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TwinCAT Library for   
RF Amplifiers, Dividers and Doublers

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| **Library** | |
| Title | RFAmplifier |
| Version | 2 |
| TwinCAT version | 2.11 |
| Name space | – |
| Author | Patrick Thomas, Daniel Sigg |
| Description | Controls an RF amplifier, [E1200111](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=86623), an RF divider, [E1200118](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=86613) and [E1200119](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=86614), and an RF doubler, [E1200117](https://dcc.ligo.org/cgi-bin/private/DocDB/ShowDocument?docid=86612).  Each of these chassis contains an RF power monitor and a voltage monitor. The RF power monitor will sample the RF signal after the amplifier, divider or doubler element.  The RF power monitors which has the calibration  The RF power levels should be alarmed when outside ±1dBm of nominal. |
| Error codes | 0x0001 – Power supply voltages out-of-range  0x0002 – Output RF power level out-of-range |
| Library dependencies | Error |

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| **Hardware Input Type**  TYPE RFAmplifierInStruct :  STRUCT  OutputMon: INT;  PowerOk: BOOL;  END\_STRUCT  END\_TYPE | |
| Type name | RFAmplifierInStruct |
| Description | Structure of the hardware inputs that are wired up for the RF amplifier, divider, or doubler |
| Definition | STRUCT |
| Element | Name: OutputMon  Type: INT  Description: Monitors the RF power at the output of the amplifier, divider or doubler element |
| Element | Name: PowerOk  Type: BOOL  Description: Voltage monitor readback |

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| **User Interface Type**  TYPE RFAmplifierStruct :  STRUCT  Error: ErrorStruct;  OutputMon: LREAL;  OutputNom: LREAL;  PowerOk: BOOL;  END\_STRUCT  END\_TYPE | |
| Type name | RFAmplifierStruct |
| Description | Structure of the user interface tags that are used to control the RF amplifier, divider, or doubler |
| Definition | STRUCT |
| Output Tag | Name: Error  Type: ErrorStruct  Description: Error handling |
| Output Tag | Name: OutputMon  Type: LREAL  Description: Monitors the RF power after the output of the amplifier, divider or doubler in dBm |
| Input Tag | Name: OutputNom  Type: LREAL  Description: Nominal value for the RF power at the output in dBm |
| Output Tag | Name: PowerOk  Type: BOOL  Description: Voltage monitor readback |

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| **Function Block**  FUNCTION\_BLOCK RFAmplifierFB  VAR\_INPUT  Request: SaveRestoreEnum;  RFAmplifierIn: RFAmplifierInStruct;  END\_VAR  VAR\_OUTPUT  END\_VAR  VAR\_IN\_OUT  RFAmplifierInit: RFAmplifierStruct;  RFAmplifier: RFAmplifierStruct;  END\_VAR  VAR  END\_VAR | |
| Name | RFAmplifierFB |
| Description | Controls the RF amplifier, divider or doubler. One function block for each RF amplifier, divider or doubler chassis needs to be instantiated. |
| Input argument | Name: Request  Type: SaveRestoreEnum  Description: Request save/restore/safemode or noop |
| Input argument | Name: RFAmplifierIn  Type: RFAmplifierInStruct  Description: Input hardware structure |
| In/out argument | Name: RFAmplifierInit  Type: RFAmplifierStruct  Description: Save/restore variable in persistent memory |
| In/out argument | Name: RFAmplifier  Type: RFAmplifierStruct  Description: User Interface structure |

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| **Visual** | |
| Name | RFAmplifierVis |
| Description | Displays the tags of four channels of whitening |
| Placeholder | Name: rfamp  Type: RFAmplifierStruct  Description: RF amplifier structure |