

TT3148-01GB

9

9.1 Setting up wireless connection.

9.1.1 Setting up wireless connection.

Motors equipped with an Ethernet system is equipped with 2 Ethernet ports and an internal Ethernet switch.

When a motor is equipped with the wireless system, one of the Ethernet ports are used for the wireless connection.

The second Ethernet port is available but only in as wireless configuration.

The following equipment is recommended to get a reliable wireless network up and running.

- I. JVL motor equipped with the wireless option and running one of the following Ethernet protocols:
 - EthernetIP
 - ProfiNet
 - ModbusTCP
- 2. A good wireless access point designed for industrial use with good diagnostic features. In house tests has been conducted with Siemens Scalance W76x, other vendors offers the same features.
- 3. Industrial grade switch systems to manage the wired connections from the PLC and Access point(s).
- 4. MacTalk VI.90.019 or newer.

To get a reliable wireless network established requires some planning and a good knowledge of the environment the system is supposed to be working in.

However wireless networks are by definition not as reliable as the wired solution and loss of packages can occur at a random interval so the system must be designed to accommodate that.

Careful planning is also vital to get a good and reliable connection to the wireless nodes.

9.1 Setting up wireless connection.

The JVL wireless network can run in 2 different modes depending on which topology is required.

From MacTalk the configuration is done from the dialog that is accessed by pressing the "WIFI" -button.



Please note that configuration of the wireless network in the motor is only possible through a serial connection (not via Ethernet). When the wireless connection is running the motor can be accessed over the wireless connection, but the wireless settings are not available.

