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# Chapter 1. Project description

AlliGator: Fluorescence Lifetime Imaging Data Analysis

AlliGator is a software dedicated to analyze individual or series of fluorescence lifetime imaging (FLI) datasets by the phasor approach or using nonlinear least-square fit (NLSF) or maximum likelihood estimation (MLE) approaches. Suppported datasets include image series, PicoQuant or Becker & Hickl hardware generated files or custom datasets generated by SwissSPAD Live, a FLI data acquisition software used with SwissSPAD detectors developed by the AQUA lab of Prof. Charbon at EPFL.

The software is released on GitHub at https://github.com/smXplorer/AlliGator, with a comprehensive online manual available at https://alligator-distribution.readthedocs.io/

# Chapter 2. Libraries

This section describes the libraries contained in the project.

# 2.1. AlliGator Accumulated Dataset.lvlib

Responsibility: Handles dataset summation tasks (sum or average).

**Version:** 1.0.0.0

#### 2.1.1. Functions

Table 1. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator Add Dataset to Accumulated Dataset	AlliGator IV DVR in [11]  Weight (1) [9]  error in (no error) [8]  Weight (2) [9]  (3) AlliGator IV DVR out	Adds the <b>Current Dataset</b> to the <b>Accumulated Dataset</b> , if and only if the number of gates and channels are the same as those of the first dataset in the series.			
		If not, the <b>Current Dataset</b> is skipped.			
AlliGator Add Image to Accumulated Image	Image Name [7] New Image [11] Accumulated Image Sum (not) Dataset Index [9] Fror In [8] Weight (1) [6]	Adds a single <b>New Image</b> (gate image) to the <b>Accumulated Image Sum</b> (for that gate).  If the current <b>Dataset Index</b> is 0 (first dataset in the Series), the <b>Accumulated Image Sum</b> is cleared first.		5	
AlliGator Clear Dataset Series Sum	Data Value Reference in [11] [3] [3] Data Value Reference out [5] [1] Message error in (no error) [8] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7	Clears the data structures associated with the Accumulated Dataset and resets the internal variable Is Displayed Image Accumulated to False.			
AlliGator Get Temp Accumulated File Name	Time-Series Folder [11]  Averaged? [9]  error in (no error) [8]  [3] temporary file name [2] filename without extension [0] error out	Builds name of acccumulated or averaged dataset displayed in AlliGator's title bar.			
AlliGator Script Sum All Datasets in Folder	Single File? (Default: False) [7] Alligator Queue Elements in [1] Path [10] AlliGator Data Series Type [9] Weights (Default: None) [6] Index Offsets (Default: None) [4]	Launches a series of steps loading each dataset in a series (including background correction) and adding them to a reset accumulated dataset. This script is followed by the usual series of steps after a new dataset is loaded (display, phasor plot update, phasor ratio or map overlay in image source and/or image ROI highlight in phasor plot).			

Scope: of → Protected | of → Community

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

## 2.1.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.2. AlliGator Action Engine.lvlib

**Responsibility:** Handles AlliGator Event Queue, dispatching events to different handlers according to their category.

**Version:** 1.0.0.0

## 2.2.1. Functions

*Table 2. Functions (non private scope only)* 

AlliGator Refnum [11] Action [0] Error Out				
Error In [8]	AlliGator action dispatcher. Each action array is handled as a package, each action in the array being sent to the appropriate category (Files, Image, Phasor Graph, etc.).			
Alligator Queue Element 1 [10] [10] [2] Alligator Queue Element 1 ( Alligator Queue Element 2 [9] [2] Error Out Error In [8] [2] Elements Order in Action St [6]	One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) an array of actions to the current ones being processed or about to be queued.			
Alligator Queue Element 1 [10] [2] Alligator Queue Element 1 ( Alligator Atomic Action [9] [2] Error Out Error In [8] Elements Order in Action St [6]	One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI. Appends (or prepends) a single action to the current ones being processed or about to be queued.			
error in (no error) [8] (0] error out	No description found (add content in vi description)			
Script in [2] W in [1] AlliGator Q Bernents [0] data value reference [5]  Data [9] error in [no error] [11] AlliGator Ct Refnums [12]	Processes AlliGator phasor calibration-related actions.			
AlliGator Q Elements [1] [0] AlliGator Q Elements	Checks whether there is any <b>Abort</b> action in the input <b>AlliGator Q Elements</b> .			
- I	Alligator Queue Element 1 [10]  Elements Order in Action St. [6]  Alligator Queue Element 1 [10]  Alligator Queue Element 1 [10]  Alligator Atomic Action St. [6]  Error In [8]  Elements Order in Action St. [6]  Alligator Queue Element 1 (  Error In [9]  Elements Order in Action St. [6]  Alligator Queue Element 1 (  Elements Order in Action St. [6]  Alligator Queue Element 1 (  Elements Order in [7]  Ele	Category (Files, Image, Phasor Graph, etc.).  Alligator Queue Bernett 1 [10]  Bernett Order in Action St., [8]  One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) an array of actions to the current ones being processed or about to be queued.  One of the two options of the polymorphic Bernett 1 [10]  Alligator Add Action(s) to Stack VI.  Appends (or prepends) as ingle action to the current ones being processed or about to be queued.  One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) a single action to the current ones being processed or about to be queued.  From in (no error) [8]  One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) a single action to the current ones being processed or about to be queued.  No description found (add content in vi description)  Processes AlliGator phasor calibration-related actions.  AlliGator Q Elements [1]  AlliGator Q Elements [1]  AlliGator Q Elements [1]  Checks whether there is any Abort action	Category (Files, Image, Phasor Graph, etc.).  One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) an array of actions to the current ones being processed or about to be queued.  One of the two options of the polymorphic Benefit (and the current ones being processed or about to be queued.  One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) as ingle action to the current ones being processed or about to be queued.  One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) a single action to the current ones being processed or about to be queued.  One of the two options of the polymorphic AlliGator Add Action(s) to Stack VI.  Appends (or prepends) a single action to the current ones being processed or about to be queued.  No description found (add content in vi description)  Processes AlliGator phasor calibration-related actions.  Checks whether there is any Abort action in the input AlliGator Q Elements.	Category (Files, Image, Phasor Graph, etc.).  Aligner Grove Beneet 1 [10]

Name	Connector pane	Description	S.	R.	I.
AlliGator Compute P2 vs P1 Plots	Lifetime Graph in [7] AlliGator IV DVR in [11] User Selection [10] Phasor Frequency [9] error in (no error) [8]	Compute a (P1, P2) scatter plot for all selected phasor plots in the Phasor Graph and send them to the Lifetime & Other Parameters Graph.  P1 & P2 are parameters associated with			
		each plasor plot or derived from the phasor and/or phasor ratio references.			
AlliGator Current Event	AlliGator Q Event in [2] [7] AlliGator Q Event out Get(F)/Set [4]	Get/Set current AlliGator action being processed.			
AlliGator Decay Actions	Script in [2]  AlliGator Q Elements in [0]  AlliGator IV DVR in [5]  Data [9]  error in (no error) [11]  AlliGator Ctrl Refnums [12]	Processes AlliGator decay-related actions.			
AlliGator Decay Fit Parameter Map Actions	Script in [2]  Vii [1]  AlliGator Q Elements in [0]  data value reference [5]  AlliGator Q Event in [7]  Data [9]  error in (no erro) [11]  AlliGator Ctrl Refnums [12]	Processes AlliGator decay fit parameter map-related actions.			
AlliGator Event to Event Category	AlliGator Q Event [8] Event Category	Extracts the category an <b>AlliGator Q Event</b> belongs to, in order to dispatch this event to the proper handler.			
AlliGator Event to String	Add Ellipsis (T) [5]  AlliGator Q Event [8] [2] String	Converts <b>AlliGator Q Event</b> enum to the corresponding string.			
AlliGator Files Actions	Script in [2]  Vii [1]  AlliGator Q Elements in [0]  AlliGator IV DVR [5]  AlliGator V Event in [7]  Data [9]  error in (no erro) [11]  AlliGator Ctr Refnums [12]	Processes AlliGator files-related actions.			
AlliGator Filter Event	Filtered Event Data [11] [3] Filter Event?  Error In [8] [0] Error Out	Prevents adding an event to the main Action Queue if a similar event has been added less than <b>Timeout</b> ago, where <b>Timeout</b> is part of the <b>Filtered Event Data</b> .			
AlliGator FLI Dataset Actions	Script in [2]  VII in 1  AlliGator Q Elements [0]  AlliGator IV DVR in [5]  AlliGator IV DVR in [5]  Data [9]  error in (no error) [11]  AlliGator Ctrl Refnums [12]	Processes AlliGator FLI Dataset-related actions.			
AlliGator FLI Dataset Series Actions	Script in [2] [3] Script out VI in [1] [3] Script out VI in [1] [3] Script out VI in [1] [4] Alligator Queue Elements (0) [4] Alligator Queue Elements AlliGator IV DVR in [5] [5] [6] AlliGator IV DVR in [6] AlliGator Queue Elements AlliGator Queue Elements AlliGator Queue Elements AlliGator Queue Elements (1) [6] [6] [6] [6] [6] [6] [6] [6] [6] [6]	Processes AlliGator FLI Dataset Series-related actions.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Generic Graph Actions	Script [2] [3] Script out VI in [1] [3] Script out VI in [1] [3] Script out VI in [1] [4] AlliGator Q Elements in [0] [4] AlliGator Q Elements out data value reference in [5] [5] [6] Data Value Reference out AlliGator Q Event in [7] [7] [6] Data [9] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7	Processes AlliGator generic graph-related actions.			
AlliGator Get First Event	AlliGator Q Elements [5] (2) AlliGator Q Elements [1] AlliGator Q Event [1] Data	Returns the first event (action + data) in the AlliGator Q Elements input array in AlliGator Q Event and the remaining events in the AlliGator Q Elements output array.  If there is a GUI:Abort element in the array, or if the abort flag is raised, returns a single GUI:Abort as AlliGator Q Event and an empty array as AlliGator Q Elements output array.			
AlliGator GUI Actions	Script [2] Vin [1] [3] Script?  AlliGator Q Elements in [0] [4] AlliGator Q Elements out AlliGator IV DVR [5] [6] AlliGator IV DVR [5] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7	Processes AlliGator GUI-related actions.			
AlliGator Hide Path Drop Boxes	AlliGator Ctrl Refnums [11] Hide (F)/Show [9] Error In [8]  [0] Error Out	No description found (add content in vi description)			
AlliGator Image Actions	Script in [2]  VII 11  AlliGator Q Elements [0]  AlliGator IV DVR in [3]  AlliGator Q Eventin [7]  AlliGator Q Eventin [7]  For a light of the property of the	Processes AlliGator source image-related actions.			
AlliGator Initialize Images	AlliGator IV DVR [11] [3] AlliGator IV DVR Phasor Plot Display [10] [10] [10] error out	Initializes AlliGator image structures.			
AlliGator Initialize Internal Variables	State Indicators [10]  Alligator version [9]  error in (no error) [8]	Initializes AlliGator internal variables.			
AlliGator Intensity Actions	Script in [2] VII in [1] AlliGator Q Elements in [0] AlliGator IV DVR in [5] AlliGator Q Event in [7] Data [9] error in (no erro) [11] AlliGator Ctrl Refnums [12]	Processes AlliGator intensity time trace- related actions.			
AlliGator No Action Event	No Action	Returns a no-op event.			
AlliGator Package Notebook Messages	AlliGator Q Event in [11]  Message [10]  Message Formatting [9]  Message Formatting [9]	Formats Notebook message by adding AlliGator Action header and style.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Phasor Graph Actions	Script in [2] Vii in [1] AlliGator Q Elements in [0] AlliGator Q Event in [7] Data Value Reference out AlliGator Q Event in [7] Data [9] error in (no error) [11] AlliGator Ctrl Refnums [12]	Processes AlliGator phasor graph-related actions.			
AlliGator Phasor Plot Actions	Script in [2]  Vii [1]  AlliGator Q Elements in [0]  AlliGator Q Event in [7]  Data [9]  error in (no error) [11]  AlliGator Ctrl Refnums [12]	Processes AlliGator phasor plot-related actions.			
AlliGator Phasor Ratio Actions	Script in [2] Vii [1] AlliGator Q Elements in [0] AlliGator Q Event in [7] Data [9] error in [no error [11] AlliGator Ctrl Refnums [12]	Processes AlliGator phasor ratio-related actions.			
AlliGator Queue Non Empty Events	AlliGator Q [11] Actions [10] Error In [8]	Removes consecutive duplicates of any kind of AlliGator action to leave a single copy of each in the array of enqueued AlliGator events.  The same action can appear several time, as long as the different copies are separated by a different action.			
AlliGator Queue	create if not found? (F) [8] [2] AlliGator Q Error In [7] [1] Error Out	Returns the AlliGator Action queue.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining:  $\rightarrow$  Inlined

## 2.2.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.3. AlliGator Dataset Information Window.lvlib

Responsibility: VIs handling Dataset Information displayed to the user.

