

MEASUREMENT NEWS



50
YEARS
1965-2015



Susanne Schroff

President of the Board of Directors
of ROTRONIC AG

Dear Business Partners,

50 years for Rotronic

Much has happened in the 50-year history of our company. Below are a few personal highlights from this time ...

Graduate engineer Hans Spegglitz established ROTRONIC AG in Zurich in the summer of 1965. Asked to explain the name, he told me: “ROTRONIC is a combination of the word elec**TRONIC** and **ROT** (German for red and the colour of our logo), which we found catchy and easy to remember”. Rotronic was the first foreign distributor of the German company Schroff, which my parents had founded three years earlier to manufacture 19” rack systems.

In 1967 a chemist working for Sihl Papier in Zurich got so frustrated because there was no precision instrument available on the market to measure relative humidity that he developed his own capacitive humidity sensor and then contacted Hans Spegglitz to develop the electronics to evaluate its data for him. This resulted in Rotronic’s first humidity meter, the GTS sword hygrometer.

The story continues ...

Rotronic’s trading activities, which later also incorporated the sale of IT accessories, grew so quickly that the field of instruments was neglected somewhat. Thanks to the high accuracy and long-term stability of the sensor, however, the products nevertheless found niche markets worldwide.

The focus was increasingly placed on humidity measurement. The company created a worldwide sales network and established numerous subsidiaries. Since the trade in IT accessories was also developing pleasingly, the company was split into the industrial enterprise ROTRONIC and IT trading house ROTRONIC-SECOMP.

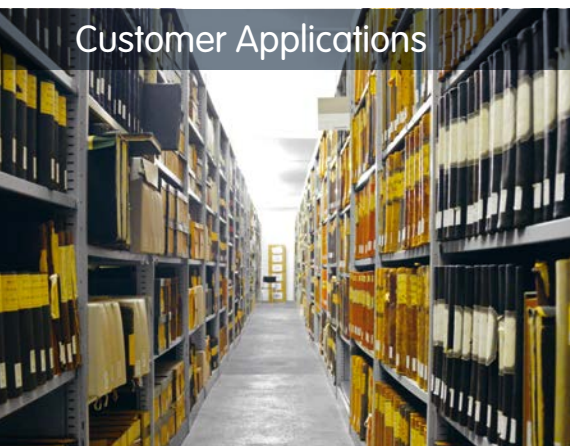
Our promise for the future ...

Rotronic sells its measurement solutions in more than 60 countries around the globe. It earns sales of 52 million euros and employs a workforce of 210 in Switzerland and its eight subsidiaries. In spite of our international focus, we have kept our “family character”. Our relations with our employees, customers and suppliers, some of which go back many years, are very important to us, today and in the future.

We look forward to working on many more projects with you!

Best regards,


Susanne Schroff



Customer Applications



New Products



Rotronic Inside



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Rotronic protects sensitive documents and data



View into the archive, where humidity and temperature are measured every five minutes and then processed with HW4 software

The protection of important historical and legal documents and data requires a technically sophisticated monitoring system. Rotronic data loggers excel with high precision and reliability.

archîvbern, a member of the Berner Archiv AG group, stores around 40,000 linear meters of documents and data. Many of them bear witness to times past and remain important from a legal point of view. The room temperature and humidity are monitored permanently by a logger system from Rotronic, which enables archîvbern to offer full archiving services from one source.

The Swiss archive specialists at archîvbern have been offering companies, administrators, law firms and individuals complete management services for their physical documents since 2006. Dr. phil. Christophe von Werdt, managing director of this ISO 9001-certified company, puts it in a nutshell: “The priorities in the day-to-day business of our clients rarely lie in archive administration. Although our cli-

ents are aware that correct and proper archiving is very important especially from a legal point of view, seen realistically, this work is considered a necessary evil. Which is why they outsource it to us.”

Gianclaudio Mordasini, vice president and head of technology at docuSAVE, is a long-standing partner and advisor to archîvbern for questions concerning damage prevention. He is convinced that the financial cost to restore damaged documents far exceeds the investment in a professional monitoring system for damage prevention. Correct and proper data storage requires temperatures between 14 °C and 18 °C and a humidity of 45 %RH to 55 %RH. Should the climate values lie outside these recommended reference values, there is a risk of mold forming.

