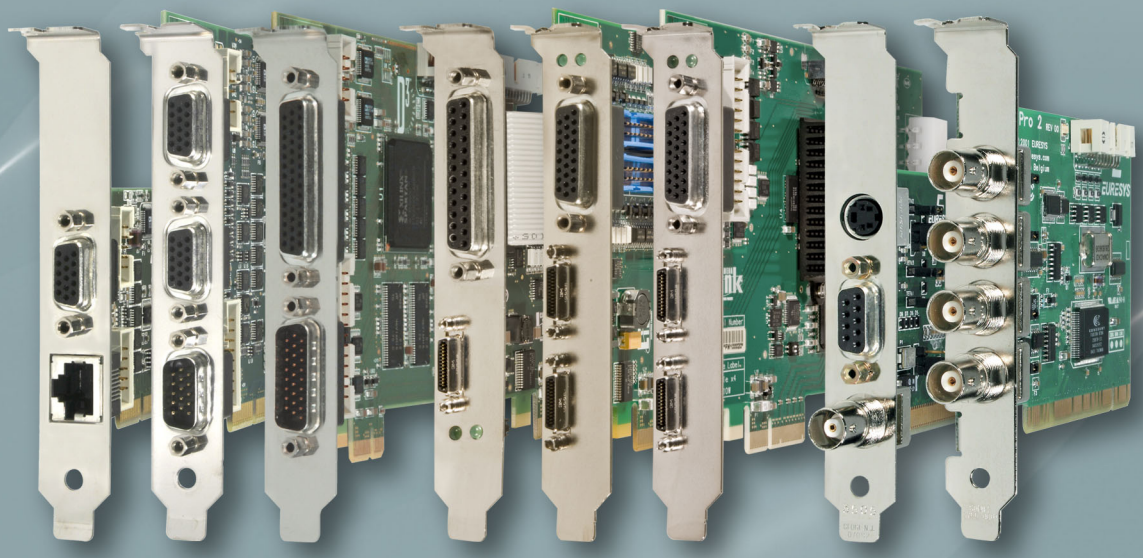
# Cognex VisionPro® Adapter for Euresys Frame Grabbers

## Documentation

DOMINO Melody™
DOMINO Harmony™
DOMINO Symphony PCIe™
GRABLINK Base™
GRABLINK DualBase™
GRABLINK Full™
Picolo™ [PCIe]
PICOLO Pro 2™ [PCIe]



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# 1. Product Description

The "Cognex VisionPro Adapter for Euresys Frame Grabbers 1.1" is a software plug-in module that enables Cognex VisionPro® software applications to directly acquire images from a selection of Euresys frame grabbers.

*Note: In this document, the term "Adapter" designates the "Cognex VisionPro Adapter for Euresys Frame Grabbers".*

## 1.1 Deliverables

The Adapter is delivered as a single executable installer file.

When executed, the tool installs the following software:

- The "**Cognex VisionPro® Adapter for Euresys Frame Grabbers**" software
- The "**Cognex VisionPro® Adapter for Euresys Frame Grabbers Configuration Utility**" application. This application allows the user to create/edit the XML configuration file of the acquisition channel.

## 1.2 Software Components

All the software components, with the exception of configuration data, are installed by default in the **Euresys\CognexVisionProAdapter** sub-folder of:

- **C:\Program Files** for 32-bit operating systems
- **C:\Program Files (x86)** for 64-bit operating systems

The subfolder contains also the " Cognex VisionPro® Adapter for Euresys Frame Grabbers Configuration Utility".

## 1.3 Configuration Data

For the storage of user-defined configuration files, the installation tool creates the **Euresys\CognexVisionProAdapter\ConfigurationFiles**sub-folder in:

- **C:\Documents and Settings\All Users\Documents** for Windows XP
- **C:\Users\Public\Documents** for Windows 7

# 1.4 Requirements

The Adapter requires the following software modules to be installed:

- The Cognex VisionPro software – version 7.0 or newer
- The Euresys MultiCam driver – version 6.6.0.1415 or newer

The Configurator requires the following additional module:

- .NET Framework 2.0 SP1

# 1.5 Specification

## 1.5.1 Supported Frame Grabbers

The Adapter supports the following Euresys frame grabbers:

**Analog industrial frame grabbers**

- Domino Melody
- Domino Harmony
- Domino Symphony PCIe

**Digital Camera Link frame grabbers**

- Grablink Base
- Grablink DualBase
- Grablink Full

**Analog standard definition (PAL/NTSC) frame grabber**

- Picolo (PCIe)
- Picolo Pro 2 (PCIe)

## 1.5.2 Supported Platforms

The Adapter supports the same platforms as VisionPro® 7.0. Namely:

- Microsoft Windows XP 32-bit Home Edition
- Microsoft Windows XP 32-bit Professional Edition
- Microsoft Windows 7 32-bit
- Microsoft Windows 7 64-bit

## 1.5.3 Supported Cameras

### 1.5.3.1 CamFile Library

Euresys provides a huge library of camera interface files (a.k.a. CamFile) for industrial cameras on Domino and Grablink frame grabbers.

The frequently updated library is published on the Euresys Web site: **http://www.euresys.com/CamFiles/CamFile.asp**.

The Adapter provides a tool to download the CamFile from the Euresys Web site. See § 2

### 1.5.3.2 Supported Cameras on Domino Boards

The Adapter supports all the operation modes available on the Domino boards for the analog area-scan cameras. Namely:

| Operation Mode Name | Operation Mode Description |
|---|---|
| **GrabberExposeAR_P** | Grabber Controlled Exposure, Asynchronous Reset, Progressive Scan |
| **CameraExposeAR_P** | Camera Controlled Exposure, Asynchronous Reset, Progressive Scan |
| **Progressive_FR** | Free-Run – Progressive Scan |
| **Interlace_FR** | Free-Run – Interlace Scan |

The Adapter supports all the synchronization modes available on the Domino boards for each operational mode. Consequently, any CamFile compatible with the targeted Domino board can be used with the Adapter.

