

Auxiliary Functions

In This Appendix. . . .

- Introduction
 - AUX 1* — Operating Modes
 - AUX 2* — RLL Operations
 - AUX 3* — V-memory Operations
 - AUX 4* — I/O Configuration
 - AUX 5* — CPU Configuration
 - AUX 6* — Handheld Programmer Configuration
 - AUX 7* — Memory Cartridge Operations
 - AUX 8* — Password Operations
-

Introduction

What are Auxiliary Functions?

Many CPU setup tasks involve the use of Auxiliary (AUX) Functions. The AUX Functions perform various operations, ranging from simple operating mode changes to copying programs to memory cartridges. They are divided into categories that affect different system resources. You can access AUX Functions from *DirectSOFT* or from the Handheld Programmer. Some AUX Functions are designed specifically for the Handheld Programmer setup, so they will not be available with the *DirectSOFT* package. You may need to supplement this Appendix with information from the documentation for your choice of programming device.

AUX Function and Description		430	440	450	HPP
AUX 1* — Operating Mode					
11	Go to Run Mode	✓	✓	✓	×
12	Go to Test Mode	✓	✓	✓	×
13	Go to Program Mode	✓	✓	✓	×
14	Run Time Edit	×	✓	✓	×
AUX 2* — RLL Operations					
21	Check Program	✓	✓	✓	×
22	Change Reference	×	✓	✓	×
23	Clear Ladder Range	✓	✓	✓	×
24	Clear Ladders	✓	✓	✓	×
25	Select MC or Flash Memory	×	×	✓	×
26	Copy MC Contents to Flash	×	×	✓	×
27	Copy Flash contents to MC	×	×	✓	×
28	Verify Flash contents = MC	×	×	✓	×
AUX 3* — V-Memory Operations					
31	Clear V Memory	✓	✓	✓	×
32	Clear V Range	✓	✓	✓	×
33	Find V-memory Value	×	✓	✓	×
AUX 4* — I/O Configuration					
41	Show I/O Configuration	✓	✓	✓	×
42	I/O Diagnostics	✓	✓	✓	×
44	Power up I/O Configuration Check	✓	✓	✓	×
45	Select Configuration	✓	✓	✓	×
46	Configure I/O	×	✓	✓	×
47	Intelligent I/O	✓	✓	✓	×

