wieland

wienet LTE LR340-EMEA

Industrial LTE Mobile Router

Manual

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INFO

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1 ABOUT THIS MANUAL

Please read this chapter carefully before using the user manual or the products.

1.1 Function of this manual

This user manual provides technical staff with information about the device and its functions. This manual contains the necessary information for the intended use and the technical data of the projects described in it. As a guidance, the overall table of contents is available at the beginning of the manual.

Use the BA001039 manual for the configuration of the wienet LTE v2/v3 Router, see Table 1.

1.2 Other applicable documents

NOTE

You can also use our website https://eshop.wieland-electric.com.
There, the following files can be downloaded:

- Product information for wienet routers
- Data sheets for wienet routers
- Technical notes for wienet Wie-Service24 (VPN Server)

Table 1: Other applicable documents

Document	Title	Article number
Assembly instructions	Assembly instructions wienet LTE LR340 EMEA	BA001311
Configuration manual	wienet LTE v2/v3 Router Configuration	BA001038

1.3 Target group

This manual is intended for:

- Those who can prove that they have the corresponding training and already have corresponding basic knowledge of commissioning electrical installations.
- System integrators
- Electricians
- Electrical system operators

1.4 Symbols and designations



DANGER

The "DANGER" symbol indicates an imminent danger. Ignoring this symbol can result in death or serious injury.
"DANGER" is used to warn against risks that already apply at the time of the warning (e.g. hot surfaces, sharp edges, pinch points, etc.).
It is used exclusively to indicate danger of personal injury!



WARNING

The "WARNING" symbol indicates a possible threat. Ignoring this symbol can result in death or serious injury could result.



CAUTION

The "CAUTION" symbol indicates a potential danger. Ignoring this symbol can result in minor injuries.

NOTE

Notes concerning the special functions of the device.

The instructions also inform you about a potentially harmful situation. Ignoring this symbol can result in the system or something in its surroundings being damaged.

2 SAFETY

2.1 Installation instructions for hazardous locations

These devices are open-type devices that must be installed in a housing that is suitable for the environment and can only be accessed using a tool or key.

This device is suitable for use in Class I, Division 2, Groups A, B, C, and D or nonhazardous locations only. This device must be mounted in an ATEX Zone 2 certified housing with a minimum ingress protection rating of at least IP54 (as defined in EN 60529) and used in an environment of not more than Pollution Degree 2 (as defined in EN 60664-1) when applied in Zone 2 environments. The housing must be accessible only by the use of a tool.



WARNING

Explosion hazard

- Do not disconnect the device unless the power supply has been interrupted or the area is known to be non-hazardous.
- Substitution of any components may impair suitability for class I, division 2.
- Batteries must only be changed in an area free of ignitable concentration.

All antennas, antenna cables and wiring have not been evaluated as external wiring.

Provision shall be made to prevent the nominal voltage from being exceeded by transient disturbances of more than 140 % of the nominal voltage when applied in Zone 2 environments.

2.2 General safety instructions

Safety notes

Please, observe the following instructions.



CAUTION

- 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 devices 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 must not be opened.
- Turn off the router and disconnect it from the power supply before inserting or removing the SIM card.
- The input voltage must not exceed 36 V DC max.



DANGER

This device is not suitable for use in locations where children are likely to be present. The SIM card could be swallowed by small children.

- Do not expose the router to extreme environmental conditions. Protect the router against dust, moisture and high temperature.
- Only routers with appropriate certification and labeling 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.
- We recommend you to create an appropriate copy or backup of all important settings that are stored in the memory of the device.

3 PRODUCT OVERVIEW

3.1 Product Introduction

The wienet LTE LR340 EMEA mobile router is designed for wireless communication in mobile networks that make use of traditional cellular technologies. It can also be used as a simple LAN-to-LAN router.

The primary purpose of this router is its use in the Category 4 (**Cat.4**) services on the cellular **LTE** network. A Cat.4 rated router is capable of achieving typical speeds in 4G coverage areas where the network is enabled with 20 MHz of contiguous spectrum.

The maximum **downlink** data rate for Category 4 is approximately **150 Mbit/s**. In the **uplink**, LTE Category 4 provides a peak data rate of **50 Mbit/s**. Therefore, the router is an ideal solution for specialized M2M devices and IoT as well as for the wireless connection of traffic and safety camera systems, individual computers, LAN networks, ATMs and other self-service terminals. The router is equipped with two independently configurable **Ethernet ports**, serial **RS232** and **RS485** ports, as well as a **digital input** and a **digital output**. The device also has 2 SIM card slots (3 V and 1.8 V).

The router can be configured via a password-protected web interface, which also provides detailed statistics about activities and the router's signal strength, system logs, etc.

The router supports **VPN tunnel** creation using various protocols to ensure safe communications.

The router provides diagnostic functions which include automatic monitoring of the wireless and wired connections, automatic restart in case of connection losses, and a hardware watchdog that monitors the router status.

In addition, it is possible for a router to create up to 4 different configurations. Depending on your requirement, you can swap between configurations, e.g. via the web interface. Routers can automatically update their firmware from a central server. This makes it possible to reconfigure a large number of routers at the same time.

With open Linux platform and wide possibilities of programming customer SW applications in **Python, C/C++**.

Examples of possible applications:

- Mobile office
- Security system
- Telematic
- Remote monitoring
- Vending machines (e.g. drinks and cash machines)

3.2 Router version

The wienet LTE LR340 EMEA router is supplied in the following version, see Table 2.

Table 2: Router versions

Type	SIM	BIN	BOUT	ETH	Wi-Fi	RS232	RS485
LR340	2 ×	1 ×	1 ×	2 ×		1 ×	1 ×

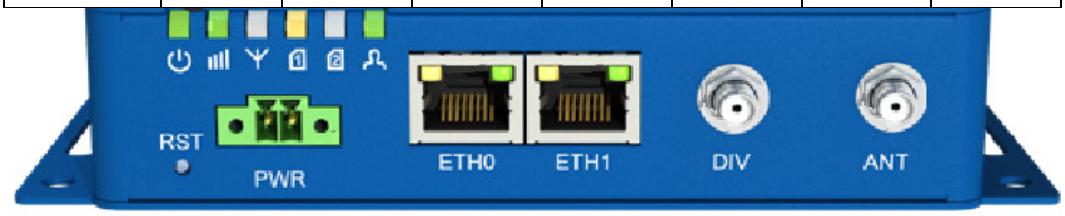


Figure 1: Version LR240

Table 3: Delivery identification

Trade name	wienet
Type Name	LTE LR340 EMEA
other	Router in metal housing

3.3 Product Label

An example of the product label, with all the information printed on it, is in Figure 2.

