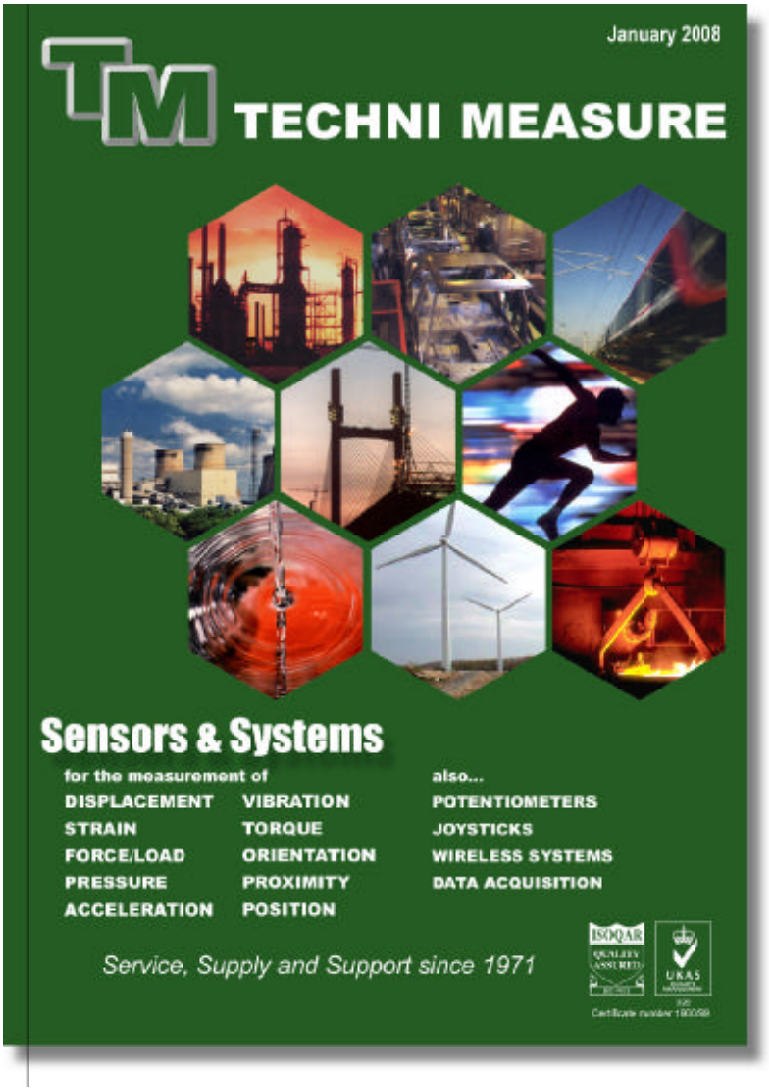
TM TechniTalk
Winter/Spring 2008

New Techni Measure Short Form

The first introduction of the Techni Measure Short Form Catalogue was way back in 1982. From that time the design has not changed significantly except perhaps for the special silver coloured front cover to commemorate our 25th Anniversary (nearly 12 years ago!). We have now decided to update the design, whilst still maintaining the same level of basic product information and this has given us the chance to reorganise some of our product offerings and include all of our new products.

We have mentioned our latest addition of Weighing Load Cells from Scaime that include Atex certified designs, but in particular we have been able to bring together most of our various ranges of displacement sensors onto one page. For your free copy of this publication please telephone, fax or email us with your postal address. Alternatively, if you would rather have an electronic copy, please let us have your email address.



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Issue No.13

Measurement and Control products for all industrial and scientific applications...

Ground Vibration Sensors

Dytran offer a range of sensors designed to monitor low levels of vibration that can typically be required in ground or building monitoring. These seismic level sensors have built in electronics, providing a full scale +- 5V output signal that can be easily displayed as a time waveform, set up for alarm monitoring, or analysed for frequency content.

Available in 1V/g, 5V/g or 10V/g output sensitivities with equivalent ranges of 5g, 1g and 0.5g, these piezoelectric accelerometers simply require a constant current voltage power supply to operate the internal electronics over a 2 wire connection. With their low impedance output and the low frequency requirements of a typical seismic type measurement, these sensors can operate over very long cables. At the moment the more sensitive sensors are part of Dytran's Industrial Vibration Monitoring range, and do not therefore appear in their general catalogue, but full details can always be seen on their web site www.dytran.com by entering "seismic" in the quick search box. All models are hermetically sealed and are isolated from ground and two of them can be supplied with an immersion proof boot for fitting over the connector for very wet environments. Applications include monitoring building vibrations where very low levels are essential for stable manufacturing conditions, monitoring general ground vibrations during building operations, and other seismic level activities.

