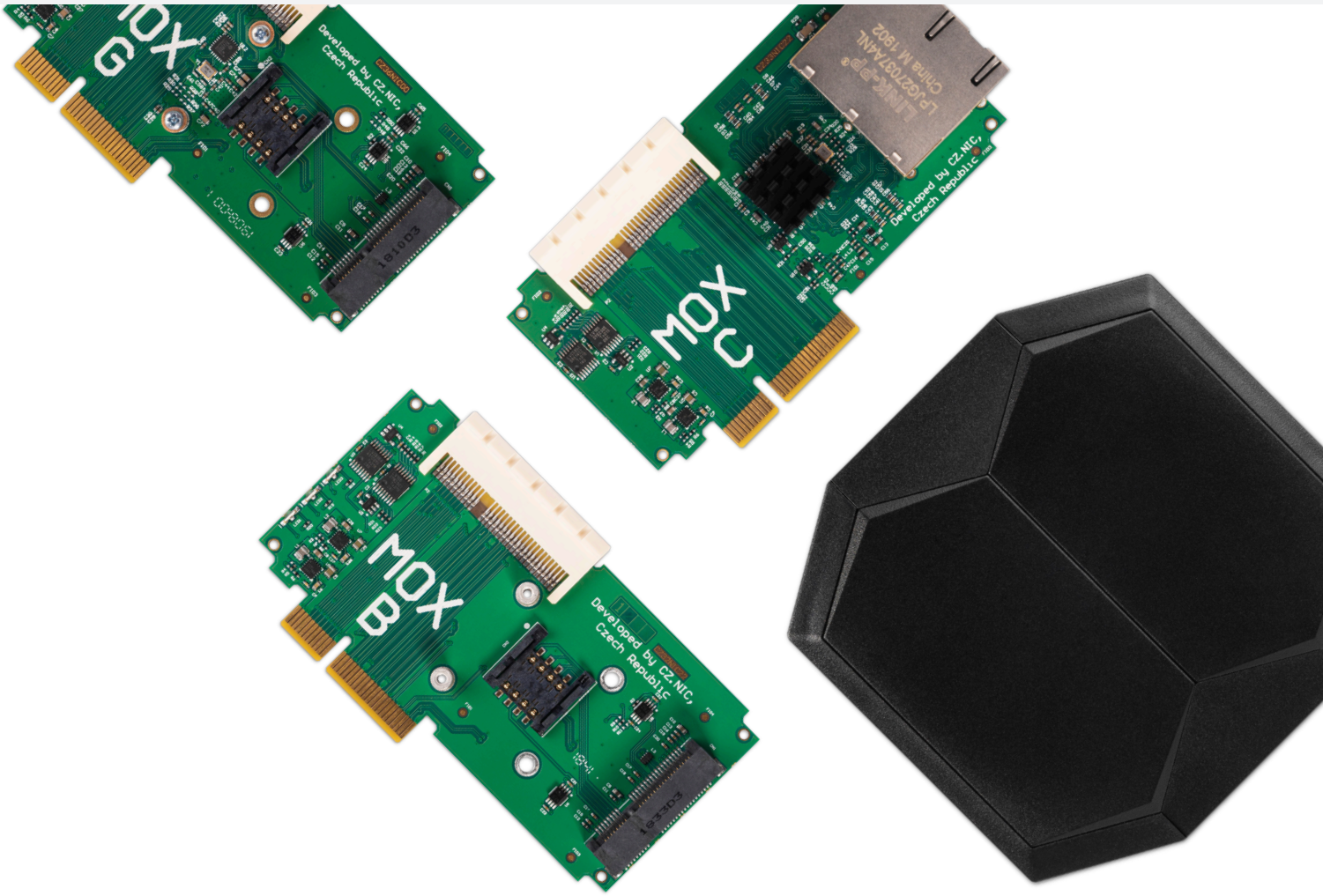
TURRIS

Turris MOX

Modular network device



Modular
Build your own device in the way how you want it

Open source
Open hardware running free operating system

Secure
Secure default configuration, easy setup and automatic updates

Modularity

MOX offers dozens of different module combinations. Design a device that meets your requirements and don't pay for anything that you don't need.

