

## MODEL LMC - LARGE MESSAGE CENTER DISPLAY



- FULL MESSAGE CENTER CAPABILITIES IN A LARGE LED DISPLAY
- 5x7 DOT MATRIX, RED LED CHARACTERS



NEMA 4 /  
IP65



PROGRAMMING  
SOFTWARE

- 2x20 VERSION, 1" (25.4 mm) HIGH CHARACTERS READABLE TO 60 FEET (18 Meters)
- 1x10 VERSION, 2" (50.8 mm) HIGH CHARACTERS READABLE TO 120 FEET (36 Meters)
- LED INTENSITY IS SOFTWARE ADJUSTABLE TO SUIT AMBIENT LIGHT CONDITIONS
- 115/230 VAC SWITCH SELECTABLE
- RUGGED STEEL CONSTRUCTION
- EASY INSTALLATION WITH VERSATILE MOUNTING OPTIONS

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DOC # 08003

### Product Features

The Large Message Center Display unit (LMC) provides the equivalent capabilities of the Apollo Message Display series of products with a large dot matrix LED display. See the MDI or MDS Bulletin for more information on programming and capabilities. The LMC display characters are red, 5 by 7, dot matrix LED's, available in either 1 line with 10 characters or 2 lines with 20 characters per line. A Message Display Personality Module (MDP) must be installed to control the LMC display. There are two modules available to meet specific application needs.

The LMC utilizes high-efficiency LED's to provide maximum brightness for the display with low power dissipation. The display intensity is software adjustable through sixteen levels using the Message Display User Software, via a personality module, to achieve the desired brightness in virtually any ambient lighting condition. The 2" (50.8 mm) high characters of the 1x10 version are readable to 120 feet (36 M), while the 2x20 version uses 1" (25.4 mm) high characters that are readable to 60 feet (18 M).

The LMC has a sealed front panel which meets NEMA 4/IP65 requirements for wash-down and dusty environments when properly installed. A removable rear cover allows easy access to wiring connections. Panel knock-outs; two 7/8" (22.2 mm) and two 1/2" (12.7 mm) fittings, permit wires to be routed neatly to the LMC unit.

#### MESSAGE DISPLAY MODULES

The LMC may be operated as an intelligent message center by the selection of the MDPI module that mirrors the operation of the Model MDI - Intelligent Message Display (See details in the Operator Interface Section of the catalog).

The MDPI module is capable of displaying messages consisting of alphanumeric, extended ASCII, and/or customized characters on an LMC display. Up to 248 messages can be programmed into the MDPI and stored in nonvolatile memory. Communication is accomplished via a serial and/or a parallel port, which can be fully configured to satisfy most requirements. Connections are made on removable terminal blocks to simplify installation.

Messages are requested by sending a message request to the MDPI via the serial or parallel port. A message can be requested by loading a BCD or binary value onto the parallel port and strobing the value in, or by using a computer to automatically request messages via the serial port. Messages can be programmed as periodic and displayed automatically at a specific time. Each message may contain parameters including message scrolling, character blinking, date and/or time fields, embedded data fields, etc. The MDPI has the ability to retrieve data from other Red Lion Controls products with 20 mA serial communications, as well as from various devices such as Programmable Logic Controllers (PLC), and embed the data received into the body of a message.

A unique feature of the MDPI is the Message Queue. The Queue will hold up to eight messages, which allows for multiple

message requests without loss of previously requested messages. Messages can be assigned priorities which determine the order in which queued messages will be displayed. The MDPI may also serve as a master controller for Slave units (model MDPS), allowing programmed messages in the MDPI to be displayed at remote locations.

Alternatively, by selecting the MDPS module, the Large Message Center operates identically to the Model MDS - Message Display Slave, except there is no parallel port option.

The MDPS is capable of displaying full alphanumeric information received via the serial port on a 1x10 or 2x20 Large Message Center Display. Information received may be messages from an MDPI, or host computer. A nonvolatile memory retains all configuration set-up information when power is removed.

*Note: Modules for the LMC cannot be installed into an LDD display.*

#### MDPI/MDPS PROGRAMMING

The MDPI requires the Apollo Message Display User Software to program messages. Once the module has been installed into a Large Message Center Display, messages are then downloaded to the MDPI from the computer via the serial port, using the Message Display Software. The MDPI will save the messages and perform the appropriate function when the message is requested. Configuration settings initially programmed at the factory can be modified by using the Message Display User Software.

The User Software allows programmed messages to be saved on a floppy or hard disk of a PC compatible computer. Also the user can simulate any programmed message on the terminal screen assuring the message is programmed to the user's needs.

Since the MDPS does not store messages, it does not require initial set-up in order to be placed into operation; although the MDPS does have initially programmed configuration settings which can be modified by the User software.

