wieland

wienet LTE LR140 EMEA

Industrial mobile LTE router

User manual

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NOTES

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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 the 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 in the manual at the beginning.

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

1.2 Other applicable documents

NOTICE

You can also use our website https://eshop.wieland-electric.com.
Following files downloadable:

- Product information wienet router
- Data sheets wienet router
- Technical notes wienet Wie-Service24 VPN Server

Table 1: Other applicable documents

Document	Title	Article number
Installation instructions	Installation instructions wienet LTE LR140 EMEA	BA001309
Configuration manual	wienet LTE v2/v3 Router Configuration	BA001039

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
- Qualified electricians
- Electrical system operators

1.4 Symbols and notations



DANGER

The symbol "DANGER" means an imminent danger. If it is not avoided, it 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 in danger of personal injury!



WARNING

The symbol 'WARNING' indicates a possible threat. If it is not avoided, it 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.

NOTICE

Notes concerning the special functions of the device.

Instructions also tell you about a potentially harmful situation. If it is not avoided, the system can be damaged or something in their environment.

2 SAFETY

2.1 Hazardous locations installation instructions

These devices are open-type devices that are to be installed in an enclosure suitable for the environment and can only be accessed with the use of a tool or key.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D or nonhazardous locations only. This equipment shall be mounted in an ATEX Zone 2 certified enclosure 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 enclosure must be accessible only by the use of a tool.



WARNING

Explosion hazard

- Do not disconnect equipment unless the power has been removed 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 rated voltage from being exceeded by transient disturbances of more than 140 % of the rated voltage when applies in Zone 2 environments.

2.2 General safety instructions

Safety notices

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 cannot be opened.
- Turn off the router and disconnect it from power supply before handling the SIM card.
- Input voltage must not exceed 48 V DC.



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.

- 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 travelling 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.

3 PRODUCT OVERVIEW

3.1 Product Introduction

Industrial cellular router wienet LTE LR140 EMEA is designed for wireless communication in mobile networks that make use of traditional cellular technologies.

The primary purpose of this router is its use in the Category 4 (**Cat.4**) services on the cellular **LTE** network. 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 peak **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**. The router is equipped with an **Ethernet port**, as well as with a **digital input** and a **digital output**.

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.

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 and dispatcher machines

3.2 Router Versions

The wienet LTE LR140 EMEA router is supplied in the following version, see Table 2.

Table 2: Router versions

Type	SIM	TUE	THU	ETH	Wi-Fi
LR140 EMEA	1 ×	1 ×	1 ×	2 ×	



Figure 1: Version LR140 EMEA

3.3 Delivery Identification

Table 3: Delivery Identification

Trade name	wienet
Type name	LTE LR140 EMEA
Other	Router in metal box

3.4 Product Label

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

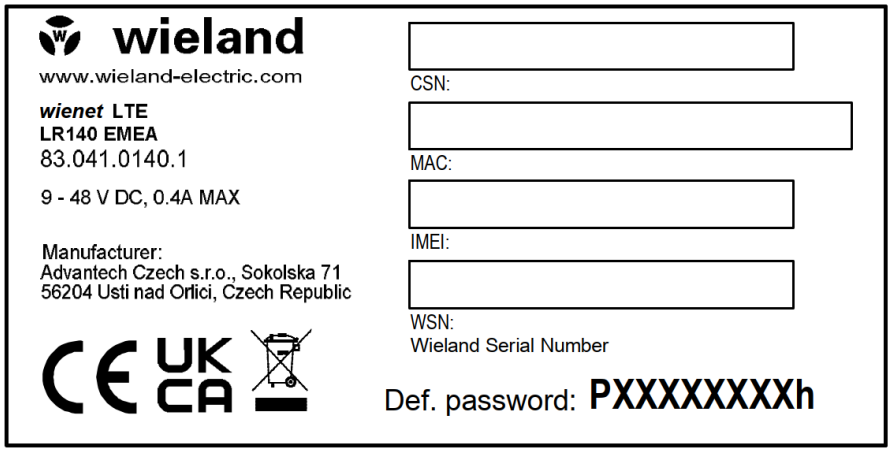


Figure 2: Label Example

3.5 Order numbers

Order codes overview is shown in Table 4.

