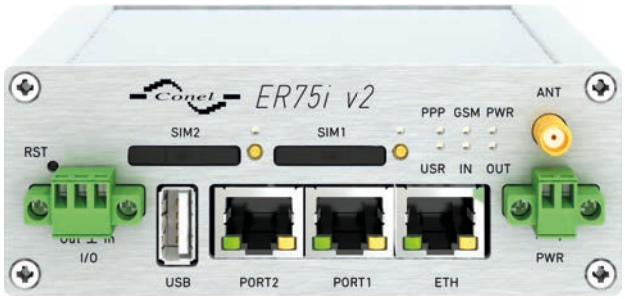
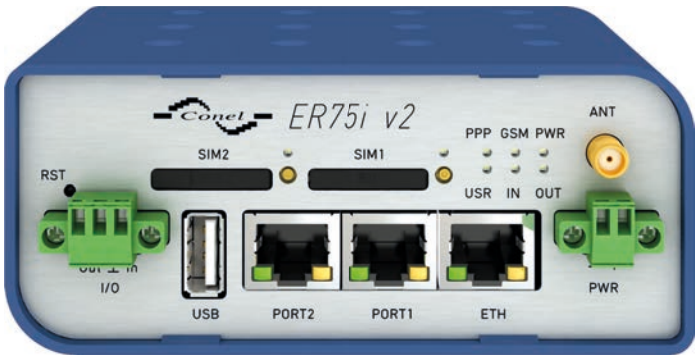
EDGE Industrial Router

ER75i v2

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, notice – Useful tips or information of special interest.

GPL licence

Source codes under GPL licence are available free of charge by sending an email to:

techSupport@advantech-bb.com.

Please see http://ep.advantech-bb.cz/devzone for more information.

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Document No. MAN-0013-EN, revision from May 19, 2020. Released in the 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!** 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.

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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 in order to minimize impact on the environment. This product contains high quality materials and components which can be recycled. At the end of it's 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. Check the terms and conditions of your supplier for disposal information.

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3. Router Description

EDGE industrial router ER75i v2 is used to wirelessly connect various equipments and devices via Ethernet interface 10/100 to the Internet or intranet. Thanks to high security level and wide coverage of GPRS/EDGE technology provided by mobile phone operators, it is mostly used in industrial applications, for remote maintenance and service of machines, or for data transfer from solar or wind power plants. Other benefits and advantages includes high modularity – the router offers option to connect various user devices via Ethernet 10/100, RS232, RS485, RS422, MBUS or I/O.

As a standard, this industrial router is equipped with one Ethernet 10/100, one USB Host port, one binary input/output (I/O) port and one SIM card. To save and backup communication data a version with two SIM cards is available. The wide range of interface options of the router further expands expansion Port1 and Port2, which are selected by the customer. For Port1 are available: Ethernet port 10/100, serial interface ports RS232, RS485, RS422, MBUS or inputs/outputs (I/O – CNT). Port2 may be equipped with serial interfaces RS232, RS485, RS422, MBUS, wireless interfaces WIFI or WMBUS, SDH expansion port or inputs/outputs (I/O – CNT). Both of ports can be fitted with internal switch (exp. port SWITCH). This wireless 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. EDGE industrial router supports creation of VPN tunnels using technologies IPsec, OpenVPN and L2TP to ensure safe communication. Web interface provides detail statistics about the wireless router activities, signal strength, detailed log, etc. Router supports functions: DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS and many other functions.

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 EDGE 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 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

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4. Contents of Package

Basic delivered set of router includes:

- router,
- power supply,
- crossover UTP cable,
- up to two 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!

As optional accessories can also be supplied the following expansion ports (one for Basic version or two for Full version):

- RS232, RS485/422, MBUS, ETHERNET, CNT, SWITCH, WIFI, WMBUS or SDH.
- Separation columns for mounting expansion boards are included.

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5. Router Design

5.1 Router versions

ER75i v2 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	I/O	USB	PORT1	PORT2	ETH
ER75i v2B	Plastic	1 x		1 x	1 x	1 x		1 x
ER75i v2B SL	Metal	1 x		1 x	1 x	1 x		1 x
ER75i v2F	Plastic	1 x	1 x	1 x	1 x	1 x	1 x	1 x
ER75i v2F SL	Metal	1 x	1 x	1 x	1 x	1 x	1 x	1 x

