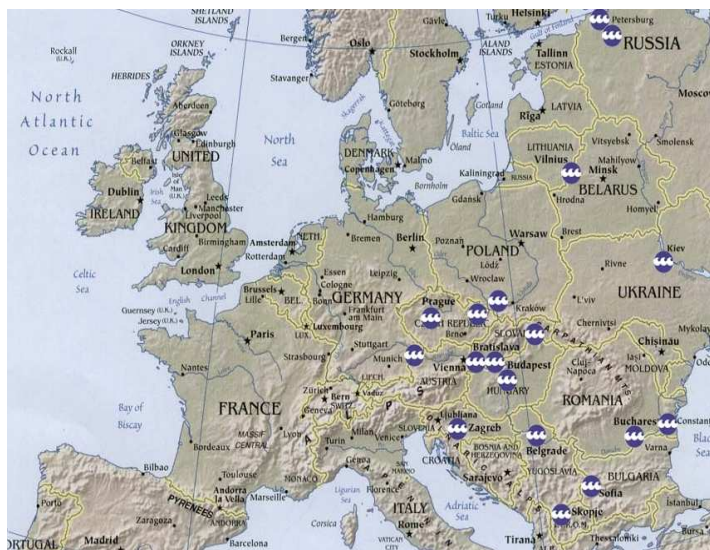


Applications for Food and Beverages

ECM Group is built around ECM ECO Monitoring, a.s. Bratislava and is operating a network of subsidiaries and offices in countries of Central / Eastern Europe and Asia.



The Territory

Key turn analytic solution for following productions and areas:

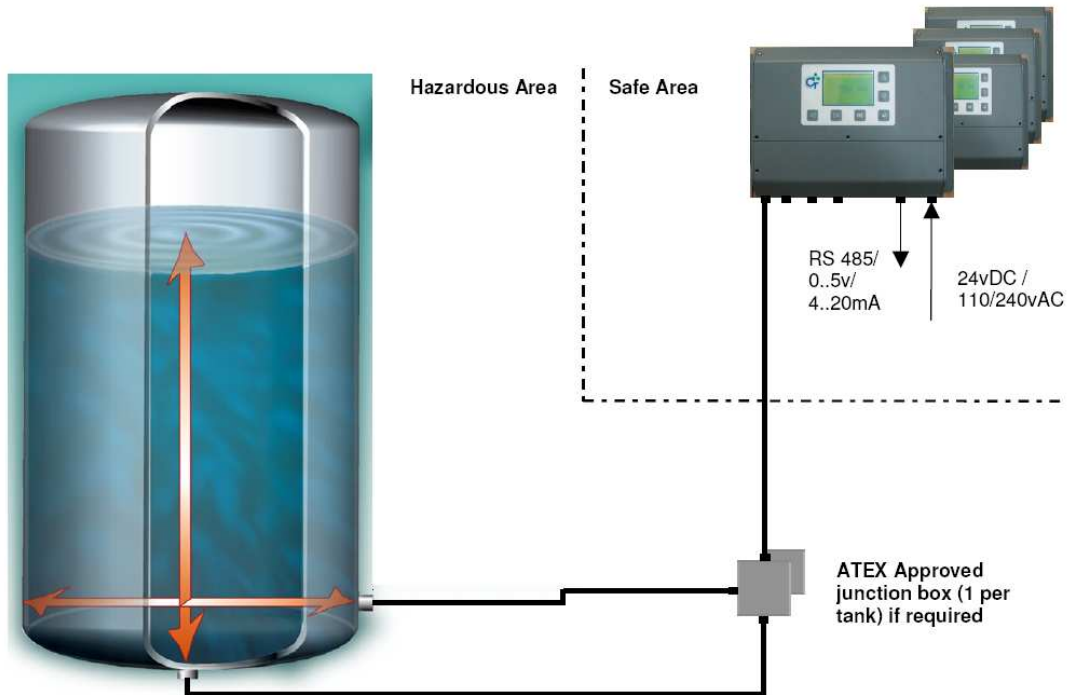
- **Breweries**
- **Soft drink manufacturers**
- **Milk powder**
- **Instant coffee**
- **Sugar**
- **Wine**
- **Brandy distillation**
- **Distillery**
- **Tanks servicing**
- **Pure water treatment**

ECM offers for food and beverages industry following applications:

- **Non-invasive Tank Level Measurement Systems – VesselCheck**
- **Ultrasonic level measurement of liquids and solids**
- **High accuracy, continuous liquid concentration measurement - DensiCheck Tx**
- **Non-sampling, integrated CO₂ measurement and control for carbonated beverages – Embra CarboCheck**
- **Monitor of filtration processes**
- **Non-invasive point level detector for tanks & pipes – SpotCheck**
- **Non-invasive flow measurement**
- **Food Pack Portable and stationers gas analyzers (O₂/ CO₂/ N₂)**
- **Process Refractometers**
- **Water Quality Monitoring System**
- **Sulphur content of CO₂**
- **Spray dryer monitoring**
- **Moisture monitoring**
- **Working Area monitoring**
- **Beverage product line purge monitoring**
- **Monitoring of leakage of organic substances**
- **Flow measurement in half empty tubes and channels**
- **Monitoring of centrifuges and storing areas**

Non-invasive Tank Level Measurement Systems - VesselCheck.

