![webdyn logo - flexitron group]

EasyTunnel

Hardware User Guide

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General Notes

Product is deemed accepted by recipient and is provided without interface to recipient's products. The documentation and/or product are provided for testing, evaluation, integration and information purposes. The documentation and/or product are provided on an "as is" basis only and may contain deficiencies or inadequacies. The documentation and/or product are provided without warranty of any kind, express or implied. To the maximum extent permitted by applicable law, Webdyn further disclaims all warranties; including without limitation any implied warranties of merchantability, completeness, fitness for a particular purpose and non-infringement of third-party rights. The entire risk arising out of the use or performance of the product and documentation remains with recipient. This product is not intended for use in life support appliances, devices or systems where a malfunction of the product can reasonably be expected to result in personal injury. Applications incorporating the described product must be designed to be in accordance with the technical specifications provided in these guidelines. Failure to comply with any of the required procedures can result in malfunctions or serious discrepancies in results.

Furthermore, all safety instructions regarding the use of mobile technical systems, including GSM products, which also apply to cellular phones, must be followed. Webdyn or its suppliers shall, regardless of any legal theory upon which the claim is based, not be liable for any consequential, incidental, direct, indirect, punitive or other damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information or data, or other pecuniary loss) arising out the use of or inability to use the documentation and/or product, even if Webdyn has been advised of the possibility of such damages. The foregoing limitations of liability shall not apply in case of mandatory liability, e.g. under the Spanish Product Liability Act, in case of intent, gross negligence, injury of life, body or health, or breach of a condition which goes to the root of the contract. However, claims for damages arising from a breach of a condition, which goes to the root of the contract, shall be limited to the foreseeable damage, which is intrinsic to the contract, unless caused by intent or gross negligence or based on liability for injury of life, body or health. The above provision does not imply a change on the burden of proof to the detriment of the recipient. Subject to change without notice at any time. The interpretation of this general note shall be governed and construed according to Spanish law without reference to any other substantive law.

Important Information

This technical description contains important information for the startup and use of the Webdyn EasyTunnel gateway. Read it carefully before you start working with the EasyTunnel device. The warranty will be void should damage occur due to non-compliance with these instructions for use. We cannot accept any responsibility for consequential loss.

Revision Information

Revision	Date	Author	Changes
1.0	2022/10	FJGG	First release

Warranty

The information contained within this user guide, including but not limited to any product specification, is subject to change without notice. Webdyn provides no warranty with regard to this user guide or any other information contained herein and hereby expressly disclaims any implied warranties of merchantability or fitness for any particular purpose with regard to any of the foregoing. Webdyn assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the uses guide. In no event shall Webdyn be liable for any incidental, consequential, special, or exemplary damages, whether based on tort, contract or otherwise, arising out of or in connection with this user guide or any other information contained herein or the use thereof

Rohs Statement

EasyTunnel gateway is compliant with the 2002/95/EC (RoHS 1) and 2011/65/EC (RoHS 2) directives of the European Parliament and of the Council of 27 January 2003 (and revised on 8 June 2011) on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

Disposal of old electrical and electronic equipment

This symbol, applied on our products and/or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.
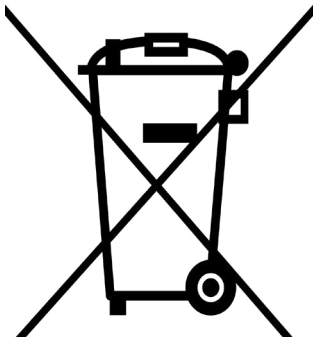
# Precautions

1.1 General Precautions
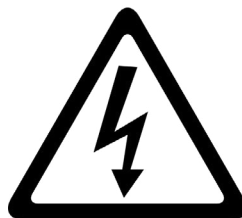
PLEASE READ THESE GENERAL PRECAUTIONS AND KEEP A COPY OF THEM

- EasyTunnel as a standalone item is designed for indoor use only. For outdoor use it must be integrated into a weatherproof enclosure. Do not exceed the environmental and electrical limits as specified in Technical Data.

- Avoid exposing the device to lighted cigarettes, naked flames or to extreme hot or cold temperatures.

- Never try to dismantle the device yourself. There are no components inside the modem that can be serviced by the user. If you attempt to dismantle the device, you may invalidate the warranty.

- The EasyTunnel terminal must not be neither installed nor located in areas where the surface temperature of the metallic case could exceed 85°C.

- Check that voltage and power available at installation is within range specified for modem. It can be found on this guide and labelled on gateway.

- Do not install any gateway that is obviously damaged or suspected of having been damaged.

- In order to provide strain relief and to avoid transmitting excessive vibration to the device during installation, all cables connected to EasyTunnel must be secured or clamped immediately adjacent to the device's connectors.

- To protect the power supply cables, and in order to comply with the fire safety requirements, when the unit is powered from a battery or a high current supply, a fast 1.25A fuse should be connected in line with the positive supply.

- No compatible component or product must not be connected to EasyTunnel.

- Note! EasyTunnel distributors and sales offices may refuse warranty claims where evidence of product misuse is found.

1.2 Safety requirements and protection regulations
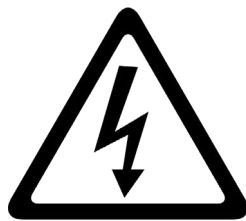
PLEASE READ THESE SAFETY INSTRUCTIONS AND KEEP A COPY OF THEM

- EasyTunnel, for any type of operation, is only accessible for instructed and skilled installers, testers and technical engineers.

- Before any type of handling of EasyTunnel, it must be ensured that it has been de-energized to allow for electrical work to be carried out and it cannot be inadvertently re-energized.

- Always ensure that use of EasyTunnel is permitted. The modem may present a hazard if used in proximity to personal electronic medical devices. As a rule, the modem must not be used in hospitals, airports or planes.

- This equipment is not suitable for use in locations where children are likely to be present.

- Never use the device at a gas station, refuelling point, blasting area or in any other environment where explosives may be present.

- Operating the device close to other electronic devices, such as antennas, television sets, and radios may cause electromagnetic interference.

- This product is intended to be used with the antenna or other radiating element at least 20cm away from any part of the human body. In applications where this rule cannot be applied, the application designer is responsible for providing the SAR measurement test report and declaration.

- You are responsible for observing your country's safety standards, and where applicable, the relevant wiring rules.

1.3 SIM Card Precautions

Before handling the SIM card in your application, ensure that you are not charged with static electricity. Use proper precautions to avoid electrostatic discharges.

- When the SIM card hatch is opened, the SIM card connectors lie exposed under the SIM card holder.

- Caution! Do not touch these connectors! If you do, you may release an electrical discharge that could damage the modem or the SIM card.

- When designing your application, the SIM card's accessibility should be taken into account. We always recommend that you have the SIM card protected by a PIN code. This will ensure that the SIM card cannot be used by an unauthorized person.

1.4 Antenna Precautions

If the antenna is to be mounted outside the device, consider the risk of lightning. Follow the instructions provided by the antenna manufacturer. Never connect more than one modem to a single antenna. The modem can be damaged by radio frequency energy from the transmitter of another modem.

- Like any mobile station, the antenna of the gateway emits radio frequency energy. To avoid EMI (electromagnetic interference), you must determine whether the application itself, or equipment in the application's proximity, needs further protection against radio emission and the disturbances it might cause. Protection is secured either by shielding the surrounding electronics or by moving the antenna away from the electronics and the external signal cable.

- The gateway and antenna may be damaged if either of them comes into contact with ground potentials other than the one in your application. Beware: ground potentials are not always what they appear to be.

1.5 Radio Frequency (RF) Exposure and SAR

Your wireless device is a low-power radio transmitter and receiver (transceiver). When it is turned on, it emits low levels of radio frequency energy (also known as radio waves or radio frequency fields).

Governments around the world have adopted comprehensive international safety guidelines, developed by scientific organizations such as ICNIRP (International Commission on Non-Ionizing Radiation Protection) and IEEE (The Institute of Electrical and Electronics Engineers Inc.), through periodic and thorough evaluation of scientific studies. These guidelines establish permitted levels of radio wave exposure for the general population. The levels include a safety margin designed to assure the safety of all persons, regardless of age and health, and to account for any variations in measurements. Specific Absorption Rate (SAR) is the unit of measurement for the amount of radio frequency energy absorbed by the body when using a transceiver. The SAR value is determined at the highest certified power level in laboratory conditions, but the actual SAR level of the transceiver while operating can be well below this value. This is because the transceiver is designed to use the minimum power required to reach the network.

