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WA & WS

Installation & Operation Manual cQPSus

The information in this manual is intended to assist with equipment design and ensure proper installation.

READ THIS INSTRUCTION FIRST

To avoid serious or fatal personal injury or major property damage, read and follow all safety instruction in this manual. If you require additional assistance, please contact SOLEXY.

SAFETY INSTRUCTION TO HAZARDOUS AREA INSTALLATION

- It is the responsibility of the installer and the end-user to ensure that the Solexy WA/WS enclosures are installed and maintained according to the suitable standards for electrical application in potentially explosive atmospheres and any other relevant electrical code, National Electrical Code or Canadian Electrical Code.
- Suitably trained personnel shall carry out installation according with applicable code practice.
- Read this first and keep this instruction manual always available.

MARKING

 US CL I, DIV 1, Groups B,C,D
CL II, DIV 1, Groups E,F,G
CL I, Zone 1, Group IIB+H2
Zone 21, Group IIIC

Enclosure type ratings: 1, 4 and 4X

This instruction refers to certified equipment covered by following certificate:

QPS File: LR1504-1

WARNINGS AVERTISSEMENT

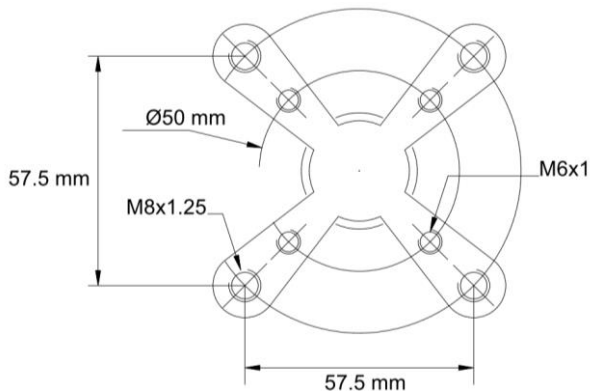
- Warns of hazard that MAY cause serious personal injury, death or major property damage.
- CONDUIT RUNS MUST HAVE A SEALING FITTING CONNECTED WITHIN 18 INCHES OF THE ENCLOSURE (only required for Division 1 locations).
UN SCEAU DOIT ÊTRE INSTALLÉ À L'INTÉRIEUR DE 18 POUCHES DE BOÎTIER (requis uniquement pour les emplacements de la Division 1)
- DISCONNECT THE EQUIPMENT FROM THE SUPPLY CIRCUIT BEFORE OPENING. KEEP ASSEMBLY TIGHTLY CLOSED WHEN IN OPERATION.

DÉBRANCHER L'ÉQUIPEMENT DU CIRCUIT D'ALIMENTATION AVANT L'OUVERTURE. LAISSER L'ENSEMBLE HERMÉTIQUEMENT FERMÉ EN FONCTIONNEMENT.

- DISCONNECT ALL POWER BEFORE SERVICING EQUIPMENT.
DÉBRANCHER TOUTES LES CONSOMMATIONS AVANT DE RÉPARER L'APPAREIL.
- HAZARDOUS VOLTAGE
TENSION DANGEREUSE
- DO NOT REMOVE COVER WHEN ENERGISED.
NE RETIREZ PAS LE COUVERCLE LORSQUE ÉNERGÉ.
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
NE PAS OUVRIR LORSQU'UNE ATMOSPHÈRE EXPLOSIVE EST PRÉSENTE.
- The equipment must be connected with an LPS or Class 2 source (SWA and SWS only)
- To avoid the thread cover blocking the thread joint can be protected with greases like Nyogel 760G, Uniflor 8512R, Uniflor 8911 or equivalent compatible with Silicone (VMQ) and Fluorosilicone (FVMQ) gasket.
- The user should not repair this equipment.
- The user should not modify the unit.
- The unit should not be painted by the user.
- For ambient temperature below 14°F (-10°C) and above 158°F (70°C) use field wiring suitable for both minimum and maximum ambient temperature.
- If the equipment is likely to come in to contact with aggressive substances, it is responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised. Aggressive substances: example Acids, liquids, gases with can affected metals.
- The metallic alloy used for the enclosure, in the event of a rare accident, could cause ignition sources due to impact or friction (sparks may occur). This shall be considered when the box is installed in group Ex area.
- Remove plastic plugs or plastic stickers supplied with enclosure before installation. The conduit plugs supplied are for transit purposes only, these components aren't certified.
- Weatherproof levels depend on cable gland and cabling methods used.
- For functionality of device installed inside the enclosure refer to the device's instruction.
- Use only cable glands and plugs that are suitable for type 1, 4 and 4X enclosures in order to maintain the enclosure's environmental protection rating.
- Any unused entries must be filled with appropriate equipment (i.e. plugs) that are suitable for the type of protection and maintain the enclosure's environmental protection rating.
- In case of plugs used, they must be at least 1.5 mm thick and engage at least 5 full threads.

