

BT500 Tango Cpp Class

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BT500 Class Identification :

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

BT500 Class Inheritance :

- [Tango::DeviceImpl](#)
 - BT500

BT500 Class Description :

handles generic BT500 cryogenic temperature controller from Air Liquide
 (through serial line)

BT500 Properties :

There is no class properties

Device Properties			
Name	Description	Type	Default Value
SerialLineUrl	Tango name of the Serial Device for Communication	String	none
Period	periodic exec period in ms	int	none
ReadTimeOut	timeout for reading	int	none
TimeInDeadband	time in deadband is used for State : when the temperature is inside deadband (abs (setpoint - temperature) < deadband) more than TimeInDeadband, the setpoint is considered as reached : state STANDBY otherwise RUNNING default : 60	int	none
ChannelsInUse	temperature channel used The device will read only the channels really used for example the BT500 comes with 2 temperature chann and on option with 2 more temperature channels for 2 channels : set property to 12 for 3 channels : 123 or 124 for 4 channels : 1234	String	1234

BT500 Class Commands				
Name	Input type	Output type	Level	Description
State	DEV_VOID	DEV_STATE	OPERATOR	This command gets the device state (stored in its <i>device_state</i> data member) and returns it to the caller.
Status	DEV_VOID	CONST_DEV_STRING	OPERATOR	This command gets the device status (stored in its <i>device_status</i> data member) and returns it to the caller.
ExecLowLevelCommand	DEV_STRING	DEV_STRING	OPERATOR	None.
ModePAP	DEV_VOID	DEV_VOID	OPERATOR	switches the BT500 from MAIN Menu to PAP Menu (PAS A PAS, STEP BY STEP Menu) current Mode must be REMOTE, and Menu must be MAIN Menu
ModeREG	DEV_VOID	DEV_VOID	OPERATOR	switches the BT500 from PAP Menu to REG Menu (REGulation Menu) current Mode must be REMOTE, and Menu must be PAP Menu
RET	DEV_VOID	DEV_VOID	OPERATOR	If in REG Menu returns to PAP Menu if in PAP Menu returns to Main Menu Must be in REMOTE Mode
Local	DEV_VOID	DEV_VOID	OPERATOR	Returns to Local Command Mode (the touch screen on the front panel of the BT500) Must be in REMOTE Mode To switch to Remote Mode again the only way is to use the on the front panel of the BT500
Stop	DEV_VOID	DEV_VOID	OPERATOR	The device returns to STANDBY State
Reset	DEV_VOID	DEV_VOID	OPERATOR	resets after a fault
ModeRGU	DEV_VOID	DEV_VOID	OPERATOR	sends the BT500 directly to RGU mode (Soleil working page)

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 ExecLowLevelCommand :

ExecLowLevelCommand Definition		
Input Argument	Tango::DEV_STRING	command to be sent (exact syntax)
Output Argument	Tango::DEV_STRING	response of the controller
DisplayLevel	OPERATOR	..
Inherited	false	..
Abstract	false	..
Polling Period	Not polled	..

Command allowed for	All states	..
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Command ModePAP :

switches the BT500 from MAIN Menu to PAP Menu (PAS A PAS, STEP BY STEP Menu)
current Mode must be REMOTE, and Menu must be MAIN Menu

ModePAP 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 ModeREG :

switches the BT500 from PAP Menu to REG Menu (REGulation Menu)
current Mode must be REMOTE, and Menu must be PAP Menu

ModeREG 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 RET :

If in REG Menu returns to PAP Menu
if in PAP Menu returns to Main Menu
Must be in REMOTE Mode

RET 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 Local :

Returns to Local Command Mode (the touch screen on the front panel of the BT500)

Must be in REMOTE Mode

To switch to Remote Mode again the only way is to use the on the front panel of the BT500

Local 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 Stop :

The device returns to STANDBY State

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	..

Command Reset :

resets after a fault

Reset 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 ModeRGU :

sends the BT500 directly to RGU mode (Soleil working page)

ModeRGU 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	..

