HIRSCHMANN
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User Manual

Installation
OWL LTE (Industrial Cellular Router)

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Contents

About this Guide

This document provides technical specifications for the Industrial Cellular Router and illustrates the hardware installation for a Hirschmann Industrial Cellular Router. It also helps the developers to validate their application design using the Industrial Cellular Router.

The information in this publication contains general descriptions or performance factors which, when applied in an actual situation, do not always correspond with the described form and may be amended by way of further development of products. The desired performance factors shall only be deemed binding if these are expressly agreed on conclusion of the contract. Please note that some characteristics of the recommended accessory parts may differ from the appropriate product. This might limit the possible operating conditions for the entire system.

Legend

The designations used in this manual have the following meanings:

▶	List
☐	Work step
■	Subheading
Link	Cross-reference with link
Note:	A note emphasizes an important fact or draws your attention to a dependency.
`Courier`	ASCII representation in the graphical user interface

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Source codes under the GPL license are available free of charge. Send an email request to:

hac-support@belden.com

Safety Instructions

General safety instructions

You operate this device with electricity. The safe operation of the device depends on proper handling during transportation, storage and assembly, and proper use of operation and maintenance procedures. Improper use of this device can cause injury or property damage.

- ☐ Read this documentation, safety instructions and warnings before connecting any cables.
- ☐ Never start an operation with damaged components.
- ☐ The device does not contain any service components. If the device is not functioning correctly, or if it is damaged, turn off the power supply and return the device to Hirschmann for inspection.

⚠ WARNING

UNCONTROLLED MACHINE ACTIONS
To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.
Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all the data transmission devices.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Qualification requirements for personnel

- ☐ Allow only qualified personnel to work on the device who have the following characteristics:
  - ▶ Properly trained personnel who have practical knowledge and experience. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current technology safety standards.
  - ▶ Qualified personnel are aware of the dangers that exist in their work.
  - ▶ Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
  - ▶ Qualified personnel receive training on a regular basis.

Intended usage

- ☐ Use the product only for the application cases described in the Hirschmann product information, including this manual.
- ☐ Operate the product according to the technical parameters. See “First Use” on page 29.
- ☐ Connect components which are suitable for the requirements of the specific application to the product.

National and international safety regulations

Verify that the electrical installation meets applicable national and international safety regulations.

Working voltage

- ☐ Connect only a working voltage that corresponds to the type plate of your device.
- ☐ Make sure the following requirements are met every time you connect the electrical conductors:
  - The power supply conforms to over voltage category I or II.
  - The power supply has an easily accessible disconnecting device (such as a switch or a plug) which is clearly identified. So in case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
  - The electrical wires are voltage-free.
  - The power supply is Class 2 compliant.
  - The working voltage inputs are designed for operation with safety extra-low voltage. Connect only SELV circuits with voltage restrictions in line with IEC/EN 60950-1 to the working voltage connections.
  - The wire diameter of the power supply cable is at least 0.5 mm² (North America: AWG20) on the working voltage input.
  - The wire diameter of the ground conductor is at least 0.5 mm² (North America: AWG20).
  - The power supply cables used are permitted for the temperature range required by the application case.
    The power cords are suitable for ambient air temperatures of at least 167 °F (75 °C). The power cord wires are made of copper.

Turn on the operating voltage for the device only when the following requirements are fulfilled:

- The housing is closed
- The terminal block is wired correctly
- The terminal block for the operating supply is connected

Installation site requirements

- ☐ Verify that there is at least 4 in (10 cm) of space above and below the device.
- ☐ Verify that there is at least 0.8 in (2 cm) of space on the right and left sides of the device.
- ☐ Verify that there is at least a minimum distance of 7.9 in (20 cm) between the antenna and the human body.

Housing

Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.

Please, observe the following instructions:

To prevent injury and damage to the device and to ensure that you comply with the relevant provisions, use original accessories only. Unauthorized modifications or unapproved utilization of accessories can result in damage to the router and in a breach of applicable regulations. Unauthorized modifications or unapproved utilization of accessories can result in the termination of the guarantee.

- ☐ Before handling the SIM card, disconnect the router from the power supply.
- ☐ Do not exceed the maximum voltage of 30 V DC at the power connector of the router.
- ☐ Do not expose the router to extreme ambient conditions. Protect the router against dust, moisture and high temperature. See table 13 on page 32.
- ☐ When cleaning the router, do not use aggressive chemicals, solvents or abrasive cleaners.
- ☐ It is recommended that you should create an appropriate copy or backup of the important settings that are stored in the memory of the device.
- ☐ **Caution!** The SIM card can be swallowed by small children.
- ☐ The SIM card must be handled carefully like a credit card. Do not bend or scratch the SIM card and do not expose the SIM card to static electricity.
- ☐ It is recommended that you do not use the router at petrol filling stations. We recommend observing local restrictions concerning the use of radio-based devices while working with explosive material for example, at petrol filling stations, or in chemical plants.
- ☐ While using the router close to personal medical devices, such as cardiac pacemakers or hearing aids, proceed with heightened caution.

Note: Insert the SIM Card holder in the SIM card slot very carefully. When inserted improperly, you can damage the SIM card slot. Also, the SIM card can fall out of the holder and end up in the router.

SAR coefficient values

The router meets the SAR coefficient values defined by the International Commission on Non-Ionizing Radiation (ICNIRP) and the values described in "About protection of health before non-ionized radiation".

1 Router Description

Hirschmann has designed the OWL router for wireless communication in mobile networks that make use of the following technologies:

- LTE
- HSPA+
- UMTS
- EDGE
- GPRS

Due to the high speed of data transfer up to 100 Mbit/s (download) and up to 50 Mbit/s (upload) is this router an ideal solution for wireless connection of data stream and security camera systems, individual computers, LAN networks, automatic teller machines (ATM) and other self-service terminals.

As a standard, the router is supplied in a metal casing.

The cellular router is also equipped with the following interfaces located on the front panel:

- 2 Fast Ethernet 10/100BaseTX ports, RJ45
- 2 SMA antenna connectors, Main + Rx Div
- 1 GPS antenna connector
- 1 USB 2.0 Host port
- binary I/O ports (2x input, 1x output)
- 1 RS232 serial interface
- 1 Connector (2-pin) for the power supply adapter

The following ports are located on the back panel of the router:

- 2 SIM Cards readers, for 3 V and 1.8 V SIM cards
- 1 microSD card reader
- 1 Reset button

Configuring the cellular router is possible using a graphical user interface which is password protected. The graphical user interface provides, after logging in, detailed statistics about the activities of the router such as, signal strength, and a detailed system log. This device supports the creation of VPN tunnels using technologies such as IPSec, OpenVPN and L2TP for secure communications. The router also supports the following functions:

- DHCP
- NAT
- DynDNS
- IPSec
- OpenVPN
- NTP
- VRRP
- control by SMS
- primary/backup connection

Diagnostic functions, which provide for continuous communication, include an automatic inspection of a PPP connection, offering an automatic restart feature in case of an unexpected termination of the connection. Another diagnostic function is the hardware watchdog, which monitors the status of the router.

