

Application Note

How to use phyCAM camera modules with the phyBOARD-MIRA-i.MX6 SBC

Revision History

Version	Changes	Author	Date
A0	Initial Release	H. Fendrich	21.08.2015

Content

1	Overview	2
2	Camera Connectors on the MIRA - Carrier Boards	5
3	Change the cameras or camera parameters (Linux PD15.2.0 YOCTO)	6
4	GStreamer function	6

1 Overview

The i.MX6 Microcontroller supported more than 1 camera interface (see **Fehler! Verweisquelle konnte nicht gefunden werden.**).

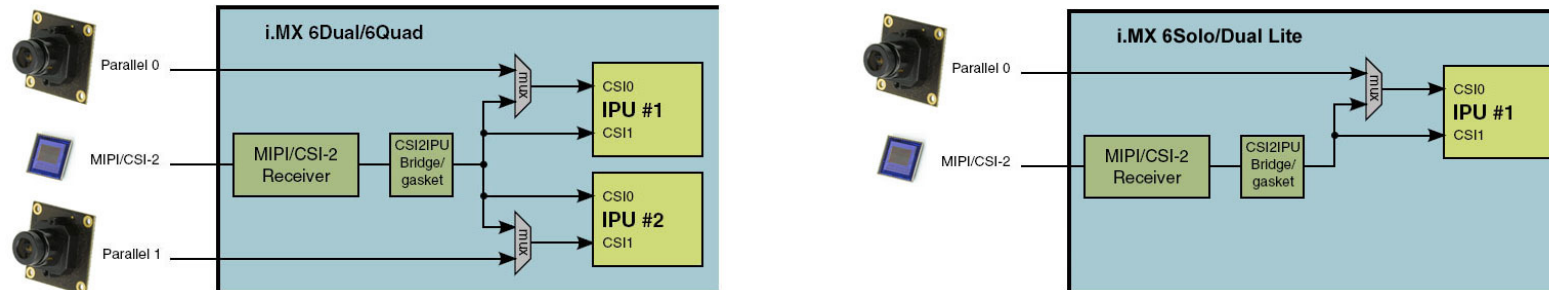


figure 1: Block Diagram Camera Interfaces of i.MX6 Controller (Quad / Dual) and i.MX6 Controller (Solo / Dual Lite)

On the phyCORE-i.MX6 the CSI0/IPU#1 camera path go out as parallel signal.

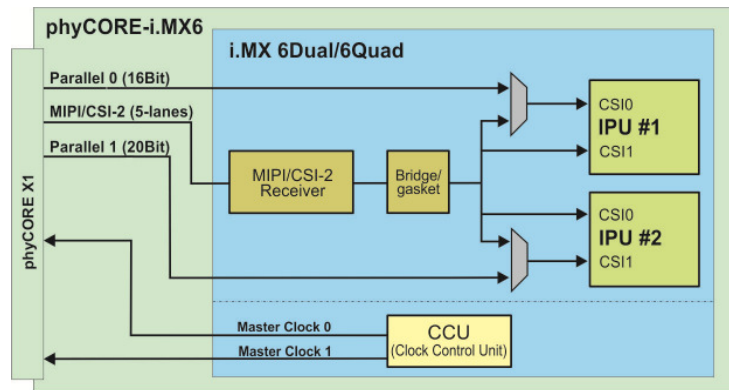


figure 2: Use of Camera_0 (CSI0 of IPU#1) and Camera_1 (CSI1 of IPU#2)

On the PHYTEC or customer carrier boards can the interfaces are led out as phyCAM-P (or raw-parallel) see

figure 3 and/or phyCAM-S+ see figure 3, or MIPI/CSI 2 interface. For more information to phyCAM-P/S+ see manual L-748.