Table 1: Router versions

Figure 2: Front panel ER75i v2B

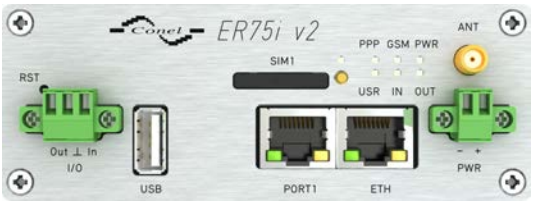

Figure 5: Front panel ER75i v2B SL

Figure 3: Front panel ER75i v2F

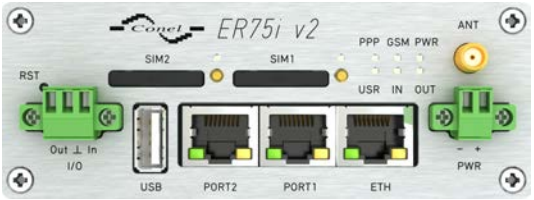

Figure 6: Front panel ER75i v2F SL

Figure 4: Front panel ER75i v2F with WiFi

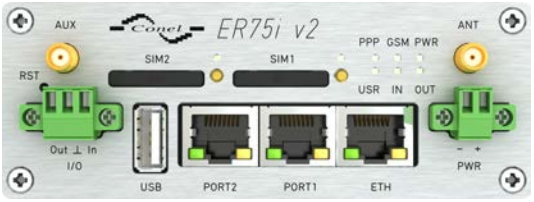

Figure 7: Front panel ER75i v2F SL with WiFi

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5.2 Delivery identification

Trade name	Order code[1]	Description
ER75i v2B	BB-ER2B51v01y	Basic version in the plastic box
ER75i v2B SL	BB-ER2B51v02y	Basic version in the metal box
ER75i v2F	BB-ER2F51vw1y	Full version in the plastic box
ER75i v2F SL	BB-ER2F51vw2y	Full version in the metal box

Table 2: Delivery identification

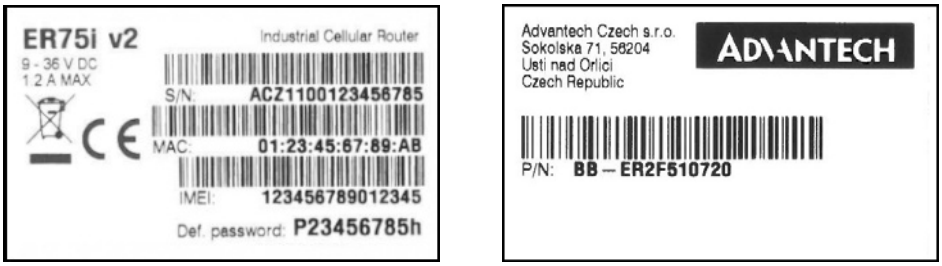

Figure 8: Label examples

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

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5.3 Order codes

5.3.1 Order code structure

Order code for **basic** version has following structure:

BB-ER2B51v0xy, where:

v = port #1,
x = type of router box,
y = type of power supply.

Order code for **full** version has following structure:

BB-ER2F51vwxy, where:

v = port #1,
w = port #2,
x = type of router box,
y = type of power supply.

Letter "v" – port #1

Port type	Letter "v" incode
none	0
ETH	1
RS232	2
RS485	3
RS422	4
MBUS	5
CNT	6
SWITCH	9[2]

Table 3: Type of port #1

[2] Occupies both, port #1 and port #2. Available for full version only.

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Letter "w" – port #2

Port type	Letter "w" in code
none	0
RS232	2
RS485	3
RS422	4
MBUS	5
CNT	6
WiFi	7
WMBUS	8
SDH	9

Table 4: Type of port #2

Letter "x" – type of the router box

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

Table 5: 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 6: Type of power supply

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5.3.2 Order code examples

Examples of order codes are listed in the table bellow:

Order code	Features – interfaces	Box	Power supply
BB-ER2B510010	EDGE module – 1x SIM reader, 1x ETH, 1x USB, 1x I/O,	plastic	none
BB-ER2B511021	EDGE module – 1x SIM reader, 2x ETH, 1x USB, 1x I/O	metal	Europe
BB-ER2F514010	EDGE module – 2x SIM reader, 1x ETH, 1x USB, 1x I/O, 1x RS422	plastic	none
BB-ER2F516322	EDGE module – 2x SIM reader, 1x ETH, 1x USB, 1x I/O, 1x CNT (4x BI), 1x RS485	metal	UK & Ireland

Table 7: Order code examples

You can use the order codes configurator on the www.bb-smartcellular.eu webpages.

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5.4 Basic dimensions of the router box

5.4.1 Plastic box

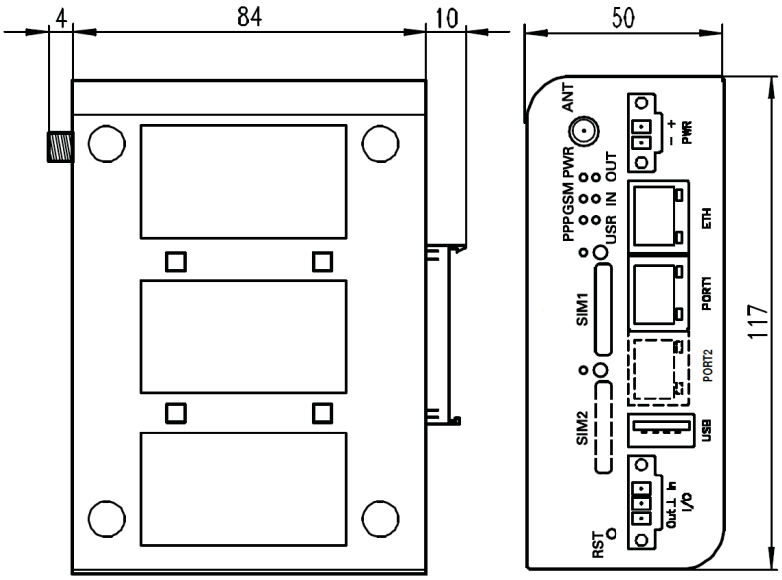

Figure 9: Basic dimensions of plastic box (bottom and front view)

