#WeAreConnectivity

SMART SOLUTIONS FOR A CHANGING WORLD

MTX TUNNEL

Firmware for MTX modems

WHITEPAPER

Based on a seminar
by Matrix on March 2018

www.matrix.es
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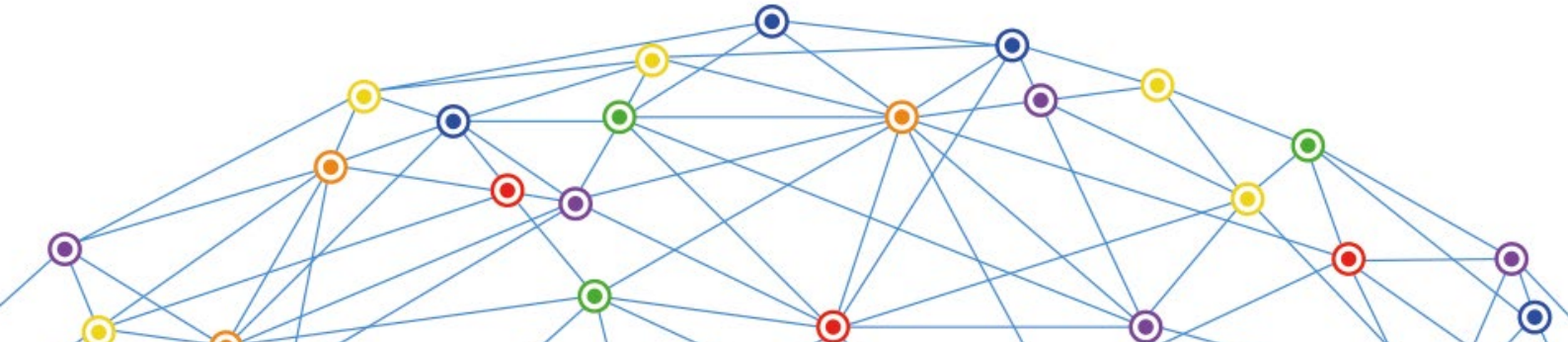

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WHAT IS MTX-TUNNEL?

MTX-Tunnel is an application running into a Java GSM module and can be defined as a SERIAL/GRPS/3G gateway. Now instead of connecting your machine to the serial port of a computer, you can connect this solution device to your machine. You can control it from your home/company location as if it were physically connected. MTX-Tunnel release 9 has dramatically increased its performance compared with previous versions. Now you will have more tools and possibilities for related real-scenarios with remote control and remote metering. Those are input/outputs read/control, analog input reading, relay control, control over external SPI/I2C bus, remote reading of GPS position, control and configuration using SMS, WebServer, Telnet, RF communications, Modbus and much more.

Main MTX models:

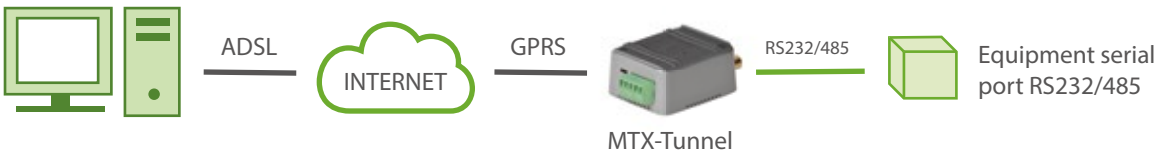
- MTX-2G-Java-T/MTX-3G-Java-T/MTX-4G-Java-T: Most common 2G/3G/4G-Serial gateways
- MTX-3G-Java-IOT-STD-N/MTX-4G-Java-IOT-STD-N: Same functionalities than T models + I/O (digital & analog, counters...)
- MTX-3G-Java-IOT-STD-G/MTX-3G-Java-IOT-STD-N-GPS: Same functionalities than IOT models + GPS)
- MTX-DIN-3G-Java and MTX-IND-3G-Java: RS485/422 serial communications, relay control and RF control

