



MTX-StarEnergy-M

Software User Manual

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Important Information

This technical description contains important information for the start up and use of the MTX-Tunnel application. Read it carefully before you start working with MTX Terminal Java enabled & MTX-TUNNEL. 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.

Service and Support

To contact customer support please use the contact details below:

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Website: mtxtunnel.com, mtx2m.com

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Introduction

The MTX-StarEnergy-M modem/router is a device belonging to the Titan router family. It has been specially designed to be used in remote reading scenarios for energy meters.

We support all users of our MTX modems and routers when they need it with free, fast-response and efficient technical support. So if after reading this manual you have any doubts, be sure to write to us at the email address iotsupport@mtxm2m.com. If you need a feature not included in our routers, or if you need a special customization, let us know and we will study it.

Software

1. Configuration Step by Step

The configuration of the MTX-StarEnergy-M is done through a web environment.

The MTX-StarEnergy-M uses its USB port to create a network connection through which it has access to said web configuration environment.

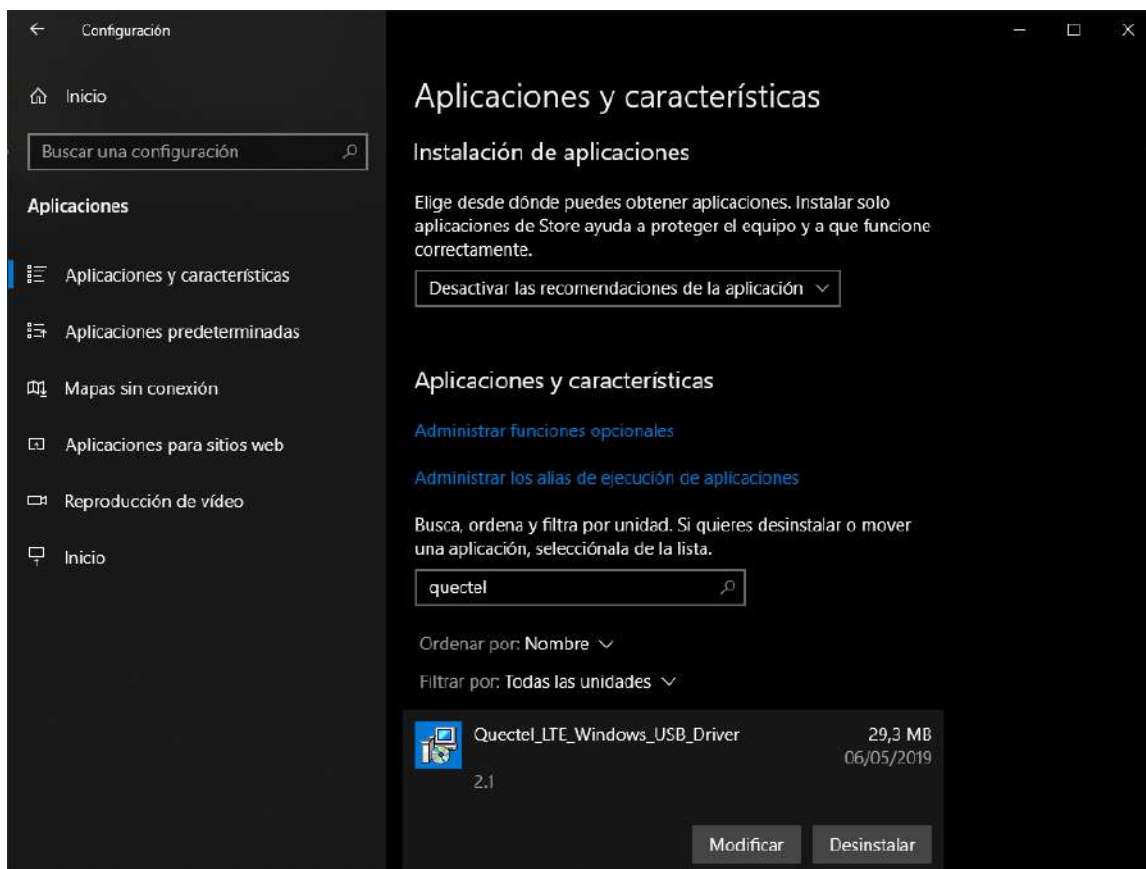
1.1 Minimum Requirements

- A PC with Windows 10 and with a web browser (Chrome, IExplorer, Firefox...) and a USB port
- A USB cable to interconnect the PC with the MTX-StarEnergy-M

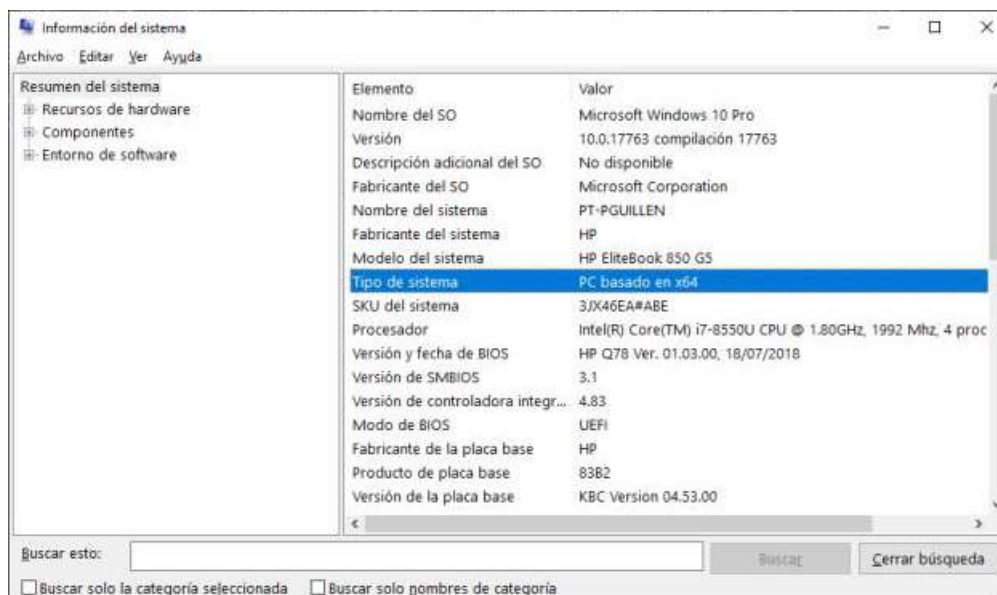
1.2 USB driver installation

If you don't have the drivers installed on your computer this is the first thing to do. The steps to install the driver are as follows:

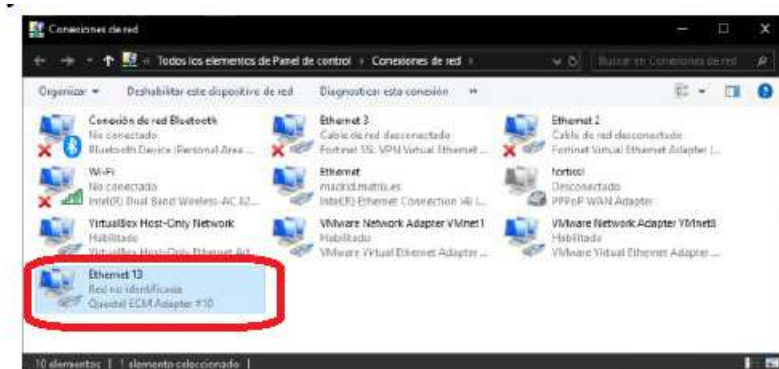
- Unzip file "1_Quectel_LTE_Windows_USB_Driver_V2.1.5.zip" and run the program "setup.exe"



- Check if you are using a 32-bit or 64-bit system. To do this, go to Windows start menu and type directly “System Information”, and a window like the following will appear

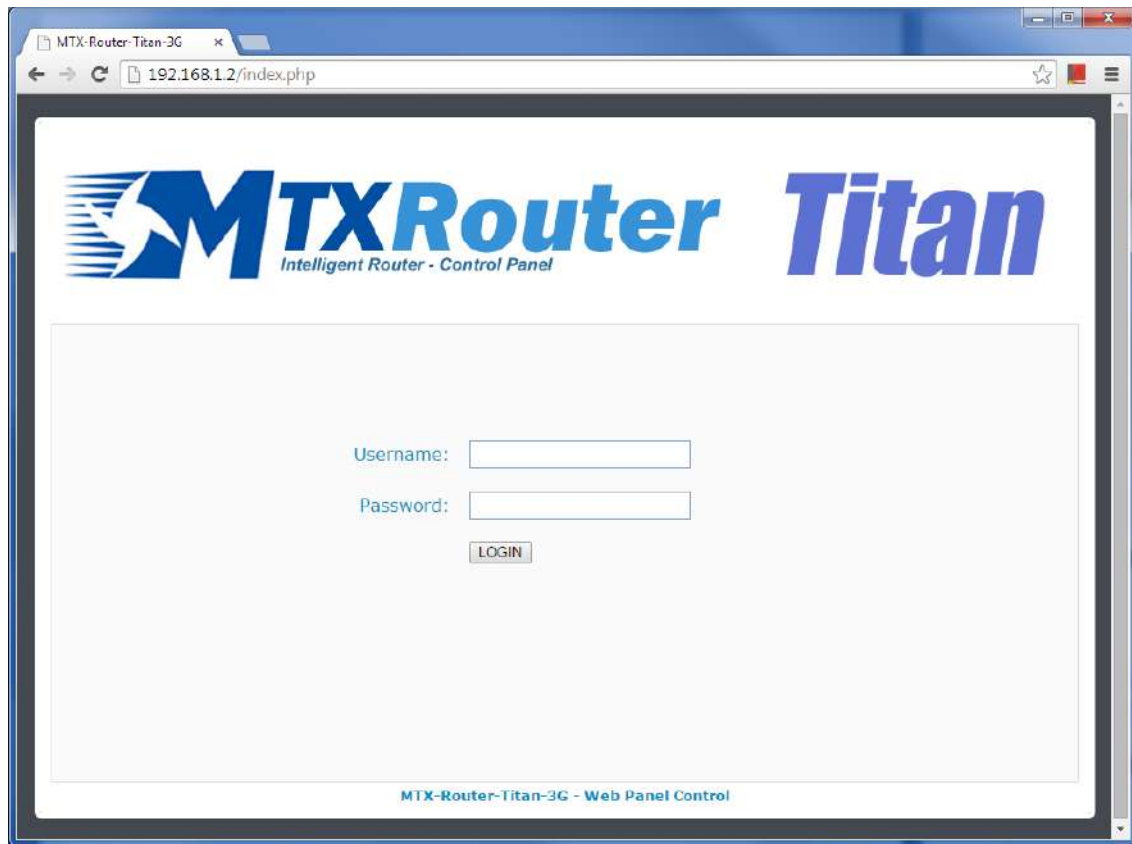


- Unzip the file “2_quectel_ecm_drivers_v1.02.0505.zip”. Run ecm_driver_setup.exe for 64 or 32 bits depending on your system and select option “1” and press “ENTER”
- Insert a SIM into the MTX-StarEnergy-M and connect the antenna. After that, power the device and then connect it to your PC through a USB cable
- Go to the “Network Connections” menu (to do this, in the Windows Start menu directly type “View network connections”) and check that a network connection named Quectel ECM has been created as shown below



- In the connection properties of said interface, configure a network address with an IP 192.168.1.X, where X is different from 2 (since 192.168.1.2 is the IP address that the MTX-StarEnergy-M has by default)

- Open a browser and access the MTX-StarEnergy-M configuration web interface at <http://192.168.1.2>. The default user is “admin” and the password is “admin”



In Annex II of this manual you will find a step-by-step example of how to configure the MTX-StarEnergy-M for remote access to an Energy meter through IP communications and CSD calls. We recommend reading it.

