Roland

V-4EX
4-CHANNEL VIDEO MIXER

Remote Control Guide

The V-4EX supports remote control via MIDI. This document describes settings for remote control.

Contents

About Control Modes

It is possible to remote control the V-4EX from an external MIDI device like keyboard or send the operation results of the V-4EX to an external MIDI device.

These are the MIDI control modes for the V-4EX.

Standard Mode

This is the exclusive control mode for the V-4EX. It is possible to control the following parameters.

- Audio level
- Audio delay
- Transition select
- Filter/composition effects
- Output fade
- Channel select
- Video fader
- Transformer
- Memory switch

MIDI Visual Control (MVC) Mode

MIDI Visual Control is a world-wide standard added to the MIDI standards to link your musical performances and visual expressions. It is possible to remote control the V-4EX in accordance with the music from an electric musical instrument that supports MIDI visual control.

When you use in this mode, send MIDI Visual Control ON message while the V-4EX is in standard mode. Remote control from a musical instrument is possible.

V-LINK Mode

V-LINK is an exclusive specification of Roland to link your musical performances and visual expressions. It is possible to remote control the V-4EX in accordance with the music from an electric musical instrument that supports V-LINK.

When you use in this mode, send V-LINK ON message while the V-4EX is in standard mode. Remote control from a musical instrument is possible.

* MIDI output is common in all modes.

MIDI Setup Menu

Execute MIDI setup of the V-4EX using the MIDI menu.
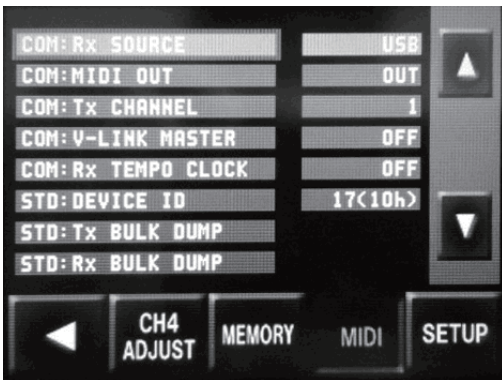
COM:Setup Menu

These set common parameters.

COM:Rx SOURCE

This selects MIDI message receiving connector, USB or MIDI IN.

COM:MIDI OUT

This selects enable of disable the MIDI message thru out. When thru out is enabled, theV-4EX outputs the received MIDI messages and does not output messages generated in the unit.
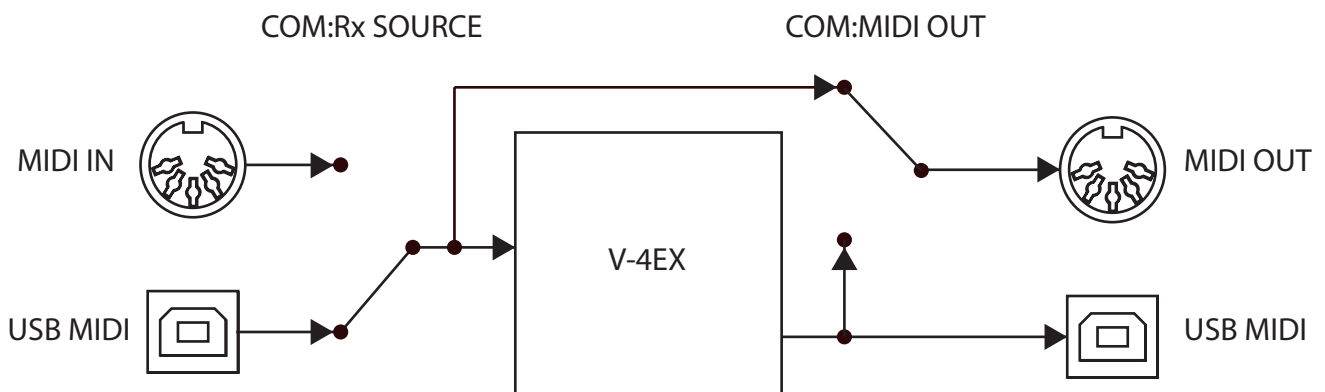
COM:Tx CHANNEL

This selects the output channel when sending out the MIDI messages.

COM:V-LINK MASTER

This turns on/off the V-LINK MASTER (remote control of the Roland V-Mixer).

COM:Rx TEMPO CLOCK

This enables/disables the receiving of MIDI TEMPO CLOCK for BPM SYNC.

STANDARTD SETUP Menu

These set parameters of standard mode.

STD:DEVICE ID

This sets the device ID to receive/send the system exclusive messages. This is also recognized as the device ID of V-LINK MASTER.

STD:Tx BULK DUMP

This sends the V-4EX parameters as the bulk dump output. The device ID is 7Fh (broadcast) in this case.

* MIDI OUT is enabled when COM:MIDI OUT is set to OUT.

STD:Rx BULK DUMP

This receives the V-4EX parameters as the bulk dump input from MIDI.

STD:Rx CHANNEL

This selects the MIDI message receiving channel. When this is turned off, the V-4EX does not receive any channel voice messages.

STD:AUTO TRANSITION

This turns on/off the auto transition feature.

STD:NOTE CTRL MODE

This selects the control mode of input select using note messages.

STD:NOTE CTRL UPPKEY

This sets the upper note number of input select control using note messages. (This works when NOTE CONTROL MODE is turned on.)

STD:NOTE CTRL LOWKEY

This sets the lower note number of input select control using note messages. (This works when NOTE CONTROL MODE is turned on.)

STD:VIDEO FADER

This sets assignment of video fader control.

STD:TRANSITION TIME

This sets assignment of transition time control when AUTO TRANSITION is turned on.

STD:TRANSITION SEL

This sets assignment of transition type control.

STD:TRANSFORMER A

This sets assignment of TRANSFORMER A control (on/off).

STD:TRANSFORMER B

This sets assignment of TRANSFORMER B control (on/off).

STD:BPM/SYNC

This sets assignment of BPM SYNC control (on/off).

STD:AUDIO LEVEL

This sets assignment of audio output volume control.