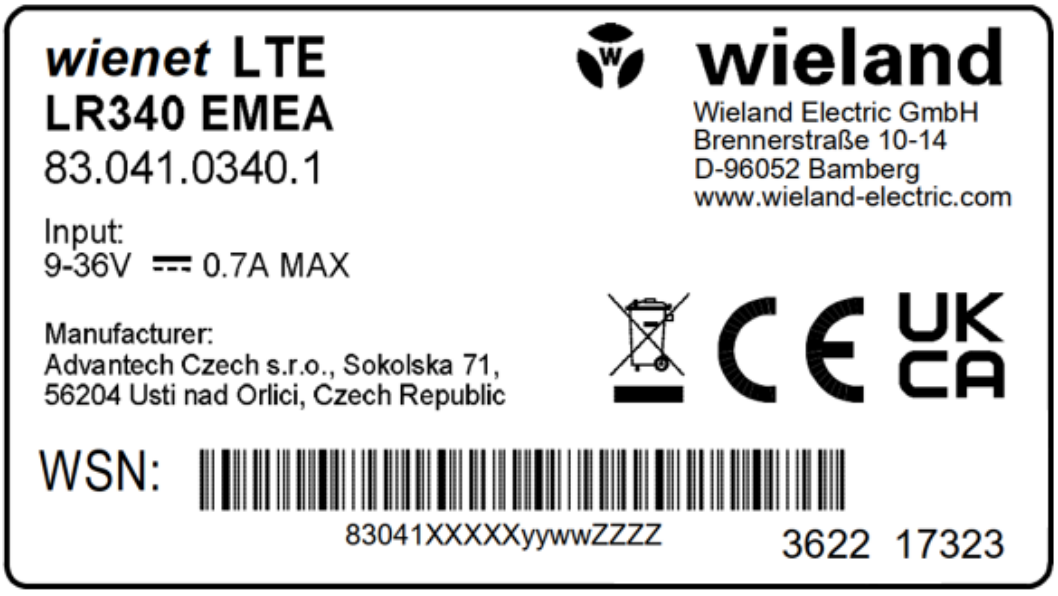


Figure 2: Label example

3.4 Article Numbers

An overview of the article numbers is provided in Table 4.

Table 4: Article number overview

Product name	Article number	Functions – interfaces
LTE LR340 EMEA	83.041.0340.1	LTE module for EMEA, 2× ETH, 1× BIN, 1× BOUT, 2× SIM, 1× RS232, 1× RS485

3.5 Hardware Overview

You can find a depiction of the router housing in Figure 3 and Figure 4. A brief description of the hardware parts of the router is provided in Table 5 which includes links to the chapters with a detailed description.

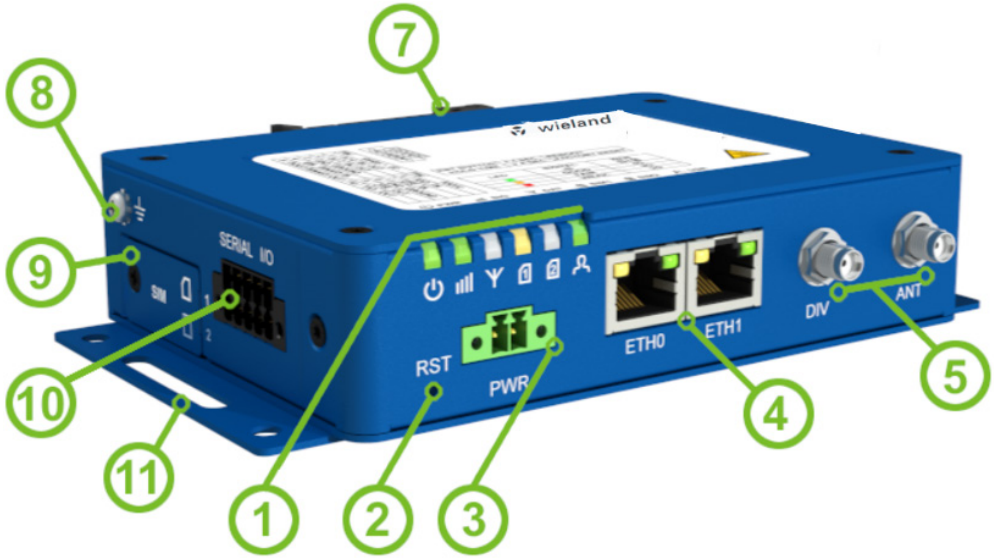


Figure 3: Front view



Figure 4: Rear view

Table 5: Hardware overview of the router

No.	Item/Designation	Type	Description
1	LEDs	-	LED status indication, see chapter 6.6 "LED Status Indication", p. 24.
2	RST	-	Button to reboot the router or restore the standard configuration, see chapter 6.7 "Reset Functions", p. 25.
3	PWR	2-pin terminal	Power supply socket, see chapter 6.4 "Power Supply", p. 20.
4	ETH0	RJ45	100 MB Ethernet connection for the first LAN, see chapter 6.3 "Ethernet Interfaces", p. 19.
	ETH1	RJ45	100 MB Ethernet connection for the second LAN, see chapter 6.3 "Ethernet Interfaces", p. 19.
5	DIV, ANT	SMA	Connector for the diversity and main antenna of the cellular module, see chapter 6.2 "Cellular Antennas", p. 18.
7	DIN clip	-	DIN rail clip, see chapter 5.2 "DIN Rail Mounting", p. 17.
8	Earthing screw	M3	Pay attention to proper grounding, see chapter 6.4 "Power Supply", p. 20.
9	SIM slots	Mini SIM	Two SIM card slots, see chapter 6.2 "Cellular Antennas", p. 18.
10	SERIAL I/O	10-pin terminal strip	RS232, RS485, binary inputs and binary outputs interfaces, see chapter 6.5 "Serial and I/O port interfaces", p. 22.
11	Wall clip	-	Wall mounting clip, included as standard accessory.

3.6 Package Contents

The standard set for the router includes items listed in Table 6.

Table 6: Package contents

Item.	Description	Figure	Q'ty
1	Router		1 pcs
2	DIN rail clip		1 pcs
3	Wall mounting kit		1 pcs
4	Assembly instructions		1 pcs
5	2-pin screw clamp PWR		1 pcs
6	10-pin spring clamp connection		1 pcs

3.7 Product Dimensions

For the dimensions of the product see Figure 5 and Figure 6. Note that all sizes are measured in millimeters.

