



**TANGO**  
Device  
Server

# **Femto Low-Noise Current Amplifier User's Guide**

## **FemtoCurrentAmplifier Class**

Revision: release\_1\_4\_1 - Author: langlois  
Implemented in C++ - CVS repository: tango-ds

### **Introduction:**

Device which controls the Femto Low-Noise Current Amplifier.  
It uses the SingleShotDIO generic Device to communicate with the Femto.

### **Class Identification:**

- **Contact** : at synchrotron-soleil.fr - langlois
- **Class Family** : Acquisition
- **Platform** : All Platforms
- **Bus** : Not Applicable

### **Class Inheritance:**

- Tango::Device\_4Impl
  - FemtoCurrentAmplifier

## Properties:

| Device Properties       |                   |                                                                                        |
|-------------------------|-------------------|----------------------------------------------------------------------------------------|
| Property name           | Property type     | Description                                                                            |
| <b>DIOBoardName</b>     | Tango::DEV_STRING | Name of the DIO board device server                                                    |
| <b>CouplingLine</b>     | Tango::DEV_STRING | Line of the Coupling (AC/DC).                                                          |
| <b>OverloadLine</b>     | Tango::DEV_STRING | Line of the Overload                                                                   |
| <b>GainModeLine</b>     | Tango::DEV_STRING | Line of the Gain Mode (HS/LN).                                                         |
| <b>OutputSignalLine</b> | Tango::DEV_STRING | Line of the Output Signal                                                              |
| <b>LSBGainLine</b>      | Tango::DEV_STRING | Line of the LSB Gain                                                                   |
| <b>MidSBGainLine</b>    | Tango::DEV_STRING | Line of the Mid SB Gain                                                                |
| <b>MSBGainLine</b>      | Tango::DEV_STRING | Line of the MSB Gain                                                                   |
| <b>FemtoType</b>        | Tango::DEV_SHORT  | Type of the Femto Current Amplifier: (Default = 2)<br>1 -> DHPCA-100<br>2 -> DLPCA-200 |
| <b>UBWL10MHzLine</b>    | Tango::DEV_STRING | Line of the Upper BandWidth Limit 10 MHz.                                              |
| <b>UBWL1MHzLine</b>     | Tango::DEV_STRING | Line of the Upper BandWidth Limit 1 MHz.                                               |

## Device Properties Default Values:

| Property Name    | Default Values   |
|------------------|------------------|
| DIOBoardName     | No default value |
| CouplingLine     | No default value |
| OverloadLine     | No default value |
| GainModeLine     | No default value |
| OutputSignalLine | No default value |
| LSBGainLine      | No default value |
| MidSBGainLine    | No default value |
| MSBGainLine      | No default value |
| FemtoType        | 2                |
| UBWL10MHzLine    | No default value |
| UBWL1MHzLine     | No default value |

**There is no Class properties.**

## **States:**

| <b>States</b>  |                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------|
| <b>Names</b>   | <b>Descriptions</b>                                                                                      |
| <b>ON</b>      | Normal operation                                                                                         |
| <b>ALARM</b>   | Femto is on Overload - or overload is not responding                                                     |
| <b>RUNNING</b> | Automatically Searching the good Gain.                                                                   |
| <b>FAULT</b>   | happend when : - Tango:exception occured during creation of the device proxy - memory allocation problem |

