

HD VIDEO SWITCHER V-1HD

Remote Control Guide



This manual describes the settings used when remotely operating the V-1HD via MIDI.

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MIDI Control Modes of the V-1HD

The V-1HD supports remote control via an external MIDI device. MIDI remote control for the V-1HD comprises the following three modes.

MEMO

You can also operate the V-1HD to send MIDI messages to an external MIDI device. The output MIDI messages are shared by the three modes.

Standard Mode

This is the MIDI remote-control mode specific to the V-1HD. You use it when remotely operating the V-1HD from a keyboard or other external MIDI device.

MIDI Visual Control (MVC) Mode

This is the mode for remote controlling the V-1HD from an external MVC (MIDI Visual Control) device.

MIDI Visual Control (MVC) is a new world-wide standard of MIDI. It aims to link music and video during live performances. By connecting the two devices via MIDI, you can remotely control the V-1HD with an electronic musical instrument in time to the music or audio. The V-1HD switches to MVC mode when it receives an MVC "On" command from a MIDI device.

V-LINK Mode

This is the mode for remote controlling V-1HD from an external V-LINK device.

V-LINK is a Roland original feature to link music and visual performances. You can remotely control the V-1HD via a MIDI connection from another V-LINK enabled Roland product.

The V-1HD can turn on its V-LINK mode when it receives a V-LINK "On" command from another Roland V-LINK enabled product.

SETUP Menu

Detailed settings for MIDI remote control are made via the SETUP menu on the V-1HD. Press the [MENU] button to display the MIDI menu.

Setting item	Value	Explanation	
MIDI Rx SOURCE	USB, MIDI IN	This sets the connector for receiving MIDI messages.	
MIDI OUT	THRU, OUT	This sets the operation of the MIDI OUT/THRU connector. <ul style="list-style-type: none"> • OUT: MIDI messages are sent from the V-1HD. • THRU: Received MIDI messages are sent unchanged. The V-1HD sends no MIDI messages itself. 	
MIDI Tx CHANNEL	1–16	This sets the Tx channel for sending MIDI messages from the V-1HD.	
MIDI DEVICE ID	1 (00h)–32 (1Fh)	This sets the device ID to receive/send the system exclusive messages. * This also doubles as the device ID in the MIDI Visual Control (MVC) mode and V-LINK mode.	
MIDI Rx CHANNEL	1–16, OFF	This sets the Rx channel of MIDI messages. If this is "OFF", the channel voice messages of standard mode will not be received.	
MIDI Rx TEMPO CLOCK	ON, OFF	Setting this to "ON" makes the unit receive a MIDI tempo clock for BPM sync.	

Receiving the Remote Control Messages

Receiving in Standard Mode

In order to receive remote control messages, set parameters as below.

MIDI OUT	If you are connecting multiple V-1HD units in a chain, set this to "THRU."
MIDI Rx CHANNEL	Set this value according to the master device channel.

You can remote control the following functions from an external MIDI device.

* For corresponding MIDI messages, refer to "MIDI Implementation" (p. 5).

- Audio input volume control for HDMI 1–4, AUDIO IN, and MIC.
- Volume control of output audio.
- Selection of input video channel.
- Output fade of the video.
- Selection of the transition effect.
- Adjustment of transition time.
- Selection of the composition effect and On/Off.
- Key composition function on/off.
- Selection of the key channel.
- Adjustment of key level
- Turning On/Off of the freeze function.
- Adjustment of the video effect.
- Switching between memory numbers.

Receiving in MVC Mode

In order to receive remote control messages, set parameters as below.

MIDI OUT	If you are connecting multiple V-1HD units in a chain, set this to "THRU."
MIDI DEVICE ID	Set this value according to the master device channel.

You can remote control the following functions from a device supporting MVC after sending MVC ON message to the V-1HD.

* For corresponding MIDI messages, refer to "1-2. MIDI Visual Control Mode" (p. 6) in "MIDI Implementations."

- Volume control of output audio.
- Selection of input video channel.
- Output fade of the video.
- Selection of the transition effect.
- Adjustment of transition time.

Receiving in V-LINK Mode

In order to receive remote control messages, set parameters as below.

MIDI OUT	If you are connecting multiple V-1HD units in a chain, set this to "THRU."
MIDI DEVICE ID	Set this value according to the master device channel.

You can remote control the following functions from a device supporting V-LINK after sending V-LINK ON message to the V-1HD.

* For corresponding MIDI messages, refer to "1-3. V-LINK Mode" (p. 7) in "MIDI Implementations."

- Volume control of output audio.
- Selection of input video channel.
- Output fade of the video.
- Selection of the transition effect.

Sending the Messages to an External MIDI Device

If you are sending MIDI messages to an external MIDI device from the V-1HD, set parameters as below.

MIDI OUT	Set this to "OUT."
MIDI Tx CHANNEL	Select the Tx channel.

You can send MIDI messages corresponding to the panel operations of the V-1HD as below.

* For corresponding MIDI messages, refer to "2. MIDI Messages Transmitted from MIDI OUT" (p. 10) in "MIDI Implementations."

- Audio input volume-control operation for AUDIO IN, MIC, and HDMI 1–4.
- Audio output volume-control operation.
- Selection of the video channel.
- Controlling of the output fade.
- Adjustment of the transition time.
- Selection of the composition effect and turning On/Off.
- Key composition function on/off.
- Selection of the key channel.
- Adjustment of the key level.
- Turning On/Off of the freeze function.
- Adjustment of the video effect.
- Switching between memory numbers.

MIDI Implementation

Model: V-1HD
 Date: November 20, 2015
 Version: 1.00

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 a 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

Channel Voice Messages

* When "MIDI Rx CHANNEL" (p. 2) is set to "OFF," channel voice messages are not received.

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 (bus A, bus B)

- * This selects one from among video input on bus A, video input on bus B, or a memory number.
- * 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.
- * Select video input or memory number to match the program change. Control for bank selects and program changes is as follows.

MSB	LSB	Program No.	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

Panpot (Controller Number 10)

Status	2nd Byte	3rd Byte
BnH	0AH	vvH

* This controls the value of the AUDIO MIXER's HDMI 1 audio input level.

Expression (Controller Number 11)

Status	2nd Byte	3rd Byte
BnH	0BH	vvH

* This controls the value of the AUDIO MIXER's HDMI 2 audio input level.

