MN-SET

User Guide

Software Version 5.30
2022-12-05

Legal Notice

Revision History

Version	Date Y-M-D	Document revision history
<5.20	-	Refer to the MN SET Release Notes. See Related Documentation on page 13.
5.20	2022-04-21	Added multiviewer APP and SMPTE ST 2110 UHD Gateway APPs Version 4.0 support. Added J2K quality settings.
5.21	2022-08-10	Improved software installation procedures and *Data Storage* information for Linux platforms.
5.30	2022-12-05	Created User Guide version for Embrionix.

See the MN SET Release Notes for more information. See Related Documentation on page 13.

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CHAPTER 1
MN SET INTRODUCTION

An over view of the MN SET APP configuration software

Overview

MN SET software can be used to configure a variety of Embrionix processing modules. It can configure, monitor, and control the routing of flows by communicating with individual modules inside your network space. MN SET is designed as a server / client software; the server software can be installed on one PC and multiple instances of clients can connect to the server remotely or locally through an Internet browser.

Find the IP Address of the device you want to configure

Before using MN SET, you must know the IP Address of the device you want to configure. See Obtaining a Device's Current Management IP Address on page 8.

Obtaining a Device's Current Management IP Address

Each device can be configured and controlled through its in-band Ethernet interface. Access is provided through the same Ethernet link(s) through which media are transported.

> **NOTE** To maintain sufficient communication performance with the device, it is important to limit the number of client connections to the management port to a maximum of three clients. Each instance of a third-party control/monitoring system or MN SET is considered as a client.

Management IP Address Retrieval

The following methods allow you to connect with the device's Management interface.

Management IP address Recovery Method	See
When shipped from the factory, each standalone device is configured with a management IP address which is derived from the individual device's MAC address.	Factory Default Device Management IP Address on page 9
If you have Ethernet connectivity from the Network Switch to the APP, then use the switch's LLDP command in CLI to retrieve the APP's current IP address.	Obtaining the Device's IP Address through LLDP on page 10

Once you have connected to the device's Management interface, you can set the IP address for the Management interface according to your network requirements. See Setting the Device's Management Network Configuration on page 33.

Factory Default Device Management IP Address

When shipped from the factory, the devices are configured with a management IP address that is derived from the device's MAC address.

To determine the management IP address, proceed as follows:

- From the MAC address printed on the Device, for example: 40:A3:6B:**A0:39:40**
- Take the last 3 Bytes: A0:39:40
- Convert each byte from hexa-decimal (HEX) to Decimal (DEC).
  - A0=160
  - 39=57
  - 40=64

  For a hexa-decimal to Decimal converter, use the Calculator APP built into Microsoft Windows / Apple iOS by setting it to *Programmer* mode.
- The management IP address will then be formed as follows:

Fixed digit	Third to last byte of MAC in decimal	Second to last byte of MAC in decimal	Last byte of MAC in decimal
10	160	57	64

NOTE

- If the last byte of the IP address ends up being 0, this field will be changed to 1 to ensure a valid IP address. For example, if the device's MAC address is 40:A3:6B:A0:39:0, the device's IP address is 10.160.57.1.
- The MAC address of any device is factory assigned and cannot be changed.

Obtaining the Device's IP Address through LLDP

For this, you need network connectivity from your PC to the LLDP-enabled switch. In turn, you need Ethernet connectivity from the Network Switch to the APP. Proceed as follows.

1. Ensure the SOC is powered and connected to an LLDP-enabled switch.
2. If you have Ethernet connectivity from the Network Switch to the APP, then use the switch's LLDP command in CLI to retrieve the APP's current Management IP address. Shown below is an example using a Nvidia switch; as such, the exact commands for other switch manufacturers will vary. This example shows the LLDP information for the device connected to port 1 of the switch.

```
WRECK-PRIM [standalone: master] (config) # show lldp remote
-------------------------------------------------------------------------------
Local Interface      Device ID            Port ID              System Name
-------------------------------------------------------------------------------
Eth1/1               40:a3:6b:a0:ab:88    40:a3:6b:a0:ab:88    device1
Eth1/2               40:a3:6b:a0:dc:3e    40:a3:6b:a0:dc:3e    device3
```

```
WRECK-PRIM [standalone: master] (config) # show lldp interfaces ethernet 1/1 remote

Eth1/1:
  Remote Index                    : 458
  Remote chassis id               : 40:a3:6b:a0:ab:88
  chassis id subtype              : Mac Address (4)
  Remote port-id                  : 40:a3:6b:a0:ab:88
  port id subtype                 : Mac Address (3)
  Remote port description         : Not Advertised
  Remote system name              : device1
  Remote system description       : SW: MN-FusioN-3-B-APP-10-2110-SDI-2R-E Version: 4.0.1640106063 HW: FusioN3 Vers
on: 100
  Remote system capabilities supported:
  Remote system capabilities enabled  :

  Remote Management Addresses:
    ------------------------------------------------
    SubType         Address
    ------------------------------------------------
    IPv4            10.26.147.56

  No Remote PFC entry
  No Remote ETS entry
  No Remote Application Priority entry
```

3. From your PC, ping the device to ensure you have network connectivity to the device.

   If you receive **Request timed out.**, then it is likely your PC's network interface settings are not compatible with the device's current IP address. For example, the device is on another subnet. In this case, change your PC's network interface settings such that it is on the same subnet as the device.

Factory Reset

Using Insomnia or MN SET, PUT `system` in `{Management IP address}/emsfp/node/v1/self/system/config_reset`

This resets ALL configuration data, including "host data" except for the MAC address, and the host is then rebooted. All loaded applications are still available on the platform but licenses for ADD-on features are lost. All configuration parameters are set to the device's default (not the factory default).

IP Address after a System Reset

If you have performed a system reset that clears the networking parameters, the IP address for the device will be set to:

- The management IP address becomes 192.168.39.230/24 if there is no active DHCP server on your network.
- DHCP is enabled on the device to obtain the management network configuration. As such, the management IP address is the address assigned to it by your network's DHCP server.

Setting the Management IP address

Once you have obtained the device's current IP address (see Obtaining a Device's Current Management IP Address on page 8), you can use MN SET or the Insomnia REST client to connect to the device and then set its IP Address according to your network address planning scheme.

Setting the Management IP Address with MN SET

See Configuring an APP with MN SET Version 5.30 on page 15, and specifically Setting the Device's Management Network Configuration on page 33.

Setting the Management IP Address with a REST Client

The REST API path to set the management network parameters is:

`{Management IP address}/emsfp/node/v1/self/interfaces/`

Where `e1` is the management interface for the RED network and `e2` is the management interface for the BLUE network (when available). .

Set the following parameters for each interface. The REST API parameter values are shown in parenthesis.

1. VLAN Tag (`vlan`). Set to 0 when VLAN tag is not used (for Untagged/native). Any value between 1 and 4094 enables this feature. See also About VLAN Tag on page 26.

   Further advanced VLAN Tag configuration for the RED network only is available at the following REST API path:

   `{Management IP address}/emsfp/node/v1/self/ipconfig/`

   - VLAN Tag (`ctl_vlan_id`): Set to 0 when VLAN tag is not used (for Untagged/native). Set a value between 1 and 4094 for the VLAN to use.
   - VLAN PCP (`ctl_vlan_pcp`): The VLAN priority code point.
   - VLAN Enable (`ctl_vlan_enable`):
     - 0: Disable VLAN Tag.
     - 1: Enable VLAN Tag.
2. DHCP (`dhcp`), when your network has a DHCP server.
   - 0: Disable DHCP Tag.
   - 1: Enable DHCP.

   Even when DHCP is enabled, you should set the following `static_ip` and `static_gateway` parameters which will be used as a fall back setting when the DHCP server has failed or is unreachable.
3. IP address (`static_ip`): The static IPv4 address with the CIDR (subnet) number in the form `10.26.220.1/24` for example.
4. Gateway (`static_gateway`): The static IPv4 gateway address.

Double check the Management network configuration values. Should this information not be correct, you will lose connectivity to the device.

For more information about Insomnia, See Related Software on page 13.

Resources

Related Software

Use the following software to configure and control the device's APP.

Always download and use the latest software to access the latest features and for performance and stability enhancements.

Software	Description	Download from
MN SET	Embrionix APP configuration software. MN SET is the first step to get the device's APP up and running.	https://www.embrionix.com/product/MN%20SET
Ember+ Viewer	An Ember+ client that allows you to use Ember+ protocol to configure and control your device's APP. For APPs that support Ember+ only. See Ember+ on page 89. Another Ember+ client can equally be used.	https://github.com/Lawo/ember-plus/releases
NMOS registry such as Sony nmos-cpp	An NMOS registry is required to use NMOS protocol to control the routing of media streams through your device's APP (as a registration server and connection manager). For APPs that support NMOS only. See NMOS on page 57. See NMOS in Specifications on page 97 for supported protocol versions. Another NMOS registry can equally be used.	https://github.com/sony/nmos-cpp
Insomnia	REST client for APP configuration. Another REST client can equally be used.	https://insomnia.rest/
iReasoning MIB browser	A MIB browser used to view the contents of an SNMP server. Another REST client can equally be used.	https://www.ireasoning.com/mibbrowser.shtml

Related Documentation

Use the following documentation to configure and use the Gateway APP, and to make better use of its features. Always download and use the latest documentation available from the Embrionix website: https://www.embrionix.com/product/MN%20SET

- MN SET User Guide (this document)
- MN SET Release Notes
- Each APP has its own user guide

CHAPTER 2
CONFIGURING AN APP WITH MN SET VERSION 5.30

How to configure an APP using MN SET

Overview

What is MN SET?

MN SET is server/client software that can be run on Windows or on Linux platforms. The software discovers a variety of Embrionix IP products and provides full configuration interface by communicating with individual modules inside your network space. Multiple instances of clients GUI can be run in parallel through an Internet web browser.

The software allows you to:

- Configure, control, and monitor each device, including Gateway and Encode/Decode.
- Monitor signal quality.
- Control IP flow routing using a simple routing control panel.
- Shuffle audio flows (Audio Mapping).

The MN SET is designed as a server / client software; the server software can be installed on one PC and multiple instances of clients can connect to the server remotely or locally through an Internet browser.

Prerequisites

Minimum hardware requirements

Hardware:

- Intel® Core™ i5 CPU 2.39 GHz, the equivalent, or better.
- The minimum Operating System hardware requirements, or better.
- 64-Bit base processor.

Minimum software requirements

Operating system:

- Microsoft® Windows 10.

  Java Version 11 or higher. If Java is not currently installed, MN SET will use Java Version 11 to run.
- Ubuntu Linux, Version 18.04 and higher.

  Java Version 11 or higher.

Supported HTML browsers

Microsoft Edge 41+, or Chrome 63+.

IP network port usage

The following port numbers on the PC must be free for use by MN SET services.

Port	Configurable?	Protocol	Description
67 68		DHCP	When your network has a working DHCP server and this option is enabled on the device, these ports are used so that the device automatically negotiates and acquires dynamically allocated Ethernet interface parameters for its management interface. To enable this option, see Setting the Device's Management Network Configuration on page 33.
Default: 80	•	HTTP	• Device firmware configuration webpage. • REST API found under `{Management IP address}/emsfp/node/v1/`. This port number can be changed through the device's REST API at the following path: `{Management IP address}/emsfp/node/v1/self/ipconfig`
-	•	IGMP	These ports are used by your network to efficiently manage multicast streams through IGMP. To change these port numbers, see Configuring Flows on page 35.
5353		mDNS DNS-SD	When your network has a working mDNS server and the device supports NMOS, these ports are used to allow the device to automatically discover and register itself with the NMOS registry on the network.
Default: 4041	•	MNOS Registry	When a device supports NMOS, these ports are used to support this protocol. To change this port number, you must configure your NMOS registry.
Default: 8080	•	TCP	MN SET web configuration interface. This is set by the installation wizard during MN SET software installation as **Server port**.
Default: 9080, 1610, 1620	•	TCP	When this option is enabled on the device, these ports are used for the MN SET North Bound API. To change these port numbers, see Enable / Disable an Array on page 69.
-	•	SPMTE ST 2110 flows	Used by the device's SMPTE ST 2110 flows for video, audio, and ancillary IP transmission. To change these port numbers, see Configuring Flows on page 35.
Default: 514	•	Syslog	When this option is enabled on the device, these ports are used to upload the device's events to a syslog on a remote host. To change this port number, see Sending Syslog Event Notifications to a Host on page 46.
Default: 9000, 9009	•	Ember+	When a device supports Ember, these ports are used to support this protocol. To change this port number, see Setting the Device's Management Network Configuration on page 33.

Getting Started

MN SET Application Download

For the latest features and stability enhancements, always download and install the latest MN SET software version available from the Embrionix website. Download MN SET from the MyRiedel at https://www.embrionix.com/product/MN%20SET.

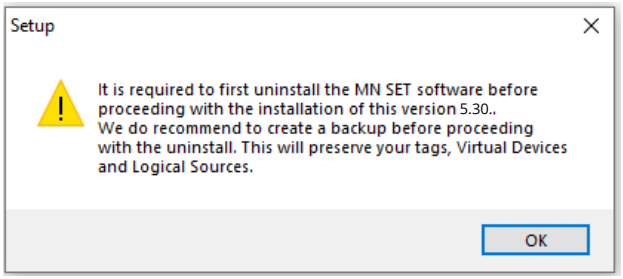
Choose an installation package that corresponds to your PC's operating system.

Always uninstall the current MN SET installation before installing the latest version

It is important to always make a clean installation of MN SET. If MN SET is currently installed on your PC, then this is done by first uninstalling MN SET, and then installing the latest MN SET version. In this situation, if you try to install MN SET over the current installation, on Microsoft Windows systems the following warning will be shown.

Installing MN SET

The way you install MN SET depends on whether MN SET is currently installed.

Current MN SET Installation Status	Description
Currently installed **Upgrading to V5.30**	MN SET is currently installed. You must first uninstall MN SET. In this situation, if you try to install MN SET over the current installation, on Microsoft Windows systems the following warning will be shown.  See Upgrade Procedure when MN SET is Currently Installed on page 20.
Not installed **First time installation**	A direct installation procedure should be followed. See: • Installing the MN SET Server Software (Windows) on page 18 • Installing the MN SET Server Software (Linux) on page 19

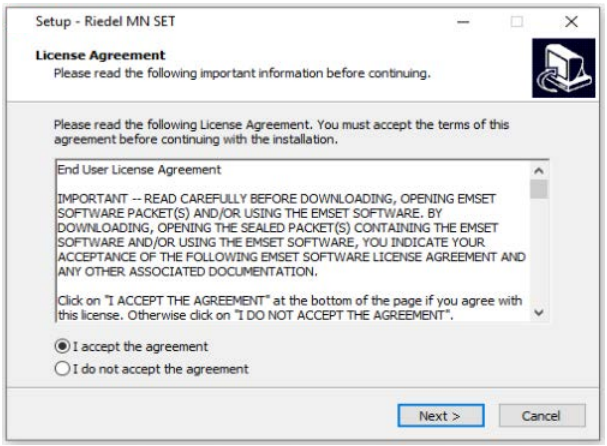
Installing the MN SET Server Software (Windows)

NOTE If MN SET is currently installed, make a backup of MN SET's database. See Backup on page 81.

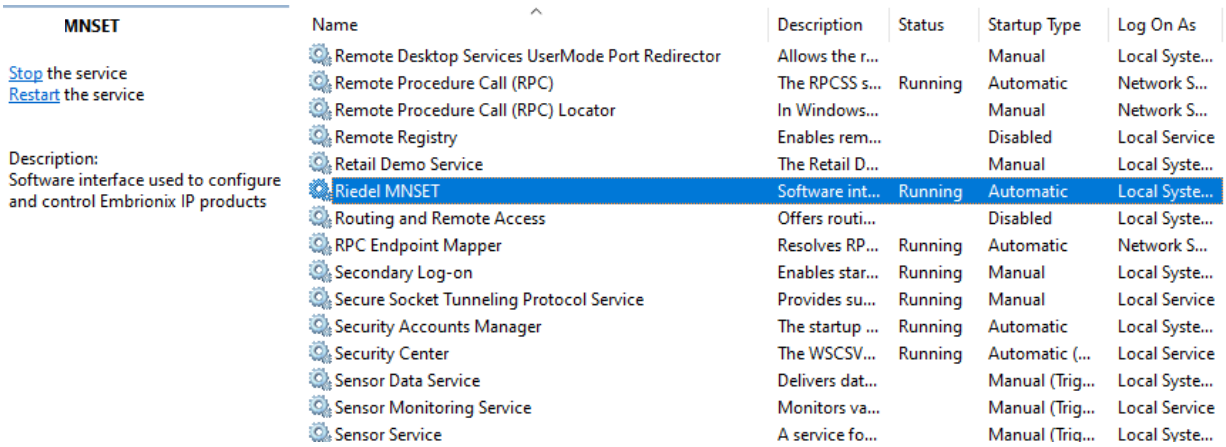
This allows you to return to a known good configuration should you have to revert to a previous version of MN SET using Restore. See Restore on page 81.

The server software installer comes as a Windows installer wizard executable.

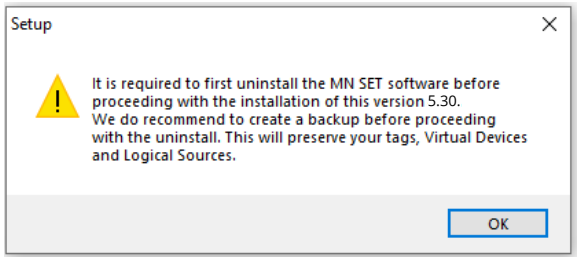
1. The software installer is an executable that runs on a 64-Bit Microsoft Windows platform. Choose a software installer that corresponds to your Windows system platform and Double Click the downloaded file to proceed with the installation.
2. Accept the end user License Agreement and click **Next**.



3. You can either choose to install the North Bound API or not by setting or clearing the option. The MN SET Service is required to use this software.
4. (Optional) If the North Bound API has been selected for installation, enter a port and an IP address for the NBAPI server.
5. Then select the port where the MN SET server will be available and click **Next**.
6. Set the Administrator password and click **Next**.
7. Click **Install** to proceed.
8. A Service "Riedel MN SET" will be installed on your System. This service starts automatically at boot up of the PC.



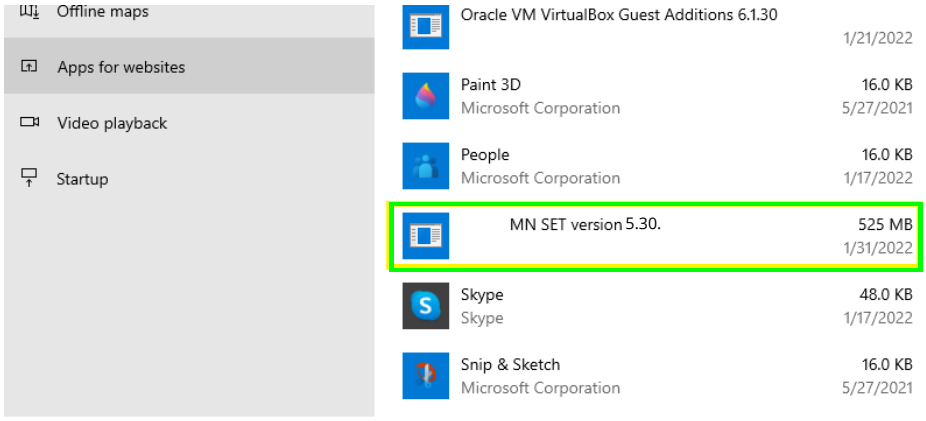
If the following warning is shown, click OK and cancel the installation. See Upgrade Procedure when MN SET is Currently Installed on page 20.



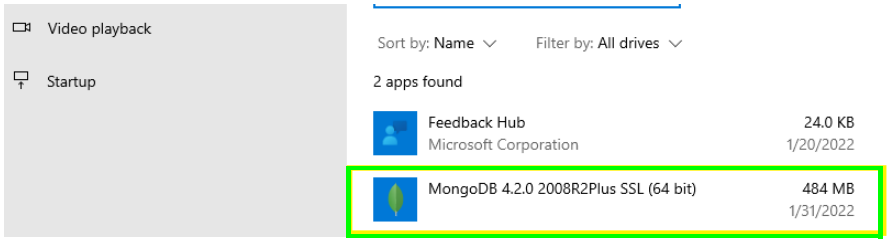
Uninstalling the MN SET Server Software (Windows)

Proceed as follows.

1. In Microsoft Windows, select **Start** (Windows logo Start button), then select **Settings** (a gear-shaped settings icon) > **Apps** > **Apps & features**.
2. Select MN SET software, and then select **Uninstall**.



3. Select MongoDB, and then select **Uninstall**.

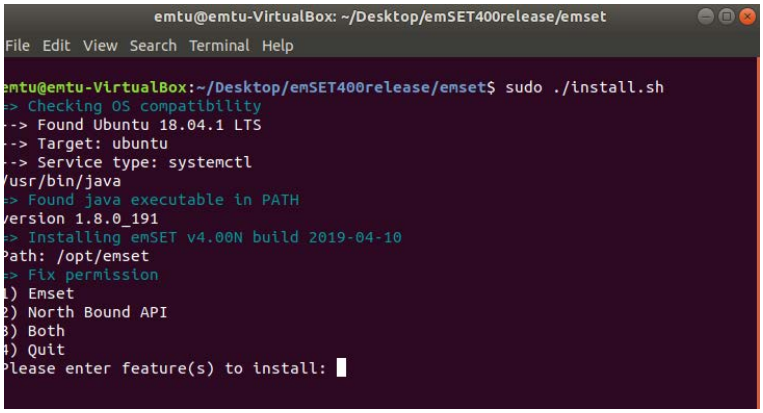


Installing the MN SET Server Software (Linux)

> **NOTE** If MN SET is currently installed, make a backup of MN SET's database. See Backup on page 81.
>
> This allows you to return to a known good configuration should you have to revert to a previous version of MN SET using Restore. See Restore on page 81.

The server software installer comes in a Tar archive file for the Linux version.

1. To start, you need to first unpack the archive. When the archive is unpacked, use the terminal to navigate to the folder where the file has been unpacked.
2. To start the MN SET installation, type the command `sudo ./install.sh`



3. The installer will first initialize and will verify your system for compatibility
4. You can now choose if you want to install MN SET, the North Bound API, or both.
5. The installer will ask you for the port that you want to install the MN SET server service on.
6. The MN SET installer will ask you for the IP address MN SET is to use for the North Bound API, if applicable.
7. Set the port for the North Bound API.
8. The MN SET service is now installed on the computer. The installer has automatically started the service at the end of the installation. To see the service status type *`sudo service mnset status`*.

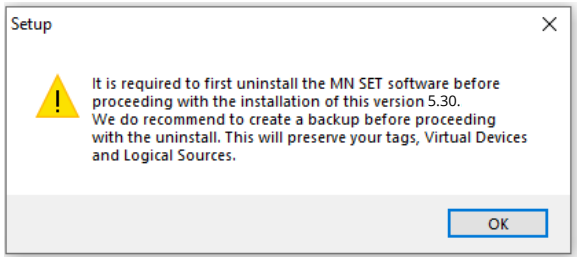
Uninstalling the MN SET Server Software (Linux)

1. Press <Ctrl> + <Alt> + <T> to open a Terminal window.
2. Navigate to `/opt/mnset`
3. To remove the MN SET installation, type the command `sudo ./uninstall.sh`
4. Enter your password when prompted and press <Enter>.
5. When asked if you want to continue, type `y` and press <Enter>.
6. To remove the MongoDB installation, type the command `sudo apt-get purge mongo*`
7. Enter your password when prompted and press <Enter>.
8. When asked if you want to continue, type `y` and press <Enter>.
9. When all software uninstallation is complete, type `exit` and press <Enter> to close the terminal window.