EasyTunnel device has been approved for applications where the antenna is located more than 20cm from the body of the user. In all other configurations the user is responsible for meeting the local SAR regulations.

Users of the EasyTunnel gateway are responsible for ensuring that they meet the SAR regulatory requirements of the countries in which they intend to operate the device and that their documentation

contains the relevant SAR declaration, certification information and user guidance as appropriate.

1.6 SAR information

Wireless Modules models: EC21 is marketed without a defined antenna.

The Maximum Antenna Gain when using indoor antennas depends on the distance from the antenna to any nearby persons when in normal operation. It should not exceed the values shown on the table below.

According to the limit in 47 CFR 1.1310, we get the value of the maximum antenna gain as follows:

The maximum measured power output in the 900 MHz band is 1995.26 mW (33 dBm).

The maximum permissible exposure defined by 47 CFR 1.1310 is f/1500 = 0.6 mW/cm².

The maximum measured power output in the 1800 MHz band is 1000 mW (30 dBm).

The maximum permissible exposure is defined as 47 CFR 1.1310 with 1 mW/cm².

According to the limit in 47 CFR 1.1310, we get the value of the maximum antenna gain as follows:

$S = P*G/4\pi R^2; G = 4\pi R^2 (S / P)$

S = 0.6 mW/cm² or 1 mW/cm²

P = 1995.26 mW or 1000 mW

R = 20 cm or 50cm

π = 3.1416

G(dBi)=10*log(G)

Solving for G; the maximum antenna gain is:

BAND	P (mW/ dBm)	S (mW/ cm²)	DISTANCE	MAX.GAIN (dBi)
900MHz	1995.26 / 33	0.6	20cm	1.79
900MHz	1995.26 / 33	0.6	50cm	9.75
1800MHz	1000 / 30	1	20cm	4.79
1800MHz	1000 / 30	1	50cm	14.97

1.7 Personal Medical Devices

Wireless devices may affect the operation of cardiac pacemakers, hearing aids and certain other implanted equipment. If a minimum distance of 15 cm (6 inches) is maintained between the EasyTunnel device radiating antenna and a pacemaker, the risk of interference is limited. If the user's application is likely to be situated in the vicinity of personnel, a suitable warning should be contained in the equipment manual to this effect.

1.8 SAR Requirements Specific to Portable Mobiles

Mobile phones, PDAs or other portable transmitters and receivers incorporating a GSM module must be in accordance with the guidelines for human exposure to radio frequency energy. This requires the Specific Absorption Rate (SAR) of portable EC21 based applications to be evaluated and approved for compliance with national and/or international regulations.

Since the SAR value varies significantly with the individual product design, manufacturers are advised to submit their product for approval if designed for portable use. For European markets the relevant directives are mentioned below. It is the responsibility of the manufacturer of the final product to verify, whether further standards recommendations or directives are in force outside these areas.

Products intended for sale in US markets

EN 50360: Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300MHz – 3GHz)

Please note that SAR requirements are specific only for portable devices and not for mobile devices as defined below:

- Portable device: A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20cm to the user's body.

- Mobile device: A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20cm is normally maintained between the transmitter's radiating structure(s) and the user's body or that of nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and cannot be easily moved to another location

Technical Description

2.1 Overview

The EasyTunnel is an innovate industrial gateway that comprises a set of features to provide remote wireless connectivity on customer facilities. It is equipped with a rich set of interfaces and Led indicators to show operating status of the modem.

Modem includes the following features:

- 4G LTE Cat 1 module.

- Antenna connection on SMA Female type connector.

- Double Mini SIM card socket.

- RS232 on RJ45 connector.

- RS485 on Terminal block connector.

- Ethernet configuration port.

- Digital input and output.

- RTC with Super-Capacitor based backup energy.

- Reset button.

- 3.5mm pitch screwed terminal blocks for power supply input connection.

- Status Leds to show power, coverage, WAN connection and errors.

EasyTunnel has an industrial temperature range (-40/+85ºC) and is built in a metal casing that provides high impact resistance. It has a detachable accessory for DIN rail mounting and is equipped with two supports with removable tray for Mini Sim cards, configuration Ethernet, digital input and output and RS485 and RS232 interfaces to minimize the need for further hardware development. This device can be used as a powerful and flexible device that can be integrated into a wide range of applications that require 4G technology, in addition, it includes a RTC in cases where real time is needed.

A full list of antennas, cables and accessory supplies are available

Mechanical and environmental specifications	
Enclosure fixing	DIN rail mounting compliant
Operating temperature (*)	-40ºC to +85ºC
Storage temperature	-40ºC to +85ºC
Dimensions with DIN Rail plate	113.2 x 30.5 x 90.2 mm
Weight	195g
(*) LTE module extended operation	

2.2 Operating Range

Electrical specifications	Min.	Typ.	Max.
Power supply voltage	7VDC	12VDC	30VDC
Current consumption (12VDC)			175mA (Average value)
Power consumption			<3W
Digital input voltage	0V		28VDC
"Low" digital input voltage	0V		0.8V
"High" digital input voltage	3V		28VDC
Factory Default input voltage	0V		30VDC
Digital Output voltage	0V		VIN-0.4V
"Low" digital output voltage	0V		
"High" digital output voltage			30VDC
RS485 baudrate			115200 bps
RS485 D+, D- common mode	-7V		12V
RS485 short circuit current			TBD
RS485 ESD protection			±12kV (HBM)
RS232 baudrate			115200 bps
RS232 ESD protection			±12kV (HBM)
SIM card slot ESD protection			±8kV (Contact)
LTE module	Detailed parameters on chapter 2.6		
LTE Main antenna	50 ohms		
LTE Diversity antenna	50 ohms		
Real Time Clock backup: Internal Supercapacitor			
Digital Output Current			100mA
Max. power transmitted			
-GSM900 (<33dBm)			
-DCSD1800 (<30dBm)			
-UMTS Band I/VIII (<24dBm)			
-LTE Band 1/3/7/8/20 (<23dBm)			

2.3 Ordering Information

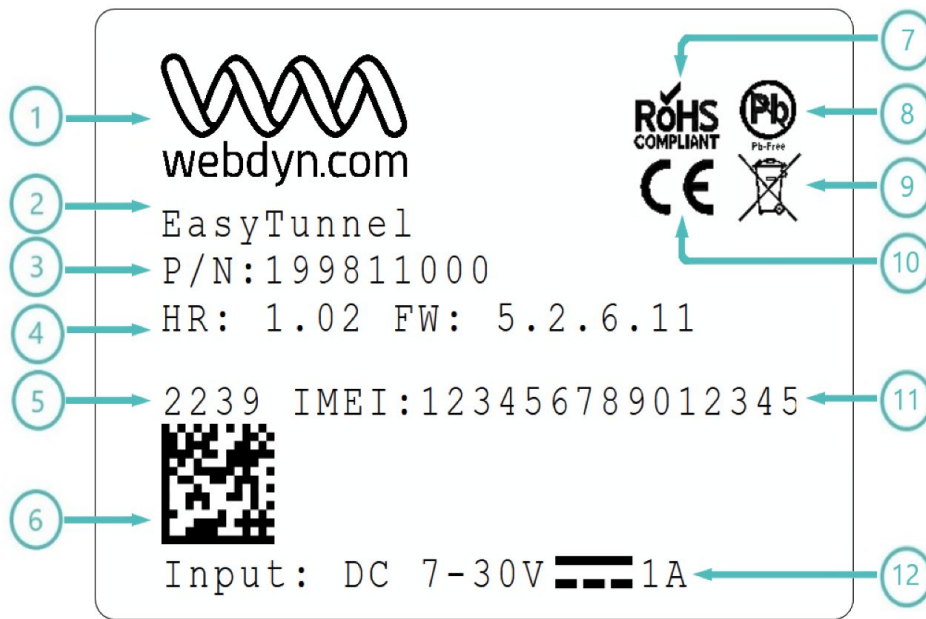| Model name	Part Number
EasyTunnel	000199811000
EasyTunnel AUS	000199811002

