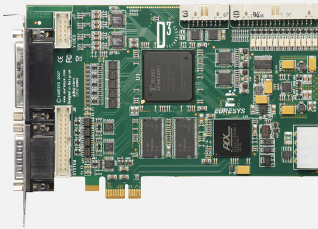


Domino Symphony PCIe

Frame grabber for four single-tap non-standard analog cameras



At a Glance

- Four 10-bit 65 MHz A/D converters with four 8- or 10-bit LUTs
- PCIe x1 bus
- D³ technology for extremely low synchronization jitter
- Support for mega-pixel progressive-scan and interlaced cameras, asynchronous reset and exposure control
- Trigger, strobe and general purpose I/O lines

Benefits

Enjoy digital quality from low-cost analog cameras thanks to our patented D³ technology

- Extremely low noise, true 10-bit image acquisition
- Lowest jitter: 0.5 ns (or 0.008 pixels) even when using composite video signals, for the most precise measurements
- No need to use pixel clock

Take advantage of the lowest-cost industrial cameras available on the market

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
- Low cost image acquisition from industrial analog cameras for inspection machines

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, 1-lane PCI Express card
Dimensions	PCB L X H: 167.65 mm x 111.15 mm, 6.6 in x 4.38 in
Weight	135 g, 4.76 oz

Host bus

Standard	PCI Express 1.0
Link width	1 lane
Link speed	2.5 GT/s (PCIe 1.0)
DMA	32-bit
Peak delivery bandwidth	256 MB/s
Effective (sustained) delivery bandwidth	180 MB/s (Host PC motherboard dependent)
Power consumption	Typ. 8.3 W (940 mA @ +3.3V, 430 mA @ +12V), excluding I/O power output

Camera / video inputs

Interface standard(s)	Non-standard Analog
Connectors	<ul style="list-style-type: none">• CAMERAS: high-density sub-D 44-pin male connector for video and camera control• Internal video: 10-pin shrouded header video connector on the PCB
Termination resistor	Selectable by software
Number of cameras	Four single-tap cameras
Number of cameras (at full frame rate)	4
A/D converter	Four, 10-bit, 65 MHz
Maximum camera line rate	52.5 kHz

On-board processing

On-board memory	64 MB (32 MB for image data)
Input LUT (Lookup Table)	4 x 8- or 10-bit LUT

General Purpose Inputs and Outputs

Number of lines	32 I/O lines: <ul style="list-style-type: none">• 4 contact inputs (Factory I/O: IN)• 12 relay outputs (Factory I/O: OUT)• 4 TTL inputs/outputs (System: IO)• 4 differential inputs (System: TR)• 4 opto-isolated outputs (System: ST)• 4 full-duplex serial com ports (Camera COM: RX/TX)
Connectors	<ul style="list-style-type: none">• EXTERNAL SYSTEM: 26-pin high-density male sub-D connector on the bracket• INTERNAL SYSTEM: 26-pin dual-row 0.1" shrouded header on the PCB• FACTORY I/O: 34-pin dual-row 0.1" shrouded header on the PCB• CAMERA COM: 16-pin dual-row 0.1" shrouded header on the PCB• Molex 4-pin connector on the PCB for powering cameras

Usage	<ul style="list-style-type: none"> • Camera and image acquisition trigger • Light strobe trigger • General purpose IO
Electrical specifications	<ul style="list-style-type: none"> • TR: Inputs compatible with TTL, LVTTTL, differential LVDS, differential RS422, differential RS-485 signals, protected against electrostatic discharge, with choke for the rejection of common-mode noise • ST: Opto-isolated outputs, compatible with signals up to 60V, with 3 μs fall time, isolated up to 500V • IO: Inputs or outputs compatible with TTL signals, protected against electrostatic discharge, with high-frequency noise filter • IN: Polarity-free inputs, compatible with TTL, 12V and 24V signals, opto-couplers, relays and switches • OUT: Opto-isolated potential-free and polarity-free solid-state outputs, compatible with signals up to 30V, with 4 μs fall time, isolated up to 500V • COM: RS232 asynchronous serial communication lines to control the cameras (exposed to the OS as standard COM ports)

Software

Host PC Operating System	<ul style="list-style-type: none"> • 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 <p>Refer to release notes for details</p>
APIs	<ul style="list-style-type: none"> • MultiCam 32- and 64-bit binary libraries (Windows and Linux), for ISO-compliant C/C++ compilers

Environmental conditions

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

Certifications

Electromagnetic - EMC standards	<ul style="list-style-type: none"> • European Council EMC Directive 2004/108/EC
EMC - Emission	<ul style="list-style-type: none"> • EN 55022:2010 Class B
EMC - Immunity	<ul style="list-style-type: none"> • EN 55024:2010 Class B
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	<ul style="list-style-type: none"> • 1601 - Domino Symphony PCIe
Optional accessories	<ul style="list-style-type: none"> • 6011 - Symphony Spider Cable



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