If you need it, in the following sections you will find detailed information on each of the configuration sections.

2. Configuration

2.1 WAN

The WAN section refers to everything related to the MTX-StarEnergy-M 2G/3G/4G configurations, from the connection status, network configuration parameters and connection supervision.

2.1.1 WAN: Status

This screen shows the general status of the MTX-StarEnergy-M.

- **Firmware Version:** firmware version
- **Public IP:** WAN IP address (assigned from 2G/3G/4G connection) if it is available
- **GSM Module:** indicates the manufacturer and model of the internal GSM module of the MTX-StarEnergy-M
- **Network (2g/3g/4g):** indicates whether the current WAN connection is using the 2G (GPRS), 3G or 4G network
- **Signal Strength:** indicates the strength of the signal. 0 = null, 31 = maximum
- **Extra signal info:** additional information when the modem is registered in 3G and 4G networks
- **Internal temperature:** shows the internal temperature of the processor (does not indicate room temperature)



The screenshot displays the 'WAN Status' page of the MTXRouter Titan. The interface includes a navigation menu on the left and a main content area on the right. The main content area shows the following information:

- Firmware version:** 5.1.4.10.6.5
- WAN IP:** 95.124.220.100 (WAN IP (2g/3g/4g Network))
- GSM Module:** Quectel EC21, Revision: EC21EFAR06A01M4G
- IMEI:** 867962042066038 (Device Identification)
- Network (2g/3g/4g):** 4g (Movistar) (Used network at this moment)
- Signal Strength:** 25 (-63dbm) (Signal Strength (0 ... 31))
- Extra signal info:** Rsrp: -87dBm | Rsrq: -9dB (For 3g & 4g Network)
- Internal temperature:** 37.0 (Temperature of internal processor (°C))

A bar chart below the signal strength information shows four bars of increasing height, representing the signal strength levels.

2.1.2 WAN: Basic Settings

This section is used to configure the parameters of the WAN connection (2G/3G/4G). You will need to know some information about your SIM card, such as the APN, the username and the password. Your provider must provide them to you.

- **Enabled WAN:** check the box to allow MTX-StarEnergy-M to enable 2G/3G/4G connection
- **Session time:** indicates the minutes that the 2G/3G/4G connection should remain active. If you specify "0" it means that the connection will always be active. If you specify a number greater than 0, the connection will remain active for the specified minutes after an event such as the receipt of an SMS message or a missed call. Go to the "Other> SMS Control" configuration menu to activate and configure these events if you are going to specify a number> 0. This parameter normally has a value of "0" for metering applications
- **APN:** APN of the operator. You should check with your GSM provider
- **Username:** username of the operator. You should check with your GSM provider
- **Password:** operator's password. You should check with your GSM provider
- **Call center:** call center number. Usually * 99 *** 1 #
- **Sim Pin:** if your SIM card has a PIN, you must specify it here
- **Authentication:** you must indicate the authentication method. Normally PAP
- **Network selection:**
 - auto: the MTX-StarEnergy-M will use 4G if there is coverage, or 3G and 2G otherwise
 - 4G: the MTX-StarEnergy-M will use the 4g network in all cases. If there is no 4G coverage, it will not change to 2G or 3G
 - 3G: the MTX-StarEnergy-M will use the 3G network in all cases. If there is no 3G coverage, it will not change to 2G
 - GPRS: the MTX-StarEnergy-M will use the 2G network in all cases. In this mode, incoming data calls (CSD) are also allowed
- **DNS1 y DNS2:** DNS servers for domain name resolution. It is recommended to use Google 8.8.8.8 and 8.8.4.4 or those indicated by your provider
- **Remote management:** if you check the box, you will be able to access the web configuration of the MTX-StarEnergy-M remotely, through its public IP address (the one indicated in WAN> Status)

- **Remote TCP port:** indicates the remote configuration TCP port. For example, if you specify 8080, the configuration URL will be `http://x.x.x.x: 8080`

MTXRouter Titan
Intelligent Router - Control Panel

Wan

- Status
- Basic Settings
- Keep Online

LAN

- Basic Settings

Firewall

- Authorized IPs

Serial Settings

- Serial Port1-232/485

Other

- AT Command
- Sms control
- Periodic Autoreset
- Time Servers
- Remote Console
- Snmp
- Tacacs+
- Https
- User Permissions
- Passwords Web UI
- Backup / Factory
- Firmware Upgrade
- Reboot
- Logout

WAN Basic Settings

Enabled WAN Enable GSM WAN interface

Session Time Time in minutes (0 = always on)

APN: APN for wireless session

Username: Username for wireless session

Password: Password for wireless session

Call center: Call center (normally *99***1#)

Sim Pin: SIM user pin

Authentication: Authentication method

Network selection: Preferred network selection

DNS selection:

DNS1: Preferred DNS1

DNS2: Preferred DNS2

Remote management Enable remote management

Remote TCP Port TCP Port for remote http connections.

ADDITIONAL NOTES

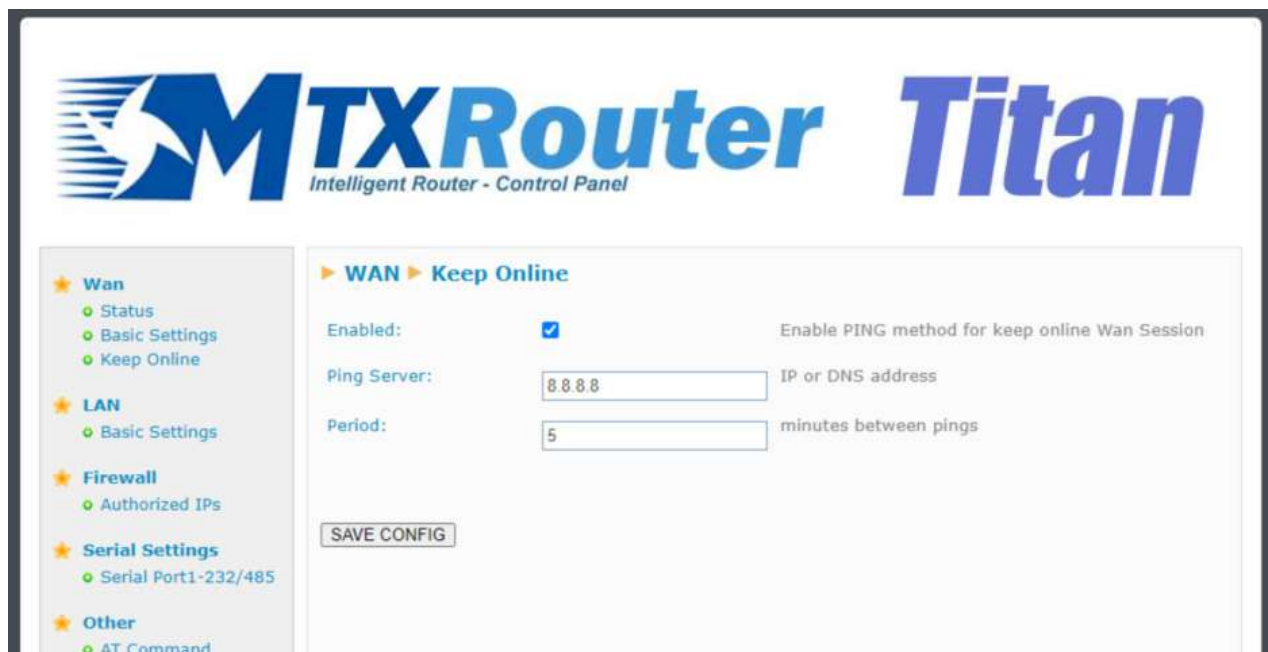
- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect

2.13 WAN: Keep Online

From this screen you can configure a PING to ensure the connectivity of the MTX-StarEnergy-M. In case of PING failure three consecutive times, the 2G/3G/4G connection will restart.

- **Enabled:** check the box to allow the MTX-StarEnergy-M to send a periodic PING to verify connectivity

- **Ping Server:** indicates the IP address of the server against which to PING
- **Period:** indicates how many minutes a check PING should be performed



ADDITIONAL NOTES

- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect

2.2 LAN

The “LAN” configuration section refers to the local network configuration part.

2.2.1 LAN: Basic Settings

This section allows you to configure the basic network parameters of the network connection (emulated via the USB port).



The screenshot displays the MTXRouter Titan Intelligent Router Control Panel. The main heading is "LAN Basic Settings". On the left, a navigation menu lists various settings: Wan (Status, Basic Settings, Keep Online), LAN (Basic Settings), Firewall (Authorized IPs), Serial Settings (Serial Port1-232/485), and Other (AT Command, Sms control, Periodic Autoreset, Time Servers, Remote Console, Snmp, Tacacs+, Https, User Permissions). The main content area shows the following configuration options:

- Static IP:** A radio button is selected, with the text "Static IP enabled" to its right.
- IP Address:** A text input field containing "192.168.1.2" with the label "Local IP LAN" to its right.
- IP Subnet Mask:** A text input field containing "255.255.255.0" with the label "Local Mask" to its right.
- IP Gateway:** An empty text input field with the label "Left blank if not used or using WAN connection" to its right.
- DNS Settings:** A sub-section titled "LAN Basic Settings DNS" containing two text input fields: "DNS 1" (labeled "DNS Server 1") and "DNS 2" (labeled "DNS Server 2").

A "SAVE CONFIG" button is located at the bottom left of the configuration area.

- **Static IP:** a static IP address will be assigned. Only option available on this device
- **IP Address:** local IP address of the emulated IP interface (by default 192.168.1.2)
- **IP Subnet Mask:** subnet mask
- **IP Gateway:** Gateway IP address. Leave blank if you are using 2G/3G/4G connectivity. This option is only useful if the MTX-StarEnergy-M is going to access the nternet through a PC via the USB connection, which is not the case for metering applications
- **DNS1:** primary DNS server. Not necessary for metering applications
- **DNS2:** secondary DNS server. Not necessary for metering applications

2.3 Firewall

Section to configure security aspects of the MTX-StarEnergy-M related to IP connectivity.