Effect Control 1 (Controller Number 12)

Status	2nd Byte	3rd Byte
BnH	0CH	vvH

* This controls the value of the AUDIO MIXER's HDMI 3 audio input level.

Effect Control 2 (Controller Number 13)

Status	2nd Byte	3rd Byte
BnH	0DH	vvH

* This controls the value of the AUDIO MIXER's HDMI 4 audio input level.

Undefined (Controller Number 14)

Status	2nd Byte	3rd Byte
BnH	0EH	vvH

* This controls the value of the AUDIO MIXER's AUDIO IN audio input level.

Undefined (Controller Number 15)

Status	2nd Byte	3rd Byte
BnH	0FH	vvH

* This controls the value of the AUDIO MIXER's MIC audio input level.

General Purpose Controllers 1 (Controller Number 16)

Status	2nd Byte	3rd Byte
BnH	10H	vvH

* This controls the value of the AUDIO MIXER's MASTER audio output level.

General Purpose Controllers 2 (Controller Number 17)

Status	2nd Byte	3rd Byte
BnH	11H	vvH

* This controls the A/B fader.

General Purpose Controllers 3 (Controller Number 18)

Status	2nd Byte	3rd Byte
BnH	12H	vvH

* This controls the value of TRANSFORMER TIME.

General Purpose Controllers 4 (Controller Number 19)

Status	2nd Byte	3rd Byte
BnH	13H	ttH

tt = Transition Select: 00H-02H (WIPE, MIX, CUT)

* This controls the type of transition effect.

Undefined (Controller Number 20)

Status	2nd Byte	3rd Byte
BnH	14H	vvH

* This turns the TRANSFORMER [▲] button on/off.

Undefined (Controller Number 21)

Status	2nd Byte	3rd Byte
BnH	15H	vvH

* This turns the TRANSFORMER [▼] button on/off.

Undefined (Controller Number 22)

Status	2nd Byte	3rd Byte
BnH	16H	vvH

* This turns the BPM SYNC function on/off.

Undefined (Controller Number 23)

Status	2nd Byte	3rd Byte
BnH	17H	vvH

* This controls the state of the [EFFECTS A] knob. When this is set to "00H," the effect on bus A is turned off.

○ Undefined (Controller Number 24)

Status	2nd Byte	3rd Byte
BnH	18H	vvH

* This controls the state of the [EFFECTS B] knob. When this is set to "00H," the effect on bus B is turned off.

○ Undefined (Controller Number 25)

Status	2nd Byte	3rd Byte
BnH	19H	vvH

* This controls the state of the [OUTPUT FADE] knob.

○ Undefined (Controller Number 26)

Status	2nd Byte	3rd Byte
BnH	1AH	eeH

* This turns the FREEZE function on/off.

● Program Change

Status	2nd Byte
CnH	ppH

pp= Program Number: 00H–7FH (1–128)

* Select video input or memory number to match the bank select. For information on control for bank select and program change, refer to "Bank Select"(p. 5).
 * Unselectable program change will be ignored.

1-2. MIDI Visual Control Mode

■ Channel Voice Messages

● Note On

Status	2nd Byte	3rd Byte
9nH	kkH	vvH

* This is received when Note Message Enabled of MVC is turned on.
 * This selects the video channel corresponding to the note number.
 * The setting range of note number is fixed by Keyboard Range Upper and Lower of MVC.
 * Unselectable note number or velocity will be ignored.
 * 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.
 * Select video input or memory number to match the program change. Control for bank selects and program changes is as follows.

MSB	LSB	Program No.	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

* 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	3rd Byte
CnH	ppH	

pp= Program Number: 00H–7FH (prog.1–prog.128)

* Select video input or memory number to match the bank select. For information on control for bank select and program change refer to the "Bank Select" section mentioned above.
 * 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	3rd Byte
DnH	vvH	

* 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	IIH	mmH

mm,II= Pitch bend value: 00 00H–40 00H–7F 7FH (-8192–0–+8191)

* 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 Messages

● 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 Keyboard Range Upper and Lower of V-LINK.
- * 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	IIH

mm,II= 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.
- * Select video input or memory number to match the program change. Control for bank selects and program changes is as follows.

MSB	LSB	Program No.	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

- * 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)

- * The receiving channel is specified by Clip Control Ch. of V-LINK.
- * If unavailable program change is received, the unit ignores.
- * Select video input or memory number to match the bank select. For information on control for bank select and program change, refer to "Bank Select" (p. 7).

● Channel Pressure

Status	2nd Byte
DnH	vvH

- * 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)

- * 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 Messages for All Modes

■ System Exclusive 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.
- * These are not received when "MIDI Rx SOURCE" is set to "USB."

● Timing Clock

Status
F8H

- * When "MIDI Rx TEMPO CLOCK" is set to "ON," BPM SYNC synchronization is performed.

● Start

Status
FAH

- * When "MIDI Rx TEMPO CLOCK" is set to "ON," the start of the BPM SYNC beat is set.

● Continue

Status
FBH

- * When "MIDI Rx TEMPO CLOCK" is set to "ON," the start of the BPM SYNC beat is set.

■ System Exclusive Messages

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

F0H: Status of the system exclusive message
 ii= ID number: This is to specify the manufacturer of the product that generates the message. The manufacture ID of Roland is 41H. The ID numbers of 7EH and 7EF are the expansion of MIDI standard and used as universal non-realtime message (7EH) and 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, 00H, 20H, 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	1st byte of model ID (V-1HD)
00H	2nd byte of model ID (V-1HD)
00H	3rd byte of model ID (V-1HD)
20H	4th byte of model ID (V-1HD)
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 "3. Parameter Address Map" (p. 12) for address and size.
- * See "Example of an Exclusive Message and Calculating a Checksum" (p. 20) 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.