VesselCheck is a highly versatile and accurate range of non-invasive liquid level measurement systems, comprising a signal processing unit and ultrasonic transceivers. Ultrasonic sensors are clamped or bonded to the outside walls of the vessel - one on the bottom of the vessel and with the fully density compensated option, one on the side. Signals from the transducers are fed into the processor and either displayed locally if that option is selected or output to a separate system. The system calculates the height and volume of the liquid in the tank from the time taken for the signal to be received from the liquid surface.



Ultrasonic level measurement of liquids and solids.

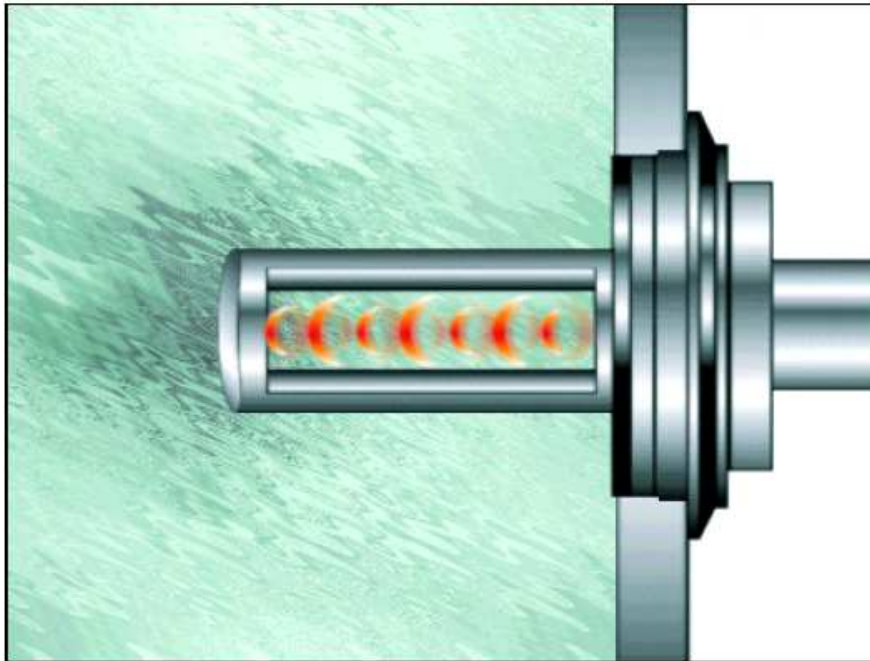
ECM provides a non contact, ultrasonic, continuous level measurement instrument that is able to provide accurate measurements for liquids and solids while automatically compensating for changes in temperature and other environmental conditions. Instruments are designed for applications such as process tanks, storage vessels, open air piles, and more. Devices are low voltage, and are available with a customized graphic LCD display.



High accuracy, continuous liquid concentration measurement - DensiCheck Tx.

Densicheck TX provides a continuous output of concentration to enable processes to be optimized. The result – reduce rework, improved quality and lower costs. DensiCheck TX uses the established principle that sound velocity in liquid is related to its concentration. Ultrasound pulses are transmitted through the liquid and reflected to their source. The time of transmission is measured using advanced high speed electronics, and the variation is converted by the on-board microprocessor to a signal representing the liquid concentration.

Temperature is automatically compensated for by an integral sensor, and the resulting value is transmitted via analogue or digital signal to a suitable display or host controller.



Non-sampling, integrated CO₂ measurement and control for carbonated beverages – Embra CarboCheck.

As the world's leading CO₂ monitor and control system, Embra CarboCheck uses the wellknown saturation pressure / temperature technique for accurate, non-sampling measurement. Embra CarboCheck can be used for measurement alone or configured as a control system.

The CarboCheck sensor features a silicone rubber membrane, through which the dissolved CO₂ permeates into a sealed, evacuated chamber. The partial pressure of the gas is then measured and displayed by the analyzers / control unit as a CO₂ content. The system incorporates a vacuum exhauster to regularly evacuate the sensor, providing continual, accurate measurement of dissolved CO₂. The analyzers / control unit can be linked to a carbonation system to enable fully integrated CO₂ measurement, injection and control.



