

Access Point



the charm of a smart solution

Access Point

The RAP

Reliable, robust and safe wireless LAN. Based on the latest technologies, the industrial Rugged Access Point (RAP) is the network interface for all data communication applications. The RAP supports all wireless standards such as 802.11a/b/g at transmission frequencies of 2.4 and 5 GHz. It provides a wide array of connection options with the built-in 4-port switch as well as its fiber-optic and RJ45 Ethernet jacks. Diversity antennas ensure a stable wireless connection in critical environments. The range of the RAP is between 1 m and 30 km, depending on the antennas used.



Transparent Wireless Bridge

The RAP and RAC can be used to implement fully transparent wireless bridges through their support of four addresses in the 802.11 protocol.



Filtering & Firewall

limits data traffic on the WLAN interface to the minimum that is necessary, thus optimizing data throughput while enhancing security.



802.11i (WPA/WPA2 TKIP/AES)

The RAP provides the safest cryptographic standard to prevent unauthorized external access to confidential data.



802.1x

ensures that only registered users have access to the wireless network. The EAP/TLS and EAP/TTLS (PEAP) standards with MD5 or MSCHAPv2 are supported in conjunction with a Radius server.

Setup and Installation

The mounting adapter allows for simple and secure mounting. A guide slot is used to attach the RAP to the adapter, after which it is permanently fastened. Although the Access Point has protection class IP65, it can be connected using standard cables. A screw-on lid covers the interfaces. A choice of 24 V DC or 110/230 V AC power supplies is available. Alternately and as a backup, the RAP can be connected via PoE ("Power over Ethernet"), thus reducing the installation effort and expense. The user can choose suitable antennas depending on the infrastructure used and the transmission distance to be covered. This is possible due to external antenna connectors.



Roaming

uses IAPP to enable connection transfer between access points in large wireless areas. Also possible when using 802.1x, due to RSN pre-authentication support.



Reduced Potential for Eavesdropping

through adaptation of transmission power using 802.11h Transmission Power Control.



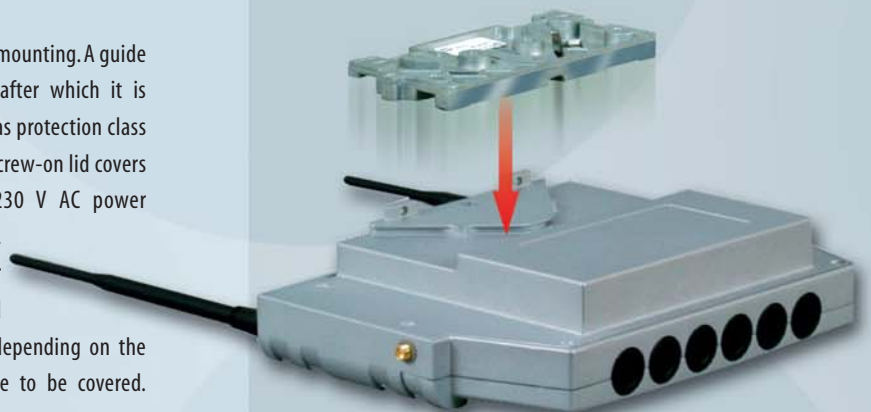
Dual WLAN

permits the implementation of high-performance WDS systems.



IP Routing

optimizes data traffic while allowing for simultaneous use of several subnets.



High Security

All data transmitted over the WLAN is reliably encrypted and secured with the WPA2/AES encryption algorithms defined in the 802.11i standard. The reliability of the AES crypto standard eliminates any chance for the type of eavesdropping that used to be possible with WEP. To authenticate individual users or WLAN clients separately, it is possible to identify each one with a personal password or X.509 certificate. 802.1x certificates are in particular also supported in client mode. MAC filters, hidden SSID and WEP128 are also available.



I/O communication

The transparent wireless bridge function allows an unlimited number of Ethernet nodes to connect to the WLAN via one access client without the need to specify or mask MAC addresses. Data can be filtered at the protocol level, in particular when machine and operating data is recorded and during system-to-system communication.

