

Application description • 2021

TIA Addin - IO List Import

TIA Portal / V16

Warranty and liability

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1 Task

1.1 Discussion

The initial creation of a project can be a critical piece in developing a successful workflow for an engineering team to develop from. Inconsistencies and changes to the hardware architecture can have time consuming consequences if it changed during the project development, especially in a team environment. This does regularly occur due to uncovering details in a project that were not known at the start of the project, though it also occurs due to errors in component selection. To avoid issues in equipment selection and configuration an automated approach in the initial creation of the hardware architecture can save time throughout the project.

In addition, it is beneficial to see limitation in the hardware architecture by configuring it and compiling it in TIA Portal. If the hardware is created in an automated manner this check can be done with minimal effort and time expended.

It is common for a projects IO list to be created in the early stages of a project prior to programming. As well this tends to be a living document throughout the project and contains the latest updates to the project configuration. Therefore this is a good document to point to when creating an architecture as it contains vital information for the hardware including part selection, IO count, and additional details associated with the IO such as voltage type, etc. This application note will review an implementation of a TIA Add-In that utilizes an IO list to create the hardware architecture and tagging scheme.

1.2 Example Applications

This application example will run through how to operate the preconfigured TIA Add-In.

To enhance the ability of the TIA user, the Add-In discussed in this application note, will allow the user to mass import data from an IO list to be able to populate the hardware architecture with the correct parts and settings. The typical work flow that has been envisioned is to build the project using the selection tool and order the equipment with that list, and with the built in features of TIA Selection and TIA Portal that configuration can be directly imported into Portal to allow for quick project generation. This method works great, but the work flow is not always followed, or the engineer tasked with developing the hardware architecture either does not trust the created selection tool file or has not received it.

In addition to the initial creation of the hardware architecture, the application allows for individual settings to be configure, and all of the IO tagnames will be created as PLC tags. The benefit of creating a project in this manor becomes apparent as the size of the project increases. This tool allows for all of the associated IO to be organized per the IO list. The IO list is typically a living document on many projects, it can be crafted as the centerpiece of the automation project in which all other information is derived. This process is achievable if the project has gone through a standardization process.

1.3 Components used

This application example has been created with the following hardware and software components:

Table 1-1

Component	Article number	Note
TIA Portal V16- Step 7 Professional	6ES78221AE060YA5	
Visual Studios 2019		

This application example consists of the following components:

Table 1-2

Component	File name	Note
TIA Portal Project	Openness Creation.zap16	TIA Portal Project Archive
Visual Studio Project	Io-list-import-tia-add-in.zip	
TIA Addin – IO List Import	TIA_Addin_IO_List_Import.addin	

1.4 Engineering

Related literature

Table 1-3

	Topic	Title / Link
\1\	TIA Openness V16 Manual	SIMATIC TIA Portal Openness: Automating Creation of Projects Entry ID: 109773802
\2\	TIA Openness Getting Started	TIA Portal Openness: Introduction and Demo Application Entry ID: 108716692
\3\	TIA Openness Explorer	TIA Openness Explorer Entry ID: 109760816

