

Calibration

WINTER 2014

WORLD



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Calibration

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Trescal, UK
CML Enterprises Inc., Argonne, US

Beamex becomes ISA's strategic partner

Calibrating Wireless HART transmitters



CEO's Letter

On November 4th, 2013, ISA announced that Beamex, a leading calibration company with products, services and support in 80 countries, will be ISA's Strategic Partner for calibration.

Our mission at Beamex is to be the benchmark in providing innovative calibration solutions that improve efficiency and quality. To achieve our goal, continuous education and competence in leadership are required. This can only be done with the right partners, and ISA is the perfect match for us. We are very excited about this strategic partnership and look forward to working together in developing the calibration industry, teaching new concepts as well as having a positive impact on people working within the field of calibration.

Through the partnership, Beamex and ISA will work together to provide ISA members and customers with access to Beamex's world-class calibration resources, including publications, case studies, seminars, expert advice and more. Beamex will work with ISA to co-develop web seminars, which will be offered at no charge to ISA members and customers world-wide. As a vision leader in calibration techniques, Beamex is uniquely positioned not only to bring its message to ISA's market through integrated campaigns, but also to contribute to the knowledge and understanding of ISA members and customers in this important field.

An ever-increasing requirement for calibration – or more precisely, for the implementation of a calibration solution – stems from the demand for higher efficiency, reliability and quality of all industrial processes. Less people must make more with less errors and less (or without) paperwork. Efficient, automated calibration procedures, together with the most advanced integrated solution, are the best way to tackle the challenge.

Seamless integration of the calibration management software with an asset management system makes it possible to bring the best of 'both worlds' together and form the best solution. The benefits of this kind of integration are covered in more detail in one of the main articles of this issue. Even with the most modern solutions, the 'old and original' requirements for calibration – reliability, repeatability and accuracy of a measurement – still exist.

Enjoy your reading and remember that we appreciate your feedback very much – not only concerning this magazine!



Raimo Ahola
CEO, Beamex Group



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Phone +358 10 550 5000, Fax +358 10 550 5404, info@beamex.com, www.beamex.com

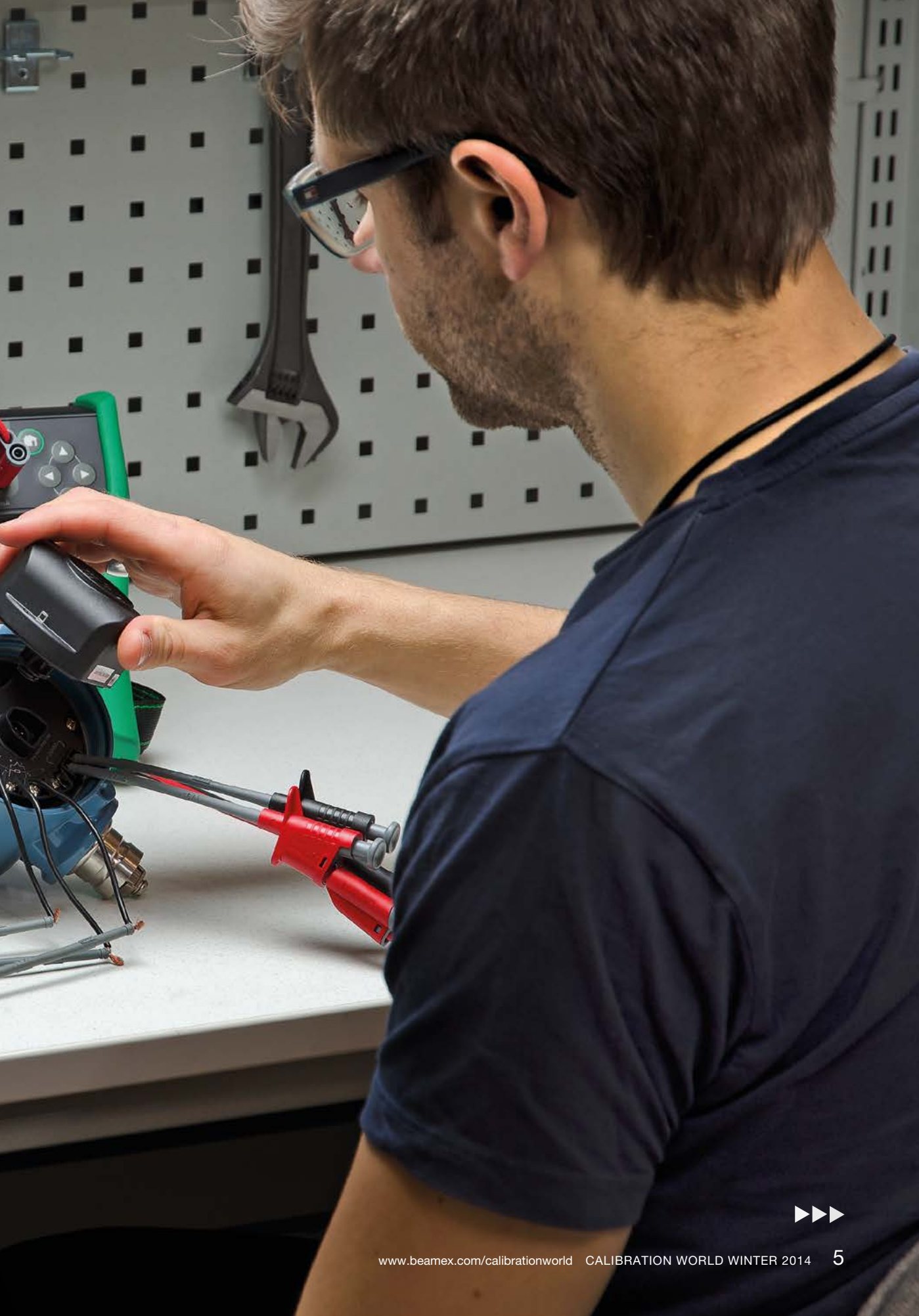
Address details and subscriptions calibrationworld@beamex.com

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Calibrating *WirelessHART* transmitters



***WirelessHART* transmitters are becoming more popular. What are they and how do they differ from wired HART transmitters? Why do the *WirelessHART* transmitters need to be calibrated and how is the calibration done?**





A very brief history of HART

The HART (Highway Addressable Remote Transducer) protocol was developed in the mid-1980s by Rosemount Inc. for use with a range of smart measuring instruments. Originally proprietary, the protocol was soon introduced for free use, and in 1990 the HART User Group was formed. In 1993, the registered trademark and all rights in the protocol were transferred to the HART Communication Foundation (HCF). The protocol remains open and free for all to use without royalties (Source: HCF).

HART is a digital communication protocol that enables communication with a field device. The communication allows you to read and write settings, read measurement results, receive diagnostic data, etc.

Wired HART signal

The wired HART Protocol uses Frequency Shift Keyed (FSK) digital communication signal superimposed on top of the standard 4-20mA analog signal. The wired HART transmitter is compatible with analog control systems.

WirelessHART

WirelessHART was approved and ratified by the HCF Board of Directors, and introduced to the market in September 2007, becoming the first officially released industrial wireless communication standard. The *WirelessHART* network uses IEEE 802.15.4 compatible radios operating in the 2.4GHz radio band. Each device in the mesh network can serve as a router for messages from other devices. The *WirelessHART* transmitter does not have an analog mA signal. It only has the digital signal which is available wirelessly, or through a screw terminal.

Since the transmitter is wireless, power cannot be fed via cables; instead, the transmitter needs a battery for

HART is a digital communication protocol that enables communication with a field device.

power. The battery life and communication speed are inversely proportional. Sometimes wireless transmitters can be programmed not to send a wireless signal very often which lengthens the lifespan of the batteries. The communication speed can also be increased if necessary. It is possible to use *WirelessHART* even on a control circuit. In practice, the *WirelessHART* transmitters are usually used in monitoring applications, which tend to change slowly, as well as in applications that are difficult to wire.

Any existing wired HART transmitter can also be made wireless by adding the wireless adapter available from many instrument manufacturers. If the control system is analog, reading only the mA signal, an additional *WirelessHART* host system can be built to process all of the additional information available in the HART devices. This can include information that is not available via the analog control system, for example, advanced diagnostics and predictive maintenance.

HART status and future

Over 30 million HART devices are installed and in service worldwide. The wired HART technology is the most widely used field communication protocol for intelligent process instrumentation. The HART share equals nearly half of the installed base of intelligent transmitters. Various studies estimate growth for HART in

the future as well. The new *WirelessHART* standard seems to be a new booster for the HART protocol. Data from studies predicts exponential growth for *WirelessHART* over the next 10 years.

