

## **ATSIFIO Function Reference – Version 0.2**

### **AT\_U32 ATSIF\_SetFileAccessMode(AT\_SIF\_ReadMode \_mode)**

**Description** This function is used to select if the entire SIF file should be read or just the header section. The read mode is decided using the ATSIF\_ReadMode enumeration which has the following values:-

ATSIF\_ReadAll  
ATSIF\_ReadHeaderOnly

**Arguments** AT\_SIF\_ReadMode \_mode: The enumeration for selecting the SIF file read mode

**Return** See list of possible return codes in this document

### **AT\_U32 ATSIF\_ReadFromFile(AT\_C \* \_sz\_filename)**

**Description** This function is used to open a SIF file where the file name and path are contained in the character array \_sz\_filename.

**Arguments** AT\_C \* \_sz\_filename: The character array containing the SIF file path and file name

**Return** See list of possible return codes in this document

**Note** If the file is opened with an access mode of ATSIF\_ReadAll then ATSIF\_CloseFile must be called to free access to the file.

### **AT\_U32 ATSIF\_CloseFile()**

**Description** This function is used to close the currently opened SIF file. This should be called whenever the SIF has been opened using the ATSIF\_ReadAll enumeration and is no longer needed by the calling program.

**Arguments** none

**Return** See list of possible return codes in this document

### **AT\_U32 ATSIF\_ReadFromByteArray(AT\_U8 \* \_buffer, AT\_U32 \_ui\_bufferSize)**

**Reserved Function**

### **AT\_U32 ATSIF\_IsLoaded(AT\_32 \* \_i\_loaded)**

**Description** This function is used to determine if a SIF file is currently loaded. \_i\_loaded will be 0 if there is no file loaded and 1 if a file is loaded.

**Arguments** AT\_32 \* \_i\_loaded: 0 – No SIF file currently loaded  
1 – SIF file currently loaded

**Return** See list of possible return codes in this document

<b>Description</b>	This function is used to determine if a particular data source is present in the SIF file. The data source is selected using the ATSIF_DataSource enumeration which has the following values:-
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<b>Arguments</b>	ATSIF_DataSource _source:	The enumeration for selecting the SIF file data source
	AT_32 *_i_present:	0 – Data source is not present 1 – Data source is present

