WAGO-I/O-*PRO* 32 Library

Mod_com.lib

Contents

ADD_DESC (Data type)

WAGO-I/O-*PRO* 32 Library elements			
Category:	More detailed information about the PLC process image		
Name:	ADD_DESC		
Type:	Data type [X]		
Library name:	Mod_com.lib		
Applicable to:	ADD_PI_INFORMATION		
Structure:			
Elements:	**Data type:**	**Comments:**	
posPAA	WORD	Bit position of the module in the PLC output process image.	
posPAE	WORD	Bit position of the module in the PLC input process image.	
sizePAA	BYTE	Number of bits assigned to this module in the PLC output process image.	
sizePAE	BYTE	Number of bits assigned to this module in the PLC input process image.	
channels	BYTE	Number of logic channels (only for complex modules).	
altFormat	BYTE	0: Standard output format 1: Alternative output format	

Header:

```
TYPE ADD_DESC :

 STRUCT
  posPAA : WORD;
  posPAE : WORD;
  sizePAA : BYTE;
  sizePAE : BYTE;
  channels : BYTE;
  altFormat : BYTE;
 END_STRUCT

END_TYPE
```

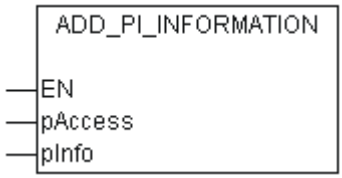
Data type description:

This data type is a structure and provides more detail process image information regarding a module.

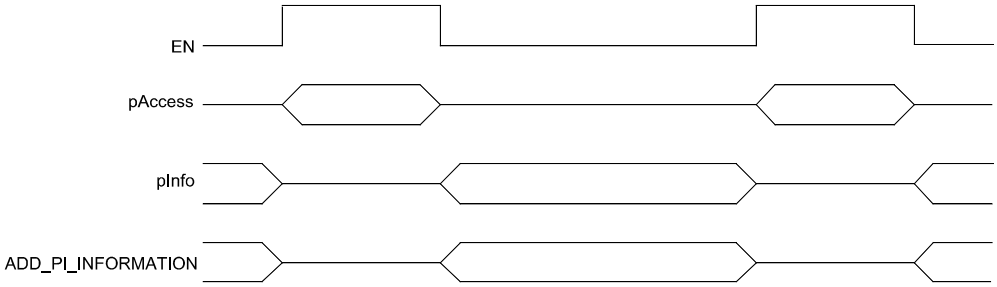
ADD_PI_INFORMATION

WAGO-I/O-*PRO* 32 Library elements			
Category:	More detailed information about the PLC process image		
Name:	ADD_PI_INFORMATION		
Type:	Function [X]	Function block [ ]	Program [ ]
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers except MODBUS		
Input parameter:	**Data type:**	**Comments:**	
EN	BOOL	A TRUE at this input activates the function.	
pAccess	POINTER TO MODULE_ INFO_ ACCESS	Pointer to a structure describing the modules from which more detailed process image information is to be determined.	
pInfo	POINTER TO MODULE_ INFO	Pointer to a structure in which the more detailed process image information of a module is to be saved. If information is to be determined from several modules then a pointer must be transferred to an array of this structure type. In this case field limits are not checked! The structure, or the array of this structure must be initialised with ZERO prior to each selection.	
Return value:	**Data type:**	**Comments:**	
ADD_PI_INFORMATION	BOOL	FALSE: The function was performed incorrectly. Possible entries in the structure MODULE_INFO to which 'pInfo‘ refers, are invalid. TRUE: The function was successfully performed.	

Graphic display:



Time behaviour:



Function description:

Using this function more detailed process image information can be determined regarding the modules (see components of the structure MODULE_INFO).