What is meant by “calibration”

According to international standards, calibration is a comparison of the device being tested against a traceable reference instrument (calibrator) and documentation of this comparison. Although calibration does not formally include any adjustments, in practice, adjustments are possible and often included in the calibration process.

What is meant by “configuration”

Configuration of a HART transmitter means changing the transmitter settings and parameters. The configuration is typically done with a HART communicator or with configuration software.

It is important to remember that although a communicator can be used for configuration, it cannot be used for metrological calibration. Configuring parameters of a HART transmitter with a communicator is not metrological calibration and it does not assure accuracy. For a real metrological calibration, a traceable reference standard (calibrator) is always needed.

How to calibrate a wired HART transmitter

It is good to remember that a HART transmitter has two different outputs that can be used and calibrated: the analog mA output and the digital HART output. In most cases, customers still use the analog output.

To calibrate the analog output, generate or measure the transmitter input and at the same time measure the transmitter output. A dual function



calibrator able to handle transmitter input and output at the same time is needed, or alternatively two separate single-function calibrators; for example if someone wants to generate a pressure and measure it accurately with a

calibrator and at the same time measure the analog mA output with an mA meter. The calibration process changes slightly if you want to calibrate the digital HART output. Obviously it is still needed to generate/measure the

transmitter input the same way as for an analog transmitter, using a calibrator. To see what the transmitter digital HART output is, you will need some kind of



Calibrating *WirelessHART* transmitters



*All of the
WirelessHART
transmitters also have
screw terminals allowing
a wired connection
with the transmitter.*

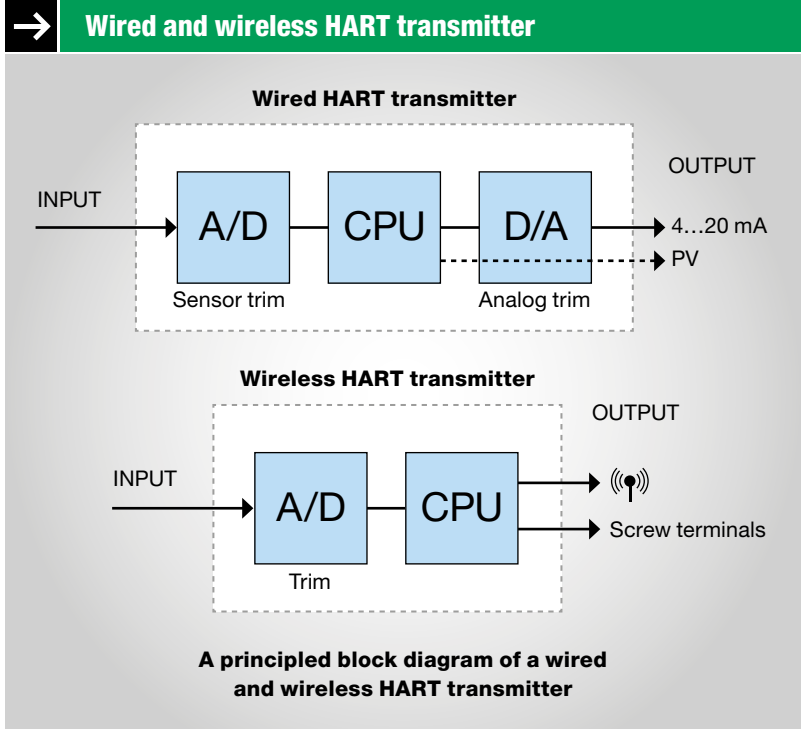
HART communicator with the ability to show the digital HART signal. A HART transmitter can have several digital variables depending on the transmitter type.

In the case of analog or digital output, you would progress through the range of the transmitter at a few points and record the input and output signals to document the calibration.

How to calibrate a *WirelessHART* transmitter

Firstly, it is good to remember that, although the *WirelessHART* transmitter has a different output than the wired HART transmitter, the *WirelessHART* transmitter also needs to be calibrated. As the calibration verifies the transmitter accuracy, i.e. the relationship between the physical input and transmitter output, the need for calibration does not change the output, whether wireless or wired, digital or analog.

The input of a *WirelessHART* transmitter needs to be generated (or measured) the same way as the analog or wired HART transmitter, using a reference standard or a calibrator. The output of the transmitter needs to be read at the same time. A *WirelessHART* transmitter does not have any analog output; it only has a digital output. The digital output can be read in two different ways.



One way is to read the output signal wirelessly, but the wireless signal can be very slow. Depending on the transmitter configuration, it may be transmitting its output only once per minute. In any case, the wireless signal is not really suitable for calibration. For example, in the case of a pressure transmitter calibration, there may be small leaks in the pressure connections or hoses, causing the input to change rather frequently. If the output is read very seldom, there could be a significant uncertainty and error between the saved calibration input and output data. Also, if there is any need to trim (adjust) the transmitter, or make any other configurations, these cannot be done wirelessly.

All of the *WirelessHART* transmitters also have screw terminals allowing a wired connection with the transmitter. While being connected via the screw terminals, the digital output can be read quickly enough for calibration purposes and any configuration or methods, such

as trimming methods, are accessible. Therefore, the *WirelessHART* transmitter should be calibrated with a wired connection to the transmitter's screw terminals.

The input can be generated or measured with a reference calibrator. The output needs to be read with a HART communicator that is able to read the transmitter via the screw terminals. Since the *WirelessHART* transmitters are made according to the HART7 standard protocol, a communicator able to support the HART7 standard is needed. If there is a separate calibrator for the input and communicator for the output, the readings will need to be manually written down and the calibration documented. However, if there is a calibrator and communicator built into one device, the input and output can be handled simultaneously with the same device. If the device also has a documenting feature, the calibration can be automatically documented without paper.

If a wired HART transmitter needs to be trimmed, the sensor section (A/D conversion), as well as the analog (D/A conversion) section, will also need to be trimmed. In the case of the *WirelessHART* transmitter, there is no analog section, so it is enough to trim the sensor section.

Why calibrate

A modern transmitter is advertised as being smart and very accurate. Sometimes people may say that there is no need for calibration at all because the transmitters are so “smart.” Why should smart transmitters be calibrated then?

First of all, changing of the output protocol of a transmitter does not change the fundamental need for calibration.

There are numerous reasons to calibrate instruments initially and periodically. The main reasons are:

- Even the best instruments do drift with time, especially when used in demanding processing conditions.
- Regulatory requirements, such as quality systems, safety systems, environmental systems, standards, etc.
- Economic reasons: any measurement has direct economic effects.
- Safety reasons: employee safety as well as customer/patient safety.
- To achieve high and consistent product quality and to optimize processes.
- Environmental reasons.

The Beamex MC6 Field Calibrator and Communicator

The new Beamex MC6 is a device that combines a field communicator and an extremely accurate multifunctional process calibrator.

With the Beamex MC6, the smart transmitter’s input can be generated/measured at the same time the digital output is read. Thus, they can be done



Example

■ Let’s take an example of calibrating an Emerson 648 *WirelessHART* temperature transmitter. The transmitter is configured for RTD measurement with sensor type Pt100 (Alpha385). Disconnect the RTD sensor and connect the MC6 to simulate the RTD sensor. Connect the MC6’s HART terminal to the transmitter’s screw terminals and configure the MC6 to read the Primary Variable (PV) of the transmitter, which is the digital output. The range to be calibrated is 0°C to 100°C (32°F to 212°F). Configure the MC6 to progress the input signal from 0 to 100 °C (32°F to 212°F) in steps of 25 %, stepping up and down. Then configure the MC6 to wait 10 seconds in each step to allow the transmitter to stabilize. Of course the transmitters damping should be taken into account when deciding the calibration delay. In completing these steps, we have programmed the maximum error tolerance to 0.5 % of the full scale.

When the connections are complete, calibration can begin. The calibration will go through the required input steps fully automatically, stopping for the delay, and then going on to the next step. Once the calibration is completed, a dialog will appear stating whether the calibration was successful or not (Pass/Fail). Next, save the calibration into the MC6’s memory. Later on, upload the calibration results to calibration management software to be saved in the database and print a calibration certificate if necessary. If the As-Found calibration failed, or you want to trim the transmitter, you can use MC6 HART communication. While trimming, it is possible to simultaneously simulate the required input with the MC6, so no other device is needed. Once the calibration is completed, run another automatic calibration procedure to perform an As-Left calibration.

simultaneously and the results can be automatically stored into the MC6 memory for later viewing or uploading to calibration software.

