

# Technical Note: Using HDMI on DIMM-MX6 and Cadun

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Rev	Date/Signature	Changes
v01en	23.06.2015/Sr	--

## 1 Introduction

HDMI uses the DDC interface to transfer a 128 or 256 byte data sequence called EDID (Extended Display Identification Data). This sequence describe the technical properties of a HDMI display described (e.g. possible resolutions, timings etc.).

The DDC interface functions like an I<sup>2</sup>C-Bus with open-drain drivers on master and slave and has pull-up resistors to restore the signal to high-level.

Voltage translation is required as the devices operate at different power supply voltages (HDMI display +5V; DIMM-MX6 +3.3V)

## 2 DIMM-MX6 on Cadun

Pull-up resistors of 2.2k $\Omega$  are used on the DIMM-MX6.

The Cadun baseboard uses a NXP IP4791CZ12 for level-shifting and ESD protection. The IP4791CZ12 has also got pull-up resistors of 3.6k $\Omega$  included at the DDC signals.

The combination of the IP4791CZ12 on the baseboard and the pull-ups on the CPU module prevent signals from reaching a safe low level for communication.

For this reason the EDID feature can currently not be used in combination with emtrion's Cadun and DIMM-MX6.

## 3 Workarounds

emtrion is not planning to change the pull-up resistors on the DIMM-MX6 for compatibility reasons. However, future revisions of the Cadun baseboard are going to include a modified HDMI level-shifter to support the EDID feature.

### 3.1 Workaround 1

A level-shifter without internal pull-up resistors ought to be used on any customer specific baseboards.

### 3.2 Workaround 2

If you are using a Cadun baseboard for development, emtrion purposes you with a DIMM-MX6 module without pull-up resistors. However, it is not recommended for series production.

## 4 Product affected

Product affected	Rev.
Cadun-1	R1A and R1B
DIMM-MX6x	All revisions

For further information please do not hesitate to contact us:

emtrion GmbH  
Alter Schlachthof 45  
76131 Karlsruhe  
Germany

Email: [sales@emtrion.de](mailto:sales@emtrion.de)  
Phone: +49 721 627 25-20