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ALLEN-BRADLEY

PLC-2/17 and PLC-5 Programmable Controller Memory Modules

(Cat. Nos. 1785-MJ and 1785-MK)

Installation Data

To the Installer

This document provides you with the following information:

- What this memory module package contains
- Installing an EEPROM
- Compatibility
- Handling the EEPROM module
- Setting backplane switches
- Using the write enable jumper
- Installing the EEPROM module
- Removing an EEPROM
- Writing to an EEPROM
- PLC-5 EEPROM memory cartridge compatibility
- Correcting incompatibility
- Restoring a program from an EEPROM
- Specifications

What this Memory Module Package Contains

Your memory module package should contain one of the following memory modules with a write enable jumper installed on the memory module:

- Cat. No. 1785-MJ (8K words)
- Cat. No. 1785-MK ((16K words)

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Compatibility

Table 1 shows the programmable controllers and the software that are compatible with the 1785-MJ and 1785-MK EEPROM modules.

Table 1
EEPROM Module Compatibility

EEPROM Module	Compatible Programmable Controllers	Compatible Software
1785-MK 1785-MJ	1772-LW (PLC-2/17) 1772-LWP (PLC-2/17) 1785-LT (PLC-5/10) 1785-LT2 (PLC-5/12) 1785-LT3 (PLC-5/15) 1785-LT4 (PLC-5/25)	6200 Programming Software

Handling the EEPROM Module

The Allen-Bradley EEPROM Modules (Cat. No. 1785-MJ, -MK) are shipped in a static-shielded bag to guard against electrostatic damage. Observe the following precautions when handling the module.

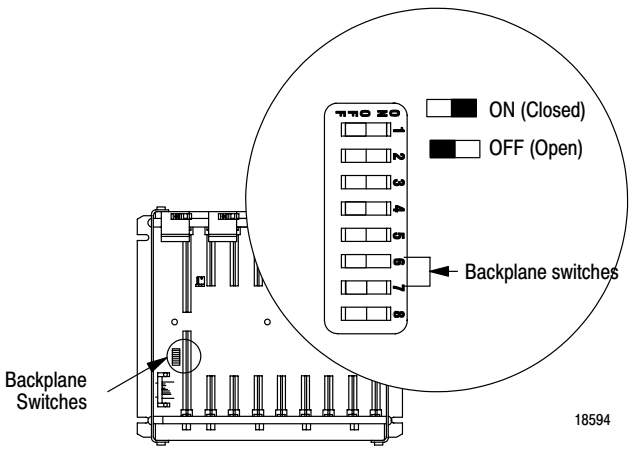
WARNING: Under some conditions, electrostatic discharge can degrade performance or damage the EEPROM module. Observe the following precautions to guard against electrostatic damage.

Touch a grounded object to rid yourself of static charge before handling the module.
When not in use, keep the module in its static-shielded bag.

Setting Backplane Switches

Set the I/O chassis backplane switches before you install the PLC-2/17 or PLC-5 programmable controllers. Use a ballpoint pen to set each switch. (Do not use a pencil because the tip can break off and short the switch.)

Use the following figure and Table 2, pg. 3 to select the mode of memory transfer at power-up.



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Table 2
Selecting mode of memory transfer and switch settings

If you want:	Then set switch 6:	Then set switch 7:
EEPROM memory to transfer to processor memory at every power-up	OFF	OFF
EEPROM memory to transfer to processor memory at every power-up	OFF	ON
EEPROM memory to transfer to processor memory when a defect is detected in existing processor memory	ON	ON
EEPROM memory **not** to transfer to processor memory when a defect is detected in existing processor memory (a processor fault occurs)	ON	OFF