STD:AUDIO CH1 LEVEL

This sets assignment of CH 1 audio input level control.

STD:AUDIO CH2 LEVEL

This sets assignment of CH 2 audio input level control.

STD:AUDIO CH3 LEVEL

This sets assignment of CH 3 audio input level control.

STD:AUDIO CH4 LEVEL

This sets assignment of CH 4 audio input level control.

STD:AUDIO IN LEVEL

This sets assignment of analog audio input level control.

STD:AUDIO DELAY 1

This sets assignment of output audio delay control.

STD:AUDIO DELAY 2

This sets assignment of audio delay control for analog input.

STD:EFFECTS A1

This sets assignment of A bus effect button 1 control (on/off).

STD:EFFECTS A2

This sets assignment of A bus effect button 2 control (on/off).

STD:EFFECTS A3

This sets assignment of A bus effect button 3 control (on/off).

STD:EFFECTS A4

This sets assignment of A bus effect button 4 control (on/off).

STD:EFFECTS B1

This sets assignment of B bus effect button 1 control (on/off).

STD:EFFECTS B2

This sets assignment of B bus effect button 2 control (on/off).

STD:EFFECTS B3

This sets assignment of B bus effect button 3 control (on/off).

STD:EFFECTS B4

This sets assignment of B bus effect button 4 control (on/off).

STD:OUTPUT FADE

This sets assignment of output fade control.

STD:FREEZE

This sets assignment of FREEZE control (on/off).

MVC SETUP Menu

These set parameters of MIDI Visual Control (MVC) mode. These settings are valid when the unit receives MVC ON message. It is not necessary to change settings normally.

When the value of "DFLT (XXX)" is displayed, it means the default value specified in the standard (in this case, white letters) of the value set by MVC setup message (in this case, light blue letters). The value set by the MVC setup message returns to the default by receiving the MVC OFF message or turning off the power of the V-4EX.

If the value other than DFLT is set using the menu, the V-4EX ignores the MVC setup message and the value set using menu takes priority.

MVC:DEVICE ID

This sets device ID to receive MVC messages.

MVC:CLIP CTRL CH

This sets the receiving channel for input select.

MVC:AUTO TRANSITION

This turns on/off the AUTO TRANSITION feature. Normally, turn this on.

* As this is an out of standard parameter, you cannot select DFLT.

MVC:NOTE CTRL MODE

This selects the control mode of input select using note messages.

MVC:NOTE CTRL UPPKEY

This sets the upper note number of input select control using note messages.

MVC:NOTE CTRL LOWKEY

This sets the lower note number of input select control using note messages.

MVC:VIDEO FADER

This sets assignment of video fader control.

* As this is an out of standard parameter, you cannot select DFLT.

MVC:TRANSITION TIME

This sets assignment of transition time control.

MVC:TRANSITION SEL

This sets assignment of transition type control.

* As this is an out of standard parameter, you cannot select DFLT.

MVC:BPM/SYNC

This sets assignment of BPM SYNC control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:AUDIO LEVEL CTRL

This sets assignment of audio output volume control.

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECT CTRL CH

This selects the receiving channel for effect/output fade control.

MVC:EFFECTS A1

This sets assignment of A bus effect button 1 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECTS A2

This sets assignment of A bus effect button 2 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECTS A3

This sets assignment of A bus effect button 3 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECTS A4

This sets assignment of A bus effect button 4 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECTS B1

This sets assignment of B bus effect button 1 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECTS B2

This sets assignment of B bus effect button 2 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECTS B3

This sets assignment of B bus effect button 3 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:EFFECTS B4

This sets assignment of B bus effect button 4 control (on/off).

* As this is an out of standard parameter, you cannot select DFLT.

MVC:OUTPUT FADE CTRL

This sets assignment of output fade control.

* As this is an out of standard parameter, you cannot select DFLT.

V-LINK SETUP Menu

These set parameters of V-LINK mode. These settings are valid when the unit receives V-LINK ON message. It is not necessary to change settings normally.

When the value of "DFLT (XXX)" is displayed, it means the default value specified in the standard (in this case, white letters) of the value set by V-LINK setup message (in this case, light blue letters). The value set by the V-LINK setup message returns to the default by receiving the V-LINK OFF message or turning off the power of the V-4EX.

If the value other than DFLT is set using the menu, the V-4EX ignores the V-LINK setup message and the value set using menu takes priority.

V-L:DEVICE ID

This sets device ID to receive V-LINK messages.

V-L:CLIP CTRL CH

This sets the receiving channel for input select.

V-L:AUTO TRANSITION

This turns on/off the AUTO TRANSITION feature.

V-L:NOTE CTRL MODE

This selects the control mode of input select using note messages.

V-L:NOTE CTRL UPPKEY

This sets the upper note number of input select control using note messages.

V-L:NOTE CTRL LOWKEY

This sets the lower note number of input select control using note messages.

V-L:VIDEO FADER

This sets assignment of video fader control.

V-L:TRANSITION TIME

This sets assignment of transition time control.

V-L:TRANSITION SEL

This sets assignment of transition type control.

V-L:TRANSFORMER A

This sets assignment of TRANSFORMER A control (on/off).

V-L:TRANSFORMER B

This sets assignment of TRANSFORMER B control (on/off).

V-L:BPM/SYNC

This sets assignment of BPM SYNC control (on/off).

V-L:AUDIO LEVEL CTRL

This sets assignment of audio output volume control.

V-L:COLOR CTRL CH

This receiving channel of effect/output fade control.

V-L:EFFECTS A1

This sets assignment of A bus effect button 1 control (on/off).

V-L:EFFECTS A2

This sets assignment of A bus effect button 2 control (on/off).

V-L:EFFECTS A3

This sets assignment of A bus effect button 3 control (on/off).

V-L:EFFECTS A4

This sets assignment of A bus effect button 4 control (on/off).

V-L:EFFECTS B1

This sets assignment of B bus effect button 1 control (on/off).

V-L:EFFECTS B2

This sets assignment of B bus effect button 2 control (on/off).

V-L:EFFECTS B3

This sets assignment of B bus effect button 3 control (on/off).