INSTALLATION

1. The unit can be installed in all position.
2. Fix the unit using n° 4 M6x10 or M8x10 bolts



GROUNDING

1. Grounding needs to make according to suitable standards for electrical application in potentially explosive atmospheres and/or other national standards.
2. The electrical devices must be grounded using their internal and external M4 grounding connections.

ELECTRICAL WIRING

1. Remove screw cover, remove protection plugs from cable entries and substitute them with cable glands or conduits or plugs suitable for the type of protection required.
2. Connect terminal strip and/or connector according to device's instruction manual.
3. Check that thread joint were free of foreign matters and deformations check the seal is properly fitted in the slot.
4. Reassemble screw cover and lock it by means of the screw or anti-rotation kit.
5. The cover must be screwed and securely locked to the body.

OPERATION

Refer to the device's instruction manual for set-up and functionality

PRODUCT'S STORAGE

Keep the boxes away from atmospheric agents

MAINTENANCE

- The verification and maintenance of the electrical equipment must be performed according to suitable standards for electrical application in potentially explosive atmospheres and/or other national standards.
- The user should guarantee the keeping of the safety characteristic of the device after maintenance.

- The cover must be securely locked to the body.
- After every opening must check before closing that the thread joint is free of foreign matters and deformations and if necessary lubricate the thread joint in order to avoid cover blocking with greases like Nyogel 760G, Uniflor 8512R, Uniflor 8911 compatible with silicone or fluorosilicone gasket or equivalent according to enclosure temperature range.
- In order to guarantee the weatherproof level, it's necessary that the gasket needs to be in good conditions and it shall be verified after every opening. In case of gasket's damage replace with Solexy spare part.
- The maintenance related to the components used for wiring must be performed according to manufacturer instruction.

DISPOSAL / RECYCLING

Disposal and recycling of the product according to national regulation for waste disposal and recycling.

WARNING: Do not dispose of the product and the components in the environment.

MODEL NOMENCLATURE

X	XX	XXX	XX	-	XX	X	XX	-	XXXXX
1	2	3	4	-	5	6	7	-	8

1 Family

- H Enclosure complete of terminals / connectors
- S Enclosure supply with the electronic device

2 Series

- WA aluminum enclosure
- WS stainless steel enclosure

3 Device

- XXX 1 digit for device installed (S family)
or terminals / connectors (H family)
- 2 digit for device / terminal version

4 Antenna barrier

- XX 2 digit for Solexy Antenna Barrier if used
(optional components)
- 00 for unit without Solexy Antenna Barrier

5 Cable entries

- XX 2 digits for cable entries combination

6 Colour - Brand

- X 1 digit for housing's colour and/or brand

7 Certification Mark

- NO QPS CL1 DIV1 and North American Zones listed
- XN QPS CL1 DIV1 and North American Zones listed
+ Atex/IECEX Gas and Dust certified
- MN QPS CL1 DIV1 and North American Zones listed
+ Atex/IECEX Gas, Dust and Mining certified

8 Special execution

- XXXXX various, consult Solexy

DESCRIPTION	1
POWER SUPPLY	1
AMBIENT TEMPERATURE RANGE.....	2
WIRING.....	2
DEVICE CONFIGURATION	3
TROUBLESHOOTING AND LED DEFINITION	5
ANTENNA LAYOUT	6
RF INFORMATION.....	6
MAXIMUM PERMITTED RF THRESHOLD POWER (Pth)	7
MAXIMUM JOULES CALCULATION IN CASE OF COAX CABLE INSTALLATION.....	8
APPROVAL INFORMATION	9

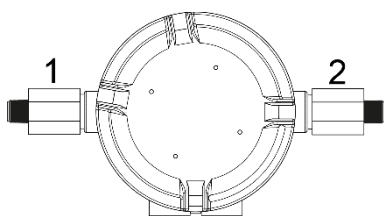
DESCRIPTION

The SWA & SWS R Series is a LTE cellular router equipped with 2 Ethernet ports, 2 LTE antenna ports, 1 WiFi port and I/O ports.

