

B25 Process Data Function

April 14th, 2025

This document covers the installation and use of a function for Siemens' TIA Portal software package. This function handles cyclic IO-Link Process Data Out to a Banner B25 via an IO-Link Master from a Siemens PLC. The function covers parsing and display of the B25 sensor Process Data Out.

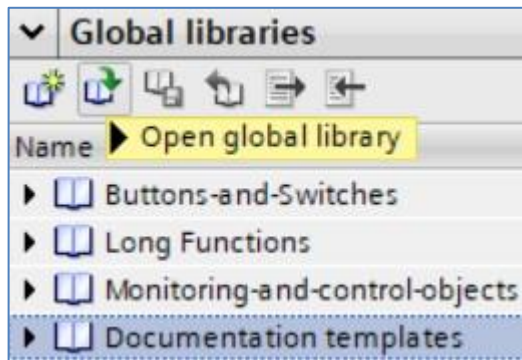
Components

Banner B25 Library v16.zal16

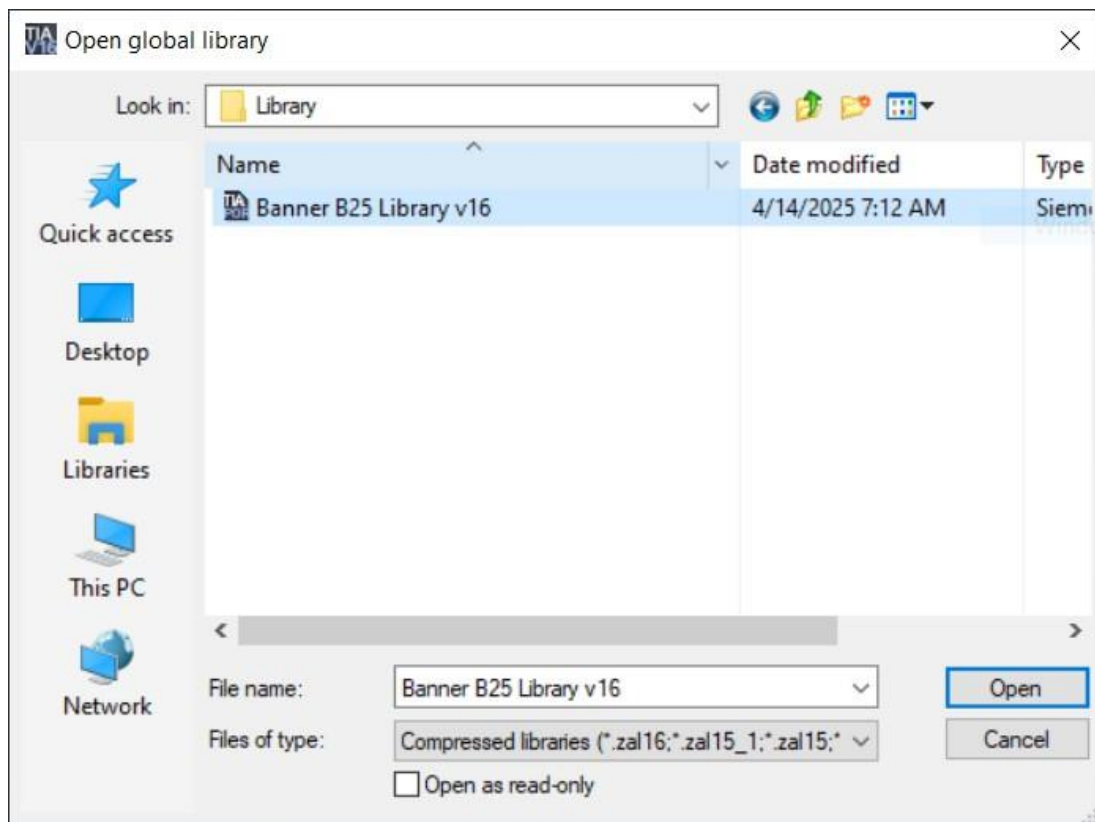
There are two methods for process data. The first is used when creating a connection to Banner's IO-Link masters. The second set of instructions are for systems using other manufacturers' IO-Link masters.

Installation Instructions

1. Open a project.
2. Go Global Libraries and select the Open Global Library option. Switch Files of Type to Compressed Libraries.



