tyrrell products ltd

niagara4

Advanced MX Fire Alarm Integration for Tridium Niagara 4

Technical Guide

Date 03/10/2023

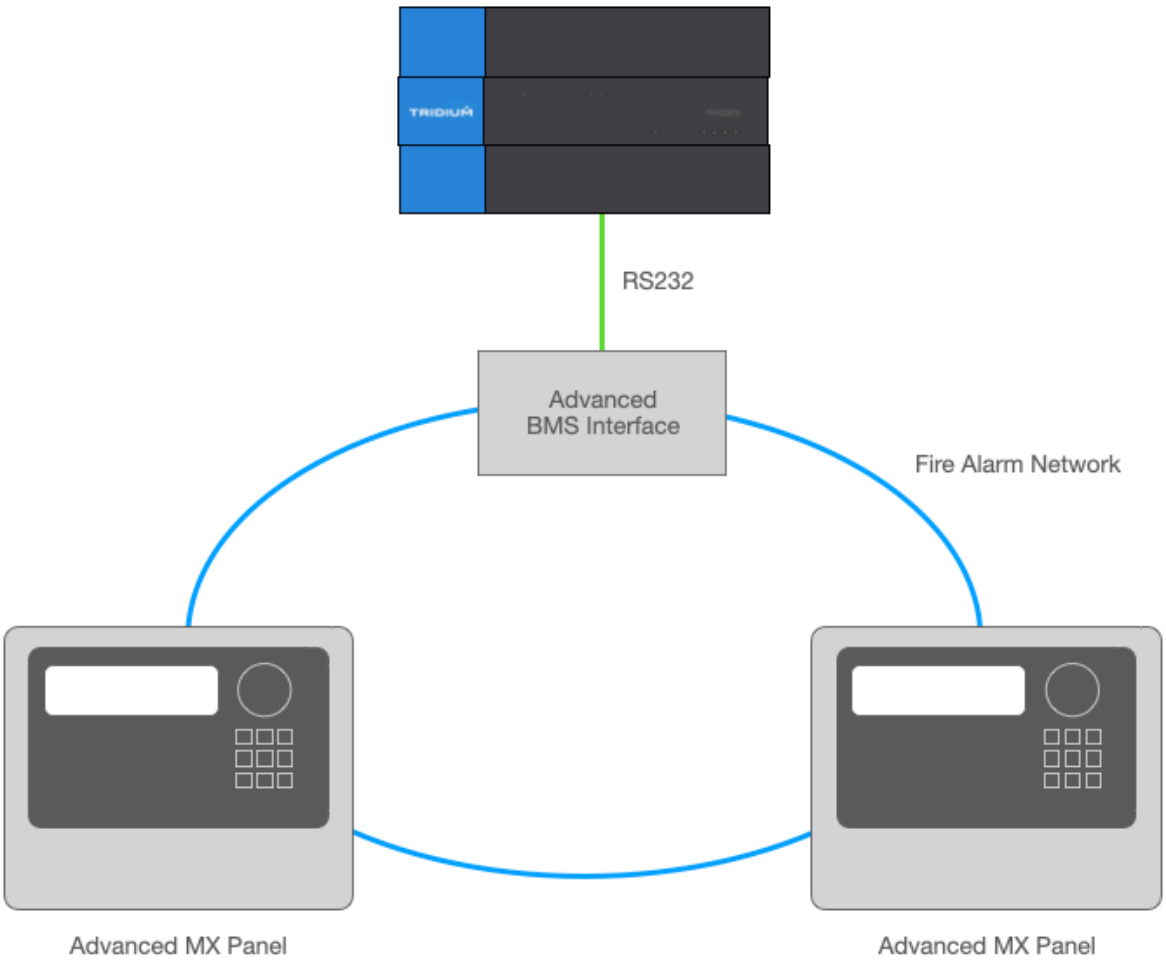
Revision 1.2

INTRODUCTION

The Advanced MX integration driver is designed to provide an easy integration interface to an Advanced MX fire alarm system .

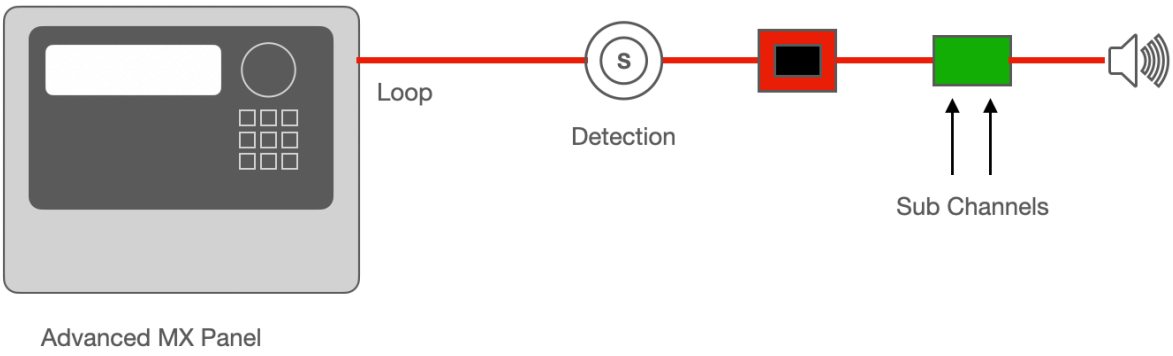
The driver supports all size installations from a single panel to a multi building-multi panel setup. The driver is licensed on a points basis, a variety of point packs to suit every project are available. An Advanced BMS interface is required to allow the Tridium controller to connect to the fire system.

The driver supports a direct RS232 connection from a field level controller such as a JACE or Tyrrell IoT Controller. Connections from a Web Supervisor are possible but require an additional IP-RS232 Device Server. The Device Server can also be used to achieve a remote connection from a field level controller that doesn't have a RS232 interface.



Advanced Fire Alarm Panels support a range of fire detection manufacturers (Apollo, Hochiki, AV, Nittan etc), the type of detection system does not affect the Niagara 4 Driver interface.

The Advanced Fire Panels supports a feature called Sub Addressing where a device can present multiple channels of information. For example an Dual Input Module has 2x channels, these will be presented as Sub Channel 0 and Sub Channel 1. Normal detections devices such as smoke detectors and manual call points will report on Sub Channel 0. Each Sub Channel that is added to the the System will consume 1x Point license (both Advanced MX and Tridium Global Capacity).



Whilst the driver is communicating with the fire system it is not a 'polling based' driver, the fire system connection is fully event driven. This means that as an event occurs in real time on the fire panel(s) an event message is reported to the Advanced BMS Interface node. This message is then reported to the Niagara 4 AMX Driver and the associated fire alarm 'point(s)' will be updated to reflect the active state of the system.

If a fire alarm event is reported but no associated Niagara point is present (Device and or Zone) then the driver will take no action. There could be situations where the device point is not programmed but the Zone point is, the Zone point would then reflect the active state of the fire alarms system.

LICENSING & SOFTWARE MAINTENANCE

The Advanced MX driver is licensed based on the number of fire alarm points being used. Points within the Advanced Driver are a multifunction point component and can provide multiple items of information. The parent point is always an Enumerated Point, this point then contains multiple slots detailing more specific alarm conditions.

In addition to having an Advanced MX point pack license the target device will need to also have adequate spare Tridium Global Capacity points licenses. Every Advanced MX point will consume 1x Tridium Global Capacity point license.

You will need to provide your Niagara 4 Host ID as part of your driver license purchase.

Once the license has been generated you can re-import your niagara license files from the Platform > License Manager providing you have an internet connection, alternatively you can be emailed a copy of the new license files.

The driver includes a software maintenance feature. Every new purchase of the driver will support the current release of Niagara 4 and the next release of Niagara 4, any subsequent upgrades will require a software maintenance license to be purchased.

As an example the current release of Niagara 4 is N4.14, a new driver purchase will cover you for N4.14 and a future upgrade to N4.15. Any further upgrades, for example to N4.16 or above, will require a software maintenance license to be updated. The software maintenance license would then cover you for the now current release of Niagara 4 and the next future release. You can upgrade from any previous release in a single step with a one off software maintenance purchase (N4.13 > N4.15).

Ensure the target Host License Manager is up to date with a Tyrrell.license and Tyrrell.certifcate containing the required license features.