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AT_U32 AT_SIF_GetStructureVersion(AT_SIF_StructureElement _element, AT_U32 * _ui_versionHigh,
                                  AT_U32 * _ui_versionLow)
```

Arguments	Description
ATSIF_StructureElement _element:	The enumeration for selecting the SIF file structure element
AT_U32 * _ui_versionHigh:	The high component of the version number
AT_U32 * _ui_versionLow:	The low component of the version number

<b>Arguments</b>	ATSIF_DataSource_source:	The enumeration for selecting the SIF file data source
	AT_U32 * ui_size:	The number of pixels in each frame in the SIF file

**Return** See list of possible return codes in this document

### AT\_U32 ATSIF\_GetNumberFrames(AT\_SIF\_DataSource \_source, AT\_U32 \* \_ui\_images)

**Description** This function is used to retrieve the number of frames in the SIF file. The data source is selected using the AT\_SIF\_DataSource enumeration which has the following values:-

AT\_SIF\_Signal  
AT\_SIF\_Reference  
AT\_SIF\_Background  
AT\_SIF\_Live  
AT\_SIF\_Source

**Arguments** AT\_SIF\_DataSource \_source: The enumeration for selecting the SIF file data source  
AT\_U32 \* \_ui\_images: The number of frames in the SIF file

**Return** See list of possible return codes in this document

### AT\_U32 ATSIF\_GetNumberSubImages(AT\_SIF\_DataSource \_source, AT\_U32 \* \_ui\_subimages)

**Description** This function is used to retrieve the number of sub-images in each frame in the SIF file. The data source is selected using the AT\_SIF\_DataSource enumeration which has the following values:-

AT\_SIF\_Signal  
AT\_SIF\_Reference  
AT\_SIF\_Background  
AT\_SIF\_Live  
AT\_SIF\_Source

**Arguments** AT\_SIF\_DataSource \_source: The enumeration for selecting the SIF file data source  
AT\_U32 \* \_ui\_subimages: The number of sub-images in each frame in the SIF file

**Return** See list of possible return codes in this document

### AT\_U32 ATSIF\_GetSubImageInfo(AT\_SIF\_DataSource \_source, AT\_U32 \_ui\_index, AT\_U32 \* \_ui\_left, AT\_U32 \* \_ui\_bottom, AT\_U32 \* \_ui\_right, AT\_U32 \* \_ui\_top, AT\_U32 \* \_ui\_hBin, AT\_U32 \* \_ui\_vBin)

**Description** This function is used to retrieve the information about each sub-image in the SIF file. The data source is selected using the AT\_SIF\_DataSource enumeration which has the following values:-

AT\_SIF\_Signal  
AT\_SIF\_Reference  
AT\_SIF\_Background  
AT\_SIF\_Live  
AT\_SIF\_Source

**Arguments** AT\_SIF\_DataSource \_source: The enumeration for selecting the SIF file data source  
AT\_U32 \_ui\_index: The sub-image index  
AT\_U32 \* \_ui\_left: The left coordinate of the sub-image  
AT\_U32 \* \_ui\_bottom: The bottom coordinate of the sub-image  
AT\_U32 \* \_ui\_right: The right coordinate of the sub-image  
AT\_U32 \* \_ui\_top: The top coordinate of the sub-image  
AT\_U32 \* \_ui\_hBin: The horizontal binning used in the selected sub-image  
AT\_U32 \* \_ui\_vBin: The vertical binning used in the selected sub-image

**Return** See list of possible return codes in this document

### **AT\_U32 ATSIF\_GetAllFrames(ATSIF\_DataSource \_source, float \* \_pf\_data, AT\_U32 \_ui\_bufferSize)**

**Description** This function is used to retrieve all the frames of data in the SIF file. The data source is selected using the ATSIF\_DataSource enumeration which has the following values:-

ATSIF\_Signal  
ATSIF\_Reference  
ATSIF\_Background  
ATSIF\_Live  
ATSIF\_Source

**Arguments**

ATSIF_DataSource _source:	The enumeration for selecting the SIF file data source
float * _pf_data:	The array of float data containing all frames in the SIF file
AT_U32 _ui_bufferSize:	The number of pixels in the float array

**Return** See list of possible return codes in this document

### **AT\_U32 ATSIF\_GetFrame(ATSIF\_DataSource \_source, AT\_U32 \_ui\_index, float \* \_pf\_data, AT\_U32 \_ui\_bufferSize)**

**Description** This function is used to retrieve a single frame in the SIF file. The data source is selected using the ATSIF\_DataSource enumeration which has the following values:-

ATSIF\_Signal  
ATSIF\_Reference  
ATSIF\_Background  
