



SYNAPSE

Rack-Mount Network Audio Interfaces

3rd Party Control API

1675 MacArthur Boulevard · Costa Mesa, CA 92626
Ph: 800/854-4079 or 714/957-7100 · Fax: 714/754-6174

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1 - Synapse Product Control Overview

All Attero Tech Synapse devices have the ability to be controlled remotely by a 3rd party system. All control is implemented as a simple ASCII based protocol using UDP network control messages.

1.1 - Message Format

The control messages used by the direct UDP command interface have a very simple format. No matter what the device, the format of the message is always the same. The overall format of the message contains only printable ASCII characters so that they can be debugged easily. All commands **are case sensitive**. Each message contains a number of data fields, each separated by a space. The message is then terminated with an ASCII carriage return character (0x0d) represented here by <CR>.

```
<Command> <Parameter1> <Parameter2><CR>
```

Field Name	Description
<Command>	The command that will be given to the device.
<Parameter1>	First optional parameter. See device command tables below for specific details
<Parameter2>	Second optional parameter. See device command tables below for specific details
<CR>	Carriage return character (ASCII character 13)

A typical message would look something like the following:

```
IG 1 25.0<CR>
```

1.2 - Command Responses

Each command sent to a device should return a response. Like the original command, the response only contains printable ASCII characters, each field is separated by a space and the message is terminated carriage return. The general format of a response message is shown below.

```
<ACK> <Command> <Parameter1> <Parameter2><CR>
```

Field Name	Description
<ACK>	Success or failure indication: "ACK" if successful; "NACK" if unsuccessful
<Command>	The original command that was given to the device
<Parameter1>	First optional parameter from the original command message
<Parameter2>	Second optional parameter from the original command message
<CR>	Carriage return character (ASCII character 13)

If the command is successful, the device will return an ACK response. The ACK message for our example message above would be

```
ACK IG 1 25.0<CR>
```

If the command is processed but for some reason unsuccessful, the device will return a NACK response instead of an ACK. Just like the ACK, the original command will also be included in the NACK message.

```
NACK IG 1 25.0<CR>
```

There are cases where the device will not respond to a command at all. This is caused when the device unable to process the message it was sent for some reason. The most typical situation where this could happen is that the terminating <CR> character missing. Alternatively it could mean that the device is currently configured for the wrong command interface.

1.3 – Delivery Method

Commands are sent by placing them in a UDP packet which is sent directly to the IP address of the device being controlled. All direct UDP messages should be sent to port 49494 of the recipient device. Responses to commands will be directed back to the specific IP address and port that the request originated from.

2 - D32i Command Overview

The following commands are available for the Synapse D32i

Description	Command	Parameter 1	Parameter 2
Reset to factory defaults	DEFAULTS	-	-
Version info	VERSION	-	-
Identify device	ID	Mode (0 = off, 1 = on)	-
Find unit	FU	-	-
Retrieve current settings	QUERY	-	-
Get front panel lock	GPL	-	-
Set front panel lock	SPL	Mode (0 = off, 1 = on)	-
Get display timeout	GDT	-	-
Set display timeout	SDT	Seconds	-
Get monitor channel	GMC	-	-
Set monitor channel	SMC	Channel ID (11..132 or 0 for Dante monitor)	-
Get monitor mute	GMM	-	-
Set monitor mute	SMM	Mode (0 = unmuted, 1 = muted)	-
Set monitor volume	GMV	-	-
Get monitor volume	SMV	-60 to 0 dB	-
Get input name	GIN	Card ID (1 = slot A, 2 = slot B)	Channel (1..16)
Get input pad	GPAD	Card ID (1 = slot A, 2 = slot B)	-
Set input pad	SPAD	Card ID (1 = slot A, 2 = slot B)	Mode (0 = off, 1 = on)
Get input mute	GIM	0 or channel ID (1 to 32)	-
Set input mute	SIM	channel ID (1 to 32)	Mode (0 = unmuted, 1 = muted)
		0	Hexadecimal mute mask (0XXXXXXXX)
Get input mutes	GIMS	Card ID (1 = slot A, 2 = slot B)	-
Set input mutes	SIMS	Card ID (1 = slot A, 2 = slot B)	Hexadecimal mute mask (0XXXX)
Get input master mute	GIMM	Card ID (1 = slot A, 2 = slot B)	-
Set input master mute	SIMM	Card ID (1 = slot A, 2 = slot B)	Mode (0 = unmuted, 1 = muted)
Get all metering data	GSM	-	-

2.1 - Defaults Command

***Note:** Using this command restores the device settings to the original factory values removing any user changes. It should be used with caution.

The DEFAULTS command forces the system to return to factory settings.

Front panel unlocked

Display timeout = 30 seconds
All input card pads disabled
All input card mutes are unmuted
Monitor channel set to input 1
Monitor volume = 0dB
Monitor unmuted

**Note: After sending this command there is a delay of several seconds while settings are reset before the response is returned.*

	Example Command	Example Response
“Set” defaults	DEFAULTS<CR>	ACK DEFAULTS<CR>

2.2 - Version Command

Returns the software version. The command takes no parameters.

	Example Command	Example Response
“Get” version	VERSION<CR>	ACK VERSION 1.0<CR>

2.3 - Identify Commands

Used to find a device by displaying “Identifying” on the screen and flashing the devices power/status LED. The Identify command (ID) turns on the identify function and it will remain active until the appropriate identify command is sent to turn it off, or the device is reset or power cycled. The find unit command (FU) activates the identify function but unlike the identify command the find unit function will automatically turn itself off after 5 seconds

	Example Command	Example Response
“Set” identify on	ID 1<CR>	ACK ID 1<CR>
“Set” identify off	ID 0<CR>	ACK ID 0<CR>
“Set” find unit on	FU<CR>	ACK FU<CR>

2.4 - Query Command

A QUERY command allows the control system to get a snapshot of the current state of the device. When a Query command is sent, the response includes all of the devices parameters. The command takes no parameters.

	Example Command	Example Response
“Get” query state	QUERY<CR>	ACK QUERY UNIT=0x01 POST=0x00 ID=OFF

The example response shows the device is configured as follows:

Unit ID (set by DIP switches) - 0x00
POST result - 0x00
ID function - Disabled

2.5 - Panel Lock Command

This command pair sets and retrieves the state of the front panel lock. When the front panel lock is active, the user will not be able to modify the settings for the monitor. When read, the parameter returned is "ON" or "OFF". When writing a value use "1" for on, and "0" for off.

