

MTX

T I T A N

Firmware for MTX routers

WHITEPAPER

Based on a seminar
by Matrix on April 2018

www.matrix.es
www.iotblue.net

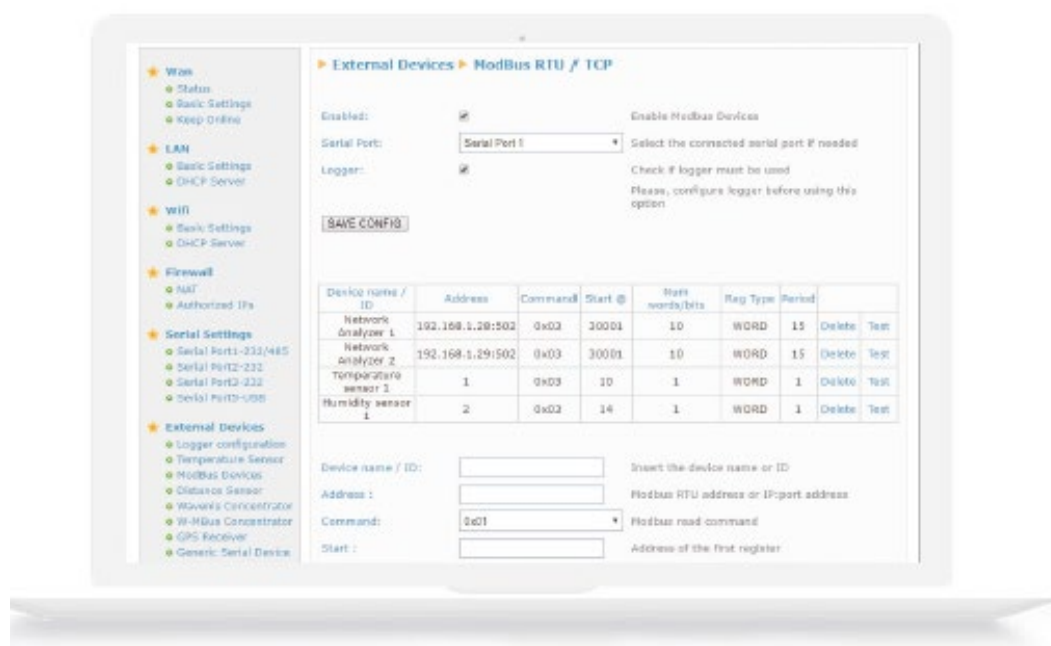


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WHAT IS MTX-TITAN?







The Titan software is a powerful firmware intended to provide MTX routers with their own independent platform. This way, MTX devices are able to be programmed to control sensors and other devices as well as receiving and sending data, without the need for further software.

TITAN FEATURES

Transparent Gateways and WiFi

- Transparent gateways 2G/3G/4G/ETH/WiFi* to RS232/RS485/USB (TCP Server, TCP Client)
- WiFi* AP or Client Mode





Serial Gateways

-  3 simultaneous 2G/3G/Eth/WiFi <-> RS232/485/USB gateways
-  Modes: TCP server/TCP client
-  SSH encryption enabled
-  Incoming CSD call for metering applications






Datalogger

- Sensor concentrator (datalogger): modbus, wavenis, digital inputs, analog inputs, pulse counters...

Datalogger

-  Data from sensors (temperature, distance...)
-  Serial data collected by RS232, RS485 or USB
-  GPS data for tracking applications or fleet management
-  Automatic data sending (HTTP/HTTPS/FTP/MQTT) with JSON format

Sensor Compatible

-  Temperature sensor MTX-Temp-RS232
-  Distance sensors (ultrasound) Maxbotics
-  Modbus RTU/TCP sensors
-  RF868 Wavenis sensors
-  Internal jamming detection sensor with alarm indicator

Internal Relays

- Digital input & relay* control (web, sms, astronomical clock, temperature, distance, GPS cells...)

Internal Relays



Control & activation by: web, schedule, SMS, astronomical clock, temperature, distance...



Automatic activation by GPS



Watchdog for external devices (relay is activated if ping doesn't respond)

VPN

- VPN (OpenVPN server, OpenVPN client, Easylink)

VPN



OpenVPN with client/server mode















Permanent or activated by SMS, AT command, modbus, SNMP, serial...

Other

- HTTP/HTTPS REST, FTP, MQTT for logged data transmission
- Full control by AT commands: web browser, Telnet, SMS, MQTT, SNMP, modbus...
- Watchdog, keep online, Ajautoreset, OTAP, GSM cell location....

Other

-  Compatible with DynDNS/No-IP & private DNS
-  GSM cell location
-  Programmable autoreset (schedule, timer...)
-  Multioperator SIM utilities (integrated rssi scanning tool)
-  Time synchronization (NTP) with timezones
-  Over The Air firmware upgrade
-  Full management with AT command by serial, socket, SMS, modbus, SNMP...
-  NAT, firewall, DHCP, etc. and other standard router characteristics
-  4G connectivity supervisor to maintain connection always active
-  Internal configuration webserver (custom logos, pictures, text, menus and features)
-  Clear and understandable application notes with examples (OpenVPN, serial gateways, modbus, datalogger, SMS, metering, SNMPv2 and SNMPv3...)
-  Traffic control (prevents excessive data traffic consumption), TACACS+ (for HTTP, Telnet and SSH), multiuser profiles

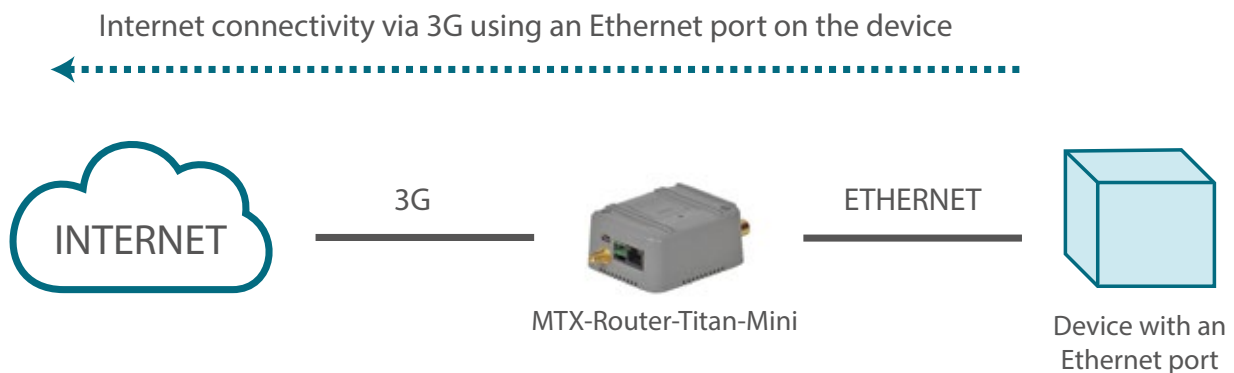
Example Scenarios

1. Configuration to provide a PLC with an Ethernet port with access to the Internet

Details of the example scenario:

- We have a PLC device with ETH port that we want to provide with Internet access in order to send data to the Cloud. The PLC has a local IP address of 192.168.1.70
- We need to be able to access the router's configuration remotely in the standard TCP port 80
- SIM cards with fixed IP address are used

Solution: MTX-Router-Titan mini router



Example configuration ready for use:

We can easily load the example from the router's web configuration environment from the menu "Other>Backup/Examples".

