



# MRX x40 Installation and Usage Guide

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## Overview

The Anthem MRX Crestron module allows for IP and RS-232 control over the Anthem MRX-x40 range of A/V receivers as well as the AVM90. This module provides control and feedback for all of the commonly used functions of the Anthem MDX range. The module provides full control over the main zone and zone 2 with feedback for all main functions.

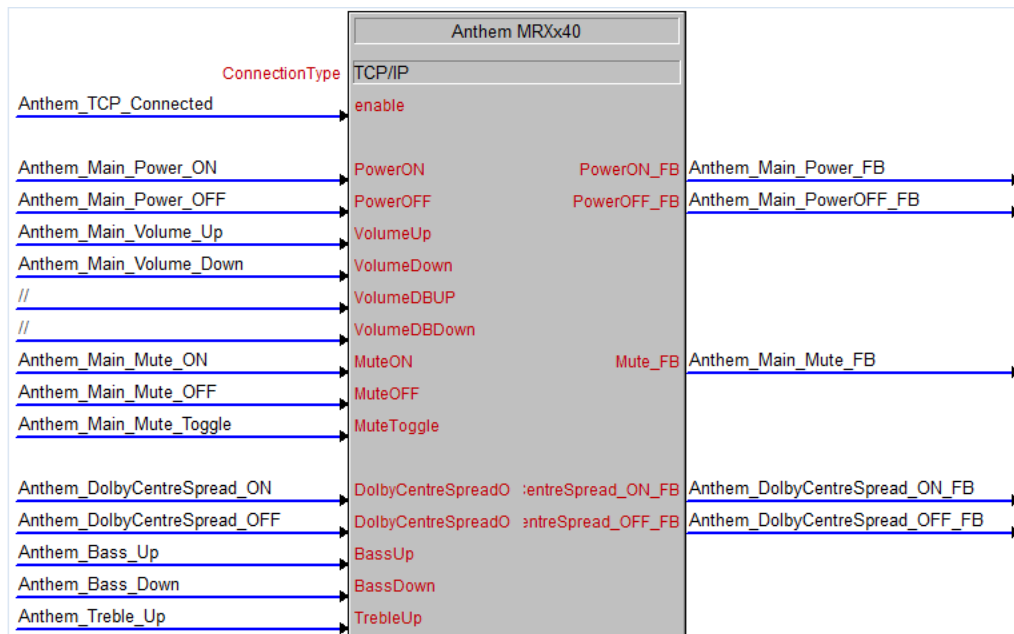
Anthem's award-winning Third Generation MRX Series of high-end multi-channel A/V receivers are known the world over for their excellent sound quality, efficient power handling, and the ease with which they integrate into an entertainment system. The MRX Series is packed with exclusive audio innovations like Anthem Room Correction (ARC) Technology and Advanced Load Monitoring (ALM) Technology, 4K Pass-Through with fast HDMI switching and more.



## Installation

The zip file that included this documentation has the simpl# (.clz file) and simpl+ (.usp file) module that needs to be copied in to your project folder. The files were built and tested on a Crestron 3-series processor, but have been compiled with 4-series support.

The zip file also contains a SIMPL project and a VT-Pro touchscreen design that you can use for testing. The device is configured using IP but it also supports RS-232. You will need to adjust the configuration of this connection to suit your local configuration.

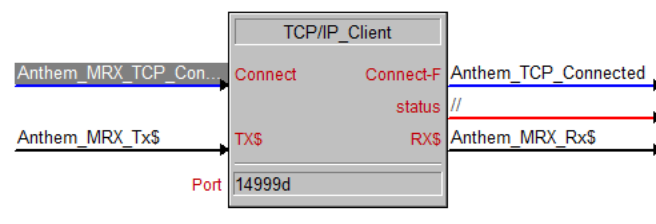


## Module Configuration

This module can be configured to communicate over IP or RS-232. Both are detailed below. One thing to note is that the Receiver has a warm up period (shown on the front display) during which commands will not be correctly processed by the receiver. It is best practice to delay sending new commands until the receiver has fully powered on (this can take up to 10 seconds).

