SONY

MULTI FORMAT COMPACT SWITCHER

MCS-8M

PROTOCOL MANUAL

1st Edition

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Table of Contents

1. Overview

This protocol manual describes the RS-232C control of Multi Format Compact Switcher (MCS-8M).
In this manual, command issuer is called “controller” and command receiver is called “control device” (such as MCS-8M).
The MCS-8M can control actions by using RS-232C communication as well as from the panel on its body.
This manual describes contents and usage of each command.

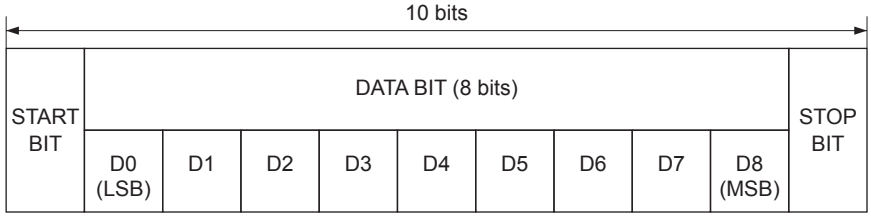
Note

The contents of this manual are applied to MCS-8M main application Ver. 1.01 and later.

2. Communication Format

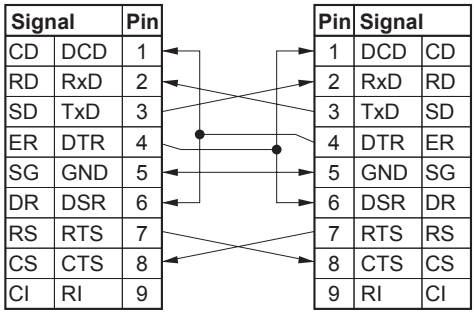
2-1. Communication Signal

- Asynchronous communication
- EIA RS-232C compliant
- 38.4 kbps
- Code: 8-bit binary code
- The bit configuration is defined as follows.



2-2. Connection

The REMOTE connector on the MCS-8M rear panel is used for communication.



Signal		Pin
CD	DCD	1
RD	RxD	2
SD	TxD	3
ER	DTR	4
SG	GND	5
DR	DSR	6
RS	RTS	7
CS	CTS	8
CI	RI	9

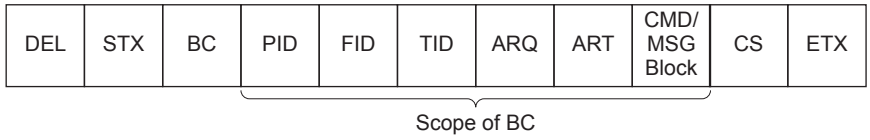
Pin	Signal	
1	DCD	CD
2	RxD	RD
3	TxD	SD
4	DTR	ER
5	GND	SG
6	DSR	DR
7	RTS	RS
8	CTS	CS
9	RI	CI

Notes

- To connect MCS-8M to a personal computer, use a commercially available cross cable.
- Hardware flow control is not supported.
- Signals other than RxD, TxD, and GND can be left disconnected.

2-3. Data Format

The structure of communication command and data is shown below.



The following table provides definition of each term.

Note

Hexadecimal numbers are shown as “xx h” in this table.

Command	Description	Data
DEL	Delimiter	1 byte = 01 h
STX	Start of Text Code	1 byte = 02 h
BC	Byte Count	2 byte Little Endian
PID	Protocol ID	1 byte =
	- VIDEO	01 h
	- AUDIO	02 h
FID	From ID	1 byte = 50 h
TID	To ID	1 byte =
	- VIDEO	20 h
	- AUDIO	30 h
ARQ	Reserved	1 byte = 00 h
ART	Reserved	1 byte = 00 h
CMD/MSG Block	Command/Message **Note** For CMD/MSG Block, refer to “4. Commands.”	
CS	Check sum byte **Note** The lower 8 bits of the sum from BC to CS becomes 0.	
ETX	End of Text Code	1 byte = 03 h

The control device discard data until it receives data in combination of DEL and STX.
After the control device has received STX, it receives only BC data. If the received BC data is not equal to the following CS, the data is discarded.
Only when the received data has matched CS and then EXT has been received, the command is regarded to be valid and control is accepted.

Note

To perform control through serial communication, transmission of one command requires about 5 milliseconds until the final byte reaches the receiver.
The controller should issue commands to the control device well in advance. Otherwise, expected execution result may not be obtained.

3. Settings

Information on serial control is disclosed to only limited customers. Carefully read the information below and observe notes.

This control was disabled when the product was shipped from the factory.
Select “Rem 1” in “Serial Cmd Group” from the “For Services” menu. At that time, perform save and restart by “Startup Define” without fail.

The “For Services” menu is made available by setting the cursor at the bottom “Back” in “System” of “Setup” and depressing the V3 knob.

Note

If an item in this menu is changed, it will cause unexpected actions. Do not operate any item other than “Serial Cmd Group.” “FACT” in “Serial Cmd Group” is a menu for factory use. Changing the “FACT” menu will also cause unexpected actions. Do not perform serial operation in the “FACT” state.

