# CXMM_MessageManagement

## Function Block library for PLCnext Engineer

| | |
|---|---|
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# 1 General Information

Help file for the PLCnext Engineer library CXMM_MessageManagement version 1.0.0.

## 1.1 Supported PLCnext Engineer versions

Minimal required version: PLCnext Engineer 2020.0 LTS.

## 1.2 Supported devices

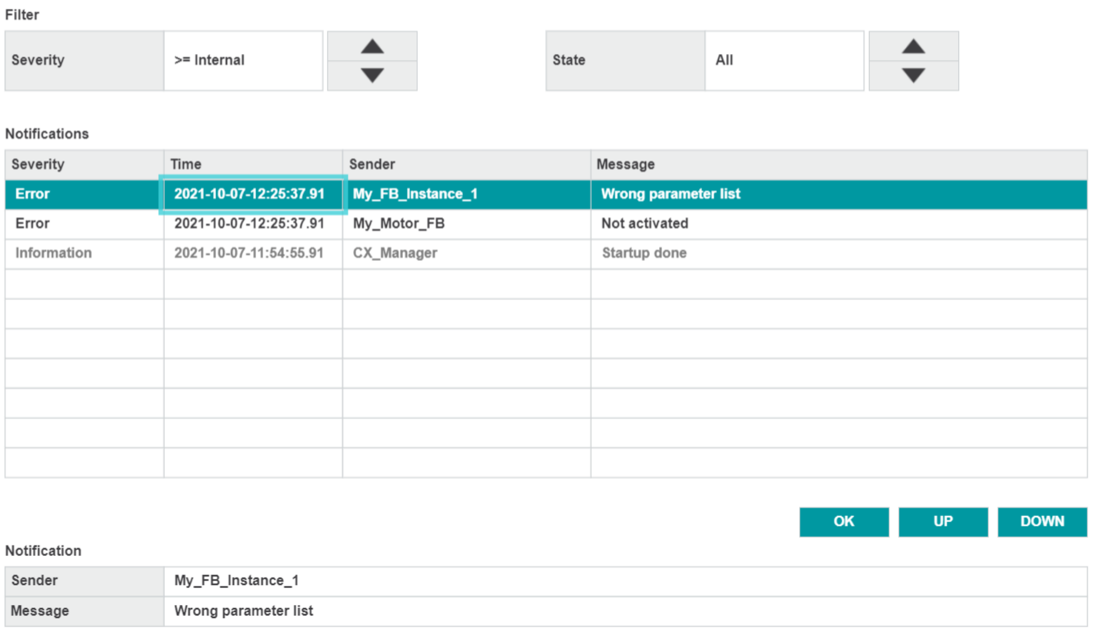
| Device | Order Number |
|---|---|
| AXC F 1152 | 1151412 |
| AXC F 2152 | 2404267 |
| AXC F 3152 | 1069208 |

## 1.3 Dependencies

The library depends not on other stuff.

# 2 Introduction

The CXMM_MessageManagement library offers functions to display information-, warning-, error- and other messages from the application program on the hmi. The design lean on the PLCnext WBM notification display.


Filter

| | | | |
|---|---|---|---|
| Severity | >= Internal | State | All |

Notifications

| Severity | Time | Sender | Message |
|---|---|---|---|
| Error | 2021-10-07-12:25:37.91 | My_FB_Instance_1 | Wrong parameter list |
| Error | 2021-10-07-12:25:37.91 | My_Motor_FB | Not activated |
| Information | 2021-10-07-11:54:55.91 | CX_Manager | Startup done |
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| | | | |
| | | | |

Notification

| | |
|---|---|
| Sender | My_FB_Instance_1 |
| Message | Wrong parameter list |

CXMM_MessageDisplay

# 3 First steps example

## 3.1 Set the message text to the plc variable udtTextBuffer

It is recommended to store the message text in an csv file and to use the FB PBCL_FileCsvRead from the PLCnextBase library to set the data to the pls variable.