### 1.5.3.3 Supported Cameras on Grablink Boards

The Adapter supports all the operation modes available on the Grablink boards for the Camera Link area-scan cameras. Namely:

| Operation Mode Name | Operation Mode Description |
|---|---|
| **MyCameraLink_PxxRG** | Grabber Controlled Exposure, Asynchronous Reset, Progressive Scan |
| **MyCameraLink_PxxRC** | Camera Controlled Exposure, Asynchronous Reset, Progressive Scan |
| **MyCameraLink_PxxSC** | Free-Run – Progressive Scan |

Consequently, any CamFile corresponding to an area-scan camera and compatible with the targeted Grablink board can be used with the Adapter.

The Adapter doesn't support the line-scan cameras.

### 1.5.3.4 Supported Cameras on Picolo (PCIe) and Picolo Pro 2 (PCIe)

The Adapter supports all the standard definition camera models available on the Picolo (PCIe) and Picolo Pro 2 (PCIe) boards. Namely:

| Camera Model | Operation Mode Description |
|---|---|
| **PAL** | Standard definition color camera delivering a color composite (CVBS) or a separate component (Y/C) video signal compliant with the 625 lines 50 Hz PAL color television standard |
| **NTSC** | Standard definition color camera delivering a color composite (CVBS) or a separate component (Y/C) video signal compliant with the 525 lines 59.94 Hz NTSC color television standard |
| **CCIR** | Standard definition monochrome camera delivering a composite video signal compliant with the 625 lines 50 Hz black/white television standard |
| **EIA** | Standard definition monochrome camera delivering a composite video signal compliant with the 525 lines 59.94 Hz black/white television standard |

# 2. Product Installation Guide

## 2.1 Installation Procedure

Follow this procedure to install the product:

| Step # | Action step |
|---|---|
| **Step 1** | Install the "Cognex VisionPro" software. |
| **Step 2** | Install the Euresys MultiCam driver.<br>Therefore:<br>■ Download the "Driver Installer" of MultiCam for Windows 32-bit and 64-bit<br>■ Execute the "Driver Installer" program and follow the instructions |
| **Step 3** | Install the "Cognex VisionPro Adapter for Euresys Frame Grabbers" software.<br>Therefore:<br>■ Download the "Euresys Frame Grabbers Configurator for the Cognex VisionPro® Adapter" installer for Microsoft Windows<br>■ Execute the "Euresys Frame Grabbers Configurator for the Cognex VisionPro® Adapter" installer and follow the instructions<br>■ Perform the initial download of the camera configuration files. Therefore:<br>☐ Connect to the Internet<br>☐ Launch the **EuresysFrameGrabbersAdapterConfigurator.exe**. Therefore:<br>● Double-click on the "Euresys Frame Grabbers Adaptor Configurator" icon on the Desktop or…<br>● …Click on the "Euresys Frame Grabbers Adaptor Configurator" icon in the "Euresys Adapter for Cognex Vision Pro" application group of the Start menu.<br>☐ Use the "Tools->Update Camera Configuration Files" menu item to start the download from the CamFile Download area of the Euresys Web site |

# 2.2 Silent Installer

## 2.2.1 Silent Installation

The "Cognex VisionPro® for Euresys Frame Grabbers Adapter" installer can optionally be executed "silently".

Therefore, append the argument "/s" to the command:

```
Cognex VisionPro Adapter for Euresys Frame Grabbers-win-1.1.0.xxxx.exe /s
```

*Note: If another version of the "Cognex VisionPro Adapter for Euresys Frame Grabbers" is already present, it will be updated without prompting the user.*

*Note: When using the silent installation mode, the default target directory cannot be changed.*

## 2.2.2 Silent Uninstallation

The "Cognex VisionPro® Adapter for Euresys Frame Grabbers" can be uninstalled silently by calling:

```
Uninst.exe 1
```

**Uninst.exe** can be found in the installation directory.

## 2.2.3 Reboot During Installation

If a reboot is necessary after the installation, it must be performed by your application. In this case, the `[HKEY_LOCAL_MACHINE\SOFTWARE\Euresys\Common] "RebootNeeded"` registry entry should be checked. If it exists and is set to 1, then it should be replaced by 0, and the system must be rebooted.

## 2.2.4 Error Reporting

After the command line installation, the following registry key is updated and holds the installation status: `[HKEY_LOCAL_MACHINE\SOFTWARE\Euresys\Common\LastInstallError]`.

The `ErrorCode` DWORD identifies the error:

| ErrorCode | Meaning |
|---|---|
| **0** | Installation was successful. |
| **1** | There was an error during file extraction. |
| **2** | Internal error. |
| **3** | The previous version was not successfully uninstalled. |
| **4** | The previous version uninstallation was still pending. |
| **5** | The needed regitry keys were not successfully added. |

The `Cause` string gives a wording of the error.

The `Source£` string identifies the installer that caused the error.

The `ErrorTime` string gives the date and time of the error.