3. Select Banner B25 Library v16. Click Open.



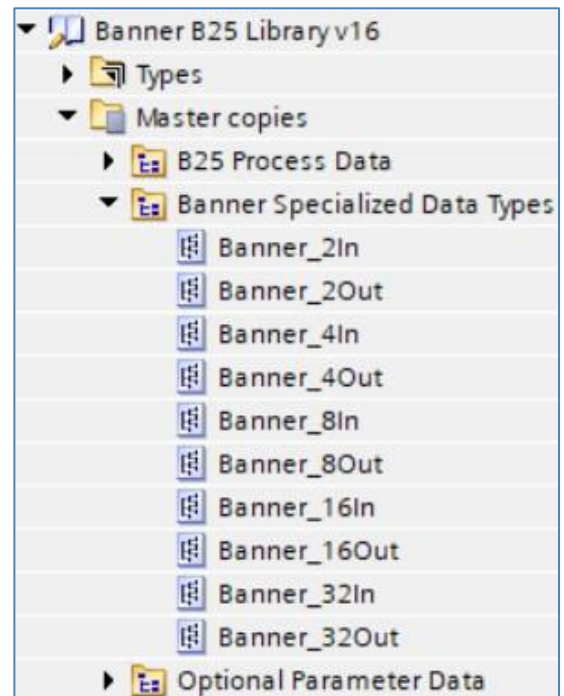
4. The library is now accessible in the Libraries tab.
5. Go to page 3 for Banner IO-Link Masters, to page 5 for all other IO-Link Masters.

Setup of B25 with a Banner DXMR

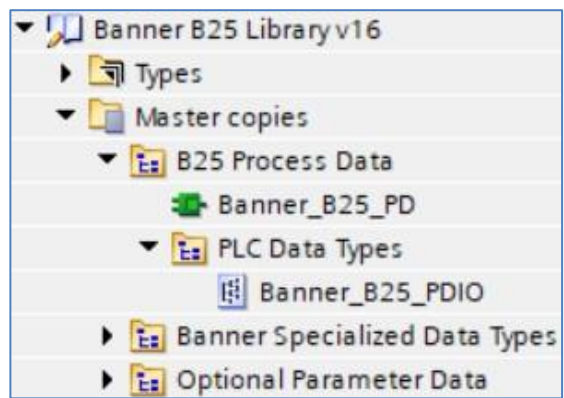
1. Go to Device and Networks to configure the DXMR. Add the DXM if it has yet to be added to the system.
2. Add Banner IO-Link Master Info to Slot 1. This sets the DXMR for IO-Link mode.
3. Open the IO-Link Generic Devices and select the proper module. The **4/4 byte** is required for **B25**. Make note of the input %I10 address for Slot 2 which represents Port 1.

Module	Rack	Slot	I address	Q address	Type
▼ dxm	0	0			1-port Device
▶ Interface	0	0 X1			dxm
Banner IO-Link Master Info_1	0	1	1...9		Banner IO-Link Master Info
IO-Link In/Out 4/ 4 Byte + Status_1	0	2	10...17	1...18	IO-Link In/Out 4/ 4 Byte + Status

4. Drag the necessary tag from Banner_Specialized_Data_Types. The tag used in this example is "Banner_4In". This tag represents the full raw process data along with port status information.
5. Open B25 Process Data folder.



6. Drag the necessary files from the B25 PD Folder.
 - a. Move Banner_B25_PDIO from the PLC Data Types folder.
 - b. Move Banner_B25_PD to the Program Blocks area.



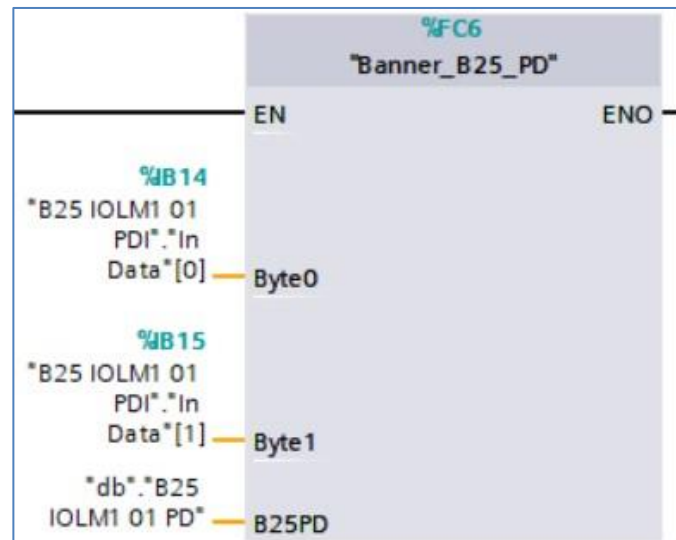
7. Go to PLC Tags. Create one tag. One set of tags is for the full data structure while the second set creates tags to represent the raw Process Data from the IO-Link Master. In this example, Tag table_1 was created, then the tag “B25 IOLM1 01 PDI” was created using a Data Type of “Banner_4In”. This naming convention calls out the type of device in question as well as the specific IO-Link Master and port number to which the sensor is connected. A different IO-Link Master might be named IOLM2 or IOLM3, for instance, and other specific sensors may be connected to different port numbers.

