

# Central control codes user manual

(MDM-D4/D8/D16 DSP matrix audio processor)



2023.7.4



## RS232/485 connecting configuration

Baud rate:

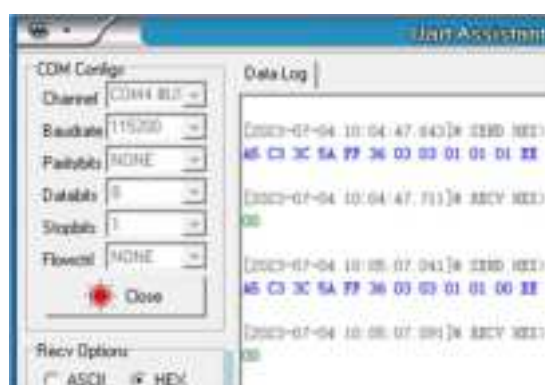
- 115200 bit/s for RS485
- 2400/4800/9600/19200/38400/57600/115200 bit/s for RS232

Parity bits: NONE

Data bits: 8

Stop bits: 1

Control sending interval: >200ms (when setting for Presets function >3s)



## TCP/IP connecting configuration

Transport protocol: TCP client

IP address: refer to IP address information in LCD display, or check it in DSP software.

Network port: 8234

Control sending interval: >200ms (when setting for Presets function >3s)



## Regulation of control codes

### Send instruction to device

0xA5 0xC3 0x3C 0x5A 0xFF 0x36 0x0? 0x?? 0x?? ... 0x?? 0xEE

feedback code from device:

- 0x00: sending successful
- 0x01: sending failed

### Read status of device

0xA5 0xC3 0x3C 0x5A 0xFF 0x63 0x00 0x?? 0x?? ... 0x?? 0xEE

feedback code from device:

- same code as above: sending successful
- 0x01: sending failed

0xA5 0xC3 0x3C 0x5A: start code

0xFF: device ID

0x0?: functions code

0x??: data length (byte-sized) of 0x?? ... 0x??

0x?? ... 0x??: data (such as input/output, channel No., on/off, etc.)

0xEE: end code

Notice: **hexadecimal** data for sample, using without the prefix "0x", such as:

A5 C3 3C 5A FF 36 00 ?? ... ?? EE

### Functions code:

|           |                                 |           |                                        |
|-----------|---------------------------------|-----------|----------------------------------------|
| <u>02</u> | Scene (presets)                 | <u>09</u> | Matrix mixing                          |
| <u>03</u> | Mute                            | <u>0D</u> | Switch of analog/Dante/USB audio input |
| <u>04</u> | Volume and channels gain        |           |                                        |
| <u>05</u> | +/-Gain in step                 |           |                                        |
| <u>06</u> | Line/Mic level with sensitivity |           |                                        |
| <u>07</u> | Phantom +48V                    |           |                                        |
| <u>08</u> | AFC feedback control setting    |           |                                        |

### Decimal and hexadecimal digit table

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| D: | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| H: | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 0D | 0E | 0F |

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| D: | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| H: | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 1A | 1B | 1C | 1D | 1E |

## Scene (presets) (0x02)

### Scene (presets) recalling

|                                 |                               |
|---------------------------------|-------------------------------|
| Recall preset 1 (default of ex) | A5 C3 3C 5A FF 36 02 01 01 EE |
| Recall preset 2                 | A5 C3 3C 5A FF 36 02 01 02 EE |
| Recall preset ...               | A5 C3 3C 5A FF 36 02 01 .. EE |
| Recall preset 30                | A5 C3 3C 5A FF 36 02 01 1E EE |

### Scene (presets) reading

|                     |                            |
|---------------------|----------------------------|
| Read current preset | A5 C3 3C 5A FF 63 02 00 EE |
|---------------------|----------------------------|

Feedback code description:

A5 C3 3C 5A FF 63 02 01 03 EE means current preset No.3

## Mute (0x03)

### Mute setting

|                                 |                                     |
|---------------------------------|-------------------------------------|
| All input channels mute         | A5 C3 3C 5A FF 36 03 03 01 00 01 EE |
| All input channels cancel mute  | A5 C3 3C 5A FF 36 03 03 01 00 00 EE |
| All output channels mute        | A5 C3 3C 5A FF 36 03 03 02 00 01 EE |
| All output channels cancel mute | A5 C3 3C 5A FF 36 03 03 02 00 00 EE |

|               |                                     |
|---------------|-------------------------------------|
| Input 1 mute  | A5 C3 3C 5A FF 36 03 03 01 01 01 EE |
| Input 2 mute  | A5 C3 3C 5A FF 36 03 03 01 02 01 EE |
| Input .. mute | A5 C3 3C 5A FF 36 03 03 01 .. 01 EE |
| Input 16 mute | A5 C3 3C 5A FF 36 03 03 01 16 01 EE |

|                      |                                     |
|----------------------|-------------------------------------|
| Input 1 mute cancel  | A5 C3 3C 5A FF 36 03 03 01 01 00 EE |
| Input 2 mute cancel  | A5 C3 3C 5A FF 36 03 03 01 02 00 EE |
| Input .. mute cancel | A5 C3 3C 5A FF 36 03 03 01 .. 00 EE |
| Input 16 mute cancel | A5 C3 3C 5A FF 36 03 03 01 16 00 EE |

|                |                                     |
|----------------|-------------------------------------|
| Output 1 mute  | A5 C3 3C 5A FF 36 03 03 02 01 01 EE |
| Output 2 mute  | A5 C3 3C 5A FF 36 03 03 02 02 01 EE |
| Output .. mute | A5 C3 3C 5A FF 36 03 03 02 .. 01 EE |
| Output 16 mute | A5 C3 3C 5A FF 36 03 03 02 16 01 EE |

|                       |                                     |
|-----------------------|-------------------------------------|
| Output 1 mute cancel  | A5 C3 3C 5A FF 36 03 03 02 01 00 EE |
| Output 2 mute cancel  | A5 C3 3C 5A FF 36 03 03 02 02 00 EE |
| Output .. mute cancel | A5 C3 3C 5A FF 36 03 03 02 .. 00 EE |

|                       |                                     |
|-----------------------|-------------------------------------|
| Output 16 mute cancel | A5 C3 3C 5A FF 36 03 03 02 16 00 EE |
|-----------------------|-------------------------------------|

### Status of mute reading

|                           |                                  |
|---------------------------|----------------------------------|
| Read Input 1 mute status  | A5 C3 3C 5A FF 63 03 02 01 01 EE |
| Read Input 2 mute status  | A5 C3 3C 5A FF 63 03 02 01 02 EE |
| Read Input .. mute status | A5 C3 3C 5A FF 63 03 02 01 .. EE |
| Read Input 16 mute status | A5 C3 3C 5A FF 63 03 02 01 16 EE |

|                            |                                  |
|----------------------------|----------------------------------|
| Read Output 1 mute status  | A5 C3 3C 5A FF 63 03 02 02 01 EE |
| Read Output 2 mute status  | A5 C3 3C 5A FF 63 03 02 02 02 EE |
| Read Output .. mute status | A5 C3 3C 5A FF 63 03 02 02 .. EE |
| Read Output 16 mute status | A5 C3 3C 5A FF 63 03 02 02 16 EE |

Feedback code description:

A5 C3 3C 5A FF 63 03 03 02 04 **00** EE means Output 4 mute cancel

A5 C3 3C 5A FF 63 03 03 02 04 **01** EE means Output 4 mute

## Volume and channels gain (0x04)

### Device volume setting

|                                   |                                                      |
|-----------------------------------|------------------------------------------------------|
| Device main volume set in -60.0dB | A5 C3 3C 5A FF 36 04 04 <b>00</b> 01 <b>A8 FD</b> EE |
| Device main volume set in -20.0dB | A5 C3 3C 5A FF 36 04 04 <b>00</b> 01 <b>9C FF</b> EE |
| Device main volume set in ... dB  | A5 C3 3C 5A FF 36 04 04 <b>00</b> 01 <b>XX XX</b> EE |

