MULTI-DOMAIN VIDEO NETWORK SWITCH

Application Programming Interface
G4 v4.5.1
(July 2023)

1   Application Programming Interface

1.1   Connection Method

Access the SCC5Net API using a TCP Socket on port 2303. For details on how to configure the system for RS-232 connectivity please refer to *Appendix B* in the *Freeport MDVNS – Admin Guide*.

TLS 1.2 encryption is enabled by default. This can be disable if the room controller does not support TLS 1.2 encryption. Your client TCP Socket will require authentication using the API user "roomcontrol". The default password is "freeporttech". This password should be changed using the SCC5Net configuration interface.

Upon connection the client TCP Socket will receive a login and password prompt.

Login Prompt:

```
login:
Password:
```

Respond with the credentials of the API user "roomcontrol".

Login Success Response:

```
Welcome to MDVNS!
```

Login Failure Response:

```
Login incorrect
```

1.2   Message Format

API commands consist of a command name followed by an argument list. All arguments are separated by commas. Commands are not case sensitive. Responses consist of a return code followed by an argument list, again, separated by commas. The return code will be 0 on success or a positive integer on an error. In the case of an error, the first argument will be a description of the error.

All commands will return a result immediately. However, commands that require a lengthy duration to execute, such as "setNetwork", will also generate events detailing the status of the operation. An event is in the format of the word event, the event name, and an argument list, all separated by commas.

Commands that may be used are:

Command	Function
getStatus	Get MDVNS status
getOperation	Get the current MDVNS operation and network
getNetworks	Get MDVNS networks configuration
getNetwork	Get CODEC's current network
setNetwork	Set CODEC's network
setSignText	Send message to room LED signs
setDefaultSignText	Restore default message for Off Mode
setState	Set system state info for digital signs
getState	Get system state info for digital signs

clearState	Clear system state info for digital signs
setAdminMode	Turn on an SCC in maintenance mode
link	Establish CODEC serial connection
capture	Perform one-time CODEC settings capture
setRelay	Controls individual SCC5Net relays
getVersion	Returns the firmware version

Errors that may be received are:

Error Code	Function
1	Invalid API command
2	Invalid Network ID
4	System State not set
6	System not idle
7	Unknown error for API command
8	Invalid system mode
9	Invalid API argument

Events that may occur are:

Event	Function
switchBegin	Signal network switch has started
switchEnd	Signal network switch has finished
switchError	Signal an error has occurred during a network switch
switchJoin	Signal network switch has left previous network and is now joining new network
linkBegin	Signal serial linking has started
linkEnd	Signal serial linking has finished
linkError	Signal an error has occurred during serial linking
maint	Signal maintenance mode for specified network
heartbeat	Network socket keep-alive
reboot	Signal that the MDVNS web UI sent a reboot command

1.3   Commands

1.3.1   *getStatus*

The getStatus command returns the current state of the MDVNS.

1.3.1.1   *Command*

Command Name	Carriage Return	New Line
getStatus	CR	LF

1.3.1.2   *Response*

If the MDVNS is not switching to a network, then its current state will be **idle**:

Response Code		Status	Carriage Return	New Line
0	,	Idle	CR	LF

If the MDVNS is switching to a network, then its current state will be **switching**:

Response Code		Status	Carriage Return	New Line
0	,	Switching	CR	LF

1.3.1.3   *Example*

To get the MDVNS status send the following packet:

getStatus	CR	LF

The MDVNS will respond with:

0	,	Idle	CR	LF

1.3.2   *getOperation*

The getOpertaion command returns the current system operation and the associated network.

1.3.2.1   *Command*

Command Name	Carriage Return	New Line
getOperation	CR	LF

1.3.2.2   *Response*

If the MDVNS is idle then the current operation bill be **none** and the current network will be returned:

Response Code		Status		Current Network ID	Carriage Return	New Line
0	,	none	,	*Current Network ID*	CR	LF

If the MDVNS is switching to a network, then its current state will be **switching**:

Response Code	Status	Carriage Return	New Line

0	,	Switching	CR	LF

1.3.2.3 Example

To get the MDVNS status send the following packet:

getStatus	CR	LF

The MDVNS will respond with:

0	,	Idle	CR	LF

1.3.3 getNetworks

The getNetworks command returns the list of networks configured in the MDVNS.