Name	Data type	Address
▶ B25 IOLM1 01 PDI	"Banner_4In"	%I10.0

8. Go to Program blocks. Add a new Data block if necessary. In this example the new data block is named “db”.
9. In the new data block, create a new tag to represent the parsed Process Data Output for our B25. The tag name again calls out the type of sensor, the IO-Link Master, and the port number. Use the data type “Banner_B25_PDIO” for the new tag.

Name	Data type
▼ Static	
■ ▼ B25 IOLM1 01 PD	"Banner_B25_PDIO"
■ Output State	Bool
■ Alarm State	Bool
■ Signal Level	USInt

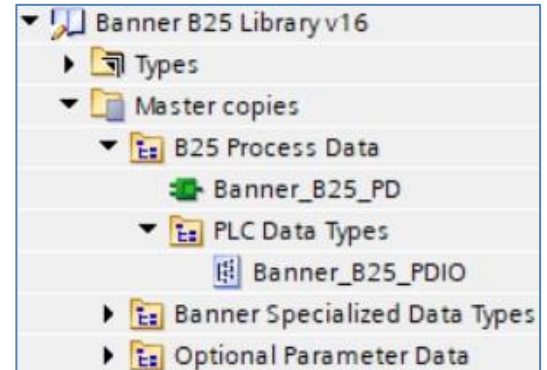
10. Add the “Banner_B25_PD” function to an OB ladder. Link the “Byte0” and “Byte1” to the raw process data variable from step 5. The tag name again calls out the type of device, IO-Link Master, and the port number. Use the variable called “B25 IOLM1 01 PDI”.”In Data”.[0] and “B25 IOLM1 01 PDI”.”In Data”.[1] from step 7. The “B25PD” needs to be linked to the variable created in step 9. It was called “db.B25 IOLM1 01 PD” for this example.
11. Process Data Setup is complete.
12. Compile and download the configuration to the PLC, then go online. Open the “db” data block and click Monitor all. The B25 can be controlled now.



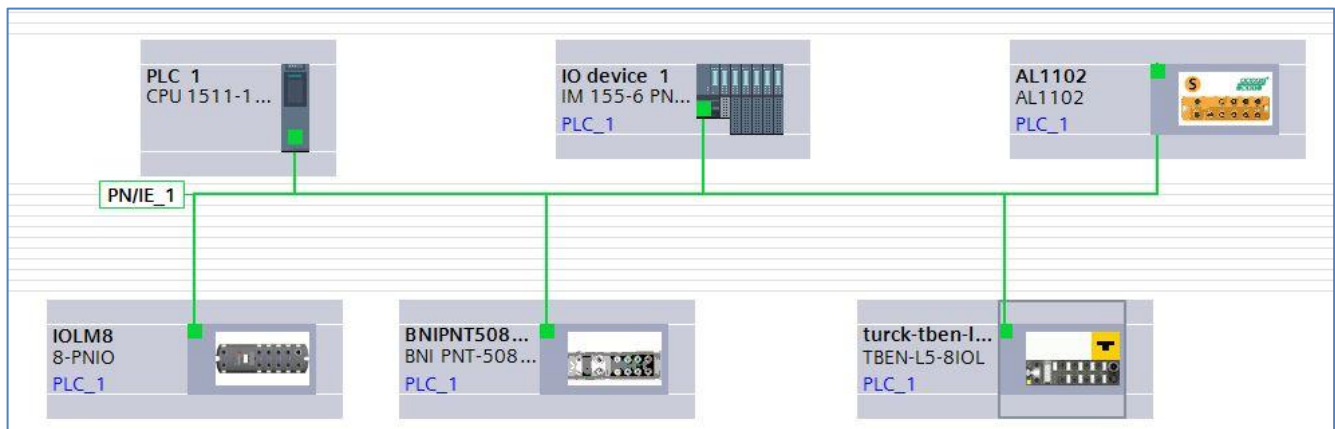
Setup of B25 with other IO-Link Masters

1. The Banner B25 library will now be in the Global Library List. Expand the Master copies section. Open the B25 PD folder.