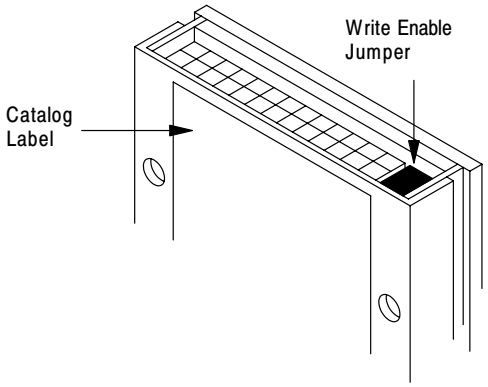
Using the Write Enable Jumper

The position of the write enable jumper determines whether data can be written to the EEPROM. The jumper can either be placed in the EEPROM or removed from the EEPROM and stored in a safe place of your choice for future use. See Table 3 for more information on positioning the write enable jumper.

Table 3
Using the Write Enable Jumper

If the Enable Jumper is:	Then a program:
positioned on top of the two pins in the EEPROM	can be written to the EEPROM
removed from the two pins in the EEPROM	cannot be written to the EEPROM

The EEPROM modules are packaged with the jumper in the position to write to the EEPROM.



To remove or insert the write enable jumper into the EEPROM module use a pair of needle nose pliers.

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Installing an EEPROM Module into the Processor

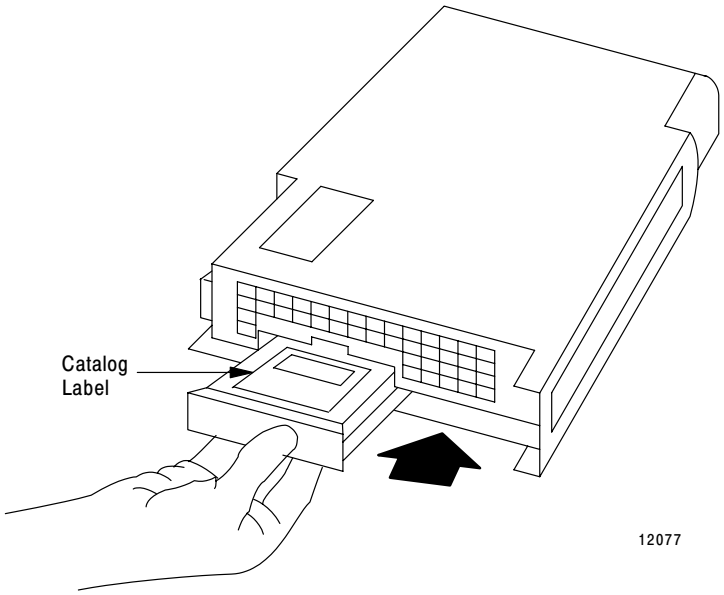
Insert the EEPROM module into the bottom of the PLC-2/17 or PLC-5 processor by following these steps:

1. Turn off power to the I/O chassis and processor.

   CAUTION: Do not insert or remove the EEPROM under power. Insertion or removal under power can result in loss of program memory and a processor fault.

2. Lift the latch of the I/O chassis that holds the processor and remove the processor from the chassis. Place the processor on a clean flat surface with the bottom of the module facing you.

3. Gently but firmly push the EEPROM into the processor until the bottom flange of the EEPROM is flush with the bottom of the processor.



Removing an EEPROM Module from the Processor

Remove the EEPROM module by following these steps:

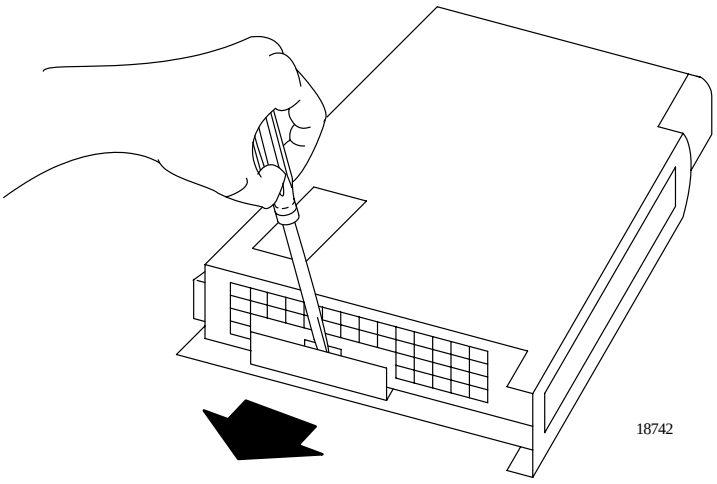
1. Turn off power to the I/O chassis and processor.

