

## DG-WM500-IT3

# AC1200 Outdoor Wave2 Dualband Wireless Enterprise AP with SFP Fiber Port



### Product Overview

The DG-WM500-IT3 is a series of new-generation 802.11ac-based high-performance gigabit outdoor wireless access points (APs) launched by DIGISOL Systems Limited (hereinafter referred to as DIGISOL) for industrial users. The DG-WM500-IT3 uses GE ports as its uplink ports for access, which break through the limitations of FE ports and enable wireless multimedia applications to come true.

While completely taking into consideration important factors, such as wireless network security, radio frequency (RF) control, mobile access, quality of service (QoS) guarantee, and seamless roaming, the DG-WM500-IT3 may be used with DIGISOL wireless ACs to perform data forwarding, security, and access control of wireless users.

The DG-WM500-IT3 operates in a 2.4 GHz or 5 GHz band and employs technologies such as multiple-input multiple-output (MIMO) and orthogonal frequency division multiplexing (OFDM), providing a data transmission rate of at most 400 Mbps in 2.4GHz band and 867Mbps in 5GHz band.

The DG-WM500-IT3 employs industrial standard components. Its shell of the IP67 class is solid, waterproof, and dustproof, enabling the device to suit an adverse indoor environment. Along with a high-gain outdoor antenna of DIGISOL, the DG-WM500-IT3 provides customers with a choice for constructing a high-performance and high-coverage wireless network. The DG-WM500-IT3 is a series of

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high-rate wireless APs preferred in various outdoor application environments for purposes such as campus WLAN access, campus coverage, and operators' hot spot coverage.

## Highlights

### High-Performance and High-Reliability Wireless Network

- **High-speed wireless broadband access**

The DG-WM500-IT3 supports the 802.11abgn/ac standard and may operate in a 2.4 GHz or 5 GHz band. It provides an access bandwidth up to 1.267Gbps.

- **GE ports for wired connections**

GE ports are used as uplink ports for access, which break through the limitations of conventional FE ports, so that wired ports are no longer a bottleneck of wireless access rates, offering a platform for smooth upgrade to support higher rates and more RF portfolios in the future.

- **High-performance RF characteristics**

Professional optimized design is employed for the RF module of the DG-WM500-IT3, so that a single antenna port supports 27 dB transit power at all rate levels, thereby improving wireless coverage in high-rate access scenarios.

- **Automatic emergency mechanism of APs**

In a centralized network architecture where fit APs and a wireless AC are deployed, the APs will be unable to operate normally when the wireless AC is down and then the entire wireless network will crash. DIGISOL wireless APs support an automatic emergency mechanism. This mechanism enables an AP to intelligently detect links. When detecting that the wireless AC is down, the AP quickly switches its operating mode so that it may continue to forward data while enabling new users to access the network. This mechanism attains high availability in the entire wireless network and really helps wireless users to be always online.

- **Broad operating temperature range**

Thanks to deliberate hardware design and the selection of dedicated components operating in a broad temperature range, DIGISOL smart APs may operate in an environment with its temperature ranging from -40°C to 65°C.

### Wireless Network of Intelligent Control and Automatic Perception

- **Only 11n access control mechanism**

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Since 802.11n is downward compatible with the 802.11a/b/g protocol, generally 802.11a/b/g users can also access an 802.11n wireless access device. When this compatibility is provided, however, users with 802.11n access capability will experience performance degradation to a certain extent. On DIGISOL smart APs, a certain RF channel may be set to only 11n access mode so that 802.11n users have guaranteed bandwidths. For some 802.11n wireless access devices capable of simultaneously providing dual frequencies for user access, it is recommended that the 5 GHz RF channel be set to only 11n access mode to guarantee a high-speed bandwidth and access performance of 802.11n access users; while the 2.4 GHz RF channel be set to compatible access mode to guarantee normal access of original 802.11b/g users.

- **Intelligent RF management**

DIGISOL smart APs may be used with a wireless AC to perform automatic power and channel adjustment. They employ particular RF detection and management algorithms to attain a better RF coverage effect. When the signals of an AP are interfered by strong external signals, the AP may automatically switch to an appropriate operating channel under the control of the AC to avoid such interference, thereby guaranteeing wireless network communications. The system also supports wireless network blackhole compensation. When an AP on the network accidentally stops operating, the RF management function of the AC compensates the resulting blind area of signals so that the wireless network can still operate normally.

- **Intelligent control of terminals based on airtime fair**

When some outdated 802.11b and 802.11g terminals are used on a wireless network or some terminals are far way from APs, negotiation rates will be low, causing a large number of users to experience a long WLAN access delay, low rates, or poor overall AP performance. The AP performance problem in a low-rate terminal access environment, however, cannot be resolved by simply employing rate control and traffic shaping. DIGISOL smart APs have essentially resolved this problem by using intelligent control of terminals based on airtime fairness, ensuring that a user can always enjoy the same joyful WLAN experience in the same location, no matter what type of the terminal the user is holding.

