Profinet wireless Example 001

This example was developed in TIA portal V16.

MacTalk settings for the 2 motors

2 MIS motors are controlled from the PLC using a Siemens Scalance W761 wireless accesspoint.

The TIA portal project includes configuration and setup for the Siemens scalance accesspoint as well as the PLC program.

From MacTalk the wireless setting in both motors are as follows:



The Siemens Scalance accesspoint is configured for SSID **JVL_EW42** with encryption and the password **MONKEY123**. So the motors are configured as wireless clients with the settings required.

From MacTalk both motors are configured as follows:

Therefore 102 102 102 102 102 102 102	Cyclic data setup (32bit)	David Calus '20 Secure'	Ethernet settings	Cyclic data se	tup (32bit)	
1000 000 102 100 120 192 100 1 20	Read Word1 2 - Operating Mode V	is mandatory.	IP address 192.168.1.30 192.168. 1. 30	Read Word1	2 - Operating Mode	Read E
Subnet mask 255.255.255.0 255.255.0	Read Word2 10 - Projected Position		Subnet mask 255.255.255.0 255.255.255.0	Read Word2 Read Word3	10 - Projected Position	V IS manu
Default gateway 192.168.1.20 192.168. 1. 20	Read Word3 12 - Actual Velocity		Default gateway 192 168 1.30 192.168. 1.30		12 - Actual Velocity	
Use DHCP to optain TP address	Read Word4 25 - Status Bits			Read Word4	25 - Status Bits	\sim
	Read words 36 - Warnings		Use DHCP to optain IP address	Read Word5	36 - Warnings	\sim
rofiNet error handling	Read Wordb 35 - Errors		ProfiNet error handling	Read Word6	35 - Errors	
Motor set Passive mode	Read Word? 0 - No Selection	0	Motor set "Passive mode"	Read Word7	0 - No Selection	
Motor set velocity = 0	Read Words 0 - No Selection		O Motor set velocity = 0	Read Word8	0 - No Selection	~ 💿
rotocol settings	Write Word1 2 - Operating Mode ~	CMD:0x01000061		Write Word1	2 - Operating Mode	Reset
Inter the Station Name (Max 240 characters):	Write Word2 3 - Requested Position V	(16777313).	Protocol settings	Write Word2	3 - Requested Position	CMD:0:
MIS001	Write Word3 5 - Max Velocity V	Cloc ? to learn more.	Enter the Station Name (Max 240 characters):	Write Word3	5 - Max Velocity	Click ??
	Write Word4 6 - Acceleration V		MIS002	Write Word4	6 - Acceleration	-
	Write Words 174 - Deceleration	2		Write Word5	174 - Deceleration	-
	Write Word? 0. Nr. Celestics	Block PLC		Write Word6	983040 - General command	-
Alt. Bute Order	Write Word9 0 No Selection	Add To Watch		Write Word7	0 - No Selection	T
	Unite Words	Add to Watch	Alt. Byte Order	Write Word8	0 - No Selection	~ 0 ,
Powerup with blank Name of station		C	Powerup with blank 'Name of station'			
Use I/O in ePLC	Set module factory defaults Apply and save	Kerresh lab	Use I/O in ePLC	Set module	factory defaults Apply and save	- 5 1
atus	dentes		Status			
onnect 0x0000	Mad de Tafa		Connect 0x0000	Clear Log	Cydic is running	
	Hoddlebild			ModuleInfo		
	Firmware version: V3.40 Build: 10252			-	100 V2 40 D 44 10252	
	Hardware version: V1.4			Firmware ver	SION: ¥3.40 BUILD: 10252	
	MAC: 54:E3:B0:00:DF:71			naruware ve	1901: 01.4	

Reg.983040 00051 sam more.

o Watch sh Tab Notice the Station names "MIS001" and "MIS002".

Please make sure that the motors are configured accordingly.