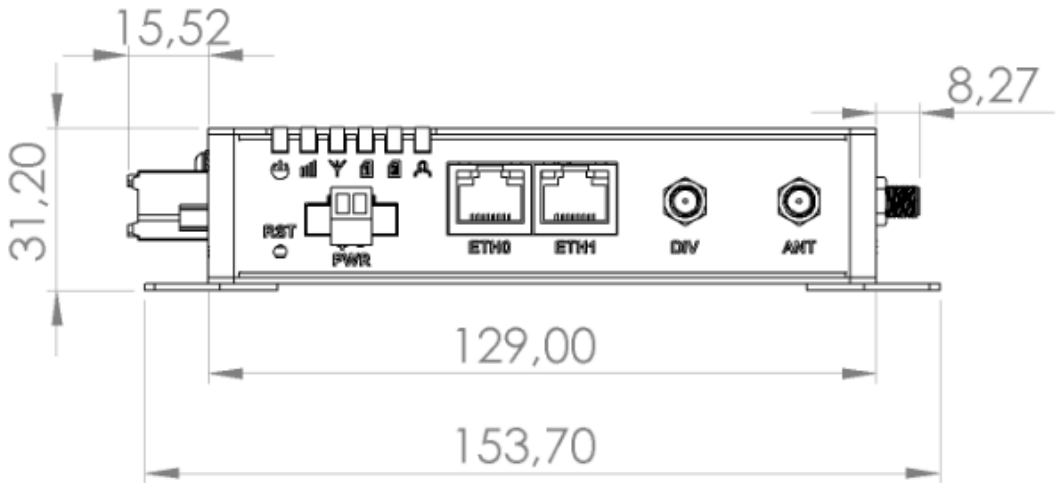


Figure 5: Product dimensions – front view

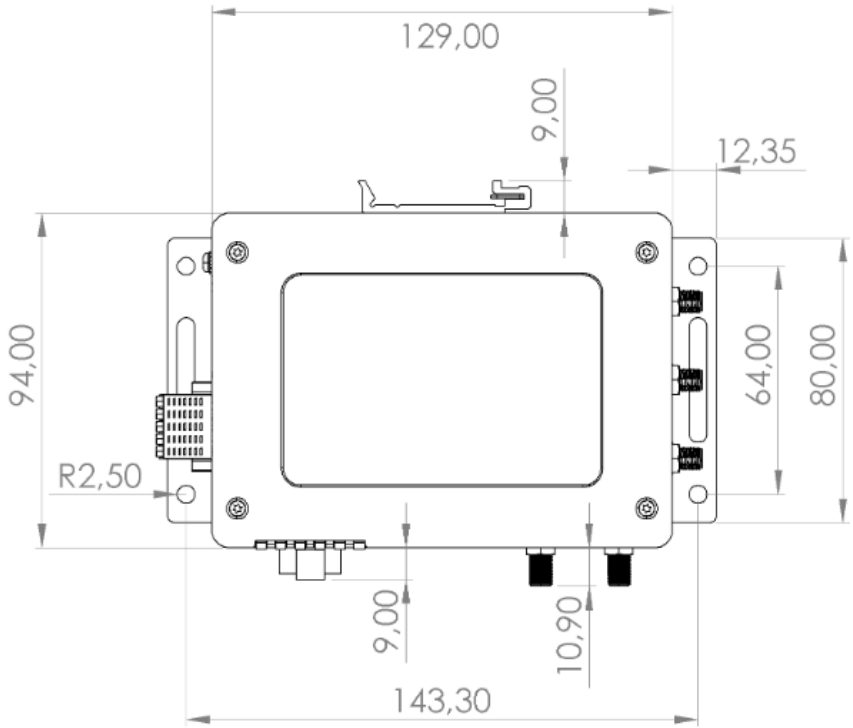


Figure 6: Product dimensions (with wall mounting clip) – top view

4 PRODUCT USAGE EXAMPLES

The router is primarily intended for these four basic situations.

