

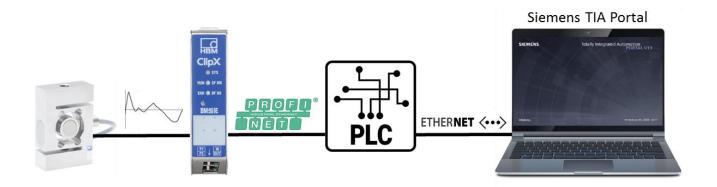
TECH NOTE – PROFINET with TIA Portal

Version: 2018-03-16 Author: Michael Guckes Status: HBM: Public



Brief description

The ClipX measurement amplifier supports a huge variety of fieldbus interfaces. In this example the ClipX communicates with a Siemens PLC via ProfiNet. Instructions are given to create a fresh project with the Siemens Tia Portal. There is also a brief explanation of how ClipX measurement values can be monitored in the Tia Portal Software. Basic knowledge of Profinet networks and HBM amplifiers is recommended.



Setting up a project in TIA Portal

After starting the program, create a new project and go to the **Devices & networks** section to add a new device. Assign a name to your project and insert the PLC used (here: Simatic 300 Station) as a next step (the label is on the right side of the PLC, the firware version is on the sticker).

Start			Add new device				
Devices & networks		Show all devices	Device name:				
networks		Add new device	PLC_1				
PLC		Aud new device					
programming				🕶 🧊 Controllers	^	Device:	The second se
				SIMATIC \$7-1200			
Motion &				SIMATIC \$7-1500			
technology			Controllers				
				🗢 🧊 CPU			
Online &				Description (1998)			CPU 315-2 PN/DP
Diagnostics	1			Final CPU 312C			0.0010211001
Didgitostics	-			Final CPU 313C		Article no.:	6ES7 315-2EH14-0AB0
		<u> </u>		🕨 🫅 CPU 313C-2 DP		Anticle no	6537 313-2EH14-0AB0
			PC systems	🕨 🧊 CPU 313C-2 PtP		Version:	V3.2
				CPU 314			
				🕨 🥅 CPU 314C-2 DP	≡	Description:	
		Configure networks		CPU 314C-2 PN/DP			ny 384KB; 0.05ms/1000 instructions;
				CPU 314C-2 PtP			erface; S7 communication (loadable DFINET IO controller; supports RT/IRT;
				CPU 315-2 DP		2 ports; PROF	FINET CBA; PROFINET CBA Proxy; TCP/IP
							otocol; combined MPI/DP interface aster or DP slave); multi-tier
		and the second		6ES7 315-2EH13-0AB0			aster or DF slave), multi-tier n up to 32 modules; constant bus
				6ES7 315-2EH14-0AB0		cycle time; ro	outing; firmware V3.2
				CPU 317-2 DP			
		the second se		CPU 317-2 PN/DP			
		and a second		CPU 319-3 PN/DP			
				🕨 🧰 CPU 315F-2 DP			
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After the project has been created, go to the **Network view** - the PLC should now be visible there.



		Workshop Profi 🕨 Devices & networks				
Devices				🛃 Торо	logy view 🕼 Network view	Device
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		\frown		^	\Upsilon Device	Туре
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🚔 Add new device		PLC 1			▶ PLC_1	CPU 315-2 F
h Devices & networks	1	CPU 315-2 PN/DP				
PLC_1 [CPU 315-2 PN/DP]						
时 Device configuration	1					
😼 Online & diagnostics	1			-		
🕨 🔜 Program blocks						
Technology objects						

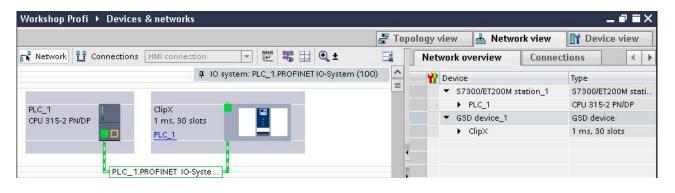
First install the GSDML-file of the ClipX. You can find the GSDML-File for the ClipX on the HBM website.

Project Edit View Insert		Tools Window Help gs	ne 🖉 Go offline	Å2 🖪 🖪
Project tree	Suppo	ort packages	vorks	
Devices	Start A	ge general station description files (G Automation License Manager	SD)	💌 🖭 🖥 E
👻 🔽 Workshop Profi	🛄 Globa	l libraries	1	
Add new device				
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🔋 📃 🔻 🚺 PLC_1 [CPU 315-2	PN/DP]	CFU 313-2 FN/DF	1	

After that the ClipX should be found in the hardware catalog. Simply add it to the configuration by double-clicking it.