TIA portal project settings

PLC program

The program is basically a call to 2 JVL function blocks that will move the motors into a certain position with a requested velocity and acceleration setting.

intern				
	%DE "JVL_N Position	3 //IS_ DB"	"JV Posi	CDB3 L_MIS_ tion_DB"
%Q0.0 "Tag_1"	%FB3 "JVL_MIS_	14 Position"	"JVL_M	B314 IS_Position"
false - 4096000 -	EN Execute ContinuousUpd ate Position	ENO Busy → false Done → false CommandAbort ed → false	EN true — Execute ContinuousUpd false — ate 409600 — Position	ENO
1000.0 - 10.0 - 0.0 - true - %DB 2 *MIS23_Axis* -	Velocity Acceleration Deceleration AbsolutePositio ning Axis	Error Haise	*SMC85_Avis* — Axis	Error Halse
etwork 2:				
mment	9/562		Gre	
	JVL_MIS_	Comms"	אנ" עעM	IS_Comms"
		ENO	EN	ENO

Please refer to the documentation regarding the JVL ProfiNet function blocks for details.

Network 2 consists of 2 communication blocks necessary for driving the 2 "JVL_MIS_Position" - function blocks located in Network 1.

By setting "Tag_1" the blocks are both excuted and the 2 motors will go to position = 4096000 using the velocity 100 RPM (Motor 1) and 200RPM (Motor 2), acceleration is set for 10.0.

Motor configuration in TIA

Please refer to the JVL ethernet manual and the JVL Profinet function block -manual for details regarding import and configuration of the JVL motor in a TIA project.

For wireless applications the update time and the watchdog settings needs to be adjusted to accommodate the slower and more error prone wireless network.

The update time is set for 64ms on both motors, but it will depend greatly on the quality of the wireless network and the load on the network.

Watchdog timeout is configured to 512ms (Cycles without data = 8):

MIS002 [MAC00-EPx]			Properties	🗓 Info 🔒 📱 Diagnostics	
General IO tags Sy	stem constants Texts				
General Catalog information PROFINET interface [X1] General Ethernet addresses Advanced options	Real time settings O cycle Shared Device				
Interface options	IO controller outside project with access to this IO device	0			
Real time settings Port 1 [X1 P1 P]	IO device send clock				ms 💌
General Port interconnection Port options Port 2 [X1 P2 R] Port interconnection Port options Identification & Maintenance Shared Device	Update time Update time:	Calculate update time automatically Set update time manually 64.000 Adapt update time when send clock changes			ms 💌
	Watchdog time Accepted update cycles without IO data: Watchdog time:	8 512.000			ms

Siemens Scalance setup from TIA Portal.

The following shows the settings for the Siemens scalance accesspoint, but a complete guide to all the details and considerations that must be done for a strong infrastructure is beyond the scope of this manual.

The example project holds a setup for the accesspoint.

Configuration and commissioning of the accesspoint can also be done by using the embedded web server in the accesspoint. This also holds some additional features to analyze the wireless environment, such as the spectrum analyzer.

In this simple example project only the wireless ethernet connection is used for both motor this topology concept prohibits the use of the secondary wired ethernet channel of both motors. In other words it is not possible to connect other Profinet devices to the motors. Using another wireless topology does however make it possible to use the secondary ethernet ports, but is beyond the scope of this example. Another example project demonstrating this concept will be available.

The Siemens Scalance W761 is configured as an accesspoint (**Device mode = AP**). So the motors needs to be configured as wireless clients.

Configuration	~											
- WLAN	, e	Basic										
Basic												
Advanced			Country	Code: Den	mark							-
Antennas			Device	Mode: AP								
Allowed Channels			Jenee									- Lind
802.11n												
AP	4	Radio	Enabled	Radio Mode	Frequency Band	WLAN Mode 2.4 GHz	WLAN Mode 5 GH	z DFS (802.11h)	Outdoor Mode	max. Tx Powe	r Tx power check	
AP WDS		WLAN 1		AP	5 GHz	• 802.11 n •	802.11 n	• 🖂		20 dBm	 Not Allowed (All Channels) 	
AP 802.11a/b/g Rates												
AP 802.11n Rates		1.										
Force Roaming	=											
Remote Capture												
ayer 2												
VLAN			Wa	ming: It is	possible that the	device may not yet be a	pproved for use in	countries denoted	l by an asterisk (*).Please chec	k the following website for more detailed	_
Dynamic MAC Aging				inioi	mation: http://ww	w.siemens.com/wreie	ss-approvais					~
Spanning Tree	~											

