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TwinCAT Library for
RF Amplifiers, Dividers and Doublers

Patrick Thomas, Daniel Sigg

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| **California Institute of Technology****LIGO Project – MS 18-34****1200 E. California Blvd.****Pasadena, CA 91125**Phone (626) 395-2129Fax (626) 304-9834E-mail: info@ligo.caltech.edu | **Massachusetts Institute of Technology****LIGO Project – NW22-295****185 Albany St****Cambridge, MA 02139**Phone (617) 253-4824Fax (617) 253-7014E-mail: info@ligo.mit.edu |
| **LIGO Hanford Observatory****P.O. Box 159****Richland WA 99352**Phone 509-372-8106Fax 509-372-8137 | **LIGO Livingston Observatory****P.O. Box 940****Livingston, LA 70754**Phone 225-686-3100Fax 225-686-7189 |

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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$$P=12 dBm-10 dBm/V×(U-4 V)$$The RF power levels should be alarmed when outside ±1dBm of nominal. |
| Error codes | 0x0001 – Power supply voltages out-of-range0x0002 – 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\_STRUCTEND\_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: OutputMonType: INTDescription: Monitors the RF power at the output of the amplifier, divider or doubler element |
| Element | Name: PowerOkType: BOOLDescription: Voltage monitor readback |

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| **User Interface Type**TYPE RFAmplifierStruct :STRUCT Error: ErrorStruct; OutputMon: LREAL; OutputNom: LREAL; PowerOk: BOOL;END\_STRUCTEND\_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: ErrorType: ErrorStructDescription: Error handling |
| Output Tag | Name: OutputMonType: LREALDescription: Monitors the RF power after the output of the amplifier, divider or doubler in dBm |
| Input Tag | Name: OutputNomType: LREALDescription: Nominal value for the RF power at the output in dBm |
| Output Tag | Name: PowerOkType: BOOLDescription: Voltage monitor readback |

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| **Function Block**FUNCTION\_BLOCK RFAmplifierFBVAR\_INPUT Request: SaveRestoreEnum; RFAmplifierIn: RFAmplifierInStruct;END\_VARVAR\_OUTPUTEND\_VARVAR\_IN\_OUT RFAmplifierInit: RFAmplifierStruct; RFAmplifier: RFAmplifierStruct;END\_VARVAREND\_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: RequestType: SaveRestoreEnumDescription: Request save/restore/safemode or noop |
| Input argument | Name: RFAmplifierInType: RFAmplifierInStructDescription: Input hardware structure |
| In/out argument | Name: RFAmplifierInitType: RFAmplifierStructDescription: Save/restore variable in persistent memory |
| In/out argument | Name: RFAmplifierType: RFAmplifierStructDescription: User Interface structure |

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| **Visual** |
| Name | RFAmplifierVis |
| Description | Displays the tags of four channels of whitening |
| Placeholder | Name: rfampType: RFAmplifierStructDescription: RF amplifier structure |