

# **WizFi360**

AT command examples

**Version 1.0**

**WIZnet Co.,Ltd**

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## History

Ver	Date	Description
1.0	Aug.2019	Initial version

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## 1. Overview

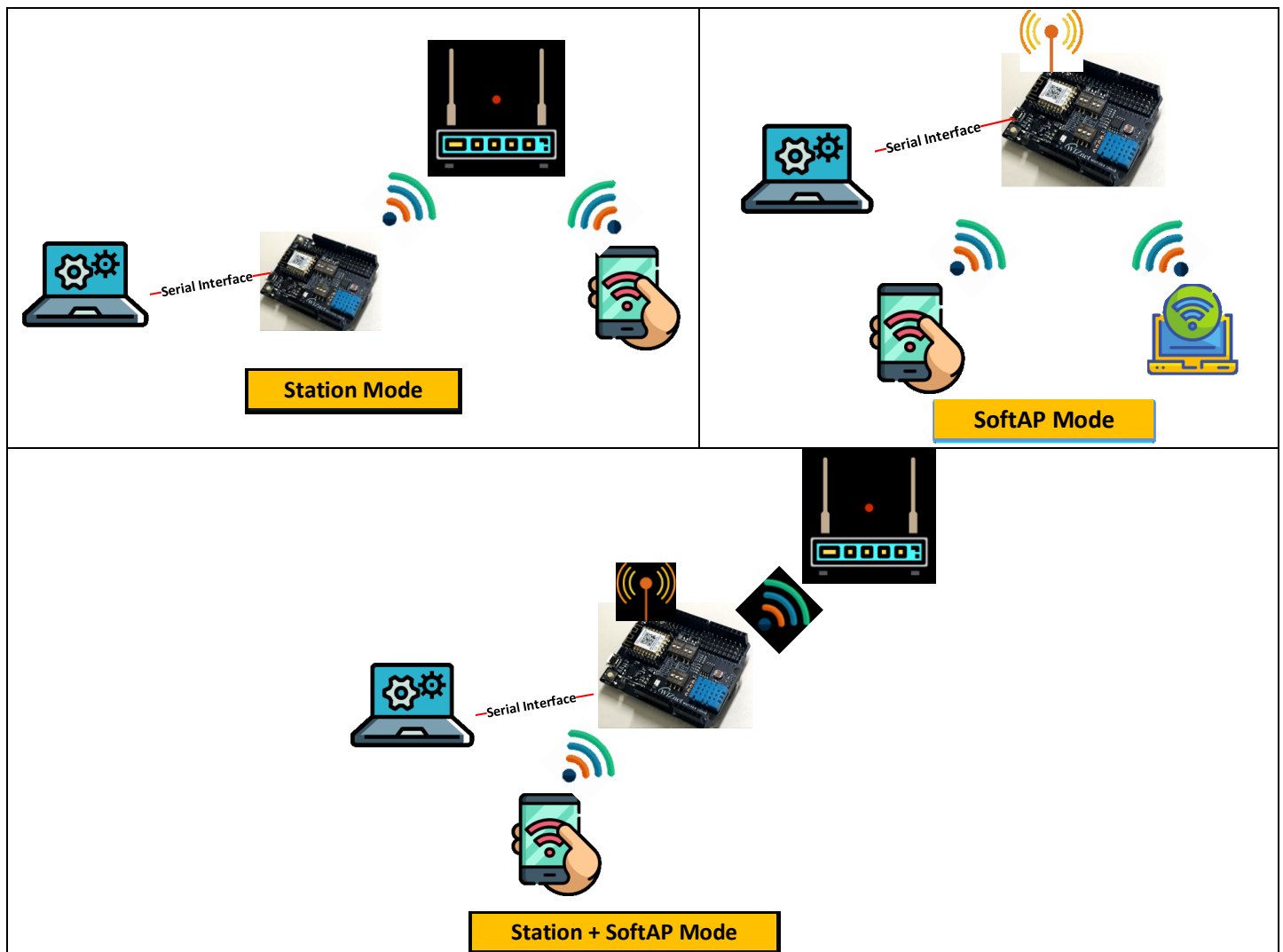
WizFi360 동작모드는 총 3 가지이며, 다음과 같다.