Using a special window, the start up script window, you can insert Linux scripts for various actions. For some applications, it is crucial to create several different configurations for a router. You can exchange these configurations as necessary for example, using SMS. The router can automatically upgrade a configuration and firmware from a server. This allows you to configure several routers at a time.

Note: For the system time backup the device contains a 3 V Lithium Battery (Li/MnO2).

2 Contents of Package

The basic router set available for delivery includes the following items:

- router
- clip for the DIN rail
- loose power connector
- 6-pin I/O connector
- 5-pin terminal block for RS232
- Safety and general information sheet
- EU Declaration of Conformity

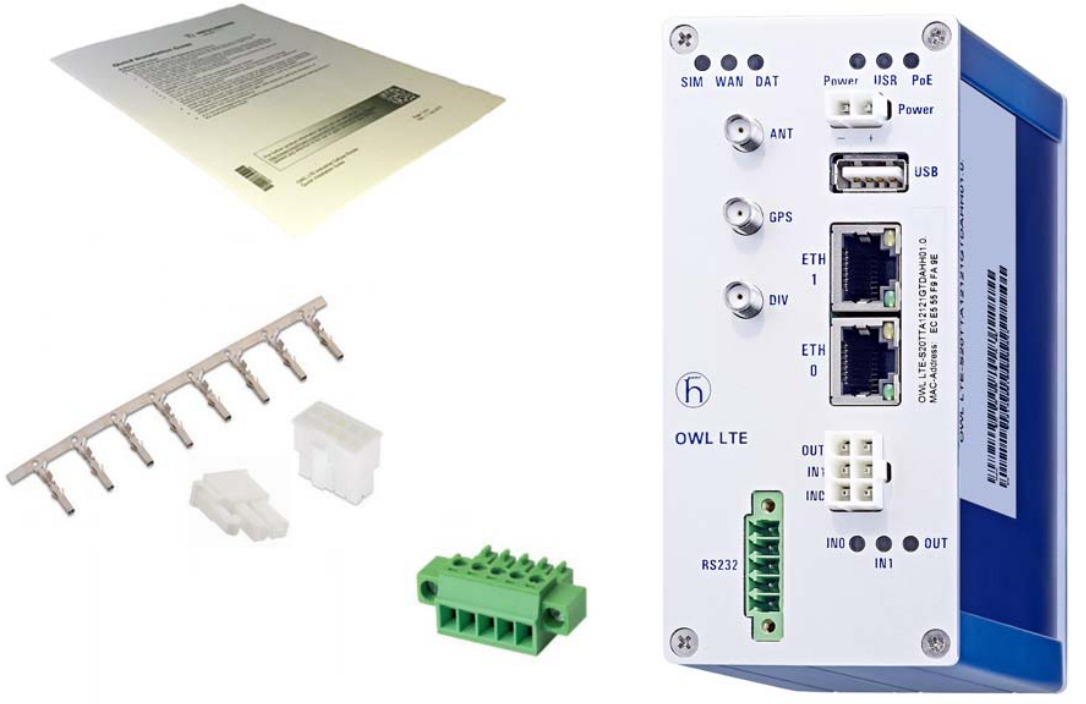

Figure 1: Contents of Package

3 Router Design

3.1 Delivery Identification

Product Name	Product Code	Product Group
OWL LTE	OWL LTE-S20TTA12121GTDAHHXX.X.XX	Industrial Cellular Router

Table 1: Delivery identification

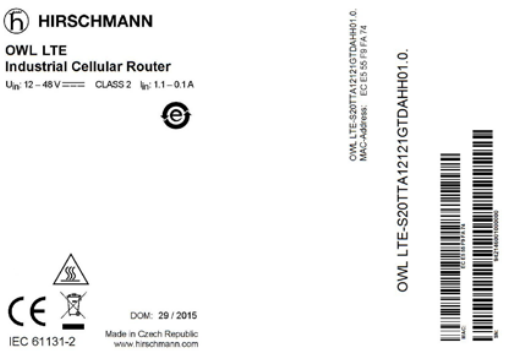

Figure 2: Example of Router Label

3.2 Basic Dimensions of Router Box

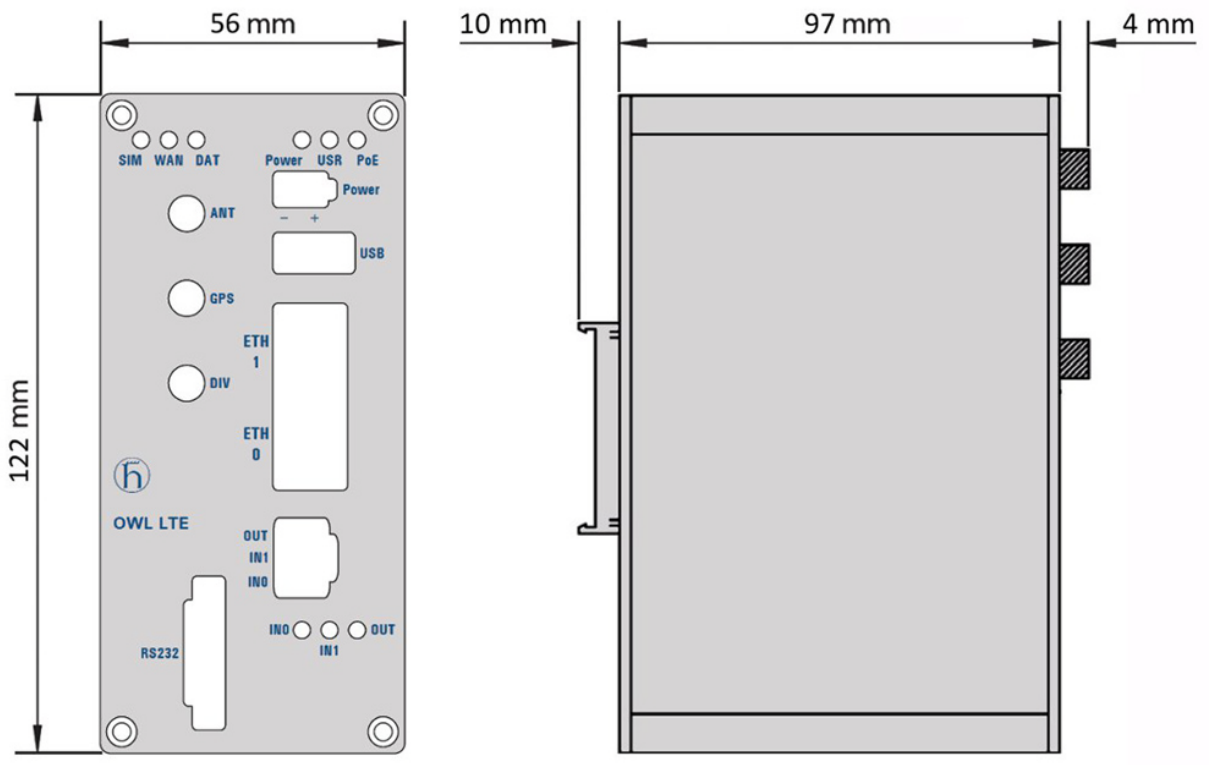

Figure 3: Basic Dimensions of Router Case

3.3 Mechanical Dimensions and Mounting Recommendations

Mounting recommendations:

- place router on a work surface
- DIN rail with the CKD2 holder included

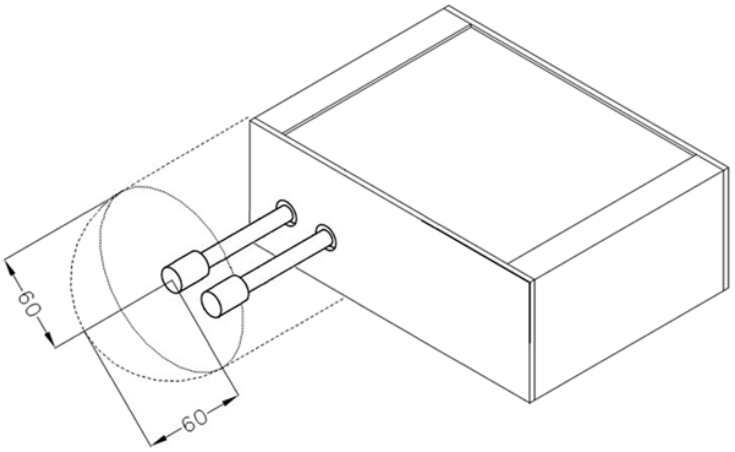

Figure 4: Space around antennas

We recommend you bind every cable in a bunch according to the following figure. For this use we recommend you observe the following rules:

- The length of the combination of power supply and data cables can be a maximum of 1.5 m. If the length of data cables or power cable exceeds 1.5 m, we recommend that you install surge protectors.
- Do not use data cables which conduct working voltage 230 V/50 Hz.

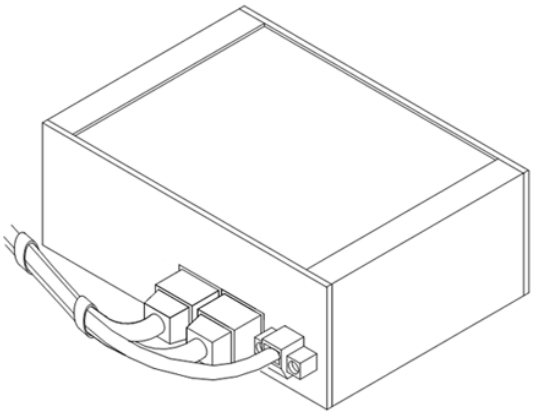

Figure 5: Cable routing

Sufficient space must be left before individual connectors for handling of the cables:

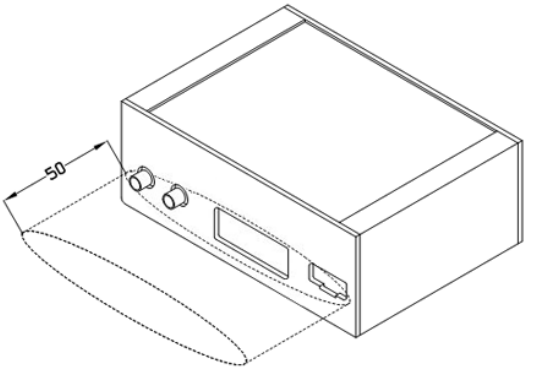

Figure 6: Space in front of connectors

For the correct function of the router, use earth-bonding distribution frame for grounding of power supply of router, data cables and antenna.

3.4 Removing from the DIN rail

Default position of holder, used for mounting the router on a DIN rail, is shown in the following figure:

Figure 7: Default position of DIN holder

To remove the router from the DIN rail, it is necessary to lightly push the router downward so that the bottom part of the holder clears the rail. After the holder clears the rail rotate the bottom part of the router out away from the DIN rail.

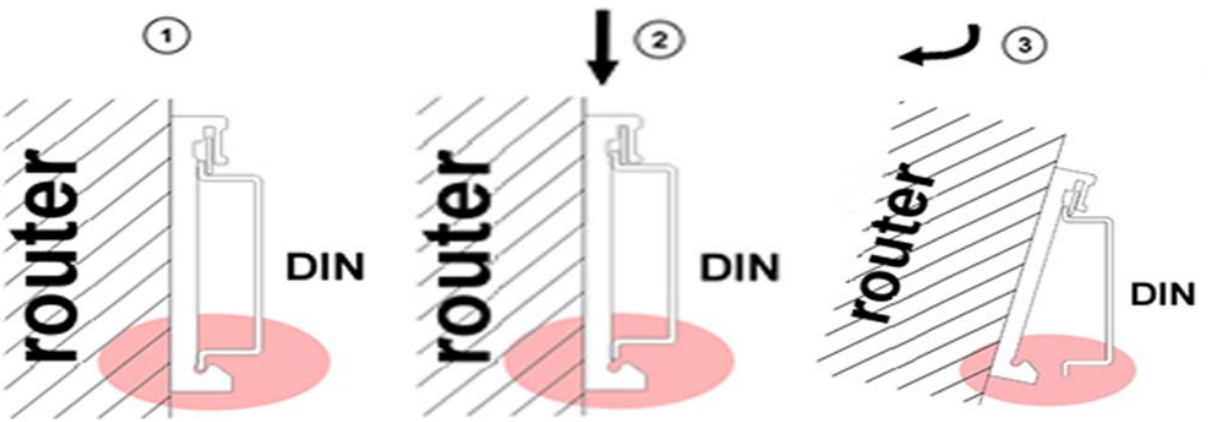

Figure 8: Removing from the DIN rail

3.5 Description of the rear panel

The rear panel contains 2 SIM card holders (SIM1 and SIM2), a holder for the SD card (SD), and the Reset (RST) button. You use the reset button to restore the default configuration and reboot the router.

3.6 Description of the Front Panel

The front panel of router contains the following connectors:

Caption	Connector	Description
Power	2-pin	Connector for the power supply adapter
ETH0	RJ45	Connector for connection into the local computer network
ETH1	RJ45	Connector for connection into the local computer network
ANT	SMA	Connector for main antenna
DIV	SMA	Connector for diversity antenna
GPS	SMA	Connector for GPS antenna
USB	USB-A 2.0 Host	Connector for connection of USB devices to the router. Supports devices with PL-2303 and FTDI USB/RS232 converters.
I/O	6-pins	Connector for connection of the binary inputs and output
I/O	8-pin A-coded M12	Connector for connection of the binary inputs and output
RS232	5-pins	Connector for serial RS232 connection

Table 2: Delivery identification

Figure 9: Router Front Panel

3.6.1 Status Indication

There are 3 LED indicators on the front panel and 2 LED indicators on every port, that provide information about the port status.