Upgrade Procedure when MN SET is Currently Installed

It is important to always make a clean installation of MN SET. If MN SET is currently installed on your PC, then this is done by first uninstalling MN SET, and then installing the latest MN SET version.

On Microsoft Windows systems, the following message will appear if you don't proceed with the uninstallation of the previous MN SET version.



Proceed as follows.

1. Open MN SET.
2. Make a backup of the MN SET database. See Backup on page 81.
3. Close MN SET.
4. Uninstall the MN SET software.
   - See Uninstalling the MN SET Server Software (Windows) on page 19.
   - See Uninstalling the MN SET Server Software (Linux) on page 20.
5. Install version 5.30.
   - See Installing the MN SET Server Software (Windows) on page 18.
   - See Installing the MN SET Server Software (Linux) on page 19.
6. Open MN SET.
7. Import the previously saved MN SET database backup from your PC's filesystem. See Restore on page 81.

Connecting to MN SET

The MN SET is accessed through a web browser. To connect, follow these steps:

1. Open a web browser either on the local PC or on a remote PC.
   - **Local PC:** Type the Local host and the configured port address. This usually is http://localhost:8080
   - **Remote PC within the same Network:** Type the IP address of the Host PC and the configured port address, such as `http://192.168.39.240:8080`

   The MN SET web interface is shown and you will be prompted to enter your login information.

   8080 is the default port number for the MN SET service. This is set by the installation wizard during MN SET software installation as **Server port**.
2. Login to MN SET. See below.

Login Into MN SET

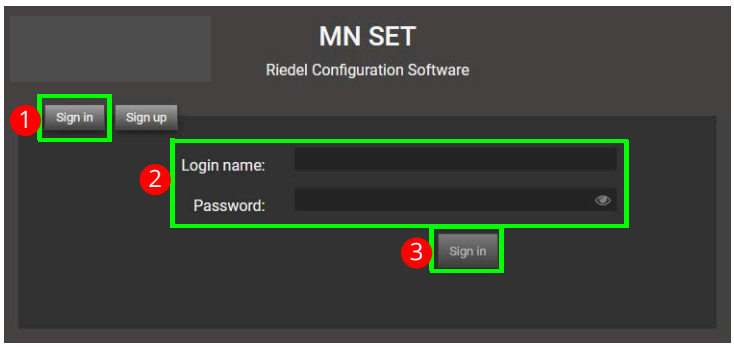
During MN SET software installation, you set the `admin` password. By default, the software installer proposes the following **admin** credentials:

- Login name: admin
- Password: admin

Login using the Sign in option

You can login using the **Sign in** option:

- Using the **admin** credentials to use MN SET as an administrator (the **admin** user). This user has the highest privileges in MN SET to allow full access to create and modify MN SET.
- Using a credential that has been created for you by the **admin** user or a credential you have created for yourself with the **Sign up** option.



1 Click **Sign in**.

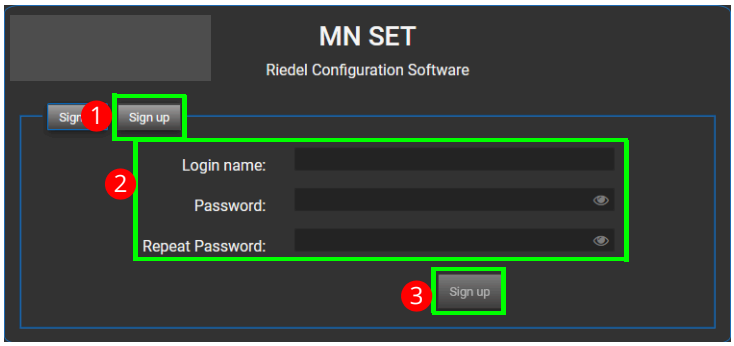
2 Enter the **Admin** login information or the login information for your account.

3 Click **Sign in**.

The software opens into the **Admin** page where you can set the discovery range of the devices you want to configure. See Defining a Discovery Range to Find Networked Devices on page 24.

Login using the Sign up option

You can login using the **Sign up** option to create a new user by yourself that can only view settings in MN SET.



Proceed as follows.

1 Click **Sign up**.

2 Create your user account: Enter your login name and password.

3 Click **Sign up**.

4 Login to you user account. See Login using the **Sign in option** on page 22.

The software opens into the **Admin** page where you can set the discovery range of the devices you want to configure. See Defining a Discovery Range to Find Networked Devices on page 24.

An **admin** user can change your access rights to MN SET configuration options. See also Defining a User and a User's Permissions on page 23.

Administration

Access the **Admin** tab in PAN A. See Main menus on page 28.

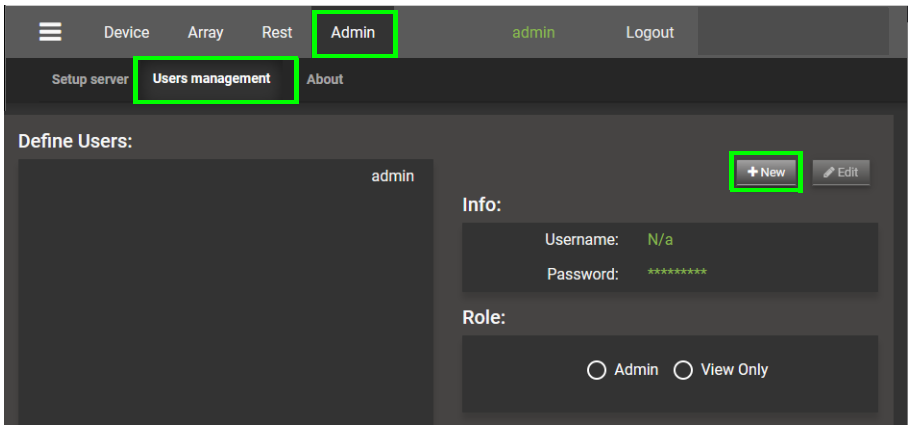
The administration tab is divided into 3 main sections:

- Server discovery settings. See Defining a Discovery Range to Find Networked Devices on page 24.
- User management. See Defining a User and a User's Permissions on page 23.
- About. See MN SET Version Information, MN SET Software Documentation, and Activity Logging on page 27.

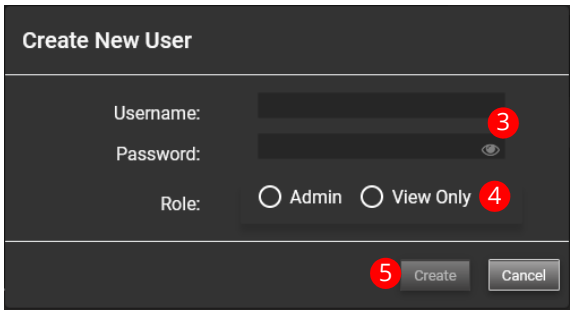
Defining a User and a User's Permissions

To create a new user

1. Access the **Admin** tab and then the **Users management** tab. See Main menus on page 28.
2. Click **New** in the **Define Users** section



3. Enter a Username and Password.
4. Select a role.
   - The **Admin** default role that can View and Edit anything.
   - The **View Only** default role that can view every page but cannot edit.

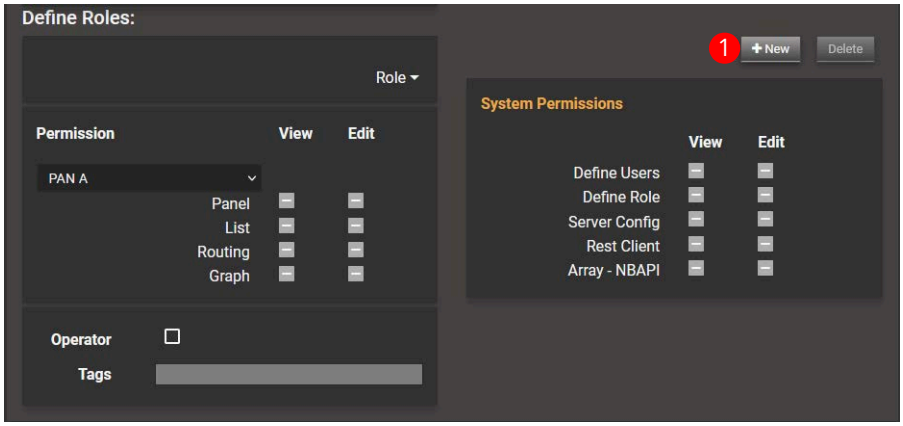


5. Click **Create**.

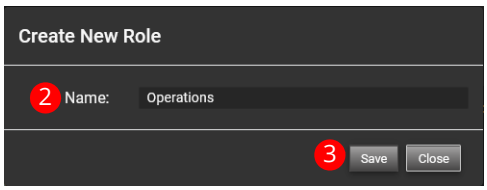
To create a new role

You can also define a new role which can later be assigned to users to give them custom access rights.

1 Click **New** in the Define Roles section.

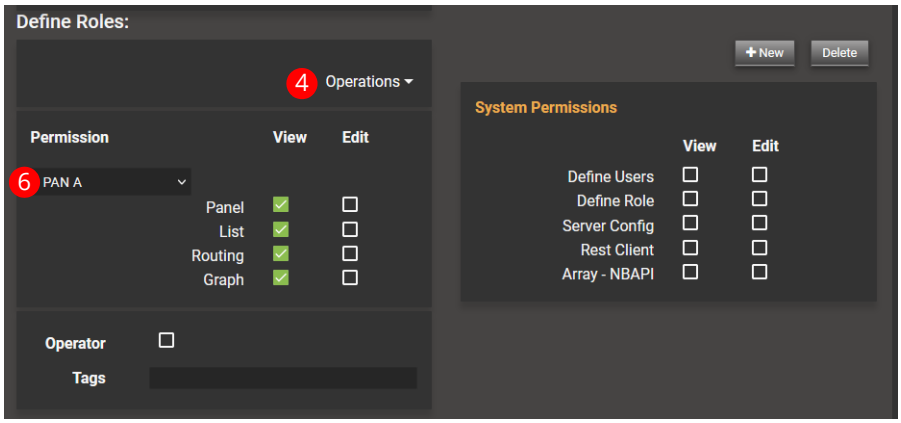


2 Assign a descriptive name to the new role.



3 Click **Save**.

4 Select the role from the dropdown list to be configured.



5 Configure the permission for this new role. To add/remove a permission for a task, you click on the permission view or edit. As soon as you click on a permission, the configuration is pushed to the server.

6 Configure the permissions for both PAN A and PAN B.

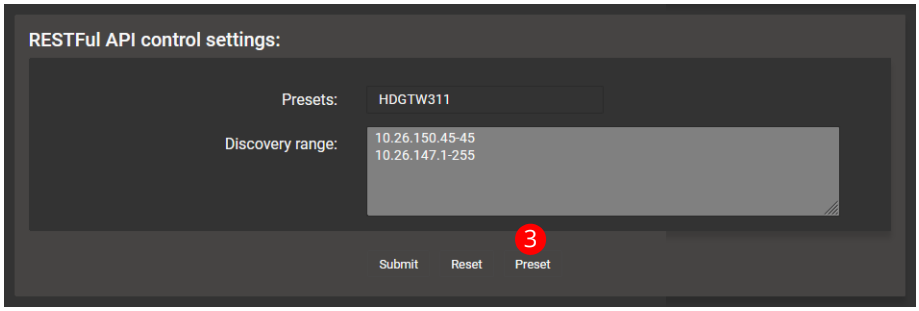
Defining a Discovery Range to Find Networked Devices

The discovery range determines the accessibility to your devices from this server. You can configure one or more preset ranges. By default, the MN SET will scan address 192.168.39.1 to 192.168.39.254. To configure a new preset, proceed as follows.

1 To establish a discovery range of IP Addresses, you need to find a device's IP Address. See Obtaining a Device's Current Management IP Address on page 8.

2 Access the **Admin** tab and then the **Setup server** tab. See Main menus on page 28.

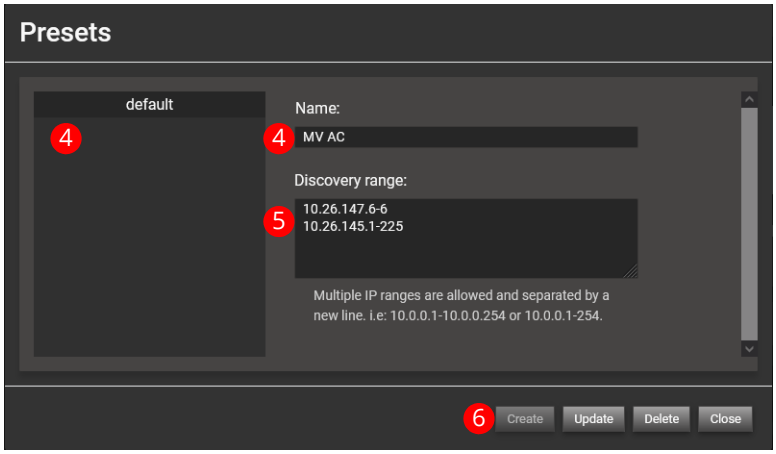
3 In **RESTful API control settings**, click **Preset**.



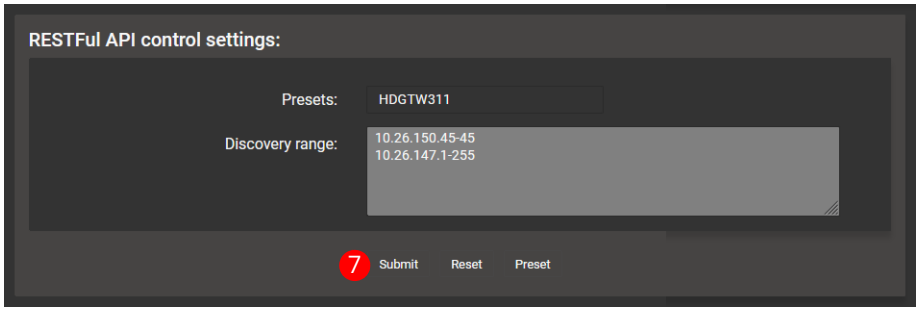
Button	Description
Presets	Select a preset. A preset defines one or more ranges of IP addresses in which MN SET is to search for devices.
Discovery range	Shows for the selected preset the current ranges of IP addresses in which MN SET is to search for devices.
Submit	Click to start device discovery in the IP address ranges shown in **Discovery range**.
Reset	Click to go back to the default settings and then click **Submit**.
Preset	Click to create one or more ranges of IP addresses in which MN SET is to search for devices. A preset is identified by a name and can be recalled so that searches for devices in the preset IP address ranges can be carried out again as necessary.

4 **Name** the preset for a new preset. To select a previously configured preset, select one from the Presets list.

5 Define one range of IP addresses per line as shown in the next image. If the 'range' is a single IP address, then repeat the last number with a dash as shown in the first entry.

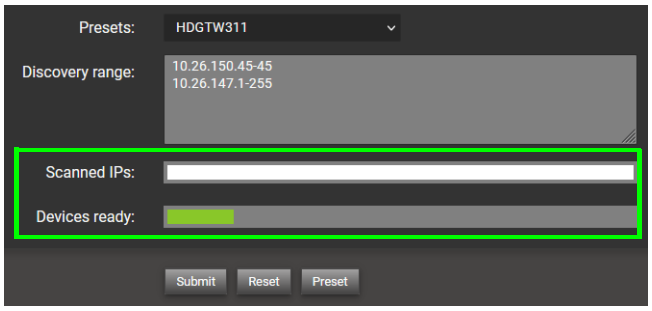


6 Click **Create**.



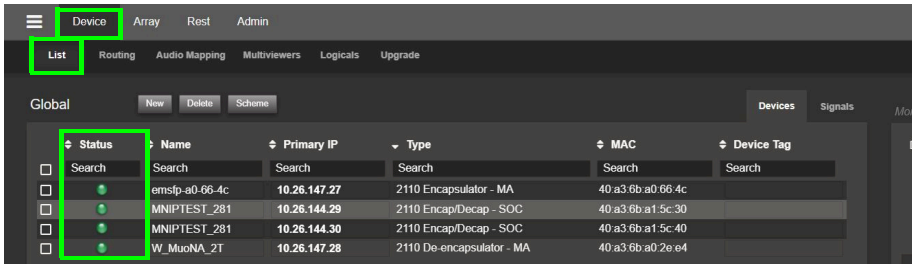
7 Click **Submit**

Progress bars show how well device discovery is progressing.



Progress Bar	Description
Scanned IPs	Progress bar shows how many of the IP addresses from the **Discovery range** have been scanned for devices.
Devices ready	Progress bar shows how many of the discovered devices are now ready to be configured in MN SET.

According to the size of the discovery range(s), device discovery can take a few minutes before they are shown in **Device** > **List**.

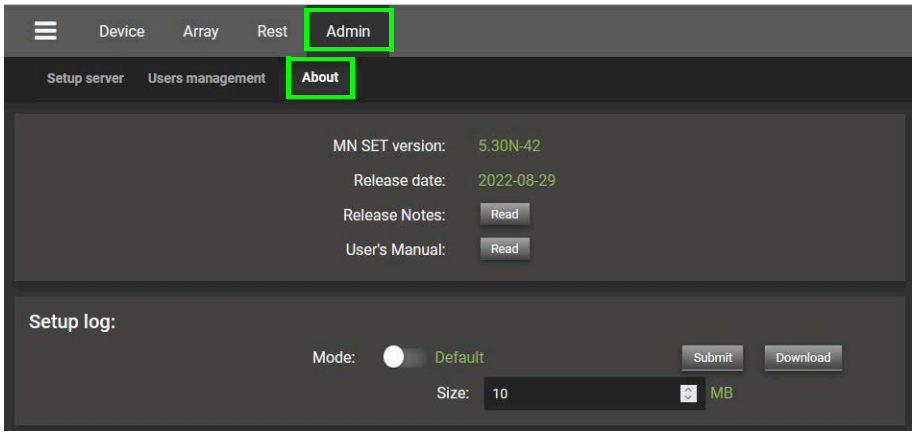


The status color for the device in **Device** > **List** changes according to its discovery status.

Status LED	Description
Gray	The device has been found on the network.
White	The device is being initialized and its parameters are being read by MN SET.
Green	The device is now ready to be configured in MN SET.

MN SET Version Information, MN SET Software Documentation, and Activity Logging

The **About** tab provides information on MN SET such as the current version, the available documentation, and activity logging.

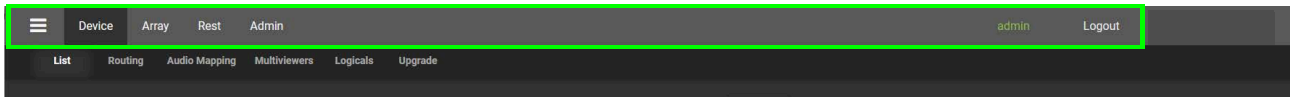


Parameter	Description
MN SET version	Shows the MN SET software version you are currently using.
Release date	The date on which this version of MN SET was created.
Release Notes	Click to view a PDF of the MN SET Release Notes.
User's Manual	Click to view a PDF of the MN SET User Guide.
Mode	Set the activity logging mode. Click **Submit** to apply your change. **Default:** The standard level of activity detail. A size limit can be applied. **Verbose:** A highly detailed activity log.
Submit	When changing **Mode** or **Size**, click **Submit** to apply the change.
Download	Click to download a ZIP file of the activity log.
Size	When **Mode** is set to **Default**, set the maximum size of the activity log file to be generated. Click **Submit** to apply your change.

Using MN SET

General Navigation

Main menus The main menus are shown below.



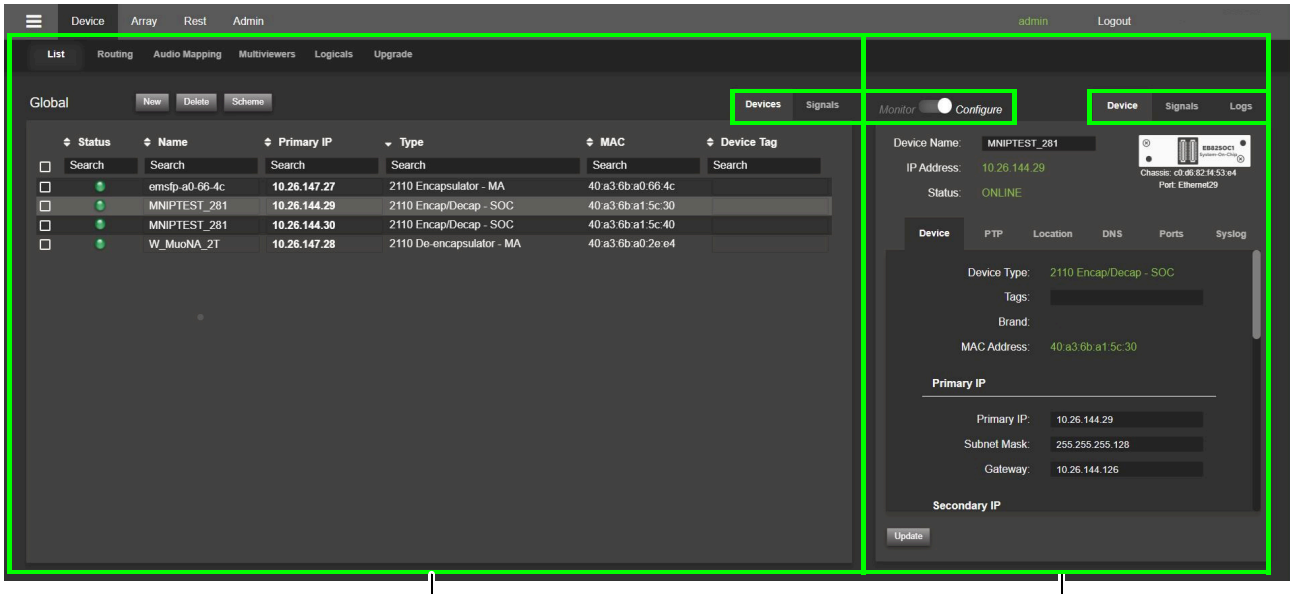
Tab	Description
	Toggles a side menu where you can: • Import and export configuration data. • View warnings. See MN SET Side Menu on page 80.
Device	Configure NMIP devices. See Device Tabs in PAN A on page 30.
Array	A page to create and manage arrays for the north bound API. These Array can be used to manage the MuoN SFP through Rest or SNMP with an external application. See Arrays for North Bound API on page 67.
Rest	A full Rest client is integrated inside MN SET. See RESTful Page on page 73.
Admin	Set the user accounts. Configuration of user accounts is only available if the current user has admin rights. See Administration on page 23.
[current user]	Shows the username under which you are currently logged into MN SET. Permissions are assigned to all usernames by the *admin* user to allow or deny the ability to perform certain tasks in MN SET. See Defining a User and a User's Permissions on page 23.
Logout	Click to logout of MN SET. To login again, see Connecting to MN SET on page 21.

MN SET Interface

The software interface is divided into two principal sections:

PAN A: The left side is used to navigate and select devices. It lets you navigate through the list of discovered devices or signals. You can also use **Routing** to route the flows. The SDI Audio Mapping can also be done through PAN A as well as PAN B.

PAN B: The right side is used for configuration and monitoring statuses of devices.



At the top of each PAN, **Devices**, **Signals**, or **Logs** tabs may be shown.

Tab	Description
Devices	Shows the currently discovered devices. To discover devices, see Defining a Discovery Range to Find Networked Devices on page 24.
Signals	Shows the current SMPTE ST 2110 flows for all discovered devices. See Configuring Flows on page 35.
Logs	Shows a list of operational events, warnings, and errors related to MN SET and the devices it is working with. See also Data Storage on page 85 to access a log file.

