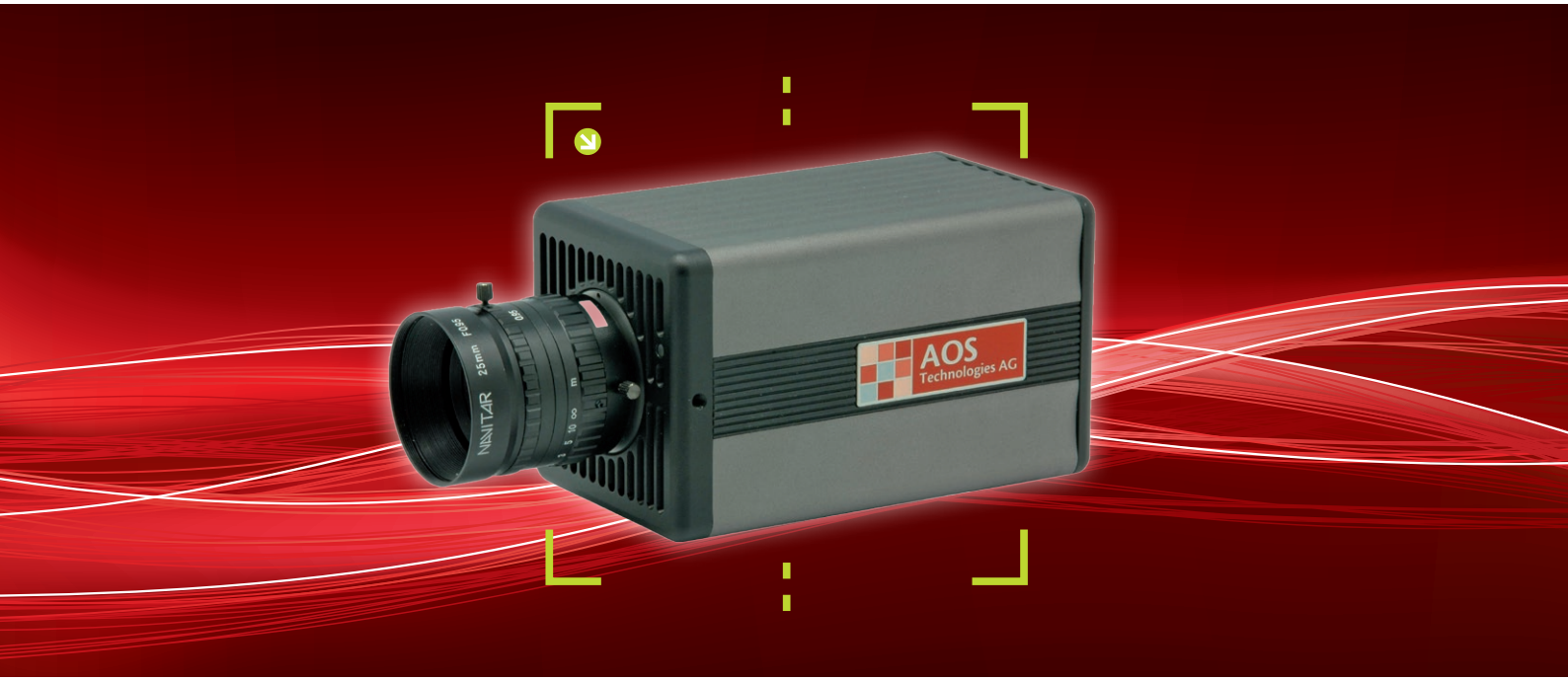
Q-PRI – High-speed camera



Q-PRI – the modular, compact high speed camera for industrial and research applications with 3 megapixel resolution

Intuitive to use, a robust camera for a variety of applications ranging from research, biomedical applications to factory floor trouble shooting.

The Q-PRI is particularly suited for all applications where a compact, portable, high resolution camera is essential. With its 3 megapixel sensor the light sensitive Q-PRI delivers crisp clear images. A robust aluminum housing insures the camera is ready to use in the field, on the factory floor or under other demanding test conditions. Q-PRI is controlled with a powerful yet easy-to-use Imaging Studio software suite with features for setting of recording parameters, play back and editing of sequences and point and click measurements. Some of the available options are additional capacity internal battery pack, compact flash card in camera, live SDI or analog video out.

