VS-411UHD Quick Start Guide

This guide helps you install and use your VS-411UHD for the first time.

Go to www.kramerav.com/downloads/VS-411UHD to download the latest user manual and check if firmware upgrades are available.

Step 1: Check what’s in the box

- VS-411UHD UHD 4x1 Auto Switcher
- 4 Rubber feet
- IR remote control transmitter with batteries
- 1 Power supply (5V DC)
- 1 Quick start guide

Step 2: Get to know your VS-411UHD

<table>
<thead>
<tr>
<th>#</th>
<th>Feature</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IR LED</td>
<td>Lights when the unit accepts IR remote commands.</td>
</tr>
<tr>
<td>2</td>
<td>IR Receiver</td>
<td>Accepts IR remote commands.</td>
</tr>
<tr>
<td>3</td>
<td>ON LED</td>
<td>Lights when power is connected to the unit.</td>
</tr>
<tr>
<td>4</td>
<td>AUTOMAN. Selector Button and LED</td>
<td>Toggle switch to select between automatic (LED on) or manual switching (LED off)</td>
</tr>
<tr>
<td>5</td>
<td>LAST/PRIO. Selector Button and LED</td>
<td>When in AUTO mode, switch toggles to select switching to the last connected input (LED on) or the highest priority input (LED off).</td>
</tr>
<tr>
<td>6</td>
<td>INPUTS Selector Buttons</td>
<td>Press the INPUT button to select the input to switch to the output (from 1 to 4). Button LED indication: A selected input – the button illuminates. An active input that is not selected – the button is dim. A non-active button that is not selected – the button is dark.</td>
</tr>
<tr>
<td>7</td>
<td>OFF Button</td>
<td>Press to mute the video output (lit when muted).</td>
</tr>
<tr>
<td>8</td>
<td>EDID Button</td>
<td>Press to copy the EDID (button is illuminated).</td>
</tr>
<tr>
<td>9</td>
<td>LOCK Button</td>
<td>Press to lock the front panel buttons (button is illuminated).</td>
</tr>
</tbody>
</table>
Step 3: Install the VS-411UHD

Attach the rubber feet and place on a table or mount the VS-411UHD in a rack (using an optional RK-1 rack mount).

Step 4: Connect the inputs and outputs

Always switch OFF the power on each device before connecting it to your VS-411UHD. For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the VS-411UHD.
**Step 5: Connect the power**

Connect the 5V DC power adapter to the VS-411UH and plug it into the mains electricity.

**Safety Instructions**

**Caution:**
There are no operator serviceable parts inside the unit.

**Warning:**
Use only the Kramer Electronics power supply that is provided with the unit.

Disconnect the power and unplug the unit from the wall before installing. See www.kramerbd.com for updated safety information.

---

**Step 6: Set the DIP-switches**

All DIP-switches are off by default.

Set the Mode/Preset DIP-switches as shown in the following table:

<table>
<thead>
<tr>
<th>DIP</th>
<th>Function</th>
<th>Off (Up)</th>
<th>On (Down)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Audio EDID</td>
<td>Pass audio EDID of sink.</td>
<td>Limit to 2-CH LPCM (effective only after DIP 3 is set to on (down)).</td>
</tr>
<tr>
<td>2</td>
<td>Color EDID</td>
<td>Pass deep color parameter of sink.</td>
<td>Limit to RGB 8bpp (effective only after DIP 3 is set to on (down)).</td>
</tr>
<tr>
<td>3</td>
<td>Lock EDID</td>
<td>Pass EDID of sink.</td>
<td>Lock current display EDID and the current settings of DIPs 1 and 2 (the settings of DIPs 1 and 2 cannot be changed when DIP 3 is locked). This state also allows copying the default EDID or an EDID file to the inputs if using EDID Designer, refresh after copying.</td>
</tr>
<tr>
<td>4</td>
<td>HDCP</td>
<td>Enable HDCP support. When Off, if the output supports HDCP, the input declares HDCP support. It then handles HDCP on the output and input actively. If the output does not support HDCP then the input does not support HDCP.</td>
<td>Disable HDCP support. When On, the device does not support HDCP on its input, even if HDCP is detected on the output.</td>
</tr>
<tr>
<td>5</td>
<td>ARC or Step-in for the 1st HDMI Input</td>
<td>Step-in</td>
<td>ARC audio</td>
</tr>
<tr>
<td>6</td>
<td>Analog Output Audio From</td>
<td>Source</td>
<td>ARC audio</td>
</tr>
<tr>
<td>7</td>
<td>Output Off</td>
<td>Disable (to support audio only embedding).</td>
<td>Enable</td>
</tr>
<tr>
<td>8</td>
<td>Output Off Delay Settings</td>
<td>15 sec default (configurable).</td>
<td>15min</td>
</tr>
</tbody>
</table>

Set the Audio Select DIP-switches as shown in the lower table:

<table>
<thead>
<tr>
<th>DIP</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input 1 audio embedding</td>
<td>Embed analog audio only if the HDMI video does not have audio (DVI).</td>
</tr>
<tr>
<td>2</td>
<td>Input 2 audio embedding</td>
<td>Always embed analog audio.</td>
</tr>
<tr>
<td>3</td>
<td>Input 3 audio embedding</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Input 4 audio embedding</td>
<td></td>
</tr>
</tbody>
</table>
Step 7: Operation

Manual Switch Mode

In Manual switch mode, the VS-411UHD does not automatically switch to another channel even if an input signal is not detected on the manually selected input.

To select the Manual switch mode:

1. Press the AUTO/MAN. button. The Auto LED turns off.
2. Press an INPUT button (1 to 4) to route this input to the HDMI output. The keys respond as follows:
   - Input LED bright: input selected.
   - Input LED dim: input active and not selected.
   - Input LED off: input is not active and not selected.

Auto Switch Mode

In Auto switch mode, the VS-411UHD automatically switches one of four HDMI inputs to a predefined or the last connected input whenever the currently active video signal is interrupted or whenever a higher-priority video signal is detected.

To select Auto switch mode:

1. Press the AUTO/MAN. button to turn the Auto LED on.
2. Press the LAST/PRIO. button to select an auto switch mode:
   - Last connected (LAST LED on) – The device always switches to a newly detected active video source. When the device is powered on, the output switches to the highest priority input.
   - Priority (LAST LED off) – The device always switches to the highest priority input source. First priority is Input 1 then 2, 3, and 4.

Manual Override Mode

Auto switch mode can be overridden by a manual command, such as pressing an input button or sending a control command. In such a case, the system switches to the manually selected source. If this manually selected source is not active, the system waits a set amount of time (10 seconds, default; can be changed using Protocol 3000 commands) and then switches back to auto mode. Manual override selection is not stored in non-volatile memory.

Step 8: Technical specifications

<table>
<thead>
<tr>
<th>INPUTS:</th>
<th>4 HDMI connectors, 4 unbalanced stereo audio on 3.5mm mini jacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUTS:</td>
<td>1 HDMI connector, 1 balanced stereo audio on 5-pin terminal block</td>
</tr>
<tr>
<td>PORTS:</td>
<td>1 RS-232 on a 3-pin terminal block, 1 mini USB for programming</td>
</tr>
<tr>
<td>COMPLIANCE WITH HDMI STANDARD:</td>
<td>HDMI 1.4, Deep Color, 3D, ARC, up to 7.1 uncompressed audio channels</td>
</tr>
<tr>
<td>MAX. DATA RATE:</td>
<td>8.91Gbps (2.97Gbps per graphic channel)</td>
</tr>
<tr>
<td>SUPPORTED RESOLUTIONS:</td>
<td>Up to 4K x 2K, 4K@60Hz (4:2:0)</td>
</tr>
<tr>
<td>CONTROLS:</td>
<td>Front panel buttons, contact closure, IR, RS-232 Protocol 3000</td>
</tr>
<tr>
<td>SOFTWARE SUPPORT:</td>
<td>Protocol 3000, EDID Designer, K-Upload</td>
</tr>
<tr>
<td>POWER CONSUMPTION:</td>
<td>5V DC, 500mA</td>
</tr>
<tr>
<td>OPERATING TEMPERATURE:</td>
<td>0° to +40°C (32° to 104°F)</td>
</tr>
<tr>
<td>STORAGE TEMPERATURE:</td>
<td>-40° to +70°C (-40° to 158°F)</td>
</tr>
<tr>
<td>HUMIDITY:</td>
<td>10% to 90%, RHL non-condensing</td>
</tr>
<tr>
<td>DIMENSIONS:</td>
<td>21.5cm x16.3cm x 4.4cm (8.4&quot; x 6.4&quot; x 1.7&quot;) W, D, H</td>
</tr>
<tr>
<td>WEIGHT:</td>
<td>0.89kg (1.96lbs) approx.</td>
</tr>
<tr>
<td>SHIPPING DIMENSIONS:</td>
<td>31.5cm x 21.2cm x 7.2cm (12.4&quot; x 8.4&quot; x 2.8&quot;) W, D, H</td>
</tr>
<tr>
<td>SHIPPING WEIGHT:</td>
<td>1.46kg (3.29lbs) approx.</td>
</tr>
<tr>
<td>INCLUDED ACCESSORIES:</td>
<td>Power adapter, IR remote control</td>
</tr>
<tr>
<td>OPTIONS:</td>
<td>RK-1 13&quot; rack adapter</td>
</tr>
</tbody>
</table>
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  2.2 Safety Instructions 2
  2.3 Recycling Kramer Products 3
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Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear INPUT 14 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer VS-411UHD UHD 4x1 Auto Switcher, which is ideal for the following typical applications:

