

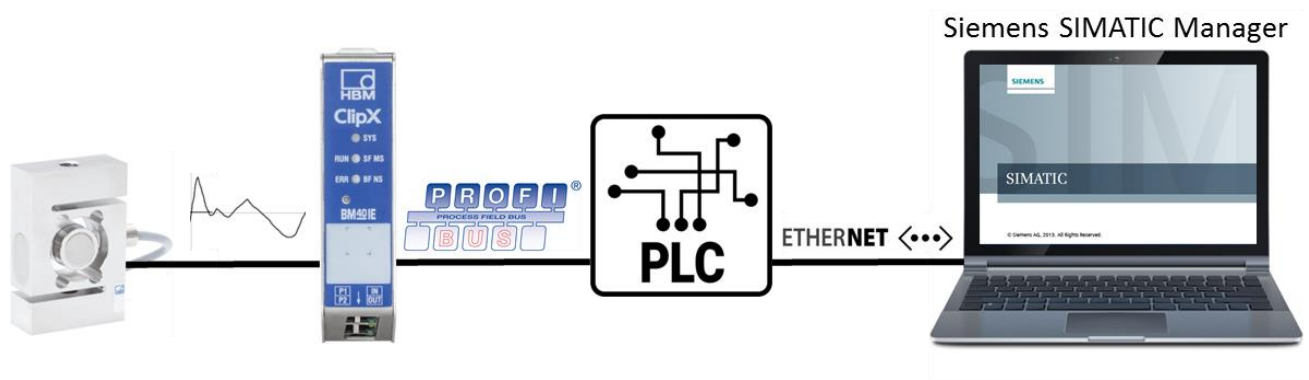
TECH NOTE – PROFIBUS with SIMATIC Manager

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 Status: HBM: Public

ClipX

Brief description

This document is meant to be a guideline to demonstrate the use of a ClipX signal conditioner within a Profibus network. For this example a Simatic 300 Station is used as PLC. There is also an explanation of how ClipX measurement values can be monitored in the Simatic Manager software. Basic knowledge of Profibus network and HBM amplifiers are recommended. The basic setup is shown in the figure below.



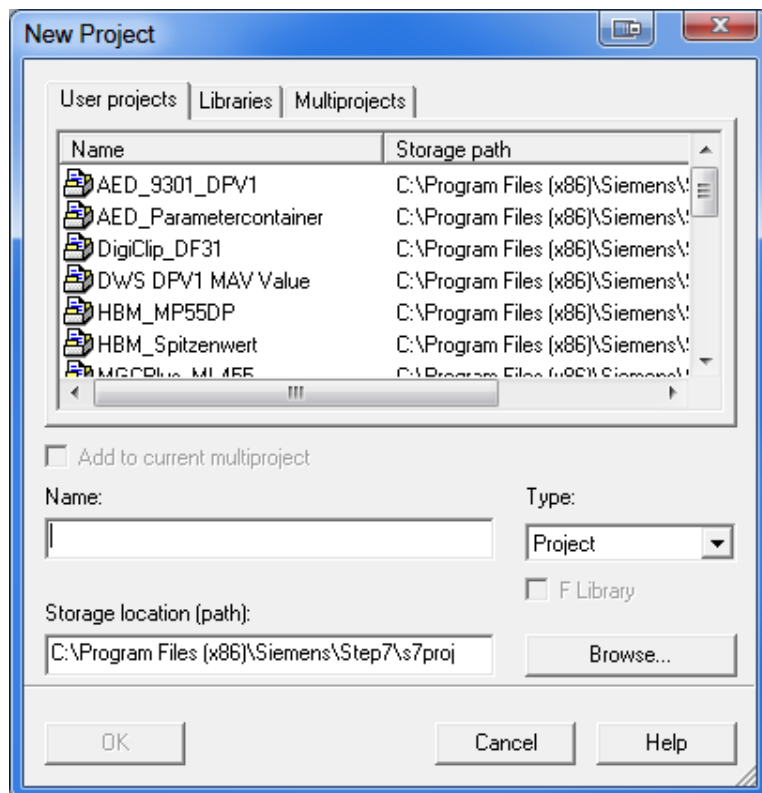
Operation

After starting the program, the following start screen appears: **Step 7 Wizard**

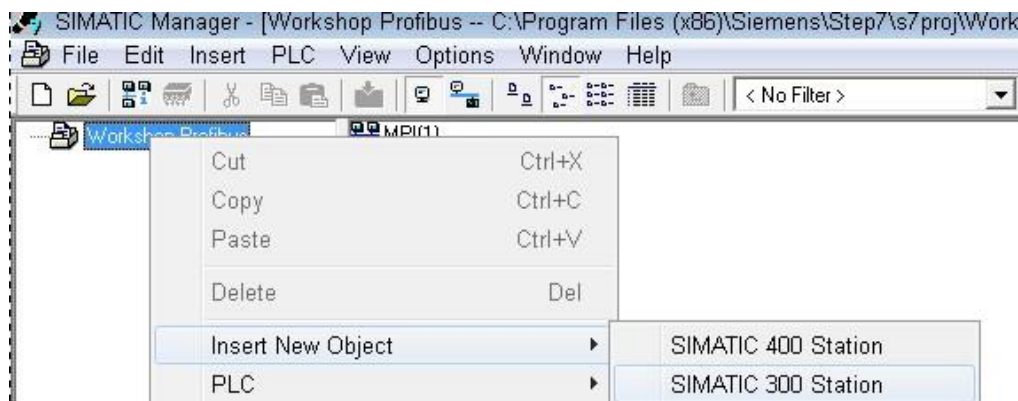


Press **Cancel** because the wizard doesn't support the Simatic 300 Station. For supported PLCs the wizard can for sure be used.

Then create a new project.



