MikroTik User Meeting

Монгол Улс, Улаанбаатар

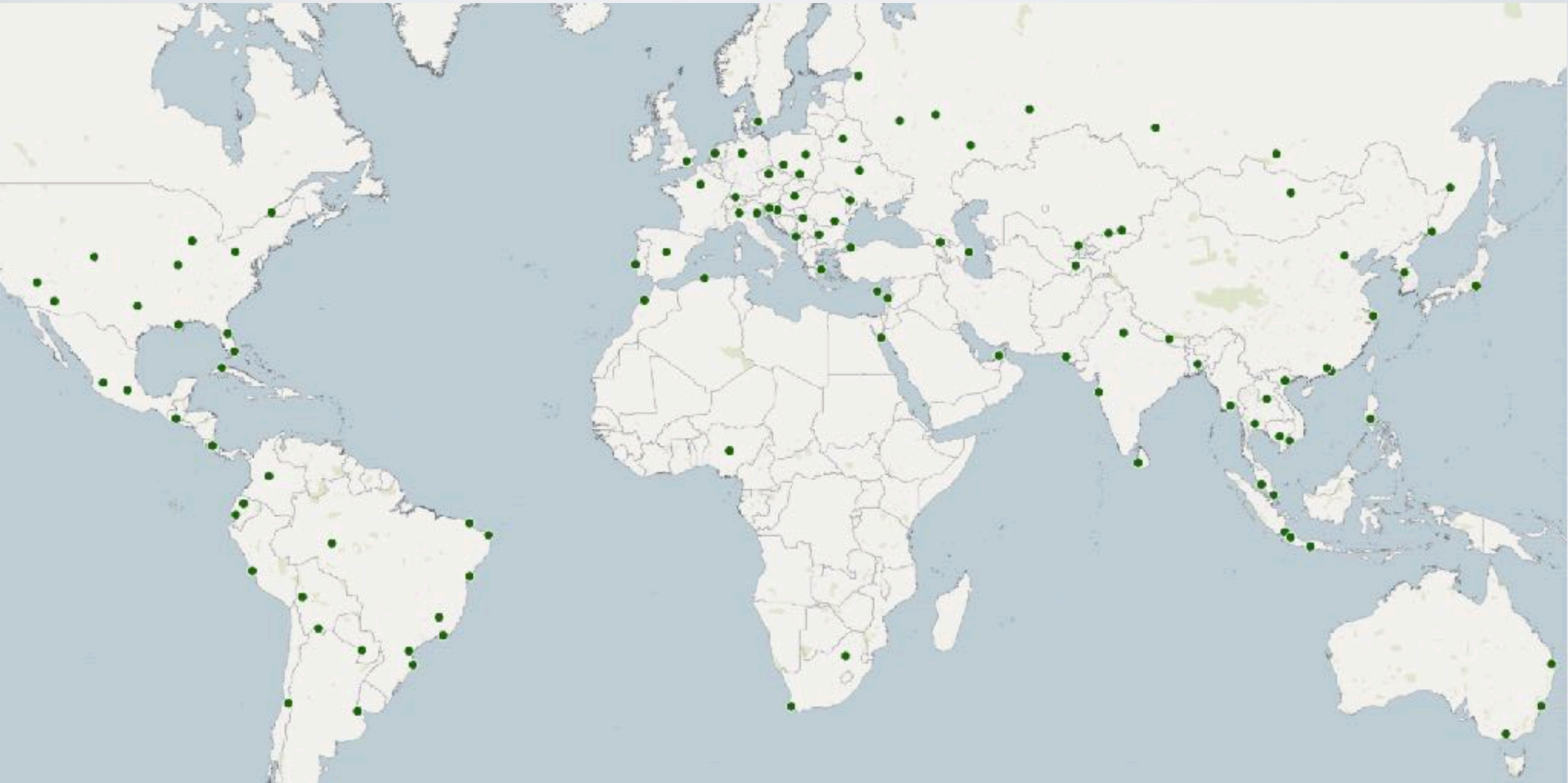
June 2017

MikroTik

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

MikroTik
LATVIA
Iceland
Finland
Sweden
Norway
Russia
Estonia
Lithuania
Denmark
Ireland
United Kingdom
Belarus
Netherlands
Poland
Belgium
Germany
Ukraine
Luxembourg
Czech Republic
Slovakia
Moldova
France
Switzerland
Liecht.
Austria
Hungary
Romania
Georgia
Slovenia
Croatia
Armenia
Monaco
San Marino
Bosnia and Herzegovina
Serbia
Andorra
Montenegro
Bulgaria
Portugal
Spain
Italy
Vatican City
Macedonia
Albania
Turkey
Greece
Syria

150 MUM events
all around the world



MikroTik at the MUM

Martins Kengis (sales)
Maris Bulans (support)
Sergejs Boginskis (support, training)

STAFF

Agenda

10:00 AM	Presentations
13:00	Lunch
15:45	Lottery and closing of MUM

MUM live

www.youtube.com/mikrotik

Special Thanks

Our products include

RouterOS
built and advanced for more than 20 years

RouterBOARD
Wireless outdoor&indoor, Ethernet routers

CRS
Switches with RouterOS

CSS
Switches with SwOS

mikrotik.com

MikroTik

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Products

Product categories

- All products
- Ethernet routers
- Switches
- Wireless systems
- Wireless for home and office
- RouterBOARD
- Enclosures
- Interfaces
- Accessories
- Antennas

Product filters

Show

Useful links

- Product catalog (PDF)
- What is RouterOS?

Ethernet routers

hEX lite

5x Ethernet, Small plastic case, 850MHz CPU, 64MB RAM, Most affordable MPLS router, RouterOS L4

$39.95

hEX

5x Gigabit Ethernet, Dual Core 880MHz CPU, 256MB RAM, USB, microSD, RouterOS L4

$59.95

hEX PoE lite

5xEthernet with PoE output for four ports, USB, 650MHz CPU, 64MB RAM, RouterOS L4

$59.95

hEX lite

The RB750r2 (hEX lite) is a small five port ethernet router in a nice plastic case.

Its price is lower than the RouterOS license alone - there simply is no choice when it comes to managing your wired home network, the RB750r2 (hEX lite) has it all.

Not only it's affordable, small, good looking and easy to use - It's probably the most affordable MPLS capable router on the market! No more compromise between price and features - RB750r2 has both. With its compact design and clean looks, it will fit perfectly into any SOHO environment.

Box contains: RB750r2 in a plastic case, power supply

Quick Guide Brochure

More info

- Design Files DXF-PDF
- Block Diagram
- User Guide
- STEP file for CAD
- High-res image: [1] [2]
- Send purchase questions
- RouterOS software manual
- Declaration of conformity (CE)

Product specifications

Details	
Product code	RB750r2
Architecture	MIPS-BE
CPU core count	1
Operating System	RouterOS

mikrotik.com

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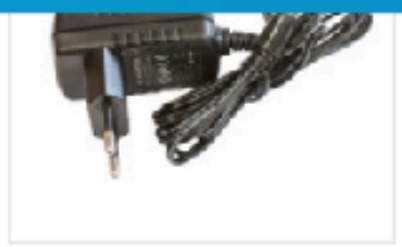
Products



12V 0.5A power adapter

Ethernet test results

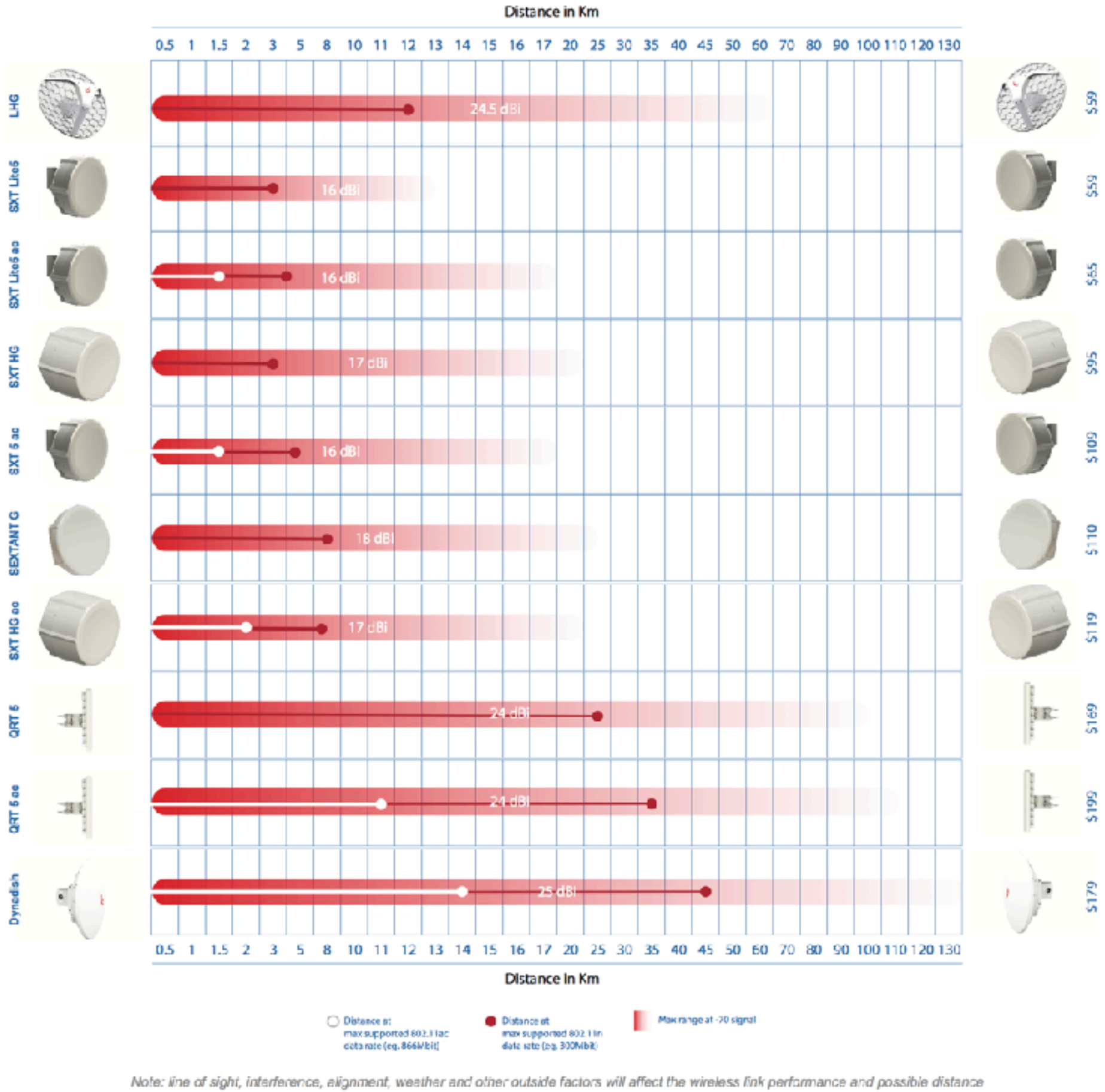
RB750r2		QCA9531 (850Mhz) 100M all port test					
Mode	Configuration	1518 byte		512 byte		64 byte	
		kpps	Mbps	kpps	Mbps	kpps	Mbps
Bridging	none (fast path)	40.6	493.0	117.4	480.9	234.8	120.2
Bridging	25 bridge filter rules	40.6	493.0	90.4	370.3	94.3	48.3
Routing	none (fast path)	40.6	493.0	117.4	480.9	217.8	111.5
Routing	25 simple queues	40.6	493.0	98.9	405.1	101.2	51.8
Routing	25 ip filter rules	40.6	493.0	52.0	213.0	52.7	27.0

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, 1518 byte packet sizes
3. Values in Italic indicate that max throughput was reached without maxing out CPU, but because board interface configuration was maxed out
4. Test results show device maximum performance, and are reached using mentioned hardware and software configuration, different configurations most likely will result in lower results

