MOTOROLA
MOTOMESH DUO 2.0
4300 Users Guide

November 2007

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Chapter

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Chapter 1: Product Introduction

This guide will provide you with technical specifications, installation guidelines, and testing procedures for the MOTOMESH Duo 4300 infrastructure devices.

Figure 1-1 MOTOMESH Duo 4300 Device Attached to a Light Pole

Infrastructure Devices

The MOTOMESH DUO 4300 device is configured to operate as an Intelligent Access Point (IAP) from the factory. The device is capable of being configured to operate as either an IAP or a MWR (Mesh Wireless Router). The selection of an IAP or MWR configuration will be determined by the customers wireless network needs at the time of purchase. When the MOTOMESH Duo 4300 device is configured to operate as an IAP, it acts as the transition point from the wireless network to the wired core network and from there, through media gateways, out to the Internet. When the MOTOMESH Duo 4300 device is configured to operate as a MWR, it behaves as a wireless device that is primarily deployed to seed and extend the range between IAPs and Wireless Clients while simultaneously increasing the spectral efficiency of the network. While running as a MWR device, the Ethernet connector for the device can be utilized to connect to another IP-enabled device. This allows a network of IP-enabled devices (such as a camera) to be directly addressed, accessed and managed over the MOTOMESH network.

IAP functionality includes:

- Transition Point between the wired and wireless network
- Dynamic Route Selection

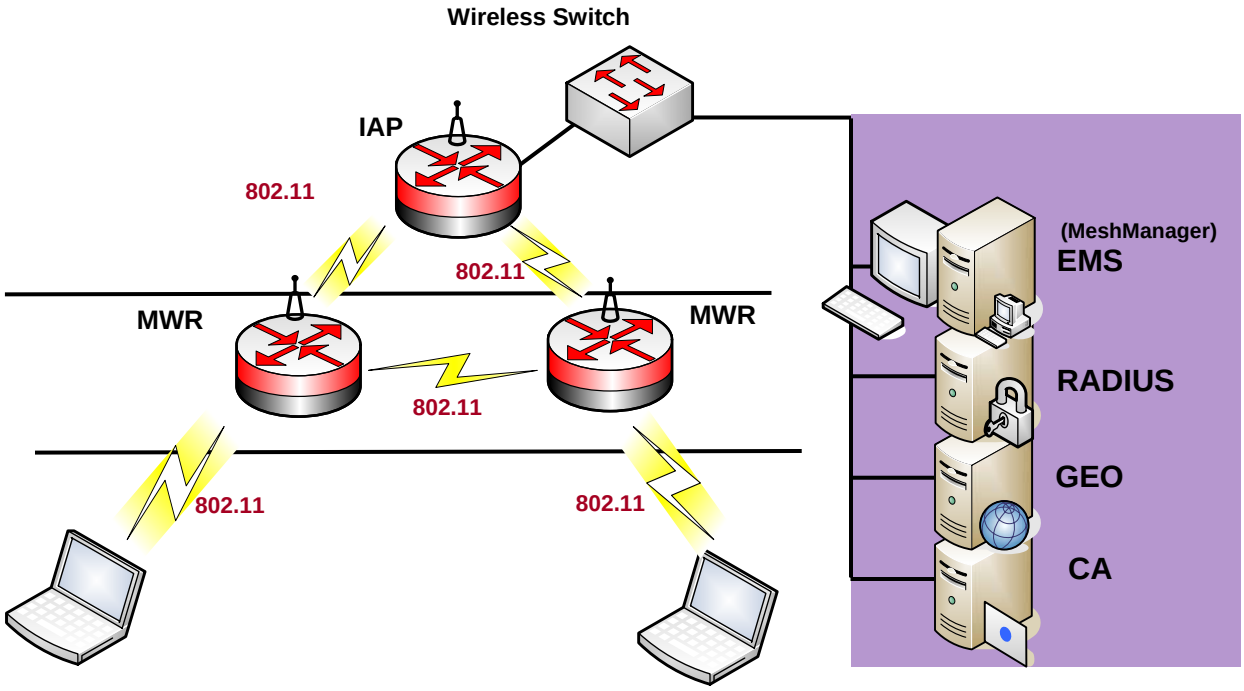
MWR functionality includes:

- Dynamic Route Selection
- Range Extension for all other network devices

Infrastructure Devices in a MOTOMESH Wireless Network

A MOTOMESH Duo 4300 device is considered a fixed **Infrastructure** device that can be configured to operate as either an IAP (Intelligent Access Point) or a MWR (Mesh Wireless Router) within the MOTOMESH Wireless Network. Infrastructure devices provide area coverage access for wireless clients to the wired network.

Figure 1-2 IAP and MWR Devices in Context of a MOTOMESH Network



MOTOMESH Duo 4300 Device Specifications

The following specification tables apply to the MOTOMESH Duo 4300-49, 4300-58, and 4300-54 Infrastructure Devices.

Table 1-1 MOTOMESH Duo 4300-49 Device Specifications

Radio Characteristics		
Primary Radio Operating Freq. (GHz)	2.400 to 2.483	
Secondary Radio Operating Freq. (GHz)	4.940 to 4.990	
Wi-Fi Support	802.11b/g at 2.4GHz; 802.11a at 4.9GHz	
RF Modulation	CCK (802.11b) / OFDM (802.11a/g)	
	2.4 GHz Portion	**4.9 GHz Portion**
Transmit Power (Maximum)	35 dBm EIRP	34 dBm EIRP
Receive Sensitivity	801.11b: -92 dBm (at 11 Mbps) to -100 dBm (at 1 Mbps) 801.11g: -78 dBm (at 54 Mbps) to -95 dBm (at 6 Mbps)	802.11a: -77 dBm (at 27 Mbps) to -93 dBm (at 3 Mbps)
Power Control	1dB increments	
Antenna Type	Two (2) omni directional, 8 dBi (for 2.4 GHz Radio) and 11 dBi (for 4.9 GHz Radio)	
Antenna Connector	N-Type	
Routing		
Routing Engine	MeshConnex™ Layer 2 routing with Layer 1 situational-awareness	
Routing Protocol	Patented, hybrid proactive/reactive routing (low latency & fast route convergence)	
IEEE 802.11s Support	Upgradeable to IEEE 802.11s standard via OTA software updates	
Network		
Network Management Software	MeshManager Element Management System via secure SNMP v.3	
Network Interface	10/100Mbps Ethernet (RJ-45) port with surge suppression	
Network Segmentation	Multiple SSIDs with VLAN mapping	
Quality of Service (QoS)	802.11e, EDCF, 802.11p and the IP precedence of DSCP (ToS) bits	
Security		
Virtual LAN (VLAN)	Supports up to sixteen (16) per node, or 4094 per network	
Client Encryption Support	WEP, WPA (TKIP) and WPA2 (AES, 802.11i)	
Internodal Encryption	Intra-Mesh Security	
Authentication	802.1X (Infrastructure/Client) and MAC address hardware authentication	

Power	
Power Input	90-264 VAC (with +/- 20% variation at 47 to 63 Hz) 10.8-14VDC input, certified LPS power supply (orderable option)
Power Connector	AC power cord, 12 ft
Power Consumption	15W (with both radios operating) 22.2W (with Canopy® Connect PoE operational) 29.4W (with IEEE 802.3af Standard PoE device)
Power over Ethernet (PoE)	Canopy and IEEE 802.3af support available
Physical	
Dimensions	9”x 6”x 3.5” (23.1cm x 15.2cm x 8.9cm)
Weight	4.5 lbs (2.04kg)
Packaging	Outdoor, all-weather enclosure (NEMA 4)
Mounting	3” (7.62cm) diameter post mounting
Environment	
Temperature Range	-30 to +60 °C
Humidity	0 to 95%, non-condensing
Certifications	FCC Part 15 & 90, UL, CSA
Available Options	
Mounting	Lamp post mount bracket assembly
Power	AC photo cell adapter

Table 1-2 MOTOMESH Duo 4300-58 Device Specifications

Radio Characteristics		
Primary Radio Operating Freq. (GHz)	2.400 to 2.483	
Secondary Radio Operating Freq. (GHz)	5.725 to 5.825	
Wi-Fi Support	802.11b/g at 2.4GHz; 802.11a at 5.8GHz	
RF Modulation	CCK (802.11b) / OFDM (802.11a/g)	
	2.4 GHz Portion	**5.8 GHz Portion**
Transmit Power (Maximum)	35 dBm EIRP	34 dBm EIRP
Receive Sensitivity	801.11b: -92 dBm (at 11 Mbps) to -100 dBm (at 1 Mbps) 801.11g: -78 dBm (at 54 Mbps) to -95 dBm (at 6 Mbps)	802.11a: -77 dBm (at 54 Mbps) to -93 dBm (at 6 Mbps)
Power Control	1dB increments	

Antenna Type	Two (2) omni directional, 8 dBi (for 2.4 GHz Radio) and 10 dBi (for 5.8 GHz Radio)
Antenna Connector	N-Type
Routing	
Routing Engine	MeshConnex Layer 2 routing with Layer 1 situational-awareness
Routing Protocol	Patented, hybrid proactive/reactive routing (low latency & fast route convergence)
IEEE 802.11s Support	Upgradeable to IEEE 802.11s standard via OTA software updates
Network	
Network Management Software	MeshManager Element Management System via secure SNMP v.3
Network Interface	10/100Mbps Ethernet (RJ-45) port with surge suppression
Network Segmentation	Multiple SSIDs with VLAN mapping
Quality of Service (QoS)	802.11e, EDCF, 802.11p and the IP precedence of DSCP (ToS) bits
Security	
Virtual LAN (VLAN)	Supports up to sixteen (16) per node, or 4094 per network
Client Encryption Support	WEP, WPA (TKIP) and WPA2 (AES, 802.11i)
Internodal Encryption	Intra-Mesh Security
Authentication	802.1X (Infrastructure/Client) and MAC address hardware authentication
Power	
Power Requirements	90-264 VAC (with +/- 20% variation at 47 to 63 Hz) 10.8-14VDC input, certified LPS power supply (orderable option)
Power Connector	AC power cord, 12 ft
Power Consumption	15W (with both radios operating) 22.2W (with Canopy® Connect PoE operational) 29.4W (with IEEE 802.3af Standard PoE device)
Power over Ethernet (PoE)	Canopy and IEEE 802.3af support available
Physical	
Dimensions	9”x 6”x 3.5” (23.1cm x 15.2cm x 8.9cm)
Weight	4.5 lbs (2.04kg)
Packaging	Outdoor, all-weather enclosure (NEMA 4)
Mounting	3" (7.62cm) diameter post mounting
Environment	
Temperature Range	-30 to +60 °C
Humidity	0 to 95%, non-condensing
Certifications	FCC Part 15 & 90, UL, CSA

Available Options	
Mounting	Lamp post mount bracket assembly
Power	AC photo cell adapter

Table 1-3 MOTOMESH Duo 4300-54 Device Specifications

Radio Characteristics		
Primary Radio Operating Freq. (GHz)	2.400 to 2.483	
Secondary Radio Operating Freq. (GHz)	5.470 to 5.725	
Wi-Fi Support	802.11b/g at 2.4GHz; 802.11a at 5.4GHz	
RF Modulation	CCK (802.11b) / OFDM (802.11a/g)	
	2.4 GHz Portion	**5.4 GHz Portion**
Output Power (Maximum)	35 dBm EIRP	34 dBm EIRP
Receive Sensitivity	801.11b: -92 dBm (at 11 Mbps) to -100 dBm (at 1 Mbps) 801.11g: -78 dBm (at 54 Mbps) to -95 dBm (at 6 Mbps)	802.11a: -77 dBm (at 54 Mbps) to -93 dBm (at 6 Mbps)
Power Control	1dB increments	
Antenna Type	Two (2) omni directional, 8 dBi (for 2.4 GHz Radio) and 10 dBi (for 5.4 GHz Radio)	
Antenna Connector	N-Type	
Routing		
Routing Engine	MeshConnex Layer 2 routing with Layer 1 situational-awareness	
Routing Protocol	Patented, hybrid proactive/reactive routing (low latency & fast route convergence)	
IEEE 802.11s Support	Upgradeable to IEEE 802.11s standard via OTA software updates	
Network		
Network Management Software	MeshManager Element Management System via secure SNMP v.3	
Network Interface	10/100Mbps Ethernet (RJ-45) port with surge suppression	
Network Segmentation	Multiple SSIDs with VLAN mapping	
Quality of Service (QoS)	802.11e, EDCF, 802.11p and the IP precedence of DSCP (ToS) bits	
Security		
Virtual LAN (VLAN)	Supports up to sixteen (16) per node, or 4094 per network	
Client Encryption Support	WEP, WPA (TKIP) and WPA2 (AES, 802.11i)	
Internodal Encryption	Intra-Mesh Security	
Authentication	802.1X (Infrastructure/Client) and MAC address hardware authentication	

Power	
Power Requirements	90-264 VAC (with variation at 47 to 63 Hz) 10.8-14VDC input, certified LPS power supply (orderable option)
Power Connector	AC power cord, 12 ft
Power Consumption	15W (with both radios operating at 50% duty cycle)
Power over Ethernet (PoE)	Support for Canopy PoE connection
Physical	
Dimensions	9”x 6”x 3.5” (23.1cm x 15.2cm x 8.9cm)
Weight	4.5 lbs (2.04kg)
Packaging	Outdoor, all-weather enclosure (NEMA 4)
Mounting	3" (7.62cm) diameter post mounting
Environment	
Temperature Range	-30 to +60 °C
Humidity	0 to 95%, non-condensing
Certifications	FCC Part 15 & 90, UL, CSA
Available Options	
Mounting	Lamp post mount bracket assembly
Power	AC photo cell adapter

Chapter

2

Chapter 2: Infrastructure Device Installation

This chapter will provide hardware and software installation information for the MOTOMESH DUO 4300 Infrastructure Device.