Open source

Just like Linux, MySQL or Firefox, Turris OS is open source. It's based on the Linux system OpenWrt.

Openness
Thanks to the open code, you know exactly what the software does. The hardware schematics are publicly available online.

Overview
The source code is typically inspected by experts all over the world, which means that bugs are found and fixed quickly.

Development
OpenWrt software has been in development for a long time and is updated by a large community of developers.

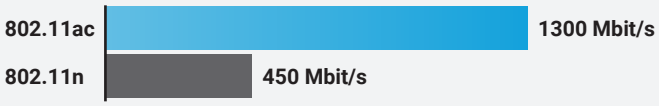
Extensibility
The repositories contain additional software that can expand your use of the device even further.

Performance

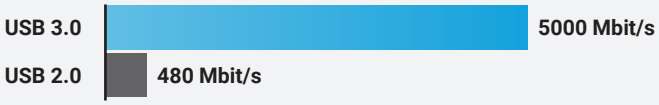
CPU Marvell Armada
1.0 GHz (dual core)

RAM DDR3
512/1024 MB

Wi-Fi 802.11ac with speeds up to
1300 Mbit/s



USB 3.0 with speeds up to
5000 Mbit/s



Security

Automatic updates
With MOX, you are always running the latest firmware with all of the security patches. You don't have to worry about anything.

Data in the security of your home
Every Turris MOX device can be used as a shared network storage, so you'll have your data under control.

Identification of possible attacks
MOX can identify suspicious data streams and send information about them to the Turris headquarters. All you have to do is to enable this feature to improve your protection.

Distributed adaptive firewall
The Turris headquarters compares data received from thousands of connected routers and if it identifies an attack, updates are sent right away to all Turris devices.

Features

Private cloud
Why give your sensitive data to third parties and pay for the privilege of doing so? Create your own cloud on your MOX (based on Nextcloud).

Parental control
Protect your children against inappropriate content. The PaKon tool allows you to monitor the activity of selected devices in your network.

Easy VPN
With MOX, you can set up an encrypted connection to your corporate or home network with a few clicks.

Network-attached storage (NAS)
A MOX with the USB 3.0 port can be used as a shared network repository and easily become your media server.

No unnecessary LEDs
If you're not a fan of blinking panels, you will appreciate that MOX has just one small LED and you can turn even that one off.