ATSIF\_Live  
ATSIF\_Source

**Arguments**

ATSIF_DataSource _source:	The enumeration for selecting the SIF file data source
float * _pf_data:	The array of float data containing the selected frame in the SIF file
AT_U32 _ui_bufferSize:	The number of pixels in the float array

**Return** See list of possible return codes in this document

### **AT\_U32 ATSIF\_GetDataStartBytePosition(ATSIF\_DataSource \_source, AT\_32 \* \_ui\_startPosition)**

**Description** This function is used to retrieve the starting byte position of the source data in the SIF file. The data source is selected using the ATSIF\_DataSource enumeration which has the following values:-

ATSIF\_Signal  
ATSIF\_Reference  
ATSIF\_Background  
ATSIF\_Live  
ATSIF\_Source

**Arguments**

ATSIF_DataSource _source:	The enumeration for selecting the SIF file data source
AT_U32 _ui_startPosition:	The start byte of the source data

**Return** See list of possible return codes in this document

**AT\_U32 AT\_SIF\_GetPropertyValue(AT\_SIF\_DataSource \_source, const AT\_C \* \_sz\_propertyName,  
AT\_C \* \_sz\_propertyValue, AT\_U32 \_ui\_bufferSize)**

**Description** This function is used to retrieve image information from the SIF file. The data source is selected using the AT\_SIF\_DataSource enumeration which has the following values:-

AT\_SIF\_Signal  
AT\_SIF\_Reference  
AT\_SIF\_Background  
AT\_SIF\_Live  
AT\_SIF\_Source

The property name is selected using one of the property type #defines which are listed in this document (e.g. AT\_SIF\_PROP\_EXPOSURETIME). The property information will be copied into the user allocated character array.

**Arguments**

AT_SIF_DataSource _source:	The enumeration for selecting the SIF file data source
const AT_C * _sz_propertyName:	The selected property chosen from the list of property types
AT_C * _sz_propertyValue:	The value of the property
AT_U32 _ui_bufferSize:	The number of characters allocated in the character array

**Return** See list of possible return codes in this document

**AT\_U32 AT\_SIF\_GetPropertyType(AT\_SIF\_DataSource \_source, const AT\_C \* \_sz\_propertyName,  
AT\_SIF\_PropertyType \* \_propertyType)**

**Description** This function is used to determine the type of each property listed in the property type #defines. The data source is selected using the AT\_SIF\_DataSource enumeration which has the following values:-

AT\_SIF\_Signal  
AT\_SIF\_Reference  
AT\_SIF\_Background  
AT\_SIF\_Live  
AT\_SIF\_Source

The property type is returned as one of the AT\_SIF\_PropertyType enumeration types which have the following values:-

AT\_SIF\_AT\_8  
AT\_SIF\_AT\_U8  
AT\_SIF\_AT\_32  
AT\_SIF\_AT\_U32  
AT\_SIF\_Float  
AT\_SIF\_Double  
AT\_SIF\_String

**Arguments**

AT_SIF_DataSource _source:	The enumeration for selecting the SIF file data source
const AT_C * _sz_propertyName:	The selected property chosen from the list of property types
AT_SIF_PropertyType * _propertyType:	The property type for the selected property

**Return** See list of possible return codes in this document

**AT\_U32 ATSIF\_GetPixelCalibration (ATSIF\_DataSource \_source, ATSIF\_CalibrationAxis \_axis,  
AT\_32 \_i\_pixel, double \* \_d\_calibValue)**

**Description** This function is used to retrieve the calibrated value (e.g. wavelength) for the corresponding pixel in the source data of the SIF file. The data source is selected using the ATSIF\_DataSource enumeration which has the following values:-

ATSIF\_Signal  
ATSIF\_Reference  
ATSIF\_Background  
ATSIF\_Live  
ATSIF\_Source

The axis to probe is selected using the ATSIF\_CalibrationAxis enumeration which has the following values:-

ATSIF\_CalibX  
ATSIF\_CalibY  
ATSIF\_CalibZ

<b>Arguments</b>	ATSIF_DataSource _source:	The enumeration for selecting the SIF file data source
	ATSIF_CalibrationAxis:	The enumeration for selecting the axis value
	AT_32 _i_pixel:	The pixel to interrogate
	Double _d_calibValue	The corresponding pixel calibration

**Return** See list of possible return codes in this document

**Note** Spectrums can be calibrated in more than one way (e.g. Raman shift as opposed to wavelength). To get both the unit and type of calibration of the axis it is necessary to call the function ATSIF\_GetPropertyValue.

## Property Types

ATSIF_PROP_TYPE	"Type"
