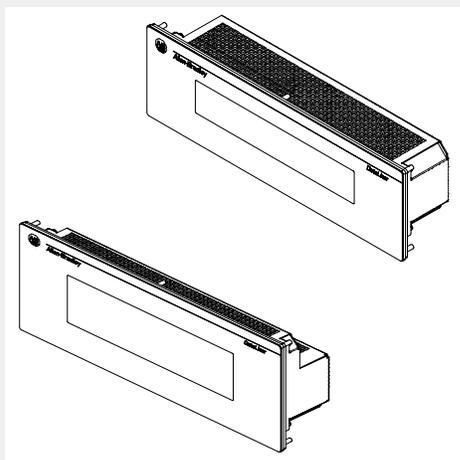




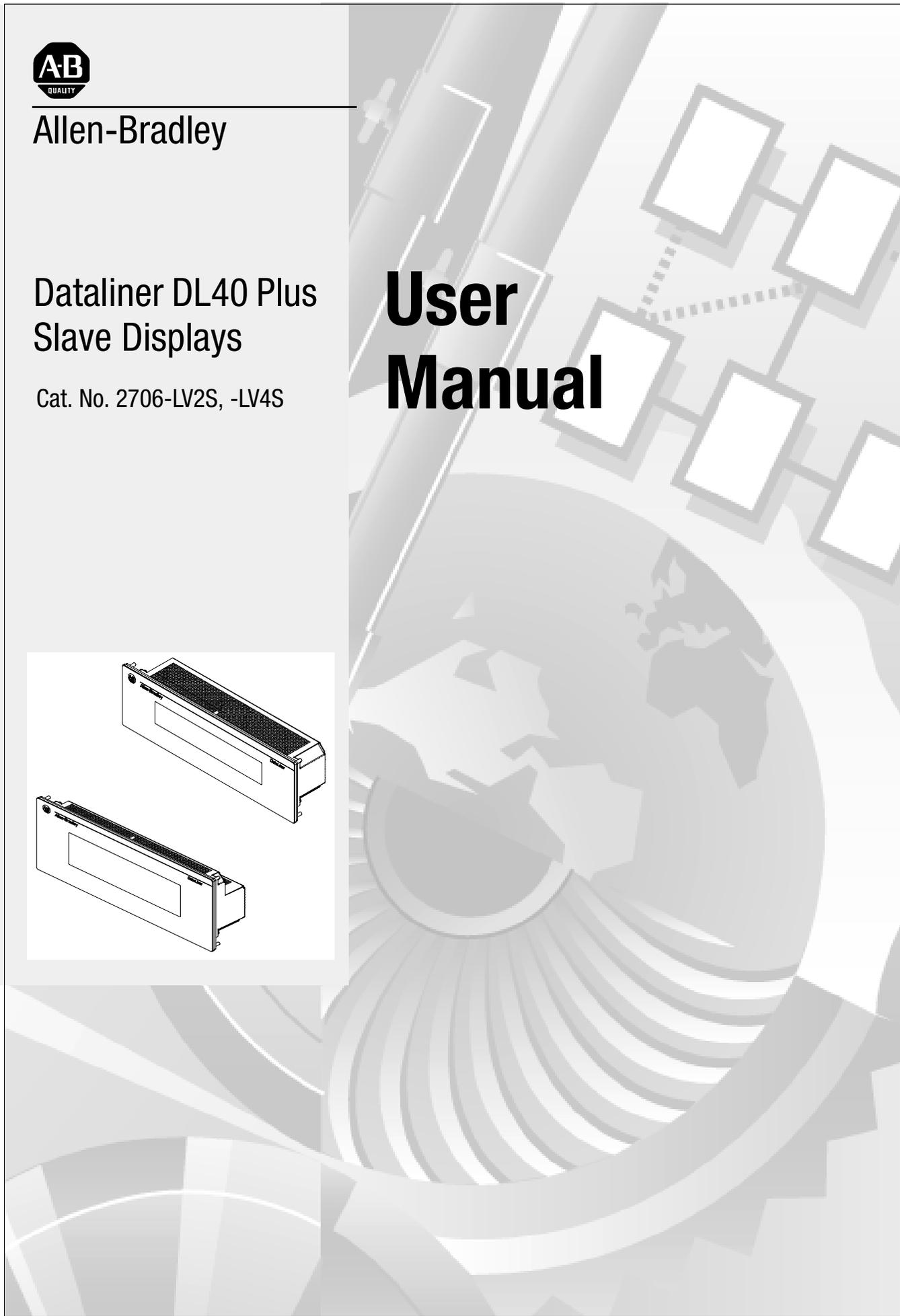
Allen-Bradley

Dataliner DL40 Plus Slave Displays

Cat. No. 2706-LV2S, -LV4S



User Manual



Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this manual we use notes to make you aware of safety considerations:



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid a hazard
- recognize the consequences

Important: Identifies information that is critical for successful application and understanding of the product.

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Using this Manual

Chapter Objectives

Read this chapter to familiarize yourself with the rest of the Dataliner DL40 Plus Slave Message Display manual. You will learn about:

- contents of this manual
- intended audience
- conventions used
- related publications

Overview of this Manual

This manual describes how to install and use your DL40 Plus Slave display. This manual contains the following:

Chapter	Title	Purpose
1	Introduction to the DL40 Slave Display	Describes basic features and operating capabilities.
2	Setting the DIP Switches	Describes configuration of the display using the DIP switches.
3	Installation and Startup	Provides installation and wiring instructions. The status display sequence on powerup is described.
4	Dataliner (DL) Slave Mode	Describes operation of the display in the DL Slave Mode (the display receives message information from a DL40 Plus master display or enhanced PanelView terminal).
5	PanelView (PV) Slave Mode	Describes operation of the display in the PV Slave Mode (displays data that would normally be printed on the PanelView printer port).
6	Terminal Mode	Describes operation of the display in the Terminal Mode. In this mode, the slave display receives ASCII message and formatting data from a host device.
7	Diagnostic Mode	Describes how to use the diagnostic mode to correct communication problems or data formatting errors.
Appendix A	Specifications	Mechanical and electrical specifications.
Appendix B	Character Sets	Standard / Extended ASCII, Cyrillic, and International Character sets.
Appendix C	Slave Address Settings	Table listing DIP switch settings for each address (1 to 255).
Appendix D	PLC / SLC Examples	SLC / PLC programming examples.

Intended Audience

No specialized knowledge is required to configure and install the DL40 slave display. However, we assume the following:

- The person responsible for equipment connections is familiar with standard wiring practices and electrical codes in your area.
- Communication cabling is done by a person having an understanding of basic communications terminology and cabling.
- Panel cutouts are made using the same methods and safety practices followed for other panel mounted equipment.

Conventions Used

The following conventions are used in this manual.

- The up caret, ^, may be used in place of [Ctrl] (Control key) where space is limited.
- Values in a hexadecimal format have the suffix “hex”. For example “B7 hex”.

Related Publications

You may need to refer to the following related publications:

Publication Title	Description	Publication Number
Dataliner DL40 Plus Message Display User Manual	Provides installation, wiring and operating instructions for the DL40 Plus display (not slave display). Also describes use of the onboard message editor.	2706-6.1
DL40 Plus Offline Programming Software User Manual	Describes installation and use of the DOS based message development software for the DL40 Plus.	2706-6.2
PanelBuilder Software User Manual	Describes how to output messages to the PanelView printer port for display on the DL40 slave.	2711-6.0
PanelBuilder 1400e Configuration Software for Windows User Manual	Provides useful information when using a PanelView enhanced terminal as a master for a DL40 Plus slave.	2711e-819

Introduction to the DL40 Plus Slave

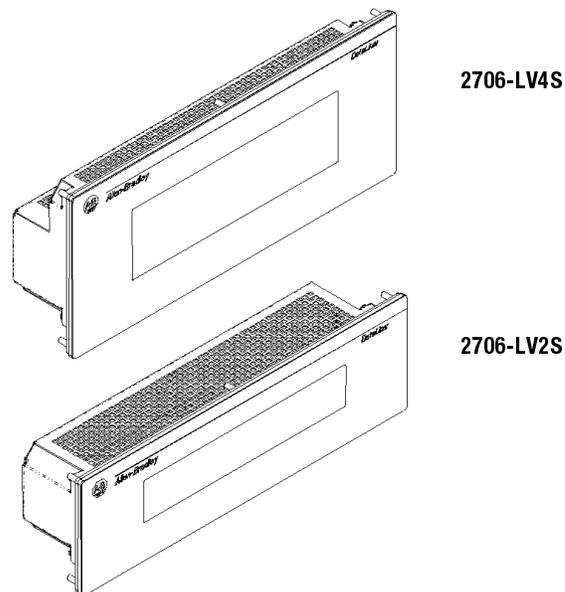
Chapter Objectives

This chapter describes the DL40 Plus Slave display and summarizes its capabilities. The following topics are included in this chapter:

- DL40 Plus Slave description
- Operating modes
- Features
- Typical configurations

Description

The DL40 Plus Slave displays are available in two-line and four-line versions. These displays are designed for panel mounting in industrial environments and require a 110-240V AC power source.



DL40 Plus Slave displays receive message text from a host device. The host device may be a DL40 Plus master display, PanelView terminal, programmable controller, or a personal computer. All messages are created and stored in the host device.

The DL40 Plus Slave displays appear similar to the standard DL40 Plus two and four-line displays except they do not have front panel buttons, indicator LEDs, keyboard port, or an RIO / parallel port.

Operating Modes

The DL40 Plus Slave has four operating modes:

- DL Slave
- PV Slave
- Terminal
- Diagnostic

DL (Dataliner) Slave Mode

Use this mode when connecting the DL40 Plus Slave to a DL40 Plus master display or an enhanced PanelView terminal such as the PV1400e. One or more DL40 Plus Slaves may be connected to a single DL40 Plus using an RS-485 link (multidrop) or an RS-232 link (single drop only).

Each DL40 Plus Slave may be individually addressed to display only the messages sent to a specific address. Displays with the same address display the same messages. Addresses 13 and 18 are not valid, see page 2-3.

PV (PanelView) Slave

Use this mode when connecting a single DL40 Plus Slave to the printer port of a standard PanelView operator terminal (PV550, 600, 900, 1000 or 1400). The DL40 Plus Slave displays any text that would normally be sent to a printer. The DL40 Plus Slave may be connected to the PanelView using the RS-232 port. Only one display may be connected on the communication link, the DL40 Plus Slave is not individually addressable in this mode.

Terminal Mode

In this mode, the DL40 Plus Slave can receive data from any device capable of sending serial ASCII characters. The ASCII characters sent by the host device control the message text, line scrolling and formatting of the messages. Only one display may be connected on the communication link, the DL40 Plus Slave is not individually addressable in this mode.

Diagnostic Mode

Use the diagnostic mode for basic setup and troubleshooting. In this mode, the DL40 Plus Slave displays the hex value of all the data it receives. An indication is provided if there is a communication error.