These sensors can be used for R&D work or for long term monitoring, and we would be very pleased to discuss any application that you may have for seismic level measurements.

Hall Effect Rotary Sensors

New to the range of rotary and linear potentiometers manufactured by Sakae, is a range of rotary sensors that utilise a Hall effect sensing element instead of their usual potentiometric tracks. These precision sensors offer long life and low torque operation.

These sensors offer full 360 degrees of measurement and with the non-contact Hall effect sensor element, life expectancy is specified as 50 million shaft revolutions. The power supply requirement is 5 VDC +/- 10%, and the output would be approximately 10% to 90% of this input voltage. Therefore the output for a 5V supply would be 0.5 to 4.5 V for 360 degrees of travel. The starting torque of these sensors is below 2mN.m and they have an operating temperature range of 40 to 120DegC. Two versions are currently available; with or without a mounting flange, and a 300mm integral cable is included. The standard units are sealed to IP65 but IP67 is also available as an option. Dual output options are also available with either a single or separated supply and ground. Other electrical angles, machining on the shafts or special wiring are some of the extra options. These sensors are already being used in several models of Sakae's range of joystick controllers, and they are best suited to applications where long life is essential.

Please let us know if you require any further details on this new range of rotary sensors, or tell us what special requirements you may have. We may have other solutions that might be more appropriate.

Product News

Wireless Orientation

MicroStrain have introduced a new orientation sensor Model 3DM-GX2. This sensor is similar to their GX1 product, but comes in a smaller package and offers wireless communication as an option, as well as a direct-wired connection.

The 3DM-GX2 is a high performance gyro enhanced orientation sensor that utilizes miniature MEMS sensor technology. It combines a triaxial accelerometer, triaxial gyro, triaxial magnetometer, temperature sensors, and an on-board processor running a sophisticated sensor fusion algorithm. The 3DM-GX2 offers a range of output data from fully calibrated inertial measurements (acceleration, angular rate and magnetic field or deltaAngle and deltaVelocity vectors), to computed orientation estimates of pitch and roll or rotation matrix. All parameters are fully temperature compensated and corrected for sensor misalignment. The use of six independent A/D converters ensures that all the accelerometers and gyros are sampled simultaneously, so that the best possible time integration results are achieved. The 3DM-GX2's communication interface hardware is currently available as modules with a wireless transceiver (2.45 GHz), a USB 2.0 interface, or as RS232 and RS422 interfaces. A lower cost OEM version is available without any communication module. Applications for this device would include use in unmanned vehicles and robotics, platform stabilisation and location tracking.

Please ask for details of this new sensor, and if you have any questions regarding the measurement of orientation in general we would be pleased to visit you to discuss any possible application

New TML Product Guide...

Call us on 01527 854103 to receive your FREE copy of the latest TML Short Form catalogue that includes brief details on several new products in their range of strain gauges, transducers and instrumentation.

Non-contact Hole Sensor

Capacitec have a unique capacitive hole measurement sensor as part of their extensive range of capacitance based displacement sensors. The CMS/CHP hole probe offers a 48 sensor complete hole mapping sensor in one portable system, but can now be supplied with a wireless communication option.

For production testing of critical hole dimensions this system allows the operator to see a quick and efficient pass/fail display, as well as being able to send results wirelessly to a central computer for quality control records. The CHP is the probe with several standard tip diameters from 3.97 to 38.1mm, suitable for straight or tapered target holes, with or without countersinks. The CMS-3 fits onto the probe to control and display the preset required readout, and communication with a computer is via a standard RS232 interface, or by a new wireless connection option allowing remote or automated testing. The probe tip has six levels with 8 sensors each level, to give an accurate profile measurement of the internal hole dimensions. Aerospace is a major market for these hole-mapping sensors, where thousands of fastener holes need to be routinely checked for tolerance, but there are many other industries where critical hole dimensions need to be measured. For over 25 years Capacitec have worked closely with manufacturing, R&D and quality engineers, to help replace mechanical measurement tools such as feeler gauges and go/no-go gauges with electronic alternatives.

We would be please to discuss any application where hole mapping is essential or where gap measurement is required.

Frictional Strain Checker

TML have introduced a new holder for their CBF-6 frictional strain gauges. The new FGMH-1 is designed for metallic targets, since a magnet holds the Strain Checker to the structure whilst a spring holds down the integral frictional gauge to the surface.

