DOMINO™ series

Analog image acquisition boards with perfect digital quality

D3™ TECHNOLOGY

DOMINO Melody™

Standard and Low Profile

DOMINO Harmony™

NEW

DOMINO Symphony™

PCI and PCIe

PCI EXPRESS™

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

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EURESYS
Excellence in vision

The DOMINO™ series Comparison Chart

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		DOMINO Iota	DOMINO Melody	DOMINO Alpha 2	DOMINO Harmony **NEW**	DOMINO Symphony **NEW**	DOMINO Symphony PCIe **NEW**
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	64-bit, 66 MHz PCI	x1 PCI Express Full height, half length
Analog cameras	Single-tap	1	1	Up to 4	2*	4	4
	Dual-tap	-	-	Up to 2	-	-	-
	RGB	-	-	1	1*	-	-
Video connector	On the bracket	1 x HD15	1 x HD15	1 x HD15	2 x HD15	1 x HD44	1 x HD44
	Internally	-	1 x 10-pin header	-	1 x 10-pin header	1 x 10-pin header	1 x 10-pin header
Sampling resolution / Max. frequency		8 bits @ 32 MHz	10 bits @ 40 MHz	8 bits @ 32 MHz	10 bits @ 40 MHz	10 bits @ 65 MHz	10 bits @ 65 MHz
D³ Technology™		-	D³	-	D³	D³	D³
Delivery bandwidth		90 MB/s	90 MB/s	90 MB/s	Up to 240 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	64-MB
Pre-processing		1 x 8-bit LUT	1 x 8/10-bit LUT	2 x 8-bit LUT	-	4 x 8/10-bit LUT	4 x 8/10-bit LUT
Input Output Lines							
- System I/O connector -							
Connector type	On the bracket	DB-9M	RJ-45 10-pin	DB-9M	HD-15M 10-pin	HD-26M 26-pin	HD-26M 26-pin
	Internal header	-	-	-	-	-	-
Input lines		3 TTL	1 LVDS	3 TTL	2 LVDS	4 LVDS	4 LVDS
Output lines		3 TTL	1 opto-isolated	3 TTL	2 opto-isolated	4 opto-isolated	4 opto-isolated
TTL bidirectional I/O lines		-	2 TTL	-	4 TTL	4 TTL	4 TTL
5V Power supply		✓	✓	✓	✓	✓	✓
- Factory I/O connector -							
Connector type	Internal header	-	-	-	-	34-pin	34-pin
Differential lines		-	-	-	-	4 Input / 12 Output	4 Input / 12 Output
- Camera Com connector -							
Connector type	Internal header	-	-	-	-	16-pin	16-pin
Serial RS-232 lines		-	-	-	-	4	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	1 Molex 4-pin