Example of how to determine information of all connected modules:

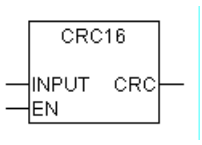
```
VAR
 access : MODULE_INFO_ACCESS;
 info : ARRAY[0..63] OF MODULE_INFO;
END_VAR

access.physicalPosTo := 0;
access.moduleType := 0;

ADD_PI_INFORMATION( 1, ADR(access), ADR(info[0]) );
```

Available from library version 3.0

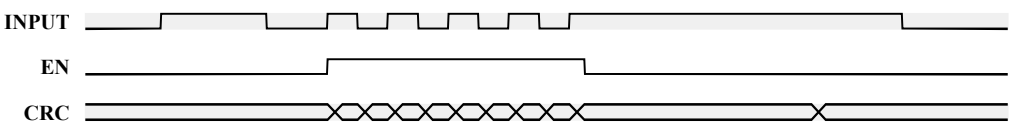
CRC16

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to process image		
Name:	CRC16		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		
Input parameters:	**Data type:**	**Comments:**	
INPUT	BYTE	Further input byte for which a CRC is to be calculated.	
EN	BOOL	A rising edge at this input signals the initialisation of the function block and calculates the CRC for the first byte. With TRUE the CRC is calculated on each of the following bytes. With FALSE no calculation is performed.	
Output parameters:	**Data type:**	**Comments:**	
CRC	WORD	The calculated value for the CRC. The CRC value is present at this output following each invocation.	

Graphic display:



Time behaviour:



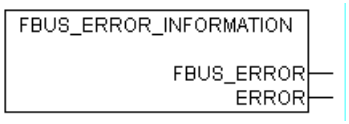
Function description:

The CTC 16 function block calculates the CRC16 value for a number of input bytes.

FBUS_ERROR_INFORMATION

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to system variables		
Name:	FBUS_ERROR_INFORMATION		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		
Input parameters:	**Data type:**	**Comments:**	
Output parameters:	**Data type:**	**Comments:**	
FBUS_ERROR	BOOL	A TRUE at this output indicates a fieldbus error.	
ERROR	WORD	Error occurred. The error messages are fieldbus specific (see individual controller description).	

Graphic display:



Time behaviour:

Function description:

This function block offers the programmer the possibility to obtain information on the status of the fieldbus communication. The values of the ERROR output are fieldbus specific.

With MODBUS for instance, the current status of the communication monitoring (Watchdog) is indicated. (0: no error, 1: Watchdog has detected „time exceeded".)

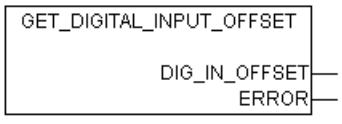
GET_DIGITAL_INPUT_OFFSET

WAGO-I/O-*PRO* 32 Library elements			
Category:	Access to process image		
Name:	GET_DIGITAL_INPUT_OFFSET		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		
Input parameters:	**Data type:**	**Comments:**	
Output parameters:	**Data type:**	**Comments:**	
DIG_IN_OFFSET	WORD	Pre-assigned value for the byte address from which the bits of the digital input modules are to be filed. The permissible value range is 0..511.	
ERROR	WORD	Fault encountered. 0: No fault 0x8001: The given value is too small and will collide with the analog data. 0x8003: The given value is too large and will collide with the variable ranges. 0x8005: The given value is larger than the maximum permissible value.	

Header:

```
FUNCTION_BLOCK GET_DIGITAL_INPUT_OFFSET
VAR_OUTPUT
 DIG_IN_OFFSET: WORD;
 ERROR: WORD;
END_VAR
```

Graphic display:



Time behaviour:
Function description: This function reads the current value of the saved address offset for the digital inputs. The value is pre-assigned with the function block SET_DIGITAL_INPUT_OFFSET and permanently saved in the controller. The read value is identical with the pre-assigned value. In case of a fault the output ERROR of the FB is set to a value not equal to 0. No communication takes place between the controller and the modules. This status is displayed via the blink code 10 by the blink argument 1 on the IO LED of the controller. The default value when supplying the controllers is 0. As the value is saved permanently, for safety reasons the value should be set once again in the user program. The current start address for the bits of the digital inputs can be interrogated with the FB PI_INFORMATION. The output INPUTBITS_OFFSET emits the value.