2.4 Packaging

EasyTunnel gateway is packaged without any additional accessories and through an open window on the box it allows the product label to be read when closed.
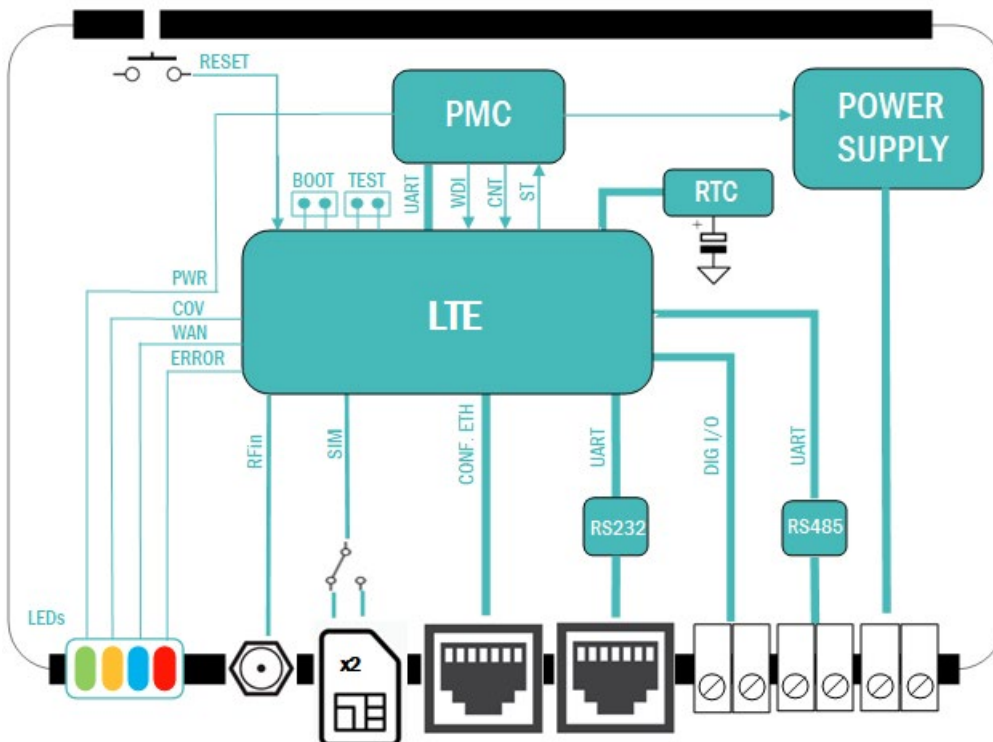
2.5 Product Label

The label fixed to the top of a EasyTunnel device comprises the following information:

1. Webdyn logo

2. Product name (model)

3. Part number/ordering code

4. Hardware and firmware versions

5. Manufacturing Year/week (YYMM)

LTE interface covers EMEA region and is CE certified with following frequency bands and data rates:

NETWORK	BANDS	TECHNOLOGY	MAX. DATA RATE	
			DL	UL
4G	B1/B3/B5/B7/B8/B20	LTE-FDD	10 Mbps	5 Mbps
3G	B1/B5/B8	DC-HSPA+	42 Mbps	5.76 Mbps
		WCDMA	384 kbps	384 kbps
2G	B3/B8	EDGE	296 kbps	236.8 kbps
		GPRS	107 kbps	85.6 kbps

And for Australian region:

NETWORK	BANDS	TECHNOLOGY	MAX. DATA RATE	
			DL	UL
4G	B1/B3/B5/B7/B8/B28	LTE-FDD	10 Mbps	5 Mbps
4G	B40	LTE-TDD	8.96 Mbps	3.1 Mbps
3G	B1/B5/B8	DC-HSPA+	42 Mbps	5.76 Mbps
		WCDMA	384 kbps	384 kbps

2.7 External Interfaces on Front and Rear Panel

Antenna

SIMs

LEDs

Configuration Port

RS232 Port

Terminal Block

Reset
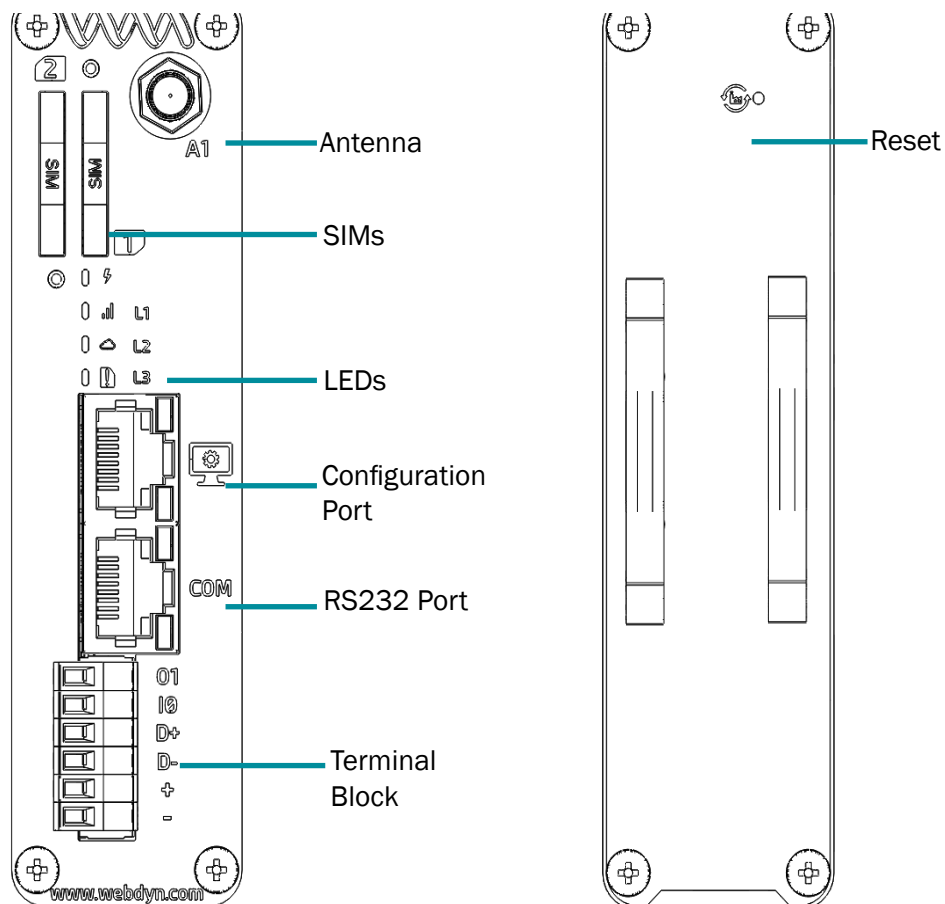
- Antenna (A1) – SMA-F connector for 4G main antenna.

- Double SIMs – x2 SIM sockets for Mini-SIM form factor card with tray.

- LEDs – Four leds for operation status.

- Ethernet configuration port (RJ45)

- COM – Communication Port RS232 (RJ45)

- TERMINAL BLOCK – 6-way plug-in 3.5mm pitch terminal block for:

- Power supply input

- RS485 interface

- 1x Digital Input

- 1x Digital Output

- Reset push button (rear panel)