	Example Command	Example Response
“Get” panel lock state	GPL<CR>	ACK GPL OFF<CR>
“Set” panel lock on	SPL 1<CR>	ACK SPL 1<CR>

2.6 - Display Timeout Commands

This command pair sets and retrieves display timeout. If no activity is detected for the specific time on the front panel controls, the screen is turned off which conserves power and prevents burn-in damage. The time value is in seconds and can range from 0 to 3600. A value of 0 turns the display on permanently.

**Note: It is not recommended to leave the display permanently. The screen will suffer permanent burn-in damage as a result if left on for long periods.*

	Example Command	Example Response
“Get” display timeout	GDT<CR>	ACK GDT 60<CR>
“Set” display timeout to 60s	SDT 60<CR>	ACK SDT 60<CR>

2.7 - Monitor Channel Commands

This command pair gets and sets the channel routed to the front panel monitor output. A parameter of I1..I32 selects the input channel being monitored. A parameter of 0 indicates monitoring of the Dante Rx channel. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
“Get” monitor channel	GMC<CR>	ACK GMC 03<CR>
“Set” monitor channel to output 3	SMC 03<CR>	ACK SMC 03<CR>

2.8 - Monitor Mute Commands

This command pair mutes and unmutes the front panel monitor output. When read the parameter returned is "ON" or "OFF". When writing a value uses "1" for on, and "0" for off. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
“Get” monitor mute state	GMM<CR>	ACK GMM OFF<CR>
“Set” monitor mute on	SMM 1<CR>	ACK SMM 1<CR>

2.9 - Monitor Volume Commands

This command pair gets and sets the monitor volume. Valid settings are 0 to -60 dB. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
“Get” monitor volume	GMV<CR>	ACK GMV -12<CR>
“Set” monitor volume to -12dB	SMV -12<CR>	ACK SMV -12<CR>

2.10 - Input Name Command

This command allows the control system to retrieve the Dante name of each input channel as it appears on the Dante network. Commands require parameters for the input bank (1 or 2) and specific channel in that bank (1 - 16).

	Example Command	Example Response
“Get” input name for input 2 bank 8	GIN 2 8<CR>	ACK GIN 2 8 B 1 MIC1<CR>

2.11 - Input Pad Command

This command pair gets and sets the state of the input pad for each bank of inputs. A bank value of "1" or "2" is used to select the bank. When read, the parameter returned is "ON" for pro levels (+4dBu nominal) or "OFF" for consumer levels (-10dBV nominal). When writing a value, use "1" for on or "0" for off.

	Example Command	Example Response
"Get" input pad for bank 1	GPAD 1<CR>	ACK GPAD 1 OFF<CR>
"Set" input pad for bank 2 on	SPAD 2 1<CR>	ACK SPAD 2 1<CR>

2.12 - Input Master Mute Commands

This command pair gets and sets the state of the master mute for each bank of inputs. Commands require the bank to which the command applies ("1" or "2"). When read the parameter returned is "ON" for muted or "OFF" for unmuted. When writing a value use "1" for muted or "0" for unmuted.

	Example Command	Example Response
"Get" mastermute for bank 1	GIMM 1<CR>	ACK GIMM 1 OFF<CR>
"Set" master mute off for bank 2	SIMM 2 0<CR>	ACK SIMM 2 0<CR>

2.13 - Input Mute Commands

These functions allow the control system to both set and retrieve the state of an individual channels mute or all mute states. When dealing with mute for all channels, the channel value is always "0" and the mute states are represented by a 32-bit bitmask in which each bit represents the mute state of an individual input. This state value is hexadecimal and prefixed by "0x" to indicate this. To address an individual channels, use the specific channels number (1..32). When reading, the state returned is "ON" meaning muted or "OFF meaning unmuted". When writing, use a value of "1" for muted or "0" for unmuted.

	Example Command	Example Response
"Get" input mute for all channels	GIM 0	ACK GIM 0 0x00000000<CR>
"Get" input mute for input 12	GIM 12	ACK GIM 12 OFF<CR>
"Set" input mute off for all channels	SIM 0 0x00000000	ACK SIM 0 0x00000000<CR>
"Set" input mute on for input 2	SIM 2 1<CR>	ACK SIM 2 1<CR>

2.14 - Bank Mute Commands

These functions allows the control system to both set and retrieve the state of all mutes in a single bank. The value used is a 4-digit bitmask in which each bit represents the mute state of an individual input. This state value is hexadecimal and prefixed by "0x" to indicate this.

	Example Command	Example Response
"Get" input mute for bank 1	GIMS 1<CR>	ACK GIMS 1 0x0000<CR>
"Set" input mute off for bank 2	SIMS 2 0x0000<CR>	ACK SIMS 2 0x0000<CR>

2.15 - Get Metering Data Command

This command gets all metering data for all Dante channels. The response contains 64 hexadecimal formatted values. Values 1 and 2 represent metering levels for Dante Rx channels 1 and 2. Values 3 through 34 represent metering levels for Dante TX channels 1 through 32. Values 35 through 64 are reserved for future use and contain a value of 0xFD, representing invalid channels.

The metering values are the following:

- 0x00 = Clip
- 0x01 = 0dB
- 0x02 = -0.5dB
- 0x03 = -1dB
- ...
- 0xFC = -125.5dB
- 0xFD = -126dB or invalid channel
- 0xFE = Mute

Note that these values are received directly from the Brooklyn II and represent metering from the Dante perspective. For example, a value of 0xFE (Mute) indicates that the corresponding Dante channel is muted on the Brooklyn II. This does not reflect the MCU's mute state.