Vehicle Terminals

In combination with our VMT vehicle terminal, the RAP is the optimal tool for ensuring a secure wireless transmission path. In addition to this, the terminal supports practical functions such as automatic power-on upon connection to the network as well as update and maintenance functions based on the LANCHECK software tool.

mobile computing

In the field of mobile computing, mobile operating architectures can be implemented in machines and production line systems in addition to diagnostic and service applications. ads-tec provides the software tool NetC@P for remote operation of PC systems via WLAN for this purpose. An intelligent wireless connection allows for operation of the various remote devices without delay.

Access Point		Access Client	
RAP 1110	1 x Ethernet port RJ45, 1 x WLAN module, 16-30 V + PoE	RAC 1110	1 x Ethernet port RJ45, 1 x WLAN module, 16-30 V + PoE
RAP 1111	1 x Ethernet port RJ45, 1 x WLAN module, 110/230 V AC	RAC 1111	1 x Ethernet port RJ45, 1 x WLAN module, 110/230 V AC
RAP 1210	1 x fiber optic, 1 x WLAN module, 16-30 V	RAC 1510	5 x Ethernet ports RJ45, 1 x WLAN module, 16-30 V + PoE
RAP 1211	1 x fiber optic, 1 x WLAN module, 110/230 V AC	RAC 1511	5 x Ethernet ports RJ45, 1 x WLAN module, 110/230 V AC
RAP 1120	1 x Ethernet port RJ45, 2 x WLAN modules, 16-30 V + PoE		
RAP 1121	1 x Ethernetport RJ45, 2 x WLAN-Module, 110/230 V AC		
RAP 1220	1 x fiber optic, 2 x WLAN modules, 16-30 V		
RAP 1221	1 x fiber optic, 2 x WLAN modules, 110/230 V AC		

Access Point

RAP – Rugged Access Point

Robust technology is a matter of course in the industrial environment. Whether you wish to deploy the equipment in a cold storage warehouse or extreme heat, the expanded temperature range makes it possible. MIL certification means the RAP is also certified by one of the strictest vibration and shock tests, guaranteeing absolute robustness.



Expanded Temperature Range

permits applications in a range of -20 ... +55°C (-4 ... +131°F).



4-Port Switch

simplifies the connection of downstream networks and network nodes.



IP65

enables application even in the most adverse ambient conditions – outdoor and indoor.



Redundant Power Supply

allows for DC and PoE simultaneously.



Diversity Antennas (2 per Wireless Module)

provide a stable wireless connection.



Client Monitoring

cyclically monitors the WLAN connection via ICMP and provides fault notification.



Variable Power Supply

through either 24V DC voltage, 110/230V AC voltage or Ethernet cable (PoE).



Direct Fiber-Optic Connection

The fiber-optic option provides an Ethernet connection that is immune to electrical interference.

Security and Availability

In addition to the usual security standards, ads-tec has integrated intelligent filters in the RAP which ensure that only the intended data types are transferred via the network. Data can be filtered according to user-defined criteria such as IP address, MAC address or TCP/UDP ports used by their network protocol. The filters restrict access to the device and allow for controlling the data traffic in the network. This ensures that only information relevant to the actual application is transferred via the wireless network. Targeted data control optimizes usage of the transfer bandwidth and individual adaptation to application-specific conditions.



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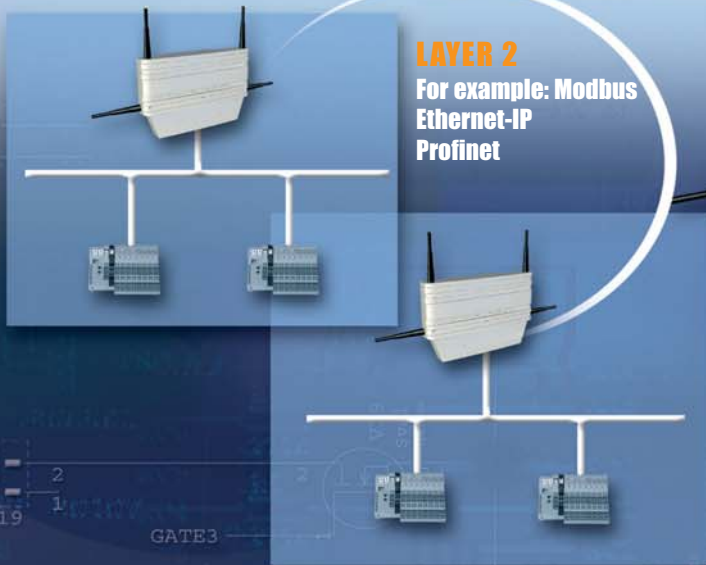
Access Point Communication Center

