AIController Tango Cpp Class

Contents :

AIController Class Identification :

Contact : at synchrotron-soleil.fr - xavier.elattaoui

Class Family : Acquisition

Platform : All Platforms

Bus : Compact PCI

Manufacturer : ADLink

Manufacturer ref. :

AIController Class Inheritance :

- Tango::DeviceImpl
  - AIController

AIController Class Description :

Class to interface ADLink digital and analog boards through the ASL library.

This device interfaces the SAI daq boards (2005;2010;2204;2205).

The main functions are :

- the daq board inititialization

- the daq board configuration

- the acquisition on N channels

NOTE :

- Start device one time to generate its default properties.

- Allowed delimiters list : tabulation, comma, dot, semicolon, pipe and colon.

- WARN : Use space character only for dynamic attribute description !!!
- FATAL : all characters must be in upper case !!

AIController Properties :

There is no class properties

Device Properties			
Name	**Description**	**Type**	**Default Value**
AutoStartAcquisition	TRUE : the acquisition starts when the device is up and ready.	boolean	false
BoardNum	ADLink ADC board identifier in the CPCI crate.	short	0
BoardType	ADLink ADC board type as this : ``Manufacturer`` : ``Familly`` : ``ID`` Examples : Adlink : SAI : 2005 Adlink : MAI : 2205		ADLINK:SAI:2005

ChannelsConfig	Dynamic attribute configuration as follow (with no quotes) :
	
	``LABEL``
	
	``CHANNEL NUMBER``
	
	``INPUT RANGE``
	
	``GROUND_REF``
	
	[ATTR DESCRIPTION]
	
	Note : [] means optionnal
		String[]	channel0:0:BP_10:SINGLE_ENDED:\"RF incident power signal\"

OverrunStrategy	The overrun strategy (the strategy adopted in case of data lost). The possible values are NOTIFY, ABORT, TRASH, RESTART, IGNORE.		NOTIFY
SamplingSource	Set the AI conversion signal source (i.e. DAC sampling source). Use one of the following: INTERNAL or EXTERNAL		INTERNAL:100000
	Sets to true, all attributes data are		

ScaledData	scaled (in type DevDouble) else the attributes type is DevUShort.	boolean	true
Timeout	Value out of which an exception is sent to inform the user that no acquired data is coming (in milliseconds).	int	1000

TriggerConfiguration	Trigger configuration parameters as follow (with no quotes) :
	
	``TYPE``
	
	``MODE``
	
	``EDGE``
	
	``SOURCE``
	
	``DELAY``
	
	``POST_TRIG_SAMPLES``
	
	Possible values for each parameter :
	
	Type : NONE, ATRIG or DTRIG
	
	Mode : POST, PRE or MIDDLE
	
	Edge : RISING or FALLING
	
	Source : [Channel_ID] [CONDITION] [LOW_LEVEL_COND_IN_VOLTS] [HIGH_LEVEL_COND_IN_VOLTS]
	
	Delay : [UNIT] [VALUE]
	
	Post_trig_Samples : [UNIT] [VALUE]
	
	NOTES :
	
	1) ``SOURCE`` : only available for ATRIG type. Value can be EXT or a channel number from 0 to 3. CONDITION can be BELOW_LOW_LEVEL, ABOVE_HIGH_LEVEL, INSIDE_REGION, HIGH_HYSTERESIS.
	
	2) ``DELAY`` : UNIT can be CLOCK_TICKS or SAMPLES. It indicates the number of samples or nanoseconds will be ignored after a specific trigger event.
	
	3) ``POST_TRIG_SAMPLES`` : only if selected Mode is MIDDLE. It indicates the number of samples will be accessed after a specific trigger event.
			TYPE : NONE