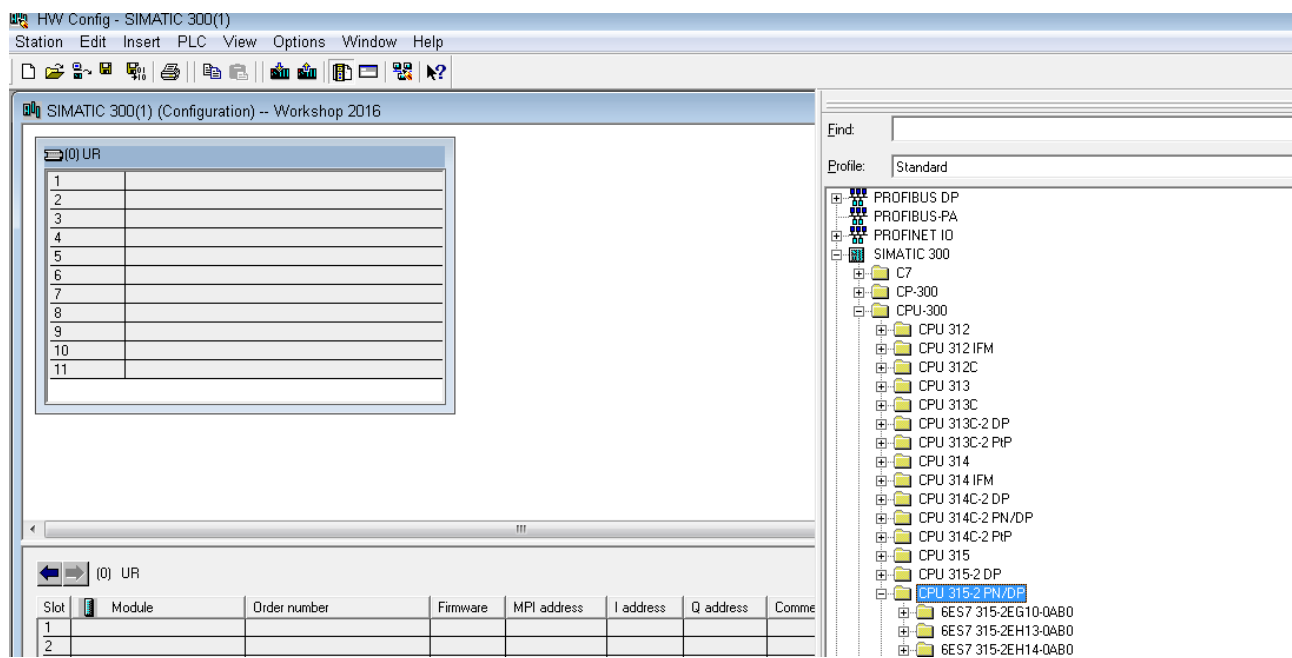
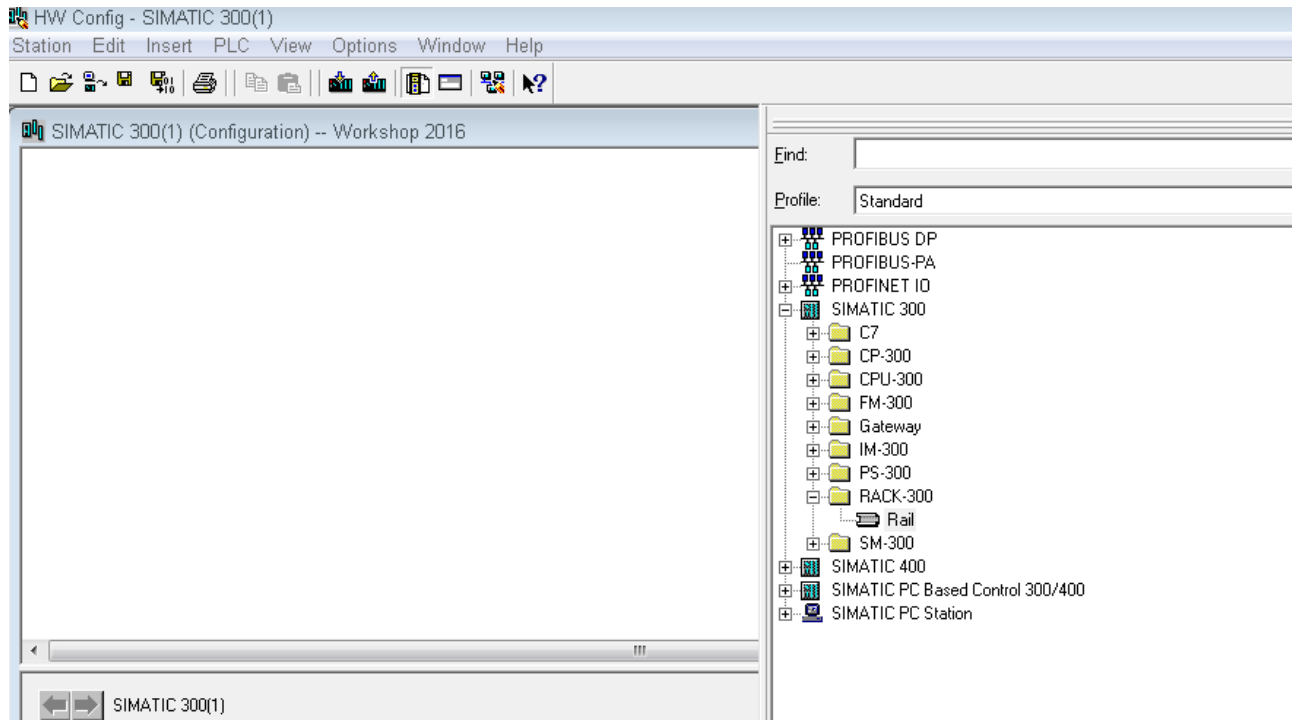
Assign a name to your project and insert a Simatic 300 Station as a next step.



