

For Remote I/O RT Series: PROFINET Compatible Device unit
Function Block Installation Guide for ISDU Communication
(For Siemens TIA Portal (S7-1200))

1. PREFACE

This document is an installation guide for the function blocks that support ISDU communication processing. The users applicable to the following conditions are intended.

- Use Siemens PLC S7-1200 series
- Use the PROFINET Compatible Device unit of Remote I/O RT Series
- Use the IO-Link master unit of Remote I/O RT series
- Use ISDU communication which uses asynchronous communication

2. PRECAUTIONS

- Use the product by referring the relevant instruction manuals for the matters not described in this document
- It may result in unintended operation in case this function block has been changed
- IN THE EVENT THAT USER SUFFERS DAMAGES (INCLUDING BUT NOT LIMITED TO, LOSS OF BUSINESS INTERESTS, BUSINESS INTERRUPTION, LOSS OF BUSINESS OR ANY OTHER MONETARY LOSS) IN CONNECTION WITH THIS FUNCTION BLOCK, CKD'S AGGREGATE LIABILITY TO USER, WHETHER BASED UPON CONTRACT, TORT OR OTHERWISE, SHALL NOT EXCEED THE AMOUNTS PAID BY USER TO CKD, EQUIVALENT TO THE FEES FOR THE PERIOD DURING WHICH USER CAN NOT USE THE PROFINET COMPATIBLE DEVICE UNIT OF REMOTE I/O RT SERIES, UNLESS SUCH DAMAGE ARE CAUSED BY DUE TO THE WILLFUL MISCONDUCT OR GROSS NEGLIGENCE OF CKD.

3. INSTRUCTIONS FOR USE

- (1) Open a new or any project in TIA Portal.
- (2) From the Project View menu bar, select [Options] → [Global libraries] → [Open library...].
- (3) In the file selection window, change the file type to [Compressed libraries] and click "CKD-RT_FB.zal18".
- (4) In the next window opens, select the destination location to unzip the file.
- (5) Open the [Libraries] tab on the right side of the screen and confirm that "CKD-RT_FB" has been added to the [Global libraries].
- (6) Add the "RT_ISDUFB" from the Types section of "CKD-RT_FB" in the [Global libraries] window to the program by drag-and-drop, change the name to a suitable one, and click [OK].
- (7) After properly setting each argument of the FB, write the program to the PLC by clicking [Compile] → [Download to device].
- (8) Change the [execute] of FB from "FALSE" to "TRUE" and start the ISDU communication process.

Do not operate multiple of this function block simultaneously for the same IO-Link master unit. That may lead the operation result undefined. Make sure to check that other processing has been completed before setting

[execute] to TRUE.

- (9) Wait until [busy] turns "FALSE" and check that the "status" indicates successful completion (16#0000).

Operating test environment:

CPU 1214C AC/DC/Rly V4.2 TIA Portal V18 Update 3

4. MAJOR ERROR CODES

Followings are the tables of major error codes included in [status] and [diagnostics.subfunctionStatus] when [error] is "TRUE."

status

Error code	Description
16#8201	[port] is out of range (valid range: 0 to 7)
16#8202	[index] is out of range (valid range: 0 to 32767).
16#8203	[subindex] is out of range (valid range: 0 to 255)
16#8205	[writeLen] is out of range (valid range: 1 to 232)
16#8210	[unitPos] is out of range (valid range: 2 to 18)
16#8401	An error has occurred in the IO-Link master or IO-Link device. (The error code is stored in [diagnostics.subfunctionStatus]. Refer to the table below.
16#8403	The FB operation was not completed within the time set in the [timeout].
16#8601 16#8602	One of the following issues is occurring: - RT is not running or is not connected to the network. - The "hwID" is not assigned to RT. - There is no IO-Link master unit at the position specified by "unitPos."

diagnostics.subfunctionStatus

When status is "16#8401", an error occurred in the IO-Link master unit or IO-Link device is stored.

Error code	Description
16#0000_0000	One of the following issues is occurring: - No device is connected to the target port. - The target port is not in IO-Link mode.
16#0003_1180	The specified index does not exist.
16#0003_1280	The specified subindex does not exist.
16#0003_2380	An attempt was made to write to a read-only index.
16#0003_3080 16#0003_3180 16#0003_3280 16#0003_3580	The specified send data is outside the parameter range.
16#0003_3380	The specified send data byte length is too long.

5. FB ARGUMENT LIST

Name	P type	Data type	Start value	Description
execute	IN	Bool	FALSE	Execute FB when FALSE becomes TRUE
hwID	IN	HW_IO	0	"Hw_SubModule" assigned to RT (Enter the "Hw_SubModule" with the name "[RT name defined on the [Devices & networks] screen of TIA Portal]~Head". It normally is "CKD-RT-Series~Head".
readWrite	IN	Bool	FALSE	Read: FALSE Write: TRUE
unitPos	IN	Int	0	Location of the IO-Link master. Count from the leftmost IO unit excluding the Device Unit starting from 2.
port	IN	Int	0	The port number IO-Link device is connected
index	IN	Int	0	The index number to be read or written (refer to the instruction manual of the IO-Link device)
subindex	IN	Int	0	The subindex number to be read or written (refer to the instruction manual of the IO-Link device)
writeLen	IN	Int	0	Write data length (in bytes)
timeout	IN	Time	T#10s	FB operation will end with an error if it is not completed by this time. (Normally, this setting is not necessary.)
pollingPeriod	IN	Time	T#100ms	Check with this interval for the time from issuing the ISDU read/write command till the status of IO-Link master unit becomes complete or an error. (Normally, this setting is not necessary.)
done	OUT	Bool	FALSE	"TRUE" on normal termination (if "execute" is "FALSE" at the termination, it will be "TRUE" for only one scan but if the "execute" is "TRUE," it will be "TRUE" while it is "TRUE")
busy	OUT	Bool	FALSE	"TRUE" when FB is running, "FALSE" otherwise.
error	OUT	Bool	FALSE	"TRUE" on abnormal termination (if "execute" is "FALSE" at the termination, it will be "TRUE" for only one scan but if the "execute" is "TRUE," it will be "TRUE" while it is "TRUE")
status	OUT	Word	16#7000	Normal termination: 16#0000. Refer to "4. MAJOR ERROR CODES" in other cases.
diagnostics	OUT	"LIOLink_typeDiagnostics"	-	Diagnostic information (structure)
.status		Word	16#0000	Previous "status"
.subfunctionStatus		Dword	16#0000_0000	IO-Link error (refer to "4. MAJOR ERROR CODES") or internal WRREC/RDREC error.
.stateNumber		Dint	0	Always 0
readLen	OUT	Int	0	Read data length (in bytes)
record	IN_OUT	Array[*] of Byte	-	Read/Write data area - When reading: Data after the read data length is padded with 0s - When writing: Data after the write data length is ignored.

6. POINTS TO BE NOTED FOR USING FB

* "record" should be an array equal to or larger than the data size to be read or written (Recommended: Array[0..231] of Byte). If the size is not sufficient, it is read/written only for that much.