* Exclusive

DOMINO Alpha 2™

DOMINO Melody™

DOMINO Iota™

DOMINO Symphony PCIe™

DOMINO Symphony™

DOMINO Harmony™
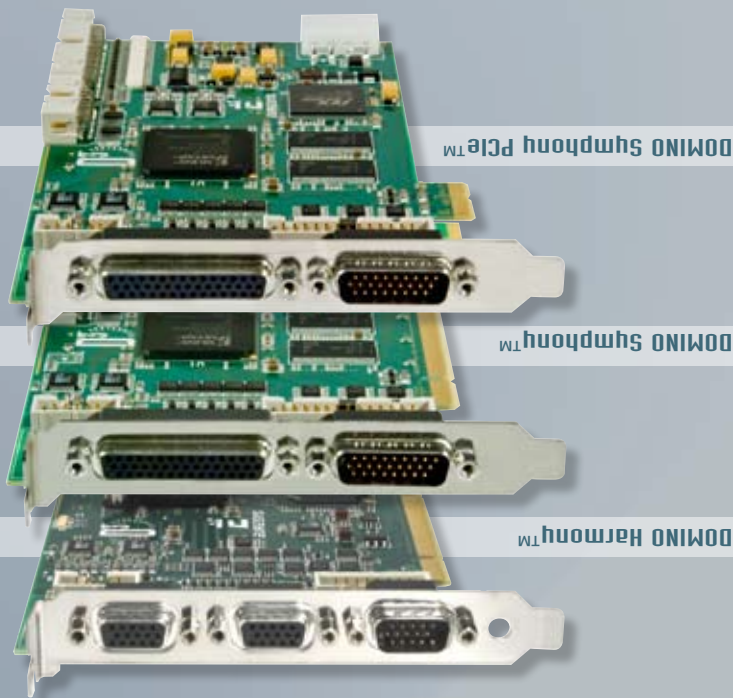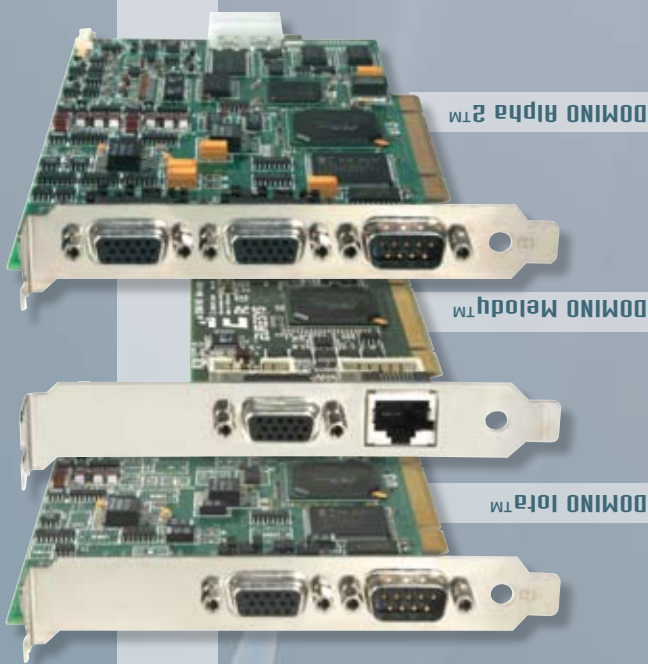
Main features

- ***Support of analog cameras***
  - Progressive or interlaced scanning
  - Synchronous timing or asynchronous reset and shutter control
  - Monochrome single-tap, dual-tap or RGB
  - Up to quad-speed
  - High-resolution, support for mega-pixel cameras

- ***A/D converters*** 8-bit 32MHz - Domino Iota and Alpha 2 -
  10-bit 40/65MHz - Domino Melody, Harmony, Symphony -
  - 8- or 10-bit input LUTs and programmable input filter

- ***On-board memory***

- ***Trigger, strobe, enhanced I/O lines***

- ***Internal connectors: video, system and power***

- ***MultiCam drivers for Microsoft Windows® and Linux***

DOMINO Melody™, DOMINO Harmony™ and DOMINO Symphony™

- ***D³ Technology™****
  - 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

The Domino series is a range of high-end **PCI** and **PCI Express** frame grabbers for **analog** cameras. They 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** - 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 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™

D3™
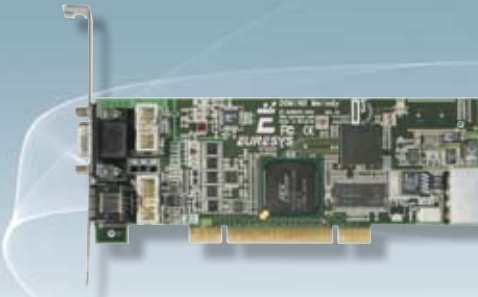
One single-tap camera
One 10-bit 40 MHz A/D converter   *One 8- or 10-bit LUT*
16-Mbyte on-board memory
Form factor: Conventional PCI   *32-bit, 33 MHz, 3V or 5V signaling*
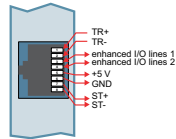*Standard and low profile*

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

Camera support

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 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**
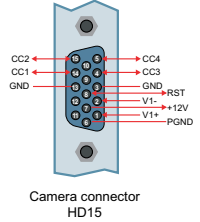
CC2, CC1, GND, V1-, V1+ / CC4, CC3, GND, RST, +12V, PGND
Camera connector
HD15

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.

