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Chapter 1. Project description

AlliGator: Fluorescence Lifetime Imaging Data Analysis

This software reads fluorescence lifetime imaging (FLI) datasets from different sources (.sdt, .ptu, .bin, PicoStar or SPAD512S image series, SwissSPAD hdf5, etc.) and provide tools to analyze them by nonlinear least-square fit (NLSF), maximum likelihood estimation (MLE) or phasor analysis.

online repository: https://github.com/smXplorer/AlliGator online manual: https://alligator-distribution.readthedocs.io/

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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 Current Dataset to the Accumulated Dataset , 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 Current Dataset 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 New Image (gate image) to the Accumulated Image Sum (for that gate). If the current Dataset Index is 0 (first dataset in the Series), the Accumulated Image Sum 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)

| Name | Connector pane | Description | S. | R. | I. |
|--|--|--|----|----|----|
| AlliGator Action Loop | AlliGator Refnums [10] AlliGator Ctrl Refnums [10] 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 Add Action Array to Stack | Alligator Queue Element 1 [10] | 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 Add Single Action to Stack | Alligator Queue Element 1 [10] [2] Alligator Queue Element 1 (Alligator Atomic Action [9] [3] [4] [5] [5] [6] [6] [6] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7 | 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. | | | |
| AlliGator Add Test Result | error in (no error) [8] [0] error out | No description found (add content in vi description) | | | |
| AlliGator Calibration Actions | Script in [2] Vi in [1] AlliGator Q Elements [0] data value reference [3] AlliGator Q Event in [7] Data [9] error in (no error) [11] AlliGator Ctrl Refnums [12] | Processes AlliGator phasor calibration-related actions. | | | |
| AlliGator Check for Abort | AlliGator Q Elements [1] [0] AlliGator Q Elements | Checks whether there is any Abort action in the input AlliGator Q Elements . If so, remove all other action items. | | | |

| 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 | | | |
| AlliGator Current Event | AlliGator Q Event in [2] [7] AlliGator Q Event out Get(F)/Set [4] | phasor and/or phasor ratio references. Get/Set current AlliGator action being processed. | | | |
| AlliGator Decay Actions | Script in [2] Vi in [1] AlliGator Q Elements in [0] AlliGator IV DVR in [5] AlliGator Q Event in [7] Data [9] error in (no error) [11] AlliGator Crif Refnums [12] | Processes AlliGator decay-related actions. | | | |
| AlliGator Decay Fit Parameter Map Actions | Script in [2] Vin [1] AlliGator Q Elements in (0) data value reference [5] AlliGator Q Event in [7] Data [9] error in (no error) [11] AlliGator Ctrl Refnums [12] | Processes AlliGator decay fit parameter map-related actions. | | | |
| AlliGator Event to Event Category | AlliGator Q Event [8] [2] Event Category | Extracts the category an AlliGator Q Event 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 AlliGator Q Event enum to the corresponding string. | | | |
| AlliGator Files Actions | Script in [2] AlliGator Q Elements in [0] AlliGator IV DVR [5] AlliGator V Event in [7] Data [9] error in (no erro) [11] AlliGator Ctri 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 Timeout ago, where Timeout is part of the Filtered Event Data . | | | |
| AlliGator FLI Dataset Actions | Script in [2] Vi in [1] AlliGator Q Elements [0] AlliGator IV DVR in [5] AlliGator IV DVR in [7] 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] Vi in [1] AlliGator Q Elements [0] AlliGator IV DVR in [5] AlliGator IV DVR in [7] Data [9] error in (no error) [11] AlliGator Ctrl Refnums [12] | Processes AlliGator FLI Dataset Series-related actions. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|--|---|---|----|----|----|
| AlliGator Generic Graph Actions | Script (2) (3) (3) Script out (4) AlliGator Q Elements out data value reference in (5) (5) (5) (6) Data Value Reference out AlliGator Q Event in (7) (7) (5) (6) Data Value Reference out AlliGator Q Event in (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] AlliGator Q Elements in [0] AlliGator (D Elements out AlliGator (D Elements out AlliGator (D Elements out AlliGator (D Event in [7]) AlliGator Q Event in [7] Obata [9] error in (no error) [11] AlliGator C Life fernums [12] | 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] Vi in [1] AlliGator Q Elements [0] AlliGator IV DVR in [5] AlliGator IV DVR in [7] AlliGator V DVR in [7] Data [9] error in (no error) [11] AlliGator Ctrl Refnums [12] | Processes AlliGator source image-related actions. | | | |
| AlliGator Initialize Images | AlliGator IV DVR [11] [3] AlliGator IV DVR Phasor Plot Display [10] [0] 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] [3] Script out [4] AlliGator Q Elements in [0] [4] AlliGator Q Elements out AlliGator IV DVR in [5] [5] AlliGator IV DVR out AlliGator C Event in [7] [5] [6] AlliGator IV DVR out AlliGator C Event in [7] [7] [7] [7] [7] [7] [7] [7] [7] [7] | 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] In [1] AlliGator Q Elements in [0] Data Value Reference out AlliGator Q Event in [7] Data [9] error in (no error) [11] AlliGator Ctri Refnums [12] | Processes AlliGator phasor graph-related actions. | | | |
| AlliGator Phasor Plot Actions | Script in [2] Vin [1] AlliGator Q Elements in [0] data value reference in [5] Data [9] error in (no error) [11] AlliGator Ctrl Refnums [12] | Processes AlliGator phasor plot-related actions. | | | |
| AlliGator Phasor Ratio Actions | Script in [2] Vi in [1] AlliGator Q Elements in [0] AlliGator Q Elements out data value reference 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] [7] [7] [7] 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 Dataset Information String 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: σ \rightarrow Protected | σ \rightarrow Community