<u>Status</u>	<u>Data Byte</u>	<u>Status</u>
F0H	41H, dev, 00H, 00H, 00H, 20H, 12H, aaH, bbH, ccH, ddH, ..., eeH, sum	F7H

<u>Byte</u>	<u>Explanation</u>
F0H	Exclusive Status
41H	Manufacturer ID (Roland)
dev	Device ID (dev: 00H–1FH, 10H is default)
00H	1st byte of model ID (V-1HD)
00H	2nd byte of model ID (V-1HD)
00H	3rd byte of model ID (V-1HD)
20H	4th byte of model ID (V-1HD)
12H	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 "3. Parameter Address Map" (p. 12) for address and size.
- * See "Example of an Exclusive Message and Calculating a Checksum" (p. 20) 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

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

<u>Byte</u>	<u>Explanation</u>
F0H	System Exclusive Status
7EH	Universal System Exclusive Non-Realtime Header
dev	Device ID (dev: F00H–1FH; MVC default= 00H)
0CH	Sub ID #1 (MIDI Visual Control)
01H	Sub ID #2 (MVC command set ID; 01H= "Version 1.0")
aaH	Upper byte of the address
bbH	Address
ccH	Address
ddH	Actual Data: The data body. The data of multiple bytes should be submitted 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 "3-2. MIDI Visual Control" (p. 18) for address and size.
- * See "Example of an Exclusive Message and Calculating a Checksum" (p. 20) for checksum.
- * Data exceeding 256 bytes should be divided into packets smaller than 256 bytes. If you send sequentially, the intervals of packets should be longer than 20 ms.

● V-LINK Message

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

<u>Byte</u>	<u>Explanation</u>
F0H	System Exclusive Status
41H	ID Number (Roland)
dev	Device ID (dev: 00H–1FH; default is 10H)
00H	Model ID upper byte (V-LINK)
51H	Model ID lower byte (V-LINK)
12H	Command ID (DT1)
aaH	Upper byte of the address
bbH	Address
ccH	Address
ddH	Actual Data: The data body. The data of multiple bytes should
:	:
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 "3.3 V-LINK" (p. 19) for the address and data.
- * See "Example of an Exclusive Message and Calculating a Checksum" (p. 20) for checksum.
- * Data exceeding 256 bytes should be divided into packets smaller than 256 bytes. If you send sequentially, the intervals of packets should be longer than 20 ms.

2. MIDI Messages Transmitted from MIDI OUT

2-1. Transmission of the Received Messages

When "MIDI OUT" (p. 2) is set to "THRU," received messages are transmitted from MIDI OUT.

2-2. Transmission of the Generated Messages

Messages that the V-1HD generates are always transmitted to USB MIDI.

When "MIDI OUT" (p. 2) is set to "OUT," messages are also transmitted from MIDI OUT.

■ Channel Voice Messages

● 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 a video input or memory number has been selected, this transmits a bank number along with a program change. Control for bank selects and program changes is as follows.

MSB	LSB	Program No.	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

○ Panpot (Controller Number 10)

Status	2nd Byte	3rd Byte
BnH	0AH	vvH

* This transmits the value when the AUDIO MIXER's HDMI 1 audio input level has been changed.

○ Expression (Controller Number 11)

Status	2nd Byte	3rd Byte
BnH	0BH	vvH

* This transmits the value when the AUDIO MIXER's HDMI 2 audio input level has been changed.

○ Effect Control 1 (Controller Number 12)

Status	2nd Byte	3rd Byte
BnH	0CH	vvH

* This transmits the value when the AUDIO MIXER's HDMI 3 audio input level has been changed.

○ Effect Control 2 (Controller Number 13)

Status	2nd Byte	3rd Byte
BnH	0DH	vvH

* This transmits the value when the AUDIO MIXER's HDMI 4 audio input level has been changed.

○ Undefined (Controller Number 14)

Status	2nd Byte	3rd Byte
BnH	0EH	vvH

* This transmits the value when the AUDIO MIXER's AUDIO IN audio input level has been changed.

○ Undefined (Controller Number 15)

Status	2nd Byte	3rd Byte
BnH	0FH	vvH

* This transmits the value when the AUDIO MIXER's MIC audio input level has been changed.

○ General Purpose Controllers 1 (Controller Number 16)

Status	2nd Byte	3rd Byte
BnH	10H	vvH

* This transmits the value when the AUDIO MIXER's MASTER audio output level has been changed.

○ General Purpose Controllers 2 (Controller Number 17)

Status	2nd Byte	3rd Byte
BnH	11H	vvH

* This transmits the value when the A/B fader has been controlled.

○ General Purpose Controllers 3 (Controller Number 18)

Status	2nd Byte	3rd Byte
BnH	12H	vvH

* This transmits the value when TRANSFORMER TIME has been changed.

○ General Purpose Controllers 4 (Controller Number 19)

Status	2nd Byte	3rd Byte
BnH	13H	ttH

tt= Transition Select: 00H–02H (WIPE, MIX, CUT)

* This transmits the value when the [WIPE], [MIX], or [CUT] button has been operated.

○ Undefined (Controller Number 20)

Status	2nd Byte	3rd Byte
BnH	14H	ttH

* This transmits the value when the TRANSFORMER [▲] button has been operated.

○ Undefined (Controller Number 21)

Status	2nd Byte	3rd Byte
BnH	15H	vvH

* This transmits the value when the TRANSFORMER [▼] button has been operated.

○ Undefined (Controller Number 22)

Status	2nd Byte	3rd Byte
BnH	16H	vvH

* This transmits the value when the [BPM SYNC] button has been operated.

○ Undefined (Controller Number 23)

Status	2nd Byte	3rd Byte
BnH	17H	vvH

* This transmits the value when the [EFFECT A] knob has been operated.

○ Undefined (Controller Number 24)

Status	2nd Byte	3rd Byte
BnH	18H	vvH

* This transmits the value when the [EFFECT B] knob has been operated.

○ Undefined (Controller Number 25)

Status	2nd Byte	3rd Byte
BnH	19H	vvH

* This transmits the value when the [OUTPUT FADE] knob has been operated.

○ Undefined (Controller Number 26)

Status	2nd Byte	3rd Byte
BnH	1AH	eeH

* This transmits the value when the [FREEZE] knob has been operated.

● Program Change

Status	2nd Byte
CnH	ppH

pp= Program Number: 00H–7FH (1–128)

* When a video input or memory number has been selected, this transmits a bank number along with a program change. For information on control for bank select and program change, refer to “Bank Select” (p. 10).

■ System Realtime Messages

● Active Sensing

Status
FEH

* Transmitted with approximately 250 ms intervals.
 * Nothing is 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 MIDI 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, 00H, 20H, 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	1st byte of model ID (V-1HD)
00H	2nd byte of model ID (V-1HD)
00H	3rd byte of model ID (V-1HD)
20H	4th byte of model ID (V-1HD)
12H	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)

* Data exceeding 256 bytes should be divided into packets smaller than 256 bytes. If you send sequentially, the intervals of packets should be longer than 20 ms.

