



Multi-Services Gateway

Version 1.3

User Manual

v1.33

FCC Compliance Information

Radio Frequency Interference Requirements – USA

WARNING A minimum separation distance of 20 cm.(6 inches) must be maintained between the radiating element of the transmitter and nearby persons in order to ensure compliance with FCC rules for rf exposure. This transmitter must not be co-located with other transmitters or antenna

This device uses, generates, and radiates radio frequency energy. The radio frequency energy produced by this device is well below the maximum exposure allowed by the Federal Communications (FCC).

THIS EQUIPMENT COMPLIES WITH PART 15 OF THE FCC RULES. ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE MANUFACTURER COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

This device complies with the limits for a class A digital device pursuant to Part 15 subpart B of the FCC Rules and Regulations. Operation is subject to the following two conditions:

1. This device must not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The FCC limits are designed to provide reasonable protection against harmful interference when the equipment is installed and used in accordance with the instruction manual and operated in a commercial environment. However, there is no guarantee that interference will not occur in a particular commercial installation, or if operated in a residential area.

If harmful interference with radio or television reception occurs when the device is turned on, the user must correct the situation at the user's own expense. The user is encouraged to try one or more of the following corrective measures:

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

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Section 1: Introduction

Graviton's Multi Service Gateway (MSG) provides local processing and buffering of data at a customers site as well as connectivity to the Graviton Data center. This document provides an overview of the installation and operation of the MSG from the perspective of an installer. It reflects the Revision X2 of the hardware and Revision 1.3.2 of the MSG application software.

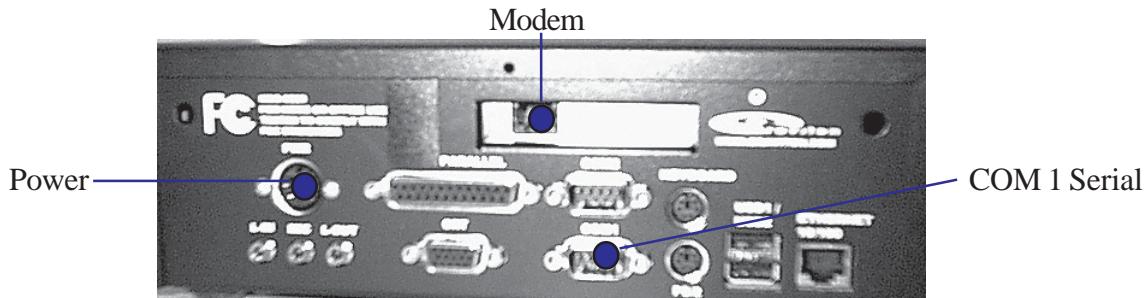
Section 2: Control Buttons and LCD Display



- **Accept / Enter:** This button functions as an OK or Enter button.
- **Cancel / Back:** Use this button to cancel an action request and go back to the previous menu.
- **Up:** This button allows you to scroll up at a menu.
- **Down:** This button allows you to scroll down at a menu.

Section 3: Connecting the MSG to AC Power and the Phone Line

If you are putting this MSG in the field, the connections are minimal. Connect the phone cable into the modem, the RF receiver into the COM 1 serial port, and connect the power cable.



Note: Use caution when removing the phone cable from the modem; **certain MSGs have experienced a problem where the modem wires come out with the cable!** It is suggested that you use a small screwdriver to pull back the tip of the phone cable (the small part that holds it in place) before gently pulling the cable out. If you do not have a screwdriver, try using your fingernail or other small flat object. This problem has been addressed and will be resolved in future releases of the MSG.

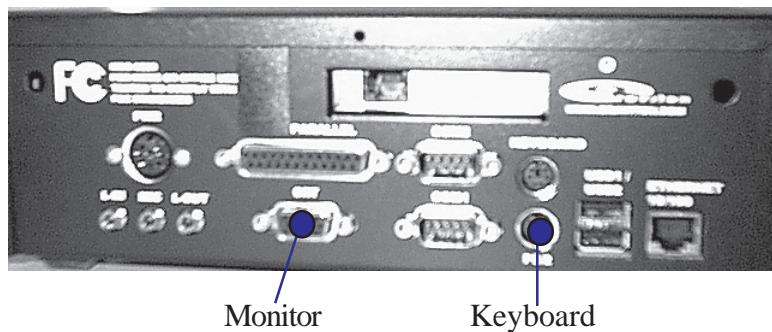
Before installing the MSG at a site that will use telephone dial-up for connection to the Graviton data center, some basic phone line tests should be performed by installing a simple analog phone into the jack to be used by the MSG:

1. Verify that a dial-tone is available, and listen to see if there is abnormal amounts of static in the background.
2. Dial the ISP's phone number that is going to be used by the MSG and verify the exact dialing number including a "9" or "area code" prefix and validate that this is what was/will be programmed into the MSG.
3. Using a cell phone or any other unit, call the number that was assigned to the MSG and verify that the phone rings. If possible, have a second party dial the number so you can again determine if there are abnormal amounts of static in the background.

Section 4: Configuring the MSG Directly via Keyboard and Monitor

Before you attempt to configure your MSG, contact your Graviton administrator to find out what has been configured already. In most cases, the configuration will be completed at Graviton. Configuration can also be done remotely by a Graviton Administrator via the dial-up modem or ethernet port. To configure the MSG directly, you need a login account and password (contact your administrator if you do not have the necessary MSG user account and password).

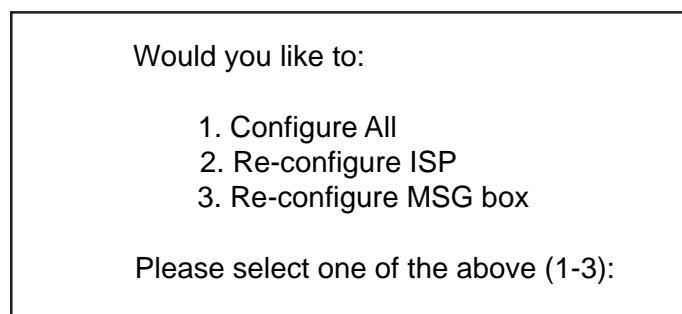
If you plan to configure the MSG directly, connect a monitor and keyboard, and then start up the MSG. Please look at the diagram below before attaching the keyboard, it does **NOT** go into the port labeled “Keyboard”, instead attach it to the port labeled “PS/2”.



The Configuration Menu gives you three options: Configure All, Re-Configure ISP and Re-Configure MSG. By selecting Configure All, you will be prompted to configure both the MSG and the ISP information. This option should only be selected the first time you configure the MSG. Select the Re-Configure ISP option whenever the phone number or user account information for your ISP has changed. Use the Re-Configure MSG only if you are connecting a new radio device type or if the MSG will be reporting to a different DAC machine.

To Open the Configuration Menu:

1. At the MSG login prompt, type in your username and hit **enter**.
2. Type in your password and hit **enter**. *Note: Passwords are case sensitive.*
3. At the command prompt, type in: **./configure**



Example of the Configuration Menu

- Decide which of the three options you need and skip to the section of this manual that corresponds with that option (the three options are detailed on the next two pages).

Option 1: Configure All

- Type in **1** and hit **enter**.
- Enter a response to each prompt that appears. See the field definitions on below for help.

Configuration Field	Field Definition
Enter ISP phone number	Enter the phone number the MSG will be dialing. See "Before Connecting the MSG" on page 3 for further instructions. Also, be sure you enter digits only, and use the prefix of 9 or 1 when appropriate.
Enter ISP user name	Be sure to enter the full user name including the ISP. For example: user@earthlink.net
Enter ISP password	Enter the password given to you by your ISP. Note: Most ISP passwords are case sensitive.
Enable Modem Speaker	This lets you turn on the modem speaker. By default the speaker is disabled so it won't disturb people who are working near the MSG.
Use Modem at Fast Speed	The default is yes, which sets speed up to 33.6 Kb. Slow speed is 19.2 Kb.
Enable SSL [yes or no]	This enables Secure Socket Layer. This should be set to "no", unless you are configuring a load balancer with SSL support. The default value for this field is "no".
Enter Graviton Load Balancer IP Address	This is the IP Address of the DIMAC machine at the Graviton Data Center that the MSG will be reporting to. There is currently no default value, so you must type the IP Address.
Enter Graviton Load Balancer port number [default=8189]	This is the port on the DIMAC machine at the Graviton Data Center that the MSG will be reporting to. If you leave this field blank, the default value of 8189 will be applied (currently this is the port number we are using on all of our DAC machines).
Select the radio type attached to serial port COM 1 (/dev/tty/S0)	Select which type of radio device you are using to receive data. If you don't know which type you are using, contact your Graviton administrator.

