## 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:

Thernet settings IP address 192 168 1 20 192 168 1 20	Cyclic data setup (32bit)	Read Entry '35 - Errors'	Setup Ethernet settings	Cyclic data se	tup (32bit)	
	Read word1 2 - Operating Mode	is mandatory.	IP address 192.168.1.30 192.168. 1.30	Read Word1	2 - Operating Mode	Read Ei
	Read Word2 10 - Projected Position V		Subnet mask 255.255.255.0 255.255.255.0	Read Word2	10 - Projected Position	V IS manu
Default gateway 192.168.1.20 192.168. 1. 20	Read Word3 12 - Actual Velocity V		Default gateway 192 168 1.30 192.168. 1.30	Read Word3	12 - Actual Velocity	
Use DHCP to optain IP address	Read Words 25 - Status Bits V Read Words 36 - Warnings V			Read Word4	25 - Status Bits	$\sim$
-	Read Word5 36 - Warnings ~		Use DHCP to optain IP address	Read Word5 Read Word6 Read Word7	36 - Warnings	$\sim$
rofiNet error handling Motor set "Passive mode"	Read Words 35 - Errors V Read Word7 0 - No Selection V		ProfiNet error handling		35 - Errors	7
		Ø	Motor set "Passive mode"		0 - No Selection	
Motor set velocity = 0		Reset Error: Reg. 983040	O Motor set velocity = 0	Read Word8	0 - No Selection	~ 🗿
rotocol settings	white word1 2-Operating Mode V	CMD:0x01000061		Write Word1	2 - Operating Mode	Reset
Inter the Station Name (Max 240 characters):		(16777313). Click "?" to learn more.	Protocol settings Enter the Station Name (Max 240 characters):	Write Word2	3 - Requested Position	CMD:0: (16777
MIS001	White Words 5-Max Vebolity	Cloc ? to learn more.		Write Word3	5 - Max Velocity	Click ??
	Write Word4 6 - Acceleration V		MIS002	Write Word4	6 - Acceleration	-
	Write Word5 174 - Deceleration ~ Write Word6 983040 - General command ~	2		Write Word5	174 - Deceleration	-
	Write Word7 0 - No Selection	Block PLC		Write Word6	983040 - General command	-
Alt, Byte Order		Add To Watch		Write Word7	0 - No Selection	$\sim$
	Unite Words	Add to Watch	Alt. Byte Order	Write Word8	0 - No Selection	~ 0 ,
Powerup with blank 'Name of station'	Set module factory defaults Apoly and save	Refresh Tab	Powerup with blank 'Name of station'			
Use I/O in ePLC	Set module factory defaults Apply and save	Kerresn Tab	Use I/O in ePLC	Set module	factory defaults Apply and save	- <del>5</del> F
atus	Clear Log Cyclic is running		Status			
onnect 0x0000	ModuleInfo		Connect 0x0000	Clear Log	Cydic is running	
				ModuleInfo		
	Firmware version: V3.40 Build: 10252			-	sion: V3.40 Build: 10252	
	Hardware version: V1.4			Hardware ver		
	MAC: 54:E3:B0:00:DF:71				80:00:87:91	

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.

	%DB "JVL_N Position	11S		<b>%DB 3</b> "JVL_MIS_ Position_DI	
%Q0.0 "Tag_1"	%FB3 "JVL_MIS_F			%FB314 "JVL_MIS_Pos	ition"
true	100 A 100	ENO Busy — false Done — false CommandAbort ed — false	true <del>-</del> false - 4096000 <del>-</del>	COL	ENO
10.0 -		Error ⊶false	0.0 -	Acceleration Deceleration AbsolutePositio	Error ⊶false
twork 2:					
3425025	%FC3 "JVL_MIS_0			%FC311 "JVL_MIS_Cor	nms" ENO ————
	L.1.	Ret_Val -+ #Temp_1	%DB4		Ret_Val -##Temp_2