Reentrancy: □ → 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 [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 (13) Guess Parameters (13) Guess Parameters (14) Guess Parameters (15) Guess (15 | 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] [6] 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 All ROIs NLSF Analysis:Interactive (Slow) 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 Country (1) Message (1) Message (1) error out | 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 Min and Max Decay Percentile 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 Fit Parameter Constraints 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 Fit Parameter Constraints . | | 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] [9] 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 Guess Parameters 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 Guess Parameters 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] [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 IRF Values as well as the IRF Locations . | | | |
| 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 Last Fitted Parameters as well as Last Decay Max - Min . | | | |

| 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 Guess Parameters 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] Is Valid? [0] Error Out | Checks whether the input Decay 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 Reference Decay 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 INDICENSES IN THE OPERATE SHAPE | Fits the provided decay to 1-Exp or 2-Exp model. This VI assumes that All Parameter Constraints 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 Head (HE) and a Tail (TS) cursor in the Decay Graph 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 Lifetime & Other Parameters Graph . | | | |
| 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 Decay Graph using the provided Shift and adds it to the last plot in the Lifetime & Other Parameters | | | |
| 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 Decay Graph maximizing the cross-correlation of that plot and the Reference Decay and adds this value to the last plot in the Lifetime & Other Parameters Graph . | | | |
| 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 Background Subtraction Parameters 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] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7 | Get/Set Decay Pre-processing parameters. | | | |
| AlliGator Preprocess Decay v3 | Decay (in) [1] [5] Decay Metadata [7] Message [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] Fabruari [1] ROI Pixels (1) [9] Fabruari [1] Fabruari [1] | 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 Decay Graph 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 Decay Location 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) | Get : Check which plot(s) to process, and add/remove checkmarks accordingly. In this case, the Menu 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] [11] Etrapolated Decay Message error in (no error) [8] [12] [13] [14] [15] [15] [16] [16] [17] [17] [18] [18] [18] [18] [18] [18] [18] [18 | 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 Intensity Time Trace 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 Plot | 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 Parameters. [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 Is Full Image Parameter Map 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 | > |
| AlliGator Plot Fit Parameter vs Intensity v2 | Lifetime Graph refnum [7] Data Value Reference in [11] ROl idx (214783647: al ROb.) [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 Lifetime & Other Parameters Graph . | | | |
| 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 Lifetime & Other Parameters Graph . | | | |
| AlliGator Update Decay Fit Parameter Map Palette | | Updates the color palette of the Decay Fit Parameter Map image. | | | |

Scope: σ \rightarrow Protected | σ \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] Min((1-G2/INT)*<int>) Error In [8] [0] Error Out Sum(INT) [6] [1] Min(1-G2/INT)*<int>) Min(G2) [1] Min(G2/INT)*<int>) Min(G2) [1] Min(G2/INT)*<int>) Min(G2) [1] Min(G2/INT)*<int>) Min(G2) [1] Min(G2/INT)*<int>) Min(G2) [2] Min(G2/INT)*<int>) Min(G2/INT)*<in< td=""><td>Computes (1 - G2/INT)*<int>.</int></td><td></td><td></td><td></td></in<></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></int></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] Sum(INT) [6] INT Images [4] | 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 Anhometic [10] GZ Channel Name (or single [13] Selected Channel Mame (or single [14] INT Channel Name (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] Period [10] 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 2 [5] a 1 [7] Error in [11] Percentiles to Keep (1, 99) [12] Percentiles to Keep (1, 99) [12] Histogram Bin Size (fau) [3] Histogram Bin Size (fau) [14] tau 1 [0] Array Statistics (fau 2) [8] Array Statistics (al) [10] Array of Scales [11] Plot Names | 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] Error In [8] [0] Error Out | Saves simulation results. | | | |
| AlliGator Too Many Histogram Bins Message | error in (no error) [0] | Too many bins error dialog. | | | |

Reentrancy:

Preallocated reentrancy |

Shared reentrancy

Inlining: → Inlined

2.13.2. Library Constant VIs

NOTE No Constant VIs Found

2.14. AlliGator Global Decay Fit.lvlib

Responsibility: VIs handling global decay fit operations

Version:

2.14.1. Functions

Table 14. Functions (non private scope only)

| Name | Connector pane | Description | S. | R. | I. |
|---|--|--|----|----|----|
| Convert Global Decay Fit Parameter Constraints | Fit Parameter Constraints [1] [3] Parameter Bounds Fit Model [10] [1] Global Parameters? Flots [9] [1] Fror In [8] | No description found (add content in vi description) | | | |
| Get 1-Exp Global Fit Guess Parameters v2 | Full Decays [11] Gan | No description found (add content in vi description) | | | |
| Get 2-Exp Global Fit Guess Parameters v2 | Full Decays [1] [2] Initial Parameters Global Fit Parameter Info [3] Frum. | No description found (add content in vi description) | | | |

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

Inlining: → Inlined

2.14.2. Library Constant VIs

NOTE No Constant VIs Found

2.15. AlliGator Globals, Variables & Constants.lvlib

Responsibility: Globals, refnums, constants, etc.

Version:

2.15.1. Functions

This library has no functions set to non private scope.

2.15.2. Library Constant VIs

NOTE No Constant VIs Found

2.16. AlliGator HDF5.lvlib

Responsibility: VIs handling HDF5 dataset files.

Version: 1.0.0.0

2.16.1. Functions

Table 15. 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] Gate Gate Gate Gate Gate Gate Gate Gate | Checks that the gate images stored in the HDF5 file correspond to the description provided by the FLI Parameters . If so updates # Gates in that structure and sets the corresponding output flags. | | | |
| AlliGator Check Gate Number in HDF5 File v3 | Gate Names [7] ref in [11] Gate 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 FLI Parameters . If so updates # Gates in that structure and sets the corresponding output flags. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|---|---|---|----|----|----|
| AlliGator Check HDF5 File Type | HDF5 File Path in [11] error in (no error) [8] Disc. [3] HDF5 File Path out [2] FLI Dataset Type [11] 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] [3] FLI Parameters out Image ROI Information [10] [3] FLI Parameters out 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 ROI Information [10] [5] [5] [6] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7 | 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 DAQ Parameters and Metadata string from internal data storage. | | | |
| AlliGator Get Pile-up Correction Parameter | Data Information [11] Pile-up Correction in [10] Pile-up Correction in [10] Pile-up Correction out Piace 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] SS2? [8] Is SS2 Dataset? Error In [9] [10] Error Out | Checks wether a HDF5 file is a SS2 dataset file (early version). | | | |
| AlliGator Load HDF5 FLI Dataset Information | File Path [11] [3] FLI Data File Information Error In [8] [7] Data Description [7] error out [4] elapsed (relative) seconds | Loads HDF5 FLI dataset information. | | | |
| AlliGator Load HDF5 FLI Dataset Prelude | File Path [11] [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 | HDFS FLI File Loading Infor [10] 29 HDFS FLI File Loading Infor [10] 29 HDFS FLI File Loading Infor [11] File Information String [10] error out | Loads HDF5 FLI dataset file information (v0.6). | | | |

| Name | Connector pane | Description | S. | R. | I. |
|---|--|--|----|----|----|
| 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] [3] Data 1 File Info [10] [1] Data 2 error in (no error) [8] [0] error out 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] Output (3) File Paths (dup) Output (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] [13] Selected Channel [22] Channel Airthmetic [1] Cancelled? [10] Error Out | Dialog window to select which SS3 channel to display. | | | |
| AlliGator Single SS3 Gate Slip Correction | Refnum in [11] [3] Refnum out [3] Re | 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] error in (no error) [8] [0] error out | Performs the column truncation for SS3 datasets needed to fix a common FPGA data transfer issue. | | | |

Reentrancy:

→ Preallocated reentrancy |

→ Shared reentrancy

2.16.2. Library Constant VIs

NOTE No Constant VIs Found

2.17. AlliGator Intensity Corrections.lvlib

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

Version: 1.0.0.0

2.17.1. Functions

Table 16. 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 timestamp and intensity corrections (if available and requested) or use defaults instead. | | | |
| AlliGator Load Intensity Corrections | Intensity Correction File [11] [3] Intensity Corrections [1] Message [0] Error Out | Loads saved dataset series intensity corrections. | | | |
| AlliGator MCP Voltage to Gain | MCP Voltage [11] Mission MCP Parameters [9] Alimenter 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. | | | |

Reentrancy:

→ Preallocated reentrancy |

→ Shared reentrancy

Inlining: → Inlined

2.17.2. Library Constant VIs

NOTE No Constant VIs Found

2.18. AlliGator Internal Variables.lvlib

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

Version:

2.18.1. Functions

This library has no functions set to non private scope.