- Mid- to small-sized meeting/conference rooms
- Educational lecture rooms
- Systems that require automatic HDMI routing
- Presentation and multimedia applications
2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual

Go to www.kramerav.com/downloads/VS-411UHD to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- For optimum range and performance, use the recommended Kramer cables available at www.kramerav.com/product/VS-411UHD
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighbouring electrical appliances that may adversely influence signal quality
- Position your Kramer VS-411UHD away from moisture, excessive sunlight and dust

This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions

Caution: There are no operator serviceable parts inside the unit
Warning: Use only the Kramer Electronics power supply that is provided with the unit
Warning: Disconnect the power and unplug the unit from the wall before installing
2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer’s recycling arrangements in your particular country go to our recycling pages at www.kramerav.com/support/recycling/.
3 Overview

The **VS-411UHD** is an automatic switcher for HDMI (up to 4K@60Hz (4:2:0)) and analog audio signals. The unit automatically switches one of four HDMI inputs to a predefined or the last connected input whenever the currently active video signal is interrupted or whenever a higher-priority video signal is detected. It also supports Kramer’s Step-in over HDMI technology.

The unit can embed analog audio to an HDMI signal and can extract the audio from either an input HDMI signal or an output Audio Return Channel (ARC) HDMI signal. The **VS-411UHD** can output an analog audio source on the HDMI output even when an HDMI source is not connected and enters sleep mode when no input is detected.

The **VS-411UHD** features:

- Maximum data rate 8.91Gbps (2.97Gbps per graphic channel)
- Resolution support for up to 4K@60Hz (4:2:0) UHD
- Supports Kramer Step-In over HDMI technology
- HDTV compatible
- Active switching – selectable manual or fast auto switching according to last connected or preset priority
- HDMI 1.4, HDCP and DVI 1.0 compliant
- HDMI 1.4 support for Deep Color, 3D, ARC, up to 7.1 uncompressed audio channels
- HDMI 1 input supports CEC and ARC
- HDMI ARC de-embedding from output to balanced stereo audio line out, uncompressed
- Automatic video input detection and selection
- Auto-power off when no HDMI input for 10 seconds (selectable)
- HDCP on/off switching
- EDID configuration options
• Default EDID
• Contact closure for remote manual switching override
• Audio embedding/de-embedding
• Analog audio input per port
• A LOCK button to prevent tampering
• Firmware upgrade over RS-232, mini-USB
• Support for Protocol 3000, EDID Designer, K-Upload via RS-232
• Varied control options – front panel buttons, contact closure, IR, RS-232
  Protocol 3000

3.1 Defining the VS-411UHD UHD 4x1 Auto Switcher

This section defines the VS-411UHD.

Figure 1: VS-411UHD 4x1 Auto Switcher
<table>
<thead>
<tr>
<th>#</th>
<th>Feature</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IR LED</td>
<td>Lights yellow when the unit accepts IR remote commands.</td>
</tr>
<tr>
<td>2</td>
<td>IR Receiver</td>
<td>Accepts IR remote commands.</td>
</tr>
<tr>
<td>3</td>
<td>ON LED</td>
<td>Lights when power is connected to the unit.</td>
</tr>
<tr>
<td>4</td>
<td>AUTO/MAN Selector Button and LED</td>
<td>Toggle switch to select between automatic (LED on) or manual switching (LED off).</td>
</tr>
<tr>
<td>5</td>
<td>LAST/PRIO. Selector Button and LED</td>
<td>When in the AUTO mode, toggle switch to select switching to the last connected input (LED on) or the highest priority input (LED off).</td>
</tr>
<tr>
<td>6</td>
<td>INPUT Select Buttons</td>
<td>Press the INPUT button to select the input to switch to the output (from 1 to 4). Button LED indication: A selected input – the button illuminates. An active input that is not selected – the button is dim. A non-active input that is not selected – the button is dark.</td>
</tr>
<tr>
<td>7</td>
<td>OFF Button</td>
<td>Press to mute the video output (lit when muted).</td>
</tr>
<tr>
<td>8</td>
<td>EDID Button</td>
<td>Press to copy the EDID (button is lit), see Section 5.4.</td>
</tr>
<tr>
<td>9</td>
<td>LOCK Button</td>
<td>Press to lock the front panel buttons (button is lit).</td>
</tr>
<tr>
<td>10</td>
<td>AUDIO INPUT 3.5mm Mini Jack</td>
<td>Connect to the unbalanced stereo audio inputs (from 1 to 4).</td>
</tr>
<tr>
<td>11</td>
<td>BALANCED OUT Terminal Block</td>
<td>Connect the balanced stereo audio output to a balanced stereo audio acceptor.</td>
</tr>
<tr>
<td>12</td>
<td>MODE/PRESET DIP-switches</td>
<td>See Section 4.2.1.</td>
</tr>
<tr>
<td>13</td>
<td>AUDIO SELECT DIP-switches</td>
<td>Set audio embedding for inputs 1 to 4 (the switch number corresponds to the input number): • Set down (ON) to always embed the analog audio. • Set up (OFF) embeds analog audio only if the HDMI video does not have audio (DVI), see Section 4.2.2.</td>
</tr>
<tr>
<td>14</td>
<td>PROG mini-USB Port</td>
<td>Connects to a PC to upgrade the firmware.</td>
</tr>
<tr>
<td>15</td>
<td>5V DC</td>
<td>+5V DC connector for powering the unit.</td>
</tr>
<tr>
<td>16</td>
<td>INPUT HDMI Connectors</td>
<td>Connect to the HDMI sources (from 1 to 4).</td>
</tr>
<tr>
<td>17</td>
<td>OUTPUT HDMI Connector</td>
<td>Connect to the HDMI acceptor.</td>
</tr>
<tr>
<td>18</td>
<td>INPUT SELECT Terminal Block</td>
<td>Connects to contact closure switches, see Section 6.2.</td>
</tr>
<tr>
<td>19</td>
<td>RS-232 Terminal Block Connector</td>
<td>Connect to the PC or the Remote Controller.</td>
</tr>
</tbody>
</table>
Always switch off the power to each device before connecting it to your VS-411UHD. After connecting your VS-411UHD, connect its power and then switch on the power to each device.

You do not have to connect all the inputs and outputs, connect only those that are required.

To connect the VS-411UHD as illustrated in the example in Figure 2:

1. Connect an HDMI source (for example, a laptop) to the INPUT 1 HDMI connector and connect an analog audio source (for example, an audio player) to the INPUT 1 3.5 mini-jack connector.
   You can also connect a DVD player with a DVI connector, using a DVI-HDMI adapter to transfer video signals.

2. Connect HDMI sources (examples: document camera, Blu-ray player, or PC) to the INPUT 2, 3, 4 HDMI connectors and connect audio inputs as required to the INPUT 2, 3, 4 3.5 mini-jack connectors.

