TL70 Profinet Setup Guide
June 5th, 2024

This document covers the installation of a Banner TL70 Ethernet or Power over Ethernet device in Siemens TIA Portal. The setup is done using PLC Data Types.

Library Components

Banner TL70E Advanced Output
Banner TL70E Basic Config
Banner TL70E Basic Output
Banner TL70E In
Banner TL70E In PN FM
Banner TL70E Segment

Contents

1.   Configuring the TL70 Ethernet Connection

Make a Profinet connection to the TL70 device using the DXM GSD. Install the DXM GSD file if necessary. Create an Ethernet communications module for the TL70 device.

1. Open a project.
2. Go to Devices and networks and add a Banner DXM. The TL70 has a built-in DXM chip inside of it for Profinet. Should get something like the image below.
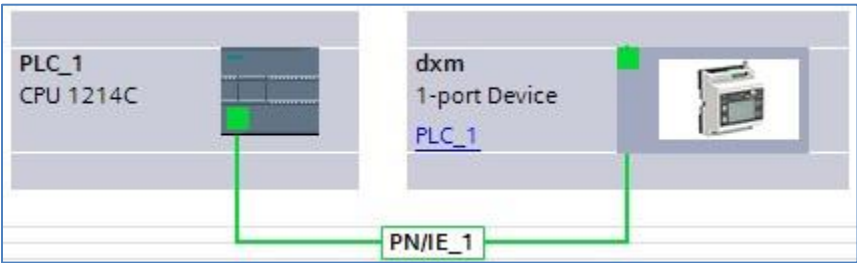
3. Go to Device View. Configure Slot 7 with 256 bytes integer output. The connection should look something like the below image. The Output addresses shown will be used for this example. This is the only link that is needed to control the TL70 Ethernet light.

Module	Rack	Slot	I address	Q address	Type
▼ dxm	0	0			1-port Device
▶ Interface	0	0 X1			dxm
	0	1			
	0	2			
	0	3			
	0	4			
	0	5			
	0	6			
256 bytes Integer Output_1	0	7		68...323	256 bytes Integer Output

4. Slots 1 and 3 are optional. Slot 1 should have 64 bytes integer input linked to it. Slot 3 is configured with 512 bytes integer input. The connection should look something like the below image. The Input addresses shown will be used for this example. Slot 1 gives information on the current mode of the Tower Light. Slot 3 gives the information on Firmware and Product information.

Module	Rack	Slot	I address	Q address	Type
▼ dxm	0	0			1-port Device
▶ Interface	0	0 X1			dxm
64 bytes Integer Input_1	0	1	68…131		64 bytes Integer Input
	0	2			
512 bytes Integer Input_1	0	3	132…643		512 bytes Integer Input
	0	4			
	0	5			
	0	6			
256 bytes Integer Output_1	0	7		68…323	256 bytes Integer Output

5. Profinet connection to TL70 is now complete.

2.   Opening and Using TL70 Profinet Library

This section describes how to install the TL70 Ethernet Library. It may be necessary to Retrieve the Library from its archived state. Follow the TIA Portal process for that retrieval.

1. Open the Banner TL70 PoE Siemens Library.
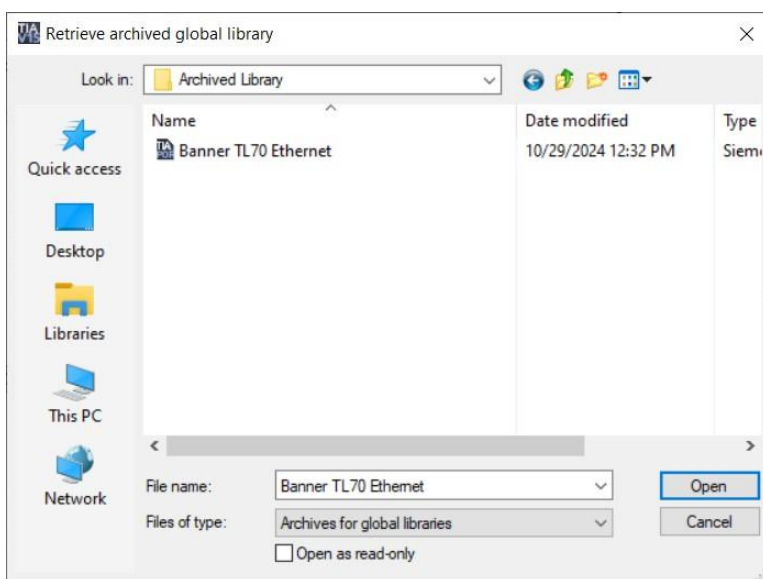
2. Expand the Master copies folder in the Library.
3. Move the PLC Data Types in the Master folder to the PLC Data Types folder under the PLC.
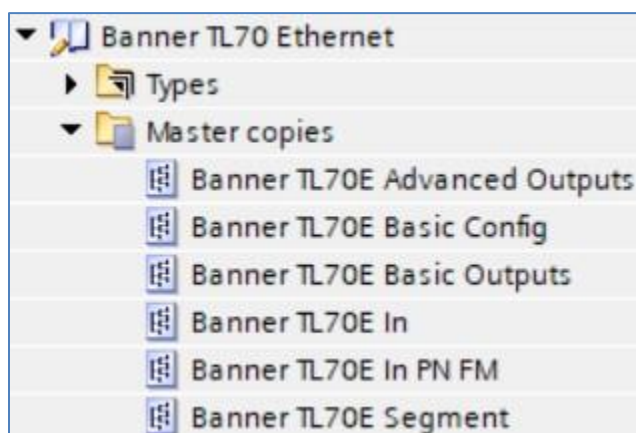
4. Create one Output (Required) Tag and 2 Input (Optional) Tags under PLC Tags. Link the Outputs tag with the Data Type "Banner TL70E Advanced Outputs". Link the inputs as shown in the image.

