2

D2–HPP Setup

In This Chapter. . . .

— Handheld Programmer Setup
— CPU Setup
— I/O Configuration
— Auxiliary Functions

Handheld Programmer Setup

This section provides information on some basic Handheld programmer features and characteristics. Regardless of which DL105 or DL205 PLC system you are using, the following operations will apply.

Clearing the Display

To begin a new function, it may be necessary to clear the Handheld programmer entry buffer and display screen. Pressing the **CLR** (clear) key will clear the buffer and display. You must press the **CLR** key several times to prepare for new entries. The **CLR** key does *not* delete instructions or data.

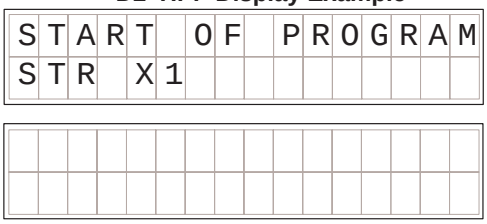
Press these keystrokes

1. To clear entry buffer and display screen

CLR CLR . . .

- Repeat pressing CLR until display screen is blank.

D2–HPP Display Example



Using the Cursor

The always flashing ■ symbol indicates the current cursor position. You can move the cursor position by using the left or right arrow keys (←,→). The arrow left key performs just like the backspace key on a PC keyboard, deleting the character position contents. The figure below is a example how the display changes by pressing the left arrow key.

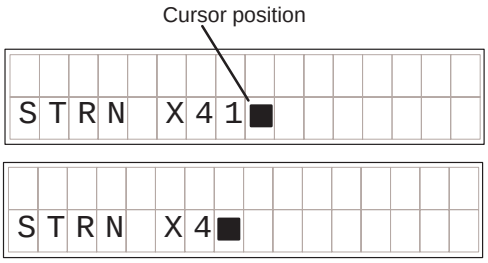
Press these keystrokes

1. To delete the previous character

←

2. To move cursor position right

→



CPU Setup

A Few Things to Know

Below is a brief list of CPU operations discussed in this section.

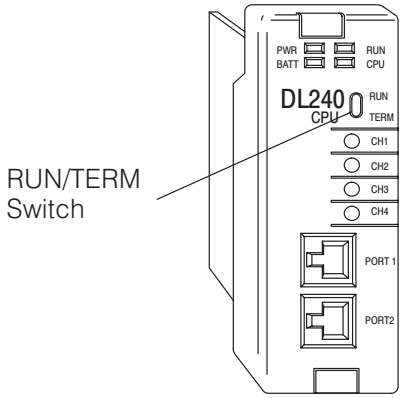
- Changing the CPU Modes
- Clearing the program (and other memory areas)
- How to initialize system memory
- Setting the CPU Network address
- Setting Retentive memory ranges
- Setting the Clock and Calendar

CPU Modes

With the Handheld Programmer connected to the CPU, you should examine the four mode LED's located near the top of the programming unit. The LED's will show the current mode status. Below is a definition for each of the Mode LED's. Test mode is not supported by all ***Direct***LOGIC™ PLC systems. Please refer to the appropriate DL105 or DL205 User Manual concerning the different CPU modes supported.

- **RUN** — executes the program and updates I/O modules.
- **PGM** — allows program entry, does not execute program or update I/O modules.
- **TEST** — allows CPU to maintain outputs, CRs, and Timer/Counter values when the CPU is changed from TEST-RUN to TEST-PGM mode. (See Chapter 6 for additional information.)
- **RUNTIME EDIT** — allows for program editing while the CPU is in RUN mode. These edits are *not* "bumpless." Instead, the CPU scan is momentarily interrupted (and the outputs are maintained in their current state) until the program change is complete.

NOTE: If your CPU has an external mode switch, it must be placed in the TERM position to change modes. This switch does *not* exist on the DL130 and DL230 CPU's.



Changing the CPU Mode

The Handheld programmer **MODE** key may be used to change the CPU mode. Pressing the MODE key will begin the process of changing modes. The keystrokes below will change the CPU mode from Run to Program.

Press these keys	HPP Display Results
1. To begin Mode Change MODE	*MODE CHANGE* GO TO PGM MODE
2. To select displayed mode ENT	*MODE CHANGE* PGM MODE?
3. To accept mode change ENT	*MODE CHANGE* CPU PGM

- Use the NEXT/PREV keys to scroll available modes.

