MikroTik RouterOS & RouterBOARD Wireless features overview

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June 2016
Overview

- RouterBOARD wAP
- Wireless quick guide
- Wireless-rep package
wAP
Black and White edition
Specification

- CPU 650 MHz
- RAM 64 MB
- Flash 16 MB
- Wireless 802.11b/g/n dual-chain
- Gain 2dBi antennas
- Ethernet 10/100Mbps
- Voltage 11-57V
- Consumption up to 4W
- Operating Temperatures -40°C to +70°C
- Dimensions 185 x 85 x 30 mm
Features

- 2 chain Wireless radio
- Jack and PoE power option
- Wide power input range (11-57V)
- Supports 802.3af/at and Passive PoE
- Low Power Consumption
- High Operating Temperatures
- Suitable for indoor and outdoor
- Waterproof case design
Usage Cases

Use it on the ceiling!

- The wAP comes bundled with all the necessary things to be mounted on ceiling
- Cable breakout provides ability to run cable through the ceiling
Usage Cases

Use it on the wall!

- Wall mounting is easy thanks to the provided drill template and screw anchor. Everything included
New wAP ac

- CPU 720 MHz
- RAM 64 MB
- Flash 16 MB
- Wireless 802.11b/g/n dual-chain
- Wireless 802.11a/n/ac triple-chain
- Gain 2dBi antennas
- Ethernet 10/100/1000Mbps
- Voltage 11-57V
- Consumption up to 12W
- Operating Temperatures -40C to +50C
- Dimensions 185 x 85 x 30 mm
Wireless quick guide
Frequency limitations

**Regulatory-domain** – Limit available channels and maximum transmit power for each channel according to the country limitations

**manual-txpower** – Use frequency limitations by country, without limiting the maximum transmit power

**superchannel** – Allow all frequencies supported by the card

**Lock specific frequencies** – Request factory installed lock package, to discard use of specific wireless frequencies
Wireless usage

**PTP** (Creates a connection between 2 points)
- PTP devices use *directional* antennas to send signal to narrow beam

**PTMP** (Allows multiple clients to establish connection)

**Sector**
- Uses *semi-directional* antenna to cover a specific range with signal, also called sector antenna

**Regular (omni)**
- Uses *omni-directional* antenna
- Allows clients to connect from all directions
Directional antenna...

Used for PTP links
- Focused beam
- Increased antenna gain
- Extended distance
- Reduced interference

**MikroTik PTP devices:** DynaDish, LHG, SXT, QRT, Sextant

**Mikrotik PTP antenna:** mANT – parabolic dish antenna

**mANT can be used with:** NetMetal, BaseBox, NetBox or any other RP-SMA connector compatible device
Choose by distance
Sector antenna...

**Used for PTMP links**
- Specific angle
- Covers large area
- Allows multiple clients
- Lower interference

**MikroTik PTMP devices:** SXT SA5, SXT SA5 ac, mANTBox 15s/19s

**Mikrotik PTMP antenna:** mANT 15s/19s – sector antenna

**mANT can be used with:** NetMetal, BaseBox, NetBox or any other RP-SMA connector compatible device
Choose by distance
Omni antenna...

Used to cover 360 degrees
- Receives and transmits signals to all directions
- Do not need to be pointed
- Allows multiple clients

**MikroTik industrial omni devices:** RB Groove, RB Metal, OmniTIK

**MikroTik home/office wireless devices** are equipped with omni antennas

**RouterBOARD:** any wireless device with attached omni antenna
Wireless **station** modes

**Station**

**Station-bridge**

**Station-WDS**
Wireless AP modes

**Bridge**

- Bridge
- Client
- PTP Link

**AP-Bridge**

- AP Bridge
- Client
- PTMP Link

**WDS-Slave**

- AP Bridge
- WDS-Slave
- Client
Wireless modes

AP modes:
• AP-bridge (Requires at least level 4 license)
• bridge (Requires at least level 3 license)

Station modes:
• Requires at least level 3 license

Other modes are available!
Configure wireless settings manually to connect to any access point.

