

APPLICATION NOTE

21X PROM Replacement Procedure



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21X PROM Replacement Procedure

This document covers the procedure for replacing the firmware (PROM) in a Campbell Scientific 21X or 21XL Micrologger. For a nominal fee, Campbell Scientific will install PROMs in 21X(L)s that are returned to the factory; request a Returned Materials Authorization (RMA) from Campbell Scientific.



This procedure erases data and programs stored in the 21X or 21XL. Before you begin, transfer to a computer or storage module all data and programs you wish to save. For information about transferring data and programs between the 21X(L) and a computer, see the 21X(L) Operator's Manual.

To prevent components from being damaged by the discharge of static electricity, the PROMs should be replaced at a grounded work station by a person wearing a grounding strap.

Tools Required

- Phillips screwdriver #1
- PROM puller
or
Flat-bladed screwdriver (shipped with 21X(L))
- New PROMs

Procedure

1. Confirm that all necessary data and programs stored in the 21X(L) have been saved to a computer or storage module.
2. Flip the ON/OFF switch (on the side of the 21X(L)) to the OFF position.

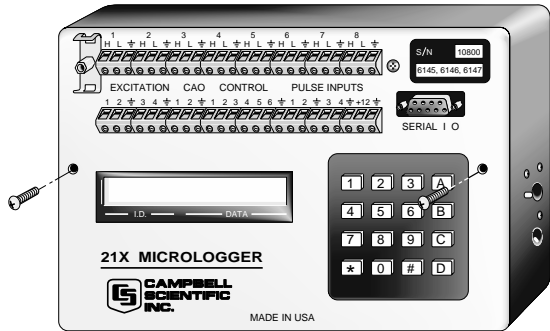


FIGURE 1. Removing Faceplate Screws

3. Use a Phillips screwdriver to remove the screws on both sides of the 21X(L) faceplate (Figure 1).

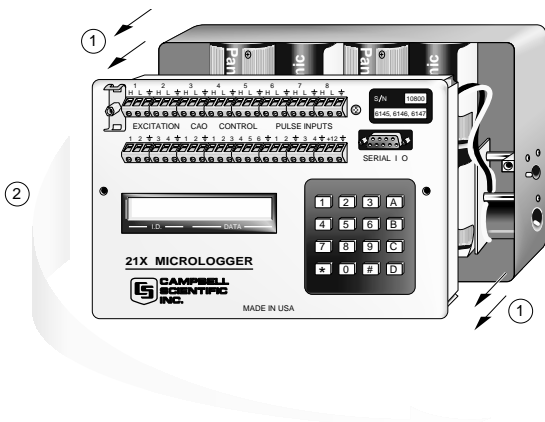


FIGURE 2. Separating the Faceplate From the Base

4. Remove the faceplate from the base by pulling the faceplate straight out from the base (① on Figure 2).



The faceplate is still connected to the base by wires from the power supply. Do not pull the faceplate more than 2” away from the base.

5. Once the faceplate has been disengaged from the mounting posts, rotate the left side of the faceplate away from the base to expose the battery pack (② on Figure 2).

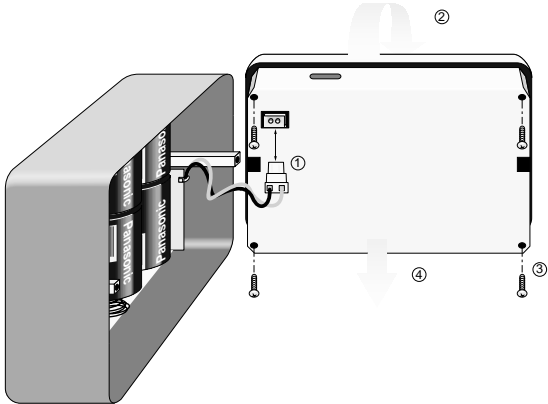


FIGURE 3. Removing the Back Cover of the Faceplate

- 6. Disconnect the Molex connector to separate the base from the faceplate (① on Figure 3).
- 7. Rotate the faceplate onto its face (② on Figure 3).
- 8. Use the Phillips screwdriver to remove the four screws that hold the back cover to the faceplate and printed circuit boards (③ on Figure 3). The screws are attached to spacers that may move once the screws have been removed... so if something rattles, don't panic (yet).
- 9. Remove the back cover of the faceplate (④ on Figure 3).

