My_Library

Function block library for PLCnext Engineer

Documentation for

PHOENIX CONTACT function blocks

PHOENIX CONTACT GmbH & Co. KG

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This documentation is available in English only.

CONTENTS

General information

Help file for the PLCnext Engineer library **My_Library** version **1**

Supported PLCnext Engineer versions

Minimal required version:

Maximum supported version:

Supported devices

Controller - AXC F 1152 - Order number: 1151412

Controller - AXC F 2152 - Order number: 2404267

Library description

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Safety-related danger messages

In accordance with the applicable standards, the following hazard messages are used in this documentation.

Note

Note texts give you addition information which may be useful when working with this library.

⚠ Caution

A caution text informs you about minor hazard situations which, if not avoided, may result in minor or moderate injury.

⚠ Warning

This is a warning text. It informs you about a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ Danger

This text indicates hazardous situation which, if not avoided, will result in death or serious injury.

Installation hints

If you did not specify a different directory during library installation all data in the MSI file will be unpacked to

C:\Users\Public\Documents\Phoenix Contact Libraries\PLCnext Engineer
(former: PC Worx Engineer)

Please copy the library data to your PLCnext Engineer (former: PC Worx Engineer) working library directory.

If you did not specify a different directory during PLCnext Engineer installation the default PLCnext Engineer working library directory is

C:\Users\Public\Documents\PLCnext Engineer\Libraries
(former: PC Worx Engineer\Libraries)

Change notes

Version*	Information
2.0.0 (2023.0.1 LTS)	Change information
1.1.0 (2022.0 LTS)	Change information (further functionality)
1.0.0 (2022.0 LTS)	Inital release

* **Format:** Mayor.Minor.Patch (Build/PLCnext Engineer version)

Functions and function blocks

Functions

LIBID_My_FU1_1

- **Version:** 1.0
- **Short description:** This function can be used ...
- **Supported artikels:**
  - AXL F AI2 AO2 1H (2702072)
  - AXL F AI2 AO2 XC 1H (1035429)
- **License:** None

...

- **Version:** ...
- **Short description:** ...
- **Supported artikels:**
  - ...
- **License:** ...

Function blocks

LIBID_My_FB1_1

- **Version:** 1.0
- **Short description:** With this function block ...
- **Supported artikels:**
  - AXL F AI2 AO2 1H (2702072)
- **License:** None

LIBID_My_FB2_1

- **Version:** 1.0
- **Short description:** This function block can be used ...
- **Supported artikels:**
  - HW independend
- **License:** None

LIBID_My_FB3_1

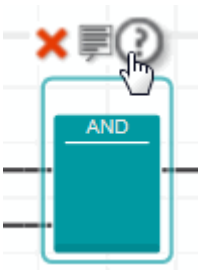
- **Version:** 1.0
- **Short description:** This function block calculates ...
- **Supported artikels:**
  - HW independend
- **License:** None

...

- **Version:** ...
- **Short description:** ...
- **Supported artikels:**
  - ...
- **License:** ...

LIBID_My_FU1_1

Type	Function
Description	This function is used to .... The function provides the following: • Item 1 • Item 2 • ...
Notes	• All parameters can be negated. **Note:** The negation of formal parameters is not supported in safety-related code (SNOLD). • ...

Parameters	**Inputs** — xActivate Data type: BOOL Description: Function activation. — xVar1 Data type: BOOL Description: Description of parameter xVar1. — xVar2 Data type: BOOL Description: Description of parameter xVar2. **Output / Return value** — OUT Data type: BOOL Description: Description of the return value.
Examples	— Example in ST ``` xResult := LIBID_My_FU1_1(TRUE, xLocalVar1, xLocalVar2); ``` — Example in FBD 

