

Bullet M5 Setup for Passive Mobile Wireless Downloads

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CAUTION If the omni-directional antenna is used, the additional black neoprene sealing washer provided with the kit must be installed in the antenna connector to ensure a waterproof seal. Water intrusion into the Bullet may occur if the additional washer is not installed.

NOTE Follow “Tips on Using Bullet 5 with Bullet M5” at the end of this bulletin to mix the newer M5 devices with the older, discontinued Bullet 5. The Passive Mobile and Master Fuel Management Unit (Master FMU) must be using firmware v3.69 or later to utilize this procedure. If the Master FMU is connecting to the Central Controller (CC) via modem (telephone or Two-Way Ringdown Device), the CC software must be v5.2.0.38 or later. If the Master FMU is connecting to the CC via LAN (cable, fiber, or wireless), the software must be v5.2.0.39 or later.

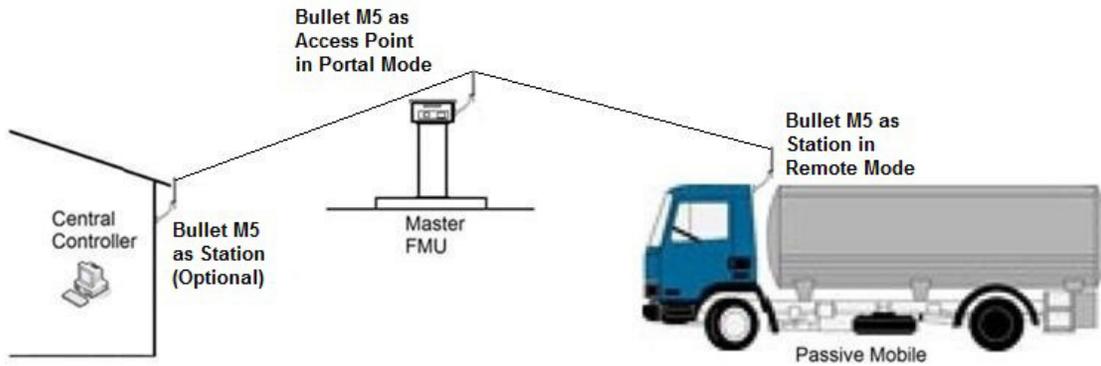


Figure 1 Wireless Path for Bullet M5 Passive Mobile Downloads

Purpose

Figure 1 depicts the wireless path from the Passive Mobile to the Master FMU and from the Master FMU to the CC. It is not necessary to use wireless from the CC to the Master FMU. LAN, telephone or a Two-Way Ringdown Device may be used to communicate to the Master FMU. If wireless communications were previously installed, reconfigure the Bullet M5 devices for this application. If previously installed on the Master FMU, reconfigure the Bullet M5 installed on the building end of the wireless network as a Station, and reconfigure the Bullet M5 installed on the Master FMU as an Access Point.

Description

Bullet M5 is a 5 GHz wireless network transmitter/receiver with an advertised line-of-sight range of 30 miles. When properly installed and configured on the Passive Mobile, the wireless Bullet M5 will continually look for a wireless connection to a Bullet M5 installed on a Master FMU. When the two devices connect, the transactions in the Passive Mobile will automatically download to the Master FMU to the compact flash card. The transactions are retrieved by the CC when the Master FMU is downloaded. When a LAN or wireless LAN connection is made from the CC to the master FMU, the connection described will permit a direct connection to the Passive Mobile from the CC for purposes other than downloads.

Since the Passive Mobile may be moving when a communications connection is made, and the connection may be lost as the vehicle moves, a transaction download will not be recorded until the download is successful. If the communications connection is lost before the download is complete, a full download must be accomplished when communications are restored. Download attempts will continue until a full download is completed.