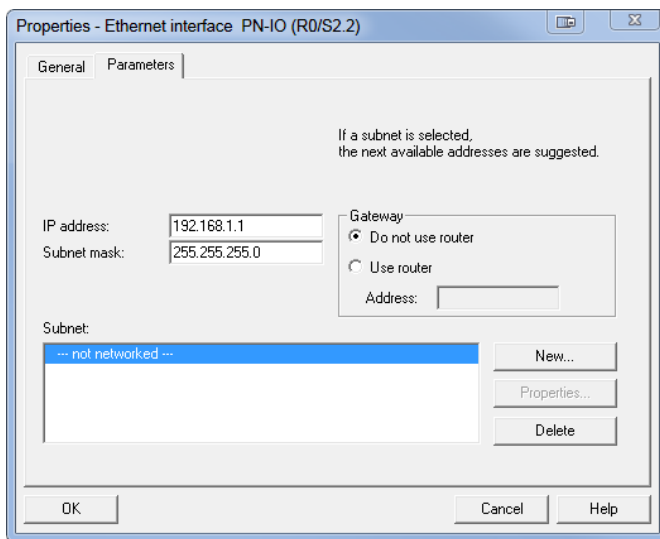
Double-click on the hardware and open the Hardware Config (HW Config).



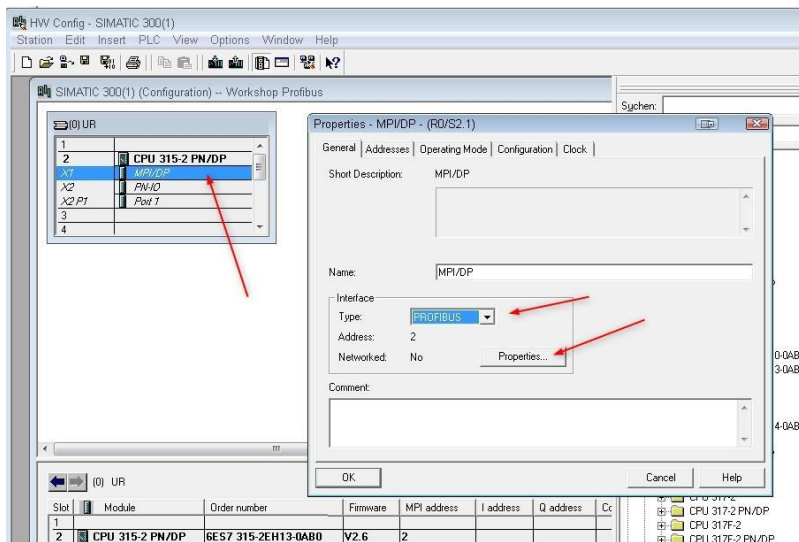
First insert the Rack/ Rail for the CPU-300 PLC and then choose the “right” PLC!!! (the label is on the right side of the PLC, the firware version is on the front)



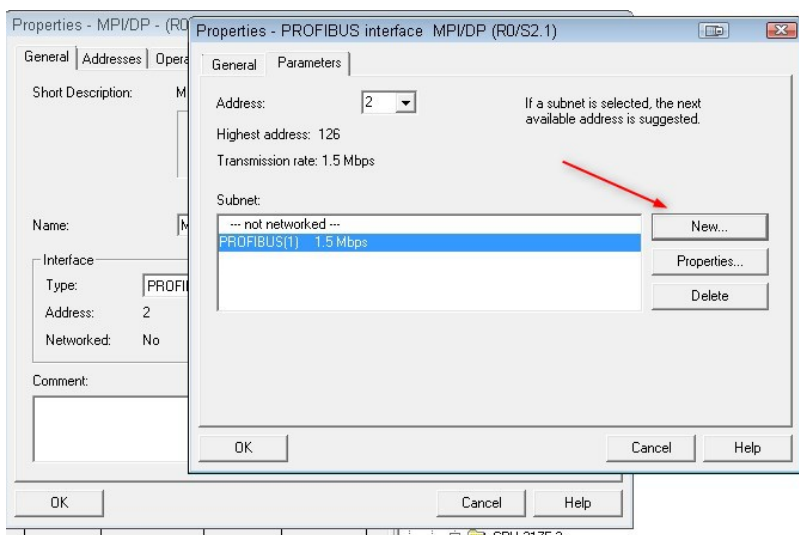
Just click on the OK-button because we don't need a New Subnet (Profinet in this case)



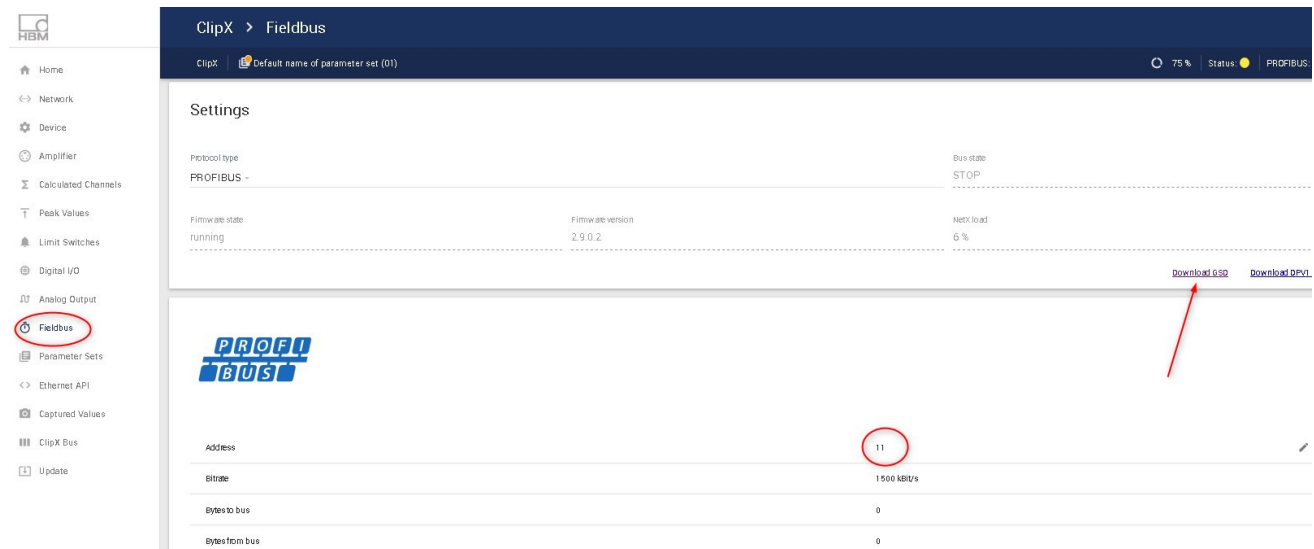
Double-click on MPI/DP and choose as Interface the Type **PROFIBUS**



