

;UdpSendBlock <BlkNum> <interval> <DstIp>
;             <BlkNum>   0-15
;             <interval> in seconds (0.0005 to 6.5535)
;             <DstIp>    Unicast or Multicast

;UdpSendMap   <Ofs> <Area>
;             <ofs>  UDP 32 bit Data Ofs (0-362 or Auto) Assumes MTU 1500
;                    Auto maps after previous mapping, 32 bit aligned
;             <Area> GoodNodeList Profibus Active Node List (128 bits, 4 32 bit words)
;                    ProfiDiag    Profibus Diagnostic Counters        (4 32 bit words)
;                    GlbCtl       Profibus Global Control             (4 32 bit words)
;                    NodeOut <Node> Outputs from Monitored or Active Profibus Node (1-125)
;                    NodeInp <Node> Inputs  from Monitored           Profibus Node (1-125)

;UdpRecvBlock <BlkNum> <timeout>
;             <BlkNum>   0-15
;             <timeout> in seconds (0.0050 to 6.5535)

;UdpRecvMap   <Ofs> <Area>
;             <ofs>  UDP 32 bit Data Ofs (0-362 or Auto) Assumes MTU 1500
;                    Auto maps after previous mapping, 32 bit aligned
;             <Area> NodeInp <Node> Inputs Sent from Active Profibus Node (1-125)

ConfigID 101        ; 1.01

UdpSendBlock  0 0.1000 10.10.2.133
UdpSendMap      0 GoodNodeList  ;         4   0->   3
UdpSendMap      4 ProfiDiag     ;         4   4->   7
UdpSendMap      8 GlbCtl        ;         1   8->   8
;             Ofs         Node    Bytes Len Strt  End
UdpSendMap      9 NodeOut    2  ;   244  61   9->  69
UdpSendMap     70 NodeOut    4  ;    10   3  70->  72
UdpSendMap     73 NodeOut    6  ;    32   8  73->  80