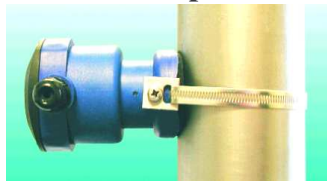
Monitor of filtration processes.

Food industry processes are frequently using membrane filtration. Breaking of one fibre out of ten thousand may cause permeation of bacteria, which starting to grow in the process. This can be usually detected only after several days. Below monitory system serves for instant detection of membrane filtration problems.

The device analyzes the interferences of scattered light reflected from particles in the volume covered. This allows particles from 0.5 μm in size or particle concentration variations of corresponding mass to be detected. As here a differential measurement method is concerned, calibration is not required. The instrument is installed on Varinline® housings with sight glasses, i.e. without coming into contact with the medium, which, for reasons of hygiene, is a requirement of the brewing, beverage and food industry. It is, however, also possible to operate the instrument in the bypass mode or to use it to monitor small volumes online via a sampling valve.



Non-invasive point level detector for tanks & pipes – SpotCheck.



SpotCheck is a level switch for use in liquid applications where avoiding contact with the product is vital. The sensor is clamped externally to the wall of the pipe or vessel. The method of measurement is suitable for steel, plastic or glass up to 50mm thick.

Non-invasive flow measurement.



Non-invasive flow measurement with ultrasound offers unmatched flexibility. Clamp-on-transducers are rapidly fixed on the pipe; no process interruption is needed for commissioning. Only two transducer pairs are needed to cover the diameters most common in industrial applications (DN10 to DN2500), the full transducer range covers DN6 to DN6500. With the our flowmeters, a reliable flow measurement is now a matter of a few minutes. No zeroing procedure is necessary since calibration data and transducer parameters are saved in a transducer internal memory and automatically sent to the electronic unit upon connection. In less than 5 minutes, reliable values appear on the display.

Food Pack Portable and stationers gas analyzers (O₂/ CO₂/ N₂).



Food packaging requires spotcheck or continuous monitoring of O₂, CO₂, N₂ and other gases. ECM is offering a brand range of analyzers for this purpose.

Small sample volume portable benchtop analyzer, but also stationers one, especially designed to meet the needs of MAP/CAP testing in the food industry. Enables single or dual measurements for percent levels of oxygen and/or carbon dioxide.

Paramagnetic transducer offers fast measurement of oxygen without the disadvantages of electrochemical or zirconium cells. Infrared technology using patented long life source gives a highly stable, selective and low maintenance measurement of CO.

It features single or dual gas measurements (O₂ and/or CO₂) and RS 232, datalogging and alarms as standard.

Process Refractometers.

For analysis of binary solutions (with two prevailing components, like sugar in water, acids, alcalics) refractometry is in many cases an optimal solution.

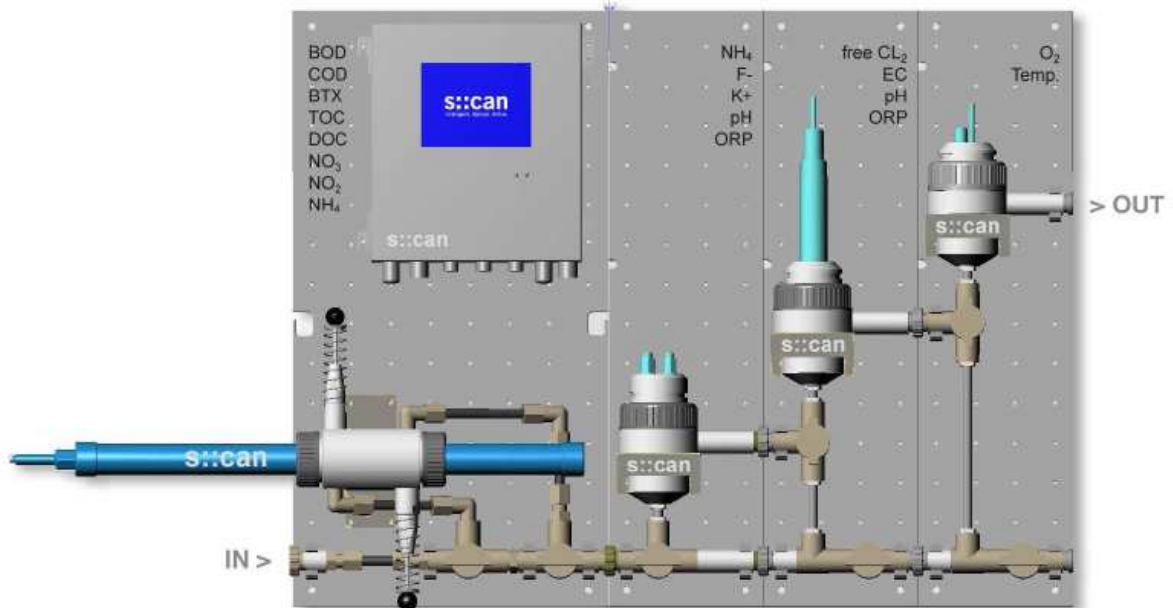
ECM provides process refractometers for accurate in-line Brix and concentration measurements in liquid food and beverage applications.

