

The Mikrotik logo features a stylized black crescent moon above the letter 'i' in 'Mikro'. The word 'Mikro' is in a black, italicized, sans-serif font. The word 'Tik' is in a bold, black, sans-serif font with a distinctive horizontal bar above the 'T' and a slanted 'k'.

MUM Saudi Arabia

October 2017

# More than 160 MUM events around the world



# MikroTik

- Established 1996
- RouterOS created in 1997
- RouterBOARD created in 2002
- First MUM event in Prague 2006
- MUM in Indonesia had 2500 people
- 34 events in 2016



The image shows a map of Europe with the country of Latvia highlighted in a bright green color. The Mikrotik logo, featuring a stylized 'M' with a sun-like symbol above it, is prominently displayed in the upper center of the map. The word 'Mikrotik' is written in a bold, black, sans-serif font. The map includes labels for various European countries, such as Iceland, Norway, Sweden, Finland, Denmark, Estonia, Lithuania, Poland, Germany, France, Spain, Portugal, and many others. The word 'LATVIA' is written in large, black, capital letters across the center of the map, directly over the highlighted country.

**Mikrotik**

**LATVIA**

Antons Belajevs (support)  
Edmunds Aperans (sales, training)  
Martins Strods (support)



STAFF

# Agenda

09:45	Presentations
12:15	Prayer and lunch break
14:00	Presentations
16:15	Lottery and closing of MUM
16:30	Soft drinks and snacks

**[mum.mikrotik.com](http://mum.mikrotik.com)**

# WiFi

**SSID: MUM\_RIYADH**

**Password: mikrotik**

# MUM Live

[www.youtube.com/mikrotik](http://www.youtube.com/mikrotik)



# Special Thanks

Future Legend Est.  
and  
Electron Tech Est.



إلكترون تك  
electron tech

New products



1 Gbit  
over wireless

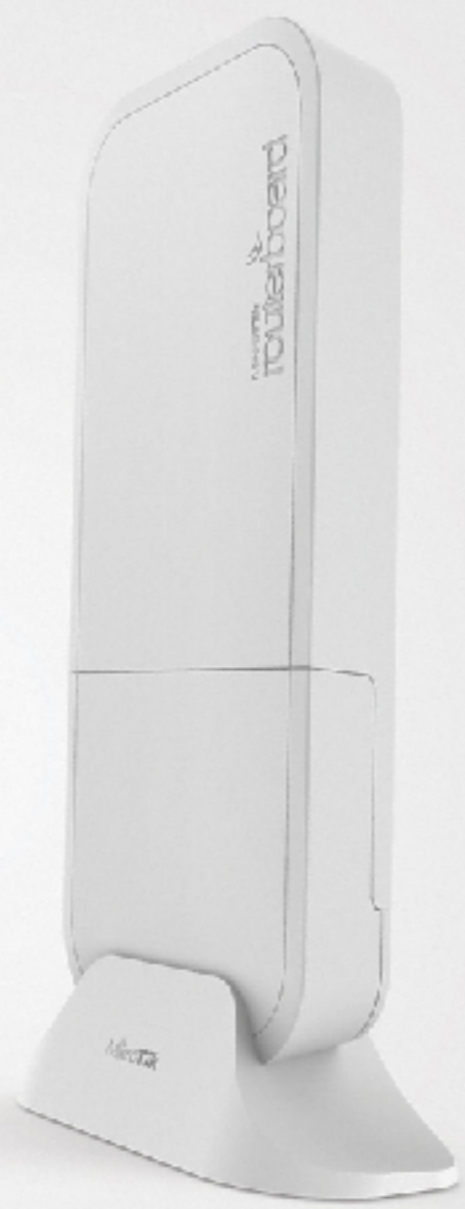
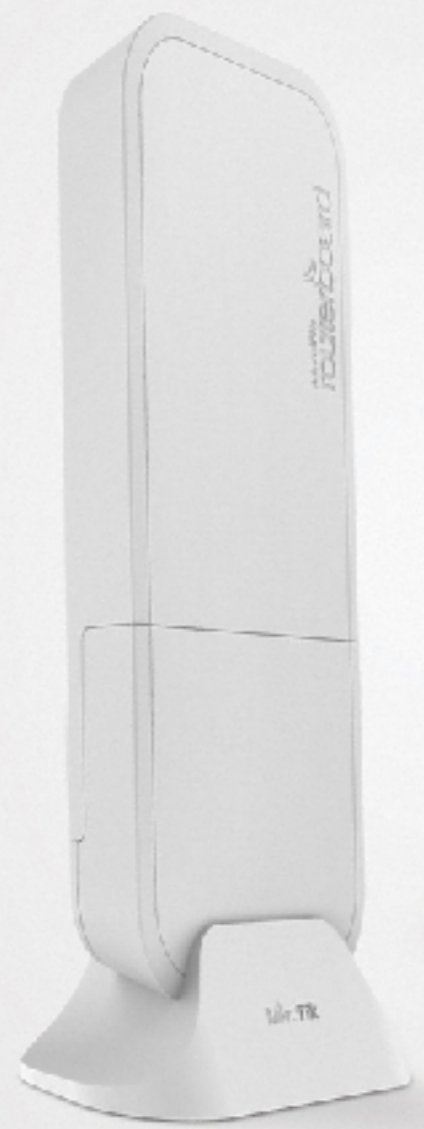
100m+  
range