Table 4: Order Codes Overview

Product name	Article number	Features – interfaces
LTE LR140 EMEA	83.041.0140.1	1× ETH, 1× DI, 1× DI, 1× SIM

3.6 Hardware Overview

The router case preview is shown in Figure 3and Figure 4. A short description of hardware parts of the router is listed in Table 5, including the links to the chapters with a detailed description.



Figure 3: Front view



Figure 4: Rear view

Table 5: Hardware Overview of the Router

#	Item/Caption	Type	Description
1	Grounding screw	M3	Pay attention to proper grounding, see chapter 6.4 "Power Supply ", p. 20.
2	PWR	6-pin terminal	Power supply socket, see chapter 6.4 "Power Supply", p. 20.
	IN/OUT	6-pin terminal	Binary input & output interfaces, see chapter 6.5 "I/O Port Interfaces ", p. 21.
4	LEDs	-	Status LED indication, see chapter 6.6 "LED Status Indication ", p. 22.
5	RST	-	Button to reboot the router or to restore the default configuration, see chapter 6.7 "Reset Functions ", p. 23.
6	ETH0	RJ45	100 MB Ethernet connection for the first LAN, see chapter 6.3 "Ethernet Interfaces ", p. 19.
7	ANT	SMA	Connector for the first main antenna of the cellular module, see chapter 6.2 "Cellular Antennas ", p. 18.
8	DIV	SMA	Connector for the first diversity antenna of the cellular module, see chapter 6.2 "Cellular Antennas ", p. 18.
9	SIM slot	micro-SIM	One SIM card slot, see chapter 6.1 "SIM card slot ", p. 18.
10	DIN clip	-	DIN rail clip (not included), see chapter 5.2 "DIN Rail Mounting ", p. 17.
11	Wall clip	-	Wall mounting clip, included as standard accessories.

3.7 Package Contents

The router is delivered without additional parts as standard. If you require a DIN rail, this can be found under item number F0.000.0053.8.

Table 6: Package Contents

Item#	Description	Figure	Q'ty
1	router		1 pcs
2	6-pin terminal		1 pcs
3	Wall mounting kit with screws		1
4	Installation instructions		1

3.8 Product Dimensions

The dimensions of the product can be found in Figure 5and Figure 6. Please note that all sizes are indicated in millimeters.