UdpSendMap     81 NodeOut    8  ;    51  13  81->  93


UdpRecvBlock  0 0.5000
;             Ofs         Node    Bytes Len Strt  End
UdpRecvMap      0 NodeInp    2  ;   244  61   0->  60
UdpRecvMap     61 NodeInp    4  ;    11   3  61->  63
UdpRecvMap     64 NodeInp    6  ;    33   9  64->  72
UdpRecvMap     73 NodeInp    8  ;    52  13  73->  85


; ProfiDiag Profibus Diagnostic Counters (4 32 bit words)
;   unsigned short  TxGood;         // 0
;   unsigned short  RxGood;         // 2
;   unsigned char   RxStpErr;       // 4
;   unsigned char   RxParErr;       // 5
;   unsigned char   RxSdErr;        // 6
;   unsigned char   RxRptErr;       // 7
;   unsigned char   RxUndErr;       // 8
;   unsigned char   RxFcsErr;       // 9
;   unsigned char   RxEdErr;        // a
;   unsigned char   RxOvrErr;       // b
;   unsigned char   RxLongErr;      // c
;   unsigned char   RxLongNde;      // d
;   unsigned char   RxDupFrm;       // e
```

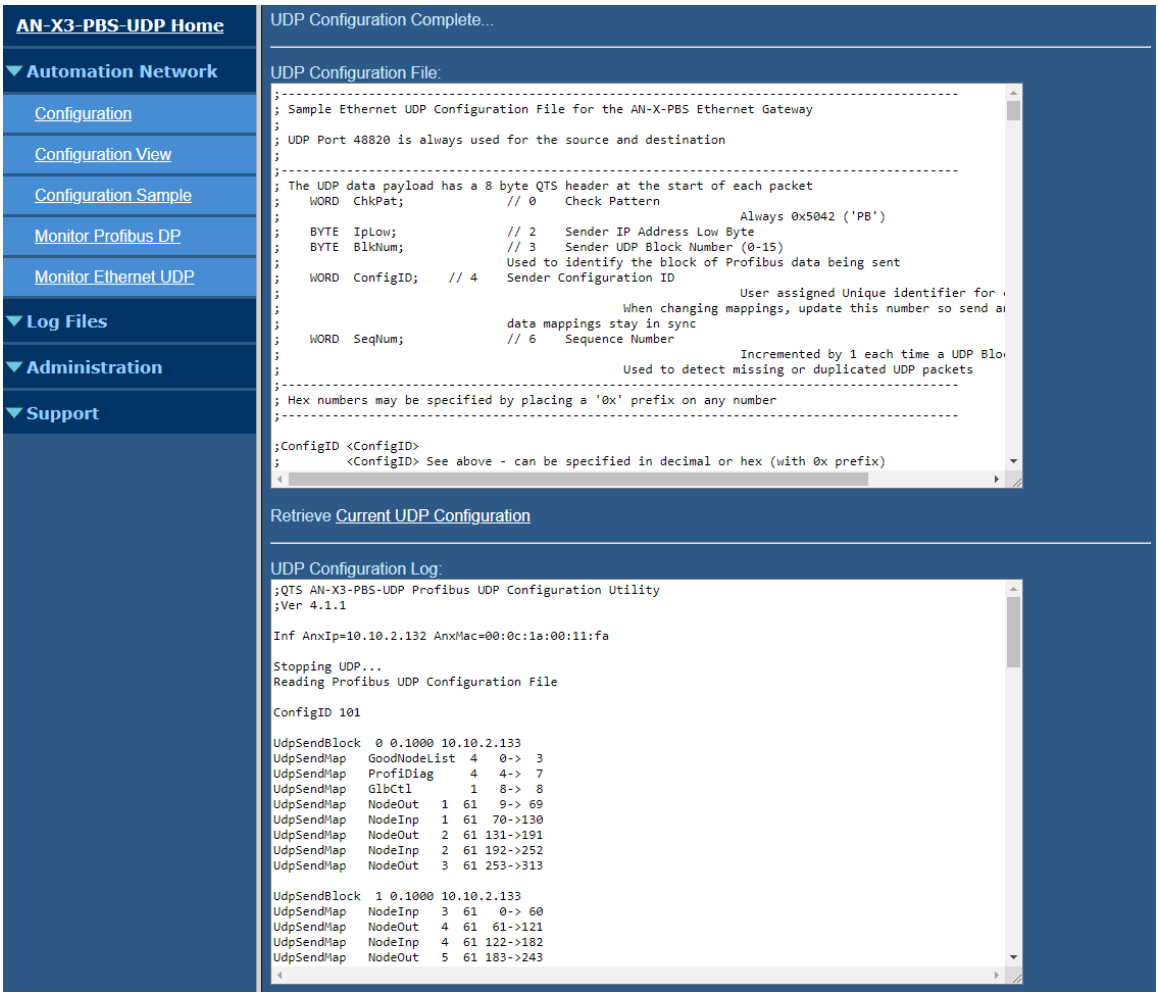
```
;   unsigned char   RxTnsOvr;       // f

; GlbCtl Profibus Global Control (1 32 bit word )
; Bit Descr
;   0 Reserved
;   1 Clear Data 1=Clear 0=Run (Operating State of the Master)
;   2 Unfreeze
;   3 Freeze
;   4 Unsync
;   5 Sync
;   6 Reserved
;   7 Reserved
```

Ethernet UDP Auto Config

Ethernet UDP Auto Config uses the I/O sizes in the current Profibus DP configuration to generate an Ethernet UDP Configuration File that maps all Profibus DP data to UDP Send and Recv Blocks.

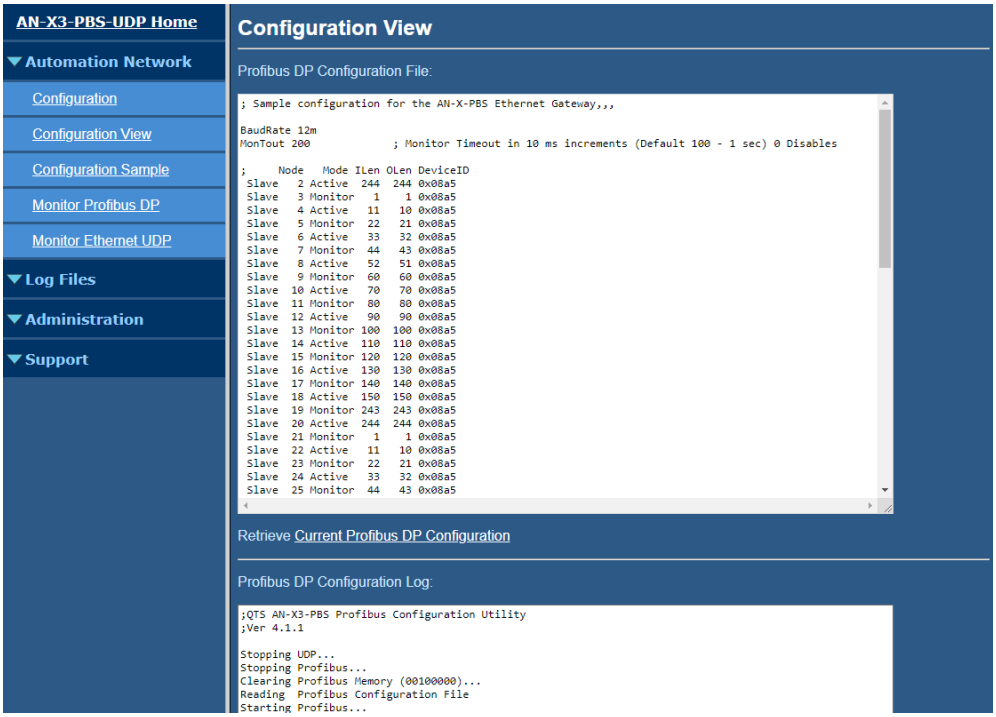
On the '*Automation Network/Configuration*' page enter a valid '*UDP Send IP Address*' and select the '*Ethernet UDP Auto Config*' button.