pe Station Ci	ient 💛 s Configured as Statio	n Client	((♥)) _5→ (LC ↔ Access Point M	(•)) ((•)) stor 1 = Motor 2 =	((p)) ••••• Motor n
		Mo	tor Setup as Station	Client	
Basic Settings					
AC Address:	54E3B0008791				5 1
SSID: .	JVL EW42				
Encruption:					
chici yprovit.	With All of the second				1.00
Password:	MONKEY123				e
Status Interface: MAC Address: SSID:	Connected 54E380008791				
Encryption:	WPA/WPA2				
ignal Strength:		4 dBm 🗸 🗖 A	udio Feedback		
	Poor Exellent	C c	yclic Update		0
Client AT Const	ole				

SSID:

Note that the SSID settings configured in the motors must match the settings of the accesspoint.

General	IO tags	Syste	m constants	Text	5				
► SNMP						11			
System 1	íme								
Auto Log	out								
Svslog C	ient		Padia	Port	Enchlor	SCID	Broadcast SSID	WDS only	WDS ID
▶ Fault Mo	nitoring		Naulo	VAD 1 1	Enabled	3310	Cal	wbs only	100510
PROFINE	г		AAPUALA I	VAP 1.1		JVL_E VV42	y		
EtherNet	/IP						1		
Interfaces									
- Ethernet									
Overview Configuration									
- WLAN		1							
Basic		- 2							
Advar	nced								
Anten	nas		-						
Allow	Allowed Channels								
802.1	1n								
AP									
AP WD	IS								
AP 80	2.11a/b/g Rates								
AP 80	2.11n Rates								
Force	Roaming								

ype Station C Vi-Fi Module is	ent ∨ ((q))+ ((q)) Configured as Station Client PLC + Access Hotor 1 + Motor Station Client + Motor Station Client +	((q)) •••• Motor n
Basic Settings		10 K
MAC Address:	54580008791	
SSID: *	JVL_EW42	18
Encryption:	WPA/WPA2 ~	
Password:	MONKEY123	
⊡Status		
Interface: MAC Address: SSID Encryption: Signal Strength:	Connected 546:380008791 MJ_EW42 WPA/MPA2 WPA/MPA2 34 dBm ∨ Audio Feedback Poor Evellent ☐ Cyclic Update	C

Encryption:

The encryption setup is obviously disguised, but the password is MONKEY123 and the settings in the motors must match the settings in the accesspoint.

WLAN_1 [SC	ALANCE W76	1-1 RJ	45]							
General	IO tags	Syst	em cor	nstants	Texts					
✓ Layer 2 ► VLAN	а.	^	WLAN	i						
Dynamic Spanning	MAC Aging		» В а	asic						
LLDP	arding			Port	Authentication Type	Encountion	Cinher	WPA(2) Pass Phrase	WPA(2) Pass Phrase Confirmatio	Default Key
▼ Security				VAP 1.1	WPA2-PSK	√	AES	*******	*****	Key 1
► AAA										
- WLAN										
Basic										
AP Cor	nmunication									
AP RAD	DIUS Authenti	4								
Keys										
▼ MAC ACL										
Rules	Configuration									
Ingres	s Rules									
Egres	s Rules									
✓ IP ACL										
Rules	Configuration	=								

ype Station Cl Ni-Fi Module is	ent V Configured as Station Client	>* ((φ)) ((φ)) ((φ) * Motor 1 Motor 2 → ••••• Motor)) r n i
	Motor Setup as 5	Station Client	
Basic Settings MAC Address: SSID:*	54E3B0008791 JVL EW42	5	4
Encryption: Password:	WPA/WPA2 V MONKEY123]a	ð
Estatus Interface: MAC Address: SSID: Encryption: Signal Strength:	Connected 545:30003791 7/A_EW42 WPA/WPA2 Poor Excellent Audio Feedback Court Excellent Cyclic Update	8	P
Client AT Consi	le	Status 🚺 Configure 🐼 Done	•

Enable the accesspoint and select frequency band (2.4GHz or 5GHz).