Selecting Different CPU Mode

You may use the **PREV** and **NEXT** key while performing a Mode Change, to choose a different mode. Always examine the Handheld programmer LED indicators to insure proper mode change, and desired CPU mode is selected.

WARNING: Only authorized personnel, familiar with all equipment concerning the PLC, should make mode and program changes. Changes during the RUN mode become effective immediately. Make sure to consider the impact of any mode change or program changes to minimize the risk of personal injury or equipment damage.

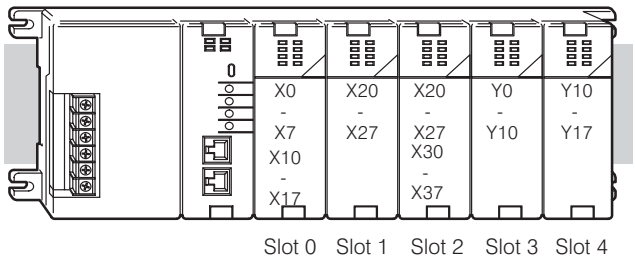
I/O Configuration

Automatic I/O Configuration (DL205 Only)

The DL205 PLC system's are designed to automatically examine installed I/O modules (including specialty modules) and establish the correct configuration and addressing when power is applied to the CPU.

The I/O addresses are assigned using octal numbering, meaning the I/O numbering always starts at zero and does not include 8 or 9. For example, a 16 point input module located in slot zero (the first slot next to the CPU) would be labeled X0–X7 for the first 8 points and X10–X17 for the second 8 points (never using the number 8 or 9) The addresses are assigned in groups of 8 or 16, depending on the number of points for the I/O module. Please refer to the DL 205 User Manual for details on automatic addressing. The following diagram shows a DL205 example I/O scheme.

- Slot 0 – 16pt Input
- Slot 1 – 8pt Input
- Slot 2 – Analog Input
- Slot 3 – 8pt Output
- Slot 4 – 8pt Relay Output



Checking I/O Configuration

The Handheld programmer may be used to view the current I/O configuration, by using the **AUX 41** function. While connected to your PLC, use the following example to display your I/O configuration.

Press these keystrokes	D2–HPP Display Results
1. Clear complete display screen CLR CLR CLR	
2. To display I/O configuration display E 4 B 1 AUX	AUX 4* I/O CFG AUX 41 SHOW CFG
3. To check I/O information ENT	AUX 41 I/O BASE D2-240: I/O BAS
4. Use arrow keys to display additional text → →	/O BASE 0/SLOTB I/O BASE
5. NEXT/PREV keys to view next and previous slots NEXT	/O BASE 0/SLOTP P/S
6. NEXT slot NEXT	/O BASE 0/SLOTC CPU V #.#
7. NEXT slot NEXT	/O BASE 0/SLOT0 8PT Input MDL
NEXT etc..	

Auxiliary Functions

What are Auxiliary Functions?

Handheld programmer keypad contains a key labeled **AUX**, which allows you to perform various Auxiliary Functions. Auxiliary Functions are divided into several different categories. Some AUX functions are for the Handheld programmer itself, and others for the PLC system. If an error occurs while performing a auxiliary function, the CPU may be in the wrong mode, or invalid data may have been entered.

Throughout this manual, step-by-step procedures for using Auxiliary functions are provided. Please refer to the DL105 or DL205 User Manual for details on AUX functions which may not be covered in this manual.

AUX Function and Description		DL130/ DL230	DL240
AUX 2* — RLL Operations			
21	Check Program	❍	❍
22	Change Reference	❍	❍
23	Clear Ladder Range	❍	❍
24	Clear All Ladders	❍	❍
AUX 3* — V-Memory Operations			
31	Clear V Memory	❍	❍
AUX 4* — I/O Configuration (DL205 CPU's Only)			
41	Show I/O Configuration	❍	❍
42	I/O Diagnostics	❍	❍
44	Power-up I/O Configuration Check	❍	❍
45	Select Configuration	❍	❍
AUX 5* — CPU Configuration			
51	Modify Program Name	❍	❍
52	Display / Change Calendar	❍	❍
53	Display Scan Time	❍	❍
54	Initialize Scratchpad	❍	❍
55	Set Watchdog Timer	❍	❍
56	Set CPU Network Address	X	❍
57	Set Retentive Ranges	X	❍
58	Test Operations	X	❍
59	Bit Override	X	❍
5B	Counter Interface Configuration	X	❍
5C	Display Error / Message History	X	❍