4.1 Access to the Internet from LAN

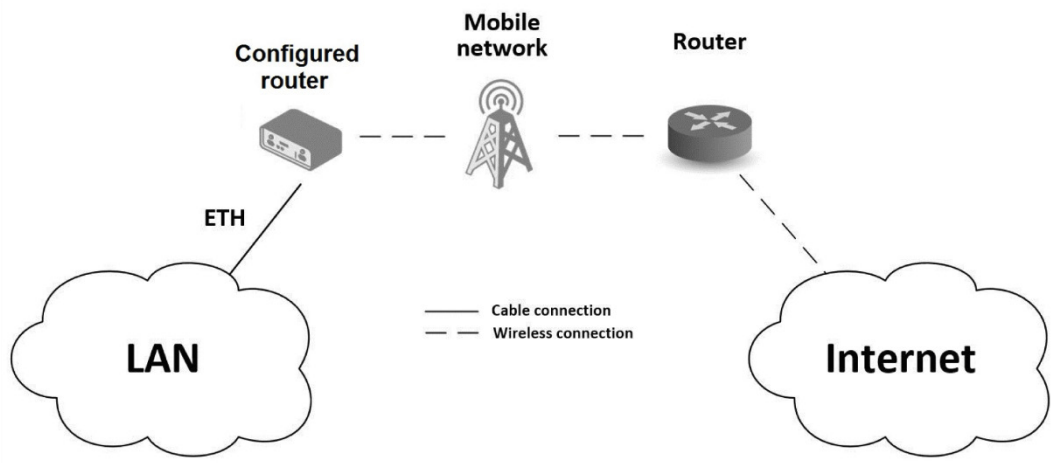


Figure 7: Access to the Internet from LAN

4.2 Backup access to the Internet (from LAN)

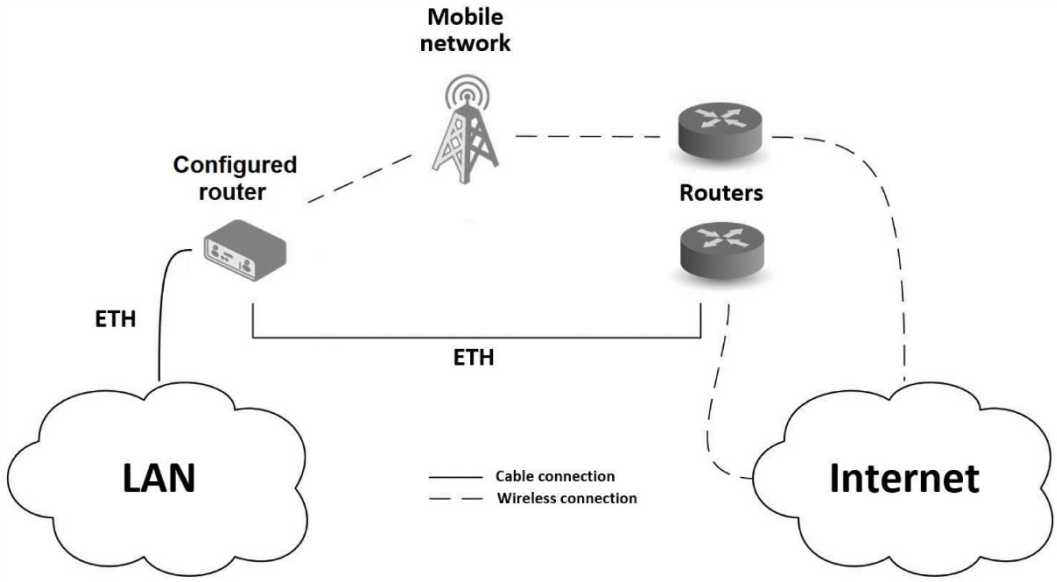


Figure 8: Backed up access to the Internet

4.3 Secure network interconnection or using VPN

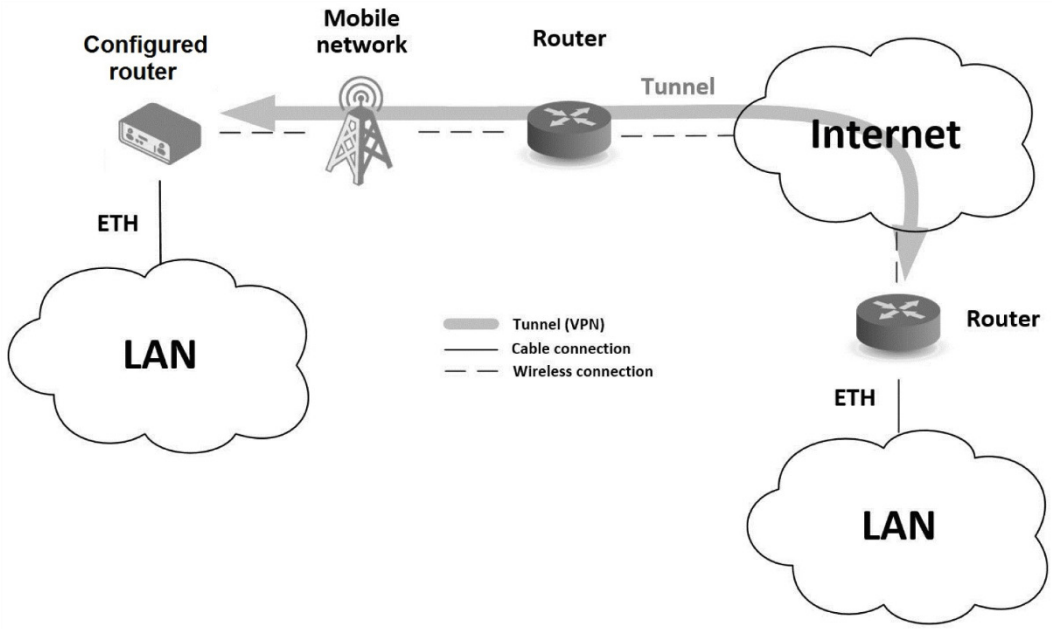


Figure 9: Using VPN tunnels

4.4 Serial Gateway

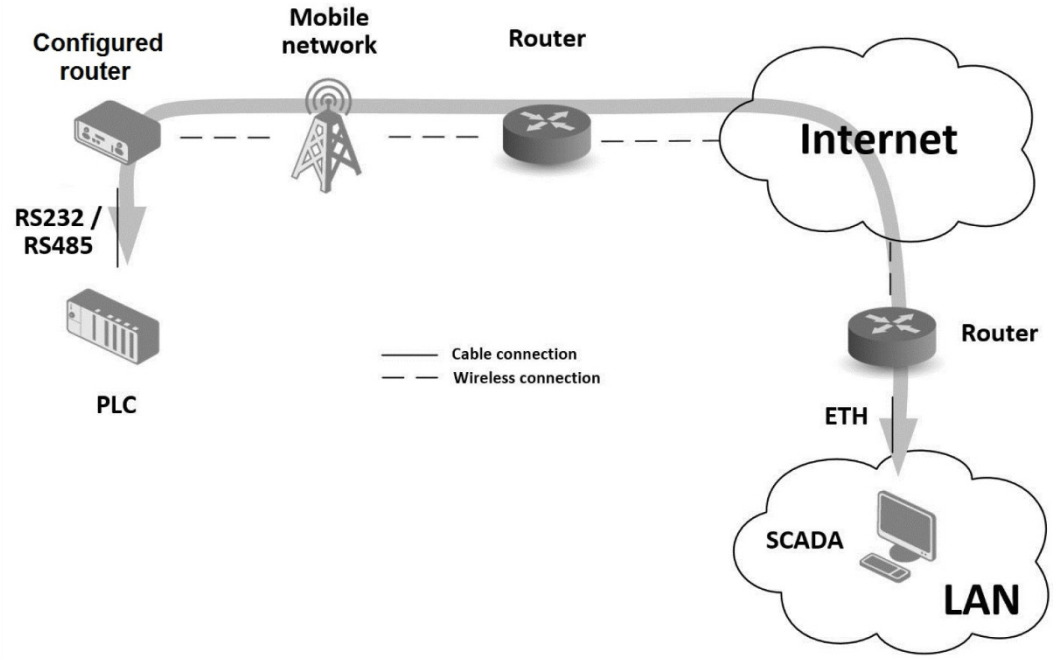


Figure 10: Serial gateway

5 MOUNTING AND REMOVAL

5.1 Mounting Recommendations

The router can be placed:

- on a flat surface,
- on a wall (or another surface) via pre-mounted side wings,
- on a DIN rail EN 60715 with the metal DIN rail clip. see chapter 5.2 "DIN Rail Mounting", p. 17.

For most applications with a built-in router within a switchboard, there are two kinds of environments:

- a non-public, industrial environment of low voltage with high interference,
- a public environment of low voltage and without high interference.

For both of these environments, it is possible to mount the router on a switchboard, after which no testing for electromagnetic immunity or issues in connection with EMC according to EN 61439-1:2011 is required.



