



G500/G100 Client Configuration SNMP

Learning Module Objective

At the completion of this module you will be able to identify and recite all concepts presented.

If you are viewing this as part of a structured training program *PLEASE* complete the associated assessment test. You are required to score above 80%.

Here's What is Covered in this Module

Learning & Development Overview

1. SNMP overview
2. Add a SNMP Connection/Device
3. Modify / Delete a SNMP Connection/Device
4. SNMP Map File – Client Properties
5. SNMP Map File – Digital Input Tab
6. SNMP Map File – Analog Input Tab
7. SNMP Map File – Accumulator and Text Tab
8. SNMP Agent Browser (Online Editor Only)
9. SNMP – Using AI Text Enumeration Feature
10. SNMP Runtime Points Details

SNMP Overview

SNMP is a protocol to send the standardized information over IP networks to enable network management.

SNMP Agent

- A network management software module that resides in a managed device that implements an SNMP interface.

SNMP Manager

- An entity responsible to communicate with the SNMP agent.

SNMP Poll

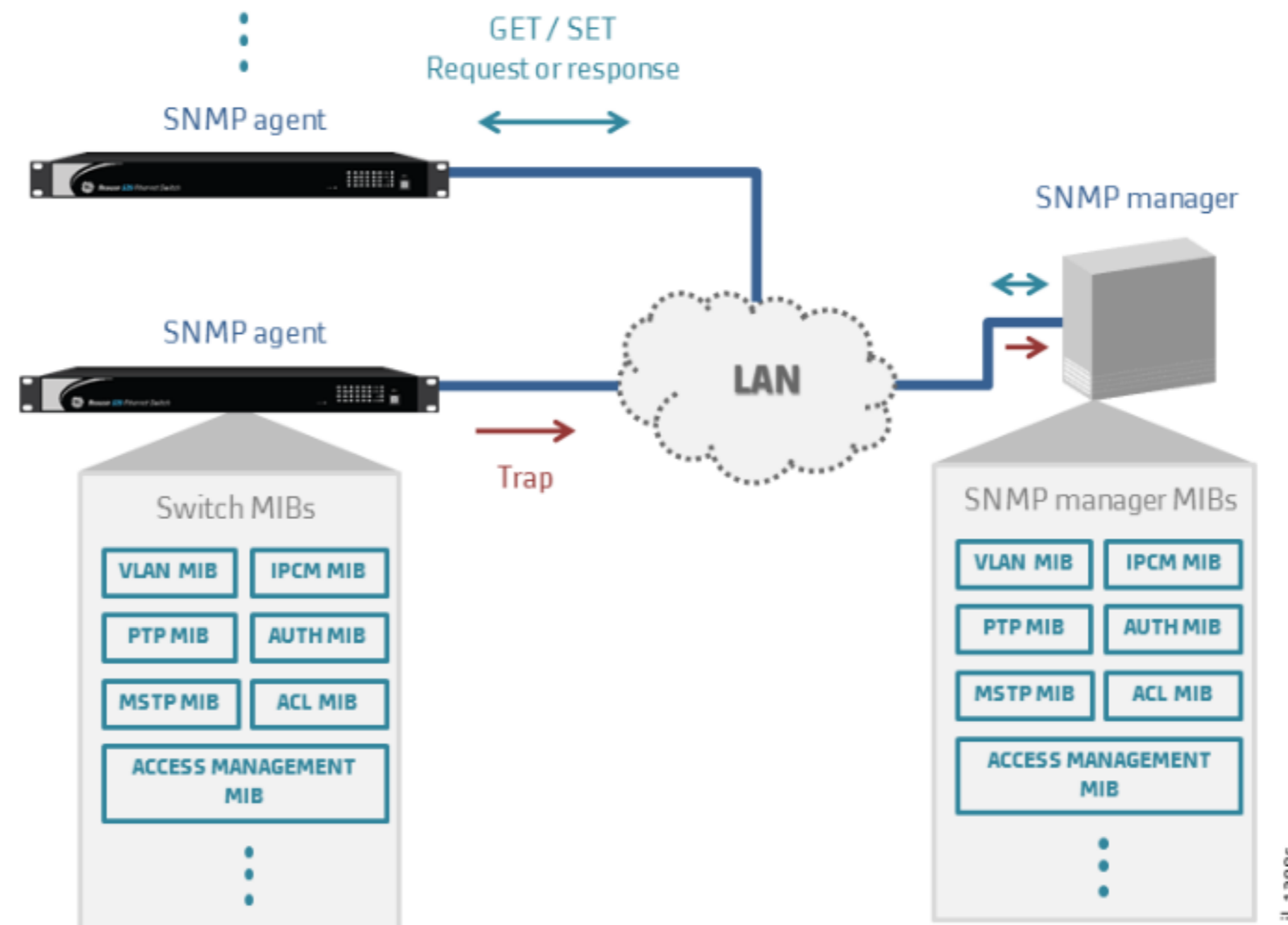
- Manager sends request to agent periodically.
- Agent searches in the database and then acknowledges with data