Software Requirements

The MOTOMESH DUO 4300 infrastructure devices can be setup and configured using the **MeshManager Element Management System** (EMS) or the **Web Interface** utility.

MeshManager EMS

MeshManager EMS is used for device setup, configuration, and management of MOTOMESH infrastructure devices. Prior to using the MeshManager software for device installation and configuration, ensure that it is installed and running on a network computer. MeshManager will be used during the device setup process to validate the installation of the device(s) as well as manage, within the wireless network.

Detailed information about the MeshManager application is found in the *MeshManager Users Guide*.

IMPORTANT

If you are using MeshManager to manage your network, there are some additional guidelines to be observed when using the Web Interface.

1. When using the following MeshManager elements:
   - VAP Manager
   - VLAN Manager
   - Security Manager

DO NOT use the Web Interface to manage VAP, VLAN, or Security configurations.

2. If a device has already been added to the network using MeshManager, **DO NOT** use the Web Interface to change the device type from an IAP to an MWR or from an MWR to an IAP.
3. If you use the Web Interface to **restore the factory defaults** for the device, you must first delete the device and add it again using MeshManager so that the device type will be properly identified in the database.

Web Interface Utility

Initial configuration and management of MOTOMESH infrastructure devices can also carried out using the Web Interface utility. The Web Interface application is designed to support the setup and configuration of smaller MOTOMESH networks. It can be used as an alternative to the MeshManager during the initial setup and configuration of MOTOMESH infrastructure devices. The application uses standard elements of a Web-based interface to allow the user to configure the basic parameters of seven primary network management elements required to successfully deploy a MOTOMESH network using the navigation menu displayed on each page.

Detailed information about the Web Interface utility can be found in the *Web Interface Users Guide*.

Hardware Installation Notes

For a MOTOMESH deployment, a permanent power source for each MOTOMESH Duo 4300 device must be provided. All infrastructure devices require professional installation to ensure that the installation is performed in accordance with FCC licensing regulations

Infrastructure devices are fitted with a single pivot mounting bracket designed to be attached to light poles and other probable installation sites. Alternate mounting hardware is available for mounting directly to posts or structures that are too large for the standard bracket. Optional remote antenna mount hardware is also available for use with the alternate mounting hardware.

Ports and Connections

The following list defines the standard ports and connections for the MOTOMESH Duo 4300 device running in either the IAP or MWR modes.

- **100-240V** A/C Power Cable with flying leads
- One **non Power over Ethernet (PoE)** Ethernet port
- One **Power over Ethernet (PoE)** capable port supporting:
  - Canopy Connect PoE
  - Standards based 802.3af PoE

IAPs can be pre-configured to use Canopy Connect PoE or 802.11 Standards Based PoE or with POE Disabled.

- Optional External Personality Plug to activate power over Ethernet Motorola Canopy ™ PoE or standards based 802.3af PoE.
- Mounting Bracket

Operator Supply List

The Network Operator must supply the following equipment:

- Mounting Location
- Power Source (100-240 VAC depending on IAP configuration)
- Ethernet connection between the IAP and MiSC.

Optional Antennas

The following antennas are recommended for use with Infrastructure Devices.

Table 2-1 Recommended Antennas for Infrastructure Devices

Motorola Part Number	Gain	Usage
8571327H01	8 dBi	2.4GHz Infrastructure Antenna
8563328B02	6 dBi	2.4GHz Infrastructure Low Power Antenna
8563328B03	4 dBi	2.4GHz Infrastructure Low Profile Antenna
8571328H01	10 dBi	5.8GHz Infrastructure antenna
8563339B01	6 dBi	5.8GHz Low Power Infrastructure Antenna
RAN4044A	10 dBi	5.4GHz Infrastructure Antenna

Motorola Part Number	Gain	Usage
RAN4019A	11 dBi	4.9GHz Infrastructure Antenna

Antenna Support Bracket

An optional support bracket (Figure 2-1, Motorola Part Number 0763325A01) can be ordered to stabilize the antennas when a network device is mounted horizontally.

Figure 2-1 Optional Antenna Support Bracket

MOTOMESH DUO Infrastructure Device Labels

The MAC address for each device is recorded on a label located on the device enclosure. Record this number in the provided ***IAP or MWR*** MAC Address Table section. The MAC Addresses will be required later to configure and test the device.

Figure 2-2 MOTOMESH DUO 4300 - 49 AC and DC Device Product Labels (Samples)

Figure 2-3 MOTOMESH DUO 4300 - 58 AC and DC Device Product Labels (Samples)

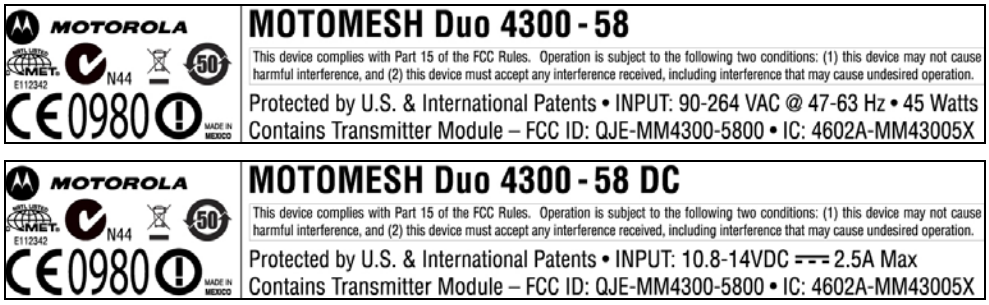
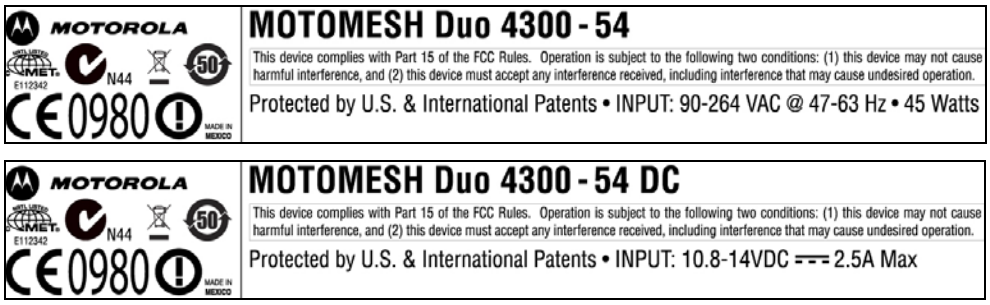


Figure 2-4 MOTOMESH DUO 4300 - 54 AC and DC Device Product Label (Samples for European Use only)



Infrastructure Device MAC Address Table

Table 2-2 MAC Address Table

IAP or MWR	Device Name	Ethernet MAC IP Address

Infrastructure Device Assembly

Figure 2-5 shows the external connection points for a MOTOMESH Duo 4300 device. The figure below it shows some examples of optional personality plugs (Black – Canopy Connect PoE, and Standards based 802.3 af PoE White). A red Hardware Reset Plug (not shown below) is also available and is used to reset a 4300 device back to its factory default configuration.

Figure 2-5 Infrastructure Device Top View showing External Connection Points

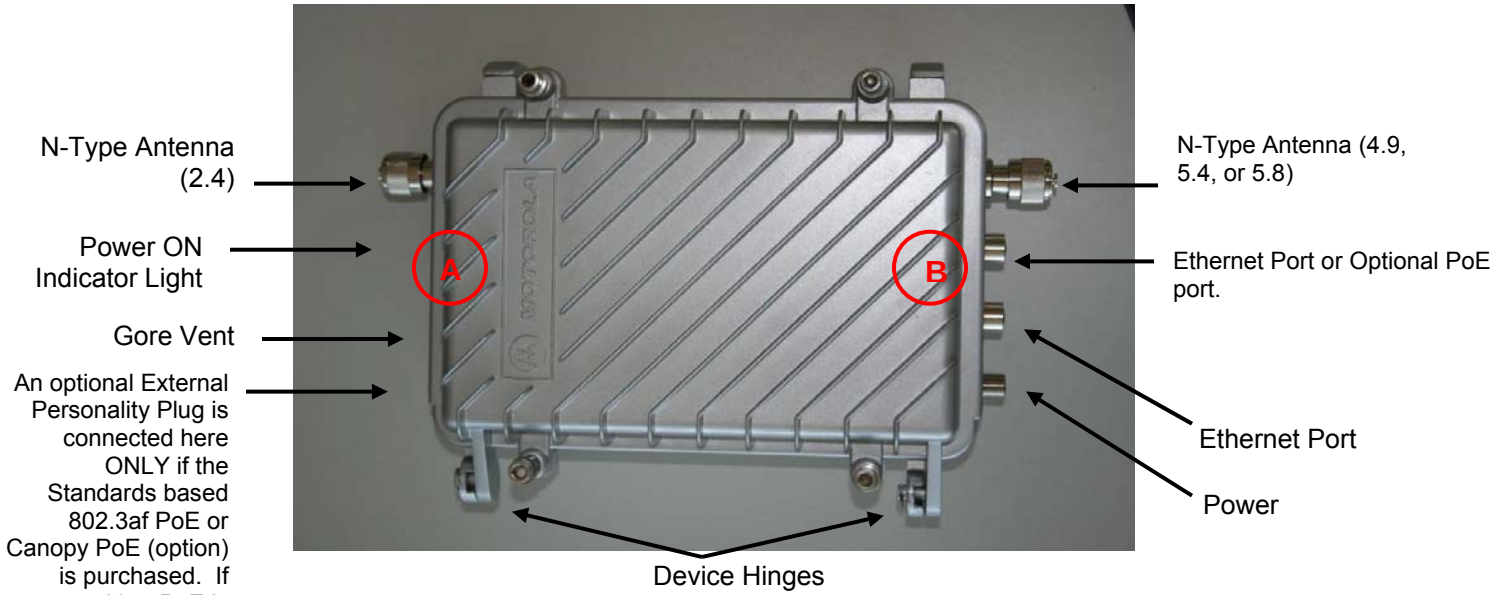
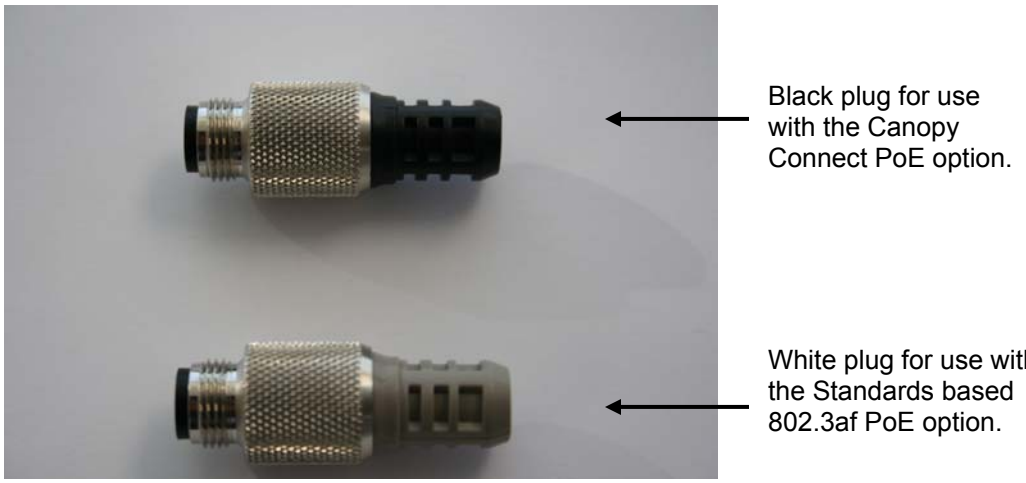


Figure 2-6 External Personality Plugs (Black, White, Red, or none)



NOTE: An optional Red Hardware Reset Plug (not shown above) is used to reset a 4300 device back to its factory default configuration. The Hardware Reset Plug must be inserted for more than 4 seconds and then removed.