Sta Merer ePIC Scrup Updatta Window Belg					
🍯 . 📓 🔺 -	k 🖌 🚳	هري 🛃	MacTak@Version	JVL	
Open Dave Deve in Motor Re-	er Postion Cent Firers Reset Moto	e LitterStetup DECH Motor V	what's New 🔊 🖗	Charlipson eserions	
Main 1/O Setup Registers DMx512 Setup Advanced	SventLog Scope sRLC -miller	Haminy	Veter statue	Sale mode	
Star net settings	Cyclic data setup (32bit)		Actual Velocity Projected Position	0.00 RPM 446188658 Quarks	
IF address 157 108 1 20 197, 106, 1, 20	Rood Words 2+Operating Mode	Read Bulky 35 - Br is mondotory.	rors' Vitin Status In Position		
Submet mark 265.265.0 255.255.0 Default relevant 102.168.1.20 192.165.1.20	Read Word? 10 - Projected Position Read Word3 12 - Actual Velodty	~ ~	At Velocity Accelerating		
Use DHCP to optain IP address	Read Word4 18 Hexble Register	×	Homing Done	an web	
Trefiliat over handing	Read WordS 0 - No Selection	~	Control Voltage (CVI) Temperature high Ses.	24 Volt 42.09 CC	
Motor act "Pessive mode" Motor act velocity = 0	Read Word? 0 No Selecton Read Word3 0 - No Selecton	~ 0	⊽Digital/Analog Input B Z B	1 0.19 W	
Protocol settings	Write Word1 2 - Operating Mode	 Reset Errors Reg. 0 GMD:0x01000061 	83040 200 200 000	🛛 🔲 (Fibered) 0. 10 Vo	
Enter the Station Name (Hax 240 characters):	White Word2 3 Requested Position White Word3 5 - Max Velocity	Click ?" to learn m	ore. 876543		
	Write World4 5 - Acceleration Write World5 0 - No Selecton	~	⊽ External Encoder		
	Write Word5 0 - No Selecton	v ?	External Encoder Volod	ty 0 Counts/s	
All. Eyle Order	Write Winds 0 - No Selection	V 🙆 Add To Walk	di Victors		
Powerop with blank Name of station*	Set module factory defaulto	oppiy and cave 😽 Rafradh Tab			
Statur			V Warnings		
** New Status received **	Clearling Motule Ide		Positive Limit Input act Negative Limit Input act Digittive Limit Treamless	tive been active	
Outputs: 0 Outputs: 0 Lieucostate: 10	Mod Jainfo		Negative Limit Input he sus voltage too low	es been active	
Error(In-In-100 to rectar one area area are to	Firmware version: V3.40 Build: 10152 Hardware version: V1.1		Temperature is ditual http://www.compercom	Warning	
	MAC: 54(E3:00:00:0F:71		2 Watch Registers		
			No ePuC program in the	arotor	
				the contract of the contract o	
			W R		
Moderete Activity (W30)	MIS173H4 (Version V5.04.00535.5NE 52	2088) ProfiNet (V3.40.10252) Connec	ted		
g Modewis Actor (g (9736)	MIS1721H4 (Version VS-04.00335.516-32	2008) Profitiket (V340.10252) Dennee	NY R.		
 Bookeens Acherly (0/3) 	MIS173H4 (Yazion V3 04.003355H) 52	2008) NYEFINET (V340,1025) Dynroe			
 Moderni Aderly (0/3) 	MIST71H+ (Venion V5 24 20335 SH 22 YH-FI Configurator - Wi-F	2008) Prefike: 0/34030020 Prefie	as Station Client		>
Modewin Adarky (\$725)	MEITZIH Yoo or VS 04 703 5.98 32 VI-Fi Configurator - WI-Fi fifterAT Command Conso	COURT Net Net (244) (CSC) - ver Thodule is Configured	es Station Client		>
 Kooleens Judarly (8/3) Kooleens Judarly (8/3) Ty Wit 	MEITZIH (Verson VS 34 509353) & 22 VI-FI Configurator - VI-F for Tat Command Conso e Station Clent - Fi Module is Configured	a Module is Configured	as Station Client	- ((q)) ((q)) Hotor 1 - Potor 2	> ⊐ ••••• [Hotter n]
Poderen Adorty (903)	MEITZIH Proson V304/003594 32 VI-Fi Configurator - WI-F File: TAT Command Conso e Station Clent: Fi Module is Configured add Settions	Ti Module is Configured	as Station Client	- ((φ)) ((φ)) Moder 1 = Moder 2 on Client	> ■ •••• [Motor n]
Pooleens Ackerly (903)	MB172HH Process V3.94.9833.5H 22 VI-Fi Configurator - Wi-F Filesc AT Command Corso e Station Client - Fi Module is Configured asic Settings AC Address: 54E38000DF	n Module is Configured	as Station Client ((P)) PLC + Cossis Motor Setup as Station	- ((φ)) ((φ)) Hotor 1 = Pater 2 on Client)
Modewin Adardy (9/3)	MEITZIHI Process V3.94.9893.594 20 VI-FI Configurator - WI-F File Station Clent FI Module is Configured asic Settings AC Address 54E28.000DF	Ti Module is Configured He de	as Station Client	• ((q ·)) ((q ·)) Moder 1 = Moder 2 on Client	>
 Kooleens Julierly (0/3) Kooleens Julierly (0/3) Try M M 	MEITZIH (Yesson V3-34-509313)4 22 VI-FI Configurator - VI-F Fire: AT Command Conso e Staton Clent - FI Module is Configured asic Settings AC Address: 54E380000F SSID:=	a Module is Configured as Station Client	as Station Client	((و) ((و)) Notor 1 کار کار کار کار Son Client	> ((*)) Meter n Meter n Meter n
Pooleens Ackerly (903)	MB172HH Process V3.94.5893.594 22 Vi-Fi Configurator - Wi-F Fiber AT Command Coroco e Station Client - Fi Module is Configured asic Settings acc Address: 54E38000DF SSID := Encryption: Open	The formation of the second seco	as Station Client ((P)) PLC + Cosss Motor Setup as Stati	- ((φ)) ((φ)) Hetter 1 = Patter 2 on Client	> ((•) Metern See See See
Doodeens Ackerly (923)	MEITZIHH HYessen V3.94.50935.94 20 VI-FI Configurator - WI-F Fifes: TI Command Geneso E Station Client - FI Phodule is Configured asic Settings AC Address: 54E38.0000DP SSID := Encryption: Open Password: Open	Thodule is Configured He He	as Station Client PLC Control Client Motor Setup as Station	• ((φ)) ((φ)) Hoder 1 = Hoder 2 on Client	> = (* q *) Motor n Motor n
 Kooleens Julierly (603) From Try With Mit 	MB1721H-1Yerson V3-04/0933.5H 22 WI-FI Configurator - WI-F flee Art Commend Corso e Staton Clent ~ Fi Module is Configured asic Settings AC Address: 54E38000DF SSID := Encryption: Open Password:	a Module is Configured is Station Client	as Station Client (()) -1-1 PLC + Ress Motor Setup as Stati	((م) (م) Notor 1 کار المانه 2 کار Son Client) ((q)) = [Motor n [Motor n]
