

OPERATION MANUAL

Fieldbus-Controller Model 9251 PROFINET Integration into TIA Portal

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Valid from: **26.10.2020** Applies to: **9251-VXX03** Manufacturer:
bursterpräzisionsmesstechnik gmbh & co kgTalstr. 1 - 5P.O. Box 143276593 Gernsbach76587 GernsbachGermanyGermany

Tel.: +49-7224-645-0 Fax.: +49-7224-645-88 Email: info@burster.com www.burster.com

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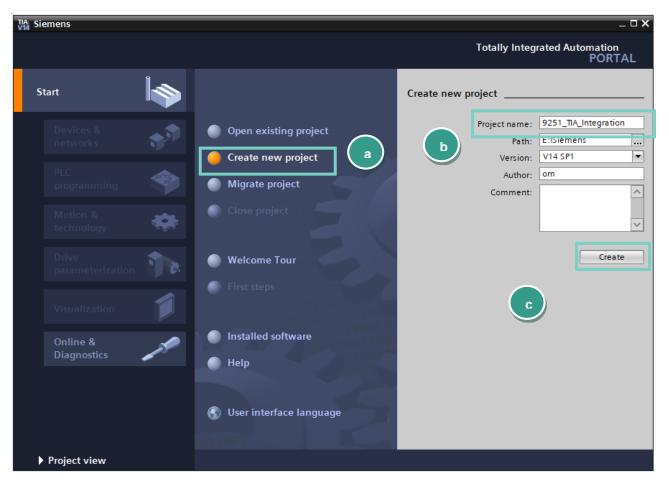
Introduction

This quick start guide describes an approach how you can configure the 9251 via TIA Portal using the example of S7-1511 CPU. Please note that the samples here cannot be directly used in your production line because they have beed extremely simplified to reach a better understanding. Therefore, you may have to complete them by checking of status, error, length values etc.

Please also note that you will have to use the 9251 PROFINET manual to get futher information about input and output parameters (cyclic as well acyclic data transfer)

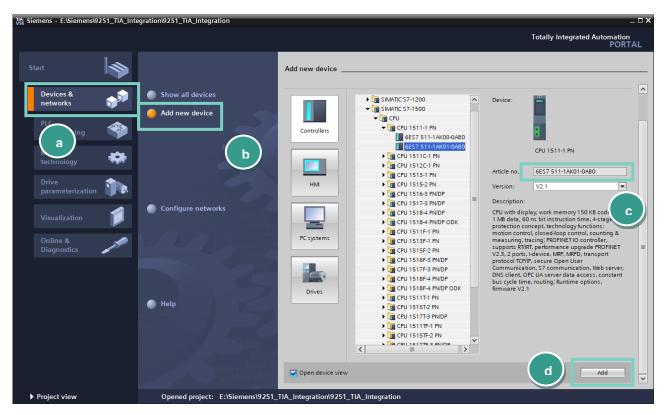
1. Creating new project

Start the Totally Integrated Automation Protal, select Create New Project (a), assign the project a name (b) and click Create (c):



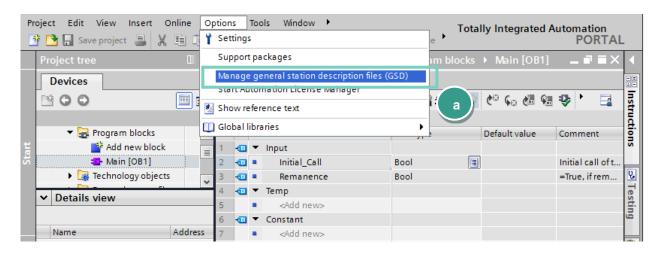
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Go to Devices & networks (a) on the left side select Add new device (b) and look for your CPU (c). Afterwards click the Add button (d).



