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Flexitron group

Titan Router

V6 Firmware

Application note 64

Using a TITAN-based device to read an IEC Electricity Meter

60870-5-102

via an IP-RS232 gateway, CSD data call and local RS485 connection

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1. Scenario details

TITAN-based devices have all the typical functions of a 4G/3G/2G router, as well as a series of additional features that make them one of the best performing devices on the market. One of the additional benefits is the ability to read IEC 60870-5-102 electricity meters through CSD-RS232, IP-RS232 and RS485-RS232 gateways

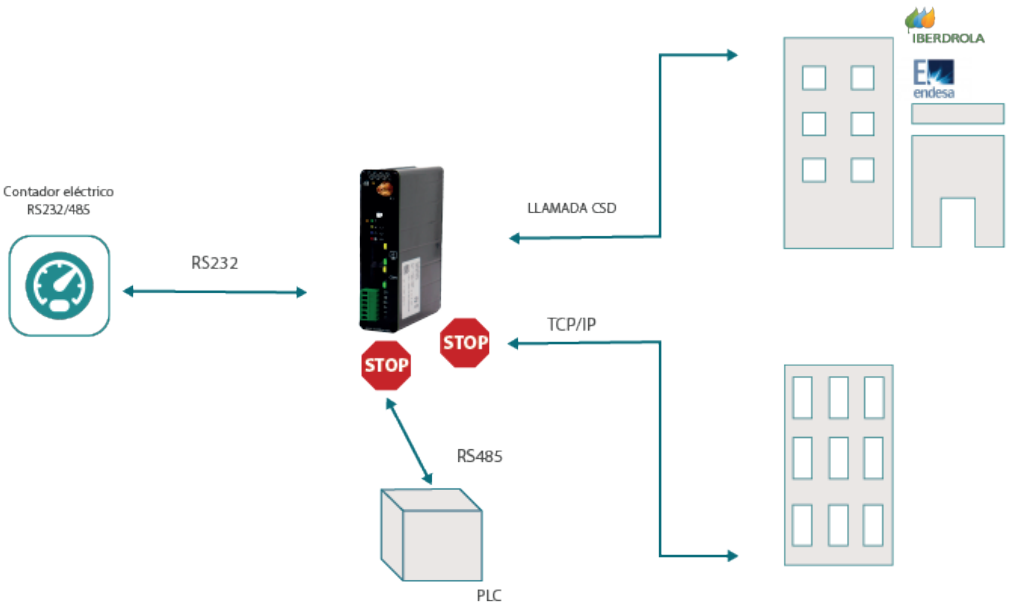
2. Example scenario description

- There is an Electricity Meter (IEC 60870-5-102) with the RS232 serial port (9600,8,N,1)

- The aim is to configure the TITAN-based device to create a IP-RS232 gateway and to use it to read the meter in real-time via TCP-IP from a specific location.

- The TITAN-based device must also accept a CSD call when entered and enable a meter reading from the electricity company via the CSD-RS232 transparent gateway. The CSD call takes priority over IP-RS232 communications, so the latter must be suspended upon receiving the call and re-enabled again once the operator's CSD call is complete.