Create a New Subnet with the 1.5Mbps baudrate and the PLC address 2

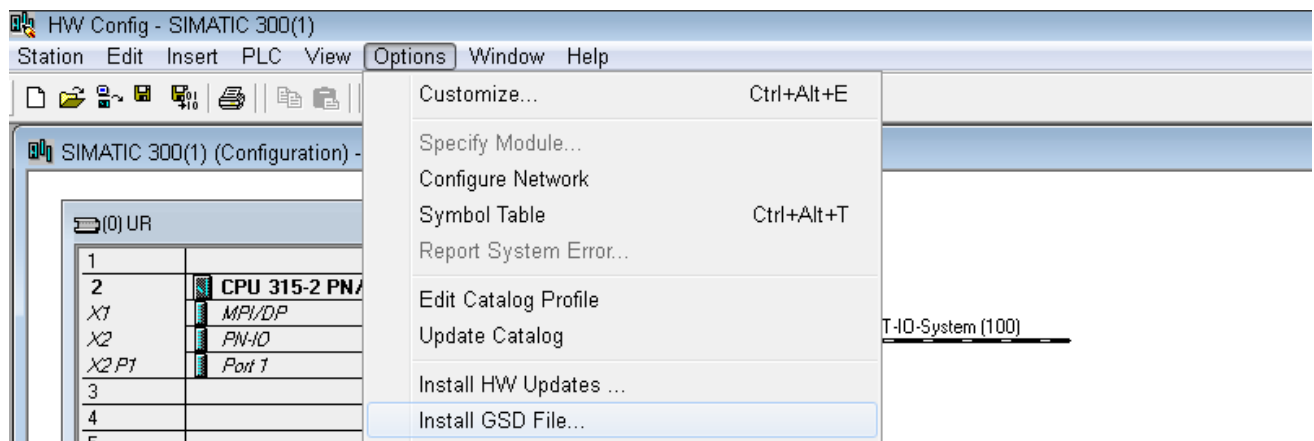


Now to get a Profibus Device on the Fieldbus we need at first to install the GSD-File of the Slave Device(ClipX). But before we can do it we have to create a GSE-File for your ClipX configuration inside the web browser!

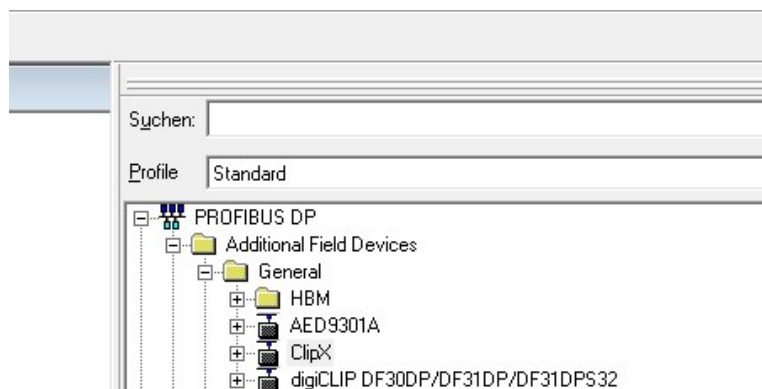


Please connect to the ClipX(Profibus) and download the GSD-File! By the way adjust the address of the slave e.g. **11**. The IP-Address is on the sticker.

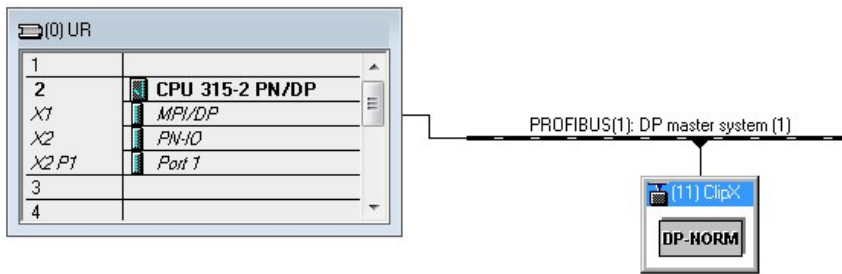
Install your created file into the HW Config.



After the installation you can now find the ClipX Device in the device catalog, choose the correct file if you are using more than one ClipX configurations!