Applies to software releases **before** 01.2.01 (2017-01-06):

Caption	Color	State	Description
Power	Green	Blinking On Fast blinking	Router is ready Starting of the router Updating firmware
WAN[a]	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 neighbors cells is exactly 3 dBm Signal strength is from -90 dBm to -113 dBm or difference between neighbors cells is smaller than 3 dBm
DAT	Red	Blinking	Communication in progress on radio channel
USR	Yellow	—	Function of this LED diode can be selected by user
POE	Yellow Green	— On Off	— The voltage present on the ETH0 or ETH1 port The voltage absent from the ETH0 or ETH1 port
SIM	Yellow Green	On (Yellow color) On (Green color)	SIM card 1 is active SIM card 2 is active
IN0	Green	On	Binary input no. 0 is active
IN1	Green	On	Binary input no. 1 is active
OUT	Yellow	On	Binary output is active
ETH0 ETH1	Green	On Off	Selected 100 Mbit/s Selected 10 Mbit/s
ETH0 ETH1	Yellow	On Blinking Off	The network cable is connected Data transmission The network cable is not connected

Table 3: Router Status Indication

a. The WAN status is updated every 10 seconds. The WAN LED displays the current status.

Applies to software releases **from** 01.2.01 (2017-01-06):

Caption	Color	State	Description
Power	Green	On Blinking Fast blinking	Router is ready Starting of the router Updating firmware
WAN[a]	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 neighbors cells is exactly 3 dBm Signal strength is from -90 dBm to -113 dBm or difference between neighbors cells is smaller than 3 dBm

Table 4: Router Status Indication

Caption	Color	State	Description
DAT	Red	Blinking	Communication in progress on radio channel
USR	Yellow	—	Function of this LED diode can be selected by user
POE	Yellow	—	—
	Green	On	The voltage present on the ETH0 or ETH1 port
		Off	The voltage absent from the ETH0 or ETH1 port
SIM	Yellow	On (Yellow color)	SIM card 1 is active
	Green	On (Green color)	SIM card 2 is active
IN0	Green	On	Binary input no. 0 is active
IN1	Green	On	Binary input no. 1 is active
OUT	Yellow	On	Binary output is active
ETH0	Green	On	Selected 100 Mbit/s
ETH1		Off	Selected 10 Mbit/s
ETH0	Yellow	On	The network cable is connected
ETH1		Blinking	Data transmission
		Off	The network cable is not connected

Table 4: Router Status Indication

a. The WAN status is updated every 10 seconds. The WAN LED displays the current status.

3.6.2 Power Connector

Panel socket 2-pin.

Pin number	Signal mark	Description
1	GND(-)	Negative pole of DC supply voltage (connected to ground)
2	VCC(+)	Positive pole of DC supply voltage (+12 V DC to +48 V DC)

Table 5: Connection of Power Connector

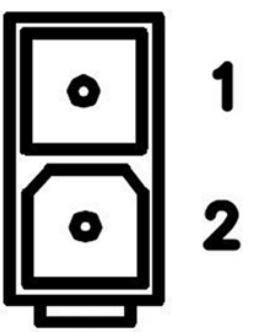

Figure 10: Power connector

Power supply for router must be between +10 V DC to +60 V DC supply. Protection against reversed polarity without signaling is built into the router.

You can place the OWL LTE into the low power mode using a special command. When in the low power mode, you can wake the router up for example, with activity on binary input or using an internal timer.

Note: You can power the router with this connector even if the router is powered with PoE, but the input voltage has to be higher than 15 V DC. If the input voltage is lower than 15 V DC and the PoE voltage is present, PoE LED illuminated green, then the Ethernet connector supplies power using PoE.

If you power the router using PoE applied to both Ethernet ports, then an unexpected restart can occur. The router restarts after disconnecting PoE power to the Ethernet port on which power was first applied. For example, you connect PoE power to port 1, then to port 2. After you disconnect power to port 1, with power still applied to port 2, the router restarts.

Circuit example:

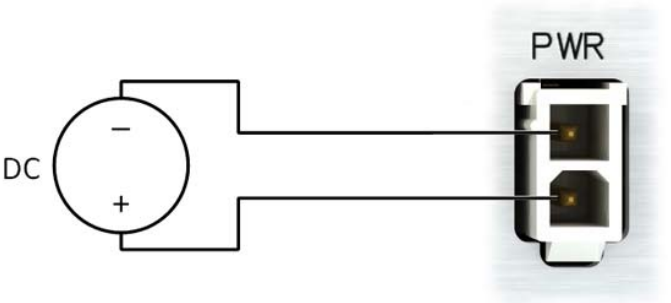

Figure 11: Power connector pin-outs

3.6.3 Grounding the device (functional earth)

Ground the device by connecting the minus pole (GND) of the power supply to earth. When you mount the device on a grounded DIN rail, then the DIN rail provides the ground.The shield of a shielded twisted pair cable is connected to the housing and the minus pole of the power supply socket.

3.6.4 Antenna Connectors

Main and diversity antennas are connected to the router using the SMA connector on the front panel. The "ANT" connector is used to connect the main antenna to the router. To connect the diversity antenna, use the second "DIV" antenna connector. The "GPS" connector is intended for the GPS antenna. The router supports an active GPS antenna.

Note: Do not operate the router without the main antenna connected.

For connecting the antenna, use an SMA connector. Screw the antennas to the SMA connector on the front panel of the router (see figure below).

Note: Be very careful when tightening the antenna. If you over tighten the antenna, then you will twist the antenna connector off of the circuit board.

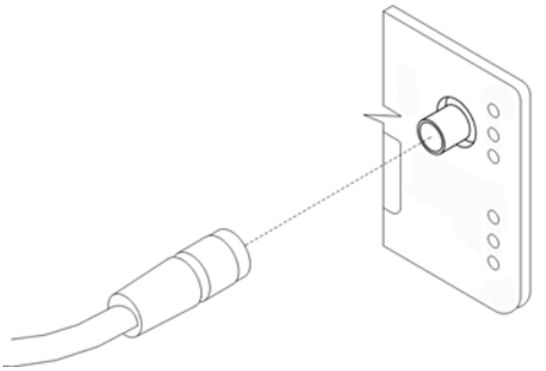

Figure 12: Connecting the Antenna

The diversity antenna improves radio features of the router at a low signal strength.

3.6.5 SIM Card Reader

There are 2 SIM card readers for 3 V and 1.8 V SIM cards located on the rear panel of the router.
In order for the router to function properly, insert an activated SIM card with the PIN code unblocked in to the SIM card holder. Each SIM card can have a different APN (Access Point Name).

