

Wireless Accessory Configuration User Manual

March 2016

About this Document

This document gives an overview of the Apple MFI program implemented for Redpine's n-Link module and gives the user information on how to configure the n-Link module using WAC.

Table Of Contents

1	Introduction	5
2	Application Overview	6
2.1	Setup Required	6
2.2	Software / Utilities Required.....	6
2.3	Installing the required utilities.....	6
3	Compiling the driver and the application	8
4	Executing the Application	9
5	Limitations.....	14

1 Introduction

The Apple MFi program is a licensing program for iOS device accessories and technologies manufactured by third party companies. The acronym MFi stands for "Made for iPod", "Made for iPhone" or "Made for iPad". It is designed to set up the wireless accessories with the credentials stored in the iPhone/iPad. After configuring the module using the iPhone/iPad, this accessory can only be accessed/operated using the iPhone/iPad. More information can be obtained from WAC_POSIX_Server_1.22 documentation.

2 Application Overview

The application developed is used to demonstrate how to configure the nLink module using WAC.

2.1 Setup Required

1. Linux machine.
2. n-Link module, with the IAP chip integrated to the I2C interface.
3. WLAN Access Point.

2.2 Software / Utilities Required

1. DHCP Server: DHCP server has to be installed in the linux machine. For a Fedora distribution, it can be installed using the following command:

```
$ yum install dhcp
```

Refer the following link for further details on installation and configuration of DHCP server:

https://docs.fedoraproject.org/en-US/Fedora/17/html/System_Administrators_Guide/s1-dhcp-configuring-server.html

2. DHCP client utility.
3. mDNS responder: This utility can be downloaded in the form of a tar file from the following link.

<https://opensource.apple.com/tarballs/mDNSResponder/>

It can also be built from the source code provided as a part of the release package. The source can be found in the following path.

```
$ cd host/APPS/WAC_POSIX_Server_1.22/
```

Note: Release package named mDNSResponder-567.tar.gz is used for the evaluation

4. WAC_POSIX_Server_1.22 package, which is provided as a part of the release package.

2.3 Installing the required utilities

1. DHCP server: Copy the dhcpd.conf file which is present in the release package to the following paths. DHCP server is configured using this file:

```
$ cp -rf dhcpd.conf /etc/
```

```
$ cp -rf dhcpd.conf /etc/dhcp/
```

Run the following command to start the dhcp server.

```
$ /sbin/service dhcpd enable
```

2. mDNS Responder: Extract the `mDNSResponder-567.tar.gz` file.

```
$ tar -xvf mDNSResponder-567.tar.gz.
```

Go to the following path in mDNSResponder-567 folder:

```
$ cd mDNSResponder-567/mDNSPosix/
```

Run the following command:

```
$ make install os=linux
```

This installs the mDNSResponder which runs in the daemon mode.

This application is used to configure the n-Link device in Accessory mode so that iPhone/iPad can configure network credentials using WAC.

3 Compiling the driver and the application

The driver has to be compiled by following the steps mentioned in the TRM.

After compiling the driver, go to the WAC sub folder present in the release package.

```
$ cd host/APPS/WAC_Posix_Server_1.22
```

To compile the application for BSD driver, open the Makefile and comment the define ONEBOX_NL80211.

For NL80211 mode, uncomment the define ONEBOX_NL80211 in the Makefile.

Compile the application by giving the following command:

```
$ make clean;make
```

This will generate an executable with the name WACServer.

Copy the executable into the release folder.

```
$ cp WACServer ../../release
```

4 Executing the Application

1. Initially stop the mDNSResponder which is running in daemon mode before starting the MFi application by giving the following command:

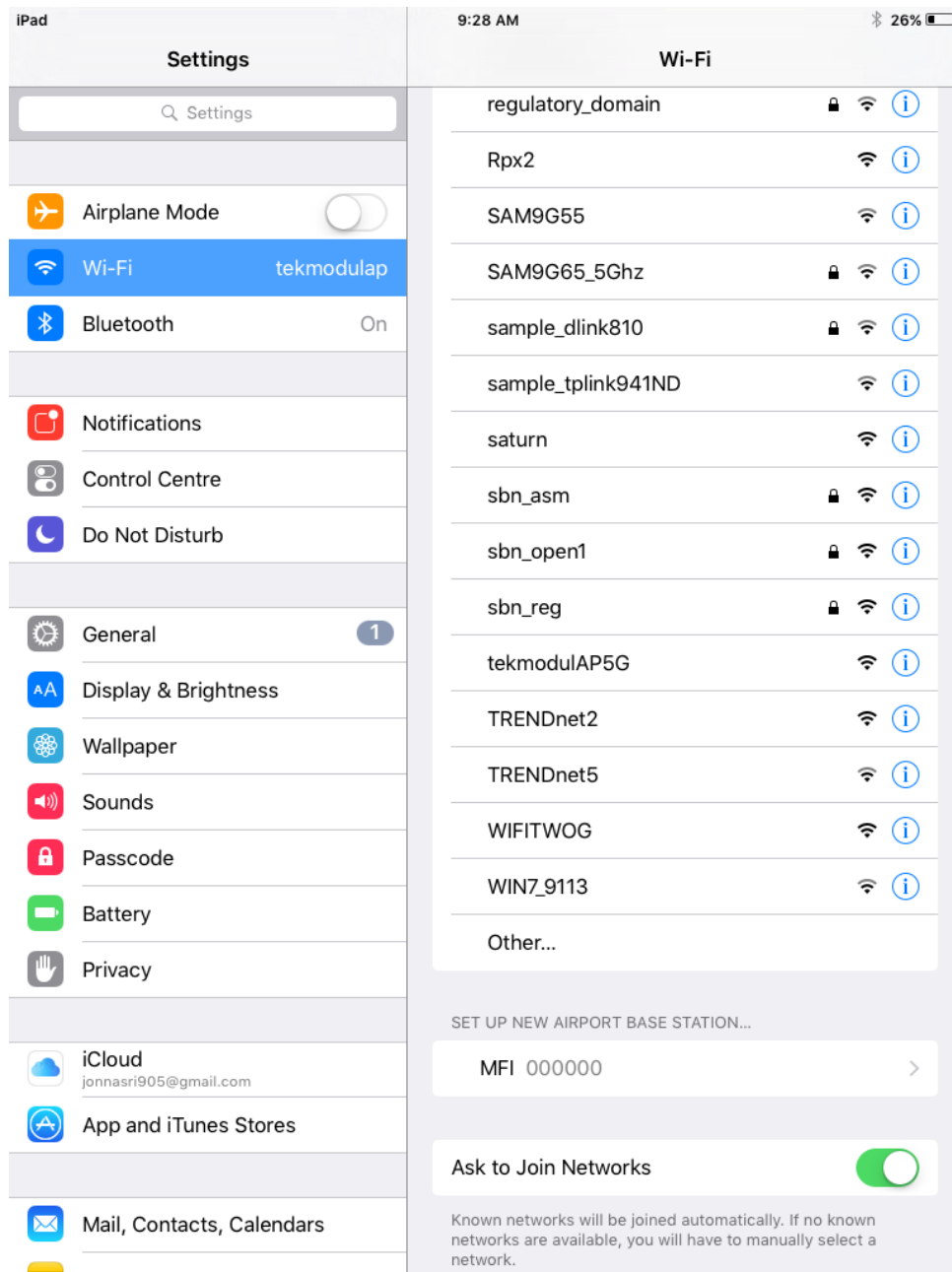
```
$ /etc/init.d/mdns stop
```

Note: Give the following command before executing the application.

