LAUREL ELECTRONICS, INC.

MAGNA Series Large Digit Displays

Serial Input Displays • Meters Counters • Clocks • Timers

Features

- **Choice of 2-1/4", 4", 6" or 8" digit heights**
- **Choice of 4 or 6 digits with period or color dividers**
- **Choice of normal or outside viewing brightness**
- **Choice of signal inputs and functions**
- **Choice of panel mount, wall mount or suspension mount**
- **Choice of 95-264 Vac or 11-30 Vdc power**
- **Sealed to NEMA-4 (IP65)**
- **Only 3.0" (75 mm) deep**
- **Programmable from front panel**
- **Optional dual 5A relay outputs, analog output, serial I/O**

Description

Viewing distances up to 320 feet (100 m) are achieved with oversize digits. A rule of thumb is that viewing distance in feet is 40 times digit height in inches, or in metric terms, that viewing distance in meters is digit height in millimeters divided by 2.

Four digit heights are available: 57 mm (2-1/4"), 102 mm (4.0"), 150 mm (5.9"), and 200 mm (7.9"). Solid segments are used for normal brightness 2.2" and 4.0" digits. Individual 5 mm LED pixels are used for larger digits and outdoor brightness versions. The number of digits can be 4, 6 or 8, depending on the display function.

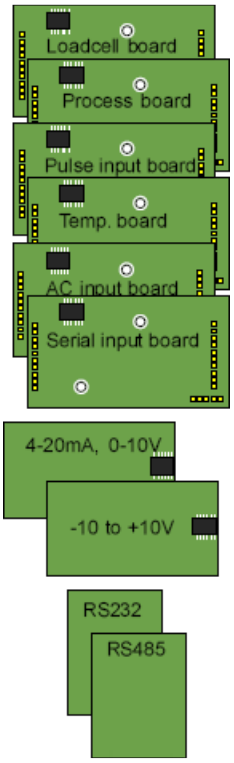
Indoor or Outdoor Viewing: MAGNA Series Displays with normal brightness LEDs can be read across an entire plant floor to keep workers informed without leaving their work area. Displays with outdoor brightness LEDs can be read across an industrial yard, parking lot or roadway, for example to display vehicle load. Available mounting options are panel mount, wall mount and suspension mount. Environmental sealing to IP65 (NEMA-4X) is standard.

Choice of Signal Inputs: MAGNA Series Displays are available for different signal types, with can each be associated with 4 or 6 digits. Please click on the links below for detailed information by signal type:

- Serial data from PCs, PLCs, serial output transmitters, and smart sensors.
- Process input (e.g., 4-20 mA)
- Strain gauge / load cell input
- Pulse input for frequency or rate
- Pulse input for total or quadrature position
- Pulse input for operation as a clock or timer

Available Options are dual 5A relays, an analog output, an RS-232 or RS485 serial data output, and 95-264 Vac or 11-30 Vdc power.

Intuitive Setup is normally provided by means of built-in front panel switches, which can be locked. It is also possible to remotely wire four pushbuttons to the display.



Specifications

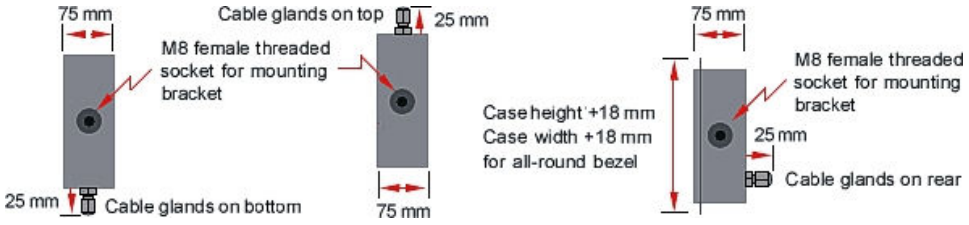
Serial Data Input	
Serial Data Types Serial Connector Displayed Information	RS232 or RS485 (specify at time of order) Detachable plug-in screw terminals ASCII: Displays any character within 7-segment display limitations. Quant: Displays only numeric ASCII values. Qa.Tot: Quantity totalizer. Can be used to accumulate weight values, for example after each batch. Uses a contact closure to trigger addition.
Baud Rate Data Format Termination Character Reject Characters Addressing	300 to 115200 baud 701, 7e1, 7n2, 801, 8e1, 8n1, 8n2 Hex 00 to FF Counted from termination character 00 (wildcard) to F7