2. Installation of GSDML files

- **Note:** Please make sure that your GSDML file is compatible to the field bus firmware in the 9251. The latest GSDML file is available for download on <u>www.burster.com</u>. Also for compatibility reasons, uninstall all previous GSDML files of particular device if you have any!
 - > Go to **Options** → **Manage general station description files (GSD)**



Navigate to your 9251 GSDML directory (a)(you will find the GSD files for download on <u>www.burster.com</u> Download Area/Software), select the GSD file (b) and click *Install* (c)

Manage genera	l station description files				×
Installed GSD	s GSDs in the project				
Source path:	E:\Embedded\9251\gsdml				
Content of im	ported path			а	
🗹 File		Version	Language	Status	l
GSDNIL-V2.35	5-burster-9251-20200723.xml	V2.35	English	Not yet installed	b
b					
<		1111		c	
			Dele	te Install Ca	ancel

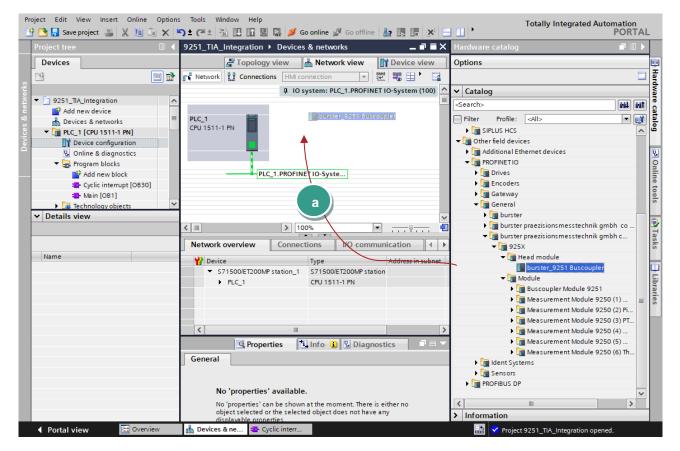
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3. Creation of network connections

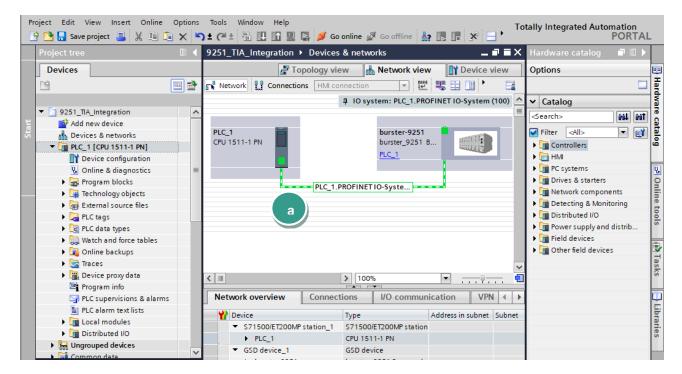
> Double click *Device Configuration* (a) in the project tree und switch to **Network view** (b) :

	oject Edit View Insert Online Op P 📑 🗔 Save project 🚊 🐰 🗎 🗎		Help	Totally I	ntegrated Automation PORTAL	_
	Project tree 🔲 🖣	DigiForceIntegration	Devices & networks	_ • • • ×	Hardware ca 🗊 🔳 🕨	
	Devices	📱 Topology vie	w 🚠 Network view [Device view	Options	
& networks	 ➢ O O I I I I I I I I I I I I I I I I I	₩ ⊞ @ ±	b		✓ Catalog ≪earch> Mu Mt Filter	🗄 Hardware catalog
Devices	Devices a flections Devices a flections Device configuration Solution Solution Solution Solution Device configuration Solution Solution Solution Devices a flections	CPU 1511-1 PN		Topolo	Controllers Gathering HMI The PC systems The Drives & starters	
				jiœi data	Metwork components Detecting & Monit Distributed I/O Other field devices	P Online tools
	Watch and force tables Watch and force tables Q Online backups Traces Program info			~		📑 Tasks
	✓ Details view	< III > 1		- ? 1		
	Name	Image: Cross General Image: Cross Image: Cross	-references Compile	ics 🛛 🖬 🖛		Libraries
		! Path	Description			
					<	
	Portal view Overview	K Main	III Antonio Alexandre Alex	Project DigiForcelr	> Information	

Now select the burster_9251_Buscoupler device in the catalog and drag & drop it into the working area (a):

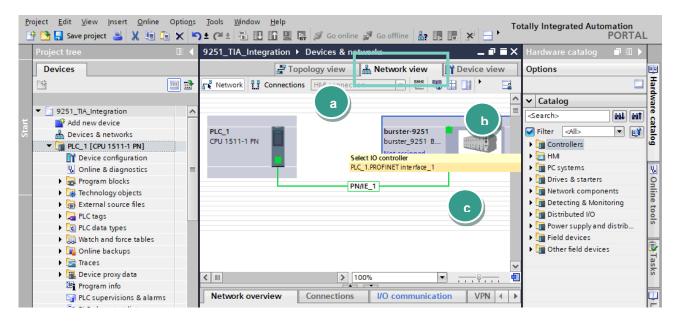


> Select an Ethernet port on the S7 and hold the left mouse button down to connect the S7 with 9251:



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If device is not automatically assigned, change now to Network view (a) to assign a controller to the 9251. Click on the link "Not assigned" (b) of 9251 and select your controller (c):



Note: Check if devices also connected physically to the right ports. You find the port number assignment directly on the device front side.

