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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: EnableType: BOOLDescription: Enable button |
| Input Tag | Name: StateRequestType: LREALDescription: Request a state for the ALS end machine |
| Output Tag | Name: StateType: ALSEndStateEnumDescription: 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: RequestXType: ALSEndStateEnumDescription: Request a state for the ALS EX machine |
| Input Tag | Name: RequestYType: ALSEndStateEnumDescription: Request a state for the ALS EY machine |
| Output Tag | Name: StateXType: ALSEndStateEnumDescription: EX station locking state |
| Output Tag | Name: StateYType: ALSEndStateEnumDescription: EY station locking state |
| Output Tag | Name: OverallType: ALSCornerStateEnumDescription: 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: PLLLockingType: ALSLaserLockingStructDescription: User interface structure to monitor PLL locking |
| In/out Argument | Name: PDHLockingType: ALSPDHLockingStructDescription: User interface structure to monitor PDH locking |
| In/out Argument | Name: ALSEndLockType: ALSLockEndStructDescription: User interface structure |