Time for a new monitoring system

archîvbern faced the challenge of replacing its old data loggers with a new, effective monitoring system. Gianclaudio Mordasini supported the archiving specialists in this process. Rotronic presented the technical possibilities of its data loggers and the related HW4 software during a visit to docuSAVE. Due to references from libraries, the cost-effectiveness of Rotronic’s solution and the company’s experience in the field of precision measurement, docuSAVE recommended use of the HL-1D data logger. Based on this recommendation, archîvbern opted for these measuring instruments from Rotronic.

At present, room mapping is being carried out to find the ideal positions for the instruments. For one whole year instruments

are being placed at certain points in the archive premises in order to evaluate the optimal position. The data loggers store their log data on a chip. The data can be downloaded to a laptop or PC via a USB-Mini port and evaluated with Rotronic's HW4 software package. Downloading the data via the USB-Mini port does not move the log points and the values are measured with pinpoint accuracy.

Regular data acquisition

The humidity and temperature are measured at the measuring points and processed every five minutes.

For Christophe von Werdt the mapping and uncomplicated management of monitoring are particularly important: "To guarantee the high quality of our services, the instruments must be easy to use for our employees. In addition to that, changes in the room climate need to be documented exactly for some clients for contractual reasons."

Efficient collaboration

Thanks to continuous project manage-



From left: Dr. Christophe von Werdt, Barbara Mordasini Voser, Hansjörg Spahr, Gianclaudio Mordasini

ment and technical advice by competent coordinators, the collaboration with Rotronic ran smoothly. The special challenge in this project lay in detecting different micro-climates and defining the

relevant measuring points for the mapping. Twenty-four measuring stations are currently in use in the archive in Kehrsatz for mapping purposes before the loggers can be installed in their final positions.

Berner Archiv AG

Founded in 2006, the company offers a simple and inexpensive solution for the archiving of digital and analog documents for companies, administrators, medical practitioners and individuals. archivbern advises, archives, organizes, transports and arranges the disposal of materials.

docuSAVE

docuSAVE specializes in restoring documents, works of art and cultural artifacts damaged by water, fire or mold. Together with its partner artsave, docuSAVE offers analyses and preventative measures in the field of emergency management.



HL-1D data logger in use

The data logger

Long-term and permanent recording of humidity and temperature measurements is of utmost importance for archives, libraries, collections and exhibitions of works of art and other valuables. The data loggers record every change and Rotronic evaluates the data with the help of its HW4 software. This data supplies information on the climatic situation and circumstances that have an influence on people and on the conditions of the material being protected.

The HL-1D data loggers used have a USB-Mini port, which can be used to set the in-

struments. Each instrument stores 16,000 data records for temperature and humidity. The logging interval can be set freely from 30 seconds to 24 hours. At an interval of five minutes, the battery has a life of about three years, adding to the value of this data logger.



An integrated solution for the National Physical Laboratory



Photo NPL

NPL London, home of the UK's National Measurement Institute

ROTRONIC Instruments UK developed a needs-orientated solution for replacement of the complete building management system.

When the National Physical Laboratory (NPL) in London needed to replace their entire building management system (BMS), they turned to Rotronic Instruments (UK) for an integrated solution for the sensors and their calibration. Their need: a complete range of temperature and humidity sensors and instrumentation. In addition Rotronic was tasked to fulfill the calibration and commissioning needs for these instruments. Working closely with the project stakeholders, the Rotronic Instruments (UK) team developed a tailored solution, matching the

instruments and service to the project requirements.

The decision by the NPL to replace the BMS was brought about by the need for tighter climate control, greater reliability and easier calibration.

Interchangeable probes

One of the key elements in achieving these objectives was the use of interchangeable probes. This immediately limited time-consuming and disruptive on-site sensor calibration to a mini-

mum. Every probe's digital output was calibrated in the UKAS accredited laboratory of ROTRONIC Instruments (UK), and every transmitter's analog output was calibrated using a simulated digital input. To resolve any measurement errors in-situ between the calibrated sensors and uncalibrated BMS, each



The versatile HC2-S probe in service at the NPL

installed high accuracy instrument was loop calibrated and adjusted. Typical installation errors corrected for to date in the brand new BMS are ± 0.5 %RH and ± 0.25 °C; a significant result for labs requiring tolerances of better than 1 %RH and 0.1 °C.