Details:

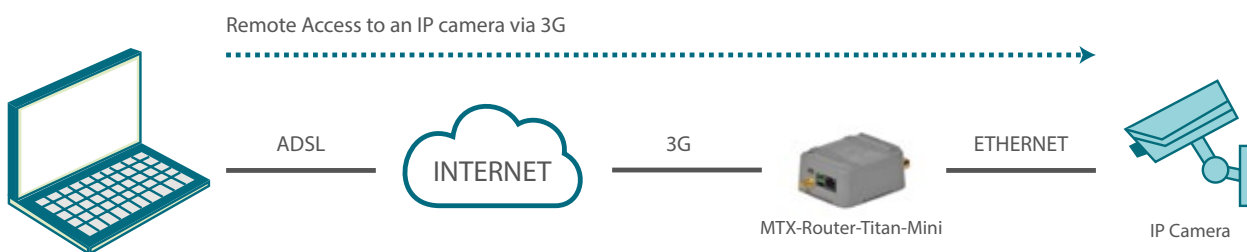
1. After the configuration is loaded in our router, we can access the router's configuration with the default username and password: "admin" and "admin", and the IP address "192.168.1.2"
2. Check the configuration in the menus "Wan>Basic Settings"
3. Remember that in order to work, the PLC's IP address should be in the range of the router's LAN IP address and we should specify the PLC's Gateway IP address with the router's LAN IP address. In this example, it would be 192.168.1.2

2. Configuration to provide Internet access and remotely connect an IP camera with an Ethernet port

Details of the example scenario:

- We have an IP camera with Ethernet port that we want to provide with Internet access. The camera has a local IP address of 192.168.1.70
- The IP camera has an internal webserver that we can use to access the video that is being recorded. The TCP port used by the camera is TCP80 and it cannot be changed. Since we also want to be able to remotely access the router in order to access the configuration, we must change the TCP port of the remote configuration from the TCP port 80 to the TCP port 8080 so that there are not conflicts with the camera port
- We also need the remote configuration to have access to the Internet from any IP address. Therefore, only the IP addresses 200.1.2.3 and 200.1.2.4, corresponding to the central offices, will be able to access the IP camera
- SIM cards with fixed IP address will be used

Solution: MTX-Router-Titan mini router



Configuration example ready for use:

Load the example from the web configuration environment from the menu “Other>Backup/Examples”.

Details:

1. After the configuration is loaded in our router, we can access the router’s configuration with the default username and password: “admin” and “admin”, and the IP address “192.168.1.2”
2. Check the configuration in the menus “Wan>Basic Settings”, “Firewall > NAT”, “Firewall > Authorized IPs”
3. In order to access the TCP port 80 belonging to the camera, we need to create an NAT. In other words, we need to redirect traffic that arrives in the router’s TCP80 port to the internal IP address and TCP port belonging to the camera; i.e. to the IP 192.168.1.70
4. Remember that in order to work, the camera’s IP address should be in the range of the router’s LAN IP address and we should specify the camera’s Gateway IP address with the router’s LAN IP address. In this example, it would be 192.168.1.2

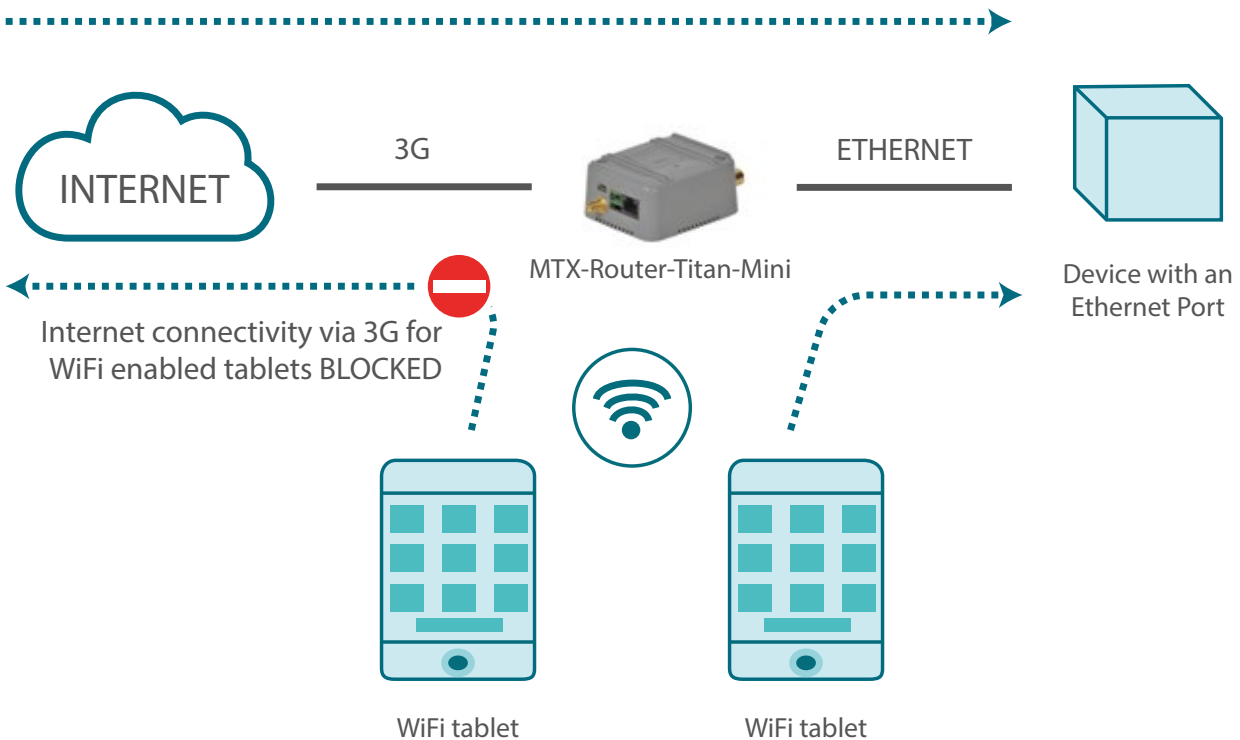
3. Configuration to provide a PLC device with an Ethernet port with Internet

Details of the example scenario:

- We have a PLC device with an ETH port which we want to provide with Internet access to send data to the Cloud. The PLC has a local IP address of 192.168.1.1
- Several tablets will also connect to the router via WiFi (DHCP) which will need to be able to connect to the Ethernet device which is connected to the router for maintenance tasks, although Internet access must also be blocked for these. Only the Ethernet device should have Internet access

Solution: MTX-Router-Titan mini router

Internet connectivity via 3G using and Ethernet port on the device



Configuration example ready for use:

We can easily load the example from the router's web configuration environment from the menu "Other>Backup/Examples".

Details:

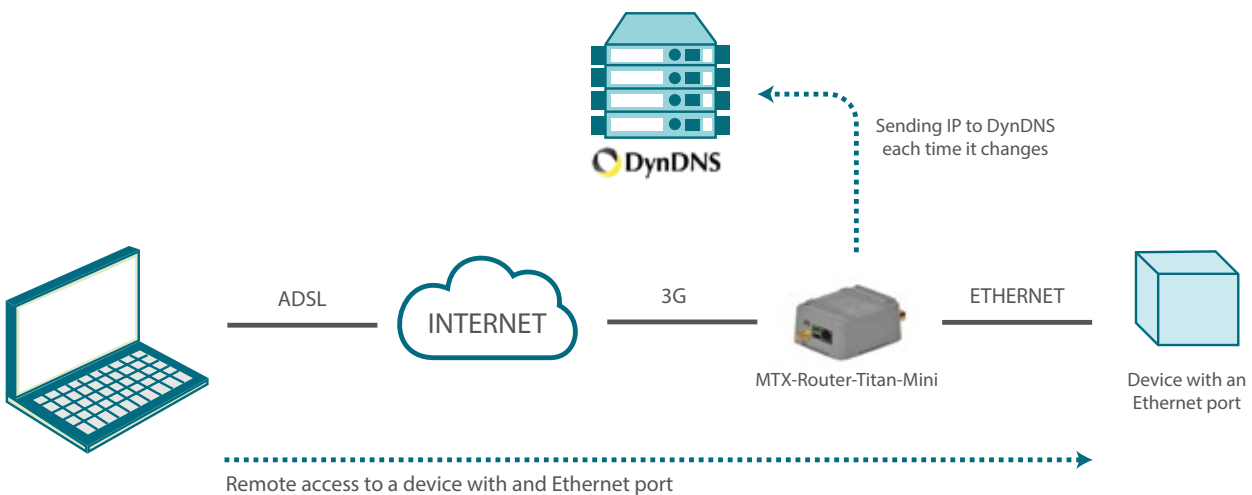
1. After the configuration is loaded in our router, we can access the router's configuration with the default username and password: "admin" and "admin", and the IP address "192.168.1.2"
2. Check the configuration in the menus "Wan>Basic Settings", "WiFi>Basic Settings", "WiFi>DHCP Server"
3. Remember that in order to work, the PLC's IP address should be in the range of the router's LAN IP address and we should specify the PLC's Gateway IP address with the router's LAN IP address. In this example, it would be 192.168.1.2

4. Internet access to a device with an Ethernet port we want to access remotely

Details of the example scenario:

- We have a device with an ETH port which we want to access remotely via Internet along the TCP port 502. The Ethernet device has a local IP address of 192.168.1.70
- We have to be able to access the router's configuration remotely in the standard TCP port 80
- We want to be able to remotely access the device. SIM cards with a dynamic IP address will be used, therefore we will use the DynDNS or No-IP services

Solution: MTX-Router-Titan mini router



Configuration example ready for use:

We can easily load the example from the router's web configuration environment from the menu "Other>Backup/Examples".