60GHz  
radio

Gigabit  
Ethernet

Paired  
Secure Link  
pre-configured

Powered by  
IEEE 802.3af Passive  
PoE, DC Jack



MikroTik

Wireless Wire

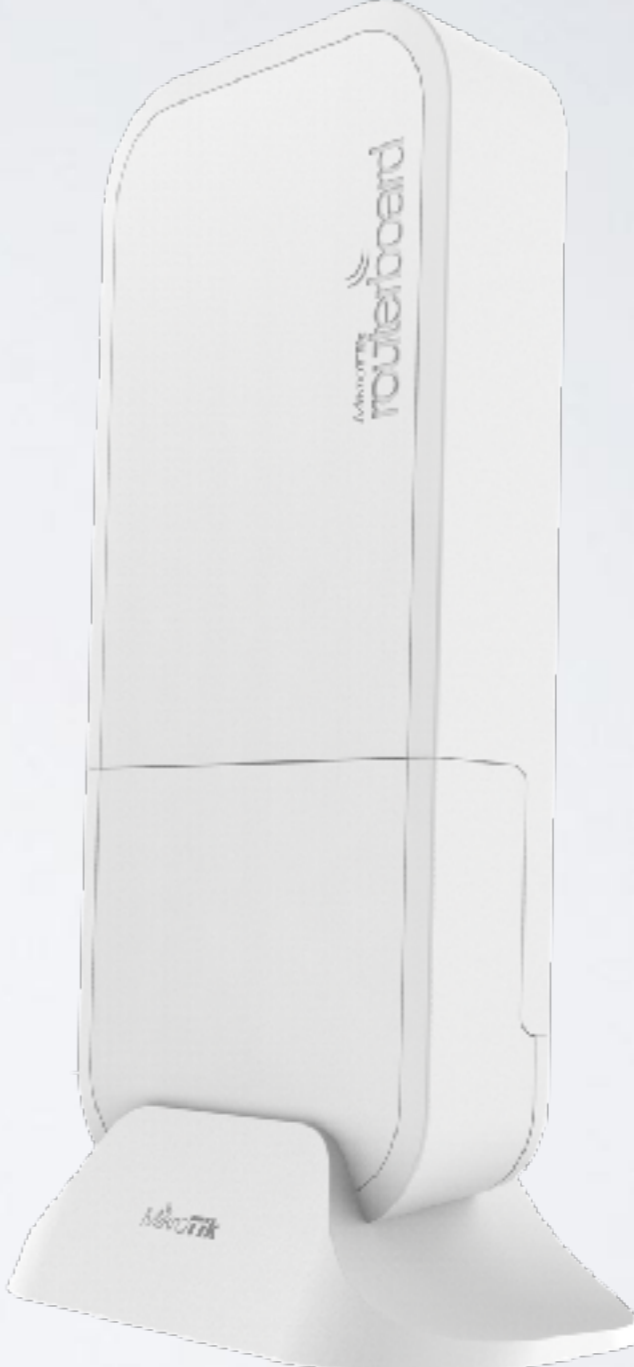
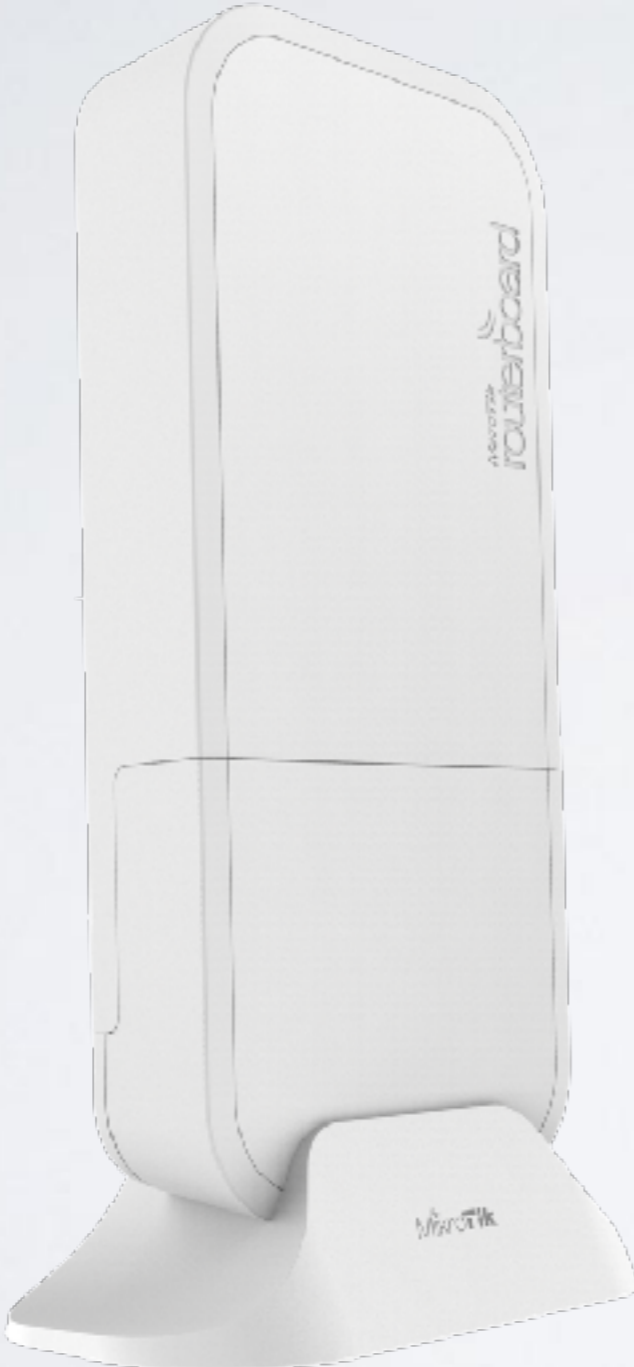
# Wireless Wire

- 1 Gbps full duplex without wires
- 100 meters +
- 60 GHz beam-forming
- Paired Secure Link Preconfigured
- \$198 kit



now

# Wireless Wire Demo



# LHG 60G

- 1 Gbit full duplex (wire speed)
- Works in 60 GHz spectrum
- Familiar LHG design
- Quad-core ARM CPU
- Low cost and low weight
- Targeted for longer distances than 100 m



# cAP lite

- Small and light 2.4 GHz AP
- Case can be changed
- Print your own case
- Designed for hotels and other public places for Internet access
- \$29 kit