2.8 Terminal Block Connection

EasyTunnel device has a terminal block type connector for fastening to front panel for power supply input, RS485 port and inputs connection.
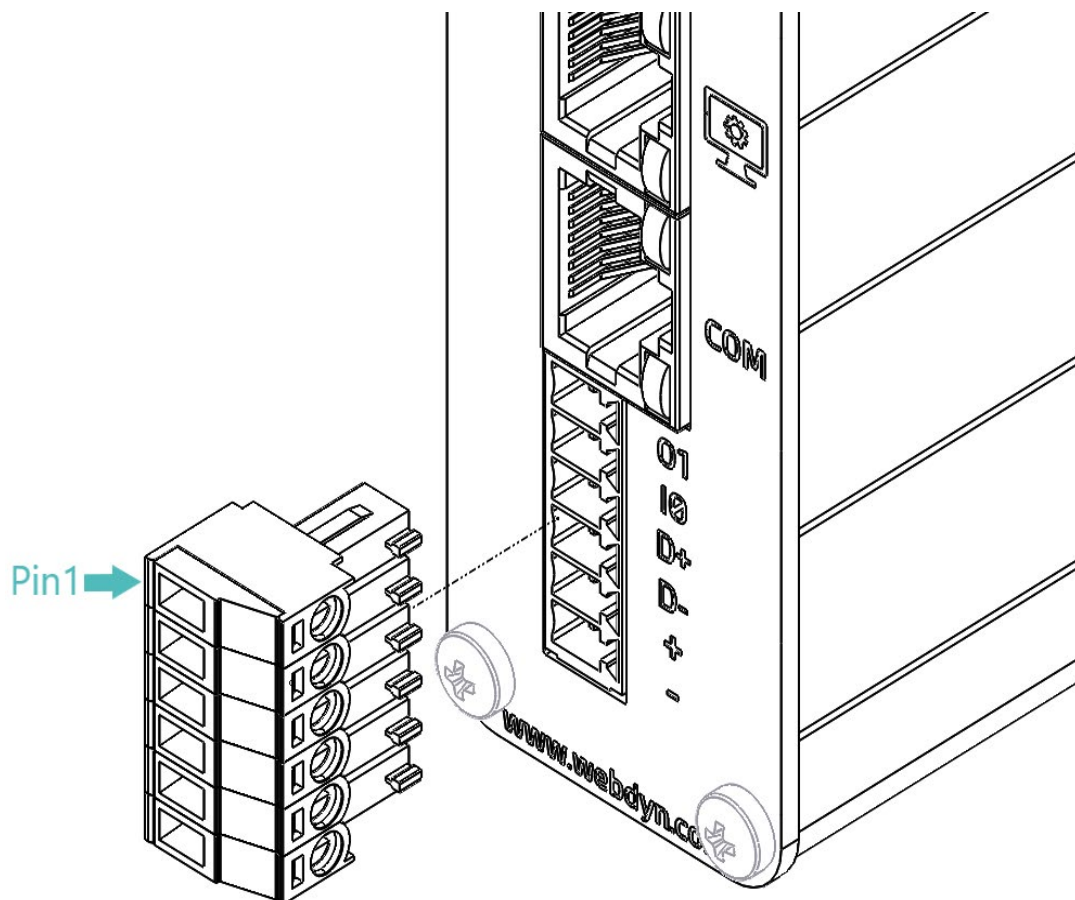
PIN	SIGNAL	TYPE	FUNCTION
1	O1	DO	Digital output #1
2	I0	DI	Digital input #0
3	D+	IO	RS485 positive line
4	D-	IO	RS485 negative line
5	+	PWR	Positive power supply input
6	-	PWR	Negative power supply input

Power supply input is externally connected on terminal block, positive signal at pin 5 and negative signal at pin 6. Operating range values are specified at (table 2.2).

EasyTunnel gateway is equipped with a RS485 half-duplex interface with external connection on terminal block type connector. D+ signal has to be connected on pin 3 and D- signal on pin 4.

Formerly, TIA/EIA-RS485 specification identifies A signal as equivalent to D- and B signal as equivalent to D+, nonetheless, some semiconductor manufacturers adopted the opposite relationship, so it is recommended to follow D+ and D- signal identification.

RS485 interface features ESD protection with internal network termination resistor and fail-safe polarization network.

A general-purpose digital input is included within EasyTunnel gateway, available on the terminal block type connector on pin 2.

To activate any input externally, it must be shorted to V- input on pin 6 of terminal block so it is recommended to use external dry-contact type devices, as relays or open-drain/collector transistors.

Finally, a general-purpose digital output is included within EasyTunnel gateway in this terminal block. Operating range values are specified at (table 2.2).

2.9 Antenna Connection

EasyTunnel device provides SMA female connector to attach external antenna. This connector allows radio frequency (RF) transmission signals between the modem and an external customer-supplied antenna. EasyTunnel is fitted with a 50Ω SMA female coaxial connector.

These external antennas must be matched properly to achieve the best performance regarding radiated power, DC-power consumption, modulation accuracy and harmonic suppression.

SMA INTERFACE SPECIFICATIONS	
Impedance	50 Ω
Type	SMA Female
ESD Protection	15 KV air / 8 KV contact
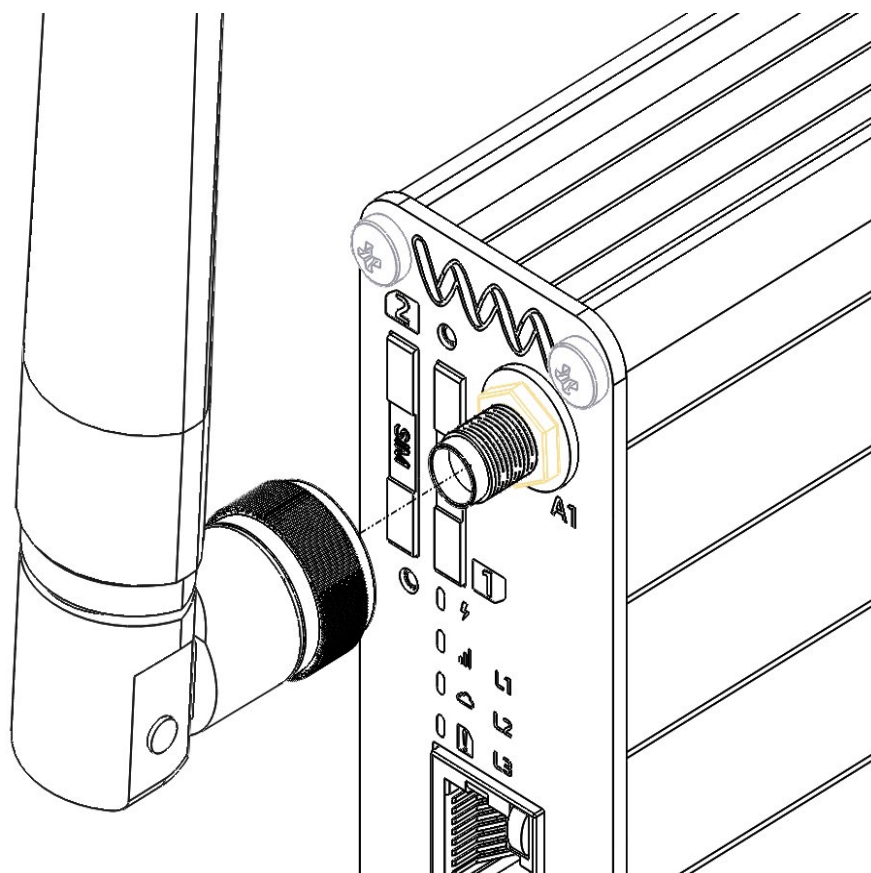
Consider the following requirements:

- The antenna must be designed for one of the frequency bands in use; please ask your network provider for more information.

- Frequency according to band of chosen 4G module

- The impedance of the antenna and antenna cable must be 50Ω

- Antenna connector should be SMA-M type

- Antenna power should be at least 500mW as maximum power is 316.23mW.

- Maximum Output RF load mismatch ruggedness at antenna is 10:1 VSWR

The antenna should be placed away from electronic devices and other antennas. The recommended minimum distance between adjacent antennas, operating in a similar radio frequency band, is at least 50cm. If the signal strength is weak, it is useful to face a directional antenna towards the closest radio base station. This can increase the strength of the signal received by the modem.

RF field strength varies with antenna type and distance. At 10cm from the antenna the field strength may be up to 70V/m and at 1m it will have reduced to 7V/m. In general, CE-marked products for residential / commercial areas and the light industry can withstand a minimum of 3V/m.

Possible communication disturbances include the following:

- Noise can be caused by electronic devices and radio transmitters

- Path-loss occurs as the strength of the received signal steadily decreases in proportion to the distance from the transmitter.

- Shadowing is a form of environmental attenuation of radio signals caused by hills, buildings, trees or even vehicles. This can be a particular problem inside buildings, especially if the walls are thick and reinforced.

- Multi-path fading is a sudden decrease or increase in the signal strength. This is the result of interference which is caused when direct and reflected signals reach the antenna simultaneously. Surfaces such as buildings, streets, vehicles, etc., can reflect signals.

- Hand-over occurs as you move from one cell to another in the GSM network. Your mobile application call is transferred from one cell to the next. Hand-over can briefly interfere with communication and may cause a delay, or at worst, disruption.