SNMP Trap

- Unrequested messages sent from agent to manager to indicate an event

Management Information Base (MIB) files

- MIB is the database of management information data in agent that contains the path to each variable, known as Object Identifiers (OID)
- MIB files are used by manager to interpret the message type sent by the agent



Most common standard SNMP Versions

- V1, v2c and v3
- MCP supports SNMP v1 and v2c

SNMP uses both standard MIBs and private MIBs

SNMP messages generally use UDP transport protocol. UDP port 161 is used to send request messages, and UDP port 162 is used for traps.

The MCP can be configured to receive SNMP messages on a polled or unsolicited basis or both.

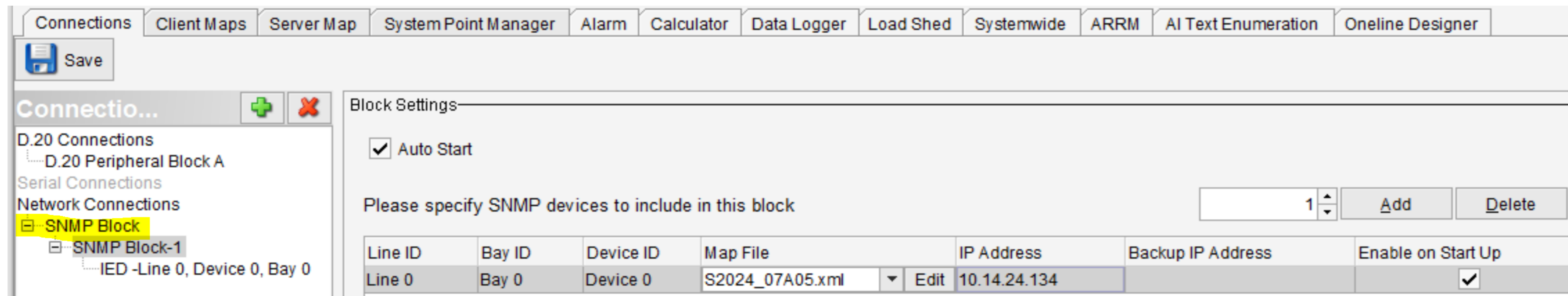
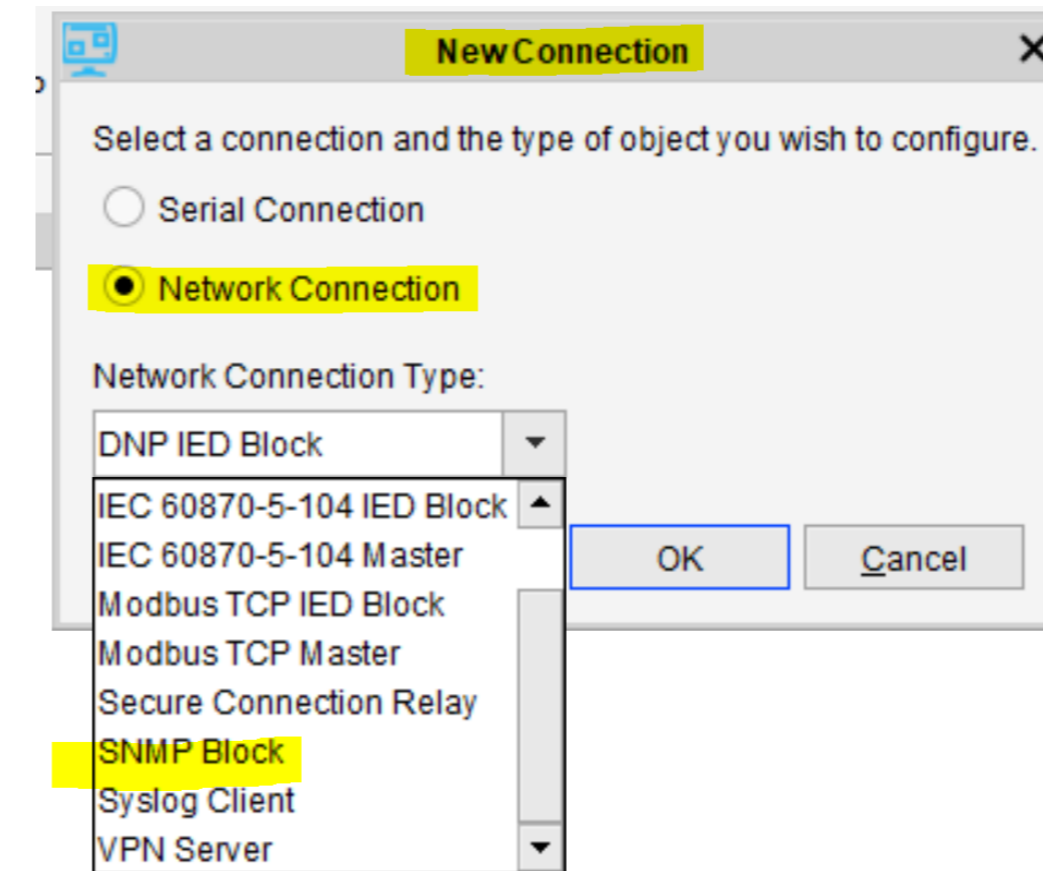
Adding a SNMP Connection/Device