   CAUTION: Do not insert or remove the EEPROM under power. Insertion or removal under power can result in loss of program memory.

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2. Lift the latch of the I/O chassis that holds the processor and remove the processor from the chassis. Place the processor on a clean flat surface with the bottom of the module facing you.

3. Using a coin or screwdriver blade, pry the EEPROM module out far enough to grasp the bottom flange of the EEPROM with your fingers.



4. Remove the EEPROM module.

Writing to an EEPROM

You can store a program on your EEPROM module if it is installed in your processor. The procedure for writing to an EEPROM is different for each type of processor. Refer to the instructions that correspond with the type of processor you are using.

Using a Mini-PLC-2/17, (Series A, B or C) Processor

Important: To avoid overriding the program you have on the processor you must set the I/O chassis backplane switches so that EEPROM memory does not transfer at power-up. See Table 2, pg. 3 for more information on setting backplane switches.

1. Insert the EEPROM into the processor by following the installation procedure on pg. 4 in this document.

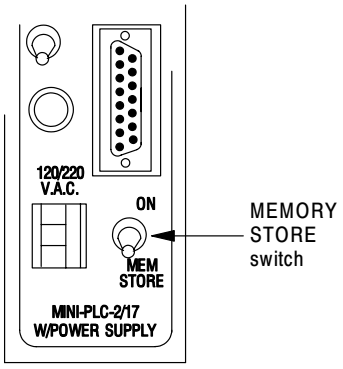
2. Replace the processor into the I/O chassis and turn on power.

3. Select the PROGRAM or REM PROGRAM mode on the front panel of the processor module.

4. Use online programming to store data table values that you want activated when the processor transfers EEPROM back-up memory to processor memory. If this is not done the transition will occur with start-up data table values.

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5. To transfer a duplicate of your program to the EEPROM, momentarily flip the MEMORY STORE switch on the processor to the ON position until the PROC RUN indicator on the front of the processor is illuminated. Refer to Table 4 for an explanation of indicator colors.



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Table 4
Interpreting the PROC RUN Indicator

If PROC RUN indicator is:	Then:
Solid green	The program is being transferred and the indicator will turn off when the transfer is complete
Solid red	There is an error and the indicator will stay illuminated

Handling an Error: Mini PLC-2/17

If an error occurs during a write to the EEPROM check to see that the following procedures have been completed:

the processor is in the PROG or REM PROGRAM mode.
the write protection jumper is seated correctly in the EEPROM.

Reset the fault by cycling power to the processor.

After the processor successfully writes to the EEPROM, do the following:

1. Turn off power to the processor and I/O chassis.

2. Remove the processor from the I/O chassis and remove the EEPROM by following the removal procedure in this document.

3. Remove the write enable jumper from the EEPROM memory module to guard against unauthorized changes. Store the jumper in a safe place for future use.

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4. Use the space provided to label your EEPROM with a ballpoint pen.

5. Set I/O chassis backplane switches so that EEPROM memory transfers at power-up. For more information see the Setting Backplane Switches section, pg. 2 in this document.

6. Re-install the EEPROM into the processor by following the installation procedure in this document.

7. Re-install the processor into the I/O chassis.

Using a PLC-2/17, (Series D) Processor

Important: To avoid overriding the program you have on the processor you must set the I/O chassis backplane switches so that EEPROM memory does not transfer at power-up. See Table 2, pg. 3 for more information on setting backplane switches.