	Example Command	Example Response
"Get" Metering Data	GSM<CR>	ACK GSM 0xFE 0xFE ... 0xFD<CR>

3 - D32o Command Overview

The following commands are available for the Synapse D32i

Description	Command	Parameter 1	Parameter 2
Reset to factory defaults	DEFAULTS	-	-
Version info	VERSION	-	-
Identify device	ID	Mode (0 = off, 1 = on)	-
Find unit	FU	-	-
Retrieve current settings	QUERY	-	-
Get front panel lock	GPL	-	-
Set front panel lock	SPL	Mode (0 = off, 1 = on)	-
Get display timeout	GDT	-	-
Set display timeout	SDT	Seconds	-
Get monitor channel	GMC	-	-
Set monitor channel	SMC	Channel ID (01..032 for output channels)	-
Get monitor mute	GMM	-	-
Set monitor mute	SMM	Mode (0 = unmuted, 1 = muted)	-
Set monitor volume	GMV	-	-
Get monitor volume	SMV	-60 to 0 dB	-
Get channel name	GCN	Channel ID (01..032 for output channels)	-
Get output mute	GOM	Channel ID (0, 1 to 32)	-
Set output mute	SOM	0	Hexadecimal mute mask (0XXXXXXXX)
		Channel ID (1 to 32)	Mode (0 = unmuted, 1 = muted)
Get output volumes	GOV	Channel ID (0, 1 to 32)	-
Set output volumes	SOV	Channel ID (1 to 32)	Gain (-100 to 0)
Get output channel mapping	GCPR	Channel ID (1 to 32)	-
Set output channel mapping	SCPR	Channel ID (1 to 32)	Dante input channel (1 to 32)
		0	0
Get metering data	GSM	-	-

3.1 - Defaults Command

**Note: Using this command restores the device settings to the original factory values removing any user changes. It should be used with caution.*

The DEFAULTS command forces the system to return to factory settings.

- Front panel is unlocked
- Display timeout = 30 seconds
- Monitor output = channel 1
- Monitor Volume = 0dB
- Monitor mute = off
- Output volume = 0dB
- Output mutes are unmuted

**Note: After sending this command there is a delay of several seconds while settings are reset before the response is returned.*

	Example Command	Example Response
"Set" defaults	DEFAULTS<CR>	ACK DEFAULTS<CR>

3.2 - Version Command

Returns the software version. The command takes no parameters.

	Example Command	Example Response
"Get" version	VERSION<CR>	ACK VERSION 1.0<CR>

3.3 - Identify Command

Used to find a device by displaying "Identifying" on the screen and flashing the devices power/status LED. The Identify command (ID) turns on the identify function and it will remain active until the appropriate identify command is sent to turn it off, or the device is reset or power cycled. The find unit command (FU) activates the identify function but unlike the identify command the find unit function will automatically turn itself off after 5 seconds

	Example Command	Example Response
"Set" identify on	ID 1<CR>	ACK ID 1<CR>
"Set" identify off	ID 0<CR>	ACK ID 0<CR>
"Set" find unit on	FU<CR>	ACK FU<CR>

3.4 - Query Command

A QUERY command allows the control system to get a snapshot of the current state of the device. When a query command is sent, the response includes all of the devices parameters. The command takes no parameters.

	Example Command	Example Response
“Get” query state	QUERY<CR>	ACK QUERY UNIT=0x01 POST=0x00 ID=OFF

The example response shows the device is configured as follows:

Unit ID (set by DIP switches) - 0x00
POST result - 0x00
ID function - Disabled

3.5 - Panel Lock Commands

This command pair sets and retrieves the state of the front panel lock. When the front panel lock is active, the user will not be able to modify the settings for the monitor. When read the parameter returned is "ON" or "OFF". When writing a value use "1" for on, and "0" for off.

	Example Command	Example Response
“Get” panel lock state	GPL<CR>	ACK GPL OFF<CR>
“Set” panel lock on	SPL 1<CR>	ACK SPL 1<CR>

3.6 - Display Timeout Commands

This command pair sets and retrieves display timeout. If no activity is detected for the specific time on the front panel controls, the screen is turned off which conserves power and prevents burn-in damage. The time value is in seconds and can range from 0 to 3600. A value of 0 turns the display on permanently.

**Note: It is not recommended to leave the display permanently. The screen will suffer permanent burn-in damage as a result if left on for long periods.*

	Example Command	Example Response
“Get” display timeout	GDT<CR>	ACK GDT 60<CR>
“Set” display timeout to 60s	SDT 60<CR>	ACK SDT 60<CR>

3.7 - Monitor Channel Commands

This command pair gets and sets the channel routed to the front panel monitor output. A parameter of 01..032 selects an output channel. This command works regardless of front panel is lock state.

	Example Command	Example Response
“Get” monitor channel	GMC<CR>	ACK GMC 03<CR>
“Set” monitor channel to output 3	SMC 03<CR>	ACK SMC 03<CR>

3.8 - Monitor Mute Commands

This command pair mutes and unmutes the front panel monitor output. When read the parameter returned is "ON" or "OFF". When writing a value use "1" for on, and "0" for off. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
“Get” monitor mute state	GMM<CR>	ACK GMM OFF<CR>
“Set” monitor mute on	SMM 1<CR>	ACK SMM 1<CR>

3.9 - Monitor Volume Commands

This command pair is used to get and set the monitor volume. Valid settings are 0 to -60 dB. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
“Get” monitor volume	GMV<CR>	ACK GMV -12<CR>
“Set” monitor volume to -12dB	SMV -12<CR>	ACK SMV -12<CR>

3.10 - Get Channel Name Command

This command allows the control system to retrieve the Dante RX name of each input channel as it appears on the Dante network. Valid values for channels are 01..032.

	Example Command	Example Response
“Get” name for channel 3	GCN 03<CR>	ACK GCN 03 Lobby<CR>

3.11 - Output Mute Commands

This command pair is used to get and set the output mute status. They can be used either with a single output channel or all channels. When dealing with mute for all channels, the channel value is always 0 and the mute states are always represented by a 32-bit bitmask with each bit representing the mute state of an individual output. This state value is hexadecimal and prefixed by “0x” to indicate this. When dealing with the mute on a single channel, the channel value is the outputs specific channel number (1-32). When reading, the response returns either “ON” for muted or “OFF” for unmuted. When writing, the value sent is either “1” for muted or “0” for unmuted.

	Example Command	Example Response
“Get” mute for all channels	GOM 0<CR>	ACK GOM 0 0xFFFFFFFF<CR>
“Get” mute setting for channel 14	GOM 14<CR>	ACK GOM 14 ON<CR>
“Set” mute for all channels	SOM 0 0xFFFFFFFF0<CR>	ACK SOM 0 0xFFFFFFFF0<CR>
“Set” mute off for channel 12	SOM 12 0<CR>	ACK SOM 12 0<CR>

3.12 - Output Volume Commands

These command pairs get and set the output volume. Individual channel volumes can be read or written. There is also a command to read all output volumes. There is no command to set all output volumes. For a single channel, the command must reference the channel by its number. The volume is written as a string and has a range of 0 to -100 dB (0 represents full volume). When using the Get command for all volumes, the response contains “0” (the channel requested) followed by 32 individual values. Each value is separated with a space.

