



## This Issue

Expanded Sales Team **P.1**

6DOF Recorder **P.2**

Spring Loaded Temperature Sensor **P.2**

WSDA-200 Wireless Gateway **P.2**

Strain Gauge Update **P.3**

649°C Accelerometer **P.3**

LXRS+ Wireless protocol **P.4**

## The latest by email

To ensure you always get the latest news on products and innovations we offer our popular updates by email option which includes the biannual TechniTalk.



Make sure you are always up to date by signing up via our website contact page or email [sales@technimeasure.co.uk](mailto:sales@technimeasure.co.uk).  
[www.technimeasure.co.uk](http://www.technimeasure.co.uk)

## Continued Techni Measure Expansion

Techni Measure are pleased to announce the addition to our team of two new technical sales engineers.

Malcolm Leahey joined us towards the end of May and is based with Andrew Ramage in our new Bristol office, with a focus on

supporting our customers in the South of the country. Malcolm has extensive years of technical sales experience across various sectors and particularly in the field of cable and

instrumentation connectors, so is already aware of many of the problems associated with the measurement world. This experience, coupled with our intensive technical training for the Techni Measure product range has Malcolm well equipped to support you.

In September, Dan Eaton joins our team at Head Office in Doncaster, and will initially work closely with Steve Whitaker across our customer base throughout the North of the country. Dan comes with experience in technical sales in the

field of industrial process control valves and we look forward to training him and quickly bringing him up to speed with our product range.

Steve Whitaker is retiring at the end of this year after a lifetime in the sensor business, the last 17 years



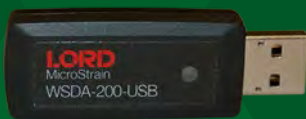
Dan a good and Steve a fond farewell.

You will also have the opportunity to meet our new team members at the upcoming series of exhibitions (see Exhibition page in the About sections of our website), at which we will be displaying our product range on our brand new display stand. As ever we look forward to meeting you and helping with your challenging applications.

of which have been with Techni Measure, and he will be missed. He will have a chance to introduce Dan to customers in the coming months, so please give welcome

## WSDA-200 Wireless Gateway

LORD MicroStrain have recently introduced their WSDA®-200-USB which is a USB stick design data acquisition gateway designed to configure, co-ordinate, and collect sensor data from LORD Sensing wireless sensor nodes for viewing, analysis, and storage. The gateway also facilitates precision sampling synchronization between sensor nodes by transmitting a continuous, system-wide timing reference known as the beacon, and thus provides seamless  $\pm 50 \mu\text{sec}$  node-to-node synchronization communication between the wireless sensor nodes and the host computer. They are compatible with LORD Sensing LXRS and the latest LXRS+ nodes which enables highspeed, synchronized sampling and lossless data throughput at rates up to 16 ksamples/s, albeit with a reduced sensor range. The dimensions of this new base station are 58.2 mm x 20.3 mm



x 10.8 mm, and it weighs just 17 grams. It can be supplied with a built-in antenna, or with an external antenna for use where the wireless communication environment may not be ideal for the built-in antenna and with the WSDA® -200-USB fitted directly into the computer port.



## New 6DOF Vibration Recorder

Dytran has introduced the VibraCorder™ II, a small, yet powerful, 6DOF vibration recorder. Model 4401A2 not only has a built-in triaxial MEMS accelerometer, but also a triaxial Gyroscope, making it capable of measuring and recording acceleration and orientation in three orthogonal directions as well as pitch, roll and yaw. These units include easily installed, user-configurable,



software that optimizes data collection while built-in firmware handles acceleration in three axes as well as gyroscope data on the removable Micro SD-card. Features of the VibraCorder™ II include multiple recording regimes (free run, triggered event, triggered free run, auto stop, etc.); several sampling rates available up to 4280 Hz; environmentally sealed with IP65 rating; mounted via mounting plate and screws; rechargeable LiPo battery or external power from 8-32

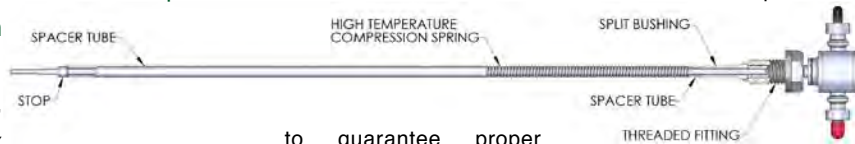
VDC; software controlled relay for the operation of external components such as cameras, indicator lights, and other accessories; multi-day recording capabilities; low battery indicator with emergency file save feature. The 4401A2 has a  $\pm 16g$  range, but there will be two other ranges,  $\pm 5g$  and  $\pm 200g$ , available soon. The VibraCorder™ II can operate in a variety of application environments, including automotive vibration testing, remote vibration measurement, rotating machinery diagnostics, impact testing, and recreational vehicles.