V-L:EFFECTS B4

This sets assignment of B bus effect button 4 control (on/off).

V-L:OUTPUT FADE CTRL

This sets assignment of output fade control.

Receiving Remote Control

Receiving in Standard Mode

Execute the following settings to receive remote control.

STANDARD SETUP   : Rx CHANNEL (Set this according to the master device).

You can control the following operations from an external MIDI device.

- Video channel select
- Video fader operation
- Transition time
- Transition type
- Turning on/off the TRANSFORMERS
- Turning on/off the BPM SYNC
- Level settings of HDMI audio (CH1-4) and analog input
- Volume setting of audio output
- Audio delay setting
- Turning on/off the video effects (filter/composition)
- Output fade setting
- Turning on/off the FREEZE feature

* When the AUTO TRANSITION is turned on, control the video channel select on A bus only.
* When the AUTO TRANSITION is turned on, do not operate on the unit's panel.
* When the AUTO TRANSITION is turned on, the MIDI device cannot recognize the current output bus (A or B). If an effect is applied while it is turned on, it may result in an unexpected video output.

cf.

Refer to "MIDI Implementations" (p. 14) for corresponding MIDI messages.

Receiving in MVC Mode

Execute the following settings to receive remote control.

MVC SETUP   : DEVICE ID (Set this according to the master device).

You can control the following operations from MVC compatible device when the V-4EX receives MVC ON message.

- Video channel select
- Video fader operation
- Transition time
- Transition type
- Turning on/off the BPM SYNC
- Volume setting of audio output
- Output fade setting

* When the AUTO TRANSITION is turned on, control the video channel select on A bus only.
* When the AUTO TRANSITION is turned on, do not operate on the unit's panel.
* When the AUTO TRANSITION is turned on, the MIDI device cannot recognize the current output bus (A or B). If an effect is applied while it is turned on, it may result in an unexpected video output.

cf.

Refer to "MIDI Implementations" (p. 14) for corresponding MIDI messages.

Receiving in V-LINK Mode

Execute the following settings to receive remote control.

V-LINK SETUP   : DEVICE ID (Set this according to the master device).

You can control the following operations from V-LINK compatible device when the V-4EX receives V-LINK ON message.

* Video channel select
* Video fader operation
* Transition time
* Transition type
* Turning on/off the TRANSFORMERS
* Turning on/off the BPM SYNC
* Turning on/off the video effects
* Volume setting of audio output
* Output fade setting

* When the AUTO TRANSITION is turned on, control the video channel select on A bus only.

* When the AUTO TRANSITION is turned on, do not operate on the unit's panel.

* When the AUTO TRANSITION is turned on, the MIDI device cannot recognize the current output bus (A or B). If an effect is applied while it is turned on, it may result in an unexpected video output.

> **cf.**

Sending MIDI Messages

Execute the following settings to send MIDI messages to an external MIDI device.

COMMON SETUP   : MIDI OUT (Set this to OUT)

COMMON SETUP   : Tx CHANNEL (Select a Tx channel)

The V-4EX can send MIDI messages corresponding to the following panel operations.

- Input select
- Video fader operations
- Transition time setting
- Transition type select
- Turning on/off the TRANSFORMERS
- Turning on/off the BPM SYNC
- Level settings of HDMI audio (CH1-4) and analog input
- Volume setting of audio output
- Audio delay setting
- Turning on/off the video effects (filter/composition)
- Output fade setting
- Turning on/off the FREEZE feature

* Operations using an external MIDI device is also sent as MIDI messages.

cf.

Refer to "MIDI Implementations" (p. 14) for corresponding MIDI messages.

MIDI Implementations

Model : V-4EX

Version : 1.000

Date : March 1. 2013

Symbol	Item	Setting Range
n:	MIDI Channel	0H-FH(ch.1 - ch.16)
vv:	Control Value, Velocity Value etc.	00H-7FH(0 - 127)
		* If note on velocity, it changes to 01H-7FH (1 - 127).
		* If there is center value, 40H(64) should be the center.
kk:	Note Number	00H-7FH(0 - 127)
xx:	Turning ON/OFF	00H-3FH(0 - 63):OFF
		40H-7FH(64 - 127):ON

1. MIDI Messages Received at MIDI IN

1-1. Standard Mode

If MENU > MIDI > STD:Rx CHANNEL is turned off (factory default), the V-4EX does not receive the following messages.

Channel Voice Message

Note On

Status	2nd Byte	3rd Byte
9nH	kkH	vvH

* This is received when MENU > MIDI > STD:NOTE CTRL MODE is turned on.

* Selects the video input channel corresponding to the note number.

* The range of note numbers is fixed by MENU > MIDI > STD:NOTE CTRL UPPKEY/LOWKEY.

* Ignores unavailable note number and velocity.

Control Change

Bank Select (Controller Number 0, 32)

Status	2nd Byte	3rd Byte
BnH	00H	mmH
BnH	20H	llH

mm,ll = Bank Number : 00 00H - 7F 7FH (bank.1 - bank.16384)

* The bank select processing is reserved until the unit receives program change.

* If unavailable bank select is received, the unit ignores it and receives program change only.

* The received bank select information is withheld until the unit receives new bank select.

* Selects a video input channel or a memory setup.

Corresponding controls to bank select/program change.

Bank Select	Program No. MSB	LSB	Control
00H	00H	00H - 03H	A ch. INPUT 1 - 4
01H	00H	00H - 03H	B ch. INPUT 1 - 4
50H	00H	00H - 07H	MEMORY 1 - 8

General Purpose Controllers (Controller Number 1-31, 64-95)

Status	2nd Byte	3rd Byte
BnH	ccH	vvH

cc = controller number : 01H-1FH, 40H-5FH

* You can assign controls as follows. No control is assigned by factory default.

- Video fader control
- Transition time when MIDI > STD:AUTO TRANSITION is turned on.
- Transition type
- Transformer A/B control
- BPM/SYNC control
- AUDIO LEVEL control
- AUDIO CH1-4 LEVEL control
- AUDIO IN LEVEL control
- AUDIO DELAY 1-2 control
- Effect A1-A4/B1-B4 control
- Output fade control
- FREEZE control

Program Change

Status	2nd Byte
CnH	ppH

pp = program number : 00H - 7FH(prog.1 - prog.128)

* Selects a video input or a memory setup. For details, refer to the bank select explanation.