FUNCTIONALITIES

Connectivity

1. 3G-GPRS/Serial Gateways

- TCP client
- TCP server
- UDP client/server



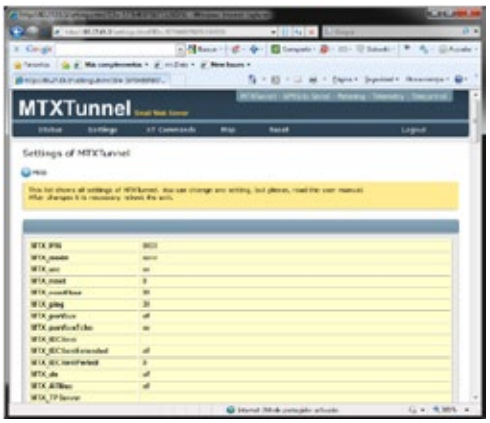
2. GPRS Connection Mode

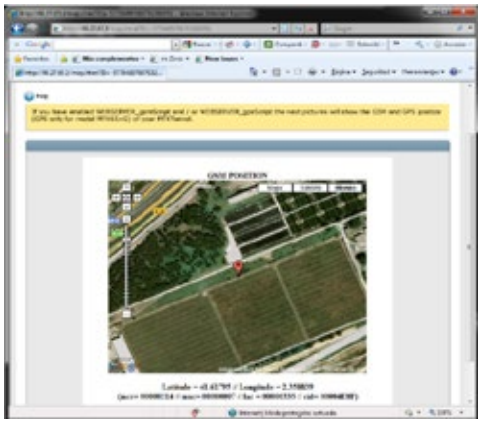
- Permanent connection 100% time
- On request by incomming SMS or missed call
- On request by change in a digital input
- On request by ADC input (by level)
- On request by incoming data on the serial port
- On request by time/date

TCP Services

1. Integrated WebServer, Telnet and MQTT

- Enables remote access to MTXTunnel using webbrowser
- Protection with login & password and firewall (authorized IP)
- Shows the status of digital and analog inputs, GSM/GPS position
- Change digital output level and relays in just one click
- Execute AT commands remotely (AT+CSQ, AT+CFUN=1,1 ...)





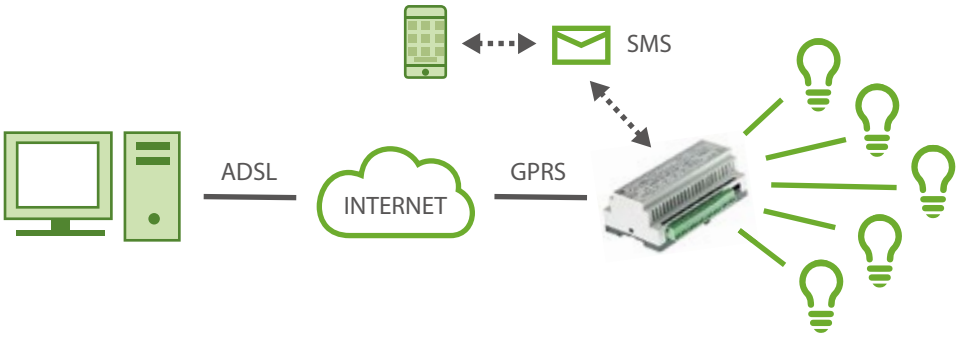
Alarm & Control with SMS

1. SMS Alarm

- Send SMS alarm when the level of digital input changes
- SMS can be sent to up to 10 remote users

2. SMS Control

- Execute remote AT command (at+csq, at+cfun=1,1,...)
- Change the status of digital outputs and relays
- Alias method is allowed (ex. “RELAY1ON > AT^SSIO=0,0”)



Solutions for Dynamic IP

1. SMS/Missed call

MTX-Tunnel allows to activate the GPRS session using a SMS or Missed call and send to you a SMS with the new IP address.

2. DynDNS

DynDNS service is supported. Compatible with other similar services as “No-IP” (free service).

3. Private DNS

Service like DynDNS. In this case MTX-Tunnel sends the IP to specific server using a TCP client socket, HTTP request or MQTT. Very used in scenarios with a big number of devices.

Security

1. Authorized Phone Numbers

- Up to 10 phone numbers can be configured.

2. Firewall IP

- Allow connections only from configured IP addresses.

3. SSL

- MTX-Tunnel is able to create SSL connections (TCP socket client or HTTPS). With SSL all communications are encrypted.

4. TACACS+

- Tacacs+ protocol can be used with Telnet sessions and SNMP

Metering, Modbus, Sensors

1. 868MHz Remote Monitoring Sensors (Wavenis)

MTX-Tunnel works as a hub in Wavenis radio remote devices. You can read the temperature remotely with Wavetherm (temperature sensor), any analog value (0-10V and 4-20mA) or read pulses from a counter using Waveflow. Data is sent with a JSON object to web server.

2. ModBus RTU Devices

MTXTunnel can be configured for reading modbus RTU devices. It sends data to web platform using a standard JSON object.

3.Relay Control, Digital I/O and Analog Inputs

Read and change digital and analog inputs. Send the state of inputs to webserver using a JSON object. Change the state of relay by schedule, astronomical clock, missed call, modbus value, ...