For configuration of the smart transmitters, the MC6 includes a field communicator for HART, *WirelessHART*, FOUNDATION Fieldbus H1 and Profibus PA protocols. All required electronics are built-in, including power supply and required impedances for the protocols.

The Beamex MC6 can therefore be used both as a communicator for configuration and as a calibrator to calibrate smart instruments with the

supported protocols.

While a normal HART communicator can be used to configure and read the HART digital output, it alone cannot be used to calibrate or trim transmitters. You will need an additional calibrator for that purpose, which leads to a situation where you need two separate devices, which lack the automatic calibration procedure and documentation. Therefore, a device such as the Beamex MC6, is superior for calibration of wired or wireless HART transmitters.

Calibration software solutions integrated with asset ma

More and more, companies are forced to focus on managing plant assets in an efficient way. Possessing many different computerized programs, maintenance and improvement of plant asset management systems has become a real challenge.

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More and more, companies are forced to focus on managing plant assets in an efficient way. Possessing many different computerized programs, maintenance and improvement of plant asset management systems has become a real challenge. The only way to improve business and to stay competitive is to integrate these systems to a higher degree than before. The communication between master data within the integrated systems becomes a crucial factor for success.

Integrated plant asset management systems play an important role in the process of continuously improving the utilization and automation of a company's critical maintenance and production resources, as well as in creating process harmonization. For international companies with facilities located worldwide, a common global integration solution of assets becomes even more essential.

Integrated calibration and asset management solutions

Beamex offers calibration solutions that can be integrated into a company's own plant asset management system or into one from e.g. SAP or Maximo. Beamex is also partners with Emerson, which enables us to offer an integrated solution that delivers the benefits of a complete automation asset management and top calibration management functionality.

Using an asset management system allows companies to reduce commissioning and maintenance expenses while improving plant efficiency and product quality. In process industries where lost production from slower startups and longer downtimes can cause millions of dollars in lost revenue, plant personnel need accurate, real-time information. For example, integrating the Emerson AMS Suite Calibration Connector together with Beamex CMX calibration software

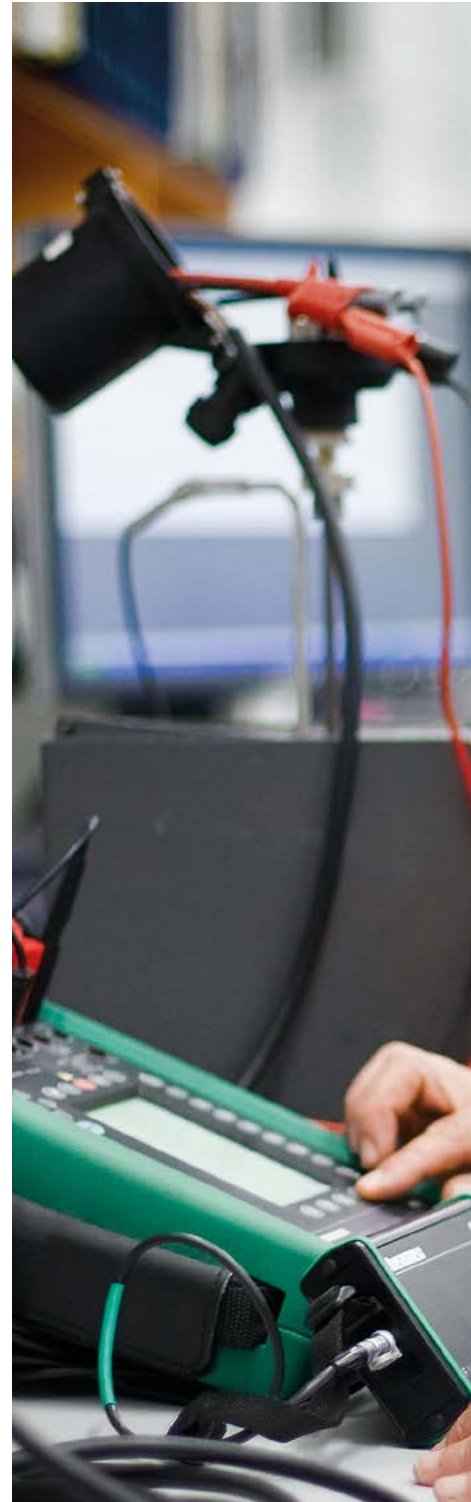
and the AMS Device Manager enables you to streamline calibration work processes. The AMS Device Manager delivers valuable diagnostics information already existing in a plant in a clear, meaningful way. This means plants can act before the process is affected by poor quality, or worse, a costly shutdown.

Calibration – an important aspect of asset health

Calibration systems are often critical because they have a direct impact on production. Therefore, regular calibration of instruments is common practice for many process manufacturers. Regular calibration maintains the credibility of measurements and the quality of process measurements. Some industries are more regulated than others and calibration schedules are necessary to maintain compliance, as instrument accuracy is critical to environmental regulations, product quality and safety. In such industries, companies may perform several thousands of calibrations per year. Calibrations are scheduled and documentation of every step in the calibration process is extremely important and necessary. The calibration records are verified according to traceable calibration references and industry-specific requirements.

With the implementation of an integrated calibration software solution as the supporting tool for automated calibration, calibrations can be fully automated. In the pharmaceutical industry, where several thousands of calibrations are performed yearly, a seamlessly integrated and automated calibration procedure results, according to studies, in significant time savings.

Calibration is one important aspect of asset health. Having calibration data integrated into an overall asset management system provides you with the full view of the factors affecting the





BENEFITS

■ **Integrating the calibration management system into plant asset management will streamline the calibration work processes and bring various benefits:**

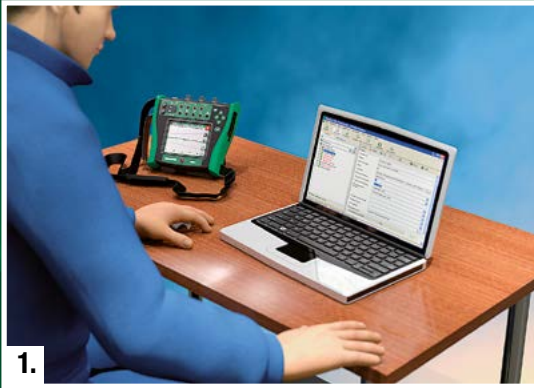
- Automatically synchronized data records between the calibration system and the asset management software
- Eliminated calculation and transcription errors, thanks to the paperless system
- Automated calibration documentation for regulatory compliance
- Scheduled calibration intervals based on historical sensor drift trends
- Combined overall asset management and calibration history

health of a given asset, enabling you to make smart decisions on maintaining all of your assets. With an integrated solution, device information is always synchronized, making it easier to manage calibrations and ensuring that you are always looking at the most updated information.





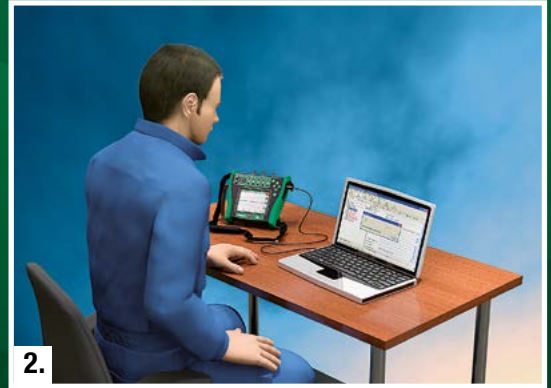
BEAMEX ICS INTEGRATED CALIBRATION SOLUTION



1.

The Beamex CMX alerts what needs to be calibrated and when

- Easy, fast and efficient
- No need to search archived paper files



2.

Download calibration procedures and instructions from the software to the MC6

- Fast procedure
- No pen, paper or notepads needed



5.