● V-LINK Message

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

Byte	Explanation
F0H	System Exclusive Status
41H	ID Number (Roland)
dev	Device ID (dev : 00H–1FH ; default is 10H)
00H	Model ID upper byte (V-LINK)
51H	Model ID lower byte (V-LINK)
12H	Command ID (DT1)
aaH	Upper byte of the address
bbH	Address
ccH	Address
ddH	Actual Data : The data body. The data of multiple bytes should be submitted in address order.
:	:
eeH	Data
sum	Checksum
F7H	EOX (End of Exclusive)

* Data exceeding 256 bytes should be divided into packets smaller than 256 bytes. If you send sequentially, the intervals of packets should be longer than 20 ms.

3. Parameter Address Map

3-1. Standard (original for the V-1HD)

- * Transmission and reception are always possible regardless of whether MVC or V-LINK is on or off.
- * At addresses with “#” appended, the specified data is transmitted divided into the upper 2 bytes and lower 2 bytes. The data is ignored if the 2-byte sets are not received in succession.

Start Address	Description
00H 00H 00H	Reserved
70H 00H 00H	System Parameter Area (See 3-1-1)
71H 00H 00H	Video, Audio Parameter Area (See 3-1-2)
72H 00H 00H	Video, Audio Parameter Memory Area (See 3-1-2)
73H 00H 00H	Reserved
73H 01H 00H	Panel Parameter Area (See 3-1-3)
74H 00H 00H	Reserved

● 3-1-1. System Parameter Area

○ Products, version, mode

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)

○ Setup Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#70H 01H 00H 01H	BPM	00 14H–01 7AH	20–250
70H 01H 02H	BPM SYNC	00H–03H	×1/4, ×1/2, ×1, ×2
70H 01H 03H	HDCP	00H–01H	OFF, ON
70H 01H 04H	OUTPUT CONTRAST	00H–7FH	-64–63
70H 01H 05H	OUTPUT SATURATION	00H–7FH	-64–63
70H 01H 06H	OUTPUT BRIGHTNESS	00H–7FH	-64–63
70H 01H 07H	OUTPUT COLOR SPACE	00H–03H	AUTO, RGB-FULL, RGB-LIMIT, YPbPr
70H 01H 08H	OUTPUT DVI-D, HDMI	00H–02H	AUTO, DVI-D, HDMI
70H 01H 09H	Reserved		
70H 01H 0aH	PREVIEW CONTRAST	00H–7FH	-64–63
70H 01H 0bH	PREVIEW SATURATION	00H–7FH	-64–63
70H 01H 0cH	PREVIEW BRIGHTNESS	00H–7FH	-64–63
70H 01H 0dH	PREVIEW COLOR SPACE	00H–03H	AUTO, RGB-FULL, RGB-LIMIT, YPbPr
70H 01H 0eH	PREVIEW DVI-D, HDMI	00H–02H	AUTO, DVI-D, HDMI
70H 01H 0fH	PREVIEW OUT	00H–02H	MULTI-VIEW, OUTPUT, PREVIEW
70H 01H 10H	PinP BORDER	00H–0FH	0–15
70H 01H 11H	PinP BORDER COLOR	00H–06H	BLACK, WHITE, GRAY, RED, GREEN, BLUE, YELLOW
70H 01H 12H	AUTO SCAN	00H–01H	OFF, ON
70H 01H 13H	AUTO SCAN TIME	01H–78H	1–120sec
70H 01H 14H	AUTO SCAN TRANS TIME	00H–28H	0.0–4.0sec
70H 01H 15H	A,/B MODE	00H–01H	A/B, PGM/PST
70H 01H 16H	FREEZE MODE	00H–01H	ALL, SELECT
70H 01H 17H	NO SIGNAL BACK	00H–01H	BLACK, BLUE
70H 01H 18H	UNFIT SIGNAL BACK	00H–02H	BLACK, BLUE, THRU

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
70H 01H 19H	DEINTERLACE MODE	00H-01H	WEAVE, BOB
70H 01H 1aH	COLOR BAR OUTPUT	00H-01H	OFF, ON
70H 01H 1bH	TEST TONE OUTPUT	00H-01H	OFF, ON
70H 01H 1cH	MIDI Rx SOURCE	00H-01H	USB, MIDI IN
70H 01H 1dH	MIDI OUT	00H-01H	OUT, THRU
70H 01H 1eH	MIDI Tx CHANNEL	00H-0FH	ch. 1-16
70H 01H 1fH	MIDI DEVICE ID	00H-1FH	1-32
70H 01H 20H	MIDI Rx CHANNEL	00H-0FH	ch. 1-16
70H 01H 21H	MIDI Rx TEMPO CLOCK	00H-01H	OFF, ON
70H 01H 22H	POWER ON LOAD	00H-07H	MEMORY 1-8
70H 01H 23H	PGM LED	00H-06H	RED, GREEN, YELLOW, BLUE, PURPLE, L.BLUE, WHITE
70H 01H 24H	PST LED	00H-06H	RED, GREEN, YELLOW, BLUE, PURPLE, L.BLUE, WHITE
70H 01H 25H	INPUT LED	00H-01H	OFF, ON
70H 01H 26H	TRANSFORMER LED	00H-01H	OFF, ON
70H 01H 27H	AUDIO LED	00H-06H	MASTER OUT, MIC, AUDIO IN, HDMI 1, HDMI 2, HDMI 3, HDMI 4
70H 01H 28H	MEMORY PANEL LOAD	00H-01H	OFF, ON
70H 01H 29H	EFFECTS TYPE CHANGE	00H-01H	OFF, ON
70H 01H 2aH	WIPE TYPE CHANGE	00H-01H	OFF, ON
70H 01H 2bH	MIX TYPE CHANGE	00H-01H	OFF, ON
70H 01H 2cH	AUTO OFF	00H-01H	OFF, ON
70H 01H 2dH	FRAME RATE	00H-01H	59.94, 50

● 3-1-2 Video/Audio Parameter Area

○ Video, Audio Parameter Area

These modify current operation.

Address	Parameter Name
71H 00H 00H	Video
71H 01H 00H	Audio Parameter-1
71H 02H 00H	Audio Parameter-2

○ Video, Audio Parameter Memory Area

These read or overwrite data saved at memory numbers other than the one currently selected. Data saved at the currently selected memory is not modified.