Next, click on the burster-9251 device (a) and then switch to Device view (b)

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	🛉 🎦 🔚 Save project ا 👗 🗎 🗊	×	🎝 ± (* ± 🖥 🗓 🟠 🖳 💋 Go	online 🖉 Go offline 🛛 🕼 📭 📭 🗶 🖃 🛄 [<search in="" project=""> 🛛 🖣</search>	
	Project tree		9251_TIA_Integration > Devices &	networks		_ = = X
	Devices			🚝 Topology view	h Network view	Device view
			Retwork Connections HMI conne	ection 🔽 🕮 🖽 🛄 🔍 🛓		
orks			PN/IE_1		b	^
Ę.	 9251_TIA_Integration 	^				=
B	💣 Add new device					
2	Devices & networks		PLC_1	burster-9251		
ë	PLC_1 [CPU 1511-1 PN]		CPU 1511-1 PN	burster_9251 B	a	_
evi	Device configuration			PLC_1		_
	🖳 Online & diagnostics					_
	Program blocks			Dure o		
	Technology objects	=		PN/IE_2		

> Now, remove the entry BusCoupler Data short 1 (a) from the Device overview

Device	overvie	w						
**	Module		Rack	Slot	I address	Q address	Туре	Article no.
	 burst 	ter-9251	0	0			burster_9251 Busc	9251-Vxxx
	► In	nterface	0	0 X1			burster-9251	
	 Busc 	oupler Data short 1	0	1			BusCoupler Data sh	
		Change device			07		BusCoupler Data sh	
		Start device tool				015	BusCoupler CTRL	
	3	🕻 Cut		Ctrl+X				
		🗐 Сору		Ctrl+C				
		🖹 Paste		Ctrl+V				
	>	🗙 Delete		Del				

in addition, insert the entry BusCoupler Data extended (a) into the Device overview table (b), you can drag it or just double click on the entry:

Tools Window Help) 🛨 🍽 🖳 🌆 🖳 📓 🦝 🍯 Go online 🖉 Go offline h 🌆 🖪 📲 🗶 🚍 🕕 (Search in project) 🖓	Totally Integrated Automation PORTAL
251_TIA_Integration 🕨 Ungrouped devices 🔸 burster-9251 [burster_9251 Buscoupler] 🛛 🗖 🖬 🕽	🗙 Hardware catalog 🛛 🗊 🕨 🕨
🔓 Topology view 🛛 👪 Network view 🛛 🔐 Device view	Options
🛊 📴 burster-9251 [burster_9251 🛛 📰 🔛 🏑 🖽 🛄 🔍 🛨	
a construction of the second sec	Catalog ✓ Catalog ✓ Search> MI MT
	Filter <all></all>
	 ▶ ☐ Head module ▼ ☐ Module
	✓ I Buscoupler Module 9251
	a BusCoupler Data exte
	BusCoupler Data short
	9250 Strain Gage ext
₩ > 100%	9250 Strain Gage short
Device overview	▶ 🛅 Measurement Module
	Measurement Module
Y Module P Slot I address Q address Type Article no. ✓ burster-9251 b b b burster 9251-Vxxx	Measurement Module
	Measurement Module
Durst 1251	📃 🔹 🕨 🗎 Measurement Module
Bus Coupler Data extended 2 2	

Note: In comparison to the "**short**" version, allows the **extended** version the receiving of 32 last measurement values, so you can expand this example to show all 32 last values.

If you have a modular device with several 9250 modules and would like to communicate with those modules, you just have to drag the modules (depending on how many modules are connected) the module "Measurement Module 9250 (1) Strain Gauge" (short or extended) from the module tree into the table Device overview.

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4. Create a sample program

In this section, you will learn how to create a simple program to read a measurement value from the analogue input of the bus controller. You will need to refer *Cyclic Input Data* of the **9251 PROFINET Interface Documentation** manual to understand the meaning of input bytes.

