Lakeshore_336 Tango Cpp Class

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Lakeshore_336 Class Identification :

Contact	: at null - null
Class Family	:
Platform	:
Bus	:
Manufacturer	:
Manufacturer ref.	:

Lakeshore_336 Class Inheritance :

- Tango::DeviceImpl
  - Lakeshore_336

Lakeshore_336 Class Description :

basic interface for the Lakeshore Model 336 Temperature controller,
GPIB/Ethernet interface.
reads 4 temperatures, outputs, alarms.

Lakeshore_336 Properties :

There is no class properties

Device Properties			
Name	**Description**	**Type**	**Default Value**
ComDeviceProxy	the Tango name of the communication device proxy (Ethernet or GPIB)	String	none
TimeInDeadBand	if temperature stays in deadband around setpoint for TimeInDeadBand seconds, the regulation is considered as successfull (the setpoint is reached, the stability is correct) The state of the device goes from RUNNING (blue color) to STANDBY (yellow)	int	60
Period	polling period of the HW for the temperature and HW status	short	none
LoopNumber	Loop number. possible values : 1 or 2. Default : 1	short	none

Lakeshore_336 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.
Off	DEV_VOID	DEV_VOID	OPERATOR	turns OFF the temperature regulation : range set to 0
Low	DEV_VOID	DEV_VOID	OPERATOR	turns ON the temperature regulation the range is set to 1 (1%, 0.5W max)
Medium	DEV_VOID	DEV_VOID	OPERATOR	turns the temperature regulation ON the range is set to 2 (10%, 5W max)
High	DEV_VOID	DEV_VOID	OPERATOR	turns the temperature regulation ON the range is set to 3 (100%, 50W max)
LoopSelectInput	DEV_SHORT	DEV_VOID	OPERATOR	selects the input for this loop
				sends a command (if no "?")

IORaw	DEV_STRING	DEV_STRING	OPERATOR	requests a value (if "?")
Stop	DEV_VOID	DEV_VOID	OPERATOR	tries to stop the regulation at the current temperature * sets the setpoint to the current temperature * stops the regulation manager (the state returns to STANDBY)

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	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command Off :

turns OFF the temperature regulation : range set to 0

Off Definition		
Input Argument	Tango::DEV_VOID	
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command Low :

turns ON the temperature regulation
the range is set to 1 (1%, 0.5W max)

Low Definition		
Input Argument	Tango::DEV_VOID	
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command Medium :

turns the temperature regulation ON
the range is set to 2 (10%, 5W max)

Medium Definition		
Input Argument	Tango::DEV_VOID	
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command High :

turns the temperature regulation ON
the range is set to 3 (100%, 50W max)

High Definition		
Input Argument	Tango::DEV_VOID	
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command LoopSelectInput :

selects the input for this loop

LoopSelectInput Definition		
Input Argument	Tango::DEV_SHORT	input to associate with the loop [1|2|3|4]
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command IORaw :

sends a command (if no "?")
requests a value (if "?")

IORaw Definition		
Input Argument	Tango::DEV_STRING	
Output Argument	Tango::DEV_STRING	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Command Stop :

tries to stop the regulation at the current temperature
* sets the setpoint to the current temperature
* stops the regulation manager (the state returns to STANDBY)

Stop Definition		

Input Argument	Tango::DEV_VOID	
Output Argument	Tango::DEV_VOID	
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..
Command allowed for	All states	..

Lakeshore_336 Class Attributes							
Name	**Inherited**	**Abstract**	**Attr. type**	**R/W type**	**Data type**	**Level**	**Description**
temperature	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	OPERATOR	temperature voie principale en Kelvin\nread : temperature courante\nwrite : nouvelle consigne\nAttribut polle pour controler si la consigne est atteinte\npolling par defaut : 250 ms\n(si on passe 3 fois par consigne = temperature \nsans depassement d`1 Delta Temperature)
output	false	false	Scalar	READ	Tango::DEV_DOUBLE	EXPERT	output value of regulation from 0 to 100 %
range	false	false	Scalar	READ_WRITE	Tango::DEV_SHORT	EXPERT	current range\ncan be Low(0.01) Medium(0.1) High(1)
							dead band in witch we consider that setpoint is reached : \nif dead band is 0.5 e.g. \nif setpoint is 12 ï¿½K and

deadBand	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	EXPERT	temp is 12.4 -> OK\nif setpoint is 12 ï¿½K and temp is 11.6 -> OK\nif setpoint is 12 ï¿½K and temp is 11.4 -> KO\n
inputA	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	temperature in Kelvin for Input A
inputB	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	temperature in Kelvin for Input B
inputC	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	temperature in Kelvin for Input C
inputD	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	temperature in Kelvin for Input D

There is no dynamic attribute defined.

Attribute temperature :

temperature voie principale en Kelvin\nread : temperature courante\nwrite : nouvelle consigne\nAttribut polle pour controler si la consigne est atteinte\npolling par defaut : 250 ms\n(si on passe 3 fois par consigne = temperature \nsans depassement d`1 Delta Temperature)

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	

Attribute Properties	
label	temperature
unit	K
standard unit	Kelvin
display unit	
format	%4.3f
max_value	
min_value	
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	

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

allowed for	All states
Write allowed for	All states

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 output :

output value of regulation from 0 to 100 %

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 allowed for	All states

Attribute Properties	
label	output
unit	%
standard unit	%
display unit	%
format	%5.2f
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 range :

current range\ncan be Low(0.01) Medium(0.1) High(1)

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

Attribute Properties	
label	range
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 deadBand :

dead band in witch we consider that setpoint is reached : \nif dead band is 0.5 e.g. \nif setpoint is 12 ï¿½K and temp is 12.4 -> OK\nif setpoint is 12 ï¿½K and temp is 11.6 -> OK\nif setpoint is 12 ï¿½K and temp is 11.4 -> KO\n

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

Attribute Properties	
label	dead band
unit	ï¿½K
standard unit	ï¿½K
display unit	ï¿½K

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

Level	EXPERT
Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	true
Write hardware at init.	true
Read allowed for	All states
Write allowed for	All states

format	%2.2f
max_value	
min_value	
max_alarm	
min_alarm	
max_warning	
min_warning	
delta_time	
delta_val	

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 inputA :

temperature in Kelvin for Input A

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 allowed for	All states

Attribute Properties	
label	input A
unit	K
standard unit	K
display unit	ï¿½K
format	%4.1f
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	Not

user code	set

Attribute inputB :

temperature in Kelvin for Input B

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 allowed for	All states

Attribute Properties	
label	input B
unit	K
standard unit	K
display unit	ï¿½K
format	%4.1f
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 inputC :

temperature in Kelvin for Input C

Attribute	

Attribute	

Attribute Event Criteria	

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 allowed for	All states

Properties	
label	input C
unit	K
standard unit	K
display unit	ï¿½K
format	%4.1f
max_value	
min_value	
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 inputD :

temperature in Kelvin for Input D

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

Attribute Properties	
label	input D
unit	K
standard unit	K
display unit	ï¿½K
format	%4.1f
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 set

Read allowed for	All states

min_warning	
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

Lakeshore_336 Class States	
Name	**Description**
ON	everything ok
UNKNOWN	comunication broken
FAULT	parameterisation or blocking fault
ALARM	at least 1 relay is ON
MOVING	the controller tries to reach the set point (this state is used by scanserver to control the scans)
STANDBY	the controller has reached the setpoint (this state is used by ScanServer to control the scan)