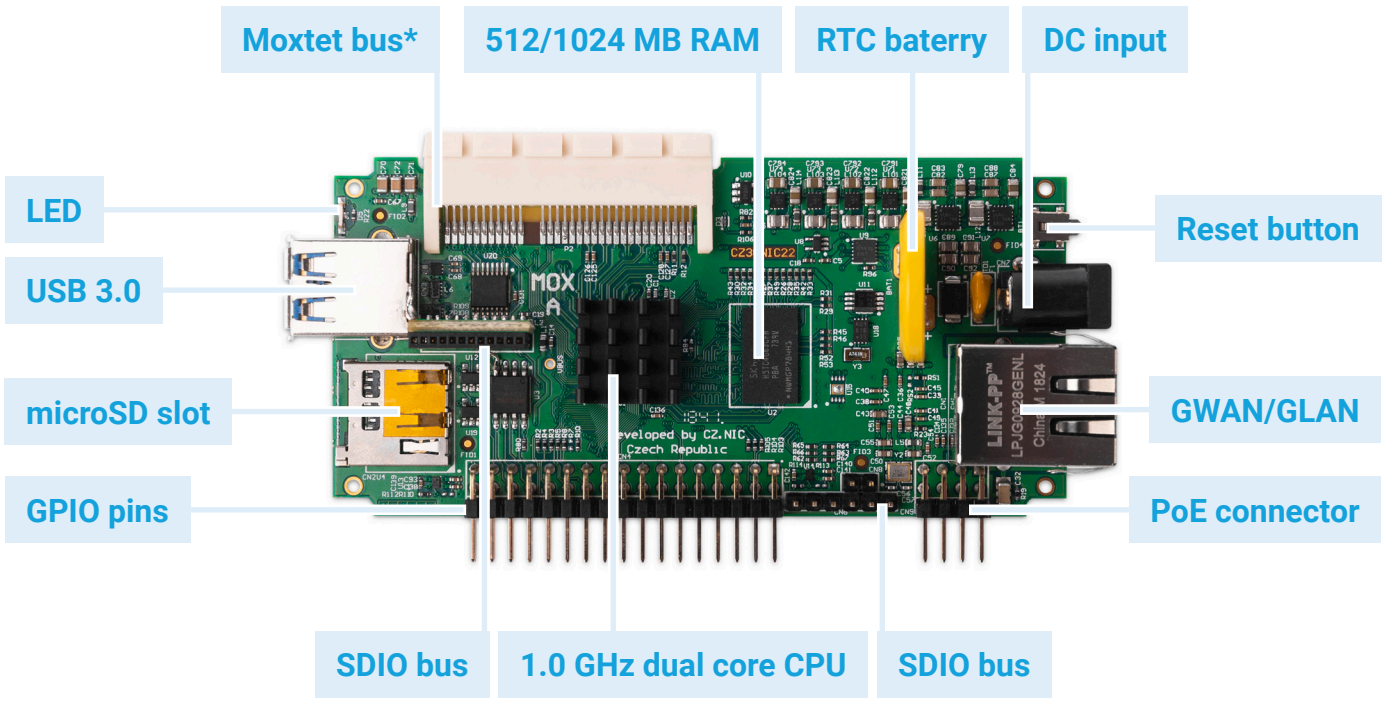
Not a single screw
You can take the device apart and put it back again without any tools in 10 seconds.

Integrated antennas
No ugly antennas in your office or home. The antennas are hidden inside the device, yet still powerful enough.

Adapter on the cable
The adapter is not on the plug, but on the cable. This keeps the remaining sockets free.

MOX A (Basic)

MOX A (Basic) is a universal network microcomputer with gigabit connectivity and USB 3.0 port, and is the basic building block of every MOX set.



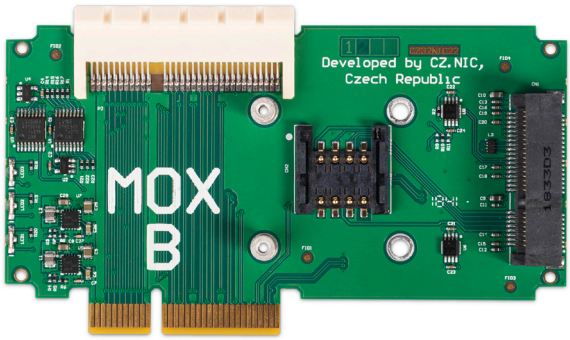
MOX A is available in two variants – 512 MB RAM and 1024 MB RAM. The first one is included in the MOX Pocket Wi-Fi, Power Wi-Fi and Classic, the second one in the MOX Start, which is the starting point for a customized network solution composed of Turris MOX components.

The MOX A module is supplied only as a part of the MOX sets, including power supply, microSD card and plastic chassis. It is sold separately only after previous arrangement and only in larger quantities.

* The original Moxtet bus is used to connect the expansion modules to the MOX A module.

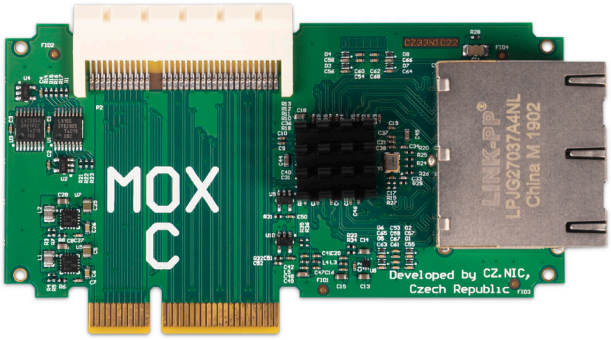
Expansion modules

Build a network device that does exactly what you need. If your requirements change in the future, you can just get the missing part.



