

**Products: Monitor Models 2018, MMU-1600, MMU1600D, MMU1600DE, MMU-1600G, & MMU-1600GE****Title: How to Upgrade the Firmware of Monitors**

Release Date: November 19, 2004

Revised Date: November 05, 2008

Scope: This bulletin applies to the Model 2018, MMU-1600 (dash 1 version), MMU-1600D, MMU-1600DE, MMU-1600G, and MMU-1600GE. It does not apply to the original MMU-1600 (dash 0 version).

There are two ways to determine if an MMU-1600 is a dash 1 version:

1. There are twelve (12) OPTIONS switches on the front of the monitor. Earlier version had eight (8) OPTIONS switches.
2. The front panel LEDs do not protrude through the holes and there is a clear film covering over the holes.

The firmware for the main microprocessor in the MMU-1600 and the 2018 can be upgraded via the front panel mounted RS-232 port or Ethernet port (on the MMU-166DE and MMU-1600GE). The most current version of firmware is available on the Reno A&E website (www.renoae.com) and can be found in the Support section. Firmware upgrades to the monitor are accomplished through the use of the RaeComM software, version 03.00.05 or greater, which is also available on the Reno A&E website in the Support section.

There are three (3) separate firmware files for the main microprocessor in the monitor that can be upgraded.

Main Code: This is the code (firmware) that runs the monitor under normal conditions. In most cases, this is the only file that needs to be upgraded and ends with BOOTCODE.RAE if more than one file is in the downloaded file.

Secondary Boot Loader: This is the code that is responsible for allowing firmware upgrades if the main code is corrupt or becomes corrupt during the programming process and ends with BOOTLD2.RAE.

Primary Boot Loader: This is the code that is responsible for allowing firmware upgrades if the secondary boot loader is corrupt and ends with BOOTLD1.RAE. This file can only be upgraded by a user with factory level privileges.

The two boot loaders exist to allow the monitor to recover from problems during the upgrade process (power fail during programming, computer crash during programming, etc.). They should not need to be upgraded, but provisions have been made in the event that they do.



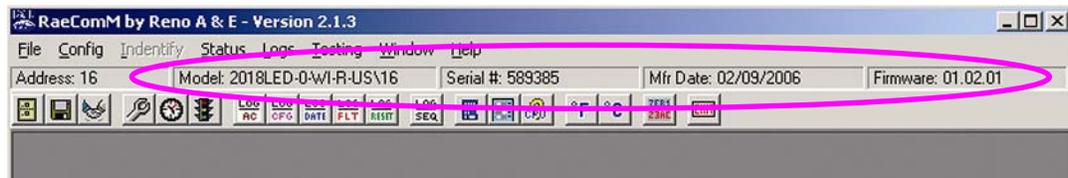
To upgrade the main code:

1. Ensure that RaeComM version 03.00.05 or greater is installed on the computer to be used during the upgrade process.
2. Download the latest file for the monitor to be upgraded from the Reno A&E website (www.renoae.com).
3. The downloaded file is a self-extracting zip file. Run this file (if it was not automatically run during the download process) to extract the files from the zip file. Save these files to a known location (example: your desktop or C:\Program Files\RaeComM)
4. Connect the monitor to the computer through the COMM PORT or ETHERNET 10/100 port (on the MMU-1600DE or MMU-1600GE). A DB-9 extension cable works well to provide a link between the computer's serial port and the monitor's communication port. If the computer being used to perform the upgrade does not have a DB-9 serial port a USB adapter may be required to connect the monitor to the computer. If connecting from the Ethernet port on the monitor directly to the computer, you will need to use a crossover network cable.
5. Start the RaeComM software. When the LOGIN screen appears, press ENTER or click on the OK button.



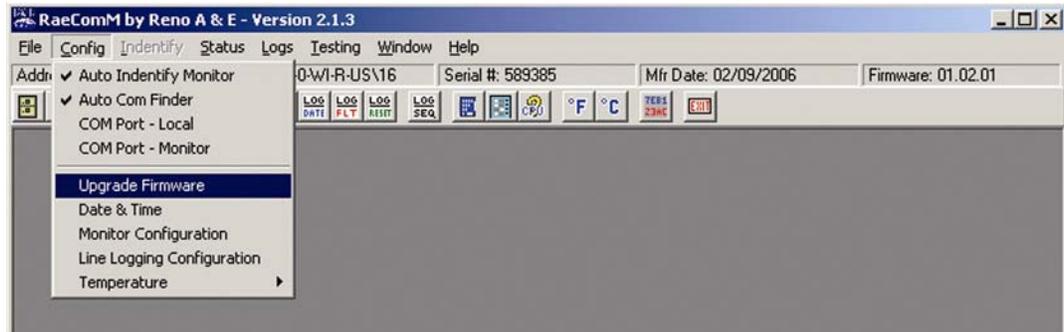
6. Ensure that the RaeComM software can communicate with the monitor to be upgraded. This should be automatic. The CONFIG file should have the AUTO IDENTIFY MONITOR activated.

