WLAN ADK AT Command Reference Guide

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Version 1.1

Adya Systems & Software (P) Ltd.

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1. INTRODUCTION

1.1. Purpose

This document describes the parameters and AT command set available to configure and drive the WLAN application development kit.

1.2. References

No.	Document Name	Version	Date

2. QUICKSTART SOFTWARE SETUP

2.1. Boot loader Firmware Download

NOTE: If boot loader firmware (arm_bl.hex) is downloaded at least once to the module, it is not required to download this firmware again. So go to section 3.2 to know how to download the release firmware.

To download the firmware first time Philips LPC flash utility is required. Run Philips LPC flash utility. The settings for the flash utility should be selected as shown below.
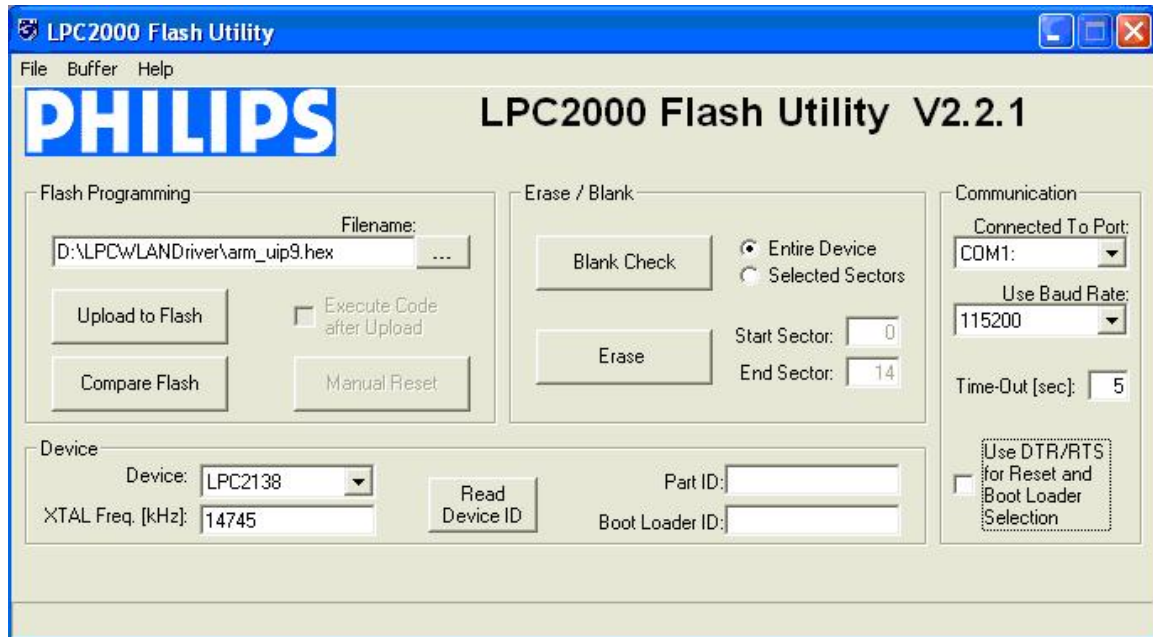
Figure 1: Philips LPC Flash Utility Settings

Note:

Select the COM port that is connected to the WLAN ADK module.
In the device edit box select LPC2138
In the XTAL Freq. [kHz] box, give value 14745

The WLAN ADK module boot loader jumper (J4) must be shorted. If the LPC2138 does not have a firmware then no need to short the boot loader jumper. If any firmware exists on LPC2138, then it is needed to short the boot loader pins to be able to download firmware again.

On the LPC flash utility, click on the button Read Device ID. If the device is connected and in boot loader mode, it will show the Part ID and Boot loader ID of the module.

From the file name edit box select the file arm_bl.hex from the release package. Upload the firmware by clicking the Upload Flash button.

Restart the module.

2.2. Release Firmware Download

The release firmware can be downloaded/upgraded locally through serial port.

Serial Port Configuration
Bits per Second – 115200
Databits – 8
Parity – None
Stopbits – 1
Flow Control – None

Open an application through which to access the serial port e.g. Hyper Term, ZOC. Configure the settings as shown above.

Restart the module. The module will prompt a message **'Press D to start firmware loader ….'**

Press D/d to enter into firmware loader. Select the XModem protocol from the terminal application. Choose the file (TBINFILE.BIN) from the release package to be uploaded. Perform a file upload.