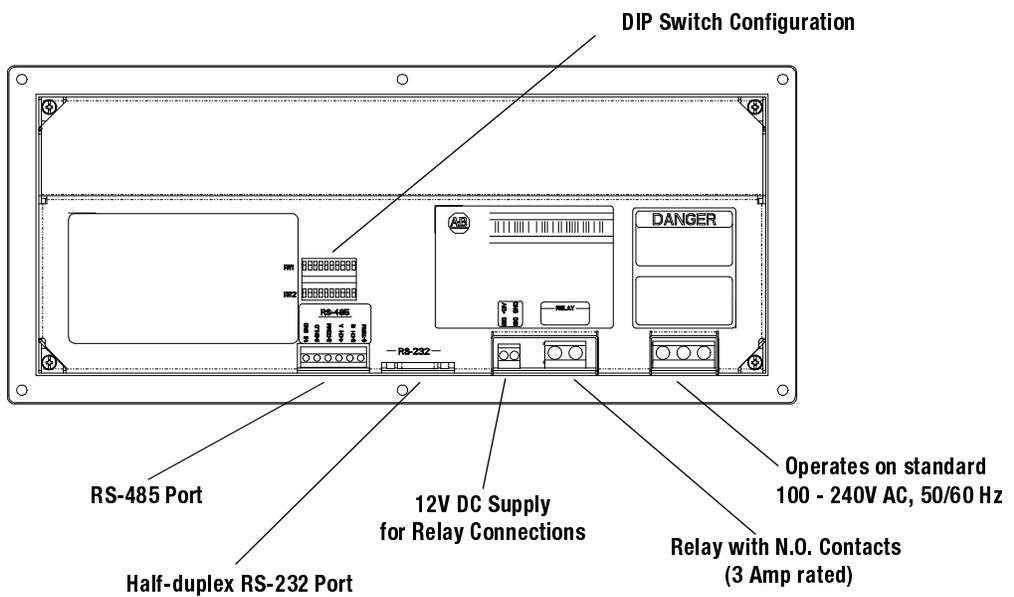
Features

DL40 Plus Slave displays have these features:



5 x 7 Dot Matrix Characters

Two or Four-Line Vacuum Fluorescent Display



DIP Switch Configuration

RS-485 Port

Half-duplex RS-232 Port

12V DC Supply
for Relay Connections

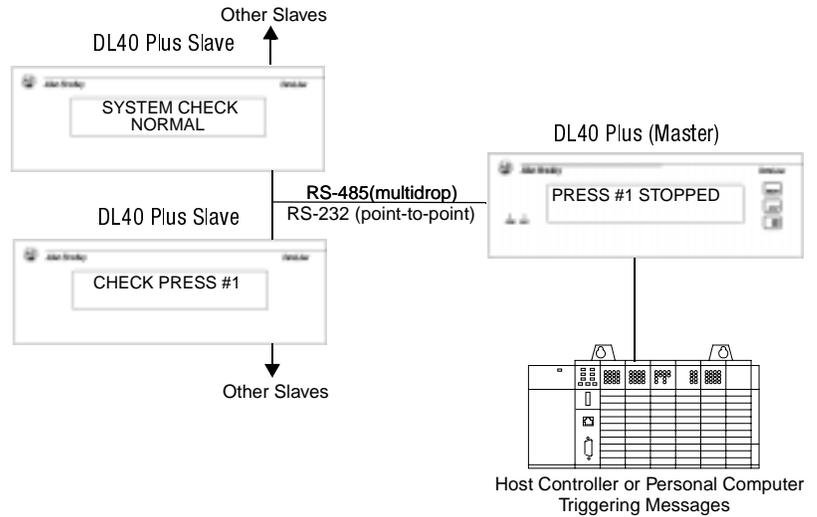
Relay with N.O. Contacts
(3 Amp rated)

Operates on standard
100 - 240V AC, 50/60 Hz

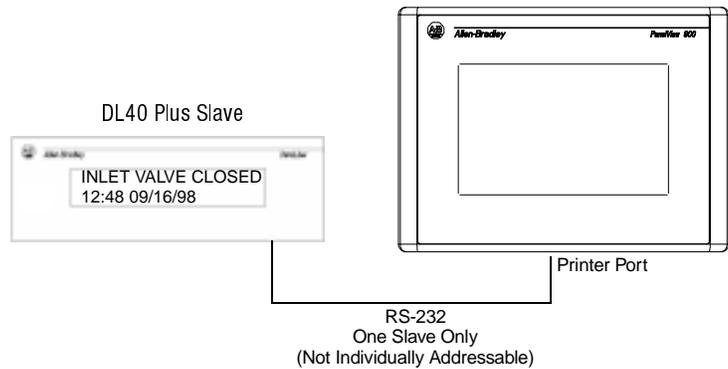
Typical Configurations

Here are some of the most typical applications:

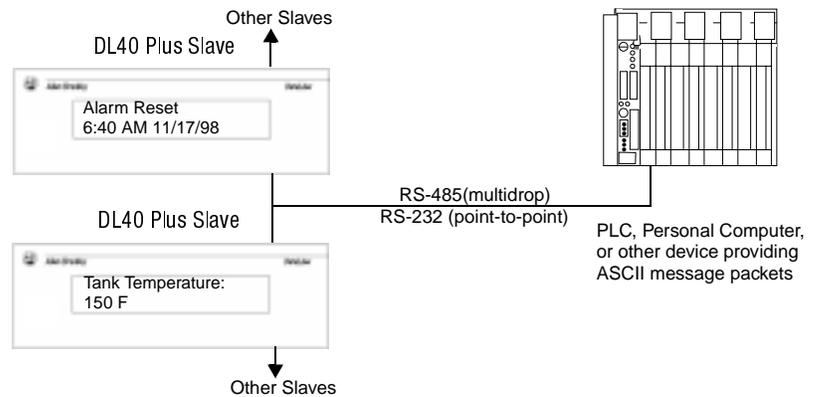
DL40 Plus to DL40 Plus Slave



PanelView to DL40 Plus Slave



PLC, PC, or Other Device to DL40 Plus Slave



Setting the DIP Switches

Chapter Objectives

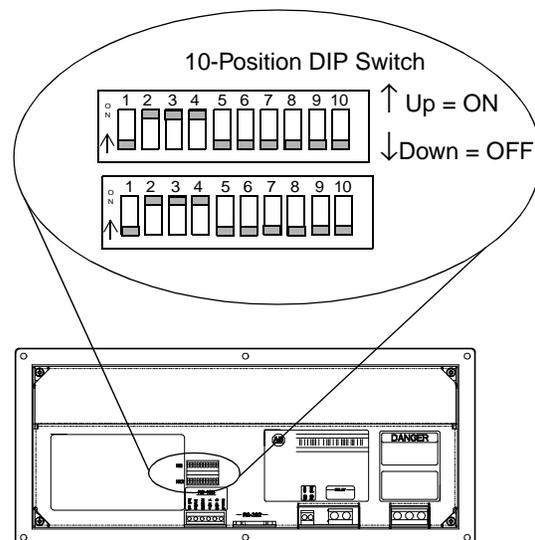
This chapter describes how to configure the DL40 Plus Slave display using the configuration DIP switches. The following topics are provided:

- DIP switch location
- Selecting the operating mode
- Selecting display language
- Setting the baud rate
- Selecting display/communication options
- Setting display address

DIP Switch Location

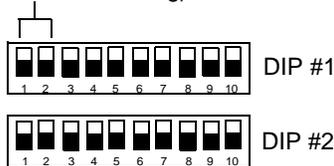
Access the 10-position DIP switches from the back of the display. Set DIP switches using a thin nonconductive object. Do not use a pencil (broken graphite pieces may short out the internal circuitry).

Changes to DIP switches take affect on powerup. If you make changes with the power applied, you will have to cycle power before the changes take effect.



Selecting the Operating Mode

Mode (DL Slaves Setting)

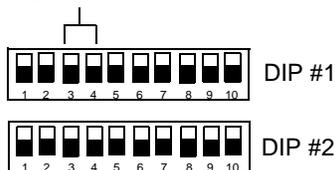


The DL40 Plus Slave display operates in one of four modes. Chapter 1 briefly describes these modes. For detailed descriptions refer to the individual chapters describing each mode. Select the mode using position #1 and #2 of DIP Switch #1.

Mode	Position #1	Position #2
DL Slave	Down ↓	Down ↓
PV Slave	Down ↓	Up ↑
Terminal	Up ↑	Down ↓
Diagnostic	Up ↑	Up ↑

Display Language

Language (English Setting)



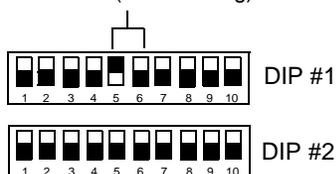
The DL40 Plus Slave displays characters in one of three language sets. Appendix B lists the characters in each of the language sets. Set the display language using positions #3 and #4 of DIP Switch #1.

Language	Position #3	Position #4
English*	Down ↓	Down ↓
International	Down ↓	Up ↑
Cyrillic	Up ↑	Down ↓
English (2)*	Up ↑	Up ↑

* Use either English setting, they provide identical character sets.

Baud Rate

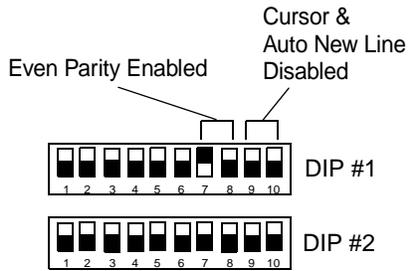
Baud Rate (9600 Setting)



Select the baud rate that matches the rate of the host device. Both the RS-232 and RS-485 ports are set at this rate. Set the rate using positions #5 and #6 of DIP Switch #1. The DL40 Plus Slave displays the currently set baud rate during its powerup sequence.

Baud Rate	Position #5	Position #6
300	Down ↓	Down ↓
1200	Down ↓	Up ↑
9600	Up ↑	Down ↓
19200	Up ↑	Up ↑

Options



Positions #7 and #8 determine the parity, set the parity to match the host device. Positions #9 and #10 apply to Terminal mode operation, Refer to Chapter 6.

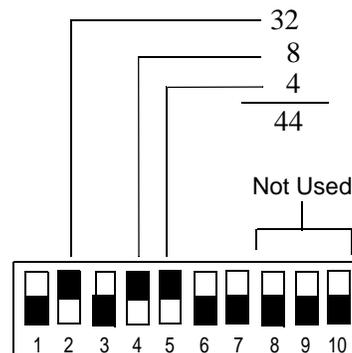
Position #	Condition	Selects	Applies to:
#7	Up ↑ Down ↓	Parity Enabled Parity Disabled	All Modes
#8	Up ↑ Down ↓	Odd Parity Even Parity	All Modes
#9	Up ↑ Down ↓	Cursor Enabled Cursor Disabled	Terminal Mode & PV Slave Mode
#10	Up ↑ Down ↓	Auto New Line Enabled Auto New Line Disabled	Terminal Mode & PV Slave Mode

Serial Address

Position #1 through #7 of DIP Switch #2 select the serial address of the slave display. The address is the binary sum of the value of all of the switches in the Up condition. Position #7 is the least significant position (ones position) and position #1 has the most significant value (64 position) as shown below. Positions #8 to #10 are not used. Refer to Appendix C for a list of all possible addresses and the corresponding switch positions.

Position #	1	2	3	4	5	6	7
Value	64	32	16	8	4	2	1

For example, with Positions #2, #4, and #5 in the up condition, the serial address is 44.



Important: Address 13 and 18 are invalid slave addresses. If you assign either of these addresses to a slave, the slave overrides the setting and internally switches the address to 127.