* The parameters in "Video Parameter" (p. 14), "Audio Parameter-1" (p. 14) and "Audio Parameter-2" (p. 15) are also common to the video and audio parameter memory area.

Address	Parameter Name	Address	Parameter Name
72H 00H 00H	Video (Memory 1)	72H 10H 00H	Video (Memory 5)
72H 01H 00H	Audio Parameter-1 (Memory 1)	72H 11H 00H	Audio Parameter-1 (Memory 5)
72H 02H 00H	Audio Parameter-2 (Memory 1)	72H 12H 00H	Audio Parameter-2 (Memory 5)
72H 04H 00H	Video (Memory 2)	72H 14H 00H	Video (Memory 6)
72H 05H 00H	Audio Parameter-1 (Memory 2)	72H 15H 00H	Audio Parameter-1 (Memory 6)
72H 06H 00H	Audio Parameter-2 (Memory 2)	72H 16H 00H	Audio Parameter-2 (Memory 6)
72H 08H 00H	Video (Memory 3)	72H 18H 00H	Video (Memory 7)
72H 09H 00H	Audio Parameter-1 (Memory 3)	72H 19H 00H	Audio Parameter-1 (Memory 7)
72H 0aH 00H	Audio Parameter-2 (Memory 3)	72H 1aH 00H	Audio Parameter-2 (Memory 7)
72H 0cH 00H	Video (Memory 4)	72H 1cH 00H	Video (Memory 8)
72H 0dH 00H	Audio Parameter-1 (Memory 4)	72H 1dH 00H	Audio Parameter-1 (Memory 8)
72H 0eH 00H	Audio Parameter-2 (Memory 4)	72H 1eH 00H	Audio Parameter-2 (Memory 8)

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○ Video Parameter

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#71H 00H 00H 01H	A/B fader	00 00H-07 7FH	0-1023
#71H 00H 02H 03H	effects A pod	00 00H-01 7FH	1-255
#71H 00H 04H 05H	effects B pod	00 00H-01 7FH	1-255
#71H 00H 06H 07H	outfader	00 00H-01 7FH	1-255
71H 00H 08H	video sel A	00H-03H	HDMI 1-4
71H 00H 09H	video sel B	00H-03H	HDMI 1-4
71H 00H 0aH	effect A	00H-01H	OFF, ON
71H 00H 0bH	effect B	00H-01H	OFF, ON
71H 00H 0cH	transition	00H-02H	WIPE, MIX, CUT
71H 00H 0dH	BPM SYNC	00H-01H	OFF, ON
71H 00H 0eH	EFFECTS A	00H-12H	NEGATIVE, EMBOSS, COLORIZE, COLORPASS, POSTERIZE, SILHOUETTE, MONOCOLOR, FINDEGE, FLIP, WHT-L.KEY, BLK-L.KEY, GRN-C.KEY, BLU-C.KEY, PinP 1/4, PinP 1/2, SPLIT-VS, SPLIT-VC, SPLIT-HS, SPLIT-HC
71H 00H 0fH	EFFECTS B	00H-12H	NEGATIVE, EMBOSS, COLORIZE, COLORPASS, POSTERIZE, SILHOUETTE, MONOCOLOR, FINDEGE, FLIP, WHT-L.KEY, BLK-L.KEY, GRN-C.KEY, BLU-C.KEY, PinP 1/4, PinP 1/2, SPLIT-VS, SPLIT-VC, SPLIT-HS, SPLIT-HC
71H 00H 10H	WIPE	00H-1DH	H-DOWN, H-UP, V-RIGHT, V-LEFT, V-IN, V-OUT, H-IN, H-OUT, R-DOWN, L-DOWN, R-UP, L-UP, BLOCK, V-GRID, H-GRID, H-DOWN/s, H-UP/s, V-RIGHT/s, V-LEFT/s, H-IN/s, H-OUT/s, V-IN/s, V-OUT/s, R-DOWN/s, L-DOWN/s, R-UP/s, L-UP/s, BLOCK/s, V-GRID/s, H-GRID/s
71H 00H 11H	MIX	00H-03H	MIX, FAM, NAM, MOS-AIC
71H 00H 12H	TRANSFORMER A	00H-0AH	NONE, TRANSFORM, ←, ←→, WHITE, BLACK, BPM SYNC, WIPE, MIX, CUT, EFFECTS
71H 00H 13H	TRANSFORMER B	00H-0AH	NONE, TRANSFORM, ←, ←→, WHITE, BLACK, BPM SYNC, WIPE, MIX, CUT, EFFECTS
71H 00H 14H	TRANSFORM TIME	00H-2CH	0.0-4.0sec, BPM×1/4, BPM×1/2, BPM×1, BPM×2

○ Audio Parameter-1

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
71H 01H 00H	HDMI IN 1 LEVEL	00H-7FH	0-127
71H 01H 01H	HDMI IN 2 LEVEL	00H-7FH	0-127
71H 01H 02H	HDMI IN 3 LEVEL	00H-7FH	0-127
71H 01H 03H	HDMI IN 4 LEVEL	00H-7FH	0-127
71H 01H 04H	AUDIO IN LEVEL	00H-7FH	0-127
71H 01H 05H	MIC LEVEL	00H-7FH	0-127
71H 01H 06H	MASTER OUT LEVEL	00H-7FH	0-127
71H 01H 07H	AUDIO FOLLOW	00H-01H	OFF, ON
71H 01H 08H	HDMI IN 1 EQ Hi	00H-1EH	-15-15dB
71H 01H 09H	HDMI IN 1 EQ Hi FREQ	00H-08H	700Hz-11.0KHz
71H 01H 0aH	HDMI IN 1 EQ Mid	00H-1EH	-15-15dB
71H 01H 0bH	HDMI IN 1 EQ Mid FREQ	00H-1BH	20.0Hz-10.0KHz
71H 01H 0cH	HDMI IN 1 EQ Mid Q	00H-05H	0.5-16.0
71H 01H 0dH	HDMI IN 1 EQ Lo	00H-1EH	-15-15dB
71H 01H 0eH	HDMI IN 1 EQ Lo FREQ	00H-09H	55Hz-800Hz
71H 01H 0fH	Reserved		
#71H 01H 10H 11H	HDMI IN 1 DELAY	00 00H-27 08 H	0.0-500.0msec
71H 01H 12H	HDMI IN 2 EQ Hi	00H-1EH	-15-15dB
71H 01H 13H	HDMI IN 2 EQ Hi FREQ	00H-08H	700Hz-11.0KHz
71H 01H 14H	HDMI IN 2 EQ Mid	00H-1EH	-15-15dB
71H 01H 15H	HDMI IN 2 EQ Mid FREQ	00H-1BH	20.0Hz-10.0KHz
71H 01H 16H	HDMI IN 2 EQ Mid Q	00H-05H	0.5-16.0
71H 01H 17H	HDMI IN 2 EQ Lo	00H-1EH	-15-15dB
71H 01H 18H	HDMI IN 2 EQ Lo FREQ	00H-09H	55Hz-800Hz

