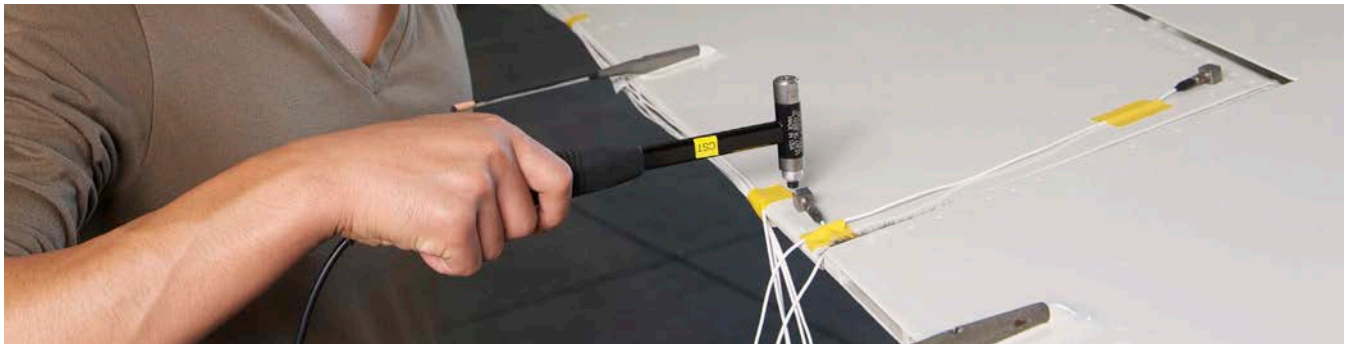
PCB PIEZOTRONICS
AN AMPHENOL COMPANY



MODAL IMPACT HAMMERS

- Compatible with standard ICP® Signal Conditioners
- Variety of hammer tips provided so excitation content can be tailored to object under test
- Extender mass included with all models except with large hammers (086D20 & 086D50)
- Modal Tuning insures the hammer's structure does not influence the measurement
- TEDS models available - typically used in high channel count & roving hammer applications

Each PCB® Modally Tuned®, ICP® instrumented impact hammer features a rugged, force sensor that is integrated into the hammer's striking surface.

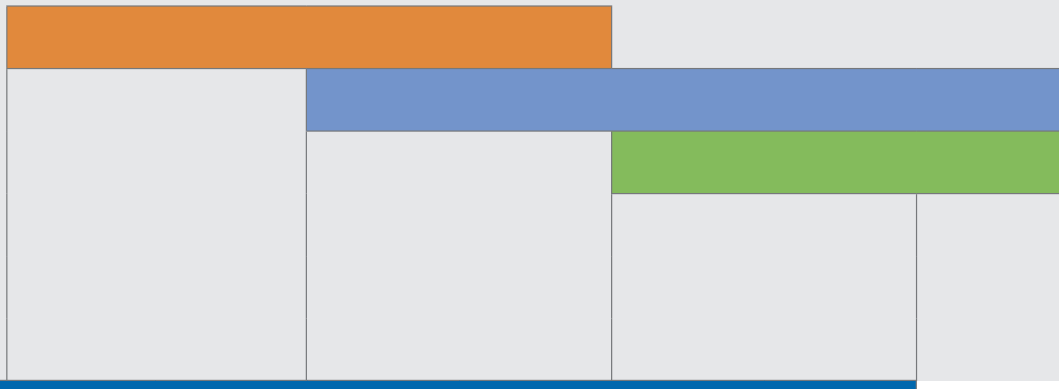
The force sensor provides a measurement of the amplitude and frequency content of the energy stimulus that is imparted to a test object. Accelerometers are used in conjunction with the hammer to provide a measurement of the object's structural response due to the hammer blow.

Using multi-channel data acquisition and analysis software, the test engineer is able to ascertain a variety of mechanical properties leading to an understanding of an object's structural behavioral characteristics. Items analyzed can include resonance detection, mode shapes, transfer characteristics, and structural health – such as crack and fatigue detection.