4. Commands

There are two types of commands: video commands and audio commands.
Use the PID command or TID command according to command types and properly install the following commands in the CMD/MSG Block.

4-1. List of Commands

Video commands

Command	Code Read/Write	Function
XPT SELECT	0x00/0x80	Changes XPT of BKGD, Key, Aux1, and Aux2.
	0x01/0x81	
	0x07/0x87	
	0x08/0x88	
NEXT TRANSITION	0x10/0x90	Changes Next transition.
TRANSITION TYPE	0x11/0x91	Changes transition type.
TRANSITION RATE	0x18/0x98	Sets transition rate.
AUTO TRANSITION START	----/0x96	Executes Auto transition, Key transition, and FTB.
WIPE PATTERN	0x1B/0x9B	Changes wipe pattern of Effect transition.
DME WIPE PATTERN	0x1C/0x9C	Changes DME wipe pattern of Effect transition.
KEY WIPE PATTERN	0x33/0xB3	Changes Key wipe pattern.
KEY DME WIPE PATTERN	0x1C/0x9C	Changes Key DME wipe pattern.
WIPE DIRECTION	0x1B/0x9B	Sets the wipe direction of Effect transition.
DME WIPE DIRECTION	0x1C/0x9C	Sets the DME wipe direction of Effect transition.
KEY WIPE DIRECTION	0x33/0xB3	Sets the Key wipe direction.
KEY DME WIPE DIREC-TION	0x1C/0x9C	Sets the Key DME wipe direction.
SNAPSHOT STORE	----/0x80	Stores snapshot in the specified register number (1 to 20).
SNAPSHOT RECALL	----/0x90	Calls snapshot of the specified register number (1 to 20).

Audio commands

Command	Code	Function
CHANNEL FADER	0x10	Adjusts the fader level.
MASTER FADER	0x12	Adjusts the MIX/AUX master fader level.
MUTE	0x13	Selects MUTE ON or OFF.
TRIM	0x14	Adjusts the TRIM level.
LOW CUT FILTER	0x17	Enables (ON) or disables (OFF) the low-cut filter.
HIGH CUT FILTER	0x18	Enables (ON) or disables (OFF) the high-cut filter.
EQ LOW IN	0x19	Enables (ON) or disables (OFF) the low-frequency set data of the equalizer.
EQ LOW FREQUENCY	0x1B	Sets low frequency of the equalizer.
EQ LOW GAIN	0x1C	Adjusts low-frequency gain of the equalizer.
EQ MID IN	0x1D	Enables (ON) or disables (OFF) the mid-frequency set data of the equalizer.
EQ MID FREQUENCY	0x1E	Sets mid frequency of the equalizer.
EQ MID GAIN	0x1F	Adjusts mid-frequency gain of the equalizer.
EQ HIGH IN	0x20	Enables (ON) or disables (OFF) the high-frequency set data of the equalizer.
EQ HIGH FREQUENCY	0x22	Sets high frequency of the equalizer.
EQ HIGH GAIN	0x23	Adjusts high-frequency gain of the equalizer.
PAN	0x33	Adjusts pan.
MONITOR LEVEL	0x40	Adjusts monitor level.
MONITOR DIM LEVEL IN	0x41	Enables (ON) or disables (OFF) the dimmer.
MONITOR SELECT	0x43	Selects a monitor.

4-2. Details of Video Commands

The CMD/MSG Block consists of “PROT”, “Byte count”, “EFF”, and “byte2, byte3...”.
PROT is fixed to 3. Byte count represents the number of EFF, byte2, byte3....
In MCS-8M, EFF represents the following in principle.
0x00: M/E
0x01: Not used
0x02: Aux1
0x03: Aux2
0x21: E-File
The WRITE command represents an execution request.
The READ command represents a status request.
ANSWER is sent back from the control device.

XPT SELECT

Format

READ: 02, EFF, CMD1
WRITE: 04, EFF, CMD1, byte3, byte4
ANSWER: 04, EFF, CMD1, byte3, byte4

EFF

0x00: M/E
0x01: (Not used)
0x02: Aux1
0x03: Aux2

CMD1

Bus
0x00/0x80: A-Bus (M/E, Aux1, Aux2)
0x01/0x81: B-Bus (M/E, Aux1, Aux2)
0x07/0x87: Key fill (M/E)
0x08/0x88: Key src (M/E)

Note

Specify 0x0* for Read and 0x8* for Write and Answer.

byte

byte3, byte4 XPT Button Number
0x00, 0x01: 1
0x00, 0x02: 2
:
0x00, 0x07: 7
0x00, 0x08: 8 (= Shift 1)
0x00, 0x09: 9 (= Shift 2)
:
0x00, 0x0E: 14 (= Shift 7)

Action

Changes BKGD, KEY, AUX1, and AUX2 crosspoint buttons.

