Using DAS Studio 3 to configure the AXN/MEM/401

TEC/NOT/094

This paper discusses the following topics:

62.1 Module overview

The AXN/MEM/401 is an Ethernet recording module that stores data on a removable Solid Sate Drive (SSD) in PCAP file format.

The AXN/MEM/401 is suitable for applications where stand-alone logging of data is required; this means there is no need for a separate data recorder such as a NET/REC/00x.
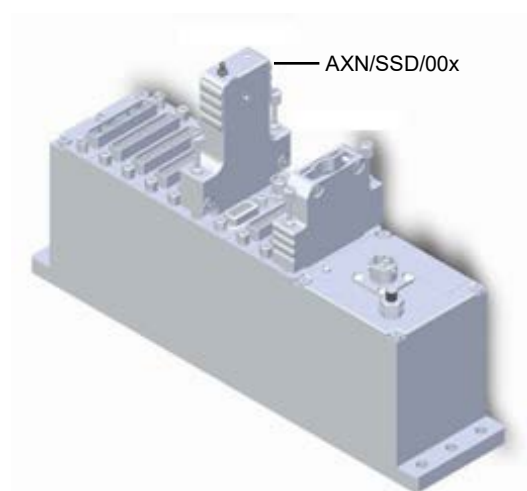

Figure 62-1: AXN/SSD/00x (SSD) attached to the AXN/MEM/401

This document explains how to record, how to retrieve the recorded data, and how to format the SSD.

NOTE: The AXN/MEM/401 is supported by the AXN/BCU/402/B (or later) backplane controller. (In this document, AXN/BCU/402 refers to AXN/BCU/402/B or later.)

62.2 Recording data to the AXN/MEM/401

The AXN/MEM/401 records up to 160 Mbps with a maximum packet rate of 14000 packets per second.

The AXN/MEM/401 can record data from two sources:

- Parameters from within the same Axon chassis, which are packaged by the AXN/BCU/402 as Ethernet packets.
- From external Ethernet packets received by the AXN/BCU/402 and forwarded to the AXN/MEM/401.

The AXN/MEM/401 module does not create packets inside the AXN/MEM/401 itself. Instead it acts like a network recorder and logs Ethernet traffic in PCAP format. It records external traffic/packets, which are routed by the AXN/BCU/402 to the AXN/MEM/401 via the backplane and it records internal packets defined in the AXN/BCU/402; packets are not defined in the AXN/MEM/401.

62.2.1 Routing packets to the AXN/MEM/401

The AXN/BCU/402 needs to be set to route traffic from the controller to the AXN/MEM/401 via the backplane. There are two settings in the AXN/BCU/402 settings, which are used to map the traffic to the slot where the AXN/MEM/401 is present.
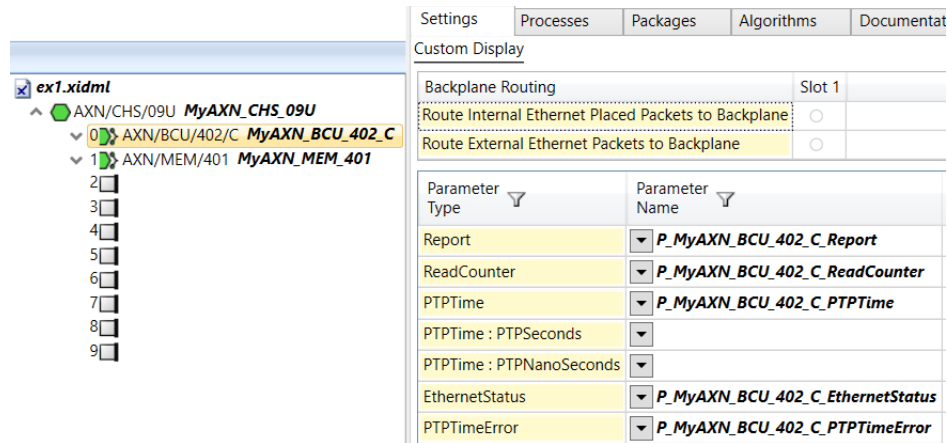

Figure 62-2: Internal and external Ethernet packets to backplane settings

Selecting **Route External Ethernet Packets to Backplane** means that all the external packets going through the internal switch of the AXN/BCU/402 are also recorded in the AXN/MEM/401 in Slot 1.

NOTE: The setting **Route External Ethernet Packets to Backplane** needs to be programmed to be able to format/extract data from the AXN/SSD/00x using the AXN/BCU/402.