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]			Q Properties	🗓 Info 🔒 🗓 Diagnostics	1				
General IO tags Sy	ystem constants Texts								
General     Catalog information     PROFINET interface [X1]     General     Ethernet addresses     Advanced options	No cycle Shared Device								
Interface options Media redundancy	with access to this IO device	IO controller outside project with access to this IO device 0							
Real time settings     Port 1 [X1 P1 R]	IO device send clock			ms 🔻					
Port (X1PTh)     General     Port interconnection     Port options     Port 2 [X1P2 R]     General     Port options     Identification 8 Maintenance     Ishared Device	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:				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	• B	lasic										
Basic												
Advanced			Country	Code: Den	mark							-
Antennas			Device	Mode: AP								
Allowed Channels			Device	mode. 14								121
802.11n												
AP		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	<ul> <li>Not Allowed (All Channels)</li> </ul>	
AP 802.11a/b/g Rates	- *											
AP 802.11n Rates												
Force Roaming	=											
Remote Capture												
ayer 2												
VLAN			Wa					countries denoted	l by an asterisk (	*).Please chec	k the following website for more detailed	<
Dynamic MAC Aging				into	mation: http://www	w.siemens.com/wirele	ss-approvais					~
Spanning Tree	~											

ype Station Cli Wi-Fi Module is	mand Console ent Configured as Station Client	((♥)) _1→ ((♥)) PLC → Access Point Motor 1	(( <b>q</b> )) (( <b>q</b> )) Motor 2 + + + + Motor n
		Motor Setup as Station Clie	nt
Basic Settings			
MAC Address:	54E3B0008791		EH
SSID: .	JVL_EW42		
Encryption:	WPA/WPA2		
Password:	MONKEY123		3
Status			
Interface:	Connected		
MAC Address:	54E3B0008791		
	JVL_EW42		
Encryption:			
Signal Strength:	-34 dBm	Audio Feedback	
	Poor Exellent		<u>v</u>
E Client AT Consc	le l		

SSID:

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

General	IO tags	Syste	m constants	Texts	5				
► SNMP						1			
System T	íme								
Auto Log									
Syslog Cl			Radio	Port	Enabled	SSID	Broadcast SSID	WDS only	WDSID
Fault Mo				VAP 1.1		JVL_EW42		1005 only	110310
PROFINET			WEAT I			200_00042	٣		
EtherNet	/IP								
Interfaces									
Overview Configuration									
		0							
- WLAN		1	-						
Basic		=							
Advan	nced								
Antennas Allowed Channels 802.11n AP									
		· · · ·							
AP WD	IS								
AP 80.	2.11a/b/g Rates								
AP 80	2.11n Rates								
Force	Roaming		1						

ype Station Cl Vi-Fi Module is	ent $\checkmark$ (( $\phi$ )) $\neg \rightarrow (\phi$ ) (( $\phi$ )) Configured as Station Client $P_{Cot} \rightarrow \Phi_{Oris}$ [Motor -2] Hotor Setue as Station Client	((p)) ••••• Motor r
Basic Settings	548/380008.791	<b>1</b> 2
Encryption:	JVL_EV42 WPA/WPA2	
Password:	MONKEY123	
⊡Status		
MAC Address: SSID:	Connected 546:380008791 WPA_NPA2 WPA_NPA2 ••••••••••••••••••••••••••••••••••••	C
	le .	

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 coi	nstants	Texts					
▼ Layer 2 ▶ VLAN		^	WLAN	i						
Spanning			> Bi	asic						
DCP Forw LLDP	arding			Port	Authentication Type	Encountion	Cinher	WPA(2) Pass Phrase	WPA(2) Pass Phrase Confirmatio	Default Key
▼ Security					WPA2-PSK	√	AES	*****	*****	Key 1
AAA										
- WLAN										
Basic										
AP Cor	mmunication									
AP RAD	DIUS Authenti	4								
Keys										
➡ MAC ACL										
Rules	Configuration									
Ingres	s Rules									
Egres	s Rules									
IP ACL										
Rules	Configuration	-								

	onfigured as Station Client	• • • Motor n
	4E380008791 NL EW42	64
Encryption:	NPA/NPA2 V MONKEY123	
Encryption: V Signal Strength:	€380008791 A_EW42	