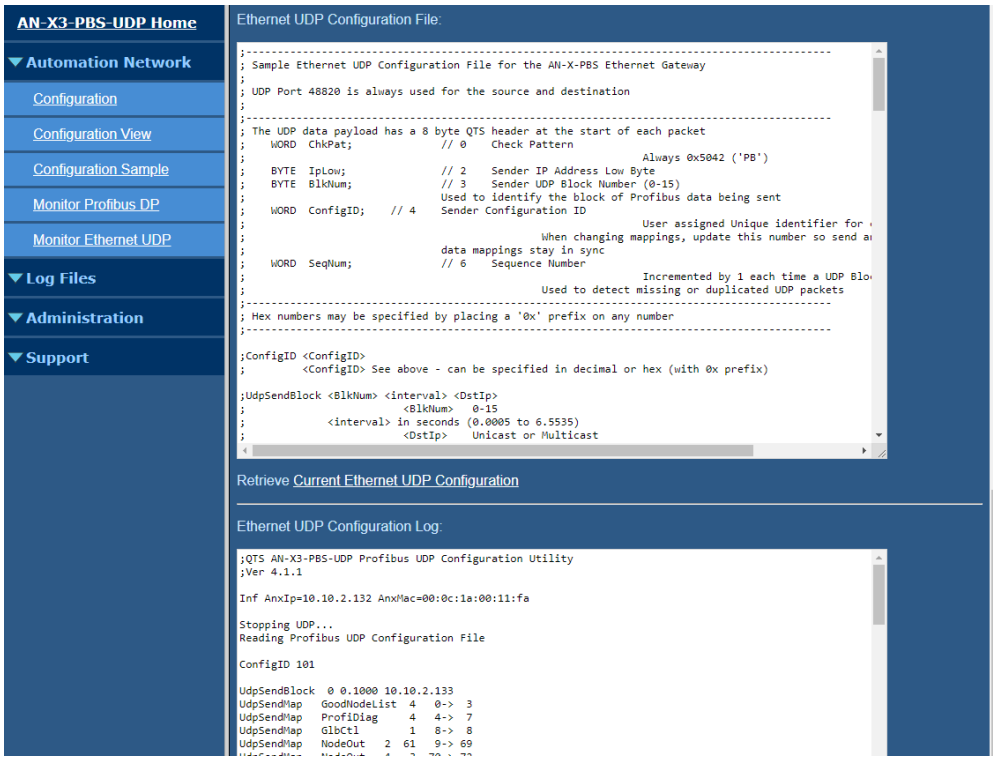


Unicast or Multicast IP addresses may be used.

Configuration View

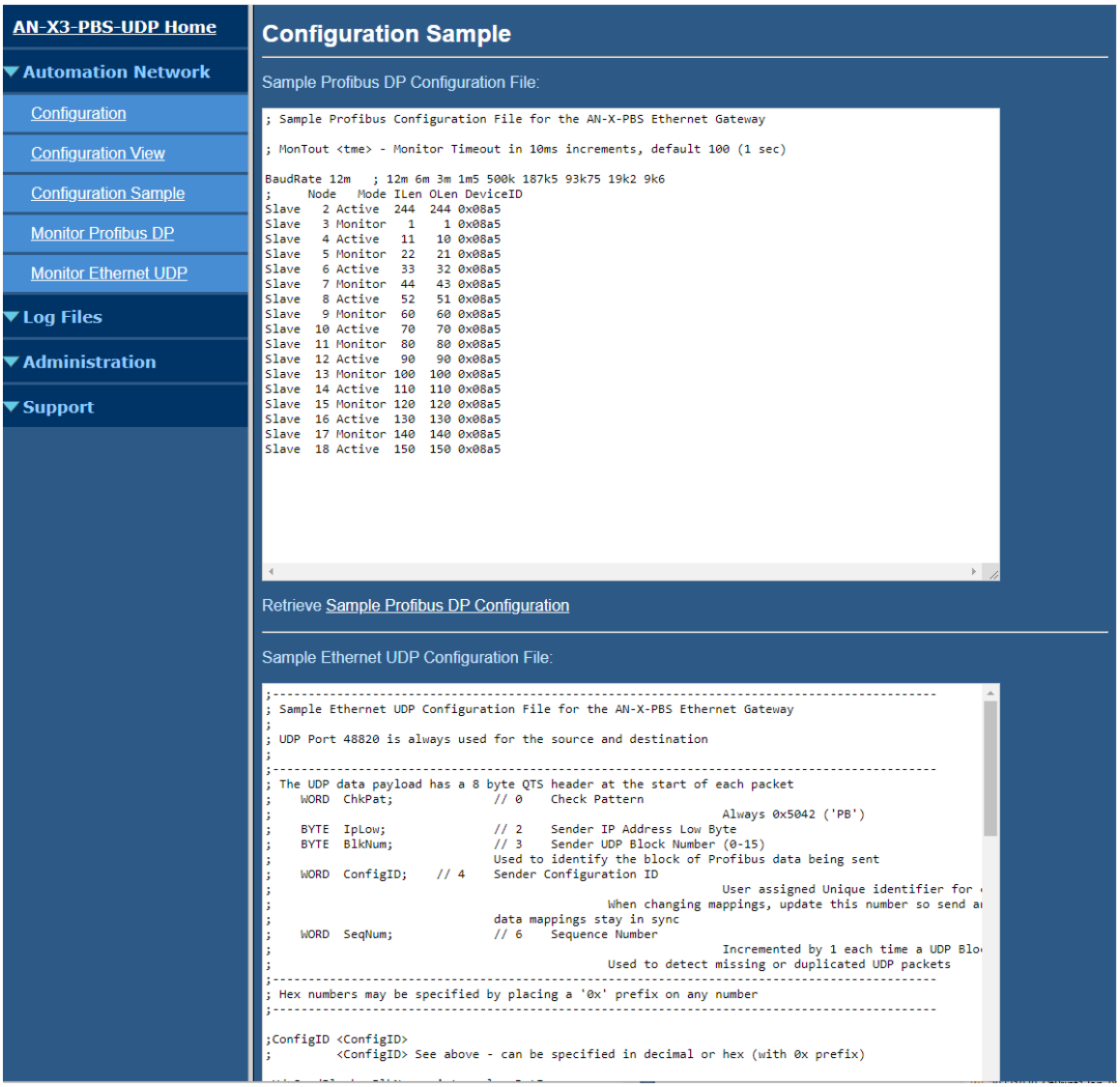
Select '*Automation Network/Configuration View*' to view or retrieve the current Profibus DP and Ethernet UDP Configuration Files and view their corresponding Configuration Logs.





