

Skywire™ LTE CAT1 Socket Dial Example

NimbeLink Corp
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1. Introduction

1.1 APPLIES TO THE FOLLOWING PART NUMBERS

Orderable Device	Description	Firmware Version	Manufacturer	Carrier	Network Type
NL-SWDK	Skywire Development Kit	n/a	NimbeLink		
NL-SW-LTE-GELS3	Skywire™ LTE CAT1 Modem	4.3.1.0	NimbeLink	Verizon	4G LTE
NL-SW-LTE-GELS3-B	Skywire™ LTE CAT1 Modem	4.3.2.0-25421	NimbeLink	Verizon	4G LTE
NL-SW-LTE-GELS3-C	Skywire™ LTE CAT1 Modem	4.3.3.0-29632	NimbeLink	Verizon	4G LTE
TG.30.8113	Cellular Antenna		Taoglas		

1.2 PREREQUISITES



This document assumes you have completed the initial setup of your modem and development kit. If you have not completed those steps, refer to the Skywire Development Kit User Manual and complete the modem setup before proceeding.

2. Socket Dial

2.1 OVERVIEW

Using socket dials is useful for uploading information to or downloading information from a website or database via HTTP commands. Below is an example for connecting to a server, uploading data, downloading data, and disconnecting from the server.

This section explains the steps required to initiate a socket dial using two different versions of firmware. To find what version of firmware your modem is running, send the following command:

ATI

The modem should respond with several lines of information, including a line that says:

REVISION 4.3.x.0

Where "x" is either 1 or 2, indicating the firmware revision. For Rev 1 firmware, use the procedure outlined in Section 2.2. For Rev 2 firmware, use the procedure outlined in Section 2.3.

2.2 SOCKET DIAL PROCEDURE - REV 1

2.2.1 CONFIGURE PDP CONTEXT

Type the following command into your terminal program:

AT+SQNSCFG=3,3,300,90,600,5

followed by the Enter key, and the terminal should respond with:

OK

Next, type the following command into your terminal program:

AT+CGDCONT=3,"IP", "[APN]"

where [APN] is your carrier's APN, followed by the Enter key. Your terminal program should respond with:

OK

For example, if your APN is "vzwinternet", type:

AT+CGDCONT=3,"IP","vzwinternet"

2.2.2 ACTIVATE CONTEXT

Type the following command into your terminal program:

AT+CGACT=1,3

Followed by the Enter key, and the terminal should respond with:

OK

This will get an IP address for your modem.

2.2.3 INITIATE SOCKET DIAL

In the terminal program, type the following command:

```
AT+SQNSD=3,0,80,"example.com"
```

where 3 is the socket we are using, 0 is the transmission protocol to use (0 - TCP, 1 - UDP), 80 is the port number you'd like to connect to, and example is the host name or IP address you'd like to connect to, followed by the enter key. After a short delay, the terminal program should respond with:

```
CONNECT
```

Note: The TCP port (third parameter) that is typically used is port 80, which is the TCP Port for HTTP. Depending on your application, you may need a different port.

2.2.4 SEND DATA VIA HTTP

In order to send data to the webserver, you can use the HTTP POST command. The syntax of the POST command is as follows:

```
POST /test/demo_form.asp HTTP/1.1
```

POST is the HTTP command being issued, /test/demo_form.asp is the endpoint of the server, and HTTP/1.1 is the HTTP version you will be using.

Note: For this step, you will not be able to see the text you are typing. To ensure that the data is accurate, it is recommended to copy and paste in the data. However, this is not necessary.

In the terminal program, enter the POST data you would like to send according to the above syntax. Make sure that the data is formatted to how your server is expecting it. Once you type the data, press CTRL+J **twice**. This will enter the two new line characters necessary to signal to the server that data transmission is complete. After a short delay, the terminal program should display:

```
HTTP/1.1 2xx OK
```

```
[text response from server]
```

```
OK
```

where 2xx is the successful response code of the HTTP server. 200 is the general HTTP/1.1 response of OK, meaning that the response was received properly. There are derivations of the 2xx response, however. If you receive an unexpected value, please consult the HTTP/1.1 Protocol Documentation at the following URL:

<http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html>

2.2.5 SHUTDOWN THE SOCKET CONNECTION

In the terminal program, type the following command:

```
+++
```

followed by the Enter key, and the terminal should respond with:

```
OK
```

This command (three plus signs) is the escape command to suspend the data connection in the socket connection.