2.10 SIM Card Reader

EasyTunnel device is fitted with two Mini SIM card readers designed for 1.8V and 3V Mini SIM cards. It is the bar push type with tray and can be accessed through the front panel.
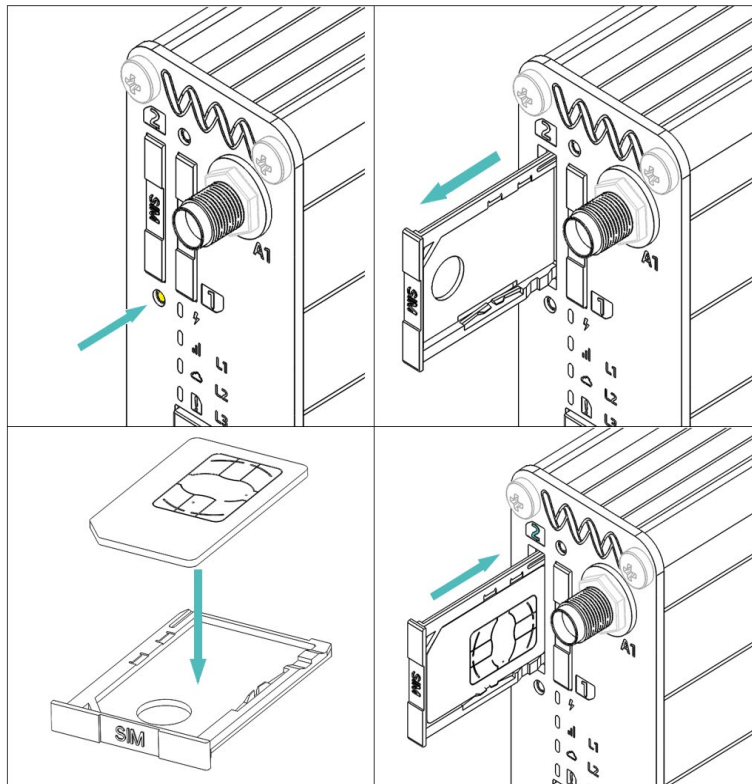
EasyTunnel presents the possibility of mounting two cards, one as a backup. In the front panel is identified SIM card priority with the numbers 1 and 2.

To insert SIM card, look at bellow picture for proper orientation.
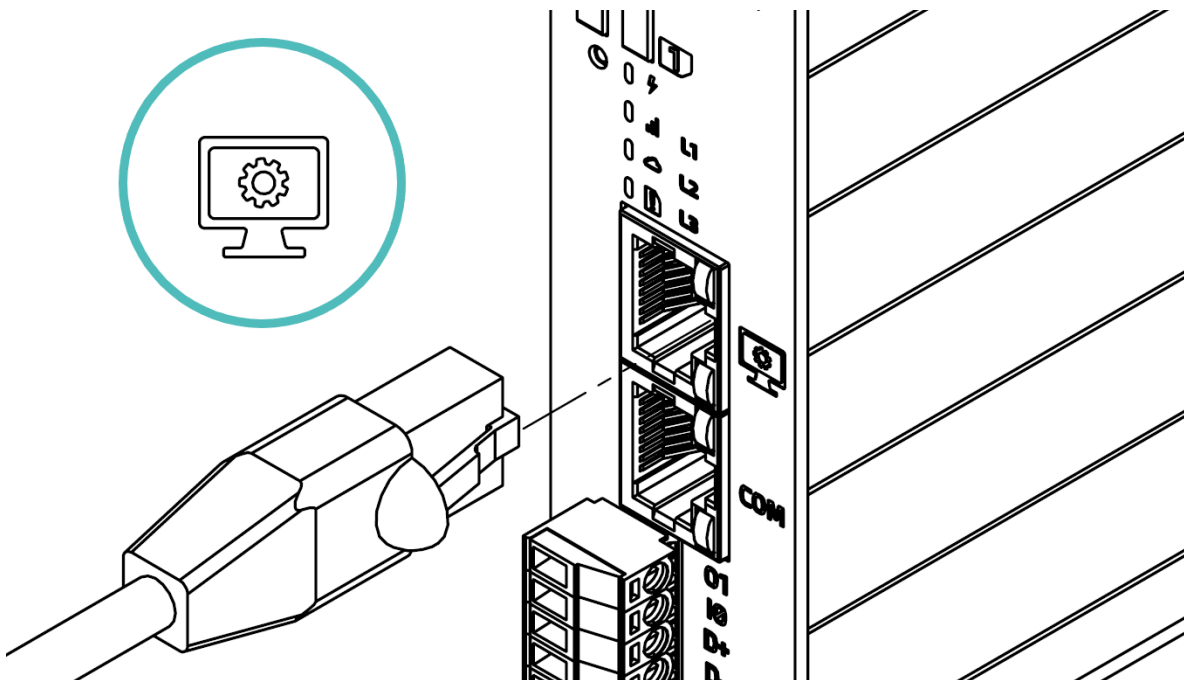
- Mini Sim 1
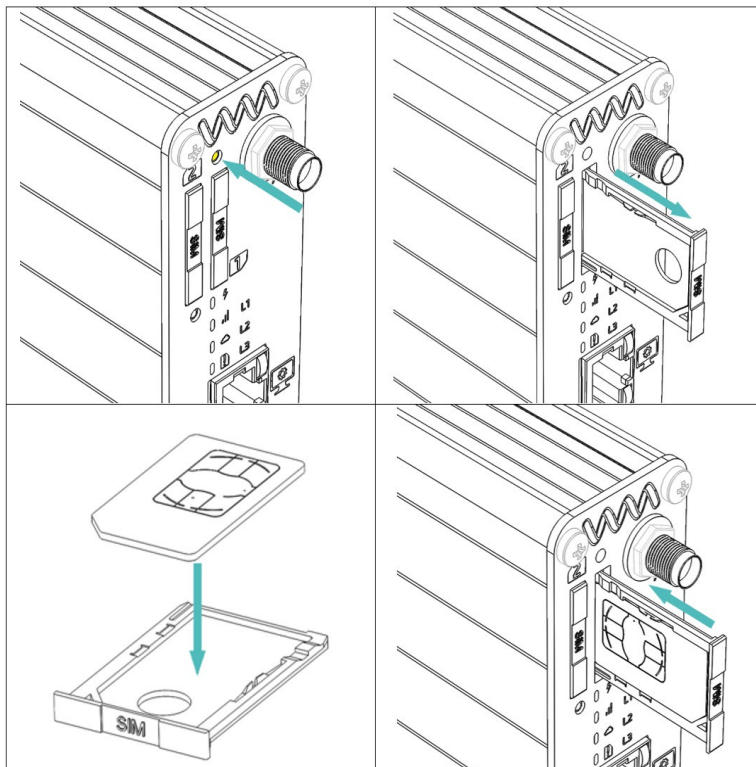
- Mini Sim 2

2.11 Ethernet Configuration Port

EasyTunnel gateway provides a basic router-like functionality with ethernet connector (RJ45) available on a RJ45 connector at the front panel with this symbol

Warning

Only a single EasyTunnel can be installed on the same LAN

By connecting EasyTunnel through an ethernet cable with our computer we will have access Titan Firmware with to the following console

Through which we can configure WAN, Titan scripts, Sims, RTC, digital input and output, etc.

See Titan software manual for more information

2.12 RS232 Connection

 EasyTunnel device have implemented RS232 interface in RJ45 (COM).