3. Connect the OUT HDMI connector to the HDMI acceptor (for example, an LCD display).

4. Connect the AUDIO OUT terminal block connector to a balanced stereo audio acceptor (for example, active speakers).

5. Set the AUDIO SELECT DIP-switches (see Section 5.1.2)

6. Set the MODE/PRESET DIP-switches (see Section 5.1.2)

7. If required, connect a PC and/or controller to the RS-232 terminal block connector (see Section 4.1).

8. If required, connect the contact closure terminal block connectors (see Section 6.2).

9. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 2).
4.1 Connecting a Serial Controller to the VS-411UHD via RS-232

The VS-411UHD operates at two baud rates – 9600 (default) and 115,200 (see all communication parameters in Section 9.1).

To connect a serial controller to the VS-411UHD:

- From the RS-232 9-pin D-sub serial port on the serial controller connect:
  - Pin 2 to the TX pin on the VS-411UHD RS-232 terminal block
  - Pin 3 to the RX pin on the VS-411UHD RS-232 terminal block
  - Pin 5 to the GND pin on the VS-411UHD RS-232 terminal block
4.2 Setting the DIP-Switches

The DIP-switches dictate the behavior of the VS-411UHD. All DIP-switches are off by default.

4.2.1 Mode/Preset DIP-Switches

<table>
<thead>
<tr>
<th>DIP</th>
<th>Function</th>
<th>Off (Up)</th>
<th>On (Down)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Audio EDID</td>
<td>Pass audio EDID of sink.</td>
<td>Limit to 2-CH LPCM (effective only after DIP 3 is set to on (down)).</td>
</tr>
<tr>
<td>2</td>
<td>Color EDID</td>
<td>Pass deep color parameter of sink.</td>
<td>Limit to RGB 8bpp (effective only after DIP 3 is set to on (down)).</td>
</tr>
<tr>
<td>3</td>
<td>Lock EDID</td>
<td>Pass EDID of sink.</td>
<td>Lock current display EDID and the current settings of DIPs 1 and 2 (the settings of DIPs 1 and 2 cannot be changed when DIP 3 is locked). This state also allows copying the default EDID or an EDID file to the inputs (if using EDID Designer, refresh after copying).</td>
</tr>
<tr>
<td>4</td>
<td>HDCP</td>
<td>Enable HDCP support. When Off, if the output supports HDCP, the input declares HDCP support. It then handles HDCP on the output and input actively. If the output does not support HDCP then the input does not support HDCP.</td>
<td>Disable HDCP support. When On, the device does not support HDCP on its input, even if HDCP is detected on the output.</td>
</tr>
<tr>
<td>5</td>
<td>ARC or Step-in for the 1st HDMI input</td>
<td>Step-in</td>
<td>ARC audio</td>
</tr>
<tr>
<td>6</td>
<td>Analog Output Audio From</td>
<td>Source</td>
<td>ARC audio</td>
</tr>
<tr>
<td>7</td>
<td>Output Off</td>
<td>Disable (to support audio only embedding).</td>
<td>Enable</td>
</tr>
<tr>
<td>8</td>
<td>Output Off Delay Settings</td>
<td>15sec default (configurable).</td>
<td>15min</td>
</tr>
</tbody>
</table>

4.2.2 Audio Select DIP-Switches

**AUDIO SELECT**

Figure 3: AUDIO SELECT DIP-Switches

<table>
<thead>
<tr>
<th>DIP #</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input 1 audio embedding</td>
<td>Embed analog audio only if the HDMI video does not have audio.</td>
</tr>
<tr>
<td>2</td>
<td>Input 2 audio embedding</td>
<td>Always embed analog audio.</td>
</tr>
<tr>
<td>3</td>
<td>Input 3 audio embedding</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Input 4 audio embedding</td>
<td></td>
</tr>
</tbody>
</table>
5 Operating the VS-411UHD

This section describes the VS-411UHD setup.

5.1 Switching – Manual and Auto

Switching can be performed automatically or manually using the device’s keypad, remote control, or control commands. This section describes using the keypad buttons to select Auto or Manual switch modes. The same procedure can also be used for controlling switching via the remote control. For information about switching via control commands, see Section 10.3.

5.1.1 The Manual Switching Mode

In the manual mode, the VS-411UHD acts as a regular switcher, switching the input video and audio signals to the output via the four front panel INPUT buttons.

To select the Manual switch mode:

1. Press the AUTO/MANUAL button to turn the AUTO LED off.

2. Press the INPUT1 to INPUT4 button to route this input to the HDMI output. The keys respond as follows:
   • Input LED bright: input active and selected
   • Input LED dim: input active and not selected
   • Input LED off: input is not active and not selected

5.1.2 Auto Switch Mode

In Auto switch mode, the VS-411UHD automatically switches one of four HDMI inputs to a predefined or the last connected input whenever the currently active video signal is interrupted or whenever a higher-priority video signal is detected.
To select Auto switch mode:

1. Press the AUTO/MAN. button to turn the AUTO LED on.

2. Press the LAST/PRIOR. button to select an auto switch mode:
   - Last connected (LAST LED on) – The device always switches to a newly detected active video source. When the device is powered on, the output switches to the highest priority input
   - Priority (LAST LED off) – The device always switches to the highest priority input source. The default priority is Input 1 then Input 2.

5.1.3 Manual Override Mode

Auto switch mode can be overridden by a manual command, such as pressing an input button or sending a control command. In such a case, the system switches to the manually selected source. If this manually selected source is not active, the system waits a set amount of time (10 seconds, default) and then switches back to auto mode. Manual override selection is not stored in non-volatile memory.

5.2 Setting the Switching Speed

The VS-411UHD supports setting normal and fast (default) switching speeds.

To set switching speed modes:

1. Disconnect device power.

2. Press and hold one of the following buttons together with the OFF button:
   - INPUT 1 button – for setting fast switching speed mode.
   - INPUT 2 button – for setting normal switching speed mode.

3. Power the device on.
   The device switching speed is modified.
5.3 Muting the Output

- Press the OFF button to mute the audio and video outputs

5.4 Copying the EDID

The EDID is a data structure transmitted by the display that enables the **VS-411UHD** to recognize the display connected to the output. The **VS-411UHD** acquires and stores the EDID to make reconnection to the display effortless.

When the device is first powered on, it has default EDID loaded. The device automatically reads and saves the first read EDID. Use DIP-switches 1-3 to set EDID functionality (see Section 4.2).

While copying EDID data, the input port's HPD function changes from Low to High which may affect the channel's auto-switching.

The device automatically recognizes EDID differences between input and output channels based on parts of the EDID data, including manufacturer, serial number, and first block check-sum information. EDID data is not copied if any difference is recognized.

Note: If a corrupted EDID is copied, the device loads the default EDID on all inputs.

5.5 Setting the 5V Output Time Delay

Use DIP-switch 8 to set the delay time. Off (Up) delays 15 seconds, On (Down) delays 15 minutes. A Protocol 3000 command can modify the delay time.

When there is no signal clock or 5V input on all inputs for the set delay, the device shuts down the 5V output.

5.6 Setting HDCP Capability

The **VS-411UHD** supports HDCP communication automatically, by default. When HDCP is detected in the input signal, it is enabled in the output signal. You can also disable HDCP support using DIP-switch 4 (see Section 4.2). Enabling or disabling HDCP support is universal for all inputs.
5.7 Setting Audio Output

The VS-411UHD enables customizing the audio output by embedding audio in HDMI, de-embedding HDMI ARC from output to the uncompressed balanced stereo audio line out, or routing the HDMI / analog inputs to the uncompressed balanced stereo audio line out.

5.7.1 Embedding Audio in HDMI

The VS-411UHD can output audio to the HDMI Out port from the original HDMI input or the Analog unbalanced 3.5mm audio input, by embedding it in the HDMI input signal. The VS-411UHD enables setting the audio output separately for each input using DIP-switches 5 and 6 (see Section 4.2).

- An Input 1 analog audio signal can only be embedded in the Input 1 HDMI signal.
- An Input 2 analog audio signal can only be embedded in the Input 2 HDMI signal.

5.7.2 Outputting Audio from ARC or Device Inputs

The VS-411UHD can output audio to the balanced stereo Audio Out terminal block from the following input sources:

- ARC – In this mode, the device does not enable embedding audio in the HDMI signal.
- HDMI inputs / Analog unbalanced 3.5mm audio inputs – In this mode, the balanced stereo Audio Out terminal block and the HDMI Out port both output audio. The Audio Out terminal block mutes the audio when the input audio signal is not LPCM.

