

# S210 Simple Motion S7-1500T using TIA Portal V16 and Startdrive

Revision Date: 4-6-2020

Launch TIA Portal V16 and open the Project View.

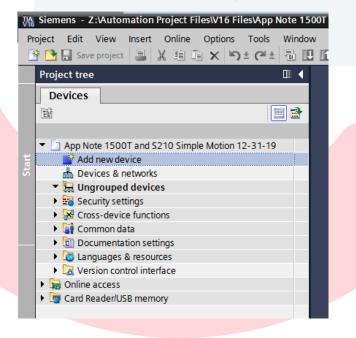
Begin by creating a new project by selecting New under the Project Menu or select the New Project Icon

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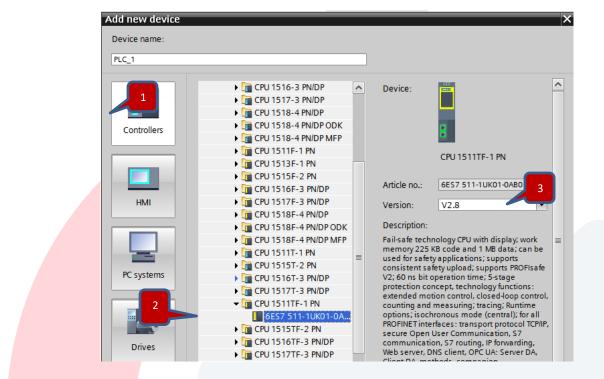
Name the Project and select the path to save.

NA Siemens		Create a new project
Project Edit View Insert	Online Options	Project name: Simple Motion S210
Open Migrate project	Ctrl+O	Path: Z:\Automation Project Files\V16 Files
Close	Ctrl+W	Version: V16
Delete project	Ctrl+E	Author: jpipkin
Save Save as Archive	Ctrl+S Ctrl+Shift+S	Comment:
Project server	•	
The Card Reader/USB memory The Memory Card file	;	Create Cancel
Start basic integrity check		
Z:\\App Note 1500T and S2 Z:\\App Note 1500T and S2 Z:\Automation Projec\S7-12	210 Simple M	
Exit	Alt+F4	

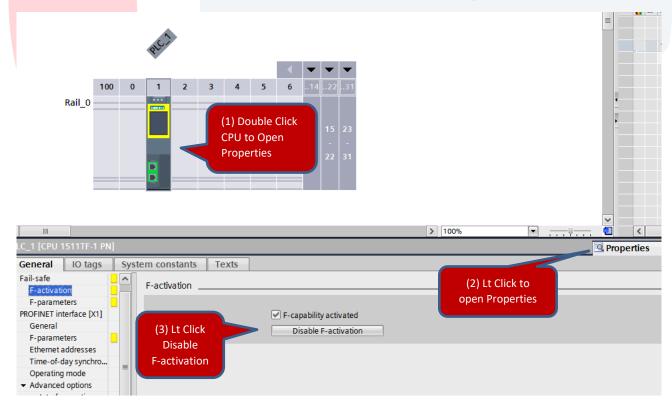
After the new project is created, select Add new device in the Project Tree.



Selec Controllers then select your S7-1500 CPU from the list. Confirm the Version matches your CPU Firmware.



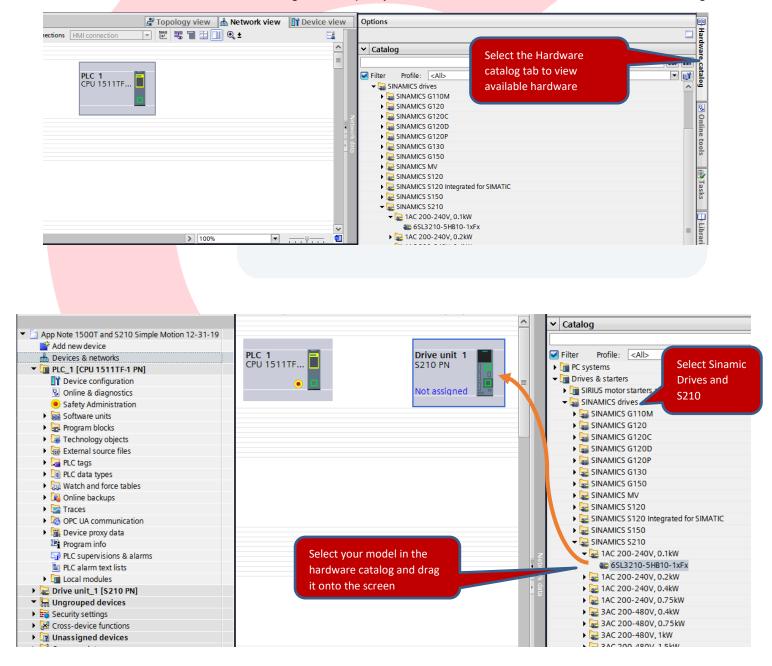
This CPU used for the document is a Failsafe CPU so for now Disable Safety in the PLC



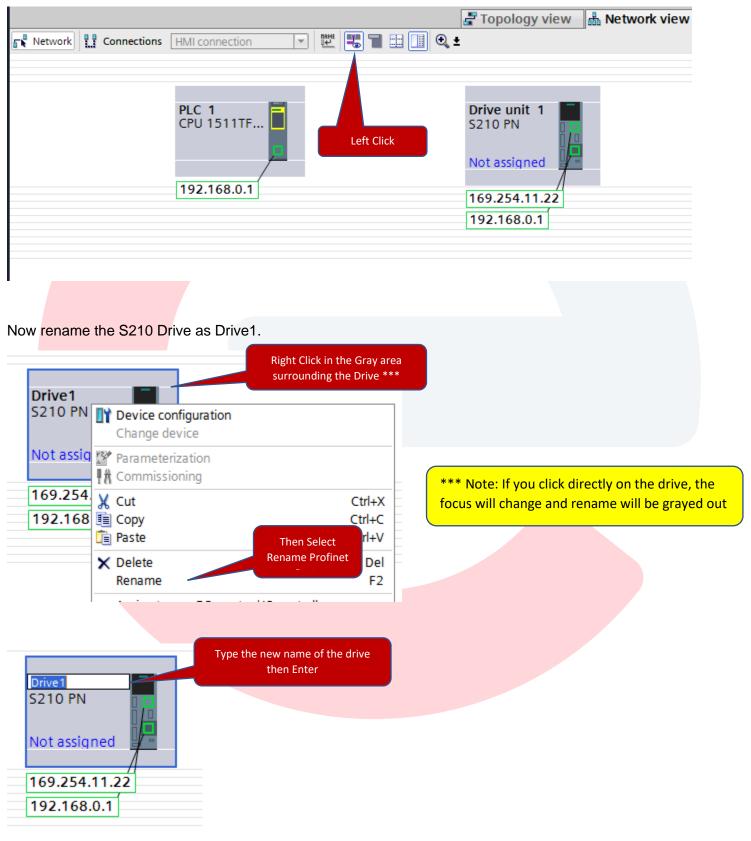
Open the Devices & Networks view to add the S210 Drive

<ul> <li>Simple Motion S210</li> </ul>			
Add new device	Double Click to open the		
🚠 Devices & networks 🗕	Devices & Networks View	PLC 1	
PLC_1 [CPU 1511TF-1 PN]		CPU 1511TF	
Device configuration			
Online & diagnostics			
Safety Administration			
Software units			

In the Devices and Networks Window, Drag and Drop in your S210 Drive model from the hardware catalog.



Click the "Show Address" icon to display the IP Addresses. At this point the Drive and the PLC are not connected on a network and have the same IP Address assigned.



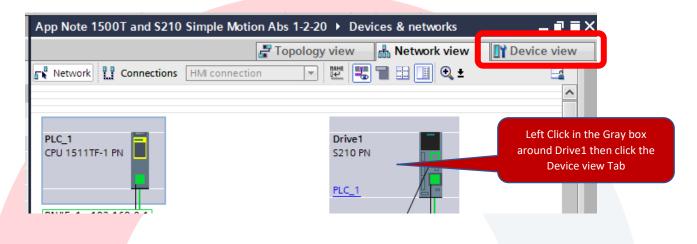
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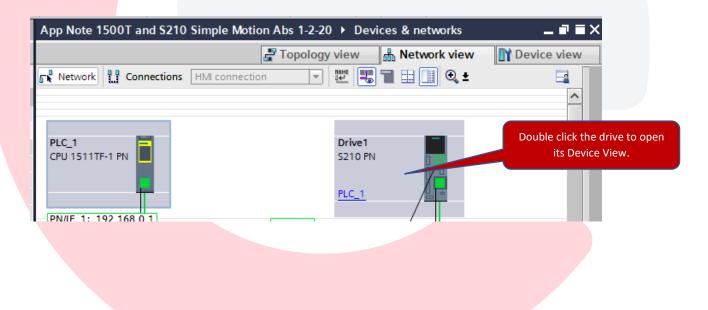
We now need to enter Drive1's device view.

Two options to open the Device View:

(1) Left Click on Drive1 then select the Device view Tab,



(2) Or you can Double Click on Drive1 to open Drive1 Device View.