The SWA & SWS R Device provides secure and stable Internet connectivity for Industrial applications using RutOS software and security features such as OpenVPN, IPsec, Firewall, Hotspot, SMS control and RMS support.

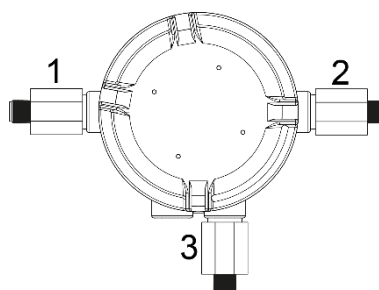
Device version	Model
R00	RUT240 *0*** - Europe, the Middle East, Africa, Korea, Thailand, India
R01	RUT240 *1*** - North America (AT&T, Bell, T-Mobile)
R02	RUT240 *2*** - North America (Verizon)
R03	RUT240 *3*** - Australia (Telstra)
R04	RUT240 *4*** - South America, Australia, New Zeland, Taiwan
R05	RUT240 *5*** - Japan
R06	RUT240 *6*** - Europe, the Middle East, Africa, Korea, Thailand
R07	RUT240 *7*** - Global

R0x 33 / R0x 45



Layout 3

R0x 30 / R0x 54



Layout 4

POWER SUPPLY

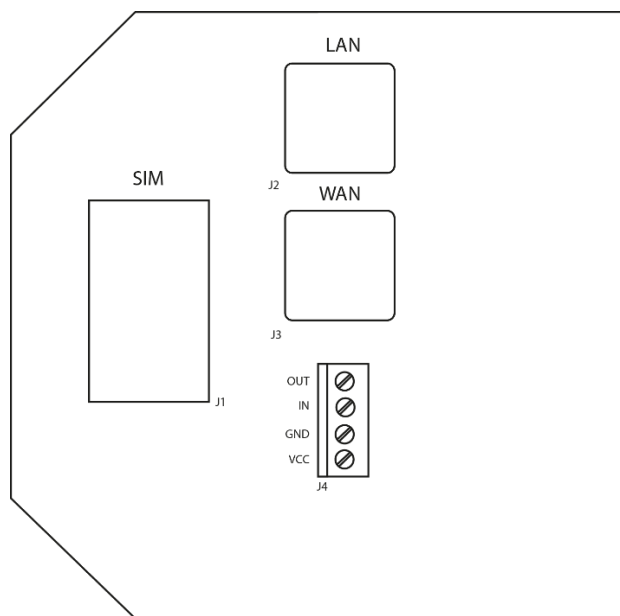
Screw terminals = Supply voltage: 9 ~ 30 VDC

Max Power Consumption 5W

AMBIENT TEMPERATURE RANGE

Min -40°C (-40°F)
Max +75°C (+167°F)

WIRING



J1		
Label	Description	
SIM	SIM socket	
J2		
Label	Description	
LAN	RJ45 LAN connector (PPoE capability 24VDC)	
J3		
Label	Description	
WAN	RJ45 WAN connector	
J4		
Label	Description	
OUT	Digital Output	
IN	Digital Input	
GND	Power supply - (9V ~ 30V DC)	
VCC	Power supply + (9V ~ 30V DC)	

Step 1 – ANTENNA CONNECTION

Connect the antenna before to turn on the device.

WARNING : use antenna only with 50Ω impedance and with operating frequency in according to technical data listed into the above paragraph “RF information”.

The device must be set according to limitation listed at paragraph MAXIMUM PERMITTED RF THRESHOLD POWER (Pth) for installation in Hazardous Location and the national regulation rules.

