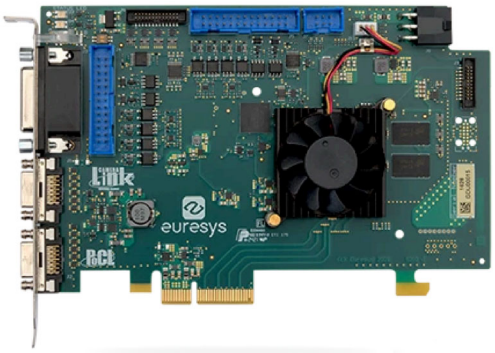
5/22/2024

Datasheet

Grablink Duo

Frame grabber for one full- or two base-configuration Camera Link cameras



- For two independent Camera Link Base configuration cameras
- For one Camera Link Base, Medium, Full, 72-bit or 80-bit camera
- Directly compatible with hundreds of Camera Link cameras available on the market
- PoCL, Power over Camera Link
- ECCO: Extended Camera Link cable length
- PCIe Gen 2 x4 bus
- Feature-rich set of 20 digital IO lines
- Support of GenCP (Generic Control Protocol)
- Compatible with eGrabber Driver
- Compatible with Memento Event Logging Tool

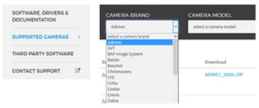
Main benefits

Compatible with eGrabber

- eGrabber Studio: eGrabber's new interactive evaluation and demonstration application
- GenICam Browser: An application giving access to the GenICam features exposed by the GenTL Producer(s)
- GenTL Console: A command-line tool giving access to the functions and commands exposed by the Euresys GenTL Producer

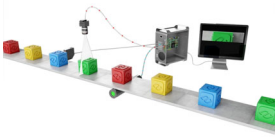
ECCO: Extended Camera Link Cable Operation

- Use longer, up to 15 meters long, Camera Link cables!



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

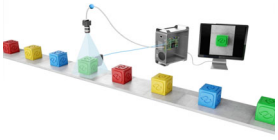
Check out our Camfiles page (in the Support menu)



Line-scan triggering capabilities

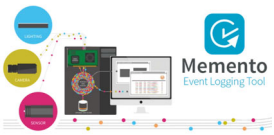
Euresys' frame grabbers offer many capabilities to synchronize line-scan or 1D cameras, sensors and lighting controllers. Frame grabbers can control the camera scanning rate based on the signals received from a motion encoder.

They support 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).



Area-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize area-scan or 2D cameras, sensors and lighting controllers, for stationery or moving objects in the field of view, or moving cameras.



Memento Event Logging Tool

- Memento is an advanced development and debugging tool available for Coaxlink and Grablink cards.
- Memento records an accurate log of all the events related to the camera, the frame grabber and its driver as well as the application.
- It provides the developer with a precise timeline of time-stamped events, along with context information and logic analyzer view.
- It provides valuable assistance during application development and debugging, as well as during machine operation.

C2C-Link camera synchronization

Allows to accurately synchronize multiple area-scan or line-scan cameras connected

- to the same card
- to different cards in the same PC
- to different cards in different PCs

Compliant with GenICam

Including support for:

- GenApi
- The Standard Feature Naming Convention (SFNC)
- GenTL

High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory
- Hardware scatter-gather support

Windows, Linux and macOS drivers available

Including support for Intel 64-bit platforms as well as ARM 64-bit platforms.

Other benefits

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 250VDC and 170VAC RMS.
- Isolated contact outputs.
- High-speed 5V-compliant TTL inputs/ LVTTL outputs.

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.

Line-scan Metadata insertion

When activated, this feature records metadata beside image data. Line metadata are captured every acquired image line. Buffer metadata are only captured when the first image line of a buffer is acquired. The metadata are composed with a configurable set of general purpose event counters, quadrature encoder position counters and/or I/O line status. This feature allows line-scan applications to correlate image data with system events including motion encoder positions.