CAUTION

If the router's negative pole is grounded, no protection is provided against reverse polarity. The only remaining protection is the fuse inside the device. The router's functionality can only be restored by a service center.



CAUTION

In compliance with the EN 61439-1:2011 specification, it is necessary to observe the following assembly instructions for a router attached to a switchboard:

- For whip antennas we recommend observing a minimum distance of 6 cm from cables and metal surfaces on every side in order to avoid interference. When using an external antenna separate from the switchboard it is necessary to fit a lightning conductor.
- When mounting a router on sheet-steel we recommend using a cable antenna.
- For all cables, we recommend bundling all cables, and for this we recommend: – The length of the bunch (the combination of power supply and data cables) should be a maximum of 1.5 m. If the length of the data cables exceeds 1.5 m or if the cable is routed towards the switchboard, we recommend installing surge protectors. – Data cables must not have a reticular tension of ~ 230 V/50 Hz or ~ 120 V/60 Hz.
- Sufficient space must be left between each connector for the handling of cables.
- To ensure the correct functioning of the router we recommend the use of a grounding distributor to ground the grounding screw, see chapter 6.4 "Power Supply", p. 20.

5.2 DIN Rail Mounting

NOTE The DIN rail clip is supplied with the router as standard accessory.

The DIN rail clip is suitable for a DIN rail according to the EN 60715 standard only. The standard position of the clip is shown in Figure 11.

CAUTION When mounting the wall mounting clip, tighten the screws with a max. torque of 0.4 Nm.



Figure 11: Position of the DIN rail clip

5.3 Removing from the DIN rail

- ➡ Push the router down lightly, so the bottom part of the DIN rail clip (hitched to the DIN rail) comes out of the rail.
- ➡ Pull out the bottom part of the router away from the DIN rail.

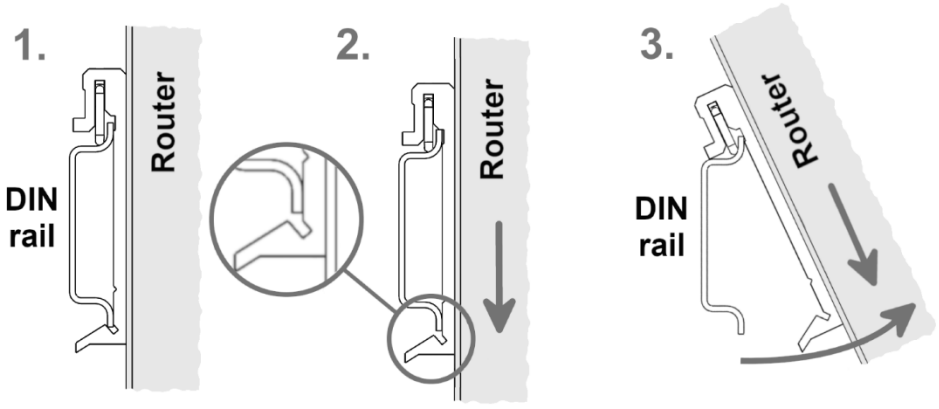


Figure 12: Removing the outer from the DIN rail

6 HARDWARE FUNCTIONALITY

See chapter 3.6 "Package Contents", p. 11 for the product hardware overview. Table 5 lists a short description of the hardware, including the links to the chapters with a detailed description.

6.1 SIM Card Slots

Two SIM card slots for 3 V and 1.8 V are located on the left side of the router under a metal cover. An activated SIM card must be inserted for the router to function properly. If a PIN is required for the SIM card, enter it via the router's web interface. Different APNs (Access Point Names) can be configured on the SIM cards. The procedure for changing the SIM card is described below.

NOTE

Type of SIM cards: mini-SIM (3FF) 25.0 × 15.0 × 0.76 mm.

CAUTION

Inserting the SIM card:

- Always disconnect the router from the power supply before inserting or removing the SIM card.
- Unscrew the two screws on the SIM card cover and remove the cover.
- To remove an inserted SIM card, use the flat end of a spudger, or your fingernail, press the SIM card slightly into its slot until you hear a click. After hearing this click, release the card, and it will pop out of its slot.
- To insert a SIM card, push the card into the slot until it clicks into place.
- Replace the cover and fix it with two screws.

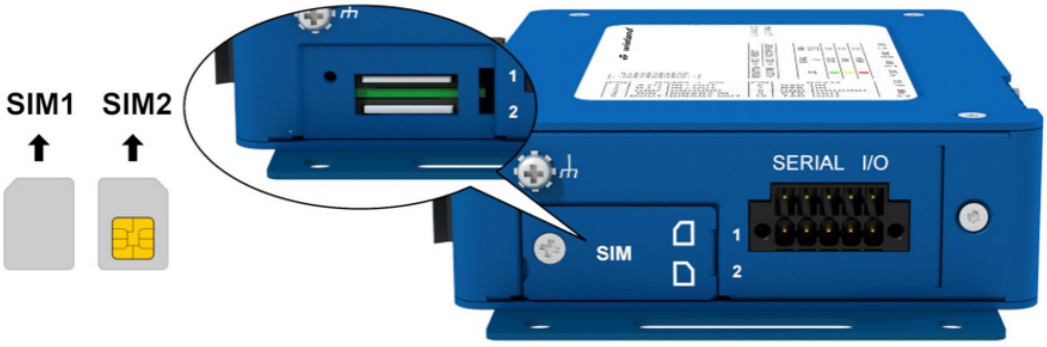


Figure 13: SIM card insertion

6.2 Cellular Antennas

Main (ANT) and diversity (DIV) antennas can be connected to the router using the SMA connectors located on the front panel.

CAUTION

Do not operate the router without a connected cellular antenna connected to the main antenna connectors, because the energy from the transmission will be effectively reflected from the open end and can damage the device.

NOTE

- The recommended tightening moment for screwing the antenna to the SMA connector is 0.9 Nm.
- The diversity antenna improves the radio capability of the router at a low signal strength.

6.3 Ethernet Interfaces

The RJ45 panel socket is used for Ethernet interface. The pinout of the socket is shown in Figure 14 and described in Table 7.

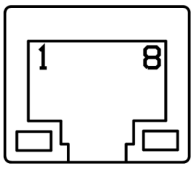


Figure 14: Ethernet connector pinout

Table 7: Ethernet connector pinout description

Pin	Signal designation	Description
1	TXD+	Transmit Data – positive pole
2	TXD-	Transmit Data – negative pole
3	RXD+	Receive Data – positive pole
4	—	—
5	—	—
6	RXD-	Receive Data – negative pole
7	—	—
8	—	—

NOTE The isolation barrier of the Ethernet ports against one another and against the ground is 1500 V.

