

Support Note –645M-4 Cellular Modem SMS

Application

The 645M-4 cellular modem has the ability to SMS the I/O alarms to a predetermined mobile phone or tablet and to get an up-to-date status of connected I/O values and other internal settings by send an SMS to the Modem.

The 645M-4 has 4 x Digital input/outputs (each can be an input or an output depending on configuration); however, the digital outputs are 3.3VDC so require an interposing relay card (Please Contact ELPRO Sales Manager for details).


Note: This application note is written using Firmware Version 3.2.254, earlier version may have some variation in how its configured.

Configuration

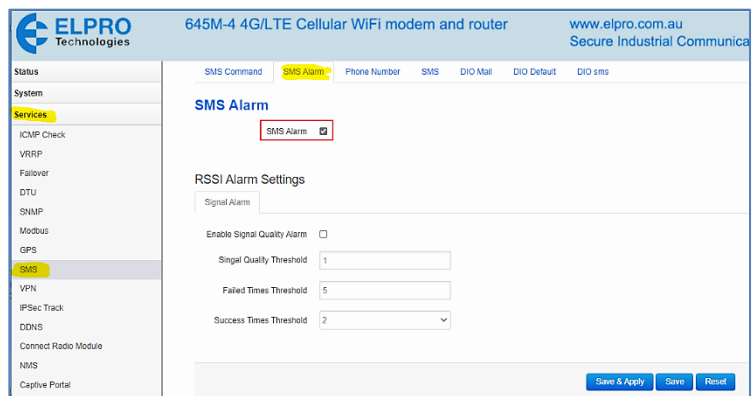
Inputs

Configuring can be found under the main web page and selecting “Services/SMS” from the Left-hand menu system.

The top row of commands shows the different configuration tabs, select the “SMS Command” tab, and select “Enable” & “SMS ACK”. Press the “Save and Apply” button.



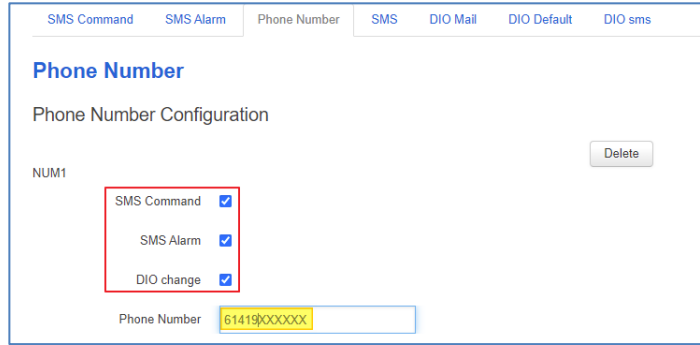
For Digital Inputs you will need to select the “SMS Alarms tab and then enable the “SMS Alarm” checkbox. Again press the “Save and Apply” button.



Next select the “Phone Number” tab and enable the checkboxes “SMS Alarm” & “DIO Change” for Inputs and if using Outputs enable “SMS Command”.

Next enter the phone/s you wish to send SMS messages to.

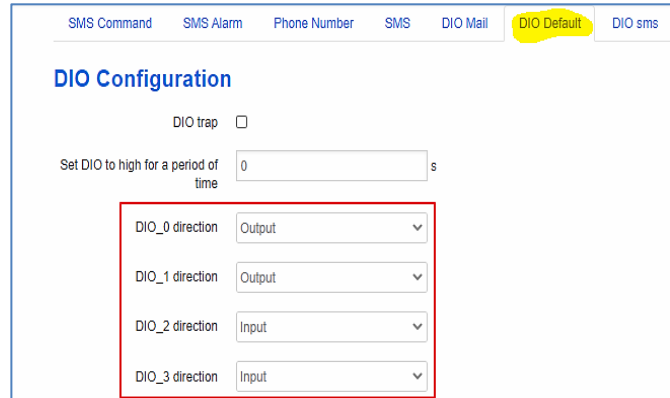
You can enter more than one number/group.



When entering the phone numbers, use the international country code format, i.e. Australia = 61 so the number will be 61418324174, etc. rather than 0418324174. Again make sure you press the “Save and Apply” button.

Next, we need to select the “DIO Default” tab and make the selection for the function of the DIO, e.g., Input or Output. (DIO selection was implemented from Firmware V3.2.250).

