

Application Note

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Topic: Activating the trigger mode of the VM-x20 (AR0234 OnSemi)

Product: phyCORE i.MX8 M Plus/Mini and VM-x20 series

Revision History

Version	Changes	Writer	Date
A0	Initial	H. Fendrich	20.10.2023
A1	Expansion point 1)	H. Fendrich	26.04.2024

To test the trigger mode, you can carry out the following procedure with the existing PHYTEC camera driver:

- 1) Use PHYTEC Embedded Imaging Pollux/Polis with VM-x20. Install Imaging BSP (available in the Imaging Kit by default). Check that VM-x20 camera is registered in Boot.txt.
- 2) Start Gstreamer script with live image display, e.g. "colcam-fbdev_full_res.sh" or "bwcam-fbdev_full_res.sh".
- 3) Open a second terminal window, e.g. via SSH
- 4) First deactivate the automatic functions (these steps are not necessary when using the ISP) and specify values, as the automatic functions cannot work in trigger mode:

```
v4l2-ctl -d /dev/v4l-subdev2 --set-ctrl=auto_exposure=1
v4l2-ctl -d /dev/v4l-subdev2 --set-ctrl=exposure=1200
v4l2-ctl -d /dev/v4l-subdev2 --set-ctrl=autogain_analogue=0
v4l2-ctl -d /dev/v4l-subdev2 --set-ctrl=autogain_digital=0
v4l2-ctl -d /dev/v4l-subdev2 --set-ctrl=analogue_gain=8000
```

Note: When using the ISP (i.MX8MP), we recommend allowing the ISP automatics to settle with a live stream. The last values determined are then used in trigger mode. Alternatively, the automatics can also be switched off in the corresponding XML file in the ISP. (Document: [L-1036](#)).

- 5) Set trigger pin active to GND.
- 6) Activate trigger mode:
v4l2-ctl -d /dev/v4l-subdev2 --set-ctrl=trigger_mode=1

Reset to master mode (deactivate trigger):
v4l2-ctl -d /dev/v4l-subdev2 --set-ctrl=trigger_mode=0
- 7) Optionally, the status of the trigger input can be read in register 0x3026 bit 2.
.../gstreamer-examples/tools/...-> ./i2cget_16bit_adr.sh 2 0x10 0x3026

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Since the trigger pin is internally provided with a pull-up, the external trigger input must be activated to end/deactivate the triggered image acquisition:

- Pin 1 on Strobe/Trigger connector (VM-020 phyCAM-M and phyCAM-L)
- Pin 12 on the phyCAM-M connector (VM-020 and VM-120)

must be connected with a GND level.

Depending on whether you want to record a single image or an image sequence, the trigger input must be connected to either a pulse or a high state. Details are found in the AND9820 Developer Guide from OnSemi. This can be obtained directly or from a distributor after signing an NDA with OnSemi.

Attention: Please note the "MIPI WAKE up Time" of 1.3ms (Document: AND9820).