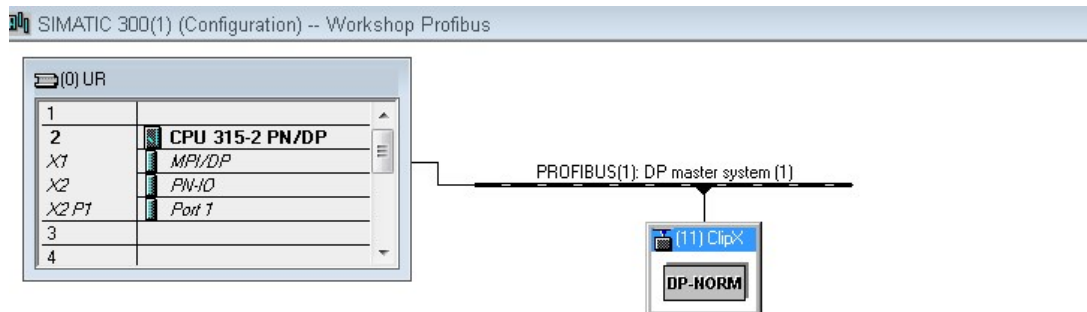
Please hold the left mouse-button and drop the ClipX on the Profibus line. The Profibus IO System got now one Profibus Slave!



For the correct communication between the Master and Slave -> one important thing is necessary:

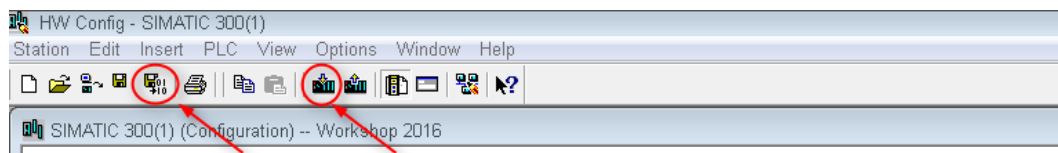
The projected hardware address and the slaves address have to be the same, please take care.

Insert the required entries from the EDS-catalog of ClipX for you needs.



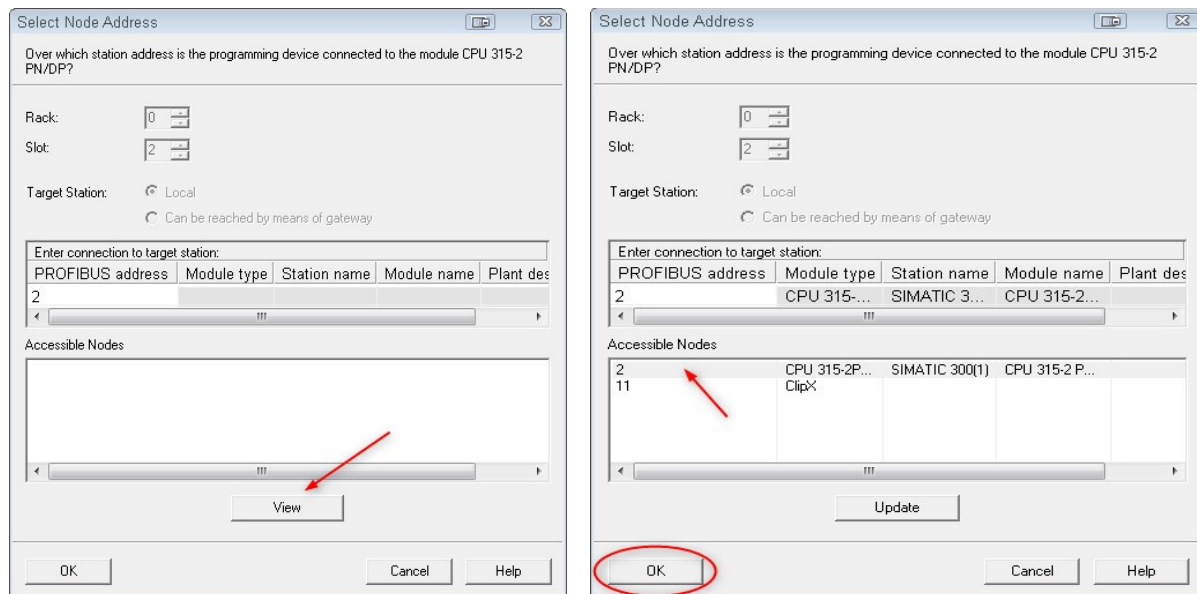
Slot	DP ID	...	Order Number / Designation	I Address	Q Address	Comment
1	65		Gross	256...260		
2	65		Net	261...265		
3	65		Electrical value	266...270		
4	65		System status	271...274		
5	65		Control word read	275...278		
6	129		Control word write		256...259	
7						
8						
9						

Now save and compile the project. After that download it to the module (PLC)