High and long-term performance

While the use of high performance instruments was essential, not every sensor location or application could justify this approach. However, mindful of the NPL's long term objectives, even the lowest specification thermistor products were customized to provide long-term performance and low drift. Additionally, a robust commissioning procedure and training for key personnel was developed to enable ongoing commitment to delivering quality measurements. Finally, it was effective communication and regular on-site interaction with all the stakeholders that helped deliver a successful outcome to this substantial project.

Conclusion

All companies that need to perform regular monitoring and instrument calibration should review their processes constantly and question their operations and procedures. As increased regulatory compliance and demands for improved energy efficiencies continue to grow, traditional processes may no longer offer the optimum solution. A change in organizational mindset may be needed to move calibration from being seen as a fixed cost to a process that can help deliver business objectives through ongoing cost and energy efficiencies. With the advent of calibration methods that can significantly reduce in-situ disruption, downtime is minimized, labor costs are reduced and productivity improved. Using interchangeable digital systems increases the accuracy and traceability of calibrations, resulting in higher product quality.

Choosing the right calibration methodology may require new thinking and a differ-

ent approach, but those companies that decide to follow this road will end up with a modern, flexible system that not only achieves compliance, but also delivers long term cost and energy efficiencies to their business.

Please contact us if you would like more information on the NPL case study or how your business can develop innovative and efficient monitoring solutions.

NPL, London

The NPL is the UK's National Measurement Institute. It is a world-leading provider of measurement standards and metrology research. The headquarters of the NPL are located in west London and comprise three buildings divided into 16 modules. Every module houses offices and research laboratories, undertaking some of the most precise measurements on the planet.



Photo NPL



HygroFlex5

The HygroFlex 5 series is the latest development of a universal transmitter. Equipped with freely selectable and scalable analog outputs, the HygroFlex5 offers a wide variety of uses and its digital outputs guarantee full network connectivity. The series boasts top repeatability and a system accuracy of ± 0.8 %RH and ± 0.1 K. The heart of this instrument is formed by the HygroClip2, a probe with AirChip3000 technology. It compensates temperature and humidity at 30,000 reference points and calculates the current dew point.

Reliable measurements even under extreme conditions



The ice load is measured at especially critical points by strain gauge sensors attached to the masts

BKW Energie AG trusts in HygroMet4 probes for its ice-load measurements at exposed points.

High voltage power lines criss cross Europe in a dense network, transporting electricity both nationally and internationally. Their functional reliability is of utmost importance.

Weather conditions change very quickly in the Alps. These changes can cause rapid ice

buildup on the transmission lines. The ability to predict this ice formation allows for preventative steps prior to a power line failure.

One significant factor is the formation of ice at low temperatures and high humidity. When ice forms on the transmission lines the weight can reach ten times normal.

The company BKW Energie AG operates transalpine high voltage lines. The ice load is measured at especially critical points. This is done with strain gauge sensors attached to the masts.

Danger for humans and animals

Although the lines are installed to minimize danger to people, it cannot be ruled out that people will stand underneath a line. Falling chunks of ice can injure or even kill people and animals, and the additional weight can also damage a line.

When ice forms, the lines are disconnected from the grid and heated with a power of about 50 MW to melt the ice. The problem with this is that disconnecting a line generates a financial loss, and the interruption must also be reported in advance to the grid operator – Swissgrid in Switzerland. BKW Energie AG therefore sought a solution by which it could not only estimate the potential for ice formation better, but also minimize grid disruptions and report them at shorter notice. The basis for this is measurement of the humidity of the ambient air.

To achieve this measurement, a meteorological probe from the Rotronic HM4 series was installed on a mast on the Grimsel and one on the Chring, both with a weather protection shield. The probe is heated constantly. Heating of the probe prevents condensation on the sensor in mist. The heated sensor is then able to reliably measure humidity even during periods of condensation.

BKW report

The hazard of ice deposits forming on high voltage overhead power lines during winter is a known problem. In critical weather conditions it can happen that

the masts are no longer able to bear the rising weight of the wires and therefore collapse.

As early as the 1920s, BKW installed sensors to measure the ice load on the transmission lines. This information, along with local weather data, was communicated several times per day back to BKW for action. Over time, the measurement system was gradually improved as new tools became available.

