



PRECISE DATA AT HIGH TEMPERATURES

M1 automation used in the metal industry

Dirt and dust, high temperatures, as well as water and oil vapor are everyday issues in industrial production plants in the metal industry. The trouble-free operation of the measurement and control technology required nevertheless has to be ensured. Thermo Fisher Scientific Messtechnik GmbH, based in Erlangen, Germany, supplies systems that are even a match for the harshest environmental conditions and acquire measuring data precisely and reliably. For this the company relies on the M1 automation systems of Bachmann electronic.

The products of Thermo Scientific cover a broad range of measurement and control systems for the coating weight gauging of flat sheet or web products in the metal, plastic and the rubber industry. These systems are used in many locations: They can be found in hot and cold rolling mills and metal process lines, as well as in hot dip galvanizing, lacquer coating and electrolytic coating plants. Their fields of activity also include flat film extruders, plastic and rubber calender machines, as well as textile production lines.

Proven over decades

The relevant measuring devices have been developed, produced and distributed in Erlangen since as far back as 1949. The processes and technologies required for this have been perfected over years. Today, non-contact and non-destructive radiometric measuring devices enable the online measurement and control of material and coating thickness during ongoing production. Depending on the application or measured material, the measuring systems use beta, gamma, X-ray or infra-red radiation sources for controlling ►►

Thermo
S C I E N T I F I C

Thermo Fisher Scientific Messtechnik GmbH is based in Erlangen (Germany) and has around 250 employees. Measuring technology for thickness gauging in the metal industry as well as radiation and fine particle dust measuring devices are built under the Thermo Scientific brand. The company is part of the Thermo Fisher Scientific Inc. based in Waltham, Massachusetts, and holds a special position in the corporation as it is the only one specializing in machine building for the metal industry. In 2013 the US corporation, which is a leading company in the US, achieved a turnover of more than 13 billion US dollars with around 50,000 employees worldwide.

► www.thermoscientific.com



▲ Thermo Scientific RM310EH X-ray fluorescence hot coating weight gauge installed directly over the zinc pot of a hot dip galvanizing line. The system contactlessly measures the surface weight of the zinc coating applied in liquid form to the steel strip. The zinc coating is regulated according to the measured value.

►► and optimizing the manufacturing processes and the quality of the end product. More than 15,000 Thermo Scientific systems have already been installed. The reliable, precise and reproducible measurements ensure that customers can maximize their uptimes, improve the quality of their products and minimize the use of raw materials.

M1: Powerful, precise and robust

To achieve this, the measured data is provided online and in real time during production. The integration in the controller system of the production plant ensures that corrective interventions in the process can be made as quickly as possible so that any rejects are virtually impossible. The resulting flood of data is huge and can only be mastered with a powerful automation system. "The challenge is enormous: Imagine the following example: A Thermo Scientific SIPRO gauge for hot strip lines measures the »real« cross profile of the hot steel strip at web speeds of around

900 m/min. For a strip width of 2,000 mm approx. 500 adjacently installed individual detectors are used, which each send a measured value every 5 milliseconds for a complete cross profile. This produces approx. 100,000 measured values per second, which are dilatation corrected and fed to the rolling stand controller," Michael Trutzel, head of gauging development at Thermo Fisher Scientific explains the difficult conditions. "Added to this is the fact that we can only allow minimum tolerances for the measurement system, which operates in conditions of considerable heat and dirt." However, to meet this challenge we found the ideal partner: "We depend on the use of high precision input and output modules," Trutzel continues. "Bachmann's modular M1

automation solution offered some impressive features. These included the guaranteed fan-free operation up to an ambient temperature of 60 °C." The openness of the system is an additional

» The high scalability of the M1 electronics allows use in low cost to high end applications. «

*Dr. Michael Trutzel,
Head of gauging development*

benefit: Typical bus systems such as Profibus or Fastbus are supported as standard. This enables the measurement system to be connected to the high-level controller systems without any problems. "Bachmann not only impressed us by its high level of performance, but the versatility of the system is also impressive," a delighted Michael Trutzel states.

Ethernet-based real time with bluecom

The bluecom communication protocol is also helpful for the engineers. "We often equip plants with measurement



◀ Thermo Scientific SIPRO gauges for hot strip lines. The upper arm in the photo contains the two X-ray sources. The detector arrays are located in the other arm below the hot strip. The gauge system delivers the hot strip thickness cross profiles every 5 milliseconds.

and control systems that are controlled with an M1 automation system. The bluecom real-time network operates without any problems and is simple," a delighted Gerald Schöppner, head of gauging software development at Thermo Fisher Scientific confirms. The Ethernet-based protocol is easy to implement. It stands out on account of its high speed and the stability of the communication. Schöppner is delighted and adds: "With bluecom, any complex

handling of interfaces is simply eliminated."

Satisfaction included

"With Bachmann, the whole package is right," Michael Trutzel emphasizes. "With the M1 automation system you not only get a powerful system but also maximum flexibility at a fair price." However, the Austrian company can also impress with services that go far beyond the product. "The technical

support at Bachmann is simply the best – and our sales team are also glad of the competent support," the engineer is pleased to state and adds: "With Bachmann we always have a good partner at our side."



» With the integrated development environment in the SolutionCenter, effective software development and analysis can be carried out quickly, also in C++, without having to constantly move between different tools. «

*Gerald Schöppner,
Head of gauging software development*