Example Command	Example Response
-----------------	------------------

“Get” volume for all channels	GOV 0<CR>	ACK GOV 0 -1 -2... -1<CR>
“Get” volume for channel 14	GOV 14<CR>	ACK GOV 14 -20<CR>
“Set” volume -10 for channel 12	SOV 12 -10<CR>	ACK SOV 12 -10<CR>

3.13 - Output Channel Mapping Commands

By default on the D32o, Dante RX channel 1 is routed to output 1, Rx channel 2 to output 2 and so on for all 32 channels. However, this can be changed and these commands, can read the current setup and write new mappings with virtually loss of audio. Each output can only be mapped to a single Dante receive channel.

There is a read command that returns all mappings which requires no parameters. There is also a read for an individual output mapping which requires the specific output mapping required (1-32). There is a write command for an individual mapping which requires an output parameter (1-32) and which the Dante RX channel it will be mapped to (1-32). Finally there is a reset command to return all mappings to the default settings 1 to 1, 2 to 2 and so on.

	Example Command	Example Response
“Get” output map for channel 1	GCPR 1<CR>	ACK GCPR 1 1<CR>
“Set” output map for channel 10	SCPR 10 18<CR>	ACK SCPR 10 18<CR>
“Get” all current mappings	GPCR<CR>	ACK GPCR 1:1 2:2...32:32<CR>
Reset mapping to defaults	SCPR 0 0<CR>	ACK SCPR<CR>

If an output channel is remapped to another position besides its own corresponding default position, its apparent metering data is the same as the metering data for the position it is remapped to.

3.14 - Get Metering Data Command

This command gets all metering data for all Dante channels. The response contains 64 hexadecimal formatted values. Values 1 through 32 represent metering levels for Dante RX channels 1 through 32. Values 33 through 64 are reserved for future use and contain a value of 0xFD, representing invalid channels.

The metering values are the following:

0x00 = Clip

0x01 = 0dB

0x02 = -0.5dB

0x03 = -1dB

...

0xFC = -125.5dB

0xFD = -126dB or invalid channel

0xFE = Mute

Note that these values are received directly from the Brooklyn II and represent metering from the Dante perspective. For example, a value of 0xFE (Mute) indicates that the corresponding Dante channel is muted on the Brooklyn II. This does not reflect the MCU's mute state.

	Example Command	Example Response
"Get" Metering Data	GSM<CR>	ACK GSM 0xFE 0xFE ... 0xFD<CR>

4 - D16Mio Command Overview

The following commands are available for the Synapse D16Mio

Description	Command	Parameter 1	Parameter 2
Reset to factory defaults	DEFAULTS	-	-
Version info	VERSION	-	-
Identify device	ID	Mode (0 = off, 1 = on)	-
Find unit	FU	-	-
Retrieve current settings	QUERY	-	-
Get front panel lock	GPL	-	-
Set front panel lock	SPL	State (0 = off, 1 = on)	-
Get display timeout	GDT	-	-
Set display timeout	SDT	Seconds	-
Get monitor channel	GMC	-	-
Set monitor channel	SMC	Channel ID (11..116 for input channels, 01..016 for output channels)	-
Get monitor mute	GMM	-	-
Set monitor mute	SMM	Mode (0 = unmuted, 1 = muted)	-
Set monitor volume	GMV	-	-
Get monitor volume	SMV	-60 to 0 dB	-
Get channel name	GCN	Channel ID (11..116 for inputs, 01..016 for outputs)	-
Get input pad	GPAD	Channel ID (0, 1 to 16)	-
Set input pad	SPAD	Channel ID (0, 1 to 16)	Hexadecimal mask (0xXXXX) or Mode (0 = Off, 1 = On)
Get phantom power	GPP	Channel ID (0, 1 to 16)	-
Set phantom power	SPP	Channel ID (0, 1 to 16)	Hexadecimal mask (0xXXXX) or Mode (0 = Off, 1 = On)
Get input master mute	GIMM	Card ID (1)	-
Set input master mute	SIMM	Card ID (1)	Mode (0 = unmuted, 1 = muted)
Get input mute	GIM	Channel ID (0, 1 to 16)	-
Set input mute	SIM	Channel ID (0, 1 to 16)	Hexadecimal mask (0xXXXX) or Mode (0 = unmuted, 1 = muted)
Set input mutes	GIMS	1	-
Set input mutes	SIMS	1	Hexadecimal mask (0xXXXX)
Get input gain	GIG	Channel ID (0, 1 to 16)	-
Set input gain	SIG	Channel ID (1 to 16)	Hexadecimal mask (0xXXXX) or Mode (0 = unmuted, 1 = muted)

Get output mute	GOM	Channel ID (0, 1 to 16)	-
Set output mute	SOM	Channel ID (0, 1 to 16)	Hexadecimal mask (0xXXXX) or Mode (0 = unmuted, 1 = muted)
Get output volumes	GOV	Channel ID (0, 1 to 16)	-
Set output volumes	SOV	Channel ID (1 to 16)	Gain (-100 to 0)
Get output channel mapping	GCPR	Channel ID (1 to 16)	-
Set output channel mapping	SCPR	0	0
		Channel ID (1 - 16)	Dante Rx channel (1 - 16)
Get metering data	GSM	-	-
Get output polarity	GOP	Channel ID (0, 1 to 16)	-
Set output polarity	SOP	Channel ID (0, 1 to 16)	Hexadecimal mask (0xXXXX) or Polarity (0 = non-inverted, 1=inverted)
Get Dante device lock	GETDEVICELOCK	-	-

4.1 - Defaults Command

***Note:** Using this command restores the device settings to the original factory values removing any user changes. It should be used with caution.

The DEFAULTS command forces the system to return to factory settings.

- Front panel is unlocked
- Display timeout = 30 seconds
- Input card pads disabled
- Input card mute disabled
- Monitor output = input channel 1
- Monitor Volume = 0dB
- Monitor unmuted
- Phantom power disabled
- Input gains = 0dB
- Output volume = 0dB
- Output mutes disabled
- Polarity non-inverted on all channels

***Note:** After sending this command there is a delay of several seconds while settings are reset before the response is returned.