RouterBOARD naming

- Series name, hEX PoE
- <board name> <board features>-<built-in wireless> <wireless card features>-<connector type>-<enclosure type>, RB960PGS
- 9 - series, 6 ports, P - power, G - Gigabit, S - SFP

Wireless systems



Note: line of sight, interference, alignment, weather and other outside factors will affect the wireless link performance and possible distance

Disc Lite5

- 5GHz antenna
- 21dBi, 802.11n 300Mbps
- Power supply, PoE and mounting included
- For CPE and PtP links
- RouterOS inside
- Recommended price $48

SXT Lite2, SXT Lite5

- 2GHz, 10 dBi
- 5GHz, 16, dBi
- 300Mbps, 802.11n
- CPE device
- All included in a box
- RouterOS inside

LHG 5

- 5GHz, 24.5 dBi
- 300Mbps, 802.11n
- CPE device
- All included
- RouterOS inside

SXT Lite5 ac

- 5GHz, 16 dBi, 28 beam width
- 867Mbps, 802.11ac
- CPE device
- RouterOS inside

SXT 2, SXT 5

- 2GHz, 10 dBI, 60 degrees
- 5GHz, 16dBi, 60 degrees
- 300Mbps 802.11n
- CPE device
- 1250mW

SXT 6

- 6GHz, 16 dBi, 28 degree
- 300Mbps, 802.11n
- Access Point

Groove 52 ac

- 5GHz, attach your antenna
- Omni antenna is included
- 433Mbps, 802.11ac
- CPE device
- Gigabit Ethernet

SXT LTE

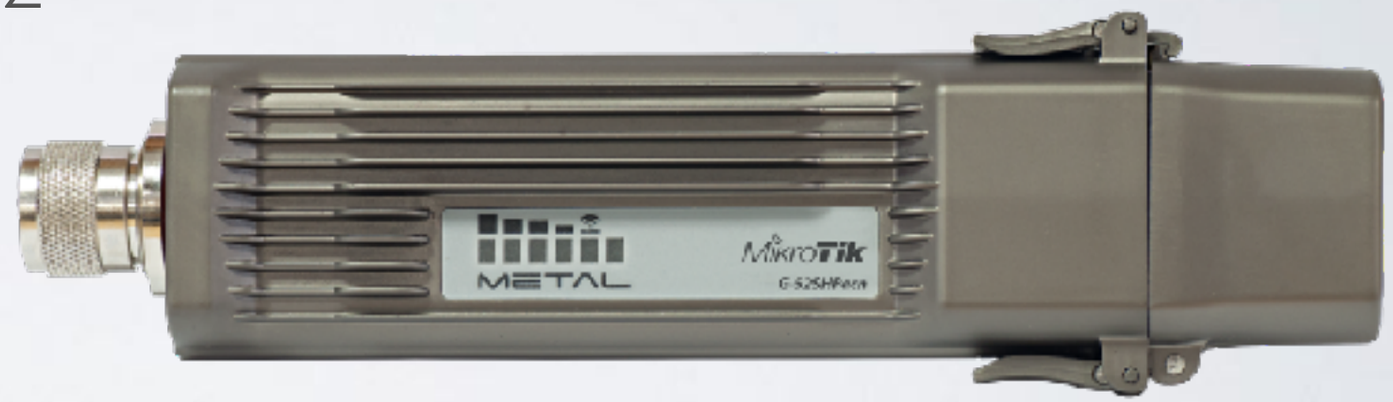
- LTE modem 3/7 and antenna
- miniSIM slot
- 100Mbps port

Basebox 2, Basebox 5

- 2GHz, SMA connectors
- 5GHz, RPSMA connectors
- 1000mW
- Access Point
- minipci-e port

Metal 52 ac

- Selection of 2GHz or 5GHz
- 433Mbps, 802.11ac
- 1300mW
- N-male connector
- Access Point device
- 6dBi omni antenna included



QRT 2, QRT 5

- 2GHz, 17 dBi, 3166mW
- 5GHz, 24 dBi, 1000mW
- 300Mbps, 802.11n
- Access Point
- 1 Gigabit interface
- QRT 5 ac is available

Dynadish 5

- 5GHz, 25 dBi
- 867Mbps 802.11ac
- CPE

NetMetal 5

- 5GHz,
- 867 or 1300Mbps, 802.11ac
- Access Point
- One SFP port
- RP-SMA connectors

mANTBox 15s, mANTBox 19s

- 5GHz
- 15s, 15dBi, 31dBm, 120 degrees
- 19s, 19dBi, 31dBm, 120 degrees
- Access Point
- RouterOS inside

Omnitik 5 ac, Omnitik 5 ac PoE

- 5GHz, 7.5 dBi, 1300mW
- 867Mbps, 802.11ac
- Access Point
- 5 Gigabit ports
- model with 4 PoE-out ports

LDF 5

- Built-in antenna to be installed on offset dish
- 100cm dish amplification 33dBi
- CPE
- 300Mbps, 802.11n

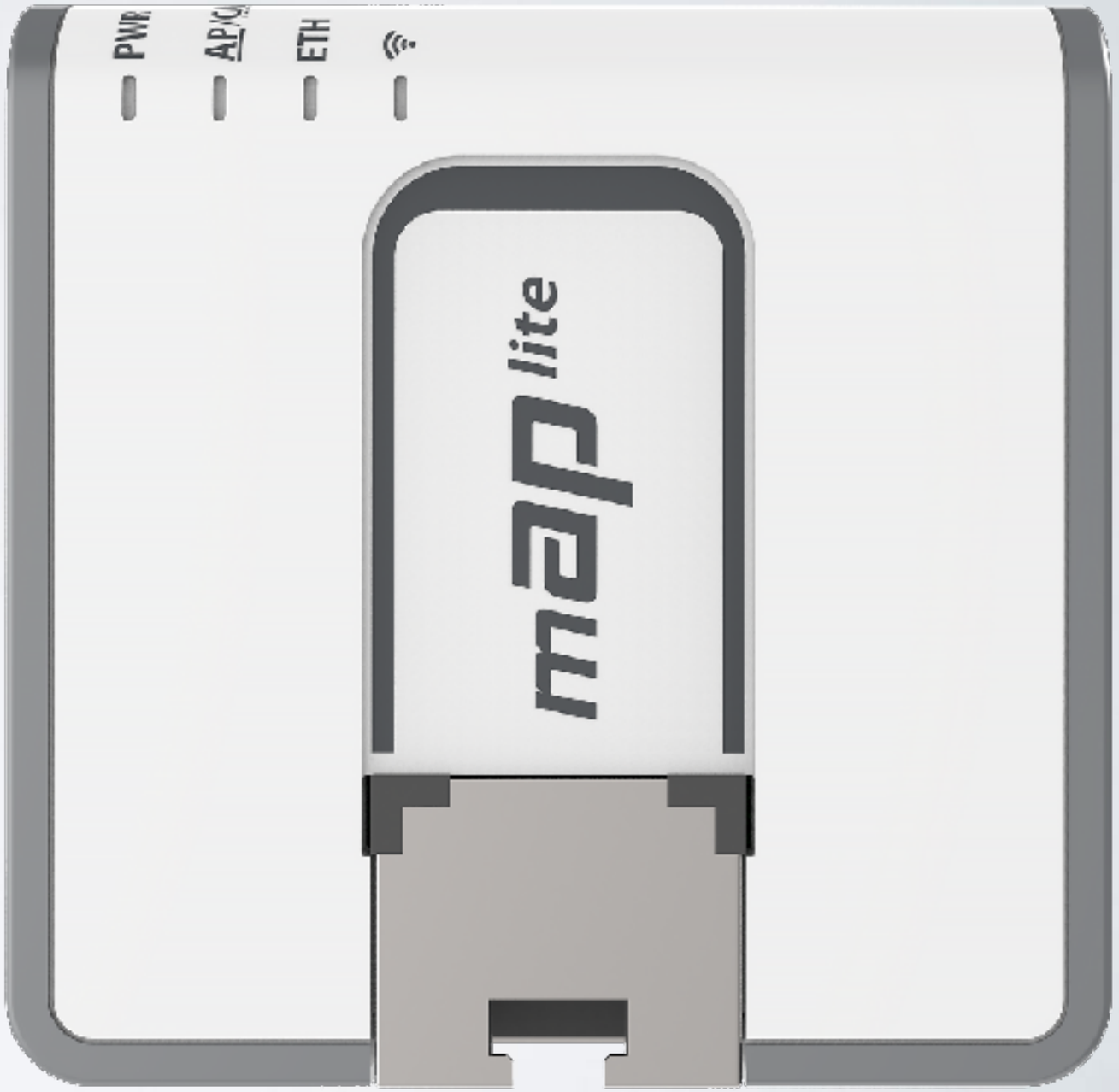
Wireless for home and office

hAP lite

- 2.4 GHz, access point
- USB power supply
- WPS support
- 300Mbps, 802.11n
- 4 Fast Ethernet ports

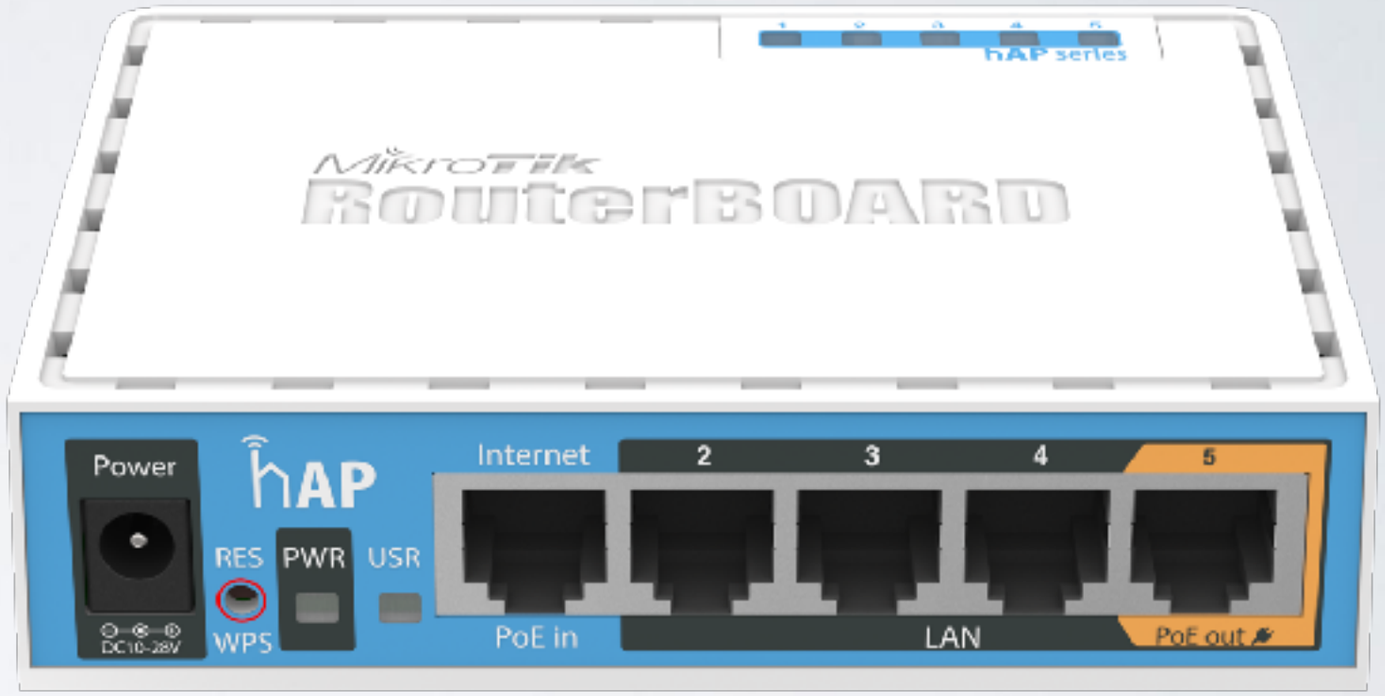
mAP lite

- Smallest AP
- 2.4GHz, 1.5 antenna gain
- 300Mbps, 802.11n



hAP

- 2.4GHz
- Access Point
- 5 Fast Ethernet ports
- PoE-out on 5 port
- USB port for 3G/4G