Set the Configure / Monitor option in PAN B.

Option	Description
 Configure	This mode allows you configure the management of the devices and the configuration of signals.
 Monitor	This mode lets you view the device's configuration parameters or signal statuses. This mode prevents you from changing a parameter by mistake. See Viewing the Device's Operational Status and Parameters on page 79.

Device Tabs in PAN A

Access the **Device** tab in PAN A. See Main menus on page 28.

Tab	Description
List	Shows a list of discovered devices. • To discover devices on your network so that they show up in the list, see Defining a Discovery Range to Find Networked Devices on page 24. • To create virtual devices, see Creating Virtual devices on page 53. • Show details of the current SMPTE ST 2110 flows in the **Signals** tab.
Routing	Make a route between 2 or more devices. See Using the Routing Panel on page 51.
Multiviewers	This tab is not applicable to the Gateway APP.
Audio Mapping	See Audio Mapping on page 48 and Audio Mapping for all SMPTE ST 2110 4K Gateway APPs V4.00 and Higher on page 49.
Logicals	A routing feature that allows the grouping of flows that are related together to be routed all at once. See Logicals on page 54.
Upgrade	• Install or upgrade an APP. • Change the running APP. • Apply Add-On licenses to enable optional features. See APP Installation, Upgrade, and Add-On Licenses on page 59.

Operational Status Feedback

Status indicators

Status indicators report the health of a:

- Parameter as to whether it is within acceptable operating limits.
- Signal as to whether it is present and available for use.

Warnings are a range of alerts concerning the current operational status.

Status indicators show their current status through color coded icons.

Icon	Description
 Extinguished	The status is: Offline, Unavailable, or Failed.
 Green	The status is: Online, Available, or Good.
 Warning	There are a number of warning types that are displayed in a range of colors. See Warnings Side Menu on page 82.

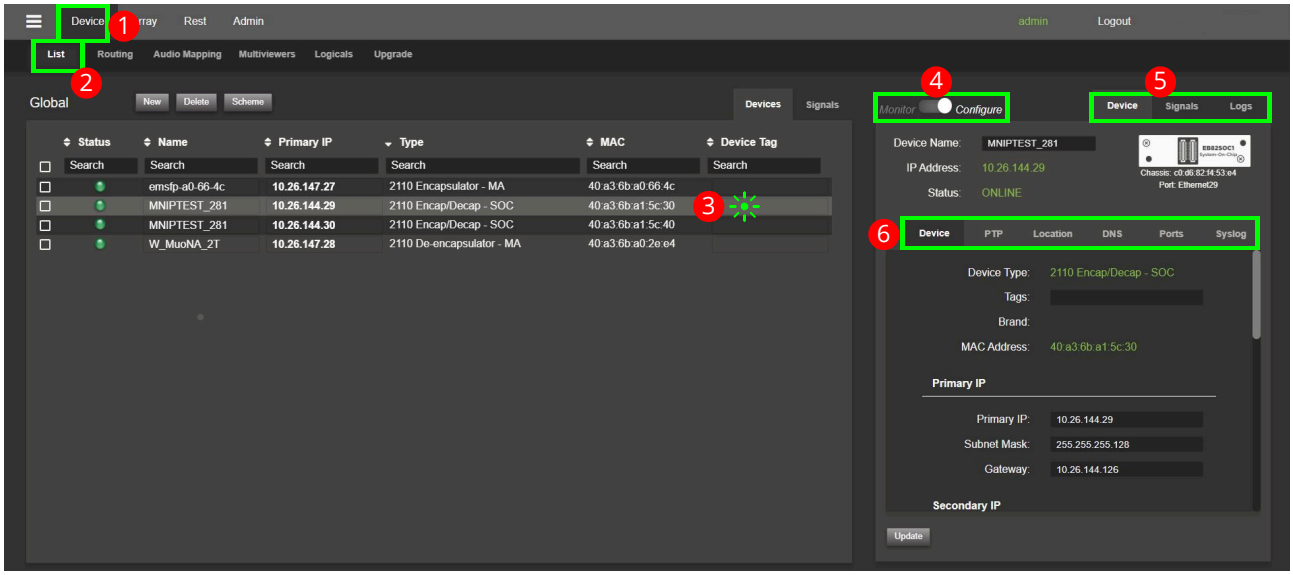
Progress bar

Some actions can take time for MN SET to process. In order to provide feedback as to whether an action was successful or not, a progress bar briefly appears to show the action's status in the lower right hand corner.

Color	Description
Green	The action has been successfully completed.
Red	The action has failed. An error message and error code are shown.

Accessing a Device's Configuration Parameters

To access a device's configuration parameters, follow the steps shown below.



PAN B Device and Signals configuration parameters tabs

Set the following parameters for the selected device (shown as item #5 above). The available tabs will vary according to the current APP.

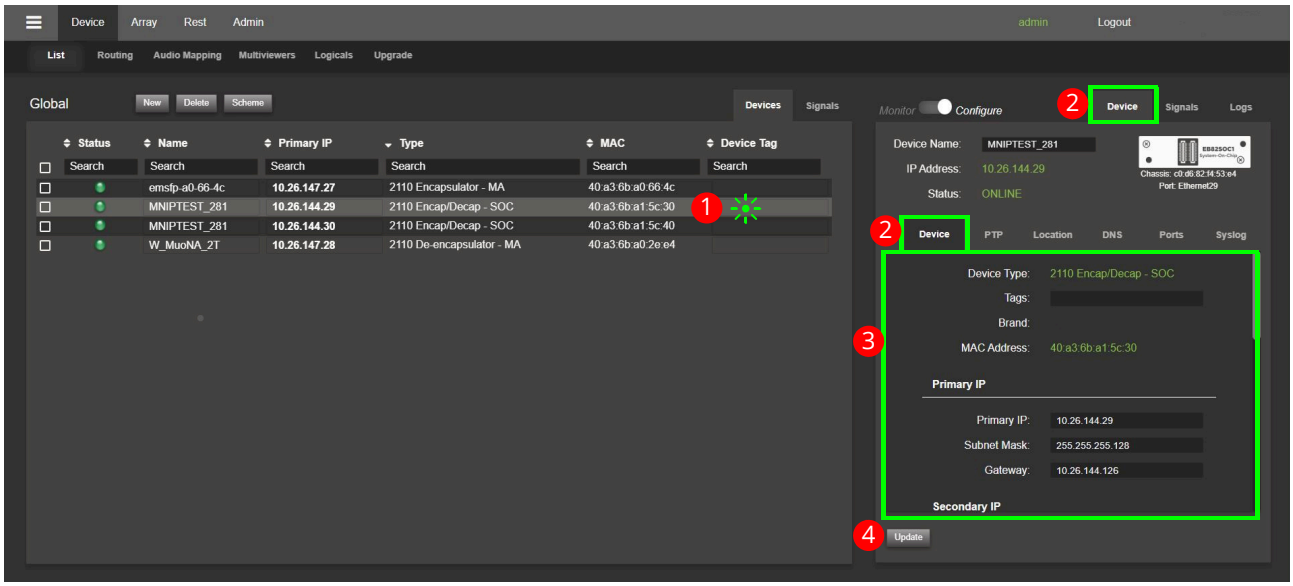
Device Tab	Signals Tab	Description
Device	-	Set the device's basic configuration parameters such as the device's name and networking information. See Setting the Device's Management Network Configuration on page 33.
PTP	-	Set the device's connection parameters to the network's PTP Master. See Configuring PTP on page 40.
Location	-	Set the device's LLDP parameters to use with the network switch. See Configuring the Device's LLDP Location on page 42.
DNS	-	Set the device's connection parameters to the network's DNS. See Configuring a DNS Server on page 43.
NMOS	-	When the APP supports NMOS, set the NMOS parameters. See Configuring an MNOS Server on page 44.
Syslog	-	Upload the device's events to a syslog on a remote host. See Sending Syslog Event Notifications to a Host on page 46.
-	Flows	Configure the device's SMPTE ST 2110 flows. See Configuring Flows on page 35.
-	SDI	The De-encapsulator is used by SMPTE ST 2110-based apps with SDI output(s). For example, for gateway, multiviewer, or JPEG-XS decoder. See Configuring a De-encapsulator on page 39.
-	Reference	Configure the device's video reference alignment. See Video Reference Alignment on page 63.
-	Clean switch	Configure the device's clean switch operation. See Clean Switch Mode Configuration on page 64.

Setting the Device's Management Network Configuration

> **WARNING** Changing the device's management IP address must be carried out during off hours as it will cause a service outage.
>
> Changing a device's management IP address will cause the device to reboot. A reboot can take about a minute to complete during which the device is offline. For the control system to re-establish routes will take longer.

Once you have obtained the device's current IP address (see Obtaining a Device's Current Management IP Address on page 8) you can use MN SET to connect to the device and then set its IP Address according to your network address planning scheme.

1. Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.
2. Access the **Device** > **Device** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.



Set the following parameters for the selected device.

Parameter	Description
Device Type	Shows the name of the current application running on the device.
Tags	Set a friendly name for the device that allows you to find it easily in MN SET. For example, this friendly name appears with the device in the device list.
Brand	Shows the name of the device manufacturer.
MAC Address	Shows the MAC address of the device's management Ethernet interface.
Primary IP / Secondary IP	When the device supports SMPTE ST 2022-7, the device has two Ethernet ports for hitless redundancy. The Primary IP is typically connected to the RED network and the Secondary IP is typically connected to the BLUE network.

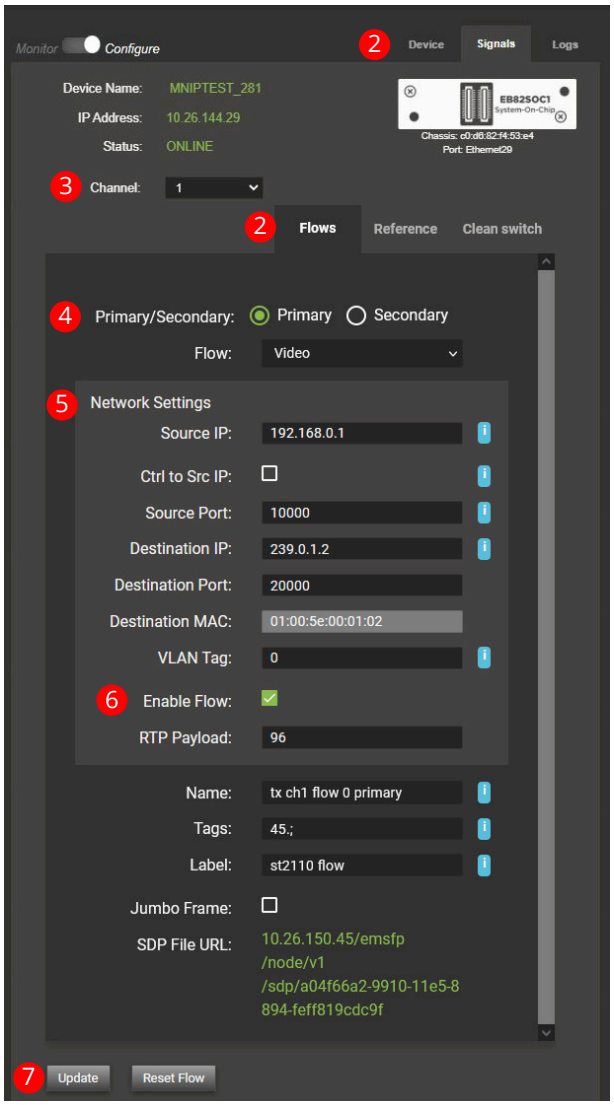
Parameter	Description
IP Primary IP Secondary IP	When the **DHCP** parameter is cleared, set the IP address for the device's management Ethernet interface. When the **DHCP** parameter is set, the **IP**, **Subnet Mask**, and **Gateway** are automatically configured. When the device supports SMPTE ST 2022-7, the Primary IP is typically connected to the RED network and the Secondary IP is typically connected to the BLUE network.
Subnet Mask	Set the mask that splits the IP address range between the host network and the network addresses. The mask for the network is defined during the configuration of the connected switch.
Gateway	Set the network switch's IP address. This is defined during the configuration of the connected switch.
Active Settings / DHCP	When your network has a working DHCP server, set this option so that the device automatically negotiates and acquires dynamically allocated Ethernet interface parameters (**IP**, **Subnet Mask**, and **Gateway**) from the network. In this situation, it is not necessary to set the above **IP**, **Subnet Mask**, and **Gateway** parameters.
Active Settings / IP Address	Shows the IP address setting currently in effect for device management.
Active Settings / Subnet Mask	Shows the subnet mask setting currently in effect.
Active Settings / Gateway	Shows the gateway setting currently in effect.
VLAN Tag	When necessary, set the VLAN Tag for the flow. This must match the VLAN ID of the PTP clock if the clock is VLAN tagged. Set to 0 for no VLAN Tag.
Protocols / mDNS	Set to allow the device to automatically discover and register itself with the NMOS registry on the network, that is used to support the networking of NMOS devices. Clear this parameter to disable the use of mDNS protocol with NMOS.
Protocols / Ember Port	Set the port number the device is to use for Ember API requests at the device's management IP address.
Protocols / SAP Announcement	For future use.

3 Double check the IP Address configuration values before clicking **Update**. Should this information not be correct, you might lose connectivity with the device.

4 If the values are correct, only then click **Update**. The device will reboot with its new network management settings.

Configuring Flows

1. Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.
2. Access the **Signals** > **Flow** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.
3. Select the channel / converter you want to configure. If you are in SMPTE ST 2110, you can choose the essence you want to configure.
4. Select the **Primary** / **Secondary** Ethernet port and the **Flow** to configure below.



Parameter	Description
Primary IP / Secondary IP	Select the Ethernet port to configure. When the device supports SMPTE ST 2022-7, the device has two Ethernet ports for hitless redundancy. The Primary IP is typically connected to the RED network and the Secondary IP is typically connected to the BLUE network.

Parameter	Description
INPUT / OUTPUT	For APPs that use: • IP flows only (that is, the APP does not support SDI or HDMI inputs or outputs). • An input and an output SDI connectors (that is, the APP does not use any IP flows). Select: **INPUT:** To configure the Encapsulator flow or the input signal. **OUTPUT:** To configure the De-encapsulator flow or the output signal.
Flow	Select the essence (Video, Audio *n*, Ancillary) to configure with the parameters shown below.
Source IP	Set the unicast IP address for your flow in an IGMP V3 network configuration. This is typically set to the device's Management IP Address.
Ctrl to Src IP	Sets the **Source IP** address to the device's Management IP Address.
Source Port	Set the port number for the flow.
Destination IP	Set the multicast IP address for this flow. MN SET can raise a warning to help you avoid a scenario where two destinations in MN SET have the same destination multicast IP address configured for them. See Duplicate Multicast Destination on page 84.
Destination Port	Set the port number to use with the multicast IP address for this flow.
Destination MAC	When a multicast destination IP address is used, this shows the MAC address of the destination IP port.
VLAN Tag	When necessary, set the VLAN Tag for the flow. Set to 0 for no VLAN Tag.
Enable Flow	Enables the flow to be sent on the network.
RTP Payload	Set the RTP Payload ID for the outgoing stream in the range of 0 to 128. The default values are: **96** for SMPTE ST 2110-20; video **97** for SMPTE ST 2110-30; audio **100** for SMPTE ST 2110-40; ancillary
IGMP SRC IP	Specify the source IP address at the IP layer (as opposed to IGMP layer) which is used when sending IGMP requests. When set to 0.0.0.0, this uses the device's management IP address.

Parameter	Description
Sender Type	This parameter is only available on receiver flows. Set this parameter to match the sender's flow type. The receiver uses a small buffer to process packet intervals from a Narrow Sender which results in less processing latency. When receiving a Wide Sender, the receiver must have a larger buffer to be able to lock and rebuild the datagram for the downstream process. **Narrow:** A narrow sender is typically a hardware processing device that uses FPGA technology. Such devices produce packets in an isosynchronous way, meaning they occur at regular intervals. **Wide:** A wide sender is typically a PC-based Encapsulator device. Unlike narrow senders, Wide Senders send packets in an irregular manner; sometimes sending packets too fast and at other times packets are sent too slowly.
Name	Set the name field in the device. This name is used within the interface to identify this receiver or sender flow.
Tags	This is used in the Device list and routing section to help you find this signal.
Label	Set the label field in the device. This can be used by a third party interface as an extra name or alias.
Nbr of SDI channels	For Audio flows only: Set the number of SDI audio channels to embed into the IP stream.
Jumbo Frame	For Video flows only: Set when your network supports jumbo Ethernet frames that have more than 1500 bytes of payload.
SDP File URL	The network path to the SDP File. To quickly view a flow's SDP file content, see **Show SDP File** in Viewing the Device's Operational Status and Parameters on page 79.
Patch SDP	Click to set a customized SDP file for a flow. This opens a text box in which you can type (or paste) the required SDP.
Audio Format	For Audio flows only: Set whether the audio channels are compressed or not. **Uncompressed:** An SMPTE ST 2110-30 flow / AES67 Audio format. **Compressed:** An SMPTE ST 2110-31 flow for Dolby support.
Packet Time	For Audio flows only: The packet time. See Audio Packet Time on page 78 for more information.
ANC Flow Profile	For Ancillary flows only: Set the Ancillary flow profile. **End of field event:** The SMPTE ST 2110-40 RTP packet is transmitted only when full or on end of frame/end-of-field event. **1ms from decoding:** The SMPTE ST 2110-40 RTP packet is forced to be sent after a 1ms timeout from the decoding of an ancillary packet inside the SDI stream. **Packet by packet:** The SMPTE ST 2110-40 RTP packet is transmitted for every single ancillary packet. As such, all ancillary packets decoded from the SDI stream are send individually over RTP.

Parameter	Description
Packet Filtering	These option fields control filters which are applied to incoming network packets. The goal is to set the filters so that the device receives only the source flows from the network it requires. In most cases, the default settings will work fine. The filters are: **Source IP**, **Source UDP Port**, **Source MAC**, **Destination IP**, **Destination UDP Port**, **Destination MAC**, and **VLAN**.

5 Minimally configure the destination IP; the destination MAC will be automatically calculated based on the multicast IP.

6 Make sure **Flow** is enabled.

7 Click **Update**.

8 Repeat for all essences, secondary flows, and channels. You can use the Routing tab to copy the configuration from the Encapsulator to the De-encapsulator.

For more information about Routing, see Using the Routing Panel on page 51.

Configuring a De-encapsulator

De-encapsulator configuration

The De-encapsulator is used by SMPTE ST 2110-based apps.

1 Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.

2 Access the **Signals** > **SDI** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.

Set the following parameters for the selected device.

Parameter	Description
SDI output when signal is lost	Set the output signal to use when the input video is lost. **Black:** On signal loss, the SDI output displays a black screen. **Freeze:** On signal loss, the SDI output repeats the last intact frame. **Blue:** On signal loss, the SDI output displays a blue screen. **No signal:** On signal loss, the SDI output is turned off.

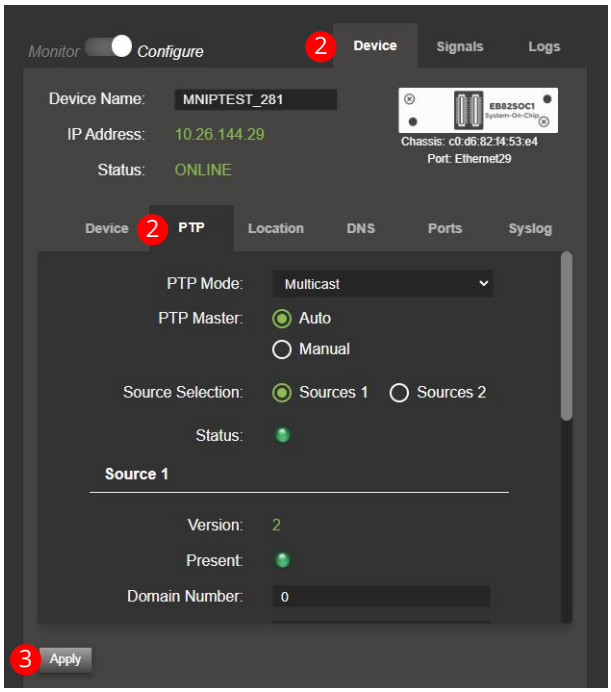
3 Click **Apply**.

Configuring PTP

When using an IP SMPTE ST 2110 devices, the PTP is a critical part of device's configuration to make sure the streams are synchronized in the IP system.

1 Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.

2 Access the **Device** > **PTP** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.



Set the following parameters for the selected device.

Parameter	Description
PTP Mode	Select between **Multicast**, **Hybrid**, and **Unicast** depending on the network's PTP configuration.
PTP Master	**Auto:** Preferred - The PTP master will automatically choose the best clock between Source 1 and 2. It will also seamlessly change clock if the currently used clock becomes unavailable. **Manual:** Non-preferred - You can lock the device on either Source 1 or Source 2. In manual mode, the device will not change to the other clock if the currently chosen clock becomes unavailable.
Source Selection	If **PTP Master** is set to **Manual**, set the PTP clock that the device will use.
Status	**Green:** At least one PTP source is locked. **Yellow:** PTP is *coarse locked*. **Grey:** PTP is not locked.

Parameter	Description
Source 1 Source 2	Configure the PTP source(s). **Version:** Shows the version of the received PTP master clock. **Present:** If the green light is on, a PTP clock is being received on this source. **Domain Number:** Set the same Domain Number for the PTP clock present on the network. Acceptable values are between 0 and 127, with a default value of 0. **Vlan ID:** When necessary, set the same VLAN ID of the PTP clock when the clock is VLAN Tagged. **DSCP:** Set the DSCP Marking for network differentiation of PTP packets. **Grand Master ID:** The Grand Master ID of the received PTP clock (Boundary clock). **Clock ID:** The Clock ID of the received PTP clock (Parent clock).

3 Click **Apply**.

The following PTP warnings are available.

- PTP Not Locked Warning on page 83.
- PTP Grandmaster Mismatch on page 83.

See also Troubleshooting PTP warnings on page 83.

Configuring the Device's LLDP Location

Devices support LLDP (IEEE- 802.1AB) protocol through which high-level information about the physical configuration of devices is exchanged between neighbors. This is useful to establish the topology of the system and easily find your physical devices.

1 Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.

2 Access the **Device** > **Location** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.

Set the following parameters for the selected device.

Parameter	Description
Show in header	**Static entry:** Set to use a location value you set below in **Location**. **From LLDP:** Set to use the location value set in the connected LLDP-enabled switch.
Static Location	**Location:** When **Static entry** is set, enter a location for this device.
LLDP	**LLDP frame rate:** Set the LLDP transmission rate in seconds. **LLDP Rx:** Set to enable/disable LLDP frame reception. **Interface:** Shows the LLDP information for the RED (**1**) and BLUE (**2**) interface. **Chassis:** Shows the MAC address for the connected switch. **Port:** Shows the port identifier of the connected switch port. **TTL:** Shows the Time To Live (TTL) of the last received LLDPDU frame.

3 Click **Apply**.

Configuring a DNS Server

Using NMOS with a DNS server on your network simplifies device discovery through DNS-SD.

1 Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.

2 Access the **Device** > **DNS** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.

Set the following parameters for the selected device.

Parameter	Description
Server address	Set the IP address for your network's DNS server.
Domain Name	Shows the name of the domain that the device is currently using. The device must have IP connectivity to a working DHCP server to receive this information.
Look up	Use the above DNS server to look up a hostname. **Host:** Set a Hostname to resolve, using the device's DNS configuration. **Name:** Shows the resolved hostname. **Address:** Shows the resolved IP address.

3 Click **Apply**.

Configuring an MNOS Server

Certain APPs support NMOS and you need to configure the connection to the NMOS registry.

