

Battery Backup

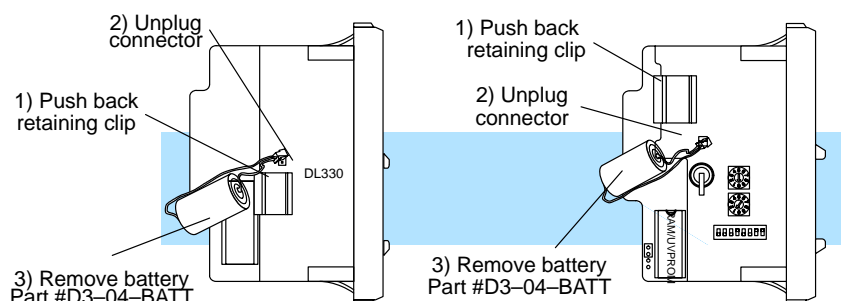
Memory Battery Backup

The DL305 CPUs have a lithium battery to retain the application program and retentive memory when the system is not receiving power from the power supply. Typical battery life is five years. This time period includes PLC runtime and normal shutdown periods such as preventative maintenance and power outages.

The CPU has indicators which tell when it is necessary to change the battery. However, if your battery has been in your system for an extended period of time, you may wish to take added precautions to ensure that the system memory will be retained by installing a new battery when shutting the system down for a period of more than ten days.

NOTE: Before replacing your CPU battery, you should back-up your application program. This can be done by saving the program to hard/floppy disk on a personal computer or using the handheld programmer along with a cassette tape recorder. The CPU has a built-in capacitor to retain the memory for several minutes while the battery is being replaced.

WARNING: If the battery connector is not connected to the PC board or the battery is not installed, the indicator will not notify you of the error. Be sure the battery is in place and the connector is firmly seated before you install the CPU into the base.



DL330, DL330P, DL340 CPU Battery Replacement

To replace the CPU battery:

1. Turn power off to the system.
2. Wait 60 seconds then remove the CPU. Do not short any connectors or components on the CPU since it may alter the program memory.
3. Unlatch and tilt the clip covering the battery.
4. Pull the two wire battery connector from the PC board and remove the battery.

WARNING: Do not attempt to recharge the battery or dispose of it by fire. The battery may explode or release hazardous materials.

To install the CPU battery:

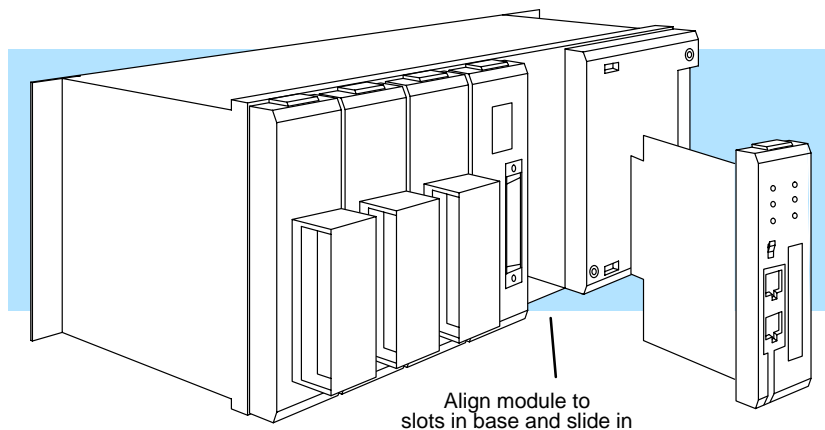
1. Plug the (keyed) two wire battery connector on the battery into the connector on the PC board.
2. Push gently till the connector snaps closed
3. Slide the battery under the battery retaining clip till the battery is positioned in the socket.
4. Push the retaining clip down over the battery snapping the clip over the edge of the PC board.
5. Note the date the battery was changed.

Installing the CPU

Before you complete these steps, make sure you have set the dipswitches and/or jumpers needed to support your application.

