

TITAN

Application Note 50

Reading IEC 60870-5-102 Electricity Meters using
IP-RS232 Gateways and CSD Data Calls

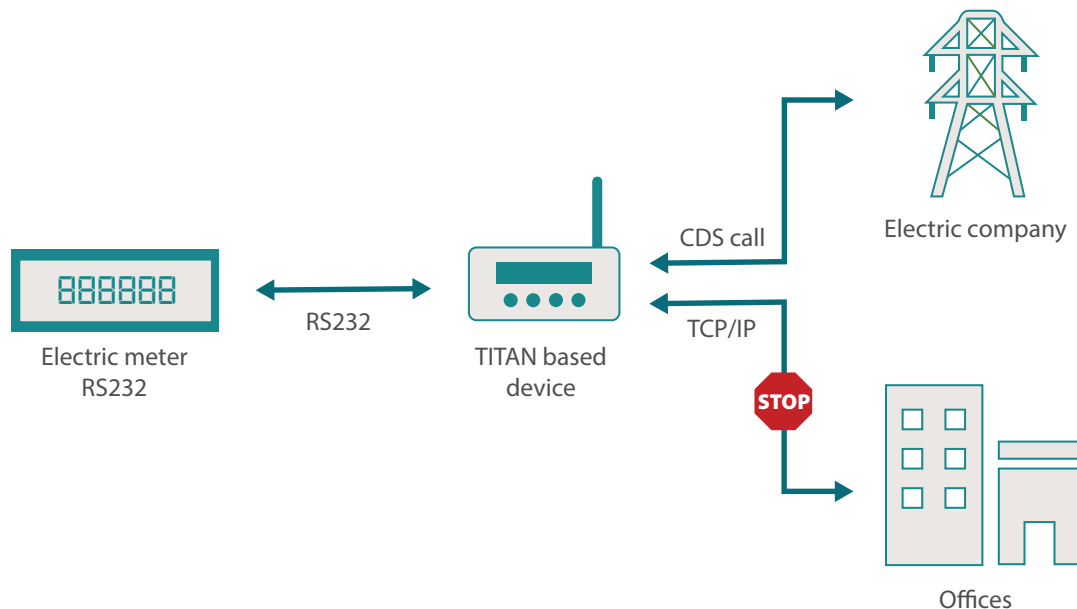
Reading IEC 60870-5-102 Electricity Meters Using IP-RS232 Gateways and CSD Data Calls

1. Scenario Details

TITAN-based devices have all the typical functionalities of 4G/3G/2G routers, as well as a series of added features that make them one of the most feature-packed routers on the market. One of the added features is the ability to create CSD-RS232 and IP-RS232 gateways, these are often used when reading IEC 60870-5-102 electricity meters.

2. Description of the Example Scenario

- We have an electricity meters (IEC 60870-5-102) with an RS232 serial port (9600,8,N,1).
- We want to configure the TITAN-based device to establish an IP-RS232 gateway and therefore be able to read the meter in real time via TCP-IP.
- Furthermore, the TITAN-based device must be able to accept a CSD call when it comes in and allow the meter to be read by the utility company via a transparent CSD-RS232 gateway. The CSD call takes precedence over IP-RS232 communications, so the latter must be suspended when the call is received, and restored when the utility company's CSD call ends.



3. Configuring the Associated Serial Port

If we want to be able to use the TITAN-based device's RS232 serial ports to accept CSD calls, we must first configure both ports to the speed and parity, etc. These values match those in the meter's serial port configuration, which in this example is 9600,8,N,1.

As in this example we also want to read the meter over an IP connection, we must configure a TCP Server gateway. In this example the listening TCP port will be TCP port 20010.

To do this, go to the "Serial Settings > Serial Port1-232" menu and configure the screen as follows:



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- Mobile
 - Status
 - Basic Settings
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- Ethernet
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 - Authorized IPs
- Serial Settings
 - Serial Port1-RS232**
 - Serial Port2-RS485
 - SSL Certificates
- External Devices
 - Logger configuration
 - ModBus Devices
 - Generic Serial Device
 - Temperature Sensor
 - IEC102 Meter
 - W-MBus
- Other
 - AT Command
 - DynDns
 - Private DynDns
 - Sms control
 - Periodic Autoreset
 - Time Servers

Serial Gateway ▶ Com1 Settings

Baudrate:	9600	Baudrate of serial port
Data bits:	8	Number of data bit
Parity:	none	Parity
Stop bits:	1	Number of stop bits
Flow Control:	none	Flow control of serial port
Timeout ms:	0	msec without serial data before sending (default: 50)

☐ 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 function Nothing

☐ Function: Nothing or used by External Device or Script

☒ Function: Serial - IP Gateway (TCP Server)

TCP Local Port: 20010 Listening TCP Port (1 ... 65535)

Temporal client RS232 ☐ Check if you need a temporal TCP Client 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

4. WAN Configuration

If the TITAN-based device needs to be configured to receive CSD calls alone, it is highly recommended (and in some locations it is essential) to configure the device to use the 2G network, avoiding 3G and 4G, even though the TITAN-based devices can use them, not all carriers allow fallback from 3G to 2G, or from 4G to 2G, to receive CSD calls when they occur.

