

Siemens Accesspoint configuration

In this example the Siemens Scalance W761 is used.

The PLC is configured to the subnet 192.168.1.xxx and is connected to one of the wired ethernet ports on the accesspoint.

The configuration of this accesspoint is done from the internal web browser.

The wired ethernet ports must match the subnet 192.168.1.xxx on which the PLC is connected

Basically the Siemens Scalance W761 is configured as an Accesspoint with the following settings:

SIEMENS 192.168.1.57/SCALANCE W761-1 RJ45

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WLAN Basic Radio Settings

Basic | Advanced | Antennas | Allowed Channels | 802.11n | AP | AP WDS | AP 802.11a/b/g Rates | AP 802.11n Rates | Force Roaming | Spectrum Analyzer

Country Code: Denmark
Device Mode: AP

Radio	Enabled	Radio Mode	Frequency Band	WLAN Mode 2.4 GHz	WLAN Mode 5 GHz	DFS (802.11h)	Outdoor Mode	max. Tx Power	Tx Power Check
WLAN 1	<input checked="" type="checkbox"/>	AP	5 GHz	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20 dBm	Allowed

Warning: The device may not be permitted for use in countries denoted by a "*" character.
Please check the following website for more detailed information:
<http://www.siemens.com/wireless-approvals>

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Device mode: AP (Accesspoint), 5GHz

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Allowed Channels Settings

Basic | Advanced | Antennas | Allowed Channels | 802.11n | AP | AP WDS | AP 802.11a/b/g Rates | AP 802.11n Rates | Force Roaming | Spectrum Analyzer

Radio: Use Allowed Channels only
WLAN 1 ☒

Frequency Band: 2.4 GHz
☒ Select / Deselect all

Radio	Radio Mode	1	2	3	4	5	6	7	8	9	10	11	12	13
WLAN 1	AP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Frequency Band: 5 GHz
☐ Select / Deselect all

Radio	Radio Mode	36	40	44	48	52	56	60	64	100	104	108	112	116	132	136	140
WLAN 1	AP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Channel: 40 @ 5GHz

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Access Point Settings

Basic | Advanced | Antennas | Allowed Channels | 802.11n | AP | AP WDS | AP 802.11a/b/g Rates | AP 802.11n Rates | Force Roaming | Spectrum Analyzer

Radio	Channel	Alternative DFS Channel	HT Channel Width [MHz]
WLAN 1	40 (5200)		20

Radio	Available Channels
WLAN 1	40

Radio	Port	Enabled	SSID	Broadcast SSID	WDS only	WDS ID
WLAN 1	VAP 1.1	<input checked="" type="checkbox"/>	JVL_EW42	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Warning: The approval process may not be finished in current country for channels denoted by a "*" character.

Please check the following website for more detailed information:
<http://www.siemens.com/wireless-approvals>

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SSID: JVL_EW42

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WLAN Security Settings

Basic | AP Communication | AP RADIUS Authenticator | Keys

Port	Authentication Type	Encryption	Cipher	WPA(2) Pass Phrase	WPA(2) Pass Phrase Confirmation	Default Key
VAP 1.1	WPA2-PSK	<input checked="" type="checkbox"/>	AES	*****	*****	Key 1

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Authentication: WPA/WPA2, Password: "MONKEY123" password is obviously not visible from the web dialog.

Motor configuration

The motors are completely factory defaulted with stock settings. The initial settings are done from the main routine using the input and output assembly.

Wifi configuration in the motors

Note, the wifi setting must follow the settings configured in the external accesspoint, that the PLC is connected to.

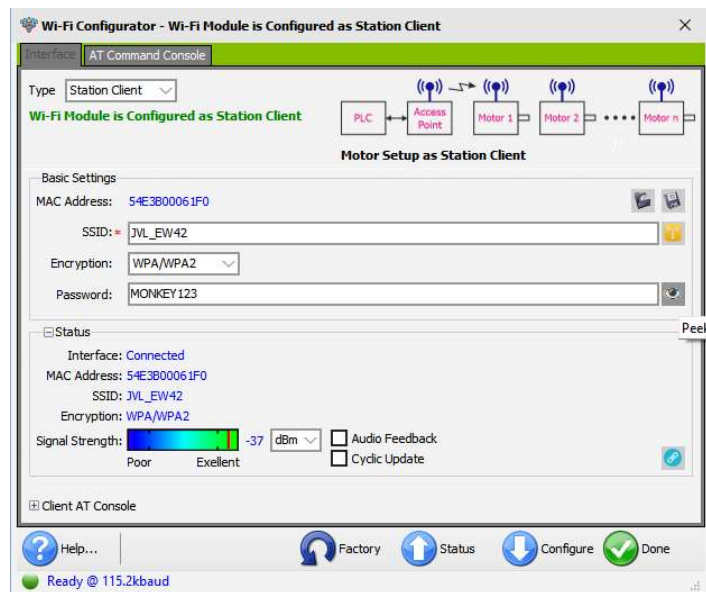
For this example we have used the Siemens scalance accesspoint configured as follows:

SSID: JVL_EW42

Encryption: WPA/WPA2

PW: MONKEY123

Please note, that the Siemens scalance in this example is in fact configured as an accesspoint, so the motors will both need to be configured as “Station Client”.