# 3. Product User Guide

## 3.1 Procedure Overview

| Step # | Action step |
|---|---|
| **Step 1** | Create/edit a configuration file.<br>Therefore:<br>■ Launch the Configurator utility: **EuresysFrameGrabbersAdapterConfigurator.exe**<br>■ In the "Device" tab, choose the frame grabber you want to use, the camera type, the connector, the "PoCL-Lite" option, and the camera you want to use.<br>■ In the "Image" tab, choose the pixel format you want to use.<br>■ Optionally, you can set up the trigger and strobe using the corresponding tabs.<br>■ Use the "Test" tab to test your settings.<br>■ Use the "File->Save" menu to save your newly created configuration file. To be seen by VisionPro, this file must be saved in the **Euresys\CognexVisionProAdapter\ConfigurationFiles** subfolder located in:<br>□ **C:\Documents and Settings\All Users\Documents** for Windows XP.<br>□ **C:\Users\Public\Documents** for Windows 7.<br>■ Close the Configurator utility<br>Repeat step 1 for all the camera devices attached to Euresys frame grabbers |
| **Step 2** | Prepare the source for use with VisionPro.<br>Therefore:<br>■ Open QuickBuild.<br>*CAUTION: It is highly recommended to start QuickBuild as administrator to avoid registry protection issues.*<br>■ Go to Image Source dialog.<br>■ Select "Camera". The filenames of the configurations saved previously (and placed beside the adapter DLL) will appear in the "Device/Frame Grabber" combo box. Select the one you want to use.<br>■ Activate the trigger if needed (Triggers are disabled by default in VisionPro; this is because there are no possibility through the AIK to tell VisionPro that triggers have been previously enabled).<br>Repeat step 2 for all the camera devices attached to Euresys frame grabbers |

# 3.2 Frame Grabber Identification Schemes

A Euresys frame grabber can be identified using one of the 3 following schemes:

- By board index
- By serial number
- By board name

The identification scheme can be set using the "Options->Frame Grabber Identification scheme" menu of the Configurator.

## 3.2.1 Board Index

The board index is a numeric value designating the PCI or PCI Express slot where the frame grabber is plugged in.

This number is given by the operating system during the hardware device scanning. Each board in the system gets a different board index; the first PCI board receives usually index 0.

*CAUTION: This value is subject to change in case of modifications of the system such as adding or removing a board.*

## 3.2.2 Serial Number

The serial number is a numeric value designating univocally a particular board of a given board type.

This number is assigned to the board at the factory and cannot be changed later.

## 3.2.3 Board Name

The board name is a string of characters that is stored into a non-volatile memory device of the board.

Each board receives a default board name at the factory. The board name can also be modified by the user.

### 3.2.3.1 Default Board Name

The default board name is composed as follows:

<*ShortBoardType*>_<*ShortSerialNumber*> where:

- <*ShortBoardType*> is an shorted version of the <*BoardType*>, namely the board type after the removal of the board family name
- <*ShortSerialNumber*> is the board serial number without the leading zeros

Examples: `FULL_1584 DUALBASE_11 MELODY_11`

#### 3.2.3.2 Modifying the Board Name

The board name can be modified using the "Tools->Frame Grabber Renaming Utility" menu of the Configurator.

## 3.3 Configurator – Detailed Description

### 3.3.1 Configuration Files

The Configurator through the "File" menu allows the user to create new , edit, and save configuration files for the camera devices attached to Euresys frame grabbers.

The configurations files are XML files. These files have the extension .xcf and are stored in the **C:\Users\Public\Documents\Euresys\CognexVisionProAdapter\ConfigurationFiles** folder beside the dll files.

#### 3.3.1.1 Configuration File Example

```
<?xml version="1.0"?>
<!DOCTYPE AdapterConfiguration SYSTEM "C:\\Program Files
(x86)\\Euresys\\CognexVisionProAdapter\\Configurator\\XmlCheck\\XmlConfiguration
File.dtd">
<AdapterConfiguration>
  <Version>1.1</Version>
  <ErrorLogging>OFF</ErrorLogging>
  <Device>
    <FrameGrabber>
      <Type>Grablink DualBase</Type>
      <IdentificationMode>Index</IdentificationMode>
      <Id>1</Id>
    </FrameGrabber>
    <CameraType>MonoAB</CameraType>
    <Connector>A</Connector>
    <PoclLite>ON</PoclLite>
    <Camera>C:\Users\Public\Documents\Euresys\MultiCam\Cameras\CIS\VCC-
GC10V31L\VCC-GC10V31L_P60SC.cam</Camera>
  </Device>
  <Image>
    <ColorFormat>Grey8</ColorFormat>
  </Image>
  <Trigger>
    <Status>OFF</Status>
    <InputType>ISO</InputType>
```

```
      <Polarity>POSITIVE</Polarity>
      <FilterStrength>MEDIUM</FilterStrength>
    </Trigger>
    <Strobe>
      <Status>OFF</Status>
      <OutputType>OPTO</OutputType>
      <Polarity>LHL</Polarity>
      <Duration>50</Duration>
      <Position>50</Position>
      <CameraExposure>0</CameraExposure>
    </Strobe>
    <LiveSettings>
      <NoContrast/>
      <NoBrightness/>
      <Exposure>0.02</Exposure>
    </LiveSettings>
  </AdapterConfiguration>
```

### 3.3.2 Managing Configuration Files

Knowing that the Adapter opens all the configuration files present in the **ConfigurationFiles** folder, the following actions must be taken:

- Remove unused configuration files to avoid wasting of processing resources.
- Avoid conflicting configuration files to prevent against startup failure of the Adapter.

The following configuration setups for a single board are conflicting:

- A PoCL-Lite camera and a non-PoCL-Lite camera on the same connector of a Grablink board.
- A 10-tap (80-bit) camera and a Base, Medium or Full Camera Link® camera on Grablink Full.
- A monochrome camera and an RGB camera on Domino Harmony.
- Two configurations using different Camera Types on Picolo (PCIe).

### 3.3.3 Device Tab

#### 3.3.3.1 Frame Grabber

The **Frame Grabber** drop-down box lists all the Euresys frame grabbers that are found in the system.

Each frame grabber is referenced as follows:

*<BoardName> (Type:<Board Type>, S/N: <SerialNumber>, Index: <BoardIndex>)*

Where:

- <*BoardName*> is the name given to the board. See § 3.2.3
- <*BoardType*> is the type of board. See § 4.1
- <*SerialNumber*> is the serial number of the board. See § 3.2.2
- <*BoardIndex*> is the PCI slot in which the board is inserted. See § 3.2.1

Examples:

```
FULL_1584 (Type: Grablink Full, S/N: 1584, Index: 0)
DUALBASE_11 (Type: Grablink DualBase, S/N 11, Index 1)
MELODY_11 (Type: Domino Melody, S/N 11, Index 2)
```

#### 3.3.3.2 Camera Type

The **Camera Type** drop-down box lists all the camera types that are supported by the selected frame grabber. Refer to § 4.2 for more information.

