

# 1 OVERVIEW

## 1.1 LIST OF FUNCTION BLOCKS (FB)

The following table lists the FBs providing Balluff BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master control for the FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.

Name <sup>i</sup>	Description
P+Balluff_CCLinkIEFieldBasicIOLinkP1_R	Initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master with 8 IO-Link ports configured as Profile 1 (2 occupied stations).
P+Balluff_CCLinkIEFieldBasicIOLinkP2_F	Initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master with 8 IO-Link ports configured as Profile 2 (3 occupied stations).
P+Balluff_CCLinkIEFieldBasicIOLinkP3_F	Initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master with 8 IO-Link ports configured as Profile 3 (4 occupied stations).
P+Balluff_DetectDevicesCIB_F	Detects IO-Link devices connected to the ports of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadDataStorageContentCIB_F	Reads the data storage content from the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadDataStorageSettingsCIB_F	Reads the data storage setting configuration for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadEventDataCIB_F	Reads pending event data from the event buffer assigned to the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadIdentificationDataCIB_F	Reads the module identification data of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadInitOperationSettingCIB_F	Reads the initial processing enable/disable setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadISDUDataCIB_F	Reads the IO-Link parameter data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadOutputHoldSettingCIB_F	Reads the outputs hold/clear setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_ReadValidationDataCIB_F	Reads the IO-Link device validation configuration and data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_WriteDataStorageSettingsCIB_F	Writes the data storage configuration for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_WriteInitOperationSettingCIB_F	Writes the initial processing enable/disable setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_WriteISDUDataCIB_F	Writes the IO-Link parameter data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_WriteOutputHoldSettingCIB_F	Writes the outputs hold/clear setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
P+Balluff_WriteValidationDataCIB_F	Writes the IO-Link device validation configuration and data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

## 1.2 VERSION HISTORY

The following table lists the version history of the FB library (P+Balluff\_CCLinkIEFieldBasicIOLink\_F).

Version	Description
00A	First edition.
00B	Updated control FB for BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master connected as Profile 2 (3 occupied stations) – IO-Link port 5 output data write fix.

## 1.3 FUNCTION BLOCK OPERATION

There are two FB operation types: Pulsed execution type and real-time execution type.

The FBs of this library operate in the real-time execution type.

Operation Type		Description
Pulsed execution type	One scan execution type	There are two pulsed execution types: One scan execution type which completes in one scan after the start of a FB, and Multiple scan execution type which processes over multiple scans.
	Multiple scan	
		The FB is executed when an execution command (Execute or Enable) turns ON, and normal completion or error

	execution type	completion turns ON when the FB execution is completed. When an execution completion (normal completion or error completion) turns ON, no processing is performed in the FB even if the execution command is ON. Changes in the input label data under this condition are not reflected to the FB processing. Hold the execution command until the normal completion or error completion turns ON. If the execution command is turned OFF before the normal completion or error completion turns ON, the FB aborts and ends the processing with the normal completion and error completion being OFF.
Real-time execution type		The FB is executed when an execution command turns ON, and normal completion or error completion turns ON when the FB execution is completed. Even if the execution completion (normal completion) turns ON, a processing is performed in the FB when the execution command is ON. Changes in the input label data under this condition are reflected to the FB processing. When the execution completion (error completion) turns ON, the processing is aborted.

## 1. 4 RELEVANT MANUALS

- Balluff BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master User's Guide.
- [CC-Link IE Field Network Basic Reference Manual \[SH081684ENG\]](#).
- [MELSEC iQ-F FX5 User's Manual \(Ethernet Communication\) \[JY997D56201\]](#).
- [MELSEC iQ-F FX5 User's Manual \(Application\) \[JY997D55401\]](#).
- [GX Works3 Operating Manual\[SH081215ENG\]](#).

## 1. 5 NOTES

This manual describes the function blocks functionality.

The manual does not include the information on restrictions for using modules, PLC CPUs, and the combination of both.

Please read the user's manuals of the products before using them.

Please note the followings and use the FBs described in this manual:

- When using the FBs in an actual system, confirm that the FBs do not cause system control problems.
- Consider the locations where interlock conditions are required in the system and insert interlock conditions.
- Mitsubishi Electric Corporation will not compensate any damages caused by the FBs.
- Contents may be deleted or changed without prior notice

# 2 DETAILS OF THE FB LIBRARY

## 2. 1 P+Balluff\_CCLinkIEfieldBasicIOLinkP1\_F

Name	
P+Balluff_CCLinkIEfieldBasicIOLinkP1_F	
Overview	
Item	Description
Function overview	Initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master configured as Profile 1 (2 occupied stations), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.

Symbol [Function Block Diagram]	<div> <div>P+Balluff_CCLinkIEFieldBasicIOLinkP1_F</div> <div> <div>(1) i_bEN</div> <div>(2) i_uStationNumber</div> <div>(3) i_uIOLinesDirection</div> <div>(4) i_uDigitalOutputs</div> <div>(5) i_uIOLinkPortsEnable</div> <div>(6) i_uIOLinkEventsClear</div> <div>(7) i_uIOLinkByteSwap</div> <div>(8) i_bAutoOrManualIOCfg</div> <div>(9) i_u4IOLinkOutputDataPort0</div> <div>(10) i_u4IOLinkOutputDataPort1</div> <div>(11) i_u4IOLinkOutputDataPort2</div> <div>(12) i_u4IOLinkOutputDataPort3</div> <div>(13) i_u4IOLinkOutputDataPort4</div> <div>(14) i_u4IOLinkOutputDataPort5</div> <div>(15) i_u4IOLinkOutputDataPort6</div> <div>(16) i_u4IOLinkOutputDataPort7</div> <div>(17) i_bErrorReset</div> <div>(18) i_bWarningReset</div> <div>(19) i_bReinitialization</div> <div>(20) io_stLinkBasicIn1</div> <div>(21) io_stLinkBasicOut1</div> <div>(22) io_stLinkBasicIn2</div> <div>(23) io_stLinkBasicOut2</div> </div> <div> <div>o_bENO</div> <div>o_bDataLinkOk</div> <div>o_bUnitReady</div> <div>o_bUnitError</div> <div>o_bUnitWarning</div> <div>o_uUnitErrorCode</div> <div>o_uUnitWarningCode</div> <div>o_bUSVoltageLow</div> <div>o_bUAVoltageLow</div> <div>o_bUAVoltageOff</div> <div>o_bIOLinkReady</div> <div>o_uIOLinesDiagnostic</div> <div>o_uPortsDiagnostic</div> <div>o_uDigitalInputs</div> <div>o_uIOLinkValidPorts</div> <div>o_uIOLinkPortEvents</div> <div>o_uDataValidIOLinkPorts</div> <div>o_u4IOLinkInputDataPort0</div> <div>o_u4IOLinkInputDataPort1</div> <div>o_u4IOLinkInputDataPort2</div> <div>o_u4IOLinkInputDataPort3</div> <div>o_u4IOLinkInputDataPort4</div> <div>o_u4IOLinkInputDataPort5</div> <div>o_u4IOLinkInputDataPort6</div> <div>o_u4IOLinkInputDataPort7</div> </div> <div> <div>(24)</div> <div>(25)</div> <div>(26)</div> <div>(27)</div> <div>(28)</div> <div>(29)</div> <div>(30)</div> <div>(31)</div> <div>(32)</div> <div>(33)</div> <div>(34)</div> <div>(35)</div> <div>(36)</div> <div>(37)</div> <div>(38)</div> <div>(39)</div> <div>(40)</div> <div>(41)</div> <div>(42)</div> <div>(43)</div> <div>(44)</div> <div>(45)</div> <div>(46)</div> <div>(47)</div> <div>(48)</div> </div> </div>		
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Labels

Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	CC-Link IE Field Basic IO-Link Master control enable/disable command	Bit	ON, OFF	ON: Control of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is enabled. OFF: Control of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is disabled.
(2)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(3)	i_uIOLinesDirection	IO lines Direction	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	Select the direction (digital input or output) for each I/O signal line corresponding to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports. <div> <div> <div>b15</div> <div>b14</div> <div>...</div> <div>b9</div> <div>b8</div> <div>b7</div> <div>b6</div> <div>...</div> <div>b1</div> <div>b0</div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div>
					b0: Port direction for Port 0 Pin 4

					b1: Port direction for Port 0 Pin 2 b2: Port direction for Port 1 Pin 4 b3: Port direction for Port 1 Pin 2 . . . b14: Port direction for Port 7 Pin 4 b15: Port direction for Port 7 Pin 2
(4)	i_uDigitalOutputs	Digital outputs	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	Specify the digital output data that will be written to the digital output signal lines (Pin 2 and Pin 4) of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port. <ul style="list-style-type: none"> <li>0: Digital output signal set to OFF</li> <li>1: Digital output signal set to ON</li> </ul> <div> <div>b15 b14</div> <div>b9 b8 b7 b6</div> <div>b1 b0</div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> </div> b0: Digital output signal Port 0 Pin 4 b1: Digital output signal Port 0 Pin 2 b2: Digital output signal Port 1 Pin 4 b3: Digital output signal Port 1 Pin 2 . . . b14: Digital output signal Port 7 Pin 4 b15: Digital output signal Port 7 Pin 2
(5)	i_uIOLinkPortsEnable	Ports operating mode	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	Select the operating mode (IO-Link mode or Digital I/O mode) for each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link compatible port. <ul style="list-style-type: none"> <li>0: Digital I/O operating mode</li> <li>1: IO-Link operating mode</li> </ul> <div> <div>b15 b14</div> <div>b9 b8 b7 b6</div> <div>b1 b0</div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Unused</div> </div> b0: IO-Link Port 0 enable b1: IO-Link Port 1 enable . . . b6: IO-Link Port 6 enable b7: IO-Link Port 7 enable
(6)	i_uIOLinkEventsClear	Ports events clear	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	Select the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports for which event data buffer clear will be performed. <ul style="list-style-type: none"> <li>0: Do not clear events</li> <li>1: Clear all events</li> </ul> <div> <div>b15 b14</div> <div>b9 b8 b7 b6</div> <div>b1 b0</div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Unused</div> </div> b0: IO-Link Port 0 event clear b1: IO-Link Port 1 event clear . . . b6: IO-Link Port 6 event clear

					b7: IO-Link Port 7 event clear																				
(7)	i_uIOLinkByteSwap	Byte swap setting	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Specify the High byte/Low byte swap setting for each IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</p> <ul style="list-style-type: none"><li>High byte/Low byte swapping enabled:</li></ul> <table><tr><td>High Byte</td><td>Low Byte</td></tr><tr><td>Byte 0</td><td>Byte 1</td></tr><tr><td>Byte 2</td><td>Byte 3</td></tr><tr><td>to</td><td>to</td></tr><tr><td>Byte 30</td><td>Byte 31</td></tr></table> <ul style="list-style-type: none"><li>High byte/Low byte swapping disabled</li></ul> <table><tr><td>High Byte</td><td>Low Byte</td></tr><tr><td>Byte 1</td><td>Byte 0</td></tr><tr><td>Byte 3</td><td>Byte 2</td></tr><tr><td>to</td><td>to</td></tr><tr><td>Byte 31</td><td>Byte 30</td></tr></table> <p>Byte swap configuration data word structure:</p> <ul style="list-style-type: none"><li>0: Byte swapping disabled</li><li>1: Byte swapping enabled</li></ul> <div><div>b15b14b9b8b7b6b1b0</div><div><div></div><div></div><div>...</div><div></div><div></div><div></div><div></div><div>...</div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>Unused</div></div> <p>b0: IO-Link Port 0 byte swap b1: IO-Link Port 1 byte swap . . . b6: IO-Link Port 6 byte swap b7: IO-Link Port 7 byte swap</p>	High Byte	Low Byte	Byte 0	Byte 1	Byte 2	Byte 3	to	to	Byte 30	Byte 31	High Byte	Low Byte	Byte 1	Byte 0	Byte 3	Byte 2	to	to	Byte 31	Byte 30
High Byte	Low Byte																								
Byte 0	Byte 1																								
Byte 2	Byte 3																								
to	to																								
Byte 30	Byte 31																								
High Byte	Low Byte																								
Byte 1	Byte 0																								
Byte 3	Byte 2																								
to	to																								
Byte 31	Byte 30																								
(8)	i_bAutoOrManualIOCfg	Auto/Manual digital I/O ports configuration	Bit	ON, OFF	OFF: Automatic digital I/O ports configuration. ON: Manual digital I/O ports configuration.																				
(9)	i_uIOLinkOutputDataPort0	Output Data port 0	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 0 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.																				
(10)	i_uIOLinkOutputDataPort1	Output Data port 1	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 1 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.																				
(11)	i_uIOLinkOutputDataPort2	Output Data port 2	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 2 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.																				
(12)	i_uIOLinkOutputDataPort3	Output Data port 3	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 3 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.																				
(13)	i_uIOLinkOutputDataPort4	Output Data port 4	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 4 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.																				
(14)	i_uIOLinkOutputDataPort5	Output Data port 5	Word [Unsigned]/Bit String [16-bit]	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 5 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.																				

			bit] (0..3)		
(15)	i_uIOLinkOutputDataPort6	Output Data port 6	Word [Unsigned]/Bit String [16- bit] (0..3)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 6 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(16)	i_uIOLinkOutputDataPort7	Output Data port 7	Word [Unsigned]/Bit String [16- bit] (0..3)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 7 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(17)	i_bErrorReset	Error reset signal	Bit	ON, OFF	On the rising edge of this signal issue an error clear request to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(18)	i_bWarningReset	Warning reset signal	Bit	ON, OFF	On the rising edge of this signal issue a warning clear request to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(19)	i_bReInitialization	Re initialization signal	Bit	ON, OFF	On the rising edge of this signal issue a re-initialization request (Operation condition setting request) to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

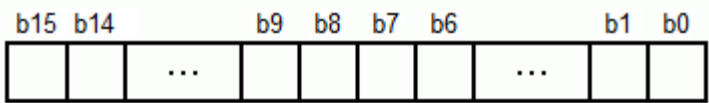
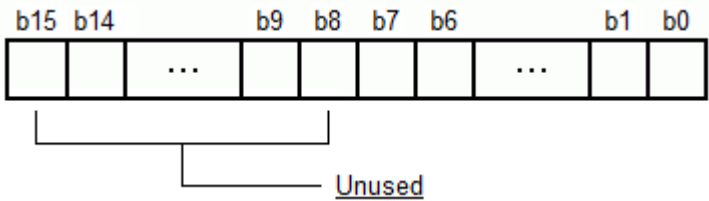
#### ■ I/O Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(20)	io_stLinkBasicIn1	Frequency inverter cyclic input data area 1	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the first occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 1).
(21)	io_stLinkBasicOut1	Frequency inverter cyclic output data area 1	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the first occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 1).
(22)	io_stLinkBasicIn2	Frequency inverter cyclic input data area 2	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the second occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 1).
(23)	io_stLinkBasicOut2	Frequency inverter cyclic output data area 2	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the second occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 1).

#### ■ Output Labels

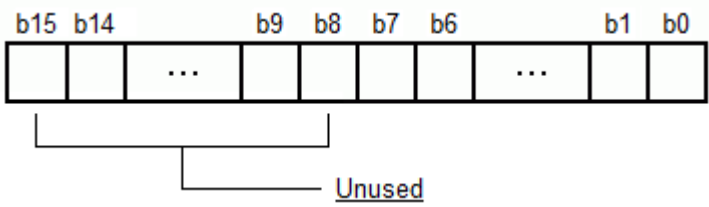
No.	Variable Name	Name	Data type	Setting Range	Description
(24)	o_bENO	CC-Link IE Field Basic IO-Link Master control command output status	Bit	OFF	ON: CC-Link IE Field Basic IO-Link Master control command signal is active. OFF: CC-Link IE Field Basic IO-Link Master control command signal is inactive.
(25)	o_bDataLinkOk	Data link status	Bit	OFF	Signals if the data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is up.
(26)	o_bUnitReady	Unit operation status	Bit	OFF	Signals if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is initialized and ready for operation.



(27)	o_bUnitError	Unit error status	Bit	OFF	Signals if an error has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initialization or operation.
(28)	o_bUnitWarning	Unit warning status	Bit	OFF	Signals if a warning has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master initialization or operation. <b>Note:</b> This signal will be automatically cleared after a defined time (approx. 10 seconds).
(29)	o_uUnitErrorCode	Unit error code	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the unit error code in case an error has occurred on the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master. For details of the error status, please refer to the <a href="#">Detail error check.</a>
(30)	o_uUnitWarningCode	Unit warning code	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the unit warning code in case a warning has occurred on the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master. For details of the error status, please refer to the <a href="#">Detail error check.</a>
(31)	o_bUSVoltageLow	US voltage low	Bit	OFF	Signal is ON if the US voltage is below 18V.
(32)	o_bUAVoltageLow	UA voltage off	Bit	OFF	Signal is ON if the UA voltage is below 18V.
(33)	o_bUAVoltageOff	UA voltage off	Bit	OFF	Signal is ON if the UA voltage is below 11V.
(34)	o_bIOLinkReady	IO-Link control cycle status	Bit	OFF	Signals if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is operational and the IO-Link devices control cycle is in progress (IO-Link devices connected).
(35)	o_uIOLinesDiagnostic	I/O signal lines status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the error status of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port's I/O signal lines. <ul style="list-style-type: none"> <li>0: No error</li> <li>1: Error (over-current, short-circuit)</li> </ul>  <p>b0: Port 0 Pin 4 I/O line diagnostic  b1: Port 0 Pin 2 I/O line diagnostic  b2: Port 1 Pin 4 I/O line diagnostic  b3: Port 1 Pin 2 I/O line diagnostic  .  .  .  b14: Port 7 Pin 4 I/O line diagnostic  b15: Port 7 Pin 2 I/O line diagnostic</p>
(36)	o_uPortsDiagnostic	Power supply line status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the error status of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port's power supply line. <ul style="list-style-type: none"> <li>0: No error</li> <li>1: Error (over-current, short-circuit)</li> </ul>  <p>b0: Port 0 Pin 1 power-supply diagnostic  b1: Port 1 Pin 1 power-supply diagnostic  .  .  .</p>

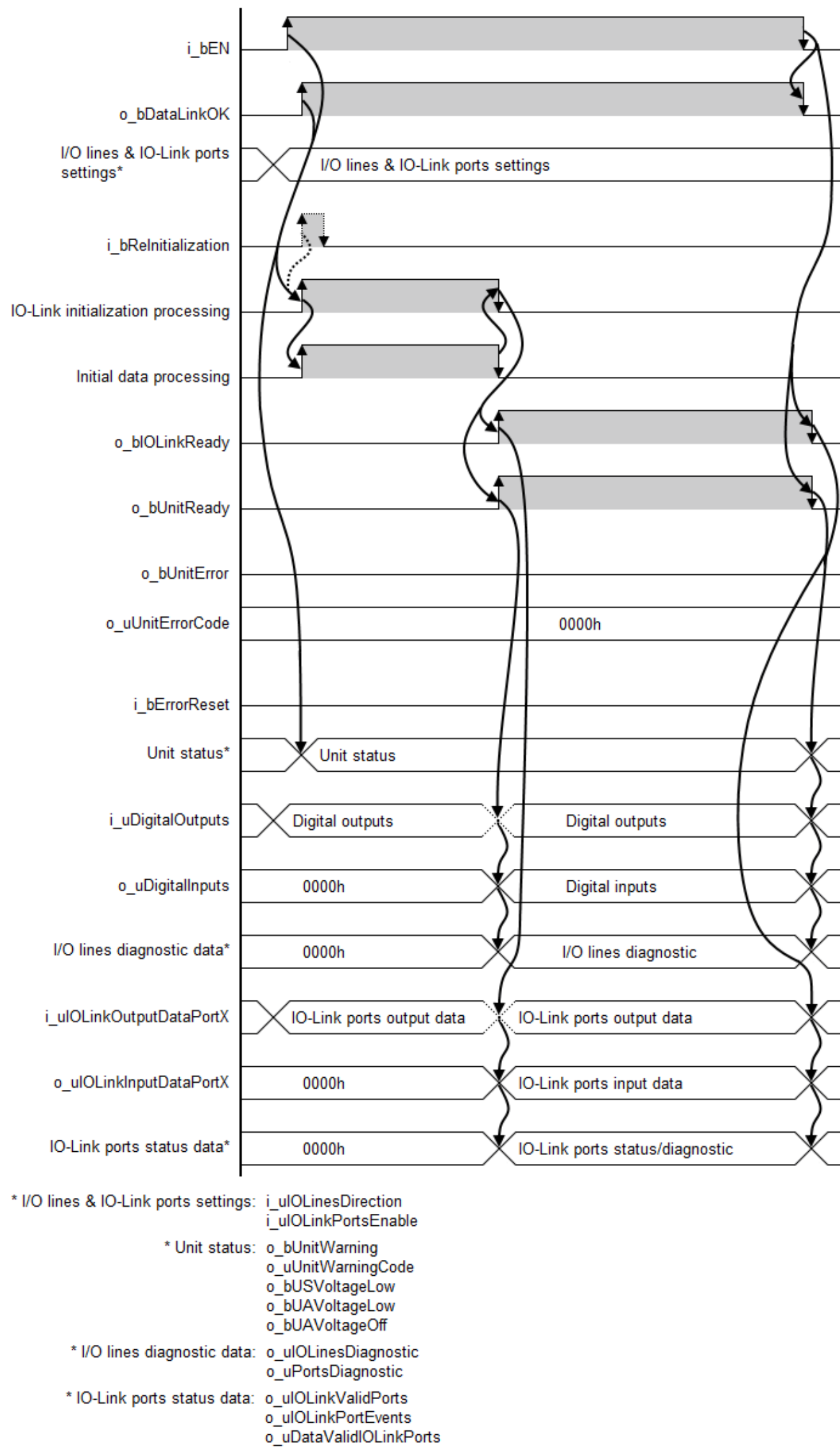
					b6: Port 6 Pin 1 power-supply diagnostic b7: Port 7 Pin 1 power-supply diagnostic
(37)	o_uDigitalInputs	Digital input signal lines status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the digital input status read from the digital input signal lines (Pin 2 and Pin 4) of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port. <ul style="list-style-type: none"> <li>0: Digital input signal set to OFF</li> <li>1: Digital input signal set to ON</li> </ul> <div> <div> <div>b15</div> <div>b14</div> <div>...</div> <div>b9</div> <div>b8</div> <div>b7</div> <div>b6</div> <div>...</div> <div>b1</div> <div>b0</div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div> b0: Digital input signal Port 0 Pin 4 b1: Digital input signal Port 0 Pin 2 b2: Digital input signal Port 1 Pin 4 b3: Digital input signal Port 1 Pin 2 . . . b14: Digital input signal Port 7 Pin 4 b15: Digital input signal Port 7 Pin 2
(38)	o_uIOLinkValidPorts	Validation Status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the validation status of the IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports. <ul style="list-style-type: none"> <li>0: IO-Link port invalid</li> <li>1: IO-Link port valid</li> </ul> <div> <div> <div>b15</div> <div>b14</div> <div>...</div> <div>b9</div> <div>b8</div> <div>b7</div> <div>b6</div> <div>...</div> <div>b1</div> <div>b0</div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Unused</div> </div> b0: IO-Link Port 0 valid b1: IO-Link Port 1 valid . . . b6: IO-Link Port 6 valid b7: IO-Link Port 7 valid
(39)	o_uIOLinkPortEvents	Event status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the pending event status of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports. <ul style="list-style-type: none"> <li>0: No event</li> <li>1: Event from the connected IO-Link device</li> </ul> <div> <div> <div>b15</div> <div>b14</div> <div>...</div> <div>b9</div> <div>b8</div> <div>b7</div> <div>b6</div> <div>...</div> <div>b1</div> <div>b0</div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Unused</div> </div> b0: IO-Link Port 0 event status b1: IO-Link Port 1 event status . . . b6: IO-Link Port 6 event status b7: IO-Link Port 7 event status
(40)	o_uDataValidIOLinkPorts	Validation status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the validation status of the process data sent using IO-Link communication for valid devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports. <ul style="list-style-type: none"> <li>0: Process data invalid</li> </ul>



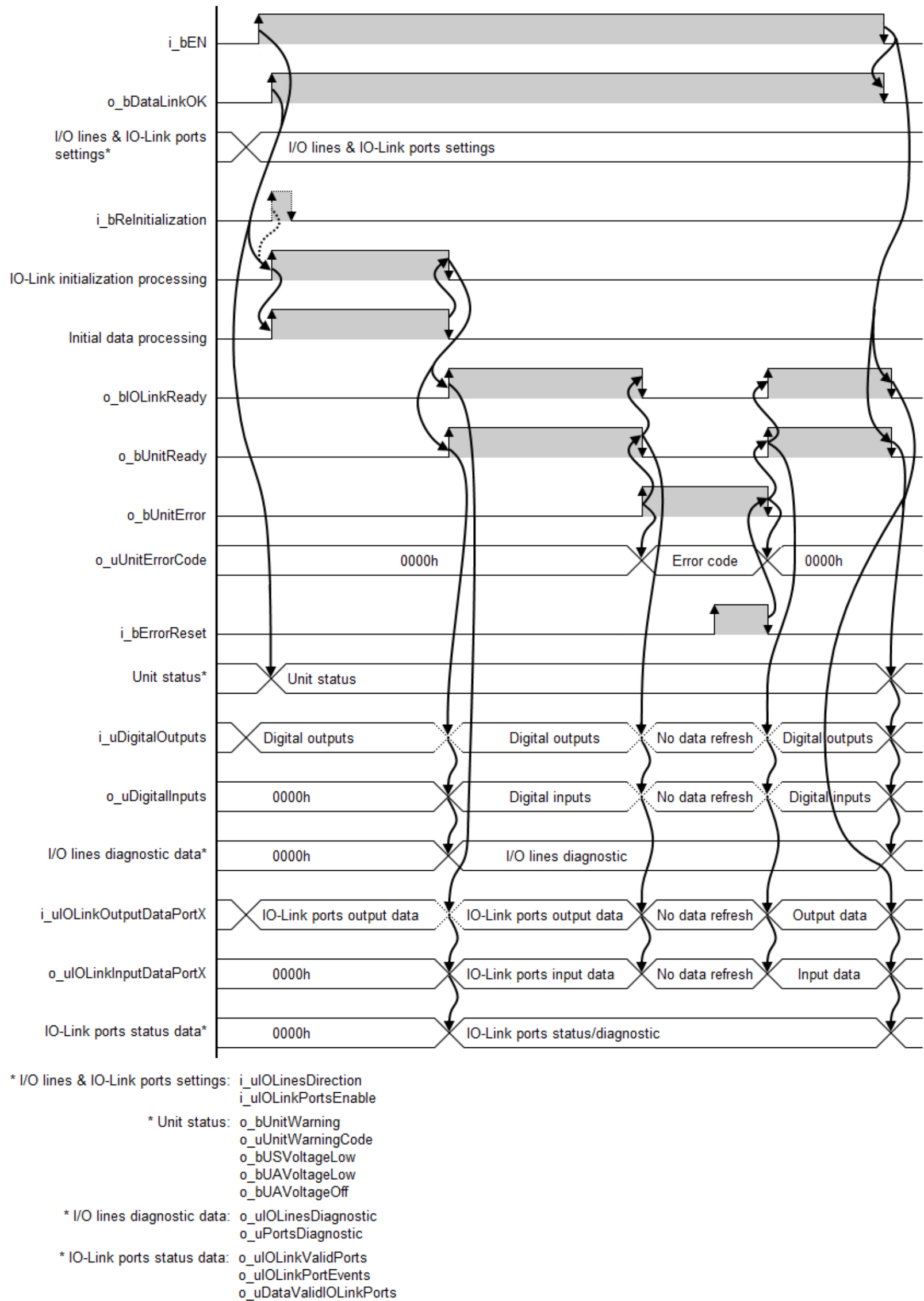
					<ul style="list-style-type: none"> <li>1: Process data valid</li> </ul>  <p>b0: Data valid IO-Link Port 0  b1: Data valid IO-Link Port 1        b6: Data valid IO-Link Port 6  b7: Data valid IO-Link Port 7</p>
(41)	o_uIOLinkInputDataPort0	Input data port 0	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 0 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(42)	o_uIOLinkInputDataPort1	Input data port 1	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 1 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(43)	o_uIOLinkInputDataPort2	Input data port 2	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 2 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(44)	o_uIOLinkInputDataPort3	Input data port 3	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 3 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(45)	o_uIOLinkInputDataPort4	Input data port 4	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 4 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(46)	o_uIOLinkInputDataPort5	Input data port 5	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 5 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(47)	o_uIOLinkInputDataPort6	Input data port 6	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 6 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(48)	o_uIOLinkInputDataPort7	Input data port 7	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 7 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	581 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	This function block is used for performing initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master configured as Profile 1 (2 occupied stations), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface. The function block provides the following functionality: <ul style="list-style-type: none"> <li>Port direction selection (digital Input or Output) for each I/O signal line corresponding to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>Digital output data write to the I/O signal lines of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>Operating mode selection (IO-Link mode or digital I/O mode) for each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link compatible port</li> <li>Event data buffer clear for selected BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating</li> </ul>	

	<p>mode ports</p> <ul style="list-style-type: none"><li>• Automatic/manual digital I/O ports configuration selection</li><li>• Automatic byte swap setting, on initialization processing, for all IO-Link ports of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master</li><li>• Output data write to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li><li>• Clear the error status (Error clear request) of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master</li><li>• Re-Initialization (Operation condition setting request) of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master's IO-Link operating mode ports</li><li>• I/O signal lines diagnostic monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li><li>• Power-supply line diagnostic monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li><li>• Digital input data read from the I/O signal lines of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li><li>• Validation status monitoring for the IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li><li>• Process data validation status monitoring for IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li><li>• Pending event data status monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li><li>• Input data read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports.</li></ul>
Restrictions and precautions	<ul style="list-style-type: none"><li>• The function block will only perform an automatic initialization (Initial data processing) each time the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is powered ON, also setting the I/O signal lines direction and activating the IO-Link mode channels with their byte swap settings as configured by the &lt;i_uIOLinesDirection&gt;, &lt;i_uIOLinkPortsEnable&gt; and &lt;i_uIOLinkByteSwap&gt; input labels respectively.</li><li>• For any changes in validation settings, data storage configuration, an I/O signal line's direction (&lt;i_uIOLinesDirection&gt; input label) or an IO-Link compatible port's operating mode selection (&lt;i_uIOLinkPortsEnable&gt; input label) made during function block operation to come into effect, a BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master re-initialization (rising edge of the &lt;i_bReInitialization&gt; input label) will be required.</li></ul>
FB compiling method	Macro
FB operation type	Real-time execution
Timing chart	<ul style="list-style-type: none"><li>• When the operation is completed successfully</li></ul>



- When the operation is completed with an error



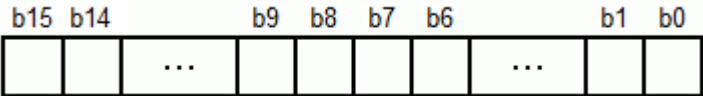
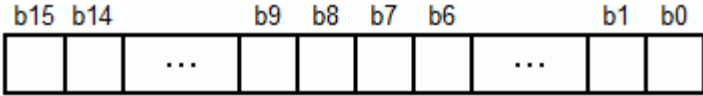
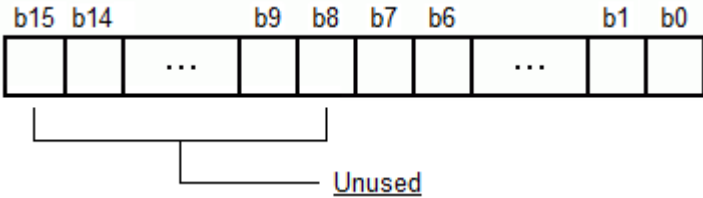
2. 2 P+Balluff\_CCLinkIEFieldBasicIOLinkP2\_F

Name	
P+Balluff_CCLinkIEFieldBasicIOLinkP2_F	
Overview	
Item	Description
Function overview	Initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master configured as Profile 2 (3 occupied stations), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_CCLinkIEFieldBasicIOLinkP2_F</div><div><div>(1) — i_bEN</div><div>(2) — i_uStationNumber</div><div>(3) — i_uIOLinesDirection</div><div>(4) — i_uDigitalOutputs</div><div>(5) — i_uIOLinkPortsEnable</div><div>(6) — i_uIOLinkEventsClear</div><div>(7) — i_uIOLinkByteSwap</div><div>(8) — i_bAutoOrManualIOCfg</div><div>(9) — i_u4IOLinkOutputDataPort0</div><div>(10) — i_u4IOLinkOutputDataPort1</div><div>(11) — i_u4IOLinkOutputDataPort2</div><div>(12) — i_u4IOLinkOutputDataPort3</div><div>(13) — i_u4IOLinkOutputDataPort4</div><div>(14) — i_u4IOLinkOutputDataPort5</div><div>(15) — i_u4IOLinkOutputDataPort6</div><div>(16) — i_u4IOLinkOutputDataPort7</div><div>(17) — i_bErrorReset</div><div>(18) — i_bWarningReset</div><div>(19) — i_bReinitialization</div><div>(20) —</div><div>(21) —</div><div>(22) —</div><div>(23) —</div><div>(24) —</div><div>(25) —</div></div><div><div>o_bENO</div><div>o_bDataLinkOk</div><div>o_bUnitReady</div><div>o_bUnitError</div><div>o_bUnitWarning</div><div>o_uUnitErrorCode</div><div>o_uUnitWarningCode</div><div>o_bUSVoltageLow</div><div>o_bUAVoltageLow</div><div>o_bUAVoltageOff</div><div>o_bIOLinkReady</div><div>o_uIOLinesDiagnostic</div><div>o_uPortsDiagnostic</div><div>o_uDigitalInputs</div><div>o_uIOLinkValidPorts</div><div>o_uIOLinkPortEvents</div><div>o_uDataValidIOLinkPorts</div><div>o_u4IOLinkInputDataPort0</div><div>o_u4IOLinkInputDataPort1</div><div>o_u4IOLinkInputDataPort2</div><div>o_u4IOLinkInputDataPort3</div><div>o_u4IOLinkInputDataPort4</div><div>o_u4IOLinkInputDataPort5</div><div>o_u4IOLinkInputDataPort6</div><div>o_u4IOLinkInputDataPort7</div><div>io_stLinkBasicIn1</div><div>io_stLinkBasicOut1</div><div>io_stLinkBasicIn2</div><div>io_stLinkBasicOut2</div><div>io_stLinkBasicIn3</div><div>io_stLinkBasicOut3</div></div><div><div>(26)</div><div>(27)</div><div>(28)</div><div>(29)</div><div>(30)</div><div>(31)</div><div>(32)</div><div>(33)</div><div>(34)</div><div>(35)</div><div>(36)</div><div>(37)</div><div>(38)</div><div>(39)</div><div>(40)</div><div>(41)</div><div>(42)</div><div>(43)</div><div>(44)</div><div>(45)</div><div>(46)</div><div>(47)</div><div>(48)</div><div>(49)</div><div>(50)</div></div></div>

Labels

■ Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	CC-Link IE Field Basic IO-Link Master control enable/disable command	Bit	ON, OFF	ON: Control of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is enabled. OFF: Control of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is disabled.

