

Application Note

HDMI Splitter with the DTA-2180

1. Introduction

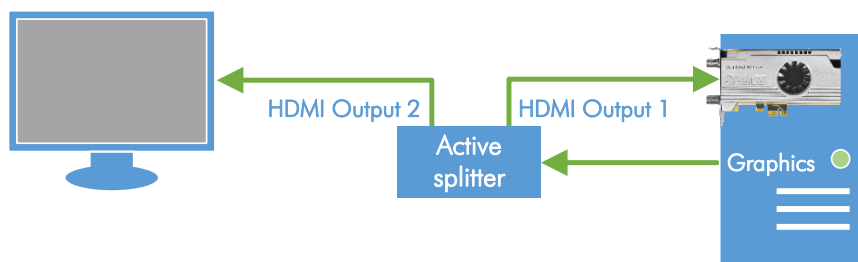
The DTA-2180 is a HD contribution encoder card for PCI Express that can encode audio/video taking zero CPU cycles. The DTA-2180 supports encoding from a HD-SDI source or a HDMI source. Examples of HDMI sources are the graphics card of a PC and a set-top box. When encoding from a HDMI source, a HDMI splitter can be used to split the signal from the source to both the DTA-2180 and a display. This application note describes common issues using a HDMI splitter and highlights key aspects to be taken into account when selecting a HDMI splitter.

2. Recommended HDMI splitter type

DekTec recommends an active HDMI splitter, which only detects the resolution and audio format of the equipment connected to "HDMI output 1" of the splitter and copies this to the source connected to the HDMI input (copy 1 method, see section §4).

DekTec recommends connecting the DTA-2180 to "HDMI output 1" of the splitter, to prevent interruption of the video signal when connecting, disconnecting, powering-on or powering-down the equipment which is connected to "HDMI output 2" of the splitter.

Configuration using Active Splitter supporting Copy 1 method



3. Background information about EDID

A large number of issues seen in HDMI networks are related to Extended Display Identification Data (EDID) management. Understanding how EDID works helps to avoid these common issues.

When a HDMI source, such as a DVD player or set-top box, connects to a display, it will request information about the display. The display will respond with a manufacturer identifier and capability information. This capability information defines the video resolution and audio signals it can handle. Once the source has received this information, it will then set up the video and audio signal accordingly. The manufacturer and capability information is known as the EDID.

Using a single source connected to a single display works straight forward. Care should be taken when splitting HDMI signals to multiple displays, due to the fact that both displays have different capabilities (EDID).

Due to the fact that each display has its own manufacturer and capability information, incompatible combinations can be created, e.g. when one display supports up to 1080p, while the other supports up to 720p. When these displays are powered-up in the wrong order, one of the displays might display an "Out of Range" message or something similar. The same applies for the audio configuration.

Depending on the type of HDMI splitter used, the issues described above could occur. This can result in a setup which does not work at all or has intermitted troubles (e.g. depending on power-up sequence of the displays).





4. HDMI Splitter types

In general the following splitters are available:

Type	Description
Passive splitter	Splitter which simply connects the HDMI outputs to the HDMI input and is not EDID aware.
Active splitter	<p>Splitters which duplicates the signal by using a HDMI receiver on the input and a HDMI transmitter on each output, maintaining signal integrity on each output port. An active splitter is EDID aware and can have multiple methods to communicate the EDID to the source, such as:</p> <ul style="list-style-type: none"> • Auto: Automatically detects the highest possible common image resolution and audio format that is supported by both displays. • Copy 1: Only detects the resolution and audio format of the display connected to "HDMI output 1". • Fixed: Using dip switches a selection can be made from a set of pre-configured EDID configurations. <p>An active splitter can support one or more methods to communicate the EDID to the source. DekTec recommends using a splitter which supports the Copy 1 method. Check with the splitter manufacturer which methods are supported.</p>

5. Hardware examples

The following tables contains a few examples of HDMI splitters and accessory, with which the DTA-2180 has been tested, and their pros and cons.

Product	Type	Pros and cons
<p>2-port splitter</p> 	Passive splitter	<p>Pros:</p> <ul style="list-style-type: none"> • Inexpensive <p>Cons:</p> <ul style="list-style-type: none"> • Does not result in a robust configuration in many cases • No transmitter per output maintaining signal integrity
<p>Aten VS182</p> 	2-port active splitter with copy 1 method	<p>Pros:</p> <ul style="list-style-type: none"> • Affordable (approx. \$50) • Predictable behaviour
<p>Marmitek Split 312 UHD</p> 	2-port active splitter with selectable method: auto or copy 1	<p>Pros:</p> <ul style="list-style-type: none"> • Affordable (approx. \$50) • Predictable behaviour • Selection between auto and copy 1 <p>Cons:</p> <ul style="list-style-type: none"> • Auto method: Disconnecting or powering-down display on port 2 interrupts video on port 1 briefly
<p>Gefen HDMI Detective Plus</p> 	EDID recorder, with options to analyse and modify the EDID with software over USB.	<p>Pros:</p> <ul style="list-style-type: none"> • Affordable (approx. \$100) • Predictable behaviour