ATSIF_PROP_ACTIVE	"Active"
ATSIF_PROP_VERSION	"Version"
ATSIF_PROP_TIME	"Time"
ATSIF_PROP_FORMATTED_TIME	"FormattedTime"
ATSIF_PROP_FILENAME	"FileName"
ATSIF_PROP_TEMPERATURE	"Temperature"
ATSIF_PROP_UNSTABILIZEDTEMPERATURE	"UnstabalizedTemperature"
ATSIF_PROP_HEAD	"Head"
ATSIF_PROP_HEADMODEL	"HeadModel"
ATSIF_PROP_STORETYPE	"StoreType"
ATSIF_PROP_DATATYPE	"DataType"
ATSIF_PROP_SIDISPLACEMENT	"SIDisplacement"
ATSIF_PROP_SINUMBERSUBFRAMES	"SINumberSubFrames"
ATSIF_PROP_PIXELREADOUTTIME	"PixelReadOutTime"
ATSIF_PROP_TRACKHEIGHT	"TrackHeight"
ATSIF_PROP_READPATTERN	"ReadPattern"
ATSIF_PROP_READPATTERN_FULLNAME	"ReadPatternFullName"
ATSIF_PROP_SHUTTERDELAY	"ShutterDelay"
ATSIF_PROP_CENTREROW	"CentreRow"
ATSIF_PROP_ROWOFFSET	"RowOffset"
ATSIF_PROP_OPERATION	"Operation"
ATSIF_PROP_MODE	"Mode"
ATSIF_PROP_MODE_FULLNAME	"ModeFullName"
ATSIF_PROP_TRIGGERSOURCE	"TriggerSource"
ATSIF_PROP_TRIGGERSOURCE_FULLNAME	"TriggerSourceFullName"
ATSIF_PROP_TRIGGERLEVEL	"TriggerLevel"
ATSIF_PROP_EXPOSURETIME	"ExposureTime"
ATSIF_PROP_DELAY	"Delay"
ATSIF_PROP_INTEGRATIONCYCLETIME	"IntegrationCycleTime"
ATSIF_PROP_NUMBERINTEGRATIONS	"NumberIntegrations"
ATSIF_PROP_KINETICCYLETIME	"KineticCycleTime"
ATSIF_PROP_FLIPX	"FlipX"
ATSIF_PROP_FLIPY	"FlipY"
ATSIF_PROP_CLOCK	"Clock"
ATSIF_PROP_ACLOCK	"AClock"
ATSIF_PROP_IOC	"IOC"
ATSIF_PROP_FREQUENCY	"Frequency"
ATSIF_PROP_NUMBERPULSES	"NumberPulses"
ATSIF_PROP_FRAMETRANSFERACQMODE	"FrameTransferAcquisitionMode"
ATSIF_PROP_BASELINECLAMP	"BaselineClamp"
ATSIF_PROP_PRESCAN	"PreScan"
ATSIF_PROP_EMREALGAIN	"EMRealGain"
ATSIF_PROP_BASELINEOFFSET	"BaselineOffset"
ATSIF_PROP_SWVERSION	"SWVersion"
ATSIF_PROP_SWVERSIONEX	"SWVersionEx"
ATSIF_PROP_MCP	"MCP"
ATSIF_PROP_GAIN	"Gain"
ATSIF_PROP_VERTICALCLOCKAMP	"VerticalClockAmp"
ATSIF_PROP_VERTICALSHIFTSPED	"VerticalShiftSpeed"
ATSIF_PROP_OUTPUTAMPLIFIER	"OutputAmplifier"
ATSIF_PROP_PREAMPLIFIERGAIN	"PreAmplifierGain"
ATSIF_PROP_SERIAL	"Serial"
ATSIF_PROP_DETECTORFORMATX	"DetectorFormatX"
ATSIF_PROP_DETECTORFORMATZ	"DetectorFormatZ"
ATSIF_PROP_NUMBERIMAGES	"NumberImages"
ATSIF_PROP_NUMBERSUBIMAGES	"NumberSubImages"
ATSIF_PROP_SUBIMAGE_HBIN	"SubImageHBin"
ATSIF_PROP_SUBIMAGE_VBIN	"SubImageVBin"
ATSIF_PROP_SUBIMAGE_LEFT	"SubImageLeft"
ATSIF_PROP_SUBIMAGE_RIGHT	"SubImageRight"
ATSIF_PROP_SUBIMAGE_TOP	"SubImageTop"
ATSIF_PROP_SUBIMAGE_BOTTOM	"SubImageBottom"
ATSIF_PROP_BASELINE	"Baseline"

ATSIF_PROP_CCD_LEFT	"CCDLeft"
ATSIF_PROP_CCD_RIGHT	"CCDRight"
ATSIF_PROP_CCD_TOP	"CCDTop"
ATSIF_PROP_CCD_BOTTOM	"CCDBottom"
ATSIF_PROP_SENSITIVITY	"Sensitivity"
ATSIF_PROP_DETECTIONWAVELENGTH	"DetectionWavelength"
ATSIF_PROP_COUNTCONVERTMODE	"CountConvertMode"
ATSIF_PROP_ISCOUNTCONVERT	"IsCountConvert"
ATSIF_PROP_X_AXIS_TYPE	"XAxisType"
ATSIF_PROP_X_AXIS_UNIT	"XAxisUnit"
ATSIF_PROP_Y_AXIS_TYPE	"YAxisType"
ATSIF_PROP_Y_AXIS_UNIT	"YAxisUnit"
ATSIF_PROP_Z_AXIS_TYPE	"ZAxisType"
ATSIF_PROP_Z_AXIS_UNIT	"ZAxisUnit"
ATSIF_PROP_USERTEXT	"UserText"
ATSIF_PROP_ISPHOTONCOUNTINGENABLED	"IsPhotonCountingEnabled"
ATSIF_PROP_NUMBERTHRESHOLDS	"NumberThresholds"
ATSIF_PROP_THRESHOLD1	"Threshold1"
ATSIF_PROP_THRESHOLD2	"Threshold2"
ATSIF_PROP_THRESHOLD3	"Threshold3"
ATSIF_PROP_THRESHOLD4	"Threshold4"
ATSIF_PROP_AVERAGINGFILTERMODE	"AveragingFilterMode"
ATSIF_PROP_AVERAGINGFACTOR	"AveragingFactor"
ATSIF_PROP_FRAMECOUNT	"FrameCount"
ATSIF_PROP_NOISEFILTER	"NoiseFilter"
ATSIF_PROP_THRESHOLD	"Threshold"
ATSIF_PROP_TIME_STAMP	"TimeStamp"

To retrieve the time stamp information create the property name like so:

"TimeStamp 0" will return the first frame time stamp (0 based index)

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"TimeStamp n-1" will return the nth frame time stamp

## Return Codes

ATSIF_SUCCESS	22002
ATSIF_SIF_FORMAT_ERROR	22003
ATSIF_NO_SIF_LOADED	22004
ATSIF_FILE_NOT_FOUND	22005
ATSIF_FILE_ACCESS_ERROR	22006
ATSIF_DATA_NOT_PRESENT	22007
ATSIF_P1INVALID	22101
ATSIF_P2INVALID	22102
ATSIF_P3INVALID	22103
ATSIF_P4INVALID	22104
ATSIF_P5INVALID	22105
ATSIF_P6INVALID	22106
ATSIF_P7INVALID	22107
ATSIF_P8INVALID	22108