General	IO tags	System	n constants	Texts											
Configurat WLAN	tion	^ ,	Basic												
Basic Advanced				Country	Code:	Denmarl	k								-
Antennas				Device I	Mode:	AP									-
802 11n	nannels														
AP			Radio	Enabled	Radio M	lode Fri	equency Band	WLAN Mode 2.4 GHz	WLAN Mode 5 GHz	DFS (802.11h)	Outdoor Mode	max. Tx Powe	r Tx power check		
AP WDS		1	WLAN 1		AP	5	GHz -	802.11 n	802.11 n	- 8		20 dBm	Not Allowed (All Channels)		
AP 802.11	a/b/g Rates	-													
AP 802.11	n Rates														
Force Roa	ming	=													
Remote Capt	ture														
ayer 2															
VLAN				Wa	ming:	It is poss	tible that the d	evice may not yet be a	approved for use in o	countries denoted	l by an asterisk (").Please checl	k the following website for mor	e detailed	^
Dynamic MAG	C Aging	- Second Second							ss approvals						V
Spanning Tre	e	Y													

Channel selection:

Overrield 10 dags 35 stell constants 12 xts Overrield Configuration Allowed Channels 12 xts VULAH Basic Advanced Basic Basic Basic Basic Advanced Antennas Basic	
Overview Allowed Channels Configuration • Allowed Channels WLAN Basic Advanced Advanced Advanced MAN 1 B02.11n AP AP AP AP 02.5 AP 802.11h Bidg Bates Force Boaring Frequency Band: 2.4 GHz Bedio Redio Mode 1 2 3 4 5 6 7 8 9 10 11 12 13 VLAN Select / Deselect all Proceeding MAN 1 Dynamic MAC Aging MAN 1 DeCP Forwarding MAN 1 LUP Select / Deselect all Prequency Band: Select / Deselect all Prequency Band: Select / Deselect all MAN Basic AP ROULS Authention Select / Deselect all WAN 1 AP Select / Deselect all Select / Deselect all	
Configuration VILAN Basic Advanced Artennas Aforwed Clasmels B02.11n AP AF NOS AF 802.11n fates FrequencyBant: 2.4 CHz AF 802.11n fates FrequencyBant: 2.4 CHz AF 802.11n fates FrequencyBant: 2.4 CHz Select / Deselect all FrequencyBant: 3.5 CHz	^
VLAN Besic Advanced Advan	=
Basic Advanced Antennas Allowed Channels only Antennas Allowed Channels B02:11n AP AP 802:11n Bates AP 802:11n Bates AP 802:11n Bates AP 802:11n Bates FrequencyBand: 2.4 GHz Select Deselectall FrequencyBand: 2.4 GHz Select Deselectall FrequencyBand: 5 GHz Select Deselectall Select Deselectall	
Advanced Advanced Advanced Advanced MLAN1 B02:11n Ref AP MOS AP MOS AP MOS AP 802:11n Bids fates AP 80:	
Antennas Microsoft Shamtidis 802.11n AP AP 05 AP 802.11n Bates Porce Reaming Remote Capture • Layer 2 VLAN Dynamic McC Aging DCP Forwarding LDP • Security • AAA • MAN Basic AP ROUS Authention. AP ROUS Authention. • Remote Capture • C	
Microsof Glawreids B02.11n AP AP AP 802.11a lbig flates Frequency Band: AP 802.11a lbig flates Select / Deselect all Force Roaring Select / Deselect all Remote Capture Select / Deselect all VLNN WAN1 Dynamic MAC Aging MAAN1 Dre Forwarding Select / Deselect all LLPP Frequency Band: Select / Deselect all Select / Deselect all Frequency Band: Select / Deselect all WLAN AP Basic Select / Deselect all AP Communication AP AP RADUS Authentim. Keys	
802.11n AP AP AV 005 AP 802.11h0 gates FrequencyBand: Force Roaming Select / Deselect all Remote Capture Redio Redio Mode 1 2 3 4 5 6 7 8 9 10 11 12 13 VLAN Dynamic MAC Aging D Paramic MAC Aging Redio Redio Mode 1 2 3 4 5 6 7 8 9 10 11 12 13 VLAN PrequencyBand: Security Security Security Select / Deselect all Security Select / Deselect all MAN Basic AP ROUS Justnetime, Keys Select / Deselect all	