4. Access to serial devices using GPRS and GSM

Is it possible to establish gateways with both at the same time, but GSM calls have priority. A typical is example is that of an energy operator (Endesa,Iberdrola). They could want daily access to a meter to take a reading via GSM but you alsowant to be able to access the meter but via GPRS, MTXTunnel allows you to do this.

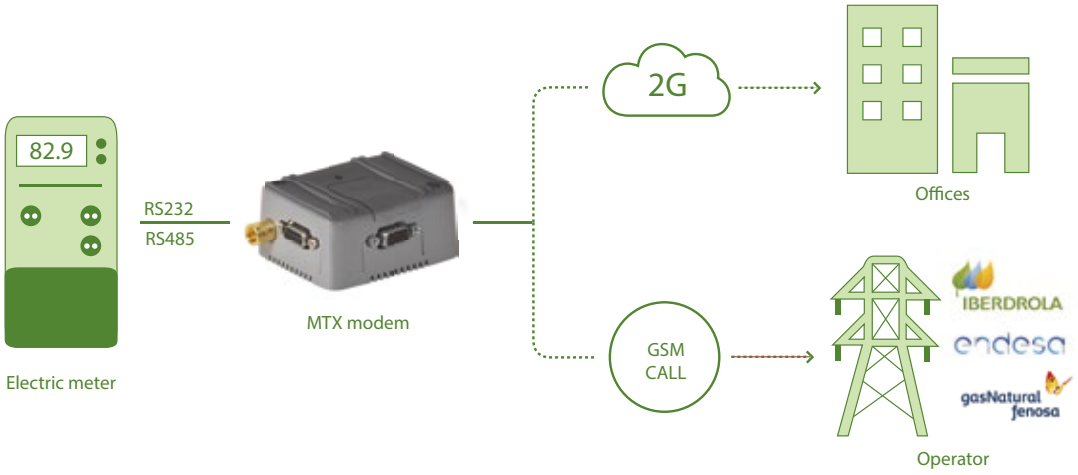
5. Sending data to Web platform

- Available methods: HTTP, HTTPS, MQTT, MQTTS
- All data is sent using JSON format

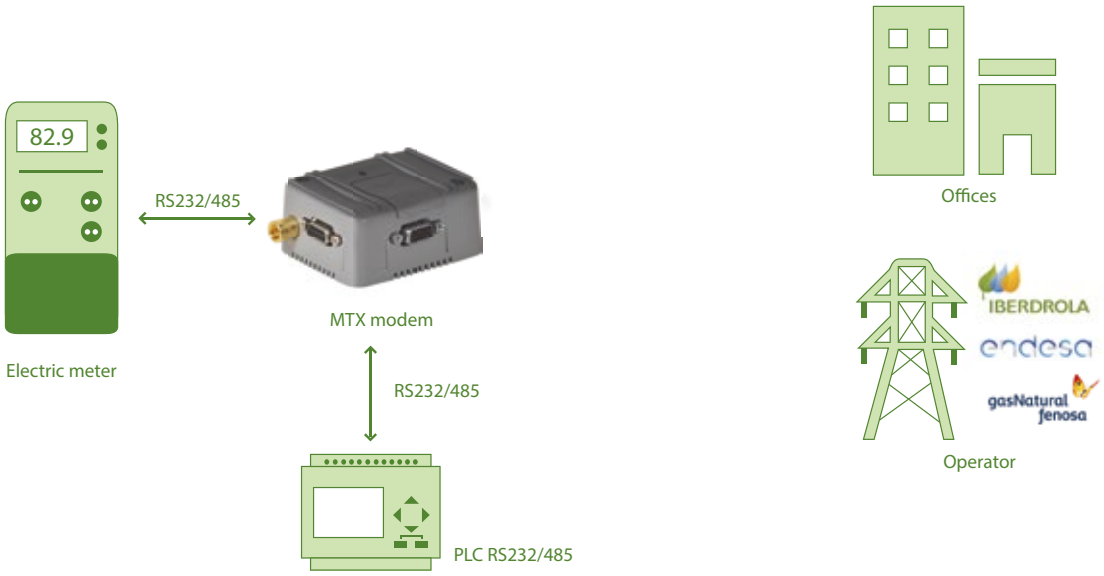
EXAMPLES

EXAMPLE 1. Metering solutions for communications GPRS-serial and GSM-serial GSM communication has priority over GPRS communication