**Version:** 1.0.0.0

#### 2.3.1. Functions

Table 3. Functions (non private scope only)

Name	Connector pane	Description	s.	R.	I.
AlliGator Build Dataset Information String	Militation Detail Detail String  [3] Dataset Information String	Creates <b>Dataset Information String</b> based on internal variables and settings.			

Name	Connector pane	Description	S.	R.	I.
Alligator Dataset Information Window	Alligator Dataret Infa	Window displaying the dataset information extracted from internal variables and settings.			

Scope:  $\bullet \to \text{Protected} \mid \bullet \to \text{Community}$ 

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

### 2.3.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.4. AlliGator Debug.lvlib

**Responsibility:** features under test and accessible via the **DEBUG** menu item (when exposed).

**Version:** 1.0.0.0

#### 2.4.1. Functions

Table 4. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator Feature Tests	Script [5] Vi in [7] data value reference [11] Debug Action List [10] Data [9] Error in [8]  AlliGator Ctrl Refnums [6]	VI implementing the successive debugged features as individual cases.			
		One feature can be tested per session, and is hardwire-selected.			

Scope:  $\sigma$   $\rightarrow$  Protected |  $\sigma$   $\rightarrow$  Community

**R**eentrancy: □ → Preallocated reentrancy | □ → Shared reentrancy

Inlining: → Inlined

## 2.4.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.5. AlliGator Decay Analysis.lvlib

Responsibility: VIs handling decay analysis (preprocessing, processing, Ifit, RF).

**Version:** 1.0.0.0

Table 5. Nested libraries

Name	Туре
AlliGator Decay Fit.lvlib	Library
AlliGator Decay Preprocessing.lvlib	Library
AlliGator Decay Processing.lvlib	Library
AlliGator IRF.lvlib	Library

#### 2.5.1. Functions

This library has no functions set to non private scope.

## 2.5.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.6. AlliGator Decay Fit.lvlib

**Responsibility:** VIs used to fit decays to 1-Exp or 2-Exp models.

**Version:** 1.0.0.0

### 2.6.1. Functions

Table 6. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator 1- Exp + IRF Fit v2	Decay [0] [4] Fitted Decay [6] Residuals [6] Residuals [7] [6] Residuals [7] [7] [7] [7] [7] [7] [7] [7] [7] [7]	Legacy code for 1-Exp decay fit.		S	
AlliGator 2- Exp + IRF Convolution Fit v2	Decay [0] [4] Fitted Decay IRF [5] [6] Residuals Fit Options [9] [10] [6] Residuals error in (no error) [11] [10] Delta Best Fit Parameters parameter bounds [12] [13] Guess Parameters (13] Guess Parameters Options	Legacy code for 2-Exp decay fit.		5	
AlliGator All ROIs Decay Fit Non- Interactive (Fast + Individual IRF) v2	AlliGator Internal Variable [1] [3] AlliGator Internal Variable [1] Message error in (no error) [8] [0] error out	Performs multi-ROIs NLSF decay fits for the selected ROIs. Each ROI has its own associated IRF.			
AlliGator All ROIs Decay Fit Script	Decay Graph [11] [3] All ROIs Decay Fit Script Lifetime Graph [10] [1] Message Error In [8] [0] Error Out	Series of actions triggered by the <b>All ROIs NLSF Analysis:Interactive (Slow)</b> Analysis menu item.			

Name	Connector pane	Description	S.	R.	I.
AlliGator All ROIs Decay Fit	AlliGator Internal Variable [1] [3] AlliGator Internal Variable [1] [3] AlliGator Internal Variable [1] Message error in (no error) [8] [7] [0] error out	Fits all ROI decays with the selected model, using a common IRF for all ROIs.			
AlliGator Best of All (weights) String	Weighted Fit [1] [0] Weighted Fit	String to append to the fit output sent to the Notebook in the case of a "Best of All" option, to specify which fit was the best (weighted or unweighted).		S	
AlliGator Check Decay Reference	AlliGator Internal Variable [11]  Firor In [8]  AlliGator Internal Variable [11]  Firor In [8]  AlliGator Internal Variable [2] Reference Decay  (1) Variable Reference Decay  (1) For Out  (4) Message  (6) AlliGator Data Series Type	Obtains the relevant IRF (either common or local) for the subsequent task.			
AlliGator Check IRF	Current Decay [11] Reference Decay [10] SYNC Period [9] Error In [8]	Check whether the provided IRF is a valid plot. If not, builds a mock Dirac IRF as a replacement.		S	
AlliGator Clear Local IRFs	AlliGator IV DVR in [11]  Current Court Co	Clears the internal variable-sored local IRFs.			
AlliGator Clip Decay for Fit	Decay in [11]  Max Decay Percentile (1) [10]  Min Decay Percentile (0) [9]  Error In [8]  [3] Clipped Decay out [22] Index Max [22] Index Max [23] Index Min [10] Error Out [4] # Points	Clips the decay according to the <b>Min</b> and <b>Max Decay Percentile</b> parameters provided.		S	
		If the decay range is [I_min, I_max] and the decay percentiles are (f_min, f_max) in [0, 1], we look for:			
		- starting from the location of the maximum (presumably the peak location) and moving forward, the point at which:			
		I_i < I_min + f_max*(I_max - I_min) = F_max			
		- starting from the last point and moving baclwards, the point at which:			
		I_i > I_min + f_min*(I_max - I_min) = F_min			

Name	Connector pane	Description	S.	R.	I.
AlliGator Convert Decay Fit Parameter Constraints v2	Fit Parameter Constraints Fit Model [10]	Returns constraints for all parameters of the model, even if the user only specified a few (or none at all).  This VI assumes that the <b>Fit Parameter Constraints</b> involve tau, and returns values with the same assumption.  Look for constrained parameters. If present, replace default constraints (-Inf, Inf) by new ones, except for the offset, which is set to the guessed value (or zero if not provided).		5	
AlliGator Convert New to Legacy Fit Parameter Constraints	All Parameter Constraints [1] [0] Parameter Bounds	version conversion for <b>Fit Parameter Constraints</b> .		S	
AlliGator Create Fit Parameter Plots Script	XYGraph in [11] Current ROI Name [10]  Overto Proc. [3] AlliGator Script	Creates as many empty parameter plots as there are parameters.			
AlliGator Decay Fit Output String	Guess Parameters Options [4]  All Fit Parameters [3]  Plot clipped] [2]  (Clipped) Plot Range [1]  Plot Name [0]  Fit Output [5]  Delta Best Fit Parameters [7]  Emorin [11]  Guess Parameters [12]  Fit Parameter Constraints [13]	Creates decay fit output string.		S	
AlliGator Enforce Lifetime Positivity	Constraints in [11] [3] Constraints out Future [3] Constraints out Future [4]	Constrains lifetime parameters to be positive (replacing them by zero otherwise).			
AlliGator Fit Decay	Decay Fit Options & Parameters [1] [2] Decay Fit Options & Parameters [3] 3] Output Plots Selected Plot Info + Flag [0] [4] Bear Fit Parameters (All) Current Decay Name [3] [5] [6] Bear Fit Parameters (All) (6) Delha Bear Fit Parameters (All) (7) Reduced Chin'2 error in (no error) [11] Use Legacy Fitting Approach [12] [13] Cutput Plot Names	VI implementing single decay fit with either a single or double exponential model with IRF convolution (or in the absence of IRF, without convolution).		5	
AlliGator Fit IRF String	Use Local IRF [11] IRF String Error In [8] [1] IRF String [0] Error Out	Create the Notebook string specifying what kind of IRF was used in the fit.		S	
AlliGator Fit IRF to Cubic Spline + Sine	Selected Plot Info [11] [3] Fitted Plot Coulc. [1] Fitted IRF Message error in (no error) [8] [1] Fitted IRF Message [0] Error Out	Fits the provided plot by a sum of a sinus function and a cubic spline.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Fit	[AlliGator Decay	Creates a string describing the fit		S	
Termination	Analysis.lvlib:AlliGator	termination criteria and quality metrics.			
Criteria &	Decay Fit.lvlib:AlliGator Fit				
Quality	Termination Criteria &				
Metrics	Quality Metrics Output				
Output String	String.vi]				
AlliGator Get	Decay [11] [3] Guess Parameters IRF [9] [1] Guess Parameters Names	Determines <b>Guess Parameters</b> for a 1-Exp			
1-Exp Guess	[0] Guess Parameters Type	fit according to the user-specified choices:			
Parameters		_			
		* Last valid fitted parameters:			
		If the number of available last valid fitted			
		parameters is correct, uses those,			
		otherwise use the estimated parameters.			
		* User-provided parameters:			
		If a parameter is provided by the user, uses			
		it, otherwise uses the estimated parameter.			
		it, otherwise uses the estimated parameter.			
		* User-provided (normalized) parameters:			
		coor provided (normanzed) parameters.			
		If a normalized-parameter (amplitude or			
		baseline) is provided by the user, uses it,			
		otherwise uses the estimated parameter.			
		- -			
		* Numerically estimated parameters:			
		Use the numerically estimated parameters.			

Name	Connector pane	Description	s.	R.	I.
AlliGator Get 2-Exp Guess Parameters	Company   Comp	Determines <b>Guess Parameters</b> for a 2-Exp fit according to the user-specified choices:		S	
		* Last valid fitted parameters:			
		If the number of available last valid fitted parameters is correct, uses those,			
		otherwise use the estimated parameters.			
		* User-provided parameters:			
		If a parameter is provided by the user, uses it, otherwise uses the estimated parameter.			
		* User-provided (normalized) parameters:			
		If a normalized-parameter (amplitude or baseline) is provided by the user, uses it, otherwise uses the estimated parameter.			
		* Numerically estimated parameters:			
		Use the numerically estimated parameters.			
AlliGator Get Fit Options & Parameters	[AlliGator Decay Analysis.lvlib:AlliGator Decay Fit.lvlib:AlliGator Get Fit Options & Parameters.vi]	Gets Decay Fit Options & Parameters.		S	
AlliGator Get Fit Output Options	All Parameters? [11] [3] Decay Fit Output Options Error In [8] [1] [1] [1] [2] [2] [3] Decay Fit Output Options [1] Laser Period [0] Error Out	Gets Fit Output Options.			
AlliGator Get Guess Offset	Fit Model [11] [3] Guess Offset Guera [0] Last Fit Parameters?	Used to get an offset parameter when no constraint is provided:			
		- if "Use last valid fitted parameters", use it.			
		- otherwise, if a guess offset parameter is available, use it, else use zero.			
AlliGator Get IRF Values & Locations	[AlliGator Decay Analysis.lvlib:AlliGator Decay Fit.lvlib:AlliGator Get IRF Values & Locations.vi]	Gets the array of stored <b>IRF Values</b> as well as the <b>IRF Locations</b> .			
AlliGator Get Last Fitted Parameters	Guess Parameters Names [11] [3] Guess Parameters Names (dup) [2] Last Fitted Parameters (dup) [1] Last Dezay Max - Min [0] Last Fitted Parameters OK	Returns <b>Last Fitted Parameters</b> as well as <b>Last Decay Max - Min</b> .			

Name	Connector pane	Description	s.	R.	I.
AlliGator Get n-Exp Guess Parameters	Model [11]  Decay [10]  IRF [9]  Error In [8]	Get numerically estimated <b>Guess Parameters</b> for 1-Exp or 2-Exp models.		S	
AlliGator Get Tabulated Results Header (Decay Fit)	[3] Tabulated Results Header Fror In [8] [0] Error Out	Creates the header line for the ASCII ouput of decay fit parameters.			
AlliGator Is Decay Valid	Decay [11] [3] Decay (dup) Plot Name [10] [2] Message Error In [8] [2] West [2] Message [1] Is Valid? [0] Error Out	Checks whether the input <b>Decay</b> is valid, i.e. is non-zero, does not contain NaN and has more than one element.		S	
AlliGator Is IRF Valid	Reference Decay [2] [7] Valid Plot?	Checks that the <b>Reference Decay</b> is a valid plot.			
AlliGator n- Exp + IRF Fit v4	VI Refnum [1] Decay [0] IRF [5] IRF [5] IRF [5] IRF [5] IRF [5] IRF [6] Residuals IRF ICOutput III] IRF [6] Residuals IRF ICOutput III] IR	Fits the provided decay to 1-Exp or 2-Exp model.  This VI assumes that <b>All Parameter Constraints</b> involve tau (rather than the square root of lifetime) and returns values with the same assumption.		S	
AlliGator Update Decay Fit Results (Stats)	Fit Results [11]  error in (no error) [8]  [0] error out	Stores basic statistics (algorithm, Chi2/N, R2 and RMSE, where N is the number of evaluation points) for a successful fit.  This is used when the "Use All" fit method option is selected, and allows picking the best result out of the 3 methods (LS, LAR, Bisquare)			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