Selecting **Route Internal Ethernet Packets to Backplane** means that all the packets created in the AXN/BCU/402 are also recorded in the AXN/MEM/401 in Slot 1.
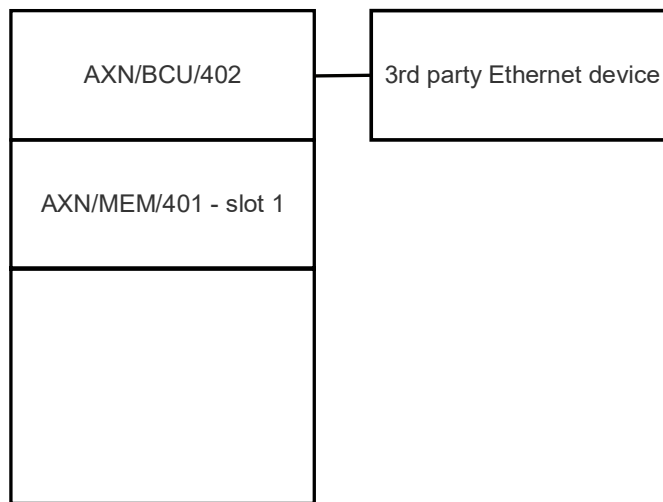

Figure 62-3: Recording external Ethernet packets

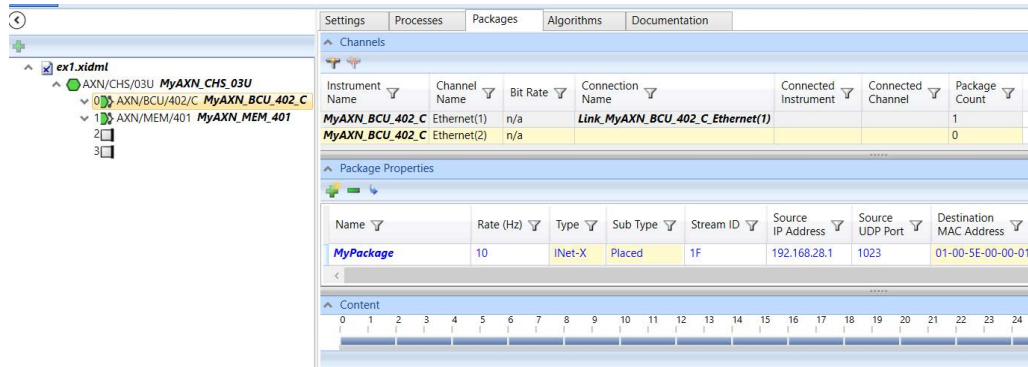The AXN/MEM/401 records the packet that is defined in the AXN/BCU/402.

Figure 62-4: Packet defined in AXN/BCU/402

62.2.2 Triggering

Recording can be set to start in the following ways:

- Log always
- Never log
- Log while Trigger Active
- Log after single Trigger

When a parameter needs to be used to trigger the recording, you need to define the traffic type as shown in the following screen.
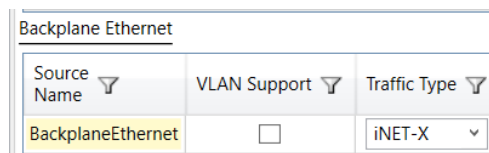

Figure 62-5: Traffic type in DAS Studio set to iNET-X

Traffic Type **iNET-X** is the packet type you are using on the AXN/BCU/402; the parameters used for triggers need to be already transmitted on an AXN/BCU/402 (IENA or iNET-X). Basically the AXN/MEM/401 has implemented an internal Ethernet Bus Monitor (EBM) that allows you to define the parameters to be used for triggering.

Traffic Type **Generic** allows you to use the Ethernet Builder tool to configure parsing of external 3rd party Ethernet streams to be used as a trigger. Ethernet Builder is explained in the *DAS Studio 3 User Manual*.

Example in DAS Studio using Discrete from the AXN/DSI/401

The example XidML configuration file contains an AXN chassis, AXN/BCU/402, AXN/DSI/401, and an AXN/MEM/401. It shows how to use the bit 0 from the DiscreteLow parameter from the AXN/DSI/401 to trigger recording using the Boolean Algorithm (for an explanation on Algorithms, see the *DAS Studio 3 User Manual*).