Create, store and manage calibration information safely and efficiently with the software

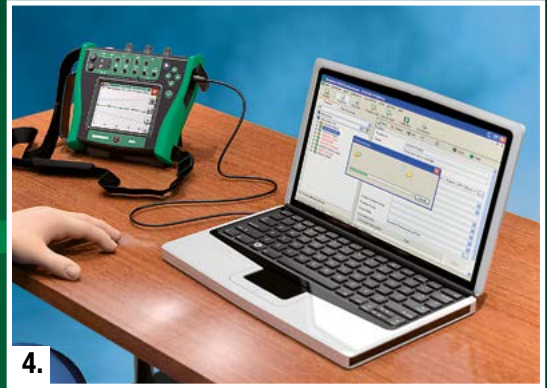
- All calibration data is stored and managed in the CMX database
- Calibration certificates, reports and labels in electronic format, on paper or both
- All documentation in the CMX is auditable and traceable (e.g. ISO 17025, cGMP, 21 CFR Part 11)



Integration to a maintenance management system

- Plant hierarchy and work orders are stored in ERP/CMMS (e.g. SAP, Maximo) and from there transferred to the CMX, which stores all calibration procedures, standards and results
- When calibration work has been performed, the CMX sends acknowledgement of the calibration back to ERP/CMMS

STEP-BY-STEP



3. Perform instrument calibration and data collection with the MC6

- The MC6 replaces many individual measurement devices and calibrators
- Automated calibration is fast

4. Upload calibration results to the software

- Automatically download calibration results back to the software
- Data transfer is fast and efficient, writing mistakes are eliminated



Calibration in hazar

This article discusses calibration in hazardous areas and what everyone needs to be aware of before entering into a hazardous area with calibration equipment. Other topics covered are flammable and combustible liquids, definition of a hazardous area, the types of industries where hazardous areas are found, the different levels of hazardous zones, regulations, equipment classification and various other practical and related issues.

A large industrial structure, possibly an offshore oil rig or a bridge under construction, is silhouetted against a clear blue sky that transitions to a warm orange glow at the horizon. A crane is visible on the structure. The foreground shows a body of water reflecting the light.

ious areas



Calibration in hazardous areas



There are many different levels of hazardous areas. There are also many different types of Ex-rated calibration equipment.

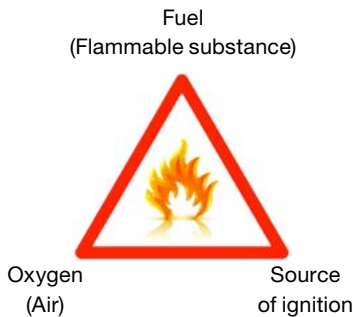
Fast forward bullets:

- What is a hazardous area?
- Brief explanation on the related legislation
- Which Ex calibration equipment can be taken to the Ex area?

What is a hazardous area?

A hazardous area is an area (indoors or outdoors) that contains, or may contain, flammable substances. The flammable substance may be a liquid, gas, vapor or dust. The area may contain a flammable substance all of the time, most of the time, or only in specific situations, such as during shut-downs or accidents.

In such a hazardous area, an explosion or fire is possible if all three conditions of the “Explosion Triangle” (below) are met. These three conditions are fuel (a flammable substance), source of ignition (or heat) and oxygen (air). The situation is often presented as a triangle; hence the name Explosion Triangle.



How to prevent an explosion

Keeping in mind the Explosion Triangle, we can conclude that one or more of the three elements must be eliminated. Many times, eliminating the flammable substance is not possible, and therefore the oxygen (air) or source

of ignition has to be eliminated. However, it is also often impossible to eliminate the air. Therefore, the most practical solution is to eliminate the source of ignition, spark or heat.

In the case of electrical calibration equipment, it can be specially designed to use in hazardous areas. There are many ways to design electrical equipment suitable for hazardous areas and this topic will be discussed later on. Calibration equipment is often designed in such a way that it cannot provide enough energy to cause the source of ignition, spark or heat.

Brief history of hazardous areas

Some of the first hazardous areas were discovered in the early coal mines. Being flammable substances, both the coal dust and the methane absorbed created a hazardous area. The lighting in early mines was produced by candles and torches, generating a source of ignition. This led to many accidents.

Later, when miners began to use electrical equipment (lighting, tools), many accidents occurred due to sparking or heating. Eventually, design standards were developed to guide the design process to prevent the sparking and heating of electrical equipment. This was the first “intrinsically safe” electrical equipment and it led the way to the standards compiled for equipment used in hazardous areas today.

Typical industries with hazardous areas

There are many industries that have hazardous areas. Some plants have large hazardous areas, while others have only small sections classified as hazardous areas. Typical industries with hazardous areas include chemical and petrochemical industries, offshore and on-shore oil and gas, oil refining, the pharmaceutical industry, food and beverage, energy production, paint shops and mining.

Since a flammable substance may be a liquid, gas, vapor or dust, there are surprisingly many different industries that may have some areas where these substances may be present during the normal operation or during shut-down. Even some seemingly safe industries may have hazardous areas.

In plants, all areas classified as hazardous should be clearly marked with the Ex logo:



Flammable and combustible liquids

There is often discussion about flammable and combustible liquids. But what are they precisely? Generally speaking, they are liquids that can burn. They may be gasoline, diesel fuel, many solvents, cleaners, paints, chemicals, etc. Some of these liquids are present in many workplaces.

Flashpoint and autoignition temperatures are also often discussed. Flashpoint is the lowest temperature of a liquid at which it produces sufficient vapor to form an ignitable mixture with air. With a spark or enough heat, it will ignite. Autoignition temperature is the lowest temperature at which a liquid will ignite even without an external source of ignition. Most commonly, flammable and combustible liquids have autoignition temperatures in the range of 572 °F to 1,022 °F (300 °C to 550 °C). However, there are liquids that have an autoignition temperature as low as 392 °F (200 °C) or less.

Based on their flashpoint, liquids are classified as flammable or combustible. Flammable liquids may ignite at normal working temperatures, while combustible liquids burn at higher temperatures. Often 100 °F (37.8 °C) is considered as the temperature limit.

Flammable liquids have a flashpoint below 100°F and combustible liquids above.

To be more precise, flammable and combustible liquids themselves do not burn, it is the vapors that burn. More precisely, it is the mixture of the vapors and air that burns. There are also limits of the concentration within which the mixture can burn. If the concentration of the mixture is too low (too thin) it will not burn; the same is true if the concentration is too high (too rich). The limits are known as lower and upper explosive limits (LEL and UEL).

It is good to remember that some liquids may have a rather low flashpoint. For example, gasoline has a flashpoint as low as c. -40°F (-40°C). It produces enough vapors in normal environmental conditions to make a burnable mixture with air. Combustible liquids have a flashpoint way above normal environmental conditions, and therefore they have to be heated before they will ignite.

Various protective techniques

As mentioned earlier, in order to prevent an explosion, one of the three elements of the Explosion Triangle should be eliminated. In practice, eliminating the source of ignition would be the most sensible.

There are various techniques in electrical equipment that make them

safer for hazardous areas. These different techniques fall into two main categories: eliminate the source of ignition (Exe, Exi) or isolate the source of ignition (Exd, Exp, Exq, Exo, Exm).

The table below briefly describes some of these different techniques:

The table also describes the letter that

Technique	Marking on equipment	Description
Exe	e	Increased safety
Exi	i	Intrinsically safe
Exn	n	Non incandive
Exd	d	Flameproof
Exp	p	Pressurized
Exq	q	(Sand/quartz) filled
Exo	o	Oil filled
Exm	m	Encapsulated

is written on the equipment classification. For example, a device with the Intrinsically Safe technique will have the “Exi” label.

Intrinsically safe technique

Exi “Intrinsically Safe” technique is the most commonly used and most suitable protective technique for electrical calibration equipment. Intrinsically safe equipment is designed for any situation; it will not provide enough energy to generate sparks and excessively high surface temperatures,

even in the case of a faulty device. The equipment is designed to be intrinsically safe.

Inside an Exi device, the Exm (“Encapsulated”) technique may also be used for certain parts of the equipment (as in a battery pack).

“Hot work permit”

Using non-Ex calibration equipment in a hazardous area may be possible, but it requires special approval from the safety personnel in the factory. Oftentimes, this also involves the use of safety devices, such as personal portable gas detectors, to be carried in the field while working. Using equipment rated Ex correctly is easier, as it does not require any special approvals. Naturally, the Ex-rated calibration equipment must be suitable for the hazardous area to which it is taken.

International / North American legislation and differences

The international standard family of IEC 60079 defines the different standards for related regulations.

The IECEx scheme involves international co-operation based on the IEC standards. The objective of the IECEx system is to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety. Today, there are approximately 30 member countries in the IECEx, including the USA.

The ATEX directive was introduced to unify hazardous equipment and work environments within the European Union. It was established about 10 years ago and is based on the directives introduced in the 90s.