Example of send message

01 02 00 0b 01 50 20 00 00 03 04 00 80 00 01 fc 03

Note

Only Bus = 0x87 (Key fill) is usually sent for changing KEY crosspoint buttons.
Only when Key Source Select = Split, specify Bus = 0x87 (Key fill) and 0x88 (Key src).

NEXT TRANSITION

Format

READ: 02, EFF, 10
WRITE: 03, EFF, 90, byte3
ANSWER: 03, EFF, 90, byte3

EFF

0x00: M/E

byte

byte3 Next Trans
0x01: BKGD
0x02: KEY
0x03: BKGD + KEY

Action

Changes Next transition.

Example of send message

01 02 00 0a 01 50 20 00 00 03 03 00 90 01 ee 03

TRANSITION TYPE

Format

READ: 04, EFF, 11, byte3, byte4
WRITE: 05, EFF, 91, byte3, byte4, byte5
ANSWER: 05, EFF, 91, byte3, byte4, byte5

EFF

0x00: M/E

byte

byte3 Trans Func
0x00: Effect Trans
0x01: Key Trans

byte4 Key Trans Direction
0x00: (Fixed)

byte5 Trans Type
0x02: MIX
0x04: WIPE
0x08: NAM
0x14: CUT (only Key Trans)
0x20: DME WIPE

Action

Changes transition type.

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 00 91 00 00 02 e8 03

Note

To control WIPE, specify the WIPE number in 0x1B/0x9B: WIPE PATTERN described later and then specify byte5: WIPE in 0x11/0x91: TRANSITION TYPE.
To control DME WIPE, specify the DME WIPE number in 0x1C/0x9C: DME WIPE PATTERN described later and then specify byte5: DME WIPE in 0x11/0x91: TRANSITION TYPE.

TRANSITION RATE

Format

READ: 04, EFF, 18, byte3, byte4
WRITE: 06, EFF, 98, byte3, byte4, byte5, byte6
ANSWER: 06, EFF, 98, byte3, byte4, byte5, byte6

EFF

0x00: M/E
0x01: (Not used)
0x02: Aux1
0x03: Aux2

byte

byte3 Trans Func
0x00: Effect Trans (M/E, Aux1, Aux2)
0x01: Key Trans (M/E)
0x06: Fade to Black (M/E)

byte4 Trans Rate Property
0x00: (Fixed)

byte5 Trans Rate
bit 7 - bit 4: No Used
bit 3 - bit 0: Transition Rate (hundreds place)

byte6 Trans Rate
bit 7 - bit 4: Transition Rate (tens place)
bit 3 - bit 0: Transition Rate (ones place)

Action

Sets transition rate.

Example of send message

01 02 00 0d 01 50 20 00 00 03 06 00 98 00 00 01 17 c9 03

Note

To set the transition rate to 123, specify byte5 and byte6 as follows.
byte5, byte6 = 0x01, 0x23
This setting is effective only for panel operation and GPI operation.

AUTO TRANSITION START

Format

WRITE: 05, EFF, 96, byte3, byte4, byte5

EFF

0x00: M/E
0x01: (Not used)
0x02: Aux1
0x03: Aux2

byte

byte3 Trans Func
0x00: Effect Trans (M/E, Aux1, Aux2)
0x01: Key Trans (M/E)
0x06: Fade to Black (M/E)

byte4 Trans Rate
bit 7 - bit 4: No Used
bit 3 - bit 0: Transition Rate (hundreds place)

byte5 Trans Rate
bit 7 - bit 4: Transition Rate (tens place)
bit 3 - bit 0: Transition Rate (ones place)

Action

Executes Auto transition, Key transition, and FTB.

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 00 96 00 00 00 e5 03

Note

To set the transition rate to 123, specify byte5 and byte6 as follows.
byte5, byte6 = 0x01, 0x23
To execute Cut, set the transition rate to 0.
The rate that is set by TRANSITION RATE command is ignored. (This command is executed at the rate that is set by AUTO TRANSITION START.)

WIPE PATTERN

Format

READ: 03, EFF, 1B, 00
WRITE: 05, EFF, 9B, 00, byte4, byte5
ANSWER: 05, EFF, 9B, 00, byte4, byte5

EFF

0x00: M/E

byte

byte4
bit 7 - bit 4: Wipe Pattern Number (thousands place)
bit 3 - bit 0: Wipe Pattern Number (hundreds place)

byte5
bit 7 - bit 4: Wipe Pattern Number (tens place)
bit 3 - bit 0: Wipe Pattern Number (ones place)

Action

Changes the wipe pattern of Effect transition.

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 00 9b 00 00 01 df 03

Note

To set the pattern number to 24, specify byte4 and byte5 as follows.
byte4, byte5 = 0x00, 0x24

DME WIPE PATTERN

Format

READ: 03, EFF, 1C, 00
WRITE: 05, EFF, 9C, 00, byte4, byte5
ANSWER: 05, EFF, 9C, 00, byte4, byte5

EFF

0x00: M/E

byte

byte4
bit 7 - bit 4: DME Wipe Pattern Number (thousands place)
bit 3 - bit 0: DME Wipe Pattern Number (hundreds place)

byte5
bit 7 - bit 4: DME Wipe Pattern Number (tens place)
bit 3 - bit 0: DME Wipe Pattern Number (ones place)

Action

Changes DME wipe pattern of Effect transition.