Pooleens Ackerly (903)	MB172HH Proson V3-94-5833.5H 22 Vi-Fi Configurator - Wi-F Fiber AT Command Conco e Station Client - Fi Hodule is Configured asic Settings AcAddress: 54E-38000DF SSID := Encryption: Open Password:	Ti Plodule is Configured le as Station Client	as Station Client ((P)) PLC + Cosss Motor Setup as Stati	- ((φ)) ((φ)) Hetter 1 = Patter 2 on Client	> = ((•)) Hotor n : : : :
Doctoren Ackerly (023)	MEITZIHH Preson V3.04.0033.5NE 32 VI-FI Configurator - Wi-F Fires: TI Command Conso E Station Client - FI Hodule is Configured asic Settings AC Address: 54E38.000DF SSID := Encryption: Open Password: Status: Interface: Connected MEITZIHH Preson V3.04.0033.5NE 32 Interface: Connected Interface: Connected	Thodule is Configured He	as Station Client es Station Client PLC Control Control Client Motor Setup as Station	- ((φ)) ((φ)) Noter 1 - Noter 2 on Client	> = ((q)) Hotor n
Cooleens Actor (; (003)	MBITZIHI (Yorson V3.94.50935.94 20 WI-FI Configurator - WI-F fier AT Command Corso e Station Clent E Station Clent Statis Settings AC Address: 54E38000DF SSID := Password: Status Interface: Connected MAC Address: 54E38000DF SSID := Password: SSID := SSID := SSI	Ti Hodule is Configured is Station Client 771	as Station Client es Station Client (()) -1-4 PLC + Access Motor Setup as Stati	(() () Notor 1 Notor 2 On Client	> ((†)) = (Motor n Motor n =
Pooleens Addrig (903)	MB1721H4 Processon V3-04-26933-594 22 W-Fi Configurator - Wi-F Fiber AT Command Conco e Station Client - Fi Module is Configured asic Settings AC Address: 54E:380000F SSID := Password: STatus Interface: Connected MAC Address: 54E:380000F SSID := Status Interface: Connected MAC Address: 54E:380000F SSID := Status Interface: Software, SHE380000F SSID: JUL_JUNAL	The second secon	as Station Client ((P)) PLC + Cosst Motor Setup as Stati	- ((φ)) ((φ)) Hotor 1 = Patter 2 on Client	> = ((*) Heter n =
Doctoren Actory (0/3)	MEITZIHI HYessen V3.94.9833.594 20 VI-FI Configurator - Wi-F frees T Command Conso E Station Client FI Hodule is Configured asic Settings AC Address: 54E38000DF SSDD:= Encryption: Password: Status Interface: Connected MAC Address: 54E38000DF SSDD:= Status Interface: Connected SSDD:= SS	Thodule is Configured	as Station Client	- ((φ)) ((φ)) Hotor 1 Hotor 2 on Client	> ((q)) = [Hotor n] [Motor n]
Poderen Adorty (903)	MBIT2HH Process V3-94-5833548 22 VI-Fi Configurator - WI-F File: AT Command Conse e Station Clent - Fi Module is Configured asic Settings AC Address: 54E38000DF SSID: = Encryption: Open Password: STatus Interface: Connected MAC Address: 54E38000DF SSID: 31, 24420 SSID: 244200 SSID: 244200	Thodule is Configured	as Station Client as Station Client PLC + Access Motor Setup as Stati Audio Freedback Cyclic Lipdate	(() () Notor 1 Notor 2 on Client	> ((+)) Hotorn We We (1)
Poderen Adorfy (903)	MBIT2IHI Proson V3-04-0833-594 20 Vi-Fi Configurator - Wi-F fine: AT Command Conco e Station Client - Fi Module is Configured asic Settings AC Address: 54E-380000F SSID := Baseword: SSID := Status Interface: Connected MAC Address: 54E-380000F SSID := Status Interface: SetE380000F SSID := STATUS STAT	The second secon	as Station Client ((P)) Motor Setup as Stati Motor Setup as Stati Cydic Update	- ((φ)) ((φ)) Hotor 1 = Patter 2 on Client	> ((*)) =(Meter n) =(Meter n) =
Doctoren Ackerly (002)	MB172HH Process V3-94-5893594 24 W-Fi Configurator - WF-F Fifece AT Command Coress e Station Client - Fi Hodule is Configured asic Settings AC Address: 54E-380000P Password: - Status Interface: Connected MAC Address: 54E-380000P MAC Address: 54E-380000P SSID: 9 SSID: 9	Ti Plodule is Configured Ie Ia Station Client	as Station Client as Station Client ((P)) PLC + Coses Motor Setup as Stati Audio Feedback Cyclic Update	- ((φ)) ((φ)) Notor 1 = Notor 2 on Client	> = ((*) Hotor n : : : : : : : : : : : : : : : : : : :
Doctoren Adardy (1923)	MEITZIHH Process V3.94.5093594 20 VI-FI Configurator - Wi-F Fiftee AT Command Conso E Station Client - FI Module is Configured asic Settings AC Address: 54E38000D Password: - Status Interface: Connected MAC Address: 54E38000D SSID :- SSID :- Password: - SSID :- SSID	Thodule is Configured	as Station Client as Station Client PLC - Point Motor Setup as Station Audio Feedback Cyclic Update Cyclic Update	- ((φ)) ((φ)) Heder 1 = Heder 2 on Client	
	MBITZIHH Processer V3.04.08935.5H2 22 VI-FI Configurator - Wi-F Fifes: AT Command Geneso e Station Clent - FI Peddule is Configured add: Settings AC Address: 54E:38000DF SSID: = Encryption: Open Password: - Status Interface: Connected MAC Address: 54E:38000DF SSID: = Status Interface: Connected MAC Address: 54E:38000DF SSID: = Status Interface: Connected MAC Address: 54E:38000DF SSID: = Connected SSID: = Connected SSID: = Connected SSID: = Connected SSID: = SSID: = SSID: = SSID: = SSID: = SSID: = SSID: = Connected SSID: = SSID: = SSID	Thodule is Configured In Module is Configured Is station Client In Thodule is Configured Is station Client In Thodule is Configured In Thodule is Configured Is station Client In Thodule is Configured Is station Client In Thodule is Configured	as Station Client as Station Client PLC + Access Motor Setup as Stati Audo Feedback Cyclic Update Factory	(p) (p) Mader 1 Mader 2 on Client	> ((*)) (*) (*) (*) (*) (*) (*) (*) (*) (