WARNING: To minimize the risk of electrical shock, personal injury, or equipment damage, always disconnect the system power before installing or removing any system component.

When inserting the CPU into the base, align the PC board with the grooves on the top and bottom of the base. Push the CPU straight into the base until it is firmly seated in the backplane connector.



CPU Setup and System Functions

A Few Things to Know

Even if you have years of experience using PLCs, there are a few things you need to do before you can start entering programs. This section includes some basic things, such as changing the CPU mode and connecting a programming device. Here is a list of the items that are discussed.

- Auxiliary Functions
- Connecting a Programming Device
- Changing the CPU Modes
- Clearing the CPU memory

The following paragraphs provide the setup information necessary to get the CPU ready for programming. The actual setup information depends on the type of programming device you are using. For example, the DL305 Handheld Programmer manual provides the Handheld keystrokes required to perform all of these operations. The **DirectSOFT** manual provides a description of the menus and keystrokes required to perform the setup procedures via **DirectSOFT**.

What are Auxiliary Functions?

Many CPU tasks involve the use of predefined functions. These are often called Auxiliary (AUX) Functions. The AUX Functions perform many different operations, ranging from simple operating mode changes to determining the firmware revision number.

You can access all of the AUX Functions from **DirectSOFT** menu options, but not from the DL305 Handheld Programmer. You can still perform some of the operations with the Handheld Programmer, but they are accomplished by using a certain series of keystrokes rather than by entering a specific AUX function.

NOTE: Neither **DirectSOFT** or the Handheld Programmer utilize the numbers shown for the AUX functions. These numbers have been included because many of you may already have existing software packages that can be used with these CPUs. If you do already have an existing software package, remember that any additional features (such as added I/O, CRs, etc. available with the DL340 CPU) may not be accessible.

AUX Function and Description		DL330, DL330P, DL340	
AUX 1* — Diagnostics and PLC Modes		Software	HP
10	Program Syntax Check (Grammar check)	○	○
11	Compare PLC to Disk	○	×
12	PLC Operational Mode	○	○
13	Revision Number	○	×
AUX 3* — Clear PLC Memory		Software	HP
31	Ladders	○	○
32	Data Registers	○	×
33	Timer / Counter Accumulators	○	×
AUX 6* — Save Data from PLC		Software	HP
61	Ladders	○	○
62	Data Registers	○	×
AUX 9* — Load Data to PLC			
91	Ladders	○	○
92	Data Registers	○	×
Password Operations			
None	Password	○	○