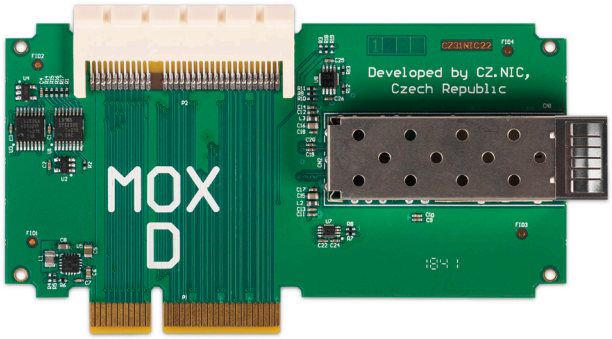
MOX B (Extension)

The MOX B allows you to add more hardware to your configuration. It contains an mPCIe slot for a compatible Wi-Fi card, disk controller or LTE modem. If you choose to install an LTE modem, the MOX B features a SIM card slot that you can use.



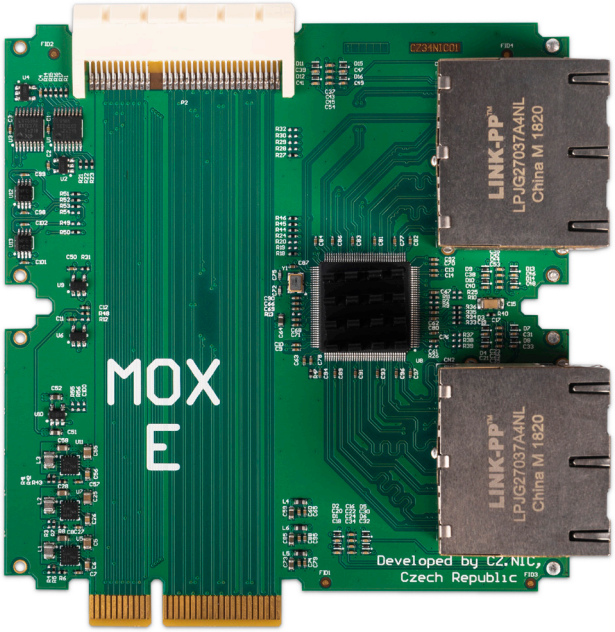
MOX C (Ethernet)

The MOX C module contains a four-port manageable switch for gigabit ethernet.



MOX D (SFP)

The MOX D module contains an SFP connector for an optical connection (with speeds of up to 2.5 Gbps) or compatible adapters.

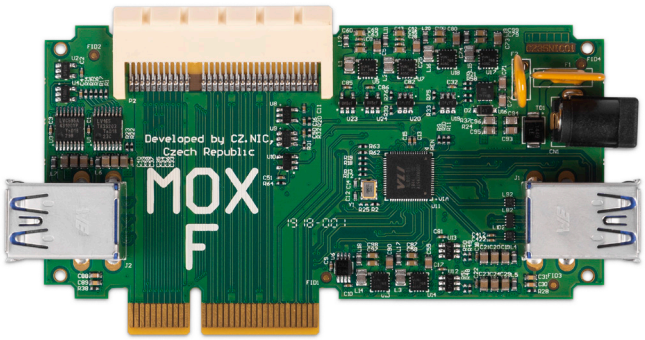


MOX E (Super Ethernet)

The MOX E module is an ideal choice if you need more ethernet ports to connect devices to your network. It has twice the width of the other modules and contains an eight-port manageable switch for gigabit ethernet.

Unlike in the MOX C module, the SGMII bus is not terminated in the MOX E module and it is possible to connect up to three MOX E modules in a row.

All the modules are available in a plastic chassis.
You can check their mutual compatibility at:
mox.turris.cz/configurator.