9.1 Setting up wireless connection.

After the connection to the module has been established, the current setup is read and displayed in the "Status" -section.

Interface AT C	ommand Console				
Type Station C Wi-Fi Module i	lient 💛 s Configured as	Station Client	PLC + Access Point	1→ ((φ)) ((φ)) Motor 1 Motor 2	((p)) Motor n
			Motor Setup as Sta	ation Client	
Basic Settings MAC Address:	54E380000F71				5
SSID:					
Encryption:	Open	~			
Password:					
Status					
Interface	: Connected				
MAC Address	: 54E38000DF71				
SSID	; JVL_EW42				
Encryption	WPA/WPA2	_	_		
Signal Strength	:	-35 dBm 🗸	Audio Feedback		-
	Poor Exe	llent	Cydic Update		V
Client AT Con	ole				
? Help		S	Factory 🕜 Sta	tus 🕡 Configure	e 🕢 Done
Ready @ 11	2khaud	_		-	-

9.2 Status indicators at the WIFI module

On the WIFI antenna socket 2 LED's indicate the current status of the wireless connection.

Please note that for convenience the antenna has been removed in the following illustration, do not operate the device without the antenna connected.



LED overview

LED1	LED2	Description
Green	Green	No wireless setup in the motor, make a new setup from MacTalk.
Green	Purple	Connection attempt to either access point (Configuration #1) or Client (Configuration #2)
Green	Blue	Connection is established, blinking indicates traffic
OFF	Purple	Internal communication is missing between ethernet controller and wireless controller, connection is attempted on the wireless interface.
Off	Blue	Internal communication is missing between ethernet controller and wireless controller, connection is established on the wireless interface.
Off	Red	Internal error in the wireless controller, try setting factory default and make a new setup.

When the motor is configured as "Station Client", the secondary Ethernet port on the motor is not available. In other words it is **NOT** possible to connect other equipment to this port and reach it through the wireless connection.

The Access point connected to the PLC works as an access point and the motors connects to this access point and works as clients.



9.3.1 MacTalk "Station Client" configuration

Interface AT Command Console		
Type Station Client V Wi-Fi Module is Configured as St	tation Client $PLC \leftrightarrow Point$ $Motor 1 \Rightarrow Motor 2 \Rightarrow \cdot$	((e)) •••• Motor n
Pasis Cattings	Motor Setup as Station Client	_
MAC Address: 54E3B000DE71		6 6
MAC AUGRESS: 54C30000F71		
SSID:* JVL_EW42		
Encryption: Open	7	
Pareword:	-	
rassivoru.		
Status		
Interface: Connected		
MAC Address: 54E3B000DF71		
SSID: JVL_EW42		
Encryption: WPA/WPA2		
Signal Strengths	-21 dBm V Audio Feedback	

9.3.2 Basic settings

In this section data for the setup can be entered.