1. Transmit the DiscreteLow parameter from the AXN/DSI/401 on the AXN/BCU/402 (trigger parameter must be transmitted in order to be available as a trigger parameter in the AXN/MEM/401). For details on adding a package and adding a parameter to the package, see "Chapter 14 - Package tab" in the *DAS Studio 3 User Manual*.

2. On the AXN/MEM/401 **Settings** tab, set the **Traffic Type** to **iNET-X** to match the trigger packet already set up. iNET-X Parsing settings are automatically programmed.

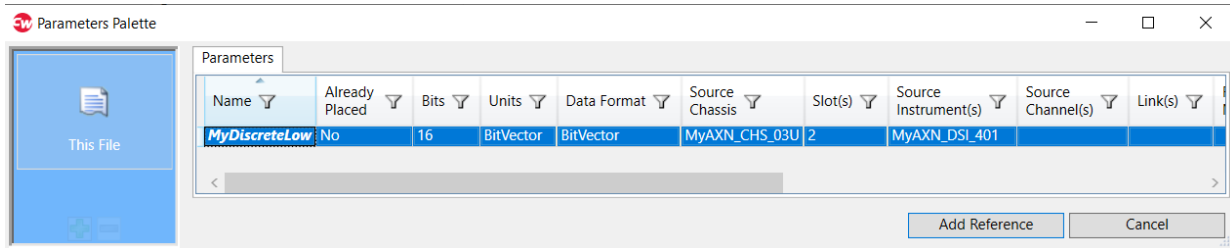3. Click the **+** icon to add a trigger.

4. In the **Trigger Condition** field, click the drop-down arrow and then click **Add**.

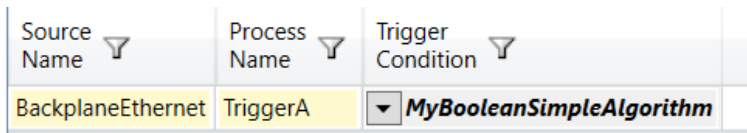5. Select **BooleanSimpleAlgorithm** and then click **Add**.
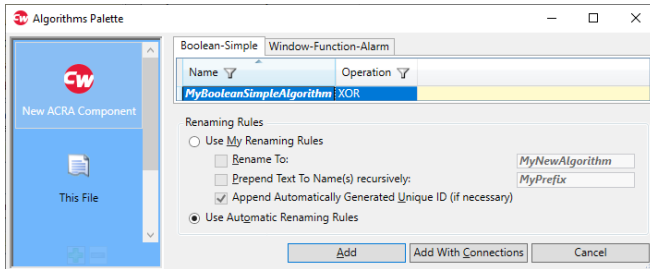
The **Parameters Palette** opens. (Only parameters that can be transmitted over the AXN/BCU/402 are available).
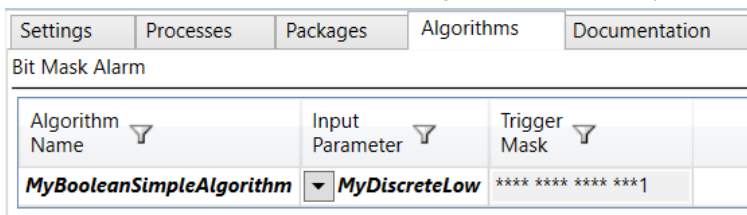
6. Click **Add Reference**.

7. Click the **Algorithms** tab to view the trigger.

8. Define the mask in order to start recording when Bit 0 is at 1 (that is, discrete 0).

62.3 Retrieving data

You can retrieve data while the SSD is connected to the AXN/MEM/401 by using the AXN/BCU/402 Ethernet link or by using the AXN/DTU/001 to connect to a PC.
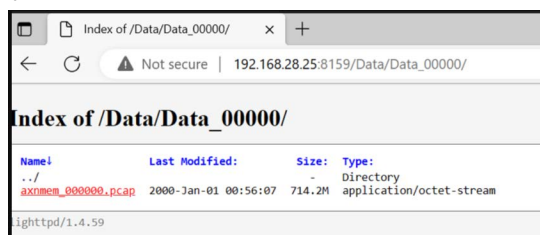
62.3.1 SSD connected to AXN/MEM/401

By accessing over the AXN/BCU/402 Ethernet interface via a file sharing service such as Internet Explorer.