CE

TYPICAL APPLICATIONS

- Circuit Boards, processors & memory modules
- Small Machined Components: impellers, lightly damped panels/frames
- Medium Structures: car frames, engines, & small electric motors
- Heavier Devices: pumps, compressors, weldments, impellers
- Heavy Devices: large weldments, propellers
- Building foundations



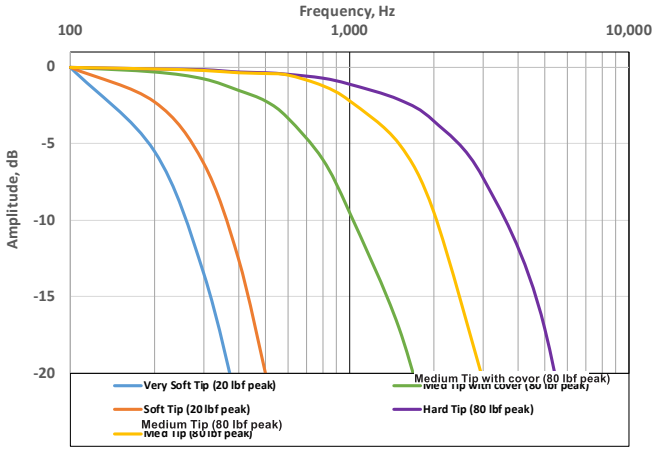
SPECIFICATIONS

Model Number	086E80		086C01		086C02	
	English	SI	English	SI	English	SI
Performance						
Sensitivity (±15%)	100 mV/lbf	22.5 mV/N	50 mV/lbf	11.2 mV/N	50 mV/lbf	11.2 mV/N
Measurement Range	±50 lbf pk	222 N pk	±100 lbf pk	±444 N pk	±100 lbf pk	±444 N pk
Resonant Frequency	≥100 kHz		≥15 kHz		≥22 kHz	
Non-Linearity	≤1 %					
Electrical						
Excitation Voltage	20 to 30 VDC					
Constant Current Excitation	2 to 20 mA					
Output Impedance	<100 Ohm					
Output Bias Voltage	8 to 14 VDC					
Discharge Time Constant	≥100 sec		≥500 sec			
Physical						
Sensing Element	Quartz					
Sealing	Epoxy					
Hammer Mass	0.17 oz	4.8 gm	0.23 lb	0.10 kg	0.34 lb	0.16 kg
Head Diameter	0.25 in	6.3 mm	0.62 in	1.57 cm	0.62 in	1.57 cm
Tip Diameter	0.10 in	2.5 mm	0.25 in	0.63 cm	0.25 in	0.63 cm
Hammer Length	4.2 in	107 mm	8.5 in	21.6 cm	8.5 in	21.6 cm
Electrical Connection Position	Side		Bottom of Handle			
Extender Mass Weight	0.044 oz	1.25 gm	0.9 oz	25 gm	2.6 oz	75 gm
Electrical Connector	5-44 Coaxial		BNC Jack			
TEDS Model Available						
	N/A		TLD086C01		TLD086C02	
Included Accessories						
	Calibration Certificate		Calibration Certificate		Calibration Certificate	
	018G10 Cable		081B05 10-32 Mounting Stud		081B05 10-32 Mounting Stud	
	080A109 Petro Wax		084A06 Extender Mass		084A08 Extender Mass	
	084A13 Extender mass		084B03 Hammer Tip, Hard SS		084B03 Hammer Tip, Hard SS	
	084A14 Handle, plastic		084B04 Hammer Tip, Medium		084B04 Hammer Tip, Medium	
	084A17 Handle, aluminum		084C05 Hammer Tip, Soft		084C05 Hammer Tip, Soft	
	084A28 Impact cap		084C11 Hammer Trip, Very soft		084C11 Hammer Trip, Very soft	
			085A10 Tip Cover		085A10 Tip Cover	