* If unavailable program change is received, the unit ignores.

Channel Pressure

Status	2nd Byte
DnH	vvH

* You can assign controls as follows. No control is assigned by factory default.

- Video fader control
- Transition time when MIDI > STD:AUTO TRANSITION is turned on.
- Transition type
- Transformer A/B control
- BPM/SYNC control
- AUDIO LEVEL control
- AUDIO CH1-4 LEVEL control
- AUDIO IN LEVEL control
- AUDIO DELAY 1-2 control
- Effect A1-A4/B1-B4 control
- Output fade control
- FREEZE control

Pitch Bend Change

Status	2nd Byte	3rd Byte
EnH	llH	mmH

mm,ll = pitch bend value : 00 00H - 40 00H - 7F 7FH(-8192 - 0 - +8191)

* You can assign controls as follows. No control is assigned by factory default.
* Video fader control
* Transition time when MIDI > STD:AUTO TRANSITION is turned on.
* Transition type
* Transformer A/B control
* BPM/SYNC control
* AUDIO LEVEL control
* AUDIO CH1-4 LEVEL control
* AUDIO IN LEVEL control
* AUDIO DELAY 1-2 control
* Effect A1-A4/B1-B4 control
* Output fade control
* FREEZE control

1-2. MIDI Visual Control Mode

Channel Voice Message

Note On

Status	2nd Byte	3rd Byte
9nH	kkH	vvH

* This is received when Note Message Enabled of MVC is turned on.
* Selects the video input channel corresponding to the note number.
* The range of note numbers is fixed by MENU > MIDI > STD:NOTE CTRL UPPKEY/LOWKEY.
* Ignores unavailable note number and velocity.
* The receiving channel is specified by Clip Control Ch. of MVC.

Control Change

Bank Select (Controller Number 0, 32)

Status	2nd Byte	3rd Byte
BnH	00H	mmH
BnH	20H	llH

mm,ll = bank number : 00 00H - 7F 7FH (bank.1 - bank.16384)

* The bank select processing is reserved until the unit receives program change.
* If unavailable bank select is received, the unit ignores it and receives program change only.
* The received bank select information is withheld until the unit receives new bank select.
* The receiving channel is specified by Clip Control Ch. of MVC.
* Selects a video input channel or a memory setup.

Corresponding controls to bank select/program change.

Bank Select	Program No. MSB	LSB	Control
00H	00H	00H - 03H	A ch. INPUT 1 - 4
01H	00H	00H - 03H	B ch. INPUT 1 - 4
50H	00H	00H - 07H	MEMORY 1 - 8

General Purpose Controllers (controller number 1-31, 64-95)

Status	2nd Byte	3rd Byte
BnH	ccH	vvH

cc = controller number : 01H-1FH, 40H-5FH

* You can assign controls as follows using various parameters of MVC. By default, it is set to MVC standard status.
• Video fader control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Transition time
• Transition type (Out of range parameter for MVC. Available in the V-4EX menu only.)
• BPM/SYNC control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• AUDIO LEVEL control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Effect A1-A4/B1-B4 control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Output fade control (Out of range parameter for MVC. Available in the V-4EX menu only.)

MEMO

The receiving channel of effect control and output fade control is specified by Effect Control Ch. of MVC. The receiving channel for all the other controls is specified by Clip Control Ch. of MVC.

Program Change

Status	2nd Byte
CnH	ppH

pp = program number : 00H - 7FH(prog.1 - prog.128)

* Selects a video input or a memory setup. For details, refer to the bank select explanation.
* The receiving channel is specified by Clip Control Ch. of MVC.
* If unavailable program change is received, the unit ignores.

Channel Pressure

Status	2nd Byte
DnH	vvH

* You can assign controls as follows using various parameters of MVC. By default, it is set to MVC standard status.
• Video fader control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Transition time
• Transition type (Out of range parameter for MVC. Available in the V-4EX menu only.)
• BPM/SYNC control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• AUDIO LEVEL control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Effect A1-A4/B1-B4 control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Output fade control (Out of range parameter for MVC. Available in the V-4EX menu only.)

MEMO

The receiving channel of effect control and output fade control is specified by Effect Control Ch. of MVC. The receiving channel for all the other controls is specified by Clip Control Ch. of MVC.

Pitch Bend Change

Status	2nd Byte	3rd Byte
EnH	llH	mmH

mm,ll = pitch bend value : 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

* You can assign controls as follows using various parameters of MVC. By default, it is set to MVC standard status.
• Video fader control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Transition time
• Transition type (Out of range parameter for MVC. Available in the V-4EX menu only.)
• BPM/SYNC control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• AUDIO LEVEL control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Effect A1-A4/B1-B4 control (Out of range parameter for MVC. Available in the V-4EX menu only.)
• Output fade control (Out of range parameter for MVC. Available in the V-4EX menu only.)

MEMO

The receiving channel of effect control and output fade control is specified by Effect Control Ch. of MVC. The receiving channel for all the other controls is specified by Clip Control Ch. of MVC.

1-3. V-LINK Mode

Channel Voice Message

Note On

Status	2nd Byte	3rd Byte
9nH	kkH	vvH

* This is received when Note Message Enabled of V-LINK is set to 49 Keys or Assignable.

* Selects the video input channel corresponding to the note number.

* In case of Assignable, the range of note numbers is fixed by MENU > MIDI > STD:NOTE CTRL UPPKEY/LOWKEY.

* The receiving channel is specified by Clip Control Ch. of V-LINK.

* In case of 49 Keys, input channels corresponding to note numbers are :-

Note No.	Input
24H	A Ch. 1
26H	A Ch. 2
28H	A Ch. 3
29H	A Ch. 4
2BH	B Ch. 1
2DH	B Ch. 2
2FH	B Ch. 3
30H	B Ch. 4

* Ignores unavailable note number and velocity.