MOX F (USB)

The MOX F module expands your configuration with more USB 3.0 ports with transfer speeds of up to 5 Gbps that you can use to connect external drives, TV tuners and other devices.

MOX G (Super Extension)

The MOX G module with an mPCIe slot allows you to connect a compatible Wi-Fi card to achieve significantly higher speeds than SDIO (we recommend the original mPCIe MOX Wi-Fi add-on). It also has a SIM card slot for users who are considering an mPCIe LTE modem.

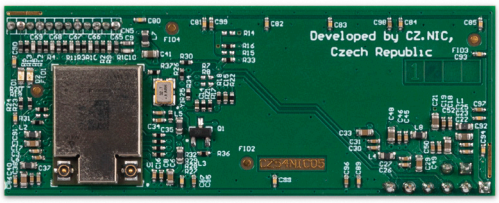
MOX G has the same features as MOX B and additionally a pass-through PCIe bus, which means that it can be used together with the MOX B or MOX F.

	MOX B (Extension)	**MOX C** (Ethernet)	**MOX D** (SFP)	**MOX E** (Super Ethernet)	**MOX F** (USB)	**MOX G** (Super Extension)
WAN port (up to 2.5 Gbps SFP)	–	–	✓	–	–	–
LAN port 10/100/1000 Mbps (RJ-45)	–	✓ (4×)	–	✓ (8×)	–	–
USB 3.0 (up to 5 Gbps)	–	–	–	–	✓ (4×)	–
mPCIe slot	✓	–	–	–	–	✓
SIM slot	✓	–	–	–	–	✓
Pass-through SGMII	✓	–	–	✓	✓	✓
Pass-through PCIe	–	✓	✓	✓	–	✓
Size without case W x D x H (mm)	100 × 61 × 14	105 × 61 × 30	106 × 61 × 14	105 × 113 × 30	110 × 61 × 19	100 × 61 × 14
Size with case W x D x H (mm)	114 × 61 × 45	114 × 61 × 45	114 × 61 × 45	114 × 112 × 45	114 × 61 × 45	114 × 61 × 45
Weight without case (g)	34	60	34	138	54	34
Weight with case (g)	74	100	74	218	94	74
Operating temperature	0 to 40 °C (40 to 104 °F)					
Relative humidity	10 to 90 %					
Warranty	2 years					
HW extensibility – MOX modules	1× 64 pin connector					

We recommend the original MOX Wi-Fi add-on (mPCIe) as a Wi-Fi card to the modules MOX B (Extension) and MOX G (Super Extension). It has been tested together with the device. Other Wi-Fi cards can be used too, but we can not guarantee proper functionality.

Add-ons

Other accessories, in the form of add-ons, will come in handy if you want to power the device via ethernet or cover your premises with Wi-Fi signal.

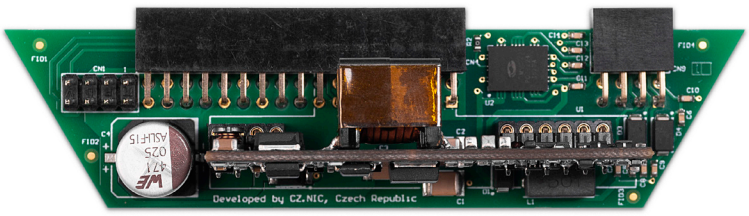


MOX Wi-Fi add-on (SDIO)

If you add the MOX Wi-Fi add-on (SDIO) to your MOX Start set, you will get a Wi-Fi router with Bluetooth support.

MOX Wi-Fi add-on (mPCIe)

The MOX Wi-Fi add-on (mPCIe) is significantly faster than SDIO and is the recommended Wi-Fi card for modules MOX B (Extension) and MOX G (Super Extension). It was tested with the device and is guaranteed to work correctly.



MOX PoE add-on

The MOX PoE add-on can be used to provide power to the Turris MOX router over ethernet without having to use a separate power cable. It connects to the MOX A (Basic) module which is part of all MOX configurations. It is compliant with IEEE standards 802.3at and 802.3af.