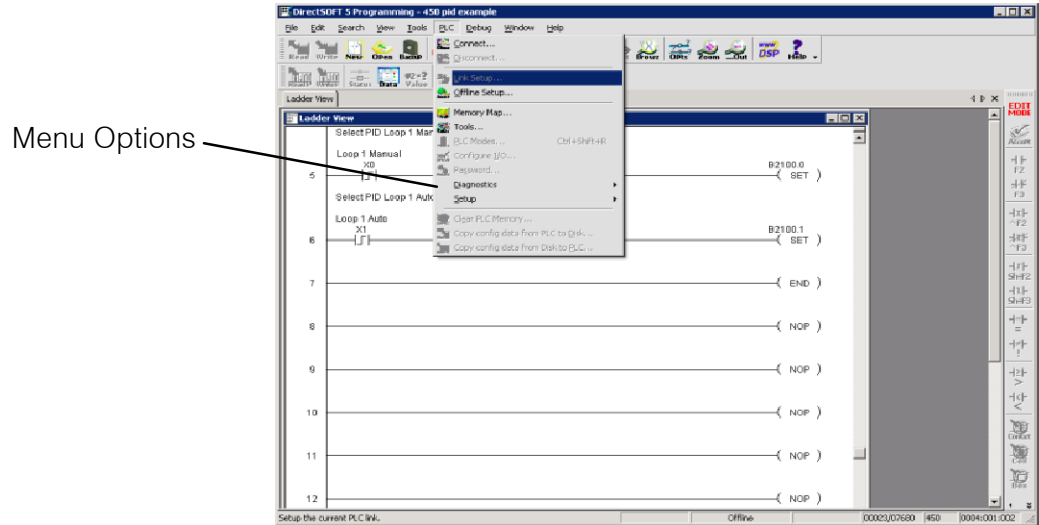
✓ — supported

×

AUX Function and Description		430	440	450	HPP
AUX 5* — CPU Configuration					
51	Modify Program Name	✓	✓	✓	×
52	Display / Change Calendar	×	✓	✓	×
53	Display Scan Time	✓	✓	✓	×
54	Initialize Scratchpad	✓	✓	✓	×
55	Set Watchdog Timer	✓	✓	✓	×
56	Configure Comm. Ports	✓	✓	✓	×
57	Set Retentive Ranges	✓	✓	✓	×
58	Test Operations	✓	✓	✓	×
5C	Display Error History	×	✓	✓	×
5D	Select PLC Scan Mode	×	×	✓	×
AUX 6* — Handheld Programmer Configuration					
61	Show Revision Numbers	✓	✓	✓	×
62	Beeper On / Off	×	×	×	✓
63	Backlight On / Off	×	×	×	✓
64	Select Online / Offline	×	×	×	✓
65	Run Self Diagnostics	×	×	×	✓
AUX 7* — Memory Cartridge Operations					
71	CPU to Memory Cartridge	✓	✓	✓	✓
72	Memory Cartridge to CPU	✓	✓	✓	✓
73	Compare MC with CPU	✓	✓	✓	✓
74	Memory Cart. Blank Check	×	×	×	✓
75	Clear Memory Cartridge	×	×	×	✓
76	Display Memory Cart. Type	✓	✓	✓	✓
77	Tape to Memory Cartridge	×	×	×	✓
78	Memory Cartridge to Tape	×	×	×	✓
79	Compare MC with Tape	×	×	×	✓
AUX 8* — Password Operations					
81	Modify Password	×	✓	✓	×
82	Unlock CPU	×	✓	✓	×
83	Lock CPU	×	✓	✓	×

Accessing AUX Functions via DirectSOFT

DirectSOFT provides various menu options during both online and offline programming. Some of the AUX functions are only available during online programming, some only during offline programming, and some during both online and offline programming. The following diagram shows an example of the PLC operations menu available within *DirectSOFT*.



Accessing AUX Functions via the Handheld Programmer

You can also access the AUX functions by using a Handheld Programmer. Plus, remember some of the AUX functions are only available from the Handheld. The following diagram shows how you could quickly access the AUX function from the Handheld.

CLR AUX

AUX FUNCTION SELECTION
 AUX 1* OPERATING MODE

Use NXT or PREV to cycle through the menus

NXT

AUX FUNCTION SELECTION
 AUX 2* RLL OPERATIONS

Press ENT to select sub-menus

ENT

AUX 2* RLL OPERATIONS
 AUX 21 CHECK PROGRAM

You can also enter the exact AUX number to go straight to the sub-menu.

Enter the AUX number directly

AUX 2 1 ENT

AUX 2* RLL OPERATIONS
 AUX 21 CHECK PROGRAM

AUX 1* — Operating Modes

AUX 11 Go to Run Mode

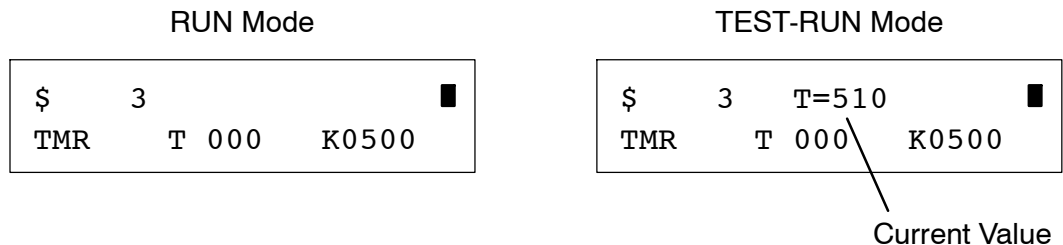
You can use AUX 11 to place the CPU in Run Mode. In Run Mode the CPU executes the program and updates the I/O modules. You can also change the PLC mode from within **DirectSOFT** by using the PLC/PLC Modes sub-menu.

AUX 12 Go to Test Mode

Test Mode allows the CPU to start in TEST-PGM mode, enter TEST-RUN mode, run a fixed number of scans (from 1 to 65,535), and then return to TEST-PGM mode. You can also change enter TEST Mode from within **DirectSOFT** by using the **PLC > PLC Modes** sub-menu. You gain some advantages by using Test Mode.

- The status displays are more detailed with the Handheld Programmer.
- You can enable the CPU to hold output states.