You should now be in the Device View of Drive1

Check the auto assigned IP addresses and change the addresses.

	de Dri	ive1 [S210	PN]	-	1944 🛃 🔛 🕨		Device overviev	v	
	DÍ	ve control					✓ Drive co	e1	SI
		SIEWERS X127 X127 X150 X150 X100			lick on the et Ports				
PROFINET interf								2	Properties
General I General	O tags		constants	Texts				-	
Ethernet address <ul> <li>Telegram config</li> </ul>	uration		hernet addre Interface net		1				
<ul> <li>Advanced option Interface option</li> <li>Media redund</li> <li>Isochronous reduction</li> </ul>	ions dancy mode			Subne	t: PN/IE_1 Add new	subnet			
<ul> <li>Real time sett</li> <li>Port [X150 P1</li> <li>Port [X150 P2</li> </ul>	1		P protocol		C 255 . 255 . 2 Synchronize	55 . 0 router setti		ange the last digit address to 2	t of the
			PROFINET	Kouter addres:		. 0			
					🗹 Generate PR	OFINET dev	vice name automatica	lly	
			PROFINI	ET device name	. defined				

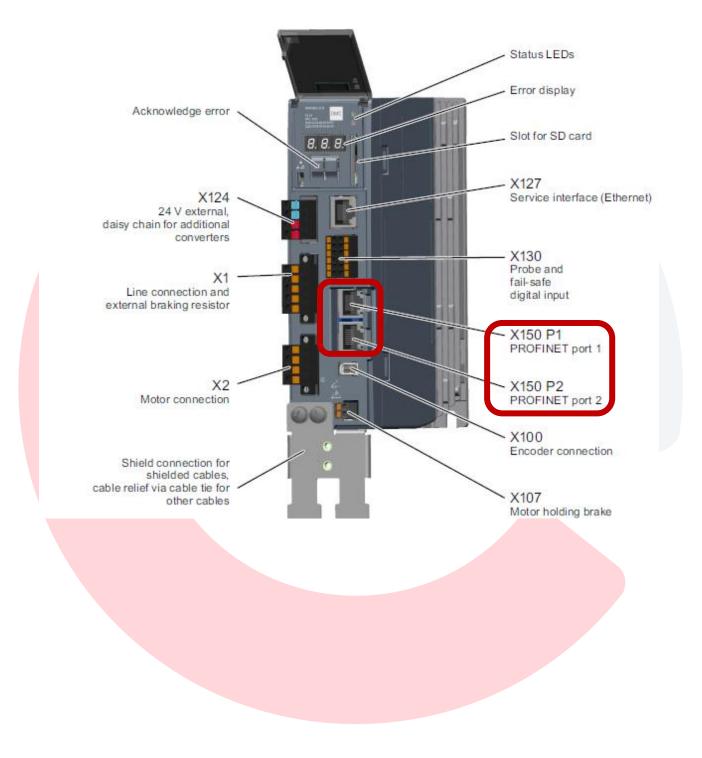
App Note 1500T and S210 Simple Motion 12-31-19 → Drive1 [S210 PN] H Drive1 [S210 PN] 💽 🖽 🕎 🖌 🔛 🗖 Device overview Drive control 💙 ... Module Slot Article no Firmw. Туре Drive control Drive1 5210 PN 6SL3210-5HB10-1.. V5.2 Motor\_1 1FK2 synchronous ... 1FK2xxx-xxxxx-xxxx Left Click the Mot to add the motor ют ~ > 100% -< ..... General IO tags System constants Texts лот v > 100% < ..... -< 1111 3 Info 😟 🖸 Diagnostics 🖳 Properties System constants Texts General IO tags ~ General (2) Left Click Motor selection Motor - selection - 1FK2 (1) Make Sure Motor details **Properties Tab is Open** Basic parameterization: 🔎 You have not selected a motor yet. Select the required motor in the list. Rated speed Rated power Encoder Selection Article number Ho... 🔳 <Filter> 🔳 0.10kW 🔳 <Filter> 6 <Filter> 🗉 <Fi... You may have to  $\bigcirc$ 1FK2102-1AG0x-xCx> 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AS22, Singleturn Wit... uncheck the funnel  $\bigcirc$ 1FK2102-1AG1x-xCxx 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AS22, Singleturn Sta... to turn off the filter  $\bigcirc$ 1FK2102-1AG0x-xSxx 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AS22, Singleturn Wit... to find your motor  $\bigcirc$ 1FK2102-1AG1x-xSxx 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AS22, Singleturn Sta...  $\bigcirc$ 1FK2102-1AG0x-xDx0 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AM22, Multiturn 409 Wit...  $\bigcirc$ 1FK2102-1AG1x-xDx> 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AM22, Multiturn 409 Sta...  $\bigcirc$ 1FK2102-1AG0x-xMx 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AM22, Multiturn 409 Wit...  $\bigcirc$ 1FK2102-1AG1x-xMx: 3,000.0rpm 0.10kW DRIVE-CLiQ encoder AM22, Multiturn 409 Sta...

#### Next select the Motor attached to the S210 Drive

ieneral IO tags Sy ieneral	stem constants	Texts			
leneral lotor - selection - 1FK2	Motor - select	ion - 1FK2	(2)	Horo you can also o	pen a screen for Basic
Notor details				ameters for the mo	
leasuring system_1 [ENC]	Basic	parameterization: 📐 💳	Pdi	ameters for the mo	lor
	Selection	Article number Rated spe	ed Rated power Encoder		Holding brake
ow select your			<pre>Filter&gt;</pre> <pre>Filter&gt;</pre>		<filter></filter>
or in the list		1FK2102-0AG0x-xCx 3,000.0r 1FK2102-0AG1x-xCx 3,000.0r		-	Without holding brake Standard holding brake
		1FK2102-0AG0x-xSx 3,000.0r			Without holding brake
	Ŏ	1FK2102-0AG1x-xSxx 3,000.0r		-	Standard holding brake
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		1FK2102-1AG0x-xCxx 3,000.0r			Without holding brake
sic parameterization					
Motor					
	Article number	1FK2102-0AG0x-xCxx	<b>Z</b>		
	Encoder	DRIVE-CLiQ encoder AS22, Sir	ngleturn		
	Brake	Without holding brake			
	L				
	Rated voltage	58 Vrms	Driv	e unit line supply voltage	230 V
			-		
	Rated current	0.75 Arms	_	otor ambient temperatu	
	Rated power	0.05 kW		Direction of rotation	on [0] Clockwise 💌
	Rated speed	3,000.0 rpm			
	Rated torque	0.16 Nm			( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (
				_	
Limitations					
Linnauons					
Positive speed limit		n			
8,000.000 rpm -				~	
				$\mathbf{X}$	
Negative speed limit				$\rightarrow$	
				$\sim$	
-8,000.000 rpm -					
Torque limit upper		мŤ			
0.66 Nm -					
Torque limit lower					t
-0.66 Nm -					
0.00 Mill					
Quick stop (Off3 ramp	down time)				

Next download to the Drive to install the basic parameters along with the assigned IP Address and the Profinet Name of the device.

Make sure your Ethernet cable is plugged into one of the X150 ports on the Drive



Note: For a successful first download, set the IP address of the wired port you plan to use to connect to the PLC and Drive Network into the same subnet as the PLC and Drive. The default IP addresses used in TIA Portal and the one we are using is 192.168.0.XXX. Set your PC IP Address to 192.168.0.250 and subnet mask to 255.255.255.0. Sometimes Wireless on a computer can also cause issues on first download, so disable wireless for the time being. Also, while in the Ethernet settings of the Computer note the Description name of the Ethernet connection. For my pc, I have extra Ethernet Ports defined. For the physical NIC RJ45 port, it is called Local Area Connection 3. The name in the Description in the Network Connections Details is the name to note. Also confirm the IPv4 Address is 192.168.0.250.

This is Windows 7, Windows 10 will look similar.

## Windows Setup Information:

Local Area Connection 3 Status		k 23	nnection 2	Local Area Connection 3 Unidentified network Intel(R) PRO/1000 MT Network Co
	nternet access etwork access Enabled	N	etwork Connection Details	
Duration:	00:00 19		Network Connection Details:	
Speed:	1.0 Gbps		Property	Value
Details			Description Pescription Physical Address PHOP Encloud	Intel(R) PRO/1000 MT Network Connection #3 00-0C-29-7A-B7-2C
Left Click to Open Window	- Received	L	Pv4 Address Pv4 Subnet Mask Pv4 Default Gateway Pv4 DNS Server	192.168.1.250 255.255.255.0
Packets: 309	610		Pv4 WINS Server VetBIOS over Tcpip Enabl .ink-local IPv6 Address	Yes fe80::585c:ecd6:ed9:a078%13
Properties Sisable Diagnose Diagnose	Close		Pv6 Default Gateway Pv6 DNS Servers	fec0:0:0:ffff::1%1 fec0:0:0:ffff::2%1 fec0:0:0:ffff::3%1
			•	4 III
				Close

Now back in TIA Portal in the Network View:

Drive1 S210 PN		ight Click on the Drive o open the menu	
Not assign	Change device		
	Parameterization Commissioning		
	从 Cut 1 Copy 1 Paste	Ctrl+X Ctrl+C Ctrl+V	
-	X Delete Rename	Del F2	
	Assign to new DP master / Disconnect from DP maste Highlight DP master system	r system / IO system	
	🚪 Go to topology view		Then select
	👖 Download to device 🛛 💳		Download to Device

For the first download you will see the Extended download to device Window. For PG/PC Interface select PN/IE – for Profinet Industrial Ethernet Download Then Select PG/PC Interface as the physical NIC Card Name as shown above Also select Direct to Slot 'CU X150' for port on the S210 Drive.

	Device	Device type	Slot	Interface type	Address	Subnet	
	Drive1	S210 PN	CU X150	PN/IE	192.168.0.2		
		S210 PN	CU X127	PN/IE	169.254.11.22		
							(1)Select PN/IE as
Colort Constant							type of interface.
Select your Ethe							
atch the port De	scription	of the PG/PC in		PN/IE			
			tertace .	PN/IE			
	_	THE PG/PC IN	terrace.				
		PG/PC in			000 MT Network Con	nection <3> 🔻 🤇	
		PG/PC in	terface:	Intel(R) PRO/10			
ame from above		PG/PC in Connection to interface/	terface:				
ame from above		PG/PC in Connection to interface/	terface:	Intel(R) PRO/10			
me from above all compatible d	levices should be self	PG/PC in Connection to interface/	terface:	Intel(R) PRO/10			
all compatible d	levices should be sele rom the pulldown	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10	JX150'	(3	
me from above all compatible d	levices should be sel- rom the pulldown Select target dev	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10	J X150' Show all compatible	e devices	
all compatible d	levices should be sele rom the pulldown	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10	JX150'	(3	
all compatible d	levices should be sel- rom the pulldown Select target dev	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10 Direct at slot 'CL	J X150' Show all compatible	e devices	
ame from above all compatible d	levices should be sel- rom the pulldown Select target dev	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10 Direct at slot 'CL	J X150' Show all compatible Iress	e devices	
me from above all compatible d	levices should be sel- rom the pulldown Select target dev	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10 Direct at slot 'CL	J X150' Show all compatible Iress	e devices	
me from above all compatible d	levices should be sel- rom the pulldown Select target dev	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10 Direct at slot 'CL	J X150' Show all compatible Iress	e devices	
me from above all compatible d	levices should be sel- rom the pulldown Select target dev	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10 Direct at slot 'CL	J X150' Show all compatible Iress	e devices	
ame from above all compatible d	levices should be sel- rom the pulldown Select target dev	PG/PC in Connection to interface/ ected by	terface:	Intel(R) PRO/10 Direct at slot 'CL	J X150' Show all compatible Iress	e devices	