TR+, TR-, enhanced I/O lines 1, enhanced I/O lines 2, +5 V, GND, ST+, ST-
System connector
RJ45

DOMINO Harmony™

D3™

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.
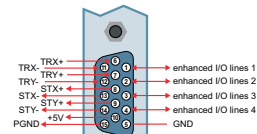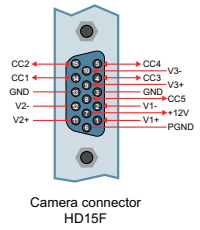
Camera support

- One or two area-scan single-tap cameras
- One RGB analog camera

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

CC2, CC1, GND, V2-, V2+ / CC4, CC3, GND, CC5, V3-, V3+, V1-, V1+, +12V, PGND
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 10-pin header system connector**

TRX-, TRX+, TRY-, TRY+, STX-, STX+, STY-, STY+, PGND, +5V / enhanced I/O lines 1, enhanced I/O lines 2, enhanced I/O lines 3, enhanced I/O lines 4, GND
System connector
HD15M

DOMINO Symphony™ **NEW**   D³

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: **Conventional PCI**   *64-bit, 66 MHz, 3V or 5V signaling*
                  PCI Express   *Full-height, half-length, x1*
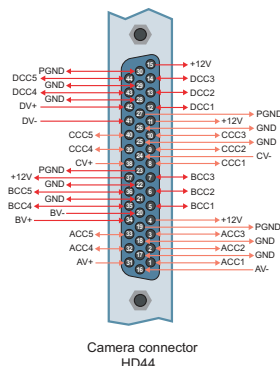
The Domino Symphony and Domino Symphony PCIe are high-speed analog frame grabbers. They provide affordable image acquisition for applications with multiple monochrome cameras.

Camera support

- Four single-tap cameras including high-speed high-resolution cameras
- Performance: sustained 30 fps acquisition of 8-bit 1.2 Megapixels images on 4 channels concurrently!

Video and power connectors:

- One HD44 video connectors on the bracket
- 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

Form Factors

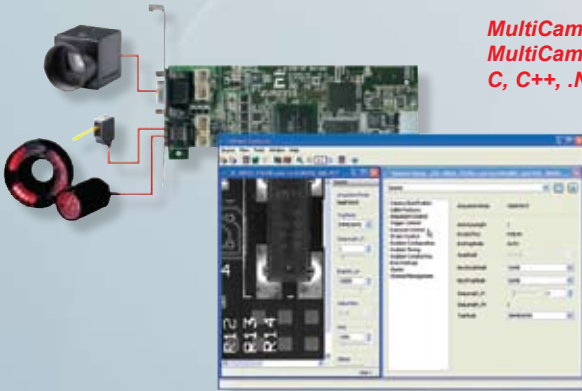The Domino Symphony is available in two versions:

- **Domino Symphony™**: conventional PCI 64-bit 66-MHz PCI-X compatible
- **Domino Symphony PCIe™**: 1-lane PCI Express

PCI EXPRESS™

Software support

MultiCam™

MultiCam for Microsoft Windows *2000®, XP®, Server 2003® and Vista®*
MultiCam for Suse Linux *Enterprise Server 10*
C, C++, .NET classes and ActiveX controls

The **MultiCam driver** enables the consistent control of several Euresys frame grabbers, using 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 page on www.euresys.com.*

MultiCam™ IDEs

Using MultiCam with C++	Microsoft Visual C++ 2005	Borland C++ Builder 2006
	Microsoft Visual C++ .NET 2003	Borland C++ Builder 6.0
	Microsoft Visual C++ 6.0	gcc c++ 4.1.0-28.4
Using MultiCam with .NET	Microsoft Visual C# 2005	
	Microsoft Visual C# .NET 2003	
Using MultiCam with C	Microsoft Visual C++ 2005	Borland C++ Builder 2006
	Microsoft Visual C++ .NET 2003	Borland C++ Builder 6.0
	Microsoft Visual C++ 6.0	gcc 4.1.0-28.4
Using MultiCam with ActiveX	Microsoft Visual Basic 6.0	Borland Delphi 2006
		Borland Delphi 6.0

Ordering Information

ORDER CODE	DESIGNATION	ORDER CODE	DESIGNATION
1162	DOMINO Iota	1168	DOMINO Harmony
1167	DOMINO Melody	1169	DOMINO Symphony
1161	DOMINO Alpha 2	1601	DOMINO Symphony PCIe