Workshop Profi → Devices & network	s							_ # #×	Hardware catalog
			6	🖣 Торо	logy view 🔒 Netwo	rk view	Dev	vice view	Options
Network Connections HMI conne	ction 💌	2 5 1	€ ±		Network overview	Connec	tions	4 >	
				^	Y Device		Туре		✓ Catalog
				-	 \$7300/ET200M st 	ation_1	\$7300/E	ET200M stati	<search></search>
PLC_1					▶ PLC_1		CPU 315	5-2 PN/DP	🖂 Filter
CPU 315-2 PN/DP									FC systems
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< 11	> 100%	-		A DESCRIPTION OF THE OWNER.	< III			>	-
				S. Pro	operties 🚺 Info 🔒	🞖 Diagn	ostics		← I Hottinger Baldwin Messtechnik GmbH ← I Clip×
General 👔 Cross-references	Compile								0.25 ms, 6 slots
3 A 3 Show all messages									1 ms, 30 slots
Snow all messages									Ident Systems
									Sensors

Both devices should now be visible in the network view. Connect them physically by linking the green dots

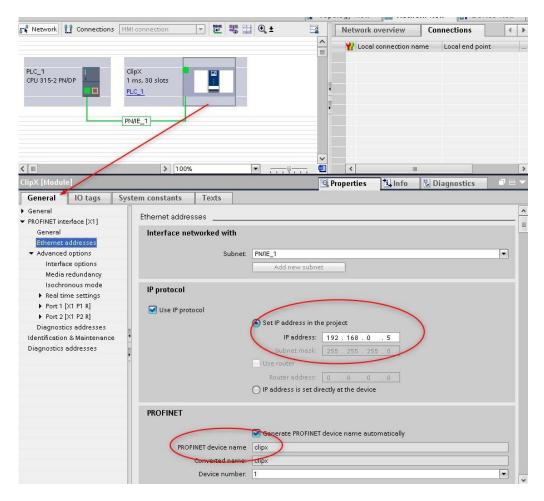


Then go to the device view of ClipX and insert the required entries from the catalog, e.g. Gross Value, Net Value and so on. Adjust the slave to your needs.

						🚽 Topology v	iew 🔒 Network vie	w 📑 Dev	ice view	Options	
Devi	ce overview										
- 12	Module	Rack	Slot	l address	Q addr	Туре	Article no.	Firmware	Com	✓ Catalog	
	▼ ClipX	0	0	2042*		1 ms, 30 slots	BMxx		^	<search></search>	
	PN-IO	0	0 PN-IO	2041*		ClipX				🖂 Filter	
	Gross value_1	0	1	256259		Gross value				• 🛅 Head module	
	Net value_1	0	2	260263		Net value				▼ 📑 Module	
	CTRL word write_1	0	3		03	CTRL word write				Calculated	
	CTRL word read_1	0	4	03		CTRL word read			=	- Control	
		0	5							CTRL word read	
		0	6							CTRL word write	
		0	7						_	Fieldbus flags	
		0	8							Fieldbus value 1	
		0	9							Fieldbus value 2	
		0	10							📕 Object dictionary rea	
		0	11							📗 Object dictionary writ	
		0	12							🚺 Parameter set (read)	
		0	13							Parameter set (write)	
		0	14							🕨 🚺 Device level	
		0	15							🕨 🧊 Limit switches	
		0	16							🕨 🧊 Measured	
		0	17							🕨 🧊 Neighbor ClipX	
		0	18 19							🕨 🛅 Reserve	

Enable the ProfiNet connection

For the correct communication between the Master and Slave two things are mandatory: The IP-address and the station name. Those two have to be exactly the same in the device and in the software. So take the time to double-check the network settings.





As next step open the web GUI of ClipX and activate the ProfiNet interface and enter the network settings.

ClipX E Default name of parameter set (01)		
Settings		
otocol type		Bus state
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mware state	Firmware version	NetX load
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PROFI Néit		
profi Nét		1
	1 ⁹ 1001	68.0.5

Now save and compile the project. After that, download the compiled project to the PLC.