wAP, wAP AC

- 2.4 GHz AP
- 2.4/5GHz AP
- 802.11b/g/n and ac
- Weatherproof AP

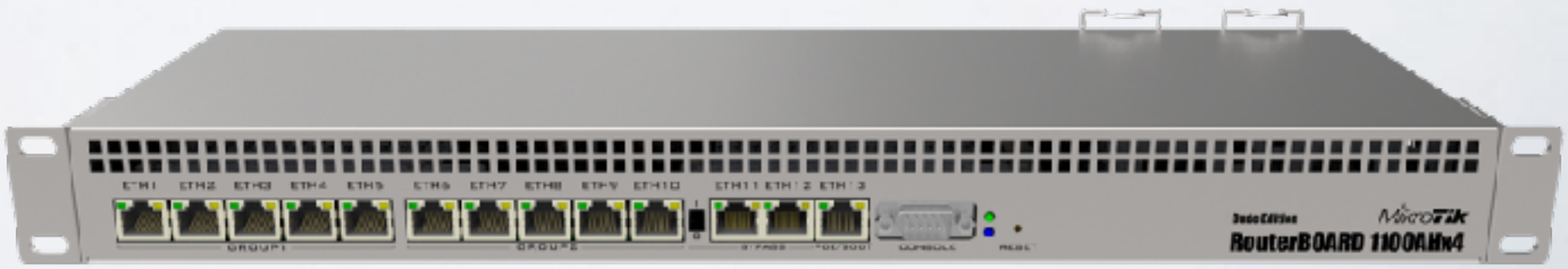
hAP ac lite

- 2.4GHz and 5GHz Access Point
- 867Mbps and 433Mbps
- USB port
- 5 Fast Ethernet ports

hAP AC

- 2.4GHz and 5GHz AP
- 1300Mbps
- USB
- SFP port
- 5 Gigabit ports

Ethernet routers

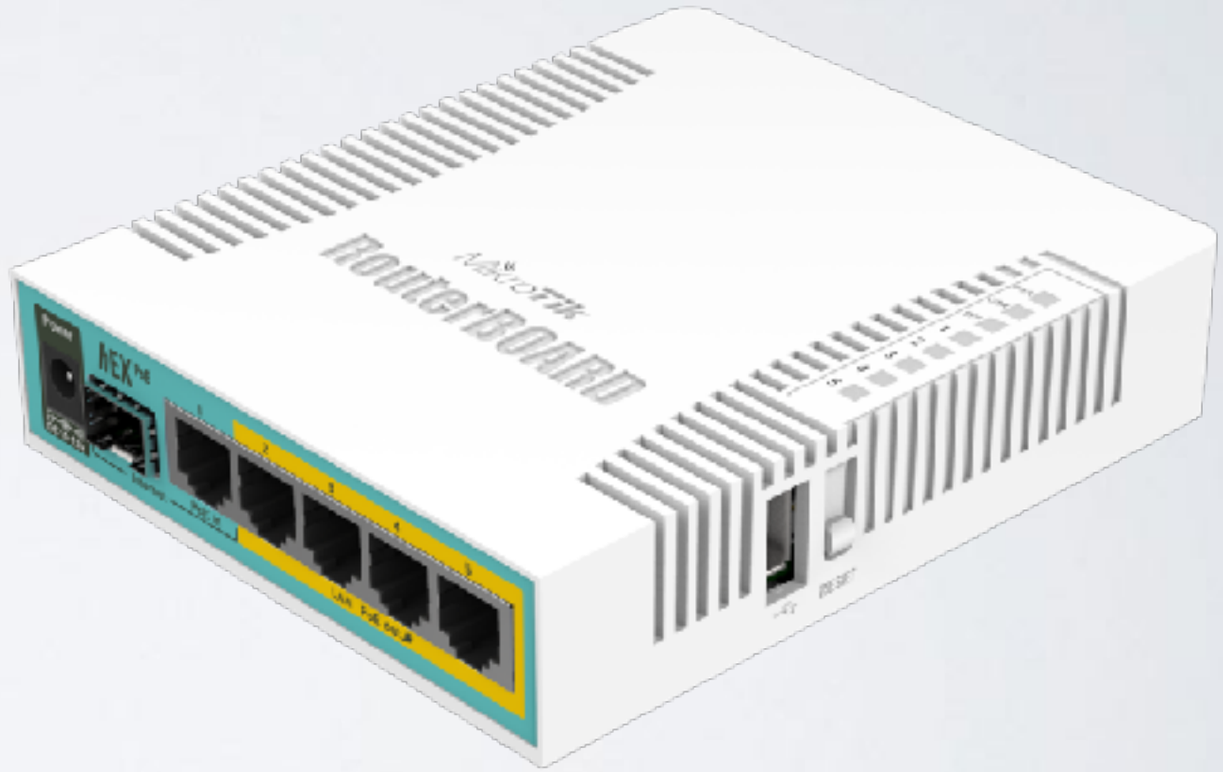


hEX

- 5 Gigabit ports
- 880MHz dual core
- 1980Mbps throughput
- IPSec acceleration, 500Mbps
- Very affordable

hEX PoE

- 5 Gigabit ports
- PoE out on 2-5, 802.3 af/at
- 1A per port
- CPU 800MHz
- SFP port

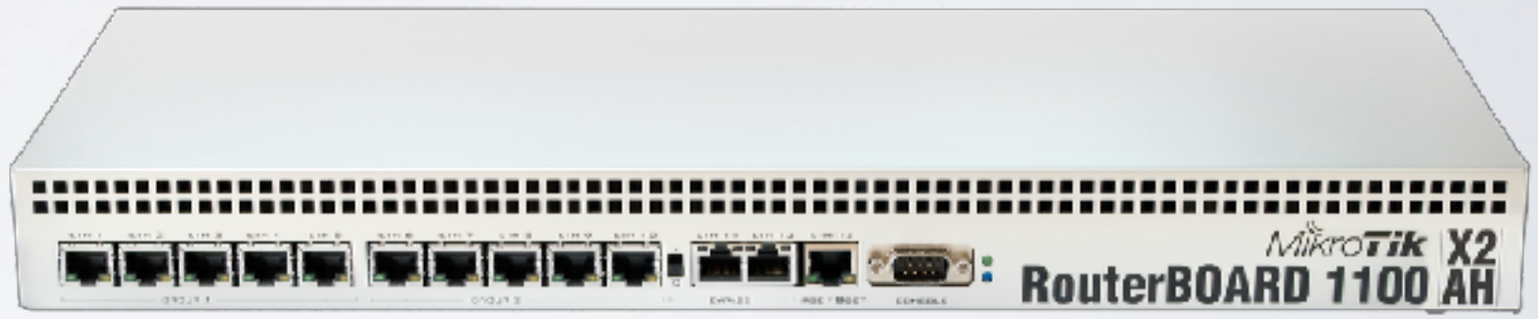


RB2011

- Desktop and rackmount
- 5 Gigabit ports
- 5 Fast Ethernet ports
- SFP port
- LCD panel
- USB port

RB1100AHx2

- CPU 1GHz, Dual core
- 13 Gigabit ports
- Extreme performance
- IPSec acceleration 800Mbps



CCR boards

9 cores

16 cores

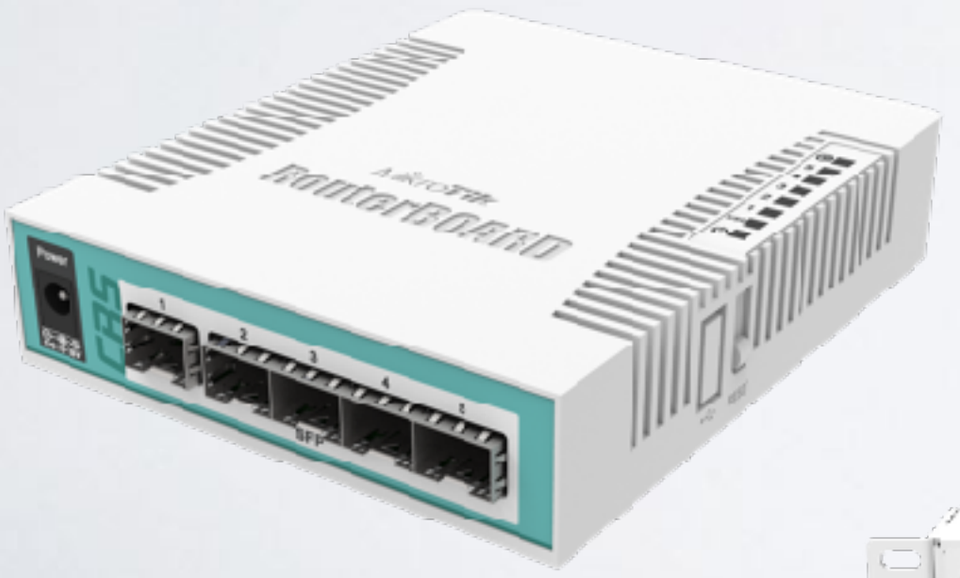
36 cores

72 cores

CCR boards

- The most powerful boards
- Up to 80Gbps of traffic
- Ethernet/SFP ports
- 1Gigabit, 10 Gigabit ports
- Desktop and rackmount
- Passive cooling option
- IPSec acceleration