GET_DIGITAL_OUTPUT_OFFSET

WAGO-I/O-*PRO* 32 Library elements			
Category:	Access to process image		
Name:	GET_DIGITAL_OUTPUT_OFFSET		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		

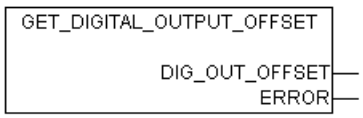
Input parameters:	**Data type:**	**Comments:**

Output parameters:	**Data type:**	**Comments:**
DIG_OUT_OFFSET	WORD	Pre-assigned value for the byte address from which the bits of the digital output modules are to be filed. The permissible value range is 0..511.
ERROR	WORD	Fault encountered. 0: No fault 0x8002: The given value is too small and will collide with the analogue data. 0x8004: The given value is too large and will collide with the variable ranges. 0x8006: The given value is larger than the maximum permissible value.

Header:

```
FUNCTION_BLOCK GET_DIGITAL_OUTPUT_OFFSET
VAR_OUTPUT
 DIG_OUT_OFFSET: WORD;
 ERROR: WORD;
END_VAR
```

Graphic display:

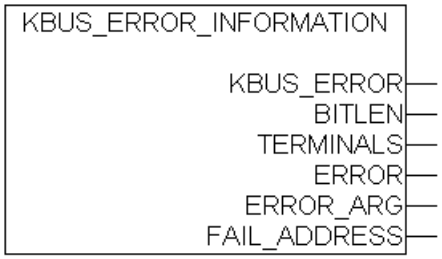


Time behaviour:
Function description: This function reads the current value of the saved address offset for the digital outputs. The value is pre-assigned with the function block SET_DIGITAL_OUTPUT_OFFSET and permanently saved in the controller. The read value is identical with the pre-assigned value. In case of a fault the output ERROR of the FB is set to a value not equal to 0. No communication takes place between the controller and the modules. This status is displayed via the blink code 10 by the blink argument 1 on the IO LED of the controller. The default value when supplying the controllers is 0. As the value is saved permanently, for safety reasons the value should be set once again in the user program. The current start address for the bits of the digital outputs can be interrogated with the FB PI_INFORMATION. The output OUTPUTBITS_OFFSET emits the value.

KBUS_ERROR_INFORMATION

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access system variables		
Name:	KBUS_ERROR_INFORMATION		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		
Input parameters:	**Data type:**	**Comments:**	
Output parameters:	**Data type:**	**Comments:**	
KBUS_ERROR	BOOL	A TRUE at this output indicates a terminal bus error.	
BITLEN	WORD	Terminal bus bit length	
TERMINALS	WORD	Number of existing terminals blocks	
ERROR	WORD		
ERROR_ARG	WORD		
FAIL_ADDRESS	WORD	In the event of a terminal bus error indicates the terminal number where the error has occurred.	

Graphic display:



Time behaviour:

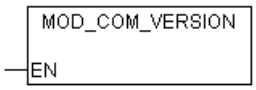
Function description:

This function block offers the programmer the possibility of receiving information about the condition and configuration of the internal bus.

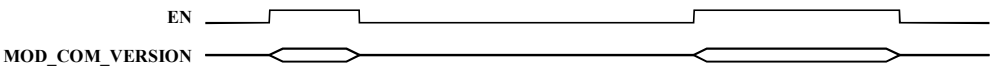
MOD_COM_VERSION

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to the process image		
Name:	MOD_COM_VERSION		
Type:	Function [X]	Function block [ ]	Program [ ]
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		
Input parameters:	**Data type:**	**Comments:**	
EN	BOOL	A TRUE at this input actives this function.	
Return value:	**Data type:**	**Comments:**	
MOD_COM_VERSION	WORD	Library version	

Graphic display:



Time behaviour:



Function description:

The function of the MOD_COM_VERSION returns the current version number of the library. This function can be used during the program development for information. In addition version conflicts during the running time can be avoided.

