

RADIATION-FREE MONITORING

**Nuclear-free density and concentration measuring
with proven M1 controller from Bachmann**

With its DENS-ITOMETER, the British company ITS (Industrial Tomography Systems) has managed to develop a measuring system that operates without the need for a nuclear energy source. It thus offers a greener and inexpensive alternative to conventional devices for this task. The rugged systems of Bachmann electronic have made a vital contribution here.



The British company ITS (Industrial Tomography Systems) is a worldwide leader in the development and manufacture of tomography measuring systems. This technology enables measurements in pipes and tanks, thus offering a deeper insight in the dynamics of complex processes.

www.itoms.com

The measurement of the density and solid particle concentration of liquids in pipe slurry is particularly important in the hydraulic conveying of (wet) dredged material. In order to determine these metrics only products operating with nuclear radiation could previously be used. This is not the case with the DENS-ITOMETER from ITS, which is also known as the »Gamma Buster« due to the absence of a nuclear energy source. »The DENS-ITOMETER is the result of years of development in successfully using the measuring techniques of electrical resistance conductivity in sea water based areas,« explains Ken Primrose, CEO of ITS.

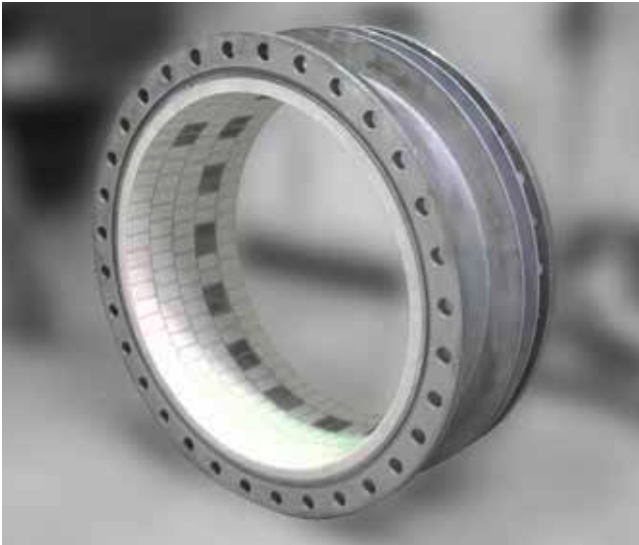
Ruggedness for harsh environments

The kernel program of the software was developed by ITS with MATLAB® / Simulink® and then tested on a standard PC. After consulting with industrial customers, it quickly became clear this was not suitable for use in the intended environment. »The computers were not industrially robust and could not therefore be deployed,« Ken Primrose explains. It was here that Bachmann electronic was able to stand out. The M1 controller hardware was the only industrial controller tested that was able to process

the software directly and was optimally suited for use by the excavation and building company due to its rugged design. The DENS-ITOMETER consists of a pipe-based sensor, and Bachmann's M1 controller is housed in the control cabinet together with the p2+ device from ITS and the associated equipment. The system also reliably supplies real-time data irrespective of flow regime and material concentration, even in extreme conditions, such as with 1.2 meter pipe diameters or slurry conveying rates of over 30,000 tons per hour.

Radiation-free measurement

The pipe-based sensor is provided with electrodes which are arranged on the inside. The solids concentration can thus be determined according to the conductivity inside the cross-sectional volume of the pipe. The sensor is connected with the ITS devices and the M1 controller, where the data is evaluated with the software, and the density of the slurry flowing in the pipe is calculated. The acquired data is then visualized via webMI in a graph and tomograms via a browser. The concentration information is provided as a 4-20 mA signal. Once installed, the DENS-ITOMETER requires no further maintenance or specially trained personnel.



▲ The DENS-ITOMETER pipeline sensor.

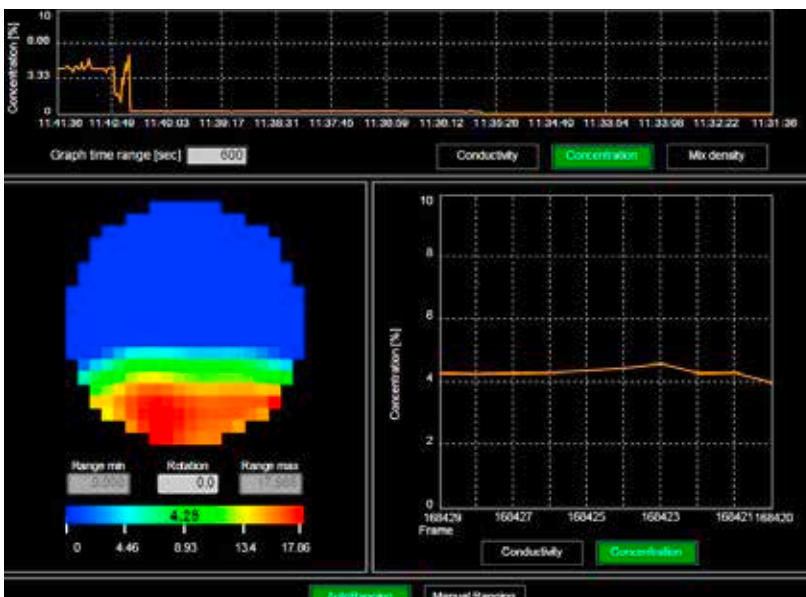


▲ The M1 controller is installed in the control cabinet.

Successful operation

Already during the development phase, the DENS-ITOMETER from ITS was deployed on a suction hopper dredger owned by Van Oord, the leading dredger company, and compared with a gamma densitometer. Even in extreme field applications, the device reliably supplied the required information – in real-time. It is now used in several excavators. It is not only used here for monitoring slurry. The measu-

ring of solids content in pipeline is also required in a large number of sectors such as the food industry. »The many years of development and the extensive know-how involved make the DENS-ITOMETER the most unique measuring system to date,« says Ken Primrose, »thanks to the easy handling and the low operating costs it is currently our number one selling industrial tomography system.«



◀ Everything in view: The acquired data is visualized in a graph.