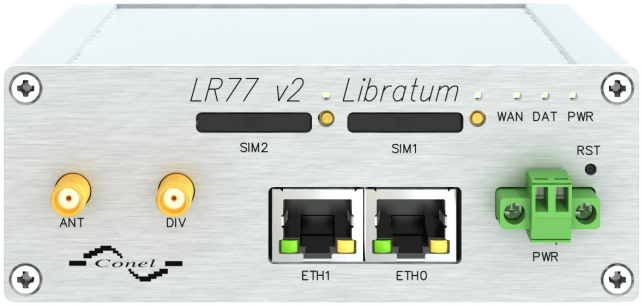
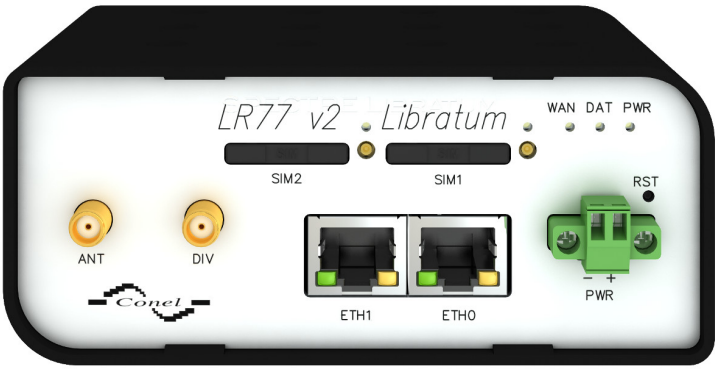
LTE Industrial Router

LR77 v2 Libratum

USER MANUAL





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Used symbols

Danger – Information regarding user safety or potential damage to the router.

Attention – Problems that can arise in specific situations.

Information – Useful tips or information of special interest.

GPL license

Source codes under GPL license are available at `https://icr.advantech.com/source-code` address.

Advantech Czech s.r.o., Sokolska 71, 562 04 Usti nad Orlici, Czech Republic
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1. Safety Instructions

Please, observe the following instructions:

- The router must be used in compliance with all applicable international and national laws and in compliance with any special restrictions regulating the utilization of the router in prescribed applications and environments.
- To prevent possible injury and damage to appliances and to ensure compliance with all relevant provisions, use only the original accessories. Unauthorized modifications or the use of unapproved accessories may result in damage to the router and / or a breach of applicable regulations. Unauthorized modifications or use of unapproved accessories may void the warranty.
- The router can not be opened.
- Turn off the router and disconnect it from power supply before handling the SIM card.
- **Caution!** This equipment is not suitable for use in locations where children are likely to be present. The SIM card could be swallowed by small children.
- Input voltage must not exceed 36 V DC max.
- Do not expose the router to extreme ambient conditions. Protect the router against dust, moisture and high temperature.
- Only routers with appropriate certification and labelling should be used in locations where flammable and explosive materials are present, including gas stations, chemical plants, or locations in which explosives are used. We remind users of the duty to observe the restrictions concerning the utilization of radio devices at such places.
- Switch off the router when traveling by plane. Utilization of the router on a plane may endanger the operation of the plane or interfere with the mobile telephone network, and may be unlawful. Failure to observe these instructions may result in the suspension or cancellation of telephone services for the respective client and / or may result in legal sanctions.
- When using the router in close proximity to personal medical devices, such as cardiac pacemakers or hearing aids, you must proceed with heightened caution.
- The router may cause interference when used in close proximity to TV sets, radio receivers or personal computers.
- It is recommended that you create an appropriate copy or backup of all important settings that are stored in the memory of the device.

2. Product Disposal Instructions

The WEEE (Waste Electrical and Electronic Equipment: 2012/19/EU) directive was introduced to ensure that electrical/electronic products are recycled using the best available recovery techniques to minimize the environmental impact. This product contains high quality materials and components which can be recycled. At the end of it's life this pro- duct MUST NOT be mixed with other commercial waste for disposal. The device contains a battery. Remove the battery from the device before disposal. The battery in the device needs to be disposed of apart accordingly. Check the terms and conditions of your supplier for disposal information.

3. Router Description

LTE router LR77 v2 Libratum is used to wireless connect various equipments and devices via Ethernet interface 10/100 to the internet or intranet. Due to the high data transfer speed of up to 14.4 Mbps (download) and up to 5.76 Mbps (upload) is this router an ideal wireless solution for traffic and security camera systems, individual computers, LAN networks, automatic teller machines (ATM) and other self-service terminals, etc.

As a standard, LTE router LR77 v2 Libratum is equipped with two Ethernet 10/100 and two SIM card holders. This cellular router is supplied either in a plastic or metal casing, based on the requirements of the customer.

Configuration is done via web interface protected by password. LR77 v2 Libratum supports creation of VPN tunnels using technologies IPsec, OpenVPN and L2TP to ensure safe communication. Web interface provides detail statistics about the 3G router activities, signal strength, detailed log, etc. Cellular router supports functions: DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS and many other function.

Other diagnostic functions ensuring continuous communication include automatic inspection of PPP connection offering an automatic restart feature – in case of connection losses, or hardware watchdog which monitors the status of the router. With the help of a special window (start up script window) you may insert Linux scripts for various actions. For some applications the key option to create several different configurations for one LTE wireless router, the so-called profiles (maximum of 4), and the option to switch between them (for example via SMS, binary input status, etc.) is essential. Cellular routers LR77 v2 Libratum may automatically upgrade configuration and firmware from server. This allows mass reconfiguration of many routers in one time.

The router also supports additional software like R-SeeNet for permanent traffic monitoring of routers or communication VPN server Digicluster.

Examples of possible applications

- mobile office
- fleet management
- security system
- telematic
- telemetric
- remote monitoring
- vending and dispatcher machines

4. Contents of Package

Basic delivered set of router includes:

- router,
- power supply,
- crossover UTP cable,
- up to three external antennas,
- clip for the DIN rail,
- paper start guide.

Figure 1: Contents of package

Temperature range for power supply is reduced to 0 °C to +40 °C!

5. Router Design

5.1 Router versions

LR77 v2 Libratum router is supplied in the following versions (see table below). All versions are available in plastic or metal box according to customer requirements.