	Example Command	Example Response
"Set" defaults	DEFAULTS<CR>	ACK DEFAULTS<CR>

4.2 - Version Command

Returns the software version. The command takes no parameters.

	Example Command	Example Response
“Get” version	VERSION<CR>	ACK VERSION 1.0<CR>

4.3 - Identify Command

Used to find a device by displaying “Identifying” on the screen and flashing the devices power/status LED. The Identify command (ID) turns on the identify function and it will remain active until the appropriate identify command is sent to turn it off, or the device is reset or power cycled. The find unit command (FU) activates the identify function but unlike the identify command the find unit function will automatically turn itself off after 5 seconds

	Example Command	Example Response
“Set” identify on	ID 1<CR>	ACK ID 1<CR>
“Set” identify off	ID 0<CR>	ACK ID 0<CR>
“Set” find unit on	FU<CR>	ACK FU<CR>

4.4 - Query Command

A QUERY command allows the control system to get a snapshot of the current state of the device. When a Query command is sent, the response includes all of the devices parameters. The command takes no parameters.

	Example Command	Example Response
“Get” query state	QUERY<CR>	ACK QUERY UNIT=0x01 POST=0x00 ID=OFF

The example response shows the device is configured as follows:

Unit ID (set by DIP switches) - 0x00
POST result - 0x00
ID function - Disabled

4.5 - Panel Lock Commands

This command pair is used to get and set the state of the front panel lock. When the front panel lock is active, the user will not be able to modify the settings for the monitor. When read, the parameter returned is "ON" or "OFF". When writing a value use “1” for on, and “0” for off.

	Example Command	Example Response
“Get” panel lock state	GPL<CR>	ACK GPL OFF<CR>
“Set” panel lock on	SPL 1<CR>	ACK SPL 1<CR>

4.6 - Display Timeout Commands

This command pair is used to get and set the display timeout. If no activity is detected for the specific time on the front panel controls, the screen is turned off which conserves power and prevents burn-in damage. The time value is in seconds and can range from 0 to 3600. A value of 0 turns the display on permanently.

**Note: It is not recommended to leave the display permanently. The screen will suffer permanent burn-in damage as a result if left on for long periods.*

	Example Command	Example Response
“Get” display timeout	GDT<CR>	GDT 60<CR>
“Set” display timeout to 60s	SDT 60<CR>	ACK SDT 60<CR>

4.7 - Monitor Channel Commands

This command pair gets and sets the channel routed to the front panel monitor output. A parameter of I1..I16 selects an input channel while O1..O16 selects an output channel. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
“Get” monitor channel	GMC<CR>	ACK GMC O3<CR>
“Set” monitor channel to output 3	SMC O3<CR>	ACK SMC O3<CR>

4.8 - Monitor Mute Commands

This command pair mutes and unmutes the front panel monitor output. This command works regardless of the state of the front panel lock. When read the parameter returned is "ON" or "OFF". When writing a value use "1" for on, and "0" for off.

	Example Command	Example Response
“Get” monitor mute state	GMM<CR>	ACK GMM OFF<CR>
“Set” monitor mute on	SMM 1<CR>	ACK SMM 1<CR>

4.9 - Monitor Volume Commands

This command pair is used to get and set the monitor volume. Valid settings are 0 to -60 dB. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
“Get” monitor volume	GMV<CR>	ACK GMV -12<CR>
“Set” monitor volume to -12dB	SMV -12<CR>	ACK SMV -12<CR>

4.10 - Get Channel Name Command

This command gets the Dante RX name of a given channel. Valid values are I1..I16 for input channels and O1..O16 for output channels.

	Example Command	Example Response
“Get” name for channel 3	GCN O3<CR>	ACK GCN O3 Lobby<CR>

4.11 - Input Pad Command

This command pair is used to get and set the state of individual input pad for the inputs or all input pad states. When dealing with the input pad for all channels, the channel value is always “0” and the input pad states are represented by a 16-bit bitmask where each bit represents the pad state of an individual input. This state value is hexadecimal and prefixed by “0x” to indicate this. To address individual channels, use the specific channel number (1..16). When reading, the parameter returned is “ON” for pro levels (+4dBu nominal) or “OFF” for consumer levels (-10dBV nominal). When writing a value, use “1” for on, and “0” for off.

	Example Command	Example Response
“Get” input pad for all inputs	GPAD 0<CR>	ACK GPAD 0 0xFFFF<CR>
“Get” input pad for channel 1	GPAD 1<CR>	ACK GPAD 1 OFF<CR>
“Set” input pad for all inputs	SPAD 0 0x0000<CR>	ACK SPAD 0x0000<CR>
“Set” input pad for bank 2 on	SPAD 2 1<CR>	ACK SPAD 2 1<CR>

4.12 - Input Phantom Power Commands

This command pair is used to get and set the phantom power state for each input channel or all channels. When dealing with the phantom power for all input channels, the channel value is always “0” and phantom power states are represented by a 16-bit bitmask where each bit represents the phantom power state of an individual input. This state value is hexadecimal and prefixed by “0x” to indicate this. To address individual channels, use the specific channel number (1..16). When reading, the parameter returned is “ON” or “OFF”. When writing a value use “1” for on, and “0” for off.

	Example Command	Example Response
“Get” phantom power for all inputs	GPP 0<CR>	ACK GPP 0 0xFFFF<CR>
“Get” phantom power for channel 1	GPP 1<CR>	ACK GPP 1 OFF<CR>
“Set” phantom power for all inputs	SPP 0 0x0000<CR>	ACK SPP 0x0000<CR>
“Set” phantom power for channel 16	SPP 16 1<CR>	ACK SPP 16 1<CR>

4.13 - Input Master Mute Commands

This command pair is used to get and set the state of the master mute for all inputs. The D16Mio only has one input card so the only accepted card ID parameter is 1. When read the parameter returned is "ON" or "OFF". When writing a value use "1" for on, and "0" for off.