Reliable and informative measurement data are critical

Apart from the tensile forces acting on the wires, weather data at exposed masts is measured and transmitted in real time via the company's optical fiber cables to its control center in Mühleberg. BKW decides, together with Swissgrid, based on current trends and defined limit values for weight, humidity, and temperature when a transmission line is removed from the grid and heated to remove the ice formations.

BKW

The BKW Group is a major Swiss energy services company. With a workforce of more than 3,000, it and its partners supply around one million people with electricity and cover all stages of energy supply from energy generation through trading and transport to sale. Apart from its energy supply operations, BKW also develops, implements and operates complete energy solutions for private and business customers as well as energy supply companies and local authorities. It also works in research programs to develop innovative technologies for a sustainable and reliable energy supply.



Daniel Hegg from BKW Energie AG with weather protection shield during installation

The reliability and accuracy of the measurement data for tensile force, humidity and temperature are therefore of decisive importance. Working closely with BKW,

Rotronic facilitated a comprehensive evaluation of the HM4 meteorological probe and shield.

The HygroMet4 probe from Rotronic



The HygroMet4 is suitable for use wherever high humidity prevails for a short or long time. In such environments conventional probes can become covered in condensation, thereby delivering false measured values. This is particularly the case in meteorology, in cheese cellars, tunnels and caves.

Heating Function

The HygroMet4 is equipped with an automatic sensor heater. It heats the sensor to 0.1...10 °C above ambient temperature depending on the setting. Heating of the sensor prevents condensation forming on it.

Features

- Allows simultaneous measurement and heating
- Measures relative humidity and temperature, calculates all psychrometric parameters
- Freely programmable RoHumiHeat sensor heater
- Adjustable RoHumiClean sensor cleaning
- SMD thermo sensor element
- Outstanding accuracy and repeatability
- Integrated real-time clock
- Freely scalable analog output signals
- RS-485 interface

Countrywide centralization of measurements with LNE



LNE headquarters in Paris

The National Laboratory for Metrology and Tests (LNE) in Trappes, France, uses complete solutions from Rotronic for its centralized monitoring network.

As a state company, the National Laboratory for Metrology and Testing (LNE) works as a reference laboratory to help improve the competitiveness of companies and maintain a high standard in product quality, consumer safety, public health, environmental protection and energy management.

With its development of new measurement technologies and testing instruments in conjunction with appropriate methods and their application in all fields of daily life regarding applicable references, the LNE is an important player in

achieving a more competitive economy and safer society.

The LNE works in nine areas: housing/construction, defense, energy, consumer products, transport, instrumentation, health/medicine, industry and institutions/communities.

The LNE has been responsible for coordinating metrology in France and its foreign representations since January 2005.

It has a workforce of 800, of which 80% are engineers, scientists and senior tech-

nicians, at 13 locations in France and abroad with a laboratory space of some 55,000 square meters.

The LNE has developed three quality systems:

- “Tests and Calibrations” based on the standard **ISO 17025**
- “Certification” based on the standards **EN 45011** and **ISO 17021**
- “**ISO 9001**” for support services

Rotronic products have long been known to LNE because they are used in its “Center for On-Site Calibration and Verification” and to measure climatic conditions in its vacuum chambers in a centralized monitoring network (Modbus RS-485) (HygroClip-IC-3/10 humidity and temperature probes as well as I2002C02P-3Cw7C2X and HygroFlex transmitters).

LNE contacted various suppliers towards the end of 2005 during the preliminary planning phase for the construction of the Center for Electrical Measurement Technology in new premises at the LNE’s site in Trappes (78). Gilles Le Dortz, project manager in the Department of Engineering/Conception, says in this regard: “We stayed with Rotronic because it offers a

LNE, Trappes

In 2004 the LNE opened a center for research & development in electrical metrology and nanometrology in Trappes. The new building comprises a laboratory space of 3,400 m² for tests and analyses of consumer products, packaging, energy, the environment as well as medicinal and health products. The LNE also offers calibrations, metrology consulting services in the fields of thermal lift, optics, electricity and acoustics as well as inspection of medical devices on-site in hospitals.

complete solution, from probe to monitoring software as well as return of the measurements over the internet, which meets the requirements of a laboratory for metrology. Three points made the difference in the end between Rotronic and the solutions of its competitors: interchangeability of the HygroClip probes,

- 200 measuring points for temperature and relative humidity (halls, laboratories, climate chambers)
- 10 measuring points for atmospheric pressure
- 5 analog measuring points (voltages)
- 12 measuring points for temperature using Pt100 probes



Gilles Le Dortz, project manager in the Department of Engineering/Conception, LNE (Laboratoire national de métrologie et d'essais, France)



One of the 120 Rotronic HygroLogs in use

communication via the internet (previous additional connection work was no longer necessary) and naturally the availability of unfalsified measurement data.”

