To make effective use of high performance CMOS cameras.

CIS Corporation
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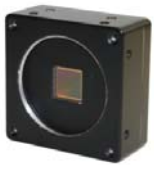
First of All

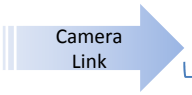
Technical innovation of CMOS sensor is making a developmental leap and its field of application has been broadening rapidly. CIS enhances product lineups with high performances such as high speed and high resolution, taking advantages of utilization of CMOS sensor.
To make effective use of high performance CMOS cameras however, application system configuration shall be fully considered. Here are some verification points to be concerned on the amount of transferring data.

Example: VCC-FC60FR19CL

In case of CIS 4M color camera, the camera output data volume will be approx. 5.4Gbps. The data output from the camera is 10bit RAW so that Bayer conversion process shall be done by the F/G or the PC.
The data volume after completion of Bayer conversion process will be very large, approx. 16.2Gbps.

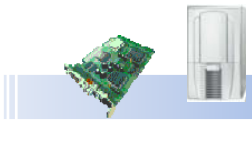


Model Name: VCC-FC60FR19CL
Resolution: 4M color
Frame Rate: 135fps
Output Format: 10bit RAW
I/F : Camera Link full configuration



RAW data 10bit
・・・011101010・・・

Approx. 5.4Gbps Data Volume
4M/frame x 10bit x 135fps = 5400Mbps



Bayer conversion
F/G board or PC

RGB data 10bit
R:・・・0111010100010・・・
G:・・・1001010011110・・・
B:・・・0011110101010・・・

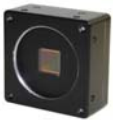
Approx. 16.2Gbps Data Volume
*) 1frame = 4M x 3(R・G・B) = 12M
12M/frame x 10bit x 135fps = 16200Mbps

Bayer Conversion

Bayer Conversion with F/G board

When PCIe is used as the interface between the frame grabber board and the PC, the data transferring rate per 1 lane will be 2.5Gbps (theoretical value), and there are possibilities that sufficient frame rate can not be acquired. Large-capacity interface such as PCIe x 8 would be needed.

Please consider the data transferring rate from the F/G board.



Camera Link

PCIe I/F etc..

5.4Gbps
4M color
10bit RAW

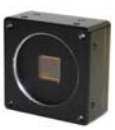
Bayer Conversion

16.2Gbps
4M color
10bit RGB

Bayer Conversion with PC

Bayer conversion from RAW 10 bit to RGB 10 bit is CPU-intensive so that there are possibilities that sufficient frame rate can not be acquired. Countermeasures to reduce loads on CPU, such as splitting Bayer conversion by multi-core, shall be taken.

Please consider the specification of the PC.



Camera Link

PCIe I/F etc...

5.4Gbps
4M color
10bit RAW

Bayer Conversion