EASY TORQUE MEASURING

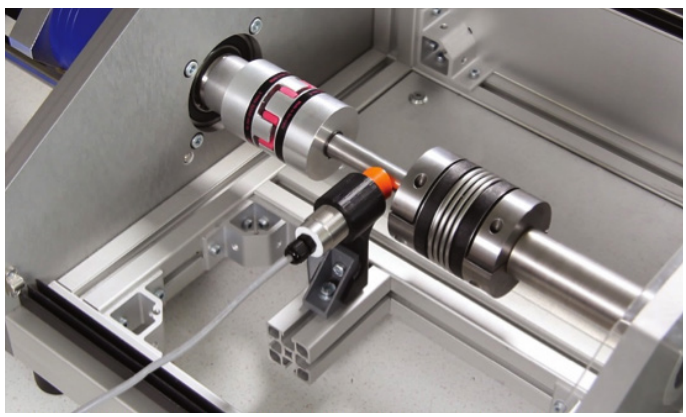
Torque And More has developed a torque sensor system that can measure torque and bending forces simply by being held near the test object

Mechanical stresses applied to an object will change its physical properties. For example, a transmission shaft will visibly begin to twist at elevated torque forces, and eventually plastic deformation may even occur. Other physical effects might not be immediately noticeable when applying mechanical stresses, but nevertheless they still occur inside the test object.

For example, ferromagnetic objects attract Earth's magnetic field and allow it to pass through them. However, how much of the magnetic field will pass through the object, and the exact path it will take as it passes through, is greatly influenced by the mechanical stresses applied to the object.

The engineering team at Torque And More (TAM) has developed a magnetic signal that can penetrate a ferromagnetic object and monitor any changes in its physical properties. By analyzing these changes, an accurate prediction of the mechanical forces inside the test object can be made, in real time.

The actual sensing element (or sensor) is not much larger than a small Lego brick and needs to be placed close to where the torque measurement should be taken. The sensing element does not need to touch the test object and can be placed a few millimeters away from the static or rotating object. The sensing element emits a very specific signal based on magnetic principles, which enters the surface of the test object. The returning signal contains all the information needed to enable the creation of an analog signal that is proportional to the mechanical stresses monitored, such as torque.



TAM's active torque sensor kit is designed for an easy installation (top) ***When in situ it is a true non-contact sensor*** (above)

"SENSOR TECHNOLOGY BASED ON MAGNETIC PRINCIPLES CAN BE DESIGNED IN SUCH A WAY THAT IT IS INSENSITIVE TO HARSH OPERATING CONDITIONS "

There are at least five ways in which a ferromagnetic object can manipulate a magnetic field that is passing through it, and any of these parametric effects can be used to detect and measure the mechanical forces applied. Over the past few years, TAM's engineering team has been studying how to pick the right physical effect that works best under a given operational condition.

The sensing element includes a transmitter, which emits an alternating magnetic field of a certain frequency (within the audible range) and of relative low intensity. The returning magnetic signal is then analyzed and compared with a signal received when no mechanical stresses are applied to the test object.

Sensor technology based on magnetic principles can be designed in such a way that it is insensitive to harsh operating conditions (water, oil, dust, vibrations, air-gap changes, etc). TAM's sensor solution also cannot be harmed or damaged by stray magnetic fields, and as an extra bonus, the sensor will not be damaged if overly high torque forces are applied to the test object.

TAM's non-contact torque-sensing solution is called Active-2/ Active-3, or simply A2/ A3, and can be applied to the object to be tested in minutes. The A2/ A3 sensor consists of a sensing module and sensor electronics. The sensing module contains passive components, which is why the module can withstand harsh operating conditions, including temperatures above 210°C. Customers can customize the unit so that the delicate sensor electronics are protected from harsh operating conditions.

The A2/ A3 sensor can also be used in many other applications, as the sensing module acts in the same way as a temperature sensor. Simply place the unit near the test object, and one can start measuring right away. <