	MOX Wi-Fi add-on (SDIO)	MOX Wi-Fi add-on (mPCIe)	MOX PoE add-on
Antenna type	Internal FLEX antenna	Internal FLEX antenna	–
Antenna gain	2 dBi for 2.4 GHz / 3 dBi for 5 GHz	2 dBi for 2.4 GHz / 3 dBi for 5 GHz	–
Model	AzureWave AW-CM276NF	Compex WLE900VX	–
Chipset	Marvell 88W8997	QCA 9880	–
Certification	CE, FCC	CE, FCC	–
IEEE standards	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.3at/af
Bluetooth	Bluetooth 4.2, BLE	–	–
Transmitting power	16 ± 1.5 dBm max.	21 ± 2 dBm max.	–
Secured transmission*	64/128 bit WEP, WPA/WPA2, WPA-PSK/WPA2-PSK	64/128 bit WEP, WPA/WPA2, WPA-PSK/WPA2-PSK	–
Transfer speed	5 GHz, up to 866 Mbps / 2.4 GHz, up to 300 Mbps	5 GHz, up to 1.3 Gbps / 2.4 GHz, up to 450 Mbps	–
Max. recommended load	–	–	15 W
Size W x D x H (mm)	67 × 25 × 12	70 × 115 × 5	100 × 27 × 26
Weight (g)	8	8	26
Operating temperature	0 to 40 °C (40 to 104 °F)		
Relative humidity	10 to 90 %		
Warranty	2 years		

* New standards can be available after updates.

We recommend the original MOX Wi-Fi add-on (mPCIe) as a Wi-Fi card to the modules MOX B (Extension) and MOX G (Super Extension). It has been tested together with the device. Other Wi-Fi cards can be used too, but we can not guarantee proper functionality.

Sets

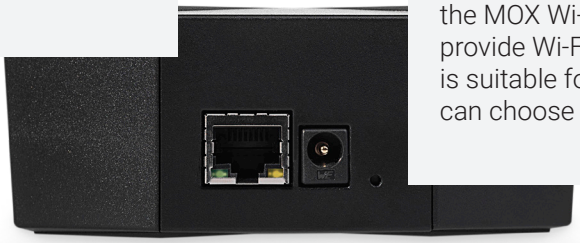
For simplicity, we sell the most popular combinations of modules and other hardware as four basic sets.

MOX Start

This set consists of MOX A (Basic), a power source and a microSD card, representing the basic building block of the modular solution Turris MOX. It can also be used as a small server.

MOX Pocket Wi-Fi

This set consists of the MOX A (Basic) module, a power source, a microSD card and the MOX Wi-Fi add-on (SDIO). It is used to provide Wi-Fi signal or increase its range and is suitable for purely wireless networks. You can choose between 2.4GHz and 5GHz Wi-Fi.



MOX Power Wi-Fi

The Power Wi-Fi set is used to provide Wi-Fi signal or increase its range. It is suitable for purely wireless networks. Unlike with Pocket Wi-Fi, with the Power Wi-Fi configuration you can use 5GHz and 2.4GHz Wi-Fi (for legacy devices) at the same time. And the 5GHz Wi-Fi is even faster than in the case of Pocket Wi-Fi.

This set consists of the MOX A (Basic) module, a power source, a microSD card, the MOX B (Extension) module, MOX Wi-Fi add-on (SDIO) and MOX Wi-Fi add-on (mPCIe).

MOX Classic

Choose the MOX Classic if you want both wireless connectivity and the option to connect several devices by ethernet cable. This set consists of the MOX A (Basic) module, a power source, a microSD card, the MOX B (Extension) module, MOX C (Ethernet) module, MOX Wi-Fi add-on (SDIO) and MOX Wi-Fi add-on (mPCIe).

You can expand them further using modules.
You can check their mutual compatibility at:
mox.turris.cz/configurator.