# 2.6.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.7. AlliGator Decay Preprocessing.lvlib

**Responsibility:** Handles decay pre-processing functions.

**Version:** 1.0.0.0

# 2.7.1. Functions

Table 7. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator Create Head & Tail Bounding Cursors	Analysis.lvlib:AlliGator Decay Preprocessing.lvlib:AlliGato	Creates a <b>Head</b> (HE) and a <b>Tail</b> (TS) cursor in the <b>Decay Graph</b> to be used for the definition of the decay end (the "Head" part) and start (the "Tail" part) when performing decay extrapolation.			
AlliGator Extrapolate Decay	Selected Plot Info [11] [3] Extrapolated Decay Replace Plot (17)? [9] [1] Message error in (no error) [8] [0] Error Out	Extrapolates a truncated decay by trying to fit an exponential to the tail part and connect it to the head part .			
AlliGator Find & Plot Threshold Crossing Position	[AlliGator Decay Analysis.lvlib:AlliGator Decay Preprocessing.lvlib:AlliGato r Find & Plot Threshold Crossing Position.vi]	Find the location where the decay reaches the provided thresholf (from below), returns that position and adds it to the last plot in the <b>Lifetime &amp; Other Parameters Graph</b> .			
AlliGator Find & Plot Zero-Crossing Position v2	[AlliGator Decay Analysis.lvlib:AlliGator Decay Preprocessing.lvlib:AlliGato r Find & Plot Zero-Crossing Position v2.vi]	decay in the <b>Decay Graph</b> using the provided <b>Shift</b> and adds it to the last plot in the <b>Lifetime &amp; Other Parameters</b>			
AlliGator Find Cross- Correlation Shift	polynomial order (3) [5] Half Width (Points) [7] Decay Graph [1] Lifetime Graph [10] Time Stamp [9] Error In [8] Reference Decay [6] normalization (none) [4]	Computes the shift of the last plot in the <b>Decay Graph</b> maximizing the cross-correlation of that plot and the <b>Reference Decay</b> and adds this value to the last plot in the <b>Lifetime &amp; Other Parameters Graph</b> .			
AlliGator Get Background Subtraction Parameters	Background Subtraction Para [1] [3] Background Subtraction Para [7] [8] [9] Background Subtraction Para [7] [8] [9] Error Out	Obtains or stores information about <b>Background Subtraction Parameters</b> from Settings.			
AlliGator Get- Set Decay Preprocessin g Options & Parameters	[AlliGator Decay Analysis.lvlib:AlliGator Decay Preprocessing.lvlib:AlliGato r Get-Set Decay Preprocessing Options & Parameters.vi]	Get/Set Decay Pre-processing Options & Parameters (Settings).			

Name	Connector pane	Description	S.	R.	I.
AlliGator Get- Set Decay Preprocessin g Parameters	Decay Preprocessing Paramet [11] [3] Decay Preprocessing Paramet [3] Decay Preprocessing Paramet [6] Error Out [6] [6] Error Out	Get/Set Decay Pre-processing parameters.			
AlliGator Preprocess Decay v3	Decay (in) [11] [5] Decay Metadata [5] Decay Metadata [7] Decay (out) [7] Decay (out) [7] Decay Preprocessing Parameters [6]	Applies the different selected pre- processing steps on the provided decay in the specified order.		S	
AlliGator Store Cursor- defined Head & Tail Fractions	Analysis.lvlib:AlliGator Decay Preprocessing.lvlib:AlliGato	Sets the head and tail fractions for decay extrapolation based on the corresponding cursor locations.  If one cursor is missing, the current fraction is preserved.			
AlliGator Subtract Background from Decay Curve v3	ROI Intensity Array in [5]  ROI Pixels (1) [9]  ROI Pixels (1) [9]  Favor  18 Background Subtracted Y Array  19 Background/Gate  10 Background/Gate  115 Error In [11]  115 Error Dut  114 Decay Background Subtractio	Subtracts background from a decay based on selected options.		5	
AlliGator Update Background Subtraction Indicators	AlliGator Ref [11]  Decay Metadata [10]  Error In [8]  Decay Metadata [10]  Error Out	Updates background subtraction indicators in the <b>Decay Graph</b> panel.			

Reentrancy: □ → Preallocated reentrancy | □ → Shared reentrancy

Inlining: → Inlined

## 2.7.2. Library Constant VIs

NOTE No Constant VIs Found

# 2.8. AlliGator Decay Processing.lvlib

Responsibility: All functions related to decay processing (but not decay PRE-processing).

**Version:** 1.0.0.0

#### 2.8.1. Functions

Table 8. Functions (non private scope only)

Name	Connector pane	Description	s.	R.	I.
AlliGator All ROIs Average Lifetimes	AlliGator Internal Variable [11] AlliGator Internal Variable Lifetime Graph [10] AlliGator Internal Variable [1] Message error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error in (no error) [8] AlliGator Internal Variable [1] Message Error Internal	Computes an approximate average lifetime for all ROI decays, based on the integral under the curve and IRF information.			
AlliGator Compute Decay Average Lifetime	Plot [1] [3] Average Lifetime Outputs t. U. IRF [0] [0] error out error in (no error) [8] Average Lifetime Options [6]	Computes an estimate of the average lifetime of a decay using the formula <tau> = <tau>_F_T - <tau>_IRF_T where F_T is the decay and IRF_T is the IRF.</tau></tau></tau>			
		This calculation involves estimating the location of the rising time for both IRF and decay.			
		When the option "Use Local IRF" is selected and a <b>Decay Location</b> is provided, the corresponding local IRF (if it exists) is used.			
AlliGator Compute ROI Decay	Pixel Threshold High [5] Pixel Threshold Low [7] Images [11] ROI Descriptor [10] Decay Points ROI Descriptor [10] Extra [2] ROI Center [1] # Valid Pixels error in (no error) [8] Loop ID [6] [4] # Pixels	Extracts the ROI pixel intensities for the different gate images, rejecting pixels not satisfying the intensity-based or peak-intensity based criteria.		5	
		A different (faster) approach is used for single-pixel ROIs.			
AlliGator Computer IRF t_0 and Mean Lifetime	Reference Decay [11] error in [8]  [2] <tau>_IRF (11) t_0 [0] error out</tau>	Computes an estimate of the average lifetime of the IRF and the location of the rising time.			
AlliGator Decay Graph Get-Set Process Plot Target	Menu [11] [3] Menu [11] Plot(s) to Process [9] [7] Plot(s) to Process Error In [8] [7] Fror Out (dup) [8] Fror Out (dup)	<b>Get</b> : Check which plot(s) to process, and add/remove checkmarks accordingly. In this case, the <b>Menu</b> reference is mandatory.			
S		Set: based on user selection, set which plot(s) to process. In this case, the Plot(s) to Processinput is mandatory (Single Plot, Selected Plots, All Plots), but not the Menu.			
AlliGator Extrapolate Multiple Plots	Selected Plot Info [11] [3] Last Etrapolated Decay Selected Plots [10] [3] [1] Etrapolated Decay Message error in (no error) [8] [0] error out [4] Single Plot?	Extrapolated the selected plots.			

Name	Connector pane	Description	s.	R.	I.
AlliGator Get Decay Average Lifetime	Selected Plot Info [11] <table (no="" [0]="" [4]="" [8]="" error="" error)="" fig.="" in="" message<="" out="" ref="" t_0_irf="" td=""  =""><td>Computes estimated average lifetime for the selected plot.</td><td></td><td></td><td></td></table>	Computes estimated average lifetime for the selected plot.			
AlliGator Get Decay Peak Constraints	[3] Decay Peak Constraints error in (no error) [8]	Get Decay Peak Constraints.			
AlliGator Get Decay Time Axis v2	Number of Gates [9] [10] t Array	Get decay time axis.			
AlliGator Get Pixel Count Constraints	[3] Pixel Count Constraints error in (no error) [8]	Get intensity constraints.			
AlliGator Get Process Plots Indices	Selected Plot Info [11]    Selected Plot Info (dup)   Selected Plot Info (dup)   Paid   Company   Company	Get indices of plots to be processed.			
AlliGator Get ROI Decay UI	VI in [7]  AlliGator IV DVR [11]  AlliGator Ctrl Refnums [10]  ROI Descriptor [9]  error in (no error) [8]	Computes the decay at the provided ROI and adds tje computed intensity (sum of all gates) and estimated background to two separate plots in the <b>Intensity Time Trace</b> Graph.			
AlliGator Get ROI Decay	AlliGator Internal Variable [11]  ROI Descriptor [10]  Decay [3]  error in (no error) [8]  AlliGator Internal Variable [2] Decay Medidata [1] ROI Decay Add'l Data error in (no error) [8]	Extract decay from provided ROI (see exception below) and apply pre-processing steps if applicable. Data and metadata are stored internally for further analysis.  Option: instead of providing a ROI (which implies a Source Image dataset), a Decay can be provided, which will not be pre-processed but stored as is, with no additional metadata.			
AlliGator Get ROI Intensity Array v4	ROI Descriptor [10] ROI Center [3] ROI Intensity Array [2] # Pytels error in (no error) [8] ROI Descriptor [10] ROI Center [13] ROI Intensity Array [12] ROI Center [13] ROI Center [13] ROI Intensity Array [12] ROI Center [13]	Gets the intensity array for the provided ROI.			
AlliGator Get Selected Plots and Reference Decay	Selected Plot Info [11]  Reference Decay [10]  error in (no error) [8]  [3] XYGraph  [2] Selected Plots  error in (no error) [8]  [4] Reference Decay  [4] Reference Decay	Get selected plot indices and reference decay.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Get Tabulated Results Header (Average Lifetimes)	[3] Tabulated Results Header Error In [8] [0] Error Out	Builds string to output results of average lifetime calculation.			
AlliGator New Decay Plot Name	Current Folder [2] [7] New Decay Name	Builds name for new decay plot.			
AlliGator Only Show Last Decay	[0] Show Last Decay Only?	Returns option of showing only the last plot.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

## 2.8.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.9. AlliGator IRF.lvlib

Responsibility: Handles IRF-related functions.

**Version:** 1.0.0.0

### 2.9.1. Functions

Table 9. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator All ROIs IRF Analysis	AlliGator Internal Variable  [11] 3] AlliGator Internal Variable  [22] Message error in (no error) [8] [1] # IBFs defined [0] error out	Extracts the decays from all ROIs and stores them as IRFs for subsequent NLSF analysis.			
AlliGator Compute Optimal IRF v2	Selected Plot Info [0] [3] Residuals Plot IRF*PSED Fixed Parameters [3] [6] Plot Name IRF Optimization Control [9] [7] First Plot IRF*PSED Fixed Parameters [6] [7] Plot Name IRF*Optimization Control [9] [7] First Parameter Values IIIIO Optimal Tau IIII Plot IIIII Plot IIII Plot III Pl	Extract IRF from provided decay using deconvolution and finding the minimal metrics.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Create Cursors for Square Gated IRF Fit	Decay Graph [11] [3] # Added Cursors    Cursor   Cursor	Creates 5 cursors (tr1, tr2, tf1, tf2 and ten) used to define the different transitions between domains in a square gate.			
AlliGator Extract IRF Instead of Decay Flag	[0] Extract IRF instead of Decay?	Get the value of the option "Get IRF instead of Decay".			
AlliGator Fit to Logistic Square Gated IRF	Selected Plot Info [11] [3] Fitted IRF [5] [6] Error in (no error) [8] [52 M7] [0] Error Out	Fits the decay to a logistic square gate.			
AlliGator Fit to Model IRF	Selected Plot Info [11] [3] Fitted IRF [1] Message [0] Error Out	Fit the selected plot to a Gaussian convolved with a single-exponential decay.			
AlliGator Fit to Tilted Logistic Square Gated IRF	Selected Plot Info [11] [3] Fitted IRF [7] [6] Error in (no error) [8] [8] [9] Error Out	Fits the selected decay to a tilted logistic square gate.			
AlliGator Get Optimal IRF from Decay v2	Selected Plot Info [11]  error in (no error) [8]  [3] Extracted IRF  [2] Message  [1] Message Style  [0] Error Out	Extract IRF from single-exponential decay by deconvolution and optimization of the time constant.			
AlliGator Get Reference Decay	Data Value Reference in [11]  [3] Data Value Reference out  [5] Reference Decay  [6] Error Out	Gets the internally stored reference decay.			
AlliGator Get Square Gated IRF Analysis Cursors	XYGraph in [11]  Error In [8]  [3] Cursor Positions Array [2] Cursor Names Array [1] 5 Cursors available? [0] Error Out	Gets locations and names of the 5 cursors needed to define the regions of a square gate fit.			
AlliGator Script All ROIs IRF Analysis	Error In [8] [3] All ROIs Analysis Script [1] Message [0] Error Out	Interactive script computing the decay for all ROIs and storing them as IRFs for subsequent NLSF analysis.			
AlliGator Sort Cursors for Square Gated IRF Fit	Cursor Position Array in [11]  Cursor Name Array in [9]  SWITTS  [3] Sorted Cursor Name Array  [1] Sorted Cursor Name Array	Sorts 5 cursors by name (if they exist) corresponding to the 5 boundaries between regions in a square gate.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Square Gated IRF Fit Cursors String	Cursor Names Array [11] 50, pt [2] Message Cursor Positions Array [9] 60, pt [0] Error In [8] -	Creates string describing the boundaries between regions in a square gate.			
AlliGator Thresholded IRF	Selected Plot Info [11]  error in (no error) [8]  (3) Thresholded IRF (11) Message (1) Error Out	Sets IRF values below threshold to 0.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid$   $\blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

## 2.9.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.10. AlliGator Decay Fit Parameter Map.lvlib

Responsibility: VIs related to the Decay Fit Parameter Map

**Version:** 1.0.0.0

#### **2.10.1. Functions**

*Table 10. Functions (non private scope only)* 

Name	Connector pane	Description	S.	R.	I.
AlliGator Build Decay Fit Parameter Map	AlliGator Internal Variable [11]	Builds the selected fit parameter map image.			
AlliGator Color Decay Fit Parameter Map in Original Image	Decay Fit Parameter Map Col [5] Image Color Scale Refnum [7] AlliGator IV DVR (1] Source Image Refnum [10] Fror In [8]  Error In [8]	Overlays the Decay Fit Parameter Map on the Source Image.			
AlliGator Convert Decay Range Options	Percentile Conversion [1]  Decay Fit Options & Paramet [0]  (0.00x)  [2] Decay Fit Options & Paramet	Converts percentiles unit.			