2.18.2. Library Constant VIs

NOTE No Constant VIs Found

2.19. AlliGator Lifetime.lvlib

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

Version: 1.0.0.0

2.19.1. Functions

Table 17. Functions (non private scope only)

| Name | Connector pane | Description | s. | R. | I. |
|---|--|--|----|----|----|
| AlliGator Add Average Lifetime to Plot | New Plot Name [5] Plot (D (-1) [7] Lifetime Graph refnum [11] Abscissa [10] Average Lifetime (dup) Alexand Lifetime [9] error in (no error) [8] [3] Average Lifetime (dup) [1] Plots [1] Plots [0] error out | 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: \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 Local Decay Window.lvlib

Responsibility: VIs used with the Local Decay Window.

Version: 1.0.0.0

2.20.1. Functions

Table 18. 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] [6] [7] [9] error out [7] [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 | YY Graph Refnum [11] Profile Window Data [10] Error In [8] [0] Error Out | Updates the Local Decay Window graph. | | | |

Scope: σ \rightarrow Protected | σ \rightarrow Community

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 Python Plugins.lvlib

Responsibility: VIs handling python plugins.

Version: 1.0.0.0

2.21.1. Functions

Table 19. 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] Parent Menu Tag [9] 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) error in (no error) [8] [0] error out | Gets object's python function's information | | | |
| AlliGator Find Python Function Information | Function Menu Item Tag [10] 7 [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 [1] [3] Python Plugin Dialog Output Error In [8] [0] Error Out | Formats path for python function consumption. | | | |
| 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] Error In [8] [2] Parameters Out [1] Cancelled? [0] Error Out | 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] [1] Valid Python Session [10] Error Out [4] Message | Gets the current (or creates a new) python session ID. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|---|--|--|----|----|----|
| 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 [11] (3) Variant (50N) [10] (501 (10) (10) (10) (10) (10) (10) (10) (1 | 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] Function Target Type [9] Salting Function Target Type [9] Salting | 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. | | | |
| 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] [3] String out Error In [8] [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". | | | |

| Name | Connector pane | Description | s. | R. | I. |
|---|---|--|----|----|----|
| 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] Error In [8] [1] Message [0] Error Out | Sends python function doc string to Notebook. | | | |
| AlliGator Run XY Graph Python Function | data value reference in [11] [3] Data Value Reference out Mouse Click Event Data [10] [1] Message Python Function Info [9] error out 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 [1] XY Graph Event [10] error in (no error) [8] AlliGator Ctrl Refnums [6] | Calls XY Graph-associated python function. | | | |
| AlliGator Add Missing Parameter Map Parameters | Parameter Names [11] Parameter_Flattened_Map in [9] Enror in [8] [1] Parameter_Flattened_Map out Enror in [8] [2] Error Out | 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] | Calls FLI Dataset python function. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|---|--|---|----|----|----|
| AlliGator Parameter Names to Parameters List | Parameter Names [11] [3] [Decay Fit Parameter Name] [11] Complete Map | Converts parameter names to an array of enums. | | | |
| AlliGator Python Plugin Get FLI Dataset | Data Value Reference in [1] 33 Data Value Reference out AlliGator Parameter Names N [1] 22 AlliGator Parameter Names N [1] 15 FL Dataset Data 90 error in (no error) [8] 00 error out | Gets FLI Dataset and related information to pass to a python plugin. | | | |
| AlliGator Python Plugin Get FLI Dataset Data | AlliGator DIV DVR in [11] Firor In [8] 77 [[IRFs.]] 5] IRF Array Time Axis 3] AlliGator DIV DVR out Error In [8] 11] SCL 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] Current Data [9] error in (no error) [8] [0] error out | Runs FLI Dataset python plugin function. | | | |
| AlliGator Pythin Plugin Get Reference Decay | Data Value Reference in [11] [3] Data Value Reference out AlliGator Parameter Names in [10] [4] Tourish (in error) [8] [5] Parameter Names out (1) Reference Decay (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 Found? 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. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|--|--|---|----|----|----|
| 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 | Valid Destination? [9] error out | Outputs warning message with invalid destination. | | | |
| AlliGator Check Invalid Python Plugin Output Value Type | Source [11] Valid Output Value Type? [9] error in (no error) [8] | Outputs warning with invalid output value type | | | |
| AlliGator Check Missing Python Plugin API Version | Function Name Found [11] Source [9] error in (no error) [8] | Outputs warning with missing function name. | | | |
| AlliGator Check Missing Python Plugin Doc String | Source [9] error in (no error) [8] | Outputs warning with missing doc string message. | | | |
| 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. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|--|--|--|----|----|----|
| 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] error in (no error) [8] [0] error out | Looks for Python Plugin Header and Footer and returns: - String before Header - Output Type - Output Destination String before Header: 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, | | | |
| 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 Get Python Plugin API Version | Script Header [11] Source [10] From (11) API Version (11) API (12) error out | No description found (add content in vi description) | | | |