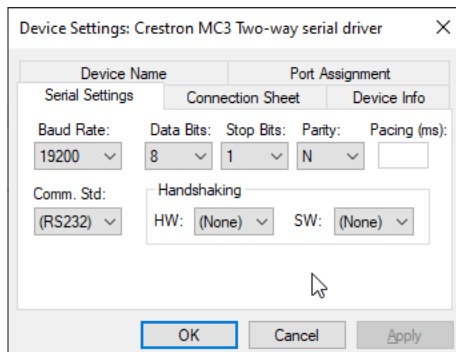
### IP Connection

For IP communication you will need to include a TCP/Client. The default port is 14999.



### RS232 Connection

For RS-232 communication you will need to configure the serial settings for a baud rate of 115200, with 8 data bits, 1 stop bit and no parity. The connection cable needs to be a straight through type cable and can be either 3-wire or fully wired.





# Input Signals

## Digital Inputs

### Enable [\[digital\]](#)

When this signal is high the module will communicate with the Anthem. When the signal goes low the module will not send out any data. For an IP connection this should be tied to the TCP/IP Clients Connect-F signal.

### PowerON [\[digital\]](#)

The Power ON join is used to power the main zone on. The command gets sent on the rising edge of this join, the trailing edge has no effect. During the power on sequence the amplifier will update feedback for a number of items, a process that takes about 1 second, so its best to leave it some time to do that before attempting further control.

### PowerOFF [\[digital\]](#)

The Power OFF join is used to power the main zone down. The command gets sent on the rising edge of this join, the trailing edge has no effect.

### VolumeUp [\[digital\]](#)

The Volume Up Command is used to raise the volume of the main zone. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC). This command affects the volume percentage so you will want to configure the amplifier to display percentage.

### VolumeDown [\[digital\]](#)

The Volume Down Command is used to lower the volume of the main zone. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC). This command affects the volume percentage so you will want to configure the amplifier to display percentage.

### VolumeDBUP [\[digital\]](#)

The Volume DB Up Command is used to raise the volume of the main zone. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC). This command affects the volume by incrementing the DB so you will want to configure the amplifier to display DB.

### VolumeDBDown [\[digital\]](#)

The Volume DB Down Command is used to lower the volume of the main zone. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC).

This command affects the volume by decrementing the DB so you will want to configure the amplifier to display DB.

### MuteON [\[digital\]](#)

The Mute ON join is used to activate volume muting for the main zone. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the Mute\_FB output signal.

### MuteOFF [\[digital\]](#)

The Mute OFF join is used to deactivate volume muting for the main zone. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the Mute\_FB output signal.

### MuteToggle [\[digital\]](#)

The Mute toggle is be used to change the mute state for the main zone from its current state to the opposite state on the rising edge of this signal, the trailing edge has no effect. The current state is reflected in the Mute\_FB output signal.

### DolbyCentreSpreadON [\[digital\]](#)

The Dolby Centre Spread ON join is used to activate the Dolby centre spread function. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the DolbyCentreSpread\_ON\_FB output signal.

### DolbyCentreSpreadOFF [\[digital\]](#)

The Dolby Centre Spread OFF join is used to deactivate the Dolby centre spread function. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the DolbyCentreSpread\_OFF\_FB output signal.

### BassUp [\[digital\]](#)

The BassUp join is used to raise the current bass level by 0.5dB. The command gets sent on the rising edge of this join, the trailing edge has no effect.

### BassDown [\[digital\]](#)

The BassDown join is used to lower the current bass level by 0.5dB. The command gets sent on the rising edge of this join, the trailing edge has no effect.

### TrebleUp [\[digital\]](#)

The TrebleUp join is used to raise the current treble level by 0.5dB. The command gets sent on the rising edge of this join, the trailing edge has no effect.

### TrebleDown [\[digital\]](#)

The TrebleDown join is used to lower the current treble level by 0.5dB. The command gets sent on the rising edge of this join, the trailing edge has no effect.

### BalanceLeft [\[digital\]](#)

The BalanceLeft join is used to shift the balance to the left by half a step (for a maximum of 5 steps). The command gets sent on the rising edge of this join, the trailing edge has no effect.

### BalanceRight [\[digital\]](#)

The BalanceRight join is used to shift the balance to the right by half a step (for a maximum of 5 steps). The command gets sent on the rising edge of this join, the trailing edge has no effect.

### MessageDisplay [\[digital\]](#)

The MessageDisplay signal is used to send a custom message to the receivers front display. The message needs to be entered as strings into the CustomMessage string inputs first. Up to three lines will be sent. The message will be displayed on the rising edge of this signal, and hidden on the trailing edge. This should be connected to a stepper or toggle in your project.

