



**DM300 WiFi Module  
User Guide**

**Document Number 646  
Revision 1.1**

**Date: September 27, 2010**



**Revision History**

Rev.	Date	Description	Author
1.0	9/9/10	Release	Joe Shidle, Andrew Grove
1.1	9/27/10	Added Part 15.21 Information To User, Part 15.19 Label, and For Part 15B	Tom Meksavan
1.2	9/29/2010	Remove block diagram and operational description section	Plato Lee

**Table of Contents**

1. Overview..... 3

2. Startup and Shutdown Sequences ..... 3

    2.1. Startup Sequence ..... 3

    2.2. Shutdown Sequence..... 3

3. WiFi Setup and Status..... 3

    3.1. WiFi Connection Modes..... 4

        3.1.1. Ad-Hoc Mode..... 4

            3.1.1.1. AT Command Sequence..... 4

        3.1.2. Infrastructure Mode..... 5

            3.1.2.1. AT Command Sequence..... 5

        3.1.3. Supplicant Mode (WPA)..... 5

            3.1.3.1. AT command sequence ..... 6

    3.2. WiFi Network Scanning ..... 6

        3.2.1. AT Command Sequence..... 6

    3.3. WiFi Connection Status..... 7

        3.3.1. AT Command Sequence..... 7

4. FCC/P15..... 7

    4.1. Part 15B ..... 7

    4.2. Part 15.19 Label..... 8

    4.3. Part 15-21 Information To User ..... 8

    4.4. For Part 15B..... 8



## 1. Overview

The DM300A (IEEE 802.11b/g) module enables connectivity on M2M and embedded devices. The module translates data on an external wired interface (UART, USB, I2C, etc.) to the connected WiFi network. The module is designed for easy hardware and software integration onto a host board.

The DM300A has an on-module trace antenna and a connector to attach an external antenna. Antenna diversity is supported via software configuration.

Standard WiFi encryption and authentication protocols are supported: WEP, WPA, WPA2, Open, Shared, Pre-Shared Key. WiFi configuration is accomplished through an AT command interface.

The module has an ARM9 processor and additional memory capacity to support custom applications. A currently supported application is serial to WiFi conversion with network communication via the Point-to-Point Protocol (PPP). This user guide provides details on establishing and configuring this particular application.

## 2. Startup and Shutdown Sequences

### 2.1. Startup Sequence

- Mount DM300A onto a host board
- Supply 3.3V to 3.7V to PIN#1 to power on
- Use UART1 to communicate with DM300A
  - UART1 settings are 115200bps, 1 stop bit, no parity and no flow control

### 2.2. Shutdown Sequence

- Send AT+HALT
- Disconnect power from DM300A

## 3. WiFi Setup and Status

In the following AT command and response sequences, the client/user input is in regular text and the DM300A response is in *italics*.



### 3.1. WiFi Connection Modes

The DM300A supports different WiFi network and encryption modes. These modes are configured via AT commands. The following sections provide the AT command and response sequences to configure the DM300A for the different modes.

#### 3.1.1. Ad-Hoc Mode

Ad-Hoc network mode is used for peer-to-peer WiFi connections.

##### 3.1.1.1. AT Command Sequence

```
AT+WMODE=adhoc
OK
AT+WENCRYPT=open
OK
AT+WSSID="Sample SSID"
OK
RING
AT+IPMODE>manual
OK
AT+IPADDRESS=192.168.1.10
OK
AT+IPNETMASK=255.255.255.0
OK
AT+IPDEFAULTROUTE=192.168.1.0
OK
ATA
CONNECT
```



### 3.1.2. Infrastructure Mode

Infrastructure network mode is used to establish a connection to a WiFi access point.

#### 3.1.2.1. AT Command Sequence

```
AT+WMODE=managed
OK
AT+WKEY=1,11223344556677889900AABBCC
OK
AT+WENCRYPT=wep
OK
AT+WSSID="Sample SSID"
OK
RING
AT+IPMODE=manual
OK
AT+IPADDRESS=192.168.1.10
OK
AT+IPNETMASK=255.255.255.0
OK
AT+IPDEFUALTRROUTE=192.168.1.0
OK
AT+IPNAMESEVER=192.168.1.1
OK
AT+IPDOMAINNAME="sample.com"
OK
ATA
CONNECT
```

### 3.1.3. Supplicant Mode (WPA)

Supplicant mode is used when it is desired to configure the DM300A to be able to connect to multiple access points in infrastructure mode. Supplicant mode cannot be used to connect to an ad-hoc client. In supplicant mode, the DM300A will automatically connect to available access points in a specified priority when roaming in and out of range. Supplicant mode is also necessary when a desired access point uses a more advanced security scheme such as WPA and WPA2. Supplicant mode requires a wpa\_supplicant.conf file to be uploaded to the DM300A via the AT+UPLOAD process outlined below. A wpa\_supplicant.conf file needs to be uploaded to the DM300A before entering supplicant mode.



### 3.1.3.1. AT command sequence

```
AT+UPLOAD="/etc/wpa_supplicant.conf", "ending"  
ctrl_interface=/var/run/wpa_supplicant  
network={  
    ssid="SampleSSID1"  
    mode=0  
    disabled=0  
    priority=5  
    psk="foobar"  
    key_mgmt=WPA-PSK  
}  
network={  
    ssid="SampleSSID2"  
    mode=0  
    disabled=0  
    priority=3  
    key_mgmt=NONE  
}  
ending  
AT+COMMIT  
+COMMIT: file /etc/wpa_supplicant.conf success  
OK  
AT+WMODE=supplicant  
OK  
RING  
AT+IPMODE=dhcp  
OK  
ATA  
CONNECT
```

## 3.2. WiFi Network Scanning

By issuing an AT command, the DM300A will scan for available WiFi networks and return the scan results.

### 3.2.1. AT Command Sequence

```
AT+WSCAN  
+WSCAN: "foo", 1, OPEN, -40  
+WSCAN: "Sample SSID", 6, WEP, -35
```



### 3.3. WiFi Connection Status

By issuing an AT command, the DM300A will report the current WiFi connection status.

#### 3.3.1. AT Command Sequence

The following examples show the connection status results when the DM300A is connected and when the DM300A is not connected to a WiFi network.

```
AT+WSTATUS
+WSTATUS:managed,"Sample SSID",OPEN,CONNECTED
+WSTATUS>manual,192.168.4.100,255.255.255.0
AT+WSTATUS
+WSTATUS: managed,"Sample SSID", OPEN,
DISCONNECTED
+WSTATUS>manual,192.168.4.100,255.255.255.0
```

## 4. FCC/P15

### 4.1. Part 15B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna. -Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



#### **4.2. Part 15.19 Label**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### **4.3. Part 15-21 Information To User**

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

#### **4.4. For Part 15B**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna. -Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### **FCC RF Radiation Exposure Statement:**

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body

700 Remington Road, 2<sup>nd</sup> Floor • Schaumburg, IL 60173  
[info@deltamobile.com](mailto:info@deltamobile.com) • [www.deltamobile.com](http://www.deltamobile.com)  
Phone: 847-884-6750