MikroTik 60GHz news

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60GHz 802.11ad

- Unlicensed band
- High attenuation helps avoiding radio interference
- To get higher gain very narrow radiation patterns are used
- Physically smaller antennas can provide high gain

60GHz 802.11AD

Comparsion with other available standards

- The highest wireless throughput compared to any MikroTik wireless device at the moment:

Band	TX	RX	TX+RX
2.4GHz dual chain	256Mbps	256Mbps	252Mbps
5GHz dual chain	560Mbps	561Mbps	570Mbps
60GHz single chain	1Gbps*	1Gbps*	2Gbps*

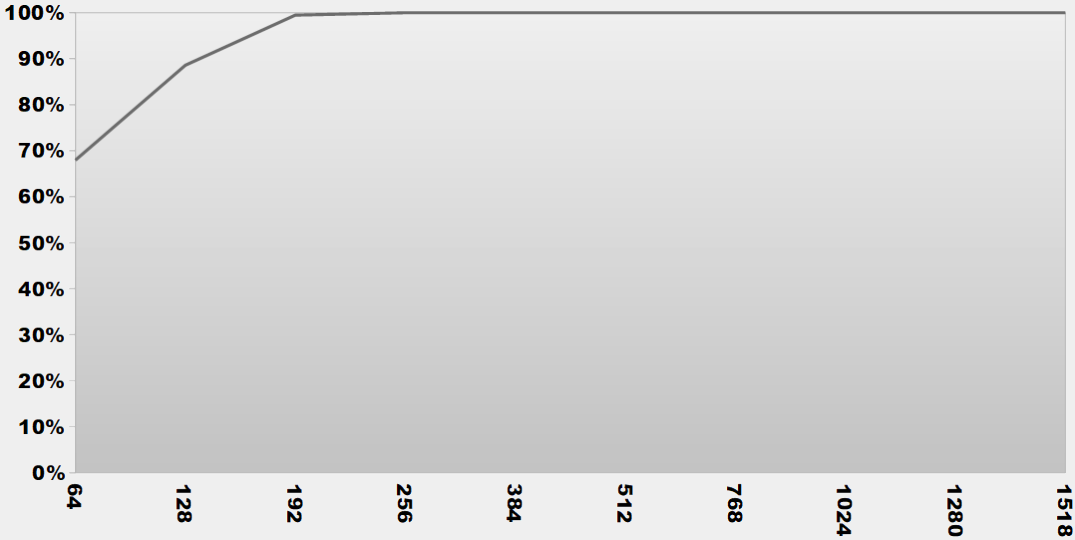
* Limited by Gigabit Ethernet interface

Comparsion with other available standards

Throughput (<0,1% loss)	Theoretical max		16 Streams both ways			4096 Streams both ways		
Frame size (bytes)	**kpps**	**Mbps**	**kpps**	**Mbps**	**%**	**kpps**	**Mbps**	**%**
64	2976,1	1 523,8	2022	1 035,3	**67,94**	1977	1 012,2	**66,43**
128	1689,2	1 729,7	1496,2	1 532,1	**88,57**	1612	1 650,7	**95,43**
192	1179,2	1 811,3	1173	1 801,7	**99,47**	1173	1 801,7	**99,47**
256	905,8	1 855,1	905,8	1 855,1	**100,00**	905,8	1 855,1	**100,00**
384	618,8	1 901,0	618,8	1 901,0	**100,00**	618,8	1 901,0	**100,00**
512	469,9	1 924,7	469,9	1 924,7	**100,00**	469,9	1 924,7	**100,00**
768	317,2	1 948,9	317,2	1 948,9	**100,00**	317,2	1 948,9	**100,00**
1024	239,4	1 961,2	239,4	1 961,2	**100,00**	239,4	1 961,2	**100,00**
1280	192,3	1 969,2	192,3	1 969,2	**100,00**	192,3	1 969,2	**100,00**
1518	162,5	1 973,4	162,5	1 973,4	**100,00**	162,5	1 973,4	**100,00**
TCP connection	181,6	1 970,6	181,6	1 970,6	**100,00**	181,6	1 970,6	**100,00**

Figure 2: Throughput test report

Comparsion with other available standards



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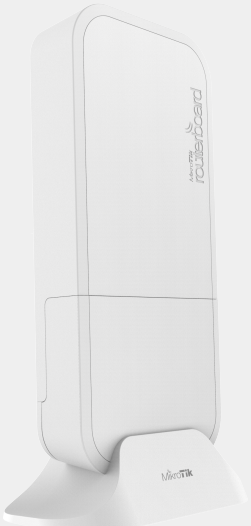
gure 3: Throughput compared to wired network