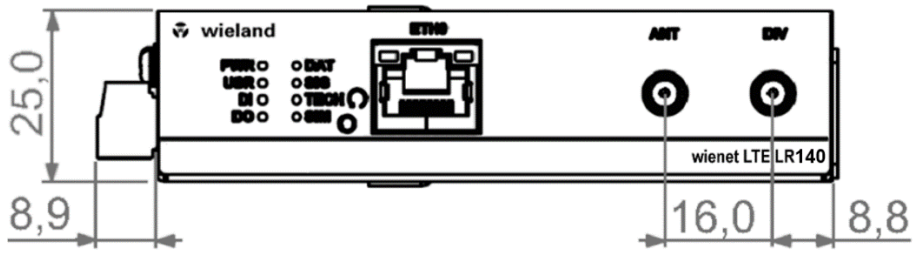


Figure 5: Product Dimensions – Front View

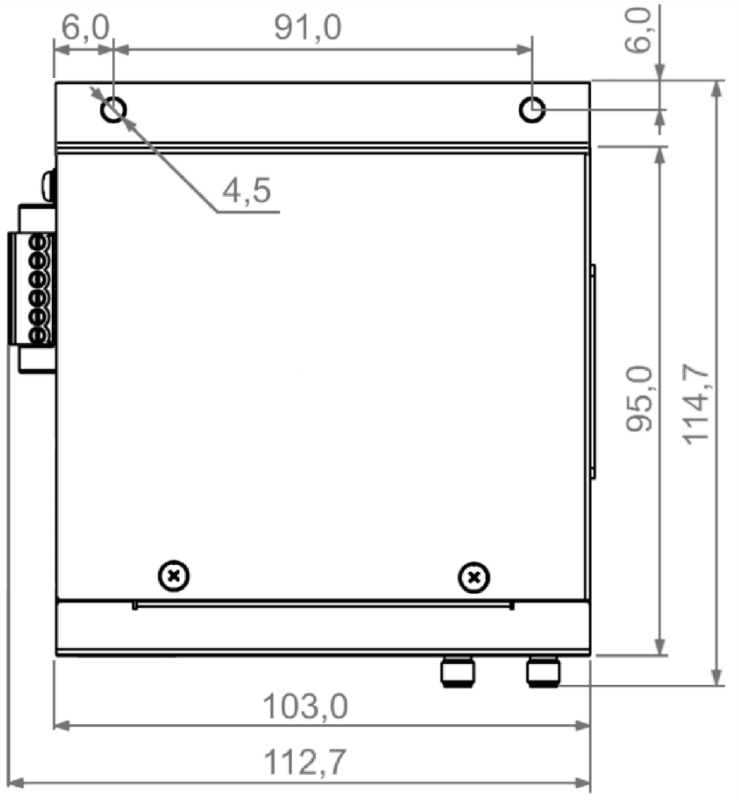


Figure 6: Product Dimensions (with wall mounting clip) – Top View

4 PRODUCT USAGE EXAMPLES

The router is primarily intended for these four basic situations.