Once the XModem file upload is finished, the module will boot up from the new firmware.

2.3. Default Settings

Once the module boots up for first time, it will load default settings to serial flash. Please refer to AT Command Reference guide for default values of all parameters. You can verify the values by giving AT command for individual module e.g. AT#IP?, AT#WLAN?. Refer to AT commands section for a complete set of AT commands supported for the module.

NOTE:
The MAC address is retained when default factory settings are again loaded. So it is not needed to set MAC address for firmware upgrade, only for first time MAC address is to be set. To change the MAC address use the AT command.
If the MAC address is not found, then the module while booting up will ask for the MAC address to be entered by the user. Enter the MAC address in following format.

00:aa:bb:cc:dd:ee
and press ENTER.

Some Important Default Settings

SSID: adyawlan_kit
IP Address: 192.168.1.100
UART bits per second: 115200
UART flow control: None

2.4. AT Commands

For a complete set of AT commands please refer to AT commands section. Some important commands are noted here.

AT&F – Load default factory settings
A/ - Previous command
AT#RESET – Restart the module

3. AT COMMANDS

3.1. General Commands

Syntax	Description	Value Range	Default Value
AT#VVERSION	This command displays the firmware version	-	-
AT#VSTATE	This command displays the current WLAN link status of the device	-	-
AT#VALL	This command displays all AT# parameters. The parameters are displayed by blocks of categories separated by a <CR><LF> sequence, all at the same time.	-	-
AT&F	This command restores the default factory settings value for the whole IP module.	-	-
A/	This command executes the earlier command	-	-
AT#RESET	This command restarts the IP module.	-	-
ATE	To turn ON/OFF echoing command at the serial terminal.	-	Echo ON
AT	To find whether the module is in AT mode or not		

3.2. Watchdog Timer

Syntax	Description	Value Range	Default Value
AT#WATCHDOG **AT#WATCHDOG?**	Disable/Enable the watchdog for system reset on HANG.	0: Disable Watchdog 1: Enable Watchdog	Enable
AT#WATCHDOGTIMER=<Value in ms> **AT#WATCHDOGTIMER?**	Set the timer value in mille seconds	Time in mille seconds (Max 7000ms)	1000

3.3. UART Configuration Commands

Syntax	Description	Value Range	Default Value
AT#UARTBAUDRATE=<value> AT#UARTBAUDRATE?	This command is used to set baud rate of UART	4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800	115200
AT#UARTDATABITS=<value> AT#UARTDATABITS?	This command is used to set number of data bits.	5, 6, 7, 8	8
AT#UARTPARITY=<value> AT#UARTPARITY?	This command is used to set parity type	0:None, 1:odd, 2:even	None
AT#UARTSTOPBIT=<value> AT#UARTSTOPBIT?	This command is used to set number of stop bits	1, 2	1
AT#UARTFLOWCONTROL=< value> AT#UARTFLOWCONTROL? NOT SUPPORTED for WLAN ADK	This command is used to set Flow control type. **(Not Supported for WLAN Application Development Kit)**	None, Hardware (RTS/CTS)	None

3.4. HTTP Module Commands

Syntax	Description	Value Range	Default Value
AT#HTTPENABLE=<value> AT#HTTPENABLE?	This enables the http server on the IP Module to listen on Port 80.	0: Disable, 1: Enable	Enable
AT#HTTPPORT=<value> AT#HTTPPORT?	Sets the HTTP server to listen on the specified port.	1 to 65535	80
AT#HTTPHOSTLOGIN AT#HTTPHOSTLOGIN?	Enable/Disable HTTP Login	0: Disable 1: Enable	Disable
AT#HTTPLOGINUN =<value> AT#HTTPLOGINUN?	User Name for HTTP login. To provide administrative privileges of configuration of the module.	Alphanumeric ASCII text string up to 64 characters. It will take blank space	No Default

Syntax	Description	Value Range	Default Value
			also.
AT#HTTPLOGINPW =\<value\> **AT# HTTPLOGINPW?**	Access password for HTTP login. To provide administrative privileges of configuration of the module.	Alphanumeric ASCII text string up to 64 characters. It will take blank space also.	No Default
AT#HTTP?	Displays the HTTP related configurations		