1.3.3.1 Command

Command Name	Carriage Return	New Line
getNetworks	CR	LF

1.3.3.2 Response

The response will contain a list of two or more network details. Each network details or separated by commas. The individual details are separated by vertical lines.

Response Code		Network List	Carriage Return	New Line
0	,	*<list of network details>*	CR	LF

If there is an argument (e.g. getNetworks,7), then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

Argument List Format of network details:

Network ID		Network Name		Network Classification
1			<Network 1>			<Classification>

1.3.3.3   Example
To get the list of configured networks on the MDVNS send the following packet:

getNetworks	CR	LF

The MDVNS will respond with:

0	,	1			NET1			Class	,	2			NET2			Unclass	,	3			NET3			Class	CR	LF

1.3.4   getNetwork
The getNetwork command returns the current network that is connected to the CODEC.

1.3.4.1   Command

Command Name	Carriage Return	New Line
getNetwork	CR	LF

1.3.4.2   Response
If the MDVNS status is **idle**, then the current Network ID, 0 through N where N is the number of networks configured in the SCC5Net, will be returned. Network ID 0 represents the Off-Network state:

Response Code		Network ID	Carriage Return	New Line
0	,	0..N	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If there is an argument (e.g. getNetwork,7), then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

1.3.4.3   Example

To get the current network send the following packet:

getNetwork	CR	LF

Assuming the current network is set to Network ID 2 then the MDVNS will respond with:

0	,	2	CR	LF

1.3.5   setNetwork

The setNetwork command tells the MDVNS to configure the CODEC for the indicated network and then to connect the CODEC to that network.

1.3.5.1   Command

Network ID can be set to 0 through N where N is the number of networks configured in the SCC5Net. Network ID 0 represents the Off-Network state:

Command Name		Network ID	Carriage Return	New Line
setNetwork	,	*0..N*	CR	LF

1.3.5.2   Response

If the MDVNS status is **idle** and the Network ID is valid, then a Success response will be returned:

Response Code	Carriage Return	New Line
0	CR	LF

If the Network ID is not valid, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
2	,	Invalid network ID.	CR	LF

If the network has not been correctly configured (e.g. no assigned fiber switch relay), then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
3	,	Network not configured.	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

1.3.5.3 Example

To switch the MDVNS and connect the CODEC to network 2 send the following packet:

setNetwork	,	2	CR	LF

The MDVNS will respond with:

0	CR	LF

1.3.6 setSignText

The setSignText command allows custom sign commands to be sent through the MDVNS system to any attached signs. This command only works while the SCC5Net is in Off network mode.

1.3.6.1 Command

The *Sign Command* argument is formatted according to the proprietary API of the LED sign attached to the MDVNS. The MDVNS will pass the *Sign Command* string through to the sign.

Command Name		Hexidecimal Byte String	Carriage Return	New Line
setSignText	,	*Sign Command*	CR	LF

1.3.6.2 Response

A Success response will be returned:

Response Code	Carriage Return	New Line
0	CR	LF

If there are an odd number of bytes or non-hex character being used, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

1.3.6.3 Example

To set an Alpha sign to a red Secret text send the following packet:

setSignText	,	0000000000015A30300241301B3062171A341C3153656372657404	CR	LF

The MDVNS will respond with:

0	CR	LF

1.3.7 setDefaultSignText

The setDefaultSignText command restores the default Off network mode message to any attached signs. This command only works while the SCC5Net is in Off network mode.

1.3.7.1   Command

Command Name	Hexidecimal Byte String	Carriage Return	New Line
setDefaultSignText	CR	LF	

1.3.7.2   Response

A Success response will be returned:

Response Code	Carriage Return	New Line
0	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If there any arguments passed with the command, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

1.3.7.3   Example

setDefaultSignText	CR	LF

The MDVNS will respond with:

0	CR	LF

1.3.8   setState

The setState command sets the current system state information for display on signs.

1.3.8.1   Command

Command Name		State Name		State Value	Carriage Return	New Line
setState	,	*State Name*	,	*State Value*	CR	LF

1.3.8.2   State Names and Valid Values

CallState: The call state of the room's CODEC.

Valid Values: "Active" or "Inactive"

SpeakerState: The state of the room's speaker system.