### Trigger1 [\[digital\]](#)

The Trigger1 signal is used to turn on the Anthem 12V trigger port 1. The Trigger will be activated on the rising edge of this signal, and deactivated on the trailing edge. This should be connected to a toggle or similar in your project.

### Trigger2 [\[digital\]](#)

The Trigger2 signal is used to turn on the Anthem 12V trigger port 2. The Trigger will be activated on the rising edge of this signal, and deactivated on the trailing edge. This should be connected to a toggle or similar in your project.

### Trigger3 [\[digital\]](#)

The Trigger3 signal is used to turn on the Anthem 12V trigger port 3. The Trigger will be activated on the rising edge of this signal, and deactivated on the trailing edge. This should be connected to a toggle or similar in your project.

### ARC\_ON [\[digital\]](#)

The ARC ON join is used to activate the Anthem Room Control function for the currently selected source. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the ARC\_ON\_FB output signal.

### ARC\_OFF [digital]

The ARC OFF join is used to deactivate the Anthem Room Control function for the currently selected source. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the ARC\_OFF\_FB output signal.

### Setup [digital]

The Setup join is used to show the Receivers setup menu. This can be used in conjunction with the IR input analog join to open and navigate the menu.

### Z2PowerON [digital]

The Zone2 Power ON join is used to power zone 2 on. The command gets sent on the rising edge of this join, the trailing edge has no effect. During the power on sequence the amplifier will update feedback for a number of items, a process that takes about 1 second, so its best to leave it some time to do that before attempting further control.

### Z2PowerOFF [digital]

The Zone2 Power OFF join is used to power zone 2 down. The command gets sent on the rising edge of this join, the trailing edge has no effect.

### Z2VolumeUp [digital]

The Zone2 Volume Up Command is used to raise the volume of zone 2. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC). This command affects the volume percentage so you will want to configure the amplifier to display percentage.

### Z2VolumeDown [digital]

The Volume Down Command is used to lower the volume of the zone 2. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC). This command affects the volume percentage so you will want to configure the amplifier to display percentage.

### Z2VolumeDBUP [digital]

The Zone2 Volume DB Up Command is used to raise the volume of the zone 2. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC). This command affects the volume by incrementing the DB so you will want to configure the amplifier to display DB.

### Z2VolumeDBDown [digital]

The Zone2 Volume DB Down Command is used to lower the volume of the zone 2. The command is a single shot, so if you want to perform a press and hold you will need to run this signal through an oscillator (OSC).

This command affects the volume by decrementing the DB so you will want to configure the amplifier to display DB.

### Z2MuteON [digital]

The Zone2 Mute ON join is used to activate volume muting for the zone 2. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the Z2Mute\_FB output signal.

### Z2MuteOFF [digital]

The Zone2 Mute OFF join is used to deactivate volume muting for the zone 2. The command gets sent on the rising edge of this join, the trailing edge has no effect. The current state is reflected in the Z2Mute\_FB output signal.

### Z2MuteToggle [digital]

The Zone2 Mute toggle is be used to change the mute state for the zone 2 from its current state to the opposite state on the rising edge of this signal, the trailing edge has no effect. The current state is reflected in the Z2Mute\_FB output signal.

## Analog Inputs

### Source [analog]

The Source input is used to set the source for the main zone. The number supplied matches the input programmed into the Anthem. The name of the source is available from the Input Name serial joins and the number of inputs is available from the TotalInputs analog output. This can be used directly or attached to a list smart object.

### Volume [analog]

The volume join is used to set the main zone volume, in percentage. The value accepted is the Crestron 0 - 100% (0 - 65535), so no scaling is required.

### Z2Source [analog]

The Zone2 Source input is used to set the source for the zone 2. The number supplied matches the input programmed into the Anthem. The name of the source is available from the Input Name serial joins and the number of inputs is available from the TotalInputs analog output. This can be used directly or attached to a list smart object.

### Z2Volume [analog]

The Zone2 volume join is used to set the zone 2 volume, in percentage. The value accepted is the Crestron 0 - 100% (0 - 65535), so no scaling is required.

## SpeakerProfile [analog]

The Speaker Profile join is used to change the profile for the current source. The valid profiles are between 1 and 4. The profiles need to be configured in advance to use this feature.