Configuration Sample

Select '*Automation Network/Configuration Sample*' to view and retrieve Sample Profibus DP and Ethernet UDP Configuration Files.

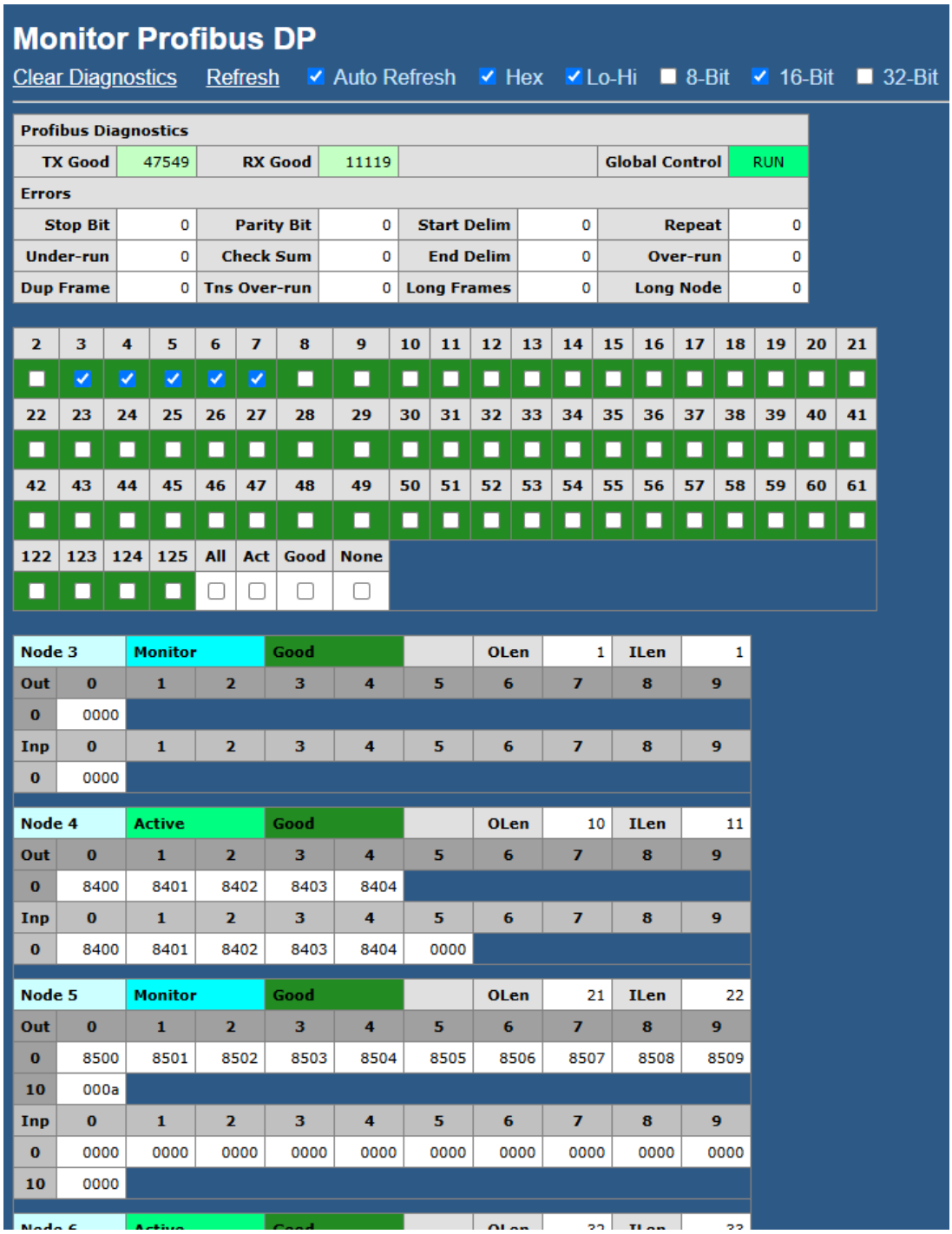


The format and layout of the configuration files are documented in these sample files (see page 18 and page 21).

Monitor

Monitor Profibus DP

To monitor Profibus Diagnostic Counters, Active Node List and Profibus DP I/O data, select '*Automation Network/Monitor Profibus DP'*.



Standard Profibus Diagnostic Counters are shown as well as some specific to the AN-X.

If Error Counters are incrementing this may indicate wiring, grounding or electrical noise problems.

A list of Active DP Slave Nodes is shown as well as check boxes to select DP Slave Nodes to monitor.

Data from any or all Active or Monitored Profibus DP slaves may be displayed.

The Mode (Active or Monitor) and State (Good or Timeout) is also shown for displayed Nodes.