# DynaDish 6 and SXT 6

- Great for use in less used 6 GHz spectrum
- Same familiar designs



\$99



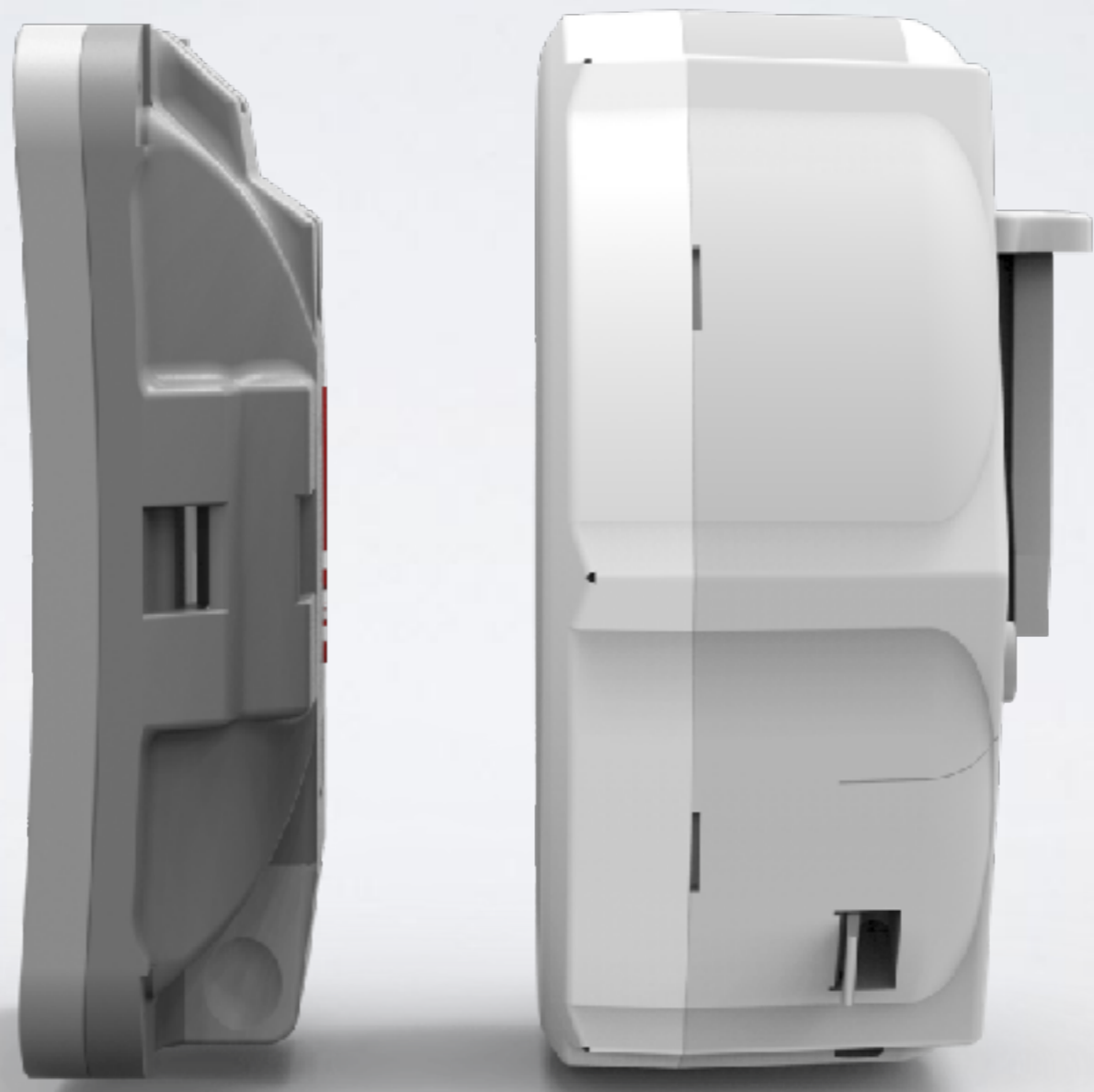
\$179

# SXTsq Lite5

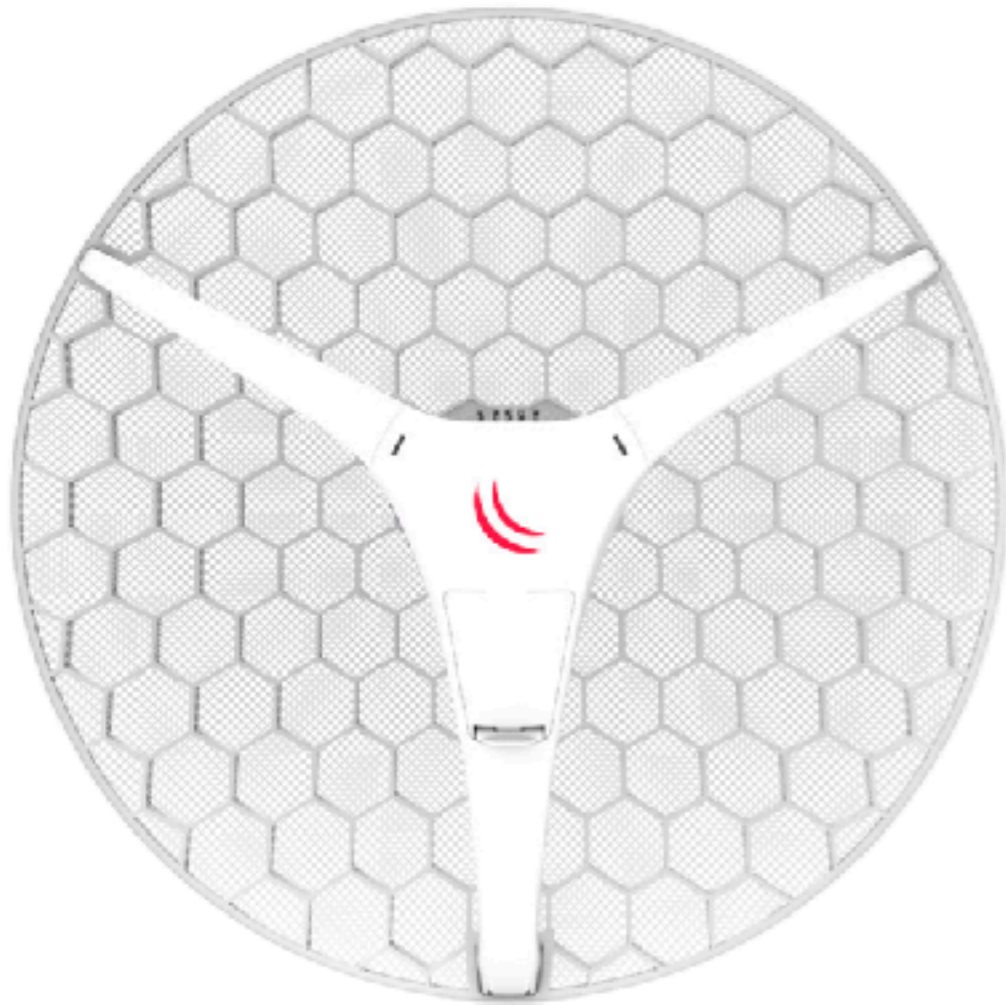
- Compact and lightweight
- Two times thinner!
- 16 dBi antenna
- 12 km wireless link
- Low cost and low weight
- Kit price \$46



# SXTsq Lite5



# New LHG!



LHG XL HP5



LHG HP5



LHG 5

# LHG HP5

- 630 mW
- 20 km full speed link
- Familiar LHG design
- Low cost and low weight
- Kit price \$69



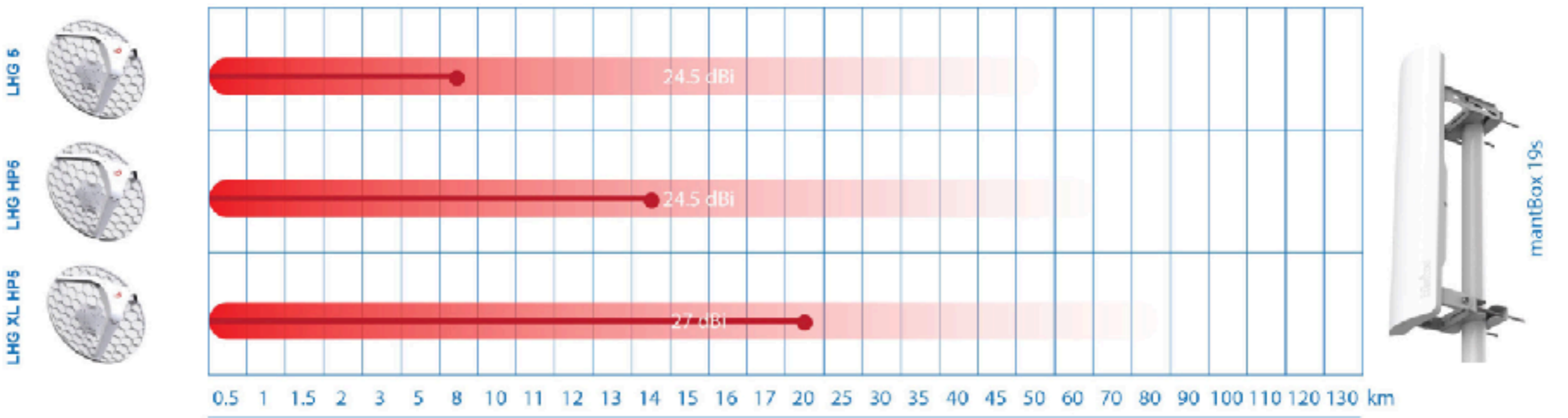
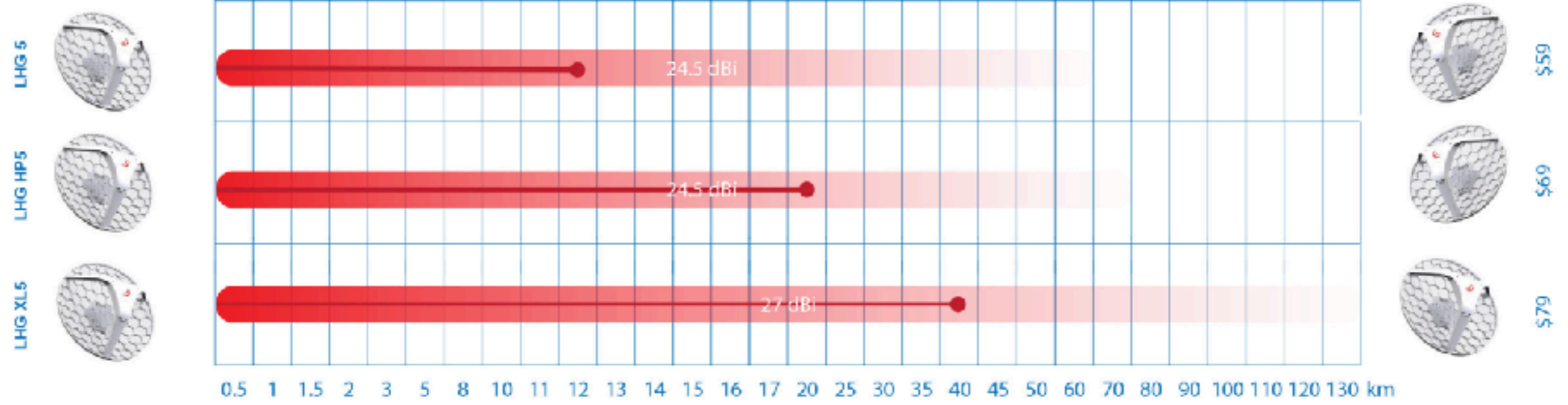
# LHG XL HP5

