

# VYDAS

## INTERNATIONAL MARKETING

*Specialist Sensors & Instruments for Industry*

### **E-201 B & E-220B** **ULTRASONIC RANGING MODULE SUBSYSTEMS** **PRODUCT SELECTION GUIDE**

#### DESCRIPTION

The Massa Ultrasonic Ranging Module is a precision electronic measurement device which includes an interface electronics module and one or two ultrasonic transducers, depending on the model selected. The ranging module provides the OEM with a PWMLATCH output pulse, whose duration is proportional to the time required for the sound to travel between the transmit and receive transducers. The LATCH pulse width may be processed through additional circuitry for applications requiring position, level, profile, or thickness measurements.

Internally or externally triggered, target distance ultimately limits the maximum pulse repetition rate. A maximum rate of 150 Hz is possible when targets are less than one foot distant; refer to individual module specifications for rep rate limits. For internal triggering, the pulse repetition rate is set via a single external resistor.

The E-201B Series utilizes two transducers, one to transmit and one to receive acoustic pulses. This arrangement allows them to be mounted side-by-side for an echo ranging application, or mounted opposing one another for high speed counting or accurate measurements at over twice the range possible with echo ranging. Two transducer echo-ranging configurations also provide shorter minimum target distances, required for certain applications.

The E-220B Series utilizes a single transducer for both sending and receiving acoustic pulses. This arrangement is ideal for applications where a limited area is available for mounting the sensor. Minimum target distance is slightly farther than two-transducer configurations.

Optional transducer mounting brackets provide for easy adjustments to sensor alignment during installation and have been specifically designed to minimize crosstalk between paired transducers (E-201B).



#### FEATURES

- ◆ Remotely Mounted Sensors
- ◆ Resolution to 0.01 inch
- ◆ Single Supply Operation
- ◆ Low Current Drain
- ◆ Internal or External Trigger

#### APPLICATIONS

- ◆ Ultrasonic Micrometer
- ◆ Non-contact Profile Gauge
- ◆ Precision Limit Switch
- ◆ Thickness Uniformity Control
- ◆ Precision Proximity Detection
- ◆ High Speed Counting

# Ultrasonic Ranging Module Product Selection Guide

Model Number	E-201B/215	E-201B/150	E-220B/215	E-220B/150	E-220B/40	E-220B/26
<b>Transducers Supplied</b>	Two	Two	One	One	One	One
<b>Detection Range(1) Echo Ranging</b>	3"-24"	5"-60"	4"-24"	8"-60"	2'-20'	2'-30'
<b>Opposed Alignment(2)</b>	3"-48"	5"-120"	N/A	N/A	N/A	N/A
<b>Resolution: Instantaneous(3) Averaged(4)</b>	0.03" 0.2%	0.04" 0.1%	0.03" 0.2%	0.04" 0.1%	0.3" 0.1%	0.4" 0.1%
<b>Beam Angle(5,6)</b>	10	10	10	10	15,35	15,35
<b>Transducer Frequency</b>	215 kHz	150 kHz	215 kHz	150 kHz	40 kHz	26 Khz
<b>Maximum Pulse Rate</b>	150 Hz	100 Hz	150 Hz	100 Hz	25 Hz	20 Hz

## Notes:

- 1- Nominal values at ambient temperature, pressure and humidity;
- 2- One transducer affixed to each of two objects, then aimed at each other;
- 3- Conservatively rated, improved dramatically with constant, controlled environment;
- 4- Percent of range; averaging processed externally, typically using a computer or PLC;
- 5- Total width at -3 dB points, no secondary lobes exist with /150 & /215 transducers;
- 6- Detachable horn supplied with /40 & /26 transducers provides smaller beam angle (required for maximum range).

## General Specifications

<b>Output Pulse Width (LATCH)(1)</b>	Echo Ranging	147.5 usec per inch (or 1.77 msec per foot) of target distance
	Opposed Alignment	73.75 usec per inch (or 0.89 msec per foot) of sensor separation
<b>External Trigger Pulse Width</b>	Optionally Required	180 10 uSec
<b>Digital Output (LATCH) Sink Current</b>	N-Channel MOSFET	30 mA @ Vds=0.5 V
<b>Voltage Requirements</b>	Limits	8 to 15 V DC
	Recommended	12 V DC
<b>Power Requirements (Nominal)</b>	20 mA @ 8 V DC	160 mW
	30 mA @ 15 V DC	450 mW
<b>Temperature Range(2)</b>	Operating	0 to 60 °C
	Storage	-25 to 85 °C
<b>Humidity</b>	Non-condensing	0 to 90%
<b>Transducer Construction</b>	Sealed Housing	/215 & /150 Models
	Standard Housing	/40 & /26 Models
<b>Weight</b>	Electronics & Transducers	4 to 8 oz
<b>Transducer Cable Lengths</b>	With Connectors	2 ft., 6.5 ft. & 16 ft