The intelligent control of terminals based on airtime fairness greatly improves the performance of both the client and the entire network. It enables all clients with high data transmission rates to attain strikingly higher performance while low-rate clients are almost not affected at all. The performance will be even more obviously higher on an open wireless network. Once high-rate clients finish data transmission, fewer clients will be transmitting data on the wireless network. In this case, there will be less contention and retry on the network, thereby greatly improving overall AP performance.

- **Intelligent load balancing mechanism**

In general, a wireless client will select an AP according to the signal strength of APs. When this uncontrolled access mode is applied, however, a large number of clients could be connected to the same AP simply because the AP provides strong signals. As more clients are connected to an AP, the bandwidth available to each client will be smaller, thereby greatly affecting user experience of the clients. DIGISOL wireless products support diversified intelligent load balancing means:

- AP load balancing based on traffic

- AP load balancing based on the number of users
- AP load balancing based on frequency bands
- Access control based on signal strength of terminals
- Mandatory roaming control of terminals to direct terminals to APs with stronger signals

- **Intelligent identification of terminals**

DIGISOL smart APs may be used with DIGISOL wireless ACs and a unified authentication platform to intelligently identify the size, system type, and type of each terminal; and comprehensively support mainstream smart terminal operating systems, such as Apple iOS, Android, and Windows. They intelligently identify the size of a terminal and adaptively present a portal authentication page of the corresponding size and page pattern, freeing users from multiple times of dragging to adjust the screen and enabling users to enjoy more intelligent wireless experience. They can also intelligently identify the system type of each terminal and present the system type of each terminal such as Windows, MAC OS, or Android on the unified authentication platform, exhibiting every detail of intelligence to users. In addition, they can intelligently identify the type of each terminal such as the mobile phone, tablet, or PC, and implement dynamic policy control of terminals according to different types of the terminals, making possible more intelligent user control at a finer granularity.

- **Comprehensive support for IPv4/v6 dual-stack networks**

Powered by DIGISOL cutting-edge IPv6 technology, DIGISOL smart APs may be deployed on an IPv6 network, with IPv6 tunnels established through auto negotiation between a wireless AC and an AP. When the wireless AC and the AP completely operate in IPv6 mode, the wireless AC can still correctly identify IPv4 terminals and process IPv4 packets from wireless clients. Featuring flexible adaptability to IPv4/6, DIGISOL smart APs cater to complex applications involved in migration from an IPv4 network to an IPv6 network. They not only provide IPv4 service to customers on an IPv6 network, but also enable users on an IPv4 network to log in to the network through the IPv6 protocol at ease.

- **Network-wide seamless roaming**

DIGISOL wireless ACs support an advanced wireless AC cluster technology to support network-wide seamless roaming, the continuity of real-time mobile services is well guaranteed.

## **Secure and Controllable Wireless Network**

- **User isolation policy**

DIGISOL wireless APs support the isolation of wireless users from one another. If this user isolation function is enabled, two wireless clients cannot directly communicate with each other but can only access an upstream wired network. This further guarantees the security of wireless network applications.

- **Wireless intrusion detection and intrusion defense**

DIGISOL wireless APs support wireless intrusion detection and intrusion defense features, such as detection of unauthorized wireless devices, intrusion detection, blacklist, and white list, thereby greatly improving security management of an entire wireless network.

- **Wireless user management at a fine granularity**

Each AP supports a maximum of 32 WLANs to implement multi-layer multi-service management of wireless users at a fine granularity. Each WLAN supports access control and uplink/downlink rate limit based on MAC or IP addresses. These WLANs may be bound to virtual local area networks (VLANs). In addition, different authentication and accounting policies can be implemented. This feature is practically significant in a multi-WLAN environment.

- **Secure user admission**

DIGISOL smart APs may be used with wireless ACs to provide multiple secure access, authentication, and accounting mechanisms for various application environments. These mechanisms include:

- 802.1x authentication
- Captive portal authentication, including built-in portal, external portal, and custom portal authentication modes
- MAC address authentication
- LDAP authentication
- WAPI encryption and authentication
- Wired/wireless integrated authentication and accounting

- **Wireless SAVI**

DIGISOL wireless network products support a source address validation (SAVI) technology to deal with spoofed packet attacks that keep emerging on today's campus networks. As users' IP addresses are obtained through an address allocation protocol, users access the Internet using correct addresses in subsequent applications and cannot spoof others' IP addresses, thereby guaranteeing the reliability of source addresses. In addition, the SAVI technology is combined with a portal technology to further guarantee the authenticity and security of packets of all users accessing the Internet.