2.3.1 Firewall: Authorized IPs

This screen allows you to define, if you wish, up to 3 IP addresses authorized to make connections to/from the WAN port (2G/3G/4G interface) for the different MTX-StarEnergy-M services. For example, if you specify an authorized IP address 90.166.108.200 (for example, your office), certain services will only be accessible from that IP address.

The screenshot displays the MTXRouter Titan control panel. The main heading is "Firewall Authorized IPs (for WAN interface)". On the left, a navigation menu lists various settings: Wan (Status, Basic Settings, Keep Online), LAN (Basic Settings), Firewall (Authorized IPs), Serial Settings (Serial Port1-232/485), and Other (AT Command, Sms control, Periodic Autoreset, Time Servers, Remote Console, Snmp, Tacacs+, Https, User Permissions). The main configuration area includes three input fields for "Authorized IP1:", "Authorized IP2:", and "Authorized IP3:", each with a description: "Remote connections from this IP are allowed". Below these are five dropdown menus for "Router configuration", "Serial gateways", "Remote console:", "Outgoing connections:", and "PING:", each with a description: "Security for remote configuration connection", "Security for remote serial connection", "Security for remote console connection", "Security for outgoing connections", and "Security for incoming PING from WAN" respectively. A "SAVE CONFIG" button is located at the bottom left of the configuration area.

- **Authorized IP1:** authorized IP address number 1
- **Authorized IP2:** authorized IP address number 2
- **Authorized IP3:** authorized IP address number 3
- **Router configuration:** specifies whether to accept remote connections to the web configuration environment from any IP or only from authorized IP addresses
- **Serial Gateways:** specifies remote connections to 2G/3G/4G-RS232/485 gateway services can be made from any IP or only from authorized IP addresses
- **Remote console:** specifies whether to accept remote connections to the remote console service from any IP or only from authorized IP addresses
- **PING:** specifies whether to only respond to PING requests made from authorized IPs

- **Outgoing Connections:** allows you to specify if from the MTX-StarEnergy-M it is possible to give Internet access to all IP addresses or only to authorized IP addresses

ADDITIONAL NOTES

- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect
- If you use “Outgoing connections” restrictions, remember that you need to specify the IP address of the DNS server to use.
- If you need more than 3 authorized IP addresses, you can specify more than one IP address in any box, separating these by “,”

2.4 Serial Settings: Serial portX

From this section it is possible to configure a CSD/2G/3G/4G-RS232/RS485 transparent gateway to remotely access serial devices, such as electricity meters.

- **Baudrate:** specifies the speed of the serial port (115200, ..., 300)
- **Data bits:** specifies the number of data bits (7, 8)
- **Parity:** specifies parity (none, even [even], odd [odd])
- **Stop bits:** number of stop bits (1, 2)
- **Flow Control:** specifies flow control (none, hardware)
- **Timeout ms:** indicates the milliseconds to wait without receiving data through the serial port before sending the data through IP. If you specify a “0” (default value), the data is sent via IP as it arrives through the serial port. A number, for example 10, specifies that no data is sent if there is not a minimum period of 10ms without receiving data through the serial port. This allows data to reach the destination without the fragmentation problems common in some protocols and data management platforms
- **Allow incoming GSM call (CSD Data Call):** selecting this box indicates that a CSD type call is accepted. Only valid to work when the MTX-StarEnergy-M is configured to work in GPRS (2G) mode. In this mode, when a CSD data call is received, it is accepted as long as a 2G-RS232/485 gateway is not currently established. If so, the CSD call is rejected. In other words, once a 2G-RS232 gateway is established, it takes precedence over the CSD call
- **Function:** Nothing or Used by External Device: select this operation option if you do not want to use a certain serial port (such as IP/serial gateway)
- **Function:** Serial – IP Gateway (TCP Server): select this operation option if you want to establish a transparent CSD/2G/3G/4G-RS232/485 gateway, that is, a scenario where the MTX-StarEnergy-M device is at the it listens on a specific TCP port waiting to receive a connection to establish the gateway. It is the usual function for metering applications
- **TCP Local Port:** TCP listening port for the Serial gateway - 2G/3G/4G
- **RTS Line:** allows you to select whether the RTS line will be active as long as a socket is connected. By default Always on. RTS line is not usually used in metering applications

- **Socket timeout:** specifies the time, in seconds, that must elapse to close an IP-RS232/485 gateway in the case of no traffic on it

The screenshot displays the web interface for the MTXRouter Titan Intelligent Router. The main heading is "MTXRouter Titan Intelligent Router - Control Panel". A left-hand navigation menu includes sections for Wan, LAN, Firewall, Serial Settings, and Other. The "Serial Settings" section is expanded to show "Serial Port1-232/485". The main content area is titled "Serial Gateway > Com1 Settings" and contains the following configuration options:

- Baudrate:** 9600 (dropdown menu) - Baudrate of serial port
- Data bits:** 8 (dropdown menu) - Number of data bit
- Parity:** none (dropdown menu) - Parity
- Stop bits:** 1 (dropdown menu) - Number of stop bits
- Flow Control:** none (dropdown menu) - Flow control of serial port
- Timeout ms:** 0 (text input) - msec without serial data before sending (normally: 0)
- Mode RS485:** - Check only if you want to use the RS485 serial port
- Allow incoming GSM call (CSD Data Call)** - Only for TCP Server and TCP Client functions (CSD only compatible using WAN in GPRS mode)
- Function: Nothing or Used by External Device**
- Function: Serial - IP Gateway (TCP Server)**
 - TCP Local Port:** 55560 (text input) - Listening TCP Port (1 ... 65535)
 - RTS Line:** Always on (dropdown menu) - RTS mode (if RTS pin is available)
 - Socket timeout:** 900 (text input) - Socket will be closed if no traffic in X seconds (0=no timeout, 1 ... 86400)

ADDITIONAL NOTES

- Once the configuration is finished, press the "SAVE CONFIG" button to save the changes. Remember that you must restart the device for the new changes to take effect

2.5 Other

2.5.1 Other: AT Command

From this section it is possible to send an AT command directly to the internal modem of the MTX-StarEnergy-M. For example, it can be interesting to check coverage, identify the surrounding telephone cells, etc.

On the other hand, it is also possible to configure up to 5 special AT commands with which to configure the MTX-StarEnergy-M at startup time (that is, they are self-executing each time the device is started).

- **AT Command:** AT command for real time execution (for example AT + COPS?). Once you press the “SEND AT COMMAND” button, the AT command will be executed and you will see the response
- **AT1, ... AT5:** initialization AT commands

The screenshot displays the web interface for the MTXRouter Titan. The header features the logo "MTXRouter Intelligent Router - Control Panel" and "Titan". A left sidebar contains a navigation menu with categories: Wan (Status, Basic Settings, Keep Online), LAN (Basic Settings), Firewall (Authorized IPs), Serial Settings (Serial Port1-232/485), and Other (AT Command, Sms control, Periodic Autoreset, Time Servers, Remote Console, Snmp, Tacacs+, Https, User Permissions, Passwords Web UI, Backup / Factory, Firmware Upgrade, Reboot, Logout). The main content area is titled "Other > AT Command". It includes a text input field for "AT Command" containing "AT+COPS?", a "SEND AT COMMAND" button, and a "Execute custom AT Command" label. Below this, the terminal output shows "AT+COPS?", "+COPS: 0,0,\"Movistar\",7", and "OK". A "SEND AT COMMAND" button is also present. The "Init commands" section contains five rows, each with a label (AT1 to AT5), an empty text input field, and a label "Custom initialization command 1" through "5". A "SAVE CONFIG" button is located at the bottom of the main content area.

ADDITIONAL NOTES

- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect

2.5.2 Other: SMS Control

This section allows you to configure the control of the MTX-StarEnergy-M by SMS. For example, you can configure so that the MTX-StarEnergy-M connects to 2G/3G/4G after receiving an SMS command, or make configuration changes/readings of status by SMS command, being able to specify the authorized telephone numbers for this.

The screenshot displays the MTXRouter Titan Intelligent Router - Control Panel. The main heading is "Other > SMS control". The page is divided into several sections:

- WAN activation:** Includes "SMS:" with an unchecked "enabled" checkbox and "Activation by SMS allowed". Below it, "send IP:" with an unchecked "enabled" checkbox and "Send SMS with IP after activation with SMS or CALL".
- Another SMS functions:** Includes "AT :" with a checked "enabled" checkbox and "Send AT Commands by SMS allowed (you can reboot the device, get IP Wan, get GSM RSSI, change configuration, ...)". Below it, "AT header:" with a text input field containing "mtx" and "Header of at commands".
- Authorized phone numbers:** Includes a checked "all phones" checkbox and "All Phones are allowed". Below it are five text input fields labeled "Authorized number 1" through "Authorized number 5", all of which are currently empty.
- ALIAS and AT COMMAND:** This section has two columns. The "ALIAS" column has "Alias 1:" with a text input field containing "reset" and "Alias 2:" with a text input field containing "network[params]". The "AT COMMAND" column has two text input fields: "AT*MTXTUNNEL=REBOOT" and "AT*MTXTUNNEL=SETPAR/".

A sidebar on the left contains a navigation menu with categories: Wan (Status, Basic Settings, Keep Online), LAN (Basic Settings), Firewall (Authorized IPs), Serial Settings (Serial Port1-232/485), and Other (AT Command, Sms control, Periodic Autoreset, Time Servers, Remote Console, Snmp, Tacacs+, Https, User Permissions, Passwords Web UI, Backup / Factory, Firmware Upgrade, Reboot, Logout).

- **SMS enabled:** check the box if you want to be able to activate the MTX-StarEnergy-M’s 2G/3G/4G connection temporarily, after sending an SMS message. The SMS message that has to be sent to activate the connection is “ROUTER ON”, in capital letters. This option has no relevance (it does not need to be activated) if the MTX-StarEnergy-M is configured for a

permanent 2G/3G/4G connection, as is usual in metering applications

- **Send IP:** check the box if you want the MTX-StarEnergy-M to send you an SMS message with the acquired IP address after a connection by SMS
- **AT enabled:** check this box if you want to be able to send AT commands by SMS to the MTX-StarEnergy-M, for example to know the coverage remotely, to perform a reset, change a configuration...
- **AT header:** write the header text for command SMS messages here. For example, if you write in this box “mtx”, when you send an AT command by SMS, let’s imagine the command AT + CSQ to know the general level of coverage, you would need to send an SMS message with the text “mtx AT + CSQ”
- **All phones:** check this box if you want all phones to be able to send AT commands by SMS to the MTX-StarEnergy-M. Do not check this box if you want to specify authorized phone numbers. You can also activate it if your telephone operator allows you to filter SMS, that is, the filtering of phone numbers is done at the operator’s network level instead of at the device level
- **Authorized Number X:** in these boxes you can specify up to 5 authorized telephone numbers in the event that the option “All phones” is not selected
- **Alias / ATCommand:** up to 10 aliases can be entered to execute SMS commands. For example, the AT command that performs a reset of the MTX-StarEnergy-M is AT ^ MTXTUNNEL = REBOOT. If, for example, you specify the alias “reset”, all you have to do is send an SMS with the text “reset” to MTX-StarEnergy-M so that it restarts instead of having to send an SMS with the text “mtx AT ^ MTXTUNNEL = RESET”, longer and more complex to remember.