5.4.2 Metal box

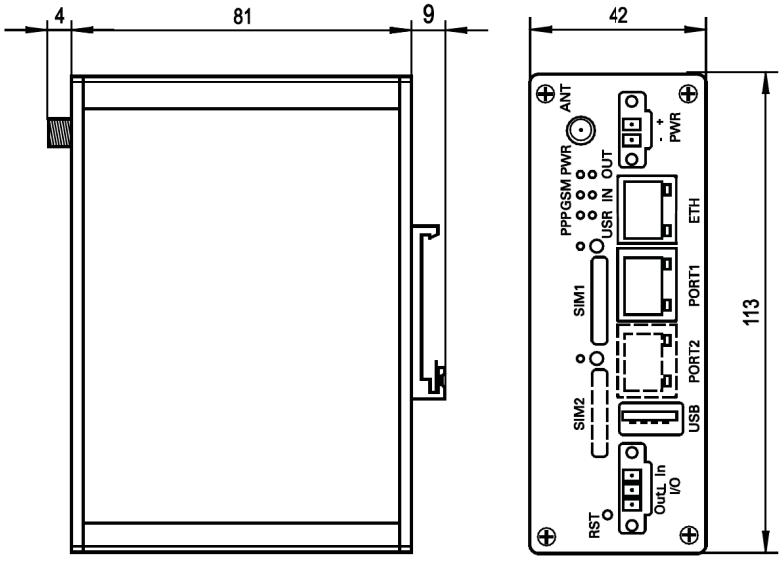

Figure 10: Basic dimensions of metal box (bottom and front view)

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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.

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

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 lightening conductor.
- Before mounting a router on sheet-steel we recommend using a "cable" antenna.

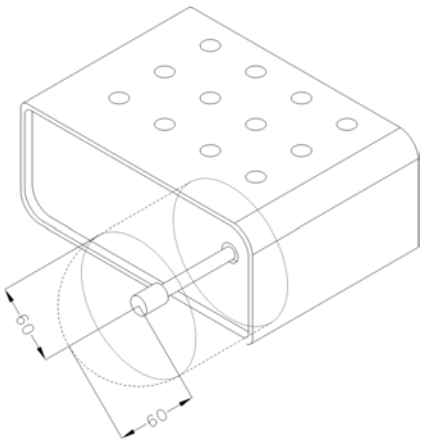

Figure 11: Space around antennas (plastic)

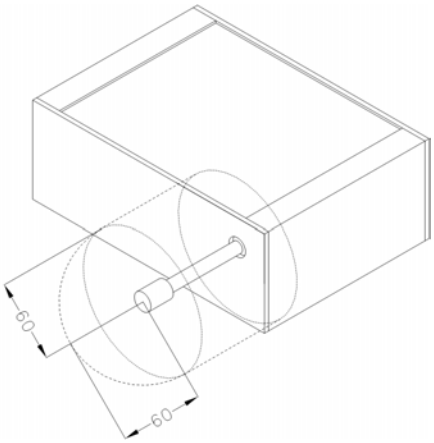

Figure 12: Space around antennas (metal)

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- For every cables we recommend to bind the bunch, we recommend for this use:
  - Length of the bunch (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 $\sim$ 230 V/50 Hz.

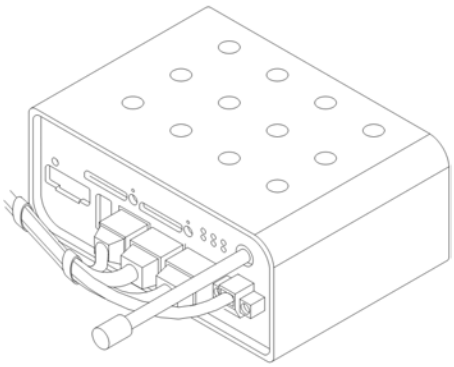

Figure 13: Cable routing (plastic)

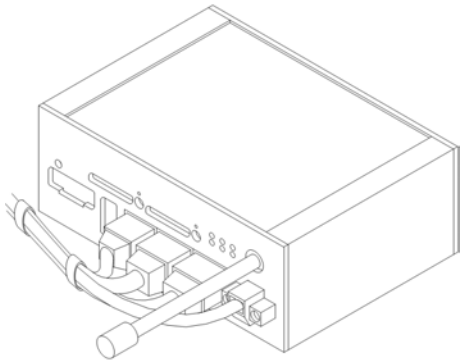

Figure 14: Cable routing (metal)

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

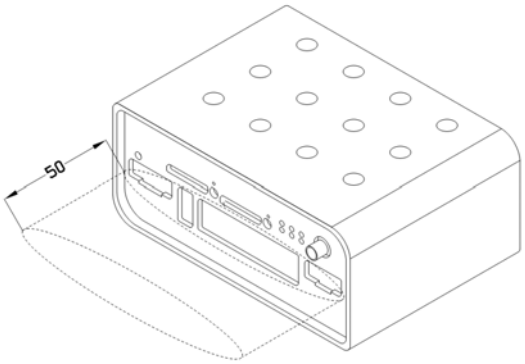

Figure 15: Space in front of connectors (plastic)

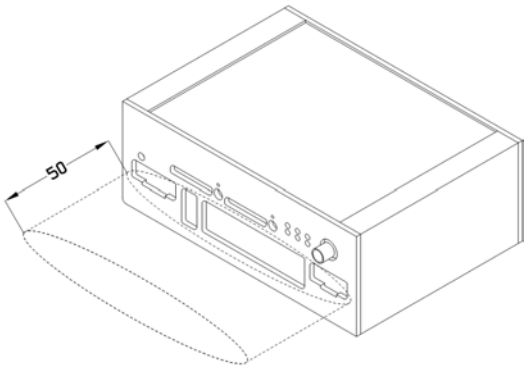

Figure 16: Space in front of connectors (metal)

- 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.