SOME EXAMPLES OF FLASHPOINT AND AUTOIGNITION TEMPERATURES

Substance	Flashpoint	Autoignition temperature
Ethylene	-276.8 °F (-136 °C)	914°F (490°C)
Propane	-155.2 °F (-104 °C)	878°F (470°C)
Butane	-76 °F (-60 °C)	550.4°F (288°C)
Diethyl ether	-113 °F (-45 °C)	320°F (160°C)
Ethanol	61.9 °F (16.6 °C)	685.4°F (363°C)
Gasoline	-45.4 °F (-43 °C)	536°F (280°C)
Diesel	143.6 °F (62 °C)	410°F (210°C)
Jet fuel	140 °F (60 °C)	410°F (210°C)
Kerosene	100 to 162 °F (38 to 72 °C)	428°F (220°C)



Calibration in hazardous areas



Hazardous zones classification

The zone classification specifies how likely it is for the flammable substance to occur in the atmosphere in that area.

Classification has been developed to specify the different hazardous areas (Zones). See the table below.

Product category and Equipment Protection Levels (EPL)

In ATEX-directive Group II, equipment is divided into product categories specifying the use of the equipment in different zones. The product categories of the Group II equipment are specified as following:

- Product category 1 – Very high safety level. Can be used even in Zone 0 (and Zone 1 & 2).
- Product category 2 – High safety level. Can be used in Zone 1 and 2 (but not in Zone 0).
- Product category 3 – Normal safety level. Can be used in Zone 2 (but not in Zones 0 & 1).

In the IEC standards, the same thing is expressed using EPLs (Equipment Protection Level). EPLs are specified using nearly the same categories:

- EPL a – Very high safety level. Can be used even in Zone 0 (and Zone 1 & 2).
- EPL b – High safety level. Can be used in Zone 1 and 2 (but not in Zone 0).

THE CLASSIFICATION DEVELOPED TO SPECIFY THE DIFFERENT HAZARDOUS AREAS (Zones)

Zone (gas, vapor)	Zone (dust)	Description
Zone 0	Zone 20	Area in which an explosive substance in the atmosphere is present continuously or for long periods or frequently.
Zone 1	Zone 21	Area in which an explosive substance in the atmosphere is likely to occur in normal operation occasionally.
Zone 2	Zone 22	Area in which an explosive substance in the atmosphere is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

THE PRODUCT CATEGORIES/EPLS AND HAZARDOUS ZONES

Product category marking	EPL marking	Hazardous zone	Flammable substance	Can also be used in hazardous zone
1G	a or Ga	0	Gas, vapor	1 and 2
2	b or Gb	1	Gas, vapor	2
3	c or Gc	2	Gas, vapor	–
1	a or Da	20	Dust	21 and 22
2	b or Db	21	Dust	22
3	c or Dc	22	Dust	–

- EPL c – Enhanced safety level. Can be used in Zone 2 (but not in Zones 0 & 1).

The relationship between the product categories/EPLs and hazardous zones is shown in the table above.

According to the table above, if there is a need to use electrical equipment in a hazardous area classified as Zone 1, the product category 1 and 2 equipment can be used. If the area is Zone 0, only equipment in product category 1 is allowed. Again, if the Zone is 2, any product category (1, 2 or 3) equipment is allowed.

A product in category 1 has the number 1 in its ATEX marking, for example “II 1 G”. It also has a letter “a” in its marking for EPL, for example “Ex ia”.

Consequently, it is important to know the zones where the calibration equipment will be used and select the equipment accordingly.

Equipment grouping

Electrical equipment for explosive atmospheres according to the IEC 60079-0 standard is divided into the following groups:

Group I

Electrical equipment in Group I is intended for use in mines susceptible to firedamp.

Group II

Electrical equipment in Group II is intended for use in places with an explosive gas atmosphere other than mines susceptible to firedamp. Electrical equipment in Group II is subdivided according to the nature of the explosive gas atmosphere for which it is intended.

Group II subdivisions

- IIA, a typical gas is propane
- IIB, a typical gas is ethylene
- IIC, a typical gas is hydrogen

This subdivision is based on the maximum experimental safe gap (MESG) or the minimum ignition current ratio (MIC ratio) of the explosive gas atmosphere in which the equipment may be installed (see IEC 60079-20-1).

Equipment marked IIB is suitable for applications requiring Group IIA equipment. Similarly, equipment marked IIC is suitable for applications requiring Group IIA or Group IIB equipment.

Group III

Electrical equipment in Group III is intended for use in places with an explosive dust atmosphere other than mines susceptible to firedamp.

Electrical equipment in Group III is subdivided according to the nature of the explosive dust atmosphere for which it is intended.

Group III subdivisions:

- IIIA: combustible flyings
- IIIB: non-conductive dust
- IIIC: conductive dust

Equipment marked IIIB is suitable for applications requiring Group IIIA equipment. Similarly, equipment marked IIIC is suitable for applications requiring Group IIIA or Group IIIB equipment.

Temperature Class

The temperature class specifies the maximum surface temperature in the equipment. The temperature class is important to take into account and assure that it matches with the flammable gas that may be present in the plant's own hazardous area.

The temperature classes and temperatures are the following:

Temperature Class	Maximum surface temperature
T1	842 °F (450 °C)
T2	572 °F (300 °C)
T3	392 °F (200 °C)
T4	275 °F (135 °C)
T5	212 °F (100 °C)
T6	185 °F (85 °C)

Some equipment may also have a maximum surface temperature specified as a certain temperature being in between the classes.

Depending on the type of flammable



Calibration in hazardous areas



ZONES AND DIVISIONS

Zone	Division	Description
Zone 0	Division 1	Area in which an explosive substance in the atmosphere is present all the time.
Zone 1	Division 1	Area in which an explosive substance in the atmosphere is present in normal operation.
Zone 2	Division 2	Area in which an explosive substance in the atmosphere is present only in abnormal operation.

substance in a certain area, the flashpoint and autoignition temperatures will be different. The equipment selected to be used in that hazardous area must have a temperature classification that suits the substances in question.

The temperature class of a device is included in its marking, for example "T4".

North American legislation differences

Divisions

While in the IEC standard the hazardous areas are divided into zones, the North American system divides them into divisions. While numbers 0 to 2 are used in zones, numbers 1 and 2 are used in divisions. Zones 0 and 1 both are covered by Division 1.

The table above compares the Zones and Divisions.

The following is a brief summary of the relationship between the product categories/EPLs and hazardous area zones (IEC) and divisions (North America):

Product Category/EPL	Zone	Division
1/a	0	1
2/b	1	1
3/c	2	2

Explosion group

The North American legislation has one more explosion/equipment group

compared to the IEC. The comparison of the explosion groups (gas) of the North American and IEC are shown in the table below:

IEC	North America
IIC – Acetylene / Hydrogen	A – Acetylene
	B – Hydrogen
IIB – Ethylene	C – Ethylene
IIA – Propane	D – Propane

The most dangerous explosion group is identified as A in North America, while it is IIC in the IEC system.

Temperature class

In the North American system, there are more intermediate temperature classes.

The table to the left shows a comparison between the IEC/ATEX and North American temperature classes:

Environmental conditions

Finally, it is important to ensure that the equipment is suitable for the environmental conditions where it will be used. For example, the safe operating temperature of the device must match the temperature in which the equipment is used in a plant. In wet and dusty conditions, the protection rating of the equipment casing needs to be considered; this can be classified IP (Ingress Protection) or NEMA. Different protective techniques may

require different classification on the casing.

It is also important to remember that the casing of some Ex equipment is made out of non-static (semi-conducting) material to avoid accumulation of any static electricity. Depending on the classification, there are limits on the size (static) of labels that can be put onto the device. For example, Group I equipment, for Zone 0, with gas Group IIC, may have a label sizing an area of maximum 4 cm² (0.6 inch²). It is important to keep that in mind before attaching any identification labels on Ex equipment.

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TEMPERATURE CLASSES

IEC/ATEX	North American	Max temperature
T1	T1	842 °F (450 °C)
T2	T2	572 °F (300 °C)
	T2A	536 °F (280 °C)
	T2B	500 °F (260 °C)
	T2C	446 °F (230 °C)
T3	T2D	419 °F (215 °C)
	T3	392 °F (200 °C)
	T3A	356 °F (180 °C)
	T3B	329 °F (165 °C)
T4	T3C	320 °F (160 °C)
	T4	275 °F (135 °C)
	T4A	248 °F (120 °C)
T5	T5	212 °F (100 °C)
T6	T6	185 °F (85 °C)

→ Example of equipment marking



■ The example is an intrinsically safe process calibrator, model Beamex MC5-IS. This is a multifunction portable process calibrator, which can be used in hazardous area.

The product has the Ex marking Ex II 1 G, Ex ia IIC T4 Ga (Ta = -4 to 122°F (-20 to 50°C)). That marking is also shown in the picture as written in the front face of the device.

The table below describes the meaning of the device's Ex marking in practice.