Specifications

Mechanical

Form factor

PCI Express card

Format

Standard profile, half length, 4-lane PCI Express card

Cooling method

Air cooling, fan-cooled heatsink

Mounting

For insertion in a standard height, 4-lane or higher, PCI Express card slot

Connectors

'A' on card bracket:

26-position Shrunk Delta Ribbon (SDR) socket with M2 jack socket screws

Camera Link camera A input, PoCL output

'B' on card bracket:

26-position Shrunk Delta Ribbon (SDR) socket with M2 jack socket screws

Camera Link camera B input or camera A second cable input, PoCL output

'EXTERNAL I/O' on card bracket:

26-pin 3-row high-density D-Sub female socket with UNC4-40 jack socket screws

I/O lines and I/O power output

'INTERNAL I/O 1' on printed circuit board:

26-pin 2-row 0.1" pitch pin header with shrouding

I/O lines and I/O power output

'INTERNAL I/O 2' on printed circuit board:

26-pin 2-row 0.1" pitch pin header with shrouding

I/O lines and I/O power output

'I/O EXTENSION' on printed circuit board:

26-pin 2-row 0.05" pitch pin header with shrouding

I/O extension cable socket

'C2C-LINK' on printed circuit board:

6-pin 2-row 0.1" pitch pin header with shrouding

Card-to-card link

'AUXILIARY POWER INPUT' on printed circuit board:

- 6-pin PEG power socket
- 12 V DC power input for PoCL and I/O power output

LED indicators

'A', 'B' on bracket:

- Bi-color red/green LEDs
- Camera Link status indicator

Switches

'RECOVERY' on PCB:

3-pin 1-row 0.1" header or 2-way DIP switch

Firmware emergency recovery

Dimensions

PCB L x H: 167.65 mm x 111.15 mm [6.6 in x 4.38 in]

Weight

Net weight: 167 g [5.9 oz]

Gross weight: 272 g [9.6 oz]

Host bus

Standard

PCI Express 2.0

Link width

4 lanes

1 lane or 2 lanes with reduced performance

Link speed

5.0 GT/s (PCIe 2.0)

2.5 GT/s (PCIe 1.0) with reduced performance

Maximum payload size

512 bytes

Peak delivery bandwidth

2,000 MB/s

Effective (sustained) delivery bandwidth

1,700 MB/s (Host PC motherboard dependent)

Power consumption

Typ. 7.1 W (2.7 W @ +3.3V, 4.4 W @ +12V), excluding camera and I/O power output

Camera / video inputs

Camera interface standard

Camera Link

Interface standard(s)

Camera Link 2.0

Maximum link speed

85 MHz

Camera powering

PoCL

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

Or two Base configuration cameras

Maximum number of cameras

2

Line-scan cameras supported

Yes

Maximum aggregated camera data transfer rate

6.8 Gbps (850 MB/s)

Camera Link configuration

Base, Medium, Full, 72-bit, 80-bit

Camera Link clock frequency

From 20 MHz up to 85 MHz

PoCL (Power over Camera Link)

PoCL Safe Power:

- Two independent controllers
- PoCL Device detection and automatic power-on
- Overload and short-circuit protection

A +12V power source must be connected to the AUXILIARY POWER INPUT connector using a 6-pin PEG cable

Camera types

Area-scan cameras:

- Grayscale and color (RGB and Bayer CFA)

Line-scan cameras:

- Grayscale and color RGB

Camera pixel formats supported

Mono8, Mono10, Mono12, Mono14, Mono16

BayerXX8, BayerXX10, BayerXX12, BayerXX16 where XX = GR, RG, GB, or BG

RGB8

NOTE: Refer to release notes for availability of BayerXX14, RGB10, RGB12, RGB14 and RGB16 formats

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 Conversion Ratio in the range 0.001 to 1000 with an accuracy better than 0.1%.

Rate Divider tool

Line strobe

Accurate control of the strobe position for strobed light sources.