Current MAC addr. of the Ethernet processor in the motor.
Enter the SSID of the access point
Encryption method used in the access point. W/PA/W/PA2 can be se
lected.
Enter the WPA/WPA2 password of the access point. Note, by press- ing the "Eye"-button, the entered password is readable.

For more information on how to setup the access point, find the section Setting up the access point for configuration #1, page 240

9.3.3 Status

This section holds the actual setup and status of the wireless interface.

Interface:	Shows the connection state to an access point [Connected / Disconnected].
MAC Address:	Current MAC address used for the wireless interface. This address should be the same as the MAC address printed on the label.
SSID:	Current SSID configuration. This is the SSID the motor will try to connect to.
Encryption:	Current encryption setting [WPA/WPA2 or OPEN]. Observe that the password is protected from viewing.
Signal strength:	When the motor is connected, the signal strength can be monitored. The units can be presented in either [dBm or %]. In good industrial access points the signal strength of the clients can be monitored as well in the managing software for the access point.

When the settings has been configured, the setup is transferred to the motor by pressing the "Configure" -button found in the bottom of the dialogue.



Note: The settings are saved permanent in the motor after they are transferred.

ype Station Cli	Configured as Station Client	Y"
VPTT Floquie is	Plc Point Point Point Point Point	otor n
	Motor Setup as Station Client	
Basic Settings		1240
MAC Address:	54E38000DF71	H
SSID: =	JVL_EW42	
Encryption:	WPA/WPA2 V	
Password:	••••••	۲
Status		
Interface:	Connected	
MAC Address:	54E3B000DF71	
SSID:	JVL_EW42	
Encrypuon:		
signal suerigui:	Poor Exellent Cyclic Update	8
		-
Client AT Conso	le	

When the transferring has completed, the motor will connect to the access point with the SSID entered, using the encryption and credentials configured.

When the motor has established a wireless connection the status changes from "Disconnected" to "Connected".

The signal strength is also changed from "---" to a value either in dBm or %.

Interface: Connected	
MAC Address: 54E3B000DF71	
SSID: JVL_EW42	
Encryption: WPA/WPA2	
Signal Strength:	ack .

In the screen-shot above the motor is connected to an access point with the SSID "JVL_EW42", there is no encryption configured. The signal strength is reported by the motor to be -20dBm (very good). For a more human readable value the unit can be switched to %.

Signal Strength:	91	%	\sim
Poor Exellen	nt	TT31	57-01GB

For the best performance and reliability the signal strength should always be in the "Excellent" -area of the status bar.

9.3.4 Setting up the access point for configuration #1

In this section we will cover the basic settings of the access point when a motor is configured as "Station Client".

The access point is the Ethernet wired to wireless gateway on which the PLC is connected.

The access point used is a Siemens Scalance W76x, but the same settings are available in other good industrial access points.

9.3.5 IP address of the access point

The IP address settings of the wired part must match the PLC settings. In this example all the equipment is running on the subnet 192.168.1.xxx. The access point is configured for the same range with the IP address 192.168.1.57.

SIEMENS	192.168.1.57/SCALANCE W761-1 RJ45
Welcome admin	Agent Internet Protocol v4 (IPv4)
Logout	
₩izards	
►Information	IP Assignment Method: Static
→System	IP Address: 192.168.1.57
▶Configuration	Default Gateway: 0.0.0.0
▶General	Agent VLAN ID: - 🗸
►Agent IPv4	MAC Address: d4-f5-27-9a-2a-4b
▶Agent IPv6 ▶DNS	Set Values Refresh
▶Restart	TT3158-010

The way IP addresses are configured can be manufacturer specific and is covered in the manual for the device.

9.3.6 SSID (ServiceSetIdentifier)

The SSID is basaically the identification on the wireless network. The SSID can be either visible or invisible for a scanner. When wireless networks are scanned it is the SSID of the networks that appears in the list.