Router versions	Router Box	SIM1	SIM2	ETH0	ETH1
LR77 v2 Libratum	Plastic	1 x	1 x	1 x	1 x
LR77 v2 Libratum with WiFi	Plastic	1 x	1 x	1 x	1 x
LR77 v2 Libratum SL	Metal	1 x	1 x	1 x	1 x
LR77 v2 Libratum SL with WiFi	Metal	1 x	1 x	1 x	1 x

Table 1: Router versions

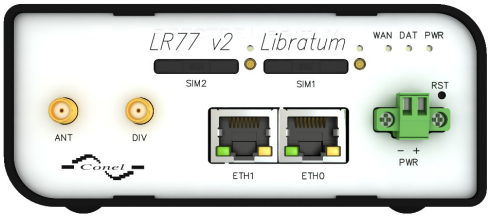

Figure 2: Front panel LR77 v2L

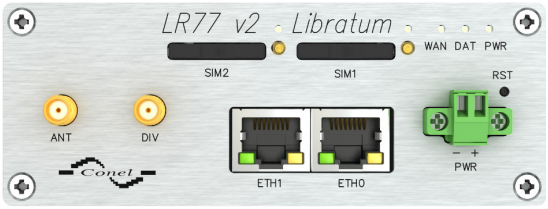

Figure 4: Front panel LR77 v2L SL

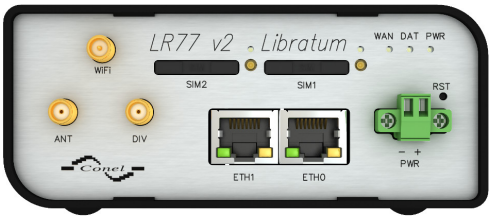

Figure 3: Front panel LR77 v2L with WiFi

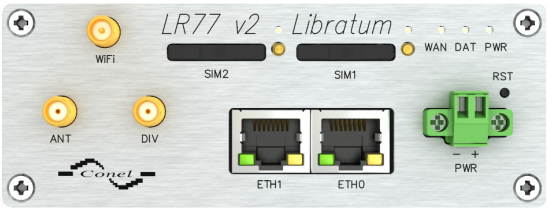

Figure 5: Front panel LR77 v2L SL with WiFi

5.2 Delivery identification

Trade name	Order code[1]	Description
LR77 v2 Libratum	BB-LR2L71001y-zzzz	Version in the plastic box
LR77 v2 Libratum with WiFi	BB-LR2L71071y-zzzz	Version with WiFi in the plastic box
LR77 v2 Libratum SL	BB-LR2L71002y-zzzz	Version in the metal box
LR77 v2 Libratum SL with WiFi	BB-LR2L71072y-zzzz	Version with WiFi in the metal box

Table 2: Delivery identification

Figure 6: Label examples

5.3 Order codes

5.3.1 Order code structure

Order code has following structure:

BB-LR2L710wxy-zzzz, where:

w = port #2,
x = type of router box,
y = type of power supply,
z = specific variation.

Letter "w" – port #2

Port type	Letter "w" in code
none	0
WiFi	7

Table 3: Type of port #2

[1] Order codes are described in detail in a separate chapter.

Letter "x" – type of the router box

Type of router box	Letter "x" in code
Plastic	1
Metal	2

Table 4: Type of router box

Letter "y" – type of the power supply

Type of power supply	Letter "y" in code
none	0
Europe	1
UK & Ireland	2
Australia	3
USA	4

Table 5: Type of power supply

Letter "z" – specific variation

Variation	Letter "z" in code
basic variation	not specified
SmartWorx HUB	-SWH

Table 6: Specific variation

5.3.2 Order code examples

Examples of order codes are listed in the table bellow:

Order code	Features – interfaces	Box	Power supply
BB-LR2L710721	LTE module – 2x SIM reader, 2x ETH, WiFi	metal	Europe
BB-LR2L710010-SWH	LTE module – 2x SIM reader, 2x ETH, SmartWorx HUB	plastic	none

Table 7: Order code examples

5.4 Basic dimensions of the router box

5.4.1 Plastic box

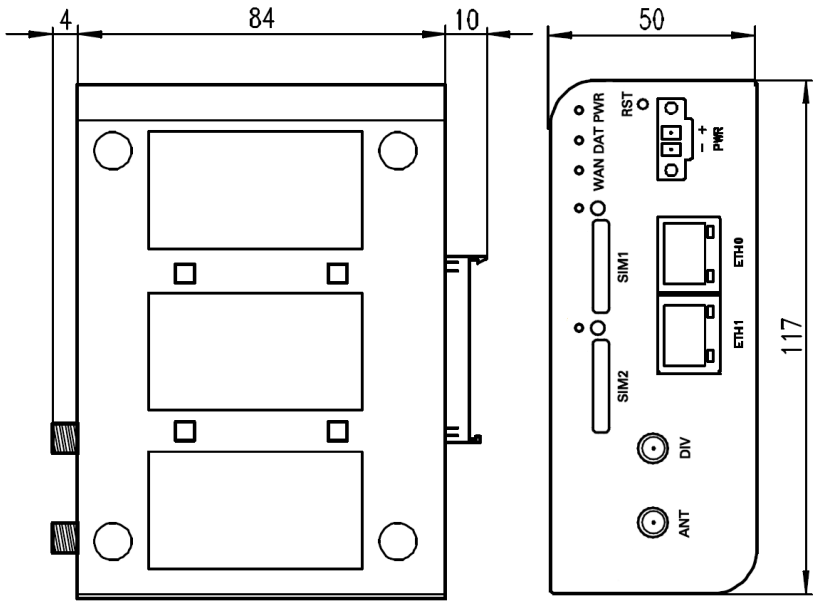

Figure 7: Basic dimensions of plastic box (bottom and front view)

5.4.2 Metal box

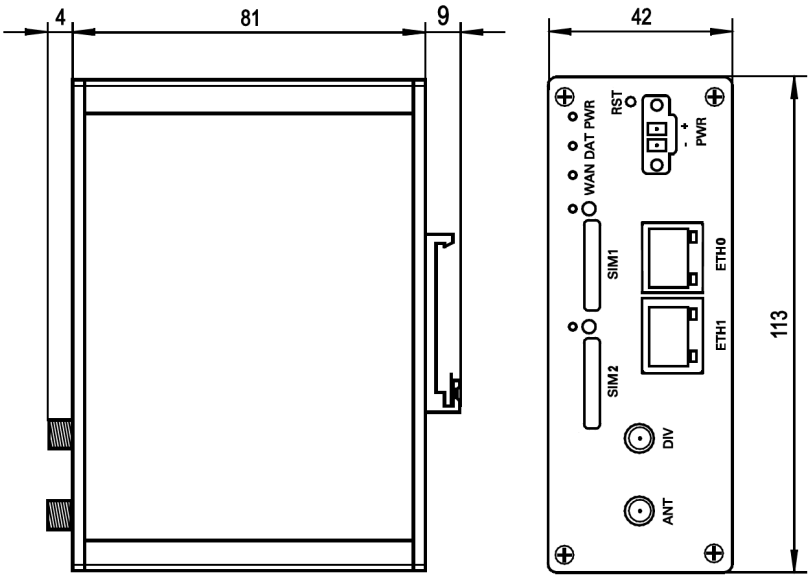

Figure 8: Basic dimensions of metal box (bottom and front view)

5.5 Mounting recommendations

- possibility to be put on a work surface,
- DIN rail EN 60715 with included plastic or metal clip.