The following boards offer multiple choices for this setting:

- Domino Harmony => 2 choices
- Grablink Full => 2 choices
- Picolo (PCIe) => 3 choices

The remaining boards offer only one possibility.

#### 3.3.3.3 Connector

The **Connector** drop-down box lists all the connectors that are supported by the selected frame grabber with the selected camera type. Refer to § 4.2.8 for more information.

The following boards offer multiple choices for this setting:

- Domino Harmony with "Single Tap Monochrome Camera on X or Y" => 2 choices
- Domino Symphony PCIe => 4 choices
- Grablink DualBase => 2 choices
- Picolo (PCIe) => 4 choices
- Picolo Pro 2 (PCIe) => 4 choices

The remaining boards offer only one possibility.

#### 3.3.3.4 PoCL-Lite

The **PoCL-Lite** checkbox is relevant only on the Grablink boards supporting PoCL-Lite cameras.

The **PoCL-Lite** checkbox must be checked when a PoCL-Lite is attached on the corresponding connector. This configures the receiver of the serial communication channel to receive serial data from the camera through one bit the Channel Link.

The **PoCL-Lite** checkbox must remain unchecked when any other type of camera is attached. This configures the receiver of the serial communication channel to receive serial data from the camera through a dedicated cable pair.

#### 3.3.3.5 Camera

The **Camera** drop-down box lists all the cameras that are supported by the Adapter.

The list is structured by *Camera Brand Name -> Camera Model Name.*

The category Standard Cameras includes the standard PAL/NTSC cameras and their monochrome CCIR/RS170 versions.

The list can be updated using the "Tools->Update Camera Configuration Files" menu of the Configurator.

*CAUTION: the list shows all the cameras even those that are not supported by the selected frame grabber, camera type and connector.*

### 3.3.4 Image Tab

#### 3.3.4.1 ColorFormat

The **Color Format** drop-down box lists all the pixel formats that are available for the selected device. Refer to § 4.4 for more information.

### 3.3.5 Trigger Tab

#### 3.3.5.1 Trigger Status (Enabled/Disabled)

These radio buttons allow the user to enable or disable the hardware trigger input. When enabled, the additional settings of the tab are to be considered.

Refer to § 4.4.5 for more information.

#### 3.3.5.2 Input Type

This setting determines the electrical style of the hardware trigger input line.

Refer to § 4.6 for more information.

#### 3.3.5.3 Edge

This setting selects the significant edge of the hardware trigger input line.

Refer to § 4.7 for more information.

#### 3.3.5.4 Filter Strength

This setting selects the time constant (strength) of the noise removal filter on the hardware trigger input line.

Refer to § 4.8 for more information.

### 3.3.6 Strobe Tab

#### 3.3.6.1 Strobe Status (Enabled/Disabled)

These radio buttons allow the user to enable or disable the strobe output. When enabled, the additional settings of the tab are to be considered.

Refer to § 4.9 for more information.

#### 3.3.6.2 Output Type

This setting determines the electrical style of the strobe output.

Refer to § 4.10 for more information.

#### 3.3.6.3 Polarity

This setting selects the polarity of the strobe output.

Refer to § 4.11 for more information.

#### 3.3.6.4 Duration

This setting selects the duration of the strobe pulse.

Refer to § 4.12 for more information.

#### 3.3.6.5 Position

This setting selects the position of the strobe pulse within the exposure time.

Refer to § 4.13 for more information.

## 3.3.7 Test Tab

### 3.3.7.1 Grab, Start Run, Stop Run Buttons

These buttons allow the user to, respectively:

- Grab a single image
- Start an acquisition sequence
- Stop the on-going acquisition sequence

### 3.3.7.2 Live Settings

The following sliders are used to adjust the following settings while acquisition is in progress:

- Gain expressed in %
- Offset expressed in %
- Exposure expressed in seconds

### 3.3.7.3 Image

A miniature of the grabbed image is displayed in the test tab.

## 3.3.8 Adapter Error Logging

In case of difficulties with configuration files into QuickBuild, it is recommended to activate the "Enable Adapter Initialization Error Logging" in the "Options" menu of the Configurator.

The Adapter logs eventually "Warning" and "Errors" occurring during the initialization of the Adapter.

The log file is stored in the **ConfigurationFiles** folder beside the configuration file.

# 4. Product Reference Guide

## 4.1 Board Type

Board Type designates a type of Euresys frame grabber board. The following table lists all the Board Type values that are supported by the Adapter. For each value:

| Board Type value | XML shortcut | Description |
|---|---|---|
| **"Domino Melody"** | "Domino Melody" | Designates a Domino Melody frame grabber |
| **"Domino Harmony"** | "Domino Harmony" | Designates a Domino Harmony frame grabber |
| **"Domino Symphony PCIe"** | "Domino Symphony PCIe" | Designates a Domino Symphony PCIe frame grabber |
| **"Grablink Base"** | "Grablink Base" | Designates a Grablink Base frame grabber |
| **"Grablink DualBase"** | "Grablink DualBase" | Designates a Grablink DualBase frame grabber |
| **"Grablink Full"** | "Grablink Full" | Designates a Grablink Full frame grabber |
| **"Picolo"** | "Picolo" | Designates a Picolo frame grabber |
| **"Picolo Pro 2"** | "Picolo Pro 2" | Designates a Picolo Pro 2 frame grabber |

# 4.2 Camera Type

This setting determines how the board resources are partitioned in terms of camera connectivity.