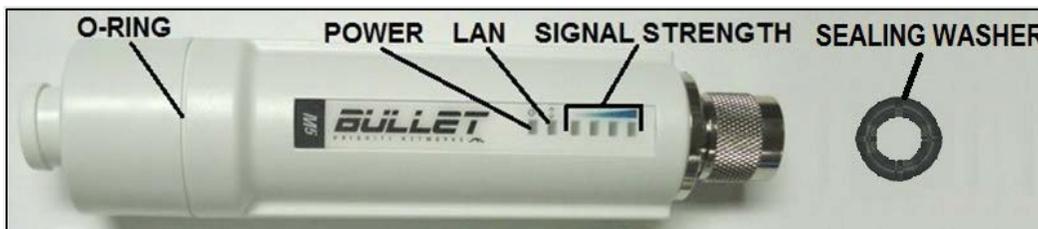


Figure 2 Bullet M5 LEDs and Seals

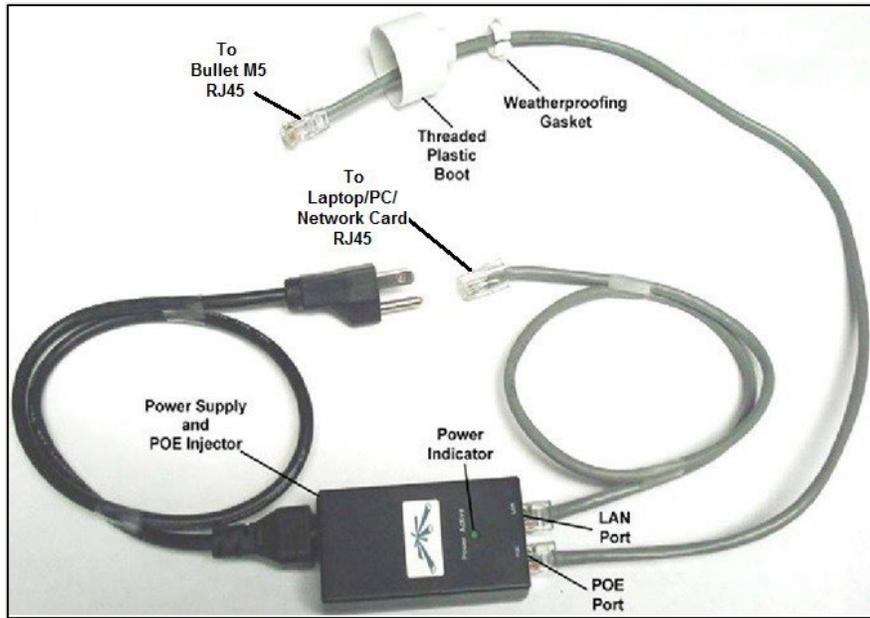


Figure 3 Power Supply/POE Injector and Patch Cables

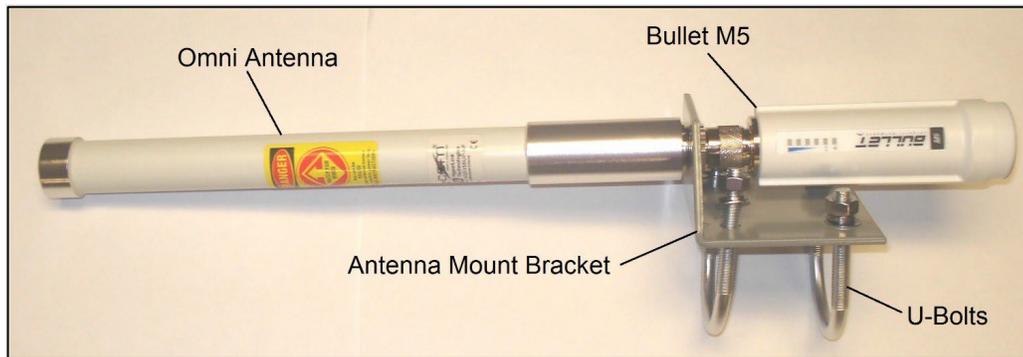


Figure 4 Bullet M5, Omni Antenna, Antenna Mount Bracket

Bullet M5 Kit Part Numbers

Bullet M5 may be programmed for connection to the CC (on the building), on a Master FMU, or on Passive Mobiles. However, the Bullet M5 is no longer manufactured. For replacement parts, please switch to the Ligowave (PB-228 or 230).

NOTE If Bullet M5 is being added to Passive Mobiles at an existing site already using Bullet M5 with omni antennas, purchase 941B0590A kits for the Passive Mobiles. The existing Bullet M5 on the building and Master FMU may be reconfigured here in Setup Procedures to work with this application.

Kit 941B0590. This kit is for use on the building or on the Master FMU:

Part Title	Amount
Bullet M5	1
universal wall/pole mount bracket	1
6dbi omni antenna	1
¼-20 x 0.75 screw	4
washer	4

¼-20 nut	4
strain relief	
network switch	1
2 ft patch cable (2 each: network switch to NIC, POE injector to Bullet M5)	
power supply with POE injector (plugs into 110VAC)	1
neoprene washer, 3/8 ID, 5/8 OD	1
3 ft outdoor patch cable with weather seal	1

Kit 941B0590A. This kit is for use on Passive Mobiles:

Part Title	Amount
Bullet M5-	1
universal wall/pole mount bracket -	1
6dbi omni antenna-	1
¼-20 x 0.75 screw-	4
Washer-	4
¼-20 nut-	4
2 ft patch cable (1 each: network switch to NIC)-	1
power supply with POE injector (connects to truck DC power)-	1
neoprene washer, 3/8 ID, 5/8 OD-	1
20 ft outdoor patch cable with weather seal	1
3 ft outdoor patch cable with weather seal	1

Setup Procedures

There are setup procedures for the Master FMU, Passive Mobile, Bullet M5, PC (Laptop and/or Central Controller), and FuelMaster® software. Before you can connect to and configure Bullet M5, configure your PC (or laptop) with a static IP address compatible with 192.168.1.20 where the address is set to any desired address after access is gained.

Bullet M5 Setup

Assumptions:

This tutorial assumes:

- The Bullet M5 has default settings active
 - Reader has access to Ubiquiti AirOS 5.5 User Guide at the following link:
https://dl.ubnt.com/guides/airOS/airOS_UG_V55_3-20-12.pdf
1. From the power supply/POE injector (STS part number 256684), run a patch cable from the LAN connector to the PC/laptop LAN port.
 2. Remove the Bullet M5 threaded plastic boot and weatherproofing gasket (Figure 3).
 3. Run a patch cable from the power supply/POE injector POE connector to the Bullet M5 RJ45 connector.
 4. Plug the power supply/POE injector into a 110VAC power source. The green Power Active light on the power supply/POE injector will illuminate, and the green power (⏻) LED, and the green LAN connect (↔) LED on the Bullet M5 will illuminate. After 15-30 seconds, connect using url:

http://192.168.1.20/. The first window that opens states there is a problem with this website's security certificate (**Figure 5**).

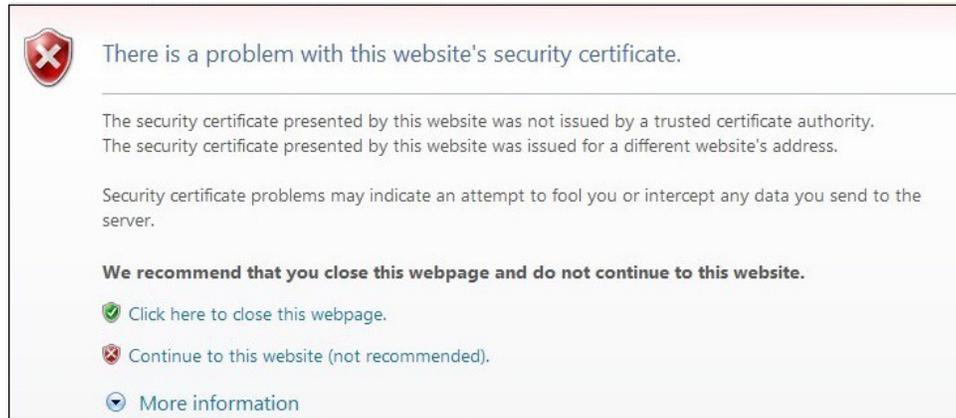


Figure 5 Certificate Error

5. Select “Continue to this website (not recommended)”.
6. Login (the default credentials are as follows):

Username: ubnt

Password: ubnt

NOTE If a change is made in any window, click on the Change button at the bottom of the window to save changes. At the top of the window, a prompt Configuration contains changes. Apply these changes? will appear with an Apply and Discard button. Click on the Apply button to save changes.