- After entering the information for the MSG box, you will see the message, "Completed configuring Multi-Services Gateway". Hit **enter** on the keyboard to continue to the ISP configuration script.

Type **yes** (or **y**) after the summary of changed ISP fields if they appear correct. This will save your changes to the MSG. If you type **no** (or **n**) here, you will be taken back to the MSG login prompt.

Option 2: Re-configure ISP

- Type in **2** and hit **enter**. Be sure to fill out all the fields on this screen, even if you only want to change one of them. For example, if you only want to change the ISP phone number, you still need to re-enter the other fields, otherwise this information will be lost. Use the field definitions above for help.
- Type **yes** (or **y**) after the summary of changed fields if they appear correct. This will save your changes to the MSG. If you type **no** (or **n**) here, you will be taken back to the MSG login prompt.

Option 3: Re-configure MSG box

1. Type in **3** and hit **enter**. Be sure to fill out all the fields on the screen even if you only want to change one of them. Use the field definitions below for help.

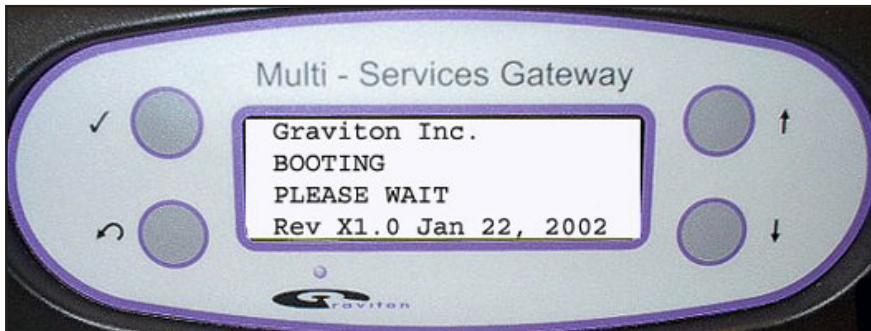
Configuration Field	Field Definition
Enter ISP phone number	Enter the phone number the MSG will be dialing. See "Before Connecting the MSG" on page 3 for further instructions. Also, be sure you enter digits only, and use the prefix of 9 or 1 when appropriate.
Enter ISP user name	Be sure to enter the full user name including the ISP. For example: user@earthlink.net
Enter ISP password	Enter the password given to you by your ISP. Note: Most ISP passwords are case sensitive.
Enable Modem Speaker	This lets you turn on the modem speaker. By default the speaker is disabled so it won't disturb people who are working near the MSG.
Use Modem at Fast Speed	The default is yes, which sets speed up to 33.6 Kb. Slow speed is 19.2 Kb.
Enable SSL [yes or no]	This enables Secure Socket Layer. This should be set to "no", unless you are configuring a load balancer with SSL support. The default value for this field is "no".
Enter Graviton Load Balancer IP Address	This is the IP Address of the DIMAC machine at the Graviton Data Center that the MSG will be reporting to. There is currently no default value, so you must type the IP Address.
Enter Graviton Load Balancer port number [default=8189]	This is the port on the DIMAC machine at the Graviton Data Center that the MSG will be reporting to. If you leave this field blank, the default value of 8189 will be applied (currently this is the port number we are using on all of our DAC machines).
Select the radio type attached to serial port COM 1 (/dev/ttyS0)	Select which type of radio device you are using to receive data. If you don't know which type you are using, contact your Graviton administrator.

2. After you have filled out all the fields, you will get a prompt saying "Completed configuring Multi-Services Gateway". Log out by typing **Exit**. You should now use the LCD display on the MSG to select **Restart**.

Section 5: Normal Power-up Cycle

This section is designed to guide you through the power-up cycle of the MSG. The following sequence is what you should expect to see on the LCD display after plugging in your MSG for the first time.