Version:	Description:
1.0	First version
1.1	The function blocks READ_OUTPUT_WORD and READ_OUTPUT_BIT were supplemented.
2.0	The function blocks GET_DIGITAL_INPUT_OFFSET, GET_DIGITAL_OUTPUT_OFFSET, SET_DIGITAL_INPUT_OFFSET and SET_DIGITAL_OUTPUT_OFFSET were supplemented.
3.0	The function ADD_PI_INFORMATION and the data types MODULE_INFO_ACCESS, MODULE_INFO and ADD_DESC are added.

MODULE_INFO (Data type)

WAGO-I/O-*PRO* 32 Library elements			
Category:	More detailed information about the PLC process image		
Name:	MODULE_INFO		
Type:	Data type X		
Library name:	Mod_com.lib		
Applicable to:	ADD_PI_INFORMATION		
Structure:			
Elements:	**Value:**	**Comments:**	
physicalPos	BYTE	Physical module position (1-64).	
moduleType	WORD	The last 3 digits of the module designation (750-xxx).	
desc	ADD_DESC	Structure variable with more detailed information.	

Header:

```
TYPE MODULE_INFO :

 STRUCT
  physicalPos : BYTE;
  moduleType : WORD;
  desc : ADD_DESC;
 END_STRUCT

END_TYPE
```

Data type description:

This data type is a structure and supplies extended process image information with regard to a module.

For digital modules no exact module designation can be determined. For this reason the 'module type' assumes one of the following values:

16#00D0: This digital module does not assume any bits in the PLC input or output process image.

16#00D1: This digital module only occupies bits in the input process image of the PLC

16#00D2: This digital module only occupies bits in the output process image of the PLC

16#00D3: This digital module occupies bits in the input and the output process image of the PLC.

MODULE_INFO_ACCESS (Data type)

WAGO-I/O-*PRO* 32 Library elements		
Category:	More detailed information about the PLC process image	
Name:	MODULE_INFO_ACCESS	
Type:	Datentyp [X]	
Library name:	Mod_com.lib	
Applicable to:	ADD_PI_INFORMATION	
Structure:		
Elements:	**Data type:**	**Comments:**
physicalPosOf	BYTE	Physical position of the first module from which the more detailed information is to be determined (1-64).
physicalPosTo	BYTE	Physical position of the last module from which the more detailed information is to be determined (0-64).
typeNumber	BYTE	Which module of a row of a type is meant (1-64).
moduleType	WORD	The last 3 numbers of the module designation (750-xxx).
window	WORD	Window for 'module type' in ascending direction.

Header:

```
TYPE MODULE_INFO_ACCESS :

 STRUCT
  physicalPosOf : BYTE;
  physicalPosTo : BYTE;
  typeNumber : BYTE;
  moduleType : WORD;
  window : WORD;
 END_STRUCT

END_TYPE
```

Data type description:

This data type is a structure and indicates which module more detailed process image information is to be determined.

Three different access types are possible:

physicalPosTo <> 0:
Determine more detailed module information from 'physicalPosOf' to 'physicalPosTo'. 'physicalPosOf' and 'physicalPosTo' may be identical.

physicalPosTo = 0 AND moduleType <> 0:
Determine more detailed module information which is specified by 'type number', 'module type' and 'window'.

physicalPosTo = 0 AND moduleType = 0:
Determine more detailed information of all connected modules.

