



Talaria TWO™ EVB-A (INP3010 & INP3011)

Module Evaluation Boards

IEEE 802.11 b/g/n, BLE 5.0

User Guide for Talaria TWO Demo Tool

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Revision History

Version	Date	Comments
0.6.1	07-21-2020	First release.
1.0	09-23-2020	Updated for SDK 2.1.1 release & MPD Tool version v1.1.
2.0	05-13-2021	Updated for SDK 2.2 release & MPD Tool version v2.2.
2.1	07-05-2021	Added note for PROG RAM functionality.
3.0	08-12-2021	Updated for SDK 2.3 release.
3.1	08-27-2021	Updated for SDK 2.3.1 release.
4.0	09-21-2021	Low Power Scan added as part of SDK 2.4 release – still need to be added.
4.1	10-13-2021	Updated with the following: <ul style="list-style-type: none">- One-Click Installation of libusbdk driver- Help option for the Tool
4.2	11-16-2021	Updated Appendix with steps to assign a new EVK serial number to device.
4.3	01-25-2022	Updated Demo Tool GUI.
4.4	02-01-2022	Updated MQTT broker.

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3 Terms & Definitions

AP	Access Point
ARP	Address Resolution Protocol
COM	Composite Device Driver
ELF	Extensible Linking Format
EVK	Evaluation Kit
FTDI	Future Technology Devices International
GARP	Gratuitous Address Resolution Protocol
GUI	Graphical User Interface
HTTP	Hyper Text Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
iPerf	Internet Performance Working Group
MPD	Multipurpose Demo
MQTT	Message Queuing Telemetry Transport
SSID	Service Set Identifier
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
URL	Uniform Resource Locator
USB	Universal Serial Bus

4 Introduction

This document describes the use of Talaria TWO Demo Tool, which is a GUI tool that enables quick evaluation of power consumption and throughput performances of Talaria TWO modules. This tool is bundled with two applications:

- Multipurpose Demo (MPD) primarily intended to verify power consumption under various protocol scenarios (such as TCP, UDP, HTTP etc.)
- iPerf3 application to showcase throughput performance

This GUI is intended for use with the INP3010 and INP3011 Talaria TWO evaluation boards to enable easy programming and accelerated evaluations.

5 Prerequisites

Each release of the Demo Tool is equipped with binaries for Windows and Linux operating systems, and signed firmware images (ELFs) for MPD and iPerf3 applications. Though this document specifically describes the use of the GUI on a Windows platform, the procedure is similar for Linux OS as well. The content of the release is shown in Figure 1

Application `INP_T2_Demo_Windows.exe` is for Windows platform while `INP_T2_Demo_Linux` is for the Linux OS.

Name	Type	Compressed size	Password p...	Size
<code>10010324.log</code>	Text Document	1 KB	No	
<code>INP.T2.Demo.Linux</code>	File	16,133 KB	No	
<code>INP.T2.Demo.Windows.exe</code>	Application	19,332 KB	No	
<code>iperf3.elf</code>	ELF File	130 KB	No	
<code>t2_mpd.elf</code>	ELF File	238 KB	No	

Figure 1: Folder Contents

The Demo tool verifies the signature of the ELFs prior to downloading it onto the evaluation board. In case the ELFs are tampered with, an error message as shown in Figure 2 is printed on the console.

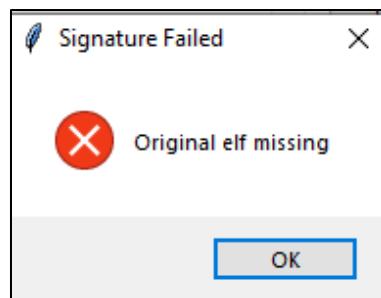


Figure 2: Signature failed window

The Talaria TWO evaluation board uses FT4323h, which is a 4-port USB to UART converter with MPSEE support. By default, these ports enumerate as COM ports in Windows OS which does not take advantage of the MPSEE capabilities of the FTDI device. The usage of these ports in the evaluation board is given in Table 1.

Port	Usage
A	Connected to JTAG pins, this enables JTAG debugging using OpenOCD
B	Connected to EN_CHIP pin, which enables resetting the module
C	Connected to UART pins, this is used for programming the module
D	Connected to GPIO17 pin which is the default debug log console port

Table 1: Usage of ports in the evaluation board

To utilize these capabilities, on Windows OS, libusbK driver needs to be installed to communicate and control the Talaria TWO module via the FTDI device on the evaluation board. The tools/applications provided by InnoPhase will use this driver.

Talaria TWO Demo Tool comes with an option of One-Click Installation of libusbK driver. In case the driver is not installed, the tool will ask for user confirmation to install this driver. If the user selects yes, various User Account Control authentication screens will appear to complete the driver installation (as shown in Figure 3).

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Note: In case of any other unwanted libusbk drivers that are already installed, the tool will automatically uninstall the unwanted drivers. This action needs User Account Control authentication screens shown in Figure 4, in addition to Figure 3. Each unwanted drives will require a separate User Account Control authentication for uninstallation.

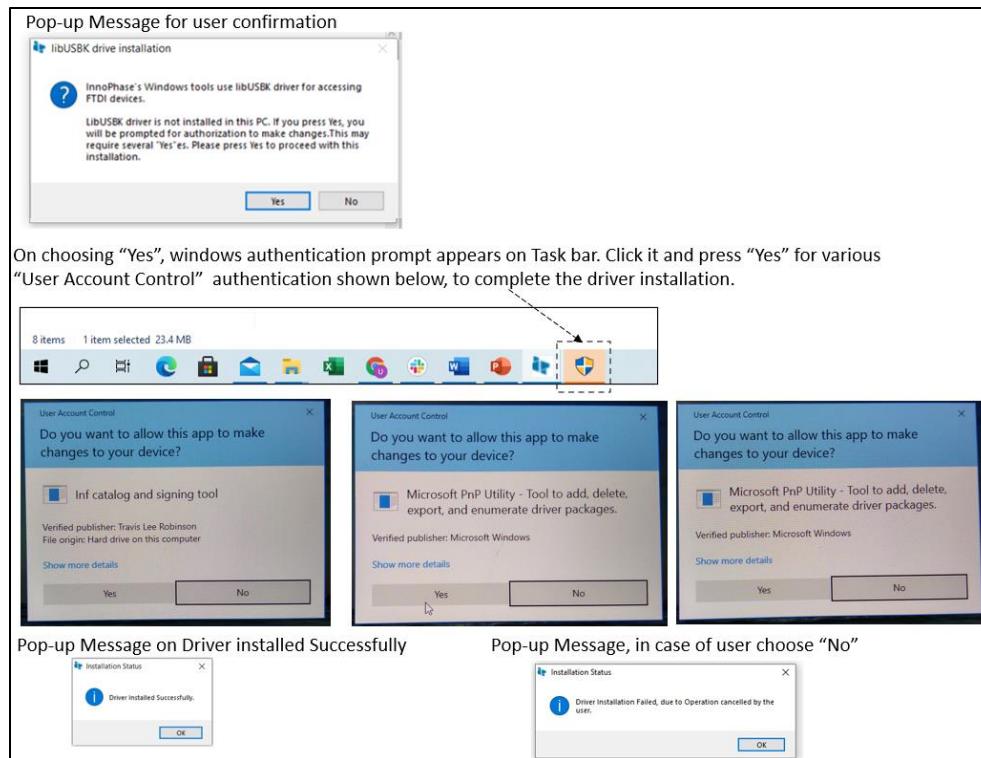


Figure 3: User Account Control authentication to complete driver installation

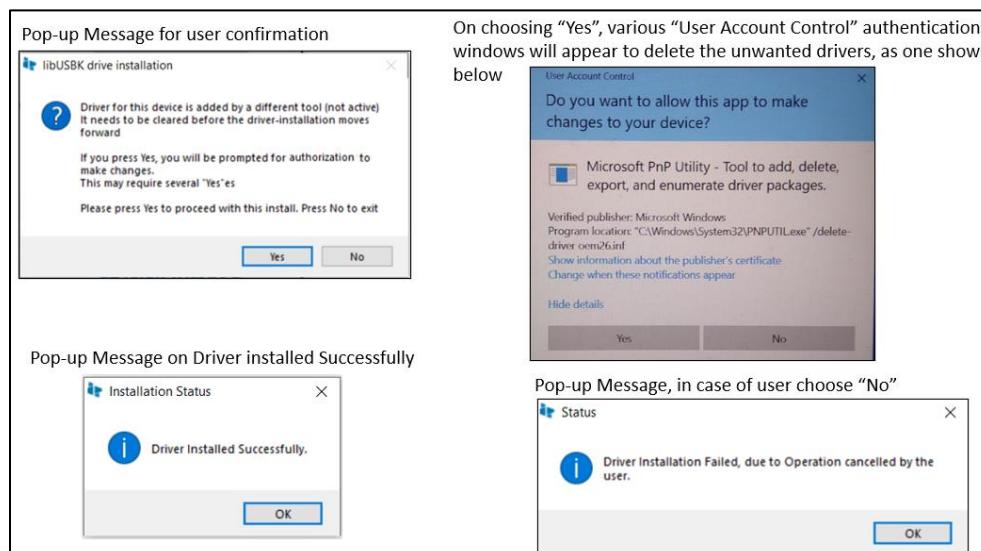


Figure 4: User Account Control authentication to delete unwanted Libusbk drivers

In case the driver installation using Talaria TWO Demo Tool is not successful, the user can manually install the driver using instructions in section 5.1. Uninstall instructions for this driver is available in section 12.1.

5.1 Installation instructions for libusbK driver

Download the free software Zadig, available here: - <https://zadig.akeo.ie/>. Connect your Windows PC or Laptop to the evaluation board using the provided USB cable. Now, open Zadig and click on Options. Select List All Devices and deselect Ignore Hubs or Composite Parents as shown in Figure 5.

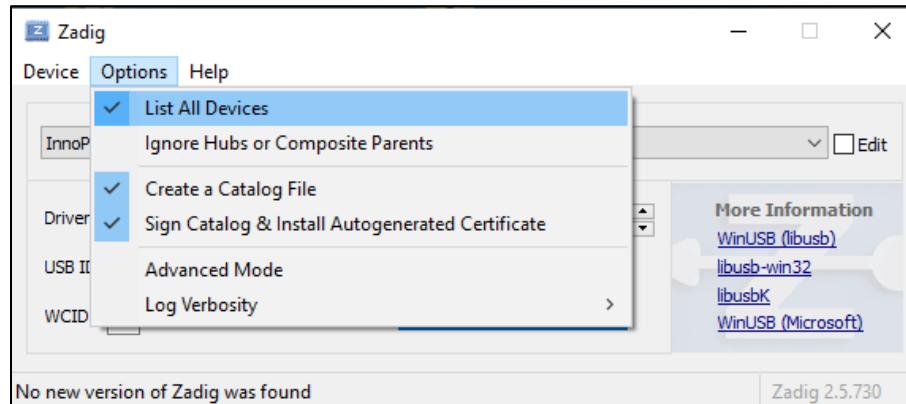


Figure 5: Listing devices in Zadig

To establish communication with Talaria TWO module via the FTDI device on the InnoPhase Evaluation Board, the Talaria TWO USB driver must be libusbK. In case the current driver is not libusbK, use the drop-down menu to select libusbK and click on Replace Driver which will update the drivers to libusbK.

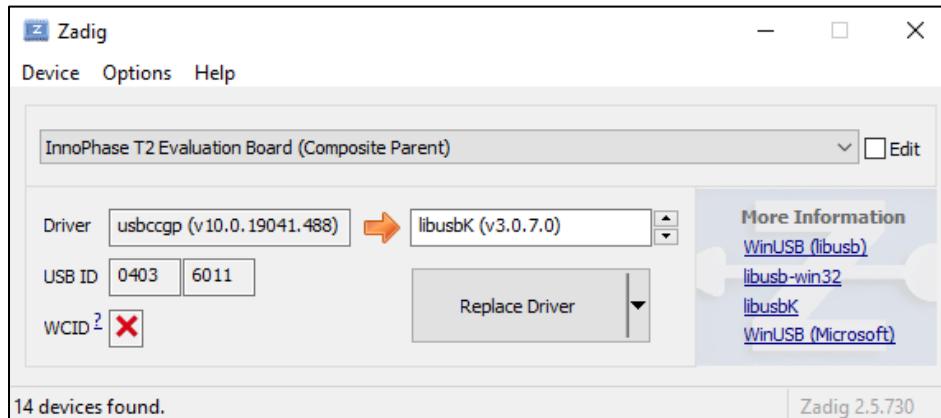


Figure 6: Updating Talaria TWO USB driver to libusbK

6 Block Diagram

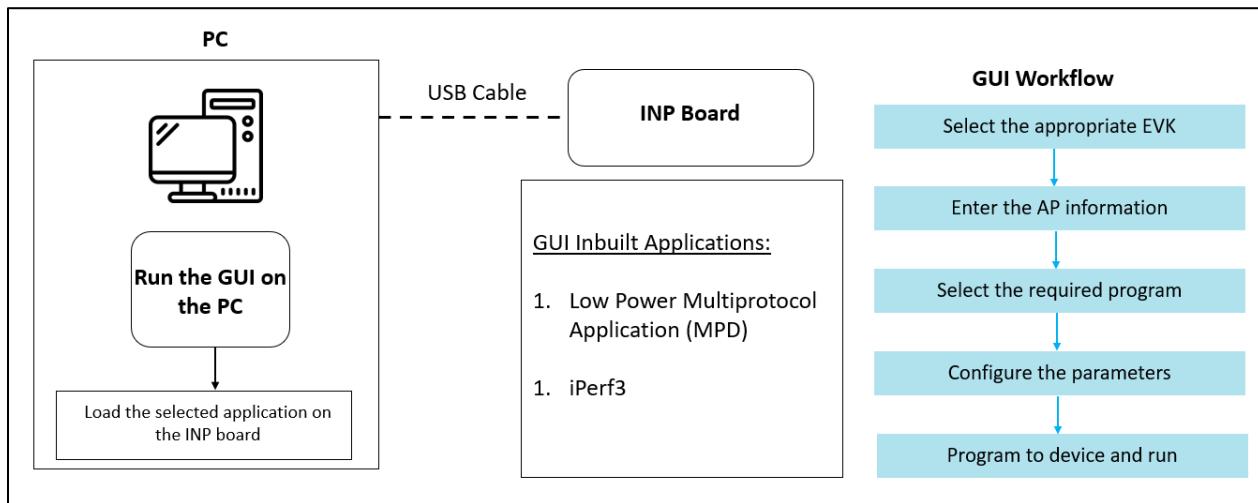


Figure 7: Block Diagram

7 GUI

On launching the application, the GUI window as shown in Figure 8 will come into view. The connected EVKs appear in the EVK serial number drop-down and the appropriate EVK can be selected. The SSID and Passphrase will connect the EVK board to the Access Point. Once connected, as per requirement either the MPD or iPerf3 applications can be loaded by selecting the appropriate tab.

Note: In case of windows display setting “Scale and layout” is more than 125%, GUI window might go out of screen.

Depending on the user’s geographical location, any one of the following Regulatory Domains can be selected:

1. FCC
2. ETSI
3. TELEC
4. KCC
5. SRCC

The Scan tab allows the user to actively scan for nearby access points.

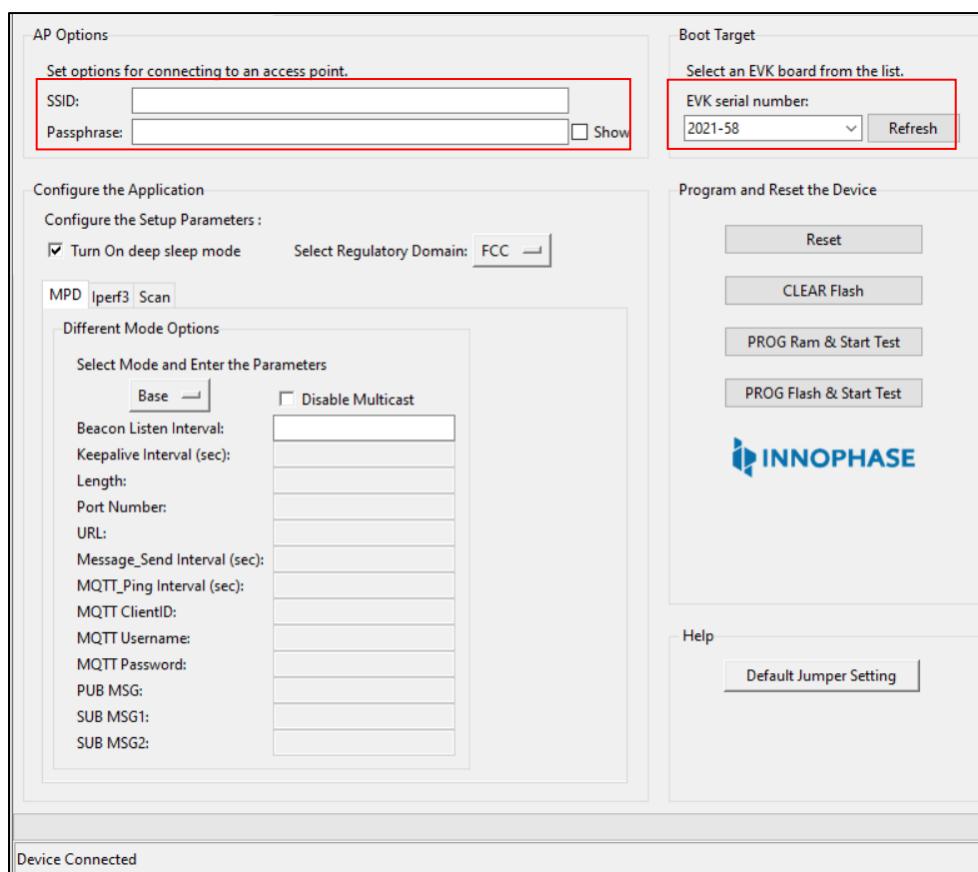


Figure 8: Demo Tool GUI

When the processor is idle or is waiting for an event or data to occur or be received, turning ON the Turn On deep sleep mode feature will put Talaria TWO in a power saving mode.

Depending on their region of operation, the user can select the appropriate regulatory domain from the Select Regulatory Domain option to establish a connection between the EVK board and the access point.

Note:

1. While loading the MPD/Iperf3/Scan applications using this tool, the existing Partition table is validated as mentioned in section 9.1 of UG_Download_Tool.pdf [1].
2. PROG RAM will clear the app from Flash. The user is alerted of the same during PROG RAM through a pop-up message as shown in Figure 9. User can select the Do not show again checkbox to stop this pop-up message from appearing next time.

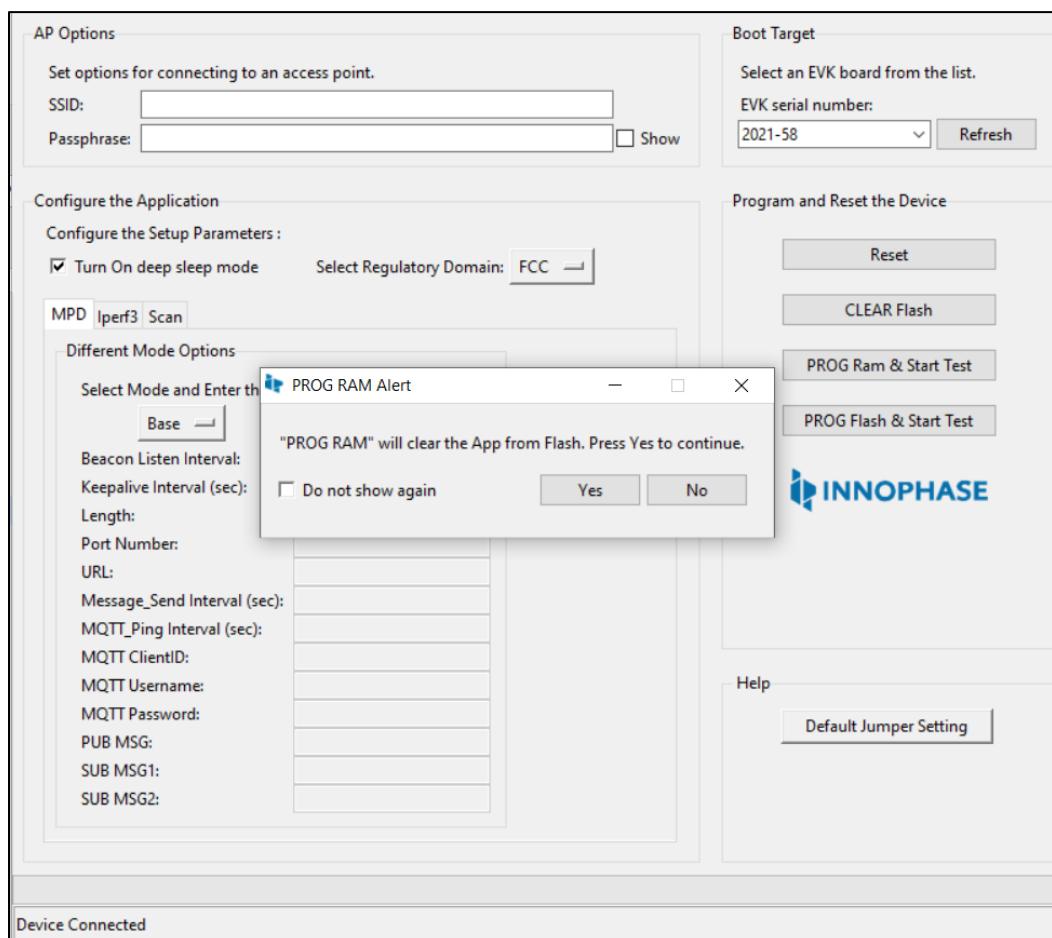


Figure 9: PROG RAM alert message

8 MPD

1. Enter your APs ssid and passphrase.
2. To automatically load the signed firmware image for MPD application, select the MPD tab as shown in Figure 10
3. For all the modes, the Keep Alive Wake time is fixed as 2 in the application. This time is the time window in milliseconds during which Talaria TWO will wait in receive mode before going to sleep.