For the most of applications with a built-in router in a switch board it is possible to recognize two kinds of environments:

- no public and industry environment of low voltage with high interference,
- public environment of low voltage without high interference.

For both of these environments, it is possible to mount router to a switch board, the following there is no need to have examination immunity or issues in connection with EMC according to EN 60439-1 ed.2:00 + A1:04.

Compliance of EN 60439-1 ed.2:00 + A1:04 specification it is necessary to observe next assembly of the router to the switch – board:

- For whip antennas, we recommend to observe a distance of 6 cm from cables and metal surfaces on every side due to the elimination of interference. While using an external antenna except for the switch-board it is necessary to fit a lightning conductor.
- Before mounting a router on sheet-steel we recommend using a cable antenna.

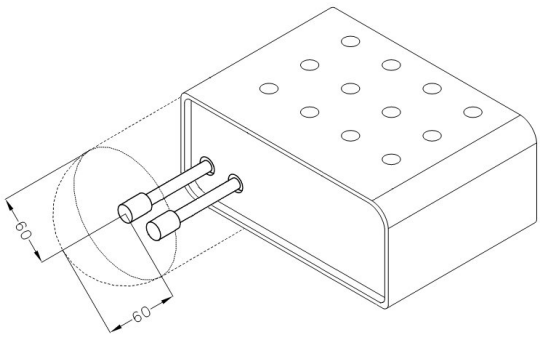

Figure 9: Space around antennas (plastic)

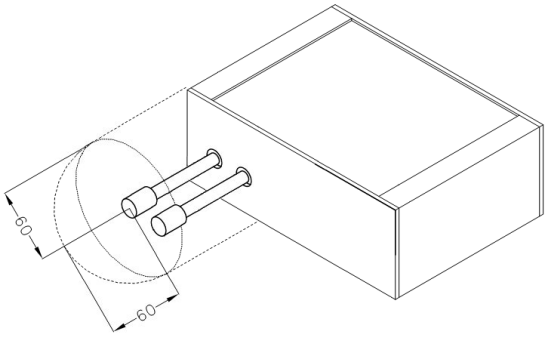

Figure 10: Space around antennas (metal)

- For every cables we recommend to bind the bunch, we recommend for this use:
  - Length of the bunch (the combination of power supply and data cables) can be maximum 1.5 m. If the length of data cables exceeds 1.5 m or in the event of, the cable leads towards the switch – board. We recommend installing over – voltage protectors (surge suppressors).
  - With data cables they mustn't carry cables with reticular tension ∼ 230 V/50 Hz.

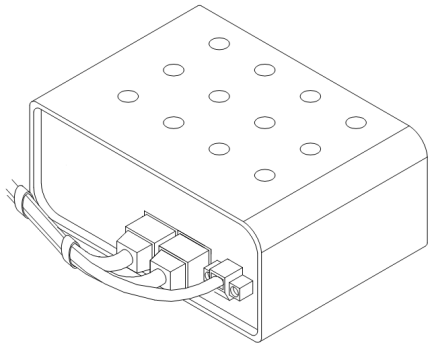

Figure 11: Cable routing (plastic)

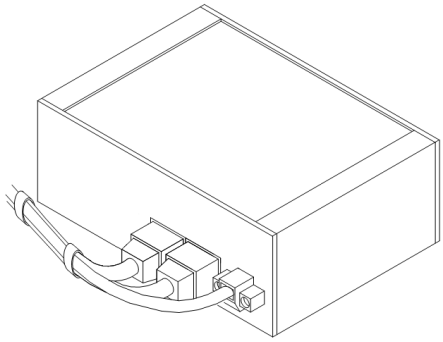

Figure 12: Cable routing (metal)

- Sufficient space must be left in front of individual connectors for handling of cables,

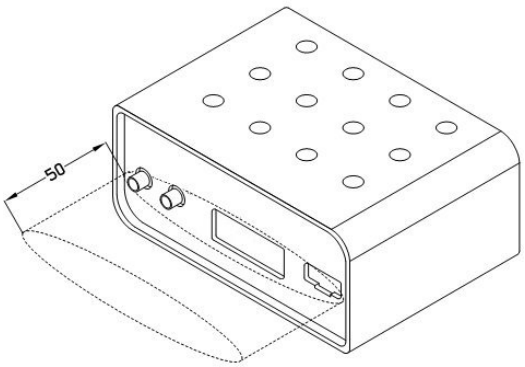

Figure 13: Space in front of connectors (plastic)

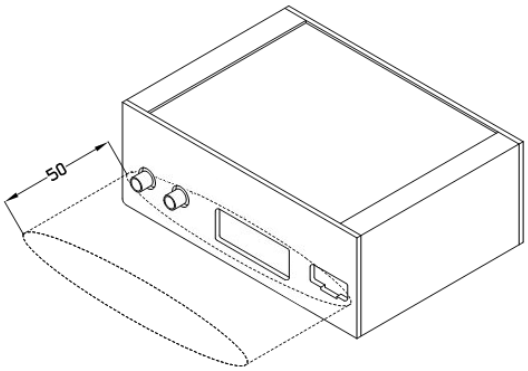

Figure 14: Space in front of connectors (metal)

- For correct function of the router we recommend to use in the switch-board earth-bonding distribution frame for grounding of power supply of router, data cables and antenna.

5.6 Removal from the DIN rail

The DIN rail clip is suitable for a DIN rail according to EN 60715 standard only. The default position of plastic or metal rail clip, which is used for mounting the router on a DIN rail, is shown in the following figure. Its position can be changed on some models (back or bottom). When changing the position of the DIN rail clip, tighten the screws with max. 0.4 Nm torque.