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
71H 01H 19H	Reserved		
#71H 01H 10H 11H	HDMI IN 2 DELAY	00 00H-27 08 H	0.0-500.0msec
71H 01H 1cH	HDMI IN 3 EQ Hi	00H-1EH	-15-15dB
71H 01H 1dH	HDMI IN 3 EQ Hi FREQ	00H-08H	700Hz-11.0KHz
71H 01H 1eH	HDMI IN 3 EQ Mid	00H-1EH	-15-15dB
71H 01H 1fH	HDMI IN 3 EQ Mid FREQ	00H-1BH	20.0Hz-10.0KHz
71H 01H 20H	HDMI IN 3 EQ Mid Q	00H-05H	0.5-16.0
71H 01H 21H	HDMI IN 3 EQ Lo	00H-1EH	-15-15dB
71H 01H 22H	HDMI IN 3 EQ Lo FREQ	00H-09H	55Hz-800Hz
71H 01H 23H	Reserved		
#71H 01H 24H 25H	HDMI IN 3 DELAY	00 00H-27 08 H	0.0-500.0msec
71H 01H 26H	HDMI IN 4 EQ Hi	00H-1EH	-15-15dB
71H 01H 27H	HDMI IN 4 EQ Hi FREQ	00H-08H	700Hz-11.0KHz
71H 01H 28H	HDMI IN 4 EQ Mid	00H-1EH	-15-15dB
71H 01H 29H	HDMI IN 4 EQ Mid FREQ	00H-1BH	20.0Hz-10.0KHz
71H 01H 2aH	HDMI IN 4 EQ Mid Q	00H-05H	0.5-16.0
71H 01H 2bH	HDMI IN 4 EQ Lo	00H-1EH	-15-15dB
71H 01H 2cH	HDMI IN 4 EQ Lo FREQ	00H-09H	55-800Hz
71H 01H 2dH	Reserved		
#71H 01H 2EH 2FH	HDMI IN 4 DELAY	00 00H-27 08 H	0.0-500.0msec

○ Audio Parameter-2

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
71H 02H 00H	AUDIO IN EQ Hi	00H-1EH	-15-15dB
71H 02H 01H	AUDIO IN EQ Hi FREQ	00H-08H	700Hz-11.0KHz
71H 02H 02H	AUDIO IN EQ Mid	00H-1EH	-15-15dB
71H 02H 03H	AUDIO IN EQ Mid FREQ	00H-1BH	20.0Hz-10.0KHz
71H 02H 04H	AUDIO IN EQ Mid Q	00H-05H	0.5-16.0
71H 02H 05H	AUDIO IN EQ Lo	00H-1EH	-15-15dB
71H 02H 06H	AUDIO IN EQ Lo FREQ	00H-09H	55Hz-800Hz
71H 02H 07H	Reserved		
#71H 02H 08H 09H	AUDIO IN DELAY	00 00H-27 08 H	0.0-500.0msec
71H 02H 0aH	MIC EQ Hi	00H-1EH	-15-15dB
71H 02H 0bH	MIC EQ Hi FREQ	00H-08H	700Hz-11.0KHz
71H 02H 0cH	MIC EQ Mid	00H-1EH	-15-15dB
71H 02H 0dH	MIC EQ Mid FREQ	00H-1BH	20.0Hz-10.0KHz
71H 02H 0eH	MIC EQ Mid Q	00H-05H	0.5-16.0
71H 02H 0fH	MIC EQ Lo	00H-1EH	-15-15dB
71H 02H 10H	MIC EQ Lo FREQ	00H-09H	55Hz-800Hz
71H 02H 11H	Reserved		
#71H 02H 12H 13H	MIC DELAY	00 00H-27 08 H	0.0-500.0msec
71H 02H 14H	MIC COMP	00H-01H	OFF, ON
71H 02H 15H	MIC COMP-THRESHOLD	00H-32H	-50-0dB
71H 02H 16H	MIC COMP-RATIO	00H-08H	1.0:1-INF:1
71H 02H 17H	MIC COMP-ATTACK	00H-19H	0.2-100ms
71H 02H 18H	MIC COMP-RELEASE	00H-7FH	30-5000ms
71H 02H 19H	MIC GATE	00H-01H	OFF, ON
71H 02H 1aH	MIC GATE-THRESHOLD	00H-32H	-50-0dB
71H 02H 1bH	MIC GATE-RELEASE	00H-7FH	30-5000ms
71H 02H 1cH	MIC HPF	00H-01H	OFF, ON
71H 02H 1dH	MAIN EQ Hi	00H-1EH	-15-15dB
71H 02H 1eH	MAIN EQ Hi FREQ	00H-08H	700Hz-11.0KHz

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Address	Parameter Name	Sys.Ex.Value	Meaning of Value
71H 02H 1fH	MAIN EQ Mid	00H-1EH	-15-15dB
71H 02H 20H	MAIN EQ Mid FREQ	00H-1BH	20.0Hz-10.0KHz
71H 02H 21H	MAIN EQ Mid Q	00H-05H	0.5-16.0
71H 02H 22H	MAIN EQ Lo	00H-1EH	-15-15dB
71H 02H 23H	MAIN EQ Lo FREQ	00H-09H	55Hz-800Hz
71H 02H 24H	HDMI IN 1 REV SEND	00H-7FH	0-127
71H 02H 25H	HDMI IN 2 REV SEND	00H-7FH	0-127
71H 02H 26H	HDMI IN 3 REV SEND	00H-7FH	0-127
71H 02H 27H	HDMI IN 4 REV SEND	00H-7FH	0-127
71H 02H 28H	AUDIO IN REV SEND	00H-7FH	0-127
71H 02H 29H	MIC REV SEND	00H-7FH	0-127
71H 02H 2aH	REVERB LEVEL	00H-7FH	0-127
71H 02H 2bH	REVERB TIME	00H-32H	0.0-5.0sec
71H 02H 2cH	REVERB TYPE	00H-01H	ROOM, HALL
71H 02H 2dH	MASTERING	00H-01H	OFF, ON
71H 02H 2eH	MASTERING NS	00H-7FH	0-127
71H 02H 2fH	MASTERING ENHANCER	00H-7FH	0-127
71H 02H 30H	MASTERING Hi	00H-7FH	0-127
71H 02H 31H	MASTERING Mid	00H-7FH	0-127
71H 02H 32H	MASTERING Lo	00H-7FH	0-127
71H 02H 33H	A.FOLLOW AUDIO IN	00H-04H	HDMI 1-4, OFF
71H 02H 34H	A.FOLLOW MIC	00H-04H	HDMI 1-4, OFF