AUX Function and Description		DL130/ DL230	DL240
AUX 6* — Handheld Programmer Configuration			
61	Show Revision Numbers	❍	❍
62	Beeper On / Off	HP	HP
65	Run Self Diagnostics	HP	HP
AUX 7* — EEPROM Operations			
71	Copy CPU memory to HPP EEPROM	HP	HP
72	Write HPP EEPROM to CPU	HP	HP
73	Compare CPU to HPP EEPROM	HP	HP
74	Blank Check (HPP EEPROM)	HP	HP
75	Erase HPP EEPROM	HP	HP
76	Show EEPROM Type (CPU and HPP)	HP	HP
AUX 8* — Password Operations			
81	Modify Password	❍	❍
82	Unlock CPU	❍	❍
83	Lock CPU	❍	❍

❍ — supported

× — not supported

HP — Handheld Programmer function

Handheld Programmer Diagnostics

The Handheld programmer has built–in self checking diagnostics. You can select the HPP Diagnostics with the **AUX 65** function. When the diagnostic operation is finished, the main HPP diagnostic menu will be displayed. You may execute any of the Diagnostics by pressing the ENT key. The following example demonstrates using the D2–HPP Diagnotic operations.

Press these keystrokes

1. Clear complete display screen

CLR CLR CLR

2. Select the Diagnostic operation

G 6 | F 5 | AUX

3. Run Diagnostic operation

ENT

4. To continue with next Diagnostic operation

NEXT

5. To run Diagnostic operation

ENT

6. This diagnostic will flash the LCD display and all the LEDs.

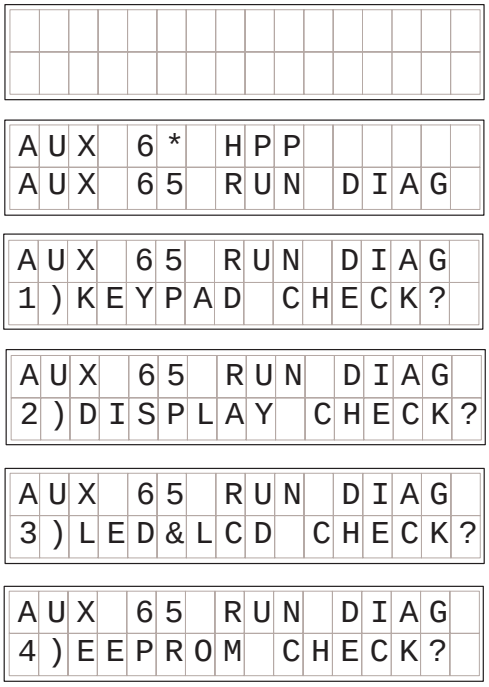
NEXT

7. The EEPROM check will test the EEPROM installed in the handheld programmer.

NEXT

- Press ENT to execute Diagnostic operation being displayed.
- Press CLR to exit the diagnostic operation being displayed.

D2–HPP display results



Beeper ON/OFF

The Handheld programmer contains a beeper which sounds to confirm the operator keystrokes. This beeper may be toggled ON and OFF with the **AUX 62** function.

Press these keystrokes

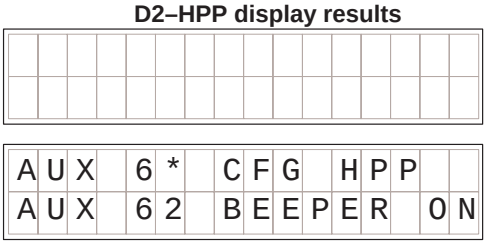
1. Clear complete display screen

CLR CLR CLR

2. To toggle beeper ON/OFF

G 6 | C 2 | AUX | ENT

D2–HPP display results



Clearing an Existing Program

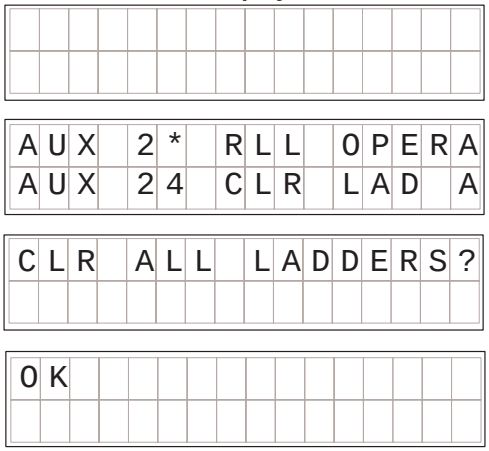
Important note, using this function will delete the PLC ladder program. With the CPU in Program mode, use the **AUX 24** function to clear the entire PLC application program.