1. Insert the EEPROM into the processor by following the installation procedure on pg. 4 in this document.

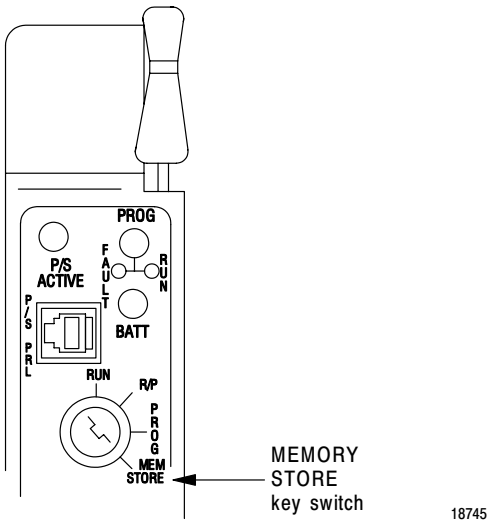
2. Replace the processor into the I/O chassis and turn on power.

3. Select the PROGRAM or REM PROGRAM mode on the front panel of the processor module.

4. Use online programming to store data table values that you want activated when the processor transfers EEPROM back-up memory to processor memory. If this is not done the transition will occur with start-up data table values.

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5. Quickly, turn the mode select key switch to the MEMORY STORE position, then to the PROGRAM position and then back to the MEMORY STORE position.



6. Check to see that the PROC RUN indicator on the front of the processor is illuminated. Refer to Table 5 for an explanation of indicator colors.

Table 5
Interpreting the PROC RUN Indicator

If PROC RUN indicator is:	Then:
Solid green	The program is being transferred and the indicator will turn off when the transfer is complete
Solid red	There is an error and the indicator will stay illuminated

Handling an Error: Mini PLC-2/17, (Series D) Processor

If an error occurs during a write to the EEPROM check to see that :

the processor is in the PROG or REM PROGRAM mode.
the write enable jumper is seated correctly in the EEPROM.

Reset the fault by cycling power to the processor.

After the processor successfully writes to the EEPROM, do the following:

1. Turn off power to the processor and I/O chassis

2. Remove the processor from the I/O chassis and remove the EEPROM by following the removal procedure in this document.

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3. Remove the write enable jumper from the EEPROM memory module to guard against unauthorized changes. Store the jumper in a safe place for future use.

4. Use the space provided to label your EEPROM with a ballpoint pen.

5. Set I/O chassis backplane switches so that EEPROM memory transfers at power-up. For more information see the Setting Backplane Switches section in this document.

6. Re-install the EEPROM into the processor by following the installation procedure in this document.

7. Re-install the processor into the I/O chassis.

Using a PLC-5/10, -5/12, -5/15 or -5/25 Processor

Important: To avoid overriding the program you have on the processor you must set the I/O chassis backplane switches so that EEPROM memory does not transfer at power-up. See Table 2, pg. 3 for more information on setting backplane switches.

1. Insert the EEPROM into the processor by following the installation procedure on pg. 4 in this document.

2. Replace the processor into the I/O chassis and turn on power.

3. Select the PROGRAM or REM PROGRAM mode on the front panel of the processor module.

4. Use online programming to store data table values that you want activated when the processor transfers EEPROM back-up memory to processor memory. If this is not done the transition will occur with start–up data table values.

5. Start on the Ladder Editor main menu to begin transfer of your program to the EEPROM.

   Press **`[F7] - General Utility`**

   The system displays the General Utility screen.

   Press **`[F8] - Write EEPROM`**

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The system will ask you to confirm your selection.

Type one of the following:

[Y] [Enter] or **[F8]** for yes
[N] [Enter] or **[F10]** for no
[Esc] to exit the write procedure

If you confirm the procedure, the EEPROM write begins. During this procedure, the "PROC" LED on the processor flashes and the programming terminal beeps until the write procedure completes.