2. Drag the necessary files from the B25 PD Folder.
 - a. Move Banner_B25_PDIO from the PLC Data Types folder.
 - b. Move Banner_B25_PD to the Program Blocks area.



3. Go to Devices and networks to configure the system as necessary. Below is an example of what a configuration might look like. This example shows five different IO-Link Masters connected to the same PLC.



4. Click on the relevant device and configure the IO-Link Master as necessary. Refer to the documentation for the IO-Link Master. Recall that a B25 requires 4 bytes of space for the Process Data In.
5. Record the "I" address where this B25 Process Data is to be stored, as these addresses will be required in the next step. In this example, 4 bytes of Process Data In will be stored in I68 through I71.

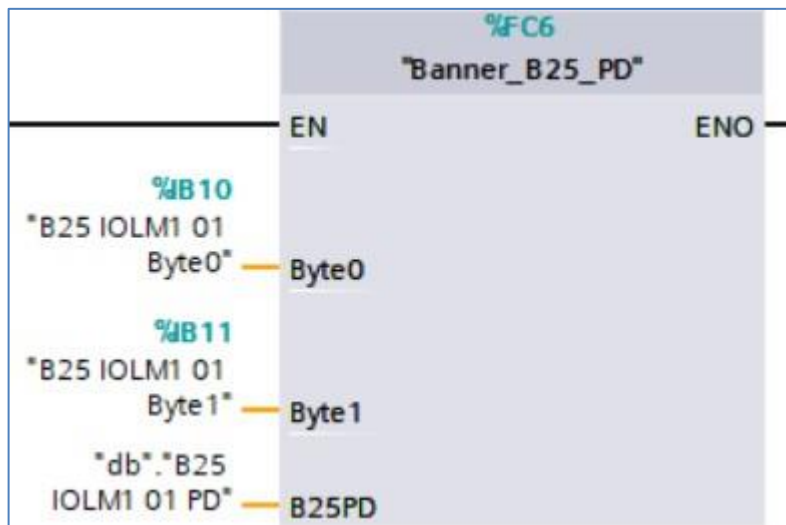
6. Go to PLC Tags. Add a new tag table, then create a new tag to represent the raw Process Data In to be sent from the IO-Link Master. In this example, Tag table_1 was created, then the tags “B25 IOLM1 01 Byte0” and “B25 IOLM1 01 Byte1” was created using a Data Type of “USINT”. This naming convention calls out the type of sensor in question as well as the specific IO-Link Master and port number where the sensor is connected. A different IO-Link Master might be named IOLM2 or IOLM3, for instance, and other specific sensors may be connected to different port numbers

B25 IOLM1 01 Byte0	USInt	%IB10
B25 IOLM1 01 Byte1	USInt	%IB11

7. Go to Program blocks. Add a new Data block if necessary. In this example the new data block is named “db”.
8. In the new data block, create a new tag to represent the parsed Process Data In for our B25. The tag name again calls out the type of sensor, the IO-Link Master, and the port number. Use the data type “Banner_B25_PDIO” for the new tag.

Name	Data type
▼ Static	
■ ▼ B25 IOLM1 01 PD	"Banner_B25_PDIO"
■ Output State	Bool
■ Alarm State	Bool
■ Signal Level	USInt

9. Add the "Banner_B25_PD" function to an OB ladder. Link the "Byte0" and "Byte1" to the raw Process Data In variable from step 6. Link "B25PD" to the parsed Process Data variable from step 8.



10. Process Data setup is complete.
11. Compile and download the configuration to the PLC, then go online. Open the "Banner IO-Link Data" data block and click Monitor all. You should see parsed B25 Process Data In.

Using B25 Process Data

The B25 Process data has three items. B25 units only have input data.

Name	Data type
▼ Static	
■ ▼ B25 IOLM1 01 PD	"Banner_B25_PDIO"
■ Output State	Bool
■ Alarm State	Bool
■ Signal Level	USInt

1. Output State: Gives the status of the output for B25.
2. Alarm State: Gives the status of the sensor.
3. Signal Level: Gives the signal value of the B25.

Appendix A**B25 Process Data**

B25 has 2 bytes of Process Data In. This function intelligently parses this Process Data into its component pieces.

ProcessDataIn "Process Data Input" id=PD_ProcessDataIn

bit length: 16

data type: 16-bit Record (subindex access not supported)

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	description
1	0	Boolean	false = Inactive, true = Active					Output State	Output State
2	1	Boolean	false = Inactive, true = Active					Alarm State	Alarm State
3	8	8-bit UInteger						Signal Level	Signal Level - Select signal type in index 64 subindex 14