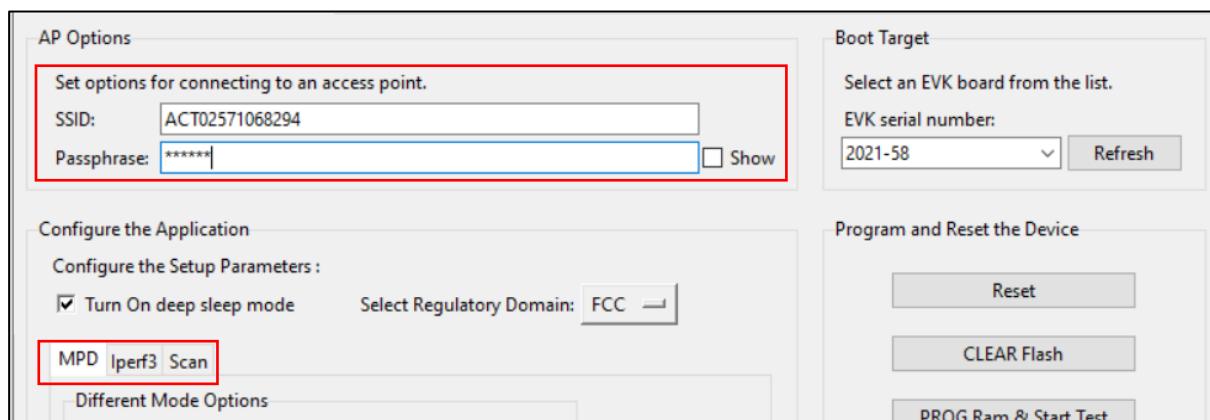


Figure 10: MPD tab

Note: Use the Show checkbox to see the passphrase value.

8.1 Base Mode

1. Select Base from the Select Mode and Enter the Parameters.
2. Enter Beacon Listen Interval value. Failure to pass any value will result in an error.
3. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

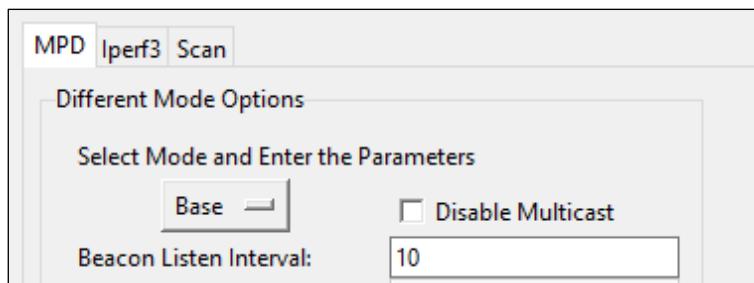


Figure 11: Selecting Base Mode

Expected Result: Rx current (Receive current) should be observed as per the Beacon listen interval configured. If beacon listen interval is configured as 10, then Rx current should be observed every 1 second.

Console output:

```
UART:NWWWWWAEBuild $Id: git-a1a0c3e62 $  
  
mpd.ssid=ACT102571068294 mpd.passphrase=43083191  
  
np_conf_path=/sys/nprofile.json mpd.mcast_rx=1 wifi.listen_interval=10  
  
krn.gpio=--K wifi.keep_alive_wake_time=2 wifi.arp_grat_period=1800  
  
wifi.max_idle_period=0 mpd.regdomain=FCC mpd.suspend=1  
  
$App:git-ee80eec  
  
SDK Ver: SDK_2.4  
  
T2 Multipurpose Demp App Version 0.12  
  
SSID 'ACT102571068294'  
  
Suspend Enabled.  
  
Multicast reception Enabled.  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
Trying Primary SSID=ACT102571068294  
  
. [10.339,335] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-45 dBm  
  
WCM_NOTIFY_MSG_LINK_UP  
  
.WCM_NOTIFY_MSG_ADDRESS  
  
[11.444,831] MYIP 192.168.0.102  
  
[11.445,110] IPv6 [fe80::e269:3aff:fe00:2c3e]-link  
  
WiFi Connection Success. SSID=ACT102571068294  
  
Listen interval=10  
  
Traffic Timeout=12  
  
pm_flags=0x0  
  
WiFi Connection success. proceeding to app..  
  
Timeout not specified.!  
  
Application Exited..
```

Going for indefinite sleep...

8.2 Keep Alive Mode

1. Select Keep Alive from the Select Mode and Enter the Parameters.
2. Enter a value for Beacon Listen Interval and Keepalive Interval (sec). Failure to pass any value will result in an error.
3. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

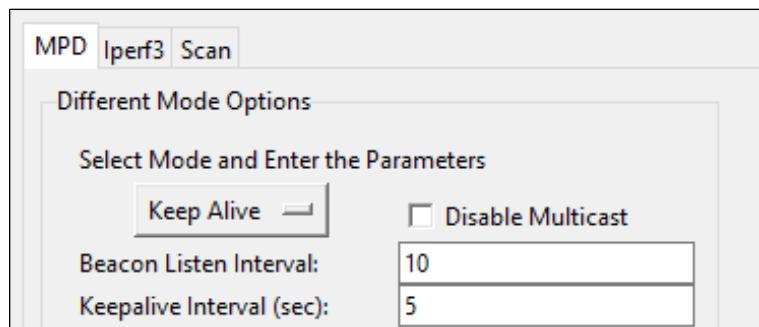


Figure 12: Selecting Keep Alive mode

Note: In order to reduce power consumption, the Keep Alive messages are aligned to the next beacon reception period. The actual Keepalive Interval can therefore be longer than specified, especially if the wifi.listen_interval is set to a high value.

Expected Result: Null frame should be observed in sniffer after every <secs> seconds configured in Keepalive Interval.

Console output:

```
UART:NWWWWWAAEBuild $Id: git-a1a0c3e62 $  
  
mpd.ssid=ACT102571068294 mpd.passphrase=43083191  
  
np_conf_path=/sys/nprofile.json mpd.mcast_rx=1 mpd.proto=none  
  
wifi.max_idle_period=5 wifi.listen_interval=10 krn.gpio=--K  
  
wifi.keep_alive_wake_time=2 wifi.arp_grat_period=0 mpd.regdomain=FCC  
  
mpd.suspend=1  
  
$App:git-ee80eec  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
SSID 'ACT102571068294'  
  
Suspend Enabled.  
  
Multicast reception Enabled.  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
Trying Primary SSID=ACT102571068294  
  
. [10.371,389] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-52 dBm  
  
WCM_NOTIFY_MSG_LINK_UP  
  
.WCM_NOTIFY_MSG_ADDRESS  
  
[11.288,225] MYIP 192.168.0.102  
  
[11.288,388] IPv6 [fe80::e269:3aff:fe00:2c3e]-link  
  
WiFi Connection Success. SSID=ACT102571068294  
  
Listen interval=10  
  
Traffic Timeout=12  
  
pm_flags=0x0  
  
WiFi Connection success. proceeding to app..  
  
Timeout not specified.!
```

```
Application Exited..
```

```
Going for indefinite sleep...
```

8.3 TCP

1. Select TCP from the Select Mode and Enter the Parameters.
2. Enter values for Beacon Listen Interval, Length, Port Number and Message_Send Interval (sec). Failure to pass any value will result in an error.
3. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

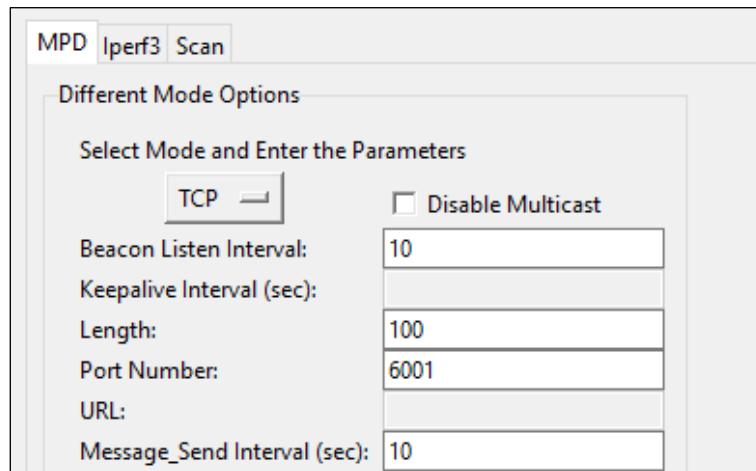


Figure 13: Selecting TCP mode

Note: Both the Host and Talaria TWO are connected to the same network.

Console output:

```
UART:NWWWWWAAEBuild $Id: git-a1a0c3e62 $  
  
mpd.ssid=ACT102571068294 mpd.passphrase=43083191  
  
np_conf_path=/sys/nprofile.json mpd.mcast_rx=1 mpd.proto=tcp  
  
mpd.tcp.msginterval=10 mpd.tcp.msglen=100 mpd.port=6001  
  
wifi.listen_interval=10 krn.gpio=--K wifi.keep_alive_wake_time=2  
  
wifi.arp_grat_period=1800 wifi.max_idle_period=0 mpd.regdomain=FCC  
  
mpd.suspend=1  
  
$App:git-ee80eec  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
SSID 'ACT102571068294'  
  
Suspend Enabled.  
  
Multicast reception Enabled.  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
Trying Primary SSID=ACT102571068294  
  
. [10.361,816] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-58 dBm  
  
WCM_NOTIFY_MSG_LINK_UP  
  
.WCM_NOTIFY_MSG_ADDRESS  
  
[11.062,363] MYIP 192.168.0.102  
  
[11.062,526] IPv6 [fe80::e269:3aff:fe00:2c3e]-link  
  
WiFi Connection Success. SSID=ACT102571068294  
  
Listen interval=10  
  
Traffic Timeout=12  
  
pm_flags=0x0  
  
WiFi Connection success. proceeding to app..
```

```
Timeout not specified.!  
  
listening socket success.. sd=0  
  
Binding to port: 6001  
  
bind success..  
  
listen success...  
  
  
Config:  
  
Proto      :tcp  
  
Port       :6001  
  
Interval:10  
  
msg len :100  
  
Waiting for incoming connections..  
  
Calling accept()  
  
accept returned. newsd=1  
  
send returned 100.  
  
msg=Times=1:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM  
  
send returned 100.  
  
msg=Times=2:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM  
  
send returned 100.  
  
msg=Times=3:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM  
  
send returned 100.  
  
msg=Times=4:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM  
  
MNOOPQRSTUVWXYZABCDEFGHIJKLM
```

```
send returned 100.

msg=Times=5:ABCDEFGHIJKLMNOOPQRSTUVWXYZABCDEFHIJKLMNOOPQRSTUVWXYZABCDEFHIJKLM
MNOPQRSTUVWXYZABCDEFHIJKLM

send returned 100.

msg=Times=6:ABCDEFGHIJKLMNOOPQRSTUVWXYZABCDEFHIJKLMNOOPQRSTUVWXYZABCDEFHIJKLM
MNOPQRSTUVWXYZABCDEFHIJKLM

send returned 100.

msg=Times=7:ABCDEFGHIJKLMNOOPQRSTUVWXYZABCDEFHIJKLMNOOPQRSTUVWXYZABCDEFHIJKLM
MNOPQRSTUVWXYZABCDEFHIJKLM
```

TCP client CMD output:

To start ncat in the host computer, follow the following steps:

1. Download and Install ncat using the following link: <https://nmap.org/ncat/>.
2. Open command prompt and pass command.
3. Ncat.exe IP-address (from console) and port_number (from console).

Expected Result: When client connects to the TCP server (server port configured with port boot argument), the TCP server sends a message to client after every <interval> seconds which is configured in Message_Send_Interval .

8.4 UDP

1. Select UDP from the Select Mode and Enter the Parameters.
2. Enter values for Beacon Listen Interval, Length, Port Number and message_Send Interval(sec). Failure to pass any value will result in an error.
3. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

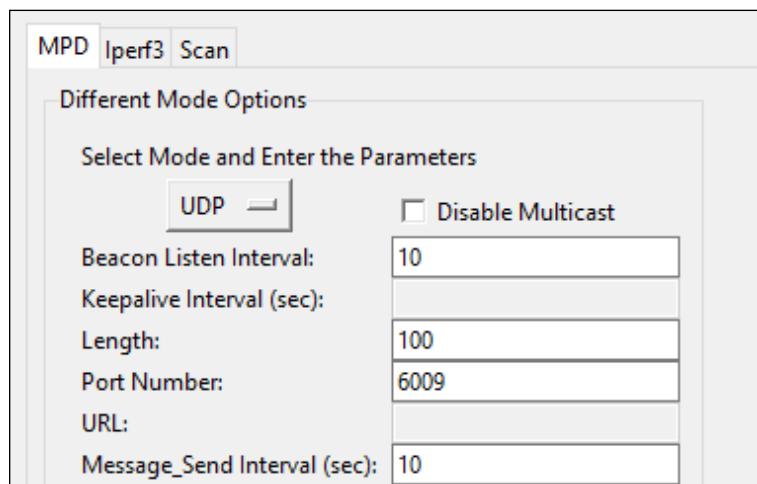


Figure 14: Selecting UDP mode

Note: Both the Host and Talaria TWO are connected to the same network.

Console output:

```
UART:NWWWWWAAEBuild $Id: git-a1a0c3e62 $  
  
mpd.ssid=ACT102571068294 mpd.passphrase=43083191  
  
np_conf_path=/sys/nprofile.json mpd.mcast_rx=1 mpd.proto=udp  
  
mpd.udp.msginterval=10 mpd.udp.msglen=100 mpd.port=6009  
  
wifi.listen_interval=10 krn.gpio=--K wifi.keep_alive_wake_time=2  
  
wifi.arp_grat_period=1800 wifi.max_idle_period=0 mpd.regdomain=FCC  
  
mpd.suspend=1  
  
$App:git-ee80eec  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
SSID 'ACT102571068294'  
  
Suspend Enabled.  
  
Multicast reception Enabled.  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
Trying Primary SSID=ACT102571068294  
  
. [10.378,092] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-40 dBm  
  
WCM_NOTIFY_MSG_LINK_UP  
  
.WCM_NOTIFY_MSG_ADDRESS  
  
[11.268,506] MYIP 192.168.0.102  
  
[11.268,670] IPv6 [fe80::e269:3aff:fe00:2c3e]-link  
  
WiFi Connection Success. SSID=ACT102571068294  
  
Listen interval=10  
  
Traffic Timeout=12  
  
pm_flags=0x0  
  
WiFi Connection success. proceeding to app..
```

```
Timeout not specified.!

UDP socket success

Config:

Proto    :udp
Port     :6009
Interval:10
msg len :100
sendto returned 100.
```

UDP client CMD output:

```
C:\Program Files (x86)\Nmap>ncat.exe -u -l 6009

Times=3:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
QRSTUVWXYZABCDEFGHIJKLM

Times=4:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
QRSTUVWXYZABCDEFGHIJKLM

Times=5:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
QRSTUVWXYZABCDEFGHIJKLM

Times=6:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
QRSTUVWXYZABCDEFGHIJKLM

Times=7:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
QRSTUVWXYZABCDEFGHIJKLM

Times=8:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
QRSTUVWXYZABCDEFGHIJKLM

Times=9:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
QRSTUVWXYZABCDEFGHIJKLM

Times=10:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
PQRSTUVWXYZABCDEFGHIJKL

Times=11:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
PQRSTUVWXYZABCDEFGHIJKL

Times=12:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
PQRSTUVWXYZABCDEFGHIJKL

Times=13:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
PQRSTUVWXYZABCDEFGHIJKL

Times=14:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
PQRSTUVWXYZABCDEFGHIJKL

Times=15:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOP
PQRSTUVWXYZABCDEFGHIJKL
```

```
Times=16:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFHIJKLMNOPQRSTUVWXYZABCDEFHIJKLMNOP  
QRSTUVWXYZABCDEFHIJKLMNO
```

To start ncat in the host computer, follow the following steps:

1. Download and Install ncat using the following link: <https://nmap.org/ncat/>.
2. Open command prompt and pass command.
3. ncat.exe -u -l port_number (from console).

Expected Result: Application sends broadcast UDP message using port number passed in boot arguments after every <interval> seconds configure in Message_Send_Interval.

8.5 HTTP

1. Select HTTP from the Select Mode and Enter the Parameters.
2. Enter Beacon listen Interval, URL, Message_Send Interval(sec). Failure to pass any value will result in an error.
3. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

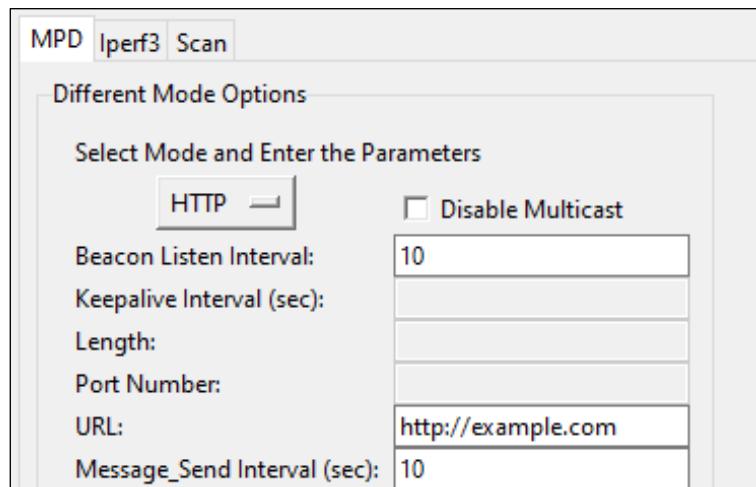


Figure 15: Selecting HTTP mode

Expected Result: At interval configured in boot arguments in Message_Send Interval, application connects to URL, performs HTTP get and hexdumps the page.