Details:

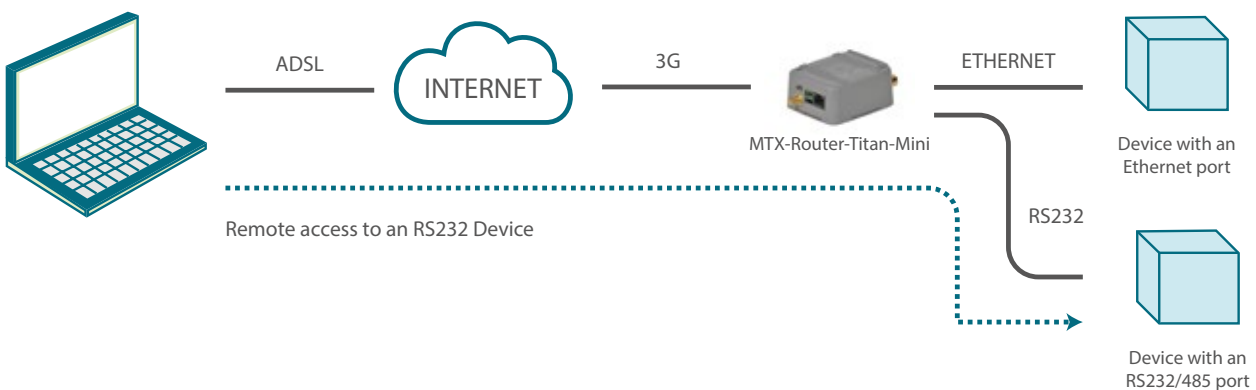
- After the configuration is loaded in our router, we can access the router's configuration with the default username and password: "admin" and "admin", and the IP address "192.168.1.2"
- Check the configuration in the menus "Wan>Basic Settings", "Firewall>Nat", "Other>DynDNS"
- Remember that in order to work, the Gateway IP address of the Ethernet device should be specified along with the router's LAN IP address. In this example, it would be 192.168.1.2

5. Configuration to access a serial device with a 3G-RS232 gateway whilst Internet access is given to a device with an Ethernet port

Details of the example scenario:

- We have a device with an Ethernet port which we want to provide with Internet access to send data to the Cloud. The device does not have a fixed LAN IP address, therefore we want to use DHCP in the Ethernet port
- We need to be able to access the router's configuration remotely via the standard TCP port 80
- The router will be listening in the TCP port 20010 to create a transparent 3G-RS232 gateway and to be able to remotely access the device via the serial port RS232 with the configuration 115200,8,N,1

Solution: MTX-Router-Titan mini



Configuration example ready for use:

We can easily load the example from the router's web configuration environment from the menu "Other>Backup/Examples".

Details:

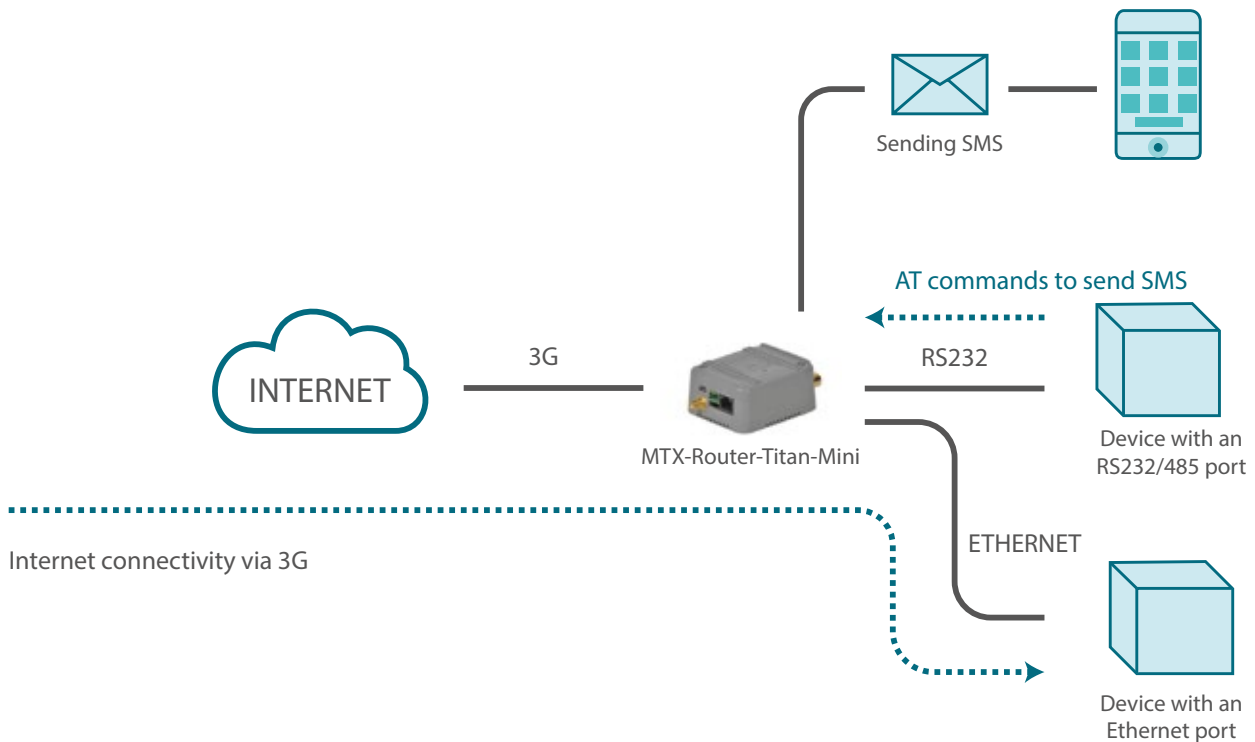
1. After the configuration is loaded in our router, we can access the router's configuration with the default username and password: "admin" and "admin", and the IP address "192.168.1.2"
2. Check the configuration in the menus "Wan>Basic Settings", "LAN>DHCP", "Serial Settings>Serial Port 1"
3. With the 3G-RS232 gateway, everything that is sent to the router's TCP port 20010 will be redirected to the device's serial port RS232 and vice versa

6. Configuration to provide Internet access to a device with an Ethernet port. Another serial device will be connected to the router via an RS232 port

Details of the example scenario:

- We have a device with an ETH port which we want to provide with Internet access for it to send data to the Cloud. The Ethernet device has the LAN IP address 192.168.1.70
- Another device, in this case with an RS232 serial port, will be connected to the router's RS232 port. This device will manage a series of alarms and must be able to send them via SMS using standard AT commands from any GSM modem

Solution: MTX-Router-Titan mini



Configuration example ready for use:

We can easily load the example from the router's web configuration environment from the menu "Other>Backup/Examples".

