

measurement
SPECIALTIES

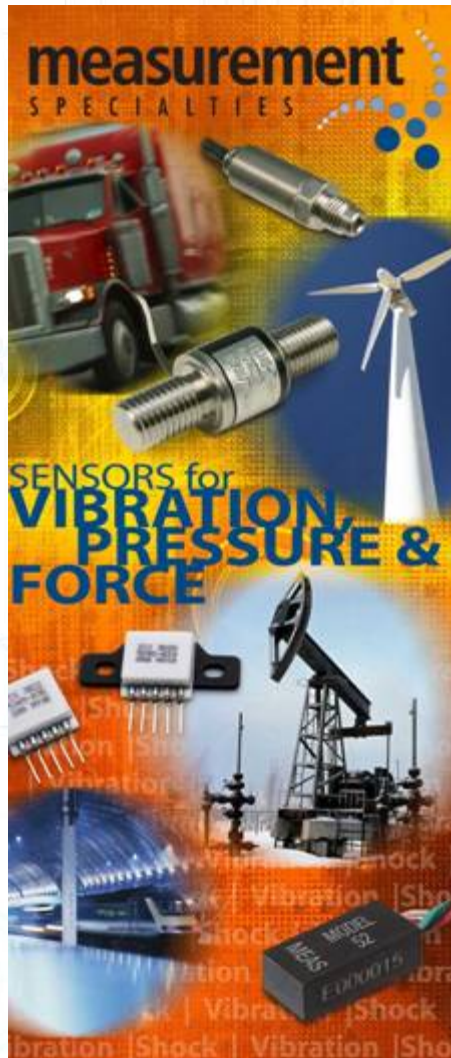


Auto Safety Interesting Accelerometer Adaptations for Crash Testing

**Leo Nieminen – Regional Sales Manager
Germany**

Welcome

MEAS Product Lines



Sensors for

- Pressure
- Force
- **Vibration**
- Position
- Humidity
- Temperature
- Photo Optics
- Piezo Film



Auto Safety Product Lines

Types and Popularity Level

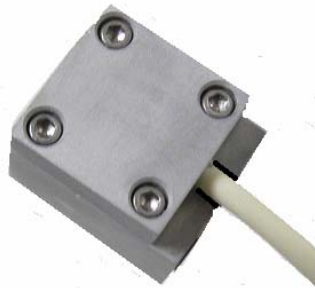
- Packaged Piezoresistive (High)
- Packaged Amplified (Medium)
- Board Level (Low)
- Board Level Amplified (Very Low)



