

CMC-4000 High-Speed CMOS Camera Requirements

1 Introduction

The CMC-4000 is a high-resolution, high-speed CMOS camera and achieves up to 386 fps at full resolution with 2320 (H) x 1726 (V) pixels. The data is transmitted via Camera Link (2 x 10 tap) to two suitable frame grabbers. Additionally it is also possible to achieve 193 fps at the same resolution by using 1 x 10 tap with one frame grabber only.

2 Frame Grabber Selection

The extensive burst data rate of up to 1526 MiB/s (= 1600 MB/s) for 2 x 10 tap mode requires two frame grabbers having the capability to grab 10 Camera Link taps at 80 MHz each.

For the 193 fps mode with a burst data rate of 763 MiB/s (= 800 MB/s) one 1 x 10 tap frame grabber with the capability to grab 10 Camera Link taps at 80 MHz is required.

The following frame grabbers have been tested successfully (alphabetical order, some with restrictions):

- a) Bitflow Karbon-CL (KBN-PCE-CL2-F-IP4 & KBN-PCE-CL4-F-IP4)¹
- b) Dalsa Xcelera-CL+ PX8 Full and Dalsa Xcelera-CL PX4 Full²
- c) Euresys GRABLINK Full³
- d) Matrox Radient eCL (RAD 2G SF 150400 & RAD 2G DF 150400)⁴
- e) National Instruments PCIe-1429 (NI PCIe-1429)⁵
- f) Silicon Software microEnable IV (AD4-CL & VD4-CL)

Configuration files for the CMC-4000 and the above frame grabbers can be handed over by Allied Vision Technologies GmbH on request.

3 Camera Link Cable

Two Camera Link cables with standard Camera Link connector MDR-26 are needed on the camera side for the 193 fps mode. Four Camera Link cables are needed for the 386 fps mode. The connector type on the other end depends on the frame grabber (Silicon Software, Dalsa PX4, National Instruments, Bitflow: standard Camera Link MDR-26; Dalsa PX8, Matrox: mini Camera Link SDR-26).

The cable must be suitable for Camera Link Full / Camera Link 10 tap and a clock rate of 80 MHz. A cable length of up to 5m has been successfully tested with the above listed frame grabbers.

4 PC Hardware

The PC system with at least one available PCI Express (PCIe) x8/x16 slot (Bitflow, Dalsa PX8, Matrox) or one free PCIe x4 slot (Dalsa PX4, National Instruments, Silicon Software) and high system bandwidth is necessary. Allied Vision Technologies GmbH recommends mainboards based on the Intel X58 chipset.

¹ Bitflow Karbon-CL: Normally, the maximum reachable resolution is 2000 (H) x 1726 (V). For full resolution one has to use the „2x“ DMA mode.

² Xcelera-CL PX4 Full: Maximum frame rate is approximately 172 FPS, depending on system performance.

³ Euresys Grablink Full: The grabber has mini-Camera Link connectors (SDK-26).

⁴ Matrox Radient eCL: The grabber has mini-Camera Link connectors (SDR-26).

⁵ NI PCIe-1429: The maximum reachable resolution is 2000 (H) x 1726 (V), depending on system performance.

5 Accessories

The CMC-4000 needs power supply with 12V / 0.3A, e. g. the Allied Vision Technologies GmbH Power Supply Type 1/15 series (art.-no. 1021000).

The camera can be delivered with F-Mount or C-Mount lens adapter. The lens should be suitable for a sensor size of 16 mm x 12 mm (Ø 20mm; 4/3").

Image grabbing software depends on the frame grabber type. A software development kit (SDK) and demo software for first live preview is usually provided by the frame grabber manufacturer.