# Industrial WLAN

## Overview

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Industrial WLAN
Wireless communication solutions

Wireless communications are preferred when working with mobile applications or difficult-to-reach areas. Currently, wireless LAN can be used for industrial manufacturing plants or facilities; it is ideal for use anywhere where traditional cabling is not suitable or where a mobile network connection is required. For example, in logistics AGVs (automatic guide vehicles) are connected over a WLAN. Here it is important that roaming between different radio cells is possible, thereby creating individually configurable radio coverage.

Weidmüller’s versatile WLAN module can be used as an access point, bridge or client. It is quite simple to integrate into existing infrastructures because it has an alternative Power over Ethernet supply (using the data cable for the power supply).

Support for RADIUS services and WPA2 secure encryption guarantees that your data is fully protected. Multiple wireless zones can be set up so that clients can move around as they wish, by roaming between the different radio/wireless cells. Multiple zones can be specified (multiple SSIDs) and different VLANs can be assigned for each wireless cell. This allows you to implement a one-to-one forwarding of the cable-based infrastructure to the wireless zone.
**Wireless operating modes**

The most common operating mode for wireless networks are AP client mode (Access Point) and bridge mode. In AP-client mode an Access Point is necessary to set up a Basic Service Set (BSS) for a wireless connection. The AP can be used to create a wireless LAN, or to connect an existing WLAN with a wired network. Bridge mode offers a simple way to connect two Ethernet devices over a point-to-point connection wirelessly with one another.

**Turbo roaming for uninterrupted connections**

A WLAN radio cell has a limited range depending on the antenna used. To maintain communications between devices which move over a long distance requires the connection to be passed from one access point to another. Performance can be affected where there are many moving devices and a large number of transfer points without powerful roaming technology. It is the roaming technology that offers a seamless wireless connection and permits a swift change between different wireless access points without the risk of interruption to the data communication.

**Integrated digital inputs / outputs**

Wireless access points are often located in distant or inaccessible places in an industrial plant. This makes monitoring the status of a device, or its environment by the system administrators, a difficult task. Weidmüller’s WLAN access points therefore have an integrated digital input/output which sends alarm messages over the network in real time to the responsible maintenance personnel when errors, like power supply failures, or link breaks, occur.
Wireless VLAN (Multi-SSID)

VLAN stands for virtual LAN. It is a network structure with all the characteristics of a normal LAN, but not geographically constrained. Based on the SSID, two or more clients can be added into a VLAN and integrated into a LAN independently of their geographical location. Without the use of routers, a level 2 switch, in conjunction with Weidmüller WLAN access points, can distinguish broadcast domains from each other. In this way, VLANs offer administrators flexibility regarding network security, network management and scalability.

WMM for prioritising communications

Quality of Service (QoS) is a network term for controlling and measuring data transmission rates, throughput and error rates. It is an essential part of wireless communication when transmitting multimedia data like audio and video. Critical data, for example, requires a high priority with respect to the data throughput and low error rates. WMM (Wi-Fi multimedia) is based on the IEEE 802.11e protocol which was designed to integrate QoS functionality into a WLAN. The advantages lie in the prioritising of important data and the associated improvement of the communication quality.
BasicLine WLAN Access Point/Client

- IEEE 802.11a/b/g/n conform access point/client
- MIMO technology for data rates up to 300Mbit/s
- Fast roaming for interruption-free connection change between access points
- DFS support in 5GHz bandwidth

Technical data

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Spread Spectrum and Modulation

- DSSS with DBPSK, DOPSK, CCK
- OFDM with DBPSK, DOPSK, 16QAM, 64QAM

Operating Channels

- 2.412 to 2.462 GHz (11 channels) / 5.260 to 5.320 GHz (4 channels) / 5.600 to 5.640 GHz (4 channels) / 5.745 to 5.825 GHz (5 channels)

Security

- SSID Broadcast enable/disable
- Firewall for MAC/IP/protocol/port-based filtering
- 64-bit and 128bit WEP encryption, WPA/WPA2 person and enterprise

Transmission Rates

- 802.11b: 1, 2, 5.5, 11 Mbps
- 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
- 802.11n: 6.5 to 300 Mbps

Transmit Power

- 802.11b: Type 26.1.5 dBm at 1 Mbps, Type 26.1.5 dBm at 2 Mbps
- 802.11a: Type 23.1.5 dBm at 6 to 24 Mbps, Type 23.1.5 dBm at 36 Mbps
- 802.11n: Type 23.1.5 dBm at MC50/0 20 MHz, Type 23.1.5 dBm at MC50/0 40 MHz
- 802.11n: Type 23.1.5 dBm at MC75/15 20 MHz, Type 23.1.5 dBm at MC75/15 40 MHz

Receive Sensitivity

- 802.11b: -93 dBm at 1 Mbps, -93 dBm at 2 Mbps
- 802.11a: -93 dBm at 5.5 Mbps, -88 dBm at 11 Mbps
- 802.11n: -93 dBm at 6 Mbps, -85 dBm at 18 Mbps