Auto Safety – MEMS Products



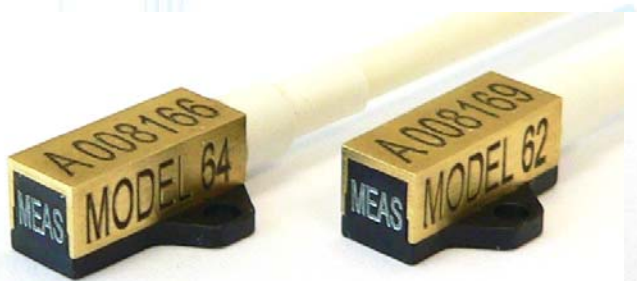
Crash Application: In-Dummy



61A/B



68C/68CM1



62

64



64B



64C

Auto Safety – MEMS Products

Crash Application: On-Vehicle



53



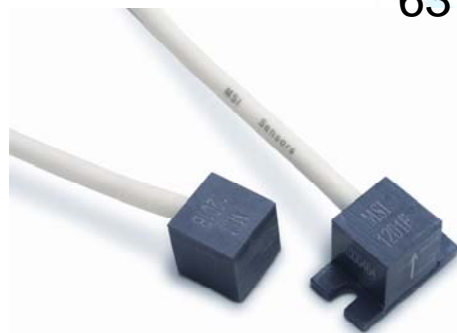
63



1203



52



1201

1201F



1202

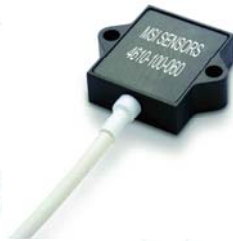


1202F

Auto Safety – MEMS Products



Ride Application: Road Test



4610



4621



4630

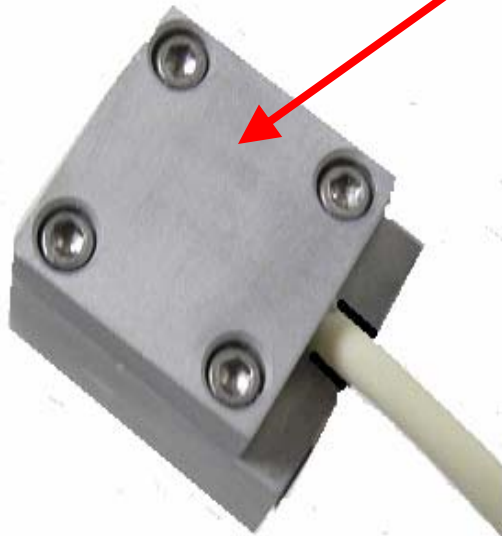
Auto Safety Products Crash/In-Dummy

Model 61A/B

- In-dummy accelerometer
- Head, Chest and Pelvis Areas
- Stud Mounted

Adaptation

Closed cover to provide Ingress Protection against dust and moisture.



Model 52

- On-Vehicle Instrumentation
- Low Cost
- Adhesive Mounting
- Sub-miniature Design

Adaptation

Plastic cover and inexpensive cable for side-impact.



Side Impact Testing

New Products

Vibration Design Center

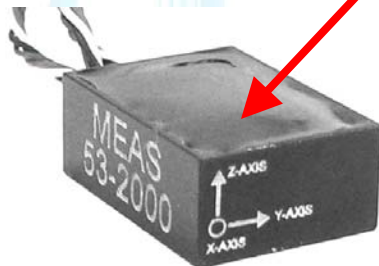


Model 53

- On-Vehicle Instrumentation
- Shock resistance to 5000 g
- Triaxial
- Low cost, low profile

Adaptation

No cover, low profile, inexpensive cable for high damage areas.



Impact Testing

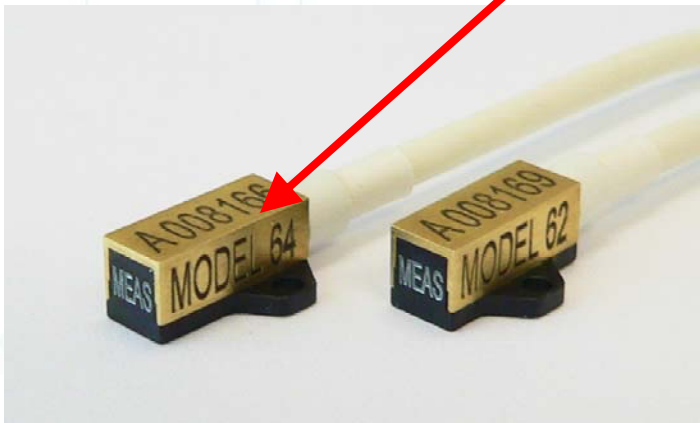
Auto Safety Products

Model 62

- In-dummy Instrumentation
- SAE J211 Footprint Compliant
- Screw Mounted

Adaptation

Large lettering for ease of sensor recognition by aging work-force.



Model 64B/64C

- In-dummy Instrumentation
- SAE J211 Footprint Compliant
- Fits all mounting blocks

Adaptation

Extension of shock range from 2000 to 6000 g.



64C vs 64B - Identical performance but different footprint. Shorter than 64 or 62



Auto Safety Products

Model 68C

- World SID, Side Impact
- Shock resistance to 5000 g
- Miniature Triax

Adaptation

Replaceable sensor modules and customer installable protective covering.

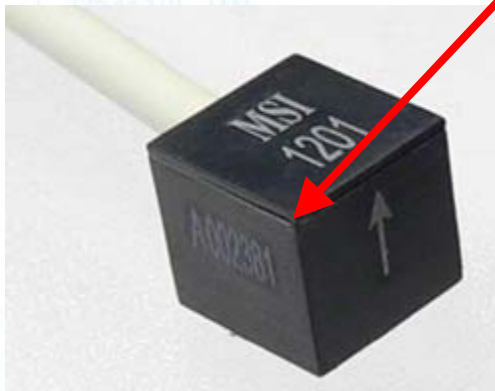


Auto Safety Crash Testing

Auto Safety Products

Model 1201

- On-Vehicle Instrumentation
- Shock resistance to 5000 g
- Gas Damping
- Low cost



Adaptation

Water-resistant construction can be submersed in water for >15 minutes at a time.