Figure 2-7 Side View (B) of the 4300 External Connection Points

Figure 2-8 Side View (A) of the 4300 External Connection Points

Personality Plug Port showing port cover when no plug is attached.

Personality Plug Usage Information

Procedure 2-1 Personality Plug Usage Information

1	Connect an external PoE device to the POE OPT port on the 4300 unit with the Ethernet cable provided.
2	Connect the Canopy Connect or Standards based 802.3 af PoE Personality Plug to the Personality Port (shown above) AFTER the Ethernet cable has been connected to the desired external device.

Reset Plug Usage Information

An optional Red Hardware Reset Plug (looks like a red personality plug, not shown above) is used to reset a 4300 device back to its factory default configuration.

Procedure 2-2 Reset Plug Usage Information

1	Connect the Reset Plug to the Personality Port located on the “A” side of the 4300 device, same side as the Power ON indicator light.
2	The Hardware Reset Plug must be inserted for more than 4 seconds, and then removed.

BandPass Filter Usage Information

The BandPass filter should be used when running a MOTOMESH DUO device together with Canopy while operating in the 5.8GHz range. The bandpass filter is supported for the 5.8GHz band only.

The BandPass filter attaches to the 5.8 antenna socket, positioned between the unit and the antenna.

Figure 2-9 BandPass Filter Example

Infrastructure Device Deployment and Installation

MOTOMESH devices require professional installation to ensure that the installation is performed in accordance with Motorola installation standards**.** All common precautions for grounding and electrostatic discharge protection should be observed during deployment and installation.

To eliminate risk of electric shock, DO NOT connect/disconnect cables while units are energized.

Observe the following additional guidelines when deploying fixed Infrastructure devices:

- The MOTOMESH Duo 4300 device may be mounted on a pole having a diameter of 1-3.5 inches, utilizing the provided brackets.
- The antenna must have a separation distance of at least 2 meters from the body of all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.
- Users and installers must be provided with antenna installation and transmitter operating conditions to satisfy RF exposure compliance.
- When deploying the MOTOMESH Duo 4300 device, the antenna(s) should be a minimum of 30 inches from any nearby metal poles to avoid distortion of the RF pattern.
- The installation location must provide power to the MOTOMESH DUO 4300 Device.

- It is the responsibility of the Network Operator to ensure that the installation complies with any local building codes and permits.

Grounding Considerations

In order for a grounding system to be effective, a low impedance path to earth ground must be present. The grounding system must have conductors of sufficient size to withstand the high fault currents that must be shunted along this path. The lower the impedance the grounding system displays, the better its capability to perform its task. The impedance requirement for a communications site is determined by the classification of the site. Sites are broken down into 2 categories: Type A-Light Duty and Type B-Light Industrial/Commercial. Type A-Light Duty sites have impedance requirements of 25 ohms or less to ground whereas Type B- Light Industrial/Commercial sites have impedance requirements of less than 5 ohms to ground. MOTOMESH networks fall into the Type B-Light Industrial/Commercial category, and therefore must be treated with greater considerations as far as grounding requirements are concerned.

Since Type B grounding requirements stipulate 5 ohms or less impedance to earth ground, things such as soil pH, type of grounding rods, size of conductors, and ground enhancing materials must be taken into account to achieve this goal. To verify the impedance requirements are met, a special Earth/Ground Resistance Tester (megohmmeter) may be necessary.

- If the MOTOMESH product is attached to a light arm and the attachment point meets the Type B grounding requirements, then the grounding stud attachment point is not required to be used.

WARNING

To avoid damage to the equipment, adequate grounding for all MOTOMESH devices is mandatory.

Assembling an AC Power MOTOMESH Duo Device

Use the following procedure to assemble a MOTOMESH Duo Device with AC power.

Procedure 2-3 Assembling a US AC Power MOTOMESH Duo Device

1	Place the brackets at the desired position on the pole.
2	Adjust the position of the box so that the antenna connecters are positioned vertically. Align the antennas with the N-type connectors on the box and rotate to close.
3	Insert the cable into the external Ethernet port and tighten the connector to ensure a weatherproof seal.
4	Insert the Power Plug into the 4-pin connector. **Note:** For detailed wiring instructions, see the separate US Wiring instructions, generally provided with the cable and power connector.

Procedure 2-4 Assembling a European or Australian AC Power MOTOMESH Duo Device

1	Place the brackets at the desired position on the pole.
2	Adjust the position of the box so that the antenna connecters are positioned vertically. Align the antennas with the N-type connectors on the box and rotate to close.
3	Insert the cable into the external Ethernet port and tighten the connector to ensure a weatherproof seal.
4	Insert the Power Plug into the 3-pin connector. **Note:** For detailed wiring instructions, see the separate European or Australian Wiring instructions, generally provided with the cable and power connector.

Assembling a DC Power MOTOMESH Duo Device

Use the following procedure to assemble a MOTOMESH Duo Device with DC power.

Procedure 2-5 Assembling a US or European/Australian DC Power MOTOMESH Duo Device

1	Place the brackets at the desired position on the pole.
2	Adjust the position of the box so that the antenna connecters are positioned vertically. Align the antennas with the N-type connectors on the box and rotate to close.
3	Insert the cable into the external Ethernet port and tighten the connector to ensure a weatherproof seal.
4	Identify a certified LPS power supply capable of 10.8-14VDC. Using the custom power cable provided, connect the **Red** wire to power and the **White** wire to ground. If a power source chassis ground is available, connect the **Green** wire to the chassis ground. **Important Note:** If the cable has 4 wires, (Black/White/Red/Green), Black is not connected. If the cable has 3 wires, (Red/Black/Green), connect RED to Power, Black to Ground and Green to Chassis.

Device Connectivity Testing

Only *after* a MiSC has been setup on the network, and an infrastructure device has been added using the MeshManager, element management system software, that the procedure below can be used to verify connectivity to a device.

Procedure 2-6 Testing Infrastructure Device Connectivity

1	Apply power to the device, the device should be operation in 60 to 120 seconds
2	Obtain the 802.11 MAC addresses for the device subcomponents that were recorded in the MAC Address Table earlier in this manual. The address will be in the following format: xx-xx-xx-xx-xx-xx.
3	Within the Device Manager screen, right-click on the appropriate IAP or MWR device in the Device Tree and select the **Ping Device** option.
4	Check for a successful response to the **Ping** command in the *Named Device* results dialog box. A successful response to the ping commands verifies connectivity to the device (IAP or MWR).
5	Repeat steps 1-4 for additional IAP or MWR devices.

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Chapter

3

Chapter 3: Device Configuration

This chapter includes the following sections:

- Pre-staging a MOTOMESH Duo 4300 device in MeshManager
- Demoting and Promoting an IAP
- Second IP Stack Aids in Troubleshooting

Pre-staging a MOTOMESH Duo 4300 Device in MeshManager

Default Device Configuration

The following is a description of default configurations for a MOTOMESH Duo 4300 device:

- Each device is preconfigured to support a Single Radio (802.11b/g) or a Dual Radio (802.11b/g *and* 802.11a) configuration. If you originally ordered a Single Radio device and have now bought a license to activate the second radio, the following sections will describe how to enable the additional 802.11a radio and network mesh.
- Management VLAN is set at 4095
- VLAN Membership is set at 0-4095

Configuring a 4300 Device Mesh from 2.4 to 5.4, 5.8, or 4.9

The following procedure describes the steps required to configure and add the following device types prior to field deployment using the MeshManager EMS:

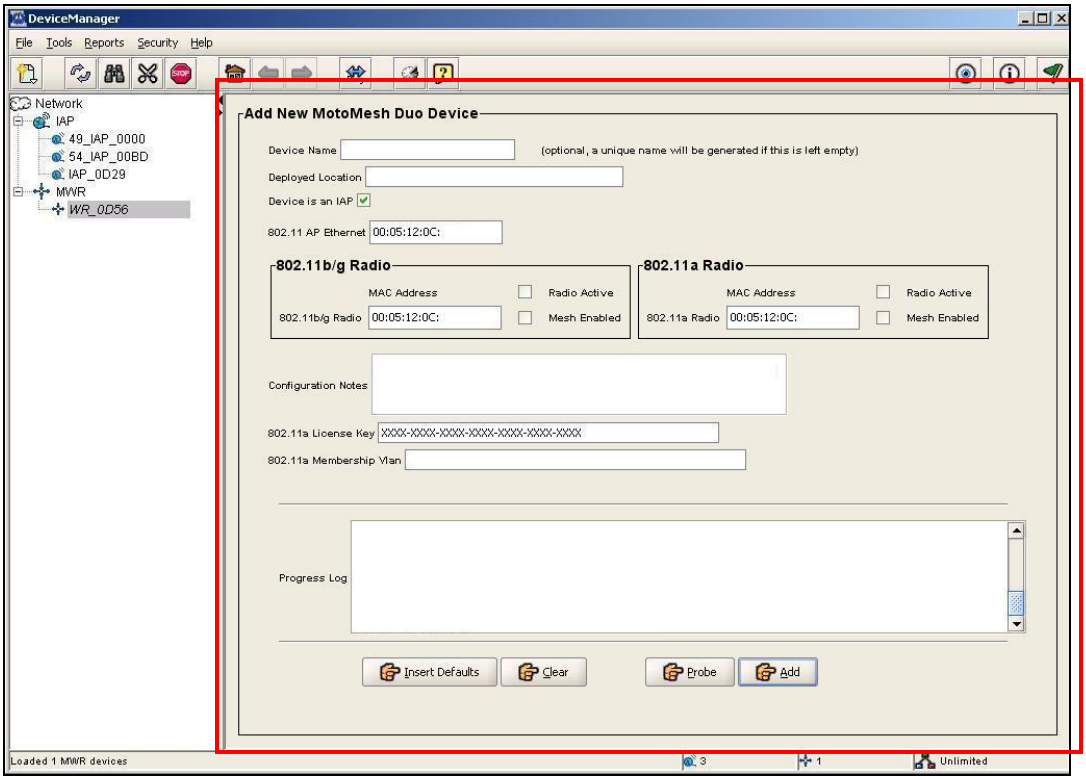
- 2.4/5.XGHz Dual Radio configured from the factory (details in Step 7)
- 2.4GHz Single Radio only configuration (details in Step 8)
- 2.4/4.9GHz Dual Radio configured from the factory (details in Step 9)
- 2.4GHz Single Radio only configuration for which you now want to activate the 802.11a radio using a License Key (details in Step 10)

Procedure 3-1 Configuring a MOTOMESH Duo 4300-XX Device Mesh

1	Ensure that all the 4300 devices are wire-connected to the MOTOMESH Duo 2.0 MiSC.  It is recommended that the 4300 devices are set-up on the bench prior to actual deployment in the field.
2	The MOTOMESH Duo 2.0 MeshManager element management application must be installed and running.
3	From within MeshManager select the  **Add New MOTOMESH Duo Device** icon from the Toolbar menu, or select **File |Add New MOTOMESH Duo Device** from the application menu.