Example:

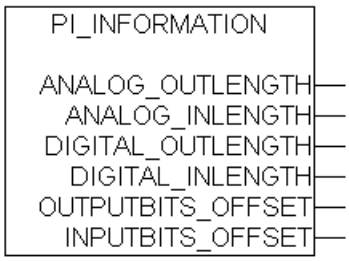
Determine information for the 3rd connected module of type 750-650/651/652/653:

```
physicalPosTo = 0
typeNumber = 3;
moduleType = 650;
window = 3;
```

PI_INFORMATION

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to process image		
Name:	PI_INFORMATION		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		
Input parameters:	**Data type:**	**Comments:**	
Output parameters:	**Data type:**	**Comments:**	
ANALOG_OUTLENGTH	WORD	Number of analog output bits	
ANALOG_INLENGTH	WORD	Number of analog input bits	
DIGITAL_OUTLENGTH	WORD	Number of digital output bits	
DIGITAL_INLENGTH	WORD	Number of digital input bits	
OUTPUTBITS_OFFSET	WORD	Number of bytes	
INPUTBITS_OFFSET	WORD	Number of bytes	

Graphic display:



Time behaviour:

Function description:

This function block offers the programmer the possibility to obtain information about the structure of the process image.

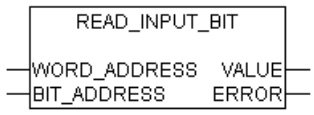
READ_INPUT_BIT

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to the process image		
Name:	READ_INPUT_BIT		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		

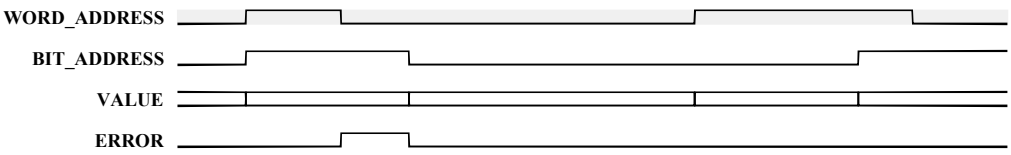
Input parameters:	**Data type:**	**Comments:**
WORD_ADDRESS	WORD	Here the word address of the bit in the process image is transferred.
BIT_ADDRESS	WORD	Here the bit position in the word is transferred.

Output parameters:	**Data type:**	**Comments:**
VALUE	BOOL	Current value of the read bit
ERROR	BOOL	TRUE in case an error has occurred. Possible errors are an inadmissible address. Otherwise FALSE

Graphic display:



Time behaviour:



Function description:

This function block offers the programmer the possibility of indirect access to the process image. The current value of the input bit is made available immediately after invoking the FB at the outputs. The function block must be used with particular care as here the guidelines of IEC 61131-3 „all addresses are assigned at the time of programming and during the running time“ are not adhered to.

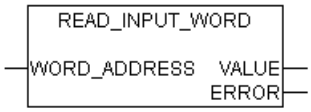
READ_INPUT_WORD

WAGO-I/O-*PRO* - Library elements			
Category:	Indirect access to process image		
Name:	READ_INPUT_WORD		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		

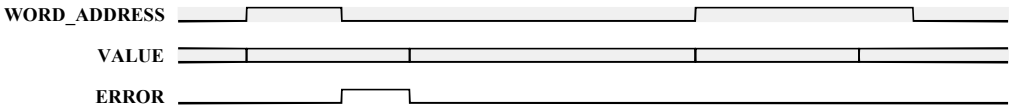
Input parameters:	**Data type:**	**Comments:**
WORD_ADDRESS	WORD	Here the word address of the word is transferred to the process image.

Output parameters:	**Data type:**	**Comments:**
VALUE	WORD	Current value of the read word
ERROR	BOOL	TRUE if an error has occurred. Possible errors are an inadmissible address, otherwise FALSE

Graphic display:



Time behaviour:



Function description:

This function block offers the programmer the possibility of indirect access to the process image. The current value of the input word is made available immediately after invoking the FB at the outputs. The function block must be used with particular care as here the guidelines of IEC 61131-3 „all addresses are assigned at the time of programming and during the running time“ are not adhered to.