Additional Info	— EN/ENO behavior The POU is only executed if TRUE is applied to the EN input. If EN = FALSE, the POU is not executed and ENO = FALSE indicates the inactivity. If any errors occurs while executing the function, ENO is set to FALSE. Further Info: See PLCnext Engineer documentation > topic “General information on execution control with EN/ENO” for further details. • Further additional information • Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

LIBID_My_FB1_1

Type	Function block
Description	This function block is used to .... The function block provides the following: • Item 1 • Item 2 • ...
Notes	• All parameters can be negated. **Note:** The negation of formal parameters is not supported in safety-related code (SNOLD). • Function blocks have to be instantiated. The instance name of the function block has to be declared in the 'Variables' table of the POU where the FB is going to be used. The instance name must be unique within the POU. • ...
Parameters	**Inputs** — xActivate Data type: BOOL Description: Function block activation . — bVar1 Data type: BYTE Description: Description of parameter xVar1. **Outputs** — xActive Data type: BOOL Description: Function block active status.

- xError
  - Data type: BOOL
  - Description: Function block error status.
- wDiagCode
  - Data type: WORD
  - Description: Diagnosis code. See “Error codes” section for further information.
- wAddDiagCode
  - Data type: WORD
  - Description: Additional diagnosis code. See “Error codes” section for further information.
- rResult
  - Data type: REAL
  - Description: Description of parameter rResult.

Error codes

— Error codes for wDiagCode

wDiagCode	Meaning
16#0000	Function block is deactivated.
16#8000	Function block is in regular operation.
...	...

— Error codes for wDiagCode and wAddDiagCode

wDiagCode	wAddDiagCode	Meaning
16#0000	16#0000	Function block is deactivated.
16#8000	16#0000	Function block is in regular operation.
16#C110		An invalid input parameter has been detected.
16#C520		Error in an internal used function block.
...	...	...

Examples	— Example in ST `LIBID_My_FB1_1_11(TRUE, BYTE#2#0010_0111);` `G_rResult := LIBID_My_FB1_1_11.rResult;` — Example in FBD 
Additional Info	My additional information

Group 1

In this group you can find function blocks for ...

List of function blocks:

- FB_2
- FB_3

LIBID_My_FB2_1

Type	Function block
Description	This function block is used to .... The function block provides the following: • Item 1 • Item 2 • ...
Notes	• All parameters can be negated. **Note:** The negation of formal parameters is not supported in safety-related code (SNOLD). • Function blocks have to be instantiated. The instance name of the function block has to be declared in the 'Variables' table of the POU where the FB is going to be used. The instance name must be unique within the POU. • ...
Parameters	**Inputs** — xActivate Data type: BOOL Description: Function block activation . — bVar1 Data type: BYTE Description: Description of parameter xVar1. **Outputs** — xActive Data type: BOOL Description: Function block active status.

- xError
  - Data type: BOOL
  - Description: Function block error status.
- wDiagCode
  - Data type: WORD
  - Description: Diagnosis code. See “Error codes” section for further information.
- wAddDiagCode
  - Data type: WORD
  - Description: Additional diagnosis code. See “Error codes” section for further information.
- rResult
  - Data type: REAL
  - Description: Description of parameter rResult.

Error codes

— Error codes for wDiagCode

wDiagCode	Meaning
16#0000	Function block is deactivated.
16#8000	Function block is in regular operation.
...	...

— Error codes for wDiagCode and wAddDiagCode

wDiagCode	wAddDiagCode	Meaning
16#0000	16#0000	Function block is deactivated.
16#8000	16#0000	Function block is in regular operation.
16#C110		An invalid input parameter has been detected.
16#C520		Error in an internal used function block.
...	...	...