Console output:

```
UART:NWWWWWAAEBuild $Id: git-a1a0c3e62 $  
  
mpd.ssid=ACT102571068294 mpd.passphrase=43083191  
  
np_conf_path=/sys/nprofile.json mpd.mcast_rx=1 mpd.proto=http  
  
mpd.http.httpgetinterval=10 mpd.url=http://example.com  
  
wifi.listen_interval=10 krn.gpio=--K wifi.keep_alive_wake_time=2  
  
wifi.arp_grat_period=1800 wifi.max_idle_period=0 mpd.regdomain=FCC  
  
mpd.suspend=1  
  
$App:git-ee80eec  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
SSID 'ACT102571068294'  
  
Suspend Enabled.  
  
Multicast reception Enabled.  
  
url=http://example.com  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
Trying Primary SSID=ACT102571068294  
  
. [10.354,238] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-41 dBm  
  
WCM_NOTIFY_MSG_LINK_UP  
  
.WCM_NOTIFY_MSG_ADDRESS  
  
[11.071,562] MYIP 192.168.0.102  
  
[11.071,725] IPv6 [fe80::e269:3aff:fe00:2c3e]-link  
  
WiFi Connection Success. SSID=ACT102571068294  
  
Listen interval=10  
  
Traffic Timeout=12  
  
pm_flags=0x0
```

```
WiFi Connection success. proceeding to app..

Timeout not specified.!

after parsing. port=80


Config:

Proto    :http
Port     :0
Interval:10
msg len :0


http_send_keepalive: times=1
[APP]Calling http_client_open(). cfg.port=80
[APP]HTTP Get. path=/callback entry


[APP]Response:

1104 -----
200

Accept-Ranges: bytes
Age: 343172
Cache-Control: max-age=604800
Content-Type: text/html; charset=UTF-8
Date: Tue, 07 Sep 2021 06:39:40 GMT
Etag: "3147526947+gzip"
Expires: Tue, 14 Sep 2021 06:39:40 GMT
Last-Modified: Thu, 17 Oct 2019 07:18:26 GMT
Server: ECS (dcb/7EC8)
Vary: Accept-Encoding
```

```
X-Cache: HIT
Content-Length: 1256
[APP] Body:
Hexdump of http data, len=1104
3C 21 64 6F 63 74 79 70 65 20 68 74 6D 6C 3E 0A | <!doctype html>.
3C 68 74 6D 6C 3E 0A 3C 68 65 61 64 3E 0A 20 20 | <html>.<head>.
20 20 3C 74 69 74 6C 65 3E 45 78 61 6D 70 6C 65 | <title>Example
20 44 6F 6D 61 69 6E 3C 2F 74 69 74 6C 65 3E 0A | Domain</title>.
0A 20 20 20 20 3C 6D 65 74 61 20 63 68 61 72 73 | . <meta chars
65 74 3D 22 75 74 66 2D 38 22 20 2F 3E 0A 20 20 | et="utf-8" />.
20 20 3C 6D 65 74 61 20 68 74 74 70 2D 65 71 75 | <meta http-equiv
69 76 3D 22 43 6F 6E 74 65 6E 74 2D 74 79 70 65 | iv="Content-type
22 20 63 6F 6E 74 65 6E 74 3D 22 74 65 78 74 2F | " content="text/
68 74 6D 6C 3B 20 63 68 61 72 73 65 74 3D 75 74 | html; charset=ut
66 2D 38 22 20 2F 3E 0A 20 20 20 20 3C 6D 65 74 | f-8" />. <met
61 20 6E 61 6D 65 3D 22 76 69 65 77 70 6F 72 74 | a name="viewport
22 20 63 6F 6E 74 65 6E 74 3D 22 77 69 64 74 68 | " content="width
3D 64 65 76 69 63 65 2D 77 69 64 74 68 2C 20 69 | =device-width, i
6E 69 74 69 61 6C 2D 73 63 61 6C 65 3D 31 22 20 | nitial-scale=1"
2F 3E 0A 20 20 20 20 3C 73 74 79 6C 65 20 74 79 | />. <style ty
70 65 3D 22 74 65 78 74 2F 63 73 73 22 3E 0A 20 | pe="text/css">.
20 20 20 62 6F 64 79 20 7B 0A 20 20 20 20 20 20 | body {.
20 20 62 61 63 6B 67 72 6F 75 6E 64 2D 63 6F 6C | background-col
6F 72 3A 20 23 66 30 66 30 66 32 3B 0A 20 20 20 | or: #f0f0f2;.
20 20 20 20 20 6D 61 72 67 69 6E 3A 20 30 3B 0A | margin: 0;.
20 20 20 20 20 20 20 20 70 61 64 64 69 6E 67 3A | padding:
20 30 3B 0A 20 20 20 20 20 20 20 20 66 6F 6E 74 | 0;. font
2D 66 61 6D 69 6C 79 3A 20 2D 61 70 70 6C 65 2D | -family: -apple-
```

```
73 79 73 74 65 6D 2C 20 73 79 73 74 65 6D 2D 75 | system, system-u
69 2C 20 42 6C 69 6E 6B 4D 61 63 53 79 73 74 65 | i, BlinkMacSyste
6D 46 6F 6E 74 2C 20 22 53 65 67 6F 65 20 55 49 | mFont, "Segoe UI
22 2C 20 22 4F 70 65 6E 20 53 61 6E 73 22 2C 20 | ", "Open Sans"3C 61 20
68 72 65 66 3D 22 68 | <p><a href="h
74 74 70 73 3A 2F 2F 77 77 77 2E 69 61 6E 61 2E | ttps://www.iana.
6F 72 67 2F 64 6F 6D 61 69 6E 73 2F 65 78 61 6D | org/domains/exam
70 6C 65 22 3E 4D 6F 72 65 20 69 6E 66 6F 72 6D | ple">More inform
61 74 69 6F 6E 2E 2E 2E 3C 2F 61 3E 3C 2F 70 3E | ation...</a></p>
0A 3C 2F 64 69 76 3E 0A 3C 2F 62 6F 64 79 3E 0A | .</div>.</body>.
3C 2F 68 74 6D 6C 3E 0A | </html>.

callback exit
```

8.6 HTTPS

1. Select HTTPS from the Select Mode and Enter the Parameters.
2. Enter Beacon Listen Interval, URL and Message_Send Interval (sec). If no value is passed, GUI will pop-up an error message.
3. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

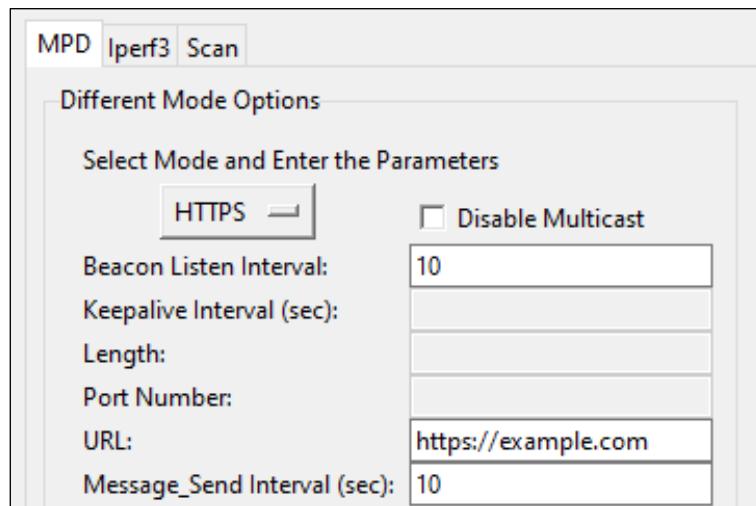


Figure 16: Selecting HTTPS mode

Expected Result: At interval configured in Message_Send Interval, application connects to URL, performs HTTPs get and hexdumps the page.

Console output:

```
UART:NWWWWWAAEBuild $Id: git-a1a0c3e62 $  
  
mpd.ssid=ACT102571068294 mpd.passphrase=43083191  
  
np_conf_path=/sys/nprofile.json mpd.mcast_rx=1 mpd.proto=https  
  
mpd.https.httpsgetinterval=10 mpd.url=https://example.com  
  
wifi.listen_interval=10 krn.gpio=--K wifi.keep_alive_wake_time=2  
  
wifi.arp_grat_period=1800 wifi.max_idle_period=0 mpd.regdomain=FCC  
  
mpd.suspend=1  
  
$App:git-ee80eec  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
SSID 'ACT102571068294'  
  
Suspend Enabled.  
  
Multicast reception Enabled.  
  
url=https://example.com  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
Trying Primary SSID=ACT102571068294  
  
. [10.371,677] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-47 dBm  
  
WCM_NOTIFY_MSG_LINK_UP  
  
.WCM_NOTIFY_MSG_ADDRESS  
  
[11.256,329] MYIP 192.168.0.102  
  
[11.256,492] IPv6 [fe80::e269:3aff:fe00:2c3e]-link  
  
WiFi Connection Success. SSID=ACT102571068294  
  
Listen interval=10  
  
Traffic Timeout=12  
  
pm_flags=0x0
```

```
WiFi Connection success. proceeding to app..

Timeout not specified.!

after parsing. port=443


Config:

Proto    :https
Port     :0
Interval:10
msg len :0


http_send_keepalive: times=1


[APP]Calling http_client_open(). http_cmn_ctx.cfg.port=443 . Checking input
configurations...

. Seeding the random number generator...
. Connecting to tcp example.com:443...
. Setting up the SSL/TLS structure...

    >setting configurations..
    >auth mode = 0 (0- skip, 1- optional, 2- required
    >max fragment len = 0

. Performing the SSL/TLS handshake...


ok

. Verifying peer X.509 certificate...


[APP]HTTP Get. path=/


[APP]Response:
0 -----
```

```
200

Age: 307863

Cache-Control: max-age=604800

Content-Type: text/html; charset=UTF-8

Date: Tue, 07 Sep 2021 07:05:45 GMT

Etag: "3147526947+ident"

Expires: Tue, 14 Sep 2021 07:05:45 GMT

Last-Modified: Thu, 17 Oct 2019 07:18:26 GMT

Server: ECS (dcb/7EA3)

Vary: Accept-Encoding

X-Cache: HIT

Content-Length: 1256

[APP] Body:

Hexdump of http data, len=0

Hexdump of http data, len=1256

3C 21 64 6F 63 74 79 70 65 20 68 74 6D 6C 3E 0A | <!doctype html>.
3C 68 74 6D 6C 3E 0A 3C 68 65 61 64 3E 0A 20 20 | <html>.<head>.
20 20 3C 74 69 74 6C 65 3E 45 78 61 6D 70 6C 65 | <title>Example
20 44 6F 6D 61 69 6E 3C 2F 74 69 74 6C 65 3E 0A | Domain</title>.
0A 20 20 20 20 3C 6D 65 74 61 20 63 68 61 72 73 | . <meta chars
65 74 3D 22 75 74 66 2D 38 22 20 2F 3E 0A 20 20 | et="utf-8" />.
20 20 3C 6D 65 74 61 20 68 74 74 70 2D 65 71 75 | <meta http-equiv
69 76 3D 22 43 6F 6E 74 65 6E 74 2D 74 79 70 65 | content-type
22 20 63 6F 6E 74 65 6E 74 3D 22 74 65 78 74 2F | " content="text/
68 74 6D 6C 3B 20 63 68 61 72 73 65 74 3D 75 74 | html; charset=ut
66 2D 38 22 20 2F 3E 0A 20 20 20 20 3C 6D 65 74 | f-8" />. <met
61 20 6E 61 6D 65 3D 22 76 69 65 77 70 6F 72 74 | a name="viewport
```

```

22 20 63 6F 6E 74 65 6E 74 3D 22 77 69 64 74 68 | " content="width
3D 64 65 76 69 63 65 2D 77 69 64 74 68 2C 20 69 | =device-width, i
6E 69 74 69 61 6C 2D 73 63 61 6C 65 3D 31 22 20 | nitial-scale=1"
2F 3E 0A 20 20 20 20 3C 73 74 79 6C 65 20 74 79 | />. <style ty
70 65 3D 22 74 65 78 74 2F 63 73 73 22 3E 0A 20 | pe="text/css">.
20 20 20 62 6F 64 79 20 7B 0A 20 20 20 20 20 20 | body { .
20 20 62 61 63 6B 67 72 6F 75 6E 64 2D 63 6F 6C | background-col
6F 72 3A 20 23 66 30 66 30 66 32 3B 0A 20 20 20 | or: #f0f0f2; .
20 20 20 20 20 6D 61 72 67 69 6E 3A 20 30 3B 0A | margin: 0; .
20 20 20 20 20 20 20 20 70 61 64 64 69 6E 67 3A | padding: 0; . font
2D 66 61 6D 69 6C 79 3A 20 2D 61 70 70 6C 65 2D | -family: -apple-
73 79 73 74 65 6D 2C 20 73 79 73 74 65 6D 2D 75 | system, system-u
69 2C 20 42 6C 69 6E 6B 4D 61 63 53 79 73 74 65 | i, BlinkMacSyste
6D 46 6F 6E 74 2C 20 22 53 65 67 6F 65 20 55 49 | mFont, "Segoe UI
22 2C 20 22 4F 70 65 6E 20 53 61 6E 73 22 2C 20 | ", "Open Sans",
22 48 65 6C 76 65 74 69 63 61 20 4E 65 75 65 22 | "Helvetica Neue"
2C 20 48 65 6C 76 65 74 69 63 61 2C 20 41 72 69 | , Helvetica, Ari
61 6C 2C 20 73 61 6E 73 2D 73 65 72 69 66 3B 0A | al, sans-serif; .
20 20 20 20 20 20 20 20 0A 20 20 20 20 20 7D 0A 20 | . } .
20 20 20 64 69 76 20 7B 0A 20 20 20 20 20 20 20 | div { .
20 77 69 64 74 68 3A 20 36 30 30 70 78 3B 0A 20 | width: 600px; .
20 20 20 20 20 20 20 20 6D 61 72 67 69 6E 3A 20 35 | margin: 5
65 6D 20 61 75 74 6F 3B 0A 20 20 20 20 20 20 20 | em auto; .
20 70 61 64 64 69 6E 67 3A 20 32 65 6D 3B 0A 20 | padding: 2em; .
20 20 20 20 20 20 20 62 61 63 6B 67 72 6F 75 6E | background-color: #fdfdff
64 2D 63 6F 6C 6F 72 3A 20 23 66 64 66 64 66 66 | border: 1px solid black;
3B 0A 20 20 20 20 20 20 20 20 20 62 6F 72 64 65 72 | ; . border-radius: 5px;

```

```

2D 72 61 64 69 75 73 3A 20 30 2E 35 65 6D 3B 0A | -radius: 0.5em;.

20 20 20 20 20 20 20 20 62 6F 78 2D 73 68 61 64 | box-shad
6F 77 3A 20 32 70 78 20 33 70 78 20 37 70 78 20 | ow: 2px 3px 7px
32 70 78 20 72 67 62 61 28 30 2C 30 2C 30 2C 30 | 2px rgba(0,0,0,0
2E 30 32 29 3B 0A 20 20 20 20 7D 0A 20 20 20 20 | .02);. }.

61 3A 6C 69 6E 6B 2C 20 61 3A 76 69 73 69 74 65 | a:link, a:visite
64 20 7B 0A 20 20 20 20 20 20 20 63 6F 6C 6F | d {. colo
72 3A 20 23 33 38 34 38 38 66 <p>Th
69 73 20 64 6F 6D 61 69 6E 20 69 69 73 20 66 6F 72 | is domain is for
20 75 73 65 20 69 6E 20 69 6C 6C 75 73 74 72 61 | use in illustra
74 69 76 65 20 65 78 61 6D 70 6C 65 73 20 69 6E | tive examples in
20 64 6F 63 75 6D 65 6E 74 73 2E 20 59 6F 75 20 | documents. You
6D 61 79 20 75 73 65 20 74 68 69 73 0A 20 20 20 | may use this.
20 64 6F 6D 61 69 6E 20 69 6E 20 6C 69 74 65 72 | domain in liter
61 74 75 72 65 20 77 69 74 68 6F 75 74 20 70 72 | ature without pr
69 6F 72 20 63 6F 6F 72 64 69 6E 61 74 69 6F 6E | ior coordination
20 6F 72 20 61 73 6B 69 6E 67 20 66 6F 72 20 70 | or asking for p
65 72 6D 69 73 73 69 6F 6E 2E 3C 2F 70 3E 0A 20 | ermission.</p>.
20 20 20 3C 70 3E 3C 61 20 68 72 65 66 3D 22 68 | <p><a href="h
74 74 70 73 3A 2F 2F 77 77 77 2E 69 61 6E 61 2E | ttps://www.iana.
6F 72 67 2F 64 6F 6D 61 69 6E 73 2F 65 78 61 6D | org/domains/exam
70 6C 65 22 3E 4D 6F 72 65 20 69 6E 66 6F 72 6D | ple">More inform
61 74 69 6F 6E 2E 2E 2E 3C 2F 61 3E 3C 2F 70 3E | ation...</a></p>
0A 3C 2F 64 69 76 3E 0A 3C 2F 62 6F 64 79 3E 0A | .</div>.</body>.
3C 2F 68 74 6D 6C 3E 0A | </html>.

[APP] Success: http_client_get(), rval = 2
http_send_keepalive: times=2

```

```
[APP]Calling http_client_open(). http_cmn_ctx.cfg.port=443 . Checking input configurations...
.
. Seeding the random number generator...
.
. Connecting to tcp example.com:443...
.
. Setting up the SSL/TLS structure...
>setting configurations..
>auth mode = 0 (0- skip, 1- optional, 2- required
>max fragment len = 0
.
. Performing the SSL/TLS handshake...
.

ok
.
. Verifying peer X.509 certificate...
[APP]HTTP Get. path=/

[APP]Response:
0 -----
200
Age: 576088
Cache-Control: max-age=604800
Content-Type: text/html; charset=UTF-8
Date: Tue, 07 Sep 2021 07:06:08 GMT
Etag: "3147526947+gzip+ident"
Expires: Tue, 14 Sep 2021 07:06:08 GMT
Last-Modified: Thu, 17 Oct 2019 07:18:26 GMT
Server: ECS (dcb/7F60)
Vary: Accept-Encoding
```

```
X-Cache: HIT  
Content-Length: 1256  
[APP] Body:  
Hexdump of http data, len=0  
Hexdump of http data, len=1256
```

8.7 MQTT

1. Select MQTT from Select Mode and Enter the Parameters.
2. Enter Beacon Listen Interval, Port number, URL, Message_Send Interval(sec), MQTT_Ping Interval(secs), MQTT ClientID, MQTT Username, MQTT Password, PUB MSG, SUB MSG1 and SUB MSG2. Failure to pass any value will result in an error.
3. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

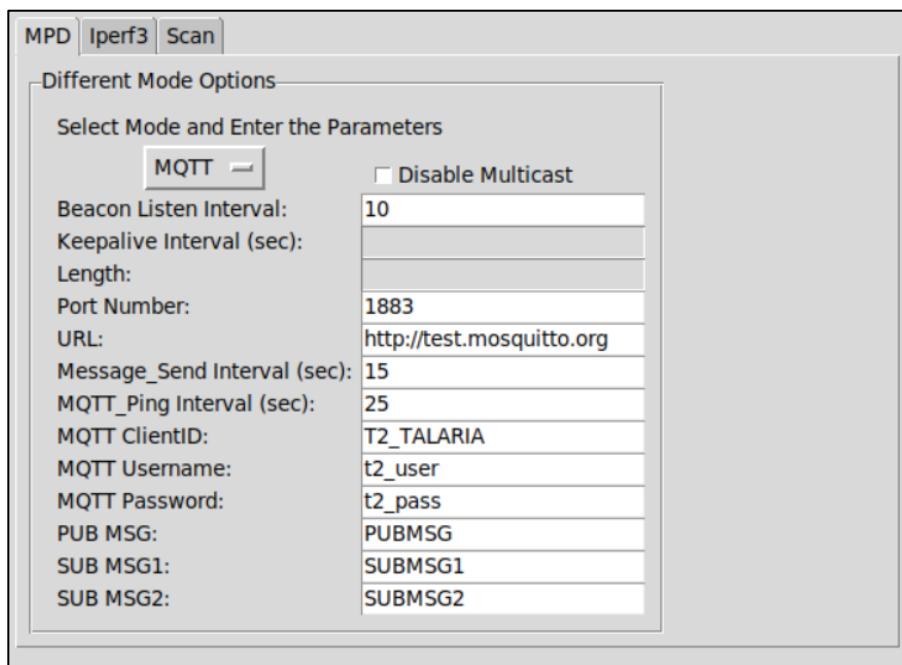


Figure 17: Selecting MQTT mode

To observe Publish messages and to Subscribe any message run the following commands:

1. To Publish:

```
mosquitto_sub.exe -d -v -h test.mosquitto.org -t PUBMSG
```

2. To Subscribe:

```
mosquitto_pub.exe -d -h test.mosquitto.org -t SUBMSG1 -m "msg1"
```

Note: Mosquitto.exe can be downloaded from the following link:
<http://mosquitto.org/download/>.