Valid Values: "Active" or "Inactive"

MicState: The state of the room's microphones. If even one microphone is active then this should be active.

Valid Values: "Active" or "Inactive"

ContentState: The content sharing state of the room's CODEC.

Valid Values: "Active" or "Inactive"

Classification: The room's classification state

Valid Value: *text data*

ClassificationColor: The color for displaying the Classification.

Valid Values: Any valid CSS color (e.g. "#00FF00", "#0F0", "Green")

ClassificationAnimation: The animation for displaying the Classification.

Valid Values: "None" or "Flash"

1.3.8.3   Response
If the MDVNS status is **idle** then the current state will be set:

Response Code		State Name		Current State	Carriage Return	New Line
0	,	*<State Name>*	,	*<Current State>*	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If there is an invalid argument (e.g. setState,UnknownState,Active), then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

1.3.8.4   Example
To set the current microphone state to inactive (i.e. muted) send the following packet:

setState	,	MicState	,	Inactive	CR	LF

The MDVNS will respond with:

0	,	MicState	,	Inactive	CR	LF

1.3.9   getState
The getState command returns the current system state information which was previously set.

1.3.9.1   Command

Command Name		State Name	Carriage Return	New Line
getState	,	*State Name*	CR	LF

1.3.9.2   State Names and Valid Values

CallState: The call state of the room's CODEC.

Valid Values: "Active" or "Inactive"

SpeakerState: The state of the room's speaker system.

Valid Values: "Active" or "Inactive"

MicState: The state of the room's microphones. If even one microphone is active then this should be active.

Valid Values: "Active" or "Inactive"

ContentState: The content sharing state of the room's CODEC.

Valid Values: "Active" or "Inactive"

Classification: The room's classification state

Valid Value: *text data*

ClassificationColor: The color for displaying the Classification.

Valid Values: Any valid CSS color (e.g. "#00FF00", "#0F0", "Green")

ClassificationAnimation: The animation for displaying the Classification.

Valid Values: "None" or "Flash"

1.3.9.3   Response

If the MDVNS status is **idle** and the requested state was already set then the current state will be returned:

Response Code		State Name		Current State	Carriage Return	New Line
0	,	*<State Name>*	,	*<Current State>*	CR	LF

If the requested state was not already set then an Error response will be returned:

Response Code		State Name		Error Message	Carriage Return	New Line
4	,	*<State Name>*	,	Unknown	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If there is an invalid argument (e.g. getState,UnknownState), then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

1.3.9.4 Example

To get the current microphone state send the following packet:

getState	,	MicState	CR	LF

Assuming the current microphone state is inactive (i.e. muted) then the MDVNS will respond with:

0	,	MicState	,	Inactive	CR	LF

1.3.10 clearState

The clearState command removes the state information from signs.

1.3.10.1 Command

Command Name		State Name	Carriage Return	New Line
clearState	,	*State Name*	CR	LF

1.3.10.2 Response

A Success response will be returned:

Response Code		Command Action		State Name	Carriage Return	New Line
0	,	Cleared	,	*State Name*	CR	LF

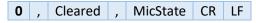If there is an invalid argument (e.g. clearState,UnknownState), then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

1.3.10.3 Example

To remove the microphone status from signs, send the following packet:

clearState	,	MicState	CR	LF

The MDVNS will respond with:

0	,	Cleared	,	MicState	CR	LF

1.3.11 setAdminMode

The setAdminMode command will put the MDVNS into Maintenance mode and power on a single SCC. This allows access to the SCC's configuration web site, log files, and the ability to update SCC firmware. The MDVNS must be switched to Off-Network (Network ID 0) before setAdminMode is called.

1.3.11.1 Command

Sending setAdminMode with network ID 1 through N, where N is the number of networks configured in the SCC5Net, will turn on the respective SCC. Sending network ID 0 will exit Maintenance and ensure any and all SCC's are turned off.

