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LIGO-E-1300772-v1 *advanced LIGO* 10/15/2013

TwinCAT Library for ALS State Machine

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| **Library** | |
| Title | ALSStateMachine |
| Version | 1 |
| TwinCAT version | V2.11.0 |
| Name space |  |
| Author | Daniel Sigg |
| Description | Monitors the state of the ALS machines; reports the state of end station locking |
| Error Code | None |
| Library Dependencies | ALSCommunication, ALSLaser, ALSLaserLocking, ALSPDHLocking, WristDAC, CommonMode, DCPower, DelayLogic, Demodulator, Error, FiberDistribution, IscWhitening, LowNoiseVCO, Photodetectors, ReadADC, RFAmplifier, RtCommunications, SaveRetore |

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| **User Interface Type**  TYPE ALSLockEndStruct :  STRUCT  Enable: BOOL;  StateRequest: ALSEndStateEnum;  State: ALSEndStateEnum;  END\_STRUCT;  END\_TYPE; | |
| Type Name | ALSLockEndStruct |
| Description | Structure used in the user interface type to monitor the end station locking |
| Definition | STRUCT |
| Input Tag | Name: Enable  Type: BOOL  Description: Enable button |
| Input Tag | Name: StateRequest  Type: LREAL  Description: Request a state for the ALS end machine |
| Output Tag | Name: State  Type: ALSEndStateEnum  Description: End station locking state |

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| **User Interface Type**  TYPE ALSLockStruct :  STRUCT  RequestX: ALSEndStateEnum;  RequestY: ALSEndStateEnum;  StateX: ALSEndStateEnum;  StateY: ALSEndStateEnum;  Overall: ALSCornerStateEnum;  END\_STRUCT;  END\_TYPE; | |
| Type Name | ALSLaserLockingFiberStruct |
| Description | Structure used in the user interface type to monitor the end station locking |
| Definition | STRUCT |
| Input Tag | Name: RequestX  Type: ALSEndStateEnum  Description: Request a state for the ALS EX machine |
| Input Tag | Name: RequestY  Type: ALSEndStateEnum  Description: Request a state for the ALS EY machine |
| Output Tag | Name: StateX  Type: ALSEndStateEnum  Description: EX station locking state |
| Output Tag | Name: StateY  Type: ALSEndStateEnum  Description: EY station locking state |
| Output Tag | Name: Overall  Type: ALSCornerStateEnum  Description: Corner station locking state |

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| **Function Block**  TYPE ALSStateMachineEndFB:  VAR\_IN\_OUT  PLLLocking: ALSLaserLockingStruct;  PDHLocking; ALSPDHLockingStruct;  ALSEndLock: ALSLockEndStruct;  END\_VAR:  END\_TYPE; | |
| Type Name | ALSFrequencyFB |
| Description | Function block used to monitor the VCO and beat note frequencies |
| Definition | Function Block |
| In/out Argument | Name: PLLLocking  Type: ALSLaserLockingStruct  Description: User interface structure to monitor PLL locking |
| In/out Argument | Name: PDHLocking  Type: ALSPDHLockingStruct  Description: User interface structure to monitor PDH locking |
| In/out Argument | Name: ALSEndLock  Type: ALSLockEndStruct  Description: User interface structure |