

# TITAN

## Application Note 3

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Using an ALIAS to Execute Commands Via SMS

# Using an ALIAS to Execute Commands Via SMS

## 1. Scenario Details

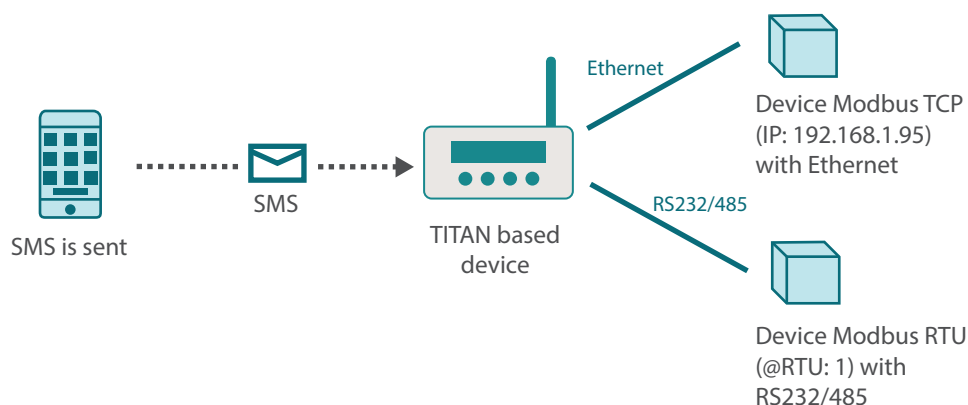
TITAN-based devices have all the typical functionalities of 2G/3G/4G routers, but they also have a series of added features that make them one of the most feature-packed routers on the market.

One of the added features is its ability to execute AT commands using SMS messages. Using AT commands it can read parameters such as coverage, it can perform a reset, change a configuration, switch a relay or write to a Modbus register on an external device connected to the router, etc.

Sometimes it is difficult to execute AT commands directly via SMS, they can be quite long and tedious to enter using a mobile phone keypad. The example below shows the advantages of ALIASes, which solve this problem.

## 2. Description of the Example

In this example, we will configure the SMS commands section of a TITAN-based device. Imagine we have the following scenario:



We want to configure 5 SMS messages. Message No. 1 is intended to obtain the coverage of the TITAN-based device remotely. With message No. 2, we want to write a "1" to register "5" of the Modbus RTU device with address @1. With message no. 3, we want to write a "0" to register "5" of the Modbus RTU device with address @1. With message No. 4, we want to write a "1" to register "5" of the Modbus TCP device with IP address 192.168.1.95 and TCP port 502. Lastly, with message No. 5 we want to write a "0" to register "5" of the Modbus TCP device with IP address 192.168.1.95 and TCP port 502. The MODBUS 16 command will be used for all writes.

## 2.1 How would SMS commands be sent without using ALIAS?

If ALIASes are not used and the AT commands have to be sent directly, we would need to send the following texts for each of the previous messages:

SMS No. 1:     mtx at+csq  
SMS No. 2:     mtx at^mtxtunnel=setmodbus,1;5;16;1  
SMS No. 3:     mtx at^mtxtunnel=setmodbus,1;5;16;0  
SMS No. 4:     mtx at^mtxtunnel=setmodbus,192.168.1.95:502;5;16;1  
SMS No. 5:     mtx at^mtxtunnel=setmodbus,192.168.1.95:502;5;16;1

As we can see, entering this text using the keypad of a mobile phone every time would be a very tedious process. We can avoid this by using ALIASes. With ALIASes, the TITAN-based device basically searches for and replaces a certain text phrase with the command we want to execute, returning the result afterwards.

## 2.2 How would SMS commands be sent without using an ALIAS?

The first step is to configure the texts we want to use for each of the 5 previous SMS messages. For example, we could choose “gsm”, “rtu on”, “rtu off”, “ip on”, “ip off”.

gsm             at+csq  
rtu on           at^mtxtunnel=setmodbus,1;5;16;1  
rtu off           at^mtxtunnel=setmodbus,1;5;16;0  
ip on            at^mtxtunnel=setmodbus,192.168.1.95:502;5;16;1  
ip off           at^mtxtunnel=setmodbus,192.168.1.95:502;5;16;0

For example, each time we send an SMS with the text: rtu on - the TITAN-based device will execute the associated AT command, in this case:

at^mtxtunnel=setmodbus,1;5;16;1 and will return an SMS message with the result.

