Application note: N° F014

June 2012

Transportation

Facts & figures:

A major step in the transportation industry was the international standardisation of shipping containers in 1955. So one container can be put directly from a vessel to a truck and this all around the globe.

Today 28´000´000 ISO containers (20 feet) are permanently on the move, transporting goods from point to point keeping our economy running.

Every year 10´000 shipping containers fall over board.

0.16 Euro cents is the transportation cost to Europe for a bottle of Chilean wine.

Transportation in general

One key aspect of today´s wealth in the modern world is specialization. So, towns, regions or even whole countries focus on a few things they are really good at. This can be based on various factors; e.g. resources the land is offering, climatic conditions or specific knowledge that has been developed over a long period and has been passed on from generation to generation. As an example, Cuba provides brilliant conditions for the Corojo and Cirollo plants, better known as tobacco. Although smoking is quite popular among Cubans, their production of tobacco exceeds the local demand by far. On the other hand they lack other resources and goods. At that point the trading and therefore the importance of transportation comes into play. In the case of the tobacco the transportation is not a simple task, since it requires a constant high humidity level to maintain the high quality expected from a Cuban cigar.

Like tobacco there are many products where special requirements for shipping has to be but in to consideration, in order to maintain freshness, internal integrity, colour quality or whatever particular property that could be affected by an inappropriate transportation.

Why the need to monitor transportation?

Various factors can have a negative impact on a product during transportation. Below are the most common parameters to be monitored to ensure product quality:

Temperature

Controlling temperature for example, is the key in transporting fresh foods, where the decomposition is reduced significantly by maintaining lower temperatures. But also as proof of an uninterrupted cool chain for frozen products or to ensure the effectiveness of medications a monitored temperature is essential.

Humidity

Monitoring humidity ensures for example that the growth of micro organisms in food and medications remains below critical levels. Also to maintain structural integrity of paper and cardboard or to avoid corrosion of metals during a long transatlantic journey in a shipping container.

Pressure

Apart of being able to reconstruct when and how long a parcel`s flight was, pressure is also en essential parameter for products that have to be transported in a vacuum or pressured chamber. This method could for example be used when transporting biological samples or hazardous chemicals.

Shock

To guarantee that expensive machinery, glass, works of art and other delicate products weren't damaged during transportation, monitoring of the G-force in all three axis is the solution.

Light

Light is a good parameter to determine if or at what time a container or package was opened. Also to ensure protection of light sensitive products such as vegetable oils, chemical substances or photo paper,

Discussed in this edition:

rotronic
MEASUREMENT SOLUTIONS

Application note: N°F014 June 2012

What solution can Rotronic offer?

Rotronic offers a wide range of products for monitoring transportation system.

The range starts from small stand-alone humidity and temperature loggers like the HL-20 to the Universal loggers which is capable of measuring, apart from humidity and temperature, also light, G-force, pressure and provides also analogue inputs to monitor other third party signals.
For a convenient read out of humidity and temperature data after a container arrival, Rotronic can offer a solution from its wireless portfolio.

Further more, the validated HW4 software makes it easy to analyse the gathered data or export the data into excel.

LOG-HC2-RO1 Universal Logger

Rotronic products:

Humidity and temperature probes:

- ***HC2-S***
  Standard humidity sensor
  -50...100°C,
  0…100%rh,
  ±0.8%rh and ±0.1K…
- ***HC2-x***
  Basically any type of rotronic probe can be used with the UART interface to match almost every possible application.