3.5. TCP Socket Services Commands

Syntax	Description	Value Range	Default Value
AT#TCPPORT=\<value\> **AT#TCPPORT?**	To exchange data over TCP, the TCP/IP stack software must know the port of the remote peer used for the TCP session	1 to 65535	1234
AT#TCPSERV=\<value\> **AT#TCPSERV?**	To exchange data over TCP, the TCP/IP stack software must know the address of the remote TCP server (or host) that is to be used.	32-bit number in dotted-decimal notation (i.e., xxx.xxx.xxx.xxx) or Alphanumeric ASCII text string up to 120 characters if DNS is integrated. It will take blank space also.	No Default
AT#TCPLISTEN = < Port number>	TCP/IP stack starts listening on given Port no	1 to 65535	-
AT#TCPSTOP=\<Port no\>	This command directs the TCP/IP stack to close a TCP listening mode (previously launched by the AT#TCPLISTEN command	-	-
AT#TCPOPEN= < IP Address, Port number>	This command sent by the attached host directs the TCP/IP stack to open a TCP connection to the specified TCP server. Once an IP link is established, the attached host can open a TCP connection at any time (except when the TCP/IP stack software is already in a process using TCP	-	-

Syntax	Description	Value Range	Default Value
	resources).		
AT#TCPAUTOCONN ECT=<value> **AT#TCPAUTOCONN ECT?**	Commands to activate auto connect to TCP server after power on. This will allow legacy device to be on the network without having to do any programming.	0: Manually connect by giving AT commands 1: automatically connect to pre-configured IP address, port	Disable
AT#TCPLISTENLIS T	The command lists the no of listening ports.		
AT#CONTERMINAT E=<value>	This command is used to set the option of termination of connection. The options are termination through escape sequence or termination from remote host.	Value can be 1, 2 1: Termination of connection through escape sequence 2: Termination of connection from remote host	
AT#TCP?	Displays all TCP related configuration parameters		

3.6. UDP Socket Services Commands

Syntax	Description	Value Range	Default Value
AT#UDPPORT=<Val ue> **AT#UDPPORT?**	To exchange data over TCP, the TCP/IP stack software must know the port of the remote peer used for the UDP session	1 to 65535	1234
AT#UDPSERV=<Val ue> **AT#UDPSERV?**	To exchange data over TCP, the TCP/IP stack software must know the address of the remote UDP server (or host) that is to be used.	32-bit number in dotted-decimal notation (i.e., xxx.xxx.xxx.xxx) or Alphanumeric ASCII text string up to 120 characters if DNS is integrated. It will take blank space also.	No Default
AT#UDPSTART=<p ort no>	Once an IP link is established, and if no other TCP/IP stack resource is active, this command sent by the attached host directs the TCP/IP stack to initiate the UDP session in listen mode on the	1 to 65535	-

Syntax	Description	Value Range	Default Value
	specified UDP local port UDPPORT.		
AT#UDPSTOP=<Port no>	This command directs the TCP/IP stack to close a UDP listening mode session previously launched by the AT#UDPSTART command).	-	-
AT#UDPOPEN=<IP address, Port no>	Once an IP link is established, and if no other TCP/IP stack resource is active, this command sent by the attached host directs the TCP/IP stack to initiate an UDP session in active mode on the specified UDP remote port UDPPORT to the specified remote IP address UDPSERV.	-	-
AT#UDP?	Displays all UDP related configuration parameters		

3.7. WLAN Configuration Commands

Syntax	Description	Value Range	Default Value
AT#WLANSECURITYMODE =<value> AT# WLANSECURITYMODE?	Set the Wireless LAN security mode	0: Security Disable 1: WEP64 Security 2: WEP128 Security	Disable
AT#WEPKEYID	Set WEP Key Index	1/2/3/4	1
AT#WEP64KEYn =<value>, where n can be 1 to 4 AT#WEP64KEYn?	Keys for WEP64 Security mode.	ASCII text string of 10 hexa-decimal characters. e.g. 1234567890	6162636465
AT#WEP128KEYn =<value>, where n can be 1 to 4 AT#WEP128KEYn?>	Set keys for WEP128 Security mode.	ASCII text string of 26 hexa-decimal characters. e.g. 12345678901234567890123456	12345678901234567890123456
AT#WLANMACADDR =<value> AT#WLANMACADDR?	Command to set MAC address of the WLAN module	ASCII text string of 12 hexa-decimal characters (0 –9, A-F).	-
AT#WLANNETWOR	Command to set Wireless LAN	0: Infrastructure	Infra