MQTT - Command Prompt Output (Subscribe message):

```
C:\Program Files\Mosquitto>mosquitto_pub.exe -d -h test.mosquitto.org -t  
SUBMSG1 -m "msg1"  
  
Client (null) sending CONNECT  
  
Client (null) received CONNACK (0)  
  
Client (null) sending PUBLISH (d0, q0, r0, m1, 'SUBMSG1', ... (4 bytes))  
  
Client (null) sending DISCONNECT
```

MQTT - Command Prompt Output (Publish message):

```
C:\Program Files\Mosquitto>mosquitto_sub.exe -d -v -h test.mosquitto.org -t  
PUBMSG  
  
Client (null) sending CONNECT  
  
Client (null) received CONNACK (0)  
  
Client (null) sending SUBSCRIBE (Mid: 1, Topic: PUBMSG, QoS: 0, Options:  
0x00)  
  
Client (null) received SUBACK  
  
Subscribed (mid: 1): 0  
  
Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))  
  
PUBMSG  
  
Times=6:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFHIJKLMNOPQRSTUVWXYZABCDEFHIJKLMNOH  
QRSTUWVXYZABCDEFGHIJKLM  
  
Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))  
  
PUBMSG  
  
Times=7:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFHIJKLMNOPQRSTUVWXYZABCDEFHIJKLMNOH  
QRSTUWVXYZABCDEFGHIJKLM  
  
Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))
```

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```
PUBMSG

Times=3:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))

PUBMSG

Times=4:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))

PUBMSG

Times=5:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))

PUBMSG

Times=6:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))

PUBMSG

Times=7:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))

PUBMSG

Times=8:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))

PUBMSG

Times=9:ABCDEFHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))
```

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```
PUBMSG

Times=10:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNO

PQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))

PUBMSG

Times=11:ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNO

PQRSTUVWXYZABCDEFGHIJKLM

Client (null) received PUBLISH (d0, q0, r0, m0, 'PUBMSG', ... (99 bytes))
```

Console output:

Y-BOOT 208ef13 2019-07-22 12:26:54 -0500 790da1-b-7

ROM yoda-h0-rom-16-0-gd5a8e586

FLASH:PNWWWWWAEBuild \$Id: git-b664be2af \$

mpd.mcast_rx=1 mpd.proto=mqtt mpd.port=1883 mpd.mqtt.publishinterval=15

mpd.url=http://test.mosquitto.org mpd.mqtt.clientid=T2_TALARIA

mpd.mqtt.username=t2_user mpd.mqtt.password=t2_pass mpd.mqtt.pub_msg=PUBMSG

mpd.mqtt.sub_msg1=SUBMSG1 mpd.mqtt.sub_msg2=SUBMSG2

mpd.mqtt.ping_interval=25 wifi.listen_interval=10 krn.gpio=--K

wifi.keep_alive_wake_time=2 wifi.arp_grat_period=1800 wifi.max_idle_period=0

mpd.regdomain=FCC mpd.suspend=1 np_conf_path=/sys/nprofile.json

mpd.ssid=innotest mpd.passphrase=innophase123

\$App:git-6e423223

SDK Ver: SDK_2.4

T2 Multipurpose Demp App Version 0.12

network profile parse success.

Suspend Enabled.

Multicast reception Enabled.

url=http://test.mosquitto.org

```
Regdomain=FCC
addr f0:43:87:b0:1c:46
Applying reg domain: 1-11@20

Connecting to network
.[0.890,493] CONNECT:84:d8:1b:b3:6a:92 Channel:7 rssi:-70 dBm
WCM_NOTIFY_MSG_LINK_UP
..WCM_NOTIFY_MSG_ADDRESS
[2.685,737] MYIP 192.168.0.33
[2.685,785] IPv6 [fe80::f243:87ff:feb0:1c46]-link
Listen interval=10
Traffic Timeout=12
pm_flags=0x0
WiFi Connection success. proceeding to app..
Timeout not specified.!
url=http://test.mosquitto.org/ hostname=test.mosquitto.org, port=1883,
page=/
starting mqtt.. Ping interval=25 Secs
Connect success. Returning :0

_mqtt_cycle : packet_type = 2
_mqtt_cycle : packet_type = 9Subscribed to "SUBMSG1"

_mqtt_cycle : packet_type = 9Subscribed to "SUBMSG2"
MQTT init: returning 0

Config:
Proto :mqtt
```

```
Port :1883
Interval:15
msg len :100
mqtt_loop entry
publish_data, value=1, interval=15Secs
publish_data, value=2, interval=15Secs

 mqtt_cycle : packet_type = 13publish_data, value=3, interval=15Secs
publish_data, value=4, interval=15Secs

 mqtt_cycle : packet_type = 13publish_data, value=5, interval=15Secs
publish_data, value=6, interval=15Secs

 mqtt_cycle : packet_type = 13publish_data, value=7, interval=15Secs
publish_data, value=8, interval=15Secs

 mqtt_cycle : packet_type = 13publish_data, value=9, interval=15Secs
publish_data, value=10, interval=15Secs

 mqtt_cycle : packet_type = 13publish_data, value=11, interval=15Secs
publish_data, value=0, interval=15Secs

 mqtt_cycle : packet_type = 13publish_data, value=1, interval=15Secs
publish_data, value=2, interval=15Secs

 mqtt_cycle : packet_type = 13publish_data, value=3, interval=15Secs

 mqtt_cycle : packet_type = 3messageArrived: SUBMSG1 msg1
```

```
publish_data, value=4, interval=15Secs  
publish_data, value=5, interval=15Secs  
  
_mqtt_cycle : packet_type = 13publish_data, value=6, interval=15Secs  
publish_data, value=7, interval=15Secs
```

Expected Result: App connects to MQTT broker. At Message_Send Interval configured, application does an MQTT publish with topic <PUBMSG> and subscribe with topic <SUBMSG>

8.8 Multicast Reception OFF GRAT ARP OFF

1. Select Base mode from the Select Mode and Enter the Parameters.
2. Select the Disable Multicast option.
3. Enter Beacon Listen Interval value. Failure to pass any value will result in an error.
4. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

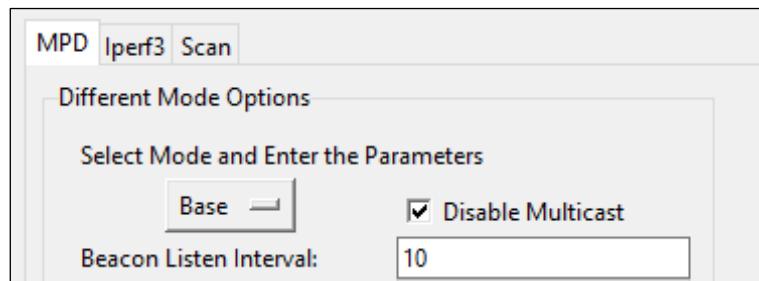


Figure 18: Selecting Multicast Reception OFF GRAT ARP OFF

Console output:

```
UART:NWWWWWAAEBuild $Id: git-f92bee540 $  
  
mpd.ssid=ACT102571068294 mpd.passphrase=43083191  
  
np_conf_path=/sys/nprofile.json mpd.mcast_rx=0 wifi.listen_interval=10  
krn.gpio=--K wifi.keep_alive_wake_time=2 wifi.arp_grat_period=1800  
wifi.max_idle_period=0 mpd.regdomain=FCC mpd.suspend=1  
  
$App:git-dc89330  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
SSID 'ACT102571068294'  
  
Suspend Enabled.  
  
Multicast reception Disabled.  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
Trying Primary SSID=ACT102571068294  
  
. [10.441,264] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-53 dBm  
  
WCM_NOTIFY_MSG_LINK_UP  
  
.WCM_NOTIFY_MSG_ADDRESS  
  
[11.182,218] MYIP 192.168.0.102  
  
[11.182,380] IPv6 [fe80::e269:3aff:fe00:2c3e]-link  
  
WiFi Connection Success. SSID=ACT102571068294  
  
Listen interval=10  
  
Traffic Timeout=12  
  
pm_flags=0x0  
  
WiFi Connection success. proceeding to app..  
  
Timeout not specified.!  
  
Application Exited..
```

User Guide for Talaria TWO Demo Tool



Going for indefinite sleep...

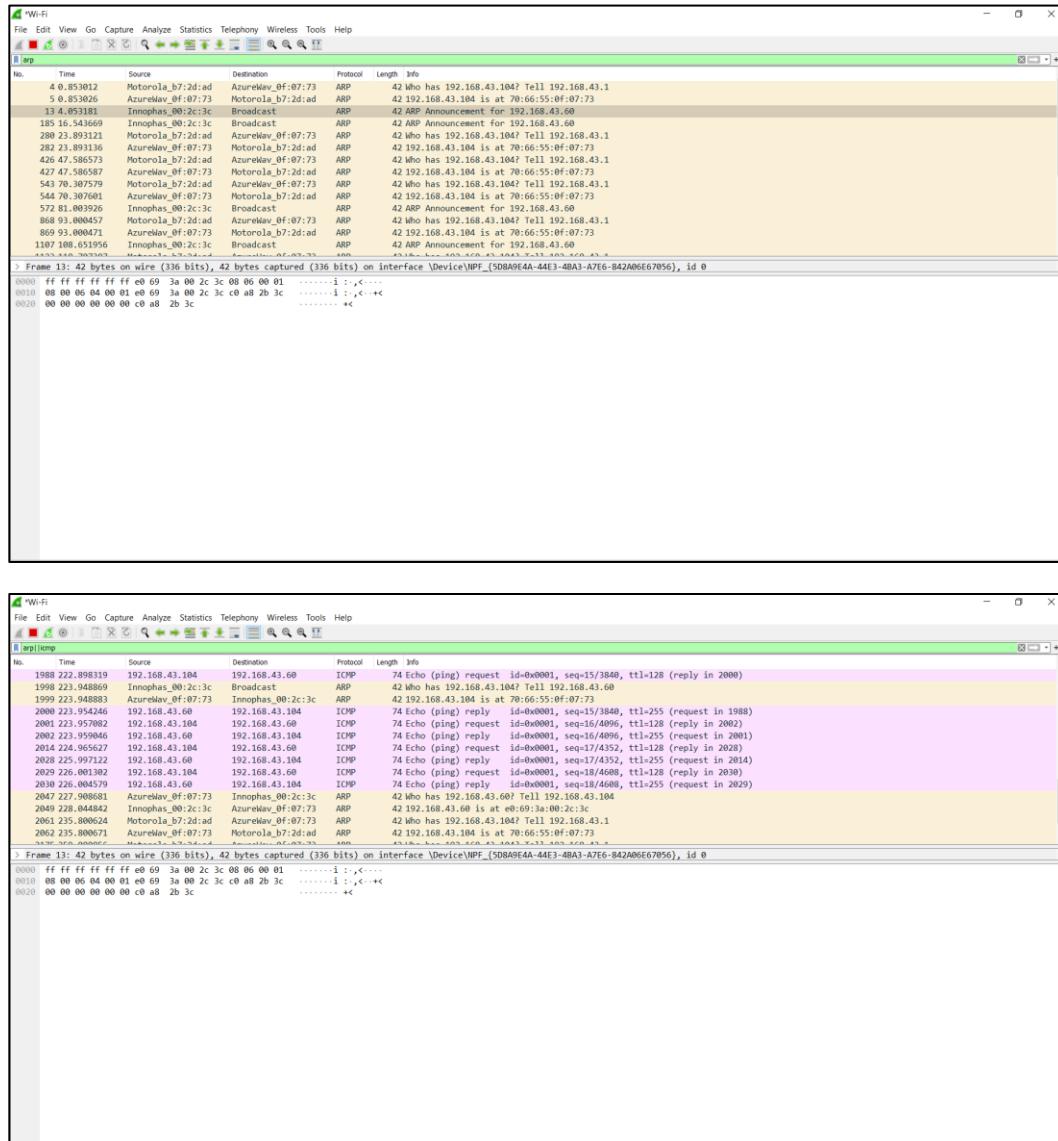


Figure 19: Multicast Reception OFF GRAT ARP OFF - Wireshark

CMD output:

```
C:\WINDOWS\system32>ping 192.168.0.104

Pinging 192.168.0.104 with 32 bytes of data:
Reply from 192.168.0.104: bytes=32 time=1546ms TTL=255
Reply from 192.168.0.104: bytes=32 time=7ms TTL=255
Reply from 192.168.0.104: bytes=32 time=16ms TTL=255
Reply from 192.168.0.104: bytes=32 time=1073ms TTL=255

Ping statistics for 192.168.0.104:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 7ms, Maximum = 1546ms, Average = 660ms
```

Expected Result: Ping the IP address which can be found from the console window. Talaria TWO connects to the AP. When PC tries to ping, ARP does not pass as the Multicast ARP at Talaria TWO is turned off. However, after some time, ARP goes through and the ping is executed.

Note: Wireshark can be downloaded from the following link: <https://www.wireshark.org/>.

8.9 Multicast Reception OFF GRAT ARP ON

1. Select Multicast OFF Grat. ARP ON from the Select Mode and Enter the Parameters.
2. Select the Disable Multicast option.
3. Enter Beacon Listen Interval and Message_Send Interval(sec). Failure to pass any value will result in an error.
4. Click on either PROG Ram & Start Test or PROG Flash & Start Test as per your requirement.

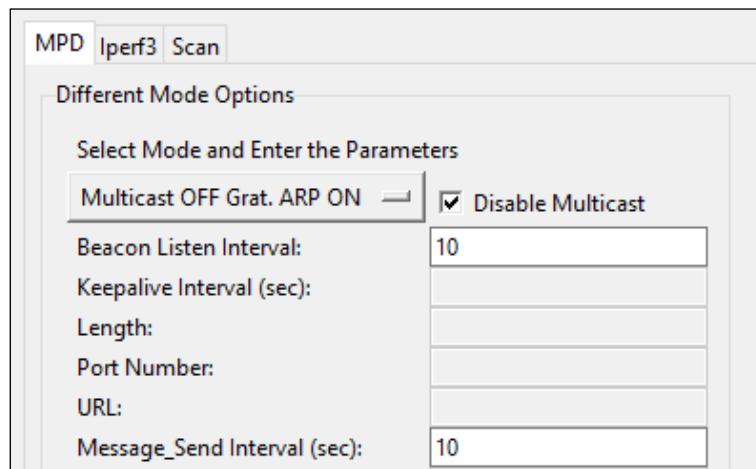


Figure 20: Selecting Multicast Reception OFF GRAT ARP ON

Console output:

```
UART:NWWWWWAAEBuild $Id: git-f92bee540 $

mpd.ssid=ACT102571068294 mpd.passphrase=43083191

np_conf_path=/sys/nprofile.json mpd.proto=none --flash=vm --reset=evk42

mpd.mcast_rx=0 wifi.arp_grat_period=10 wifi.max_idle_period=0

wifi.listen_interval=10 krn.gpio=--K wifi.keep_alive_wake_time=2

mpd.regdomain=FCC mpd.suspend=1

$App:git-dc89330

SDK Ver: SDK_2.4alpha

T2 Multipurpose Demp App Version 0.12

SSID 'ACT102571068294'

Suspend Enabled.

Multicast reception Disabled.

Regdomain=FCC

addr e0:69:3a:00:2c:3e

Applying reg domain: 1-11@20

Trying Primary SSID=ACT102571068294

.[10.341,021] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssi:-60 dBm

.WCM_NOTIFY_MSG_LINK_UP

.WCM_NOTIFY_MSG_ADDRESS

[12.120,775] MYIP 192.168.0.102

[12.120,937] IPv6 [fe80::e269:3aff:fe00:2c3e]-link

WiFi Connection Success. SSID=ACT102571068294

Listen interval=10

Traffic Timeout=12

pm_flags=0x0

WiFi Connection success. proceeding to app..

Timeout not specified.!
```

User Guide for Talaria TWO Demo Tool



Application Exited..

Going for indefinite sleep...

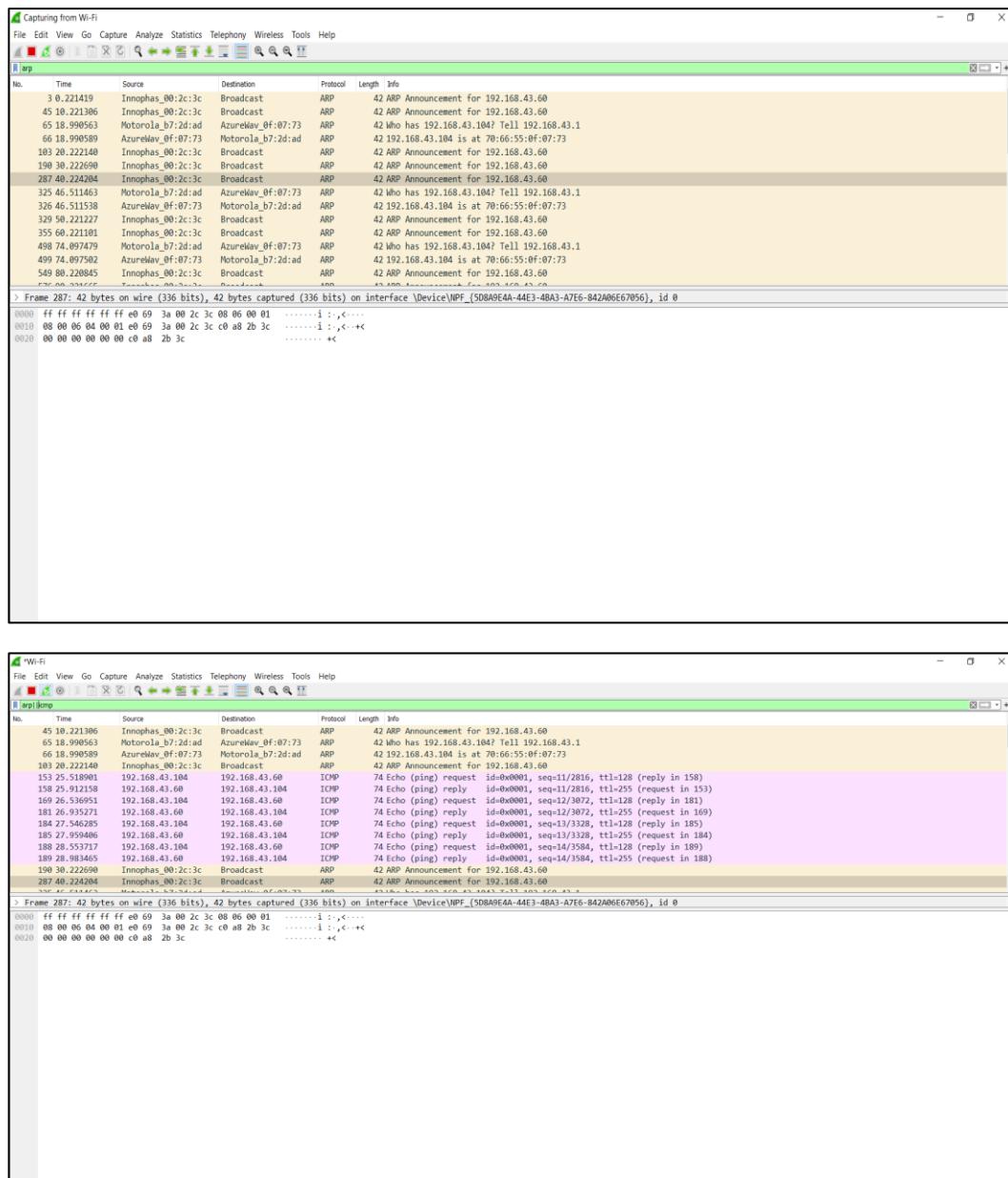


Figure 21: Multicast Reception OFF GRAT ARP ON - Wireshark and CMD Output

CMD output:

```
C:\WINDOWS\system32>ping 192.168.0.104

Pinging 192.168.0.104 with 32 bytes of data:
Reply from 192.168.0.104: bytes=32 time=2106ms TTL=255
Request timed out.

Reply from 192.168.0.104: bytes=32 time=841ms TTL=255
Reply from 192.168.0.104: bytes=32 time=380ms TTL=255

Ping statistics for 192.168.0.104:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 380ms, Maximum = 2106ms, Average = 1109ms
```

Expected Result: Talaria TWO connects to the AP. When the PC tries to ping, ARP does not pass as the mcast rx at Talaria TWO is turned off. However, Talaria TWO keeps sending the GRAT ARPs at configured interval. Laptop receives the GRAT ARP and the ARP table at the laptop gets updated, and the ping is executed.

9 iPerf3

You can download the iperf.exe application from the following link: <https://iperf.fr/iperf-download.php>

1. Enter your SSID and passphrase.
2. To automatically load the signed firmware image for iPerf3 application, select the iPerf3 tab as shown in Figure 22.
3. Recommended to click on PROG Flash & Start Test to start Talaria TWO as a Server.

Note:

- In case the PROG Ram & Start Test option does not load the application, click on PROG Flash & Start Test.
- Work around for the above limitation is to click Reset before clicking on PROG Ram & Start Test again.
- Work around for error with CLEAR Flash option: Click Reset before clicking on CLEAR Flash again.

