**OMNETICS**
CONNECTOR CORPORATION

Micro-Miniature Connectors Expand Micro-Sensor And Detector Industry Use

Low profile and ruggedized connectors solve a rapidly changing signal routing environment challenge in designing today's compact high-density circuit modules. PZN (polarized Nano connectors) are designed specifically to offer constant signal integrity processing through high shock and vibration applications. These unique connectors can handle cable with up to 1 amp where needed. Micro signals can be routed from a wide range of devices evolving in the micro and sensor industry and interface with standard printed circuit boards for data processing.

PZN are being used for controlling our robots, triggering cameras at the airport and being used for monitoring our biomedical data. The semiconductor industry categorizes these devices as biosensors, Nano sensors, and MEMs (micro-mechanical chip) sensors. Circuit cards and flex-circuits usually support these devices and offer a wide range of applications.
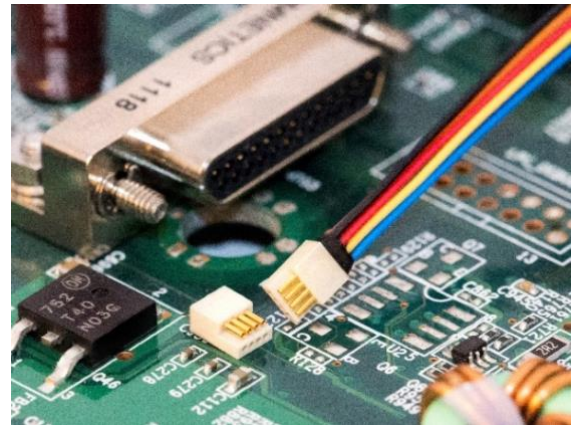

When needed, the sensor cards can activate plungers to open and or close devices, move flaps, turn on cooling devices and alert of oil level problems. These circuits can be designed to be triggered by sound, energized my magnetism, operate like transducers under pressure changes and notify display panels when chemical ph. levels change. Although the life sciences industry and automotive designers are currently leading in sensor system usage, we are seeing rapid growth in sensor use for activating items in satellites, such as opening solar arrays and position steering for managing satellite to earth attitude.

Dynamic changes are also occurring in our medical service system. The focus is driven towards smaller, more portable, more capable equipment that can move from office to office within a service center. There is a need for more clarity, higher definition, and more functions. To serve the practitioner and patient better and at a lower cost, highly reliable equipment, significantly upgraded processing capabilities are being developed. This also includes portability and a size reduction of the instruments and equipment used in the industry. To accomplish this, every portion of the equipment design is considered a candidate for miniaturization.