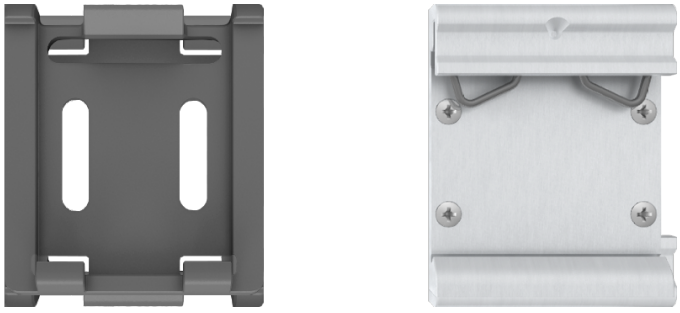

Figure 15: Default position of plastic and metal DIN rail clip

To remove the router from the DIN rail, push the router down lightly, so the bottom part of the DIN rail clip (hitched to the DIN rail) gets out of the rail and then pull out the bottom part of the router away from the DIN rail.

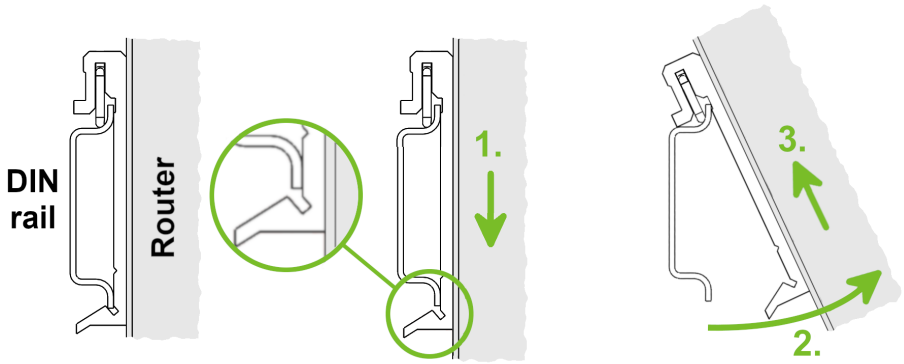

Figure 16: Removal from the DIN rail

5.7 Description of the front panel

On the front panel is the following:

Caption	Connector	Description
PWR	2-pin	Connector for the power supply.
ETH0	RJ45	Connector for connection into the local computer network.
ETH1	RJ45	Connector for connection into the local computer network.
ANT	SMA	Connector for main antenna.
DIV	SMA	Connector for diversity antenna.
WIFI	R-SMA	Connector for WIFI antenna. **Available only when the router is equipped with WIFI module.**
SIM1	—	Holder for the first SIM card.
SIM2	—	Holder for the second SIM card.

Table 8: Front panel description

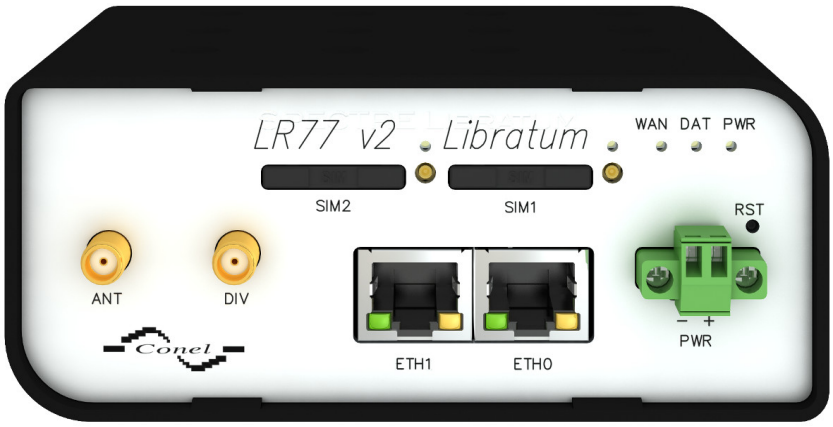

Figure 17: Front panel LR77 v2 Libratum

5.7.1 Status indication

About router status inform three LED indicators on the front panel. ETH0 and ETH1 ports have two additional LEDs that provide information about port status.

Caption	Color	State	Description
PWR	Green	Blinking On Fast blinking	Router is ready. Starting of the router. Updating firmware.
DAT	Red	Blinking	Communication in progress on radio channel.
WAN	Yellow	1x flash per sec. 2x flash per sec. 3x flash per sec.	Signal strength is good. Signal strength is fair[1]. Signal strength is poor[2]. For value ranges of signal strength see *Configuration manual*, chapter *Mobile WAN Status*.
ETH	Green	On Off	Selected 100 Mbit/s. Selected 10 Mbit/s.
ETH	Yellow	On Blinking Off	The network cable is connected. Data transmission. The network cable is not connected.
SIM1	Yellow	On	The first SIM card is active.
SIM2	Yellow	On	The second SIM card is active.

Table 9: Status indication

State indication of WAN LED is updated every 10 seconds.

[1] Or the difference between neighbouring cells is exactly 3 dBm.
[2] Or the difference between neighbouring cells is smaller than 3 dBm.

5.7.2 Power connector PWR

Panel socket 2-pin.

Pin number	Signal mark	Description
1	VCC(+)	Positive pole of DC supply voltage (+9 to +36 V DC)
2	GND(-)	Negative pole of DC supply voltage

Table 10: Connection of power connector

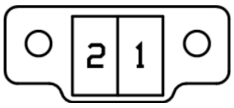

Figure 18: Power connector

Power supply for router is required between +9 V to +36 V DC supply. Protection against reversed polarity without signaling is built into the router. **Note:** The protection against reversed polarity is lost if the negative pole is grounded!

The power consumption during receiving is 2.3 W. The peak power consumption during data sending is 5.5 W. However, values of consumption can be increased, if some expansion port is eqquipped. For correct operation it is necessary that the power source is able to supply a peak current of 1.2 A.

If the negative pole of the router is grounded, there is no protection against reversed polarity!

Circuit example:

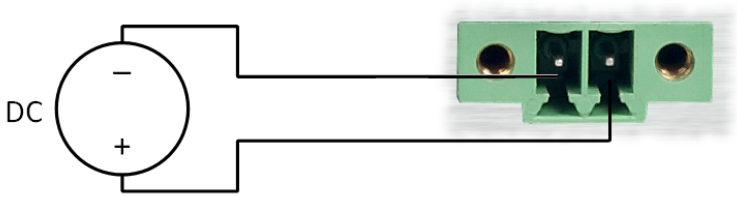

Figure 19: Connection of power supply

The positive pole VCC is marked by a red socket on the power.

All metal parts are connected together with the negative pole of power supply (common pole). However, the router box may not be connected to the negative pole properly.