The following items are required to perform the above objectives:

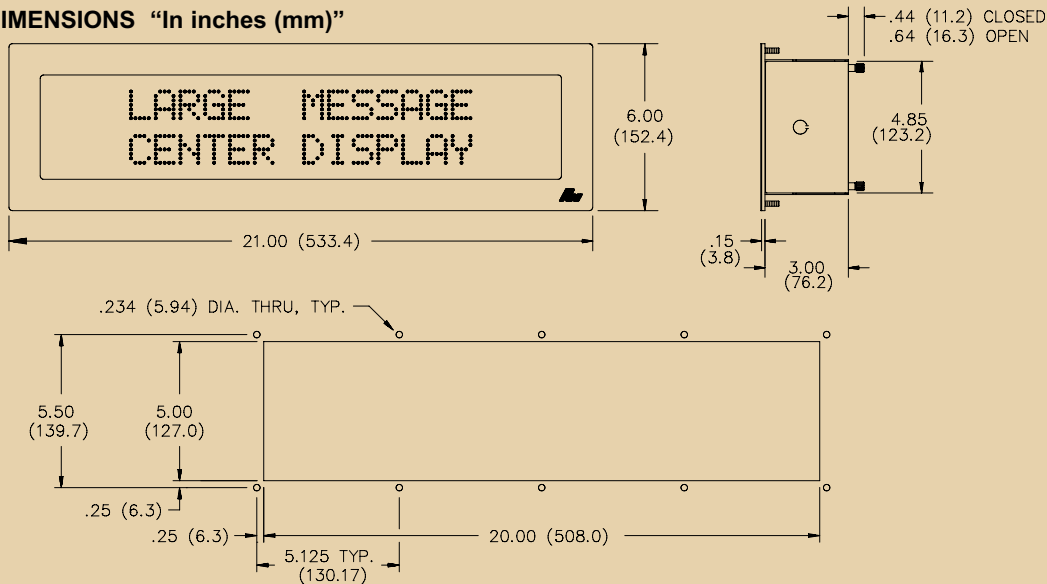
#### MINIMUM REQUIREMENTS:

- PC compatible computer (286 or greater) with:
  - RS232 serial port
  - DOS 3.0 or later
  - 640 K RAM (550 K free)
  - 1.44 Meg floppy drive
- Monitor with MDA, CGA, EGA, or VGA graphics card.
- MCCA cable for initial set-up of a single unit.
- GCM232 - Serial Converter Module (RS232/20 mA Current Loop).
- APS (Accessory Power Supply) or equivalent (+12 VDC power supply).
- Apollo Message Display User Software (available in 3.5" disk)
- Large Message Center Display (LMC10000 or LMC20000)

*Note: Setup may only be performed via the serial port.*

### Product Features Continued

#### DIMENSIONS "In inches (mm)"



### General Specifications Display

- DISPLAY:** 5x7 dot matrix, Red LEDs (AlGaAs Technology).  
**1x10 Version:** 2.0" (50 mm) character height.  
**2x20 Version:** 1.0" (25 mm) character height.
- DISPLAY INTENSITY:** Software adjustable in 16 increments from full brightness to display off.
- POWER REQUIREMENTS:** Switch selectable 115/230 VAC ( $\pm 10\%$ ), 50/60 Hz, 25 VA 1x10 version, 30 VA 2x20 version (including MDP module).
- STORAGE TEMPERATURE RANGE:** -20°C to 60°C.
- OPERATING TEMPERATURE RANGE:** 0°C to 50°C.
- MOUNTING REQUIREMENTS:** Max. panel thickness is 0.375" (9.5 mm). Min. panel thickness for NEMA 4/IP65 sealing is 0.125" (3.2 mm). (Mounting template, Panel gasket, and keps nuts included with unit.)
- CONSTRUCTION:** Steel construction with textured black polyurethane paint for scratch and corrosion resistance protection. Front panel meets NEMA 4/IP65 requirements.
- WEIGHT:** 8.12 lbs. (3.7 Kg).

### General Specifications Modules

- POWER:** AC power is connected to the module but is switch selected via the LMC driver board. See LMC specifications for power requirements.
- REAL-TIME CLOCK:** Nonvolatile Date and Time, accurate to 1 minute/month.
- MDPI MESSAGE MEMORY:** Nonvolatile.  
**32 K:** Provides space for 248 messages of 120 characters each.  
**MDS MEMORY:** Nonvolatile EPROM memory retains all factory configuration settings when power is removed or interrupted.
- TEMPERATURE RANGE:**  
**Operational:** 0° to +50° C  
**Storage:** -20° to +60° C
- CONSTRUCTION:** P.C. Board mounted in a plastic carrier.
- CONNECTIONS:** Removable terminal blocks.
- WEIGHT:** 0.6 lbs (272g)

## MODEL LMC - LARGE MESSAGE CENTER DISPLAY

### Input/Output Communications

#### 1. PARALLEL COMMUNICATIONS (MDPI ONLY):

##### Message Format:

**Binary:** 4 or 8 bits.  
**BCD:** 4, 8, or 9 bits.

##### Embedded Data Format:

**Binary:** 4 or 8 bits.  
**BCD:** 4 or 8 bits.  
**ASCII:** 4 or 8 bits.

##### PARALLEL PORT INPUTS:

##### Data (D0-D7) inputs:

$V_{IH} = 8$  VDC min.,  $V_{IL} = 4$  VDC max.,  $V_{MAX} = 30$  VDC

##### Ctrl (Strobe and message/data) inputs:

$V_{IH} = 4$  VDC,  
 $V_{IL} = 1$  VDC,  $V_{MAX} = 30$  VDC.