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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.

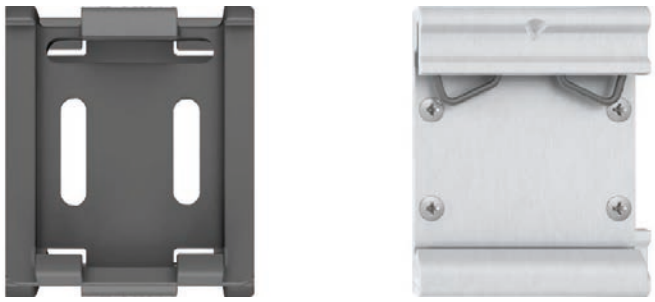

Figure 17: Default position of plastic and metal DIN rail clip

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.

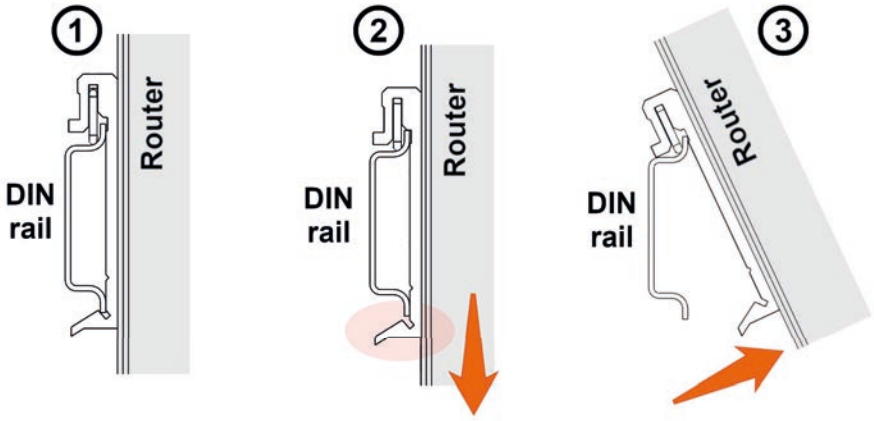

Figure 18: Removal from the DIN rail

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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.
ETH	RJ45	Connector for connection into the local computer network.
PORT1	RJ45	Connector for expansion port RS232, RS458/422, MBUS, ETHERNET, CNT or SWITCH.
PORT2	RJ45	Connector for expansion port RS232, RS485/422, MBUS, SWITCH, WIFI, WMBUS or SDH (**only FULL versions**).
ANT	SMA	Connector for main antenna.
USB	USB-A Host	Connector for connection of USB devices to the router. Supports devices with PL-2303 and FTDI USB/RS232 converters.
I/O	3-pin	Connector for connection of the binary input and output.
SIM1	—	Holder for the first SIM card.
SIM2	—	Holder for the second SIM card (**only FULL versions**).

Table 8: Front panel description

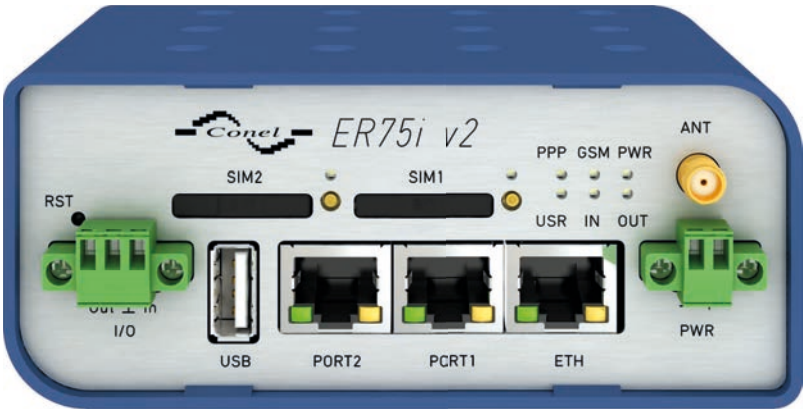

Figure 19: Front panel ER75i v2F

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5.7.1 Status indication

About router status inform eight LED indicators on the front panel. ETH port, PORT1 and PORT2 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
GSM	Red	Blinking	Communication in progress on radio channel
PPP	Yellow	1x flash per sec. 2x flash per sec. 3x flash per sec.	Signal strength is from –50 dBm to –69 dBm Signal strength is from –70 dBm to –89 dBm or difference between neighbours cells is exactly 3 dBm Signal strength is from –90 dBm to –113 dBm or difference between neighbours cells is smaller than 3 dBm
USR	Yellow	Function of this LED diode can be selected by user	
OUT	Green	On	Binary output active
IN	Green	On	Binary input active
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
PORT	Green	Depends on the expansion port (see user's manual for used port)	
PORT	Yellow	Depends on the expansion port (see user's manual for used port)	
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 PPP LED is updated every 10 seconds.

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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 20: 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 2.0 W. The peak power consumption during data sending is 5.5 W. However, values of consumption can be increased, if some expansion port is equipped. For correct operation it is necessary that the power source is able to supply a peak current of 1.2 A.