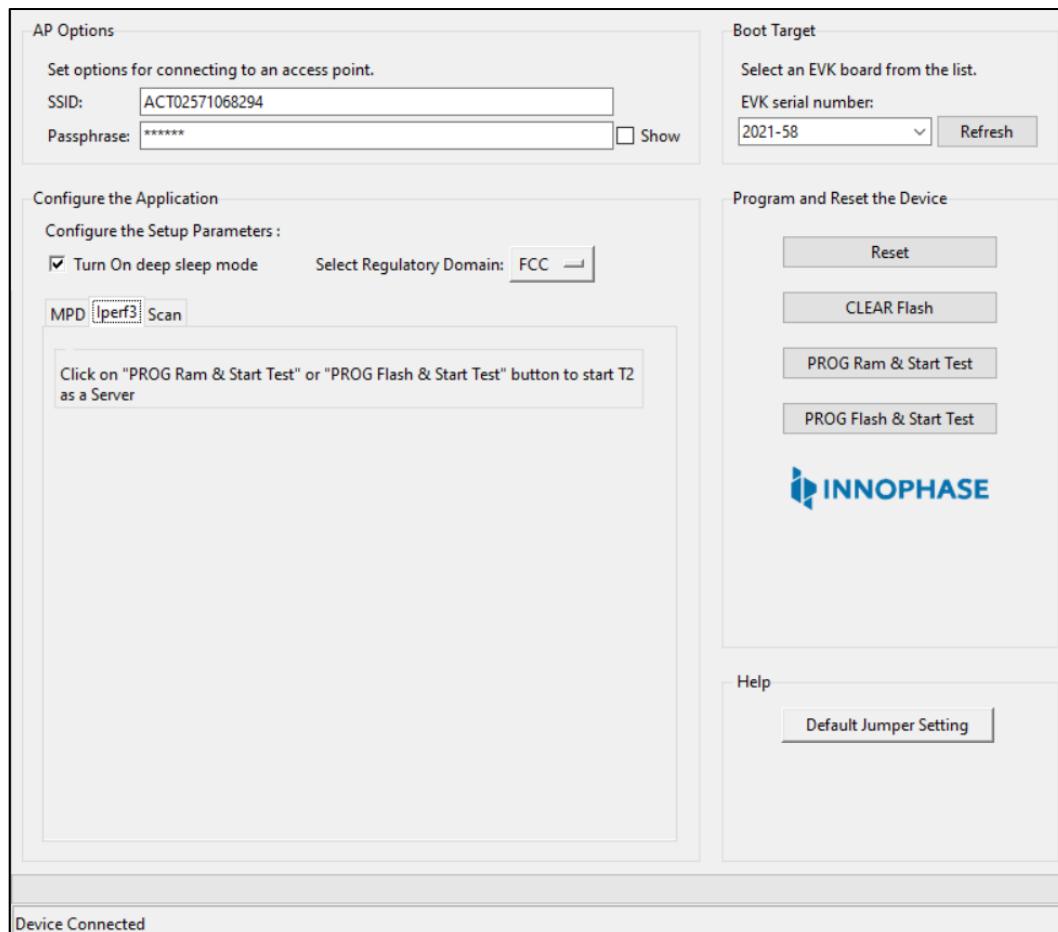


Figure 22: Selecting iPerf3

Following sections provide information on the different modes in which the iPerf3 application can be used along with their respective outputs.

9.1 TCP Throughput Test

Console output:

```
UART:NWWWWWAAEBuild $Id: git-f92bee540 $

ssid=ACT102571068294 passphrase=43083191 np_conf_path=/sys/nprofile.json
krn gpio=--K suspend=1
addr e0:69:3a:00:2c:3e

[10.573,053] CONNECT:00:5f:67:cd:c5:a6 Channel:6 rssl:-60 dBm
[11.423,832] MYIP 192.168.0.102
[11.423,880] IPv6 [fe80::e269:3aff:fe00:2c3e]-link
iperf3 server @ 192.168.0.102
-----
Iperf3 TCP/UDP server listening on 5201
-----
Accepted connection from 192.168.0.103 port 1032
[ 1] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 1033
-----
[ ID] Interval Transfer Bitrate
[ 1] iperf3[S-RX-tcp]: 0.0-10 sec 6.5 MBytes 5.4 Mbits/sec
User: 2213434 (21%)
IRQ: 250215 (2%)
Idle: 7598946 (75%)
-----
Iperf3 TCP/UDP server listening on 5201
-----
```

CMD output:

```
C:\Users\InnoP\Downloads\iperf-3.1.3-win64 (1)\iperf-3.1.3-win64>iperf3.exe  
-c 192.168.0.102  
  
Connecting to host 192.168.0.102, port 5201  
  
[ 4] local 192.168.0.103 port 1033 connected to 192.168.0.102 port 5201  
  
[ ID] Interval Transfer Bandwidth  
[ 4] 0.00-1.00 sec 1.12 MBytes 9.44 Mbits/sec  
[ 4] 1.00-2.00 sec 640 KBytes 5.24 Mbits/sec  
[ 4] 2.00-3.00 sec 512 KBytes 4.19 Mbits/sec  
[ 4] 3.00-4.00 sec 640 KBytes 5.23 Mbits/sec  
[ 4] 4.00-5.00 sec 512 KBytes 4.20 Mbits/sec  
[ 4] 5.00-6.00 sec 640 KBytes 5.24 Mbits/sec  
[ 4] 6.00-7.00 sec 512 KBytes 4.20 Mbits/sec  
[ 4] 7.00-8.00 sec 1.00 MBytes 8.39 Mbits/sec  
[ 4] 8.00-9.00 sec 896 KBytes 7.33 Mbits/sec  
[ 4] 9.00-10.00 sec 256 KBytes 2.10 Mbits/sec  
  
- - - - -  
  
[ ID] Interval Transfer Bandwidth  
[ 4] 0.00-10.00 sec 6.62 MBytes 5.56 Mbits/sec sender  
[ 4] 0.00-10.00 sec 6.54 MBytes 5.49 Mbits/sec  
  
receiver  
  
iperf Done.
```

9.2 UDP Throughput Test

Console output:

```
-----  
Iperf3 TCP/UDP server listening on 5201  
-----  
Accepted connection from 192.168.0.103 port 25882  
[ 1] local 192.168.0.102 port 20756 connected to 192.168.0.103 port 56797  
-----  
[ ID] Interval Transfer Bitrate  
[ 1] iperf3[S-RX-udp]: 0.0-10 sec 1.2 MBytes 1.0 Mbits/sec  
User: 295954 (2%)  
IRQ: 40554 (0%)  
Idle: 9693097 (96%)
```

CMD output:

```
C:\Users\InnoP\Downloads\iperf-3.1.3-win64 (1)\iperf-3.1.3-win64>iperf3.exe  
-c 192.168.0.102 -u  
Connecting to host 192.168.0.102, port 5201  
[ 4] local 192.168.0.103 port 56797 connected to 192.168.0.102 port 5201  
[ ID] Interval Transfer Bandwidth Total Datagrams  
[ 4] 0.00-1.00 sec 136 KBytes 1.11 Mbits/sec 17  
[ 4] 1.00-2.00 sec 128 KBytes 1.05 Mbits/sec 16  
[ 4] 2.00-3.00 sec 128 KBytes 1.05 Mbits/sec 16  
[ 4] 3.00-4.00 sec 128 KBytes 1.05 Mbits/sec 16  
[ 4] 4.00-5.00 sec 136 KBytes 1.11 Mbits/sec 17  
[ 4] 5.00-6.00 sec 136 KBytes 1.12 Mbits/sec 17  
[ 4] 6.00-7.00 sec 120 KBytes 982 Kbits/sec 15  
[ 4] 7.00-8.00 sec 128 KBytes 1.05 Mbits/sec 16
```

```
[ 4] 8.00-9.00 sec 128 KBytes 1.05 Mbits/sec 16
[ 4] 9.00-10.00 sec 128 KBytes 1.05 Mbits/sec 16
-
[ ID] Interval Transfer Bandwidth Jitter Lost/Total
Datagrams
[ 4] 0.00-10.00 sec 1.27 MBytes 1.06 Mbits/sec 0.000 ms 3/162 (1.9%)
[ 4] Sent 162 datagrams

iperf Done.
```

9.3 Bidirectional Test/Reverse Mode

Console output:

```
Accepted connection from 192.168.0.103 port 1030

[ 1] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 1031
-----
[ ID] Interval Transfer Bitrate
[ 1] iperf3[S-TX-tcp]: 0.0-10 sec 10.6 MBytes 8.9 Mbits/sec
User: 2870392 (28%)
IRQ: 263801 (2%)
Idle: 6947091 (68%)
-----
Iperf3 TCP/UDP server listening on 5201
-----
```

```
C:\Users\InnoP\Downloads\iperf-3.1.3-win64 (1)\iperf-3.1.3-win64>iperf3.exe -c 192.168.0.102 -R
Connecting to host 192.168.0.102, port 5201
Reverse mode, remote host 192.168.0.102 is sending
[ 4] local 192.168.0.103 port 1031 connected to 192.168.0.102 port 5201
[ ID] Interval Transfer Bandwidth
[ 4] 0.00-1.00 sec 1.58 MBytes 13.3 Mbits/sec
[ 4] 1.00-2.00 sec 1.16 MBytes 9.74 Mbits/sec
[ 4] 2.00-3.00 sec 1.33 MBytes 11.1 Mbits/sec
[ 4] 3.00-4.00 sec 845 KBytes 6.93 Mbits/sec
[ 4] 4.00-5.00 sec 622 KBytes 5.09 Mbits/sec
[ 4] 5.00-6.00 sec 231 KBytes 1.89 Mbits/sec
[ 4] 6.00-7.00 sec 1.27 MBytes 10.7 Mbits/sec
[ 4] 7.00-8.00 sec 1.38 MBytes 11.6 Mbits/sec
```

```
[ 4] 8.00-9.00 sec 1.12 MBytes 9.40 Mbits/sec
[ 4] 9.00-10.00 sec 1.11 MBytes 9.27 Mbits/sec
-
[ ID] Interval Transfer Bandwidth Retr
[ 4] 0.00-10.00 sec 10.7 MBytes 8.95 Mbits/sec 0 sender
[ 4] 0.00-10.00 sec 10.7 MBytes 8.95 Mbits/sec receiver

iperf Done.
```

9.4 Specific Duration Test

In the specific duration test, `-t 10` implies that the test will run for a duration of 10 seconds.

Console output:

```
-----  
Iperf3 TCP/UDP server listening on 5201  
-----  
Accepted connection from 192.168.0.103 port 1031  
[ 1] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 1038  
-----  
[ ID] Interval Transfer Bitrate  
[ 1] iperf3[S-RX-tcp]: 0.0-10 sec 14.1 MBytes 11.9 Mbits/sec  
User: 4577471 (45%)  
IRQ: 539771 (5%)  
Idle: 4903631 (48%)
```

CMD output:

```
C:\Users\InnoP\Downloads\iperf-3.1.3-win64 (1)\iperf-3.1.3-win64>iperf3.exe  
-c 192.168.0.102 -t 10  
Connecting to host 192.168.0.102, port 5201  
[ 4] local 192.168.0.103 port 1038 connected to 192.168.0.102 port 5201  
[ ID] Interval Transfer Bandwidth  
[ 4] 0.00-1.00 sec 768 KBytes 6.28 Mbits/sec  
[ 4] 1.00-2.00 sec 896 KBytes 7.35 Mbits/sec  
[ 4] 2.00-3.00 sec 1.50 MBytes 12.6 Mbits/sec  
[ 4] 3.00-4.00 sec 1.62 MBytes 13.6 Mbits/sec  
[ 4] 4.00-5.00 sec 1.50 MBytes 12.6 Mbits/sec  
[ 4] 5.00-6.00 sec 1.62 MBytes 13.6 Mbits/sec  
[ 4] 6.00-7.00 sec 1.50 MBytes 12.6 Mbits/sec
```

```
[ 4] 7.00-8.00 sec 1.62 MBytes 13.6 Mbits/sec
[ 4] 8.00-9.00 sec 1.62 MBytes 13.7 Mbits/sec
[ 4] 9.00-10.00 sec 1.75 MBytes 14.7 Mbits/sec
- - - - -
[ ID] Interval Transfer Bandwidth
[ 4] 0.00-10.00 sec 14.4 MBytes 12.1 Mbits/sec sender
[ 4] 0.00-10.00 sec 14.2 MBytes 11.9 Mbits/sec
receiver

iperf Done.
```

9.5 Specific Data Rate Test

In the specific data rate test, `-b 500k` implies a data rate of 500kbps.

Console output:

```
-----
Iperf3 TCP/UDP server listening on 5201
-----
Accepted connection from 192.168.0.103 port 1030
[ 1] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 1032
-----
[ ID]           Interval         Transfer       Bitrate
[ 1] iperf3[S-RX-tcp]: 0.0-10 sec 6.7 MBytes 5.6 Mbits/sec
User: 2311297 (22%)
IRQ: 259311 (2%)
Idle: 7605124 (74%)
```

CMD output:

```
C:\Users\InnoP\Downloads\iperf-3.1.3-win64 (1)\iperf-3.1.3-win64>iperf3.exe
-c 192.168.0.102 -b 500k
Connecting to host 192.168.0.102, port 5201
[ 4] local 192.168.0.103 port 1032 connected to 192.168.0.102 port 5201
[ ID] Interval         Transfer       Bandwidth
[ 4] 0.00-1.00   sec    256 KBytes  2.09 Mbits/sec
[ 4] 1.00-2.00   sec    512 KBytes  4.20 Mbits/sec
[ 4] 2.00-3.00   sec    640 KBytes  5.24 Mbits/sec
[ 4] 3.00-4.00   sec    256 KBytes  2.10 Mbits/sec
[ 4] 4.00-5.00   sec    256 KBytes  2.10 Mbits/sec
[ 4] 5.00-6.00   sec    768 KBytes  6.29 Mbits/sec
[ 4] 6.00-7.00   sec   1.12 MBytes  9.44 Mbits/sec
```

```
[ 4] 7.00-8.00 sec 896 KBytes 7.34 Mbits/sec
[ 4] 8.00-9.00 sec 1.25 MBytes 10.5 Mbits/sec
[ 4] 9.00-10.00 sec 1.00 MBytes 8.40 Mbits/sec
- - - - -
[ ID] Interval Transfer Bandwidth
[ 4] 0.00-10.00 sec 6.88 MBytes 5.77 Mbits/sec sender
[ 4] 0.00-10.00 sec 6.73 MBytes 5.65 Mbits/sec
receiver

iperf Done.
```

9.6 Specific Transfer Size Test

In the specific transfer size test, `-n 5M` implies 5 megabytes are transferred.

Console output:

```
-----  
Iperf3 TCP/UDP server listening on 5201  
-----  
Accepted connection from 192.168.0.103 port 19498  
[ 1] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 19500  
-----  
[ ID] Interval Transfer Bitrate  
[ 1] iperf3[S-RX-tcp]: 0.0-5 sec 4.8 MBytes 8.0 Mbits/sec  
User: 1613392 (27%)  
IRQ: 184124 (3%)  
Idle: 3997107 (68%)
```

CMD output:

```
C:\Users\InnoP\Downloads\iperf-3.1.3-win64 (1)\iperf-3.1.3-win64>iperf3.exe  
-c 192.168.0.102 -n 5M  
Connecting to host 192.168.0.102, port 5201  
[ 4] local 192.168.0.103 port 19500 connected to 192.168.0.102 port 5201  
[ ID] Interval Transfer Bandwidth  
[ 4] 0.00-1.00 sec 512 KBytes 4.19 Mbits/sec  
[ 4] 1.00-2.00 sec 512 KBytes 4.19 Mbits/sec  
[ 4] 2.00-3.00 sec 768 KBytes 6.28 Mbits/sec  
[ 4] 3.00-4.00 sec 1.25 MBytes 10.5 Mbits/sec  
[ 4] 4.00-5.00 sec 1.12 MBytes 9.44 Mbits/sec  
[ 4] 5.00-5.74 sec 896 KBytes 10.0 Mbits/sec  
-----
```

```
[ ID] Interval           Transfer     Bandwidth
[  4]  0.00-5.74    sec   5.00 MBytes   7.31 Mbits/sec
[  4]  0.00-5.74    sec   4.81 MBytes   7.04 Mbits/sec
receiver
iperf Done.
```

9.7 Multiple Stream Test

In multiple stream test, -P 3 implies 3 simultaneous streams.

Console output:

```
-----
Iperf3 TCP/UDP server listening on 5201
-----
Accepted connection from 192.168.0.103 port 1043
[ 1] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 1044
[ 3] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 1045
[ 4] local 192.168.0.102 port 5201 connected to 192.168.0.103 port 1046
-----
[ ID] Interval Transfer Bitrate
[ 1] iperf3[S-RX-tcp]: 0.0-10 sec 3.1 MBytes 2.6 Mbits/sec
[ 3] iperf3[S-RX-tcp]: 0.0-10 sec 2.2 MBytes 1.8 Mbits/sec
[ 4] iperf3[S-RX-tcp]: 0.0-10 sec 3.7 MBytes 3.1 Mbits/sec
User: 3038692 (29%)
IRQ: 342139 (3%)
Idle: 6776685 (66%)
```

CMD output:

```
C:\Users\InnoP\Downloads\iperf-3.1.3-win64 (1)\iperf-3.1.3-win64>iperf3.exe
-c 192.168.0.102 -P 3
Connecting to host 192.168.0.102, port 5201
[ 4] local 192.168.0.103 port 1044 connected to 192.168.0.102 port 5201
[ 6] local 192.168.0.103 port 1045 connected to 192.168.0.102 port 5201
[ 8] local 192.168.0.103 port 1046 connected to 192.168.0.102 port 5201
[ ID] Interval Transfer Bandwidth
[ 4] 0.00-1.00 sec 640 KBytes 5.24 Mbits/sec
```

[6]	0.00-1.00	sec	256 KBytes	2.10 Mbits/sec
[8]	0.00-1.00	sec	640 KBytes	5.24 Mbits/sec
[SUM]	0.00-1.00	sec	1.50 MBytes	12.6 Mbits/sec
<hr/>				
[4]	1.00-2.00	sec	512 KBytes	4.19 Mbits/sec
[6]	1.00-2.00	sec	128 KBytes	1.05 Mbits/sec
[8]	1.00-2.00	sec	512 KBytes	4.19 Mbits/sec
[SUM]	1.00-2.00	sec	1.12 MBytes	9.43 Mbits/sec
<hr/>				
[4]	2.00-3.00	sec	384 KBytes	3.15 Mbits/sec
[6]	2.00-3.00	sec	128 KBytes	1.05 Mbits/sec
[8]	2.00-3.00	sec	384 KBytes	3.15 Mbits/sec
[SUM]	2.00-3.00	sec	896 KBytes	7.34 Mbits/sec
<hr/>				
[4]	3.00-4.00	sec	384 KBytes	3.14 Mbits/sec
[6]	3.00-4.00	sec	128 KBytes	1.05 Mbits/sec
[8]	3.00-4.00	sec	384 KBytes	3.14 Mbits/sec
[SUM]	3.00-4.00	sec	896 KBytes	7.34 Mbits/sec
<hr/>				
[4]	4.00-5.00	sec	256 KBytes	2.10 Mbits/sec
[6]	4.00-5.00	sec	128 KBytes	1.05 Mbits/sec
[8]	4.00-5.00	sec	256 KBytes	2.10 Mbits/sec
[SUM]	4.00-5.00	sec	640 KBytes	5.25 Mbits/sec
<hr/>				
[4]	5.00-6.00	sec	256 KBytes	2.09 Mbits/sec
[6]	5.00-6.00	sec	256 KBytes	2.09 Mbits/sec
[8]	5.00-6.00	sec	256 KBytes	2.09 Mbits/sec
[SUM]	5.00-6.00	sec	768 KBytes	6.28 Mbits/sec

[]	Interval	Transfer	Bandwidth	
[4]	0.00-10.00	sec	3.25 MBytes	2.73 Mbits/sec
[4]	0.00-10.00	sec	3.11 MBytes	2.61 Mbits/sec
receiver				
[6]	0.00-10.00	sec	2.38 MBytes	1.99 Mbits/sec
[6]	0.00-10.00	sec	2.21 MBytes	1.85 Mbits/sec
receiver				
[4]	6.00-7.00	sec	128 KBytes	1.05 Mbits/sec
[6]	6.00-7.00	sec	256 KBytes	2.10 Mbits/sec
[8]	6.00-7.00	sec	384 KBytes	3.15 Mbits/sec
[SUM]	6.00-7.00	sec	768 KBytes	6.30 Mbits/sec
[4]	7.00-8.00	sec	128 KBytes	1.05 Mbits/sec
[6]	7.00-8.00	sec	256 KBytes	2.10 Mbits/sec
[8]	7.00-8.00	sec	256 KBytes	2.10 Mbits/sec
[SUM]	7.00-8.00	sec	640 KBytes	5.24 Mbits/sec
[4]	8.00-9.00	sec	256 KBytes	2.10 Mbits/sec
[6]	8.00-9.00	sec	384 KBytes	3.15 Mbits/sec
[8]	8.00-9.00	sec	512 KBytes	4.20 Mbits/sec
[SUM]	8.00-9.00	sec	1.12 MBytes	9.44 Mbits/sec
[4]	9.00-10.00	sec	384 KBytes	3.15 Mbits/sec
[6]	9.00-10.00	sec	512 KBytes	4.19 Mbits/sec
[8]	9.00-10.00	sec	384 KBytes	3.15 Mbits/sec
[SUM]	9.00-10.00	sec	1.25 MBytes	10.5 Mbits/sec

```
[ 8] 0.00-10.00 sec 3.88 MBytes 3.25 Mbits/sec sender
[ 8] 0.00-10.00 sec 3.77 MBytes 3.16 Mbits/sec
receiver
[SUM] 0.00-10.00 sec 9.50 MBytes 7.97 Mbits/sec sender
[SUM] 0.00-10.00 sec 9.09 MBytes 7.63 Mbits/sec
receiver
iperf Done.
```

10 Scan

The Scan tab allows the user to actively scan for nearby access points.