(2)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master.
(3)	i_uIOLinesDirection	IO lines Direction	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Select the direction (digital input or output) for each I/O signal line corresponding to the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master ports.</p> <ul style="list-style-type: none"> <li>0: Digital input</li> <li>1: Digital output</li> </ul>  <p>b0: Port direction for Port 0 Pin 4  b1: Port direction for Port 0 Pin 2  b2: Port direction for Port 1 Pin 4  b3: Port direction for Port 1 Pin 2  .  .  .  b14: Port direction for Port 7 Pin 4  b15: Port direction for Port 7 Pin 2</p>
(4)	i_uDigitalOutputs	Digital outputs	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Specify the digital output data that will be written to the digital output signal lines (Pin 2 and Pin 4) of each BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master port.</p> <ul style="list-style-type: none"> <li>0: Digital output signal set to OFF</li> <li>1: Digital output signal set to ON</li> </ul>  <p>b0: Digital output signal Port 0 Pin 4  b1: Digital output signal Port 0 Pin 2  b2: Digital output signal Port 1 Pin 4  b3: Digital output signal Port 1 Pin 2  .  .  .  b14: Digital output signal Port 7 Pin 4  b15: Digital output signal Port 7 Pin 2</p>
(5)	i_uIOLinkPortsEnable	Ports operating mode	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Select the operating mode (IO-Link mode or Digital I/O mode) for each BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master IO-Link compatible port.</p> <ul style="list-style-type: none"> <li>0: Digital I/O operating mode</li> <li>1: IO-Link operating mode</li> </ul>  <p>b0: IO-Link Port 0 enable  b1: IO-Link Port 1 enable  .  .  .  b6: IO-Link Port 6 enable  b7: IO-Link Port 7 enable</p>
(6)	i_uIOLinkEventsClear	Ports events clear	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Select the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports for which event data buffer clear will be performed.</p> <ul style="list-style-type: none"> <li>0: Do not clear events</li> </ul>



					<div><div><div><div><div></div><div>b15</div></div><div><div>b14</div><div></div></div><div><div></div><div>...</div></div><div><div>b9</div><div></div></div><div><div>b8</div><div></div></div><div><div>b7</div><div></div></div><div><div>b6</div><div></div></div><div><div></div><div>...</div></div><div><div>b1</div><div></div></div><div><div>b0</div><div></div></div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>Unused</div></div> <div>b0: IO-Link Port 0 event clear</div> <div>b1: IO-Link Port 1 event clear</div> <div>.</div> <div>.</div> <div>.</div> <div>b6: IO-Link Port 6 event clear</div> <div>b7: IO-Link Port 7 event clear</div>																				
(7)	i_uIOLinkByteSwap	Byte swap setting	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<div>Specify the High byte/Low byte swap setting for each IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</div> <div><div>High byte/Low byte swapping enabled:</div><table><tr><td>High Byte</td><td>Low Byte</td></tr><tr><td>Byte 0</td><td>Byte 1</td></tr><tr><td>Byte 2</td><td>Byte 3</td></tr><tr><td>to</td><td>to</td></tr><tr><td>Byte 30</td><td>Byte 31</td></tr></table></div> <div><div>High byte/Low byte swapping disabled</div><table><tr><td>High Byte</td><td>Low Byte</td></tr><tr><td>Byte 1</td><td>Byte 0</td></tr><tr><td>Byte 3</td><td>Byte 2</td></tr><tr><td>to</td><td>to</td></tr><tr><td>Byte 31</td><td>Byte 30</td></tr></table></div> <div>Byte swap configuration data word structure:</div> <div><div>0: Byte swapping disabled</div><div>1: Byte swapping enabled</div></div> <div><div><div><div><div></div><div>b15</div></div><div><div>b14</div><div></div></div><div><div></div><div>...</div></div><div><div>b9</div><div></div></div><div><div>b8</div><div></div></div><div><div>b7</div><div></div></div><div><div>b6</div><div></div></div><div><div></div><div>...</div></div><div><div>b1</div><div></div></div><div><div>b0</div><div></div></div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>Unused</div></div> <div>b0: IO-Link Port 0 byte swap</div> <div>b1: IO-Link Port 1 byte swap</div> <div>.</div> <div>.</div> <div>.</div> <div>b6: IO-Link Port 6 byte swap</div> <div>b7: IO-Link Port 7 byte swap</div>	High Byte	Low Byte	Byte 0	Byte 1	Byte 2	Byte 3	to	to	Byte 30	Byte 31	High Byte	Low Byte	Byte 1	Byte 0	Byte 3	Byte 2	to	to	Byte 31	Byte 30
High Byte	Low Byte																								
Byte 0	Byte 1																								
Byte 2	Byte 3																								
to	to																								
Byte 30	Byte 31																								
High Byte	Low Byte																								
Byte 1	Byte 0																								
Byte 3	Byte 2																								
to	to																								
Byte 31	Byte 30																								
(8)	i_bAutoOrManualIOCfg	Auto/Manual digital I/O ports configuration	Bit	ON, OFF	<div>OFF: Automatic digital I/O ports configuration.</div> <div>ON: Manual digital I/O ports configuration.</div>																				
(9)	i_uIOLinkOutputDataPort0	Output Data port 0	Word [Unsigned]/Bit String [16-bit] (0..7)	-	<div>Specify the start address of the memory area storing the output data that will be written to IO-Link Port 0 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</div>																				
(10)	i_uIOLinkOutputDataPort1	Output Data port 1	Word [Unsigned]/Bit String [16-bit] (0..7)	-	<div>Specify the start address of the memory area storing the output data that will be written to IO-Link Port 1 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</div>																				
(11)	i_uIOLinkOutputDataPort2	Output Data port 2	Word [Unsigned]/Bit String [16-bit] (0..7)	-	<div>Specify the start address of the memory area storing the output data that will be written to IO-Link Port 2 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</div>																				

(12)	i_uIOLinkOutputDataPort3	Output Data port 3	Word [Unsigned]/Bit String [16- bit] (0..7)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 3 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(13)	i_uIOLinkOutputDataPort4	Output Data port 4	Word [Unsigned]/Bit String [16- bit] (0..7)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 4 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(14)	i_uIOLinkOutputDataPort5	Output Data port 5	Word [Unsigned]/Bit String [16- bit] (0..7)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 5 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(15)	i_uIOLinkOutputDataPort6	Output Data port 6	Word [Unsigned]/Bit String [16- bit] (0..7)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 6 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(16)	i_uIOLinkOutputDataPort7	Output Data port 7	Word [Unsigned]/Bit String [16- bit] (0..7)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 7 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(17)	i_bErrorReset	Error reset signal	Bit	ON, OFF	On the rising edge of this signal issue an error clear request to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(18)	i_bWarningReset	Warning reset signal	Bit	ON, OFF	On the rising edge of this signal issue a warning clear request to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(19)	i_bReInitialization	Re initialization signal	Bit	ON, OFF	On the rising edge of this signal issue a re-initialization request (Operation condition setting request) to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

#### ■ I/O Labels

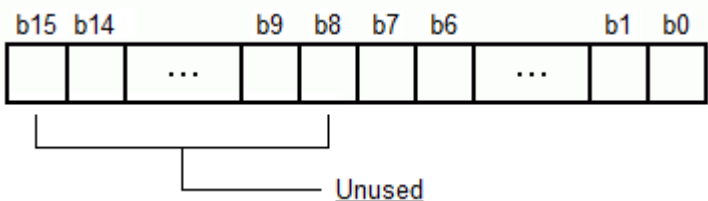
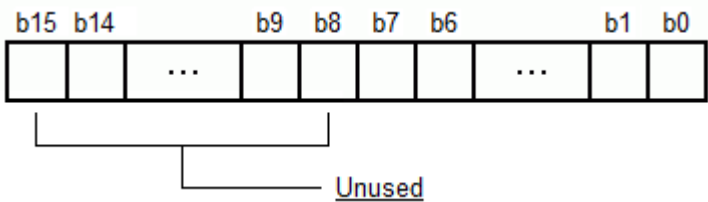
No.	Variable Name	Name	Data type	Setting Range	Description
(20)	io_stLinkBasicIn1	Frequency inverter cyclic input data area 1	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the first occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 2).
(21)	io_stLinkBasicOut1	Frequency inverter cyclic output data area 1	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the first occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 2).
(22)	io_stLinkBasicIn2	Frequency inverter cyclic input data area 2	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the second occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 2).
(23)	io_stLinkBasicOut2	Frequency inverter cyclic output data area 2	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the second occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 2).
(24)	io_stLinkBasicIn3	Frequency inverter cyclic input data area 3	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the third occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 2).

(25)	io_stLinkBasicOut3	Frequency inverter cyclic output data area 3	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the third occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 2).
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■ Output Labels

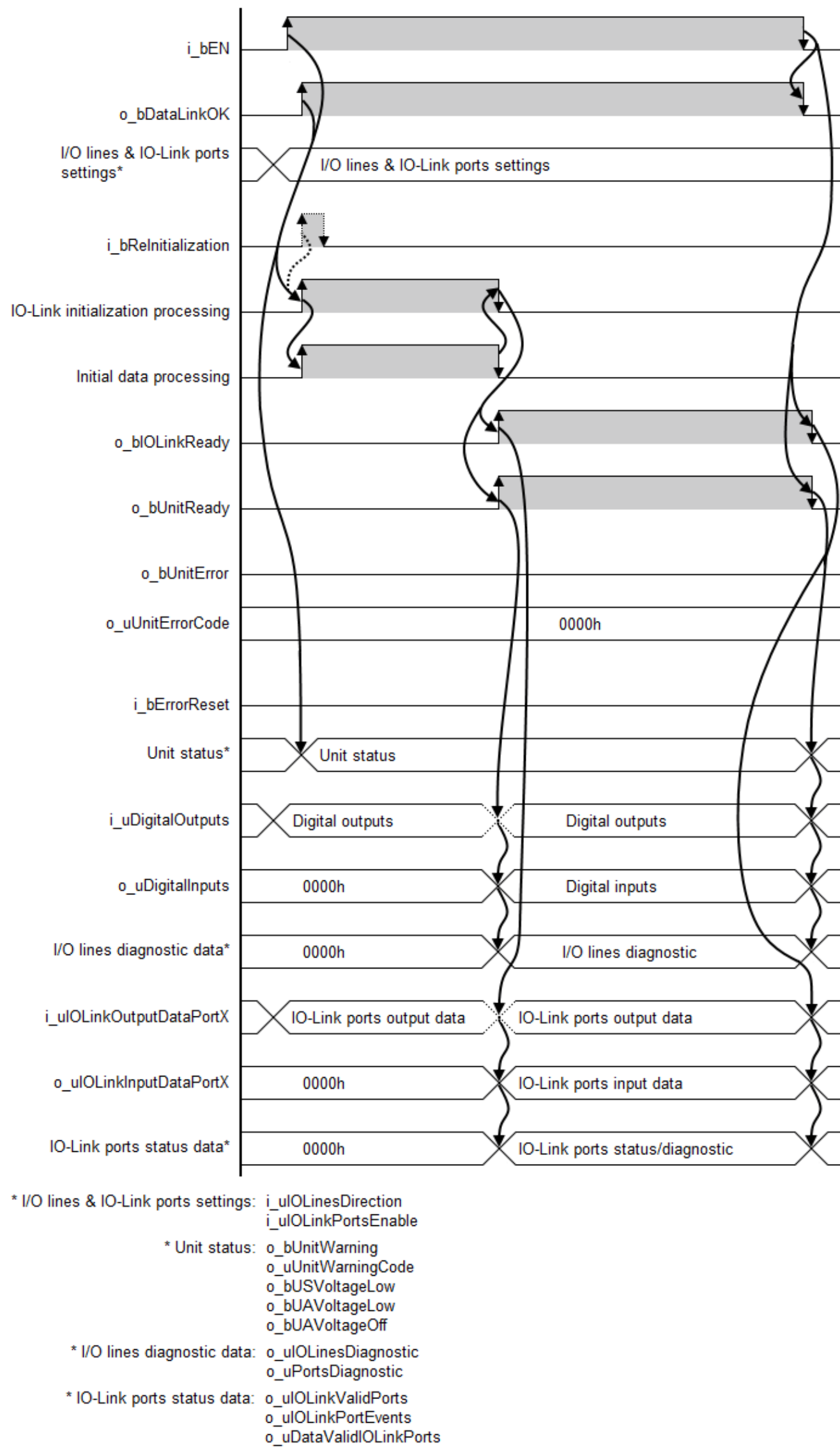
No.	Variable Name	Name	Data type	Setting Range	Description
(26)	o_bENO	CC-Link IE Field Basic IO-Link Master control command output status	Bit	OFF	ON: CC-Link IE Field Basic IO-Link Master control command signal is active. OFF: CC-Link IE Field Basic IO-Link Master control command signal is inactive.
(27)	o_bDataLinkOk	Data link status	Bit	OFF	Signals if the data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is up.
(28)	o_bUnitReady	Unit operation status	Bit	OFF	Signals if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is initialized and ready for operation.
(29)	o_bUnitError	Unit error status	Bit	OFF	Signals if an error has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initialization or operation.
(30)	o_bUnitWarning	Unit warning status	Bit	OFF	Signals if a warning has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master initialization or operation. <b>Note:</b> This signal will be automatically cleared after a defined time (approx. 10 seconds).
(31)	o_uUnitErrorCode	Unit error code	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the unit error code in case an error has occurred on the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master. For details of the error status, please refer to the <a href="#">Detail error check.</a>
(32)	o_uUnitWarningCode	Unit warning code	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the unit warning code in case a warning has occurred on the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master. For details of the error status, please refer to the <a href="#">Detail error check.</a>
(33)	o_bUSVoltageLow	US voltage low	Bit	OFF	Signal is ON if the US voltage is below 18V.
(34)	o_bUAVoltageLow	UA voltage off	Bit	OFF	Signal is ON if the UA voltage is below 18V.
(35)	o_bUAVoltageOff	UA voltage off	Bit	OFF	Signal is ON if the UA voltage is below 11V.
(36)	o_bIOLinkReady	IO-Link control cycle status	Bit	OFF	Signals if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is operational and the IO-Link devices control cycle is in progress (IO-Link devices connected).
(37)	o_uIOLinesDiagnostic	I/O signal lines status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the error status of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port's I/O signal lines. <ul style="list-style-type: none"> <li>0: No error</li> <li>1: Error (over-current, short-circuit)</li> </ul> <div> <div> <div>b15</div> <div>b14</div> <div></div> <div></div> <div>...</div> <div></div> <div>b9</div> <div>b8</div> <div>b7</div> <div>b6</div> <div></div> <div></div> <div>...</div> <div></div> <div>b1</div> <div>b0</div> </div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div> b0: Port 0 Pin 4 I/O line diagnostic b1: Port 0 Pin 2 I/O line diagnostic b2: Port 1 Pin 4 I/O line diagnostic

					b3: Port 1 Pin 2 I/O line diagnostic    b14: Port 7 Pin 4 I/O line diagnostic b15: Port 7 Pin 2 I/O line diagnostic
(38)	o_uPortsDiagnostic	Power supply line status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the error status of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port's power supply line. <ul style="list-style-type: none"> <li>0: No error</li> <li>1: Error (over-current, short-circuit)</li> </ul> <div> <div> b15b14b9b8b7b6b1b0 </div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> <div>Unused</div> </div> b0: Port 0 Pin 1 power-supply diagnostic b1: Port 1 Pin 1 power-supply diagnostic    b6: Port 6 Pin 1 power-supply diagnostic b7: Port 7 Pin 1 power-supply diagnostic
(39)	o_uDigitalInputs	Digital input signal lines status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the digital input status read from the digital input signal lines (Pin 2 and Pin 4) of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port. <ul style="list-style-type: none"> <li>0: Digital input signal set to OFF</li> <li>1: Digital input signal set to ON</li> </ul> <div> <div> b15b14b9b8b7b6b1b0 </div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> </div> b0: Digital input signal Port 0 Pin 4 b1: Digital input signal Port 0 Pin 2 b2: Digital input signal Port 1 Pin 4 b3: Digital input signal Port 1 Pin 2    b14: Digital input signal Port 7 Pin 4 b15: Digital input signal Port 7 Pin 2
(40)	o_uIOLinkValidPorts	Validation Status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the validation status of the IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports. <ul style="list-style-type: none"> <li>0: IO-Link port invalid</li> <li>1: IO-Link port valid</li> </ul> <div> <div> b15b14b9b8b7b6b1b0 </div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div>...</div> <div></div> <div></div> <div></div> <div></div> <div>...</div> <div></div> <div></div> </div> <div>Unused</div> </div> b0: IO-Link Port 0 valid b1: IO-Link Port 1 valid    b6: IO-Link Port 6 valid b7: IO-Link Port 7 valid
(41)	o_uIOLinkPortEvents	Event status	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the pending event status of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode

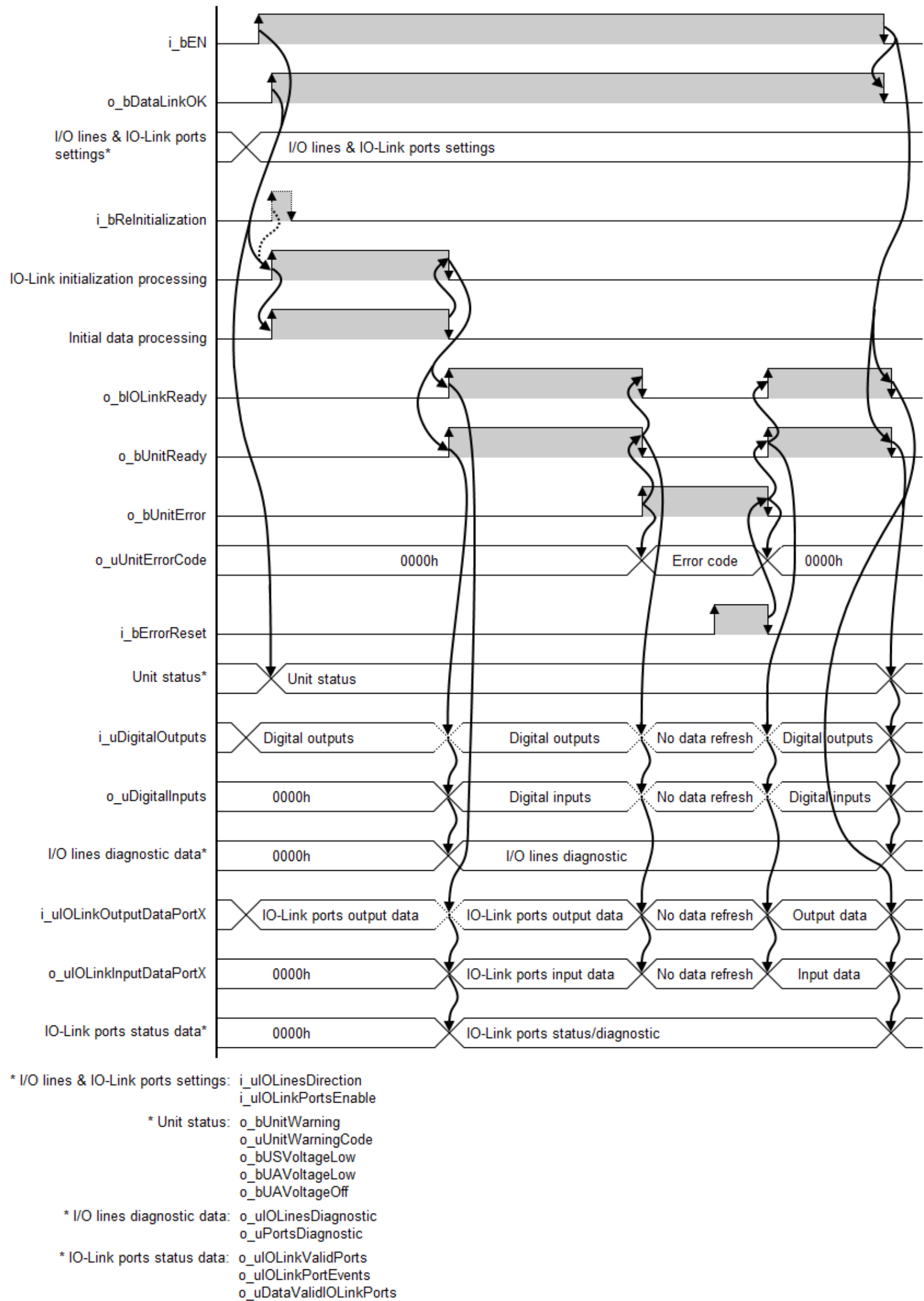
					<p>ports.</p> <ul style="list-style-type: none"> <li>0: No event</li> <li>1: Event from the connected IO-Link device</li> </ul>  <p>b0: IO-Link Port 0 event status b1: IO-Link Port 1 event status . . . b6: IO-Link Port 6 event status b7: IO-Link Port 7 event status</p>
(42)	o_uDataValidIOLinkPorts	Validation status	Word [Unsigned]/Bit String [16-bit]	0000h	<p>Stores the validation status of the process data sent using IO-Link communication for valid devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports.</p> <ul style="list-style-type: none"> <li>0: Process data invalid</li> <li>1: Process data valid</li> </ul>  <p>b0: Data valid IO-Link Port 0 b1: Data valid IO-Link Port 1 . . . b6: Data valid IO-Link Port 6 b7: Data valid IO-Link Port 7</p>
(43)	o_uIOLinkInputDataPort0	Input data port 0	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 0 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(44)	o_uIOLinkInputDataPort1	Input data port 1	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 1 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(45)	o_uIOLinkInputDataPort2	Input data port 2	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 2 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(46)	o_uIOLinkInputDataPort3	Input data port 3	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 3 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(47)	o_uIOLinkInputDataPort4	Input data port 4	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 4 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(48)	o_uIOLinkInputDataPort5	Input data port 5	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 5 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(49)	o_uIOLinkInputDataPort6	Input data port 6	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 6 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(50)	o_uIOLinkInputDataPort7	Input data port 7	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 7 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	637 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	<p>This function block is used for performing initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master configured as Profile 2 (3 occupied stations), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.</p> <p>The function block provides the following functionality:</p> <ul style="list-style-type: none"> <li>• Port direction selection (digital Input or Output) for each I/O signal line corresponding to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Digital output data write to the I/O signal lines of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Operating mode selection (IO-Link mode or digital I/O mode) for each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link compatible port</li> <li>• Event data buffer clear for selected BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Automatic/manual digital I/O ports configuration selection</li> <li>• Automatic byte swap setting, on initialization processing, for all IO-Link ports of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master</li> <li>• Output data write to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Clear the error status (Error clear request) of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master</li> <li>• Re-Initialization (Operation condition setting request) of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master's IO-Link operating mode ports</li> <li>• I/O signal lines diagnostic monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Power-supply line diagnostic monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Digital input data read from the I/O signal lines of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Validation status monitoring for the IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Process data validation status monitoring for IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Pending event data status monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Input data read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports.</li> </ul>	
Restrictions and precautions	<ul style="list-style-type: none"> <li>• The function block will only perform an automatic initialization (Initial data processing) each time the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is powered ON, also setting the I/O signal lines direction and activating the IO-Link mode channels with their byte swap settings as configured by the &lt;i_uIOLinesDirection&gt;, &lt;i_uIOLinkPortsEnable&gt; and &lt;i_uIOLinkByteSwap&gt; input labels respectively.</li> <li>• For any changes in validation settings, data storage configuration, an I/O signal line's direction (&lt;i_uIOLinesDirection&gt; input label) or an IO-Link compatible port's operating mode selection (&lt;i_uIOLinkPortsEnable&gt; input label) made during function block operation to come into effect, a BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master re-initialization (rising edge of the &lt;i_bReInitialization&gt; input label) will be required.</li> </ul>	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<ul style="list-style-type: none"> <li>• When the operation is completed successfully</li> </ul>	





- When the operation is completed with an error



2.3 P+Balluff\_CCLinkIEFieldBasicIOLinkP3\_F

Name	
P+Balluff_CCLinkIEFieldBasicIOLinkP3_F	
Overview	
Item	Description
Function overview	Initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master configured as Profile 3 (4 occupied stations), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_CCLinkIEFieldBasicIOLinkP3_F</div><div><div>(1) — i_bEN — o_bENO — (28)</div><div>(2) — i_uStationNumber — o_bDataLinkOk — (29)</div><div>(3) — i_uIOLinesDirection — o_bUnitReady — (30)</div><div>(4) — i_uDigitalOutputs — o_bUnitError — (31)</div><div>(5) — i_uIOLinkPortsEnable — o_bUnitWarning — (32)</div><div>(6) — i_uIOLinkEventsClear — o_uUnitErrorCode — (33)</div><div>(7) — i_uIOLinkByteSwap — o_uUnitWarningCode — (34)</div><div>(8) — i_bAutoOrManualIOCfg — o_bUSVoltageLow — (35)</div><div>(9) — i_u4IOLinkOutputDataPort0 — o_bUAVoltageLow — (36)</div><div>(10) — i_u4IOLinkOutputDataPort1 — o_bUAVoltageOff — (37)</div><div>(11) — i_u4IOLinkOutputDataPort2 — o_bIOLinkReady — (38)</div><div>(12) — i_u4IOLinkOutputDataPort3 — o_uIOLinesDiagnostic — (39)</div><div>(13) — i_u4IOLinkOutputDataPort4 — o_uPortsDiagnostic — (40)</div><div>(14) — i_u4IOLinkOutputDataPort5 — o_uDigitalInputs — (41)</div><div>(15) — i_u4IOLinkOutputDataPort6 — o_uIOLinkValidPorts — (42)</div><div>(16) — i_u4IOLinkOutputDataPort7 — o_uIOLinkPortEvents — (43)</div><div>(17) — i_bErrorReset — o_uDataValidIOLinkPorts — (44)</div><div>(18) — i_bWarningReset — o_u4IOLinkInputDataPort0 — (45)</div><div>(19) — i_bReinitialization — o_u4IOLinkInputDataPort1 — (46)</div><div>o_u4IOLinkInputDataPort2 — (47)</div><div>o_u4IOLinkInputDataPort3 — (48)</div><div>o_u4IOLinkInputDataPort4 — (49)</div><div>o_u4IOLinkInputDataPort5 — (50)</div><div>o_u4IOLinkInputDataPort6 — (51)</div><div>o_u4IOLinkInputDataPort7 — (52)</div><div>(20) — io_stLinkBasicIn1</div><div>(21) — io_stLinkBasicOut1</div><div>(22) — io_stLinkBasicIn2</div><div>(23) — io_stLinkBasicOut2</div><div>(24) — io_stLinkBasicIn3</div><div>(25) — io_stLinkBasicOut3</div><div>(26) — io_stLinkBasicIn4</div><div>(27) — io_stLinkBasicOut4</div></div></div>

Labels

■ Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	CC-Link IE Field Basic IO-Link	Bit	ON, OFF	ON: Control of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is enabled.

		Master control enable/disable command			OFF: Control of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is disabled.
(2)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(3)	i_uIOLinesDirection	IO lines Direction	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Select the direction (digital input or output) for each I/O signal line corresponding to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports.</p> <ul style="list-style-type: none"> <li>0: Digital input</li> <li>1: Digital output</li> </ul> <div> <div> b15 b14 b9 b8 b7 b6 b1 b0 </div> <div> <div></div><div></div><div>...</div><div></div><div></div><div></div><div></div><div>...</div><div></div><div></div> </div> </div> <p> b0: Port direction for Port 0 Pin 4  b1: Port direction for Port 0 Pin 2  b2: Port direction for Port 1 Pin 4  b3: Port direction for Port 1 Pin 2        b14: Port direction for Port 7 Pin 4  b15: Port direction for Port 7 Pin 2 </p>
(4)	i_uDigitalOutputs	Digital outputs	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Specify the digital output data that will be written to the digital output signal lines (Pin 2 and Pin 4) of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port.</p> <ul style="list-style-type: none"> <li>0: Digital output signal set to OFF</li> <li>1: Digital output signal set to ON</li> </ul> <div> <div> b15 b14 b9 b8 b7 b6 b1 b0 </div> <div> <div></div><div></div><div>...</div><div></div><div></div><div></div><div></div><div>...</div><div></div><div></div> </div> </div> <p> b0: Digital output signal Port 0 Pin 4  b1: Digital output signal Port 0 Pin 2  b2: Digital output signal Port 1 Pin 4  b3: Digital output signal Port 1 Pin 2        b14: Digital output signal Port 7 Pin 4  b15: Digital output signal Port 7 Pin 2 </p>
(5)	i_uIOLinkPortsEnable	Ports operating mode	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Select the operating mode (IO-Link mode or Digital I/O mode) for each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link compatible port.</p> <ul style="list-style-type: none"> <li>0: Digital I/O operating mode</li> <li>1: IO-Link operating mode</li> </ul> <div> <div> b15 b14 b9 b8 b7 b6 b1 b0 </div> <div> <div></div><div></div><div>...</div><div></div><div></div><div></div><div></div><div>...</div><div></div><div></div> </div> <div> <div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div> </div> <div>Unused</div> </div> <p> b0: IO-Link Port 0 enable  b1: IO-Link Port 1 enable        b6: IO-Link Port 6 enable  b7: IO-Link Port 7 enable </p>
(6)	i_uIOLinkEventsClear	Ports events	Word	0000h	Select the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-

		clear	[Unsigned]/Bit String [16-bit]	to FFFFh	<p>Link Master IO-Link operating mode ports for which event data buffer clear will be performed.</p> <ul style="list-style-type: none"><li>0: Do not clear events</li><li>1: Clear all events</li></ul> <div><div>b15b14...b9b8b7b6...b1b0</div><div></div><div>Unused</div></div> <p>b0: IO-Link Port 0 event clear b1: IO-Link Port 1 event clear . . . b6: IO-Link Port 6 event clear b7: IO-Link Port 7 event clear</p>																				
(7)	i_uIOLinkByteSwap	Byte swap setting	Word [Unsigned]/Bit String [16-bit]	0000h to FFFFh	<p>Specify the High byte/Low byte swap setting for each IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</p> <ul style="list-style-type: none"><li>High byte/Low byte swapping enabled:</li></ul> <table><tr><td>High Byte</td><td>Low Byte</td></tr><tr><td>Byte 0</td><td>Byte 1</td></tr><tr><td>Byte 2</td><td>Byte 3</td></tr><tr><td>to</td><td>to</td></tr><tr><td>Byte 30</td><td>Byte 31</td></tr></table> <ul style="list-style-type: none"><li>High byte/Low byte swapping disabled</li></ul> <table><tr><td>High Byte</td><td>Low Byte</td></tr><tr><td>Byte 1</td><td>Byte 0</td></tr><tr><td>Byte 3</td><td>Byte 2</td></tr><tr><td>to</td><td>to</td></tr><tr><td>Byte 31</td><td>Byte 30</td></tr></table> <p>Byte swap configuration data word structure:</p> <ul style="list-style-type: none"><li>0: Byte swapping disabled</li><li>1: Byte swapping enabled</li></ul> <div><div>b15b14...b9b8b7b6...b1b0</div><div></div><div>Unused</div></div> <p>b0: IO-Link Port 0 byte swap b1: IO-Link Port 1 byte swap . . . b6: IO-Link Port 6 byte swap b7: IO-Link Port 7 byte swap</p>	High Byte	Low Byte	Byte 0	Byte 1	Byte 2	Byte 3	to	to	Byte 30	Byte 31	High Byte	Low Byte	Byte 1	Byte 0	Byte 3	Byte 2	to	to	Byte 31	Byte 30
High Byte	Low Byte																								
Byte 0	Byte 1																								
Byte 2	Byte 3																								
to	to																								
Byte 30	Byte 31																								
High Byte	Low Byte																								
Byte 1	Byte 0																								
Byte 3	Byte 2																								
to	to																								
Byte 31	Byte 30																								
(8)	i_bAutoOrManualIOCfg	Auto/Manual digital I/O ports configuration	Bit	ON, OFF	<p>OFF: Automatic digital I/O ports configuration. ON: Manual digital I/O ports configuration.</p>																				
(9)	i_uIOLinkOutputDataPort0	Output Data port 0	Word [Unsigned]/Bit String [16-bit] (0..11)	–	<p>Specify the start address of the memory area storing the output data that will be written to IO-Link Port 0 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</p>																				
(10)	i_uIOLinkOutputDataPort1	Output Data port 1	Word [Unsigned]/Bit String [16-bit] (0..11)	–	<p>Specify the start address of the memory area storing the output data that will be written to IO-Link Port 1 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</p>																				
(11)	i_uIOLinkOutputDataPort2	Output Data port	Word	–	<p>Specify the start address of the memory area storing the</p>																				

		2	[Unsigned]/Bit String [16-bit] (0..11)		output data that will be written to IO-Link Port 2 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(12)	i_uIOLinkOutputDataPort3	Output Data port 3	Word [Unsigned]/Bit String [16-bit] (0..11)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 3 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(13)	i_uIOLinkOutputDataPort4	Output Data port 4	Word [Unsigned]/Bit String [16-bit] (0..11)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 4 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(14)	i_uIOLinkOutputDataPort5	Output Data port 5	Word [Unsigned]/Bit String [16-bit] (0..11)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 5 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(15)	i_uIOLinkOutputDataPort6	Output Data port 6	Word [Unsigned]/Bit String [16-bit] (0..11)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 6 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(16)	i_uIOLinkOutputDataPort7	Output Data port 7	Word [Unsigned]/Bit String [16-bit] (0..11)	–	Specify the start address of the memory area storing the output data that will be written to IO-Link Port 7 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(17)	i_bErrorReset	Error reset signal	Bit	ON, OFF	On the rising edge of this signal issue an error clear request to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(18)	i_bWarningReset	Warning reset signal	Bit	ON, OFF	On the rising edge of this signal issue a warning clear request to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(19)	i_bReInitialization	Re initialization signal	Bit	ON, OFF	On the rising edge of this signal issue a re-initialization request (Operation condition setting request) to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

#### ■ I/O Labels

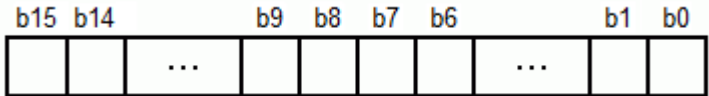
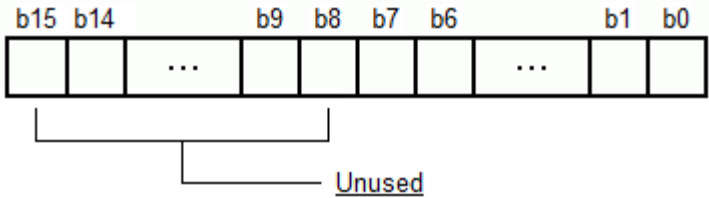
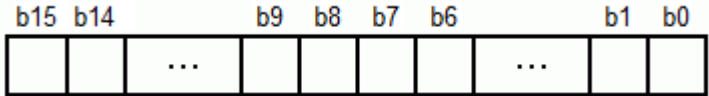
No.	Variable Name	Name	Data type	Setting Range	Description
(20)	io_stLinkBasicIn1	Frequency inverter cyclic input data area 1	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the first occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 3).
(21)	io_stLinkBasicOut1	Frequency inverter cyclic output data area 1	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the first occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 3).
(22)	io_stLinkBasicIn2	Frequency inverter cyclic input data area 2	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the second occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 3).
(23)	io_stLinkBasicOut2	Frequency inverter cyclic output data area 2	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the second occupied station of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master (Profile 3).
(24)	io_stLinkBasicIn3	Frequency inverter cyclic	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers

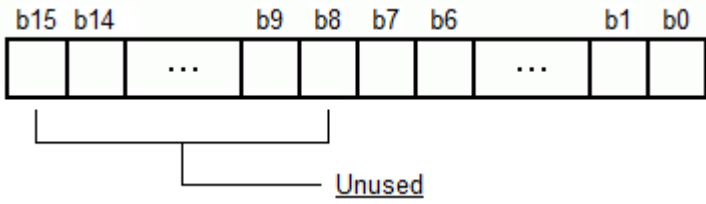
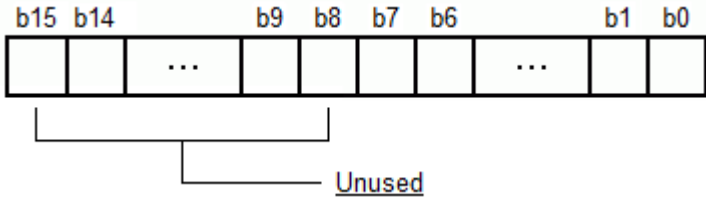
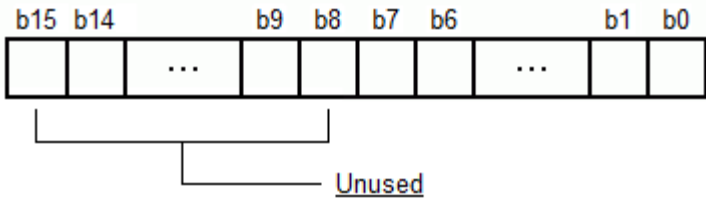


		input data area 3			corresponding to the third occupied station of the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master (Profile 3).
(25)	io_stLinkBasicOut3	Frequency inverter cyclic output data area 3	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the third occupied station of the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master (Profile 3).
(26)	io_stLinkBasicIn4	Frequency inverter cyclic input data area 4	<a href="#">stRemoteDataBasicIn</a>	–	Specifies the CC-Link IE Field Basic cyclic input data area structure storing the Remote inputs and Remote Read registers corresponding to the fourth occupied station of the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master (Profile 3).
(27)	io_stLinkBasicOut4	Frequency inverter cyclic output data area 4	<a href="#">stRemoteDataBasicOut</a>	–	Specifies the CC-Link IE Field Basic cyclic output data area structure storing the Remote outputs and Remote Write registers corresponding to the fourth occupied station of the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master (Profile 3).