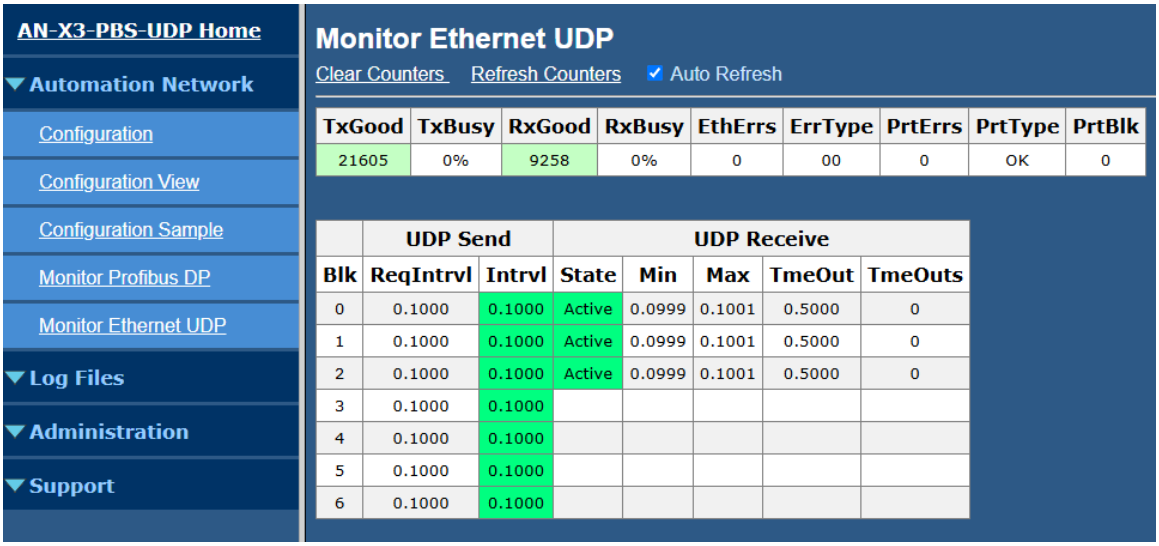
Data can be displayed in Hexadecimal or Signed Integer.

Data display size can be 8, 16 or 32 bit.

For 16 and 32 bit, byte ordering can be low to high (Lo-Hi, Little Endian) or high to low (Big Endian).

Monitor Ethernet UDP

To monitor Ethernet UDP Diagnostic Counters and UDP Send & Receive Blocks, select '*Automation Network/Monitor Ethernet UDP'*.



Ethernet UDP Protocol Error Types (PrtType)

Code	Description	Frame Action
OK	No Protocol Error	
UdpCSum	UDP Checksum Error	Ignored
ChkPat	QTS 'PB' Check Pattern Mismatch	Ignored
BlkHi	UDP Block ID High Nibble not zero	Ignored
CfgID	Configuration ID Mismatch	Ignored
UDP Short	UDP Frame Too Short	Ignored
RxOvr	UDP Rx Greater Than 1,500 Bytes	Ignored
SeqDup	QTS Sequence Number Duplicate (retransmission)	Accepted
SeqMsm*	QTS Sequence Number no Previous +1	Accepted

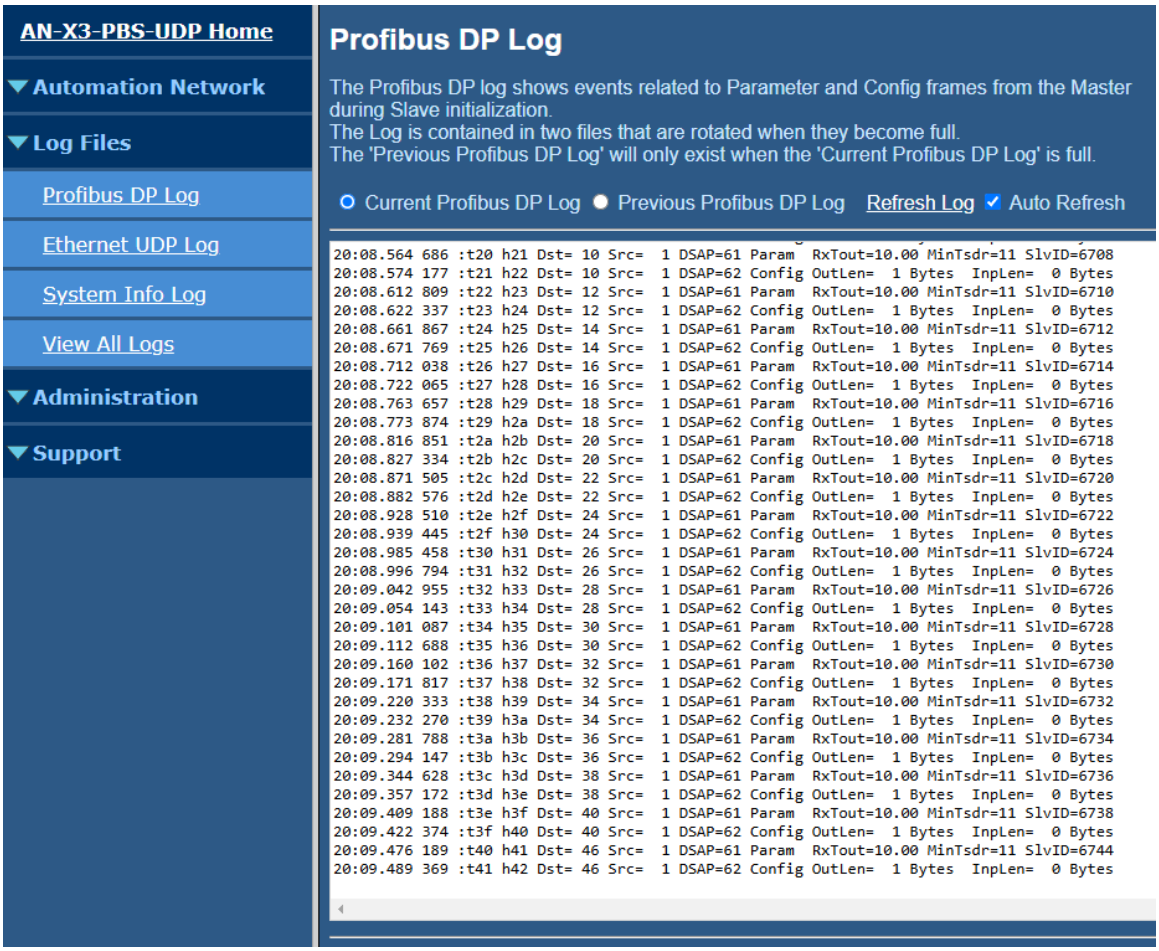
* One SeqMsm occurs when an Ethernet UDP Block frames is received for the first time

Log Files

Profibus DP Log

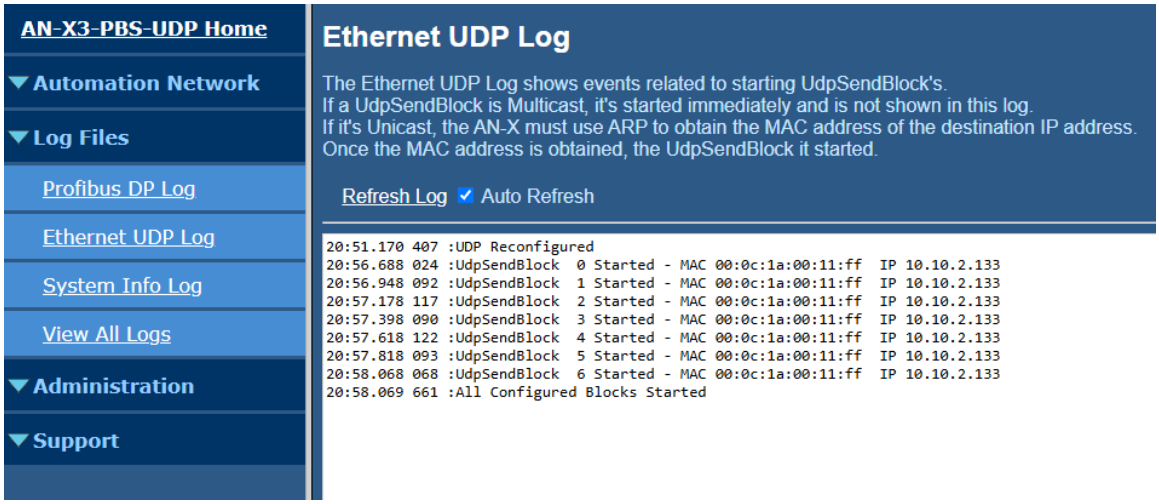
The Profibus DP log shows events related to Parameter and Config frames from the Master during Slave initialization.