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

General I	O tags	Systen	n constants	Texts											
Configurati • WLAN	ion	^ ,	Basic												
Basic Advanced				Country	Code ·	Denn	nark								-
Antennas				Device											-
Allowed Ch 802.11n	nannels														
802.11n			Radio	Enabled	Radio	Mode	Frequency Band	WLAN Mode 2.4 GH	Z WLAN Mode 5 Gt	tz DES (802.11h)	Outdoor Mode	max. Tx Powe	Tx power check		
AP WDS		É.	WLAN 1		AP					•	E		Not Allowed (All Channels)		
AP 802.11a	big Rates	-													
AP 802.11r	n Rates														
Force Roan	ning	=													
Remote Captu	ure														
ayer 2															
VLAN				Wa	ming:	It is p	ossible that the d	evice may not yet be v.siemens.com/wire	approved for use in ess-approvals	countries denote	d by an asterisk (	").Please check	k the following website for more	detailed	
Dynamic MAC		-												~	2
Spanning Tree	e	~													

# Channel selection:

General       IO. tags       System constants       Texts         Overview Configuration * MAN       Advanced Advanced Antennas       Advanced MAN 1       Radio       Use Allowed Channels only         Basic Advanced Antennas       Radio       Use Allowed Channels only       Radio       Redio         Basic Advanced Antennas       Radio       Select Obselect all       Frequency Band:       2.4 GHz         AP       AP 802.11n blag Bates       Select Obselect all       Select Obselect all       Frequency Band:       2.4 GHz         AP 802.11n Bates       Frequency Band:       2.4 GHz       Select Obselect all       Frequency Band:       2.4 GHz         VLAN       Basic       Radio       Redio       Redio       Redio       Select Obselect all         VLAN       MAN       Prequency Band:       Soltz       Select Obselect all       Select Obselect all         VLAN       AP       Select Obselect all       Select Obselect all       Select Obselect all         VLAN       AP       Select Obselect all       Select Obselect all       Select Obselect all         MAN       Basic       AP ADUS Authention       Select Obselect all       Select Obselect all         MAN       Basic       Redio Redio Mode 36 40 44 49 52 56 60 64 100 104 105 112 116 132 136 140       MAN	
Configuration VILAN Basic Advanced Antennas Advanced Antennas Advanced Antennas Advanced Antennas AP AP AP NOS AP 802.11n Rates FrequencyBand: 2.4 GHz Frequency	
Comgutation WLAN Basic Advanced Antennas Microsoft Sharmels B02:11n AP AP 02:11a blog fastes FrequencyBand: 24.6Hz Sector Deselect all FrequencyBand: 5.6Hz Sector Deselect all PrequencyBand: 5.6Hz Sector Deselect all FrequencyBand: 5.6Hz Sector Deselect all NUAN 1 AA NUAN 1 AA AP 0005 Authent. MUAN 1 AP 0005 Authent. MUAN 1 AP 0005 Authent. MUS Authent. FrequencyBand: 5.6Hz Sector Deselect all Ketter Deselect al	^
Basic       Advanced         Advanced       Antennas         Microsoft Channels       Basic         Basic       AP         AP       AP         AP 802.11 nalves       FrequencyBand:         2.4 GHz       Select / Deselect all         Select / Deselect all       Select / Deselect all         Port RANG       Basic         AP       AAA         • MAN N       Basic         AP Communication       AP         AP Communication       AP         AP Communication       AP	=
Advanced       Auternas         Antennas       Microsoft Channels         B02.11n       AP         AP       AP         AP NOS       FrequencyBand: 2.4 GHz         AP 802.11n Bates       Select / Deselect all         Force Roaming       Select / Deselect all         Remote Capture       Select / Deselect all         VLAN 1       AP         VLNN       Select / Deselect all         Spanning Tee       DCP Frowarding         LDP       FrequencyBand: 5 GHz         Security       Select / Deselect all         NUNN       Select / Deselect all         Basic       Radio Radio Mode 36 40 44 49 52 56 60 64 100 104 108 112 116 132 136 140         MUNN       Select / Deselect all         Radio Radio Mode 36 40 44 49 52 56 60 64 100 104 108 112 116 132 136 140	