Dual access points allow the establishment of separate wireless transmission paths. The integrated data filter regulates the exchange of data between the secure Ethernet and the wireless interface. The layer 2 filters are so-called transparent filters and are not visible to connected nodes at the Ethernet level. Ethernet protocols such as Ethernet IP are transmitted here. The access point can simultaneously function as an IP router to transmit IP packets. The data traffic is specifically filtered here to provide greater protection against attacks. For networks with a lot of broadcast traffic, the bandwidth can be controlled via a multicast filter.



LAYER 2
For example: Modbus
Ethernet-IP
Profinet

LAYER 3
For example: Terminal application
client/server communication



Networks

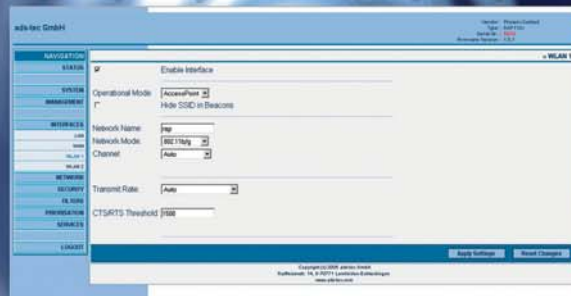
A fiber-optic interface is integrated for applications that require the bridging of large distances to connect the RAP. Even for installations in EMC/ESD critical environments, the fiber-optic technology ensures interference-free data communication between the access point and the wire-based network. The access point is equipped with a choice of one or two wireless modules. The use of two wireless modules allows the dual RAP to set up a redundant wireless transmission path.

When RAP and RAC are used together, it is possible in bridging mode to connect any number of user devices via Ethernet cable to one RAC access client. This proves advantageous primarily for devices without own IP address, as it is in common in industrial networks. The data traffic can be exchanged in full transparency between active users or with the application server. The networks established in this manner can be optimally structured by prioritizing individual users and limiting bandwidth to transport data according to previously defined priorities.

Configuration & Diagnosis

Configuration and Diagnosis

Operation of the web interface is distinguished by the simplicity and clarity of its configuration. The multilingual web interface can be accessed by entering its web address in the browser. Security is guaranteed here as well through HTTPS and a login and password prompt.



Quick Setup

A wizard carries out the key settings in just a few steps, thereby ensuring quick and easy startup.



Real-time Monitoring

provides real-time status information for all devices currently running. Attributes such as firmware, MAC address, IP address, etc., can be listed and sorted.



Grouping

simplifies parameterization. Groups can be formed freely and broken down to their individual elements.



Fixed Channel Specification

When more than one access point is connected, the channels can be specified.



TPC Profiles

allow configuration of the dynamics connection alignment and the target corridor of the reception quality.



Synchronized Channel Move

for radar events. If a radar event is detected during operation, the 802.11h standard can be used for synchronized switching of all clients that are logged in.

Centralized Management

A central management tool for Windows is available as an option for centralized management of multiple access points and access clients. The multilingual user interface is easy to use. You can use drag-and-drop to organize devices and groups into a logical and hierarchical structure. Firmware versions and updates can also be centrally managed here. Even previously unconfigured devices register with the management application when first switched on and are then automatically provided with the proper firmware. In addition to a simple startup, the tool also facilitates monitoring and logging. All log files can be recorded, filtered and sorted centrally.



5 GHz/802.11a/802.11h

The support of the 5 GHz frequency range provides 19 new WLAN channels that, unlike in the 2.4 GHz range, do not overlap. The permitted antenna broadcast power on this band is 10 times higher than for 2.4 GHz. This makes the technology especially well suited for long-distance wireless transmission for areas where data traffic is hindered by an existing high density of 2.4 GHz WLAN systems. Potential interference from Bluetooth, ZigBee and the like are eliminated in this frequency range.