Aliases also allow the passing of parameters. For example, imagine that you have configured the MTX-StarEnergy-M in “2g” mode to be able to accept IP connections and CSD calls. In the future, where you will not need CSD calls (IP only) you will want to be able to change the working mode to “auto” so that the MTX-StarEnergy-M connects to 2G/3G/4G depending on the network availability in the area.

For this you can specify an alias such as “network [params]” together with the command “AT ^ MTXTUNNEL = SETPARAM, WAN_NETWORK, [* 1]”.

If you send the MTX-StarEnergy-M an SMS message with the text “auto network”, the setting will change from “2g” to “auto”. (Note: Do not forget to send a reset SMS to the equipment so that it takes the new configuration).

- **Alias Result OK:** text that will be sent as a response in the event that the execution of an ALIAS command is successful
- **Alias Result ERROR:** text that will be sent as a response in the event that the execution of an ALIAS command is wrong

ADDITIONAL NOTES

- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect

2.5.3 Other: Periodic Autoreset

From this section you can configure a scheduled autoreset.

- **Autoreset not enabled:** activate the option if you do not want the device to reset automatically
- **Autoreset every X hours:** activate the option if you want the device to autoreset every certain number of hours. Usually set to 24h in metering applications
- **Auto-reset at specific time:** select this option if you want the device to self-reset at a specific time of day
- **Auto-reset if router can't obtain IP after X minutes:** allows specifying the minutes after which the device must autoreset in case of not being able to obtain an IP address

The screenshot displays the web interface for the MTXRouter Titan. The header includes the logo 'MTXRouter Intelligent Router - Control Panel' and 'Titan'. A left sidebar contains a navigation menu with categories: Wan (Status, Basic Settings, Keep Online), LAN (Basic Settings), Firewall (Authorized IPs), Serial Settings (Serial Port1-232/485), and Other (AT Command, Sms control, Periodic Autoreset, Time Servers, Remote Console, Snmp, Tacacs+, Https, User Permissions, Passwords Web UI, Backup / Factory, Firmware Upgrade, Reboot, Logout). The main content area is titled 'Other > Periodic Autoreset' and features three radio button options: 'Autoreset not enabled', 'Autoreset every X hours' (which is selected), and 'Autoreset at specific time'. The 'Autoreset every X hours' option has a text input field set to '24' and the label 'Every X hours device will be rebooted'. The 'Autoreset at specific time' option has a text input field set to '0' and the label '0 ... 23'. Below these is an unchecked checkbox for 'Reset if router can't obtain IP after X minutes' with a text input field set to '0' and the label '5 ... 1440 min.'. A 'SAVE CONFIG' button is located at the bottom of the configuration area.

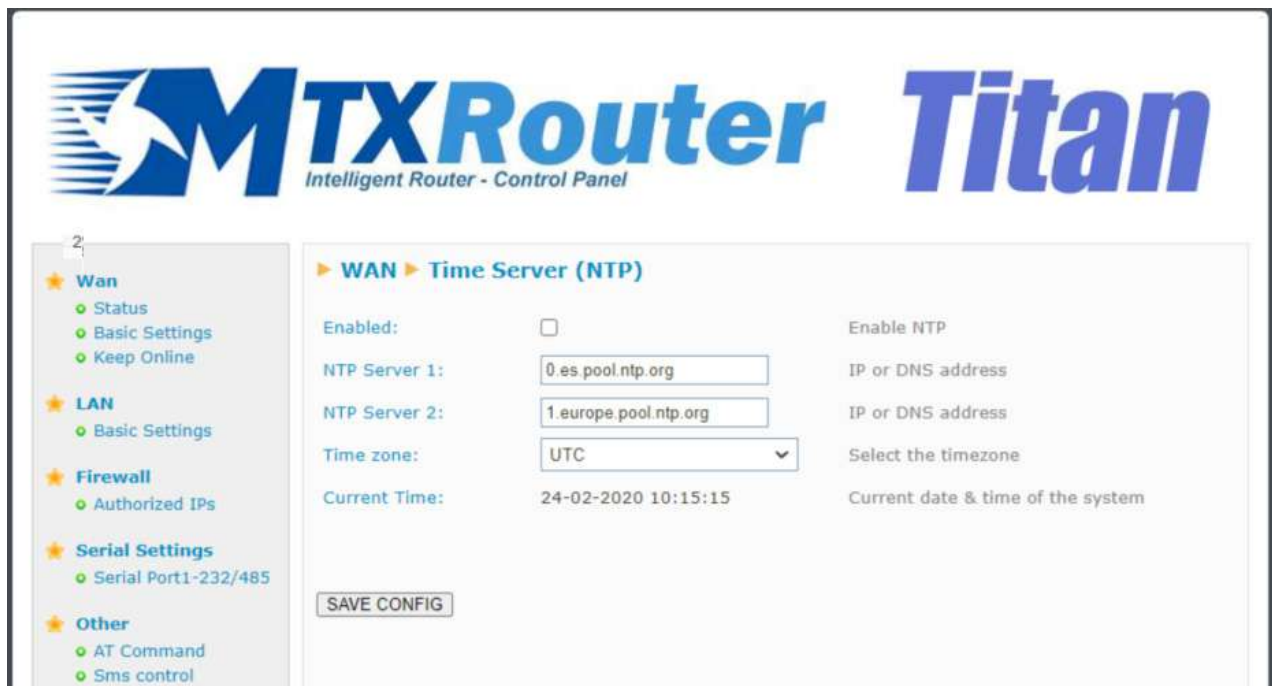
ADDITIONAL NOTES

- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect

2.5.4 Other: Time Server (NTP)

The MTX-StarEnergy-M has a real-time clock inside that allows it to keep the time even after power loss. Periodically, this internal clock needs to be synchronized with time servers through the NTP protocol if you want to keep the device on time.

- **Enabled:** check this box if you want to use NTP time servers
- **NTP Server 1:** IP or DNS address of time server 1
- **NTP Server 2:** IP address or DNS of time server 2
- **Time Zone:** specify the time zone



The screenshot displays the MTXRouter Titan Intelligent Router Control Panel. The main heading is "WAN Time Server (NTP)". The configuration options are as follows:

Field	Value	Description
Enabled:	<input type="checkbox"/>	Enable NTP
NTP Server 1:	0.es.pool.ntp.org	IP or DNS address
NTP Server 2:	1.europe.pool.ntp.org	IP or DNS address
Time zone:	UTC	Select the timezone
Current Time:	24-02-2020 10:15:15	Current date & time of the system

A "SAVE CONFIG" button is located at the bottom of the configuration area. A sidebar on the left contains navigation links for Wan, LAN, Firewall, Serial Settings, and Other.

ADDITIONAL NOTES

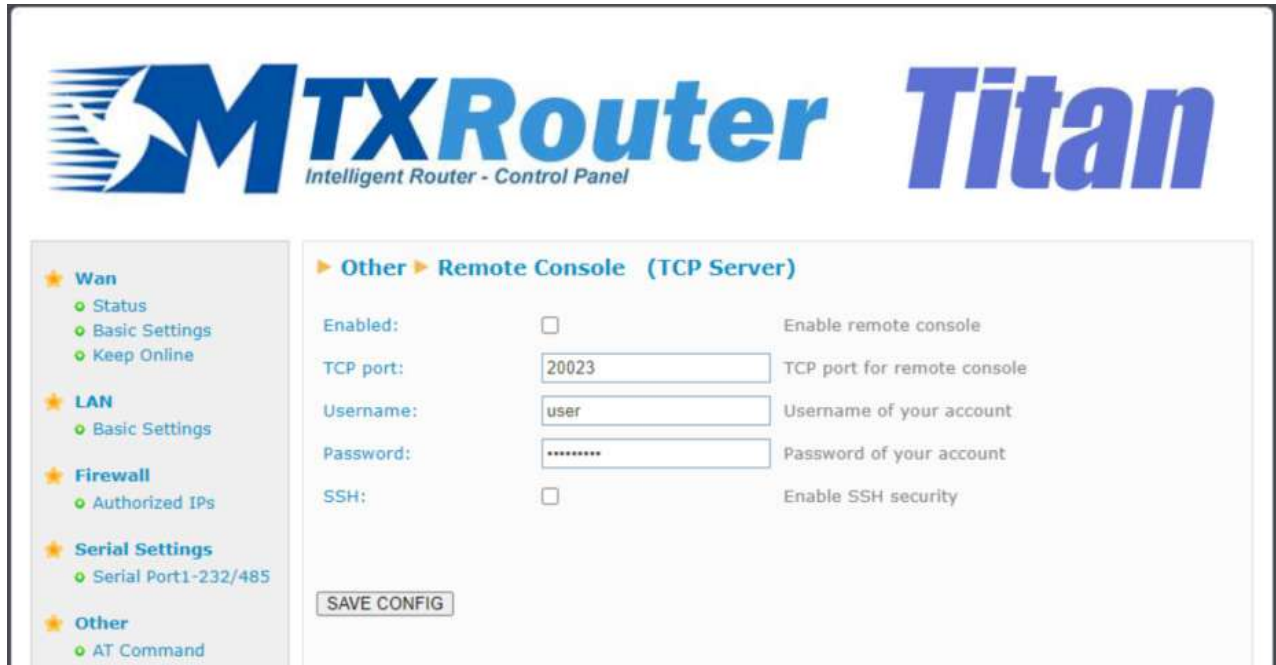
- Once the configuration is finished, press the "SAVE CONFIG" button to save the changes. Remember that you must restart the device for the new changes to take effect

2.5.5 Other: Remote Console (TCP Server)

If at any time you need to perform a special remote operation on the MTX-StarEnergy-M, you can also do it through a "Telnet or SSH type" connection, you can do it by configuring this section. That is, with this special connection you can, by sending AT commands through a telnet-type connection, make a device configuration change, reset it, etc. In other words, the same thing that can be done by SMS messaging but by IP connection.