7. (Load a Stored Configuration File) If applicable, perform the following to load a stored configuration file:

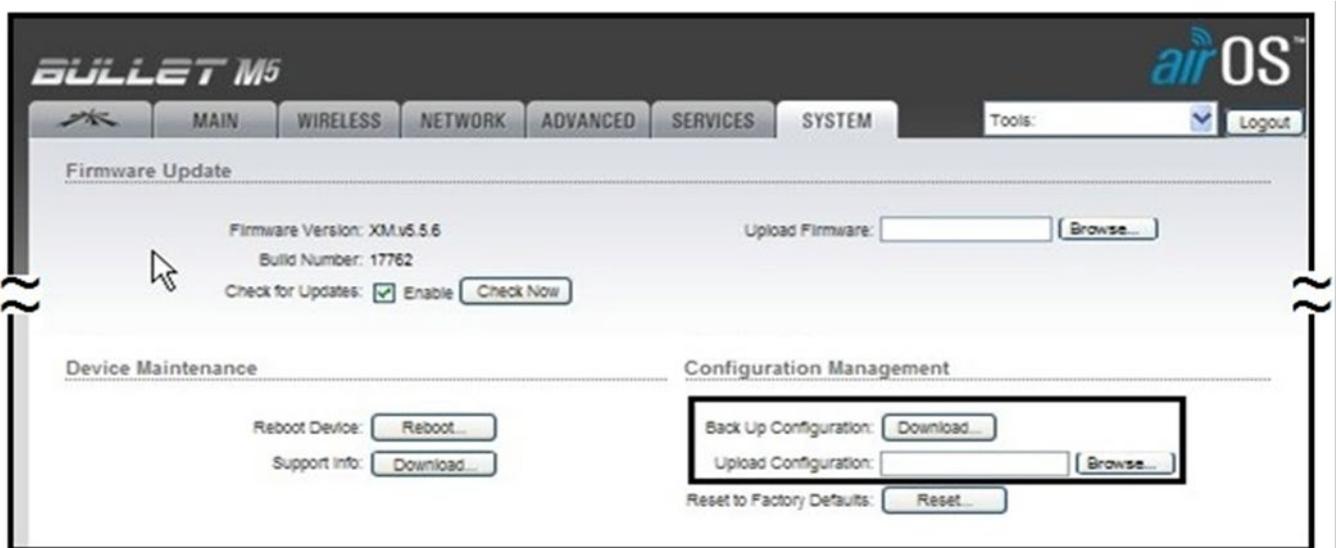


Figure 6 System Window

- a. Select the **SYSTEM** tab (See **Figure 6**).
- b. Under Configuration Management, select **Browse...**

- c. Browse and select the *.cfg file to load/restore.
 - d. Select **Open** button. The file name and path will be populated in the box to the right of Upload Configuration, and an Upload button will appear.
 - e. Select **Upload**. At the top of the window, a question, “Configuration contains changes. Apply these changes?” appears.
 - f. Select **Apply**. The change is applied, and the Bullet M5 is configured.
8. Select **WIRELESS** tab (See Figure 7).

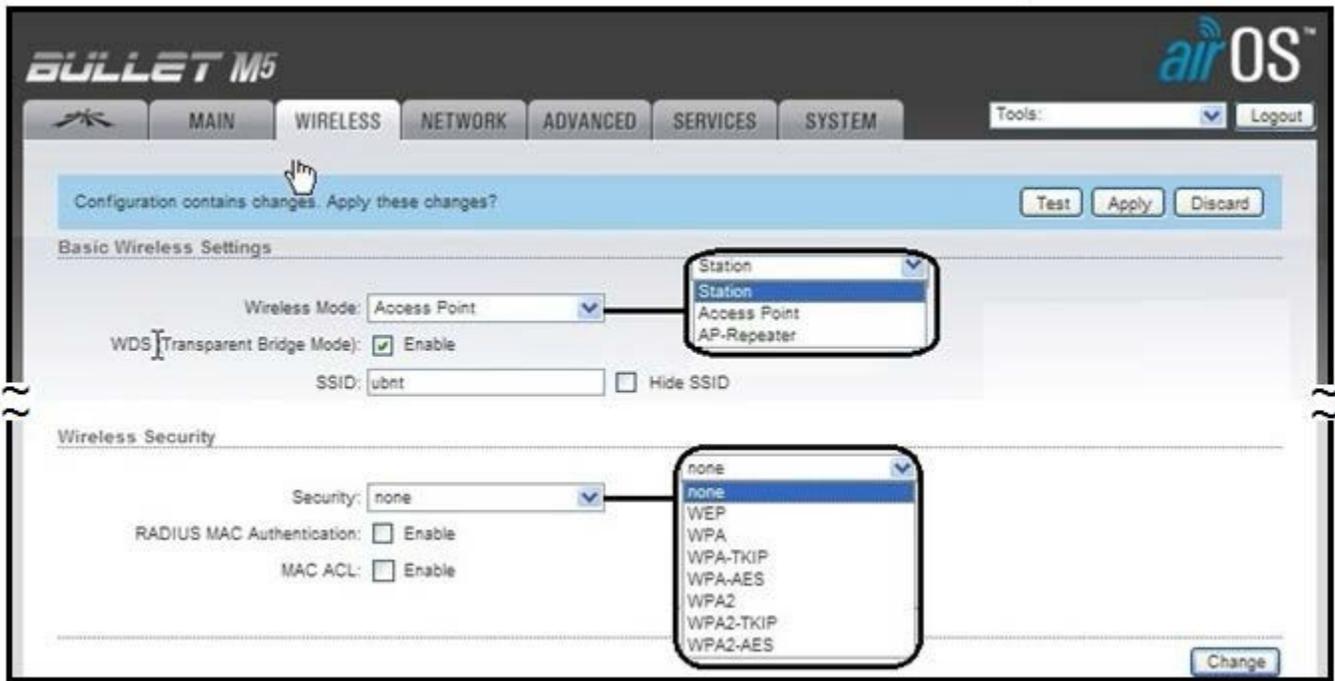


Figure 7 Wireless Setup and Change Prompt

9. Under Basic Wireless Settings, select **Access Point** for the master FMU and **Station** for a Passive Mobile. The default screen is for Station. When Access Point is selected, the screen will refresh and offer a few different setting choices. The settings need not be changed for a basic connection.
10. **Ensure WDS Transparent Bridge Mode** checkbox is enabled.