To shut down the socket connection, type the following command:

```
AT+SQNSH=3
```

followed by the Enter key, and the terminal should respond with:

```
OK
```

2.3 SOCKET DIAL PROCEDURE - REV 2

2.3.1 CONFIGURE PDP CONTEXT

Type the following command into your terminal program, followed by the Enter key:

```
AT+CGDCONT=3,"IPV4V6","[APN]"
```

Where [APN] is your carrier's APN. The modem should respond with:

```
OK
```

For example, if your APN is "VZWINTERNET", type:

```
AT+CGDCONT=3,"IPV4V6","VZWINTERNET"
```

2.3.2 CONFIGURE INTERNET SERVICE SETUP PROFILE

Type the following commands into your terminal program, each followed by the Enter key:

```
AT^SISS=0,"srvType","Socket"
```

```
AT^SISS=0,"conId",3
```

```
AT^SISS=0,"address","socktcp://www.example.com:[port]"
```

Where "www.example.com" is the website you want to connect to, and [port] is the port number the socket should use (for example, port 80 would be used for HTTP over TCP). The modem should respond to each command with the following:

```
OK
```

This is the minimum profile configuration required to establish a connection over a socket.

2.3.3 ACTIVATE CONTEXT

Type the following command into your terminal program, followed by the Enter key:

```
AT^SICA=1,3
```

The modem should respond with

```
OK
```

At this point, the modem will begin attempting to activate the specified PDP context.

To verify that the context has been activated, type the following command followed by the Enter key:

```
AT^SICA?
```

The modem should respond with:

^SICA: 1,1

^SICA: 2,0

^SICA: 3,1

^SICA: 4,0

^SICA: 8,0

OK

If the line for context 3 shows "**^SICA: 3,0**", retry the context activation command at the beginning of this section.

2.3.4 OPEN THE SOCKET

Type the following command into your terminal program, followed by the Enter key:

AT^SISO=0

The modem should respond with:

OK

^SISW: 0,1

The modem uses the parameters entered in Section 3.3 when opening the socket.

2.3.5 SEND DATA VIA HTTP

To initiate sending data, a POST command is sent using the following command:

AT^SISW=0,#

Where # is the size of the message in bytes (i.e. the number of characters). It is recommended to type out the desired message in a text editor of your choice to determine the message length.

Note: The message length must include the carriage return and newline characters that are required at the end of the POST message (4 extra characters)

After entering the previous command, type the POST command using the following syntax:

POST /test/demo_form.asp HTTP/1.1

Followed by CTRL+M, CTRL+J, CTRL+M, CTRL+J. This sends two sequences of newline and carriage return characters. In the above example, the POST message contains 33 characters, so 37 would be entered as the second parameter of the AT^SISW command (33 message characters + 4 whitespace characters).

If entered properly, the modem should respond with:

OK

^SISW: 0,1

^SISW: 0,1

^SISR: 0,1

2.3.6 READ HTTP RESPONSE

If the modem responded with "**^SISR: 0,1**" in the previous step, that means there is incoming data on the socket that can be read. To read from the socket, type the following command followed by Enter:

AT^SISR=0,1000

Where 1000 is the maximum number of bytes to read. If there are fewer than 1000 bytes to read, all of them will be read. If more data is available, the command can be issued multiple times until all data is received.

The modem should respond with:

HTTP/1.1 2xx [status code description]

[text response from server]

OK

2.3.7 SHUTDOWN THE SOCKET CONNECTION

Type the following command in your terminal program, followed by the Enter key:

AT^SISC=0

The modem should respond with:

OK

The socket should now be closed.

3. Working Example 1: dweet.io

3.1 OVERVIEW

This section will provide a working example of sending and receiving data via an HTTP transfer using a Skywire™ NL-SW-LTE-GELS3 modem using a 4G Verizon LTE SIM.

dweet.io is a lightweight messaging service specifically designed for IoT (Internet of Things) devices. In addition to being lightweight, dweet.io does not require an account to get up and running. At www.dweet.io, they have an excellent "hello world" example we will be using.