Examples	— Example in ST `LIBID_My_FB1_1_11(TRUE, BYTE#2#0010_0111);` `G_rResult := LIBID_My_FB1_1_11.rResult;` — Example in FBD 
Additional Info	My additional information

LIBID_My_FB3_1

Type	Function block
Description	This function block is used to .... The function block provides the following: • Item 1 • Item 2 • ...
Notes	• All parameters can be negated. **Note:** The negation of formal parameters is not supported in safety-related code (SNOLD). • Function blocks have to be instantiated. The instance name of the function block has to be declared in the 'Variables' table of the POU where the FB is going to be used. The instance name must be unique within the POU. • ...
Parameters	**Inputs** — xActivate Data type: BOOL Description: Function block activation . — bVar1 Data type: BYTE Description: Description of parameter xVar1. **Outputs** — xActive Data type: BOOL Description: Function block active status.

- xError
  - Data type: BOOL
  - Description: Function block error status.
- wDiagCode
  - Data type: WORD
  - Description: Diagnosis code. See “Error codes” section for further information.
- wAddDiagCode
  - Data type: WORD
  - Description: Additional diagnosis code. See “Error codes” section for further information.
- rResult
  - Data type: REAL
  - Description: Description of parameter rResult.

Error codes

— Error codes for wDiagCode

wDiagCode	Meaning
16#0000	Function block is deactivated.
16#8000	Function block is in regular operation.
...	...

— Error codes for wDiagCode and wAddDiagCode

wDiagCode	wAddDiagCode	Meaning
16#0000	16#0000	Function block is deactivated.
16#8000	16#0000	Function block is in regular operation.
16#C110		An invalid input parameter has been detected.
16#C520		Error in an internal used function block.
...	...	...

Examples	— Example in ST `LIBID_My_FB1_1_11(TRUE, BYTE#2#0010_0111);` `G_rResult := LIBID_My_FB1_1_11.rResult;` — Example in FBD 
Additional Info	My additional information

Appendix

Diag codes of used firmware function blocks

PDI_READ

for PLCnext Engineer

ERROR = TRUE

STATUS[0]	STATUS[1]	Meaning
16#09B0	16#000C	The variable connected to RD_1 is invalid (no array or invalid array type).
16#09B0	16#000B	The array connected to RD_1 is too small to save the requested receive data.
16#09B0	16#000E	Timeout. No response to the sent PDI READ request received.
16#09B0	16#000F	An internal error has occurred.

When receiving a negative confirmation as response to a PDI_READ request, the Axioline module directly copies the received error code (Error_Code and Add_Info) to STATUS[0] or STATUS[1]. These error codes are module-specific. For a description see the respective module documentation.

PDI_WRITE

for PLCnext Engineer

ERROR = TRUE

STATUS[0]	STATUS[1]	Meaning
16#09B0	16#000A	The variable connected to SD_1 is invalid (no array or invalid array type). connected to SD_1, greater than the maximum allowed length (245 bytes) or equal to zero.
16#09B0	16#0009	Invalid value at DATA_CNT input. The value is either greater than the array
16#09B0	16#000E	Timeout. No response to the sent PDI WRITE request received.
16#09B0	16#000F	An internal error has occurred.

When receiving a negative confirmation as response to a PDI_WRITE request, the Axioline module directly copies the received error code (Error_Code and Add_Info) to STATUS[0] or STATUS[1]. These error codes are module-specific. For a description see the respective module documentation.

RDREC

for PLCnext Engineer

Error code	Meaning
16#0000	No error occurred.
16#F001	Too many instances used.
16#F002	Error during initialization of the function block.
16#F003	Invalid ID.
16#F004	Invalid HANDLE/ID.
16#F005	Resources conflict.
16#F006	A function block internal task could not be generated.
16#F007	Too many instances used.
16#F008	Invalid type of a parameter.
16#F009	Invalid parameter value.
16#F00A	Unallowed parameter.
16#F00B	Invalid length specified.
16#F00C	ID could not be created (too many IDs).
16#F00D	No entry found that matches the specified ID.
16#F00F	No further entries found.
16#F010	Entry in use.
16#F011	Alarm acknowledgement could not be done.
16#F012	Error reading the AR parameters (1st time).
16#F013	Negative acknowledgement received for the execution of a PROFINET service.
16#F014	Invalid length for parameter LEN/MLEN or/and RECORD data record too short.
16#F015	The service used to read the RECORD data record could not be run.
16#F016	The service used to write the RECORD data record could not be run.
16#F017	Service acknowledgement not received.