After allowing a few seconds for TIA Portal to search the network, your drive should display on the Devices List. If you are connected directly to the Drive from your computer, then the drive will be all that is listed. Select the drive from the target device list and click Load.

	to device				×	3
	Configured access not	des of "Drive1"				
	Device	Device type Slo	ot Interf	ace type Address	Subnet	
	Drive1	5210 PN CU	U X150 PN/IE	192.168.0.2		
		S210 PN CU	U X127 PN/IE	169.254.11.22		
	ту	/pe of the PG/PC interfac	te: 🛃 PN/IE		•	
		PG/PC interfac	te: 🛛 💹 Intel	(R) PRO/1000 MT Network C	onnection <3> 💌 😍 🔯	
	Conn	ection to interface/subne	et: Direct a	at slot 'CU X150'	▼ 🕐	
		1st gatewa	ay:			
			·			
	Select target device:			Show all compati	ble devices 👻	
	Device	Device type	Interface type	Address	Target device	Select the S210 in the list
	Accessible device		ISO	00-1C-06-3E-CC-1E		
B A			PN/IE	Access address		
1.18						
E.						
Elsch I ED						
Flash LED						
Flash LED						
Flash LED					<u>Start search</u>	
Flash LED	1:			🗌 Display only er		
				🗌 Display only er	ror messages	
Online status information found accessible de Scan completed. 1 co	evice Accessible device compatible devices of 3 a	accessible devices found	d.	🗌 Display only er	ror messages	
Online status information Found accessible de Scan completed. 1 cc Scan and information	evice Accessible device compatible devices of 3 a on retrieval completed.	accessible devices found	d.	🗌 Display only er	ror messages	
Online status information found accessible de Scan completed. 1 co	evice Accessible device compatible devices of 3 a on retrieval completed.	accessible devices found	d.	🗌 Display only er	ror messages	
Online status information Found accessible de Scan completed. 1 cc Scan and information	evice Accessible device compatible devices of 3 a on retrieval completed. formation	accessible devices found		Display only er	ror messages	

Next you will see the Load preview window. Make sure the Save parameterization retentively is checked and click Load to begin the download.

status	!	Target • Drive1	Message Ready for loading.	Action Load 'Drive1'
	0	<ul> <li>Drive parameteria</li> </ul>	Please note the following information:	
	0	Dive parameteriz.	Save the parameterization retentively after the download	Save parameterization retentively
			Make sure this is checked	
<			Ш	>

This will load the initial drive setup parameters motor data and the Profinet Name to Drive1

Note: Using Profinet Communications, the PLC assigns the IP address to each device by their Profinet Name, so you don't assign an IP address directly in the Drive, just the Profinet name.

Next, configure the Profinet Connection between Drive1 and PLC 1.

Open the Network View Tab. Left Click on Not Assigned on the Drive and select IO controller. Left Click PLC\_1.PROFINET interface\_1 to connect the two devices.

App Note 1500T and S210 Simple Motion Abs 1-2	-20 > Devices & networks	_ 🗗 🖬 X
and the second s	ogy view 🔒 Network view	Device view
Network Connections HMI connection	- 🕅 🗄 🛄 🍳 ±	
PLC 1 CPU 1511TF	Drive1 S210 PN Not assigned Select IO controller PLC_1.PROFINET interface_1 169.254.11.22 192.168.0.2	

Now we see a Profinet Connection (Green Dashed Line) between the PLC and Drive

E

💦 Network 🔡 Connections HMI connection 💌 🗮 🖽 🖽 🖽	€, ±
PLC 1 CPU 1511TF	Drive1 S210 PN PLC_1 169.254.11.22 PN/IE_1: 192.168.0.2

With Technology Objects and Motion, we also need to configure Topology View to be used the Profinet IRT (Isochronous Real-Time) communications

For Topology this needs to match the exact physical connections between the PLC and the Drive.

For my setup Port 2 on the PLC is connected directly to Port 1 on the drive.

Left Click on Port 2 of the PLC and Drag to Port 1 on the Drive

		📲 Topology view 🛔 Network view 🚺
	€ ±	
	•	
		Click to Open
	Drive1	Topology view
Left Click port	S210 PN	
Discussion of the second se		
to port on Drive	PLC_1	
		🚽 Topology view
	🗄 🛄 🔍 ±	
PLC 1	Drive1	
CPU 1511T	F \$210 PN	
	🖲 📮 PLC_1 🗗	
	<b></b>	a

Next configure IRT communications for motion control over Profinet.

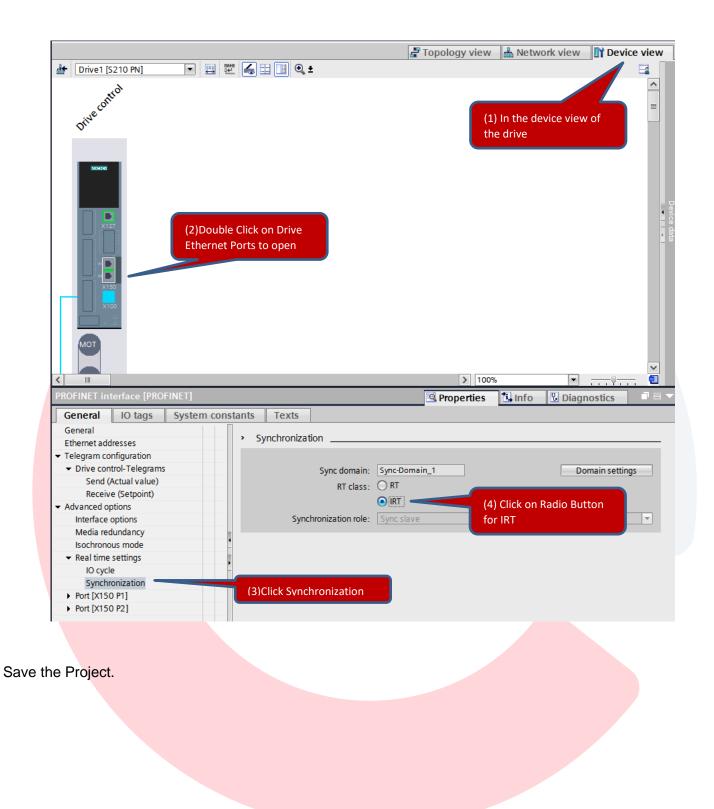
		1 🛄 🔍 ±		🛃 Τορ	ology view		
Double Click on Plopen Settings	LC to	s:	rive1       210 PN       LC_1				
				🛃 Торо	logy view 🛛 📥 Network vi	ew 🛛 🚺 Device vi	ew
# PLC_1 [CPU 1511TF	F-1 PN] 💌 🖽 🔛	🖌 🛄 🔍 ±			Device overview		
Rail_0		3 4 5 6 Click on PLC Eth Ports to open Pr			Y Module     ✓ PLC_1     ✓ PROFINET integration	0 0 erface_1 0 0 0 0 0 0 0 0	Sl 1 0 1 1 2 3 4 5 6
< Ⅲ			> 100%	· · · · · · · · · · · ·	<		>
PLC_1 [CPU 1511TF-1	PN]			🔍 Pro	operties 🗓 Info 🔒 🗓 D	iagnostics	
General IO tag	s System constant	ts Texts					
<ul> <li>Fail-safe         <ul> <li>F-activation</li> <li>F-parameters</li> </ul> </li> <li>PROFINET interface [X1 General         <ul> <li>F-parameters</li> <li>Ethernet addresses</li> <li>Time-of-day synchro</li> <li>Operating mode</li> <li>Advanced options</li> <li>Interface options</li> <li>Media redundand</li> <li>Real time setting:</li></ul></li></ul>	I] onization	Synchronization Sync dom n: Synchronization r e: RT cl: s:	Sync master			Domain settings	
Set the PLC a	is Sync Maste	r for the IRT Co	mmunications				
> > Synchror	nization			- V	-		
	Sync domain:	Sync-Domain_1		Domain settings			
Curr.	ichronization role:	Sync master		▼			
Syr		Unsynchronized		<b>▼</b>			
	RT class:	Sync master					
		Sync slave					

Double check IO Communications Send Clock and set to 4ms if not already set.

PROFINET interface_1 [X1]		🔍 Properties	🗓 Info 📲 Diagnostics 👘 💷
General IO tags System	em constants Texts		
General			
F-parameters	IO communication		
Ethernet addresses			
Time-of-day synchroniza	Send clock: 4.000		ms 💌 Domain settings
Operating mode			
<ul> <li>Advanced options</li> </ul>			
Interface options			2
Media redundancy			
IO communication			
Synchronization	1		

Now we will setup up the communications in the drive. Click the Network View tab, and double click on the drive to open its device view.

Network 🔡 Connections HMI connection 💌 🖭 🖫 🖬 🔜 💷 🍕 🛨 📮 IO system: PLC_1.PROFIN	NET IO-Syst
PLC 1 Drive1 Double click th	he drive to open ice View.



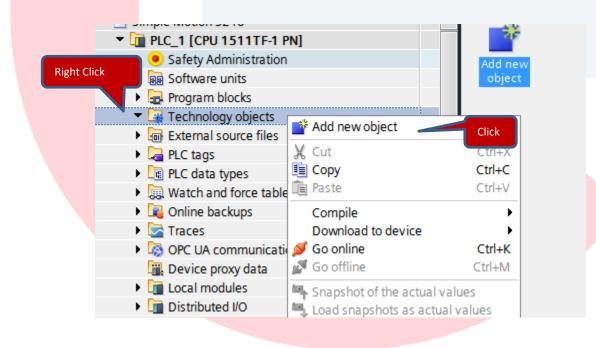
Select the Window menu and select Close all to close out all open windows.