In this example we use "JVL_EW42" as SSID, in the Siemens configuration this is setup in the following dialog:

Welcome admin	Access	Point Se	ettings						
					↓				
Logout	Rasic Adva	nced Ante	ennas Allo	wed Chann	els 802.11n AP AP WD	S AP 802 11a/b/n Rates	AP 802 11n Rate	S Force R	oamina
 Wizards 	Duble Hard	need printe		neu enum		o ni oozinaong nateo	n outrin nu	io roice ii	ourning
Information		Radio	Channel		Alternative DFS Channel	HT Channel Width MHz			
		WLAN 1	Auto	~	- v	20	~		
System		Radio	Available	Channels					
-Interfaces		WLAN 1	11	onument					
▶Ethernet		Radio	Port	Enabled	SSID		Broadcast SSID	WDS only	WDSI
+WLAN		WLAN 1	VAP 1.1		JVL_EW42				
Remote	Warning	The appro	val process	may not be	e linished in current count	ry for channels denoted b	y a **' character.		
Capture		Please ch	eck the folly	wing webs	ite for more detailed infor	mation:			
Layer 2		http://www	siemens.c	om/wireles	s-approvals	mauori.			
Security	Set Valu	es Refres	h						
	1.0		100			TT3159-01GB			

9.3.7 Encryption

The encrytion scheme supported in the motor is WPA/WPA2. The password "MONKEY123" is chosen and configured in the access point.

Welcome admin	WLAN Security Settings Canoes will be saved automatically in 19 seconds Press Write Startup Config to save immediately									
► Wizards	Basic AP Com	munication AP RADIUS Auth	enticator K	eys			-			
Information	Port VAP 1.1	Authentication Type	Encryption	Cipher	WPA(2) Pass Phrase	WPA(2) Pass Phrase Confirmation	Default			
▶System	4ru 1.1	Onen System		AUTO .			Juck 1			
Interfaces	Set Values	Shared Key								
►Layer 2		WPA (RADIUS) WPA-PSK								
 Security 		WPA2 (RADIUS)								
▶Users		WPA2-PSK								
▶Passwords		WPA/WPA2 AUTO (RADIUS)								
► AAA		WPA/WPA2-AUTOPSK								
+WLAN		2	-							
►MAC ACL										
▶IP ACL										
►Management										

The same password credentials must be configured in the motor. Press the "Configure" button to transfer the settings to the motor.

Interface AT Command Console	
Type Station Client Wi-Fi Module is Configured as Station Client	((q)) _ → ((q)) ((q)) ((q)) PLC → Access Point Notor 1 Motor 2 · · · · · Motor n =
	Motor Setup as Station Client
Basic Settings	leaf. the
MAC Address: 54E3B000DF71	58
SSID: * JVL_EW42	<u>8</u>
Encryption: WPA/WPA2 V	
Password: MONKEY123	Ŷ.
3161-01GB	
	Hint ! By pressing and holding down the "Evo", button, the Password is visib

When everything has been configured, the motor will try establishing a connection to the access point.

when the connection has been established, the LED's on the motor will show the following indication:



NOTE : The above image shows a motor without the antenna connected, this is purely for demonstration reasons, do not operate the motor without the antenna connected.

9.4

Each wireless motor is configured as an access point and the PLC is connected to a wireless client. This method leaves the secondary Ethernet port in the motor, open for connecting another wired node and the internal switch in the motor will route the packages through the wireless network to and from the PLC to the nodes connected to the port. The drawback of this setup is that it gets very complicated requiring a lot of bandwidth if many wireless "strings" are needed. The PLC and each Client should be connected to a industrial grade managed switch.



9.4 Configuration #2, Access point

9.4.1 Mactalk setup "Access point"

When the motor acts as an access point there are more settings that must be considered. An additional set of IP addresses must be setup.

Type Access Point Wi-Fi Module is Configured as Station Client	((¶)) PLC →→ Client * Motor 1 → Motor 2 → ···· Motor n
Rasic Sattings	* Access Point Setup as Client
SSID: # IV EW42	
Hidden SSID	
Channel: 1 ~	
Encryption: WPA/WPA2	
Provent Annual	
Password:	
IP Address: * 192 168 1 20	
Subnet Mask: * 255 255 255 0	
Gateway: * 192 . 108 . 1 . 20	5
- Status-	
Interface: -	
Client MAC Address: -	
SSID: -	
Hidden SSID: -	
Channel: -	
Encryption: -	
IP Address: -	
Subnet Mask: -	

9.4.2 Basic settings

In this section data for the setup can be entered.

SSID:	Enter the SSID for the Access point. This is the ID the motor will use for the Clients to connect to.
Hidden SSID:	Check this setting if the SSID should not be visible in a network scan.
Channel:	Select the channel for the Access point configuration.
Encryption:	Select the encryption that must be used. Note, by pressing the "Eye"- button, the entered password is shown.
Password:	Enter the WPA/WPA2 password of the access point. Note, by pressing the "Eye"-button, the entered password is shown.
IP Address:	Enter the IP address that the Wireless adapter in the motor should have. Note the clients that connects to this motor must be in the same subnet.
Subnet Mask: Gateway:	Subnet mask settings of the wireless network. Gateway settings the wireless adapter.