AP AP AP 802.11 a lbg fates AP 802.11 a lbg fates Porce Roaming Remote Capture VLAN Dynamic MAC Aging Dynamic MAC Aging LDP DCP Frowarding LLDP Security AAA • WLAN Basic AP ROUUS Juffending AP ROUUS Juffending VLAN MAA • WLAN Basic AP ROUUS Juffending VLAN Basic AP ROUUS Juffending WLAN Basic AP ROUUS Juffending WAN 1 AP Basic AP ROUUS Juffending WAN 1 AP <t< td=""><td></td></t<>	
A P VOS A P 802.11 h lightes FreequencyBand: 2.4 GHz Select / Deselect all VLAN 1 AP PrequencyBand: 5 GHz FreequencyBand: 5 GHz Fr	
A # 802.11 a lbg fats A # 802.11 a lbg fats FrequencyBand: 2.4 GHz Select / Deselect all VLAN Loger 2 VLAN VLAN Dynamic MAC Aging Spanning Tree DCP Frowarding LLDP FrequencyBand: 5 GHz FrequencyBand: 5 GHz Select / Deselect all FrequencyBand: 5 GHz Select / Deselect all Select / Deselect	
A # 902.11n Rets Force Roaming Remote Capture V Layer 2 V LAN Dynamic MAC Aging DCP Forwarding LLDP Scientify AAA Basic AP Communication AP ROBUS Authentif Keys	
Force Reaming Remote Capture Redio Red	
Remote Capture Layer 2 Image: Capture 2	
Loger 2 Keys	
• VLAN VLAN 1 AP Upsminic WAC-Aging • > Spanning Tree DCP Frowarding LLDP • > AAA • WLAN = Basic AP AP RoBUS Authenti Keys	
Dynamic MAC Aging + Spanning Tree - DCP Forwarding - LLDP Security > AAA Basic - AP Communication - AP RONUS Authentia - Keys -	
• Spanning Tree DCP Frowarding LLDP • • Security • Select/Deselectall • WLAN • Basic • AP Communication • AP RONUS Authenti • Keys •	
DCP Forwarding FrequencyBand: 5 GHz LLDP Security > AAA Select/Deselect all WLAN E Basic Redio AP Communication Redio AP RONUS Authentia WLAN 1	
LLDP FrequencyBand: 5 GHz Security SAA SAA A A A A A A A A A A A A A A B Communication A A R A D US A A C A B C A B C C A C A C A C A C A C	
Security FAQuerkyean. Surz Solect all Security S	
AAA Select / Deselect all WLAN Basic AP Communication Radio Radio Mode 36 40 44 48 52 56 60 64 100 104 108 112 116 132 136 140 WLAN 1 AP V	
• WLAN # Basic AP Communication AP ROBUS Authenti Keys	
Basic Radio Radio Mode 36 40 44 48 52 56 64 100 101 112 116 132 136 140 AP RADUS Authenti WLAN 1 AP V <td></td>	
AP Communication AP RADUS WLAN1 AP	
AP RADIUS Authenti Keys	
Keys	
> MAC ACL	
> IP ACL	
Management ACL 🔍	
	~
X	Cancel

5GHz, channel 40 –selection

General	IO tags	Syste	m constants	Texts		
Overvie	iew	^	> Allowed Cha	nnek		^
Configu	uration		Allowed Cha			
▼ WLAN						
Basic			Radio	Use Allo	ved C.	
Advanc	ced		WLAN 1			
Antenn	nas					
Allowe	d Channels					
802.11	In					
AP						
AP WDS	s					
AP 802	2.11a/b/g Rates			Frequency Band	: 2.4 GHz	
AP 802	2.11n Rates				Select/Deselectall	
Force F	Roaming					
Remote G	lapture					
Layer 2		4	Radio	Radio Mo	de 1 2 3 4 5 6 7 8 9	
VLAN			WLAN 1	AP		
Dynamic I	MAC Aging	- *				
Spanning	Tree					
DCP Forwa	arding					
LLDP				Fraguancy Bang	5 Chr	
Security				riequency barre		
AAA					Select/Deselectall	
▼ WLAN		=				
Basic			Radio	Radio Mode	40	
AP Com	nmunication		WLAN 1	AP		
AP RAD	OIUS Authenti					
Keys						
MAC ACL						
IP ACL						
Managem	nent ACL	~				
1)					
					OK Canc	el