Circuit example:

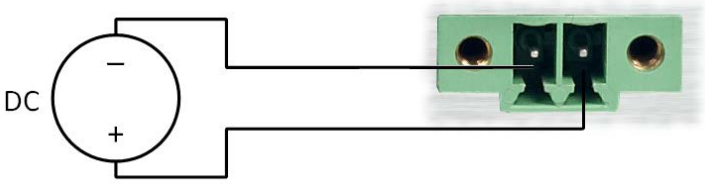

Figure 21: Connection of power supply

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.

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5.7.3 Antenna connector ANT (and AUX)

Main antenna is connected to the router using the SMA connector on the front panel. If WIFI or WMBUS expansion port is equipped on customer's request, the second SMA antenna connector is also available on the front panel. Through this connector can be connected the additional antenna (it is reverse connector R-SMA in case of the WIFI expansion port).

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

ANT connector is used to connect the main antenna. If WIFI or WMBUS expansion port is equipped on customer's request, there is also available AUX antenna connector for connecting corresponding antenna.

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

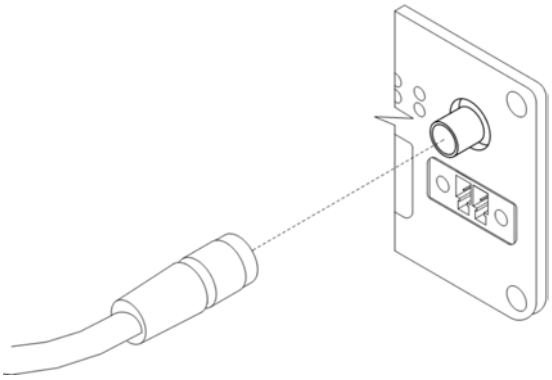

Figure 22: Connecting of the antenna

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

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5.7.4 SIM card reader

The SIM card reader for 3 V and 1,8 V SIM cards is placed on the front panel of the router. For getting the router to work is necessary to insert an activated SIM card with an unblocked PIN code. The SIM cards might be of different adjusted APN (Access Point Name).

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

Changing the SIM card:

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

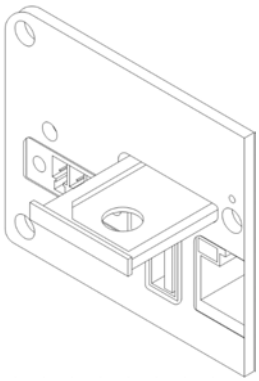

Figure 23: Ejected SIM holder

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5.7.5 Ethernet Port ETH

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

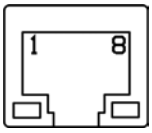

Figure 24: Ethernet connector

ETH port is not PoE (Power over Ethernet) compatible!

Plug Ethernet cable into the RJ45 connector labeled as ETH (see the figure below).

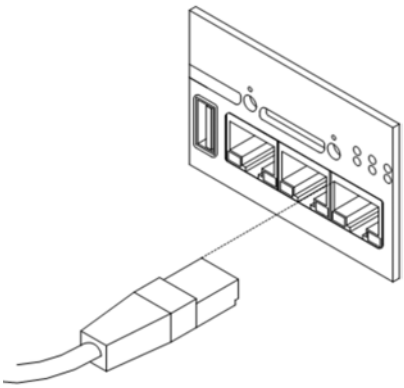

Figure 25: Connection of ethernet cable

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5.7.6 PORT1

The PORT1 is equipped on customer's request with one of the offered expansion ports:

- RS232
- RS485
- RS422
- ETHERNET
- MBUS
- CNT
- SWITCH (together with PORT2)

Description and examples of expansion ports connection can be found in user's guide for corresponding expansion port.

Plug cable for the first expansion port into the RJ45 connector labeled as PORT1 (see the figure below).

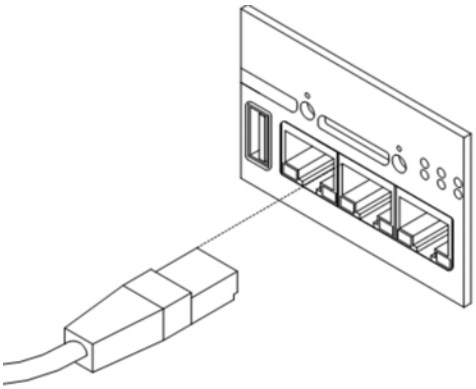

Figure 26: PORT1 cable connection

5.7.7 PORT2

The PORT2 is equipped on customer's request with one of the offered expansion ports:

- RS232
- RS485
- RS422
- MBUS
- SDH
- SWITCH (together with PORT1)
- WIFI
- WMBUS

PORT2 is available only in the Full version of the router! Description and examples of expansion ports connection can be found in user's guide for corresponding expansion port.

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Plug cable for the second expansion port into the RJ45 connector labeled as PORT2 (see the figure below).

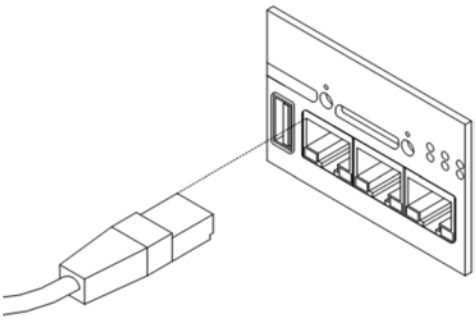

Figure 27: PORT2 cable connection

5.7.8 USB Port

Panel socket USB-A.