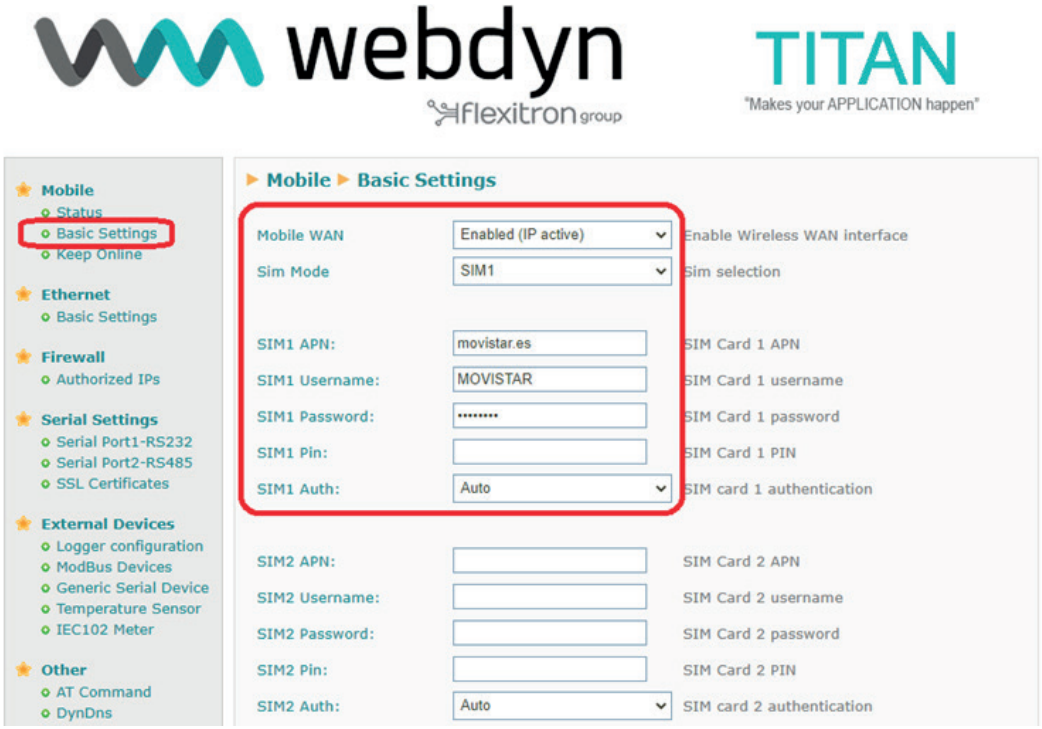
- You must also be able to read the meter from a PLC with the RS485 port. In other words, while a CSD call has not been made or an IP-RS232 gateway has not been created, the TITAN-based device must create a gateway between its RS485 and RS232 ports to allow a PLC to access the meter directly.



3. Configuring the corresponding RS232 serial port

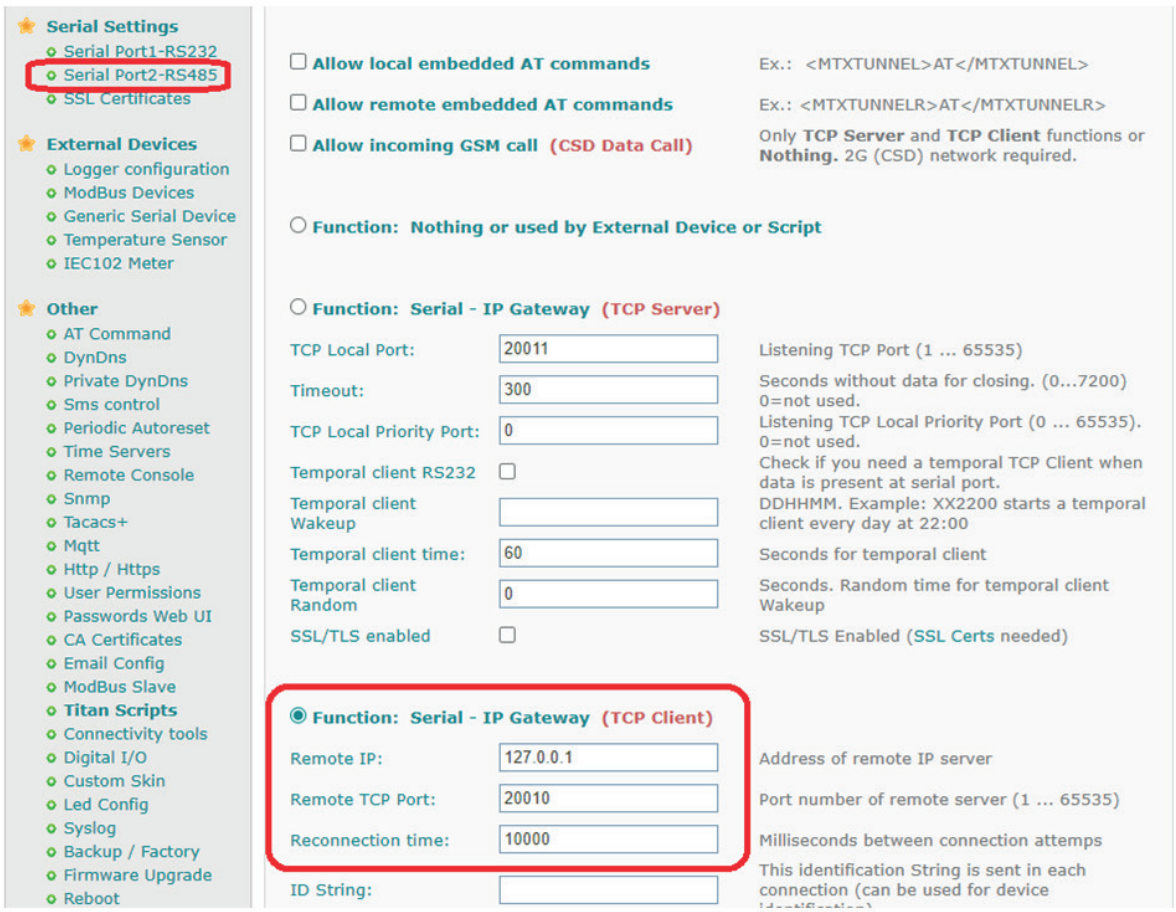
You need to configure the RS232 serial port of the TITAN-based device first, since this port will be used to read the meter. These values coincide with those of the configuration of the meter's serial port, which in this example is 9600,8,N,1.