## ■ Output Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(28)	o_bENO	CC-Link IE Field Basic IO-Link Master control command output status	Bit	OFF	ON: CC-Link IE Field Basic IO-Link Master control command signal is active. OFF: CC-Link IE Field Basic IO-Link Master control command signal is inactive.
(29)	o_bDataLinkOk	Data link status	Bit	OFF	Signals if the data link with the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master station is up.
(30)	o_bUnitReady	Unit operation status	Bit	OFF	Signals if the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master is initialized and ready for operation.
(31)	o_bUnitError	Unit error status	Bit	OFF	Signals if an error has occurred during the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master initialization or operation.
(32)	o_bUnitWarning	Unit warning status	Bit	OFF	Signals if a warning has occurred during the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link-Master initialization or operation. <b>Note:</b> This signal will be automatically cleared after a defined time (approx. 10 seconds).
(33)	o_uUnitErrorCode	Unit error code	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the unit error code in case an error has occurred on the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link-Master. For details of the error status, please refer to the <a href="#">Detail error check.</a>
(34)	o_uUnitWarningCode	Unit warning code	Word[Unsigned]/Bit String[16-bit]	0000h	Stores the unit warning code in case a warning has occurred on the BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link-Master. For details of the error status, please refer to the <a href="#">Detail error check.</a>
(35)	o_bUSVoltageLow	US voltage low	Bit	OFF	Signal is ON if the US voltage is below 18V.
(36)	o_bUAVoltageLow	UA voltage off	Bit	OFF	Signal is ON if the UA voltage is below 18V.
(37)	o_bUAVoltageOff	UA voltage off	Bit	OFF	Signal is ON if the UA voltage is below 11V.

(38)	o_bIOLinkReady	IO-Link control cycle status	Bit	OFF	Signals if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is operational and the IO-Link devices control cycle is in progress (IO-Link devices connected).
(39)	o_uIOLinesDiagnostic	I/O signal lines status	Word[Unsigned]/Bit String[16-bit]	0000h	<p>Stores the error status of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port's I/O signal lines.</p> <ul style="list-style-type: none"> <li>0: No error</li> <li>1: Error (over-current, short-circuit)</li> </ul>  <p>b0: Port 0 Pin 4 I/O line diagnostic  b1: Port 0 Pin 2 I/O line diagnostic  b2: Port 1 Pin 4 I/O line diagnostic  b3: Port 1 Pin 2 I/O line diagnostic  .  .  .  b14: Port 7 Pin 4 I/O line diagnostic  b15: Port 7 Pin 2 I/O line diagnostic</p>
(40)	o_uPortsDiagnostic	Power supply line status	Word[Unsigned]/Bit String[16-bit]	0000h	<p>Stores the error status of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port's power supply line.</p> <ul style="list-style-type: none"> <li>0: No error</li> <li>1: Error (over-current, short-circuit)</li> </ul>  <p>b0: Port 0 Pin 1 power-supply diagnostic  b1: Port 1 Pin 1 power-supply diagnostic  .  .  .  b6: Port 6 Pin 1 power-supply diagnostic  b7: Port 7 Pin 1 power-supply diagnostic</p>
(41)	o_uDigitalInputs	Digital input signal lines status	Word[Unsigned]/Bit String[16-bit]	0000h	<p>Stores the digital input status read from the digital input signal lines (Pin 2 and Pin 4) of each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master port.</p> <ul style="list-style-type: none"> <li>0: Digital input signal set to OFF</li> <li>1: Digital input signal set to ON</li> </ul>  <p>b0: Digital input signal Port 0 Pin 4  b1: Digital input signal Port 0 Pin 2  b2: Digital input signal Port 1 Pin 4  b3: Digital input signal Port 1 Pin 2  .  .  .  b14: Digital input signal Port 7 Pin 4  b15: Digital input signal Port 7 Pin 2</p>
(42)	o_uIOLinkValidPorts	Validation Status	Word[Unsigned]/Bit String[16-bit]	0000h	<p>Stores the validation status of the IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports.</p> <ul style="list-style-type: none"> <li>0: IO-Link port invalid</li> <li>1: IO-Link port valid</li> </ul>

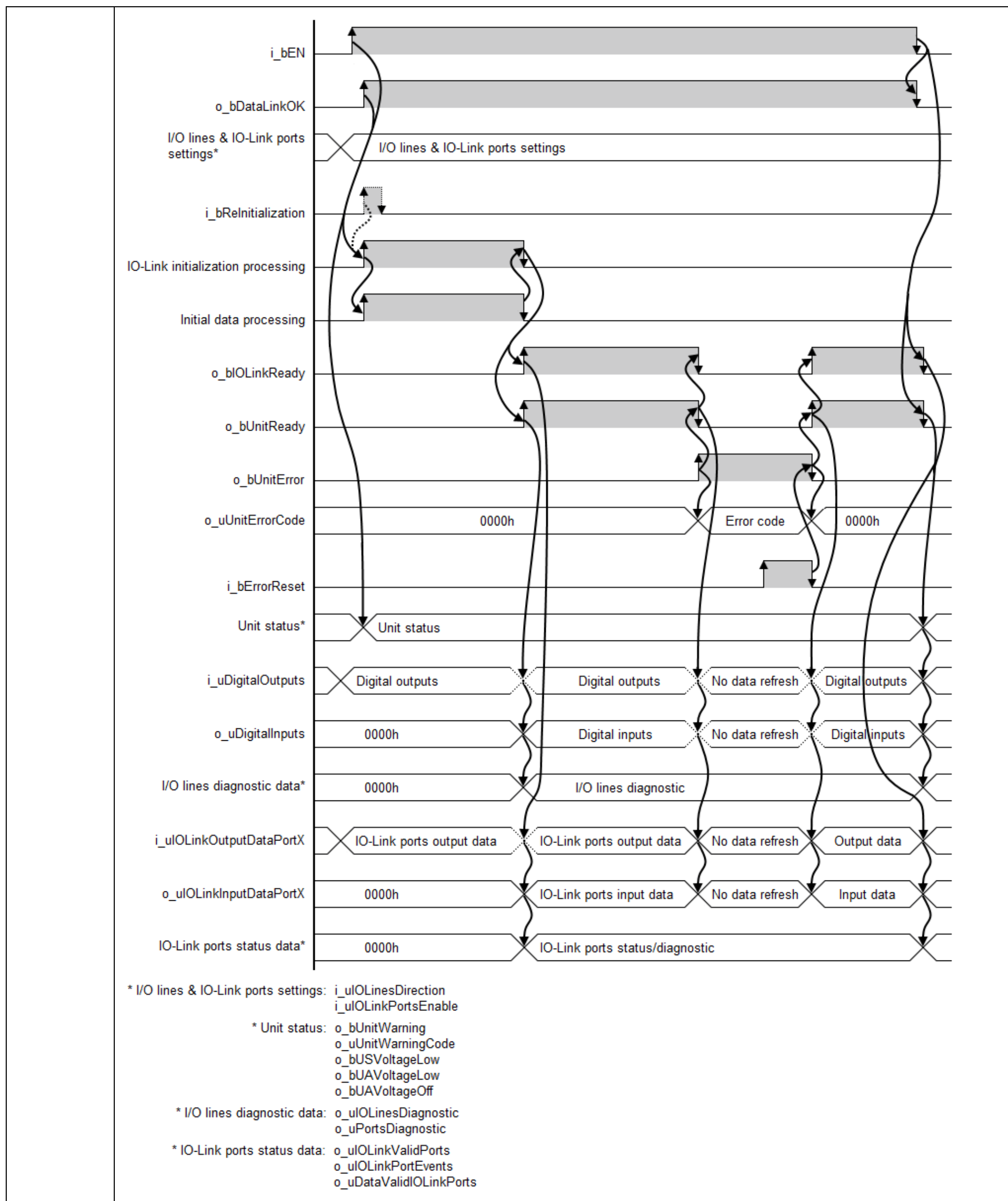
					 <p>b0: IO-Link Port 0 valid b1: IO-Link Port 1 valid . . . b6: IO-Link Port 6 valid b7: IO-Link Port 7 valid</p>
(43)	o_uIOLinkPortEvents	Event status	Word[Unsigned]/Bit String[16-bit]	0000h	<p>Stores the pending event status of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports.</p> <ul style="list-style-type: none"> <li>0: No event</li> <li>1: Event from the connected IO-Link device</li> </ul>  <p>b0: IO-Link Port 0 event status b1: IO-Link Port 1 event status . . . b6: IO-Link Port 6 event status b7: IO-Link Port 7 event status</p>
(44)	o_uDataValidIOLinkPorts	Validation status	Word[Unsigned]/Bit String[16-bit]	0000h	<p>Stores the validation status of the process data sent using IO-Link communication for valid devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports.</p> <ul style="list-style-type: none"> <li>0: Process data invalid</li> <li>1: Process data valid</li> </ul>  <p>b0: Data valid IO-Link Port 0 b1: Data valid IO-Link Port 1 . . . b6: Data valid IO-Link Port 6 b7: Data valid IO-Link Port 7</p>
(45)	o_uIOLinkInputDataPort0	Input data port 0	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 0 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(46)	o_uIOLinkInputDataPort1	Input data port 1	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 1 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(47)	o_uIOLinkInputDataPort2	Input data port 2	Word [Unsigned]/Bit String [16-bit] (0..3)	-	Specify the start address of the memory area storing the input data read from IO-Link Port 2 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(48)	o_uIOLinkInputDataPort3	Input data port 3	Word [Unsigned]/Bit String [16-bit]	-	Specify the start address of the memory area storing the input data read from IO-Link Port 3 of the BNI CIB-508-105-Z015 CC-

			bit] (0..3)		Link IE Field Basic IO-Link Master.
(49)	o_uIOLinkInputDataPort4	Input data port 4	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 4 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(50)	o_uIOLinkInputDataPort5	Input data port 5	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 5 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(51)	o_uIOLinkInputDataPort6	Input data port 6	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 6 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(52)	o_uIOLinkInputDataPort7	Input data port 7	Word [Unsigned]/Bit String [16-bit] (0..3)	–	Specify the start address of the memory area storing the input data read from IO-Link Port 7 of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

## FB details

Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	653 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	<p>This function block is used for performing initialization and control of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master configured as Profile 3 (4 occupied stations), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.</p> <p>The function block provides the following functionality:</p> <ul style="list-style-type: none"> <li>• Port direction selection (digital Input or Output) for each I/O signal line corresponding to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Digital output data write to the I/O signal lines of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Operating mode selection (IO-Link mode or digital I/O mode) for each BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link compatible port</li> <li>• Event data buffer clear for selected BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Automatic/manual digital I/O ports configuration selection</li> <li>• Automatic byte swap setting, on initialization processing, for all IO-Link ports of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master</li> <li>• Output data write to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Clear the error status (Error clear request) of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master</li> <li>• Re-Initialization (Operation condition setting request) of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master's IO-Link operating mode ports</li> <li>• I/O signal lines diagnostic monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Power-supply line diagnostic monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Digital input data read from the I/O signal lines of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ports</li> <li>• Validation status monitoring for the IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Process data validation status monitoring for IO-Link devices connected to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Pending event data status monitoring for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports</li> <li>• Input data read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master IO-Link operating mode ports.</li> </ul>	
Restrictions and precautions	<ul style="list-style-type: none"> <li>• The function block will only perform an automatic initialization (Initial data processing) each time the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master is powered ON, also setting the I/O signal lines direction and activating the IO-Link mode channels with their byte swap settings as configured by the &lt;i_uIOLinesDirection&gt;, &lt;i_uIOLinkPortsEnable&gt; and &lt;i_uIOLinkByteSwap&gt; input labels respectively.</li> <li>• For any changes in validation settings, data storage configuration, an I/O signal line's direction</li> </ul>	

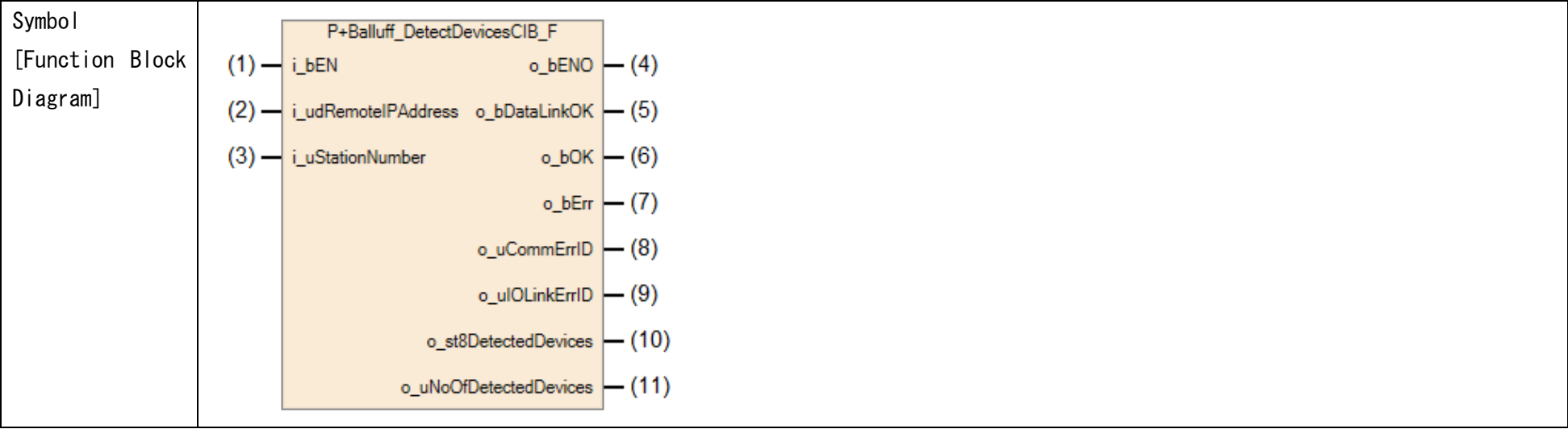
	<p>(&lt;i_uIOLinesDirection&gt; input label) or an IO-Link compatible port's operating mode selection (&lt;i_uIOLinkPortsEnable&gt; input label) made during function block operation to come into effect, a BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master re-initialization (rising edge of the &lt;i_bReInitialization&gt; input label) will be required.</p>
FB compiling method	Macro
FB operation type	Real-time execution
Timing chart	<div><div><div>• When the operation is completed successfully</div><p>The timing chart illustrates the sequence of events for a successful IO-Link Master re-initialization. It shows the interaction between various inputs and outputs over time. Key events include the rising edge of <i>i_bEN</i>, the rising edge of <i>i_bReInitialization</i>, the activation of <i>o_bDataLinkOK</i>, <i>o_bLinkReady</i>, and <i>o_bUnitReady</i>. Data exchanges for <i>o_uUnitErrorCode</i> (0000h), <i>Unit status</i>, <i>Digital outputs</i>, <i>Digital inputs</i>, <i>I/O lines diagnostic data</i>, <i>IO-Link ports output data</i>, <i>IO-Link ports input data</i>, and <i>IO-Link ports status data</i> are shown. Shaded bars indicate the active periods for inputs and outputs. Arrows show the flow of data and control signals.</p></div><div><div>* I/O lines &amp; IO-Link ports settings: <i>i_uIOLinesDirection</i> <i>i_uIOLinkPortsEnable</i></div><div>* Unit status: <i>o_bUnitWarning</i> <i>o_uUnitWarningCode</i> <i>o_bUSVoltageLow</i> <i>o_bUAVoltageLow</i> <i>o_bUAVoltageOff</i></div><div>* I/O lines diagnostic data: <i>o_uIOLinesDiagnostic</i> <i>o_uPortsDiagnostic</i></div><div>* IO-Link ports status data: <i>o_uIOLinkValidPorts</i> <i>o_uIOLinkPortEvents</i> <i>o_uDataValidIOLinkPorts</i></div></div><div><div>• When the operation is completed with an error</div></div></div>



## 2. 4 P+Balluff\_DetectDevicesCIB\_F

Name	
P+Balluff_DetectDevicesCIB_F	
Overview	
Item	Description
Function overview	Detects IO-Link devices connected to the ports of a Balluff Network Interface BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.





Labels

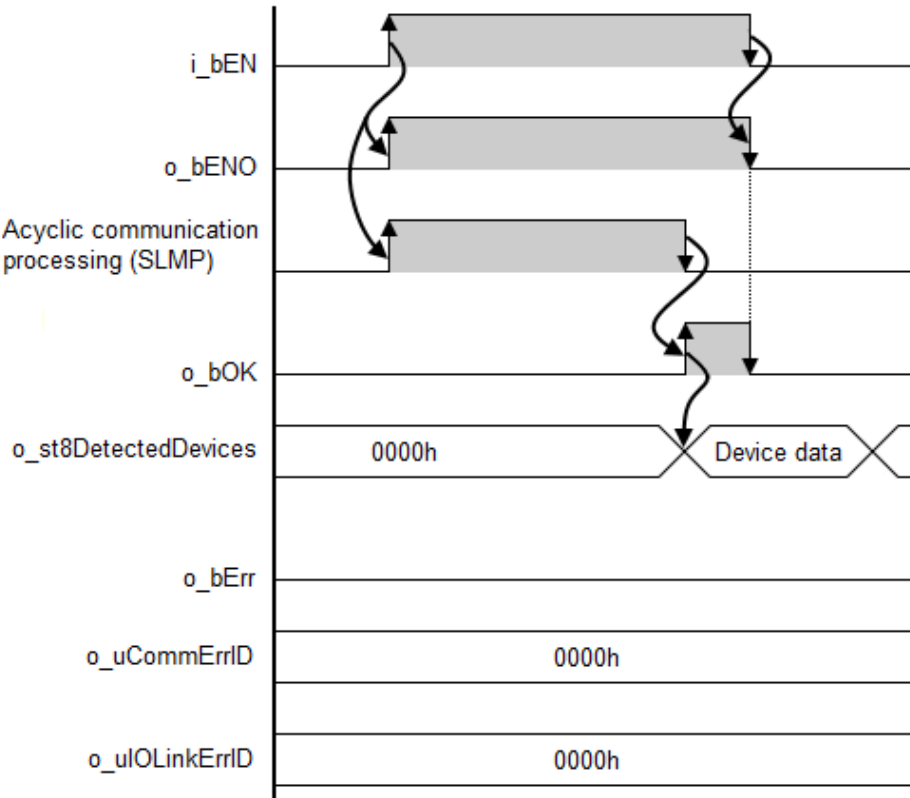
Input Labels

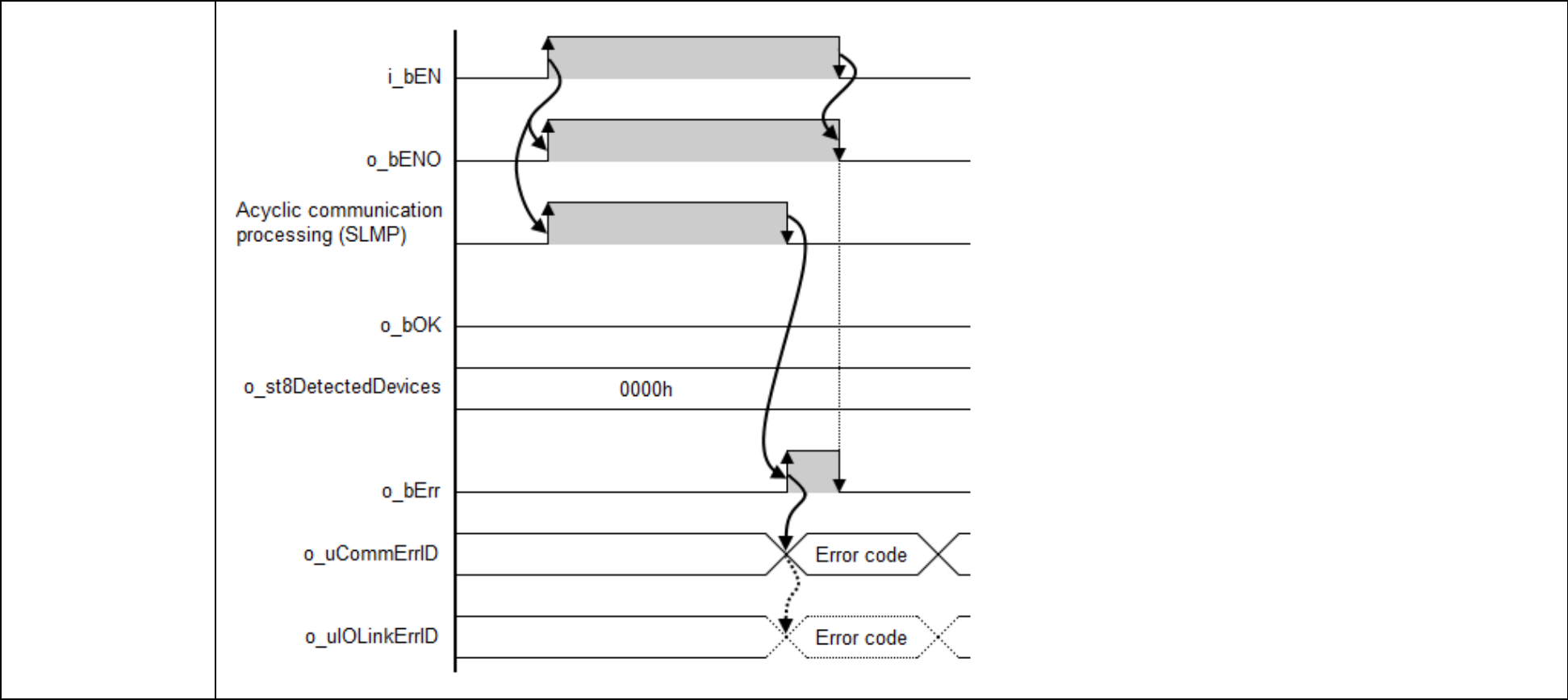
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Device detection start command	Bit	ON, OFF	ON: The IO-Link device detection command is enabled. OFF: The IO-Link device detection command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(4)	o_bENO	Device detection command output status	Bit	OFF	ON: The IO-Link device detection command control signal is active. OFF: The IO-Link device detection command control signal is inactive.
(5)	o_bDataLinkOk	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(6)	o_bOK	Command completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link device detection command is normally completed.
(7)	o_bErr	Command error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link device detection command execution.
(8)	o_uCommErrID	Communication error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(9)	o_uIOLinkErrID	IO Link Error ID	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution.

					For details of the error status, please refer to the <a href="#">Detail error check</a> .
(10)	o_st8DetectedDevices	Detected devices	<a href="#">stDeviceIdent</a> (0..7)	0000h	Stores the information corresponding to detected IO-Link devices connected on the IO-Link ports of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(11)	o_uNoOfDetectedDevices	Number of detected devices	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the number of detected devices.

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	629 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	This function block is used for detecting IO-Link devices connected to the ports of the Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	•	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<div>• When the operation is completed successfully</div> <div></div> <div>• When the operation is completed with an error</div>	



2. 5 P+Balluff\_ReadDataStorageContentCIB\_F

Name

P+Balluff\_ReadDataStorageContentCIB\_F

Overview

Item	Description
Function overview	Reads the data storage content from the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_ReadDataStorageContentCIB_F</div><div><div>(1) i_bEN</div><div>(2) i_udRemoteIPAddress</div><div>(3) i_uStationNumber</div><div>(4) i_uIOLEnkPortNo</div><div>o_bENO</div><div>o_bDataLinkOK</div><div>o_bOK</div><div>o_bErr</div><div>o_uCommErrID</div><div>o_uIOLEnkErrID</div><div>o_u1024DataStorage</div><div>(5)</div><div>(6)</div><div>(7)</div><div>(8)</div><div>(9)</div><div>(10)</div><div>(11)</div></div></div>

Labels

Input Labels

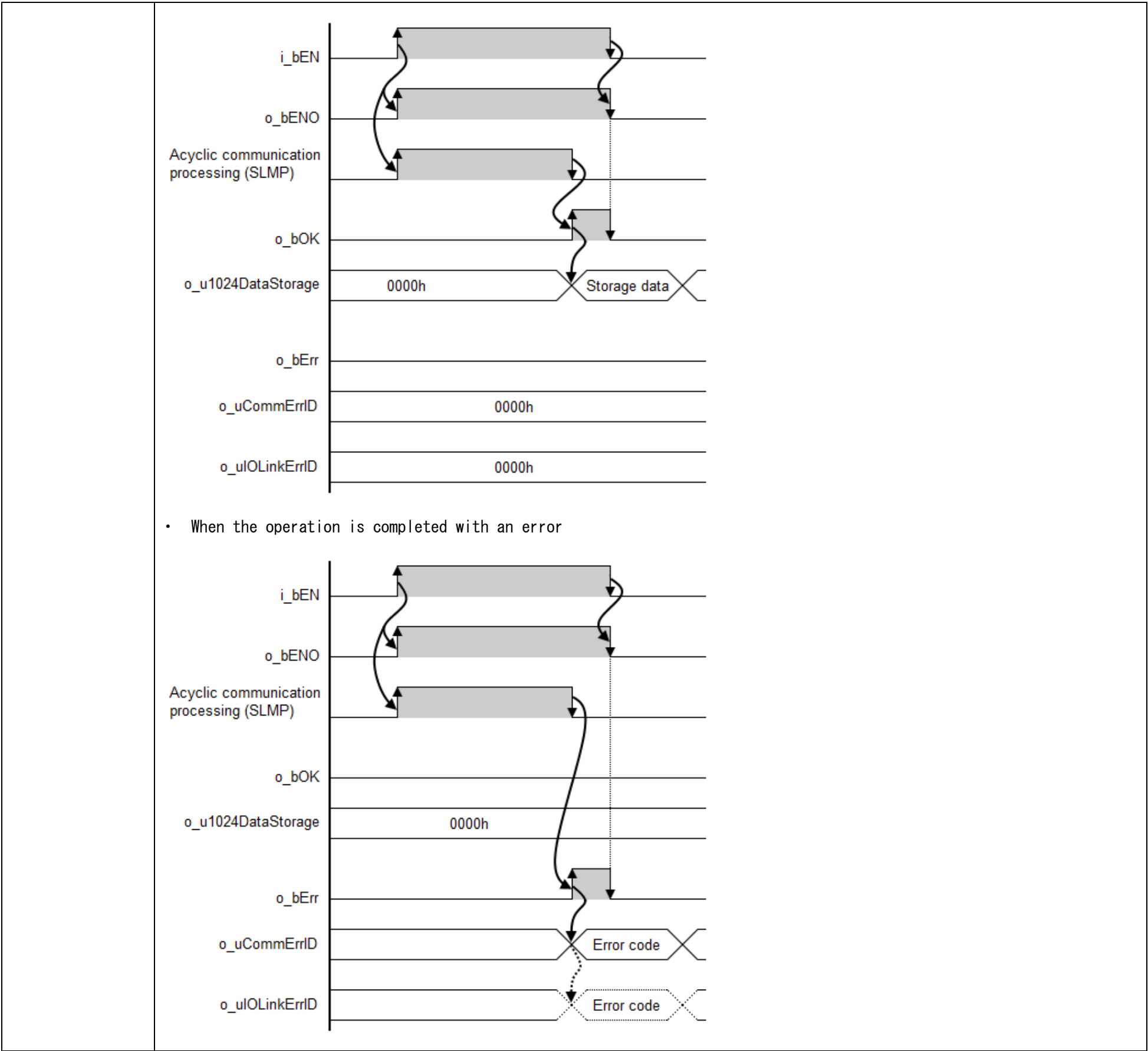
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read data storage content start command	Bit	ON, OFF	ON: The IO-Link port data storage content read command is enabled. OFF: The IO-Link port data storage content read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0Third octetFourth octet</div><div>+1First octetSecond octet</div></div></div>
(3)	i_uStationNumber	IO-Link Master station	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

		number			
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number for which the data storage content is read.

■ Output Labels

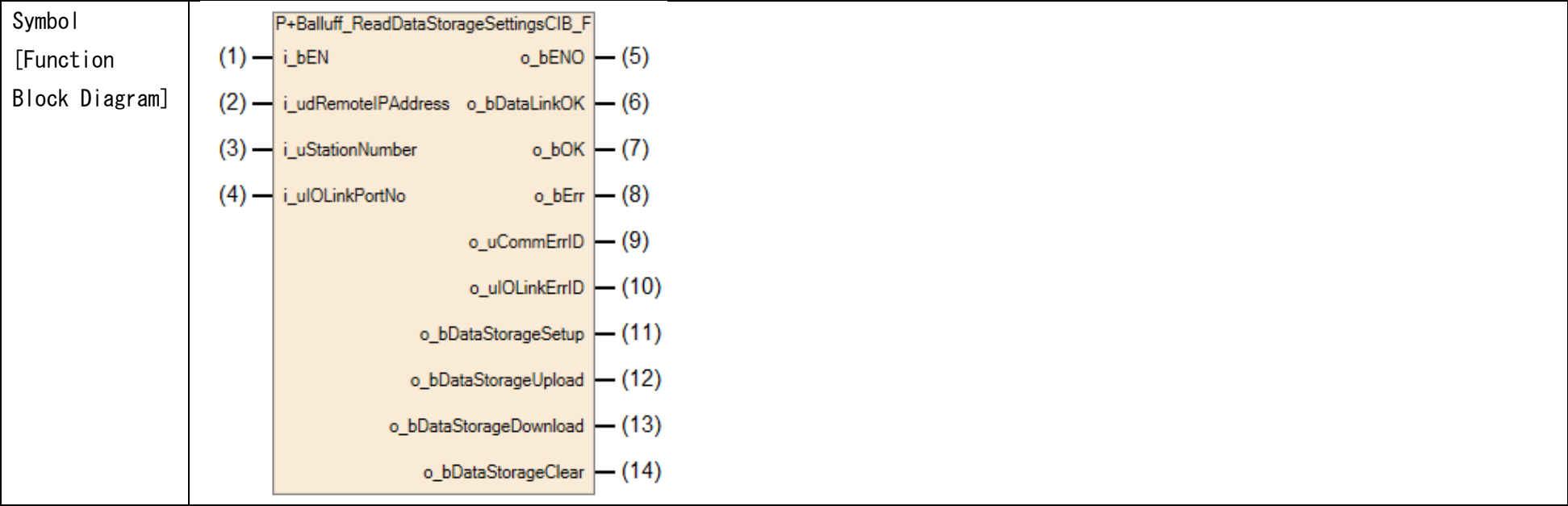
No.	Variable Name	Name	Data type	Default Value	Description
(5)	o_bENO	Read data storage content command output status	Bit	OFF	ON: The IO-Link port data storage content read command control signal is active. OFF: The IO-Link port data storage content read command control signal is inactive.
(6)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(7)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link port data storage content read command is normally completed.
(8)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link port data storage content read command execution.
(9)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(10)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(11)	o_u1024DataStorage	Data Storage	Word [Unsigned]/Bit String [16-bit] (0..1023)	–	Specify the memory area where the data storage content read from the selected IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master will be stored.  The actual data is always constructed in the same way: <ul style="list-style-type: none"> <li>Index LSB + Index MSB + Subindex + Length + Parameter (if present)</li> </ul>

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	766 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description	This function block is used for reading the data storage content from the specified IO-Link port of the Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	•	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	• When the operation is completed successfully	



## 2. 6 P+Balluff\_ReadDataStorageSettingsCIB\_F

Name	
P+Balluff_ReadDataStorageSettingsCIB_F	
Overview	
Item	Description
Function overview	Reads the data storage setting configuration for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.



Labels

■ Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read data storage settings start command	Bit	ON, OFF	ON: The IO-Link port data storage settings read command is enabled. OFF: The IO-Link port data storage settings read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octetFourth octet</div></div><div>+1<div>First octetSecond octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number for which the data storage settings are read.