Use the procedure in Section 3.2 for modems with Rev 1 firmware and the procedure in Section 3.3 for modems with Rev 2 firmware.

3.2 REV 1 FIRMWARE PROCEDURE

Use the following sequence of commands if you have the Rev 1 firmware on your modem.

3.2.1 GET IMEI OF MODEM

dweet.io requires a unique device name in order to send and receive data. For this, we will be using the IMEI of our modem, which is unique to our modem. To display the IMEI, type the following command into the terminal program:

```
AT+CGSN
```

followed by the Enter key, and the terminal will respond with something similar to:

```
353238060023699
```

```
OK
```

The number should be identical to the IMEI printed on the top of the modem label.

3.2.2 INITIATE SOCKET DIAL

Using the syntax described in Step 2.4, type the following command into the terminal program:

```
AT+SQNSD=3,0,80,"dweet.io"
```

followed by the Enter key, and the terminal program should respond with

```
CONNECT
```

In this case, **3** is the socket we are using on the Skywire™ modem, **0** means we are using the TCP transmission protocol, **80** is the TCP port we are using (TCP port 80 is used for HTTP), and **dweet.io** is the hostname we are connecting to.

3.2.3 SEND DATA VIA HTTP

Using the syntax described in Step 2.5, enter the following command into the terminal program:

```
POST /dweet/for/353238060023699?hello=world HTTP/1.1
```

Note: **353238060023699** is the example IMEI that we used in Step 3.2.1. Replace this with your unique IMEI.

Press CTRL+J **twice**, and after a short delay the terminal program should respond with something similar to:

```
HTTP/1.1 200 OK
```

```
Access-Control-Allow-Origin: *
```

```
Content-Type: application/json
```

```
Content-Length: 203
```

```
Date: Tue, 15 Mar 2016 21:50:59 GMT
```

```
Connection: keep-alive
```

```
{"this":"succeeded","by":"dweeting","the":"dweet","with":{"thing":"353238060023699","created":"2016-03-15T21:50:59.822Z","content":{"hello":"world"},"transaction":"debcf53b-1494-4a37-852e-c4d5278f79e6"}}
```

Notice that our IMEI appears next to **"thing"**. By going to the website <https://dweet.io/get/latest/dweet/for/353238060023699>, and replacing **353238060023699** with your IMEI, you will see:

```
{this: "succeeded",by: "getting",the: "dweets",with: [{thing: "353238060023699",created: "2016-03-15T21:51:25.173Z",content:{hello: "world"}}]}
```

This text is the same as the text at the bottom of the terminal response, indicating a successful HTTP transaction.

3.2.4 RECEIVE DATA VIA HTTP

Using the syntax described in step 2.5, enter the following command into the terminal program:

```
GET /get/latest/dweet/for/353238060023699 HTTP/1.1
```

Note: **353238060023699** is the example IMEI that we used in Step 3.2.1. Replace this with your unique IMEI.

Press CTRL+J **twice**, and after a short delay the terminal program should respond with something similar to:

```
HTTP/1.1 200 OK  
Access-Control-Allow-Origin: *  
Content-Type: application/json  
Content-Length: 152  
Date: Tue, 15 Mar 2016 21:58:13 GMT  
Connection: keep-alive
```

```
{"this":"succeeded","by":"getting","the":"dweets","with":[{"thing":"353238060023699","created":"2016-03-15T21:51:25.173Z","content":{"hello":"world"}}]}
```

Notice that our IMEI appears next to **"thing"**. This indicates that we successfully received the HTTP information.

3.3 REV 2 FIRMWARE PROCEDURE

Use the following sequence of commands if you have the Rev 2 firmware on your modem.

3.3.1 GET IMEI OF MODEM

dweet.io requires a unique device name in order to send and receive data. For this, we will be using the IMEI of our modem, which is unique to our modem. To display the IMEI, type the following command into the terminal program:

```
AT+CGSN
```

followed by the Enter key, and the terminal will respond with something similar to:

353238060023699

OK

The number should be identical to the IMEI printed on the top of the modem label.