The screenshot shows the 'Intelligent Router' web interface. The left sidebar contains the following navigation options:

- Firewall
  - NAT
  - 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
  - GPS Receiver
- Other
  - AT Command
  - DynDns
  - Private DynDns
  - Sms control** (highlighted)
  - 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

The main content area displays the 'Sms control' configuration page. It features a table with two columns: 'ALIAS' and 'AT COMMAND'. The table contains 9 rows of configuration data, with the first 6 rows highlighted by a red box.

ALIAS	AT COMMAND
gms	at+csq
rtu on	at^mbxtunnel=setmodbus,1;
rtu off	at^mbxtunnel=setmodbus,1;
ip on	at^mbxtunnel=setmodbus,1;
ip off	at^mbxtunnel=setmodbus,1;
valor[params]	at^mbxtunnel=setmodbus,1;

## 2.3 Which SMS messages can be returned when using an ALIAS?

This depends on the configuration. There are two boxes: “Alias Result OK” and “Alias Result ERROR”, as can be seen in the following screen:

The screenshot shows the 'Intelligent Router' web interface. The sidebar on the left lists various configuration options, including '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', and 'Logout'. The main area displays the 'other-sms-call-control.php' configuration page. It includes fields for 'Alias 4' through 'Alias 10'. A red-bordered box highlights the 'Alias Result OK' (set to 'OK'), 'Alias Result ERROR' (set to 'ERROR'), and 'Alias Hide AT' (checked) settings. A 'SAVE CONFIG' button is located at the bottom.

If nothing is entered in these 2 configuration boxes, the TITAN-based device will return the response for the execution of an AT command. This may or may not be successful depending on the type of AT command. For example, if we send an SMS command with the ALIAS “gsm”, the TITAN-based device will return an SMS message similar to the following:

```
at+csq
+CSQ: 20,99
OK
```

Which is correct, as we wanted to find out the GSM coverage (which in this case is “20”).

But if we send the ALIAS “rtu on”, the response would be something like:

```
at^mtxtunnel=setmodbus,1;5;1
OK
```

Which, depending on the user's profile, may be correct or not. TITAN-based devices can return a personalized response for each ALIAS. Let's continue with the example, imagine that we want to receive the following responses:

gsm	always the response to the AT command
rtu on	rtu on OK (if it was executed correctly)
	rtu on ERROR (if execution failed)
rtu off	rtu off OK (if it was executed correctly)
	rtu off ERROR (if execution failed)
ip on	ip on OK (if it was executed correctly)
	ip on ERROR (if execution failed)
ip off	ip off OK (if it was executed correctly)
	ip off ERROR (if execution failed)

This can be achieved by entering the text in the "Alias Result OK" box that we want returned for each correctly executed ALIAS:

```
<a1></a1><a2>rtu on OK</a2><a3>rtu off OK</a3><a4>ip on OK</a4><a5>ip off OK</a5>
```

Similarly, we can enter the text in the "Alias Result ERROR" box that we want returned for each ALIAS that is executed with an ERROR:

```
<a1></a1><a2>rtu on ERROR</a2><a3>rtu off ERROR</a3><a4>ip on ERROR</a4><a5>ip off ERROR</a5>
```

It should be noted that the response from alias No. 1 is <a1></a1>. If no text is specified, that alias returns the execution of the AT command as a response. If useful, we may want to find out the coverage.

### 3. Other Considerations

Remember, in order to execute SMS commands, even if they are ALIASes, you must check the box enabling the execution of AT commands via SMS, you must also specify the authorized phone numbers (either all of them, or a list of authorized numbers).