- **Enabled:** check this box if you want to use this special connection
- **TCP Port:** TCP listening port, where you must make the connection

- **Login:** username that will be requested after making the connection
- **Password:** user password that will be requested after entering the user name
- **SSH:** check the box if you want to use SSH instead of Telnet



ADDITIONAL NOTES

- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect. If you check/uncheck the SSH box, be sure to also re-enter the password

2.5.6 Other: Passwords

It is possible to set three users to access the MTX-StarEnergy-M configuration, each with a level of privileges. From the “admin” user you will have access to all the MTX-StarEnergy-M configuration, the “user” user will have access to the configurations that are selected from the admin user for this, and the “guest” user will be able to access the same configuration menus as “user” but without being able to make configuration changes.

MTXRouter Titan
Intelligent Router - Control Panel

- ★ Wan
 - Status
 - Basic Settings
 - Keep Online
- ★ LAN
 - Basic Settings
- ★ Firewall
 - Authorized IPs
- ★ Serial Settings
 - Serial Port1-232/485
- ★ Other
 - AT Command
 - Sms control
 - Periodic Autoreset
 - Time Servers
 - Remote Console
 - Snmp
 - Tacacs+
 - Https
 - User Permissions
 - Passwords Web UI
 - Backup / Factory
 - Firmware Upgrade
 - Reboot
 - Logout

▶ Other ▶ Password Web UI

Administrator

Username: Mandatory. Default 'admin'

Password: Password for router administration

Re enter Password: Re-enter password for router administration

General User

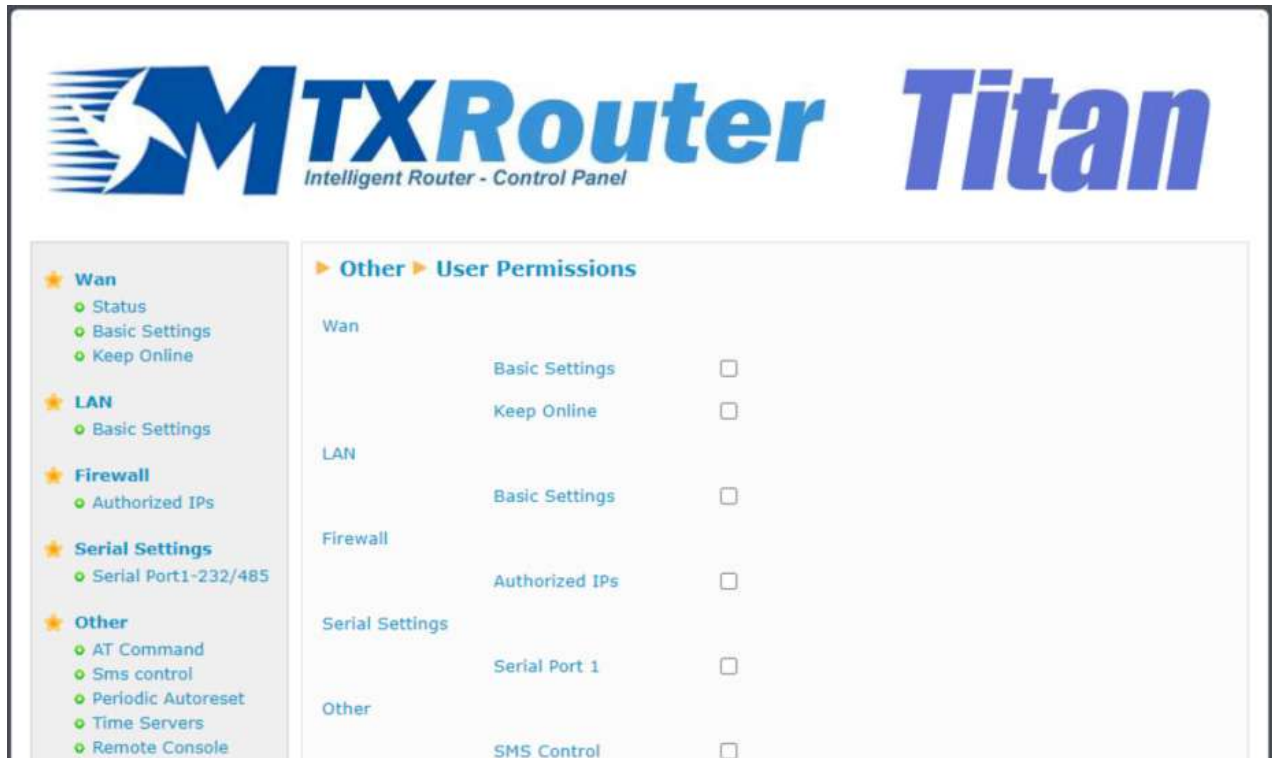
Username: Blank is not used

Password: Password for router administration (user)

Re enter Password: Re-enter password for router administration (user)

2.5.7 Other: User Permissions

From this section the user “admin” can configure the permissions to which the user “user” and “guest” will have access. The configuration options that you do not select will not appear in the menu on the left of the configuration environment when you log into the MTX-StarEnergy-M with the username “user” or “guest”.



ADDITIONAL NOTES

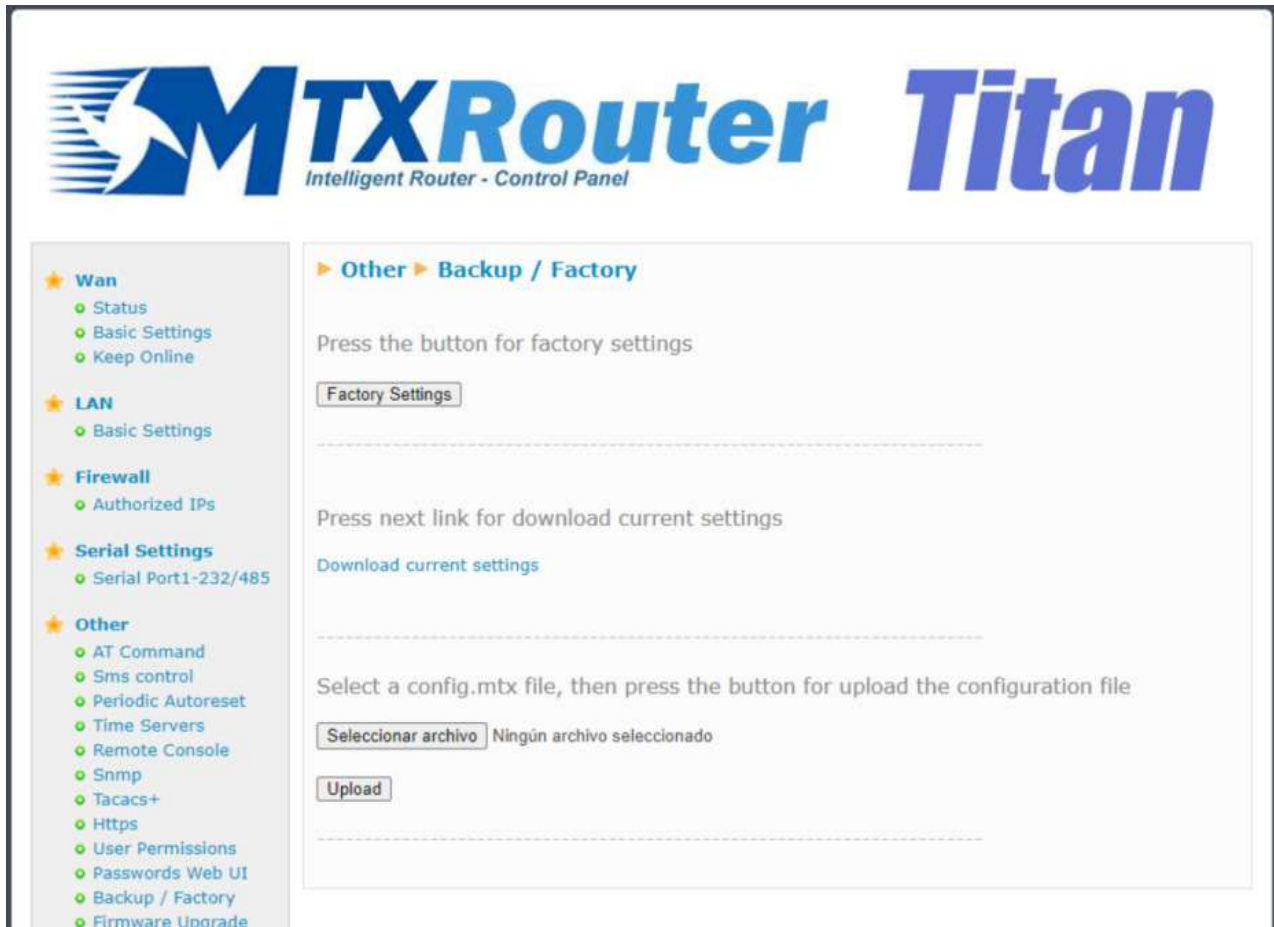
- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect

2.5.8 Other: Backup/Factory

You can perform a full backup of the MTX-StarEnergy-M configuration from this menu. You can save the configuration to a file and write it back to the device when you need it. It also allows you to configure the MTX-StarEnergy-M with the factory settings.

- **Botón “Factory Settings”**: press this button if you want to restore the equipment to factory settings
- **Link “Download settings”**: click on the link to download the configuration of the MTX-StarEnergy-M in a file named “config.mtx”

- **Botón “Seleccionar archivo”**: to restore a saved configuration, after indicating the configuration file to use, press the “Upload” button to upload the file



ADDITIONAL NOTES

- You can also restore the MTX-StarEnergy-M to factory settings using a jumper housed inside, next to the asim holder. To do this, you would have to turn on the MTX-StarEnergy-M with the jumper connected and wait 1 minute. After removing the jumper and turning the device back on, it will start up with the default configuration

2.5.9 Other: SNMP

The MTX-StarEnergy-M device allows to execute SET and GET operations through SNMP protocol from standard SNMP applications.

The screenshot displays the 'Other > SNMP' configuration page in the MTXRouter Titan control panel. The page is divided into a left sidebar with navigation options and a main configuration area. The sidebar includes sections for Wan, LAN, Firewall, Serial Settings, and Other, each with sub-options. The main configuration area contains several settings for SNMP, including an 'Enabled' checkbox, 'SNMP Version' dropdown (set to SNMPv2c), 'UDP Port' (161), 'Custom OID' (.45711.1.1), 'Community' (public), 'Username', 'Auth Password', 'Priv. Password', 'Auth Protocol' (MD5), and 'Priv Protocol' (DES). There are also sections for 'Traps' with 'UDP Port' (162), 'IP', and 'Community' (public). A link for 'download MIB' is visible at the bottom right of the configuration area.