In this example, the aim is to read the meter via a CSD call, but also via an IP connection, and the RS485 port to which a PLC will be connected. So, enable the CSD calls in the configuration, configure the **"TCP Server"** option, then configure the reading port as TCP 20010, and a priority TCP port as TCP 30010. The remote reading via an IP should be done through the TCP 30010 port (priority port), while the TCP 20010 port will be used for the RS485 connection (which you will configure in the next step, point 3). For this RS485 port, you will configure a TCP Client gateway that will connect to the TCP 20010 port of the device itself (127.0.0.1), which will provide local access to the reading when there are no CSD calls or connections through the port with priority TCP 20010. This will be explained in the next step, point 3.



4. Configuring the RS485 serial port

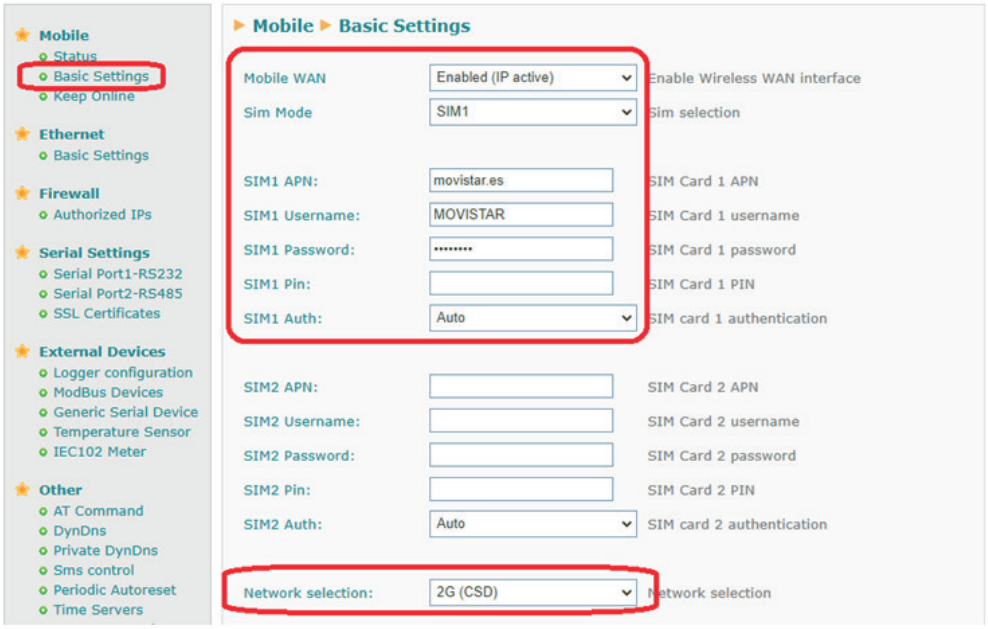
The RS485 port of the TITAN-based device will be connected to a PLC. As in this example, the PLC must be able to read the meter when there are no CSD calls or an established TCP-IP connection, and must even function without a SIM card. To do this, you must configure a transparent RS485-RS232 connection via a **"TCP Client"**-type connection. The destination of this gateway will be the local IP of the device itself (127.0.0.1) and the address will be TCP 20010 sr (the NON-priority port). The configuration of the RS485 serial port must be the same as that of the PLC, which in this example will also be 9600,8,N,1.