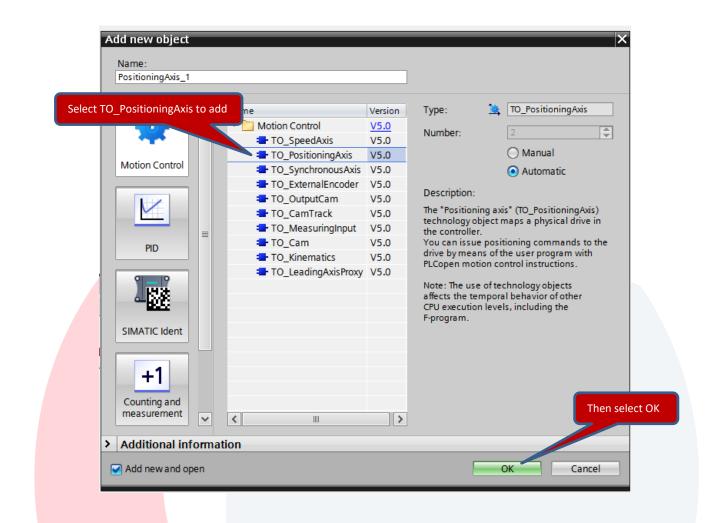
Tools	Wi	ndow	Help								
± (24 ±		Close a Minimiz			Clo	ose all					× 🗄
		Next eo Previou	ditor Is editor			Ctrl+Rig +Ctrl+Le	·		i1TF-		1
		Split ed		e vertically e horizonta	lly	F Ctrl+F Shift+F					
	F.			yout as vindow layo	out S	hift+Alt-	+0				
	۲	Default	t window	layout	S	hift+Alt	+1				
		More w	indow la	youts				_			
					100	0	1		2	3	4
				Rail_0							

Now we begin Programming the Axis

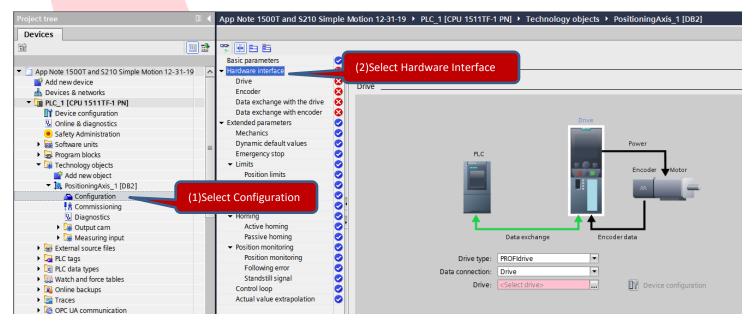
Right Click Technology Objects and Select Add new object

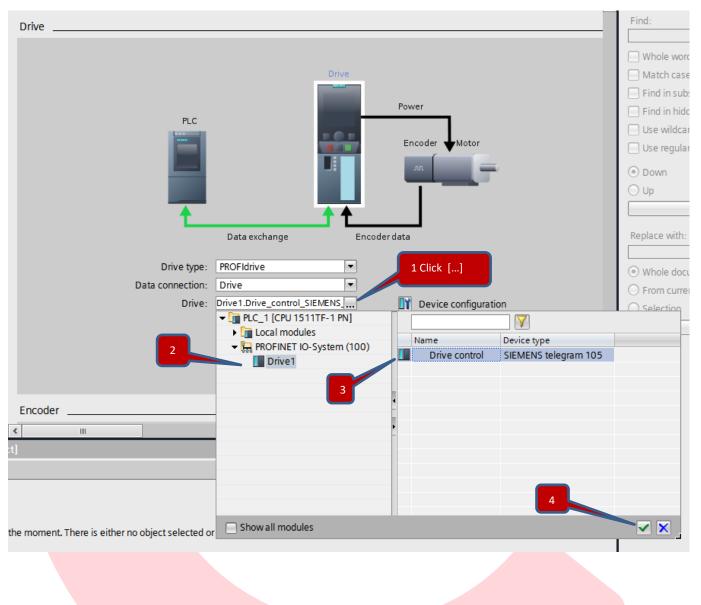
Then Select TO\_Position ingAxis and keep the default name.





# Under the new PositioningAxis\_1 select Configuration





Select the Drive to attach to this Technology Object. Select the ellipsis (...) button and dive down under PROFINET IO-System, then Drive1, and select Drive Control for Drive1.

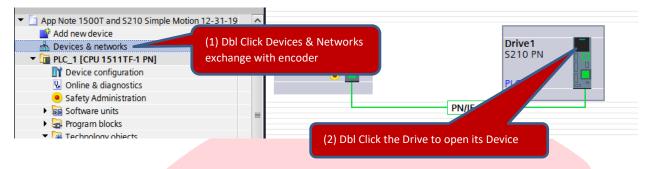
Check the Data exchange with the drive settings

Basic parameters 🧹	Data exchange with the drive
<ul> <li>Hardware interface</li> </ul>	Data exchange with the three
Drive 🗸	
Encoder 🗸	
Data exchange with the drive	Select data exchange wit drive
Data exchange with encoder 🛛 😪	
<ul> <li>Extended parameters</li> </ul>	Power
Mechanics 🗸	PLC
Dynamic default values 🛛 🗸	Encoder Motor
Emergency stop 🧹	Encoder Motor
👻 Limits 😔	
Position limits 🧹	
Dynamic limits 📿	
Torque limits 🧹	
Fixed stop detection 🧹	
🝷 Homing 🛛 😔	Data exchange Encoder data
Active homing <	
Passive homing <	Drive data
<ul> <li>Position monitoring</li> </ul>	
Position monitoring 🧹	Drive telegram: Standard telegram 105 💌 🛐 Device configuration
Eollowing error	
Make sure both check boxe	s are checked
	Automatically apply drive values at runtime (online)
	Reference speed: 8000.0 1/min
	Maximum speed: 8000.0 1/min
	Reference torque: 0.6603 Nm

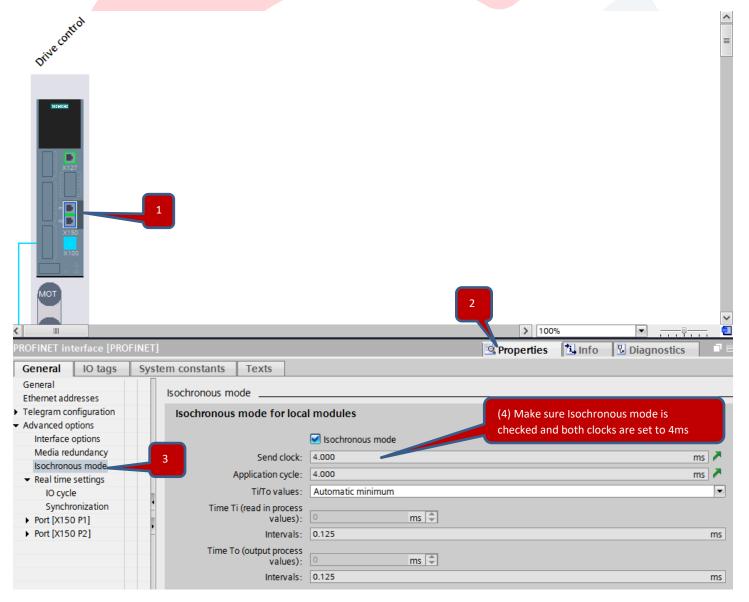
# Then the Data exchange with encoder.

✓ Hardware interface	Data exchange with encoder
Drive	
Encoder	
Data exchange with the drive	Drive
Data exchange with encoder	Select data exchange with encoder
Extended parameters	Power
Mechanics	PLC
Dynamic default values	
Emergency stop	
👻 Limits 🔍	
Position limits	
Dynamic limits	
Torque limits	
Fixed stop detection	
👻 Homing	Data exchange Encoder data
Active homing	
Passive homing 🗧 🤤	Settings for:
✓ Position monitoring	Setungs for.
Position monitoring	Encoder 1
Following error	
Standstill signal 🤇	
Control loop	
Actual value extrapolation	Encoder telegram: Standard telegram 105 💌 🕅 Device configuration
	Automatically apply encoder values during configuration (offline)
Make sure both check boxes	
	Automatically apply encoder values during runtime (online)
	Measuring system: Rotary
	Increments per revolution: 2048
	Number of revolutions: 1

Now go back to the Devices & Networks Screen



On the Device View click the Profinet Ports of the Drive, then click the Properties Tab at the bottom of the page, and check the Isochronous mode settings as shown.



# Create the S7 Program

<ul> <li>PLC_1 [CPU 1511TF-1 PN]</li> <li>Device configuration</li> <li>Online &amp; diagnostics</li> </ul>		
Safety Administration		
<ul> <li>Software units</li> <li>Program blocks</li> </ul>	Dbl Click Add new block	
📫 Add new block		
📲 Main [OB1]		
The second secon		
The MC-Servo [OB91]		

Create a new FB with the name MC\_Pos.

	Add new block						2
4	Name:				(1) Type	MC_Pos to name I	block
	MC_Pos						
	Organization	Language: Number:	LAD 2 O Manual	<ul> <li>▼</li> </ul>			
	block		<ul> <li>Automatic</li> </ul>				
		Fail-safe:	Create F-block	-			
	FB-FB-		ick Function Block				
	Function block	Function blocks so that they ren	are code blocks that sto nain available after the bl	re their values p ock has been ex	ermanently in i œcuted.	nstance data blocks,	
	Function						
Ì	Data block		(3) Click OK to	complete			
		more					
)	Additional inform	nation					
,	Add new and open				ОК	Cancel	

Add Local InOut Variable named Axis to MC\_Pos as data type TO\_PositionAxis.

You will need to Type TO\_PositioningAxis as it can't be found by a search.

This InOut Axis Variable will be used to link the physical axis to these functions.