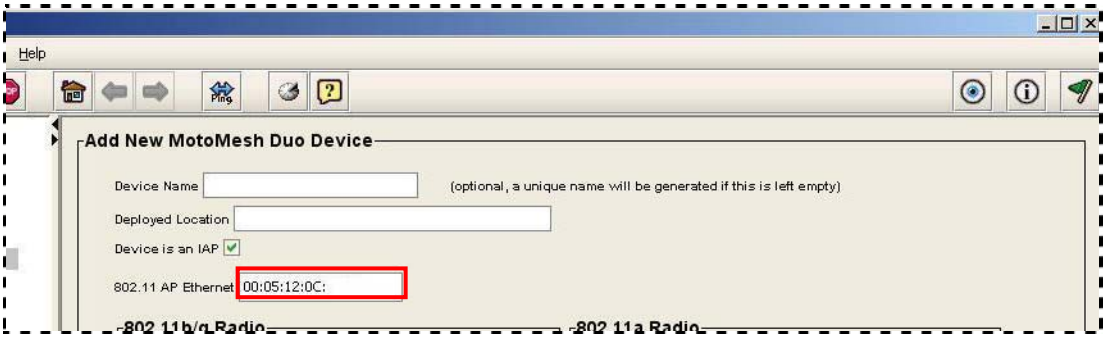
4 The **Add New MOTOMESH Duo Device** panel will be displayed.

Figure 3-1 The Add New MOTOMESH Duo Device Panel in MeshManager



5 Enter the 4300 802.11 Ethernet MAC address on the external label for the device in the **802.11 AP Ethernet** entry field.

Figure 3-2 Entering the 802.11a Ethernet MAC Address in MeshManager



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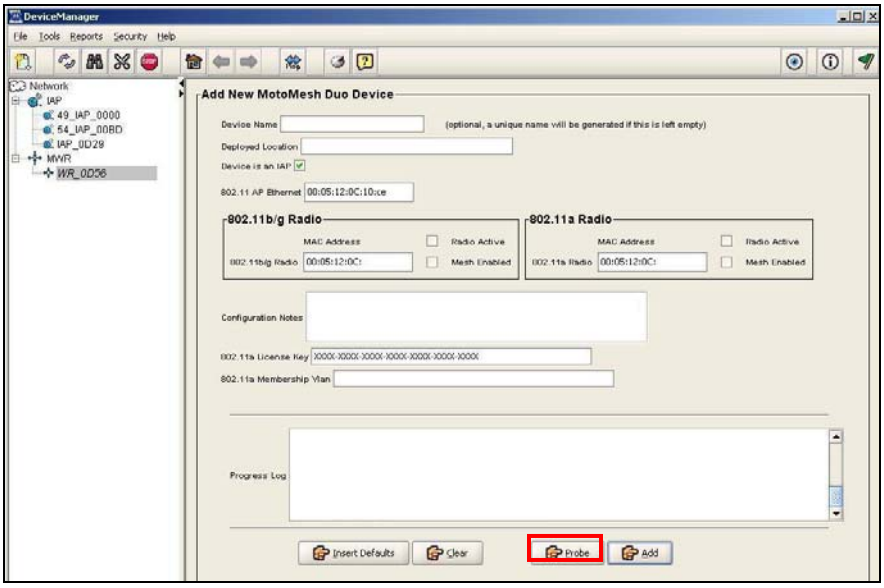
After entering the Ethernet MAC address for the device, click **Probe**.

The *probing* operation will ensure that the device is communicating with the MiSC in addition to capturing the other MAC Addresses.

Figure 3-3 Selecting the Probe Button in MeshManager



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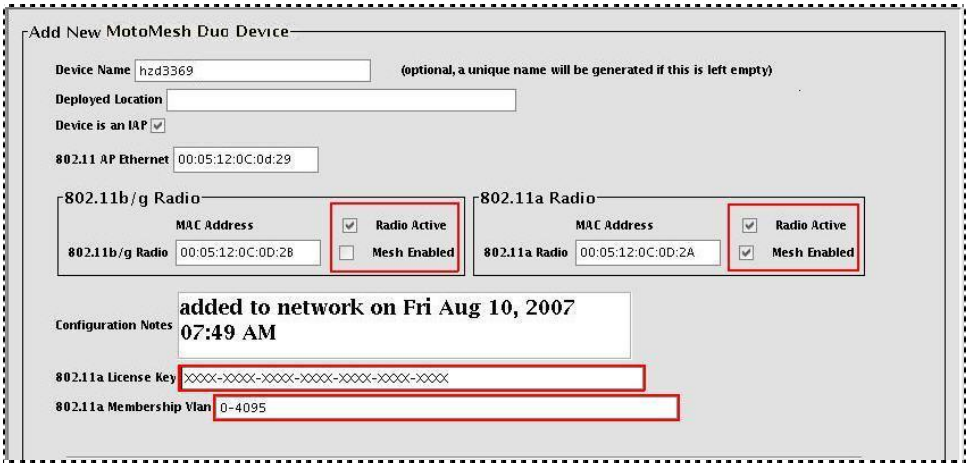
When ordering a **Dual Radio device with an active 5.8GHz or 5.4GHz 802.11a radio**, the device is preconfigured from the factory with both the 802.11b/g and 802.11a radios active.

When the Add New MOTOMESH Duo Device panel is displayed as you add the device to the network, note that the **802.11b/g** Radio is ENABLED by default and the **802.11a** Radio and Mesh are **both** enabled by default.

The **802.11a License Key** string and **802.11a Membership VLAN** default setting (0-4095) will be displayed. Since the settings for a Dual Radio have been preconfigured with the factory defaults for the device, the license key is not required.

You do not need to make any changes to these parameters.

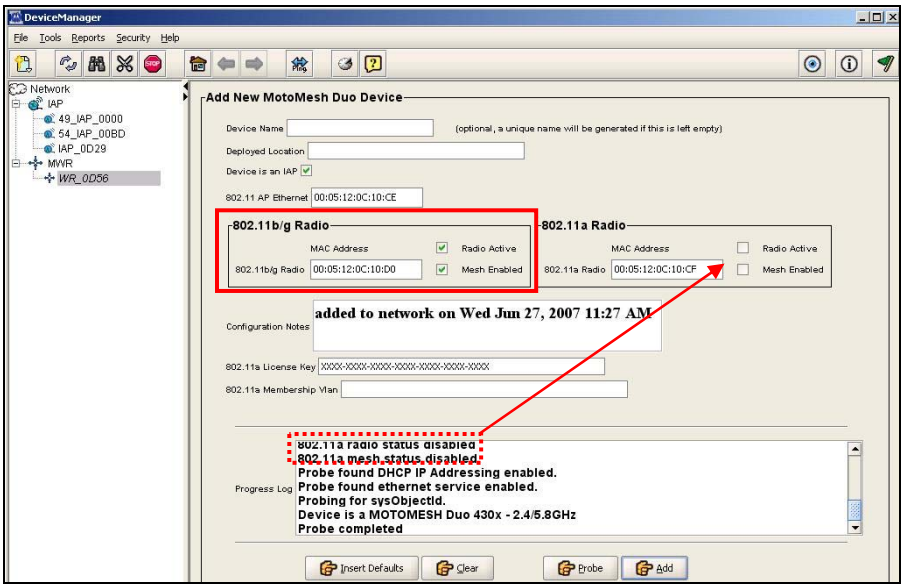
Figure 3-4 Dual Radio 4300 Device Preconfigured with 5.8/5.4 802.11a Radio Active



To complete this procedure, go to Step 18 below.

8 When ordering a **Single Radio** device from the factory, note that after initial *Probing* during the *Add New Device* procedure, the **802.11b/g** Radio and Mesh are **both** ENABLED by default and the **802.11a** Radio and Mesh are both DISABLED by default.

Figure 3-5 Examining Initial Device Defaults in MeshManager



NOTE

DO NOT enter any License Key or Membership VLAN information.

To complete this procedure, go to Step 18 below.

9 When enabling the **802.11a** Radio and Mesh on a 4300-49 device, select the 802.11a **Radio Active** check box AND the **Mesh Enabled** check box.

Figure 3-6 Enabling the *802.11a* Radio on a 4300-49 Device

Both Meshes will be enabled.

To complete this procedure, go to Step 18 below.

10 If you had previously ordered a **Single Radio** device and now wish to activate the 802.11a radio using a license key, select the 802.11a **Radio Active** check box AND the **Mesh Enabled** check box to enable the 802.11a Radio and Mesh devices.

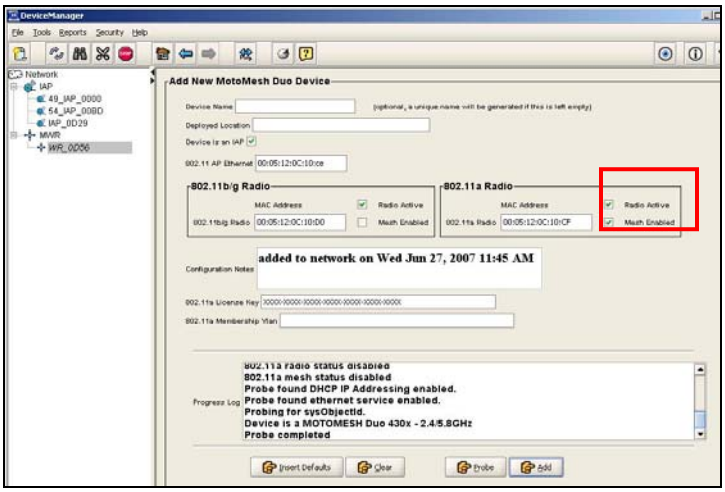
NOTE

Selecting the 802.11a Radio Active and Mesh Enabled check boxes will automatically cause the **802.11b/g Radio Active** check box to remain enabled while the **Mesh Enabled** check box will be deselected.

IMPORTANT

Only one mesh can be active when setting up 2.4/5.4 and 2.4/5.8 devices. However, when setting 2.4/4.9 devices, both meshes will be activated.

Figure 3-7 Enabling the *802.11a* Radio on a Device

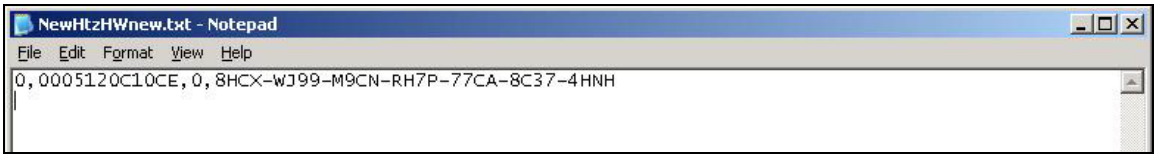


11 Minimize MeshManager temporarily as you will return to it shortly. There are still tasks that must be performed in MeshManager to complete the *Adding* and *Changing* of a New Device from an **802.11b/g** Mesh into an **802.11a** Mesh network.

12 Open the License Key text file that was provided with your MOTOMESH DUO 2.0 Product CDs. The file should be located on its own CD. Check with your sales representative for the exact file name.

The file contents will look similar to the graphic below. If there are several devices to add to a (5.x) 802.11a Mesh network, then several license keys may be listed in one License Key file. Note that each License Key is unique to a MAC Address.

Figure 3-8 An Example of a License Key Text File

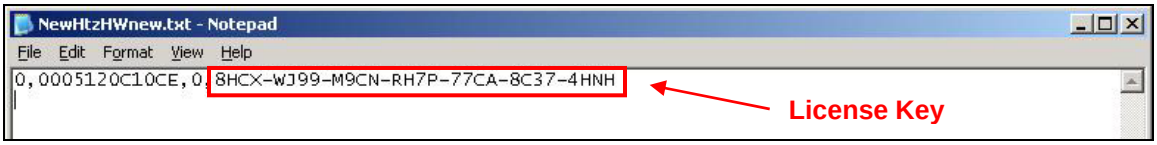


13 Copy ONLY the License Key from the text file to the clipboard. Verify that you copying the correct License key by comparing the MAC Address listed after the first comma delimiter to the MAC Address of your device(s).

IMPORTANT

DO NOT copy any extra characters or spaces from the front or back of the License key data. Any extra spaces in the License key can render the key unrecognizable by a device.