- **Enabled:** select if you want to enable the SNMP service of the MTX-StarEnergy-M
- **SNMP Version:** can be selected between SNMPv2c and SNMP v3
- **UDP port:** the standard UDP port for SNMP is 161, but you can specify the one that suits you best
- **Custom OID:** allows you to change the Enterprise-Product OID from the default value (.45711.1.1) in case you want to adjust it to your corporate values
- **Community:** the password to be able to execute SET and GET commands. Only necessary for SNMPv2
- **Username:** username in the case of using SNMPv3 (not necessary for SNMPv2)
- **Auth Password:** authentication password for SNMPv3 (not necessary for SNMPv2)

- **Priv Password:** privacy password for SNMPv3 (not necessary for SNMPv2)
- **Auth Protocol:** protocol for authentication (MD5 or SHA)
- **Priv Protocol:** encryption protocol (DES, AES128, AES192, AES256)
- **Traps – UDP Port:** allows you to specify the port for SNMP TRAPS
- **Traps – IP:** IP address for sending SNMP TRAPS
- **Community:** community field for sending TRAPS

ADDITIONAL NOTES

- Once the configuration is finished, press the “SAVE CONFIG” button to save the changes. Remember that you must restart the device for the new changes to take effect
- In the previous screen you will see a link with the text “Click here for download MIB”. Download the file to obtain the MIB with the OIDs
- Through SNMP you can monitor the MTX-StarEnergy-M, for example by interrogating to obtain the RSSI (coverage), the date and time, the operating time, if it is working in 2G/3G/4G mode, the operator used

2.5.10 Other: HTTPS

From this section it is possible to activate HTTPS in the configuration environment, if necessary.

- **Enabled:** enables the HTTPS service (self-signed certificates are generated automatically after reboot)



ADDITIONAL NOTES

- Once the configuration is finished, press the "SAVE CONFIG" button to save the changes. Remember that you must restart the device for the new changes to take effect
- When you try to connect to MTX-StarEnergy-M via HTTPS your browser will probably show you a warning message regarding the self-signed digital certificate. It's completely normal

2.5.11 Other: Tacacs+

If an external Tacacs+ server is required to authenticate the device's HTTP and Telnet services, it must be configured in this section.

- **Server:** IP or DNS address of the Tacacs+ server
- **Port:** listening port of the Tacacs+ server (by default 49)
- **KEY:** encryption password
- **Service http:** check the box if you want the device's web access to use the Tacacs+ authentication service
- **Service console:** check the box if you want access by telnet or ssh (Remote console) to the device to use the authentication service Tacacs+

The screenshot displays the MTXRouter Titan Intelligent Router Control Panel. The main heading is "MTXRouter Titan Intelligent Router - Control Panel". On the left, a navigation menu includes sections for Wan, LAN, Firewall, Serial Settings, and Other. The "Other" section is expanded to show "Tacacs+ authentication". The configuration fields are as follows:

Server:	<input type="text"/>	IP or DNS of Tacacs+ server
Port:	<input type="text" value="49"/>	0 ... 65535 (default 49)
Key:	<input type="text"/>	KEY for tacacs+
Service Http:	<input type="checkbox"/>	Check if tacacs+ is needed for HTTP (WAN)
Service Console	<input type="checkbox"/>	Check if tacacs+ is needed for CONSOLE

Note: although tacacs+ "service http" to be active, the "admin" user will be able to use the local password.

ADDITIONAL NOTES

- Once the configuration is finished, press the "SAVE CONFIG" button to save the changes. Remember that you must restart the device for the new changes to take effect
- Keep in mind that the MTX-StarEnergy-M will allow you to use the username and password assigned to the user "admin" locally, so that if the route does not have internet connectivity (change of operator, etc.) it has an option to enter the team. Therefore keep the local password of the user "admin" safely

2.5.12 Other: Firmware Upgrade

From this section it is possible to update the FW of the MTX-StarEnergy-M whenever necessary.

Just press the “Select File” button and choose the firmware file with which to update the equipment. After that, the “Upload” button must be pressed.

The update process will take approximately 2 minutes.



3. AT Commands

The MTX-StarEnergy-M firmware allows you to send AT commands directly to the internal modem (QUECTEL) through multiple interfaces:

- By SMS
- Via Telnet/SSH (remote console)
- Using webserver
- Via SNMP

Therefore, at your own risk, you can send AT commands to the MTX-StarEnergy-M. The accepted AT commands are those indicated in the QUECTEL module AT command manual plus some additional ones listed below:

```
AT^MTXTUNNEL=REBOOT
```

Action: reset the MTX-StarEnergy-M

```
AT^MTXTUNNEL=VERSION
```

Action: returns the firmware version of the MTX-StarEnergy-M

```
AT^MTXTUNNEL=GETIP
```

Action: return the WAN IP address (2G/3G/4G)

```
AT^MTXTUNNEL=SMS, telephoneNumber, message
```

Action: send an SMS message to a specific phone number

Example: AT ^ MTXTUNNEL = SMS, + 34677123456, burglary alarm

```
AT^MTXTUNNEL=GETTIME
```

Action: returns the current time

Example: AT^MTXTUNNEL=GETTIME

```
AT^MTXTUNNEL=GETTIME
```

```
21/05/2016 10:56:52
```

```
OK
```

```
AT^MTXTUNNEL=GETPARAM, paramName
```

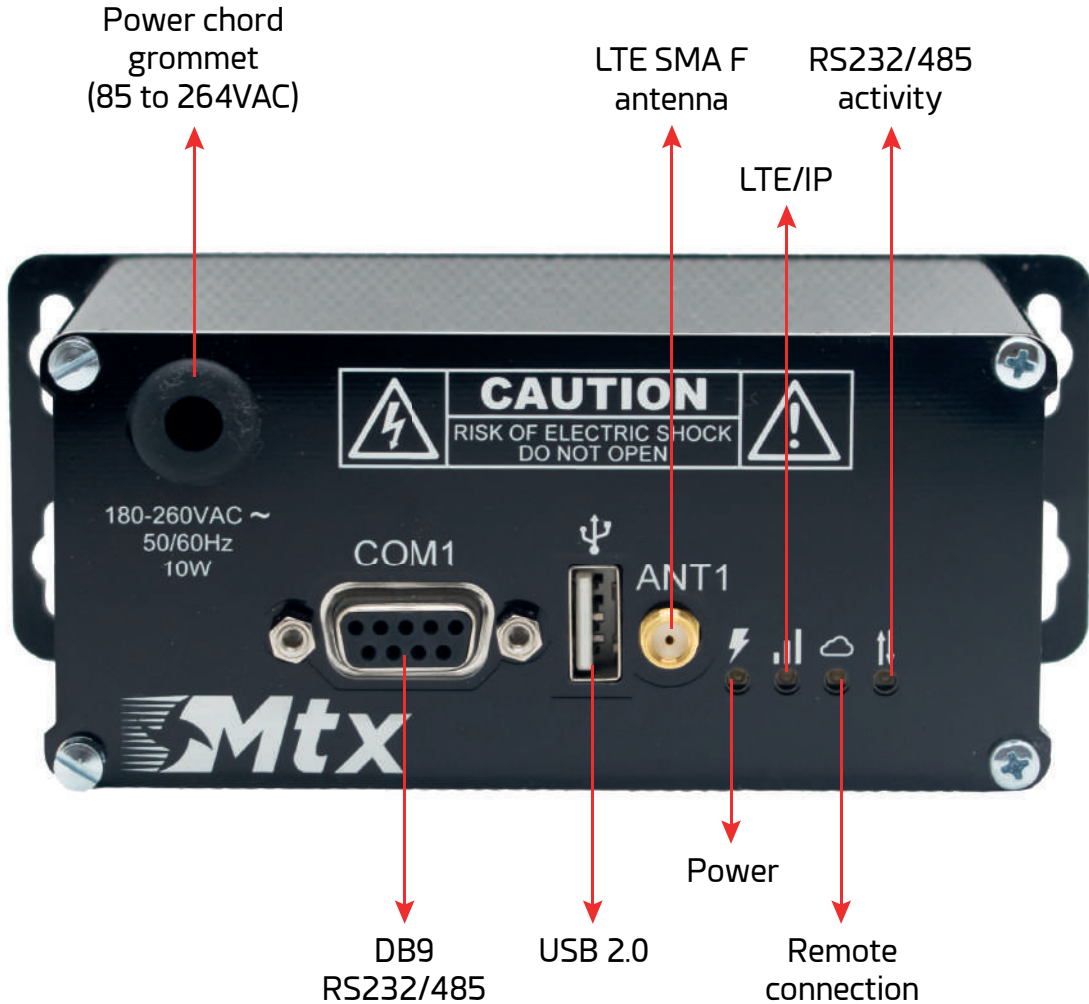
Action: allows reading the value of the MTX-StarEnergy-M configuration parameters. For example, you can check the APN field you have configured, the speed of the serial port, etc.) via AT commands. Consult with Matrix Electrónica iotsupport@mtxm2m.com in case you want to use this command for a specific configuration parameter

```
AT^MTXTUNNEL=SETPARAM, paramName, paramValue
```

Action: allows you to change the value of the MTX-StarEnergy-M configuration parameters. For example, you can change the APN field you have configured, the serial port speed, etc.) via AT commands. Consult with Matrix Electrónica iotsupport@mtxm2m.com in case you want to use this command for a specific configuration parameter

ANNEX 1: Connection Quick Guide

1. Connectors/indicators



LED	Status
Power (orange)	Power LED: lights up when the equipment is properly powered.
LTE signal/IP (blue)	Network LED: it lights up when the equipment gets the IP address from the operator. Solid blue when coverage is good, flashing blue when coverage is poor.
Remote connection (orange)	Connection LED: it lights up when the Reading Platform makes an IP connection against the modem to remotely read the meter.
RS232/485 activity (orange)	Serial Port LED: it lights up when data is received on the serial port, that is, data from the meter. It allows to check the proper functioning of the serial link with the meter.

DB9	Signal	Level
1	NC	NA
2	RxD	RS232
3	TxD	RS232
4	NC	NA
5	GND	RS232
6	Rx-	RS485
7	Rx+	RS485
8	Tx-	RS485
9	Tx+	RS485

2. Start Up

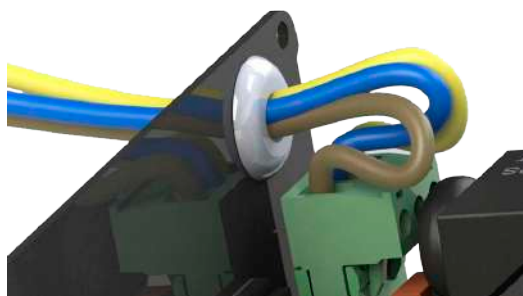
Step 1

To power the device, the front must first be removed, unscrewing the 4 corner screws. Then, pass the power cables through the grommet located in the upper left corner of the front. And connect the cables to the female terminal, supplied with the equipment. The distribution of signals in the internal terminals of the equipment is shown in the following image.