■ Output Labels

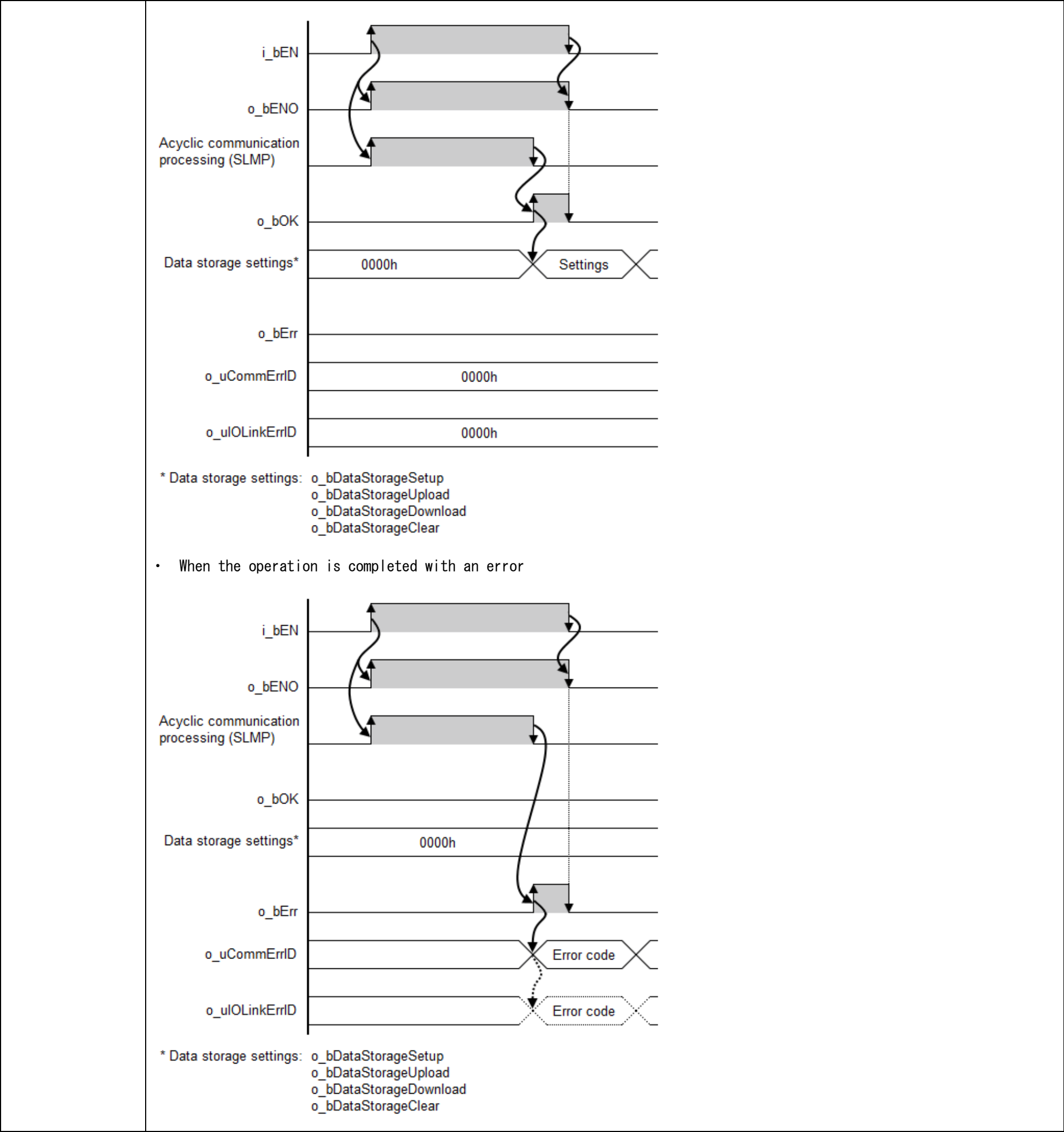
No.	Variable Name	Name	Data type	Default Value	Description
(5)	o_bENO	Read data storage settings command output status	Bit	OFF	ON: The IO-Link port data storage settings read command control signal is active. OFF: The IO-Link port data storage settings read command control signal is inactive.
(6)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(7)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link port data storage settings read command is normally completed.
(8)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link port data storage settings read command execution.
(9)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication.



					For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(10)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(11)	o_bDataStorageSetup	Data storage function status	Bit	OFF	Stores the data storage function status (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"> <li>OFF: Data storage function disabled</li> <li>ON: Data storage function enabled</li> </ul>
(12)	o_bDataStorageUpload	Data storage upload status	Bit	OFF	Stores the data storage upload status (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"> <li>OFF: Data storage upload disabled</li> <li>ON: Data storage upload enabled</li> </ul>
(13)	o_bDataStorageDownload	Data storage download status	Bit	OFF	Stores the data storage download status (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"> <li>OFF: Data storage download disabled</li> <li>ON: Data storage download enabled</li> </ul>
(14)	o_bDataStorageClear	Data storage clear status	Bit	OFF	Stores the data storage clear status (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"> <li>OFF: Data storage clear disabled</li> <li>ON: Data storage clear enabled</li> </ul>

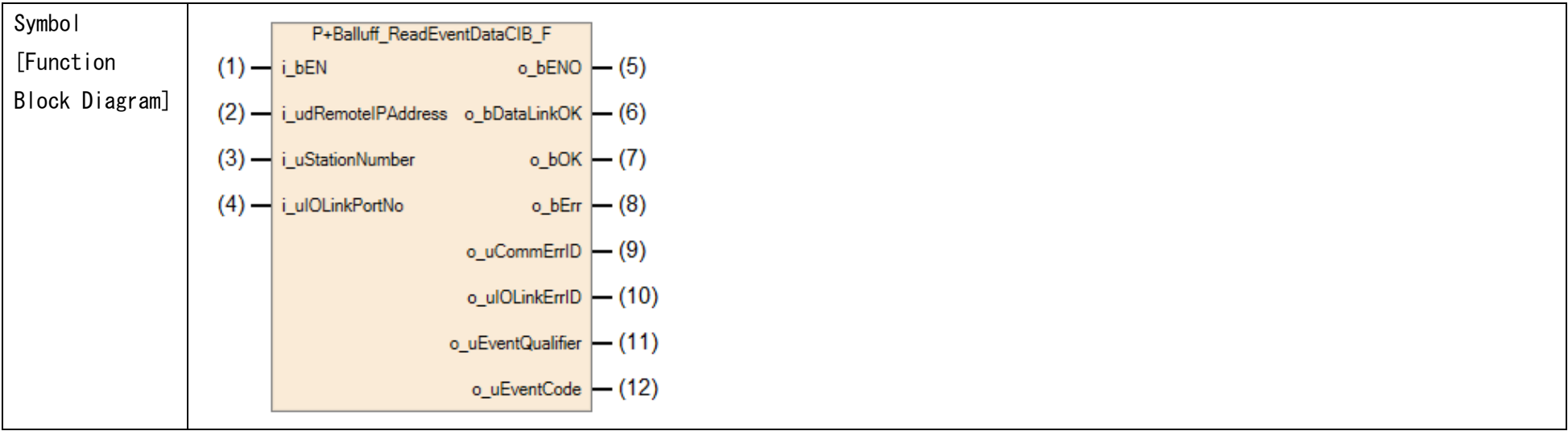
#### FB details

Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	570 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	This function block is used for reading the data storage setting configuration for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	<ul style="list-style-type: none"> <li></li> </ul>	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<ul style="list-style-type: none"> <li>When the operation is completed successfully</li> </ul>	



## 2.7 P+Balluff\_ReadEventDataCIB\_F

Name	
P+Balluff_ReadEventDataCIB_F	
Overview	
Item	Description
Function overview	Reads pending event data from the event buffer assigned to the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.



Labels

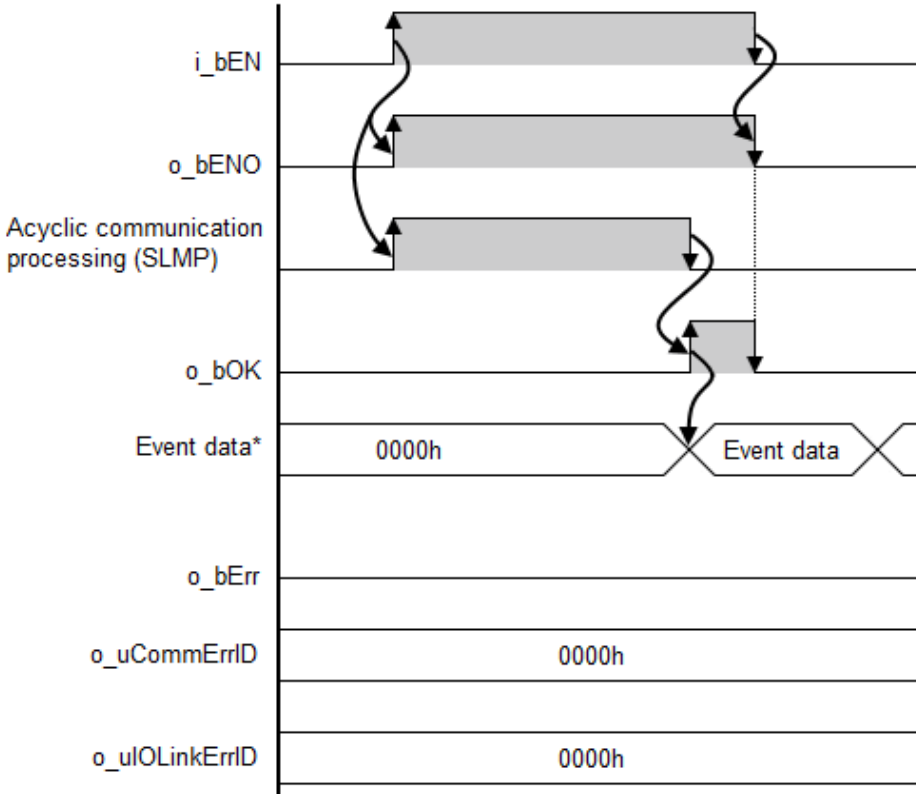
Input Labels

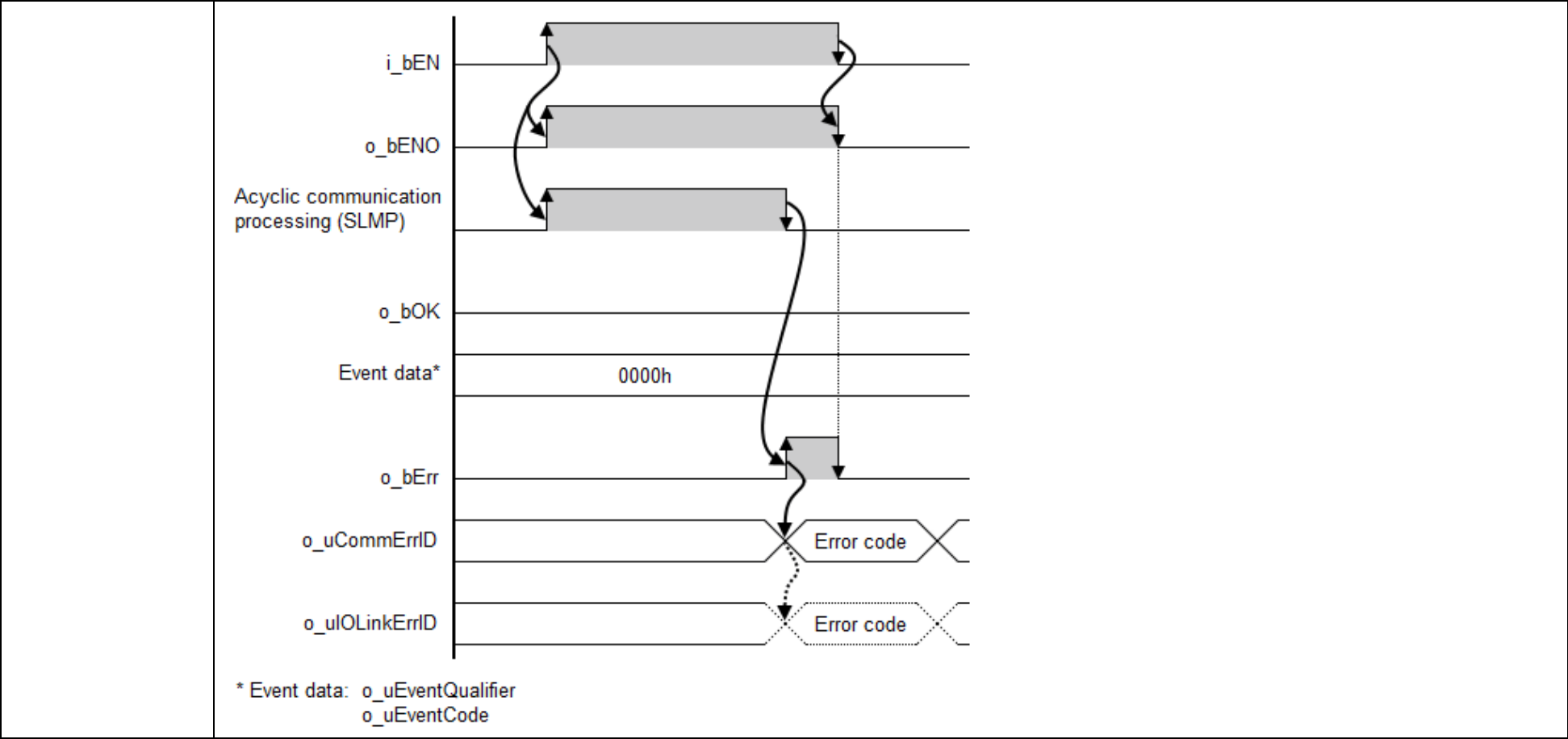
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read event data start command	Bit	ON, OFF	ON: The IO-Link port event data read command is enabled. OFF: The IO-Link port event data read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number for which the event data is read.

Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(5)	o_bENO	Read event data command output status	Bit	OFF	ON: The IO-Link port event data read command control signal is active. OFF: The IO-Link port event data read command control signal is inactive.
(6)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(7)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link port event data read command is normally completed.
(8)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link port event data read command execution.
(9)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .

(10)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(11)	o_uEventQualifier	Event qualifier	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the event qualifier code read for the specified IO-Link port.
(12)	o_uEventCode	Event code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the event data code read for the specified IO-Link port.

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U (C) /FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	600 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	<p>This function block is used for reading pending event data from the event buffer assigned to the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.</p> <p>The event data consists of two components, each stored in a data word:</p> <ul style="list-style-type: none"><li>• Event qualifier</li><li>• Event code.</li></ul> <p>The event qualifier and event code values range along with their corresponding description vary depending on the IO-Link module connected through the specified IO-Link port.</p> <p>A pending event is indicated by the &lt;o_uIOLinkPortEvents&gt; output label of the <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP1_F</a>, <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP2_F</a> or <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP3_F</a> function blocks. Once the event is read, if the corresponding's IO-Link port event buffer is clear, the IO-Link channel event status changes to 0.</p>	
Restrictions and precautions	<ul style="list-style-type: none"><li>•</li></ul>	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<ul style="list-style-type: none"><li>• When the operation is completed successfully</li></ul> <div></div> <p>* Event data: o_uEventQualifier o_uEventCode</p> <ul style="list-style-type: none"><li>• When the operation is completed with an error</li></ul>	



2.8 P+Balluff\_ReadIdentificationDataCIB\_F

Name

P+Balluff\_ReadIdentificationDataCIB\_F

Overview

Item	Description
Function overview	Reads the module identification data of the Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_ReadIdentificationDataCIB_F</div><div><div>(1) i_bEN</div><div>(2) i_udRemoteIPAddress</div><div>(3) i_uStationNumber</div></div><div><div>o_bENO (4)</div><div>o_bDataLinkOK (5)</div><div>o_bOK (6)</div><div>o_bErr (7)</div><div>o_uCommErrID (8)</div><div>o_ulOLinkErrID (9)</div><div>o_sManufacturerName (10)</div><div>o_sManufacturerText (11)</div><div>o_sProductName (12)</div><div>o_udProductID (13)</div><div>o_sProductText (14)</div></div></div>

Labels

Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read identification data start command	Bit	ON, OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master identification data read command is enabled. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master identification data read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word.

					<table><tr><td></td><td>b15</td><td>b8</td><td>b7</td><td>b0</td></tr><tr><td>+0</td><td colspan="2">Third octet</td><td colspan="2">Fourth octet</td></tr><tr><td>+1</td><td colspan="2">First octet</td><td colspan="2">Second octet</td></tr></table>		b15	b8	b7	b0	+0	Third octet		Fourth octet		+1	First octet		Second octet	
	b15	b8	b7	b0																
+0	Third octet		Fourth octet																	
+1	First octet		Second octet																	
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.															

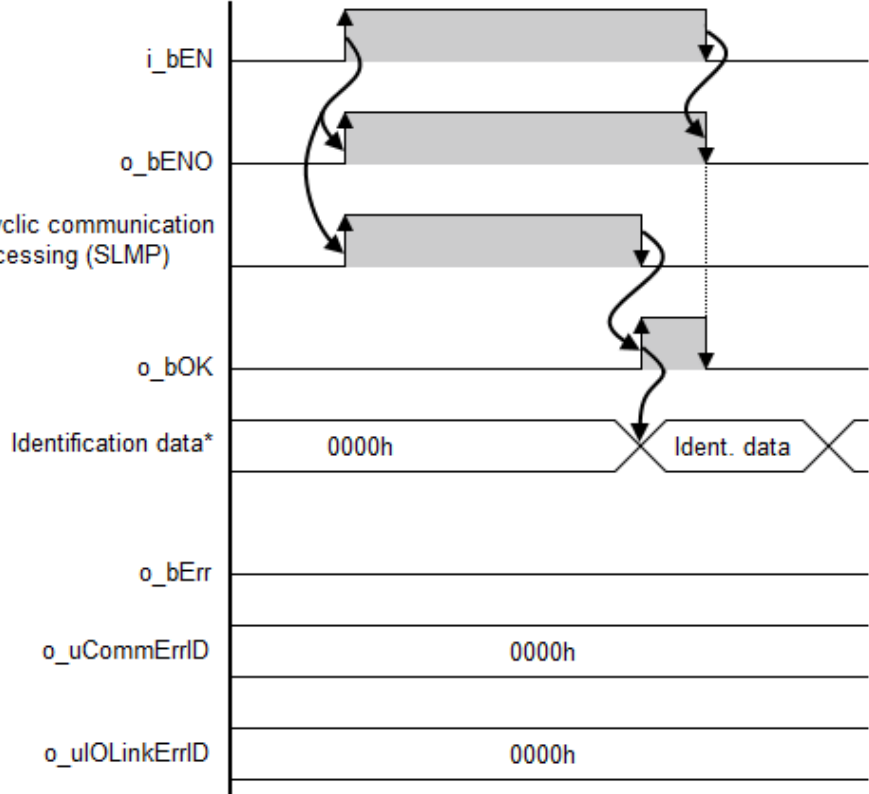
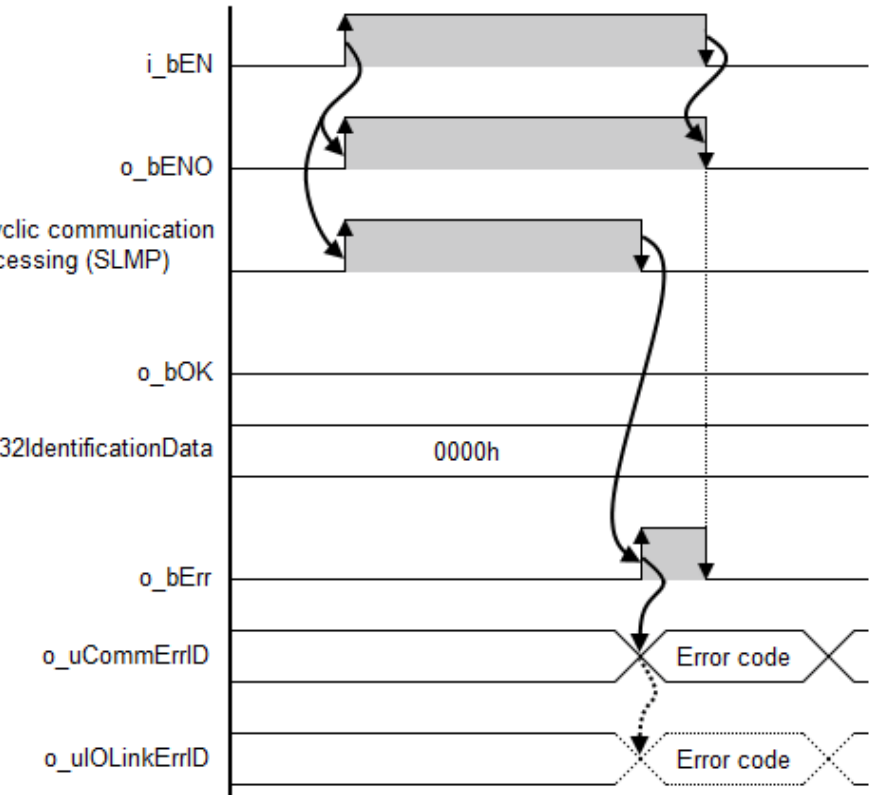
## ■ Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(4)	o_bENO	Read identification data command output status	Bit	OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master identification data read command control signal is active. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master identification data read command control signal is inactive.
(5)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(6)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master identification data read command is normally completed.
(7)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master identification data read command execution.
(8)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(9)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(10)	o_sManufacturerName	Manufacturer name	String (56)	–	Stores the manufacturer name for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(11)	o_sManufacturerText	Manufacturer text	String (56)	–	Stores the manufacturer text for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(12)	o_sProductName	Product name	String (56)	–	Stores the product name (website for example) for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(13)	o_udProductID	Product ID	Double Word [Unsigned]/Bit String [32-bit]	00000000h	Stores the product ID for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(14)	o_sProductText	Product text	String (56)	–	Stores the product text for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

## FB details

Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic	576 steps	



steps	The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .
Function description and operation	This function block is used for reading the module identification data of the Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Restrictions and precautions	•
FB compiling method	Macro
FB operation type	Real-time execution
Timing chart	<ul style="list-style-type: none"> <li>When the operation is completed successfully</li> </ul>  <p>* Identification data: o_sManufacturerName o_sManufacturerText o_sProductName o_udProductID o_sProductText</p> <ul style="list-style-type: none"> <li>When the operation is completed with an error</li> </ul>  <p>* Identification data: o_sManufacturerName o_sManufacturerText o_sProductName o_udProductID o_sProductText</p>

2. 9 P+Balluff\_ReadInitOperationSettingCIB\_F

Name	
P+Balluff_ReadInitOperationSettingCIB_F	
Overview	
Item	Description
Function overview	Reads the initial processing enable/disable setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_ReadInitOperationSettingCIB_F</div><div><div>(1) i_bEN</div><div>(2) i_udRemoteIPAddress</div><div>(3) i_uStationNumber</div><div>o_bENO</div><div>o_bDataLinkOK</div><div>o_bOK</div><div>o_bErr</div><div>o_uCommErrID</div><div>o_ulOLinkErrID</div><div>o_bInitOperationSetting</div><div>(4)</div><div>(5)</div><div>(6)</div><div>(7)</div><div>(8)</div><div>(9)</div><div>(10)</div></div></div>

Labels

Input Labels

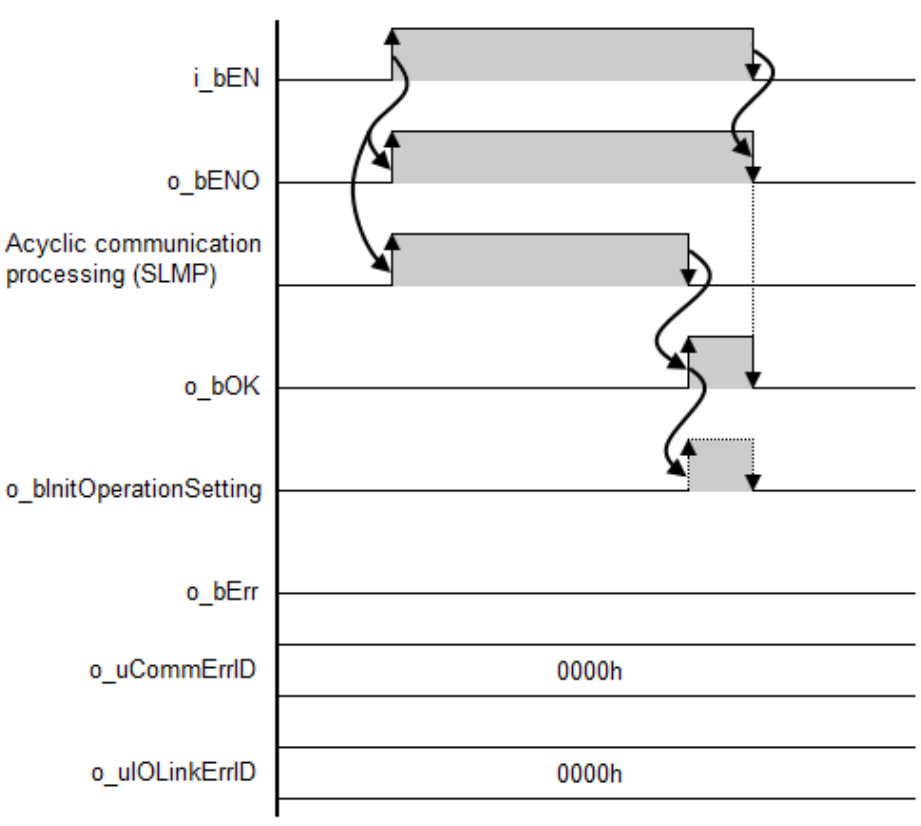
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read initial operation setting start command	Bit	ON, OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting read command is enabled. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

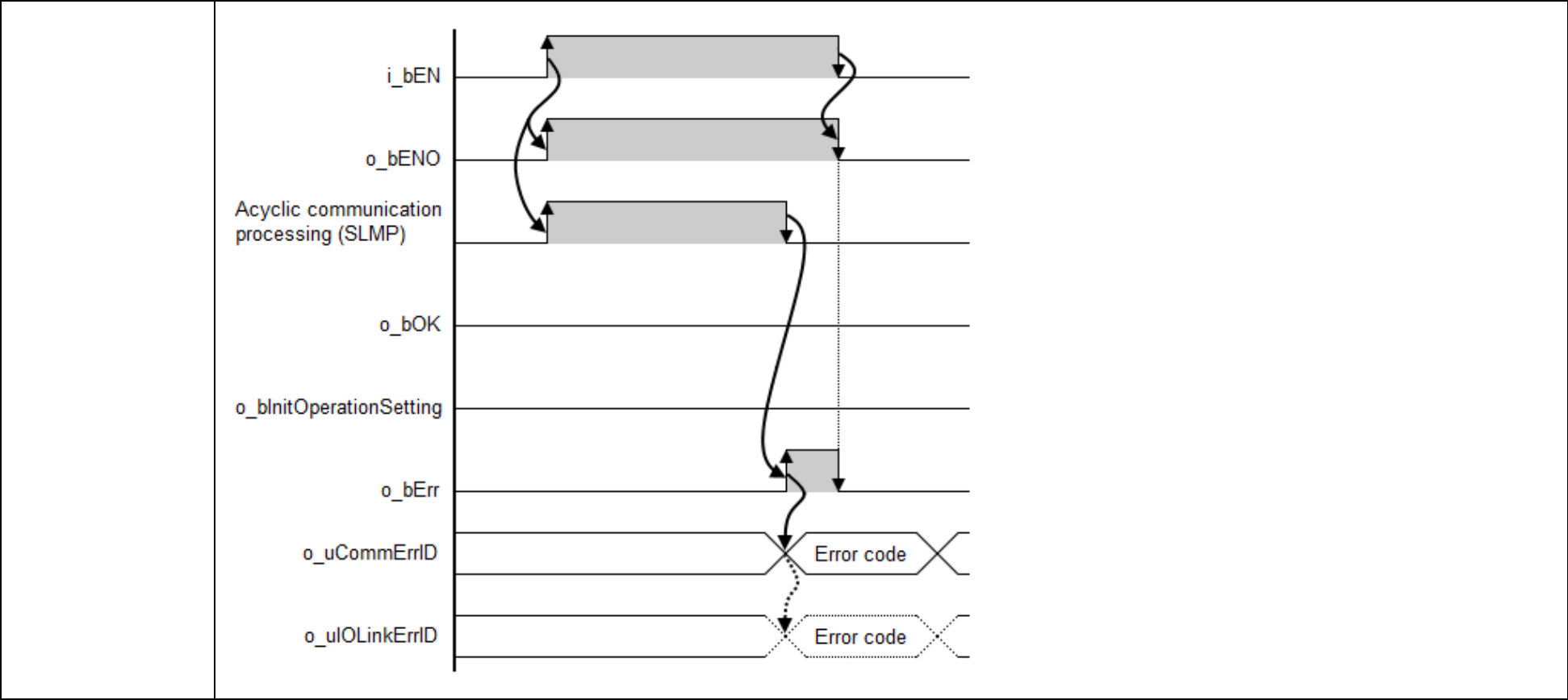
Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(4)	o_bENO	Read initial operation setting command output status	Bit	OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting read command control signal is active. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting read command control signal is inactive.
(5)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(6)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting read command is normally completed.
(7)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error

					has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting read command execution.
(8)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(9)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(10)	o_bInitOperationSetting	Initial operation status	Bit	OFF	Stores the requested initial operation setting status for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"> <li>ON: No Initial processing request flag necessary. After booting up the device goes to "Ready" mode. The ports are configured as inputs.</li> <li>OFF: The device can only be brought to "Ready" mode by means of the "Initial processing request flag".</li> </ul>

## FB details

Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	551 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	This function block is used for reading the initial processing enable/disable setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	<ul style="list-style-type: none"> <li></li> </ul>	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<ul style="list-style-type: none"> <li>When the operation is completed successfully</li> </ul>  <ul style="list-style-type: none"> <li>When the operation is completed with an error</li> </ul>	



2. 10 P+Balluff\_ReadISDUDataCIB\_F

Name

P+Balluff\_ReadISDUDataCIB\_F

Overview

Item	Description
Function overview	Reads the IO-Link parameter data for a specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_ReadISDUDataCIB_F</div><div><div>(1) i_bEN</div><div>(2) i_udRemoteIPAddress</div><div>(3) i_uStationNumber</div><div>(4) i_uLOLinkPortNo</div><div>(5) i_uIndex</div><div>(6) i_uSubIndex</div><div>o_bENO</div><div>o_bDataLinkOK</div><div>o_bOK</div><div>o_bErr</div><div>o_uCommErrID</div><div>o_uLOLinkErrID</div><div>o_uISDURReadErrID</div><div>o_uISDURReadData</div><div>o_uISDUDataLength</div><div>(7)</div><div>(8)</div><div>(9)</div><div>(10)</div><div>(11)</div><div>(12)</div><div>(13)</div><div>(14)</div><div>(15)</div></div></div>

Labels

Input Labels

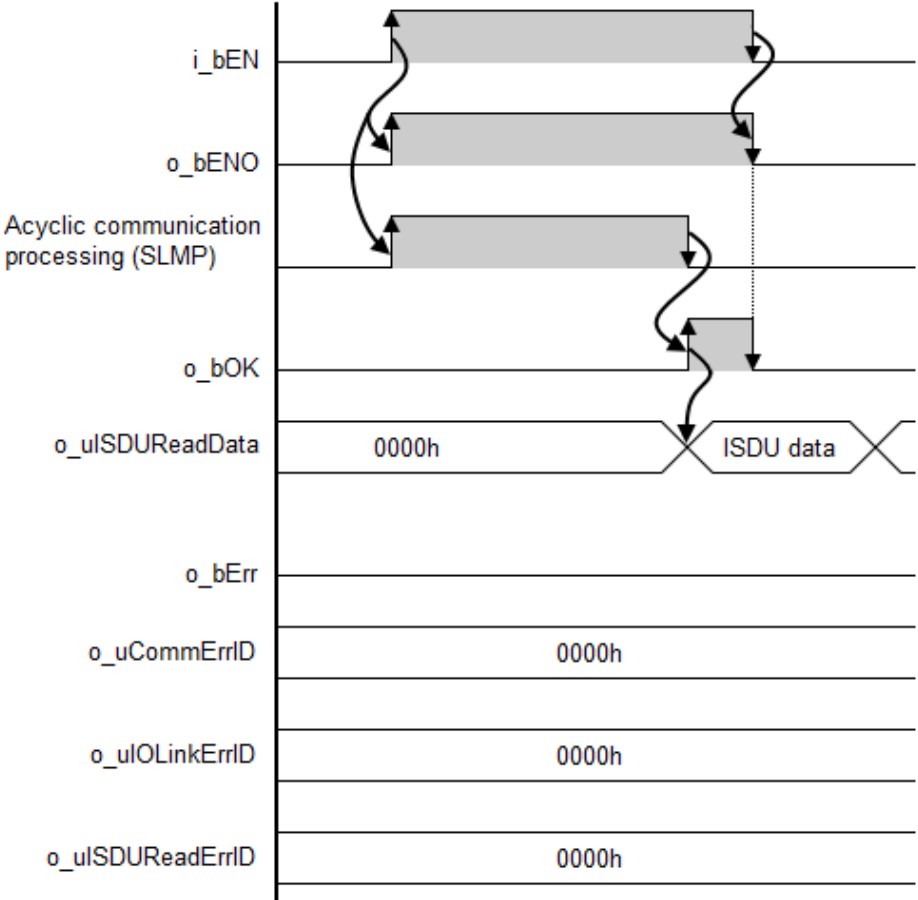
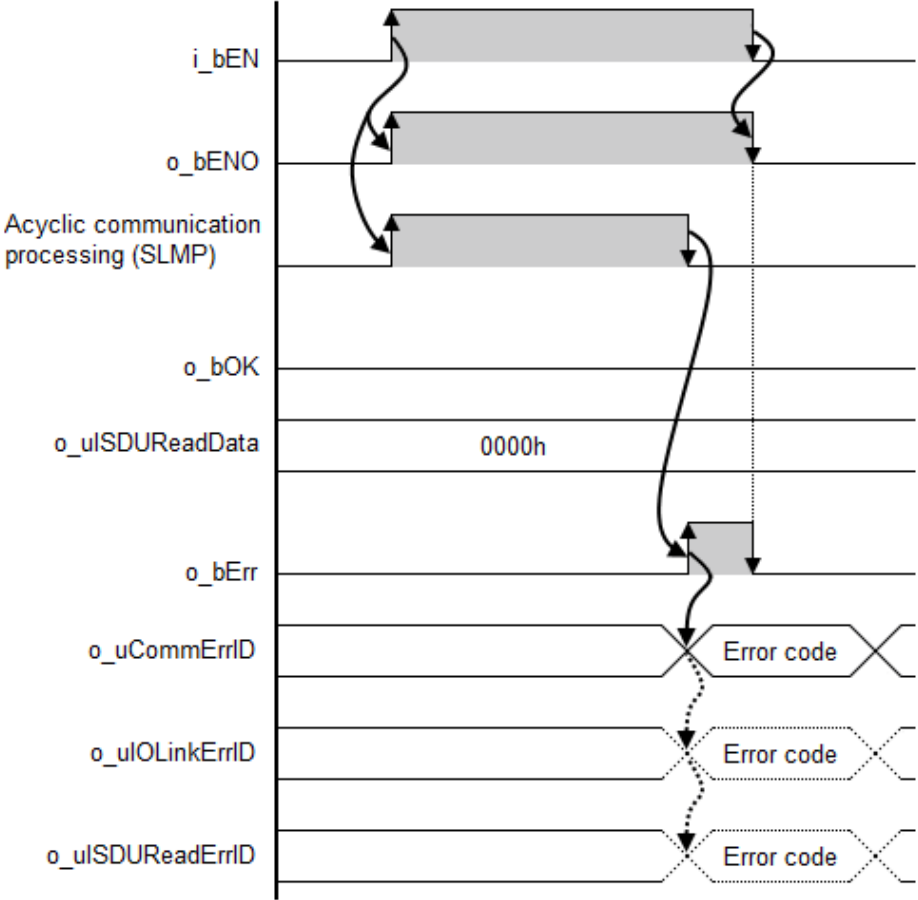
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read ISDU data start command	Bit	ON, OFF	ON: The IO-Link port parameter data read command is enabled. OFF: The IO-Link port parameter data read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

		number			
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number from which the parameter data is read.
(5)	i_uIndex	Index	Word [Unsigned]/Bit String [16-bit]	0 to 65535	Specify the index (start) address of the IO-Link parameter object from which data will be read using a BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master Read Device Parameter/ISDU request.
(6)	i_uSubIndex	Subindex	Word [Unsigned]/Bit String [16-bit]	0 to 255	Specify the subindex (offset) address of the IO-Link parameter object data element to be read using a BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master Read Device Parameter/ISDU request.

■ Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(7)	o_bENO	Read ISDU data command output status	Bit	OFF	ON: The IO-Link port parameter data read command control signal is active. OFF: The IO-Link port parameter data read command control signal is inactive.
(8)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(9)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ISDU data read command is normally completed.
(10)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master ISDU data read command execution.
(11)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(12)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(13)	o_uISDUDataReadErrID	ISDU Error ID	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the ISDU request data read error code.
(14)	o_uISDUDataRead	IO-Link parameter data	Word [Unsigned]/Bit String [16-bit]	OFF	Specify the head address of the memory area storing the IO-Link parameter data read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master using a Read Device Parameter/ISDU request.
(15)	o_uISDUDataLength	Data length	Word [Unsigned]/Bit String [16-bit]	0 to 232	Stores the length of the IO-Link parameter data read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master in BYTE units.

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	625 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description and operation	This function block is used for reading the IO-Link parameter data for a specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	

	<ul style="list-style-type: none"><li>To perform IO-Link parameter data read, the function block sends a Read Device Parameters/ISDU(Index Service Data Unit) request to the gateway.</li><li>An IO-Link parameter data object is addressed in an ISDU request through an <b>Index</b> and a <b>SubIndex</b> (if the parameter data object contains multiple data elements).</li></ul>
Restrictions and precautions	<ul style="list-style-type: none"><li></li></ul>
FB compiling method	Macro
FB operation type	Real-time execution
Timing chart	<ul style="list-style-type: none"><li>When the operation is completed successfully</li></ul>  <p>The timing chart for a successful operation shows the following sequence of events: 1. i_bEN (input enable) is activated. 2. o_bENO (output enable) is activated. 3. Acyclic communication processing (SLMP) begins. 4. o_bOK (output OK) is activated. 5. o_uISDUReadData (output ISDU read data) is updated with 0000h and then ISDU data. 6. o_bErr (output error) remains inactive. 7. o_uCommErrID (output communication error ID) remains at 0000h. 8. o_uIOLinkErrID (output IO-Link error ID) remains at 0000h. 9. o_uISDUReadErrID (output ISDU read error ID) remains at 0000h.</p> <ul style="list-style-type: none"><li>When the operation is completed with an error</li></ul>  <p>The timing chart for an error operation shows the following sequence of events: 1. i_bEN (input enable) is activated. 2. o_bENO (output enable) is activated. 3. Acyclic communication processing (SLMP) begins. 4. o_bOK (output OK) remains inactive. 5. o_uISDUReadData (output ISDU read data) is updated with 0000h. 6. o_bErr (output error) is activated. 7. o_uCommErrID (output communication error ID) is updated with an error code. 8. o_uIOLinkErrID (output IO-Link error ID) is updated with an error code. 9. o_uISDUReadErrID (output ISDU read error ID) is updated with an error code.</p>



2. 11 P+Balluff\_ReadOutputHoldSettingCIB\_F

Name	
P+Balluff_ReadOutputHoldSettingCIB_F	
Overview	
Item	Description
Function overview	Reads the outputs hold/clear setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_ReadOutputHoldSettingCIB_F</div><div><div>(1) — i_bEN</div><div>(2) — i_udRemoteIPAddress</div><div>(3) — i_uStationNumber</div><div>o_bENO — (4)</div><div>o_bDataLinkOK — (5)</div><div>o_bOK — (6)</div><div>o_bErr — (7)</div><div>o_uCommErrID — (8)</div><div>o_ulOLinkErrID — (9)</div><div>o_bHoldClear — (10)</div></div></div>

Labels

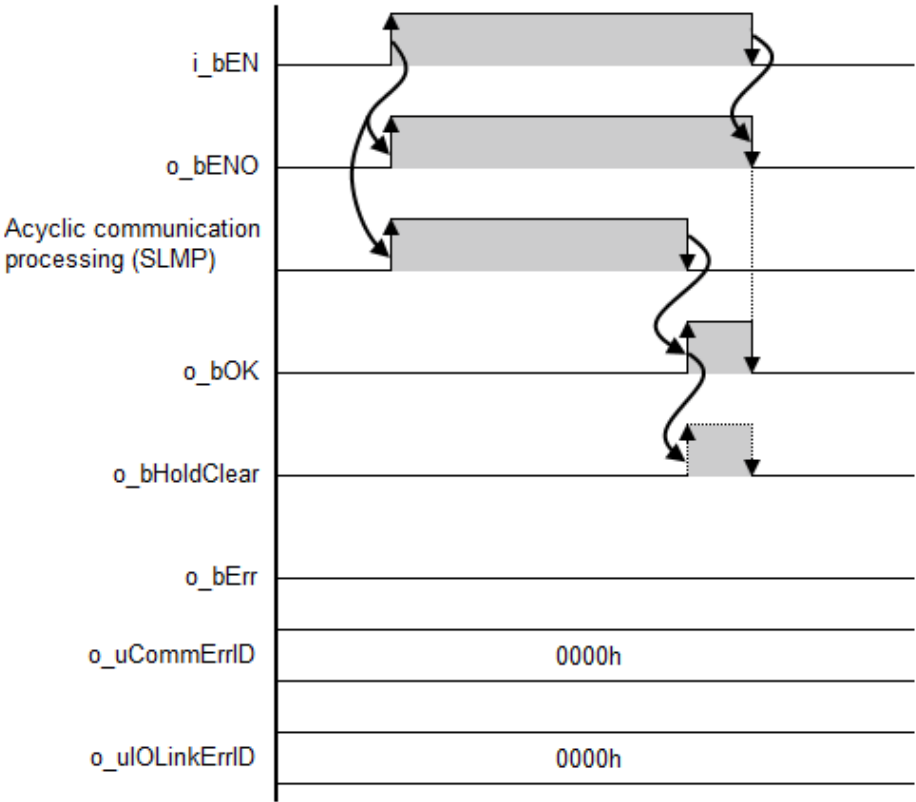
■ Input Labels

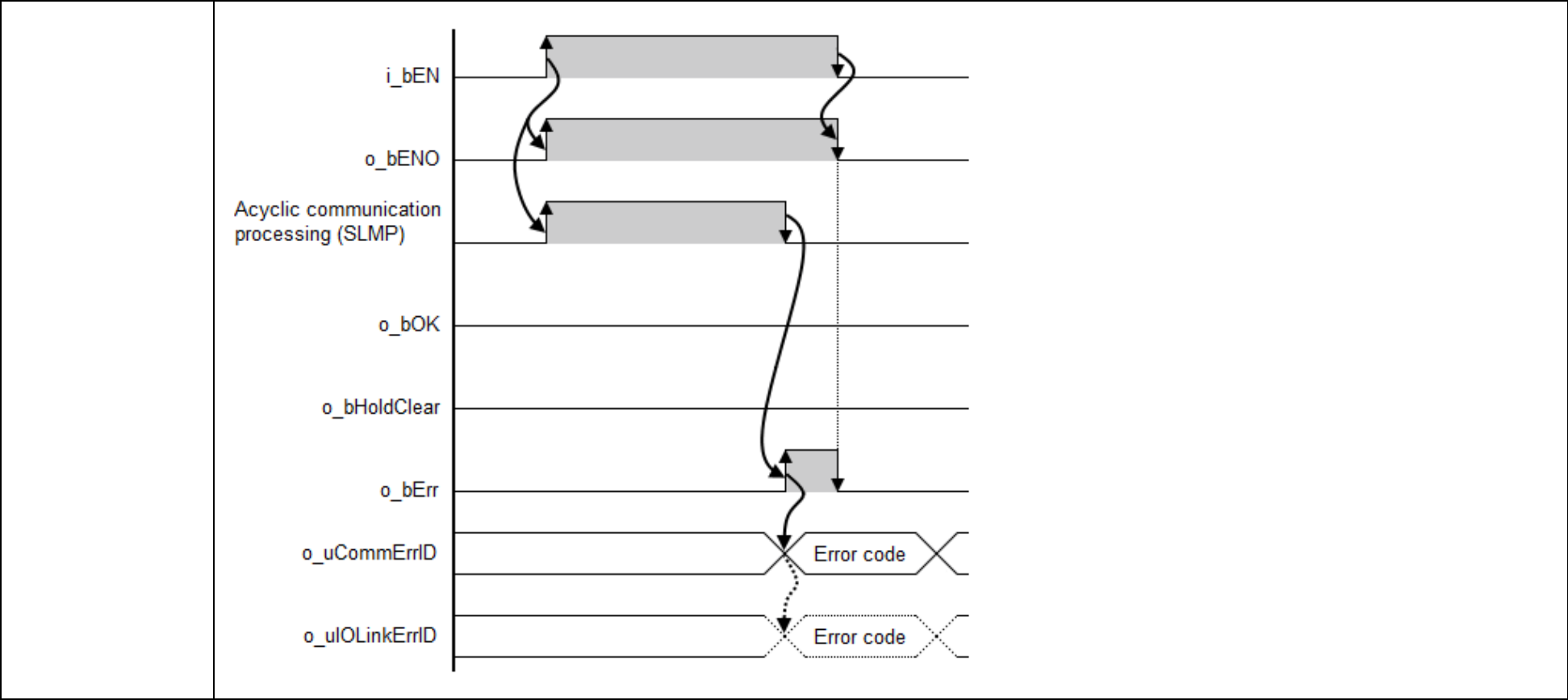
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read output hold/clear settings start command	Bit	ON, OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting read command is enabled. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

■ Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(4)	o_bENO	Read output hold/clear settings command output status	Bit	OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting read command control signal is active. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting read command control signal is inactive.
(5)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(6)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the outputs hold/clear setting read command is normally completed.

(7)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the outputs hold/clear setting read command execution.
(8)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(9)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(10)	o_bHoldClear	Output hold/clear status	Bit	OFF	Stores the requested outputs hold/clear setting for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"> <li>ON: The last state of the outputs is held when the module is disconnected from the fieldbus network or the CPU is in the STOP state.</li> <li>OFF: The outputs are reset when the named events occur.</li> </ul>

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	551 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description	This function block is used for reading the outputs hold/clear setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	<ul style="list-style-type: none"> <li></li> </ul>	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<ul style="list-style-type: none"> <li>When the operation is completed successfully</li> </ul>  <ul style="list-style-type: none"> <li>When the operation is completed with an error</li> </ul>	



2. 12 P+Balluff\_ReadValidationDataCIB\_F

Name

P+Balluff\_ReadValidationDataCIB\_F

Overview

Item	Description
Function overview	Reads the IO-Link device validation configuration and data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_ReadValidationDataCIB_F</div><div><div>(1) i_bEN</div><div>(2) i_udRemoteIPAddress</div><div>(3) i_uStationNumber</div><div>(4) i_uLOLinkPortNo</div><div>o_bENO</div><div>o_bDataLinkOK</div><div>o_bOK</div><div>o_bErr</div><div>o_uCommErrID</div><div>o_uLOLinkErrID</div><div>o_uValidationType</div><div>o_u2VendorID</div><div>o_u3DeviceID</div><div>o_u16SerialNumber</div></div><div><div>(5)</div><div>(6)</div><div>(7)</div><div>(8)</div><div>(9)</div><div>(10)</div><div>(11)</div><div>(12)</div><div>(13)</div><div>(14)</div></div></div>

Labels

Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Read validation data start command	Bit	ON, OFF	ON: The IO-Link port device validation data read command is enabled. OFF: The IO-Link port device validation data read command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word.

					<table><tr><td></td><td>b15</td><td>b8</td><td>b7</td><td>b0</td></tr><tr><td>+0</td><td colspan="2">Third octet</td><td colspan="2">Fourth octet</td></tr><tr><td>+1</td><td colspan="2">First octet</td><td colspan="2">Second octet</td></tr></table>		b15	b8	b7	b0	+0	Third octet		Fourth octet		+1	First octet		Second octet	
	b15	b8	b7	b0																
+0	Third octet		Fourth octet																	
+1	First octet		Second octet																	
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.															
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number from which the device validation is read.															

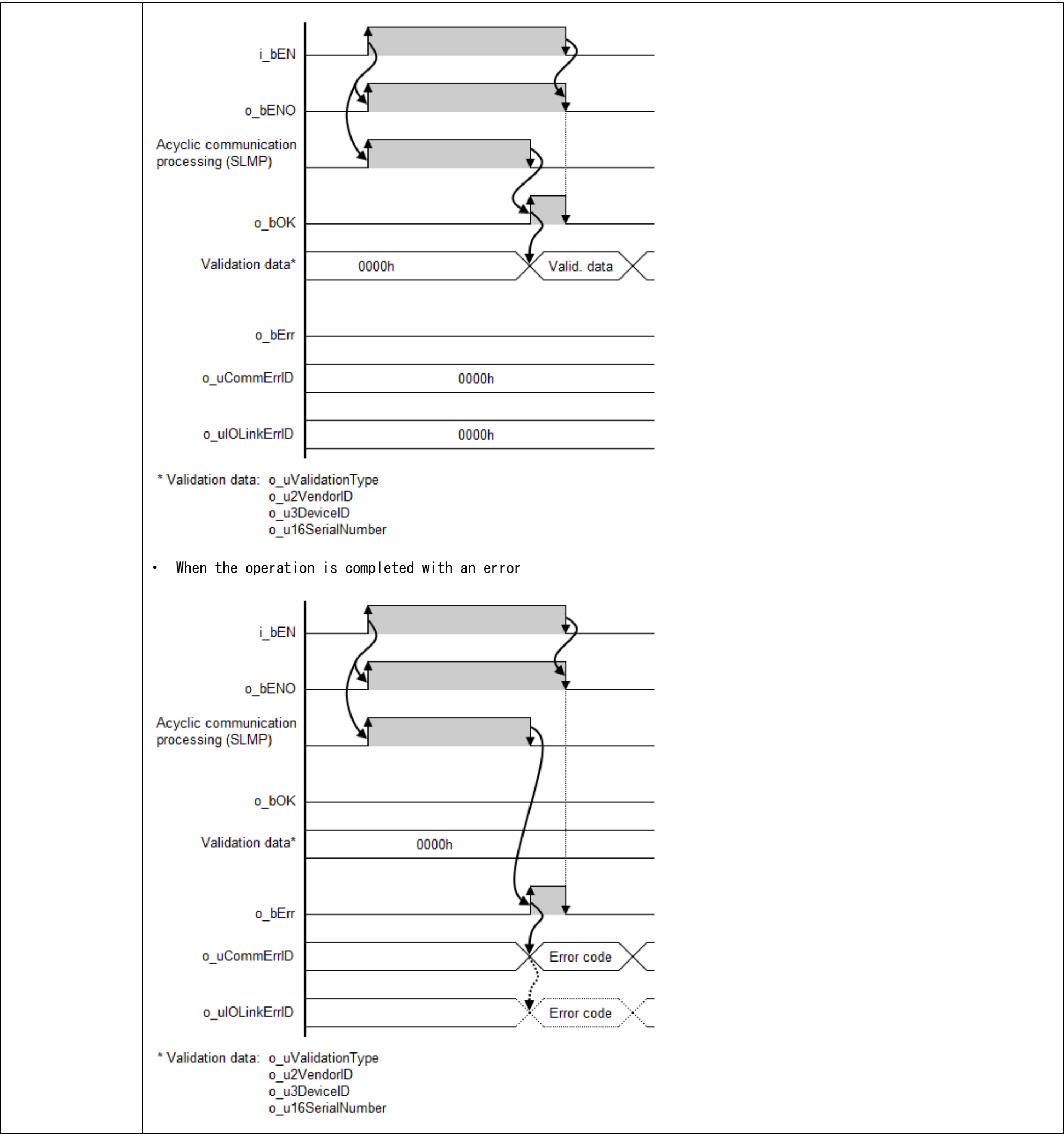
■ Output Labels

No.	Variable Name	Name	Data type	Default Value	Description											
(5)	o_bENO	Read validation data command output status	Bit	OFF	ON: The IO-Link port device validation data read command control signal is active. OFF: The IO-Link port device validation data read command control signal is inactive.											
(6)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.											
(7)	o_bOK	Read completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link port device validation data read command is normally completed.											
(8)	o_bErr	Read error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link port device validation data read command execution.											
(9)	o_uCommErrID	Read error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .											
(10)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .											
(11)	o_uValidationType	Validation type	Word [Unsigned]/Bit String [16-bit]	00h to 02h	Stores the current configuration of the IO-Link device validation for the selected IO-Link compatible port read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Depending on the configuration of the IO-Link device validation, the connected device's information is verified and the result is indicated by the corresponding port valid bit (see the <o_uIOLinkValidPorts> output label of the <a href="#">P+BalIuff_CCLinkIEFieldBasicIOLinkP1_F</a> , <a href="#">P+BalIuff_CCLinkIEFieldBasicIOLinkP2_F</a> and <a href="#">P+BalIuff_CCLinkIEFieldBasicIOLinkP3_F</a> IO-Link Master control function blocks).											
					<table><tr><th>ValidationType (hex)</th><th>Description</th></tr><tr><td>0x00</td><td>Unused</td></tr><tr><td>0x01</td><td>Manufacturer name</td></tr><tr><td>0x02</td><td>Manufacturer text</td></tr></table>	ValidationType (hex)	Description	0x00	Unused	0x01	Manufacturer name	0x02	Manufacturer text			
ValidationType (hex)	Description															
0x00	Unused															
0x01	Manufacturer name															
0x02	Manufacturer text															
(12)	o_u2VendorID	Vendor ID	Word [Unsigned]/Bit String [16-bit] (0..1)	–	Stores the current IO-Link device validation Vendor ID read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.											
					<table><tr><th rowspan="2">Array index</th><th colspan="2">VendorID array data word</th></tr><tr><th>Most Significant Byte</th><th>Least Significant Byte</th></tr><tr><td>0</td><td>- Unused -</td><td>Vendor ID 1 (MSB)</td></tr><tr><td>1</td><td>- Unused -</td><td>Vendor ID 2 (LSB)</td></tr></table>	Array index	VendorID array data word		Most Significant Byte	Least Significant Byte	0	- Unused -	Vendor ID 1 (MSB)	1	- Unused -	Vendor ID 2 (LSB)
Array index	VendorID array data word															
	Most Significant Byte	Least Significant Byte														
0	- Unused -	Vendor ID 1 (MSB)														
1	- Unused -	Vendor ID 2 (LSB)														
(13)	o_u3DeviceID	Device ID	Word	–	Stores the current IO-Link device validation Device ID read from the											

			[Unsigned]/Bit String [16-bit] (0..2)		BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <table><tr><th rowspan="2">Array index</th><th colspan="2">DeviceID array data word</th></tr><tr><th>Most Significant Byte</th><th>Least Significant Byte</th></tr><tr><td>0</td><td>- Unused -</td><td>Device ID 1 (MSB)</td></tr><tr><td>1</td><td>- Unused -</td><td>Device ID 2</td></tr><tr><td>2</td><td>- Unused -</td><td>Device ID 3 (LSB)</td></tr></table>	Array index	DeviceID array data word		Most Significant Byte	Least Significant Byte	0	- Unused -	Device ID 1 (MSB)	1	- Unused -	Device ID 2	2	- Unused -	Device ID 3 (LSB)						
Array index	DeviceID array data word																								
	Most Significant Byte	Least Significant Byte																							
0	- Unused -	Device ID 1 (MSB)																							
1	- Unused -	Device ID 2																							
2	- Unused -	Device ID 3 (LSB)																							
(14)	o_u16SerialNumber	Serial number	Word [Unsigned]/Bit String [16-bit] (0..15)	-	Stores the current IO-Link device validation Serial Number read from the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <table><tr><th rowspan="2">Array index</th><th colspan="2">DeviceID array data word</th></tr><tr><th>Most Significant Byte</th><th>Least Significant Byte</th></tr><tr><td>0</td><td>- Unused -</td><td>Serial No. 1 (MSB)</td></tr><tr><td>1</td><td>- Unused -</td><td>Serial No. 2</td></tr><tr><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td></tr><tr><td>15</td><td>- Unused -</td><td>Serial No. 16 (LSB)</td></tr></table>	Array index	DeviceID array data word		Most Significant Byte	Least Significant Byte	0	- Unused -	Serial No. 1 (MSB)	1	- Unused -	Serial No. 2	.	.	.	.	.	.	15	- Unused -	Serial No. 16 (LSB)
Array index	DeviceID array data word																								
	Most Significant Byte	Least Significant Byte																							
0	- Unused -	Serial No. 1 (MSB)																							
1	- Unused -	Serial No. 2																							
.	.	.																							
.	.	.																							
15	- Unused -	Serial No. 16 (LSB)																							

#### FB details

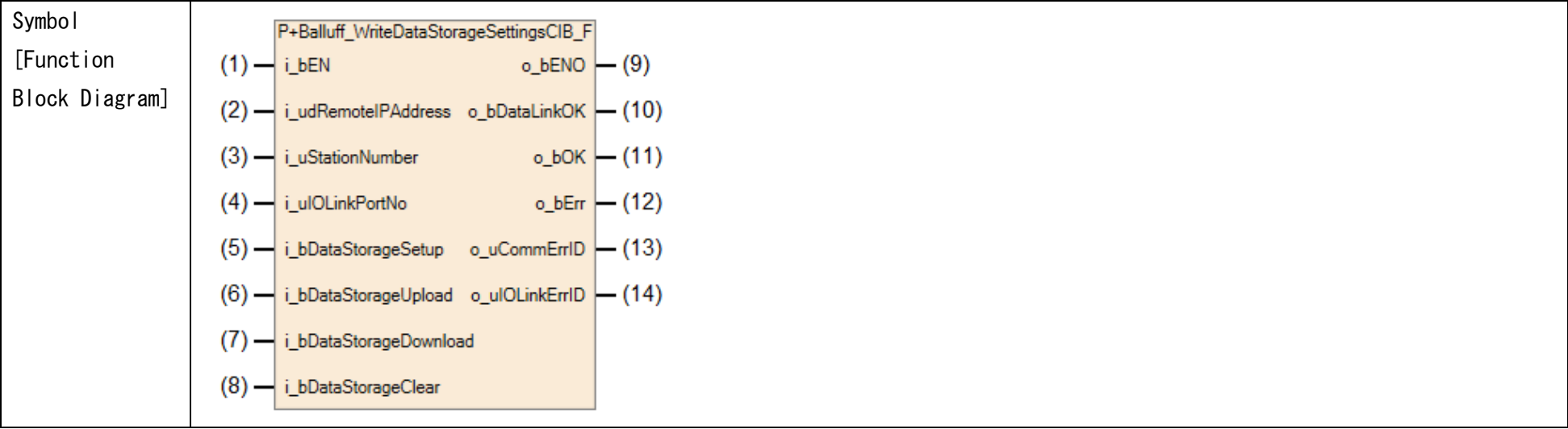
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	579 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description	<p>This function block is used for reading the IO-Link device validation configuration and data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.</p> <p>The IO-Link device validation configuration specifies whether validation is activated and if so, what IO-Link device parameters are verified.</p> <p>Validation data specifies the three types of IO-Link device parameters for which validation is performed:</p> <ul style="list-style-type: none"> <li>• Vendor ID</li> <li>• Device ID</li> <li>• Serial Number.</li> </ul> <p><b>NOTE:</b> If validation is performed, the connected IO-Link device's information is verified and the result is indicated by a port valid bit (see the &lt;o_uIOLinkValidPorts&gt; output label of the <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP1_F</a>, <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP2_F</a> and <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP3_F</a> IO-Link Master control function blocks).</p>	
Restrictions and precautions	•	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	• When the operation is completed successfully	



## 2. 13 P+Balluff\_WriteDataStorageSettingsCIB\_F

Name	
P+Balluff_WriteDataStorageSettingsCIB_F	
Overview	
Item	Description
Function overview	Writes the data storage configuration for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.





Labels

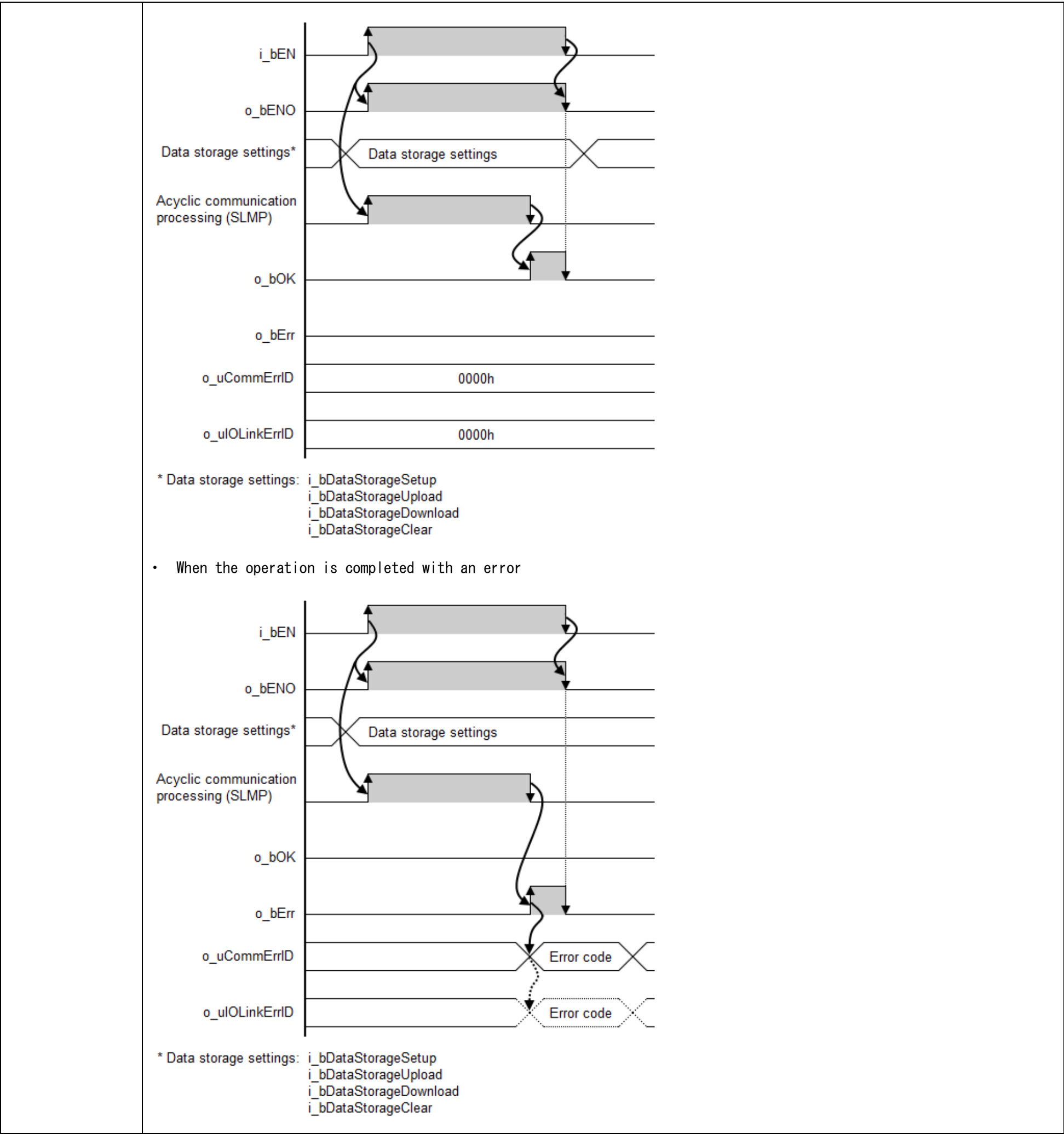
■ Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Write data storage config start command	Bit	ON, OFF	ON: The IO-Link ports data storage function configuration write command is enabled. OFF: The IO-Link ports data storage function configuration write command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number from which the device validation is read.
(5)	i_bDataStorageSetup	Data storage function setting	Bit	0000h to FFFFh	Specify the data storage function setting (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"><li>OFF: Data storage function disabled</li><li>ON: Data storage function enabled</li></ul>
(6)	i_bDataStorageUpload	Data storage upload setting	Bit	ON, OFF	Specify the data storage upload setting (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"><li>OFF: Data storage upload disabled</li><li>ON: Data storage upload enabled</li></ul>
(7)	i_bDataStorageDownload	Data storage download setting	Bit	ON, OFF	Specify the data storage download setting (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"><li>OFF: Data storage download disabled</li><li>ON: Data storage download enabled</li></ul>
(8)	i_bDataStorageClear	Data storage clear setting	Bit	ON, OFF	Specify the data storage clear setting (enabled or disabled) for the specified IO-Link port of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"><li>OFF: Data storage clear disabled</li><li>ON: Data storage clear enabled</li></ul>

■ Output Labels

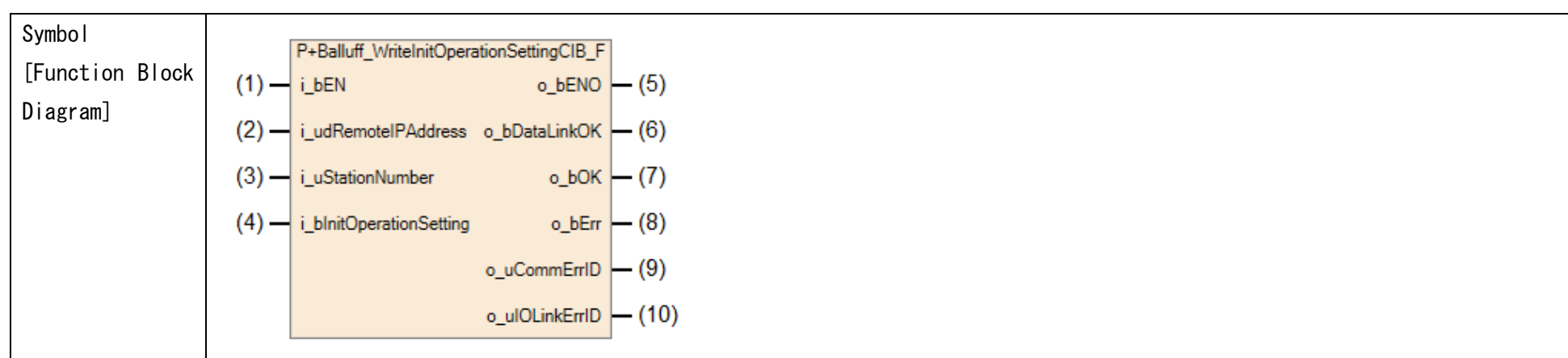
No.	Variable Name	Name	Data type	Default Value	Description
(9)	o_bENO	Write data storage config command output status	Bit	OFF	ON: The IO-Link ports data storage function configuration write command control signal is active. OFF: The IO-Link ports data storage function configuration write command control signal is inactive.
(10)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(11)	o_bOK	Write completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link ports data storage function configuration write command is normally completed.
(12)	o_bErr	Write error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link ports data storage function configuration write command execution.
(13)	o_uCommErrID	Write error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(14)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	709 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description	This function block is used for writing the data storage configuration for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	• The data storage configuration of a BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master can be written during operation. The new settings however will only be applied after a IO-Link Master re-initialization using the <i_bReInitialization> input label of the <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP1_F</a> , <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP2_F</a> and <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP3_F</a> IO-Link Master control function blocks.	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	• When the operation is completed successfully	



## 2. 14 P+Balluff\_WriteInitOperationSettingCIB\_F

Name	
P+Balluff_WriteInitOperationSettingCIB_F	
Overview	
Item	Description
Function overview	Writes the initial processing enable/disable setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.



## Labels

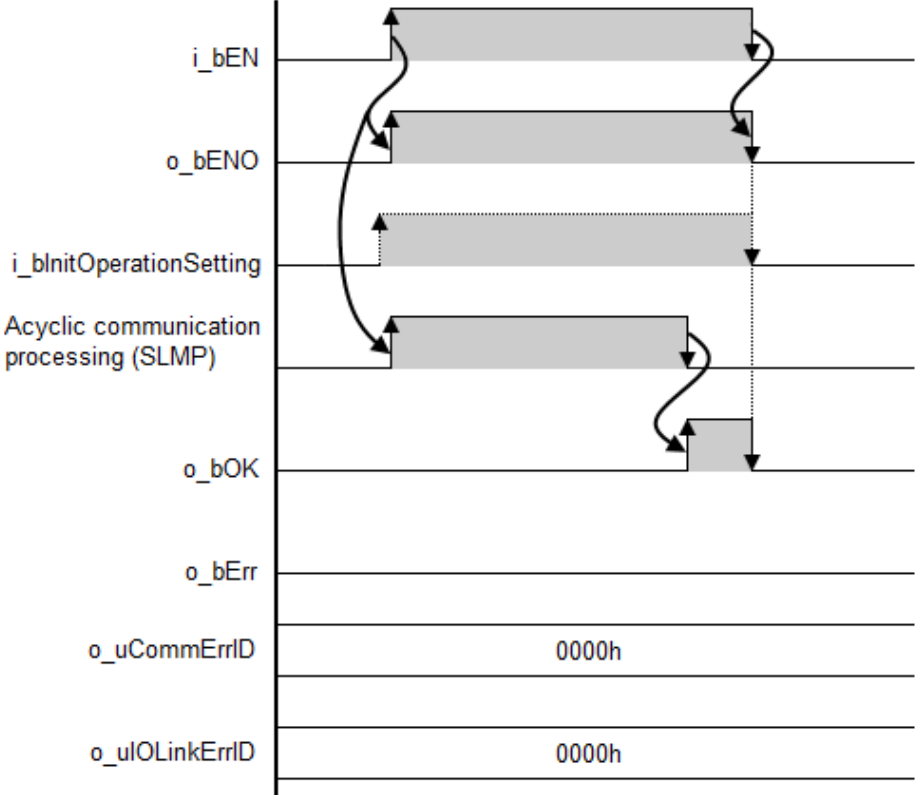
### ■ Input Labels

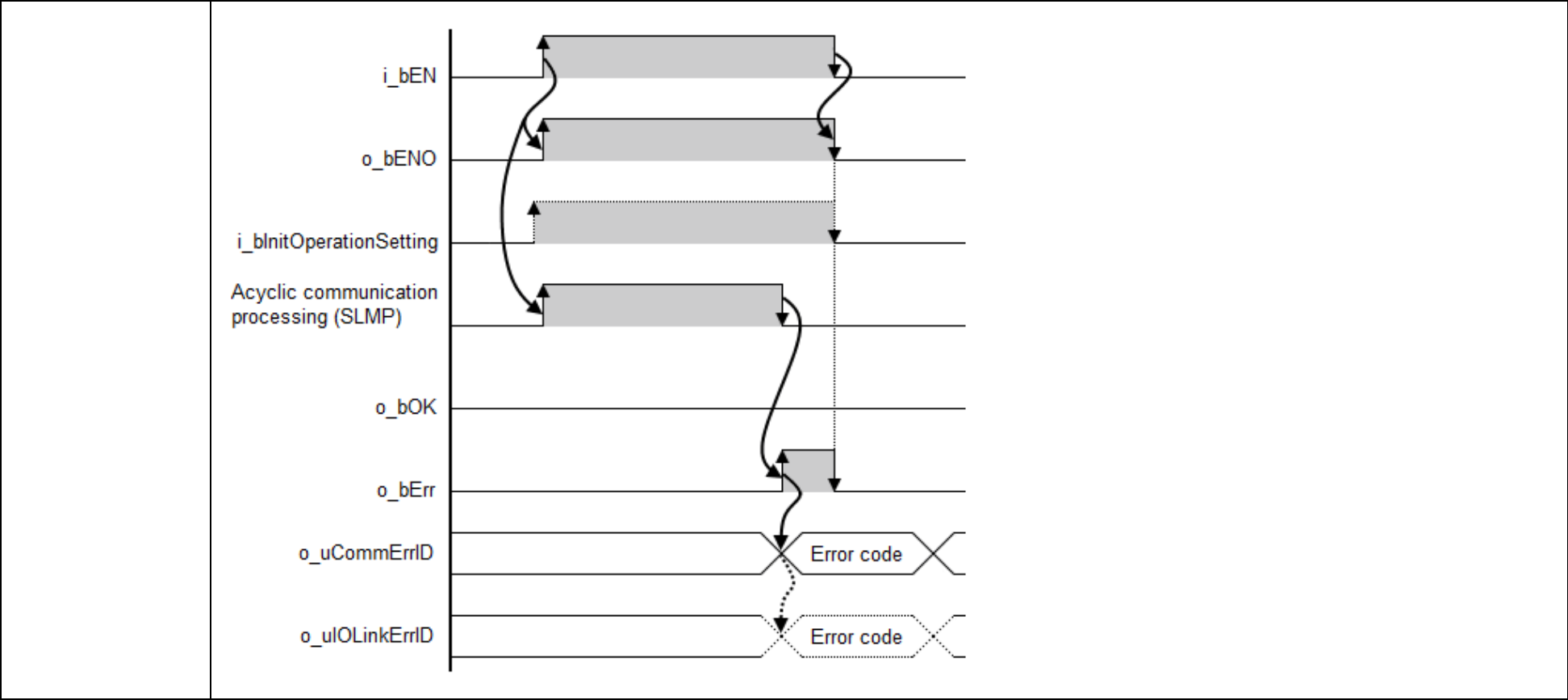
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Write initial operation setting start command	Bit	ON, OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting write command is enabled. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting write command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word.  <div> <div>b15b8b7b0</div> <div>+0<div>Third octet</div><div>Fourth octet</div></div> <div>+1<div>First octet</div><div>Second octet</div></div> </div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(4)	i_bInitOperationSetting	Initial operation setting	Bit	ON, OFF	Specify the initial operation setting for the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"> <li>ON: No Initial processing request flag necessary. After booting up the device goes to "Ready" mode. The ports are configured as inputs.</li> <li>OFF: The device can only be brought to "Ready" mode by means of the "Initial processing request flag".</li> </ul>

### ■ Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(5)	o_bENO	Write initial operation setting command output status	Bit	OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting write command control signal is active. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting write command control signal is inactive.
(6)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(7)	o_bOK	Write completed	Bit	OFF	The signal turns ON for one program scan if the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting write command is normally completed.
(8)	o_bErr	Write error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master initial operation setting write command execution.