- **PEAP user authentication**

With the popularization and application of smart terminals, wireless terminal users require authentication mechanisms of higher usability and convenience. Using a mechanism that combines portal authentication and MAC address authentication, DIGISOL wireless network products support Protected Extensible Authentication Protocol (PEAP) authentication to attain better user experience. Initially a user needs to manually perform portal authentication and later the user gets authenticated through PEAP in automatic mode. DIGISOL wireless network products feature high terminal adaptation and provide good authentication compatibility. They adapt to the majority of WLAN terminals and do not need to adapt to clients. DIGISOL wireless network

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products are compatible with existing portal authentication modes.

- **Secure access mechanism**

An AP is usually deployed in a public area and therefore requires a strict security mechanism to guarantee the legality of access devices. The following secure access mechanisms may be applied between a DIGISOL smart AP and a wireless AC:

- AP MAC address authentication
- AP password authentication
- Bidirectional digital certificate authentication

## **Easy-to-Manage Wireless Network**

- **Plug-and-play**

DIGISOL smart APs are able to automatically discover DIGISOL wireless ACs. A wireless network function can be enabled on an AP without performing any configuration on the AP at all. The AP can be seamlessly integrated with existing switches, firewalls, authentication servers, and other network devices without changing existing network architecture.

When used with a DIGISOL wireless AC, DIGISOL smart APs support plug-and-play and zero configuration. The wireless AC undertakes all the management, control, and configuration of the APs. Network administrators do not need to separately manage or maintain a huge number of wireless APs. All actions, such as configuration, firmware upgrade, and security policy updating, are performed uniformly under the control of the wireless AC.

- **Fit and Fat modes**

DIGISOL smart APs may work in fit or fat mode and can flexibly switch between the fit mode and the fat mode according to network planning requirements. Users may also flexibly choose an ex-factory device version according to specific application requirements. APs working in fit mode are managed by a wireless AC in a centralized manner. System administrators may easily manage the entire network as the states of all the APs are clear at a glance.

- **Remote probe analysis**

DIGISOL smart APs support a remote probe analysis function, which listens to and captures Wi-Fi packets in the coverage and mirrors them to a local analysis device in real time to help network administrators better perform troubleshooting or optimization analysis. The remote probe analysis function can perform non-convergence mirroring of a working channel and sampling of all channels in polling mode as well to flexibly meet various wireless network monitoring, operation, and maintenance requirements.

## Product Specifications

### Hardware Specifications

Item	DG-WM500-IT3
Dimensions (mm)	214mm×214mm×67.5mm
Working Frequency	2.4G : 802.11b/g/n 5G : 802.11a/n/ac wave2 2.4G : Bluetooth
Maximum Data Rate	2.4G : 400Mbps 5G : 867Mbps
Physical Port	1 * 10/100/1000Base-T PoE port for uplink 1 * 10/100/1000Base-T port for downlink, could connect external IoT module 1 * 1000M SFP fiber port  One Bluetooth interface, could connect Bluetooth device which could be used for IoT
PoE	802.3at
Maximum power consumption	< 20W
Antenna	Internal antenna, 2.4G 10dBi, 5G 10dBi, H110
Working frequency band	802.11a/n : 5.150 GHz to 5.850 GHz 802.11b/g/n : 2.4 GHz to 2.483 GHz 802.11ac: 5.150GHz to 5.250GHz 5.250GHz to 5.350GHz 5.725GHz to 5.850GHz
Modulation technology	OFDM : BPSK@6/9Mbps, QPSK@12/18Mbps, 16-QAM@24Mbps, 64-QAM@48/54Mbps DSSS : DBPSK@1Mbps, DQPSK@2Mbps, CCK@5.5/11Mbps MIMO-OFDM ( 11n ) : MCS 0-15 MIMO-OFDM ( 11ac ) : MCS 0-9 802.11b : BPSK , QPSK , CCK 802.11a/g/n: BPSK , QPSK , 16-QAM , 64-QAM 802.11ac : BPSK , QPSK , 16-QAM , 64-QAM , 256-QAM
Transmit power	Maximum 27 dBm for all rate levels and modulation modes
Power adjustment granularity	1 dBm
Working/Storage	-40°C to +65°C

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<b>temperature</b>	-45°C to +80°C
<b>Working/Storage RH</b>	5% to 95% (non-condensing)
<b>Protection level</b>	IP67

