

General Information	
Brand	LibreRouter
Model	LR1

Hardware Specification	
Configuration	Triple-radio 2x2 802.11n Mesh Node
Design License	Open-source Hardware
Firmware	LibreMesh (based on OpenWrt 18.06.1)
Main chip	MCU: Atheros QCA9558 RF: QCA9558 2T2R GE PHY: QCA8337N (10/100/1000)
RF	Radio 1: 2.4G 802.11b/g/n + LNA + PA, 2T2R (QCA9558) Radio 2: 5G 802.11a/n + LNA + PA, 2T2R (AR9582 mPCI) Radio 3: 5G 802.11a/n + LNA + PA, 2T2R (AR9582 mPCI)
Memory	128MB RAM DDR2
Flash	16MB NOR Flash
Hardware Watchdog	ATTiny13 available via GPIO
Physical Interface	2 x Gigabit Ethernet RJ-45 2 x Gigabit Ethernet ports available (internal) 1 x USB 2.0 connector 1 x USB 2.0 connector (internal, inside enclosure) 1 x serial console 3.3V 115200 8N1 (internal header on the board) 1 x push button (reset) 1 x 2.4 RF Tx header (2.4GHz Ant_A, 2.4GHz Ant_B, GND) 1 x GPIO pin header 8 x Status LEDs, software controllable through GPIO

Radio Specification	
<b>Radio 1</b>	
Frequency Band	802.11b/g/n 2412-2472 MHz
Supported Data Rate	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 6.5 Mbps - 130 Mbps (20MHz), 13.5 - 300 Mbps (40MHz)
RF Shield	Included, to block cross-interference with other radios
Max Output Power	19 dBm +- 2 dBm   Real power depends on country regulations (wireless-regdb) Measured at channel 11
Sensitivity	-86dBm +- 2dBm   One chain at channel 11 at 6mbps
<b>Radio 2</b>	
Frequency Band	802.11a/n 5150-5875 MHz
Supported Data Rate	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 6.5 Mbps - 130 Mbps (20MHz), 13.5 - 300 Mbps (40MHz)
RF Shield	Included, to block cross-interference with other radios
Max Output Power	27 dBm +- 2 dBm   Real power depends on the country according to the regulations Measured at channel 48
Sensitivity	-83dBm +- 2dBm   One chain at channel 48 at 6mbps
<b>Radio 3</b>	
Frequency Band	802.11a/n 5150-5875 MHz
Supported Data Rate	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 6.5 Mbps - 130 Mbps (20MHz), 13.5 - 300 Mbps (40MHz)
RF Shield	Included, to block cross-interference with other radios
Max Output Power	27 dBm +- 2 dBm   Real power depends on the country according to the regulations Measured at channel 48
Sensitivity	-83dBm +- 2dBm   One chain at channel 48 at 6mbps

<b>Antenna</b>	
Connectors	4 x external antenna connectors (RP-SMA female) for 5GHz 2 x internal UFL antenna connectors for 2.4Ghz
Pigtails	4 x pigtails for 5ghz, 1m long each, RP-SMA male to RP-SMA female connectors
2.4ghz	1 x antenna MIMO 2x2, 14dB gain, integrated inside enclosure
5ghz	2 x antenna MIMO 2x2, 12dB gain, 10x10cm, weatherproof casing, RP-SMA male

<b>Power</b>		
Input	PoE: 12v ~ 32v Passive PoE. 2-Pairs powering pins 4, 5 (+) and pins 7, 8 (-) Standard DC Power Jack 2.1mm (internal diam) 5.5mm (external diam): 9v ~ 32v	
PoE passthrough	Software controllable, over 2 <sup>nd</sup> Ethernet port, supporting up to 16W consumption	
Earthing / Grounding	Screw for earth cable	
Power consumption	Idle: three radios on + 1 GETH	4.5W
	Typical: all radios in moderate use + 1 GETH	5-8W
	Max: all radios in full use + full CPU + 2x GETH	14W
	Max + PoE passthrough	30W

<b>Environment &amp; Mechanical</b>	
Temperature Range	Operating: 0°C~40°C Storage: -40°C to 70°C
Humidity	5%~90% typical
Dimensions	Enclosure: 300 mm x 205 mm x 76 mm
Weight	Main device 0.8kg, antennas 0.35kg each (with pigtails). 1.5kg total

<b>Reliability</b>	
ESD	Conductive: 4kV; Air: 8kV
Surge protection	8 x gas discharge arrestors, four per Ethernet port
MTBF	Over 20000hrs

<b>Compliance Standard</b>	
IC	Canada RF Approval
	Canada RF Report
RCM	AS/NZS 4268
	RCM

<b>Package content</b>	
Contents	1 x Device
Power adapter	None
Enclosure	CPE-75 Weatherproof box with integrated 2.4ghz antenna
Pigtails	4 x pigtails for 5ghz, 80cm long each, RP-SMA male to RP-SMA female connectors
External antennas	2 x antennas 5ghz MIMO 2x2

<b>LED Indicators</b>	
LEDs	1 x Power
	1 x System status
	1 x USB
	3 x WiFi activity (one for each radio)
	2 x Ethernet activity (one for each port)