(9)	o_uCommErrID	Write error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(10)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	702 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description	This function block is used for writing the initial processing enable/disable setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	<ul style="list-style-type: none"> <li></li> </ul>	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<ul style="list-style-type: none"> <li>When the operation is completed successfully</li> </ul>  <ul style="list-style-type: none"> <li>When the operation is completed with an error</li> </ul>	



2. 15 P+Balluff\_WriteISDUDataCIB\_F

Name

P+Balluff\_WriteISDUDataCIB\_F

Overview

Item	Description
Function overview	Writes the IO-Link parameter data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_WriteISDUDataCIB_F</div><div><div>(1) — i_bEN</div><div>(2) — i_udRemoteIPAddress</div><div>(3) — i_uStationNumber</div><div>(4) — i_uIOLELinkPortNo</div><div>(5) — i_uIndex</div><div>(6) — i_uSubIndex</div><div>(7) — i_uISDUDataLength</div><div>(8) — i_uISDUWriteData</div><div>o_bENO — (9)</div><div>o_bDataLinkOK — (10)</div><div>o_bOK — (11)</div><div>o_bErr — (12)</div><div>o_uCommErrID — (13)</div><div>o_uIOLELinkErrID — (14)</div><div>o_uISDUWriteErrID — (15)</div></div></div>

Labels

Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Write ISDU data start command	Bit	ON, OFF	ON: The IO-Link port parameter data write command is enabled. OFF: The IO-Link port parameter data write command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

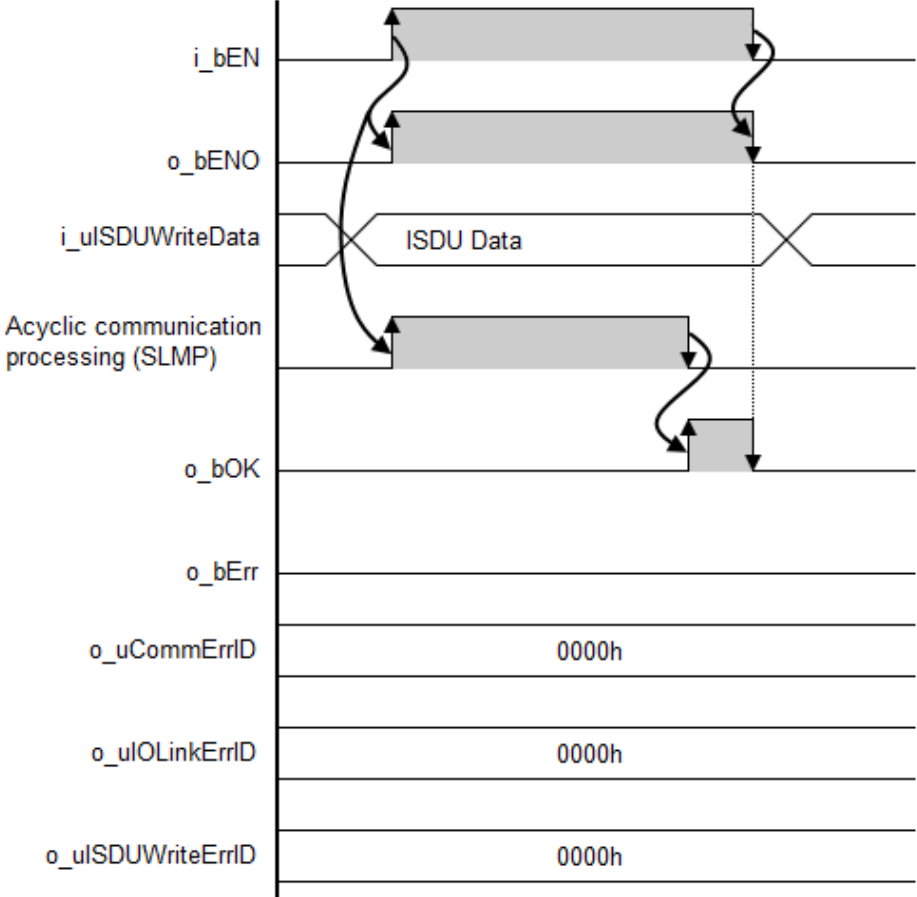
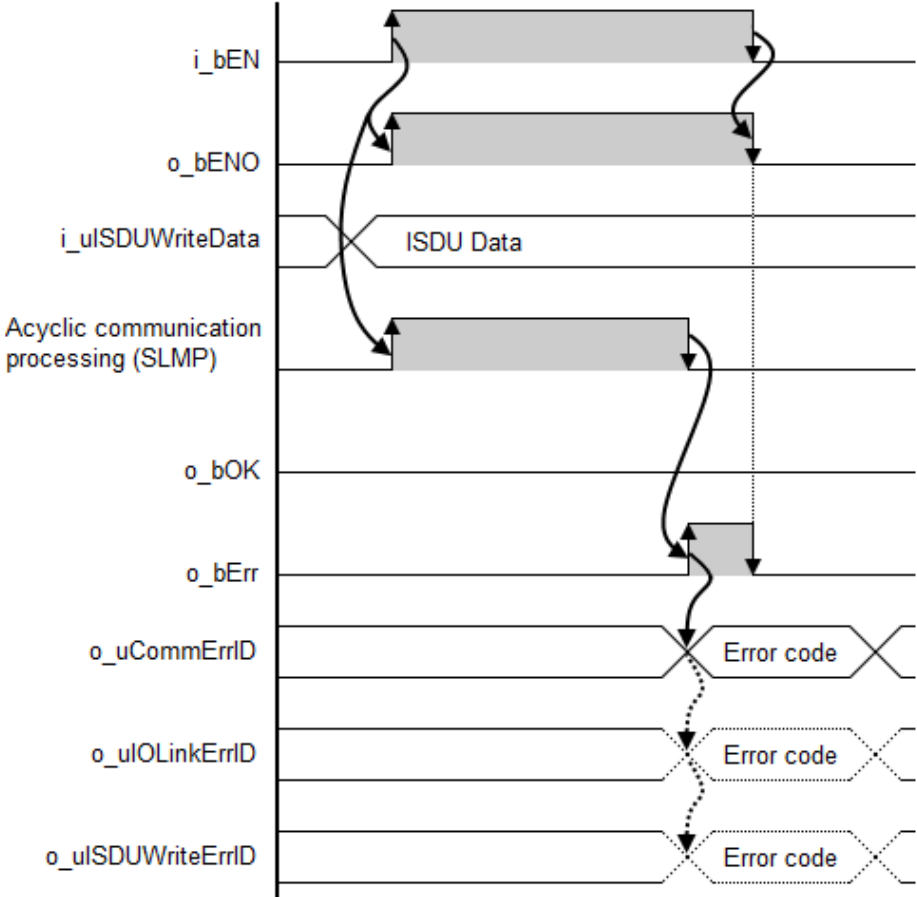
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number for which the IO-Link parameter data is written.
(5)	i_uIndex	Index	Word [Unsigned]/Bit String [16-bit]	0 to 65535	Specify the index (start) address of the IO-Link parameter object to which data will be written using a BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master Write Device Parameter/ISDU request.
(6)	i_uSubIndex	Subindex	Word [Unsigned]/Bit String [16-bit]	0 to 255	Specify the subindex (offset) address of the IO-Link parameter object data element to be written using a BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master Write Device Parameter/ISDU request.
(7)	i_uISDUDataLength	Data length	Word [Unsigned]/Bit String [16-bit]	0 to 232	Specify the length of the IO-Link parameter data to be written to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, in BYTE units.
(8)	i_uISDUWriteData	IO-Link write parameter data	Word [Unsigned]/Bit String [16-bit]	–	Specify the head address of the memory area storing the IO-Link parameter data to be written to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master using a Write Device Parameter/ISDU request.

■ Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(9)	o_bENO	Write ISDU data command output status	Bit	OFF	ON: The IO-Link port parameter data write command control signal is active. OFF: The IO-Link port parameter data write command control signal is inactive.
(10)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(11)	o_bOK	Write completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link parameter data write command (ISDU request) is normally completed.
(12)	o_bErr	Write error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link parameter data write command (ISDU request) execution.
(9)	o_uCommErrID	Write error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(10)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .
(15)	o_uISDUWriteErrID	ISDU Write error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the ISDU request data write error code.

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	613 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description	This function block is used for writing the IO-Link parameter data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC	



	<div>FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.</div> <div><ul style="list-style-type: none"><li>To perform IO-Link parameter data write, the function block sends a Read Device Parameters/ISDU(Index Service Data Unit) request to the gateway.</li><li>An IO-Link parameter data object is addressed in an ISDU request through an <b>Index</b> and a <b>SubIndex</b> (if the parameter data object contains multiple data elements).</li></ul></div>
Restrictions and precautions	<div><ul style="list-style-type: none"><li></li></ul></div>
FB compiling method	Macro
FB operation type	Real-time execution
Timing chart	<div><div><ul style="list-style-type: none"><li>When the operation is completed successfully</li></ul></div><div></div><div><ul style="list-style-type: none"><li>When the operation is completed with an error</li></ul></div><div></div></div>

2. 16 P+Balluff\_WriteOutputHoldSettingCIB\_F

Name

P+Balluff\_WriteOutputHoldSettingCIB\_F

Overview

Item	Description
Function overview	Writes the outputs hold/clear setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_WriteOutputHoldSettingCIB_F</div><div><div>(1) i_bEN</div><div>(2) i_udRemoteIPAddress</div><div>(3) i_uStationNumber</div><div>(4) i_bHoldClear</div><div>o_bENO</div><div>o_bDataLinkOK</div><div>o_bOK</div><div>o_bErr</div><div>o_uCommErrID</div><div>o_uIOLErrID</div><div>(5)</div><div>(6)</div><div>(7)</div><div>(8)</div><div>(9)</div><div>(10)</div></div></div>

Labels

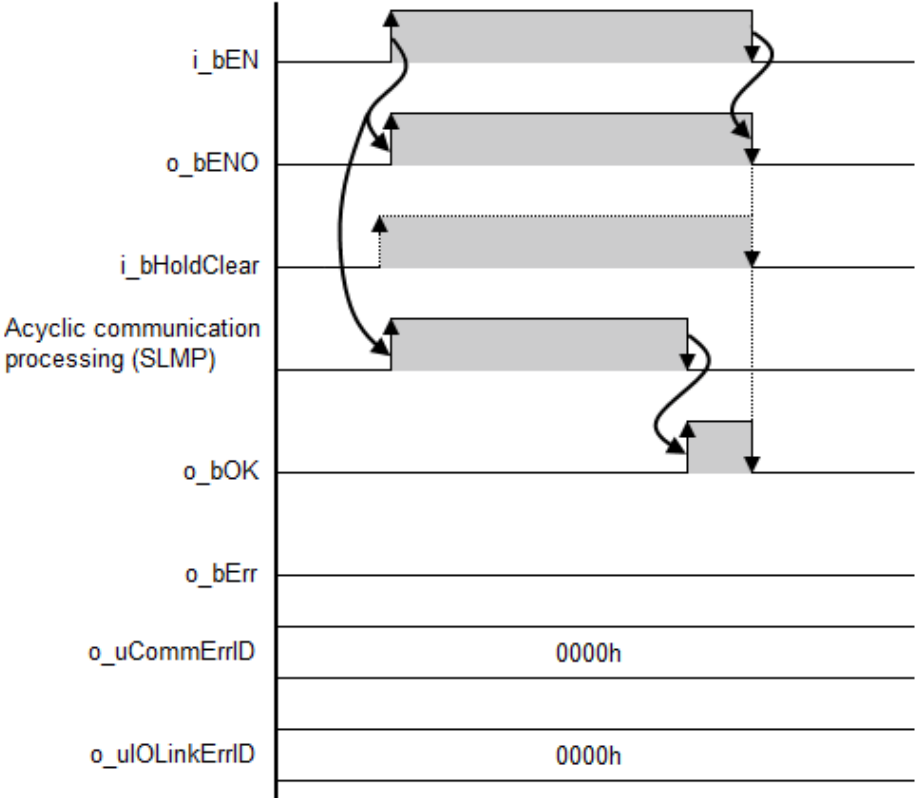
Input Labels

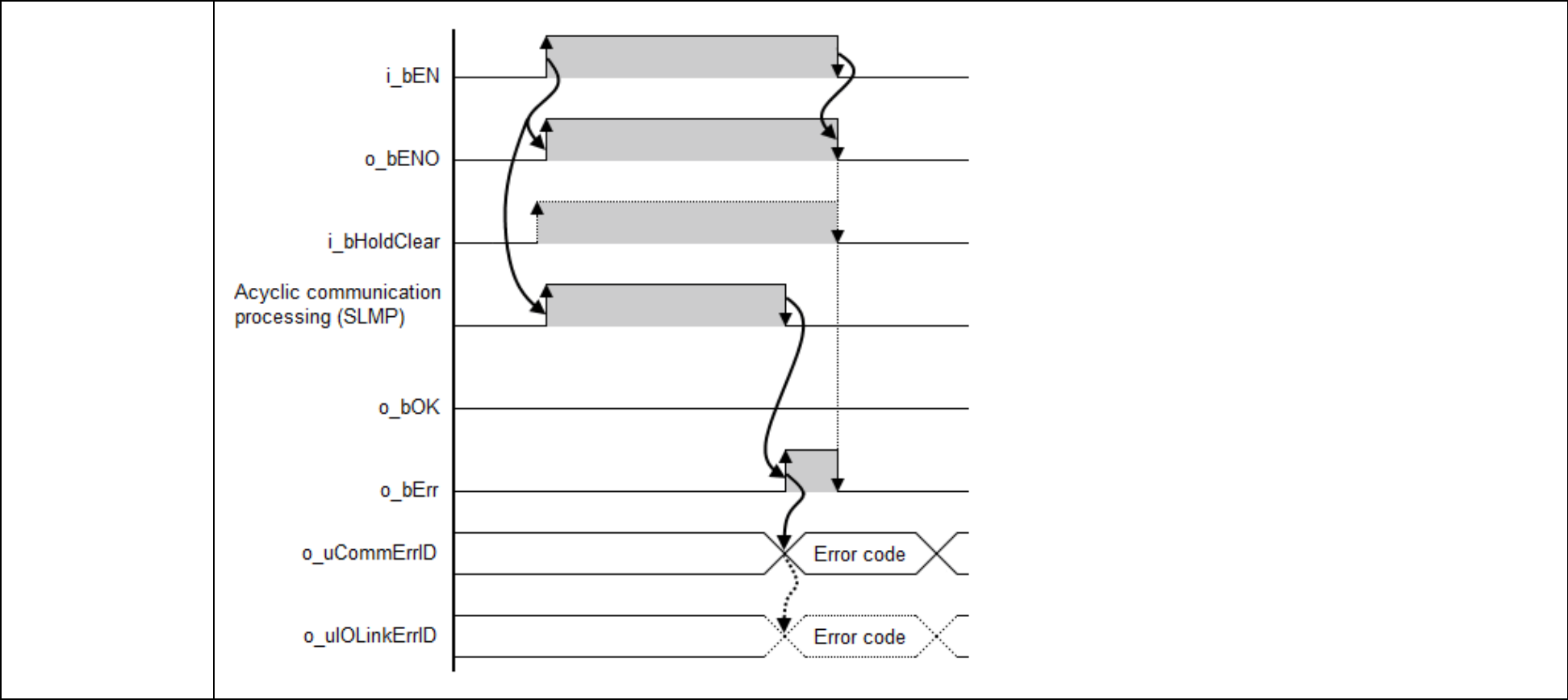
No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Write output hold/clear settings start command	Bit	ON, OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting write command is enabled. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting write command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0Third octetFourth octet</div><div>+1First octetSecond octet</div></div></div>
(3)	i_uStationNumber	IO-Link Master station number	Word [Unsigned]/Bit String [16-bit]	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.
(4)	i_bHoldClear	Hold/Clear settings	Bit	ON, OFF	Specify the outputs hold/clear setting to be written to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. <ul style="list-style-type: none"><li>ON: The last state of the outputs is held when the module is disconnected from the fieldbus network or the CPU is in the STOP state.</li><li>OFF: The outputs are reset when the module is disconnected from the fieldbus network or the CPU is in the STOP state</li></ul>

Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(5)	o_bENO	Write output hold/clear settings command output status	Bit	OFF	ON: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting write command control signal is active. OFF: The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master output hold/clear setting write command control signal is inactive.
(6)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.

(7)	o_bOK	Write completed	Bit	OFF	The signal turns ON for one program scan if the outputs hold/clear setting write command is normally completed.
(8)	o_bErr	Write error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the outputs hold/clear setting write command execution.
(9)	o_uCommErrID	Write error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(10)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .

FB details		
Item	Description	
Applicable hardware and software	Applicable CPU	FX5U(C)/FX5UJ CPU
	Applicable engineering tool	GX Works3
Language	Function Block Diagram (FBD/LD)	
Number of basic steps	702 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .	
Function description	This function block is used for writing the outputs hold/clear setting of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.	
Restrictions and precautions	<ul style="list-style-type: none"> <li></li> </ul>	
FB compiling method	Macro	
FB operation type	Real-time execution	
Timing chart	<ul style="list-style-type: none"> <li>When the operation is completed successfully</li> </ul>  <ul style="list-style-type: none"> <li>When the operation is completed with an error</li> </ul>	



2. 17 P+Balluff\_WriteValidationDataCIB\_F

Name

P+Balluff\_WriteValidationDataCIB\_F

Overview

Item	Description
Function overview	Writes the IO-Link device validation configuration and data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master, using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.
Symbol [Function Block Diagram]	<div><div>P+Balluff_WriteValidationDataCIB_F</div><div><div>(1) — i_bEN</div><div>(2) — i_udRemoteIPAddress</div><div>(3) — i_uStationNumber</div><div>(4) — i_uOLinkPortNo</div><div>(5) — i_uValidationType</div><div>(6) — i_u2VendorID</div><div>(7) — i_u3DeviceID</div><div>(8) — i_u16SerialNumber</div><div><div>o_bENO — (9)</div><div>o_bDataLinkOK — (10)</div><div>o_bOK — (11)</div><div>o_bErr — (12)</div><div>o_uCommErrID — (13)</div><div>o_uOLinkErrID — (14)</div></div></div></div>

Labels

■ Input Labels

No.	Variable Name	Name	Data type	Setting Range	Description
(1)	i_bEN	Write validation data start command	Bit	ON, OFF	ON: The IO-Link port device validation data write command is enabled. OFF: The IO-Link port device validation data write command is disabled.
(2)	i_udRemoteIPAddress	Remote IP address	Double Word [Unsigned]/Bit String [32-bit]	1h to FFFFFFFFh	Specify the remote IP address of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. Specify the third and fourth octets to the 1st word, and first and second octets to the 2nd word. <div><div><div>b15b8b7b0</div><div>+0<div>Third octet</div><div>Fourth octet</div></div><div>+1<div>First octet</div><div>Second octet</div></div></div></div>
(3)	i_uStationNumber	IO-Link Master	Word [Unsigned]/Bit	1 to 16	Specify the CC-Link IEF Basic station number of the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.

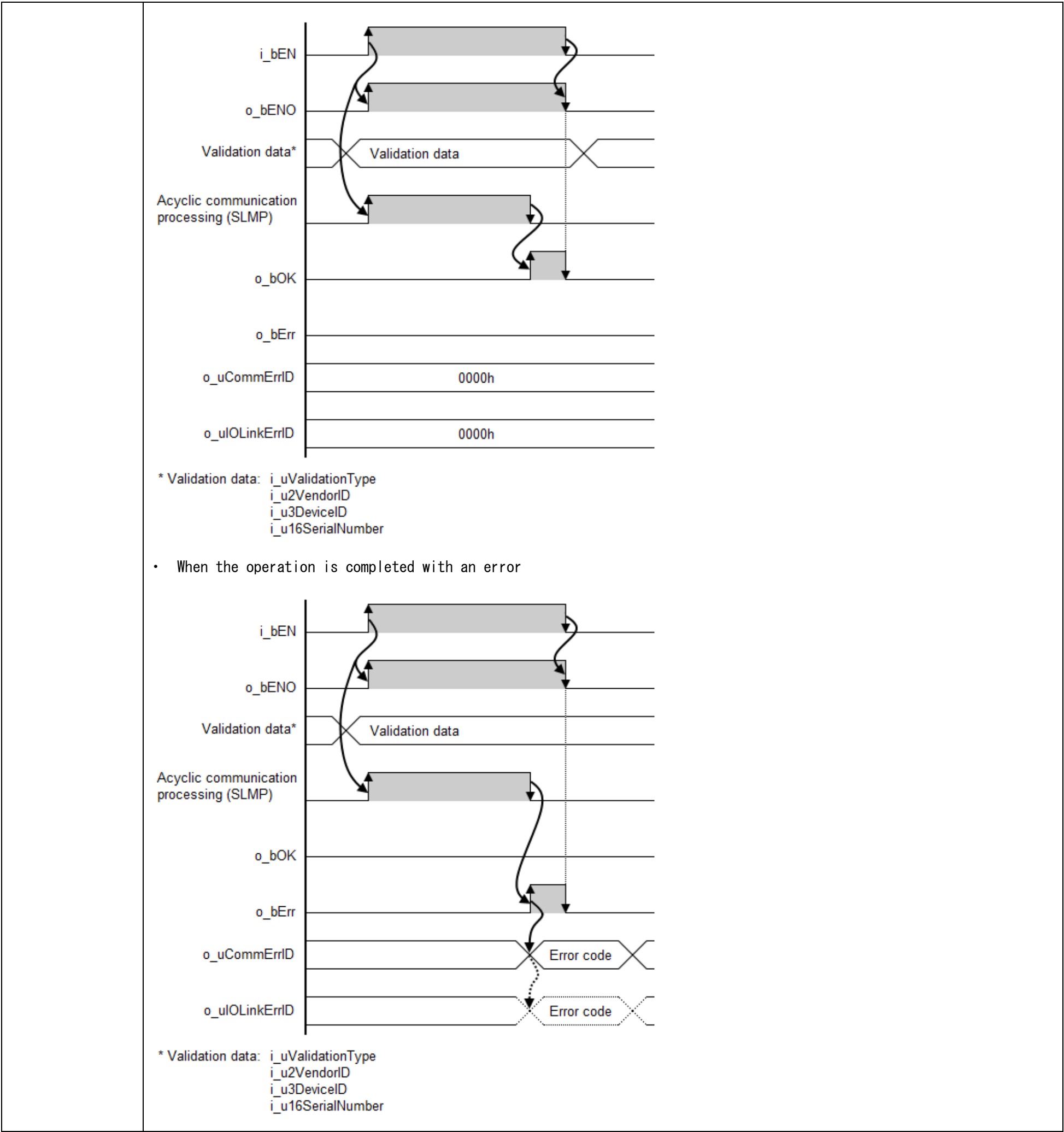
		station number	String [16-bit]																						
(4)	i_uIOLinkPortNo	IO-Link port number	Word [Unsigned]/Bit String [16-bit]	0 to 7	Specify the IO-Link port number for which the device validation data is written.																				
(5)	i_uValidationType	Validation type	Word [Unsigned]/Bit String [16-bit]	00h to 02h	<p>Specify the IO-Link device validation configuration for the selected IO-Link compatible port to be written to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master.</p> <p>Depending on the configuration of the IO-Link device validation, the connected device's information is verified and the result is indicated by the corresponding port valid bit (see the &lt;o_uIOLinkValidPorts&gt; output label of the <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP1_F</a>, <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP2_F</a> and <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP3_F</a> IO-Link Master control function blocks).</p> <table><tr><th>ValidationType (hex)</th><th>Description</th></tr><tr><td>0x00</td><td>Unused</td></tr><tr><td>0x01</td><td>Manufacturer name</td></tr><tr><td>0x02</td><td>Manufacturer text</td></tr></table>	ValidationType (hex)	Description	0x00	Unused	0x01	Manufacturer name	0x02	Manufacturer text												
ValidationType (hex)	Description																								
0x00	Unused																								
0x01	Manufacturer name																								
0x02	Manufacturer text																								
(6)	i_u2VendorID	Vendor ID	Word [Unsigned]/Bit String [16-bit] (0..1)	–	<p>Specify the IO-Link device validation Vendor ID setting to be written to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. The <b>Vendor ID</b> is an identifier specified on 2 data bytes. Each byte must be stored on the Least Significant Byte of the <b>VendorID</b> array's word elements, as detailed in the image below:</p> <table><tr><th rowspan="2">Array index</th><th colspan="2">VendorID array data word</th></tr><tr><th>Most Significant Byte</th><th>Least Significant Byte</th></tr><tr><td>0</td><td>- Unused -</td><td>Vendor ID 1 (MSB)</td></tr><tr><td>1</td><td>- Unused -</td><td>Vendor ID 2 (LSB)</td></tr></table>	Array index	VendorID array data word		Most Significant Byte	Least Significant Byte	0	- Unused -	Vendor ID 1 (MSB)	1	- Unused -	Vendor ID 2 (LSB)									
Array index	VendorID array data word																								
	Most Significant Byte	Least Significant Byte																							
0	- Unused -	Vendor ID 1 (MSB)																							
1	- Unused -	Vendor ID 2 (LSB)																							
(7)	i_u3DeviceID	Device ID	Word [Unsigned]/Bit String [16-bit] (0..2)	–	<p>Specify the IO-Link device validation Device ID setting to be written to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. The <b>Device ID</b> is an identifier specified on 3 data bytes. Each byte is stored on the Least Significant Byte of the <b>DeviceID</b> array's word elements, as detailed in the image below:</p> <table><tr><th rowspan="2">Array index</th><th colspan="2">DeviceID array data word</th></tr><tr><th>Most Significant Byte</th><th>Least Significant Byte</th></tr><tr><td>0</td><td>- Unused -</td><td>Device ID 1 (MSB)</td></tr><tr><td>1</td><td>- Unused -</td><td>Device ID 2</td></tr><tr><td>2</td><td>- Unused -</td><td>Device ID 3 (LSB)</td></tr></table>	Array index	DeviceID array data word		Most Significant Byte	Least Significant Byte	0	- Unused -	Device ID 1 (MSB)	1	- Unused -	Device ID 2	2	- Unused -	Device ID 3 (LSB)						
Array index	DeviceID array data word																								
	Most Significant Byte	Least Significant Byte																							
0	- Unused -	Device ID 1 (MSB)																							
1	- Unused -	Device ID 2																							
2	- Unused -	Device ID 3 (LSB)																							
(8)	i_u16SerialNumber	Serial number	Word [Unsigned]/Bit String [16-bit] (0..15)	–	<p>Specify the IO-Link device validation Serial Number setting to be written to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master. The <b>Serial Number</b> is an identifier specified on 16 data bytes. Each byte is stored on the Least Significant Byte of the <b>SerialNumber</b> array's word elements, as detailed in the image below:</p> <table><tr><th rowspan="2">Array index</th><th colspan="2">DeviceID array data word</th></tr><tr><th>Most Significant Byte</th><th>Least Significant Byte</th></tr><tr><td>0</td><td>- Unused -</td><td>Serial No. 1 (MSB)</td></tr><tr><td>1</td><td>- Unused -</td><td>Serial No. 2</td></tr><tr><td>-</td><td>-</td><td>-</td></tr><tr><td>-</td><td>-</td><td>-</td></tr><tr><td>15</td><td>- Unused -</td><td>Serial No. 16 (LSB)</td></tr></table>	Array index	DeviceID array data word		Most Significant Byte	Least Significant Byte	0	- Unused -	Serial No. 1 (MSB)	1	- Unused -	Serial No. 2	-	-	-	-	-	-	15	- Unused -	Serial No. 16 (LSB)
Array index	DeviceID array data word																								
	Most Significant Byte	Least Significant Byte																							
0	- Unused -	Serial No. 1 (MSB)																							
1	- Unused -	Serial No. 2																							
-	-	-																							
-	-	-																							
15	- Unused -	Serial No. 16 (LSB)																							

■ Output Labels

No.	Variable Name	Name	Data type	Default Value	Description
(9)	o_bENO	Write validation data command output status	Bit	OFF	ON: The IO-Link port device validation data write command control signal is active. OFF: The IO-Link port device validation data write command control signal is inactive.
(10)	o_bDataLinkOK	Data link status	Bit	OFF	ON: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is active. OFF: The data link with the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master station is inactive.
(11)	o_bOK	Write completed	Bit	OFF	The signal turns ON for one program scan if the IO-Link device validation data write command is normally completed.
(12)	o_bErr	Write error	Bit	OFF	The signal turns ON for one program scan if an error has occurred during the IO-Link device validation data write command execution.
(13)	o_uCommErrID	Write error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the SLMP acyclic communication. For details of the error status, please refer to the <a href="#">MELSEC iQ-F FX5 User's Manual (Ethernet Communication)</a> .
(14)	o_uIOLinkErrID	IO-Link request error code	Word [Unsigned]/Bit String [16-bit]	0000h	Stores the error code if an error has occurred during the IO-Link command execution. For details of the error status, please refer to the <a href="#">Detail error check</a> .

FB details

Item	Description
Applicable hardware and software	Applicable CPU FX5U(C)/FX5UJ CPU
	Applicable engineering tool GX Works3
Language	Function Block Diagram (FBD/LD)
Number of basic steps	717 steps The number of steps of the FB in a program varies depending on the CPU module used, input and output definition, and the option settings of GX Works3. For the option settings of GX Works3, refer to the <a href="#">GX Works3 Operating Manual</a> .
Function description	<p>This function block is used for writing the IO-Link device validation configuration and data for the specified IO-Link port of a Balluff Network Interface BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master via acyclic communication (SLMP), using the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet/CC-Link IE Field Basic interface.</p> <p>The IO-Link device validation configuration specifies whether validation is activated and if so, what IO-Link device parameters are verified.</p> <p>Validation data specifies the three types of IO-Link device parameters for which validation is performed:</p> <ul style="list-style-type: none"><li>• Vendor ID</li><li>• Device ID</li><li>• Serial Number.</li></ul> <p><b>NOTE:</b> If validation is performed, the connected IO-Link device's information is verified and the result is indicated by a port valid bit (see the &lt;o_uIOLinkValidPorts&gt; output label of the <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP1_F</a>, <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP2_F</a> and <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP3_F</a> IO-Link Master control function blocks.</p>
Restrictions and precautions	<ul style="list-style-type: none"><li>• The validation configuration of an IO-Link port can be written during operation. The new settings however will only be applied after a IO-Link Master re-initialization using the &lt;i_bReInitialization&gt; input label of the <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP1_F</a>, <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP2_F</a> and <a href="#">P+Balluff_CCLinkIEFieldBasicIOLinkP3_F</a> gateway control function blocks.</li></ul>
FB compiling method	Macro
FB operation type	Real-time execution
Timing chart	<ul style="list-style-type: none"><li>• When the operation is completed successfully</li></ul>



### 3 LIST OF STRUCTURED DATA TYPES

The following table lists the Structure Data Types provided by the **P+Balluff\_CCLinkIEFieldBasicIOLink\_F** library to be used for cyclic remote I/O data specification.

Structure Name	Access Type	Description
stRemoteDataBasicIn	Read	Stores the cyclic Remote input data ((Remote inputs and Remote Read registers) corresponding to a single CC-Link IE Field Basic station number (1 occupied station).
stRemoteDataBasicOut	Read/Write	Stores the cyclic Remote output data ((Remote outputs and Remote Write registers) corresponding to a single CC-Link IE Field Basic station number (1 occupied station).

#### 3.1 stRemoteDataBasicIn

The **stRemoteDataBasicIn** Data Unit Type stores the cyclic input data corresponding to a single CC-Link IE Field Basic station number (1 occupied station).



The Data Unit Type structure, detailed descriptions and data access rights for all component labels are listed in the table below.

Label Name	Data Type	Access Type	Description	Details
b64RX	Bit(0..63)	Read	CC-Link IE Field Basic cyclic data Remote inputs corresponding to 1 occupied station (64 points).	–
u32RWr	Word [Unsigned]/Bit String [16-bit] (0..31)	Read	CC-Link IE Field Basic cyclic data Remote Read registers corresponding to 1 occupied station (32 points).	–

### 3.2 stRemoteDataBasicOut

The **stRemoteDataBasicOut** Data Unit Type stores the cyclic output data corresponding to a single CC-Link IE Field Basic station number (1 occupied station).

The Data Unit Type structure, detailed descriptions and data access rights for all component labels are listed in the table below.

Label Name	Data Type	Access Type	Description	Details
b64RY	Bit(0..63)	Read/Write	CC-Link IE Field Basic cyclic data Remote outputs corresponding to 1 occupied station (64 points).	–
u32RWw	Word [Unsigned]/Bit String [16-bit] (0..31)	Read/Write	CC-Link IE Field Basic cyclic data Remote Write registers corresponding to 1 occupied station (32 points).	–

### 3.3 stDeviceIdent

The **stDeviceIdent** Data Unit Type stores the information corresponding to a single detected IO-Link device.