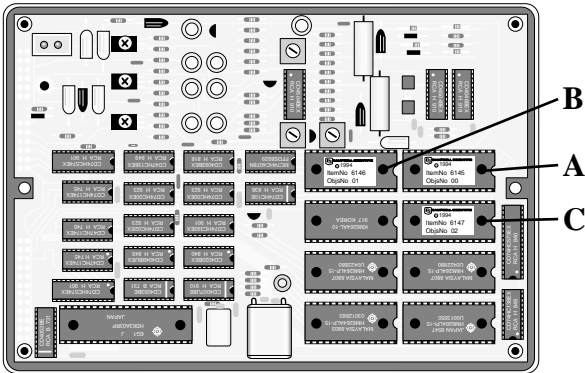


FIGURE 4. Inside the Faceplate

- 10. See Figure 4 and the table below to determine the PROM(s) you want to replace. The installed PROMs all have a notch on the right side. The replacement PROMs must also be installed with the notch on the right.

Firmware	Socket A	Socket B	Socket C
OSX-0.1	6145-03	6146-05	6147-06
OSX-1.1	6145-03	6146-05	6160-05
OSX-2.1	6145-03	6146-05	6161-06



Older 21X(L) Microloggers, pre 1986, were shipped with only two 4K RAM chips (p/n 6116). When these Microloggers are upgraded to new software PROMs, you must replace the two 4K chips with five 8K chips (p/n 6264). You may also need to reset two jumpers. M15 must be jumpered on the right set of pins and W20 and W27 must be jumpered on the left set of pins (see Appendix E in the 21X manual).

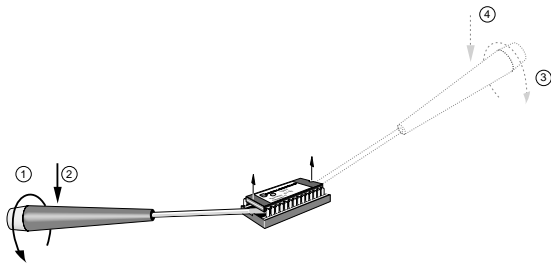


FIGURE 5. Removing the PROM with a Screwdriver

11. Use a PROM puller to remove the PROM. If you don't have a PROM puller, use the less elegant procedure described below:
 - a) Insert the end of a small flat-bladed screwdriver underneath the PROM, then gently rotate the screwdriver to slightly lift the PROM from the PROM socket (① on Figure 5).
 - b) Gently pry up the end of the PROM to about 1/8" off the socket (② on Figure 5).
 - c) Move the screwdriver to the other end of the PROM and perform the same procedure (③ and ④ on Figure 5).
 - d) Alternate prying the PROM from either end. Lift the PROM approximately 1/8" with each pry until the pins clear the sockets and the PROM can be lifted out of the socket.



FIGURE 6. Inserting the New PROM

12. Hold the new PROM by either end as shown in Figure 6. Position the PROM over the sockets with the circular notch on the end of the PROM oriented the same direction as the surrounding PROMs.



CAUTION

The notch must be on the right side. Inserting the PROM in the wrong direction can damage it.

Set the pins of the PROM on the individual sockets and press gently. Make sure individual pins are being inserted straight into the socket clips and are not bending. Gently push the PROM in until it seats fully in the socket.



NOTE

Inspect the PROM assuring that none of the pins have been bent or are not in the socket.

13. Repeat steps 9 through 1 (in reverse order) to reassemble the 21X(L).