● 3-1-3 Panel Parameter Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
73H 01H 00H	Memory Select Memory PANEL Save	00H-07H 10H-17H	Memory 1-8 Memory 1-8
73H 02H 00H	LED OUTFADER BLACK	00H-01H	OFF, Green (Read Only)
73H 02H 01H	LED OUTFADER WHITE	00H-01H	OFF, Green (Read Only)
73H 02H 02H	LED FREEZE	00H-01H	OFF, Red (Read Only)
73H 02H 03H	LED MEMORY	00H-01H	OFF, Blue (Read Only)
73H 02H 04H	LED AUDIO	00H-03H	OFF, Red, Green, Orange (Read Only)
73H 02H 05H	LED PEKSIG	00H-03H	OFF, Red, Green, Orange (Read Only)
73H 02H 06H	LED TAP	00H-01H	OFF, Green (Read Only)
73H 02H 07H	Reserved		
73H 02H 08H	LED EFFECTS A	00H-01H	OFF, Green (Read Only)
73H 02H 09H	LED EFFECTS B	00H-01H	OFF, Green (Read Only)
73H 02H 0aH	LED HDCP	00H-01H	OFF, Red (Read Only)
73H 02H 0bH	LED BPM SYNC	00H-01H	OFF, Red (Read Only)
73H 02H 0cH	LED WIPE	00H-01H	OFF, Green (Read Only)
73H 02H 0dH	LED MIX	00H-01H	OFF, Green (Read Only)
73H 02H 0eH	LED CUT	00H-01H	OFF, Green (Read Only)
73H 02H 0fH	LED TRANSFRMER A	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 10H	LED TRANSFRMER B	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 11H	LED VDOSELA-1	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 12H	LED VDOSELA-2	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 13H	LED VDOSELA-3	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 14H	LED VDOSELA-4	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 15H	LED VDOSELB-1	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 16H	LED VDOSELB-2	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 17H	LED VDOSELB-3	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 02H 18H	LED VDOSELB-4	00H-07H	OFF, Red, Green, Yellow, Blue, Mazenta, Cyan, White (Read Only)
73H 03H 00H	Audio Level Master L	00H-7fH	output level (Read Only)
73H 03H 01H	Audio Level Master R	00H-7fH	output level (Read Only)
73H 03H 02H	Audio Level HDMI 1	00H-7fH	input level (Read Only)
73H 03H 04H	Audio Level HDMI 2	00H-7fH	input level (Read Only)

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
73H 03H 06H	Audio Level HDMI 3	00H-7fH	input level (Read Only)
73H 03H 08H	Audio Level HDMI 4	00H-7fH	input level (Read Only)
73H 03H 0aH	Audio Level Line	00H-7fH	input level (Read Only)
73H 03H 0cH	Audio Level MIC	00H-7fH	input level (Read Only)
73H 04H 00H	Ctrl Button	ON, OFF	The on/off status of the respective button changes according to the value of Value. * To ensure correct operation, after executing an "on" operation, be sure to insert an "off" operation.
73H 04H 00H	[FREEZE]	00H, 40H	[FREEZE] button on/off
	[MEMORY]	01H, 41H	[MEMORY] button on/off
	[AUDIO]	02H, 42H	[AUDIO] button on/off
	[TAP (BPM)]	03H, 43H	[(TAP) BPM] button on/off
	[EFFECTS A]	04H, 44H	EFFECTS A [ON] button on/off
	[EFFECTS B]	05H, 45H	EFFECTS B [ON] button on/off
	[VIDEO SELECT 1A]	06H, 46H	[A-1] button on/off
	[VIDEO SELECT 2A]	07H, 47H	[A-2] button on/off
	[VIDEO SELECT 3A]	08H, 48H	[A-3] button on/off
	[VIDEO SELECT 4A]	09H, 49H	[A-4] button on/off
	[VIDEO SELECT 1B]	0aH, 4aH	[B-1] button on/off
	[VIDEO SELECT 2B]	0bH, 4bH	[B-2] button on/off
	[VIDEO SELECT 3B]	0cH, 4cH	[B-3] button on/off
	[VIDEO SELECT 4B]	0dH, 4dH	[B-4] button on/off
	[BPM SYNC]	0eH, 4eH	[BPM SYNC] button on/off
	[WIPE]	0fH, 4fH	[WIPE] button on/off
	[MIX]	10H, 50H	[MIX] button on/off
[CUT]	11H, 51H	[CUT] button on/off	
[TRANSFORMER A]	12H, 52H	TRANSFORMER [] button on/off	
[TRANSFORMER B]	13H, 53H	TRANSFORMER [] button on/off	

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.
- * MVC messages (except MVC ON messages) are ignored if received while MVC is set to OFF (when in standard mode or V-LINK mode).
- * The unit automatically switches to standard mode when MVC OFF is received.
- * 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
Color Control Ch.	—	1
Note Control	—	OFF
Transition Time	CC#05	0
Keyboard Range Lower	—	36
Keyboard Range Upper	—	84

- * 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	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
Note Control	—	OFF
Transition Time	CC#05	0
Transition Type Sel.	OFF	—
Audio Level	OFF	—
Output Fade	OFF	—
Keyboard Range Lower	—	36
Keyboard Range Upper	—	84

* 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 Enabled	00H–01H	OFF, ON
10H 00H 01H	V-LINK Rx MIDI Channel (Clip)	00H–10H	1–16 Ch., OFF
10H 00H 02H	V-LINK Rx MIDI Channel (Color)	00H–10H	1–16 Ch., OFF
10H 00H 03H	V-LINK Note Mode	00H, 02H	OFF, Assignable

