



DOMINO™ series

Analog Image Acquisition Boards with Perfect Digital Quality

D3™
TECHNOLOGY



**DOMINO
Melody™**

Standard and Low Profile

**DOMINO
Harmony™**

**DOMINO
Symphony PCIe™**

**PCI
EXPRESS™**

DOMINO™ series

DOMINO Melody™ – DOMINO Alpha 2™

DOMINO Harmony™ – DOMINO Symphony PCIe™

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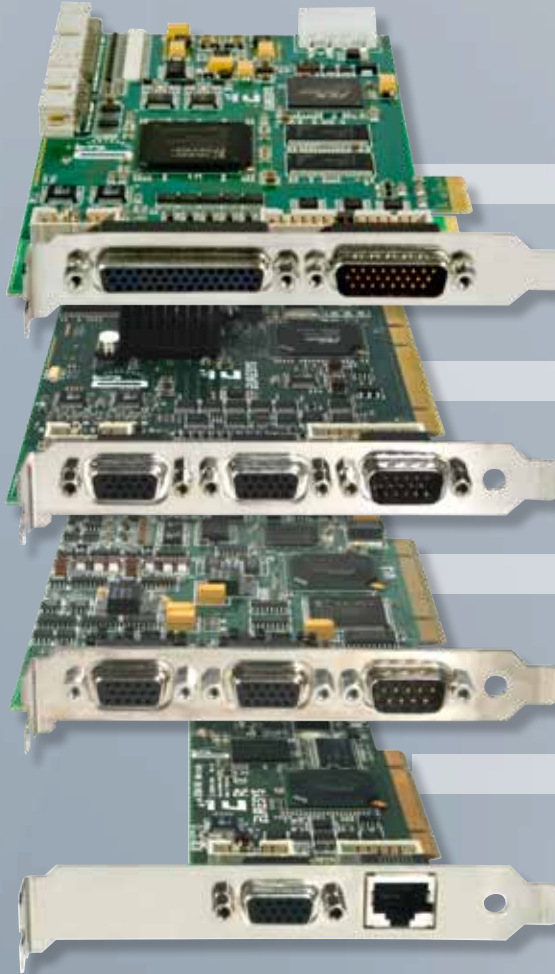


EURESYS™
Excellence in vision

The DOMINO™ series Comparison Chart

	DOMINO Melody	DOMINO Alpha 2	DOMINO Harmony	DOMINO Symphony PCIe
Form factor	32-bit, 33 MHz PCI Low Profile compatible	32-bit, 33 MHz PCI	64-bit, 66 MHz PCI	x1 PCI Express Full height, half length
Analog cameras	Single-tap Dual-tap RGB	Up to 4 Up to 2	2*	4
Video connector	On the bracket Internally	1 x HD15 1 x 10-pin header	2 x HD15 1 x 10-pin header	1 x HD44 1 x 10-pin header
Sampling resolution / Max. frequency Max. line rate operation a	10 bits @ 40 MHz	8 bits @ 32 MHz	10 bits @ 40 MHz	10 bits @ 65 MHz
Max. line rate	Synchronous mode Asynchronous mode	31.5 kHz 31.5 kHz	42 kHz 31.5 kHz	52.5 kHz 52.5 kHz (digital vertical synchron.)
Delivery bandwidth	90 MB/s	90 MB/s	Up to 240 MB/s	Up to 180 MB/s
On-board memory	16-MB	8-MB	32-MB	64-MB
D³ Technology™	✓	-	✓	✓
Pre-processing	1 x 8- or 10-bit LUT	2 x 8-bit LUT	-	4 x 8- or 10-bit LUT
Input Output Lines				
- System IO connector -				
Connector type	On the bracket Internal / header	DB-9M	HD-15M 10-pin	HD-26M 26-pin
Input lines	1 LVDS	3 TTL	2 LVDS	4 LVDS
Output lines	1 opto-isolated	3 TTL	2 opto-isolated	4 opto-isolated
TTL bidirectional I/O lines	2 TTL	-	4 TTL	4 TTL
5V Power supply	✓	✓	✓	✓
- Factory IO connector -				
Connector type	Internal / header	-	-	34-pin
Differential lines	-	-	-	4 Input / 12 Output
- Camera Com connector -				
Connector type	Internal / header	-	-	16-pin
Serial RS-232 lines	-	-	-	4
- 12V camera power connector -				
Connector type	Internal / header	1 Molex 4-pin	1 Molex 4-pin	1 Molex 4-pin