3.3.2 CONFIGURE SOCKET SERVICE PROFILE

Using the commands outlined in Section 2.3.2, issue the following commands, each followed by the Enter key:

```
AT^SISS=0,"srvType","Socket"
```

```
AT^SISS=0,"conId",3
```

```
AT^SISS=0,"address","socktcp://dweet.io:80"
```

The modem should respond to each command with:

OK

These commands specify that we want a generic **Socket** that uses PDP context **3** to connect to **dweet.io** on port **80** over **TCP**.

3.3.3 ACTIVATE CONTEXT

Type the following command to activate PDP context 3:

```
AT^SICA=1,3
```

Wait for the modem response as described in Section 2.3.3.

3.3.4 OPEN THE SOCKET

Type the following command to open the socket:

```
AT^SISO=0
```

This uses the socket profile settings we set in Section 3.3.2 to initiate the socket dial.

The modem should respond with:

OK

```
^SISW: 0,1
```

3.3.5 SEND DATA VIA HTTP

To allow data to be send over the socket, send the following command, followed by the Enter key:

```
AT^SISW=0,56
```

The modem should respond with:

```
^SISW: 0,56,0
```

Note: The value of 56 is specific to the message we are going to send in this example. If your message is a different length, this value must be updated accordingly.

Next, send the POST command in the following format:

POST /dweet/for/353238060023699?hello=world HTTP/1.1

Followed by CTRL+M, CTRL+J, CTRL+M, CTRL+J.

Note: **353238060023699** is the example IMEI that we used in Step 3.3.1. Replace this with your unique IMEI.

The modem should respond with:

```
OK
^SISW: 0,1
^SISW: 0,1
^SISR: 0,1
```

The response from the POST message can be read by issuing the following command:

AT^SISR=0,1000

The modem should respond with something similar to the following output:

```
^SISR: 0,368
HTTP/1.1 200 OK
Access-Control-Allow-Origin: *
Content-Type: application/json
Content-Length: 203
Date: Fri, 03 Jun 2016 20:18:39 GMT
Connection: keep-alive

{"this":"succeeded","by":"dweeting","the":"dweet","with":{"thing":"353238060023699",
"created":"2016-06-03T20:18:39.914Z","content":{"hello":"world"},"transaction":"48c0b
299-dcba-484d-a587-c974043dd51f"}}
OK
```

Notice that our IMEI appears next to **"thing"**. By going to the website <https://dweet.io/get/latest/dweet/for/353238060023699>, and replacing **353238060023699** with your IMEI, you will see:

```
{this: "succeeded",by: "getting",the: "dweets",with: [{thing: "353238060023699",created:
"2016-06-03T20:18:39.914Z",content:{hello: "world"}}]}
```

This text is the same as the text at the bottom of the terminal response, indicating a successful HTTP transaction.

3.3.6 READ HTTP RESPONSE

To read data via HTTP, first send the following command:

```
AT^SISW=0,54
```

Note: The value of 54 is specific to the message we are going to send in this example. If your message is a different length, this value must be updated accordingly.

Next, send a GET request using the following syntax:

```
GET /get/latest/dweet/for/353238060023699 HTTP/1.1
```

Followed by CTRL+M, CTRL+J, CTRL+M, CTRL+J. The modem should respond with:

```
OK  
^SISW: 0,1  
^SISW: 0,1  
^SISR: 0,1
```

To read the response to the GET request, issue the following command:

```
AT^SISR=0,1000
```

The modem should respond with:

```
^SISR: 0,317  
HTTP/1.1 200 OK  
Access-Control-Allow-Origin: *  
Content-Type: application/json  
Content-Length: 152  
Date: Fri, 03 Jun 2016 20:31:21 GMT  
Connection: keep-alive
```

```
{"this":"succeeded","by":"getting","the":"dweets","with":{"thing":"353238060023699","created":"2016-06-03T20:18:39.914Z","content":{"hello":"world"}}}
```

```
OK
```

Notice that our IMEI appears next to **"thing"**. This indicates that we successfully received the HTTP information.

4. Working Example 2: Exosite

4.1 OVERVIEW

This section will provide a working example of sending and receiving data via an HTTP transfer using a Skywire™ NL-SW-LTE-GELS3 modem using a 4G Verizon LTE SIM.

Exosite is a management service that manages sensor and device data. Exosite allows you to set up a web dashboard that you can send data to via HTTP for M2M applications.