## Spring-loaded Temperature Sensors

Standard exhaust gas temperature sensors in 7F and 9F class turbines are at risk of premature failure due to vibrations caused by gas flows, input vibrations and thermal expansion mismatch which cause the sensor tips to break off in service

However, Conax Technologies have recently developed their patented Spring-loaded Exhaust Gas Sensors, which have a high temperature compression spring that is inserted between two spacer tubes so that through the spring's oscillating characteristics in dealing with stress and strain, the spring damps the vibration and keeps the temperature sensor tip stable within the radiation shield by ensuring a continuity of contact between the stop on the sheath and the seat of the radiation

shield. The bushing is also fabricated of material that reduces the possibility of seizure in the radiation shield. The cold end features a ceramic insulated junction box using two different sized studs or a keyed 2-pin circular connector



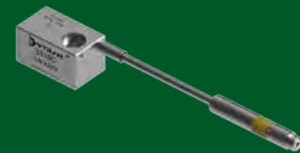
to guarantee proper installation every time. It also enables a convenient, stress-free orientation of the thermocouple junction box as it relates to the mating cable. This 100% hermetic thermocouple also has the latest more compatible materials to help eliminate open circuits during start up, thus eliminating false turbine trips and inconvenient down times. The new exhaust gas thermocouple has been subjected to rigorous qualification tests including vibration testing to 10 million cycles

of simulated on-turbine operation, thermal cycling the measuring tip 20,000 times between 660°C and room temperature, and thermal cycling the hermetic terminal head 600 times between 370°C and -54°C, passing all OEM qualification tests and meeting all design specifications required by the OEM. The sensor is manufactured with an all welded construction that is superior to brazing in prolonging the life of the thermocouple. Available exclusively from Conax, these Spring-loaded Exhaust Gas Sensors are interchangeable with OEM parts and tested to OEM specifications. When used in 7F and 9F class turbines, these sensors have proven to significantly increase sensor life and provide thousands of hours of field operation without failures.



## New 649 °C Accelerometer from Dytran

The Dytran model 3335C single axis charge mode accelerometer operates up to +649°C with allowable excursions to 700°C. The model has 1-2 pC/g sensitivity with a 2500Hz upper-frequency range and is installed using a 10-32 mounting screw with a lock-wire hole for securing the sensor to the structure. It features an integral 10ft hard line cable with 10-32 connector designed to survive harsh environments and transmit a reliable signal to the data acquisition unit. The 3335C is case ground isolated, hermetically sealed and is only 24.4 x 14.5 x 13.3mm



in size. Every aspect of this model is designed to provide high performance and long durability in the harshest high-temperature environments. Its base isolation, low mass, hermetically-sealed super alloy Inconel™ 600 housing and Dytran's patented Silver Window™ technology make it ideal for use in high-temperature applications. In addition, the use of smaller piezoelectric crystals makes the assembly more robust and able to resist thermal shocks.

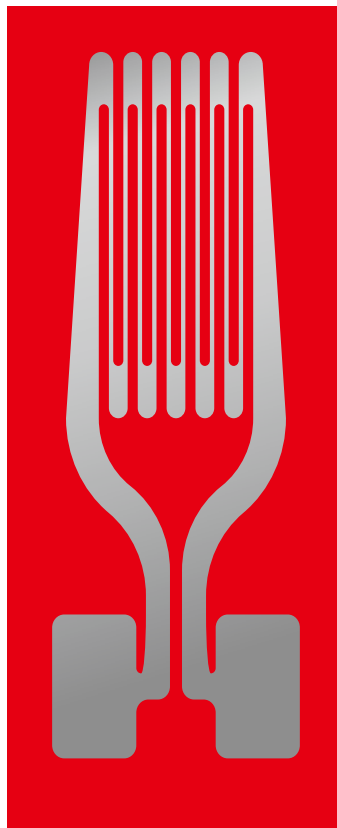


## New Strain Gauge Design by TML

TML have developed a new design of general purpose strain gauge, designed to improve the temperature range and fatigue life of the gauges whilst eliminating the lead content from the materials of construction, allowing these gauges to be CE marked & RoHS 2 compliant. The new design has been given the name GOBLET, since the pattern looks like a goblet, as well as being an acronym for "Gauges Of Brilliant Lifespan and Environmentally Thoughtful". They have also greatly improved the operational temperature range of the general purpose F series gauges from -20 to +80°C to -196 to +150°C, due to the use of special plastics for the gauge backing.

The innovation has in part been driven by the applicability of the EU RoHS 2 legislation which came into force for products within category 9 "industrial monitoring & control instruments" earlier this year and requires products to either be free from or contain minimal harmful substances, including lead. Removing lead from the strain gauge construction materials resulted in a shorter fatigue life of the strain gauge, however test results for the unique gauge pattern and special plastic backing of the GOBLET design show a fatigue life better than that of conventional strain gauges. Most of the general-purpose strain gauges in the TML "F" series are now available in this design, and they are supplied as RoHS 2 compliant products bearing a CE mark.

TML will continue to extend the GOBLET design to other series of their strain gauges, and the higher temperature "QF" series gauges are already being supplied. Many of the other series gauges are already compliant, or like the very high temperature "ZF" series, are exempt from the legislation due to the temperature requirement of the gauge.