##### Data SNK/SRC:

Current sink or source Data inputs, switch selectable.

##### Ctrl SNK/SRC:

Current sink or source Control inputs, switch selectable.

##### Data LOGIC:

Positive or negative logic for Data inputs, switch selectable.

##### Ctrl LOGIC:

Positive or negative logic for control inputs, switch selectable.

##### Current sinking:

Internal 10 K $\Omega$  pull-up to +12 VDC,  $I_{MAX} = 1.2$  mA.

##### Current sourcing:

Internal 10 K $\Omega$  pull-down,  $I_{MAX} = 3.1$  mA @ 30 VDC.

**Debounce time:** 0.01 to 2.5 seconds (programmable).

**Strobe time:** 3 to 255 msec (programmable).

#### 2. SERIAL COMMUNICATIONS: 20 mA current loop, full duplex.

##### Data Format:

Four types available. switch selectable.  
**11 bits:** 1 start bit, 8 data bits, 1 parity bit, 1 stop bit.  
**10 bits:** 1 start bit, 8 data bits, 1 stop bit; or  
 1 start bit, 7 data bits, 1 parity bit, 1 stop bit.  
**9 bits:** 1 start bit, 7 data bits, 1 stop bit.

##### Data Code:

ASCII

**Maximum Address:** 0 to 99, software selectable. (Actual number in a single loop is limited by serial hardware specifications).

**Baud Rate:** 300 to 19200, Switch selectable.

**Parity:** Enable or Disabled, Switch selectable.

**Even/Odd:** Selects parity type, Switch selectable.

**7/8 BIT:** Selects number of data bits, Switch selectable.

**Serial Hardware:** Terminal TBA.

**+20mA SRC:** Provides 20 mA @ 12 VDC

(Powers up to 6 units in a loop).

**-20mA SRC:** Loop return for +20 mA SRC.

**SO - Output Transistor Rating:**  $V_{MAX} = 30$  VDC,

$V_{SAT} = 1 V_{MAX}$  @ 20 mA

(Note: This will allow up to 28 units max. in each loop.)

**SI - Input Diode Rating:**  $V_F = 1.25 V_{TYP}$ ;  $1.5 V_{MAX}$  @ 20 mA.

(Note: The compliance voltage rating of the source must be greater than the sum of the voltage drops around the loop. Typically a 30 VDC powered source would be capable of operating between 18 and 22 units in a loop.)

#### 3. OUTPUT/BUSY PIN:

**Solid State:** NPN open-collector, current sinking,  $V_{MAX} = 30$  VDC,  $I_{MAX} = 100$  mA,  $V_{SAT} = 1 V_{MAX}$  at 100 mA.

**Busy Mode:** Indicates the Ready/Busy status of the unit.

**Output Mode:** Output is activated from a Command or Message for a specified time out value.

**Time Out:** 10 msec to 63 mins or Latched.

### Ordering Information

TYPE	MODEL NO.	DESCRIPTION	PART NUMBER
Display	LMC1	LARGE MESSAGE CENTER 1x10	LMC10000
	LMC2	LARGE MESSAGE CENTER 2x20	LMC20000
Personality Modules	MDPI	MDPI MODULE	MDPI1000
	MDPS	MDPS MODULE	MDPS0000
Accessories	MB6	LMC/LDD MOUNTING BRACKETS	MB600000
	ENC7	LMC/LDD NEMA 4/IP65 ENCLOSURE	ENC70000
	SHR	Shroud for LMC	SHR10000
	SFMD	Apollo Message Display User Software(3½": 1.44M)	SFMD0
	MCCA	AC Communications Adapter	MCCA0000
	*GCM232	Serial Converter Module RS-232	GCM23201
	*APS01	+12 VDC Unregulated Power Supply, 115 VAC	APS01000
	*APS02	+12 VDC Unregulated Power Supply, 230 VAC	APS02000
	SKT1	8-Pin Socket	SKT10000
—	Din Rail Mount, 8-Pin Octal	SKTDIN00	

#### Notes:

- The personality modules will NOT operate in a Model LDD unit.
- The MDPI requires the Apollo Message Display User Software to program messages.
- Only one copy of software is required for multiple units.

\* Refer to MDPI/MDPS Programming Set-up section for minimum requirements.