Protocol Support

- Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, LLDP

Interfaces

- RJ45 port 1x 10/100/1000BaseT(X) auto negotiation, full/half duplex mode and auto MDI/MDI-X connection

Console Port

- RS 232 (RS232-type)

Note: In accordance with regional regulations, the maximum permissible transmit power is limited on the UNII bandwidths via the device firmware. The corresponding values are contained in the following tables.
### Technical data

**Housing**
- Metal, IP30 protection

**Weight**
- 307 g

**Dimensions (W x H x D)**
- 58 x 115 x 70 mm (2.29 x 4.53 x 2.76 in)

**Installation**
- DIN-Rail, wall (with optional mounting kit)

### Environmental Limits

**Operating temperature**
- Standard Models: 0 to 60 °C (32 to 140 °F)
- Wide Temp. Models: 40 to 75 °C (40 to 167 °F)

**Storage Temperature**
- -40 to 85 °C (-40 to 185 °F)

**Ambient Relative Humidity**
- 5 % to 95 % (non-condensing)

### Power Requirements

**Input Voltage**
- 24 V DC (12 to 48 V DC), two redundant inputs

**Connection**
- 1 removable 4-pin terminal block, 500 V insulation

**Power Consumption**
- 0.56 A at 12 VDC
- 0.14 A at 48 VDC
- 6.96 W

**Reverse Polarity Protection**
- Present

### Approvals

**Security**
- EN 60950-1, UL 60950-1

**Radio**
- EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID: SLE-WAPN008

**EMC**
- EN 55032/24
- CISPR 32, FCC Part 15B Class B
- IEC 61000-4-2 ESD: Contact: 4 kV, Air: 8 kV
- IEC 61000-4-3 RS: B0 Mts to 1 Gic: 10 kV
- IEC 61000-4-4 EFT: Power: 2 kV, Signal: 1 kV
- IEC 61000-4-5 Surge: Power: 2 kV, Signal: 1 kV
- IEC 61000-4-6 CD: 3 V
- IEC 61000-4-8

**MTBF (mean time between failures)**
- 749,476 hrs

**Database**
- Telcordia (Bellcore), GB

**Warranty**
- Warranty Period: 5 years

### Ordering data

**Version**
- WLAN Access Point/Client, IEEE 802.11 a/b/g/n, EU-Modell

**Type**
- IE-WL-AP-CL-EU
- IE-WLT-CL-AP-EU

**Order No.**
- 0 to +60 °C: 2536600000
- -40 to +75 °C: 2536650000

**Warranty Period**
- 5 years

**Accessories**

**Type**
- External Backup and Restore Module: EBR-Modul RS232
- 13" Rack Mounting Kit: RM KIT
- Wall mounting kit: IE-WALLMOUNT-KIT-46MM

**Order No.**
- 1241430000
- 1241440000
- 1504640000
ValueLine WLAN Access Point/Bridge/Client

- IEEE 802.11a/b/g/n conform Access Point/Client/Bridge
- MIMO technology for data rates up to 300Mbit/s
- Fast roaming for interruption-free connection change between access points
- DFS support in 5GHz bandwidth
- Power can be supplied via PoE in accordance with IEEE 802.3af
- Integrated DI/DOs for monitoring and alarms

Technical data

WLAN Interface

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<td>IEEE 802.3ab for 1000BaseT</td>
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<tr>
<td></td>
<td>IEEE 802.3af for Power-over-Ethernet</td>
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<tr>
<td></td>
<td>IEEE 802.10 for Spanning Tree Protocol</td>
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<td></td>
<td>IEEE 802.1w for Rapid STP</td>
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<tr>
<td></td>
<td>IEEE 802.1Q for VLAN</td>
</tr>
</tbody>
</table>

| Spreading code process and modulation (typical) | DSSS with DBPSK, DQPSK, CCK |
|                                                | OFDM with BPSK, QPSK, 16QAM, 64QAM |

| Operating Channels (control frequency) | US model: 2.412 to 2.462 GHz (11 channels) / 5.180 to 5.240 GHz (4 channels) |
|                                       | 5.260 to 5.320 GHz (4 channels)* / 5.500 to 5.700 GHz (8 channels, excluding 5.600 to 5.640 GHz) / 5.745 to 5.825 GHz (5 channels) |
|                                       | EU model: 2.412 to 2.472 GHz (13 channels) / 5.180 to 5.240 GHz (4 channels) |
|                                       | 5.260 to 5.320 GHz (4 channels)* / 5.500 to 5.700 GHz (11 channels)* |

DFS (Dynamic Frequency Selection): If the device is operated in access point mode on these channels, the device automatically switches to another channel once a radar signal is detected. After switching to another channel, a 2-second availability check is first carried out in accordance with the specification, before communication can take place on the channel.