Name	Connector pane	Description	s.	R.	I.
AlliGator Decay Fit Parameter Map Context Menu Handler	Image Event Data [11] [3] AlliGator Actions Error In [8] [9] Error Out	Decay Fit Parameter Map contextual menu handler.			
AlliGator Decay Parameter Range Mouse Move Event	AlliGator Actions in [11]  Decay Fit Parameter [9]  Error In [8]  [0] Error Out	Handles mouse move event in the Decay Fit Parameter Map display range control.			
AlliGator Decay Parameters Map Mouse Up Event	AlliGator Actions in [11] [3] AlliGator Actions out Image Control Refnum [10] [0] error out error in (no error) [8]	Handles Mouse Up event in the Decay Fit Parameter Map image.			
AlliGator Export ROI(s) NLSF Parameters as ASCII File	AlliGator Ctrl Refnums [7] AlliGator IV DVR in [11] All ROIs [10]  All ROIs [10]  [1] Message error in (no error) [8]	Exports Decay Fit Parameter Map data to an ASCII file.			
AlliGator Get Decay Fit Parameter Map Data Wrapper	Data Value Reference in [11] Compute Decay fit Parameter. [10] Fit Parameter [19] Fit Parameter [10] Fit Par	Returns selected fit parameter's map.			
AlliGator Get Decay Fit Parameter Map Data	Compute Decay Fit Parameter [7] Multiple Decays Fit Parameters [11]  X Resolution [10]  V Resolution [10]  Error [18]  Map index [6]	Fills in matrix with fit parameter wherever it has been computed, NaN otherwise.			
AlliGator Get Local Fit Results String	[Decay Fit Parameter Name] [11]  X [10]  Y [9]  Parameters [8]  Decay Sum [6]	Builds Decay Fit Parmeters string.			
AlliGator Get Single ROI Message Start	Single-Pixel Fit? [1] [3] Message header error in (no error) [8] [2] ROI idx [0] error out	Builds single-ROI Decay Fit Parameters header string.			
AlliGator Load IRFs & Fit Data (Map) HDF5 File v0.3	[AlliGator Decay Fit Parameter Map.lvlib:AlliGator Load IRFs & Fit Data (Map) HDF5 File v0.3.vi]	Loads Decay Fit Parameter Map and associated metadata.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Load IRFs & Fit Data Map v1	[AlliGator Decay Fit Parameter Map.lvlib:AlliGator Load IRFs & Fit Data Map v1.vi]	Old version of Load Decay Fit Parameter Map.			
AlliGator New NLSF Parameter Map Resolution	Old NLSF Parameters Map X R [1] [3] New NLSF Parameters Map X R  Is Full Image Parameter Map [9] [2] New NLSF Parameters Map X R	Map resolution conversion.  If <b>Is Full Image Parameter Map</b> is true, returns the input resolution parameters.  If not, returns -1.			
AlliGator NLSF Parameters to Coordinates	[[Multiple Decays Fit Param [1] [0] Decay Locations	Extracts ROI coordinates from the Decay Fit Parameters array for all ROIs in the map.		5	<b>&gt;</b>
AlliGator Plot Fit Parameter vs Intensity v2	Lifetime Graph refnum [7]  Data Value Reference in [11]  ROl idx (214783647: all ROls) [9]  error in (no error) [8]  Fit Parameter [6]	Creates scatter plot of selected parameter vs intensity for all ROIs and sends it to the <b>Lifetime &amp; Other Parameters Graph</b> .			
AlliGator Post-Fit Parameter Map Update	Decay Fit Parameter [11]  Error In [8]  [0] Error Out	Updates Decay Fit PArameter Map image and Profile Plot window.			
AlliGator Read IRFs & Fit Data HDF5 File Metadata	[AlliGator Decay Fit Parameter Map.lvlib:AlliGator Read IRFs & Fit Data HDF5 File Metadata.vi]	Reads Decay Fit Parameter Map metadata from HDF5 file.			
AlliGator Save All Decay Fit Parameter Maps to ASCII	Data Value Reference in [11] [3] [3] Data Value Reference out error in (no error) [8] [0] error out	Saves the Decay Fir Parameter Map 2D array to an ASCII file.			
AlliGator Save Decay Fit Parameter Map to ASCII	Data Value Reference in [11] [3] Data Value Reference out Dialog? [9] [9] [9] [9] [9] [9] [9] [9] [9] [9]	Saves single Decay Fit Parameter Map data into an ASCII file.			
AlliGator Save IRFs & Fit Data (Map) HDF5 File v0.4	[AlliGator Decay Fit Parameter Map.lvlib:AlliGator Save IRFs & Fit Data (Map) HDF5 File v0.4.vi]	Saves Decay Fit Parameter Map and associated metadata to an HDF5 file.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Save-Load IRFs & Fit Data (Map)	[AlliGator Decay Fit Parameter Map.lvlib:AlliGator Save- Load IRFs & Fit Data (Map).vi]	Load/Save Decay Fit Parameter Map & Metadata from/to HDF5 file.			
AlliGator Send Decay Fit Parameter Map to Lifetime Graph	Lifetime Graph refnum [7] Data Value Reference in [1] ROI idx (2147483647-3il ROIs) [9] error in (no error) [8]  Fit Parameter [6]	Send the selected Decay Fit Parameter Map data to a single plot in <b>Lifetime &amp; Other Parameters Graph</b> .			
AlliGator Update Decay Fit Parameter Map Palette		Updates the color palette of the <b>Decay Fit Parameter Map</b> image.			

Scope:  $\sigma$   $\rightarrow$  Protected |  $\sigma$   $\rightarrow$  Community

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

# 2.10.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.11. AlliGator Decay Statistics.lvlib

Responsibility: Handles the Decay Statistics Graph.

**Version:** 1.0.0.0

#### **2.11.1. Functions**

*Table 11. Functions (non private scope only)* 

Name	Connector pane	Description	S.	R.	I.
AlliGator Compute Decay Statistics v2	Decay Statistics Bin [7] Decay Statistics Graph Ref [11] Image Array [10] Current Data [9] Error In [8]  [2] Decays Max Values [2] Decays Min Values [1] Message [0] Error Out [4] Time (s)	Computes decay min & max histograms.			

Name	Connector pane	Description	S.	R.	I.
AlliGator	Decay Statistics Graph [7]  Decays Max Values [11]	Rebins decay Min & Max histograms.			
Recompute	Decays Min Values [10]  Decay Statistics Bin [9]  Error In [8]				
Decay	2				
Statistics					
Histograms					

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

## 2.11.2. Library Constant VIs

**NOTE** No Constant VIs Found

## 2.12. AlliGator Dual-Channel Datasets.lvlib

Responsibility: VIs handling dual-channel datasets

**Version:** 1.0.0.0

#### **2.12.1. Functions**

*Table 12. Functions (non private scope only)* 

Name	Connector pane	Description	S.	R.	I.
AlliGator Channel Arithmetic Computation	AlliGator IV DVR in [11] [13] AlliGator IV DVR out Channel Arithmetic Action P [10] [10] [11] Message Error In [8] [10] Error Out	If selected, computes the arithmetic combination of ING & G2 channel and stores it nito the Dataset 1 structure.  If no arithmetic operation is selected, the G2 channel is in Dataset 1 structure, INT in Dataset 2 structure.			
AlliGator Compute (1- G2_INT)xMea n(INT) Images	G2 Images [7] [5] (1-G2/INT)* <int> Images Sum(G2) [11] [3] Sum((1-G2/INT)*<int>) Max(G2) [10] [2] Max([1-G2/INT)*<int>) Min(G2) [3] [4] [5] Error In [8] [6] Error Out [7] Sum((NT) [6] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7</int></int></int>	Computes (1 - G2/INT)* <int>.</int>			
AlliGator Compute G2_INTxMea n(INT) Images	G2 Images [7] [5] G2/INT* <int> Images Sum(G2) [11] [3] Sum(G2/INT*<int>) Max(G2) [10] [4] Max(G2/INT*<int>) [7] Min(G2/INT*<int>) [8] Sum(INT) [6] [9] Error In [8] Sum(INT) [6] [9] Error Out</int></int></int></int>	Computes G2/INT * <int>.</int>			

Name	Connector pane	Description	s.	R.	I.
AlliGator Compute INT - G2 Images	G2 Images [7] [5] INT - G2 Sum(G2) [11] [3] Sum(INT - G2) Max(G2) [10] [11] [17 - G2 [1] Max(INT - G2) Min(G2) [9] [1] Min(INT - G2) Error in [8] [17 - G2 [1] Min(INT - G2) Sum(INT) [6] [18 - G2 [1] Min(INT - G2) Sum(INT) [6] [19 - G2 [1] Min(INT - G2) Sum(INT) [19 - G2 [1] Min(INT - G	Computes INT - G2.			
AlliGator Get Channel Names & Indices	[AlliGator Dual-Channel Datasets.lvlib:AlliGator Get Channel Names & Indices.vi]	Returns information on the dataset file's channel(s).			
AlliGator Get Selected, INT & G2 Channel Names	Datasets.lvlib:AlliGator Get	Formats dual-gate channel name and returns selected channel.			
AlliGator Get- Set Channel Selection	Available Channel Names [11]  Selected Channel Name [10]  Channel Arithmetic [9]  error in (no error) [8]  Set (T)/Get (f) [6]	Groups access to 3 different types of Dataset Information: - available channel names - channel name - channel arithmetic			
AlliGator Is Selected Channel First Channel	Selected Channel Name [11] [3] First channel?	Identifies what type of channel is selected (First channel = TRUE: G2 or First channel = FALSE: INT).  In the case of a single-channel dataset, the output is TRUE.			
AlliGator Select FLI Channel Type	Available Channel Names [0] [2] Available Channel Names [2] Available Channel Names [2] Available Channel Names [3] Complementary Channel Name [4] Selected Channel Name [4] Selected Channel Name [6] Channel Anthroetic [10] GZ Channel Name (or single [13] Selected Channel Mame (or empty) [13] Selected Channel Message	Used when loading a new dataset. If the selected channel name is compatible, use it, if not either open a dialog (dual-channel dataset) or use the default (single-channel dataset).			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

## 2.12.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.13. AlliGator Fit Method Benchmark.lvlib

**Responsibility:** VIs for the Fit Method Benchmark Tool.

**Version:** 1.0.0.0

# **2.13.1. Functions**

Table 13. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator 2- Exp Decay Model	Decay Simulation Parameters [11] [3] Output Plot Period [10] [5] Fit Simulation Parameters [9]	Computes a 2-#xp decay with the provided parameters.			
AlliGator Baseline Simulation Check	New Baseline in [11]  # Bins [9]  # Counts [8]  # Counts [8]	Computes an optimized baseline.			
AlliGator Compute Lifetime Simulation Histograms	Histogram Bin Size (f1) [2] Histogram Bin Size (f1) [2] Histogram Bin Size (fau) [1]  tau 1 [0]  tau 1 [0]  tau 1 [0]  tau 1 [0]  tau 2 [5]  a 1 [7]  Ferror in [11]  Percentiles to Keep (1, 99) [12]  Percentiles to Keep (1, 99) [12]  Percentiles to Keep (1, 99) [12]	Computes fitted parameter histograms and statistics.			
AlliGator Decay Sum	Output Plots [1] [0] # Photons	Computes the number of simulated photons in each decay (the other two plots are the fit and the residuals).			
AlliGator Fit Linear Combination s of Exponentials	Fit Simulation Parameters [0]  Decay Simulation Parameters [1]  Decay Fit Options & Parameters [7]  Decay Fit Options [7]  Show Decays, Fits & Residuals [12]	Simulate a 1-Exp or 2-Exp decay and fits it with the selected model.			
AlliGator Fit Method Benchmark	Alligator Fit Mothad Benchmik	Fit Method Benchmark GUI.			
AlliGator Get tau1, tau2 & a1	[AlliGator Fit Method Benchmark.lvlib:AlliGator Get tau1]	Outputs tau1, tau2 and a1.			
AlliGator Load Experimental IRF	XYGraph in [11] Plot Data in [10] Experimental IRF Loaded? [9] error in [8]  ID Experimental IRF Loaded?  (0) error out  (4) Message	Load experimental IRF from ASCII file.			
AlliGator Pad or Truncate Decay	# Requested Points [9] Error In [8]  [3] Plot out  Fast  Foresty  [0] Error Out	Adds or removes decay points for it to match the laser period.			
AlliGator Pseudo Dirac IRF	Reference Decay in [11] Period [10] Decay Bin Size [9] Error In [8]	Computes a decay with a single non-zero bin.			
AlliGator Rescale 2-Exp Fraction	a 1 in [11] [3] r 1 out  2-Exp Parameters [9] [7] [82 cdd r1	Normalizes decay amplitudes for random timestamp generation.		S	

Name	Connector pane	Description	S.	R.	I.
AlliGator Save Simulation Outputs to ASCII	Fit Results [11] Simulati Simu	Saves simulation results.			
AlliGator Too Many Histogram Bins Message	error in (no error) [0]	Too many bins error dialog.			