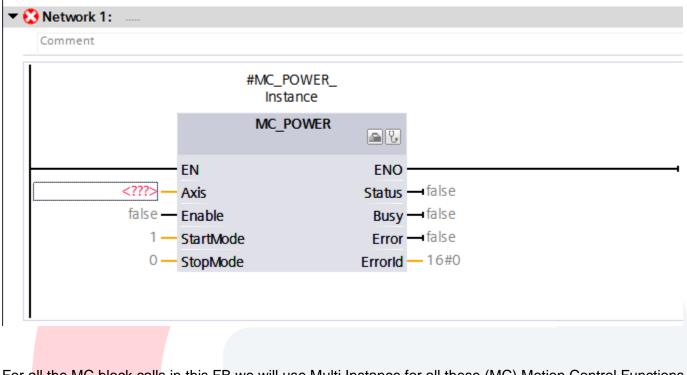
Image: Software units       4         Image: Software units       6         Image: Software units       6         Image: Software units       7	1	<add news<br="">Output <add news<br="">InOut &gt; Axis <add news<br="">Static <add news<br="">Temp <add news<="" th=""><th>TO_PositioningAxis</th><th></th><th></th><th></th><th></th><th></th></add></add></add></add></add>	TO_PositioningAxis					
<ul> <li>Safety Administration</li> <li>Safety Administration</li> <li>Software units</li> <li>Program blocks</li> <li>Add new block</li> <li>Main [081]</li> <li>Mc-Interpolator [0892]</li> <li>Mc-Servo [0891]</li> <li>Mc-Servo [0891]</li> <li>Mc-Servo [0891]</li> <li>Main_Safety_RTG1_D81[081]</li> <li>Main_Safety_RTG1_D81[081]</li> <li>System blocks</li> <li>Technology objects</li> <li>Add new object</li> <li>Moringartion</li> <li>Configuration</li> <li>Configuration</li> <li>Diagnostics</li> </ul>	2 4 4 3 4 4 5 4 7 6 4 8 7 8 4 7 9 8 10 4 7 11 1 12 4 7 13 1	Output <add new="">           InOut            Add new&gt;            Static            <add new="">            Temp            <add new="">            Constant</add></add></add>	TO_PositioningAxis					
<ul> <li>Software units</li> <li>Program blocks</li> <li>Add new block</li> <li>Mc-Fore (D892)</li> <li>MC-Enterpolator (D892)</li> <li>MC-Servo (D891)</li> <li>MC-Fore (D892)</li> <li>MC-Fore (D892)</li> <li>Mc-Fore (FB2)</li> <li>Main_Safety_RTG1[FB1]</li> <li>Main_Safety_RTG1_DB [DB1]</li> <li>Software blocks</li> <li>Technology objects</li> <li>Add new object</li> <li>RostioningAvis_1 [D82]</li> <li>Configuration</li> <li>Configuration</li> <li>Configuration</li> <li>Configuration</li> <li>Configuration</li> <li>Configuration</li> <li>Configuration</li> </ul>	4 ■ 5 €1 ▼ 6 €2 ■ 7 ■ 8 €2 ▼ 9 ■ 10 €2 ▼ 11 ■ 12 €2 ▼ 13 ■	<add new=""> InOut &gt; Axis <add new=""> Static <add new=""> Temp <add new=""> Constant</add></add></add></add>	TO_PositioningAxis					
Image: Configuration     Image: Configuration       Image: Configuration     Ima	5 40 4 6 40 4 8 40 4 9 8 10 40 4 11 1 12 40 4 13	InOut Axis <add new=""> Static <add new=""> Temp <add new=""> Constant</add></add></add>	TO_PositioningAxis					
Add new block     6       Main [OB1]     7       Molin [OB1]     7       Mc-Interpolator [OB92]     8       MC-Interpolator [OB92]     8       MC-Interpolator [OB92]     9       Mc-Interpolator [OB92]     9       Mc-Interpolator [OB92]     9       Mc-Servo [OB91]     9       Main_Safety_RTG1[FB1]     1       Main_Safety_RTG1_DB [DB1]     1       System blocks     9       Technology objects     9       Add new object     9       Configuration     1       Configuration     1       O Diagnostics     9	6 4 1 7 8 4 7 9 8 10 4 7 11 8 12 4 7 13 8	Axis <li>Add new&gt;     </li> <li>Static         <ul> <li>Add new&gt;</li> </ul> </li> <li>Temp             <li>Add new&gt;</li> </li> <li>Constant</li>	TO_PositioningAxis					
Main [081]     7     MC-Interpolator [0892]     MC-Exervo [0891]     9     MC-Pos [F82]     1     Main_Safety_RTG1[F81]     Main_Safety_RTG1_D8 [081]     Main_Safety_RTG1_RTB1_D8 [081]     Main_Safety_RTG1_RTB1_RTB1_RTB1_RTB1_RTB1_RTB1_RTB1_RTB	7     ■       8        9     ■       10        11     ■       12        13     ■	<add new=""> Static <add new=""> Temp <add new=""> Constant</add></add></add>	TO_PositioningAxis					
Image: Provide the second	8	Static <add new=""> Temp <add new=""> Constant</add></add>						
** MC-Servo [OB91]         9           ** MC-Pos [FB2]         1           ** FO8_RTG1 [OB123]         1           ** Main_Safety_RTG1 [FB1]         1           ** Main_Safety_RTG1_DB [DB1]         1           ** Technology objects         **           ** Add new object         **           ** PositioningAxis_1 [DB2]         *           ** Onfiguration         *           ** Configuration         *           ** Diagnostics         *	9 • • • • • • • • • • • • • • • • • • •	<add new=""> Temp <add new=""> Constant</add></add>						
MC_Pos [FB2]     FOB_RTG1 [OB123]     Main_Safety_RTG1 [DB1]     Main_Safety_RTG1 [DB1]     Main_Safety_RTG1_DB [DB1]     System blocks     For Precision locks     Add new object     Main_Safety_RTG1 [DB2]     Configuration     M Configuration     M Configuration     M Diagnostics	10 🖅 👻 11 = 12 🐨 👻 13 =	Temp <add new=""> Constant</add>						
FOB_RTG1 [OB123]     Main_Safety_RTG1 [FB1]     Main_Safety_RTG1 [DB1]     Main_Safety_RTG1_DB [DB1]     Technology objects     Add new object     Add new object     Aconfiguration     If Commissioning     Qi Diagnostics	11 ■ 12 - 20 ▼ 13 ■	<add new=""> Constant</add>						
Main_Safety_RTG1 [FB1] Main_Safety_RTG1_DB [DB1] Technology objects Add new object Add new object Configuration 1 Configuration 1 Configuration V Diagnostics	12 - T	Constant						
Main_Safety_RTG1_DB [DB1]  Solution  Add new object  Add new object  Add new object  Configuration  Add new object  Display and the solution  Add new object  Add new o	13 •							
System blocks     Technology objects     Add new object     SositioningAxis_1 [DB2]     Configuration     A configuration     A configuration     Diagnostics		<add new=""></add>						
Technology objects     Add new object     Social and the second sec	<							
Add new object  Add new object  Configuration  At commissioning  Diagnostics	<							
Lasse PositioningAxis_1 [DB2]     Configuration     In Commissioning     Diagnostics								
Configuration  Configuration  Conmissioning  Diagnostics						1		
Image: state		-0-12 -0-1						
Diagnostics	▼ Block t	itle		_				
	Commen							
	Commen				Click	the Dowr	n Arro	ow to
	▼ Nety	work 1:						
Add new output cam	Comr	ment			expar	nd ths loc	al va	riables
📑 Add new cam track		nem						
Measuring input								
📑 Add new measuring input								
External source files								
PLC tags								
PLC data types								
🗳 Add new data type								
<ul> <li>System data types</li> </ul>	A1 - A	aas used>						

Here we will add logic for control of the Axis. We will be using functions from Motion Control under the Technology Library. Make sure to click on the Instructions Tab to open the Libraries the click on Technology to open the Technology Library. Left Click the Instruction and drag and drop onto the Ladder Network.

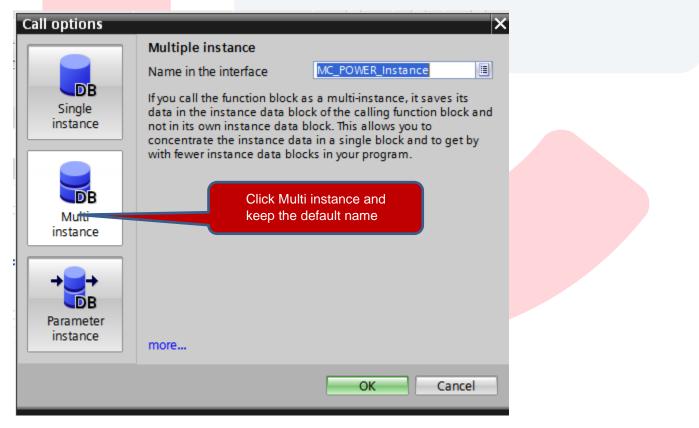
App Note 1500T and S210 Simple Motion Abs 1-2-20 + PLC_1 [CPU 1511TF-1 PN] + Program blocks + MC_Pos [FB2]	Instructions	
	Options	
(2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	🕉 💀 tiù kù	Instructions
MC_Pos	> Favorites	12
Name Data type Default value Retain Accessible f Writa Visible in Setpoint Supervis	> Basic instructions	9
1 di V Input		°
2 • <add new=""></add>	te Tashualawi	
	V Technology	
	Counting and measurem     V4.1	10
	PID Control	ing
▼ Block title:		
Comment	MC_Power     Enable, disable technol V4.0	Tasks
▼ Network 1;	Acknowledge alarms, r V4.0	Ta
	MC_Home Home technology obje V4.0	sks
Comment	HC_Halt Pause axis V4.0	
	MC_MoveAbsolute Position axis absolutely V4.0	
	MC_MoveRelative Position axis relatively V4.0	Libraries
	MC_MoveVelocity Move axis with velocity V4.0	ora
	HC_MoveJog Move axis in jog mode V4.0	Te
	MC_MoveSuperimpo Position axis overlapping V4.0	0,
▼ Network 2:	MC_SetSensor Switch alternative enco V4.0	-
Comment	Measuring input, out	Ad
	Synchronous motion	Add-ins
	Cam	S
	MotionIn	
	Torque data	
	Motion (kinematics)	
	Zones	

First, select MC\_Power. MC\_Power allows the drive to be enabled

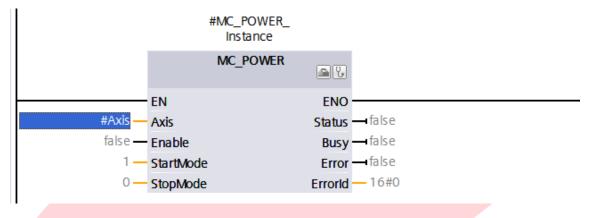
Left Click and hold on MC\_Power in the Technology Instructions and drag and drop into the network.



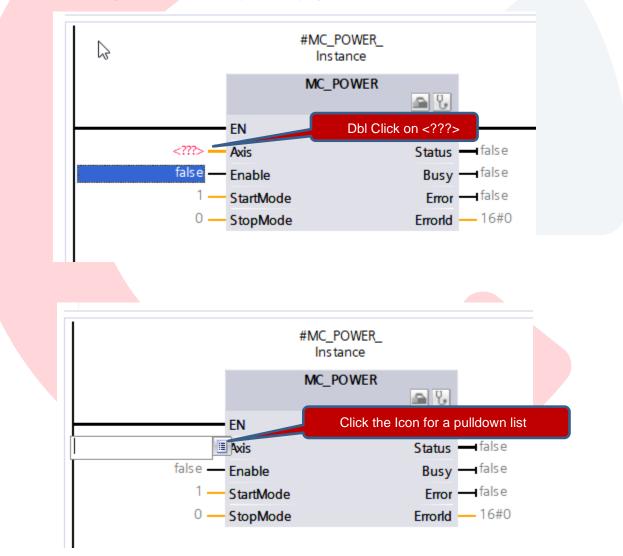
For all the MC block calls in this FB we will use Multi Instance for all these (MC) Motion Control Functions.

