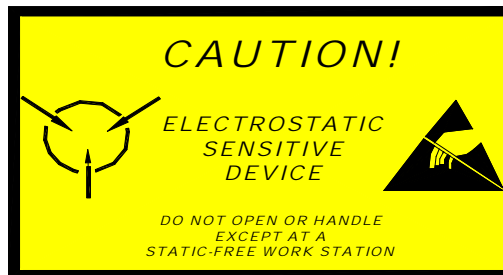




07-004A
20 March, 2007

Motherboard Replacement in “E” Series Instruments

- I. PURPOSE:**
To provide instruction on replacement of the Motherboard of any E series analyzer.
- II. TOOLS:**
#1 Phillips screwdriver
Needle nose pliers
ESD wrist strap
ESD safe work surface
- III. PARTS:**
Motherboard
- IV. REFERENCES:**
Service Note: 03-020A – How to perform a manual DAC calibration on E series machines
Service Note: 03-022A - ESD Prevention



The electronics used in T-API analyzers are sensitive to Electrostatic Discharge (ESD). When working on any T-API device, please ensure that you are properly grounded prior to handling or touching any electronic circuitry in the analyzers! For more information on how to protect sensitive components from ESD during handling, please contact T-API customer service and ask for the ESD Service note number 03-022.

- IV. PROCEDURE:**
1. Prepare a static protected work surface to set the board after removal.
 2. Power down the analyzer and unplug 3 prong power cord from the back panel.
 3. Remove top cover.
 4. Loosen rear panel captive screws and allow the rear panel to tip down.
 5. Note locations of all electrical connectors on the motherboard and CPU board.
 6. Install your wrist strap before touching the internal electronics.

7. Unplug every connector on the motherboard and CPU board.
8. Remove 4 long screws fastening the CPU board (and multidrop board if installed) through the motherboard and then through to the back panel.
9. If there are analog output current driver boards installed in J19, J21, or J23, they will need to be transferred to the new mother board by removing the bottom screw and unplugging the board – set aside on the static protected surface.
10. If there are analog output stabilization boards installed in J19, J21, or J23 they will need to be transferred to the new motherboard, they just unplug (place on static protected work surface), note that they have an indicator arrow (“UP”) to indicate installation direction.
11. Remove the remaining 5 short screws from the motherboard.
12. Remove the boards from the analyzer to the static protected surface.
13. Separate the CPU board from the motherboard by rocking the boards against each other while pulling the boards apart. Be careful to go slowly so the pins do not become bent. If they get bent over, use needle nose pliers to straighten them out.
 - a. The motion is to pull the loose end of the CPU board up – no more than ½” while pulling up slightly. The push the end of the CPU board back down (still use tension to pull the CPU board up and away from the motherboard). Again pull the loose end of the CPU board up no more than ½” while pulling up. Repeat this “rocking” action until the boards are separated.
14. Remove the new motherboard from the ESD safe packaging – be sure to still have on your wrist strap – and place it near the other boards.
15. Remove the old board from the work surface and place into the ESD safe packaging that the new board came in.
16. Carefully align the CPU board pins with the new motherboard connector and push to install.
17. Place the boards back into the analyzer and align with mounting holes.
18. Install 4 long screws (that mounts the CPU to the motherboard) and the 5 short screws. Do not tighten all the way until all screws are started. Install the analog output current driver boards or analog output stabilization boards if applicable.
19. Reconnect all connectors.
20. Swing the rear panel back up and tighten the captive screws.
21. Reinstall the top cover.
22. Plug in power cord to back panel.
23. Power up instrument; allow to warm up for 30 minutes.
24. The analog output calibration may need to be performed, if the analog output warning comes on, perform the procedure outlined in service note:

03-020A – How to perform a manual DAC calibration on E series machines

25. Perform a zero and span calibration check, recalibrate if necessary.
26. If the board was sent under warranty, return the old board to Teledyne using the appropriate ESD protective packaging and use the RMA number that was issued.
27. If you experience any trouble with this procedure, please contact Customer Service.