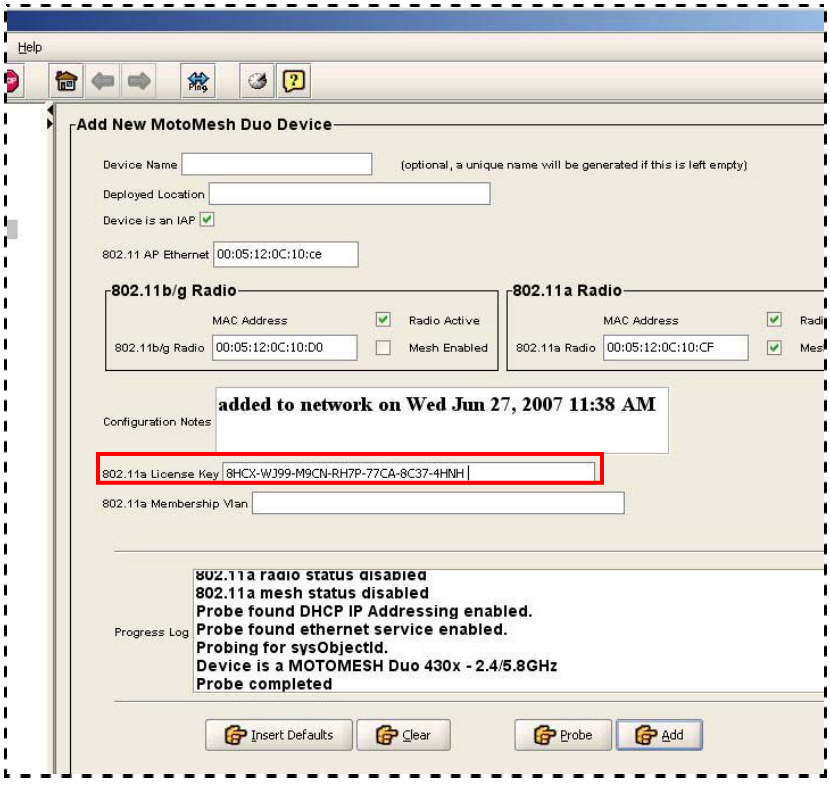
Figure 3-9 Copying the License Key from the Text File



14 Maximize the view for the MeshManager application.

15 Paste the previously copied License key into the **802.11a License Key** entry field in MeshManager.

Figure 3-10 Pasting the License Key into MeshManager



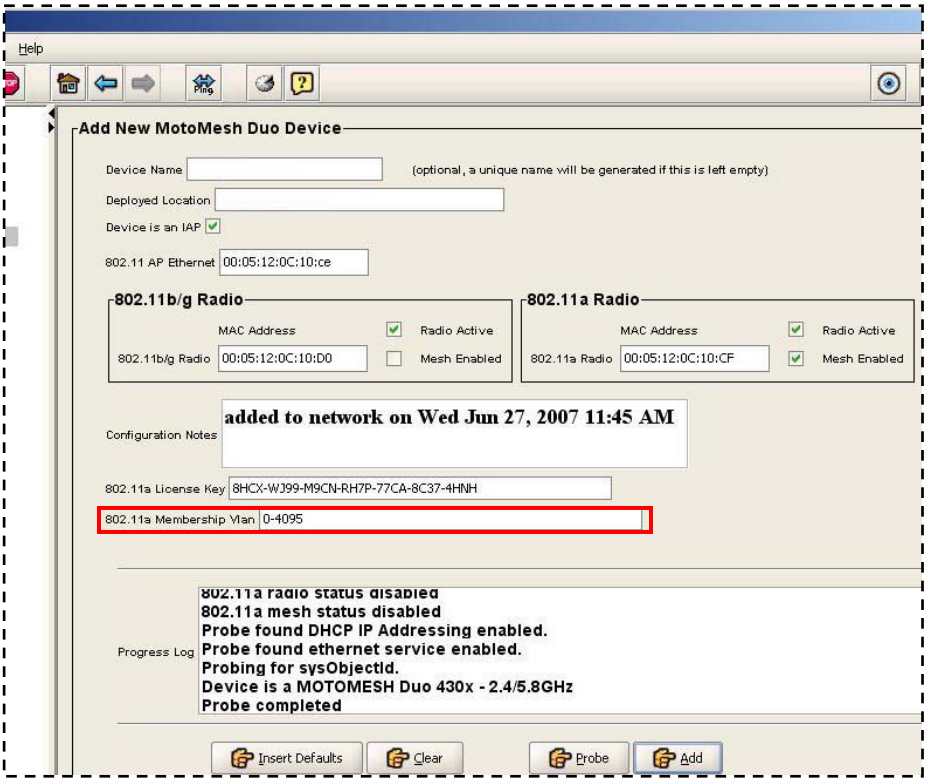
16 Configure the 802.11a Membership VLAN by entering 0-4095 into the **802.11a Membership VLAN** entry field.

IMPORTANT

The minimum requirement for this field is 4095, which is the initial designated Management VLAN.

If the NEW Device is to be a 2.4/4.9 Mesh, the **802.11a Membership VLAN** entry field will become disabled. This is will eliminate the possibility of creating a network loop and VLAN overlap. Use the VLAN Configuration Tool after the device(s) have been added using the **Tools | VLAN Configuration** menu option.

Figure 3-11 Entering 802.11a Membership VLAN Data



17 Decide if you want the device to be an IAP or an MWR on your network.

The **Device is an IAP** checkmark is ENABLED by default. If you wish to add a device to the Network as a MWR, simply uncheck the check box associated with this selection.

IMPORTANT

All MOTOMESH Duo 4300 devices are initially preconfigured as IAPs. If you wish to demote an IAP to a WR after it has been added to the Network, you can do so at a later time.

Figure 3-12 Configuring a Device to be an IAP or WR

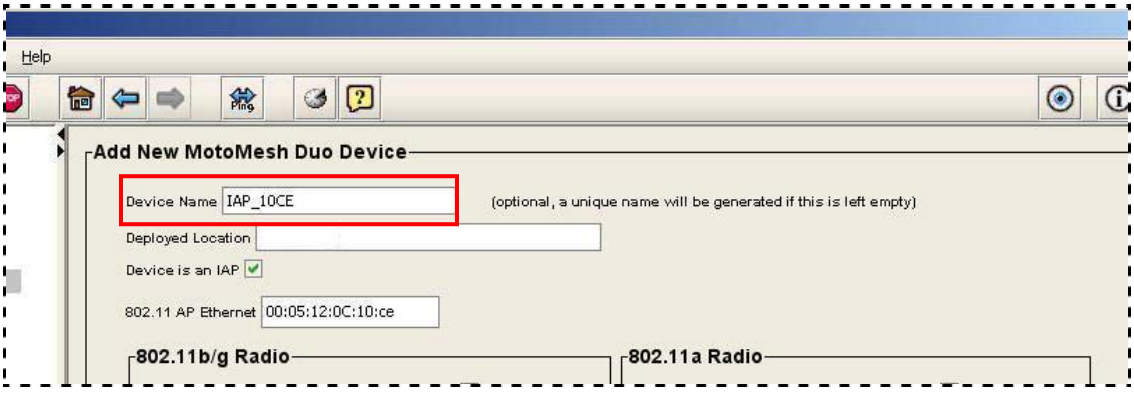
18 Enter a device name into the **Device Name** entry field. Follow the device network naming conventions established for your network.

IMPORTANT

No spaces are allowed when entering a Device Name. Your entry must be a fully qualified Domain Name.

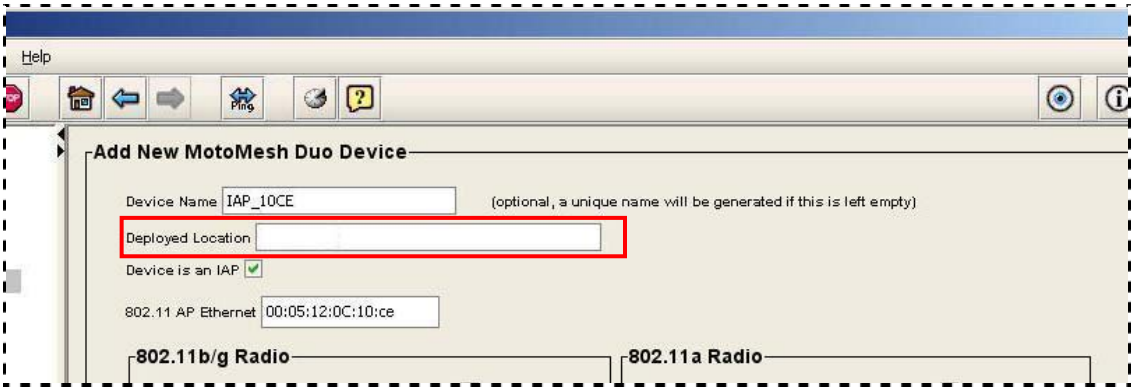
If a device name is not entered, MeshManager will randomly generate a unique name.

Figure 3-13 Entering a Device Name



19 Enter an optional deployed location description into the **Deployed Location** entry field. Follow the device network naming conventions established for your network.

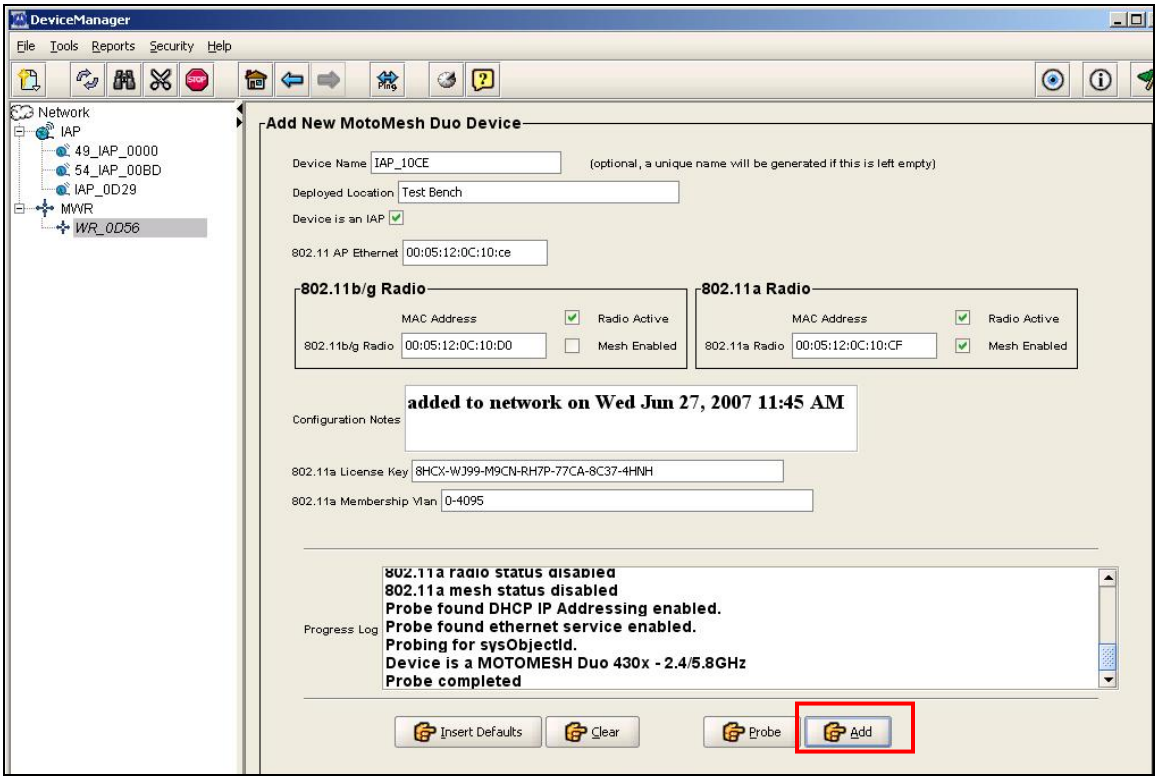
Figure 3-14 Entering an Optional Deployed Location



20 All of the Device configuration selections should now be completed.

Select the **Add** button to formally add the device to the Network.

