



TANGO
Device
Server

User's Guide

currentTransformer Class

Revision: - Author: verdier
Implemented in C++ - CVS repository: ESRF

Introduction:

This server normally handles only one PCT device.

Class Inheritance:

- Tango::Device_4Impl
 - currentTransformer

Class Description:

Download cmdStates.doc

This server normally handles only one PCT device.

The device can have 3 states:

- Calibration: During this state, which last several seconds the server thread commands the Electronics to inject calibration current. The sever calculates the gain and offsets, which will be applied for the 2 measurement modes below.
- Injection: When the server detects an increase in the current value, it switches in

injection mode. The Voltmeter resolution is decreased in order to have faster measures. When server detect that the current is stable or starts to decrease it switches back to Lifetime mode.

- Lifetime: During the current decay, the lifetime is calculated.

Properties:

Device Properties		
Property name	Property type	Description
 GPIBAddress 	Tango::DEV_LONG	
 DioDeviceName 	Tango::DEV_STRING	example : /dev/edio0
 Gain 	Tango::DEV_FLOAT	
 OffsetA 	Tango::DEV_FLOAT	
 OffsetB 	Tango::DEV_FLOAT	
 InitRange 	Tango::DEV_LONG	
 InjSample 	Tango::DEV_STRING	
 CalibSample 	Tango::DEV_STRING	
 LtSample 	Tango::DEV_STRING	
 ResCalib 	Tango::DEV_LONG	
 ResLt 	Tango::DEV_LONG	
 ResBim 	Tango::DEV_LONG	
 IntegrBim 	Tango::DEV_STRING	
 IntegrLt 	Tango::DEV_STRING	
 IntegrCalib 	Tango::DEV_STRING	
 VoltmRange 	Tango::DEV_STRING	
 MaxTimeLt 	Tango::DEV_LONG	
 DeltaIntensity 	Tango::DEV_LONG	
 MaxHistory 	Tango::DEV_LONG	
 Trigging 	Tango::DEV_STRING	
 MaxNoise 	Tango::DEV_FLOAT	noise of the signal in milliamp
 MaxCalibrationCurrent 	Tango::DEV_LONG	Calibration current forced to 240 mA (e.g ID6)
 DebugFlags 	Tango::DEV_LONG	Debugging flags DEBUG FLAGS meaning THREAD_FUNCTION_IO bit 0 (1) : Printout Thread functions IO FUNCTION_IO bit 1 (2) : Printout device server functions IO GPIB_FUNCTION_IO bit 2 (4) : Printout Thread functions IO GPIB_ACCESS bit 3 (8) : Printout GPIB access strings #define DIO_ACCESS bit 4 (16): Printout DIO access #define RESULTS bit 5 (32): Printout Internal results #define MODE_CHANGE bit 6 (64): Printout mode changment

Device Properties Default Values:

Property Name	Default Values
GPIBAddress	No default value
DioDeviceName	No default value
Gain	No default value
OffsetA	No default value
OffsetB	No default value
InitRange	No default value
InjSample	No default value
CalibSample	No default value
LtSample	No default value
ResCalib	No default value
ResLt	No default value
ResBim	No default value
IntegrBim	No default value
IntegrLt	No default value
IntegrCalib	No default value
VoltmRange	No default value
MaxTimeLt	No default value
DeltaIntensity	No default value
MaxHistory	No default value
Trigging	No default value
MaxNoise	No default value
MaxCalibrationCurrent	No default value
DebugFlags	No default value

There is no Class properties.

States:

States	
Names	Descriptions
OFF	The OFF state is used when in INJECTION mode.
ON	The ON state is used when the current Transformer mode is LIFETIME calculation mode
DISABLE	The DISABLE state is used during the CALIBRATION phase.

Attributes:

Scalar Attributes			
Attribute name	Data Type	R/W Type	Expert
Current: Machine Current measured by the PCT	DEV_DOUBLE	READ	No
Lifetime: Beam Lifetime	DEV_DOUBLE	READ	No
PulseCount: Pulse count number.	DEV_LONG	READ	No
InjectCurrent: Injected Current.	DEV_DOUBLE	READ	No
Average: average of the last 100 current values.	DEV_DOUBLE	READ	No
DeltaCurrent: the delta current (in mA) used for calculation in LIFETIME mode.	DEV_LONG	READ_WRITE	No
Range: range currently in used on the Current Transformer black box electronics. should be a string holding A or B	DEV_STRING	READ_WRITE	No

Commands:

More Details on commands....