4.1 Access to the Internet from LAN

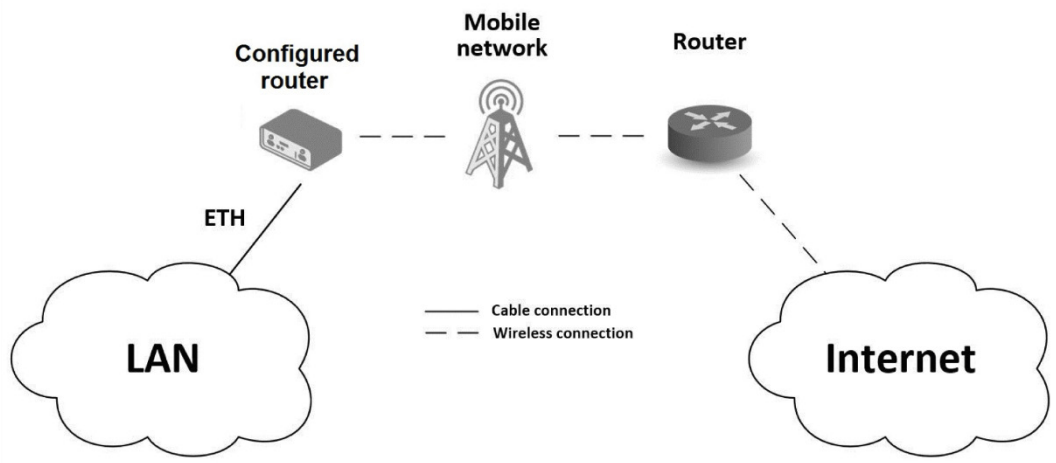


Figure 7: Access to the Internet from LAN

4.2 Backup access to the Internet (from LAN)

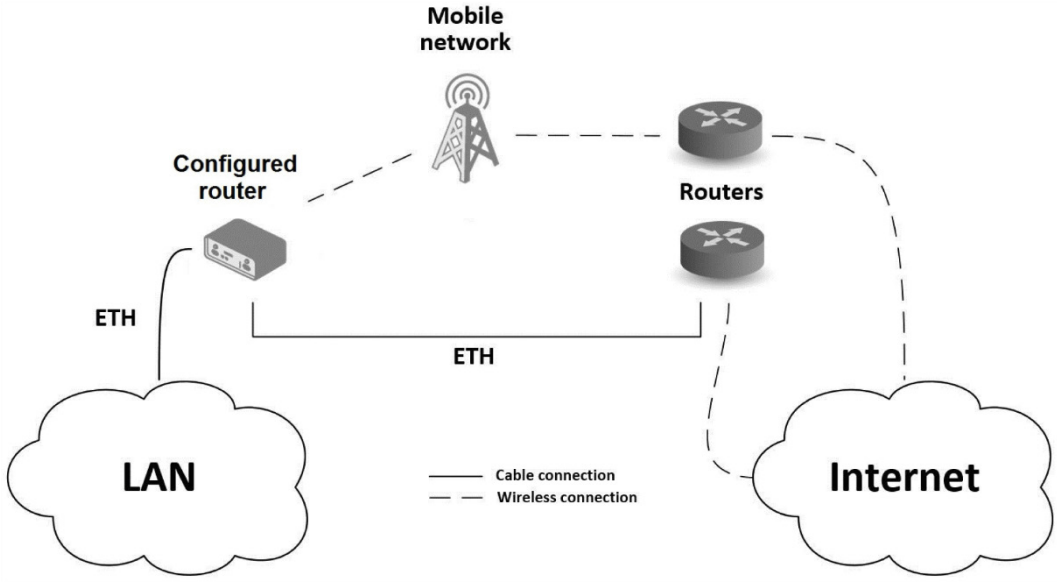


Figure 8: Backed up access to the Internet

4.3 Secure networks interconnection or using VPN

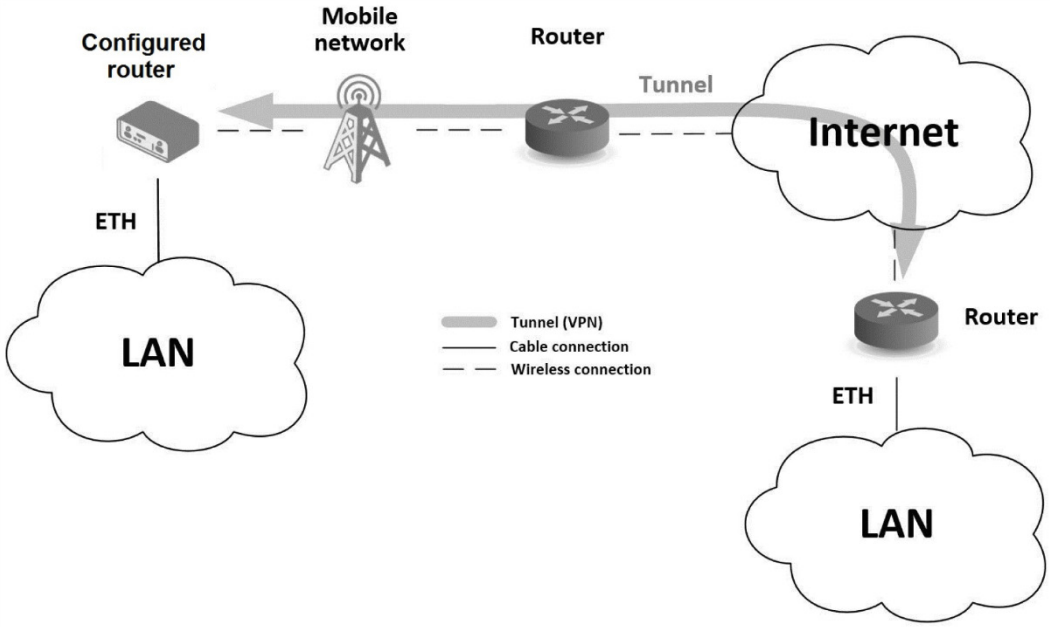


Figure 9: Using VPN Tunnel

5 MOUNTING AND REMOVAL

5.1 Mounting Recommendations

The router can be placed:

- on a flat surface.
- on a DIN rail EN 60715 with the metal DIN rail clip. See chapter 5.2 "DIN Rail Mounting ", p. 17.
- on a wall, screwed in place using a wall mounting clip. See chapter 5.4 "Wall mounting clip", p. 17.