| Name | Connector pane | Description | S. | R. | I. |
|--|--|--|----|----|----|
| AlliGator Get Python Plugin Function Parameters String | Function Display Name [11] Function Parameters [10] all [2] Function Parameters JSON St error in (no error) [8] | 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] [0] Error Out | 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 [0] error out | Extracts list of python plugin functions and their information from python script. | | | |
| 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 String in [11] [3] String in (dup) Error In [8] [2] Function Offsets [0] Error Out | Finds function definition section Offsets . Returns the script part preceding the first function as Script Header . | | | |
| 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 [1] Parent Menu Locations [0] 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] Walid Python Session [6] error out [4] Message | Resets python session. | | | |
| 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. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|---------------|--|-------------------------------------|----|----|----|
| AlliGator | Image Event [11] Data Value Reference in [10] error in (no error) [8] [1] Message [0] error out | Runs image-related python plugin | | | |
| Image | | function. | | | |
| Python | | | | | |
| Function | | | | | |
| Handler Core | | | | | |
| AlliGator Run | Data Value Reference in [11] Python Function Info [10] Source Image [9] For ror in (no error) [8] Python Function Output Type For ror of the ror out | Runs image-related python function. | | | |
| Source Image | entri in (no entri) (s) —————————————————————————————————— | | | | |
| Python | | | | | |
| Function | | | | | |

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

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 ROIs.lvlib

Responsibility: VIs handling ROI actions.

Version: 1.0.0.0

2.22.1. Functions

Table 20. 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] | Computes complementary ROI and adds it to the ROI list. | | | |
| AlliGator Create Individual Pixel ROIs from ROI | V Resolution [5] X Resolution [7] ROI [11] Selected ROI (-1: use ROI D | Converts a closed ROI into a series of single-pixel ROIs. | | | |
| AlliGator Find ROI Name | ROI Descriptor [11] [3] Image Control ROI Description [11] Fund? [11] Found? [12] Error Out | Looks for the stored ROI having thes same definition as the input ROI and returns its name if found. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|---|--|---|----|----|----|
| AlliGator Get Current ROI Name | Current ROI Name | Returns the current ROI name. | | | |
| AlliGator Get ROI Components | Stored ROIs [11] Secretary | separates stored ROIs information into arrays of: - ROI Descriptors - ROI Names - Overlay Colors | | | |
| AlliGator Get ROI Names | Stored ROIs in [2] EXILIBRITIAN [7] ROI Name | Returns list of ROI names. | | | |
| AlliGator Load ROI v3 | Source Image Refram [1] Dialog (T) [10] Destination Image (Source I [9] Error In [8] [5] # ROIs Loaded [3] Message [2] Updated ROIs [1] Current ROI [0] (For Out [4] Phasor Plot Image [6] 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] Fraction [3] # ROIs Loaded [1] 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] State Save Since Si | Saves single ROI. | | | |
| AlliGator Set New ROI Name | Stored ROIs in [2] ROI Name in [3] [0] ROI Name out Default Name ("") [4] | Sets new ROI name (verifies that the input name is not already used). | | | |
| AlliGator Update ROI After Mouse Release | ROI Descriptor [11] ROI Types [10] Shift Key? (F) [9] Fror In [8] Phasor Image? (F) [6] | Builds list of actions handling ROI update following a mouse release event. | | | |
| AlliGator Get Phasor Plot ROI Event Refnum | [0] Phasor Plot ROI Event Refnum | Returns the Phasor Plot Image ROI Event refnum. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|---|--|---|----|----|----|
| AlliGator Get Phasor Plot ROIs, Names & Current ROI | [AlliGator ROIs.lvlib:AlliGator Get Phasor Plot ROIs] | 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 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 Plat ROI Manager | Phasor Plot image ROI list display UI. | | | |
| AlliGator Quit Phasor Plot Image ROI Manager | Error In [8] [0] Error Out | Handles Phasor Plot image ROI Manager quit event. | | | |
| AlliGator Select Phasor Plot ROI | ROI Selection Data [11] [3] ROI Descriptor [2] ROI Mame [0] Error In [8] [0] Error Out | Handles Phasor Plot image ROI selection. | | | |
| AlliGator Compute & Plot All ROIs Characteristi cs | [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. | | | |
| 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. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|---|--|---|----|----|----|
| AlliGator Add Multiple Source Image ROIs | Header message [7] ROI Mask Image Path [11] ROIs [9] Error In [8] From [9] Error Out | Adds multiple Source Image ROIs to ROI storage. | | | |
| AlliGator Get All Image ROIs | All mage Role | 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 | _ | 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) [7] [7] [7] [7] [7] [7] [7] [7] [7] [7] | 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 (11) Mask Image Name (Default n. (19) 10) 11 Massign (10) error in [8] 10 Proposition (10) error out | Define ROIs as sets of Mask Image pixels with identical integer values. If the Mask Image Name 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 cs | Source Image Refnum [10] Flaton Color Roll Mask Refnum [10] Flaton Color Roll Mask Refnum [10] Flaton Color Roll Roll Characteristics String error in (no error) [8] Flaton Color Roll Roll Characteristics String error out | Computes ROI characteristics and compare them to the conditions defined by the user in a dialog box. Keeps only the ROIs that meet those conditions. | | | |
| AlliGator ROIs to Mask Image | Data Value Reference in [11] [3] Data Value Reference out All ROIs? [9] [1] Message error in [8] [7] error out | Uses existing ROIs to build a mask image summarizing their information. Define ROIs as sets of Mask Image pixels with identical integer values. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|---|---|---|----|----|----|
| AlliGator Select Source Image ROI | ROI Selection Data [11] [5] # ROIs [3] ROI Descriptor [2] ROI Name [7] Overlaye Color [9] Error Out [4] Current ROI | Selects Source Image ROI(s). | | | |
| AlliGator Set Source Image ROI ID | New ROI ID [10] Sat [2] New ROI ID [2] New ROI ID [3] # ROIS [4] New ROI ID [6] Error Out | 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 in [1] old ROI Name in [0] accepted? | Changes current Source Image ROI name. | | | |
| AlliGator Source Image ROI Manager | Alliques Source Im. 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. | | | |

