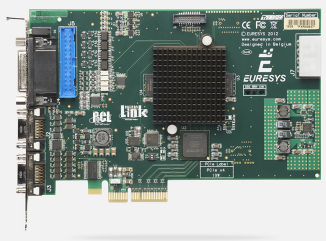
euresys
Empowering Computer Vision

Grablink Full XR

Frame grabber for one full-configuration Camera Link camera with support for extra long cables



At a Glance

- For one Camera Link 80-bit, 72-bit, Full, Medium or Base configuration camera
- Directly compatible with hundreds of Camera Link cameras available on the market
- Supports PoCL, Power over Camera Link
- ECCO+: Double Camera Link maximum cable length
- PoCL SafePower compliant
- PCIe x4 bus: 850 MB/s sustained delivery bandwidth
- Feature-rich set of 10 digital IO lines
- Memento Event Logging Tool

Benefits

New in MultiCam 6.19

- Support of the Windows Core Isolation security feature
- Windows 11 support
- Support of recent Linux distributions & kernels
- New Python bindings for MultiCam

ECCO+: Extended Camera Link Cable Operation

- Use longer, up to 20 meters long, Camera Link cables!

Directly compatible with hundreds of Camera Link cameras available on the market

Check out our supported cameras page (in the Support menu)

General purpose I/O lines

- Compatible with a wide range of sensors and motion encoders.
- High-speed differential inputs: Quadrature motion encoder support up to 5 MHz.
- Isolated current-sense inputs: 5V, 12V, 24V signaling voltages accepted, up to 50 kHz, individual galvanic isolation up to 500VAC RMS.
- Isolated contact outputs.

High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory and hardware boards that expose PCI addresses
- Hardware scatter-gather support
- 64-bit addressing capability

Area-scan triggering capabilities

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the Grablink's I/O lines. Software triggers come from the application.
- An optional trigger delay is available to postpone the acquisition for a programmable time.
- A trigger decimation function allows to skip some of the triggers.
- Camera exposure control allows the application to control the exposure time of the camera.
- When the acquisition starts, at the appropriate timing, the Grablink board generates a signal to control an illumination device connected to one of its output lines.

Line-scan triggering capabilities 1/2

Grablink supports continuous web scanning (to inspect infinite, continuously moving surfaces without losing a single line) and discrete object scanning (to acquire the image of objects moving in front of the camera).

- A trigger is used to start the acquisition when the part is in position. Hardware triggers come from the board's I/O lines. Software triggers come from the application.
- After it is started, the acquisition either:
  - Continues indefinitely (for web inspection applications)
  - Continues for a programmable number of lines (to acquire the image of objects of a known length)
  - Continues until an end trigger is received (to acquire the image of objects of a variable length)
- An optional trigger delay is available to postpone the beginning of the acquisition for a programmable number of lines.

Line-scan triggering capabilities 2/2

- The Grablink frame grabber controls the camera scanning rate based on the signals received from a motion encoder. When the parts move faster, the acquisition line rate of the camera increases. When the parts move slower, the acquisition line rate of the camera decreases.
- The Grablink boards interpret A/B signals from quadrature motion encoders to know in which direction (forward or backward) the part is moving.
- Optionally, the Grablink can be instructed to acquire lines only when the object is moving forward or only when the object is moving backward.
- A feature called Backward Motion Cancellation stops the acquisition when a backward motion is detected. The line acquisition automatically resumes when the motion is again in the forward direction, at the exact place where the acquisition was interrupted.
- A Rate Converter allows the camera to acquire lines at any programmable resolution lower or higher than the resolution of the motion encoder. This gives the designer incredible freedom and flexibility during the development of the application.
- A Rate Divider allows the camera to acquire lines at a resolution lower than the resolution of the motion encoder. It divides the frequency of the incoming encoder signal by a programmable integer.

Flexible line-scan camera operation with the rate converter

- The rate converter is a smart, programmable frequency multiplier/divider.
- Used with motion encoders and line-scan cameras, it allows the user to choose the aspect ratio of the pixels in the image.
- It provides a way to calibrate the acquisition chain to easily reach square (1:1 aspect ratio) pixels.