This first system allowed measurement of the temperature, relative humidity and pressure in 15 meteorological rooms in a single building with 15 HygroClip probes and 13 HygroLog NT transmitters.

All measurements were collected on a computer by the HW4 software via the LNE's internet connection and the data then made available to all other users via the network.

After this first measurement network had served a probationary period of more than three years, the LNE extended this monitoring solution to all sites and all buildings, i.e. to Trappes, Paris, Nîmes, Toulouse, Poitiers and Saint-Denis from 2010 to 2013.

LNE's measurement network in numbers:

- 120 HygroLog NT loggers

In addition to capturing the readings of the individual measuring points on their internal flash memories, the HW4 software also carries out measurements continuously via the LNE's internet connection (PC data login mode). These measurements can be retrieved via the LNE's internet connection and processed directly with a spreadsheet program such as Excel®.


The data are retrieved to the LNE's network automatically every month by the HW4 software. These files (*.log) are transferred in binary format (protected mode, only readable by HW4).

They cannot be falsified and guarantee true traceability of the measurements.

Rotronic also supplies a DLL (Ro3drv.dll), which enables communication with the

HygroLog NT transmitters and ensures direct access to the measurements from the software developed in LNE in various languages such as LabVIEW®, VB6, VBA and C#/VB.NET. This made internal development of an interface necessary to act as “wrapper” for languages other than .NET (dot net).

“This project required skills in various disciplines such as metrology, instrumentation, Ethernet, computer programming (Windows Batch and various programming languages) and reorganization of our buying operations. Thanks to the close collaboration with ROTRONIC France, the project was concluded successfully,” says Gilles Le Dortz.



HygroLog NT

The HygroLog NT not only fulfills all FDA and GAMP requirements, but also supports users in validation; with a storage capacity of more than three million data records, the loggers also have virtually unlimited memory space. Thanks to the digital communication interface between the HygroClip2 probe and the loggers, no measurement errors arise.

- Highest precision and long-term stability
- Unlimited memory with flash card
- Display
- Interchangeable sensors for humidity and temperature
- Large range of probes
- User-friendly, validated HW4 software

Our new products at a glance

Reliable measurement of trace moisture

Low dew point probe HC2-LDP



Designed for compressed air systems in a variety of applications

Product information:

- High accuracy in dew point and temperature measurement
- High repeatability
- Compatible with Rotronic transmitters and HW4 software
- New HYGROMER® LDP-1 sensor
- With the latest AirChip4000 measurement technology



Compact, precise and inexpensive

Data logger HL-1D / TL-1D



The perfect logger for mappings in archives, libraries, clean-rooms, storage, production and server rooms, in residential and office rooms and in transportation.

Product information:

- Compact with high level of IP protection
- High storage capacity: 32,000 data point memory
- MIN/MAX/AVG function
- Free evaluation and configuration software HW4-lite
- Very long battery life (3 years at logging interval of 5 min.)



The heated probe

Meteorology probe HM4



The HygroMet4 is ideal for use where conventional probes run the risk of becoming covered in condensation, thus delivering falsified measured values, because the heated sensor prevents condensation forming

Product information:

- Allows simultaneous measurement and heating
- Measures relative humidity and temperature, calculates all psychrometric parameters
- Freely programmable RoHumiHeat sensor heater
- Adjustable RoHumiClean sensor cleaning
- SMD thermo sensor element
- Outstanding accuracy and repeatability
- Integrated real-time clock



Reliable measurements under extreme conditions

ATEX transmitter & probe



The HygroFlex5-EX series is the latest development in two-channel transmitters for exact measurement of humidity and temperature in hazardous atmospheres. This measuring device conforms to the latest international standards.