1 Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.

2 Access the **Device** > **NMOS** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.

Set the following parameters for the selected device.

Parameter	Description
Status	Shows the current connection status to the NMOS registry. **DISCOVERING:** Device has not yet found a valid registry. **CONNECTING:** Device is registering its NMOS tree in the registry. **CONNECTED:** Device is fully registered in the registry.
Registry Address	When **Registry Mode** is set to **Manual**, set the IP address of the NMOS registry.
Uptime	Shows the number of seconds the Device has been fully registered in the registry without disconnection.
Connection Count	Shows the number of times the Device has disconnected from the registry and then: • Connected successfully. • Tried to reconnect but failed. For this counter to work, the configuration for the device to connect to the NMOS registry must have been made. That is, the **Registry Address** field must have been configured or the address must have been received from the DNS.
Registry Mode	Set the registry address selection mode. **Auto:** DNS-SD is used to discover the NMOS registry. **Manual:** You must specify the **Registry Address** field.
DNS Registry Service	Set the registry service name to search for in the DNS.
DNS-SD	If there is network support for mDNS and DNS-SD, this field will be visible. It allows you to change from DNS-SD (default) to mDNS.
DNS Server Address	IP address of the DNS Server currently in use. When **0.0.0.0** is shown, then no DNS server has been discovered.
Manual DNS Server Address	When **Registry Mode** is set to **Manual**, set the IP address of the DNS Server to be used.
Refresh	Click to update the values shown above.

3 Click **Apply**.

EB82SOC1 Mapping

When using an EB83SOC1, you need to configure the Ports to properly match with your I/O usage.

Proceed as follows.

1. Access the **List** tab and then select an EB82SOC1 device from the list in PAN A. See Device Tabs in PAN A on page 30.
2. Access the **Device** > **Ports** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.
3. The EB82SOC1 configured with a SMPTE ST 2110-based APP must also be configured with the proper Frame Rate setting that matches your signal's current frame rate:
   - **Fractional:** Fractional frame rates such as 59.94Hz, 29.97Hz...
   - **Integer:** Integer frame rates such as 50Hz, 30Hz...
4. For compatible devices only, the RS-FEC can be activated or deactivated on the management ports.

Sending Syslog Event Notifications to a Host

MN SET uses the syslog protocol to send event notification messages as an originator to a remote host where they can be stored and managed. Every 15 minutes, a syslog message is sent with the device's current health. Event notification messages are time stamped.

Configuring the Syslog event notifications

SysLog messages are based on RFC5424: see https://tools.ietf.org/html/rfc5424

1. Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.
2. Access the **Device** > **Syslog** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.
3. For this device, set the following networking parameters for the remote syslog host for the selected device.

Parameter	Description
Server	Set the remote syslog host's IP address.
Port	Set the port number for the syslog service on the host.
Enable	Set to enable the transmission of event notification messages to the remote syslog host.

4 Set one or more event types to enable notification messages for those types to be sent to the remote syslog host.

Parameter	Description
Monitoring - Common	**PTP event:** PTP unlock events. **Temperature event:** • 75˚C warning. • 80˚C critical temperature.[a] • Warnings are cleared when the temperature drops back below 70˚C. **RTP 48K event:** • RTP 48kHz unlock events (audio de-synchronization). RTP clock resynchronization due to a change at the flow timing or timing mismatch with PTP reference.
Monitoring - Encap	**SDI event:** SDI input unlock events. **No signal:** No-signal events (occurs if the flows are enabled, but there is no SDI signal detected at the input).
Monitoring - Decap	**Output FlyWheel:** Output flywheel unlock events: • The output flywheel error is raised when the SDI output is no longer synchronized with PTP and the respective Vsync are misaligned. When this happens, the PTP is not locked or it is unstable and the video signal will show glitches. **Memory packet error:** Memory packet errors (advanced troubleshooting) **Flow impairment:** The device is unable to reconstruct a valid media signal from the combination of RED and BLUE network flows. **Dash-7 FIFO:** Dash7 FIFO error event (Advanced Troubleshooting). **Repeated output frame:** SMPTE ST 2110-20 receiver frame repeat (if the output repeats a frame or if a packet is missed or received too late). **Skipped output frame:** SMPTE ST 2110-20 receiver frame skipped (if the output skips a frame).

a. The device will automatically shut itself down when its core temperature reaches 85°C. In this situation, the device needs to be power cycled for it to work again once its internal temperature has gone down to a safe operating temperature (<70°C).

5 Click **Apply**.

Audio Mapping

If you are configuring SMPTE ST 2110, you can configure the SDI Audio Mapping.

1 Access the **Audio Mapping** tab in PAN A. See Device Tabs in PAN A on page 30.

2 Select the type of APP to filter through your devices.

3 Select one channel from your device in the list. Only one channel at a time can be configured.

4 Select your Mapping Destination: This can differ if the device is sending or receiving a flow or if the signal is SDI or IP.

- With the above example, the selected device is an SDI to IP Gateway.

  In this case, the flow is to map your 16 × audio channels from your SDI into up to 8 × SMPTE ST 2110-30 flows.

  You first select the flow, then select the position of the channel inside the flow where you want to do the mapping.

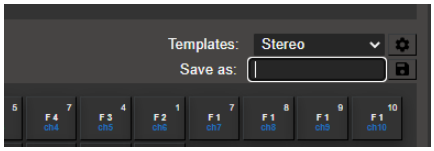
5 Once the Destination is selected. You can select the audio channels for this destination.

6 Click **Clear** to remove the Audio channel mappings (mute).

7 Click **Clear all** to remove the mapping for all audio channels.

NOTE Some products have different Audio Mapping limitations, and it may differ from one version to another as improvements are made to the application. The software adapts the flow to let you only make successful assignments. For example, you might not have the ability to map an audio channel from an SDI source multiple times inside the same flow. Also, some applications only allow the mapping of audio channels in a contiguous manner.

The software lets you save a Mapping configuration as a template that can then be applied to other devices. This is only possible among the same type of APP. It comes with a couple of templates such as Stereo mapping or 1-to-1 mapping, and you can add other templates that you have created.

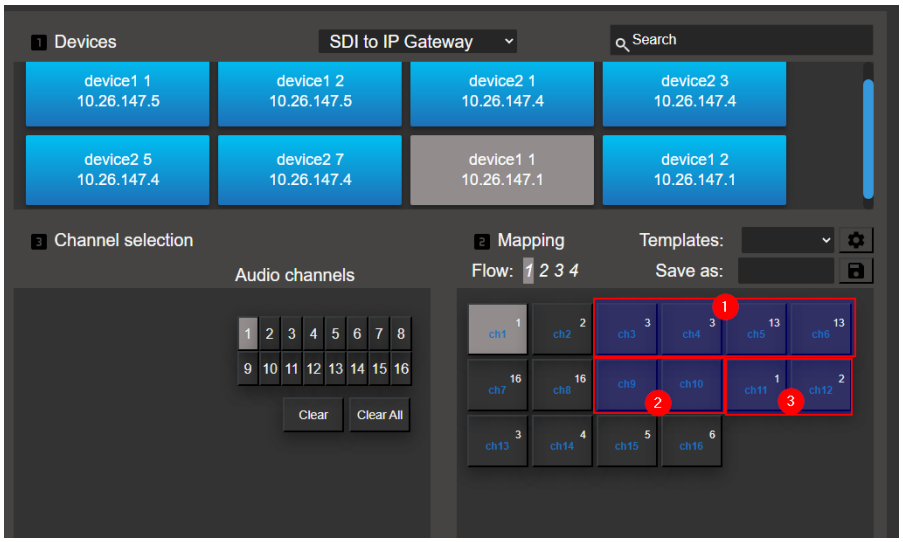


Audio Mapping for all SMPTE ST 2110 4K Gateway APPs V4.00 and Higher

A channel can be repeated any number of times within a flow, up to 16 times.

A channel can be muted (using the clear button).

A channel can be mapped at any position in the channel lineup.



SMPTE ST 2110 Time of Arrival Feature

Time of arrival is a SMPTE ST 2110 De-encapsulator feature that monitors the time in between received packet for a specific flow. This feature is useful for troubleshooting network problems. You can monitor the timing of 2 flows at the same time which allows you to compare and observe the differences between them. Make sure the receiver is receiving packets.

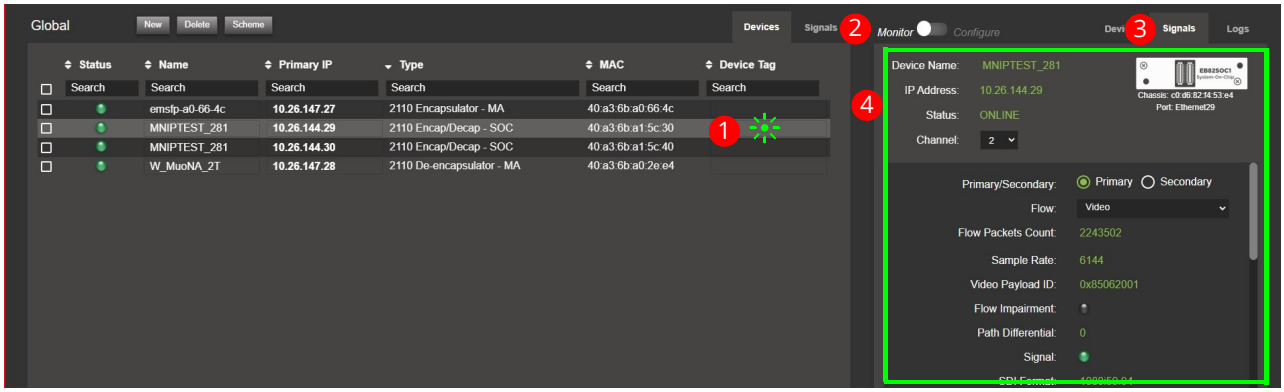
To see the time of arrival measure, proceed as follows.

1 Access the **List** tab and then select the De-encapsulator device from the list in PAN A. See Device Tabs in PAN A on page 30.

2 Set the PAN B to **Monitor** mode.

3 Select the **Signals** tabs.

4 Scroll pass the Host (IP) information and you should see **Packet Interval Time**.



You should see Measure A and Measure B;

5 Select the channel of where the flow is situated.

6 Select if it is a primary or secondary flow.

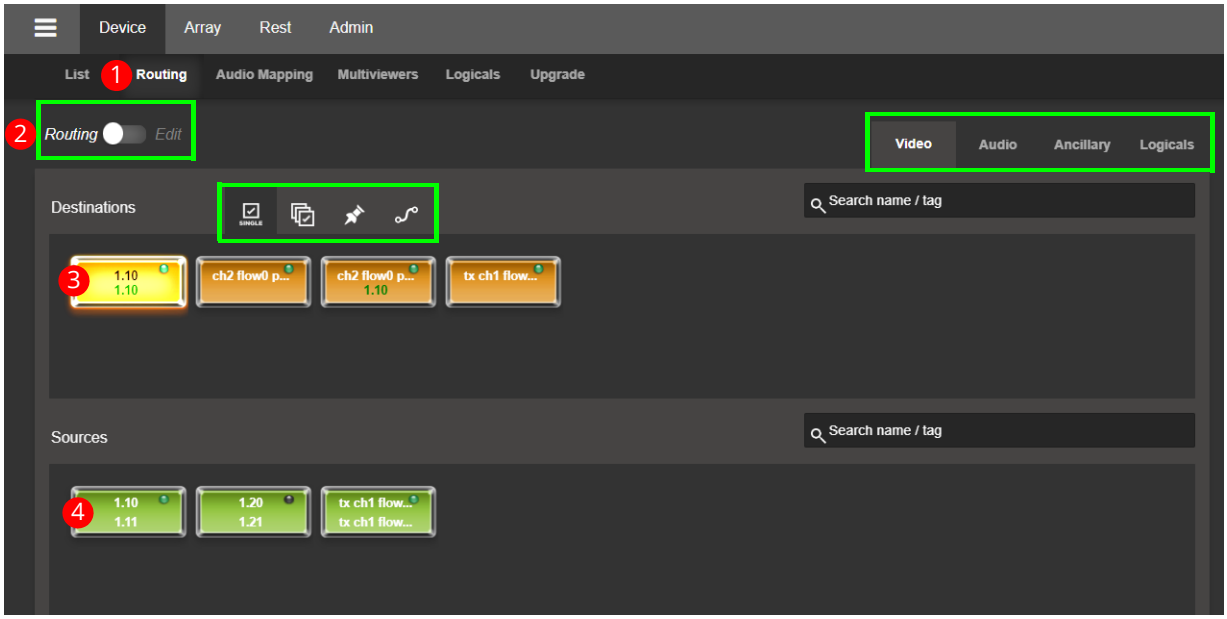
7 Select the flow type.

You can monitor and compare the packet arrival time of both flows.

Using the Routing Panel

To change the flow configuration of an De-encapsulator, you can use Routing Panel. The routing will copy the configuration of the Encapsulator and paste it to the De-encapsulator. To perform a routing action, proceed as follows.

1 Access the **Routing** tab in PAN A. See Device Tabs in PAN A on page 30.



The following option settings and buttons are available.

Option / Button / Tab	Description
Routing Edit Routing	You can use the PAN A as a router panel.
Routing Edit Edit	To pause routing and enter the Edit mode in PAN B. This lets you change the configuration of the Signals and the Devices.
Video	Show routing for video type sources and destinations.
Audio	Show routing for audio type sources and destinations.
Ancillary	Show routing for Ancillary type sources and destinations.
Logicals	Show routing for logical grouping of sources and destinations. To create a logical group of related flows, see Logicals on page 54.
Single selection mode	Changes to the single selection mode. In routing mode, the single selection mode allows you send a source to a destination. See Making IP Routes on page 52.
Multiple selection mode	Changes to the multiple selection mode. In routing mode, the multiple selection mode allows you send the same source to multiple destinations. See Making IP Routes on page 52.
Select all	You can also change all De-encapsulators after having set on **Multiple selection**.

Option / Button / Tab	Description
Show Routed Flows	This will disable routing, and will show you the source flow that is being routed to the currently-selected destination flows.

2 Put the panel into the Routing mode Routing Edit .

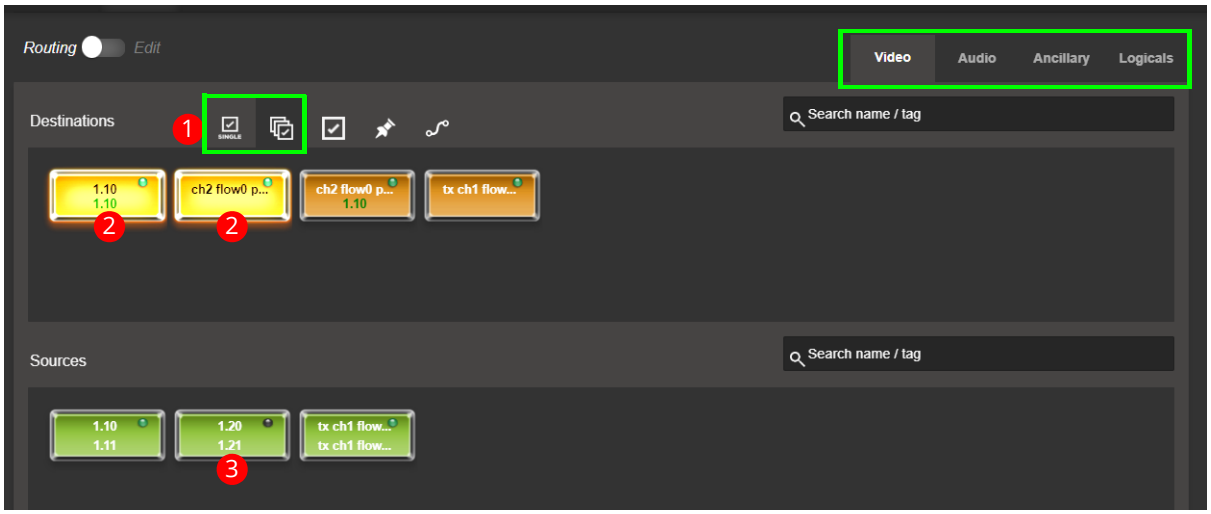
3 Select a Destination (De-encapsulator).

4 Click a Source (Encapsulator) to execute a Take.

NOTE Clean switch is not used when routing with the MN SET Routing Panel.

Making IP Routes

To initiate a route between 2 or more devices, select the right type of devices / flows with the device type tab.



1 Select:

- The single selection mode to allow routing to only one destination at a time.
- The multiple selection mode to allow routing to multiple destinations at a time.

2 Select 1 or more destination(s) according to the selection mode you have set.

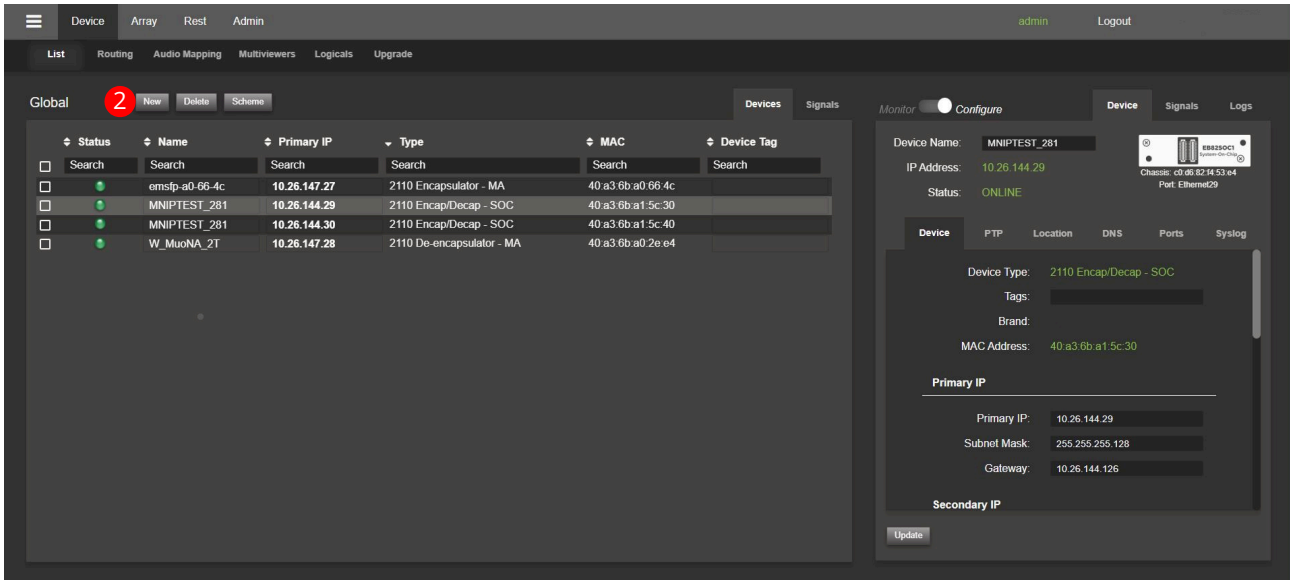
3 Click on one of the sources to make the Take.

The route is now executed, and the destinations will have the source name written in the middle.

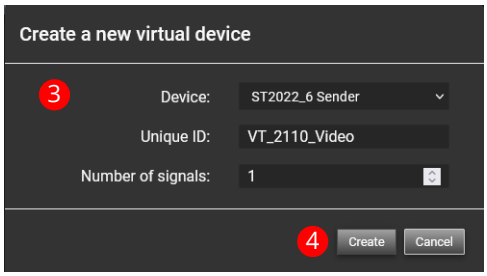
Creating Virtual devices

Virtual devices can be created to generate additional Senders within your routing area. This is useful in the routing control task when needing to route a third-party device signal into a Embrionix receiver.

1 Access the **List** tab in PAN A. See Device Tabs in PAN A on page 30.



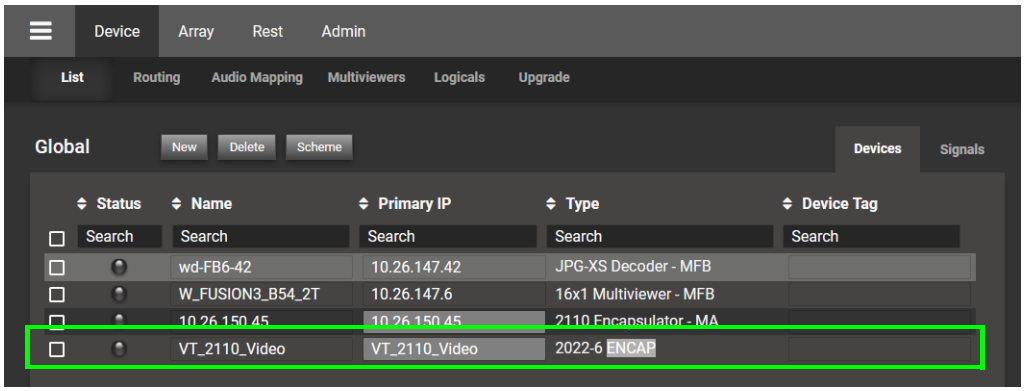
2 Click **New**.



3 Select the type of **Device**, define a **Unique ID**, and select the number of flow essences.

4 Click **Create**.

5 The new device will appear in the **Device** > **List** as any other Embrionix device does.



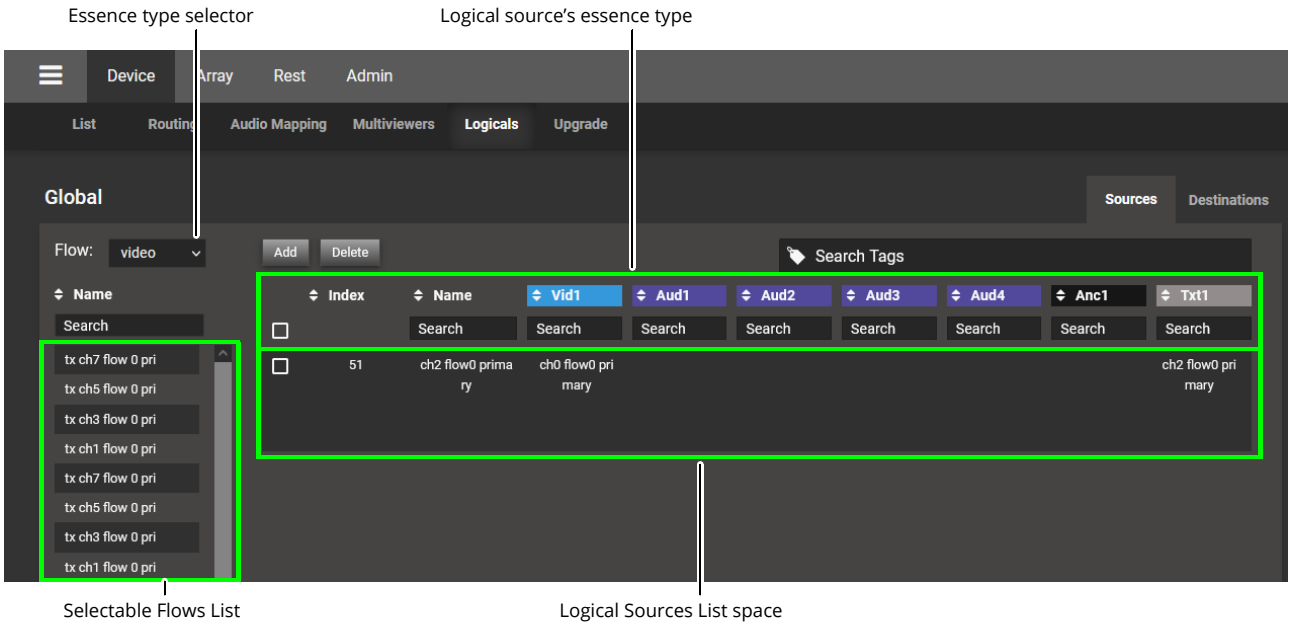
6 Define all the necessary parameters for each flow in Signals Pan B. See Accessing a Device's Configuration Parameters on page 32.

