*LIGO Laboratory / LIGO Scientific Collaboration*

LIGO- E1200630-v2 Advanced LIGO 9/4/2013

TwinCAT Library for
Auxiliary Channels

Alexa Staley, Daniel Sigg

Distribution of this document:

LIGO Scientific Collaboration

This is an internal working note
of the LIGO Laboratory.

|  |  |
| --- | --- |
| **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 |

http://www.ligo.caltech.edu/

|  |
| --- |
| **Library** |
| Title | Auxiliary |
| Version | 2 |
| TwinCAT version | 2.11 |
| Name space | – |
| Author | Alexa Staley, Daniel Sigg |
| Description | Controls the auxiliary  |
| Error codes | None |
| Library dependencies | Error, SaveRestore |

|  |
| --- |
| **Hardware Input Type**TYPE AuxiliaryInStruct :STRUCT AI1: INT;AI2: INT;AI3: INT;AI4: INT;BI1: INT;BI2: INT;BI3: INT;BI4: INT;END\_STRUCTEND\_TYPE |
|   | AuxiliaryInStruct |
| Description | Structure of the hardware input that are wired up for the auxiliary |
| Definition | STRUCT |
| Element | Name: AI1Type: INTDescription: Analog input 1 |
| Element | Name: AI2Type: INTDescription: Analog input 2 |
| Element | Name: AI3Type: INTDescription: Analog input 3 |
| Element | Name: AI4Type: INTDescription: Analog input 4 |
| Element | Name: BI1Type: INTDescription: Binary input 1 |
| Element | Name: BI2Type: INTDescription: Binary input 2 |
| Element | Name: BI3Type: INTDescription: Binary input 3 |
| Element | Name: BI4Type: INTDescription: Binary input 4 |

|  |
| --- |
| **Hardware Output Type**TYPE AuxiliaryOutStruct :STRUCT AO1: INT;AO2: INT;AO3: INT;AO4: INT;BO1: INT;BO2: INT;BO3: INT;BO4: INT;END\_STRUCTEND\_TYPE |
|   | AuxiliaryOutStruct |
| Description | Structure of the hardware output that are wired up for the auxiliary |
| Definition | STRUCT |
| Element | Name: AO1Type: INTDescription: Analog output 1 |
| Element | Name: AO2Type: INTDescription: Analog output 2 |
| Element | Name: AO3Type: INTDescription: Analog output 3 |
| Element | Name: AO4Type: INTDescription: Analog output 4 |
| Element | Name: BO1Type: INTDescription: Binary output 1 |
| Element | Name: BO2Type: INTDescription: Binary output 2 |
| Element | Name: BO3Type: INTDescription: Binary output 3 |
| Element | Name: BO4Type: INTDescription: Binary output 4 |

|  |
| --- |
| **User Interface Type**TYPE AuxiliaryStruct :STRUCTError: ErrorStruct;BI: ARRAY [1..4] OF BOOL;BO: ARRAY [1..4] OF BOOL;AI: ARRAY [1..4] OF BOOL;AO: ARRAY [1..4] OF BOOL;END\_STRUCTEND\_TYPE |
| Type name | AuxiliaryStruct |
| Description | Structure of the user interface tags that are used to control the auxiliary |
| Definition | STRUCT |
| Output Tag | Name: ErrorType: ErrorStructDescription: For error handling |
| Input Tag | Name: AIType: ARRAY [1..4] OF BOOL;Description: Array of analog inputs  |
| Input Tag | Name: BIType: ARRAY [1..4] OF BOOL;Description: Array of binary inputs |
| Output Tag | Name: AOType: ARRAY [1..4] OF BOOL;Description: Array of analog outputs |
| Output Tag | Name: BO1Type: ARRAY [1..4] OF BOOL;Description: Array of binary outputs |

|  |
| --- |
| **Function Block**FUNCTION\_BLOCK AuxiliaryFBVAR\_INPUT Request: SaveRestoreEnum;AuxiliaryIn: AuxiliaryInStruct;END\_VARVAR\_OUTPUTAuxiliaryOut: AuxiliaryOutStruct;END\_VARVAR\_IN\_OUT AuxiliaryInit: AuxiliaryStruct; Auxiliary: AuxiliaryStruct;END\_VAR |
| Name | AuxiliaryFB |
| Description | Controls the auxiliary channels  |
| Input argument | Name: Request:Type: SaveRestoreEnumDescription: Rquest for save/restore/safemode or noop |
| Input argument | Name: AuxiliaryInType: AuxiliaryInStructDescription: Input hardware structure |
| Output argument | Name: AuxiliaryOutType: AuxiliaryOutStructDescription: Output hardware structure |
| In/out argument | Name: AuxiliaryInitType: AuxiliaryStructDescription: Save/restore variable in persistent memory |
| In/out argument | Name: AuxiliaryType: AuxiliaryStructDescription: User Interface structure |

|  |
| --- |
| **Visual** |
| Name | AuxiliaryVis |
| Description | Displays auxiliary input and output, and standard error message |
| Placeholder | Name: AuxiliaryStructType: AuxiliaryDescription: Auxiliary structure |