Details:

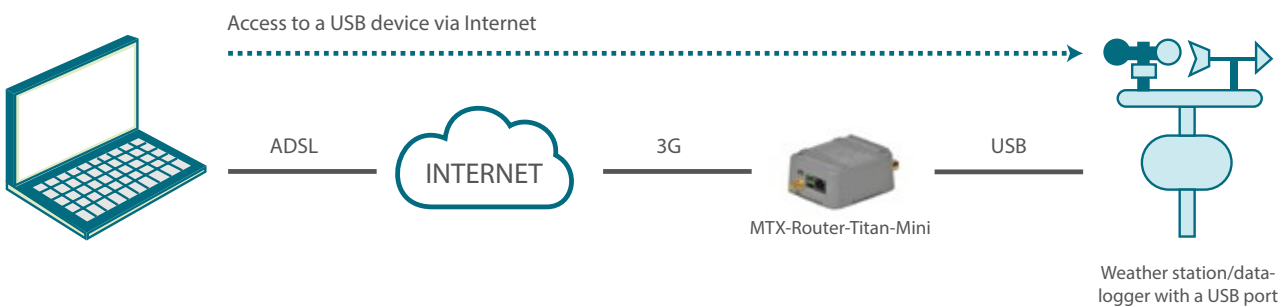
1. After the configuration is loaded in our router, we can access the router's configuration with the default username and password: "admin" and "admin", and the IP address "192.168.1.2"
2. Check the configuration in the menus "Wan>Basic Settings", "LAN>DHCP", "Serial Settings>Serial Port 1"
3. Check the configuration in "Serial Settings > Serial Port 1". The router redirects all traffic received in the serial port to the internal GSM module, therefore the AT commands that are sent through it must be appropriate for the Cinterion EHS5 module. Consult the commands AT+CMGF and AT+CMGS of the manual, which can be requested from us at gsm-support@matrix.es, to know about the sending of SMS

7. Configuration to remotely access a USB device via Internet using a 3G router

Details of the example scenario:

- We have a device with a USB port (a weather station) which we want to access remotely to extract the data from the internal datalogger. The driver is of the standard USB FTDI type
- The router will be listening in the TCP port 20014 to create a 3G-USB gateway and remotely access the device via USB port
- For simplicity, a SIM card with fixed IP address will be used in this example, although the IP address can be obtained via SMS, or we can use a missed call as seen in previous examples

Solution: MTX-Router-Titan mini



Configuration example ready for use003A:

We can easily load the example from the router's web configuration environment from the menu "Other>Backup/Examples".

Details:

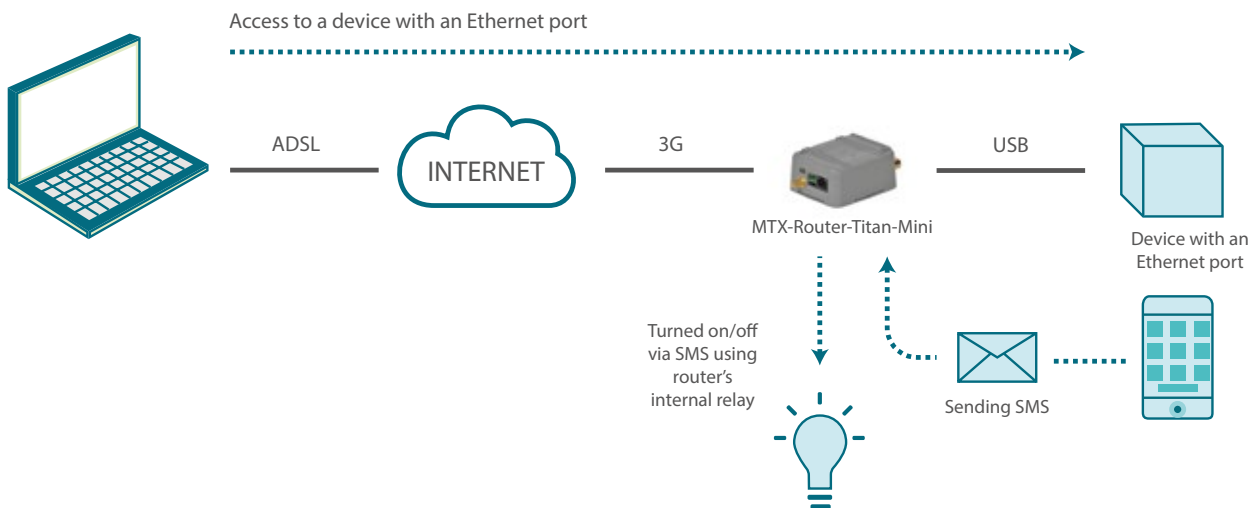
1. After the configuration is loaded in our router, we can access the router's configuration with the default username and password: "admin" and "admin", and the IP address "192.168.1.2"
2. Check the configuration in the menus "Wan>Basic Settings", "Serial Settings>Serial Port 5"
3. Remember that in order for the gateway to work, the driver that the device uses must be USB FTDI or ACM. For other USB devices, get in touch with us at gsm-support@matrix.es
4. A USB FTDI device emulates a serial device via USB. It is very important that we check the section "Serial Settings>Serial Port 5>Timeout ms" and the timeouts section, if this exists, in our control software
5. If we use the MTX-Router-Titan mini device, we will likely need to use a miniUSB-USB adaptor
6. Remember that the USB device must be connected to the router before the MTX router is connected to a power source. The MTX router will not detect the USB device correctly if it is connected after the power supply

8. Configuration to provide remote access to a device with an Ethernet port as well as to change a relay via SMS to activate/deactivate a third device

Details of the example scenario:

- We have a device with an ETH port which we want to provide with Internet access to send data to the Cloud. The Ethernet device has the IP address 192.168.1.70
- We have to be able to remotely access the router's configuration in the standard TCP port 80 as well as the Ethernet device via the TCP port 8080
- The router must also be configured so we can use the internal relay to activate/deactivate the power supply of an additional device. This activation/deactivation can be done via the router's webserver or via SMS. The text will be "ON" to activate the relay and "OFF" to deactivate it. Finally, we need to be able to carry out a reset of the external device's power supply without needing to send two SMSs. For this, we will send the text "RESET" which will deactivate the relay for three seconds

Solution: MTX-Router-Titan mini



Configuration example ready for use:

We can easily load the example from the router's web configuration environment from the menu "Other>Backup / Examples".

Details:

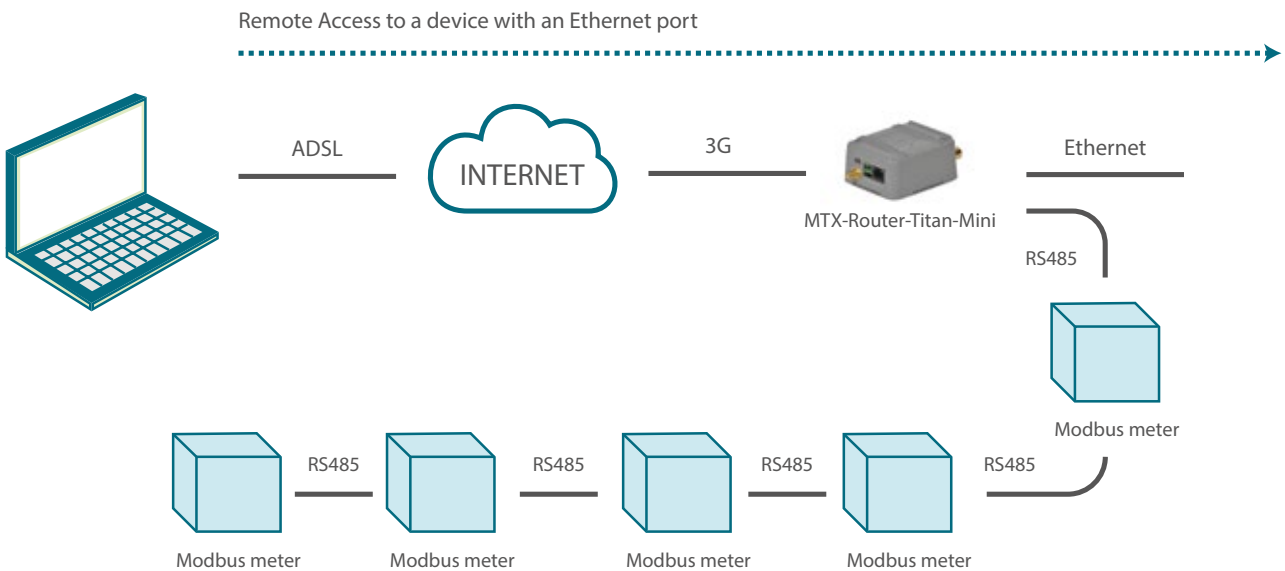
1. After the configuration is loaded in our router, we can access the router's configuration with the default username and password: "admin" and "admin", and the IP address "192.168.1.2"
2. Check the configuration in the menus "Wan>Basic Settings", "Firewall>Nat", "Other>Relay 1"