Security

- ESSID Broadcast enable/disable
- Firewall for MAC/IP/protocol/port-based filtering
- 64-bit and 128-bit WEP encryption, WPA/WPA2 personnel and enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates

<table>
<thead>
<tr>
<th>IEEE 802.11b: 2.4 GHz</th>
<th>1, 2, 5.5, 11 Mbps</th>
</tr>
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<tr>
<td>802.11a/b/g: 5 GHz</td>
<td>6, 9, 12, 18, 24, 36, 48, 54 Mbps</td>
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Transmit power

<table>
<thead>
<tr>
<th>IEEE 802.11b: 2.4 GHz</th>
<th>Type 26±1.5 dBm at 1 Mbps, Type 26±1.5 dBm at 2 Mbps</th>
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<tr>
<td>802.11a/b/g: 5 GHz</td>
<td>Type 23±1.5 dBm at 5.5 Mbps, Type 25±1.5 dBm at 11 Mbps</td>
</tr>
</tbody>
</table>

Supported protocols

- General protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP, LLDP, VLAN, STP/RSTP
- Supported protocols: 802.11a, 802.11b, 802.11g, 802.11n

Interfaces

- Supplied antenna: 2x omni-directional dual-band antenna, 2x 2dBi antenna
- Connection for external antennas: 1x 10/100/1000BaseT(X) auto negotiation, full/half duplex mode and auto MDI/MDI-X connection
- Console port: RS 232, RS 485 connections
- Alarm contact: 1 relay output with a current capacity of 1 A at 24 V DC

Digital inputs: 2 galvanically separated inputs

- +13 to +30 V for the state “1”
- +3 to -30 V for the state “0”
- max. Current consumption: 8 mA
Technical data

**Housing**
- Metal, IP30 protection class

**Weight**
- 860 g

**Dimensions (W x H x D)**
- 52.7 x 135 x 105 mm (2.08 x 5.32 x 4.13 in)

**Installation**
- DIN-Rail, wall (with optional mounting kit)

**Environmental conditions**

**Operating temperature**
- Standard models: -25 to 60°C (-13 to 140°F)
- Models with extended temperature range: -40 to 75 °C (-40 to 167 °F)

**Storage temperature**
- -40 to 85 °C (-40 to 185 °F)

**Relative ambient air humidity**
- 5% to 95% (non-condensing)

**Power supply**

**Input voltage**
- 24 V DC (12 to 48 V DC), two redundant inputs or 48 V DC PoE (IEEE802.3af)

**Connection**
- 1 removable 10-pin terminal block, 500 V insulation

**Current consumption**
- 0.6 A at 12 VDC
- 0.15 A at 48 VDC

**Power consumption**
- 7.2 W

**Reverse polarity protection**
- Present

**Approvals**

**Security**
- E1-, 8/Ă-

**Wireless**
- EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, FCC ID: SLE-WPN008

**EMC**
- EN 61000-6-2/6-4
- CISPR 32, FCC Part 15B Class B
- IEC 61000-4-2: Ed.: Contact: 8 kV; Air: 15 kV
- IEC 61000-4-3: LD: 80 MHz to 1 GHz: 3 V/m
- IEC 61000-4-4: EFT: Power: 2 kV; Signal: 2 kV
- IEC 61000-4-5: Surge: Power: 2 kV; Signal: 1 kV
- IEC 61000-4-6: CS: 3 V/m
- IEC 61000-4-8: PMF: 1 A/m

**Explosive risk zones**
- UL / cUL Class I, Division 2; ATEX Zone 2

**MTBF (mean time between failures)**
- Time: 570,854 hrs

**Database**
- Telcordia (Bellcore), GB

**Warranty**
- Period: 5 Years

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**Ordering data**

<table>
<thead>
<tr>
<th>Version</th>
<th>Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>WLAN Access Point/Bridge/Client, IEE 802.11 a/b/g/n, EU-Modell</td>
<td>IE-WL-VAP-BR-CL-EU</td>
<td>-25 to +60 °C</td>
<td>2536680000</td>
</tr>
<tr>
<td></td>
<td>IE-WL-WLAP-BR-CL-EU</td>
<td>-40 to +75 °C</td>
<td>2536690000</td>
</tr>
<tr>
<td>WLAN Access Point/Bridge/Client, IEE 802.11 a/b/g/n, US-Modell</td>
<td>IE-WL-VAP-BR-CL-US</td>
<td>-25 to +60 °C</td>
<td>2536700000</td>
</tr>
<tr>
<td></td>
<td>IE-WL-WLAP-BR-CL-US</td>
<td>-40 to +75 °C</td>
<td>2536710000</td>
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**Accessories**

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<th>Type</th>
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<tbody>
<tr>
<td>External backup and restore module</td>
<td>EBIR-Modul RS232</td>
</tr>
<tr>
<td>19&quot; Rack Mounting Kit</td>
<td>RM KIT</td>
</tr>
<tr>
<td>Wall mounting set</td>
<td>IE-WALLMOUNT-KIT-46MM</td>
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