HL20 Logger

Handheld instruments:

- ***HP22***
  For interchangeable probes,
  High accurate relative humidity and temperature measurement,
  Dew point and other psychrometric calculations,
  Display
- ***HP23***
  Same functionality as HP22 plus: two interchangeable probes, 20´000 data point memory with real-time clock,
  Data capture of 250 data points each for up to 8 defined locations

Dataloggers:

- ***Universal logger***
  Two interchangeable probes,
  Display and USB interface,
  2million measurement parameters for:
  °C / % rh / light / G-Force / pressure / Analog In- / Outputs
  Display
- ***Wireless logger***
  500'000 measurement pairs,
  ±0.8%rh and ±0.1K,
  Radio frequency: 433.92 or 915Mhz,
  USB and LAN interfaces,
  Conform to FDA21 CFR Part 11 and GAMP4…
- ***HL-21D logger***
  ±0.2 °C accuracy
  FDA 21 CFR Part 11 / GAMP 4
  Adjustable log interval
  Memory: 20000 data records
- ***HL-20D logger***
  0..100%rh, ±0.8 %rh / ±0.2 °C
  FDA 21 CFR Part 11 / GAMP 4
  Adjustable log interval
  Memory: 20`000 data records

LOG-PT1000-RC Wireless Logger

LOG-HC2-RC Wireless Logger

LAN-Interface for Wireless Logger

USB-Interface for Wireless Logger

Customer benefits:

Accuracy:

Choosing Rotronic gives you the best accuracy on the market. So, it doesn't matter what you are monitoring or controlling you can always rely on the measured data.

Long term stability:

Apart of the exceptional long term stability of our IN-1 humidity sensor, that is better then 1%rh per year, Rotronic also chooses for its other parameters only high quality state of the art sensors. This ensures that we can provide long living reliable products.

Communication:

With all of the different communication methods, from conventional analogue output signals to RS-485, Wireless or Ethernet RJ45, Rotronic can provide the individual solution for each installation.

Easy to handle:

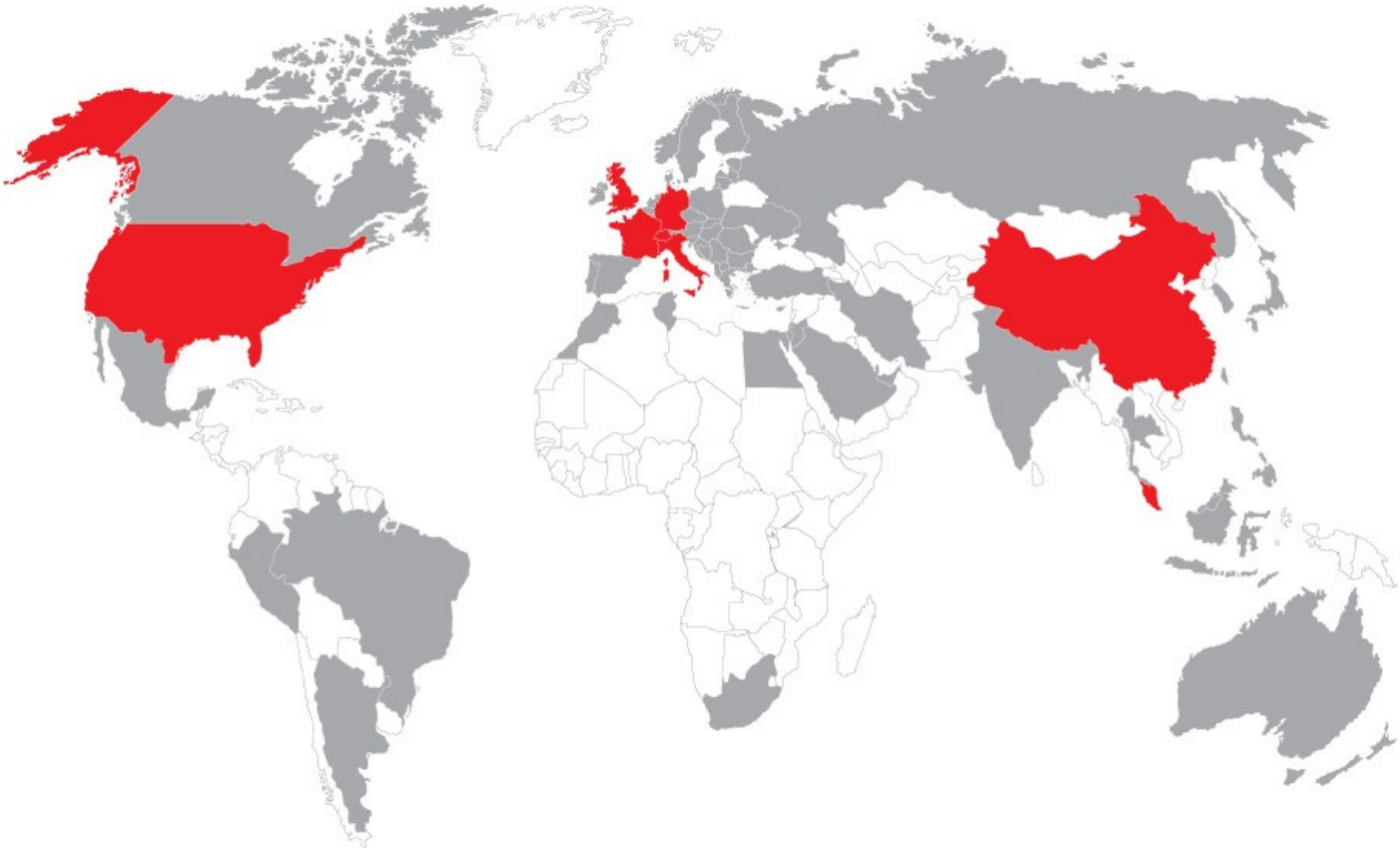
Since our HW4 software is used for almost all of our devices, it is super convenient to do reconfigure or adjust the units. And it does not end there! With the HW4 software it is even possible to build up a professional validated monitoring system that fulfils all the requirements according to FDA 21 CFR Part 11.