> Expand the tree node *Program blocks* in the **Project tree** and double click *Add new block:*

Pr E	rroject Edit View Insert Online 🞐 🎦 🔚 Save project 🎩 💥 🗎 🗎	Option			Window	Help	🛃 🔊 G	o online 🖉	Go offline 🛔	, 18 1	×E	, To
	Project tree		1	9251_	TIA_Integ	gration →	Device	s & network	ks		-	∎ ≡ ×
	Devices					📲 Toj	pology vi	ew 🔥 i	Network view	/ []	Device vi	iew
				🗗 🖁 Netv	work	Connection	IS HMI CO	onnection	THAHE		1	
								₽ IO syste	em: PLC_1.PRO			100) ^
	 9251_TIA_Integration 		^					-				
별	Add new device											
Sta	📠 Devices & networks			PLC_1					burster-925		antil i fa	
	▼ → PLC_1 [CPU 1511-1 PN]			CPU 1	511-1 PN				burster_9251	B		
	Device configuration								PLC_1			í.
	🖳 Online & diagnostics		≡									
	🔻 🔂 Program blocks						PLC 1	1.PROFINET I	O Susta			
	Add new block						FLC_	PROFINELLA	J-Syste			
	💶 Main [OB1]			I								
	🕨 🚂 Technology objects	ł										
	🕨 🔙 External source files			L								
	🕨 🌄 PLC tags			1								
	PLC data types			1								
	Watch and force tables			1								~
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	🕨 🔄 Traces								I			
	Device proxy data			Netw	work overv	view	Connec	tions	I/O communi	ication	VPN	
	🖭 Program info			2	Device			Туре		Address	in subnet	Subnet
	PLC supervisions & alarms			-		0/ET200MP s	station 1		200MP station		mounter	Submet
	E PLC alarm text lists				 B/1500 PLC 		.taraon	CPU 1511-1				
	Local modules				✓ GSD dev	-		GSD device				
	Distributed I/O		~			ster-9251			e 251 Buscoupl			
	✓ Details view					101 9201		buister_s_	or buscoup			

Select in the new window Organization block (a) and then Cyclic interrupt (b). As language set SCL (c), change the cyclic time to 1.000.000 µs (d) and click OK (e):

Add new block							
Name:							
Cyclic interrupt							
Cyclic Interrupt							
a	💶 Program cycle	Language: c SCL 🔻					
	startup						
-OB	Time delay interrupt	Number: 30 🌩					
Organization block	Cyclic interrupt b	🔘 manual					
БІОСК	- Hardware Interrupt	 Automatic 					
	💶 Time error interrupt	Cyclic time (us): 1000000					
	💶 Diagnostic error interrupt	Cyclic time (µs): 1000000 d					
	💶 Pull or plug of modules	Description:					
гв	Rack or station failure	A "Cyclic interrupt" OB allows you to start					
Function block	💶 Programming error	programs at periodic intervals,					
	IO access error	independently of cyclic program execution.					
	💶 Time of day	The intervals can be defined in this dialog or in the properties of the OB.					
	MC-Interpolator						
FC	💶 MC-Servo						
	💶 Synchronous Cycle						
Function	💶 Status						
	💶 Update						
	💶 Profile						
DB							
Data block							
		More					
Additional inform	nation	e)					
Add new and open		OK Cancel					

> Declare a new variable meas_val under PLC Tags

	oject Edit View Insert Online 🤅					Window Help	💋 Go onlir	ne 🚀 Go offline	<mark>#</mark> ?		- 🛄 <ea< th=""><th>rch in</th></ea<>	rch in		
	Project tree 9251_TIA_Integration > PLC_1 [CPU 1511-1 PN] > PLC tags													
	Devices 🗐 Tags 🗉 User co													
			•	*	🔮 🖻 🗄 🛍									
50			Pl	PLC tags										
Ē	9251_TIA_Integration					Name		Tag table		Data type	Address			
Jue.	📑 Add new device			1		meas_val		Default tag table	•	Real 🔳	%MD6	-		
6	📩 Devices & networks			2	[<add new=""></add>								
F	PLC_1 [CPU 1511-1 PN]													
FC	Device configuration													
	🗓 Online & diagnostics													
	🔻 🙀 Program blocks													
	💕 Add new block		≡											

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> then type in the following source code in the code field of the new block:

"meas_val" := DWORD_TO_REAL("INPUT_BYTES_2_5");

Please note: the addresses may be different. You have to check them in the **Device view** \rightarrow Device **overview** of the 9251.