6.4 Power Supply

The pins of the power supply are physically connected to the 2-pin terminal block panel socket located on the left side of the device. The connection for the power supply is shown in Figure 15 and described in Table 8.

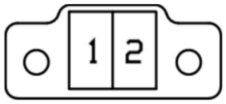


Figure 15: Connection to the power supply

Table 8: Power supply pinout

Pin	Signal designation	Description
1	PWR(+)	Positive pole of DC supply voltage (+9 … +36 V DC)
2	PWR(-)	Negative pole of DC supply voltage

The required power supply voltage for the router is between +9 V and +36 V DC, see the connection scheme on Figure 15. Protection against reversed polarity without signaling is built into the router.



If the router's negative pole is grounded, no protection is provided against reverse polarity. The only remaining protection is the fuse inside the device. The router's functionality can only be restored by a service center.

For correct functioning, the power source must be able to supply a peak current of 1 A.



The device must be supplied by a power supply specified as a Limited Power Source (LPS) or CEC/NEC Class 2 source of supply.

Low Power Mode

Low Power Mode (LPM) is perfectly suited to applications with a low power consumption. We recommend you to activate the LPM before the whole router is shut down. This can be done via a command in the web interface under the Scripts menu item. The command has 2 parameters.

The command looks like this: `lpm [-b] [-i <interval>]`

With the parameter –b, you can activate the router via the binary input BIN0; with the parameter –i, you can activate the LPM for a particular duration. The duration is specified in seconds. If both parameters are specified, the router will be woken up by the event that occurs first.

Examples:

- `lpm -b`: Activates the LPM until the binary input is activated.
- `lpm -i 300`: This command activates the LPM for 5 minutes.
- `lpm -b -i 300`: Activates the LPM for 5 minutes unless the binary input is activated first.

The metal housing and all the metal parts of the router are connected to the negative pole of the power supply (common pin). If recommended for the installation environment, protect the router by grounding it properly with the grounding screw on the right side, see Figure 16.



Figure 16: Position of the grounding screw

6.5 Serial and I/O port interfaces

The pins of the serial interfaces RS232 and RS485 are connected, together with the I/O interface, physically to the 10-pin terminal strip on the left side of the device. None of the 3 interfaces are isolated from the router. The pin assignment of this connector is described in Figure 17 and in Table 9: RS485 connection and Table 10.

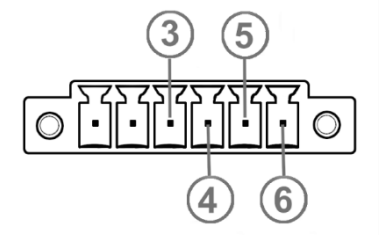


Figure 17: RS485 and RS232 pinout and I/O connection

Table 9: RS485 connection

Pin	Signal designation	Description
1	D (+)	In/Out (Input/Output)
2	D (-)	In/Out (Input/Output)
3	GND	Ground

Table 10: I/O connection

Pin	Signal designation	Description
4	BIN	Binary IN
5	BOUT	Binary OUT

Table 11: RS232 connection

Pin	Signal designation	Description
6	RXD	Receive Data
7	CTS	Clear to Send
8	GND	Ground
9	RTS	Request to Send
10	TXD	Transmit Data

NOTE The serial interfaces are not electrically isolated from the router.

The I/O user interface is intended for processing binary inputs and controlling binary outputs. By default, the binary output is open, i.e., not grounded. The maximum binary output load is 36 V at 500 mA. The constant current supplied by the binary input is 3 mA.

The functional connection scheme of the binary input and output is shown in the following figure.

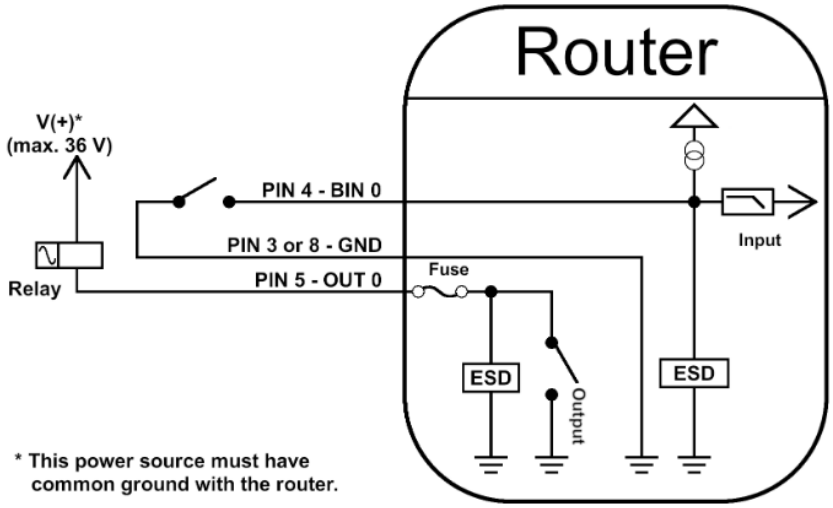


Figure 18: Functional scheme of the binary interface

6.6 LED Status Indication

There are LED indicators on the front panel of the router to provide router status information. Moreover, the ETH connector has two additional LEDs providing information about the port status.

Table 12: LED status indication

Designation	Colour	State	Description
PWR	Green Green Green	On Blinking Fast blinking	Starting of the router. Router is ready. Updating firmware.
USR	Green	On Blinking Fast blinking	Function of this LED diode can be selected by user.
DAT	Green	Blinking	Communication in progress on radio channel.
SIG	Green Orange Red	On On On	Good signal. Fair signal. Poor signal.
SIM1	Green Green Orange Red Red	Blinking On On On Fast blinking	SIM has been selected, router is waiting for data connection SIM card is using 4G technology SIM card is using 3G technology SIM card is using 2G technology SIM card problem (missing SIM card or PIN not entered)
SIM2	Green Green Orange Red Red	Blinking On On On Fast blinking	SIM has been selected, router is waiting for data connection SIM card is using 4G technology SIM card is using 3G technology SIM card is using 2G technology SIM card problem (missing SIM card or PIN not entered)
ETH0 ETH1	Green Green	On Off	Selected 100 Mbps bit rate. Selected 10 Mbps bit rate.
ETH0 ETH1	Yellow Yellow Yellow	On Blinking Off	The network cable is connected. Data transmission. The network cable is not connected.