2 Engineering

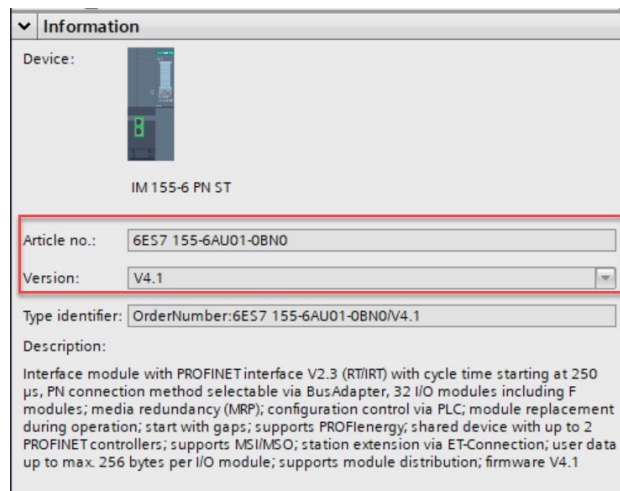
2.1 Configuration of IO List

The IO list for this application is required to have a specific layout. The following displays a sheet with all of the required columns in the order they need to be for this version of the tool.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Tagname	IO Type	Rack	Slot	Channel	PLC	Signal Type	Part Number	Firmware Version	IP Address	Subnet Mask	Default Gateway
2	N/A	PLC	N/A	N/A	N/A	Main	N/A	6ES7 516-3AN01-0AB0	V2.8	172.168.0.21	255.255.255.0	N/A
3	N/A	PLC	N/A	N/A	N/A	Plant	N/A	6ES7 516-3AN01-0AB0	V2.8	172.168.1.21	255.255.255.0	N/A
4	N/A	PLC	N/A	N/A	N/A	Line	N/A	6ES7 516-3AN01-0AB0	V2.8	172.168.2.21	255.255.255.0	N/A
5	N/A	IM		1	N/A	Main	N/A	6ES7 155-6AU01-0BNO	V4.1	192.168.0.31	255.255.255.0	N/A
6	Digital Input 1	DI		1	1	0 Main	24VDC	6ES7 131-6BF01-0BA0	V1.1			
7	Door Open	DI		1	1	1 Main	24VDC	6ES7 131-6BF01-0BA0	V1.1			

For the tool to function the IO list must have this format. There are several rules and limitations that should be realized to allow for smooth operations:

1. PLC's and IM's must be listed on the IO list to facilitate the system creation
2. Part number and firmware must match TIA Portal exactly:



3. Cells that do not include information can be filled out with "N/A" or "".
4. If IP information is not entered, default values will be used.
5. Tagnames, Rack names/numbers, and PLC names must be unique.
6. Slot and channel must be numbers.
7. The import uses a .csv file for the actual import, so if this is done in excel or other workbook editors, save off a .csv version. See raw contents of the file:

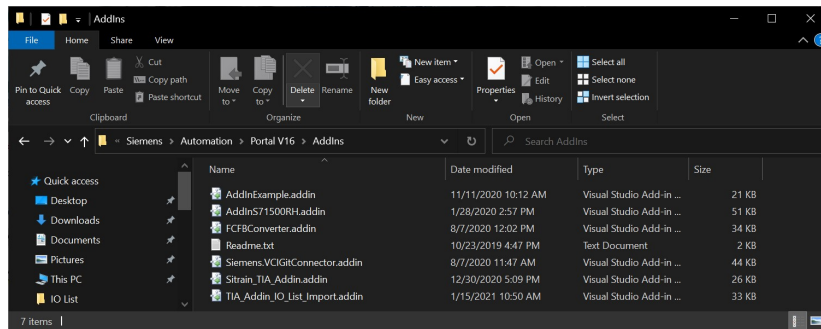
```

1 Tagname,IO Type,Rack,Slot,Channel,PLC,Signal Type,Part Number,Firmware Version,IP Address,Subnet Mask,Default Gateway
2 N/A,PLC,N/A,N/A,N/A,Main,N/A,6ES7 516-3AN01-0AB0,V2.8,172.168.0.21,255.255.255.0,N/A
3 N/A,PLC,N/A,N/A,N/A,Plant,N/A,6ES7 516-3AN01-0AB0,V2.8,172.168.1.21,255.255.255.0,N/A
4 N/A,PLC,N/A,N/A,N/A,Line,N/A,6ES7 516-3AN01-0AB0,V2.8,172.168.2.21,255.255.255.0,N/A
5 N/A,IM,N/A,N/A,Main,N/A,6ES7 155-6AU01-0BNO,V4.1,192.168.0.31,255.255.255.0,N/A
6 Digital Input 1,DI,1,1,0,Main,24VDC,6ES7 131-6BF01-0BA0,V1.1,,,
7 Door Open,DI,1,1,1,Main,24VDC,6ES7 131-6BF01-0BA0,V1.1,,,
8 Door Close,DI,1,1,2,Main,24VDC,6ES7 131-6BF01-0BA0,V1.1,,,

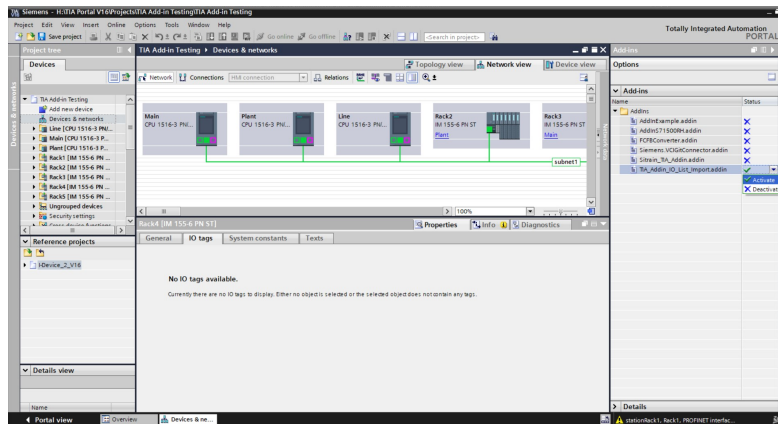
```

