Getting un-Wired with IEEE 802.11

◣ Overview

Are you ready for the convenience that comes from sending your Ethernet packets over the air instead of through a wire? Wireless is not for everyone, but if your application uses mobile equipment that is controlled over a TCP/IP network, or the cost of installing wire conduits at your work site is prohibitive, then consider setting up a wireless local area network (WLAN). The

IEEE 802.11 standard established a way to use radio frequency (RF) technology to send Ethernet packets over the air. Applications that include TCP/IP will run on 802.11-compliant WLANs the same as they do over Ethernet. By common agreement between regulatory agencies around the world (FCC, ETSI, etc.), a WLAN transmits over unlicensed spectrums, with only minor variations from country to country.

◣ 802.11 Specifications

	802.11b	802.11g	802.11a
Approval Date	Sept. 1999	June 2003	Sept. 1999
Compatibility	IEEE 802.11b compliant	IEEE 802.11b and 802.11g compliant	IEEE 802.11a compliant
Number of Channels	3 non-overlapping	3 non-overlapping	8 non-overlapping (4 in some countries)
Data Rates	11, 5.5, 2, and 1 Mbps	54, 48, 36, 24, 18, 12, 9, and 6 Mbps	54, 48, 36, 24, 18, 12, 8, and 6 Mbps
Wireless Medium	Direct Sequence Spread Spectrum (DSSS), 2.4 GHz	Orthogonal Frequency Division Multiplexing (OFDM), 2.4 GHz	Orthogonal Frequency Division Multiplexing (OFDM), 5 GHz

◣ Typical Wireless Network Configurations

A wireless LAN is configured for either Ad-hoc mode or Infrastructure mode. In Ad-hoc mode, stations use peer-to-peer transmission to send information from station to station, without requiring an AP (Access Point) to connect to a wired network. This is the easiest and least expensive way to set up

a wireless network. Alternatively, Infrastructure mode requires using an AP. The AP can be used by itself to set up a WLAN, or can be used to connect the WLAN to a wired network. In either case, all wireless communication goes through the AP.

Infrastructure Mode

Ad-hoc Mode

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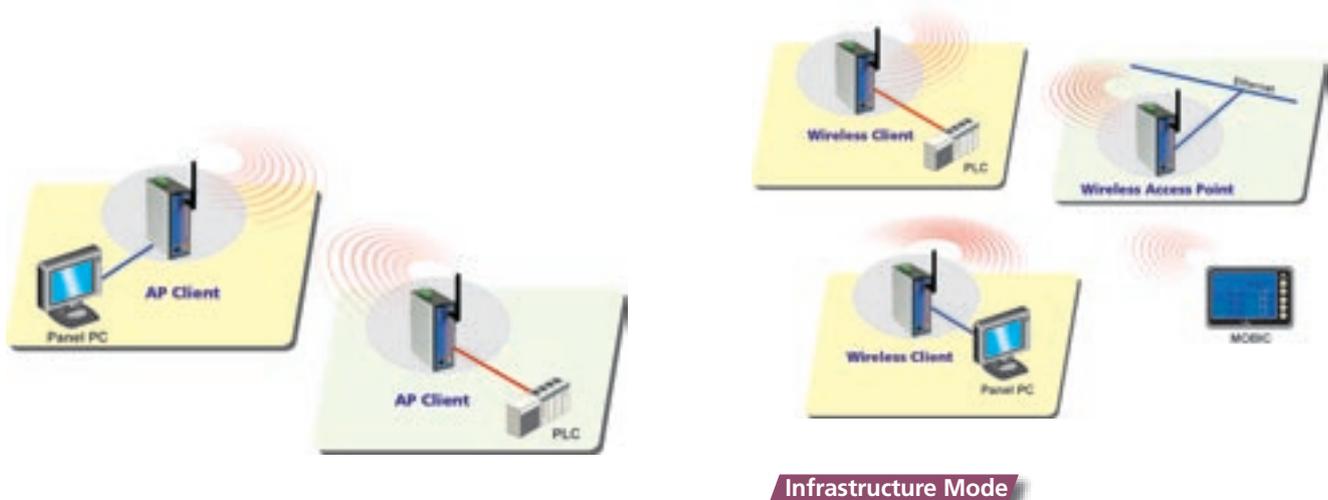
Benefits of using Wireless Technology

What makes wireless networking a natural choice for many networking requirements?

Flexibility: Wireless networks work anywhere, anytime.