Unique features

- **Excellent image quality** – Q-PRI – the modular, compact high speed camera for industrial and research applications with a high resolution 3 megapixel sensor. The unique format fitting algorithm allows recordings in image formats of up to 1920 x 1080 pixels.
- **Modular concept** – Q-PRI is configured for a perfect match to your application by choosing from an extensive range of options and extensions.
- **High sensitivity** – the Q-PRI is a high resolution light sensitive camera ideal for recording with less light and shorter shutter times to minimize motion blur of fast moving objects.
- **Truly portable** – with long battery life time, available option up to 2.5 hrs, Q-PRI is truly a camera where mobility and independent operation is a requirement.

Quantum Design EUROPE

Quantum Design GmbH
Im Tiefen See 58
D-64293 Darmstadt

Please contact Stefan Wittmer
✆ +49 6151 8806-63, wittmer@qd-europe.com
or find your local contact at www.qd-europe.com

AOS Technologies AG

Q -PRI – Key Specifications

Frame rate vs resolution vs recording time (partial)

Resolution ►	Resolution @ fps	Resolution @ fps	Resolution @ fps (Requires option "Ext Speed")	Resolution @ fps (Requires option "Ext Speed")	Resolution @ fps (Requires option "Ext Speed")	Resolution @ fps (Requires option "Ext Speed" and "Max Speed")	Resolution @ fps (Requires option "Ext Speed" and "Max Speed")	Resolution @ fps (Requires option "Ext Speed" and "Max Speed")
	1696 x 1710 @ 500 fps	1360 x 1024 @ 1000 fps	1280 x 720 @ 1500 fps	900 x 700 @ 2000 fps	512 x 512 @ 4 290 fps	320 x 240 @ 12 000 fps	256 x 256 @ 12 700 fps	128 x 128 @ 32 450 fps
Memory ▼	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time	Sec recording time
1.3 GB	0.9	0.9	0.9	1.0	1.1	1.4	1.5	2.5
2.6 GB	1.8	1.9	1.8	2.1	2.3	2.8	3.1	5.0
5.2 GB	3.6	3.8	3.8	4.2	4.7	5.7	6.3	10.0
10.4 GB	7.2	7.6	7.7	8.4	9.4	11.5	12.7	20.0

Table shows typical resolution vs. fps, resolution is freely adjustable, fps = max fps @ resolution, fps adjustable by software in steps of 1 fps, max 100 000 fps @ reduced resolution

Extended resolution mode

Resolutions vs max. fps	1920 x 1080 @ 2000 fps	1024 x 1024 @ 4000 fps	1280 x 720 @ 5000 fps	853 x 480 @ 10 000 fps
Recording Times	1.3 GB memory: 1 sec	2.6 GB memory: 2 sec	5.2 GB memory: 4 sec	10.4 GB memory: 8 sec

Optical/Sensor specifications

Image Sensor	1696 x 1710 pixel with 8 Bit dynamic range, monochrome or color version
Sensor Size	8 µm pixel size / 13.6 mm x 13.7 mm @ 1696 x 1710 pixel
Light Sensitivity	ISO 3200 (monochrome), ISO 1600 (color)
Dynamic Range	Standard 8 Bit
HDR Mode	High Dynamic Range Mode for higher image dynamic up to 12 Bit, free adjustable by slider in control software
Pixel Correction	Built-in pixel correction for highest image accuracy
Shutter Type	Global, independent of frame rate
Exposure Time	Free adjustable from 2 µsec to 1 / framing rate by software
Lens Mount	C-Mount or optional F-Mount