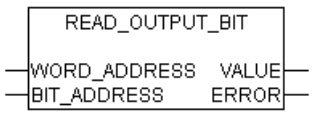
READ_OUTPUT_BIT

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to process image		
Name:	READ_OUTPUT_BIT		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib (from Version 1.1)		
Applicable to:	All programmable fieldbus controllers		

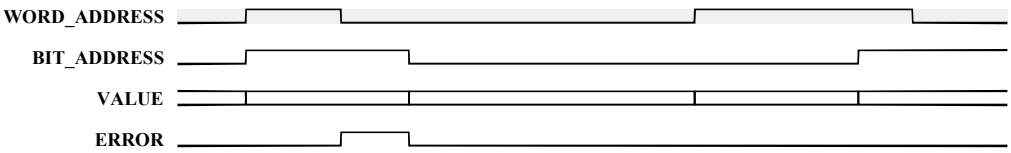
Input parameters:	**Data type:**	**Comments:**
WORD_ADDRESS	WORD	Here the word address of the bit are transferred to the process image.
BIT_ADDRESS	WORD	Here the bit position in the word is transferred.

Output parameters:	**Data type:**	**Comments:**
VALUE	BOOL	Current value of the read bit.
ERROR	BOOL	TRUE if an error has occurred. Possible errors are an inadmissible address, otherwise FALSE.

Graphic display:



Time behaviour:



Function description:

This function block offers the programmer the possibility of indirect access to the process image. The current value of the output bit is made available immediately after invoking the FB at the outputs. The function block must be used with particular care as here the guidelines of IEC 61131-3 „all addresses are assigned at the time of programming and during the running time“ are not adhered to.

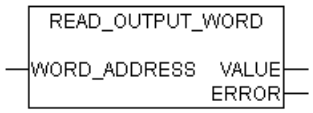
READ_OUTPUT_WORD

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to process image		
Name:	READ_OUTPUT_WORD		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib (from Version 1.1)		
Applicable to:	All programmable fieldbus controllers		

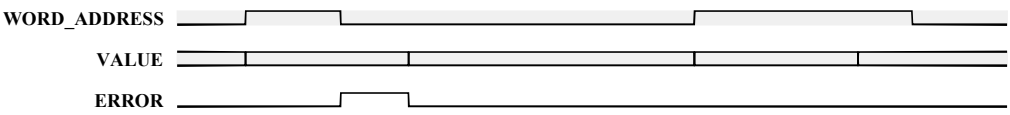
Input parameters:	**Data type:**	**Comments:**
WORD_ADDRESS	WORD	Here the word address of the bits are transferred to the process image.

Output parameters:	**Data type:**	**Comments:**
VALUE	WORD	Current value of the read bit.
ERROR	BOOL	TRUE if an error has occurred. Possible errors are an inadmissible address, otherwise FALSE.

Graphic display:



Time behaviour:



Function description:

This function block offers the programmer the possibility of indirect access to the process image. The current value of the output word is made available immediately after invoking the FB at the outputs. The function block must be used with particular care as here the guidelines of IEC 61131-3 „all addresses are assigned at the time of programming and during the running time“ are not adhered to.

SET_DIGITAL_INPUT_OFFSET

WAGO-I/O-*PRO* 32 Library elements			
Category:	Access to process image		
Name:	SET_DIGITAL_INPUT_OFFSET		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		

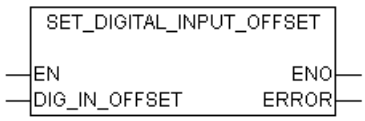
Input parameters:	**Data type:**	**Comments:**
EN	BOOL	FB execution control. The function block is executed on a rising edge at EN.
DIG_IN_OFFSET	WORD	Byte address, from where the bits of the digital input modules are to be filed. The permissible value range is 0..511. With the assignment of 0 the digital inputs are saved directly behind the bytes of the analogue modules, if analogue modules are present.

Output parameters:	**Data type:**	**Comments:**
ENO	BOOL	FB execution result. ENO is TRUE as long as EN is TRUE.
ERROR	WORD	Fault encountered. 0: No fault 0x0001: This funktion is not supported. 0x8001: The given value is too small and will collide with the analogue data. 0x8003: The given value is too large and will collide with the variable ranges. 0x8005: The given value is larger than the maximum permissible value.