	Example Command	Example Response
"Get" master mute for bank 1	GIMM 1<CR>	ACK GIMM 1 OFF<CR>
"Set" master mute on for bank 1	SIMM 1 1<CR>	ACK SIMM 1 1<CR>

4.14 - Input Mute Commands

This command pair is used to get and set the state of an individual channels mute or all mute states. When dealing with mute for all channels, the channel value is always "0" and the mute states are represented by a 16-bit bitmask in which each bit represents the mute state of an individual input. This state value is hexadecimal and prefixed by "0x" to indicate this. To address an individual channels, use the specific channels number (1..16). When reading, the state returned is "ON" meaning muted or "OFF meaning unmuted". When writing, use a value of "1" for muted or "0" for unmuted.

	Example Command	Example Response
"Get" input mute for all channels	GIM 0	ACK GIM 0 0x0000<CR>
"Get" input mute for input 12	GIM 12	ACK GIM 12 OFF<CR>
"Set" input mute off for all channels	SIM 0 0x00000000	ACK SIM 0 0x0000<CR>
"Set" input mute on for input 2	SIM 2 1<CR>	ACK SIM 2 1<CR>

4.15 - Bank Mute Commands

This command pair is used to get and set the state of all input mutes in a single bank. The D16Mio only has one input card so the only accepted card ID parameter is 1. The value used is a 4-digit bitmask in which each bit represents the mute state of each individual input. This state value is hexadecimal and prefixed by "0x" to indicate this.

	Example Command	Example Response
"Get" input mute for bank 1	GIMS 1<CR>	ACK GIMS 1 0xFFFF<CR>
"Set" input mute off for bank 1	SIMS 1 0x0000<CR>	ACK SIMS 1 0x0000<CR>

4.16 - Input Gain Commands

This command pair is used to get and set the input gain of the inputs channels. The input channel parameter is 0 for all channels or 1-16 for an individual channel. There is no “write all” input gains command. Use a channel value “0” to read all input gains. When reading all input gain states, the response returns each of the 16 input gains in channel order. All gain parameters range from 0 to 51 is 3dB steps. Any parameter written that is not divisible by three will be NACK’d.

	Example Command	Example Response
“Get” input gain for all channels	GIG 0<CR>	ACK GIG 0 9 9...9<CR>
“Get” input gain for channel 5	GIG 5<CR>	ACK GIG 5 12<CR>
“Set” input gain off for channel 8	SIG 8 21<CR>	ACK SIG 8 21<CR>

4.17 - Output Mute Commands

This command pair is used to get and set the output mute status. They can be used either with a single output channel or all channels. When dealing with mute for all channels, the channel value is always 0 and the mute states are always represented by a 16-bit bitmask with each bit representing the mute state of an individual output. This state value is hexadecimal and prefixed by “0x” to indicate this. When dealing with the mute on a single channel, the channel value is the outputs specific channel number (1-16). When reading, the response returns either “ON” for muted or “OFF” for unmuted. When writing, the value sent is either “1” for muted or “0” for unmuted.

	Example Command	Example Response
“Get” mute for all channels	GOM 0<CR>	ACK GOM 0 0xFFFF<CR>
“Get” mute setting for channel 14	GOM 14<CR>	ACK GOM 14 ON<CR>
“Set” mute for all channels	SOM 0 0xFFFF<CR>	ACK SOM 0 0xFFFF<CR>
“Set” mute off for channel 12	SOM 12 0<CR>	ACK SOM 12 0<CR>

4.18 - Output Volume Commands

This command pair is used to get and set the output volume. Individual channel volumes can be read or written. There is also a command to read all output volumes. There is no command to set all output volumes. Use a channel value “0” to read all output volumes. The response returns each of the 16 output volumes in channel order separated by a space. For a single channel, the command must reference the channel by its number. The volume parameter is a string and has a range of 0 to -100 db (0 represents full volume).

	Example Command	Example Response
“Get” volume for channel 14	GOV 14<CR>	ACK GOV 14 -20<CR>
“Set” volume -10 for channel 12	SOV 12 -10<CR>	ACK SOV 12 -10<CR>
“Get” volume for all channels	GOV 0<CR>	ACK GOV 0 -1 -2... -1<CR>

4.19 - Output Channel Mapping Commands

By default on the D16Mio, Dante RX channel 1 is routed to output 1, Rx channel 2 to output 2 and so on for all 16 Dante receive channels. However, this can be changed and these commands, can read the current setup and write new mappings with virtually loss of audio. Each output can only be mapped to a single Dante receive channel.

There is a read command that returns all mappings which requires no parameters. There is also a read for an individual output mapping which requires the specific output mapping required (1-16). There is a write command for an individual mapping which requires an output parameter (1-16) and which the Dante RX channel it will be mapped to (1-16). Finally there is a reset command to return all mappings to the default settings 1 to 1, 2 to 2 and so on.

	Example Command	Example Response
“Get” output map for channel 1	GPCR 1<CR>	ACK GPCR 1 1<CR>
“Set” output map for channel 10	SCPR 10 18<CR>	ACK SCPR 10 18<CR>
“Get” all current mappings	GPCR<CR>	ACK GPCR 1:1 2:2...16:16<CR>
Reset mapping to defaults	SCPR 0 0<CR>	ACK SCPR<CR>

If an output channel is remapped to another position besides its own corresponding default position, its apparent metering data is the same as the metering data for the position it is remapped to.

4.20 - Get Metering Data Command

This command gets all metering data for all Dante channels. The response contains 64 hexadecimal formatted values. Values 1 through 16 represent metering levels for Dante RX channels 1 through 16. Values 17 through 32 represent metering levels for Dante TX channels 1 through 16. Values 33 through 64 are reserved for future use and contain a value of 0xFD, representing invalid channels.

The metering values are the following:

0x00 = Clip

0x01 = 0dB

0x02 = -0.5dB

0x03 = -1dB

...

0xFC = -125.5dB

0xFD = -126dB or invalid channel

0xFE = Mute

Note that these values are received directly from the Brooklyn II and represent metering from the Dante perspective. For example, a value of 0xFE (Mute) indicates that the corresponding Dante channel is muted on the Brooklyn II. This does not reflect the MCU’s mute state.

	Example Command	Example Response
“Get” Metering Data	GSM<CR>	ACK GSM 0xFE 0xFE ... 0xFD<CR>

4.21 - Output Polarity Commands

This command pair is used to get and set the polarity reversal of the output channels. An inverted output provides a 180 degree polarity reversal to accommodate mis-wirings in connected analog audio cabling. Individual channel polarities can be read or written. The polarity parameter is either a 0 or 1”, where 0=non-inverted and 1=inverted. There is also a form of these commands that allow operations on all output polarity states in one go. The form of these commands uses a single hexadecimal bit-mask value to represent the state of every input where bit 0 of the value represents the polarity state on output 1 and bit 15 represents the polarity state on output 16.