On-board processing

On-board memory

512 MB

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 to 8-bit transformation

Monochrome 10-bit to 8-, 10- or 16-bit transformations

Monochrome 12-bit to 8-, 12- or 16-bit transformations

Bayer CFA to RGB decoder

Advanced interpolation method using average and median functions on a 3x3 kernel

Data stream statistics

Measurement of:

- Frame rate (Area-scan only)
- Line rate
- Data rate

Configurable averaging interval

Event signaling and counting

The application software can be notified of the occurrence of various events:

- Standard event: the EVENT_NEW_BUFFER event notifies the application of newly filled buffers
- A large set of custom events

Custom events sources:

- I/O Toolbox events
- Camera and Illumination control events

Each custom event is associated with a 32-bit counter that counts the number of occurrences

The last three 32-bit context data words of the event context data can be configured with event-specific context data:

- Event-specific data

State of all System I/O lines sampled at the event occurrence time

Value of any event counter

General Purpose Inputs and Outputs

Number of lines

20 I/O lines:

4 differential inputs (DIN)

4 singled-ended TTL inputs/outputs (TTLIO)

8 isolated inputs (IIN)

4 isolated outputs (IOUT)

NOTE: The number of I/O lines can be extended using I/O modules attached to the I/O EXTENSION connector.

Usage

Any I/O input lines can be used by any LIN tool of the I/O Toolbox

Selected pairs of I/O input lines can be used by any QDC tool of the I/O toolbox to decode A/B signals of a motion encoder

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

TTLIO: High-speed 5V-compliant TTL inputs or LVTTL outputs, compatible with totem-pole LVTTL, TTL, 5V CMOS drivers or LVTTL, TTL, 3V CMOS receivers

IIN: Isolated current-sense inputs with wide voltage input range up to 30V, signaling up to 200 kHz, individual galvanic isolation up to 250VDC and 170 VAC, 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 on all System I/O input lines

Configurable filter delay:

Custom value

Fixed values for DIN and TTLIO lines: 50 ns, 100 ns, 200 ns, 500 ns, 1 µs

Fixed values for IIN lines: 500 ns, 1 µs, 2 µs, 5 µs, 10 µs

Polarity control

Yes

Power output

Non-isolated, +12V, 1A, with electronic fuse protection

I/O Toolbox tools

The I/O Toolbox is a configurable interconnection of tools that generates events (usually triggers):

Line Input tool (LIN): edge detector delivering events on rising or falling edges of any selected input line.

Quadrature Decoder tool (QDC): a composite tool including:

- A quadrature edge detector delivering events on selected transitions of selected pairs of input lines.
- An optional backward motion compensator for clean line-scan image acquisition when the motion is unstable.
- A 32-bit up/down counter for delivering a position value.

User Actions Scheduler tool (UAS): to delegate the execution of 'User Actions' at a scheduled time or encoder position. Possible user actions include setting low/high/toggle any bit of the User Output Register or generation of any User Events.

Delay tool (DEL): to delay up to 16 events from one or two I/O toolbox event sources, by a programmable time or number of motion encoder ticks (any QDC events).

Divider tool (DIV): to generate an event every nth input events from any I/O toolbox event source.

Multiplier/divider tool (MDV): to generate m events every d input events from any I/O toolbox event source.

The 'Input Tools' (LIN, QDC and UAS) can be further processed by the 'Event Tools' (DEL, DIV and MDV) to generate any of the following "trigger" events:

- The "cycle trigger" of the Camera and Illumination controller
- The "cycle sequence trigger" of the Camera and Illumination controller
- The "start-of-scan trigger" of the Acquisition Controller (line-scan only)
- The "end-of-scan trigger" of the Acquisition Controller (line-scan only)

I/O Toolbox composition

Determined by the selected firmware variant:

'1-camera': 8 LIN, 1 QDC, 1 UAS, 2 DEL, 1 DIV, 1 MDV, 2 C2C

'2-camera': 8 LIN, 2 QDC, 1 UAS, 2 DEL, 2 DIV, 2 MDV, 2 C2C

'1-camera, line-scan': 8 LIN, 1 QDC, 1 UAS, 2 DEL, 1 DIV, 1 MDV, 3 C2C

'2-camera, line-scan': 8 LIN, 2 QDC, 1 UAS, 2 DEL, 2 DIV, 2 MDV, 3 C2C

C2C-Link

Description

Accurate synchronization of the trigger and the start-of-exposure of multiple grabber-controlled area-scan cameras.