Command Name		Network ID	Carriage Return	New Line
setAdminMode	,	*0..N*	CR	LF

1.3.11.2 Response

If the MDVNS status is **idle**, **Off-Network**, and the Network ID is valid, then a Success response will be returned:

Response Code	Carriage Return	New Line
0	CR	LF

If the Network ID is not valid, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
2	,	Invalid network ID.	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

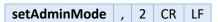| Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If the MDVNS current Network ID is not 0, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
8	,	Invalid system mode.	CR	LF

1.3.11.3 Example

To put the MDVNS into Maintenance Mode and turn on SCC 2 send the following packet:

setAdminMode	,	2	CR	LF

The MDVNS will respond with:

0	CR	LF

1.3.12 link

The link command tells the MDVNS to power on the appropriate SCC for the current network and establish a serial connection with the CODEC. The SCC will handle any required login procedures for the serial connection. The client application should issue the link command when it needs to log into the CODEC while on network, (e.g. after the CODEC is rebooted). This command can only be used while the MDVNS is on network and idle. This command requires generation 4 SCC's with firmware 4.0.2.763 or later.

1.3.12.1 Command

Command Name	Carriage Return	New Line
link	CR	LF

1.3.12.2 Response

If the MDVNS status is **idle** and **On-Network** then a Success response will be returned:

Response Code	Carriage Return	New Line
0	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If the MDVNS current Network ID is 0, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
8	,	Invalid system mode.	CR	LF

1.3.12.3 Example

To establish a serial connection link with the CODEC, send the following packet:

link	CR	LF

The MDVNS will respond with:

0	CR	LF

1.3.13 capture

The capture command must be sent while on network, and the Network ID must match the current network. When leaving the network, the SCC5Net will signal the SCC to capture. If the SCC capture switch is in the auxiliary position, the SCC will perform a capture. If the capture fails or the leave does not occur (e.g. power failure), the capture will not be retried.

1.3.13.1 Command

Network ID can be set to 1 through N where N is the network count configured in the MDVNS Sequencer. Network ID 0 represents the Off-Network state and therefore no CODEC settings will be captured:

Command Name		Network ID	Carriage Return	New Line
setNetwork	,	*1..N*	CR	LF

1.3.13.2 Response

If the MDVNS status is **idle** and **On-Network** and the Network ID matches then a Success response will be returned:

Response Code	Carriage Return	New Line
0	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If the MDVNS current Network ID does not match the Network ID parameter of the Network ID parameter is missing, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
2	,	Invalid network ID.	CR	LF

1.3.13.3 Example

To capture the CODEC settings for network 2 first make sure the SCC5Net is switched to network 2 and the network 2 SCC has its key in the auxiliary position then send the following packet:

capture	,	2	CR	LF

The MDVNS will respond with:

0	CR	LF

1.3.14 setRelay

The setRelay command allows external control of SCC5Net relays. Using the SCC5Net web Configuration tool via the Custom Relays tab API access can be enabled for each relay.

1.3.14.1 Command

The Relay ID parameter is a three digit number with the left most digit specifying the SCC5Net (0 - 4) hosting the relay and the next two digits specifying the relay number (21 – 26). For example Relay ID's

on the primary SCC5Net would be 021, 022, 023, 024, 025, 026, and on the secondary SCC5Net 121, 122, 123, 124, 125, 126. The State Value is either 0 for open/off or 1 for closed/energized.

Command Name		Relay ID		State Value	Carriage Return	New Line
setRelay	,	*Relay ID*	,	*State Value*	CR	LF

1.3.14.2 Response

If the MDVNS status is **idle** and the Relay ID is valid with API access enabled then a Success response will be returned:

Response Code	Carriage Return	New Line
0	CR	LF

If the MDVNS status is **switching**, then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
6	,	System not idle.	CR	LF

If the Relay ID or State Value is missing, the Relay ID is a wrong format, the Relay ID is not enabled for API access, or the State Value is not 0 or 1, then an Error response will be returned:
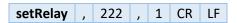
Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

If the Relay ID cannot be set (e.g. the Relay ID is on the secondary SCC5Net and the secondary SCC5Net is not reachable on the network), then an Error response will be returned:

Response Code		Error Message	Carriage Return	New Line
5	,	Operation failed.	CR	LF

1.3.14.3 Example

To close relay 22 on the tertiary SCC5Net, send the following packet:

setRelay	,	222	,	1	CR	LF

The MDVNS will respond with:

0	CR	LF

1.3.15 getVersion

The getVersion command returns the current firmware version of the SCC5Net.