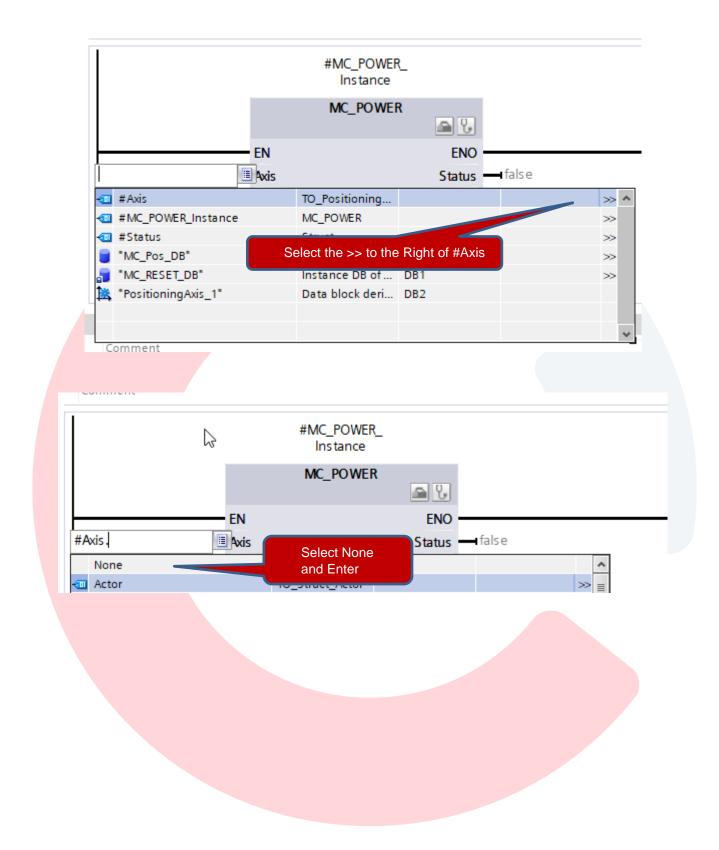


Next link our local InOut Variable #Axis to the Axis Pin on the MC\_Power Block



Selecting #Axis can be tricky. Follow these steps to simplify the exercise.





As another alternative, you can drag the variable directly from the Local FB variables table.

llock interface

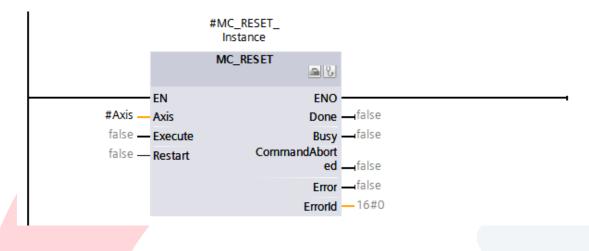
Click the down arrow below Block interface to open the table

You can then single click the Axis variable from the Local Variables to select the variable.

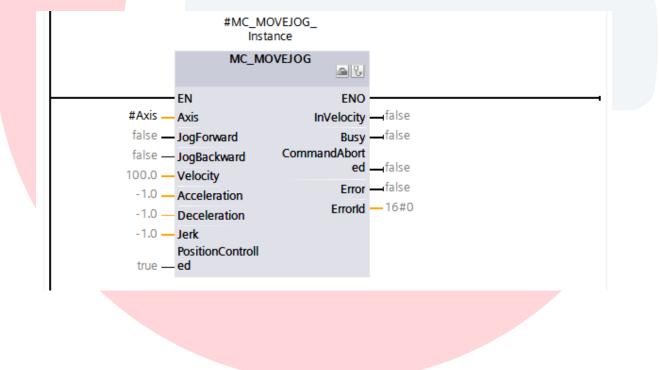
Then Left Click it and drag and drop onto the MC\_Power Axis input pin.

ľ	MC_P	me		Data ty	be	Default value	Retain	Accessible f	Writa	Visible in	Setpoint	Superv
	_	Input										
ľ	•	<add n<="" td=""><td>ew&gt;</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Ē</td><td></td></add>	ew>								Ē	
-	• 🗉	Output										
		<add n<="" td=""><td>ew&gt;</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></add>	ew>									
-	•	InOut										
-	•	Axis		TO_Pos	itioning 🔳		Ŧ					
		Static										
_			WER_Instan		WER							
	• •	MyTarg	etPos	LReal		0.0	Non-retain					
_		Temp		Struct								
_	• •			Struct								
- 1  - -    -	-1/1-	Constant 0- [ title: nt	3 ⊶ -	t								
-1  - ► [] Cα	H/H Block	0- ( title:	₽ ⊶ -	t								•
-1⊢ ▼ 8 (Co	H/H Block omme Net	o- [ title:	3 → -	t								
-1⊢ ▼ 8 (Co	H/H Block omme Net	o- [ title: <sup>nt</sup> twork 1:			#MC_POWER Instance	_						
-1⊢ ▼ 8 (Co	H/H Block omme Net	o- [ title: <sup>nt</sup> twork 1:										
-1⊢ ▼ 8 (Co	H/H Block omme Net	o- [ title: <sup>nt</sup> twork 1:			Instance	1						
⊣⊢ ▼ 8	H/H Block omme Net	o- [ title: <sup>nt</sup> twork 1:	2		Instance	<u>a</u> 2	false					
-+⊢ ▼ 8 (Co	H/H Block omme Net	o- [ title: <sup>nt</sup> twork 1:	#Axis	EN Axis	Instance	ENO - Status -						
⊣⊢ ▼ B	H/H Block omme Net	o- [ title: <sup>nt</sup> twork 1:	#Axis	EN	Instance	ENO -	false					

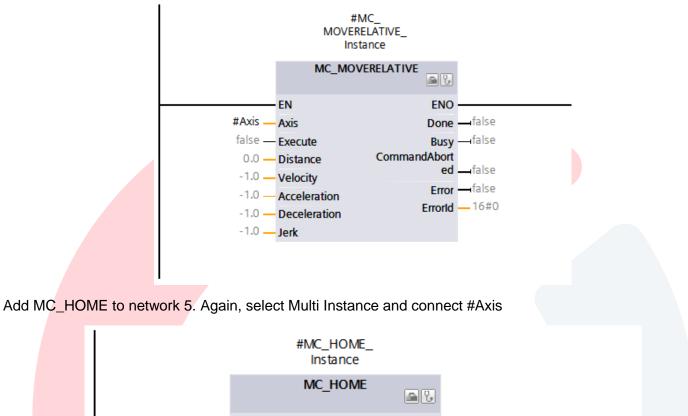
Note: It may help to enter all of the MC blocks below the go back and add the #Axis Variable. You can copy form the MC\_Power Block by Rt Clicking and select Copy, then past on each block on the Axis pin.

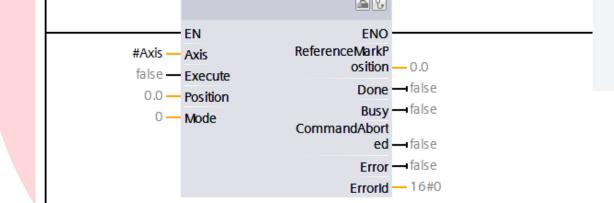


Add MC\_MOVEJOG to network 3. Again, select Multi Instance and connect #Axis

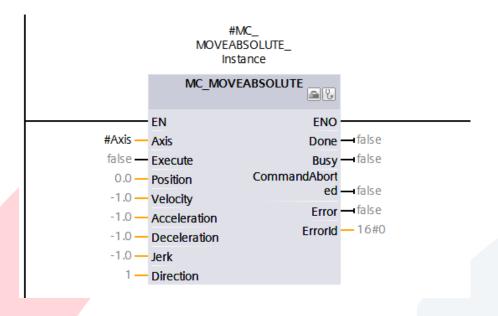


Add MC\_MOVERELATIVE to network 4. Again, select Multi Instance and connect #Axis

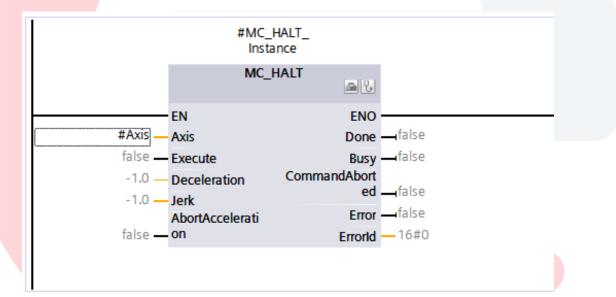




Add MC\_MOVEABSOLUTE to network 6. Again, select Multi Instance and connect #Axis



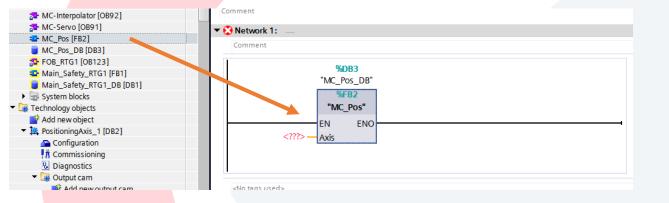
Finally add MC\_Halt to network 7. Again, select Multi Instance and connect #Axis



## Next open the Main [OB1]

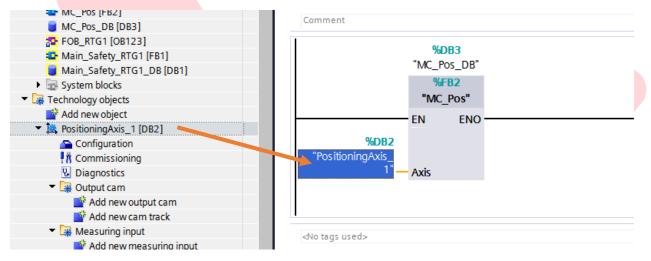
🔻 🔙 Program blocks	
📑 Add new block	
💶 Main [OB1]	▼ Block title: "Main Program Sweep (Cycle)"
🔂 MC-Interpolator [OB92]	Comment
🔂 MC-Servo [OB91]	▼ Network 1:
MC_Pos [FB2]	
🔂 FOB_RTG1 [OB123]	Comment
🔁 Main_Safety_RTG1 [FB1]	
🥃 Main_Safety_RTG1_DB [DB1]	
System blocks	
🔻 🚂 Technology objects	
📑 Add new object	
💌 🚉 PositioningAxis_1 [DB2]	
🕿 Configuration	<no tags="" used=""></no>
🕂 Commissioning	
😼 Diagnostics	
👻 🚂 Output cam	
📑 Add new output cam	
📑 Add new cam track	
🔻 🚂 Measuring input	
📑 Add new measuring input	

#### Left Click and drag and drop MC\_Pos onto Network 1



Left Click PositioningAxis\_1 and drag and drop to the Axis pin on MC\_Pos FB Call.

