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 Iota™ – DOMINO Melody™ – DOMINO Alpha 2™
DOMINO Harmony™ – DOMINO Symphony PCIe™

www.euresys.com
info@euresys.com

EURESYS
Excellence in vision

The DOMINO™ series Comparison Chart

EURESYS
Excellence in vision

		DOMINO Iota	DOMINO Melody	DOMINO Alpha 2	DOMINO Harmony	DOMINO Symphony PCIe
Form factor		32-bit, 33 MHz PCI	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*	1	1	Up to 4	2*	4
	Dual-tap	-	-	Up to 2	-	-
	RGB	-	-	-	1*	-
Video connector	*On the bracket*	1 x HD15	1 x HD15	2x HD15	2 x HD15	1 x HD44
	Internally	-	1 x 10-pin header	-	1 x 10-pin header	1 x 10-pin header
Sampling resolution / Max. frequency *Max. line rate operation a*		8 bits @ 32 MHz	10 bits @ 40 MHz	8 bits @ 32 MHz	10 bits @ 40 MHz	10 bits @ 65 MHz
Max. line rate	*Synchronous mode*	31.5 kHz	42 kHz	31.5 kHz	42 kHz	52.5 kHz
	Asynchronous mode	31.5 kHz	31.5 kHz	31.5 kHz	31.5 kHz	52.5 kHz (digital vertical synch.)
Delivery bandwidth		90 MB/s	90 MB/s	90 MB/s	Up to 240 MB/s	Up to 180 MB/s
On-board memory		8-MB	16-MB	8-MB	32-MB	64-MB
D³ Technology™		-	✓	-	✓	✓
Pre-processing		1 x 8-bit LUT	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*	DB-9M	RJ-45	DB-9M	HD-15M	HD-26M
	Internal header	-	10-pin	-	10-pin	26-pin
Input lines		3 TTL	1 LVDS	3 TTL	2 LVDS	4 LVDS
Output lines		3 TTL	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	1 Molex 4-pin	1 Molex 4-pin

* Exclusive

DOMINO Alpha 2™

DOMINO Symphony PCIe™

DOMINO Melody™

DOMINO Iota™
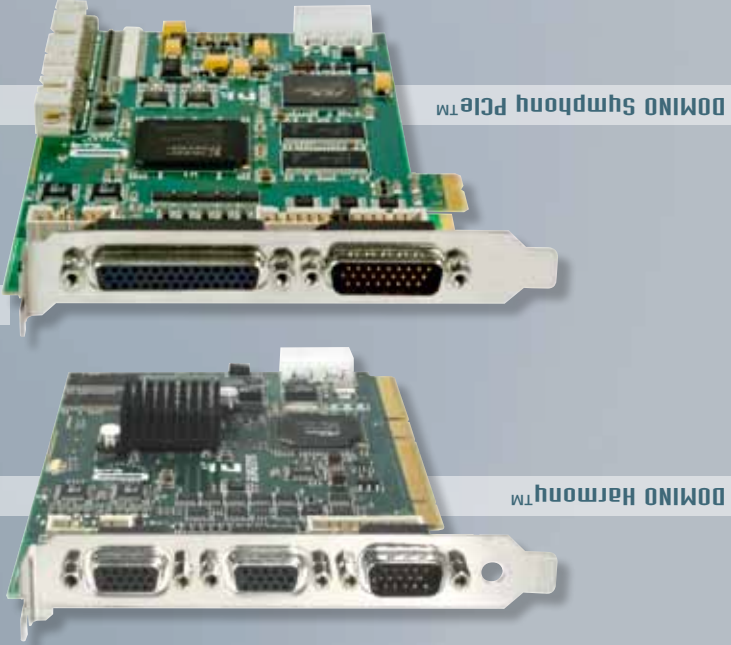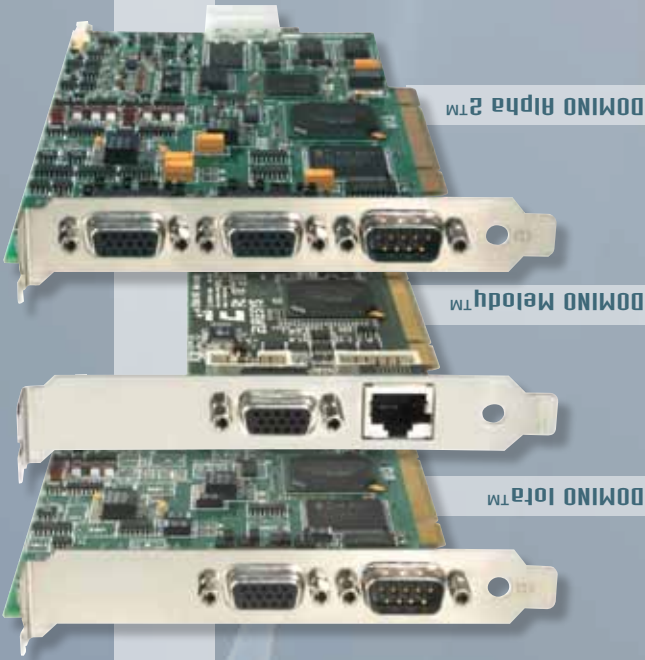
DOMINO Harmony™

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
    - Sampling clock generation
    - Gain, offset control
    - Color sub-carrier removal
    - Control over horizontal and vertical pixel counts
    - Synchronization recovery: vertical and horizontal
    - Low-pass filtering
  - 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.