16#F018	Invalid INDEX used to access the RECORD data record of the IO device, for example, INDEX greater than 16#7FFF.
16#F019	Unknown command code.
16#F01A	Error starting the Application Relation (AR).
16#F01B	Error stopping the Application Relation (AR).
16#F01C	Notification of stopped Application Relation (AR) failed.
16#F01D	Setting the “Drive BF” flag failed.
16#F01E	Error reading the AR parameters (2nd time).

WRREC

for PLCnext Engineer

Error code	Meaning
16#0000	No error occurred.
16#F001	Too many instances used.
16#F002	Error during initialization of the function block.
16#F003	Invalid ID.
16#F004	Invalid HANDLE/ID.
16#F005	Resources conflict.
16#F006	A function block internal task could not be generated.
16#F007	Too many instances used.
16#F008	Invalid type of a parameter.
16#F009	Invalid parameter value.
16#F00A	Unallowed parameter.
16#F00B	Invalid length specified.
16#F00C	ID could not be created (too many IDs).
16#F00D	No entry found that matches the specified ID.
16#F00F	No further entries found.

16#F010	Entry in use.
16#F011	Alarm acknowledgement could not be done.
16#F012	Error reading the AR parameters (1st time).
16#F013	Negative acknowledgement received for the execution of a PROFINET service.
16#F014	Invalid length for parameter LEN/MLEN or/and RECORD data record too short.
16#F015	The service used to read the RECORD data record could not be run.
16#F016	The service used to write the RECORD data record could not be run.
16#F017	Service acknowledgement not received.
16#F018	Invalid INDEX used to access the RECORD data record of the IO device, for example, INDEX greater than 16#7FFF.
16#F019	Unknown command code.
16#F01A	Error starting the Application Relation (AR).
16#F01B	Error stopping the Application Relation (AR).
16#F01C	Notification of stopped Application Relation (AR) failed.
16#F01D	Setting the “Drive BF” flag failed.
16#F01E	Error reading the AR parameters (2nd time).

TCP_SOCKET, TCP_READ, TCP_WRITE, UDP_SOCKET,UDP_READ, UDP_WRITE

ERROR = FALSE

Error code	Meaning
16#0000	Situation is normal (no error).
16#8000	Socket is trying to connect the partner.
16#8001	Server is listening for a client.
16#8002	Server has rejected a client because the IP address and port number do not match.
16#8003	Not all data could be sent. Remaining data will be sent in the next cycle(s).
16#8004	Not all data received: Received length < Expected length

ERROR = TRUE

Error code	Meaning	Error only for
16#C001	Socket creation failed.	
16#C002	IP has wrong format.	
16#C003	Memory allocation failed.	
16#C100	Unexpected error during connecting of a client to a server.	TCP/TLS_SOCKET
16#C101	Unexpected error during receive operation.	UDP/TCP/TLS_RECEIVE
16#C102	Unexpected error during send operation.	UDP/TCP/TLS_SEND
16#C103	Unexpected error during bind operation.	UDP_SOCKET
16#C104	Unexpected error during listen operation.	TCP/TLS_SOCKET
16#C105	Unexpected error during accept operation.	TCP/TLS_SOCKET
16#C150	The TLS parameterization of the TLS_SEND/TLS_RECEIVE function blocks is inconsistent with the TLS_SOCKET function block. This is the case when: • TLS_SEND/TLS_RECEIVE require secure transmission/reception of data (SEND_SECURE/RECEIVE_SECURE input = TRUE), but the socket is not yet initialized for TLS communication (START_TLS input of TLS_SOCKET is FALSE). • TLS_SEND/TLS_RECEIVE require insecure transmission/reception of data (SEND_SECURE/RECEIVE_SECURE input = FALSE), but the socket is already initialized for TLS communication (START_TLS input of TLS_SOCKET is TRUE).	TLS_*
16#C151	An error regarding the START_TLS input of the TLS_SOCKET function block has occurred. START_TLS was set from TRUE to FALSE during opened TLS socket (ACTIVE input = TRUE).	TLS_SOCKET
16#C201	There are too many open sockets in the underlying socket provider.	
16#C202	An operation on a nonblocking socket cannot be completed immediately.	
16#C204	The datagram is too long.	