● 3-3-2. Clip Control Assignment Area

Address	Parameter Name	Sys.Ex.Value	Meaning of Value
#10H 10H 02H	V-LINK Rx Setting (Dissolve Time)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Transition Time: Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 04H	V-LINK Rx Setting (Audio Level)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Audio Level: Control Change, Channel Press, Pitch Bend, OFF
#10H 10H 10H	V-LINK Rx Setting (Transition Type)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Transition Type: 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 20H	V-LINK Rx Setting (Output Fader)	01H-05H, 07H-1FH, 40H-5FH, D0H, E0H, FFH	Output Fader: 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	V-LINK Rx Setting (Assignable Note Mode: Lower Key)	00H–7FH	Note Number
10H 30H 03H	V-LINK Rx Setting (Assignable Note Mode: Upper Key)	00H–7FH	Note Number

4. Supplementary Material

● Decimal and Hexadecimal Table

In MIDI documentation, data values and addresses/sizes of exclusive messages etc. are expressed as hexadecimal values for each 7 bits. The following table shows how these correspond to decimal numbers.

D	H	D	H	D	H	D	H
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

D: decimal
H: hexadecimal

- * Decimal values such as MIDI channel, bank select, and program change are listed as one (1) greater than the values given in the above table.
- * A 7-bit byte can express data in the range of 128 steps. For data where greater precision is required, we must use two or more bytes. For example, two hexadecimal numbers aa bbH expressing two 7-bit bytes would indicate a value of $aa \times 128 + bb$.
- * In the case of values which have a ± sign, 00H = -64, 40H = ±0, and 7FH = +63, so that the decimal expression would be 64 less than the value given in the above chart. In the case of two types, 00 00H = -8192, 40 00H = ±0, and 7F 7FH = +8191. For example if aa bbH were expressed as decimal, this would be $aa \times 128 + bb - 64 \times 128$.
- * Data marked "nibbled" is expressed in hexadecimal in 4-bit units. A value expressed as a 2-byte nibble 0a 0bH has the value of $a \times 16 + b$.

<Example1>
What is the decimal expression of 5AH?
From the preceding table, 5AH = 90

<Example2>
What is the decimal expression of the value 12 34H given as hexadecimal for each 7 bits?
From the preceding table, since 12H = 18 and 34H = 52
 $18 \times 128 + 52 = 2356$

<Example3>
What is the decimal expression of the nibbled value 0A 03 09 0D?
From the preceding table, since 0AH = 10, 03H = 3, 09H = 9, 0DH = 13
 $((10 \times 16 + 3) \times 16 + 9) \times 16 + 13 = 41885$

<Example4>
What is the nibbled expression of the decimal value 1258?

- 16) 1258
- 16) 78... 10
- 16) 4... 14
- 0... 4

Since from the preceding table, 0 = 00H, 4 = 04H, 14 = 0EH, 10 = 0AH, the answer is 00 04 0E 0AH.

● MIDI Message Examples

<Example 1> 92H 3EH 5FH
"9n" is a note on status and "n" is MIDI channel number.
As 2H = 2, 3EH = 62 and 5FH = 95, this is a note on message of MIDI CH = 3, note number 62 (D4) and velocity 95.

<Example 2> CEH 49H
"CnH" is program change status and "n" is MIDI channel number.
As EH = 14 and 49H = 73, this is a program change message of MIDI CH = 15 and program number 74.

● Example of an Exclusive Message and Calculating a Checksum

Roland Exclusive messages are transmitted with a checksum at the end (before F7) to make sure that the message was correctly received. The value of the checksum is determined by the address and data (or size) of the transmitted exclusive message.

○ How to Calculate the Checksum (Hexadecimal Numbers are Indicated by 'H')

The checksum is a value derived by adding the address, size and checksum itself and inverting the lower 7 bits.

Here's an example of how the checksum is calculated. We will assume that in the exclusive message we are transmitting, the address is aa bb ccH and the data or size is dd ee ffH.

$$aa + bb + cc + dd + ee + ff = \text{sum}$$

$$\text{sum} / 128 = \text{quotient} \dots \text{remainder}$$

$$128 - \text{remainder} = \text{checksum}$$

(However, the checksum will be 0 if the remainder is 0.)

<Example>
In case you are setting Modulation of Control Change for Dissolve Time Ctrl Assign using MIDI Visual Control ...
From "Parameter Address Map", the start address of the Dissolve Time Ctrl Assign in MIDI Visual Control is 10H 10H 02H and the Modulation parameter 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 Control Version 1.0)
- (5) Address
- (6) Data
- (7) Checksum
- (8) EOX

Next calculate the checksum. Add (5) to (6).
 $10H + 10H + 02H + 00H + 01H = 16 + 16 + 2 + 0 + 1 = 35$ (sum)
 35 (sum) / $128 = 0$ (quotient) ... 35 (remainder)
Checksum = $128 - 35$ (remainder) = $93 = 5DH$

Thus, the message to transmit is :-
F0H 7EH 00H 0CH 01H 10H 10H 02H 00H 01H 5DH F7H

MIDI Implementation Chart

Function...	Transmitted	Recognized	Remarks
Basic Channel Default Changed	X 1-16	X 1-16	Saved when power off
Mode Default Messages Altered	X X *****	X X *****	
Note Number : True Voice	X	X	
Velocity Note On Note Off	X X	X X	
After Touch Key's Channel's	X X	X O	*1 Controls various parameters
Pitch Bend	O	O	*1 Controls various parameters
Control Change	0, 32 O	O	
	1-9 X	O	*1 Controls various parameters
	10-26 O	O	
	28-31 X	O	*1 Controls various parameters
	33-63 X	X	
	64-95 X	O	*1 Controls various parameters
	96-119 X	X	
Program Change : True Number	O 0-127	O 0-127	Channel select
System Exclusive	O	O	
System Common : Song Position : Song Select : Tune Request	X X X	X X X	
System Real Time : Clock : Commands	X X	X X	
Aux Messages : All Sound Off : Reset All Controllers : Local On/Off : All Notes Off : Active Sensing : System Reset	X X X X O X	X X X X O X	
Notes	*1 Only while the MVC Mode or V-LINK Mode is activated		