- 630 mW
- 40 km full speed link
- 27 dBi antenna
- Familiar LHG design
- Low cost and low weight
- Kit price \$79



# New LHG!

Distance in Km



○ Distance at max supported 802.11a data rate (eg. 865Mbit/s) ● Distance at max supported 802.11n data rate (eg. 300Mbit/s) ■ Max range at -70dBm signal





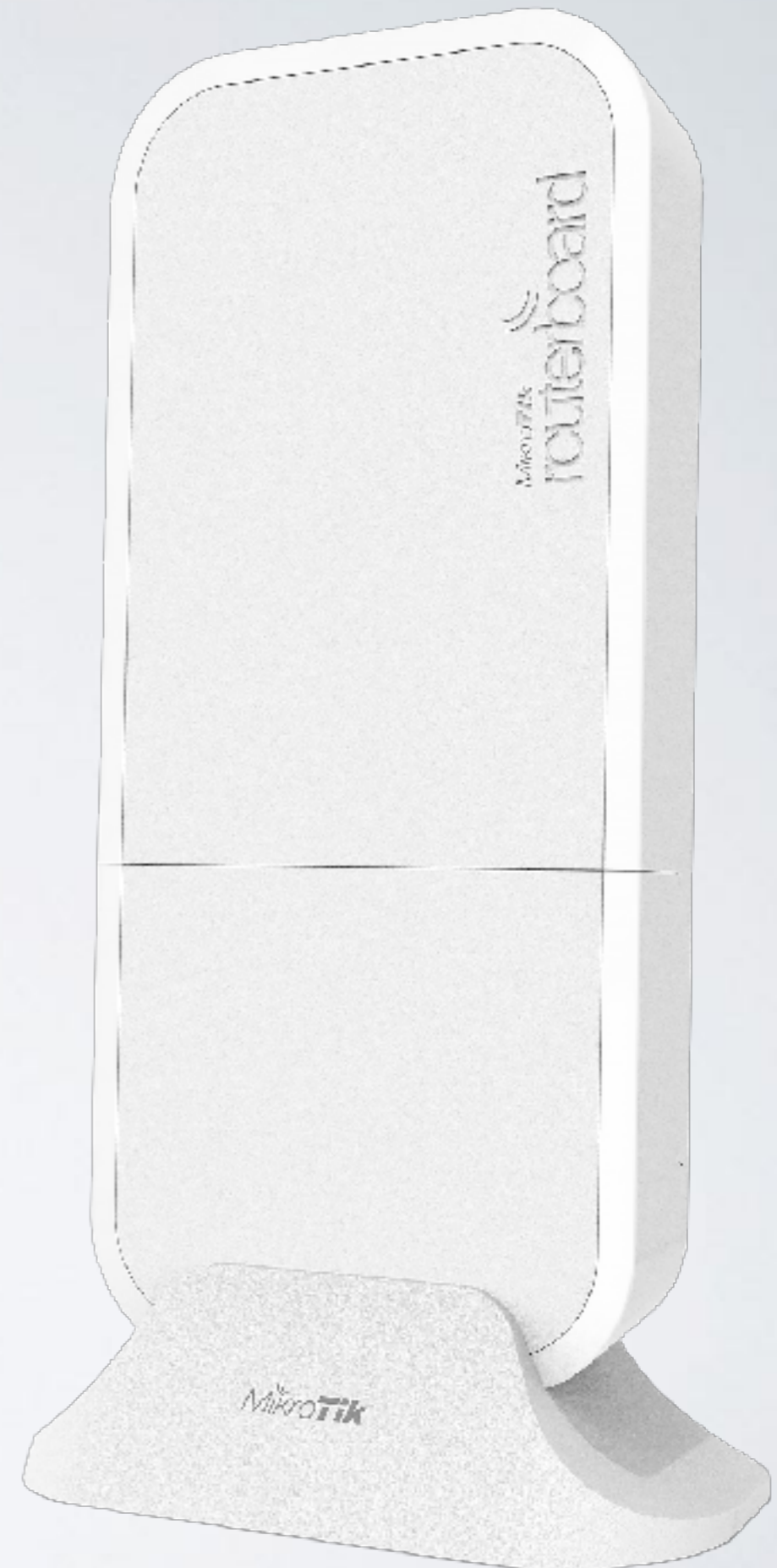
# wAP R

- 2.4 GHz AP
- miniPCI-e slot for 3G/4G
- PoE, power jack, automotive connector
- Kit price \$79



# wAP LTE KIT

- Wireless AP for LTE
- EU/Int. version supports LTE bands 1, 2, 3, 7, 8, 20, 38, 40
- 2G, 3G, LTE supported
- Optional external antennas
- Comes with a stand mount
- Kit price \$119



# LtAP mini

- 2.4 GHz AP in a rugged case
- miniPCle for LTE
- Built-in GPS
- Serial port
- Ethernet port
- Perfect for cars or outdoor mobile applications





# LtAP

- 2x miniPCle
- Built-in 2.4 GHz AP
- MMIPS Mediatek CPU 880MHz
- 2x MMCX connectors
- 1 Gbps ethernet port
- Built-in GPS