Process Signal Input	
A/D Converter	20-bit resolution
Current Signal Types	0-10 mA, 0-20 mA, 4-20 mA with 33Ω input resistance.
Voltage Signal Types	0-5V, 1-5V, 0-10V with 1 MΩ input resistance.
Accuracy	± 0.05% of range.
Tempco, Scale	± 25 ppm/°C
Tempco, Offset	± 30 ppm/°C
Excitation	24 Vdc up to 40 mA, or ratiometric 0-10V for slide-wire
Strain Gauge / Load Cell Input	
A/D Converter	20-bit resolution
Signal Gain	Suitable for 0.5 mV / V to 4 mV / V load cells
Accuracy	± 0.05% of range.
Tempco, Scale	± 25 ppm/°C
Tempco, Offset	± 30 ppm/°C
Excitation Output	Isolated 10V up to 120 mA to power up to four 350Ω load cells in parallel
Pulse Input for Frequency, Rate, Total	
Number of Inputs	4
Signal Types	Configurable for contact closures, NPN or PNP proximity switches, 5V logic pulses, 24V pulses, quadrature
Debounce	Programmable to eliminate false counting from contact bounce.
Timing Reference	Temperature-controlled quartz crystal.
Pulse Input for Clock Operation	
Time Reference	Precision, temperature-compensated quartz crystal.
Clock Format	HH:MM or HH:MM:SS
Display	
Number of Digits	4 or 6
Digit Height	57 mm (2-1/4"), 102 mm (4.0"), 150 mm (5.9"), or 200 mm (7.9")
Digit Color	Red
Brightness	Variable
Numeric Format	8.8.8.8. or 8.8.8.8.8.8. (standard)
Clock Format	HH:MM or HH:MM:SS (optional, specify at time of order)
User Controls	
Scaling	Digital direct or theoretical scaling with scale & offset.
Filtering	Digital filtering, time constants adjustable from 0 to 25 sec.
Rounding	Selectable last-digit rounding of 1, 2, 5, 10, 20, 50 units.
Linearization	Up to 10 points, direct or theoretical calibration.
Logic Inputs	
Font Panel Controls	Calibration, Tare, Reset, Max/Min, Alarms
Logic Functions	Three logic inputs, individually configurable for Hold, Reset, Tare, Peak / Valley, Net/Gross, Memory Address.
Logic Levels	Normally open, NPN or contact closure input to activate. 5V open circuit, 1 mA switched current.
Power	
AC Power (standard)	100-240 Vac
DC Power (option)	11-30 Vdc
Max Consumption	30 VA
Analog Output Option	
Output Levels	0-20/4-20 mA into 0 to 500Ω, 0.4 µA resolution. 0-10V into loads > 600Ω, 0.2 mV resolution. -10 to+10V into loads > 600Ω, 0.4 mV resolution.
Resolution	16 bits
Accuracy	0.1% -of range
Stability	50 ppm/°C
Output Isolation	Isolated from input and power
Scaling	Digitally scalable
Special Features	Can be set to operate from net or gross value.

