Which programming Mode to use.

HARDWARE and SOFTWARE Modes: There are two ways to upgrade your firmware. They are called HARDWARE mode and SOFTWARE mode. All gauges can be upgraded using HARDWARE mode, however, this requires removing the bottom endcap and using a 0.1 inch jumper plug. The SOFTWARE mode upgrade can be done without the jumper or removing the endcap, but this approach requires that the firmware currently in your gauge have this capability. In other words, if your firmware version is before a certain version, you will have to upgrade using the HARDWARE mode. Once you have upgraded, further upgrades can be performed using SOFTWARE mode.

The easiest way to tell if your firmware version supports SOFTWARE mode is to hold down the MENU key and press the power button. If the gauge displays the message, “UPGRADING FIRMWARE” when you do this, you can use the SOFTWARE programming mode. (Note, it's OK to turn off the power while this screen is displayed, as long as you haven't started the upgrade procedure.) Please see the document HowToFlashSoftware.pdf for directions on the steps involved to upgrade using the SOFTWARE mode.

If the “UPGRADING FIRMWARE” screen does not appear and the gauge turns on normally, then you must use the HARDWARE mode. Please see the document HowToFlashHardware.pdf for directions on the steps involved to upgrade using the HARDWARE mode.

How to Upgrade Firmware Version using Software Mode.

Note: While the firmware programming is similar, there are significant hardware differences between different models of the gauges. DO NOT try and put firmware for one model gauge into another model gauge. It will not hurt the hardware, but it will not work properly and you may end up scrambling calibration constants in the gauge which will require factory recalibration. Also, while normally no data or settings are lost when upgrading firmware, it is a very good idea to make a backup of any important data before upgrading.

Required Items: You need a gauge with fresh batteries, a serial cable, a computer with a serial port or USB to serial adapter, running Windows 98/XP/2000. You also need the latest ZIP archive for the gauge you wish to program. You will also need a way to extract the ZIP archive like WinZip. (XP has this built in to the operating system.)

Unzip the ZIP Archive. You will need a copy of WinZip or it's equivalent to do this. It doesn't much matter where you choose to extract this to, but be sure to extract it with the "Use folder names" set. You may want to put it on the Desktop to make it easy to find. In any event be sure you do take note of where you extract this so you can find it in the next step.

Run the uFlash batch file: Double click the extracted folder to open it. You will see 16 files in the archive. Double click the file named UFLASH.BAT (maybe just UFLASH depending on your Windows settings.) You should see a window labeled Flash Programmer appear with a prompt asking for the COM port number. Connect your serial cable from the Lemo connector on the bottom of the gauge to the computer and note what communications port. Type the COM port number (it must be a 1, 2, 3, or 4) and press ENTER on your PC's keyboard. A new screen will appear that tells you to HOLD THE MENU BUTTON DOWN AND POWER THE GAUGE ON. Do this and when the gauge displays “UPGRADING FIRMWARE” press the space bar on the PC. A message should appear that “Kernel Downloaded OK” and after a few seconds you should see the numbers changing as blocks of the flash are being programmed. DO NOT TURN OFF THE GAUGE OR INTERUPT POWER until the process is complete!!! When the process is complete unplug the serial cable. Turn on the power and confirm that the software version is updated. (See the XFER menu).

This completes the upgrade process. You can delete the entire extracted folder from your computer to save space. Simply drag the folder to the trash can.

If your batteries fail during upgrade and the gauge will not turn on, you will need to perform the HARDWARE mode upgrade procedure which requires removing the bottom end cap.

How to Upgrade Firmware Version using Hardware Mode.

Warning! In order to upgrade your firmware version you must remove the bottom endcap of your gauge. BE VERY CAREFUL NOT TO SLIDE THE CIRCUIT BOARD AS DAMAGE TO THE KEYPAD CABLE WILL RESULT. ALWAYS HOLD THE TOP ENDCAP OF THE GAUGE WHEN PLUGGING IN THE SERIAL CABLE OR THE PROGRAMMING JUMPER.