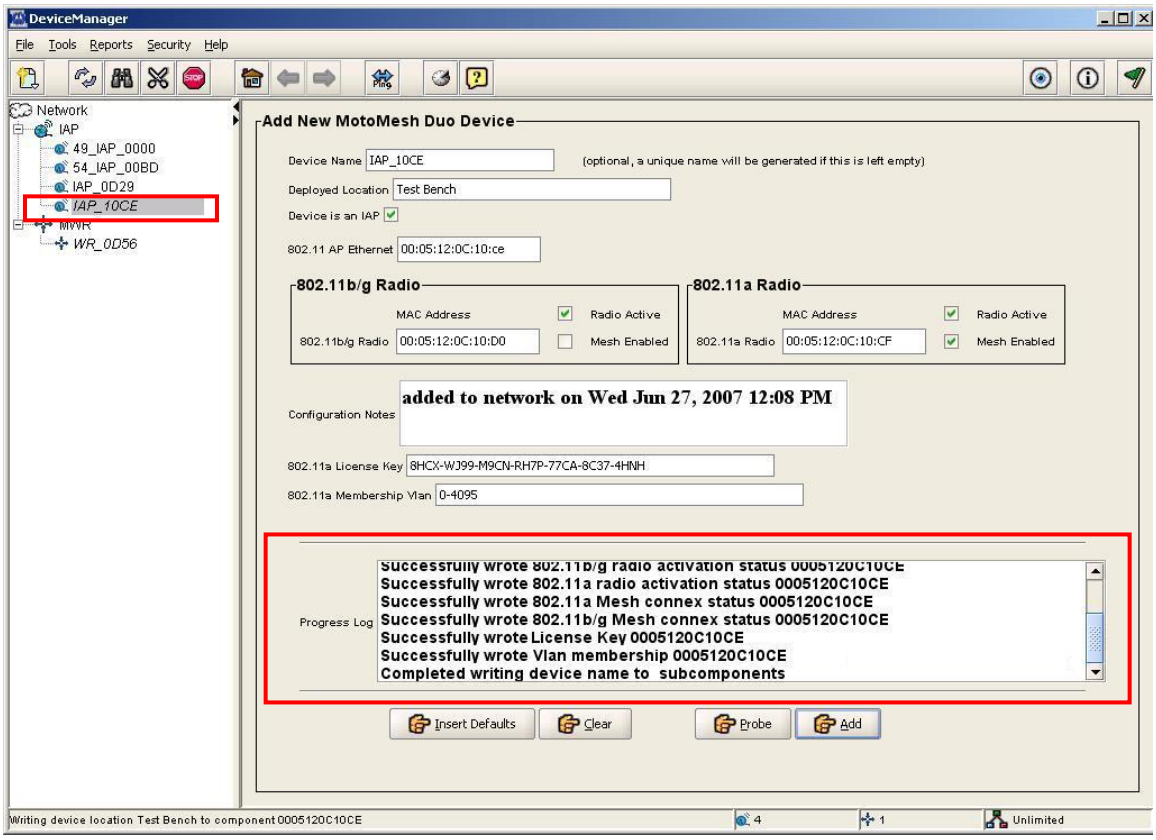
Figure 3-15 Adding a Device to the Mesh



21 Observe the **Progress Log** for any errors.

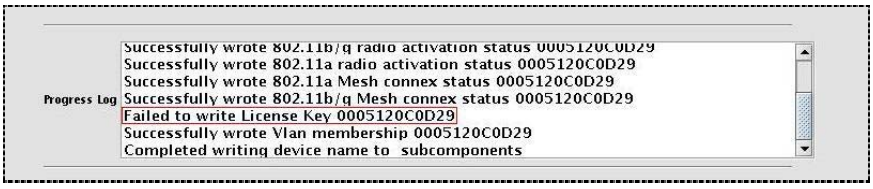
Notice that the new device is now displayed in the IAP group in the Device Tree in MeshManager.

Figure 3-16 After Adding a Device to the Mesh



NOTE

When adding a Dual Radio device that has been preconfigured from the factory, a license key IS NOT required. A *Failed to write License Key* message will appear in the Progress Log. This is expected behavior and you can disregard the message.



22 To verify the new device configuration, select the **Probe** button again to re-probe the device.

IMPORTANT

If there are any errors at the time that a device is added, performing a *re-probe* will confirm a successful configuration.

23

A successfully configured device will display the same information in the entry fields and check boxes that were intended when configuring the device. Incorrectly displayed entry fields or check boxes will be a sign of a failed device configuration.

You can also check the progress log for the following characteristics:

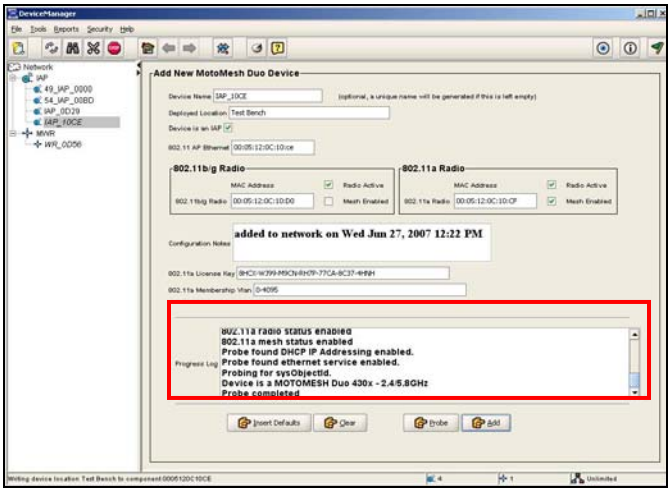
- 802.11a radio status enabled
- 802.11a mesh status enabled
- Probe found DHCP IP addressing
- Successfully wrote 802.11a ….
- Successfully wrote License Key xxxxxxxxxx (newly added license key #)

NOTE

When adding a Dual Radio device that has been preconfigured from the factory, a license key IS NOT required. A *Failed to write License Key* message will appear in the Progress Log. This is expected behavior and you can disregard the message.

- Successfully wrote VLAN Membership xxxxxxxxx (newly added license key #)
- Completed writing device name to subcomponents.

Figure 3-17 After Successfully Adding a Device to the Mesh



24

If any errors are detected, you should delete the device from the Device Tree and start over with the specific device.

To delete a device, right-click on the in the Device Tree, and then select **Delete Device** from the pop-up menu.

25	 **IMPORTANT** *Changes to any of the following fields:* *- 802.11 Radio* *- License Key* *- Membership VLAN* *- Device is an IAP (check box)* *would require a system Restart to take effect.* *This can be accomplished using the **Select an Action** dropdown menu on or by physically removing and reapplying power to the device.*
26	End of Procedure.

Demoting an IAP Device to a MWR

The following is a step by step procedure that describes how to demote an existing IAP device to an MWR, and then promote it back to an IAP.

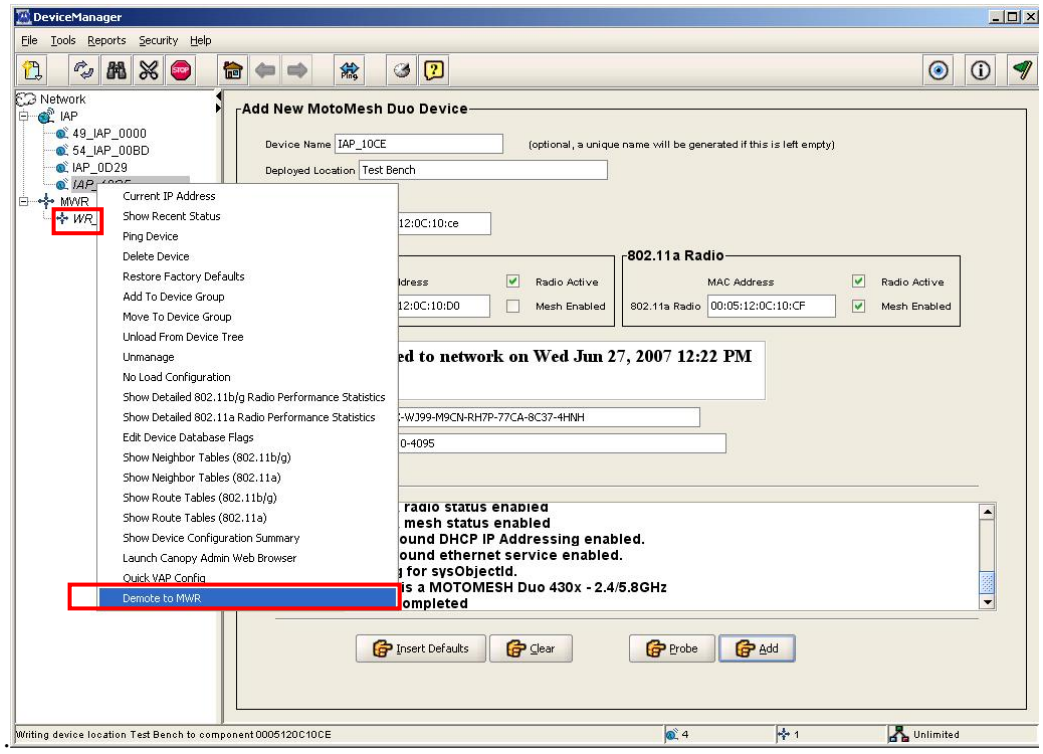
IMPORTANT

1. *Once a device is demoted to an MWR, you will no longer be able to communicate with the device through its Ethernet connection. It will need to route to an active IAP.*
2. *Careful considerations should be made prior to demoting an IAP with respect to VLAN configurations. Precautions must be taken to prevent a loop condition from occurring in the network.*
3. *When a device is demoted, it will no longer use backhaul detection routines even if the Backhaul Detection feature is enabled.*
4. *The demoted device will be restarted as part of the change.*

Procedure 3-2 Demoting an IAP to a MWR

1 Within MeshManager, right-click on the IAP device to be demoted and select **Demote to MWR**.

Figure 3-18 Selecting an IAP Device to be Demoted

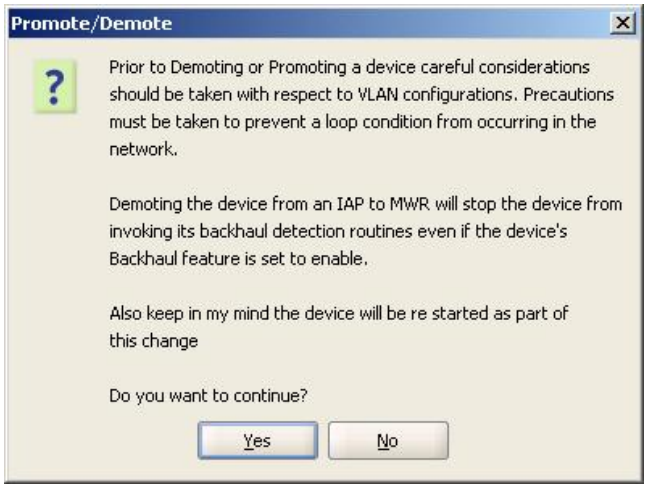


2 From the newly opened **Promote/Demote** dialog box, select **Yes** to continue demoting the device, or select **No**.

IMPORTANT

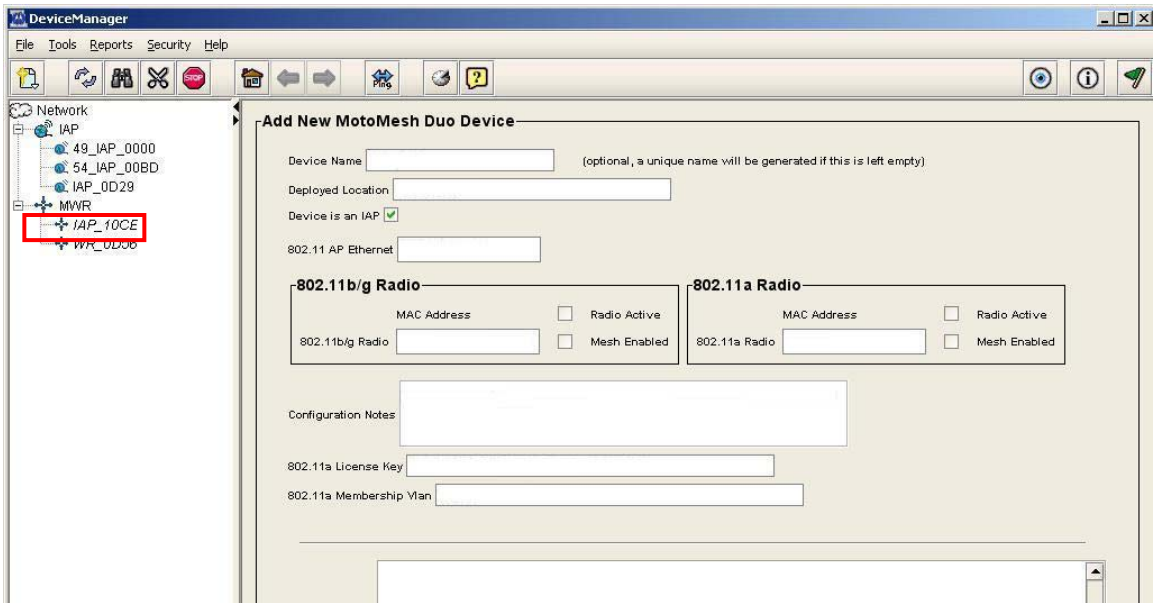
1. Careful consideration should be taken prior to demoting an IAP with respect to VLAN configurations. Precautions must be taken to prevent a loop condition from occurring in the network.
2. When a device is demoted it will stop invoking its backhaul detection routines even if the Backhaul feature is enabled for the device.
3. The demoted device will be restarted as part of the change.