6.7 Reset Functions

The **RST** button on the front panel can be used in three different situations:

- **Reboot the router**: Hold the **RST** button for less than 4 seconds, the router will be restarted.
- **Factory reset** – restore the factory setting: Hold the RST button for more than 4 seconds. The **PWR** LED turns off and on again. We recommend holding down the **RST** button for 1 second after turning on the **PWR** LED on the front panel.
- **Emergency factory reset** – If the router is unable to boot up due to a bad configuration, turn off the router (disconnect the power supply). Push and hold the **RST** button, turn on the router and hold the **RST** button for at least 10 seconds. This will reset the router to the standard configuration.

CAUTION

We recommend backing up the settings of the router configuration, prior to performing the factory reset of the router. Note that resetting of the router reset the whole configuration to the standard state.

NOTE

Use a narrow screwdriver or any other small tool to press the **RST** button.

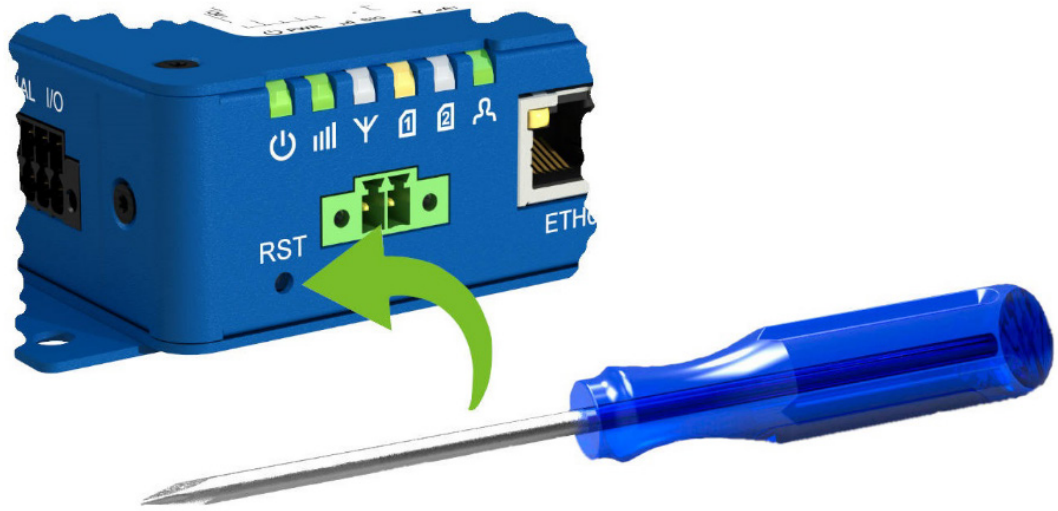


Figure 19: Resetting the router

Table 13: Overview of reset functions

Action	Router behavior	Trigger events – options
Reboot	Turns off and then turns on the router	• Disconnect and reconnect the power supply. • Send the text reboot via SMS to the SIM card number you have inserted in your router (your phone number has to be authorized – see the configuration manual). • Press the Reboot menu item in the web interface. • Press the RST button and hold it for less than 4 seconds.
Factory Reset	Restores the default configuration and reboots the router	• Hold the RST button for more than 4 seconds. • If that does not help (router does not start at all), turn off the router (power supply). Push and hold the RST button, then turn on the router, holding the RST button for more than 10 seconds.

7 FIRST USE

Before starting up the router, all the components required to execute your applications must be connected. Do not forget to insert a SIM card.



CAUTION

The router cannot function without an antenna, SIM card and power supply. If no antenna is connected, the router may become damaged.

7.1 Starting up the Router

The router will start up when a power supply is connected to it. By default, the router will automatically log on to the standard APN of the inserted SIM card. The DHCP server will assign an address to the devices connected through the Ethernet port ETH0.

7.2 Router Configuration



CAUTION

The router cannot function if no SIM card is inserted. The SIM card/one of the SIM cards must have an activated data transmission.

Initial router configuration can be made via a web browser running on your PC. Here you can perform router monitoring, configuration, and administration. First, connect the PC to the standard LAN interface. To reach the router interface, enter the https://192.168.1.1 address in a web browser. Please note that usage of the HTTPS protocol for secure communication over the network is required.

By default, only the root user account has been created on the router. See the product label on the router for its default password. Log in to the web interface via the root user and its password. If logged in successfully, the user will have access to the router web interface, see Figure 20. See the configuration manual of the router for a detailed description and examples of the router configuration.



CAUTION

After logging in to the device for the first time, we strongly recommend changing the default password due to security reasons.



CAUTION

For security reasons, we highly recommend updating the router's firmware to the latest version regularly. Downgrading the firmware to an older version than the production version or uploading firmware intended for a different device may cause malfunction of the device.



Figure 20: Router's web interface

NOTE A detailed description of the router settings in the web interface can be found in the configuration manual of the router.

8 TECHNICAL DATA

8.1 Basic Parameters

Table 14: Basic parameters

Router parameters		
Temperature range	Operation Storage	-40 °C … +75 °C -40 °C … +85 °C
Humidity	Operation Storage	0 … 95 % relative humidity, non condensing 0 … 95 % relative humidity, non condensing
Altitude	Operation	2000 m / 70 kPa
Protection rating		IP30
Supply voltage		9 … 36 V DC
Battery (RTC)		CR1225
Power consumption	Idle Average Peak Sleep mode	2.5 W 4 W 11 W 10 mW
Dimensions of the device w/o clip		31.2 × 84 × 129 mm
DIN rail clip (optional part) specification		DIN 35 mm, EN 60715
Weight	Box w/o clip	477 g
Antenna connectors		2 SMA connectors for LTE – 50 Ω
User interface	2× ETH: I/O | SERIAL:	RJ-45 socket for 10/100 Mbps Ethernet 10-pin socket for RS485, RS232, and I/O interfaces

8.2 Standards and Regulations

The router complies with the following standards and regulations.