### Software Specifications

Item	Feature	DG-WM500-IT3
WLAN	<b>Product positioning</b>	Outdoor dual-frequency
	<b>Working frequency band</b>	2.4 GHz and 5 GHz
	<b>Maximum Concurrent Clients</b>	256
	<b>Virtual AP (BSSID)</b>	32
	<b>Number of spatial streams</b>	2
	<b>Dynamic channel adjustment (DCA)</b>	Yes
	<b>Transmit power control (TPC)</b>	Yes
	<b>Blind area detection and repair</b>	Yes
	<b>SSID hiding</b>	Yes
	<b>RTS/CTS</b>	Yes
	<b>RF environment scanning</b>	Yes
	<b>Hybrid access</b>	Yes
	<b>Restriction on the number of access users</b>	Yes
	<b>Link integrity check</b>	Yes
	<b>Intelligent control of terminals based on airtime fairness</b>	Yes
<b>High-density application optimization</b>	Yes	
11n enhancements	<b>40 MHz bundling</b>	Yes
	<b>400Mbps (PHY)</b>	Yes
	<b>Frame aggregation (A-MPDU)</b>	Yes



Item	Feature	DG-WM500-IT3
	<b>Maximum likelihood demodulation (MLD)</b>	Yes
	<b>Transmit beam forming (TxBF)</b>	Yes
	<b>Maximum ratio combining (MRC)</b>	Yes
	<b>Space-time block coding (STBC)</b>	Yes
	<b>Low-density parity-check code (LDPC)</b>	Yes
<b>Security</b>	<b>Encryption</b>	64/128 WEP, dynamic WEP, TKIP, and CCMP encryption
	<b>802.11i</b>	Yes
	<b>WAPI</b>	Yes
	<b>MAC address authentication</b>	Yes
	<b>LDAP authentication</b>	Yes
	<b>PEAP authentication</b>	Yes
	<b>WIDS/WIPS</b>	Yes
	<b>Protection against DoS attacks</b>	Anti-DoS for wireless management packets
	<b>Forwarding security</b>	Frame filtering, white list, static blacklist, and dynamic blacklist
	<b>User isolation</b>	AP L2 forwarding suppression Isolation between virtual APs (multiple SSIDs)
	<b>Periodic SSID enabling and disabling</b>	Yes
	<b>Access control of free resources</b>	Yes
	<b>Secure admission control of wireless terminals</b>	Secure admission control of wireless terminals based on DCSM
	<b>Wireless SAVI</b>	Yes
	<b>ACL</b>	Access control of various data packets such as MAC, IPv4, and IPv6 packets
<b>Secure access control of APs</b>	Secure access control of APs, such as MAC authentication, password authentication, or digital certificate authentication between an AP and an AC	
<b>Forwarding</b>	<b>IP address setting</b>	Static IP address configuration or dynamic DHCP address

Item	Feature	DG-WM500-IT3
		allocation
	IPv6 forwarding	Yes
	IPv6 portal	Yes
	Local forwarding	Yes
	Multicast	IGMP Snooping
	Roaming	Yes
	AP switching reference	Signal strength, bit error rate, RSSI, S/N, whether neighboring APs are normally operating, etc.
	WDS	Yes
QoS	WMM	Yes
	Priority mapping	Ethernet port 802.1P identification and marking Mapping from wireless priorities to wired priorities
	QoS policy mapping	Mapping of different SSIDs/VLANs to different QoS policies Mapping of data streams that match with different packet fields to different QoS policies
	L2-L4 packet filtering and flow classification	Yes: MAC, IPv4, and IPv6 packets
	Load balancing	Load balancing based on the number of users Load balancing based on user traffic Load balancing based on frequency bands
	Bandwidth limit	Bandwidth limit based on APs Bandwidth limit based on SSIDs Bandwidth limit based on terminals Bandwidth limit based on specific data streams
	Call admission control (CAC)	CAC based on the number of users
	Power saving mode	Yes
	Automatic emergency mechanism of APs	Yes
	Intelligent identification of terminals	Yes
	Multicast enhancement	Multicast to unicast
Management	Network management	Centralized management through an AC; both fit and fat modes
	Maintenance mode	Both local and remote maintenance
	Log function	Local logs, Syslog, and log file export

Item	Feature	DG-WM500-IT3
	Alarm	Yes
	Fault detection	Yes
	Statistics	Yes
	Switching between the fat and fit modes	An AP working in fit mode can switch to the fat mode through a wireless AC; An AP working in fat mode can switch to the fit mode through a local control port or Telnet.
	Remote probe analysis	Yes
	Watchdog	Yes

### Product Purchase Information

Product Model	Description	Remarks
DG-WM500-IT3	802.11a/b/g/n/ac wave2 outdoor high performance AP (2.4GHz & 5GHz dual band, 1.267Gbps, internal 10dBi directional antenna, 2 * 10/100/1000Base-T GE ports and 1 * SFP fiber port, 802.3at PoE)	Mandatory