 $\textbf{R} eentrancy : \blacksquare \ \rightarrow \ Preallocated \ reentrancy \ | \ \blacksquare \ \rightarrow \ Shared \ reentrancy$

Inlining: → Inlined

2.22.2. Library Constant VIs

NOTE No Constant VIs Found

2.23. AlliGator Scripts.lvlib

Responsibility: AlliGator actions performing a series of sequential tasks.

Version: 1.0.0.0

2.23.1. Functions

Table 21. Functions (non private scope only)

| Name | Connector pane | Description | s. | R. | I. |
|--|--|---|----|----|----|
| AlliGator Calibrated Phasor Map Series Dialog | [15] Calibration Map/Gate Step List [16] Destination Folder [17] File Name (F Steps will be [18] Save Phasor Map [19] error out [12] OK | Dialog window to enter the information eeded to run the Calibrated Phasor Map Series script. | | | |
| AlliGator Calibrated Phasor Maps Series Script | Phasor Graph refnum [6] Alligator Queue Elements in (0) Calibration Hay/Gate Step Ist [1] File Name (# Steps will be [3] Save Phasor File (\$ 1 | 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] [3] AlliGator Internal Variable [1] [7] [7] [7] [8] [7] [8] [7] [8] [7] [8] [7] [8] [7] [8] [8] [8] [8] [8] [8] [8] [8] [8] [8 | Clears internal data structure before a script. | | | |
| AlliGator Get Series Analysis Type | Menu Tag [11] Series Analysis Type | Decodes menu tag to determine whether an action is limited to the Current ROI or All ROIs . | | | |
| 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 pattern [10] [2] Sorted Subfolder Names error in (no error) [8] [9] [1] Subfolder Paths [10] error out [4] # Files [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] 2] 2 2 3 2 3 2 4 Information out [3] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | Gets/Sets Dataset Information stored in the Settings Storage.vi | | | |
| AlliGator Get- Set Loading & Pre- Processing Options | Scripts.lvlib:AlliGator Get- | Gets/Sets Data Information , Source Image Settings and Decay Preprocessing 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] [0] error out Get (F)/Set (T) [6] | Gets/Sets Source Image options. | | | |
| AlliGator IV Script Destination File Path | [0] Destination File Path | Gets the Script Destination File Path internal variable. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|---|---|--|----|----|----|
| 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 [11] Cursor Positions Array [10] 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] ROI Descriptor [11] FIT Output [10] Delta Best fit Parameters [10] error in (no error) [8] | 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] Detination Folder [16] Gate Step Sperior [17] Phasor Calibration Dataset [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. | | | |
| AlliGator Playback Time-Gated Data Series v2 | Save Phasor Plot with Overlay [3] Save Image with Overlay [1] Alligator Quee Elements io [0] Series Paths [5] Diphayed Image [7] Time Sider Refnum [9] Front in [1] AlliGator Data Series Type [12] Phypack (17/Loop (1) [14] | Launches the playback of a FLI dataset series. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|--|---|--|----|----|----|
| AlliGator Save Single Phasor Plot Script | Phasor Graph Refnum [11] [3] Name & Save Phasor Plot Script Destination Folder path [10] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7 | 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] Path [10] | 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] Tath [10] AlliGator Ctrl Refnums [9] 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 Mame [9] Lord [13] 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-processin [10] Lifetime Graph Refnum [8] Phasor Graph refnum [8] Phasor Graph refnum [8] Phasor Graph refnum [8] IRF rise [1] Dataset File [2] Dataset File [3] Decay Fit Parameter to Savel [19] Error Out Results Folder [7] Bins Array [9] | 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] IRF Loading & Pre-processin [10] IRF Loading & Pre-processin [10] Phasor Graph Refinum [8] Phasor Graph Refinum [8] Phasor Graph Refinum [8] Phasor Graph Refinum [8] IRF File [1] Dataset File [2] Rot File [3] Error In [5] Results Folder [7] Phasor Parameters Scatter Plot [11] | Scripts performing phasor analysis of all pixels in all ROIs, using individual IRFs if provided. | | | |
| AlliGator Script Open Mask Image | Image Path [9] [3] Action List out Error In [8] | Script used to open a Mask Image and identify the corresponding ROIs. | | | |
| AlliGator Script Open White Light Image | Image Path [9] [0] Error Out | Script used to open a White Light Image . | | | |