This example assumes that you have registered your device with Exosite. If you have not, please consult the Exosite documentation located at www.exosite.com/support and docs.exosite.com.

To post to Exosite, we have created a Dashboard specifically for NimbeLink customers to walk through the complete process of sending and receiving information from Exosite. The NimbeLink Exosite Example Dashboard is located at the following URL:

<https://nimbelink.exosite.com/views/2334257135/2984653781>

and contains three values that we can send and read: Key1, Key2, and Key3. Key1 is of type “String”, Key2 is of type “integer”, and Key3 is of type “float” (decimal). When we send information in Section 4.4, we must send information of the correct type.

In this example, we will be changing those three values to something we specify, in order to verify that communication is working as expected.

Use the procedure in Section 4.2 for modems with Rev 1 firmware and the procedure in Section 4.3 for modems with Rev 2 firmware.

4.2 REV 1 FIRMWARE PROCEDURE

Use the following sequence of commands if you have the Rev 1 firmware on your modem.

4.2.1 GET CIK OF MODEM OR DEVICE FROM EXOSITE

Exosite requires a unique device name in order to send and receive data. This unique name—called a CIK—is created by Exosite when you register your device with them. For NimbeLink’s example page, we will be using the following CIK:

```
7cafee22ab8628b2838187a7774f5e4b3f05f877
```

Note: This CIK is unique to this example. When you register your device, you will have a different CIK.

4.2.2 INITIATE SOCKET DIAL

Using the syntax described in Section 2.3, type the following command into the terminal program:

```
AT+SQNSD=3,0,80,"m2.exosite.com"
```

followed by the enter key, and the terminal program should respond with

```
CONNECT
```

In this case, **3** is the socket we are using on the Skywire™ modem, **0** means we are using the TCP transmission protocol, **80** is the TCP port we are using (TCP port 80 is used for HTTP), and **m2.exosite.com** is the hostname we are connecting to.

4.2.3 SEND DATA VIA HTTP

Note: The following command must be entered correctly and in a specific order. As such, it is recommended to copy and paste the commands instead of typing them.

Note: Information entered into the terminal program at this point will not be visible on the screen.

Below is the entire command sequence we will be sending on the modem.

```
POST /onep:v1/stack/alias HTTP/1.1
Host: m2.exosite.com
X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877
Content-Type: application/x-www-form-urlencoded; charset=utf-8
Accept: application/xhtml+xml
Content-Length: 28
```

```
Key1=asdf&Key2=100&Key3=11.1
```

Below is the exact process needed to successfully send the data.

Enter the following command into the terminal program:

```
POST /onep:v1/stack/alias HTTP/1.1
```

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

```
Host: m2.exosite.com
```

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

```
X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877
```

followed by CTRL+J on the keyboard. Note that the example CIK is present in this line. This is where you would put your unique CIK in.

Enter the following command into the terminal program:

```
Content-Type: application/x-www-form-urlencoded; charset=utf-8
```

followed by CTRL+J on the keyboard.

Enter the following command into the keyboard:

```
Accept: application/xhtml+xml
```

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

```
Content-Length: 28
```

followed by CTRL+J **twice** on the keyboard. Typing CTRL+J twice will put the necessary blank line in that the HTTP server is expecting.

Note: The value after **Content-Length:** must be equal to the number of characters that you are sending on with the following command. In this case, we have 28 characters.

Finally, enter the following command into the terminal program:

```
Key1=asdf&Key2=100&Key3=11.1
```

where **asdf** is a string of characters, **100** is an integer number, and **11.1** is a decimal number. There is no need to type anything additional to get the data sent. You may want to change these values while keeping the same type to see your specific changes on the Exosite page.