- Configure security profiles (authentication-type, mode, key)
- Configure wireless settings (station mode,frequency, band, SSID)

Or use **wireless scan** feature!
Wireless scan
The fastest way to connect to AP
Create AP using Quickset
Frequency scan

Use scan tool, to find the best frequency
CLI wireless spectral scan

Use terminal to check used frequencies
Dude

Scan wireless from Dude
Results

Compare throughput in different frequencies

<table>
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<tr>
<th>Frequency</th>
<th>Rx Mbps</th>
<th>Tx Mbps</th>
<th>Rx CCQ</th>
<th>Tx CCQ</th>
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</table>
Test throughput

Measure throughput between wireless devices
Wireless Snooper
Monitor wireless devices
Wireless Sniffer
Capture frames & packets
Wireless-rep-package
Wireless-rep package

- Repeater setup
- Background scan
- Virtual Wireless Interfaces
- WPS client
- New Wireless Scan features
- Scan-list Step support
- Station Roaming support
- G/N band support
- CAPsMAN additional settings enabled
- CAPsMAN Rates support
Repeater Setup

- Allow to receive signal from the AP and repeat the signal using the same physical interface locally for connecting other clients
- Allows to extend wireless service for the wireless clients
- Steps that this setup command does:
  - Configure wireless interface to connect to the AP
  - Create a Virtual AP interface
  - Create Bridge interface
  - Adds both (main and virtual) interfaces to bridge ports
Background Scan

- Supported for 802.11 protocol only
- Working conditions
  - Wireless interface should be enabled
  - For AP mode – when operating on fixed channel
  - For Station mode – when connected to AP
- Supported also on Virtual interfaces
  - Scan is only performed in channel where master interface is running
Virtual Wireless Interfaces

- Supported for 802.11 protocol only
- Virtual AP and Client interface can be added on the same physical interface
- Multiple Virtual Wireless interfaces can be added
- Background scan is supported on Virtual Wireless Interfaces and is only performed in channel where master interface is running
WPS Client Support

- Allows wireless client to get Pre-Shared Key configuration of the AP that has WPS Server enabled
- Gets information from any WPS Server running or can be specified to get only with specific SSID or MAC address
- Received configuration is shown on the screen and can be also saved to a new wireless security profile
Wireless Scan features

- **Scan to file**
  - Allows to save the scan results in a CSV format file
  - Supported with background scan

- **Scan Round setting**
  - Allows to do full scan of the scan-list and then stop scanning
  - Useful for remote scans on the clients
  - Supported with background scan as well
Scan-list Step feature

- Scan-list Step feature allows to make compact scan-list entries
- To make scan-list from 5500-5700 with 20mhz step now you need just one entry:
  - Scan-list=5500-5700:20
  - In system it will create scan-list with such frequencies:
    5500, 5520, 5540, 5560, 5580, 5600, 5620, 5640, 5660, 5680, 5700
Station Roaming support

- Supported for 802.11 protocol only
- While connected to AP station does periodic background scans to look for a better AP
- When a better AP is found station roams to the new AP
- Time intervals between scans becomes shorter when signal becomes worse
- Time intervals between scans becomes longer when signal becomes better
G/N Band Setting

- Regular Wireless Interface and CAPsMAN supports '2ghz-g/n' band setting
  - basic-rates – 6-54Mbps
  - supported – 6-54Mbps
  - ht-basic-mcs – None
  - ht-supported-mcs – 0-23
CAPsMAN Settings

- CAPsMAN now supports the following settings:
  - distance – default value is 'indoors'
  - hw-retries
  - hw-protection-mode
  - frame-lifetime
  - disconnect-timeout
CAPsMAN Rates support

- CAPsMAN supports Rates configuration tab:
  - Basic – B and A/G basic-rates
  - supported – B and A/G supported data-rates
  - ht-basic-mcs – N basic-rates
  - ht-supported-mcs – N supported data-rates
  - vht-basic-mcs – AC basic rates
  - vht-supported-mcs – AC supported data-rates
Suggestions?
Feature requests?

THANK YOU!