## 4.2.1 Camera Type on Domino Melody

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Single Tap Monochrome Camera on X"** | "MonoX" | Single-tap analog monochrome camera attached on connector X |

## 4.2.2 Camera Type on Domino Harmony

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Single Tap Monochrome Camera on X or Y"** | "MonoXY" | Single-tap analog monochrome cameras attached on connector X and Y respectively |
| **"RGB Camera on X"** | "RGBX" | One three-tap RGB analog camera attached on connector X |

## 4.2.3 Camera Type on Domino Symphony PCIe

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Single Tap Monochrome Camera on A, B, C or D"** | "MonoABCD" | Up to four single-tap analog monochrome cameras attached on connectors A, B, C, and D respectively. |

## 4.2.4 Camera Type on Grablink Base

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Camera Link Camera on M"** | "MonoM" | One Base Camera Link camera attached on connector M |

## 4.2.5 Camera Type on Grablink DualBase

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Camera Link Camera on A or B"** | "MonoAB" | Up to two Base Camera Link cameras attached on connectors A and B respectively |

### 4.2.6 Camera Type on Grablink Full

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Camera Link Camera on M"** | "MonoM" | One Base, Medium, or Full Camera Link camera attached on connector M |
| **"Camera Link 10-Tap Camera on M"** | "Mono10M" | One 10-tap camera attached on connector M |

### 4.2.7 Camera Type on Picolo (PCIe)

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Composite on VID1 or VID3, or S-Video on YC"** | "C1C3SY" | Up to three analog PAL/NTSC color cameras:<br>one composite on VID1 input (BNC connector)<br>one S-Video on YC inputs (S-VIDEO connector)<br>one composite on VID3 input (DB9 connector) |
| **"Composite on VID1, VID2 or VID3"** | "C1C2C3" | Up to three analog PAL/NTSC color cameras:<br>one composite on VID1 input (BNC connector)<br>one composite on VID2 input (DB9 connector)<br>one composite on VID3 input (DB9 connector) |
| **"Composite on VID1, or S-Video VID2 or VID3"** | "C1S2S3" | Up to two analog PAL/NTSC color cameras:<br>one composite on VID1 input (BNC connector)<br>one S-Video on VID2 and VID3 inputs (DB9 connector) |

*Note: refer to the Picolo (PCIe) Handbook for jumper settings.*

### 4.2.8 Camera Type on Picolo Pro 2 (PCIe)

| Camera Type value | XML shortcut | Description |
|---|---|---|
| **"Composite on any Connector"** | "CANY" | Up to four color composite PAL/NTSC cameras |

*Note: refer to the Picolo Pro 2 (PCIe) Handbook for jumper settings.*

# 4.3 Connector

This setting determines the connector where the camera is attached to the board.

## 4.3.1 Connector on Domino Melody

| Connector value | Description |
|---|---|
| **"X"** | The camera is attached on Connector X |

## 4.3.2 Connector on Domino Harmony

The following connectors are available when Camera Type is set to **Single Tap Monochrome Camera on X or Y**:

| Connector value | Description |
|---|---|
| **"X"** | The camera is attached on Connector X |
| **"Y"** | The camera is attached on Connector Y |

The following connectors are available when Camera Type is set to **RGB Camera on X**:

| Connector value | Description |
|---|---|
| **"X"** | The camera is attached on Connector X |

## 4.3.3 Connector on Domino Symphony PCIe

| Connector value | Description |
|---|---|
| **"A"** | The camera is attached on Connector A |
| **"B"** | The camera is attached on Connector B |
| **"C"** | The camera is attached on Connector C |
| **"D"** | The camera is attached on Connector D |

The connector A, B, C, and D are gathered into a single physical 44-pin connector. A breakout cable is available as accessory.

## 4.3.4 Connector on Grablink Base

| Connector value | Description |
|---|---|
| **"M"** | The camera is attached on Connector M |

### 4.3.5 Connector on Grablink DualBase

| Connector value | Description |
|---|---|
| **"A"** | The camera is attached on Connector A |
| **"B"** | The camera is attached on Connector B |

### 4.3.6 Connector on Grablink Full

| Connector value | Description |
|---|---|
| **"M"** | The camera is attached on Connector M |

For base configuration camera, use the Camera Link #1 physical connector.

For Medium, Full, and 10-tap cameras, two cables of the same length are required; connect the first cable to the Camera Link #1 physical connector; connect the second cable to the Camera Link #2 physical connector.

### 4.3.7 Connector on Picolo (PCIe)

The following connectors are available when Camera Type is set to **Composite on VID1 or VID3, or S-Video on YC**:

| Connector value | Description |
|---|---|
| **"VID1"** | The camera is attached on Connector "VID1" (BNC physical connector) |
| **"VID3"** | The camera is attached on Connector "VID3" (DB9 physical connector) |
| **"YC"** | The camera is attached on Connector "YC" (MiniDIN4 physical connector) |

The following connectors are available when Camera Type is set to **Composite on VID1, VID2 or VID3**:

| Connector value | Description |
|---|---|
| **"VID1"** | The camera is attached on Connector "VID1" (BNC physical connector) |
| **"VID2"** | The camera is attached on Connector "VID2" (DB9 physical connector) |
| **"VID3"** | The camera is attached on Connector "VID3" (DB9 physical connector) |

The following connectors are available when Camera Type is set to **Composite on VID1, or S-Video VID2 or VID3**:

| Connector value | Description |
|---|---|
| **"VID1"** | The camera is attached on Connector "VID1" (BNC physical connector) |
| **"YC"** | The camera is attached on Connector "VID2" and "VID3" (DB9 physical connector" |

### 4.3.8 Connector on Picolo Pro 2 (PCIe)

| Connector value | Description |
|---|---|
| **"VID1"** | The camera is attached on Connector "VID1" |
| **"VID2"** | The camera is attached on Connector "VID2" |
| **"VID3"** | The camera is attached on Connector "VID3" |
| **"VID4"** | The camera is attached on Connector "VID4" |

## 4.4 Color Format

The Adapter provides the capability to select the pixel format of the delivered image.