The user can manage the SNMP connections on the Connections tab while opening the Online/Offline editor from DSAS.

Only one SNMP Block can be added.

To Add a SNMP Device:

- On the Connections tab, click Add Connection (+) button.
- On the New Connection window, select Network Connection and select the SNMP Block from the list. A Block Settings page then appears.
- Click Add button to add a new SNMP device in this Block.
- Modify the settings for the new device. Double-click a cell to modify a value.
- Select if the application automatically starts (Auto Start) when the configuration is loaded and when the MCP reboots.
- Click Save to save your changes.



- Line ID: Text to identify the transmission line (Default: Line x)
- Bay ID: Text to identify the bay area (Default: Bay x)
- Device ID: Text to identify the device (Default: Device x)
- Map File: Name of the client map to be used
- IP Address: IP address of the device (Default: 0.0.0.0)
- Backup IP Address: Redundant backup IP address of the device
- Enable on Start Up: Indicate if communication to the device automatically starts (Default: Enabled)

Modify / Delete a SNMP Connection/Device

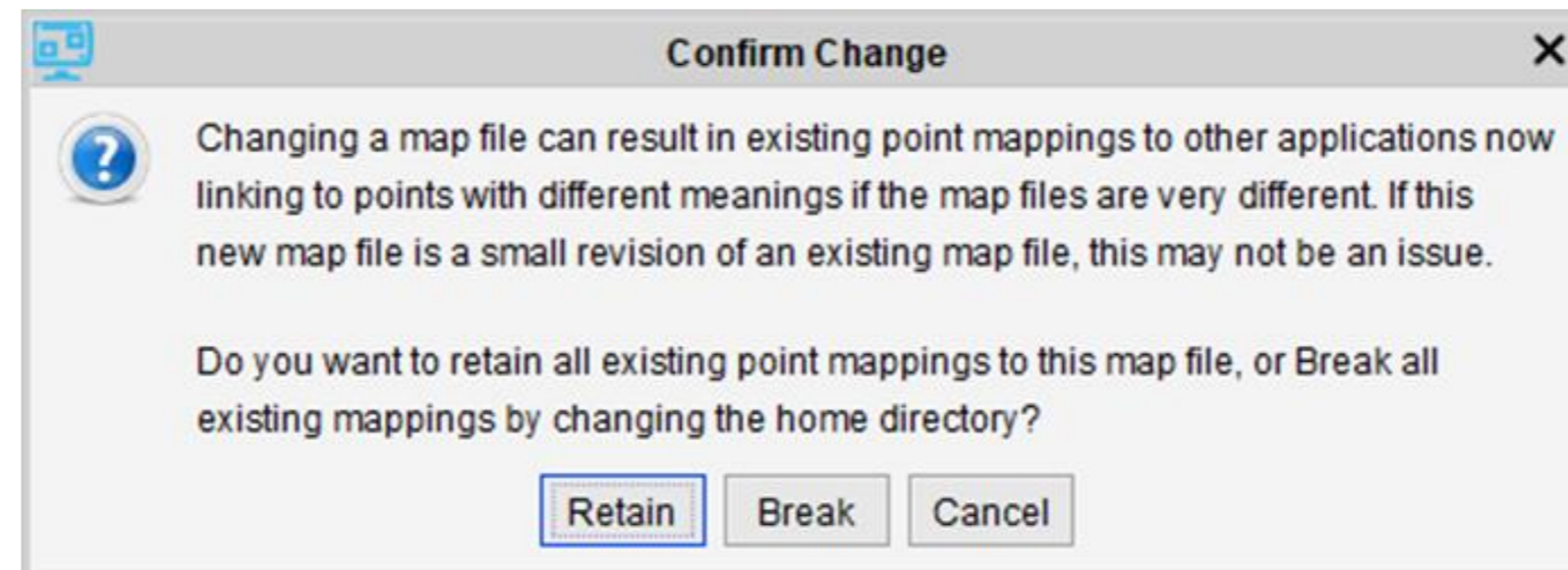
To Modify a SNMP Device:

1. Select the device in the SNMP Block pane.
2. Double-click or select a setting field
3. Enter a new value in the setting field.
4. Click Save to save your changes.

