Cable Considerations

By nature, cables are usually the weakest part of any measurement system. Because they are somewhat fragile, they must be handled with care. The weakest point on the cable assembly is the intersection of the wire and the cable connector, so excess stress at this point must be minimized. Sharp bends here can overstress conductors and insulation causing cable failure.

Tie Cables Down

It is very important to anchor cables properly, especially when using accelerometers for high shock and vibration measurements or any time excessive motion is involved. Figure 1 illustrates the preferred methods of cable tie-down for several styles of accelerometers. The idea is to cause the flexure to occur away from the cable connector to avoid stressing this weak point.

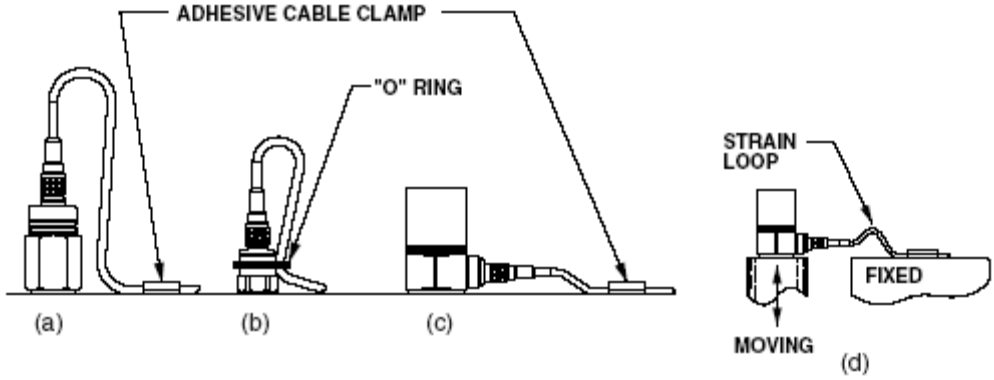

Figure 1: Various Methods of Cable Tie-down

Relative cable motion at the sensor body or connector can cause erroneous output signals at frequencies where cable motion is amplified by cable resonance (sometimes called “cable whip”). Miniature accelerometers are especially susceptible due to their small size and relatively low mass. This problem can be remedied by proper cable tie-down. A strain relief loop with proper tie-down will ensure that cable flexure does not occur at the connector when the cable is fastened to a stationary surface.

Figures 1a, 1b and 1c illustrate proper tie-down methods for situations where the cable is tied to a surface which moves with the accelerometer. Figure 1d illustrates the proper way to handle the case where the cable can be tied to surface which is stationary with respect to the accelerometer.

Cleaning Connectors

Clean 10-32 connector ends periodically with a stiff bristled brush dipped in a solvent such as Freon TF® or equivalent. This will remove oil, other contaminants and metal slivers which can peel off from connector threads and short across contacts.

Cleaning of high impedance low noise cable connectors used with charge mode accelerometers is especially important since degradation of insulation resistance can adversely affect low frequency performance.

Tightening Cable Nuts

When connecting 10-32 or 5-44 miniature threaded connectors, do not use a pliers to torque the knurled cable nuts in place. Hand tightening is sufficient for most applications. To hold the nut in place under severe shock or vibration, we suggest the use of a mild thread locking compound. Use it very sparingly and apply it only to the male thread (jack) to avoid contamination of the electrical contact.

Cable Selection

At the time you purchase your sensor, the sales engineers at Dytran will recommend the best cable for your application. Remember that “general purpose” cables are used with LIVM sensors and “low noise” cables are used with charge mode sensors. Small LIVM sensors generally use flexible light weight cables to minimize cable whip effect.

Cables are available in any length with very few exceptions. Standard lengths for most cables are three, five and ten feet. (These are the lengths most likely to be in stock). The Model Series designation (6010A, 6020A, etc.) specifies cable type and connector (s). The length of the cable (in feet) is added to this designation after the letter “A”. For example: Model 6010A10 is a series 6010A cable, 10 feet long. The combination of the series designation and the length in feet constitute the complete cable model number.

Pricing per foot for the various cables can be found in the published Dytran price list or can be supplied by our sales department. This pricing will be expressed as a base price for the cable plus a cost per foot for the specified length.

“Output” cables are used to connect the “output” jack of power units to readout instruments. This type of cable (series 6020A) uses RG-58/U coaxial cable and has BNC connectors at both ends. All Dytran power units have BNC output jacks as do most readout instruments such as oscilloscopes, analyzers, recorders and meters, so this is the cable of choice for this purpose. Since this Model cable is less expensive than most miniature coaxial cables, many users prefer to make long runs with this type using various available adapters to switch between 10-32 or 5-44 to BNC connectors as needed.

2-Pin Electrical Adapters

Models 6115 and 6116 connector adapters thread onto 10-32 sensor connectors and permit the solder connection of light 2-wire ribbon cable or twisted pair wire for LIVM sensors. These adapters are useful for situations where the use of heavier coaxial cable is impractical such as in some high shock and vibration applications that tend to destroy conventional coaxial cables. When using this light cable, be sure to tie the sensor body as shown in Figure 2 to avoid stress on the solder joints.

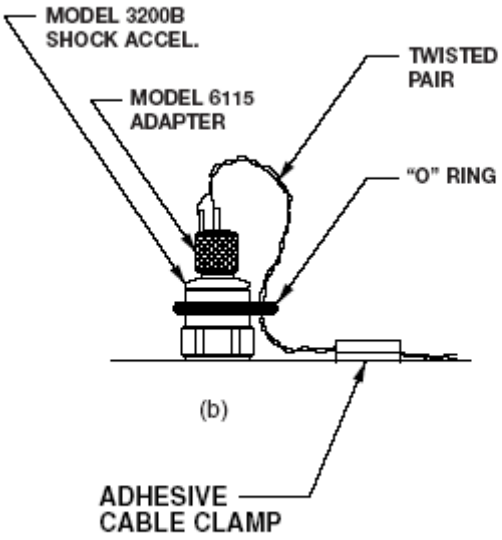

Figure 2: Solder Terminal Adapter