For some instructions, the Handheld Programmer TEST-RUN mode display is more detailed than the status displays shown in RUN mode. The following diagram shows an example of a Timer instruction display during TEST-RUN mode.



AUX 13 Go to Program Mode

Use AUX 13 to place the CPU in Program Mode. In PGM mode, you can enter or change the program. The CPU does not execute the program or update the output modules. All output points are turned off. You can also change enter Program Mode from within **DirectSOFT** by using the **PLC > PLC Modes** sub-menu.

AUX 14 Run Time Edit

With the DL440 or DL450 CPU you can edit programs during Run Mode and Test-Run Mode with AUX14, or from within **DirectSOFT** by using the **PLC > PLC Modes** sub-menu.

Most of the things you can do in Program Mode also apply. For example, you can use the same techniques to search for a specific instruction or a specific address. However, you cannot use Search and Replace functions during Run Mode.

The Run Mode Edits are not “bumpless.” Instead, the CPU maintains the outputs in their last state while it accepts the new program information. If an error is found in the new program, then the CPU will turn all the outputs off and enter the Program Mode.



WARNING: Only authorized personnel fully familiar with all aspects of the application should make changes to the program. Changes during Run Mode become effective immediately. Make sure you thoroughly consider the impact of any changes to minimize the risk of personal injury or damage to equipment. Edits during Run Mode are ideally suited to small changes.

For major program changes, we strongly recommended switching the system to program mode, taking the same precautions as if it were the initial machine startup.

AUX 2* — RLL Operations

AUX 21 Check Program

Both the Handheld and *DirectSOFT* automatically check for errors during program entry. However, there may be occasions when you want to check a program that has already been in the CPU. There are two types of checks available.

- Syntax
- Duplicate References

The Syntax check will find a wide variety of programming errors, such as missing END statements, incomplete FOR/NEXT loops, etc. If you perform this check and get an error, see Appendix B for a complete listing of programming error codes. Correct the problem and then continue running the Syntax check until the message “NO SYNTAX ERROR appears.

Use the Duplicate Reference check to verify you have not used the same output coil reference more than once. Note, this AUX function will also find the same outputs even if they have been used with the OROUT instruction, which is perfectly acceptable.

This AUX function is available on the **PLC > Diagnostics** sub-menu from within *DirectSOFT*.

AUX 22 Change Reference

There will probably be times when you need to change an I/O address reference or control relay reference. AUX 22 allows you to quickly and easily change all occurrences of a specific instruction. For example, you can replace every instance of X5 with X10.

AUX 23 Clear Ladder Range

There have been many times when we've taken existing programs and added or removed certain portions to solve new application problems. By using AUX 23 you can select and delete a portion of the program. *DirectSOFT* does not have a menu option for this AUX function, but you can just select the appropriate portion of the program and cut it with the editing tools.

AUX 24 Clear Ladders

AUX 24 clears the entire program from CPU memory. Before you enter a new program, you should always clear ladder memory. This AUX function is available on the **PLC > Clear PLC Memory** sub-menu within *DirectSOFT*.

AUX 25 Select MC or Flash Memory

AUX 25 lets you select either the (optional) Memory Cartridge or the CPU's built-in flash memory as the current working memory. NOTE: operations such as Clear Ladder Range and Clear Ladders operate on the current selected memory device.

AUX 26 Copy MC Contents to Flash

AUX 26 copies the entire Memory Cartridge contents to the CPU's built-in flash memory. Any data in the flash memory will be over-written.

AUX 27 Copy Flash Contents to MC

AUX 27 copies the entire CPU's built-in flash memory contents to the Memory Cartridge memory. Any data in the Memory Cartridge will be over-written.

AUX 28 Verify Flash Contents = MC

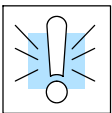
AUX 28 verifies that the data in the CPU's internal flash memory is the same as the Memory Cartridge contents. This is useful when verifying ladder program updates, and generally managing the ladder program during program development.