The MPD tool Scan tab allows the user to perform Wi-Fi scan by specifying No_of_Probes, Idle_Slots, Min_Listen_Time(ms), Max_Listen_Time(ms), Wait_time(ms), Scan Interval(s). User can set the Probe Rate and select Required Channels as per requirement.

Further, providing the SSID and BSSID will enable scan for a specific access point.

User can choose Standard Wi-Fi sczn or Low-Power Wi-Fi scan scheme for Scanning. Parameters Nap_Enable and Interval(s) are corresponding the Low Power scheme, disabled during Standard scheme and enabled during Low Power scheme.

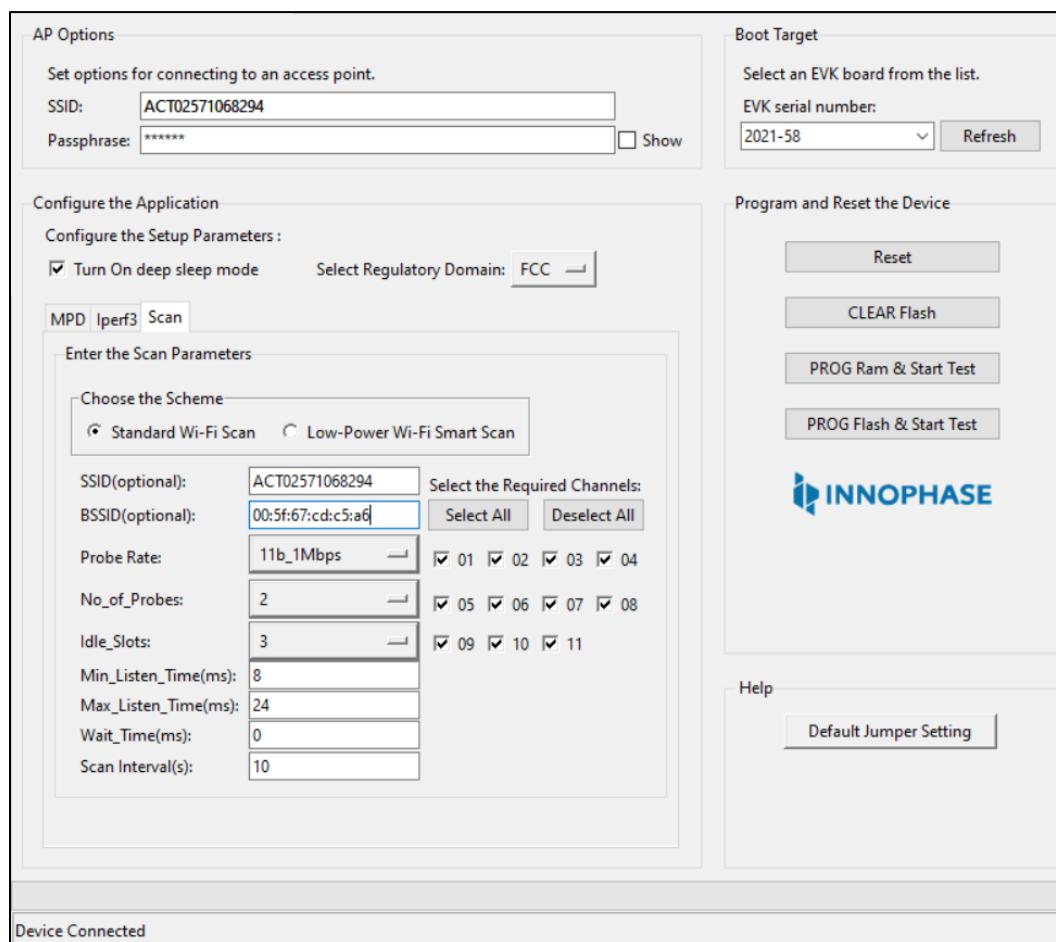


Figure 23: Scanning for access points

Default values of parameters for Standard Wi-Fi and Low-Power Wi-Fi Scan are shown in Table 2. Depending on the user's choice of scanning scheme, respective default values will be set to corresponding parameters.

Default Value			
Parameters	Standard Wi-Fi scan	Low-Power Wi-Fi Scan	Remark
No_of_Probes	2	1	Configurable
Idle_Slots	3	3	Configurable
Select the Required Probe Rate	11b_1Mbps	11b_6Mbps	Configurable
NAP Enable	No	Yes	Hard coded

Table 2: Default values for Standard Wi-Fi and Low-Power Wi-Fi Scan

Console output for Standard Scheme:

```

UART:NWWWWWAE4 DWT comparators, range 0x8000

Build $Id: git-b0887ef06 $

mpd.proto=scan wifi.scan_num_probes=2 wifi.scan_idleslots=3

wifi.scan_min_listen_time=8 wifi.scan_max_listen_time=24 wifi.scan_wait_time=0

wifi.probe_rate=0x00 wifi.scan_channel_mask=0x7ff mpd.regdomain=FCC mpd.suspend=1

$App:git-3f9b8a0

SDK Ver: SDK_2.4alpha

T2 Multipurpose Demp App Version 0.12

Suspend Enabled.

Regdomain=FCC

addr e0:69:3a:00:06:34

Applying reg domain: 1-11@20

MPD scan mode.

channel_mask=0x7ff

Found 1 nets:

cc:61:e5:b9:96:4d on channel 1 @ -70 'Moto_G' 'WPA2-PSK+PMF'

scan completed

-----
Going for indefinite sleep...

```

Expected Result: Depending on the Scan specifications, available networks are identified and displayed.

Console output for Low Power Scheme with NAP Enabled:

```
UART:NWWWWWAE4 DWT comparators, range 0x8000

Build $Id: git-b0887ef06 $

mpd.proto=lpscan wifi.scan_num_probes=2 wifi.scan_idleslots=3

wifi.scan_min_listen_time=8 wifi.scan_max_listen_time=24 wifi.nap_scan=1

mpd.ap_logging=1 mpd.dt_iterations=10 wifi.probe_rate=0x00

wifi.scan_channel_mask=0x7ff mpd.regdomain=FCC mpd.suspend=1

$App:git-3f9b8a0

SDK Ver: SDK_2.4alpha

T2 Multipurpose Demp App Version 0.12

Suspend Enabled.

Multicast reception Disabled.

Regdomain=FCC

addr e0:69:3a:00:06:34

Applying reg domain: 1-11@20

MPD lpscan mode.

[0.395,971] Round:1 Found 13 nets:

-----
[0.396,767] 8e:d7:33:e1:0b:3e on channel 1 @ -46 'TPGuest_886N' 'WPA-PSK/WPA2-
PSK Mixed Mode'

[0.396,912] fc:d7:33:e1:0b:3e on channel 1 @ -47 'TP-LINK_WR886N' 'WPA-PSK/WPA2-
PSK Mixed Mode'

[0.397,061] 50:c7:bf:a3:86:4f on channel 1 @ -48 'TP-LINK_864' 'WPA-PSK/WPA2-
PSK+PMF Mixed Mode'

[0.397,210] 56:c7:bf:a3:86:40 on channel 1 @ -48 'TP-LINK_Guest_864F' 'WPA-
PSK/WPA2-PSK+PMF Mixed Mode'
```

```
[0.397,358] 50:c7:bf:f4:22:c2 on channel 9 @ -64 'rooftop' 'WPA2-PSK/WPA3-SAE
Mixed Mode'

[0.397,503] 50:c7:bf:e2:5e:b1 on channel 9 @ -67 'rooftop' 'WPA2-PSK/WPA3-SAE
Mixed Mode'

[0.397,619] f0:72:ea:97:e9:a2 on channel 6 @ -68 'RaniNestHome' 'WPA2-PSK+PMF'

[0.397,732] b0:e4:d5:15:cb:52 on channel 6 @ -69 'RaniNestHome' 'WPA2-PSK+PMF'

[0.397,845] f0:72:ea:57:b1:1a on channel 6 @ -76 'RaniNestHome' 'WPA2-PSK+PMF'

[0.397,960] 2c:30:33:d5:72:a0 on channel 2 @ -78 'Elongated Muskrat' 'WPA2-
PSK+PMF'

[0.398,077] f4:17:b8:a3:be:c9 on channel 1 @ -83 'ATT2VED5x8-5.0' 'WPA2-PSK+PMF'

[0.398,266] 50:c7:bf:f4:41:d0 on channel 9 @ -84 'rooftop' 'WPA2-PSK/WPA3-SAE
Mixed Mode'

[0.398,382] f8:2c:18:38:14:b3 on channel 1 @ -87 '' 'WPA2-PSK+PMF'

[10.392,951] Round:2 Found 11 nets:
-----
[10.393,065] fc:d7:33:e1:0b:3e on channel 1 @ -45 'TP-LINK_WR886N' 'WPA-
PSK/WPA2-PSK Mixed Mode'

[10.393,210] 8e:d7:33:e1:0b:3e on channel 1 @ -45 'TPGuest_886N' 'WPA-PSK/WPA2-
PSK Mixed Mode'

[10.393,360] 50:c7:bf:a3:86:4f on channel 1 @ -48 'TP-LINK_864' 'WPA-PSK/WPA2-
PSK+PMF Mixed Mode'

[10.393,510] 56:c7:bf:a3:86:40 on channel 1 @ -52 'TP-LINK_Guest_864F' 'WPA-
PSK/WPA2-PSK+PMF Mixed Mode'

[10.393,659] 50:c7:bf:f4:22:c2 on channel 9 @ -64 'rooftop' 'WPA2-PSK/WPA3-SAE
Mixed Mode'

[10.393,778] 56:c7:bf:f4:22:c2 on channel 9 @ -66 '' 'WPA2-PSK'

[10.393,915] 50:c7:bf:e2:5e:b1 on channel 9 @ -71 'rooftop' 'WPA2-PSK/WPA3-SAE
Mixed Mode'
```

```
[10.394,032] 0a:a6:bc:8c:b4:e5 on channel 9 @ -71 '' 'WPA2-PSK+PMF'  
[10.394,143] 2c:30:33:d5:72:a0 on channel 2 @ -79 'Elongated Muskrat' 'WPA2-  
PSK+PMF'  
[10.394,258] cc:f4:11:6f:20:38 on channel 11 @ -80 'RaniNestHome' 'WPA2-PSK+PMF'  
[10.394,374] 56:c7:bf:f4:41:d0 on channel 9 @ -82 '' 'WPA2-PSK'
```

Console output for Low Power Scheme with NAP not Enabled:

```
UART:NWWWAE

Build $Base: git-7c26d8efa $

hio.baudrate=115200

uuid: 45303830-3528-7512-ffff-ffffffffffff

flash: Gordon ready!

UART:NWWWWWWAE4 DWT comparators, range 0x8000

Build $Id: git-b0887ef06 $

mpd.proto=lpscan wifi.scan_num_probes=2 wifi.scan_idleslots=3

wifi.scan_min_listen_time=8 wifi.scan_max_listen_time=24 wifi.nap_scan=0

mpd.ap_logging=1 mpd.dt_iterations=10 wifi.probe_rate=0x00

wifi.scan_channel_mask=0x7ff mpd.regdomain=FCC mpd.suspend=1

$App:git-3f9b8a0

SDK Ver: SDK_2.4alpha

T2 Multipurpose Demp App Version 0.12

Suspend Enabled.

Multicast reception Disabled.

Regdomain=FCC

addr e0:69:3a:00:06:34

Applying reg domain: 1-11@20

MPD lpscan mode.

[0.417,532] Round:1 Found 9 nets:

-----
[0.418,327] fc:d7:33:e1:0b:3e on channel 1 @ -47 'TP-LINK_WR886N' 'WPA-PSK/WPA2-
PSK Mixed Mode'

[0.418,472] 8e:d7:33:e1:0b:3e on channel 1 @ -47 'TPGuest_886N' 'WPA-PSK/WPA2-
PSK Mixed Mode'
```

```
[0.418,621] 50:c7:bf:a3:86:4f on channel 1 @ -48 'TP-LINK_864' 'WPA-PSK/WPA2-  
PSK+PMF Mixed Mode'  
  
[0.418,769] 56:c7:bf:a3:86:40 on channel 1 @ -48 'TP-LINK_Guest_864F' 'WPA-  
PSK/WPA2-PSK+PMF Mixed Mode'  
  
[0.418,918] 50:c7:bf:f4:22:c2 on channel 9 @ -66 'rooftop' 'WPA2-PSK/WPA3-SAE  
Mixed Mode'  
  
[0.419,034] f0:72:ea:97:e9:a2 on channel 6 @ -69 'RaniNestHome' 'WPA2-PSK+PMF'  
  
[0.419,176] 50:c7:bf:e2:5e:b1 on channel 9 @ -72 'rooftop' 'WPA2-PSK/WPA3-SAE  
Mixed Mode'  
  
[0.419,292] e0:22:04:83:72:a7 on channel 11 @ -81 '' 'WPA2-PSK+PMF'  
  
[0.419,402] e0:22:04:83:72:a5 on channel 11 @ -83 'Elongated Muskrat' 'WPA2-  
PSK+PMF'  
  
[10.434,620] Round:2 Found 14 nets:  
-----  
  
[10.434,735] fc:d7:33:e1:0b:3e on channel 1 @ -44 'TP-LINK_WR886N' 'WPA-  
PSK/WPA2-PSK Mixed Mode'  
  
[10.434,881] 8e:d7:33:e1:0b:3e on channel 1 @ -44 'TPGuest_886N' 'WPA-PSK/WPA2-  
PSK Mixed Mode'  
  
[10.435,030] 50:c7:bf:a3:86:4f on channel 1 @ -45 'TP-LINK_864' 'WPA-PSK/WPA2-  
PSK+PMF Mixed Mode'  
  
[10.435,180] 56:c7:bf:a3:86:40 on channel 1 @ -46 'TP-LINK_Guest_864F' 'WPA-  
PSK/WPA2-PSK+PMF Mixed Mode'  
  
[10.435,329] 50:c7:bf:f4:22:c2 on channel 9 @ -64 'rooftop' 'WPA2-PSK/WPA3-SAE  
Mixed Mode'  
  
[10.435,446] f0:72:ea:97:e9:a2 on channel 6 @ -68 'RaniNestHome' 'WPA2-PSK+PMF'  
  
[10.435,560] b0:e4:d5:15:cb:52 on channel 6 @ -70 'RaniNestHome' 'WPA2-PSK+PMF'  
  
[10.435,673] f0:72:ea:57:b1:1a on channel 6 @ -73 'RaniNestHome' 'WPA2-PSK+PMF'
```

```
[10.435,790] f4:17:b8:a3:be:c9 on channel 1 @ -76 'ATT2VED5x8-5.0' 'WPA2-  
PSK+PMF'  
  
[10.435,933] 50:c7:bf:e2:5e:b1 on channel 9 @ -77 'rooftop' 'WPA2-PSK/WPA3-SAE  
Mixed Mode'  
  
[10.436,051] 08:02:8e:cc:52:ab on channel 1 @ -78 'NETGEAR00' 'WPA2-PSK'  
  
[10.436,164] 24:05:88:1e:74:c0 on channel 6 @ -80 'LazarusPit' 'WPA2-PSK+PMF'  
  
[10.436,277] 26:05:88:1e:74:c0 on channel 6 @ -80 'LazarusPit-Guest' 'WPA2-  
PSK+PMF'  
  
[10.436,394] 2c:30:33:d5:72:a0 on channel 2 @ -81 'Elongated Muskrat' 'WPA2-  
PSK+PMF'
```

Cases explained in the following sub sections are explained using scan with standard scheme.

10.1 Case 1

The Scan tab allows the user to actively scan for nearby access points by specifying the parameters.

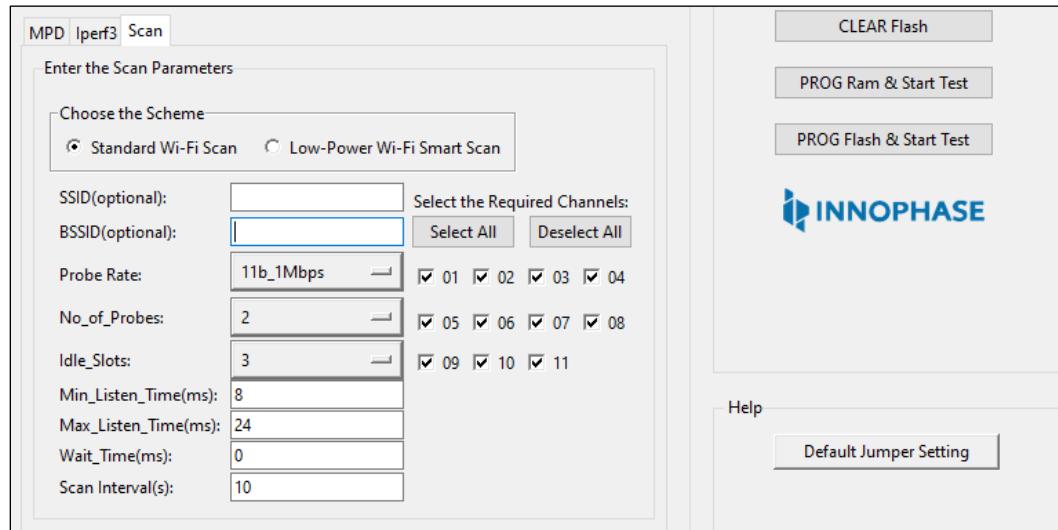


Figure 24: Case 1: Demo Tool GUI

Console output:

```

UART:NWWWAEE
Build $Base: git-7c26d8efa $
hio.baudrate=115200
uuid: 39483937-3207-00af-0057-ffffffffffff
flash: Gordon ready!
UART:NWWWWWWWAEBuild $Id: git-f92bee540 $
mpd.proto=scan wifi.scan_num_probes=2 wifi.scan_idleslots=3
wifi.scan_min_listen_time=8 wifi.scan_max_listen_time=24
wifi.scan_wait_time=0 wifi.probe_rate=0x00 wifi.scan_channel_mask=0x7ff
mpd.regdomain=FCC mpd.suspend=1
$App:git-2f38bc2
SDK Ver: SDK_2.4alpha
T2 Multipurpose Demp App Version 0.12
Suspend Enabled.

```

```
Multicast reception Disabled.

Regdomain=FCC

addr e0:69:3a:00:2c:3e

Applying reg domain: 1-11@20

MPD scan mode.

channel_mask=0x7ff

Found 6 nets:

00:5f:67:cd:c5:a6 on channel 6 @ -26 'ACT102571068294' 'WPA-PSK'

e0:1c:fc:e6:9d:2e on channel 6 @ -62 'Ashwini' 'WPA-PSK/WPA2-PSK Mixed

Mode'

34:e8:94:be:16:9b on channel 11 @ -78 'InfecteD v2.4' 'WPA2-PSK'

18:0f:76:8c:c7:bc on channel 11 @ -80 'Thirumala 06' 'WPA-PSK/WPA2-PSK Mixed

Mode'

7e:1f:d0:03:b4:f8 on channel 4 @ -90 'POCO M2 Pro' 'WPA2-PSK+PMF'

74:da:88:dd:f1:70 on channel 11 @ -92 'Stephen' 'WPA2-PSK'

scan completed

-----
Going for indefinite sleep...
```

10.2 Case 2

Running a test by setting the Channel, Regulatory Domain and Prob_rate.

Where,

1. Regulatory Domain: Depending on the user's geographical location, any one of the listed Regulatory Domains can be selected.
2. Channel_list: Set the Wi-Fi channels to use.

For example: set 1-11, 13 to use channels 1 to 11 and 13, depending on the selected Regulatory Domain.