RS232 interface is implemented as a serial asynchronous transmitter and receiver conforming to ITU-T V.24 Interchange Circuits DCE. It is configured for 8 data bits, no parity and 1 stop bit and can be operated at fixed bit rates from 300bps to 460.8kbps.
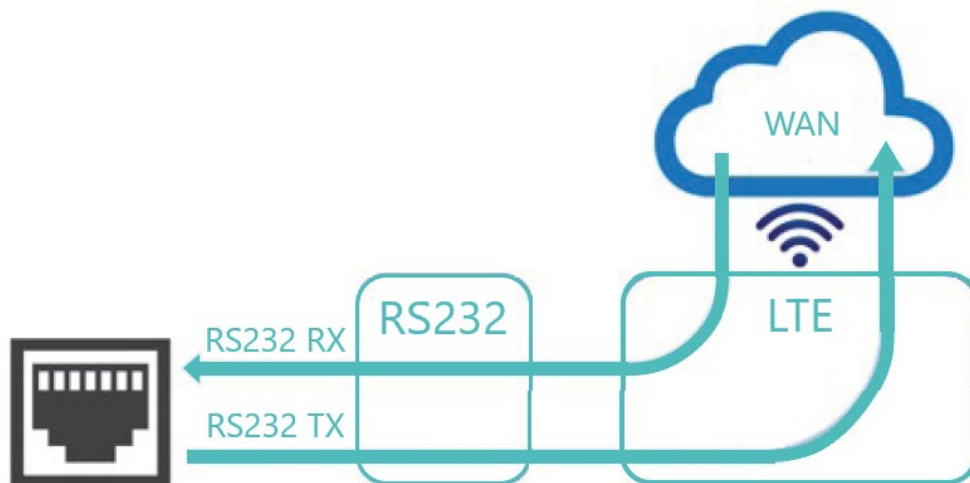
If RS232 cable required length is longer than 3m, it is recommended to use a shielded cable. No hardware related configuration action is needed to enable RS232 port communication.
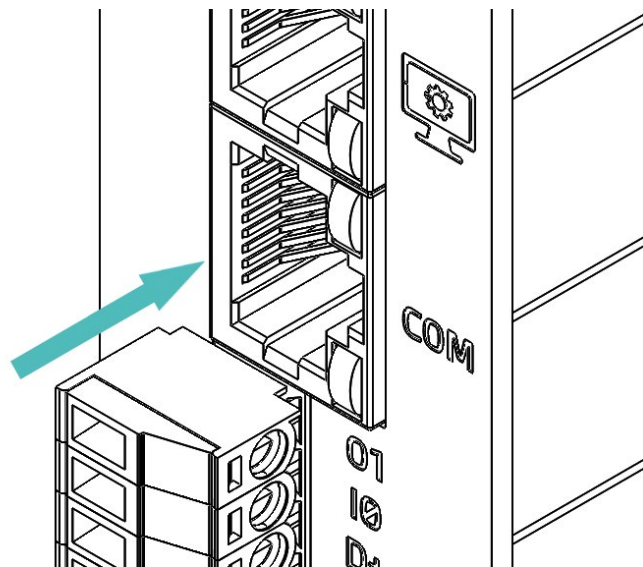
Terminal	RS232 DCE	Type	Decription
1	+Vdd	Pwr	Power in (*)
2	RS232 CTS	Out	Clear to send
3	RS232 Rx	Out	WAN received data is transmitted on this output
4	RS485 +	-	Non-Standard Version, only in optional version
5	RS232 RTS	In	Ready to send
6	GND	Pwr	Reference common signal
7	RS485 -	-	Non-Standard Version, only in optional version
8	RS232 Tx	In	Data received on this Input is transmitted to WAN

Caution

Be careful when connecting pin 1. This voltage is the same that power supply input (+) in terminal block.

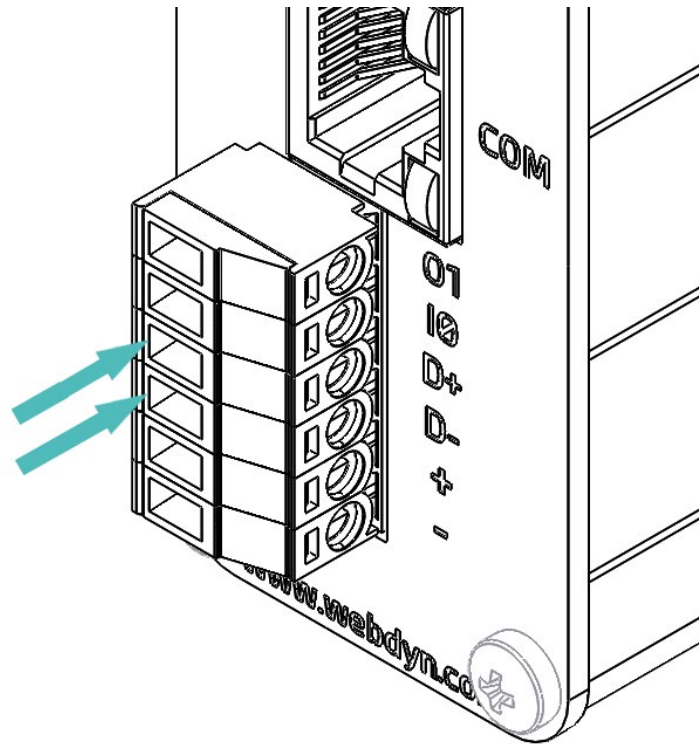| RS232 SPECIFICATIONS	
Baud Rate	Max. 115200 bps
ESD Protection	15 KV air / 15 KV contact
Cable length	Max. 1.5 m

2.13 RS485 Connection

EasyTunnel provides RS485 interface on terminal block connector D+ and D-.

This communication port is intended to be connected to external meter through an additional cable ended with proper type connector and signal distribution. Maximum length for this cable is 1.5m.

If RS485 cable required length is longer than 3m, it is recommended to use a shielded cable.

No hardware related configuration action is needed to enable RS485 port communication.


PIN	RS485	Type	Description
1	01	DO	Digital output
2	I0	DI	Digital input
3	D+	IO	RS485 positive line
4	D-	IO	RS485 negative line
5	+	PWR	Positive power supply input
6	-	PWR	Negative power supply input

RS485 SPECIFICATIONS	
Baud Rate	Max. 115200 bps
Termination	Internal Resistors on RS485 Fail-Safe Bias
ESD Protection	15 KV air / 15 KV contact
Cable length	Max. 1.5 m

2.14 Status LEDs

Four LEDs on front panel are included to inform about operation status of EasyTunnel gateway.
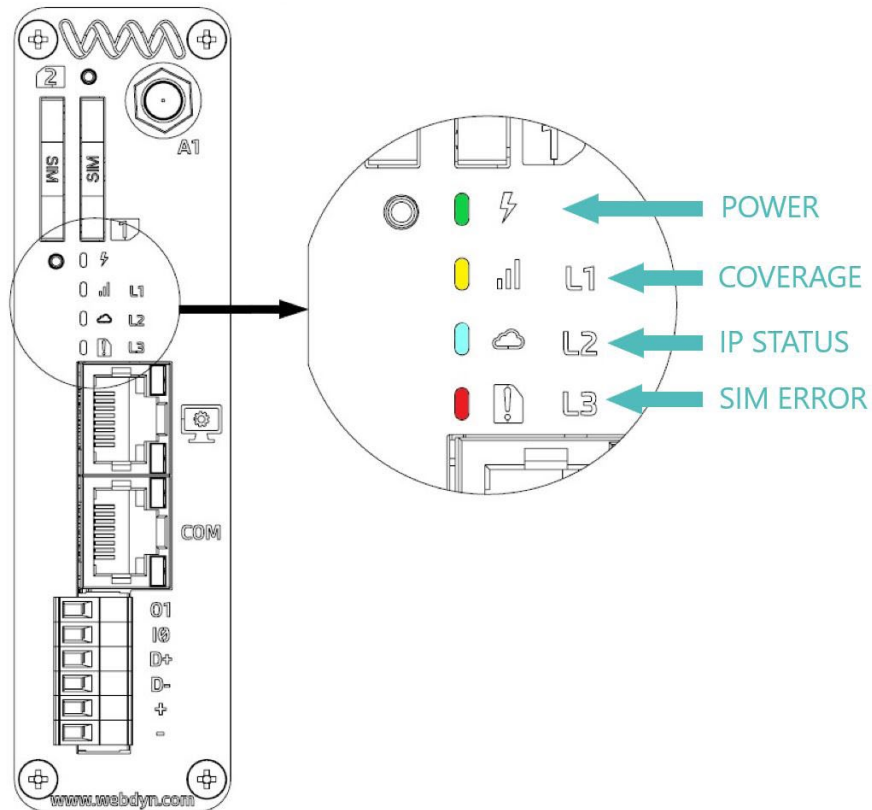
Following table shows relationship between operation status and LED operation.

Fast refers to fast blinking On-Off every 1 second.

Slow refers to slow blinking On-Off every 2 seconds.

- Power LED:

OPERATING STATES	STATE
Power Off	OFF
Power Off	ON
Boot Failure	Fast

- Coverage LED:

OPERATING STATES	STATE
Starting Router	3 blinks
Mini SIM detected and ready	Slow/Fast/ON
Mini SIM undetected or incorrect PIN	OFF
Not enough / critical coverage	Slow
Low Coverage	Fast
Good Coverage	ON

- IP Status LED:

OPERATING STATES	STATE
IP Not Assigned	OFF
IP Assigned	ON

- SIM Error LED:

| OPERATING STATES	STATE
Mini SIM OK	OFF
Mini SIM Error	ON

2.15 Real Time Clock (RTC)

EasyTunnel device integrates Real Time Clock for timestamping purposes.

RTC power backup is based on a supercapacitor to allow the system to keep it operating for a time when external power supply is removed.