AUX 3* — V-memory Operations

- AUX 31
Clear V-Memory** AUX 31 clears all the information from the V-memory locations available for general use. This AUX function is available on the **PLC > Clear PLC Memory** sub-menu within *DirectSOFT*.
- AUX 32
Clear V-memory Range** Just as you can use AUX 23 to delete a portion of the control program, you can also use AUX 32 to clear a portion of V-memory. *DirectSOFT* provides access to this AUX function on the **Tools > Memory Editor** sub-menu.
- AUX 33
Find V-memory Value** AUX 33 allows you to search through a range of V-memory locations to find a specific value. For example, you may want to search a value of 1234 through the range of V1400 - V2000. This feature is also available within *DirectSOFT* via the **Tools > Memory Editor** sub-menu.

AUX 4* — I/O Configuration

- AUX 41
Show I/O Configuration** This AUX function allows you to display the current I/O configuration. With the Handheld Programmer, you can scroll through each base and I/O slot to view the complete configuration. The configuration shows the type of module installed in each slot. *DirectSOFT* provides the same information, but it is much easier to view because you can view a complete base on one screen.
- AUX 42
I/O Diagnostics** This is probably one of the most useful AUX function available in the DL405 system. This AUX function will show you the exact base and slot location of any I/O module error that has occurred. This feature is also available within *DirectSOFT* under the **PLC > Diagnostics** sub-menu.
- AUX 44
Power-up Configuration Check** By selecting this feature you can quickly detect any changes that may have occurred while the power was disconnected. For example, if someone placed an output module in a slot that previously held an input module, the configuration check would detect the change.
- If the system detects a change in the I/O configuration at power-up, an error code E252 NEW I/O CONFIGURATION will be generated. You can use AUX 42 to determine the exact base and slot location where the change occurred.



WARNING: You should always correct any I/O configuration errors before you place the CPU into RUN mode. Uncorrected errors can cause unpredictable machine operation that can result in a risk of personal injury or damage to equipment.

This feature is also available within *DirectSOFT* under the **PLC > Setup** sub-menu.

AUX 45 Select Configuration

Even though the CPU can automatically detect configuration changes, you may actually want the new I/O configuration to be used. For example, you may have intentionally changed a module to use with a new program. You can use AUX 45 to select the new configuration, or, keep the existing configuration that is stored in memory. This feature is also available within *DirectSOFT* from the **PLC > Setup** sub-menu.



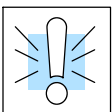
WARNING: Make sure the I/O configuration being selected will work properly with the CPU program. You should always correct any I/O configuration errors before you place the CPU into RUN mode. Uncorrected errors can cause unpredictable machine operation that can result in a risk of personal injury or damage to equipment.

AUX 46 I/O Configuration

You will probably never need to use this feature, but the DL440 CPU allows you to use AUX 46 to manually assign I/O addresses for any or all I/O slots on the local or expansion bases. It is generally much easier to do the I/O configuration operations from within *DirectSOFT*. The software package provides a really nice screen that is available from the **PLC > Configure I/O** sub-menu.

This feature is useful if you have a standard configuration you must sometimes change slightly to accommodate special requests. For example, you may require two adjacent input modules to have addresses starting at X10 and X200 respectively.

In automatic configuration, the addresses were assigned on 8-point boundaries. Manual configuration assumes that all modules are at least 16 points, so you can only assign addresses that are a multiple of 20 (octal). For example, X30 and Y50 would not be valid starting addresses for a module. X20 and Y40 are valid examples of starting addresses in a manual configuration. This does not mean you can only use 16 or 32 point modules with manual configuration. You can use 8 point modules, but 16 addresses will be assigned and 8 of them are unused.



WARNING: If you manually configure an I/O slot, the I/O addressing for the other modules will change. This is because the DL405 products do not allow you to assign duplicate I/O addresses. You should always correct any I/O configuration errors before you place the CPU into RUN mode. Uncorrected errors can cause unpredictable machine operation that can result in a risk of personal injury or damage to equipment.

Once you have manually configured the addresses for an I/O slot, the system will automatically retain these values even after a power cycle. You can remove any manual configuration changes by simply performing an automatic configuration.

AUX 47 Intelligent I/O Monitor

This AUX function allows you to monitor the shared RAM data that is associated with many specialty I/O modules. For example, you could use this AUX function to monitor the data accessed by shared RAM in the High Speed Counter. *DirectSOFT* provides this capability through the **PLC > Setup Global I/O** sub-menu.