Scope:  $\bullet \leftarrow \bullet$  Protected  $\mid \bullet \leftarrow \bullet$  Community

**R**eentrancy: □ → Preallocated reentrancy | □ → Shared reentrancy

Inlining: → Inlined

### 2.13.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.14. AlliGator Globals, Variables & Constants.lvlib

Responsibility: Globals, refnums, constants, etc.

**Version:** 

#### **2.14.1. Functions**

This library has no functions set to non private scope.

### 2.14.2. Library Constant VIs

**NOTE** No Constant VIs Found

## 2.15. AlliGator HDF5.lvlib

Responsibility: VIs handling HDF5 dataset files.

**Version:** 1.0.0.0

#### **2.15.1. Functions**

*Table 14. Functions (non private scope only)* 

Name	Connector pane	Description	S.	R.	I.
AlliGator Check Gate Number in HDF5 File v2	Gate Names [7] ref in [11]  FLI Parameters [9] error in (no error) [8]  [1] FLI Parameters [0] error out [4] Missing Gates? [6] Additional Gates?	Checks that the gate images stored in the HDF5 file correspond to the description provided by the <b>FLI Parameters</b> .			
		If so updates # <b>Gates</b> in that structure and sets the corresponding output flags.			
AlliGator Check Gate Number in HDF5 File v3	Gate Names [7] ref in [11] Glack Glack [1] FLI Parameters [9] error in (no error) [8] [1] FLI Parameters [0] error out [4] Missing Gates? [6] Additional Gates?	Checks that the gate images stored in the HDF5 file correspond to the description provided by the <b>FLI Parameters</b> .			
		If so updates # <b>Gates</b> in that structure and sets the corresponding output flags.			
AlliGator Check HDF5 File Type	HDF5 File Path in [11]  error in (no error) [8]  13] HDF5 File Path out [2] FLI Dataset Type [1] FLI Dataset? [0] error out	Tries reading the HDF5 file's information for the 3 different supported dataset type, until success, and returns the identified dataset type.			
AlliGator Check HDF5 Image Size v2	FLI Parameters in [11] Image ROI Information [10] Image Binning Options [9]	Determines the gate image dimension (X, Y) from the provided file information.			
AlliGator Check HDF5 Image Size	FLI Parameters in [11] [3] FLI Parameters out Image Binning Options [9]	Determines the gate image dimension (X, Y) from the provided file information.			
AlliGator Convert FLI Dataset Info to String	File Path [5]  FLI Parameters [11]  Metadata [10]  size [9]  error in (no error) [8]	Builds HDF5 Dataset Information string			
AlliGator Get DAQ & Metadata	*	Gets <b>DAQ Parameters</b> and <b>Metadata</b> string from internal data storage.			
AlliGator Get Pile-up Correction Parameter	Data Information [11]   Pile-up Correction in [10]   Pikel Well Capacity in [9]   error in (no error) [8]	Reads from the metadata whether or not pile-up correction was already applied, and if so, does not repeat it.			
AlliGator Is SS2 Dataset HDF5 File	File Path [7]	Checks wether a HDF5 file is a SS2 dataset file (early version).			
AlliGator Load HDF5 FLI Dataset Information	File Path [11]  Error In [8]  (3) FLI Data File Information  (2) Metadata  (11) Data Description (0) error out  (4) elapsed (relative) seconds	Loads HDF5 FLI dataset information.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Load HDF5 FLI Dataset Prelude	File Path [11] error in (no error) [8]  [3] File Path out [2] FLI Data File Information [1] Metadata [0] error out [4] Data Description	Initial steps of loading a HDF5 FLI dataset file.			
AlliGator Load HDF5 FLI Header File Information v0.6	HDF5 FLI File Loading Infor [10] 22 HDF5 FLI File Loading Infor [1] File Information String error in (no error) [8] [9] error out	Loads HDF5 FLI dataset file information (v0.6).			
AlliGator Load Single Gate Image from HDF5 v 0.6b	Gate Index [11] File Info [10]  error in (no error) [8]  Action [6]	Loads single gate image (or dual-channel images) from HDF5 FLI dataset file (v0.6b).			
AlliGator Load Single HDF5 Gate Image v 0.2b	Gate Index [11] File Info [10] error in (no error) [8] Action [6]	Loads single gate image from HDF5 FLI dataset file (v0.2).			
AlliGator Load Single HDF5 Gate Image v 0.3b	Gate Index [11] File Info [10] error in (no error) [8] Action [6]	Loads single gate image (or dual-channel images) from HDF5 FLI dataset file (v0.3b).			
AlliGator Read HDF5 FLI Dataset Series Timestamps	File Paths [11]  Observed  (1)  Error in (no error) [8]  (2) Timestamps  (0) error out	Loads HDF5 FLI dataset gate images timestamps			
AlliGator Read HDF5 FLI Image Information	ref in [11] [3] Image ROI Information error in (no error) [8] [2] Image Binning Options [1] Image Information [0] error out	Reads HDF5 FLI dataset image information.			
AlliGator Read HDF5 SSX Detector nformation	ref in [11] [3] SwissSPAD Detector Information error in (no error) [8] [0] error out	Reads HDF5 FLI dataset SSx detector information.			
AlliGator Select FLI Dataset Channel Name	Input Message [11] Channel Names [9] Error In [8]  [0] Error Out	Dialog window to select which SS3 channel to display.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Single SS3 Gate Slip Correction	Refnum in [11] [3] Refnum out 1552 [1] Last Strip Saturated? [7] Last Strip Saturated?	Removes one of two sets of columns of a SS3 dataset to account for common FPGA data transfer issues.			
AlliGator SS3 Gates Slip Correction	Data Value Reference in [11] [3] [3] Data Value Reference out [3] [4] Reference out [5] [6] Reference out [6] Reference	Performs the column truncation for SS3 datasets needed to fix a common FPGA data transfer issue.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

### 2.15.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.16. AlliGator Intensity Corrections.lvlib

Responsibility: VIs handling intensity correction to the Sum of All Gates image.

**Version:** 1.0.0.0

#### **2.16.1. Functions**

*Table 15. Functions (non private scope only)* 

Name	Connector pane	Description	S.	R.	I.
AlliGator Define & Save Intensity Corrections File	[AlliGator Intensity Corrections.lvlib:AlliGator Define & Save Intensity Corrections File.vi]	UI to enter intensity correction sepcifications.			
AlliGator Get Dataset Series Timestamp & Intensity Correction	Corrections.lvlib:AlliGator Get Dataset Series	Get dataset timestamp and intensity corrections (if available and requested) or use defaults instead.			
AlliGator Load Intensity Corrections	Intensity Correction File [11] [3] Intensity Corrections Error In [8] [1] Message [0] Error Out	Loads saved dataset series intensity corrections.			

Name	Connector pane	Description	S.	R.	I.
AlliGator MCP Voltage to Gain	MCP Voltage [11] MCP Parameters [9] MCP Parameters [9]	Heuristic fit of the relationship between effective ICCD gain G and MCP voltage V_MCP.  The function used is a stretched exponential with vertical and horizontal offsets.			
		Parameters need to be fitted independetly with a G(V_MCP) series.			

Scope:  $\sigma$   $\rightarrow$  Protected |  $\sigma$   $\rightarrow$  Community

Reentrancy: 

Preallocated reentrancy | □ → Shared reentrancy

Inlining: → Inlined

### 2.16.2. Library Constant VIs

**NOTE** No Constant VIs Found

### 2.17. AlliGator Internal Variables.lvlib

**Responsibility:** VIs to access individual (or group of) internal data or variables using a data by value reference (DVR).

Version:

#### **2.17.1. Functions**

This library has no functions set to non private scope.

### 2.17.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.18. AlliGator Lifetime.lvlib

Responsibility: VIs handling lifetime plots (Lifetime & Other Parameters Graph).

**Version:** 1.0.0.0

#### **2.18.1. Functions**

Table 16. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator Add Average Lifetime to Plot	New Plot Name [5] Plot ID (-1) [7]  Lifetim Graph refnum [11] Abscissa [10] Average Lifetime [9] Average Lifetime [9] error in (no error) [8]  [9]  [1]  [1]  [1]  [9]  [1]  [1]  [1	Adds a single lifetime data point to a plot.			
AlliGator Add Decay Shift to Plot	Decay Shift [9]	Adds timestamp and decay shift to internal variables when computing a new decay.			

Reentrancy:  $\square$   $\rightarrow$  Preallocated reentrancy  $|\square$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

### 2.18.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.19. AlliGator Local Decay Window.lvlib

Responsibility: VIs used with the Local Decay Window.

**Version:** 1.0.0.0

#### **2.19.1. Functions**

*Table 17. Functions (non private scope only)* 

Name	Connector pane	Description	S.	R.	I.
AlliGator Decay Window	Docay	Local Decay Window UI. This window displays the decay (and when available, IRF, fit and residuals) at the selected ROI.			
AlliGator Get Local Fit & Residuals	[AlliGator Local Decay Window.lvlib:AlliGator Get Local Fit & Residuals.vi]	Gets the fit and residuals for the selected ROI.			
AlliGator Send Local Decay Plots	AlliGator IV DVR in [11] [3] AlliGator IV DVR out ROI Descriptor [10] [0] error out error in (no error) [8]	Gets the data (decay, fit, IRF, residuals and fit parameters) at the selected ROI and sends it to the Local Decay Window for update.			
AlliGator Update Local Decay Graph	XY Graph Refnum [11] Profile Window Data [10] Error In [8]  [0] Error Out	Updates the Local Decay Window graph.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

### 2.19.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.20. AlliGator Python Plugins.lvlib

Responsibility: VIs handling python plugins.

**Version:** 1.0.0.0

### **2.20.1. Functions**

Table 18. Functions (non private scope only)

