PLC-5 Programmable Controller Flash Tool

(Catalog Number 1785-L11B, -L20B, -L20C, -L20C15, -L20E, -L26B, -L30B, -L40B, -L40C, -L40C15, -L40E, -L40L, -L46B, -L46C15, -L60B, -L60C, -L60C15, -L60L, -L80B, -L80C, -L80C15, -L80E, -L86B)

Use This Manual If...

Use this manual if you are responsible for performing a flash firmware upgrade to a flash-based PLC-5® processor.

This Manual Describes...

This manual describes how to use the PLC-5 programmable controller flash tool to upgrade these products:

- series E and later Enhanced PLC-5 processors
- series E and later Ethernet® PLC-5 processors
- series C and later ControlNet™ PLC-5 processors

This manual also describes what to do if the flash upgrade does not complete successfully.

The following publications contain additional information about Allen-Bradley PLC-5 processor products. To obtain copies, contact your local Allen-Bradley office or distributor.

For more information about:	Read this publication:	Publication number:
Enhanced PLC-5 processors	Enhanced and Ethernet PLC-5 Programmable Controllers User Manual	1785-6.5.12
Ethernet PLC-5 processors		
ControlNet 1.0 or 1.25 PLC-5 processors	ControlNet PLC-5 Programmable Controllers User Manual	1785-6.5.14
ControlNet 1.5 PLC-5 processors	ControlNet PLC-5 Programmable Controllers Phase 1.5 User Manual	1785-6.5.22

Before You Begin...

Gathering What You Need

Gather the following items before you begin using the flash upgrade. (Items marked with an asterisk (*) are included in the flash tool package you ordered.)

- flash firmware upgrade tool disk*
- PLC-5 processor whose firmware you want to update (with chassis and power supply)
- personal computer with PLC-5 programming software installed
- shielded serial cable (1784-CP10 or 1784-CP11)
- this manual*
- firmware revision label*
- plug PROM(s) (if you require a plug PROM firmware update)*

Running the Software

ATTENTION: You must install and run the PLC-5 flash tool on a computer booted up in DOS 6.22 or later. **Do not use a DOS window running under Windows 95 or Windows NT**.

You will copy the flash files to your hard drive.

Using the Flash Tool

To successfully use the flash tool, you need to complete seven steps:

ATTENTION: Pay strict attention to the flash tool procedure. Failure to follow this procedure exactly may result in an inoperable processor.

1. Prepare the PLC-5 processor.
2. Install the flash tool.
3. Perform the firmware upgrade.
4. Apply the firmware revision label.
5. Update the communication plug firmware, if necessary.
6. Reconnect the PLC-5 processor.
7. Uninstall the flash tool.

Step 1 - Preparing the PLC-5 Processor

ATTENTION: You must save the processor memory to your hard disk or to an EEPROM. If you do not, the PLC-5 user memory will be lost because the flash procedure erases processor memory.

1. Save processor memory to your hard disk or to an EEPROM using your PLC-5 programming software.
2. Remove the processor battery cover and disconnect the battery. This resets the serial port to its default configuration so that the PLC-5 processor and the flash tool can communicate.
3. Turn off processor power.
4. Disconnect all cables (serial, DH+™, ControlNet, Ethernet, etc.) from the processor.
5. Disconnect the coprocessor or PLC-5 Ethernet Interface module, if one is connected.
6. Turn the processor keyswitch to Program mode.
7. Turn on processor power.
8. Attach the shielded serial cable (1784-CP10 or 1784-CP11) between channel 0 on the PLC-5 processor and the serial port on the computer.

Step 2 - Installing the Flash Tool

1. Boot the computer in DOS 6.22 or later. **Do not use a DOS window running under Windows 95 or Windows NT**. Verify that there is a DOS prompt on the screen.
2. Create the following directory on the programming terminal's hard drive by typing:

   `md c:\flash` Return

ATTENTION: Make sure you install this application on the hard drive. Do not attempt to run it from the floppy disk; it will not work.

3. Place the flash firmware upgrade tool diskette in the a: drive of the programming terminal. Copy the files from this diskette to the programming terminal hard drive by typing:

   `copy a:\*.* c:\flash` Return

4. On the programming terminal, change to the following directory containing the firmware files by typing:

   `cd c:\flash` Return

Step 3 - Performing the Flash Upgrade

Follow these steps to upgrade the processor firmware.

ATTENTION: Do not interrupt the flash download process by disturbing the processor or computer. Failure to do so may result in an inoperable processor.

1. Enter this command:

   `flash5` Return

   The flash upgrade catalog number selection screen appears.