The terminal program should respond with the following:

HTTP/1.1 204 No Content

Date: [today's date and time]

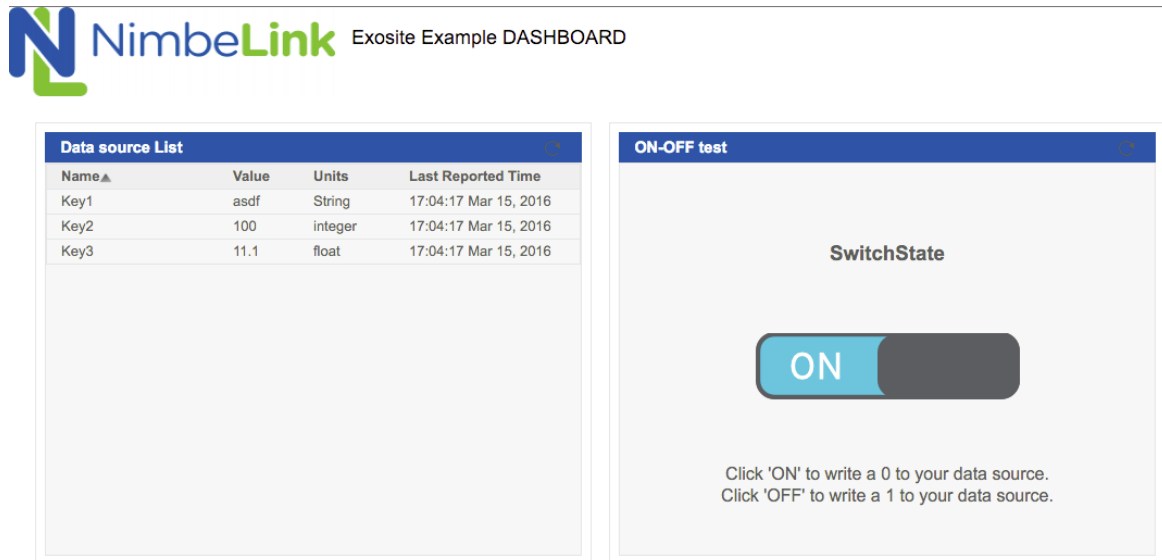
Content-Length: 0

Server: nginx

If you visit the NimbeLink Exosite Example Dashboard at the following URL:

<https://nimbelink.exosite.com/views/2334257135/2984653781>

you will see that your values have been updated:



The screenshot displays the NimbeLink Exosite Example DASHBOARD. It features two main panels. The left panel, titled "Data source List", contains a table with the following data:

Name▲	Value	Units	Last Reported Time
Key1	asdf	String	17:04:17 Mar 15, 2016
Key2	100	integer	17:04:17 Mar 15, 2016
Key3	11.1	float	17:04:17 Mar 15, 2016

The right panel, titled "ON-OFF test", shows a "SwitchState" control. It consists of a toggle switch currently in the "ON" position. Below the switch, there is a text instruction: "Click 'ON' to write a 0 to your data source. Click 'OFF' to write a 1 to your data source."

4.2.4 RECEIVE DATA VIA HTTP

Note: The following command must be entered correctly and in a specific order. As such, it is recommended to copy and paste the commands instead of typing them.

Note: Information entered into the terminal program at this point will not be visible on the screen.

Below is the entire command sequence we will be sending on the modem.

```
GET /onep:v1/stack/alias?Key1&Key2&Key3HTTP/1.1
Accept: application/x-www-form-urlencoded; charset=utf-8
Accept-Encoding: gzip, deflate
Host: m2.exosite.com
Connection: Close
X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877
```

Below is the exact process needed to successfully receive data from the Exosite Dashboard.

Enter the following command into the terminal program:

```
GET /onep:v1/stack/alias?Key1&Key2&Key3 HTTP/1.1
```

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

```
Accept: application/x-www-form-urlencoded; charset=utf-8
```

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

```
Accept-Encoding: gzip, deflate
```

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

```
Host: m2.exosite.com
```

followed by CTRL+J on the keyboard.

Enter the following command into the keyboard:

```
Connection: Close
```

followed by CTRL+J on the keyboard.

Finally, enter the following command into the terminal program:

```
X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877
```

followed by CTRL+J **three times** on the keyboard. Typing CTRL+J three times will put the necessary blank lines in that the HTTP server is expecting. Note that the example CIK is present in this line. This is where you would put your unique CIK in.

The terminal program should respond with the following:

```
HTTP/1.1 200 OK
```

```
Date: Tue, 15 Mar 2016 22:08:05 GMT
```

Content-Length: 28

Connection: close

Server: nginx

Key3=11.1&Key2=100&Key1=asdf

4.3 REV 2 FIRMWARE PROCEDURE

Use the following sequence of commands if you have the Rev 2 firmware on your modem.