AUX 5* — CPU Configuration

AUX 51 Modify Program Name

The DL405 products can use program names for memory cartridges or cassette tapes. Program names are especially useful with cassette tapes since they can store multiple programs. The program name can be up to eight characters in length and can use any of the available characters (A-Z, 0-9). AUX 51 allows you to enter a program name. You can also perform this operation from within *DirectSOFT* by using the **PLC > Setup** sub-menu.

AUX 52 Display /Change Calendar

The DL440 CPU has a clock and calendar feature. If you are using this, you can use the Handheld and AUX 52 to set the time and date. The following format is used.

- Date — Year, Month, Date, Day of week (0 - 6, Sunday thru Saturday)
- Time — 24 hour format, Hours, Minutes, Seconds

You can use the AUX function to change any component of the date or time. However, the CPU will not automatically correct any discrepancy between the date and the day of the week. For example, if you change the date to the 15th of the month and the 15th is on a Thursday, you will also have to change the day of the week (unless the CPU already shows the date as Thursday).

You can also perform this operation from within *DirectSOFT* by using the **PLC > Setup** sub-menu.

AUX 53 Display Scan Time

AUX 53 displays the current, minimum, and maximum scan times. The minimum and maximum times are the ones that have occurred since the last Program Mode to Run Mode transition. You can also perform this operation from within *DirectSOFT* by using the **PLC > Diagnostics** sub-menu.

AUX 54 Initialize Scratchpad

The DL405 CPUs maintain system parameters in a memory area often referred to as the “scratchpad”. In some cases, you may make changes to the system setup that will be stored in system memory. For example, if you specify a range of Control Relays (CRs) as retentive, these changes are stored.



NOTE: You may never have to use this feature unless you have made changes that affect system memory. Usually, you'll only need to initialize the system memory if you are changing programs and the old program required a special system setup. You can usually change from program to program without ever initializing system memory.

AUX 54 resets the system memory to the default values. You can also perform this operation from within *DirectSOFT* by using the **PLC > Setup** sub-menu.

AUX 55 Set Watchdog Timer

The DL405 CPUs have a “watchdog” timer that is used to monitor the scan time. The default value set from the factory is 200 ms. If the scan time exceeds the watchdog time limit, the CPU automatically leaves RUN mode and enters PGM mode. The Handheld displays the following message E003 S/W TIMEOUT when the scan overrun occurs.

Use AUX 55 to increase or decrease the watchdog timer value. You can also perform this operation from within *DirectSOFT* by using the **PLC > Setup** sub-menu.

**AUX 56
CPU Network
Address**

Since the DL405 CPUs have built-in **DirectNET** ports, you can use the Handheld to set the network address for the port and the port communication parameters. The default settings are:

- Station address 1
- Hex mode
- Odd parity

The **DirectNET** Manual provides additional information about communication settings required for network operation.



NOTE: You will only need to use this procedure if you have the bottom port connected to a network. Otherwise, the default settings will work just fine.

Use AUX 56 to set the network address and communication parameters. You can also perform this operation with **DirectSOFT** by using the **PLC > Setup** sub-menu.

**AUX 57
Set Retentive
Ranges**

The DL405 CPUs provide certain ranges of retentive memory by default. The default ranges are suitable for many applications, but you can change them if your application requires additional retentive ranges or no retentive ranges at all. The default settings are:

Memory Area	DL430		DL440		DL450	
	Default Range	Avail. Range	Default Range	Avail. Range	Default Range	Avail. Range
Control Relays	C600 - C737	C0 - C737	C600 - C737	C0 - C1777	C1000 - C3777	C0 - C3777
V-Memory	V2000 - V7377	V0 - V7377	V2000 - V7777	V0 - V17777	V1400 - V37777	V0 - V37777
Timers	None by default	T0 - T177	None by default	T0 - T377	None by default	T0 - T377
Counters	CT0 - CT177	CT0 - CT177	CT0 - CT177	CT0 - CT177	CT0 - CT377	CT0 - CT377
Stages	None by default	S0 - S577	None by default	S0 - S1777	None by default	S0 - S1777

Use AUX 57 to change the retentive ranges. You can also perform this operation from within **DirectSOFT** by using the **PLC > Setup** sub-menu.