### 3.1.1 Set text for the sender column

For the sender column set the parameters as follow:
uiSender > 0, wCode = 0, wAddCode = 0

```
CXMM_udtMessageMgr.udtTextBuffer.arrText[0].uiSender := 12345;
CXMM_udtMessageMgr.udtTextBuffer.arrText[0].wCode    := WORD#16#0;
CXMM_udtMessageMgr.udtTextBuffer.arrText[0].wAddCode := WORD#16#0;
CXMM_udtMessageMgr.udtTextBuffer.arrText[0].strText  := 'My_FB';
```

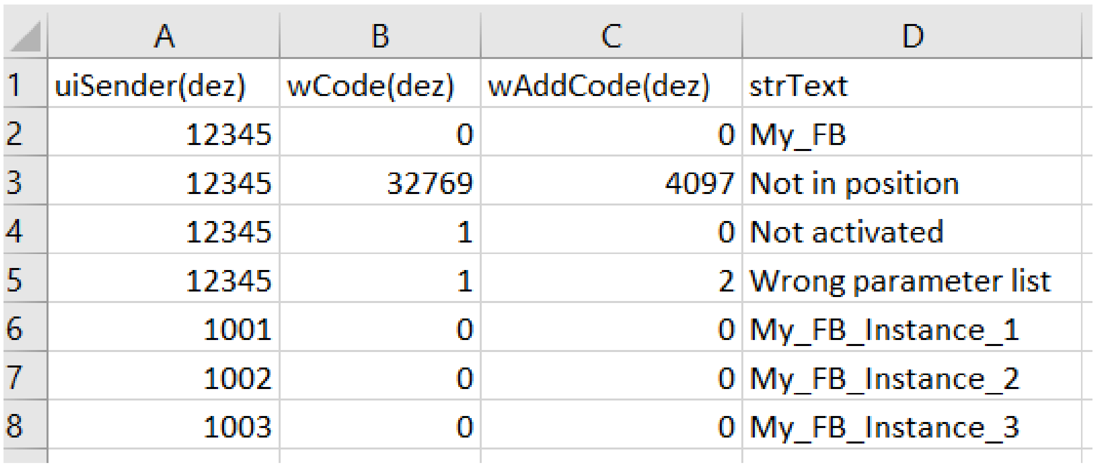
### 3.1.2 Set text for the message column

For the message column set the parameters as follow:
uiSender > 0, wCode > 0, wAddCode > 0

```
CXMM_udtMessageMgr.udtTextBuffer.arrText[1].uiSender := 12345;
CXMM_udtMessageMgr.udtTextBuffer.arrText[1].wCode    := WORD#16#8001;
CXMM_udtMessageMgr.udtTextBuffer.arrText[1].wAddCode := WORD#16#1001;
CXMM_udtMessageMgr.udtTextBuffer.arrText[1].strText  := 'Not in position';
```

### 3.1.3 Example how to use the PBCL_FileCsvRead FB

```
PBCL_FileCsvRead(
    uiOffset        := UINT#1,
    strFileName     := strFileNameFileCsvRead,
    strDataTypes    := 'UINT;WORD;WORD;STRING' ,
    strDelimiter    := ';',
    udiRowCnt       => udiRowCntFileCsvRead,
    anyTable        := CXMM_udtMessageMgr.udtTextBuffer.arrText);
```



| | A | B | C | D |
|---|---|---|---|---|
| 1 | uiSender(dez) | wCode(dez) | wAddCode(dez) | strText |
| 2 | 12345 | 0 | 0 | My_FB |
| 3 | 12345 | 32769 | 4097 | Not in position |
| 4 | 12345 | 1 | 0 | Not activated |
| 5 | 12345 | 1 | 2 | Wrong parameter list |
| 6 | 1001 | 0 | 0 | My_FB_Instance_1 |
| 7 | 1002 | 0 | 0 | My_FB_Instance_2 |
| 8 | 1003 | 0 | 0 | My_FB_Instance_3 |