- Station mode
- SoftAP mode
- Station + SoftAP mode

Station mode 인 경우 AP(Access Point)에 접속하여 통신을 하는 모드이고, softAP mode 인 경우는 AP 로써 동작을 하며, 장치들의 통신을 주관하고, DHCP 로 IP 를 할당하기도 한다.

Station + SoftAP mode 인 경우에는 Station 으로 다른 AP 에 접속하면서, softAP 로 동작하면서 장치들의 통신을 주관하고, DHCP 로 IP 를 할당하기도 한다.

해당모드는 아래의 그림을 참고하면 된다.



WizFi360 에 데이터를 전송하는 모드는 AT 명령 모드와 데이터전송모드가 있다. 이 두가지 모드의 차이는 AT 명령을 보낼 수 있는냐로 나뉜다.

데이터전송모드로 들어가게 되면, AT 명령또한 데이터로 인식하고 데이터로 보내게 된다.

데이터전송모드에서 AT 명령모드로 변경하려면, "+++"를 시리얼로 보내게 되면 AT 명령모드로 변경된다.

## 2. Default setting value of AT command

AT Command	Description
<b>ATE1</b>	Echo Enable
<b>+CWMODE:2&lt;CR&gt;&lt;LF&gt;</b>	SoftAP mode
<b>+UART_DEF:115200,8,1,0,0&lt;CR&gt;&lt;LF&gt;</b>	Uart 설정
<b>+CIPDNS_DEF:192.168.1.1&lt;CR&gt;&lt;LF&gt;</b>	DNS 주소 설정
<b>+CIPSTA_DEF:ip:"192.168.1.1"&lt;CR&gt;&lt;LF&gt;</b> <b>+CIPSTA_DEF:gateway:"192.168.1.1"&lt;CR&gt;&lt;LF&gt;</b> <b>+CIPSTA_DEF:netmask:"255.255.255.0"&lt;CR&gt;&lt;LF&gt;</b>	Station mode일 때 사용하는 네트워크 정보
<b>+CIPAP_CUR:ip:"192.168.36.1"&lt;CR&gt;&lt;LF&gt;</b> <b>+CIPAP_CUR:gateway:"192.168.36.1"&lt;CR&gt;&lt;LF&gt;</b> <b>+CIPAP_CUR:netmask:"255.255.255.0"&lt;CR&gt;&lt;LF&gt;</b>	SoftAp mode 일 때 사용하는 네트워크 정보
<b>+CIPSTAMAC_DEF:"00:08:dc:a1:b2:33"&lt;CR&gt;&lt;LF&gt;</b>	Station mode 일 때 MAC address
<b>+CWDHCPS_CUR:120,"192.168.36.2","192.168.36.101"&lt;CR&gt;&lt;LF&gt;</b>	SoftAP mode 일 때, DHCP Server로써 IP 주소 할당영역 지정
<b>+CWSAP_CUR:"WizFi360","",11,0,0,0&lt;CR&gt;&lt;LF&gt;</b>	SoftAP mode일 때, SSID, PW등 AP설정
<b>+CIPMODE:0&lt;CR&gt;&lt;LF&gt;</b>	데이터전송모드 중 AT 모드
<b>+CIFSR:APIP,"192.168.36.1"&lt;CR&gt;&lt;LF&gt;</b> <b>+CIFSR:APMAC,"02:08:dc:a1:b2:33"&lt;CR&gt;&lt;LF&gt;</b>	SoftAP mode일 때, IP/MAC 주소

## 3. Using Serial Command

### 3.1 AT 모드 확인

AT command	Terminal
AT	<pre> AT&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; </pre>