Changing a SNMP Map file

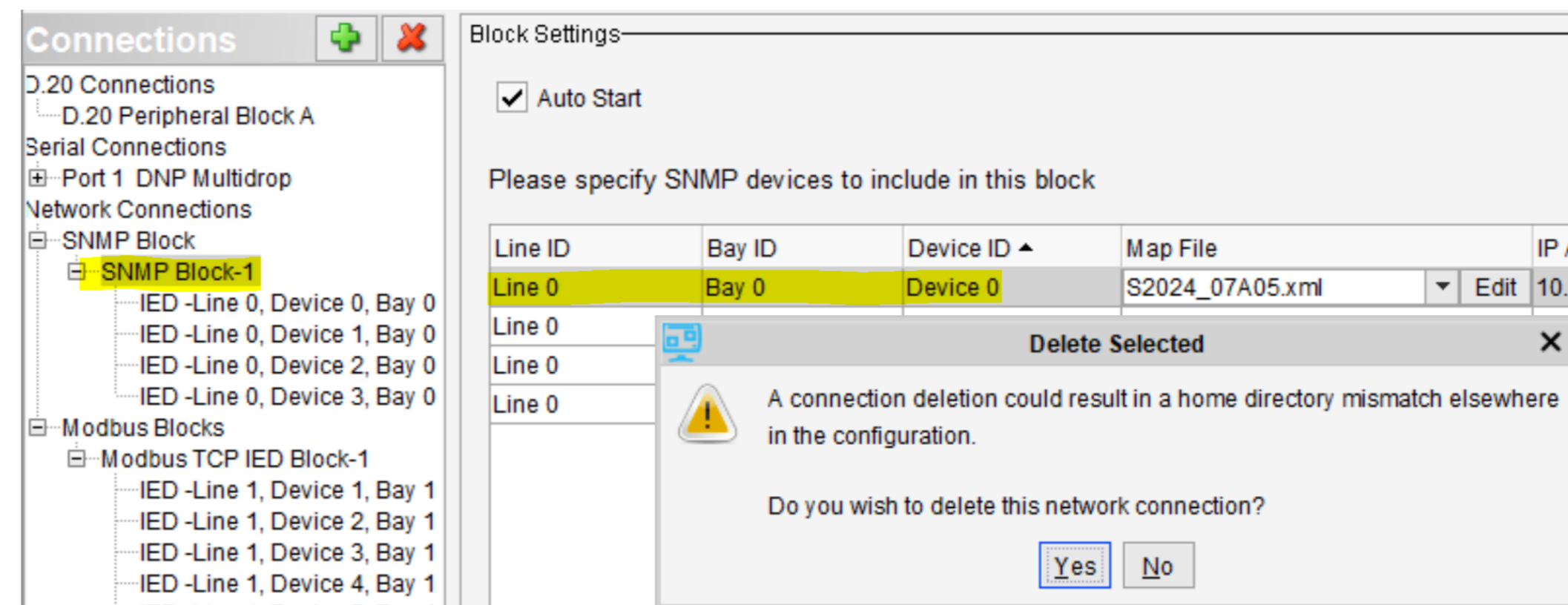
If you select a different SNMP map file for an existing SNMP device in the dropdown list, or when you save it as a different filename when opened from within the Connections > Map File Edit button, you will be prompted with the following dialog:

- Retain:
Apply the new map file with home directory and point mappings unchanged
- Break:
Apply the new map file with home directory changed and existing point mappings invalidated
- Cancel:
Abandon the change and revert to what was selected before



To Delete a SNMP Connection/Device:

1. Select the SNMP Block or device you wish to delete in the Connection or SNMP Block pane.
2. Click Delete (X) button.
3. Click Yes to confirm deletion.
Result: The item is removed from the connections/devices list.
4. Click Save to save your changes.



Deleting a SNMP Block will also delete configured devices. In Addition, it could result in a home directory mismatch elsewhere in the configuration.