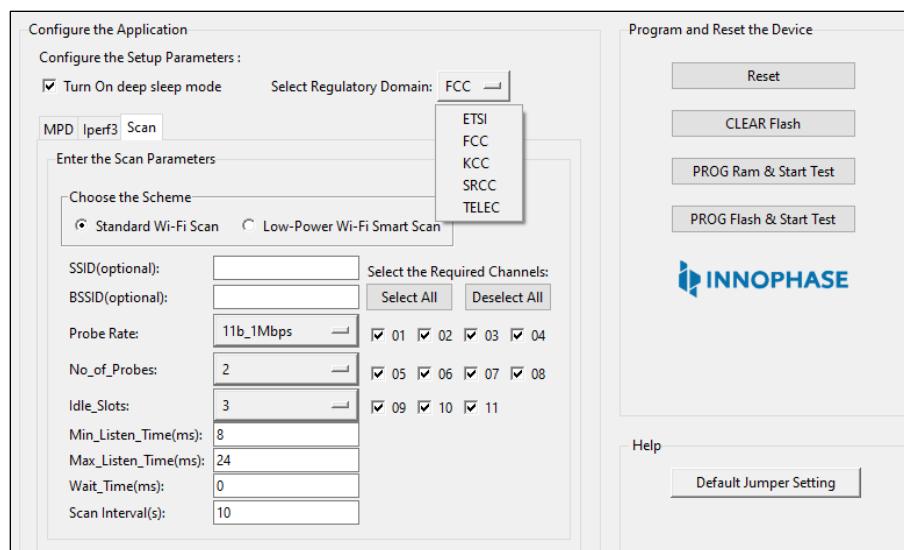


Figure 25: Case 2: Demo Tool GUI

All channels can be selected from Select All tab. Deselect All can be used to deselect all the channels. Channels can also be selected individually using the checkbox as per requirement.

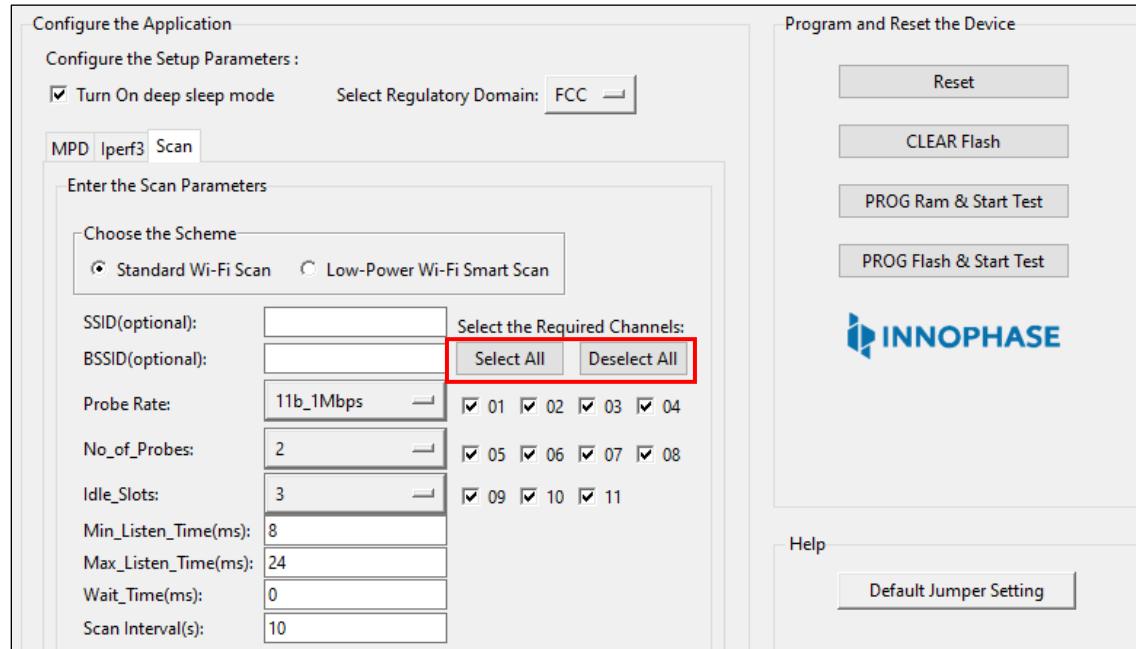


Figure 26: Channel Selection

3. Prob_rate: The rate as defined by `rate_t` is used to transmit the probe request. If this field is set to `0xffff`, no probes will be sent and the scan will only be passive.

Select the `Prob_rate` as per requirement from the drop down.

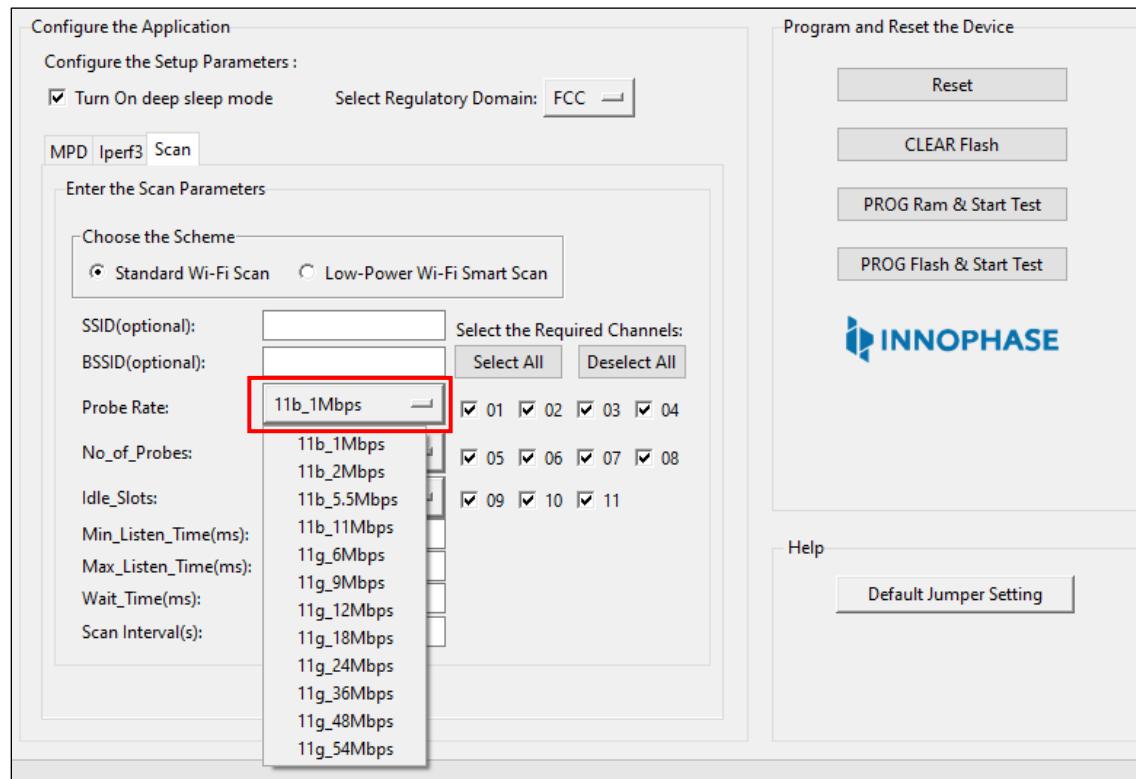


Figure 27: `Prob_rate` selection

Console output:

```
UART:NWWWWWAEBuild $Id: git-f92bee540 $  
  
mpd.proto=scan wifi.scan_num_probes=2 wifi.scan_idleslots=3  
  
wifi.scan_min_listen_time=8 wifi.scan_max_listen_time=24  
  
wifi.scan_wait_time=0 wifi.probe_rate=0x00  
  
wifi.scan_channel_mask=0x7ff mpd.regdomain=FCC mpd.suspend=1  
  
$App:git-2f38bc2  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
Suspend Enabled.
```

```
Multicast reception Disabled.

Regdomain=FCC

addr e0:69:3a:00:2c:3e

Applying reg domain: 1-11@20

MPD scan mode.

channel_mask=0x7ff

Found 6 nets:

00:5f:67:cd:c5:a6 on channel 6 @ -33 'ACT102571068294' 'WPA-PSK'
d8:47:32:2e:e1:e0 on channel 1 @ -79 'GPMH' 'WPA2-PSK'
8e:ff:f2:21:92:72 on channel 7 @ -79 'POCO X3' 'WPA2-PSK+PMF'
34:e8:94:be:16:9b on channel 11 @ -79 'Infected v2.4' 'WPA2-PSK'
7e:1f:d0:03:b4:f8 on channel 4 @ -89 'POCO M2 Pro' 'WPA2-PSK+PMF'
0c:d2:b5:3c:0e:88 on channel 10 @ -90 '3th floor' 'WPA-PSK/WPA2-PSK

Mixed Mode'

scan completed

-----
Going for indefinite sleep...
```

10.3 Case 3

Setting the SSID.

SSID (Service Set Identifier) is the name of the user's wireless network, also known as Network ID. If the SSID of the network is provided and the BSSID field is kept empty, it scans for the network as per the provided SSID and gives the following details:

1. BSSID
2. Channel
3. RSSI Range
4. Mode

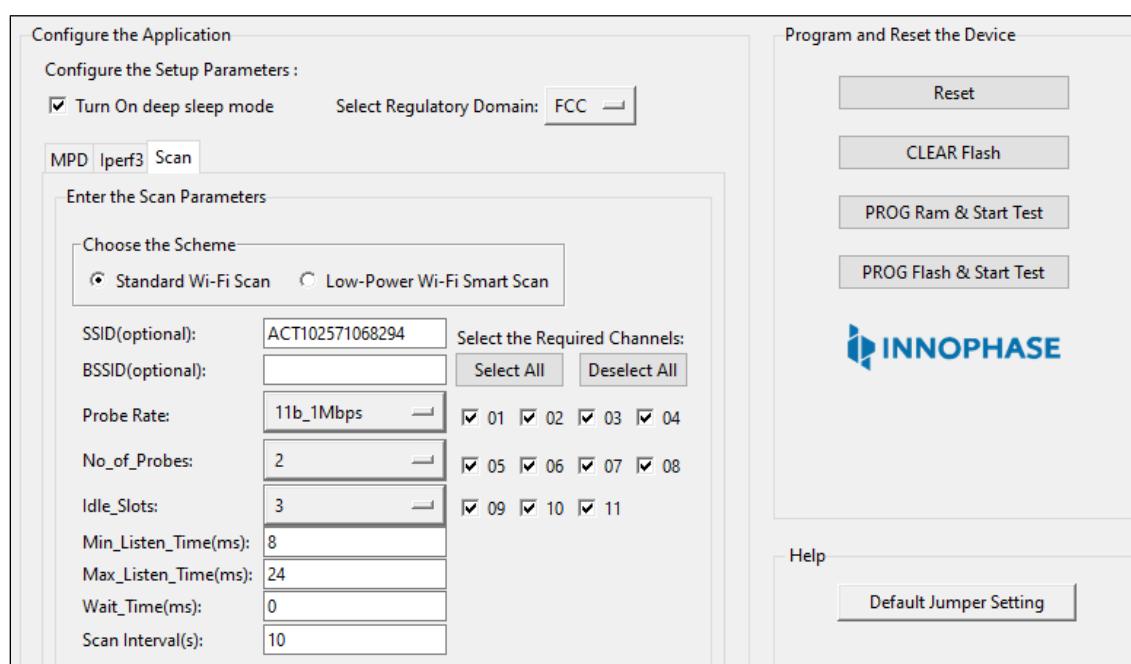


Figure 28: Case 3: Demo Tool GUI

Console output:

```
UART:NWWWWWAAEBuild $Id: git-f92bee540 $  
  
mpd.proto=scan wifi.scan_num_probes=2 wifi.scan_idleslots=3  
  
wifi.scan_min_listen_time=8 wifi.scan_max_listen_time=24  
  
wifi.scan_wait_time=0 wifi.probe_rate=0x00 wifi.scan_channel_mask=0x7ff  
  
mpd.scan.ssid=ACT102571068294 np_conf_path=/sys/nprofile.json  
  
mpd.regdomain=FCC mpd.suspend=1  
  
$App:git-2f38bc2  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
Suspend Enabled.  
  
Multicast reception Disabled.  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3e  
  
Applying reg domain: 1-11@20  
  
MPD scan mode.  
  
ssid=ACT102571068294  
  
channel_mask=0x7ff  
  
Found 1 nets:  
  
00:5f:67:cd:c5:a6 on channel 6 @ -33 'ACT102571068294' 'WPA-PSK'  
  
scan completed  
  
-----  
  
Going for indefinite sleep...
```

10.4 Case 4

Setting the BSSID.

BSSID recognizes the AP or router as it has a unique address which creates the wireless network. To set the BSSID of a network, enter the BSSID in the provided field and click on Start.

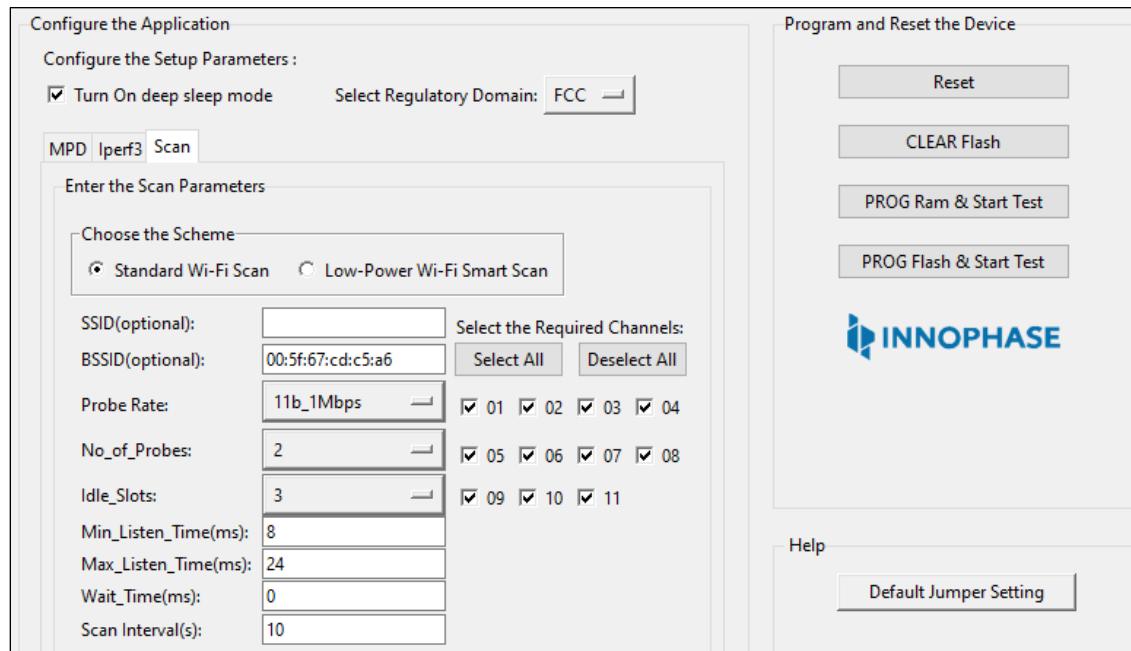


Figure 29: Case 4: Demo Tool GUI

Console output:

```
UART:NWWWWWAAEBuild $Id: git-f92bee540 $  
  
mpd.proto=scan wifi.scan_num_probes=2 wifi.scan_idleslots=3  
  
wifi.scan_min_listen_time=8 wifi.scan_max_listen_time=24  
  
wifi.scan_wait_time=0 wifi.probe_rate=0x00 wifi.scan_channel_mask=0x7ff  
  
mpd.scan.bssid=00:5f:67:cd:c5:a6 mpd.regdomain=FCC mpd.suspend=1  
  
$App:git-dc89330  
  
SDK Ver: SDK_2.4alpha  
  
T2 Multipurpose Demp App Version 0.12  
  
Suspend Enabled.  
  
Regdomain=FCC  
  
addr e0:69:3a:00:2c:3c  
  
Applying reg domain: 1-11@20  
  
MPD scan mode.  
  
bssid str=00:5f:67:cd:c5:a6  
  
bssid=00:5f:67:cd:c5:a6  
  
channel_mask=0x7ff  
  
Found 10 nets:  
  
00:5f:67:cd:c5:a6 on channel 6 @ -62 'ACT102571068294' 'WPA-PSK'  
  
scan completed  
  
-----  
  
Going for indefinite sleep...
```

11 Help

Help provides information about default Jumper/Switch settings. Clicking on Default Jumper Setting as shown in Figure 30 will pop-up new window with default Jumper/Switch settings information as shown in Figure 31.