4.3.1 GET CIK OF MODEM OR DEVICE FROM EXOSITE

Exosite requires a unique device name in order to send and receive data. This unique name—called a CIK—is created by Exosite when you register your device with them. For NimbeLink's example page, we will be using the following CIK:

```
7cafee22ab8628b2838187a7774f5e4b3f05f877
```

Note: This CIK is unique to this example. When you register your device, you will have a different CIK.

4.3.2 CONFIGURE SOCKET SERVICE PROFILE

To configure the modem to connect to Exosite, issue the following commands, each followed by the Enter key:

```
AT^SISS=0,"srvType","Socket"
```

```
AT^SISS=0,"conId",3
```

```
AT^SISS=0,"address","socket://m2.exosite.com:80"
```

The modem should respond to each command with:

```
OK
```

These commands specify that we want a generic **Socket** that uses PDP context **3** to connect to **m2.exosite.com** on port **80** over **TCP**.

4.3.3 ACTIVATE CONTEXT

Type the following command to activate PDP context 3:

```
AT^SICA=1,3
```

Wait for the modem response as described in Section 2.3.3.

4.3.4 OPEN THE SOCKET

Type the following command to open the socket:

```
AT^SISO=0
```

This uses the socket profile settings we set in Section 3.3.2 to initiate the socket dial.

The modem should respond with:

OK

^SISW: 0,1

4.3.5 SEND DATA VIA HTTP

Note: The following command must be entered correctly and in a specific order. As such, it is recommended to copy and paste the commands instead of typing them.

Below is the entire POST command sequence we will be sending to the modem.

```
POST /onep:v1/stack/alias HTTP/1.1
Host: m2.exosite.com
X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877
Content-Type: application/x-www-form-urlencoded; charset=utf-8
Accept: application/xhtml+xml
Content-Length: 28
```

```
Key1=asdf&Key2=100&Key3=11.1
```

Before sending the POST command, issue the following command to the modem, followed by the Enter key:

AT^SISW=0,253

The modem should respond with:

^SISW: 0,253,0

Note: The value 253 is the length in bytes (i.e. characters) of the entire POST message, including the CTRL+J characters. If your message is a different length, this value should be changed accordingly.

Now we can begin entering the POST command. Enter the following command into the terminal program:

POST /onep:v1/stack/alias HTTP/1.1

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

Host: m2.exosite.com

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877

followed by CTRL+J on the keyboard. Note that the example CIK is present in this line. This is where you would put your unique CIK in.

Enter the following command into the terminal program:

Content-Type: application/x-www-form-urlencoded; charset=utf-8

followed by CTRL+J on the keyboard.

Enter the following command into the keyboard:

Accept: application/xhtml+xml

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

Content-Length: 28

followed by CTRL+J **twice** on the keyboard. Typing CTRL+J twice will put the necessary blank line in that the HTTP server is expecting.

Note: The value after **Content-Length:** must be equal to the number of characters that you are sending on with the following command. In this case, we have 28 characters.

Finally, enter the following command into the terminal program:

Key1=asdf&Key2=100&Key3=11.1

where **asdf** is a string of characters, **100** is an integer number, and **11.1** is a decimal number. There is no need to type anything additional to get the data sent. You may want to change these values while keeping the same type to see your specific changes on the Exosite page.

The modem should respond to the POST command with the following:

OK

^SISW: 0,1

^SISR: 0,1

To see the result of the POST command, send the following command to the modem:

AT^SISR=0,1000

The modem should respond with something similar to the following:

^SISR: 0,98

HTTP/1.1 204 No Content

Date: [today's date and time]