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 00 9c 00 10 01 ce 03

Note

To set the pattern number to 1201, specify byte4 and byte5 as follows.
byte4, byte5 = 0x12, 0x01

KEY WIPE PATTERN

Format

READ: 03, EFF, 33, 00
WRITE: 05, EFF, B3, 00, byte4, byte5
ANSWER: 05, EFF, B3, 00, byte4, byte5

EFF

0x00: M/E

byte

byte4
bit 7 - bit 4: Wipe Pattern Number (thousands place)
bit 3 - bit 0: Wipe Pattern Number (hundreds place)

byte5
bit 7 - bit 4: Wipe Pattern Number (tens place)
bit 3 - bit 0: Wipe Pattern Number (ones place)

Action

Changes Key wipe pattern.

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 00 b3 00 00 01 c7 03

Note

To set the pattern number to 24, specify byte4 and byte5 as follows.
byte4, byte5 = 0x00, 0x24

KEY DME WIPE PATTERN

Format

READ: 03, EFF, 1C, 10
WRITE: 05, EFF, 9C, 10, byte4, byte5
ANSWER: 05, EFF, 9C, 10, byte4, byte5

EFF

0x00: M/E

byte

byte4
bit 7 - bit 4: DME Wipe Pattern Number (thousands place)
bit 3 - bit 0: DME Wipe Pattern Number (hundreds place)

byte5
bit 7 - bit 4: DME Wipe Pattern Number (tens place)
bit 3 - bit 0: DME Wipe Pattern Number (ones place)

Action

Changes Key DME wipe pattern.

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 00 9c 10 10 01 be 03

Note

To set the pattern number to 1201, specify byte4 and byte5 as follows.
byte4, byte5 = 0x12, 0x01

WIPE DIRECTION

Format

READ: 03, EFF, 1B, 04
WRITE: 04, EFF, 9B, 04, byte4
ANSWER: 04, EFF, 9B, 04, byte4

EFF

0x00: M/E

byte

byte4
bit 7 - bit 3: No Used
bit 2: REVERSE
bit 1: NORMAL
bit 0: NORMAL/REVERSE

Action

Sets the Wipe direction of Effect transition.

Example of send message

01 02 00 0b 01 50 20 00 00 03 04 00 9b 04 04 da 03

DME WIPE DIRECTION

Note

DME WIPE DIRECTION commands different in byte3 are sent in a pair.

Format

READ: 03, EFF, 1C, 01
WRITE: 04, EFF, 9C, 01, byte4
ANSWER: 04, EFF, 9C, 01, byte4

EFF

0x00: M/E

byte

byte4 Direction
0x00: Normal
0x01: Reverse

Format

READ: 03, EFF, 1C, 02
WRITE: 04, EFF, 9C, 02, byte4
ANSWER: 04, EFF, 9C, 02, byte4

EFF

0x00: M/E

byte

byte4 Direction
0x00: Normal/Reverse Off
0x01: Normal/Reverse On

Action

Sets the DME wipe direction of Effect transition.

Example of send message

01 02 00 0b 01 50 20 00 00 03 04 00 9c 01 01 df 03
01 02 00 0b 01 50 20 00 00 03 04 00 9c 02 01 de 03

KEY WIPE DIRECTION

Format

READ: 03, EFF, 33, 04
WRITE: 04, EFF, B3, 04, byte4
ANSWER: 04, EFF, B3, 04, byte4

EFF

0x00: M/E

byte

byte4
bit 7 - bit 3: No Used
bit 2: REVERSE
bit 1: NORMAL
bit 0: NORMAL/REVERSE

Action

Sets the Key wipe direction.

Example of send message

01 02 00 0b 01 50 20 00 00 03 04 00 b3 04 04 c2 03

KEY DME WIPE DIRECTION

Note

KEY DME WIPE DIRECTION commands different in byte3 are sent in a pair.

Format

READ: 03, EFF, 1C, 11
WRITE: 04, EFF, 9C, 11, byte4
ANSWER: 04, EFF, 9C, 11, byte4

EFF

0x00: M/E

byte

byte4 Direction
0x00: Normal
0x01: Reverse

Format

READ: 03, EFF, 1C, 12
WRITE: 04, EFF, 9C, 12, byte4
ANSWER: 04, EFF, 9C, 12, byte4

EFF

0x00: M/E

byte

byte4 Direction
0x00: Normal/Reverse Off
0x01: Normal/Reverse On

Action

Sets the Key DME wipe direction.