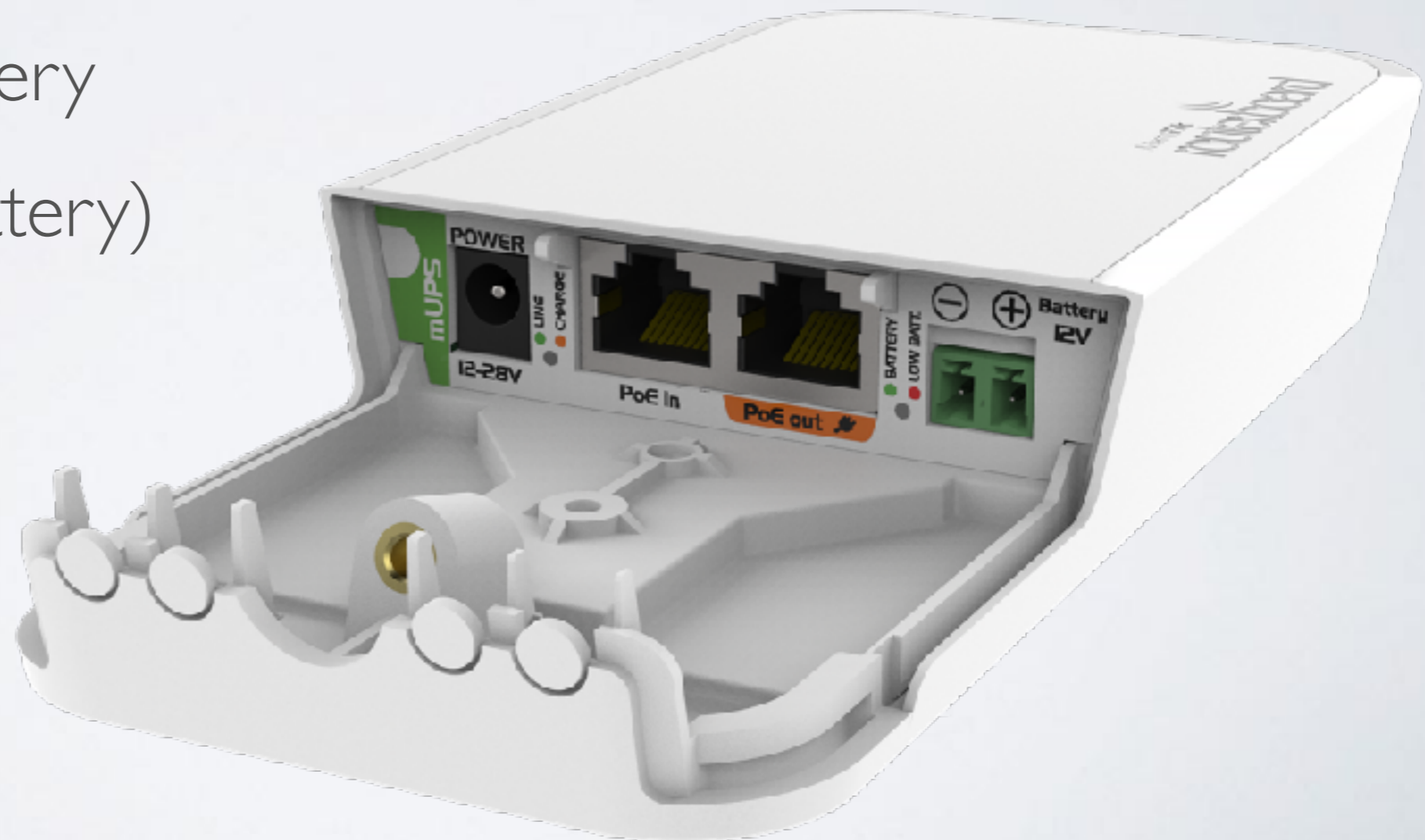
# Woobm

- Wireless out of band management
- Connect to your device and get serial access over wireless
- Price \$16



# mUPS

- Gigabit PoE injector
- Power supplied by PoE or jack
- RouterBOARD could be powered by battery
- \$29 (without battery)





# wsAP ac lite

- Mount into standard EU or US electrical sockets
- Dual band ac (2.4 and 5 GHz)
- Phone jack passthrough
- Two LAN ports
- One of them is PoE out port
- USB port