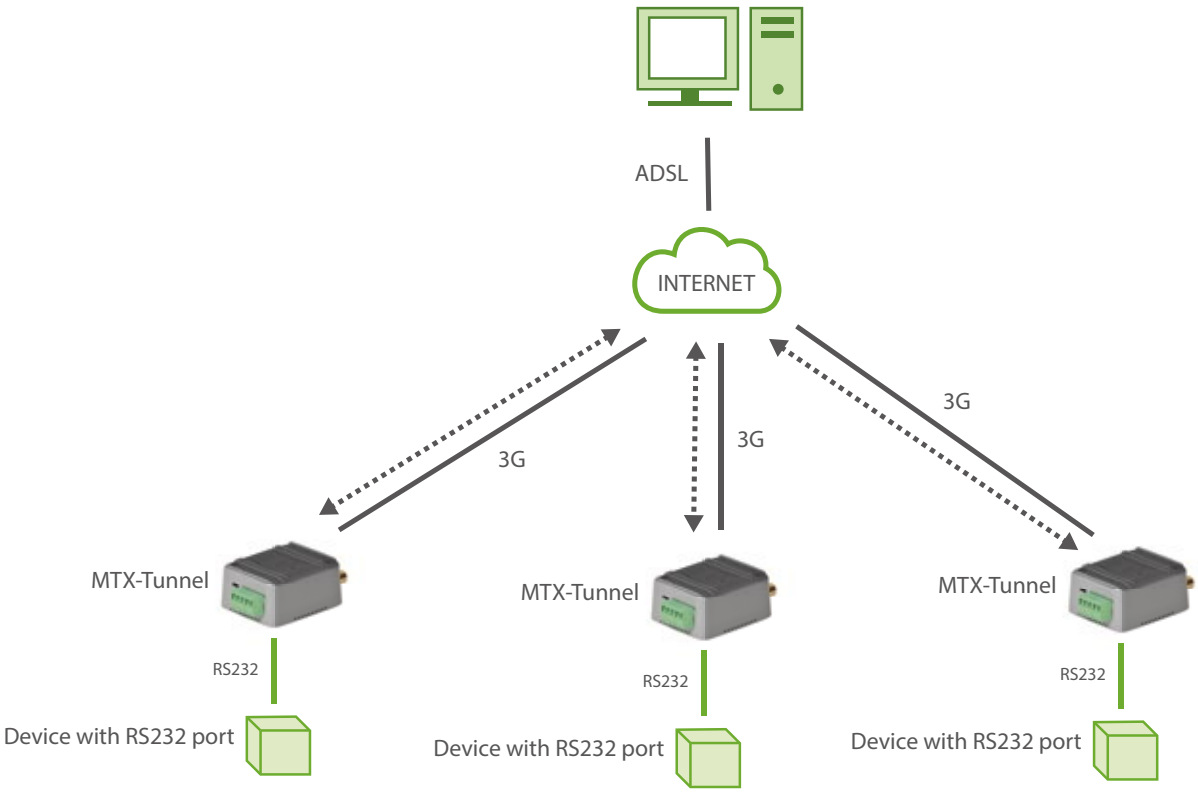
Real time electric meter readings can be made from your own office via GPRS.



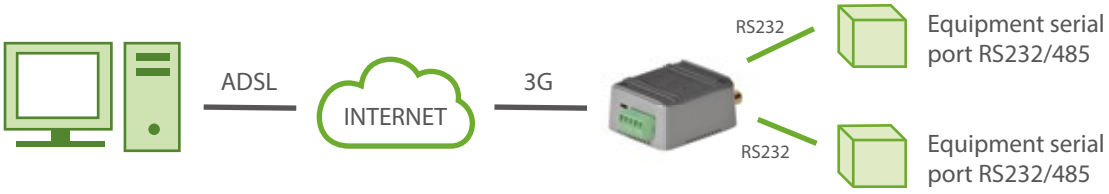
When the electrical operator (Endesa, Iberdrola...) makes a daily GSM call to the modem to take a meter reading, GPRS connection with the meter “freeze” in order to give priority to the operator’s call.