2.16 Factory Default Reset

EasyTunnel parameters can be restored to factory default values with an external input push button in rear panel. This input is labelled on rear panel with this symbol:
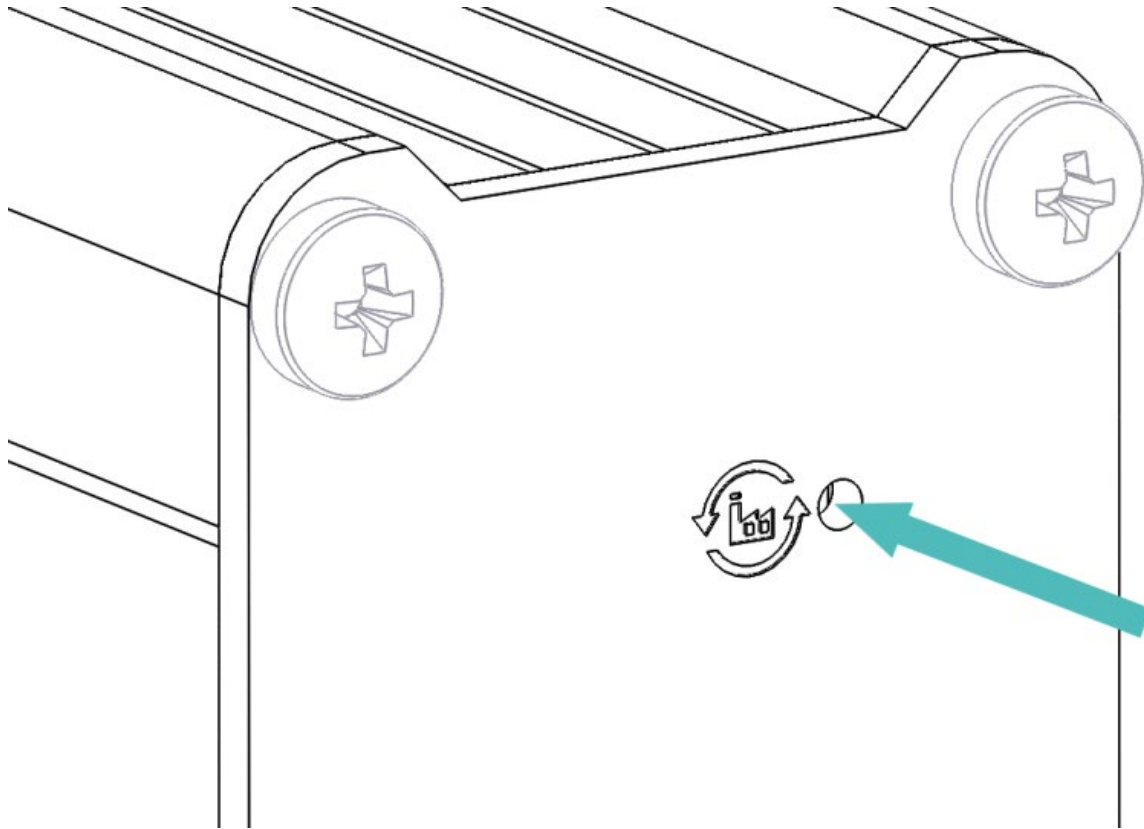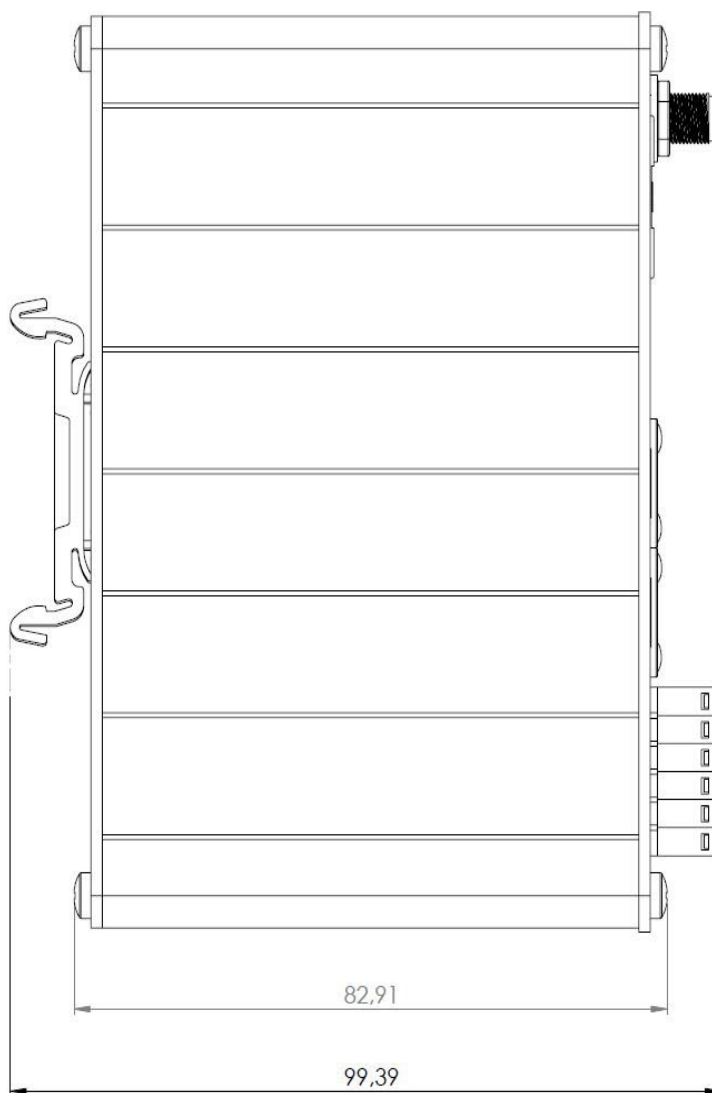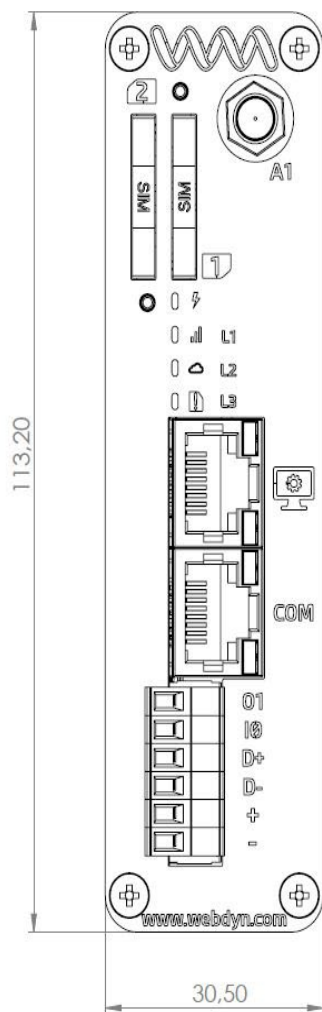

To proceed to restore parameters to factory default:

1. Power off the modem.

2. Hold on Reset button and power on the modem.

3. Wait for modem to restart and ready for operation to check default parameters. Coverage LED start to blink (yellow LED).

4. Release Reset button.

5. Power off the gateway.

6. Power on again.

Mechanical Description

3.1 Dimensions

Device Installation

This chapter gives you advices and helpful hints on how to install the EasyTunnel device from a hardware perspective.

There are several conditions which need to be taken into consideration when designing your application as they might affect the modem and its function.

Please, read carefully the complete hardware user guide as there are many details to be considered for installation.

4.1 Installation Location

EasyTunnel is intended to be installed indoor with environmental conditions as stated in the Operating range chapter.

Gateway is equipped with a DIN Rail holder on its rear-side plate lo let it be installed on a vertical flat surface, preferred into a cabinet.

Installation height referred to floor must guarantee proper visibility of status Leds and connection of wires, SIM card insertion and Antenna attachment.

4.2 RF Signal Strength

The device has to be placed in a way that ensures sufficient signal strength. To improve signal strength, the antenna can be moved to another position. Signal strength may depend on how close the gateway is to a radio base station. You must ensure that where you intend to use the modem is within the network coverage area. Degradation in signal strength can be the result of disturbance from another source, i.e., an electronic device in the immediate vicinity. More information about possible communication disturbances can be found in section Operation 3.5 (Possible communications disturbances).

Tip! Before installing the modem, use an ordinary mobile telephone to check a possible location for it. In determining the location for the modem and antenna, you should consider signal strength as well as cable length.