SNMP Map File – Client Properties

A SNMP client map is used to determine how information is retrieved from SNMP-enabled devices. Settings are available in the Device Properties pane while creating/editing the SNMP client map. The following table lists the device-specific protocol settings:

- **Version Name:**
Select the SNMP protocol version to be used when communicating with the remote device. (Default: V1)
- **Comm Name:**
The name of the community that the SNMP device belongs to. (Default: public)
- **Poll Frequency:**
The amount of time that the MCP waits before polling the remote device for new SNMP messages. (Default: 60 seconds)
- **Session Timeout:**
The amount of time to wait for a response from the remote device before the MCP assumes that a poll has failed (Default: 5 seconds)
- **Retry Count:**
The number of session timeouts that must occur before the MCP attempts to contact the remote device on an alternate port. (Default: 3)
- **Reconnect Time:**
The amount of time that the MCP waits before attempting to retry polling a remote device after a session timeout. (Default: 60 seconds)
- **Poll Size:**
This represents the number of OIDs that can be polled in single request. Value 0 represents all the OIDs will be polled in single

| Name | Value |
|-----------------|--------|
| Version Name | V1 |
| Comm Name | public |
| Poll Frequency | 60 |
| Session Timeout | 5 |
| Retry Count | 3 |
| Reconnect Time | 60 |
| Poll Size | 0 |

Version Name
Specifies the version of SNMP Agent (V1 or V2).

The MCP currently supports V1 and V2 of SNMP protocol.

SNMP Map File – Digital Input Tab

The following settings are available while adding Digital Input points:

| Point Reference | Point Description | OID | Poll Type | OFF State | ON State | Point Group |
|-----------------|-------------------|--|-----------|-----------|----------|-------------|
| DI 0 | Digital Input 0 | <input type="text" value="Agent Browser"/> | POLL | OFF | ON | PVal |
| DI 1 | Digital Input 1 | <input type="text"/> | POLL | OFF | ON | PVal |
| DI 2 | Digital Input 2 | <input type="text"/> | POLL | OFF | ON | PVal |

- **Point Reference:**
The short user-defined identifier for the point. (Default: DI x)
- **Point Description:**
The user-defined block of text in Unicode that provide a detailed and localized description of the point. (Default: Digital Input x)
- **OID:**
The identifier of the SNMP object to be retrieved as the point value. Double clicking this field will bring up SNMP Agent Browser button to allow the retrieval of a listing of all available OIDs from the remote device, supported only in Online Editor. (Default: None)
- **Poll Type:**
The type of poll to be performed for the point. Available options are POLL, TRAP and BOTH. (Default: POLL)
- **OFF State:**
A text string that is associated with the 0 state. (Default: OFF)
- **ON State:**
A text string that is associated with the 1 state. (Default: ON)
- **Point Group:**
Point group to which the point belongs. 3 predefined point group are PVal, Demand and Peak Demand.

While working with the client map file in general, the user can always use the Copy option to copy the point details into Excel sheet via clipboard and use Paste option to import the point details from Excel via clipboard after modification.

To add points in batch, type the number of rows you want to add and click Add button.

Point groups can be modified or added on the Systemwide tab of the Editor.

SNMP Map File – Analog Input Tab

The following settings are available while adding Analog Input points:

| Point Reference | Point Description | OID | Poll Type | Multiplier | Offset | Point Group |
|-----------------|-------------------|-----|-----------|------------|--------|-------------|
| AI 0 | Analog Input 0 | | POLL | 1 | 0 | PVal |
| AI 1 | Analog Input 1 | | POLL | 1 | 0 | PVal |
| AI 2 | Analog Input 2 | | POLL | 1 | 0 | PVal |



The formula $(mx+b)$ is used to scale an analog value, m refers to Multiplier and b is the Offset.

- **Point Reference:**
The short user-defined identifier for the point. (Default: AI x)
- **Point Description:**
The user-defined block of text in Unicode that provide a detailed and localized description of the point. (Default: Analog Input x)
- **OID:**
The identifier of the SNMP object to be retrieved as the point value. (Default: None)
- **Poll Type:**
The type of poll to be performed for the point. (Default: POLL)
- **Multiplier:**
Scale factor of the point (m of formula $mx+b$). (Default: 1.0)
- **Offset:**
Scale factor of the point (b of formula $mx+b$) (Default: 0.0)
- **Point Group:**
Point group to which the point belongs. (Default: PVal)

SNMP Map File – Accumulator and Text Tab



The following settings are available while adding Accumulator / Text points:

Digital Input Analog Input **Accumulator** Text

Please specify which Accumulators you would like to map:  

| Point Reference | Point Description | OID | Poll Type | Point Group |
|-----------------|-------------------|-----|-----------|-------------|
| ACC 0 | Accumulator 0 | | POLL | PVal |
| ACC 1 | Accumulator 1 | | POLL | PVal |

