



## Features

- Choice of 2-1/4", 4", 6" or 8" digit heights
- Choice of 4 or 6 digits with decimal points
- Choice of normal or outside viewing brightness
- Frequency range from 0-100 kHz
- Configurable for most industrial pulse signals
- 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

**MAGNA Series Frequency & Rate Input Large Digit Displays** accept frequencies from 0 to 100 kHz. They accept the most common industrial pulse inputs, namely contact closures, NPN or PNP proximity sensors, 5V logic pulses, 24V PLC pulses, and quadrature encoders. The units are easily scaled to display frequency in Hz or rate in engineering units such as feet/sec, gallons/minutes, liters/sec, etc. An isolated 24V excitation output is standard to power active sensors and encoders.

**A quartz-crystal controlled timing reference** provides excellent long-term stability. Scaling is digital for excellent precision. Scale factors can be non-whole numbers, such as 1.245.

**Displayed values** can be smoothed by averaging multiple readings over a preset time. The units accept extremely low input frequencies, such as production rate from an assembly line which only produces two items per hour.

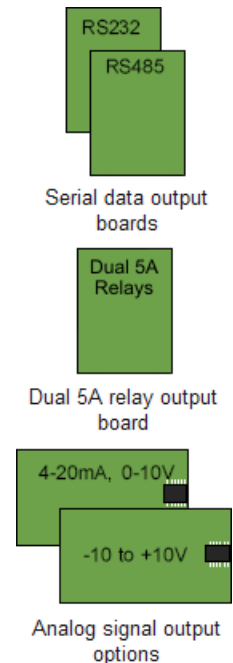
**Viewing distances up to 320 feet (100 m)** are achieved with oversize digits. A rule of thumb is that viewing distance in feet is 40 times digit height in inches, or in metric terms, that viewing distance in meters is digit height in millimeters divided by 2.

**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 or 6.

**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.

**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

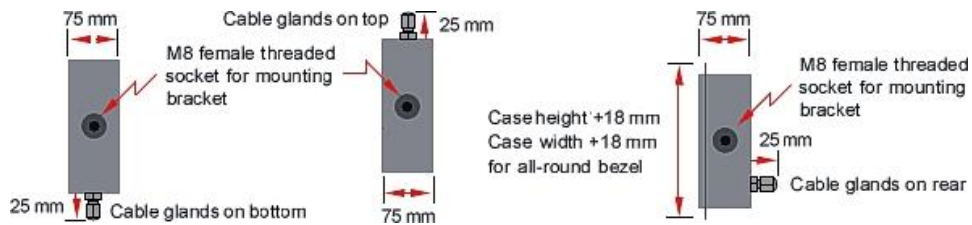
| Approvals            |  |
|----------------------|--|
| Types                | Produced to IPC 610 Class 2 Standard<br>UL ISO9001:2008 QA   |
| Pulse Inputs         |  |
| Number of Inputs     | 1  |
| Signal Types         | Configurable for contact closures, NPN or PNP proximity switches, 5V logic pulses, 24V pulses, quadrature  |
| Frequency Range      | 0-100 kHz in rate mode   |
| Accuracy             | ± 0.5% of range, quartz crystal reference  |
| Tempco               | ± 20 ppm/°C  |
| Debounce             | Programmable to eliminate false counting from contact bounce.  |
| Timing Reference     | Temperature-controlled quartz crystal.   |
| 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   |
| Display Update Rate  | 3 readings/second above 3 Hz, otherwise signal pulse rate.   |
| 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         |  |
| Front Panel Controls | Four buttons to set time, date, alarms, etc.   |
| 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.<br>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.<br>0-10V into loads > 600Ω, 0.2 mV resolution.<br>-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     | Forward or reverse action possible.<br>Can be set to operate from net or gross value.  |
| Alarm Output Option  |  |
| Relay Type           | 2 Alarms rated 5A, 250VAC, SPDT  |
| Special Features     | Adjustable hysteresis<br>In-flight compensation facility.<br>Energize or de-energize on trip.<br>Adjustable timers to set energize and de-energize delays. Can also be set to pulse for applications needing less than 100% duty cycle.<br>In-band and out-of-band alarm function.<br>Manual and automatic in-flight compensation.<br>Can be set to operate from net or gross value. |

| Serial Data Output Option                    |   |
|--|---|
| Output Types<br>Special Features             | RS232 or RS485, addressable, on demand or continuous output.<br>Can include time and date with RTC option fitted.<br>Can be set to operate from net or gross value. |
| Environmental                                |   |
| Storage Temperature<br>Operating Temperature | -20°C to +70°C<br>0°C to 50°C, non-condensing<br>-25°C to 50°C, non-condensing, with MHTR AC heater option  |
| Sealing<br>Mounting                          | NEMA-4 (IP65) standard, all-round<br>Wall mount, suspension mount, panel mount  |

### Number of Digits & Case Dimensions



| Display Format       | <i>8.8.8.8.</i>              | <i>8.8.8.8.8.8.</i>           |
|----------------------|------------------------------|-------------------------------|
| Digit Height         | 4-Digit Case Width x Height  | 6-Digit Case Width x Height   |
| 57 mm (2.2") digits  | 280 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 (17.1" x 7.7")  | 616 x 196 mm (24.3" x 7.7")   |
| 150 mm (5.9") digits | 580 x 247 mm (22.8" x 9.8")  | 820 x 248 mm (32.3" x 9.8")   |
| 200 mm (7.9") digits | 750 x 290 mm (29.5" x 11.4") | 1072 x 290 mm (42.2" x 11.4") |
| Case depth           | <b>75 mm (3.0")</b>          |                               |



**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-MT1**

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