### 3.2 Station/SoftAP/Station+SoftAP 모드

#### 3.2.1 Station

AT command	Terminal
<pre> AT AT+CWMODE_CUR=1 AT+CWDHCP_CUR=1,1 AT+CWLAP AT+CWJAP_CUR="wizms1","maker0701" AT+CIPSTA_CUR? </pre>	<pre> AT&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWMODE_CUR=1&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWDHCP_CUR=1,1&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWLAP&lt;CR&gt;&lt;LF&gt; +CWLAP:(4,"DIR-815_Wiznet",-59,"",1)&lt;CR&gt;&lt;LF&gt; +CWLAP:(0,"ESP_574935",-71,"",1)&lt;CR&gt;&lt;LF&gt; +CWLAP:(3,"##WIZnet_irina",-46,"",1)&lt;CR&gt;&lt;LF&gt; +CWLAP:(3,"Matthew2.4",-63,"",2)&lt;CR&gt;&lt;LF&gt; +CWLAP:(3,"rena",-46,"",3)&lt;CR&gt;&lt;LF&gt; +CWLAP:(0,"iptime",-67,"",4)&lt;CR&gt;&lt;LF&gt; +CWLAP:(3,"Dap",-63,"",5)&lt;CR&gt;&lt;LF&gt; +CWLAP:(0,"ESP_577CC7",-67,"",6)&lt;CR&gt;&lt;LF&gt; +CWLAP:(3,"wizms1",-63,"",6)&lt;CR&gt;&lt;LF&gt; +CWLAP:(0,"Wizfi360",-69,"",6)&lt;CR&gt;&lt;LF&gt; +CWLAP:(4,"DLINK-IPv6",-55,"",10)&lt;CR&gt;&lt;LF&gt; +CWLAP:(0,"iptime",-59,"",11)&lt;CR&gt;&lt;LF&gt; +CWLAP:(3,"WIZnet_Scott",-51,"",11)&lt;CR&gt;&lt;LF&gt; +CWLAP:(0,"WizFi360_A1B2D1",-69,"",11)&lt;CR&gt;&lt;LF&gt; +CWLAP:(3,"Teddy_AP",-57,"",13)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWJAP_CUR="wizms1","maker0701"&lt;CR&gt;&lt;LF&gt; WIFI_DISCONNECT&lt;CR&gt;&lt;LF&gt; WIFI_CONNECTED&lt;CR&gt;&lt;LF&gt; WIFI_GOT_IP&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CIPSTA_CUR?&lt;CR&gt;&lt;LF&gt; +CIPSTA_CUR:ip:"192.168.1.120"&lt;CR&gt;&lt;LF&gt; +CIPSTA_CUR:gateway:"192.168.1.1"&lt;CR&gt;&lt;LF&gt; +CIPSTA_CUR:netmask:"255.255.255.0"&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; </pre>

### 3.2.2 SoftAP

AT command	Terminal
<b>AT</b> <b>AT+CWMODE_CUR=2</b> <b>AT+CWDHCP_CUR=0,1</b> <b>AT+CWSAP_CUR="WizFi360_ffffff","0123456789",1,3,4,0</b> <b>AT+CIPAP_CUR="192.168.36.1","192.168.36.1","255.255.255.0"</b> <b>AT+CWDHCPS_CUR=1,120,"192.168.36.100","192.168.36.200"</b>	<pre> AT&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWMODE_CUR=2&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWDHCP_CUR=0,1&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWSAP_CUR="WizFi360_ffffff","0123456789",1,3,4,0&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CIPAP_CUR="192.168.36.1","192.168.36.1","255.255.255.0"&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWDHCPS_CUR=1,120,"192.168.36.100","192.168.36.200"&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; </pre>

### 3.2.3 Station+SoftAP

AT command	Terminal
<b>AT+CWMODE_CUR=3</b> <b>AT+CWDHCP_CUR=2,1</b> <b>AT+CWDHCPS_CUR=1,120,"192.168.36.100","192.168.36.200"</b> <b>0"</b> <b>AT+CWSAP_CUR="WizFi360_ffffff","0123456789",1,3,4,0</b> <b>AT+CIPAP_CUR="192.168.36.1","192.168.36.1","255.255.255.0"</b> <b>0"</b> <b>AT+CWJAP_CUR="wizms1","maker0701"</b>	<pre> AT+CWMODE_CUR=3&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWDHCP_CUR=2,1&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWDHCPS_CUR=1,120,"192.168.36.100","192.168.36.200"&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWSAP_CUR="WizFi360_ffffff","0123456789",1,3,4,0&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CIPAP_CUR="192.168.36.1","192.168.36.1","255.255.255.0"&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CWJAP_CUR="wizms1","maker0701"&lt;CR&gt;&lt;LF&gt; WIFI CONNECTED&lt;CR&gt;&lt;LF&gt; WIFI GOT IP&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; </pre>