○ — Function or keystrokes available

× — Not available

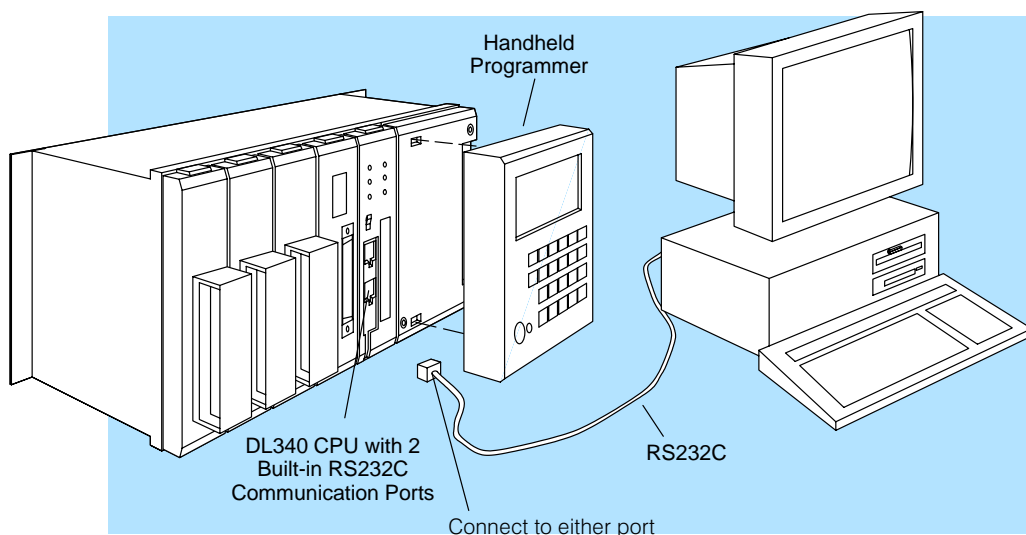
**Connecting the
Programming
Devices**

You can mount the Handheld directly to the port of the CPU, or you can use a cable. The cable, part number D3-HPCBL, is approximately 4.5 feet (1.5m) in length and provides more flexibility. There are two different handheld programmers for the DL305 CPUs. The D3-HP can be used with either the DL330 or the DL340. The D3-HPP can only be used with the DL330P. The D3-HPP supports the RLL^{PLUS} features.

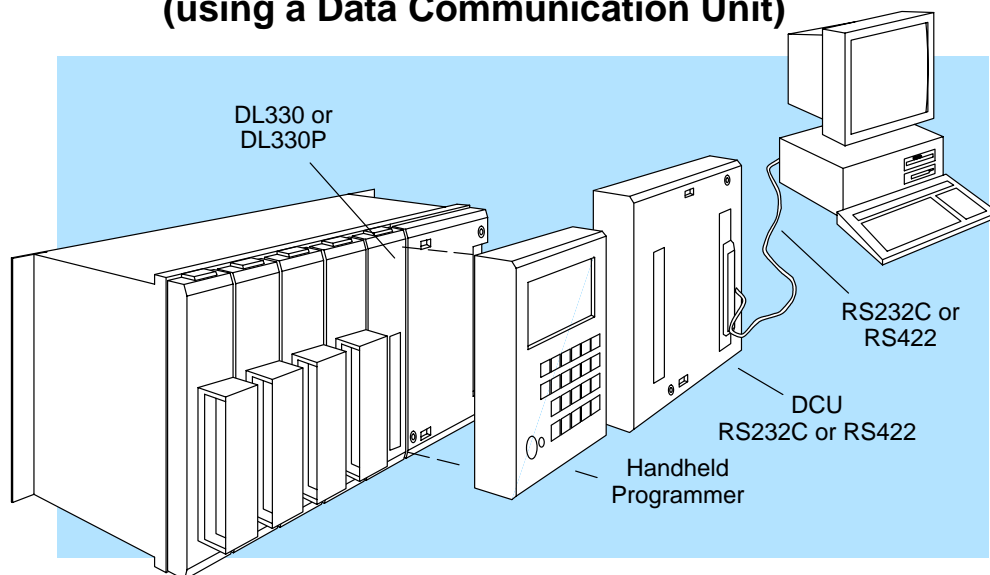
If you're using a Personal Computer with the **DirectSOFT** programming package, a Data Communications Unit (either RS232C or RS422) must be used to interface to the DL330/DL330P CPUs. DCUs may also be used to establish a connection between the DL305 and an operator interface or a network.

The DL340 CPU provides two built-in RS232C ports which can be used to directly connect to a personal computer, operator interface or network. The DCU may also be used with the DL340 if the built-in ports are otherwise occupied.

Programming the DL340 CPU with either the Handheld programmer or the PC



Programming the DL330 CPU with either the Handheld programmer or the PC (using a Data Communication Unit)



Changing the CPU Mode of Operation

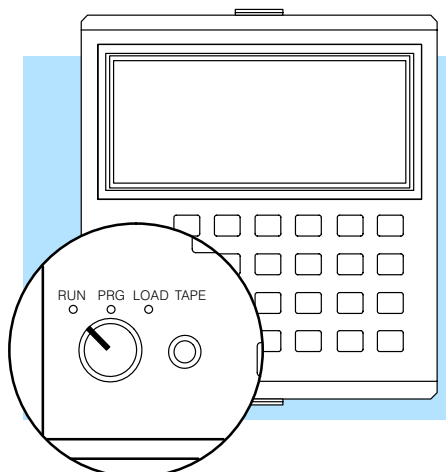
There are two modes of operation for the DL305 CPUs:

- RUN — executes the application program and updates I/O modules
- PGM — allows program entry, does not execute the application program or update I/O modules

The CPU modes for all DL305 CPUs can be changed by using either a Handheld Programmer or **DirectSOFT**. The DL330 and DL330P require a Data Communications Unit when using **DirectSOFT**. This is discussed later in this chapter.