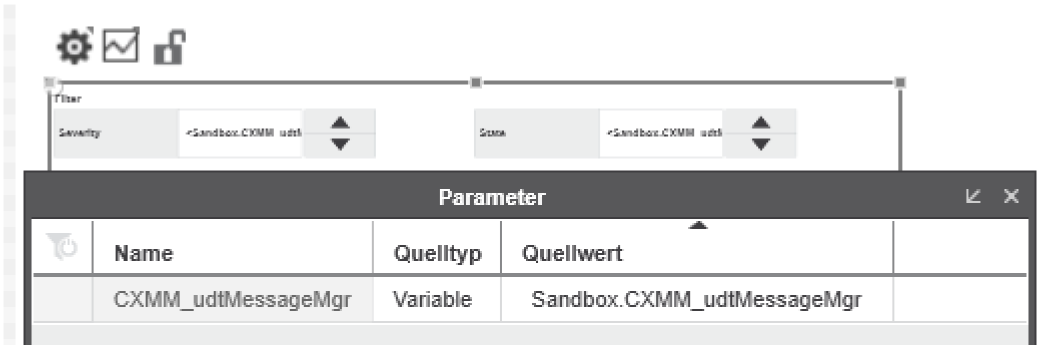
MessageText_csv

## 3.2 Instantiate the function block CXMM_MessageManager

```
CXMM_MessageManager(udtMessageMgr := CXMM_udtMessageMgr);
```

## 3.3 Instantiate the hmi symbol CXMM_MessageDisplay

Connect it to the **CXMM_MessageManager** function block.



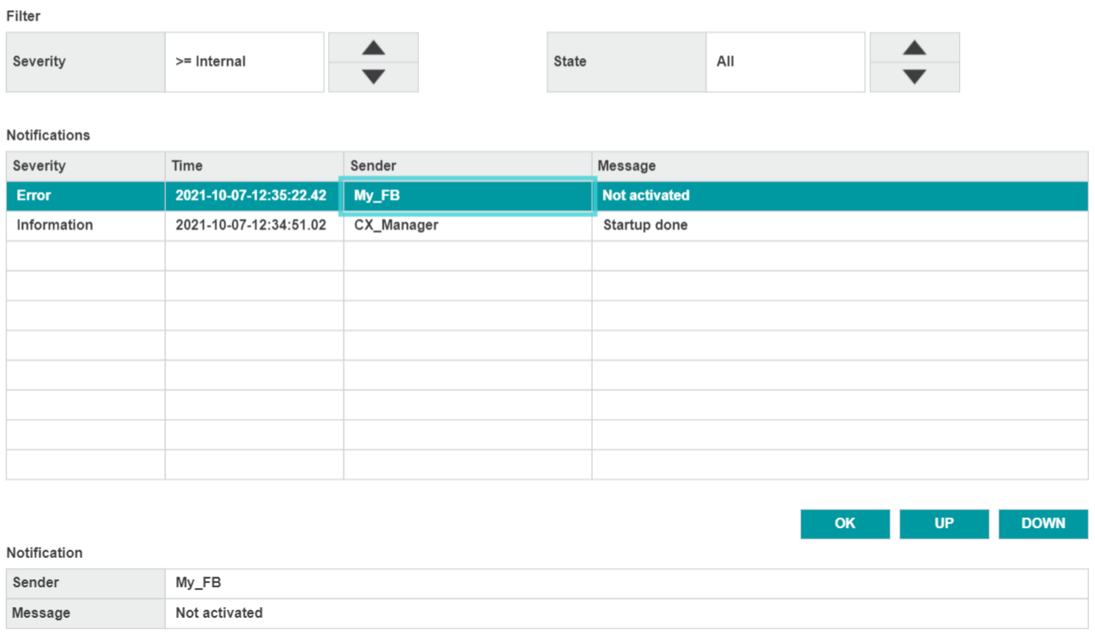
| Name | Quelltyp | Quellwert |
|---|---|---|
| CXMM_udtMessageMgr | Variable | Sandbox.CXMM_udtMessageMgr |