* Exclusive



DOMINO Symphony PCIe™

DOMINO Harmony™

DOMINO Alpha 2™

DOMINO Melody™

DOMINO Melody™, Harmony™ & Symphony PCIe™ Common Features

- **Support of analog cameras**
 - Progressive or interlaced scanning
 - Synchronous timing or asynchronous reset and shutter control
 - Monochrome single-tap or RGB
 - High-resolution, support for mega-pixel cameras
- **High-accuracy 10-bit 40/60 MHz A/D converters**
 - 8- or 10-bit input look-up-table and programmable input filter
 - Programmable gain and offset control
- **On-board memory**
- **Trigger, strobe, enhanced I/O lines**
- **Internal connectors: video, system and power**
- **D³ Technology™*** - Melody, Harmony, Symphony PCIe -
 - Fully digital signal processing chain
 - Black level restoration
 - Control over horizontal and vertical pixel counts
 - Sampling clock generation
 - Synchronization recovery: vertical and horizontal
 - Gain, offset control
 - Low-pass filtering
 - Color sub-carrier removal
 - Extremely low synchronization jitter
 - Absolute digital stability and consequently no need of pixel clock
 - Absolute parametric stability
 - Various camera synchronization mode supported
 - Excellent performance reproducibility
- **MultiCam drivers for Microsoft Windows® and Linux**



The Domino series is a range of high-end **PCI** and **PCI Express** frame grabbers for **analog** cameras. The Domino series support any system function associated to industrial acquisition, such as camera asynchronous reset, exposure and strobe control. The latest Domino boards - Melody, Harmony and Symphony PCIe - are based on an innovative proprietary technology called **D³ Technology™***. It provides a **perfect digital image** with the benefits of a proven analog environment: low-cost, reliable cabling and connections, smallest cameras, low power, ... The D³ Technology* offers unequalled signal stability and image quality to the analog acquisition. These boards are further enhanced by extensive on-board I/O capabilities.

Bus Mastering

All Euresys frame grabbers are **PCI bus mastering** agents that directly store the acquired images into the PC physical memory without CPU involvement. As a **unique feature**, a Euresys board automatically recovers the **scatter-gather** virtual memory mapping to present the data as a regular bitmap image in a user allocated memory buffer.

Interfaced Cameras

The Domino series and the MultiCam drivers interface an impressive choice of different analog cameras. ► *An up-to-date list is available on the web site www.euresys.com*

The Domino Melody, Harmony and Symphony PCIe support top-notch cameras such as dual, triple and quad-speed. As a unique feature, they have strictly no jumpers. Even the 75-ohm termination resistor is a software selectable feature.

Trigger, Strobe, Enhanced I/O Lines

In order to facilitate the integration of the board into the application system, the new Domino boards offer digital I/O lines configurable for trigger input, strobe output or general purpose control.



DOMINO Melody™



- One single-tap camera**
- One 10-bit 40 MHz A/D converter**
- One 8- or 10-bit LUT**
- 16-Mbyte on-board memory**
- Form factor: Conventional PCI**
- 32-bit, 33 MHz, 3V or 5V signaling**
- Standard and low profile**

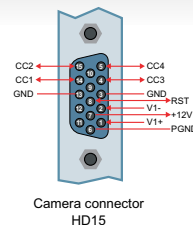
The Domino Melody is an ideal solution for single-camera applications inspecting fast moving objects.

Camera Support

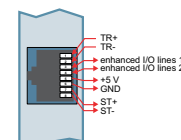
- One single-tap analog camera
- Maximum line rate:
 - ✓ 42 kHz - synchronous mode -
 - ✓ 31.5 kHz - asynchronous mode -

Video and power connectors:

- One HD15 video connector on the bracket
- One internal 10-pin header video connector
- One Molex 4-pin connector for camera power supply



Camera connector HD15



System connector RJ45

Trigger, Strobe, Enhanced I/O Lines

- One **opto-isolated output line** for safe control of external strobe light equipment
- One **differential LVDS input line** for high-speed, robust and flexible control from external equipment
- Two **digital TTL I/O lines** for general purpose control

- System connectors:**
- One **RJ45 system connector on the bracket**
 - One **internal 10-pin header**

Form Factors

The Domino Melody has a small PCB size corresponding to the Low Profile form factor. It is delivered with two brackets, allowing to install the board in either a low profile small standard PC or in a conventional larger PC. The Low Profile computers are smaller than standard PCs saving space which is so important for industrial applications.



DOMINO Harmony™



- One RGB or two monochrome cameras**
- 10-bit 40 MHz A/D converters**
- 32-Mbyte on-board memory**
- Two DMA channels**
- Form factor: Conventional PCI**
- 64-bit, 66 MHz, 3V or 5V signaling**

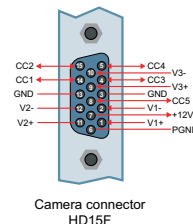
The Domino Harmony is an analog frame grabber for on-the-fly acquisition with two industrial monochromes and one RGB analog camera.