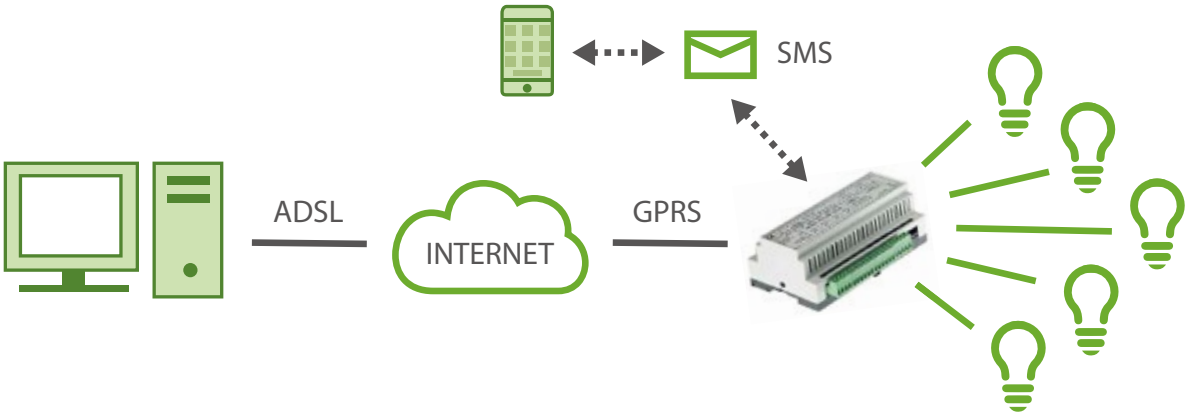
EXAMPLE 2. Remote 3G access to RS232/RS485 serial devices. Modes TCP server, TCP client and UDP



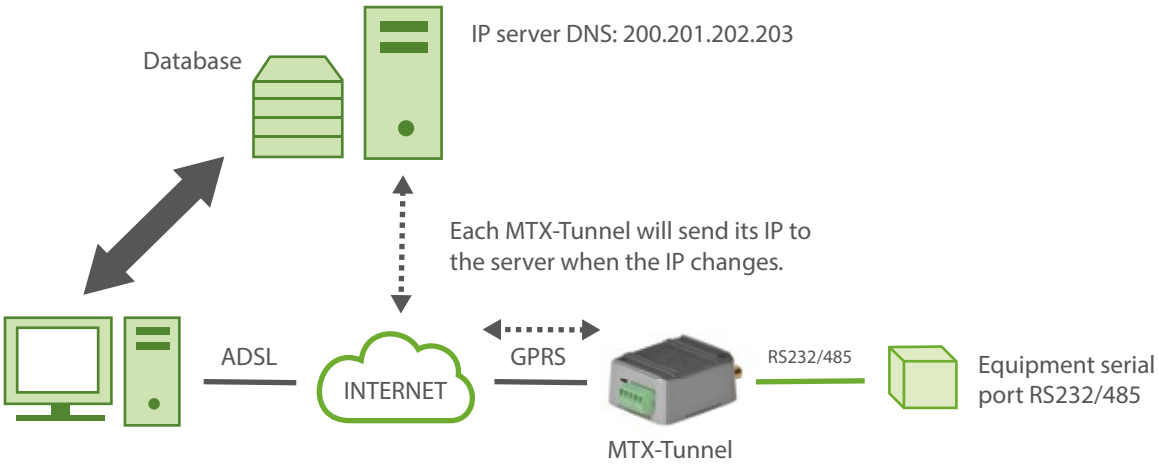
EXAMPLE 3. Double 3G-RS232 Tunnel. Two RS232 devices controlled by a single modem and a single SIM card



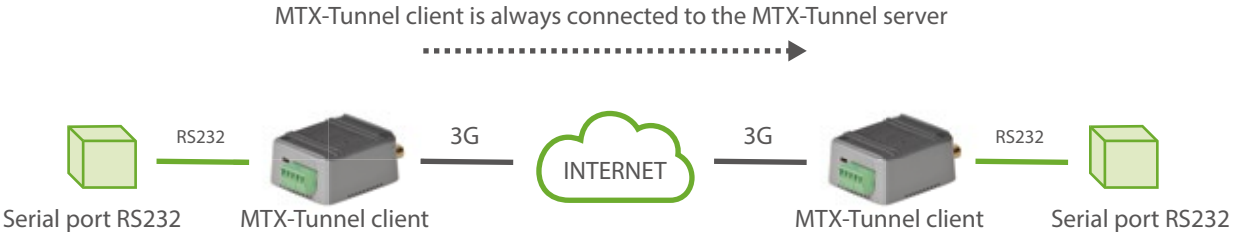
EXAMPLE 4. Relay control by SMS message and MTX-Tunnel access by 3G/GPRS



