

## Background

Each fluorometer contains one or two memory chips with embedded batteries. One chip, the NVRAM (non-volatile data), stores various instrument parameters such as calibration values. The chip's battery will deplete after several years and need to be replaced.

## Battery Failure Notification

If the NVRAM internal battery is low, a warning screen will automatically be displayed when the instrument is turned on. The screen displays: "WARNING! NEW NVRAM, select <1> to set default." The instrument will still operate, but once this message appears, every time the fluorometer is turned off it will lose instrument settings and previous calibration settings.

## Temporary Solution

The problem can be mitigated simply by leaving the instrument ON at all times until the NVRAM module can be changed. If it is turned off, instrument settings will have to be reset and the instrument recalibrated. If this failure message appears, it is recommended that you write down your parameter settings immediately, in case the fluorometer is inadvertently turned off.

**Note:** *When the NVRAM fails, data stored in the internal data logger will be saved, as it is not dependent on the NVRAM.*

**Note:** *On rare occasions, you may see "Some NVRAM DATA are corrupted, select <1> to restore default, select <0> to continue." This may indicate that there is a problem with the NVRAM for storage of instrument settings. Select <1> and this may temporarily allow you to obtain readings. If readings or software performance is not normal, contact the manufacturer and we may be able to temporarily mitigate the problem. If this screen appears, however, you should replace the NVRAM. If it appears again after a new NVRAM is installed, contact the manufacturer.*

## IMPORTANT PRECAUTIONS

**WARNING!! High voltage up to 1000 volts may be present inside the instrument. Use caution and avoid the area around the large orange capacitors and lamp transformer (300 V) on the Power PCB (PCB at front of the instrument, right hand side as you face the front of the unit). Stored voltage will dissipate after a few minutes.**

**Note:** *It is important to follow disassembly and reassembly instructions carefully to avoid damage to internal components and impairment of instrument function.*

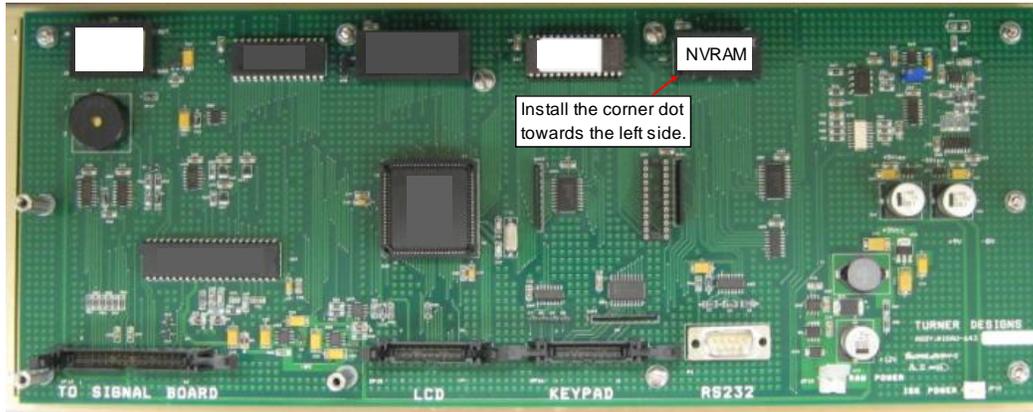
### Notes on chip handling:

- **Do not touch the metal pins on the chip without discharging static electricity from your hands. To discharge, touch the metal instrument chassis or handle BEFORE touching the chip.**
- **Chip should be stored in a clean, dry place, free of electromagnetic sources.**
- **Installation in the wrong orientation will damage the chip and cause a malfunction.**
- **Bent or improperly seated pins will cause a malfunction.**

## NVRAM Installation

1. **UNPLUG THE INSTRUMENT!!!**
2. If the NVRAM has not failed yet and the parameters are still set, go through each screen and write down the parameters that are currently set (so resetting parameters after installation will be easier).
3. Remove the fluorometer from the case.
  - a. Set the instrument on a clean, dry bench or table, front panel up (facing the ceiling).
  - b. Remove the hex-head screws on the perimeter of the front panel.
  - c. Grasp the handles on the front panel of the instrument and lift it straight up. It is helpful if someone holds the case while another person lifts the unit out. **Note: Make sure no wiring is caught before final removal from the case. Be careful not to damage the rubber gasket on the inside perimeter of the case.**