KMODE =<value> **AT#WLANNETWOR** **KMODE?**	Network Mode	mode 1: Ad – Hoc mode	
AT#WLANCOUNTR **YCODE =<value>** **AT#WLANCOUNTR** **YCODE?**	Command to set Country code. Different countries have different restrictions on Wireless LAN parameters like operating channels and transmit power. To make it operable the country code can be set by using this AT command.	DOMAIN_FCC 0x10 (For US) DOMAIN_IC 0x20 (For Canada) DOMAIN_ETSI 0x30 (For Europe) DOMAIN_SPAIN 0x31 (For Spain) DOMAIN_FRANCE 0x32 (For France) DOMAIN_MKK 0x40 (For Japan)	FCC
AT#WLANSCANMO **DE =<value>** **AT#WLANSCANMO** **DE?**	Command to set scanning mode. The module can work in both active scanning and passive scanning mode. In active scanning the module actively sends probe request to associate with the AP and in passive scanning the module waits for beacon from AP and then it associates	0: Active scanning 1: Passive scanning	Active Scanning
AT# **WLANTXPOWER** **=<value>** **AT#** **WLANTXPOWER?**	Command to set maximum transmit output power for WLAN module while communicating.	Only interger values. Range is 0 dBm to 16 dBm	15
AT#WLANSSID **=<value>** **AT#WLANSSID?**	Command to set WLAN network SSID.	Alphanumeric ASCII Text String of up to 32 characters. It will take blank space also.	adyawlan_kit
AT#WLANDATARAT **E=<value>** **AT#WLANDATARAT** **E?**	Command to set WLAN transmission data rate	1, 2, 5.5, 11 (in Mbps)	11 Mbps
AT#WLANIBSSCHA **NNEL=<value>** **AT#WLANIBSSCHA** **NNEL?**	Command to set channel for Ad-Hoc mode.	1 to 13	9
AT#WLANENABLE	On Power UP, this parameter determines whether to connect to AP automatically or manually. A value of 0, means the module will not connect to AP automatically. Connection to AP can be established by AT#WLANCONNECT command.	0: Manual connection to AP 1: Automatic connection to AP	Disable

Syntax	Description	Value Range	Default Value
	A value of 1, means on power UP the module tries to connect to AP for configured settings.		
AT#WLANROAM	For WLANROAM=Disable, When link is lost with AP, the module will not try to roam and AT Command can be issued. For WLANROAM=Enable, When link is lost the module will try to roam and re-connect with AP. AT command can't be issued while trying to roam. To issue AT command again issue escape sequence on serial terminal with AT#CONTERMINATE configured as 1 previously.	0: Disable Roaming Feature 1: Enable Roaming Feature	Disable
AT#WLANPOWERSAVE	If Enable, the device will automatically go into power save mode after connection with AP.	0: Disable Power save 1: Enable Power save	Disable
AT#WLAN?	Display all WLAN configuration parameters		

3.8. WLAN Operation Commands

Syntax	Description	Value Range	Default Value
AT#WLANCONNECT	This command is used to connect the module with AP.		
AT#WLANDISCONNECT	This command is used to disconnect the module with AP.		
AT#WLANSETTXPOWER=<value in dBm>	The command is used to set transmit power of WLAN radio.	Any value between 0 - 16 dBm	No Default
AT#WLANGETRSSI	The command displays the received signal strength of the last beacon received.		
AT#WLANDOZE	To move the module into power save mode. The command can be issued while in connected state. IMP: In power save mode commands like Connect/Disconnect/Scan are		

Syntax	Description		
	not allowed.		
AT#WLANACTIVATE	To move the power module into Active power state.		