Note: When changing the SIM Card, pay close attention to the following rules:

- Before handling the SIM card, disconnect the router from the power supply.
- Use the flat end of a plastic screwdriver, or your fingernail, to press the SIM card slightly deeper into the slot until you hear a click.
- After you hear a click, release the SIM card. The SIM card pops out of the slot.
- Place SIM card 1 in the slot with the contacts face down, and SIM card 2 in the slot with the contacts face up.

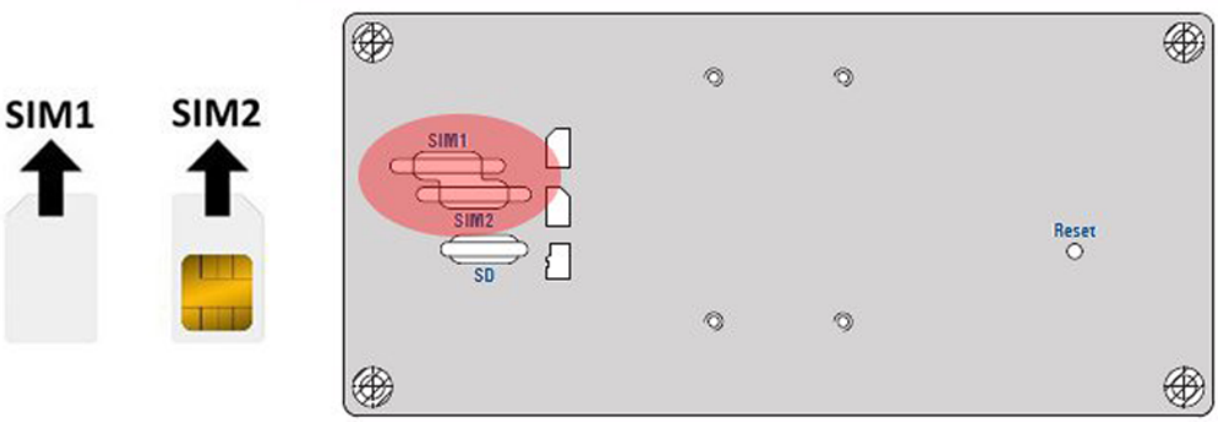

Figure 13: Placement and location of the SIM holder

3.6.6 MicroSD card reader

The microSD card reader is located on the rear panel of the router, the third slot from the top. This card reader allows the router to operate with microSD memory cards. Technical specifications are stated in the table below.

Technical specifications of microSD card		
Supported technologies		SDHC, SDXC
Supported capacity	SDHC SDXC	up to 32 GB from 32 GB to 64 GB

Table 6: Technical specifications of microSD card

Changing the microSD card:

- Use the flat end of a plastic screwdriver, or your fingernail to press the microSD card slightly deeper into its slot until you hear a click.
- After you hear a click, release the microSD card. The microSD card pops out of the slot.
- Remove the microSD card and push another microSD card into the slot until it clicks in place.

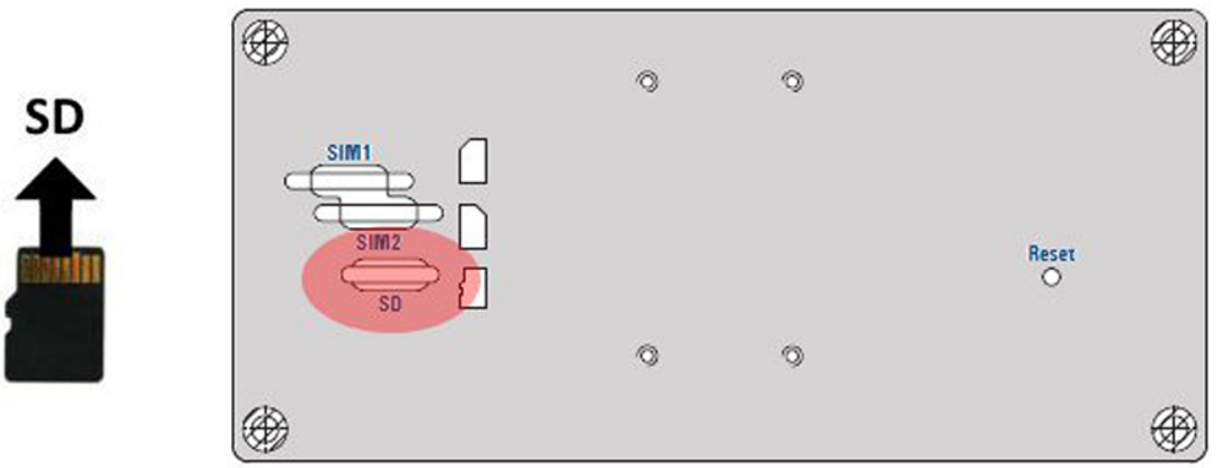

Figure 14: SD card

3.6.7 Reset

When the "Power" LED on the front panel has turned on, it is possible to restore the default configuration of the router by pressing the "Reset" button. After pressing the "Reset" button, the default configuration is restored and the router reboots. During rebooting, the "Power" LED blinks.

Note: We recommend that you back up the router configuration before resetting the router. For detailed information about resetting the router refer to the User Manual Configuration. Resetting the router returns the configuration to the default state.

Use a narrow screwdriver for pressing the "Reset" button located on the rear panel.

It is important to distinguish the difference between resetting and rebooting the router.

Action	Router behavior	Invoking events
Reboot	Turn off and then turn on router.	Disconnect and connect the power.
Reset	Restore default configuration and reboot the router	Press "RST" button on rear panel

Table 7: Description of Reset and Restart Router

3.6.8 Ethernet Ports ETH0 & ETH1

Panel socket RJ45.

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	DC+	POE power +	
5	DC+	POE power +	
6	RXD-	Receive Data - negative pole	Input/Output
7	DC-	POE power -	
8	DC-	POE power -	

Table 8: Ethernet connector pin-outs

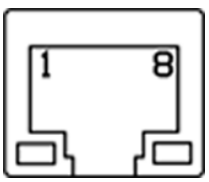

Figure 15: Ethernet Connector

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

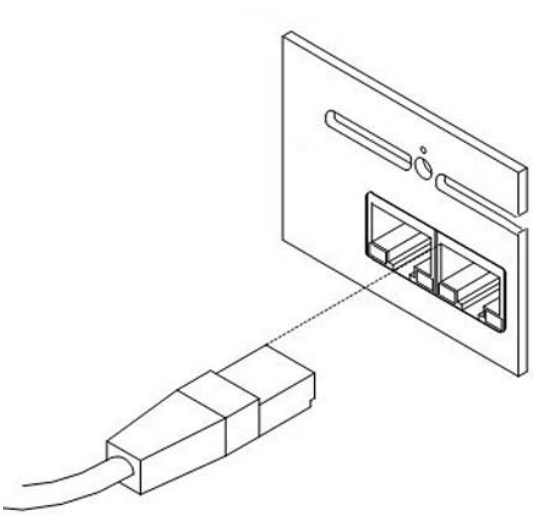

Figure 16: Connection of an Ethernet Cable

PoE PD

The router supports the PoE+ standard for PoE PD. You can supply power to the router from the Ethernet ports "ETH0" or "ETH1". See the PoE parameters located in “PoE PD Technical Parameters – PSE Requirements” on page 35. When voltage is present on an Ethernet port, the "PoE" LED on the front panel of the router illuminates green indicating that the router is using PoE power. When you use PoE to supply power to the router, you can connect the router to a 15 V DC and higher power source to the "Power" connector. If the power source provides less than 15 V DC, then the router uses the PoE power from the Ethernet ports.