4.3 DIN Rail Mounting

To install device on the DIN Rail, position the top groove of the rear module installation adapter on the top edge of the DIN rail. Push on the arrow direction on the adapter until the bottom groove of the installation adapter fits under the DIN rail.
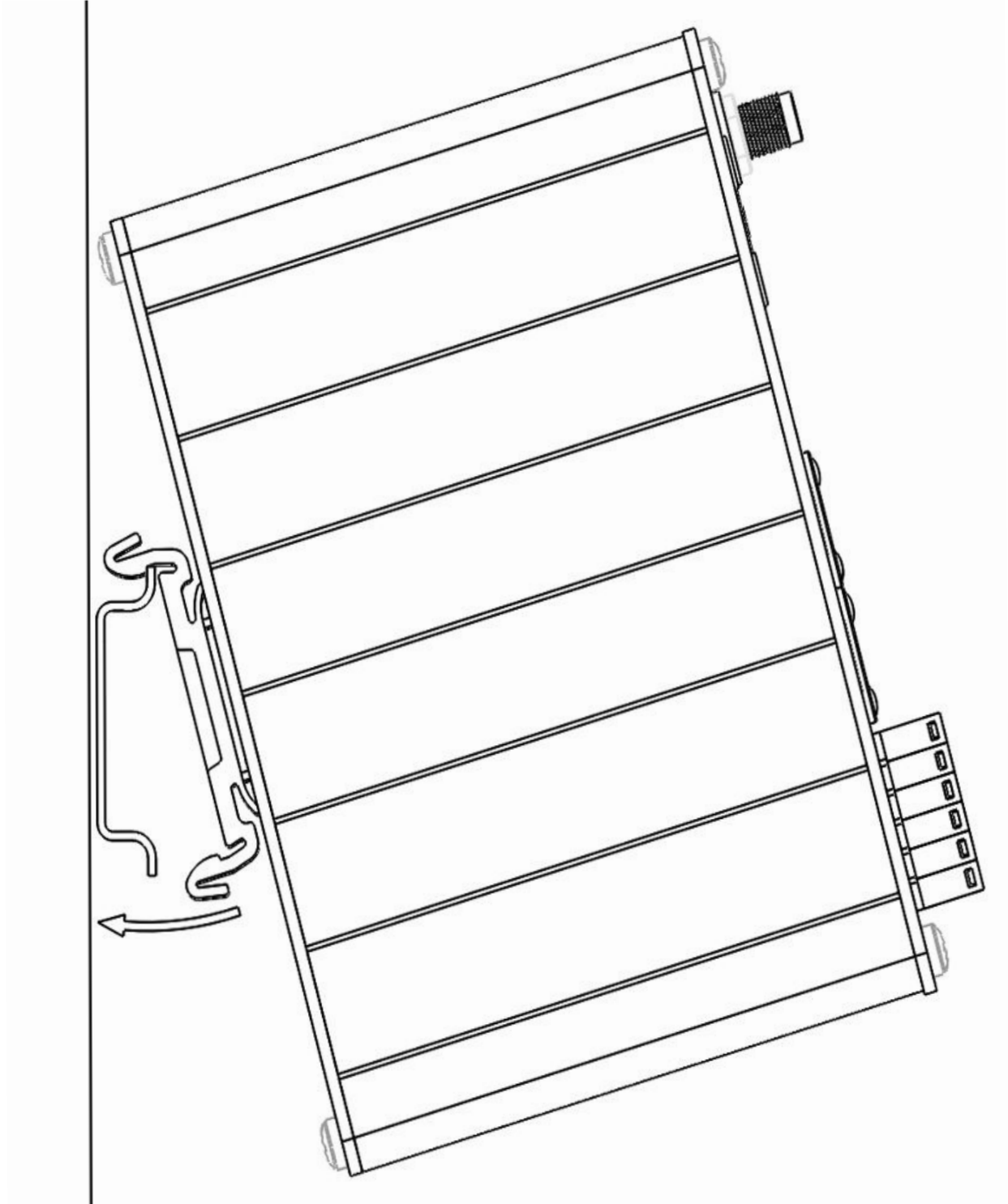
4.4 Connections of EasyTunnel

The user is responsible for the final integrated system. If not correctly designed or installed, external components may cause radiation limits to be exceeded. For instance, improperly made connections or improperly installed antennas can disturb the network and lead to malfunctions in the modem.

For power supply connection, use a high-quality power supply cable with low resistance. This ensures that the voltages at the connector pins are within the allowed range, even during the maximum peak current.

It is encouraged to perform installation with no external power applied, unplug the terminal block from the gateway and screw all required wirings. Plug again terminal block, fixing both fastening screws, and finally apply external power to the system.

When the unit is powered from a battery or a high current supply, connect a fast 1.25A fuse in line with the positive supply. This protects the power cabling and gateway.

Bellow figure shows connection for all available interfaces, nonetheless, only those required for the end application are to be connected
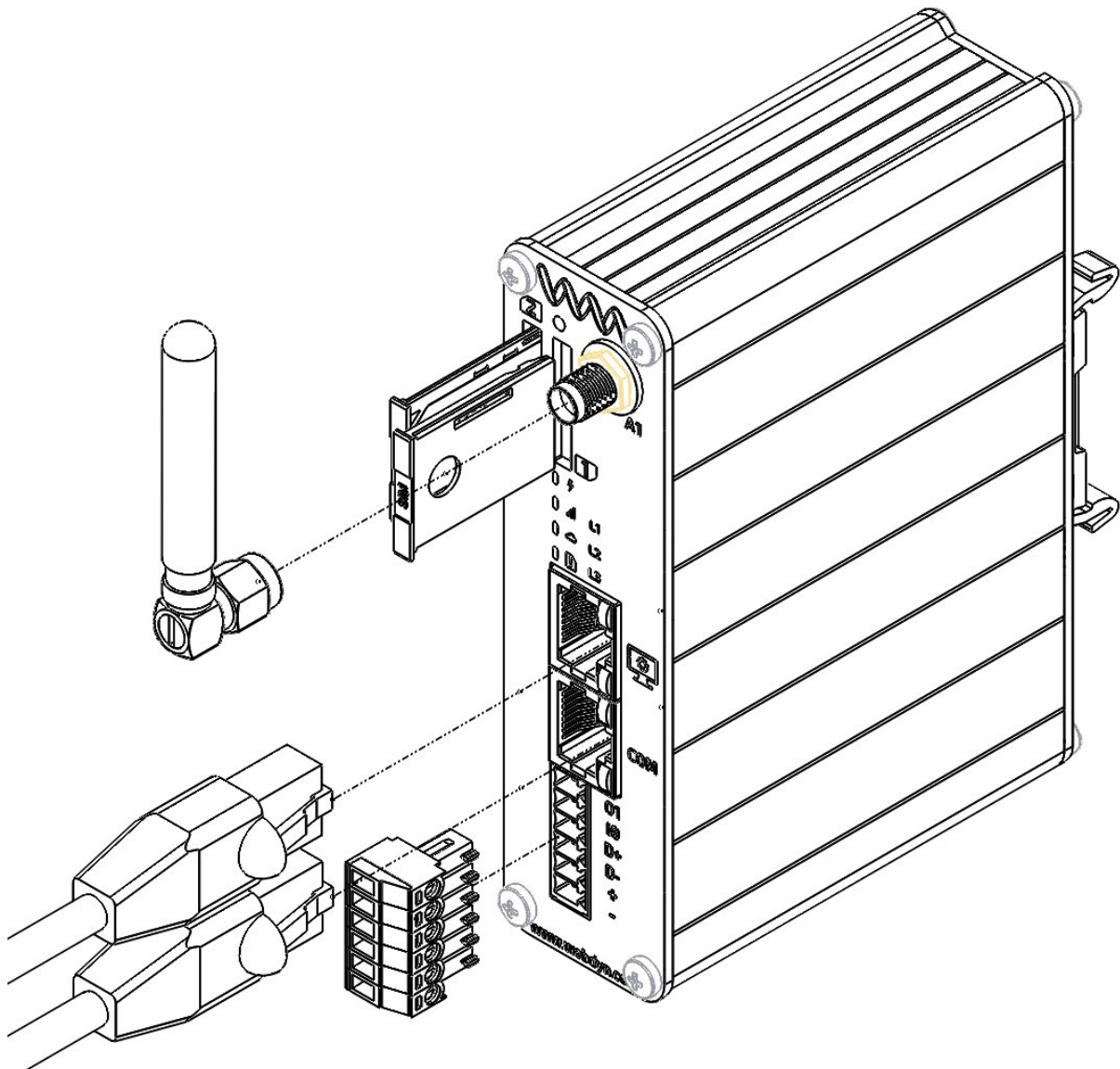
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