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*Bose EX-1280C Gain Sharing Automatic Mic Mixer  
V1.0 Module Application Guide*

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## Description

This module allows 2-way control of the Gain Sharing Automatic Mixer object in the Bose EX-1280C. Output Volume, AMM Settings, and Mic Controls (up to 32 mics) are provided.

## Supported Processors

This module may be used with any 2-Series or 3-Series Crestron processor with Ethernet or Serial port capable of 115,200 baud.

## Communication setup

This module is intended to be used with the Bose\_EX-1280C\_Communication\_Manager\_v1. Please see the Communication Manager for communications setup.

## Module Setup and Unsolicited Changes

Each ControlSpace Designer object contains a Label property. This Label is used in the Crestron Module parameter to control that object. The Label for any object can be found by opening the properties for that object in ControlSpace Designer. When entering the label into the Crestron Module, you must surround the label in quotes. Additionally the label must be an exact match to the Label in ControlSpace Designer.

The recommended practice is to prefix the label with # in both ControlSpace Designer and in the Crestron Module to enable unsolicited feedback when the object's values change. If the label is not prefixed with a #, it will limit the functionality of the Crestron Modules. When prefixing a label with #, you must surround the label with quotes in SIMPL.

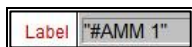


Image 1: Example Label Parameter in SIMPL Windows

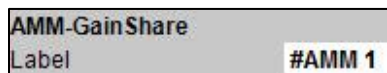


Image 2: Example Label Property in ControlSpace Designer

## Inputs, Outputs, and Parameter Descriptions

### Digital Inputs

|                         |   |
|-------------------------|---|
| [output_volume_up]      | Pulse or latch high this input to raise the output volume level. Pulsing the input will increment the level as defined in the <b>Step Size</b> parameter. Latching high will increment the level as defined in the <b>Step Size</b> parameter and then start auto incrementing every .25 seconds thereafter until the signal is low or has reached the <b>Output Volume Upper Limit</b> . |
| [output_volume_down]    | Pulse or latch high this input to lower the output volume level. Pulsing the input will increment the level as defined in the <b>Step Size</b> parameter. Latching high will increment the level as defined in the <b>Step Size</b> parameter and then start auto incrementing every .25 seconds thereafter until the signal is low or has reached the <b>Output Volume Lower Limit</b> . |
| [output_mute_on]        | Pulse to mute the output volume.  |
| [output_mute_off]       | Pulse to unmute the output volume.  |
| [amm_bypass_all_on]     | Pulse to bypass all mics.   |
| [amm_bypass_all_off]    | Pulse to un-bypass all mics.  |
| [amm_bypass_all_toggle] | Pulse to toggle bypass all mics.  |
| [micx_volume_up]        | Pulse or latch high this input to raise the mics volume level. Pulsing the input will increment the level as defined in the <b>Step Size</b> parameter. Latching high will increment the level as defined in the <b>Step Size</b> parameter and then start auto incrementing every .25 seconds thereafter until the signal is low or has reached the <b>Mic Volume Upper Limit</b> .      |
| [micx_volume down]      | Pulse or latch high this input to lower the mics volume level. Pulsing the input will increment the level as defined in the <b>Step Size</b> parameter. Latching high will increment the level as defined in the <b>Step Size</b> parameter and then start auto incrementing every .25 seconds thereafter until the signal is low or has reached the <b>Mic Volume Lower Limit</b> .      |
| [micx_mute_on]          | Pulse to mute the Mic.  |
| [micx_mute_off]         | Pulse to unmute the Mic.  |
| [micx_mute_toggle]      | Pulse to toggle mic mute.   |
| [micx_bypass_on]        | Pulse to force the channel to be open at all times, bypassing the automatic mixer gating circuit.   |
| [micx_bypass_off]       | Pulse to enable the automatic mixer gating circuit for the Mic.   |
| [micx_bypass_toggle]    | Pulse to toggle bypass for the mic.   |
| [request_settings]      | Pulse to query all values for the Gain Sharing Mic Mixer.   |

### Analog Inputs

|                         |  |
|-------------------------|--|
| [output_volume_set(dB)] | Analog input to set the output volume to specific level. Valid ranges are -605d to +120d in tenths of a db. Half steps are only valid, thus the tenths digit may only be 0d or 5d. Example: 65d = 6.5 dB and -340d = -34.0 dB Use with an analog initialize symbol. Range is -605d to 120d in 0.5 dB increments. |
| [amm_slope]             | Initialize to a slope value. Valid ranges are 0-200 in hundredths of a step.   |
| [amm_attack_time]       | Initialize to an attack time. Valid ranges are 0-1000 in tenths. Half steps are only valid, thus the tenths digit may only be 0d or 5d. Example: 65d = 6.5 ms and 340d = 34.0 ms Use with an analog initialize symbol.   |
| [amm_decay_time]        | Initialize to a decay time whole number. Valid ranges are 5d-50000d. Use with an analog initialize symbol.   |

|                               |  |
|-------------------------------|--|
| [amm_input_rms_average_time]  | Initialize to an RMS average time. Valid ranges are 1-5000 in tenths of a ms. Example: 61d = 6.1 ms and 340d = 34.0 ms Use with an analog initialize symbol.   |
| [amm_output_rms_average_time] | Initialize to an RMS average time. Valid ranges are 1-5000 in tenths of a ms. Example: 61d = 6.1 ms and -340d = -34.0 ms Use with an analog initialize symbol.   |
| [micx_volume_set(dB)]         | Analog input to set the incoming volume to specific level. Valid ranges are -605d to +120d in tenths of a db. Half steps are only valid, thus the tenths digit may only be 0d or 5d. Example: 65d = 6.5 dB and -340d = -34.0 dB Use with an analog initialize symbol. Range is -605d to 120d in 0.5 dB increments. |
|                               |  |