## ListeningMode [analog]

The Listening Mode join is used to change the current listening mode. The currently available listening modes are

Listening Mode	Name
0	None
1	AnthemLogic-Cinema
2	AnthemLogic-Music
3	Dolby Surround
4	DTS Neural:X
5	DTSVirtual:X
6	All Channel Stereo
7	Mono
8	All Channel Mono

**NOTE:** If you select a listening mode that is not supported there will be no change in mode, and the feedback will remain on the currently selected mode.

## DolbyRange [analog]

The Dolby range join is used to set the Dolby Digital dynamic range. There are three valid options detailed in the table below.

Range	Name
0	Normal
1	Reduced
2	Late Night

## IRCommand [analog]

The IR command join is used to simulate an existing IR command sent to the main zone. Some commands are only accessible this way, like the OSD direction commands. There are 37 available commands. A full list of commands has been detailed below.

Command	Name
0	Key 0
1	Key 1
2	Key 2
3	Key 3
4	Key 4
5	Key 5
6	Key 6
7	Key 7
8	Key 8
9	Key 9
10	Power On
11	Power Off
12	Setup
13	Input
14	Mode
15	Dim
16	Level
17	Info
18	Up
19	Down
20	Left
21	Right

Command	Name
22	Select
23	Page Up
24	Page Down
25	Volume Up
26	Volume Down
27	Mute Toggle
28	Last
29	Tone
30	Bass
31	Treble
32	Lip Sync
33	Balance
34	Dynamics
35	Clear
36	Preset

## Z2IRCommand **[analog]**

The Zone2 IR Command is used to simulate an existing IR command sent to the zone 2. Some commands are only accessible this way, like the OSD direction commands. The available commands are available in the table listed in the IRCommand join above.

## String Inputs

### Rx\$[255] [string]

The Rx\$ join is used to connect to the TCP/IP client, or the RS-232 connection in your project. Please refer to the section labeled Module Configuration for details on how to configure the connection to the receiver.



### CustomMessage[3] [string]

The Custom Message joins (1 to 3) are used to send a custom message to the display on the Receiver. There are three lines available that correspond to the three joins, CustomMessage[1] for line 1, etc. The maximum length for each line is 32, any additional text will be clipped. To display the message the MessageDisplay join must be held high.

# Output Signals

## Digital Outputs

### PowerON\_FB [digital]

The PowerON\_FB signal will be high when the main zone is powered on and low when it is off.

### PowerOFF\_FB [digital]

The PowerOFF\_FB signal will be high when the main zone is powered off and low when it is on.

### Mute\_FB [digital]

The Mute\_FB signal will be high when the main zone has mute activated and go low when the mute is deactivated.

### DolbyCentreSpread\_ON\_FB [digital]

The DolbyCentreSpread\_ON\_FB will go high when the Dolby Centre Spread function is activated and go be low when its deactivated. This is controlled via the DolbyCentreSpreadON and DolbyCentreSpreadOFF commands.

### DolbyCentreSpread\_OFF\_FB [digital]

The DolbyCentreSpread\_OFF\_FB will go high when the Dolby Centre Spread function is deactivated and go be low when its activated. This is controlled via the DolbyCentreSpreadON and DolbyCentreSpreadOFF commands.

### ARC\_ON\_FB [digital]

The ARC\_ON\_FB will go high when the ARC function is activated and go be low when its deactivated.

### ARC\_OFF\_FB [digital]

The ARC\_OFF\_FB will go high when the ARC function is deactivated and go be low when its activated.

### Z2PowerON\_FB [digital]

The Z2PowerON\_FB signal will be high when Zone 2 is powered on and low when it is off.

### Z2PowerOFF\_FB [digital]

The Z2PowerOFF\_FB signal will be high when Zone 2 is powered off and low when it is on.

## Z2Mute\_FB [digital]

The Mute\_FB signal will be high when Zone 2 has mute activated and go low when the mute is deactivated.

## Analog Outputs

### TotalInputs [analog]

The TotalInputs join reports the number of configured sources available. This can be used to configure a dynamic list smart object. The maximum number of zones is 30.

### Source\_FB [analog]

The Source FB join will contain the source number for the main zone. The values will match the source programmed into the Anthem. This value will be updated to the current source for the main zone on startup and when the source changes either from the module or directly on the receiver.

### Volume\_FB [analog]

The Volume FB join will contain the volume for the main zone. The value reported is the Crestron 0 - 100% (0 - 65535), so no scaling is required. This value will be updated to the current volume on startup and when the main zone volume changes either from the module or directly on the receiver.