**AUX 58
Test Operations**

In normal RUN mode, the outputs are turned off when you return to PGM mode. In TEST-RUN mode you can set each individual output to either turn off or hold its last output state on the transition to TEST-PGM mode. The ability to hold the output states is especially useful, since It allows you to maintain key system I/O points for examination. The following diagram shows the differences between RUN and TEST-RUN modes.

You can use AUX 58 to configure each individual output. You can also perform this operation from within **DirectSOFT** by using the **PLC > Setup** sub-menu.

**AUX 5C
Display Error
History**

The DL440 and DL450 CPUs will automatically log any system error codes and custom messages created with the FAULT instructions. The CPU logs the error code, date, and time the error occurred in two separate tables:

- **Error Code Table** - the system logs up to 32 errors in the table. When an error occurs, the errors already on the table are pushed down and the most recent error is loaded into the top slot. If the table is full when an error occurs, the oldest error is pushed out (erased) of the table.

- **Message Table** – the system logs up to 16 messages in this table. When a message is triggered, the messages already stored in the table are pushed down and the most recent message is loaded into the top slot. If the table is full when an error occurs, the oldest message is pushed out (erased) of the table. Example messages below.

Date	Time	Message
1993-05-26	08:41:51:11	* Conveyor-2 stopped
1993-04-30	17:01:11:56	* Conveyor-1 stopped
1993-04-30	17:01:11:12	* Limit SW1 failed
1993-04-28	03:25:14:31	* Saw Jam Detect

You can use AUX Function 5C to show the error codes or messages. You can also view the errors and messages from within **DirectSOFT** by using the **PLC > Diagnostics** sub-menu.

AUX 5D Select PLC Scan Mode

The DL450 CPU has two program scan modes: fixed and variable. In fixed mode, the scan time is lengthened to the time you specify (in milliseconds). In variable scan mode, the CPU begins each scan as soon as the previous scan's activities complete.

AUX 6* — Handheld Programmer Configuration

AUX 61 Show Revision Numbers

Over the years there have been several additions and enhancements made to the products that are compatible with the DL405 family. Sometimes these new features only work with certain releases of firmware. By using AUX 61 you can quickly view the CPU, Gate Array, and Handheld Programmer firmware revision numbers. This information is also available from within **DirectSOFT** from the **PLC > Diagnostics** sub-menu.

AUX 62 Beeper On / Off

The Handheld has a beeper that provides confirmation of keystrokes. This can be quite annoying in an office environment. You can use Auxiliary (AUX) Function 62 to turn off the beeper.

AUX 63 Turning Off the Backlight

If necessary, you can use AUX 63 to turn off the display backlight. However, in most cases it seems to be easier to read if you just leave the display backlight enabled.

AUX 64 Select Online / Offline

You can use AUX 64 to take the Handheld Programmer offline. That is, the Handheld will not communicate with the CPU until it is returned to online operation. For example, if you have selected offline you cannot access the CPU.

AUX 65 Run Self Diagnostics

If you think the Handheld Programmer is not operating correctly, you can use AUX 65 to run a self diagnostics program. You can check the following items.

- Keypad
- Display
- LEDs and Backlight
- Tape Port (requires adapter)
- Memory Cartridge

AUX 7* — Memory Cartridge Operations

Transferrable Memory Areas

Many of these AUX functions allow you to copy different areas of memory to and from the CPU, memory cartridge, and cassette tapes. The following table shows the areas that may be mentioned.

Option and Memory Type	DL440 Range	DL430 Range
1:PGM — Program	\$00000 - \$07679 (7.5K program memory) \$00000 - \$015871 (15.5K program memory)	\$00000 - \$03583
2:V — V-memory	\$00000 - \$37777	\$00000 - \$07777
3:SYS — System memory	Non-selectable copies all system parameters	

AUX 71 CPU to Memory Cartridge

AUX 71 copies information from a CPU to a memory cartridge that is installed in the Handheld Programmer. If a memory cartridge is not present in the Handheld, you can just remove the memory cartridge from the CPU and place it in the Handheld, but if you want to keep the CPU that is already installed up and running you should use this AUX function to copy the CPU memory.

You can copy different portions of CPU memory to the memory cartridge as shown in the previous table. A single memory cartridge cannot hold an entire system. You may have to use more than one cartridge. If so, put V memory on a cartridge by itself.