Installation and Startup

Chapter Objectives

This chapter describes how to mount and make electrical connections to the DL40 Plus Slave display. The following topics are described:

- Mounting Instructions
- Panel Cutout Dimensions
- RS-232 Connections
- RS-485 Connections
- Relay Connections
- Power Connections
- Powerup Sequence

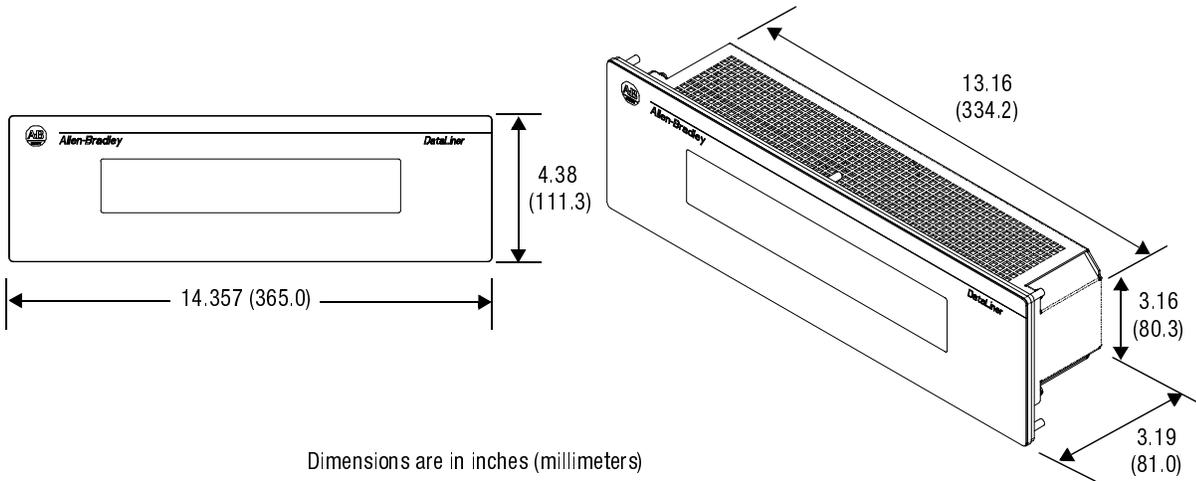
Mounting the DL40 Plus Slave

The following pages provide panel cutout dimensions and overall dimensions for the DL40 Plus Slave displays.

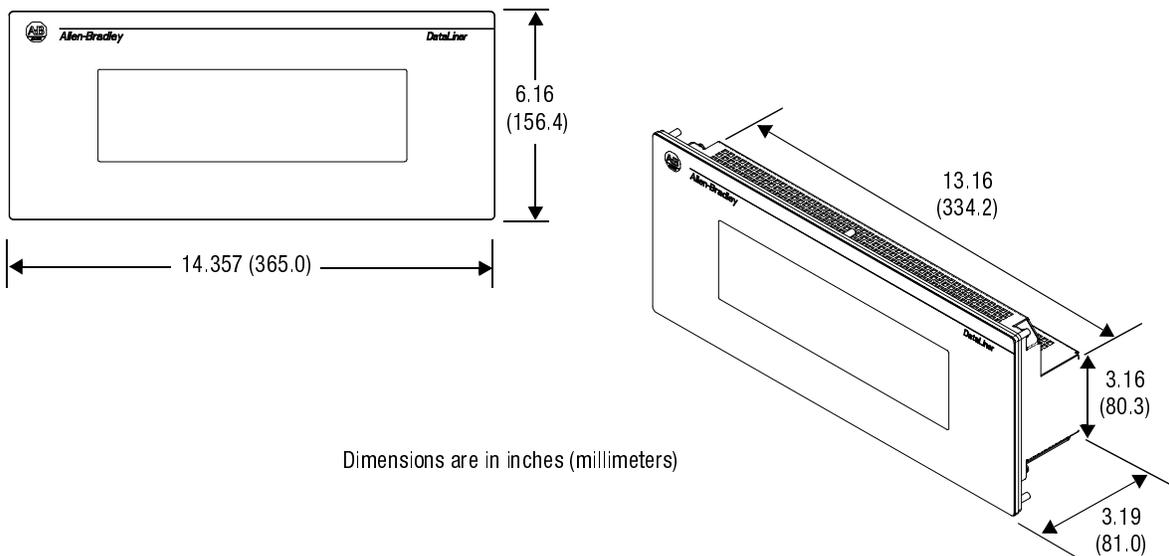
You can also mount the DL40 Plus Slaves in a custom panel or enclosure. When a DL40 plus is properly installed, the faceplate of the DL40 Plus Slave provides a NEMA Type 12, 13, and 4X(indoor) rating. To install the DL40 Plus Slave:

1. Cut and drill the appropriate mounting holes in the enclosure or panel.
2. Remove the six mounting nuts from the hardware bag provided with the display.
3. Position the DL40 Plus Slave in the panel or enclosure mounting hole.
4. Install and alternately tighten the nuts to a torque of 10in•lbs (1.13N•m).

Dimensions 2-Line Display



Dimensions 4-Line Display



Electrical Precautions

Install the DL40 Plus Slave display conforming to NFPA 70E, Electrical Safety Requirements for Employee Workplaces. In addition to the NFPA general guidelines, refer to the following:

Careful cable routing helps minimize electrical noise. Route incoming power to the module by a separate path from the communication cables.

Do not run communications wiring and power wiring in the same conduit!

Where communication and wire paths must cross, make their intersection perpendicular.

Grounding helps limit the effects of noise due to electromagnetic interference (EMI). To avoid problems caused by EMI, properly ground all equipment and use shielded cables.

Input Voltage Requirements

Before connecting the DL40 Plus Slave to the incoming power, verify that the power source provides:

100-240 Volts AC, 50/60 Hz, 0.60 - 0.25 amperes

Important: Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods [Article 501-4(b) of the National Electrical Code, NFPA70] and in accordance with the local authority having jurisdiction.

Hazardous Location Installations



ATTENTION: THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D, OR NON-HAZARDOUS LOCATIONS ONLY.



ATTENTION: EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.



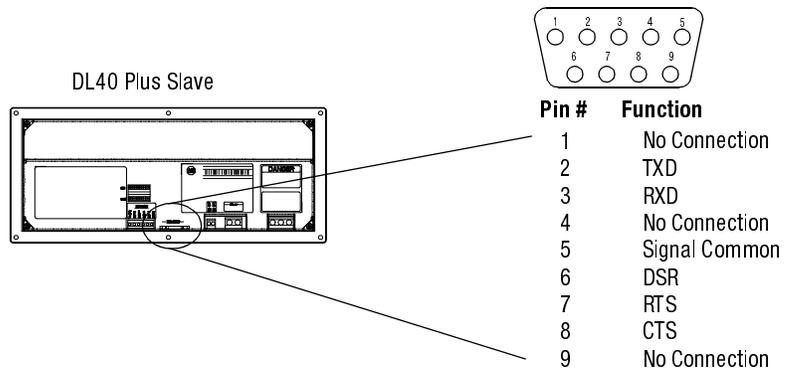
ATTENTION: EXPLOSION HAZARD - DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

RS-232 Connections

Use the RS-232 port to connect the DL40 Plus Slave to:

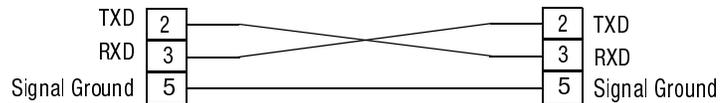
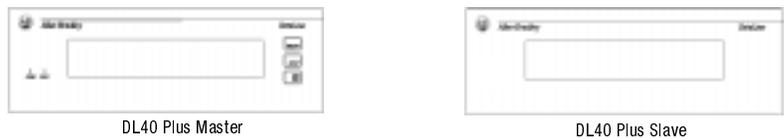
- DL40 Plus Master
- PanelView Printer Port
- 1771 or 1746-DB BASIC Module
- PLC-5 Channel 0
- SLC Channel 0

The following figure shows the location and terminal definitions for the RS-232 port.



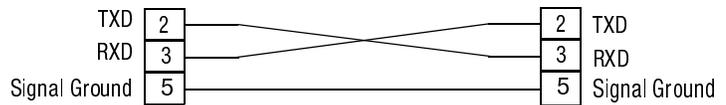
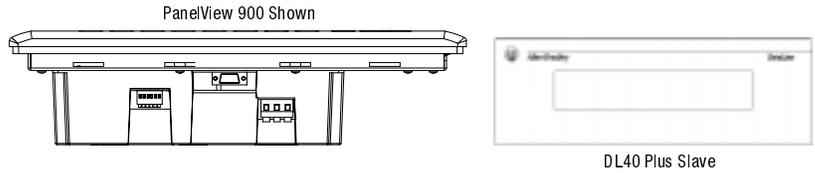
DL40 Plus Slave to DL40 Plus Master RS-232 Port

Connect a single DL40 Plus slave to a DL40 Plus master as shown below. You can also use the DTAM Plus programming cable (Catalog No. 2707-NC2) with a male-female pin adapter.

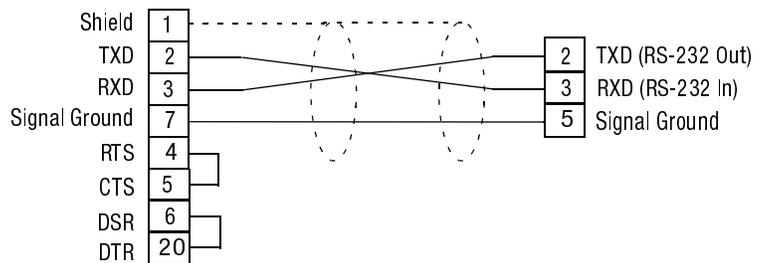


DL40 Plus Slave to PanelView RS-232 Printer Port

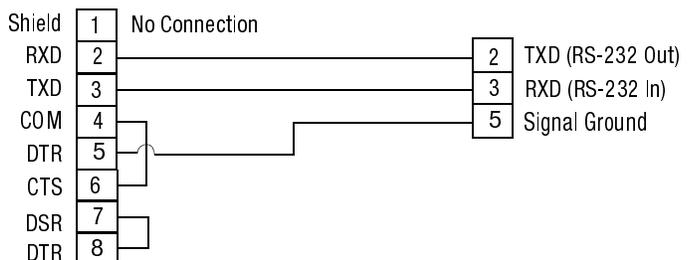
Connect the DL40 Plus Slave to a PanelView RS-232 printer port as shown below. The PanelView sends messages to the DL40 using its print messages function. You can also use the DTAM Plus programming cable (Catalog No. 2707-NC2) with a male-female pin adapter.



DL40 Plus Slave to 1771-DB BASIC Module

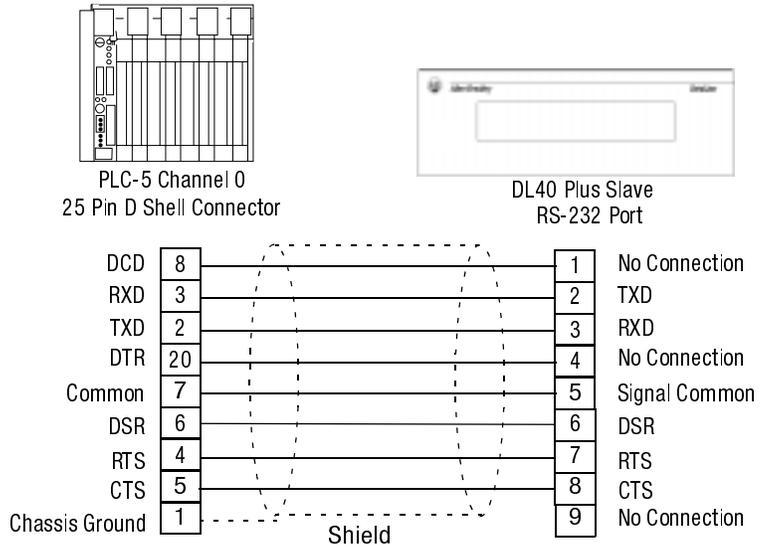


DL40 Plus Slave to 1746-BAS BASIC Module



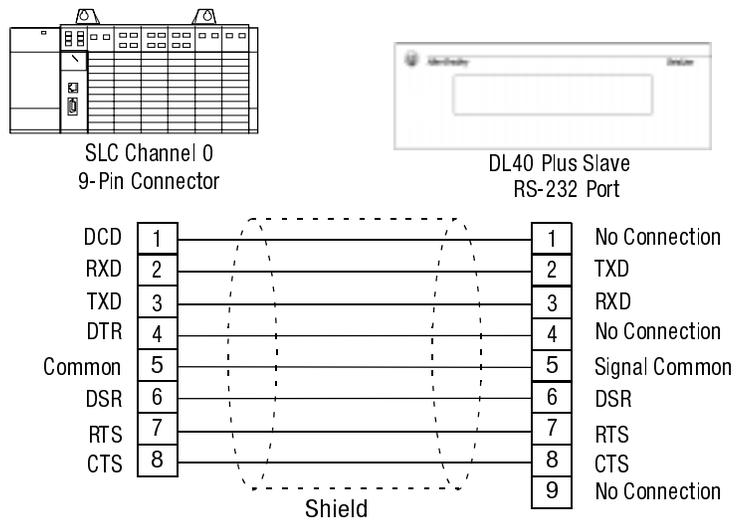
DL40 Plus Slave to PLC-5 Channel 0

Connect the DL40 Plus Slave to a PLC-5 Channel 0 port as shown below. You can also use programming cable (Catalog No. 2706-NC12).