1. To view recorded files, use this command:
   http://<chassis_ip_address>:8150 + <AXN/MEM/401 slot>
   For example, to view the recorded files from the AXN/MEM/401 in slot 9, with AXN/BCU/402 IP address of 192.168.28.25, type in the address bar: **192.168.28.25:8159/Data/Data_00000/**
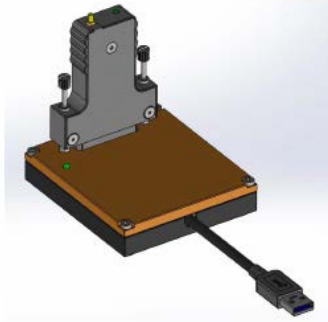

2. Right-click the file to save as a PCAP file to the PC.

62.3.2 SSD connected to AXN/DTU/401

1. Remove the AXN/SSD/00x and connect it to the AXN/DTU/001 Data Transfer Unit.

2. Then connect it to a USB port on the PC. For details, see the *AXN/DTU/001* data sheet.

The AXN/DTU/001 download rate is up to 5 Gbps while AXN/BCU/402 interface has a 400 Mbps access rate. Theoretically, downloading the 250 GB on the SSD would take 7 minutes using the AXN/DTU/001 and 90 minutes using the AXN/BCU/402 interface.

62.4 Tips

62.4.1 Formatting the AXN/SSD/00x while mounted on the AXN/MEM/401

The AXN/MEM/401 is accessible via a HTTP web interface using the IP address of the host AXN/BCU/402 at port 8100 + <AXN/MEM/401 slot number>

Figure 62-6: Example to format AXN/MEM/401 in slot 9 with AXN/BCU/402 with an IP address of 192.168.28.25

It takes a few seconds to format the AXN/SSD/00x.

62.4.2 Analyzing data

IADS RT Station can replay PCAP files recorded in the AXN/MEM/401, however, you must only select packets in the XidML file that were recorded in the AXN/MEM/401. Packets from other modules (such as Ethernet) that may be in the XidML file must not be selected.

The Data Exporter tool can be used to extract the parameters defined in XidML 3.0 file from the PCAP file and output the data as CSV or MATLAB files (placed packets only). Starting with version 3.4.23 of DAS Studio 3, Data Exporter is installed here: C:\acra\DASStudio\3.4.23\Tools\DataExporter

62.4.3 Boot time

The AXN/MEM/401 has a boot time of 27 seconds. This delay is mostly due to Linux booting.

62.4.4 Hot Plug

When the AXN/SSD/00x is recording with an AXN/MEM/401, the release switch on the AXN/SSD/00x can be used to unmount the disk from the AXN/MEM/401 to allow safe removal. When you press the switch, the power LED blinks for a few seconds before switching off. The AXN/SSD/00x can now be removed from the AXN/MEM/401 top block.
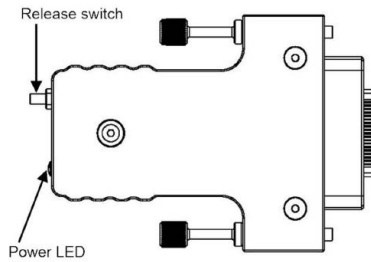

Figure 62-7: AXN/SSD/00x release switch

62.4.5 AXN/MEM/401 parameters

The Report parameter is an important parameter used for monitoring. It reports if the AXN/SSD/00x is invalid or if a packet is dropped, that is, the recording rate exceeds 160 Mbps and/or 14000 packets per second.

The Status parameter reports the AXN/SSD/00x used space and if the AXN/MEM/401 is recording.