This links this call of MC\_Pos to PositioningAxis\_1.



Save the Project

Now we will Download the program to the PLC.

	oject Edit V 🛉 🎦 🔚 Save p			Options		Vindo		Help	RT 🔎	Goo	online
	Project tree					•	Ар		1500	)T an	4 62
	Devices							(2) C	lick D	ownlo	bad
	Ê					ð	iĝi	⊧X ≣	è 🖹	iii,	
Đ								Main			
E	🔻 📄 App Note	e 1500T and	S210 Simp	le Motion 12	2-31-19	^	_	Nan	ne		
E I	📑 Add n	new device					1 .	- 🗈	Input		
160	📩 Devic	es & network	CS 20						Initi	ial_Ca	II
Б	👻 🗖 PLC_	1 [CPU 1511	TF-1 PN]		📕 (1)Let	(1)Left Click PLC1 Remanence				ce	
Ę	📑 De	evice configu	ration			=					
	😵 Or	nline & diagn	ostics			=	⊣⊢		-0-	??	$\rightarrow$
	🦲 Sa	fety Adminis	tration								
	🕨 🖡 So	Software units						<ul> <li>Block title: "Main Prog</li> </ul>			
		ogram blocks					Co	ommen	t		

Here again we will see the Extended download to device window.

xtended download	d to device			_			
		ess nodes of "PLC_1"					
	Device		Slot	Interface type		Subnet	
	PLC_1	CPU 1511TF-1 PN	TXI	PN/IE	192.168.0.1	PN/IE_1	
All settings shou		Type of the PG/PC inter	facor	PN/IE		<b>.</b>	
the same as from		PG/PC inter			1000 MT Network Cor		1
Drive Download	earlier			Direct at slot '			• 当
							♥ €)
		1st gate	way:			- (	•
	Select target de				Show all compatible		-
	Device	Device type			ddress ccess address	Target device	
			PN/IE	A	ccess address		
a a							
-							
🔲 Flash LED							
	_	Click Start sea	arch 1	o search		Start se	a vela
		the network for	or the	PLC		<u>s</u> tan se	arcn
	oni				Display only erro	or messages	
Online status informati	011.						
Online status informati							
Online status informati							
Online status informati							
Online status informati							

	Configured access					
	Device PLC_1	Device type CPU 1511TF-1 PN	Slot 1 X1	Interface type PN/IE	Address 192.168.0.1	Subnet PN/IE_1
-						
		Type of the PG/PC inte		PN/IE		<b>•</b>
(1) Select th	e S7-1500	PG/PC inte			000 MT Network Conr	
		onnection to interface/su	ibnet:	Direct at slot '1	X1'	-
Device from	n the list	1st gate	eway: [			
	arget devic				Show all compatible	
	Del e	Device type			dress	Target device
	Accessible device		Interfac ISO PN/IE	AC	dress -64-17-47-C1-74 cess address	Target device
	Accessible device	\$7-1500	ISO	AC	-64-17-47-C1-74	
	Accessible device	\$7-1500	ISO	AC	-64-17-47-C1-74	
	Accessible device	\$7-1500	ISO	AC	-64-17-47-C1-74	
Flash LED	Accessible device	\$7-1500	ISO	AC	-64-17-47-C1-74	
E Flash LED	Accessible device	\$7-1500	ISO	AC	-64-17-47-C1-74	
E Flash LED	Accessible device	\$7-1500	ISO	AC	-64-17-47-C1-74	
Flash LED	Accessible device	\$7-1500	ISO	AC	-64-17-47-C1-74	  <u>S</u> tart sea
Online status informa	Accessible device	 	ISO	AC	-64-17-47-C1-74 :ess address	  Start sea
Online status informa Found accessible Scan completed	Accessible devicetion: e device Accessible devi .1 compatible devices o	S7-1500	ISO PN/IE	AC	-64-17-47-C1-74 :ess address	  Start sea
Online status informa Found accessible Scan completed	Accessible device ttion: e device Accessible devi .1 compatible devices o ation retrieval complete	S7-1500	ISO PN/IE	AC	-64-17-47-C1-74 :ess address	  Start sea

Next you will see the Load preview screen.

If the PLC had a previous program loaded, then you will see the No Action highlighted in Pink.

If this is the case change No action to Stop all. This will stop PLC processing so the new program can be loaded.

Status	1	Target	t	Message	Action	
<b>⁺</b> ∦	1	▼ PL	.C_1	Loading will not be performed because preconditions are not met	Load 'PLC_1'	
	Δ	•	Protection	Protection from unauthorized access		
	A			Devices connected to an enterprise network or directly to the internet must be appropriately protected against unauthorized access, e.g. by use of firewalls and network segmentation. For more information about industrial security, please visit http://www.siemens.com/industrialsecurity		
	1	•	Stop modules	The modules are stopped for downloading to device.	No action	
	0	•	Device configurati	Delete and replace system data in target	Download to device	2
	0	•	Test and commiss	Modules with active test and commissioning function can preven	Accept all	
٢				100		>
					Refre	ch

## CEAdvancedTech.com

atus	1	Target		Message		Action	
<b>↓</b> <mark>∦</mark>	1	▼ PL		Loading will not be performed because preconditions are	not met	Load 'PLC_1'	
	1	•	Protection	Protection from unauthorized access			
				Devices connected to an enterprise network or directly to internet must be appropriately protected against unauthor	o the prized		
	4			Select Stop all if you see No action	For		
	0	•	Stop modules	The modules are stopped for downloading to device.		Stop all Download to device	
	0	•	Device configurati.	. Delete and replace system data in target			
	0	•	Test and commiss.	. Modules with active test and commissioning function car	n preven	Accept all	
				111			>
							Refresh
				Ficial		- Land	Canaal
				Finish		Load	Cancel
_				Finish			
	Loa	d resul	ts	Finish			Cancel
			ts us and actions after do				
	•				Action		
	Sta	Stati	us and actions after do	wnloading to device			
	Sta	Stati	us and actions after do	wnloading to device Message Downloading to device completed without error.	Load		
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device Message Downloading to device completed without error. Start modules after downloading to device.	Load	f'PLC_1'	
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device Message Downloading to device completed without error. Start modules after downloading to device.	Load	f'PLC_1'	
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device Message Downloading to device completed without error. Start modules after downloading to device.	Load	f'PLC_1'	
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device Message Downloading to device completed without error. Start modules after downloading to device.	Load	f'PLC_1'	
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device Message Downloading to device completed without error. Start modules after downloading to device.	Load	f'PLC_1'	
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device Message Downloading to device completed without error. Start modules after downloading to device.	Load	f'PLC_1'	
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device  Message  Downloading to device completed without error.  S Start modules after downloading to device.  Son Result of CRC comparison	Load	d 'PLC_1' t module	×
	Sta	Stati	us and actions after do Target ✓ PLC_1 ♦ Start modules	wnloading to device Message Downloading to device completed without error. Start modules after downloading to device.	Load	f'PLC_1'	×
	Sta	Stati	us and actions after do Target PLC_1 Start modules CRC comparis	wnloading to device          Message         Downloading to device completed without error.         s       Start modules after downloading to device.         son       Result of CRC comparison	Load	d 'PLC_1' t module	×
	Sta	Stati	us and actions after do Target PLC_1 Start modules CRC comparis	winloading to device          Message         Downloading to device completed without error.         s       Start modules after downloading to device.         son       Result of CRC comparison	Load	d'PLC_1' t module	×
	Sta	Stati	us and actions after do Target PLC_1 Start modules CRC comparis	wnloading to device          Message         Downloading to device completed without error.         s       Start modules after downloading to device.         son       Result of CRC comparison	Load	d 'PLC_1' t module	×
	Sta	Stati	us and actions after do Target PLC_1 Start modules CRC comparis	winloading to device          Message         Downloading to device completed without error.         s       Start modules after downloading to device.         son       Result of CRC comparison	Load	d'PLC_1' t module	×

Also Download to the Drive again to get all network settings transferred to the drive. Again, make sure Save parameterization retentively is checked.

atus	!	Target	Message	Action		
	0	▼ Drive1	Ready for loading.	Load 'Drive1'		
	0	<ul> <li>Drive parameteriz</li> </ul>	Please note the following information:			
	0		Save the parameterization retentively after the download	Save parameterization retentively		
	×			recentively		
			111	>		

After the drive is loaded you will need to restart the PLC.

	oject Edit View Insert Online Options Tools Wir F 🎦 🔚 Save project 📑 💥 🏥 🗎 🗡 🏷 🛨 (주 生 🖥		Go online 📓	🕻 Go offline  🏭 📭 💶 💶
	Project tree			
	Devices			
	Name			(2) Click the Start PLC
Start	<ul> <li>Simple Motion S210</li> <li>Add new device</li> </ul>	^		
	Devices & networks	PLC_1		
	Device configuration			
	<ul> <li>Safety Administration</li> <li>Software units</li> </ul>			
	Grogram blocks     Grogram blocks     Grogram blocks			

You should now see a Green Run Light on the PLC and two Green Led's on the Drive.

Drive Testing and Control:

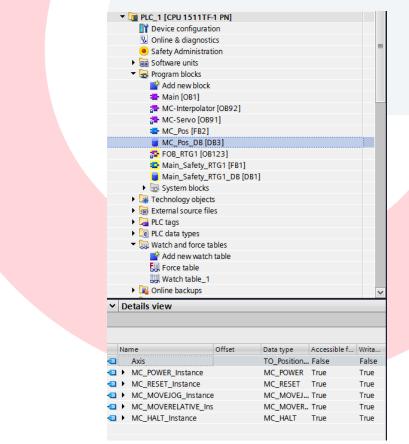
Add a Watch Table for easy access to the MC Blocks

PLC\_1 [CPU 1511TF-1 PN]
 Device configuration
 Online & diagnostics
 Safety Administration
 Software units
 Software units
 Program blocks
 Technology objects
 External source files
 PLC tags
 PLC tags
 PLC data types
 Watch and force tables
 Add new watch table
 Force table

Keep the Default Name of Watch table\_1.

Next add variables to the Watch Table.

