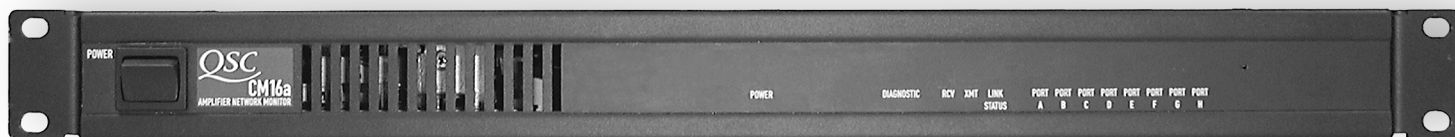


CM16a Firmware Upgrade Q&A

QSC AUDIO'S AMPLIFIER NETWORK MONITOR



Many people are reluctant to upgrade the firmware in their audio products for fear of damaging a component, or worse yet, the entire unit. In the past, firmware upgrades were a painful process—requiring either the unit be removed from the rack and opened, or the upgrade process itself might fail and render the unit useless. Today, firmware upgrades are no longer something to fear, thanks to QSC's failsafe TFTP firmware upgrade process.

Why would you want to upgrade the firmware on a piece of audio equipment anyway?

The answer to that is simple. Product enhancement. As the QSC engineers program newer and more sophisticated features into the CM16a, you might want to take advantage of these enhancements. In the past, you either had to live with the older firmware revision, or unrack all of your gear and send it to the factory (or have a field service representative come to your system and do it for you.) Either choice meant settling for

mediocrity. Now you can log on to QSC's web site, www.qscaudio.com, and download the latest revision of firmware to a PC, then apply this firmware directly to your CM16a's. In a matter of seconds, you are back on line and ready to rock n' roll. (It takes about 3 seconds to send the firmware to the CM16a, and about 7 seconds to reprogram it.)

What is TFTP, why does QSC use it, and what can it do for me?

TFTP stands for Trivial File Transfer Protocol, and is very similar to the transfer protocol that computers use to send files back and forth over the Internet.

TFTP uses the Ethernet connection on the back of the CM16a, along with a TCP/IP software protocol, to establish a link to any PC on the same network. The only software that is required on the PC is the "TFTP Client", which is available for free on the Internet and is included with Windows NT 4.0®, and Windows 2000®. Your Windows system must also have the TCP/IP protocol—this is normally included with Windows.

Now that you know what TFTP is, why does QSC use it?

QSC uses TFTP as a very safe, reliable, and quick method for upgrading the firmware that is located in the CM16a. With TFTP, you no longer have to pull all of the devices out of the rack, and send them back to



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the factory to have EEPROMS replaced—hence, there is less work for you, less chance that something happens to the hardware during the process of replacing the EEPROM, and most importantly, there is absolutely NO down time.

Is it safe?

QSC uses a very special method of implementing the TFTP transfer and the firmware upgrade. You may be familiar with upgrading the BIOS on a PC, or upgrading the firmware on other pieces of gear. It can be downright scary! If you type the command line incorrectly, or if the power goes down during the upgrade, your PC or piece of gear is dead. You cannot revive it. Now you *absolutely* have to send it to the factory for an expensive and time consuming repair. The fact that you can kill a piece of gear during firmware upgrade is enough to discourage most people from even attempting the procedure. The engineers at QSC fixed all of those problems with the firmware upgrade process that the CM16a uses. It is completely failsafe.

No matter what happens during a firmware upgrade, the CM16a will recover. If power fails during the upgrade the CM16a will recover. If the wrong file, or a corrupt file is transferred to the CM16a, it can recover. The CM16a may not recover to the point of full operation, but the unit is guaranteed to power up with a reduced level of functionality that is capable of TFTP transfer. To understand this, it is important to know the basics of how the CM16a upgrades it's firmware.

First, the CM16a receives the new firmware from the TFTP transfer. It scans and checks the firmware to make sure that the file is OK, then it stores this file in memory. Next, the CM16a erases the old program file that was stored in non-volatile FLASH memory. Finally, the CM16a reprograms the FLASH with the new file and reboots.

Imagine the power failing right after the CM16a erased the FLASH memory. In other devices without similar protection, it would be necessary to unrack and ship. Instead of dying, the CM16a detects that the power failed during the upgrade process, and powers up into a special mode of operation. This special mode does not allow control of all the CM16a's functions, but it does allow the user to send the upgrade file over TFTP again. This cycle can happen repeatedly until the FLASH is upgraded successfully. So, instead of a dead box, at the very least, you can reprogram the original version of firmware back into the CM16a, and you are ready to return to work.

Ok, now you are convinced that QSC's secure TFTP is the best and easiest way to upgrade firmware, but you don't know how to do it. Not a problem.

TFTP is invoked by a single command line. You run it from a DOS window in Microsoft Windows®. For example, assume that you just downloaded the latest CM16a firmware, called "CM16av2" from QSC's web site, and you saved it in a folder on your C:\ drive called "QSCUpgrade". Now you want to TFTP your new file to the CM16a. All you have to do is follow the TFTP format. It works like this:

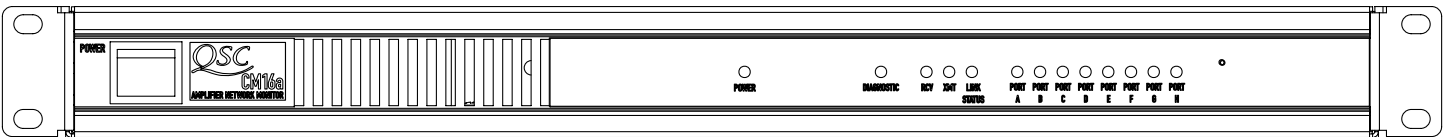
```
TFTP <ip address> PUT <filename> CM16a
```

So, if we were going to upgrade the software in a CM16a with address 10.10.34.16, we would type:

```
TFTP 10.10.34.16 PUT C:\QSCUpgrade\CM16av2 CM16a
```

The PC would report that the TFTP transfer was successful and that it took about 3 seconds to complete. The diagnostic LED on the CM16a would begin to blink, then after about 7 seconds, the CM16a would reboot, and the firmware that you just TFTP transferred would be running.

CM16a FRONT



CM16a REAR