Impact Testing

Model 1202

- On-Vehicle Instrumentation
- Adhesive Mounting
- Low cost

Adaptation

Sensor design uses extra wire for self-test function.

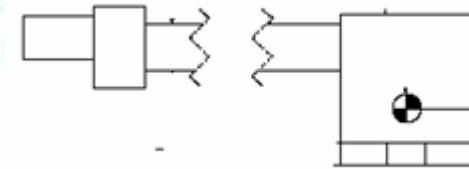
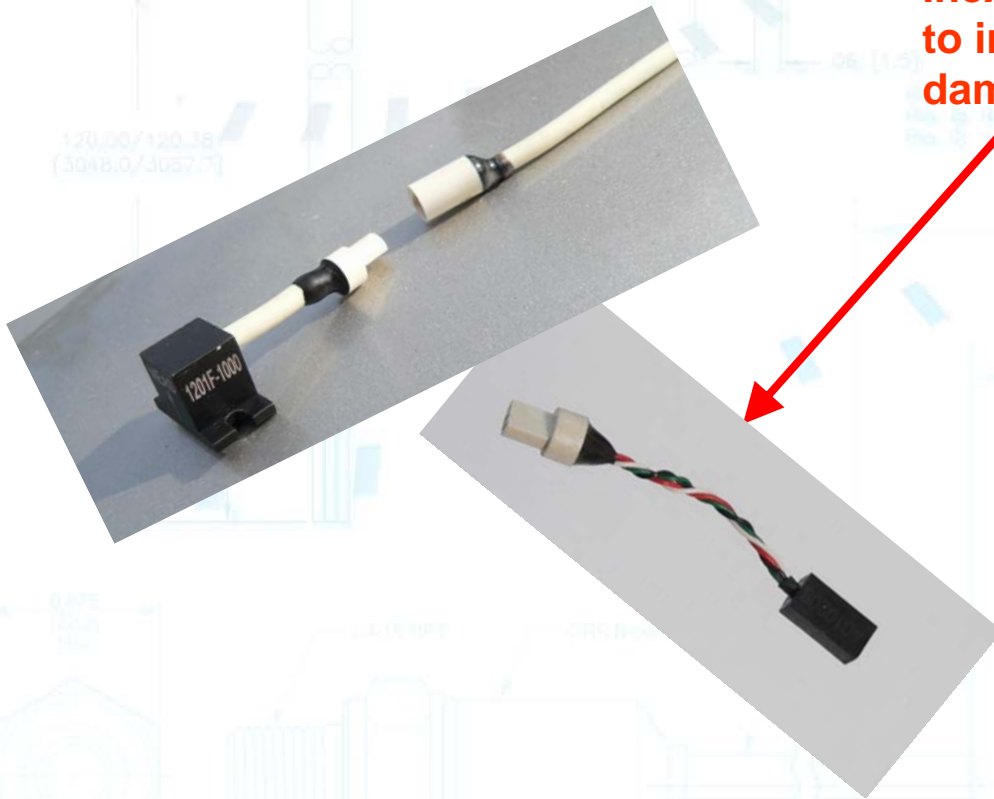


Auto Safety Products

All Models

Adaptation

Inexpensive connector and mating cable to increase life of sensor due to cable damage.

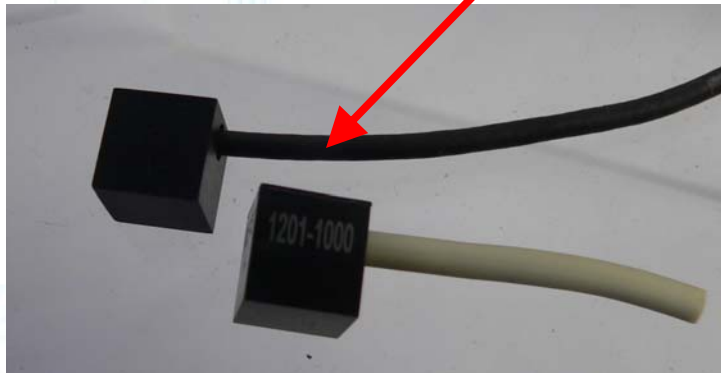


Auto Safety Products

Model 1200's

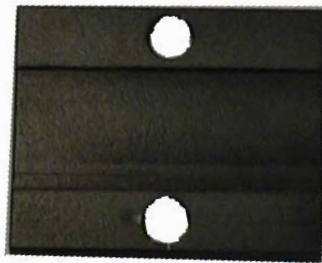
Adaptation

Customer-supplied cable rather than manufacturer's cable.