## 3.3 TCP/IP

### 3.3.1 TCP Server

AT command	Terminal
<b>AT+CIPMUX=1</b> <b>AT+CIPSERVER=1,5000</b> <b>AT+CIPSENDDBUF=0,10</b> 0123456789 => 10byte data <b>AT+CIPSENDEX=0,10</b> 012W0 => 3byte data	<b>AT+CIPMUX=1&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>OK&lt;CR&gt;&lt;LF&gt;</b> <b>AT+CIPSERVER=1,5000&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>OK&lt;CR&gt;&lt;LF&gt;</b> <b>0,CONNECT&lt;CR&gt;&lt;LF&gt;</b> <b>AT+CIPSENDDBUF=0,10&lt;CR&gt;&lt;LF&gt;</b> <b>1,0&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>OK&lt;CR&gt;&lt;LF&gt;</b> > <b>0123456789</b> <CR><LF> <b>Recv 10 bytes&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>0,1,SEND OK&lt;CR&gt;&lt;LF&gt;</b> <b>AT+CIPSENDEX=0,10&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>OK&lt;CR&gt;&lt;LF&gt;</b> > <b>012\0</b> <CR><LF> <b>Recv 3 bytes&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>SEND OK&lt;CR&gt;&lt;LF&gt;</b>

### 3.3.2 TCP Client

AT command	Terminal
<b>AT+CIPSTART="TCP","192.168.1.74",5000</b> <b>AT+CIPSENDDBUF=10</b> 0123456789 => 10byte data <b>AT+CIPSENDEX=10</b> 012W0 => 3byte data	<b>AT+CIPSTART="TCP","192.168.1.74",5000&lt;CR&gt;&lt;LF&gt;</b> <b>CONNECT&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>OK&lt;CR&gt;&lt;LF&gt;</b> <b>AT+CIPSENDDBUF=10&lt;CR&gt;&lt;LF&gt;</b> <b>1,0&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>OK&lt;CR&gt;&lt;LF&gt;</b> > <b>0123456789</b> <CR><LF> <b>Recv 10 bytes&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>1,SEND OK&lt;CR&gt;&lt;LF&gt;</b> <b>AT+CIPSENDEX=10&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>OK&lt;CR&gt;&lt;LF&gt;</b> > <b>012\0</b> <CR><LF> <b>Recv 3 bytes&lt;CR&gt;&lt;LF&gt;</b> <CR><LF> <b>SEND OK&lt;CR&gt;&lt;LF&gt;</b>



### 3.3.3 UDP

AT command	Terminal
<b>AT+CIPSTART="UDP","192.168.1.74",5000,8888</b> <b>AT+CIPSEND=10</b> <b>0123456789 =&gt; 10byte data</b> <b>AT+CIPSEND=10,"192.168.1.74",5000</b> <b>0123456789 =&gt; 10byte data</b> <b>AT+CIPSENDEX=10</b> <b>012W0 =&gt; 3byte data</b>	<pre> AT+CIPSTART="UDP","192.168.1.74",5000,8888&lt;CR&gt;&lt;LF&gt; CONNECT&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CIPSEND=10&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; &gt; 0123456789 &lt;CR&gt;&lt;LF&gt; Recv 10 bytes&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; SEND OK&lt;CR&gt;&lt;LF&gt; AT+CIPSEND=10,"192.168.1.74",5000&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; &gt; 0123456789 &lt;CR&gt;&lt;LF&gt; Recv 10 bytes&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; SEND OK&lt;CR&gt;&lt;LF&gt; AT+CIPSENDEX=10&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; &gt; 012\0 &lt;CR&gt;&lt;LF&gt; Recv 3 bytes&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; SEND OK&lt;CR&gt;&lt;LF&gt; </pre>