9. Configuration to send to a webserver the modbus readings of 5 devices

Details of the example scenario:

- We have 5 meters with Modbus RTU with variables/registers (current and consumption) in its memory which is periodically read and sent to a webserver
- The router requests data from the meter every 15 min. The registers to be read for the current consumption is register 20, and the average consumption is register 21.
- The router sends the value of registers to a webserver via HTTP GET using a JSON object after each reading. It must be able to store up to 1000 readings in its flash memory in case of failure. For each meter, a JSON string will be sent where the meter that is read will be indicated with an identifier (the modbus address)
- The router provides Internet to a network with Ethernet. Its IP is 192.168.1.1. The router maps the TCP port 8080 to the TCP port 80 to remotely access it
- The router will use a SIM card with a dynamic IP address. Therefore, the IP address must be send each time it is changed to the webserver

Solution: MTX-Router-Titan mini



Configuration example ready for use:

We can load the example from the menu “Other>Backup/Examples”.

Details:

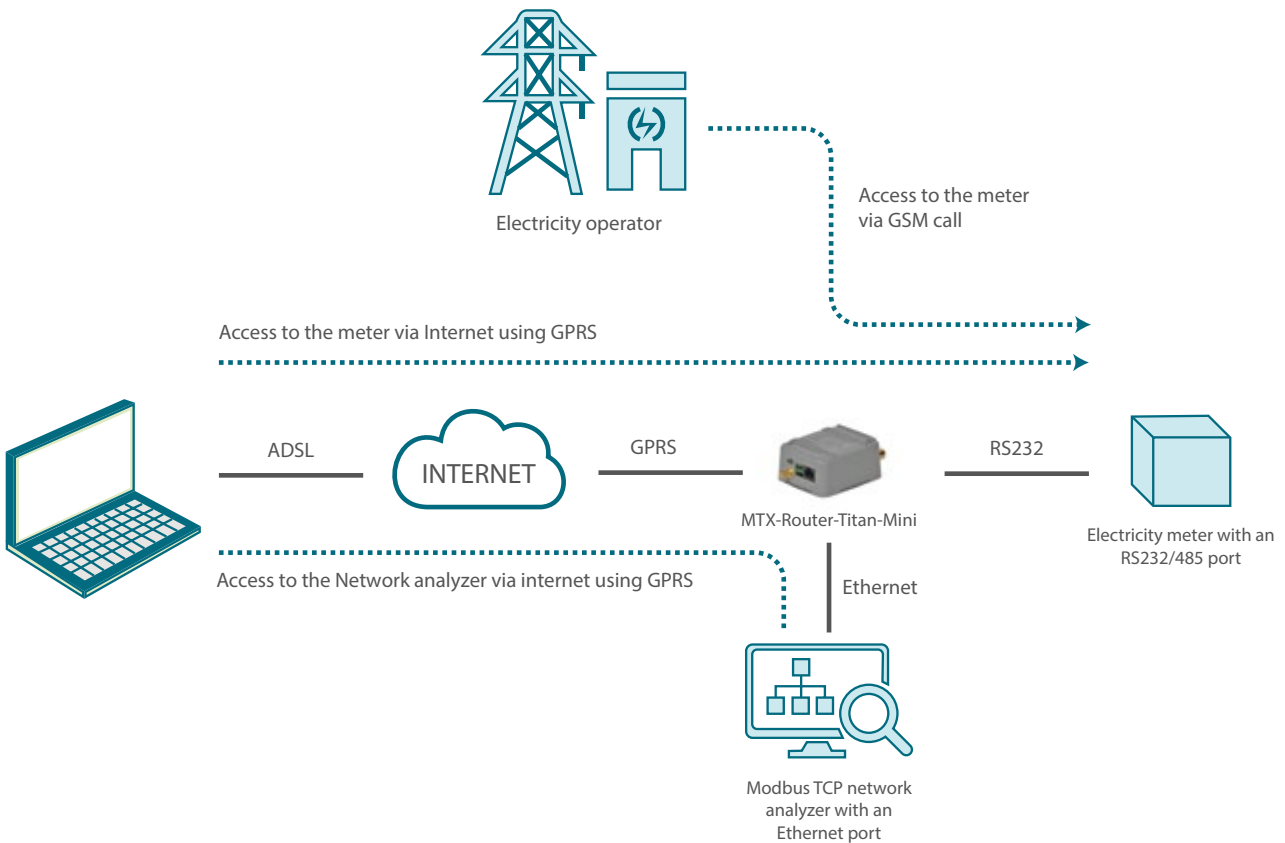
1. After the configuration is loaded in our router, we access the configuration with the username and password “admin” and “admin”, and the IP address “192.168.1.2”
2. Check the configuration in the menus “Wan>Basic Settings”, “Lan>Basic Settings”, “Firewall>Nat”, “Serial Settings>Serial Port1”, “External Devices>Logger Configuration”, “External Devices>Generic Modbus RTU”, “Other>Time Servers”
3. If we need a webserver to carry out testing, write to us at gsmssupport@matrix.es and request a testing account in the test server site www.metering.es

10. Accessing data from an electronic meter via GSM data call and GPRS, giving priority to the GSM

Details of the example scenario:

- We need to provide Internet access to a network analyzer with an Ethernet interface. We must be able to access it in the TCP502 port given that it is a Modbus TCP meter. The meter’s LAN IP address is 192.168.1.70
- On the other hand, we have an electricity meter with an RS232 port with the configuration 9600bps 8N1. The data from this meter should be accessed using a transparent GPRS-RS232 gateway, for which we will use the TCP20010 port
- The energy provider (Iberdrola, Endesa, etc.) must also be able to access the electricity meter via a typical GSM (CSD) data call. When the operator access the data, the GPRS connection will be suspended until the call is terminated

Solution: MTX-Router-Titan router



Configuration example ready for use:

Load it from the router’s web configuration environment “Other>Backup/Examples”.

Details:

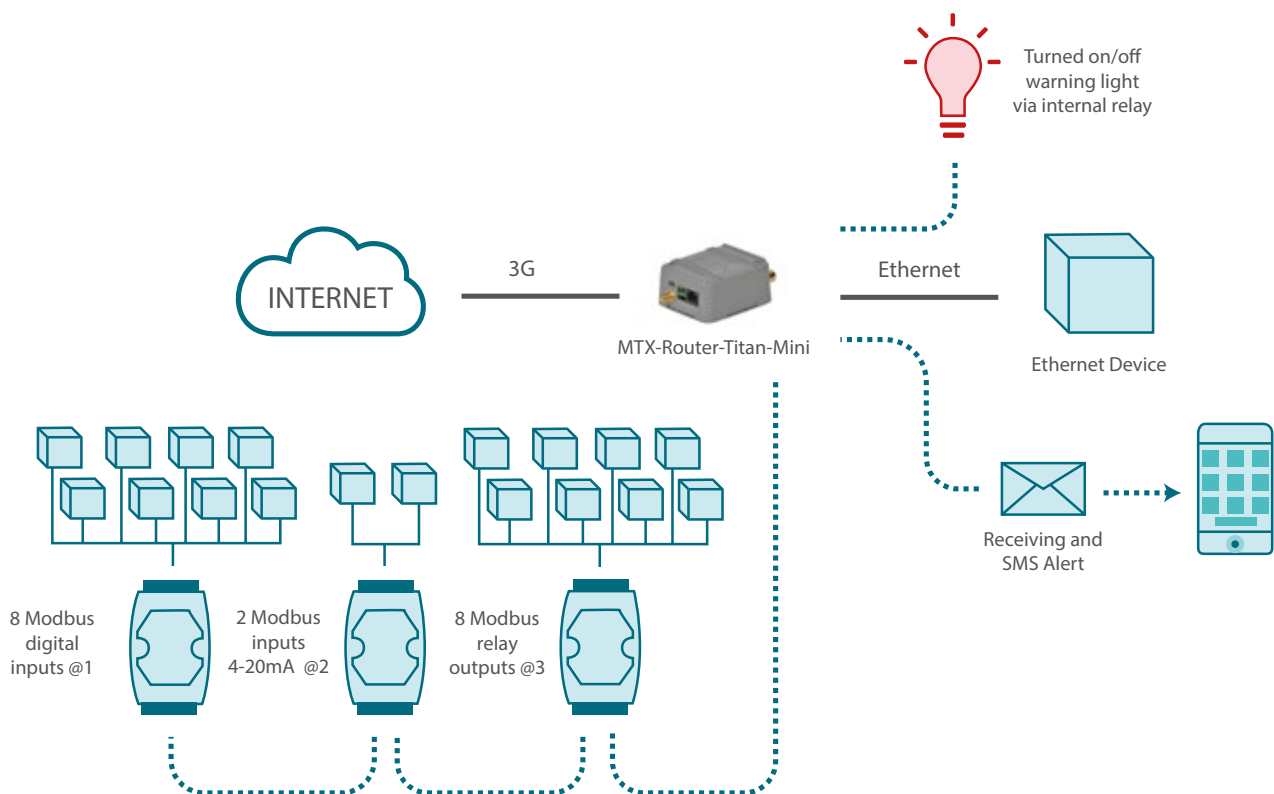
1. After loading the configuration on our router, we access the router’s configuration with the default username and password: “admin” and the IP address “192.168.1.2”
2. Check the configuration in the menus “Wan>Basic Settings”, “LAN>Basic Settings”, “Firewall>NAT”, “Serial Settings>Serial Port 1”
3. Remember that the router can only be configured to accept CSD calls when the router is in fixed GPRS mode. It is not possible when in 3G mode