Step 2

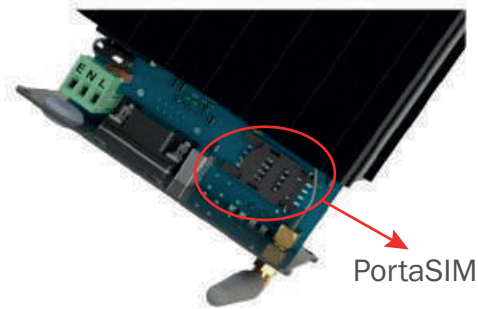
Finally, connect the female terminal, with the power cables, to the male terminal inside the equipment (as shown in the following image); close the box by screwing back the front and connect the equipment to the electrical network.



The device connects directly to the mobile phone network assigned to it by the IP indicated on the side label. Afterwards, the team waits for the Iberdrola platform to initiate communication. Confirm the correct operation of the equipment indicated by the status of the LEDs on the front (see table above).

Step 3

The device is supplied without a SIM card. The customer must insert a card in the internal SIM tray of the equipment.



3. Accessories

Accessories included with the kit:



Serial cable



Antenna stub



2 DIN rail clips



3 way terminal

ANNEX 2: Configuration Examples

1. Example Scenario: Configuration to access an IEC60870-5-102 electric meter through IP connection and GSM data call (CSD).

Details of the example scenario:

There is an electrical meter with the IEC60870-5-102 protocol which is intended to be read periodically remotely through a modem.

The meter must be accessible via a transparent TCP/IP connection but also via a GSM data call (CSD). Therefore, the modem to which the meter is connected must support both types of connectivity.

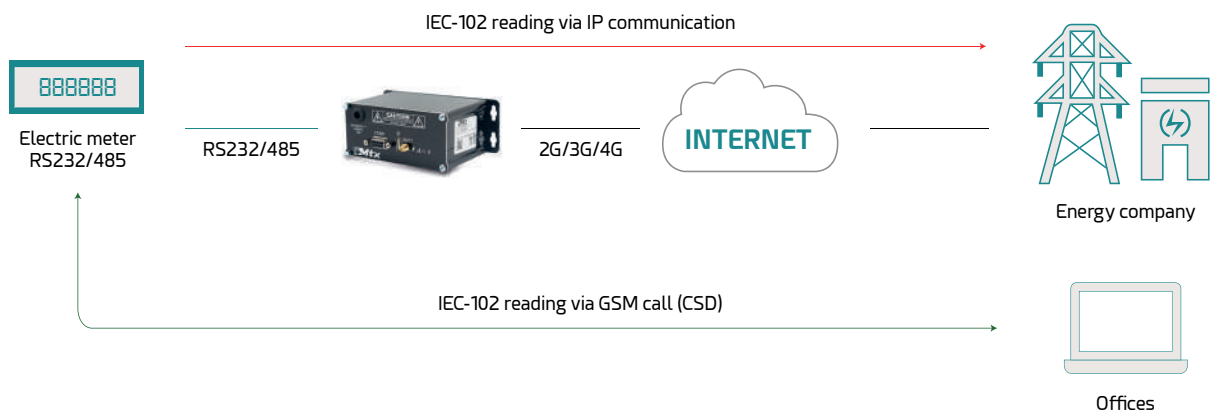
SIM phone cards with private APN with fixed IP address will be used.

For exceptional maintenance cases, the modem must be able to be configured remotely through SMS messaging, as well as being able to carry out operations to consult coverage, reset, etc. Everything from authorized telephone numbers.

The modem must be able to autoselect completely every 24 hours.

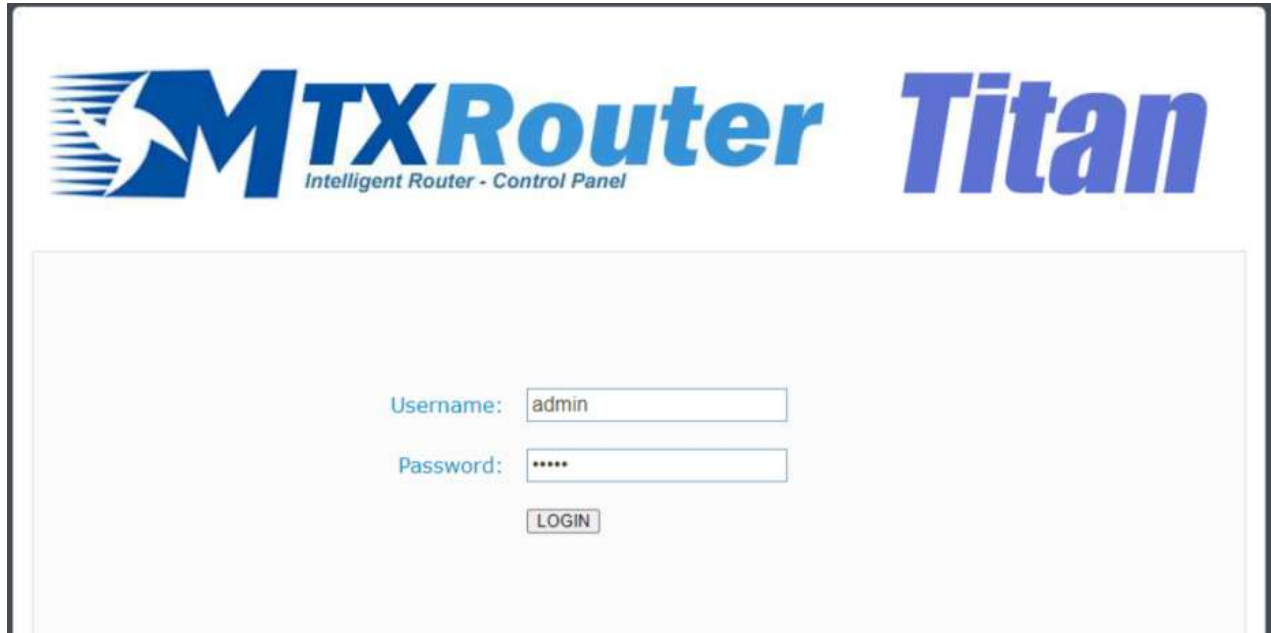
The modem must also have 4 LEDs to facilitate installation work. One that indicates that the modem is on, another that indicates if there is IP connectivity with good coverage, another that indicates if there is an IP connection from the reading platform and another that indicates if there is serial connectivity with the meter.

Solution: MTX-StarEnergy-M



Step 1. Access the configuration environment

To access the MTX-StarEnergy-M configuration, you must have the corresponding USB drivers installed as detailed in the “SOFTWARE” section of this manual. Once the steps have been followed, it is possible to access the MTX-StarEnergy-M configuration through a browser, by detecting it through the url <http://192.168.1.2> The default username and password is “admin”, “admin”.



The screenshot shows the login interface for the MTXRouter Titan. At the top left is the logo for MTXRouter, which includes a stylized blue and white star icon and the text "MTXRouter Intelligent Router - Control Panel". To the right of this is the word "Titan" in a large, bold, blue font. Below the logos is a white rectangular area containing the login form. The form has two input fields: "Username:" with the text "admin" entered, and "Password:" with "*****" entered. Below these fields is a button labeled "LOGIN".

Step 2. Configuring the WAN section

The next step is the WAN configuration, adjusting it to the parameters of the SIM card to be used. To do this, go to the “WAN> Basic Settings” section of the side menu. As the following image shows, there are several main sections to fill out. Configure the equipment as shown in the image by adjusting the parameters “APN”, “Username” and “Password” depending on the SIM card used (these parameters must be provided by your telephone operator). If the SIM card has a PIN, you must also enter it in the “Sim Pin” section. In the “Network Selection” section you can choose between “auto”, “GPRS”, “3G” and “4G”. The “auto” option will make the modem choose the network based on the availability of the area. In this example “GPRS” is selected because you want the modem to be able to handle CSD calls.

Once the section has been configured, the “SAVE CONFIG” button must be pressed.

The screenshot displays the 'WAN Basic Settings' configuration page. The left sidebar shows the navigation menu with 'Basic Settings' selected. The main content area includes the following fields and options:

- Enabled WAN:** (checked)
- Session Time:** 0
- APN:** movistar.es
- Username:** MOVISTAR
- Password:** MOVISTAR
- Call center:** *99***1#
- Sim Pin:** (empty)
- Authentication:** PAP
- Network selection:** GPRS
- DNS selection:** Get DNS from Operator
- DNS1:** 8.8.8.8
- DNS2:** 8.8.4.4
- Remote management:** (unchecked)
- Remote TCP Port:** 80

The 'SAVE CONFIG' button is located at the bottom of the page.

Step 3. Serial port configuration

In this section the parameters related to the serial port will be configured and that must correspond to those of the meter to which it will be connected. To do this, access the section “Serial Settings > Serial Port1-232/485”

The meter to be read has a configuration of 9600,8, N, 1 without flow control (that is, only TX, RX and GND lines) for a serial port of the RS485 type.

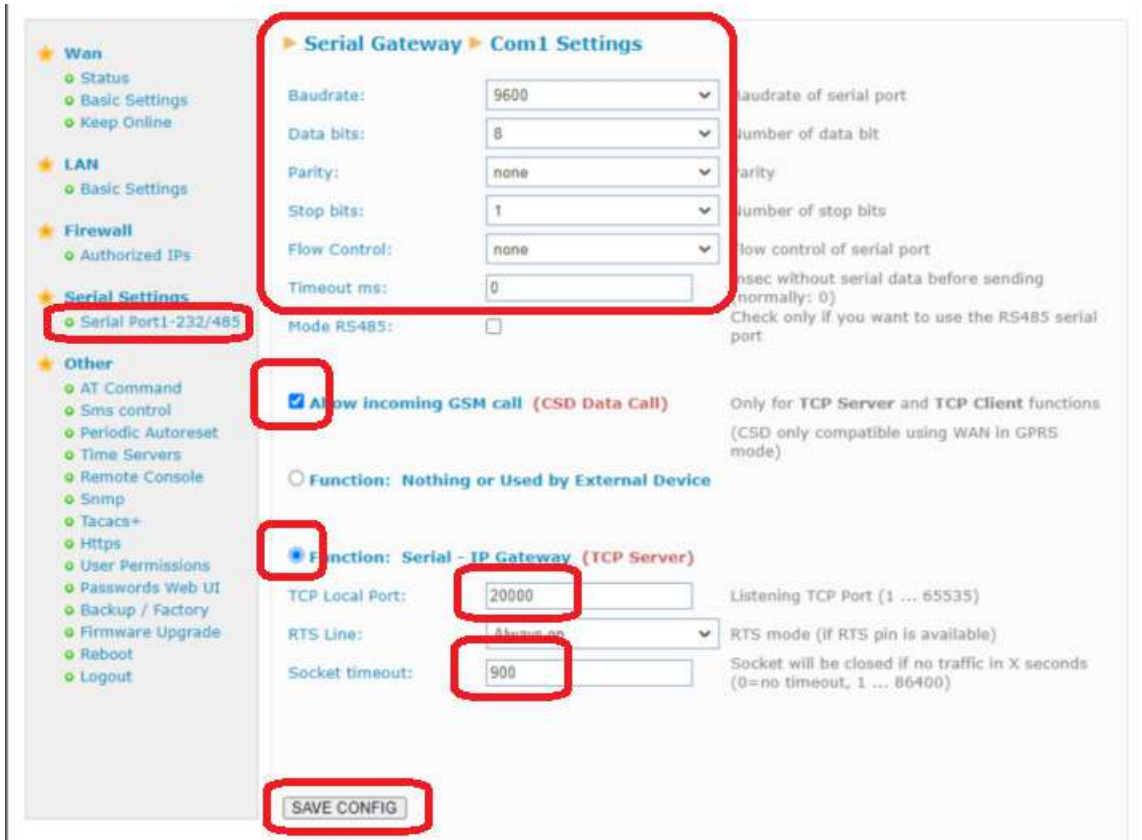
It must also be possible to access the serial gateway by means of a GSM data call (CSD), so the

corresponding box will be checked.