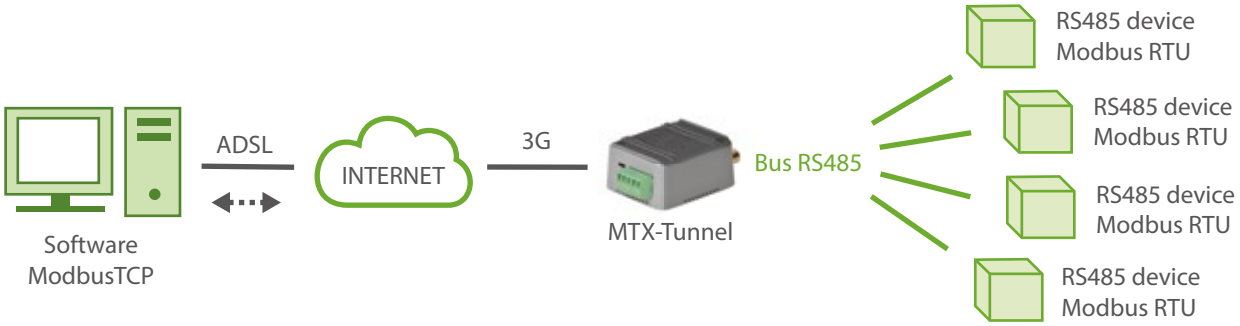
EXAMPLE 5. Remote access to serial RS232/485 devices with dynamic IP SIM card