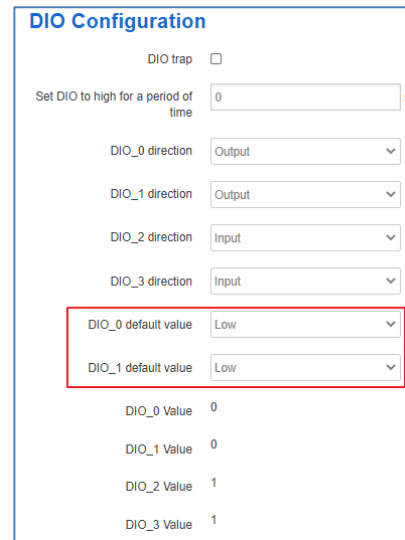
If the DIO’s are selected as Inputs, then they will automatically be selected as High and the default Value option for this input will be removed from the list. This brings it into line with standard ELPRO Digital input logic format.



Elpro radio inputs are generally pulled high and are then activated when a Ground is switched to it. You will note in the screenshot that the DIO_0-3 (Input 1-4) value for DIO_2 & DIO_3 are High (1) and will activate when the input is connected to GND and if you refreshed the Web page you would see the state change from “1” to “0” indicating the input is ON

If they are selected as Outputs, the default output value will be Low (Off) and you have the option to make high if you wish to reverse the logic.

If the DIO is being used as an Outputs, they need to be set to “Low” from the dropdown list.



Finally selecting the “DIO SMS” tab allows you to configure the feedback text message you will get back when the output is turned ON & OFF. If this is not enabled the default Module S/N and DIO status will be shown, i.e., “**S/N 660420156A0094F7. DIO2 is changed from 0 to 1**”.

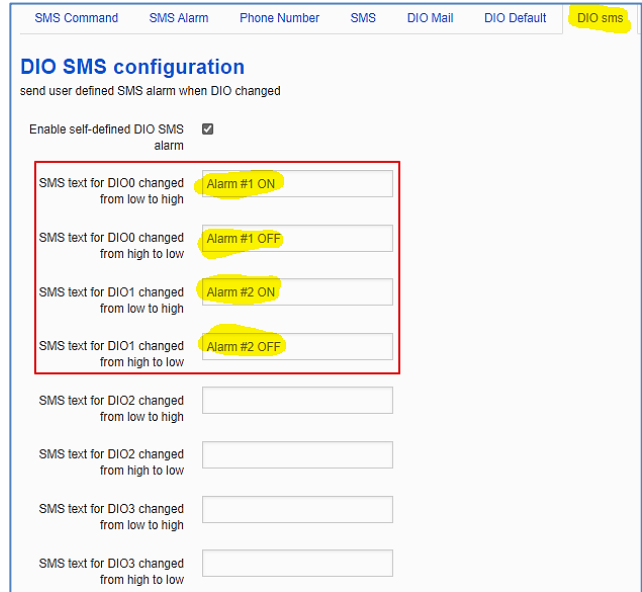
If you enable the “Enable self-defined DIO SMS alarm”, this will display an ON and OFF field for each digital input.

Enter appropriate text for each ON and OFF alarm state, i.e. when switched from High to Low the Alarm would indicate ON and from Low to High would indicate OFF.

To test

The “SMS” Tab will display the SMS log, i.e., if alarms have been triggered and sent or if the modem has received an SMS to set particular outputs. To test the SMS functionality, turn on one of the Digital Inputs (connect a piece of wire from “GND” to the “DIO0-4” terminals and you get the message on your Phone indicating which one was triggered, you will also see in the SMS Log what inputs state changes have occurred, when they have been sent and who they were sent to.

If the firmware Version is pre V3.2.243, you can also send a test message to the Phone number from the Web page to check that it can receive ok, this function was removed because of security concerns in Firmware V3.2.243.