	MOX Start	MOX Pocket Wi-Fi	MOX Power Wi-Fi	MOX Classic
CPU	Marvell Armada 3720 1.0 GHz dual core ARMv8 Cortex A-53			
RAM – DDR3	1024 MB	512 MB	512 MB	512 MB
MicroSD card slot	✓			
USB 3.0 (up to 5 Gbps)	✓			
WAN port 10/100/1000 Mbps (RJ-45)	✓			
LAN port 10/100/1000 Mbps (RJ-45)	–	–	–	✓ (4×)
2.4/5 GHz Wi-Fi	–	2×2 MIMO	2×2 + 3×3 MIMO	2×2 + 3×3 MIMO
mPCIe slot*	–	–	✓	✓
SIM slot**	–	–	✓	✓
Bluetooth	–	✓	✓	✓
Size W x D x H (mm)	114 × 114 × 45	114 × 114 × 45	166 × 114 × 45	218 × 114 × 45
Weight (g)	184	192	294	394
AC input	100–240 V / 800 mA			
Power frequency	50/60 Hz, Single Phase			
Button and switch	Reset Button			
Operating temperature	0 to 40 °C (40 to 104 °F)			
Relative humidity	10 to 90 %			
Warranty	2 years			
HW extensibility – MOX modules	1× 64 pin connector			
HW extensibility – others	1× 34 pin GPIO (1.8 V logic)			

* By default occupied by Wi-Fi card.
** Needs additional LTE modem in the mPCIe slot.

Set's composition

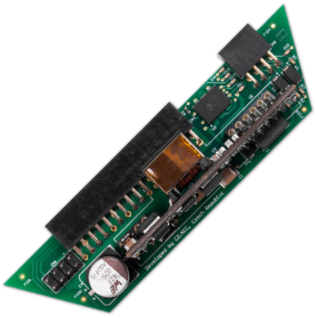
MOX Start	MOX Pocket Wi-Fi	MOX Power Wi-Fi	MOX Classic
MOX A 1024 MB RAM	MOX A 512 MB RAM	MOX A 512 MB RAM	MOX A 512 MB RAM
	MOX Wi-Fi add-on (SDIO)	MOX Wi-Fi add-on (SDIO)	MOX Wi-Fi add-on (SDIO)
		MOX B (Extension)	MOX B (Extension)
		MOX Wi-Fi add-on (mPCIe)	MOX Wi-Fi add-on (mPCIe)
			MOX C (Ethernet)

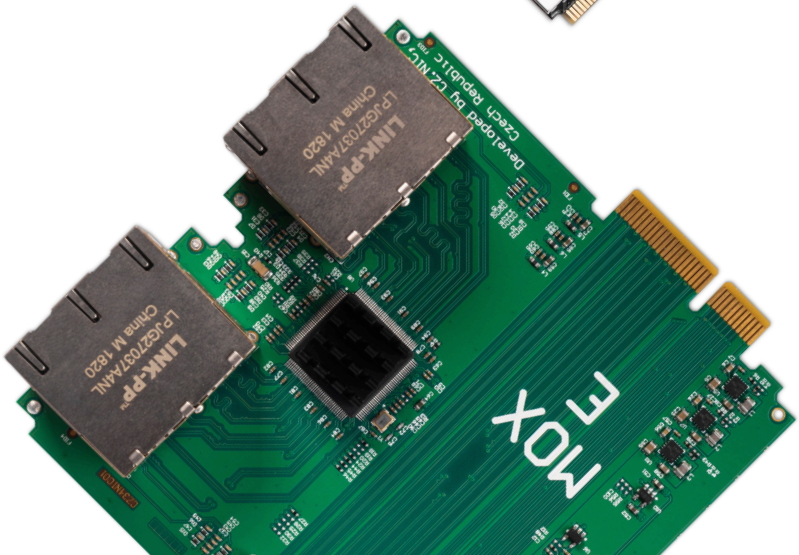
Every set also contains a microSD card, a power source and a case.

Turris MOX

The ideal solution for system integrators, as well as for advanced business and household users, whose priority is security and the ability to perfectly customize their device.

MOX.TURRIS.CZ **INFO@TURRIS.CZ**





Turris MOX was developed by CZ.NIC.

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