Windows and Linux drivers available

Applications

Machine Vision for the Electronic Manufacturing Industry

- High speed image acquisition for AOI, 3D SPI, 3D lead/ball inspection machines.
- Very high resolution line-scan image acquisition for Flat Panel Display inspection and solar cell inspection

Machine Vision for the General Manufacturing Industries

- High frame rate image acquisition for inspection machines
- Line-scan image acquisition for surface inspection machines
- Line-scan image acquisition for textile inspection

Machine Vision for the Printing Industry

- High speed line-scan image acquisition for printing inspection machines

Video Acquisition and Recording

- High-frame-rate video acquisition for motion analysis and recording

Specifications

Mechanical

Format	Standard profile, half length, 4-lane PCI Express card
Cooling method	Air-cooling, fanless
Mounting	For insertion in a standard height, 4-lane or higher, PCI Express card slot
Connectors	• 'BASE' on bracket: – 26-position Shrunk Delta Ribbon (SDR) socket – Camera Link Base connector • 'MEDIUM/FULL' – 26-position Shrunk Delta Ribbon (SDR) socket – Camera Link Medium/Full/80-bit connector • 'EXTERNAL I/O' on bracket: – 26-pin 3-row high-density female sub-D connector – I/O lines and power output • 'INTERNAL I/O' on PCB: – 26-pin 2-row 0.1" pitch pin header with shrouding – I/O lines and power output • 'POWER INPUT' on module: – 4-pin MOLEX power socket – 12 VDC power input for PoCL camera and I/O power
Dimensions	PCB L X H: 167.65 mm x 111.15 mm, 6.6 in x 4.38 in
Weight	136 g, 4.80 oz

Host bus

Standard	PCI Express 1.0
Link width	4 lanes
Link speed	2.5 GT/s (PCIe 1.0)
Maximum payload size	1024 bytes
DMA	32- and 64-bit
Peak delivery bandwidth	1,024 MB/s

Effective (sustained) delivery bandwidth	• Up to 833 MB/s for a PCI Express payload size of 256 bytes and 64-bit addressing • Up to 844 MB/s for a PCI Express payload size of 256 bytes and 32-bit addressing • Up to 754 MB/s for a PCI Express payload size of 128 bytes and 64-bit addressing • Up to 780 MB/s for a PCI Express payload size of 128 bytes and 32-bit addressing
Power consumption	Max. 9.9 W; Typ. 8.2 W (1.0 A @ 3.3V;0.41 A @+12V)

Camera / video inputs

Interface standard(s)	Camera Link 2.0
Connectors	Two Shrunk Delta Ribbon (SDR) Miniature Camera Link (MiniCL)
ECCO - Extended Camera Link Cable Operation	ECCO+
Number of cameras	One 80-bit / 72-bit / Full / Medium / Base configuration camera
Maximum aggregated camera data transfer rate	6.8 Gbit/s (850 MB/s)
Camera Link configuration	Base, Medium, Full, 72-bit, 80-bit Note: Unpacking to 16-bit and image reconstruction are not available for the 8x 10-bit variant of the 80-bit configuration.
Camera Link clock frequency	From 20 MHz up to 85 MHz
PoCL (Power over Camera Link)	Two independent PoCL SafePower compliant controllers with overload, over-voltage and short-circuit protection
Camera types	Grayscale and color (RGB and Bayer) area- and line-scan cameras
Camera pixel formats supported	• Mono8, Mono10, Mono12, Mono14, Mono16 • BayerXX8, BayerXX10, BayerXX12, BayerXX14, BayerXX16 where XX = GR, RG, GB, or BG • RGB8, RGB10, RGB12, RGB14, RGB16

Area-scan camera control

Trigger	• Precise control of asynchronous reset cameras, with exposure control. • Support of camera exposure/readout overlap. • Support of external hardware trigger, with optional delay and trigger decimation.
Strobe	• Accurate control of the strobe position for strobed light sources. • Support of early and late strobe pulses.

Line-scan camera control

Scan/page trigger	• Precise control of start-of-scan and end-of-scan triggers. • Support of external hardware trigger, with optional delay. • Support of infinite acquisition, without missing line, for web inspection applications.
Line trigger	• Support for quadrature motion encoders, with programmable noise filters, selection of acquisition direction and backward motion compensation. • Rate Converter tool for fine control of the pixel aspect ratio. • Rate Divider tool
Line strobe	• Accurate control of the strobe position for strobed light sources.

On-board processing

On-board memory	128 MB (64 MB for image data)
Image data stream processing	• Unpacking of 10-/12-/14-bit to 16-bit with selectable justification to LSb or MSb
Input LUT (Lookup Table)	• Monochrome: 8-bit, 10-bit or 12-bit per pixel, up to 1000 MPixel/s • RGB: 3x8-bit, 3x10-bit or 3x12-bit per pixel, up to 250 MPixel/s
Bayer CFA to RGB decoder	• Advanced interpolation method using average and median functions on a 3x3 kernel • Up to 225 MPixel/s