2.2 Installing Add-In

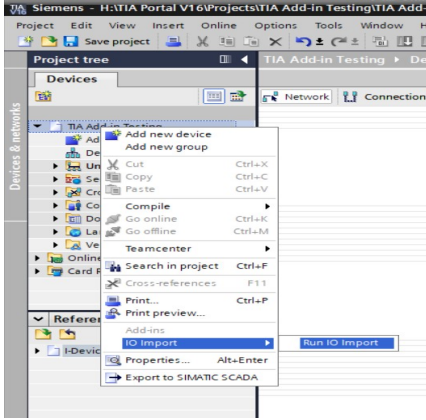
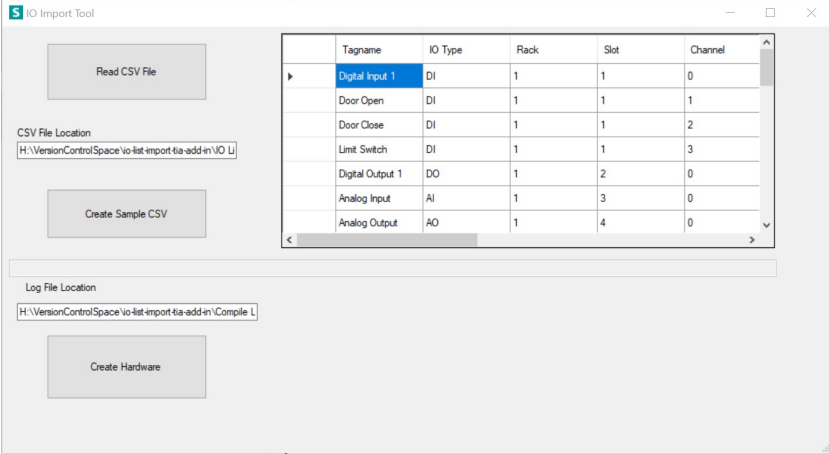
To install the add-in the .add-in files needs moved so that TIA Portal can read it. Find the .addin file in the attachments to this application note and copy it in the “Addins” folder in the installation directory of TIA Portal.



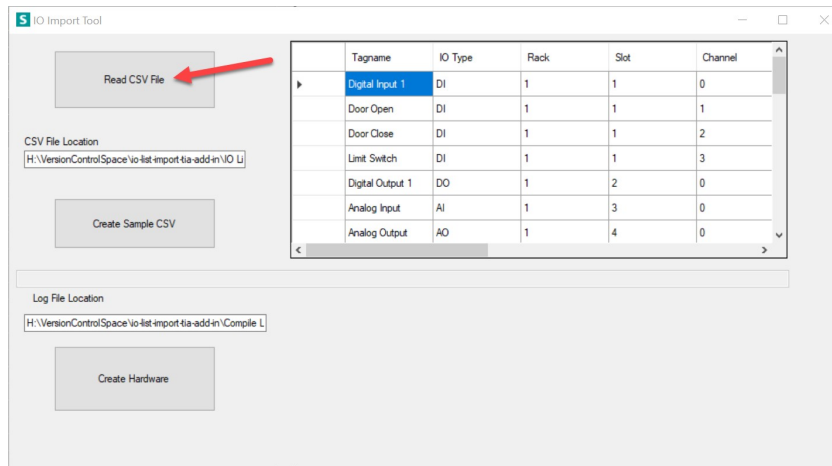
Then activate the Add-in from the Add-in Tab:



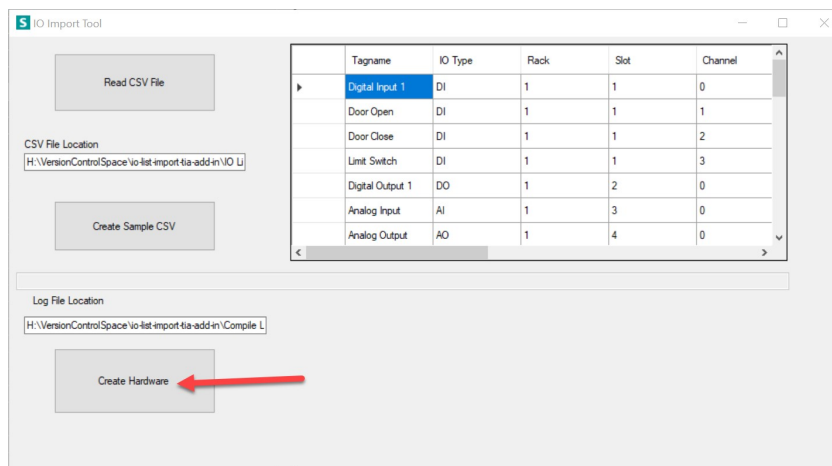
2.3 Running Add-In

Step:	Action:
1.	<p>To run the tool, right click on any item of the project tree and point to "IO Import". It may take a moment, when the menu item "Run IO Import" appears select it:</p> 
2.	<p>A new window will appear. Select the IO field labelled "CSV Location:" to set the path to the IO List:</p> 

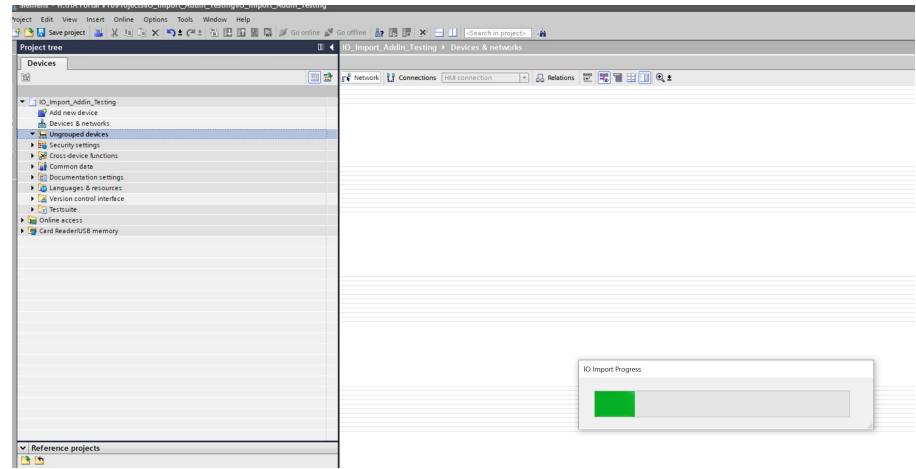
3. Click on “Read CSV” to bring in the data and display it in the tool:



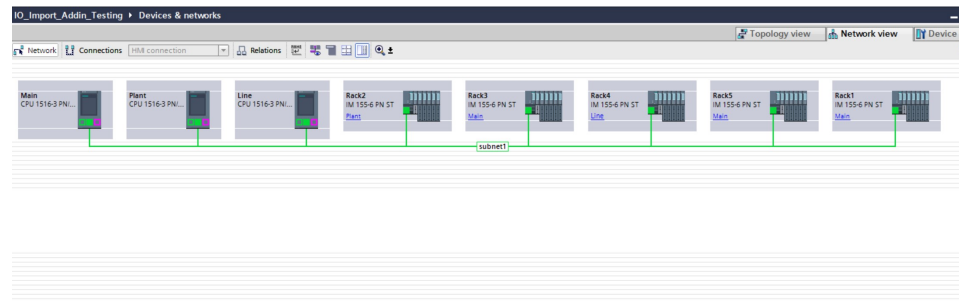
4. Click “Create Hardware” to generate the hardware architecture:



5. Wait for the IO Import tool to finish processing(TIA will not respond until it is complete):



6. The hardware architecture is now imported and compiled:



3 History

Table 3-1

Version	Date	Modifications
V1.0	5/2021	First version