*LIGO Laboratory / LIGO Scientific Collaboration*

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TwinCAT Library for Error Handling

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| **Library** |
| Title | Error |
| Version | 3 |
| TwinCAT version | 2.11 |
| Name space | – |
| Author | Daniel Sigg |
| Description | Handles error conditions for TwinCAT libraries.The library exports an error structure for reporting error conditions. This structure is typically declared as the first element of an interface structure. A handler is provided to report errors. Errors are bit encoded into a DWORD. Error messages for multiple simultaneous conditions are concatenated until the maximum string length is reached. If there are additional error conditions, this is indicated with a ‘+’ character at the end of the string. Multiple error conditions can always be reconstructed from the bit-encoded error code. |
| Error codes | Library dependent |
| Library dependencies: | none |

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| **User Interface Type**TYPE ErrorStruct :STRUCT Flag: BOOL; Code: DWORD; Msg: STRING;END\_STRUCTEND\_TYPE |
| Type name | ErrorStruct |
| Description | Structure in a user interface to define an error condition |
| Definition | STRUCT |
| Output Tag | Name: FladType: BOOLDescription: Flag indicating any error condition |
| Output Tag | Name: CodeType: DWORDDescription: Bit-encoded value describing the error condition(s) |
| Output Tag | Name: MsgType: STRINGDescription: Human readable text describing the error |

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| **Enum Type**TYPE ErrorMethodEnum : (Init, Report, Commit);END\_TYPE |
| Type name | ErrorMethodEnum |
| Description | Describes the handler method |
| Definition | ENUM |
| Enum tag | Name: InitDescription: Initializes the error handler |
| Enum Tag | Name: ReportDescription: Reports an error condition |
| Enum Tag | Name: CommitDescription: Commit the error to the interface structure |

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| **Function Block**FUNCTION\_BLOCK ErrorHandlerFBVAR\_INPUT ErrorMethod: ErrorMethodEnum; Code: DWORD := 0; Msg: STRING := '';END\_VARVAR\_OUTPUTEND\_VARVAR\_IN\_OUT Error: ErrorStruct;END\_VAR |
| Name | ErrorHandlerFB |
| Description | Handles error conditions. |
| Input argument | Name: ErrorMethodType: ErrorMethodEnumDescription: For initialization, report and commit |
| Input argument | Name: CodeType: DWORDDescription: Error code |
| Input argument | Name: MsgType: STRINGDescription: Error message string |
| In/out argument | Name: ErrorType: ErrorStructDescription: Input and output of error structure |

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| **Example:**VAR ErrorHandler: ErrorHandlerFB;END\_VAR(\* Initialize \*)ErrorHandler (ErrorMethod := Init, Error := LowNoiseVco.Error);(\* read and process values... report an error... process further... \*)...IF NOT LowNoiseVco.PowerOk THEN ErrorHandler (ErrorMethod := Report, Error := LowNoiseVco.Error, Code := 16#01, Msg := 'Power supply voltages out-of-range');END\_IF;...(\* Finally commit \*)ErrorHandler (ErrorMethod := Commit, Error := LowNoiseVco.Error); |

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| **Visual** |
| Name | ErrorCodeVis |
| Description | Displays error message with color indicator  |
| Placeholder | Name: ErrorMesageType: ErrorStructDescription: Displays the error message |
| PlaceHolder | Name: ErrorType: ErrorStructDescription: Displays the alarm when error for the message is true  |
| PlaceHolder | Name: CodeType: ErrorStructDescription: Code for the error message |

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| **Visual** |
| Name | ErrorVis |
| Description | Displays error message and error code  |
| Placeholder | Name: ErrorType: ErrorStructDescription: Alarm is on when error is true; displays bit number; displays error message and include “+” for multiple errors |