Any questions or queries in relation to this item should be sent to sales@tyrrellproducts.com

Advanced MX License Packs:

Product Code	Description
	Advanced MX Driver For 100x Fire Alarm Points
	Advanced MX Driver For 250x Fire Alarm Points
	Advanced MX Driver For 500x Fire Alarm Points
	Advanced MX Driver For 1,250x Fire Alarm Points
	Advanced MX Driver For 2,500x Fire Alarm Points
	Advanced MX Driver For 5,000x Fire Alarm Points
	Advanced MX Driver For 10,000x Fire Alarm Points
	Advanced MX Driver Upgrade For 100x Fire Alarm Points
	Advanced MX Driver Upgrade For 250x Fire Alarm Points
	Advanced MX Driver Upgrade For 500x Fire Alarm Points
	Advanced MX Driver SMA - Niagara Version Upgrade

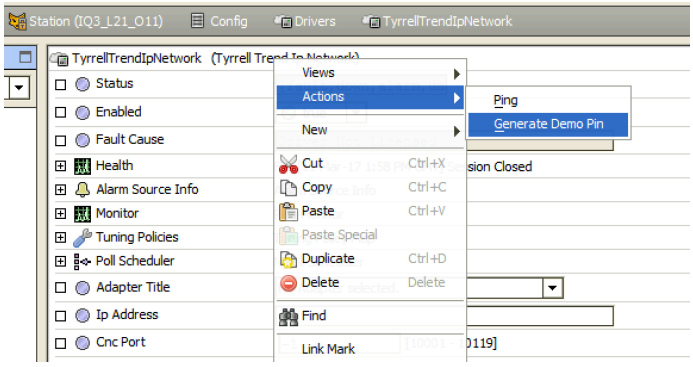
The driver will also consume Tridium Global Capacity points from the Tridium license, if upgrading ensure you have adequate Global Capacity license before ordering.

DEMO MODE

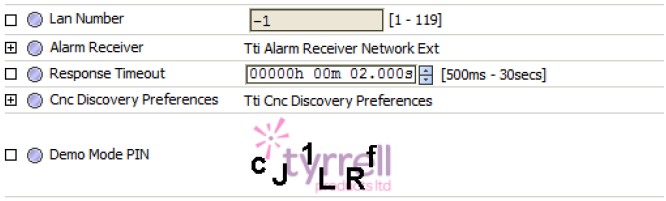
In addition to permanent licenses the driver also supports a two hour demonstration mode.

To activate this mode follow the below steps -

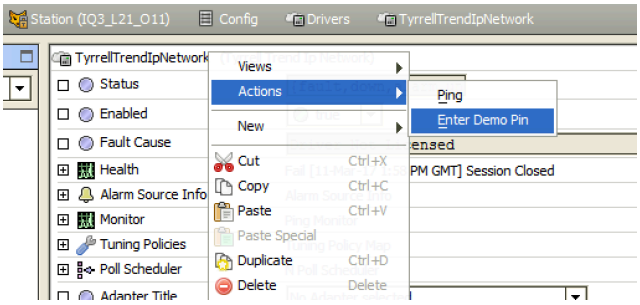
- Insert a new Advanced network (see the following section)
- Go into the **AX Property Sheet** of the network
- Right click on the **Driver > Actions > Generate Demo PIN**



- An image will appear at the bottom of the property sheet with a demo PIN



- Right click on the **Driver > Actions > Enter Demo PIN**



- Enter the PIN exactly as it is shown in the image
- When entered correctly a pop up box will appear with instructions.
- Restart the station to complete the activation of the demo mode.
- After two hours the demo mode will expire
- Restart the Station and repeat the above steps to re-activate the demo mode.

DRIVER INSTALLATION

The Advanced MX driver supports Niagara 4.10 and above.

NOTE:
If your installation is running an an older version of the Niagara software then it must be upgraded to meet the above requirements to run this driver.

Any future updates to the Advanced MX driver will be available for the long term maintenance release and above. All other releases will become legacy and unsupported.

Niagara 4 Installation:
You will need the version specific JAR files for your Niagara 4 installation. These can be downloaded from the Customer Portal or alternatively contact the support team (support@tyrrellproducts.com).

To install the driver copy the below JARS to the following directory

- advancedMX-rt.jar
- advancedMX-wb.jar

c:\niagara\niagara 4.x.xx\modules

Once the files have been put into the correct directory close your workbench, and relaunch. Any running Stations on the local machine will have to be re-started to make use of the Advanced MX driver.

The Advanced MX driver is now ready to use in a local station or to commission / update a Niagara controller. To install the driver on a Niagara controller use the Commissioning Wizard on the platform of the target device.

PRE REQUISITES

Before proceeding you should ensure the following:

- Advanced Fire Alarm System has a BMS Interface installed.
  For MxPro 4 networks use an MXP-010
  For MxPro 5 networks use an MXP-510
- All Advanced panels must be fully commissioned, this includes having a unique node address and the next node address set for each Panel.
  This can be configured on the Panel display or via the Advanced panel programming tool.
- All panels are logged out of Level 3 (Commissioning Mode).
- If using a JACE8000 this must be fitted with an expansion RS232 port and installed within 15m of the Advanced BMS Interface.

RS232 CABLE

The Advanced MX BMS Interface provides a terminal block RS232 connection. The specification of the cable from the Niagara controller is as follows:

Tridium Controller RS232 (DB 9F)	Advanced BMS Interface (Terminals)
2	TX
3	RX
5	GND

The maximum cable length is 15m.
This means the Niagara controller must be installed directly adjacent to the Advanced BMS interface panel.

If a remote interface is required (more than 15m) then use the TCP Driver option, additional hardware will be require for this option.

DRIVER CONFIGURATION

Connect to the Niagara station where you intend to configure the Advanced MX driver.

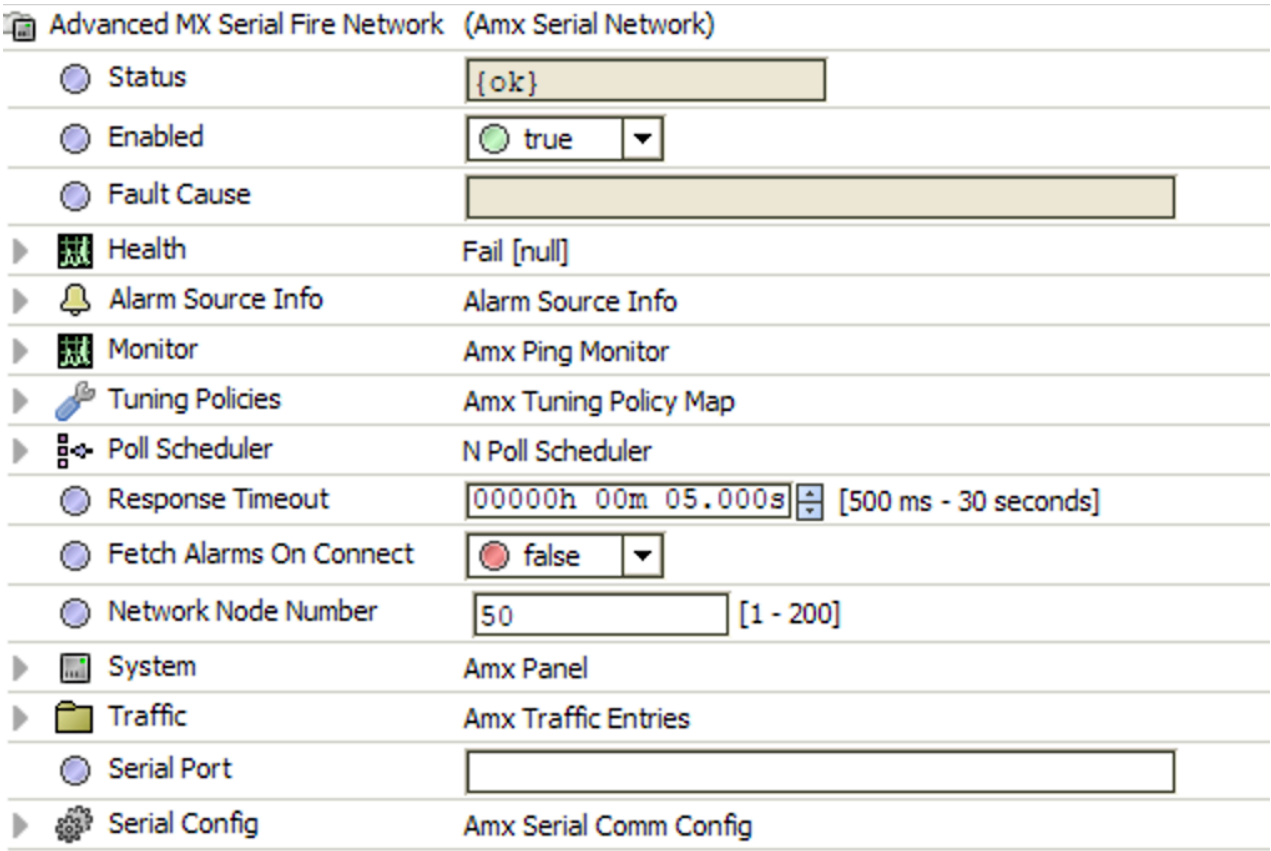
Expand **Config > Drivers** container and add a new **Advanced MX** driver, there will be two choices:

- AMX Serial Network
- AMX TCP Network

Navigate to the **AX Property Sheet** view of the driver to configure based on the type of network selected.