Accurate synchronization of the start-of-cycle, start-of-scan and end-of-scan of multiple grabber-controlled line-scan cameras.

Specification

C2C-Link synchronizes cameras connected to:

- the same card
- to different cards in the same PC (requires an accessory cable such as the "3303 C2C-Link Ribbon Cable" or a custom-made C2C-Link cable)

to different cards in different PCs (requires one "1636 InterPC C2C-Link Adapter" for each PC and one RJ 45 CAT 5 STP straight LAN cable for each adapter but the last one)

Maximum distance:

120 cm inside a PC

1200 m cumulated adapter to adapter cable length

Maximum trigger rate:

2.5 MHz for configurations using a single PC, or up to 10 PCs and 100 m total C2C-Link cable length

200 kHz for configurations up to 32 PCs and 1200m total C2C-Link cable length

Trigger propagation delay from master to slave devices:

Less than 10 ns for cameras on the same card or on different cards in the same PC

Less than 265 ns for cameras on different cards in different PCs (3 PCs and 40m total C2C-Link cable length)

Software

Host PC Operating System

Microsoft Windows 11, 10 for x86-64 (64-bit) processor architecture

Linux for x86-64 (64-bit) and AArch64 (64-bit) processor architectures

macOS for x86-64 (64-bit) and AArch64 (64-bit) processor architectures

APIs

EGrabber class, with C++ and .NET APIs: .NET assembly designed to be used with development environments compatible with .NET frameworks version 4.0 or higher

GenICam GenTL producer libraries compatible with C/C++ compilers:

'x86_64' dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of x86-64 (64-bit) applications

'aarch64' dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of AArch64 (64-bit) applications

Memento supported

Yes

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

EMC standards

European Council EMC Directive 2014/30/EU

United States FCC rule 47 CFR 15

EMC - Emission

EN 55032:2015 / CISPR 32:2012 Class B

FCC 47 Part 15 Class B

EMC - Immunity

EN 55035:2017 / CISPR 35:2016

EN 61000-6-2:2005 / IEC 61000-6-2:2016

EN 61000-4-2:2009

EN 61000-4-3:2006

EN 61000-4-4:2004

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

PC1628 Grablink Duo

Related products

PC1625 DB25F I/O Adapter Cable

PC1636 InterPC C2C-Link Adapter

PC3303 C2C-Link Ribbon Cable

PC3304 HD26F I/O Adapter Cable

PC3610 HD26F I/O Extension Module - TTL-RS422

PC3612 HD26F I/O Extension Module - TTL-CMOS5V-RS422

Offices

- Europe, Middle East & Africa
  Euresys SA
  Contact support : support.europe@euresys.com

  Sensor to Image GmbH
  Contact support : support.europe@euresys.com

- China
  Euresys Shanghai Liaison Office
  Contact support : support.china@euresys.com

  Euresys Shenzhen Liaison Office
  Contact support : support.china@euresys.com

- Japan
  Euresys Japan K.K.
  Contact support : support.japan@euresys.com

- South Korea
  Euresys South Korea Liaison Office
  Contact support : support.korea@euresys.com

- Asia (other countries)
  Euresys Pte. Ltd.
  Contact support : support.asia@euresys.com

- North, Central & South America
  Euresys Inc.
  Contact support : support.usa@euresys.com

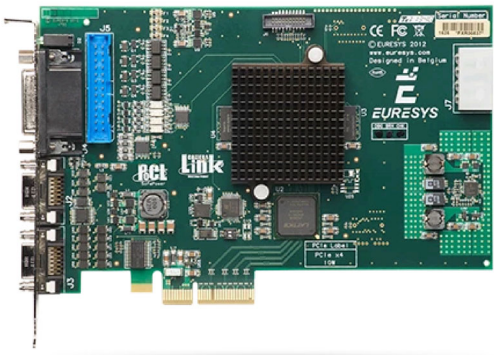
  TKH Vision Experience Center
  Contact support : support.usa@euresys.com

