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LIGO-E1300790-v1 *advanced LIGO* 10/16/2013

TwinCAT Library for Photodetectors

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of the LIGO Laboratory.

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| **Library** |
| Title | Photodetectors |
| Version | 1 |
| TwinCAT version | V2.11.0 |
| Name space |  |
| Author | Daniel Sigg |
| Description | Information about the photodetectors |
| Error Code | (Qpd) 1 — Whiten(Wfs) 1 — Dc(Wfs) 2 — Demod(Wfs) 3 — Whiten(WfsSimple) 1 — Demod(WfsSimple) 2 — Whiten(LsDc) 1 — Dc(LsDcWhiten) 1 — Dc(LsDcWhiten) 4 — Whiten(LsDemod) 2 — Demod(LsDemodPhase) 2 — Demod(LsDemodPhase) 8 — Phase(LsDemodPhaseWhiten) 2 — Demod(LsDemodPhaseWhiten) 4 — Whiten(LsDemodPhaseWhiten) 8 — Phase(LsDemodWhiten) 2 — Demod(LsDemodWhiten) 4 — Whiten(LsError) 1 — Dc(LsError) 2 — Demod(LsError) 8 — Phase(LsSimpleError) 1 — Dc(LsSimpleError) 2 — Demod(LsSimpleWhiten) 1 —Dc(LsSimpleWhiten) 2 — Demod(LsSimpleWhiten) 4 —Whiten(LsWhiten) 1 — Dc(LsWhiten) 2 — Demod(LsWhiten) 4 — Whiten(LsWhiten) 8 — Phase |
| Library Dependencies | Error, ReadADC, WriteADC, SaveRestore, DCPower, DelayLogic, IscWhitening  |

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| **User Interface Type**TYPE QpdStruct : STRUCT Error: ErrorStruct; Whiten: IscWhiteningSimpeQpdStruct;END\_STRUCT;END\_TYPE; |
| Type Name | QpdStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: WhitenType: IscWhiteningSimpleQpdStructDescription: Whitening |

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| **User Interface Type**TYPE WfsStruct : STRUCT Error: ErrorStruct; Dc: QuadDCPowerStruct; Demod: werStructorAscStruct; Whiten: IscWhiteningSimpeDemodWfsStruct;END\_STRUCT;END\_TYPE; |
| Type Name | WfsStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output tag | Name: DcType: QuadDCPowerStructDescription: |
| Output tag | Name: DemodType: werStructorAscStructDescription: |
| Output Tag | Name: WhitenType: IscWhiteningSimpleDemodWfsStructDescription: Whitening |

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| **User Interface Type**TYPE WfsSimpleStruct : STRUCT Error: ErrorStruct; Demod: DemodulatorAscStruct; Whiten: IscWhiteningSimpeWfsSimpleStruct;END\_STRUCT;END\_TYPE; |
| Type Name | WfsSimpleStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DemodType: DemodulatorAscStructDescription: |
| Output Tag | Name: WhitenType: IscWhiteningSimpleWfsSimpleStructDescription: Whitening |

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| **User Interface Type**TYPE LsDcStruct : STRUCT Error: ErrorStruct; Dc: DCPowerStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsDcStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DcType: DCPowerStructDescription: DC Power |

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| **User Interface Type**TYPE LsDcWhitenStruct : STRUCT Error: ErrorStruct; Dc: DCPowerStruct; Whiten: IscWhiteningChannelStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsDcWhitenStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DcType: DCPowerStructDescription: DC Power |
| Output Tag | Name: WhitenType: IscWhiteningChannelStructDescription: Whitening |

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| **User Interface Type**TYPE LsDemodPhaseStruct : STRUCT Error: ErrorStruct; Demod: icStructtorLscStruct; Phase: DelayLogicStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsDemodPhaseStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: PhaseType: DelayLogicStructDescription:  |
| Output Tag | Name: DemodType: icStructtorLscStrucDescription:  |

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| **User Interface Type**TYPE LsDemodPhaseWhitenStruct : STRUCT Error: ErrorStruct; Demod: DemodulatorLscStruct; Phase: DelayLogicStruct; Whiten: IscWhiteningSimpleDemodIQStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsDemodPhaseWhitenStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: PhaseType: DelayLogicStructDescription:  |
| Output Tag | Name: DemodType: DemodulatorLscStructDescription:  |
| Output Tag | Name: WhitenType: IscWhiteningSimpleDemodIQStructDescription: |