For more information on how to setup the access point, find the section Setting up the accesspoint for the Configuration #2, page 247

9.4 Configuration #2, Access point

9.4.3 Status

This section holds the actual setup and status of the wireless interface.

Interface:	Shows the connection state to an access point [Connected / Disconnected].
MAC Address:	Current MAC address used for the wireless interface. This address should be the same as the MAC address printed on the label.
SSID:	Current SSID configuration. This is the SSID the motor will try to connect to.
Encryption:	Current encryption setting [WPA/WPA2 or OPEN]. Observe that the password is protected from viewing.
Signal strength:	When the motor is connected, the signal strength can be monitored. The units can be presented in either [dBm] or [%]. In good industrial access points the signal strength of the clients can be monitored as well.

EStatus		
Interface:	Active	TT3165 - 01GB
Client MAC Address:		
SSID:	JVL_EW42	
Hidden SSID:	No	
Channel:	1	
Encryption:	WPA/WPA2	
IP Address:	192.168.1.20	
Subnet Mask:	255.255.255.0	
Gateway:	192.168.1.20	8
nterface: Client MAC Add SSID: Hidden SSID: Channel: Encryption: P Address: Subnet Mask:	Active/Passive ress: Not used Setting of the SSID that clients can connect to. Yes/No Active channel number Encryption method used. IP address of the wireless access point in the motor. Subnet mask	

When the settings has been configured, the setup is transferred to the motor by pressing the "Configure" -button found in the bottom of the dialogue.

* WI-FI Configurator - WI-FI Module is Config Interface AT Command Console	gured as Access Point	×
Type Access Point V Wi-Fi Module is Configured as Access Point	((p)) ((p)) PLC + Client * Motor 1 Motor 2 · · · · Motor * Account Point Sotum on Client	r n
Basic Settings	Access Point Setup as Chent	
SSID:= JVL_EW42		
Hidden SSID		
Channel: 1		
Encryption: WPA/WPA2 V		
Password:		۲
IP Address: * 192 168 1 20		
Subnet Mask:		
Gateway: * 192 168 1 20	5	
⊡Status		
Interface: Active		
Client MAC Address:		
Hidden SSID: No		
Channel: 1		
IP Address: 192,168,1.20		
Subnet Mask: 255,255,255,0		
Gateway: 192.168.1.20		Ð

9.4

9.4 Configuration #2, Access point

9.4.4 Setting up the accesspoint for the Configuration #2

SIEMENS													English - Go
	192.168	3.1.57	/SCA	LANCE	E W761-1	RJ4	5					01/01	2000 00 05 16
Weltome admin	WLAN Basic	c Radio	Settings										Clie
Looput													□?≞*
Wizards	Basic Advanced	Antennas	Allowed C	hannels 802.	.11n Client Signal	Recorder	Force Roamin	9					
Information	Country Code:	Not define	ed	- v.									
	Device Mode:	Client		v									
 Sthetwist 		Rado	Enabled	Radio Mode	Frequency Band	WLAN I	Node 2.4 GHz	WLAN Mode 5 GHz	DFS (802.11h)	Outdoor Mode	max. Tx Power	Tx Power Check	
		100 000 4		Contract of the second se				000 44 -		and the second sec	0.0 400-0	difference of	
interfaces		WLAN 1		Client	2.4 GH2	· 802.11	n v	802.11 n	*		20 dBm ~	Allowed	
interfaces >Elbernet	Warning	WLAN 1 The device	e may not be	client e permitted for	2.4 GHZ use in countries de	o 802.11	n v	802.11 n	×		20 dBm	Allowed	
•Elbernel •WLAN	Warning	WLAN 1 The device Please ch	e may not be	Client e permitted for wing website f	2.4 GHz use in countries de for more detailed int	ormation:	n v	802.11 n	•	0	20 dBm	Allowed	
•interfaces • Elbernet • WLAN • Remote Capture	Warning	WLAN 1 The device Please ch http://www	e may not be eck the folic islemens o	Client e permitted for wing website f om/wireless-ap	2.4 GHZ use in countries de for more detailed int pprovails	o 802.11 noted by a " formation:	n v	802.11 n	•		20 d⊞m ∨	Allowed	

Observe the Device mode and the Radio mode which is set to "Client". Encryption is configured according to the encryption settings configured from MacTalk.