### Serial Inputs

|                                |   |
|--------------------------------|---|
| from_communications_manager \$ | Tie to Bose EX-1280C Communications manager output. |
|--------------------------------|---|

### Digital Outputs

|                      |   |
|----------------------|---|
| [output_mute_on_fb]  | High when the output volume is muted.           |
| [output_mute_off_fb] | High when the output volume is unmuted.         |
| [amm_bypass_on_fb]   | High when the AMM Bypass is on.                 |
| [amm_bypass_off_fb]  | High when the AMM Bypass is off.                |
| [micx_mute_on_fb]    | High when the mic is muted.                     |
| [micx_mute_off_fb]   | High when the mic is not muted.                 |
| [micx_bypass_on_fb]  | High when the mic is bypassed from the AMM.     |
| [micx_bypass_off_fb] | High when the mic is not bypassed from the AMM. |

### Analog Outputs

|                                      |  |
|--------------------------------------|--|
| [amm_slope_fb(ms)]                   | Analog output indicating the AMM slope in tenths of a step.  |
| [amm_attack_fb(ms)]                  | Analog output indicating the AMM attack time in tenths of a ms.  |
| [amm_hold_time_fb(ms)]               | Analog output indicating the AMM hold time in tenths of a ms.  |
| [amm_decay_time_whole_fb(ms)]        | Analog output indicating the AMM decay time whole numbers.   |
| [amm_decay_time_tenths_fb(ms)]       | Analog output indicating the AMM decay time tenths number.   |
| [amm_input_rms_average_time_fb(ms)]  | Analog output indicating the AMM input RMS average time in tenths.   |
| [amm_output_rms_average_time_fb(ms)] | Analog output indicating the AMM input RMS output time in tenths.  |
| [micx_volume_fb(dB)]                 | Analog output indicating the incoming call volume level in dB<br>Range is -605d to 120d in 0.5 dB increments.  |
| [micx_volume_fb_(0%-100%)]           | Analog output indicating the incoming call volume level in percent.<br>Output values are calculated with the <b>Mic Volume Upper Limit</b> and <b>Mic Volume Lower Limit</b> . |
| [micx_priority_fb(1-5)]              | Analog output indicating the mics priority in the AMM. Range is 1-5.   |

### Serial Outputs

|                             |   |
|-----------------------------|---|
| to_communications_manager\$ | Tie to Bose EX-1280C Communications manager output. |
|-----------------------------|---|

### Paramaters

|                           |  |
|---------------------------|--|
| Label                     | Enter in the Label of the AMM object as defined in ControlSpace Designer properties. This parameter must be enclosed in quotes. Use a # before the label name in both ControlSpace Designer and the module to enable unsolicited feedback. |
| Number of Mics            | Enter the number of Mics that are being used on the AMM object. This number enables the corresponding digital inputs and outputs, and controls polling for the mics being used. .  |
| Step Size                 | Select a step size to increment the volume by when holding a volume up or down digital input. Available step sizes range from 0.5dB to 6.0dB in 0.5dB increments.  |
| Output Volume Lower Limit | Set the output volume upper limit. This input is used to limit the user's ability to raise the volume past a certain value. Range is -605d to 120d in 0.5 dB increments. Example: 65d = 6.5 dB and -340d = -34.0 dB                        |
| Output Volume Upper Limit | Set the output volume lower limit. This input is used to limit the user's ability to lower the volume past a certain value. Range is -605d to 120d in 0.5 dB increments. Example: 65d = 6.5 dB and -340d = -34.0 dB                        |
| Mic Volume Lower Limit    | Set the mic volume upper limit. This input is used to limit the user's ability to raise the volume past a certain value. Range is -605d to 120d in 0.5 dB increments. Example: 65d = 6.5 dB and -340d = -34.0 dB                           |
| Mic Volume Upper Limit    | Set the mic volume lower limit. This input is used to limit the user's ability to lower the volume past a certain value. Range is -605d to 120d in 0.5 dB increments Example: 65d = 6.5 dB and -340d = -34.0 dB                            |

## Testing Environment

|                       |                   |
|-----------------------|-------------------|
| EX-1280C              | v0.201_build4     |
| EX-8ML                | v1.000            |
| ControlSpace Designer | v5.0.0.805        |
| Crestron AV3          | v1.501.2867.26681 |
| SIMPL Windows         | 4.07.03           |
| Device Database       | 86.05.003.00      |
| Crestron Database     | 63.06.002.00      |

## Distribution Files

|   |   |
|---|---|
| Bose_EX-1280C_Gain_Sharing_Automatic_Mic_Mixer_v1.0.umc | User module containing the Virtual GPI logic. |
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## Revision History

V1.0 – Initial Release