	Example Command	Example Response
“Get” polarity for CH 14	GOP 14<CR>	ACK GOP 14 -20<CR>

"Get" polarity for all channels	GOP 0<CR>	ACK GOP 0 0x0000<CR>
"Set" inverted polarity for CH 12	SOP 12 1<CR>	ACK SOP 12 1<CR>
"Set" polarity off for all channels	SOP 0 0x0000<CR>	ACK SOP 0 0x0000<CR>

4.22 - Device Lock Commands

This command pair is used to get state of the Dante Device Lock. There are three possible returned states:

LOCKED - Dante lock enabled

UNLOCKED - Dante lock disabled

UNKNOWN - Could not retrieve device lock (Dante lock feature not supported on device)

	Example Command	Example Response
Get Dante Device Lock	GETDEVICELOCK<CR>	ACK GETDEVICELOCK LOCKED<CR>

5 - D32Mi Command Overview

The following commands are available for the Synapse D32Mi

Description	Command	Parameter 1	Parameter 2
Reset to factory defaults	DEFAULTS	-	-
Version info	VERSION	-	-
Identify device	ID	Mode (0 = off, 1 = on)	-
Find unit	FU	-	-
Retrieve current settings	QUERY	-	-
Get front panel lock	GPL	-	-
Set front panel lock	SPL	Mode (0 = off, 1 = on)	-
Get display timeout	GDT	-	-
Set display timeout	SDT	Seconds	-
Get monitor channel	GMC	-	-
Set monitor channel	SMC	Channel ID (11..132 or 0 for Dante monitor)	-
Get monitor mute	GMM	-	-
Set monitor mute	SMM	Mode (0 = unmuted, 1 = muted)	-
Set monitor volume	GMV	-	-
Get monitor volume	SMV	-60 to 0 dB	-
Get channel name	GCN	Channel ID 11..132	-
Get input pad	GPAD	Channel ID (0, 1 to 32)	-
Set input pad	SPAD	Channel ID (0, 1 to 32)	Mode (0 = Off, 1 = On)
Get phantom power	GPP	Channel ID (0, 1 to 32)	-
Set phantom power	SPP	Channel ID (0, 1 to 32)	Hexadecimal mask (0xFFFFFFFF) or Mode (0 = Off, 1 = On)
Get input mute	GIM	Channel ID (0, 1 to 32)	-
Set input mute	SIM	Channel ID (0, 1 to 32)	Hexadecimal mask (0xFFFFFFFF) or Mode (0 = unmuted, 1 = muted)
Set input mutes	GIMS	Card ID (1 or 2)	-
Set input mutes	SIMS	Card ID (1 or 2)	Hexadecimal mask (0xFFFFFFFF)
Get input gain	GIG	Channel ID (0, 1 to 32)	-
Set input gain	SIG	Channel ID (1 to 32)	Gain (0 to 51 db,in 3dB steps)
Get metering data	GSM	-	-

5.1 - Defaults Command

***Note:** Using this command restores the device settings to the original factory values removing any user changes. It should be used with caution.

The DEFAULTS command forces the system to return to factory settings.

- Front panel is unlocked
- Display timeout = 30 seconds
- Input card pads disabled
- Input mutes disabled
- Phantom power disabled
- Input gains = 0dB
- Monitor output = input channel 1
- Monitor Volume = 0dB
- Monitor unmuted

**Note: After sending this command there is a delay of several seconds while settings are reset before the response is returned.*

	Example Command	Example Response
“Set” defaults	DEFAULTS<CR>	ACK DEFAULTS<CR>

5.2 - Version Command

Returns the support CPU firmware version and the FPGA firmware version. The command takes no parameters.

	Example Command	Example Response
“Get” version	VERSION<CR>	ACK VERSION 1.0 2.2<CR>

5.3 - Identify Command

Used to find a device by displaying “Identifying” on the screen and flashing the devices power/status LED. The Identify command (ID) turns on the identify function and it will remain active until the appropriate identify command is sent to turn it off, or the device is reset or power cycled. The find unit command (FU) activates the identify function but unlike the identify command the find unit function will automatically turn itself off after 5 seconds

	Example Command	Example Response
“Set” identify on	ID 1<CR>	ACK ID 1<CR>
“Set” identify off	ID 0<CR>	ACK ID 0<CR>
“Set” find unit on	FU<CR>	ACK FU<CR>

5.4 - Query Command

A QUERY command allows the control system to get a snapshot of the current state of the device. When a Query command is sent, the response includes all of the devices parameters. The command takes no parameters.

	Example Command	Example Response
“Get” query state	QUERY<CR>	ACK QUERY UNIT=0x01 POST=0x00 ID=OFF

The example response shows the device is configured as follows:

- Unit ID (set by DIP switches) - 0x00
- POST result (0 means OK) - 0x00
- ID function - Disabled

5.5 - Panel Lock Commands

This command pair is used to get and set the state of the front panel lock. When the front panel lock is active, the user will not be able to modify the settings for the monitor. When read, the parameter returned is "ON" or "OFF". When writing a value use "1" for on, and "0" for off.

	Example Command	Example Response
"Get" panel lock state	GPL<CR>	ACK GPL OFF<CR>
"Set" panel lock on	SPL 1<CR>	ACK SPL 1<CR>

5.6 - Display Timeout Commands

This command pair is used to get and set the display timeout. If no activity is detected for the specific time on the front panel controls, the screen is turned off which conserves power and prevents burn-in damage. The time value is in seconds and can range from 0 to 3600. A value of 0 turns the display on permanently.

**Note: It is not recommended to leave the display permanently. The screen will suffer permanent burn-in damage as a result if left on for long periods.*

	Example Command	Example Response
"Get" display timeout	GDT<CR>	GDT 60<CR>
"Set" display timeout to 60s	SDT 60<CR>	ACK SDT 60<CR>

5.7 - Monitor Channel Commands

This command pair gets and sets the channel routed to the front panel monitor output. The parameter of I1..I32 indicates a specific input channel. This command works regardless of the state of the front panel lock.