Table 15: Standards and Regulations

Standards and Regulations	
Radio	EN 301 511, EN 301 908-1, EN 301 908-2, EN 301 908-13, EN 303 413, EN 301 893, EN 300 328
EMC	EN 301 489-1, EN 301 489-19, EN 301 489-52, EN 301 489-17, EN 61000-6-2, EN 61000-6-4
SAFETY	UL/EN/AS/NZS 62368-1
Transport	E-Mark E8 homologation number: 10R – 05 10350, EN 45545-2
National	CE, UKCA compliant
Environmental	REACH, RoHS3 and WEEE compliant

8.3 Type Tests and Environmental Conditions

Table 16: Type tests and environmental conditions

Phenomena	Test	Description	Test level
ESD	EN 61000-4-2	Contact discharge Air discharge	± 6 kV (crit. A) ± 8 kV (crit. A)
RF field AM modulated	EN 61000-4-3	Housing	10 V/m (crit. A) (80 – 6000 MHz)
Burst	EN 61000-4-4	Signal ports Power connectors Ethernet ports	± 1 kV (crit. A) ± 2 kV (crit. A) ± 1 kV (crit. A)
Surge	EN 61000-4-5	Ethernet ports Power connectors	± 1 kV (crit. A), protected cabin ± 0.5 kV (crit. A)
RF conducted	EN 61000-4-6	All ports	10 V/m (crit. A) (0.15 – 80 MHz)
Radiated emission	EN 55032	Housing	Class B
Conducted emission	EN 55032	DC power connector Ethernet ports	Class B Class B
Dry heat	EN 60068-2-2	+75 °C, 40 % rel. humidity	
Cold	EN 60068-2-1	-40 °C	
Humid heat	EN 60068-2-78	95 % rel. humidity (+40 °C)	
Vibration	EN 60068-2-64 ed. 2	Vibration spectrum A.3 (vehicles)	Category 1 (3 axes, 8 hours per axis)
Shock	EN 60068-2-27 ed. 2	Half-sine, 50 g peak, 11 ms	

8.4 Parameters of the Cellular Module

Table 17: Technical parameters of the cellular module

Technical parameters of the cellular module	
LTE parameters	**LTE**: LTE Cat.4, 3GPP E-UTRA Rel. 11 **FDD frequencies**: B28A (700 MHz), B20 (800 MHz), B8 (900 MHz), B7 (2600 MHz), B3 (1800 MHz), B1 (2100 MHz) **TDD frequencies**: B41 (2500 MHz), B40 (2300 MHz), B38 (2600 MHz) LTE FDD bit rates: 150 Mbit/s (DL) / 50 Mbit/s (UL) LTE TDD bit rates: 130 Mbit/s (DL) / 35 Mbit/s (UL) Supported bandwidths: 1.4/3/5/10/15/20 MHz
HSPA+ parameters	**HSPA:** 3GPP R8 DC-HSPA+ **Supported frequencies**: B8 (900 MHz), B1 (2100 MHz) **Bit rates**: 42 Mbps (DL) / 5.76 Mbps (UL)
UMTS Parameter	**Supported frequencies:** B8 (900 Mhz), B1 (2100 MHz) **Bit rates:** 384 Kbit/s (DL), 384 Kbit/s (UL)
EDGE parameters	**Supported frequencies**: 900 MHz, 1800 MHz **Data throughput**: max. 236.8 Kbit/s
GPRS Parameter	**Supported frequencies:** 900 Mhz, 1800 MHz **Data throughput: max. 85.6 Kbit/s**

Antenna Requirements

- VSWR: <2:1 (Antenna input impedance response as a function of frequency. This shows the antenna resonances and its bandwidth).
- SMA: 50 Ω
- For good diversity performance, the primary and secondary antennas should have different polarizations.

8.5 Parameters of I/O Ports

Electrical characteristics of the binary inputs can be found in Table 18. The status of the binary input is reported in the GUI on the **General Status** page or can be retrieved in the Shell via the io get bin0 command.

Table 18: Electrical characteristics of binary inputs

Get command output	**Voltage**	**Web interface status**
0	≤ 0.8 V (0.5 mA))	On
1	≥ 2 V	Off

The maximum binary output load is **100 mA** at **9 … 36 V**.

8.6 System Configuration

The main parameters of the system are listed in Table 19.

Table 19: System configuration

Other technical parameters	
CPU architecture	Cortex A8
CPU frequency	1 GHz
CPU power	2 DMIPS/MHz
Flash Memory	Available memory: 1862 MB • 2 MB - FW • 512 MB for user data storage • 838 MB for user modules
RAM size	512 MB

9 TROUBLESHOOTING



CAUTION

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 from the DHCP server (by default the DHCP server is running in the router).
- Connect the router to the PC via a switch.
- Connect the router to the PC, start the router first and then start the PC after the router's initialization.

The router restarts itself and the Ethernet connection fails.

The router cannot function correctly without an antenna. The antenna should be placed as far away as possible from the power supply.

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 the "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 neighboring 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 the 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 always takes place through the mobile WAN network interface.

Mobile WAN connection cannot be established.

- Check the "Mobile WAN Configuration" – APN, name, password and IP address (all may 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 we do not recommend obtaining the DNS settings from operator (on "Mobile WAN" page).
- Go to "System Log" page in the "Status" section and see 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 that it points to the router.

I cannot access my Web server located behind the router over NAT.

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

DynDNS without function

- With private APN this will not function.
- 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 check NAT by sending a ping to your server with a static address and then comparing it with router's IP address.
- You can verify a Firewall by remotely accessing the router's Web interface.
- The operator may not provide the address of DNS server and without the 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 the host name: no such file or directory.
  - Connection to DynDNS server failed.

L2TP or IPSec is not establishing.

Check the "System Log" page for error messages.

The IPSec tunnel is established but the communication does not function.

It is possible that incorrect routing rules are defined in the connected devices, or the standard gateway.

I switched the router to offline mode via 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.

Check that the router model supports serial communications. Also check the serial communication settings. To do so, open the router's configuration menu via the web browser, select the appropriate "Expansion Port" from the "Configuration" part of the menu and check 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. Therefore, the Cisco configuration cannot be used. However, the network connections are defined by regulations / standards so connecting the router to the Cisco or other networking devices is possible and will be compatible.

FTP or SFTP not functioning.

You can use SFTP on all routers to transfer files to/from the router. If you have problems with FTP on LR340 EMEA routers, make sure you have enabled FTP: "Configuration" section, "Services", "FTP". Then you can connect to any client on port 21 with the same name and password as for the Web interface. If you have problems with SFTP, make sure you have enabled SSH: "Configuration" section, "Services", "SSH". Then you can connect to any client on port 22 with the same name and password as for the Web interface.

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

SSH or Telnet can be used on all routers. SSH should be activated by default, but you can check this on the web interface in the "Configuration", "Services", "SSH" section. Then, connect to an SSH client of your choice via Port 22 of the router. The username and password are the same as for the web interface. Telnet can be activated here: "Configuration", "Services", "Telnet".

10 DISPOSAL

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 in order to minimize impact on the environment. This product contains high quality materials and components which can be recycled. At the end of its life cycle, this product 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 must be disposed of separately as appropriate.

11 SERVICE AND SUPPORT

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