The screenshot shows a web browser window with the address bar displaying '192.168.1.2/other-sms-call-control.php'. The page header features the 'webdyn' logo, 'powered by TITAN', and 'flexitron group'. A left sidebar contains navigation links for Mobile, Ethernet, Wifi, Firewall, and Serial Settings. The main content area is titled 'Other > SMS control' and contains the following configuration options:

- SMS function:** A checkbox labeled 'enabled' is checked and highlighted with a red box.
- AT header:** A text input field contains the value 'mtx'.
- Authorized phone numbers:** A checkbox labeled 'all phones' is checked and highlighted with a red box. Below it are five empty text input fields labeled 'Authorized number 1' through 'Authorized number 5'.

Explanatory text on the right side of the form states: 'Send AT Commands by SMS allowed (you can reboot the device, get IP Wan, get GSM RSSI, change configuration, ...)' and 'Header of at commands'.

In the case of this example, ALIASes are being executed using Modbus RTU, meaning that the corresponding serial port (the serial port that will be used to communicate with the Modbus RTU devices) must be properly configured.

The same is true for the configuration of the Modbus RTU devices, in which the serial port to be used must be associated.

Intelligent Router x +

No es seguro | 192.168.1.2/serial-settings.php?id=1

**webdyn** powered by **TITAN**  
flexitron group

- Mobile
  - Status
  - Basic Settings
  - Keep Online
- Ethernet
  - Basic Settings
- Wifi
  - Basic Settings
  - DHCP Server
- Firewall
  - NAT
  - Authorized IPs
- Serial Settings**
  - Serial Port1-RS232
  - Serial Port2-RS485
  - SSL Certificates
- External Devices
  - Logger configuration

**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 functions or Nothing

☒ Function: Nothing or used by External Device or Script

Intelligent Router x +

No es seguro | 192.168.1.2/external-modbusrtu.php

**webdyn** powered by **TITAN**  
flexitron group

- Mobile
  - Status
  - Basic Settings
  - Keep Online
- Ethernet
  - Basic Settings
- Wifi
  - Basic Settings
  - DHCP Server
- Firewall
  - NAT
  - 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
  - GPS Receiver

**External Devices > ModBus RTU / TCP**

Enabled: ☒ Enable Modbus Devices

Serial Port: Serial Port 1 Select the connected serial port if needed

Logger: ☐ Check if logger must be used  
Please, configure logger before using this option

Dev. name / ID	Addr.	Command	Start @	Num word/bit	Reg Type	Period
Device name / ID:	Address:	Command: 0x01	Start:	Number Words / Bits:	Reg Type: WORD	Period: 1
Insert the device name or ID						
Modbus RTU address or IP:port address						
Modbus read command						
Address of the first register						
Words for command 0x03/0x04. Bits for 0x01/0x02						
Type of registers for command 0x03/0x04						
Read period (minutes)						



## 4. ALIAS Parameters

Configuration parameters can be used in ALIASes. This enables a single ALIAS to be configured to change a parameter that may have multiple values, for example.

Let's imagine that we want to configure an ALIAS to arbitrarily change the value of a Modbus register. In other words, imagine that we have a Modbus Slave device on address 192.168.1.28 and we want to be able to modify the value of register X with value Y, i.e. value Y is written to register X when sent as a parameter by SMS.

To achieve this, we need to enter the ALIAS text followed by the [params] tag in the ALIAS field. The tag indicates that the ALIAS will have parameters.

We then enter the command that we want to be executed in the TITAN-based device in the AT COMMAND field. We then enter the tags [\*1] and [\*2] in the field where we want to put the value sent as a parameter.

Alias 4:	ip on	at^mtxtunnel=setmodbus,19;
Alias 5:	ip off	at^mtxtunnel=setmodbus,19;
Alias 6:	valor[params]	at^mtxtunnel=setmodbus,19;
Alias 7:		
Alias 8:		

In this example, we get:

```
VALUE[params]  
AT^MTXTUNNEL=SETMODBUS,192.168.1.502;[*1];16;[*2]
```

So, if we send an SMS with the text: VALUE 14 12

The TITAN-based device will execute the following:

```
AT^MTXTUNNEL=SETMODBUS,192.168.1.502;14;16;12
```