Control Change

Bank Select (controller number 0, 32)

Status	2nd Byte	3rd Byte
BnH	00H	mmH
BnH	20H	llH

mm,ll = bank number : 00 00H - 7F 7FH (bank.1 - bank.16384)

* The bank select processing is reserved until the unit receives program change.

* If unavailable bank select is received, the unit ignores it and receives program change only.

* The received bank select information is withheld until the unit receives new bank select.

* The receiving channel is specified by Clip Control Ch. of V-LINK.

* Selects a video input channel or a memory setup.

Corresponding controls to bank select/program change.

Bank Select	Program No. MSB	LSB	Control
00H	00H	00H - 03H	A ch. INPUT 1 - 4
01H	00H	00H - 03H	B ch. INPUT 1 - 4
50H	00H	00H - 07H	MEMORY 1 - 8

General Purpose Controllers (controller number 1-31, 64-95)

Status	2nd Byte	3rd Byte
BnH	ccH	vvH

cc = controller number : 01H-1FH, 40H-5FH

* You can assign controls as follows using various parameters of MVC. By default, it is set to V-LINK standard status.

- • - Video fader control
- • - Transition time
- • - Transition type
- • - TRANSFORMER A/B control
- • - BPM/SYNC control
- • - AUDIO LEVEL control
- • - Effect A1-A4/B1-B4 control
- • - Output fade control

(MEMO)

The receiving channel of effect control and output fade control is specified by Color Control Ch. of V-LINK. The receiving channel for all the other controls is specified by Clip Control Ch. of V-LINK.

Program Change

Status	2nd Byte
CnH	ppH

pp = program number : 00H - 7FH(prog.1 - prog.128)

* Selects a video input or a memory setup. For details, refer to the bank select explanation.
* The receiving channel is specified by Clip Control Ch. of V-LINK.
* If unavailable program change is received, the unit ignores.

Channel Pressure

Status	2nd Byte
DnH	vvH

* You can assign controls as follows using various parameters of MVC. By default, it is set to V-LINK standard status.

- • Video fader control
- • Transition time
- • Transition type
- • TRANSFORMER A/B control
- • BPM/SYNC control
- • AUDIO LEVEL control
- • Effect A1-A4/B1-B4 control
- • Output fade control

(MEMO)

The receiving channel of effect control and output fade control is specified by Color Control Ch. of V-LINK. The receiving channel for all the other controls is specified by Clip Control Ch. of V-LINK.

Pitch Bend Change

Status	2nd Byte	3rd Byte
EnH	llH	mmH

mm,ll = pitch bend value : 00 00H - 40 00H - 7F 7FH (-8192 - 0 - +8191)

*   You can assign controls as follows using various parameters of MVC. By default, it is set to V-LINK standard status.

•   Video fader control

•   Transition time

•   Transition type

•   TRANSFORMER A/B control

•   BPM/SYNC control

•   AUDIO LEVEL control

•   Effect A1-A4/B1-B4 control

•   Output fade control

(MEMO)

The receiving channel of effect control and output fade control is specified by Color Control Ch. of V-LINK. The receiving channel for all the other controls is specified by Clip Control Ch. of V-LINK.

1-4. Common for All Modes

System Realtime Messages

Active Sensing

Status
FEH

*   When the unit receives active sensing, the unit status changes to observe the message intervals. In this status, the unit executes receiving error process if a message interval exceeds 400 msec. Then the unit returns to status of no interval observation.

*   This is not received if USB is selected in MIDI > COM:Rx SOURCE.

Timing Clock

Status
F8H

*   Synchronizes the BPM SYNC when MENU > MIDI > COM:Rx TEMPO CLOCK is turned on.

Start

Status
FAH

*   This specifies the first beat of BPM SYNC when MENU > MIDI > COM:Rx TEMPO CLOCK is turned on.

Continue

Status
FBH

*   This specifies the first beat of BPM SYNC when MENU > MIDI > COM:Rx TEMPO CLOCK is turned on.

@4 System Exclusive Message

Status	Data Byte	Status
F0H	iiH,ddH,...,eeH	F7H

- • F0H: Status of System Exclusive Message
- • ii = ID number: This is the ID to recognize manufacturer of the exclusive message (manufacturer ID). The manufacturer ID of Roland is 41H. The ID numbers of 7EH and 7FH are expansion of MID standards and used as universal non-realtime message (7EH) of universal realtime message (7FH).
- • dd,...,ee = data: 00H - 7FH (0 - 127)
- • F7H: EOX (end of exclusive)

Data Request 1 (RQ1)

This is the message to request of "send data" to the connected device. Specify data type and amount using address and size. When this is received, the unit sends the requested data as "Data Set 1 (DT1)" message in case the unit is in status where the sending of data is possible and requested address and size are appropriate. If not, the unit sends nothing.

Status	Data Byte	Status
F0H	41H, dev, 00H, 00H, 6fH, 11H, aaH, bbH, ccH, ssH, ttH, uuH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
dev	Device ID (dev : 00H - 1FH, 10H is default)
00H	Model ID upper byte (V-4EX)
00H	Model ID middle byte (V-4EX)
6fH	Model ID lower byte (V-4EX)
11H	Command ID (RQ1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ssH	Size upper byte
ttH	Size middle byte
uuH	Size lower byte
sum	Checksum
F7H	EOX (end of exclusive)

* Depending on the data type, the amount of single-time transmission is specified. It is necessary to execute data request according to the specified first address and size. Refer to the "Parameter Address Map" for address and size.

* See "Exclusive Message and Checksum Calculation" () for checksum.

Data Set 1 (DT1)

This is the message of actual data transmission. Use this when you want to set data to the unit.

Status	Data Byte	Status
F0H	41H, dev, 00H, 00H, 6fH, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
dev	Device ID (dev : 00H - 1FH, 10H is default)
00H	Model ID upper byte (V-4EX)
00H	Model ID middle byte (V-4EX)
6fH	Model ID lower byte (V-4EX)
11H	Command ID (RQ1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ddH	Data : actual data to transmit. Multiple byte data is sent in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (end of exclusive)

* Depending on the data type, the amount of single-time transmission is specified. It is necessary to execute data request according to the specified first address and size. Refer to the "Parameter Address Map" for address and size.