Since the DL340 has the possibility of being accessed through multiple ports at the same time, the Handheld Programmer and DCU have priority over the built-in RS232C ports during mode change operations. If no Handheld Programmer or DCU is online, **DirectSOFT** can perform mode changes through either of the built-in ports. When the Handheld Programmer or DCU is online and a mode change is attempted with **DirectSOFT**, the Handheld Programmer or DCU will immediately change the mode back to the original mode. This forces the CPU mode to always correspond with the keyswitch position on the Handheld Programmer.

WARNING: The CPU will automatically change modes when you connect the Handheld Programmer if the keyswitch is set for a different mode of operation. For example, if the CPU is in Run mode and the Handheld Programmer keyswitch is set to the PRG (Program) position, the CPU will automatically enter Program mode when the Handheld is connected.

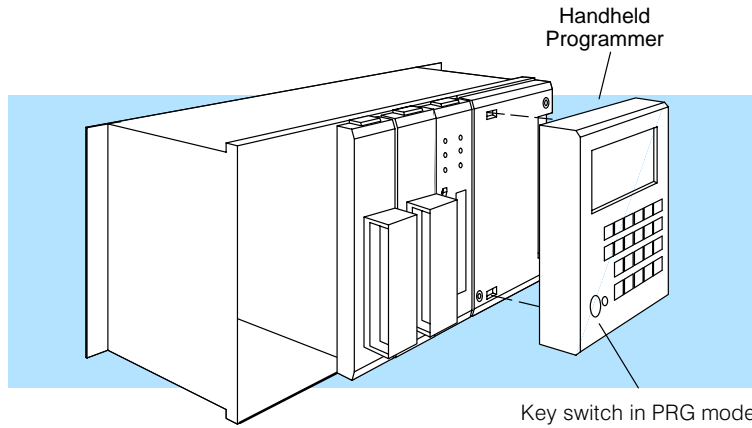


The LOAD position is used for uploading a program from CPU memory to a cassette tape, or downloading a program from cassette tape to CPU memory.

Clearing the CPU Memory

Before you enter a new program, you should always clear the CPU memory. Only a few keystrokes are required. The next few steps show how to clear the CPU memory using the handheld programmer.

Put the handheld programmer's key switch in the PRG position. Attach the handheld programmer directly to the front of the CPU making sure that the port on the back of the programmer aligns properly with the port on the CPU and the programmer's latches connect with the slots in the base power supply. Apply power to the base. LED's on the programmer will display indicating a good connection.



You can clear the memory by using the PLC/Clear PLC sub-menu from within **DirectSOFT**, or you can use the following Handheld Programmer keystrokes.

CLR		0	4	0	4
		(AND)	(OUT)	(MCS)	(ADR)
ADDRESS/DATA		1	5	1	5
		(OR)	(TMR)	(MCR)	(SHF)
ON/OFF RUN BATT		2	6	2	6
		(STR)	(CNT)	(SET)	(DATA)
PWR CPU		3	7	3	7
		(NOT)	(SR)	(RST)	(REG)

CLR SHF 3 4 8 DEL NXT (Clears the CPU memory)

NOTE: This Handheld Programmer operation only clears the program memory. Any values stored in data registers are not cleared. You do have an additional menu option within **DirectSOFT** that allows you to clear the data registers.

CPU Checklist

Before you proceed with the I/O configuration or programming information, make sure you have:

- set the CPU dipswitches
- selected and installed the EEPROM/UVPROM (if chosen.)
- a good understanding of the various system functions needed to setup the CPU.