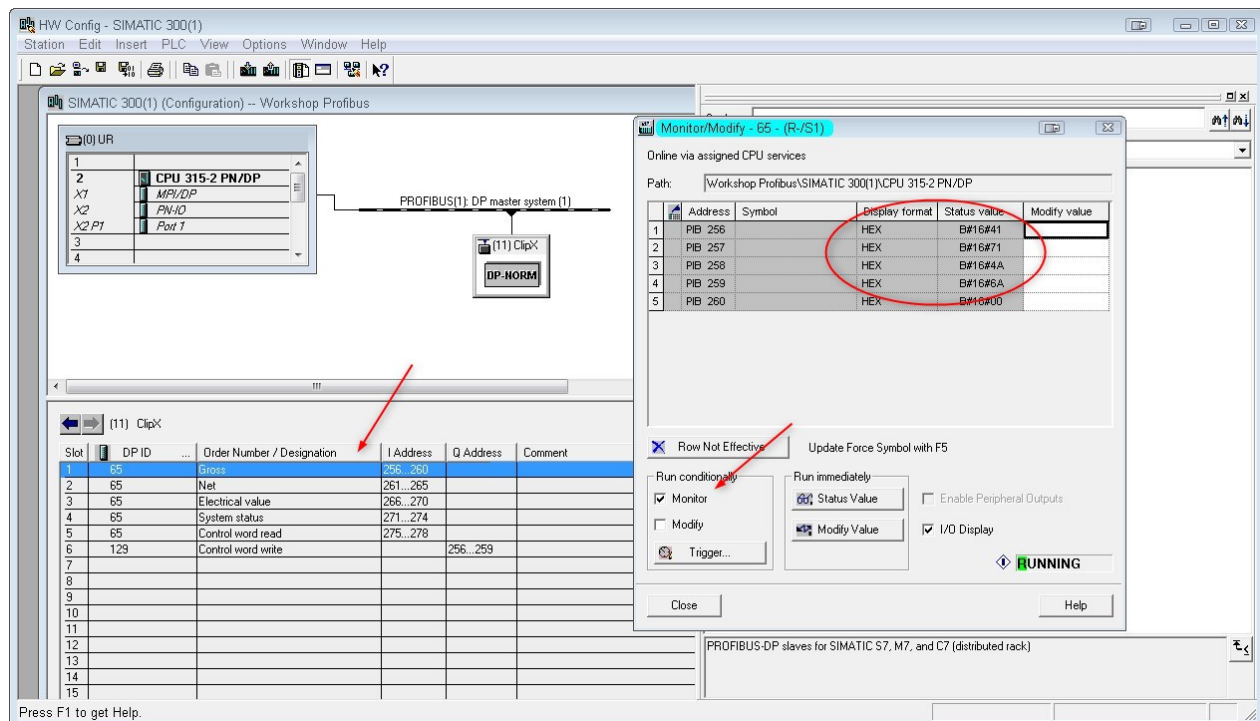
For the Profibus communication the Profibus master is needed in our case we use the CP5711 master. Please check if the USB cable is connected to the Computer and the Profibus wires to the PLC and the slave.

Scan now for accessible nodes and download the hardware configuration into the module

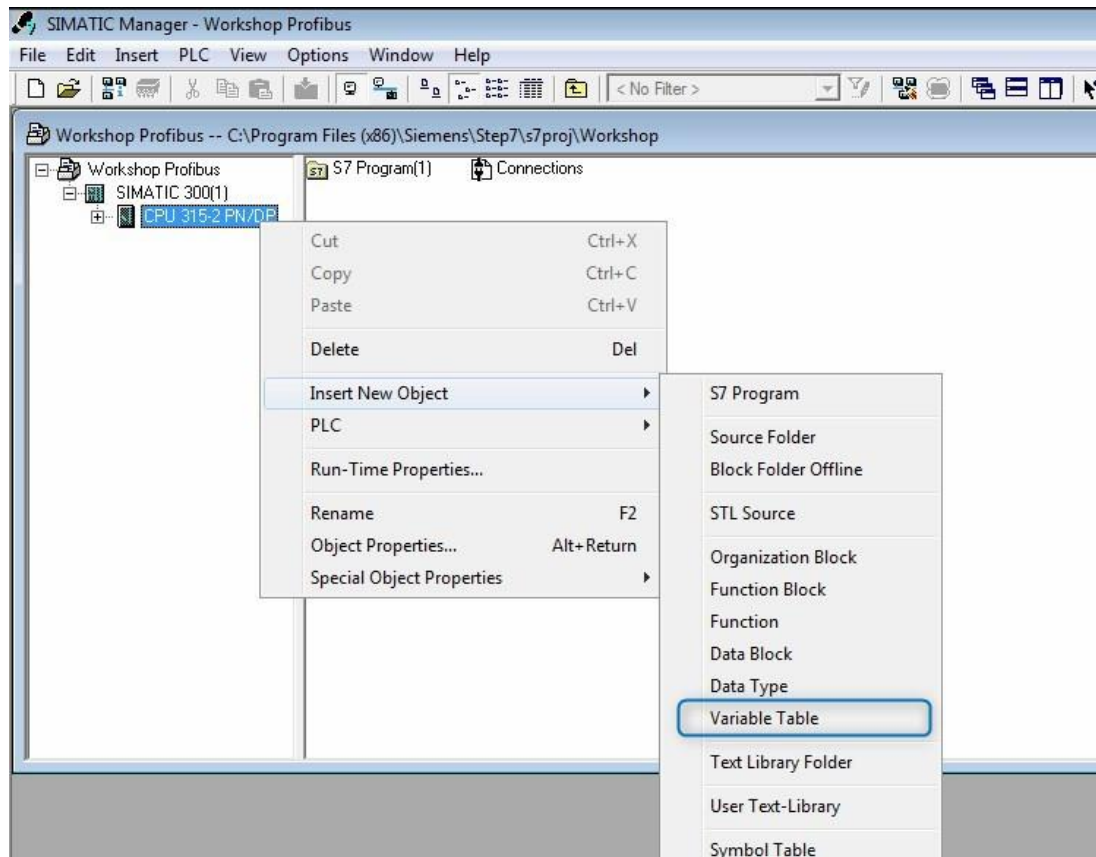
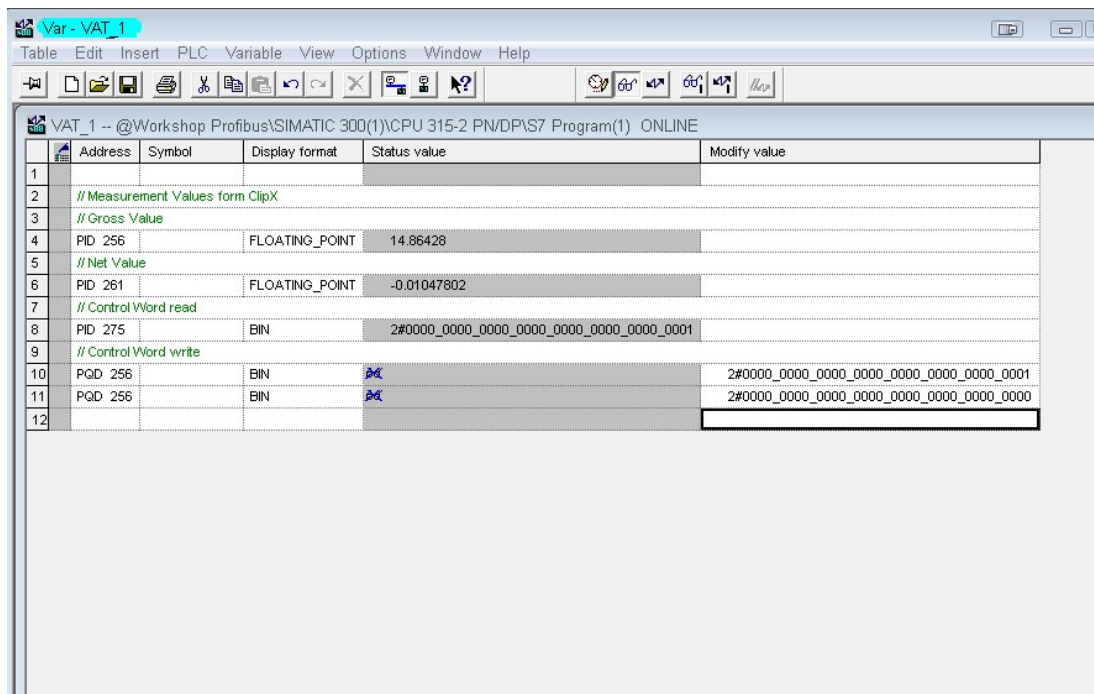