THE EX MARKING CODE

Code	Description
Ex	Ex-certified product
II	Equipment group II (non-mining)
1	Product category 1 (can be used in zone 0)
G	Explosive atmosphere caused by gases
Ex	Ex-certified product
ia	Intrinsically safe (i), level of protection ia
IIC	Application above ground (II), Gas group C
T4	Temperature class
Ga	EPL Equipment protection level Ga
Ta	Safe operating temperature

Trescal, UK

Trescal uses the new Beamex MC6 for extreme accuracy calibrations for

Trescal is a global specialist in calibration and measurement services for the industry. Metrology services include calibration, maintenance and repair of test and measurement equipment, inventory management software solutions.

In 2012 Trescal was present in 16 countries, with a 157 million euro turnover business consisting of 62 calibration laboratories, 90 customer satellite facilities, 1,500 employees and 25,000 customers. In the UK, Trescal has the most extensive UKAS accredited technical capability and employs 360 people, of which 250 are qualified engineers and technicians across a wide range of instrumentation and measurement disciplines.

The centre of excellence for the Trescal Equipment Managed Services (TEMS) resides in the UK providing Customer Test Equipment Asset and Inventory Management and OEM Supply Chain Management. Neil Hoskins is Deputy Calibration Manager at Trescal's facility near Coventry, managing test equipment assets and providing in-situ calibration services for an aerospace giant that provides integrated power solutions for customers in civil and defence aerospace.

Accuracy and stability of the instruments are extremely important

The majority of calibration activities performed by Trescal for their aerospace customers are related to thermal processing equipment used for heat treatment of aerospace metal components. The most pertinent specification for such calibration work is provided by the Aerospace Metal Specification AMS2750, frequently audited by National Aerospace and Defense Contractors Accreditation Program (NADCAP), which covers the pyrometric requirements for thermal processing equipment used for heat treatment; specifically, temperature

sensors, instrumentation, thermal processing equipment, system accuracy tests (SAT) and temperature uniformity surveys (TUS). Within AMS2750, there are regulations controlling the calibration accuracy of measurement instruments for various applications.

The accuracy and stability of the instruments used are extremely important, as errors can lead to variations in aircraft component product quality which in turn could lead to production downtime, product quarantine, or even the grounding of aircraft.

Usually aerospace component heat treatment furnaces are equipped with thermocouples, temperature control systems and temperature recording equipment each of which complies with regulations in AMS2750. These furnaces are regularly checked for temperature uniformity by the temperature control systems and the temperature control systems are, in turn, frequently checked for accuracy. These SATs are a critical check on system accuracy, typically performed weekly to identify early signs of system accuracy changes or drift. The accuracy and stability of the instruments used for the SAT are extremely important, as errors can lead to variations in aircraft component product quality, which in turn could lead to production downtime, product quarantine, or even the grounding of aircraft. As Neil says, "Getting these SATs wrong is not an option".



No surprises wanted, reliable history trend analyses are crucial

For many companies manufacturing components such as fan blades, fan casings, fuel systems, landing gear and many others, the critical weekly SAT checks are completed by Trescal using the Beamex MC2 TE temperature and electrical calibrator and the Beamex



MC2 MF multifunction calibrator with added pressure measurement capability for performing pressure calibration of pressure gauges and transmitters. Trescal uses the Beamex MC5 and the MC6 calibrator to calibrate the furnace temperature control system elements and data recording devices every 3 months.

Neil constantly reviews the test

equipment used for TUS, SAT and instrument calibration to make sure it is accurate enough, and, equally important, stable enough. Each individual calibrator's calibration history is recorded and analysed to ensure that the calibrator is within the specification limits and will remain within the specification limits with a high degree of confidence until the next SAT or calibration event. Neil says, "We record at least 5 calibration events, and sometimes up to 2 years of data, before we can be sure that a calibrator can be considered stable and fit for the purpose. This calibration history is more valuable to us than the monetary value of the test equipment".

"We record at least 5 calibration events, and sometimes up to 2 years of data, before we can be sure a calibrator can be considered stable and fit for the purpose. This calibration history is more valuable to us than the monetary value of the test equipment", Neil says.

Over the years, Neil has acquired significant calibrator accuracy information which has proven that the MC2 and the MC5 are fit for Trescal's purposes and adhere to its requirement to meet AMS2750. More recently, the MC6 calibrator has also passed the stringent tests of both Neil and Trescal. Particular attention is paid to the accuracy of the calibrator's internal reference junction. Neil comments, "The accuracy of the reference junction



SOLUTION

Description

- Beamex MC6 advanced field calibrator and communicator
- Beamex MC5 multifunction calibrator
- Beamex MC2 multifunction calibrator

Main benefits

- Extreme accuracy
- Reliability
- History Trend analyses
- Ease of use

in the MC2, the MC5 and the MC6 across the working range of the calibrator is excellent". Neil's considerable data on the MC2, the MC5 and the MC6, coupled with the excellent feedback his field-based technicians provide on the robustness and reliability of the Beamex calibrators, have meant that the MC2, the MC5 and now the MC6 are placed on the Trescal Approved Product List (APL) and remain Neil's preferred choice for calibration.

Neil's confidence in the Beamex calibrator range has led to his recommendation of Beamex products for similar use at a number of different Trescal facilities around the world. He also recommends Beamex products to many of Trescal's customers. When asked for a response on what the Beamex experience means to Neil, and Trescal, he replies, "As Deputy Manager of a calibration facility, what I want in a calibrator is something that gives me no surprises, an instrument that does what it is supposed to do and can be relied on in complete confidence to deliver accuracy, functionality and ease of use time after time".

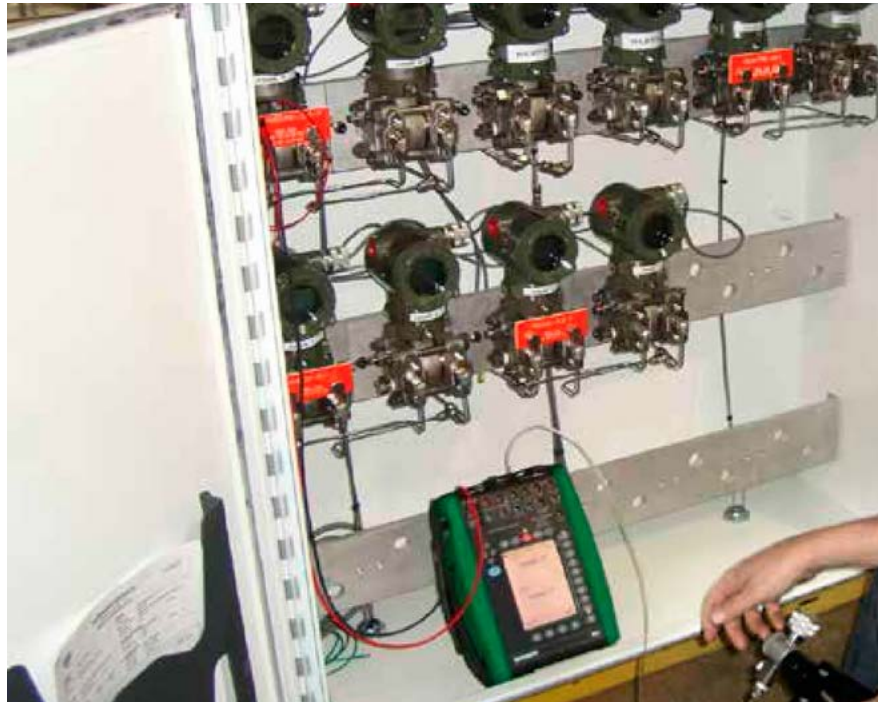
CML Enterprises Inc. Argonne,

Maximizing productivity and creating a solid documentation system

CML Enterprises Inc. (CML) specializes in process control instrumentation including calibration services and repairs. CML operates an in-house repair and calibration shop as well as on-site plant services. Calibration services and repairs are a very necessary function to their customers to keep instrumentation running properly. CML utilizes Beamex MC5 multifunction calibrator extensively to calibrate devices for customers during semiannual or annual maintenance outages at various manufacturing and utility facilities. They also utilize the Beamex CMX Professional calibration management software to provide detailed documentation.

CML operates an in-house repair and calibration shop as well as onsite plant services. Calibration services and repairs are a very necessary function to their customers to keep instrumentation running properly.