Whilst ordinary strain gauges measure strain generated in a structure through adhesive mounting, the frictional strain gauge measures the strain by the friction produced at the interface. This is not as accurate as bonding a standard strain gauge, but the CBF-6 gauge can easily be used again and again by simply repositioning it, and it can therefore be used as a tool for quickly locating the highest strain levels on a beam for instance. TML have offered a hand held device for use with these gauges for many years, but with this new holder, once fitted in place, the user can operate recording instruments with hands free. Strain measurements can also be taken without special surface preparation, and even on a painted surface. In this case however care should be taken that loose layers are removed, and that measurements are repeated with standard bonded strain gauges if accurate results are required. Stress distribution and the direction of principal stress can be obtained by simultaneous multi-point measurement using multiple Strain Checkers. Measurements on large on-site structures such as bridges or cranes, are obvious application examples.

Please ask for further details on this new device or for any advice you may need for any strain gauge measurements. We have the products and expertise to solve most applications.

Tel: 01527 854103 Fax: 01527 853267 Email: info@techni-measure.co.uk Web: www.techni-measure.co.uk

Who's Where ?

Dytran facility in the USA

Dytran Instruments Inc. were founded in 1980 and after moving to Chatsworth, California a few years later have since grown into one of the major manufacturers of piezoelectric sensors in the world. The entrance to their manufacturing facility is pictured here.

New sensors are being added all the time, so if you do not see what you want on their web site www.dytran.com please ask. If anyone should be in the Los Angeles area, you would be sure of a warm welcome.

Techni Measure on Show...

A list of exhibitions planned so far for 2008 follows, where we would be pleased to meet with anyone to discuss possible applications for our wide range of products. If you need tickets or further information then please let us know.

6 - 7th February
MANUFACTURING SOUTH at Farnborough

13 - 14th February
MTEC at Birmingham

4th March EIS INSTRUMENTATION at Cosford

9 - 10th April
INSTRUMENTATION NORTH at Leeds

22 - 24th April DRIVES & CONTROLS at Birmingham

10th September
EMEX at Teddington

Tech Note

What is ... Torque ?

Torque can be defined as a rotational force, or more correctly a tangential force acting at a distance from the axis of rotation, and can be described as either dynamic or static depending on whether there is any actual angular rotation involved. It is thus the product of force and distance, with typical units of torque being N.m or ft.lbs.

Generally methods used to measure torque can be divided into either reaction or in-line systems. A reaction torque sensor takes advantage of Newton's third law: - For every action there is an equal and opposite reaction.

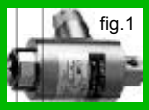
fig.1

The static torque of a mounted bolt head for example can be measured by a mechanical or dial torque arm or by fitting a sensor (Fig 1.) between the socket head and the handle. Alternatively, to measure the torque produced by a motor, it could either be determined how much torque is required to prevent the motor from turning (static/reaction), or the torque could be measured directly on the revolving shaft (dynamic/in-line). For static torque measurements on a motor, a mechanical arm would be attached to the body of a brake mechanism. The measured force on the outer end of the arm (usually measured by a load cell), multiplied by the distance from the axis of rotation, would be the torque. In-line torque measurements are made by inserting a torque sensor between torque carrying components, or by measuring the strain produced by the torque, directly from the surface of the shaft through the application of strain gauges. Measuring torque in this way however introduces the problem of getting the signals away from a revolving shaft. A commonly used method to make this connection between rotating sensors and stationary electronics is the slip ring. This consists of a set of conductive rings that rotate with the sensor, and a series of brushes that contact the rings and transmit the sensor signal. Another approach to making the connection between a rotating sensor and the stationary world utilizes an RF transmitter. These transmitters are used to remotely connect any sensor, whether force or torque, to its remote data acquisition system by converting the sensor's signal to a digital form and transmitting it to an RF receiver were it is converted back to an analogue voltage (Fig 2) or direct into a computer by USB connection (Fig 3). In-line sensors are also available, which have built in transmission systems so that the outer housing remains static for a direct cable output to recording instruments (Fig 4).


fig.2


fig.3


fig.4

Torque measurements can be important for safety reasons or for applications where specific levels of torque are required in certain assemblies or processes. These would include bolt or fastener mounting, motor and machine starting torques, or vehicle drive shafts or wheel torque measurements. Understanding the type of torque to be measured, as well as the different types of sensors that are available, is important for the accuracy of the resulting data, and appropriate advice is available from your Techni Measure sales engineer.