If the circled information in the graphic below does not show up on the screen and the IDENTIFY on the menu bar is not grayed out, then you must click on the IDENTIFY button. Like the circled fields in the graphic below, your screen will then contain the monitor's data.

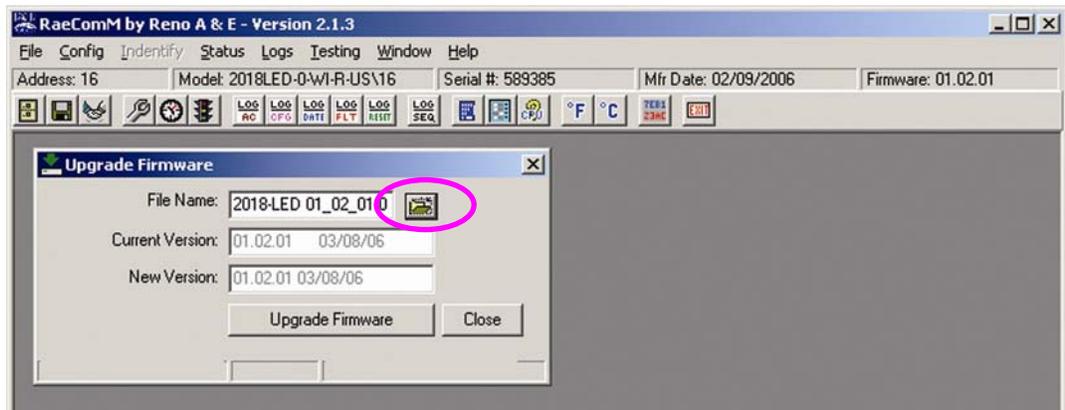




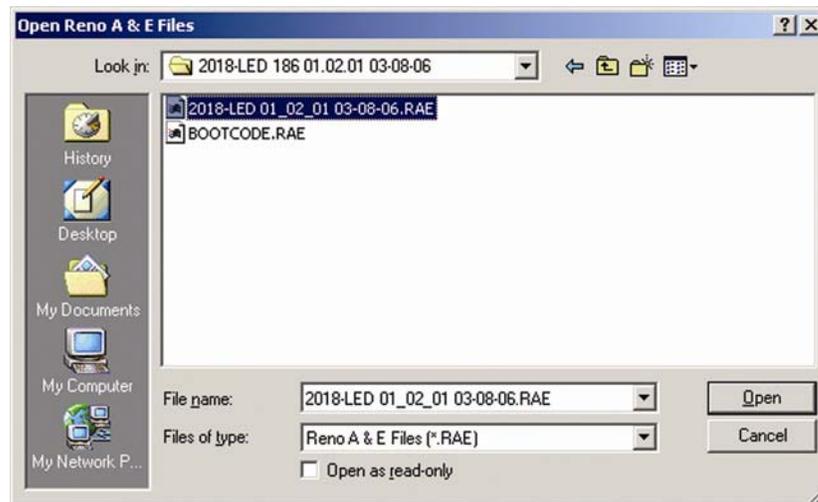
7. Open the CONFIG menu and choose UPGRADE FIRMWARE.