The range of value depends on the board type, and eventually on its configuration, and the camera type:

### 4.4.1 Color Format on Domino Melody and Domino Symphony PCIe

The following Color Formats are available:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit Greyscale (Y8)"** | "Grey8" | 8-bit greyscale |
| **"10-bit Greyscale (Y10)"** | "Grey10" | 10-bit greyscale |
| **"16-bit Greyscale (Y16)"** | "Grey16" | 16-bit greyscale |

### 4.4.2 Color Format on Domino Harmony

The following Color Formats are available when Camera Type is set to **Single Tap Monochrome Camera on X or Y** :

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit Greyscale (Y8)"** | "Grey8" | 8-bit greyscale |
| **"10-bit Greyscale (Y10)"** | "Grey10" | 10-bit greyscale |
| **"16-bit Greyscale (Y16)"** | "Grey16" | 16-bit greyscale |

The following Color Format is available when Camera Type is set to **RGB Camera on X**:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit per component RGB color (RGB24), planar storage"** | "RGBPlanar" | 3-planes RGB planar, 8-bit per color component |
| **"8-bit per component RGB color (RGB24), packed storage"** | "RGBPacked" | 3-planes RGB packed, 8-bit per color component. See note § 4.4.5 |

### 4.4.3 Color Format on Grablink Base, Grablink DualBase, and Grablink Full

The following Color Formats are conditionally available on Grablink Base, Grablink DualBase, and Grablink Full.

For 8-bit monochrome cameras:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit Greyscale (Y8)"** | "Grey8" | 8-bit greyscale |

For 10-bit monochrome cameras:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit Greyscale (Y8)"** | "Grey8" | 8-bit greyscale |
| **"10-bit Greyscale (Y10)"** | "Grey10" | 10-bit greyscale |
| **"16-bit Greyscale (Y16)"** | "Grey16" | 16-bit greyscale |

For 12-bit monochrome cameras:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit Greyscale (Y8)"** | "Grey8" | 8-bit greyscale |
| **"12-bit Greyscale (Y12)"** | "Grey12" | 12-bit greyscale |
| **"16-bit Greyscale (Y16)"** | "Grey16" | 16-bit greyscale |

For 14-bit and 16-bit monochrome cameras:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit Greyscale (Y8)"** | "Grey8" | 8-bit greyscale |
| **"16-bit Greyscale (Y16)"** | "Grey16" | 16-bit greyscale |

For Bayer CFA color cameras:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit RAW"** | "RAW8" | 8-bit raw data |
| **"8-bit per component RGB color (RGB24), planar storage"** | "RGBPlanar" | 3-planes RGB planar, 8-bit per color component |
| **"8-bit per component RGB color (RGB24), packed storage"** | "RGBPacked" | 3-planes RGB packed, 8-bit per color component. See note § 4.4.5 |

For RGB color cameras:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit per component RGB color (RGB24), planar storage"** | "RGBPlanar" | 3-planes RGB planar, 8-bit per color component |
| **"8-bit per component RGB color (RGB24), packed storage"** | "RGBPacked" | 3-planes RGB packed, 8-bit per color component. See note § 4.4.5 |

### 4.4.4 Color Format on Picolo (PCIe) and Picolo Pro 2 (PCIe)

The following Color Formats are available on Picolo (PCIe) boards:

| Color Format value | XML shortcut | Description |
|---|---|---|
| **"8-bit Greyscale (Y8)"** | "Grey8" | 8-bit greyscale |
| **"8-bit per component RGB color (RGB24), packed storage"** | "RGBPacked" | 3-planes RGB packed, 8-bit per color component. See note § 4.4.5 |

### 4.4.5 Note about RGBPacked Color Format

*CAUTION: Selecting "RGBPacked" implies additional processor workload since the Adapter performs a conversion to the RGB planar format.*

## 4.5 Trigger Status

This setting enables /disables the trigger input function.

| Trigger Status value | XML shortcut | Description |
|---|---|---|
| **"No Hardware Trigger"** | "OFF" | The trigger input is disabled. The acquisition controller initiates every image acquisition phase at the earliest possible time disregarding the state of the hardware trigger input line. |
| **"Hardware Trigger"** | "ON" | The trigger input is enabled. The acquisition controller initiates every image acquisition phase at the next occurrence of a valid Trigger Event on the hardware trigger input line. |

## 4.6 Trigger Input Type

This setting selects the trigger input line by specifying its electrical style. The selection of the Trigger Input Line is board dependent.

### 4.6.1 Trigger Input Type on Domino Melody

| Trigger Input Type value | XML shortcut | Description |
|---|---|---|
| **"Single-ended TTL compliant with pull-up resistor"** | "TTL" | The trigger input line is "Enhanced IO1": a TTL compliant input with a pull-up resistor.<br>This is the default setting. |
| **"Differential high-speed compatible with EIA/TIA-422 signaling"** | "DIFF" | The trigger input line is "TR": a differential high-speed input compatible with EIA/TIA-422 signaling. |

### 4.6.2 Trigger Input Type on Domino Harmony

| Trigger Input Type value | XML shortcut | Description |
|---|---|---|
| **"Single-ended TTL compliant with pull-up resistor"** | "TTL" | The trigger input line is :<br>■ "Enhanced IO1" for camera A<br>■ "Enhanced IO3" for camera B<br>Both are TTL compliant inputs with a pull-up resistor.<br>This is the default setting. |
| **"Differential high-speed compatible with EIA/TIA-422 signaling"** | "DIFF" | The trigger input line is:<br>■ "TRX" for camera A<br>■ "TRY" for camera B<br>Both are differential high-speed inputs compatible with EIA/TIA-422 signaling. |