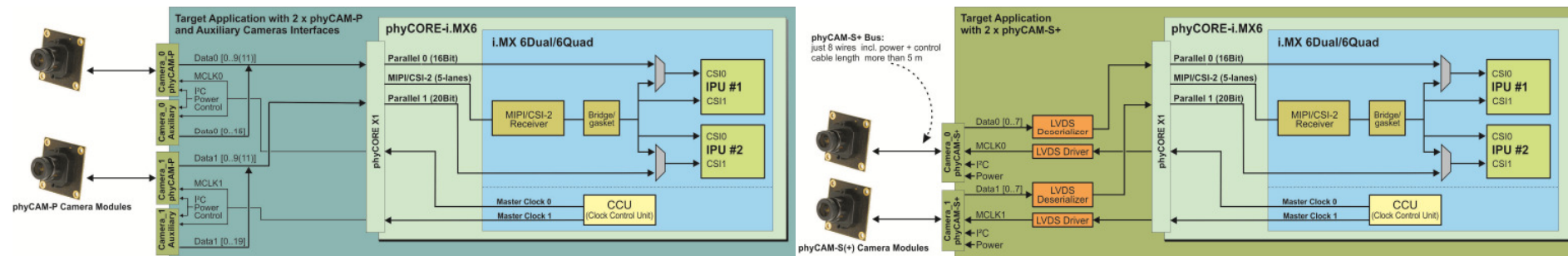


figure 3: Block Diagram of a phyCAM-P solution and an phyCAM-S (+) solution with phyCORE-i.MX6 (Quad / Dual) SBC

On the phyBOARD-Mira baseboard is only the CSIO/IPU#1 camera path (thru a serializer) go out as LVDS signal (see figure 4). Here you can connect one of the different phyCAM-S(+) camera modules. See the phyCAM-P-/S manual L-748 for more information.

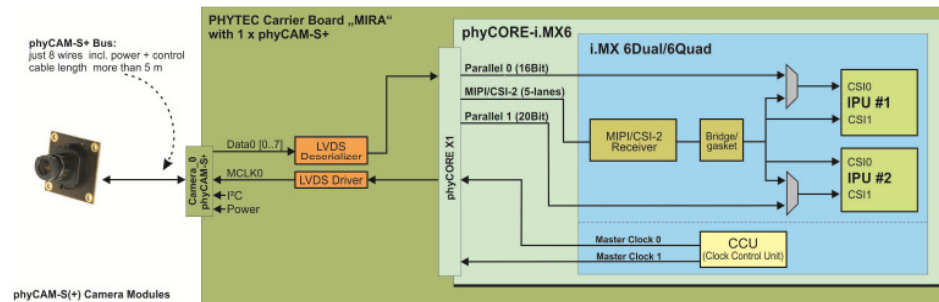


figure 4: Block Diagram of phyCAM-S (+) Camera Interfaces of phyCORE-i.MX6 (Quad / Dual) and the go out on the phyBOARD-MIRA-i.MX6 - SBC

The BSP shipped with the Kit includes already the software drivers for the supported phyCAM camera modules. The drivers are compatible with v4l2. Also GStreamer scripts are included for the evaluation of the camera modules. If you need more then one camera interface or/and phyCAM-P support, please use the phyFLEX-i.MX6 Modul.

Note:

The phyBOARD-MIRA features one CSI interface for phyCAM-S(+) camera modules.
Please find more information about the camera support in the path: ... \Documentation \...

The kit version KPB-01501-001 is shipped with an i.MX6 controller board which has no camera support installed.
The kit version KPB-01501-002 is shipped with an i.MX6 controller board which has camera support installed.

The Linux BSP PD15.2.0 for these kits does support the camera VM-010-BW-LVDS. For support the other PHYTEC phyCAM-S(+) cameras you have to compile a new device tree.

ftp://ftp.phytec.de/pub/ImageProcessing/phyBOARD-Mira-i.MX6_linux_PD15.2.0/

The table below lists the options:

Hardware Configuration		Software Support
phyBOARD Kit	phyCAM-S+ at CSI_0	phyCAM-S+ at CSI_0
KPB-01501-001	NM (at base board)	no
KPB-01501-002	yes	yes (VM-010-BW-LVDS) (for all other PHYTEC cameras you have to compile a new device tree)

NM = no mount

2 Camera Connectors on the MIRA - Carrier Boards

The development kits for the phyBOARD-MIRA-i.MX6 contain:

- one carrier board (MIRA)
- one phyCORE-i.MX6 modul SOM

The carrier board connects to the phyCORE-connector, with the phyCORE-i.MX6 modul.