Pin	Signal mark	Description	Data flow direction
1	+5 V	Positive pole of 5 V DC supply voltage, 0.5 A	
2	USB data -	USB data signal – negative pole	Input/Output
3	USB data +	USB data signal – positive pole	Input/Output
4	GND	Negative pole of DC supply voltage	

Table 12: Connection of USB connector

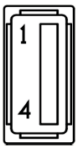

Figure 28: USB connector

Mounting USB flash drive to the system: To use the USB flash drive in the Linux system of the router, it is necessary to mount it. Use `dmesg` command to see the name of recently connected device (E. g. `sda: sda1`) and then use `mount` command. Example:

```
mount /dev/sda1 /mnt
```


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5.7.9 I/O Port

Panel socket 3-pin.

Pin	Signal mark	Description	Data flow direction
1	BIN0	Binary input	Input
2	GND	Signal ground	
3	OUT0	Binary output	Output

Table 13: Connection of I/O port

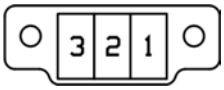

Figure 29: I/O connector

I/O user interface is designed for processing of binary input and control (setting) binary output. Binary output is not switched to ground in the default configuration. Maximum load binary output is 30 V / 100 mA. The constant current supplied by the binary input is 3 mA.

Connect I/O cable into the I/O connector on the front panel of the router and tighten locking screws (see the figure below).

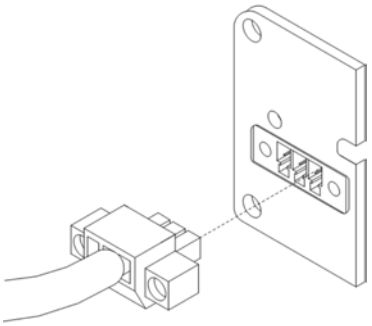

Figure 30: Connection of I/O cable

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Example of a circuit describing connection of binary input and output to the router:

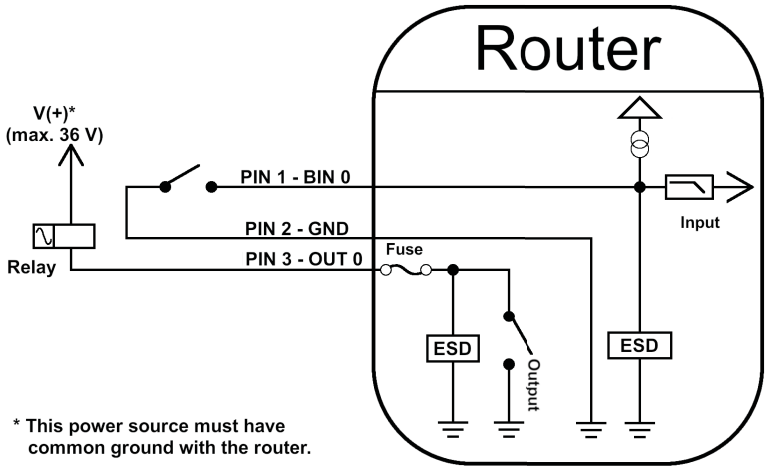

Figure 31: Connection of input and output to the router

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5.7.10 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.

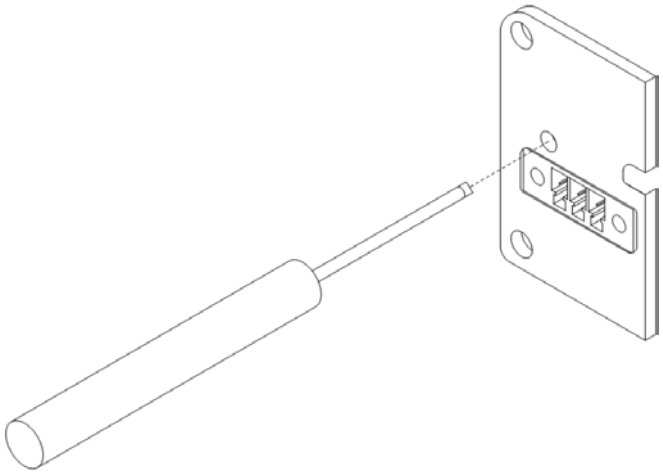

Figure 32: Router reset

We recommend backing up configuration of the router (see *Configuration manual for 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 14: Description of reset and restart router

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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.