General Purpose Inputs and Outputs

Number of lines	10 I/O lines: • 2 differential inputs (DIN) • 4 isolated inputs (IIN) • 4 isolated outputs (IOUT)
Usage	• The input lines can be used by the acquisition channel as: – Camera frame trigger source (area-scan only) – Acquisition sequence trigger source (area-scan only) – Camera line trigger source (line-scan only) – Page acquisition trigger source (line-scan only) – Page acquisition end trigger source (line-scan only) – (Quadrature) motion encoder input (line-scan only) • The IOUT 1 output line can be used by the acquisition channel as: – Illumination strobe output • All the input lines can be used as general purpose inputs • All the output lines can be used as general purpose outputs
Electrical specifications	• DIN: High-speed differential inputs, up to 5 MHz, compatible with ANSI/EIA/TIA-422/485 differential line drivers and complementary TTL drivers • IIN: Isolated current-sense inputs with wide voltage input range up to 30V, compatible with totem-pole LVTTL, TTL, 5V CMOS drivers, RS-422 differential line drivers, potential free contacts, solid-state relays and opto-couplers • IOUT: Isolated contact outputs compatible with 30V / 100mA loads NOTE: IIN and IOUT lines provide a functional isolation grade for the circuit technical protection. It does not provide an isolation that can protect a human being from electrical shock!
Filter control	• Glitch removal filter available only on input lines used as trigger sources • Configurable with five time constants: – 100 ns, 500 ns, and 2.5 µs for trigger / page trigger / page end trigger sources – 40 ns, 100 ns, 200 ns, 500 ns, 1 µs, 5 µs, 10 µs for line trigger sources
Power output	Non-isolated, +5V, 1A and +12V, 1A, with electronic fuse protection

Software

Host PC Operating System	• Microsoft Windows 10, 8.1, 7 for x86 (32-bit) and x86-64 (64-bit) processor architectures • Linux for x86 (32-bit) and x86-64 (64-bit) processor architectures Refer to release notes for details
APIs	• MultiCam 32- and 64-bit binary libraries (Windows and Linux), for ISO-compliant C/C++ compilers

Environmental conditions

Operating ambient air temperature	0 °C to +50 °C / +32 °F to +122 °F
Operating ambient air humidity	10% to 90% RH non-condensing
Storage ambient air temperature	-20 °C to +70 °C/ -4 °F to +158 °F
Storage ambient air humidity	10% to 90% RH non-condensing

Certifications

Electromagnetic - EMC standards	• European Council EMC Directive 2014/30/EU • United States FCC rule 47 CFR 15

EMC - Emission	• EN 55022:2010 / CISPR 22:2008 Class B • EN 55032:2015 / CISPR 32:2012 Class B • FCC 47 Part 15 Class B
EMC - Immunity	• EN 55024:2010 / CISPR 24:2010 • EN 55035:2017 / CISPR 35:2016 • EN 61000-4-2:2009 • EN 61000-4-3:2006 • EN 61000-4-4:2004 • EN 61000-4-5:2014 • EN 61000-4-6:2014
KC Certification	Korean Radio Waves Act, Article 58-2, Clause 3
Flammability	PCB compliant with UL 94 V-0
RoHS	European Union Directive 2015/863 (ROHS3)
REACH	European Union Regulation 1907/2006
WEEE	Must be disposed of separately from normal household waste and must be recycled according to local regulations

Ordering Information

Product code - Description	• 1626 - Grablink Full XR

EMEA

Euresys SA

Liège Science Park - Rue du Bois Saint-Jean, 20
4102 Seraing - Belgium

Email: sales.europe@euresys.com

EMEA

Sensor to Image GmbH

Lechtorstrasse 20
86956 Schongau - Germany

Email: sales.europe@euresys.com

AMERICA

Euresys Inc.

316 Prado Way
Greenville, SC 29607 - United States

Email: sales.americas@euresys.com

ASIA

Euresys Pte. Ltd.

750A Chai Chee Road - #07-15 ESR BizPark @ Chai Chee
Singapore 469001 - Singapore

Email: sales.asia@euresys.com

CHINA

Euresys Shanghai Liaison Office

Unit 802, Tower B, Greenland The Center - No.500 Yunjin Road, Xuhui District
200232 Shanghai - China
Euresys上海联络处
上海市徐汇区云锦路500号绿地汇中心B座802室
200232

Email: sales.china@euresys.com

CHINA

Euresys Shenzhen Liaison Office

Room 1202 - Chinese Overseas Scholars Venture Building
518057 Shenzen - China
Euresys深圳联络处
深圳南山区留学生创业大厦1期1202
518057

Email: sales.china@euresys.com

JAPAN

Euresys Japan K.K.

Expert Office Shinyokohama - Nisso Dai 18 Building, Shinyokohama 3-7-18, Kohoku
Yokohama 222-0033 - Japan
〒222-0033
神奈川県横浜市港北区新横浜3-7-18 日総第18ビル　エキスパートオフィス新横浜

Email: sales.japan@euresys.com

More at www.euresys.com