Serial Settings
Serial Port1-RS232
Serial Port2-RS485
SSL Certificates
External Devices
Logger configuration
ModBus Devices
Generic Serial Device
Temperature Sensor
IEC102 Meter
Other
AT Command
DynDns
Private DynDns
Sms control
Periodic Autoreset
Time Servers
Remote Console
Snmp
Tacacs+
Mqtt
Http / Https
User Permissions
Passwords Web UI
CA Certificates
Email Config
ModBus Slave
Titan Scripts
Connectivity tools
Digital I/O
Custom Skin
Led Config
Syslog
Backup / Factory
Firmware Upgrade
Reboot
Allow local embedded AT commands
Ex.: <MTXTUNNEL>AT</MTXTUNNEL>
Allow remote embedded AT commands
Ex.: <MTXTUNNELR>AT</MTXTUNNELR>
Allow incoming GSM call (CSD Data Call)
Only TCP Server and TCP Client functions or Nothing. 2G (CSD) network required.
Function: Nothing or used by External Device or Script
Function: Serial - IP Gateway (TCP Server)
TCP Local Port: 20011
Listening TCP Port (1 ... 65535)
Timeout: 300
Seconds without data for closing. (0...7200) 0=not used.
TCP Local Priority Port: 0
Listening TCP Local Priority Port (0 ... 65535). 0=not used.
Temporal client RS232
Check if you need a temporal TCP Client when data is present at serial port.
Temporal client Wakeup
DDHHMM. Example: XX2200 starts a temporal client every day at 22:00
Temporal client time: 60
Seconds for temporal client
Temporal client Random 0
Seconds. Random time for temporal client Wakeup
SSL/TLS enabled
SSL/TLS Enabled (SSL Certs needed)
Function: Serial - IP Gateway (TCP Client)
Remote IP: 127.0.0.1
Address of remote IP server
Remote TCP Port: 20010
Port number of remote server (1 ... 65535)
Reconnection time: 10000
Milliseconds between connection attemps
ID String:
This identification String is sent in each connection (can be used for device

5. Configuring the Mobile section

If the TITAN-based device needs to be configured to receive CSD calls, it is highly recommended (and in some locations impractical) to configure it to work on the 2G network, thus avoiding 3G and 4G networks although permitted by the device. Not all telephone operators enable fallback from 3G to 2G, or from 4G to 2G, which is required to receive the CSD call when produced.

Go to the **"Mobile - Basic Settings"** menu to correctly configure the network. The correct configuration is shown in the image below. In this configuration, the 4G/3G/2G WAN interface is enabled (so that the device obtains an IP) and the APN, username and password of the SIM card are all specified. Lastly, configure the device to operate on the 2G network