1. **Booting Screen:** This is the first screen you will see when you power up your MSG. It will typically take a few minutes before it goes on to the next screen.



2. **Splash Screen:** A grayed out version of this screen will appear when the MSG is almost finished booting. You will not be able to navigate past this screen until the backlight comes on. Once the backlight has come on, the MSG has finished booting. Hit the **Accept button** once to move on to the Status screen.



3. **Status Screen:** The last line on this screen displays the current status of the MSG. It will either be "Initializing", "Ready!", or "No Config!". The status of Initializing indicates that the MSG is trying to connect to the ISP account that was defined during configuration. Once the connection has been made, the status will change to "Ready!". If the status says "No Config!", shutdown the MSG and see the Section 4 of this manual for further instructions. No matter what the status is, you can move on to the Main Menu by hitting the **Accept button**. Or, you can hit the **Cancel button** to return to the Splash screen.



4. **Main Menu:** This menu offers four commands: About, Shutdown, Restart, and Reset and Recovery. See Section 6 (starting on the next page) of this manual for detailed instructions on how to use these four commands.



Section 6: Using the LCD and Control Buttons

There are four basic MSG operations available when using the LCD and control buttons: About, Shutdown, Restart, and Reset and Recover. Use About to view version information regarding the software installed on the MSG. Use Shutdown before unplugging the power cable. Use Restart anytime there has been a change to the configuration. Use Reset and Recovery only if the MSG is experiencing problems. Below are explanations of every screen you will encounter and instructions on how to navigate between screens.

Splash Screen

The Splash screen is the homepage of the MSG. You will see this page every time the MSG boots up. You can return to it by pushing the **Cancel / Back button** (pushing the button once will take you to the previous screen, so if you've navigated through multiple screens, keep pushing this button until you end up on this page). It looks like this:



Status Page

The Status page will appear after you hit the **Accept button** while viewing the Splash screen. The status will either be “Initializing”, “Ready”, or “No Config!”. The status of “Initializing” means that the MSG is connecting to the ISP account defined during configuration. The status will change to “Ready” once the connection is complete. You will see “No Config!” if the MSG has never been configured before (if you see this, shutdown the MSG and go to Section 4 of this manual for further instructions).



Hit the **Accept button** again to go on to the Main Menu.

Main Menu

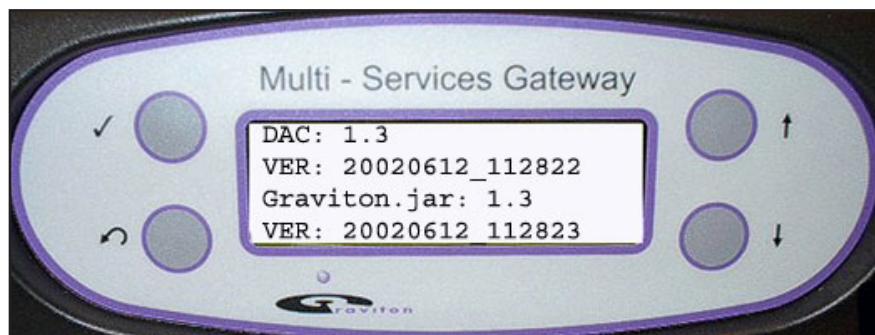
The Main Menu offers four choices: About, Shutdown, Restart, and Reset and Recover. Below you will find detailed instructions on how to use each of the four options. If you do not wish to select any of these options, you can push the **Cancel / Back button** to return to the previous screen.



About

This screen shows you the DAC release and version numbers as well as the Graviton.jar release and version numbers. To view the about screen, follow these steps:

1. Select **About** using the **Down button**.
2. Push the **Accept button**. Below is an example of the About screen.



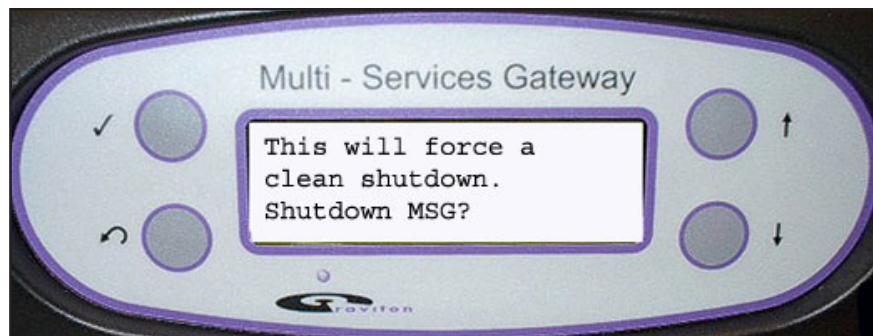
Shutdown

This is the appropriate method of shutting down the system before removing the power cable. Unplugging the MSG without completing the shutdown process could lead to future system errors.