If no error occurs during the write to the EEPROM, the system displays the following message:

```
EEPROM SUCCESSFULLY BURNED
```

After the processor successfully writes to the EEPROM, do the following:

1. Turn off power to the processor and I/O chassis
2. Remove the processor from the I/O chassis and remove the EEPROM by following the removal procedure in this document.
3. Remove the write enable jumper to guard against unauthorized changes. Store the jumper in safe place for future use.
4. Use the space provided to label your EEPROM with a ballpoint pen.
5. Set I/O chassis backplane switches so that EEPROM memory transfers at power–up. For more information see the Setting Backplane Switches section in this document.
6. Re-install the EEPROM into the processor by following the installation procedure in this document.
7. Re-install the processor into the I/O chassis.

Handling an Error:Mini PLC -5/10, -5/12, -5/15 or -5/25 Processor

If an error occurs during a write to the EEPROM, the system displays the following message:

```
EEPROM NOT BURNED
```

If unsuccessful, review the PLC-5/10, -5/12, -5/15, -5/25 procedure for writing to an EEPROM and repeat it from the beginning.

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PLC-5 EEPROM Memory Cartridge Compatibility

When using a 1785-MJ or 1785-MK EEPROM to transfer programs between PLC-5 family processors, check compatibility between the processors. Some series/revision processor combinations are incompatible, regardless of EEPROM. Refer to the Table below for cartridge compatibility.

Check compatibility by comparing the series/revision levels of the "burned one" and "loaded into" processors in Table 6 where:

Y = compatible
N = incompatible
N* = incompatible with LED indication

Newer processors indicate transport incompatibility (shown by * in Table 6) by:

Flashing PROC LED
Setting bit 09 in word 11 of the processor status file

These indications only occur when the processor attempts to transfer the program from EEPROM to processor RAM at power up or after the processor has detected its RAM is invalid.

Table 6
EEPROM and PLC-5 Processor Compatibility

Cartridge Burned		Cartridge Loaded Into							
		PLC-5/10 Series A	PLC-5/12 Series A	PLC-5/15 Series A		PLC-5/15 Series B		PLC-5/25 Series A	
Processor	Ser/ Rev	≥A/A	>A/A	≤A/H	≥A/K	≤B/E	≥B/F	A/A	≥A/B
PLC-5/10 Series A	≥A/A	Y	Y	N	N*	Y	Y	N	Y
PLC-5/12 Series A	>A/A	Y	Y	N	N*	Y	Y	N	Y
PLC-5/15 Series A	<A/H >A/K	N* N*	N* N*	Y Y	Y Y	N N	N* N*	N N	N N
PLC-5/15 Series B	<B/E >B/F	Y Y	Y Y	N N	N* N*	Y Y	Y Y	N N	Y Y
PLC-5/25 Series A	A/A ≥A/B	N Y	N Y	N N	N* N*	N Y	N Y	Y N	N Y

For processor combinations indicated by N* in the table, you can check for incompatibility by attempting to transfer the program from EEPROM to processor RAM. The PROC LED blinks if the combination is incompatible.

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Correcting Incompatibility Between PLC-5 Family Processors

Correct incompatibility by replacing the EEPROM program (downloaded from another processor) with the program downloaded from its host processor.

To restore a processor memory file, do the following:

1. Start on the Online Program Directory
2. Press **[F2]** – **Save/Restore**

   The system displays the Save/Restore screen.
3. Press **[F4]** – **Restore Program**

   The system displays the Restore File window.
4. Press **[F8]** – **Select Type** until the directory at the top of the file window is the directory for .ACH files (processor memory files, also known as archive files).

   The default directory listing is for the .ACH files.
5. Select the processor memory file you want to restore.