Artennas         Model 1           AP         AP           AP 802.11 m Ates         FrequencyBand: 2.4 GHz           AP 802.11 m Ates         Select / Deslect all           Remote Capture         Select / Deslect all           • Layer 2         VLAN           Dynamic MAC Aging         Select / Deslect all           • Spanning Tree         Def FrequencyBand: 5 GHz           • Security         Select / Deslect all           • Security         Select / Deslect all           • Security         Select / Deslect all           • AAA         • MLAN 1           Basic         Redio Redio Mode 36 40 44 48 52 56 60 64 100 104 108 112 116 132 136 140           MLAN 1         AP           PADUDS Authenti.         AP	
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802.11n       Ref         AP W05       AP 802.11a blg hates         AP 802.11a blg hates       AP 802.11a blg hates         AP 802.11a blg hates       AP 802.11a blg hates         AP 802.11a blg hates       Belect / Deselect all         Remote Capture       Select / Deselect all         VLAN       MUAN 1         DP Forwarding       MUAN 1         LDP       Frequency Band: 5 GHz         Security       Select / Deselect all         Basic       Redio Redio Mode 36 40 44 45 52 56 60 64 100 104 108 112 115 130 140         MUAN 1       AP         Basic       Redio Redio Mode 36 40 44 45 52 56 60 64 100 104 108 112 115 130 140	
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Force Roaming         Image: Construction           Layer 2         VLAN           Dynamic MAC Aging         Image: Construction           Spanning Tree         ULDP           DCP Forwarding         Image: Construction           LLDP         FrequencyBand: 5 GHz           Security         Select / Deselect all           WLAN         Basic           AP Communication         Redio Redio Mode 36 40 44 44 52 56 60 64 100 104 108 112 116 132 136 140           WLAN         AP	
Remote Capture         I         Radio Radio Mode 1 2 3 4 5 6 7 8 9 10 11 12 13           VLAN         Dynamic MAC Aging Dynamic MAC Aging DCP Forwarding LLDP         I	
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Dynamic MAC Aging         *           \$ Spanning Tree DCP Frowarding LLDP         *           LLDP         *           \$ Security         \$ Select / Deslect all           * WLAN         *           Basic AP Communication AP ROJUS Authenti.         *	
• Spanning Tree         DCP Frowarding           LLDP         FrequencyBand: 5 GHz           • Security         • Select / Deselect all           • WLAN         • Select / Deselect all	
DCP Forwarding         Image: Constraint of the state of the sta	
LLDP         FrequencyBani:         5 GHz           • Scouthy         • Select / Deselect all         • Select / Deselect all           • WLAN         =         • Redio         Redio         64 44 48 52 56 60 64 100 104 108 112 116 132 136 140           • AP Communication         AP ROUUS Authenti         • WLAN 1         AP         • W	
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Keys	
> MAC ACL	
> IP ACL	
Management ACL	
	~
OK	Cancel

### 5GHz, channel 40 –selection

General	IO tags	Syste	m constants	Texts		
Overvie		^	<ul> <li>Allowed Cha</li> </ul>	nnolr		-
Configu	uration		· Allowed Cha			
▼ WLAN						
Basic			Radio	Use Allow	ved C	
Advanc			WLAN 1	<b></b>		
Antenn						
	d Channels					
802.11	In					
AP						
AP WDS						
	2.11a/b/g Rates			Frequency Band	2.4 GHz	
	2.11n Rates				Select / Deselect all	
	Roaming					
Remote G	lapture					
Layer 2		4	Radio	Radio Mo	ie 1 2 3 4 5 6 7 8 9	
VLAN			WLAN 1	AP		
Dynamic I		- *				
Spanning						
DCP Forwa	arding					
LLDP				Frequency Band	5 Chr	
Security				riequency band	Select / Deselect all	
AAA					select / Deselect all	
▼ WLAN		=				
Basic			Radio	Radio Mode		
	nmunication		WLAN 1			
	OIUS Authenti					
Keys						
MAC ACL						
IP ACL						
Managem		~				
111						- [
					OK Cance	el