

APPLICATION NOTE

Multiple Regions of Interest (Multiple ROI)

V1.1.0
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Introduction

This document presents information on how to use the new Multiple Regions of Interest (Multiple ROI) feature set with Bonito PRO CoaXPress cameras and the Euresys Coaxlink Quad G3 frame grabber. Multiple ROI allows you to configure up to four non-overlapping regions of interest. This enables you to compute each region differently at a higher frame rates.

Prerequisites

The following items are required:

- Allied Vision Bonito PRO camera
Supported models: Bonito PRO X-1250, X-2620
- Euresys Coaxlink Quad G3 frame grabber with related viewer or SDK installed on the host PC.



The Euresys Coaxlink Quad G3 frame grabber has been tested with Bonito PRO cameras and fully supports the Multiple ROI feature set.



Ensure that frame grabber firmware and related SDK include driver support to operate a single camera and up to four data streams.



The Bonito PRO Multiple ROI feature set may be supported with other frame grabbers which support the Multiple ROI feature set and are compliant with GenICam SFNC V2.2 and CoaXPress V1.1 (or higher) standards. Please check with the frame grabber manufacturer for more information.

Region of Interest versus Multiple Regions of Interest

With Region of Interest, you can configure a single region of interest. You can configure **Height**, **Width**, **OffsetX**, and **OffsetY** for this single region.

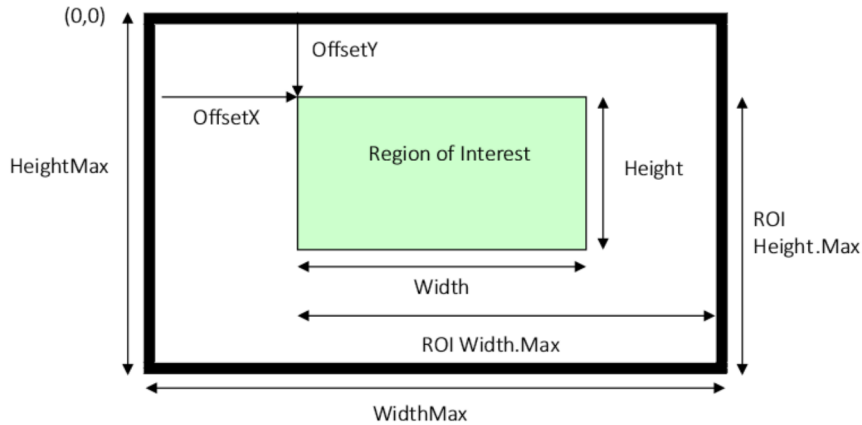


Figure 1: Single region interest

With Multiple Regions of Interest, you can configure up to four non-overlapping regions of interest. For each region you can configure **Height**, **Width**, **OffsetX**, and **OffsetY**.

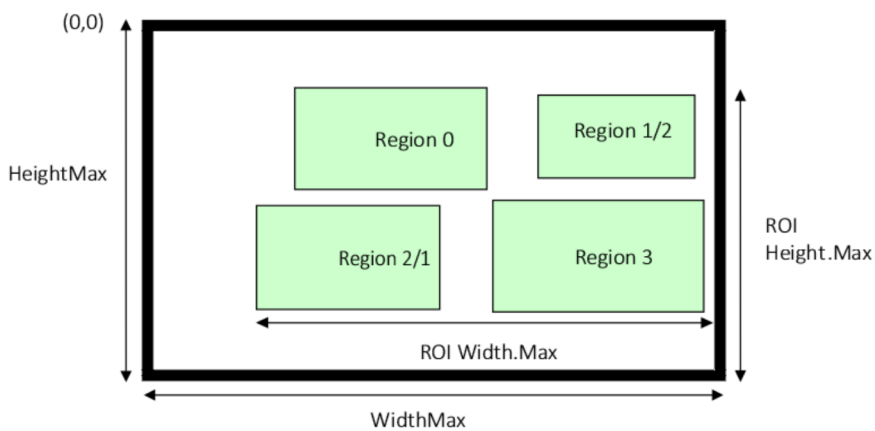


Figure 2: Four regions of interest



Rules to defining regions

- Regions can share rows and columns
- Regions cannot overlap
- When Multiple ROI is enabled, binning and decimation are not available.
- Each region is displayed in a different window when using the Euresys Frame Grabber SDK/Viewer.

Multiple ROI features

The Multiple ROI feature implementation is fully compliant with GenICam SFNC Version 2.2 or later.



Camera features reference

The features described in this document add Multiple ROI functions in accordance with SFNC. For a complete description of individual features, see the Bonito PRO Features Reference, available on the Allied Vision technical documentation webpage.