Logicals

Logicals is a feature that allows the grouping of related flows to be routed all at once. The concept is like traditional SDI routing with Logical constructs using levels with different types of signals. In the process, Logical Destinations are automatically created. Logical Sources must be created manually. Labels and alarms can also be configured as part of the grouping.

Once configured, the Logicals will be available in the routing panel area, with each:

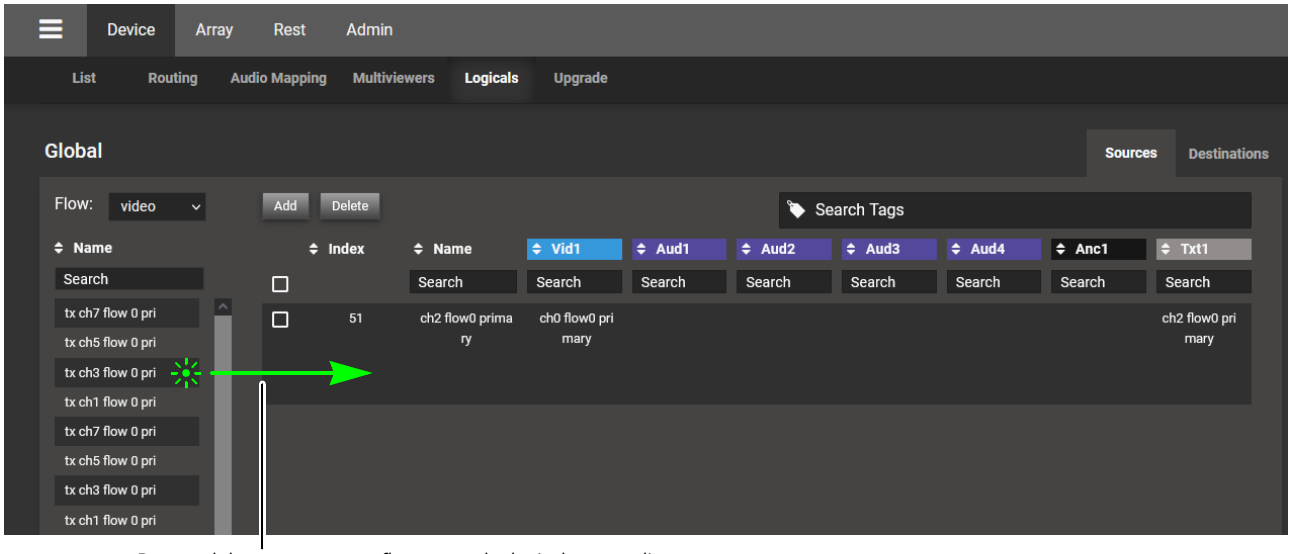
- Source button representing a group of Sources, Texts, and Alarms.
- Destination button representing a Receiver for these signal types.



Option / Button	Description
Flow	Filters the Selectable Flows List according to the essence type: Video, Audio, and Ancillary.
Add	Click to acknowledge the creation of a new Source.
Delete	Click to delete the selected logical source(s).

Creating Logical Sources

1 Access the **Logicals** tab in PAN A and then the **Sources** tab. See Device Tabs in PAN A on page 30.



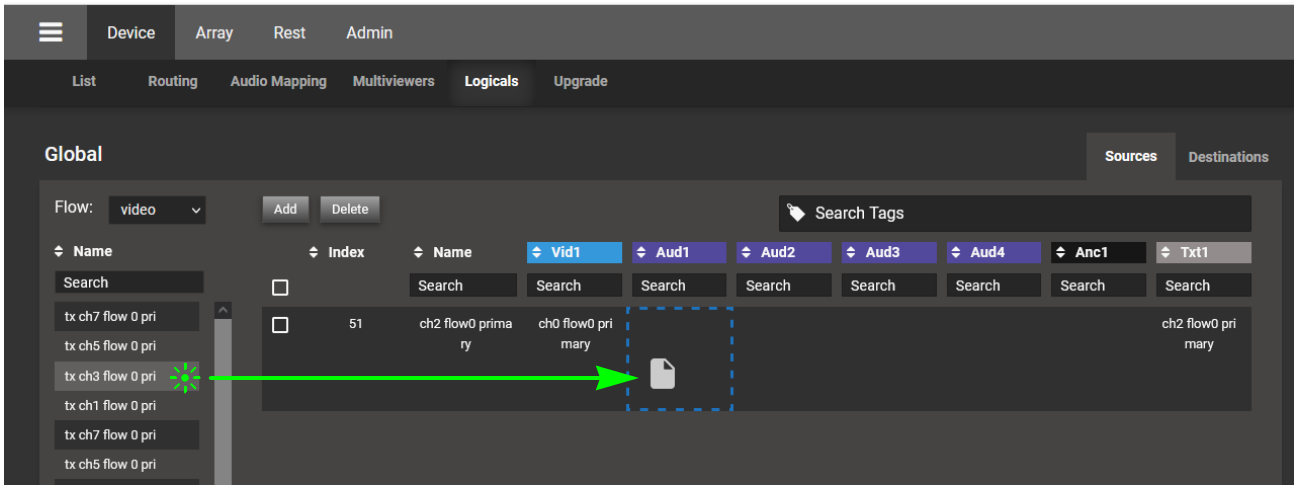
Drag and drop one or more flows onto the logical sources list

2 Drag and drop video flows onto the logical sources list to quickly create Logical Sources. More than one flow can be selected at a time from the left hand side list; to add to a selection, use <Shift> or <Ctrl> to select a range of flows or to add another flow to the selection. Then drag all the video flows into the Logical Source List space to create all the corresponding Logical Sources at once. Note: The Logical Source List will automatically derive the other flows when possible.

- The Video flow is normally used as the header flow.
- The Logical Source label will be derived from the Video flow. If the Logical Source does not contain a Video flow, it will use the first Audio flow for the Source name. Or else the next Audio flow and so on all the way up to the ANC data flow.

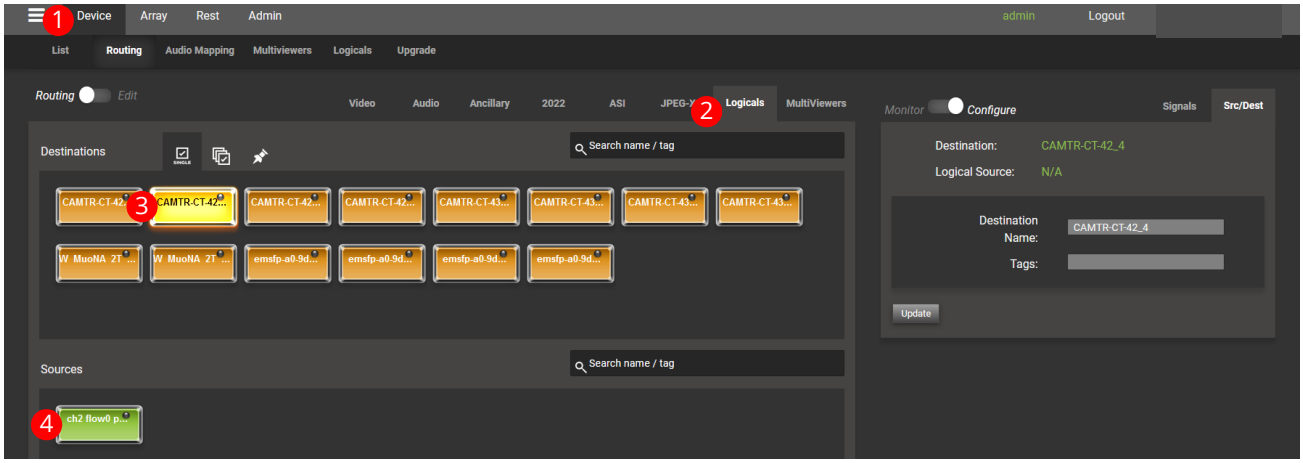
3 Press <Enter> or click **Add** to acknowledge the creation of the new Source.

4 You can browse to other Flow types and make individual edits by dragging and dropping flows into the Cells within the list.



Routing mode

In routing mode, when selecting the Logicals filtering, the user interface will provide the list of Logical Sources and Destinations. Making a route will execute a route for every flow configured in the Source to the Destination. The mapping will be made to follow the types and Levels as they are configured in the table.

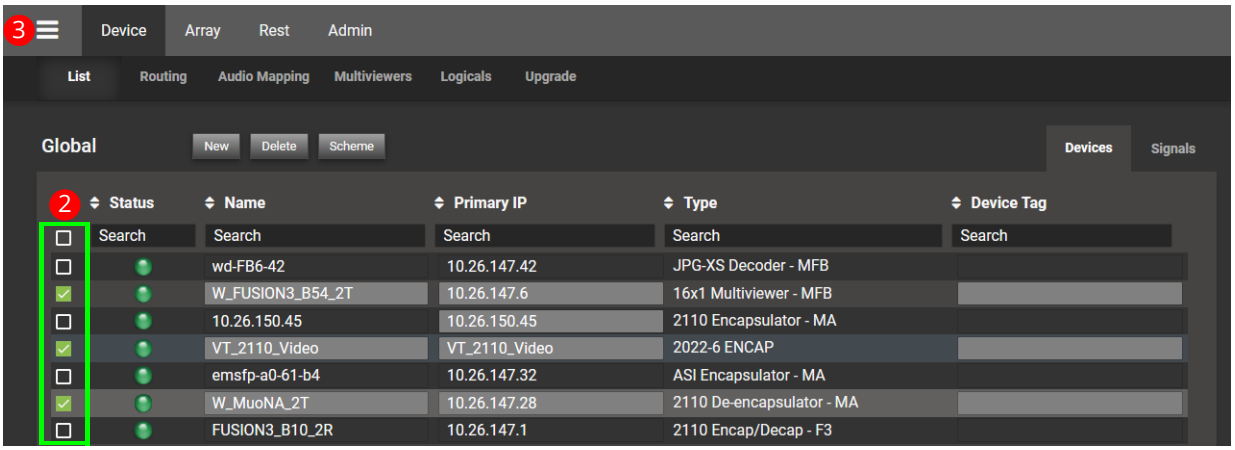


Import/Export Flow Configuration to a .csv File

With SMPTE ST 2110 Encapsulator, a great quantity of flows must be configured. Each one with different names and IP addresses. To accelerate this process, the MN SET offers a means to export the flow configuration to a .csv file to allow you to use a Spreadsheet software to enter data in a much faster fashion.

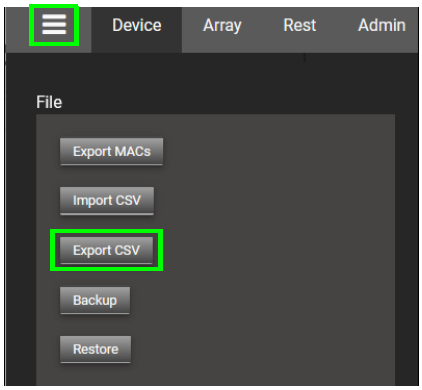
1 Access the **List** tab in PAN A. See Device Tabs in PAN A on page 30.

2 Select the devices you want to export to .csv.



3 Click ☰ to open the side menu.

4 Click **Export CSV**. This will automatically create a file labeled flow_config_"date"



5 Open this file in your preferred Spreadsheet software and edit the fields as necessary.

> **NOTE** *Fields Index, Device Name, Device Type, Mac Address, Management IP Channel, Flow type and flow number* should not be edited.

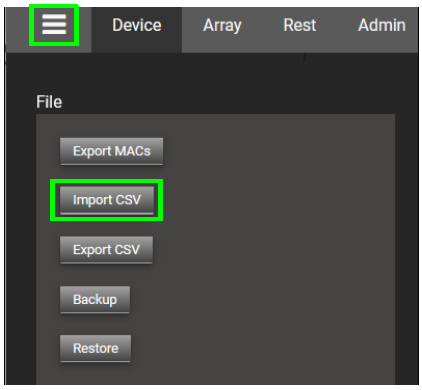
Index	Device Name	Device Ty	MAC Address	Control IP	Channel	Flow Type	Flow Num	Primary Flow	Primary Flow !	Primary S	Primary Dest	Primary D	Primary D	Primary V	Secondary Fl	Secondary Flow	Secondary Source F	Secodary Destination S
1	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	1	2110-20	1	Dst 1v	10.194.205.1	10000	225.16.2.60	20000	01:00:5e:1	0	31_1	10.194.205.1	10000	226.16.2.60
2	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	1	2110-30	1	Dst 1a1	10.194.205.1	10000	225.0.23.192	20000	01:00:5e:0	0	31_1	10.194.205.1	10000	226.0.23.192
3	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	1	2110-30	2	Dst 1a2	10.194.205.1	10000	225.0.23.194	20000	01:00:5e:0	0	31_3	10.194.205.1	10000	226.0.23.194
4	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	1	2110-30	3	Dst 1a3	10.194.205.1	10000	225.0.23.196	20000	01:00:5e:0	0	31_5	10.194.205.1	10000	226.0.23.196
5	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	1	2110-30	4	Dst 1a4	10.194.205.1	10000	225.0.23.198	20000	01:00:5e:0	0	31_7	10.194.205.1	10000	226.0.23.198
6	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	1	2110-40	1	Dst 1m	10.194.205.1	10000	225.17.2.60	20000	01:00:5e:1	0	31_1	10.194.205.1	10000	226.17.2.60
7	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	2	2110-20	1	Dst 1v	10.194.205.1	10000	225.16.2.2	20000	01:00:5e:1	0	1_3	10.194.205.1	10000	226.16.2.2
8	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	2	2110-30	1	Dst 1a1	10.194.205.1	10000	225.0.20.100	20000	01:00:5e:0	0	1_9	10.194.205.1	10000	226.0.20.100
9	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	2	2110-30	2	Dst 1a2	10.194.205.1	10000	225.0.20.102	20000	01:00:5e:0	0	1_11	10.194.205.1	10000	226.0.20.102
10	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	2	2110-30	3	Dst 1a3	10.194.205.1	10000	225.0.20.104	20000	01:00:5e:0	0	1_13	10.194.205.1	10000	226.0.20.104
11	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	2	2110-30	4	Dst 1a4	10.194.205.1	10000	225.0.20.106	20000	01:00:5e:0	0	1_15	10.194.205.1	10000	226.0.20.106
12	emsfp-a0-28-ca	DECAP	40:a3:6b:a0:28:ca	192.168.39.105	2	2110-40	1	Dst 1m	10.194.205.1	10000	225.17.2.2	20000	01:00:5e:1	0	1_3	10.194.205.1	10000	226.17.2.2

6 Do not change the formatting of the Spreadsheet but only the data inside the flow section.

7 Save the file.

8 Return to MN SET, and click ☰ to open the side menu.

9 Click on **Import CSV**.



10 Select the .csv spreadsheet file you edited.

The new flow parameters will be changed and applied to the Online devices.

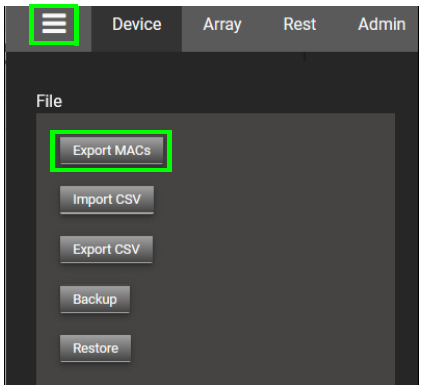
APP Installation, Upgrade, and Add-On Licenses

Installing APPs on a Device

Exporting your device's MAC Addresses

To upgrade an APP, you need an upgrade package linked to your device's mac address. If you do not already have a package for your devices, you need to provide a MAC address list of the devices you want to upgrade to Embrionix. Upgrades are subject to fees, based on your SLA contract. See Technical Support on page 87.

1. Access the **List** tab and then select one or more devices from the list in PAN A. See Device Tabs in PAN A on page 30.
2. Click  to open the side menu.
3. Click **Export MACs**. You can use the filter option in the device list to export different types of devices separately.

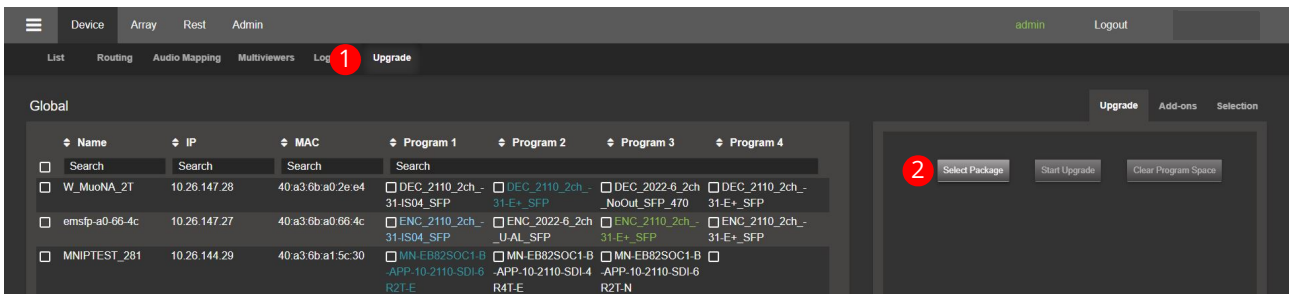


APP installation

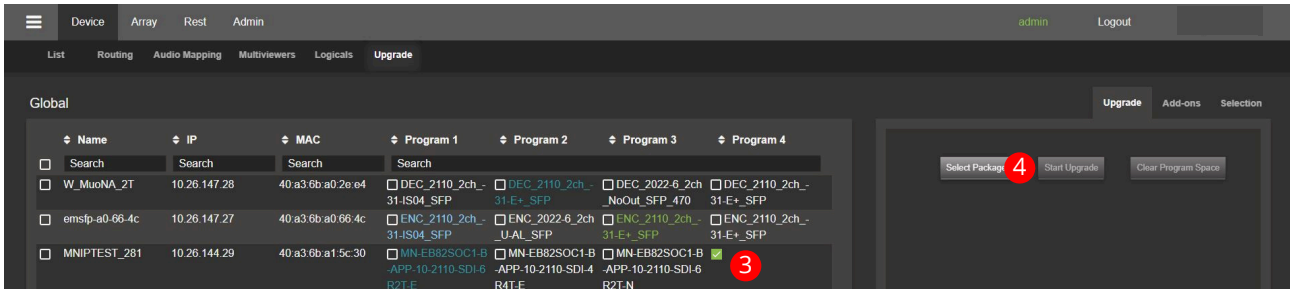
While four program spaces are shown, certain devices only support three program spaces.

1. Access the **Upgrade** tab in PAN A. See Device Tabs in PAN A on page 30.
2. Click **Select package** situated on the PAN B. An explorer window pops up. Select the upgrade package file on your computer and click **Open**.

   MN SET will automatically detect and select the device(s) on PAN A that matches the uploaded package and it will automatically select the first available program for each device. The program slot to be used can be adjusted as needed. If for some devices there is no free slot for the new program, an exclamation mark will be displayed. In this situation, a program space will have to be cleared. See Removing an APP from a Device on page 60.



3 Click **Start Upgrade** and wait a few minutes for the upgrade to finish.



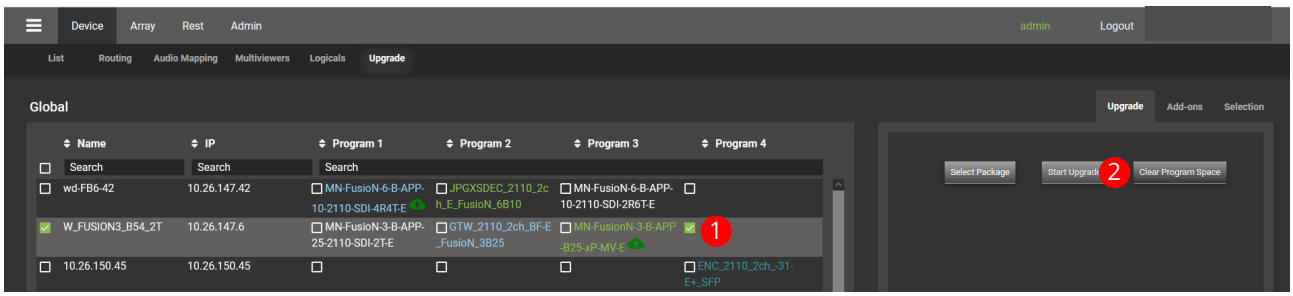
4 Once completed you can click **Clear Package** to upgrade another set of devices.

Now the program is installed, but it is not currently running. To change the current program, see Selecting an APP to Run on a Device on page 60.

Removing an APP from a Device

If all the program spaces on the device are used, you can clear a program space to make it available for another program.

1 Select the program you want to clear on each device.



2 Click **Clear Program Space** in PAN B. Once you click the clear button it will take approximately one minute for the program to be erased from the device's flash memory.

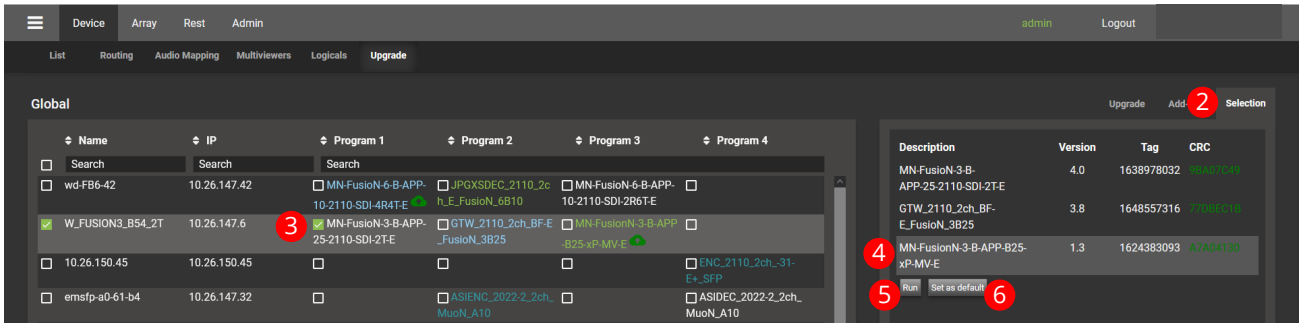
Once completed, you will be able to select this empty program slot to install the new program.

Selecting an APP to Run on a Device

> **WARNING** You must plan this maintenance procedure to be carried out during off hours as it will cause a service outage.
>
> Changing a device's program will cause the device to reboot. A reboot can take about a minute to complete during which the device is offline. For the control system to re-establish routes will take longer.