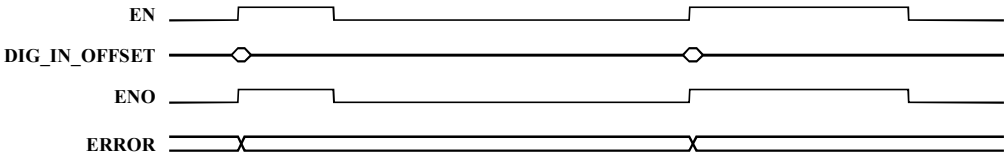
Header:

```
FUNCTION_BLOCK SET_DIGITAL_INPUT_OFFSET
VAR_INPUT
 EN: BOOL;
 DIG_IN_OFFSET: WORD;
END_VAR
VAR_OUTPUT
 ENO: BOOL;
 ERROR: WORD;
END_VAR
```

Graphic display:



Time behaviour:



Function description:

This function sets the address offsets current value for the digital inputs. The changed configuration is used when reading the input PA during the next PLC cycle. The value is permanently saved in the controller.

When entering an invalid offset value the controller transmits the blink code 10 with the blink argument 1. The data exchange between the controller and the modules is stopped.

The default value when supplying the controllers is 0. As the value is saved permanently, for safety reasons the value should be set once again in the user program.

The saved value can be read with the FB GET_DIGITAL_INPUT_OFFSET.
The current start address for the bits of the digital outputs can be interrogated with the FB PI_INFORMATION. The output INPUTBITS_OFFSET emits the value.

SET_DIGITAL_OUTPUT_OFFSET

WAGO-I/O-*PRO* 32 Library elements			
Category:	Access to process image		
Name:	SET_DIGITAL_OUTPUT_OFFSET		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		

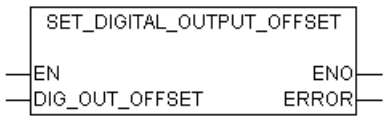
Input parameters:	**Data type:**	**Comments:**
EN	BOOL	FB execution control. The function block is executed on a rising edge at EN.
DIG_OUT_OFFSET	WORD	Byte address, from where the bits of the digital output modules are to be filed. The permissible value range is 0..511. With the assignment of 0 the digital outputs are saved directly behind the bytes of the analogue modules, if analogue modules are present.

Output parameters:	**Data type:**	**Comments:**
ENO	BOOL	FB execution result. ENO is TRUE as long as EN is TRUE.
ERROR	WORD	Fault encountered. 0: No fault 0x0001: This funktion is not supported. 0x8002: The given value is too small and will collide with the analogue data. 0x8004: The given value is too large and will collide with the variable ranges. 0x8006: The given value is larger than the maximum permissible value.

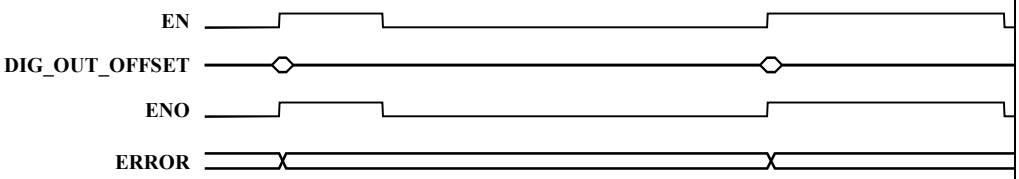
Header:

```
FUNCTION_BLOCK SET_DIGITAL_OUTPUT_OFFSET
VAR_INPUT
 EN: BOOL;
 DIG_OUT_OFFSET: WORD;
END_VAR
VAR_OUTPUT
 ENO: BOOL;
 ERROR: WORD;
END_VAR
```

Graphic display:



Time behaviour:



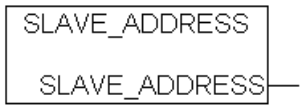
Function description:

This function sets the address offsets current value for the digital outputs. The changed configuration is used when writing the output PA during the next PLC cycle. The value is permanently saved in the controller.