1.3.15.1 Command

Command Name	Carriage Return	New Line
getVersion	CR	LF

1.3.15.2 Response

If the command is correctly formatted then a Success response with the firmware version will be returned:

Response Code		Firmware Version	Carriage Return	New Line
0	,	*Firmware Version*	CR	LF

If any command arguments are provided the MDVNS will return an error response:

Response Code		Error Message	Carriage Return	New Line
9	,	Invalid argument.	CR	LF

1.3.15.3 Example

getVersion	CR	LF

The MDVNS will respond with:

0	,	**4.5.1.3076**	CR	LF

1.4 Events

1.4.1 switchBegin

The switchBegin event is sent when the MDVNS Sequencer starts to switch the CODEC to a new network.

1.4.1.1 Event

The switchBegin Network ID indicates the new network the CODEC is switching to. If the CODEC is being switched to **Off-Network,** then the Network ID will be 0.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	switchBegin	,	*0..9*	CR	LF

1.4.2 switchEnd

The switchEnd event is sent when the MDVNS Sequencer finishes switching the CODEC to a new network. If an error occurred during the switching the switchEnd event is still sent to indicate that the MDVNS is finished switching and is currently in an **idle** status.

1.4.2.1 Event

The switchEnd Network ID indicates the new network the CODEC switched to. If the CODEC was switched to **Off-Network,** then the Network ID will be 0.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	switchEnd	,	*0..9*	CR	LF

1.4.3 switchError

The switchError event is sent when the MDVNS Sequencer encounters any failure that prevents the CODEC from being correctly configured and securely connected to the new network. The switchEnd event is still sent after the switchError event to indicate that the MDVNS is finished switching and is currently in an **idle** status.

1.4.3.1 Event

The switchError Network ID indicates the new network the CODEC was trying to switch to when the error occurred.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	switchError	,	*0..9*	CR	LF

1.4.4 switchJoin

The switchJoin event is sent when the MDVNS Sequencer finishes leaving the previous network and starts to join the CODEC to the new network. This event occurs between the switchBegin and switchEnd events.

1.4.4.1 Event

The switchJoin Network ID indicates the new network the CODEC is switching to. If the CODEC is being switched to **Off-Network,** then the Network ID will be 0.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	switchJoin	,	*0..9*	CR	LF

1.4.5 linkBegin

The linkBegin event is sent when the MDVNS Sequencer starts to link the serial connection between an SCC and the CODEC.

1.4.5.1 Event

The linkBegin Network ID indicates the current network the CODEC is on.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	linkBegin	,	*0..9*	CR	LF

1.4.6 linkEnd

The linkEnd event is sent when the MDVNS Sequencer finishes linking the serial connection to the CODEC. If an error occurred during the linking the linkEnd event is still sent to indicate that the MDVNS is finished linking and is currently in an **idle** status.

1.4.6.1 Event

The linkEnd Network ID indicates the current network the CODEC is on.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	linkEnd	,	*0..9*	CR	LF

1.4.7   linkError

The linkError event is sent when the MDVNS Sequencer encounters any failure that prevents establishing the serial connection to the CODEC. The linkEnd event is still sent after the linkError event to indicate that the MDVNS is finished linking and is currently in an **idle** status. A failure does not activate the System Error routine. If the link procedure fails, the client should switch to **Off-Network**.

1.4.7.1   Event

The linkError Network ID indicates the current network the CODEC is on when the error occurred.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	linkError	,	*0..9*	CR	LF

1.4.8   maint

The maint event is sent when the MDVNS Sequencer is going into maintenance mode.

1.4.8.1   Event

The maint Network ID indicates the SCC that is powering on for maintenance. If maintenance mode is turning off, then the Network ID will be 0.

Event Indicator		Event Name		Network ID	Carriage Return	New Line
Event	,	maint	,	*0..9*	CR	LF

1.4.9   heartbeat

The heartbeat event is used by the MDVNS API to verify that a valid network socket connection still exists. The client application can ignore any heartbeat events.

1.4.9.1   Event

The heartbeat event will be sent every ten minutes to all connected clients. No action is required of the clients.

Event Indicator		Event Name	Carriage Return	New Line
Event	,	heartbeat	CR	LF

1.4.10 reboot

The reboot event is sent when the MDVNS Web UI sends a reboot command.

1.4.10.1 Event

Event Indicator		Event Name	Carriage Return	New Line
Event	,	reboot	CR	LF