Device Commands for Operator Level		
Command name	Argument In	Argument Out
Init	DEV_VOID	DEV_VOID
State	DEV_VOID	DEV_STATE
Status	DEV_VOID	CONST_DEV_STRING
DevReadValue	DEV_VOID	DEVVAR_FLOATARRAY
DevGetRange	DEV_VOID	CONST_DEV_STRING
DevSetRange	DEV_STRING	DEV_VOID
DevCalibration	DEV_VOID	DEV_VOID
DevReadCurrent	DEV_VOID	DEVVAR_FLOATARRAY
DevReadValueCycle	DEV_VOID	DEVVAR_FLOATARRAY
DevGetAverage	DEV_VOID	DEV_FLOAT
DevGetDeltaCurrent	DEV_VOID	DEV_LONG
DevSetDeltaCurrent	DEV_LONG	DEV_VOID
DevResetPulseCount	DEV_VOID	DEV_VOID
DevReset	DEV_VOID	DEV_VOID
DevGetSens	DEV_VOID	DEVVAR_FLOATARRAY
DevSetSens	DEV_VOID	DEV_VOID
DevReadSens	DEV_VOID	DEVVAR_FLOATARRAY
DevSetCalibrationON	DEV_VOID	DEV_VOID
DevSetCalibrationOFF	DEV_VOID	DEV_VOID
DevInject	DEV_VOID	DEV_VOID
DevSetIntegration	DEV_LONG	DEV_VOID
DevGetIntegration	DEV_VOID	DEV_STRING
DevError	DEV_VOID	DEVVAR_LONGARRAY
DevReadSigValues	DEV_VOID	DEVVAR_FLOATARRAY

1 - Init

- Description:** This commands re-initialise a device keeping the same network connection. After an Init command executed on a device, it is not necessary for client to re-connect to the device. This command first calls the device *delete_device()* method and then execute its *init_device()* method. For C++ device server, all the memory allocated in the *init_device()* method must be freed in the *delete_device()* method. The language device desctructor automatically calls the *delete_device()* method.

- **Argin:**
DEV_VOID : none.
- **Argout:**
DEV_VOID : none.
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

2 - State

- **Description:** This command gets the device state (stored in its *device_state* data member) and returns it to the caller.
- **Argin:**
DEV_VOID : none.
- **Argout:**
DEV_STATE : State Code
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

3 - Status

- **Description:** This command gets the device status (stored in its *device_status* data member) and returns it to the caller.
- **Argin:**
DEV_VOID : none.
- **Argout:**
CONST_DEV_STRING : Status description
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

4 - DevReadValue

- **Description:** Return the last value of the Current and Lifetime. - argout[0] = current - argout[1] = lifetime
- **Argin:**
DEV_VOID :
- **Argout:**
DEVVAR_FLOATARRAY :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

5 - DevGetRange

- **Description:** Get the range currently in used on the Current Transformer black box electronics. The answer should be a string holding "A" or "B".
- **Argin:**
DEV_VOID :
- **Argout:**
CONST_DEV_STRING :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

6 - DevSetRange

- **Description:** Set the range "A" or "B" on the current transformer black box electronics. Warning: The value must be passed as a string
- **Argin:**
DEV_STRING :
- **Argout:**
DEV_VOID :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON

- Tango::DISABLE

7 - DevCalibration

- **Description:** Ask the device to go in CALIBRATION mode. During that time the device state is set to DISABLE. The server performs itself an algorithm to calculate the GAIN, OFFSET-A and OFFSET_B which lasts several seconds.
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_VOID :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

8 - DevReadCurrent

- **Description:** Used in INJECTION mode only, this command allows to read the last injected current and the pulse count number. - argout[0] = injected current - argout[1] = pulse count - argout[2] = reserved
- **Argin:**
DEV_VOID :
- **Argout:**
DEVVAR_FLOATARRAY :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