Switches

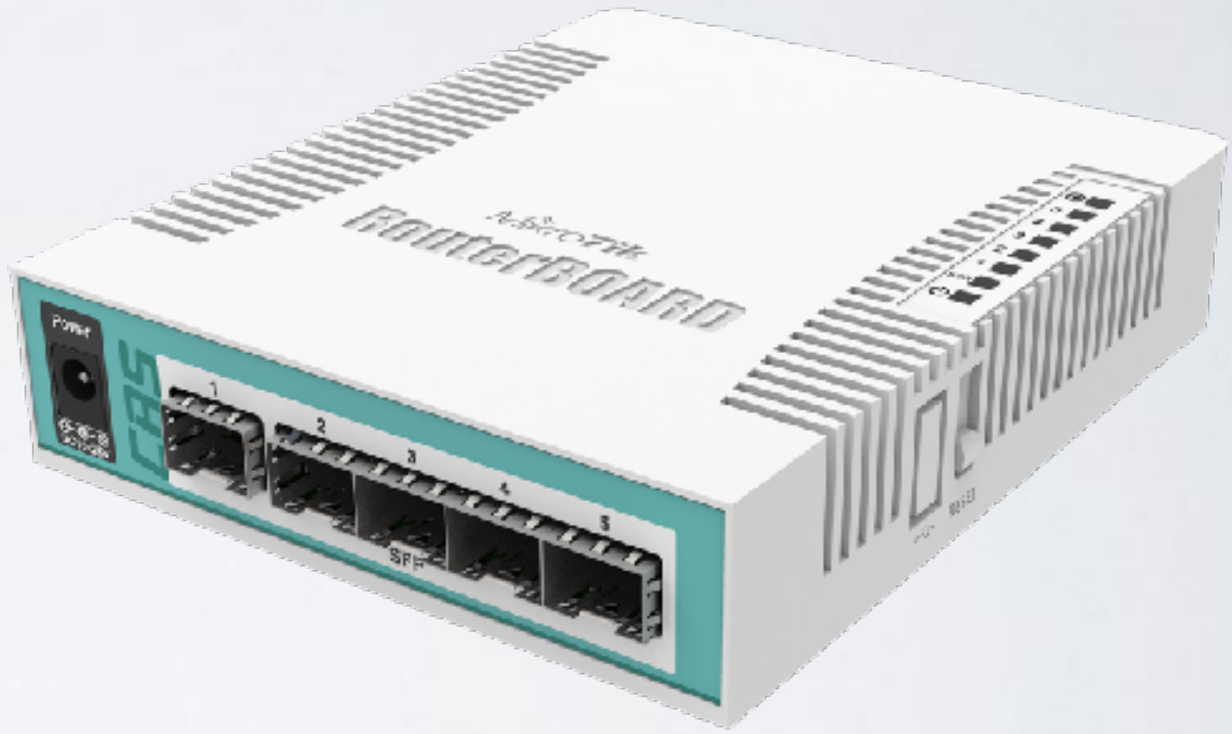

RouterBOARD
Power
CRS

Cloud Router Switch
MikroTik

MikroTik
Cloud Router Switch

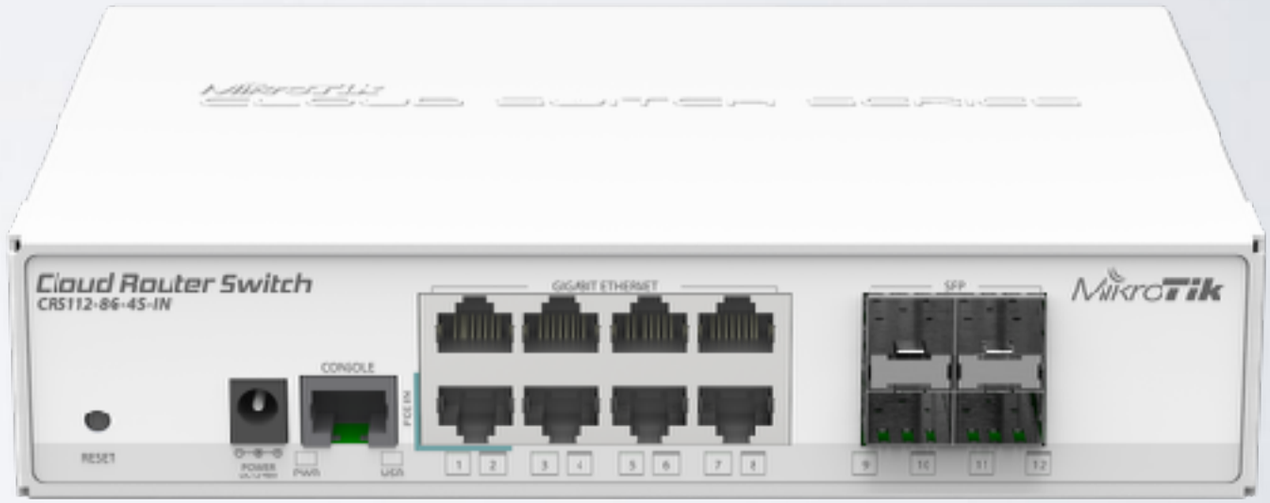
CRS106-1C-5S

- Desktop size switch
- 400MHz CPU
- RouterOS inside, L3 features
- 5 SFP ports, 1 combo port
- Wire speed on switching



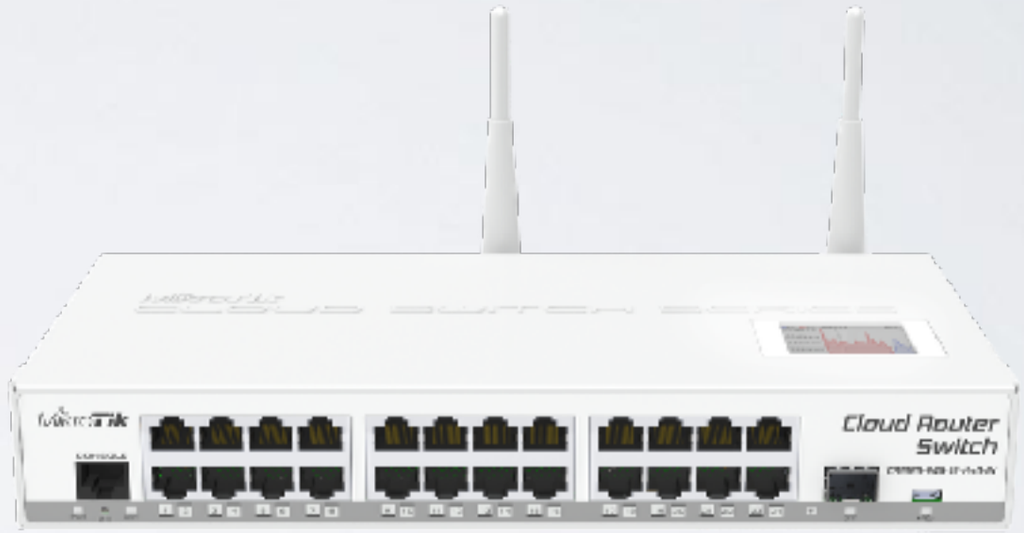
CRS112-8G-4S-IN

- Desktop size switch
- 400MHz
- 8 Gigabit ports
- 4 SFP ports
- Wire speed on switching



CRS125

- Desktop and rackmount
- 600MHz
- 24 Gigabit ports
- 1 SFP port
- Model with wireless interface



CRS-212-1G-10S-1+IN

- Desktop switch
- 10SFP ports
- 1SFP+ port
- 1 Gigabit port
- L3 features

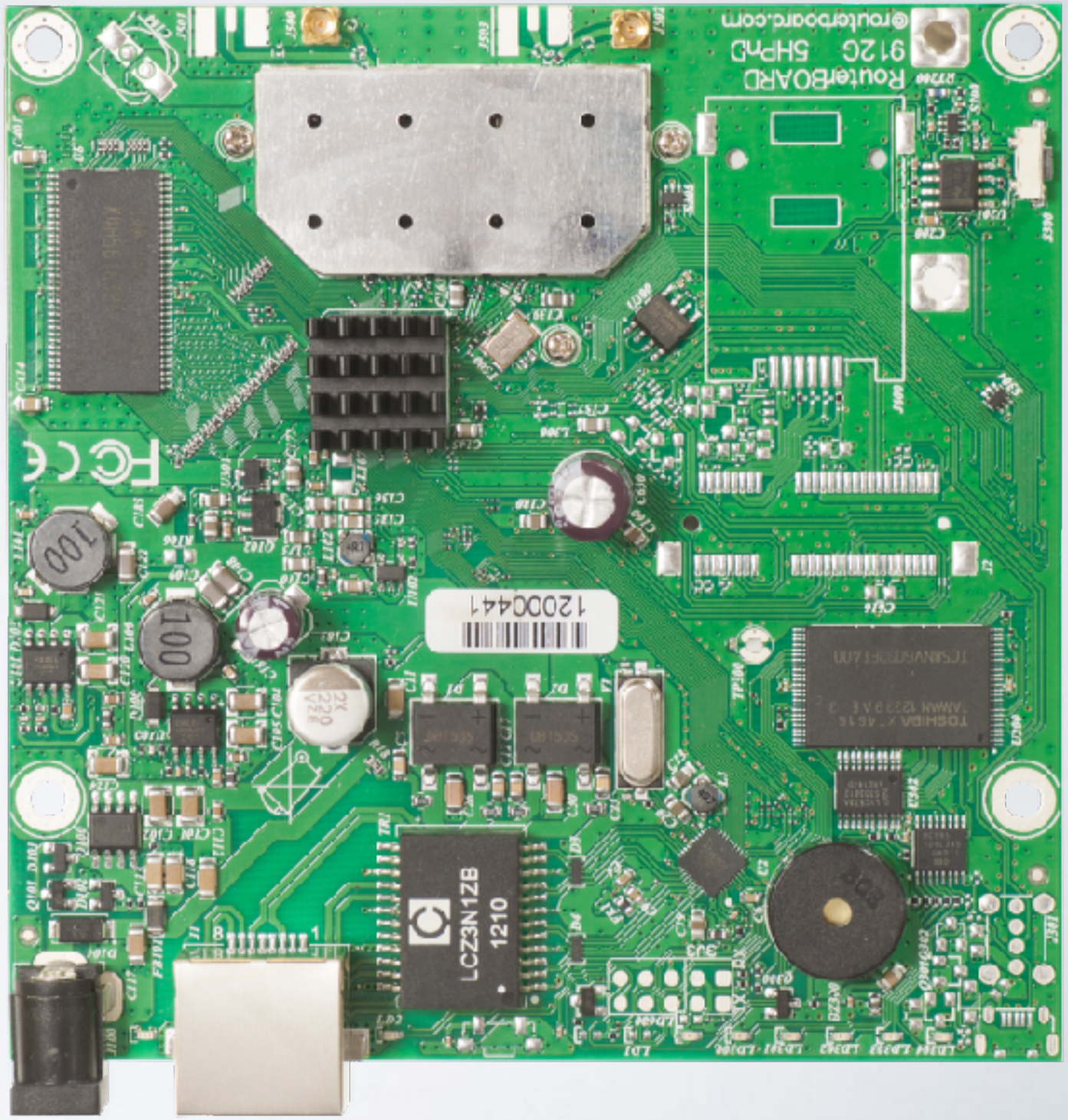
CRS226-24G-2S+RM

- Rackmount switch
- 24 Gigabit ports
- 2 SFP ports
- L3 features
- Wire speed on switching

RouterBOARDs

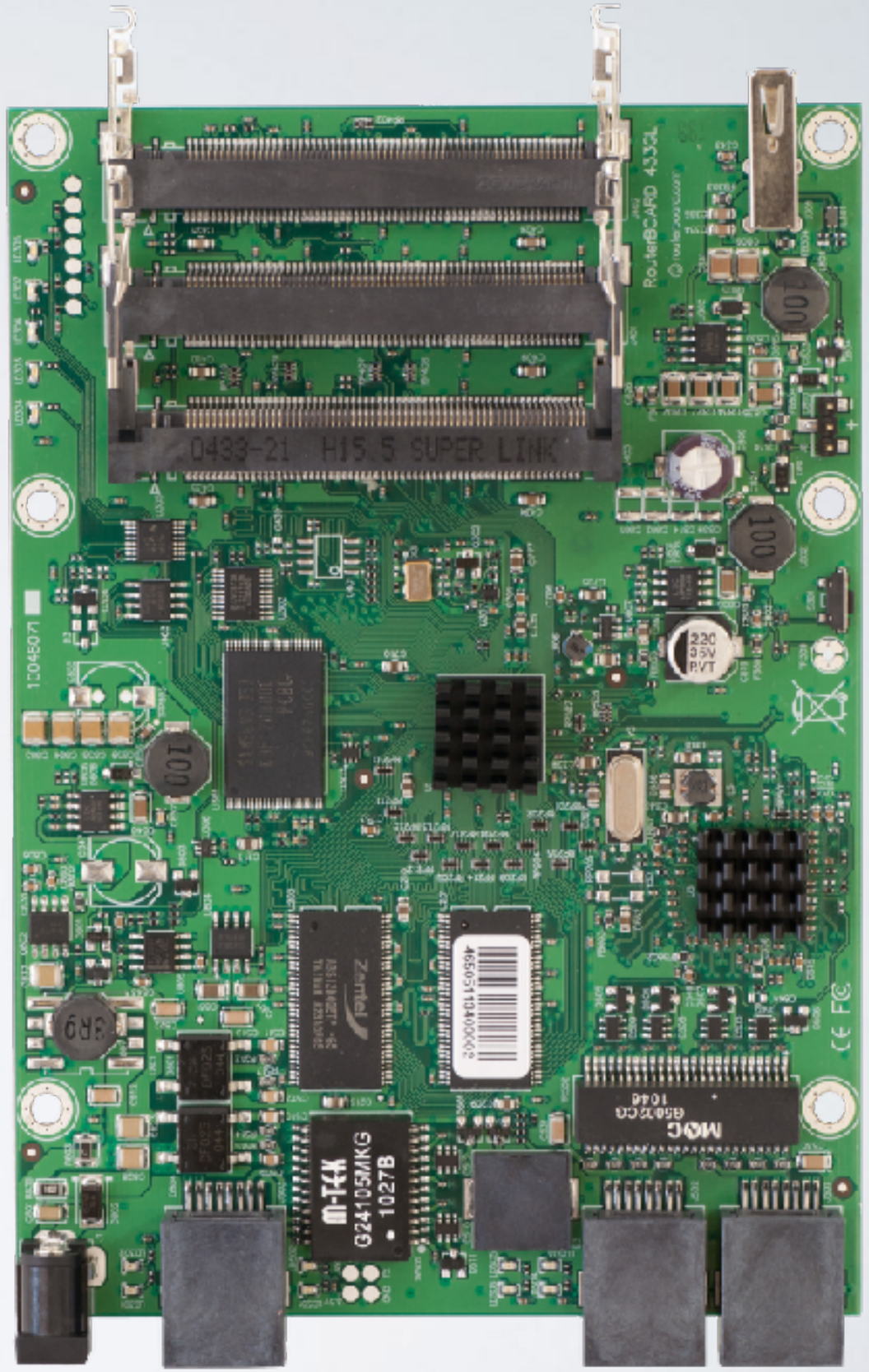
911 series

- Make your own case
- Various number of models
- Wireless interface
- minipci-e
- USB