| Name | Connector pane | Description | S. | R. | I. |
|--|--|---|----|----|----|
| AlliGator Script Sequential ROIs Time- Gated Data Series NLSF Analysis | Alligator Queue Elements in [11] Path [10] Alligator Cure Elements out Path [10] Alligator Cure Elements out Path [10] Alligator Cure Elements out Path [10] Alligator Queue Elements out Path [| 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 [1] 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 [1] [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] | 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] Treels Treels Error In [3] [9] Error Out | 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: → Inlined

2.23.2. Library Constant VIs

NOTE No Constant VIs Found

2.24. AlliGator Settings.lvlib

Responsibility: VIs handling user-defined parameters.

Version: 1.0.0.0

2.24.1. Functions

Table 22. 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] [0] error out error in (no error) [8] | Handles user-initiated parameter changes in the Fit Options panel. | | | |
| AlliGator Compute Natural Frequency | [3] Laser Period Ratural Error In [8] [0] Error Out | 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 Gate Separation settings parameter. | | | |
| AlliGator Get Available Fitting Parameters | Parameter Names [11] [3] Missing Parameter Names [22] [22] [23] [24] [25] [25] [25] [25] [25] [25] [25] [25 | Returns list of parameters not in the Parameter Names list. | | | |
| AlliGator Get Control Label & Settings Element | Settings.lvlib:AlliGator Get | Returns the label string of the Settings control whose CtlRef refnum is provided, as well as the corresponding AlliGator Settings List enumerated value. | | | |
| AlliGator Get Control Notebook String | Control Label [11] [3] Notebook String Value [9] [0] error out | Formats the input Value of the control whose Control Label 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. | | | |
| AlliGator Get Phasor Ratio Interpolated Color Scale | Reference 1 Color [11] [3] Interpolated Color Scale De Reference 2 Color [9] [0] Error Out | Builds a Interpolated Color Scale Definition based on the colors associated with both references. | | | |

| Name | Connector pane | Description | S. | R. | I. |
|---|--|---|----|----|----|
| AlliGator Hot Pixel Removal Options String | Image Display Options [11] [3] String out error in (no error) [8] [0] error out | 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 | (T) [0] Laser Period | Settings Data Information:Laser Period value. | | | |
| AlliGator Nanotime Gate Separation | [0] Nanotime Gate Separation | Settings Data Information:Nanotime Gate Separation value. | | | |
| AlliGator Number of Gates | ⑥——— [0] # Gates | Settings Data Information:# Gates value. | | | |
| AlliGator Phasor Frequency | (F) [0] 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 (1) [7] VI Ref in [11] Control Label [10] Data [9] Error In [8] | Refresh the control with Control Label with the provided Data . Optionally sends this label and value to the Notebook. | | | |
| AlliGator Remove Duplicated Fit Parameter Constraints | Old Constraints [11] County [3] New Constraints out New Constraints in [9] County [6] Error Out [7] Error In [8] | Removes any potential duplicate entries in the array of fit parameter constraints. | | | |
| AlliGator Reorder Decay Pre- processing Operations | Ring in [11] Rearder Proor In [8] Operation Operation [0] Error Out | Dialog window allowing the user to reorder decay pre-processing steps. | | | |
| AlliGator Save-Load Parameter Map Color Palette List | Refnum in [11] [3] Refnum out Load(F)/Save [10] [7] [7] [7] [7] [7] [7] [7] [7] [7] [7 | Loads/Save the list of palettes used for the Decay Fit Parameter Map in the AlliGator Settings ini file. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|---|--|---|----|----|----|
| 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 Phasor Plot 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 File Path 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] Load(F)/Save [10] error in (no error) [8] [0] error out | Loads/Save the list of palettes used for the Source Image in the AlliGator Settings ini file. | | | |
| AlliGator Save-Load Source Image Overlay 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 to overlay a phasor-based map on the Source Image in the AlliGator Settings ini file. | | | |
| AlliGator Set Phasor Ratio Display Range | Phasor Ratio Display Range [11] | 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. | | | |
| AlliGator Settings Element to Control Label | AlliGator Settings List [2] [7] Label | Returns the last string after the rightmost semicolon in the parameter's name., which corresponds to the control's label. | | | |