2. Use the arrow keys to move the cursor to the catalog number of the flash upgrade you want to download to the processor and press Return.

3. Select the appropriate script file by moving the cursor to the file name and pressing Return. Script files are named as follows: *Lwwx_yz.ini*

Where:	Represents:
ww	11, 20, 26, 30, 40, 46, 60, 80, or 86 depending on what flash upgrade you are trying to download to the processor.
x	the type of flash upgrade to download: • B (for Enhanced) • L (for Extended-local I/O) • C (for ControlNet 1.0 or 1.25) • E (for Ethernet) • C15 (for ControlNet 1.5)
y	the series of the flash upgrade to download (see the disk label)
z	the revision of the flash upgrade to download (see the disk label)

4. On your computer, select the communication port (COM1 or COM2) by moving the cursor to select the port and pressing Return.

5. Make sure you have established a connection. This could take about 60 seconds.

If you:	The screen displays:
established a connection	information about the target processor The processor's PROC LED flashes red/green.
did not establish a connection	an error message See the following table.

If you received an error:

If you received this error:	Do this:
`Processor not connected.`	a. Make sure the keyswitch is in Program mode. b. Make sure the processor power is on. c. Check the serial cable. d. Verify the COM port being used by the computer. e. Return to item 3, step 3 on page 5 and repeat this section.
`Target processor does not match script file.`	a. Check the name of the script file. b. Make sure you are connected to the correct type and series of processor. c. Return to item 3, step 3 on page 5 and repeat this section.
`Firmware series stated in script file does not match PLC.`	a. Make sure you are connected to the correct type and series of processor. b. Return to item 3, step 3 on page 5 and repeat this section.
`No script files found.`	a. Make sure you copied all files from the firmware upgrade diskette to the c:\flash hard drive directory as described in item 2, step 2 on page 4. b. Make sure you selected the catalog number of the **flash upgrade you want to download to the processor on the flash upgrade catalog number selection screen. Do not select the catalog number of the processor you currently have.** c. Return to item 3, step 3 on page 5 and repeat this section.

When the flash download begins:

- the processor's COMM LED blinks green
- the processor's PROC LED blinks red/green
- a percent complete status (0 - 100) appears in the middle of the screen that indicates how much of the flash update is complete

6. Wait for the flash update to complete. The upgrade should take about 5 minutes to complete.

When the download is complete the status bar will be at 100% and the screen will display this message: `Processors Flash Update Completed. Press Any Key to Continue.`

7. When the flash update is complete, cycle power to the processor.

If the processor powers up with the:	Do this:
PROC LED solid red and CH1A DH+ LED blinking green (normally)	continue with the item 8, step 3 that follows this table.
PROC LED flashing red/green (flash mode)	Return to item 3, step 3 on page 5 and repeat this section.
PROC LED solid red and CH1A DH+ LED off	If you have repeated this item more than 3 times, send the processor to Allen-Bradley repair services.

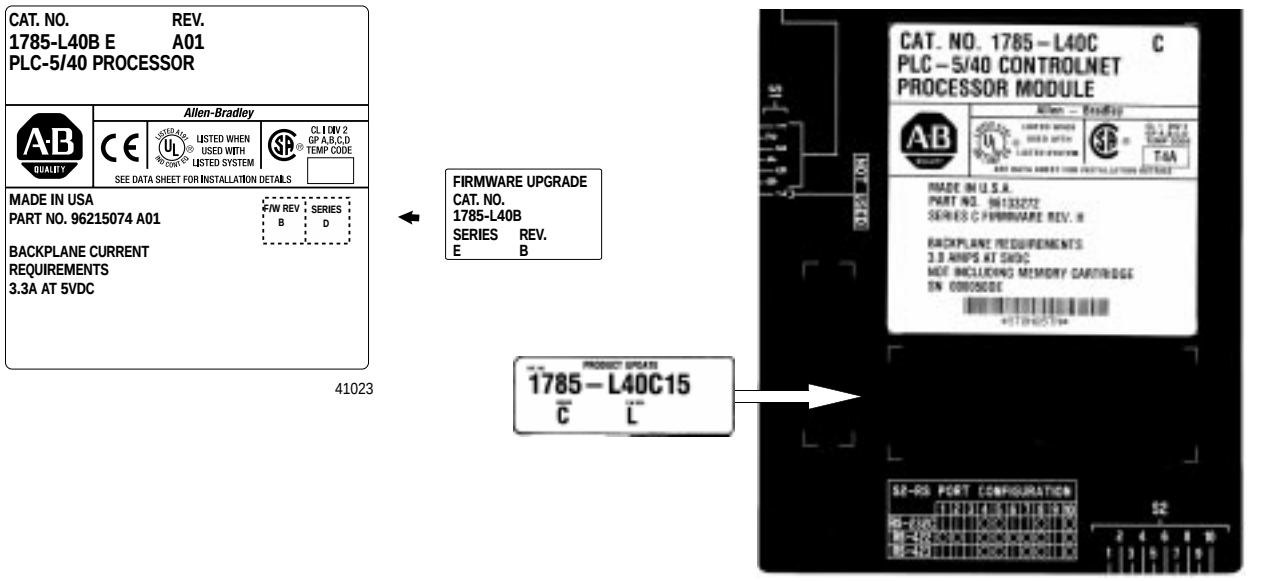
8. Disconnect the serial cable that you used to perform the flash upgrade.