1. Move the asterisk to **Shutdown** using the **Down button**.



2. Push the **Accept button**. You will see a prompt saying, "This will force a clean shutdown. Shutdown MSG?"



3. Push the **Down button** once to verify that you want to shutdown the MSG. This will place a * next to "Shutdown MSG".



4. Push the **Accept button**. You will see a prompt saying, “Shutting down, please wait...”



5. The next screen you will see is a greyed-out splash screen. This indicates that the MSG shutdown process is complete.



6. Unplug the power cable. If you do not unplug the power cable, the screen will display “WAITING FOR SHUTDOWN” for a couple of minutes and then it will restart the MSG.



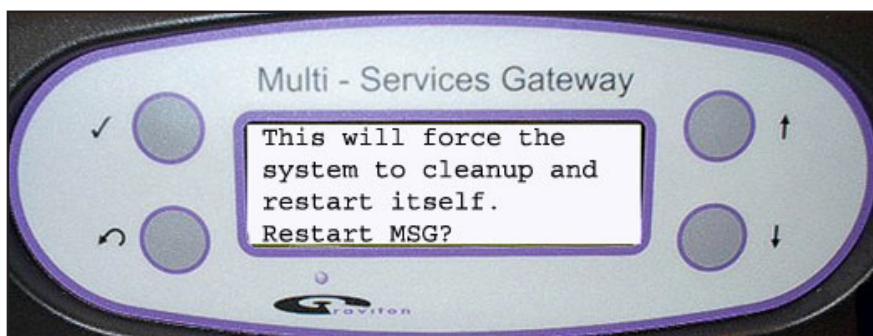
Restart

This is the preferred option for restarting the MSG because it is the quickest and most reliable way to restart the system. This process usually takes 2-3 minutes.

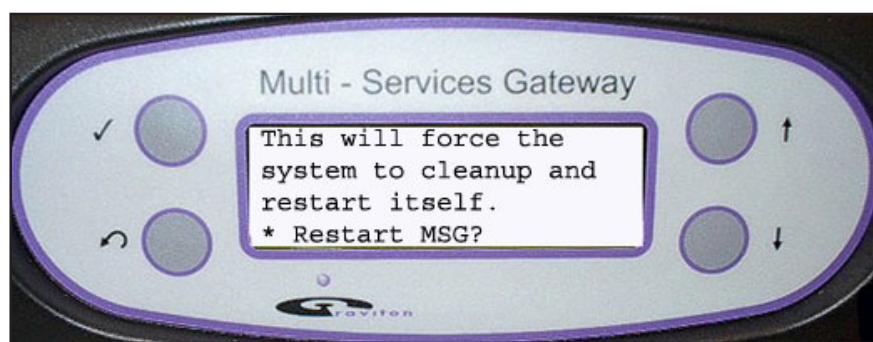
1. Move the asterisk to **Restart** using the **Down button**.



2. Push the **Accept button**. You will see a prompt saying “This will force the system to cleanup and restart itself. Restart MSG?”



3. Push the **Down button** once to verify that you want to restart the MSG. This will place an asterisk next to “Restart MSG?”.