60GHz devices

Wireless Wire



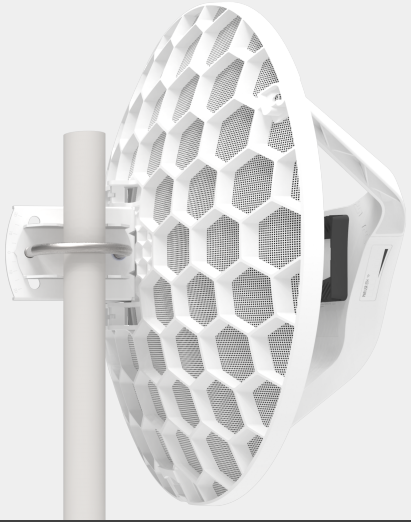
Wireless Wire:

- Pre-configured 60 GHz radio link (Plug and Play)
- 4 core CPU running at 716 MHz, 256 MB of RAM
- Only 5 W of maximum power consumption 802.11af/at
- Range of 200 meters or more
- Beamforming and PtMP support
- Channel bandwidth 2.16 GHz

Wireless Wire:

- Supports 5 frequency channels
- Total EIRP under 40 dBm
- 32 antenna elements
- Can be also used as CPEs in PtMP setups
- Price $198 for kit of two devices

Wireless Wire Dish



Wireless Wire Dish

Wireless Wire Dish:

- Recomended for distances up to 1500m+
- Antenna gain 42 dBi
- Total EIRP under 55dBm
- Can be used as CPEs in PtMP
- Price $298 for kit

SXTsq Lite60

SXTsqLite60:

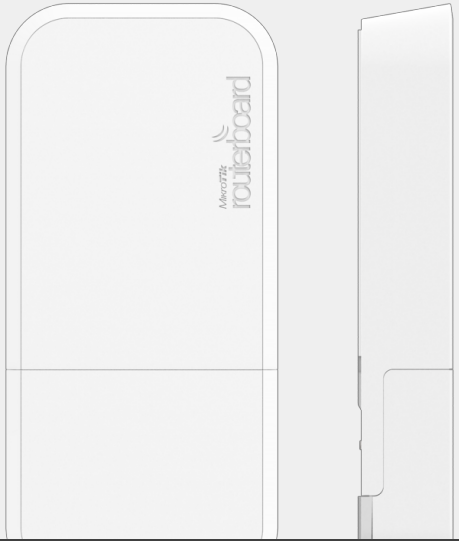
- Low cost unit
- Fast Ethernet
- Range of 200 meters or more
- Slim design
- Designed as short range CPE in PtMP setups or PtP device
- Price $69

LHG Lite60

LHG Lite60:

- Low cost unit
- Fast Ethernet
- Works in the same distances as LHG60G (1500m+)
- Designed as long range CPE in PtMP setups
- Price 99$

wAP 60G AP



wAP 60G AP:

- Same hardware as used in Wireless Wire kit
- Access Point device for 8 clients
- 60 degree field of view
- Price $129

wAP 60Gx3 AP

wAP 60Gx3 AP:

- Multiple antenna elements provide wider field of view
- Access Point device for 8 clients
- 180 degree field of view
- Price $199

Point to Multi Point use:

- All our devices are mutually compatible
- License level 4 or higher required for PtMP access point
  - PtMP license is included in **wAP60G AP** and **wAP60G X3** devices
  - License can be upgraded on existing devices
- Multiple channels allows multiple devices to be mouned in same location
- 8 clients are supported per each Access Point

Expected distances in PtMP mode with wAP60G or wAP60G X3 as Access Points:

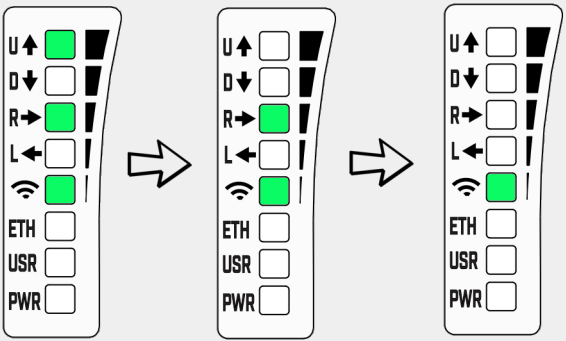
CPE	Distance
wAP60G	up to 200m
SXTsq	up to 200m
LHG60Lite	up to 800m
LHG60G	up to 800m

Few recomendations

Few recomendations:

- Update to latest RouterOS releases
- Used sector information available under: `/interface w60g monitor wlan60-1`
- Align mode: `/interface w60g align wlan60-1`
- After aligning - test throughput:
  - Traffic generator
  - Bandwidth Test (now supports multicore tests)
  - Speed-test: `/tool speed-test address=...`

Alignment LEDs



Frequency selection

- All devices has 5 available frequency channels
- Much higher distances can be achived at 64800MHz and 66000MHz channels

Thank you for your attention