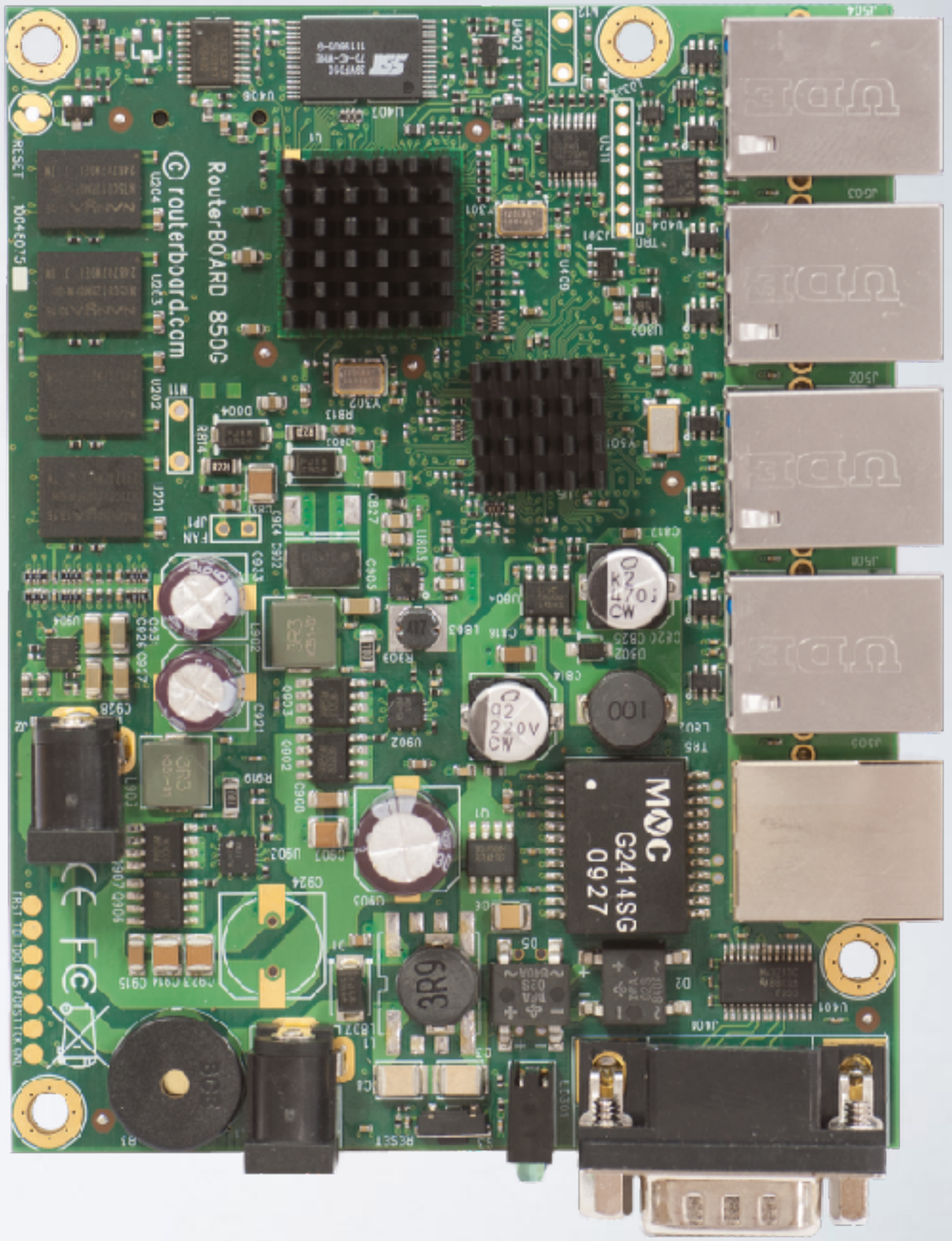
433 series

- 3 Gigabit ports
- 3 wireless miniPCI interfaces
- Other features



RB850Gx2

- Dual core CPU
- 5 Gigabit ports
- Small and fast router



Antennas and interfaces

mANT 30

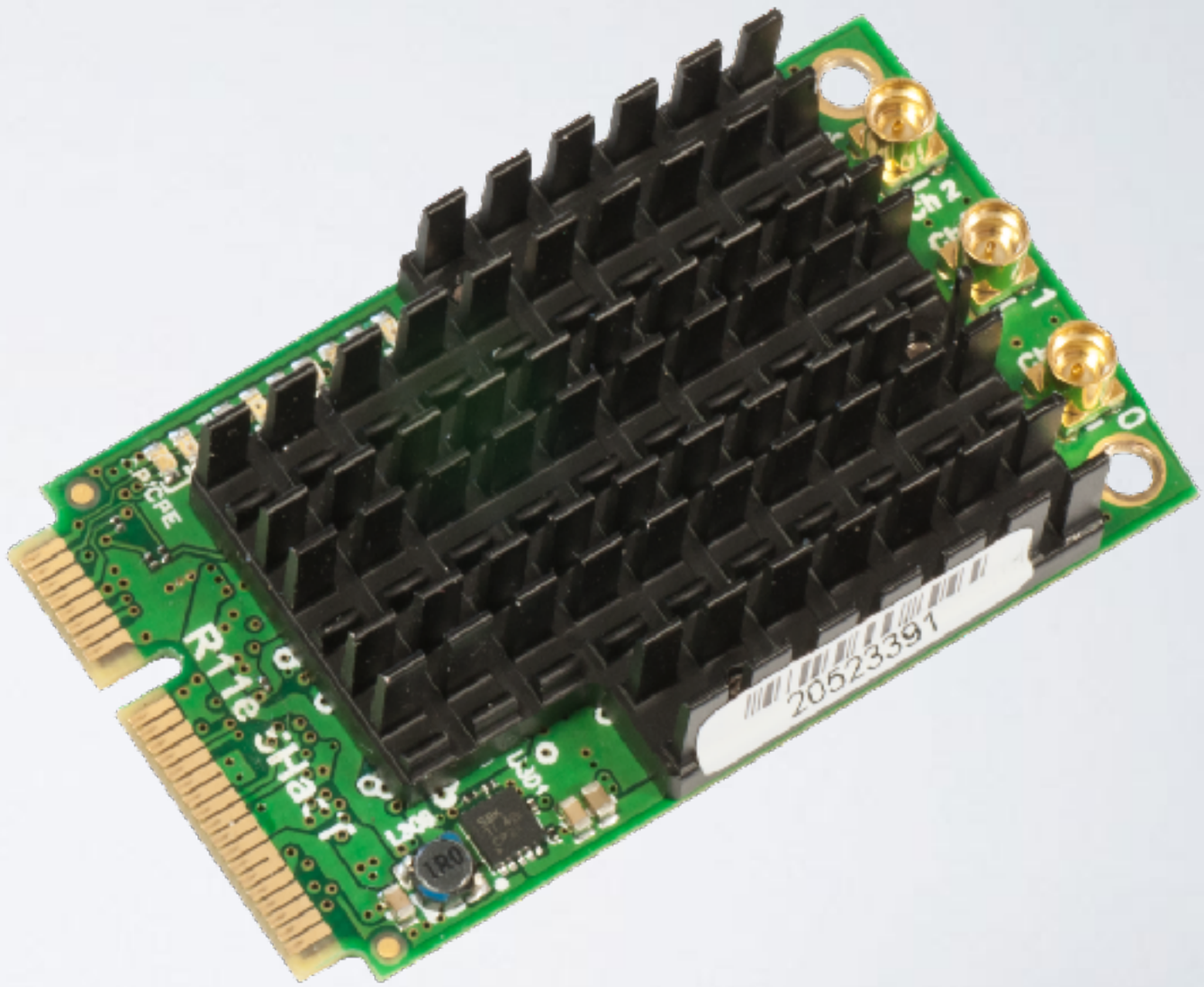
- 5GHz 30 dBi antenna
- For Basebox or any other
- For very long range wireless links

SFP modules

- Different kinds of SPF modules
- Singlemode/multimode
- 1.25G, 10G
- Short and long range

Wireless cards

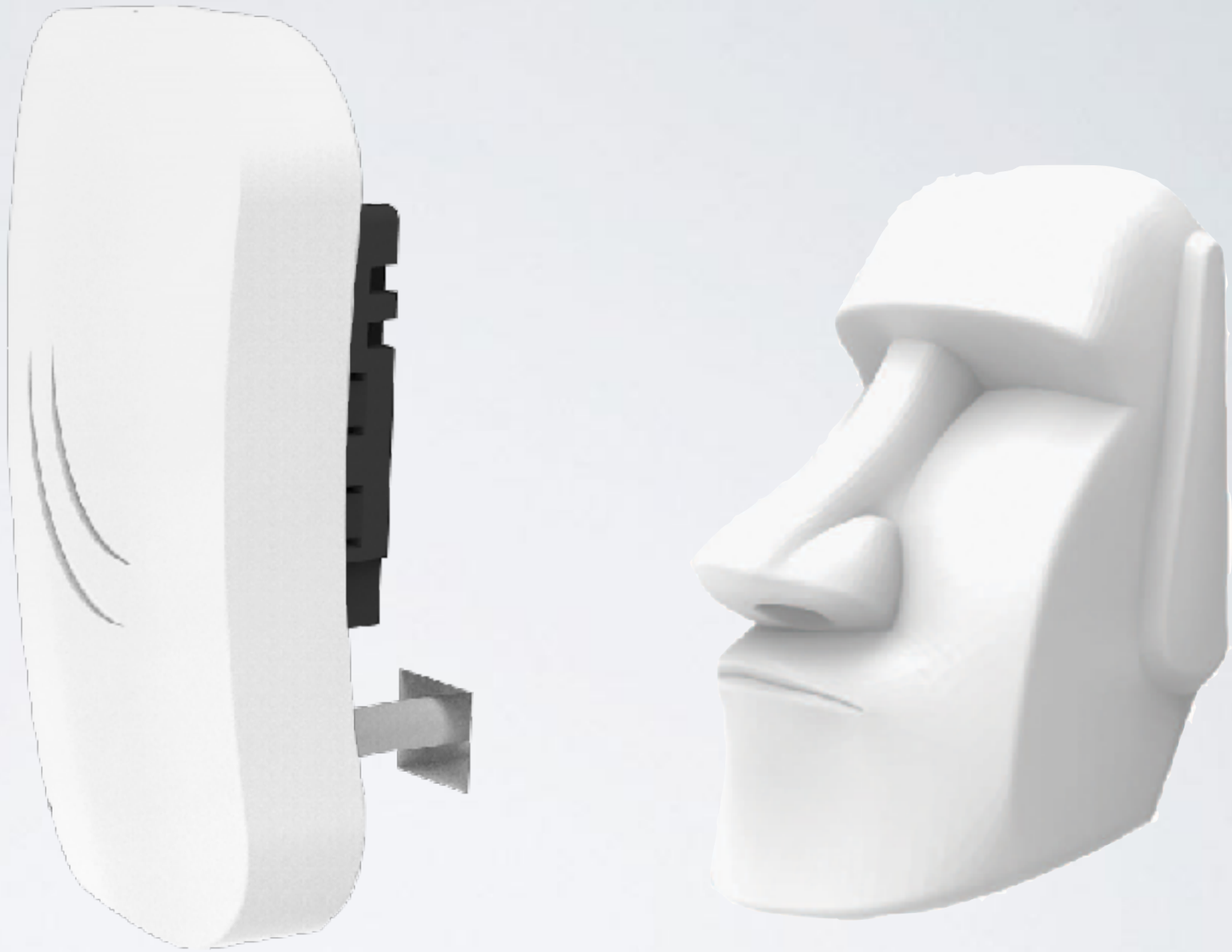
- 2GHz and 5GHz
- miniPCI, minipci-e
- Different power range
- 802.11n and 802.11ac