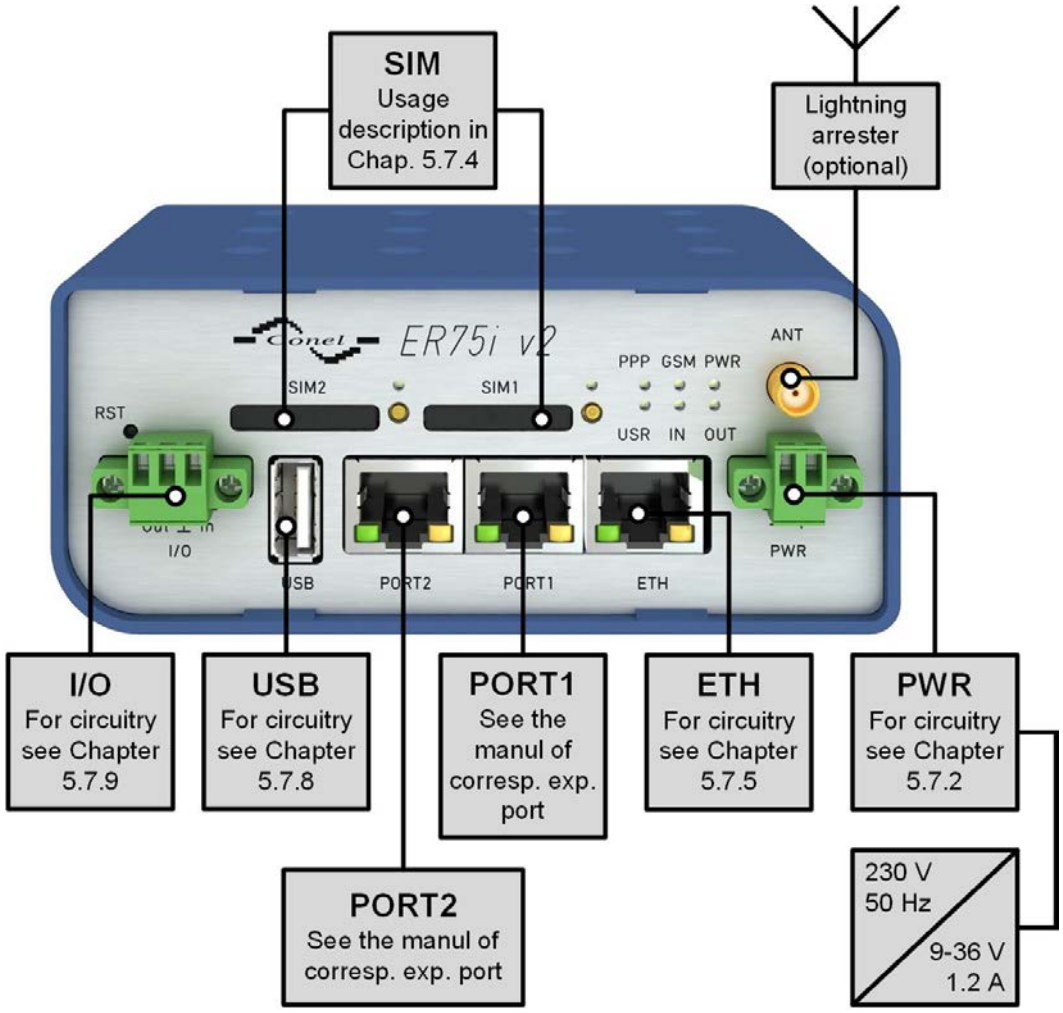

Figure 33: Router connection

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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*.

The power consumption during receiving is 2.0 W. The peak power consumption during data sending is 5.5 W. However, values of consumption can be increased, if some expansion port is equipped. 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.

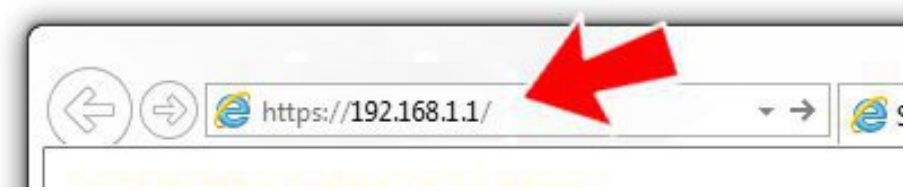

Figure 34: Entering the IP address of the router

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!