Name	Connector pane	Description	s.	R.	I.
AlliGator Add Python Functions to Menu	Menu in [11] [3] Menu out Object Context Menu? [10] [0] error out error in (no error) [8]	Adds python function found in script to corresponding menu in AlliGator.			
AlliGator Add Python Functions to Object Menu	Object Refnum [11] [3] Object Refnum dup  Menu in [10] [2] Menu out  error in (no error) [8] [0] error out	Adds python function to object menu.			
AlliGator Export Plugin Parameters to Clipboard	AlliGator IV DVR [11] [3] AlliGator IV DVR Parameter Names only [9] [1] Message Error In [8] [0] Error Out	Sends a string containing all parameters, internal variables and data accessible to python plugins.			
AlliGator Find Object Python Function Information	Object Refnum [11] Menu Item Tag [10] error in (no error) [8] [3] Python Function Info Menu Item Tag (dup) [1] Found? [0] error out	Gets object's python function's information			
AlliGator Find Python Function Information	Target [11] [3] Python Function Info Function Menu Item Tag [10] ? [0] error out error in (no error) [8] [4] Found?	Gets python function's information.			
AlliGator Format Path String for Python	Python Plugin Dialog Output [11] [3] Python Plugin Dialog Output Error In [8] [0] Error Out	Formats path for python function consumption.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Get Message & Parameters from JSON Output		Interprets JSON string output and formats it to be sent to the Notebook.			
AlliGator Get Python Function Parameter Values Dialog	Parameters In [10] [2] Parameters Out [1] Cancelled? [0] Error In [8]	Dialog to allow user to enter python function parameters.			
AlliGator Get Python Session ID	Python Plugins Folder Path [11] [3] Python Session Error In [8] [7] [7] Valid Python Session [9] Error Out [4] Message	Gets the current (or creates a new) python session ID.			
AlliGator JSON Output Warning	Function Name [9] error in (no error) [8] [0] error out	Formats error message with python function information.			
AlliGator JSON String to Settings Parameter	AlliGator Settings List Ele [1] [3] Variant JSONs [10] [9] error out	Decodes JSON python ouput string.			
AlliGator Parameter Type to Default Value String	Parameter Type [11] [3] Default Parameter String	Returns default value of input parameter type.			
AlliGator Plugin Target to Submenu	Function Target [11] Transfer [3] Menu Tag Function Target Type [9] Lattland	Convert Plugin Target to Menu Tag for insertion of the menu item.			
		For plugins associated with objects such as Source Image or Decay Graph, the insertion takes place at the bottom of contextual menu and thus an empty string is provided.			
		For plugins associated with data not exposed to the user (such as the Gate Series), the plugin menui is added to the main menu, and thus the tag of the submenu in which it will be inserted needs to be provided.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Python Plugin Function Doc String	String in [11] [3] String out Source [9] [1] Doc String Error In [8] [0] Error Out	Extracts doc string from python function.			
AlliGator Python Plugin is Function a Plugin	String in [11]  Error In [8]  [3] String out [1] Is AlliGator Python Plugin?  [0] Error Out	Checks for the presence of the # IsAlliGatorPythonPlugin # tag in the python function.			
AlliGator Python Plugin Plot Data Type	Function Name [11] [3] Type of Plot Data error in (no error) [8] [0] error out	Looks at the python function name to figure out whether it acts on "All Plots" or "Selected Plots".			
AlliGator Python Plugin Valid Input Datatype	Input Datatype [2] [7] Valid Datatype?	Checks whether the input datatype is valid.			
AlliGator Python Plugin Valid Output Datatype	Output Datatype [2] [7] Valid Datatype?	Checks whether the output datatype is valid.			
AlliGator Python Plugin Valid Output Destination	Output Destination [2] [7] Valid Destination?	Checks whether the output destination is valid.			
AlliGator Send Python Function Doc String to Notebook	Target [11]   Item Tag [10]	Sends python function doc string to Notebook.			
AlliGator Run XY Graph Python Function	data value reference in [11]  Mouse Click Event Data [10]  Python Function Info [9]  error in (no error) [8]  AlliGator Ctrl Refnums [6]	Calls a XY Graph-associated python function.			
AlliGator XY Graph Python Function Handler Core	data value reference in [11]  XY Graph Event [10]  [1] Message error in (no error) [8]  AlliGator Ctrl Refinums [6]	Calls XY Graph-associated python function.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Add Missing Parameter Map Parameters	Parameter Names [11] [3] [Decay Fit Parameter Name] out Parameter_Plattened_Map in [9] [11] Parameter_Plattened_Map out Error in [9] [12] [13] [14] [15] [16] [17] [17] [18] [18] [18] [18] [18] [18] [18] [18	Complements python function output parameter map by adding "NaN" instead of the missing parameters.  The map needs to be complete to be displayable in AlliGator, even though the python function might only ouput a few parameters.			
AlliGator FLI Dataset Python Function Handler Core	Item Tag [11] [3] Alligator Atomic Action  Data Value Reference in [10] [2] Data Value Reference out  Current Data [9] [1] [1] Message  error in (no error) [8] [0] error out	Calls FLI Dataset python function.			
AlliGator Parameter Names to Parameters List	Parameter Names [11] [3] [Decay Fit Parameter Name]	Converts parameter names to an array of enums.			
AlliGator Pythin Plugin Get FLI Dataset	Data Value Reference in [1] AlliGator Parameter Names N. I. [1] Correct Data [9] Correct Da	Gets FLI Dataset and related information to pass to a python plugin.			
AlliGator Python Plugin Get FLI Dataset Data	AlliGator DIV DVR in [11]  Error In [8]  (7) [[IRFa:]]  (3) AlliGator DIV DVR out  (2) Reference Decay  (1) SGL Gate Images  (0) Error Out  (4) Image Mask (U16)	Gets FLI Dataset Images and additional information for python plugin call.  - IRFs: array of decays (IRFs) preceded by the (X, Y) coordinate of the corresponding pixel. Each decay is an array of DBL IRF Time Axis: common array of time points (DBL) corresponding to the IRF values - Reference Decay: in the case where the IRF is common to the whole dataset, it is provided as a single decay plot structure comprised of a Plot Name, X Array (DBL) and Y Array (DBL) Image Mask is a U16 array defining the different ROIs by different pixel values.			
AlliGator Run FLI Dataset Python Function	Data Value Reference in [11]  Python Function Info [10]  Cyrnert Data [9]  error in (no error) [8]  [0] error out	Runs FLI Dataset python plugin function.			

Name	Connector pane	Description	s.	R.	I.
AlliGator Pythin Plugin Get Reference Decay	Data Value Reference in [11]  AlliGator Parameter Names in [10]  error in (no error) [8]  [3] Data Value Reference out  [2] AlliGator Parameter Names out  [1] Reference Dexay  [0] error out  [4] Found?	If AlliGator Parameter Names in contains 'Reference Decay', returns the Reference Decay cluster and removes 'Reference Decay' from AlliGator Parameter Names out. Sets the Found? flag to TRUE.  Otherwise, do nothing and returns the			
		default cluster and set the <b>Found?</b> flag to FALSE			
AlliGator Add Plugins to Main Menu	Menu in [11] [3] Menu out error in (no error) [8] [0] error out	Adds python functions to the corresponding AlliGator submenus.			
		If a submenu is empty, deactivates it.			
AlliGator Check Invalid Python Plugin Input Parameter Types	Invalid Parameter Types [11] Source [9] error in (no error) [8]	Formats error with invalid input parameter message.			
AlliGator Check Invalid Python Plugin Output Destination	Source [11] Valid Destination? [9] error in (no error) [8]	Outputs warning message with invalid destination.			
AlliGator Check Invalid Python Plugin Output Value Type	Valid Output Value Type? [9] error in (no error) [8]	Outputs warning with invalid output value type			
AlliGator Check Missing Python Plugin Doc String	Doc String Found [11] Source [9] error in (no error) [8] [0] error out	Outputs warning with missing doc string message.			

Name	Connector pane	Description	s.	R.	I.
AlliGator Check Missing Python Plugin Function Name	Function Name Found [11]  Source [9]  error in (no error) [8]	Outputs warning with missing function name.			
AlliGator Check Missing Python Plugin Input Section	Input Section Found [11] Source [9] error in (no error) [8]	Outputs warning with missing input section.			
AlliGator Check Missing Python Plugin Output Section	Source [11] Output Section Found [9] error in (no error) [8]	Outputs warning with missing output section.			
AlliGator Check Valid Python Plugin Target	Target Found? [11] Source [9] error in (no error) [8]	Outputs warning with missing python plugin target.			
AlliGator Clear Unknown Python Error	error in (no error) [8] [0] error out	Clears unknown python function error (i.e. code != 1672).			
AlliGator Close Python Session	Error In [8] [1] Message [0] Error Out	Closes python session with message.			
AlliGator Decode Python Plugin Output Section	Input String [11] Source [9] Fig. [3] Output String [22] Function Outputs error in (no error) [8]	Looks for Python Plugin Header and Footer and returns:  - String before Header - Output Type - Output Destination			
occuon		<b>String before Header</b> : isf the section is not found (no header or no footer), the input string is passed unchanged.			
		If the section is found, the part that preceded that section is returned,			

Name	Connector pane	Description	S.	R.	I.
AlliGator Get Python Plugin Function Parameters String	Function Display Name [11]  Function Parameters   100 and   22   Function Parameters   150 N St  error in (no error)   83	Gets requested parameter names from the python function description, opens up a dialog window to allow the user to enter the required parameters, and builds a JSON string to pass those parameters (names and values) to the python function.			
AlliGator Get Python Plugin Functions List	Python Plugins Folder Path [11] Include Example Plugins [9] Error In [8]	Extracts list of python plugin functions from the Python Plugin folder.			
AlliGator Get Python Script Function List	File Path [11] [3] Array of Python Functions Info [1] Parent Menu Locations [6] error in (no error) [8] [6] error out	Extracts list of python plugin functions and their information from python script.			
AlliGator Get Python Functions List in Scripts	All Files in Dir [11] [3] Array of Python Functions error in (no error) [8] [1] Parent Menus [0] error out	Gets python functions list in scripts array.			
AlliGator Parse Python Function Input Parameters	Input String [11] Source [9] Error In [8]  [3] Output string [1] Function Input Parameters [0] Error Out	Looks for Python Plugin Input Paramater Section Header and Footer and returns the parameter names, types and descriptions If the section is found, the part that follows that section is returned.			
AlliGator Python Plugin Function Offsets	String in [11] [5] Script Header [3] String in (dup) [2] Function Offsets [0] Error Out	Finds function definition section <b>Offsets</b> .  Returns the script part preceding the first function as <b>Script Header</b> .			
AlliGator Python Plugin Get Function Name	String in [11] Source [9] Error In [8] [3] String out [2] Is preceded by Separator [1] function_name [0] Error Out	Returns function name and whether the function should be preceded by a separator in the menu.			
AlliGator Python Plugin Target Information	Script Header [11]  error in (no error) [8]  [3] Function Target Windows [2] Function Target Types [11] Parent Menu Locations [10] error out	Extracts information on the python plugin target(s).			
AlliGator Reset Python Session	error in (no error) [8] [3] Python Session [2] Include Example Plugins [1] Valid Python Session [0] error out [4] Message	Resets python session.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Unzip Python Plugins	Application Directory [11] [3] Python Plugins Folder Error In [8] [0] Error Out	Unzips python plugin archive provided with AlliGator installation.			
AlliGator Image Python Function Handler Core	Image Event [11]  (3) Alligator Atomic Action  Data Value Reference in [10]  (1) Intersage  (1) error out	Runs image-related python plugin function.			
AlliGator Run Source Image Python Function	Data Value Reference out Python Function Info [10] Source Image [9] In Message error in (no error) [8]  Data Value Reference out [2] Function Output Type [1] Message [9] error out	Runs image-related python function.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

#### 2.20.2. Library Constant VIs

**NOTE** No Constant VIs Found

## 2.21. AlliGator ROIs.lvlib

Responsibility: VIs handling ROI actions.