AUX 72 Memory Cartridge to CPU

AUX 72 copies information from a memory cartridge installed in the Handheld Programmer to the CPU. If a memory cartridge is not present in the CPU, you can just remove the memory cartridge from the Handheld and place it in the CPU. You can copy different information types from the memory cartridge as shown in the previous table.

AUX 73 Compare Memory Cartridge to CPU

AUX 73 compares the Handheld memory cartridge program with the CPU program. You can compare different types of information as shown previously.

AUX 74 Memory Cartridge Blank Check

AUX 74 allows you to check the memory cartridge to make sure it is blank. It's a good idea to use this function anytime you start to copy information to a memory cartridge.

AUX 75 Clear Memory Cartridge

AUX 75 allows you to clear all data from a memory cartridge. This is true for the RAM and EEPROM memory cartridges. The UV PROM cartridges must be erased with a UV light source.

AUX 76 Display Memory Cartridge Type

You can use AUX 76 to quickly display the type of memory cartridge that is installed in both the CPU and the Handheld Programmer. Remember, there are three types of memory cartridges, CMOS RAM, EEPROM, and UV PROM.

AUX 77 Tape to Memory Cartridge

Use AUX 77 to read a program from a cassette tape. Before you begin the procedure make sure you review the procedures identified in the DL405 Handheld Programmer manual. These procedures are important to help ensure a successful transfer of information.

AUX 78 Memory Cartridge to Tape

Since it is very easy to store multiple programs on a single cassette it is very important idea to name each program. You already know you can enter a name for the CPU program. The cassette program name does not have to be the same. For example, the CPU name may be PRESS1 and the tape name may be STATION1. Since there are three areas of CPU memory that can be transferred, it is a good idea to give each of these a separate program name. For example, you could use three programs, STAT1PGM, STAT1V, and STAT1SYS, for Station 1.



NOTE: Remember tape programs are stored sequentially. It is very easy to overwrite existing programs if you do not position the tape correctly. Make sure you review the procedures identified in the DL405 Handheld Programmer manual before beginning this procedure.

AUX 79 Compare Memory Cartridge to Tape

Use AUX 79 to compare a cassette program to a program stored in the CPU. Make sure you review the procedures identified in the DL405 Handheld Programmer manual before beginning this procedure.

AUX 8* — Password Operations

AUX 81 Modify Password

You can use AUX 81 with the DL440 or DL450 CPU to provide an extra measure of protection by entering a password that prevents unauthorized machine operations. The password must be an eight-character numeric (0–9) code. Once you've entered a password, you can remove it by entering all zeros (00000000). (This is the default from the factory.)



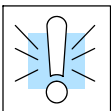
NOTE: The 440 and 450 CPUs support multi-level passwords. This allows password protection of the ladder program while not locking the communication port to operator interfaces. The multi-level password can be invoked by making a password with an upper case "A" followed by 7 numeric characters (e.g. A12345678).

The password is stored in the memory cartridge. If you install the memory cartridge in another CPU or Handheld, the password protection remains in effect.

Once you've entered a password, you can lock the CPU against access. There are two ways to lock the CPU with the Handheld Programmer.

- The CPU is always locked after a power cycle (if a password is present).
- You can use AUX 83 and AUX 84 to lock and unlock the CPU.

You can also enter or modify a password from within *DirectSOFT* by using the **PLC > Password** sub-menu. This feature works slightly differently in *DirectSOFT*. Once you've entered a password, the CPU is automatically locked when you exit the software package. It will also be locked if the CPU is power cycled.



WARNING: Make *sure* you remember the password *before* you lock the CPU. Once the CPU is locked you cannot view, change, or erase the password. You also cannot erase the memory cartridge and start over. You can have the password removed by returning the CPU or memory cartridge to the factory for password removal. It is the policy of AutomationDirect to clear the PLC memory along with the password, so be sure to have a copy of the program to reload into the CPU memory once the CPU or memory cartridge has been returned.

AUX 82
Unlock CPU

AUX 82 can be used to unlock a CPU that has been password protected. *Direct*SOFT will automatically ask you to enter the password if you attempt to communicate with a CPU that contains a password.

AUX 83
Lock CPU

AUX 83 can be used to lock a CPU that contains a password. Once the CPU is locked, you will have to enter a password to gain access. Remember, this is not necessary with *Direct*SOFT since the CPU is automatically locked whenever you exit the software package.