For most applications with a built-in router within a switchboard, it is possible to recognize two kinds of environments:

- a non-public, industry 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 to a switchboard, after which there is no need to have examination immunity or issues in connection with EMC according to EN 61439-1:2011.



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 it is recommended to observe 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 to bind the bunch, and for this we recommend: – The length of the bunch (the combination of power supply and data cables) should be a maximum 1.5 m. If the length of data cables exceeds 1.5 m or if the cable is leading 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 an earth bonding distribution frame for the grounding of the grounding screw, see chapter 6.4 "Power Supply ", p. 20.

5.2 DIN Rail Mounting

NOTICE

The DIN rail clip is suitable for a DIN rail according to EN 60715 standard only. The default position of the clip is shown in Figure 10.

CAUTION

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



Figure 10: 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) gets out of the rail.
- ➡ Pull out the bottom part of the router away from the DIN rail.

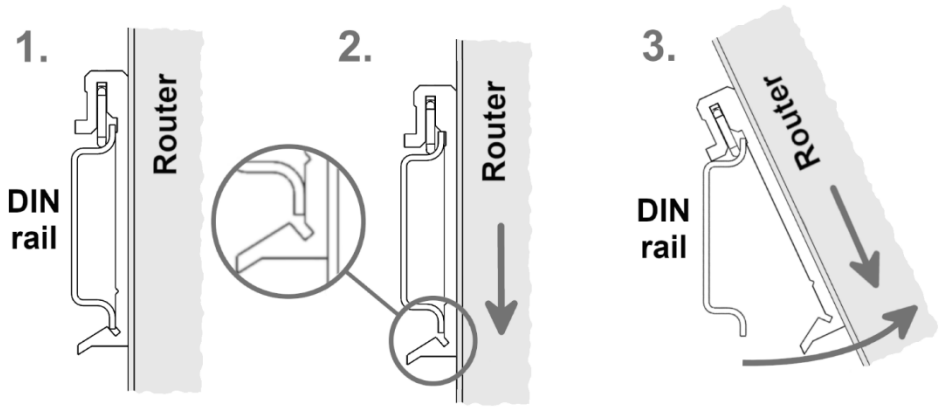


Figure 11: Removing Router from the DIN Rail

5.4 Wall mounting clip

The router can be screwed to a wall (or another surface) using wall mounting clips. There are two holes with a diameter of 4 mm. More detailed information about the installation dimensions can be found Figure 6 in chapter 3.8 "Product Dimensions", p. 13.

Tightening the screws

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

6 HARDWARE FUNCTIONALITY

See chapter 3.6 "Hardware Overview ", 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 slot

A SIM card slot is located on the right 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, it can be entered 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.

NOTICE

Type of SIM cards: micro-SIM (3FF) 15.0 × 12.0 × 0.76 mm.

CAUTION

Inserting the SIM card:

- Always disconnect the router from the power supply before handling the SIM card.
- Unscrew 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 card into the slot until it clicks into place.
- Place back the cover and fix it by two screws.