**Version:** 1.0.0.0

#### **2.21.1. Functions**

*Table 19. Functions (non private scope only)* 

Name	Connector pane	Description	S.	R.	I.
AlliGator Create Complement ary ROI	Image Label [7] Image [11] ROI [10] Error In [8] [2] Message [0] Error Out	Computes complementary ROI and adds it to the ROI list.			
AlliGator Create Individual Pixel ROIs from ROI	Y Resolution [5] X Resolution [7] ROI [11] Selected ROI (-1: use ROI D	Converts a closed ROI into a series of single-pixel ROIs.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Find ROI Name	ROI Descriptor [11] [3] Image Control ROI Description [1] Found? [1] Found? [0] Error In [8] [0] Error Out	Looks for the stored ROI having thes same definition as the input ROI and returns its name if found.			
AlliGator Get Current ROI Name	Ourrent ROI Name	Returns the current ROI name.			
AlliGator Get ROI Components	Stored ROIs [11] [2] ROI Names [2] ROI Descriptors [0] Overlay Colors	separates stored ROIs information into arrays of: - ROI Descriptors - ROI Names - Overlay Colors			
AlliGator Get ROI Names	Stored ROIs in [2] FOIRmm [7] ROI Name	Returns list of ROI names.			
AlliGator Load ROI v3	Source Image Refnum [11]  Dialog (1) 100  Destination Image (Source L. [9]  Error In [8]  [9] Fire Out  [1] Current ROI  [9] Time (s)	When invoked from a context menu, used Dialog for file selection: the Dialog flag should be set to True (default) and the Destination Image string is ignored.			
		When invoked from a drag & drop event, the Dialog flag should be set to False and the Destination Image (Source Image or Phasor Plot Image) should be provided.			
AlliGator Preview ROI File	File Path [11]  Destination Image [9]  Error In [8]  File Path [11]  [3] # ROIs Loaded [11] Phasor Plot Image [0] Error Out	Returns information on ROIs stored in the file.			
AlliGator ROI Analysis Script	Image ROI [10]  Decay Graph OR Phasor Graph [9]  Error In [8]  From In [8]	Actions needed to extract the decay corresponding to the current ROI or input ROI and compute its phasor.			
AlliGator Save ROI(s)	Current Dataset Name [7] Image Label [11] All ROIs? [10] ROI Descriptor [9] Error In [8]	Saves one or more ROIs.			
AlliGator Save Multiple ROIs v3	ROI Description [11] [3] Notebook Message Destination Folder (Default [10] [3] Default File Name [9] [0] Error Out Error In [8]	Save multiple ROIs.			
AlliGator Save ROI v3	Image Label [7] ROI Description [11]  Error In [8]  [3] Notebook Message finds [6] Error Out	Saves single ROI.			
AlliGator Set New ROI Name	Stored ROIs in [2]  ROI Name in [3]  Default Name ("") [4]  [0] ROI Name out	Sets new ROI name (verifies that the input name is not already used).			
AlliGator Update ROI After Mouse Release	Profile Tool? (F) [5]  ROI Descriptor [7]  Not Zoom or Pan? (T) [11]  Ellipse? (F) [10]  Shift Key? (F) [9]  Error In [8]  Phasor Image? (F) [4]	Builds list of actions handling ROI update following a mouse release event.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Get Phasor Plot ROI Event Refnum	[0] Phasor Plot ROI Event Refnum	Returns the Phasor Plot Image ROI Event refnum.			
AlliGator Get Phasor Plot ROIs, Names & Current ROI	-	Returns all ROIs and their names as well as the index of the current ROI.			
AlliGator Phasor Plot Image Edit ROI Name	ROI Name in [11] [3] ROI Name out [2] Old ROI Name [0] accepted?	Changes current Phasor Plot image ROI name.			
AlliGator Phasor Plot Image ROI Storage [MULT] v3	[AlliGator ROIs.lvlib:AlliGator Phasor Plot Image ROI Storage [MULT] v3.vi]	Handles multiple Phasor Plot image ROIs storage.			
AlliGator Phasor Plot Image ROI Storage [SGL] v3	[AlliGator ROIs.lvlib:AlliGator Phasor Plot Image ROI Storage [SGL] v3.vi]	Handles single Phasor Plot image ROI storage.			
AlliGator Phasor Plot ROI Manager	Alligator Pharor Plot ROI Manager	Phasor Plot image ROI list display UI.			
AlliGator Quit Phasor Plot Image ROI Manager	Error In [8] Phwer [0] Error Out	Handles Phasor Plot image ROI Manager quit event.			
AlliGator Select Phasor Plot ROI	ROI Selection Data [11] [3] ROI Descriptor	Handles Phasor Plot image ROI selection.			
AlliGator Compute & Plot All ROIs Characteristi	[AlliGator ROIs.lvlib:AlliGator Compute & Plot All ROIs Characteristics.vi]	Computes all Source Image ROI characteristics and sends them as plots to the Lifetime & Other Parameters Graph.			
AlliGator Create Source Image Contour ROI	ROI Mask [7] Image [11] ROI [10] Error In [8] Image Label [6]	Create new Source Image ROI consisting of the contour of the input ROI.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Create Source Image ROI Grid	ROI [11] [2] Message Error In [8] [0] Error Out	Creates a series of Source Image ROIs layed out on a grid.			
AlliGator Add Multiple Source Image ROIs	Header message [7]  ROI Mask Image Path [11]  ROIs [9]  Error In [8]	Adds multiple Source Image ROIs to ROI storage.			
AlliGator Get All Image ROIs	All Image ROL	Returns all Source Image ROI names.			
AlliGator Get Source Image ROI Event Refnum	[0] Source Image ROI Event Refnum	Returns the Source Image ROI Event refnum.			
AlliGator Get Source Image ROIs, Names & Current ROI	[AlliGator ROIs.lvlib:AlliGator Get Source Image ROIs]	Returns list of store Source Image ROIs, their names and the index of the current ROI.			
AlliGator is Full-Frame ROI	ROI Descriptor in [11] [3] ROI Descriptor (dup) error in (no error) [8] [1] Full-Frame ROI? [0] error out	Checks whether the Source Image ROI is a full-frame ROI.		S	>
AlliGator Mask Image to ROIs	Data Value Reference in [11] [3] Data Value Reference out Mask Image Name (Default: n [9] [1] Message error in [8] [10] error out	Define ROIs as sets of <b>Mask Image</b> pixels with identical integer values.  If the <b>Mask Image Name</b> parameter is left unconnected (or is an empty string), the file name of the loaded Mask Image is used as a prefix to all ROI names.			
AlliGator Quit Source Image ROI Manager	Error In [8] [0] Error Out	Handles Source Image ROI manager quit event.			
AlliGator Reject Source Image ROIs based on Characteristi	Source Image Refnum [11]  ROI Mask Refnum [10]  error in (no error) [8]  ###################################	Computes ROI characteristics and compare them to the conditions defined by the user in a dialog box.  Keeps only the ROIs that meet those			
CS		conditions.			

Name	Connector pane	Description	S.	R.	I.
AlliGator ROIs to Mask Image	Data Value Reference in [11] [3] Data Value Reference out All ROIs2 [9] [1] Message error in [8] [7] [9] error out	Uses existing ROIs to build a mask image summarizing their information.  Define ROIs as sets of <b>Mask Image</b> pixels with identical integer values.			
AlliGator Select Source Image ROI	ROI Selection Data [11] [5] # ROIs [3] ROI Descriptor [2] ROI Name [1] Overlay Color [0] Error Out [4] Current ROI	Selects Source Image ROI(s).			
AlliGator Set Source Image ROI ID	New ROI ID [10]  Error In [8]    10     10	Change the selected Source Image ROI ID.			
AlliGator Source Image Edit ROI Name	ROI Name in [11] [3] ROI Name out [1] old ROI Name [0] accepted?	Changes current Source Image ROI name.			
AlliGator Source Image ROI Manager	Alliquer Source In. ROI Manager	Source Image ROI list display UI.			
AlliGator Source Image ROI Storage [MULT] v3	[AlliGator ROIs.lvlib:AlliGator Source Image ROI Storage [MULT] v3.vi]	Handles multiple Source Image ROIs storage.			
AlliGator Source Image ROI Storage [SGL] v3	[AlliGator ROIs.lvlib:AlliGator Source Image ROI Storage [SGL] v3.vi]	Handles single Source Image ROI storage.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

#### 2.21.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.22. AlliGator Scripts.lvlib

**Responsibility:** AlliGator actions performing a series of sequential tasks.

**Version:** 1.0.0.0

## **2.22.1. Functions**

Table 20. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator Calibrated Phasor Map Series Dialog	error in (no error) [5] [15] Calibration Map/Gate Step List [16] Destination Folder [17] File Name (5 Exps will be [18] Save Phasor Map [19] error out [13] OK	Dialog window to enter the information eeded to run the Calibrated Phasor Map Series script.			
AlliGator Calibrated Phasor Maps Series Script	Phasor Graph refinum (6)  Alligator Queue Elements in (7)  Calibration MagNeda Step Let II (1)  Destination Todder (2)  File Name (F Stpasor Find (4)  Error in (5)	Loops through a series of FLI Dataset files, loads them with the specified gate step, and performs an All ROIs Phasor Analysis, using the resulting phasor plot as Phasor Calibration Map. This map is then save and optionally, the phasor plot as well.			
AlliGator Clear Internal Variables before Script	AlliGator Internal Variable [1]	Clears internal data structure before a script.			
AlliGator Get Series Analysis Type	Menu Tag [11] [3] Series Analysis Type	Decodes menu tag to determine whether an action is limited to the <b>Current ROI</b> or <b>All ROIs</b> .			
AlliGator Get Series Dataset Type	AlliGator Dataset Series Type [11] [3] FLI Dataset Type Error In [8] [0] Error Out	Converts Dataset Series type to FLI Dataset type enum.			
AlliGator Get Series Subfolders Information	Path [11] [5] Files in the Root Folder [3] dup directory path [3] dup directory path [3] dup directory path [5] Subfolder Names [7] Subfolder Paths [7] Files [7] [6] Same # Files?	Returns a breadown of the folder's content for subsequent script actions.			
AlliGator Get- Set Data Information	Data Information in [11] [3] Data Information out error in (no error) [8] [0] error out Get (F)/Set (T) [6]	Gets/Sets Dataset Information stored in the Settings Storage.vi			
AlliGator Get- Set Loading & Pre- Processing Options	Scripts.lvlib:AlliGator Get-	Gets/Sets <b>Data Information</b> , <b>Source Image Settings</b> and <b>Decay Preprocessing</b> from/in the Settings Storage.vi.			
AlliGator Get- Set Source Image Settings	Source Image Settings in [11] [3] Source Image Settings out error in (no error) [8] [9] (0) error out Get (F)/Set (T) [6]	Gets/Sets <b>Source Image</b> options.			

Name	Connector pane	Description	s.	R.	I.
AlliGator IV Script Destination File Path	[0] Destination File Path	Gets the <b>Script Destination File Path</b> internal variable.			
AlliGator Load ROIs, Select one ROI (& Convert to Pixel ROIs) Script	[AlliGator Scripts.lvlib:AlliGator Load ROIs]	Script loading the selected ROI from a multi-ROIs file,  This requires a number of subsequent steps that are queued by this script.			
AlliGator Load, Merge & to Pixel ROIs Script	[AlliGator Scripts.lvlib:AlliGator Load]	Loads a (multi-) ROI(s) file and merges all the ROIs (including the existing ones), before converting it to a list of single-pixel ROIs.			
AlliGator Logistic Square Gated IRF Characteristi cs Map	AlliGator Internal Variable [1]  Cursor Names Array [9]  error in (no error) [8]	Computes the decays of all ROIs and fits them with a logistic square gate model.  Saves the results in an ASCII file.			
AlliGator Logistic Square Gated IRF Fit Result File String	ROI Descriptor [11] [5] Header String Fit Output [10] [7] String [7] [7] [7] [7] [7] [7] [7] [7] [7] [7]	Builds string containing the output of a logistic square gate fit.		5	
AlliGator NLSF & Phasor Multi- ROI Analysis Dialog	[AlliGator Scripts.lvlib:AlliGator NLSF & Phasor Multi-ROI Analysis Dialog.vi]	Dialog window to set up a multi-ROIs single-pixel NLSF analysis of a FLI dataset.			
AlliGator Phasor Calibration Map Series Dialog	error in (no error) [5] [14] File Name (# Steps will be [15] Destination Folder [16] Gate Step Series [17] Phasor Calibration Dataset [18] OK [19] error out	Dialog to enter the parameters necessary for the calculation of a Series of Phasor Calibration Maps differing by the gate step used when loading the FLI dataset.			
AlliGator Phasor Calibration Maps (# Gates Series) Script	[AlliGator Scripts.lvlib:AlliGator Phasor Calibration Maps ( Gates Series) Script.vi]	Series of Phasor Calibration Map differing by the gate step used when loading the FLI dataset script.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Playback Time-Gated Data Series v2	Save Phasor Plot with Overlay [3] Save Image with Overlay [1] Alligator Queue Elements in [0]  Displayed Image [7]  Times Sider Refnum [9]  Enter in [1]  AlliGator Data Series Type [12]  Playback (f)/Loop [1] [14]	Launches the playback of a FLI dataset series.			
AlliGator Save Single Phasor Plot Script	Phasor Graph Refrum [1] Destination Folder path [10] Plot Name [9] Error In [8]  [0] Error Out	Script used to save the last Phasor Plot in the Phasor Graph with the specified name and folder.			
AlliGator Script Current ROI Time-Gated Data Series NLSF Analysis v1	Alligator Queue Elements in [11]  Path [10]  AlliGator Ctrl Refnums [9]  Error in [8]  AlliGator Data Series Type [4]	Script performing NLSF analysis of the current ROI for the series of FLI dataset in the provided folder.			
AlliGator Script Current ROI Time-Gated Data Series Phasor Analysis v2	Alligator Queue Elements in [11]  Path [10]  AlliGator Ctrl Refnums [3]  Error In [8]  AlliGator Data Series Type [6]	Script computing a phasor plot consisting of the current ROI's phasor in the FLI dataset series.			
AlliGator Script Export ROI Fit Parameters as ASCII	XYGraph in [7]  # ROis Loaded [11]  Results folder [10]  Dataset Hame [9]  Decay Fit Parameter to Save [6]  Bins Array [4]	Script saving the Decay Fit Parameter Map parameters selected by the user to individual ASCII files (one file per parameter per ROI).  This script works for a single ROI or all ROIs.			
AlliGator Script Multi- ROI Single- Pixel NLSF Analysis	Dataset Loading & Pre-proce [12] IRF Loading & Pre-proce [12] IRF Loading & Pre-processin [10] IFF Loading & Pre-processin [10] IFF Loading & Pre-proce [12] IRF Loading & Pre-	Scripts performing NLSF analysis of all pixels in all ROIs, using individual IRFs if provided.			
AlliGator Script Multi- ROI Single- Pixel Phasor Analysis	Dataset Loading & Pre-proce [12]  IRF Loading & Pre-processin [10]  Lifetime Graph Refinum [8]  Phasor Graph refinum [8]  Phasor Graph refinum [8]  Phasor Graph refinum [8]  IRF File [1]  Route File [2]  Route File [2]  Route File [3]  Route File [1]  Route File [1]  Phasor Parameters Scatter Plot [1]	Scripts performing phasor analysis of all pixels in all ROIs, using individual IRFs if provided.			
AlliGator Script Open Mask Image	Image Path [9] [0] Error Out	Script used to open a <b>Mask Image</b> and identify the corresponding ROIs.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Script Open White Light Image	Image Path [9] Error In [8]	Script used to open a White Light Image.			
AlliGator Script Sequential ROIs Time- Gated Data Series NLSF Analysis	Alligator Queue Elements in [11]  Tath [10]  AlliGator Ctrl Refraums [9]  Error in [8]  AlliGator Data Series Type [4]	Script performing NLSF analysis of a different ROI for each dataset in a series. This is used for instance if the ROI list is representing the successive locations of an object being tracked across the dataset series.			
AlliGator Script Sequential ROIs Time- Gated Data Series Phasor Analysis	Alligator Queue Elements in [11]  Path [10]  Alligator Ctrl Refnums [9]  Error In [8]  AlliGator Data Series Type [6]	Script performing phasor analysis of a different ROI for each dataset in a series. This is used for instance if the ROI list is representing the successive locations of an object being tracked across the dataset series.			
AlliGator Square Gated IRF Characteristi cs Map	AlliGator Internal Variable [11] [3] AlliGator Internal Variable [1] Message error in (no error) [8] [0] error out	Performs a crude square gate analysis of all ROI decays and saves the gate parameters in an ASCII file.			
AlliGator Tilted Square Gated IRF Characteristi cs Map	AlliGator Internal Variable  Cursor Positions Array [10] [3] AlliGator Internal Variable  Cursor Names Array [10] [1] [4] [5] [6] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7	Performs a tilted logistic square gate NLSF analysis of all ROI decays and saves the gate parameters in an ASCII file.			
AlliGator Toggle (Loop) Playback	Playback (F)/Loop (T) [0] Testic Testic (Testic Testic Tes	Toggles from normal playback (stops at the end of the series) to looped playback or vice versa.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid$   $\blacksquare$   $\rightarrow$  Shared reentrancy