CXMM_MessageDisplayParameter

## 3.4 Instantiate the function block CXMM_SendMessage

```
CXMM_SendMessage_11(
    xSend           := xSend,
    uiSender        := UINT#12345,
    uiSenderType    := UINT#0,
    wCode           := WORD#1,
    wAddCode        := WORD#0,
    enSeverity      := CXMM_enSeverity#Error,
    udtMessageMgr   := CXMM_udtMessageMgr);
```

## 3.5 CXMM_MessageDisplay show the message text



| | |
|---|---|
| Severity | >= Internal |
| State | All |

Notifications

| Severity | Time | Sender | Message |
|---|---|---|---|
| Error | 2021-10-07-12:35:22.42 | My_FB | Not activated |
| Information | 2021-10-07-12:34:51.02 | CX_Manager | Startup done |

Notification

| | |
|---|---|
| Sender | My_FB |
| Message | Not activated |

CXMM_MessageDisplay

# 4 Function and Function Blocks

## 4.1 CXMM_MessageManager

POU type: `Function Block`

Description of the POU.

The function block is the ‘backend’ for the CXMM_MessageDisplay hmi symbol. It forwards the message to it and holds all functions the user has on the CXMM_MessageDisplay hmi symbol.

### 4.1.1 InOut Parameters

#### 4.1.1.1 udtMessageMgr

Data type: *`CXMM_udtMessageManager`*

Data exchange structure.

## 4.2 CXMM_SendMessage

POU type: `Function Block`

Description of the POU.

The function block takes an message entry into the buffer.

### 4.2.1 Input Parameters

#### 4.2.1.1 xSend

Data type: `INT`

Put the message into the buffer on rising edge.

#### 4.2.1.2 uiSender

Data type: `UINT`

Identifier of the instance which sends the message.

#### 4.2.1.3 uiSenderType

Data type: `UINT`

Identifier of the instance type from the sender which sends the message. 0: Not used.

**Example**

Message text csv:

| uiSender | wCode | wAddCode | strText |
|---|---|---|---|
| 12345 | 0 | 0 | My_FB |
| 12345 | 8001 | 0 | Not in position |
| 12345 | 1 | 0 | Not activated |
| 1001 | 0 | 0 | My_FB_Instance_1 |
| 1002 | 0 | 0 | My_FB_Instance_1 |

The call of the FB CXMM_SendMessage with following parameters

```
CXMM_SendMessage_12(
    xSend           := xSend,
    uiSender        := UINT#1001,
    uiSenderType    := UINT#12345,
    wCode           := WORD#1,
    wAddCode        := WORD#0,
    enSeverity      := CXMM_enSeverity#Error,
    udtMessageMgr   := CXMM_udtMessageMgr);
```

will send this message:

| Severity | Time | Sender | Message |
|---|---|---|---|
| Error | 2021.10.07-11:56:32.12 | My_FB_Instance_1 | Not activated |

#### 4.2.1.4 wCode

Data type `WORD`

Diag code.

#### 4.2.1.5 wAddCode

Data type: `WORD`

Additional diag code.

#### 4.2.1.6 enSeverity

Data type: `CXMM_enSeverity`

Severity of message. 1: InternalOnly, 2: Information, 3: Warning, 4: Error, 5: Critical Error, 6: Fatal Error.

#### 4.2.1.7 InOut Parameters

#### 4.2.1.8 udtMessageMgr

Data type: *`CXMM_udtMessageManager`*

Data exchange structure.

# 5 Data types

## 5.1 CXMM_udtMessageManager

Data type: `STRUCT`

```
CXMM_udtMessageManager : STRUCT
    udtMessageBuffer     : CXMM_udtMessageBuffer;
    udtTextBuffer        : CXMM_udtMessageTextBuffer;
    udtMessageDisplay    : CXMM_udtMessageDisplay;
END_STRUCT;
```

