GenericMirror Tango Cpp Class

Contents :

GenericMirror Class Identification :

Contact	: at synchrotron-soleil.fr - langlois
Class Family	: Motion
Platform	: All Platforms
Bus	: Not Applicable
Manufacturer	:
Manufacturer ref.	: Gener

GenericMirror Class Inheritance :

- Tango::DeviceImpl
  - GenericMirror

GenericMirror Class Description :

This device is used to control a Mirror:

when the user write on the theta attribute, the device calculate (via Optical Formulas) the values to send to the underlying devices (theta rotation,bender)

GenericMirror Properties :

There is no class properties

Device Properties			
Name	**Description**	**Type**	**Default Value**
AttributeCurvatureName	If a bender is used this property gives the name of the curvature attribute of the bender device.	String	none
AttributePositionName	Give the name of the attribute to move the motor according the motors device used.	String	position
AttributeThetaName	The name of the attribute to reach for the theta. For instance, if a TPP is used to rotate the mirror, the properties must be set to pitch	String	none
BenderDeviceName	If a bender is used this property gives the name of the bender device to reach	String	none
ChangeStripMotorName	This method allows to change the strip of the mirror	String	none
CommandStateName	Gives the name of the STATE command according the target device. For SimulatedMotor it is State.	String	state
CommandStopName	Name of the command stop for the reached device.	String	stop
DistanceBetweenMirrorAndImageQ	This is the q parameter representing the distance between the mirror and the image (infinity so INVALID for a focalisation mirror)	double	none
DistanceBetweenSourceAndMirrorP	This is the p parameter representing the distance between the beam source and the mirror (infinity so INVALID for a collimation mirror)	double	none
HasBender	Indicate if there is a bender linked to the mirror	boolean	none
MirrorType	The type of the mirror : - `0` for a normal mirror - `1` for a focusing mirror - `2` for a collimation mirror - `3` for an elliptic mirror	short	none
StripNumber	The number of strip of the mirror. Set to 1 if there is no strip.	short	none
StripValues	The values of the reference position of each mirror strip. These values are used to position the mirror to the wanted strip.	double[]	none
StripNames	The name of the strip.	String[]	none
ThetaMotorName	The name of the motor which can move the theta mirror angle.	String	none
	This propertie is used to indicate if there is a motor to		

HasChangeStripMotor	change strip.	boolean	false
CanRotate	This property indicate if the mirror have a motor to rotate. This property must be set to TRUE if there is a motor and FALSE if not.	boolean	none
RotationAngle	If the CanRotate property is set to TRUE, then this property is used to set the default angle of the mirror.	double	none
BenderCurvatureUnit	This property is used to indicate what is the unit of the bender curvature if the miror use a bender. Indeed, the curvature value is computed thanks the next equation : 1/R = (p+q)*sin(theta)/(2*p*q) But the bender device is waiting a new value of curvature in the same unit as it is configured in the device bender. So it is necessary to compute (in the generic mirror device) a good value of 1/R in the same unit as in the bender. 1 - bender curvature is in m-1 2 - bender curvature is in km-1	short	none
ThetaMotorUnit	This property is used to make coincidate the unit of the theta (for instance pitch of a TPP in mrad) with the value of theta in the mirror device. The possible choice are : 1 - mrad 2 - degre	short	1
DefaultStrip	The default strip index to be used when a init command is called	int	1
StripValuesTolerance	Tolerance on the strip values. if the strip setting does not correspond to the motor position +/- the tolerance, the device will be disabled	double	0

GenericMirror 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.

Stop	DEV_VOID	DEV_VOID	OPERATOR	Stop all the motors
InitializeMirror	DEV_VOID	DEV_VOID	OPERATOR	Method to initialize all the object needed by the device mirror
ChangeStrip	DEV_USHORT	DEV_VOID	OPERATOR	Method to change the wanted strip of the mirror

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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 Stop :

Stop all the motors

Stop Definition		
Input Argument	Tango::DEV_VOID	
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command NOT allowed for	• FAULT • INIT	..

Command InitializeMirror :

Method to initialize all the object needed by the device mirror

InitializeMirror Definition		
Input Argument	Tango::DEV_VOID	
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command NOT allowed for	• MOVING • FAULT	..