## Notes:

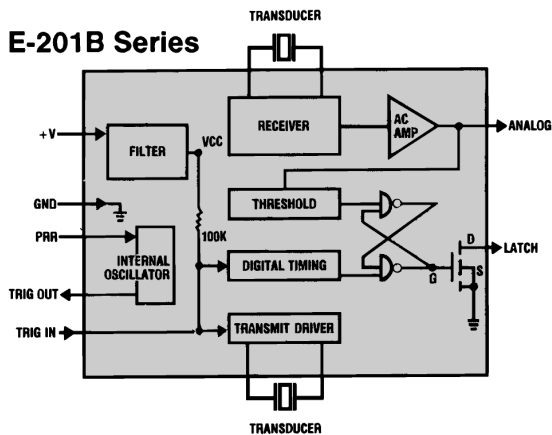
- 1- When ambient temperature is 20°C;
- 2- When ambient temperature exceeds 50°C, E-220B series modules Operating at 12 V DC input will require a 75 kOhm resistor between the TRIG IN and GND pins. Minimum sensing range will increase (move out) by approximately 5%. Please contact factory for additional information.

$$\text{Pulse width vs. temperature} = \frac{1}{13,044 \sqrt{1 + \frac{T}{273}}} \times 10^5 \text{ } \mu\text{sec/inch of total sound path.}$$

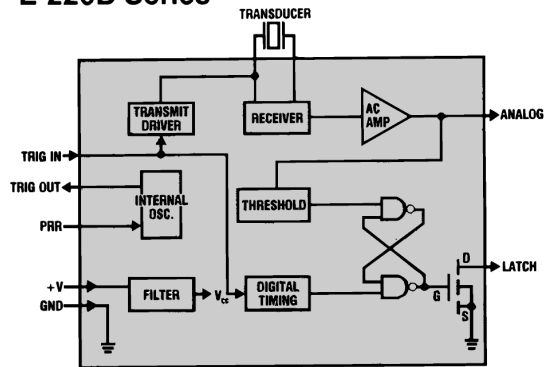
Where T=temperature °C

## Functional Block Diagrams

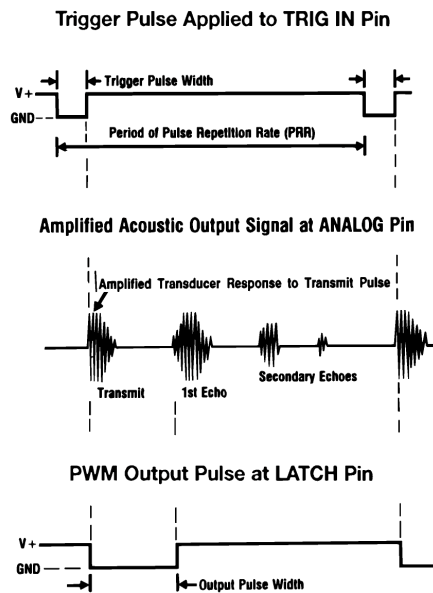
### E-201B Series



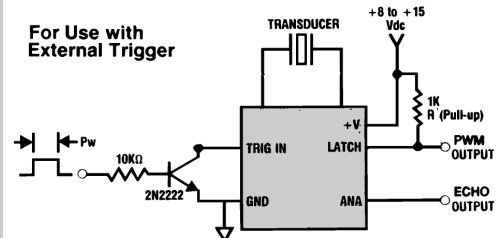
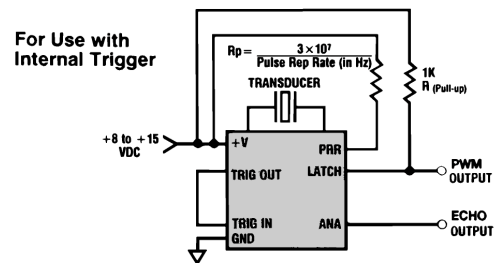
### E-220B Series