Step 4 - Applying the Firmware Revision Label

Important: It is important to apply this label to your processor to ensure you receive the correct version back if you send it in for repair.

1. Turn off power to the processor.
2. Remove the processor from the chassis.
3. Apply the new firmware revision label in the space indicated by dotted lines on the product identification label. The following figure shows where to place the label on a series E PLC-5 processors and on older PLC-5 processors.

Series E PLC-5 Processor **Series C or Series D PLC-5 Processor**



Step 5 - Updating the Communication Plug Firmware

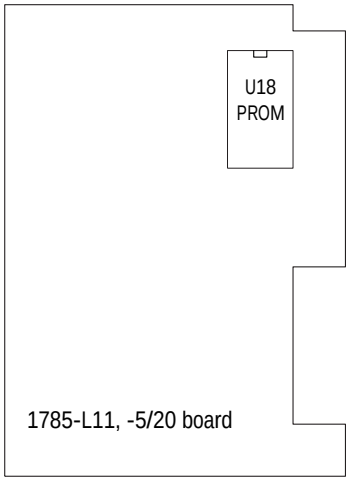
If you received communication plug PROM(s) with your order, you need to update your PROM(s) to complete the flash upgrade.

ATTENTION: Printed circuit board components can be damaged during routine handling and installation. Follow these precautions to reduce static electricity discharges before you upgrade the processor firmware.

- Handle the printed circuit board by the case or carrier without touching the pins or the edge connector.
- Use a static-free workstation.
- Connect the static-free workstation to ground through a minimum 200K ohm resistance.
- Wear a grounded, conductive wrist strap with a minimum 200K ohm resistance.
- Ground all tools before you begin to upgrade the firmware.
- Control the relative humidity of the installation area. Ideal conditions are 40-60% relative humidity.

1. Make sure you have already removed the battery cover and disconnected the battery and disconnected any cables attached to the processor.

2. Do one of the following:

If you have a:	Do this:
PLC-5/11, or -5/20 type processor 	a. Remove the four screws that hold the right side plastic cover. b. Remove the cover. c. Remove the two large screws and washers located in the middle of the exposed circuit board. d. Separate the two processor boards by pulling the exposed circuit board at the backplane edge connector away from the metal cover as you would open a book. Notice the direction in which the battery cable is wrapped around the nearby standoff. e. Disconnect the wires leading from the battery to the stake pins on the exposed circuit board. f. Disconnect the wires leading from the keyswitch to the stake pins on the exposed circuit board. See the figure at the left for the location of the communication plug PROM.
Series D and earlier PLC-5/40C, -5/60C, or -5/80C processor	Remove the phillips head screw near the channel 1B LED and gently remove the channel 1 communication plug. Be aware that the memory grounding clip may move or drop off from the cover mounting tab.

3. Remove the PROM, observing the orientation of the PROM notch. Replace the plug PROM, checking to see that the PROM notch is correctly oriented.

4. Reassemble and power up the processor.

Step 6 - Reconnecting the PLC-5 Processor

1. Reconnect the battery, any cables, and coprocessor or PLC-5 Ethernet Interface module.

2. Reload your program and make certain that it runs properly.
(If you have any questions, call technical support at 440-646-6800.)

Step 7 - Uninstalling the Flash Tool

We recommend that you remove the flash tool directory and all of the files it contains. Follow these steps to uninstall the flash tool.

Important: Make sure you are in the flash directory that you created on the hard drive so that you do not accidentally delete the wrong files.

1. On the programming terminal, change to the directory containing the firmware files by typing:

   `c:` Return

   `cd \flash` Return

2. Delete all files within that directory by typing:

   `del *.*` Return

3. Change to the root directory by typing:

   `cd\` Return

4. Remove the flash directory by typing:

   `rd flash` Return

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