	192.168.1	1.57/SCALA	NCE	W7	61-1 R	J45	ō			
Welcome admin	WLAN Security	y Settings								
Looput										
▶ Wizards	Basic Client RADIUS	Supplicant Keys								
Information	Security Context	Authentication Type	Enc	ryption	Cipher		WPA(2) Pass Phrase	WPA(2) Pass Phrase Confirmation	Default Key	
Custam	1	WPA2-PSK	~	2	AES	~	•••••		Key 1	Ŷ
- oyanın	1 entry.									
Interfaces	Create Dalate	Cat Valuar Defrach								
Layer 2	Decisive) (Economic) (Gervalues [[Kenesii]								
·Security										
+Users										
+Passwords										
* AAA										
+WLAN										
+ MAC ACL										
FIP ACL										
+Management									TT316	8-01GB

The Password is of course defined in the motor, since the motor acts as the access point. The Password is in this case MONKEY123 as configured from MacTalk.

When everything has been configured, the motor will wait for Client(s) to connect, when a client is connected, the LED's on the motor will show the following indication:



Green and Blue indicates that the internal bridging between the wireless chip and the Ethernet controller has been established.

The blue LED indicates that the wireless connection is established. When data is transmittet the LED's are blinking indicating the traffic.

NOTE: The above image shows a motor without the antenna connected, this is purely for demonstration reasons, do not operate the motor without the antenna connected. In some cases it may be necessary to reduce the RPI (Requested Package Interval) compared to a classic wired connection.

The bandwidth of the wireless network can be significantly lower than the bandwidth of a wired connection.

In order to have a stable reliable connection it is imperative needed that the correct settings are achieved in the access point.

Using a good access point designed to work in an automation environment is the first step to success establishing a wireless network.

Wireless networks will always be less deterministic than a traditional wired Ethernet network, so careful planning must be done with considerations of lost connections, lost packages etc.

Most access points designed for industrial use, supports a lot of fine tuning to optimize the infrastructure for the actual usage end existing infrastructure.

This section will cover some of the considerations and features modern access points offer for industrial use.

All demonstrations are carried out using the **Siemens Scalence W761** -Access point and configuration software.

First step in determining how reliable or/and fast a wireless network can be on the plant floor is to analyze the channels in use and the traffic load on each.

Please note that most access points offer running on both 2.4GHz and 5GHz so in case channels are heavily loaded on 2.4GHz, 5 GHz can be used instead.

The JVL wireless system supports running either 2.4GHz or 5GHz.

The channel selection determines whether the motor operates on 2.4GHz or 5 GHz.

For operation in 2.4GHz, select a channel in the range: I - II

For operation in the 5GHz band, select a channel in the range: **36 - 64, 100 - 116, 132 - 140.**

NOTE:

Observe the local regulations of allowable channels before commissioning.

9.5

WIFI settings for optimal quality

9.5

Spectrum analyzer in Siemens Scalence W761 Showing the channel load on the different channels at 2.4GHz.



WIFI settings for optimal quality

Motor and access point appx. 300mm apart using a std. JVL antenna on the motor. On the 5GHz frequency band the channel loading on Channel 36-48, leaving Channel 40 as a good choice of operation:



	192	.16	3.1.57	SCAL	ANCE W7	61-1 RJ4	5								
instance allowed	WLAP	N Ciler	vts												
Wizarda	Overview	AP CB	ent List WE	IS List Over	tap AP Force Roaming	Nome Floor									
internation.	Asso	coaled (tations: 1												
+ Stat Page + Vensione	AID 1	Radia WLAN	Port 1 VAP 11	Type Station	MAC Address 54-e3-50-03-df 71	Bystem Name	Channel 6	Signal Strength (dBm) -21	Signal Strength (%) 100	Age [k] O	Security Open System	WLAN Mode 802 11 n	Max, Data Rate (Mops) #5.0	State connected	
+ ISM + ARIP / falighbors + Log Tables + Falits	(Ref)	esh)													
+ Chemet Statistics														TT	3173-01GB

Note the reception quality in the motor can be monitored from the access point web interface.

Note that all the settings are available from TIA portal and can be saved into a TIA portal project.

All JVL examples include the complete project for TIA Portal or Rockwell studio. A lot of information is available on the internet regarding planning and designing of wireless networks. Covering everything is beyond the scope of this manual.

9.5

On the JVL web page in the download section all the example projects can be found and downloaded.

Follow the link: https://www.jvl.dk/List/310/Downloads