BT500 Class Attributes							
Name	Inherited	Abstract	Attr. type	R/W type	Data type	Level	Description
setpoint	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	OPERATOR	setpoint and setpoint read back
TC1	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	Temperature 1
TC2	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	Temperature 2
TC3	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	Temperature 3
TC4	false	false	Scalar	READ	Tango::DEV_DOUBLE	OPERATOR	Temperature 4
							used for state management\n* setpoint is reached if temperature is stabilised in

deadband	false	false	Scalar	READ_WRITE	Tango::DEV_DOUBLE	OPERATOR	the range (setpoint +/- deadband)\n=> state is STANDBY\notherwise state is RUNNING
pumpModeAutomatic	false	false	Scalar	READ_WRITE	Tango::DEV_BOOLEAN	EXPERT	displays the control mode of the Pump [MANUAL AUTOMATIC]\ntrue : automatic mode\nfalse : manual mode\n
pumpManualSpeed	false	false	Scalar	READ_WRITE	Tango::DEV_LONG	EXPERT	Displays the speed of the pump (0 to 32, no unit)\nin manual mode, use it to set the speed of the pump
regulationChannel	false	false	Scalar	READ_WRITE	Tango::DEV_LONG	EXPERT	displays the channel used as input for regulation\nsets the channel for regulation [1 2 3 4]
ovenMaxPower	false	false	Scalar	READ_WRITE	Tango::DEV_SHORT	EXPERT	oven maximum power\nthe standard hardware does not support more than 100W
ovenPowerPercent	false	false	Scalar	READ	Tango::DEV_SHORT	EXPERT	the current value of the percentage of maximum power in the oven

There is no dynamic attribute defined.

Attribute setpoint :

setpoint and setpoint read back

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 allowed for	All states
Write allowed for	All states

Attribute Properties	
label	Setpoint
unit	K
standard unit	K
display unit	K
format	%6.3f
max_value	400
min_value	0.1
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 TC1 :

Temperature 1

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	Temperature 1
unit	K
standard unit	K
display unit	K
format	%6.3f
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 TC2 :

Temperature 2

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	Temperature 2
unit	K
standard unit	K
display unit	K
format	%6.3f
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

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

Attribute TC3 :

Temperature 3

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	Temperature 3
unit	K
standard unit	K
display unit	K
format	%6.3f
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 TC4 :

Temperature 4

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

Attribute Properties	
label	Temperature 4
unit	K
standard unit	K
display unit	K

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

Inherited	false
Abstract	false
Polling Period	Not polled
Memorized	Not set
Read allowed for	All states

format	%.3f
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 deadband :

used for state management\n* setpoint is reached if temperature is stabilised in the range (setpoint +/-deadband)\n=> state is STANDBY\notherwise state is RUNNING

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.	true
Read allowed for	All states
Write allowed for	All states

Attribute Properties	
label	Deadband
unit	K
standard unit	K
display unit	K
format	%.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 pumpModeAutomatic :

displays the control mode of the Pump [MANUAL|AUTOMATIC]\ntrue : automatic mode\nfalse : manual mode\n

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 allowed for	All states
Write allowed for	All states

Attribute Properties	
label	Pump Mode Automatic
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 pumpManualSpeed :

Displays the speed of the pump (0 to 32, no unit)\nin manual mode, use it to set the speed of the pump

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_LONG
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	Pump Manual Speed
unit	
standard unit	
display unit	
format	
max_value	32
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 regulationChannel :

displays the channel used as input for regulation\nsets the channel for regulation [1|2|3|4]

Attribute Definition	
Attribute Type	Scalar
R/W Type	READ_WRITE
Data Type	Tango::DEV_LONG
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	Regulation Channel
unit	
standard unit	
display unit	
format	
max_value	4
min_value	1
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 ovenMaxPower :

oven maximum power\nthe standard hardware does not support more than 100W

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

Attribute Properties	
label	puissance max four
unit	W
standard unit	W
display unit	W
format	%3d
max_value	100
min_value	0
max_alarm	
min_alarm	

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

Write allowed for	All states
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max_warning	
min_warning	
delta_time	
delta_val	

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

Attribute ovenPowerPercent :

the current value of the percentage of maximum power in the oven

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

Attribute Properties	
label	Oven Power in Percent
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

There is no state defined