Note: While the firmware programming is similar, there are significant hardware differences between different models of the gauges. DO NOT try and put firmware for one model gauge into another model gauge. It will not hurt the hardware, but it will not work properly and you may end up scrambling calibration constants in the gauge which will require factory recalibration. Also, while normally no data or settings are lost when upgrading firmware, it is a very good idea to make a backup of any important data before upgrading.

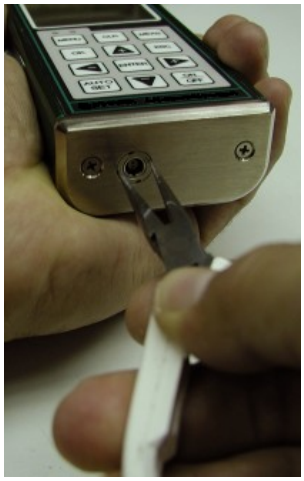
Required Items: You need a gauge with fresh batteries, a serial cable, a computer with a serial port or USB to serial adapter, running Windows 98/XP/2000, and a 0.1 center 0.025 square post jumper. This jumper is commonly supplied on computer peripheral cards like modems, Ethernet cards, etc. You can also obtain one from your sales representative. You also need the latest ZIP archive for the gauge you wish to program. You will need a pair of needle nose pliers or heavy tweezers and a Phillips screw driver. You will also need a way to extract the ZIP archive like WinZip. (XP has this built in to the operating system.)

Overview of process: The steps to upgrading the gauge are as follows. (1) Unzip the ZIP archive. (2) Double click the "FLASH" batch file in the directory. (3) Remove the bottom endcap, connect the cable and jumper. (4) Enter the COM port and press enter.

(1) Unzip the ZIP Archive. You will need a copy of WinZip or it's equivalent to do this. It doesn't much matter where you choose to extract this to, but be sure to extract it with the "Use folder names" set. You may want to put it on the Desktop to make it easy to find. In any event be sure you do take note of where you extract this so you can find it in the next step.

(2) Run the Flash batch file: Double click the extracted folder to open it. You will see 16 files in the archive. Double click the file named FLASH.BAT (maybe just FLASH depending on your windows settings.) You should see a window labeled Flash Programmer appear.
Connect your serial cable to the computer and note what communications port it is on. After reading the directions, press the spacebar for the next screen.

(3) Gauge Disassembly:



Remove the bottom end cap of the gauge: refer to the pictures. The first step is to remove the nut from the Lemo serial port connector. The next step is to remove the two Phillips head screws on the bottom end cap. Finally carefully pull the end cap off the bottom of the gauge. As already stated, be extremely careful when this end cap is removed. The circuit board and top endcap are free to slide out the top of the gauge, however this will damage the keyboard cable which is locked into the circuit board. If you must remove the circuit board, the procedure is to remove the top end cap, slide the board out the bottom until the keyboard cable connector is visible and can be unplugged, then slide the entire assembly out the top endcap.

Connect the serial cable to the bottom Lemo. Now carefully connect the jumper to the two pins visible near the screw on the opposite side of the serial cable. This activates power to the gauge, although the display will not activate.

(4) Enter Com Port:

Now, back to the computer, enter the COM port number (1-4) and press enter. A message should appear that programming is in process and after a few seconds you should see the numbers changing as blocks of the flash are being programmed. When the process is complete, carefully unplug the jumper and then the serial cable. Turn on the power and confirm that the software version is updated. (See the XFER menu).

Carefully replace the endcap, DO NOT SLIDE THE CIRCUIT BOARD! Replace the two Phillips screws and the Lemo nut.

This completes the upgrade process. You can delete the entire extracted folder from your computer to save space. Simply drag the folder to the trash can.

Now that you have current firmware, you can now use the SOFTWARE MODE for further upgrades.