The Log is contained in two files that are rotated when they become full.



Ethernet UDP Log

The Ethernet UDP Log shows events related to starting UdpSendBlocks.
If a UdpSendBlock is Multicast, it's started when configured and is not shown in this log.
If it's Unicast, the AN-X must use Address Resolution Protocol (ARP) to obtain the MAC address of the destination IP address.
Once the MAC address is obtained, the UdpSendBlock is started.
This log may useful for diagnosing Ethernet UDP Unicast Startup issues.



System Info Log

The *System Info Log* records informational messages during AN-X startup and normal operation. This is mostly used by technical support and does not contain information useful to the end user.

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

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

AN-X IP/FW Configuration

See page 14 for details on setting the IP address.

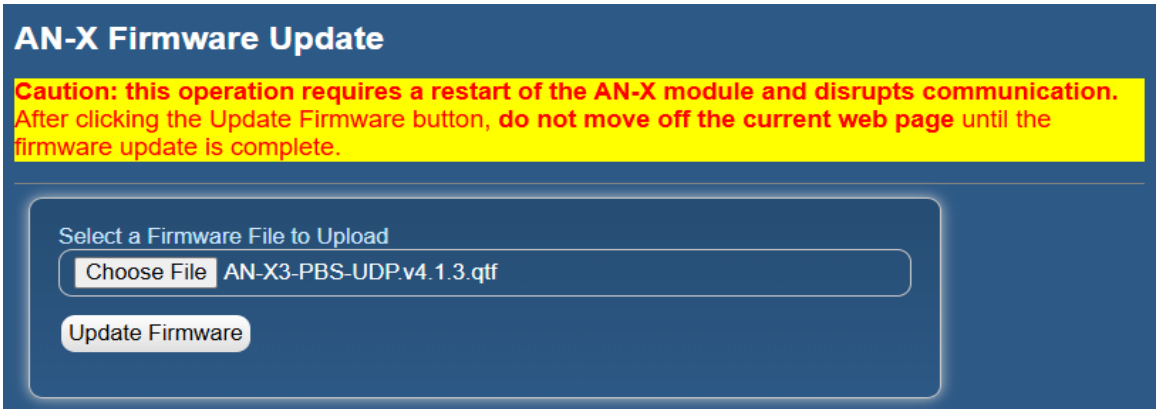
If other firmware images are available and on the microSD card, you can select this firmware with the '*Firmware Type*' Drop Down box.

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.