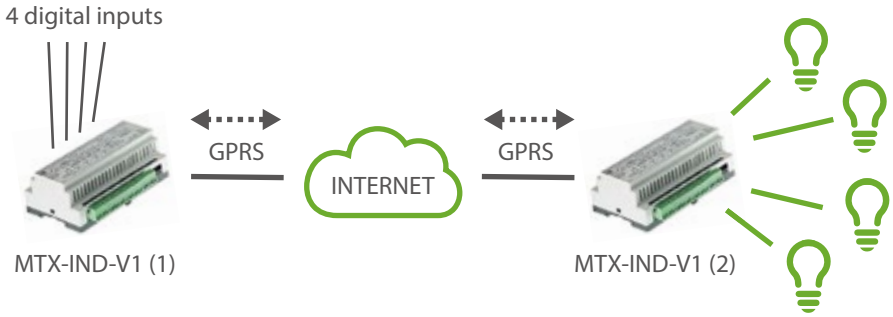
EXAMPLE 6. Serial cable replacer



EXAMPLE 7. ModBusTCP/ModBUS RTU

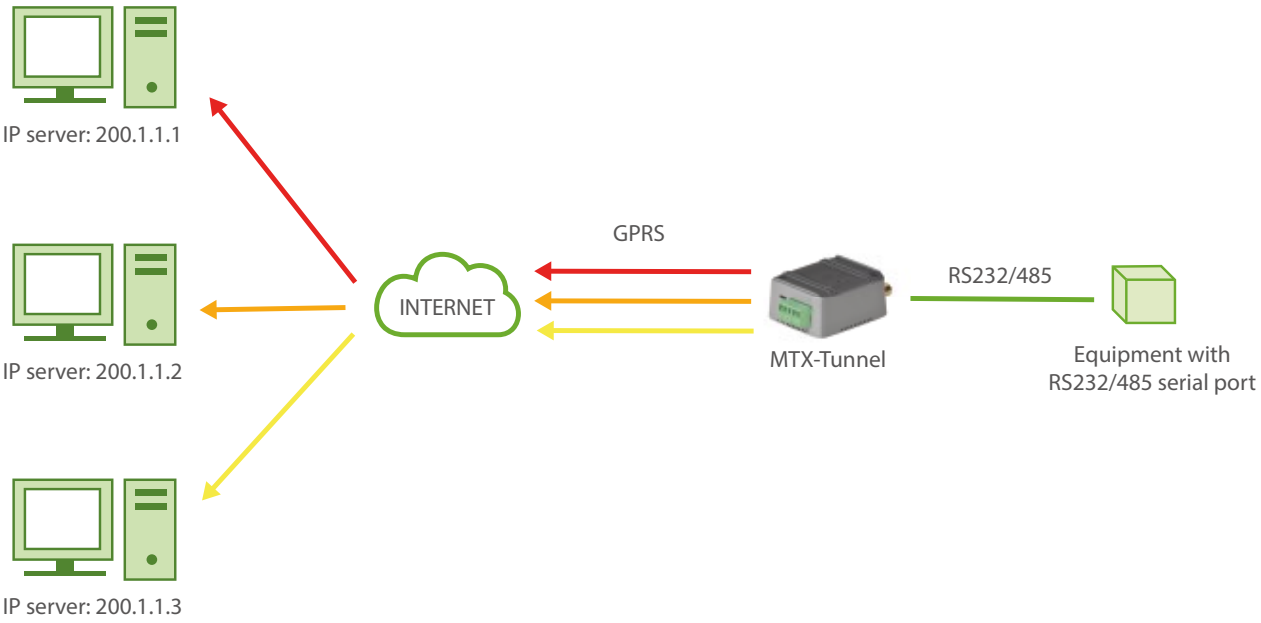


EXAMPLE 8. Sending replications of digital inputs over relays via 3G/GPRS

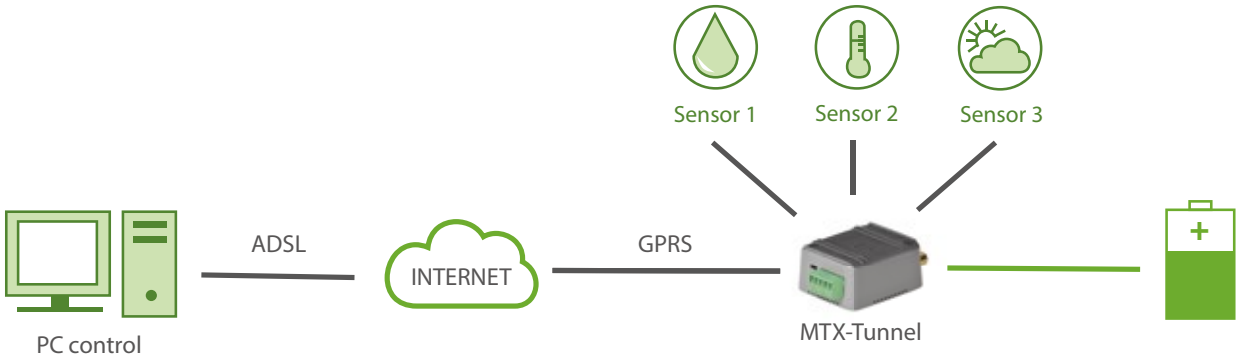


EXAMPLE 9. SMS alarm by digital input (door...)