On the base board MIRA (PBA-C-06-002) we convert the parallel Camera_0 interface in the phyCAM-S+ camera interface standard (see figure 4). The phyCAM-S+ interface is support on connector X10 (Hirose CAM). Information's to phyCAM-S+ are in the phyCAM-manual (L-748).

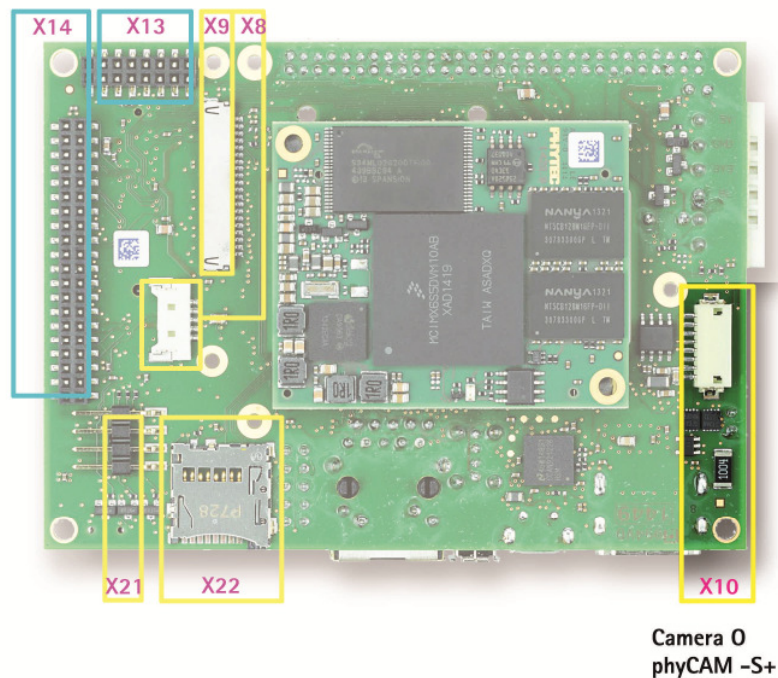


figure 5: Camera Interfaces on phyBOARD-MIRA for the phyCORE-i.MX6 SOM

3 Change the cameras or camera parameters (Linux PD15.2.0 YOCTO)

The Linux BSP PD15.2.0 for these kits does support the camera VM-010-BW-LVDS. For support the other PHYTEC phyCAM-S(+) cameras you have to compile a new device tree.

Even if you want to change the camera master clock or the I2C address of the cameras, you have to compile a new device tree.

For more information see on FTP:

ftp://ftp.phytec.de/pub/ImageProcessing/phyBOARD-Mira-i.MX6_linux_PD15.2.0/

Notes:

- I2C addresses of the camera are set by hardware configuration (jumper setting on the camera and / or on the baseboard. Please refer to the phyCAM-manual L-748 and the hardware manual of the kit.

4 GStreamer function

After login, change into the directory: `\gstreamer_examples\.`

`cd gstreamer_examples <ENTER>`.

At the first start disable the QT-Demo. Start the script "remove_qt_demo.sh".

Now you can start working with the GStreamer demo-scripts.

Detailed information about the GStreamer examples can be found in the phyCAM-Manual L-748.

In this kernel version we use the media-device structure. So all camera/video components get an separate "/dev/video[x]" or "dev/v4l-subdev[x]" device.

Show the mapping with type: "media-ctl -p". The capabilities are showed if you type: "v4l2-ctl -d [device] --all" e.g. "v4l2-ctl -d /dev/v4l-subdev5 --all".