Command ChangeStrip :

Method to change the wanted strip of the mirror

ChangeStrip Definition		
Input Argument	Tango::DEV_USHORT	The index of the strip
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command NOT allowed for	• MOVING • FAULT • INIT	..

GenericMirror Class Attributes							
Name	Inherited	Abstract	Attr. type	R/W type	Data type	Level	Description
theta	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	OPERATOR	The angle of the mirror
pDistance	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	The distance between source and mirror in meter
qDistance	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	OPERATOR	The distance between mirror and image in meter
type	false	false	Scalar	READ	Tango::DEV_STRING	OPERATOR	The type of the mirror :\n- `0` for a normal mirror\n- `1` for a focusing mirror\n- `2` for a collimation mirror\n- `3` for an elliptic mirror
currentStrip	false	false	Scalar	READ	Tango::DEV_USHORT	OPERATOR	The current strip index
currentStripName	false	false	Scalar	READ	Tango::DEV_STRING	OPERATOR	The name of the strip

curvature	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	The value of the curvature of the bender device (if in use)
tx	false	false	Scalar	READ	Tango::DEV_DOUBLE	EXPERT	The translation value to switch between mirror strips
isBenderLess	false	false	Scalar	READ_WRITE	Tango::DEV_BOOLEAN	EXPERT	If IsBenderLess attribute is notched, only the mirror can move.\nThe bender doesn`t received any value according a new angle

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There is no dynamic attribute defined.

Attribute theta :

The angle of the mirror

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	true
Write	

Attribute Properties	
label	Theta
unit	ï¿½
standard unit	
display unit	
format	%10.6f
max_value	
min_value	
max_alarm	
min_alarm	
max_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

hardware at init.	Not set
Read NOT allowed for	• MOVING • FAULT • INIT • DISABLE
Write allowed for	All states

min_warning	
delta_time	
delta_val	

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

Attribute pDistance :

The distance between source and mirror in meter

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

Attribute Properties	
label	p
unit	m
standard unit	
display unit	
format	%10.6f
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 qDistance :

The distance between mirror and image in meter

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	true
Write hardware at init.	Not set
Read NOT allowed for	• MOVING • FAULT • INIT • DISABLE
Write allowed for	All states

Attribute Properties	
label	q
unit	m
standard unit	
display unit	
format	%10.6f
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 type :

The type of the mirror :\n- `0` for a normal mirror\n- `1` for a focusing mirror\n- `2` for a collimation mirror\n- `3` for an elliptic mirror

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ
Data Type	Tango::DEV_STRING
Display Level	OPERATOR
Inherited	false

Attribute Properties	
label	Mirror Type
unit	
standard unit	
display unit	
format	

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 • INIT

max_value	
min_value	
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 currentStrip :

The current strip index

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

Attribute Properties	
label	Current Strip
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 currentStripName :

The name of the strip

Attribute Definition	
Attribute Type	Scalar
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	Strip Name
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 curvature :

The value of the curvature of the bender device (if in use)

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

Attribute Properties	
label	1/R
unit	
standard unit	

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 • INIT

display unit	
format	%10.6f
max_value	
min_value	
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 tx :

The translation value to switch between mirror strips

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

Attribute Properties	
label	Tx
unit	mm
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 isBenderLess :

If IsBenderLess attribute is notched, only the mirror can move.\nThe bender doesn`t received any value according a new angle

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	true
Write hardware at init.	true
Read NOT allowed for	• MOVING • FAULT • INIT
Write allowed for	All states

Attribute Properties	
label	Is Bender Less
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

GenericMirror Class States	
Name	**Description**

MOVING	Mirror is MOVING (at least one motor is Moving)
STANDBY	Mirror is STANDBY (all motors are Standby)
ALARM	Mirror is ALARM (at least one motor is Alarm)
FAULT	Mirror is FAULT not possible to reach a device, getting a value or a state. (In this case it is only allowed to redone a init after correcting the problem with the other devices)
INIT	The device is in this state after the Init command succeeded. After it needs a InitializeMirror call to be fully use.
DISABLE	The strip does not correspond to the motor position.