Left Click the MC\_Pos\_DB to list its variables in the Details View



From the Details view Select one or more pertinent variables and drag them to the Watch Table

Note: Multiple variables can be selected and brought over together.

	i	Name	Address	Display format	Monitor value
1	// MC_F	ower			
2		"MC_Pos_DB".MC_POWER_Instance.Enable		Bool	
3		"MC_Pos_DB".MC_POWER_Instance.Status		Bool	
4		"MC_Pos_DB".MC_POWER_Instance.Busy		Bool	
5		"MC_Pos_DB".MC_POWER_Instance.Error		Bool	
6	// MC_F	Reset			
7		"MC_Pos_DB".MC_RESET_Instance.Execute		Bool	
8		"MC_Pos_DB".MC_RESET_Instance.Done		Bool	
9		"MC_Pos_DB".MC_RESET_Instance.Busy		Bool	
10		"MC_Pos_DB".MC_RESET_Instance.Error		Bool	
11	II MC N	love Jog			
12		"MC_Pos_DB".MC_MOVEJOG_Instance.JogForward		Bool	
13		"MC_Pos_DB".MC_MOVEJOG_Instance.JogBackward		Bool	
14		"MC_Pos_DB".MC_MOVEJOG_Instance.Velocity		Floating-point nu.	
15		"MC_Pos_DB".MC_MOVEJOG_Instance.Error		Bool	
16	II MC N	love Relative			
17		"MC_Pos_DB".MC_MOVERELATIVE_Instance.Execute		Bool	
18		"MC_Pos_DB".MC_MOVERELATIVE_Instance.Distance		Floating-point nu.	
19		"MC_Pos_DB".MC_MOVERELATIVE_Instance.Velocity		Floating-point nu.	
20		"MC_Pos_DB".MC_MOVERELATIVE_Instance.Done		Bool	
21		"MC_Pos_DB".MC_MOVERELATIVE_Instance.Busy		Bool	
22		"MC_Pos_DB".MC_MOVERELATIVE_Instance.Error		Bool	
23	// мс н	alt			
24		"MC_Pos_DB".MC_HALT_Instance.Execute		Bool	
25		"MC_Pos_DB".MC_HALT_Instance.Done		Bool	
26	// МС Н				
27		"MC_Pos_DB".MC_HOME_Instance.Execute		Bool	
28		"MC_Pos_DB".MC_HOME_Instance.Position		Floating-point nu.	
29		"MC_Pos_DB".MC_HOME_Instance.Mode		DEC+/-	
30		"MC_Pos_DB".MC_HOME_Instance.Busy		Bool	
31		"MC_Pos_DB".MC_HOME_Instance.Done		Bool	
32		"MC_Pos_DB".MC_HOME_Instance.Error		Bool	
33	ll MC N	love Absolute			
34		"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Execute		Bool	
35		"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Position		Floating-point nu.	
36		"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Velocity		Floating-point nu.	
37		"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Done		Bool	
38		"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Busy		Bool	
39		"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Error		Bool	
40					

## Important Watch Table Icons

Insert Row before current selected

Add Row after current selected



Insert Commend Line with //



Monitor the variables in the Watch Table



Wright Modified Values from Modify Value Column to the PLC

To run the drive from the Watch Table;

First Press the Monitor Button to go online with the Watch Table



Monitor the variables in the Watch Table

First Enable the Drive with MC\_Power.

Type 1 or TRUE in the Modify Value column next to MC\_Power\_Instance.Enable and

21

3										
	i	Name	Address	Display format	Monitor value	Modify value				
1	// MC_P	ower								
2		"MC_Pos_DB".MC_POWER_Instance.Enable		Bool	TRUE	TRUE				
3		"MC_Pos_DB".MC_POWER_Instance.Status		Bool	TRUE					
4		"MC_Pos_DB".MC_POWER_Instance.Busy		Bool	TRUE					
5		"MC_Pos_DB".MC_POWER_Instance.Error		Bool	FALSE					

select Modify Values selected values.

With MC\_Power Enabled, now you can enter a 1 in JogForward or JogBackward and Modify Values to jog the motor. Return value to 0 and Modify All to stop the motion

// MC Move Jog			
"MC_Pos_DB".MC_MOVEJOG_InstanceJogForward	Bool	TRUE	TRUE
"MC_Pos_DB".MC_MOVEJOG_InstanceJogBackward	Bool	FALSE	FALSE
"MC_Pos_DB".MC_MOVEJOG_Instance.Velocity	Floating-poin 💌	100.0	
"MC_Pos_DB".MC_MOVEJOG_Instance.Error	Bool	FALSE	
Harden and C			

For a Relative Move enter a Distance in mm, a velocity in mm/sec and Modify All, then Enter a 1 in Execute and again Modify All. The motor will move 10 Revolutions or 100 mm (Default Scaling of the Technology Object that was created was a linear axis and is configured as a 10mm travel per 1 revolution of the motor). After the move you must toggle the Execute bit to OFF and Modify All then toggle back ON and Modify All again to move another 100mm. Most servo move commands trigger off of a rising edge of the input bit.

// MC Move Relative		
"MC_Pos_DB".MC_MOVERELATIVE_Instance.Execute	Bool FALSE	TRUE 🗹 🛓
"MC_Pos_DB".MC_MOVERELATIVE_Instance.Distance	Floating-poin 💌 0.0	100.0
"MC_Pos_DB".MC_MOVERELATIVE_Instance.Velocity	Floating-point nu1.0	100.0 🗹 🛓
"MC_Pos_DB".MC_MOVERELATIVE_Instance.Done	Bool FALSE	
"MC_Pos_DB".MC_MOVERELATIVE_Instance.Busy	Bool FALSE	
"MC_Pos_DB".MC_MOVERELATIVE_Instance.Error	Bool FALSE	

We will next Home the Motor. My Motor has an Absolute Encoder so homing is not required to do an Absloute move, but it will help to set the current position to 0 for a base reference

First add ActualPosition to the Watch Table from PositioningAxis\_1.

<ul> <li>Technology object</li> </ul>	rte			37	"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Done		Bool	FALSE	
Add new object			-	38	"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Busy			FALSE	
🔻 🚉 PositioningAxi	🔻 🚉 PositioningAxis_1 [DB2]			39	"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Error		Bool	FALSE	
🕋 Configurat	ion			40					
🕺 Commissio	oning			41	"PositioningAxis_1".ActualPosition		Floating-point number	6716.551	
😼 Diagnostic	Diagnostics			42					
Details view				43					
				44					
				45					
				46					
Name	Offset	Data type		47					
VirtualAxis		TO_Struct	^	48		<add new=""></add>			
Simulation		TO_Struct							
Position		LReal							
ActualPosition		LReal							

For the MC\_Home block there are several options for homing mode. For this example we will just use mode 0, which will set the Actual Position Value to the value loaded in the MC\_HOME\_Instance.Position variable. We will use 0, so when the block is executed the ActualPosition will be set to 0.

Set Instance.Execute to 1 and modify all. The Done Bit should immediately turn on and Actual Position should be set to 0.

						_						
// MC Home												
r	"MC_Pos_DB".MC_HOME	_Instance.Execute			Bool	TRUE	TRUE					
5	"MC_Pos_DB".MC_HOME	Instance.Position	=		Floating-point nu	0.0						
	"MC_Pos_DB".MC_HOME	_Instance.Mode			DEC+/-	0		Ē				
)	"MC_Pos_DB".MC_HOME	_Instance.Busy			Bool	FALSE						
	"MC_Pos_DB".MC_HOME	_Instance.Done			Bool	TRUE						
2	"MC_Pos_DB".MC_HOME	_Instance.Error			Bool	FALSE						
"Desitioning Avia 1" Actual Desition				Election point number	0.0							
	"PositioningAxis_1".ActualPosition				Floating-point number	0.0						

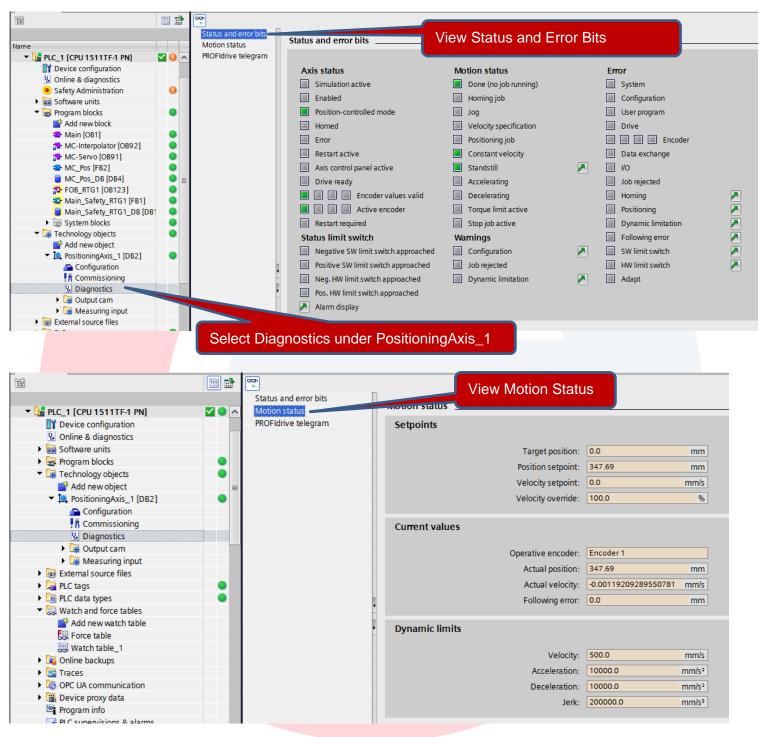
Now you can turn off the Execution Bit. Again type in 0 and Modify All.

Now you can make an Absolute Move. Set the Instance Position to the Absolute Position you want the motor to move to and Modify All. Then Trigger the Execute bit to make the move. After the move is complete the Done Bit will turn on and you will see the Actual Position be very close to the target position.

// MC Move Absolute									
"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Execu	te	Bool	TRUE	TRUE					
"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Position	on	Floating-point number	100.0	100.0					
"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Veloc	ity	Floating-point number	-1.0						
"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Done		Bool 💌	TRUE						
"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Busy		Bool	FALSE						
"MC_Pos_DB".MC_MOVEABSOLUTE_Instance.Error		Bool	FALSE						
"PositioningAxis_1".ActualPosition		Floating-point number	99.999						

## Technology Object Monitoring Screens

There are also some other status screens for the drive built into the Technology Object



Save Project