Product information:

- Safe operation in hazardous atmospheres
- Electrically intrinsically safe construction with safe electrical isolation
- No intrinsically safe feed required
- Interchangeable stainless steel probes
- Robust aluminum housing



For highest demands

Chromium steel probe HC2-SM

For adverse environments with high demands on the probe housing and mechanical system

Product information:

- Best long-term stability
- Highest possible accuracy
- Robust housing
- Developed for highest demands



Inexpensive and easy to use logger

TL-CC1

The single-use logger for the monitoring of sensitive freight such as pharmaceuticals, foods, technical products and the like

Product information:

- Generation of PDF reports without software installation
- Freely configurable
- Clear alarm indication
- Contains: configuration file, PDF report, instruction manual and calibration certificate
- Conforms to GxP, EN 12830 and FDA 21 CFR Part 11 / GAMP 5



New: Rotronic Canada

Due to the significant opportunity of the Canadian market, ROTRONIC Canada Inc. was formed on 1 January 2015. ROTRONIC Canada will take over sales for the Canadian market from Rotronic USA as of 1 July. This will ensure that our leading products for the measurement of humidity, dew

point, water activity, temperature and differential pressure can be offered locally.

"I am truly excited to represent a company with the reputation of ROTRONIC and to have the opportunity to start the Canadian subsidiary" says Phil Alfieri.



Phil Alfieri
Country Manager
ROTRONIC Canada Inc.

Rotronic Singapore on the road to success



Skyline of Singapore, from where the second-youngest Rotronic subsidiary serves the Asian market

ROTRONIC Instruments PTE Ltd. is a wholly owned subsidiary of ROTRONIC AG and was officially opened in Singapore on 1 September 2013. The Rotronic Group established Rotronic Singapore to strengthen its position on the Asian market. ROTRONIC AG appointed Sinna Sinnathurai, who had collaborated with Rotronic for many years and who knows the Asian market inside out, as Asia Sales Director. Rotronic Singapore has in the meantime successfully grown sales and support in Asia from its office in Singapore.

"Working hand-in-hand with strong sales partners, Rotronic has built up excellent partnerships over the last few years.

We have achieved outstanding results in implementing our strategy to expand our global sales network in Asia further," says Sinna.

A good example of the projects supported by Rotronic Singapore in 2014 is the pharmaceutical plant of Novartis BiopharmOps in Singapore. Novartis BiopharmOps is a new center of excellence for biotechnology. One of the decisive factors for the location of the center in Singapore was its close proximity to the growth markets in Asia. Due to its reputation for reliable and high-quality products, which Novartis already uses in Switzerland, the Novartis head office in Basle recommended

Rotronic to its Singapore CoE. Rotronic Singapore supported Novartis BiopharmOps with metrological solutions and the establishment of an in-plant calibration system, thereby saving Novartis time and money with this local solution.

Following a visit by Rotronic Singapore, Novartis BiopharmOps expressed its wish for a reliable and high-quality product that offered enough flexibility to perform calibration itself in the plant. Rotronic's proposal comprised the humidity and temperature instruments in the HF5 and TF5 series. This proposal was accepted as first choice.



Sinna Sinnathurai, Asia Sales Director
ROTRONIC Instruments PTE Ltd.

Rotronic at TOTO Shanghai – a hot affair!



TOTO Shanghai, subsidiary of the prestigious Japanese sanitary ware manufacturer

Founded in Japan in 1917, TOTO is known for its leading and innovative “luxury bathroom products”. When developing products, TOTO pays as much attention to the environment as it does to the desire for comfort, design and functionality.

TOTO China was established in 1995. China has since grown into one of the most important locations for production and development. The drying process is very critical in the production of ceramics.

The clay must dry completely – if it is not completely dry before first firing, it becomes deformed and cracks. The same happens when the clay is dried too quickly.

In order to produce high quality ceramics, therefore, the climate needs to be monitored exactly. A humidity of 90 %RH and a temperature of 80 °C normally prevail in the drying chamber. Since the drying process takes around a week, the sensors must have good long-term stability and

deliver exact measurements at high temperatures. The Rotronic HC2-IC302 temperature and humidity probe fulfills these requirements impeccably. Supplemented by the flexible Rotronic transmitter Hygro HF562-WB1XX1XX, it can meet the requirements of any performance range.

Cena Wang from ROTRONIC Shanghai headed this project and may be contacted for further details.



Take part and win

Answer the questions correctly and win an “Apple Watch Sport”!