Figure 3-19 Promote / Demote Dialog



3 The successfully demoted IAP is now displayed in the MWR group in the Device Tree.

Figure 3-20 Demoted IAP Device shown moved into a MWR Group



4	To Promote the device back to an IAP, right-click on the device in the *Device Tree* and choose **Promote to an IAP** from the pop-up menu.
5	From the newly opened **Promote/Demote** dialog box, select **Yes** to continue promoting the device, or select **No**.
6	The device icon will be moved from the MWR group to the IAP group in the Device Tree.

Second IP Stack Aids in Troubleshooting

The second IP Stack feature is available in MOTOMESH Duo 4300 devices and allows for a pre-configured SSID and connectivity to a fixed IP. This feature can assist you with correcting and diagnosing some cases of stranded units rather than having to roll a bucket truck. Operators will find this feature helpful when configuring nodes for expansion or replacement.

Second IP Stack Settings

A MOTOMESH Duo device can be accessed via an 802.11b/g client access card (a PCMCIA Wireless Client Card) that is attached to a laptop computer. The client access card must be set to the settings specified in the *MeshManager Users Guide Device Recovery Configuration Tab* section to enable a successful connection.

VAP 15 information is to be used only for Second IP Stack data.

Accessing the MOTOMESH Duo Device Recovery Settings in MeshManager

Procedure 3-3 Accessing the MOTOMESH Duo Device Recovery Settings

1	Select a specific device from the *Device Tree* in MeshManager.
2	From the right side of the screen, select **Global Configuration** from the *Action* drop-down list.
3	Select the ***Device Recovery*** tab.
4	View the Default VAP 15 Settings setup for the purpose of device recovery.
5	You can choose to keep the default settings or change them after your wireless network is setup, configured, and working properly.

Device Recovery Settings

The MOTOMESH Duo *device recovery* default settings (VAP 15) have the following conditions:

Authentication Type	WPA-AUTO-PSK
Cipher Mode	AUTO
Passphrase	blackd0g
Static IP Address	192.168.1.1
IP Network Mask	255.255.255.0
SSID	
SSID Suppression	On

If you change any of the default settings for VAP15, make sure that when it is time to recover your MOTOMESH Duo Device, the Client Access Card is set to match your current network settings for Device Recovery (VAP15).

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Chapter

4

Chapter 4: License Information

This chapter includes the contents of the Motorola End User License Agreement (EULA) as well as a Third Party License section.

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hostapd - user space IEEE 802.11aP and IEEE 802.1X/WPA/WPA2/EAP
        Authenticator and RADIUS authentication server
=================================================================

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Chapter

5

Chapter 5: Customer Service

This chapter provides information about how to obtain customer service support from Motorola and describes the type of information you should have available prior to making the support call.

Customer Service Information

If you have read this document and made every effort to resolve installation or operation issues yourself and still require help, please contact your regional Motorola support representatives

USA

Motorola System Support Center (SSC) using the following contact information:

Phone: 800-221-7144

Hours of Operation: 7 days a week, 24 hours

Europe

Phone: +44 (0)1793 564680

Email: essc@motorola.com

Hours: Mon-Fri 09:00 - 17:00 GMT

Calls are logged 24 x 7, cases will be worked Mon-Fri 09:00 - 17:00 GMT

Asia and Pacific Region

Remote Technical Help Desk (Channel Partners)
Phone: +63 28 92 79 93
Email: wi4Tech@motorola.com
Hours of Operation: Mon - Fri 8 am - 6 pm
Sat 8 am - 12 noon

Obtaining Support

Motorola provides technical support services for your system and recommends that you coordinate warranty and repair activities through the Motorola System Support Center (SSC). When you consult the Motorola SSC, you increase the likelihood that problems are rectified in a timely fashion and that warranty requirements are satisfied. Check your contract for specific warranty and service information.

System Information

To be provided with the best possible opportunity for support, collect the following system information and have it available when obtaining support.

- Location of the system
- Date the system was put into service
- Software or firmware version information for components of your system
- Serial number(s) of the device(s) or component(s) requiring support
- A written description of the symptom or observation of the problem:

  - When did it first appear?

  - Can it be reproduced?

  - What is the step-by-step procedure to cause it?
- Do other circumstances contribute to the problem? For example, changes in weather or other conditions?
- Maintenance action preceding problem:

  - Upgrade of software or equipment

  - Change in the hardware or software configuration

  - Software reload - from backup or from CD-ROM (note the version and date)

Return Material Request

After collecting system information, contact the Motorola System Support Center for assistance or to obtain a Return Material Authorization (RMA) number for faulty Field Replaceable Entities (FREs):

North America: 800-221-7144

Radio Products and Services Division

The Radio Products and Services Division is your source for manuals and replacement parts.

Radio Products and Services Division Telephone Numbers

The telephone numbers for ordering are: (800)-422-4210 (US and Canada orders)

The fax numbers are: (800)-622–6210 (US and Canada orders)

The number for help identifying an item or part number is (800)-422-4210; select choice “3” from the menu

Returning System Components to Motorola

Motorola's service philosophy is based on field replaceable entities (FREs). FREs are system components identified by Motorola to be returned to Motorola for repair.

Returning FREs

Return faulty FREs to Motorola for repair. When you return an assembly for service, follow these best practices:

- Place any assembly containing CMOS devices in a static-proof bag or container for shipment.
- Obtain a return authorization (RA) number from the Motorola System Support Center.
- Include the warranty, model, kit numbers, and serial numbers on the job ticket, as necessary.
- If the warranty is out of date, you must have a purchase order.
- Print the return address clearly, in block letters.
- Provide a phone number where your repair technician can be reached.
- Include the contact person's name for return.
- Pack the assembly tightly and securely, preferably in its original shipping container.

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Chapter

6

Chapter 6: Certification and Safety Information

This chapter lists the relevant FCC Certification and Product Safety Information for the MOTOMESH devices described in this manual.

FCC Regulatory Information

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.

The IAP (Intelligent Access Point) is an infrastructure device that is positioned at a fixed location such as a building rooftop.

The MWR (Mesh Wireless Router) is an infrastructure device positioned in a fixed location, such as on a pole, wall, or rooftop. The MWR requires professional installation to ensure the installation is performed in accordance with FCC licensing regulations.

Federal Communications Commission (FCC) Statement

Intelligent Access Point/Mesh Wireless Router

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Safety Information for the MOTOMESH Products

The Federal Communications Commission (FCC) with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC certified equipment. Motorola MOTOMESH products meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1, 1991. Proper operation of this radio according to the instructions found in this manual and the hardware and software guides on the MOTOMESH CD will result in user exposure that is substantially below the FCC recommended limits.

- Do not touch or move the antenna(s) while the unit is transmitting or receiving.
- Do not hold any component containing a radio such that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is a type especially qualified for such use.
- Do not operate the radio or attempt to transmit data unless the antenna is connected; otherwise, the radio may be damaged.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 2 meters between the radiator and your body.

Safety Certification

Conforms to UL STD ANSI/UL 60950 3rd Edition

- Certified to CAN/CSA C22.2 NO. 60950-00

Equipment shall be suitable for use in Air pressure: 86kPa to106kPa.

Regulatory Requirements and Legal Notices

Regulatory Requirements for CEPT Member States (www.cept.org)

When operated in accordance with the instructions for use, Motorola MOTOMESH Wireless equipment operating in the 2.4 and 5.4 GHz bands is compliant with CEPT Recommendation 70-03 Annex 3 for Wideband Data Transmission and HIPERLANs. For compliant operation in the 2.4 GHz band, the transmit power (EIRP) from the antenna shall be no more than 100mW (20dBm). For compliant operation in the 5.4 GHz band, the transmit power (EIRP) from the antenna shall be no more than 1 W (30 dBm).

The following countries have completely implemented CEPT Recommendation 70-03 Annex 3A (2.4 GHz band):

- EU & EFTA countries**:** Austria, Belgium, Denmark, Spain, Finland, Germany, Greece, Iceland, Italy, Ireland, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Switzerland, Sweden, UK
- New EU member states**:** Bulgaria, Czech Republic, Cyprus, Estonia, Hungary, Lithuania, Latvia, Malta, Poland, Slovenia, Slovakia
- Other non-EU & EFTA countries: Bosnia and Herzegovina, Turkey

The following countries have a limited implementation of CEPT Recommendation 70-03 Annex 3A:

- France - Outdoor operation at 100mW is only permitted in the frequency band 2400 to 2454 MHz;

  Any outdoor operation in the band 2454 to 2483.5MHz shall not exceed 10mW (10dBm);

  Indoor operation at 100mW (20dBm) is permitted across the band 2400 to 2483.5 MHz
- French Overseas Territories:

  Guadeloupe, Martinique, St Pierre et Miquelon, Mayotte – 100mW indoor & outdoor is allowed

  Réunion and Guyana – 100mW indoor, no operation outdoor in the band 2400 to 2420MHz
- Italy - If used outside own premises, general authorization required
- Luxembourg - General authorization required for public service
- Romania - Individual license required. T/R 22-06 not implemented

Motorola MOTOMESH Radios operating in the 2400 to 2483.5MHz band are categorized as “Class 2” devices within the EU and are marked with the class identifier symbol  , denoting that national restrictions apply (for example, France). The French restriction in the 2.4 GHz band will be removed in

2011. This 2.4 GHz equipment is “CE” marked CE0980 to show compliance with the European Radio & Telecommunications Terminal Equipment (R&TTE) directive 1999/5/EC and that National restrictions apply.

Where necessary, the end user is responsible for obtaining any National licenses required to operate this product and these must be obtained before using the product in any particular country. However, for CEPT member states, 2.4 GHz Wideband Data Transmission equipment has been designated exempt from individual licensing under decision ERC/DEC(01)07. For EU member states, RLAN equipment in both the 2.4 & 5.4GHz bands is exempt from individual licensing under Commission Recommendation 2003/203/EC. Contact the appropriate national administrations for details on the conditions of use for the bands in question and any exceptions that might apply. Also see http://www.ero.dk for further information.

Motorola MOTOMESH dual radio Radio equipment operating in the 5470 to 5725 MHz band also operates in the 2400 to 2483.5MHz band and is categorized as “Class 2” devices within the EU because of the additional 2.4GHz radio. These devices will become “Class 1” devices after 2011 when the restrictions on the 2.4GHz band are removed but are currently “CE” marked CE0980 to show compliance with the European Radio & Telecommunications Terminal Equipment (R&TTE) directive 1999/5/EC and that National restrictions apply.

Relevant Declarations of Conformity can be found at
http://motorola.canopywireless.com/support/software/index.php?catid=10

European Union Notification

The CE mark is the official marking required by the European Community for all Electric and Electronic equipment that will be sold, or put into service for the first time, anywhere in the European community. It proves to the buyer or user that this product fulfills all essential safety and environmental requirements as they are defined in the European Directives.