11. Updating registers in a Modbus device according to the Modbus registers in a different device

Details of the example scenario:

- We need to provide Internet connectivity to a network analyzer with an Ethernet interface. The LAN IP address of the Ethernet device 192.168.1.70
- We also have 3 Modbus RTU modules. One of them, with address Modbus1, is to read 8 digital inputs. The module with address 2 allows us to read 2 analog inputs (4-20mA). The module with address 3 has 8 relay outputs
- We can change Relay1 in module 3 (by writing “1” in register 1) when the digital inputs 1, 2 and 3 (registers 1, 2 and 3) in module 1 are activated (all three of them have the value “1”). Also, Relay2 in module 3 will be changed (writing 1 in register 2) when the digital entries 4 or 5 (registers 4 and 5) in module 1 are not activated or when the analog input 1 in module 2 has a value of 10mA or less. Finally, an SMS alert should be sent and an internal relay in the Titan minidevice should be changed when the second analog input in module 2 has a value greater than 18mA

Solution: MTX-Router-Titan mini router



Configuration example ready for use:

Load it from the router's web configuration environment "Other>Backup/Examples".

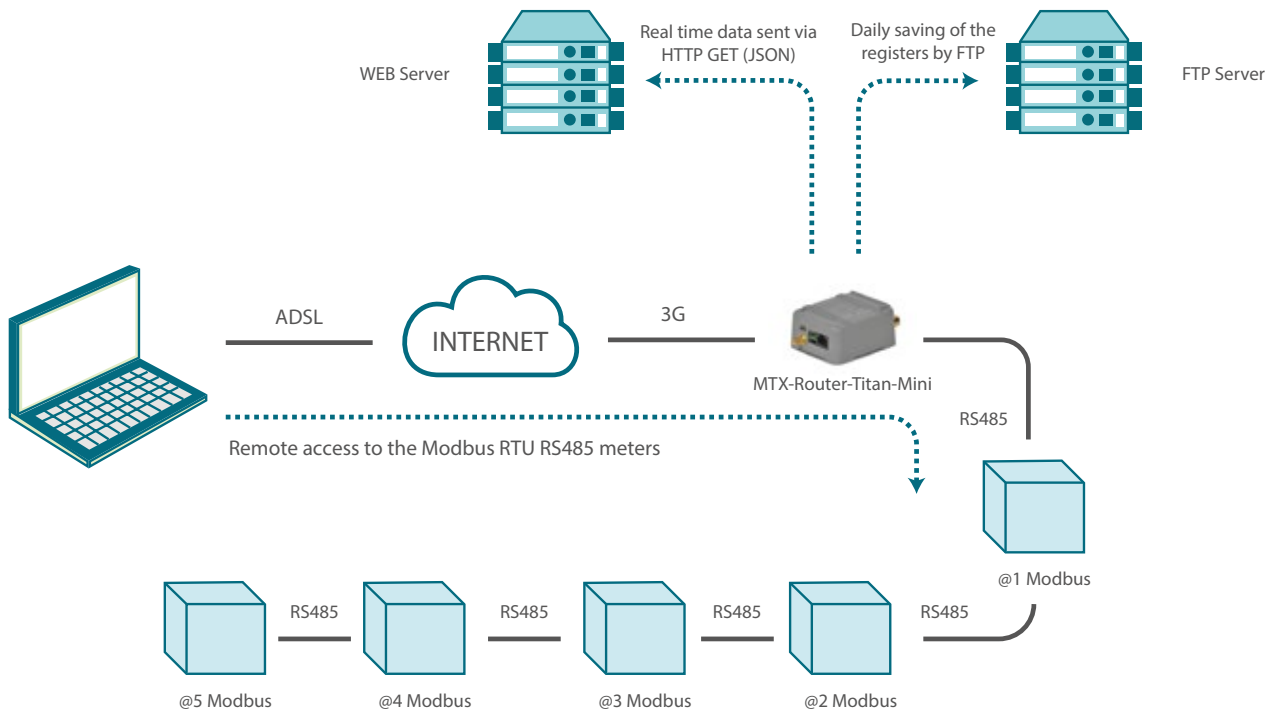
Details:

1. After loading the configuration on our router, we can access the router's configuration with the default username and password: "admin" and the IP address "192.168.1.2"
2. Check the configuration in the menus "Wan>Basic Settings", "LAN>Basic Settings", "Serial Settings>Serial Port 1", "Other>Titan Scripts"

12. Autonomous reading of modbus registers and automatic sending to web platforms

Details of the example scenario:

- We need to read several Modbus registers of 5 Modbus RTU devices. The data should be read every 10 minutes
- The router must send the readings to two web platforms. On the one hand, we will send the readings in real time (in JSON format) via HTTP GET to Platform 1. On the other hand, the router will send a file once a day with the readings to Platform 2 via FTP. The file will have a name of the format “IMEI-year-month-day.txt”
- Registers: @1: registers 1-10, @2: register 20 and 30, @3: registers 21-25, @4: registers 100-105 and @5: registers 1-5 and 20-25. All will use the Modbus read command 0x03
- We also need to remotely access each of the Modbus devices, and change registers remotely via a Telnet console and webserver



Configuration example ready for use:

We can easily load the example from the router’s web configuration environment from the menu “Other>Backup/Examples”.