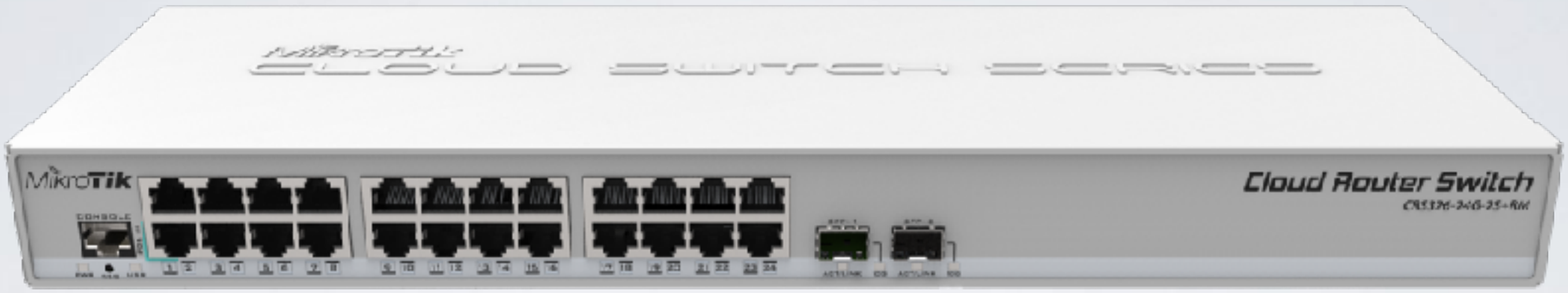


New products

cAP lite

- Small and light 2.4GHz AP
- Case can be changed
- Print your own cases
- Perfect for hotel, public areas and extending networks in your house



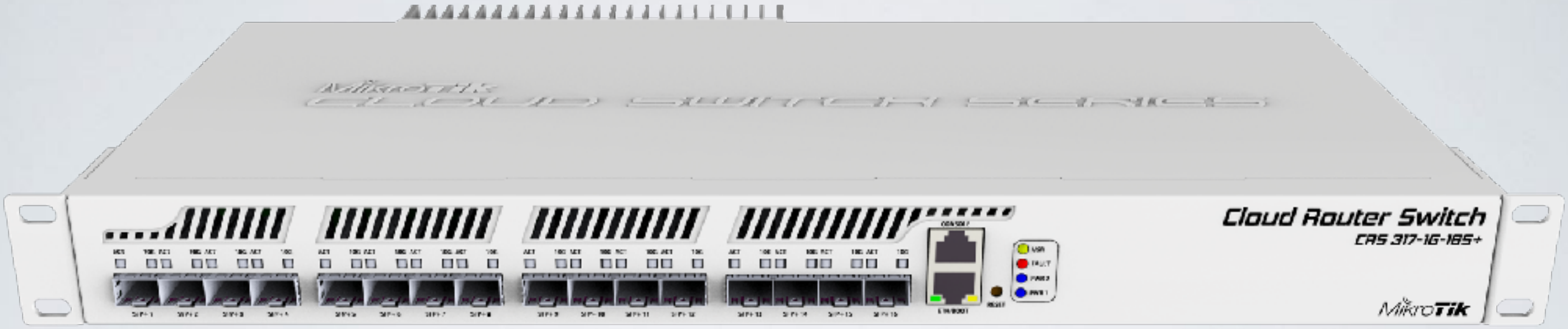


CRS326-24G-2S+RM

Multiport dual boot RouterOS/SwOS switch

DynaDish 6 and SXT 6

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



CRS317-1G-16S+

high performance SFP+ switch

CRS317-1G-16S+

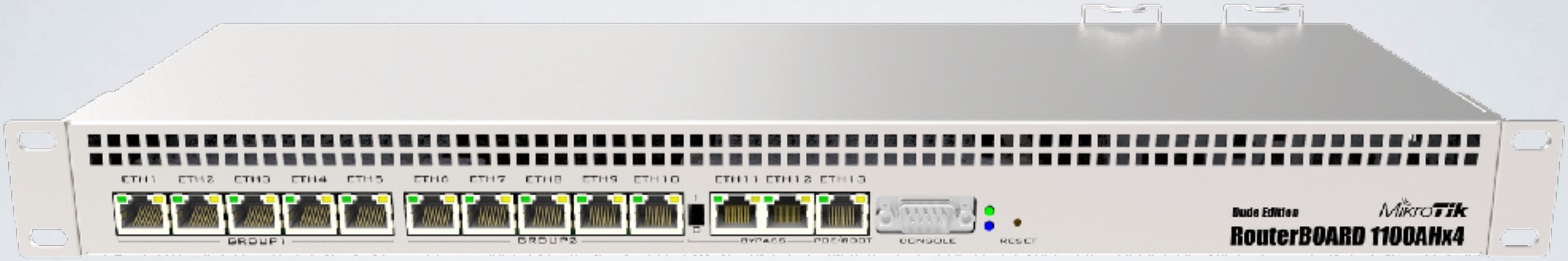
- 16 SFP+ ports
- Next generation switching chip
- Wire speed for all 10GbE ports
- Hardware-based Spanning Tree Protocol
- Dual boot SwOS or RouterOS

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

hAP mini

- Tiny 2GHz AP with three ports
- Upright design in new colours
- Only 8cm tall
- Two LAN ports, one WAN
- Configure differently if needed

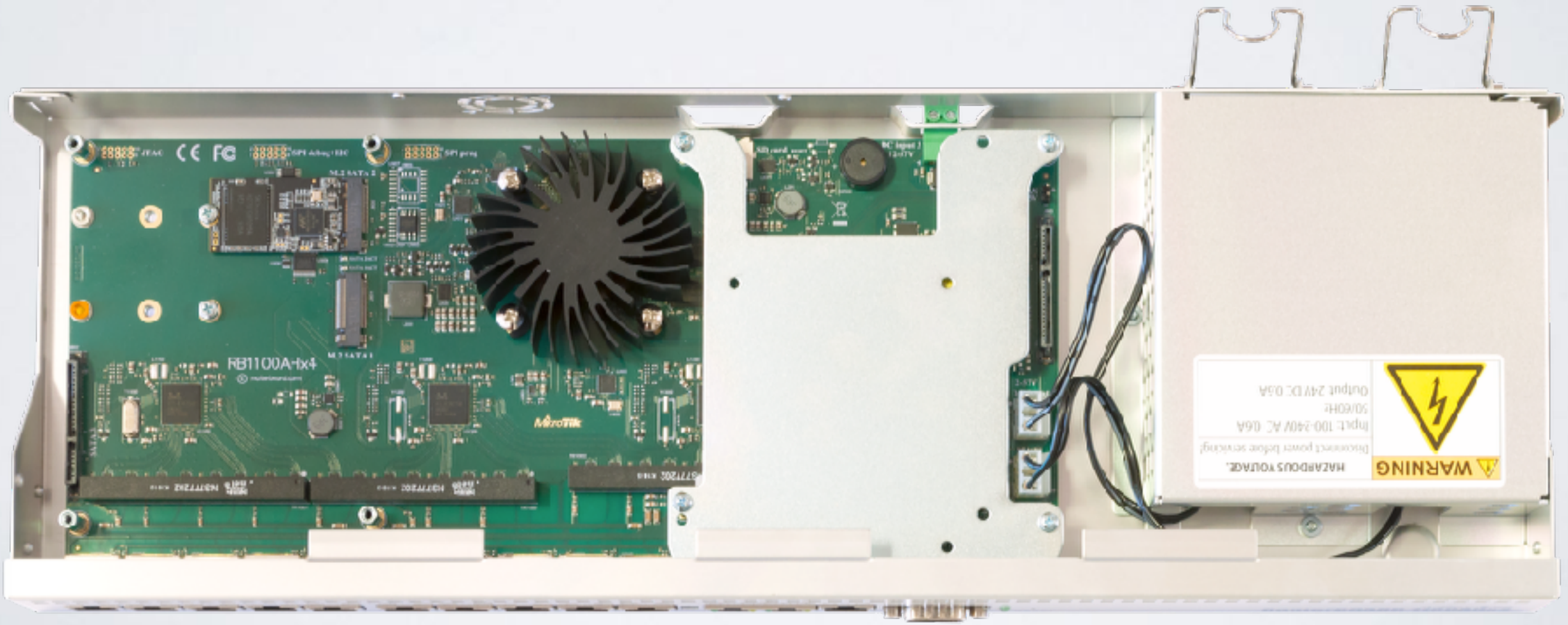


RB1100AHx4

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
- 60GB SSD included
- Accelerated IPsec
- -48V DC telecom power
- Dual PSU



- 5.5 million PPS
- 7.5Gbps
- IPsec up to 2.2Gbps with AES128
- Overclock up to 2GHz

Two editions

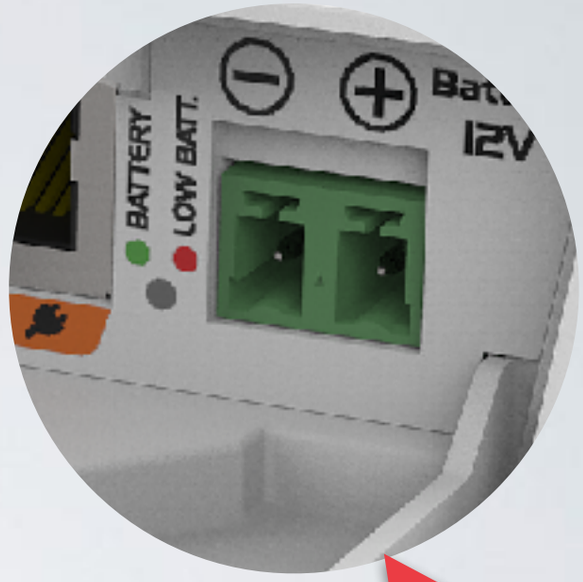
- **RB1100AHx4**
- **RB1100AHx4 Dude edition**
  includes 2x M.2 and 2x SATA3 ports