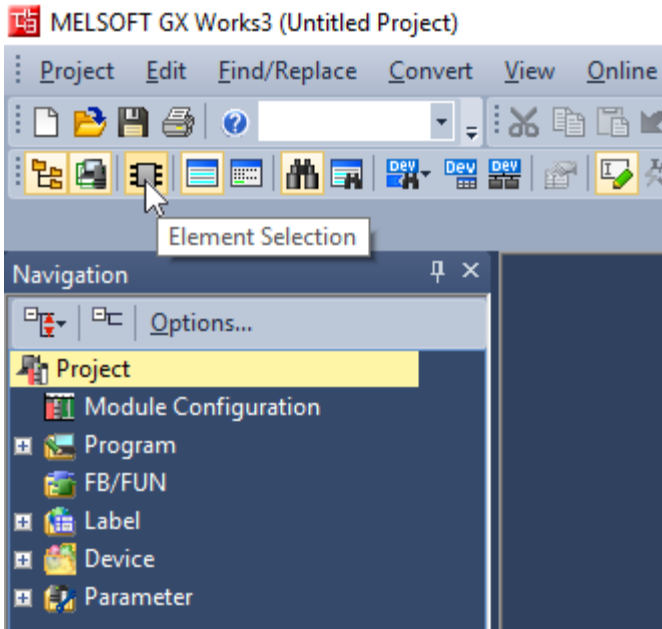
The Data Unit Type structure, detailed descriptions and data access rights for all component labels are listed in the table below.

Label Name	Data Type	Access Type	Description	Details
uPortNo	Word [Unsigned]/Bit String [16-bit]	Read	IO-Link port number (0 to 7).	–
uVendorID	Word [Unsigned]/Bit String [16-bit]	Read	IO-Link device Vendor ID code.	–
udDeviceID	Double Word [Unsigned]/Bit String [32-bit]	Read	IO-Link device Device ID code.	–
u8SerialNo	Word [Unsigned]/Bit String [16-bit] (0..7)	Read	IO-Link device Serial number.	–

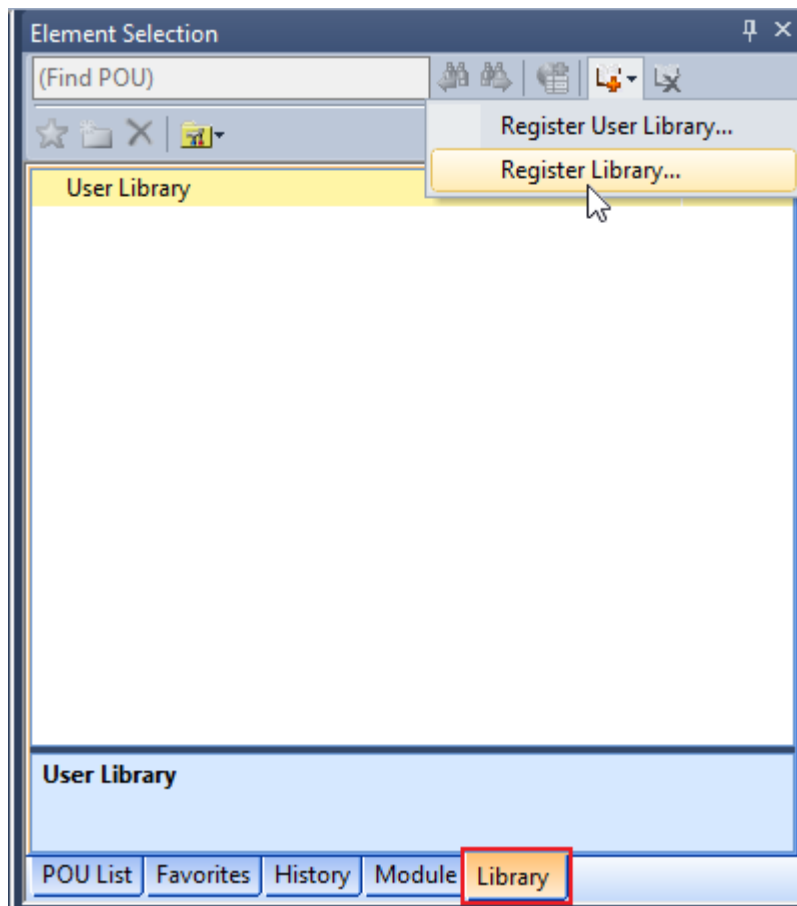
## 4 PROJECT SETTING EXAMPLE

### 4.1 Library Registration Procedure

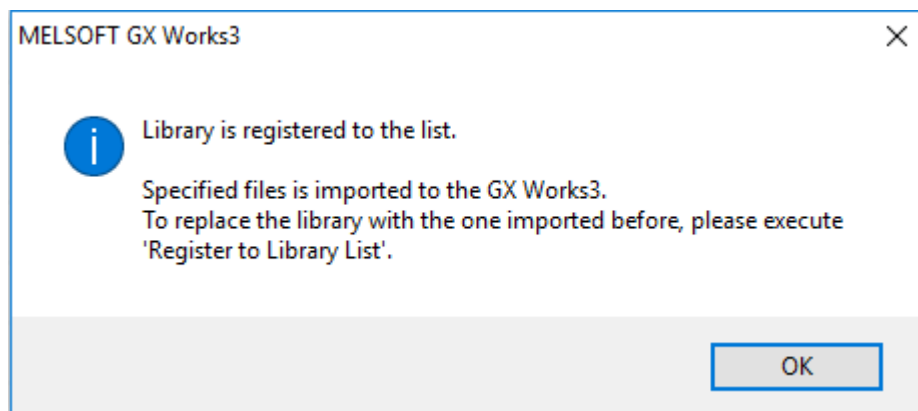
1. Start GX Works3, select [Project] ⇒ [New] menu, and select a CPU type. Display the “Element Selection” window.



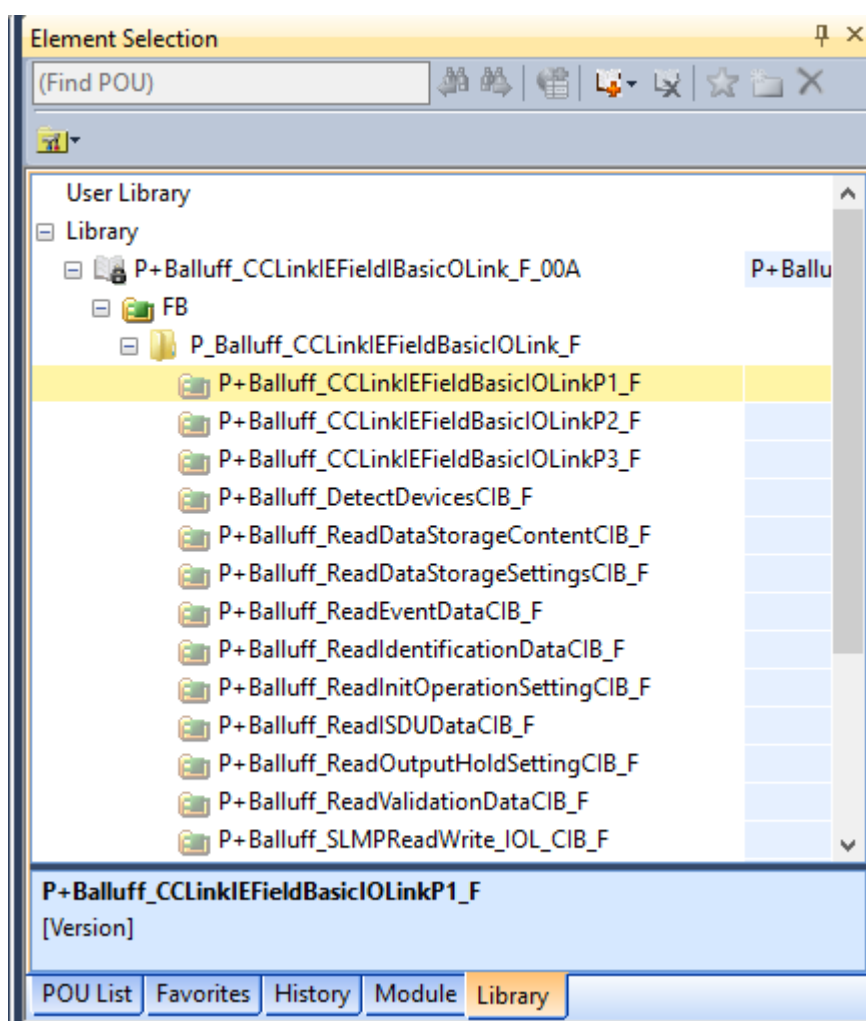
2. In the “Element Selection” window select the Library tab and select the “Register Library...” option after pressing the “Register to Library List” icon.



3. The following dialog box appears. Click the [OK] button.



4. The "Register Library to Library List" window is displayed. Browse the disk for the "P+Balluff\_CCLinkIEFieldBasicIOLink\_F\_\*\*\*.mslm" file, select it and click the [Open] button.
5. The list of FBs and data structures imported from the library is displayed in the "Element Selection" window.



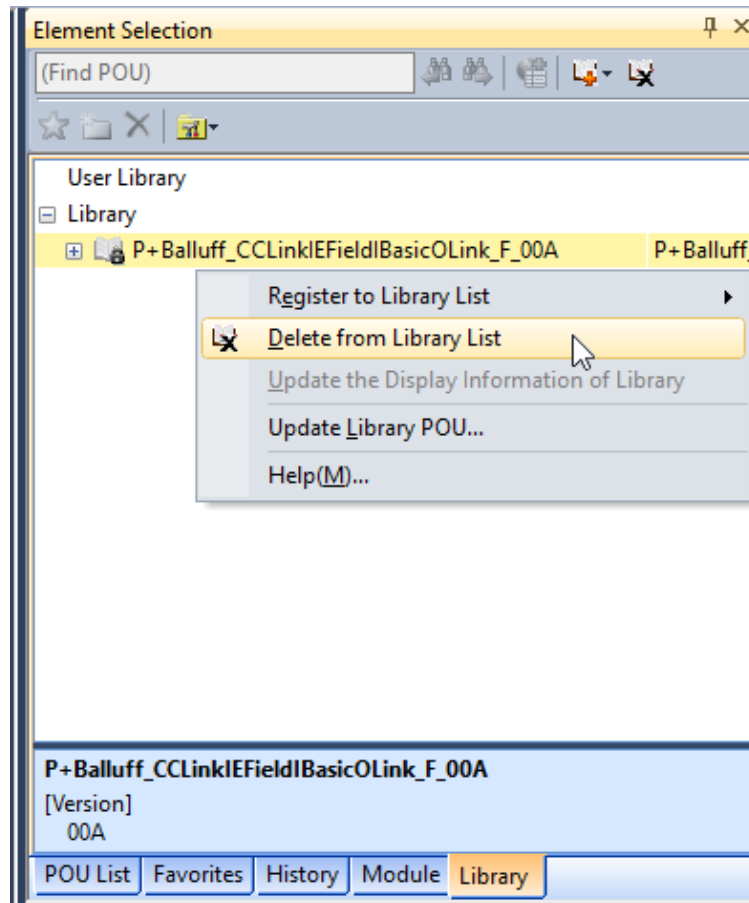
6. Select a FB in the "Element Selection" window, then drag and drop it into the work window or right-click it and select [Add to Project]

⇒ [FB File] in the shortcut menu. The FB is added in the “Navigation” window in the selected FB File along with all the support structure (internally used FBs and necessary data structures).

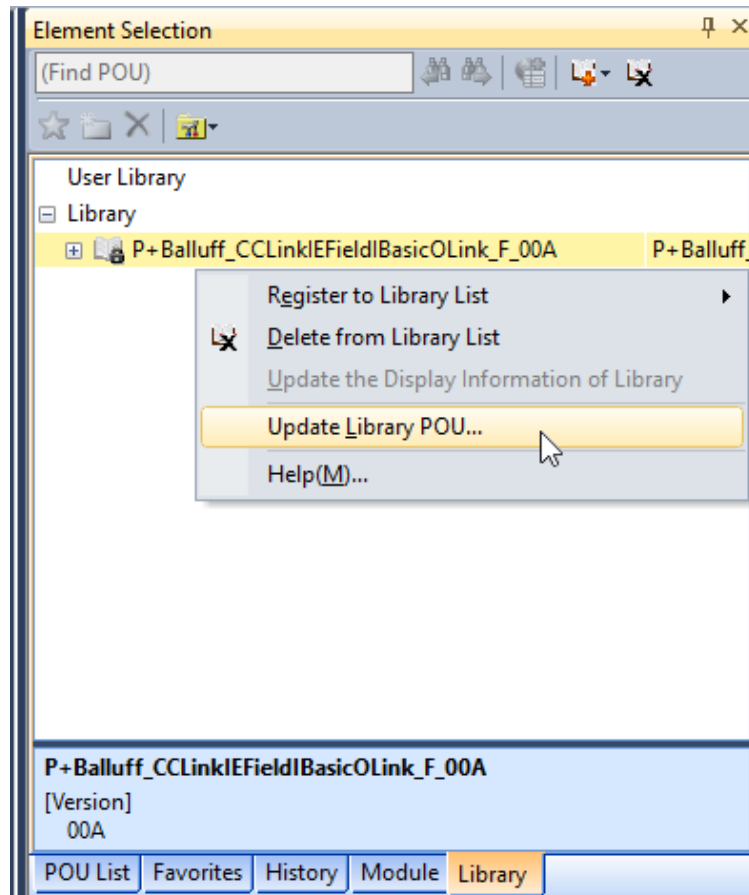
## 4.2 Library Update Procedure

To update the version of the FB library, delete the old library version from the Library List and register the new library version (see previous section).

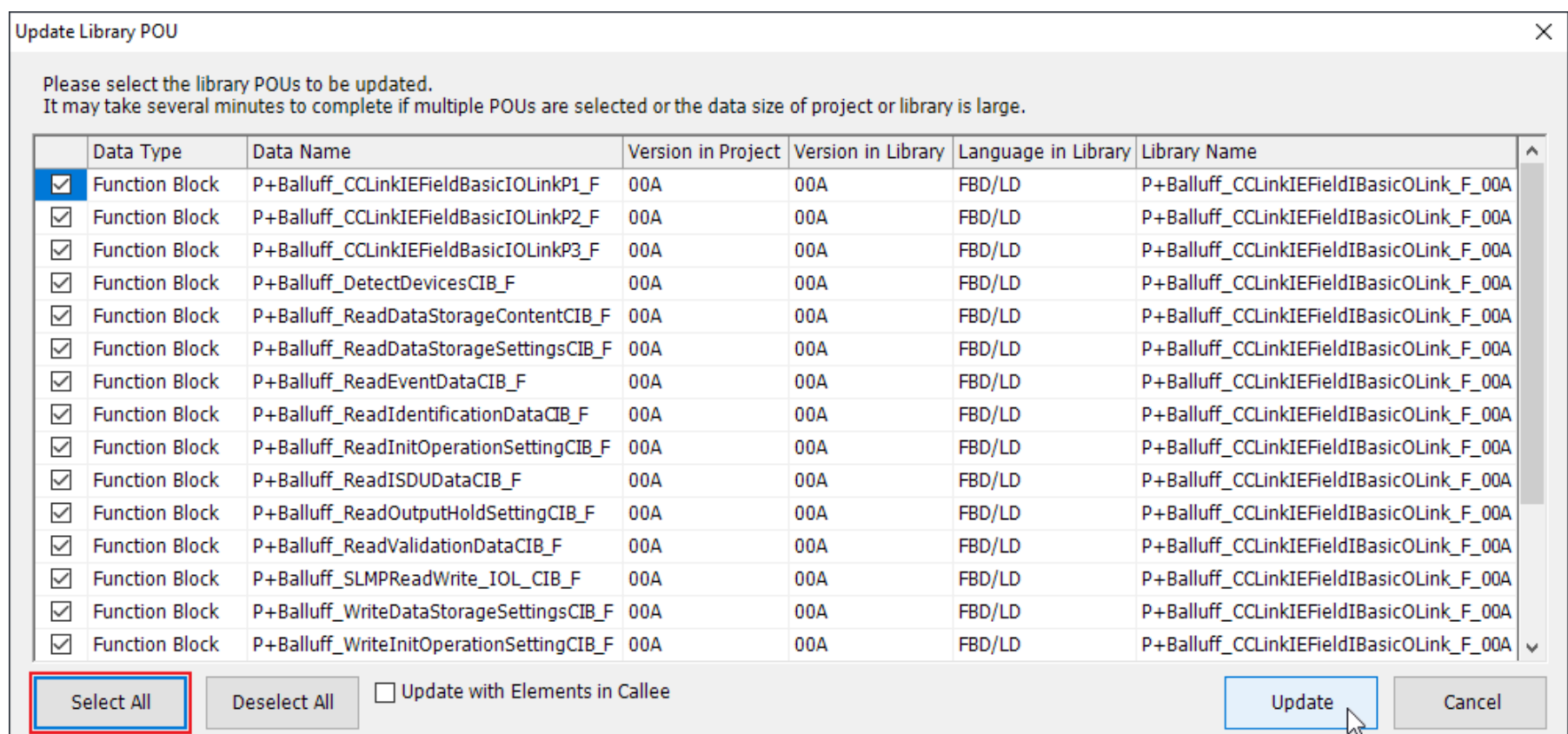
1. Select the old library in the Library List, then right-click it and select [Delete from Library List] in the shortcut menu.



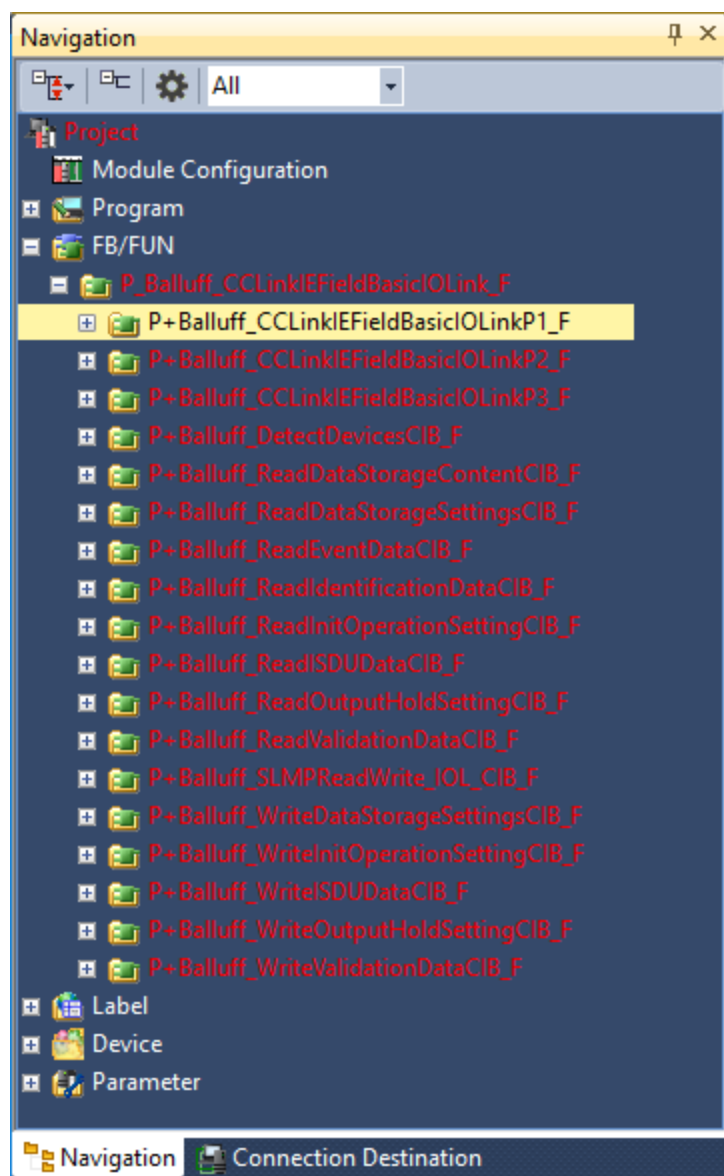
2. Register the new library version, following the procedure outlined in the previous section.
3. Select [Project] ⇒ [Library Operation] ⇒ [Update Library POU], or right-click the library in the “Element Selection” window and select [Update Library POU] in the shortcut menu.



4. Select the FBs and structures of the new version in the “Update Library POU” window and click [Update].



5. The selected FBs and structures are updated in the project's "Navigation" window. In case new FBs or structures have been added to the library, it might be necessary to add them to the project separately.



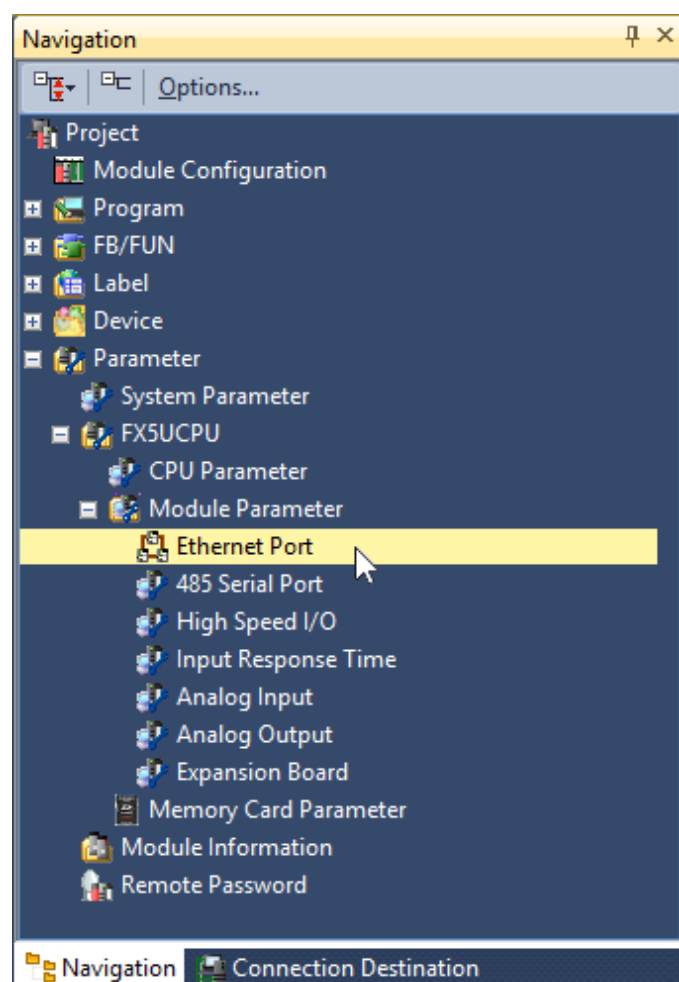
6. Execute a project Rebuild All once the update is completed and rewrite the project to the PLC.

## 4.3 CC-Link IE Field Basic Network Parameters Setting Example

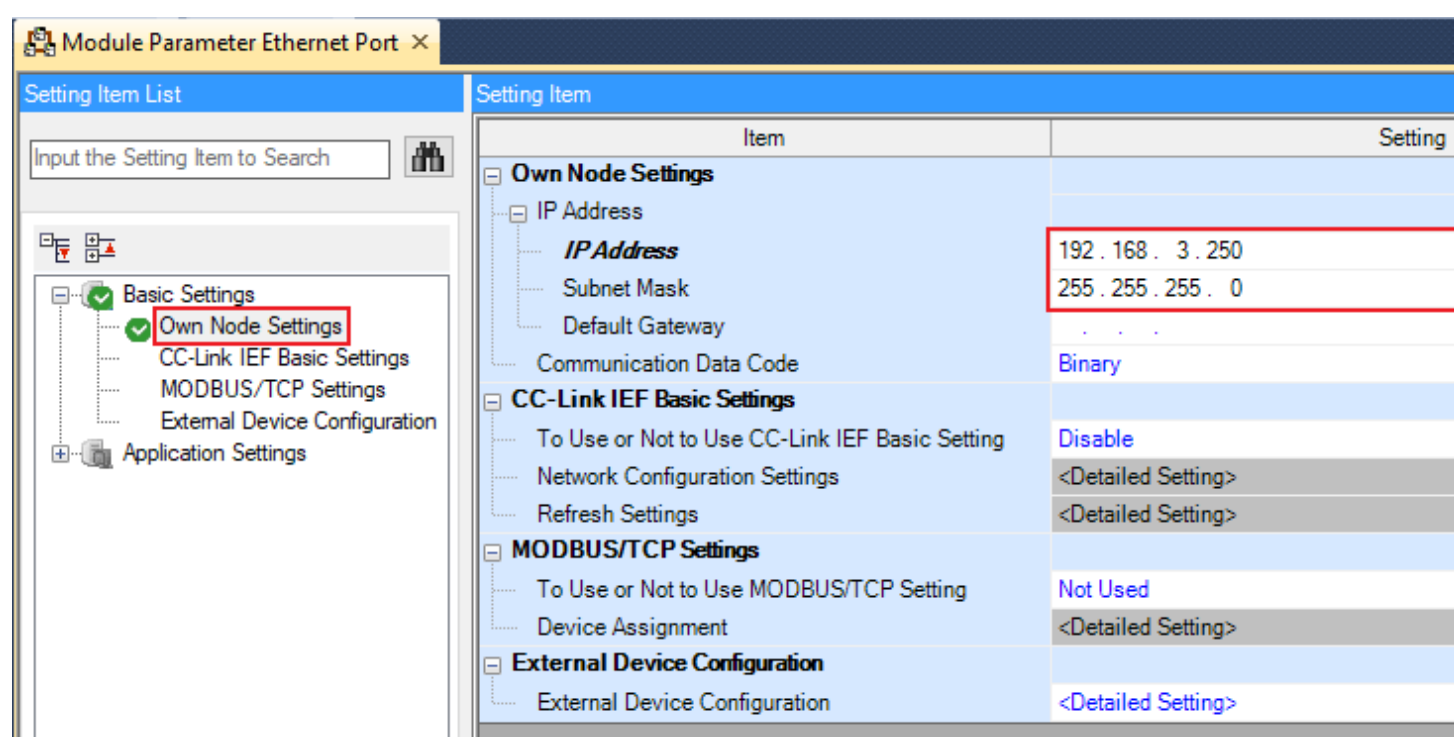
### FX5U(C)/FX5UJ CPU built-in CC-Link IE Field Basic Network Master Setting

This section describes the procedure used for enabling the MELSEC FX5U(C)/FX5UJ CPU built-in Ethernet port as a CC-Link IE Field Basic network Master in a GX Works3 project.

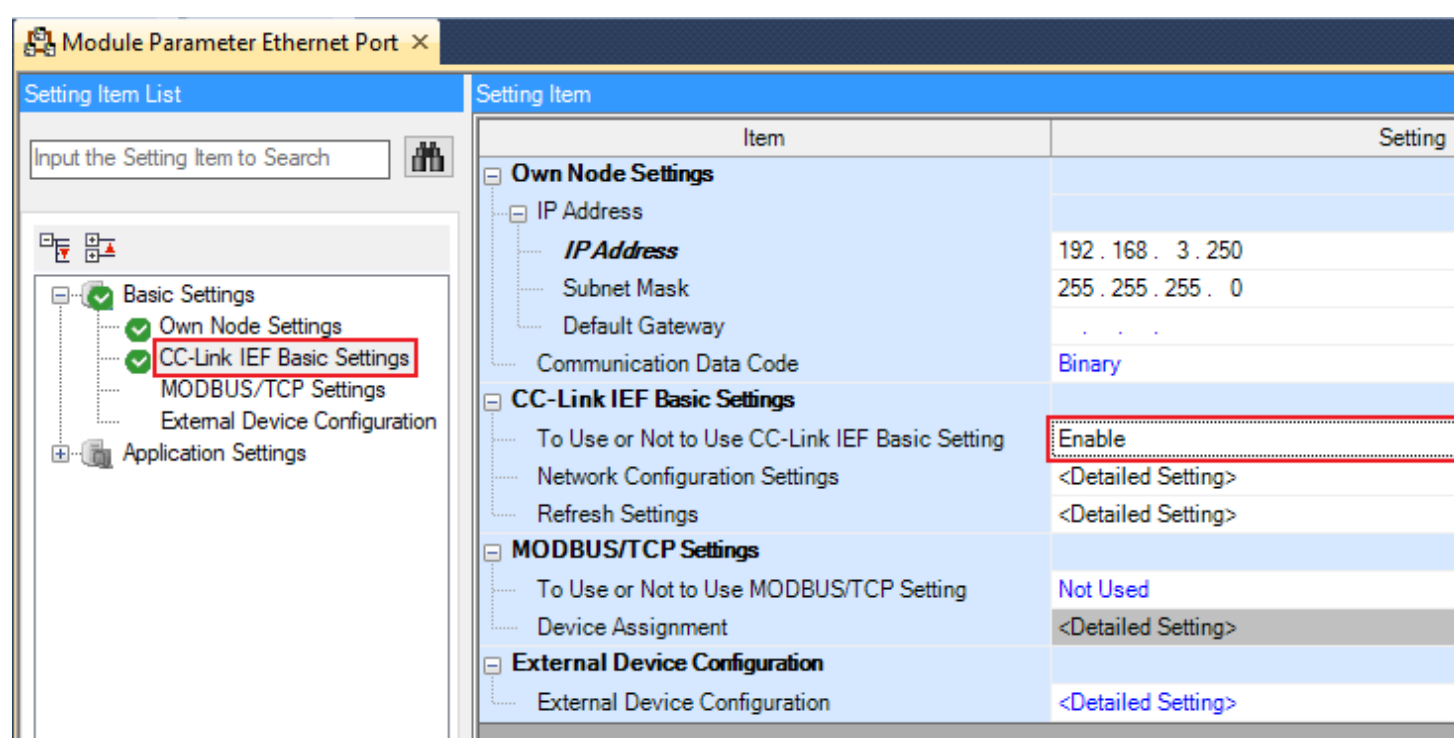
1. In the "Navigation" window open the [Parameter] ⇒ [FX5UCPU] ⇒ [Module Information] ⇒ [Ethernet Port] section.



2. In the [Module Parameter Ethernet Port] window, first make the basic settings for the built-in Ethernet interface (IP Address, Subnet Mask, Default Gateway IP Address) according to the specific Local Area Network configuration.



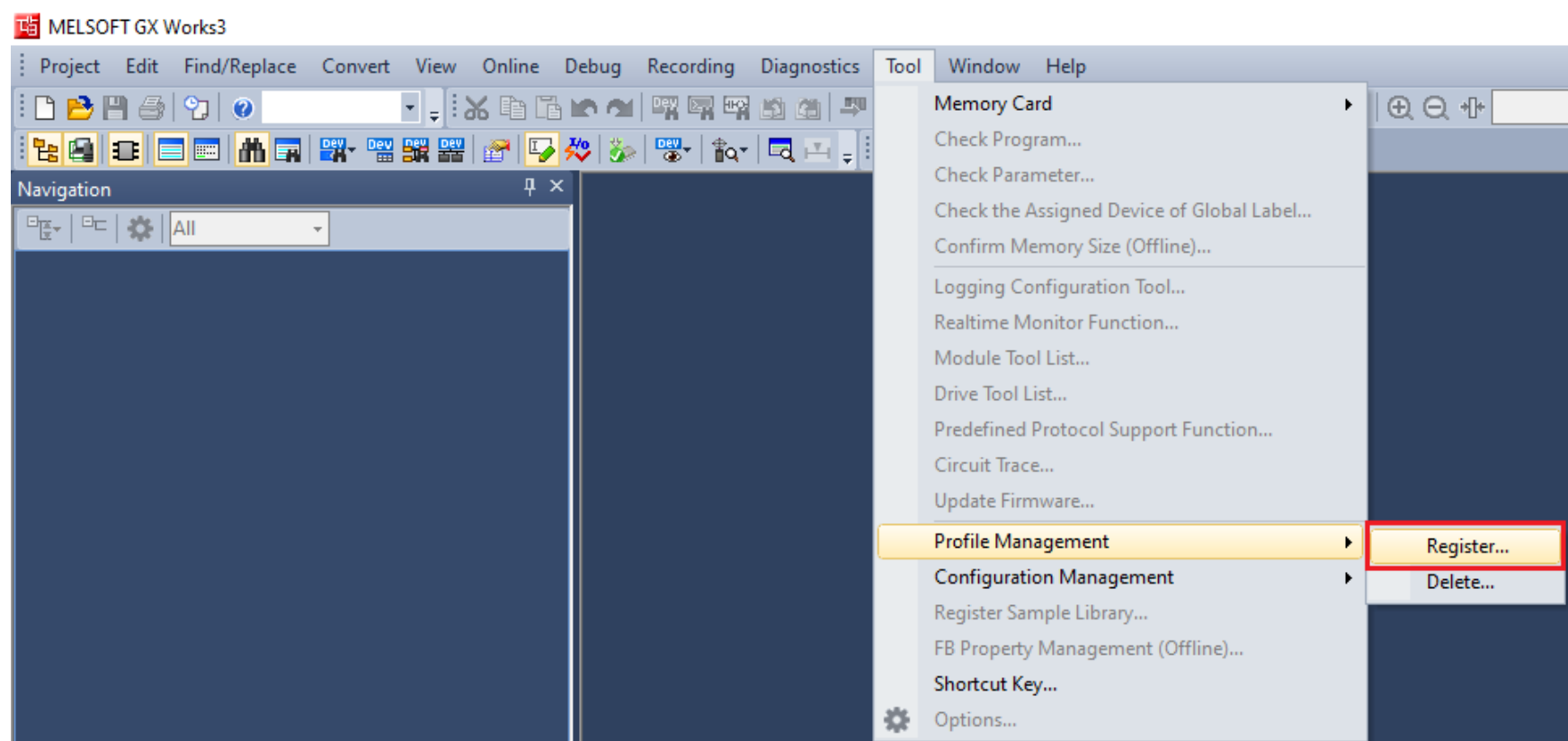
3. Next, in the "CC-Link IEF Basic Settings" section of the [Module Parameter Ethernet Port] window, enable the use of the MELSEC FX5U(C)/FX5UJ CPU CC-Link IE Field Basic Settings.



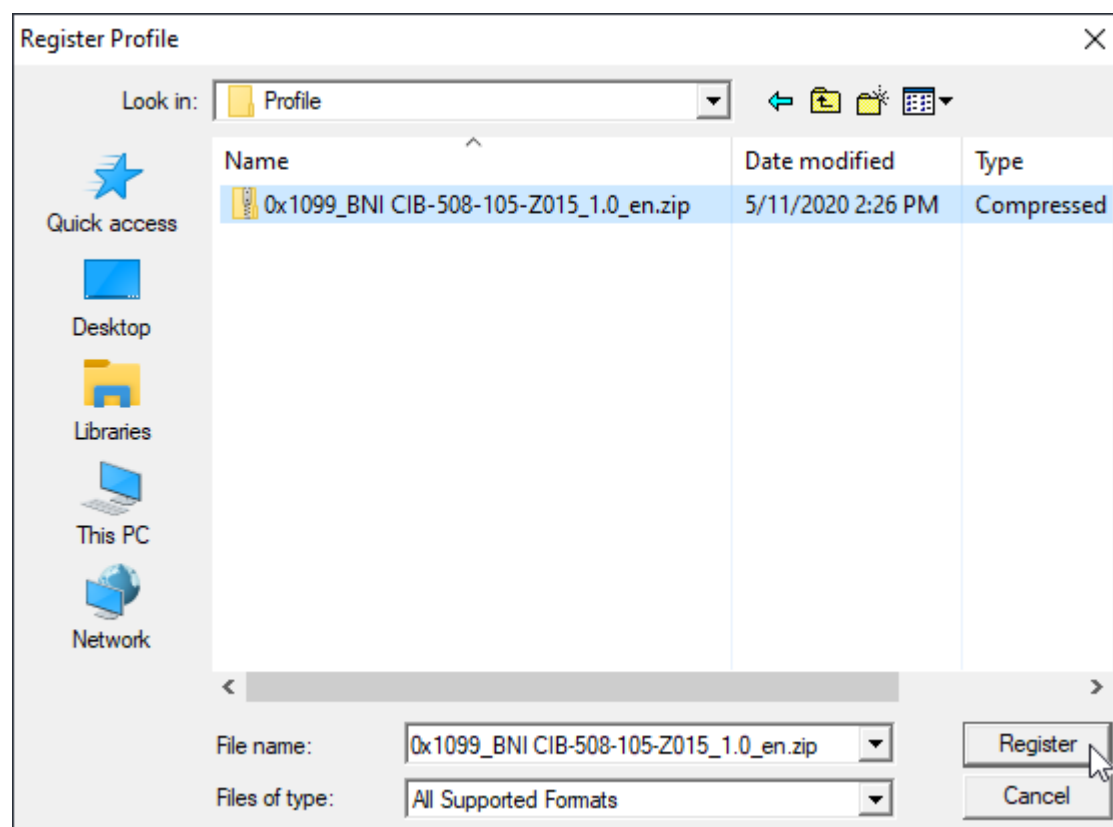
## CSP+ Profile – BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master node integration

To be able to use and set the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master node in a CC-Link IEF Basic network configuration in GX Works3, you will need to register the corresponding CSP+ profile to GX Works3.