086C03		086C04		086D05		086D20		086D50	
English	SI	English	SI	English	SI	English	SI	English	SI
10 mV/lbf	2.25 mV/N	5 mV/lbf	1.10 mV/N	1 mV/lbf	0.23 mV/N	1 mV/lbf	0.23 mV/N	1 mV/lbf	0.23 mV/N
±500 lbf pk	±2224 N pk	±1000 lbf pk	±4448 N pk	±5000 lbf pk	±22,240 N pk	±5000 lbf pk	±22,240 N pk	±5000 lbf pk	±22,240 N pk
≥22 kHz						≥12 kHz		≥5 kHz	
≤1 %									
20 to 30 VDC									
2 to 20 mA									
<100 Ohm									
8 to 14 VDC									
≥2000 sec						≥1400 sec		≥2000 sec	
Quartz									
Epoxy						Hermetic			
0.34 lb	0.16 kg	0.34 lb	0.16 kg	0.7 lb	0.32 kg	2.4 lb	1.1 kg	12.1 lb	5.5 kg
0.62 in	1.57 cm	0.62 in	1.57 cm	1.0 in	2.50 cm	2.0 in	5.1 cm	3.0 in	7.6 cm
0.25 in	0.63 cm	0.25 in	0.63 cm	0.25 in	0.63 cm	2.0 in	5.1 cm	3.0 in	7.6 cm
8.5 in	21.6 cm	8.5 in	21.6 cm	9.0 in	22.7 cm	14.5 in	37 cm	35 in	89 cm
Bottom of Handle									
2.6 oz	75 gm	2.6 oz	75 gm	7.0 oz	200 gm	Not Available			
BNC Jack									
TLD086C03		TLD086C04		TLD086D05		TLD086D20		TLD086D50	
Calibration Certificate		Calibration Certificate		Calibration Certificate		Calibration Certificate		Calibration Certificate	
081B05 10-32 Mounting Stud		081B05 10-32 Mounting Stud		081B05 10-32 Mounting Stud		084B61 Hammer Tip, Soft		084B31 Hammer Tip, Soft	
084A08 Extender Mass		084A08 Extender Mass		084A09 Extender Mass		084B62 Hammer Tip, Medium		084B32 Hammer Tip, Med. / Hard	
084B03 Hammer Tip, Hard SS		084B03 Hammer Tip, Hard SS		084A52 Hammer Tip, Soft		084B63 Hammer Tip, Med. / Hard			
084B04 Hammer Tip, Medium		084B04 Hammer Tip, Medium		084A51 Tip Adaptor					
084C05 Hammer Tip, Soft		084C05 Hammer Tip, Soft		084B03 Hammer Tip, Hard SS					
084C11 Hammer Trip, Very soft		084C11 Hammer Trip, Very soft		084B04 Hammer Tip, Medium					
085A10 Tip Cover		085A10 Tip Cover		084C05 Hammer Tip, Soft					
				085A10 Tip Cover					

PROPER IMPACT HAMMER USE:

Multiple hammer tips - allows tailoring of the impact pulse to frequencies of greatest interest. Increased durometer / hardness of tip provides for higher frequency content as shown in graphic to the right. Increasing the hammer speed (magnitude of impact) does not change excited frequencies and may cause adverse tip wear. Replacement tips are available but should not be required under normal use.



Single tap / double tap - Modal analysis benefits from the cleanest possible input, which is not as easy as it sounds. Practice swinging the hammer prior to data capture with the most direct impact possible and the least chance of secondary impacts (double tap). That will minimize the need for post-capture data filtering. Also note that items under test should be supported but not constrained - supports can provide damping.

During initial setup, confirm the measurement system is functioning properly. It is good practice to avoid the upper half of the measurement range to leave room for individual impulse variation. Impulse data with flat peaks can indicate saturation of measurement chain.

MODELS 333B30 / 333B40 / 333B50 MODAL ACCELEROMETERS

SINGLE AXIS CUBE WITH 10-32 COAXIAL CONNECTOR

- Low noise minimizes error in modal analysis
- Quartz sensing element
- Stud mounting for excellent mechanical coupling, UNF & metric studs included

MODEL 485B39 PORTABLE ICP® SIGNAL CONDITIONER

DUAL CHANNEL INTERFACE FOR ICP® SENSORS TO A POWERED USB PORT

- Makes high quality measurement more accessible
- Pocket-sized, ICP® sensors to USB signal converter
- Digitized data, 24-bit analog to digital converter

MODEL 410C01 SINGLE CHANNEL ICP® SIGNAL CONDITIONER

DIN RAIL MOUNT (35MM) FOR ELECTRICAL SYSTEM ENCLOSURES

- Delivers excitation power for ICP® sensors
- Provides peak track hold and waveform analog output signals, 0 to 10 volts
- Offers AC or DC signal coupling and choice of 7 gain settings
- Setup configurable via USB or ethernet communications

PCB PIEZOTRONICS
AN AMPHENOL COMPANY

3425 Walden Avenue, Depew, NY 14043 USA

pcb.com | info@pcb.com | 800 828 8840 | +1 716 684 0001