Press these keystrokes

1. Clear complete display screen
   CLR CLR CLR
2. Select AUX 24 Clear Ladders display
   C 2 E 4 AUX
3. To select Clear Ladders operation
   ENT
4. To clear all ladders
   ENT

- The PLC must be in Program mode.

D2–HPP Display Results



To clear specified range of ladder program, or V memory, use the following Auxiliary functions.

- **AUX 23** — Clear Ladder Range
- **AUX 31** — Clear V Memory Range

Initializing System Memory

The CPU setup and configuration data are stored in memory which is called Scratchpad Memory. The Scratchpad memory may require initializing if major changes are introduced to your PLC system configuration or setup. For example, if you specify a range of Control Relays (CRs) as retentive, this setup data will be stored in scratchpad memory. Basic program changes or loading new programs do *not* always demand that the Initialize Scratchpad function be executed. If required you may default Scratchpad memory with the **AUX 54** function.

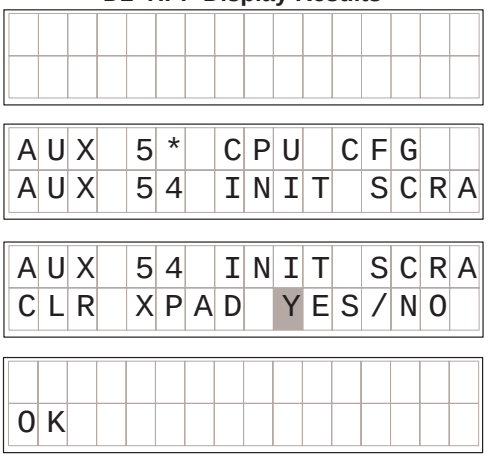
NOTE: This function may change PLC setup and configuration data in your system.

Press these keystrokes

1. Clear complete display screen
   CLR CLR CLR
2. Select AUX 54 Initialize Scratchpad
   F 5 E 4 AUX
3. To select YES/NO option
   →
4. To begin initialization
   ENT

- Select NO option to exit without initializing.

D2–HPP Display Results



Setting the CPU Network Address

Some CPU's, such as the DL240, contain a built-in ***Direct***NET™ port (PORT2). The Handheld programmer may be used to set the Port 2 network address and parameters. The default parameter settings are:

- Station address 1
- HEX mode (the handheld programmer will only support HEX mode)
- Odd parity
- 9600 baud rate

The ***Direct***NET™ User Manual provides additional information about network and communication parameter settings.

The following example demonstrates how to use the AUX 56 function.

Press these keystrokes	D2–HPP Display Results
1. Clear complete display CLR CLR CLR	
2. To select the diagnostic operation F 5 G 6 AUX	AUX 5* CPU CFG AUX 56 CPU N/W A
3. To change the network address ENT	AUX 56 CPU N/W A N/W # 01
4. Type new address number 1–90	AUX 56 CPU N/W A N/W # 01 02
5. To save the newly entered address ENT	AUX 56 CPU N/W A N/W # 01 02
6. To select communications mode use arrow keys to move cursor position → ←	AUX 56 CPU N/W A HEX / ASCII
7. To save communications mode ENT	AUX 56 CPU N/W A NONE / ODD
8. To select communications parity → ←	AUX 56 CPU N/W A 9600/19.2
9. To save communications parity ENT	AUX 56 CPU N/W A 9600/19.2
10. To select communications parity →	AUX 56 CPU N/W A OK

- Press the CLR key to exit the AUX 56 function.
- Shaded box indicates cursor position.

Retentive Memory Ranges

The DL105 and DL205 CPU's all contain Retentive memory. Retentive memory is memory ranges which may store information in case of power loss. A super capacitor will maintain latest register values in case of short period CPU power loss or failure. If retentive memory ranges are important in your application, make sure to install a optional backup battery. Battery installation is covered in appropriate DL105 and DL205 User Manuals. Factory defaults for Retentive memory ranges are suitable for most applications. To change Retentive memory range, use **AUX 57** to select and set the desired range. The table below lists the Retentive memory factory defaults for the DL105 and DL205 CPU's.