6/3/2024

Datasheet

Grablink Full XR

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

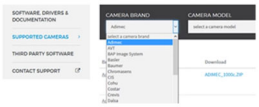


- For one Camera Link 80-bit, 72-bit, Full, Medium or Base configuration camera
- Directly compatible with hundreds of Camera Link cameras available on the market
- Supports PoCL, Power over Camera Link
- ECCO+: Double Camera Link maximum cable length
- PoCL SafePower compliant
- PCIe x4 bus: 850 MB/s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

Main benefits

ECCO+: Extended Camera Link Cable Operation

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



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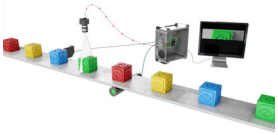

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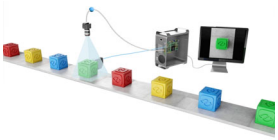


Area-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize area-scan or 2D cameras, sensors and lighting controllers, for stationery or moving objects in the field of view, or moving cameras.

High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory
- Hardware scatter-gather support

Windows and Linux drivers available

- Windows and Linux drivers available

Other benefits

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 250VDC and 170VAC RMS.
- Isolated contact outputs.
- High-speed 5V-compliant TTL inputs/ LVTTL outputs.

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.

Specifications

Mechanical

Form factor

PCI Express card

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

Net weight: 135 g [4.8 oz]

Gross weight: 236 g [8.3 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

Camera interface standard

Camera Link

Interface standard(s)

Camera Link 2.0

Maximum link speed

85 MHz

Maximum link width

80-bit

Camera powering

PoCL

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 number of cameras

1

Line-scan cameras supported

Yes

Maximum aggregated camera data transfer rate

6.8 Gbps (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

Memento supported

Yes

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

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

PC1626 Grablink Full XR

Related products

PC3305 C2C SyncBus Cable

PC3306 C2C Quad SyncBus Cable

Offices

- Europe, Middle East & Africa
  Euresys SA
  Contact support : support.europe@euresys.com

  Sensor to Image GmbH
  Contact support : support.europe@euresys.com

- China
  Euresys Shanghai Liaison Office
  Contact support : support.china@euresys.com

  Euresys Shenzhen Liaison Office
  Contact support : support.china@euresys.com

- Japan
  Euresys Japan K.K.
  Contact support : support.japan@euresys.com

- South Korea
  Euresys South Korea Liaison Office
  Contact support : support.korea@euresys.com

- Asia (other countries)
  Euresys Pte. Ltd.
  Contact support : support.asia@euresys.com

- North, Central & South America
  Euresys Inc.
  Contact support : support.usa@euresys.com

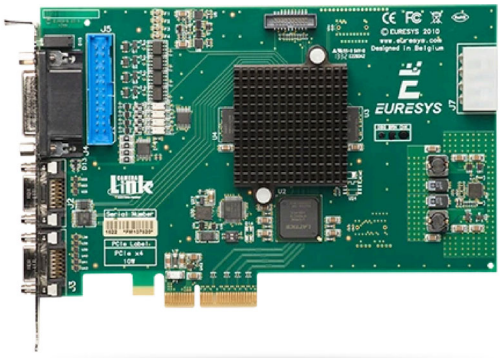
  TKH Vision Experience Center
  Contact support : support.usa@euresys.com

6/3/2024

Datasheet

Grablink Full

Frame grabber for one full-configuration Camera Link camera

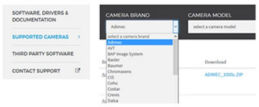


- For one Camera Link 80-bit, 72-bit, Full, Medium or Base configuration camera
- Directly compatible with hundreds of Camera Link cameras available on the market
- ECCO: Extended Camera Link cable length
- PCIe x4 bus: 850 MB/s sustained delivery bandwidth
- Feature-rich set of 10 digital IO lines
-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

Main benefits

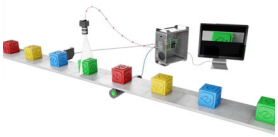
ECCO: Extended Camera Link Cable Operation

- Use longer, up to 15 meters long, Camera Link cables!