NOTE If wireless security is desired, each Bullet M5 must be set up with identical security settings or they will not communicate with each other.

11. (Wireless Security) Under Wireless Security, select a **Security** setting if desired.
12. Select **Change** to save any changes. At the top of the window, a prompt, “Configuration contains changes. Apply these changes?” will appear.
13. Select **Apply**.
14. Select **NETWORK** tab (Figure 8).
15. Under Management Network Settings, verify **Static** is selected, and enter IP Addresses, as required. Each device being configured must have a different static IP address. One of the devices may continue to use the default IP address of 192.168.1.20. The other

devices must have their IP address changed to a compatible address (example: 192.168.1.XXX).

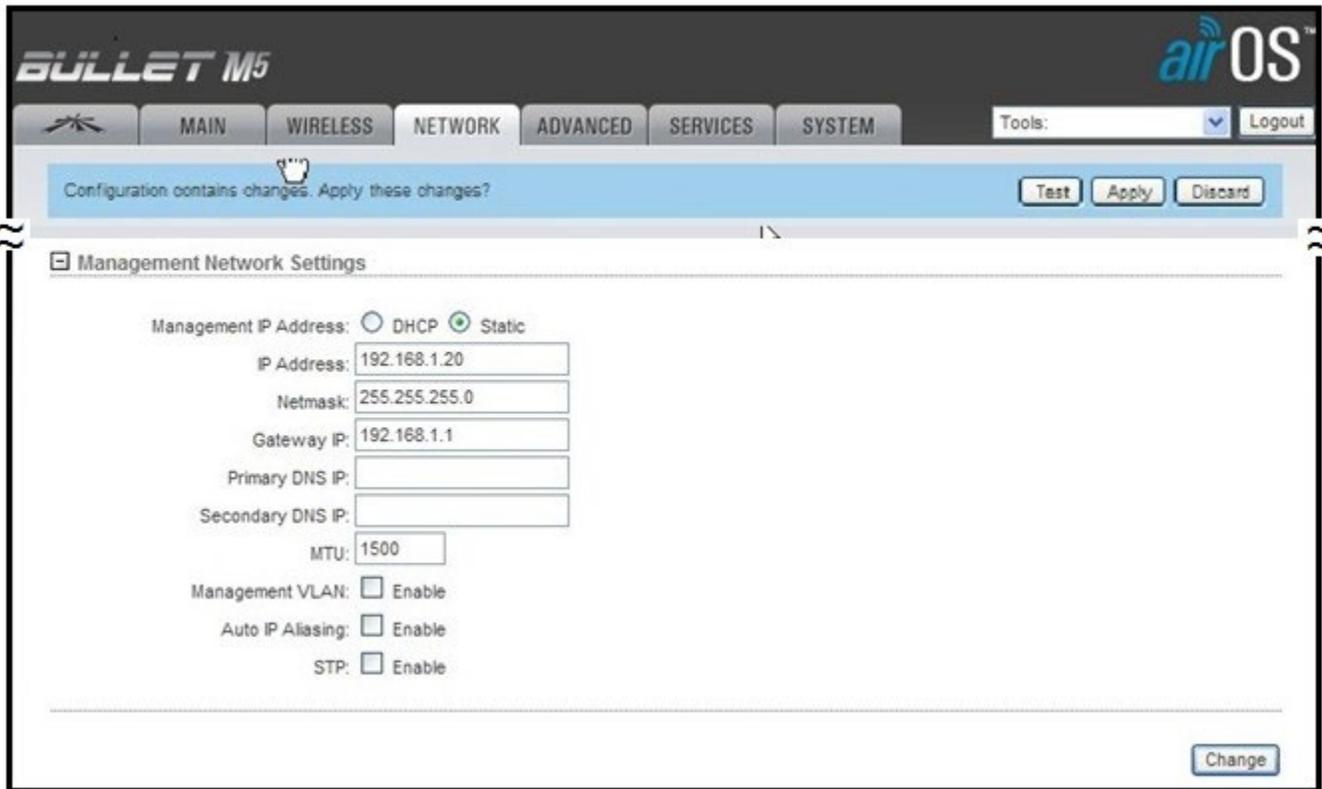


Figure 8 Network Settings

16. Select **Change** at the bottom of the screen. A progress bar at the bottom of the window will indicate saved progress.
17. At the top of the window, a question, “Configuration contains changes. Apply these changes?”
18. Select **Apply**.
19. The minimum configuration of the first device is complete. Exit the program, and disconnect the PC/laptop connection.
20. Repeat steps 1 through 19 as required for the second or subsequent device. Each device must have a different IP address. Each master FMU being used to download Passive Mobiles must be configured as an Access Point. Each Passive Mobile must be configured as a Station. If your PC/laptop fails to connect to the second device using 192.168.1.20, reboot your PC/laptop.

Master FMU/Passive Mobile NIC Setup

The only setup covered herein is the FMU Network Interface Card (NIC) setup to accommodate this procedure. The Master FMU should otherwise be set up in accordance with the FMU Installation Manual and the FMPlus User Manual. The Passive Mobile should otherwise be set up in accordance with the Passive Mobile Install Manual and the FMPlus User Manual.

If the site was originally setup with Bullet M5 without Passive Mobiles for wireless communications from the building to the fuel island, a setting change will be necessary in the

Master FMU NIC. The steps below preceded with (Master FMU) must be performed to make the necessary change.

Initial NIC settings must be configured with a laptop connection. After the initial configuration, changes may be accomplished with a Supervisor Key. Perform the following:

1. Make a laptop connection in accordance with Product Bulletin 111.

NOTE There may be some variation in the commands shown depending upon the firmware in use in the FMU. Firmware version 3.69d was used in developing these procedures.

Until the networking equipment is set up and installed, there may be error messages stating No Link, Unable to Establish Network Link, FMU Is Not In Network Mode, etc..