### Channels gain setting

|                              |                                                             |
|------------------------------|-------------------------------------------------------------|
| Input 1 gain set in -60.0dB  | A5 C3 3C 5A FF 36 04 04 <b>01</b> <b>01</b> <b>A8 FD</b> EE |
| Input 2 gain set in -60.0dB  | A5 C3 3C 5A FF 36 04 04 01 02 A8 FD EE                      |
| Input .. gain set in -60.0dB | A5 C3 3C 5A FF 36 04 04 01 .. A8 FD EE                      |
| Input 16 gain set in -60.0dB | A5 C3 3C 5A FF 36 04 04 01 16 A8 FD EE                      |

|                              |                                        |
|------------------------------|----------------------------------------|
| Output 1 gain set in 12.0dB  | A5 C3 3C 5A FF 36 04 04 02 01 78 00 EE |
| Output 2 gain set in 12.0dB  | A5 C3 3C 5A FF 36 04 04 02 02 78 00 EE |
| Output .. gain set in 12.0dB | A5 C3 3C 5A FF 36 04 04 02 .. 78 00 EE |
| Output 16 gain set in 12.0dB | A5 C3 3C 5A FF 36 04 04 02 16 78 00 EE |

Remark: 0.1dB in step when calculate

Example 1: if set volume in -60.0dB,  $-60.0/0.1=-600$

Using excel to calculate low bit: =RIGHT(DEC2HEX(-600,2),2), final value **A8**

Using excel to calculate high bit: =MID(DEC2HEX(-600,4),LEN(DEC2HEX(-600,4))-3,2), final value **FD**

### Channel volume value reading

|                         |                                  |
|-------------------------|----------------------------------|
| Read device main volume | A5 C3 3C 5A FF 63 04 02 00 00 EE |
|-------------------------|----------------------------------|

|                      |                                  |
|----------------------|----------------------------------|
| Read Input 1 volume  | A5 C3 3C 5A FF 63 04 02 01 01 EE |
| Read Input 2 volume  | A5 C3 3C 5A FF 63 04 02 01 02 EE |
| Read Input .. volume | A5 C3 3C 5A FF 63 04 02 01 .. EE |
| Read Input 16 volume | A5 C3 3C 5A FF 63 04 02 01 16 EE |

|                       |                                  |
|-----------------------|----------------------------------|
| Read Output 1 volume  | A5 C3 3C 5A FF 63 04 02 02 01 EE |
| Read Output 2 volume  | A5 C3 3C 5A FF 63 04 02 02 02 EE |
| Read Output .. volume | A5 C3 3C 5A FF 63 04 02 02 .. EE |
| Read Output 16 volume | A5 C3 3C 5A FF 63 04 02 02 16 EE |

Feedback code description:

A5 C3 3C 5A FF 63 04 04 00 00 **AC FE** EE means device main volume is -34.0dB

A5 C3 3C 5A FF 63 04 04 02 04 **EC FF** EE means Output 4 volume is -2.0dB

**To calculate dB volume value from hex answer:**

=HEX.N.DEC(A1 & A2) / 256

Example 78 00:

- A1 is MSB (78) .
- A2 is LSB (00) .

Voor 78 00 levert dit:

$30720 + 256 = 12030720 \div 256 = 12030720 \div 256 = 120$

Divide this answer by 10 to get 12dB in this example

Example A8 FD:

1. **Hexadecimale value:** A8FD → 432614326143261 (unsigned decimaal).
2.  $43261 + 256 = -60043261 \div 256 = -60043261 \div 256 = -600$ .
3.  $-600 / 10 = -60\text{dB}$