Camera and control features

Image Memory	Standard: 1.3 GB, optional 2.6 / 5.2 / 10.4 GB
Nonvolatile Memory	Optional flash card interface for up to 64 GB flash disk in camera. Camera can save image data on flash disk w/o PC attached
Power	9–16 V / optional 24–36 VDC /12–15 Watts depending on options and extensions
I/O Tolerance	TTL level, all I/O are 0–24 V tolerant
LED Control	LED on back and front for indication of camera status
Reset	Reset function to reset camera status w/o affecting image memory
Power On/Off	Switch on/off , Remote Switch on
Battery	Re-chargeable NiMH battery inside for up to 30 min autonomous operation of camera, optional internal battery for up to 2.5 hrs autonomous operation is available
Trigger Delay	Programmable up to 65 sec
Trigger Windowing/ De-bouncing	User programmable trigger window to eliminate false triggering by external devices
Trigger Modes, Positions	Pre-post recording, freely adjustable in steps of 1% of total camera memory
Timing	High precision time base, temperature compensated
Multi-Buffer	Split buffer for up to 32 individual sub-buffers
Auto-Download	Auto download to PC for 24/7 recording or automatic download to optional flash card until flash card full
Pre-Program of Camera	Q-PRI may be preprogrammed with a specific set of commands. Ideal when camera can no longer be accessed before a test and remote power up is required
OSD	Information on camera, recording features, time stamp, event marker may be added in image data, position of OSD is set by user
Extended Format Mode	By switching on the "Extended Format Mode" the cameras built in sophisticated image algorithms provides desired image formats up to a maximum of 1920 x 1080. This unique camera feature is a powerful tool allowing users to customize image format based on desired output needs

Data interface

Data Interface	Gigabit Ethernet (10 / 100 / 1000) with RJ45 connector
I/O Interface	14 pin LEMO connector
Synchronization	Sync in / Sync out for phase-locked master-slave operation with other cameras or synchronization to external frequency
Armed Out	Armed out indicates camera is ready to receive trigger
Trigger In	Trigger input, rising, falling edge, TTL, switch closing/opening
Triggered Out	Indicates camera is triggered
Set_To_Rec	Used to set the camera from idle mode into recording mode
Remote Switch On	Switch on camera by simple 2 wire connection over a distance of up to 100 m (300 feet)
Event Marker	Event marker to record/mark events during image data acquisition
Strobe	Strobe out to synchronize external equipment to camera. Pulse width represents shutter time

Physical specifications

Size/Weight	72 x 72 x 122 mm, 980 gr (2.1 lb)
Operating Temperature	-5 °C … + 45 °C / 23 °F … +113 °F
Storage Temperature	-40 … +70 °C / -40 °F … +158 °F
I/O Connector (type required for cable)	LEMO type: FGG.2B.314.CLAD82Z ODU: S22LOC-P14MFG0-8200
CE	In compliance with relevant standards
Mounting	¼" UNC thread, bottom

Configuration and options

Standard Configuration	Up to 1000 fps with free definition of ROI by software within specifications of sensor. Extended format up to 1920 x 1020 pixel 1 event marker
Extended Speed	Recording up to 10 000 fps with free definition of ROI by software within specifications of sensor. Extended format up to 1920 x 1020 pixel
Max Speed	Recording up to 100 000 fps with free definition of ROI by software within specifications of sensor. Extended format up to 1920 x 1020 pixel
Option Event Markers	Additionally 3 event markers (total of 4) to record and display external events in frames
Option External Sync Multi Camera	Allows external synchronization of cameras (phase lock) to any external TTL source or master slave synchronization. Multi camera operation on one PC. Includes Pigtail cable AOS# 2200116
Option Auto Exposure	Auto exposure function
Option Motion Detection	Motion detection function

Extensions

Video Out	PAL or NTSC format, SDI or analog. Video out on camera for live view
Flash Card Interface	Flash card interface for up to 64 GB flash card memory
Extended Battery	Internal NIMH battery for up to 2.5 hrs autonomous recording
IRIG-B	IRIG-B 122 input for phase lock/time stamp of recording to/with IRIG-B signal
Motion Analysis	TEMA Starter 2D Motion Analysis packages
Extended Temperature Range	Camera tested for temperature -50 °C to +55 °C (-58 °F … 131 °F)

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