5.7.3 Antenna connector ANT, DIV (and WIFI)

Main and diversity antennas are connected to the router using the SMA connector on the front panel. For LR77 v2 Libratum with WiFi module is also available reverse SMA antenna connector, through which the WIFI antenna can be connected.

The router can not operate without connected main antenna marked as *ANT*!

ANT connector is used to connect the main antenna. For connecting the diversity antenna use the second antenna connector DIV. If WiFi module is equipped on customer's request, there is also available WIFI antenna connector for connecting corresponding antenna.

The antenna is connected by screwing this antenna to the SMA connector on the router's front panel (see the figure below).

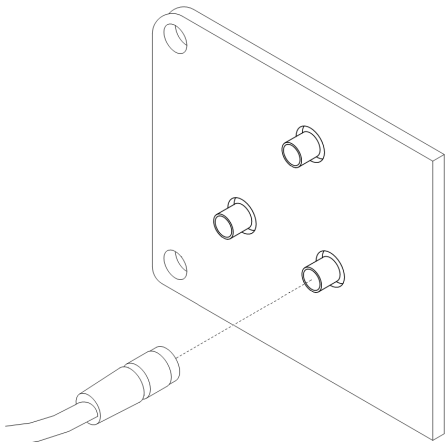

Figure 20: Connecting of the antenna

Diversity antenna improves radio features of the router at low signal strength.

5.7.4 SIM card reader

The SIM card reader for 3 V and 1.8 V SIM cards is located on the front panel of the router. In order for the router to function, it is necessary to insert an activated SIM card with an unblocked PIN code. The SIM cards may have different APNs (Access Point Names) adjusted.

Supported type of SIM cards: **Mini SIM** (2FF), dimensions 25.0 x 15.0 x 0.76 mm.

Changing the SIM card:

- Always disconnect the router from power supply before handling the SIM card !
- Press the small yellow button to eject the reader holder.
- Insert the SIM card into the reader holder and slide it into the reader (see the figure below).

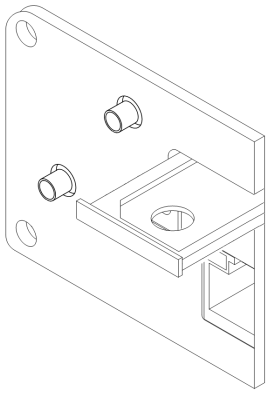

Figure 21: Ejected SIM holder

For correct function of mobile network module **it is necessary to have both SIM card holders inserted in the readers when router is running**, even if they are empty. Ejected holder of any SIM card can cause inability to connect the mobile network.

5.7.5 Ethernet port (ETH0 and ETH1)

The panel socket RJ45 is used for this interface. The isolation barrier of the Ethernet signal ports against the ground is 1500 V.

Pin	Signal mark	Description	Data flow direction
1	TXD+	Transmit Data – positive pole	Input/Output
2	TXD-	Transmit Data – negative pole	Input/Output
3	RXD+	Receive Data – positive pole	Input/Output
4	—	—	
5	—	—	
6	RXD-	Receive Data – negative pole	Input/Output
7	—	—	
8	—	—	

Table 11: Connection of Ethernet connector

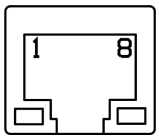

Figure 22: Ethernet connector

ATTENTION! ETH0 and ETH1 ports are not PoE (Power over Ethernet) compatible!

Plug Ethernet cable into the RJ45 connector labeled as ETH0 or ETH1 (see the figure below).

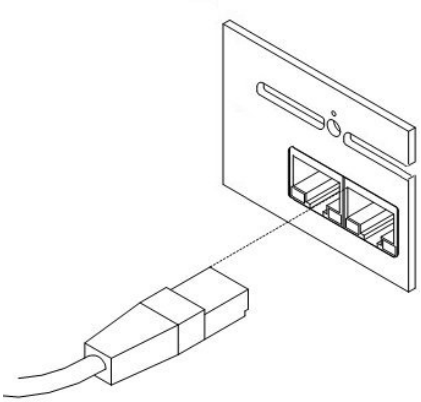

Figure 23: Connection of ethernet cable

5.7.6 Reset

When *PWR* LED starts flashing on the front panel, it is possible to restore the default configuration of the router by pressing the *RST* button on the front panel. After pressing this button the default configuration is restored and then router reboots (green LED will be on).

For pressing the *RST* button could be used a narrow screwdriver.

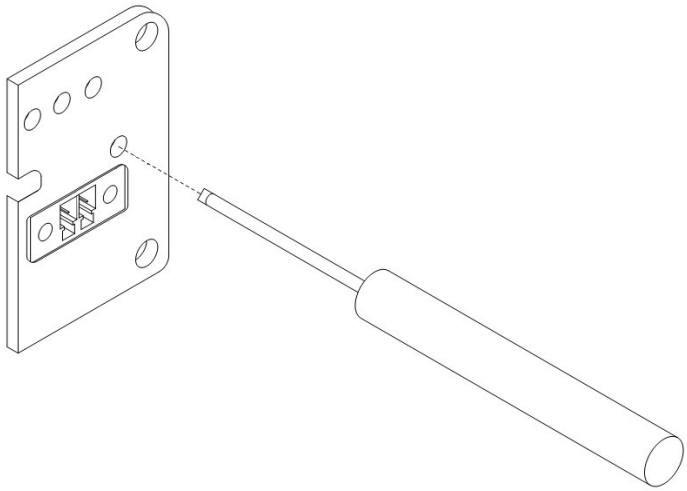

Figure 24: Router reset

We recommend backing up configuration of the router (see *Configuration manual for OWL v2 routers*) because reset of the router sets the configuration to the default state.

It is important to distinguish between reset and reboot the router.

Action	Router behavior	Invoking events
Reboot	Turn off and then turn on router	Disconnect and connect the power, Press the *Reboot* button in the web configuration
Reset	Restore default configuration and reboot the router	Press *RST* button

Table 12: Description of reset and restart router

6. First Use

6.1 Connecting the router before first use

Before putting the router into operation it is necessary to connect all components which are required to run your applications. Don't forget to insert SIM card.

The router can not operate without connected antenna, SIM card and power supply. If the antenna is not connected, router can be damaged.