## +/-Gain in step (0x05)

|                                |                                        |
|--------------------------------|----------------------------------------|
| Input all channels gain +1.0dB | A5 C3 3C 5A FF 36 05 04 01 00 00 0A EE |
| Input all channels gain -1.0dB | A5 C3 3C 5A FF 36 05 04 01 00 01 0A EE |

|                                 |                                        |
|---------------------------------|----------------------------------------|
| Output all channels gain +1.0dB | A5 C3 3C 5A FF 36 05 04 02 00 00 0A EE |
| Output all channels gain -1.0dB | A5 C3 3C 5A FF 36 05 04 02 00 01 0A EE |

|                      |                                        |
|----------------------|----------------------------------------|
| Input 1 gain +1.0dB  | A5 C3 3C 5A FF 36 05 04 01 01 00 0A EE |
| Input 2 gain +1.0dB  | A5 C3 3C 5A FF 36 05 04 01 02 00 0A EE |
| Input .. gain +1.0dB | A5 C3 3C 5A FF 36 05 04 01 .. 00 0A EE |
| Input 16 gain +1.0dB | A5 C3 3C 5A FF 36 05 04 01 16 00 0A EE |

|                     |                                        |
|---------------------|----------------------------------------|
| Input 1 gain -1.0dB | A5 C3 3C 5A FF 36 05 04 01 01 01 0A EE |
|---------------------|----------------------------------------|



|                      |                                        |
|----------------------|----------------------------------------|
| Input 2 gain -1.0dB  | A5 C3 3C 5A FF 36 05 04 01 02 01 0A EE |
| Input .. gain -1.0dB | A5 C3 3C 5A FF 36 05 04 01 .. 01 0A EE |
| Input 16 gain -1.0dB | A5 C3 3C 5A FF 36 05 04 01 16 01 0A EE |

|                       |                                        |
|-----------------------|----------------------------------------|
| Output 1 gain +1.0dB  | A5 C3 3C 5A FF 36 05 04 02 01 00 0A EE |
| Output 2 gain +1.0dB  | A5 C3 3C 5A FF 36 05 04 02 02 00 0A EE |
| Output .. gain +1.0dB | A5 C3 3C 5A FF 36 05 04 02 .. 00 0A EE |
| Output 16 gain +1.0dB | A5 C3 3C 5A FF 36 05 04 02 16 00 0A EE |

|                       |                                        |
|-----------------------|----------------------------------------|
| Output 1 gain -1.0dB  | A5 C3 3C 5A FF 36 05 04 02 01 01 0A EE |
| Output 2 gain -1.0dB  | A5 C3 3C 5A FF 36 05 04 02 02 01 0A EE |
| Output .. gain -1.0dB | A5 C3 3C 5A FF 36 05 04 02 .. 01 0A EE |
| Output 16 gain -1.0dB | A5 C3 3C 5A FF 36 05 04 02 16 01 0A EE |

Remark: 0.1dB in step when calculate

Example: if +/-1.0dB, 1.0/0.1=10

Using excel to calculate low bit: =DEC2HEX(10,2), final value 0A

## Line/Mic level with sensitivity (0x06)

### Mic level with sensitivity setting

|                                            |                                     |
|--------------------------------------------|-------------------------------------|
| Input 1 mic input with sensitivity in 5dB  | A5 C3 3C 5A FF 36 06 03 01 00 01 EE |
| Input 1 mic input with sensitivity in 10dB | A5 C3 3C 5A FF 36 06 03 01 00 02 EE |
| Input 1 mic input with sensitivity in 15dB | A5 C3 3C 5A FF 36 06 03 01 00 03 EE |
| Input 1 mic input with sensitivity in 20dB | A5 C3 3C 5A FF 36 06 03 01 00 04 EE |
| Input 1 mic input with sensitivity in 25dB | A5 C3 3C 5A FF 36 06 03 01 00 05 EE |
| Input 1 mic input with sensitivity in 30dB | A5 C3 3C 5A FF 36 06 03 01 00 06 EE |
| Input 1 mic input with sensitivity in 35dB | A5 C3 3C 5A FF 36 06 03 01 00 07 EE |

Remark:

Sensitivity from 1 to 7 level: 5/10/15/20/25/30/35 dB

|                      |                                      |
|----------------------|--------------------------------------|
| Input 1 line input   | A5 C3 3C 5A FF 36 06 03 01 00 01 EE  |
| Input 2 line input   | A5 C3 3C 5A FF 36 06 03 02 01 00 EE  |
| Input ... line input | A5 C3 3C 5A FF 36 06 03 ... 01 00 EE |
| Input 16 line input  | A5 C3 3C 5A FF 36 06 03 16 01 00 EE  |

### Line/Mic input reading

|           |                                |
|-----------|--------------------------------|
| Input 1   | A5 C3 3C 5A FF 63 06 01 01 EE  |
| Input 2   | A5 C3 3C 5A FF 63 06 01 02 EE  |
| Input ... | A5 C3 3C 5A FF 63 06 01 ... EE |
| Input 16  | A5 C3 3C 5A FF 63 06 01 16 EE  |

Feedback code description:

A5 C3 3C 5A FF 63 06 03 **02 00 05** EE means input channel **2** in **Mic level** with **No.5 sensitivity** (25dB)

## Phantom +48V (0x07)

### Input in Mic level with phantom +48V setting

|                                          |                                         |
|------------------------------------------|-----------------------------------------|
| Input 1 in Mic level open phantom +48V   | A5 C3 3C 5A FF 36 07 02 <b>01 01</b> EE |
| Input 1 in Mic level close phantom +48V  | A5 C3 3C 5A FF 36 07 02 <b>01 00</b> EE |
| Input 2 in Mic level open phantom +48V   | A5 C3 3C 5A FF 36 07 02 <b>02 01</b> EE |
| Input 2 in Mic level close phantom +48V  | A5 C3 3C 5A FF 36 07 02 <b>02 00</b> EE |
| ...                                      | ...                                     |
| Input 16 in Mic level open phantom +48V  | A5 C3 3C 5A FF 36 07 02 16 01 EE        |
| Input 16 in Mic level close phantom +48V | A5 C3 3C 5A FF 36 07 02 16 00 EE        |

Remark: user should effect Mic level before opening or closing 48V phantom

### Input in Mic level with phantom +48V reading

|           |                                      |
|-----------|--------------------------------------|
| Input 1   | A5 C3 3C 5A FF 63 07 01 <b>01</b> EE |
| Input 2   | A5 C3 3C 5A FF 63 07 01 02 EE        |
| Input ... | A5 C3 3C 5A FF 63 07 01 ... EE       |
| Input 16  | A5 C3 3C 5A FF 63 07 01 16 EE        |

Feedback code description:

A5 C3 3C 5A FF 63 07 02 **05 00** EE means input channel **5 closed** phantom +48V

## AFC feedback control setting (0x08)

### Input with AFC level setting

|                            |                                         |
|----------------------------|-----------------------------------------|
| Input 1 with AFC level 1   | A5 C3 3C 5A FF 36 08 02 01 <b>01</b> EE |
| Input 1 with AFC level 2   | A5 C3 3C 5A FF 36 08 02 01 <b>02</b> EE |
| Input 1 close AFC function | A5 C3 3C 5A FF 36 08 02 01 <b>00</b> EE |
| ...                        | ...                                     |

Remark:

AFC level 1: 01; level 2: 02

AFC close: 00

### Input with AFC level reading

|                            |                                      |
|----------------------------|--------------------------------------|
| Input 1 AFC status reading | A5 C3 3C 5A FF 63 08 01 <b>01</b> EE |
| Input 2 AFC status reading | A5 C3 3C 5A FF 63 08 01 <b>02</b> EE |
| ...                        | ...                                  |

Feedback code description:

A5 C3 3C 5A FF 63 08 02 **02 01** EE means input channel **2** opened with AFC level 1