*Patent pending

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
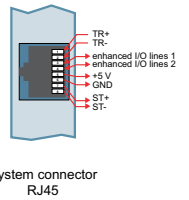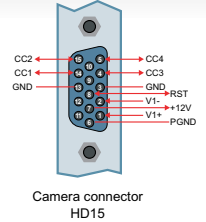
Trigger, Strobe, Enhanced I/O Lines

- 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.

Camera connector
HD15

System connector
RJ45

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
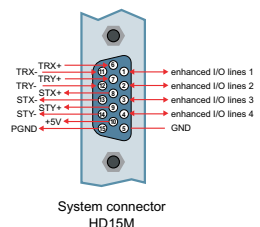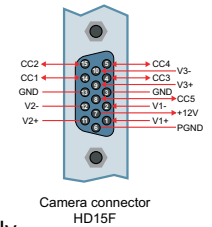
Trigger, Strobe, Enhanced I/O Lines

- 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**

System connector
HD15M

DOMINO Symphony PCIe™
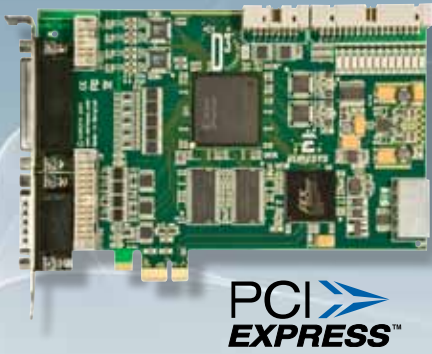
Four single-tap cameras
10-bit 65 MHz A/D converters   *Four 8- or 10-bit LUTs*
64-Mbyte on-board memory
Four DMA channels
Form factor: ***PCI Express***   *Full-height, half-length, x1*
   *1-lane PCI Express: up to 176 MB/s delivery bandwidth*

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

Camera connector
HD44
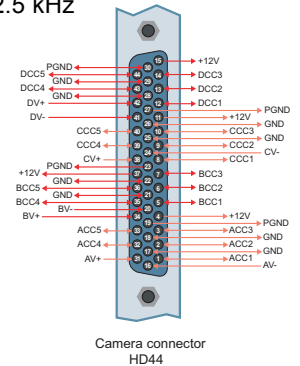
Rich Set of I/O Lines

Connector name	Type of connector	I/O lines
System IO connectors	*On the bracket:* One HD26 system connector	- 4 opto-isolated output lines for safe control of external equipment
	Internally: 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	*Internally:* One 34-pin header	- 4 contact-closure inputs - 12 solid-state outputs
Camera COM connector *Exposed to the OS as standard COM ports*	*Internally:* 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
- MultiCam for Windows 64-bit
- MultiCam for Linux 32-bit
- MultiCam for Linux 64-bit

Components delivered
- MultiCam for Windows 32-bit and 64-bit
  - MultiCam driver: - A 32 bit and 64 bit binary library
    - DirectShow® filters
    - An ActiveX controls library
  - MultiCam Studio
- MultiCam for Linux 32-bit and 64-bit
  - MultiCam driver: a 32 bit and 64 bit binary library
  - MultiCam Studio
- Documentation
- Sample programs

Supported OS
- MultiCam for Windows 32-bit: Windows 7®, Vista®, XP® and Server 2008®
- MultiCam for Windows 64-bit: Windows 7®, Vista®, XP®, Server 2008® and Server 2008 R2®
- MultiCam for Linux 32-bit and 64-bit
  These two MultiCam drivers are designed to be distribution-independent on x86 and x86-64 platforms with kernels versions up to 2.6.31. It is expected to work with a wide range of distributions. Support will only be provided under Red Hat Enterprise Linux 5.2, which is the validated distribution.

Supported development tools
- The 32-bit and 64-bit binary libraries are designed to be used with ISO-compliant C/C++ compilers for the development of respectively 32-bit (x86) and 64-bit (x86-64) applications.
- DirectShow® filters are designed to be used with 32-bit (x86) Microsoft Visual C++ compilers for the development of 32-bit (x86) applications.
- The ActiveX controls library is designed to be used with ActiveX-compatible development tools for the development of 32-bit (x86) applications

Ordering Information

ORDER CODE	DESIGNATION	ORDER CODE	DESIGNATION
1162	DOMINO Iota	1168	DOMINO Harmony
1167	DOMINO Melody	1601	DOMINO Symphony PCIe
1161	DOMINO Alpha 2		

www.euresys.com   **info@euresys.com**

Your distributor

EURESYS
Excellence in vision ™