### 4.6.3 Trigger Input Type on Domino Symphony PCIe

| Trigger Input Type value | XML shortcut | Description |
|---|---|---|
| **"Single-ended TTL compliant with pull-up resistor"** | "TTL" | The trigger input line is :<br>■ "IO1" for camera A<br>■ "IO2" for camera B<br>■ "IO3" for camera C<br>■ "IO4" for camera D<br>All are TTL compliant inputs with a pull-up resistor.<br>This is the default setting. |
| **"Differential high-speed compatible with EIA/TIA-422 signaling"** | "DIFF" | The trigger input line is:<br>■ "TRA" for camera A<br>■ "TRB" for camera B<br>■ "TRC" for camera C<br>■ "TRD" for camera D<br>All are differential high-speed inputs compatible with EIA/TIA-422 signaling. |

### 4.6.4 Trigger Input Type on Grablink Base and Grablink Full

| Trigger Input Type value | XML shortcut | Description |
|---|---|---|
| **"Isolated current loop compatible with TTL, +12V, +24V signaling"** | "ISO" | The trigger input line is IIN2: an isolated current loop input compatible with TTL, +12V, +24V signaling.<br>This is the default setting. |
| **"Differential high-speed compatible with EIA/TIA-422 signaling"** | "DIFF" | The trigger input line is DIN2: a differential high-speed input compatible with EIA/TIA-422 signaling. |

### 4.6.5 Trigger Input Type on Grablink DualBase

| Trigger Input Type value | XML shortcut | Description |
|---|---|---|
| **"Isolated current loop compatible with TTL, +12V, +24V signaling"** | "ISO" | The trigger input line is:<br>■ IIN2A for camera A<br>■ IIN2B for camera B<br>Both are isolated current loop inputs compatible with TTL, +12V, +24V signaling.<br>This is the default setting. |
| **"Differential high-speed compatible with EIA/TIA-422 signaling"** | "DIFF" | The trigger input line is:<br>■ DIN2A for camera A<br>■ DIN2B for camera B<br>Both are differential high-speed inputs compatible with EIA/TIA-422 signaling. |

### 4.6.6 Trigger Input Type on Picolo (PCIe) and Picolo Pro 2 (PCIe)

| Trigger Input Type value | XML shortcut | Description |
|---|---|---|
| **"Single-ended TTL compliant with pull-up resistor"** | "TTL" | The trigger input line is "IO1": a TTL compliant input with a pull-up resistor.<br>This is the default setting. |

## 4.7 Trigger Polarity

This setting selects the polarity of the trigger input line.

| Trigger Polarity value | XML shortcut | Description |
|---|---|---|
| **"Trigger event generated at each positive-going transition"** | "POSITIVE" | The trigger event is generated at each valid low-to-high edge of the signal.<br>This is the default setting. |
| **"Trigger event generated at each negative-going transition"** | "NEGATIVE" | The trigger event is generated at each valid high-to-low edge of the signal. |

# 4.8 Trigger Filter Strength

This setting selects the strength of the noise filter of the trigger input line. It applies exclusively on Domino and Grablink boards.

## 4.8.1 Trigger Filter Strength on Domino Melody, Domino Harmony, and Domino Symphony PCIe

| Trigger Filter Strength value | XML shortcut | Description |
|---|---|---|
| **"No filtering effect"** | "OFF" | The noise removal filter strength is minimal.<br>The filter time constant is 50 ns. |
| **"Moderate filtering effect"** | "MEDIUM" | The noise removal filter strength is moderate.<br>The filter time constant is 200 ns.<br>This is the default setting. |
| **"Strong filtering effect"** | "STRONG" | The noise removal filter strength is maximal.<br>The filter time constant is 800 ns. |

## 4.8.2 Trigger Filter Strength on Grablink Base, Grablink DualBase, and Grablink Full

| Trigger Filter Strength value | XML shortcut | Description |
|---|---|---|
| **"No filtering effect"** | "OFF" | The noise removal filter strength is minimal.<br>The filter time constant is 100 ns. |
| **"Moderate filtering effect"** | "MEDIUM" | The noise removal filter strength is moderate.<br>The filter time constant is 500 ns. |
| **"Strong filtering effect"** | "STRONG" | The noise removal filter strength is maximal.<br>The filter time constant is 2500 ns.<br>This is the default setting. |

# 4.9 Strobe Status

This setting enables /disables the Strobe function. It applies only to Domino and Grablink boards.

The strobe function is available exclusively for asynchronous reset cameras!

The following values are applicable for asynchronous cameras when the exposure time is controlled by the frame grabber:

| Strobe Status value | XML shortcut | Description |
|---|---|---|
| **"No Strobe"** | "OFF" | The strobe function is disabled. |
| **"Strobe with frame grabber controlled exposure"** | "FCE" | The strobe function is enabled. The strobe timing is defined relatively to the exposure period. |

The following values are applicable when the exposure time is controlled by the camera:

| Strobe Status value | XML shortcut | Description |
|---|---|---|
| **"No Strobe"** | "OFF" | The strobe function is disabled. |
| **"Strobe with camera controlled exposure"** | "CCE" | The strobe function is enabled. The strobe timing is defined relatively to the declared exposure time setting which is expected to be the same as the actual camera exposure settings. |

The following value is applicable for the other types of cameras:

| Strobe Status value | XML shortcut | Description |
|---|---|---|
| **"No Strobe"** | "OFF" | The strobe function is disabled. |

# 4.10 Strobe Output Type

This setting selects the strobe output line by specifying its electrical style.

The selection of the Strobe Output Line is board dependent.