## Matrix mixing (0x09)

### Input - output channels matrix setting

|                                  |                                                   |
|----------------------------------|---------------------------------------------------|
| Set matrix Input 1- Output 1 ✓   | A5 C3 3C 5A FF 36 09 03 <b>01 01</b> <b>01</b> EE |
| Set matrix Input 1- Output 2 ✓   | A5 C3 3C 5A FF 36 09 03 01 02 01 EE               |
| Set matrix Input ..- Output .. ✓ | A5 C3 3C 5A FF 36 09 03 ... .. 01 EE              |
| Set matrix Input 16- Output 16 ✓ | A5 C3 3C 5A FF 36 09 03 16 16 01 EE               |

|                                  |                                                   |
|----------------------------------|---------------------------------------------------|
| Set matrix Input 1- Output 1 ×   | A5 C3 3C 5A FF 36 09 03 <b>01 01</b> <b>00</b> EE |
| Set matrix Input 1- Output 2 ×   | A5 C3 3C 5A FF 36 09 03 01 02 00 EE               |
| Set matrix Input ..- Output .. × | A5 C3 3C 5A FF 36 09 03 ... .. 00 EE              |
| Set matrix Input 16- Output 16 × | A5 C3 3C 5A FF 36 09 03 16 16 00 EE               |

### Status of Input - output channels matrix reading

|                     |                                   |
|---------------------|-----------------------------------|
| Input 1- Output 1   | A5 C3 3C 5A FF 63 09 02 01 01 EE  |
| Input 1- Output 2   | A5 C3 3C 5A FF 63 09 02 01 02 EE  |
| Input ..- Output .. | A5 C3 3C 5A FF 63 09 02 ... .. EE |
| Input 16- Output 16 | A5 C3 3C 5A FF 63 09 02 16 16 EE  |

Feedback code description:

A5 C3 3C 5A FF 63 09 03 04 04 **01** EE means Input 4 - Output 4 connecting ✓

A5 C3 3C 5A FF 63 09 03 04 04 **00** EE means Input 4 - Output 4 disconnecting ×

## Switch of analog/Dante/USB audio input (0x0D)

### Analog/Dante/USB audio input setting

|                   |                                                |
|-------------------|------------------------------------------------|
| Input 1 - analog  | A5 C3 3C 5A FF 36 0D 02 <b>01</b> <b>00</b> EE |
| Input 2 - analog  | A5 C3 3C 5A FF 36 0D 02 02 00 EE               |
| Input .. - analog | A5 C3 3C 5A FF 36 0D 02 .. 00 EE               |
| Input 16 - analog | A5 C3 3C 5A FF 36 0D 02 16 00 EE               |

|                  |                                                |
|------------------|------------------------------------------------|
| Input 1 - Dante  | A5 C3 3C 5A FF 36 0D 02 <b>01</b> <b>04</b> EE |
| Input 2 - Dante  | A5 C3 3C 5A FF 36 0D 02 02 04 EE               |
| Input .. - Dante | A5 C3 3C 5A FF 36 0D 02 .. 04 EE               |
| Input 16 - Dante | A5 C3 3C 5A FF 36 0D 02 16 04 EE               |

|                     |                                  |
|---------------------|----------------------------------|
| Input 1 - USB audio | A5 C3 3C 5A FF 36 0D 02 01 05 EE |
| Input 2 - USB audio | A5 C3 3C 5A FF 36 0D 02 02 05 EE |

#### Status of analog/Dante/USB audio input reading

|          |                               |
|----------|-------------------------------|
| Input 1  | A5 C3 3C 5A FF 63 0D 01 01 EE |
| Input 2  | A5 C3 3C 5A FF 63 0D 01 02 EE |
| Input .. | A5 C3 3C 5A FF 63 0D 01 .. EE |
| Input 16 | A5 C3 3C 5A FF 63 0D 01 16 EE |

Feedback code description:

A5 C3 3C 5A FF 63 0D 02 04 04 EE means Input 4 is using Dante signal

A5 C3 3C 5A FF 63 0D 02 06 00 EE means Input 6 is using analog signal

A5 C3 3C 5A FF 63 0D 02 02 05 EE means Input 2 is using USB audio signal