9251_TIA_Integration Ungrouped	devices	burs	ter-9251	[burster_	9251 Buscoupler]	_ 7 5	× I	lardware catalog 👘 🗖 🔟 🕨
			📲 Topol	ogy view	h Network view	w 📑 Device view		ptions
🏦 🖢 burster-9251 [burster_9251 🗗 📰			🔍 ±					
buster9+							<u>^</u> -	Catalog
DI								Search>
								Filter <all></all>
								🖬 Head module
							- L 1	🗖 Module
_	8							🕶 🛅 Buscoupler Module 9251
		and the						📗 BusCoupler Data exte
								📗 BusCoupler Data short
								🕶 🛅 Measurement Module
								📗 9250 Strain Gage ext
							\mathbf{v}	📗 9250 Strain Gage short
< III				>	100%	▼₽	•	🕨 🫅 Measurement Module
			* *		·			🕨 🫅 Measurement Module
Device overview								🕨 🛅 Measurement Module
Y Module	Rack	Slot	I address	Q address	Туре	Article no.		Measurement Module
 burster-9251 	0	0			burster_9251 Busc	9251-Vxxx	^	Measurement Module
Interface	0	0 X1			burster-9251			
 BusCoupler Data extended_1 	0	1			BusCoupler Data ex			
BusCoupler Data extended	d 0	11	0135		BusCoupler Data ex			
BusCoupler CTRL	0	12		015	BusCoupler CTRL			
	0	2						

You will also see that the TIA-Editor replaces the input addresses with tags. You can change the tags names in PLC Tag table (e.g. to **IN_BYTES_2_5**):

Project Edit View Inse					dow Help	🍠 Go onlir	ne 🔊 Go offline 🖁	? 📘 🛛	× -	- III (<	arch in project	> 1 4				
Project tree		• •	9251_	_TIA_I	ntegration 🕨 PLC	_1 [CPU 1	511-1 PN] ▶ PLC	tags						_∎■×		
Devices									🕣 Tags	E Use	er constants	🔎 🔊	stem co	onstants		
24		}	* 1) 🖻	🕒 🗊				-							
Ð			PI (PI C tans												
👻 🔄 9251_TIA_Integratio	n	^		Nam	ne		Tag table	Data typ	e	Address	Retain	Acces	Writa	Visibl S		
🗧 📑 Add new device		1	1	a 1	meas_val		Default tag table	Real		%MD6	-					
🗄 📩 Devices & netwo	orks	2	2	- I	INPUT_BYTES_2_5		Default tag table	DWord		%ID2						
🚊 🚽 🗖 PLC_1 [CPU 151	I-1 PN]		-	_	Add nova	_		-								
🗧 🛛 📑 Device config	uration															
🖳 🖳 Online & dia	nostics															
🔻 🚘 Program blog	ks															
📑 Add new	olock	=														
💶 Cyclic inte	rrupt [OB30]															

Before you load the project into the CPU you have to set the IP address of your CPU. To do this please go to **Device view** and select *Ethernet addresses* (a) in *General* tab. Set now the IP-Address and a subnet mask(b) for your PLC:

PLC_1 [CPU 1511-1 PN]	🖳 Properties 🚺 Info 🔒 🗓 Dia	gnostics 🛛 🗆 🗸 🗸
General IO tags Sys	n constants Texts	
 ✓ General Project information Catalog information Identification & Maintenance ✓ PROFINET interface [X1] 	Ethemet addresses	
General Ethernet addresses Time synchronization	Add new subnet	
Operating mode Advanced options	IP protocol	
Web server access	Set IP address in the project IP address: 192 . 168 . 110	
Hardware identifier Startup	Subnet mask: 255 . 255 . 255	(b)
Cycle	Use router	
Communication load System and clock memory	Router address: 0.0.0	. 0
 System diagnostics 	IP address is set directly at the device	
General Alarm settings	PROFINET	
Web serverDisplay	PROFINET device name is set directly at	t the device
User interface languages	Generate PROFINET device name autor	natically 🗸