SMS Command SMS Alarm Phone Number SMS DIO Mail DIO Default **DIO sms**

DIO SMS configuration

send user defined SMS alarm when DIO changed

Enable self-defined DIO SMS alarm

SMS text for DIO0 changed from low to high

SMS text for DIO0 changed from high to low

SMS text for DIO1 changed from low to high

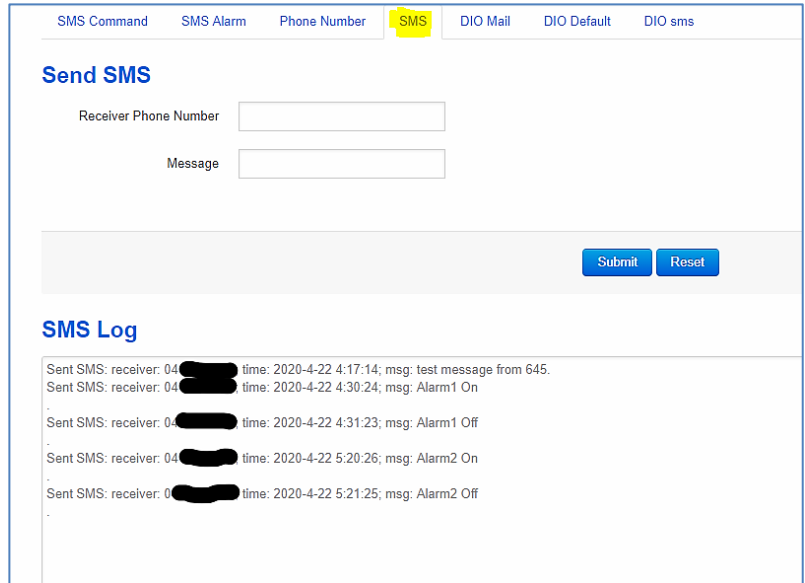
SMS text for DIO1 changed from high to low

SMS text for DIO2 changed from low to high

SMS text for DIO2 changed from high to low

SMS text for DIO3 changed from low to high

SMS text for DIO3 changed from high to low



SMS Command SMS Alarm Phone Number **SMS** DIO Mail DIO Default DIO sms

Send SMS

Receiver Phone Number

Message

SMS Log

Sent SMS: receiver: 04 [REDACTED] time: 2020-4-22 4:17:14; msg: test message from 645.

Sent SMS: receiver: 04 [REDACTED] time: 2020-4-22 4:30:24; msg: Alarm1 On

...

Sent SMS: receiver: 04 [REDACTED] time: 2020-4-22 4:31:23; msg: Alarm1 Off

Sent SMS: receiver: 04 [REDACTED] time: 2020-4-22 5:20:26; msg: Alarm2 On

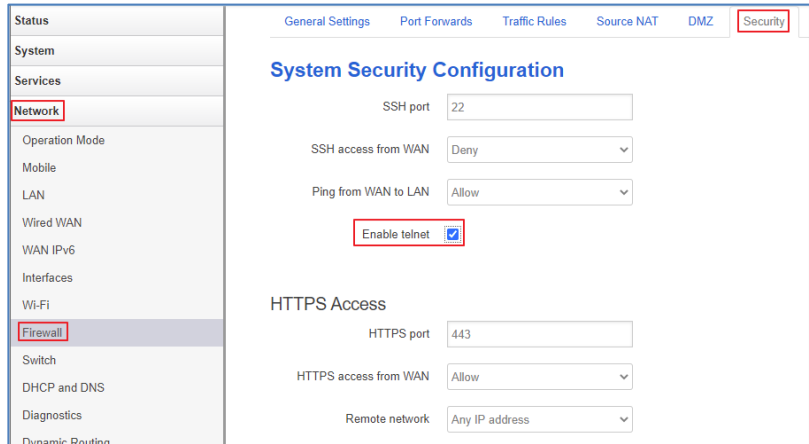
...

Sent SMS: receiver: 0 [REDACTED] time: 2020-4-22 5:21:25; msg: Alarm2 Off

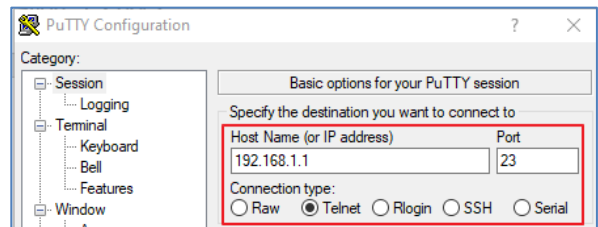
...

Now the only way to send a Test SMS is via an SSH command terminal.

First you will need to enable the Telnet function under the Network / Firewall / Security tab.



To do this use "Putty.exe" and connect to the LAN IP address via Telnet using Port 23. (see Screenshot)



Login with the following details

Username: = router

Password: = admin!@#

To send an SMS input the following command at the prompt.

"/etc/system/sms_send 0419XXXXXX "This is the Test Message", where "0419XXXXXX" is the mobile phone, you wish to send to.

```
BusyBox v1.23.2 (2020-01-09 23:33:24 CST) built-in shell (ash)
=====645M-4=====
root@645M-4:~# /etc/system/sms_send 0419[REDACTED] "This is the Test Message"
root@645M-4:~# █
```

Outputs & Commands

To be able to turn on the Digital outputs and/or use some of the commands to Turn on/off functions or read statuses we need to select the "SMS Command" tab and enable the checkbox and if you want you can select "SMS ACK", this will send a confirmation back to you when it receives the message.

The rest of the configuration fields are where we setup what command texts we can send to the Modem from your mobile phone and what these functions will perform.

i.e. **reboot** will reboot the modem, **cellstatus** will get a message back from the modem showing what the status of the Cellular connection, i.e. "Up" - connected or "Down" not connected.