Example of send message

01 02 00 0b 01 50 20 00 00 03 04 00 9c 11 00 d0 03
01 02 00 0b 01 50 20 00 00 03 04 00 9c 12 00 cf 03

SNAPSHOT STORE

Format

WRITE: 05, EFF, 80, byte3, 00, 00
ANSWER: 05, EFF, 80, byte3, 00, 00

EFF

0x21: E-File

byte

byte3 Register Number
0x01: 1
0x01: 2
:
0x14: 20

Action

Stores snapshot in the specified register number (1 to 20).

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 21 80 01 00 00 d9 03

SNAPSHOT RECALL

Format

WRITE: 05, EFF, 90, byte3, 00, 00
ANSWER: 05, EFF, 90, byte3, 00, 00

EFF

0x21: E-File

byte

byte3 Register Number
0x01: 1
0x01: 2
:
0x14: 20

Action

Calls snapshot of the specified register number (1 to 20).

Example of send message

01 02 00 0c 01 50 20 00 00 03 05 21 90 01 00 00 c9 03

4-3. Details of Audio Commands

The CMD/MSG Block consists of “Cmd”, “Data1, Data2...DataN”. The byte count (BC) increases or decreases depending on the data count.
Audio commands are grouped into execution request and status request.
The code shown below is an execution request. The control device sends back ACK “04” to inform the controller of command reception.

Note

To make a status request, set the upper bit of the command byte to 1 with any data.
The current status is sent back in the execution request format from the control device.

Example:

Execution request

Controller: 01 02 00 08 02 50 30 00 00 17 00 01 5e 03
Control device: 04
The controller sends a request for setting “LOW CUT FILTER” to ON and the control device sends back “ACK.”

Status request

Controller: 01 02 00 08 02 50 30 00 00 97 00 01 de 03
Control device: 01 02 00 08 02 50 30 00 00 17 00 01 5f 03
The controller sends a “LOW CUT FILTER” status request and the control device sends back a response showing that “LOW CUT FILTER” is OFF.
At this time, “01 = ON” prior to the checksum of command from the controller is ignored.

CHANNEL FADER

Cmd
0x10

Function
Adjusts the fader level.

Data
Data 0: Fader-1
Data 1: Fader-2
Data 2: Fader-3
Data 3: Fader-4
Data 4: Fader-5
Data 5: Fader-6
Data 6: Reserved
Data 7: Fader-PGM

Action
Performs control equivalent to the channel fader and program fader operations on the operation panel of the unit.

Example of send message
execution request: 01 02 00 0e 02 50 30 00 00 10 00 00 00 00 00 00 00 00 60 03
status request: 01 02 00 0e 02 50 30 00 00 90 00 00 00 00 00 00 00 00 e0 03

Note
Specify the fader level of each channel according to the table “CHANNEL FADER Values” below.
Be careful when using remote operation and panel operation together because this unit is not a moving fader and does not perform synchronization.