16#C205	Only one use of an address is normally permitted. In case of a TCP or TLS connection, this error code can be emitted when a rising edge is detected at the ACTIVATE input while the ACTIVE and BUSY outputs both are still not FALSE (i.e., a new connection is requested while the previous socket termination is not yet completed). The error also occurs if the controller is switched to STOP and afterwards to the RUN state as this terminates established connections. This error is also emitted if a TCP/TLS server shall listen to several clients. To avoid this error use the newer FB generation TLS_*_2.	
16#C206	The selected IP address is not valid in this context.	
16#C207	The connection was aborted by the .NET Framework or the underlying socket provider.	
16#C208	The connection was reset by the remote peer.	
16#C210	The application tried to send or receive data, and the socket is not connected.	
16#C211	No such host is known. The name is not an official host name or alias.	
16#C212	An internal error occurred with unclear reason. On controllers up to firmware 2019.3 one cause for this error is an empty CipherList. Another known cause is trying to send a UDP datagram to a broadcast address (255.255.255.255) using the UDP_SEND or UDP_SEND_2 function block. In case the error is thrown for the UDP_SEND_2 FB, ensure that the gateway in your IP configuration is set to a valid address (address 0.0.0.0 is invalid and treated as a missing gateway). (It is not required that the network contains a device with the configured gateway address.)	
16#C213	The remote host is actively refusing a connection. The service is not available on the remote host.	
16#C214	• Parameters like CipherList, TrustStoreName and IdentityStoreName are invalid or missing. • An invalid port number was specified.	
16#C215	A blocking operation is in progress.	

16#C216	The overlapped operation was aborted due to the closure of the System.Net.Sockets.Socket.	
16#C217	The application has initiated an overlapped operation that cannot be completed immediately.	
16#C218	A blocking System.Net.Sockets.Socket call was canceled.	
16#C219	An attempt was made to access a System.Net.Sockets.Socket in a way that is forbidden by its access permissions.	
16#C21A	An invalid pointer address was detected by the underlying socket provider.	
16#C21B	A System.Net.Sockets.Socket operation was attempted on a non-socket.	
16#C21C	A required address was omitted from an operation on a System.Net.Sockets.Socket.	
16#C21D	An unknown, invalid, or unsupported option or level was used with a System.Net.Sockets.Socket.	
16#C21E	The protocol type is incorrect for this System.Net.Sockets.Socket.	
16#C21F	The protocol is not implemented or has not been configured.	
16#C220	The support for the specified socket type does not exist in this address family.	
16#C221	The address family is not supported by the protocol family.	
16#C222	The protocol family is not implemented or has not been configured.	
16#C223	The address family specified is not supported. This error is returned if the IPv6 address family was specified and the IPv6 stack is not installed on the local machine. This error is returned if the IPv4 address family was specified and the IPv4 stack is not installed on the local machine.	
16#C224	Network is down.	
16#C225	Network unreachable.	
16#C226	Network dropped connection on reset.	