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NAVIGATION



Enable Interface

Operational Mode:

AccessPoint



Hide SSID in Beacons

Network Name:

rep

Network Mode:

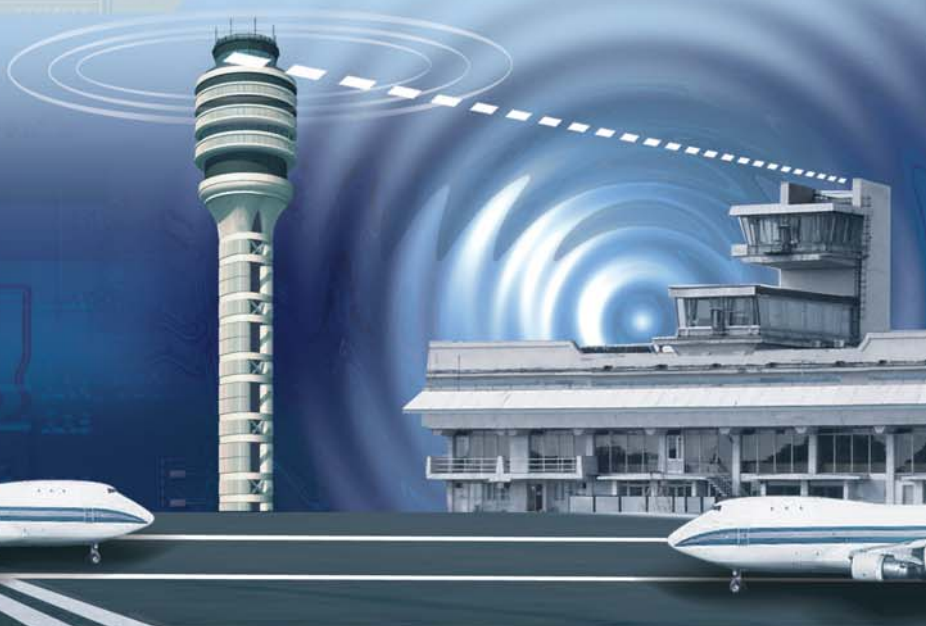
802.11b/g

Channel:

Auto

Transmit Rate

CTS/RTS



Transmission Power Control-TPC

TPC enables the devices to notify each other of their reception and transmission characteristics. This makes it possible to automatically determine the optimal transmission power. Through this process, the maximum transmission power is 3dB below the maximum value on average, thereby always remaining in compliance with standards.

A power constraint value also makes it possible to define a maximum power for the wireless cell of the Access Point. This maximum is automatically applied to all WLAN clients that are logged in. WLAN microcells are now very easy to implement.

Dynamic Frequency Selection-DFS

This technology forces an Access Point to automatically select the transmission channel. This occurs to ensure that reserved channels are not used and that there is no interference with the actual primary users of the 5 GHz channel-aircraft and weather radar systems. Access Points supported by DFS are thus able to rapidly detect aircraft radar, for example, and switch to a free channel. WLAN clients report such events to their Access Point using 802.11h so that the Access Point can react immediately.

