



Dataliner DL40 Plus Message Displays

The Dataliner DL40 Plus Message Displays, the next generation of Allen-Bradley message displays, directly replace the Dataliner DL40, DL20 and DL10 Series Message Displays. This document covers the following:

- new catalog numbers
- software enhancements
- hardware enhancements
- regulatory enhancements
- removed features
- panel cutout
- installation changes
- programming software
- compatibility of application files
- slave support

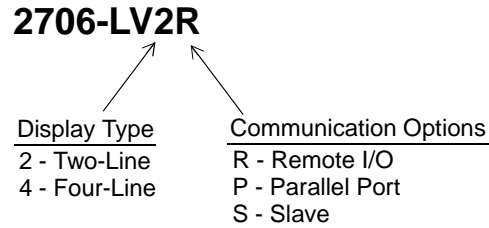
New Catalog Numbers

The DL40 Plus Message Display is a replacement for the DL40 Series and DL20 Message Displays. The table below shows the catalog number conversions from older DL40/DL20 Displays to the newer DL40 Plus displays.

These DL40 Display Catalog Numbers:	Convert to these DL40 Plus Catalog Numbers	These DL40 Display Catalog Numbers:	Convert to these DL40 Plus Catalog Numbers
2706-E23J16	2706-LV2P	2706-B43J16	2706-LV4P
2706-E23J32		2706-B43J31	
2706-E23C16		2706-B43C16	
2706-E23C32		2706-B43C31	
2706-E23J16B1	2706-LV2R	2706-B23J8	2706-LV2P
2706-E23J32B1		2706-B23J16	
2706-E23C16B1		2706-B23J31	
2706-E23C32B1		2706-B23C8	
2706-NX7		2706-B23C16	
2706-E43J32	2706-LV4P	2706-B23C31	2706-LV2P
2706-E43J64		2706-B13J8	
2706-E43J128		2706-B13J16	
2706-E43C32		2706-B13J31	
2706-E43C64		2706-B13C8	
2706-E43C128		2706-B13C16	
2706-E43J32B1	2706-LV4R	2706-B13C31	2706-LV2S
2706-E43J64B1		2706-NX6	
2706-E43J128B1			
2706-E43C32B1			
2706-E43C64B1			
2706-E43C128B1			
2706-NX3			

Catalog Number Definition

The breakdown of the DL40 Plus catalog number results in 4 standard displays and 2 slave displays. Six catalog numbers replace catalog numbers for the entire DL40, DL20 and DL10 product lines.



Software Enhancements

The Dataliner DL40 Plus is a superset of the Dataliner DL40 Series Message Display, providing additional functionality:

- Increased user application memory of 128K in all units
- Real-time clock with full year 2000 compliance
- RS-232 message triggering using serial ASCII protocol
- RS-232 point-to-point slave display communications
- Direct connection to PLC and SLC Channel 0 ports
- Concurrent RS-232 and RS-485 communications
- RS-232 auto-wakeup for offline programming
- Full 16K historical event stack, data logging memory
- Enhanced slave message display application support
- Power fail recovery during message editing
- 3 character sets: English, Cyrillic and International (ISO 8859-1)

Hardware Enhancements

The new DL40 Plus Message Displays offer these benefits:

- Catalog number reductions: from 30+ to 6 catalog listings
- Flash memory: increases user memory to 128K in all units
- New VFD display: brighter Vacuum Fluorescent Display with adjustable brightness from 0 to 100%
- Real-time clock: Y2K compliant with replaceable battery
- Isolated I/O ports: optically isolated RS-232, RS-485, Parallel port and IBM PC Keyboard port.
- Power supply upgrade: IEC 1131-2 compliant design
- Integral fuse: common for 120 or 240 VAC installations
- Reliability improvements with less electronic components
- Increased panel mount stud length from 0.5 to .625 inches
- Panel depth reduction from 4.53 to 3.00 inches
- Weight reduction from 7.3 to 3.7 lbs (2-Line Display) and from 8.9 to 4.9 lbs (4-Line Display)

