xiQ
USB 3.0
SuperSpeed
ximea
ximea.com
xiQ
MQ013MG-E2
SN: 237198173
STATUS 1
STATUS 2
POWER
INPUT
OUTPUT
GND
USB 3.0 SuperSpeed
For use with XIMEA approved connection cables only.

inspect application forum
08.11.2016

inspect application forum
8.–10. Nov. 2016
Messe Stuttgart

Virtual Realty Starts from Reality

THE CHALLENGES AND COMPLEXITIES WHEN DESIGNING THE CAPTURING SYSTEM

Virtual Reality Definition

Generate realistic images (and sound) that replicate a real environment

or

Immersive, interactive experience generated by a computer

Where VR is used today?

- Consumer market
- Academic researches, education
- Art, film production, entertainment
- Sports, Media
- Industrial installations

… and many more

Where VR is used today?

- Consumer market
- Academic researches, education
- Art, film production, entertainment
- Sports, Media
- Industrial installations

… and many more: NBT – Next Big Thing

The Essentials

- What is needed?
  - Capture the Reality in 3D,
  - and create/reconstruct it’s model
  - With high resolution, high frame rate multiple viewpoints and synchronous capturing

Ingredients

- Suitable sensors
  - The more pixels the better (HD at least)
  - At least 30 fps
  - High dynamic range
- Interface to deliver image data to the point of use
- Processing and storage software
- … and much more

Sensors

High resolution, like:

Mfg.	Sensor	Image Size [MB]	Max fps	Data Rate [MB/s]
CMOSIS	CMV20000 @12bit	29.5 (5120x3840 @12bit)	32.5	960
CMOSIS	CMV12000 @8bit	12.6 (4096x3072 @8bit)	330	4150
CMOSIS	CMV12000 @10bit	15.7 (4096x3072 @10bit)	300	4720
CMOSIS	CMV50000 @12bit	71.3 (7920x6004 @12bit)	30	2140

Many challenges

- Many sensors, many interfaces, many cables
  - Space
  - Reliability
  - Complexity

  - Bandwidth
  - Distance
  - Processor protocol overheads

Interface requirements

Mfg.	Sensor	Image Size [MB]	Max fps	Data Rate [MB/s]	PCIe config
CMOSIS	CMV20000 @12bit	29.5 (5120x3840 @12bit)	32.5	960	x4 Gen2
CMOSIS	CMV12000 @8bit	12.6 (4096x3072 @8bit)	330	4150	x8 Gen3
CMOSIS	CMV12000 @10bit	15.7 (4096x3072 @10bit)	300	4720	x8 Gen3
CMOSIS	CMV50000 @12bit	71.3 (7920x6004 @12bit)	30	2140	x4 Gen3