3.6.9 USB Port

Panel socket USB

Pin	Signal Mark	Description	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	GND Negative pole of DC supply voltage	

Table 9: USB connector pin-outs

Figure 17: USB connector

3.6.10 I/O Port

Panel socket 6-pin.

Pin number	Signal mark	Description
1	IN0	Binary input 0
2	IN0	Binary input 0
3	IN1	Binary input 1
4	IN1	Binary input 1
5	OUT	Binary output
6	OUT	Binary output

Table 10: I/O connector pin-outs

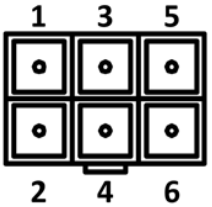

Figure 18: I/O connector

The I/O user Interface is designed for processing binary input and control binary output. The binary output is inactive in the default configuration. The insulation strength is 1.5 kV. The pins are isolated from each other with the same strength.

The input circuits are bipolar and allow connections as needed with a common plus or minus, according to connection of the external voltage.

Binary inputs

Characteristics of inputs:

logical 0 / 1	Voltage	Current
log. 0 max	3 V	0.4mA
log. 1 min	5 V	0.7mA
log. 1 type	12 V	2mA
log. 1 max	60 V	7mA

Table 11: Characteristics of inputs

To retrieve the binary input status from the Shell use either `io get bin0` or `io get bin1`.

Binary inputs connection with example:

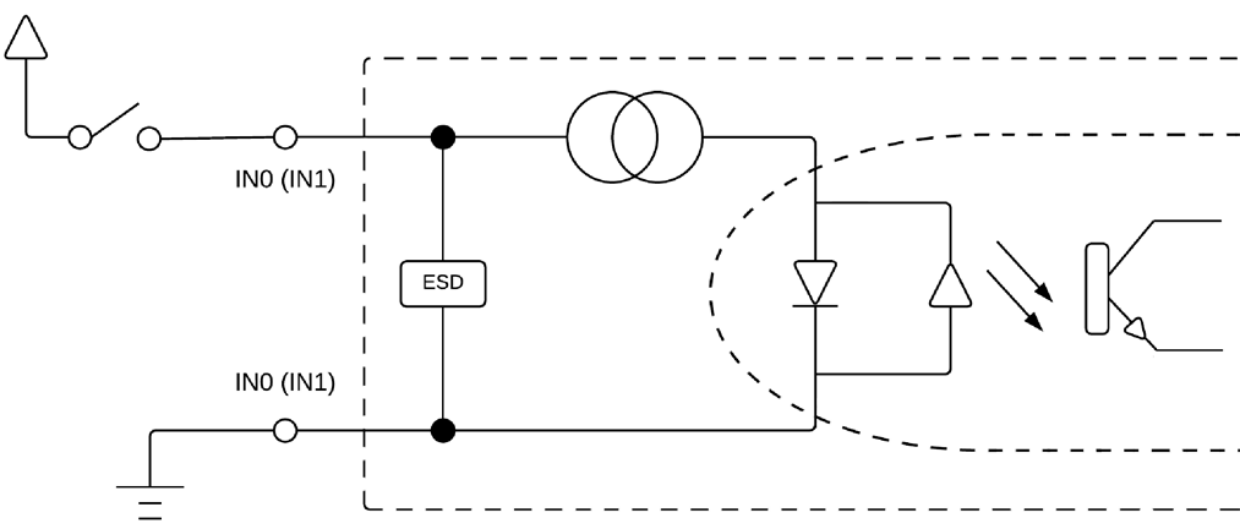

Figure 19: Binary inputs connection

Binary output parameters:

- 60 V AC / 300 mA
- 60 V DC / 300 mA

Current of binary output is limited by a resettable fuse (300 mA)

Binary output connection with example:

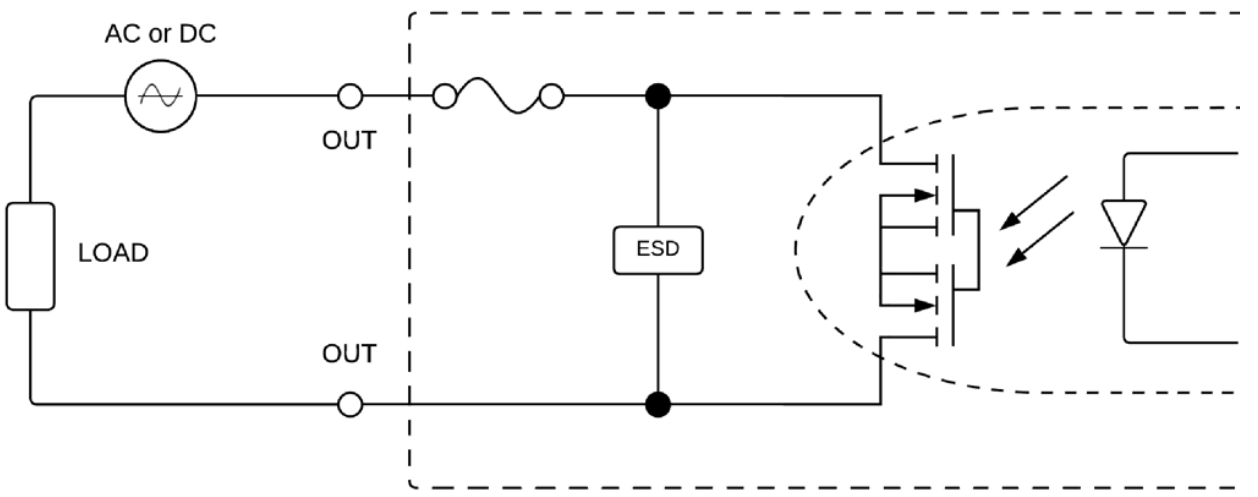

Figure 20: Binary output connection

3.6.11 RS232 interface

The RS232 interface is physically connected on a five-pin terminal block. The insulation strength is up to 2.5 kV. The RS232 converter is protected against an overload on the bus.