Step 2 – POWER SUPPLY CONNECTION

WARNING : DO NOT WIRED POWER SUPPLY WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.

FOR SAFETY REASONS WIRING MUST BE MADE ACCORDING TO WA & WS INSTALLATION AND OPERATION MANUAL IM0009

THE EQUIPMENT MUST BE CONNECTED WITH AN LPS OR CLASS 2 SOURCE

The device can be powered by terminal strip (J4 9 ~ 30 VDC) or through PPoE (Passive Power over Ethernet, 24 VDC) on LAN port.

The device has no ON/OFF switch. It turns on automatically when power is applied.

Step 3 – ETHERNET CONNECTION

Connect the Ethernet cable.

DEVICE CONFIGURATION

FACTORY SETTINGS:

- IP address: 192.168.1.1
- Radio Interface disable, preset for access point mode
- SSID: Teltonika (broadcast)
- No security (no WEP, no WAP, no WAP2, no MAC filter)
- WEB interface for device configuration: IP address: 192.168.1.1
User name: admin
Password: admin01

Step 1

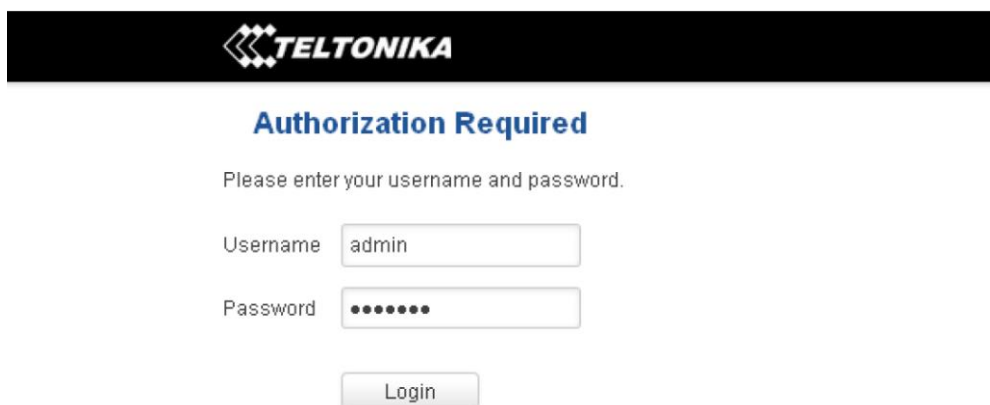
Verify that the IP address factory setting is compatible with your network, if the IP address is not suitable for your network, set up your network card so that it could properly communicate with the router.

Step 2

From the list of the available wireless networks, select "Teltonika" and click connect. Then launch your favourite browser and enter the router's IP into the address field:



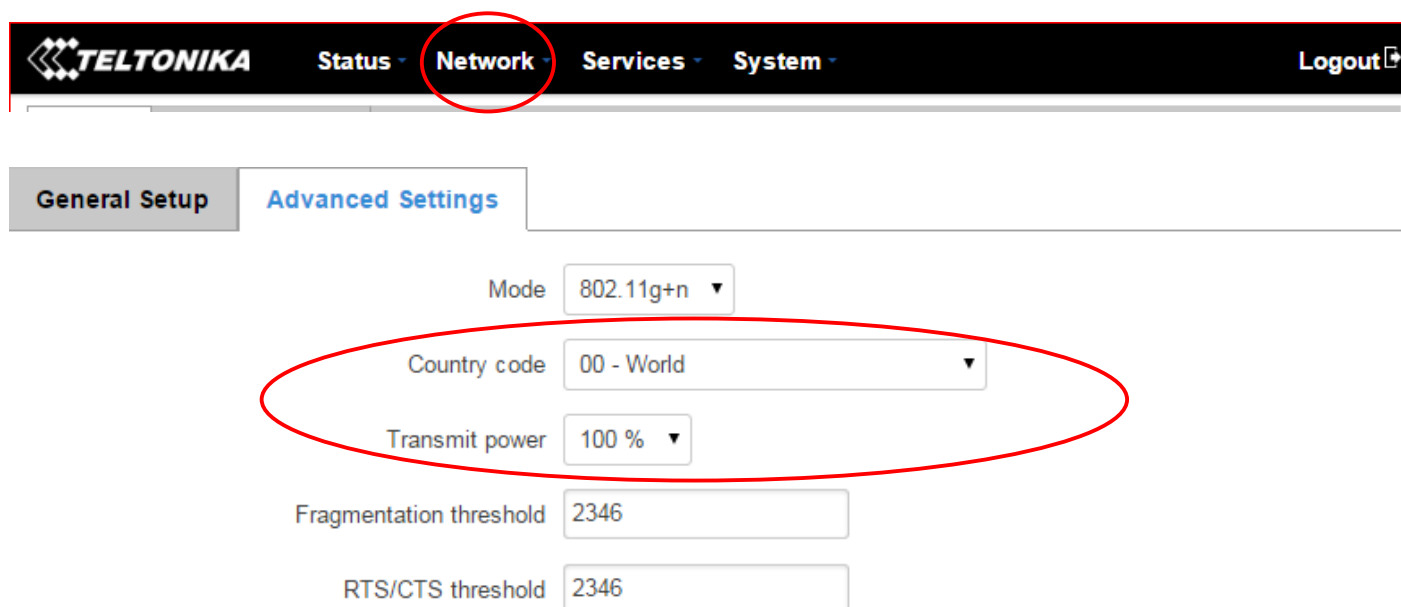
Press enter. If there are no problems you should be greeted with a login screen such as this:



Enter the default password, which is "admin01" into the "Password" field and then either click Login with your mouse or press the Enter key. You have now successfully logged into the RUT240!

From here on out you can configure almost any aspect of your router.

On the “Network” → “Wireless” page you should first select your **country** in order to enforce applicable **regulation rules**. The country selector is located in the advanced settings tab.



TELTONIKA Status **Network** Services System Logout

General Setup **Advanced Settings**

Mode 802.11g+n

Country code 00 - World

Transmit power 100 %

Fragmentation threshold 2346

RTS/CTS threshold 2346

Note:

Adjust the output transmit power considering the antenna gain in order to respect your country power limits (that differs from the Ex RF limits indicated in the “MAXIMUM PERMITTED RF THRESHOLD POWER” paragraph). See paragraph “RF INFORMATION” for the device RF output power and antenna gain.

More detailed information about the max power limit is available at the local frequency management authority.

For LAN interface setup click on “network” → “LAN”:



Configuration

General Setup **Advanced Settings**

IP address 192.168.1.1

IP netmask 255.255.255.0

IP broadcast

This page is used to configure the LAN network, where all your devices and computers that you connect to the router will reside.

TROUBLESHOOTING AND LED DEFINITION

None of the LED indicators turn ON

- Verify the power supply (voltage, cabling)

The WiFi link does not come up

- Make sure that the Wireless parameters of the Client (case sensitive SSID, 802.11 mode, radio channel and security) match those of the AP
- Check the radio conditions: distance between devices, placement of antennas, interferences and obstacles to radio waves propagation
- Try with all securities and encryption settings temporarily disabled
- Try another radio channel

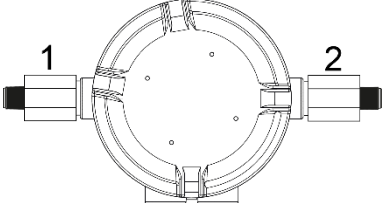
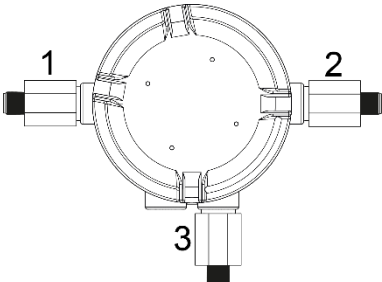
How to restore factory settings?

- If the built-in web-based interface is reachable, you can use a browser to restore factory settings.
- Else, power up the unit, then hold down the reset button (for at least 5 seconds). Then release it. To help user to determine how long the reset button should be pressed, signal strength LEDs indicates the elapsed time. All 5 lit LEDs means that 5 seconds have passed and reset button can be released. Part of the reset to defaults will be indicated by flashing of all 5 signal strength LEDs together with red connection status LED. SIM PIN on the main SIM card is the only user parameter that is kept after reset to defaults.