CHANNEL FADER Values

Code	Level	Code	Level	Code	Level	Code	Level	Code	Level	Code	Level
0	-∞	44	-41.6 dB	88	-24.6 dB	132	-10.3 dB	176	-3.0 dB	220	4.1 dB
1	-77.1 dB	45	-40.8 dB	89	-24.3 dB	133	-10.0 dB	177	-2.8 dB	221	4.3 dB
2	-76.2 dB	46	-40.0 dB	90	-24.0 dB	134	-9.8 dB	178	-2.6 dB	222	4.5 dB
3	-75.4 dB	47	-39.6 dB	91	-23.6 dB	135	-9.6 dB	179	-2.5 dB	223	4.6 dB
4	-74.5 dB	48	-39.2 dB	92	-23.3 dB	136	-9.5 dB	180	-2.3 dB	224	4.8 dB
5	-73.7 dB	49	-38.8 dB	93	-23.0 dB	137	-9.3 dB	181	-2.1 dB	225	5.0 dB
6	-72.8 dB	50	-38.4 dB	94	-22.6 dB	138	-9.1 dB	182	-2.0 dB	226	5.1 dB
7	-72.0 dB	51	-38.0 dB	95	-22.3 dB	139	-9.0 dB	183	-1.8 dB	227	5.3 dB
8	-71.1 dB	52	-37.6 dB	96	-22.0 dB	140	-8.8 dB	184	-1.6 dB	228	5.5 dB
9	-70.2 dB	53	-37.3 dB	97	-21.6 dB	141	-8.7 dB	185	-1.5 dB	229	5.6 dB
10	-69.4 dB	54	-36.9 dB	98	-21.3 dB	142	-8.5 dB	186	-1.3 dB	230	5.8 dB
11	-68.5 dB	55	-36.5 dB	99	-21.0 dB	143	-8.3 dB	187	-1.1 dB	231	6.0 dB
12	-67.7 dB	56	-36.1 dB	100	-20.6 dB	144	-8.2 dB	188	-1.0 dB	232	6.1 dB
13	-66.8 dB	57	-35.7 dB	101	-20.3 dB	145	-8.0 dB	189	-0.8 dB	233	6.3 dB
14	-66.0 dB	58	-35.3 dB	102	-20.0 dB	146	-7.9 dB	190	-0.6 dB	234	6.5 dB
15	-65.1 dB	59	-35.0 dB	103	-19.6 dB	147	-7.7 dB	191	-0.5 dB	235	6.6 dB
16	-64.2 dB	60	-34.2 dB	104	-19.3 dB	148	-7.5 dB	192	-0.3 dB	236	6.8 dB
17	-63.4 dB	61	-34.2 dB	105	-19.0 dB	149	-7.4 dB	193	-0.1 dB	237	7.0 dB
18	-62.5 dB	62	-33.8 dB	106	-18.7 dB	150	-7.2 dB	194	0 dB	238	7.1 dB
19	-61.7 dB	63	-33.4 dB	107	-18.3 dB	151	-7.0 dB	195	0.1 dB	239	7.3 dB
20	-60.8 dB	64	-33.0 dB	108	-18.0 dB	152	-6.9 dB	196	0.3 dB	240	7.5 dB
21	-60.0 dB	65	-32.6 dB	109	-17.7 dB	153	-6.7 dB	197	0.4 dB	241	7.6 dB
22	-59.2 dB	66	-32.3 dB	110	-17.4 dB	154	-6.6 dB	198	0.6 dB	242	7.8 dB
23	-58.4 dB	67	-31.9 dB	111	-17.0 dB	155	-6.4 dB	199	0.8 dB	243	8.0 dB
24	-57.6 dB	68	-31.5 dB	112	-16.7 dB	156	-6.2 dB	200	0.9 dB	244	8.1 dB
25	-56.8 dB	69	-31.1 dB	113	-16.4 dB	157	-6.1 dB	201	1.1 dB	245	8.3 dB
26	-56.0 dB	70	-30.7 dB	114	-16.1 dB	158	-5.9 dB	202	1.2 dB	246	8.5 dB
27	-55.2 dB	71	-30.3 dB	115	-15.8 dB	159	-5.8 dB	203	1.4 dB	247	8.6 dB
28	-54.4 dB	72	-30.0 dB	116	-15.4 dB	160	-5.6 dB	204	1.6 dB	248	8.8 dB
29	-53.6 dB	73	-29.6 dB	117	-15.1 dB	161	-5.4 dB	205	1.7 dB	249	9.0 dB
30	-52.8 dB	74	-29.3 dB	118	-14.8 dB	162	-5.3 dB	206	1.9 dB	250	9.1 dB
31	-52.0 dB	75	-29.0 dB	119	-14.5 dB	163	-5.1 dB	207	2.0 dB	251	9.3 dB
32	-51.2 dB	76	-28.6 dB	120	-14.1 dB	164	-5.0 dB	208	2.2 dB	252	9.5 dB
33	-50.4 dB	77	-28.3 dB	121	-13.8 dB	165	-4.8 dB	209	2.4 dB	253	9.6 dB
34	-49.6 dB	78	-28.0 dB	122	-13.5 dB	166	-4.6 dB	210	2.5 dB	254	9.8 dB
35	-48.8 dB	79	-27.6 dB	123	-13.2 dB	167	-4.5 dB	211	2.7 dB	255	10.0 dB
36	-48.0 dB	80	-27.3 dB	124	-12.9 dB	168	-4.3 dB	212	2.9 dB		
37	-47.2 dB	81	-27.0 dB	125	-12.5 dB	169	-4.1 dB	213	3.0 dB		
38	-46.4 dB	82	-26.6 dB	126	-12.2 dB	170	-4.0 dB	214	3.2 dB		
39	-45.6 dB	83	-26.3 dB	127	-11.9 dB	171	-3.8 dB	215	3.3 dB		
40	-44.8 dB	84	-26.0 dB	128	-11.6 dB	172	-3.6 dB	216	3.5 dB		
41	-44.0 dB	85	-25.6 dB	129	-11.2 dB	173	-3.5 dB	217	3.7 dB		
42	-43.2 dB	86	-25.3 dB	130	-10.9 dB	174	-3.3 dB	218	3.8 dB		
43	-42.4 dB	87	-25.0 dB	131	-10.6 dB	175	-3.1 dB	219	4.0 dB		

MASTER FADER

Cmd
0x12

Function
Adjusts MIX/AUX master fader level.

Data
Data 0: Channel No.
Data 1: Level (0 to 30)

Action
Performs control equivalent to the MIX/AUX-1/AUX-2 output level change in the SETUP/AUDIO menu.

Example of send message
01 02 00 08 02 50 30 00 00 12 00 1e 46 03

Note
Specify the master fader level of each channel according to the following table “Level Values”.

