Overview

The Hagstrom KE-USB36 is a 36 GPI to USB Keyboard Encoder that allows the CrossOver™ Multi-Definition Live Production Switcher to use GPI output triggers to control the XPression™ Sequencer through keyboard commands. Using the Hagstrom KE-USB36, any key found on a standard north american keyboard and mouse (including movement) can be generated with GPI outputs from CrossOver. This allows the use of Hotkeys on the XPression Sequencer to perform Reads, Advancements, Take Offline and even move the Item bar in the sequencer. Additional commands such as Clear Channel is available by enabling the Shift, Alt, and Ctrl commands that can be added as modifiers to the Keystroke on a GPI by GPI basis.

The RossLinq™ feature allows you to connect the Ross XPression™ CG directly to the media-store channels of CrossOver over ethernet. Have XPression render images and graphics into the media-store channels of CrossOver without using any of the video input BNC on CrossOver.

Port Connections

The Ross XPression™ CG connects to the switcher through the USB port on XPression to the USB port on the Hagstrom KE-USB36 and from the Hagstrom IOX36 Breakout Board on the Hagstrom KE-USB36 to the GPI port on the switcher (Figure 1).

![Figure 1 Cable Connection to Hagstrom KE-USB36](image)

The GPI port on CrossOver provides three (3) banks of eight (8) GPIs. You can connect the pins from any one of these banks to the Hagstrom IOX36 Breakout Board.

Table 1  GPI I/O Cable Connections

<table>
<thead>
<tr>
<th>CrossOver (GPI Port)</th>
<th>Hagstrom IOX36 Breakout Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank 1</td>
<td>Bank 2</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>25</td>
<td>GND(10,20,30,40)</td>
</tr>
</tbody>
</table>
Switcher Setup

GPI Output Control Setup

1. Press **MENU** ⇒ **CONFIG** ⇒ **GPIO**.
2. Use the **Bank** knob to select the GPI bank you want to configure. This is the set of pins you connected to the Hagstrom IOX36 Breakout Board.
3. Use the **I/O** knob to select **GPO**.
4. Press **Next**.
5. Use the **Pin** knob to select the GPI output that you want to configure.
6. Use the **Type** knob to select **LowE**.
7. Use the **Dur** knob to select **5fr**.
8. Repeat this procedure for each GPI output you want to assign.

Assigning a GPI Output to an Input BNC

You can assign a GPI output to a video source. When **RClip** is active for a transition, the switcher triggers the GPI to tell XPression to take the currently highlighted take ID online, and then takes the video source on-air with the transition.

1. Press **MENU** ⇒ **CONFIG** ⇒ **Input** ⇒ **NEXT** ⇒ **NEXT**.
2. Use the **Input** knob to select the input BNC that is connected to XPression.
3. Use the **GPO** knob to select **4**. This is the GPI output we are going to assign the take currently highlighted take id online command to.
4. Use the **Predly** knob to select **7** frames. This is the length of time that the switcher will wait after the GPI has been triggered, before taking the source on-air.

Setting a Static IP Address

CrossOver must be set up with a static IP Address so that XPression can connect to CrossOver for uploading graphics to the media-store channels of CrossOver.

1. Ensure your switcher is connected to your network via the ethernet port and on the same subnet as XPression.
2. Press **MENU > SYSTEM > NEXT > NEXT > IP Addr**.
3. Press the **Edit** knob.
4. Use the **IPMode** knob to select **Static**.
5. Press **NEXT**.
6. Use the left knob to select **IPAddr**.
   - Use the **Field** knob to select the fields in the address.
   - Use the **Value** knob to modify the field value.
7. Use the left knob to select **Mask**.
   - Use the **Field** knob to select the fields in the address.
   - Use the **Value** knob to modify the field value.

8. Use the left knob to select **Gateway**.
   - Use the **Field** knob to select the fields in the address.
   - Use the **Value** knob to modify the field value.

9. Press the left knob to save all network settings.

10. Press the **Confirm** knob or the **Reboot** knob to commit the changes. Press the **Cancel** knob to discard the changes and return to the previous setting.

### Hagstrom KE-USB36 Setup

To program the hotkeys you must connect the KE-USB36 to a computer using a USB cable. Information on connecting the KE-USB36 to your computer, and using the Hagstrom programming application are available from Hagstrom.

Ross Video recommends the following GPI command mapping for controlling XPression from CrossOver (Table 2).

### Table 2  GPI Command Mappings

<table>
<thead>
<tr>
<th>GPI</th>
<th>Keystroke</th>
<th>XPression Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN1</td>
<td>UP Arrow</td>
<td>Move the Sequencer Item Bar Up the Sequencer list by 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line.</td>
</tr>
<tr>
<td>IN2</td>
<td>DOWN Arrow</td>
<td>Move the Sequencer Item Bar Down the Sequencer list by 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line.</td>
</tr>
<tr>
<td>IN3</td>
<td>Numpad ENTER</td>
<td>Take Sequencer Item ONLINE that is Highlighted by the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sequencers Item Bar.</td>
</tr>
<tr>
<td>IN4</td>
<td>Numpad +</td>
<td>ENTER Key function plus the Addition of Moving the Item</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bar Down 1 Line.</td>
</tr>
<tr>
<td>IN5</td>
<td>Numpad -</td>
<td>Take Sequencer Item OFFLINE that is Highlighted by the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sequencers Item Bar.</td>
</tr>
<tr>
<td>IN6</td>
<td>CTRL F1</td>
<td>Clear Channel 1.</td>
</tr>
<tr>
<td>IN7</td>
<td>CTRL F2</td>
<td>Clear Channel 2.</td>
</tr>
<tr>
<td>IN8</td>
<td>HOME</td>
<td>Go to top of Sequencer list.</td>
</tr>
<tr>
<td>IN9</td>
<td>END</td>
<td>Go to bottom of Sequencer list.</td>
</tr>
</tbody>
</table>

### XPression Setup

To control XPression from CrossOver, XPression must be running with the Sequencer having focus.
Setting up RossLinq™

1. On the Edit menu, click Hardware Setup, and then click the Inputs/Outputs tab.
2. Click Add.
3. In the Brand list, click XPression RossLinq Connector.
4. Click OK.
5. In the Host box, enter the IP address of the CrossOver switcher.
6. In the Channel box, enter the Media-Store channel (1 or 2) on CrossOver that you want to upload images to. Media-Store channels 3 and 4 are for alpha channels only. If you load an image or animation with an embedded alpha channel, the switcher automatically places the alpha channel in the paired Media-Store channel.

Switcher Control Interface

From the switcher, you can trigger a GPI output manually using the pattern buttons on the CrossOver control panel, or automatically using the RIClip feature for transitions.

To control XPression from CrossOver, XPression must be running with the Sequencer having focus.

A preview channel can be set up on XPression using a virtual frame buffer. As you move through the list, the virtual frame buffer displays the preview frame of the Take item. This is rendered in real time and will display all of the information Pixel Accurately before taking it to air.

Manually Triggering a GPI

1. Press and hold the NEXT button.
2. Press the pattern button corresponding to the command you want to send to the Ross XPression™ CG.

Using the Roll Clip Function

1. Select the video source button for the video channel on XPression that you want to play.
2. Toggle the RIClip button on, on the transition area.
3. Perform the transition. CrossOver will trigger the GPI to tell XPression to take the currently highlighted take ID online, wait for the pre-delay (Predly), and then perform the transition.