PCIe solution

Mfg.	Sensor	Image Size [MB]	Max fps	Data Rate [MB/s]	PCIe config
CMOSIS	CMV20000 @12bit	29.5 (5120x3840 @12bit)	32.5	960	x4 Gen2
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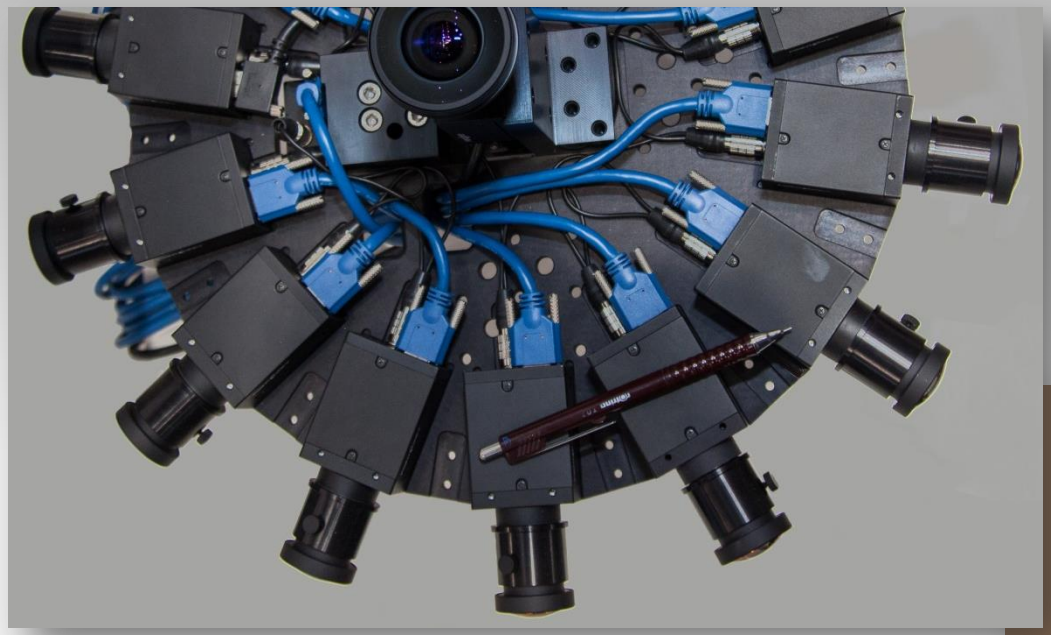
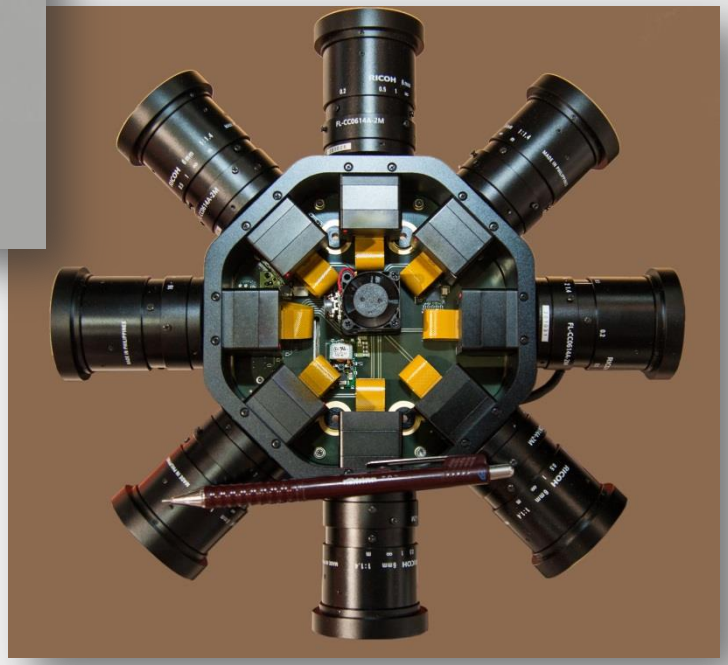
CMOSIS	CMV50000 @12bit	71.3 (7920x6004 @12bit)	30	2140	x4 Gen3