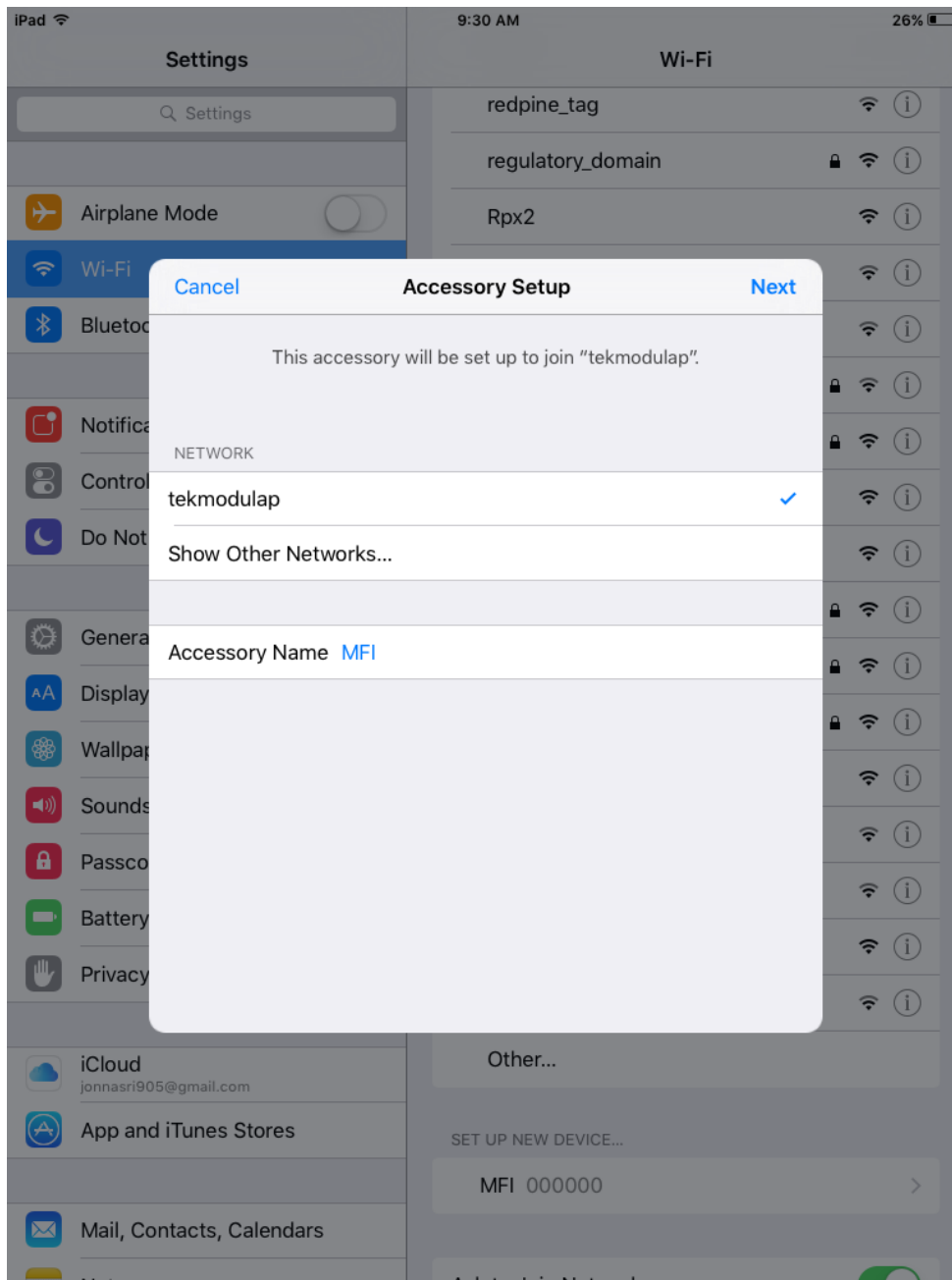
```
$ iptables -F
```

2. Start the application by running the following command:

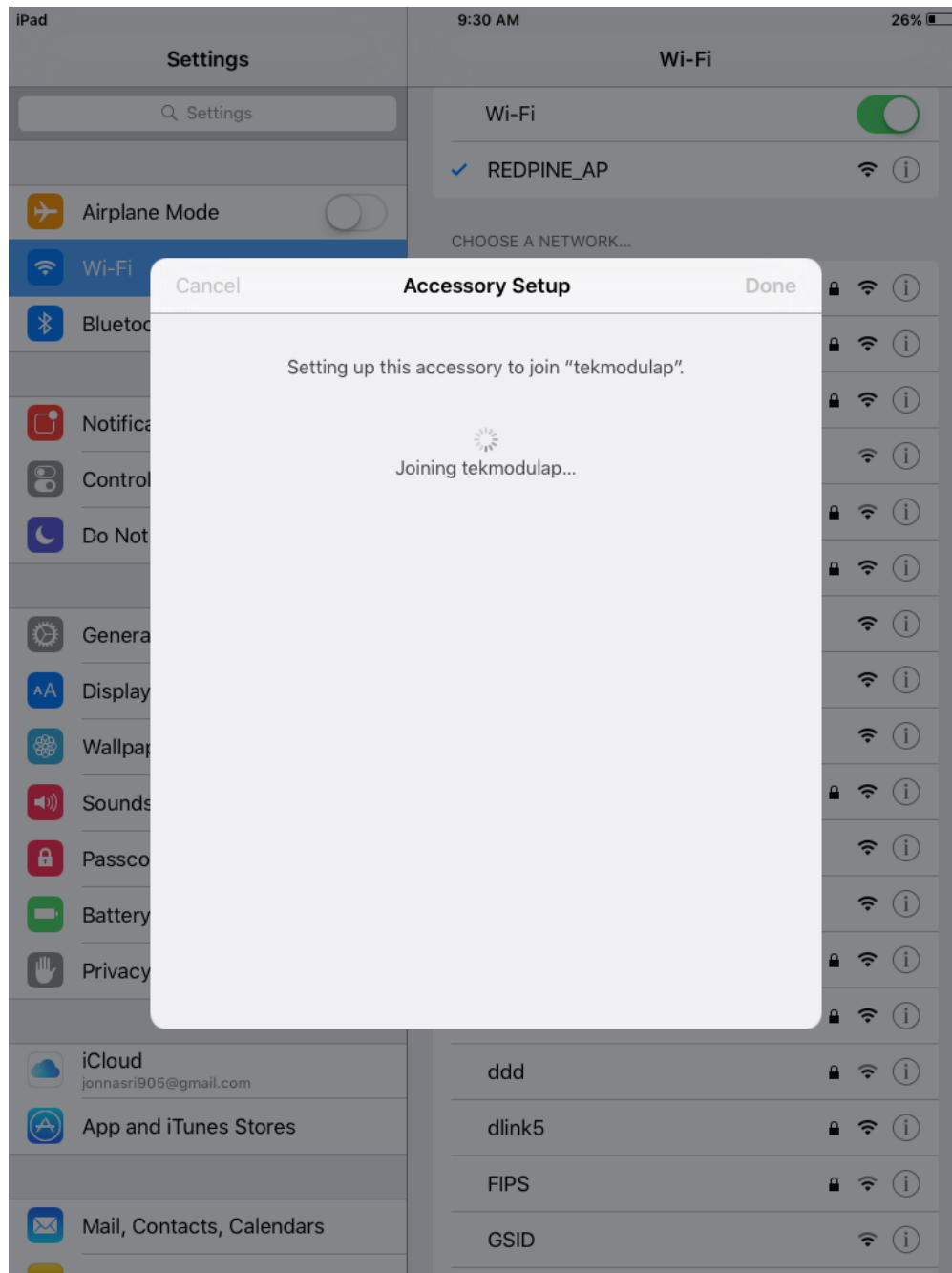
```
$ ./WACServer
```
3. Scan for the device in iPhone/iPad in WiFi settings for the device named "MFI" as shown in the screen shot given below.