   Do one of the following to select the processor memory file you want to restore:

   Use the arrow keys to place the cursor on the processor memory file you want.
   Type in the complete name of the processor memory file or a partial name or letter and press **[Enter]**.
6. Press **[F1]** – **Begin Operation**

Important: The system displays a message that the restore utility is being loaded. You can stop the process with **[F3]** – **Abort Utility**. If you press **[F3]** – **Abort Utility** to cancel the restore process the system clears processor memory and you lose any information that was there.

When communication is established, the top part of the status screen displays the processor address and file name. The remainder of the status screen displays messages about the restore procedure.

You will see a message and prompt displayed if :

the processor is in REMOTE**,** RUN or TEST mode
the file is too large to restore to available memory

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The message and prompt will be displayed as follows:

```
The processor will be put in REMOTE PROGRAM.
Press F8 to abort, F10 to continue.
```

Press **[F8]** – **Abort** to stop the save or **[F10] – Continue** to continue the save.

7. When the restore process finishes, press any key to return to the Online Program Directory screen.

If you started the restore procedure in REMOTE**,** RUN**,** or TEST mode, the software prompts you whether you want to return to the mode in which the processor started.

Important: Early PLC-5 processors set a fault when you restore processor memory files. The fault prevents you from accidentally placing the processor in RUN mode while the restore occurs. Once the complete processor memory file is restored, the system clears the fault and the fault LED stops flashing.

8. Transfer a copy of your program to the EEPROM. Use the procedure in this document for transferring a copy of your program to an EEPROM using a PLC-5/10, -5/12,-5/15, or -5/25 processor.

Restoring a Program from an EEPROM

Use the following procedure to restore the program saved on your EEPROM to a processor. The procedure is the same for the compatible processors.

Important: We recommend that you check compatibility before transporting programs between PLC-5 family processors. Refer to the section on PLC-5 EEPROM Memory Cartridge Compatibility, pg. 11 in this document.

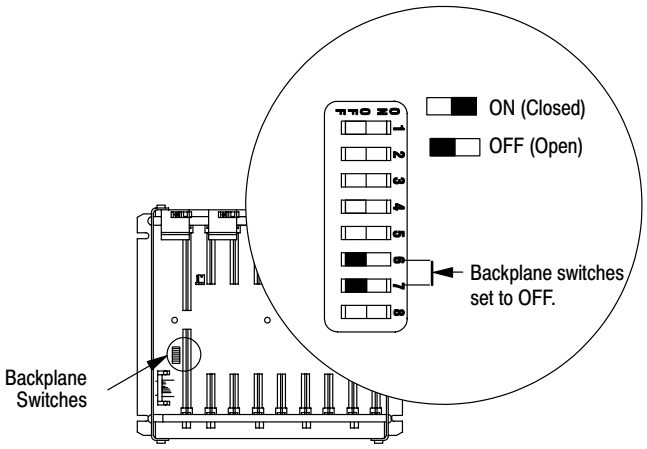
1. Check that the processor's back-up lithium battery is installed and its expiration date has not passed.

2. Turn off power to the I/O chassis and processor.

3. Insert the EEPROM into the processor using the installation procedure in this document.

4. Set switches 6 and 7 of the switch assembly group on the I/O chassis backplane to the OFF position.

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5. Insert the processor into the I/O chassis.

6. Turn on power to the processor. Program transfer and execution begin immediately if the processor is in RUN, RUN/PROG, or REMOTE PROGRAM mode.

Specifications

Capacity	8K words (1785-MJ) 16K words (1785-MK)
Type	Nonvolatile
Size	Inches = 2.18L x 1.73H x 0.69D Millimeters = 55.4L x 43.9H x 17.4D
Environmental	
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	–40 to 85°C (–40 to 185°F)
Relative Humidity	5 to 95% (without condensation)

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Installation Data
EEPROM Memory Modules
(Cat. Nos. 1785-MJ and 1785-MK)

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For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

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