- d. Set the instrument carefully on the bench, top side up, with the front of the unit facing toward you.
4. Face the front of the instrument. At your right, toward the back of the instrument is a corner bracket. Locate the rear-most printed circuit board (PCB). Close to the place where the corner bracket meets the rear panel there is an NVRAM in position U22



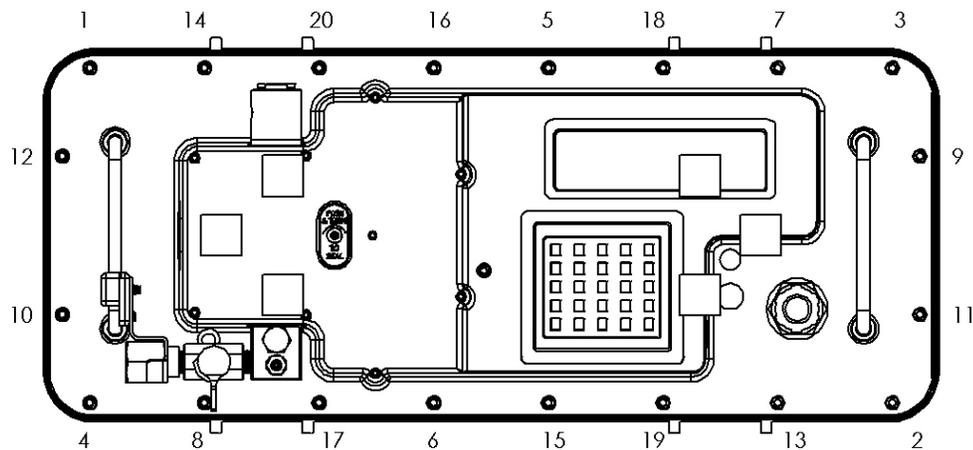
5. Take a small flat-head screwdriver and **GENTLY** pry the NVRAM from its socket. Set aside.
6. Discharge static electricity by touching the chassis.
7. To install the new NVRAM into the empty socket:
  - e. Examine the NVRAM before installing to make sure all pins are straight.
  - f. Locate the small dot on the new NVRAM. The new NVRAM **must be** installed with the dot at the lower left-hand corner as you **face the front** of the instrument.
  - g. Carefully line up the bottom row of pins with the bottom row of openings.
  - h. Then gently press the top row of pins into the socket.
  - i. When you are sure all pins are properly seated, use the flat side of a screwdriver to press the NVRAM evenly all around, making sure it is in as far as it will go.
8. Make a visual check of the inside components to make sure no wiring is hung up and that everything appears to be secure: cable connections tight, IC's snug, etc.
9. Set the instrument case on its back and grasping the instrument handles, carefully slide the instrument back into the case. Check the rubber gasket on the case perimeter to make sure it is properly seated and undamaged.



10. Before reinstalling the hex-head screws, plug in the unit and turn it on. A screen will appear announcing a new NVRAM. Press <1> and access the Main Menu and check for normal operation by paging through screens, etc. Turn the instrument off, then on again to make sure no NVRAM warning screen appears again. If a warning screen reappears, recheck your installation of the NVRAM.
11. Check the hex-head screws to make sure the o-rings underneath the screw heads are present and undamaged. Reinstall the hex-head screws in order of the drawing below. Tighten the screws snugly, but **DO NOT over-tighten**.

**CAUTION:** If your instrument has a plastic faceplate extra care must be taken when tightening the hex-head screws. **DO NOT over torque the screw. Tighten in the pattern shown below. Initial tightening must be in the order specified by the drawing below to no greater than 10.5 in/lbs torque. Final tightening of screws should be done with a torque wrench to 13 in/lbs torque.**

Plastic faceplate tightening pattern:



12. Reset instrument parameters and calibrate.
13. Write down the date of installation on the label supplied and affix it to the instrument.