Digital Input Analog Input Accumulator **Text**

Please specify which Texts you would like to map:  

| Point Reference | Point Description | OID | Poll Type | Point Group |
|-----------------|-------------------|-----|-----------|-------------|
| TEXT 0 | Text 0 | | POLL | PVal |
| TEXT 1 | Text 1 | | POLL | PVal |

- **Point Reference:**
The default Point Reference for Accumulator point is ACC x and is TEXT x for Text point.
- **Point Description:**
The default point Description for Accumulator point is Accumulator x and is Text x for Text point
- **OID:**
The identifier of the SNMP object to be retrieved as the point value. (Default: None)
- **Poll Type:**
The type of poll to be performed for the point. (Default: POLL)
- **Point Group:**
Point group to which the point belongs. (Default: PVal)

SNMP Agent Browser (Online Editor Only)

A SNMP Agent Browser window will pop up by clicking Agent Browser button that appears while double-clicking OID field. Enter an IP address and port number and then click Retrieve Data. It will then walk through entire tree on the remote device and may take a longer time to complete. This tool is only supported in Online Editor.

- IP Address
 - IP address of the remote device
- Port Number
 - UDP port number used by SNMP Walk
- Filter:
 - Used to narrow down the selection of OIDs
- Showing results in this example:
 - Total OIDs retrieved: 941
 - The number of objects that map to AI points with filter in place: 155
- OID:
 - The identifier of the SNMP object available from the remote device
- Name:
 - Interpretation of the OID by referring to the standard MIB files
- Current Value:
 - Current value of the object
- Object Type
 - SNMP defined data type of the object

The screenshot shows the 'SNMP Agent Browser' window. Under 'Agent Settings', the IP Address is '10.14.24.137' and the Port Number is '161'. A 'Retrieve Data' button is present. Under 'Agent Data', the Filter is '.1.3.6.1.2.1.2'. A message states: 'Showing 155 of 941 results. Please note that only objects that map to Analog Input type are shown.' Below this is a table with columns: OID, Name, Current Value, and Object Type. The table lists 13 rows of data, all with Object Type 'INTEGER32'. Buttons for 'Select OID' and 'Cancel' are at the bottom right.

| OID | Name | Current Value | Object Type |
|--------------------------|---|---------------|-------------|
| .1.3.6.1.2.1.2.1.0 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifNumber.0 | 22 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.1 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 1 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.2 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 2 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.3 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 3 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.4 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 4 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.5 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 5 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.101 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 101 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.102 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 102 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.103 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 103 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.104 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 104 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.105 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 105 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.106 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 106 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.107 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 107 | INTEGER32 |
| .1.3.6.1.2.1.2.2.1.1.108 | .iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntr... | 108 | INTEGER32 |

The Object Type of INTEGER and INTEGER32 can be mapped to either Analog Input or Accumulator type.

Starting from MCP v4.1, the private OIDs available for retrieval will also be retrieved.

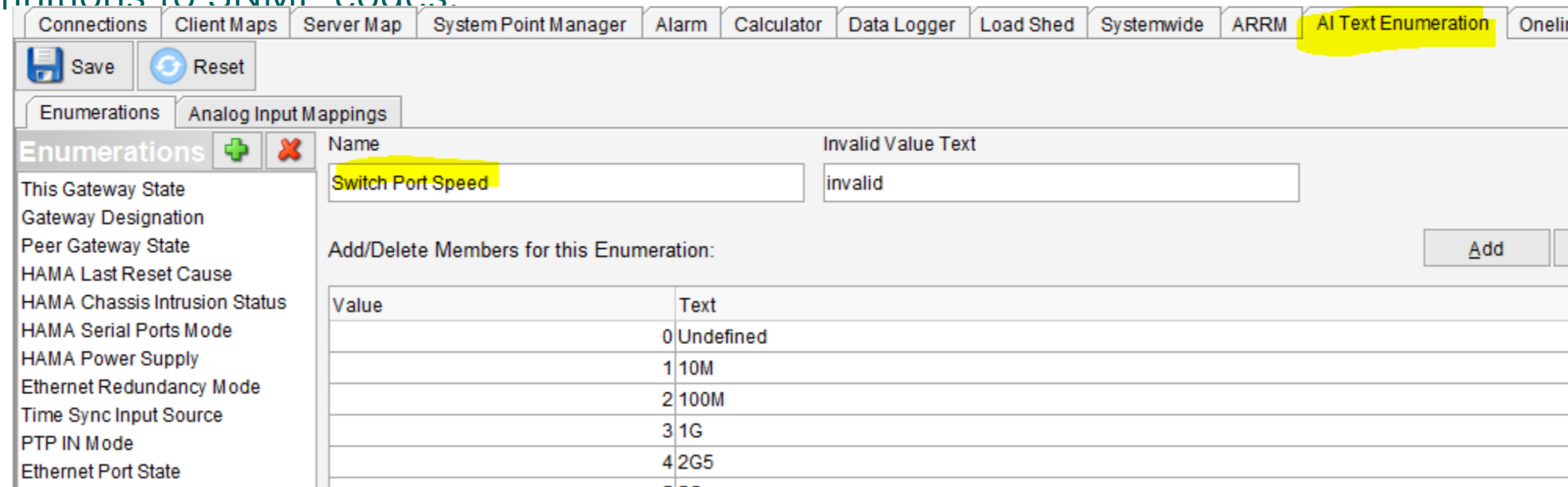
SNMP – Using AI Text Enumeration Feature