Advanced MX Serial Network

This driver option can only be used on a Niagara controller supporting a RS232 connection and cannot be used on a Web Supervisor.



Settings on the following page:

PROPERTY	DESCRIPTION
Status	Driver status should always be OK
Enabled	Enable / Disable the Driver
Fault Cause	Details of any configuration issues
Response Timeout	Default 5000ms (5 Seconds)
Fetch Alarms On Connect	When a connection to the BMS Interface is made request all current alarms / events. This applies to Station Re-Starts and BMS Interface Re-Connections. This should be set to **True** to ensure the driver is always in sync with the fire alarm system.
Network Node Number	Address of the Advanced BMS Interface Default Node 50
Serial Port Name	The COM Port Name of the RS232 Serial Port Controller Hardware Platform Specific
Baud Rate	To match the config of the Advanced BMS Interface. 38400 bps (Default) or 19200 bps

Configure the Serial connection as required and save the property sheet. The serial port configuration will be dependent on the type of Niagara controller that is in use.

JACE8000 / JACE9000

JACE with 1x RS232 Expansion port

COM3 / 38400* bps

eBMS IoT Controller

Onboard RS232 connection (DB9 Male)

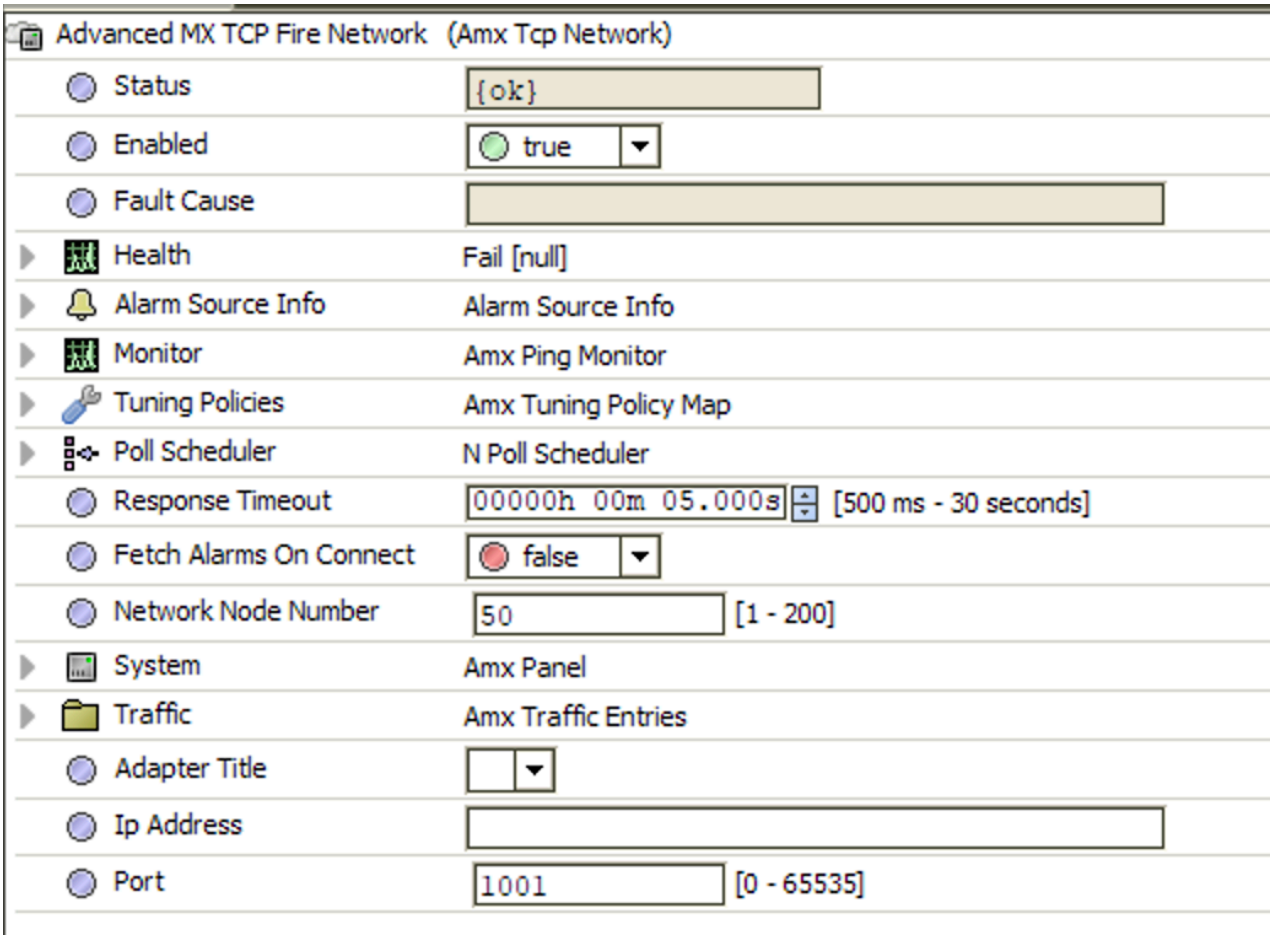
RS232 / 38400* bps

*38400 bps is the default baud rate for the Advanced BMS Interface.
The BMS Interface supports baud rates of 19200 or 38400 bps.

Advanced MX TCP Network

This option requires additional hardware to be purchased.

This driver option can be used on a Niagara controller that does not have a RS232 connection and can also be used on a Web Supervisor. Web Supervisors must have Global Capacity points licensed.



Settings on the following page:

PROPERTY	DESCRIPTION
Status	Driver status should always be OK
Enabled	Enable / Disable the Driver
Fault Cause	Details of any configuration issues
Response Timeout	Default 5000ms (5 Seconds)
Fetch Alarms On Connect	When a connection to the BMS Interface is made request all current alarms / events. This applies to Station Restarts and RS232 Re-Connections. This should be set to **True** to ensure the driver is always in sync with the fire alarm system.
Network Node Number	Address of the Advanced BMS Interface Default Node 50
Adaptor Title	Network Interface Adapter.
IP Address	IP Address Of Target IP Gateway *Config dependent
Port	IP Port Of Target IP Gateway *Config dependent - Default 1001

IP DEVICE SERVER CONFIGURATION

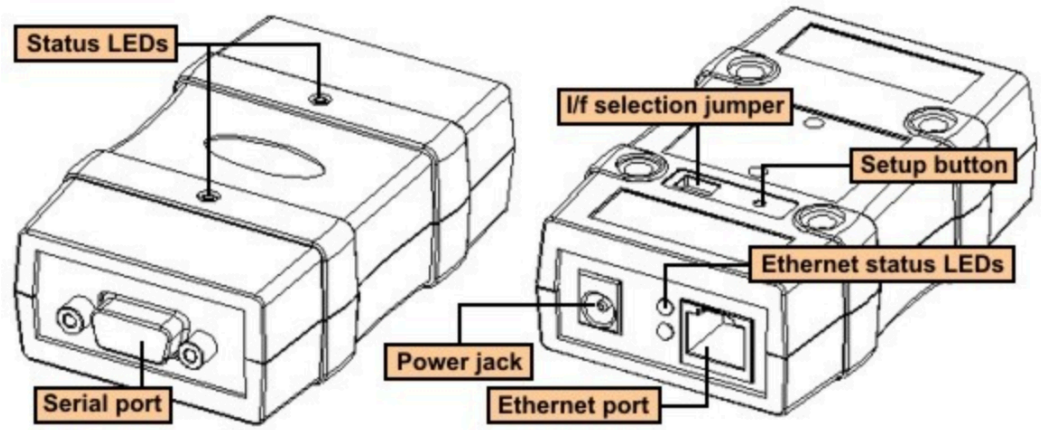
The IP Device Server will need to be configured for the remote connection to the Advanced BMS Interface. You will require the following:

- 12v DC Power Supply
- USB - RS232 Converter
- RS232 Null Modem Cable (DB9F - DB9F)
- Device Server Configuration Software

The Device Configuration Software can be downloaded from:

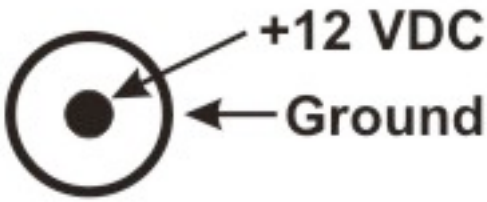
- https://tibbo.com/support/downloads/tdst.html

Device Server

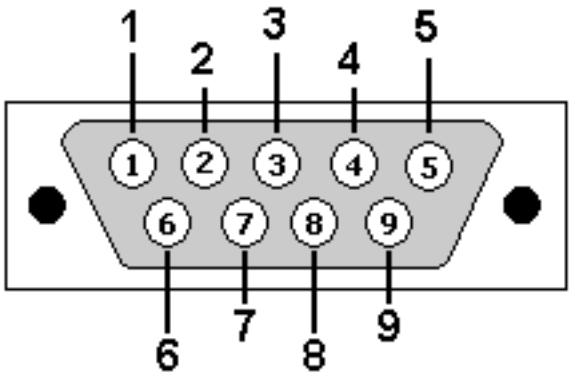


Power:

The Device Server is 12vDC Only, minimum of 500ma.



Serial Port DB9 Pin Out:



	RS232 (full-duplex op.)
#1	*<No connection>*
#2	**RX** (input)
#3	**TX** (output)
#4	*<No connection>*
#5	**Ground**
#6	*<No connection>*
#7	**RTS** (output)
#8	**CTS** (input)
#9	*<No connection>*

The Device Server does not have a fixed IP address and DHCP is not enabled by default. The device can **only** be initially configured via a serial connection.

Install the Device Server Tool Kit.

Power on the Device Server.
NOTE: 12vDC ONLY.

Connect the Device Server to your laptop via the **USB - RS232** converter and null modem cable.

Launch the Tibbo **DS Manager Tool.**

Select the **Serial Access** Tab.

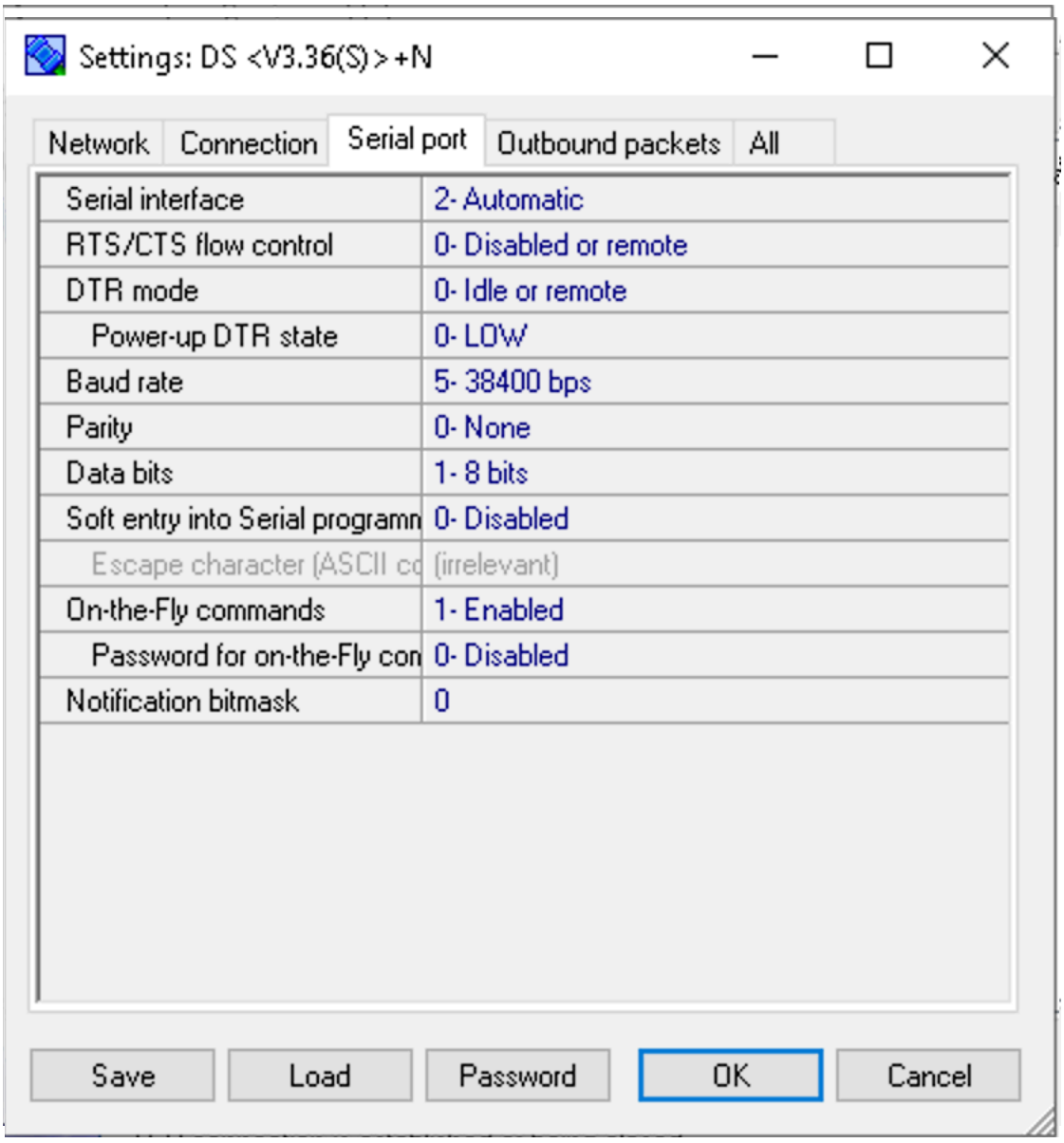
Select the **RS232 COM Port** your PC.

You will then be prompted to press the config button on the Device Server. You will need a sharp tipped implement such as a pencil or paper clip.

The Device will then connect and can be configured with the following settings.