1 Access the **Upgrade** tab in PAN A. See Device Tabs in PAN A on page 30.

2 Click **Selection** tab in PAN B.



3 Select the device for which you want to change the running program.

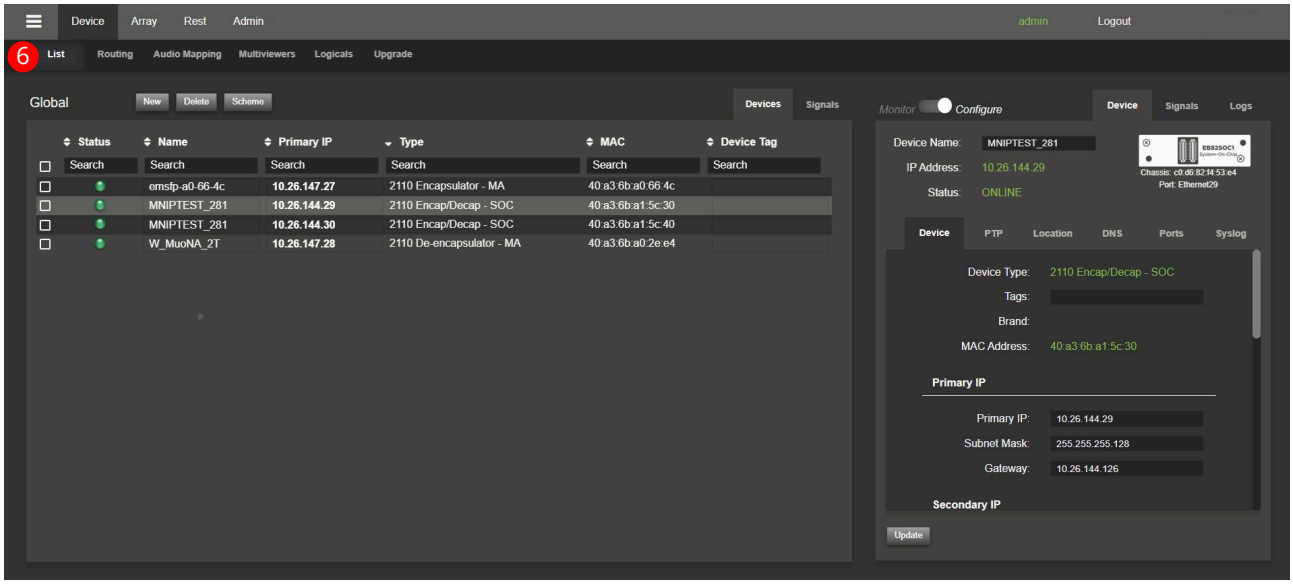
4 Select the program in PAN B that you want to change to.

5 Click **Run**.

The program will change, and the device will come back shortly. If you lose contact with the device, reboot the device to restore the default program.

6 Thereafter, click **Set as default** to set this new program as the default. The default program is what will be loaded after a power outage or a host reboot.

You will have to wait for the confirmation that the selection has been made. After the confirmation, you can go back to the device list by clicking the **List** tab.



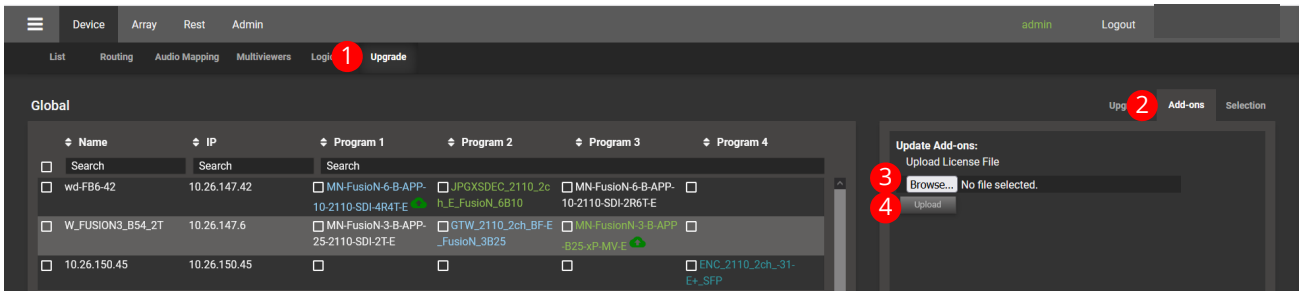
Installing Add-On Licenses

The installation of Add-On licenses through MN SET is done with the Upgrade devices panel.

1 Access the **Upgrade** tab in PAN A. See Device Tabs in PAN A on page 30.

2 Click on **Add-ons** in PAN B.

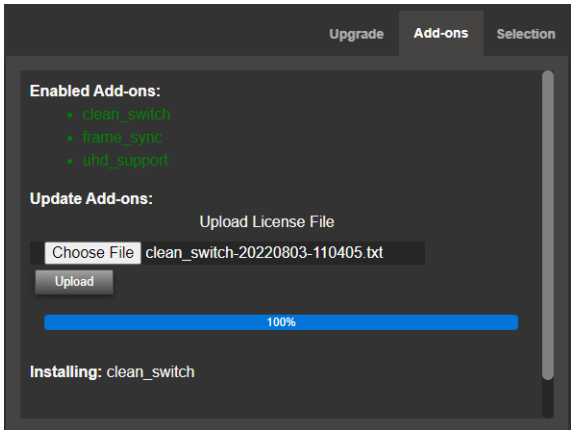
3 Click **Choose file** to select the provided license file.



4 Click **Upload**.

MN SET will automatically select the device to upgrade.

5 Click on upload to start the upgrade.



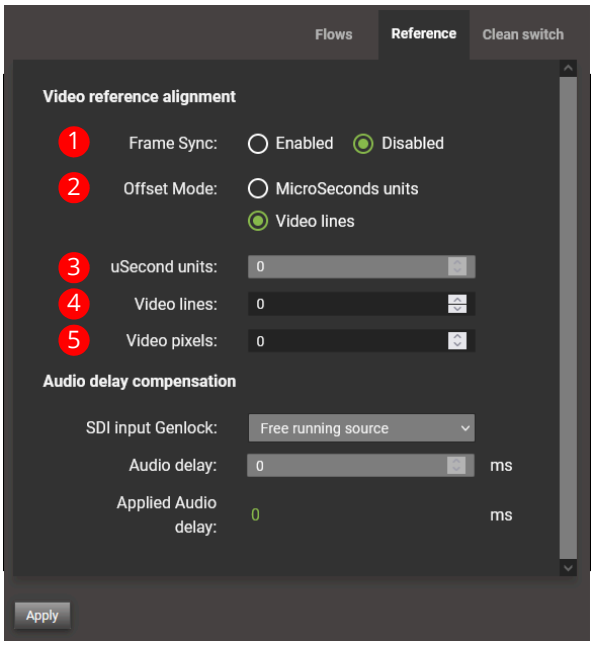
An update successful message will appear after the upgrade, and your Add-Ons are now activated on your devices.

You can now start configuring and using the feature that you just activated.

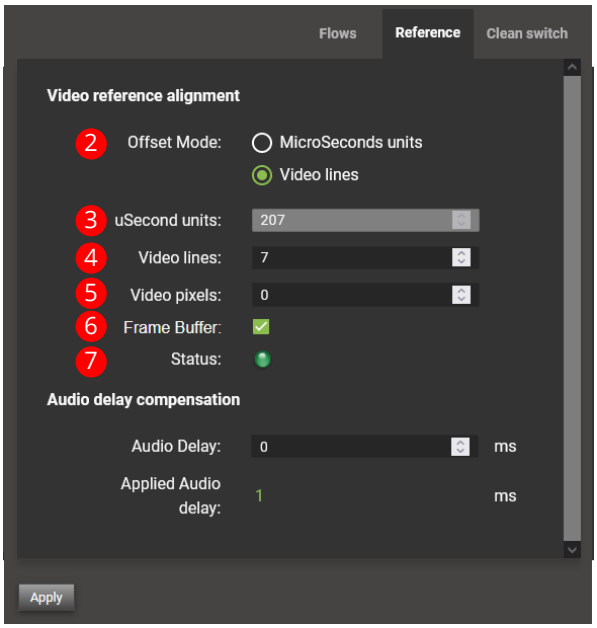
Video Reference Alignment

Access the **Signals** > **Reference** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.

Encapsulator



De-encapsulator



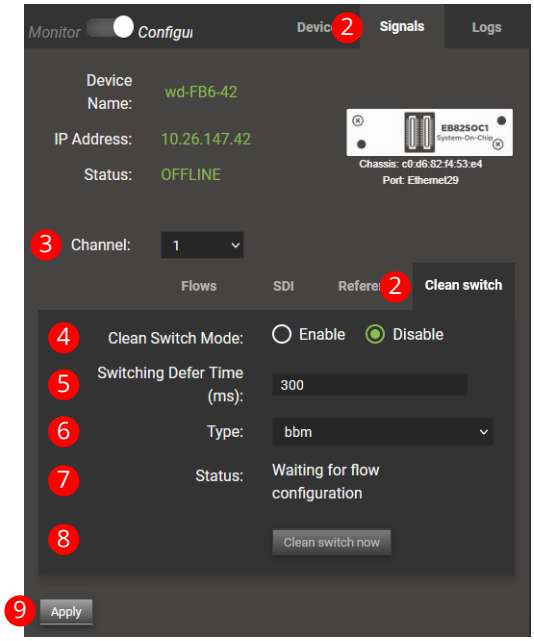
#	Encapsulator	De-encapsulator	Parameter	Description
1	•		Frame sync	When enabled, the 2110 stream will be timed with the received PTP clock, and the following parameters are available: **Offset mode**, **MicroSecond Units**, **Video Lines**, **Video Pixels**.
2	•	•	Offset mode	The timing configuration mode (**MicroSeconds** or **Video lines**).
3	•	•	MicroSecond units	Value in micro-seconds for the stream timing **(Only available in MicroSeconds timing mode).**
4	•	•	Video lines	The number of video lines that the stream will be offset by **(Only available in Video lines time mode).**
5	•	•	Video pixels	The number of pixels that the stream will be offset by **(Only available in Video lines timing mode).**
6		•	Frame buffer	When activated, the frame buffer will automatically time the output to make sure the device does not starve.
7		•	Status	Status will be green if the configuration of the Video reference alignment is valid for the current received SMPTE ST 2110 stream.

Clean Switch Mode Configuration

The clean switch mode sets how the video and audio are switched from one source to another at the IP receiver. The switching mode you choose will impact the quality of the transition.

Clean switching is a licensed feature. See APP Installation, Upgrade, and Add-On Licenses on page 59.

1. Access the **List** tab and then select a device from the list in PAN A. See Device Tabs in PAN A on page 30.
2. Access the **Signals** > **Clean switch** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.
3. Select the channel you want to configure. If you are in SMPTE ST 2110, you can choose the essence you want to configure.



Parameter	Description
Clean Switch Mode	Set the clean switch mode. **Enable:** Clean switch is enabled. **Disable:** No clean switch is performed.
Switching Defer Time (ms)	The IGMP setup delay is used to specify the time the setup (the network and all devices in the datapath) takes to route new traffic when the clean switch is performed. A value too low can cause a missing frame error during the clean switch. A value too high may strain this device's network bandwidth processing capacity during the clean switch. **NOTE** A delay of '0' will result in an infinite timeout (packet needs to be received in order to switch. A 0 delay can only be used when **Timeout Option** is NOT **Revert** and type is **mbb**.

Parameter	Description
Type	Select the type of clean switch you want to use. **bbm:** Break before make. Uses less bandwidth, but video frame may freeze during switch for a second. **mbb:** Make before break. Guarantees a clean transition at the cost of more bandwidth during the switch.
Timeout Option	When **Type** is set to **mbb** and **Switching Defer Time** > 0, select the timeout option to apply. If the **Switching Defer Time** timer has elapsed, set what action the device should take. **Switch:** Perform the switch anyway. **Revert:** Remain on the current flows, and will change the flows configuration to reflect a revert.
Status	Shows the current clean switch status.
Clean switch now	Once a new source has been setup through `/flows`, `/sdp`, or a control system, this button becomes active. Click to force a clean switch immediately.

4 Click **Apply**.

5 Route new source through:

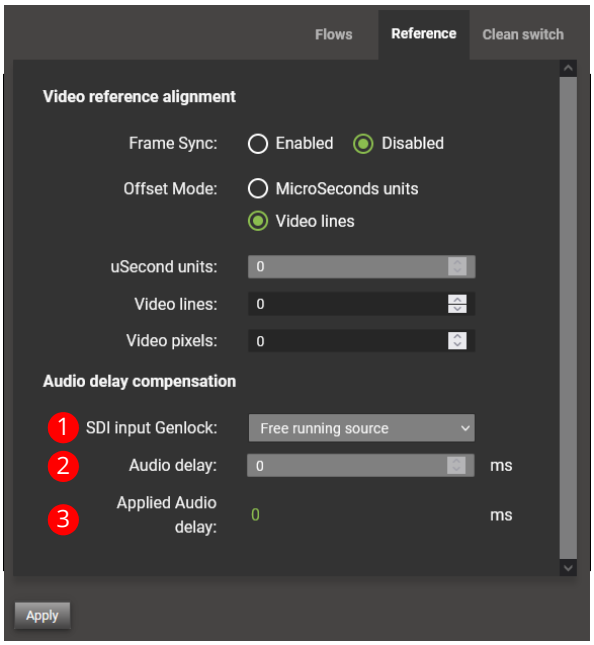
- The REST API:
  - `{Management IP address}/emsfp/node/v1/flows`
  - `{Management IP address}/emsfp/node/v1/sdp`
- A control system.

6 Click **Clean switch now**.

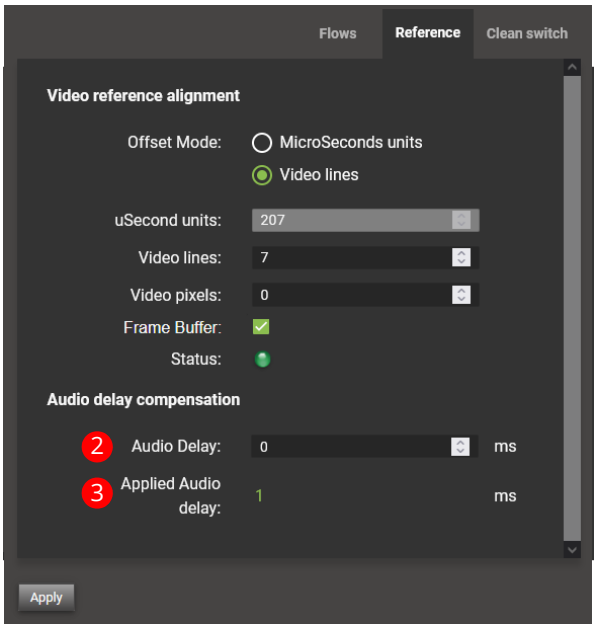
Audio Delay Compensation

Access the **Signals** > **Reference** tab of the device's configuration parameters in PAN B. See Accessing a Device's Configuration Parameters on page 32.

Encapsulator



De-encapsulator



#	Encapsulator	De-encapsulator	Parameter	Description
1	•		SDI Input Genlock	Shows if the SDI input signal feeding the Encapsulator is locked and in phase to a reference clock or not.
2	•	•	Audio delay	Audio offset in milliseconds.
3	•	•	Applied audio delay	Currently applied audio delay on this device channel.

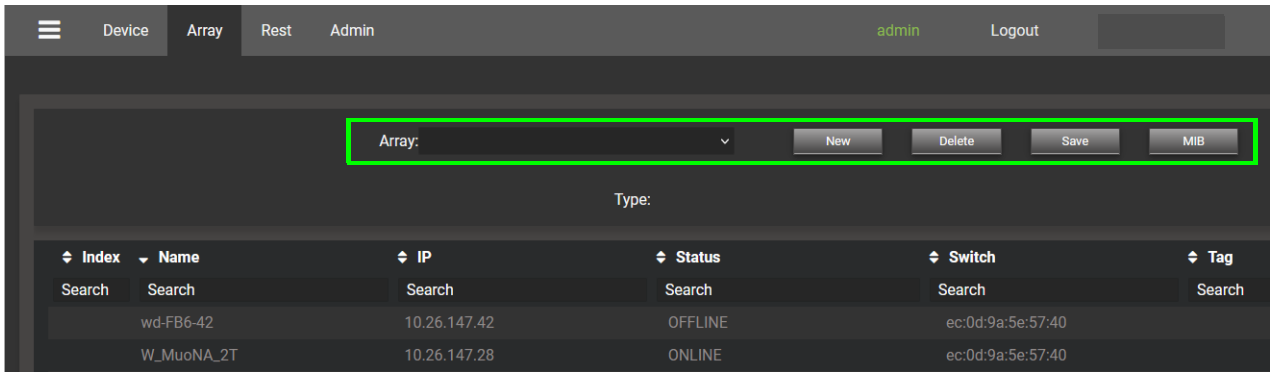
Arrays for North Bound API

Prerequisite You must have configured the NBAPI server interface. See Enable / Disable an Array on page 69.

Introduction to the Array page

The Array page is used to create and manage arrays for the north bound API. These Arrays can be used to manage the MuoN SFP through Rest or SNMP with an external application.

1 Access the **Array** tab in PAN A. See Main menus on page 28.



UI Item	Description
Array (dropdown list)	Select a previously-created array to manage. See Manage an Array on page 68.
New	Create a new array. See Create an Array on page 68.
Delete	Delete the array selected in the **Array** dropdown list.
Save	All modifications to the array need to be saved before quitting the page or selecting another array. Click **Save** when array modifications have been finalized.
MIB	Create MIB files to be used with SNMP. See Getting the Array ready for SNMP on page 71.
Type	When a previously-created array has been selected from the **Array** dropdown list, this shows the type of emSFP included in the selected array in the table below.

When no Array is selected, you see an overview of all the MuoN SFP detected by the MN SET.

Create an Array

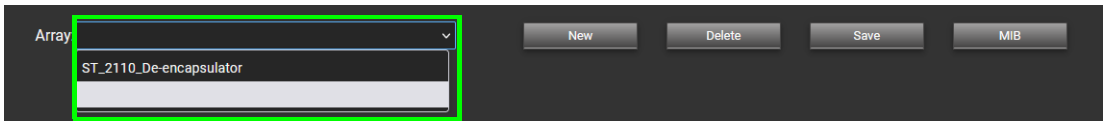
North Bound API Arrays are determined by the device type.

1 Click **New**. See Introduction to the Array page on page 67.

2 Set the Array name and select the type of devices to be used with this Array.

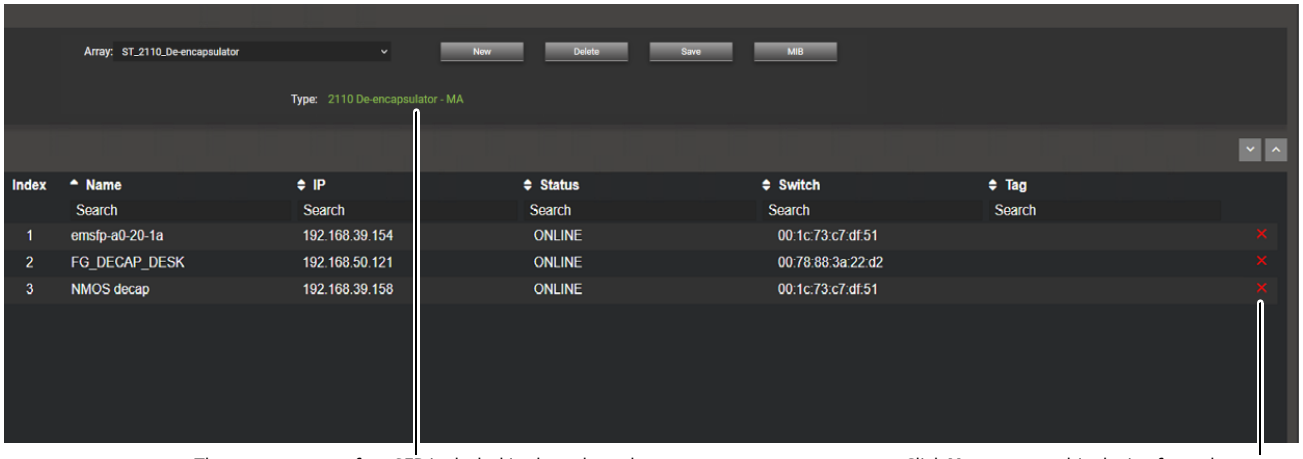
3 Click **Create**.

4 To manage the newly created Array; select the Array from the **Array** dropdown list.



Manage an Array

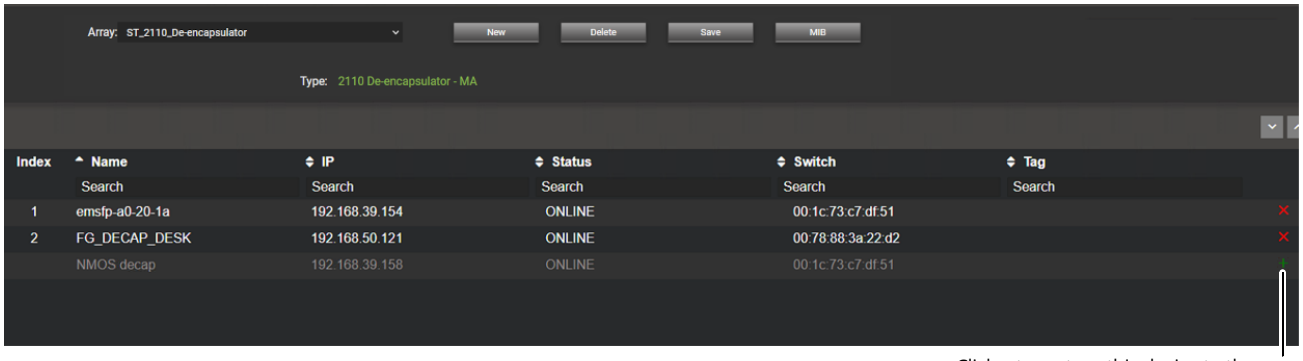
A newly created array will include all devices of the type selected during array creation. You can see the index of each device, the IP, the status, the device, or switch in which the SFP is hosted in, the Tag, also a button to include or subtract the MuoN SFP from the array. To subtract a MuoN SFP from an array, click on the red “X” on the far right.



The current type of emSFP included in the selected array

Click **X** to remove this device from the array

When a MuoN SFP is subtracted from an array, the device's information is grayed out. To restore a device to the array, click the green "+" sign. Click **Save** to keep your changes.



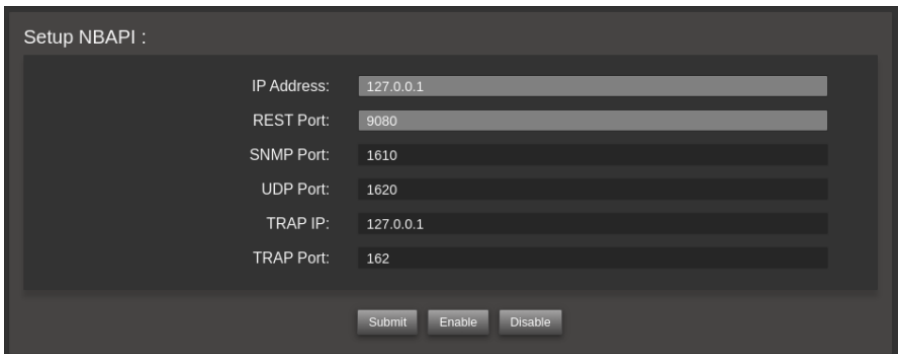
Click **+** to restore this device to the array

Enable / Disable an Array

To complete the configuration of an Array and make it available to a north bound interface or MIB manager, you must set up the following information.

1 Access the **Admin** tab and then the **Setup server** tab. See Main menus on page 28.

2 In **Setup NBAPI**, set the following parameters.



Parameter	Description
IP address	Address to communicate with the North Bound API.
REST Port	Port through which North Bound RESTful commands will be sent. The default value is 9080.
SNMP Port	This is the SNMP Agent's port. The default value is 1610.
UDP Port	The UDP Port for receiving the SNMP messages from devices. The default value is 1620.
Trap IP	Specifies the IP address of Trap Receiver for receiving SNMP trap messages from MN SET.
Trap Port	Specifies a destination port number, on which to send generated traps. The default value is 162.
Submit	Click to apply the configuration parameters.
Enable	Click to enable this north bound interface. See Getting the Array ready for SNMP on page 71.
Disable	Click to disable this north bound interface.

Accessing the Array using the Rest API

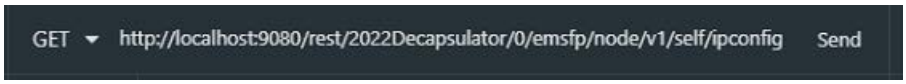
The created array can be accessed through the Rest API. To access the array, use the following URL in a Rest client.