DL40 Plus Slave to SLC Channel 0

Connect the DL40 Plus Slave to an SLC Channel 0 port as shown below. You can also use programming cable (Catalog No. 2706-NC12).

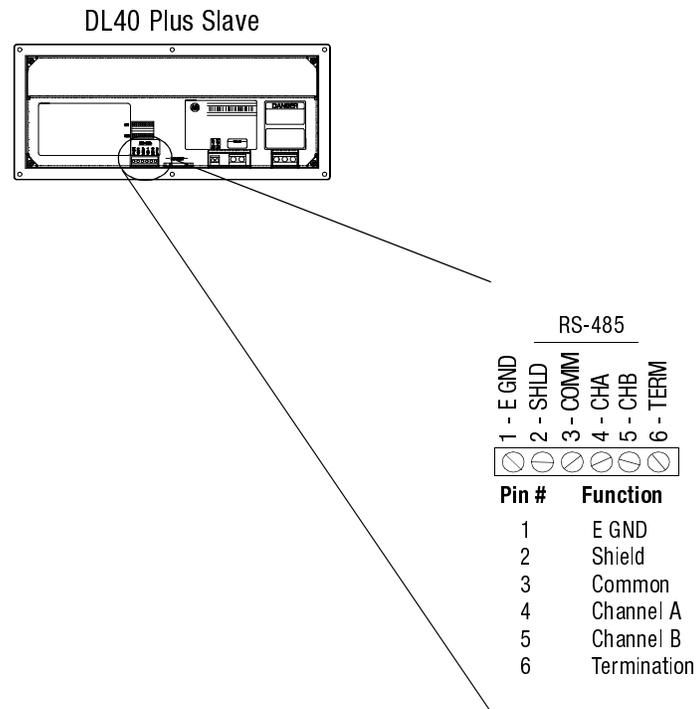


RS-485 Connections

Use the RS-485 port to connect the DL40 Plus Slave to:

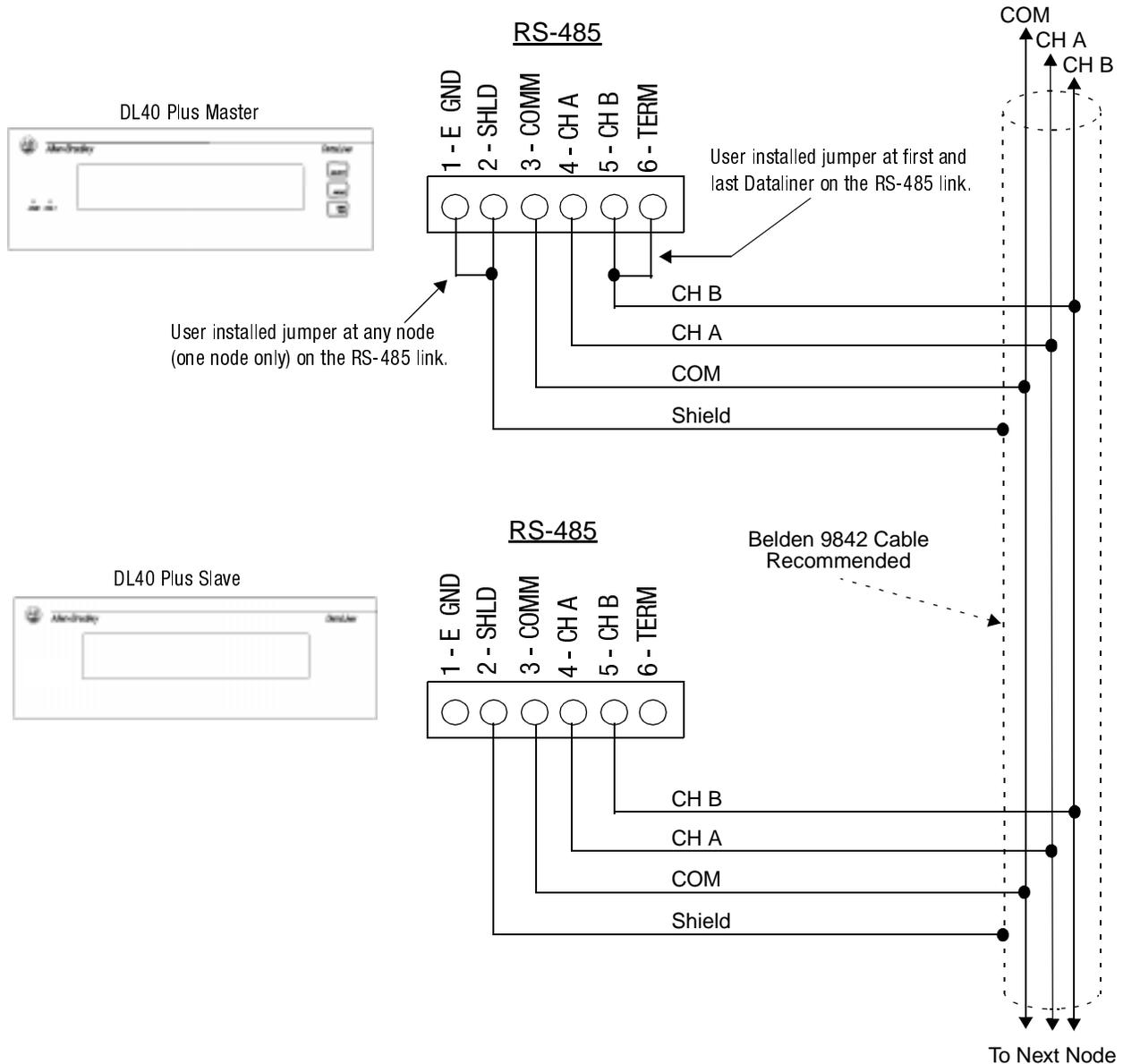
- DL40 Plus Master
- Personal Computer using an RS-485 Converter

The following figure shows the location and terminal definitions for the RS-485 port.



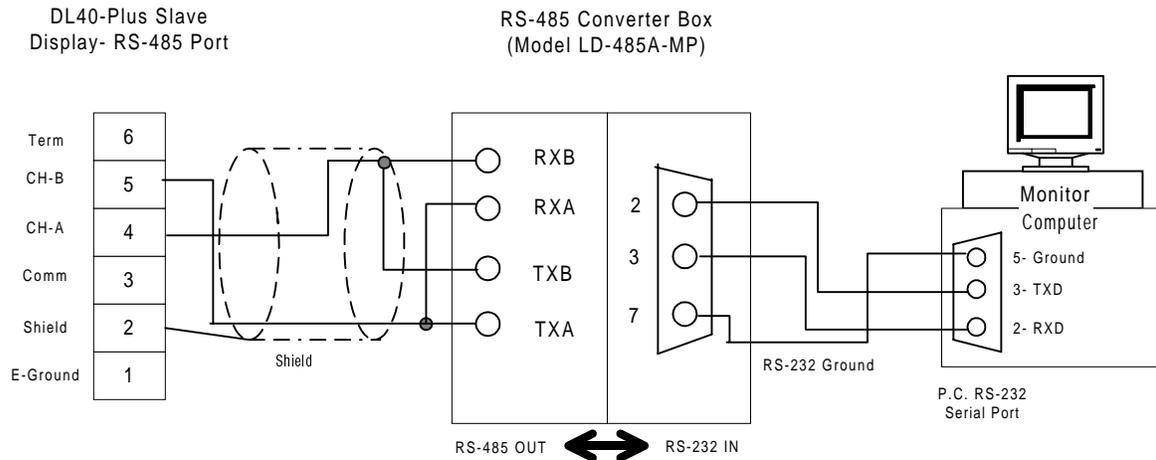
Connecting to a DL40 Master

One or multiple DL40 Plus Slave displays may be connected to a single DL40 Plus master display using the RS-485 port. The RS-485 network supports multi-drop communications with up to 126 slave displays. Use Belden 9842 cable at a maximum length of 4,000 ft (1219 meters). Refer to the following illustration.



DL40 Plus Slave to a Computer using an RS-485 Converter Box

If you are using a personal computer to send messages to the DL40 Plus Slave using the RS485 port, refer to the following diagram:



Note: When using the Black Box RS-485 Converter (LD-485A-MP):

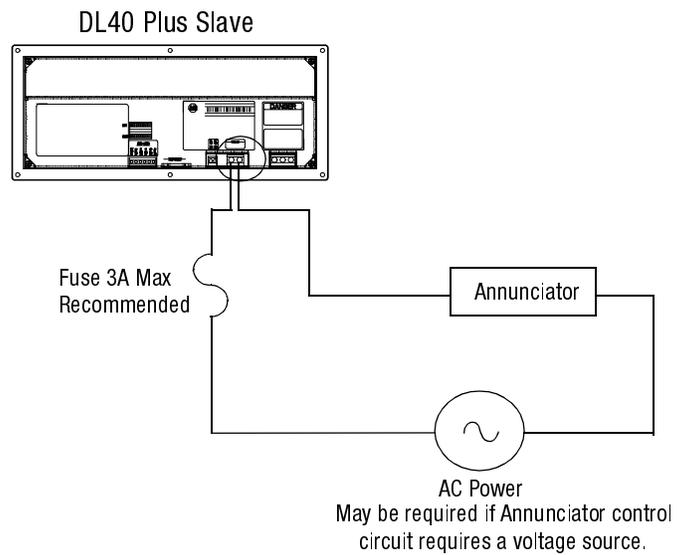
- Set the RTS/CTS delay time to 5 milliseconds using jumper W9.
- Set Switch S2 to the unterminated position.
- If the RS-485 Driver Enable is set to “Enable When Data is Received on the RS-232 Port” (Jumper W15 in the B-C position), set the “Disable Timeout Delay” to 100 msec or greater (Jumper W17) when communicating at lower Baud rates (300 or 1200 Baud).
- You can use a programming cable (Catalog No. 2706-NC15) to connect the computer serial port to the RS-485 converter box.

Relay Connections

Use the DL40 plus slave relay to trigger a remote alarm or warning light. The relay has contacts rated at 3A at 250V AC. Connect the remote alarm or light to the relay connectors on the back of the DL40 Plus Slave. Shown below is a typical wiring application.



ATTENTION: Use the Alarm Relay for annunciator purposes only. Do not use it for control circuits.

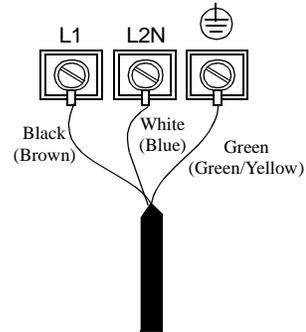


Power Connections

Before making power connections, make sure that the power is turned off. The DL40 Plus Slave requires 100-240Volts AC, 50/60 Hz, 0.60 - 0.25 Amperes.



ATTENTION: Improper wiring of the power connections may result in damage to the DL40.