Use DIP-switch 7 to set output to ARC / device inputs (see Section 4.2).

When de-embedding multichannel audio, the device outputs FL (front left) and FR (front right) channels only and cuts the rest of the audio channels.
5.8 Using the Remote Control

You can use the RC-IR3 wireless remote control to control the VS-411UHD via the built-in IR receiver on the front panel. For more information, see www.kramerav.com/Product/RC-IR3.

5.9 Step-In Support

The VS-411UHD supports programmable step-in functionality when used in conjunction with compatible step-in devices, such as the SID-X3N and DIP-31 (using an HDMI cable that supports HEC, the HDMI Ethernet Channel).

When ARC mode is enabled, Input 1 step-in mode is disabled. If you require step-in mode on Input 1, set the audio output to the device inputs (see Section 5.7.2).

5.10 Using VCOM on USB

USB can work as a port for virtual com (VCOM). Verify that the USB port on the PC that connects to the VS-411UHD is configured as a VCOM port. You may need to install a driver to do this. Use a tool such as Hercules or K-Config to use Protocol 3000 over USB. For more information on using the commands see Section 10.

5.11 Upgrading the Firmware

The VS-411UHD can be upgraded via USB or RS-232.

For instructions on upgrading the firmware, see “K-Upload Software User Guide” (k.kramerav.com/support/download.asp?f=39700).
6 Controlling the VS-411UHD

The VS-411UHD can be controlled via:

- The front panel buttons (see Section 6.1)
- Contact closure (see Section 6.2)
- The RC-IR3 Remote control transmitter (see Section 6.3)
- RS-232 port (see Section 6.4)

6.1 Using the Front Panel Buttons

The VS-411UHD includes the following front panel buttons:

- The AUTO/MAN. button, toggling between the Auto and the manual mode (see Section 5.1)
- The LAST/PRIO. button, toggling between set priorities or last connected modes (see Section 5.1.2)
- Front Panel INPUT buttons (see Section 3.1)
- The OFF button to mute the video output
- The EDID button to copy EDID (see Section 5.4)
- The LOCK button to lock the front panel buttons

The front panel button LEDs behave as follows:

- Bright red: an active input signal is detected and selected
- Dim red: that input is active, but not selected
- Off: no signal is detected (or the signal is not active)
  If a non-active signal is selected, the display appears black
6.2 Switching via the Terminal Block Connector

The INPUT SELECT terminal block connector includes five input pins and a G pin for selecting an input:

- 1 – Switch to Input 1
- 2 – Switch to Input 2
- 3 – Switch to Input 3
- 4 – Switch to Input 4
- OFF – Mutes the HDMI output

For example, you may override (equivalent to pressing a different input button) the presently routed input by using the remote control contact closure. To do so, connect the appropriate input number (input 1, 2, 3 or 4) pin on the REMOTE terminal block connector to the G (Ground) pin, as Figure 4 illustrates.

To disconnect the inputs from the output, connect the OFF pin on the REMOTE terminal block connector to the G (Ground) pin, as Figure 4 illustrates.

When in the manual mode (AUTO front panel LED is off), you can switch an input to the output using the front panel INPUT SELECT button.

Note that unless the connection is permanent, the VS-411UHD reverts to an automatic switcher when the connection is removed.

**DO NOT** Connect more than one pin to the Ground pin at the same time.

To select HDMI 1 (2, 3, 4), momentarily connect the INPUT SELECT 1 (2, 3, 4) pin to the G pin

To disconnect all the inputs from the output, momentarily connect the INPUT SELECT OFF pin to the G pin

Figure 4: Connecting the Contact Closure Remote Control Pins
6.3 Using the RC-IR3 Remote Control Transmitter with the VS-411UHD

You can control the VS-411UHD via the Kramer RC-IR3 Remote Control Transmitter.

To switch an input to the output:

- Press key 1 (2, 3, 4) to switch INPUT 1 (2, 3, 4) to the output

To mute audio and video on the output:

- Press the OFF key to disconnect the output

The IR LED behaves as follows:

- When the device is powered on, the IR LED turns on for a short time and then turns off
- Before finding the sink, the LED is off
- After finding the sink, the LED is on
- When receiving information, the LED flashes

6.4 Connecting to the VS-411UHD via RS-232

Connect the RS-232 Terminal block connector on the product to the RS-232 9-pin D-sub port on your PC/controlled device to control the VS-411UHD, as shown in Figure 5:

<table>
<thead>
<tr>
<th>Connect this pin on the terminal block connector</th>
<th>To this pin on the 9-pin D-sub Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx</td>
<td>Pin 2</td>
</tr>
<tr>
<td>Rx</td>
<td>Pin 3</td>
</tr>
<tr>
<td>GND</td>
<td>Pin 5</td>
</tr>
</tbody>
</table>

Figure 5: RS-232 Pinout
6.5 Performing a Factory Reset

Factory reset returns all the parameters of the device to their factory default settings.

To perform a factory reset:

1. Disconnect device power.

2. Press and hold INPUT 1 while reconnecting device power.
   All indicators flash while resetting to the factory default parameters.

3. When all the lights turn off the reset is complete.
## Technical Specifications

<table>
<thead>
<tr>
<th>INPUTS:</th>
<th>4 HDMI connectors, 4 unbalanced stereo audio on 3.5mm mini jacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANALOG AUDIO UNBALANCED INPUT:</td>
<td>Nominal level: 316mVRMS, Maximum level: 1VRMS, Impedance: 10kΩ.</td>
</tr>
<tr>
<td>OUTPUTS:</td>
<td>1 HDMI connector, 1 balanced stereo audio on 5-pin terminal block</td>
</tr>
<tr>
<td>ANALOG AUDIO BALANCED OUTPUT:</td>
<td>Nominal level: 316mVRMS, Maximum level: 1VRMS, Impedance: 150Ω.</td>
</tr>
<tr>
<td>PORTS:</td>
<td>1 RS-232 on a 3-pin terminal block, 1 mini USB for programming</td>
</tr>
<tr>
<td>COMPLIANCE WITH HDMI STANDARD:</td>
<td>HDMI 1.4, Deep Color, 3D, ARC, up to 7.1 uncompressed audio channels, CEC</td>
</tr>
<tr>
<td>MAX. DATA RATE:</td>
<td>8.91Gbps (2.97Gbps per graphic channel)</td>
</tr>
<tr>
<td>SUPPORTED RESOLUTIONS:</td>
<td>Up to 4K x 2K, 4K@60Hz (4:2:0)</td>
</tr>
<tr>
<td>CONTROLS:</td>
<td>Front panel buttons, contact closure, IR, RS-232 Protocol 3000</td>
</tr>
<tr>
<td>SOFTWARE SUPPORT:</td>
<td>Protocol 3000, EDID Designer, K-Upload</td>
</tr>
<tr>
<td>POWER CONSUMPTION:</td>
<td>5V DC, 500mA</td>
</tr>
<tr>
<td>OPERATING TEMPERATURE:</td>
<td>0° to +40°C (32° to 104°F)</td>
</tr>
<tr>
<td>STORAGE TEMPERATURE:</td>
<td>-40° to +70°C (-40° to 158°F)</td>
</tr>
<tr>
<td>HUMIDITY:</td>
<td>10% to 90%, RHL non-condensing</td>
</tr>
<tr>
<td>DIMENSIONS:</td>
<td>21.5cm x 16.3cm x 4.4cm (8.4&quot; x 6.4&quot; x 7.2&quot;) W, D, H</td>
</tr>
<tr>
<td>WEIGHT:</td>
<td>0.89kg (1.96lbs) approx.</td>
</tr>
<tr>
<td>SHIPPING DIMENSIONS:</td>
<td>31.5cm x 21.2cm x 7.2cm (12.4&quot; x 8.4&quot; x 2.8&quot;) W, D, H</td>
</tr>
<tr>
<td>SHIPPING WEIGHT:</td>
<td>1.49kg (3.28lbs) approx.</td>
</tr>
<tr>
<td>INCLUDED ACCESSORIES:</td>
<td>Power adapter, IR remote control</td>
</tr>
<tr>
<td>OPTIONS:</td>
<td>RK-1 19” rack adapter</td>
</tr>
</tbody>
</table>

Specifications are subject to change without notice at [www.kramerav.com](http://www.kramerav.com)
### Supported Resolutions