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➤ To load the configuration into the CPU select it first go to Online → Download to device and click on Start search (a) to look for your controller. Then select the controller and click on Load (b):

xtended download to	device										
	Configured access not	des of "PLC_1"									
	Device	Device type	Slot	Туре	Address	Subnet					
	PLC_1	CPU 1511-1 PN	1 X1	PN/IE	192.168.110.33						
	CM1542-5_1	CM 1542-5	3 X1	PROFIBUS	5	PROFIBUS_1					
		Type of the PG/PC inte		PN/IE		· ·					
		PG/PC inte	rface:	Intel(R) 82	579V Gigabit Network (
	Conr	nection to interface/su	ibnet:	Direct at slot	'1 X1'						
		1st gat	eway:			- 💎 💽					
					C channell a server	dela destana					
	Compatible devices in	-			🛃 Show all compa						
	Device	Device type	Туре	P	Address	Target device					
	PLC_1	CPU 1511-1 PN	PN/IE		192.168.110.33	PLC_1					
	-		PN/IE		Access address	-					
€											
Flash LED						(a)					
						<u>Start search</u>					
Online status information:	:										
Retrieving device info	ormation										
Scan and information											
Display only error me	ssages				b						
						ad <u>C</u> ancel					

To watch the measurement value, go to **Watch and force tables** (a) \rightarrow **Add new watch table** (a) und add the variable **meas_val** to the table (b):

Project Edit View Insert Online Options 🌁 🎦 🔒 Save project 💄 🐰 🗐 👔 🗙 🕊		📓 💋 Go online 🖉	🛙 Go offline 🛛 🔒 🔒 🚺		Search in proj	ect>
Project tree 🔲 🖣	9251_TIA_Integration →	PLC_1 [CPU 1511	-1 PN] 🕨 Watch a	nd force tables	Watch table_	1
Devices						
🖼 🔟 🖬	🖻 🔮 📲 🐓 🗓 🖉 1	R Z 🍄 📬				
5	i Name	Address	Display format	Monitor value	Modify value	9
🗧 💌 💽 PLC data types 🔨	1 "meas_val"	%MD6	Floating-poin 💌			
E Add new data type	2	W>				
🗟 🕐 🥁 Watch and force tables		b				
Add new watch table						
🗧 🔚 Force table a						
Book Watch table_1						

Now click on "Go online" (a) and then "Monitor all" (b) to watch the value of meas_val

Project Edit View Insert Online Op 🌁 🎦 🎦 Save project 🔳 💥 🗐 🗊	· .		Tools Window Help	🛛 🖪 🚿 Go online	e 🔊 Go offline 🛔	
Project tree		925	51_TIA_Integration >	PLC_1 [CPU 151	1-1 Pl a Watch a	nd force tables 🔸
Devices						
	2	₫¢	🗳 📖 🕼 🗓 🔗	A 🛷 🖺 🕯		
2			i Name	ddress	Display format	Monitor value
🗧 💌 🗋 9251_TIA_Integration 🗹	0	1	"meas_val"	b MD6	Floating-poin 💌	0.5261108
🗧 📑 Add new device		2		<add new=""></add>		1
🗄 📠 Devices & networks						
🎽 👻 🚰 PLC_1 [CPU 1511-1 PN] 🛛 🗹	0					
Device configuration					/	
😵 Online & diagnostics					Measuremen	t value of
Program blocks						
Technology objects					analogue inp	ul
External source files						
👻 📜 PLC tags	0					
Show all tags						
💕 Add new tag table						
💐 Default tag table [61]	1					
PLC data types						
 Watch and force tables 						
🚔 Add new watch table						
Force table						
Watch table_1						

5. Further Examples

In the followed examples, a *Hardware-ID* is used to access a certain slot. To find this, please select a **burster-9251** device in **Topology view** or **Network view** and then switch to **Device view**. Click with the right mouse button on the desired module, e.g. *BusCoupler Data extended* and select **Properties**:

Device	overview							
- 🍟 1	Module	Rack	Slot	I address	Q address	Туре	Article no.	
	 burster-9251 	0	0			burster_9251 Busc	9251-Vxxx	^
	Interface	0	0 X1			burster-9251		
	 BusCoupler Data extended_1 	0	1			BusCoupler Data ex		
	Change device		11	0135		BusCoupler Data ex		=
	Start device tool		12		015	BusCoupler CTRL		
	X Cut	Ctrl+X	2					
	П Сору	Ctrl+C	3					
	Taste	Ctrl+V	4					
	X Delete	Del	5					
	Rename	F2	7					
	Pack addresses		8					~
<	Unpack addresses		1111				>	
BusCouple	Compile	•	🖳 🖳 Prop	perties	🔄 Info (i 🗓 Diagnostics		
General	· ·	•	Texts					
General	💋 Go online	Ctrl+K	u					_
Catalo	🛃 Go offline	Ctrl+M	ifier					
I/O addre	😯 Online & diagnostics	Ctrl+D	ntifier					
Hardware	🕰 Assign device name		numer					
manaman	Update and display forced o	perands	rdware id	entifier: 2	64			
	Cross-references	F11	raware ra					
	Cross-reference information	Shift+F11						
	Show catalog C	trl+Shift+C						
	🔯 Properties	Alt+Enter						
		racecurect						