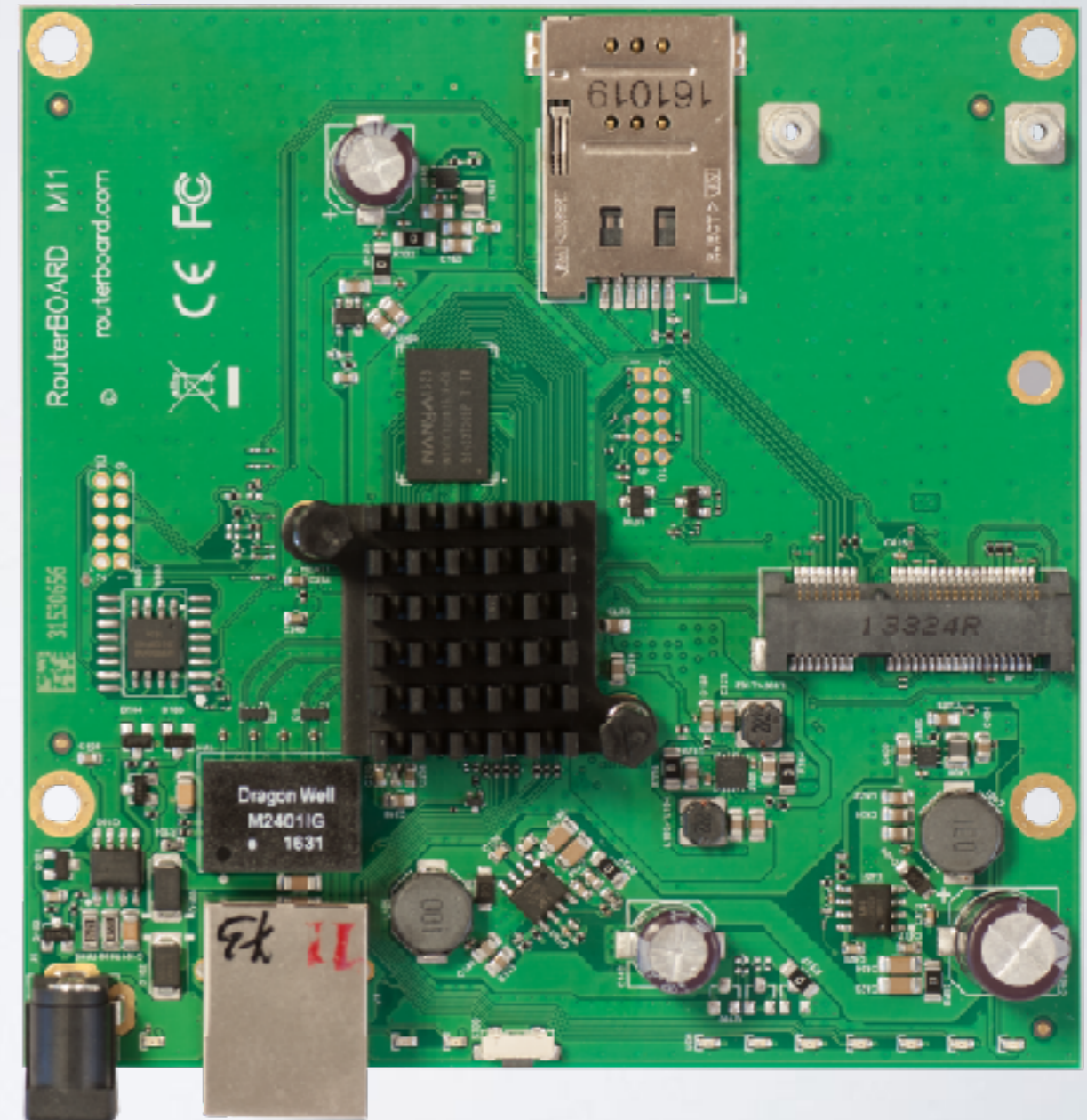






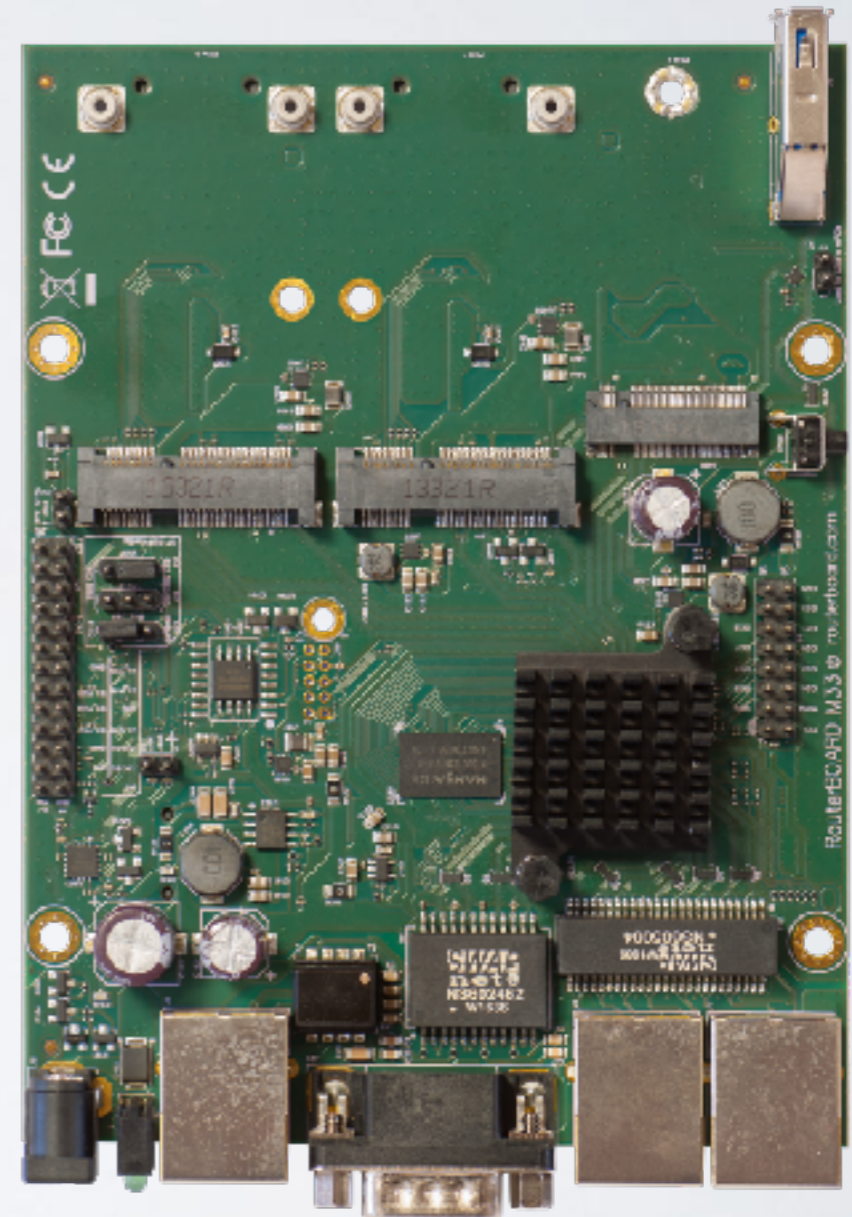
# MIIG

- Four core 880 MHz CPU
- 1 miniPCle slot
- 1 Gigabit Ethernet
- Upgrade for RB411
- \$39



# M33G

- Four core 880 MHz CPU
- 3 Gigabit Ethernet
- 2 miniPCIe slots
- 1 M.2 slot
- USB 3.0 and serial port
- Upgrade for RB433



# S+RJ10

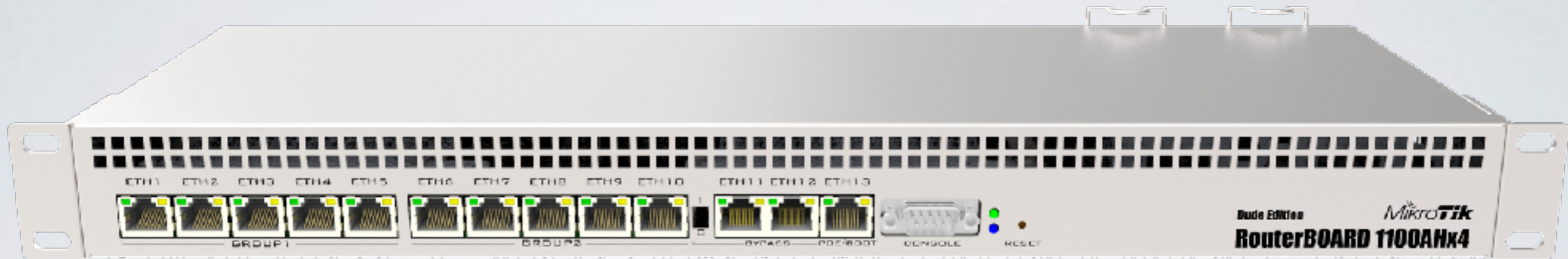
- SFP+ to Ethernet
- 6-speeds (10/100/1G/2.5G/5G/10G)
- 2.4 W
- Works with all MikroTik SFP+
- \$65



# PW48V

- Hot Swap -48 and +48 V DC telecom power supply
- For CCR1072
- \$100





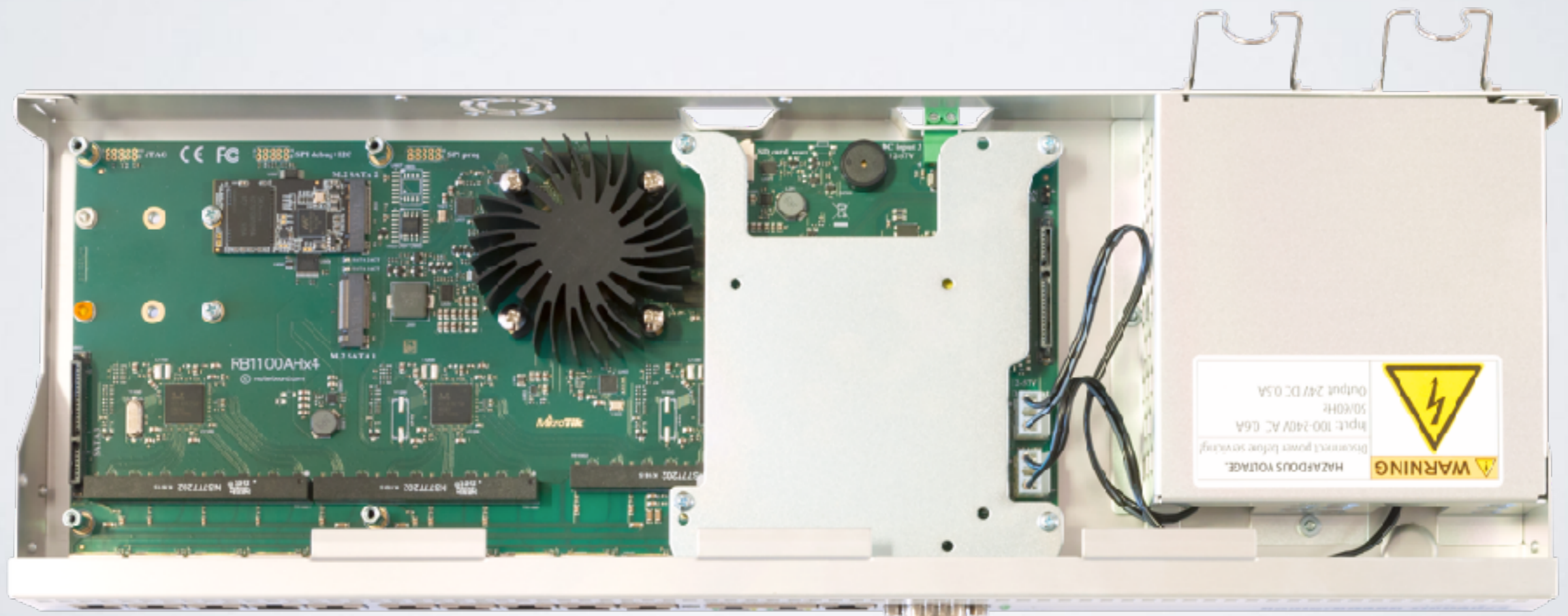
# RB 1100AHx4

The timeless classic upgraded with  
a new quad core CPU and more



Annapurna Alpine AL21400 CPU with four Cortex A15 cores clocked at 1.4 GHz

- Two SATA3 ports
- Two M.2 ports
- 60 GB SSD included
- Hardware accelerated IPSec
- -48 V DC telecom power
- Dual PSU