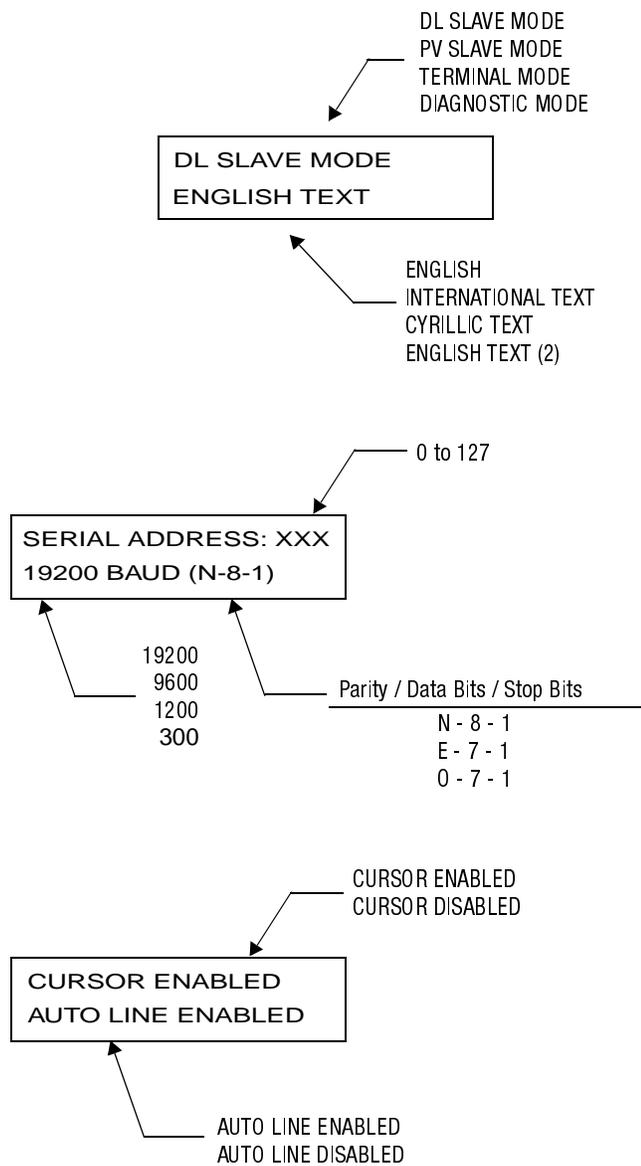
Important: Make sure all DIP switches are properly set as described in Chapter 2 before applying power.

Startup Sequence

When power is applied to the DL40 Plus Slave a powerup sequence of displays are shown. The first display on powerup is the sign-on banner identifying the hardware and firmware:

```
DL40 PLUS SLAVE 2L
VER 1.00 (10/16/98)
```

Following the sign-on banner, all of the display pixels are turned on for 2 seconds followed by a series of informational messages indicating the current DIP switch settings. Each display lasts for about four seconds.



After the status messages are displayed, the DL40 Plus Slave clears the display and enters the selected run mode.

Dataliner (DL) Slave Mode

Chapter Objectives

This chapter describes the operation of the DL40 Plus Slave in DL Slave Mode. This chapter contains the following topics:

- Slave mode description
- Slave mode protocol
- Example messages
- Display options
- Clearing one or more lines
- Energizing relay

Slave Mode Operation

Dataliner (DL) Slave mode allows multiple slave displays to display different messages while connected to a single master device. Each slave display is assigned an address and only displays messages sent to that address. DL40 Plus Slaves assigned the same address display the same messages. Messages sent to address 127 (global address) are displayed on all slave displays regardless of their assigned address.

Note: If a DL40 Plus is used as a master display, make sure it is configured for DL Slave protocol on its communication port (RS-232 or RS-485).

DL Slave Mode is selected by DIP switch settings as described in Chapter 2.

Slave Mode Protocol

Messages sent to the DL40 Plus Slave in DL Slave mode must have the following format:

20 Characters to Display	Slave Address	Line Number	Carriage Return
--------------------------	---------------	-------------	-----------------

If you are using a DL40 Plus as the master, configure its communication port for DL Slaves (refer to the DL40 Plus user manual, Publication 2706-6.1). This configures the DL40 master to send message data in the DL Slave format.

20 Characters to Display

Send the message text characters to be displayed. ASCII characters 32 to 255 (20hex to FFhex) are supported. All control characters within the message text field, except [Ctrl][F] and [Ctrl][R], are ignored. Any valid ASCII character, upper or lower case can be sent. If fewer than 20 characters are sent, the remaining character positions are filled with spaces. Refer to Appendix A for the character sets available for the selected language character set (DIP switch settable, see Chapter 2).

Slave Address

A one byte character from 1 to 127 (1 to 7F hex) that specifies the address of the slave display that is to receive the message.

The following addresses are invalid:

- 13 (0Dhex) is invalid because it corresponds to Carriage Return
- 18 (12hex) is invalid because it corresponds to Ctrl-R
- If you select an invalid address, the DL40 overrides the setting with an address of 127.

Address 127 is a global address that accepts all messages regardless of the message's address. In addition, any message sent with the address 127 is received by all slave displays. Use address 127 for messages you want displayed on all slaves instead of repeating the same message to multiple displays.

Line Number

A one byte character specifying the line number the message is to be displayed on. Valid line numbers are 1 to 4 decimal (not ASCII 1 to 4). Ctrl-A = 1, Ctrl-B = 2, Ctrl-C = 3 and Ctrl-D = 4.

Carriage Return

Message is terminated by a carriage return, Ctrl-M (decimal 13, 0Dhex).

Example Messages

For example, a print statement for a Catalog No. 1771-DB Basic module with a DL40 Plus Slave display would be:

Slave 1
Line 1
Carriage Return
↓
↓
↓
 100 PRINT #”VALVE NUMBER 1 OPEN”, CHR(1), CHR(1), CHR(13)

The message VALVE NUMBER 1 OPEN would be displayed on line one of slave number one. Note that to send the message fields, the print CHR (decimal character equivalent) function is used.

To send the same message from any PC terminal program, use:

Slave #1
(01hex)
Carriage Return
↓
↓
 Valve Number 1 OPEN^A^A^A^M
|
↑
Message Text
Line #1
(01hex)

Where ^A is the [Ctrl] and [A] keys pressed at the same time.

Display Options

Use the following control codes in the message text for flash and reset functions. Any other control codes are ignored.

[Ctrl][F]

This is the flash code. Send this code when you want the display characters to flash. All characters following the first flash code in a message flash. If two [Ctrl][F] codes appear in a message, only the characters between the codes flash.

You can turn flash on and off multiple times in a message. At the start of each new line of message text, the flash option is turned off. The [Ctrl][F] character is not included in the 20 character limit of the display protocol.

[Ctrl][R]

This is the reset command. When a [Ctrl][R] is received by the DL40 Plus Slave, all data for the current line is discarded. For example, if 10 characters are received by the DL40 Plus Slave and then a [Ctrl][R] is sent, the 10 characters are discarded. After using the reset command, you can start a new message. [Ctrl][R] resets the flash status to non-flashing.

Clearing One or More Lines

To clear one or more lines on a DL40 Plus Slave, use:

Slave Address	Line Number	Carriage Return
---------------	-------------	-----------------

The following table lists the line number byte required for clearing any or all lines of the display.

To Clear:	Use this Byte for Line Number:	
	ASCII	Equivalent Value
Line 1	[Ctrl][A]	1 decimal (1 hex)
Line 2	[Ctrl][B]	2 decimal (2 hex)
Line 3	[Ctrl][C]	3 decimal (3 hex)
Line 4	[Ctrl][D]	4 decimal (4 hex)
All Lines	2	50 decimal (32 hex)

Energizing Relay

To control the relay, use:

Slave Address	Line Number	Carriage Return
---------------	-------------	-----------------

The following table indicates the line numbers to use for relay control:

To:	Use this Byte for Line Number:	
	ASCII	Equivalent Value
Energize Relay	0	48 decimal (30 hex)
De-energize Relay	1	49 decimal (31 hex)

PanelView (PV) Slave Mode

Chapter Objectives

This chapter describes the operation of the DL40 Plus Slave in the PV Mode. The following topics are described:

- PV Slave Mode description
- PV Mode protocol
- Display options

PV Slave Mode

Use the PanelView (PV) Slave Mode to send the DL40 Plus Slave messages from a PanelView operator terminal. The DL40 acts like a printer attached to the PanelView communication port. Any messages printed by the PanelView are displayed on the DL40 Plus Slave.

Note: In PV Mode, only one DL40 Plus Slave display can be connected to the PanelView communication port (RS-232). In this mode, DL40 Plus Slave displays cannot be addressed individually.

PV Slave Mode is selected by DIP switch settings as described in Chapter 3. For information on setting up a PanelView to print messages, refer to the PanelBuilder Software user manual (Publication 2711-6.0).

PV Slave Mode Protocol

Messages to the DL40 in PV mode consist of the following:

Message Text (Up to 128 Characters)	Carriage Return
-------------------------------------	-----------------

Only ASCII characters 32 to 255 (20hex to FFhex) are displayed. ASCII characters 0 through 31 (1F hex) are non-printable control characters.

Text is displayed from left to right. When the end of the current line is reached, the cursor shifts and starts on the next line. If the display is on the last line, the first line is cleared and the lines are shifted up. Some control characters can be used to control the display of messages (refer to display options, next section).

Display Options

Use the following control codes to control the appearance of messages displayed in PV Mode.

[Ctrl][F] (06 hex)

Flash code. Send the [Ctrl][F] command when you want the display characters to flash. All characters following the first flash code in a message flash. If two [Ctrl][F] codes appear in a message, only the characters between the codes flash.

You can turn flash on and off multiple times in a message. At the start of each new line of message text, the flash option is turned off.

[Ctrl][G] (07 hex)

This command energizes the DL40 Plus Slave relay. Display text is not affected.

[Ctrl][L] (0C hex)

Form feed code. Sending a [Ctrl][L] command clears the display and moves the cursor to the upper left corner of the display. Flash mode is set to non-flashing. The relay is not affected.

[Ctrl][M] (0D hex)

Carriage return command. Sending the [Ctrl][M] command terminates the current message line, sets the flash mode to non-flashing, and moves the cursor to the beginning of the current line. The relay is not affected.

If the Auto New Line DIP switch is enabled (see Chapter 2), the cursor is also moved down to the start of the next line. If the cursor is at the last line, the first line is cleared and the lines are shifted up.

Note: The cursor is not moved until the next displayable character is received. This allows the current text to be displayed for the longest period of time before being shifted or cleared.

[Ctrl][R] (12 hex)

Relay reset command. Sending a [Ctrl][R] command de-energizes the relay. Displayed text is unchanged.

[Ctrl][J] (0A hex)

Line Feed command. Send a [Ctrl][J] command to move the cursor down to the next line. If the cursor is on the last line, it remains on the last line and all of the lines are shifted up (first line is removed).

Note: The cursor is not moved until the next displayable character is received. This allows the current text to be displayed for the longest period of time before being shifted or cleared.

Line Display Characteristics

The PanelView Slave mode has two special display characteristics that make messages easier to read:

Line to Line Delay

After each individual line is displayed, there is a one second pause before the next line is displayed. This delay provides time for each line to be read.

Cursor Movement Command Delay

Line wrap, carriage return, line feed and form feed operations are not executed immediately. These commands are stored and executed only when the next displayable character (or identical cursor movement) is received. This allows the current text to be displayed for the longest period of time before being shifted or cleared.

Terminal Mode

Chapter Objectives

This chapter describes the operation of the DL40 Plus Slave in Terminal Mode. This chapter contains the following topics:

- Terminal mode operation
- Protocol

Terminal Mode Operation

Terminal mode allows more control over messages than the basic Slave Mode setting. In terminal mode, you can control:

- Cursor position
- Line scrolling
- Character-by-character display options

However, this mode also requires that you control the positioning and formatting of each message. In Terminal Mode, only one DL40 Plus Slave may be connected to the RS-485 or RS-232 link.