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Project tree	Workshop ClipX net Devices & networks	_ # # ×
Devices	🚽 Topology view 🏻 🏙 Network view	Device view
00	💦 Network 👫 Connections HM connection 🔻 🕎 🖏 🖽 🔍 ±	Network overvie 4
 Workshop ClipX net Add new device Devices & networks C 1 (CRU 315:2 PN/OP) Device configuration Online & diagnostics Program blocks External source files PLC 1 (Cata spes Watch and force tables Online backups Berogram info 	IO system: PLC_1.PROFINET IO-System (100) PLC_1 PLC_1.PROFINET IO-Syste PLC_1.PROFINET IO-Syste	Y Device ▼ 57300/ET200M ▶ PLC_1 ▼ GSD device_1 ▶ ClipX
PLC alarms		
E Text lists	< III > 100% •	< m
Local modules		de de de de
Distributed I/O	Properties I Info 🔒 🗓 Dia	gnostics
Common data	General 🗓 Cross-references Compile	
Documentation settings	Show all messages	
Languages & resources	Compiling completed (errors: 0) warnings: 0)	
Online access	Path Description Go to	? Errors War.
Card Reader/USB memory	PLC 1	c Errors war.
	ruc_i • ruc_i • Program blocks	0 0
	Program blocks No block was compiled. All blocks are up-to-date.	0 0
	Hardware configuration	0 0
	Hardware was not compiled. The configuration is up-to-date.	2
✓ Details view	Compiling completed (errors: 0; warnings: 0)	

Check and update the PG/PC communication interface and download the configuration into the PLC.

Window Help			-			
- 🗟 🛄 🖬 🖳	RT 💋	Go online 📓 Go offline	(A?)			
		Workshop ClipX net	PLC_	1 [CPU 315-2 PN/DP]	► D	list

	-		Type of the PG/PC interfa	ace: PN/IE			-
-		(PG/PC interfa	ace: 💹 Intel	(R) Ethernet Connection	1217-LM 💌 🐑	3
		Accessible nodes of	the selected interface:				
		Device	Device type	Туре	Address	MAC address	
		plc_1 clipx	CPU 315-2 PN/DP 0.25 ms, 6 slots	PN/IE PN/IE	192.168.0.1 192.168.0.5	00-1B-1B-16-DD-47 00-09-E5-00-AA-A4	
Ê		Cilpx	0.25 113, 0 31013	THAT	192.100.0.5	000929007074	
-							
Flas	h LED						
						Start searc	1
ne sta	tus informati	on:				Zuitsent	
Scan	completed. 2	devices found.					*
Retrie	ving device i	nformation					
		ion retrieval completed.					*
Displa	and a she array of	nercaner					
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After the download the PLC should run and the LEDs should be green. Just check now if the measurement values come in we have to add a new watch table and assign the hardware addresses to it



To read the value we need the addresses from the Hardware-Config (You can find the mapping in the device view of the ClipX e.g. **256** for the Gross Value in this example.

								🚽 Topology v	iew 🔥 Network view
	Devic	e o	verview					a Maria da Cara	
	¥? -	. N	Iodule	Rack	Slot	I address	Q addr	Туре	Article no.
			 ClipX 	0	0	2042*		1 ms, 30 slots	BMxx
			PN-IO	0	0 PN-IO	2041*	~	ClipX	
			Gross value_1	0	1/	256259	1	Gross value	
			Net value_1	0	7	260263		Net value	
			CTRL word write_1	0	в		03	CTRL word write	
			CTRL word read_1	0	4	03		CTRL word read	
				0	5		/		
1				0	6	-			

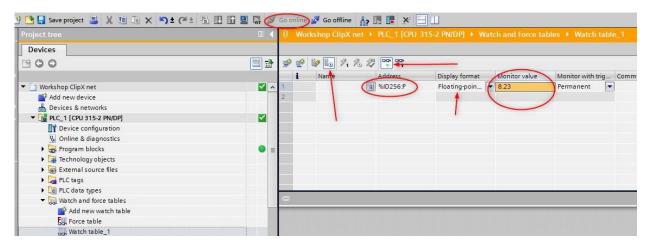
Type in the **PID256** into the Watch table, go online, activate the expand mode and activate the monitoring. **PI** means Peripheral Input and **B** -> Byte, **W** -> Word(16 Bit), **D** -> Double Word(32Bit).

Double Word is necessary for the Floating Point Format.

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

acknowieugemeni	1 1			
Measured value slot x.y		60xy.1	x.y bytes 0.3	float3 2
Measured value	see 'Measured value	60xy.2	x.y	uint8

The result looks like ...



And in the web browser

Net Net - Tare 0 - Voltage +/-10V TESTSIGNAL	8.230 v	Gross Gross - Zero 0 - Voltage +/-10V TESTSIGNAL	8.230 v
Minimum Minimum · Gross	⊕ -0.026 v	Maximum Maximum - Gross	∰ 8.230 v
Peak to Peak Peak to Peak - Gross	₩ 8.256 v	Analog output Analog Output - Gross DISABLED	8.230



Disclaimer

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