

# LP-100

## OLED Display Upgrade Kit



(colors in photos are not accurate)



## Preliminary Information

## Assembly Manual

June 2011  
TelePost Incorporated  
Rev. A3

## Preliminary information...

Because there are some slight differences in the instruction set for the OLED displays, the display is not a 100% drop in replacement. Depending on your current settings, however, it can be almost 100% without flashing new firmware. The main differences between the OLED and PLED displays is the way in which custom characters are programmed and the operation of the cursor. Both of these factors affect the display of the bargraphs, which use both custom characters which the meter loads when it starts, and the cursor. If you are using the 2<sup>nd</sup> option for the displaying the bargraphs, where the bars are grouped tightly into groups of 5 bars each, then you can just plug in the OLED and it will work except for the funny cursor at the end of each bargraph. If not, you would have to go into the Setup menus and navigate to the one below, where you would select the display option on the right. See below...



This is done by pressing the third button on the LP-100. If you have very old firmware, you may not have this option, in which case you must flash new firmware to see anything on your new display. After making the selection, you must power the meter down and back up.

**WARNING: If you set the bargraph style on your LP-100 to style 1, the meter will not work at all with the OLED display. After flashing new firmware (v1.1.8.0 or newer), the style choice will not be available. Only style 2 is supported.**

**NOTE:** If you have a serial number below 00100, you may still have the original microcontroller, which does not have enough memory to store the latest firmware.

If that's the case, you need to contact TelePost to obtain a new microcontroller. The only cost associated with this is shipping. You will need to supply your serial number so that we can program the correct Calibration table into your meter. You can check the status of your microcontroller by looking at the number stamped on it (the chip is the large one behind the display on the main board). It should read 18F2620 if it is the new one.

After you have done the hardware installation, you will have a working display except for the cursor, which will make the end of the bargraph look strange. See below...



Flashing new firmware will fix this. Other changes in the new firmware include changing the “dashes” in the bargraphs to “dots”. There are some technical reasons why this was necessary. Also, since the OLED does not have a way to adjust brightness, it was decided to shorten the time before the screen saver starts, and to change the duty cycle of the call sign flashing to extend the life of the display. Of course, you can also eliminate the call sign flashing by programming all “spaces” for the letters.

Another change is the addition of a “Display Type” setup screen. This allows selecting between PLED, VFD and OLED. It defaults to OLED after flashing and power cycling the meter. The VFD position is for commercial customers who use a large VFD display. For reference, here is the new screen, which again you should not need to touch...



## Hardware Installation...

- Remove the top cover of the LP-100 and note the position of the PLED display and connector.



- Remove the plug from the back of the PLED display, then remove the display by removing the four front panel screws which support it. Move the mounting screws and standoffs from the PLED display to the OLED display. See below.



## Hardware Installation, continued...

- ❑ Remove the protective film from the face of the OLED display.
- ❑ Mount the display to the front panel using the screws which held the PLED display in place. Make sure that the display is oriented as before.



- ❑ Reinstall the cover on the LP-100. This completes the hardware installation.

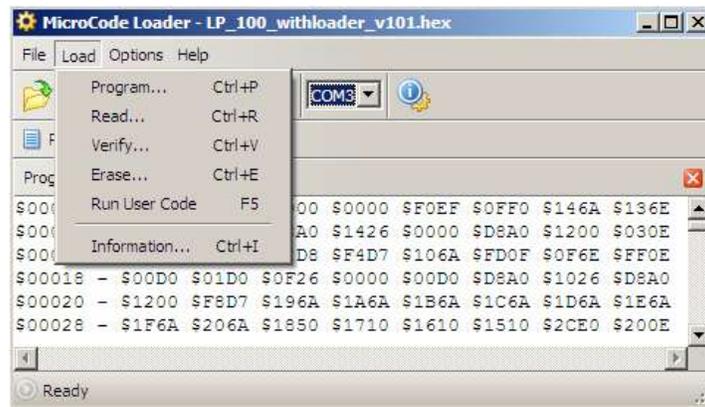
# Firmware Installation...

## Flashing the new firmware.

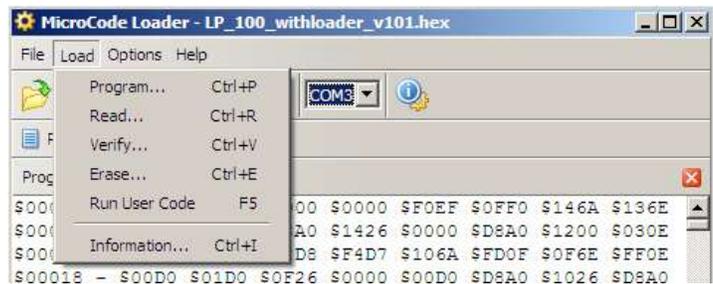
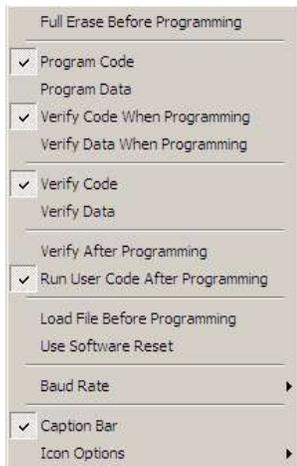
New firmware must be flashed into your original processor in order for the new display to work properly. To start with, download the latest firmware from the TelePost website. The latest firmware can be found at the bottom of the page, <http://www.telepostinc.com/LP-100-Update.html> The version number will be below v1.2.0.0 (which designates the starting number for LP-100A firmware). The first version that supports the PLED displays is v1.1.8.0.

Locate MCLoader. If you can't find it, email TelePost for a new copy, which will be sent to you via email. MCLoader works with the MicroCode Loader bootstrap loader program installed on your PIC. It allows the user to easily update the firmware in the LP-100. Before attempting to flash new firmware, make sure the connection between the LP-100 and PC is solid. You can do this by running the VCP program. If you have not used VCP before, make sure that you have it set up for the LP-100, not the LP-100A. To do this, open the "Setup" section using the menu at the top of the program, and "uncheck" the little check box that says "v1.2.0.0 or newer". Once you have verified a good connection, close VCP.

Start MCLoader. It will look like the picture on the left (but without the additional sub menu on top). If you see data in the white window, it is the hex data from a previous programming session. This data goes with the filename shown in the blue bar at the top of the program, next to the name MicroCode Loader. Click on the File menu, and select Open.



Navigate to the new hex file you downloaded and unzipped earlier, and open it. The name in the blue bar will change to the new filename, and the data in the white window will change. Click the Options menu and verify that the settings are as shown below left...



Click on the Load menu (above right) and select Program. This will start the programming process. The first thing you will see will be a message to reset the microcontroller. To do this, simply turn the LP-100 off and back on. The message will be replaced with a progress bar showing that programming is underway. When the process is finished, the LP-100 will start back up with the new firmware. The display will look strange at this point because the new display parameter won't be recognized until the meter is rebooted. To do this, simply power cycle the meter.