Regulatory Enhancements

The DL40 Plus meets and is listed for the following environmental, safety, and European Union regulatory requirements:

- European Union Directive Compliance & CE marked for EMC Directive and LVD Directives, IEC 1131-2 Equipment Class I.
- UL Listed for Class I, Division 2, Groups A,B,C,D Hazardous Locations
- UL Listed for Class I, Zone 2, Ex nAIIIC and AEx nAIIIC Hazardous Environments
- cUL Listed for Canadian Safety Standards

Removed Features

Minor features removed from the DL40 Plus displays to reduce product costs and meet regulatory requirements are:

- EEPROM memory module backup support
- SB tape recorder backup support
- Normally closed relay contact (N.O. relay still available)
- Remote reset connection
- Power and reset connection

Panel Cutout

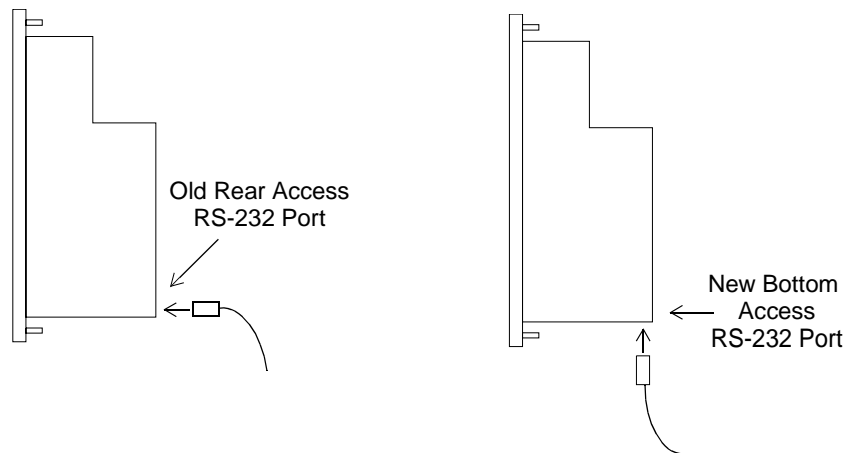
The DL40 Plus Message Displays fit into the same panel cutout as the previous DL40, DL20, and DL10 products allowing direct mechanical replacement for these products.

Installation

The installation of DL40 Plus displays is similar to the older DL40/DL20 units with minor differences in installation and wiring.

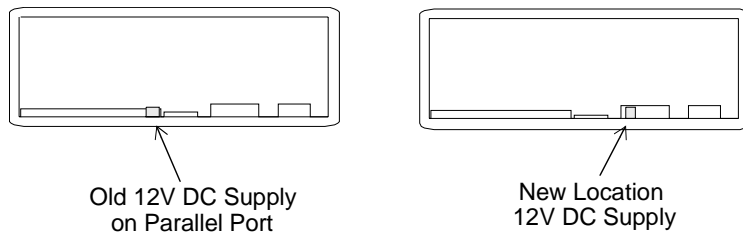
DL40 Remote I/O Communication Units

The installation differences between the older DL40 units and the DL40 Plus is the location of the RS-232 port. On the DL40 Plus, the RS-232 port is a right angle connector, providing bottom rear panel access. The RS-232 port is still a standard 9-pin, D-shell connector.



DL40 Parallel Port Communication Units

The installation differences between the older DL40 units and the DL40 Plus is the location of the RS-232 port and the 12 VDC supply output. On the DL40 Plus, the RS-232 port is a right angle connector, providing bottom rear panel access (see illustration above). The RS-232 port is still a standard 9-pin, D-shell connector. The isolated 12 VDC output supply source is now a single 2-pin screw terminal connector located on the rear panel next to the annunciator relay connector.