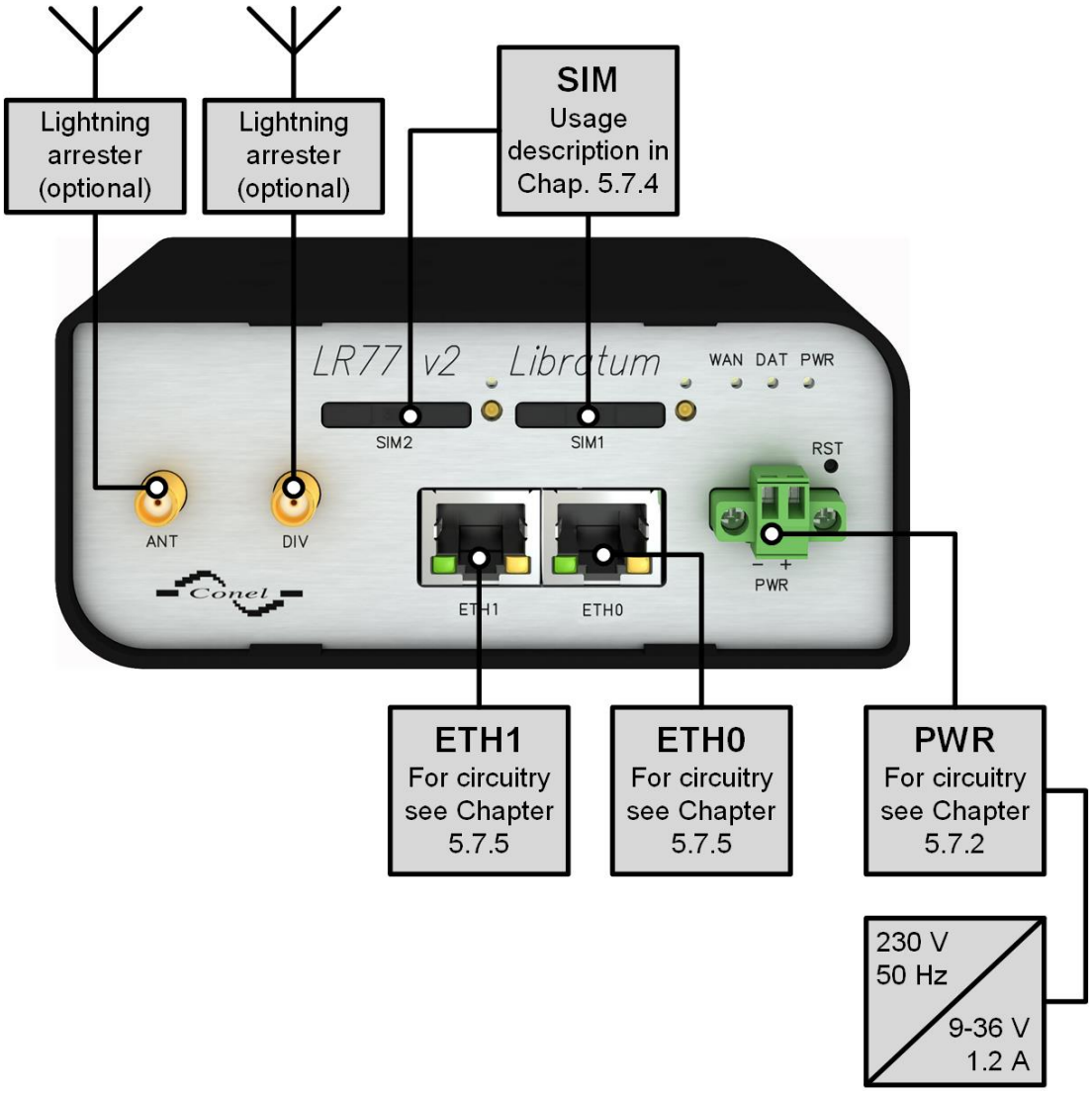

Figure 25: Router connection

6.2 Start

The router is put into operation when the power supply is connected to this router. By default, the router will automatically start to log on to the default APN. DHCP server will start to assign addresses for devices on the Ethernet port ETH0. Router's behavior can be changed via the web interface. This is described in detail in the *Configuration manual for v2 routers*.

The power consumption during receiving is 2.3 W. The peak power consumption during data sending is 5.5 W. However, values of consumption can be increased, if some expansion port is eqquipped. For correct operation it is necessary that the power source is able to supply a peak current of 1.2 A.

6.3 Configuration

If no SIM card is inserted in the router, it is not possible to operate. Inserted SIM card must have activated data transmission.

6.3.1 Configuration over web browser

For status monitoring, configuration and administration of the router is available a web interface which can be accessed by entering the IP address of the router into the web browser. The default IP address of the router is 192.168.1.1.

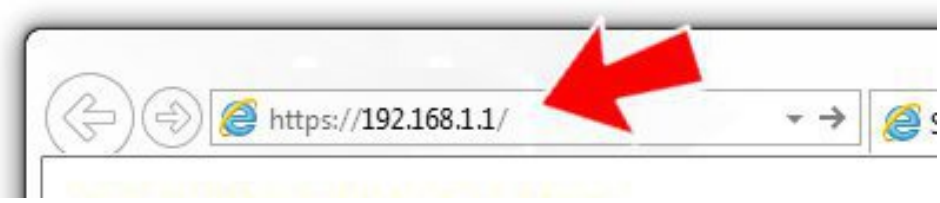

Figure 26: Entering the IP address of the router

Configuration may be performed only by the user "root". The default password is printed on the router's label.[1] Change the default password as soon as possible!

All routers have the *WebAccess/DMP* client pre-installed by default. The activated client periodically uploads router identifiers, configuration, and cellular network statistics to the *WebAccess/DMP* server. See the configuration manual [2], chapter *Basic Information -> WebAccess/DMP Configuration*, for more information.

After successfully entering login information user gains access to the router via his internet browser.

A detailed description of the router settings via the Web interface can be found in the document *Configuration manual for v2 routers*.

[1] If the router's label does not contain a unique password, use the password "root".