Content-Length: 0

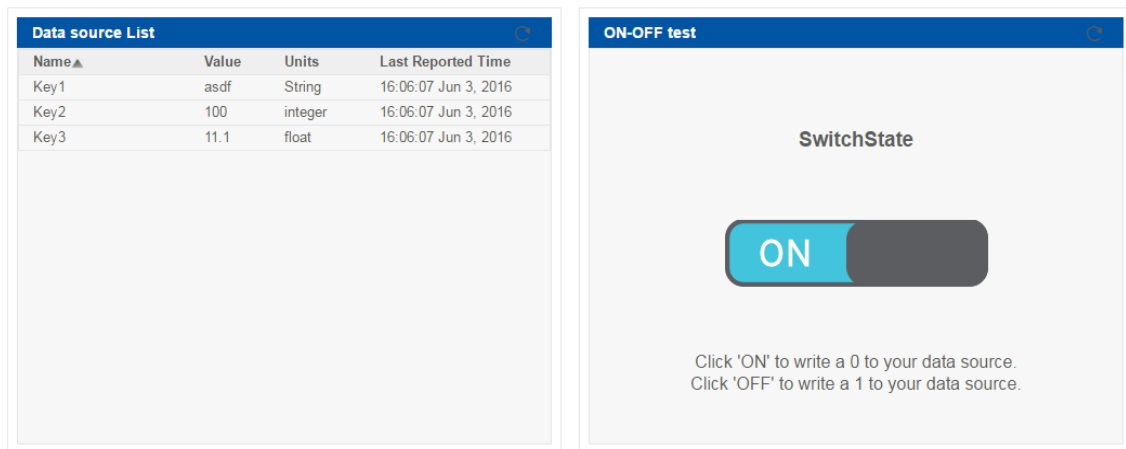
Server: nginx

OK

If you visit the NimbeLink Exosite Example Dashboard at the following URL:

<https://nibelink.exosite.com/views/2334257135/2984653781>

you will see that your values have been updated:



4.3.6 RECEIVE DATA VIA HTTP

Note: The following command must be entered correctly and in a specific order. As such, it is recommended to copy and paste the commands instead of typing them.

Below is the entire GET command sequence we will be sending on the modem.

```
GET /onep:v1/stack/alias?Key1&Key2&Key3HTTP/1.1
Accept: application/x-www-form-urlencoded; charset=utf-8
Accept-Encoding: gzip, deflate
Host: m2.exosite.com
Connection: Close
X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877
```

Before sending the GET command, issue the following command to the modem, followed by the Enter key:

AT^SISW=0,233

The modem should respond with:

^SISW: 0,233,0

Note: The value 233 is the length in bytes (i.e. characters) of the entire POST message, including the CTRL+J characters. If your message is a different length, this value should be changed accordingly.

Now we can begin sending the GET command. Below is the exact process needed to successfully receive data from the Exosite Dashboard.

Enter the following command into the terminal program:

GET /onep:v1/stack/alias?Key1&Key2&Key3 HTTP/1.1

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

Accept: application/x-www-form-urlencoded; charset=utf-8

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

Accept-Encoding: gzip, deflate

followed by CTRL+J on the keyboard.

Enter the following command into the terminal program:

Host: m2.exosite.com

followed by CTRL+J on the keyboard.

Enter the following command into the keyboard:

Connection: Close

followed by CTRL+J on the keyboard.

Finally, enter the following command into the terminal program:

X-Exosite-CIK: 7cafee22ab8628b2838187a7774f5e4b3f05f877

followed by CTRL+J **two times** on the keyboard. Typing CTRL+J two times will put the necessary blank lines in that the HTTP server is expecting. Note that the example CIK is present in this line. This is where you would put your unique CIK in.

The modem should respond to the GET command with the following:

OK

^SISW: 0,1

^SISW: 0,1

^SISR: 0,1

To receive the data requested in by the GET command, send the following command to the modem, followed by the Enter key:

AT^SISR=0,1000

The terminal program should respond with something similar to the following:

^SISR: 0,138

HTTP/1.1 200 OK

Date: [today's date and time]

Content-Length: 28

Connection: close

Server: nginx

Key3=11.1&Key2=100&Key1=asdq

OK

5. Troubleshooting

5.1 SERIAL CLIENTS

If you are manually inputting the above sequences into a serial program such as PuTTY or TeraTerm, some serial clients may interpret the "Carriage Return" (CTRL-M) and "Line Feed" (CTRL-J) characters differently. For instance, if you are having issues sending information using a HTTP POST, try sending four "Line Feed" characters instead of the sequence of "Carriage Return" and "Line Feed".

So, in Section 2.3.5, instead of sending:

```
"CTRL-M" "CTRL-J" "CTRL-M" "CTRL-J"
```

send:

```
"CTRL-J" "CTRL-J" "CTRL-J" "CTRL-J"
```