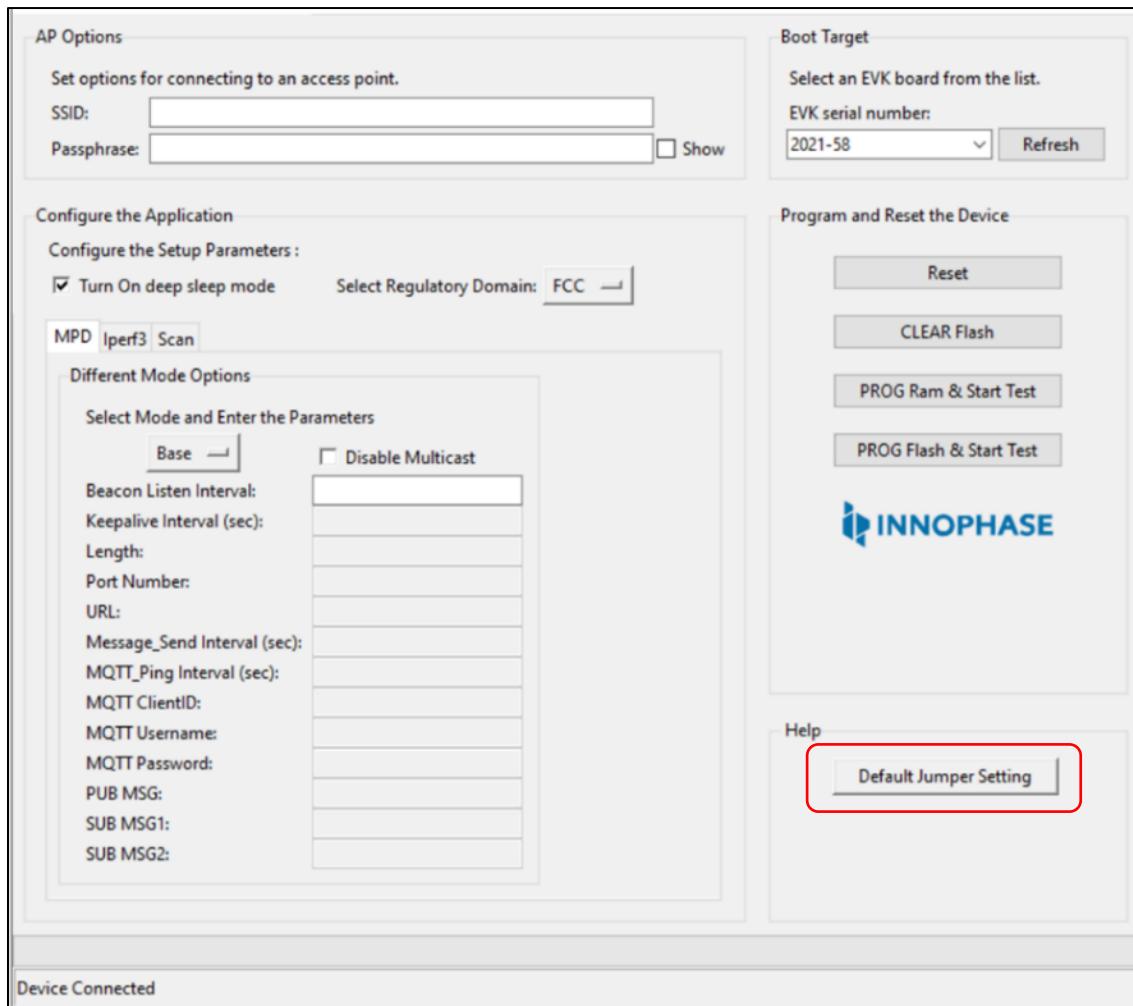


Figure 30: Help Frame

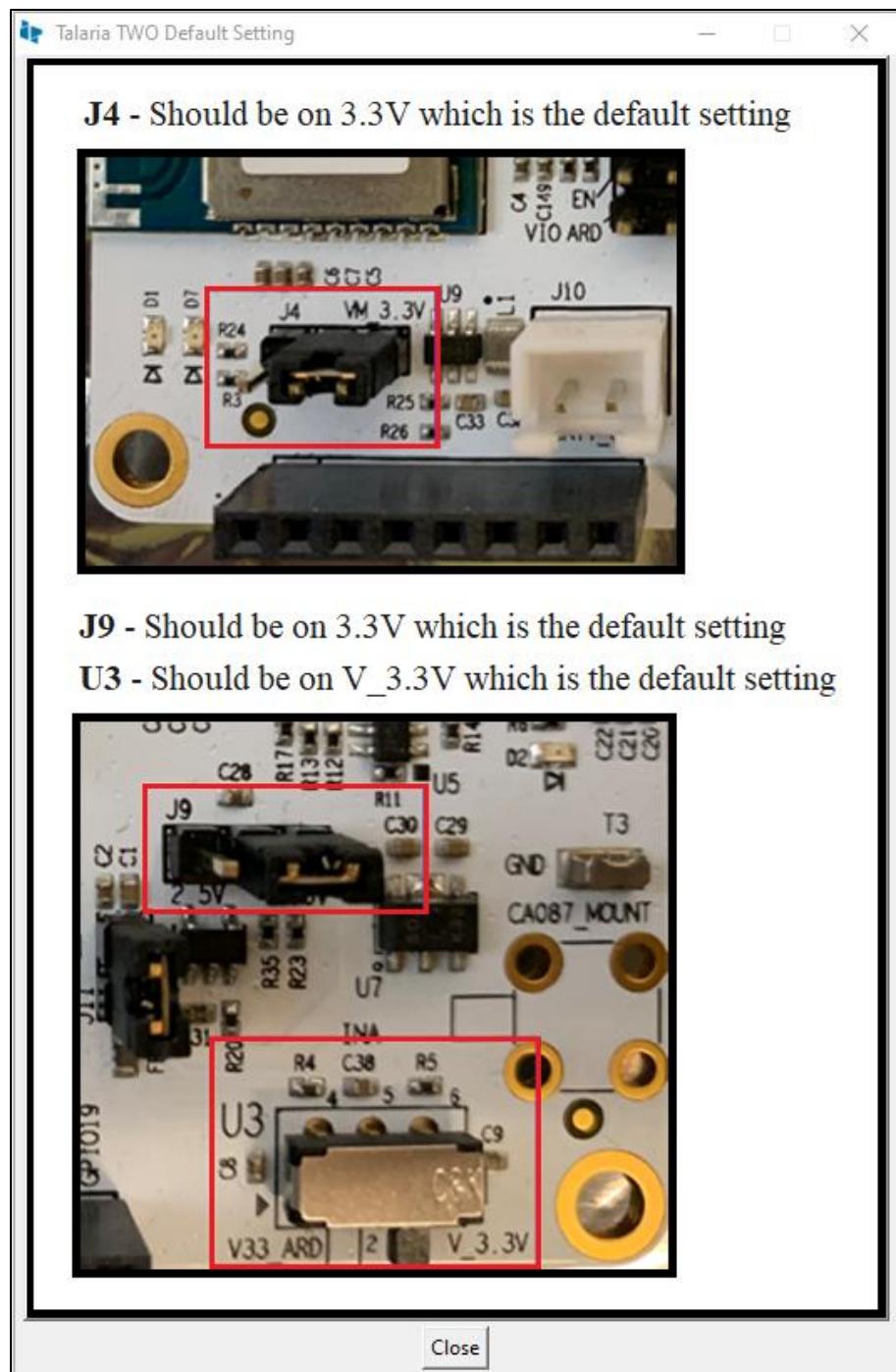


Figure 31: Default Jumper/Switch setting Window

Note: Default Jumper/Switch setting window will appear every time when tool is launched, as shown in Figure 32. To turn this feature OFF permanently, check the Do not show again option and close the window.

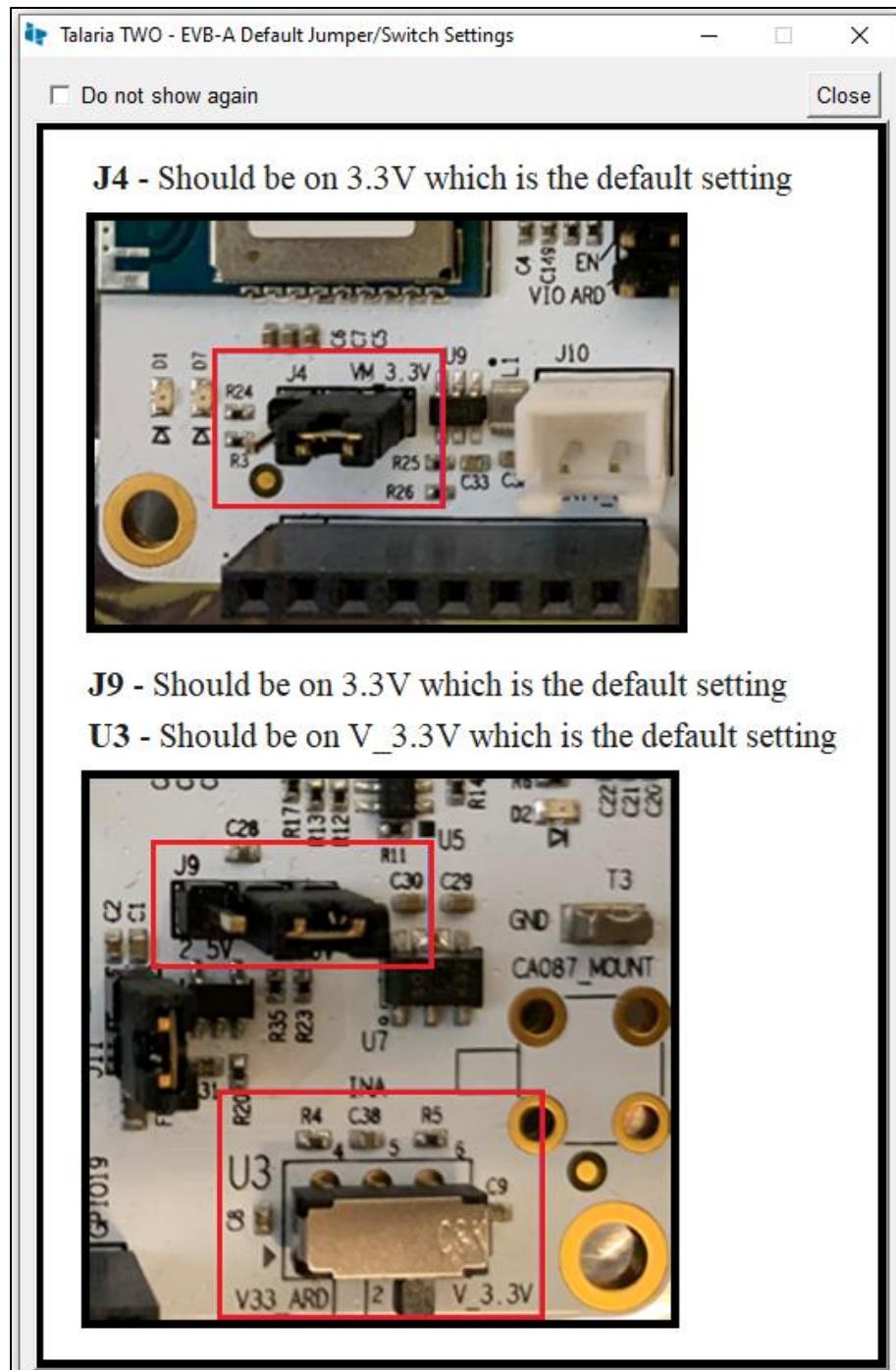


Figure 32: Default Jumper/Switch setting Window during Tool Launch

12 Appendix

12.1 Uninstall instructions for libusK driver

To uninstall libusbK and retrieve COM ports, follow the following steps:

1. Go to Device Manager. Expand the libusbK USB Devices and right click on the InnoPhase T2 Evaluation Board (Composite Parent). Click on Update Driver as shown in Figure 33.

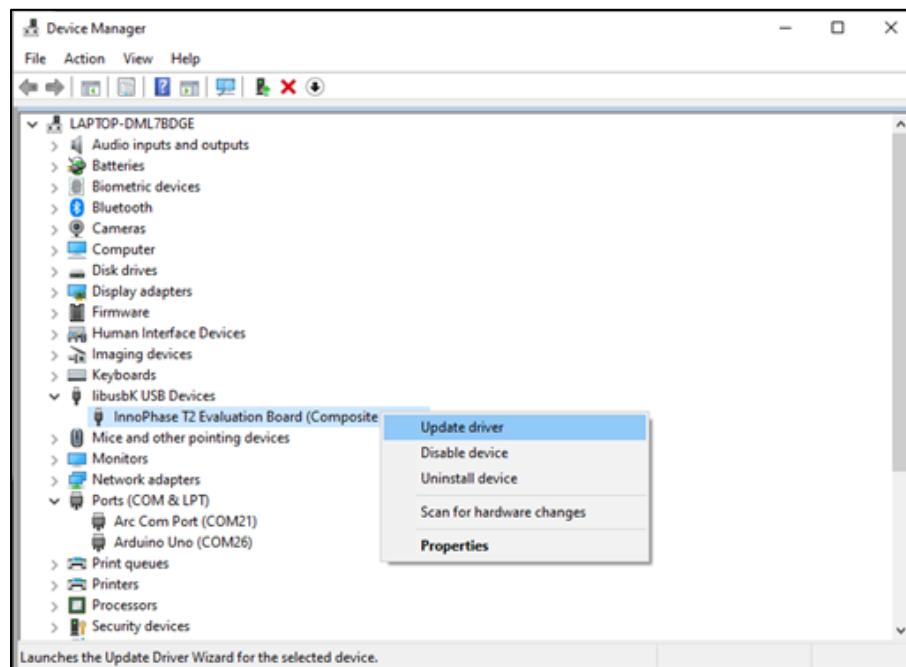


Figure 33: Device Manager

2. On the new window, click on Let me pick from a list of available drivers on my computer option and click on Next.

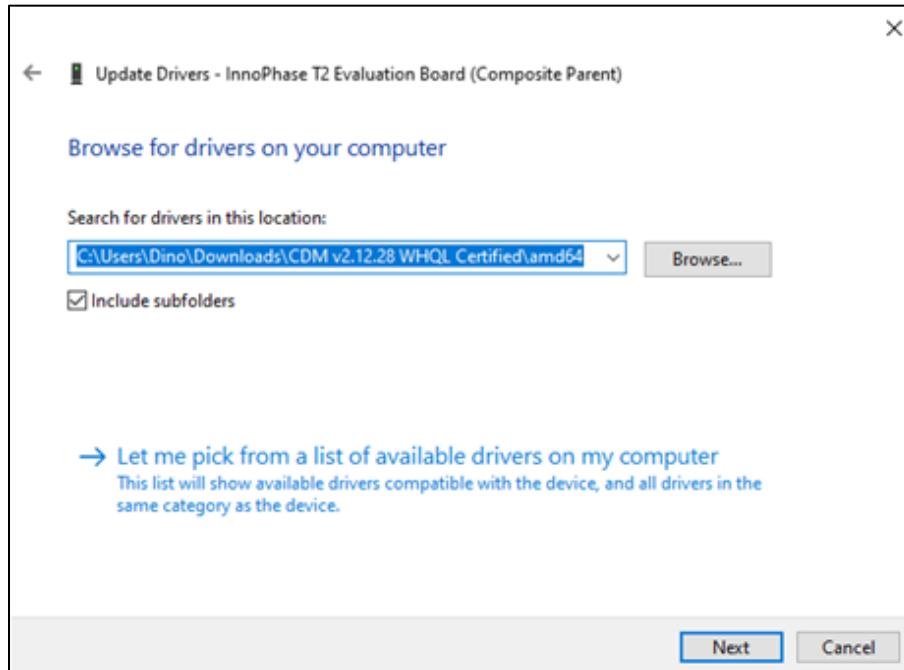


Figure 34: Update Devices

3. Select USB Composite Device and install the same for reinstalling COM ports.

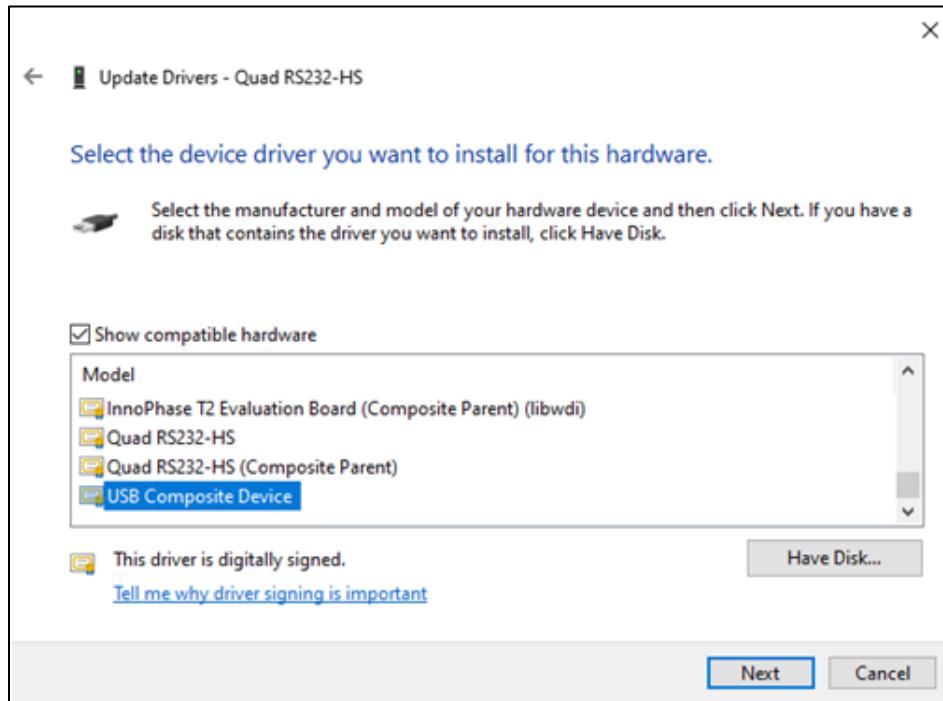


Figure 35: Select the device driver

12.2 New Serial Number to Device

There might be certain instances when the EVK serial number is absent or appears to be corrupted on a Talaria TWO (T2) device.

The following are the setups needed to create a new serial number created and write it to the Talaria TWO flash using the tool. This process of creating a new serial number and writing it is executed automatically.

1. Ensure the device is connected to the PC

If the connection from Talaria TWO device is not found, unplug and re-plug the cable, to ensure the device is recognized by the host machine.

2. Run the Zadig Tool to Install the libusbK driver (Windows PC only)

The libusbK driver installation is for Windows machine only.

The interface provided by libusbK driver is supported natively on Linux machine, hence, no additional installation is required on Linux.

On launching Zadig, the devices that are listed on it might have a slightly different name tag with respect to the Talaria TWO device. This is dependent on the how the user-installed drivers were used the previous time. For example:

- The driver has been uninstalled, or
 - The port has been updated to a COM port or
 - The way in which the device list has been updated by the machine's Device Manager is different.
- a. If the InnoPhase T2 Evaluation Board is shown on the list, either InnoPhase T2 Evaluation Board (Composite Parent), or InnoPhase T2 Evaluation Board, go ahead to install the driver per standard procedure.
 - b. If the InnoPhase T2 Evaluation Board is not shown on the list, a device by the name Quad RS232-HS should be on the list of instead.

Ensure to check the following:

- a. There should be only one Talaria TWO device that is connected, to which the new serial number will be written to
- b. If there are any other known devices that are probably using the libusbK driver, disconnect them, unplug/re-plug the Talaria TWO device and re-launch Zadig to ensure Quad RS232-HS is actually the device from the Talaria TWO connection.

Select the Quad RS232-HS (Composite Parent) device and select the driver libusbK and click on Replace Driver.

After the installation, the Talaria TWO device with the libusbK driver should be shown as evident in Figure 36:

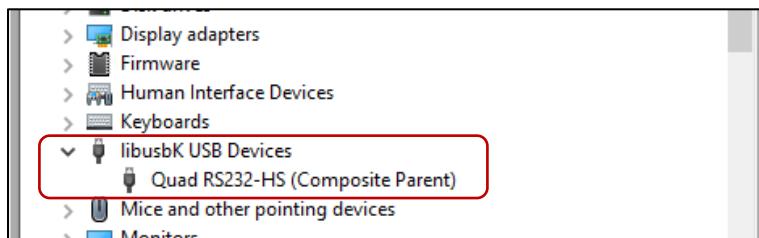


Figure 36: libusbK driver installed

3. Launch the Tool (Detecting absence of Serial Number and creating a new one in device). On launching, the tool checks if the serial number is present on the device. If it is not found, the tool will automatically generate one and write it to the device as the new serial number.

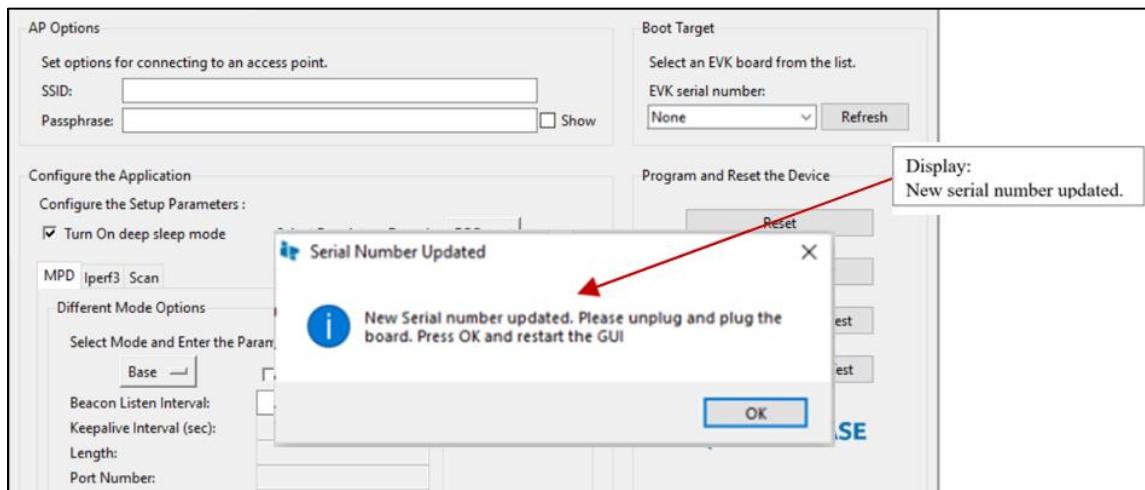


Figure 37: Serial number updated

Format of the serial number:

```
<year_stamp>-<integer>
```

where,

- <year_stamp>: current year (for example: 2021)
- <integer>: formed from the sum of last 3 octets (in decimal) of the mac address found in the device.

Before relaunching the tool, unplug and re-plug the device to have the connection of the device refreshed by the host machine.

4. Re-Launch of the Tool (Serial Number Detected)

Now the device has a new serial number in its flash.

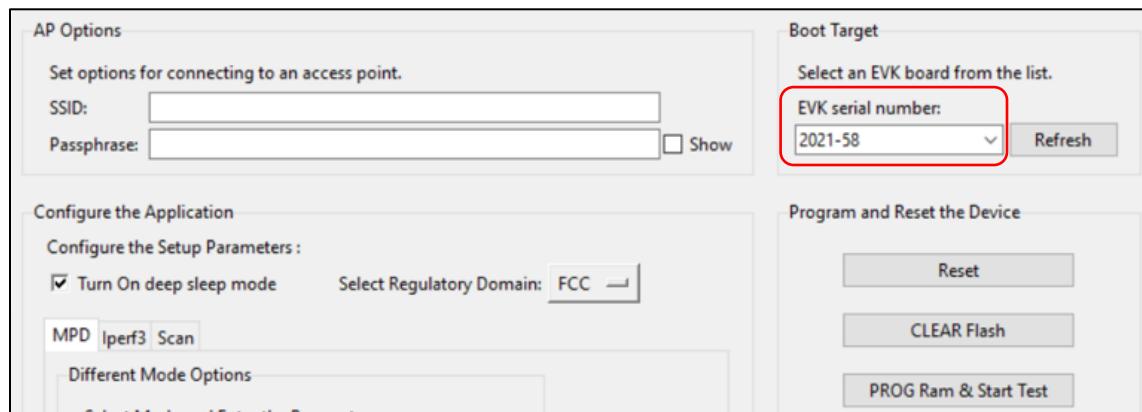


Figure 38: New serial number in flash

13 References

1. UG_Download_Tool.pdf
(sdk_x.y/pc_tools/Download_Tool/doc/UG_Download_Tool.pdf).

14 Support

1. Sales Support: Contact an InnoPhase sales representative via email – sales@innophaseinc.com
2. Technical Support:
 - a. Visit: <https://innophaseinc.com/contact/>
 - b. Also Visit: <https://innophaseinc.com/talaria-two-modules>
 - c. Contact: support@innophaseinc.com

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