## **Attributes:**

| Scalar Attributes                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |          |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|--------|
| Attribute name                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data Type   | R/W Type | Expert |
| <b>gain:</b> Select a Gain (0-6).<br>-----<br>0 & HS -> 10 <sup>5</sup> ; 0 & LN -> 10 <sup>3</sup><br>1 & HS -> 10 <sup>6</sup> ; 1 & LN -> 10 <sup>4</sup><br>2 & HS -> 10 <sup>7</sup> ; 2 & LN -> 10 <sup>5</sup><br>3 & HS -> 10 <sup>8</sup> ; 3 & LN -> 10 <sup>6</sup><br>4 & HS -> 10 <sup>9</sup> ; 4 & LN -> 10 <sup>7</sup><br>5 & HS -> 10 <sup>10</sup> ; 5 & LN -> 10 <sup>8</sup><br>6 & HS -> 10 <sup>11</sup> ; 6 & LN -> 10 <sup>9</sup> | DEV_SHORT   | WRITE    | No     |
| <b>coupling:</b> Set the Coupling Mode (AC/DC):<br>false -> AC<br>true -> DC                                                                                                                                                                                                                                                                                                                                                                                | DEV_BOOLEAN | WRITE    | No     |
| <b>gainMode:</b> Set the Gain Mode (HS/LN):<br>false -> High Speed Gain<br>true -> Low Noise Gain                                                                                                                                                                                                                                                                                                                                                           | DEV_BOOLEAN | WRITE    | No     |
| <b>overload:</b> Tell if Femto is overloaded:<br>0 -> not Overloaded<br>1 -> Overloaded                                                                                                                                                                                                                                                                                                                                                                     | DEV_SHORT   | READ     | No     |
| <b>outputSignal:</b> Value of the output signal                                                                                                                                                                                                                                                                                                                                                                                                             | DEV_DOUBLE  | READ     | No     |
| <b>gainSelected:</b> Gain Selected                                                                                                                                                                                                                                                                                                                                                                                                                          | DEV_STRING  | READ     | No     |
| <b>upperBWLimit:</b> Upper BandWidth Limit:<br>0 -> Full Bandwidth<br>1 -> 10 MHz<br>2 -> 1 MHz                                                                                                                                                                                                                                                                                                                                                             | DEV_SHORT   | WRITE    | No     |

## Commands:

More Details on commands....

| Device Commands for Operator Level |             |                  |
|------------------------------------|-------------|------------------|
| Command name                       | Argument In | Argument Out     |
| <b>Init</b>                        | DEV_VOID    | DEV_VOID         |
| <b>State</b>                       | DEV_VOID    | DEV_STATE        |
| <b>Status</b>                      | DEV_VOID    | CONST_DEV_STRING |
| <b>IncreaseGain</b>                | DEV_VOID    | DEV_VOID         |
| <b>DecreaseGain</b>                | DEV_VOID    | DEV_VOID         |

| Device Commands for Expert Level Only |             |              |
|---------------------------------------|-------------|--------------|
| Command name                          | Argument In | Argument Out |
| AutoSearchGain                        | DEV_VOID    | DEV_VOID     |

## 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 *nit\_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::ON
  - Tango::ALARM
  - Tango::RUNNING
  - Tango::FAULT

## 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::ON
  - Tango::ALARM
  - Tango::RUNNING
  - Tango::FAULT

## 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::ON
  - Tango::ALARM
  - Tango::RUNNING
  - Tango::FAULT

## 4 - IncreaseGain

- **Description:** Increase the Gain (max = 6).
- **Argin:**  
**DEV\_VOID** :
- **Argout:**  
**DEV\_VOID** :
- **Command allowed for:**
  - Tango::ON
  - Tango::ALARM
  - Tango::RUNNING
  - Tango::FAULT

## 5 - DecreaseGain

- **Description:** Decrease the Gain (min = 0).
- **Argin:**  
**DEV\_VOID** :
- **Argout:**  
**DEV\_VOID** :
- **Command allowed for:**
  - Tango::ON
  - Tango::ALARM

- Tango::RUNNING
- Tango::FAULT

## 6 - AutoSearchGain (for expert only)

- **Description:** Automatically search Gain: Set 1st Gain Check if Overload ....
- **Argin:**  
**DEV\_VOID :**
- **Argout:**  
**DEV\_VOID :**
- **Command allowed for:**
  - Tango::ON
  - Tango::ALARM
  - Tango::FAULT

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