| Name | Connector pane | Description | s. | R. | I. |
|--|---|--|----|----|----|
| 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 | Fare processes [0] Settings Name Array (lower | 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] [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] [3] VI Refnum (dup) AlliGator Settings List Ele [9] [2] VI Name error in (no error) [8] [9] [10] Error Out | Handles update of some Settings controls & indicators as a result of settings changes. | | | |
| AlliGator SYNC Period | [0] SYNC Period | Returns the SYNC Period 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 Channel Name and Channel Arithmetic controls, as well as of the hidden Available Channel Names 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] Vertex trainable Vertex | Updates the Channel Name control in the Settings window. | | | |
| AlliGator Update Settings Dataset Channel | AlliGator Queue [11] Selected Channel [10] 1 Selected | Updates Source Image according to the Selected Channel . | | | |

| Name | Connector pane | Description | s. | R. | I. |
|--|--|--|----|----|----|
| 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] [10] error out | Updates the Fit Options cluster's Laser Period obtained from the Data Information tab ot the Settings if the User Data Information Period option is selected. | | | |
| AlliGator Update Settings Fit Options | Fit Options Refnum [11] [3] Fit Options Refnum Use Data Information Laser [10] [0] error out error in (no error) [8] [0] error out | If the Laser Period parameter of the Fit Options is modified, and it is different from the value associated with the dataset, toggles the Use Data Information Laser Period checkbox off. | | | |
| AlliGator Update Settings Guess Parameter Arrays | Modified Control [7] Guess Parameters [11] Guess Parameter Names [10] Guess Parameter Names [10] Error In [8] [9] Error In [8] | Handles user modifications of the Guess Parameter Names and/or Guess Parameter Values in the Settings window. Ensures that both arrays have the same size. | | | |
| AlliGator Update Settings IRF Analysis Method Control | IRF Analysis Method Refnum [11] error in (no error) [8] [1] Message 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. | | | |
| 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 ln [8] Gate Duration [6] | Updates SEPL parameters in the Settings window. | | | |

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

Inlining: → Inlined

2.24.2. Library Constant VIs

NOTE No Constant VIs Found

2.25. 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

2.25.1. Functions

Table 23. 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 (Pure Poisson) Average Lifetimes (MilGator) [3] Lifetime Histo Percentiles [7] Average Lifetime SDVs (All [3] Average Lifetime DVs (All [3] Average Lifetime SDVs (All [3] Average Lifetime (AlliGator) Lifetime Histogram Bin Size (DV) [12] SDV Histo Percentiles [13] | Computes histograms and summary statistics for the computed lifetimes. | | | |
| AlliGator Shot Noise Influence on Average Lifetime | Alliquiur (T) Statirtica | Main window of the Shot Noise Influence on Average Lifetime tool. | | | |
| AlliGator Simulate Average Lifetime of Linear Combination | Simulation Parameters [11] Phasor Parameters [10] Fror In [8] Seed [6] Fig. 13 Average Lifetimes (Pure Poi [2] Average Lifetimes (Pure Poi [2] Average Lifetimes SDV (Alli [0] Error Out [4] Message | Performs the simulations used in the Shot Noise Influence on Average Lifetime tool. | | | |

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

Inlining: → Inlined

2.25.2. Library Constant VIs

NOTE No Constant VIs Found

2.26. AlliGator Test Suite.lvlib

Responsibility: No description found (add content in lylib description)

Version: 1.0.0.0

2.26.1. Functions

Table 24. Functions (non private scope only)

| Name | Connector pane | Description | S. | R. | I. |
|---|---|--|----|----|----|
| AlliGator Test Internal Data | AlliGator Test Data [11] [3] AlliGator Test Data Error In [8] [0] Error Out Test State [6] | Updates tested VI's error code. | | | |
| AlliGator Test Suite | Suita | Runs a series of tests. | | | |
| AlliGator Wait for Test Result [no Error] | Time out (10 s) [9] error in (no error) [8] .Vİ | No description found (add content in vi description) | | | |

Reentrancy:

Preallocated reentrancy |

Shared reentrancy

Inlining: \rightarrow Inlined

2.26.2. 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 LabVIEWTM

Project website: Asciidoc toolkit

Maintainer website: Wovalab

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3.2. Product used in the project

Antidoc hasn't been able to detect third party products in the project. This is the author's responsibility to list any of the missing product used.