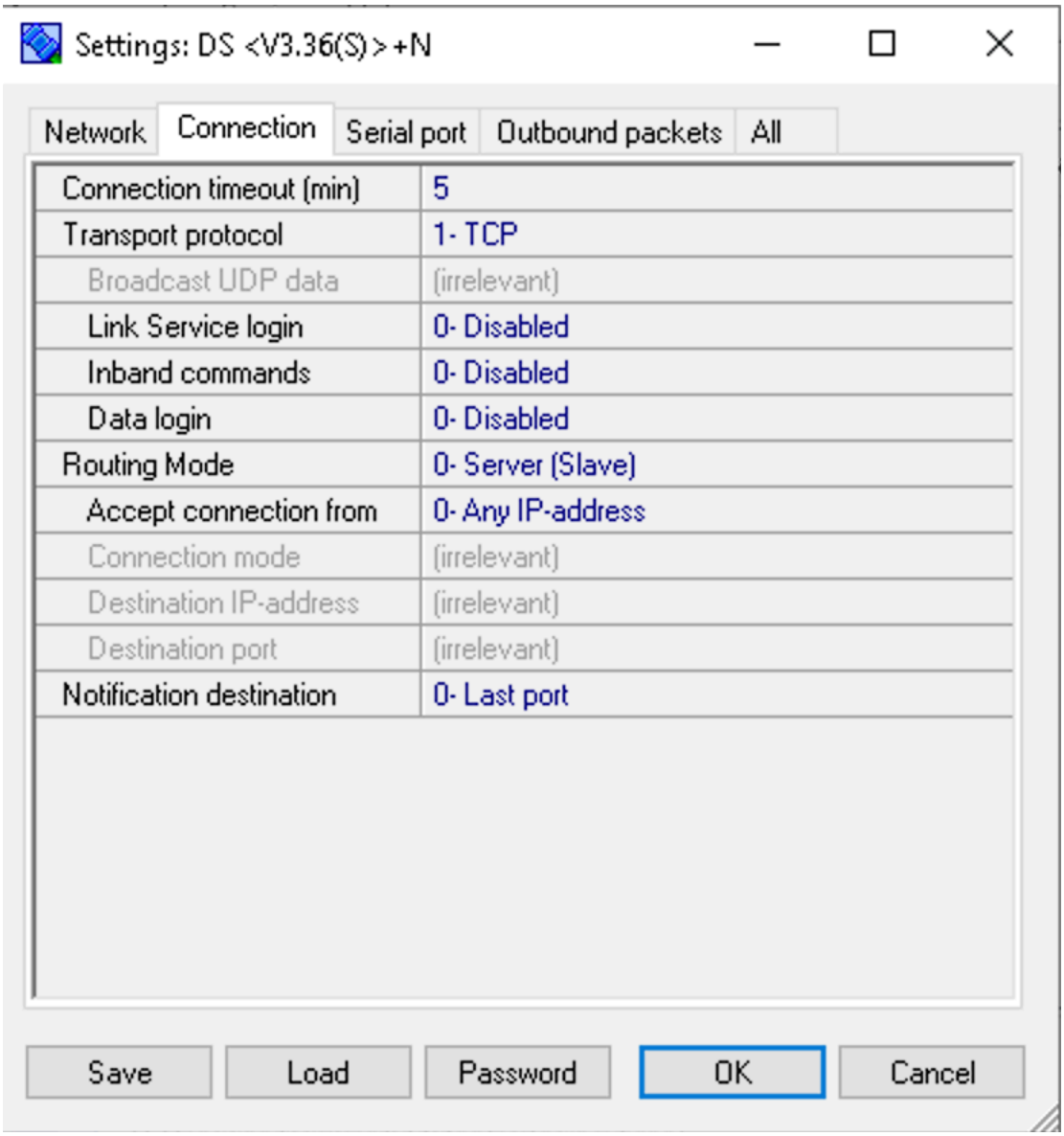
Network Settings Tab

- DHCP - **Disabled**
- IP Address - **Site Specific**
- Subnet Mask - **Site Specific**
- Gateway (If Required) - **Site Specific**
- Port - **1001 (Default)**



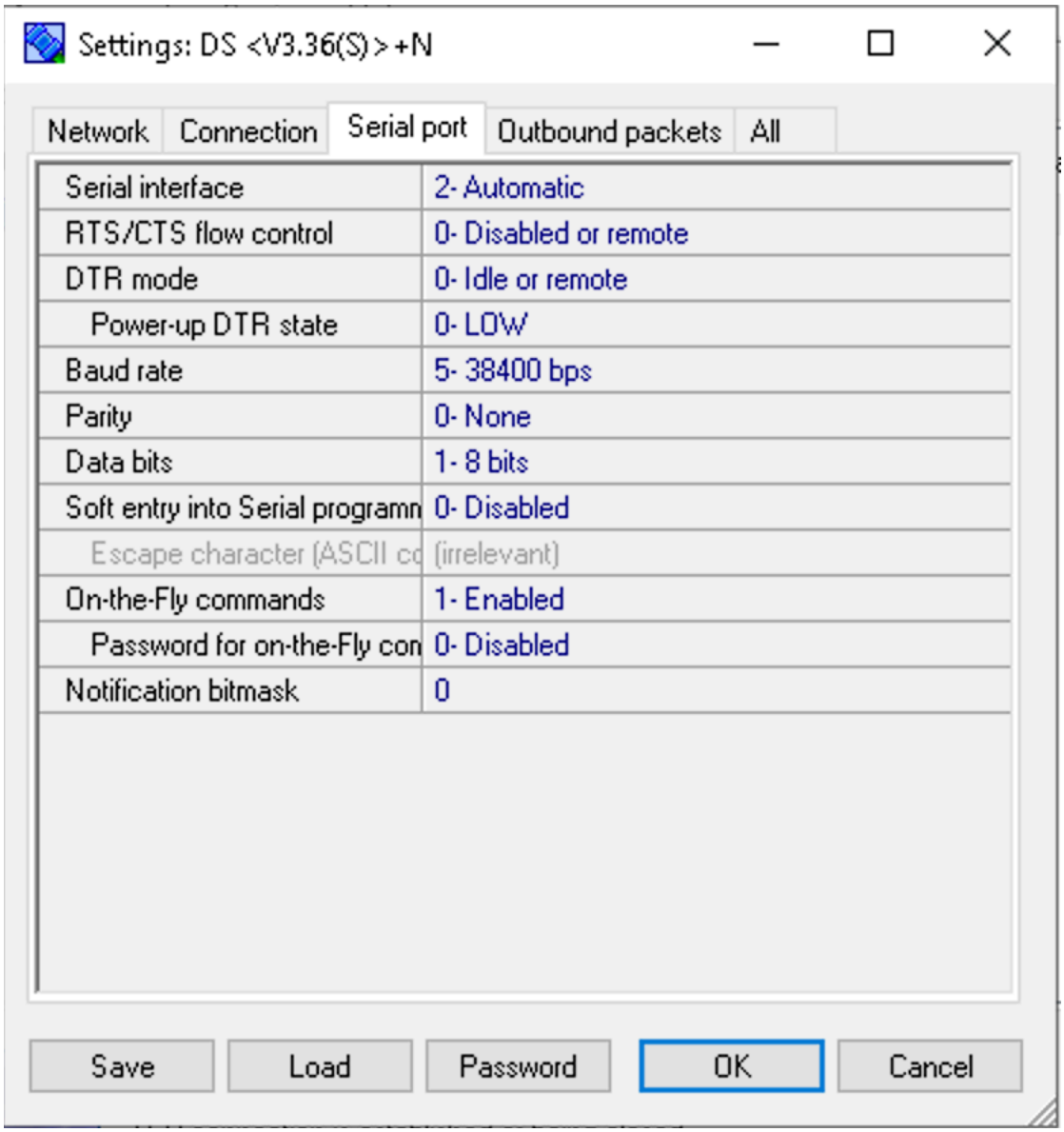
Network Settings

- Connection Timeout - **5 Mins (Default)**
- Transfer Protocol - **TCP**
- Routing Mode - **Server (Slave)**



Serial Settings

- Serial Interface - **Automatic**
- RTS / CTS Flow Control - **Disabled or Remote**
- Baud Rate - **38400bps**
- Parity - **None**
- Data Bits - **8 bits**
- On Fly Commands - **Enabled**



NETWORK COMMANDS

The Advanced MX Network supports several Actions / Commands, these are accessible via **right clicking the network > Actions**