When entering an invalid offset value the controller transmits the blink code 10 with the blink argument 2. The data exchange between the controller and the modules is stopped.
The default value when supplying the controllers is 0. As the value is saved permanently, for safety reasons the value should be set once again in the user program.

The saved value can be read with the FB GET_DIGITAL_OUTPUT_OFFSET.
The current start address for the bits of the digital outputs can be interrogated with the FB PI_INFORMATION. The output OUTPUTBITS_OFFSET emits the value.

SLAVE_ADDRESS

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to system variables		
Name:	SLAVE_ADDRESS		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		
Input parameters:	**Data type:**	**Comments:**	
Output parameters:	**Data type:**	**Comments:**	
SLAVE_ADDRESS	BYTE	The current node address.	
Graphic display:  			
Time behaviour:			
Function description: This function block allows the programmer access to the address set on the programmable fieldbus controller. The address is made available when invoking the FB.			

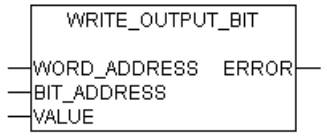
WRITE_OUTPUT_BIT

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to process image		
Name:	WRITE_OUTPUT_BIT		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		

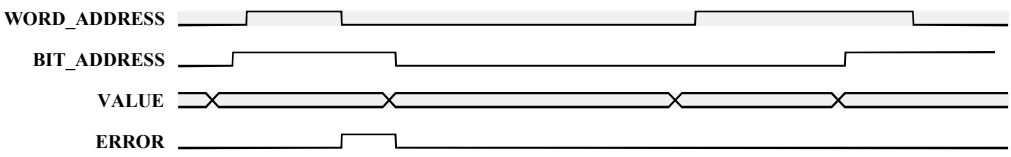
Input parameters:	**Data type:**	**Comments:**
WORD_ADDRESS	WORD	Here the word address of the word is transferred to the process image.
BIT_ADDRESS	WORD	Here the bit position in the word is transferred.
VALUE	BIT	Value to be written.

Output parameters:	**Data type:**	**Comments:**
ERROR	BOOL	TRUE if an error has occurred. Possible errors are an inadmissible address, otherwise FALSE.

Graphic display:



Time behaviour:



Function description:

This function block offers the programmer the possibility of indirect access to the process image. The current value of the output bit is made available immediately after invoking the FB. The function block must be used with particular care as here the guidelines of IEC 61131-3 „all addresses are assigned at the time of programming and during the running time“ are not adhered to.

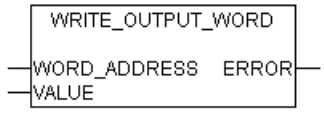
WRITE_OUTPUT_WORD

WAGO-I/O-*PRO* 32 Library elements			
Category:	Indirect access to process image		
Name:	WRITE_OUTPUT_WORD		
Type:	Function ☐	Function block ☒	Program ☐
Library name:	Mod_com.lib		
Applicable to:	All programmable fieldbus controllers		

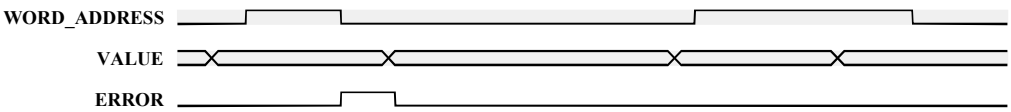
Input parameters:	**Data type:**	**Comments:**
WORD_ADDRESS	WORD	Here the word address of the word is transferred to the process image.
VALUE	WORD	Value to be written.

Output parameters:	**Data type:**	**Comments:**
ERROR	BOOL	TRUE if an error has occurred. Possible errors are an inadmissible address, otherwise FALSE.

Graphic display:



Time behaviour:



Function description:

This function block offers the programmer the possibility of indirect access to the process image. The current value of the output word is made available immediately after invoking the FB. The function block must be used with particular care as here the guidelines of IEC 61131-3 „all addresses are assigned at the time of programming and during the running time“ are not adhered to.