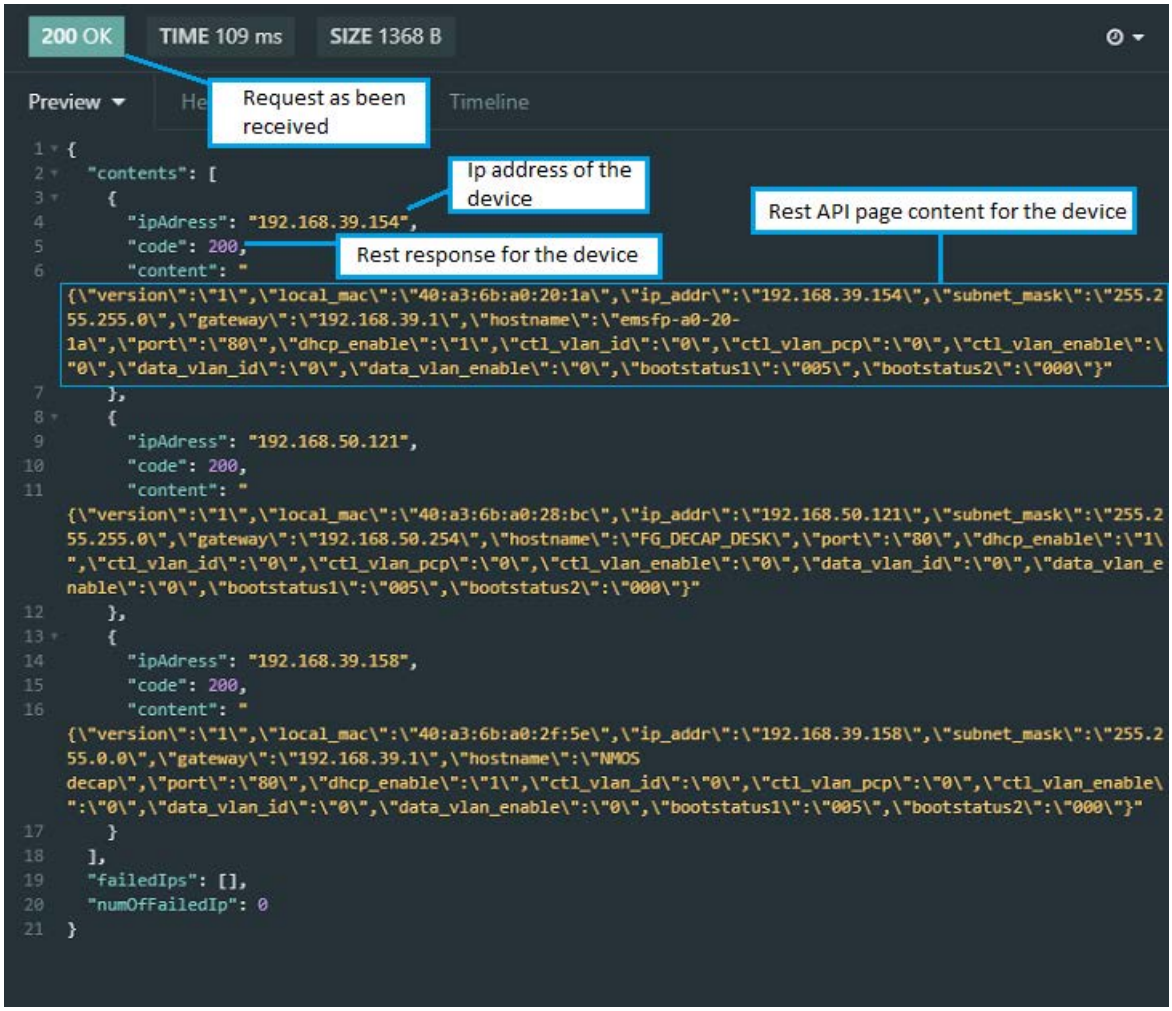
The URL is formatted as follows: `http://localhost:(NBAPI port)/rest/(name of the array)/(index of a device in the array or "0" access all device of the array)/emSFP/node/v1`.

For an example of a URL: `http:///localhost:9080/rest/2022De-encapsulator/0/emsfp/node/v1/self/ipconfig/`

With this command we can receive the IP management information of the devices of the array. The NBAPI supports all the pages from the Rest API of the MuoN SFP's.

Here is an example using the Insomnia REST client. See Related Software on page 13.



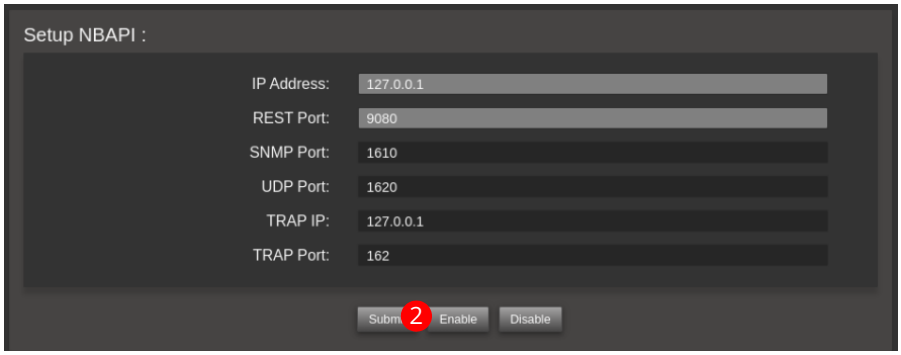


Getting the Array ready for SNMP

A few steps are needed to make an array ready to work with SNMP protocol.

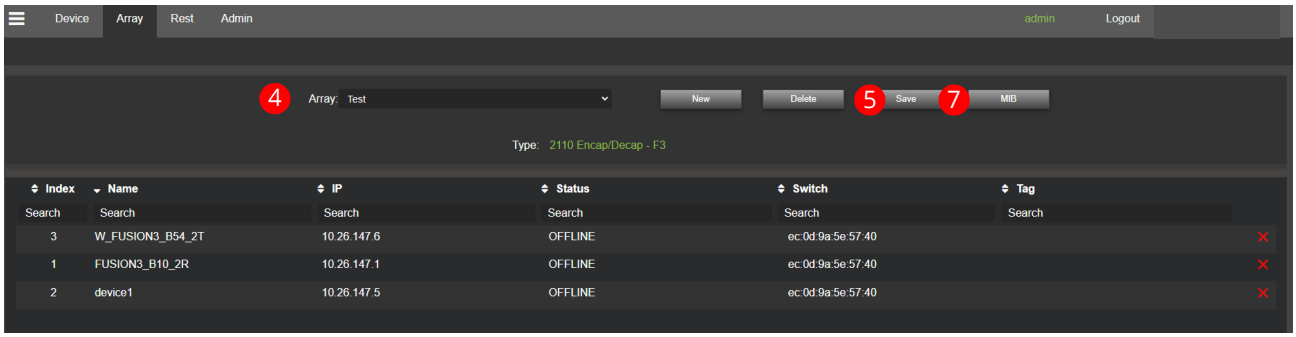
1 Access the **Admin** tab and then the **Setup server** tab. See Main menus on page 28.

2 Start the NBAPI SNMP server. In **Setup NBAPI**, Click **Enable**.



3 You now need to wait at least 5 minutes before exporting the MIB files.

4 Access the **Array** tab in PAN A. See Main menus on page 28.



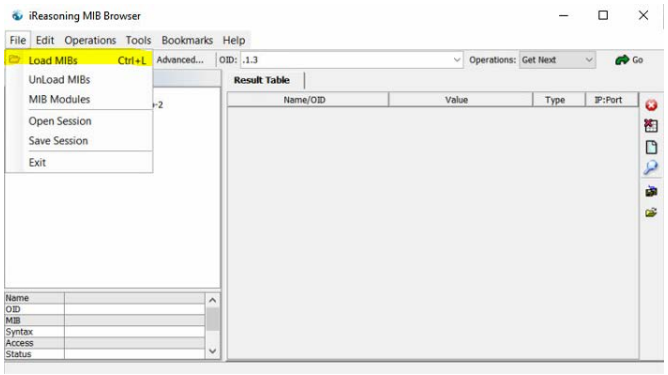
5 Select the array you want to use for SNMP.

6 Make sure the Array is saved correctly. To do so, click **Save**.

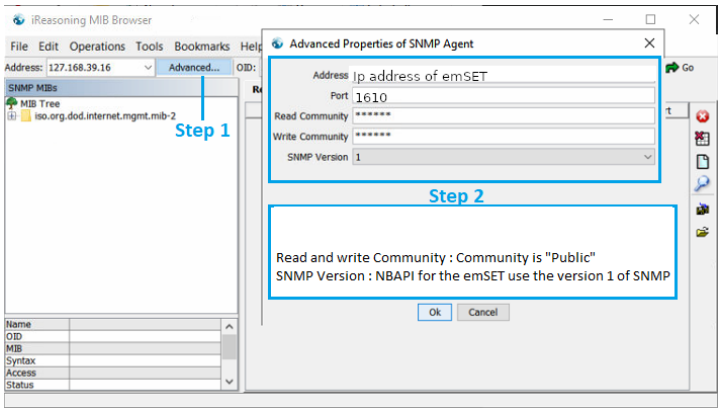
7 When 5 minutes have passed, click **MIB**. A zip file containing the MIB files for all the Arrays is created for download with your browser.

Connecting to the SNMP server

Using your preferred MIB browser, import the MIB files created in MN SET. The screenshots below were taken with iReasoning MIB browser, for reference. See Related Software on page 13. Click on File, Load MIBs then select the MIB files.



Now that the MIBs are loaded, click on “Advanced”. You can now configure the connection to the SNMP server. Type in the address configured for the NBAPI during the MN SET installation in the address field. See Enable / Disable an Array on page 69. The port for the NBAPI is 1610. Community is “Public”, and the SNMP version is 1. Click **OK** to confirm your settings.



Now that the connection configuration is set, you can now access the devices using the MIB browser software of your choice.

RESTful Page

The device's REST API gives you full access to:

- Set advanced configuration and control parameters.
- View all health and monitoring operational parameters.

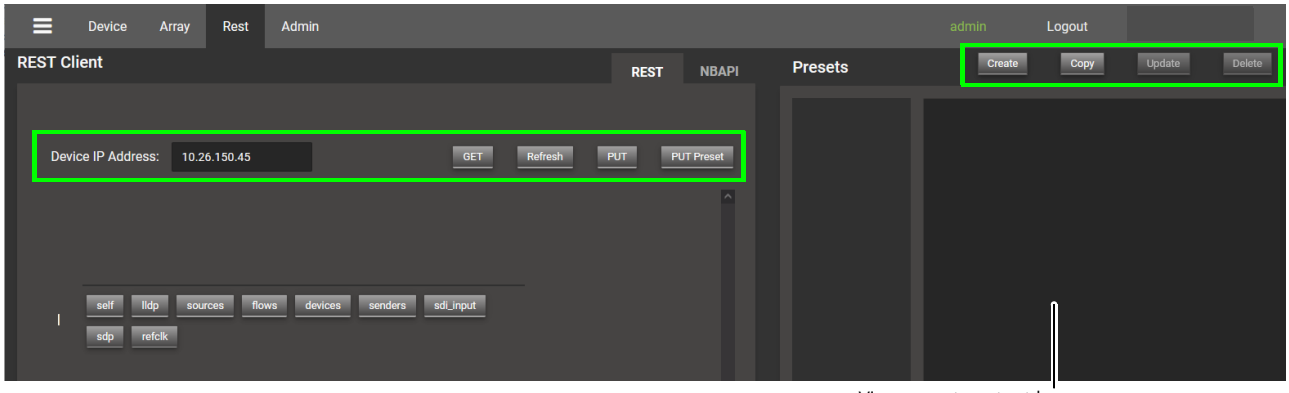
Note that there are no protections against setting erroneous values. Read the REST API documentation for a more detailed explanation of what parameters are available and what range of value settings are supported for a parameter. See Related Documentation on page 13.

Before modifying a device's configuration, make a backup of its configuration for an easy recovery from an invalid configuration. See Backup on page 81.

Access the **Rest** tab in PAN A. See Main menus on page 28.

REST Overview and Functionality

The Rest page is as a full Rest client inside MN SET. You can use this page to make GET and PUT on Rest API pages of your devices and store and send preset commands in a user-friendly environment.

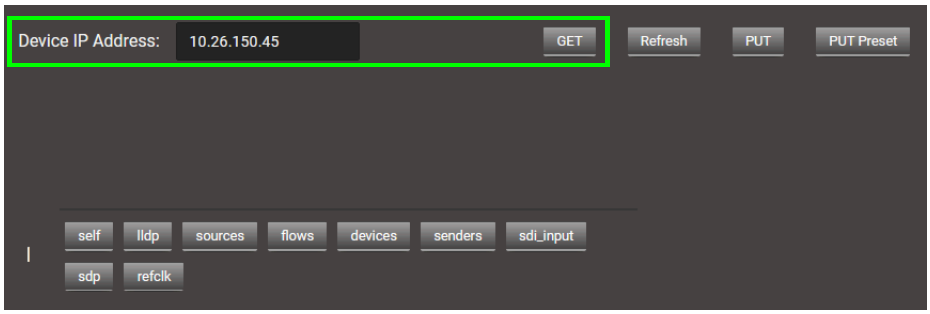


Parameter	Description
Device IP address	Set the IP Address of the device with a REST API to connect to.
GET	REST GET command to view parameters and values. See GET and PUT Commands on page 74.
PUT	REST PUT command to set a value. See GET and PUT Commands on page 74.
PUT Preset	PUT preset content to the device. See Send Preset with PUT Command on page 75.
Create	Create a new preset. See Create Presets on page 75.
Copy	Create a preset from the current REST page. See Create a Preset from a Device's REST Page on page 76.
Update	Update the current preset. See Update a Preset on page 77.
Delete	Delete the current preset. See Delete a Preset on page 78.

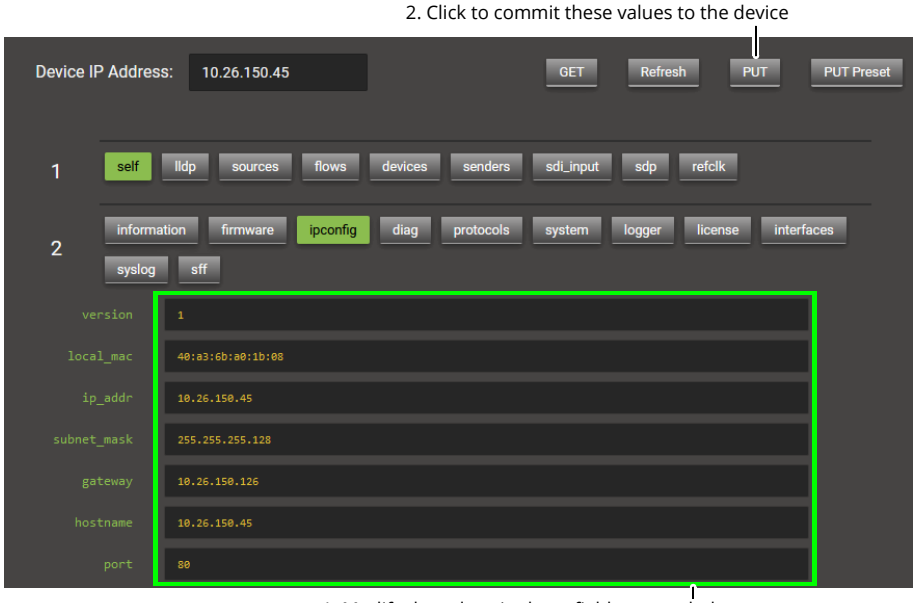
GET and PUT Commands

To get a Rest API page from a device, start by typing the IP address of the device and click on the GET button. You will now see the Rest API tree of the device as button. You can navigate through the Rest API of the MuoN SFP using these buttons.

NOTE The Rest API pages information can be found in the Rest API documentation according to the device type.

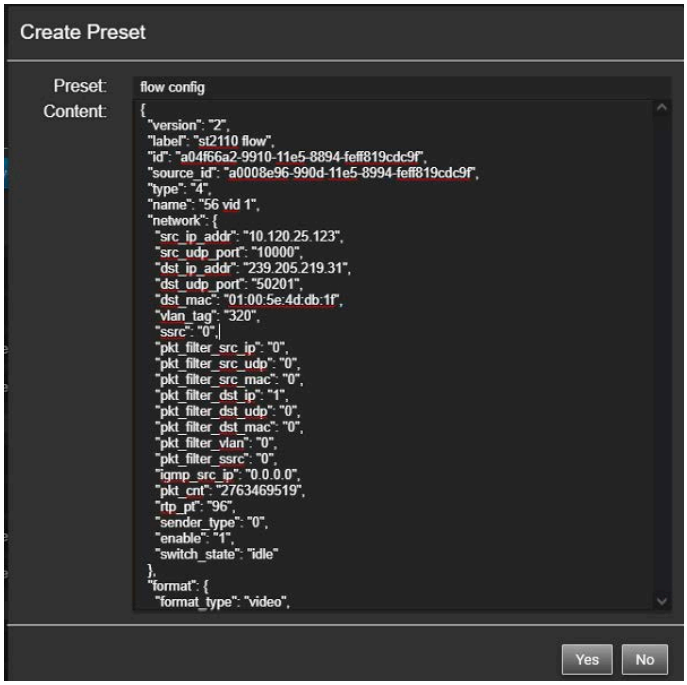


When you select a page with content, the content will be displayed as an editable field. If needed, you can edit a field to configure the device as necessary. After the modification, click **PUT** to send the fields to the device's Rest API page.



Create Presets

MN SET Rest page has a preset feature. This is used to store pre-made json commands and PUT them to devices through Rest. To create a preset, click the create button. From there you can set a name to the preset and enter the json command in the content field. When finished, click **Yes**.



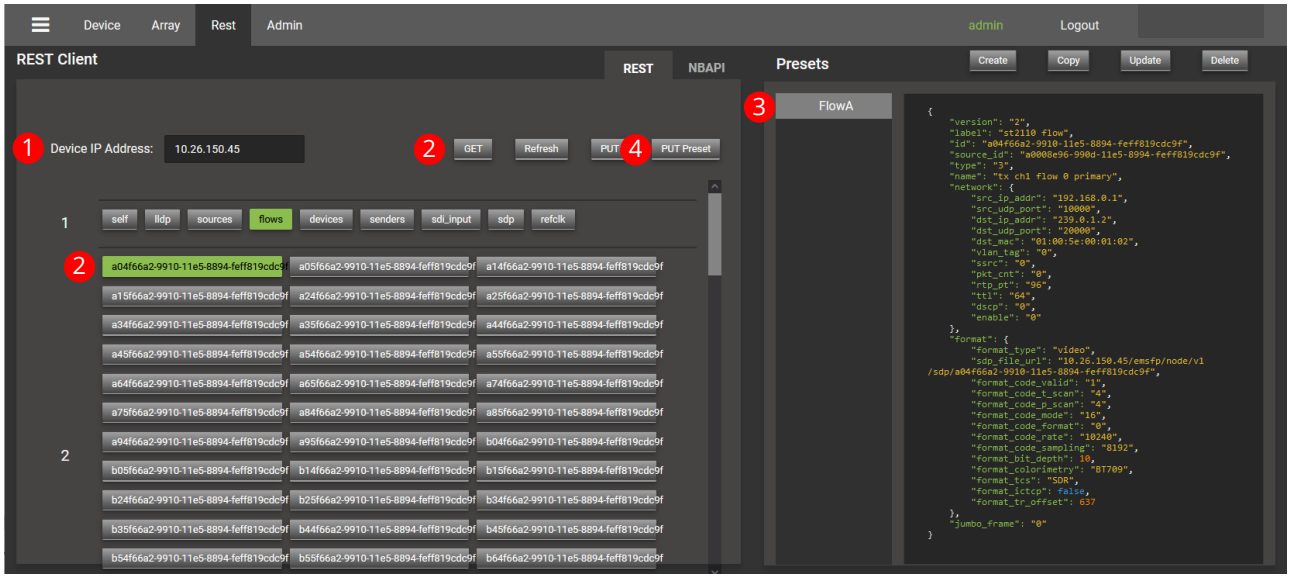
Send Preset with PUT Command

To send a preset to the device, proceed as follows.

1. Enter the device's IP address and press <Enter>.
2. Click **GET** and navigate to the page related to the json command. See REST Overview and Functionality on page 73.
3. Select the preset by clicking on the preset name.

   The preset content should now appear.

4 Click **PUT Preset** to send the preset to the desired Rest API page.



Create a Preset from a Device's REST Page

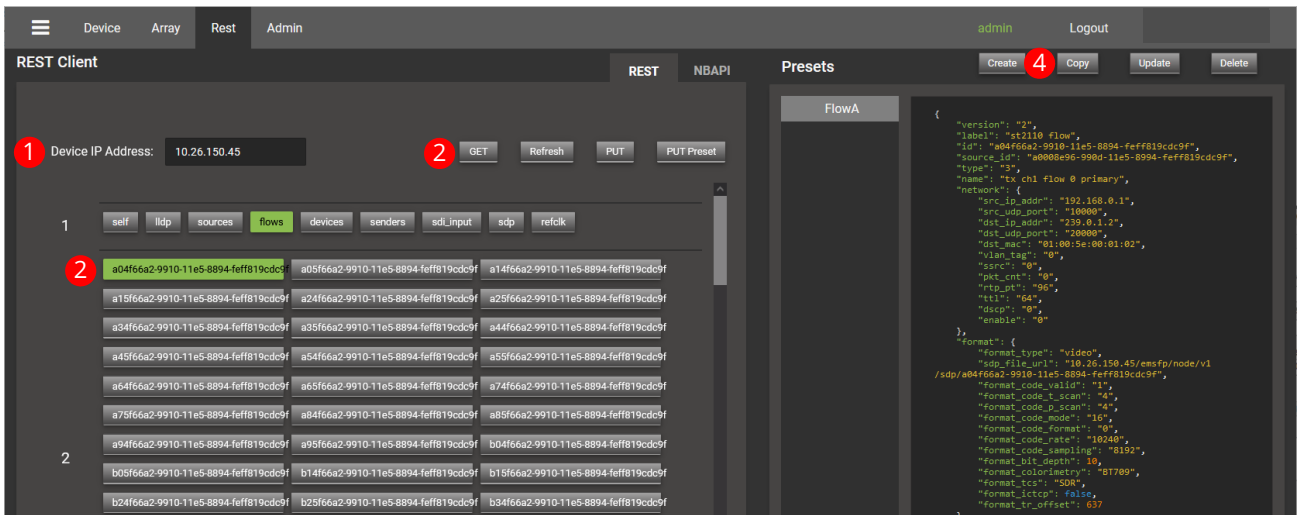
To create a preset from a device's REST page, proceed as follows.