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

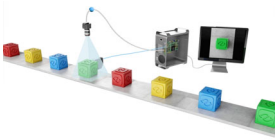
Check out our Camfiles page (in the Support menu)



Line-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize line-scan or 1D cameras, sensors and lighting controllers. Frame grabbers can control the camera scanning rate based on the signals received from a motion encoder.

They support 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).



Area-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize area-scan or 2D cameras, sensors and lighting controllers, for stationery or moving objects in the field of view, or moving cameras.

High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory
- Hardware scatter-gather support

Windows and Linux drivers available

- Windows and Linux drivers available

Other benefits

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 250VDC and 170VAC RMS.
- Isolated contact outputs.
- High-speed 5V-compliant TTL inputs/ LVTTL outputs.

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.

Specifications

Mechanical

Form factor

PCI Express card

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 I/O

Dimensions

PCB L X H: 167.65 mm x 111.15 mm, 6.6 in x 4.38 in

Weight

Net weight: 133 g [4.7 oz]

Gross weight: 235 g [8.3 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. 6.9 W; Typ. 5.7 W (0.48 A @ 3.3V, 0.34 A @+12V)

Camera / video inputs

Camera interface standard

Camera Link

Interface standard(s)

Camera Link 2.0

Maximum link speed

85 MHz

Maximum link width

80-bit

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 number of cameras

1

Line-scan cameras supported

Yes

Maximum aggregated camera data transfer rate

6.8 Gbps (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

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

Memento supported

Yes

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

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

PC1622 Grablink Full

Related products

PC3305 C2C SyncBus Cable

PC3306 C2C Quad SyncBus Cable

Offices

- Europe, Middle East & Africa
  Euresys SA
  Contact support : support.europe@euresys.com

  Sensor to Image GmbH
  Contact support : support.europe@euresys.com

- China
  Euresys Shanghai Liaison Office
  Contact support : support.china@euresys.com

  Euresys Shenzhen Liaison Office
  Contact support : support.china@euresys.com

- Japan
  Euresys Japan K.K.
  Contact support : support.japan@euresys.com

- South Korea
  Euresys South Korea Liaison Office
  Contact support : support.korea@euresys.com

- Asia (other countries)
  Euresys Pte. Ltd.
  Contact support : support.asia@euresys.com

- North, Central & South America
  Euresys Inc.
  Contact support : support.usa@euresys.com

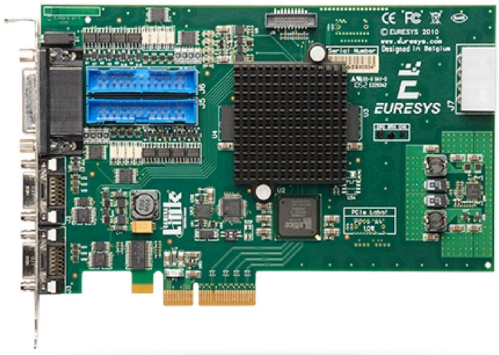
  TKH Vision Experience Center
  Contact support : support.usa@euresys.com

6/3/2024

Datasheet

Grablink DualBase

Frame grabber for two base-configuration Camera Link cameras

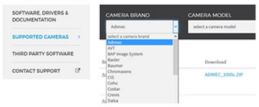


- For two Camera Link Base or Lite configuration cameras
- Directly compatible with hundreds of Camera Link cameras available on the market
- Supports PoCL, Power over Camera Link
- ECCO: Extended Camera Link cable length
- PCIe x4 bus: 850 MB/s sustained delivery bandwidth
- Feature-rich set of 20 digital IO lines
- Memento Event Logging Tool

Main benefits

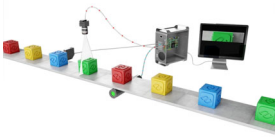
ECCO: Extended Camera Link Cable Operation

- Use longer, up to 15 meters long, Camera Link cables!



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

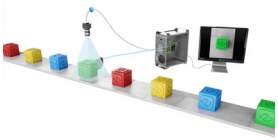
Check out our Camfiles page (in the Support menu)



Line-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize line-scan or 1D cameras, sensors and lighting controllers. Frame grabbers can control the camera scanning rate based on the signals received from a motion encoder.