Name	Data type	Address
▶ Outputs	"Banner TL70E Advanced Outputs"	%Q68.0
▶ Inputs Standard	"Banner TL70E In"	%I68.0
▶ Inputs PN FM	"Banner TL70E In PN FM"	%I132.0

5. Setup and configuration are complete.

3.   Using the TL70 Ethernet Tags

Start with the Inputs Standard Tag. This is an optional tag that gives information on the number of segments the connected TL70 has. It also states the current mode of the tower light. If this information is not needed for the application do not create this tag.

▼	Inputs Standard	"Banner TL70E In"	%I68.0
	Num of Segments	UInt	%IW68
	Operation Mode	UInt	%IW70

The second input is also optional. In this example it was called Inputs PN FM. This tag has the Part Number and Firmware version for the tower light. If this information is not needed for the application do not create this tag.

▼ Inputs PN FM	"Banner TL70E In PN FM"	%I132.0
▶ Reserved	Array[1..93] of UInt	%I132.0
▶ Name	Array[1..10] of UInt	%I318.0
▶ Product Name	Array[1..16] of UInt	%I338.0
Item H	UInt	%IW370
Item L	UInt	%IW372
▶ Serial Numer	Array[1..4] of UInt	%I374.0
▶ Firmware PN	Array[1..2] of UInt	%I382.0
▶ Firmware Version	Array[1..2] of UInt	%I386.0
▶ Firmware Build	Array[1..2] of UInt	%I390.0
▶ User Defined Tag	Array[1..11] of UInt	%I394.0

The output tag is required as it allows for the control of the light. The Data Type "Banner TL70E Advanced Outputs" configures all the tags needed for the light.

Outputs	"Banner TL70E Advanced Outputs"	%Q68.0
▶ Segment	Array[1..5] of Banner TL70E Segment	%Q68.0
Audible Type	UInt	%QW138
Audible Volume	UInt	%QW140
Audible Tone	UInt	%QW142
Custom Speed	UInt	%QW144
Custom Intensity	UInt	%QW146
Operation Mode	UInt	%QW148
Reserved1	UInt	%QW150
Reserved2	UInt	%QW152
Reserved3	UInt	%QW154
Reserved4	UInt	%QW156
Reserved5	UInt	%QW158
Reserved6	UInt	%QW160
Reserved7	UInt	%QW162
Reserved8	UInt	%QW164
Reserved9	UInt	%QW166
▶ Basic Config	Array[1..5] of Banner TL70E Basic Config	%Q168.0
Basic Audible Type	UInt	%QW258
Basic Audible Volume	UInt	%QW260
Basic Audible Tone	UInt	%QW262

The segment array controls each individual segment. The array has a size of 5 which represents the possible 5 segments for a tower light. Only use the required number of segments for the light you have.

▼ Segment	Array[1..5] of Banner TL70E Segment	%Q68.0
▶ Segment[1]	Banner TL70E Segment	%Q68.0
▶ Segment[2]	Banner TL70E Segment	%Q82.0
▶ Segment[3]	Banner TL70E Segment	%Q96.0
▶ Segment[4]	Banner TL70E Segment	%Q110.0
▶ Segment[5]	Banner TL70E Segment	%Q124.0

Each Segment has the following tags for controlling the segment. Set the necessary options for the segment to get it to light up in the manner needed for the application.

1. Animation: This controls the type of animation that the light uses. This needs to be a non-zero value for the light to turn on. Zero represents the Off state. Some examples of animation modes are: 1 for On, 2 for Flashing, 3 for 2 Color Flash, etc. The comment section for the tag gives all the possible options. Can also reference the option in the user's manual.
2. Color 1: This controls the color of the light. Color 1 is used for every Animation. There are several possible color options. Some of the options are: 0 for green, 1 for red, 2 for orange, etc. The comment section for the tag gives all the possible options. Can also reference the option in the user's manual.
3. Color 2: This controls the color of the light when moving between two colors. This is only used for the 2 color animation options.
4. Color 1 Intensity: Controls the light intensity of the light. There are 5 options: 0 for High, 1 = Medium, 2 = Low, 3 = Off, and 4 = Custom.
5. Color 2 Intensity: Controls the light intensity of the light. There are 5 options: 0 for High, 1 = Medium, 2 = Low, 3 = Off, and 4 = Custom.
6. Speed: This controls the speed for Animation modes with Flash, Rotate, Chase, or Sweep in the name. There are 4 options: 0 for Slow, 1 for Medium, 2 for Fast, and 3 for Custom.
7. Pattern: Is used for the flash pattern. There are 5 options: 0 for Normal, 1 for Strobe, 2 for Triple Pulse, 3 for SOS, and 4 for Random.

Segment[1]	Banner TL70E Segment	%Q68.0
Animation	UInt	%QW68
Color 1	UInt	%QW70
Color 2	UInt	%QW72
Color 1 Intensity	UInt	%QW74
Color 2 Intensity	UInt	%QW76
Speed	UInt	%QW78
Pattern	UInt	%QW80