- 5.5 million PPS
- 7.5 Gbps
- IPSec up to 2.2 Gbps with AES 128
- Overclock up to 2 GHz

# Two editions

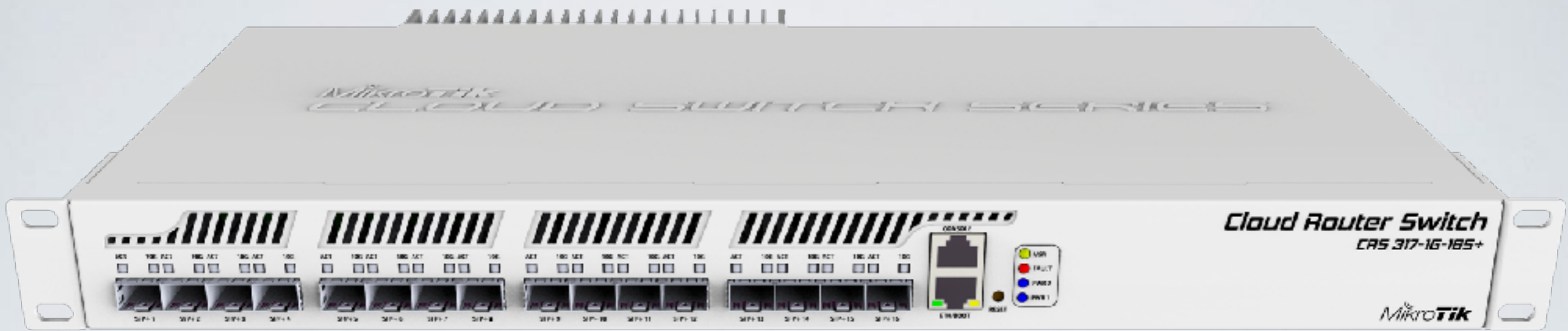
- **RBI I100AHx4 - \$299**
- **RBI I100AHx4 Dude edition**  
2x M.2, 2x SATA3 and 60 GB SSD disk - **\$349**

# FiberBox

- Weatherproof case
- 5 SFP ports
- RJ45 SFP (S-RJ01) included
- \$79



now



# CRS317-1G-16S+

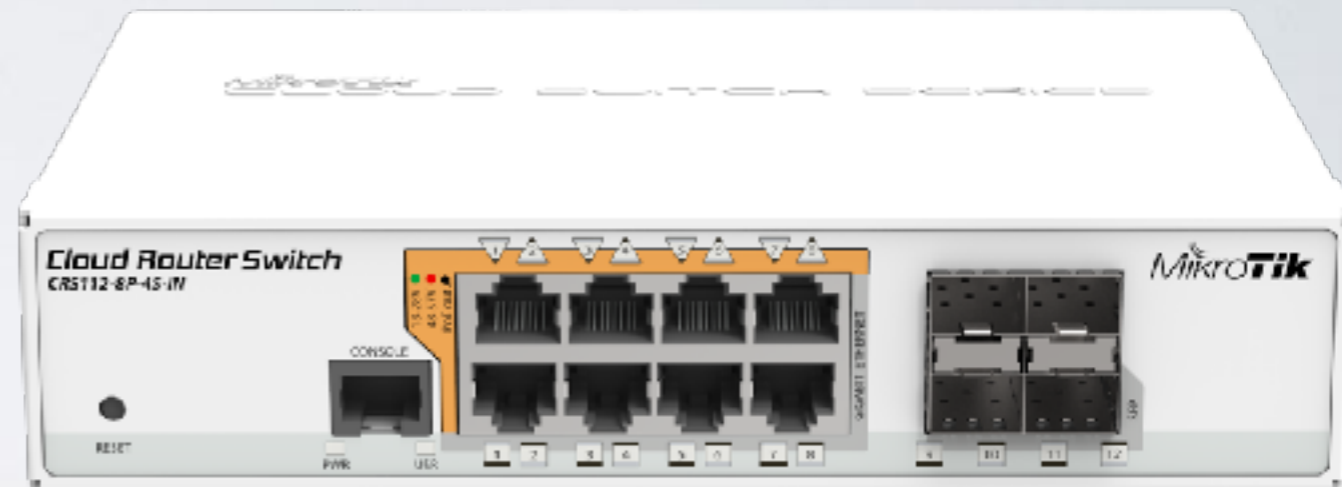
High performance SFP+ switch

# CRS317-1G-16S+

- 16 SFP+ ports
- Next generation switching chip
- Hardware-based Spanning Tree Protocol
- Dual boot - SwOS or RouterOS
- \$399

# CRS112-8P-4S

- PoE out 802.3af/at
- Eight Gigabit Ethernet ports
- 4 SFP ports
- Separate PSU for passive or 802.3af/at PoE out
- Low voltage PSU included
- Per port auto detection of PoE standard





# CRS328-24P-4S+RM

Smart PoE out switch



# CRS328-24P-4S+RM

- Dual boot - SwOS or RouterOS
- 24 port with PoE out function
- Supports 802.3af/at and passive output
- Per port auto detection of PoE standard
- Four SFP+ ports for 10 GbE
- One 100-240 V IEC connector

# All products

- Included free software upgrades for life
- Run the same RouterOS or SwOS software
- For more information see:  
<https://mikrotik.com/products>

# NEWS IN ROUTEROS

# CHR

## Cloud Hosted Router

- RouterOS version tailored for running in virtual environments
- Runs on VMware, Workstation, VirtualBox, ESXi, HyperV, KVM, XenServer, etc.
- Cloud services - Amazon, Azure and others
- CHR available as OVA (Open Virtual Appliance)

# CHR

## Use cases

- Firewall for your cloud services
- VPN server in the cloud
- The Dude monitoring server
- Simulate networks for learning or training purposes
- And many more

# CHR

## Licensing

License	Speed limit per	Price
Free	1 Mbit	FREE
P1	1 Gbit	US\$45
P10	10 Gbit	US\$95
P-Unlimited	Unlimited	US\$250

- 60 day trial available
- Purchased license can be transferred

# CHR

## Licensing

1

Licence

System ID: 6R1ZP/utuJ

Level: free

Next Renewal At:

Deadline At:

Limited Upgrades

OK

Generate New ID

Renew Licence

Renew Licence

Account: mymikrotikcomaccount

Password: \*\*\*\*\*

Level: P1

Start

Stop

Close

done

2

Licence

System ID: 6R1ZP/utuJ

Level: P1

Next Renewal At: Jan/10/2016 21:59:59

Deadline At: Feb/09/2016 21:59:59

Limited Upgrades

OK

Generate New ID

Renew Licence

WinBox → System → License

# CHR

## Licensing

3

The screenshot shows the MikroTik client account page. At the top, the MikroTik logo is on the left, and a navigation menu includes Home, Buy, About, Jobs, Hardware, Software, Support, Training, and Account (highlighted with a red circle). Below the navigation is a blue header with 'My account' and a 'Log out MikroTik' link. A 'Toggle menu' icon is on the left. The main content area is divided into two columns. The left column contains sections: ACCOUNT INFORMATION (Home, Balance, Edit account details, MUM registration history, Hardware orders), WEB ORDERS (Your orders and invoices, Purchase a RouterOS license key), ROUTEROS KEYS (Search and view all keys, Request key from another account, Transfer prepaid keys (21), Make a demo key, Make a key from prepaid key (21)), and CHR LICENCES (All CHR keys, CHR orders and invoices, Transfer CHR prepaid keys - highlighted with a red circle). The right column features a 'Welcome, MikroTik!' message, an 'Account notices' section with a 'Prepaid keys: You have 5 prepaid license keys available' notification, and a 'Visit upcoming MUM events!' section listing events for Indonesia in Yogyakarta (Oct 27-28), Brazil in Maceio, Alagoas (Nov 9-10), Uruguay in Montevideo (Nov 13), and South Africa in Cape Town (Nov 24). A red arrow points from the 'Account' link in the top navigation to the 'CHR LICENCES' section in the left sidebar.