DL20 RS-422/Parallel Communications

The DL20 parallel port data line (D0 - D15) wiring is compatible with the parallel port of the DL40 Plus. However, the DL40 Plus has four strobe lines MS0 through MS3 while the DL20 has only two strobe lines. Connect the DL20 strobe lines (MS0, MS1) to the corresponding strobe lines on the DL40. Your application will need to be updated (strobe lines added) because of differences in the operation of the strobe lines.

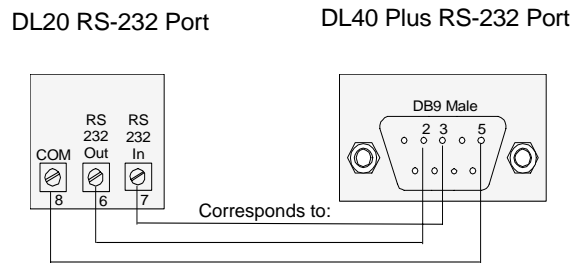
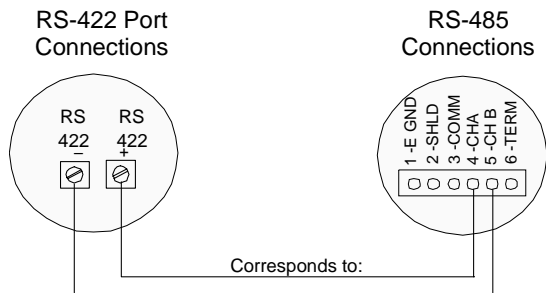
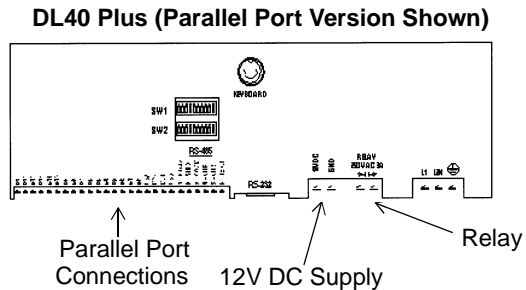
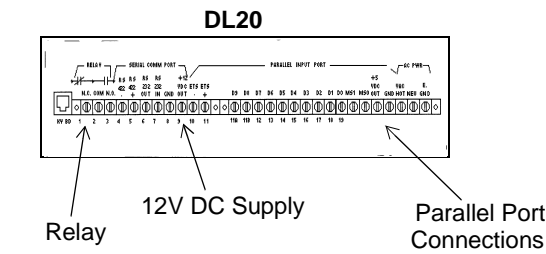
DL20 Strobe Lines

MS1	MS0	
0	0	Null
0	1	LDAT (Low variable byte)
1	0	HDAT (High variable byte)
1	1	MSG (Data Lines = Message #)

DL40 Plus Strobe Lines

MS3	MS2	MS1	MS0	
0	0	0	0	Null
0	0	0	1	D0 - D15 = Message #
0	0	1	0	D0 - D15 = Slave Address
0	0	1	1	D0 - D9 = BCD Variable Sign Bits
1	0	0	0	D0 - D15 = variable 1
1	0	0	1	D0 - D15 = variable 2
1	0	1	0	D0 - D15 = variable 3
1	0	1	1	D0 - D15 = variable 4
1	1	0	0	D0 - D15 = variable 5
1	1	0	1	D0 - D15 = variable 6
1	1	1	0	D0 - D15 = variable 7
1	1	1	1	D0 - D15 = variable 8
0	1	1	0	D0 - D15 = variable 9
0	1	1	1	D0 - D15 = variable 10

RS-422 Connections - connect the RS-422 + connection to the DL40 Plus RS-485 CH A terminal. Connect the RS-422 - connection to the CH B terminal as shown below.