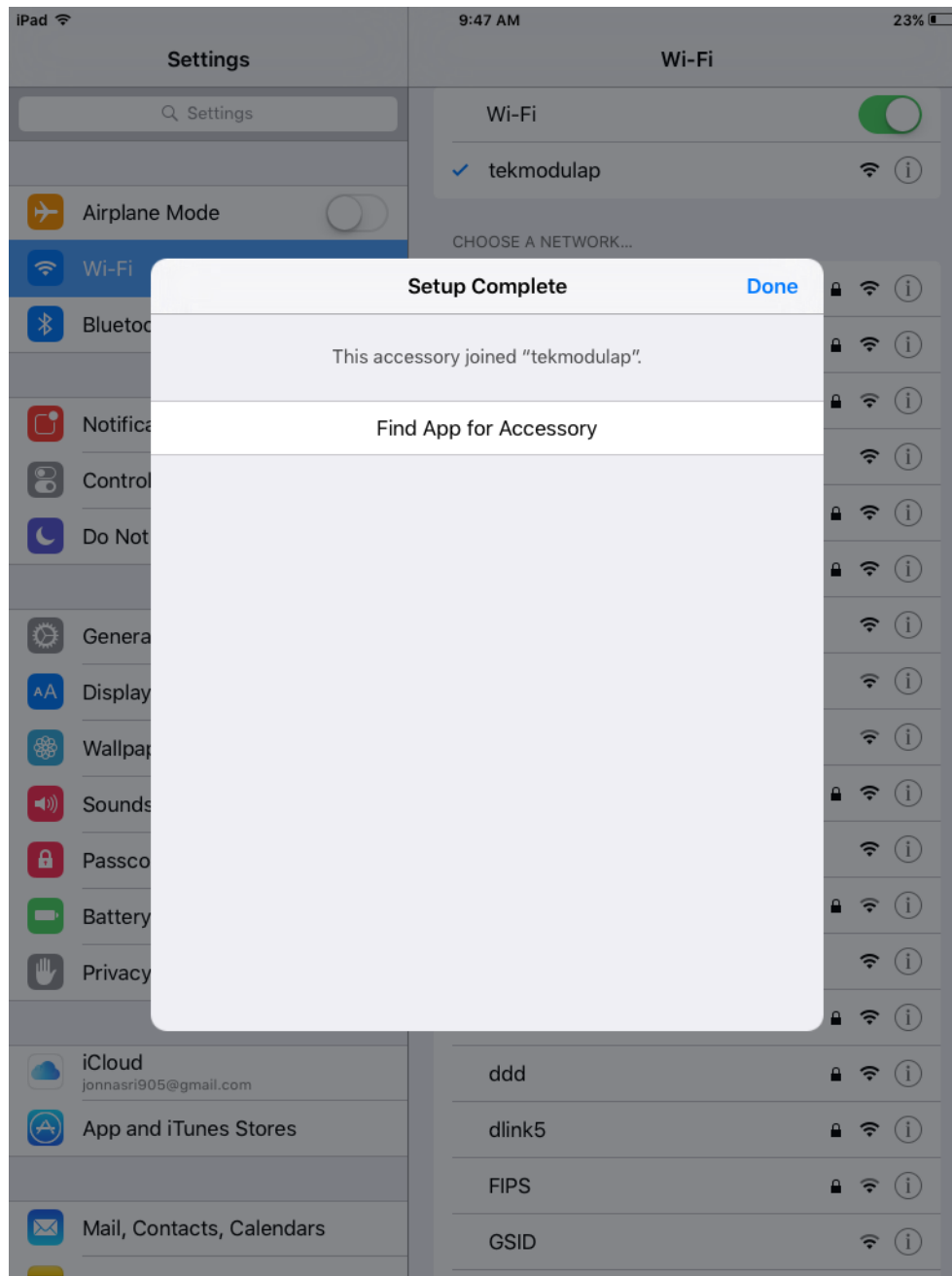
4. Select the device and select the destination WiFi network to join after configuring the module in Wifi client mode and select next, as shown in the screen shot below.



5. iPhone/iPad authenticates the module and configures the module to join to the destination network (`tekmodulap`) as shown in the screen shot below.



6. After joining to the desired network iPhone/iPad performs the final authentication and pops up a message after the entire configuration as shown in the screen shot below.