9 - DevReadValueCycle

- **Description:** Same features than the DevReadCurrent() command, but it reads back the last 20 values of the injected current, pulse count. - argout[0] = injected current at t time - argout[1] = pulse count at t time - argout[2] = reserved - argout[3] = injected current a 't-1' - argout[4] = pulse count at 't-1'
- **Argin:**
DEV_VOID :
- **Argout:**

DEVVAR_FLOATARRAY :

- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

10 - DevGetAverage

- **Description:** Read the averaged of the last 100 current values.
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_FLOAT :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

11 - DevGetDeltaCurrent

- **Description:** Returns the delta current (in mA) used for calculation in LIFETIME mode
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_LONG :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

12 - DevSetDeltaCurrent

- **Description:** Set the delta current (in mA) used for calculation in LIFETIME mode.
- **Argin:**
DEV_LONG :
- **Argout:**

DEV_VOID :

- **Command allowed for:**

- Tango::OFF
- Tango::ON
- Tango::DISABLE

13 - DevResetPulseCount

- **Description:** Reset the pulse count number used. The pulse counter is used in INJECTION mode and is incremented by one on each reading of the injected current.

- **Argin:**

DEV_VOID :

- **Argout:**

DEV_VOID :

- **Command allowed for:**

- Tango::OFF
- Tango::ON
- Tango::DISABLE

14 - DevReset

- **Description:** Ask to reset the device. This command does not do anything with this new version of the server, but has been kept to assume backward compatibility.

- **Argin:**

DEV_VOID :

- **Argout:**

DEV_VOID :

- **Command allowed for:**

- Tango::OFF
- Tango::ON
- Tango::DISABLE

15 - DevGetSens

- **Description:** Get the last values of the GAIN, OFFSET-A and OFFSET_B return by the last DevCalibration command. **WARNING:** These values are taken into effect and stored in the static database only if the command DevSetSens() is issued, otherwise these values are lost when the server is restarted (see the state algorithm in chapter below)

- **Argin:**
DEV_VOID :
- **Argout:**
DEVVAR_FLOATARRAY :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

16 - DevSetSens

- **Description:** Ask to turn into effect and to store in the database of the GAIN, OFFSET-A and OFFSET-B values calculated during the last DevCalibration() command. WARNING: The previous values are destroyed (see state algorithm in chapter below).
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_VOID :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

17 - DevReadSens

- **Description:** Reac the values of the GAIN, OFFSET-A and OFFSET_B currently in use (see state algorithm in chaper below)
- **Argin:**
DEV_VOID :
- **Argout:**
DEVVAR_FLOATARRAY :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

18 - DevSetCalibrationON

- **Description:** Switch the Current Transformer black box electronics to the CALIBRATION ON state. In this state the electronics send 200 mA on its current output . This command is only for test purpose and does not perform the calibration algorithm. See DevCalibration
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_VOID :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

19 - DevSetCalibrationOFF

- **Description:** Set the current transformer black box electronics to the CALIBRATION OFF state.
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_VOID :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

20 - DevInject

- **Description:** Ask the server to switch to INJECTION calculation mode. This is done only for test purpose. In normal operation the server switches automatically to INJECTION mode it detects that the current grows during a certain period of time.
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_VOID :
- **Command allowed for:**
 - Tango::OFF

- Tango::ON
- Tango::DISABLE

21 - DevSetIntegration

- **Description:** Set the Voltmeter integration time and number of digits resolution
- **Argin:**
DEV_LONG :
- **Argout:**
DEV_VOID :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

22 - DevGetIntegration

- **Description:** Get the integration time and digit resolution
- **Argin:**
DEV_VOID :
- **Argout:**
DEV_STRING :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

23 - DevError

- **Description:** Get the last 20 errors reported by the server
- **Argin:**
DEV_VOID :
- **Argout:**
DEVVAR_LONGARRAY :
- **Command allowed for:**
 - Tango::OFF

- Tango::ON
- Tango::DISABLE

24 - DevReadSigValues

- **Description:** Same command as the DevReadValues() but for TACO data collector compatibility
- **Argin:**
DEV_VOID :
- **Argout:**
DEVVAR_FLOATARRAY :
- **Command allowed for:**
 - Tango::OFF
 - Tango::ON
 - Tango::DISABLE

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