	Example Command	Example Response
"Get" monitor channel	GMC<CR>	ACK GMC I3<CR>
"Set" monitor channel to output 3	SMC I3<CR>	ACK SMC I3<CR>

5.8 - Monitor Mute Commands

This command pair mutes and unmutes the front panel monitor output. This command works regardless of the state of the front panel lock. When read the parameter returned is "ON" or "OFF". When writing a value use "1" for on, and "0" for off.

	Example Command	Example Response
"Get" monitor mute state	GMM<CR>	ACK GMM OFF<CR>
"Set" monitor mute on	SMM 1<CR>	ACK SMM 1<CR>

5.9 - Monitor Volume Commands

This command pair is used to get and set the monitor volume. Valid settings are 0 to -60 dB. This command works regardless of the state of the front panel lock.

Example Command	Example Response
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“Get” monitor volume	GMV<CR>	ACK GMV -12<CR>
“Set” monitor volume to -12dB	SMV -12<CR>	ACK SMV -12<CR>

5.10 - Get Channel Name Command

This command gets the Dante TX name of a given channel. Valid values are 11..132.

	Example Command	Example Response
“Get” name for channel 3	GCN I3<CR>	ACK GCN I3 Lobby<CR>

5.11 - Input Pad Command

This command pair is used to get and set the state of individual input pad for the inputs or all input pad states. When dealing with the input pad for all channels, the channel value is always “0” and the input pad states are represented by a 32-bit bitmask where each bit represents the pad state of an individual input. This state value is hexadecimal and prefixed by “0x” to indicate this. To address individual channels, use the specific channel number (1..32). When reading, the parameter returned is “ON” for pro levels (+4dBu nominal) or “OFF” for consumer levels (-10dBV nominal). When writing a value, use “1” for on, and “0” for off.

	Example Command	Example Response
“Get” input pad for all inputs	GPAD 0<CR>	ACK GPAD 0 0xFFFFFFFF<CR>
“Get” input pad for channel 1	GPAD 1<CR>	ACK GPAD 1 OFF<CR>
“Set” input pad for all inputs	SPAD 0 0x00000000<CR>	ACK SPAD 0x00000000<CR>
“Set” input pad for bank 2 on	SPAD 2 1<CR>	ACK SPAD 2 1<CR>

5.12 - Input Phantom Power Commands

This command pair is used to get and set the phantom power state for each input channel or all channels. When dealing with the phantom power for all input channels, the channel value is always “0” and phantom power states are represented by a 32-bit bitmask where each bit represents the phantom power state of an individual input. This state value is hexadecimal and prefixed by “0x” to indicate this. To address individual channels, use the specific channel number (1..32). When reading, the parameter returned is “ON” or “OFF”. When writing a value use “1” for on, and “0” for off.

	Example Command	Example Response
“Get” phantom power for all inputs	GPP 0<CR>	ACK GPP 0 0xFFFFFFFF<CR>
“Get” phantom power for channel 1	GPP 1<CR>	ACK GPP 1 OFF<CR>
“Set” phantom power for all inputs	SPP 0 0x00000000<CR>	ACK SPP 0x00000000<CR>
“Set” phantom power for channel 10	SPP 10 1<CR>	ACK SPP 10 1<CR>

5.13 - Input Mute Commands

This command pair is used to get and set the state of an individual channels mute or all mute states. When dealing with mute for all channels, the channel value is always “0” and the mute states are represented by a 32-bit bitmask in which each bit represents the mute state of an individual input. This state value is hexadecimal and prefixed by “0x” to indicate this. To address an individual

channels, use the specific channels number (1..32). When reading, the state returned is "ON" meaning muted or "OFF meaning unmuted". When writing, use a value of "1" for muted or "0" for unmuted.

	Example Command	Example Response
"Get" input mute for all channels	GIM 0	ACK GIM 0 0xFFFFFFFF<CR>
"Get" input mute for input 12	GIM 12	ACK GIM 12 OFF<CR>
"Set" input mute off for all channels	SIM 0 0x00000000	ACK SIM 0 0x00000000<CR>
"Set" input mute on for input 2	SIM 2 1<CR>	ACK SIM 2 1<CR>

5.14 - Bank Mute Commands

This command pair is used to get and set the state of all input mutes on a particular input card. The D32Mi has two input cards so the card ID parameter is 1 (for inputs 1 through 16) or 2 (for inputs 17 through 32). The value used is a 4-digit bitmask in which each bit represents the mute state of each individual input. This state value is hexadecimal and prefixed by "0x" to indicate this.

	Example Command	Example Response
"Get" input mute for bank 1	GIMS 1<CR>	ACK GIMS 1 0xFFFF<CR>
"Set" input mute off for bank 1	SIMS 1 0x0000<CR>	ACK SIMS 1 0x0000<CR>

5.15 - Input Gain Commands

This command pair is used to get and set the input gain of the input channels. The input channel parameter is 0 for all channels or 1-32 for an individual channel. There is no “write all” input gains command. Use a channel value “0” to read all input gains. When reading all input gain states, the response returns each of the 32 input gains in channel order. All gain parameters range from 0 to 51 is 3dB steps. Any parameter written that is not divisible by three will be NACK’d.

	Example Command	Example Response
“Get” input gain for all channels	GIG 0<CR>	ACK GIG 0 9 9...9<CR>
“Get” input gain for channel 5	GIG 5<CR>	ACK GIG 5 12<CR>
“Set” input gain off for channel 8	SIG 8 21<CR>	ACK SIG 8 21<CR>

5.16 - Get Metering Data Command

This command gets all metering data for all Dante channels. The response contains 64 hexadecimal formatted values. Values 1 and 2 represent metering level for the Dante RX channels 1 and 2. Values 3 through 34 represent metering levels for Dante TX channels 1 through 32. Values 35 through 64 are reserved for future use and contain a value of 0xFD, representing invalid channels.

The metering values are the following:

- 0x00 = Clip
- 0x01 = 0dB
- 0x02 = -0.5dB
- 0x03 = -1dB
- ...
- 0xFC = -125.5dB
- 0xFD = -126dB or invalid channel
- 0xFE = Mute

Note that these values are received directly from the Brooklyn II and represent metering from the Dante perspective. For example, a value of 0xFE (Mute) indicates that the corresponding Dante channel is muted on the Brooklyn II. This does not reflect the MCU’s mute state.

	Example Command	Example Response
“Get” Metering Data	GSM<CR>	ACK GSM 0xFE 0xFE ... 0xFD<CR>