1 Enter the device's IP address and press <Enter>.

2 Click **GET** and navigate to the page related to the json command. See REST Overview and Functionality on page 73

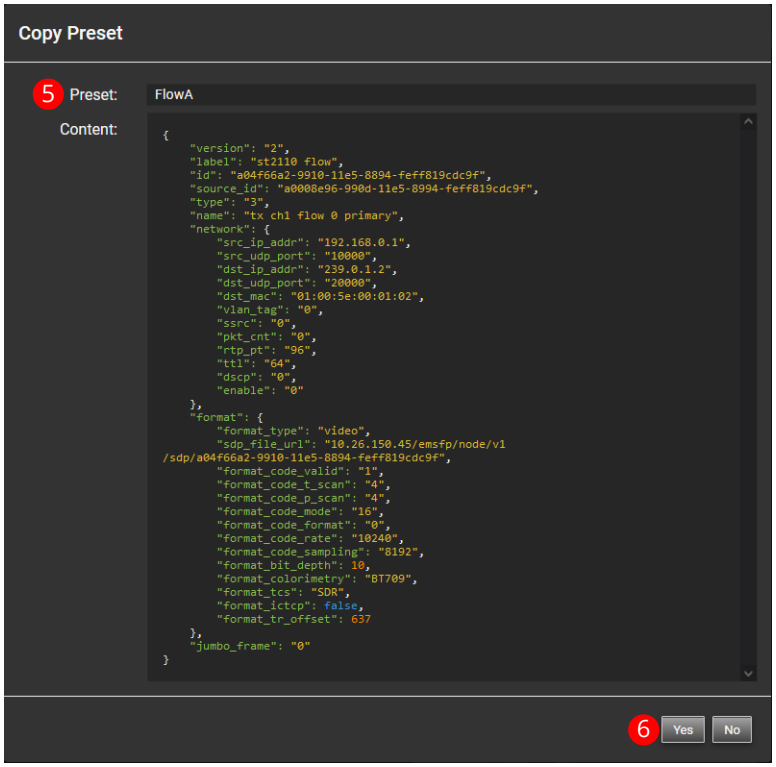
3 If needed, edit the fields as needed. See GET and PUT Commands on page 74.

4 To create the preset, click **Copy**.



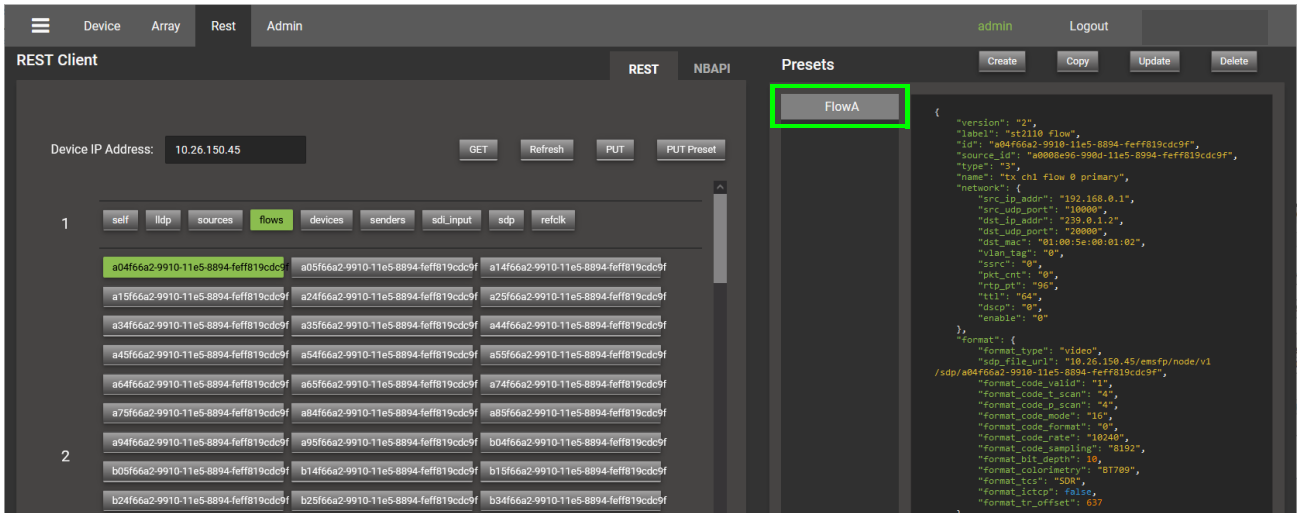
A **Copy Preset** window opens. In the content field, you should see the formatted json command created from the REST API page fields.

5 Enter a name in **Preset**.



6 Click **Yes** to confirm the creation of the preset.

Preset should now appear in the presets list.

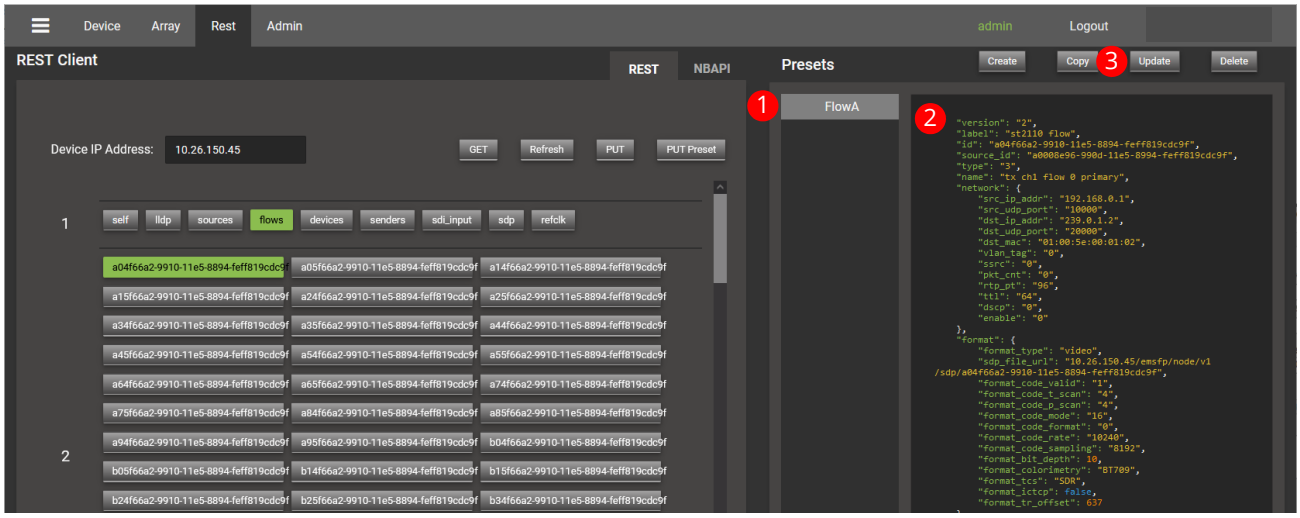


Update a Preset

1 To edit a preset, select a preset.

2 When a preset is selected, you can edit the formatted json content.

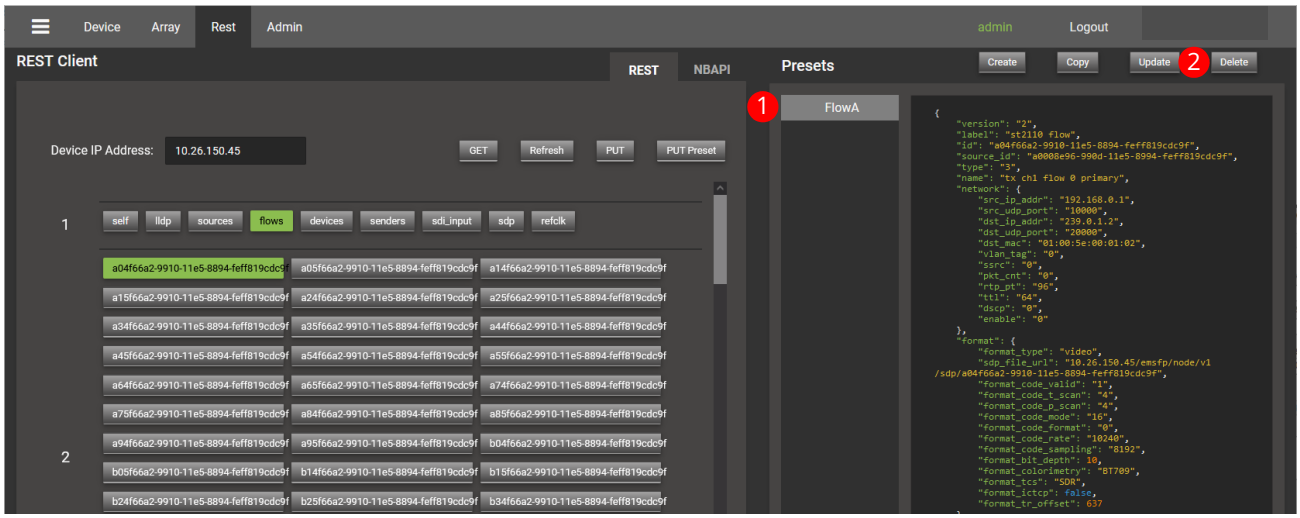
3 When finished, click **Update**.



Delete a Preset

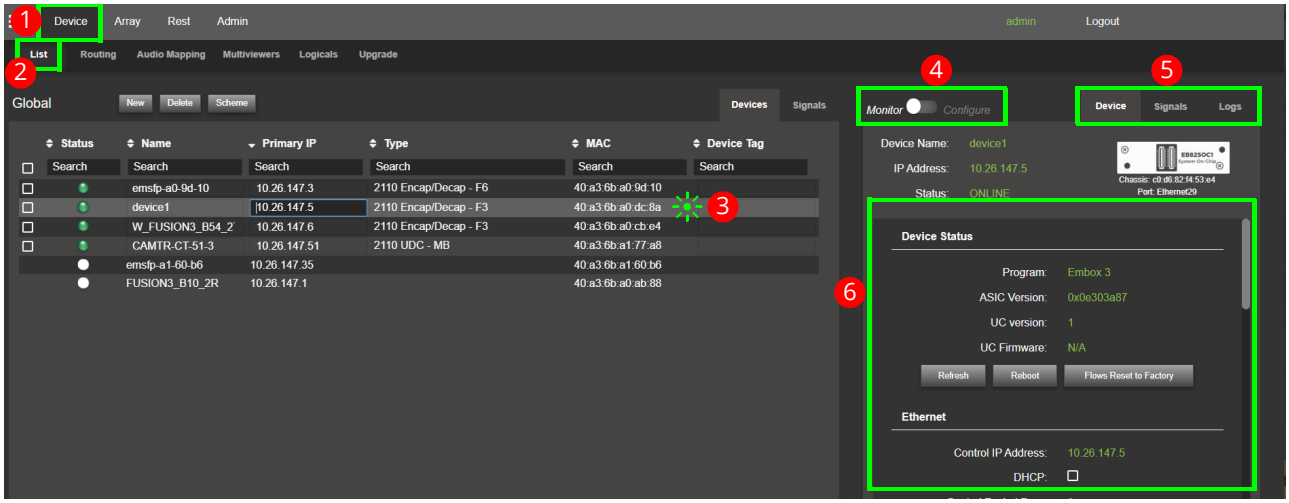
1 To delete a preset, select a preset.

2 When a preset is selected, click **Delete** to delete the preset from the preset list.



Viewing the Device's Operational Status and Parameters

To view a device's current status and operational parameters, follow the steps shown below.



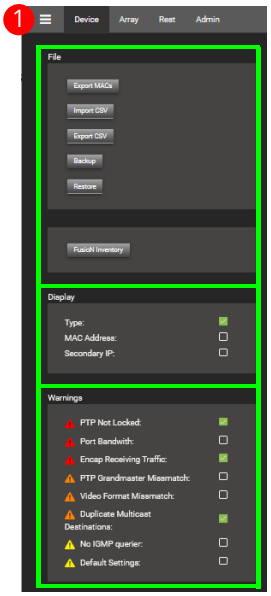
Item	Description
Refresh	MN SET periodically reads the current device parameters in order to refresh the MN SET interface. Click to have MN SET refresh its interface with the selected device's latest parameters immediately.
Reboot	Click to reboot the selected device. **WARNING** You must plan this maintenance procedure to be carried out during off hours as it will cause a service outage.
Flows Reset to Factory	Click to apply the device's factory default network parameters to all of the device's flow settings. **WARNING** You must plan this maintenance procedure to be carried out during off hours as it will cause a service outage.
Show SDP file	First select the SMPTE ST 2110 **Flow** and then hover-over to see the related SDP file content for the selected device. For the SDP file's URL, see **SDP File URL** in Configuring Flows on page 35.

MN SET Side Menu

Access the MN SET Side Menu

To access the MN SET side menu:

1 Click  at the top left corner of MN SET.



Section	See
File	File Side Menu on page 80
Display	Display Side Menu on page 82
Warnings	Warnings Side Menu on page 82

2 To close the MN SET side menu, click  a second time to toggle it closed.

File Side Menu

The file section includes the buttons used for managing MN SET settings and devices files.

Export MACs This is used to export a list of MACs of the currently selected devices. See Exporting your device's MAC Addresses on page 59.

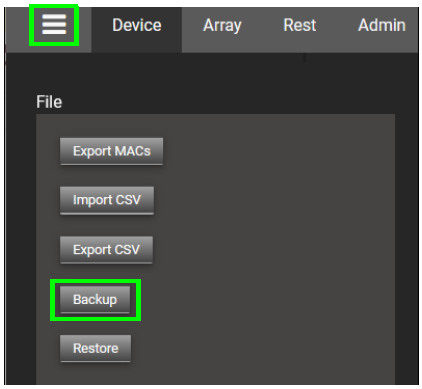
Import CSV This is used to import a device configuration CSV file. The configuration is then applied to the devices. See Import/Export Flow Configuration to a .csv File on page 57.

Export CSV This is used to export a CSV file including the configuration of the flows of the currently selected devices. See Import/Export Flow Configuration to a .csv File on page 57.

Backup

This is used to create a backup of the current settings and devices in MN SET.

1. Click to open the side menu.
2. Click **Backup** to make a backup of the MN SET database.

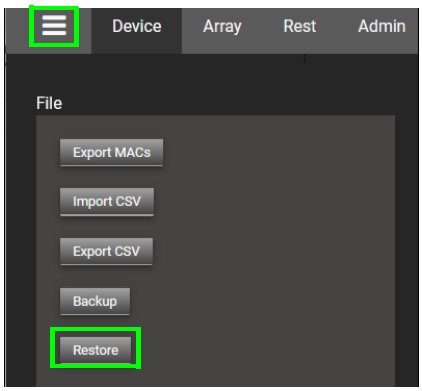


Restore

This is used to restore a backup file to overwrite MN SET's current configuration. This will apply the MN SET settings and devices data included in the backup.

> **WARNING** Only use the Restore feature when MN SET is no longer connected to devices. Restore can cause issues if used while MN SET is connected to devices on the network.

1. Change the discovery range such that there are no devices listed in the **Devices** > **List**.
   - To change the discovery range, see Defining a Discovery Range to Find Networked Devices on page 24.
   - To view the **Devices** > **List** to confirm that it is empty, see Device Tabs in PAN A on page 30.
2. MN SET has not discovered any device (there are no devices listed in the Devices > List).
3. Click to open the side menu.
4. Click **Restore** to import a previously-saved MN SET database backup.



5. Select from your PC's filesystem the MN SET database backup.
6. Change the discovery range such that all of your devices are now listed in the **Devices** > **List**.

Display Side Menu

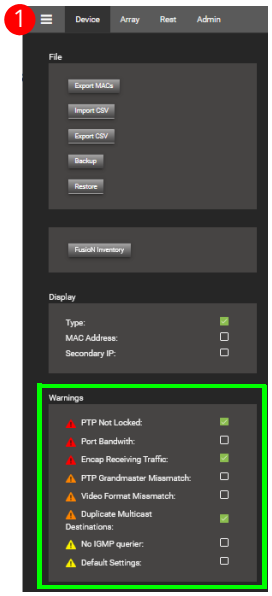
The display section allows you to decide which device information you want to see in the device list. You can set or clear the device type and the MAC address from the side menu.

Warnings Side Menu

As of MN SET version 4.0 or higher, a warning message system has been implemented. This system helps you to quickly see if there is a configuration or system error in your setup. To activate or deactivate a warning, you must first access the side menu by clicking on the button on the top left of the MN SET page.

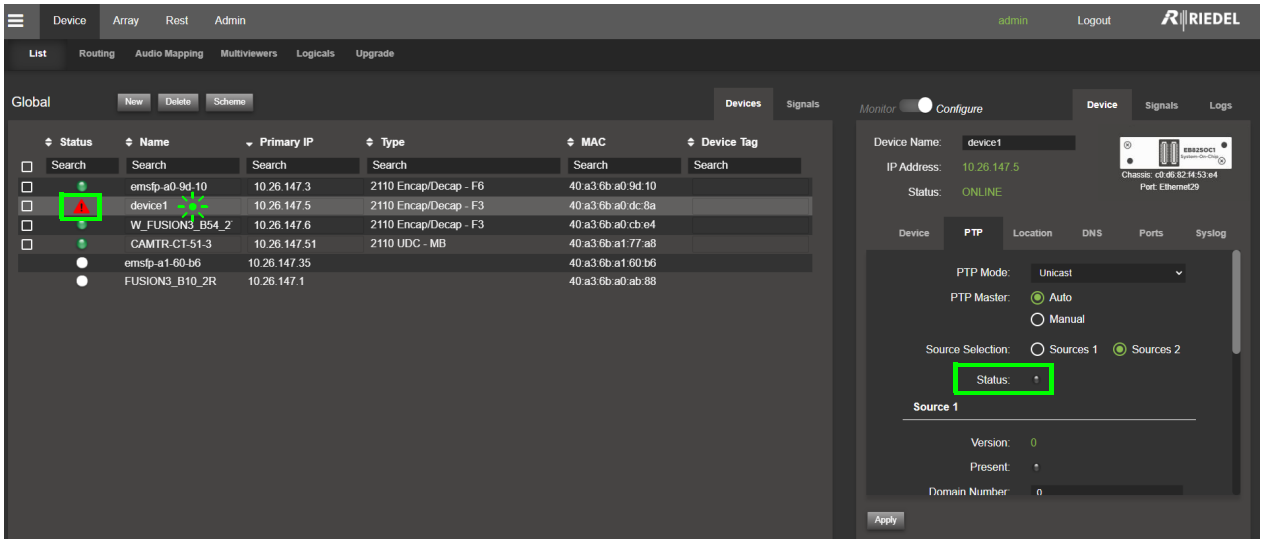
Overview and functionality

From the side menu, use the **Warnings** section to set or clear the warnings you want to make visible in the MN SET.



PTP Not Locked Warning

The *PTP Not Locked warning* will tell you if a device is not locked to PTP (for SMPTE ST 2110 devices only). This is also shown in the device's properties, **PTP** tab. See Configuring PTP on page 40.



Troubleshooting PTP warnings

If you have a PTP not locked warning, first make sure your PTP configuration on the device is correct. Secondly, make sure there is a PTP server on your network and that the port is configured to receive PTP messages.

Port Bandwidth Warning

A *Port Bandwidth* warning on your device warns you that the device's bandwidth is over subscribed. This can be caused by the device receiving too many flows or video signals not supported by the device. This can also be caused by multiple Encapsulators sending video on the default flow configuration if the De-encapsulator is also on the default flow configuration.

Encap Receiving Traffic Warning

This warning is displayed on Encapsulator devices when receiving too much incoming traffic. Since the Encapsulator device is made to send the flows to the switch, an unusual amount of traffic going to the Encapsulator can cause an issue. Verify that the Encapsulator port is configured correctly so no unneeded traffic can reach the device.

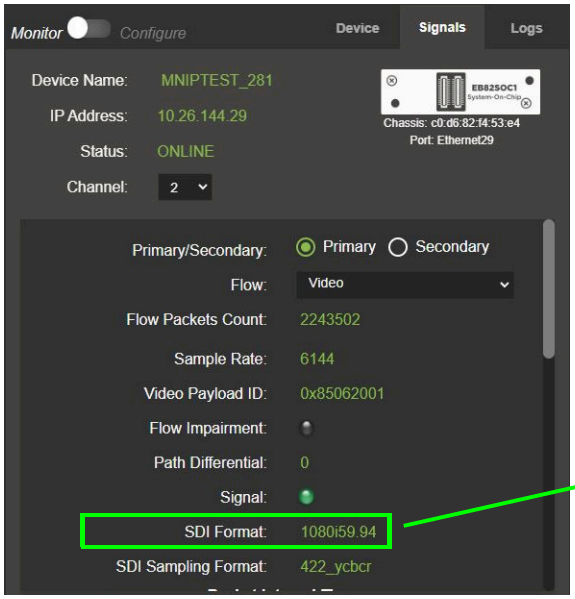
PTP Grandmaster Mismatch

The *PTP Grandmaster Mismatch* warning will tell you when the PTP Grandmaster is different on 2 or more devices that are routed together. If the Grandmaster differs on routed devices, this can cause some glitches in the video because they will not be synchronized on the same clock. Make sure all devices are on the same Grandmaster. See Configuring PTP on page 40.

Video Format Mismatch Warning

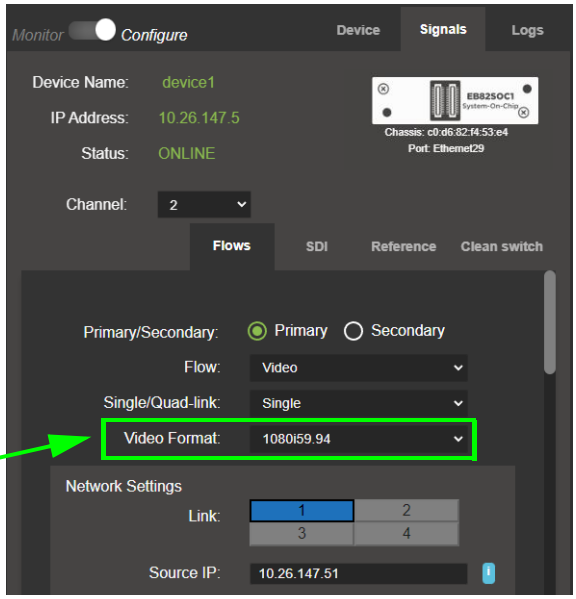
The *Video Format Mismatch* warning will tell you if the format or frame rate is different between routed devices. If you have this warning, make sure to set the video format in the De-encapsulator device flow configuration to be the same as the video format of the source on the Encapsulator device.

Typical view of video format for the Encapsulator



De-encapsulator video format setting must match that of the Encapsulator or source flow

Typical setting of video De-encapsulator format



Duplicate Multicast Destination

This warning indicates that more than one Encapsulator flow is using the same multicast Destination IP. This can cause problems if an De-encapsulator device is routed to the flow because it will receive all the flows that have the same destination IP. This error will only be displayed if the flow has the same VLAN Tag. To configure the flow Destination IP, see Configuring Flows on page 35. On this page, you must configure a new Destination IP for the flow.

No IGMP Querier Warning

This warning is displayed if MN SET detects that the flow is not sent through the switch through an IGMP querier. To make sure all flows are routed correctly through the network, configure IGMP queriers on the switch that hosts the devices.

Default Settings Warning

This warning indicates that an enabled flow on the device is using the default flow destination address. Using the default flow configurations settings can cause issues in a network if more than one Encapsulator is sending flows on the same destination IP causing the De-encapsulator to receive all these flows at the same time making the De-encapsulator bandwidth overflow. It is recommended to configure the Encapsulator flow before connecting the SDI signals on the device. This warning will be displayed for all flow types.

Data Storage

Configuration data Most of the configuration data is stored inside the devices themselves. Some additional information such as tags and device location are stored inside the database located here.

Filesystem Path According to Operating System		
Microsoft Windows	**Linux**	**Description**
`C:\Program Files\Riedel MN SET\data`	`/opt/mnset/data`	Discovery, users and permissions.
`C:\Program Files\Riedel MN SET\logs`	`/opt/mnset/logs`	Contains logging information. These files are very useful for Embrionix support in case you experience issues with the software.
`C:\Program Files\Riedel MN SET`	`/opt/mnset`	Includes the user manual, release notes, .CSV files.

Chapter 3
Technical Support

How to contact Embrionix

If you have any technical support issues, help is available by sending an email to: embrionix-oem.support@riedel.net.

For general inquiries, documentation requests, quote requests, licensing, or sales, send an email to: embrionix_sales@riedel.net.