TIP The most recent firmware for the AN-X is available at qtsusa.com/dist

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



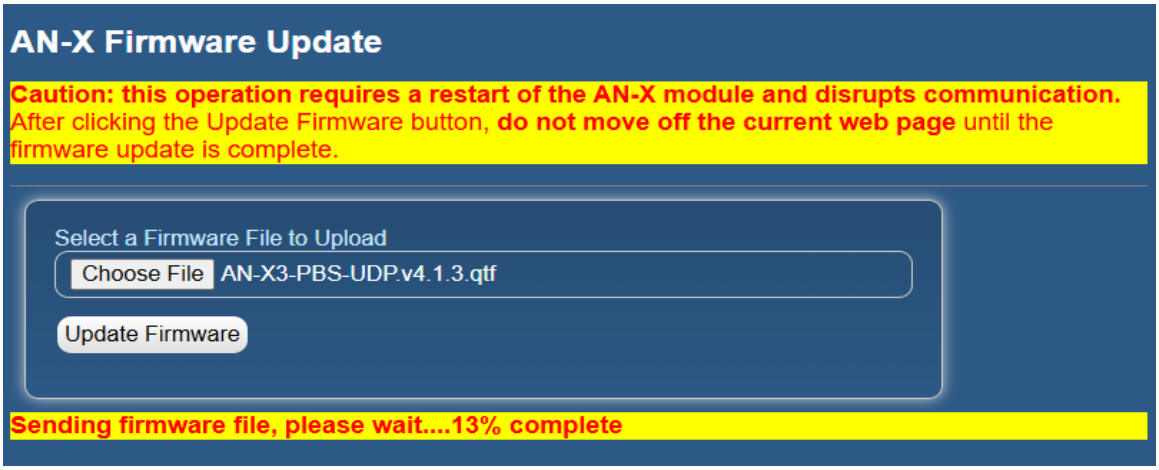
Browse to select the file, then click the '*Update Firmware*' button to transfer the file.

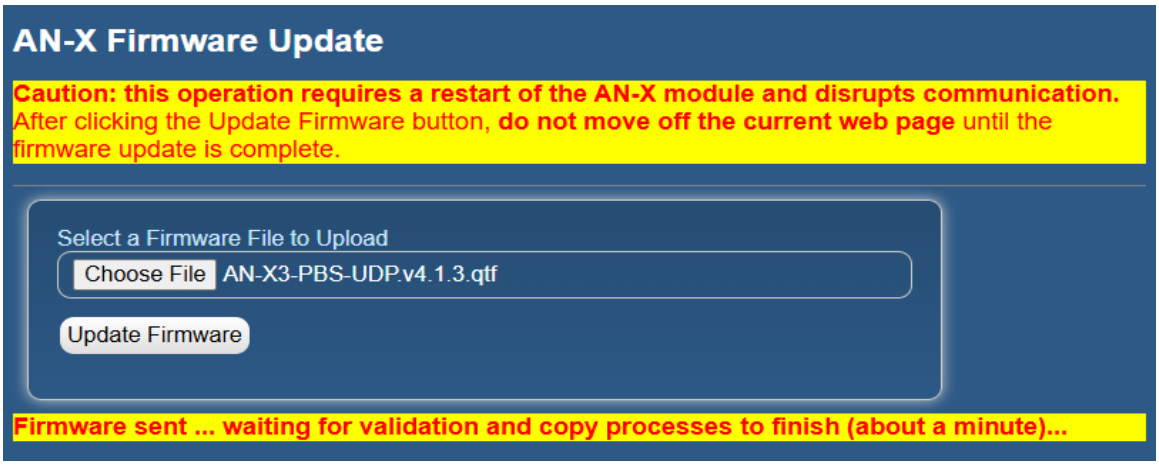
WARNING!

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.

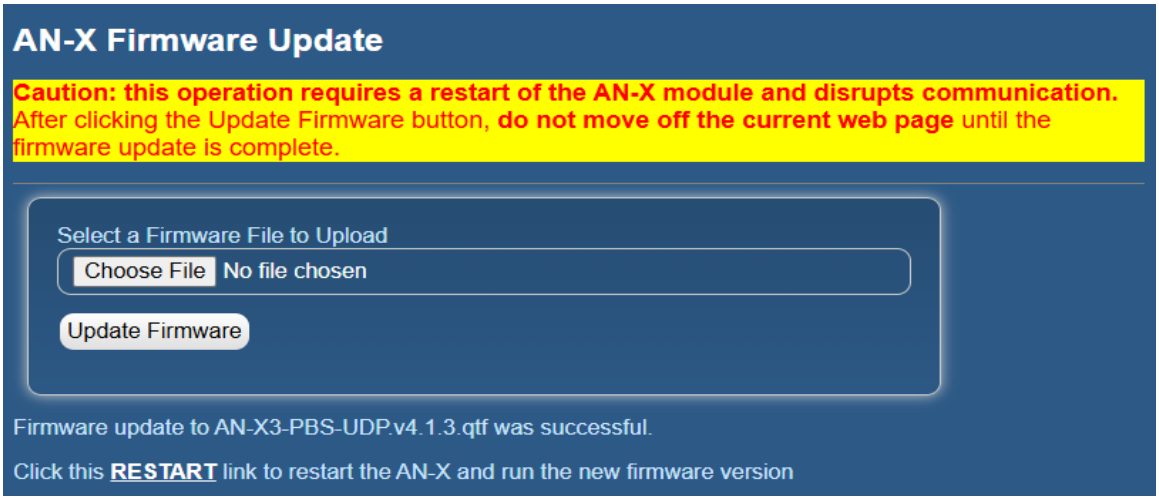
Interrupting power at some points in the update process could render the AN-X inoperative and it will have to be returned to the factory for re-initialization.