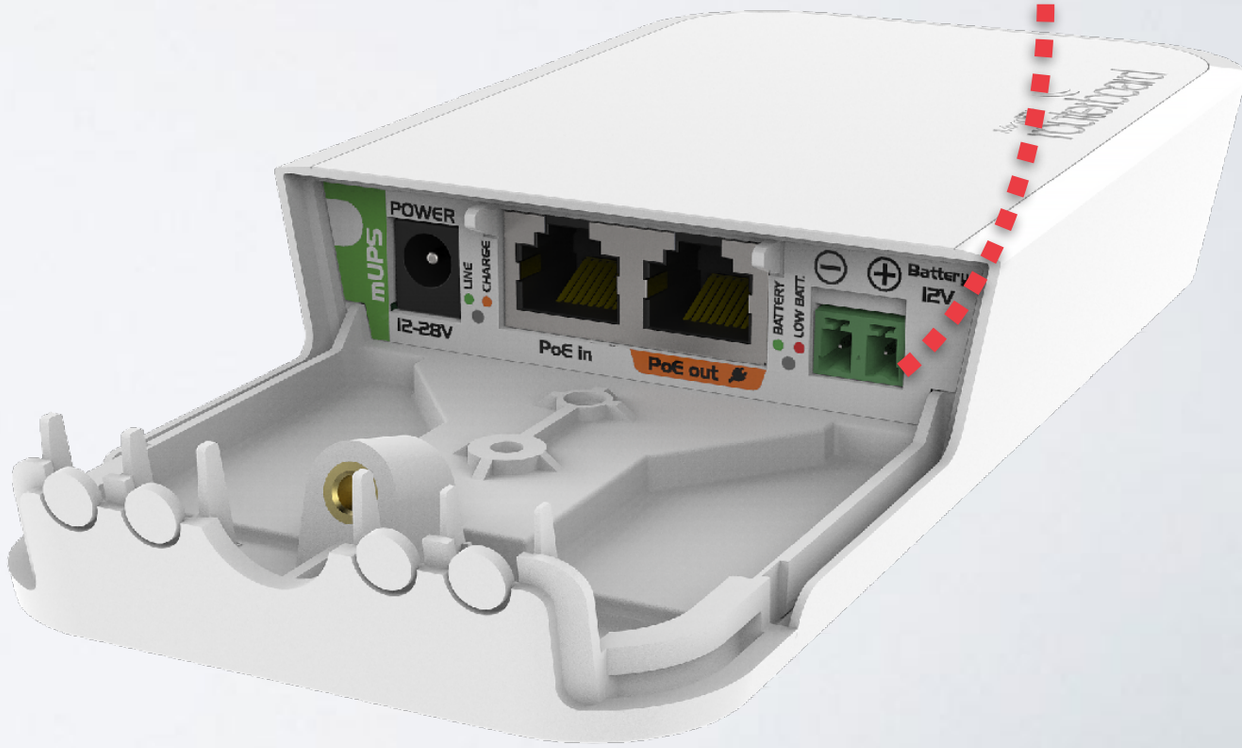
PowerBox Pro

- Gigabit ethernet ports
- PoE output for your CPEs
- Same as hEX PoE
- Supports 802.3af/at
- SFP for fiber to the tower (FttT)
- Improved design

mUPS

- Just like a smart PoE injector
- Battery connector for 12V batteries (external)
- Battery kicks in when power is lost
- Step up converter keeps device going even if the voltage differs
- Can charge and monitor





LtAP mini

- 2.4GHz AP in a rugged case
- miniPCIe for LTE (2x SIM)
- Built in GPS
- Serial port for other devices
- Perfect for cars or outdoor mobile applications

MikroTik
M
R

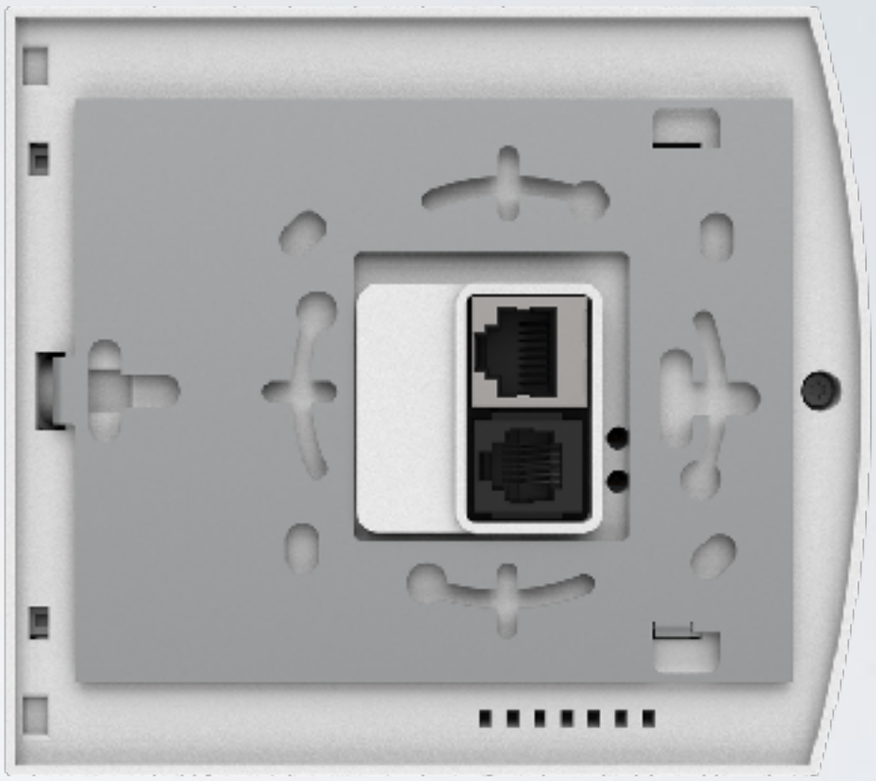
LtAP

- 2x miniPCIe
- Built in 2.4GHz AP
- MMIPS Mediatek CPU 880MHz
- 2x MMCX connectors
- Built in GPS

routerboard

wsAP ac lite

- Mount into standard EU or US electrical sockets
- Dual band ac (2.4 and 5GHz)
- Phone jack passthrough
- Two LAN ports
- USB for charging cell phones

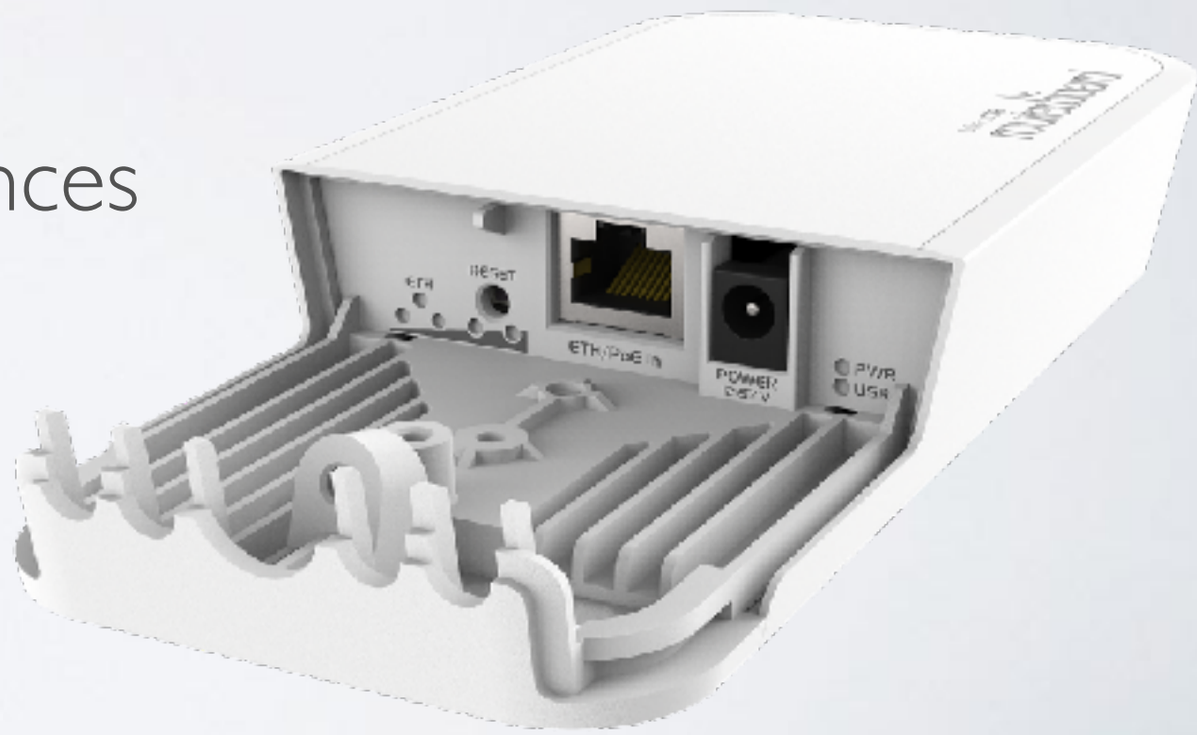


MikroTik

MikroTik

wAP 60G

- 1Gbit full duplex (wire speed)
- Works in 60GHz spectrum
- "Wireless wire" kit preconfigured
- Quad-core ARM CPU
- Targeted for up to 100m distances

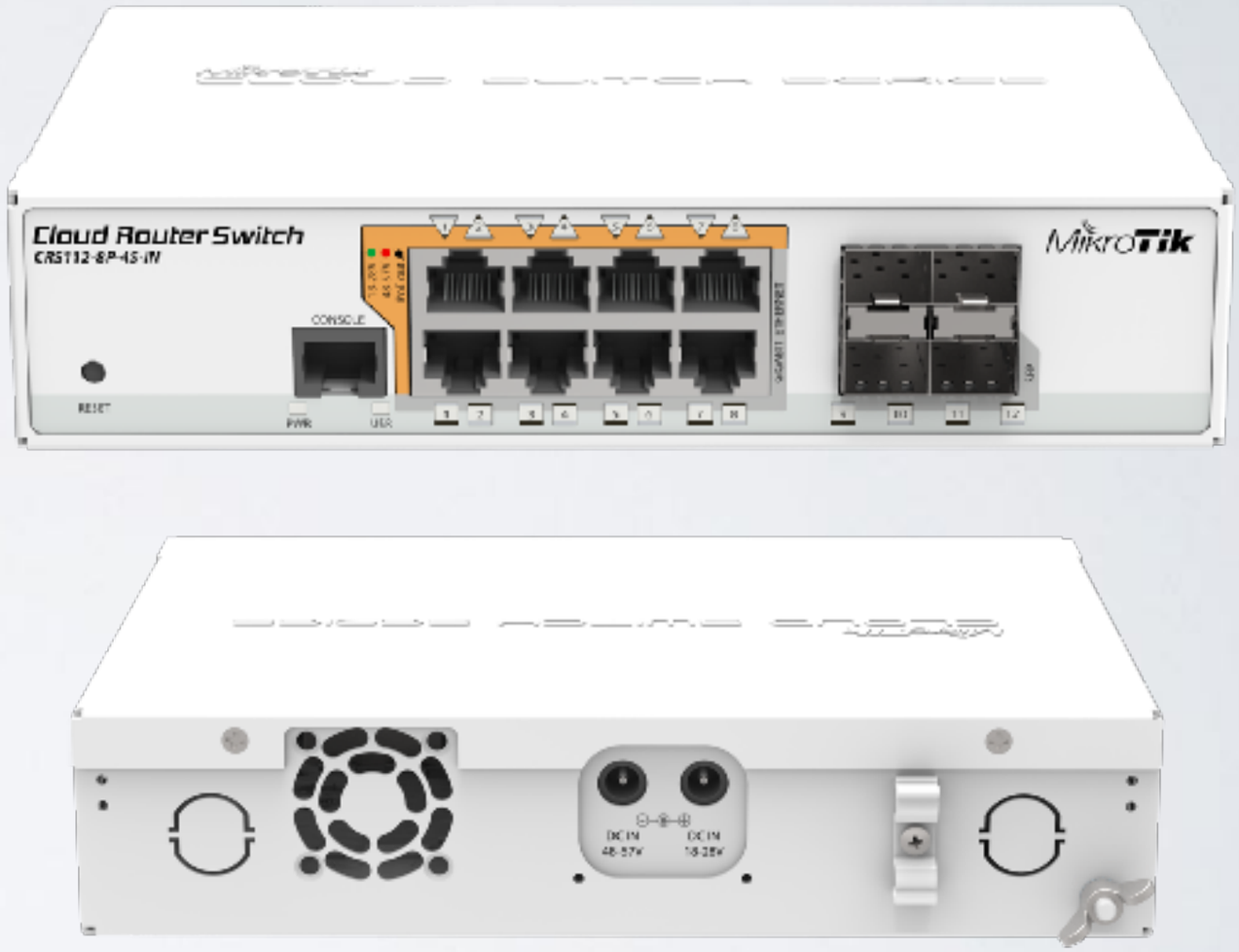


LHG 60G

- 1Gbit full duplex (wire speed)
- Works in 60GHz spectrum
- Familiar LHG design
- Quad-core ARM CPU
- Low cost and low weight
- Targeted for longer distances than100m