Similarly, robotic systems often depend upon miniature linear actuators that are interconnected by cable and connectors within the unit. Electrical cables route "sense and or drive" signals to and from pneumatic actuators, respond to piezoelectric detectors and drive hydraulic pistons and gears. Prosthetic hands clench and fingers squeeze as if this is magic. But it's not; this is our newest technology at its best. The key is in interconnecting memory chip technology on high density printed circuit boards to driver chips that can respond and then send the action
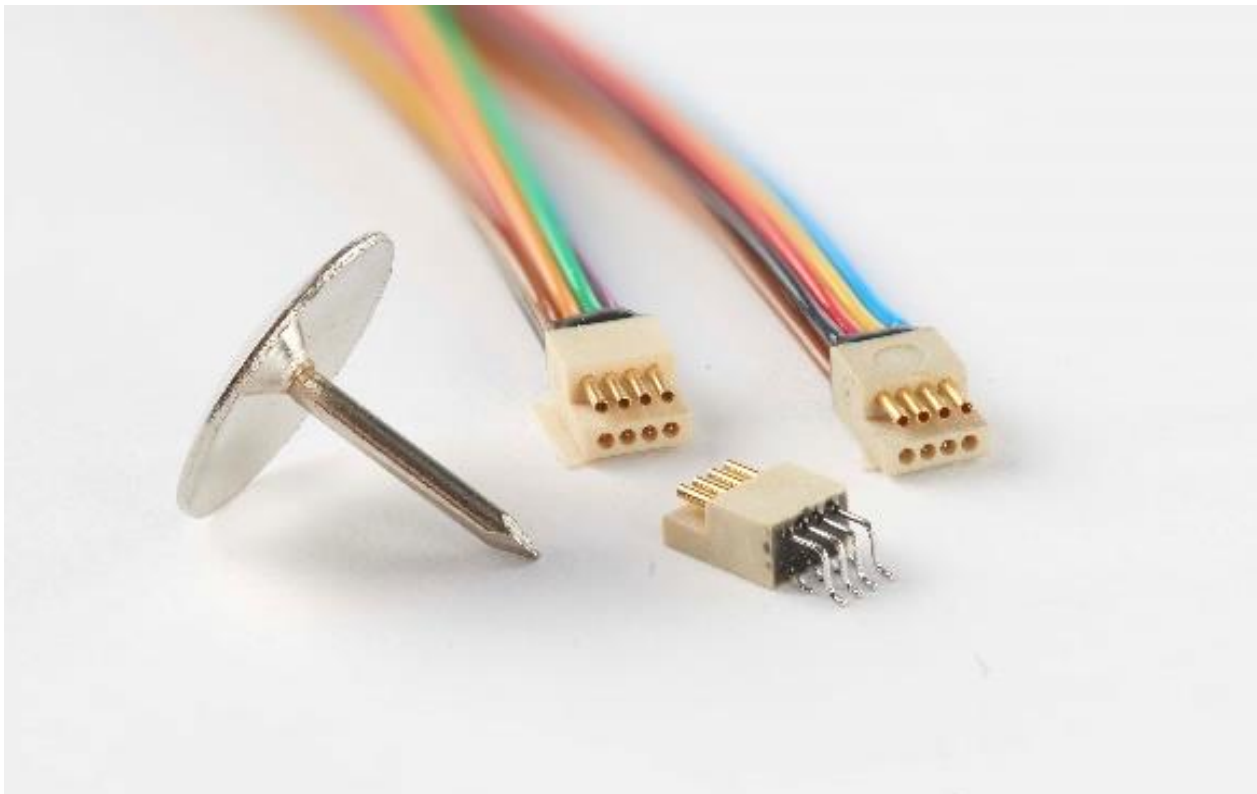
instructions through a miniature cabling system to the item we want moved. In reverse we route sensor data back down the cable to the circuit board that is watching for position or other kinds of data. One must think of miniature signals continuously running back and forth from the cable to the p.c. board. To accomplish this constant activity, system designers focus on ultra-miniature connections that are extremely small, lightweight and rugged. In many cases sensors are at the end of an extension or arm to measure or detect changes. Continuous signal integrity signal integrity is critical, despite being exposed to shock and vibration. Connector and cable design and selection is critical. Designers often use ruggedized micro-miniature connectors called PZNs (Polarized Nano-Connectors).
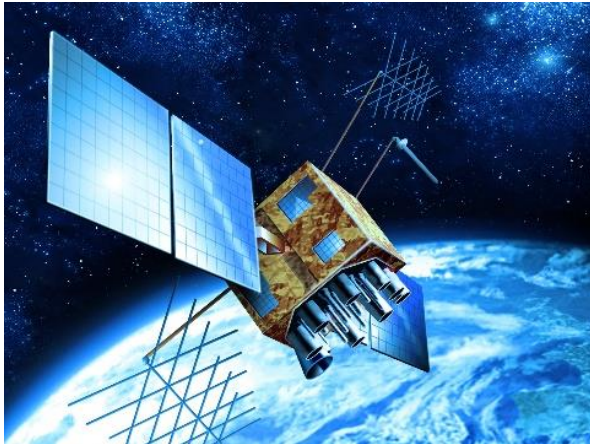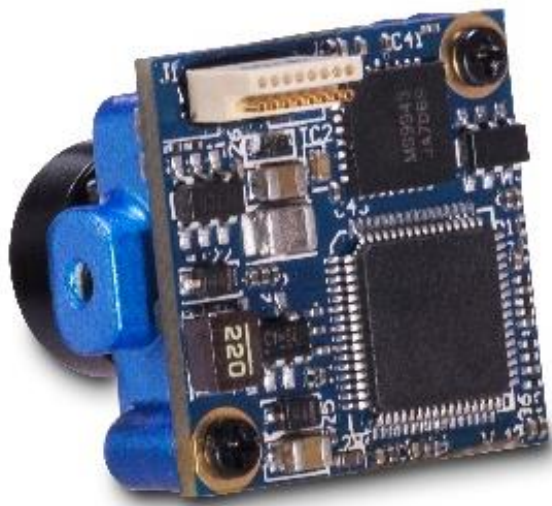

PZN connectors are designed with military-standard proven spring pins made from tempered beryllium

copper that mate into solid metal tubes. The pin and sockets are plated in nickel and then gold to assure constant contact. These Nano sized elements are assembled in LCP insulators at .025" pitch and receive up to 30-gauge Teflon® insulated wiring. The insulator has an alignment feature to insure correct mating as well. A range of pin counts are available and p.c. board mounts fit standard printed circuit card design standards.

Applications using the mighty PZN and other rugged ultra-miniature interconnects are emerging in the medical industry. Included are small cameras in endoscopes, and in neuro-link cables used to send signals from the brain to other parts of our body. Brain mapping devices and interconnections to prosthetic legs are also being developed. Deep space PZNs route signals to small sensors on giant separation ring assemblies to help measure torque on locking screws for rockets. Small solar arrays are deployed with cable to the main satellite. F-1 race cars measure fuel rate consumption, lubricating oil levels are monitored and reported for large windmills, and even towable

sonar arrays use PZN interconnects because of their rugged versatility.

Finally, designers can tailor their polarized Nano connectors specifically to fit their application. One can save time by selecting a standard design format that is currently available and then contacting the connector supplier for modifications. Using solid modeling, a new size, shape or format can be developed in a matter of hours and sent to the system engineer. Changes can be made on the phone as the design is shared with the designer. Since the key elements are the insulator and spring pin to socket assembly, reliability can be assured with the final modification. Standards and COTs are available for early prototyping of circuits as well.

Compact reliability during all operating conditions in electronics is mandatory. Designers are well advised to select their interconnection cable and connectors that have proven test data and performance to match their needs. Military level testing of miniature interconnection elements is a key to insuring that goal. We are becoming a portable world and one that uses remote technology to work for us. PZN Connectors serve that world well. Let's all "Think small"!