## Timing Diagram



## Circuit Connections



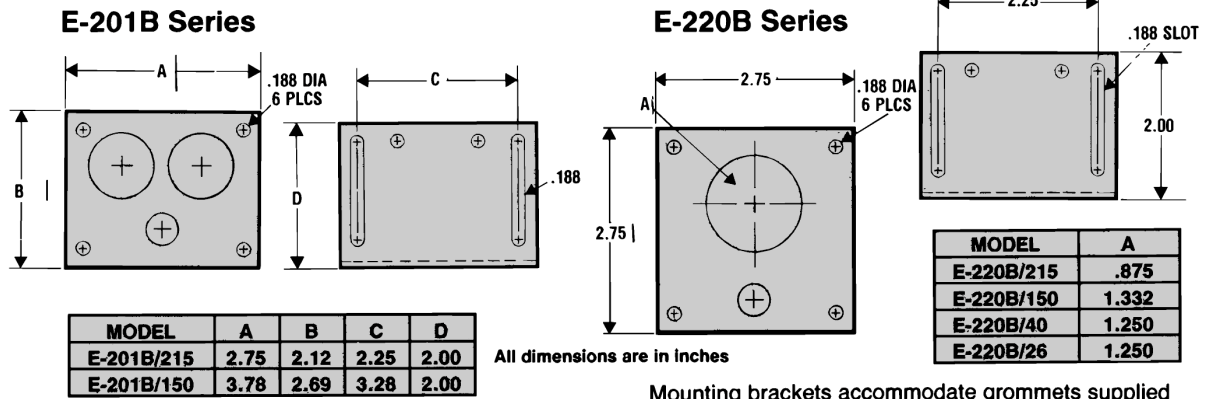
- Notes:
- 1 - A ground plane is recommended beneath the electronics module.
  - 2 - E-220B configuration shown (single transducer).

## Ordering Information

Specify the part number which corresponds to both the model number and transducer cable length desired. Specify the optional mounting bracket part number as listed for each model number.

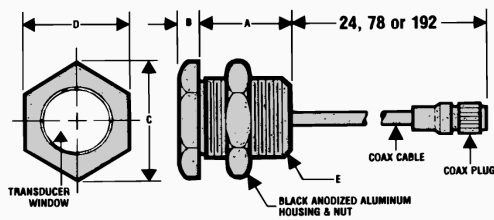
Model Number	2 ft. Cable	6.5 ft. Cable	16 ft. cable	Mounting Bracket
MP-E-201B/215	MP-200344-501	MP-200344-502	MP-200344-503	MP-200359-1
MP-E-201B/150	MP-200343-501	MP-200343-502	MP-200343-503	MP-200362-1
MP-E-220B/215	MP-200374-501	MP-200374-502	MP-200374-503	MP-200358-3
MP-E-220B/150	MP-200373-501	MP-200373-502	MP-200373-503	MP-200358-2
MP-E-220B/40	MP-200355-502	MP-200355-505	MP-200355-506	MP-200358-1
MP-E-220B/26	MP-200355-501	MP-200355-503	MP-200355-504	MP-200358-1

## Mounting Brackets



## Transducers

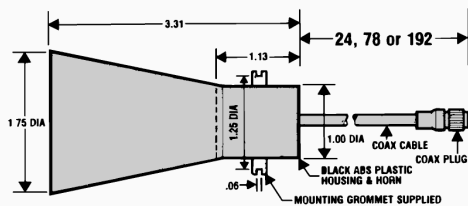
### 215 kHz & 150 kHz Transducers



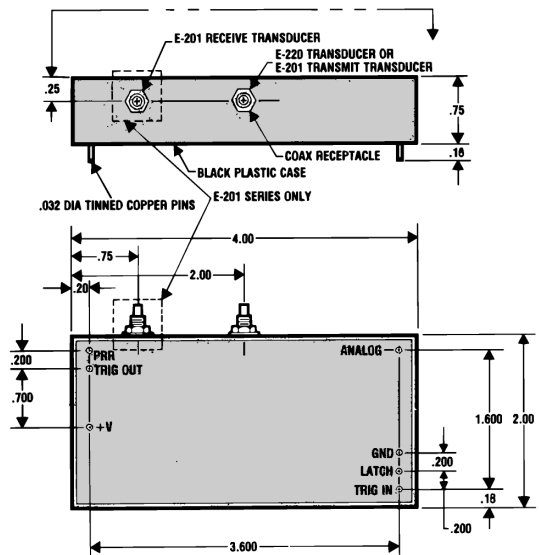
TRANSDUCER	A	B	C	D	E
215 KHz	.75	.12	1.00	.88	3/16 UNF-2A
150 KHz	1.06	.12	1.59	1.38	1/8 UNF-2A

All dimensions are in inches

### 40 kHz & 26 kHz Transducers



## Electronics Module



All dimensions are in inches

#### NOTE:

SIP sockets supplied with unit for customer convenience in hook up.



Call **01428 751822**

For Further Information