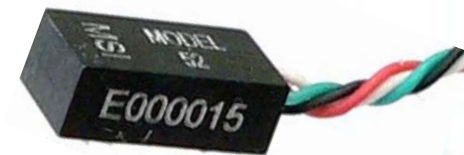
Impact Testing

Model 52



Adaptation

Miniature mounting block for high g, Model 52 makes uniaxial installation easy while converting an adhesive mount device to a screw mountable unit. Also available is block for triaxial mounting.



Models 62/64/64B/64C

Adaptation

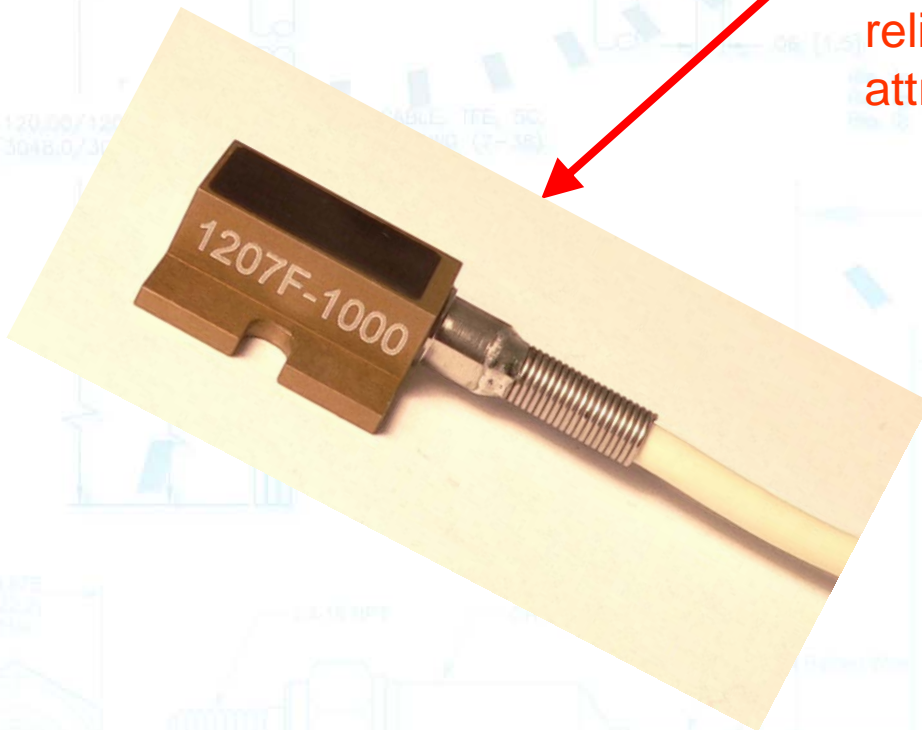
Research on cable-jacket material composition provides solution to “gummy and tangled” silicon jacket



Model 1207

Adaptation

Custom design requiring cable strain relief, water-resistance, rugged yet attractive housing.