8. On the Upgrade Firmware form that appears, click on the file folder icon next to the file name.

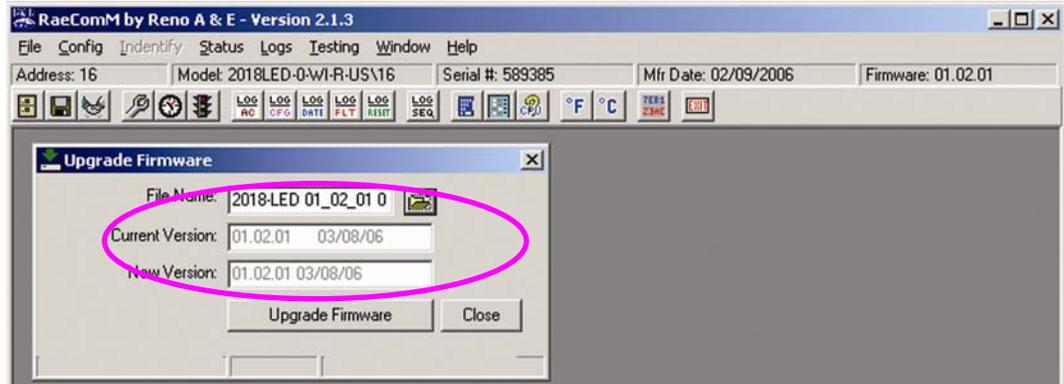


9. Select the file that was just downloaded from the Reno A&E website. If more than one file was in the downloaded file, select the one that ends with BOOTCODE.RAE.

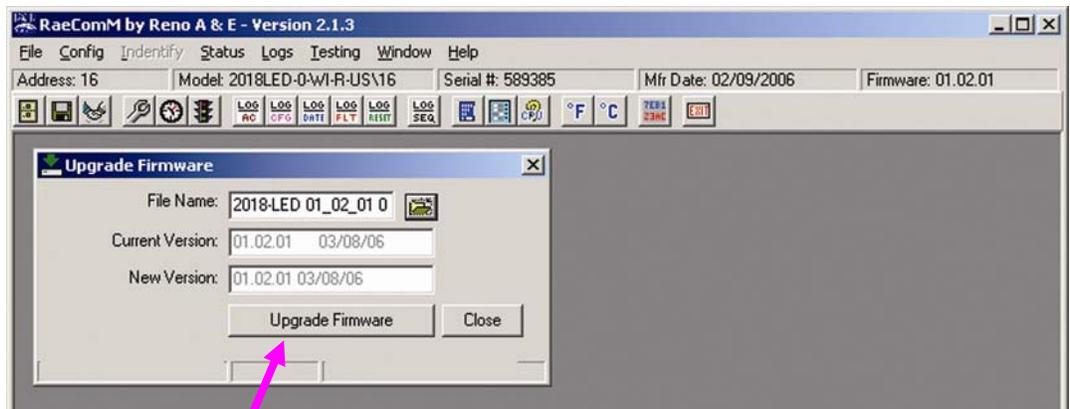




10. If the file you selected is the correct file for the monitor connected to the computer, the Upgrade Firmware form will show the version of firmware currently in the monitor and the version that is about to be transferred.



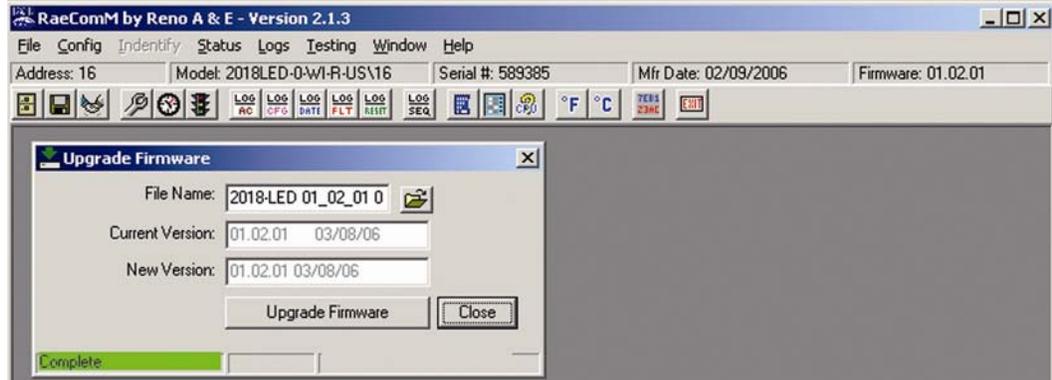
11. If this is correct, click on the UPGRADE FIRMWARE button and the transfer process will begin.



12. If an error is encountered once the transfer process has begun, RaeComM will automatically retry the transfer process up to five (5) times. Do not cycle power to the monitor if an error is encountered. Exit and restart RaeComM and attempt the transfer again.



13. Wait a few seconds to ensure that the RaeComM software does not automatically start another upgrade process (this will happen if the boot loaders need to be upgraded and is automatic). Once the transfer process is complete, cycle power to the monitor to begin running the new code.



IMPORTANT: Do not interrupt power to the monitor during the transfer process. This will corrupt the firmware being transferred.

Each firmware file is encrypted and contains information identifying what model monitor it can be used in and what type of firmware it is. This ensures that the user cannot inadvertently upgrade a monitor with the incorrect firmware and that the firmware file has not been tampered with.