GOBLET strain gauges have the letter B in the part number immediately after the series/grid configuration letters and before the gauge length and thermal compensation numbers – for example the general purpose linear 5mm strain gauge with mild

steel temperature compensation FLA-5-11 has now become FLAB-5-11. We continue to offer most of the TML strain gauges with integral lead-wires for direct connection to instrumentation, with lead-free solder being used to tin the ends of the wires and make the join with the gauge wires, and a -F is also appended to the end of the leadwire descriptor in the part number. There are many different types of lead wire available, in any length required and with either 2 or 3 wire versions. There are also several choices of lead wire to gauge joint to be considered, depending on the application conditions. Standard types have parallel vinyl lead wires joined to polyimide insulated gauge leads, with the solder joint being covered with the vinyl insulation of the lead wire, but there are other types available with a heat shrink seal for the joint, and twisted wires. Other accessories for strain gauge applications includes a variety of adhesives, coatings and terminal strips, as well as monitoring instrumentation. Many gauges are held in stock at Techni Measure for quick delivery, and our on-line store is also available to aid simple purchases. If you have any questions on the new strain gauge part number or availability, or any other aspect of strain gauge selection or application then please contact us. Full details are also available in the new TML strain gauge catalogue and we will be happy to send you a copy.

## Techni Measure Product Guide

The latest edition of our newly formatted product guide is now available in both print and PDF format. Recent changes include our offerings now organised by measurement parameter and technology to assist with selection of the correct items. For more details and to request your copy please contact us.



## Techni Measure On Show

We continue to exhibit at various shows across the country. We have a large selection of our current products along with live demonstrations available on our stand. Our team always welcome the opportunity to meet new and existing customers to discuss any products or applications where we may be able to assist. For information on which shows we will be attending please see the Exhibitions page on our website located in the 'About' section.

# TechNote: LXRS & LXRS+ Wireless protocols

This article will attempt to explain the difference between the LORD Sensing MicroStrain term LXRS and their new LXRS+ wireless communication protocol

Lossless eXtended Range Synchronized is the proprietary LORD Sensing data communications protocol used in their wireless sensor network. It was initially developed in 2013 to support applications including flight test and heavy machine monitoring, when applications such as these require large amounts of raw sensor data, synchronization between sensor nodes, and no lost data. The Lossless protocol allows the user to achieve near lossless data collection

of poor radio communication. This feature allows lossless performance in environments where the node achieves as high as 50% packet error rate. It also allows for operation in situations where the gateway and node move in and out of range of each other. The Lossless feature is only available when Synchronized is enabled. If the application requires consistent latency or can tolerate lost data, then the user can disable the lossless feature.

By selecting Synchronized, all the nodes in the network will periodically synchronize their time clocks to a beacon that is broadcasted by the WSDA gateway. Each beacon contains

user should deselect Synchronized if, either low latency, or the lowest possible power at slow sample rates, is required.

LXRS allows for dependable synchronized wireless sensing for both long term monitoring and high bandwidth test and measurement. LXRS+ is the second generation of LXRS, and has been developed to accommodate customers who want more data over their wireless networks, at shorter range. Customers using the V-Link-200 or G-Link-200 with the new WSDA-200-USB gateway may toggle their network into either LXRS or LXRS+ mode, depending on whether their application prioritises range or

Number of sensor channels per node →	1	2	4	1	2	4
<b>Sample Rate</b>	<b>LXRS</b>			<b>LXRS+</b>		
<b>4096</b>	1	--	--	4	2	1
<b>2048</b>	2	1	--	8	4	2
<b>1024</b>	4	2	1	16	8	4
<b>512</b>	8	4	2	32	16	8
<b>256</b>	16	8	4	63	32	16
<b>128</b>	31	16	8	127	63	32
<b>64</b>	63	31	16	255	127	63
<b>32</b>	127	63	31	255	255	127
<b>16</b>	127	127	63	255	255	255

in most environments by using data buffering, radio acknowledgments, and retransmissions. Each node buffers collected data and timestamps to an internal 2 Mbit FIFO buffer, then for each transmission, data is pulled from this buffer, and upon receiving the data packet, an acknowledgment is sent from the WSDA gateway that is providing the beacon. The node will retransmit data until this acknowledgment is received. Inherent overhead in the transmission scheduling protocol assures the node time to recover from periods

a UTC timestamp, allowing nodes to timestamp their collected data within an accuracy of +/- 50 μs. Each node will also buffer data and transmit this data in time-slots allocated prior to sampling. Using time-slots assures the transmissions will not "collide", or corrupt each other. It also provides a means for efficiently scaling the size of the network to allow as much data throughput as possible. If Synchronized is deselected, the node will not require a beacon time source and will transmit a data transmission for each measurement sweep. The

network throughput. LXRS uses the 802.15.4 protocol, has a -93.5 dBm Rx Sensitivity, and 4000 samples/s maximum for a single channel full scale. The new LXRS+ uses a proprietary protocol, has a -86.5 dBm Rx sensitivity, with 16000 samples/second maximum for a single channel full scale. The table shows the number of nodes that can be used simultaneously for continuous data transmission using each protocol at various sample rates.



Measurement and control systems for industrial and research applications