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





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



Manual Firmware Update

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

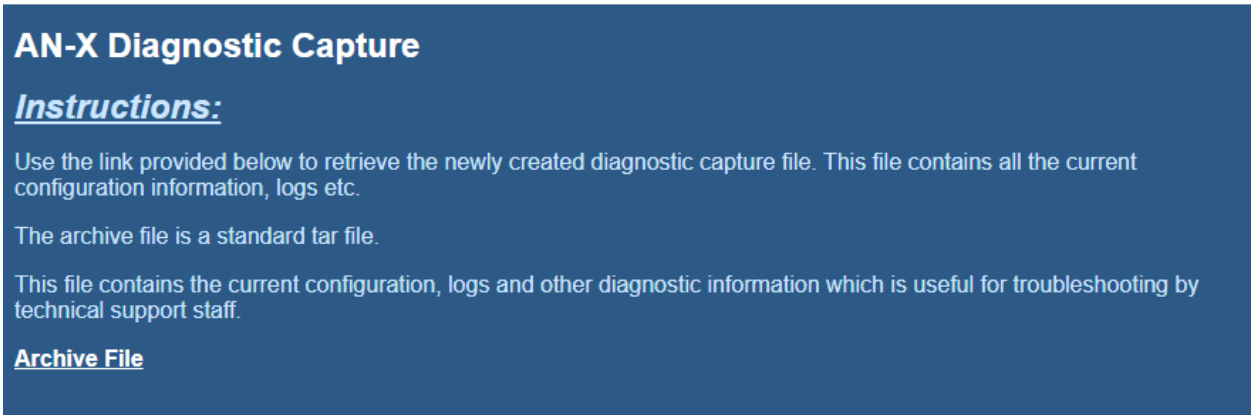
- Remove the microSD and insert it into your computer. You should see the current qtf file (AN-X3-PBS-UDP.v4.1.1.qtf for example).
- Delete or change the name of the current qtf file (zzAN-X3-PBS-UDP.v4.1.1.qtf for example). Renaming may be useful in case we need to revert back to the previous version.
- 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 8).

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.

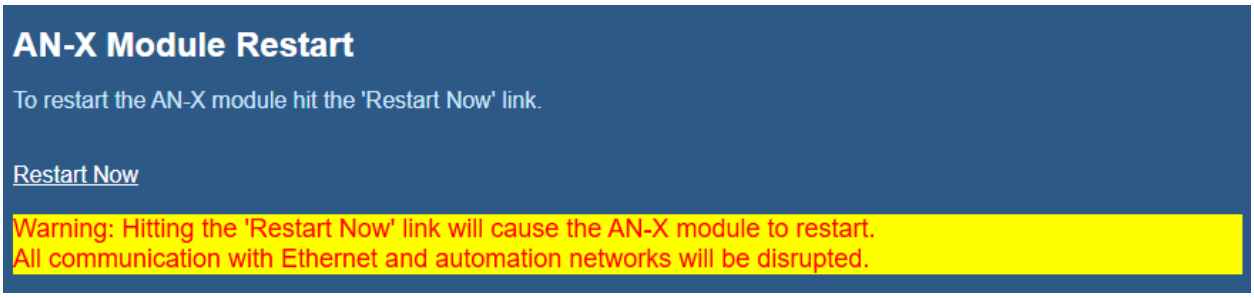


Click the Archive File link.

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

AN-X Module RESTART

Use the '*AN-X Module RESTART*' page to restart the AN-X module.



Support Menu

Contact Information

The Support contains contact information and links if you need help with the AN-X.

Troubleshooting

LEDs

The AN-X3-PB has LEDs that indicate the state of the Ethernet connection, the overall module state and the connection to the Profibus 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 300 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	Meaning
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

‘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 normal production mode.

SYS and NET LEDs: Runtime

SYS – AN-X Status

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

SYS LED	Meaning
Red	An error has occurred during configuration
Green	Configuration was successful

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

NET LED – Network Status

The NET LED indicates the status of the Profibus DP Network.

NET LED	Meaning
Red	One or more Active or Monitored DP Slaves has not been updated from the Profibus DP master within the Timeout period
Green	All Active and Monitored DP Slaves are being updated successfully

Specifications

Parameter	Specification
Function	Gateway between Ethernet and Profibus
Maximum Power Consumption	160 mA at 12 VDC, 80 mA at 24 VDC
Maximum Power dissipation	2 Watts
Operational Temperature	0-50°C (32-122°F)
Storage Temperature	–40 to 85°C (–40 to 185°F)
Relative Humidity	5-85% 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

+60.3.2247.1898
support.ap@prosoft-technology.com

Europe – Middle East – Africa

Languages Spoken: French, English

+33.5.34.36.87.20
support.EMEA@prosoft-technology.com

North America

Languages Spoken: English, Spanish

+1.661.716.5100
support@prosoft-technology.com

Latin America (Brasil)

Languages Spoken: Portuguese, English

+ 55.11.5084.5178
support.la@prosoft-technology.com

Latin America (Spanish Speaking Countries)

Languages Spoken: Spanish, English

+52.222.264.1814
support.la@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 21/25	Initial Release
1.2	Jan 28/25	UDP Sample file – added description for ProfiDiag and GlbCtl
1.3	Mar 6/25	Fixed format, typos and screen captures