	Examples : TYPE : ATRIG MODE : MIDDLE EDGE : RISING SOURCE : 0:BELOW:-2.5 (or 1:HIGH_HYSTERESIS:-2.5:+2.5) DELAY : SAMPLES:100 POST_TRIG_SAMPLES : 1000		
NexusNbAcqPerFile	Indicates the number of acquisition pushed in a single Nexus file. Default set to 10.	int	10
NexusDataToPush	Attributes name list to push in Nexus file. Expected value : ``RAW``, ``SCALED`` or ``AVERAGE``. Default is empty. NOTE : - Expected value is case sensitive !!!	String	none
DO_NOT_MODIFY_DefaultDriverMemorySize	The fixed max samples number the driver can hold ! WARNING : DO NOT MODIFY THIS PROPERTY , THE DEVICE CAN CRASH !!!	int	1024
ConcatenateDaqBuffers	Only available in Trigger mode when a triggerNumber is specified. Allows ADLINK driver to concatenate triggerNumber buffers in one buffer.	boolean	false

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AIController Class Commands				
Name	**Input type**	**Output type**	**Level**	**Description**
State	DEV_VOID	DEV_STATE	OPERATOR	This command gets the device state (stored in its *device_state* data member) and returns it to the caller.
Status	DEV_VOID	CONST_DEV_STRING	OPERATOR	This command gets the device status (stored in its *device_status* data member) and returns it to the caller.
Start	DEV_VOID	DEV_VOID	OPERATOR	Command to start the acquisition.
Stop	DEV_VOID	DEV_VOID	OPERATOR	Command to stop the acquisition.
Abort	DEV_VOID	DEV_VOID	OPERATOR	Command to abort the acquisition. Note that data may be lost .

Command State :

This command gets the device state (stored in its *device_state* data member) and returns it to the caller.

State Definition		
Input Argument	Tango::DEV_VOID	none.
Output Argument	Tango::DEV_STATE	State Code
DisplayLevel	OPERATOR	..
Inherited	true	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command Status :

This command gets the device status (stored in its *device_status* data member) and returns it to the caller.

Status Definition		
Input Argument	Tango::DEV_VOID	none.
Output Argument	Tango::CONST_DEV_STRING	Status description
DisplayLevel	OPERATOR	..
Inherited	true	..
Abstract	true	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command Start :

Command to start the acquisition.

Start Definition		
Input Argument	Tango::DEV_VOID	no argin
Output Argument	Tango::DEV_VOID	no argout
DisplayLevel	OPERATOR	..
Inherited	false	..

Abstract	false	..
Polling Period	Not polled	..
Command NOT allowed for	• FAULT • RUNNING	..

Command Stop :

Command to stop the acquisition.

Stop Definition		
Input Argument	Tango::DEV_VOID	no argin
Output Argument	Tango::DEV_VOID	no argout
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command NOT allowed for	• FAULT	..

Command Abort :

Command to abort the acquisition. Note that data may be lost .

Abort Definition		
Input Argument	Tango::DEV_VOID	no argin
Output Argument	Tango::DEV_VOID	no argout
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

AIController Class Attributes							
Name	**Inherited**	**Abstract**	**Attr. type**	**R/W type**	**Data type**	**Level**	**Description**
[dataCounter]()	false	false	Scalar	READ	Tango::DEV_LONG	EXPERT	Number of sample data received.

errorCounter	false	false	Scalar	READ	Tango::DEV_LONG	EXPERT	Number of errors received.
overrunCounter	false	false	Scalar	READ	Tango::DEV_LONG	EXPERT	Number of overrun buffer received.
timeoutCounter	false	false	Scalar	READ	Tango::DEV_LONG	OPERATOR	Number of timeout received.
forceContinuousMode	false	false	Scalar	READ_WRITE	Tango::DEV_BOOLEAN	OPERATOR	TRUE : force the acquisition in continuous mode (triggers are ignored).
samplesNumber	false	false	Scalar	READ	Tango::DEV_LONG	OPERATOR	Read part : Number of samples already acquired. \nNote that samplesNumber = Integration time * sample frequency.
frequency	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	OPERATOR	DAQ board sampling frequency in Hertz.
integrationTime	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	OPERATOR	buffer integration time in milliseconds.
triggerNumber	false	false	Scalar	READ_WRITE	Tango::DEV_LONG	OPERATOR	Available only in retrig mode.\nREAD : number of received triggers. \nWRITE : wanted triggers number for an acquisition.
nexusFileGeneration	false	false	Scalar	READ_WRITE	Tango::DEV_BOOLEAN	EXPERT	Allows storage of acquired data into Nexus files.
nexusTargetPath	false	false	Scalar	READ_WRITE	Tango::DEV_STRING	EXPERT	Define the root path for generated nexus files.
logs	false	false	Spectrum	READ	Tango::DEV_STRING	OPERATOR	Device logs

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There is no dynamic attribute defined.