- | | | |
|--|--|--|
| <p>1 What is Rotronic celebrating?</p> <p>a) Gold medal for handheld hygroscope</p> <p>b) Establishment of its 10th subsidiary</p> <p>c) 50th anniversary</p> | <p>2 Which product monitors cold chains?</p> <p>a) HC2-LDP</p> <p>b) TL-CC1</p> <p>c) HM4</p> | <p>3 How many HygroLogs are there in service at LNE?</p> <p>a) 200</p> <p>b) 12</p> <p>c) 120</p> |
|--|--|--|

First name _____ Surname _____

Company _____ Position _____

Street _____ Postal code/Town _____

E-mail _____

Entry conditions

The closing date for entries is 31 August 2015. The winner will be notified by 15 September 2015. The winner will be notified in person and his name may be published. Entry is free-of-charge and entails no obligation. No cash alternative is available. No correspondence will be entered into regarding the competition and the judges' decision is final. Rotronic employees and their families may not enter the competition. Personal data will be treated confidentially and not passed on to third parties.

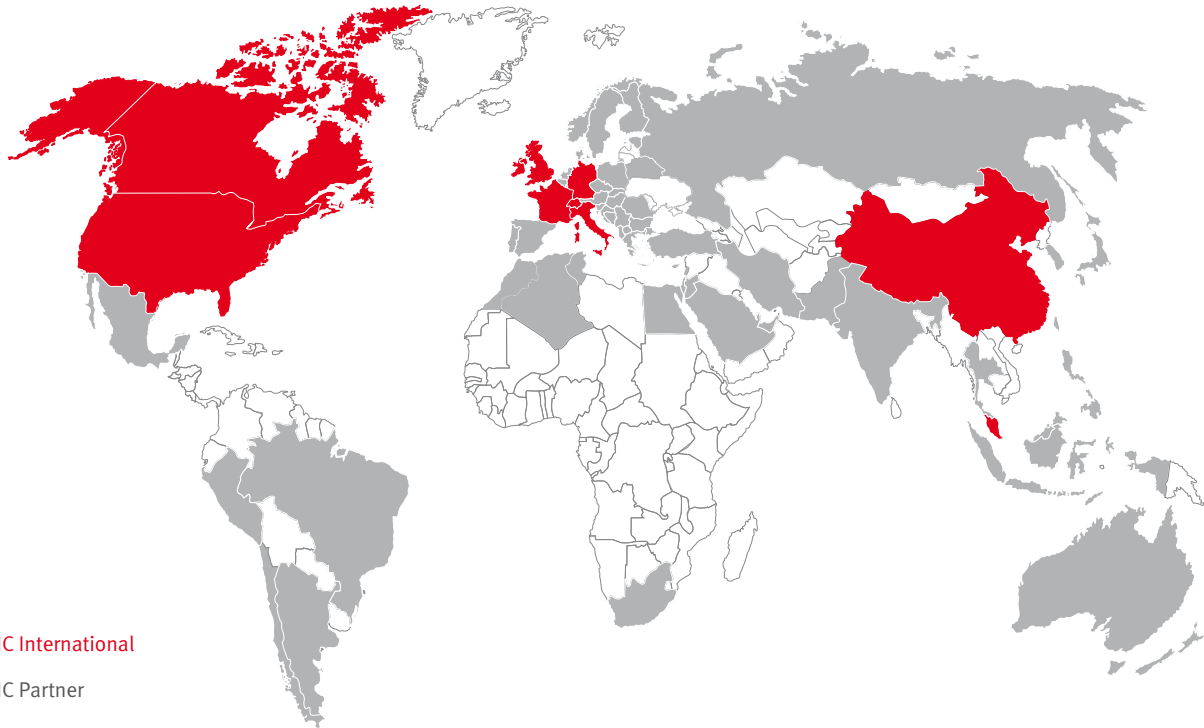


Answers:

1 2 3

Send the answers (e.g. 1a / 2b / 3c) either by email to kow@rotronic.ch or enter them in the **boxes** above, add your contact details and fax to +41 44 838 13 07.

Rotronic worldwide



■ ROTRONIC International

■ ROTRONIC Partner

Rotronic is present in more than 40 countries worldwide. You can find a complete, up-to-date list of our partners at www.rotronic.com/distributor

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Please see www.rotronic.ch/rotronic-events for a list of trade fairs and exhibitions where you can meet us.

rotronic
MEASUREMENT SOLUTIONS