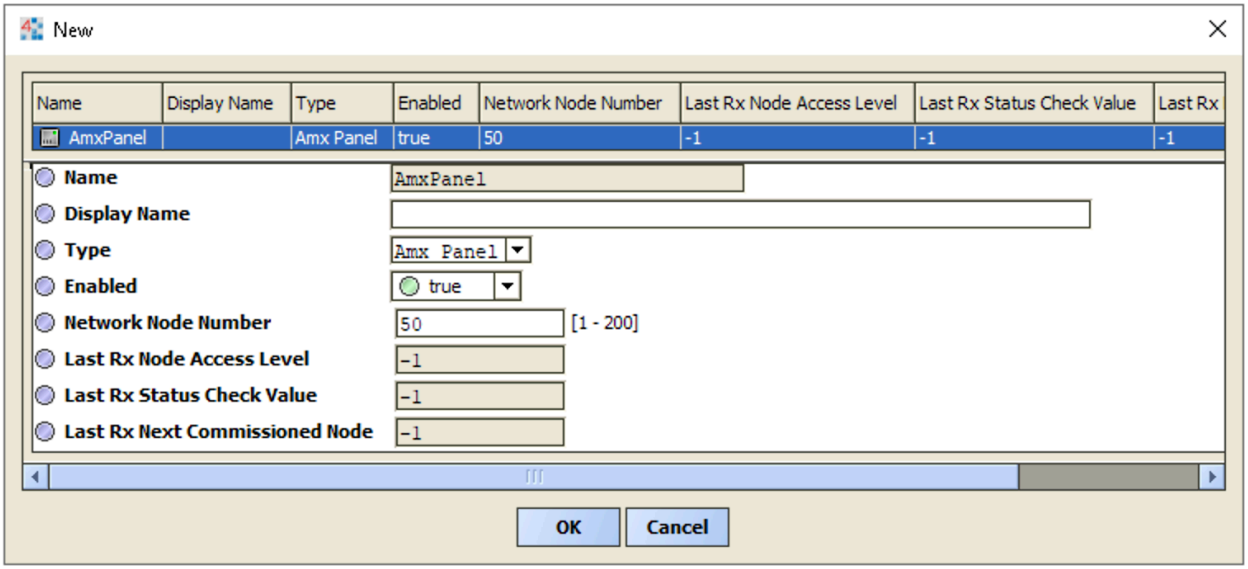
ACTION	DESCRIPTION
Reset All Panels	Global reset command to all panels on the network.
Resound All Alarms	Global re-sound command to all panels on the network. **WARNING:** Will evacuate the panel(s)
Silence And Mute All	Global silence and mute command to all panels on the network.
Silence All Sounders	Global silence to all panels on the network.
Mute All Panel Buzzers	Global mute to all panel on the network.
Evacuate All	Global evacuate to all panel on the network. **WARNING:** Will evacuate the panel(s)
Cancel Evauate All	Cancel the evacuation command.
Resend Alarms	Provide a re-sync between the driver and BMS interface. This is a 'request all alarm' from the fire system function.

AMX DEVICES (PANELS)

The Advanced MX network will always have 1x Device by default, this represents the BMS Interface Node (Default of Node 50). This device holds the Zone Container, fire alarm zones on Advanced are shared across Panels and do not belong to a specific panel.

Each installed fire panel on the network will need a device adding to the network. It is recommended to add all panels before populating with data points.

To add a new Fire Panel Device click the **New Button**



PROPERTY	DESCRIPTION
Display Name	Descriptive Label of the Panel
Network Node Number	Node number as programmed on the Panel

Each New Panel Device will support:

- Device Points

DEVICE (PANEL) COMMANDS

The Advanced MX Network supports several Actions or Commands, these are accessible via **right clicking** the **Device > Actions**

ACTION	DESCRIPTION
Ping	Ping the specific Panel Address
Request Node Status	Request the current state of this node
Import CSV	Import a CSV configuration file Allows rapid configuration of all devices in the node
Export CSV	Export a CSV configuration file Allows the current configuration to be exported and quickly edited for re-import
Reset Panel	Reset command to this panel only
Resound Alarms	Resound Alarm command to this panel only **WARNING:** Will evacuate the panel
Silence And Mute	Silence & Mute command to this panel only
Silence Sounders	Silence Sounders command to this panel only
Mute Panel Buzzers	Mute Buzzer command to this panel only
Resend Alarms	Resend Alarms from this specific panel only

ZONE POINTS

Zone points **ONLY** belong to the BMS Interface device.

Zone points can be added by:

- Manually Creating Point(s)
- Discovery
- CSV Import

Each Zone Point will consume 1x AMX Point & 1x Tridium Global Capacity Point license.

Zone points are not reliant on the associated AMX Panel OR Device points being programmed. This means that driver can be configured only with Zone points and still function correctly reflecting the live state of the fire alarm system.

A Zone can potentially have multiple events occurring at the same time:

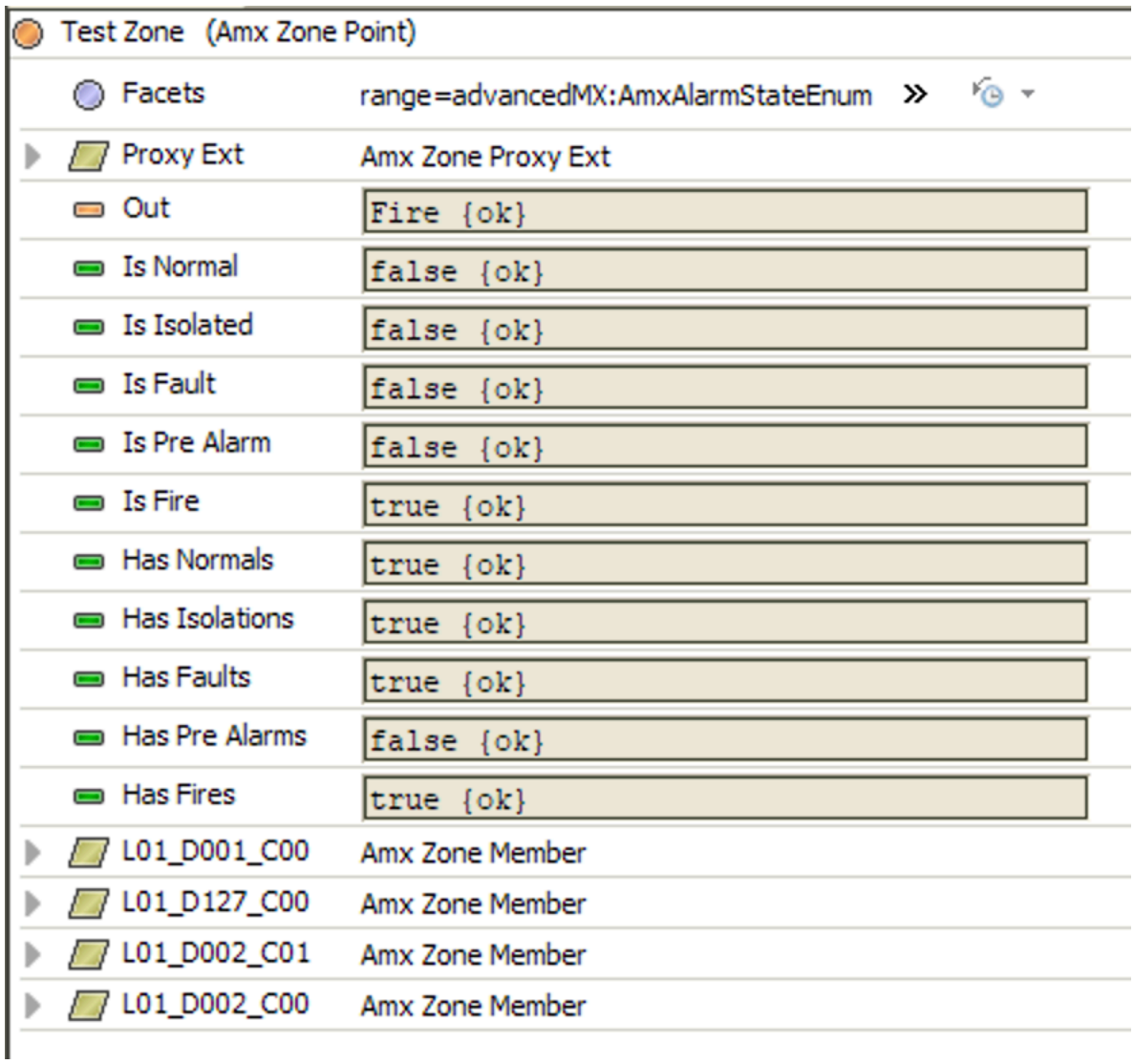
- Fire
- Pre-Alarm
- Fault
- Isolations

The Zone Point Out slot will reflect the most significant state of the fire alarm system, Fire Alarm conditions will always be the most significant state. The point will also present additional informant slots:

- Is Fire
- Is Pre Alarm
- Is Fault
- Is Isolated
- Has Fire(s)
- Has Pre Alarm(s)
- Has Fault(s)
- Has Isolations(s)

Whilst the driver is communicating with the fire system it is not a 'polling based' driver, the system is fully event driven. This means that as an event occurs in real time on the fire panel(s) an event message is reported to the Advanced BMS Interface node. This message is then reported to the driver and the associated fire alarm 'point' will be updated to reflect the active state.

Each Zone Point is a Multi State Enumerated Point. Within the Point there are additional Status Slots reflecting specific conditions.



Point Facets are:

VALUE	DESCRIPTION
0	Normal
1	Isolated / Disabled
2	Fault
3	Pre-Alarm
4	Fire

Additional Slots are also provided.

The **Is** fields represent the current most significant state of the Zone. Fire Alarm will always be the most significant event.