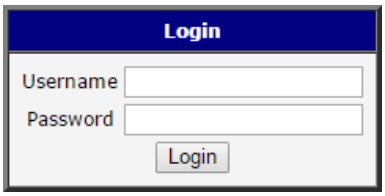

Figure 27: Entering login information

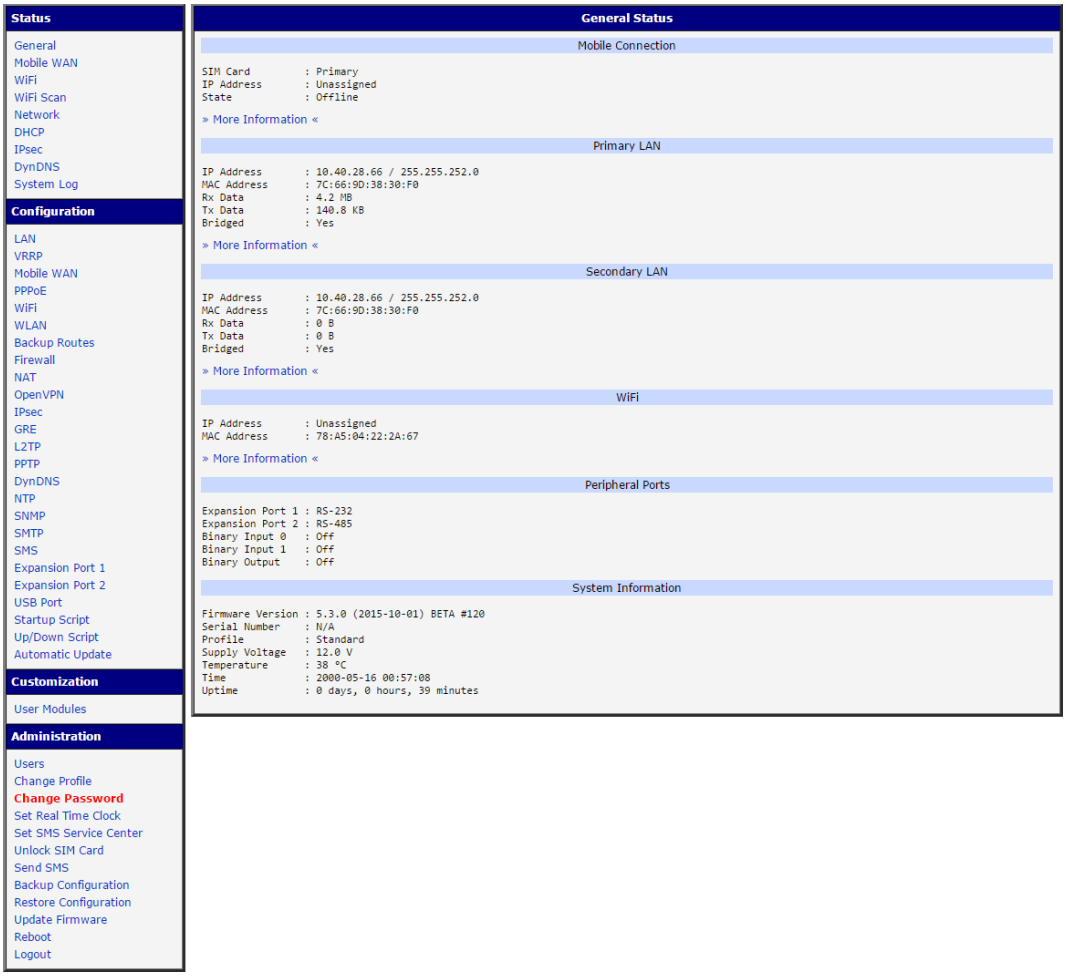

Figure 28: Router web interface

6.3.2 Configuration over SSH or Telnet

Device management can be done by accessing the device through the *Secure Shell* (SSH) or the *Telnet* protocol. The default IP address of the device is 192.168.1.1. Standard TCP ports are used, 22 for the *SSH* and 23 for the *Telnet*. Please note, that access is permitted for users of the admin role only and that the *Telnet* protocol is disabled by default. For a detailed description of *SSH* and *Telnet* configuration, see the *Configuration Manual*.

7. Technical Parameters

7.1 Basic parameters

LR77 v2 Libratum		
Temperature range *	Function Storage	-40 °C to +70 °C -40 °C to +85 °C
Humidity	Operating Storage	0 to 95 % relative humidity non condensing 0 to 95 % relative humidity non condensing
Altitude	Operating	2000 m / 70 kPa
Degree of protection		IP30
Supply voltage		9 to 36 V DC
Battery for RTC		CR1225
Consumption	Idle GPRS LTE	2.3 W to 3.5 W (GPRS transmission) to 5.5 W (LTE transmission)
Dimensions	Plastic box Metal box	51 x 87 x 116 mm (DIN 35 mm) 42 x 87 x 113 mm (DIN 35 mm)
Weight		LR77 v2 Libratum – 150 g LR77 v2 Libratum SL – 280 g
Antenna connector		2x SMA – 50 Ohm 1x R-SMA – 50 Ohm (**only for WiFi**)
User interface	ETH0 ETH1	Ethernet (10/100 Mbps) Ethernet (10/100 Mbps)

Table 13: Basic parameters

* If the router is equipped with WIFI module, the temp. range is reduced to -15 °C to +65 °C.

7.2 Standards and regulations

The router complies with the following standards and regulations.

Parameter	Description
Telecom and emission	ETSI EN 301 511 V12.5.1, ETSI EN 300 440 V2.1.1, ETSI EN 301 908-1 V13.1.1, ETSI EN 301 908-2 V11.1.1, ETSI EN 301 908-13 V11.1.1, ETSI EN 300 328 V2.2.2
EMC	ETSI EN 301 489-1 V2.1.1, ETSI EN 301 489-19 V2.1.0, ETSI EN 301 489-52 V1.1.0, ETSI EN 301 489-17 V3.1.1
Safety	IEC 62368-1, EN 62311
E-Mark	E-Mark homologation number: 10R – 04 7950
National	CE, UKCA compliant

Table 14: Standards and Regulations

7.3 Technical parameters of module

LTE module	
LTE parameters	Bit rate 100 Mbps (DL) / 50 Mbps (UL) 3GPP rel. 8 standard Supported bandwidths: 5 MHz, 10 MHz, 20 MHz Supported frequencies: B20 (800 MHz), B8 (900 MHz), B3 (1800 MHz), B1 (2100 MHz), B7 (2600 MHz) Max power – typical 23 dBm
HSPA+ parameters	Bit rate 42 Mbps (DL) / 5,76 Mbps (UL) 3GPP rel. 7 standard UE CAT. 1 to 6, 8, 10, 12, 14 3GPP data compression Supported frequencies: B8 (900 MHz), B3 (1800 MHz), B1 (2100 MHz) Max power – typical 24 dBm
UMTS parameters	PS bit rate 384 kbps (DL) / 384 kbps (UL) CS bit rate 64 kbps (DL) / 64 kbps (UL) W-CDMA FDD standard Supported frequencies: B8 (900 MHz), B3 (1800 MHz), B1 (2100 MHz) Max power – typical 24 dBm
GPRS/EDGE parameters	Bit rate 237 kbps (DL) / 59,2 kbps (UL) GPRS multislot class 10, CS 1 to 4 EDGE multislot class 12, CS 1 to 4, MCS 1 to 9 Supported frequencies: 900 / 1800 MHz Max power – typical 26–33 dBm
Supported GPRS/EDGE power classes	EGSM 900: Class 4 (33 dBm) GSM 1800: Class 1 (30 dBm) EDGE 900: Class E2 (27 dBm) EDGE 1800: Class E2 (26 dBm)