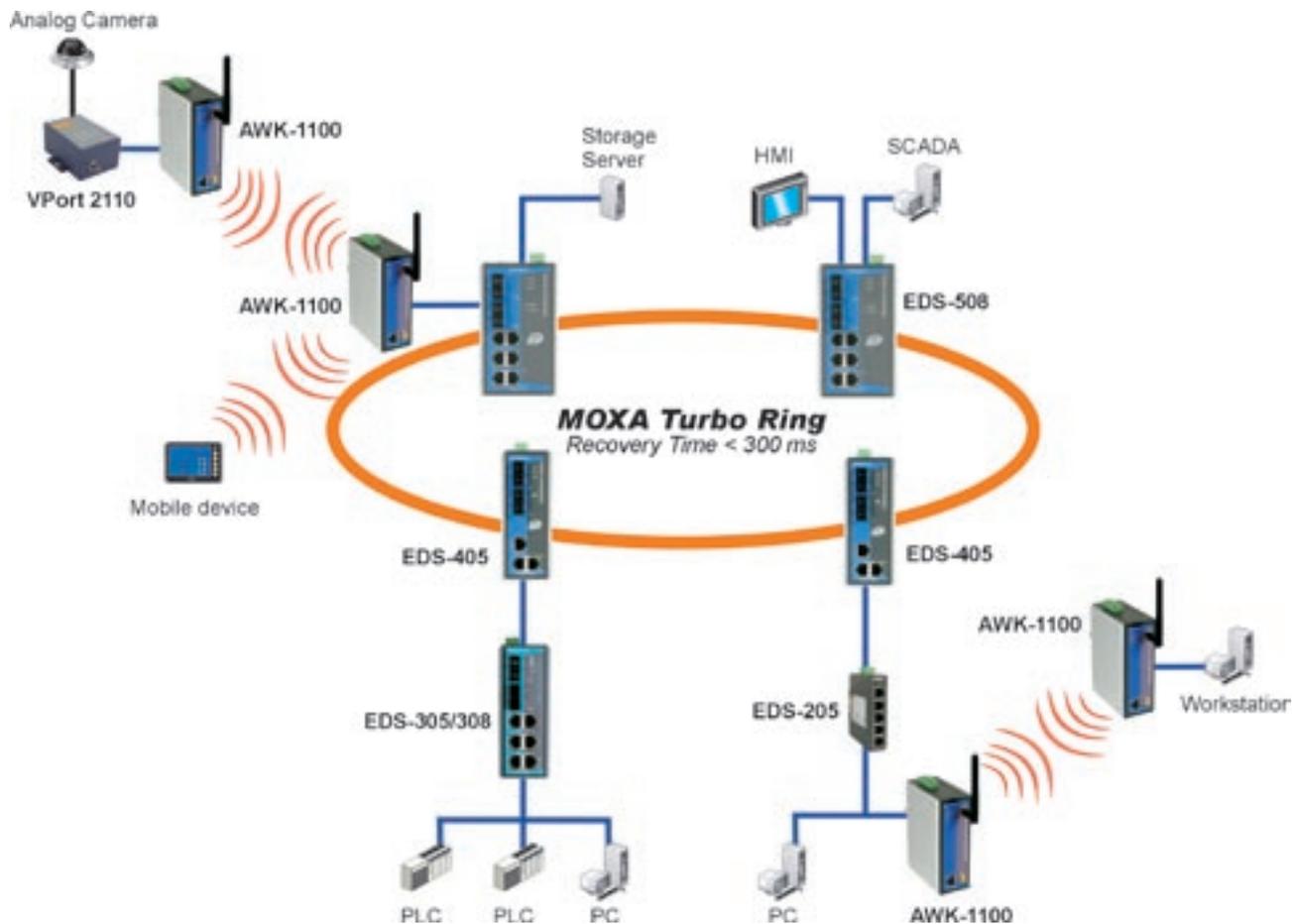**Easy Deployment:** Wireless networks are ideal for those hard to wire areas.

High Performance: Wireless networks have the bandwidth and safeguards needed to keep essential applications running continuously.

Cost Effective: Wireless networks can be installed quickly, and help reduce the cost of cabling and maintenance.

MOXA's Wireless Solution for Industrial Markets

One of the biggest concerns raised by potential users of WLAN technology is safety. Since data is transmitted by radio waves, how can users guarantee the confidentiality of their information? To provide secure transmission over wireless networks, MOXA provides Wi-Fi Protected Access (WPA) security specifications to overcome weaknesses in Wired Equivalent Privacy (WEP). In addition, MOXA's wireless products incorporate several important features to meet the stringent demands of industrial applications, including redundant power inputs, operating temperature range from 0 to 60°C, and DIN-Rail mounting capability. The enhanced reliability of these products make them a great choice for your wireless industrial applications.

MOXA Wireless Solution

Solution Tutorial