Serial Connector Pin outs

Pin	Signal Mark	Description	Direction
1	CTS	Clear To Send	Output
2	RTS	Request To Send	Input
3	GND	Signal ground	—
4	RXD	Receive Data	Input
5	TXD	Transmit Data	Output

Table 12: RS232 connector pin-outs

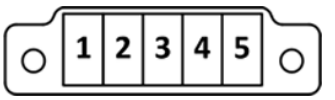

Figure 21: RS232 connector

4 First Use

4.1 Connecting Components before the First Use

Before putting the router into operation, it is necessary to connect the components which are required for your applications. Do not forget to insert at least 1 SIM card.

Note: The router can not operate without connecting the main antenna, at least 1 SIM card and a power supply. If the antenna is not connected, the router can be damaged.

Note: Be very careful when tightening the antenna. If you over tighten the antenna, then you can twist the antenna connector off of the circuit board.

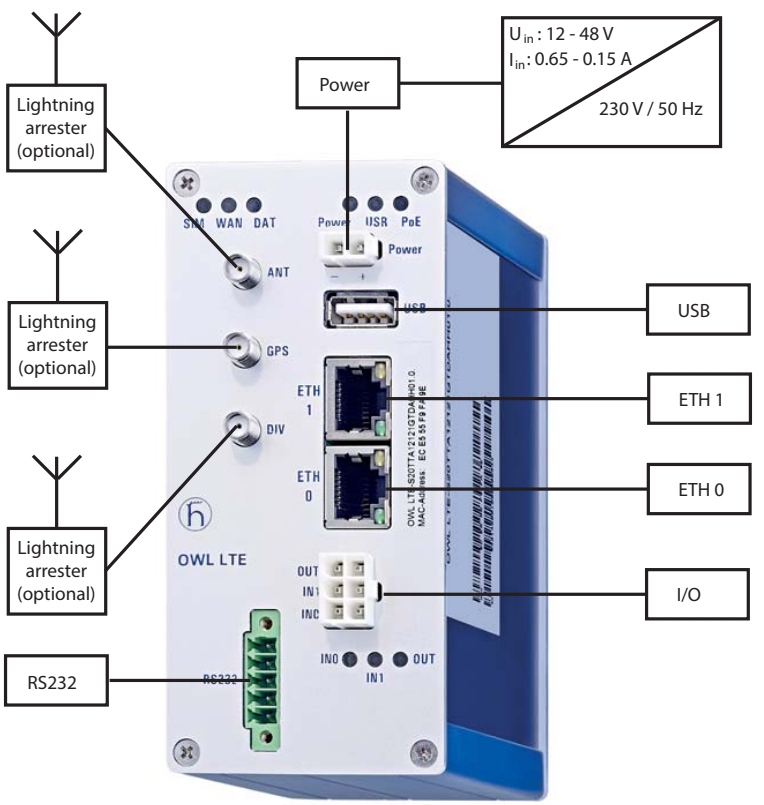

Figure 22: Router Connection

4.2 Start

The router operates when the power supply is connected to the router. By default, the router automatically starts to log in to the default APN. You can change the parameters of the router behavior using the web interface. You can find a detailed description of the parameters in the User Manual Configuration.

4.3 Configuration

Note: Before you apply power to the router, insert at least 1 SIM card in the router, and install the main antenna. Activate the SIM card in the "Administration > Unlock SIM card" dialog, after inserting it into the SIM card reader.

4.3.1 Configuration using a Web Browser

Status monitoring, configuration and administration of the router is available using the graphical user interface (GUI) which can be accessed by entering the IP address of the router into your web browser. The default IP address of the router is 192.168.1.1 netmask 255.255.255.0.

Note: Use the HTTPS protocol for secure communication.

- **Applies to devices that are delivered without unique default password:**

  The default settings allow only the user `admin` with the default password `private` to configure the router.

  After successfully entering the login information a user has access to the router using the Internet browser.

- **Applies to devices that are delivered with an unique default password that is located on a label on the device**

  Perform the following steps:
  - ☐ Open the Graphical User Interface the first time you log on to the device.
  - ☐ Type in the user name “admin”.
  - ☐ Type in the unique default password that is located on a label (“Def. password”) on the device.
  - ☐ Click the “Login” button.
    After successfully entering the login information you have access to the router using the Internet browser.
  - ☐ **To help maintain the security of your network, change the unique default password of the router.**

  Note: Some features may be disabled until you change the default password.

  Note: The unique default password will be applied again if you reset the router by the “Reset” button.

5 Technical Parameters

5.1 Basic parameters

OWL LTE		
Complies with standards		EN 301 511, EN 300 440-2 EN 301 908-1, -2, -13 EN 301 489-1, -7, -24 EN 60950-1, EN 62311 EN 61000-6-2 EN 61131-2 EN 55022
Temperature range	Operation	-40 °C to +75 °C
	Storage	-40 °C to +85 °C
Cold start	-35 °C -40 °C	Data transfers via mobile network are available immediately Data transfers via mobile network are available approximately in five minutes after the start of the router. Everything else is functional immediately.
Humidity	Operating Storage	0 to 95 % relative humidity non condensing 0 to 95 % relative humidity non condensing
Altitude	Operating	2000 m / 70 kPa
Protection		IP30
Supply voltage		12 V DC to 48 V DC
Consumption	Idle Average Peak Sleep mode	2.5 W 4 W 11 W 10 mW
Dimensions		55 mm x 97 mm x 125 mm (DIN 35 mm)
Weight		approximately 390 g
Antenna connectors		SMA - 50 Ohm
Use interfaces	2x ETH USB I/O RS232	Ethernet (10/100 Mbit/s) USB 2.0 6-pin panel socket 5-pin terminal block

Table 13: Technical Parameters of the Router

5.2 Type tests and environmental conditions

Phenomena	Test	Description	Test levels
ESD	EN 61000-4-2	Enclosure contact Enclosure air	±6 kV ±8 kV
RF field AM modulated	IEC 61000-4-3	Enclosure	10 V/m (80 – 2700 MHz)
Fast transient	EN 61000-4-4	Signal ports Power ports Ethernet ports	±2 kV ±2 kV ±2 kV
Surge	EN 61000-4-5	Ethernet ports Power ports I/O ports	±2 kV, shielded cable ±0.5 kV ±1 kV, L to L ±2 kV, L to GND
RF conducted	EN 61000-4-6	All ports	10 V/m (0.15 – 80 MHz)
Radiated emission	EN 55022	Enclosure	Class B
Conducted emission	EN 55022	DC power ports Ethernet ports	Class B Class B
Dry heat	EN 60068-2-2	+75 °C, 40 % rel. humidity	
Cold	EN 60068-2-1	-40 °C	
Damp heat	EN 60068-2-78	95 % rel. humidity (+40 °C)	