### Z2Source\_FB [analog]

The Zone2 Source FB join will contain the source number for the zone 2. The values will match the source programmed into the Anthem. This value will be updated to the current source for the zone 2 on startup and when the source changes either from the module or directly on the receiver.

### Z2Volume\_FB [analog]

The Zone2 Volume FB join will contain the volume for the main zone. The value reported is the Crestron 0 - 100% (0 - 65535), so no scaling is required. This value will be updated to the current volume on startup and when the zone 2 volume changes either from the module or directly on the receiver.

### SpeakerProfile\_FB [analog]

The Speaker Profile FB join will contain the current speaker profile selected. Valid values are between 1 and 4.

### ListeningMode\_FB [analog]

The Listening Mode FB signal will contain the current listening mode. The currently available listening modes are

Listening Mode	Name
0	None
1	AnthemLogic-Cinema
2	AnthemLogic-Music
3	Dolby Surround
4	DTSNeural:X
5	DTSVirtual:X
6	All Channel Stereo
7	Mono
8	All Channel Mono

**NOTE:** If you select a listening mode that is not supported there will be no change in mode, and the feedback will remain on the currently selected mode.

### DolbyNormalizationDB [analog]

The Dolby Normalisation FB join contains the amount of normalisation in dB.

### AudioInChannels [analog]

The Audio In Channels join contains the a value representing the number of channels for the current input. Valid values are

In Channel Value	Actual Channels
0	No Input
1	Other
2	Mono (Centre Only)
3	2 Channel
4	5.1 Channel
5	7.1 Channel
6	Atmos
7	DTS-X

### AudiInFormat [analog]

The Audio In Format join contains the a value representing the audio format for the current input. Valid values are

Audio In Value	Audio Format
0	No Input
1	Analog
2	PCM
3	Dolby
4	DSD
5	DTS
6	Atmos
7	DTS-X

### AudiInSample [analog]

The Audio In Sample join contains the sample rate in kHz for the current input.

### AudiInBitDepth [analog]

The Audio In Bit Depth will be either 16-bit, 24-bit or 32-bit. Alternatively if the bit depth isn't recognised it will return 0.

### HorizResolution [analog]

The Horizontal Resolution join will return the horizontal resolution in pixels for the current input.

### VertResolution [analog]

The Vertical Resolution join will return the vertical resolution in pixels for the current input.

## String Outputs

### Tx\$ [string]

The Tx\$ join is used to connect to the TCP/IP client, or the RS-232 connection in your project. Please refer to the section labeled Module Configuration for details on how to configure the connection to the receiver.

VolumeDB\$ [string]

The VolumeDB join contains the volume in dB for the main zone.

Z2VolumeDB\$ [string]

The VolumeDB join contains the volume in dB for the zone 2.

Firmware [string]

The Firmware join contains the current firmware version.

Model [string]

The Firmware join contains the current model number.

DSPVersion [string]

The Firmware join contains the current DSP firmware version.

LCDCVersion [string]

The Firmware join contains the current LCDC firmware version.

Serial [string]

The Firmware join contains the devices serial number.

BuildDate [string]

The Firmware join contains the current device build date.

Hardware [string]

The Firmware join contains the current hardware version.

NetSoftware [string]

The Firmware join contains the current network firmware version.

NetHardware; [string]

The Firmware join contains the current network hardware version.

AudioInChannel\$ [string]

The Audio In Channel join contains a text value for the audio input channels. The value will match the table for the analog output AudioInChannels

#### AudiInFormat\$ [string]

The Audio In Format join contains a text value for the audio input format. The value will match the table for the analog output AudiInFormat.

#### AudiInName [string]

The Audio In Name join contains a text value for the audio input name for the current input.

#### AudiInRate [string]

The Audio Input Rate join contains the the audio rate shown as bit rate for lossy inputs (eg. 384kbps) or the sample rate and bit depth combined (eg. 48/16).

#### SpeakerProfileName[4] [string]

The Speaker Profile names contain the names configured in the Anthem for the 4 speaker profiles. The profiles can be used with a list smart object in conjunction with the SpeakerProfile% analog input.

#### InputName[30] [string]

The Inputs Names are available on these joins. These joins can be used in conjunction with the TotalInputs analog output to create a dynamic list of source for selection.