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| **User Interface Type**TYPE LsDemodStruct : STRUCT Error: ErrorStruct; Demod: DemodulatorLscStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsDemodStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DemodType: DemodulatorLscStructDescription:  |

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| **User Interface Type**TYPE LsDemodWhitenStruct : STRUCT Error: ErrorStruct; Demod: DemodulatorLscStruct; Whiten: IscWhiteningSimpleDemodIQStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsDemodWhitenStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DemodType: DemodulatorLscStructDescription:  |
| Output Tag | Name: WhitenType: IscWhiteningSimpleDemodIQStructDescription: |

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| **User Interface Type**TYPE LsSimpleStruct : STRUCT Error: ErrorStruct; Dc: DCPowerStruct; Demod: DemodulatorLscStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsSimpleStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DcType: DCPowerStructDescription: |
| Output Tag | Name: DemodType: DemodulatorLscStructDescription:  |

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| **User Interface Type**TYPE LsSimpleWhitenStruct : STRUCT Error: ErrorStruct; Dc: DCPowerStruct; Demod: DemodulatorLscStruct; Whiten: IscWhiteningSimpleDemodIQStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsSimpleWhitenStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DcType: DCPowerStructDescription: |
| Output Tag | Name: DemodType: DemodulatorLscStructDescription:  |
| Output Tag | Name: WhitenType: IscWhiteningSimpleDemodIQStructDescription: |

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| **User Interface Type**TYPE LsStruct : STRUCT Error: ErrorStruct; Dc: DCPowerStruct; Demod: DemodulatorLscStruct; Phase: DelayLogicStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DcType: DCPowerStructDescription: |
| Output Tag | Name: DemodType: DemodulatorLscStructDescription:  |
| Output Tag | Name: PhaseType: DelayLogicStructDescription: |

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| **User Interface Type**TYPE LsWhitenStruct : STRUCT Error: ErrorStruct; Dc: DCPowerStruct; Demod: DemodulatorLscStruct; Phase: DelayLogicStruct; Whiten: IscWhiteningSimpleDemodIQStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsWhitenStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: DcType: DCPowerStructDescription: |
| Output Tag | Name: DemodType: DemodulatorLscStructDescription:  |
| Output Tag | Name: PhaseType: DelayLogicStructDescription: |
| Output Tag | Name: WhitenType: IscWhiteningSimpleDemodIQStructDescription: |

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| **User Interface Type**TYPE LsDcWhitenOnlyStruct : STRUCT Error: ErrorStruct; Whiten: IscWhiteningChannelStruct;END\_STRUCT;END\_TYPE; |
| Type Name | LsDcWhitenOnlyStruct |
| Description | User interface structure |
| Definition | STRUCT |
| In/out Tag | Name: ErrorType: ErrorStructDescription: Calls error handler |
| Output Tag | Name: WhitenType: IscWhiteningChannelStructDescription: Whitening |

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| **Function Block**TYPE QpdErrorHandlerFB:VAR\_IN\_OUT Qpd: QpdStruct;END\_VAR:END\_TYPE; |
| Type Name | QpdErrorHandlerFB |
| Description | Function block used to monitor Qpds  |
| Definition | Function Block |
| In/out Argument | Name: QpdType: QpdStructDescription: User interface structure |

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| **Function Block**TYPE WfsErrorHandlerFB:VAR\_IN\_OUT Wfs WfsStruct;END\_VAR:END\_TYPE; |
| Type Name | WfsErrorHandlerFB |
| Description | Function block used to monitor Wfs  |
| Definition | Function Block |
| In/out Argument | Name: WfsType: WfsStructDescription: User interface structure |

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| **Function Block**TYPE WfsSimpleErrorHandlerFB:VAR\_IN\_OUT WfsSimple WfsSimpleStruct;END\_VAR:END\_TYPE; |
| Type Name | WfsSimpleErrorHandlerFB |
| Description | Function block used to monitor Wfs simple |
| Definition | Function Block |
| In/out Argument | Name: WfsSimpleType: WfsSimpleStructDescription: User interface structure |

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| **Function Block**TYPE LsDcErrorHandlerFB:VAR\_IN\_OUT LsDc LsDcStruct;END\_VAR:END\_TYPE; |
| Type Name | LsDcErrorHandlerFB |
| Description | Function block used to monitor LsDc  |
| Definition | Function Block |
| In/out Argument | Name: LsDcType: LsDcStructDescription: User interface structure |