- Low and high concentration alarms can be configured.
- Record process data for every batch or lot via Ethernet.
- 3A Sanitary approved and EHEDG tested.



Water Quality Monitoring System.

In food industry there are three obvious applications for water quality monitoring. One is discharge water monitoring requested by environmental authorities. Second is monitoring of leakages of organic matter into water and problems with process control and last one is purity of intake water. Last application is covering also a safe warning in case of intentional or accidental water pollution by toxic substances. Above system are built around a quite unique spectrometric probe and set of auxiliary sensors.



Select any module/parameter combination you need. Start with a simple module and add other modules or sensors later at any time of your convenience. Or invest into a complete station and have all parameters available that comprehensively describe your water quality. Available parameters: BOD, COD, TOC, DOC, UV 254, BTX, NO₃, NO₂, NH₄, K⁺, free chlorine, F⁻, turbidity, colour, pH, ORP, EC, temperature, O₂, O₃, H₂S, fingerprints, contaminant alarm.

Sulphur content of CO₂.

H₂S can cause an inconvenient contamination of CO₂ used for beverages and packaging. ECM is providing analytic solutions for safe monitoring of sulphuric products.



Spray dryer monitoring.

Production of milk powder, instant coffee and other similar products is based on drying of product solution spray by hot air. This process is moving wet powder particles which are not easy to separate from drying air and may plug the transport system. ECM particle monitoring help to control the process keeping high efficiency and avoiding plugging problems.



Moisture monitoring.

The exact monitoring of dew point temperature in compressed air systems, dryers for plastic and other industrial processes is becoming increasingly more important. ECM provides a measuring range -80...60°C. The core of the transmitter is the monolithic measurement cell in thin-film technology. Technology and an autocalibration procedure which is integrated in the device make an accuracy of <math><2^{\circ}\text{C}</math> possible.

The compact construction in robust aluminium housing and the numerous options allow easy mounting and many application possibilities.



Working Area monitoring.

Protective and safety devices are designed to detect presence of harmful gases (H_2S , CO , O_2), solid particles but also minimal movement of air. Presence of dangerous gases is detected via infrared, electrochemical sensors or photoionization detectors. Devices for monitoring working area can be portable, including personal detectors or stationary, including bump test device. Instruments can provide one or multi gas detection. Very important is also monitoring of radiation, vibrations, thermal stress and noise dosimeters in working areas. In many cases is vital to monitor basic parameters of internal areas of buildings – hospital, libraries, museums and so on. It is necessary to monitor temperature, dew point, indoor air quality, air flow and many others. For all this applications ECM is ready to offer key turn solution, which represents accurate and reliable answer for all your worries and cares about employee.



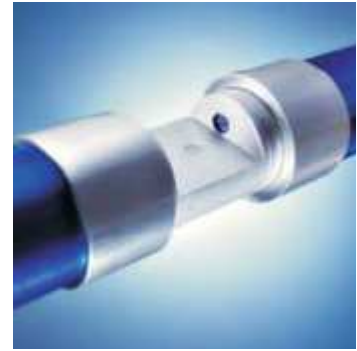
Beverage product line purge monitoring.

Beverage production lines must be regularly cleaned. ECM analytic equipment allows safe detection of product, water and detergent to keep the process under control.



Monitoring of leakage of organic substances.

This new spectrometric analytic system is designed for monitoring of pollutants directly in water with no need of any sampling system. A pressurized air cleaning system allows a long-term maintenance free operation. A flow-through cell based application is certainly possible as well. The instrument allows any monitoring based on analysis of UV-VIS spectra in terms of individual polluting compounds and general characteristics (COD, TOC, BOD, oil in water, etc.) as well. Special applications are warning systems based on spectral deviations compared to standard conditions. The instrument may be extended by special sensors to monitor DO, pH, conductivity, ammonia, etc.



Flow measurement in half empty tubes and channels.



Monitoring of flow in half empty tubes and channels is based on Doppler ultrasonic monitoring of average flow speed and water level. Since tube or channel profile is known, flow monitoring is calculated by instrument control unit.

Monitoring of centrifuges and storing areas.

Centrifuges, silos, and storing areas dangerous for powder explosion caused by static, must be inerted by nitrogen. ECM is providing analyzers to monitor this process.



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