Memory Area	DL130	
	Default Range	Available Range
Control Relays	C300 – C377	C0 – C377
V Memory	V2000 – V2377	V0 – V7777
Timers	None by default	T0 – T77
Counters	CT0 – CT77	CT0 – CT77
Stages	None by default	S0 – S377
Memory Area	**DL230**	
	Default Range	**Available Range**
Control Relays	C300 – C377	C0 – C377
V Memory	V2000 – V2377	V0 – V7777
Timers	None by default	T0 – T77
Counters	CT0 – CT77	CT0 – CT77
Stages	None by default	S0 – S377
Memory Area	**DL240**	
	Default Range	**Available Range**
Control Relays	C300 – C377	C0 – C377
V Memory	V2000 – V7777	V0 – V7777
Timers	None by default	T0 – T177
Counters	CT0 – CT177	CT0 – CT177
Stages	None by default	S0 – S777

Changing Retentive Memory Ranges

The **AUX 57** function may be used to change the Retentive memory ranges. When changing Retentive Memory ranges, keep in mind all memory ranges are defined with Octal addresses (8 bit boundaries, except for V–memory). For example, the Retentive memory factory default for CRs (control relays) are C300 thru C377, and could be reduced to C177 thru C300. You should always enter desired memory ranges in Octal numbers (e.g. xxx0–xxx7).The following figure demonstrates changing the Retentive memory range as described.

Press these keystrokes

1. Clear entire display screen
CLR CLR CLR

2. Select AUX 57 function
F 5 | H 7 | AUX

3. To change memory range
ENT

4. Enter new start address
B 1 | H 7 | H 7

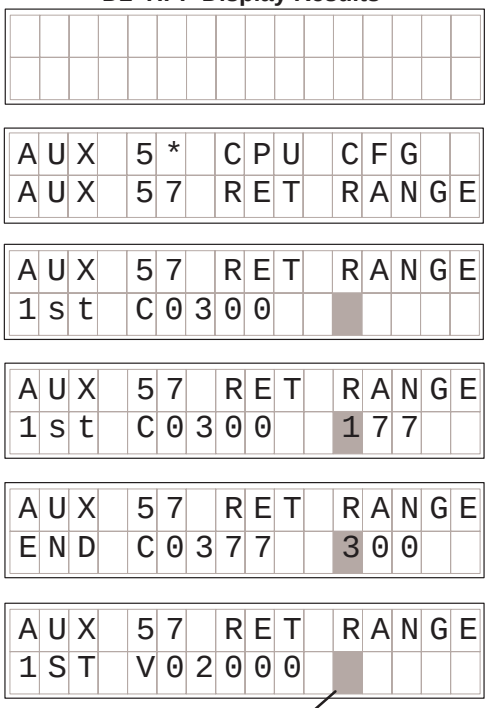
5. Accept entry
ENT

6. Enter new end address
D 3 | A 0 | A 0

7. Accept entry
ENT

- Press ENT to continue with other memory types.
- Press CLR to exit AUX 57 function.

D2–HPP Display Results



Setting the Clock and Calendar

The **AUX 52** function allows you to set the Real–time clock and calender. Not all ***Direct***Logic™ PLC's support the hardware clock and calender feature. For the CPU's which feature a clock and calendar the following format is used.

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

If you change the date without updating the day of week (0–6), 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). Use the following example to change any component of the date or time settings.

NOTE: Verify the clock and calender is supported by your CPU, before attempting to use this Auxiliary function.

Press these keystrokes	D2–HPP Display Results
1. Clear complete display screen CLR CLR	
2. Select AUX 57 F 5 C 2 AUX	AUX 5* CPU CFG AUX 52 CALENDER
3. Select date and clock display ENT	AUX 52 CALENDAR 96/01/01/6(SAT)
4. Enter new date if required → → → → A 0 C 2	AUX 52 CALENDAR 96/01/02/7(SUN)
5. To accept press ENT twice ENT ENT	
6. Enter new time if required B 1 C 2 D 3 A 0	AUX 52 CALENDAR TIME 00:06:00
7. To accept new entry press ENT twice ENT ENT	AUX 52 CALENDAR TIME 12:30:00
	96/01/02 12:30:15

- The shaded area indicates cursor position.
- Press the CLR key to exit date and clock function.

NOTE: If the CPU is without power for an extended period of time a battery is required to maintain the proper date and time.