After the download the PLC should run and the LEDs should be green.



Just to check if the measurement values come in select the channel and open (right-mouse click) the Monitor/Modify Window



To read in the values more comfortable we could do it with the help of the variable table, please go to the S7-Project and Insert a New Object

The screenshot shows the 'Var - VAT_1' window. The title bar indicates the path: '@Workshop Profibus\SIMATIC 300(1)\CPU 315-2 PN/DP\S7 Program(1) ONLINE'. The table below lists variables with their addresses, symbols, display formats, status values, and modification values.

	Address	Symbol	Display format	Status value	Modify value
1					
2		// Measurement Values form ClipX			
3		// Gross Value			
4	PID 256		FLOATING_POINT	14.86428	
5		// Net Value			
6	PID 261		FLOATING_POINT	-0.01047802	
7		// Control Word read			
8	PID 275		BIN	2#0000_0000_0000_0000_0000_0000_0001	
9		// Control Word write			
10	PGD 256		BIN		2#0000_0000_0000_0000_0000_0000_0001
11	PGD 256		BIN		2#0000_0000_0000_0000_0000_0000_0000
12					

To read the value we need the addresses from the HW-Config e.g. **PID256** for the Gross Value of ClipX for our configuration in this example. **PI** means Peripheral Input and **B** -> Byte, **W** -> Word(16 Bit), **D** -> Double Word(32Bit). Double Word is necessary for the **Floating Point Format**.

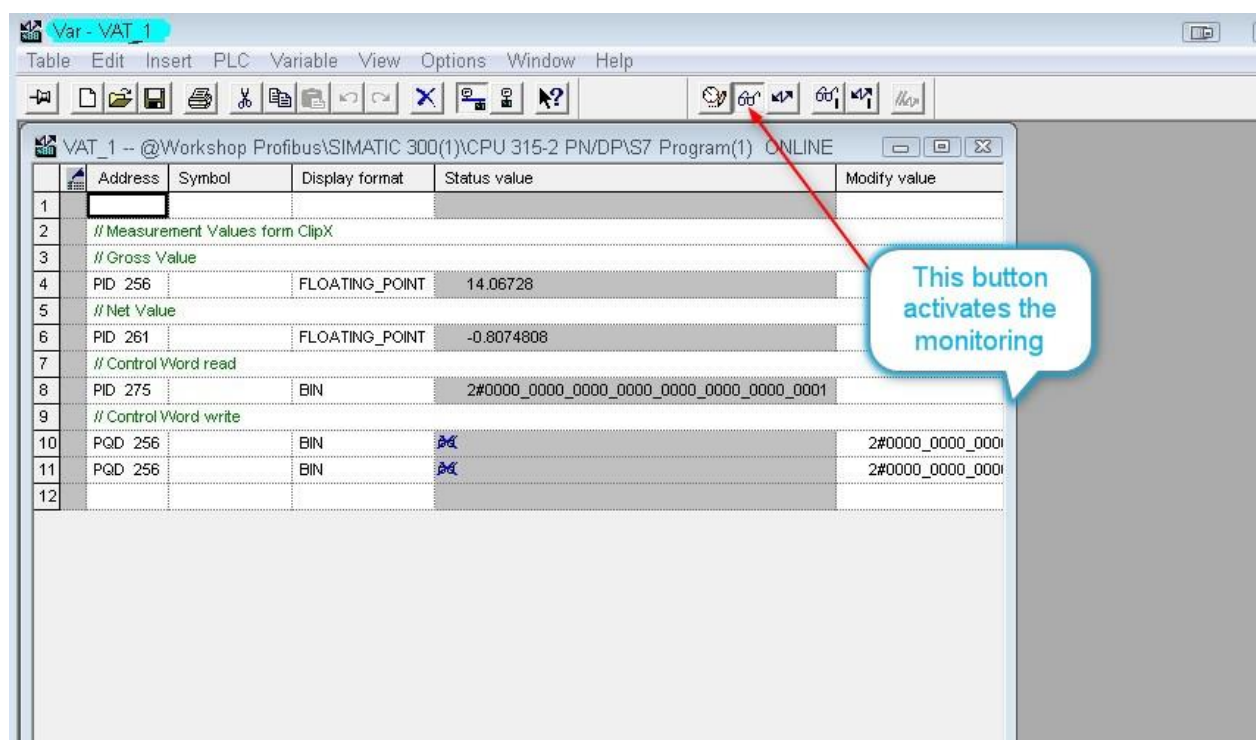
The exact length and format could be found in the manual of ClipX

acknowledgement				
Measured value slot x.y		60xy.1	x.y bytes 0.3	float3 2
Measured value status	see 'Measured value status' table 13.4.4	60xy.2	x.y byte 4	uint8
Measured value control word acknowledgement (confirms processing of the control word)	Control word return 70xy.2	60xy.3	x.y byte 5	uint8
---	Number dependent on the connected measurement cards			

The result looks like...