Camera Support

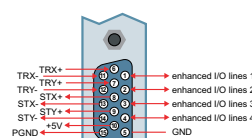
- One or two single-tap analog cameras
- One RGB analog camera
- Maximum line rate:
 - ✓ 42 kHz - synchronous mode -
 - ✓ 31.5 kHz - asynchronous mode -

Video and power connectors:

- Two HD15 video connectors on the bracket
- One internal 10-pin header video connector
- One Molex 4-pin connector for camera power supply



Camera connector HD15F



System connector HD15M

Trigger, Strobe, Enhanced I/O Lines

- Two **opto-isolated output lines** for safe control of external strobe light equipment
- Two **differential LVDS input lines** for high-speed, robust and flexible control from external equipment
- Four **digital TTL I/O lines** for general purpose control

- System connectors:**
- One **HD15 system connector on the bracket**
 - One **internal 16-pin header system connector**

DOMINO Symphony PCIe™



Four single-tap cameras
10-bit 65 MHz A/D converters
64-Mbyte on-board memory
Four DMA channels
Form factor: PCI Express

Four 8- or 10-bit LUTs

Full-height, half-length, x1
1-lane PCI Express: up to 176 MB/s delivery bandwidth



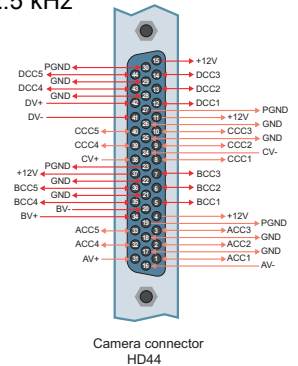
The Domino Symphony PCIe is a high-speed analog frame grabbers. It provides affordable image acquisition for applications with multiple monochrome cameras.

Camera Support

- Four single-tap analog cameras
- Maximum line rate in synchronous and asynchronous (digital vertical synchronization) modes: 52.5 kHz
- Including top-notch cameras with high performances such as:
 - ✓ 30 fps, 1.2 Megapixels
 - ✓ 90 fps VGA

Video and power connectors:

- One HD44F video connectors on the bracket. For evaluations, a spider cable is available on request. This adapter enables 4 cameras connections on independent connectors compatible with the other Domino boards camera connectors -HD15-.
- One internal 10-pin header video connector
- One Molex 4-pin connector for camera power supply



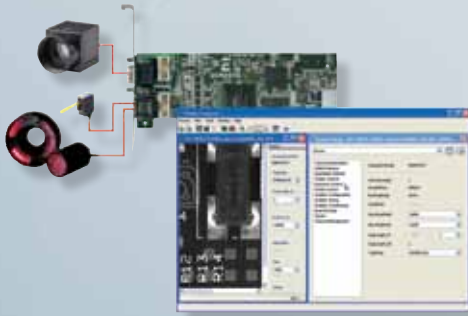
Rich Set of I/O Lines

Connector name	Type of connector	I/O lines
System IO connectors	<i>On the bracket:</i> One HD26 system connector	- 4 opto-isolated output lines for safe control of external equipment
	<i>Internally:</i> One 26-pin header	- 4 differential LVDS input lines for high-speed, robust and flexible control from external equipment - 4 digital TTL I/O lines for general purpose control
Factory IO connector	<i>Internally:</i> One 34-pin header	- 4 contact-closure inputs - 12 solid-state outputs
Camera COM connector <i>Exposed to the OS as standard COM ports</i>	<i>Internally:</i> One 16-pin header	- 4 RS232 asynchronous serial communication lines to control the cameras



Software Support

MultiCam™ Drivers



The **MultiCam driver** enables the consistent control of several Euresys frame grabbers, tusing an arbitrary number of cameras, from **one or several software applications**.

MultiCam allows defining **channels** linking cameras to buffers in the PC memory.

The MultiCam channel **identifies all parameters** ruling the acquisition process from a camera. Every camera feature, such as its type, resolution or image format, is described and controlled through **simple parameters**, considerably easing the camera control task. For each channel-controlled camera, a set of dedicated parameters is created from a CAM file.

Euresys delivers pre-defined files for many popular cameras; still the user can customize his **CAM files**.

► An up-to-date list is available on the *Interfacing Cameras* web page.

Multicam drivers available

- MultiCam for Windows 32-bit and 64-bit
- MultiCam for Linux 32-bit and 64-bit

Ordering Information

PRODUCT CODE	DESIGNATION	PRODUCT CODE	DESIGNATION
1167	DOMINO Melody	1168	DOMINO Harmony
1161	DOMINO Alpha 2	1601	DOMINO Symphony PCIe

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