Table 15: Technical parameters of module

7.4 Technical Parameters of WiFi

WiFi	
Antenna connector	R-SMA – 50 Ω
Supported WiFi band	2.4 GHz
Standards	802.11b, 802.11g, 802.11n
2.4 GHz supported channels	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
RX Sensitivity	11b, 11 Mbps: typ. -85 dBm 11g, 54 Mbps: typ. -70 dBm (HT20) 11n, MSC7: typ. -66 dBm (HT40) 11n, MSC7: typ. -62 dBm
TX Output Power	11b, 11 Mbps: min. 18, typ. 19, max. 20 dBm 11g, 54 Mbps: min. 14.5, typ. 16, max. 17.5 dBm 802.11n (HT20): min. 13.5, typ. 15, max. 16.5 dBm 802.11n (HT40): min. 13.5, typ. 15, max. 16.5 dBm
Type of device	Access point, station
AP maximum users	Unlimited (WiFi module does not support multi-role operation).

Table 16: Technical parameters of WiFi

7.5 Other Technical Parameters

Other technical parameters	
CPU	32b ARM microprocessor 0.25 DMIPS per MHz
Flash memory	16 MB DDR SDRAM
RAM	64 MB
M-RAM	128 kB

Table 17: Other technical parameters

8. Related Documents

[1] Advantech Czech: **Start guide for v2 routers**,
[2] Advantech Czech: **Configuration manual for v2 routers**,
[3] Advantech Czech: **Application note – Programmer guide**.

9. Troubleshooting

If you cannot connect to the router from your PC, your network card may be configured in such a way that it is not possible to connect to the router. Take one or more of the following steps in order to solve the problem:

- Make sure your PC's network card is configured to obtain the IP address form the DHCP server (by default the DHCP server is running in the router).
- Connect the router to the PC via Switch.
- Connect the router to the PC, start the router first and then start the PC after the router's initialization.

9.1 FAQ

✍ **Ethernet connection fails or is not establishing.**

- *It is possible to turn auto negotiation off and set a rate and duplex manually on the Ethernet interface of the router. Available on "LAN Configuration" page in the router.*

✍ **Mobile WAN connection fails.**

- *Check the signal power ("Mobile WAN status" page). If the signal power is weak, you will have to use a better antenna. If the neighbouring cells have a similar signal strength, you will need to use a directional antenna. For proper operation, the signal levels have to be good.*
- *Try to enable automatic ping from the router, which will check the connection when there are no data running and in the case of a failed ping, restart the connection. This can be done on the "Mobile WAN Configuration" page in the router in the "Check connection" section. "Enable + bind" option is to ensure the ping goes always through Mobile WAN network interface.*

✍ **Mobile WAN connection cannot be established.**

- *Check the "Mobile WAN Configuration" – APN, name, password and IP address (all can be blank).*
- *Try to enter the SIM card PIN – verify that the SIM card has the PIN code entered. Available on "Unlock SIM Card" page in the "Administration" section.*
- *In a private APN it is not recommended to get the DNS settings from operator (on "Mobile WAN" page)*
- *Go to "System Log" page in "Status" section and observe where the error occurs.*

✍ **I cannot connect from the Internet to the device behind the router. I have NAT enabled.**

- *The device's gateway has to be configured so it points to the router.*

✍ **I can't access my Web server placed behind the router over NAT.**

- *The remote HTTP access to the router has to be disabled on "NAT Configuration" page in the router. Also enable "Send all remaining incoming packets to default server" feature and fill in the IP address of your Web server. On the Web server, the default gateway has to be the IP address of the router.*

✍ **DynDNS doesn't work.**

- *With private APN this will not work.*
- *If the same IP address is recorded in your canonic name as a dynamically assigned address, it means that the operator is using NAT or a firewall.*
- *You can verify NAT using ping to your server with static address and then compare with router's IP address.*
- *You can verify a Firewall by accessing remotely to the router's Web interface.*
- *The operator may not provide the address of DNS server and without DNS server's address it is impossible to connect to the dyndns.org server. The following messages will be shown in the System Log:*
  - *DynDNS daemon started*
  - *Error resolving hostname: no such file or directory*
  - *Connect to DynDNS server failed*

✍ **L2TP or IPSec isn't establishing.**

- *Check the "System Log" page for error messages.*

✍ **IPSec tunnel establishes but the communication does not run.**

- *Probably there are bad routing rules defined in the connected devices, or the default gateway.*

✍ **I switched the router to offline mode by SMS message, but the router is in online mode after reboot.**

- *SMS messages do not change the router configuration. They remain in effect only until the router is rebooted.*

✍ **Serial communication is not working.**

- *Verify that the router model supports serial communications. Also verify the serial communication settings. To do so, open the router's configuration menu via the web browser, select the appropriate "Expansion Port" from "Configuration" part of the menu and verify the settings.*

✍ **Is the router Cisco compatible? Can I use the Cisco configuration?**

- *No, the Firmware in the router (Conel OS) is based on Linux with BusyBox. Thus the Cisco configuration cannot be used. But network connections are defined by standards so connecting the router to the Cisco or other networking devices is possible and will be compatible.*

✍ **FTP or SFTP does not work**

- *FTP will work on v2 routers only. You can use SFTP on all routers to transfer files to/from the router. If having troubles with FTP on v2 routers, make sure you have FTP enabled: "Configuration" section, "Services", "FTP". Then you can connect with any client on port 21 with name and password same as for the Web interface. If having troubles with SFTP, make sure you have SSH enabled: "Configuration" section, "Services", "SSH". Then you can connect with any client on port 22 with name and password same as for the Web interface.*

✍ **How can I connect to the router's command line? (SSH, Telnet)**

- *You can use SSH on all routers or Telnet on v2 routers only. SSH is enabled by default, but you can verify in Web interface in "Configuration" section, "Services", "SSH". Then connect with any SSH client on port 22 of the router. User and password is the same as for the Web interface. Telnet on v2 routers can be enabled here: "Configuration" section, "Services", "Telnet".*

10. Customer Support

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