Details:

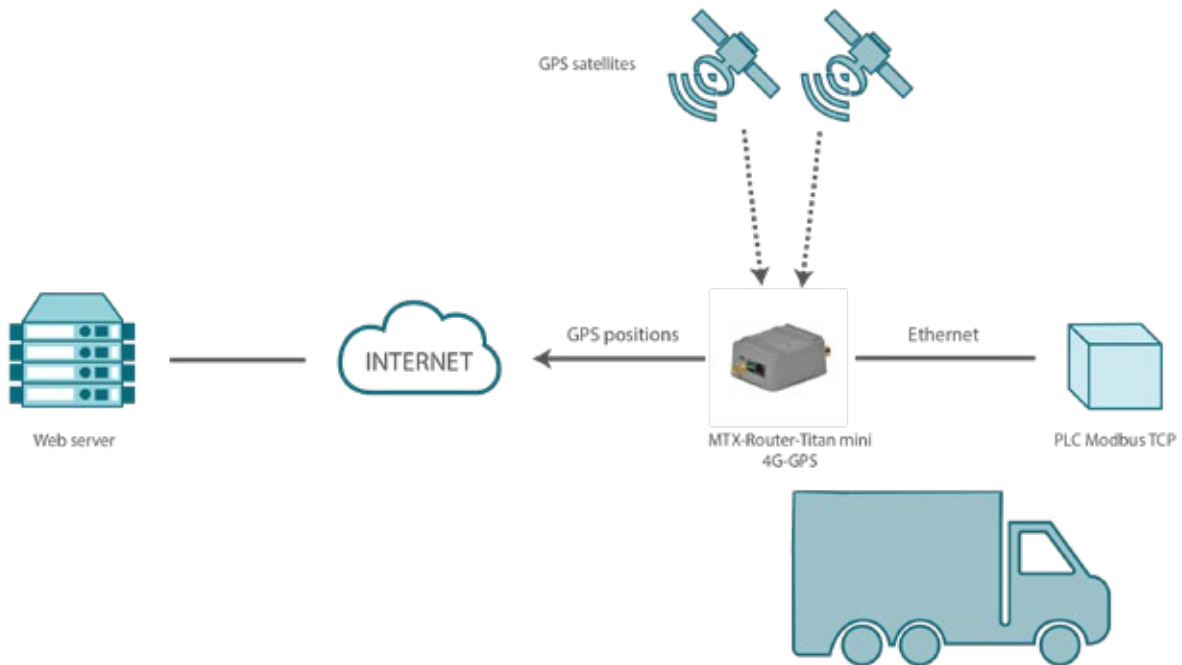
1. After loading the configuration on our router, we can access the router’s configuration with the default username and password: “admin” and “admin” and the IP address “192.168.1.2”
2. Check the configuration in the menus “Wan>Basic Settings”, “Serial Settings > Serial Port 1”, “External devices > Logger Configuration”, “External Devices>Modbus RTU”
3. Remember that readings are not taken immediately upon start-up, but at xx:00, xx:10, xx:20, xx:30, xx:40, etc. (i.e. every 10 minutes)

13. Sending GPS locations to a WEB platform

Some Titan router models have an internal GPS. That means that, apart from doing everything a 3G router does (Internet connectivity), it can manage a small fleet.

Titan routers allow to manage a GPS location in several ways. For example, it is possible to configure a Titan router to send NMEA location data through one of its three serial ports, so a third equipment can use them. It is also possible to configure a TCP server socket so a third equipment (in this case via Ethernet, Wifi or even 3G/4G) can connect to it and get NMEA location data. In this application note we are going to develop an example in which the Titan router will be configured to automatically send its GPS location periodically to a web server via HTTP.

Solution: MTX-Router-Titan mini router



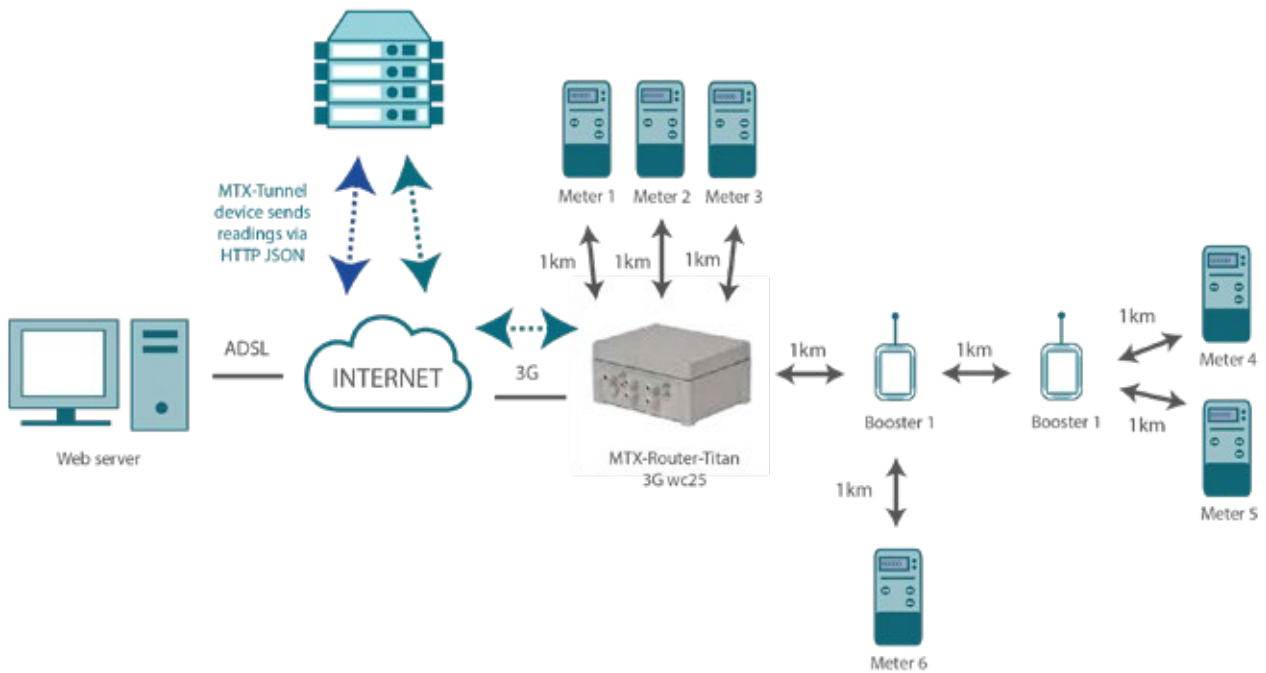
Details:

1. Configuring the sections “WAN > Basic Settings,” and “External Devices > Logger Configuration.” For this concrete example, we choose to send the data via HTTP GET to a test web server called www.metering.es. Finally, we configure the GPS in the section “External devices > GPS receiver.” Once this is done, we just need to go to the section “Other > Reboot” and restart the router. Once the Titan router starts again, it should work according to the new configuration
2. Once we reset the Titan router, it will connect to the 2G/3G/4G network and, as soon as it gets the GPS locations, it will send them to the configured web server
3. It is possible to make many more additional configurations to the Titan router, like commands via SMS, OpenVPN, modbus sensor readings, etc. In this application note we have only explained the basic configurations

14. Implementing a radio communication concentrator in order to read meters

Titan routers can be used as a radio communication concentrator (RF 868MHz) in order to read meters (using pulses) and send the data to a server, either via HTTP or via FTP. This is a typical metering application scenario, which, although seemingly complex, is simple to carry out using the Titan router, in particular the MTX-Router-Titan-3G-wc25 model.

Solution: MTX-Router-Titan router



Details:

1. In order to test the communication between the Waveflow devices and the MTX-Router-Titan-3G-wc25 device, we can use the section “Tools”
2. In this section it is also possible to reset alarms that detect any wire faults or battery shortages (in the event that it contains a replaceable battery). The meter’s battery life can also be consulted from this menu
3. In order to test that the logger is correctly functional, we recommend using a reading period of 1 minute for both the Wavecard and the Logger. In this way, the system can be checked easily without long waits

GENERAL DOCUMENTATION

Titan routers

Application notes:

- The application notes are examples of use
- All Titan routers share the same application notes
- Obviously some AN can't be used by some Titan models (HW limitations)
- Languages: Spanish & English

Link to MTX-Tunnel documentation:

<https://www.dropbox.com/sh/6czbmtwndkar5ao/AAB9Bxcx3jSDm9cxzsS1Fiv8a?dl=0>

Link to Titan router documentation:

https://www.dropbox.com/s/4293vm6a51gyox5/Docs_ENG.rar?dl=0

TITAN ROUTER

WAN

All related with 2G/3G/4G connections (apn configurations, gsm operators...).

- WAN > Status: Information about the FW, WAN IP, RSSI...
- WAN > Basic Settings: Configuration of all 2G/3G/4G (WAN) parameters and some tools related with GSM (BTS Scanning...)
- WAN > Keep Online: Useful to maintain alive the WAN connection. Reboot the connection if problems

LAN

All parameters related with ETHERNET interface.

- LAN > Basic Settings: Settings of all ethernet parameters (IP, netmask, DNS, Gateway...)
- LAN > DHCP Server: Settings of internal DHCP Server (for ETH devices)

WiFi

All parameters related with WIFI interface.