Channel No. Values

Code	Channel No.
0	MIX-1/2
1	MIX-3/4
2	AUX-1
3	AUX-2

Level Values

Code	Level
0	-∞
1	-60 dB
2	-52 dB
3	-48 dB
4	-44 dB
5	-40 dB
6	-36 dB
7	-32 dB
8	-28 dB
9	-24 dB

Code	Level
10	-20 dB
11	-18 dB
12	-16 dB
13	-14 dB
14	-12 dB
15	-10 dB
16	-8 dB
17	-6 dB
18	-4 dB
19	-2 dB

Code	Level
20	**0 dB**
21	1 dB
22	2 dB
23	3 dB
24	4 dB
25	5 dB
26	6 dB
27	7 dB
28	8 dB
29	9 dB
30	10 dB

Note
The bold set value (0 dB) is factory setting.

MUTE

Cmd
0x13

Function
Selects MUTE ON or OFF.

Data
Data 0: Channel No. (0 to 5)
Data 1: OFF 0 / ON 1

Action
Performs control equivalent to the CH ON button on the operation panel of the unit.

Example of send message
01 02 00 08 02 50 30 00 00 13 00 01 62 03

TRIM

Cmd
0x14

Function
Adjusts the TRIM level.

Data
Data 0: Channel No. (0 to 5)
Data 1: TRIM (0 to 30)

Action
Performs control equivalent to TRIM in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 14 00 00 62 03

Note
Specify the level according to the following table “TRIM Values.”

TRIM Values

Code	Level	Code	Level	Code	Level
0	-15 dB	10	-5 dB	20	5 dB
1	-14 dB	11	-4 dB	21	6 dB
2	-13 dB	12	-3 dB	22	7 dB
3	-12 dB	13	-2 dB	23	8 dB
4	-11 dB	14	-1 dB	24	9 dB
5	-10 dB	**15**	**0 dB**	25	10 dB
6	-9 dB	16	1 dB	26	11 dB
7	-8 dB	17	2 dB	27	12 dB
8	-7 dB	18	3 dB	28	13 dB
9	-6 dB	19	4 dB	29	14 dB
				30	15 dB

Note

The bold set value (0 dB) is factory setting.

LOW CUT FILTER

Cmd
0x17

Function
Enables (ON) or disables (OFF) the low-cut filter.

Data
Data 0: Channel No. (0 to 5)
Data 1: OFF 0 / ON 1

Action
Performs control equivalent to FILTER ON/OFF in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 17 00 00 5f 03

HIGH CUT FILTER

Cmd
0x18

Function
Enables (ON) or disables (OFF) the high-cut filter.

Data
Data 0: Channel No. (0 to 5)
Data 1: OFF 0 / ON 1

Action
Performs control equivalent to FILTER ON/OFF in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 18 00 01 5d 03

EQ LOW IN

Cmd
0x19

Function
Enables (ON) or disables (OFF) the low-frequency set data of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: OFF 0 / ON 1

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 17 00 00 5f 03

EQ LOW FREQUENCY

Cmd
0x1B

Function
Sets low frequency of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: FREQ (0 to 30)

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 1b 00 0f 4c 03

Note
Specify frequency according to the following table “EQ Low Frequency.”

EQ Low Frequency

Code	Frequency	Code	Frequency
0	31.0 Hz	**15**	**114.1 Hz**
1	33.8 Hz	16	124.4 Hz
2	36.8 Hz	17	135.7 Hz
3	40.2 Hz	18	148.0 Hz
4	43.8 Hz	19	161.5 Hz
5	47.8 Hz	20	176.1 Hz
6	52.2 Hz	21	192.1 Hz
7	56.9 Hz	22	209.6 Hz
8	62.1 Hz	23	228.6 Hz
9	67.7 Hz	24	249.3 Hz
10	73.9 Hz	25	272.0 Hz
11	80.6 Hz	26	296.7 Hz
12	87.9 Hz	27	323.6 Hz
13	95.9 Hz	28	353.0 Hz
14	104.6 Hz	29	385.0 Hz
		30	420.0 Hz

Note

The bold set value (114.1 Hz) is factory setting.

EQ LOW GAIN

Cmd
0x1C

Function
Adjusts low-frequency gain of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: GAIN (0 to 30)

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 1c 00 0f 4b 03

Note
Specify gain according to the following table “EQ GAIN.”

EQ GAIN

Code	Gain
0	-15 dB
1	-14 dB
2	-13 dB
3	-12 dB
4	-11 dB
5	-10 dB
6	-9 dB
7	-8 dB
8	-7 dB
9	-6 dB
10	-5 dB
11	-4 dB
12	-3 dB
13	-2 dB
14	-1 dB

Code	Gain
15	**0 dB**
16	1 dB
17	2 dB
18	3 dB
19	4 dB
20	5 dB
21	6 dB
22	7 dB
23	8 dB
24	9 dB
25	10 dB
26	11 dB
27	12 dB
28	13 dB
29	14 dB
30	15 dB

Note

The bold set value (0 dB) is factory setting.

EQ MID IN

Cmd
0x1D

Function
Enables (ON) or disables (OFF) the mid-frequency set data of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: OFF 0 / ON 1

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 1d 00 00 59 03

EQ MID FREQUENCY

Cmd
0x1E

Function
Sets mid frequency of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: FREQ (0 to 30)

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 1e 00 00 58 03

Note
Specify frequency according to the following table “EQ Mid Frequency.”