<https://www.alliedvision.com/en/support/technical-documentation/bonito-PRO-documentation.html>



Defining Regions

In Multiple ROI mode, when different regions share rows, the left region must have a smaller **RegionIDValue**. If the left region has a larger region ID, the feature does not work. This is a sensor limitation.

MultipleROIEnable

Select to enable or disable Multiple Regions of Interest. Once enabled, you can configure up to four regions of interest.

Use the **RegionSelector** feature to select the region you want to configure. You can configure image **Width**, **Height**, **OffsetX**, and **OffsetY**. Use the **RegionMode** feature to enable the usage of the region. Repeat for each region of interest.

Standard	Custom
Feature type	Boolean
Access	Read/Write
Visibility	Beginner
Possible values	<i>True, False</i>
Default	<i>False</i>
Category	<i>/ImageFormatControl</i>

CondensedRegionStatus

Status of all regions.

Standard	Custom
Feature type	String
Access	Read
Visibility	Expert
Possible values	<i>D, V, P, O</i>
Category	<i>/ImageFormatControl</i>

Value	Description
<i>D</i>	Disabled
<i>V</i>	Valid
<i>P</i>	Position error
<i>O</i>	Overlap error

RegionSelector

Selects the ROI to control. The **RegionSelector** feature allows devices that are able to extract multiple regions out of an image, to configure the features of those individual regions independently.

As multiple ROIs are supported by the device, the **RegionSelector** can be added to various features such as **Height**, **Width**, **OffsetX**, and **OffsetY** to specify the behavior of the selected region.

Standard	GenICam SFNC Version 2.2
Feature type	Enumeration
Access	Read/Write
Visibility	Beginner
Possible values	<i>Region0, Region1, Region2, Region3</i>
Default	<i>Region0</i>
Category	<i>/ImageFormatControl</i>

Value	Description
<i>Region0</i>	Selected feature controls region 0.
<i>Region1</i>	Selected feature controls region 1.
<i>Region2</i>	Selected feature controls region 2.
<i>Region3</i>	Selected feature controls region 3.

RegionMode

Controls if the selected region of interest is active and streaming.

Standard	GenICam SFNC Version 2.2
Feature type	Enumeration
Access	Read/Write
Visibility	Beginner
Possible values	<i>Off, On</i>
Default	<i>On</i>
Category	<i>/ImageFormatControl</i>

Value	Description
<i>Off</i>	Disable the usage of the region.
<i>On</i>	Enable the usage of the region.

RegionDestination

Controls the destination of the selected region.

Standard	GenICam SFNC Version 2.2
Feature type	Enumeration
Access	Read/Write
Visibility	Beginner
Possible values	<i>Stream0, Stream1, Stream2, Stream3</i>
Default	<i>Stream0</i>
Category	<i>/ImageFormatControl</i>

Value	Description
<i>Stream0</i>	The destination of the region is data stream 0.
<i>Stream1</i>	The destination of the region is data stream 1.
<i>Stream2</i>	The destination of the region is data stream 2.
<i>Stream3</i>	The destination of the region is data stream 3.

RegionIDValue

Returns a unique identifier value that corresponds to the selected region. This value is typically used by the transport layer to specify the region where the transmitted data comes from.

Standard	Custom
Feature type	Integer
Access	Read
Visibility	Expert
Possible values	<i>0, 1, 2, 3</i>
Default	<i>0</i>
Category	<i>/ImageFormatControl</i>

Example configuration

1. Set the **MultiROIEnable** feature to **True** to enable Multiple Regions of Interest. If this feature is set to **False**, you can only configure a single region of interest, **Region0**.
2. To configure the first region, select **Region0** in **RegionSelector**.
3. Select **Width** and configure the width of **Region0**. The minimum supported width is 64 pixels.
4. Select **Height** and configure the height of **Region0**. The minimum supported height is 16 pixels.
5. Select **OffsetX** and configure the starting column of **Region0** (relative to the first column of the sensor). **OffsetX** must be configured in multiples of 64.
6. Select **OffsetY** and configure the starting row of **Region0** (relative to the first row of the sensor). **OffsetY** must be configured in multiples of 16.
7. Enable the region by changing **RegionMode** from **Off** to **On**.

8. Check the region status using the **CondensedRegionStatus** feature to ensure that the region is valid.
9. To configure the second region, select **Region1** in **RegionSelector**.
10. Repeat steps 3 to 8 for **Region1**.
11. To configure the third region, select **Region2** in **RegionSelector**.
12. Repeat steps 3 to 8 for **Region2**.
13. To configure the fourth region, select **Region3** in **RegionSelector**.
14. Repeat steps 3 to 8 for **Region3**.

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