3.9. PING Module Commands

Syntax	Description	Value Range	Default Value
AT#PINGNUM=<Value> AT#PINGNUM?	This command sets the number of PING echo requests to issue to PINGREMOTE	From 1 to 255 inclusive	20
AT#PINGREMOTE=<IP address> AT#PINGREMOTE?	Sets the IP address of remote device to PING.	IP address in 32-bit number in dotted-decimal notation (i.e., xxx.xxx.xxx.xxx)	192.168.1.1
AT#PINGSTART	Directs the module to start PING requests to the configured PING remote address. No of requests to be sent is obtained from the PINGNUM parameter.		
AT#PING?	Displays PING module related configuration parameters		

3.10. IP Configuration Commands

Syntax	Description	Value Range	Default Value
AT#IPDEFGW=<value> AT#IPDEFGW?	Sets the default gateway address. GET command Shows whether the address is statically configured or obtained from DHCP server	IP address in dotted decimal notation (xxx.xxx.xxx.xxx).	192.168.1.1
AT#IPDHCP=<value> AT#IPDHCP?	Enables or disables DHCP client. If DHCP client is enabled the module will take IP address from DHCP server. If DHCP client is disabled the module	1: enable/ 0: disable	Disable

Command	Description	Value	Example
	will take the static IP address configured for the module.		
AT#IPADDR=\<value> **AT#IPADDR?**	Sets the local static IP address. GET command Shows whether the address is statically configured or obtained from DHCP server.	IP address in dotted decimal notation (xxx.xxx.xxx.xxx) 255 is Maximum Value in an Octate	192.168.1.100
AT#IPNETMASK=\<value> **AT#IPNETMASK?**	Sets the subnet mask. GET command Shows whether the address is statically configured or obtained from DHCP server	IP address in dotted decimal notation (xxx.xxx.xxx.xxx). 255 is maximum value in an Octate	255.255.255.0
AT#IPDNSSERV1=\<value> **AT#IPDNSSERV1?**	In order to translate the server names from literal format into IP addresses, the TCP/IP stack software implements the Domain Name System (DNS) protocol. The DNS Server IP address must be specified for use by the TCP/IP stack software.	32-bit number in dotted-decimal notation (i.e., xxx.xxx.xxx.xxx).	202.56.215.6
AT#IP?	Display all IP module parameters		
AT#IPDNSSERV	Enable DNS. By default DNS is not enabled. Use this command before using DNS services.		
AT#IPQUERY=\<Host Name>	Sends a query to DNS server to resolv the name.	Host name in alpha-numeric string format	
AT#IPRESOLV=\<Host Name>	If the DNS client is successful in resolving the name, this command shows the IP address of the resolved host name. If the DNS client fails to resolv, it shows error message.	Host name in alpha-numeric string format	
AT#IPDNSTABLE	The command displays the DNS table.		

4. TCP/UDP SERVICES

4.1. IP Module Acting as a TCP Server

To start the module as a TCP server, give the following command on the serial terminal.

AT#TCPLISTEN=<Port No>

The TCP server will keep listening on the port no given in the command. When a remote host gets connected to the module, the serial terminal will show message

Connected To: xxx.xxx.xxx.xxx Port No: xxxxx

Accepting connections from remote host can be automatic or manual. This can be set by the command ATS0.

ATS0=0 is for manual connection
ATS0=1 is for automatic connection
By default the value is 1, i.e. automatic connection.

When manual connection mode is selected, when connection requests comes to the module server, it shows a message **Ringing...** on serial terminal. To accept connection user will have to give the command **ATA**.

4.2. IP Module Acting as a TCP Client

To connect the module to a TCP server running on remote host, issue the following command on serial terminal

AT#TCPOPEN=<IP address of remote host>,<Port No>,<Tx delay in ms>

e.g. AT#TCPOPEN=192.168.1.68,3000,5

When the server accepts the connection, on serial terminal a message will be shown
Connected To: xxx.xxx.xxx.xxx Port No: xxxxx

Data transfer can be started after this.

4.3. IP Module Acting as a UDP Server

To start the module as a UDP server, issue following command on serial terminal.

AT#UDPSTART=<Remote IP>,<Remote Port>,<Listen Port No>,<Tx Delay>

For UDP server mode the Remote IP is entered as 0.0.0.0 and Remote Port is also entered as 0.

e.g. AT#UDPSTART=0.0.0.0,0,2400,0

To stop a listening port issue the following command

AT#UDPSTOP, it will close the current connection.

4.4. IP Module Acting as a UDP Client

To connect the module to a UDP server running on remote host, issue the following command on serial terminal

AT#UDPOPEN=<Remote IP Address><Port NO><Tx Delay>

e.g. AT#UDPOPEN=192.168.1.13,2500,0

Remote IP address and port no are mandatory. If Tx Delay value is not entered on command console, it will take the value from serial flash.

After this whatever data is entered on serial terminal will be sent over UDP to the remote host.

Extra Features for TCP/UDP Services

AUTOCONNECT
To auto connect to a TCP server upon booting up of the module, the following command is given.