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Refresh Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>640 x 480p (59.95Hz is available on quantum 780B)</td>
<td>85Hz; 75Hz; 72Hz; 60Hz; 59.95Hz</td>
</tr>
<tr>
<td>720 x 480p</td>
<td>60Hz</td>
</tr>
<tr>
<td>720 x 576p</td>
<td>50Hz</td>
</tr>
<tr>
<td>800 x 600p</td>
<td>85Hz; 75Hz; 72Hz; 60Hz</td>
</tr>
<tr>
<td>848 x 480p</td>
<td>60Hz</td>
</tr>
<tr>
<td>852 x 480p (available on quantum 780B)</td>
<td>60Hz</td>
</tr>
<tr>
<td>1024 x 768p</td>
<td>85Hz; 75Hz; 70Hz; 60Hz</td>
</tr>
<tr>
<td>1280 x 960</td>
<td>60Hz</td>
</tr>
<tr>
<td>1280 x 1024p</td>
<td>75Hz; 60Hz</td>
</tr>
<tr>
<td>1280 x 768p (available on quantum 780B)</td>
<td>60Hz</td>
</tr>
<tr>
<td>1280x800p</td>
<td>60Hz</td>
</tr>
<tr>
<td>1920 x 1080p</td>
<td>50Hz; 60Hz; 30Hz; 24Hz;</td>
</tr>
<tr>
<td>1920 x 1080p</td>
<td>60Hz;</td>
</tr>
<tr>
<td>1920 x 1080i</td>
<td>50Hz; 60Hz;</td>
</tr>
<tr>
<td>1600 x 1200p</td>
<td>60Hz</td>
</tr>
<tr>
<td>1920 x 1200p</td>
<td></td>
</tr>
<tr>
<td>1600 x 900p</td>
<td>60Hz</td>
</tr>
<tr>
<td>1152 x 864p</td>
<td>75Hz</td>
</tr>
<tr>
<td>1440 x 900p</td>
<td>60Hz</td>
</tr>
<tr>
<td>1680 x 1050p</td>
<td>60Hz</td>
</tr>
<tr>
<td>1360 x 768p</td>
<td>60Hz</td>
</tr>
<tr>
<td>1366 x 768</td>
<td>60Hz; 50Hz</td>
</tr>
<tr>
<td>1400 x 1050p</td>
<td>60Hz</td>
</tr>
<tr>
<td>720 x 480i (available on quantum 780B)</td>
<td>30Hz</td>
</tr>
<tr>
<td>3840 x 2160</td>
<td>30Hz; 25Hz; 24Hz; 60Hz 4:2:0</td>
</tr>
<tr>
<td>4096 x 2160</td>
<td>24Hz</td>
</tr>
</tbody>
</table>
9 Default Settings

The VS-411UHD has the following default settings for communication, first power on and EDID.

9.1 Default Communication Settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RS-232</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>3000 (Default)</td>
</tr>
<tr>
<td>Baud Rate</td>
<td>9600</td>
</tr>
<tr>
<td>Data Bits</td>
<td>8</td>
</tr>
<tr>
<td>Stop Bits</td>
<td>1</td>
</tr>
<tr>
<td>Parity</td>
<td>None</td>
</tr>
<tr>
<td>Command Format</td>
<td>ASCII</td>
</tr>
</tbody>
</table>

9.2 First Power On Default Settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out HDCP mode</td>
<td>Follow</td>
</tr>
<tr>
<td>Communication Format</td>
<td>KMR3000 (KMR device)</td>
</tr>
<tr>
<td>Close Output 5v Time</td>
<td>15sec</td>
</tr>
<tr>
<td>Current Input Source Port</td>
<td>Input port 1</td>
</tr>
<tr>
<td>Manual/Auto Switch Mode</td>
<td>Auto mode</td>
</tr>
<tr>
<td>Pr/Lc Switch Mode</td>
<td>Priority mode</td>
</tr>
<tr>
<td>ARC/De-embed Audio Out</td>
<td>DE-embed audio out</td>
</tr>
<tr>
<td>RS-232 Connection</td>
<td>CPU</td>
</tr>
<tr>
<td>Input Port HDCP</td>
<td>All ON</td>
</tr>
<tr>
<td>Kramer 3000 Model Name</td>
<td>'V', 'S', '4', '1', 'U', 'H', 'D'</td>
</tr>
<tr>
<td>EDID</td>
<td>Default</td>
</tr>
<tr>
<td>USB for Virtual Com</td>
<td>Virtual Com</td>
</tr>
<tr>
<td>IP Address</td>
<td>192.168.1.39</td>
</tr>
<tr>
<td>Mask Number</td>
<td>255.255.0.0</td>
</tr>
<tr>
<td>Gateway Number</td>
<td>192.168.0.254</td>
</tr>
<tr>
<td>DHCP</td>
<td>Disabled (OFF)</td>
</tr>
</tbody>
</table>
9.3 Default EDID

Monitor
Model name............... VS-411UHD
Manufacturer............. KMR
Plug and Play ID.......... KMR03ED
Serial number............ 1
Manufacture date......... 2015, ISO week 20
Filter driver............ None

EDID revision............ 1.3
Input signal type........ Digital (HDMI-a)
Color bit depth........... Undefined
Display type............. RGB color
Screen size............... 700 x 390 mm (31.5 in)
Power management......... Not supported
Extension blocs........... 1 (CEA-EXT)

Color characteristics
Default color space...... Non-sRGB
Display gamma............. 2.20
Red chromaticity.......... Rx 0.640 - Ry 0.341
Green chromaticity........ Gx 0.286 - Gy 0.610
Blue chromaticity.......... Bx 0.146 - By 0.069
White point (default)... Wx 0.284 - Wy 0.293

Timing characteristics
Horizontal scan range.... 31-94kHz
Vertical scan range...... 50-85Hz
Video bandwidth.......... 170MHz
CVT standard............. Not supported
GTF standard............. Not supported
Preferred timing......... Yes
Native/preferred timing.. 1280x720p at 60Hz
Modeline.................. "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #1....... 1920x1080p at 60Hz (16:9)
Modeline.................. "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync

Standard timings supported
720 x  400p at  70Hz - IBM VGA
720 x  400p at  88Hz - IBM XGA2
640 x  480p at  60Hz - IBM VGA
640 x  480p at  67Hz - Apple Mac II
640 x  480p at  72Hz - VESA
640 x  480p at  75Hz - VESA
800 x  600p at  56Hz - VESA
800 x  600p at  60Hz - VESA
800 x  600p at  72Hz - VESA
800 x  600p at  75Hz - VESA
832 x  624p at  75Hz - Apple Mac II
1024 x  768p at  70Hz - VESA
1024 x  768p at  75Hz - VESA
1024 x  768p at  75Hz - VESA
1280 x  1024p at  75Hz - VESA
1152 x  870p at  75Hz - Apple Mac II
1280 x  720p at  60Hz - VESA STD
1280 x  800p at  60Hz - VESA STD
1440 x  900p at  60Hz - VESA STD
1280 x  960p at  60Hz - VESA STD
1280 x  1024p at  60Hz - VESA STD
1400 x 1050p at  60Hz - VESA STD
1680 x 1050p at  60Hz - VESA STD
1600 x 1200p at  60Hz - VESA STD
EIA/CEA-861 Information
Revision number: 3
IT underscan: Not supported
Basic audio: Supported
YCbCr 4:4:4: Not supported
YCbCr 4:2:2: Not supported
Native formats: 1
Detailed timing #1: 720x480p at 60Hz (4:3)
Modeline: "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2: 1920x1080i at 60Hz (16:9)
Modeline: "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3: 1920x1080i at 50Hz (16:9)
Modeline: "1920x1080" 74.250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4: 1280x720p at 60Hz (16:9)
Modeline: "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5: 1280x720p at 50Hz (16:9)
Modeline: "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync
CE video identifiers (VICs) - timing/formats supported
720 x 576p at 50Hz - EDTV (4:3, 16:15)
1280 x 720p at 50Hz - HDTV (16:9, 1:1)
1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
1920 x 1080i at 50Hz - HDTV (16:9, 1:1)
1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
1920 x 1080p at 50Hz - HDTV (16:9, 1:1)
1920 x 1080p at 50Hz - HDTV (16:9, 1:1)
NB: NTSC refresh rate = (Hz*1000)/1001
CE audio data (formats supported)
LPCM 2-channel, 24-bits at 44/48 kHz
CE speaker allocation data
Channel configuration: 2.0
Front left/right: Yes
Front LFE: No
Front center: No
Rear left/right: No
Rear center: No
Front left/right center: No
Rear left/right center: No
Rear LFE: No
CE vendor specific data (VSDB)
IEEE registration number: 0x000C03
CEC physical address: 1.0.0.0
Maximum TMDS clock: 165MHz
Report information
Date generated: 25/07/2016
Software revision: 2.70.0.989
Data source: Real-time 0x0071
Operating system: 6.1.7601.2.Service Pack 1
Raw data
00,FF,FF,FF,FF,FF,FF,00,00,00,00,00,00,14,19,01,03,80,34,20,78,E2,B3,25,AC,51,30,B4,26,
10,50,5A,00,80,81,9F,81,99,A9,40,61,59,45,59,31,59,71,4A,81,40,01,1D,00,72,51,D0,1E,20,6E,28,
55,00,07,44,21,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,
53,2D,34,31,31,55,48,44,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,
02,03,1B,C1,23,09,07,08,48,10,05,84,03,02,07,16,01,65,03,0C,00,10,00,83,01,00,00,00,02,3A,80,18,71,
38,2D,40,58,2C,45,00,07,44,21,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,
00,00,18,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,
The **VS-411UHD** can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with the **VS-411UHD**. For example, a basic video input switching command that routes a layer 1 video signal to HDMI out 1 from HDMI input 2 (ROUTE 1,1,2), is entered as follows:

- Terminal communication software, such as Hercules:

  ![Hercules Utility](image)

  The framing of the command varies according to the terminal communication software. This command is used for demonstration purposes only and its syntax may vary per device.

- K-Touch Builder (Kramer software):

  ![Device Code (17) Properties](image)

- As a driver in K-Config (Kramer configuration software):
You can enter commands directly using terminal communication software (e.g., Hercules) by connecting a PC to the serial port on the **VS-411UHD**. To enter CR press the Enter key (LF is also sent but is ignored by the command parser).

Commands sent from various non-Kramer controllers (e.g., Crestron) may require special coding for some characters (such as, /X##). For more information, refer to your controller’s documentation.

For more information about:

- Using Protocol 3000 commands, see **Section 10.1**
- General syntax used for Protocol 3000 commands, see **Section 10.2**
- Protocol 3000 commands available for the **VS-411UHD**, see **Section 10.3**

### 10.1 Understanding Protocol 3000

Protocol 3000 commands are structured according to the following:

- **Command** – A sequence of ASCII letters (A-Z, a-z and -). A command and its parameters must be separated by at least one space.

- **Parameters** – A sequence of alphanumeric ASCII characters (0-9, A-Z, a-z and some special characters for specific commands). Parameters are separated by commas.

- **Message string** – Every command entered as part of a message string begins with a message starting character and ends with a message closing character.

  A string can contain more than one command. Commands are separated by a pipe (|) character.

  The maximum string length is 64 characters.

- **Message starting character**:
  - # – For host command/query
- ~ – For device response

- **Device address** – K-NET Device ID followed by @ (optional, K-NET only)

- **Query sign** – ? follows some commands to define a query request

- **Message closing character:**
  - CR – Carriage return for host messages (ASCII 13)
  - CR LF – Carriage return for device messages (ASCII 13) and line-feed (ASCII 10)

- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|). When chaining commands, enter the message starting character and the message closing character only at the beginning and end of the string.

  Spaces between parameters or command terms are ignored. Commands in the string do not execute until the closing character is entered. A separate response is sent for every command in the chain.
10.2 **Kramer Protocol 3000 Syntax**

The Kramer Protocol 3000 syntax uses the following delimiters:

- \( \text{CR} = \) Carriage return (ASCII 13 = 0x0D)
- \( \text{LF} = \) Line feed (ASCII 10 = 0x0A)
- \( \text{SP} = \) Space (ASCII 32 = 0x20)

Some commands have short name syntax in addition to long name syntax to enable faster typing. The response is always in long syntax.

The Protocol 3000 syntax is in the following format:

- **Host Message Format**:

<table>
<thead>
<tr>
<th>Start</th>
<th>Address (optional)</th>
<th>Body</th>
<th>Delimiter</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>Device_id@</td>
<td>Message</td>
<td>CR</td>
</tr>
</tbody>
</table>

- **Simple Command** – Command string with only one command without addressing:

<table>
<thead>
<tr>
<th>Start</th>
<th>Body</th>
<th>Delimiter</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>Command SP Parameter_1, Parameter_2,…</td>
<td>CR</td>
</tr>
</tbody>
</table>

- **Command String** – Formal syntax with command concatenation and addressing:

<table>
<thead>
<tr>
<th>Start</th>
<th>Address</th>
<th>Body</th>
<th>Delimiter</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>Device_id@</td>
<td>Command_1 Parameter1_1, Parameter1_2,…</td>
<td>CR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Command_2 Parameter2_1, Parameter2_2,…</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Command_3 Parameter3_1, Parameter3_2,…</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>…</td>
<td></td>
</tr>
</tbody>
</table>

- **Device Message Format**:

<table>
<thead>
<tr>
<th>Start</th>
<th>Address (optional)</th>
<th>Body</th>
<th>Delimiter</th>
</tr>
</thead>
<tbody>
<tr>
<td>~</td>
<td>Device_id@</td>
<td>Message</td>
<td>CR</td>
</tr>
</tbody>
</table>

- **Device Long Response – Echoing command**:

<table>
<thead>
<tr>
<th>Start</th>
<th>Address (optional)</th>
<th>Body</th>
<th>Delimiter</th>
</tr>
</thead>
<tbody>
<tr>
<td>~</td>
<td>Device_id@</td>
<td>Command SP [Param1, Param2 …] result</td>
<td>CR</td>
</tr>
</tbody>
</table>

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10.3 Protocol 3000 Commands

This section includes the following commands:

- System Commands Mandatory (see Section 10.3.1)
- System Commands (see Section 10.3.2)
- Switching/Routing Commands (see Section 10.3.3)
- EDID Handling Commands (see Section 10.3.4)

10.3.1 System Commands - Mandatory

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>Protocol handshaking (system mandatory)</td>
</tr>
<tr>
<td>BUILD-DATE</td>
<td>Get device build date (system mandatory)</td>
</tr>
<tr>
<td>FACTORY</td>
<td>Reset to factory default configuration</td>
</tr>
<tr>
<td>HELP</td>
<td>Get command list (system mandatory)</td>
</tr>
<tr>
<td>MODEL</td>
<td>Get device model (system mandatory)</td>
</tr>
<tr>
<td>PROT-VER</td>
<td>Get device protocol version (system mandatory)</td>
</tr>
<tr>
<td>RESET</td>
<td>Reset device (system mandatory)</td>
</tr>
<tr>
<td>SN?</td>
<td>Get device serial number (system mandatory)</td>
</tr>
<tr>
<td>VERSION</td>
<td>Get device firmware version (system mandatory)</td>
</tr>
</tbody>
</table>

10.3.1.1 #

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>#</td>
<td>End User</td>
</tr>
<tr>
<td>Get:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Description

<table>
<thead>
<tr>
<th>Set:</th>
<th>Protocol handshaking</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>#</td>
</tr>
<tr>
<td>Get:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Response

```
~nn@SPOKCR LF
```

Notes

Validates the Protocol 3000 connection and gets the machine number
Step-in master products use this command to identify the availability of a device

K-Config Example

```
“#”,0x0D
```
### 10.3.1.2 BUILD-DATE

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: BUILD-DATE</td>
<td>End User</td>
<td>-</td>
</tr>
<tr>
<td>Get:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description**

**Syntax**

Set:

```
#BUILD-DATE?
```

**Response**

```
~nn@BUILD-DATESPdateSPtimeCR LF
```

**Parameters**

- **date** – Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day
- **time** – Format: hh:mm:ss where hh = hours, mm = minutes, ss = seconds

**K-Config Example**

Read the device build date:

```
"#BUILD-DATE?",0x0D
```

### 10.3.1.3 FACTORY

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: FACTORY</td>
<td>End User</td>
<td>Public</td>
</tr>
<tr>
<td>Get:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description**

**Syntax**

Set:

```
#FACTORY
```

**Response**

```
~nn@FACTORYSPokCR LF
```

**Notes**

This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.

