Industrial wireless

Overview

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Industrial wireless
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.
**Industrial Wireless - Access point/bridge/client**

- IEEE 802.11a/b/g compatible single radio module (2.4 GHz or 5 GHz band)
- Power input by redundant 24 V DC power inputs or Power-over-Ethernet
- Multi-SSID and VLAN support
- Turbo Roaming for seamless wireless connections
- Integrated DI/DD for on-site monitoring and warning
- DoS (WMM) support

### Technical data

#### Standards
- IEEE 802.11a/b/g for Wireless LAN
- IEEE 802.11 for Wireless Security
- IEEE 802.3u for 10/100BaseT(X)
- IEEE 802.3af for Power-over-Ethernet
- IEEE 802.10 for Spanning Tree Protocol
- IEEE 802.1x for Rapid STP

#### Transmitter Power
- IEEE 802.11b: Typical 23±1.5 dBm @ 1 to 11 Mbps
- IEEE 802.11a/g: Typical 15±1.5 dBm @ 54 Mbps
- IEEE 802.11a: Typical 18±1.5 dBm @ 48 Mbps

#### Transmission Rates
- 802.11b: 1, 2, 5.5, 11 Mbps
- 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

#### Security
- SSDP broadcast enable/disable
- Firewall for MAC/Network/Port-based filtering
- 802.1X/IEEE 802.11x /MAC/802.1X authentication
- WPA/WPA2 Personal and Enterprise
- WPA/WPA2-Enterprise
- 802.1X based access control
- 802.1X with EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-SIM
- 802.11i with WPA/WPA2-Enterprise
- 802.11i with WPA/WPA2-Personal and Enterprise
- TKIP and AES
- 64-bit and 128-bit WEP encryption
- Websense for MAC/IP/Protocol/Port-based filtering

### Environmental Limits

#### Dimensions (W x H x D)
- Standard Models: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
- Wide Temp. Models: 53.6 x 151.85 x 105 mm (2.11 x 6.00 x 4.13 in)

#### Weight
- 850 g

#### Operating Channels (central frequency)
- IEEE 802.11b: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
- IEEE 802.11a: 9, 10, 11, 12, 13, 14, 15
- IEEE 802.11g: 1 to 13 channels
- IEEE 802.11n: 1 to 144 channels

#### RX Sensitivity
- IEEE 802.11b: -97 dBm @ 2.472 GHz (11 channels)
- IEEE 802.11a: -97 dBm @ 5.18 GHz (4 channels)
- IEEE 802.11g: -97 dBm @ 2.472 GHz (13 channels)

#### RX Gain
- IEEE 802.11b: 5.18 to 5.24 GHz (4 channels)
- IEEE 802.11a: 5.18 to 5.24 GHz (4 channels)
- IEEE 802.11g: 5.18 to 5.24 GHz (4 channels)

#### Power Requirements
- Input Voltage: 12 to 48 V DC, redundant dual DC power inputs or 48 V DC
- Power-over-Ethernet (IEEE 802.3af compliant)
- Connection: 10-pin removable terminal block
- Power Consumption:
  - 0.121 to 0.494 A @ 12 to 48 V DC
  - 0.3 A @ 24 V DC

#### Reverse Polarity Protection
- Present

#### Warranty
- Warranty Period: 5 years

#### Ordering data

#### Interfaces
- Connector for External Antennas: RP-SMA (female)
- LAN Port: 10/100BaseFX (auto negotiation speed)
- Console Port: RS 232 (RS485-type)
- ID/POST: PWR1, PWR2, PoE, FAULT, STATE, signal strength
- LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, signal strength
- LED Indicators: CLIENT MODE, BRIDGE MODE, WLAN, 10M, 100M

### Interfaces

#### Default Antennas
- 2 dBi dual-band omni-directional antenna, RP-SMA (male)

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