The TCP port on which the MTX-StarEnergy-M will be listening waiting for a connection will be TCP port 20000. For security reasons, we will establish a timeout of 900 seconds, that is, if after a TCP/IP connection with the modem, no data is received by the platform in that time, the connection socket will be closed automatically.

After configuring all the sections, press the “SAVE CONFIG” button.

The following figure shows all the settings established.



Step 4. SMS access configuration

To configure the MTX-StarEnergy-M to have access by SMS for configuration changes, remote resets, etc., go to the configuration section “OTHER > SMS control”.

In this section we activate the “AT” box that will allow the sending of AT commands by SMS. The “AT header” box specifies the SMS header, that is, the text that must precede the SMS command to be executed by the MTX-StarEnergy-M. In this example we indicate “mtx”.

In this example we will indicate that all phone numbers are valid, but up to 5 authorized phone numbers could be specified. Also, in the case of private APNs, the security of sending/receiving SMS messages can be managed at the level of the GSM operator’s own platform.

We will also add some ALIAS commands, that is, some custom commands that when received by the MTX-StarEnergy-M will execute the corresponding associated command. We will add:

```

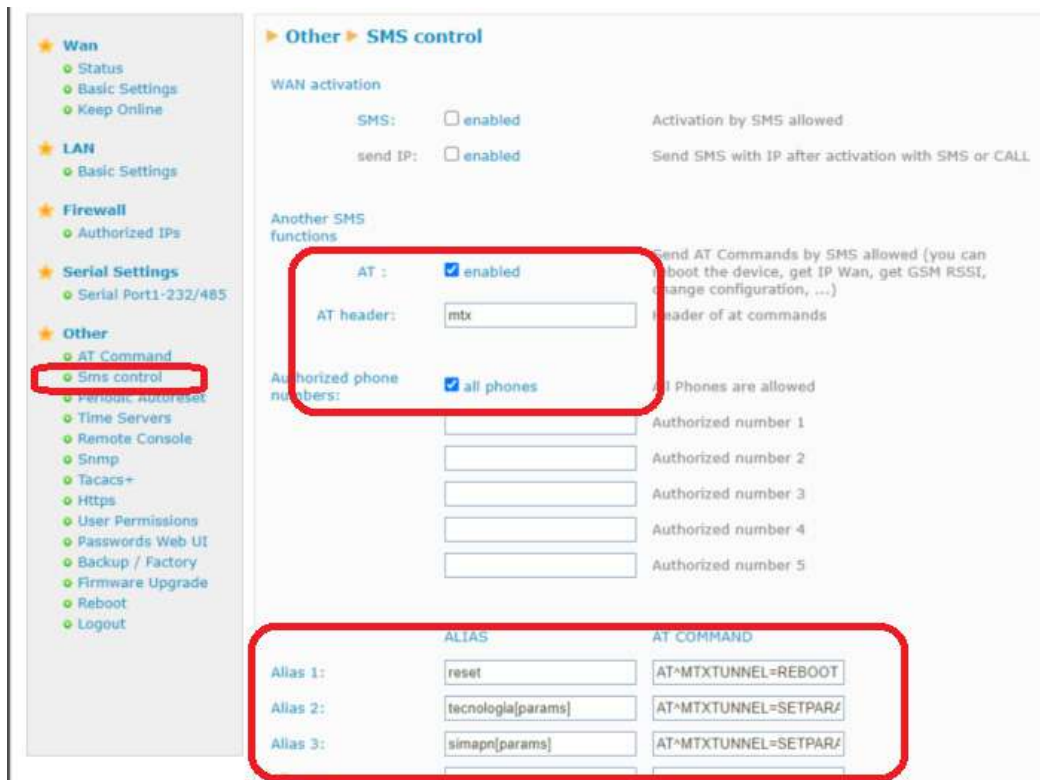
reset > AT^MTXTUNNEL=REBOOT
red[params] > AT^MTXTUNNEL=SETPARAM,WAN_NETWORK,[*1]
apn[params] > AT^MTXTUNNEL=SETPARAM,WAN_USERNAME,[*1]

```

In other words, when sending a command with the text “reset”, the MTX-StarEnergy-M will self-reset. When sending an SMS command as “auto network” the modem will be configured to work in “auto” mode (4g, 3g, 2g depending on availability) and for example, if we want to change apn, it will be enough to send an SMS as “apn minuevoapn”.

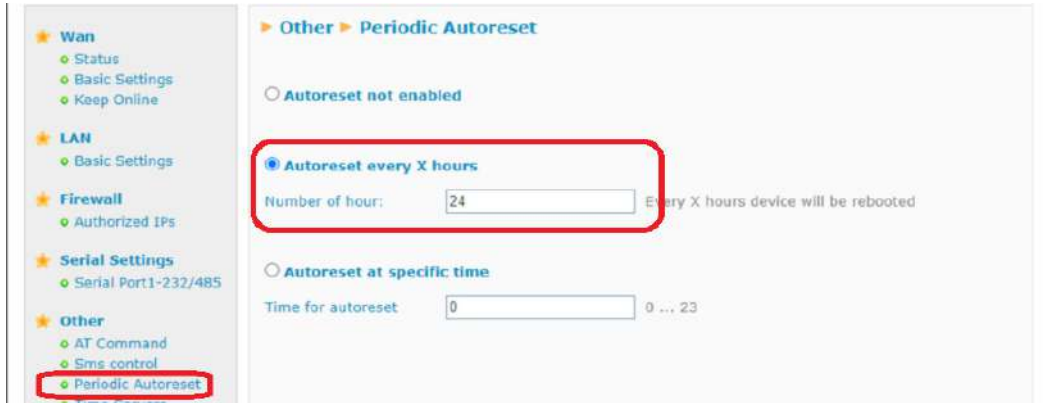
Remember that after the configuration changes, for them to be applied by the MTX-StarEnergy-M, the equipment must be restarted (manually, by SMS message, etc.).

The next screen shows the boxes to configure.



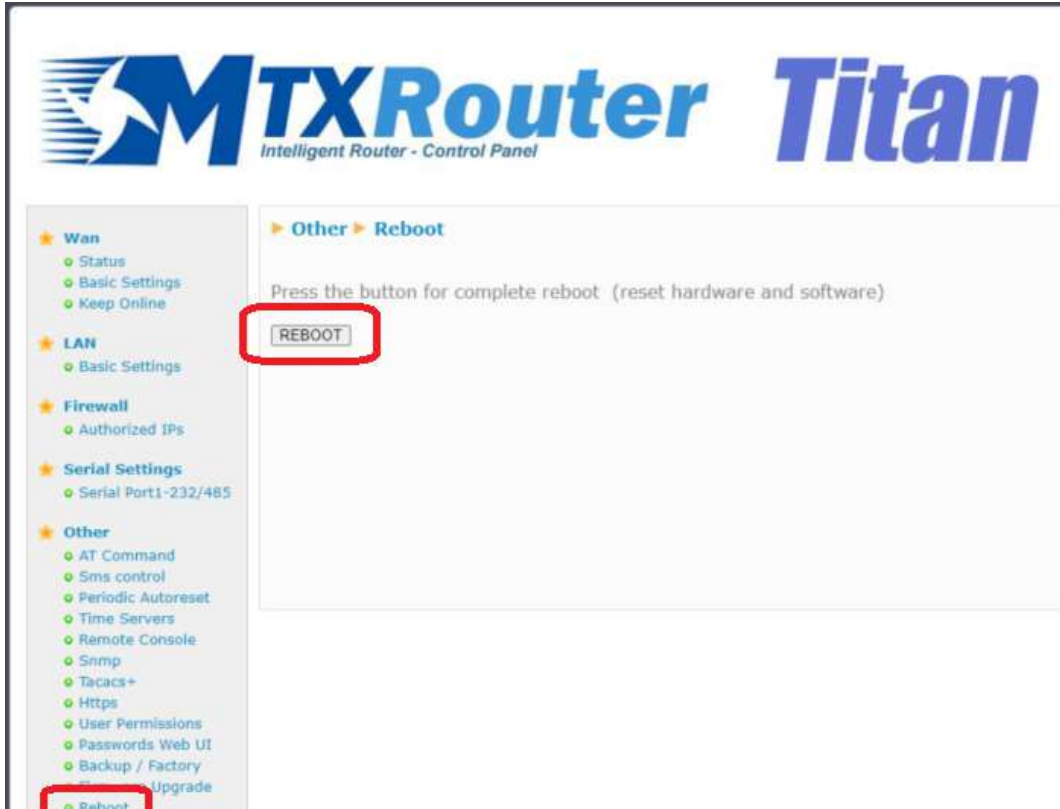
Step 5. Autoreset configuration every 24h

Although it is not necessary, it is typical for many users who use modems in telemetry scenarios, to schedule a daily reset every 24 hours to completely restart the terminal. The MTX-StarEnergy-M also has that option. To activate it, just go to the menu “Other > Periodic autoreset” and in the option “Autoreset every X hours” indicate 24.



Step 6. Restarting the MTX-StarEnergy-M

Once all the necessary options have been configured, simply restart the MTX-StarEnergy-M. This can be done from the Other > Reboot menu and pressing the “REBOOT” button.



Step 7. Testing the configuration

Once rebooted, after about 30-40 seconds, it is possible to check that the device has obtained an IP from the configuration menu from the “Wan > Status” menu.



Additionally, the MTX-StarEnergy-M has a series of LEDs on the front that, in case of problems, will help you to solve it. See Annex 1 of this manual where each LED is detailed.

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