### 5.1.1 Structure elements

#### 5.1.1.1 udtMessageBuffer

Data type: `STRUCT`

Types for the messaging function.

```
CXMM_enSeverity : (NotDefined, InternalOnly, Information, Warning, Error,
         CriticalError, FatalError) OF INT := Error;
CXMM_enState : (NotDefined, Comming, Acknowledged) OF INT;

CXMM_udtMessage :   STRUCT
    uiSender           : UINT;         // Identifier of the instance which sends the
         message.
    uiSenderType       : UINT;         // Identifier of the instance type from the
         sender which sends the message.
                                       // 0: Not used.
    enSeverity         : CXMM_enSeverity; // Severity of message. 1: Internal, 2:
         Information, 3: Warning, 4: Error,
                                         // 5: Critical Error, 6: Fatal Error
    wCode              : WORD;         // Code of the instance which sends the message.
    wAddCode           : WORD;         // Additional code
    enState            : CXMM_enState;        // Message state 1: comming, 2:
         acknowledged.
    strDateTime        : STRING;       // Date and time of the message
END_STRUCT;

CXMM_arrMessage : ARRAY[0..99] OF CXMM_udtMessage;

// Structure to hold the current messages. It's a ringbuffer.
CXMM_udtMessageBuffer : STRUCT
    arrMessage         : CXMM_arrMessage;    // message array *)
    uiArrMessageMax    : UINT := 99;      // upper array bound of the message array. *)
    uiPointer          : UINT;            // pointer of last message entry in the
         message array. *)
END_STRUCT;
```

#### 5.1.1.2 udtTextBuffer

Data type: `STRUCT`

Types to handle the message texts.

```
CXMM_udtMessageText : STRUCT
    uiSender     : UINT;
    wCode        : WORD;
    wAddCode     : WORD;
    strText      : STRING;   // the message text
END_STRUCT;

CXMM_arrMessageText   : ARRAY[0..99] OF CXMM_udtMessageText;

CXMM_udtMessageTextBuffer : STRUCT
    arrText             : CXMM_arrMessageText;  // Hold the text of the message
    uiArrTextMax        : INT := 99;            // Upper bound of CXMM_arrMessageText
END_STRUCT;
```

### 5.1.1.3 udtMessageDisplay

Data type: `STRUCT`

Type for the message line in the message display.

```
CXMM_udtMessageLine : STRUCT
    strSenderText        : STRING;       // Text of sender.
    strMessageText       : STRING;       // Text of message.
    strDataTime          : STRING;       // Time of message is occured.
    strSeverity          : STRING;       // Severity of message -> 1: Internal, 2:
         Information, 3: Warning, 4: Error,
                                         // 5: Critical Error, 6: Fatal Error
    iState               : INT;          // Message state -> 1: comming(new message), 2:
         acknowledged(button OK was pressed)
    xMarked              : BOOL;         // Line is marked
    usiFontColor         : USINT;        // Font color of line -> 0: default, 1: marked,
         2: acknowledged
END_STRUCT;

CXMM_arrMessageLine : ARRAY[0..9] OF CXMM_udtMessageLine;

// Type for the large line. It shows the full text of the marked message.
CXMM_udtLargeLine : STRUCT
    strSenderText    : STRING;
    strMessageText   : STRING;
END_STRUCT;

// Type for the message display
CXMM_udtMessageDisplay : STRUCT
    arrLine              : CXMM_arrMessageLine;
    uiArrLineMax         : UINT := 9;        // Max index for arrLine.
    iShowSeverity        : INT := 1;         // Show only messages which has the
         severity >= the filter value for severity
    iShowState           : INT := 0;         // Show messages with state 0: show all, 1:
         comming(new message),
                                             // 2: acknowledged(button OK was pressed)
    xAcknowledge         : BOOL;            // Acknowledge all messages
    xShowMsgBefore       : BOOL;             // Show messages before
    xShowMsgAfter        : BOOL;             // Show messages after
    udtLargeLine         : CXMM_udtLargeLine;  // Large line for the marked message
    strShowSeverity      : STRING;           // Displayed name for message severity at
         the filter parameter
    strShowState         : STRING;           // Displayed name for message state at the
         filter parameter
END_STRUCT;
```

# 6 Support

Owner:

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