* See "Exclusive Message and Checksum Calculation" (p. 32) for checksum.

* Data exceeding 256 bytes should be divided into packets of 256 bytes or smaller. If you send data set 1 successively, set interval of 20 ms or longer between packets.

MIDI Visual Control Message

Status	Data Byte	Status
F0H	7EH, dev, 0CH, 01H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	System Exclusive Status
7EH	Universal system exclusive non-realtime header
dev	Device ID (dev:00H - 1FH; MVC default = 00H)
0CH	Sub ID#1 (MIDI Visual Control)
01H	Sub ID#2 (MVC command set ID; 01H = "Version 1.0")
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ddH	Data : actual data to transmit. Multiple byte data is sent in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (End of exclusive)

* Depending on the data type, the amount of single-time transmission is specified. The data other than specified first address and size is not received. Refer to "3-2. MIDI Visual Control" (p. 28) for address and size.

* See "Exclusive Message and Checksum Calculation" (p. 32) for checksum.

* Data exceeding 256 bytes should be divided into packets of 256 bytes or smaller. If you send data set 1 successively, set interval of 20 ms or longer between packets.

V-LINK Message

Status	Data Byte	Status
F0H	41H, dev, 00H, 51H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
dev	Device ID (dev:00H - 1FH; default 10H)
00H	Model ID upper byte (V-LINK)
51H	Model ID lower byte (V-LINK)
12H	Command ID (DT1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ddH	Data : actual data to transmit. Multiple byte data is sent in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (End of exclusive)

* Depending on the data type, the amount of single-time transmission is specified. The data other than specified first address and size is not received. Refer to "3-3. V-LINK" (p. 29) for address and size.

* See "Exclusive Message and Checksum Calculation" (p. 32) for checksum.

* Data exceeding 256 bytes should be divided into packets of 256 bytes or smaller. If you send data set 1 successively, set interval of 20 ms or longer between packets.

2. MIDI Messages Transmitted from MIDI OUT

2-1. Transmission of Received Messages

When COM:MIDI OUT is set to THRU, the unit transmits the received messages from MIDI OUT.

2-2. Messages Generated and Transmitted

The unit always transmits the messages generated in the unit from USB MIDI. These messages are also transmitted from MIDI OUT when COM:MIDI OUT is set to OUT.

Channel Voice Message

Note Off

Status	2nd Byte	3rd Byte
8nH	kkH	40H

* Same note number is transmitted when note on is transmitted.

Note On

Status	2nd Byte	3rd Byte
9nH	kkH	40H

* This is transmitted when MENU > MIDI > STD:NOTE CTRL MODE is turned on.

* Corresponding note number is transmitted when video switching is happened.

* The range of note number is specified by MENU > MIDI > STD:NOTE CTRL UPPKEY/LOWKEY.

Control Change

Bank Select (controller number 0, 32)

Status	2nd Byte	3rd Byte
BnH	00H	mmH
BnH	20H	llH

mm,ll = bank number : 00 00H, 01 00H (bank.1, bank.2)

* When video input or memory setup is selected, bank number is transmitted prior to the program change.

Controls corresponding to bank select/program change.

Bank Select	Program No. MSB	LSB	Control
00H	00H	00H - 03H	A ch. INPUT 1 - 4
01H	00H	00H - 03H	B ch. INPUT 1 - 4
50H	00H	00H - 07H	MEMORY 1 - 8

General Purpose Controllers (controller number 1-31, 64-95)

Status	2nd Byte	3rd Byte
BnH	ccH	vvH

cc = controller number : 01H-1FH, 40H-5FH

* This is sent when assigned control is carried out. You can assign the following controls (same as standard mode setup). By default, nothing is assigned.

- Video fader control
- Transition time when MIDI > STD:AUTO TRANSITION is turned on.
- Transition type
- TRANSFORMER A/B control
- BPM/SYNC control
- AUDIO LEVEL control
- AUDIO CH1-4 LEVEL control
- AUDIO IN LEVEL control
- AUDIO DELAY 1-2 control
- Effect A1-A4/B1-B4 control
- Output fade control
- FREEZE control

Program Change

Status	2nd Byte
CnH	ppH

pp = program Number : 00H - 7FH (1 - 128)

* When video input or memory setup is selected, program number is transmitted together with bank select. See bank select for details.

System Realtime Messages

Active Sensing

Status
FEH

* Transmitted with approx 250 ms interval.
* Not transmitted to USB MIDI.

System Exclusive Message

Status	Data Byte	Status
F0H	iiH,ddH,...,eeH	F7H

- F0H :   Status of system exclusive message
- ii = ID number :   This is the ID to recognize manufacturer of the exclusive message (manufacturer ID). The manufacturer ID of Roland is 41H. The ID numbers of 7EH and 7FH are expansion of MID standards and used as universal non-realtime message (7EH) of universal realtime message (7FH).
- dd,...,ee = data :   00H - 7FH (0 - 127)
- F7H :   EOX (end of exclusive)

Data Set 1 (DT1)

This is the message of actual data transmission. Use this when you want to set data to the unit.

Status	Data Byte	Status
F0H	41H, dev, 00H, 00H, 6fH, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
dev	Device ID (dev:00H - 1FH, default is 10H)
00H	Model ID upper byte (V-4EX)
00H	Model ID middle byte (V-4EX)
6fH	Model ID lower byte (V-4EX)
12H	Command ID (DT1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ddH	Data : actual data to transmit. Multiple byte data is sent in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (end of exclusive)

* Data exceeding 256 bytes should be divided into packets of 256 bytes or smaller. Then send with interval of 20 ms or longer.

V-LINK Message

Status	Data Byte	Status
F0H	41H, dev, 00H, 51H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

Byte	Explanation
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
dev	Device ID (dev:00H - 1FH; default 10H)
00H	Model ID upper byte (V-LINK)
51H	Model ID lower byte (V-LINK)
12H	Command ID (DT1)
aaH	Address upper byte
bbH	Address middle byte
ccH	Address lower byte
ddH	Data : actual data to transmit. Multiple byte data is sent in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (end of exclusive)

* Data exceeding 256 bytes should be divided into packets of 256 bytes or smaller. Then send with interval of 20 ms or longer.