AT#TCPAUTOCONNECT=1

TXDELAY
To introduce delay between sending of TCP packets, delay value can be set by following command

AT#TCPTXDELAY=<value in mille seconds>

5. HTTP WEB SERVER

5.1. Setup & Configuration

Following parameters must be configured to successfully work with the HTTP web server.

- Enable HTTP
  Command: AT#HTTPENABLE=<Value: 1 – Enable, 0 - Disable>
- HTTP Login
  Command: AT#HTTPHOSTLOGIN= <Value: 1 – Enable, 0 - Disable>
- HTTP Port No
  Command: AT#HTTPPORT=<Port No>
- HTTP Login User Name
  Command: AT#HTTPLOGINUN=<Login User Name>
  NOTE: Currently HTTP Login is not implemented
- HTTP Login Password
  Command: AT#HTTPLOGINPW=<Login Password>

5.2. Monitoring & Configuring Settings through Web browser

Open Web browser (Internet Explorer) in remote machine. Enter the IP address of the MT800SWM module in the address bar of the web browser. The index page of the IP module will open by default. Click on link IP Module Configuration to open the configuration page of IP module.

Click on link Host Device Configuration to open the configuration page of serial host device. By default this page is not written to the serial module. So when the module is started first time, or version of firmware is changed, it is needed to upload the host device page through AT command. For details regarding uploading the .html file through AT command refer to Section 10.3.

Once the IP module configuration page is open, click on links to go to configuration pages of all the modules.

To configure the device, change the form field corresponding to the parameter that is to be changed and click on Save button.

Error Responses
1. If the requested page is not available, then Page cannot be found message is displayed on the HTTP client.
2. Login failure message are displayed on client.

6. PING

To check the link status of the module, a minimal PING application is implemented in IP module. So that the IP module can become host and send PING request to remote machines.

6.1. Setup & Configuration

Following parameters should be configured to work with PING application.

- IP address to PING
  Command: AT#PINGREMOTE=xxx.xxx.xxx.xxx
- No of PING Requests to send
  Command: AT#PINGNUM=<Value>

The following parameters cannot be configured and works with default values only.

Ping Request Timeout: default value 5 seconds
Ping Data size: default 32 bytes
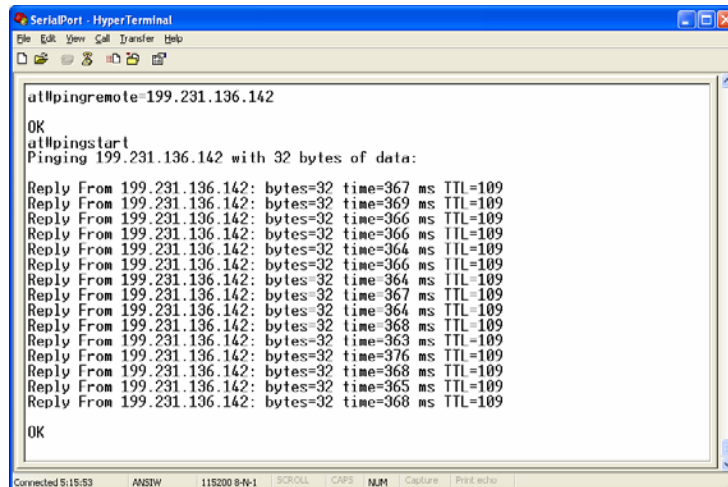
6.2. Send PING Request

Issue the following command on serial terminal.

AT#PINGSTART

The module will send PING requests to remote host configured earlier by AT command. If it is able to get replies from the remote host, then it shows messages as shown in Figure below. If the module is unable to get Replies (within timeout period), then it shows the message **Request timed out**.

Figure 2: Sending PING Request From IP Module

Error Responses
1. If user gives the value of pingnum beyond the lower and upper limit then the module will show Invalid Ping Number.
2. If user gives the value of the pingremote as wrong then the module will show ERROR message.

7. MISCELLANEOUS

7.1. Watchdog Timer

Watchdog can be enable or disable by issuing the following command

AT#WATCHDOG=<0/1>
0: Disable Watchdog feature
1: Enable Watchdog feature

Watchdog time can be configured by issuing the following command

AT#WATCHDOGTIME=<time in mille seconds>, Maximum value that can be entered is 7000 ms.

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