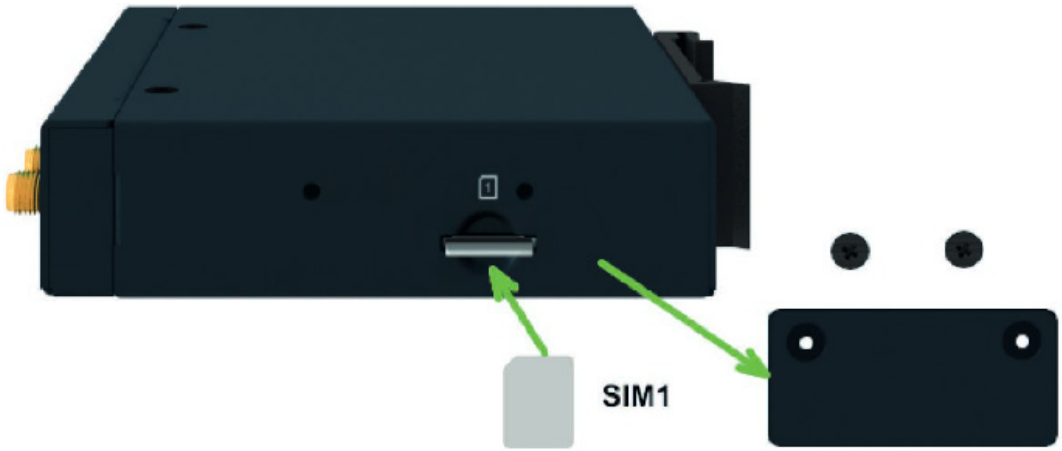


Figure 12: SIM Cards Insertion

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 run the router without connected cellular antenna connected to the main antenna connectors as the energy from the transmission is effectively reflected by the open end and can damage the equipment.

NOTICE

- 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 low signal strength.

6.3 Ethernet Interfaces

CAUTION

In order to meet the requirements for EMC immunity, the cables connected to the Ethernet port must not be longer than 30 m.

The panel socket of RJ45 is used for Ethernet interface. The pinout of the socket is shown in Figure 13 and described in Table 7.

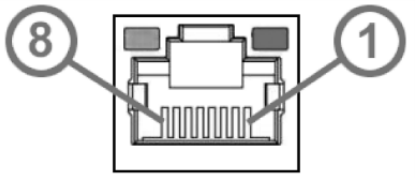


Figure 13: Ethernet Connector Pinout

Table 7: Ethernet Connector Pinout Description

Pen	Signal mark	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	—	—

NOTICE

The isolation barrier of the Ethernet ports against the ground is 1500 V.

6.4 Power Supply

The pins of power supply are physically connected to the 6-pin terminal block panel socket located on the left panel. The connection of power supply is shown in Figure 14 and described in Table 8.

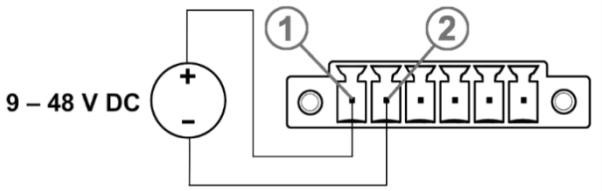


Figure 14: Connection of Power Supply

Table 8: Power Supply Pinout

Pen	Signal mark	Description
1	PWR(+)	Positive pole of DC supply voltage (+9 … +48 V DC)
2	PWR(-)	Negative pole of DC supply voltage

Required power supply voltage for the router is between +9 V and +48 V DC, see the connection scheme on Figure 14. Protection against reversed polarity without signaling is built into the router. For correct operation it is necessary that the power source is able to supply a peak current of 1 A.



Unit has to be supplied by a power supply specified as a Limited Power Source (LPS) or CEC/NEC Class 2 source of supply.

The metal case of the router is not connected to the negative pole of the power supply (common pole). If recommended for the installation environment, protect the router by grounding it properly by the grounding screw on the right panel, see Figure 15.



Figure 15: Position of the Grounding Screw

6.5 I/O Port Interfaces

CAUTION

The maximum length of wires connected to the I/O ports is 3 meters to meet the EMC immunity conditions.

The pins of I/O interface are physically connected to the 6-pin terminal block panel socket located on the left panel. The pinout of one binary input and one binary output is shown in Figure 16 and described in Table 9.

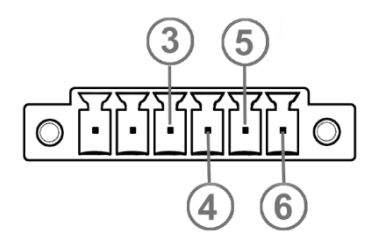


Figure 16: I/O Connector Pinout

Table 9: I/O Ports Pinout

Pen	Signal mark	Description
3	IN(+)	The binary input (positive pole)
4	IN(-)	The binary input (negative pole)
5	OUT(+)	The binary output (positive pole)
6	OUT(-)	The binary output (negative pole)

The I/O user interface is designed for binary input processing and binary output control. For details about the electrical parameters, see chapter 8.5 "Technical parameters of the I/O port ", p. 28. The binary output is open, i.e. not earthed. The functional connection scheme for the binary input and binary output can be found in Figure 17.