2. Verify the network interface card is detected.
3. Use **Ctrl-D** to connect to the FMU, then issue an **F1** command. A display similar to the following will appear:

```

NETWORKING CONFIGURATION
Hardware Address: 00-50-C2-2D-84-39
Link Status: OK
10 => Use DHCP:                disabled
15 => Domain Name:              localdomain
20 => IP Address:                0.0.0.0
30 => Subnet Mask:              255.255.255.0
40 => Default Gateway:          0.0.0.0
45 => Domain Name Server #1:    0.0.0.0
46 => Domain Name Server #2:    0.0.0.0
50 => Broadcast IP Address:     enabled
60 => Re-Broadcast IP at Midnight: enabled
70 => UDP Broadcast port:       3000
    => FTP Server:               enabled
85 => Portal/Remote Configuration
90 => Reset Networking Configuration
95 => Display Network Statistics
0 => QUIT
Enter Selection: 0

```

4. If 10 => Use DHCP: reflects enabled, enter **10** to disable it.
5. Enter **20** to change the IP address. A prompt, Set New IP Address: will appear.

```

Enter Selection: 20
Set New IP Address: 192.168.1.150

```

6. Enter a compatible IP address. Compatible means the IP address must match the application. The IP addresses for Bullet M5, the PC or network switch, and the FMU NIC

must be in the same subnet. After the IP address is entered, the NETWORKING CONFIGURATION will be displayed showing the new IP address.

```

NETWORKING CONFIGURATION
Hardware Address: 00-50-C2-2D-84-39
Link Status: OK
10 => Use DHCP:                disabled
15 => Domain Name:             localdomain
20 => IP Address:               0.0.0.0
30 => Subnet Mask:              255.255.255.0
40 => Default Gateway:         0.0.0.0
45 => Domain Name Server #1:   0.0.0.0
46 => Domain Name Server #2:   0.0.0.0
50 => Broadcast IP Address:     enabled
60 => Re-Broadcast IP at Midnight: enabled
70 => UDP Broadcast port:      3000
    => FTP Server:              enabled
85 => Portal/Remote Configuration
90 => Reset Networking Configuration
95 => Display Network Statistics
0 => QUIT
Enter Selection: 0

```

7. As required, enter the **Subnet Mask, Default Gateway, Domain Name Server #1, and Domain Name Server #2.**
8. Enter **85** to change the Portal/Remote Configuration:

```

PORTAL/REMOTE CONFIGURATION
1 => Client Type:              NORMAL
2 => UDP Comm Port:           4242
3 => Portal Timeout Period:    15
0 => QUIT
Enter Selection: 0

```

NOTE

A longer Portal Timeout Period is preferred. The longer timeout will provide a lower frequency and clearer signal. The timeout is too long if the Passive Mobile is only in range of the Master FMU for a very short duration, and the download cannot be completed. In this case, reduce the timeout period until the download is successful.

- a. (Master FMU) At the prompt, enter **1** to change Client Type to PORTAL.

PORTAL/REMOTE CONFIGURATION	
1 => Client Type:	PORTAL
2 => UDP Comm Port:	4242
3 => Portal Timeout Period:	120
=> Remote IP Addresses:	255.255.255.255
4 => Add New Remote IP Address	
5 => Remove Remote IP Address	
0 => QUIT	
Enter Selection:	

- b. (Master FMU) Increase the Portal Timeout Period to 120 seconds or as far as practical.
- c. (Master FMU) Enter **4**, and repeat until all desired IP addresses have been added there is a problem and you need the Master FMU to pick up only designated IP addresses. REMOTE is for Passive Mobile(s). The Remote IP Address of 255.255.255.255 will allow the Master FMU to connect to any Passive Mobile remote IP address.
- d. (Master FMU) Enter **5** to remove all unwanted remote IP addresses from the Master FMU.
- e. (Passive Mobile) Enter **1** and repeat until Client Type changes to REMOTE.

PORTAL/REMOTE CONFIGURATION	
1 => Client Type:	REMOTE
2 => UDP Comm Port:	4242
3 => Portal Timeout Period:	120
0 => QUIT	
Enter Selection: 0	

- f. (Passive Mobile) Increase the Portal Timeout Period to 120 seconds or as far as practical.
- g. When the setting changes are complete, enter **0** to QUIT and exit the PORTAL/REMOTE CONFIGURATION.
9. Enter **0** to QUIT and exit the NETWORKING CONFIGURATION.
10. Disconnect in accordance with Product Bulletin 111.
11. Repeat steps 1 through 11, as required, for additional Master FMUs or Passive Mobiles.

Software Setup

The only software setup covered herein is the setup to accommodate this procedure. The software should otherwise be set up in accordance with the FMPlus User Manual. Changes to accommodate wireless downloads of Passive Mobiles are made in two screens: 1) Site ID, and 2) Go Online with FMUs. Perform the following:

Figure 9 Software Site ID Window

1. Set the **Site ID** in the software to identify where the transaction originated.
 - a. From the main window of the software, select the **Site** icon.
 - b. In the Site List window, open an existing site, or add a new site. A Site ID window will open as shown in Figure 9.
 - c. Enter a unique **Site ID**.
 - d. Select an FMU in the now highlighted **FMU* dropdown menu**.
 - e. Just above, select F-Fixed or P-Passive Mobile in the **Type dropdown menu**.
 - f. Select LAN in the **Connection Type dropdown menu**.
 - g. Select **Configure**. A LAN Connection Config Dialog window will open.
 - a. Click on the check box to the left of IP address, and enter the IP address of the network card. Depending upon the selection made in the Type: box, the IP address should correspond to the IP address of the applicable Fixed FMU or Passive Mobile network card, then
 - b. Select **OK** to return to the Site IT window.
 - h. Complete the remaining configuration in accordance with the FMPlus User Manual.
 - i. Select **Apply** and then **OK**. The Site ID window will close.

2. **Go Online with FMUs.** See Figure 20. The software developed for the Passive Mobile download application has a change in the Go Online with FMUs window. There is a selection for Download Transactions, and another selection for Download Passive Mobile Transactions. These choices are dependent upon the site selected to start the download from:

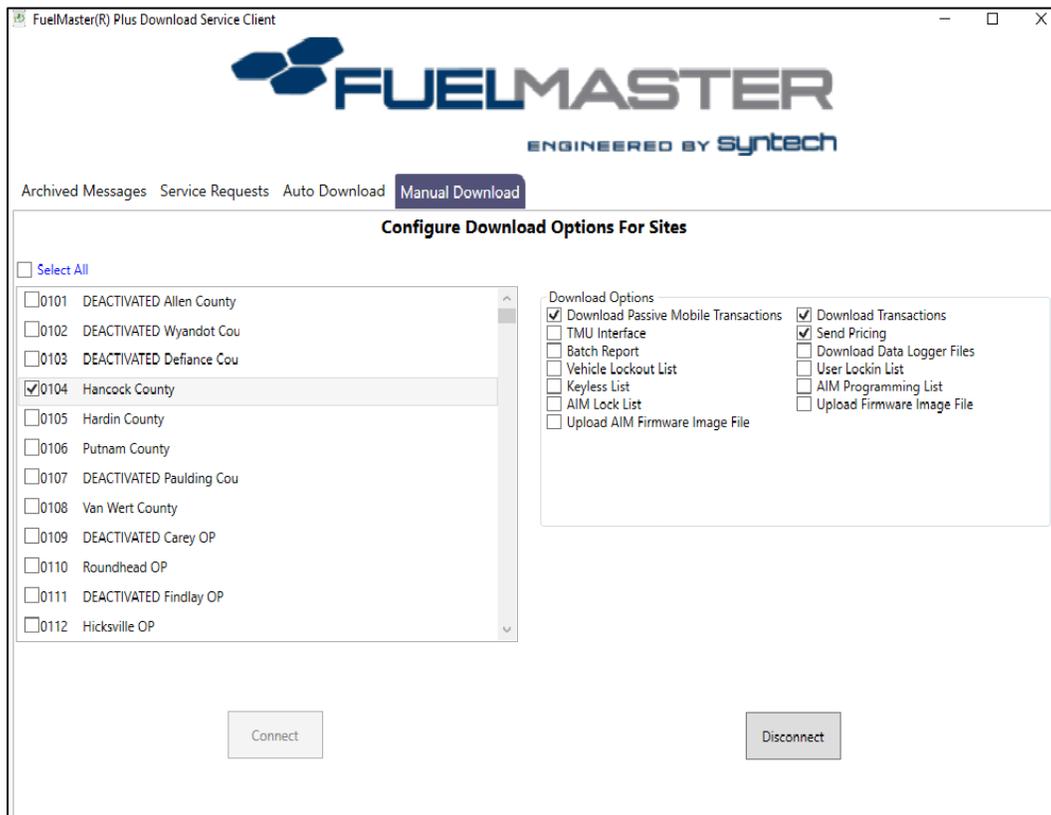


Figure 10 Software Go Online with FMUs Window

(Master FMU is selected site) Selecting the Master FMU as the site and **Download Transactions**, will download Master FMU transactions only. If you select **Download Passive Mobile Transactions**, you will download only Passive Mobile transactions already downloaded from the Passive Mobile and stored in the Master FMU. The Passive Mobile cannot be pulled through this selection. Select both **Download Transactions** and **Download Passive Mobile Transactions** to download both FMU and Passive Mobile transactions with one action.

(Passive Mobile is selected site) Selecting the Passive Mobile as the site and **Download Transactions** will poll the Passive Mobile directly for its transactions. Selecting **Download Passive Mobile Transactions** will do nothing. Since the connection is dependent upon a good wireless connection, no transactions will be downloaded if unable to connect to the Passive Mobile. If only a partial download from the Passive Mobile occurs, such as when the Passive Mobile may drive out of range of the wireless network, the download will not complete. All transactions will remain in the Passive Mobile until a complete download occurs.

NOTE

If the omni-directional antenna is used, the additional black neoprene sealing washer provided with the kit must be installed in the antenna connector to ensure a waterproof seal. Water intrusion into the Bullet may occur if the additional washer is not installed.

Install Bullet M5

Assumptions

This tutorial assumes

- the access point has been setup
 - you have the IP address of the FMU NIC on hand
 - there is access to a power supply within the FMU, which is plugged into a 110 VAC power receptacle
 - the patch cables have been run
1. Configure the station operation in conjunction with the access point, FMU, and PC. If it has not been configured, return to Bullet M5 Setup and configure the Bullet M5 station.
 2. Find a suitable location for mounting the Bullet M5. It is installed with an omni-directional antenna so it can communicate with Passive Mobiles approaching from any direction. A Wall/Pole Mount Bracket (Figure 11) is provided with the kit for mounting on any flat surface, or on a pole. Wherever it is mounted, it must accept input from a patch cord connected to the power supply/POE injector in the FMU. If not mounted on top of the FMU, consider the National Electric Codes when in or around a hazardous location. The Master FMU Bullet M5 will continually search for Passive Mobiles to download.



Figure 11 Wall/Pole Mount Bracket

3. If the Bullet M5 will be mounted directly on the FMU, perform the following:

CAUTION If the omni-directional antenna is used, the additional black neoprene sealing washer provided with the kit must be installed in the antenna connector to ensure a waterproof seal. Water intrusion into the Bullet may occur if the additional washer is not installed.

NOTE If the FMU is an AIM FMU, do not mount anything between the FMU AIM antennas and the fueling point. It will interfere with AIM RF reception.

Do not run the patch cable weather seal through the top of the FMU cabinet under the sunscreen. If the antenna mount bracket is installed on the sunscreen, run the patch cable through a hole in the side or back of the FMU cabinet.

- a. Four ¼-20 screws, washers, and nuts are provided with the installation kit. A location must be found for mounting the antenna bracket and making an access hole for a patch cable with a weatherseal. The weatherseal will require a 5/8-inch hole where the patch cable enters the FMU.