Network configuration is done from the “Mobile > Basic Settings” menu. The figure below shows the appropriate settings. The WAN interface is enabled (so that the device obtains an IP) and the SIM card’s APN, username and password are specified. Lastly, we will configure the device to work on the 2G network.

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Mobile

Status

Basic Settings

Keep Online

Ethernet

Basic Settings

Firewall

Authorized IPs

Serial Settings

Serial Port1-RS232

Serial Port2-RS485

SSL Certificates

External Devices

Logger configuration

ModBus Devices

Generic Serial Device

Temperature Sensor

IEC102 Meter

W-MBus

Other

AT Command

DynDns

Private DynDns

Sms control

Periodic Autoreset

Time Servers

Remote Console

Snmp

Mobile Basic Settings

Mobile WANEnabled (IP active)Enable Wireless WAN interface

Sim ModeSIM1Sim selection

SIM1 APN:movistar.esAPN of SIM card 1

SIM1 Username:MOVISTARUsername of SIM card 1

SIM1 Password:*****Password of SIM card 1

SIM1 Pin:PIN of SIM card 1

SIM2 APN:APN of SIM card 2

SIM2 Username:Username of SIM card 2

SIM2 Password:Password of SIM card 2

SIM2 Pin:PIN of SIM card 2

Authentication:AutoAuthentication method

Network selection:2GNetwork selection

DNS selection:Get DNS from Operator

DNS1:8.8.8.8Preferred DNS1


DNS2:8.8.4.4Preferred DNS2

5. Configuration

Optionally, it can be useful to configure the TITAN-based device to use SMS messages in the event that remote commands need to be sent to it in the future (i.e. a configuration change, a remote reset, a status reading, etc.). SMS message configuration can be done from the “Other > SMS control” menu.

The following screenshot shows a configuration in which SMS messages are enabled with headers (password), with text “mtx”, and all phone numbers are authorized (those from which all AT commands can be sent by SMS). If you only want authorized phones to be able to send AT commands via SMS, leave the “all phones” checkbox unchecked and enter the authorized phone numbers in full (e.g. +34666123456).

For example, if you need to remotely check the coverage, send an SMS with the text “mtx at+csq” and you will get an SMS message back with the requested information.

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★ **Mobile**

◆ Status

◆ Basic Settings

◆ Keep Online

★ **Ethernet**

◆ Basic Settings

★ **Firewall**

◆ Authorized IPs

★ **Serial Settings**

◆ Serial Port1-RS232

◆ Serial Port2-RS485

◆ SSL Certificates

★ **External Devices**

◆ Logger configuration

◆ ModBus Devices

◆ Generic Serial Device

◆ Temperature Sensor

◆ IEC102 Meter

◆ W-MBus

★ **Other**

▶ **Other ▶ SMS control**

SMS function

AT : ☒ enabled

AT header:

Authorized phone numbers: ☒ all phones

Send AT Commands by SMS allowed (you can reboot the device, get IP Wan, get GSM RSSI, change configuration, ...)

Header of at commands

All Phones are allowed

Authorized number 1

Authorized number 2

Authorized number 3

Authorized number 4


Authorized number 5

Authorized number 6

Authorized number 7

Authorized number 8

If your SIM card gives you a public IP address (or accessible IP) it can also be useful to have Telnet or SSH enabled to send AT commands to your device remotely to avoid unnecessary journeys. This can be done in the “Other > Remote console” menu. Try not to use the usual ports for Telnet (23) and SSH (22) if you are using a SIM card with a public IP address, in order to avoid unwanted traffic. You can also use the “Firewall > Authorized IPs” menu to authorize remote console access from authorized IP addresses only.



The image shows the Webdyn logo, which consists of a stylized 'w' made of three overlapping waves in grey, teal, and blue, followed by the word 'webdyn' in a bold, black, sans-serif font. Below 'webdyn' is the text 'flexitron group' with a small icon of three connected nodes. To the right of the logo, it says 'powered by TITAN' in a smaller font, with 'TITAN' in a larger, bold, teal font.

The navigation menu on the left includes the following items:

- ★ Mobile
 - ◇ Status
 - ◇ Basic Settings
 - ◇ Keep Online
- ★ Ethernet
 - ◇ Basic Settings
- ★ Firewall
 - ◇ Authorized IPs
- ★ Serial Settings
 - ◇ Serial Port1-RS232
 - ◇ Serial Port2-RS485
 - ◇ SSL Certificates

The main content area is titled 'Other > Remote Console (TCP Server)' and contains the following settings:

Enabled:	<input checked="" type="checkbox"/>	Enable remote console
TCP port:	<input type="text" value="20023"/>	TCP port for remote console
Username:	<input type="text" value="user"/>	Username of your account
Password:	<input type="password" value="*****"/>	Password of your account (min 8 char)
SSH:	<input type="checkbox"/>	Enable SSH security

At the bottom of the form is a button labeled 'SAVE CONFIG'.

6. End of the Configuration Process

After entering the above settings, simply reboot the TITAN-based device for them to take effect. You can do this from the “Other > Titan Scripts” menu.