Terminal Mode is selected by DIP switch settings as described in Chapter 2.

Terminal Mode Protocol

Message text and control codes are sent serially to the DL40 Plus Slave in terminal mode. The following control codes are used:

Cursor Up (Ctrl-K) (0B hex)

Positions the cursor directly above the current cursor position. If the cursor is on the first line, the cursor is moved to the last line on the display.

Cursor Down (Ctrl-V) (16 hex)

Positions the cursor directly below the current cursor position. If the cursor is on the last line, the cursor is moved to the first line on the display.

Cursor Left (Ctrl-H) (08 hex)

Moves the cursor one position to the left of the current cursor position. If the cursor is at the leftmost position on a line, the cursor is moved to the rightmost position on the line above. If the cursor is at the leftmost position of the first line, the cursor is moved to the rightmost position of the last line.

Cursor Right (Ctrl-L) (0C hex)

Moves the cursor one position to the right of the current cursor position. If the cursor is at the rightmost position on a line, the cursor is moved to the leftmost position on the next lower line. If the cursor is at the rightmost position of the last line, the cursor is moved to the leftmost position of the first line.

Cursor Return (Ctrl-M) (0D hex)

Moves the cursor to the leftmost position on the current line.

Line Feed (Ctrl-J) (0A hex)

Moves the cursor directly below the current position. If the cursor is on the last line, the cursor stays in its position and every line is moved up one line (first line is removed).

Reverse Line Feed (Esc and then J) (1B, 4A hex)

Moves the cursor directly above the current position. If the cursor is on the first line, the cursor stays in its position and every line is moved down one line (last line is removed).

Cursor Home (Ctrl-T) (14 hex)

Moves the cursor to the leftmost position on the first line of the display.

Clear Screen (Esc and then *) (1B, 2A hex)

Clears the display and moves the cursor to the leftmost position on the first line of the display.

New Line (Ctrl-_) (1F hex)

Moves the cursor to the beginning of the line below. If the cursor is on the last line, every line is moved up one line and the bottom line is cleared.

Delete Line (Esc and then R) (1B, 52 hex)

Clears the current line. The cursor remains at its current position.

Insert Line (Esc and then E) (1B, 45 hex)

Moves the current line and all lines below it down one line (text on bottom line is removed). Then clears the current line. The cursor remains at its current position.

Set Cursor Position (Esc,=,<row>,<column>) (1B, 3D <r><c> hex)

Moves the cursor to the specified row and column. Refer to the following table. If you exceed the parameters listed in the table, the cursor position defaults to the greatest row or column number.

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Row	1	2	3	4																
ASCII	SP	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3
Decimal	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Hex	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F	30	31	32	33

For example, the following ASCII character sequence places the cursor in Row 3, Column 9 of a four line display: ESC=“(

Set Cursor Invisible (ESC . 0) (1B, 2E, 30 hex)

Makes the cursor invisible.

Set Cursor Visible (ESC . 1) (1B, 2E, 31 hex)

Makes the cursor visible.

De-energize Relay (ESC . 2) (1B, 2E, 32 hex)

De-energizes the annunciator relay.

Energize Relay (ESC . 3) (1B, 2E, 33 hex)

Energizes the annunciator relay.

Set Flashing Mode (ESC G 2) (1B, 47, 32 hex)

Enables flashing text mode. All characters received after this command are displayed flashing until disabled with a Clear Flashing Mode command.

Clear Flashing Mode (ESC G 0) (1B, 47, 30 hex)

Disables flashing text mode.

Monitor Mode (ESC U) (1B, 55 hex)

Displays all control codes as custom characters. These characters represent the hexadecimal value of the control code. Any command associated with the control code is ignored.

Exit Monitor Mode (ESC u) or (ESC X) (1B, 75 hex) or (1B, 58 hex)

Exits Monitor Mode.

Display Status (ESC h) (1B, 68 hex)

Displays the status of the display as defined by the DIP switches. This is the same configuration text displayed on powerup (see page 3-13) without product version text and pixel test. After displaying the status information, the screen is cleared with the cursor in the leftmost position on the first line.

Diagnostic Mode

Chapter Objectives

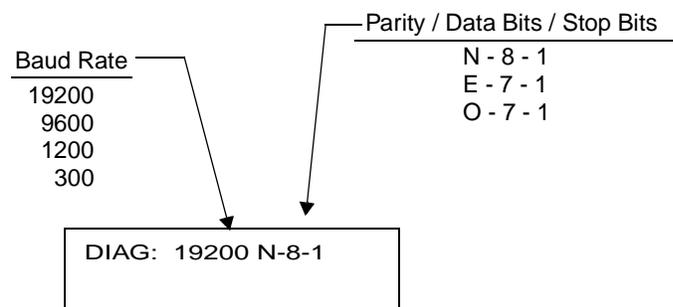
This chapter describes the operation of the DL40 Plus Slave in the Diagnostic Mode. Use the diagnostic mode to verify communications with a host device. Diagnostic mode displays the exact data being sent by a host device. Use the diagnostic mode as a temporary installation and troubleshooting aid.

Set the DL40 Plus Slave for diagnostic mode using the DIP switch settings described in Chapter 2.

Using the Diagnostic Mode

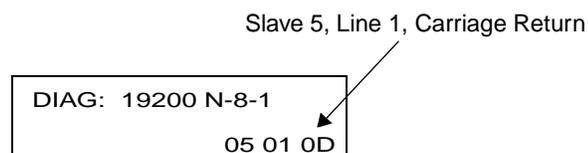
Serial Port Settings

In diagnostic mode, the first line of the display indicates the mode and serial port configuration:



Data Received Display

Every byte received on either the RS-232 or RS-485 port is displayed in a hexadecimal format on line 2 of the display. The bytes shift from right to left as each new byte is received. The byte on the right is always the last byte received. For example:



The value of every byte is displayed including control characters. Characters are displayed as fast as they are received (no buffer). This usually means that only the last 7 bytes of a long message are viewable.

Data Errors

If the DL40 Plus Slave and host are not set to the same serial port settings, a reception error occurs. The error symbol is a ! displayed as the last character on line 1. This symbol is displayed for 1/5 sec (200 msec) after each serial error.



```
DIAG: 19200 N-8-1  !
                    05 01 0D
```

Serial Port Error

Note: Data cannot be displayed when a serial port error occurs.

Specifications

Display Characters

Character Height Two line display Four line display	11.3 mm (0.44 inch) 11.3 mm (0.44 inch)
Character Set English Cyrillic International	Standard & Extended ASCII Characters Standard & Cyrillic (Russian) Characters Standard & International ISO 8859-1 Characters
Characters per Display Line	20
Viewing Distance - Approximate	7.6 meters (25 feet)
Character Type	Vacuum fluorescent, 5 x 7 dot matrix characters. Filtered to blue/green color.

Electrical

Input Voltage	100 - 240V AC, 50-60 Hz, 0.60 - 0.25A
Input Power	60VA
Fuse Type	Internal sealed (not user replaceable)
Annunciation Relay AC Resistive Load DC Resistive Load	Single N.O. contact 3 Amperes at 240V AC 3 Amperes at 30V DC

Serial Communications

Electrical Interface	RS-232 (EIA-/TIA-232-E) RS-485 (EIA-485)
Baud Rate	300, 1200, 9600, 19200
Data Format	7 or 8 data bits; odd, even, or no parity

Environmental

Temperature Range - Operating	0° to 60°C (+32° to 140°F)
Temperature Range - Storage	-40° to 85°C (-40° to 185°F)
Humidity	5% to 95% (non-condensing)
Shock	Operating 15G, Non-operating 30G pulses
Vibration	Operating 1.0G, Non-operating 2.5G sinusoidal

Mechanical

Enclosure Type	UL listed for NEMA Type 12, 13, 4, 4X (indoor use only) when mounted in a suitable enclosure of Type 12, 13, 4, 4X, IP65, or IP54
Weight - Approximate Catalog No. 2706-LV2S Catalog No. 2706-LV4S	3.6 lbs. (1.6 kg) 4.8 lbs. (2.2 kg)

Certifications

UL Listings  	UL listed for UL-508 Industrial Control Equipment Class I, Groups A, B, C, and D Division 2, Hazardous Locations UL Listed for Canadian Safety Standards CSA 22.2 No. 213
European Union Directive 	Electromagnetic Compatibility Directive (89/336/EEC) EN 50082-2 Generic Emission Standard - Industrial Environment EN 50081-2 Generic Immunity Standard - Industrial Environment IEC 1131-2 Programmable Controllers - Equipment Class I

Character Sets

ASCII (English) Character Set

Dec.	Oct.	Hex	Char	Control Code	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char
0	000	00	NUL	CTRL @	32	040	20	SP	64	100	40	@	96	140	60	'
1	001	01	SOH	CTRL A	33	041	21	!	65	101	41	A	97	141	61	a
2	002	02	STX	CTRL B	34	042	22	"	66	102	42	B	98	142	62	b
3	003	03	ETX	CTRL C	35	043	23	#	67	103	43	C	99	143	63	c
4	004	04	EOT	CTRL D	36	044	24	\$	68	104	44	D	100	144	64	d
5	005	05	ENQ	CTRL E	37	045	25	%	69	105	45	E	101	145	65	e
6	006	06	ACK	CTRL F	38	046	26	&	70	106	46	F	102	146	66	f
7	007	07	BEL	CTRL G	39	047	27	'	71	107	47	G	103	147	67	g
8	010	08	BS	CTRL H	40	050	28	(	72	110	48	H	104	150	68	h
9	011	09	HT	CTRL I	41	051	29	)	73	111	49	I	105	151	69	i
10	012	0A	LF	CTRL J	42	052	2A	*	74	112	4A	J	106	152	6A	j
11	013	0B	VT	CTRL K	43	053	2B	+	75	113	4B	K	107	153	6B	k
12	014	0C	FF	CTRL L	44	054	2C	,	76	114	4C	L	108	154	6C	l
13	015	0D	CR	CTRL M	45	055	2D	-	77	115	4D	M	109	155	6D	m
14	016	0E	SO	CTRL N	46	056	2E	.	78	116	4E	N	110	156	6E	n
15	017	0F	SI	CTRL O	47	057	2F	/	79	117	4F	O	111	157	6F	o
16	020	10	DLE	CTRL P	48	060	30	0	80	120	50	P	112	160	70	p
17	021	11	DC1	CTRL Q	49	061	31	1	81	121	51	Q	113	161	71	q
18	022	12	DC2	CTRL R	50	062	32	2	82	122	52	R	114	162	72	r
19	023	13	DC3	CTRL S	51	063	33	3	83	123	53	S	115	163	73	s
20	024	14	DC4	CTRL T	52	064	34	4	84	124	54	T	116	164	74	t
21	025	15	NAK	CTRL U	53	065	35	5	85	125	55	U	117	165	75	u
22	026	16	SYN	CTRL V	54	066	36	6	86	126	56	V	118	166	76	v
23	027	17	ETB	CTRL W	55	067	37	7	87	127	57	W	119	167	77	w
24	030	18	CAN	CTRL X	56	070	38	8	88	130	58	X	120	170	78	x
25	031	19	EM	CTRL Y	57	071	39	9	89	131	59	Y	121	171	79	y
26	032	1A	SUB	CTRL Z	58	072	3A	:	90	132	5A	Z	122	172	7A	z
27	033	1B	ESC	CTRL [	59	073	3B	;	91	133	5B	[	123	173	7B	{
28	034	1C	FS	CTRL \	60	074	3C	<	92	134	5C	\	124	174	7C	|
29	035	1D	GS	CTRL]	61	075	3D	=	93	135	5D	]	125	175	7D	}
30	036	1E	RS	CTRL ^	62	076	3E	>	94	136	5E	^	126	176	7E	~
31	037	1F	US	CTRL _	63	077	3F	?	95	137	5F	_	127	177	7F	␣

Extended ASCII Character Set

The following extended ASCII characters are available with all character sets (English, International, and Cyrillic).

Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char
128	200	80	Ç	160	240	A0	á	192	300	C0	ℓ	224	340	E0	α
129	201	81	ü	161	241	A1	í	193	301	C1	±	225	341	E1	β
130	202	82	é	162	242	A2	ó	194	302	C2	⊥	226	342	E2	Γ
131	203	83	â	163	243	A3	ú	195	303	C3	⊥	227	343	E3	π
132	204	84	ä	164	244	A4	ñ	196	304	C4	—	228	344	E4	Σ
133	205	85	à	165	245	A5	Ñ	197	305	C5	+	229	345	E5	σ
134	206	86	á	166	246	A6	ä	198	306	C6	≡	230	346	E6	μ
135	207	87	ç	167	247	A7	º	199	307	C7	⊥	231	347	E7	τ
136	210	88	ê	168	250	A8	¿	200	310	C8	⊥	232	350	E8	Φ
137	211	89	ë	169	251	A9	┌	201	311	C9	⊥	233	351	E9	Θ
138	212	8A	è	170	252	AA	┐	202	312	CA	≡	234	352	EA	Ω
139	213	8B	ï	171	253	AB	1/2	203	313	CB	≡	235	353	EB	δ
140	214	8C	î	172	254	AC	1/4	204	314	CC	⊥	236	354	EC	∞
141	215	8D	ì	173	255	AD	¡	205	315	CD	=	237	355	ED	∅
142	216	8E	Ë	174	256	AE	<<	206	316	CE	≡	238	356	EE	€
143	217	8F	À	175	257	AF	>>	207	317	CF	≡	239	357	EF	∩
144	220	90	É	176	260	B0	■	208	320	D0	±	240	360	F0	≡
145	221	91	æ	177	261	B1	▨	209	321	D1	≡	241	361	F1	±
146	222	92	Æ	178	262	B2	■	210	322	D2	⊥	242	362	F2	≥
147	223	93	Ô	179	263	B3	|	211	323	D3	⊥	243	363	F3	≤
148	224	94	ö	180	264	B4	†	212	324	D4	⊥	244	364	F4	┌
149	225	95	ò	181	265	B5	‡	213	325	D5	⊥	245	365	F5	┐
150	226	96	û	182	266	B6	‡	214	326	D6	⊥	246	366	F6	+
151	227	97	ù	183	267	B7	⊥	215	327	D7	⊥	247	367	F7	≈
152	230	98	ÿ	184	270	B8	‡	216	330	D8	‡	248	370	F8	°
153	231	99	Û	185	271	B9	‡	217	331	D9	┘	249	371	F9	•
154	232	9A	Ü	186	272	BA	||	218	332	DA	┌	250	372	FA	.
155	233	9B	ç	187	273	BB	‡	219	333	DB	■	251	373	FB	√
156	234	9C	£	188	274	BC	┘	220	334	DC	■	252	374	FC	n
157	235	9D	¥	189	275	BD	┘	221	335	DD	┘	253	375	FD	²
158	236	9E	ƒ	190	276	BE	┘	222	336	DE	┘	254	376	FE	▪
159	237	9F	f	191	277	BF	┘	223	337	DF	■	255	377	FF	

Cyrillic Character Set

The Cyrillic character set is enabled when position #3 is On and position #4 is Off on DIP Switch 1.

Dec.	Oct.	Hex.	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex.	Char
128	200	80	д	160	240	A0	а	192	300	C0	Л	224	340	E0	р
129	201	81	Б	161	241	A1	б	193	301	C1	л	225	341	E1	с
130	202	82	В	162	242	A2	в	194	302	C2	Т	226	342	E2	т
131	203	83	Г	163	243	A3	г	195	303	C3	т	227	343	E3	у
132	204	84	Д	164	244	A4	д	196	304	C4	—	228	344	E4	ф
133	205	85	Е	165	245	A5	е	197	305	C5	†	229	345	E5	х
134	206	86	Ж	166	246	A6	ж	198	306	C6	‡	230	346	E6	ц
135	207	87	З	167	247	A7	з	199	307	C7	‡	231	347	E7	ч
136	210	88	И	168	250	A8	и	200	310	C8	℄	232	350	E8	ш
137	211	89	Й	169	251	A9	й	201	311	C9	℄	233	351	E9	щ
138	212	8A	К	170	252	AA	к	202	312	CA	⌚	234	352	EA	ъ
139	213	8B	Л	171	253	AB	л	203	313	CB	‡	235	353	EB	ы
140	214	8C	М	172	254	AC	м	204	314	CC	‡	236	354	EC	ь
141	215	8D	Н	173	255	AD	н	205	315	CD	=	237	355	ED	э
142	216	8E	О	174	256	AE	о	206	316	CE	‡	238	356	EE	ю
143	217	8F	П	175	257	AF	п	207	317	CF	⌚	239	357	EF	я
144	220	90	Р	176	260	B0	⋮	208	320	D0	⌚	240	360	F0	Ё
145	221	91	С	177	261	B1	⋮	209	321	D1	‡	241	361	F1	ё
146	222	92	Т	178	262	B2	■	210	322	D2	‡	242	362	F2	Є
147	223	93	У	179	263	B3	|	211	323	D3	℄	243	363	F3	є
148	224	94	Ф	180	264	B4	‡	212	324	D4	℄	244	364	F4	Ī
149	225	95	Х	181	265	B5	‡	213	325	D5	℄	245	365	F5	ī
150	226	96	Ц	182	266	B6	‡	214	326	D6	℄	246	366	F6	Ÿ
151	227	97	Ч	183	267	B7	‡	215	327	D7	‡	247	367	F7	ÿ
152	230	98	Ш	184	270	B8	‡	216	330	D8	‡	248	370	F8	°
153	231	99	Щ	185	271	B9	‡	217	331	D9	‡	249	371	F9	•
154	232	9A	Ъ	186	272	BA	||	218	332	DA	℄	250	372	FA	·
155	233	9B	Ы	187	273	BB	‡	219	333	DB	■	251	373	FB	Г
156	234	9C	Ь	188	274	BC	‡	220	334	DC	■	252	374	FC	#
157	235	9D	Э	189	275	BD	‡	221	335	DD	■	253	375	FD	□
158	236	9E	Ю	190	276	BE	‡	222	336	DE	■	254	376	FE	□
159	237	9F	Я	191	277	BF	‡	223	337	DF	■	255	377	FF	

International Character Set

The International character set is enabled when position #3 is Off and position #4 is On (DIP Switch 1).

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	'	p			NBSP	°	À	Ð	à	ð
1			!	1	A	Q	a	q			ı	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			\$	4	D	T	d	t			¤	'	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	,	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			SHY	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o				-	¿	Ï	ß	ï	ÿ

Slave Address Settings

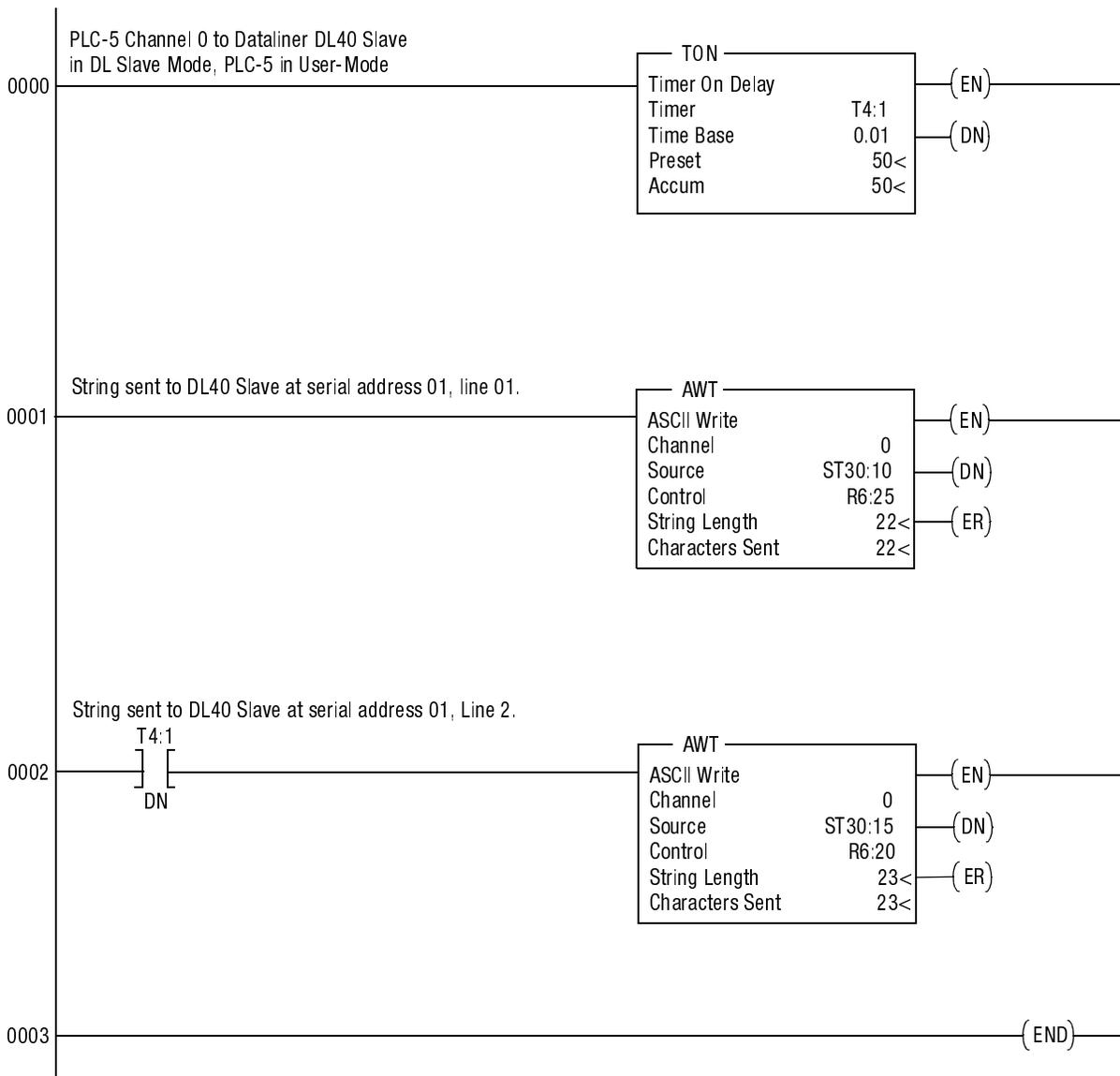
Address								Address							
	1	2	3	4	5	6	7		1	2	3	4	5	6	7
00	OFF	OFF	OFF	OFF	OFF	OFF	OFF	38	OFF	ON	OFF	OFF	ON	ON	OFF
01	OFF	OFF	OFF	OFF	OFF	OFF	ON	39	OFF	ON	OFF	OFF	ON	ON	ON
02	OFF	OFF	OFF	OFF	OFF	ON	OFF	40	OFF	ON	OFF	ON	OFF	OFF	OFF
03	OFF	OFF	OFF	OFF	OFF	ON	ON	41	OFF	ON	OFF	ON	OFF	OFF	ON
04	OFF	OFF	OFF	OFF	ON	OFF	OFF	42	OFF	ON	OFF	ON	OFF	ON	OFF
05	OFF	OFF	OFF	OFF	ON	OFF	ON	43	OFF	ON	OFF	ON	OFF	ON	ON
06	OFF	OFF	OFF	OFF	ON	ON	OFF	44	OFF	ON	OFF	ON	ON	OFF	OFF
07	OFF	OFF	OFF	OFF	ON	ON	ON	45	OFF	ON	OFF	ON	ON	OFF	ON
08	OFF	OFF	OFF	ON	OFF	OFF	OFF	46	OFF	ON	OFF	ON	ON	ON	OFF
09	OFF	OFF	OFF	ON	OFF	OFF	ON	47	OFF	ON	OFF	ON	ON	ON	ON
10	OFF	OFF	OFF	ON	OFF	ON	OFF	48	OFF	ON	ON	OFF	OFF	OFF	OFF
11	OFF	OFF	OFF	ON	OFF	ON	ON	49	OFF	ON	ON	OFF	OFF	OFF	ON
12	OFF	OFF	OFF	ON	ON	OFF	OFF	50	OFF	ON	ON	OFF	OFF	ON	OFF
13	OFF	OFF	OFF	ON	ON	OFF	ON	51	OFF	ON	ON	OFF	OFF	ON	ON
14	OFF	OFF	OFF	ON	ON	ON	OFF	52	OFF	ON	ON	OFF	ON	OFF	OFF
15	OFF	OFF	OFF	ON	ON	ON	ON	53	OFF	ON	ON	OFF	ON	OFF	ON
16	OFF	OFF	ON	OFF	OFF	OFF	OFF	54	OFF	ON	ON	OFF	ON	ON	OFF
17	OFF	OFF	ON	OFF	OFF	OFF	ON	55	OFF	ON	ON	OFF	ON	ON	ON
18	OFF	OFF	ON	OFF	OFF	ON	OFF	56	OFF	ON	ON	ON	OFF	OFF	OFF
19	OFF	OFF	ON	OFF	OFF	ON	ON	57	OFF	ON	ON	ON	OFF	OFF	ON
20	OFF	OFF	ON	OFF	ON	OFF	OFF	58	OFF	ON	ON	ON	OFF	ON	OFF
21	OFF	OFF	ON	OFF	ON	OFF	ON	59	OFF	ON	ON	ON	OFF	ON	ON
22	OFF	OFF	ON	OFF	ON	ON	OFF	60	OFF	ON	ON	ON	ON	OFF	OFF
23	OFF	OFF	ON	OFF	ON	ON	ON	61	OFF	ON	ON	ON	ON	OFF	ON
24	OFF	OFF	ON	ON	OFF	OFF	OFF	62	OFF	ON	ON	ON	ON	ON	OFF
25	OFF	OFF	ON	ON	OFF	OFF	ON	63	OFF	ON	ON	ON	ON	ON	ON
26	OFF	OFF	ON	ON	OFF	ON	OFF	64	ON	OFF	OFF	OFF	OFF	OFF	OFF
27	OFF	OFF	ON	ON	OFF	ON	ON	65	ON	OFF	OFF	OFF	OFF	OFF	ON
28	OFF	OFF	ON	ON	ON	OFF	OFF	66	ON	OFF	OFF	OFF	OFF	ON	OFF
29	OFF	OFF	ON	ON	ON	OFF	ON	67	ON	OFF	OFF	OFF	OFF	ON	ON
30	OFF	OFF	ON	ON	ON	ON	OFF	68	ON	OFF	OFF	OFF	ON	OFF	OFF
31	OFF	OFF	ON	ON	ON	ON	ON	69	ON	OFF	OFF	OFF	ON	OFF	ON
32	OFF	ON	OFF	OFF	OFF	OFF	OFF	70	ON	OFF	OFF	OFF	ON	ON	OFF
33	OFF	ON	OFF	OFF	OFF	OFF	ON	71	ON	OFF	OFF	OFF	ON	ON	ON
34	OFF	ON	OFF	OFF	OFF	ON	OFF	72	ON	OFF	OFF	ON	OFF	OFF	OFF
35	OFF	ON	OFF	OFF	OFF	ON	ON	73	ON	OFF	OFF	ON	OFF	OFF	ON
36	OFF	ON	OFF	OFF	ON	OFF	OFF	74	ON	OFF	OFF	ON	OFF	ON	OFF
37	OFF	ON	OFF	OFF	ON	OFF	ON	75	ON	OFF	OFF	ON	OFF	ON	ON