The AI Text Enumeration feature allows you to assign text strings to integer values of analog input points. This can be used to provide user-friendly definitions to SNMP codes.

With AI Text Enumeration feature, the underlying data reported remains intact, that is, the actual reported integer value of the point is still recorded in the database.

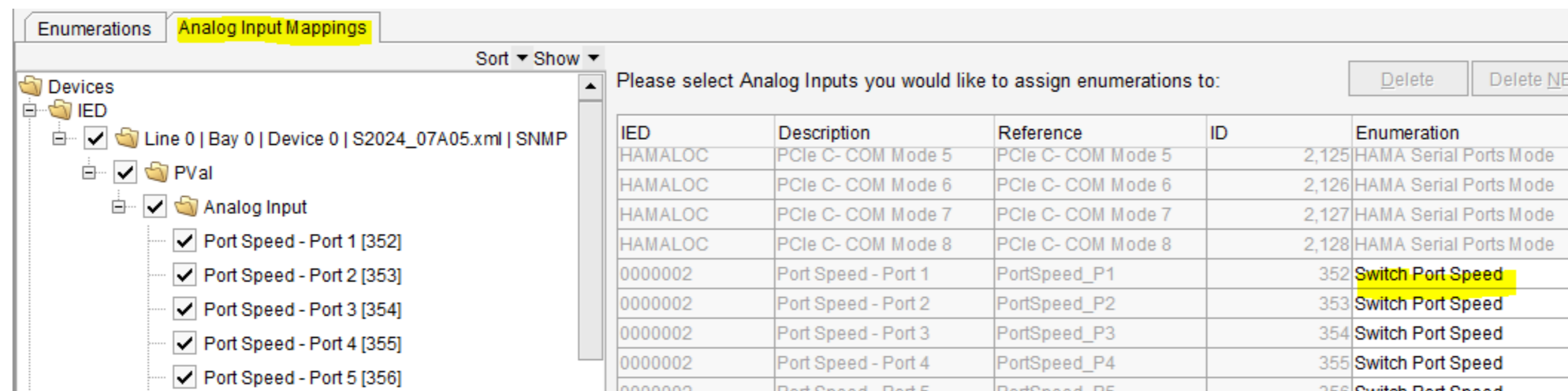
STEP ONE

- Create enumerations



STEP TWO

- Select AI points from SNMP IED(s)