LED Definition

LED	Function
POWER	On : power on Off : power not present
LAN/WAN	On : connected Off : not connected
Signal Strength	0 to 5 led's on indicate the signal strength
2G/3G/4G	<ul style="list-style-type: none">• 2G, 3G and 4G LEDs constantly blinking every 1 sec.: no SIM or bad PIN• Blinking from 2G LED to 4G LED every 1 sec.: SIM holder not inserted.• 2G/3G/4G LEDs blinking every 1 sec.: connected to 2G/3G/4G, but no data session established• 2G/3G/4G LED turned on: connected to 2G/3G/4G with data session• 2G/3G/4G LED blinking rapidly: connected to 2G/3G/4G with data session and data is being transferred

ANTENNA LAYOUT

Device version	Model		
R0x 33 R0x 45	Cellular Router		Antenna 1 - WiFi Antenna 2 - Cellular
R0x 30 R0x 54	Cellular Router		Antenna 1 - WiFi Antenna 2 - Cellular Antenna 3 - Cellular

RF INFORMATION

Device version	
R00 R01 R02 R03 R04 R05 R06 R07	RF technologies: GSM, GPRS, EDGE, UMTS/HSPA+, LTE Max RF power: 33 dBm@GSM, 24 dBm@WCDMA, 23 dBm@LTE
R00	Europe, the Middle East, Africa, Korea, Thailand, India Frequency Band: 4G (LTE-FDD): B1, B3, B5, B7, B8, B20 4G (LTE-TDD): B38, B40, B41 3G: B1, B5, B8 2G: B3, B8
R01	North America (AT&T, Bell, T-Mobile) Frequency Band: 4G (LTE-FDD): B2, B4, B12 3G: B2, B4, B5
R02	RUT240 *2*** - North America (Verizon) Frequency Band: 4G (LTE-FDD): B4, B13
R03	RUT240 *3*** - Australia (Telstra) Frequency Band: 4G (LTE-FDD): B1, B3, B5, B7, B28 3G: B1, B5
R04	RUT240 *4*** - South America, Australia, New Zeland, Taiwan Frequency Band: 4G (LTE-FDD): B1, B2, B3, B4, B5, B7, B8, B28 4G (LTE-TDD): B40 3G: B1, B2, B5, B8 2G: B2, B3, B5, B8
R05	RUT240 *5*** - Japan Frequency Band: 4G (LTE-FDD): B1, B3, B8, B18, B19, B26 4G (LTE-TDD): B41 3G: B1, B6, B8, B19
R06	Europe, the Middle East, Africa, Korea, Thailand Frequency Band: 4G (LTE-FDD): B1, B3, B7, B8, B20, B28A 3G: B1, B8 2G: B3, B8



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R07	RUT240 *7*** - Global Frequency Band: 4G (LTE-FDD): B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28 4G (LTE-TDD): B38, B39, B40, B41 3G: B1, B2, B4, B5, B6, B8, B19 2G: B2, B3, B5, B8
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Device version	WiFi
R00 R01 R02 R03 R04 R05 R06 R07	WiFi standards : IEEE 802.11b/g/n Frequency range: 2.401 – 2.495 GHz * WiFi TX power : 20 dBm max *Supported frequency bands are dependent on geographical location and may not be available in all markets

Solexy Antenna KIT	Antenna	Antenna Gain
KA-R33U	N° 1 ANHC2 for 4G LTE port	2 dBi
	N° 1 ANH73 for WiFi port	4.35 dBi
KA-R03U	N° 2 ANHC2 for 4G LTE port	2 dBi
	N° 1 ANH73 for WiFi port	4.35 dBi

MAXIMUM PERMITTED RF THRESHOLD POWER (Pth)

The RF threshold power (Pth), sometimes called the effective isotropic radiated power (EIRP), as defined in UL 60079-0, is the product of the effective output power of the transmitter multiplied by the antenna gain. The maximum threshold powers for each equipment group as defined by Table 4 in UL 60079-0 are provided below.