16#C227	No free buffer space is available for a System.Net.Sockets.Socket operation.	
16#C228	A request to send or receive data was disallowed because the Socket has already been closed.	
16#C229	The connection attempt timed out, or the connected host has failed to respond.	
16#C22A	The operation failed because the remote host is down.	
16#C22B	There is no network route to the specified host. Could not connect to DEST_IP.	
16#C22C	Too many processes are using the underlying socket provider.	
16#C22D	The network subsystem is unavailable.	
16#C22E	The version of the underlying socket provider is out of range.	
16#C22F	The underlying socket provider has not been initialized.	
16#C230	A graceful shutdown is in progress.	
16#C231	The specified class was not found.	
16#C232	The name of the host could not be resolved. Try again later.	
16#C233	The error is unrecoverable or the requested database cannot be located.	
16#C234	The requested name or IP address was not found on the name server.	

FILE_OPEN

Error ID	Meaning
0	No error information available.
2	The maximum number of files is already opened.
4	The file is already opened.
5	File is write protected or access denied.
6	File name not defined.

FILE_SEEK

Error ID	Meaning
0	No error information available.
1	Invalid file handle.
13	Invalid positioning mode or position specified is before the beginning of the file.
24	Position could not be set.

FILE_READ

Error ID	Meaning
0	No error information available.
1	Invalid file handle.
10	End of data reached.
12	The number of characters to be read is greater than the data buffer.
22	No data could be read.

FILE_CLOSE

Error ID	Meaning
0	No error information available.
1	Invalid file handle.
20	File could not be closed.

STRING_TO_BUF

Status number	Meaning
0	The copy process has been finished correctly.
1	The VAR_IN_OUT descriptors used for the parameter SRC and BUFFER are invalid. This is an internal error.
2	The length of the source buffer does not fit. The size of bytes to be copied assigned in BUF_CNT is larger than the available size of the SRC.
3	The length of the destination buffer does not fit. The sum of the bytes to be copied assigned in BUF_CNT and the offset in the connected byte stream assigned in BUF_OFFS is larger than the size of the connected byte stream.
4	This data type is not supported.
5	The alignment does not fit to this data type. The size to be copied assigned in BUF_CNT must be divisible without remainder by the size of the data type.
6	The conversion INTEL/MOTOROLA (Little-/Big-Endian)has failed.
7	The string length does not fit. Additional checks are necessary for the data type string.
8	The destination buffer has a wrong data type. In some cases the data type is checked. This is described in the special chapter for each data type.
9	The offset value is not correct. In some cases the offset is checked. This is described in the special chapter for each data type.
10	The BUF_CNT does not fit. In some cases the size to be copied is checked.
11	The addresses of the source and the destination are the same.

Data types

```
TYPE

 (* Array for logging *)

 SLO_ARR_BUFFER : ARRAY [0..8499] OF BYTE;


 (* Two switching arrays for no data loss *)

 SLO_ARR_ARR_BUFFER : ARRAY [0..1] OF SLO_ARR_BUFFER;


 (* Internal information *)

 SLO_UDT_LOGGING_BUFFER : STRUCT
  iCount : INT;
  iNumStrings : INT;
 END_STRUCT;


 (* Array for user logging values *)

 SLO_ARR_LOGGING_STRING : ARRAY[0..8] OF STRING;


 (*Diagnostic information *)

 SLO_UDT_DIAG : STRUCT
  iState : INT;
  wDiagCode : WORD;
  wAddDiagCode : WORD;
 END_STRUCT;

END_TYPE
```

Known issues

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.

Support

For technical support please contact your local PHOENIX CONTACT agency at https://www.phoenixcontact.com

Owner:

PHOENIX CONTACT Electronics GmbH
Business Unit Automation Systems
System Services
Library Services

In case of a support request, we need:

- Development system with:
  - Name (e.g., PC Worx, PLCnext Engineer)
  - Version (e.g., PLCnext Engineer 2022.0.1 LTS)
- Bus structure / plant including all articles with:
  - Name
  - Order number
  - Firmware version
  - External components
- Used libraries with:
  - Name
  - Version (e.g., IOL_Basic_7)