CE0980

Motorola Products are covered under the following product certification Europe:

ETSI EN 300 328 V 141 (2003-04)

ETSI EN 301 489-1 (2002-08) and EN 301 489-17

EN 55022:1998 and EN 55024:1998

CENELEC EN 50360 and EN50371 – Specific Absorption Test – SAR

European Union Notification 5.7GHz Product

The 5.7 GHz MOTOMESH is a Class 2 device and uses operating frequencies that are not harmonized throughout the EU member states. The operator is responsible for obtaining any national licenses required to operate this product and these must be obtained before using the product in any particular country. The 5.7GHz MOTOMESH dual radio products also operate in the 2.4GHz band – see other sections of this document for restrictions on operating in the 2.4GHz band.

This equipment is marked CE0980! to show compliance with the European R&TTE directive 1999/5/EC and that National restrictions apply.

The relevant Declaration of Conformity can be found at http://motorola.canopywireless.com/support/software/index.php?catid=10

Equipment Disposal

Waste (Disposal) of Electronic and Electric Equipment

Please do not dispose of Electronic and Electric Equipment or Electronic and Electric Accessories with your household waste. In some countries or regions, collection systems have been set up to handle waste of electrical and electronic equipment. In European Union countries, please contact your local equipment supplier representative or service center for information about the waste collection system in your country.

UK Notification

The 5.7 GHz MOTOMESH product has been notified for operation in the UK, and when operated in accordance with instructions for use it is compliant with UK Interface Requirement IR2007. For UK use, installations must conform to the requirements of IR2007 in terms of EIRP spectral density against elevation profile above the local horizon in order to protect Fixed Satellite Services. The frequency range 5795-5815 MHz is assigned to Road Transport & Traffic Telematics (RTTT) in the U.K. and shall not be used by FWA systems in order to protect RTTT devices. UK licensing specifies that radiolocation services shall be protected by a Dynamic Frequency Selection (DFS) mechanism to prevent co-channel operation in the presence of radar signals.

Belgium Notification

Belgium national restrictions in the 2.4 GHz band include

- EIRP must be lower then 100 mW
- For crossing the public domain over a distance > 300m the user must have the authorization of the BIPT.
- No duplex working

Luxembourg Notification

For the 2.4 GHz band, point-to-point or point-to-multipoint operation is only allowed on campus areas. 5.4GHz products can only be used for mobile services.

Czech Republic Notification

2.4 GHz products can be operated in accordance with the Czech General License No. GL-12/R/2000.

5.4 GHz products can be operated in accordance with the Czech General License No. GL-30/R/2000.

Norway Notification

Use of the frequency bands 5725-5795 / 5815-5850 MHz are authorized with maximum radiated power of 4 W EIRP and maximum spectral power density of 200 mW/MHz. The radio equipment shall implement Dynamic Frequency Selection (DFS) as defined in Annex 1 of ITU-R Recommendation M.1652 / EN 301 893. Directional antennae with a gain up to 23 dBi may be used for fixed point-to-point links. The power flux density at the border between Norway and neighbouring states shall not exceed - 122.5 dBW/m^2 measured with a reference bandwidth of 1 MHz.

MOTOMESH 5.7GHz products have been notified for use in Norway and are compliant when configured to meet the above National requirements. Users shall ensure that DFS functionality is enabled, maximum EIRP respected for a 20 MHz channel, and that channel spacings comply with the allocated frequency band to protect Road Transport and Traffic Telematics services (for example, 5735, 5755, 5775 or 5835 MHz are suitable carrier frequencies).

Greece Notification

The outdoor use of 5470-5725MHz is under license of EETT but is being harmonized according to the CEPT Decision ECC/DEC/(04) 08, of 12th November 2004. End users are advised to contact the EETT to determine the latest position and obtain any appropriate licenses.

DECLARATION OF CONFORMITY

CE0980

Česky [Czech]	Motorola tímto prohlašuje, že tento *Motorola* ***MOTOMESH Duo 4300-54*** *series,* je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede Motorola erklærer herved, at følgende udstyr *Motorola* ***MOTOMESH Duo 4300-54*** *series,* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF
Deutsch [German]	Hiermit erklärt Motorola, dass sich diese Motorola MOTOMESH Duo 4300-54 series, in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi)
	Hiermit erklärt Motorola die Übereinstimmung des Gerätes Motorola MOTOMESH Duo 4300-54 series, mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)
Nederlands [Dutch]	Hierbij verklaart Motorola dat het toestel *Motorola* ***MOTOMESH Duo 4300-54*** *series,* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG
	Bij deze verklaart Motorola dat deze *Motorola* ***MOTOMESH Duo 4300-54*** *series,* voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.
English	Hereby, Motorola, declares that this *Motorola* ***MOTOMESH Duo 4300-54*** *series,* is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Eesti [Estonian]	Käesolevaga kinnitab Motorola seadme Motorola MOTOMESH Duo 4300-54 series, vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
Suomi [Finnish]	Motorola vakuuttaa täten että *Motorola* ***MOTOMESH Duo 4300-54*** *series*, tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Français [French]	Par la présente Motorola déclare que l'appareil *Motorola* ***MOTOMESH Duo 4300-54*** *series*, est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE
	Par la présente, Motorola déclare que ce *Motorola* ***MOTOMESH Duo 4300-54*** *series*, est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables
Ελληνική [Greek]	*ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ* Motorola *ΔΗΛΩΝΕΙ ΟΤΙ Motorola* ***MOTOMESH Duo 4300-54*** *series, ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ*

Magyar [Hungarian]	Alulírott, Motorola nyilatkozom, hogy a *Motorola* ***MOTOMESH Duo 4300-54*** *series,* megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Íslenska [Icelandic]	Hér með lýsir Motorola yfir því að *Motorola* ***MOTOMESH Duo 4300-54*** *series,* er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
Italiano [Italian]	Con la presente Motorola dichiara che questo *Motorola* ***MOTOMESH Duo 4300-54*** *series,* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo Motorola deklarē, ka *Motorola* ***MOTOMESH Duo 4300-54*** *series,* atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo Motorola deklaruoja, kad šis *Motorola* ***MOTOMESH Duo 4300-54*** *series,* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Malti [Maltese]	Hawnhekk, Motorola, jiddikjara li dan *Motorola* ***MOTOMESH Duo 4300-54*** *series,* jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC
Norsk [Norwegian]	Motorola erklærer herved at utstyret *Motorola* ***MOTOMESH Duo 4300-54*** *series,* er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.
Slovensky [Slovak]	Motorola týmto vyhlasuje, že *Motorola* ***MOTOMESH Duo 4300-54*** *series,* spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Slovensko [Slovenian]	Motorola izjavlja, da je ta *Motorola Canopy* ***MOTOMESH Duo 4300-54*** *series*, v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Svenska Swedish	Härmed intygar Motorola att denna *Motorola* ***MOTOMESH Duo 4300-54*** *series,* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Español [Spanish]	Por medio de la presente Motorola declara que el *Motorola* ***MOTOMESH Duo 4300-54*** *series,* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE
Polski [Polish]	Niniejszym, firma Motorola oświadcza, że produkt serii *Motorola* ***MOTOMESH Duo 4300-54*** *series*, spełnia zasadnicze wymagania i inne istotne postanowienia Dyrektywy 1999/5/EC.
Português [Portuguese]	Motorola declara que este *Motorola* ***MOTOMESH Duo 4300-54*** *series,* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

EU Declaration of Conformity for RoHS Compliance

Motorola hereby, declares that this *Motorola MOTOMESH **4300-xx** series* is in compliance with the essential requirements and other relevant provisions of Directive 2002/95/EC, Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment for the Motorola products listed.

DECLARATION OF CONFORMITY

Motorola declares under it sole responsibility that the products, to which this declaration relates, conform to the applicable essential requirements of the following Directive(s) of the Council of the European Communities:

- 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on the radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).
- 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
- 2004/108/EC of 20 July 2007 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).
- 2006/95/EC on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).
- 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

Product: Model: Motorola ***MOTOMESH Duo 4300-54 and MOTOMESH Duo 4300-54 DC***

Model Number	Description
HK1599A	Mains (90-264Va.c. 47-63Hz) powered single radio (2.4GHz) assembly comprising: • MLUX4019A – 2.4/5.4GHz radio unit (a.c.) • 8571327H01 – 2.4GHz 8dBi Omni antenna
HK1717A	Mains (90-264Va.c. 47-63Hz) powered dual radio (2.4GHz & 5.4GHz) assembly comprising: • MLUX4019A – 2.4/5.4GHz radio unit (a.c.) • 8571327H01 – 2.4GHz 8dBi Omni antenna • RAN4044A – 5.4GHz 10dBi Omni antenna
HK1598A	D.C. (10.8 – 14 VDC) powered single radio (2.4GHz) assembly comprising: • MLUX4023A – 2.4/5.4GHz radio unit (d.c.) • 8571327H01 – 2.4GHz 8dBi Omni antenna
HK1720A	D.C. (10.8 – 14 VDC) powered dual radio (2.4GHz & 5.4GHz) assembly comprising: • MLUX4023A – 2.4/5.4GHz radio unit (d.c.) • 8571327H01 – 2.4GHz 8dBi Omni antenna • RAN4044A – 5.4GHz 10dBi Omni antenna

Manufacturer: Motorola Inc.
Description: Dual Radio transceiver operating in 2.4/5.4GHz band using Atheros AP30 chipset. 802.11a/b/g

Conformity: **Harmonized standards / Methods used to demonstrate conformity: Annex IV of R&TTE using MET Laboratories Notified Body, CE0980Φ. Certified to meet:-**

a) Safety – EN 60950-1:2001 + Amendment A11:2004
b) Radio – EN300 328 v1.7.1 & EN301 893 v1.2.3
c) EMC – EN 301 489-1 v1.6.1 & EN 301 489-17 v1.2.1
d) Health – N.B. Statement of Opinion & Test Report 22037 MPE Calculation

Year of first application of CE mark: 2007

Signature:

Name: W. Vann Hasty
Title: Director of Engineering,
Mesh Network Product Group

Name: Laura Phillips
Title: Quality Director

Date: October 29th 2007

November 2007

CMM Labeling and Disclosure Table

The People's Republic of China require that our products comply with China Management Methods (CMM) environmental regulations. (China Management Methods refers to the regulation *Management Methods for Controlling Pollution by Electronic Information Products* Two items are used to demonstrate compliance; the Label and Disclosure Table.

The label is placed in a customer visible position on the product. The first of the following examples means that the product contains no hazardous substances; the second means that the product contains hazardous substances, and has an Environmental Friendly Use Period (EFUP) of fifty years.

Logo 1 Logo 2

The Environmental Friendly Use Period (EFUP) is the period (in years) during which the Toxic and Hazardous substances (T&HS) contained in the Electronic Information Product (EIP) will not leak or mutate causing environmental pollution, or bodily injury from use of the EIP.

The Disclosure Table, printed in simple Mandarin, is included with each customer order. An example of the Disclosure Table follows, in both Mandarin and English.

部件名称 (Parts)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 (Metal Parts)	×	○	○	×	○	○
电路模块 (Circuit Modules)	×	○	○	×	○	○
电缆及电缆组件 (Cables & Cable Assemblies)	×	○	×	×	○	○
塑料和聚合物部件 (Plastic and Polymeric parts)	○	○	○	○	○	×

○： 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
Indicates that the concentration of the hazardous substance in all homogeneous materials in the parts is below the relevant threshold of the SJ/T11363-2006 standard.

×： 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。
Indicates that the concentration of the hazardous substance of at least one of all homogeneous materials in the parts is above the relevant threshold of the SJ/T11363-2006 standard.

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Glossary

EDCF – Enhanced Distributed Coordination Function

EMS – Element Management System

IAP – Intelligent Access Point

MiSC – Mobile Internet Switching Controller

MWR– Mesh Wireless Router

POE – Power over the Ethernet, optional feature. Two types of PoE are currently supported on the MOTOMESH Duo 4300 device. It is the standards based 802.3af PoE or the Canopy Connect PoE. Only one type of PoE is available at any one time, if this optional feature is purchased, otherwise PoE is not enabled.

TFTP - Trivial File Transfer Protocol. A network utility that is simpler to use than the File Transfer Protocol (FTP).

WR – Wireless Router (same as MWR)

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