Alarm Output Option	
Relay Type Special Features	2 Alarms rated 5A, 250VAC, SPDT Adjustable hysteresis In-flight compensation facility. Energize or de-energize on trip. Adjustable timers to set energize and de-energize delays. Can also be set to pulse for applications needing less than 100% duty cycle. In-band and out-of-band alarm function. Manual and automatic in-flight compensation. Can be set to operate from net or gross value.
Serial Data Output Option	
Output Types Special Features	RS232 or RS485, addressable, on demand or continuous output. Can include time and date with RTC option fitted. Can be set to operate from net or gross value.
Environmental	
Storage Temperature Operating Temperature Sealing Mounting	-20°C to +70°C 0°C to 50°C, non-condensing -25°C to 50°C, non-condensing, with MHTR AC heater option NEMA-4 (IP65) standard, all-round Wall mount, suspension mount, panel mount
Approvals	
Types	Produced to IPC 610 Class 2 Standard UL ISO9001:2008 QA

Number of Digits & Case Dimensions

Signal Type	4 Digits	6 Digits
Serial Data Input	8.8.8.8.	8.8.8.8.8.8.
Process, Strain, Frequency, Total, Quadrature	8.8.8.8.	8.8.8.8.8.8.
Clock / Timer	88:88	88:88:88
Case width x height	**4 Digits**	**6 Digits**
57 mm (2.2") digits	279 x 155 mm (11.0" x 6.1")	376 x 155 mm (14.8" x 6.1")
102 mm (4.0") digits	434 x 196 mm (16.7" x 7.7")	616 x 196 mm (24.3" x 7.7")
150 mm (5.9") digits	514 x 247 mm (20.2" x 9.8")	744 x 248 mm (29.3" x 9.8")
200 mm (7.9") digits	664 x 298 mm (26.1" x 11.7")	984 x 298 mm (38.7" x 11.7")
Case depth	**75 mm (3.0")**	



Notes: Models with 57 mm (2.2") digits, 4 digits and 4 relays require the larger 6-digit case.
For panel mount versions, add 18 mm (0.7") to case width and height for the bezel and 25 mm (1.0") for cable glands in back of the case.

Ordering Guide

Create a model a model number in this format: **M24-MCR-MT2**

Base Model	**M24**	2” (57 mm) digit height, 4 digits. Display to 8.8.8.8.
	M24UM	2” (57 mm) digit height, 4 digits. Display to 8.8.8.8. (UM includes needed extra width to fit relay, analog or serial output options)
	M26	2” (57 mm) digit height, 6 digits. Display to 8.8.8.8.8.8.
	M44	4” (102 mm) digit height, 4 digits. Display to 8.8.8.8.
	M46	4” (102 mm) digit height, 6 digits. Display to 8.8.8.8.8.8.
	M64	6” (150 mm) digit height, 4 digits. Display to 8.8.8.8.
	M66	6” (150 mm) digit height, 6 digits. Display to 8.8.8.8.8.8.
	M84	8" (200 mm) digit height, 4 digits, Display to 8.8.8.8.
	M86	8" (200 mm) digit height, 6 digits, Display to 8.8.8.8.8.8.
Signal Input (one required, select one)	**MCR**	Frequency, rate, total, quadrature input
	MCT	Clock / timer, display with decimal "." separators between digits
	MCT2	Clock / timer, display with colon ":" separators between groups of 2 digits
	MLC	Load cell
	MPR	Process (4-20 mA, 0-10V)
	M232	RS232 serial input
	M485	RS485 / RS422 serial input
	MRTD	RTD input
	MTC	Thermocouple input
Analog Output Board (one optional)	**MAO1**	4-20 mA
	MAO2	0-10V
	MAO3	-10V to +10V
Relay Output Board (one optional)	**MRL1**	Two 5A, 250 Vac relays
	MRL2	Four 5A, 250 Vac relays
Serial Data Output Board (one optional)	**MO232**	RS232
	MO485	RS485 with Modbus ASCII
Case and Mounting (one required)	**MT1**	Panel mount, black NEMA-4 (IP65) case
	MT2	Wall mount, black NEMA-4 (IP65) case
	MT3	Suspension mount, black NEMA-4 (IP-65) case
Meter Modifying Options (not shippable separately from meter)	**MRDLV**	Daylight viewing brightness instead of normal indoor brightness
	MHTR	AC heater for operation down to -25°C (-13°F)
	MPS2	11-30 Vdc power instead of normal 85-265 Vac power
Add-on Option (shipped separately from meter)	**MRP**	MAGNA remote programmer (wire connection to display unit)