You will see the hardware identifier in the tab General:

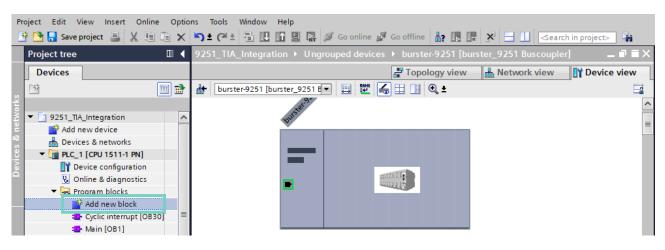
Device o	verview												
省 N	Iodule	Rac	k Slot	I address	Q address	Туре	Article no.	Firmware	Comment				
	burster-9251	0	0			burster_9251 Busc	9251-Vxxx						
~	Interface	0	0 X1			burster-9251							
Image:	 BusCoupler Data exter 	nded_1 0	1			BusCoupler Data ex							
	BusCoupler Data e	xtended 0	11	0135		BusCoupler Data ex							
~	BusCoupler CTRL	0	12		015	BusCoupler CTRL							
		0	2										
BusCouple	r Data extended [Bu	sCoupler [Data exten	ided]					R 🖻	Properties			
General	IO tags Syst	tem consta	ants T	exts									
 General 													
Catalog	g information	Hardwal	re identifie	9r									
I/O addresses Ha			Hardware identifier										
Hardware	Hardware identifier												
			Hardware identifier: 264										

5.1 Reading of 'string' data types

Example 1: Reading the serial number of the 9251

In this example, we perform a read access on index 15 to get the serial number of 9251. For these acyclic operations, you will need an instance of a RDREC block.

Add a Startup block to the Program blocks using Add new block:



Add new block			×
Name:			
Startup			
Startup Crganization block FB Function block Function FC Function	 Program cycle Startup Time delay interrupt Cyclic interrupt Hardware interrupt Time error interrupt Diagnostic error interrupt Pull or plug of modules Rack or station failure Programming error IO access error Time of day MC-Interpolator MC-Servo Synchronous Cycle Status Update Profile 	the operating m STOP to RUN. Aft	SCL 100 Manual Automatic will execute one time when hode of the PLC changes from ter completion, the main 'OB will begin executing.
Data block		more	

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> Add variables to the **Startup** block:

		St	artup							
 9251_TIA_Integration 	-		Na	me	Data type	Default value	Supervision	Comment		
📑 Add new device	4		-	Temp						
Devices & networks	5		•	Valid	Bool					
PLC_1 [CPU 1511-1 PN]	6		•	Busy	Bool					
Device configuration	7			Error	Bool					
🖳 Online & diagnostics	8			Status	DWord					
Program blocks	9			Done	Bool					
📑 Add new block	10	-		lenRead	UInt					
- cyclic interrupe [0B30]	11			serial	Array[019] of Byte					
💶 Main [OB1]	12		•	<add new=""></add>						
🔁 Startup [OB100]	13		-	Constant						

> Then add a new **Data block**:

Add new block				×
Name:				
Data_block_1				
	Type:	🧧 Global DB	-	
OB	Language:	DB	T	
Organization	Number:	2	\$	
block		🔿 Manual		
		 Automatic 		
FB	Description:			
Function block	Data blocks (DBs)) save program data.		
Tunction block	more			
Function				
Data block				

> In addition, insert the variable **device_serial** into this new block:

	Data_block_1											
	-	Nar	me	Data type	Start value	Retain	Accessible f	Writa	Visible in	Setpoint		
1		•	Static									
2			device_serial	String 🔳				\checkmark	\sim			
з		•	<add new=""></add>									

> Use the following source code to get the serial number from the device:

Source code:

REPEAT								
"RDREC_DB"(REQ:=TRUE,								
ID:=264,	// 263: HW-ID (see introduction of 'Further examples')							
INDEX:=15,	// Index 15: Serial							
MLEN:=20,	// Max. length of data to read							
VALID=>#Valid,	LID=>#Valid, // New Data received and valid							
BUSY=>#Busy,	BUSY=>#Busy, // Read not completed yet							
ERROR=>#Error,	// Error							
STATUS=>#Status,	// State							
LEN=>#lenRead, // Number of bytes was read from device								
RECORD:= #serial);	// Array[019] of Byte							
UNTIL NOT #Busy								
END_REPEAT;								
IF #Error = T RUE OR #Status	s <> 0 THEN							
RETURN;								
END_IF;								
Chars TO Stra(Chars)=#seria								
Chars_TO_Strg(Chars:=#serial, pChars:=0,								
Cnt:=19,								
Strg=>"Data block 1	".device serial);							
	_ //							

Example 2: Reading of serial number

> Add now the variable to your **Watch table** and set the PLC into the **RUN** mode:

*											
	i	Name	Address	Display format	Monitor value	Monitor with trig	Modify with trigge	Modify value			
1		"meas_val"	%MD6	Floating-point nu	3287.3	Permanent	Permanent				
2		"Data_block_1".device_serial		String	'125805'	Permanent	Permanent				
3			<add new=""></add>								

Note: Datatype **String** in TIA Portal contains two additional bytes, which represent the length of the string. To cut off these two bytes, use the function '*Chars_TO_Strg*' to convert the byte array to a String data type.

burster

5.2 Read and Write of 'real' data types

Example 3: Set and Get the Limit A – Lower Value

This example shows you how to write and read the Limit A – Lower Value.

> Add the needed variables to the **parameters table**:

	Startup_Limit_A_LOW									
		Na	ime	Data type	Default value	Supervision	Comment			
4		•	Temp							
5			Valid	Bool						
6			Done	Bool						
7			Busy	Bool						
8			Error	Bool						
9			Status	DWord						
10			LenRead	UDInt						
11			limit_a_low_write	Real						

> Add the variable **limit_a_low** to a data block as shown in the example 1 above

	Da	Data_block_1									
_	-	Name		Data type		Start value	Retain	Accessible f	Writa	Visible in	Setpoint
1	-	▼ Sta	atic								
2	-	•	device_serial	String					~	~	
3		•	limit_a_low	Real	=	0.0		\checkmark		~	
4		•	<add new=""></add>								

> Use the following source code to write the value 0.525 as Limit A Lower Value and then read it back:

<pre>#limit_a_low_write := 0.525;</pre>				
REPEAT				
"WRREC_DB"(REQ := TRUE,	// Write access			
$\overline{\text{ID}} := 264,$	// Hardware-ID (see section 'Further examples')			
INDEX := 6 ,	// Index 6 to set the Limit A lower			
LEN := 4,	// Length in bytes to write			
DONE => #Done,				
$BUSY \Longrightarrow #Busy,$				
ERROR => #Error,				
STATUS => #Status,				
RECORD := #limit_a_low_write);				
UNTIL NOT #Busy AND #Done				
END_REPEAT;				
IF #Error = TRUE OR #Status <> 0 THEN RETURN; END_IF;	// If write failed \rightarrow return			
REPEAT				
"RDREC DB"(REQ := TRUE,	// Read access			
ID := 264,	// Hardware-ID (see section 'Further examples')			
INDEX := 6,	// Index 6 to set the Limit A lower			
MLEN := 4,	// Max. length of bytes to read			
VALID => #Valid,				
BUSY => #Busy,				
ERROR => #Error,				
STATUS => #Status.				

LEN => #lenRead, RECORD := "Data_block_1".limit_a_low); UNTIL NOT #Busy AND #Done END_REPEAT;

// Number of bytes read
// Limit A lower value

Example 3: Writing and Reading of limit a lower value

> Check that the variable **limit_a_low** is identical to the value of the variable **limit_a_low_write**:

Ŷ											
	i	Name	Address	Display format	Monitor value	Monitor with trig	Modify with trigge				
1		"meas_val"	%MD6	Floating-point nu	3287.9	Permanent	Permanent				
2		"Data_block_1".device_serial		String		Permanent	Permanent				
3		"Data_block_1".limit_a_low		Floating-poin 💌	0.525	Permanent 🖉	Permanent 📃 💌				