Inlining:  $\rightarrow$  Inlined

## 2.22.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.23. AlliGator Settings.lvlib

**Responsibility:** VIs handling user-defined parameters.

**Version:** 1.0.0.0

#### **2.23.1. Functions**

Table 21. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator Check Fit Options	Fit Options Refnum [11] 3] MLE Options Visible? Use Data Information Period [10] 50 cut. Modified Option [9] 70 cut. error in (no error) [8] [0] error out	Handles user-initiated parameter changes in the <b>Fit Options</b> panel.			
AlliGator Compute Natural Frequency	[3] Laser Period Hours [0] Error In [8]	Computes the "natural" phasor frequency as a functions of various settings parameters.			
AlliGator Export Settings Parameter JSON String to Clipboard	Control Refnum [11] [3] JSON String Error In [8] [0] Error Out	Reads the control's value and creates a JSON string describing it and copies it into th clipboard.			
AlliGator Gate Separation (ns)	[3] Gate Separation (ns) error in (no error) [8] [0] error out	Returns the <b>Gate Separation</b> settings parameter.			
AlliGator Get Available Fitting Parameters	Parameter Names [11] [3] Missing Parameter Names Fun.	Returns list of parameters not in the <b>Parameter Names</b> list.			
AlliGator Get Control Label & Settings Element	Settings.lvlib:AlliGator Get	Returns the label string of the Settings control whose <b>CtlRef</b> refnum is provided, as well as the corresponding <b>AlliGator Settings List</b> enumerated value.			
AlliGator Get Control Notebook String	Control Label [11] [3] Notebook String Value [9] [0] error out	Formats the input <b>Value</b> of the control whose <b>Control Label</b> is provided into a string.  A special case is needed when units are			
		involved, otherwise the default case should be able to handle all other cases.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Get Phasor Ratio Interpolated Color Scale	Reference 1 Color [11] [3] Interpolated Color Scale De Reference 2 Color [9] [9] [9] Error Out	Builds a <b>Interpolated Color Scale Definition</b> based on the colors associated with both references.			
AlliGator Hot Pixel Removal Options String	Image Display Options [11] [3] String out Prior   Final   [7]   [7	Builds a string defining the hot pixel removal options.			
AlliGator Init Settings v2	Settings Panel (Empty: All) [11] Parameters to set to Default [10] error in [8]	Resets selected Settings parameters to their default values.			
AlliGator Laser Period	(0) Laser Period	Settings Data Information:Laser Period value.			
AlliGator Nanotime Gate Separation	[0] Nanotime Gate Separation  [10] (10) [10] [10] [10] [10] [10] [10] [10] [10]	Settings Data Information:Nanotime Gate Separation value.			
AlliGator Number of Gates	⑥—— [0] # Gates	Settings Data Information:# Gates value.			
AlliGator Phasor Frequency	① Phasor Frequency	Settings Data Information:Phasor Frequency value.			
AlliGator Refresh All Settings	VI Refnum in [11]  Verbose (T) [9]  Error In [8]	Reads all Settings values and refresh the corresponding controls and indicators with those values.			
AlliGator Refresh Single Setting	Verbose (T) [7] VI Ref in [11] Control Label [10] Data [9] Error In [8]	Refresh the control with <b>Control Label</b> with the provided <b>Data</b> .  Optionally sends this label and value to the Notebook.			
AlliGator Remove Duplicated Fit Parameter Constraints	Old Constraints [11] Old Old Onstraints out  New Constraints in [3] Old	Removes any potential duplicate entries in the array of fit parameter constraints.			
AlliGator Reorder Decay Pre- processing Operations	Ring in [11]  Rearder  Error In [8]  Operatin  Operatin	Dialog window allowing the user to reorder decay pre-processing steps.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Save-Load Parameter Map Color Palette List	Refnum in [11] Load(F)/Save [10] error in (no error) [8]	Loads/Save the list of palettes used for the <b>Decay Fit Parameter Map</b> in the AlliGator Settings ini file.			
AlliGator Save-Load Phasor Plot Color Palette List	Refnum in [11]  Load(F)/Save [10]  error in (no error) [8]  [0] error out	Loads/Save the list of palettes used for the <b>Phasor Plot</b> in the AlliGator Settings ini file.			
AlliGator Save-Load Settings	AlliGator Refnum in [11] File Path [10] Error In [8] Load(F)/Save (T) [6]	Use this file to Save or Load AlliGator's settings to an ini file.  If the <b>File Path</b> input is left unconnected, the defaut ini file is used (overriding the current ini file).  To save settings in a user-specified location, either provide a valid path, or connect a "Not a Path" constant to the input. A File Dialog window will then open to allow the user to choose a path.			
AlliGator Save-Load Source Image Color Palette List	Refnum in [11] [3] Refnum out Load(F)/Save [10] [6] error out	Loads/Save the list of palettes used for the <b>Source Image</b> in the AlliGator Settings ini file.			
AlliGator Save-Load Source Image Overlay Color Palette List	Refnum in [11] [3] Refnum out Load(F)/Save [10] [0] error out error in (no error) [8]	Loads/Save the list of palettes used to overlay a phasor-based map on the <b>Source Image</b> in the AlliGator Settings ini file.			
AlliGator Set Phasor Ratio Display Range	Phasor Ratio Display Range [11]  Error in (no error) [8]  Error [0] error out	Constrains the sliders of the Phasor Ratio (or other parameter) Range to the displayed slide's min and max values.			
AlliGator Settings Array	[0] AlliGator Settings Array	Returns the complete list of settings parameters (values of the enumerated constant).			
AlliGator Settings Control Label to Element	Control Label [8] [2] AlliGator Settings List Ele Error In [7] [1] Error Out	Convert Control label to Settings Parameter List enum.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Settings Element to Control Label	AlliGator Settings List [2] TEDY [7] Label	Returns the last string after the rightmost semicolon in the parameter's name., which corresponds to the control's label.			
AlliGator Settings Event Refnum	AlliGator Settings Event [1] [7] AlliGator Settings Event Re  [9] Error Out	Sends user event to the Settings window.			
AlliGator Settings Names	Settings Name Array   Settings Name Array	Returns the list of settings parameter names stored internally.			
AlliGator Settings Storage	AlliGator Settings List [7] Variant Data in [11]  Error In [8]  Get(F)/Set [6]  [3] Variant Data out [0] Error Out	Get/Set Settings parameter values using variant attributes.			
AlliGator Settings to String v2	Settings to Export (All) [11] [3] Message error in (no error) [8] [0] error out	Returns a string listing all or only the selected settings.			
AlliGator Settings Window	Sottings	GUI providing access to settings parameters for all aspect of AlliGator's functions.			
AlliGator Special Controls Update	VI Refnum [11] AlliGator Settings List Ele [9] error in (no error) [8]  VI Refnum (dup) 22 VI Name [0] Error Out	Handles update of some Settings controls & indicators as a result of settings changes.			
AlliGator SYNC Period	⑤——— [0] SYNC Period	Returns the <b>SYNC Period</b> stored in Settings.			
AlliGator Update Channel File Settings	Available Channel Names [11] Selected Channel Name [10] Channel Arithmetic [9] Error In [8]	Updates the values of the <b>Channel Name</b> and <b>Channel Arithmetic</b> controls, as well as of the hidden <b>Available Channel Names</b> indicator.			
AlliGator Update Settings & Control	[AlliGator Settings.lvlib:AlliGator Update Settings & Control.vi]	Updates the Control whose reference or label is passed. The Settings window is updated as well (or if the Settings Window is the sender, AlliGator is).			
AlliGator Update Settings Available Channel Names	Gate Name Refnum [11]  Update  Update  Update  Update  Update  [1] Message  error in (no error) [8]  [0] error out	Updates the <b>Channel Name</b> control in the Settings window.			

Name	Connector pane	Description	s.	R.	I.
AlliGator Update Settings Dataset Channel	AlliGator Queue [11] Selected Channel [10] Initialization? [9] error in (no error) [8]	Updates <b>Source Image</b> according to the <b>Selected Channel</b> .			
AlliGator Update Settings Decay Shift Parameters Visibility	Shift Parameters Refnum [11] [3] Shift Parameters Refnum error in [8] [0] error out	Updates the visibility of controls related to shift pre-processing operations.			
AlliGator Update Settings Fit Options Laser Period	Fit Options Refnum [11] [13] Fit Options Refnum Use Data Information Laser [10] [10] error out	Updates the <b>Fit Options</b> cluster's <b>Laser Period</b> obtained from the Data Information tab ot the Settings if the <b>User Data Information Period</b> option is selected.			
AlliGator Update Settings Fit Options	Fit Options Refnum [11] [13] Fit Options Refnum Use Data Information Laser [10] [10] error out	If the <b>Laser Period</b> parameter of the <b>Fit Options</b> is modified, and it is different from the value associated with the dataset, toggles the <b>Use Data Information Laser Period</b> checkbox off.			
AlliGator Update Settings Guess Parameter Arrays	Modified Control [7] Guess Parameters [11] Guess Parameter Names [10] Guess Parameter Name (10) Guess Parameter Name (10) Guess Parameter Name Array [2] Guess Parameter Name Array [6] Error Out	Handles user modifications of the <b>Guess Parameter Names</b> and/or <b>Guess Parameter Values</b> in the Settings window.  Ensures that both arrays have the same size.			
AlliGator Update Settings IRF Analysis Method Control	error in (no error) [8] [1] Message [0] error out	Update decay shifting parameters in the Settings window.			
AlliGator Update Settings Python Options & Valid Flag	[AlliGator Settings.lvlib:AlliGator Update Settings Python Options & Valid Flag.vi]	Updates Python Plugins options and Valid Session flag in the Settings window.			

Name	Connector pane	Description	S.	R.	I.
AlliGator Update Settings Python Options	Python Settings Refnum [11]  error in (no error) [8]  [0] error out	Updates Python Plugins options in the Settings window.			
AlliGator Update Settings SEPL Parameters	# Gate Parameters Refnum [11] # Gates [10] Gate Separation [9] Error In [8] Gate Duration [6]	Updates SEPL parameters in the Settings window.			

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid$   $\blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

#### 2.23.2. Library Constant VIs

**NOTE** No Constant VIs Found

# 2.24. AlliGator Shot Noise Influence on Average Lifetime.lvlib

Responsibility: VIs used for the Shot Noise Influence on Average Lifetime Analysis Tool.

**Version:** 1.0.0.0

#### **2.24.1. Functions**

Table 22. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
AlliGator Compute Shot Noise Average Lifetime Simulation Histograms	Histogram Bin Size [1]  Average Lifetimes (Micro Fol. [0]  Lifetime Histo Percentiles [7]  Average Lifetime SUNG (Am. [9]  Lifetime Histo Percentiles [7]  Histogram Bin Size (SDV) [12]  SDV Histo Percentiles [13]	Computes histograms and summary statistics for the computed lifetimes.			
AlliGator Shot Noise Influence on Average Lifetime	Alliquitor  (T)  Statistics	Main window of the Shot Noise Influence on Average Lifetime tool.			

Name	Connector pane	Description	S.	R.	I.
AlliGator	Phasor Parameters [10]  Phasor Parameters [10]  Error In [8]  Fror In [8]  Fror In [8]	Performs the simulations used in the Shot			
Simulate	seed [6] [0] Error Out [4] Message	Noise Influence on Average Lifetime tool.			
Average					
Lifetime of					
Linear					
Combination					

Reentrancy:  $\blacksquare$   $\rightarrow$  Preallocated reentrancy  $\mid \blacksquare$   $\rightarrow$  Shared reentrancy

Inlining: → Inlined

## 2.24.2. Library Constant VIs

**NOTE** No Constant VIs Found

# **Chapter 3. Legal Information**

#### 3.1. Document creation

This document has been generated using the following tools.

#### **3.1.1.** Antidoc

Project website: Antidoc

Maintainer website: Wovalab

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#### 3.1.2. Asciidoc for LabVIEW<sup>TM</sup>

Project website: Asciidoc toolkit

Maintainer website: Wovalab

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## 3.2. Product used in the project

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