### 3.3.4 SSL

AT command	Terminal
<b>AT+CIPSTAT="SSL","facebook.com",443</b> <b>AT+CIPSEND=18</b> <b>GET / HTTP/1.1{0x0d}{0x0a} =&gt; Data보냄</b>	<pre> AT+CIPSTART="SSL","facebook.com",443&lt;CR&gt;&lt;LF&gt; CONNECT&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; AT+CIPSEND=18&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt; &gt; GET / HTTP/1.1{0x0d}{0x0a} &lt;CR&gt;&lt;LF&gt; Recv 18 bytes&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt; SEND OK&lt;CR&gt;&lt;LF&gt; </pre>

```
<CR><LF>
+IPD,1500:HTTP/1.1 400 Bad Request<CR><LF>
Content-Type: text/html; charset=utf-8<CR><LF>
Date: Thu, 11 Jul 2019 07:21:45 GMT<CR><LF>
Connection: close<CR><LF>
Content-Length: 2959<CR><LF>
<CR><LF>
<!DOCTYPE html><LF>
<html lang="en" id="facebook"><LF>
<head><LF>
<title>Facebook | Error</title><LF>
<meta charset="utf-8"><LF>
<meta http-equiv="cache-control" content="no-cache"><LF>
<meta http-equiv="cache-control" content="no-store"><LF>
<meta http-equiv="cache-control" content="max-age=0"><LF>
<meta http-equiv="expires" content="-1"><LF>
<meta http-equiv="pragma" content="no-cache"><LF>
<meta name="robots" content="noindex,nofollow"><LF>
<style><LF>
html, body {<LF>
color: #141823;<LF>
background-color: #e9eae2;<LF>
font-family: Helvetica, Lucida Grande, Arial,<LF>
Tahoma, Verdana, sans-serif;<LF>
margin: 0;<LF>
padding: 0;<LF>
text-align: center;<LF>
}<LF>
<LF>
#header {<LF>
height: 30px;<LF>
padding-bottom: 10px;<LF>
padding-top: 10px;<LF>
text-align: center;<LF>
}<LF>
<LF>
#icon {<LF>
width: 30px;<LF>
}<LF>
<LF>
h1 {<LF>
font-size: 18px;<LF>
}<LF>
<LF>
p {<LF>
font-size: 13px;<LF>
}<LF>
<LF>
#footer {<LF>
border-top: 1px solid #ddd;<LF>
color: #9197a3;<LF>
font-size: 12px;<LF>
padding: 5px 8px 6px 0;<LF>
}<LF>
</style><LF>
</head><LF>
<body><LF>
<div id="header"><LF>
<a href="//www.facebook.com/"><LF>
<LF>
</a><LF>
</div><LF>
<div id="core"><LF>
<h1 id="sorry">Sorry, something went wrong.</h1><LF>
<p id="promise"><LF>
We're working on it and we'll get it fixed as soon as we can.<LF>
</p><LF>
<p id="back-link"><LF>
<a id="back" href="//www.facebook.com/">Go Back</a><LF>
</p><LF>
<div id="footer"><LF>
Facebook<LF>
<span id="copyright"><LF>
&copy; 2019<LF>
</span><LF>
<span id="help-link"><LF>
&#183;<LF>
<a id="help" href="//www.facebook.com/help/">Help Center</a><LF>
</span><LF>
</div><LF>
</div><LF>
<script><LF>
document.getElementById('back').onclick = function() {<LF>
if (history.length > 1) {<LF>
history.back();<LF>
return false;<LF>
}<LF>
};<LF>
<LF>
// Adjust the display based on the window size<LF>
if (window.innerHeight < 80 || window.innerWidth < 80) {<LF>
// Blank if window is too small<LF>
document.body.style.display = 'none';<LF>
};<LF>
if (window.innerWidth < 200 || window.innerHeight < 150) {<LF>
document.getElementById('back-link').style.display = 'none';<LF>
document.getElementById('help-link').style.display = 'none';<LF>
};<LF>
if (window.innerWidth < 200) {<LF>
document.getElementById('sorry').style.fontSize = '16px';<LF>
};<LF>
if (window.innerWidth < 150) {<LF>
document.getElementById('promise').style.display = 'none';<LF>
};<LF>
if (window.innerHeight < 150) {<LF>
document.getElementById('sorry').style.margin = '4px 0 0 0';<LF>
document.getElementById('sorry').style.fontSize = '14px';<LF>
document.getElementById('promise').style.display = 'none';<LF>
};<LF>
</script><LF>
</body><LF>
</html><LF>
<CR><LF>
+IPD,2:<SOH><NUL>CLOSED<CR><LF>
```

### 3.3.5 SNTP

AT command	Terminal
AT+CIPSNTPCFG=1,8 AT+CIPSNTPTIME?	AT+CIPSNTPCFG=1,8<CR><LF> <CR><LF> OK<CR><LF> AT+CIPSNTPTIME?<CR><LF> +CIPSNTPTIME:Wed Aug 07 08:21:19 2019<LF><CR><LF> OK<CR><LF>