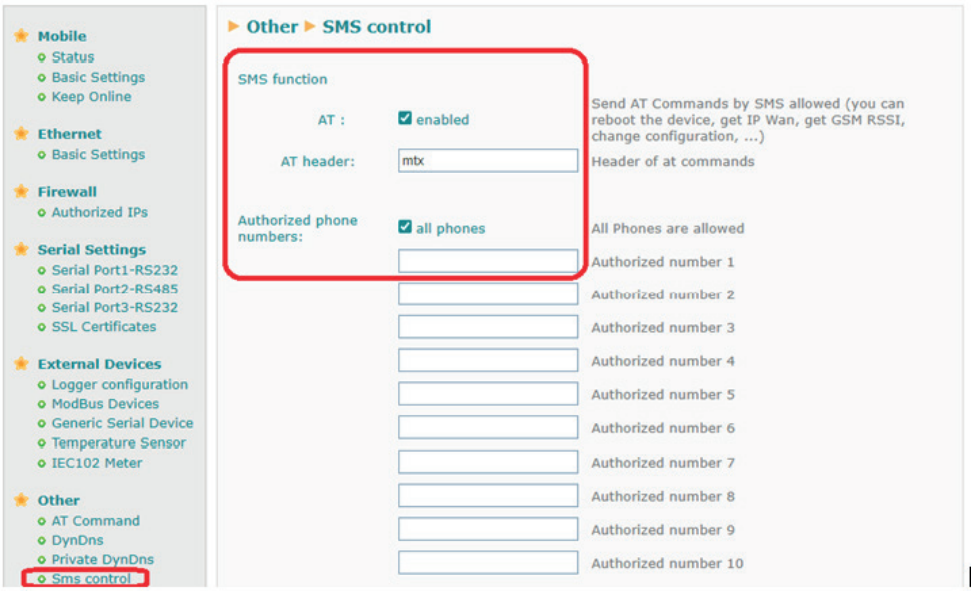


6. Other configurations

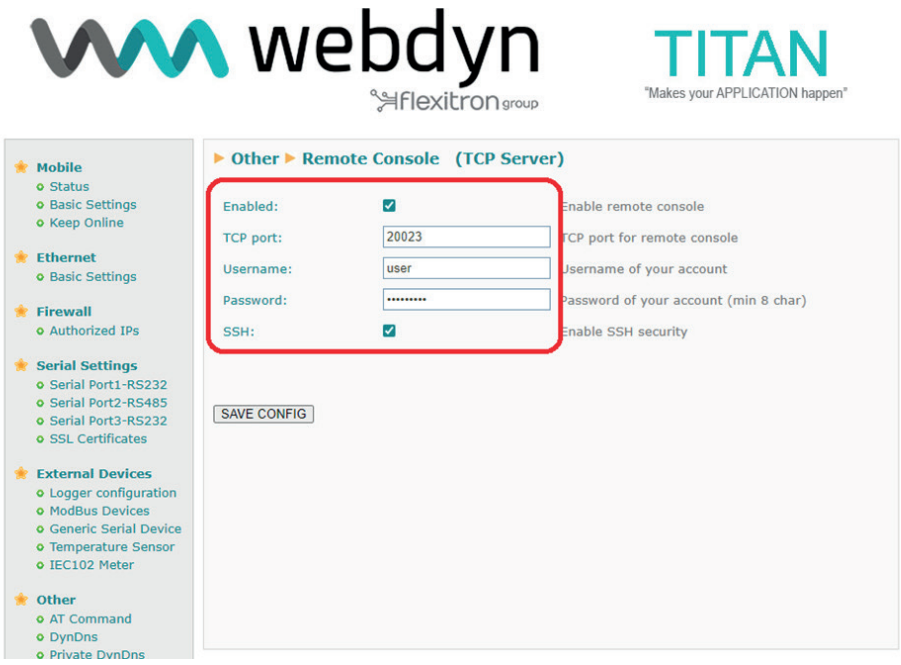
You also have the option to configure SMS messages on the TITAN-based device in case you need to perform any future action on it (such as a configuration change, a remote reset, a status reading, etc.) from any location. You can configure SMS messages from the **"Other - SMS control"** menu.

The image below shows a configuration where SMS messages are enabled, with a header (password) containing the text "mtx" and all phone numbers authorised (from where an AT command is sent via SMS). If you only want authorised telephones to send AT commands via SMS, do not select the "all phones" box and enter the authorised telephone numbers in full (for example, +34666123456).

With this in mind, if you need to check the coverage remotely, for example, you can send an SMS containing the text "mtx at+csq" and you will receive an SMS message with the requested information.



It may also be useful if your SIM card provides you with a public IP address (or accessible IP) and you have enabled the Telnet or SSH console to send AT commands to the device remotely and avoid unauthorised access. This can be done from the "Other - Remote console" menu. Try not to use standard ports for Telnet (23) and SSH (22) if you are using a SIM card with a public IP address. This will also avoid unwanted traffic. You can also use the **"Firewall - Authorized IPs"** menu section to authorise access to the remote console only from authorised IP addresses.



7. Once the configurations are complete

Once you have completed the aforementioned configurations, you should re-start the TITAN-based device so that it can begin to operate with the new configuration. To do so, please go to the "Other - reboot" menu.

Any questions?

Please send us an email to iotsupport@mtxm2m.com