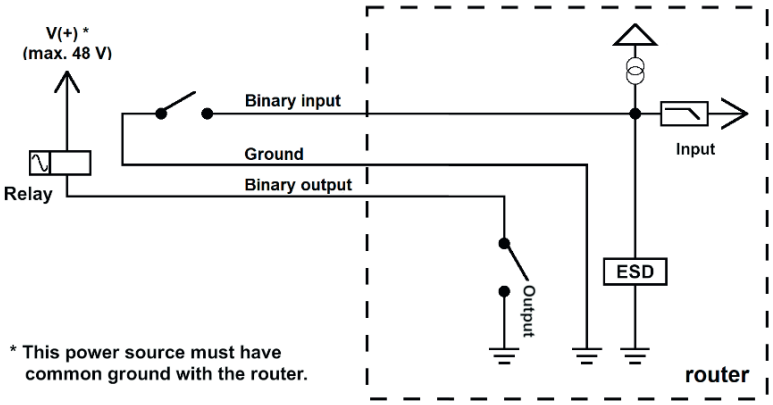


Figure 17: Functional Scheme of the Binary Interface

6.6 LED Status Indication

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

Table 10: LED Status Indication

Caption	Farbe	State	Description
PWR	Green Green Green	On Blinking Fast blinking	Starting of the router. Router is ready. Updating firmware.
USR	Green		Function of this LED diode can be selected by user.
TUE	Green	On	The first binary input is active.
THU	Green	On	The second binary input is active.
DAT	Green	Blinking	Communication in progress on radio channel.
SIG	Green	On Blinking Fast blinking	Good signal. Fair signal. Poor signal.
TECH	Green	On Blinking Fast blinking	4G technology is used by the active SIM. 3G technology is used by the active SIM. 2G technology is used by the active SIM.
SIM	Green	On Fast blinking	SIM1 is selected. SIM card problem (missing SIM or PIN not entered).
ETH0	Green	On	Always on
ETH0	Orange Orange Orange	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 default configuration: 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 the 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 return the configuration of the router to default one.

CAUTION

It is recommended to back 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 default state.

NOTICE

It is necessary to use a narrow screwdriver or any other small tool to press the **RST** button.



Figure 18: Resetting the Router

Table 11: Overview of reset functions

Action	Router behavior	Trigger events – options
Reboot	Turns off and then turns on the router	• Disconnect and reconnect the power. • Send text reboot via SMS to SIM card number put 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 less than 4 seconds.
Factory Reset	Restores the default configuration and reboots the router	• Hold the RST button for more than 4 seconds. • If it 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 and hold the RST button for more than 10 seconds.

7 FIRST USE

7.1 Powering 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 default 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

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 default LAN interface. To get 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, there is just the **root user account** created on the router. See the **product label** on the router for its **default password**. Log in to the web interface by the root user and his password. If logged in successfully, the user will have access to the router web interface, see Figure 19. See the configuration manual of the router for a detailed description and examples of the router configuration.



CAUTION

After logging on 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 the malfunction of the device.



Figure 19: Router's Web Interface

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

8 TECHNICAL SPECIFICATIONS

8.1 Basic Parameters

Table 12: Basic Parameters

Router parameters		
Temperature range	Operating Storage	-40 °C … +75 °C -40 °C … +85 °C
Humidity	Operating Storage	5 … 95 % relative humidity non condensing 5 … 95 % relative humidity non condensing
Altitude	Operating	2000 m / 70 kPa
Protection rating		IP30
Supply voltage		9 … 48 V DC
Battery for RTC		CR2032X (non-replaceable)
Consumption	Idle Average Peak	2 W 3,5 W 10 W
Dimensions of device w/o clip		103 × 95 × 25 mm
DIN rail clip (optional part) specification		DIN 35 mm, EN 60715
Weight	Box w/o clip	315 g
Antenna connectors		2 SMA connectors for LTE – 50 Ω
User interface	ETH0: 1 port I/O	RJ-45 socket for 10/100 Mbps Ethernet 6-pin socket for I/O interfaces

8.2 Standards and Regulations

The router complies with the following standards and regulations.