One of the U.S. Department of Energy's largest national laboratories for scientific and engineering research is Argonne National Laboratory (ANL), located just outside of Chicago. At the location, over 200 research projects conducted by fourteen research divisions, seven national scientific user facilities, nine centers and joint institutes are undertaken. Advanced Photon Source (APS) is the biggest of Argonne user facilities comprised of three research divisions. The APS is one of the



Manager Rob Lefley uses an MC5 calibrator and a pump to calibrate a pressure transmitter.

most technologically complex machines in the world. This premier national research facility provides the brightest x-ray beams in the Western Hemisphere to more than 5,000 scientists from around the United States and the world. These scientists come to the APS from universities, industry, medical schools and other research institutions.

Calibration service with Beamex instruments

CML was chosen as ANL's calibration provider. Their role in the project at ANL is to perform calibration, and document and manage all calibration information as it relates to the Yokogawa DP Transmitters within the APS facility. Efficient and safe use of the Beamex MC5 multifunction calibrator with the CMX Professional calibration

management software created quality operations and valuable documentation.

Rob Lefley, Manager at CML, and responsible for executing CML's calibration program. Personal experience with Beamex equipment led Rob to choose Beamex as the calibration vendor for CML. "Back in the mid-90s, with my previous employer, I personally had purchased and used the Beamex MC5 multifunction calibrator and CMX software products with very good results. So when CML decided to move into the calibration business, Beamex was the first and only place I called," Rob explains.

Critical procedures

As part of the personnel safety system (PSS) at APS, which is designed to prevent radiation exposure, the



CML and ANL have both maximized their productivity and created a solid documentation system through the use of Beamex equipment and software.

instrumentation for resistivity and PH monitoring. Beamex calibrators allow calibration to be done in-place without the need to remove transmitters, saving considerable time and funding. Rob explains, “The ease of use and the fact that I can be completely mobile with all the portable equipment, makes it very convenient to take it to a customer site and perform the necessary calibrations of their instruments, return back to our shop, download the information and print out the calibration certificates.”

Quick and efficient calibration

A specific APS data base is designed and maintained by CML using the Beamex CMX calibration management software. ANL supplies CML the with the location, tag number, chain A/B, serial number, high pressure range, and high flow range in GPM. All of this information is entered into the CMX along with the model number and any additional notes or information as required. All transmitter information is then downloaded to the MC5 multifunction calibrator to be used in the field.

Each transmitter is disconnected from their respected impulse lines and hooked up to the MC5 and a hand-held pressure source. A three-point up-and-down calibration (0.50 % and 100 %) is performed by applying actual input pressure in inH2O to the transmitter and

equipment protection system utilizes high-accuracy differential pressure transmitters to ensure sufficient water flow through critical components.

It is critical that the PSS system functions properly and therefore the performance of the system must be verified annually and calibration of the transmitters performed tri-annually. Because APS operates continually on 24-hour basis, with the exception of three one-month maintenance periods per year, 180 PSS transmitters are calibrated in 60 unit batches during the maintenance periods. In addition to transmitters in the PSS system, over 300 units are used throughout the APS for measuring flow that is then used for critical systems interlocks.

Due to the success of the calibration process in the PSS systems, consideration is given to Beamex equipment to calibrate many critical differential pressure transmitters, RTD/transmitter combinations and water quality

→ SOLUTION

Description

- Beamex MC5 multifunction calibrator
- Beamex EXT600 pressure module
- Beamex CMX Professional calibration management software package
- Beamex PGM / PGV pump kit
- Beamex PGXH hydraulic hand pump kit

Main benefits

- Ease of use
- Portability
- Versatility

recording the mA output, which will equate to a specific sq. ft. flow rate. The “As Found” and “As Left” results for each transmitter is saved on the MC5 and uploaded to the Beamex CMX calibration software. Calibration certificates are printed and/or stored electronically as PDF files. They are provided to ANL for full traceability.

Being a manager in a service company, Rob recognizes the importance of customer support. “Our overall experience has been very positive; our customer is very satisfied with both CML and Beamex. We have got great support from the Beamex Team in Atlanta and Colorado,” Rob explains. Recently, Rob performed 60 documented calibrations in 2 days. This is the largest amount of instruments that CML has calibrated in such a short period of time. Although it took hours of preparation, Rob is now set up to perform “Round 2” of 60 calibrations. All in all, CML and ANL have both maximized their productivity and created a solid documentation system through the use of Beamex equipment and software.

ISA announces Beamex as ISA premier strategic

■ ISA announced that Beamex, a leading calibration company with products, services and support in 80 countries, will be ISA's Strategic Partner for Calibration.

Through the partnership, Beamex and ISA will work together to provide ISA members and customers with access to Beamex's world-class calibration resources, including publications, case studies, seminars, expert advice, and more. Beamex will work with ISA to co-develop custom web seminars, which will be offered at no charge to ISA members and customers world-wide. Beamex will also have the opportunity to host events for ISA training students; to provide guidance and insight into important calibration topics in conjunction with ISA's training development team; and to donate equipment and resources for ISA's educational offerings related to calibration. As a thought leader in calibration techniques, Beamex is uniquely positioned not only to bring its message to ISA's market through integrated campaigns, but also to contribute to the knowledge and understanding of ISA's members and customers in this important field.

Beamex specializes in calibration for pressure measurement, electrical measurement, frequency measurement, and temperature measurement. The company's team of experts also focuses on intrinsically safe calibrations, calibration software, and pressure generation. End users around the world use Beamex's suite of products, including portable calibrators, calibration software, workstations, temperature blocks, and accessories.



2013 ISA Society President Terrence G. Ives and Beamex Inc. President Greg Summers announce Beamex as ISA's Strategic Partner for calibration.

With nearly 40 years of experience in manufacturing and developing calibration equipment and systems, Beamex has developed a reputation for uncompromising quality standards and world-class calibration solutions, and more than 10,000 companies are currently utilizing their products and services.

"Quality and precision are two of the

most important characteristics of calibration solutions, and Beamex's suite of products and services is among the best in the world. Accuracy, reliability, and functionality are more than marketing lingo for Beamex – the company strives to bring these characteristics into every part of its operations," said ISA Corporate Partnerships Manager Jennifer

partner for calibration



Infantino. “Our partnership with Beamex will allow them to show our members and customers what they’ve been working on for almost 40 years – and it will give our audience a chance to benefit from the high-quality educational materials and resources Beamex has developed.”

“Our mission at Beamex is to be the benchmark in providing innovative

calibration solutions that improve efficiency and quality. To achieve our goal, continuous education as well as the capability to lead the industry is required. This can only be done with the right partners and ISA is for us, a perfect match. We are very excited about this strategic partnership and look forward to working together in developing the calibration industry, teaching new concepts as well as having a positive impact on people working within the field of calibration,” states Raimo Ahola, CEO of Beamex.

The ISA Corporate Partnerships Program offers companies a customized, tailored approach to sponsorship within the organization. Partnership packages include year-round promotion, prominent association-wide access and recognition, and turnkey service from a dedicated team of professionals. Companies can bundle ISA products and services with marketing opportunities, providing a more streamlined approach to corporate sponsorship. Strategic partners enjoy an exclusive platform for their partnership term, building all of the elements of their package around one central concept; in Beamex’s case, calibration. Thought leadership, resource sharing, and education are important opportunities within a strategic partnership. For more information about ISA’s Corporate Partnerships Program, visit www.isa.org/partnershipsoverview.



About ISA

■ Founded in 1945, the International Society of Automation (www.isa.org) is a leading, global, nonprofit organization that is setting the standard for automation by helping over 30,000 worldwide members and other professionals solve difficult technical problems, while enhancing their leadership and personal career capabilities. Based in Research Triangle Park, North Carolina, ISA develops standards; certifies industry professionals; provides education and training; publishes books and technical articles; and hosts conferences and exhibitions for automation professionals. ISA is the founding sponsor of The Automation Federation (www.automationfederation.org).

Beamex establishes subsidiary in France

■ Beamex, one of the world's leading providers of calibration solutions, has established a subsidiary in France. The new subsidiary, Beamex SAS, will increase Beamex's presence and ensure high-quality customer service to the company's customers in France.

Beamex has been providing calibration equipment, software and systems for customers in the processing industry in France already for decades and it has already established a strong market presence in the country. "We consider France as one of the most important markets for calibration equipment, software and systems in Europe and in the world. Even though we have operated successfully in France through independent distributors, we are now in a situation, where establishing a subsidiary was the natural next step for us in order to increase our presence and ensure high-quality service to our customers", Raimo Ahola, CEO of Beamex Group, explains.

Beamex SAS has already started its operation and it operates as a sales, service and support company for Beamex's customers in France. Beamex SAS is located in Lille and its CEO (Président) is Alex Maxfield.



Raimo Ahola
CEO Beamex
Group and
Alex Maxfield
CEO Beamex
SAS are very
positive about
Beamex's sales
in France.