PCIe does it all

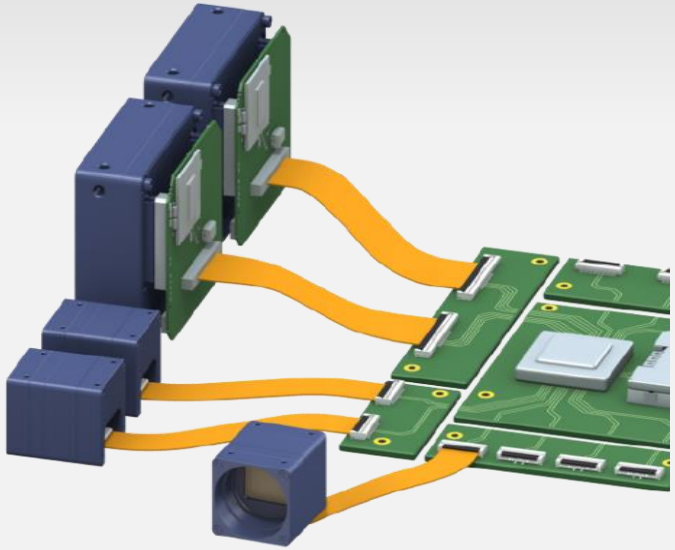
USB3 vs PCIe Integration Solution



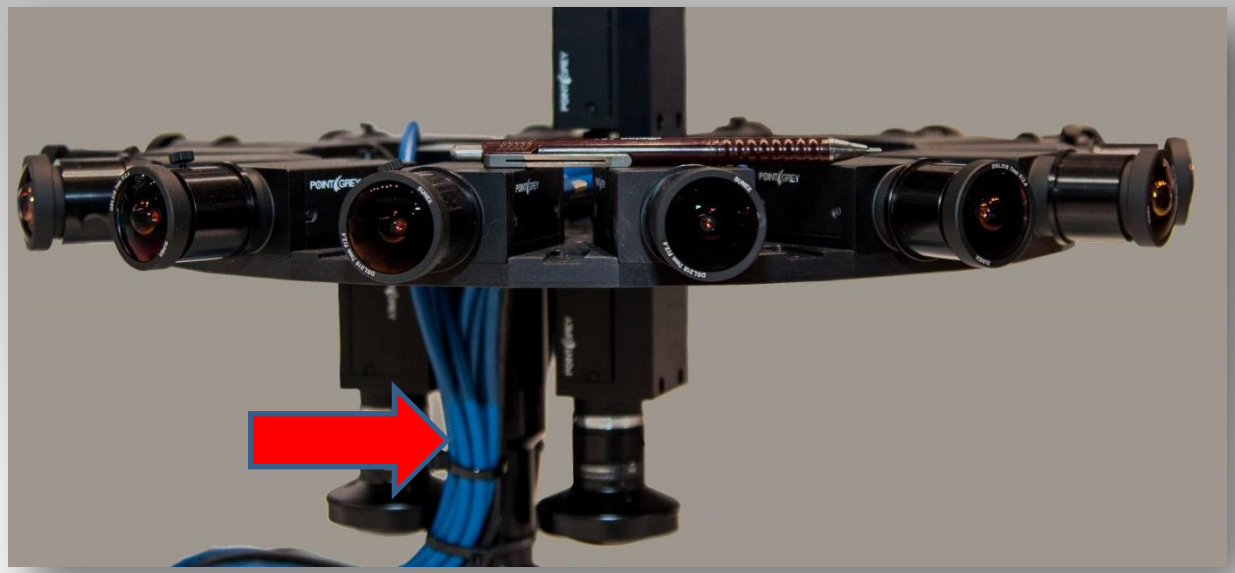


PCIe Integration Solutions

- Connections
  - Arranging
  - Assembling
  - Maintaining
  - TCO

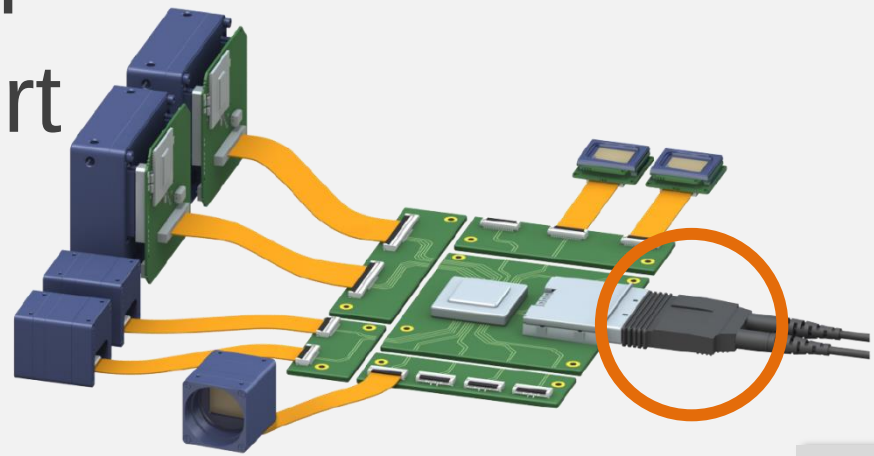


USB3 vs PCIe Integration Solution



Integration solutions

- Aggregation
  - Bandwidth
  - Heterogeneous downstream
  - Homogeneous upstream
  - Fiberoptic support
  - TCO



PCIe does it all

- Space
  - Smaller connectors, different orientations
- Reliability
  - Maturity
  - Low to no latency
  - Less components
- Cost
  - Standard OTS
  - TCO: Less components and all standard
- Complexity
  - Standard
  - Mature
  - Heterogeneous downstream, homogeneous upstream
- Processor protocol overheads
  - DMA
- Distance
  - Fiber optic Stds. implemented multifold
- Bandwidth
  - Scalable up to 64Gb/s

PCIe does it all

See it live at XIMEA booth 1C5

Thank you for your attention