## 4.10.1 Strobe Output Type on Domino Melody

| Strobe Output Type value | XML shortcut | Description |
|---|---|---|
| **"Issued on an opto-isolated pair of pins"** | "OPTO" | The strobe output line is "ST": an opto-isolated pair of pins.<br>The + pin is the collector and the - pin is the emitter of an uncommitted photo- transistor driven by LED-emitted light.<br>This is the default setting. |
| **"TTL compliant"** | "TTL" | The strobe output line is "Enhanced IO2": a TTL compliant output. |

### 4.10.2 Strobe Output Type on Domino Harmony

| Strobe Output Type value | XML shortcut | Description |
|---|---|---|
| **"Issued on an opto-isolated pair of pins"** | "OPTO" | The strobe output line is:<br>■ "STX" for camera A<br>■ "STY" for camera B<br>Both are opto-isolated pairs of pins.<br>The + pin is the collector and the - pin is the emitter of an uncommitted photo- transistor driven by LED-emitted light.<br>This is the default setting. |
| **"TTL compliant"** | "TTL" | The strobe output line is:<br>■ "Enhanced IO2" for camera A<br>■ "Enhanced IO4" for camera B<br>Both are TTL compliant outputs. |

### 4.10.3 Strobe Output Type on Domino Symphony PCIe

| Strobe Output Type value | XML shortcut | Description |
|---|---|---|
| **"Issued on an opto-isolated pair of pins"** | "OPTO" | The strobe output line is:<br>■ "STA" for camera A<br>■ "STB" for camera B<br>■ "STC" for camera C<br>■ "STD" for camera D<br>All are opto-isolated pairs of pins.<br>The + pin is the collector and the - pin is the emitter of an uncommitted photo- transistor driven by LED-emitted light.<br>This is the default setting. |
| **"TTL compliant"** | "TTL" | The strobe output line is:<br>■ "IO1" for camera A<br>■ "IO2" for camera B<br>■ "IO3" for camera C<br>■ "IO4" for camera D<br>All are TTL compliant outputs. |

### 4.10.4 Strobe Output Type on Grablink Base and Grablink Full

| Strobe Output Type value | XML shortcut | Description |
|---|---|---|
| **"Issued on an opto-isolated pair of pins"** | "OPTO" | The strobe output line is "IOUT1": an opto-isolated pair of pins. The + pin is the collector and the - pin is the emitter of an uncommitted photo- transistor driven by LED-emitted light.<br>This is the default setting. |

### 4.10.5 Strobe Output Type on Grablink DualBase

| Strobe Output Type value | XML shortcut | Description |
|---|---|---|
| **"Issued on an opto-isolated pair of pins"** | "OPTO" | The strobe output line is:<br>■ "IOUT1A" for camera A<br>■ "IOUT1B" for camera B<br>Both are opto-isolated pairs of pins.<br>The + pin is the collector and the - pin is the emitter of an uncommitted photo- transistor driven by LED-emitted light.<br>This is the default setting. |

## 4.11 Strobe Polarity

This setting selects the polarity of the strobe output line.
It applies only on Domino boards when the Strobe Output Type is **TTL compliant**:

| Strobe Polarity value | XML shortcut | Description |
|---|---|---|
| **"Logic low-high-low pulse"** | "LHL" | The strobe output line generates a low-high-low pulse.<br>This is the default setting. |
| **"Logic high-low-high pulse"** | "HLH" | The strobe output line generates a high-low-high pulse. |

## 4.12 Strobe Duration

This setting selects the duration of the strobe pulse.

| Strobe Duration value range | XML shortcut | Description |
|---|---|---|
| **0% ~100%** | 0 ~100 | Relative Duration of the Strobe Pulse w.r.t. the exposure time<br>Default value: 50 |

# 4.13 Strobe Position

This setting selects the position of the strobe pulse within the exposure period.

| Strobe Position value range | XML shortcut | Description |
|---|---|---|
| **0% ~100%** | 0 ~100 | Relative Position of the Strobe Pulse w.r.t. the exposure time (0 = earliest; 50 = centered; 100 = latest)<br>Default value: 50 |

# 4.14 Gain

This setting selects the gain applied to the analog video signal. This setting applies exclusively to analog frame grabbers.

## 4.14.1 Gain on Picolo (PCIe) and Picolo Pro 2 (PCIe)

| Gain value range | XML shortcut | Description |
|---|---|---|
| **0% ~100%** | 0 ~100 | Relative gain of the analog video input front-end circuit w.r.t. the maximum achievable gain.<br>The default value is **42%**. This corresponds to the unity gain: i.e. the gain for which the digitizer span matches the nominal video level. |

## 4.14.2 Gain on Domino Boards

| Gain value range | XML shortcut | Description |
|---|---|---|
| **0% ~100%** | 0 ~100 | Relative gain of the analog video input front-end circuit w.r.t. the maximum achievable gain.<br>The default value is **20%**. This corresponds to the unity gain: i.e. the gain for which the digitizer span matches the nominal video level. |

# 4.15 Offset

This setting selects the offset applied to the analog video signal. This setting applies exclusively to analog frame grabbers.

## 4.15.1 Offset on Picolo (PCIe), Picolo Pro 2 (PCIe), and Domino Boards

| Offset value range | XML shortcut | Description |
|---|---|---|
| **0% ~100%** | 0 ~100 | Relative offset of the analog video input front-end circuit w.r.t. to the digitizer span. Increasing the offset value results into a brighter image, and reversely, decreasing the offset value results into a darker image.<br>The default value is **50%**. This corresponds to the null offset: i.e. the offset for which the bottom of digitizer span matches the blanking level. |

# 4.16 Exposure

This setting selects the exposure time. This setting applies exclusively to asynchronous reset cameras attached to Domino and Grablink boards.

## 4.16.1 Exposure on Domino and Grablink Boards

| Exposure range | XML shortcut | Description |
|---|---|---|
| ***Camera-dependent value range*** | 1E-6 ~1E1 | Exposure time expressed in seconds.<br>The value range is camera-dependent.<br>This setting can be modified during acquisition. |