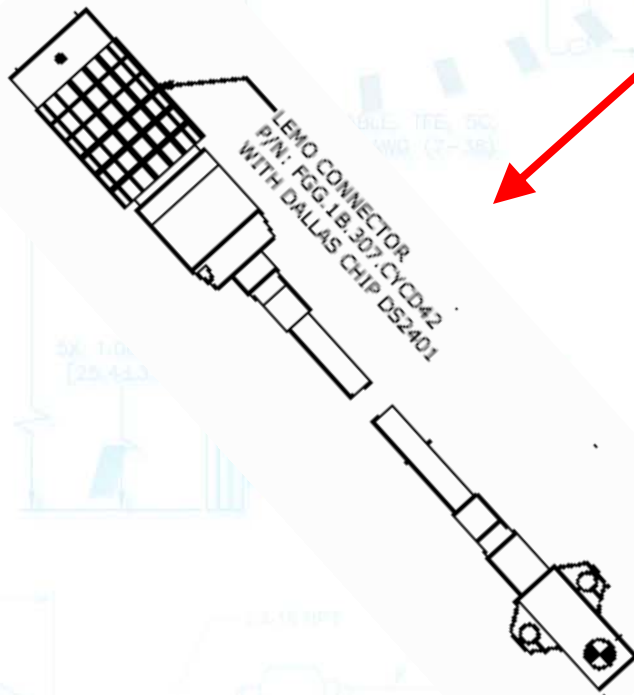


Auto Safety Products

All Models

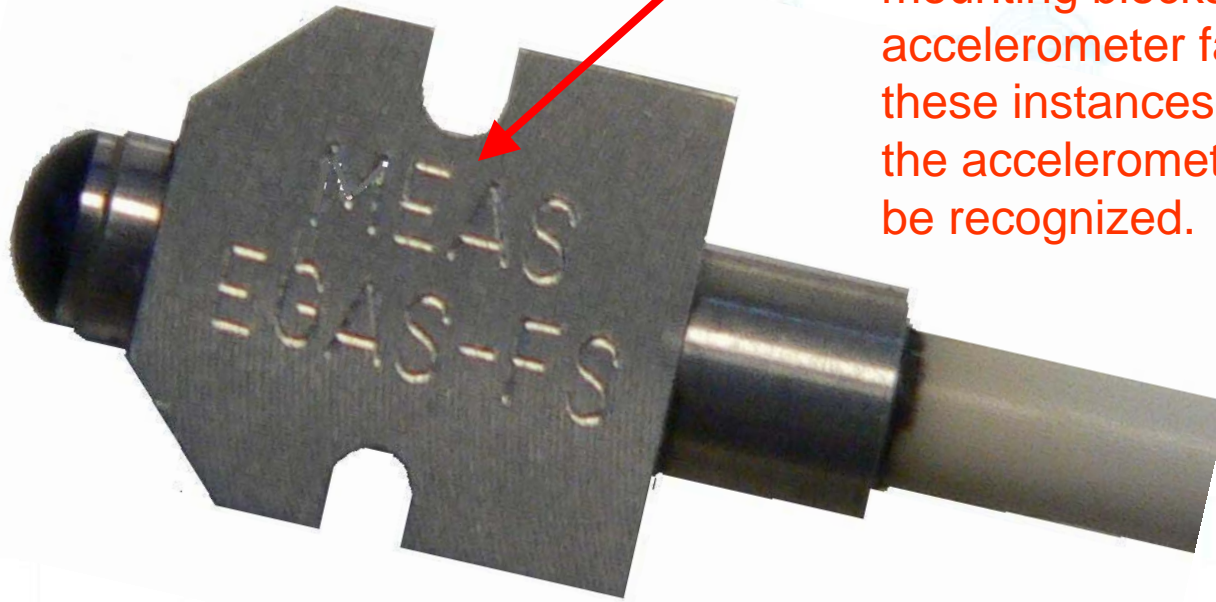
Adaptation

Attachement of connectors with special wiring specifications and identification chips.



Adaptation

Some installations call for accelerometers to be mounting in mounting blocks with the bottom of the accelerometer facing the installer. In these instances, it is important to mark the accelerometer so that it can easily be recognized.



Auto Safety Products

All Models

Adaptation

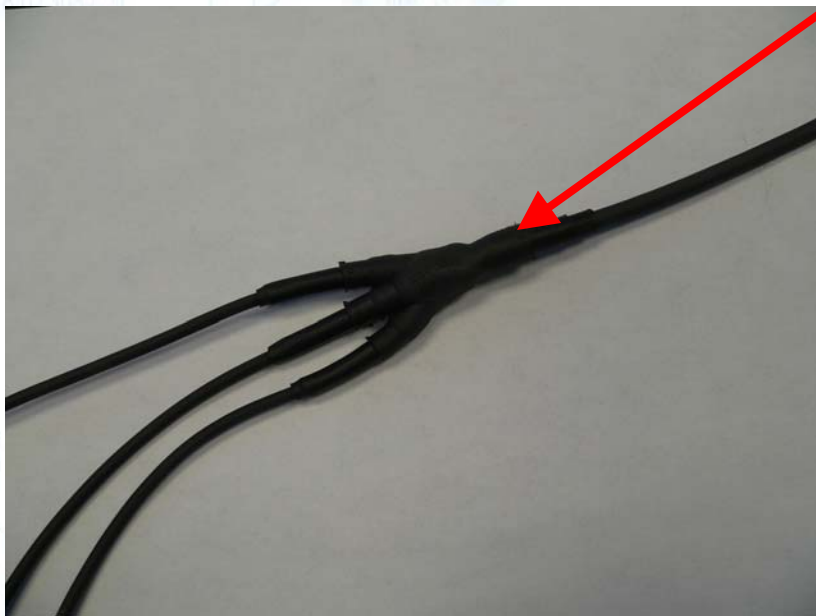
Special calibrations are often required to ensure ease of system integration with data acquisition equipment and power supplies.