The **Has** fields represent all conditions in the current zone. It is possible for a Zone to have all conditions active a the same time based on one detector being in each possible state.

Each of the associated detection points are also listed underneath the Zone, providing they are programmed in the Station.

Any of these slots can be referenced within the Station for PX Pages, Wire Sheet logic or BMS Point Export such as Modbus or BACnet.

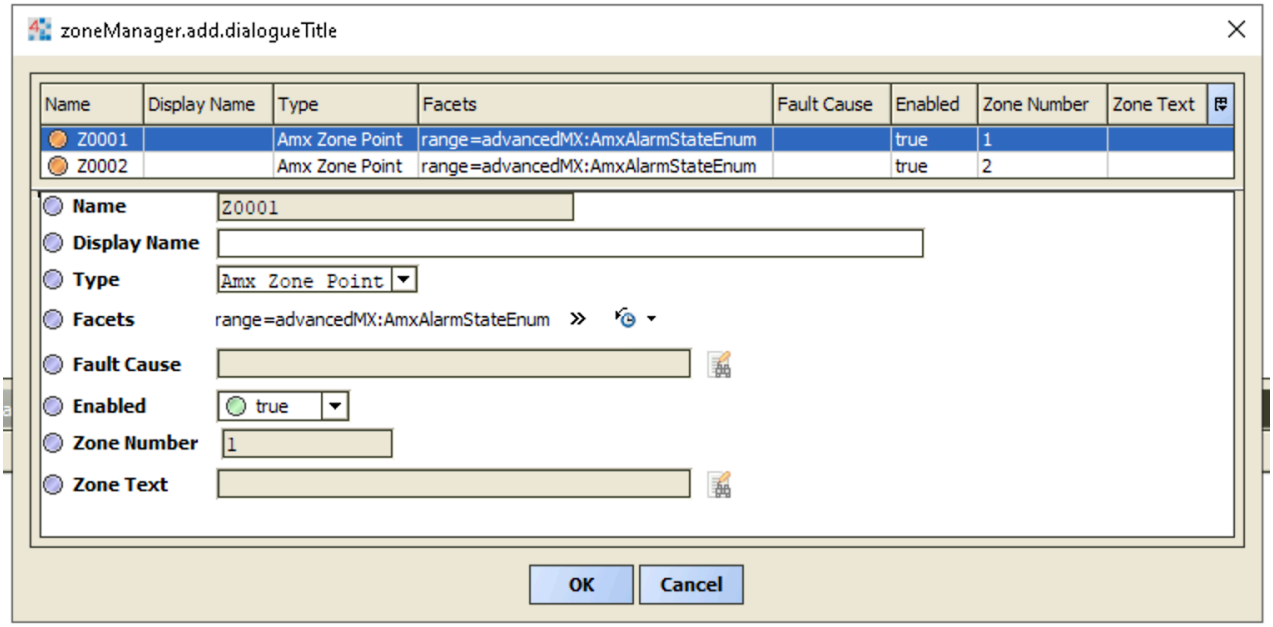
Manually Creating Zone Points

Navigate to the **System Node** > **Zone Points** container.

Select the **New** Button.

Enter a range of the Zones to be created. For example

- From 1 To 1
- From 1 To 20



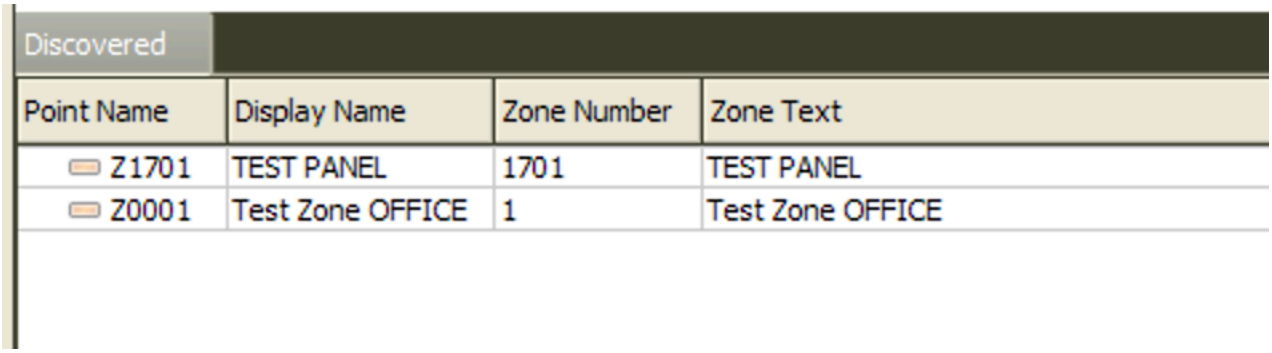
PROPERTY	DESCRIPTION
Display Name	Programmed Label of the Zone
Enabled	Enable / Disable This Point
Zone Number	Number of the Zone This property is frozen and non adjustable

Discovery of Zone Points

Navigate to the **System Node** > **Zone Points** container.

Select the **Discover** Button.

The driver will communicate to the BMS Interface and discover all programmed fire alarm zones in the system. Depending on the number of Zones this may take several minutes to complete.



CSV Import of Zone Points

Navigate to the **System Node** > **Zone Points** container.

Right click on the parent **Panel Device > Actions** and select **CSV Export**.

The CSV file will be exported to the Station folder ***amx\csvExports***

The CSV file can then be edited with Excel or similar.

Network Node #	Point Type	Folder Path	Loop #	Device #	Channel #	Zone #	Display Name
50	Zone					1	Ground East
50	Zone					2	Ground West

Once the CSV file has been updated the file should be re-saved to the folder ***amx\csvImports***

Right click on the parent **Panel Device > Actions** and select **CSV Import**.

Select the target CSV file.

The Zone container will then populate as per the configured CSV file.

ZONE POINT COMMANDS

The Advanced Zone points support several Actions or Commands, these are accessible via **right click the Zone Point > Actions**

ACTION	DESCRIPTION
Isolate Zone	Isolate / Disable the Zone. NOTE Manual Call Points will remain active when a Zone is isolated / disabled.
De-Isolate Zone	De-Isolate / Enable the Zone.
Read Zone Text	Read the as programmed label of the Zone. This will update the Zone Text Field. A Zone Container command can then take all Zone Field text and apply to the Display Name of each Zone

DEVICE POINTS

Device points can belong to any Panel device including the System device.

Device points can be added by:

- Manually Creating Point(s)
- Discovery
- CSV Import

Each Device Point will consume 1x Tridium Global Capacity Point.

Device points are sourced from a Loop (Loop 0 - 16). Each device may also have multiple points depending on if the fire alarm device has any Sub Channels. For example a Zone Monitor Unit may have 2x Inputs & 1x Output, this would required 3x Points in total - one for each sub channel.

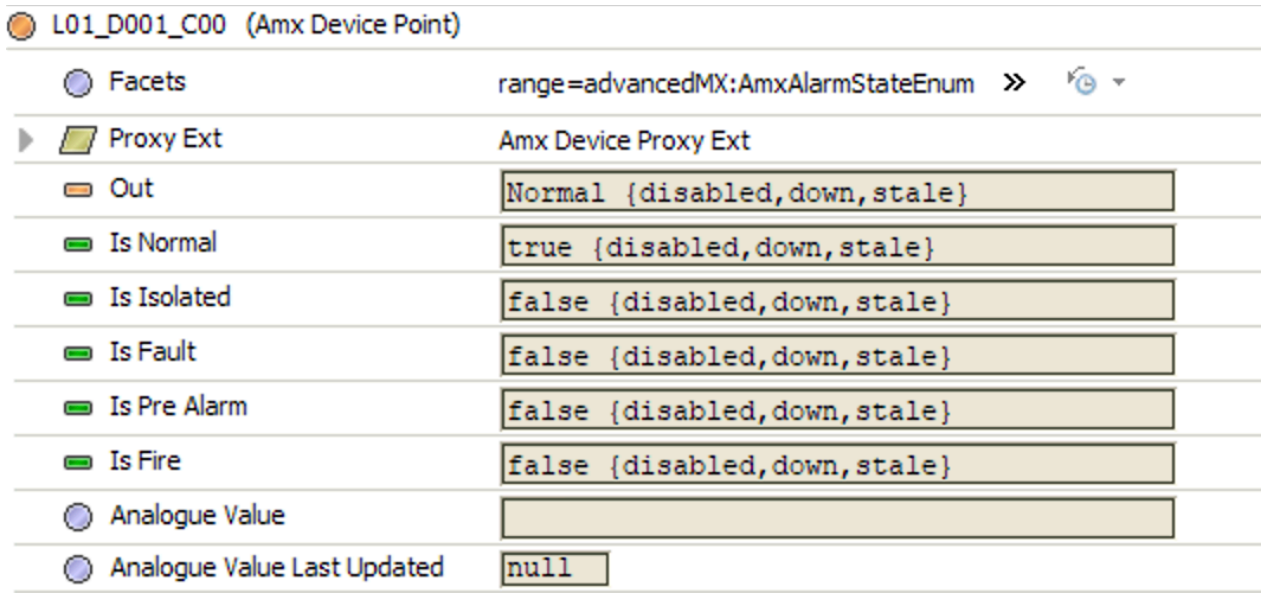
Loop 0 is used to reflect any onboard devices that a Panel may have, such as Sounder Faults or Programmable Inputs. Loops 1 - 16 are used to reflect the state of detection Loops. Physically a panel will only have up to 4x Loops, however a Loop Offset can be applied in software (Physical Loop 1 > Software Loop 5).