CRS112-8P-4S

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



CRS328-24P-4S+RM

PoE out switch

CRS328-24P-4S+RM

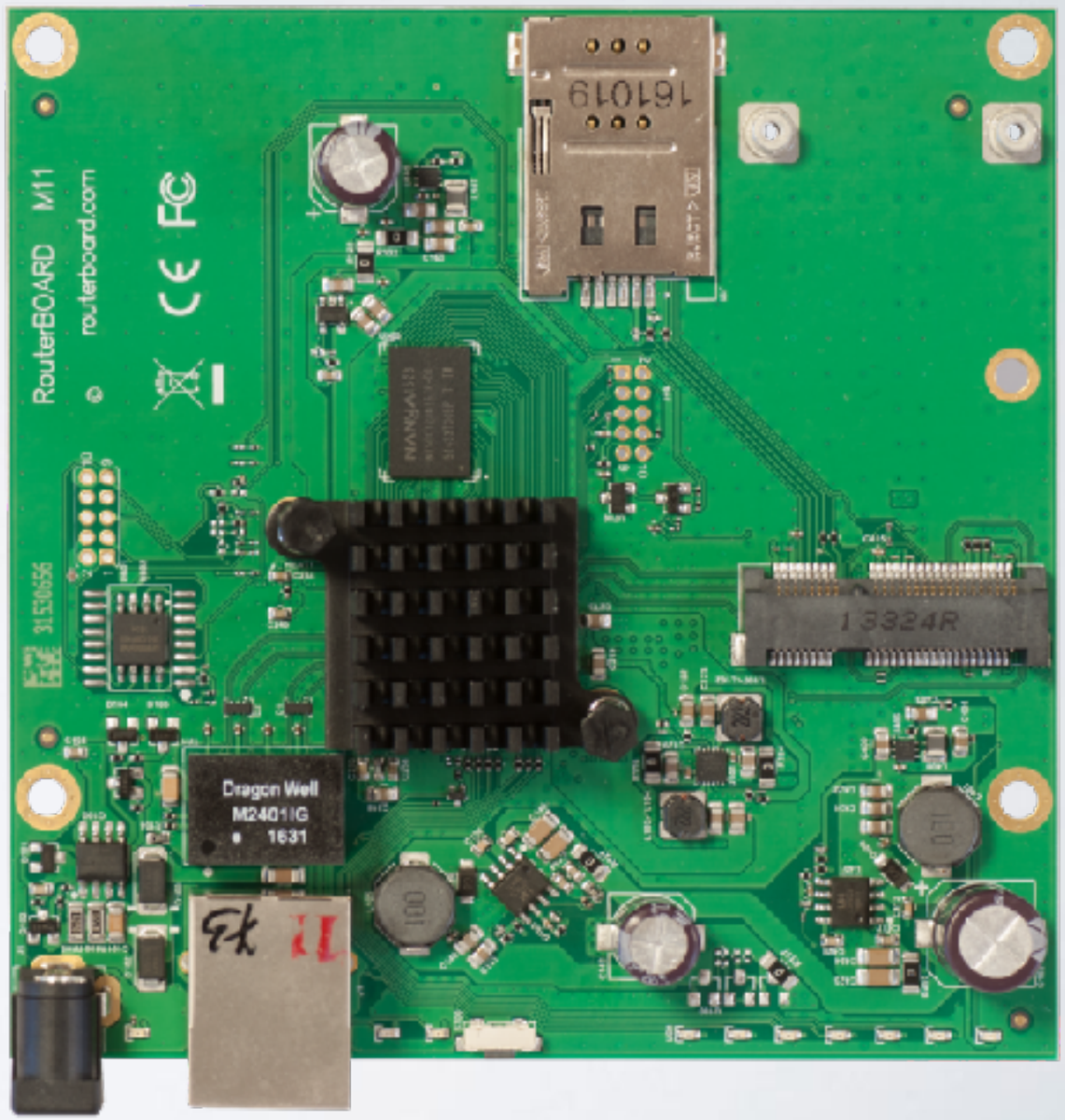
- Dual boot SwOS or RouterOS
- 24 ports with PoE out function
- Supports 802.3af/at output
- Per port auto detection of PoE standard
- Four SFP+ ports for 10GbE
- One 120/220V IEC connector

Woobm

- Wireless out of band management (Woobm)
- Plug into a device to have a new management AP
- Can work as client to use in CCR rackmounts

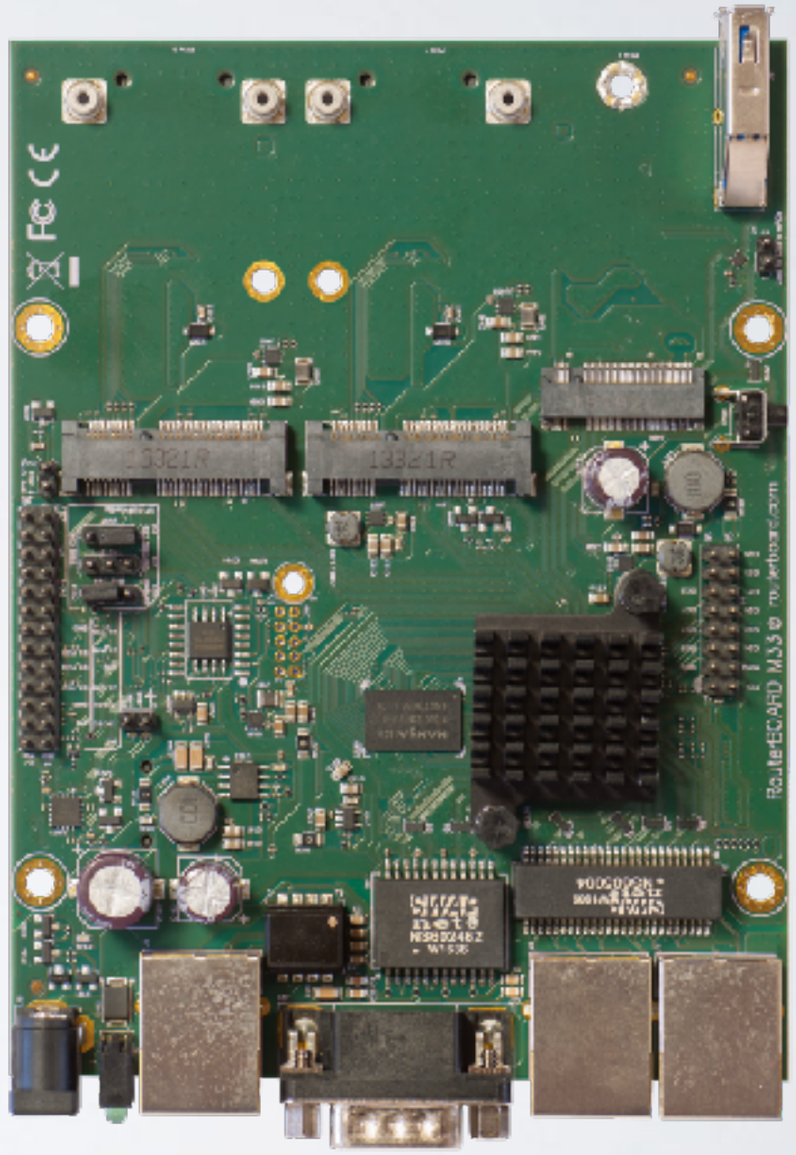
M11

- Four core 880MHz CPU
- 1 miniPCIe slot
- 1 Gigabit ethernet
- Upgrade for RB411



M33

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



All Products

- Include free software upgrades for life
- Run the same RouterOS software
- For more info see **routerboard.com**

ROUTEROS FEATURES

CHR

Cloud Hosted Router

- RouterOS version tailored for running in virtual environments
- Runs on VMware Workstation and ESXi, VirtualBox, HyperV, KVM, XenServer, etc.
- Cloud services - Amazon, Azure and others

CHR

Use cases

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

CHR

Licensing

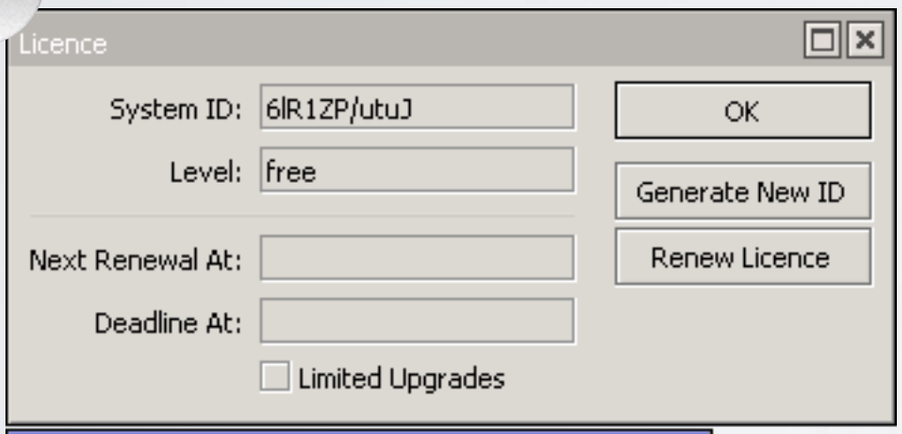
License	Speed limit	Price
Free	1Mbit	FREE
P1	1Gbit	US$45
P10	10Gbit	US$95
P-Unlimited	Unlimited	US$250

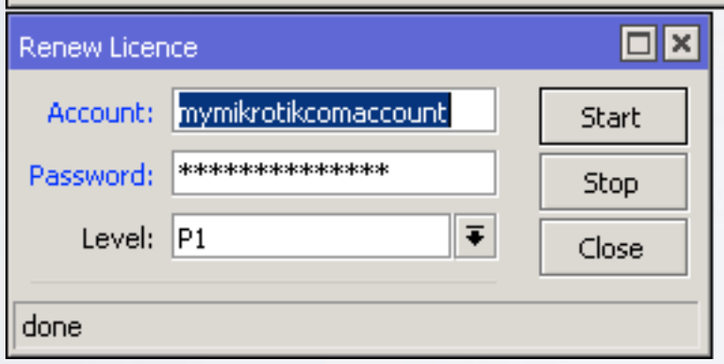
- 60 day trial available
- Purchased license can be transferred

CHR

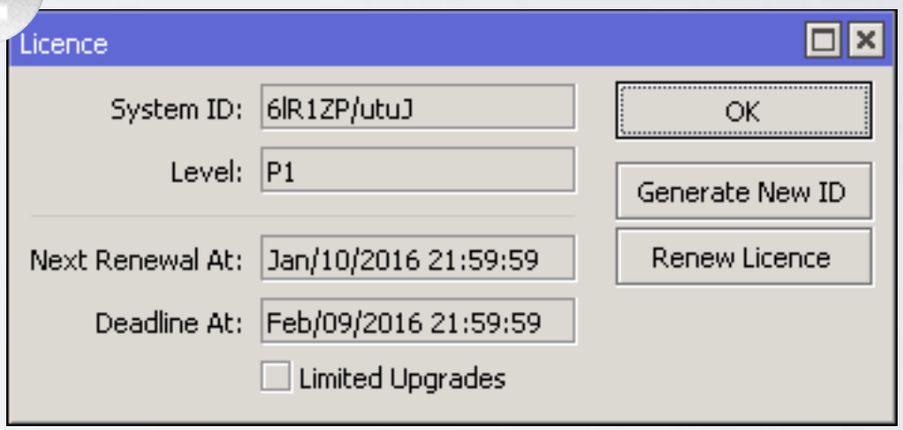
Licensing

1





2



WinBox → System → License

CHR

Cloud Hosted Router

- For more info, see the CHR page on our wiki: https://wiki.mikrotik.com/wiki/Manual:CHR
- Available on the download page: https://mikrotik.com/download#chr

Need help?

- Ask a local **distributor**
- Read the manual **wiki.mikrotik.com**
- Email **support@mikrotik.com**
- Hire a **consultant**
- Attend a training class or join an Academy class in a University

After the MUM

- All presentations - mum.mikrotik.com
- Video - youtube.com/mikrotik
- License will be added to your account

MikroTik