They support 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).



Area-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize area-scan or 2D cameras, sensors and lighting controllers, for stationery or moving objects in the field of view, or moving cameras.

High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory
- Hardware scatter-gather support

Windows and Linux drivers available

- Windows and Linux drivers available

Other benefits

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 250VDC and 170VAC RMS.
- Isolated contact outputs.
- High-speed 5V-compliant TTL inputs/ LVTTL outputs.

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.

Specifications

Mechanical

Form factor

PCI Express card

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

'A' on bracket:

26-position Shrunk Delta Ribbon (SDR) socket

Camera Link Camera A

'B' on bracket:

26-position Shrunk Delta Ribbon (SDR) socket

Camera Link Camera B

'EXTERNAL I/O' on bracket:

26-pin 3-row high-density female sub-D connector

I/O lines and power output

'INTERNAL I/O A on PCB:

26-pin 2-row 0.1" pitch pin header with shrouding

I/O lines of camera A and power output

'INTERNAL I/O B on PCB:

26-pin 2-row 0.1" pitch pin header with shrouding

I/O lines of camera B and power output

'POWER INPUT' on module:

4-pin MOLEX power socket

12 VDC power input for PoCL cameras and I/O power

Dimensions

PCB L X H: 167.65 mm x 111.15 mm, 6.6 in x 4.38 in

Weight

Net weight: 142 g [5 oz]

Gross weight: 242 g [8.5 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.7.2 W; Typ. 6.0 W (0.47 A @ 3.3V, 0.37 A @+12V)

Camera / video inputs

Camera interface standard

Camera Link

Interface standard(s)

Camera Link 2.0

Maximum link speed

85 MHz

Maximum link width

24-bit (BASE)

Camera powering

PoCL

Connectors

Two Shrunk Delta Ribbon (SDR) Miniature Camera Link (MiniCL)

ECCO - Extended Camera Link Cable Operation

ECCO

Number of cameras

Two Base or Lite cameras

Maximum number of cameras

2

Line-scan cameras supported

Yes

Maximum aggregated camera data transfer rate

4.08 Gbps (510 MB/s)

Camera Link configuration

Base or Lite

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

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 500 MPixel/s per camera

RGB: 3x8-bit per pixel, up to 125 MPixel/s per camera

Bayer CFA to RGB decoder

Advanced interpolation method using average and median functions on a 3x3 kernel

Up to 125 MPixel/s per camera

General Purpose Inputs and Outputs

Number of lines

2 sets of 10 I/O lines, each set including:

2 differential inputs (DIN)

4 isolated inputs (IIN)

4 isolated outputs (IOUT)

Usage

Each acquisition channel has a dedicated set of 10 I/O's

- The I/O set of INTERNAL IO CONNECTOR A is dedicated to the acquisition channel of CAMERA A
- The I/O set of INTERNAL IO CONNECTOR B is dedicated to the acquisition channel of CAMERA B

The input lines of an I/O set can be used by the corresponding 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 of an I/O set can be used by the corresponding 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

Memento supported

Yes

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

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

PC1623 Grablink DualBase

Related products

PC1625 DB25F I/O Adapter Cable

PC3304 HD26F I/O Adapter Cable

Offices

- Europe, Middle East & Africa
  Euresys SA
  Contact support : support.europe@euresys.com

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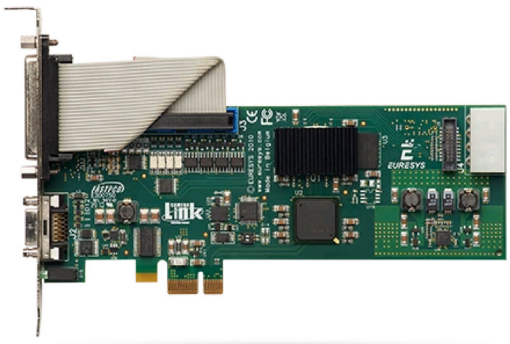
6/3/2024