EQ Mid Frequency

Code	Frequency	Code	Frequency
0	260.0 Hz	**15**	**1.28 kHz**
1	289.2 Hz	16	1.43 kHz
2	321.8 Hz	17	1.59 kHz
3	358.1 Hz	18	1.77 kHz
4	398.5 Hz	19	1.97 kHz
5	443.4 Hz	20	2.20 kHz
6	493.4 Hz	21	2.44 kHz
7	549.0 Hz	22	2.72 kHz
8	610.8 Hz	23	3.03 kHz
9	679.7 Hz	24	3.37 kHz
10	756.3 Hz	25	3.75 kHz
11	841.5 Hz	26	4.17 kHz
12	936.3 Hz	27	4.64 kHz
13	1.04 kHz	28	5.16 kHz
14	1.15 kHz	29	5.75 kHz
		30	6.40 kHz

Note

The bold set value (1.28 kHz) is factory setting.

EQ MID GAIN

Cmd
0x1F

Function
Adjusts mid-frequency gain of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: GAIN (0 to 30)

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 1f 00 0f 48 03

Note
Specify gain according to the following table “EQ GAIN” of EQ LOW GAIN.

EQ HIGH IN

Cmd
0x20

Function
Enables (ON) or disables (OFF) the high-frequency set data of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: OFF 0 / ON 1

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 20 00 01 55 03

EQ HIGH FREQUENCY

Cmd
0x22

Function
Sets high frequency of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: FREQ (0 to 30)

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 22 00 00 54 03

Note
Specify frequency according to the following table “EQ High Frequency.”

EQ High Frequency

Code	Frequency	Code	Frequency
0	1.30 kHz	**15**	**4.75 kHz**
1	1.41 kHz	16	5.18 kHz
2	1.54 kHz	17	5.65 kHz
3	1.68 kHz	18	6.16 kHz
4	1.83 kHz	19	6.72 kHz
5	2.00 kHz	20	7.32 kHz
6	2.18 kHz	21	7.99 kHz
7	2.38 kHz	22	8.71 kHz
8	2.59 kHz	23	9.49 kHz
9	2.83 kHz	24	10.35 kHz
10	3.08 kHz	25	11.29 kHz
11	3.36 kHz	26	12.31 kHz
12	3.66 kHz	27	13.42 kHz
13	4.00 kHz	28	14.63 kHz
14	4.36 kHz	29	15.95 kHz
		30	17.40 kHz

Note

The bold set value (4.75 kHz) is factory setting.

EQ HIGH GAIN

Cmd
0x23

Function
Adjusts high-frequency gain of the equalizer.

Data
Data 0: Channel No. (0 to 5)
Data 1: GAIN (0 to 30)

Action
Performs control equivalent to the equalizer control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 23 00 00 53 03

Note
Specify gain according to the following table “EQ GAIN” of EQ LOW GAIN.

PAN

Cmd
0x33

Function
Adjusts pan.

Data
Data 0: Channel No. (0 to 5)
Data 1: PAN (0 to 30)

Action
Performs control equivalent to the pan control in the ACCESS menu.

Example of send message
01 02 00 08 02 50 30 00 00 33 00 0f 34 03

Note
Specify left/right audio balance according to the following table “PAN Values.”

PAN Values

Code	L: left, R: right
0	15L
1	14L
2	13L
3	12L
4	11L
5	10L
6	9L
7	8L
8	7L
9	6L
10	5L
11	4L
12	3L
13	2L
14	1L

Code	L: left, R: right
15	**0**
16	1R
17	2R
18	3R
19	4R
20	5R
21	6R
22	7R
23	8R
24	9R
25	10R
26	11R
27	12R
28	13R
29	14R
30	15R

Note

The bold set value (0) is the center audio balance.

MONITOR LEVEL

Cmd
0x40

Function
Adjusts monitor level.

Data
Data 0: 0
Data 1: 0 to 255

Action
Performs control equivalent to the monitor level knob on the operation panel of the unit.

Example of send message
01 02 00 08 02 50 30 00 00 40 00 80 b6 03

Note
Specify monitor level according to the table “CHANNEL FADER Values” of CHANNEL FADER.

MONITOR DIM LEVEL IN

Cmd
0x41

Function
Enables (ON) or disables (OFF) the dimmer.

Data
Data 0: 0
Data 1: OFF 0 / ON 1

Action
Performs control equivalent to the DIM button on the operation panel of the unit.

Example of send message
01 02 00 08 02 50 30 00 00 41 00 01 34 03

MONITOR SELECT

Cmd
0x43

Function
Selects a monitor.

Data
Data 0: 0
Data 1: 1: PGM-L/R
2: MIX-L/R
4: AUX-1
5: AUX-2

Action
Performs control equivalent to the MONITOR SEL button on the operation panel of the unit.

Example of send message
01 02 00 08 02 50 30 00 00 43 00 01 32 03

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