Access Point

Features

Wireless module	One or two WLAN modules, cutoff of WLAN interfaces configurable
Wireless standards	IEEE 802.11a/b/g
Frequency range	2.412 to 2.483 GHz (IEEE 802.11b/g) in the ISM band; 5.15 to 5.34 GHz and 5.47 to 5.725 GHz (IEEE 802.11a)
Wireless channels	13 with 802.11b/g; 19 (indoor), 11 (outdoor) with 802.11a
Transfer bandwidth	based on 802.11b (11 Mbit/s), 802.11a/g (54 Mbit/s), Automatic Rate Selection (ARS) or fixed rates, auto-fallback
Transmitting power	max. 17 dBm at R-SMA connector, transmitting power reducible, Transmission Power Control (TPC): 5 GHz and 2.4 GHz, 802.11h power constraints
Input sensitivity	at R-SMA connector: 802.11b: 94 dBm @ 1 Mbps; 89 dBm @ 11 Mbps 802.11g: 89 dBm @ 6 Mbps; 73 dBm @ 54 Mbps, 802.11a: 87 dBm @ 6 Mbps; 70 dBm @ 54 Mbps
Permissible antenna broadcast power	20 dBm (100 mW) at 2.4 GHz / 23 dBm (200 mW) at 5.15–5.35 GHz (indoor only), 30 dBm (1000 mW) at 5.47–5.725 GHz
Modulation technology	802.11b: DSSS; 802.11g: OFDM; 802.11a/h: OFDM
Antennas	2 external R-SMA antenna connectors per wireless module Polarity vertical/horizontal with antenna diversity
Roaming	IAPP (Inter-Access Point Protocol), forced roaming when uplink is lost
Supported network protocols	TCP/IP, IPX/SPX, NetBEUI, PROFINET, all Ethernet-based protocols (including industry protocols)
Additional features	DHCP client, DHCP server / 802.1q VLAN / 802.1d Spanning Tree Protocol & bridging functionality, FTB (Fully Transparent Bridge) when using RAP/RAC, IP ROUTING (RIPv2), prioritization of individual network nodes through compatible standard criteria such as TCP/IP ports or IP TOS; also on wire-based Ethernet interfaces, traffic shaping with bandwidth limitation, data filters (MAC address, IP header contents, network protocol, TCP/UDP ports), WDS (Wireless Distributed System), second WLAN interface configurable as uplink interface, Syslog, client monitoring (monitoring via ICMP), NTP system time (server-controlled time synchronization), configuration can be saved to file
Ethernet cable connection	RAP : 1 x 10/100baseT (Cu) for RJ45 connector or 1 x 100baseFX (fiber optic multimode) for MTRJ fiber-optic connectors, RAC : 1 x 10/100baseT (Cu) for RJ45 connector, optional built-in 4-port switch with 4 x 10/100baseT (Cu) for RJ45 connectors

Security

Authentication	Pre-shared key (PSK), 802.1x authentication: EAP/TLS, EAP/TTLS (MD5, MSCHAPv2), EAP/PEAP (MD5, MSCHAPv2), Primary and secondary Radius server
Encryption	WEP64, WEP128, WEPplus, 802.11i: WPA/TKIP, WPA/AES, WPA2/AES, WPA2/TKIP
Additional	MAC filter, Hide SSID, data filter

CONFIGURATION MANAGEMENT

Web interface	HTTP, HTTPS, access via standard Web browsers, multilingual, access via WLAN can be disabled
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MISCELLANEOUS

Power supply	“Power over Ethernet” PoE (IEEE 802.3af), 24 V DC or AC integrated 110/230 V AC
Redundant power supply	Redundant supply via DC and PoE
Housing	Magnesium diecast metal housing, shock- and vibration-proof, no rotating parts, easy to mount, protection class IP65
Dimensions	(W x H x D) 250 x 160 x 65 mm (9.8" x 6.3" x 2.6"), without antenna or power supply unit, weight 1.0 kg (2.2 lbs)
Thermal properties	-20°C ... + 55°C (-4°F ... +131°F); humidity 10% - 85%, without condensation

Several versions of the device are available: as a Rugged Access Point (RAP) or Rugged Access Client (RAC), combinable with various options: One or two WLAN modules (wireless interfaces) for RAP, Cu or fiber-optic Ethernet port (fiber-optic only for RAP), power supply via 24 V DC +/-20% or 110/230 V AC and PoE (PoE only with Cu Ethernet port). The RAC is also available with an additional 4-port switch for Cu Ethernet cable.

	RAP110	RAP111	RAP1210	RAP1211	RAP1120	RAP1121	RAP1220	RAP1221	RAC1110	RAC1111	RAC1510	RAC1511
1 WLAN module	x	x	x	x					x	x	x	x
2 WLAN modules					x	x	x	x				
1 x Cu Ethernet port	x	x			x	x			x	x		
5 x Cu Ethernet ports (built-in switch)											x	x
1 x fiber-optic Ethernet port			x	x			x	x				
PoE (IEEE 802.3af), 48 V DC	x	x			x	x			x	x	x	x
16 - 30 V DC	x	x	x	x	x	x	x	x	x	x	x	x
AC integrated 110–230 V AC		x		x		x		x		x		x
RAP can also be operated in client mode	x	x	x	x	x	x	x	x				