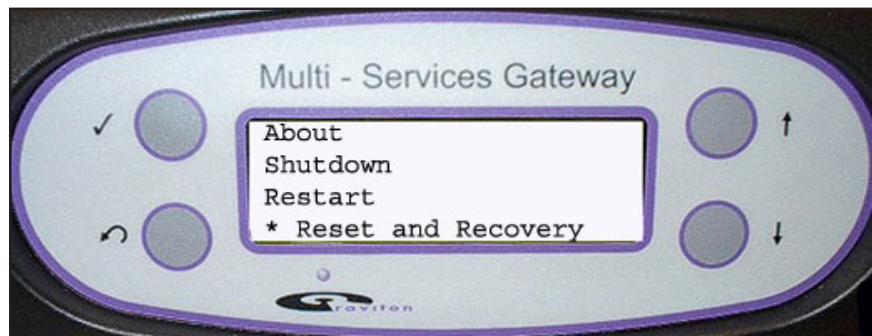


4. Push the **Accept button**. You will see a prompt saying “Rebooting. Please wait...” After a couple of minutes you will see a grayed out Splash screen, and then the regular Splash screen will appear, indicating that the reboot is finished.

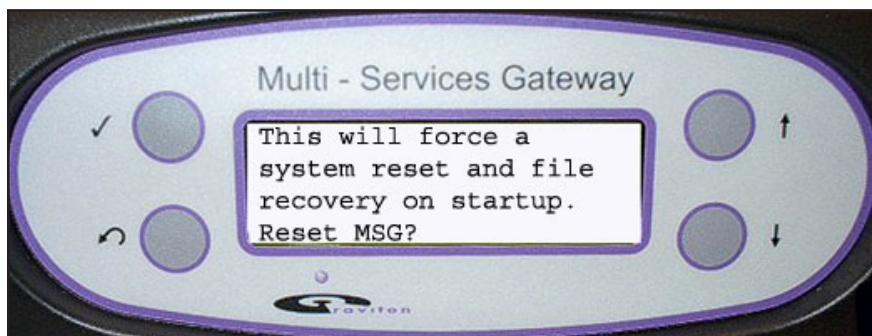
Reset and Recovery

This option is provided in the event the MSG appears to have some kind of corruption or other serious problem that went undetected in the normal detection phase. ***This process can take up to twenty minutes to complete and should only be done when absolutely necessary.***

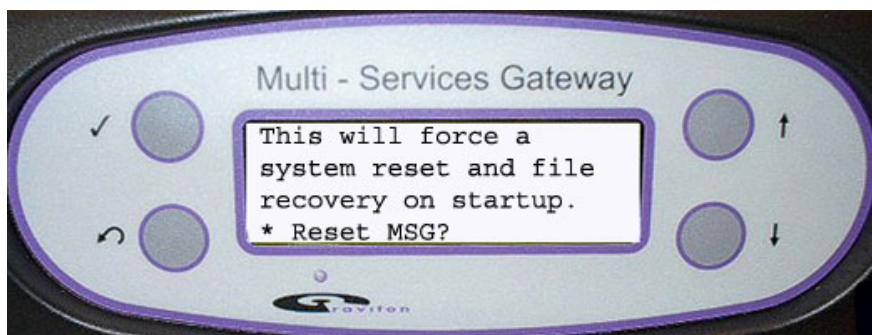
1. Move the asterisk to **Reset and Recovery** using the **Down button**.



2. Push the **Accept button**. You will see a prompt saying “This will force a system reset and file recovery on startup. Reset MSG?”



3. Push the **Down button** once to verify that you want to reset the MSG. This will place a * next to “Reset MSG”.



4. Push the **Accept button** again. The LCD will display “WAITING FOR SHUTDOWN”, then “Booting, please wait”. It will restart twice before finishing. After the second restart, the LCD will display a grayed out Splash screen. The regular Splash screen will appear when the process has completed.

Section 7: Multi-Services Gateway FAQs

- 1 **What is the gateway connectivity time?** Typically very hour (configurable).
- 2 **What type of data storage occurs, RAM/Disk?** Mostly RAM and some disk.
- 3 **Does a reboot clear the data?** Yes. How much data depends on the underlying cause.
- 4 **How many times does the MSG retry before rebooting?** It depends on the type of data it is failing on. Configuration data will result in staged retries (every minute, then every five minutes, fifteen minutes, half hour, etc. with sleep periods in between). Measurement data will keep trying non-stop for up to three or four hours depending on the box configuration and modem specifications
- 5 **Why can't I navigate past the Splash screen?** There are times when the Splash screen is greyed out and you can not navigate past it. Be patient and you will see the backlight come on indicating the MSG is finished with the process it was running. At this point, hit the **Accept button** to go on to the Status page.