- WIFI > Basic Settings: Settings of all Wifi parameters (Mode (Client/AP), IP, netmask, DNS, Gateway...)
- WIFI > DHCP Server: Settings of internal DHCP Server (for WIFI devices)

Firewall

All parameters related NAT and Security policies.

- FIREWALL > NAT: Port forwarding rules (for connecting with IP (ETH/WiFi) devices) and Interface for NAT
- FIREWALL > Auth IP: Authorized remote WAN IPs for each service

Serial Settings

All parameters related with RS232, RS485, USB and IP-Serial Gateways.

- Serial Settings: Settings of serial port (baudrate, parity...)
- Serial Gateways: TCP Server, TCP Client (transparent gateways)
- CSD call: Another serial gateway. Only for 2G mode
- Modbus Gateway: Modbus TCP to Modbus RTU gateway
- Direct to modem: COM port is redirected to internal modem (call, SMS...)

External Devices

Parameters related with sensors and data logging.

- Logger Configuration: Sending method (HTTP REST, FTP, MQTT). Titan always send data with JSON format like: {"variable1":"value1";"variable2":"value2"...}
- To develop REST web platform ask a test account in www.metering.es
- Temperature Sensor: Configuration and reading of MTX-Temp-RS232 (accessory)
- Modbus Devices: Configuration and reading of Modbus devices (Modbus RTU & TCP registers). Until 10 devices. SEE AN. Also SNMP to Modbus Gateway
- Distant Sensor: Configuration and reading of Maxbotix devices (ultrasonic distance sensor)
- Wavenis Concentrator: Configuration and reading of Wavenis sensors (868MHz and 915MHz)
 - Wavetalk > RF Repeater (max 3 repeaters between MTX and sensor)
 - Wavetherm > RF Temperature sensor
 - Waveflow > RF pulse counter (each waveflow can count 4 meters)
 - Wavesense > RF 4-20mA or 0-10V
- W-MBUS Concentrator: Configuration and reading of Wireless MBus devices (temperature, humidity, pulse counter...)
- GPS Receiver: Configuration and reading of GPS. "internal" if GSM module includes a GPS inside or "external" if GPS is connected to RS232 or USB port. Position can be logger and sent (Fleet control)
- Serial Device: Logging miscellaneous serial data. Example: temperature sensor that sends every 1 minute by its serial port ASCII data with temperature. All data received is logger and sent by Titan router

VPN

Parameters related with VPN and Secure Connections.

- OpenVPN Server: Configuration of Titan router as VPN Server. Supports until 25 VPN client vpn connection
- OpenVPN Client: Configuration of Titan router as VPN Client (the most common connection). Can be used the WAN, LAN or WIFI interface
- Easy Link: A very easy way of communication with remote ethernet devices. Communication doesn't depend on the SIM card (private or public IP)of the remote device. 2 MTX-Router-Titan are needed. Local Titan needs public IP. SMS needed (in order to start the communication)

Plugins

Small applications with some special features. Customizations are here.

- WiFi Scan: Scan, save and send all Wifi detected MACs. Useful for counting people
- Biometric: Detect people in front of a shop window (gender, age...)
- Watchdog: Titan can PING some ETH device every X minutes. If PING fails a relay is activated in order to reboot the ETH device
- CSD_emulator: Titan can "convert" CSD calls into IP communications
- NoNAT: Avoid NAT problems with remote devices using a private IP

Other

The rest of functionalities of TITAN Routers.

- DynDNS: DynDNS Service (compatible with DynDNS and NO-IP providers). Useful to associate a dns (xxx.mydomain.com) with a dynamic IP
- Private DNS: Similar to DynDNS, but for sending the IP and status data to a custom web platform
- Relay X: Available only for routers with relays. Set the control (manual, schedule, SMS, astronomical, temperature, distance, GPS, jamming, movement, bitcoin)
- Digital input X: Available only for routers with digital inputs. Configuration of digital input (digital input, alarm (call/SMS), pulse counter...)
- Modbus slave: Section for configure the Titan router as Modbus slave RTU or TCP. Useful for scenarios with PLC devices. It is possible to configure the Titan router by modbus protocol, read GPS, AT execution...
- Titan scripts: User scripts for modbus devices (for example, if modbus register X > 10, then send SMS or email). All available commands are in the user manual
- Jamming detection: Available only if router is working in 2G network. Titan can detect jamming and send SMS, close relay...
- SMS ontrol: Configuration of SMS parameters: password, authorized phone numbers, and ALIAS. ALIAS example: TEMP > instead of AT^MTXTUNNEL=GETMODBUS,1;1;1;3

- AT commands: Useful for sending AT commands from GUI (it is possible to use all AT commands of user manual). Remember: MTX-Router-Titan can be fully handled by AT commands (status, configuration) SMS can be sent by: TELNET, SSH, SMS, HTTP, MQTT, MODBUS, SNMP... Example: AT+CSQ to see the signal strength
- Email configuration: Email settings (emails can be sent in Titan scripts section)
- GSM location: Shows an approximate GPS position (Google Maps) with the current location (based on used BTS)
- Periodic autoreset: Autoreboot configuration (time, schedule, WAN problems...). All Titan routers have a internal watchdog (the watchdog auto reboots the unit if it has internal problems)
- Movement detector: MTX-Router-Titan-xG-mini has an internal accelerometer. The router can make a voice call or send an SMS if movement is detected
- Custom skin: The logo of the header and some texts can be customized (some customers or re-sellers don't want to show the Matrix logo)
- Custom LED: MTX-Router-Titan-mini-xG and MTX-Router-Titan-II-S has 1 custom led. The behaviour of this led can be choosed by user. Next releases led2 will be also customized
- Time servers: NTP Time server configuration, mandatory for OpenVPN, data logging
- Remote console: Telnet or SSH configuration. This option allows to connect remotelly with Titan router to send AT commands
Telnet = plane text (recommended only for private APNs), SSH = encrypted communications
Examples: AT+CSQ, AT^MTXTUNNEL=REBOOT, AT^MTXTUNNEL=GETPARAM,WAN_ APN...
- SNMP: Support for Simple Network Management Protocol (SNMP). Many companies use this protocol to control remote devices. Titan supports v2c and v3. The main difference between v2c and v3 is that v3 is encrypted. The MIBs can be downloaded from the UI
- Tacacs+: Support for TACACS+ protocol. This is a security protocol. Titan only implements "tacacs+ authentication"
Example:
 1. The user types the username and password into the GUI of the Titan router
 2. Titan re-sends this data (username & password) to a tacacs+ server
 3. Tacacs+ server tells Titan if the username and password are valid
- MQTT: MQTT is a IOT protocol. The main feature is that MQTT is a very light protocol
 - Titan can work as an MQTT broker, which is an MQTT concentrator
Broker Example:
Device1 connects to broker
Device2 connects to broker
Device1 subscribes in the broker to the "topic" "temperature"
Device2 sends data to the broker with the "topic" "temperature"
As Device1 is subscribed to "temperature", broker sends receive data from Device2 to Device1
 - Titan can work as an MQTT client (normal configuration) using external broker
When Titan is an MQTT client, data can be sent to the broker
Also Titan can receive AT commands by MQTT and respond by MQTT
- HTTPS: Allows to use a secure connection. Keep in mind that a autosigned certificate is used, so the webbrowser will show warnings (that is normal)

- Audio: Can reproduce audio files. Accessory is needed
- Passwords: Titan router allows 3 users: “admin”, “user” and “guest”
 - admin: can read/change anything
 - user: can read/change the selected options by admin
 - guest: can read the selected options by admin
user changes remain saved in flash memory
- User permissions: Allows to select the options which can be used by “user” and “guest” users
- Backup & factory: Useful for saving or restoring a configuration
Factory reset -> All parameters are set to default
Titan1 can be set to factory defaults with jumper number 8 (check user manual for procedure)
Titan2 can be set to factory defaults with input number 3 (check user manual for procedure)
- Firmware upgrade: Local or remote FW upgrade

Special Pages

Some private sections.

- zlog.php: Internal log of Titan Router
- zhardware.php: Some special HW configurations