rotronic
MEASUREMENT SOLUTIONS

Application note: N°F014 June 2012

Contact us:

Rotronic is represented in more than 40 countries around the world. An up to date list of all our partners is available at www.rotronic-humiditiy.com/international



SWITZERLAND
ROTRONIC AG
Grindelstrasse 6,
CH-8303 Bassersdorf
Phone: +41 44 838 11 44
Fax: +41 44 837 00 73
www.rotronic-humidity.com

FRANCE
ROTRONIC Sarl
56, Bld. De Courcerin,
F-77183 Croissy-Beaubourg.
Phone: +33 1 60 95 07 10
Fax: +33 1 60 17 12 56
www.rotronic.fr

SINGAPORE
ROTRONIC South East Asia Pte Ltd
16 Kallang Place #07-04
Singapore 339156
Phone: +65 6294 6065
Fax: +65 6294 6096
www.rotronic.com.sg

GERMANY
ROTRONIC Messgeräte GmbH
Einsteinstrasse 17-23
DE-76275 Ettlingen
Phone: +49 7243 383 250
Fax: +49 7243 383 260
www.rotronic.de

UK
ROTRONIC Instruments UK Ltd.
Crompton Fields, Crompton Way
Crawley, West Sussex, RH10 9EE
Phone: +44 1293 57 10 00
Fax: +44 1293 57 10 08
www.rotronic.co.uk

ITALY
ROTRONIC Italia srl
Via Repubblica di San Marino, 1
I-20157 Milano (MI)
Phone: +39 02 39 00 71 90
Fax: +39 02 33 27 62 99
www.rotronic.it

USA
ROTRONIC Instrument Corp.
Suite 150, 135 Engineers Road, Haup-
pauge, NY 11788
Phone: +1 631 427 38 98
Fax: +1 631 427 39 02
www.rotronic-usa.com

CHINA
ROTRONIC Shanghai Rep. Office
2B, Zao Fong Universe Building, No. 1800
Zhing
Shan West Road, Shanghai 200233
China
Phone: +86 21 644 03 55
Fax: +86 21 644 03 77
www.rotronic-humidity.cn

rotronic
MEASUREMENT SOLUTIONS