Datasheet

Grablink Base

Frame grabber for one base-configuration Camera Link camera

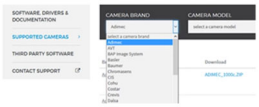


- For one Camera Link Base or Lite configuration camera
- Directly compatible with hundreds of Camera Link cameras available on the market
- Supports PoCL, Power over Camera Link
- ECCO: Extended Camera Link cable length
- PCIe x1 bus: 200 MB/s sustained delivery bandwidth
- Feature-rich set of 10 digital IO lines
- Memento Event Logging Tool

Main benefits

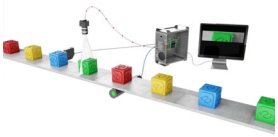
ECCO: Extended Camera Link Cable Operation

- Use longer, up to 15 meters long, Camera Link cables!



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

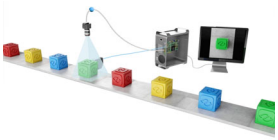
Check out our Camfiles page (in the Support menu)



Line-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize line-scan or 1D cameras, sensors and lighting controllers. Frame grabbers can control the camera scanning rate based on the signals received from a motion encoder.

They support 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).



Area-scan triggering capabilities

Euresys' frame grabbers offer many capabilities to synchronize area-scan or 2D cameras, sensors and lighting controllers, for stationery or moving objects in the field of view, or moving cameras.

High-performance DMA (Direct Memory Access)

- Direct transfer into user-allocated memory
- Hardware scatter-gather support

Windows and Linux drivers available

- Windows and Linux drivers available

Other benefits

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 250VDC and 170VAC RMS.
- Isolated contact outputs.
- High-speed 5V-compliant TTL inputs/ LVTTL outputs.

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.

Specifications

Mechanical

Form factor

PCI Express card

Format

Low profile, half length, 1-lane PCI Express card

Cooling method

Air-cooling, fanless

Mounting

For insertion in a low-profile or standard height, 1-lane or higher, PCI Express card slot

Connectors

'A' on bracket:

26-position Shrunk Delta Ribbon (SDR) socket

Camera Link Base connector

'EXTERNAL I/O' on standard bracket:

25-pin 2-row 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 68.90 mm, 6.6 in x 2.71 in

Weight

Net weight: 93 g [3.3 oz]

Gross weight: 203 g [7.2 oz]

Host bus

Standard

PCI Express 1.0

Link width

1 lane

Link speed

2.5 GT/s (PCIe 1.0)

Maximum payload size

1024 bytes

DMA

32- and 64-bit

Peak delivery bandwidth

256 MB/s

Effective (sustained) delivery bandwidth

Up to 200 MB/s for a PCI Express payload size of 256 bytes

Up to 180 MB/s for a PCI Express payload size of 128 bytes

Power consumption

Max. 4.5 W; Typ. 3.8 W (0.34 A @ 3.3V, 0.22 A @+12V)

Camera / video inputs

Camera interface standard

Camera Link

Interface standard(s)

Camera Link 2.0

Maximum link speed

85 MHz

Maximum link width

24-bit (BASE)

Camera powering

PoCL

Connectors

One Shrunk Delta Ribbon (SDR) Miniature Camera Link (MiniCL)

ECCO - Extended Camera Link Cable Operation

ECCO

Number of cameras

One Base or Lite camera

Maximum number of cameras

1

Line-scan cameras supported

Yes

Maximum aggregated camera data transfer rate

2.04 Gbps (255 MB/s)

Camera Link configuration

Base or Lite

Camera Link clock frequency

From 20 MHz up to 85 MHz

PoCL (Power over Camera Link)

One PoCL SafePower compliant controller with overload, over-voltage and short-circuit protection

Camera types

Grayscale and color (RGB and Bayer) area- and line-scan cameras

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

64 MB (32 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 500 MPixel/s

RGB: 3x8-bit per pixel, up to 125 MPixel/s

Bayer CFA to RGB decoder

Advanced interpolation method using average and median functions on a 3x3 kernel

Up to 125 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

Memento supported

Yes

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

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

PC1624 Grablink Base

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