62.4.6 Possible configurations

Setup to record the data from a KAM-500 chassis, an external Ethernet device, and internal packets, that is, packets defined on the AXN/BCU/402 which are located in the AXN/MEM/401.
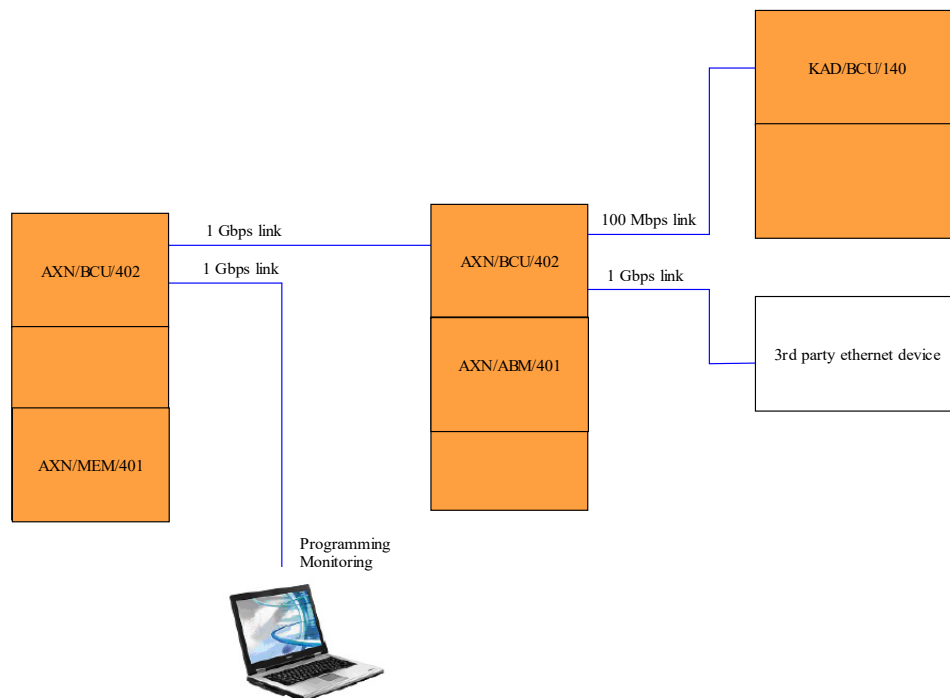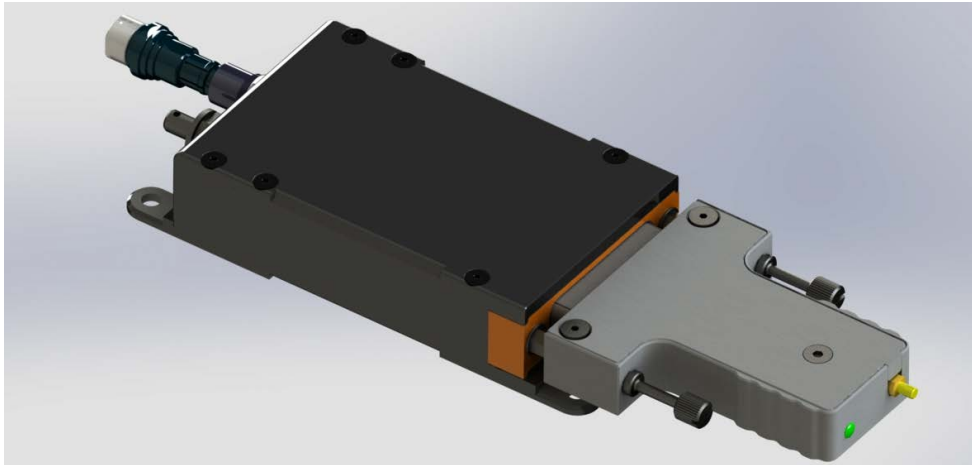

Figure 62-8: Setup showing packets from different sources recorded to the AXN/MEM/401

The AXN/SSD/00x can be connected to an AXN/MEM/401 and then connected to an Axonite as shown in the following figure.

Figure 62-9: Setup showing the AXN/SSD/00x connected to an AXN/MEM/401 in an Axonite

The following figure shows an AXN/MEM/401 connected to an Axonite, which is fixed with brackets to the side of an Axon chassis.
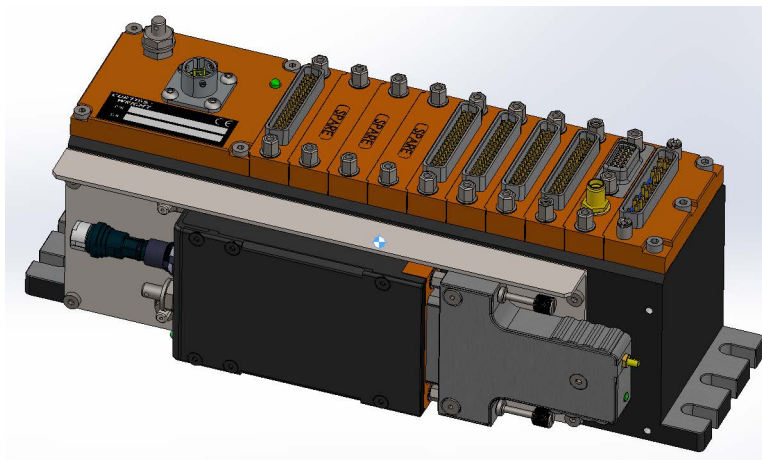
Figure 62-10: Axonite and AXN/SSD/00x setup where height is restricted

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