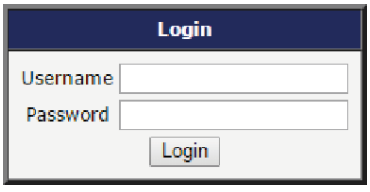

Figure 35: Entering login information

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

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

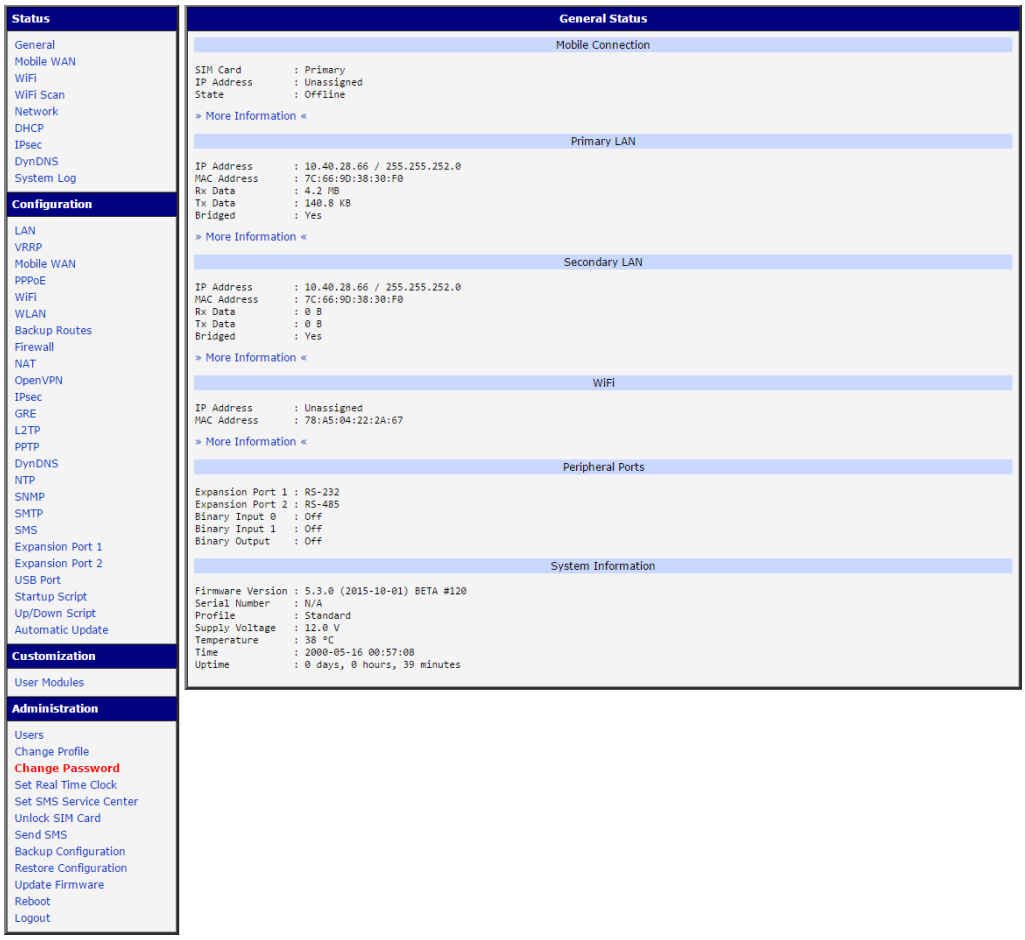

Figure 36: Router web interface

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

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*.

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7. Technical Parameters

7.1 Basic parameters

ER75i v2		
Temperature range	Operating 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 Transmission	2.0 W 5.5 W
Dimensions	Plastic box Metal box	51 x 87 x 116 mm (DIN 35 mm) 42 x 87 x 113 mm (DIN 35 mm)
Weight		ER75i v2 – 150 g ER75i v2 SL – 280 g
Antenna connector		1x SMA – 50 Ohm 1x R-SMA – 50 Ohm (**only for WiFi**)
User interface	ETH USB PORT1 PORT2	Ethernet (10/100 Mbps) USB 2.0 type A host On customer's request On customer's request

Table 15: Basic parameters

7.2 Standards and regulations

The router complies with the following standards and regulations.

Standards and regulations	
Telecom and emission	ETSI EN 301 511 V12.5.1 (2017-03), ETSI EN 300 328 V2.1.1 (2016-11), ETSI EN 300 220-2 V3.1.1 (2017-02)
EMC	ETSI EN 301 489-1 V2.1.1 (2016-11), Draft ETSI EN 301 489-52 V1.1.0 (2016-11), ETSI EN 301 489-17 V3.1.1 (2017-02), ETSI EN 301 489-3 V2.1.1 (2017-03)
Safety	EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 + AC:2011

Table 16: Standards and regulations

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7.3 Technical parameters of module

EDGE module	
Frequency bands	EGSM850, EGSM900, GSM1800 and GSM1900
Transmit power	Class 4 (2 W) for EGSM850 Class 4 (2 W) for EGSM900 Class 1 (1 W) for GSM1800 Class 1 (1 W) for GSM1900

Table 17: Technical parameters of module

7.4 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 18: Other technical parameters

7.5 Technical parameters of I/O port

Binary input and output		
Input/Output	Binary input Binary output	Reed contact with trigger level 1.3 up to 1.4 V 100 mA / max. 30 V

Table 19: Technical parameters of I/O port

7.6 Technical parameters of expansion port

Technical parameters of expansion ports are provided in separate manuals.

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8. Related Documents

[1] Advantech Czech: **Start guide for v2 routers**,
[2] Advantech Czech: **Configuration manual for v2 routers**,
[3] Advantech Czech: **User's manual – Expansion port RS232**,
[4] Advantech Czech: **User's manual – Expansion port RS485/422**,
[5] Advantech Czech: **User's manual – Expansion port MBUS**,
[6] Advantech Czech: **User's manual – Expansion port CNT**,
[7] Advantech Czech: **User's manual – Expansion port ETH**,
[8] Advantech Czech: **User's manual – Expansion port SWITCH**,
[9] Advantech Czech: **User's manual – Expansion port WIFI**,
[10] Advantech Czech: **User's manual – Expansion port WMBUS**,
[11] Advantech Czech: **User's manual – Expansion port SD**,
[12] Advantech Czech: **Application note – Expansion port mounting**,
[13] Advantech Czech: **Application note – Programmer guide**.

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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).
- 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.

9.1 FAQ

✍ **The router reboots itself and the Ethernet connection fails.**

- *The router will not work well without an antenna. Keep the antenna as far 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 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.*

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- *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.*

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✍ **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".*

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10. Customers Support

10.1 Customer Support for NAM

E-mail: support@advantech-bb.com
Web: www.advantech-bb.com

10.2 Customer Support for Europe

E-mail: iiotcustomerservice@advantech.eu
Web: www.advantech-bb.com

10.3 Customer Support for Asia

E-mail: icg.support@advantech.com.tw
Web: www.advantech.com

Upkeep – Advices:

- The SIM-card must be handled carefully as with a credit card. Don't bend, don't scratch on this and do not expose to static electricity.
- During cleaning of the router do not use aggressive chemicals, solvents and abrasive cleaners!

Hereby, Advantech Czech s.r.o. company declares that the radio equipment narrated in this user's guide is in compliance with EU Directive **2014/53/EU**.

The full text of the EU Declaration of Conformity is available at the following internet address: www.advantech-bb.cz/eudoc

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