3. Parameter Address Map

3-1. Standard(original for the V-4EX)

Start Address	Description
00H 00H 00H	Reserved
70H 00H 00H	System Information Area (See 3-1-1)
7FH 00H 00H	Memory Dump Area (See 3-1-2)

3-1-1. System Information

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
70H 00H 00H	System Version String (1)	00H - 7FH	ASCII Character (Read Only)
70H 00H 01H	System Version String (2)	00H - 7FH	ASCII Character (Read Only)
70H 00H 02H	System Version String (3)	00H - 7FH	ASCII Character (Read Only)
70H 00H 03H	System Version String (4)	00H - 7FH	ASCII Character (Read Only)
70H 00H 04H	System Version String (5)	00H - 7FH	ASCII Character (Read Only)
70H 00H 05H	System Version String (6)	00H - 7FH	ASCII Character (Read Only)
70H 00H 06H	System Version String (7)	00H - 7FH	ASCII Character (Read Only)
70H 00H 07H	System Version String (8)	00H - 7FH	ASCII Character (Read Only)
70H 00H 08H	Reserved		
70H 00H 10H	System Device Mode	00H	00H: Normal (Read Only)

3-1-2. Memory Dump Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
7FH 00H 00H	Memory Dump Area	00H - 7FH	Memory Image of Settings Used by STD:Tx/Rx BULK DUMP Menu
7FH 7FH 7FH			

* Only the data transmitted with MIDI > STD:Tx BULK DUMP is received using MIDI > STD:Rx BULK DUMP.

* Nothing is transmitted if this area is specified using RQ1 system exclusive message.

* If Bulk Dump of different system software version is received, an error may occur.

3-2. MIDI Visual Control

Start Address	Description
10H 00H 00H	System Preference Area (See 3-2-1)
10H 10H 00H	Clip Control Assignment Area (See 3-2-2)
10H 30H 00H	Clip Control Preference Area (See 3-2-3)

* MVC messages are ignored if received while MVC is turned OFF.

* If MVC ON is received after reception of V-LINK ON, the unit changes from V-LINK mode to MVC mode.

* The settings executed using MVC messages are not saved to internal memory.

* Default MVC settings as follows.

Parameter	Assign	Value (status)
Clip Control Ch.	-	1
Effect Control Ch.	-	1
Auto Transition	-	ON
Note Control	-	OFF
Transition Time	CC#05	0
Keyboard Range Lower	-	36
Keyboard Range Upper	-	84

MEMO

Send data divided into 2 parts for the address with "#", upper nibble (upper 4 bits) and lower nibble (lower 4 bits).

Example)

If the data you are transmitting is BCH, send 0BH as the first byte, then send 0CH. When receiving, if the unit does not receive consecutive 2 byte, such data transmission is ignored.

3-2-1. System Preference Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
10H 00H 00H	MIDI Visual Control ON/OFF	00H - 01H	OFF, ON
10H 00H 01H	Clip Control Rx MIDI Ch.	00H - 10H	1 - 16 Ch., OFF
10H 00H 02H	Effect Control Rx MIDI Ch.	00H - 10H	1 - 16 Ch., OFF
10H 00H 03H	Note Mode Enabled	00H - 01H	OFF, ON

3-2-2. Clip Control Assignment Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#10H 10H 02H	Dissolve Time Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Transition Time : Control Change, After touch, Pitch Bend, OFF

3-2-3. Clip Control Preference Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
10H 30H 02H	Keyboard Range Lower	00H - 7FH	Note Number
10H 30H 03H	Keyboard Range Upper	00H - 7FH	Note Number

3-3. V-LINK

Start Address	Description
10H 00H 00H	System Preference Area (See 3-3-1)
10H 10H 00H	Clip Control Assignment Area (See 3-3-2)
10H 20H 00H	Color Control Assignment Area (See 3-3-3)
10H 30H 00H	Clip Control Preference Area (See 3-3-4)

* V-LINK messages are ignored if received while V-LINK is turned OFF.

* If V-LINK ON is received after reception of MVC ON, the unit changes from MVC mode to V-LINK mode.

* The settings executed using V-LINK messages are not saved to internal memory.

* Default V-LINK settings as follows.

Parameter	Assign	Value (status)
Clip Control Ch.	-	1
Color Control Ch.	-	1
Auto Transition	-	ON
Note Control	-	OFF
Transition Time	CC#05	0
Transition Type Sel.	OFF	-
Transformer A/B	OFF	-
BPM SYNC	OFF	-
Audio Level	OFF	-
Video Fader (T Bar)	OFF	-
Effect Control A1-A4	OFF	-
Effect Control B1-B4	OFF	-
Output Fade	OFF	-
Keyboard Range Lower	-	36
Keyboard Range Upper	-	84

MEMO

Send data divided into 2 parts for the address with "#", upper nibble (upper 4 bits) and lower nibble (lower 4 bits).

Example)

If the data you are transmitting is BCH, send 0BH as the first byte, then send 0CH. When receiving, if the unit does not receive consecutive 2 byte, such data transmission is ignored.