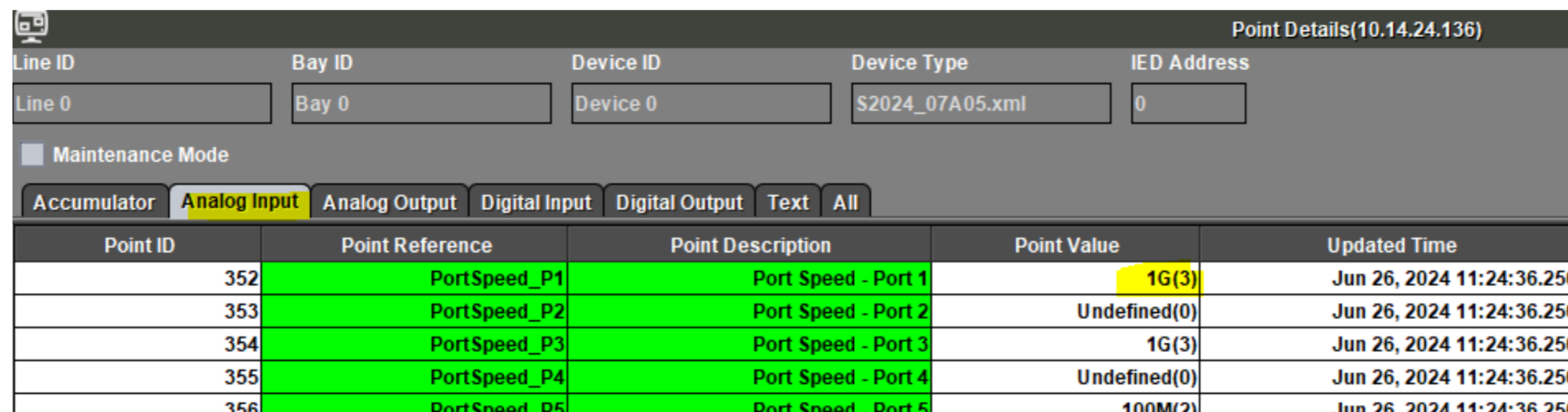


STEP THREE

- Assign enumerations to the AI points

HMI Point Details:

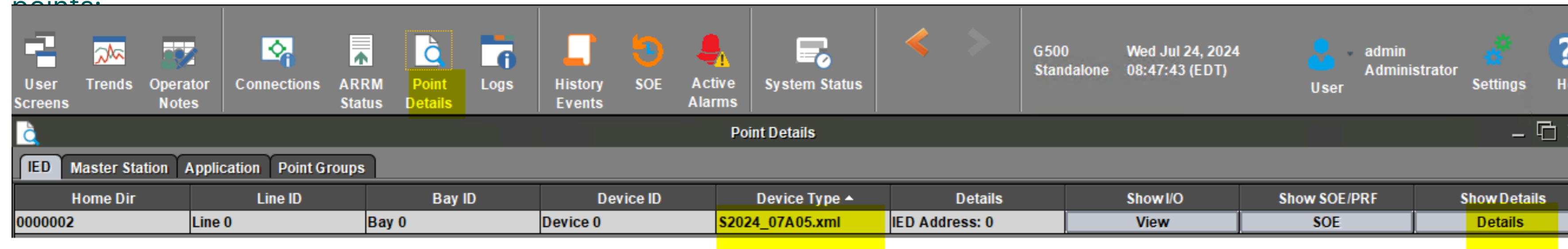
- Shows the associated user-friendly text enumerations instead of the integer values for Analog Input points



SNMP Runtime Point Details

SNMP runtime point details can be accessed through the Point Details page of the Local / Remote HMI. To view these details:

Device Type of IED Point Summary page is the Name of the client map file used with the specific device.



- Click Point Details button on the toolbar once logged into the HMI.
- Click Details button for the selected SNMP device under IED tab. The Point Details page displays.
- Select a Point Type tab or All points tab, the points (real and pseudo) and point details appear.
- To force a point value, right-click the point and select Point Forcing Interface.
- To send a control request, right-click the DO point and

| Point ID | Point Reference | Point Description | Point Value | Quality Attributes |
|----------|--------------------------|------------------------------|-------------------------------------|--------------------|
| 425 | Sys_Description | System Description | S2024 GigaBit Ethernet Switch | |
| 426 | Sys_OID | System ObjectID | iso.3.6.1.4.1.33251.20 | |
| 427 | Sys_Contact | System Contact | | |
| 428 | Sys_Name | System Name | S2024 | |
| 429 | Sys_Location | System Location | | |
| 430 | Boot_ImageName | Boot loader Image Name | RedBoot | |
| 431 | Boot_ImageVersion | Boot loader Image Version | version 1_20-Vitesse | |
| 432 | Boot_ImageBuildDate | Boot loader Image Build Date | 08:17:47, May 8 2019 | |
| 433 | App_ImageName | Application Image Name | S2024-firmware.install-07A08.00.sdt | |
| 434 | App_ImageVersion | Application Image Version | S2024 - Release 07A08.00 | |
| 435 | App_ImageBuildDate | Application Image Build Date | 2022-08-04T08:11:20-03:00 | |
| 436 | Base_ImageName | Base System Image Name | S2024-firmware.install-07A03.00.sdt | |
| 437 | Base_ImageVersion | Base System Image Version | S20FAC - Release 06A02.00 | |
| 438 | Base_ImageBuildDate | Base System Image Build Date | 2017-08-16_16:54 | |
| -5000 | DeviceInfo_LineID | DeviceInfo_LineID | Line 0 | |
| -5001 | DeviceInfo_DeviceID | DeviceInfo_DeviceID | Device 0 | |
| -5002 | DeviceInfo_DeviceType | DeviceInfo_DeviceType | S2024_07A05.xml | |
| -5003 | DeviceInfo_DeviceAddress | DeviceInfo_DeviceAddress | 0 | |
| -5004 | DeviceInfo_BayID | DeviceInfo_BayID | Bay 0 | |

Thank You for Watching this Module.

If you are watching this as part of a structured learning program, please don't forget to take the test.

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