Advanced Fire Alarm Panels support a range of fire detection manufacturers (Apollo, Hochiki, AV, Nittan etc), the type of detection system does not affect the Niagara 4 Driver interface.

The Advanced Fire Panels supports a feature called Sub Addressing where a device can present multiple channels of information. For example an Dual Input Module has 2x channels, these will be presented as Sub Channel 0 and Sub Channel 1. Normal detections devices such as smoke detectors and manual call points will report on Sub Channel 0. Each Sub Channel that is added to the the System will consume 1x Point license (both Advanced MX and Tridium Global Capacity).

Whilst the driver is communicating with the fire system it is not a ‘polling based’ driver, the system is fully event driven. This means that as an event occurs in real time on the fire panel(s) an event message is reported to the Advanced BMS Interface node. This message is then reported to the driver and the associated fire alarm ‘point’ will be updated to reflect the active state.

Each Device Point is a Multi State Enumerated Point. Within the Point there are additional Status Slots reflecting specify conditions.



Point Facets are:

VALUE	DESCRIPTION
0	Normal
1	Isolated / Disabled
2	Fault
3	Pre-Alarm
4	Fire

Any if these slots can be referenced within the Station for PX Pages, Wire Sheet logic or BMS Point Export such as Modbus or BACnet.

The Analogue Value can be read from an Action on the device.

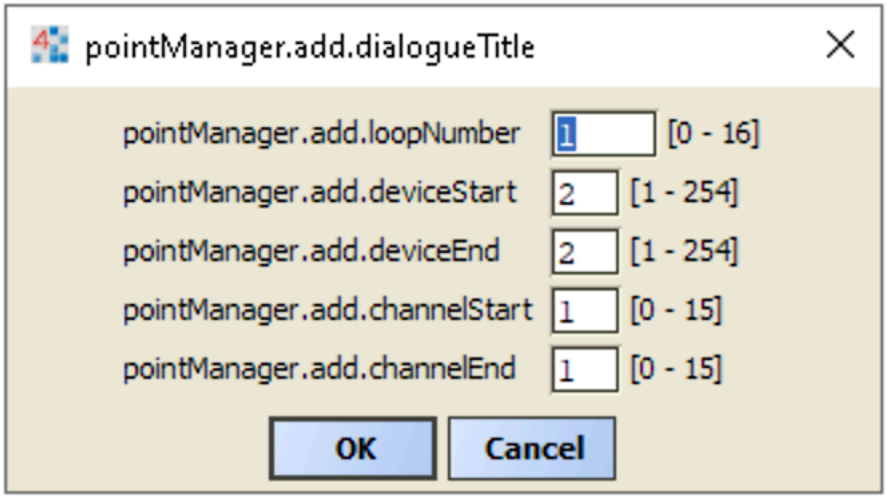
Manually Creating Device Points

Navigate to the target **Panel** > **Device Points** container.

It is recommended to create a **Points Folder** to represent each Loop of fire alarm devices. Otherwise the Point container may become a very large list of Points.

Select the **New** Button.

A range of input settings will be requested:



PROPERTY	DESCRIPTION
Device Start Address	Fire Detection Start Address
Device End Address	Fire Detection End Address
Sub Channel Start Address	Fire Detection Channel Start Default Will be 0
Sub Channel End Address	Fire Detection Channel End Default Will be 0 If changed from zero will create multiple points per detection device.

Discovery of Device Points

Navigate to the **Panel** > **Device Points** container.

Select the **Discover** Button.

The driver will interrogate the panel and return a list of programmed devices across all available Loops. Ensure to select devices form the correct Loop when adding to the database.

CSV Import of Device Points

Navigate to the **Panel** > **Device Points** container.

Right click on the parent **Panel Device > Actions** and select **CSV Export**.

The CSV file will be exported to the Station folder ***amx\csvExports***

The CSV file can then be edited with Excel or similar.

Network Node #	Point Type	Folder Path	Loop #	Device #	Channel #	Zone #	Display Name
1	Device		1	1	0	1	Kitchen Manual Call Point

Once the CSV file has been updated the file should be re-saved to the folder ***amx\csvImports***

Right click on the parent **Panel Device > Actions** and select **CSV Import**.

Select the target CSV file.

TheDevice Points container will then populate as per the configured CSV file.

DEVICE POINT COMMANDS

The Advanced Device points support several Actions or Commands, these are accessible via **right click the Device Point > Actions**

ACTION	DESCRIPTION
Isolate Device	Isolate / Disable the Device.
De-Isolate Device	De-Isolate / Enable the Device.
Read Analogue Value	Read the analogue level of the device
Activate Output	Activate Device Output Channel
Deactivate Output	Deactivate Device Output Channel

RECENT EVENT LIST

The AMX Driver provides a list of recent events from the fire system. This cab accessed form the **AMX Network > Traffic** folder.

Traffic Entries — 36 objects

Timestamp	Traffic Type	networkNodeNumber	loopNumber	deviceAddress	deviceSubAddress	zoneNumber	deviceState	deviceDisabled	outputState	deviceType	deviceText
09-Feb-23 10:18 AM GMT	RX Device Status	1	1	127	0	1	3	false	0	23	
09-Feb-23 10:18 AM GMT	RX Device Status	1	1	1	0	1	33	false	0	6	
09-Feb-23 10:18 AM GMT	RX Device Status	1	0	7	0	1701	12	false	0	16	
09-Feb-23 10:18 AM GMT	RX Device Status	1	0	3	0	1701	12	false	0	8	
09-Feb-23 10:18 AM GMT	RX Device Status	1	0	1	1	1701	12	false	0	8	
09-Feb-23 10:18 AM GMT	RX Device Status	1	0	1	0	1701	12	false	0	8	
09-Feb-23 10:18 AM GMT	RX Device Status	1	1	1	0	1	33	false	0	6	WHAT A PAIN

The Table can be used for testing and diagnosis. The table format is as follows:

- Timestamp
- Traffic Type
- Network Address
- Loop Number
- Device Address
- Sub Address
- Zone Number
- Device State
- Device Isolated
- Output State
- Device Type
- Device Text

The Event Viewer Window also includes a **Clear All Events** Button at the bottom of the Window.

The Event Viewer will keep the last 100 Events by default, this can be increased to a maximum of 1000 events via the **AX Property Sheet** View.

FAULT FINDING

If communications are not working check the following items:

- Ensure the Advanced Panel is not logged in at Level 3. All Panels should be logged in at Level 2.
- Check that both the TX / RX lights on BMS Interface are flashing indicating good network communications.
- 2 Row chip must be on the bottom row
  (located under the network card - you need to be able to see B NOT A).
- Panel / BMS Interface must be in RUN mode and not programming.
- BMS Interface Setup slider switch must be to the right
- If you are missing Nodes then a 'discover' must be done from the panel at Level 3 Commission Mode.
- Each Panel must be configured with its own Node Address and the Next Node Address.
- From Level 2 Menu:
  View Network - should see all Panelodes.
  Comms Packet Counter - there shouldn't be any bad packets.

REVISION HISTORY

REVISION	DESCRIPTION
1.0	Draft Release For Approval
1.1	Driver Release
1.2	General Update