Attribute dataCounter :

Number of sample data received.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ
Data Type	Tango::DEV_LONG
Display Level	EXPERT
Inherited	false

Attribute Properties	
label	data counter
unit	
standard unit	
display unit	
format	%7d

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
	Not

Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT

max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Archive Periodic	set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute errorCounter :

Number of errors received.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ
Data Type	Tango::DEV_LONG
Display Level	EXPERT
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT

Attribute Properties	
label	error counter
unit	
standard unit	
display unit	
format	%7d
max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute overrunCounter :

Number of overrun buffer received.

Attribute	

Attribute	

Attribute Event Criteria	

Definition	
Attribute Type	Scalar
R/W Type	READ
Data Type	Tango::DEV_LONG
Display Level	EXPERT
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT

Properties	
label	overrun counter
unit	
standard unit	
display unit	
format	%7d
max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute timeoutCounter :

Number of timeout received.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ
Data Type	Tango::DEV_LONG
Display Level	OPERATOR
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT

Attribute Properties	
label	timeout counter
unit	
standard unit	
display unit	
format	%7d
max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute forceContinuousMode :

TRUE : force the acquisition in continuous mode (triggers are ignored).

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_BOOLEAN
Display Level	OPERATOR
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT
Write allowed for	All states

Attribute Properties	
label	force continuous mode
unit	
standard unit	
display unit	
format	
max_value	
min_value	
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute samplesNumber :

Read part : Number of samples already acquired.
\nNote that samplesNumber = Integration time * sample frequency.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ
Data Type	Tango::DEV_LONG
Display Level	OPERATOR
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT

Attribute Properties	
label	samples Number
unit	
standard unit	
display unit	
format	%7d
max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set

delta_time	
delta_val	

Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute frequency :

DAQ board sampling frequency in Hertz.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_DOUBLE
Display Level	OPERATOR
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT
Write allowed for	All states

Attribute Properties	
label	sampling frequency
unit	Hertz
standard unit	Hz
display unit	Hz
format	%7.0f
max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute integrationTime :

buffer integration time in milliseconds.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_DOUBLE

Attribute Properties	
label	integration time
unit	ms

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set

Display Level	OPERATOR
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT
Write allowed for	All states

standard unit	ms
display unit	ms
format	%6.2f
max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute triggerNumber :

Available only in retrig mode.\nREAD : number of received triggers.
\nWRITE : wanted triggers number for an acquisition.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_LONG
Display Level	OPERATOR
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT
Write allowed for	All states

Attribute Properties	
label	trigger number
unit	
standard unit	
display unit	
format	%7d
max_value	
min_value	0
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute nexusFileGeneration :

Allows storage of acquired data into Nexus files.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_BOOLEAN
Display Level	EXPERT
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT
Write allowed for	All states

Attribute Properties	
label	generate Nexus File
unit	
standard unit	
display unit	
format	%1d
max_value	
min_value	
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute nexusTargetPath :

Define the root path for generated nexus files.

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_STRING
Display Level	EXPERT
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read NOT allowed for	• FAULT
Write allowed for	All states

Attribute Properties	
label	nexus file path
unit	
standard unit	
display unit	
format	%s
max_value	
min_value	
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

Attribute logs :

Device logs

Attribute Definition	
Attribute Type	Spectrum (2048)
R/W Type	READ
Data Type	Tango::DEV_STRING
Display Level	OPERATOR
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read allowed for	All states

Attribute Properties	
label	logs
unit	
standard unit	
display unit	
format	%s
max_value	
min_value	
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

Attribute Event Criteria	
Periodic	Not set
Relative Change	Not set
Absolute Change	Not set
Archive Periodic	Not set
Archive Relative Change	Not set
Archive Absolute Change	Not set
Push Change event by user code	false
Push Archive event by user code	false
Push DataReady event by user code	Not set

AIController Class States	
Name	**Description**
FAULT	Device/Board is not well initialised.
RUNNING	Daq is running.
STANDBY	Device/Daq is waiting for a Start acquisition.