Address								Address							
	1	2	3	4	5	6	7		1	2	3	4	5	6	7
76	ON	OFF	OFF	ON	ON	OFF	OFF	121	ON	ON	ON	ON	OFF	OFF	ON
77	ON	OFF	OFF	ON	ON	OFF	ON	122	ON	ON	ON	ON	OFF	ON	OFF
78	ON	OFF	OFF	ON	ON	ON	OFF	123	ON	ON	ON	ON	OFF	ON	ON
79	ON	OFF	OFF	ON	ON	ON	ON	124	ON	ON	ON	ON	ON	OFF	OFF
80	ON	OFF	ON	OFF	OFF	OFF	OFF	125	ON	ON	ON	ON	ON	OFF	ON
81	ON	OFF	ON	OFF	OFF	OFF	ON	126	ON	ON	ON	ON	ON	ON	OFF
82	ON	OFF	ON	OFF	OFF	ON	OFF	127	ON	ON	ON	ON	ON	ON	ON
83	ON	OFF	ON	OFF	OFF	ON	ON								
84	ON	OFF	ON	OFF	ON	OFF	OFF								
85	ON	OFF	ON	OFF	ON	OFF	ON								
86	ON	OFF	ON	OFF	ON	ON	OFF								
87	ON	OFF	ON	OFF	ON	ON	ON								
88	ON	OFF	ON	ON	OFF	OFF	OFF								
89	ON	OFF	ON	ON	OFF	OFF	ON								
90	ON	OFF	ON	ON	OFF	ON	OFF								
91	ON	OFF	ON	ON	OFF	ON	ON								
92	ON	OFF	ON	ON	ON	OFF	OFF								
93	ON	OFF	ON	ON	ON	OFF	ON								
94	ON	OFF	ON	ON	ON	ON	OFF								
95	ON	OFF	ON	ON	ON	ON	ON								
96	ON	ON	OFF	OFF	OFF	OFF	OFF								
97	ON	ON	OFF	OFF	OFF	OFF	ON								
98	ON	ON	OFF	OFF	OFF	ON	OFF								
99	ON	ON	OFF	OFF	OFF	ON	ON								
100	ON	ON	OFF	OFF	ON	OFF	OFF								
101	ON	ON	OFF	OFF	ON	OFF	ON								
102	ON	ON	OFF	OFF	ON	ON	OFF								
103	ON	ON	OFF	OFF	ON	ON	ON								
104	ON	ON	OFF	ON	OFF	OFF	OFF								
105	ON	ON	OFF	ON	OFF	OFF	ON								
106	ON	ON	OFF	ON	OFF	ON	OFF								
107	ON	ON	OFF	ON	OFF	ON	ON								
108	ON	ON	OFF	ON	ON	OFF	OFF								
109	ON	ON	OFF	ON	ON	OFF	ON								
110	ON	ON	OFF	ON	ON	ON	OFF								
111	ON	ON	OFF	ON	ON	ON	ON								
112	ON	ON	ON	OFF	OFF	OFF	OFF								
113	ON	ON	ON	OFF	OFF	OFF	ON								
114	ON	ON	ON	OFF	OFF	ON	OFF								
115	ON	ON	ON	OFF	OFF	ON	ON								
116	ON	ON	ON	OFF	ON	OFF	OFF								
117	ON	ON	ON	OFF	ON	OFF	ON								
118	ON	ON	ON	OFF	ON	ON	OFF								
119	ON	ON	ON	OFF	ON	ON	ON								
120	ON	ON	ON	ON	OFF	OFF	OFF								

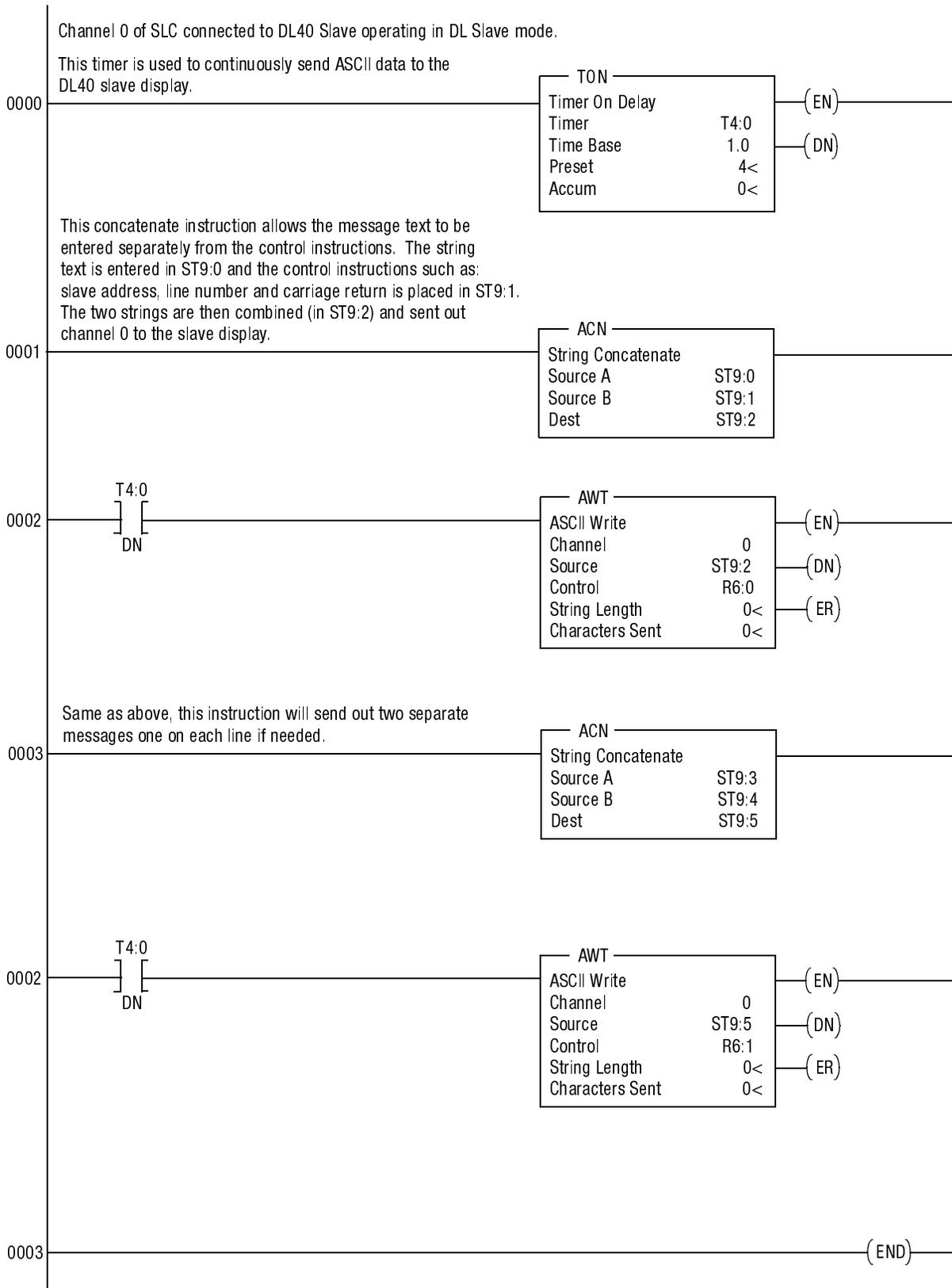
SLC/PLC Program Examples

PLC-5 Channel 0 to DL40 Plus Slave

This program assumes that the message text is entered in the string file ST30:10. This file contains the message text and defines the slave number and line number the message is to be displayed on. Refer to page 4-3 for an example message.



SLC Channel 0 to DL40 Plus Slave



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