

May 1999

TECHNICAL BULLETIN

New Appointments



▲ We are pleased to announce that **Rob White** has assumed the position of Account Manager following the recent departure of Mauro Lantschner. Rob brings a strong technical background to the role, having previously worked in our Development Department and more recently as our Technical Support Officer. His experience will ensure customers receive the highest level of commercial and technical support through regular meetings and contact.

Mark Green has assumed overall responsibility for the Technical Support Department as Technical Support Officer. He will continue to work closely with all our customers and provide the latest information about new product developments and existing products.



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■ Technical Literature

A brief update on the manuals that are currently available:

4-Series Issue 2.2
5-Series Issue 3.0
7-Series Issue 1.2
Medical Issue 3.0
Automotive Issue 4.0

Future publications will include Millivolt CiTiceLs® & 4-20mA Transmitters; 3-Series and Operating Instruction manuals.

Data sheets are now available on our website and our Technical Support Team are always on hand to send the latest product information by fax, email or mail. We are also looking into the possibility of producing all our literature on CD-ROM. Watch this space!

■ Recent production delays

3CLH and 7CLH

Regrettably, there have been delays in shipping recent orders. These are the result of catalyst material problems. New catalyst batches have now successfully passed our internal quality checks and have been approved for electrode manufacture. The production department is working to full capacity to expedite overdue orders. We apologise for this delay.

4P-50 CiTipeLs

Production is still being restricted owing to lower than expected yields. Work is currently underway to resolve this issue and our Pellistor department will return to full production as early as possible.

MOX-1 and MOX-2

A recent problem with suppliers of mouldings for these sensors has now been resolved and production is now back to full capacity. We apologise to customers affected by this.

■ City Technology at Sensor '99



Sensor '99, the ninth International Fair & Congress for Sensors, Transducers & Systems, has just taken place in Nurnberg, Germany.

The largest exhibition of its kind in Europe, the show was exceptionally busy attracting visitors from all over the world.

City Technology were one of over 650 exhibitors at the three-day show and it was great to see so many of our existing and prospective customers there. Thank you for visiting our stand and we look forward to doing it all over again in two years' time.

■ Toxic Sensors 2 - Design Overview

4-electrode sensors

The use of 3-electrode sensors is commonplace in many applications but cross-interfering gases or zero-offset changes with temperature can compromise their overall performance. By introducing a fourth 'auxiliary' sensor, City has both maintained accurate sensor performance while also allowing the simultaneous measurement of two gases.

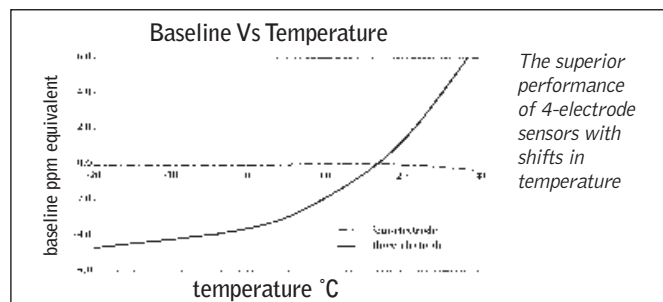
Overcoming cross interference

Take the example of electrochemical CO sensors. Most of these sensors show a significant response to hydrogen which can make the accurate measurement of CO difficult when hydrogen is present. City Technology's 4-electrode A3E/F Carbon Monoxide CiTiceL[®], however, with the auxiliary electrode, performs well. All of the CO and some of the H₂ reacts on the sensing electrode. Once the ratio of the responses on each electrode is known, a H₂-compensated signal can be obtained by subtracting the auxiliary signal from the sensing electrode signal with an analogue circuit or using a microprocessor with appropriate software.

Overcoming temperature effects

The baseline signal of most electrochemical sensors tends to increase exponentially with temperature, approximately doubling for every 10°C rise in temperature. For the majority of applications this does not normally present problems but for applications involving very low concentrations of gases, such as ambient O₃ or CO monitoring, any baseline shift with temperature could seriously affect the ability to measure these gases accurately.

The signals from both the sensing electrode and auxiliary electrode will both show similar responses to changes in temperature but because the auxiliary electrode is not exposed to reactive gas, its signal can simply be subtracted from that of sensing electrode. This is an effective method of compensating for any baseline shifts that would normally occur as a result of changes in temperature. Our A3CO Carbon Monoxide, A3ST/F Sulphur Dioxide and A3OZ Ozone EnviroceLs™ all use this technology allowing measurement in the parts per billion range.



Dual gas sensor

This 4-electrode technology allows CO and H₂S to be measured using just one sensor. With space at a premium inside portable safety instruments, this is a significant advantage for instrument designers. The 4COSH sensor operates in a similar way to other standard sensors except that it comprises two sensing electrodes: one for CO and the other for H₂S. The first sensing electrode oxidises the H₂S completely while the CO diffuses through to be oxidised by the second electrode. This 4-electrode design is able to produce two separate signals which allow two gases to be measured with one sensor.

■ Shorter lead times

In a bid to offer customers shorter product lead times City introduced the Japanese lean production system of Kanbans five years ago. Since that time we have been fine tuning the process to such an extent that 90% of all parts within our manufacturing facility are supplied in this way. Today we offer customers short lead times and an ex-stock option on most of our sensors. The Kanban system has enabled us to achieve more efficient levels of work in progress and to forge much closer relationships with our suppliers. Also, being able to manufacture on demand, means that sensors are stored for minimum periods prior to despatch.

'Kanban' can be defined as any material production control system which enables automatic replenishment of parts, used with minimal input of management and overhead systems. A well-known Japanese lean production system, Kanban literally means 'ticket'. Bins are set up at each

manufacturing point to hold a fixed quantity of parts expected to be used over a certain time period. This could range from as little as hours to days or weeks. The Kanban is the ticket that holds all the information about a bin. The Kanban system is used in component supply and process flow control.'

Three types of Kanban at City

Direct Feed Kanbans Stock levels on our production cells are monitored and replenished either by members of our materials department, or directly by our suppliers. This enables production staff to devote their time and skills to building sensors.

Internal Kanbans These are used to fulfill the demand from our production cells for sensor electrodes which are produced in-house.

Ex-stock Kanbans We vouchsafe to ship up to a certain quantity of many sensor types two working days after receipt of order.

For more information on our ex-stock facility or product lead times, please contact our Customer Services Team.

June '99 Issue:
Millivolt CiTiceLs[®] and
4-20mA Transmitters Sensor
testing at City

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