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| **Function Block**TYPE WfsErrorHandlerFB:VAR\_IN\_OUT Wfs WfsStruct;END\_VAR:END\_TYPE; |
| Type Name | LsDcWhitenErrorHandlerFB |
| Description | Function block used to monitor LsDcWhiten  |
| Definition | Function Block |
| In/out Argument | Name: LsDcWhitenType: LsDcWhitenStructDescription: User interface structure |

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| **Function Block**TYPE LsDcWhitenOnlyErrorHandlerFB:VAR\_IN\_OUT LsDcWhitenOnly LsDcWhitenOnlyStruct;END\_VAR:END\_TYPE; |
| Type Name | LsDcWhitenOnlyErrorHandlerFB |
| Description | Function block used to monitor LsDcWhitenOnly  |
| Definition | Function Block |
| In/out Argument | Name: LsDcWhitenOnlyType: LsDcWhitenOnlyStructDescription: User interface structure |

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| **Function Block**TYPE LsDemodErrorHandlerFB:VAR\_IN\_OUT LsDemod LsDemodStruct;END\_VAR:END\_TYPE; |
| Type Name | LsDemodErrorHandlerFB |
| Description | Function block used to monitor LsDemod  |
| Definition | Function Block |
| In/out Argument | Name: LsDemodType: LsDemodStructDescription: User interface structure |

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| **Function Block**TYPE LsDemodPhaseErrorHandlerFB:VAR\_IN\_OUT LsDemodPhase LsDemodPhaseStruct;END\_VAR:END\_TYPE; |
| Type Name | LsDemodPhaseErrorHandlerFB |
| Description | Function block used to monitor LsDemodPhase  |
| Definition | Function Block |
| In/out Argument | Name: LsDemodPhaseType: LsDemodPhaseStructDescription: User interface structure |

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| **Function Block**TYPE LsDemodPhaseWhitenErrorHandlerFB:VAR\_IN\_OUT LsDemodPhaseWhiten LsDemodPhaseWhitenStruct;END\_VAR:END\_TYPE; |
| Type Name | LsDemodPhaseWhitenErrorHandlerFB |
| Description | Function block used to monitor LsDemodPhaseWhiten  |
| Definition | Function Block |
| In/out Argument | Name: LsDemodPhaseWhitenType: LsDemodPhaseWhitenStructDescription: User interface structure |

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| **Function Block**TYPE LsDemodWhitenErrorHandlerFB:VAR\_IN\_OUT LsDemodWhiten LsDemodWhitenStruct;END\_VAR:END\_TYPE; |
| Type Name | LsDemodWhitenErrorHandlerFB |
| Description | Function block used to monitor LsDemodWhiten  |
| Definition | Function Block |
| In/out Argument | Name: LsDemodWhitenType: LsDemodWhitenStructDescription: User interface structure |

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| **Function Block**TYPE LsErrorHandlerFB:VAR\_IN\_OUT Ls LsStruct;END\_VAR:END\_TYPE; |
| Type Name | LsErrorHandlerFB |
| Description | Function block used to monitor Ls  |
| Definition | Function Block |
| In/out Argument | Name: LsType: LsStructDescription: User interface structure |

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| **Function Block**TYPE LsSimpleErrorHandlerFB:VAR\_IN\_OUT LsSimple LsSimpleStruct;END\_VAR:END\_TYPE; |
| Type Name | LsSimpleErrorHandlerFB |
| Description | Function block used to monitor LsSimple  |
| Definition | Function Block |
| In/out Argument | Name: LsSimpleType: LsSimpleStructDescription: User interface structure |

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| **Function Block**TYPE LsSimpleWhitenErrorHandlerFB:VAR\_IN\_OUT LsSimpleWhiten LsSimpleWhitenStruct;END\_VAR:END\_TYPE; |
| Type Name | LsSimpleWhitenErrorHandlerFB |
| Description | Function block used to monitor LsSimpleWhiten  |
| Definition | Function Block |
| In/out Argument | Name: LsSimpleWhitenType: LsSimpleWhitenStructDescription: User interface structure |

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| **Function Block**TYPE LsWhitenErrorHandlerFB:VAR\_IN\_OUT LsWhiten LsWhitenStruct;END\_VAR:END\_TYPE; |
| Type Name | LsWhitenErrorHandlerFB |
| Description | Function block used to monitor LsWhiten  |
| Definition | Function Block |
| In/out Argument | Name: LsWhitenType: LsWhitenStructDescription: User interface structure |