Because most antennas list the gain relative to an isotropic radiator (dBi) instead of the raw power gain, it is often easier to simply add the antenna gain in dBi to the radio output power in decibel-milliwatts (dBm). Any added cable loss between the RF output and the antenna may also be factored in.

$$P_{th} \text{ (dBm)} = \text{RF output power (dBm)} + \text{Antenna gain (dBi)} - \text{Coax cable loss between RF output and Antenna (dB)}$$

The resulting threshold power calculated by the above formula MUST be below the threshold power for the operating area group rating below.

Equipment for	Threshold Power (W)	Threshold Power (dBm)
Group I	6	37.7
Group IIA	6	37.7
Group IIB	3.5	35.4
Group IIB + H2	2	33.0
Group III	6	37.7

The above threshold level refer to installation in classified area Ex according to UL 60079-0 standard.

The use of device differs from one region and/or country to another. The user of the device must take care that the device is operated only according to local rules and standard or without the permission of the local authorities on frequencies other than those specifically reserved and intended for use without a specific permit. More detailed information is available at the local frequency management authority.

MAXIMUM JOULES CALCULATION IN CASE OF COAX CABLE INSTALLATION

In case of use of a coax cable installation for antenna installation the adding cable need to be evaluating to ensure that the maximum energy stored on cable not exceeded the value allowable per UL 60079-11:

Max energy (Joules) allowed per UL 60079-11	
Group I	1500 μ J
Group IIA	950 μ J
Group IIB	250 μ J
Group IIB + H2	50 μ J

The calculation can be done according to following equation:

$$E = \frac{1}{2} *$$

Where:

E = Energy

C_1 = Antenna Barrier Capacitance (18 pF)

C_2 = Coax cable capacitance

R = Impedance (50 Ω)

P = RF power output (18 dBm, 63 mW)

1.5 = Safety Factor

Example:

Antenna cable capacitance = 1195 pF

$$E = \frac{1}{2} * \{(18pF + 1195pF) * 7.08\}$$
$$= 0,00858\mu J$$

Answer = 0,00858 μ J acceptable for any Group



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APPROVAL INFORMATION

DEVICE VERSION R01

The device R01 contain the RUT240 01**** device manufacturer by Teltonika LTD.

FCC Regulatory Requirements	FCC ID: 2AET4RUT240A
	<p>This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:</p> <p>(1) This device may not cause harmful interference, and</p> <p>(2) this device must accept any interference received, including interference that may cause undesired operation.</p>
	<p>This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:</p> <ul style="list-style-type: none">- Reorient or relocate the receiving antenna.- Increase the separation between the equipment and receiver.- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.- Consult the dealer or an experienced radio/ TV technician for help. <p>FCC RF Exposure Information</p> <p>This device complies with the relevant RF radiation exposure limit set forth for an uncontrolled environment. This device must be installed and operated with the minimum distance 20cm between the radiator and your body. This device must be not co-located or operating in conjunction with any other antenna or transmitter.</p>
IC Regulatory Requirements	<p>Certification Number: 23005-RUT240A</p> <p>This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:</p> <p>(1) This device may not cause interference; and</p> <p>(2) This device must accept any interference, including interference that may cause undesired operation of the device.</p> <p><i>Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes:</i></p> <p><i>(1) le dispositif ne doit pas produire de brouillage préjudiciable, et</i></p> <p><i>(2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.</i></p> <p>This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.</p>



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Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

DEVICE VERSION R02

The device R01 contain the RUT240 02**** device manufacturer by Teltonika LTD.

FCC Regulatory Requirements	FCC ID: 2AET4RUT240V
	<p>This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:</p> <p>(1) This device may not cause harmful interference, and</p> <p>(2) this device must accept any interference received, including interference that may cause undesired operation.</p> <p>This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:</p> <ul style="list-style-type: none">- Reorient or relocate the receiving antenna.- Increase the separation between the equipment and receiver.- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.- Consult the dealer or an experienced radio/ TV technician for help. <p>FCC RF Exposure Information</p> <p>This device complies with the relevant RF radiation exposure limit set forth for an uncontrolled environment. This device must be installed and operated with the minimum distance 20cm between the radiator and your body. This device must be not co-located or operating in conjunction with any other antenna or transmitter.</p>

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.