1. First, find and download the CSP+ profile file corresponding to the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master on the <https://www.balluff.com/> website.
2. Open the MELSOFT GX Works3 Engineering software and make sure no projects are open.
3. In the GX Works3 main menu select [Tools] ⇒ [Profile Management] ⇒ [Register...],



4. In the [Register Profile] dialog window navigate and select the downloaded CSP+ profile, then click the “Register” button to execute the profile registration,

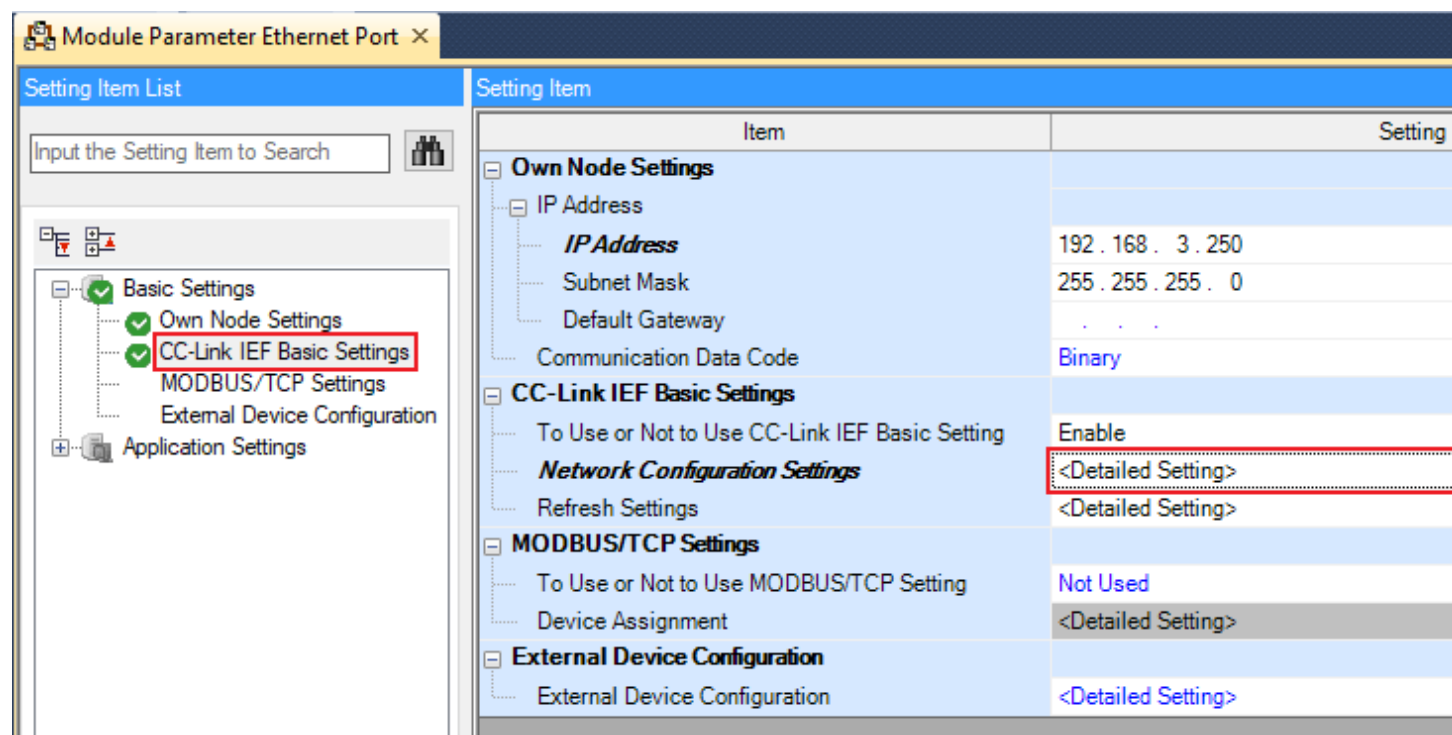


## CC-Link IE Field Basic Network Configuration and BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master node Setting

This section describes the procedure used for configuring the CC-Link IE Field Basic Network on the built-in Ethernet interface of a MELSEC FX5U(C)/FX5UJ CPU for successful communication with up to 16 BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master nodes.

1. In the [Module Parameter Ethernet Port] window's “CC-Link IEF Basic Settings” section, select and then double-click **Network Configuration Settings** <Detailed Setting>.





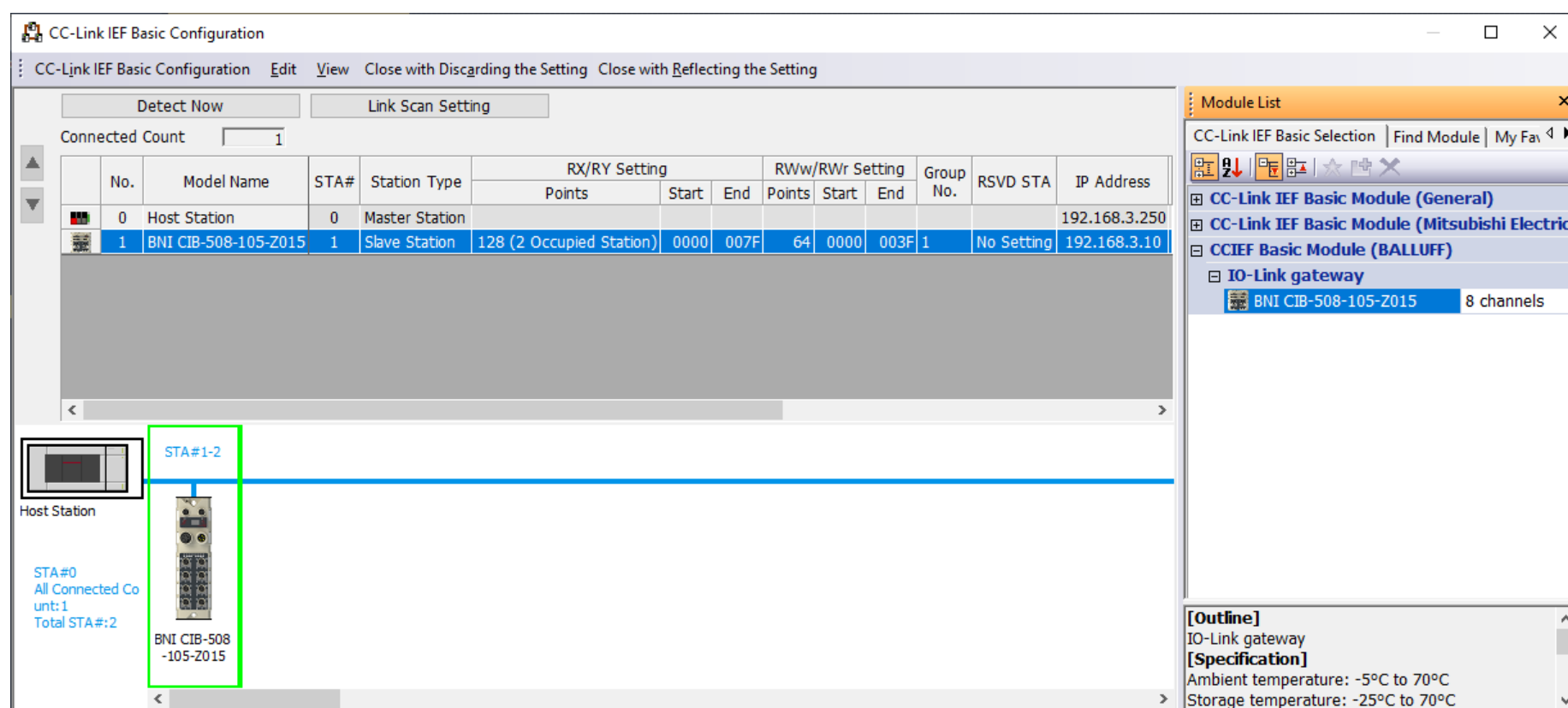
2. In the “CC-Link IEF Basic Configuration” window add the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link Master nodes to the configuration. In the Module List right panel expand the **CCIEF Basic Module (BALLUFF)** section and select an **IO-Link gateway** → **BNI CIB-508-105-Z015** node from the list, then drag-and-drop it to the network line. If the module is installed and connected to the network, it is recommended to click the “Detect Now” button, to detect and add it to the network configuration.

The BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master station default parameters will automatically be set (Profile 1) :

- Slave station, 2 Occupied Stations
- occupies 128 RX/Ry points
- occupies 64 RWr/RWw points

The default setting will allow a 4 data words input and 4 data words output data exchange with each IO-Link device connected on the IO-Link Master ports.

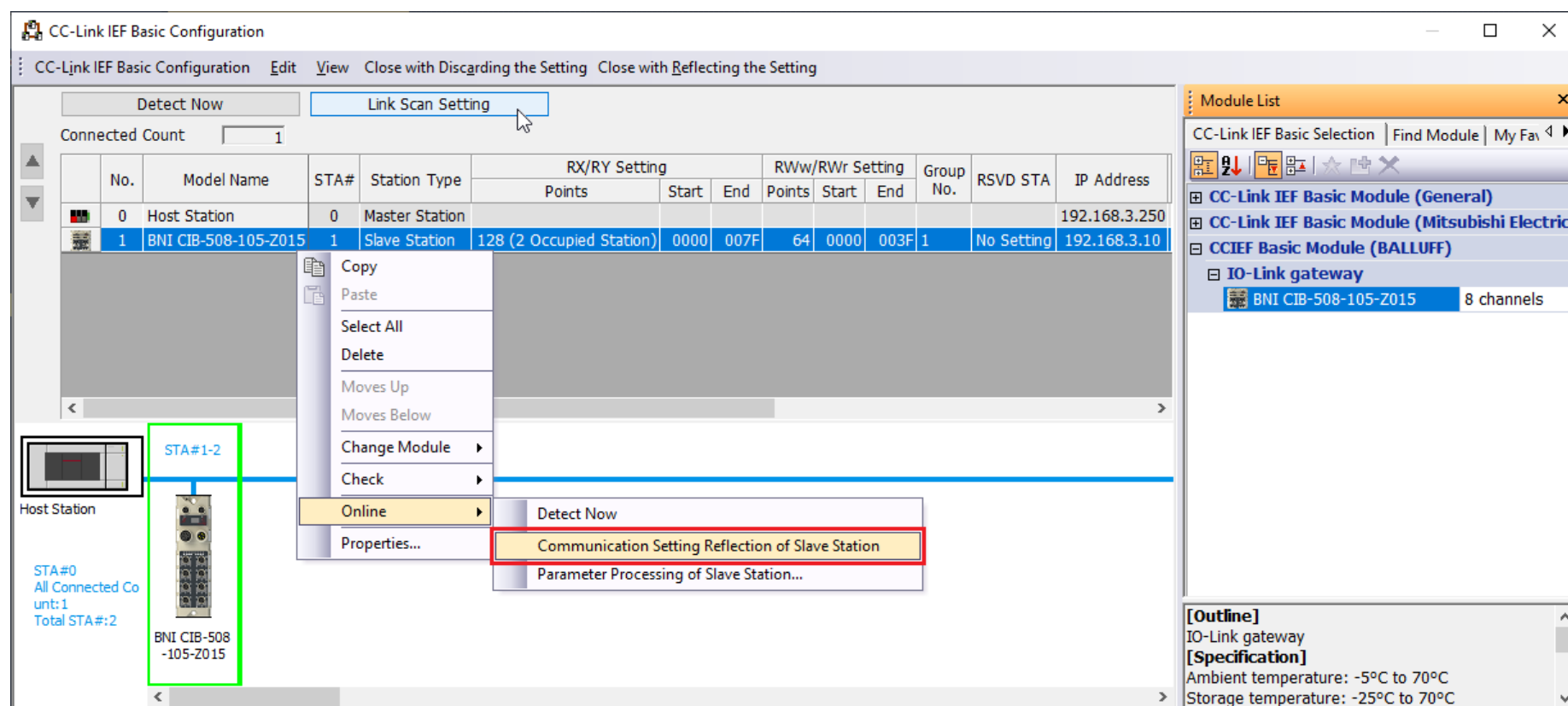
For more detailed information regarding the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master specifications, configuration and operation please consult the corresponding “Balluff BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master User’s Manual”.



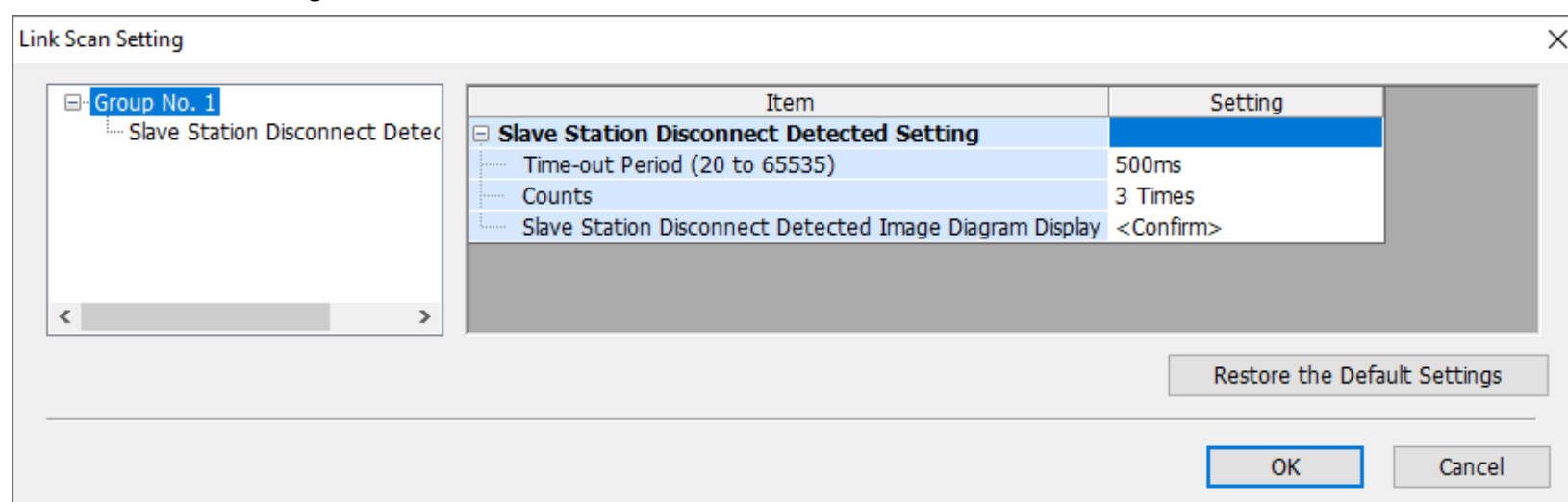
3. The number of stations occupied by the BNI CIB-508-105-Z015 CC-Link IE Field Basic IO-Link-Master can be changed to 3 (Profile 2) or 4 (Profile 3) and the IP address can also be set according to the specific network configuration. If the IO-Link Master is online and detected, right-click it in the configuration then select [Online] ⇒ [Communication Setting Reflection of Slave Station] to write the new communication settings on it. Once the settings are made, make sure to reset the IO-Link master unit to ensure the settings are operational.

Once the setting is completed, click the “Link Scan Setting” button to set the Link scan settings for the CC-Link IE Field Basic group containing the IO-Link Master.

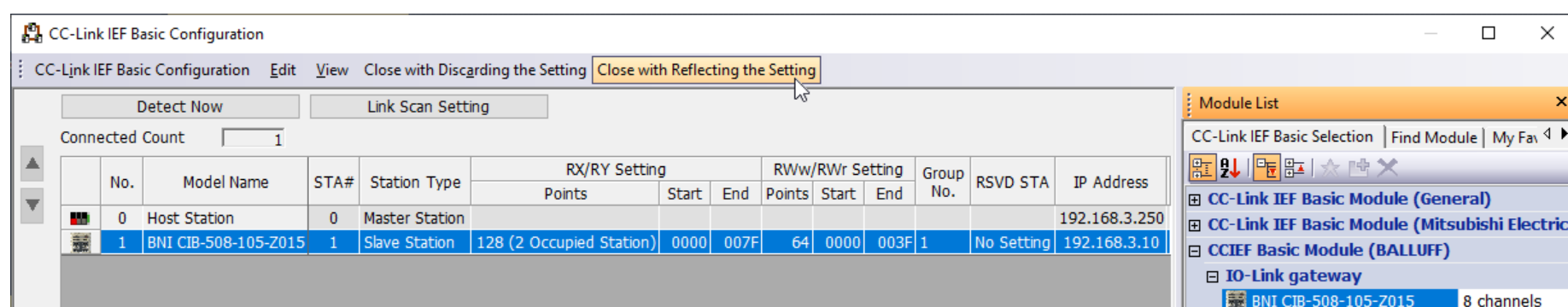




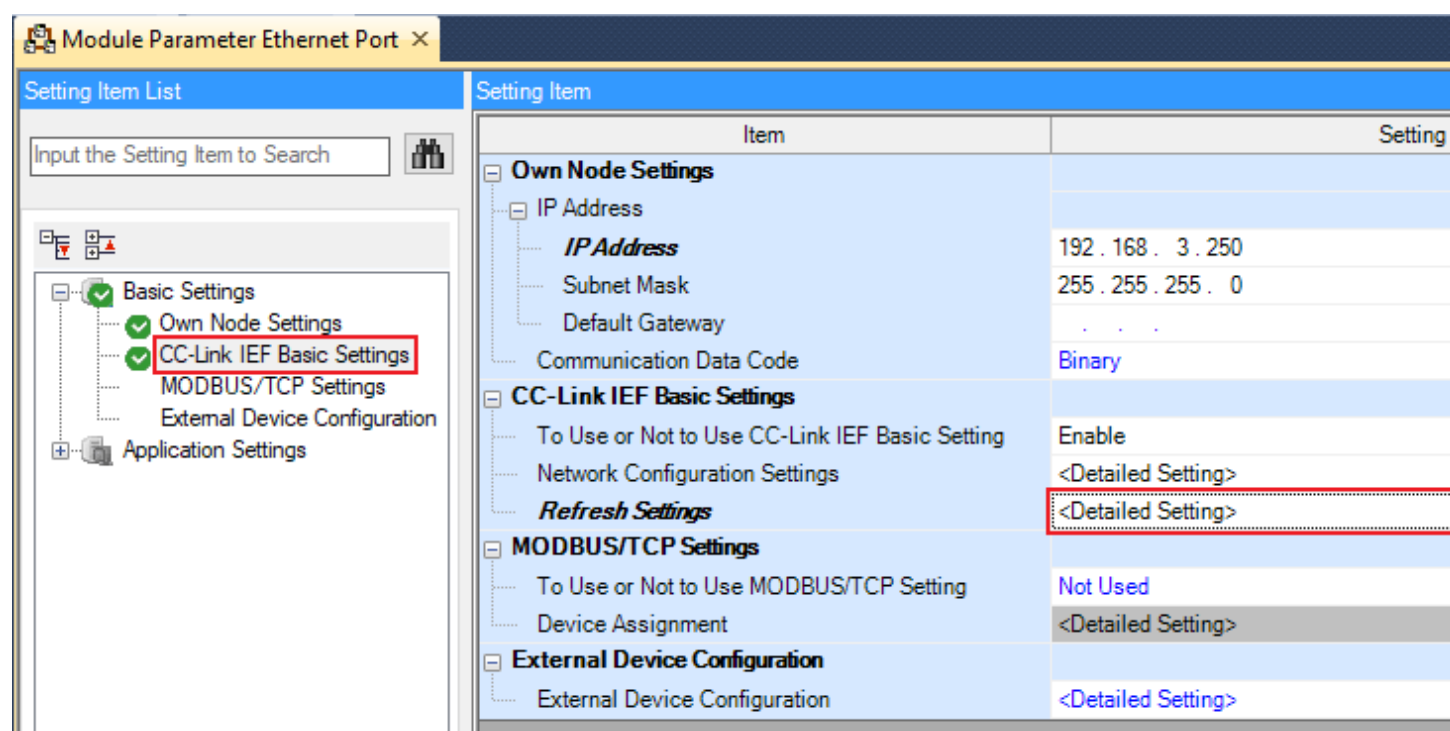
4. In the [Link Scan Setting] screen set the Slave station disconnect detected settings (Time-out, counts), then click the “OK” button to finalize the setting.



5. With the network configuration completed, click the “Close with Reflecting the Setting” button to save the changes for the project.



6. Next, to set the Refresh parameters for the CC-Link IEF Basic network, select and then double-click **Refresh Settings** <Detailed Setting> in the [Module Parameter Ethernet Port] window’s “CC-Link IEF Basic Settings” section.



7. For each Remote device type (RX, RY, RWr, RWw) set the corresponding PLC CPU device type and start address. The remote device type refresh area for all the stations in the network will be a contiguous device memory area starting from the specified addresses.

Setting Item

Link Side					CPU Side					
Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
RX	1024	00000	003FF	↔	Specify Device	B	1024	00000	003FF	
RY	1024	00000	003FF	↔	Specify Device	B	1024	00C00	00FFF	
RWr	512	00000	001FF	↔	Specify Device	W	512	00000	001FF	
RWw	512	00000	001FF	↔	Specify Device	W	512	00600	007FF	

**IMPORTANT !:** The auto-refresh memory area associated to the selected Station Number must be directly provided by the user to the [P+Balluff\\_CCLinkIEFieldBasicIOLinkP1\\_F](#), [P+Balluff\\_CCLinkIEFieldBasicIOLinkP2\\_F](#) or [P+Balluff\\_CCLinkIEFieldBasicIOLinkP3\\_F](#) gateway control function blocks using the `io_stLinkBasicInX` and `io_stLinkBasicOutX` input/output labels.  
A typical Global label setup for multiple frequency inverters can be seen in the image below:

Global [Global Label Setting]					
<Filter>		Easy Display	Display Setting	Check	
	Label Name	Data Type		Class	Assign (Device/Label)
1	G_stIOLinkBasicIn	stRemoteDataBasicIn(1..6)	...	VAR_GLOBAL	Detailed Setting
2	G_stIOLinkBasicOut	stRemoteDataBasicOut(1..6)	...	VAR_GLOBAL	Detailed Setting

The `G_stIOLinkBasicIn` global label is a data structure array mapped over the CC-Link IE Field Basic network auto-refresh memory area corresponding to the Remote input data (RX and RWr). One index of the array stores the cyclic input data corresponding to a single CC-Link IE Field Basic station number.

**Example:** `G_stIOLinkBasicIn[2]` would store the cyclic input data (RX and RWr) corresponding to the CC-Link IE Field Basic station number 2.

Structure Device Setting Window

Structure Array

stRemoteDataBasicIn

1

2

3

4

5

6

G\_stIOLinkBasicIn (stRemoteDataBasicIn[6])

Label Name	Data Type	Device
b64RX	Bit(0..63)	B0
u32RWr	Word [Unsigned]/Bit String [16-bit](0..31)	W0

Module Parameter Ethernet Port

Setting Item List

Input the Setting Item to Search

Basic Settings

Own Node Settings

CC-Link IEF Basic Settings

MODBUS/TCP Settings

External Device Configuration

Application Settings

Setting Item

Link Side					CPU Side					
Device Name	Points	Start	End		Target	Device Name	Points	Start	End	
RX	128	00000	0007F	↔	Specify Device	B	128	00000	0007F	
RY	128	00000	0007F	↔	Specify Device	B	128	00C00	00C7F	
RWr	64	00000	0003F	↔	Specify Device	W	64	00000	0003F	
RWw	64	00000	0003F	↔	Specify Device	W	64	00600	0063F	

Word Device: Bit Device:

☐ Use Bit Specification

OK

Cancel

The `G_sIOtLinkBasicOut` global label is a data structure array mapped over the CC-Link IE Field Basic network auto-refresh memory area corresponding to the Remote output data (RY and RWw). One index of the array stores the cyclic output data corresponding to a single CC-Link IE Field Basic station number.

**Example:** `G_stIOLinkBasicOut[2]` would store the cyclic output data (RY and RWw) corresponding to the CC-Link IE Field Basic station number 2.

Structure Device Setting Window

Structure Array

G\_stIOLinkBasicOut  
(stRemoteDataBasicOut[6])

Label Name	Data Type	Device
b64RY	Bit(0..63)	B0C00
u32RWw	Word [Unsigned]/Bit String [16-bit](0..31)	W600

stRemoteDataBasicOut

[1]

[2]

[3]

[4]

[5]

[6]

Module Parameter Ethernet Port

Setting Item List

Input the Setting Item to Search

Basic Settings

Own Node Settings

CC-Link IEF Basic Settings

MODBUS/TCP Settings

External Device Configuration

Application Settings

Setting Item

Link Side					CPU Side				
Device Name	Points	Start	End		Target	Device Name	Points	Start	End
RX	128	00000	0007F	↔	Specify Device	B	128	00000	0007F
RY	128	00000	0007F	↔	Specify Device	B	128	00C00	00C7F
RWr	64	00000	0003F	↔	Specify Device	W	64	00000	0003F
RWw	64	00000	0003F	↔	Specify Device	W	64	00600	0063F

Word Device:

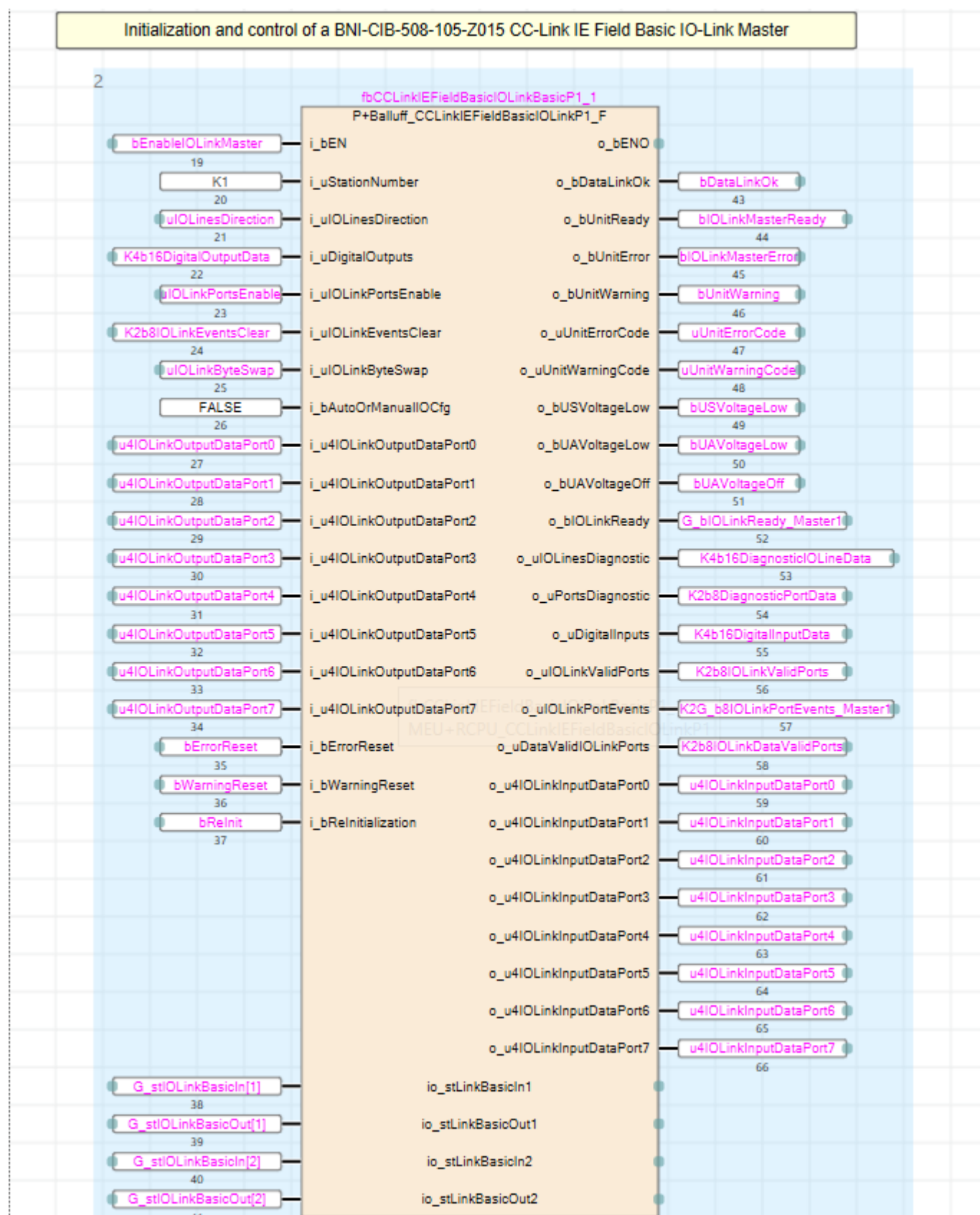
Bit Device:

☐ Use Bit Specification

OK

Cancel

The **G\_stIOLinkBasicIn** global label indexes corresponding to an IO-Link Master's station numbers would be used at the **io\_stLinkBasicInX** input labels of the control function block instance associated to that specific IO-Link Master, and the same applies to the **G\_stIOLinkBasicOut** global label with respect to the **io\_stLinkBasicOutX** input labels of the same control function block instance.



## 5 APPENDIX

### 5.1 List of IO-Link Master error codes

The `o_uUnitErrorCode` / `o_uUnitWarningCode` / `o_uIOLinkErrID` output labels are used to store the error code in case a BNI CIB-508-105-2015 CC-Link IE Field Basic IO-Link Master error has occurred during communication.

Major errors are displayed when there is a network interruption under Major Error in the display.

Moderate errors are displayed either in the `o_uUnitErrorCode` / `o_uUnitWarningCode` / `o_uIOLinkErrID` output labels if they were triggered by the IO-Link Master, or within the network PLC.

Moderate errors of an IO-Link device always begin with 0xE2XX. The actual IO-Link error code is in the lowest byte, e.g. 0xE235 for Function not available.

If IO-Link errors occur which are not described in this manual, please refer to the manual for the respective IO-Link device. Warnings are displayed in the Word area.

Error Hex.	code	Source	Clasification	Description / Procedure
0001H		Gateway	Critical	Watchdog was tripped. Take measures to prevent interference – use shielded cables. Then perform a restart.
0002H		Gateway	Critical	Internal bus error. See 0x0001
0003H		Gateway	Critical	Flash memory error. See 0x0001
0004H		Gateway	Critical	Buffer RAM access error. See 0x0001
0005H		Gateway	Critical	Internal communication error. See 0x0001



0101H	Gateway	Moderate	Undervoltage. Check the cyclical bit range to see which voltage is affected.
0102H	Gateway	Moderate	Diagnostics. Check the cyclical bit range to see which port or pin is affected.
0103H	Gateway	Warning	Station or network number changed while the system is running.
0104H	Gateway	Warning	Configuration changed while the system is running.
D529H	Gateway	Critical	LSI RAM error CIE initialization. See 0x001. Also check cable lengths and ground connections. A unit test can also be performed to preclude hardware errors.
D52AH	Gateway	Critical	LSI RAM error CIE MIB update. See 0x001. See 0xD529.
D52BH	Gateway	Critical	LSI error CIE MAC initialization. See 0x001. See 0xD529.
D52CH	Gateway	Critical	LSI error – opening of CIE communication. See 0x001. See 0xD529.
DOA0H	Network	Moderate	Transient reply timeout. If the station is disconnected from the network, try to localize the disconnection.
DOA1H	Network	Moderate	Transient completion timeout. Check the fieldbus wiring. Connect the device to a different fieldbus port. A unit test can also be performed to preclude hardware errors.
DOA2H	Network	Moderate	Transient transmission timeout. Check the transient communication frequency in the master.
DOA3H	Network	Moderate	Wrong or non-locatable station/network number. See 0xDOA0. In addition, the routing parameters can be checked in the master.
E106H	Gateway	Warning	Wrong data for the request. Check the data for the instruction RIWT.
E107H	Gateway	Warning	I0-Link request failed. Check the data for the instruction RIWT.
E108H	Gateway	Warning	Wrong I0-Link configuration data. Check the data for the instruction RIWT.
E109H	Gateway	Warning	Wrong attribute code, not externally byte-serial. Check the parameters for the instruction RIWT.
E110H	Gateway	Warning	Wrong attribute code, not internally word-serial. Check the parameters for the instruction RIWT.
E111H	Gateway	Warning	Number of telegram blocks greater than one.
E112H	Gateway	Warning	Wrong attribute code, not externally word-serial. Check the parameters for the instruction RIWT.
E113H	Gateway	Warning	Outside the address code. Check the parameters for the instruction RIWT.
E114H	Gateway	Warning	Outside the write size. Check the parameters for the instruction RIWT.
E115H	Gateway	Warning	Unknown Access codes. Check the parameters for the instruction RIWT.
E116H	Gateway	Warning	Wrong attribute code, not internally word-serial. Check the parameters for the instruction RIRD.
E117H	Gateway	Warning	Number of telegram blocks greater than one.
E118H	Gateway	Warning	Wrong attribute code, not externally word-serial. Check the parameters for the instruction RIRD.
E119H	Gateway	Warning	Outside the address code. Check the parameters for the instruction RIRD.
E120H	Gateway	Warning	Outside the read size. Check the parameters for the instruction RIRD.
E121H	Gateway	Warning	Unknown Access codes. Check the parameters for the instruction RIRD.
E123H	Gateway	Warning	Wrong data for the request. Check the data for the instruction RIRD.
E211H	IOL Device	Moderate	ISDU Index not available.
E123H	IOL Device	Moderate	ISDU Subindex not available.
E220H–E222H	IOL Device	Moderate	Service temporarily not available.
E223H	IOL Device	Moderate	– Access denied for ISDU Write command: Index is read-only. – Access denied for ISDU Read command: Index is write-only.
E230H	IOL Device	Moderate	Parameter value out of range.
E231H	IOL Device	Moderate	Parameter value above limit.
E232H	IOL Device	Moderate	Parameter value below limit.
E233H	IOL Device	Moderate	Parameter length overrun.
E234H	IOL Device	Moderate	Parameter length underrun.
E235H	IOL Device	Moderate	Function not available.
E236H	IOL Device	Moderate	Function temporarily not available.
E240H	IOL	Moderate	Invalid parameter set.

	Device		
E241H	IOL Device	Moderate	Inconsistent parameter set.

# REVISIONS

\* The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
July 2020	MEU-F0016-001-A	First edition.
June 2021	MEU-F0016-001-A	<b>Modified/corrected parts:</b> <ul style="list-style-type: none"><li>Updated library version history</li></ul>

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