Table 14: Type tests and environmental conditions

5.3 Technical Parameters of module

LTE module	
LTE parameters	Bit rate 100 Mbps (DL) / 50 Mbps (UL) 3GPP rel. 8 standard Supported bandwidths: 5 MHz, 10 MHz, 20 MHz Supported frequencies: 800 / 900 / 1800 / 2100 / 2600 MHz
HSPA+ parameters	Bit rate 21.1 Mbps (DL) / 5.76 Mbps (UL) 3GPP rel. 7 standard UE CAT. 1 to 6, 8, 10, 12, 143GPP data compression Supported frequencies: 900 / 2100 MHz
UMTS parameters	PS bit rate 384 kbps (DL) / 384 kbps (UL) CS bit rate 64 kbps (DL) / 64 kbps (UL) W-CDMA FDD standard Supported frequencies: 900 / 2100 MHz

Table 15: Technical parameters of the module

LTE module	
GPRS/EDGE parameters	Bit rate 237 kbps (DL) / 59.2 kbps (UL) GPRS multislot class 10, CS 1 to 4 EDGE multislot class 12, CS 1 to 4 MCS 1 to 9 Supported frequencies: 900 / 1800 / 1900 MHz
Supported GPRS/EDGE power classes	EGSM 900: Class 4 (33 dBm) GSM 1800/1900: Class 1 (30 dBm) EDGE 900: Class E2 (27 dBm) EDGE 1800/1900: Class E2 (26 dBm)

Table 15: Technical parameters of the module

5.4 Technical Parameters of the processor

32b ARM microprocessor	
Memory	512 Mb DDR SDRAM 128 Mb FLASH 1 Mb MRAM
Interface	Serial interface RS232 Ethernet interface 10/100 Mbit/s USB 2.0 interface

Table 16: Technical Parameters of the processor

5.5 Technical parameters of the GPS

GPS specifications	
Antenna	Impedance: 50 Ω active (3.3 V, 100 mA max.)
Protocols	NMEA 0183 v3.0, Json
Frequency	1575.42MHz
Sensitivity	Tracking: -161 dBm Acquisition (Assisted): -158 dBm Acquisition (Standalone): -145 dBm
Acquisition time	Hot start: 1 s Warm start: 29 s Cold start: 32 s
Accuracy	Velocity: <0.2 m/s

Table 17: Technical parameters of the GPS

5.6 Technical parameters of the I/O port

5.6.1 Characteristics of inputs

logical 0 / 1	Voltage	Current
log. 0 max	3 V	0.4 mA
log. 1 min	5 V	0.7 mA
log. 1 type	12 V	2 mA
log. 1 max	60 V	7 mA

Table 18: Characteristics of the inputs

5.6.2 Binary output parameters

- 60 V DC / 300 mA

5.6.3 PoE PD Technical Parameters – PSE Requirements

The following table contains the recommended requirements for the PoE Power Source Equipment (PSE), with which you supply power to the router using PoE. You can also use a passive PoE injector that meets these parameters.

Parameters	
Input voltage range	42.5 V DC to 57 V DC
Power available	Class 4, approximately 21 W
Maximum current	600 mA
Supported cabling	Category 5, up to 12.5 Ohm

Table 19: PoE PD parameters

5.7 Other technical parameters

Other technical parameters	
CPU power	2 DMIPS per MHz
Flash memory	256 MB
RAM	512 MB
M-RAM	128 kB

Table 20: Other technical parameters

6 Recommended literature

The “Configuration” user manual, Application Notes, and documentation of several OWL user modules can be found as PDF files for downloading on the Internet at:
https://www.doc.hirschmann.com

7 Possible problems

7.1 Solutions

Some network cards are able to be set in a situation, when it is not possible to connect directly to the router. Follow the steps below to solve this problem:

- manually select the 10 Mbit/s communication rate for the network card
- connect the computer to the router through a switch
- start the computer only after the router has completed its boot process

8 FAQ

- When I have NAT enabled, I can't access the equipment from the internet, which is connected to the router.
  - Configure the gateway in the device with the IP address of the router.
- The router resets itself and the Ethernet connection fails.
  - Connect an antenna to the router. Keep the antenna as far as possible away from the power supply.
- I cannot get on the web server at NAT.
  - The remote http access of the router has to be disabled, default server address has to be your web server and the gateway of the web server has to be the IP of router.
- Mobile WAN connection fails. (DAT LED off)
  - Check the signal power. If the signal power is weak, then use a better antenna. If the neighboring cells have a similar signal strength, then use a directional antenna. For proper operation, the signal levels have to be in the range from -50 dBm through -90 dBm.
  - Configure the router to ping the neighbors. The router verifies the connection using the ping function. When the ping fails, the router attempts to re-establish the connection.
- The router can not establish the Mobile WAN connection. (DAT LED off)
  - Recheck GPRS settings – APN, name, password and IP address.
  - Try to enter the PIN – verification if the SIM card has the PIN code set.
  - In private APN, disable the DNS server.
  - Enable the system log and observe where the router detected errors.
- Connection fails on Ethernet or connection not established.
  - It is possible to disable the auto negotiation and set a rate and duplex manually on the Ethernet interface of the router.
- DynDNS is not functioning.
  - In a private APN, the DynDNS function is unavailable.
  - If the same IP address is recorded in your canonic name as a dynamically assign address, it means that the operator is using NAT or firewall.
  - To verify NAT, ping the static server address.
  - Verify Firewall accessing remotely to the GUI interface of the router.
  - The operator does not give out the address of DNS servers and without the address of the DNS servers, it is impossible to connect to the dyndns.org server. The router displays the following messages in the log system:
  - DynDNS daemon started
  - Error resolving hostname: no such file or directory
  - Connect to DynDNS server failed

- FTP does not function.
  - Router does not support the active FTP mode, supports the passive mode only.
- L2TP or IPSec is not established.
  - Verify the reason in the log system.
- I switched the router to the off line mode using an SMS message, but the router is in the online mode after restart.
  - The control SMS message does not change the router configuration. For example, if the router is changed to the off line mode using an SMS message, then the router remains in this mode until the next restart. This behavior is the same for every control SMS message.
- RS-232 is not functioning.
  - Verify the RS-232 communication settings. To verify the settings, open the appropriate expansion port dialog in "Device Configuration> Expansion Port", and verify the settings.

9 CE marking

Hirschmann hereby declares that the labeled devices comply with the regulations contained in the following European directives:

2011/65/EU and 2015/863/EU (RoHS)

Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

2014/53/EU (RED)

Directive of the European Parliament and of the council on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment.

This product may be operated in all EU (European Union) countries.

In accordance with the above-named EU directives, the EU declaration of conformity will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

The product can be used in industrial areas only.

Warning! This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

Note: The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

10 E marking

The labeled devices comply with the regulations contained in the following European directive(s):
Regulation No. 10 of the Economic Commission for Europe of the United Nations (UN/ECE): **Devices with an approval are labeled with the E type approval mark.**

A Further support

Technical questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You find the addresses of our partners on the Internet at http://www.hirschmann.com.

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at https://hirschmann-support.belden.com.

This site also includes a free of charge knowledge base and a software download section.

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