EthernetIP Configuration from MacTalk,

note the IP address for the motors are 192.168.1.20 and 192.168.1.30, which follows the subnet of the PLC and the wifi connection.

The screenshot shows the 'EtherNet/IP' configuration tab in MacTalk. The 'Setup' section on the left includes Ethernet settings (IP address: 192.168.1.30, Subnet mask: 255.255.255.0, Default gateway: 192.168.1.30), EtherNet/IP error handling (Motor set 'Passive mode'), and Protocol settings (Sercos Address: 0, Poll division: 0, ModbusTCP timeout: 0). The 'Cyclic data setup (32bit)' section on the right lists Read and Write words for 8 cyclic I/Os, configured with standard registers like Operating Mode, Projected Position, Actual Velocity, Errors, Warnings, Status Bits, Actual Torque, and Follow Error. A 'Reset Error' button is also present. At the bottom, there are buttons for 'Set module factory defaults', 'Apply and save', and 'Refresh Tab'.

Note that the 8 cyclic I/O's are configured to hold the typical used registers for normal operation.

Make sure that both motors are configured as described above.

The status of the EthernetIP connection can be seen from MacTalk on the "EthernetIP" -tab.

The screenshot shows the 'Status' window for the Ethernet/IP connection. It displays a log of messages, including 'TCP Conf. ok 0x0000' and '** New Status received **'. The status shows 'Inputs : 0', 'Outputs : 0', 'DeviceState : 0', and 'ErrorCode : 00'. A yellow 'Module Idle' button is visible. To the right, the 'ModuleInfo' section provides details: Firmware version: V3.41 Build:10271, Hardware version: V1.4, MAC: 54:E3:B0:00:21:06, and Serialnumber 130281.

The yellow LED will go green as soon as the EthernetIP connection is established to the PLC.

Studio5000 project

The project is kept as simple as possible for the main purpose of demonstrating the wireless capabilities. In principle there are no differences in the handling of the communication between running wireless and normal wired ethernet, however some important points needs to be considered.

1. RPI of the communication
2. In case of lost communication (temporary or permanent), which actions needs to be taken.

Since the accesspoint used is a Siemens product (Siemens Scalance W761), the configuration of this is held outside of the Rockwell project and is beyond the scope of this example, only the basic settings will be discussed.

In the Example the RPI is set for 64ms for both motors which ensured a reliable connection. This value will depend on the actual application.

Configuration of the motors in Studio5000

General Connection Module Info

Type: ETHERNET-MODULE Generic Ethernet Module

Vendor: Rockwell Automation/Allen-Bradley

Parent: Local

Name: Motor1

Description:

Comm Format: Data - DINT

Address / Host Name

IP Address: 192.168.1.20

Host Name:

Connection Parameters

Assembly Instance: 101

Size: 8 (32-bit)

Input: 101

Output: 100

Configuration: 1

Status Input:

Status Output:

Requested Packet Interval (RPI): 64.0 ms (1.0 - 3200.0 ms)

Inhibit Module

Major Fault On Controller if Connection Fails While in Run Mode

Use Unicast Connection over EtherNet/IP

Module Fault

Status: Offline

OK Cancel Apply Help

General Connection Module Info

Type: ETHERNET-MODULE Generic Ethernet Module

Vendor: Rockwell Automation/Allen-Bradley

Parent: Local

Name: Motor1

Description:

Comm Format: Data - DINT

Address / Host Name

IP Address: 192.168.1.20

Host Name:

Connection Parameters

Assembly Instance: 101

Size: 8 (32-bit)

Input: 101

Output: 100

Configuration: 1

Status Input:

Status Output:

Requested Packet Interval (RPI): 64.0 ms (1.0 - 3200.0 ms)

Inhibit Module

Major Fault On Controller if Connection Fails While in Run Mode

Use Unicast Connection over EtherNet/IP

Module Fault

Status: Offline

OK Cancel Apply Help

Connection Parameters

Assembly Instance: 101

Size: 8 (32-bit)

Input: 101

Output: 100

Configuration: 1

Status Input:

Status Output:

Notice the configuration of the assembly instance which follows the configuration in MacTalk with 8 cyclic input and output registers.

Mainroutine

The mainroutine is very basic with basic initialization in the first 3 rungs.

Both motors are setup with the following parameters in rung 1-3.

Mode (Cyclic write word 1): Position

Requested velocity (Cyclic write word 3): 20000 = 200RPM

Requested Acceleration (Cyclic write word 4): 1000

Max. Torque (Cyclic write word 5): 511 = 100%

The rest of the main routine is a simple statemachine positioning the motors between position = 0 and Position = 4096000 with a small delay in between. The position is read back to decide when to move to the next position. The actual position is read from read word 2 Actual position.