- b. Remove FMU power and remove the Backplate Assembly in accordance with Product Bulletin 052.
 - c. Mark and drill holes for the antenna mount bracket, and patch cable weatherseal. The patch cable with weatherseal is 3 feet long, and must reach the power supply/POE injector mounted inside the cabinet.
 - d. Remove all drill shavings, then install the mount bracket and run the patch cable. The compression fitting of the weatherseal should be outside the FMU. An o-ring is provided to seal the hole from water intrusion into the cabinet.
 - e. Reinstall the FMU Backplate Assembly in accordance with Product Bulletin 052.
 - f. Securely mount the Bullet M5 and omni antenna.
 - g. Remove the threaded plastic boot and weatherproofing gasket from Bullet M5. Ensure an o- ring is still present on Bullet M5.
 - h. Route the patch cable RJ-45 connector through the small end of the threaded plastic boot, then plug it into the Bullet M5 RJ-45 receptacle.
 - i. Thread the threaded plastic boot on Bullet M5 until it seats against the o-ring.
 - j. Install the split weatherproofing gasket over the patch cable and into the small end of the threaded plastic boot. Some form of sealant such as silicon or RTV should be applied over the weatherproofing gasket to prevent water intrusion. Verify the sealant will not react with the plastic material in the threaded plastic boot.
 - k. Do not pull tight. Remove slack from the POE cable by pushing it into the FMU through the weatherseal. As necessary, secure the POE cable to the antenna mount/FMU to prevent wind lash.
 - l. Tighten the compression fitting to prevent water intrusion through the weatherseal.
4. If the Bullet M5 will not be mounted on the FMU, perform the following:
- a. Mount the Bullet M5 and antenna in the desired location.
 - b. Run a POE cable from the Bullet M5 station to the FMU. A 20-foot outdoor rated patch cable with weatherseal is available and must be specified in the equipment order. If the cable must be longer than 20 feet, ensure outdoor rated cable is used or enclose the cable in some type of protective conduit. If the cable is entering a hazardous area, an explosion-proof conduit will be necessary to enclose the cable. If the cable is over 30 meters (approximately 100 feet), Ubiquiti recommends the use of a 24 VDC power supply/POE injector. A weatherproof entry point for cable entry into the FMU must also be provided for.
 - c. If a hole must be drilled into the FMU, ensure internal components are protected from damage and metal shavings.
 - d. Disassemble as necessary following applicable Product Bulletin references to safely drill into the FMU.
 - e. Run the POE cable into the FMU and seal to prevent water intrusion.
5. Mount the power supply/POE injector in the FMU to permit connection to the POE cable. If mounting close to any circuit board, anchor the power supply with industrial Velcro or some other mounting method to prevent contact with circuit boards. Ensure

the mounting location supports connection to a 110 VAC outlet, and permits patch cables to be routed to the FMU network interface card.

6. Connect the POE cable to the power supply/POE injector POE port.
7. Run a patch cable from the FMU network interface card to the power supply LAN connector.
8. Plug the power supply into a 110 VAC power receptacle. A green power-on and LAN light will illuminate on Bullet M5. Installation of the Master FMU Bullet M5 is complete.
9. Seal any holes where the patch cable exits the FMU.

Install Passive Mobile Bullet M5 Station

This installation includes a 12VDC POE (Power Over Ethernet) injector for the Bullet M5, and it is not weatherproof. It must be installed where one Cat5 patch cable can be routed from it to Bullet M5, and another can be routed from it to the Passive Mobile NIC. It will also require a wire connection to 12VDC switched power.

Consider the placement of Bullet M5 and the antenna. The antenna cannot extend high enough to interfere with anything in the path of the Passive Mobile (garage doors, fuel site canopies, etc.), but should extend high enough to provide line-of-sight when the Passive Mobile is moving within RF range of the Master FMU Bullet M5. It should not be placed where it will interfere with refilling the fuel tank on the Passive Mobile.

A variety of mounting positions have been used for Passive Mobiles. Some are mounted inside the truck cab. Some are mounted outside the cab which requires weatherproofing. Keeping with these considerations, perform the following to install Bullet M5 on Passive Mobiles:

1. If not configured, return to Bullet M5 Setup and configure the Bullet M5 as a Station.
2. Find a suitable location for mounting the Bullet M5. It is installed with an omnidirectional antenna so it can communicate with the Master FMU Bullet M5 approaching from any direction. A Wall/Pole Mount Bracket (Figure 11) is provided with the kit for mounting on any flat surface, or on a pole. Some have used the flat surface of the antenna mount bracket (Figure 4) to mount the assembly against a vertical flat surface on the Passive Mobile.

CAUTION If an external Cat5 connection is not provided on the Passive Mobile, an entry point must be made for the patch cable into the Passive Mobile cabinet. Exercise caution when selecting the entry point. Creating mounting or entry holes must not damage or interfere with FMU internal components or mount points, and must not permit water intrusion.

NOTE Do not mount anything that will interfere with AIM RF reception. Most Passive Mobiles fuel from a fixed mount hose reel. Locate Bullet M5 so as not to block AIM RF reception between the Passive Mobile antennas and fueling vehicles.

3. A location must be found for mounting the antenna bracket and, if applicable, making an entry hole in the Passive Mobile cabinet for the weatherseal. Four ¼-20 screws, washers, and nuts are provided with the installation kit to be used for mounting hardware. The weatherseal will require a 5/8-inch hole where the patch cable enters the FMU.
4. If holes must be made in the Passive Mobile cabinet:

- a. Remove Passive Mobile power and remove/protect the Backplate Assembly.
 - b. Mark and drill holes for the antenna mount bracket, and patch cable weatherseal. The patch cable with weatherseal is 3 feet long, and must reach the power supply/POE injector.
 - c. Remove all drill shavings then, as required, install the mount bracket and run the patch cable. The compression fitting of the weatherseal should be outside the FMU. An o-ring is provided to seal the hole from water intrusion into the cabinet.
 - d. Reinstall the FMU Backplate Assembly.
5. Securely mount the Bullet M5 and omni antenna.
 6. The POE injector (see Figure 12) is 12VDC. It requires a 12VDC input. Recommend a switched power source to avoid the possibility of vehicle battery drain. The top of the POE Injector has two RJ-45 receptacles marked Network and Equip+PoE.



Figure 12 12VDC POE Injector

- a. Find a weatherproof mounting location for the 256692 POE Injector. It has a removable DIN rail mount that may be removed. For this application, industrial strength Velcro is a good mounting choice.
 - b. Locate a switched 12VDC power source. Run a two-conductor cable from the power source to the POE Injector.
 - c. The two-pin connector on the POE Injector is removable, if necessary, and the connection points are labeled + and -. Connect the 12VDC switched power source to the POE Injector.
7. Connect a patch cable from the POE Injector Network receptacle to the Passive Mobile NIC.
 8. Remove the threaded plastic boot and weatherproofing gasket from Bullet M5. Ensure an o-ring is still present on Bullet M5.
 9. Connect another patch cable to the POE Injector Equip+PoE receptacle, and route it to the Bullet M5.
 10. Route the patch cable RJ-45 connector through the small end of the threaded plastic boot, and plug it into the Bullet M5 RJ-45 receptacle.
 11. Thread the threaded plastic boot on Bullet M5 until it seats against the O-ring.