New functionality for Beamex MC6



■ Beamex has recently launched a new firmware update, version 1.30, for the MC6 field calibrator and communicator. This is the third firmware update made available for the MC6, which was launched in early 2012.

The new firmware adds new, beneficial functionality to the MC6. The main features include:

1) New 'Group Calibration' functionality has been added. This allows the user to calibrate multiple instruments simultaneously. There are many practical applications for this functionality, for example when calibrating a measurement loop comprising a transmitter, local indication and DCS indication. These can be now calibrated at the same time with only one calibration cycle. This saves a lot of time and makes calibration even more efficient.

2) Communication drivers have been added to communicate with selected Ametek/Jofra and Fluke/Hart scientific temperature controllers. This makes it possible to automate temperature calibration with the MC6 and the mentioned temperature blocks, making the temperature calibration more efficient, while the automatic documentation improves the quality of results.

3) New features have been added to the already versatile Data Logging functionality of the MC6. For example, it is now possible to make customized step or ramp generation/source during the data logging. This is also possible while controlling a temperature or pressure controller during the data logging.

Also, several other minor improvements have been added to the

new firmware. It can be downloaded free of charge from the Beamex website. A more detailed release note is downloadable together with the new firmware.

Just six months ago, the previous firmware update was introduced for MC6. This version added new functionality mainly for the Field Communicator section of the MC6. It became possible to read all the configurations from a HART/Fieldbus transmitter and save them in the MC6 or upload them to a PC.

MC6-related PC tools

■ Several PC tools for the MC6 have been updated with new versions as well. These tools include Beamex MC6 Data Log Viewer, Beamex MC6 Device Description Installer and Beamex MC6 Fieldbus Configuration Viewer. The new versions introduce some new functionality and fix known issues. The new versions of these tools can be downloaded free of charge from the Beamex website.

Device Description packages

■ New Device Description (DD) packages have been released for MC6 as well. These are available for HART, FOUNDATION Fieldbus and Profibus protocols. The new DD packages are downloadable from the Beamex website.

Learn more about Beamex's participation in different events



■ Beamex participates in different types of events related to the industry. Industry-specific events, such as seminars, table-top exhibitions, roadshows and user group meetings are forums where Beamex is able to emphasize the Beamex experience, quality, expertise and branding in a face-to-face customer environment.

Roadshows

Beamex arranged its own roadshow when launching the MC6 in 2012. The roadshow visited 17 different countries in Europe during a period of 2.5 months. The main purpose of the roadshow was to present Beamex's complete product range face-to-face near the customers.

Roadshows have also been arranged locally with great success. Beamex's distributor in Italy, Danetech srl arranged its own roadshow in June 2013. Supported by Danetech and Beamex, the roadshow van toured in Italy during the entire month of June. Covering approximately, 3 500 km, the roadshow started in Milan and made stops in Tuscany, the area of Rome, Sicily, Adriatic coastal area, as well as the Ravenna and Ferrara petrochemical

sites. The van was equipped with a workstation and the complete range of Beamex portable calibrators and CMX software.

Danetech's Sales Manager Paolo Pria explains enthusiastically, "The Roadshow has been the perfect opportunity to show the complete Beamex product range in most of the industrial areas around Italy, in chemical, petrochemical, pharmaceutical, power generation, oil and gas and service companies. We have visited an immense number of customers with the intention to demo and receive orders. We have identified interesting new sales opportunities, and we strongly believe that this is an important way to promote calibration products and the Beamex philosophy. We are definitely considering repeating the roadshow in 2014 also".

User group meetings and customer seminars

User group meetings and customer seminars are important value adding events. They often last half a day or one entire day. Guest speakers from outside of Beamex have been an appreciated ingredient presenting metrology from

another perspective. Small workshops during the seminar day have also been very rewarding.

Table-top exhibitions and industry-specific events

Beamex has participated in a couple of industry-specific events. The main purpose of which is to network with others in the same industry. The day before the event starts there is usually an ice-breaker session for the participants. This lowers the barrier to exchange ideas and comments during the event. The event agenda contains various types of presentations and case stories by the invited companies and sponsors. The agenda also includes round-table discussions, which involves a discussion leader who chooses a topic in advance and then it is discussed in small groups.

PLEASE CONTACT
marketing@beamex.com for more
information regarding arranging
seminars, roadshows or an
industry-specific event.

Celebrating 20 years of accredited calibration

■ The Beamex factory in Pietarsaari Finland has had a calibration laboratory for more than 35 years.

The Beamex calibration laboratory in Pietarsaari, Finland was accredited on 19th December 1993. In December 2013, Beamex is celebrating 20 years of continuous accreditation of the calibration laboratory.

“Having our own accredited calibration laboratory is a crucial and fundamental aspect of our operations, since we manufacture high-accuracy calibration equipment”, says Mr. Pasi Kauppila, who has been the Chief of the calibration laboratory during its 20 years of accreditation.

All Beamex calibrators automatically include an accredited calibration certificate when delivered from the factory. This is another credibility argument for Beamex calibrators and is beneficial for customer, as it saves them time and money.

Today Beamex calibration laboratory also performs many re-calibrations for Beamex and non-Beamex equipment.

The calibration laboratory accreditation is based on the International EN ISO/IEC 17025:2005 standard.

Details of the accreditation are on the Beamex and FINAS (Finnish Accreditation Service) websites.

Back in 1993, accredited quantities included pressure and DC electrical signals. Today, the Beamex calibration laboratory is accredited for DC voltage, DC current, resistance, frequency, gauge pressure, absolute pressure and temperature.



Toni Alatalo, Calibration Engineer, preparing the triple point of water.



Pasi Kauppila, Chief of the Beamex accredited calibration laboratory, checking calibration results.

Beamex PG pressure generators



To complement our integrated calibration solutions we have extended our range of calibration pumps. With precision and performance in mind, interchangeable across our range of pressure calibrators ranging from -0.95 to 700 bar the Beamex PG range are a fast and reliable way to generate pressure.

beamex
WORLD-CLASS CALIBRATION SOLUTIONS

www.beamex.com
info@beamex.com



PGV
0...-0.95 bar
0...-13.7 psi



PGM
0...20 bar
0...300 psi



PGXH
0...700 bar
0...10 000 psi



PGPH
-0.95...140 bar / -13.7...2000 psi



PGL
-400...400 mbar / -160...160 iwc

Beamex in brief

Beamex is a leading worldwide provider of calibration solutions that meet even the most demanding requirements of process instrumentation. Beamex offers a comprehensive range of products and services — from portable calibrators to workstations, calibration accessories, calibration software, industry-specific solutions and professional services. Through Beamex's partner network, our products and services are available in more than 80 countries.

Learn more about Beamex products and services

www.beamex.com

Brochures, product demonstrations and quotations

info@beamex.com

www.beamex.com/request (online request form)

Software support

support@beamex.com

Re-calibration and service

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Beamex products and services

Portable calibrators

Beamex's range of portable MC calibrators for field calibration is known for accuracy, versatility and meeting both high and uncompromised quality standards.

- MC6 advanced field calibrator and communicator
- MC5-IS intrinsically safe multifunction calibrator
- MC2 series
- MC4 documenting process calibrator
- MC2-IS intrinsically safe multifunction calibrator
- FB/MB temperature dry blocks
- POC6 automatic pressure controller

Workstations

A workstation can be considered ideal when most of the maintenance and calibration tasks are performed in the workshop.

- MCS200 workstation
- MCS100 workstation
- MC5P calibration host module

Accessories

Beamex's calibration accessories complete your investment in calibration equipment.

- External pressure modules
- Calibration hand-pumps
- Spare parts

Calibration software

Plan, manage and document all your calibrations efficiently and safely using Beamex's calibration software.

- CMX Light
- CMX Professional
- CMX Enterprise

Professional services

An essential part of a complete calibration solution is professional services — service and re-calibration, installation and training, software support, validation services and integration services.

- Re-calibration and service
- Installation and training
- Software service agreement (SSA)
- Validation services (pharmaceutical industry)
- Integration services



Beamex – an experienced supplier of software systems

Beamex has an extensive background and long-standing experience in executing customer-specific projects that include provision of software systems and related services.



CMX calibration management software

CMX software is specifically designed for managing calibrations. CMX automates calibration management procedures in various ways. The CMX offers built-in communication with Beamex documenting calibrators for downloading and uploading calibration information. It's fast and efficient and there's no need for pen and paper. The CMX also supports communication with many other major field calibrator brands.

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www.beamex.com
info@beamex.com