**K-Config Example**

Reset the device to its factory default configuration:

```
"#FACTORY",0x0D
```
### 10.3.1.4 HELP

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Get:</td>
<td>HELP</td>
<td>End User</td>
</tr>
</tbody>
</table>

#### Description

Syntax

- **Set:**
  - Get command list or help for specific command

- **Get:**
  - #HELP

#### Response

1. Multi-line:

   ~nn@Device available protocol 3000 commands:CR LF

   command,...CR LF

#### Parameters

- **COMMAND_NAME** – name of a specific command

#### Notes

To get help for a specific command use: #HELP SP COMMAND_NAME CR LF

#### K-Config Example

```
“#HELP”,0x0D
```

### 10.3.1.5 MODEL

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Get:</td>
<td>MODEL?</td>
<td>End User</td>
</tr>
</tbody>
</table>

#### Description

Syntax

- **Set:**
  - Get device model

- **Get:**
  - #MODEL?

#### Response

~nn@MODEL SP model_name CR LF

#### Parameters

- **model_name** – String of up to 19 printable ASCII chars

#### Notes

This command identifies equipment connected to Step-in master products and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests

#### K-Config Example

Get device model:

```
“#MODEL?” ,0x0D
```
### 10.3.1.6 PROT-VER

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Get:</td>
<td>PROT-VER?</td>
<td>End User</td>
</tr>
</tbody>
</table>

**Description**

<table>
<thead>
<tr>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
</tr>
<tr>
<td>Get:</td>
</tr>
</tbody>
</table>

**Response**

```
~:#PROT-VER\sp\0300:version\cr\lf
```

**Parameters**

*version* — Format: *XX.XX* where *X* is a decimal digit

**K-Config Example**

Get the protocol version:
```
“#PROT-VER?”,0x0D
```

### 10.3.1.7 RESET

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>RESET</td>
<td>Administrator</td>
</tr>
<tr>
<td>Get:</td>
<td>-</td>
<td>Public</td>
</tr>
</tbody>
</table>

**Description**

<table>
<thead>
<tr>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
</tr>
<tr>
<td>Get:</td>
</tr>
</tbody>
</table>

**Response**

```
~:#RESET\sp\0300: \cr\lf
```

**Notes**

To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.

**K-Config Example**

Reset the device:
```
“#RESET”,0x0D
```
### 10.3.1.8 SN

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Get:</td>
<td>SN?</td>
<td>End User</td>
</tr>
</tbody>
</table>

**Description**

**Syntax**

#### Get device serial number

```
#SN?CR
```

**Response**

```
~nn@serial_numberCR LF
```

**Parameters**

- `serial_number` – 14 decimal digits, factory assigned

**K-Config Example**

Get device serial number:

```
“#SN?”,0x0D
```

### 10.3.1.9 VERSION

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Get:</td>
<td>VERSION?</td>
<td>End User</td>
</tr>
</tbody>
</table>

**Description**

**Syntax**

#### Get version number

```
#VERSION?CR
```

**Response**

```
~nnfirmware_versionCR LF
```

**Parameters**

- `firmware_version` – format: `XX.XX.XX.XXX` where the digits group are: major, minor, build, revision

**K-Config Example**

Get the firmware version number:

```
“#VERSION?”,0x0D
```
### 10.3.2 System Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDCP-MOD</td>
<td>Set/get HDCP mode</td>
</tr>
<tr>
<td>HDCP-STAT?</td>
<td>Get HDCP signal status</td>
</tr>
<tr>
<td>LOCK-FP</td>
<td>Set/get front panel lock</td>
</tr>
<tr>
<td>UART</td>
<td>Set/get comm port configuration</td>
</tr>
</tbody>
</table>

#### 10.3.2.1 HDCP-MOD

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>HDCP-MOD</td>
<td>Administrator</td>
</tr>
<tr>
<td>Get:</td>
<td>HDCP-MOD?</td>
<td>End User</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: Set HDCP mode</td>
<td>#HDCP-MODSPinp_id,modeCR</td>
</tr>
<tr>
<td>Get: Get HDCP mode</td>
<td>#HDCP-MOD?SPstage_idCR</td>
</tr>
</tbody>
</table>

**Response triggers**
- Response is sent to the com port from which the Set (before execution) / Get command was received
- Response is sent to all com ports after execution if HDCP-MOD was set by any other external control device (button press, device menu and similar) or HDCP mode changed

**Notes**
- Set HDCP working mode on device input:
  - HDCP supported – HDCP ON [default]
  - HDCP not supported – HDCP OFF
  - HDCP support changes following detected sink – MIRROR OUTPUT

**K-Config Example**
- Set HDCP mode on HDMI 1 on:
  - “#HDCP-MOD 1,1",0x0D
### 10.3.2.2 HDCP-STAT

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Get:</td>
<td>HDCP-STAT?</td>
<td>End User</td>
</tr>
</tbody>
</table>

**Description**

**Syntax**

Set: - - -
Get: HDCP-STAT?

**Response**

~ `mHDCP-STATspstage,stage_id,modeCR LF`

**Parameters**

- `stage`: 0 (input), 1 (output)
- `stage_id`: for input stage: 1 (Input 1 HDMI), 2 (Input 2 HDMI), for output stage: 1 (HDMI Out)
- `actual_status`: HDCP signal encryption status: 0 (Off), 1 (On), 2 (Follow input), 3 (Mirror output – MAC mode)

**Response Triggers**

A response is sent to the comm port from which the Get command was received.

**Notes**

- Output stage (1) – get the HDCP signal status of the sink device connected to HDMI Out
- Input stage (0) – get the HDCP signal status of the source device connected to the specified input

**K-Config Example**

Get the HDCP input signal status of the source device connected to Input 1 HDMI:

```
"#HDCP-STAT? 0,1",0x0D
```

### 10.3.2.1 LOCK-FP

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>LOCK-FP</td>
<td>End User</td>
</tr>
<tr>
<td>Get:</td>
<td>LOCK-FP?</td>
<td>End User</td>
</tr>
</tbody>
</table>

**Description**

**Syntax**

Set: LOCK-FP
Get: LOCK-FP?

**Response**

~ `mLOCK-FPspP1spCR LF`

**Parameters**

- `P1`: 0 (No), 1 (Yes)

**K-Config Example**

Lock the front panel:

```
"#LOCK-FP 1",0x0D
```
### 10.3.2.1 UART

<table>
<thead>
<tr>
<th>Command Name</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: UART</td>
<td>Administrator</td>
<td>Public</td>
</tr>
<tr>
<td>Get: UART?</td>
<td>End User</td>
<td>Public</td>
</tr>
</tbody>
</table>

#### Description

<table>
<thead>
<tr>
<th>Set:</th>
<th>Get:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Set comm port configuration</strong></td>
<td><strong>Get comm port configuration</strong></td>
</tr>
</tbody>
</table>

#### Syntax

**Set:**

```
#UART<cr>Com_Num,Baud_Rate,Data_Bit,Parity,Stop_Bit<cr>
```

**Get:**

```
~<cr>Com_Num<cr>
```

#### Response

**Set:**

```
~<cr>ComNum,BaudRate,DataBit,Parity,StopBit<cr>
```

**Get:**

```
~<cr>ComNum,BaudRate,DataBit,Parity,StopBit,SerialType<cr>
```

#### Parameters

- **COM_Num** - 1 (RS-232 terminal block)
- **baud_rate** - 9600 – 115200
- **data_bit** - 7, 8
- **parity** - 0 (No), 1 (Odd), 2 (Even), 3 (Mark), 4 (Space)
- **stop_bit** - 1, 2
- **serial1_type** - 232

#### Response Triggers

#### Notes

---

#### K-Config Example

Set the RS-232 terminal block to 115200 baud rate, 8 data bits, no parity, 1 stop bit:

```
"#UART 1,115200,8,N,1",0x0D
```
### 10.3.3 Switching Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPLAY?</td>
<td>Get output HPD status</td>
</tr>
<tr>
<td>MTX-MODE</td>
<td>Set/get auto-switch mode</td>
</tr>
<tr>
<td>VID</td>
<td>Set/get video switch state</td>
</tr>
</tbody>
</table>