Offline Programming Software

Use the DL40 Plus Message Display Offline Programming Software (Catalog No. 2706-LSW) to create, edit, archive and transfer DL40 Plus application files to and from DL40 and DL40 Plus displays. Also use the DL40 Plus programming software to load DL20 application messages into the DL40 Plus Offline Programming Software.

Application Files

The DL40 Plus displays are compatible with applications developed for previous versions of the DL40/DL20 displays. Download application files to the DL40 Plus displays using either the previous DL40 (Catalog No. 2706-ND1) or new DL40 Plus version (Catalog No. 2706-LSW) of the Offline Programming Software.

Backward Compatibility of Application Files

You can download application files created with previous versions of the DL40 Offline Programming Software (Catalog No. 2706-ND1) to the new DL40 Plus displays.

Forward Compatibility of Application Files

You can download applications files created with the new DL40 Plus Offline Programming Software (Catalog No. 2706-LSW) to the older DL40 displays. However, enhanced features of the DL40 Plus are not available in the older displays. You can not download applications to DL20 message displays using files from the new Offline Programming Software (Catalog No. 2706-LSW). The DL40 Plus programming software is not compatible with the DL20 hardware.

Compatibility of Application Transfers

Upload application files from older DL40 displays using the previous (Catalog No. 2706-ND1) or new version (Catalog No. 2706-LSW) of the Offline Programming Software and then download the files into the new DL40 Plus displays.

Note: Application files downloaded to the new DL40 Plus can only be uploaded using the new Offline Programming Software (Catalog No. 2706-LSW).

To load DL20 applications:

Upload the application from the DL20 programming software (Catalog No. 2706-NP3) and then convert the file using the DL40 Plus Offline Programming Software (Catalog No. 2706-LSW).

Important: DL20 .dat message files must be compressed to an S Record format file before you can convert them to DL40 Plus files. S Record files contain all messages and configuration data in a single file. Refer to the DL20 Offline Programming manual (Publication No. 2706-804).

After the DL20 application is loaded into the DL40 format, you may need to make the following changes:

- On the Device menu, you must select the type of DL40 Plus the application will be downloaded to.
- The decimal position of formatted variables must be corrected. For example, a variable with a size of 5 and decimal point location of 2 (00.00) is displayed as 0.000 on the DL40.
- Ladder logic programs may need to be updated because of differences between DL40 Plus and DL20 strobe line operation.
 - ⓘ In the DL20, variables are strobed one at a time in the order they appear in a message. In the DL40 plus, variables can be strobed in any order, regardless of their sequence in a message.
 - ⓘ In the DL20, variables are strobed before the message number. In the DL40 Plus, variables must always be strobed after the message number. Messages with variables are initially displayed on the DL40 Plus with an asterisk in the variable position (for a fraction of a second). The variable value replaces the asterisk as soon as the variable is strobed.

Compatibility of Memory Module Application Transfers

You can recover application files stored in EEPROM Memory Modules (2706-NM16, -NM32, -NM64) by loading the module into an old DL40 display, transferring the module contents to internal memory, and then uploading the application file using the previous (Catalog No. 2706-ND1) or new version (Catalog No. 2706-LSW) of the Offline Programming Software.

Note: DL20 message displays do not support memory modules.

Slave Support

The DL40 Plus message displays support enhanced slave message display functions and communications capabilities:

Communication Enhancements for Slave Displays

RS-232 slave message display communications provides a point-to-point connection between a DL40 Plus master and a slave display (DL40 Plus or DL50 marquee slave display).

Increased RS-485 slave network capacity allows 126 slave display nodes from a single DL40 Plus master.

Functional Enhancements for Slave Displays

- Tri-Color DL50 support allows you to display messages on a DL50 marquee slave display in either red, green, or amber colors.
- Remote display relay control allows you to control the annunciator relay contact in remote slave displays (DL40 Plus or DL50 marquee slave display).
- On-board editor provides access to slave message attributes using a standard computer keyboard connected to the DL40 Plus.

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