7. Thus device is configured and can be accessed.

5 Limitations

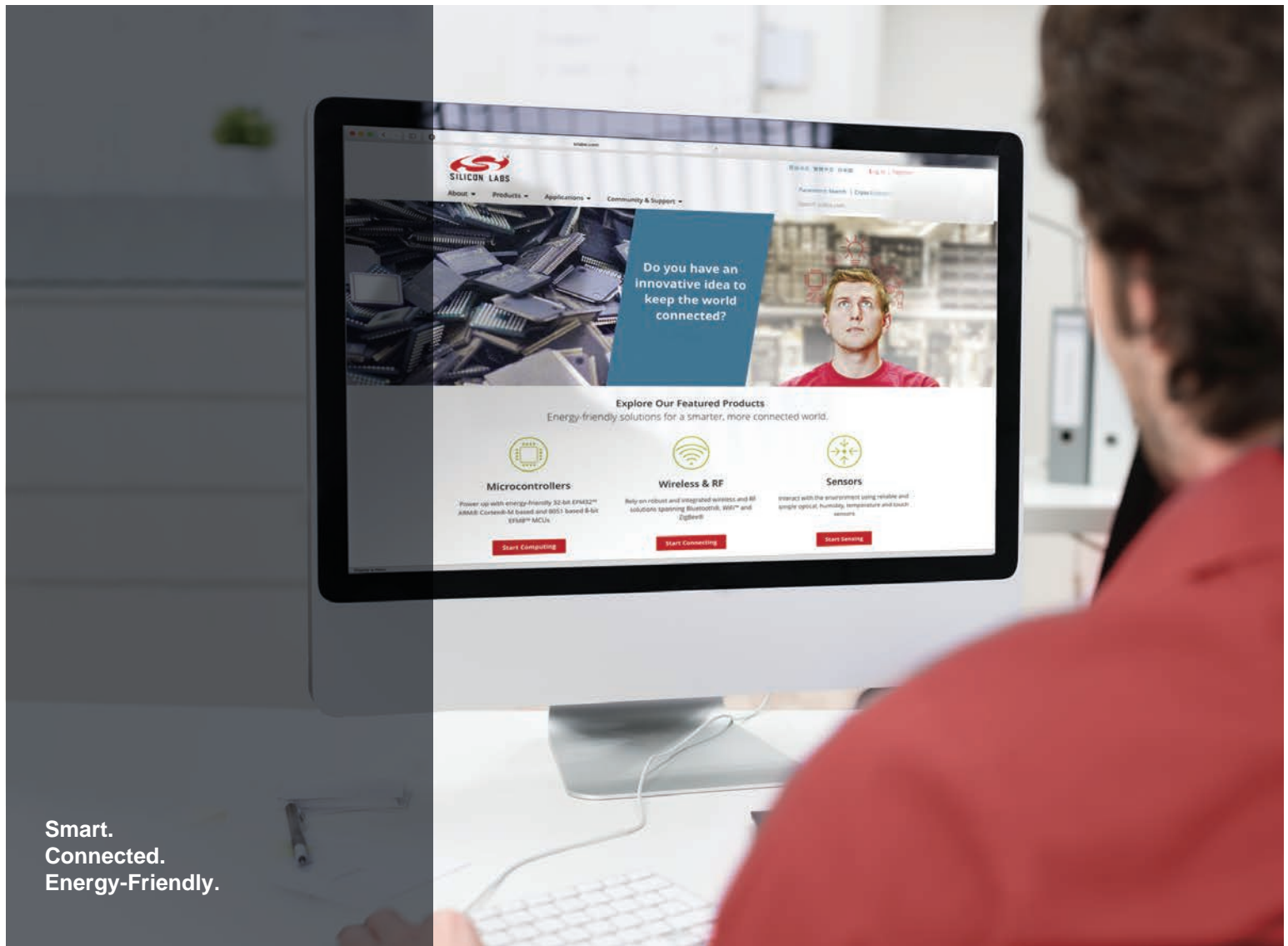
Facing issues some times with mDNSResponder connection with WAC server .WAC is not able to connect to the mDNS Responder.

Revision History

Revision No.	Version No.	Date	Author	Changes
1	1	12/02/2016	Jahnavi Meher	Initial Version

Review History

Review No.	Version No.	Date	Reviewer	Comments
	0.1			Initial Version

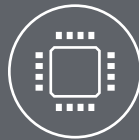


Smart.
Connected.
Energy-Friendly.



Products

www.silabs.com/products



Quality

www.silabs.com/quality



Support and Community

community.silabs.com

Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Labs reserves the right to make changes without further notice to the product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Without prior notification, Silicon Labs may update product firmware during the manufacturing process for security or reliability reasons. Such changes will not alter the specifications or the performance of the product. Silicon Labs shall have no liability for the consequences of use of the information supplied in this document. This document does not imply or expressly grant any license to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any FDA Class III devices, applications for which FDA premarket approval is required, or Life Support Systems without the specific written consent of Silicon Labs. A "Life Support System" is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Labs products are not designed or authorized for military applications. Silicon Labs products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons. Silicon Labs disclaims all express and implied warranties and shall not be responsible or liable for any injuries or damages related to use of a Silicon Labs product in such unauthorized applications.

Trademark Information

Silicon Laboratories Inc.®, Silicon Laboratories®, Silicon Labs®, SiLabs® and the Silicon Labs logo®, Bluegiga®, Bluegiga Logo®, ClockBuilder®, CMEMS®, DSPLL®, EFM®, EFM32®, EFR®, Ember®, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Ember®, EZLink®, EZRadio®, EZRadioPRO®, Gecko®, Gecko OS, Gecko OS Studio, ISOModem®, Precision32®, ProSLIC®, Simplicity Studio®, SiPHY®, Telegesis, the Telegesis Logo®, USBXpress®, Zentri, the Zentri logo and Zentri DMS, Z-Wave®, and others are trademarks or registered trademarks of Silicon Labs. ARM, CORTEX, Cortex-M3 and THUMB are trademarks or registered trademarks of ARM Holdings. Keil is a registered trademark of ARM Limited. Wi-Fi is a registered trademark of the Wi-Fi Alliance. All other products or brand names mentioned herein are trademarks of their respective holders.



Silicon Laboratories Inc.
400 West Cesar Chavez
Austin, TX 78701
USA

<http://www.silabs.com>