



**02-039H**  
**22 April, 2013**

**Downloading New Firmware into "E" Series Analyzers**

**I. PURPOSE:**

This procedure guides you through downloading new firmware into E series analyzers.

**II. TOOLS:**

A computer with communications program (HyperTerminal is on all Windows computers).  
DB9 to DB9 Female to Female Serial Communications cable.  
If your computer only has a USB serial port, you will need a USB to RS232 adapter

**III. PARTS and SUPPLIES:**

New Firmware file, this file may be e-mailed to you or can be sent by other media

**IV. REFERENCE:**

Service Note 06-005 - Extracting Parameters, Readings, Settings, and Data using HyperTerminal.  
Service Note 05-023 - APICOM and IDAS Procedure Tutorial  
Service Note 03-020 - How to Perform a Manual DAC Calibration on "E" Series Machines  
APICOM Manual [http://www.teledyne-api.com/manuals/07463A\\_APICOM\\_v\\_5.05\\_Manual.pdf](http://www.teledyne-api.com/manuals/07463A_APICOM_v_5.05_Manual.pdf)

**V. PROCEDURE:**

1. Before downloading new firmware, it is recommended to extract and save various important parameters from the instrument, refer to Service Note: 06-005 - Extracting Parameters, Readings, Settings, and Data using HyperTerminal.
2. When the firmware is downloaded, all of the stored data in the IDAS (internal data acquisition system) will be deleted, refer to Service Note 05-023 for instructions on saving this data, or the IDAS Manual available from the Teledyne-API website.
3. Perform this download procedure after you receive the new firmware file and install it to the downloading computer. Usually the firmware file is installed on the desktop.
4. Check current firmware version from the analyzer front panel.
  - a. Press **SETUP**, look at upper-left blinking letter / number, such as **C.3**;  
Record on scrap paper, this old version will be used later.
5. Change analyzer baud rate to 115200.
  - a. **SETUP - MORE - COMM - COM1 - SET> - EDIT - NEXT....until 115200 - ENTR**
6. Connect computer com port to analyzer com port with RS-232 cable.
7. Open HyperTerminal and **type a name** for the connection (such as **Direct Download**), and press **OK**. Depending on your version of Microsoft Windows, HyperTerminal is located on your computer at: Start / All Programs / Accessories / Communications / HyperTerminal (example of Windows XP).
8. Select Connect using: **COM1** (or use dropdown to select your computers active com port), and press **OK**.
9. Use bits per second dropdown and select **115200**.
10. Ensure Data bits = **8**, Parity = **None**, Stop bits = **1**, Flow control = **None**.

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11. Now press **OK**.
12. Type a question mark (?) (even if the ? character does not display on the screen) and press **Enter (↵)**.
13. If the analyzer does not respond with the help menu, go to the back of the analyzer and observe the red / green LEDs on the back panel near the serial com ports. If only one LED is lit, change the position of the DCE/DTE switch on the back of the analyzer, then both LEDs should be lit. Now type a question mark again (?) and **Enter (↵)**, the help menu should display.
14. If typing characters do not display on the screen, press the "Control" key and the "T" key together (**Ctrl + T**) to turn on the terminal mode, now typing will echo onto the screen.
15. Type: **D RESET 11** and press (**↵**),  

There are spaces here

↑

↑

**or** go to **HALT FIRMWARE** on front panel of the instrument, and press, **Setup – More – Diag – 929 – Entr – Next (until... Halt Firmware) – Entr**, push **Yes** to exit to DOS, then push the **(.)** period key **or** choose **RCMD** (Remote Commands). Now choose baud rate of 115 K or let the timer count down and automatically connect. Rates must match between the instrument and the computer.
16. In the HyperTerminal window, type: **DIR (↵)** to see all of the files, (DIR = directory) and locate the file called FIRMWARE.EXE.

**The goal is to rename the file that the instrument uses called FIRMWARE.EXE, then delete the data file that the old firmware wrote into (DATA.BIN), then download a new firmware file and rename it to FIRMWARE.EXE**

**NOTE: In the following step, type your old version if it is not C.3 (C.3 = current firmware version from example in step 4). By keeping the old file, it is possible to revert to old firmware.**

17. Type **REN FIRMWARE.EXE FIRMWARE.C3 (↵)** (REN = rename)  

There are spaces here

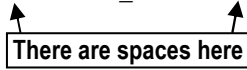
↑

↑
18. Type **DIR (↵)** to see that the file was renamed correctly.
19. Type **DEL DATA.BIN (↵)** (DEL = delete)
  - a. Check to ensure screen displays:  
 FILE DATA.BIN DELETED  
 1 FILE(S) DELETED
20. Type **RCV YMODEM (↵)**. Immediately after this command, go to step 21, do not wait. The RCV YMODEM command gets the analyzer waiting for you to send the file to it from your computer. Step 21 sends the file from your computer to the analyzer. The analyzer only waits for a short time and then reports a timeout warning. If the receive timeout happens, press OK for the warning and repeat steps 20 - 21.
21. Now on the hyper terminal menu screen, select **Transfer**, then select **Send File**.
  - a. Select the Filename **BROWSE** button and go to the firmware version file that you want. Select the file and press **Open**. This file will be the new firmware that may have been e-mailed to you or installed on a computer drive, (must be the **.EXE** file).
  - b. Select or ensure the PROTOCOL is **YMODEM** (use dropdown to select).

- c. Press **Send** to download to the instrument, you should see the “packets” begin counting; when finished, ensure that FILE RECEIVED OK is displayed.
  - d. If a timeout error has occurred or data does not transfer, press cancel, then press OK, and start over at RECV YMODEM step 20 – 21 above.
22. Type: **DIR (↵)** to see the newly installed file. Use this newly installed file name for the next step.

**NOTE: In the following step, rename the file that you downloaded – the filename must be typed exactly as displayed from the directory command, (example = M400E\_D4.EXE).**

23. Type **REN M400E\_D4.EXE FIRMWARE.EXE (↵)**


  
 There are spaces here

24. Type **DIR (↵)** to see that the file was renamed correctly.
25. Type **EXIT (↵)** and the analyzer will reboot using the new firmware file.
26. The analyzer needs to be power cycled for the upgrade to be complete, but first the factory options need to be reassigned.
- a. Use the data captured from the parameter extraction procedure to reassign the factory options and input to VARS. The v list ! parameter is called:  
V 210:12:35 0200 FACTORY\_OPT=513 (0 to 65535) BitFlag.  
In this example, 513 is the parameter, use your parameter for the next step.
  - b. Press, **SETUP - MORE - VARS - 929 - ENTR - NEXT...until FACT\_OPT=0 BitFlag - EDIT** - Change to your number and press – **ENTR.**
  - c. If you don't have the VAR number and know what the options are, press, **SETUP - MORE - DIAG - 929 - ENTR - NEXT...until FACTORY OPTIONS - ENTR** - Change the various options as required and press – **ENTR.**
27. Power cycling should happen any time the firmware is upgraded, or if factory options or VARS are changed.
28. Turn power off, wait 5 seconds, turn power back on (this is referred to as power cycling).
29. Usually there will be ANALOG CAL WARNING displayed on the analyzer – if this warning is present, you must perform ANALOG I/O CONFIGURATION CALIBRATION (DAC CAL) procedure, refer to Service Note 03-020 - How to Perform a Manual DAC Calibration on “E” Series Machines.
30. You must now recalibrate (zero and span) the analyzer.