Table 13: Standards and Regulations

Standards and Regulations	
Radio	EN 301 511, EN 301 908-1, EN 301 908-2, EN 301 908-13
EMC	EN 301 489-1, EN 301 489-52, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11
Safety	EN 62368-1, IEEE 802.3
National	CE, UKCA compliant
Environmental	REACH, RoHS3 and WEEE compliant

8.3 Type Tests and Environmental Conditions

Table 14: Type Tests and Environmental Conditions

Phenomena	Testing	Description	Test levels
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 DC port Ethernet ports AC/DC adapter	± 1 kV (crit. A) ± 1 kV (crit. A) ± 1 kV (crit. A) ± 2 kV (crit. A)
Surge	EN 61000-4-5	DC port	± 0.5 kV L-G (crit. A), ± 0.5 kV L-L (crit. A)
RF conducted	EN 61000-4-6	DC port Ethernet ports Serial ports	10 V/m (crit. A) (0.15 – 80 MHz)
Radiated emission	EN 55032	Housing	Class B
Conducted emission	EN 55032	DC power port Ethernet ports Serial ports	Class B Class B Class B
Damp heat	EN 60068-2-2	Operating Storage	+75 °C, 40 % rel. humidity +85 °C, 40 % rel. humidity
Cold	EN 60068-2-1	Operating Storage	-40 °C -40 °C
Damp heat	EN 60068-2-78	95 % rel. humidity (+40 °C)	
Variation of temperature	EN 60068-2-14	-40 °C / +75 °C (3h / 3h)	

8.4 Parameters of Cellular Module

Table 15: Technical Parameters of Cellular Module

Technical parameters of cellular module	
LTE parameters	**LTE**: LTE Cat.4, 3GPP 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) **Bit rates**: up to 150 Mbps (DL), 50 Mbps (UL)
HSPA+/UMTS parameters	**Supported frequencies**: B8 (900 MHz), B1 (2100 MHz) **Bit rates**: 42 Mbps (DL) / 5.76 Mbps (UL)
EDGE/GPRS parameters	**Supported frequencies**: B8 (900 MHz), B3 (1800 MHz) **Bit rates**: max. 296 kbps (DL) / 236.8 kbps (UL)

Antenna Requirements

- VSWR: <2:1 (Antenna input impedance response as 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 Technical parameters of the I/O port

Electrical characteristics of the binary inputs are in Table 16. Status of the binary input is reported in the GUI on **General Status** page or can be retrieved in the Shell via io get bin0 command.

Table 16: Electrical Characteristics of Binary Inputs

Get command output	**Stretch**	**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 … 48 V**.

8.6 System Configuration

The main parameters of the system are listed in Table 17.

Table 17: System Configuration

Other technical parameters	
CPU architecture	ARM926EJ-S
CPU frequency	600 MHz
Flash Memory	64 MB NOR Flash
RAM size	128 MB
Watchdog	HW Watchdog
RTC	Battery Backup RTC

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).
- Set the communication rate to 10 MB/s in the properties of your network card.
- 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.

The router restarts itself and the Ethernet connection fails.

The router will not function optimally 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 "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 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 cannot 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 does not work.

- It will not work with a private APN.
- 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 is not 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.

You can use SFTP on all routers to transfer files to/from the router. If having troubles with FTP on LR140 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)

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" section.

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 this product MUST NOT be mixed with other commercial waste for disposal. The device contains the battery. Remove the battery from the device before disposal. The battery in the device needs to be disposed apart accordingly.

11 SERVICE AND SUPPORT

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