#### 10.3.3.1 DISPLAY

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Get: DISPLAY?</td>
<td>End User</td>
<td>Public</td>
</tr>
</tbody>
</table>

**Description**

Set: -

Get: Get output HPD status

**Syntax**

Set: -

Get: Get output HPD status

`#DISPLAY?出_id CR`

**Response**

```
~nnDISPLAY出_id,status CR LF
```

**Parameters**

- `out_id`: 1 (HDMI Out)
- `status`: HPD status according to signal validation: 0 (Off), 1 (On), 2 (On and all parameters are stable and valid)

**Response Triggers**

- After every change in output HPD status from On to Off (0)
- After every change in output HPD status from Off to On (1)
- After every change in output HPD status from Off to On and all parameters (new EDID, etc.) are stable and valid (2)

**Notes**

K-Config Example

Get the output HPD status of HDMI Out:

```
"#DISPLAY? 1", 0x0D
```
### 10.3.3.1 MTX-MODE

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: MTX-MODE</td>
<td>End User</td>
<td>Public</td>
</tr>
<tr>
<td>Get: MTX-MODE?</td>
<td>End User</td>
<td>Public</td>
</tr>
</tbody>
</table>

**Description**

Set: Set auto-switch mode

Get: Get auto-switch mode

**Syntax**

- **Set:** `#MTX-MODE\output_id,mode\CR`
- **Get:** `#MTX-MODE?\output_id\CR`

**Parameters**

- `output_id=1` (HDMI Out)
- `mode=0` (manual), `1` (auto priority), `2` (auto last connected)

**Response Triggers**

After execution, a response is sent to the comm port from which the Set/Get was received.

After execution, a response is sent to all comm ports if MTX-MODE was set by any other external control device (button press, WEB, device menu and similar).

**Notes**

Not recommended for new devices

**K-Config Example**

Set the auto switch mode of HDMI Out to last connected input:

```
"#MTX-MODE 1,2",0x0D
```
10.3.3.2 VID

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: VID</td>
<td>End User</td>
<td>Public</td>
</tr>
<tr>
<td>Get: VID?</td>
<td>End User</td>
<td>Public</td>
</tr>
</tbody>
</table>

Description

Set: Set video switch state

Get: Get video switch state

Syntax

Set: #VIDSPin>outCR

Get: #VID?SPoutCR

Response

Set: -nn@VIDSPin>outCR LF

Get: -nn@VIDSPin>outCR LF

Parameters

in = 0 (disconnect output), 1 (Input 1 HDMI), 2 (Input 2 HDMI)

> – Connection character between in and out parameters

out = 1 (HDMI Out), * (all outputs)

Response Triggers

Notes

The GET command identifies input switching on Step-in clients

New Step-in modules support the ROUTE command

K-Config Example

Set the video switch state of HDMI Out to HDMI INPUT 1:

“#VID 1>1”, 0x0D
10.3.4 EDID Handling Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPEDID</td>
<td>Copy EDID data from the output to the input EEPROM</td>
</tr>
<tr>
<td>GEDID</td>
<td>Set/get EDID data</td>
</tr>
<tr>
<td>LDEDID</td>
<td>Load EDID data</td>
</tr>
</tbody>
</table>

10.3.4.1 CPEDID

<table>
<thead>
<tr>
<th>Functions</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set:</td>
<td>CPEDID</td>
<td>End User</td>
</tr>
<tr>
<td>Get:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Description

**Set:** Copy EDID data from the output to the input EEPROM

Syntax

```
set CPEDID src_type,src_id,dst_type,dest_bitmap
```

**Get:**

- -

Response

```
~#CPEDID src_type,src_id,dst_type,dest_bitmap CR LF
```

Parameters

- `src_type` - EDID source type (usually output): 1 (output), 2 (default EDID)
- `src_id` - for output source: 1 (HDMI Out), for default EDID source: 1 (default EDID)
- `dst_type` - EDID destination type (usually input): 0 (input)
- `dest_bitmap` - destination input to which the EDID data is copied: 0x1 (Input 1 HDMI), 0x2 (Input 2 HDMI), 0x3 (Input 3 HDMI), 0x4 (Input 4 HDMI)

Response Triggers

Response is sent to the comm port from which the Set was received (before execution)

Notes

K-Config Example

Copy the EDID data from the HDMI Out output (EDID source) to the Input 1 HDMI:

```
"#CPEDID 1,1,0,0x1",0x0D
```

Copy the EDID data from the default EDID source to Input 2 HDMI:

```
"#CPEDID 2,1,0,0x2",0x0D
```
### 10.3.4.2 GEDID

<table>
<thead>
<tr>
<th>Command Name</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: GEDID</td>
<td>Administrator</td>
<td>Public</td>
</tr>
<tr>
<td>Get:</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

#### Description

**Set:** Set EDID data from device

**Get:**

#### Syntax

**Set:**

\[
\texttt{GEDID}\texttt{[stage,stage_id]}\cr \texttt{EDID\_data}\cr \texttt{~nn}\texttt{GEDID}\texttt{[stage,stage_id]}\cr \texttt{OK}\cr
\]

**Get:**

\[
\texttt{~nn}\texttt{ERR 002}\cr
\]

#### Parameters

- **stage** - input/output: 0 (input), 1 (output), 2 (default EDID)
- **stage_id** - number of chosen stage (1.. max number of inputs/outputs)
- **size** - EDID data size. For Set, size of data to be sent from device, for Get, 0 means no EDID support

#### Response Triggers

Response is sent to the comm port from which the Set (before execution) / Get command was received

#### Notes

For Get, size=0 means EDID is not supported

For old devices that do not support this command, \texttt{~nn@ERR 002}\cr \texttt{L} is received

#### K-Config Example

Set the EDID data (size x) from the HDMI Out 1:

\[
\texttt{"GEDID 1,1", 0x0D}
\]
### 10.3.4.3 LDEDID

<table>
<thead>
<tr>
<th>Command Name</th>
<th>Permission</th>
<th>Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set: LDEDID</td>
<td>End User Public</td>
<td>-</td>
</tr>
<tr>
<td>Get: -</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description**

**Set:** Write EDID data from external application to device

**Get:** - - -

**Syntax**

**Set:**

| Write EDID data from external application to device | Multi-step syntax (see following steps) |

**Communication Steps (Command and Response)**

**Step 1:**

```plaintext
#LDEDID dst_type,dest_bitmask,size,safe_mode
```

**Response 1:**

```plaintext
~nn@LDEDID dst_type,dest_bitmask,size,safe_mode
```

**Step 2:** If ready was received, send **EDID_DATA**

**Response 2:**

```plaintext
~nn@LDEDID dst_type,dest_bitmask,size,safe_mode
```

**Parameters**

- `dst_type` - EDID destination type – 0 (input)
- `dest_bitmask` – (see table below) bitmap representing destination IDs. The binary presentation of this number is a bit mask for destinations. Setting '1' means EDID data has to be copied to this destination
- `size` - EDID data size (see table below)
- `safe_mode` - 0 (device accepts the EDID as is without trying to adjust **EDID_DATA** - data in protocol packets)

<table>
<thead>
<tr>
<th>dest_bitmask</th>
<th>size</th>
<th>dest_bitmask</th>
<th>size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x01=HDMI1</td>
<td>256</td>
<td>0x02=HDMI2</td>
<td>256</td>
</tr>
<tr>
<td>0x04=HDMI3</td>
<td>256</td>
<td>0x08=HDMI4</td>
<td>256</td>
</tr>
<tr>
<td>0x10=HDMI5</td>
<td>256</td>
<td>0x01=PC</td>
<td>128</td>
</tr>
<tr>
<td>0x20=HDMI6</td>
<td>256</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Response Triggers**

Response is sent to the comm port from which the Set (before execution)

**Notes**

When the unit receives the LDEDID command it replies with READY and enters the special EDID packet wait mode. In this mode the unit can receive only packets and not regular protocol commands.

If the unit does not receive correct packets for 30 seconds or is interrupted for more than 30 seconds before receiving all packets, it sends timeout error `~nn@LDEDID ERR01` and returns to the regular protocol mode. If the unit received data that is not a correct packet, it sends the corresponding error and returns to the regular protocol mode.

**K-Config Example**

Write EDID to input1:

```
"#LDEDID 0,0x01,256,1",0x0D
```
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