3-3-1. System Preference Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
10H 00H 00H	V-LINK ON/OFF	00H - 01H	OFF, ON
10H 00H 01H	Clip Contorl Rx MIDI Channel	00H - 10H	1 - 16 Ch., OFF
10H 00H 02H	Color Control Rx MIDI Channel	00H - 10H	1 - 16 Ch., OFF
10H 00H 03H	Note Mode Enabled	00H, 02H	OFF, Assignable
10H 00H 07H	Auto Mix Mode (Auto Transition)	00H - 01H	OFF, ON

3-3-2. Clip Control Assignment Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#10H 10H 02H	Dissolve (Transition) Time Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Transition Time : Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 04H	Audio Level Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Audio Level : Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 06H	T Bar (Video Fader) Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Video Fader : Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 10H	Transition Select Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Transition Select : Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 12H	Transformer A Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Transformer A : Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 14H	Transformer B Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Transformer A : Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 16H	BPM Sync Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	BPM Sync : Control Change, Channel Press, Pitch Bend, OFF

3-3-3. Color Control Assignment Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#10H 20H 06H	Effect A1 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect A1 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 08H	Effect A2 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect A2 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 0AH	Effect A3 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect A3 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 0CH	Effect A4 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect A4 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 16H	Effect B1 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect B1 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 18H	Effect B2 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect B2 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 1AH	Effect B3 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect B3 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 1CH	Effect B4 Ctrl Assign	01H-1FH, 40H-5FH,D0H,E0H,FFH	Effect B4 : Control Change, Channel Press, Pitch Bend, OFF
#10H 20H 20H	Output Fade Ctrl Assign	01H-05H,07H-1FH, 40H-5FH,D0H,E0H,FFH	Output Fade : Control Change, Channel Press, Pitch Bend, OFF

3-3-4. Clip Control Preference Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
10H 30H 02H	Keyboard Range Lower	00H - 7FH	Note Number
10H 30H 03H	Keyboard Range Upper	00H - 7FH	Note Number

4. Appendices

Decimal and hexadecimal conversion table

* The "H" follows the numbers in hexadecimal notation.

MIDI uses hexadecimal notation in 7-bit units to indicate data values, addresses and sizes within an exclusive message. Decimal and hexadecimal numbers corresponds as follows.

Deci	Hexa	Deci	Hexa	Deci	Hexa	Deci	Hexa
0	00H	32	20H	64	40H	96	60H
1	01H	33	21H	65	41H	97	61H
2	02H	34	22H	66	42H	98	62H
3	03H	35	23H	67	43H	99	63H
4	04H	36	24H	68	44H	100	64H
5	05H	37	25H	69	45H	101	65H
6	06H	38	26H	70	46H	102	66H
7	07H	39	27H	71	47H	103	67H
8	08H	40	28H	72	48H	104	68H
9	09H	41	29H	73	49H	105	69H
10	0AH	42	2AH	74	4AH	106	6AH
11	0BH	43	2BH	75	4BH	107	6BH
12	0CH	44	2CH	76	4CH	108	6CH
13	0DH	45	2DH	77	4DH	109	6DH
14	0EH	46	2EH	78	4EH	110	6EH
15	0FH	47	2FH	79	4FH	111	6FH
16	10H	48	30H	80	50H	112	70H
17	11H	49	31H	81	51H	113	71H
18	12H	50	32H	82	52H	114	72H
19	13H	51	33H	83	53H	115	73H
20	14H	52	34H	84	54H	116	74H
21	15H	53	35H	85	55H	117	75H
22	16H	54	36H	86	56H	118	76H
23	17H	55	37H	87	57H	119	77H
24	18H	56	38H	88	58H	120	78H
25	19H	57	39H	89	59H	121	79H
26	1AH	58	3AH	90	5AH	122	7AH
27	1BH	59	3BH	91	5BH	123	7BH
28	1CH	60	3CH	92	5CH	124	7CH
29	1DH	61	3DH	93	5DH	125	7DH
30	1EH	62	3EH	94	5EH	126	7EH
31	1FH	63	3FH	95	5FH	127	7FH

Decimal expressions used for MIDI channels, bank select, program change and device ID are 1 greater than the decimal value shown on above table.

In the hexadecimal expression of 7-bit steps, the maximum steps of 1 byte data is 128. If greater resolution is required, use multiple bytes. For example, ""aa"" and "bb" (2 bytes) in the hexadecimal expression of 7-bits means : aa x 128 + bb.

<Example 1> 5AH in decimal ?

According to the chart : 5AH = 90.

<Example 2> 12H 34H in hexadecimal of 7-bit steps in decimal ?

According to chart : 12H = 18, 34H = 52.

18 x 128 + 52 = 2356

MIDI Message Example

<Example 1> 92H 3EH 5F

"9n" is a note on status and "n" is a MIDI channel number.

2H = 2, 3EH = 62, 5FH = 95. So this is a note on message of MIDI CH = 3, Note Number 62 (D4) and Velocity 95.

<Example 2> CEH 49H

"CnH" is a program change status and "n" is a MIDI channel number.

EH = 14, 49H = 73. So this is a program change message of MIDI CH = 15 and Program Number 75 (Flute in GS).

Exclusive Message and Checksum Calculation

In the system exclusive message of MVC and V-LINK, checksum is added after the data (before F7). This is to check proper reception of the message. The checksum value is fixed depending on the address and data of the sent exclusive message.

Checksum Calculation ("H" is added after hexadecimal numbers)

The checksum is a value that produces a lower 7 bits of zero when the address, size, and checksum itself are summed. If the exclusive message to be transmitted has an address of aaH bbH ccH and the data is ddH eeH, the actual calculation would be as follows:

aaH + bbH + ccH + ddH + eeH = sum

sum / 128 = quotient --- remainder

128 - remainder = checksum

<Example> Set Modulation of Control Change to Dissolve Time Ctrl Assign of MIDI Visual Control

* Refer to "Parameter Address Map".

The start address of Dissolve Time Ctrl Assign in MIDI Visual Control is 10H 10H 02H. The parameter of modulation in control change is 00H 01H. Therefore :-

F0H	7EH	00H	0CH 01H	10H 10H 02H	00H 01H	??H	F7H
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

(1) Exclusive Status   (2) ID Number (Universal SysEx Non Realtime)

(3) Device ID(0)   (4) Sub ID(MIDI Visual Contro Version 1.0)

(5) Address   (6) Data

(7) Checksum   (8) EOX

Then, calculate checksum.

10H + 10H + 02H + 00H + 01H = 16 + 16 + 2 + 0 + 1 = 35 (sum)

35 (total) / 128 = 0 (quotient) … 35 (remainder)

Checksum = 128 ? 35 (remainder) = 93 = 5DH

Therefore, F0H 7EH 00H 0CH 01H 10H 10H 02H 00H 01H 5DH F7H is the message to transmit.