All Triaxial Models

Adaptation

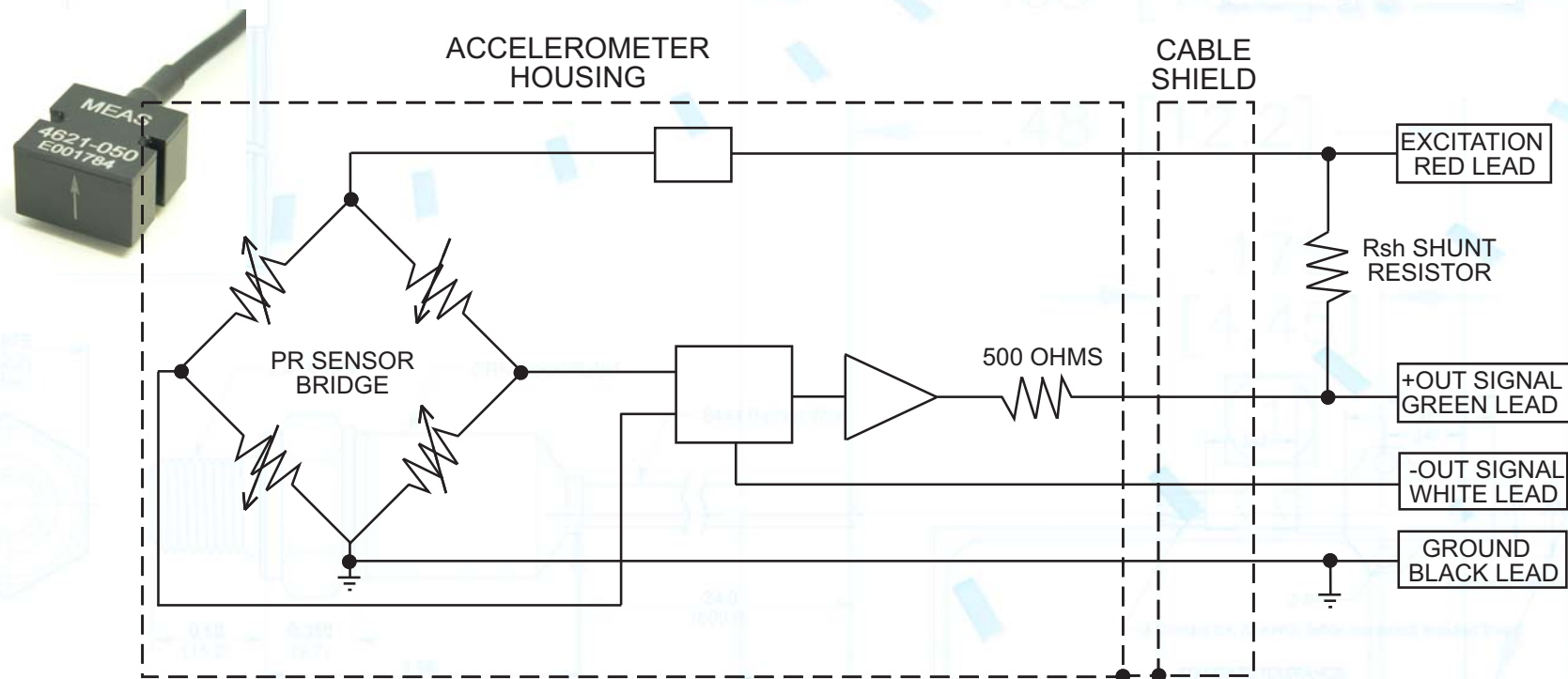
Special cable configurations facilitate installation of triaxial accelerometers



Model 4621

Adaptation

Many test setups are designed for shunt-cal of unamplified units. A special adaptation of accelerometer circuitry allows amplified units to be shunt calibrated.



measurement
SPECIALTIES



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Adaptations for Crash Testing

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Thank You