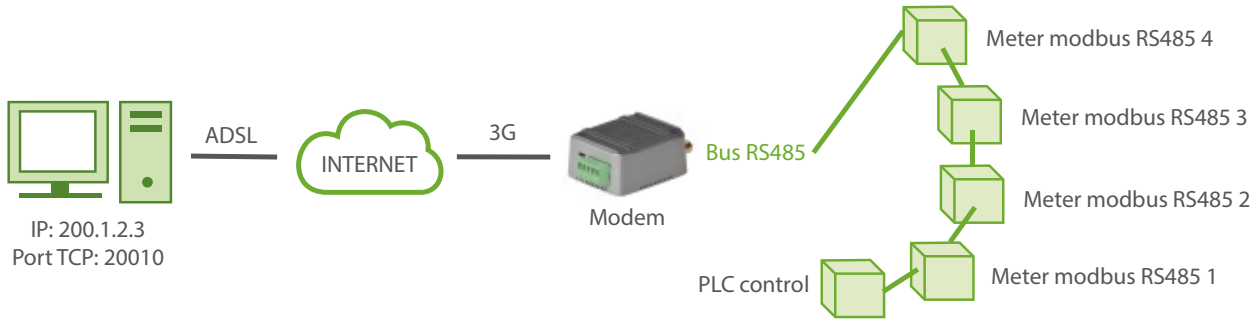
EXAMPLE 10. Multiserver UDP



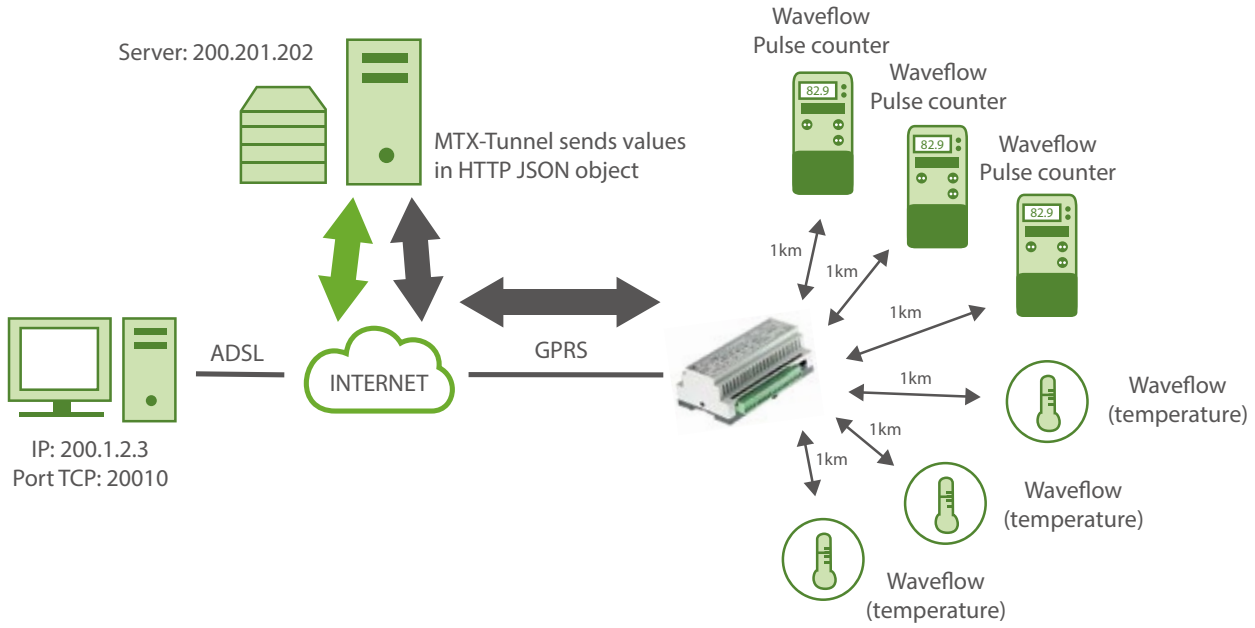
EXAMPLE 11. Low Power scenario. MTX-65ULP wakes up every X hours, power up an external device, do work and go to sleep again



EXAMPLE 12. MTX-Tunnel reads the internal map register of 5 modbus devices and sends the information to webserver platform using a JSON object

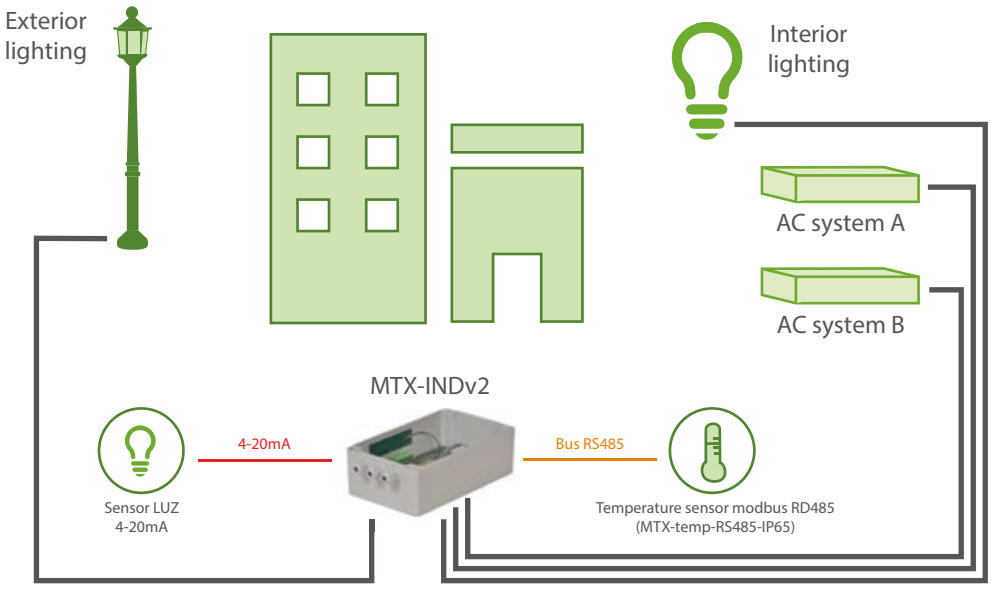


EXAMPLE 13. 3G-GPRS/868MHz Wavenis concentrator, sensors (GPIOS,ADCs, temp,...), metering...

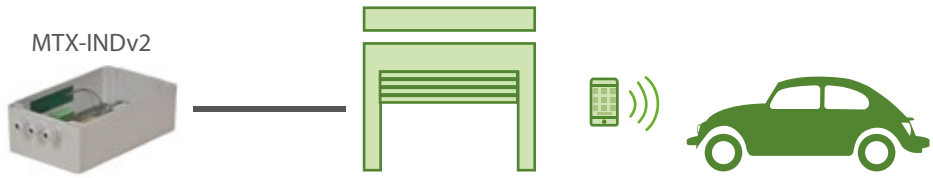


EXAMPLE 14. Change the state of relays by:

- Schedule (street lamp)
- Modbus register (temperature sensor)
- Astronomical clock
- Etc.



EXAMPLE 15. Relay by missed call



EXAMPLE 16. Relay and SMS alarm by temperature