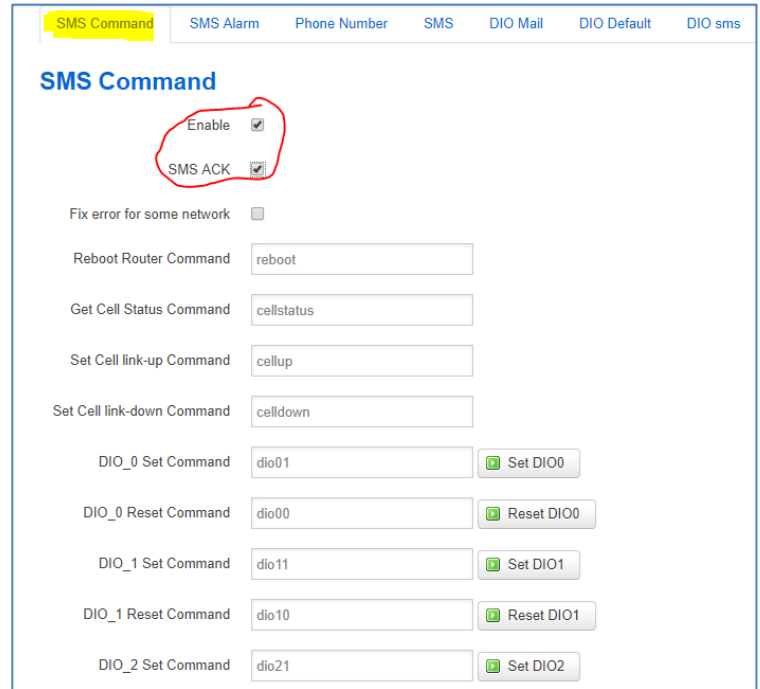
We also can configure commands to “Set” and “Reset” each digital Outputs, Set will drive the output Low (GND) and Reset will reset to High (3.3VDC).

These commands are the SMS messages that you can text to the modem to turn ON/OFF the outputs.

dio10 will Reset DIO1 which will essentially ground the Output and if connected to an input device will turn it ON.

dio11 will Set DIO1 which will switch the transistor output OFF (3.3V)

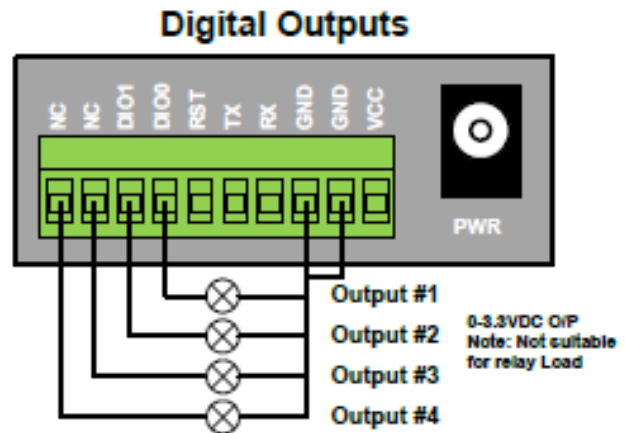
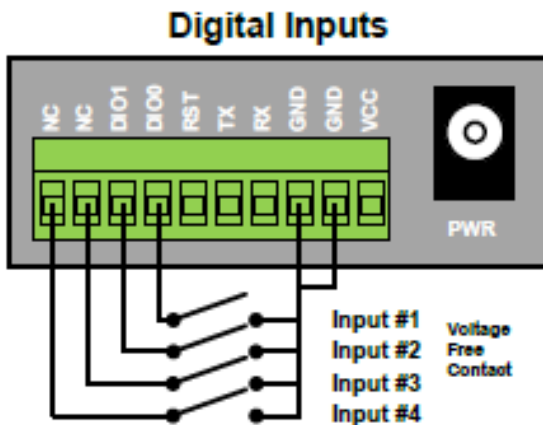
These outputs are a low power 3.3V DC transistor output. To switch something or drive a 12 or 24 V Relay you will need an appropriate output card. Please contact Elpro for possible options.



I/O Wiring

Below are examples for wiring the I/O connectors on the 645M-4 modems (module end connector).

Note: Digital Outputs will require and addon Output Card.



Amendment Register:

Issue No.	Date	Details of Amendment
1.0	22/4/2020	Draft Issue
1.1	2/11/2020	Amendment to Phone number and Firmware requirement for inputs.
1.2	11/11/2020	Amend Phone number & add extra info for Output operation