[mikrotik.com/client](https://mikrotik.com/client)



# CHR

## Licensing

4

### User keys

Show entries

10

Search

System ID	Issued	Expires	Level	Transfer	Action	Status	Note
vmxAucZ7VtK	2016-05-31	---	P1-Perpetual	Transfer	Upgrade		
OMaZwuXjj4N	2016-04-04	---	P10-Perpetual	Transfer	Upgrade		
Cm8ATgygn2H	2017-09-13	---	P-Unlimited	Transfer			
+OfzKswA4TC	2017-08-24	---	P10-Perpetual	Transfer	Upgrade		
4Mc+U51oLoN	2016-06-10	---	P1-Perpetual	Transfer	Upgrade		
10971UBIKZK	2015-12-28	---	P1-Perpetual	Transfer	Upgrade		
JPyotBTRsJK	2015-12-09	---	P10-Perpetual	Transfer	Upgrade		

[mikrotik.com/client/cloudhosting](https://mikrotik.com/client/cloudhosting)

# CHR

## Licensing

5

### Upgrade system license

System ID

AuykNnBPF/E

Level

P1-Perpetual (\$ 45.00 )

 Upgrade key

1Gbit per interface (\$45 one time payment)

You have following prepaid balance keys available to purchase a CHR license:

- P1-Perpetual - 5 keys

[mikrotik.com/client/cloudhosting](https://mikrotik.com/client/cloudhosting)

# CHR

## Licensing

6

### Payment i

You have selected	System ID
P1-Perpetual	AuykNnBPF/E
<b>Total price: \$54.45</b>	

Pay using deposit (left: \$100)

Pay using CC

Pay using PayPal

Pay using Balance key (5)

**Note:** Price includes VAT 21% because you have specified EU country as your residence. To avoid this you have to enter your VAT registration number in your account settings.

[mikrotik.com/client/cloudhosting](https://mikrotik.com/client/cloudhosting)

# RouterOS changelog

- 6.40 - 161 entries
- 6.40.1 - 14 entries
- 6.40.2 - 10 entries
- 6.40.3 - 28 entries
- 6.40.4 - 33 entries
- 246 entries in total!

# LTE passthrough

- Bridge over LTE to the connected device
- IPv4/IPv6 to the connected device
- On LTE device **only modem configuration**
- For one device only
- Specific modems are supported

# Bridge functions

- Hardware based MSTP support for CRS3xx devices
- Software based MSTP support for other RouterOS powered devices
- Hardware IGMP snooping for CRS
- Software IGMP snooping for other RouterOS powered devices

# TR069 client

- RouterOS data model based TR-181 issue 2 amendment 11
- Works with AVSystem, Axiros, FriendlyTech and GenieACS servers
- Installed as separate package
- Recommended to use with HTTPS

# IPSec results

## IPsec test results

RB750Gr3		RB750Gr3 IPsec throughput					
Mode	Configuration	1400 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Single tunnel	AES-128-CBC + SHA1	42.6	477.1	56.9	233.1	55.2	28.3
256 tunnels	AES-128-CBC + SHA1	42.9	480.5	49.5	202.8	51.3	26.3
256 tunnels	AES-128-CBC + SHA256	42.9	480.5	49.5	202.8	51.3	26.3
256 tunnels	AES-256-CBC + SHA1	32.0	358.4	49.1	201.1	49.2	25.2
256 tunnels	AES-256-CBC + SHA256	32.0	358.4	49.1	201.1	49.2	25.2

1. All tests are done with Xena Networks specialized test equipment (XenaBay), and done according to RFC2544 (Xena2544)
2. Max throughput is determined with 30+ second attempts with 0,1% packet loss tolerance in 64, 512, 1400 byte packet sizes
3. Test results show device maximum performance, and are reached using mentioned hardware and software configuration, different configurations most likely will result in lower results



# Wireless link calculator

The screenshot shows a web-based wireless link calculator interface. The browser address bar displays "mikrotik.com". The interface is divided into several sections:

- Specifications and results:** A sidebar on the left containing input fields and a dropdown menu.
  - Frequency:** 5 GHz
  - Desired data rate:** 1300 Mbps
  - Tx device:** DISC Lite5
  - Rx device:** A dropdown menu is open, listing various antenna models such as BaseBox 2, BaseBox 5, DISC Lite5, DynaDish 5, DynaDish 6, Groove 52, Groove 52 ac, GrooveA 52, GrooveA 52 ac, LDF 5, LHG 6, LHG HP5, LHG XL HP5, Metal 2, Metal 6, Metal 52 ac, Metal 9, NetBox 5, NetMetal 5, NetMetal 5, NetMetal 5, NetMetal 5, OmniTIK 5, OmniTIK 5 PoE, OmniTIK 5 PoE ac, OmniTIK 5 ac, QRT 2, and QRT 5.
  - Tx Gain (dBi):** 21
  - RX Sensitivity (dBm):** (empty field)
  - Output Power (dBm):** (empty field)
  - Distance:** 16.0 Km (9.94 miles)
  - Free Space Path Loss:** (empty field)
  - Theoretical signal level at TX:** (empty field)
  - Theoretical signal level at RX:** (empty field)
  - Link status:** (empty field)
  - Reset:** A red button with a circular arrow icon.
- Map:** A satellite-style map of Latvia showing a red line connecting a Tx (Transmitter) location near Rīga to an Rx (Receiver) location near Ādaži. The map includes labels for various locations like Rīga, Ādaži, Vangaži, Sigulda, Ropāži, Jugla, Kekava, Ogre, Olaine, and Daugavgrīvas sala.
- Terrain Profile:** A graph at the top right showing the elevation profile of the link path. The vertical axis is labeled "m" (meters) with values 0, 10, and 20. The horizontal axis is labeled "km" with values 0, 2, 4, 6, 8, 10, 12, 14, and 16. The profile shows several peaks, with the highest reaching approximately 20 meters.

# Detect Internet

- Automatic interface functionality detection

```
[[sergejs@3B12_SergejsGW_CCR1036] > interface detect-internet state print
```

#	NAME	STATE
0	sfp1	no-link
1	ether1	no-link
2	ether2	no-link
3	ether3	no-link
4	ether4	no-link
5	ether5	lan
6	ether6	lan
7	ether7	lan
8	ether8	internet
9	bridge1	lan

```
[[sergejs@3B12_SergejsGW_CCR1036] > █
```

# Need help?

- Ask a local distributor
- Hire MikroTik consultant
- Read the manual [wiki.mikrotik.com](http://wiki.mikrotik.com)
- Email [support@mikrotik.com](mailto:support@mikrotik.com)
- Attend a training class or join and Academy class in a University

# After the MUM

- All presentations - [mum.mikrotik.com](http://mum.mikrotik.com)
- Videos - [youtube.com/mikrotik](http://youtube.com/mikrotik)
- License for paid and voucher registrations will be sent by an e-mail

The logo for MikroTik, featuring the word "MikroTik" in a stylized, italicized font. The "i" in "Mikro" has a unique graphic element above it consisting of three curved lines. The "T" in "Tik" is bold and blocky. The entire logo is rendered in a dark gray color and is reflected on a light gray surface below it.

*MikroTik*