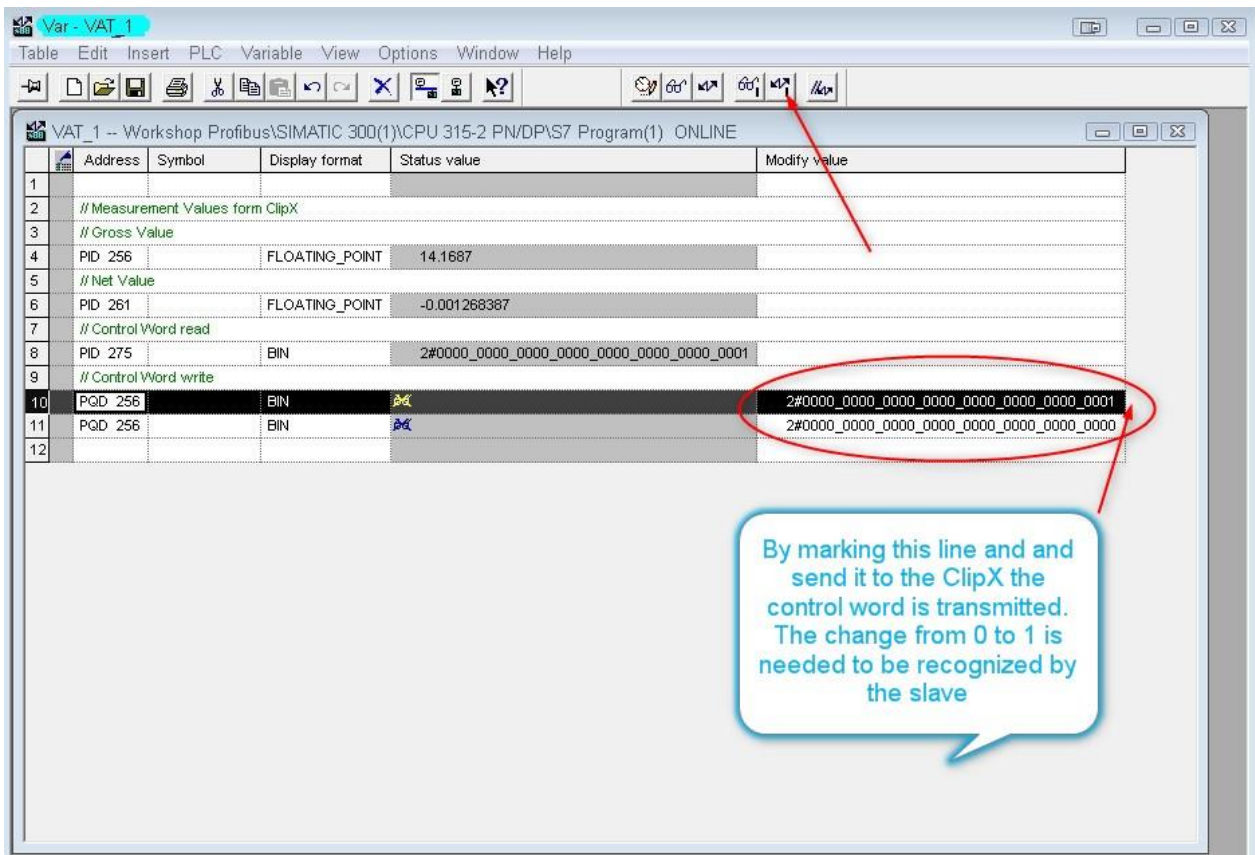
And in the variable table



The screenshot shows the SIMATIC Manager variable table for 'VAT_1'. A red arrow points to the 'Monitoring' button in the toolbar, with a callout stating: 'This button activates the monitoring'.

Address	Symbol	Display format	Status value	Modify value
1				
2	// Measurement Values from ClipX			
3	// Gross Value			
4	PID 256	FLOATING_POINT	14.06728	
5	// Net Value			
6	PID 261	FLOATING_POINT	-0.8074808	
7	// Control Word read			
8	PID 275	BIN	2#0000_0000_0000_0000_0000_0000_0001	
9	// Control Word write			
10	PGD 256	BIN	2#0000_0000_0000_0000_0000_0000_0001	
11	PGD 256	BIN	2#0000_0000_0000_0000_0000_0000_0001	
12				

One example how to use the control word.



	Address	Symbol	Display format	Status value	Modify value
1					
2		// Measurement Values form ClipX			
3		// Gross Value			
4	PID 256		FLOATING_POINT	14.1687	
5		// Net Value			
6	PID 261		FLOATING_POINT	-0.001268387	
7		// Control Word read			
8	PID 275		BIN	2#0000_0000_0000_0000_0000_0000_0001	
9		// Control Word write			
10	PGD 256		BIN	2#0000_0000_0000_0000_0000_0000_0001	
11	PGD 256		BIN	2#0000_0000_0000_0000_0000_0000_0000	
12					

By marking this line and and send it to the ClipX the control word is transmitted. The change from 0 to 1 is needed to be recognized by the slave

Disclaimer

These examples are for illustrative purposes only. They cannot be used as the basis for any warranty or liability claims.