12. Install the split weatherproofing gasket over the patch cable and into the small end of the threaded plastic boot. Some form of sealant such as silicon or RTV should be applied over the weatherproofing gasket to prevent water intrusion. Verify the sealant will not react with the plastic material in the threaded plastic boot.
13. Do not pull tight. Remove slack from the POE cable by pushing it into the FMU through the weather seal. As necessary, secure the POE cable to the antenna mount/FMU to prevent wind lash.
14. Tighten the compression fitting to prevent water intrusion through the weather seal.
15. Repeat steps 1 through 14 as required for second and subsequent Passive Mobiles.

Post Installation Tests

This test is only verifying Passive Mobile downloads to the Master FMU and to the Central Controller. It assumes the Passive Mobile(s) and Master FMU have been properly installed, and the applicable post installation tests/Acceptance Test Procedures have been performed.

1. Bring each Passive Mobile (one at a time) within RF range of the Master FMU, and perform a test transaction with each Passive Mobile.
2. The Passive Mobile should download its test transaction to the Master FMU when the transaction completes. A prompt will appear on the Passive Mobile display, PREPARING TO UPLOAD TRANSACTIONS and will remain until the transaction(s) has been uploaded to the Master FMU.
3. When a test transaction has been run on each Passive Mobile, go to the Central Controller and click on the Online icon.
4. In the Go Online with FMUs window, click on Download Passive Mobile Transactions, and click on the Site ID for the Master FMU.
5. When the Master FMU Site ID has been selected, select **Connect**. The Central Controller should connect with the Master FMU. Each test transaction should download and appear in the Polling Report.

Reset to Defaults

There are two ways to reset Bullet M5 to default settings: from within the firmware or by initiating a reset in the Bullet M5.

1. (From Within the Firmware) If you are connected with a laptop and viewing the firmware, perform the following:
 - a. Go to the **SYSTEM** tab (Figure 13).

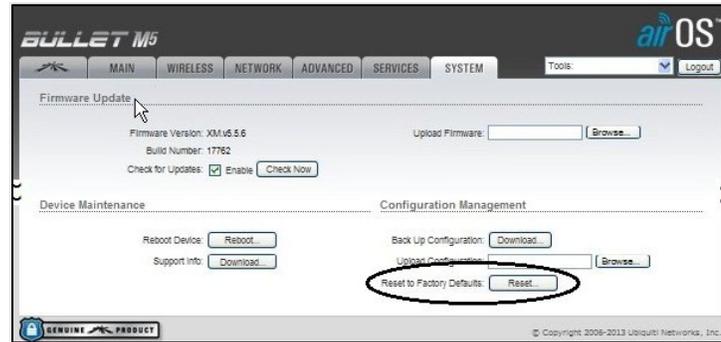


Figure 13 Reset to Defaults from within Firmware

- b. Select **Reset to defaults...** A window with a prompt to **RESET TO DEFAULTS**, and Do you really want to reset the device to defaults?



Figure 14 Confirming Reset to Defaults from within Firmware

- c. Select **Yes, reset** (Figure 14)! A progress bar will appear showing the reset progress. When complete, the firmware will return to the default login screen.
2. (Cannot Get into Firmware) If you don't know the IP address or login password and cannot get into the firmware, perform the following:
 - a. While the Bullet M5 is powered through the POE cable, press and hold a paperclip in the RESET switch for 10-15 seconds (Figure 15). The four signal strength LEDs on the side of the Bullet M5 will flash in an alternating pattern. They will not go out. The green power and LAN LEDs do not change during the process.



Figure 15 Bullet Reset Switch

- b. Access using IP address 192.168.1.20 and credentials: Username: ubnt and Password: ubnt. If unsuccessful, repeat steps a and b.

Troubleshooting

If you experience difficulty while setting up Bullet M5, perform the following:

- If you are unable to connect to a Bullet with any IP address, perform **Reset to Defaults**. The procedure will restore Bullet to the manufacturer's original default configuration.
- When you make a PC connection to a Bullet, remember it takes a moment for the device to boot up. It is not immediately available as soon as the connections are made and power is applied.
- If you are trying to communicate between two devices which are very close together (as when you are performing setup), they may not communicate with each other because of too much output power. In the firmware, under the Wireless tab, is a slider to adjust Output Power. Adjust output power to the lowest setting, and retry.
- If your PC is not connecting to the Bullet or FMU, reboot your PC and try again before assuming there is something wrong with the equipment. Reboot the FMU if the problem is with communications to the FMU. Sometimes the need to reboot is caused by the association of an IP address to a specific MAC address. If you go to the command prompt and type arp -a (enter a space with spacebar between arp and -a), you should see No ARP Entries Found. If you see something else, it is likely showing this association of the IP address to a specific MAC address. It can be cleared by going to the command prompt and typing arp -d * (space between arp and -d, and -d and *).
- Verify the two units are configured correctly. They, and the devices they are connected to, must be on the same subnet. They must be using the same SSID. They cannot be using the same IP address.
- When a directional antenna is being used, the signal may not be reaching all the FMUs. This may be tested by performing the Antenna Alignment procedure. It may be necessary to replace the directional antenna with an omni antenna.
- If the PC is presently on a network, it may have to be reconfigured with a static IP address as opposed to Obtaining an IP address automatically.
- After any changes are made to the configuration of either of the two devices, be sure they are saved correctly after making changes. Do not remove power while a save or reboot is in progress.
- If wireless security is enabled, verify all devices are configured with the same settings.
- If troubleshooting doesn't resolve communication conflicts, reset both devices to their default settings and accomplish configuration of both devices. A simple typographical error in one setting can be very difficult to find and can prevent communications.

TIP

If any questions arise, contact Syntech Systems, Inc.'s Customer Satisfaction Center (CSC) at 1-800-888-9136, ext. 2, or email support@myfuelmaster.com.

Change Log

Date	Description
9/17/2014	Original
8/13/2015	Revised Page 1 and 21, added CAUTION: If the omni-directional antenna is used, the additional black neoprene sealing washer provided with the kit must be installed in the antenna connector to ensure a waterproof seal. Water intrusion into the Bullet may occur if the additional washer is not installed.
3/28/2016	Revision Page and Figure, added explanation and procedure for disabling Client Isolation. Revised PC/Laptop setup to match Windows 7 operating system.
11/17/2020	Reformatted/rebranded
5/06/2021	Edited for conciseness