

# Digital Communication in Steel-Plate Manufacturing

FieldConnex® monitors and controls the continuous casting line in Europe's largest steel mill

## At a Glance

- Technology for long cable runs and harsh conditions including high temperatures, humidity, and dust formation
- Easy DCS integration through transparency between ROFIBUS PA and PROFIBUS DP
- Quick installation using pre-wired enclosure solutions for the fieldbus junction boxes
- Ready-to-use documentation of installation quality with the advanced diagnostic module



## The Application

Continuous casting systems are used to produce steel plates in modern mills. This continuous process adds a new dimension to the manufacture steel-plate products, which are used in the construction of wind turbines, for example. The continuous casting system of a German manufacturer is arranged vertically, enabling high-quality production of steel plates weighing well over 100 tons.

The slabs are cut during the manufacturing process. This is only possible once the core of the slab has solidified, so cooling with water plays a key role in the process. Several hundred pressure, flow, and temperature measurements are taken, with approximately 40 control valves regulating the water supply and the cooling process.

## The Goal

A central control room shall replace the decentralized control system usually found in steel mills. The sheer length of the production halls for processing the slabs requires long cable runs resulting in considerable installation costs. To minimize investment and operating costs, the possibilities of digital communication, such as remote parameterization and status management, shall be implemented and used to their full potential during both commissioning and operation.

In-house teams will handle project management, planning, construction, operation, and maintenance for the plant. Both the planning and maintenance of the plant will be under the control of a specialized department.

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## The Solution

High temperatures and dust contamination are characteristic of steel mill environments. FieldConnex® Segment Protectors in pre-wired, ready-to-install housings serve as fieldbus junction boxes. A board in the control cabinet connects to a fieldbus segment via the power supply. The segment connects and supplies up to 31, realistically 12 to 20 instruments via a two-wire cable. The cable can be up to 1900 m in length.

Because data is digitized once in the sensor, digital communication enables precise transfers with high resolution. The data can be transferred over long distances without drift. Status, diagnostics, and configuration information are transferred alongside the measured or control values.

Familiar methods for integrating control technology for motor starters and frequency converters using PROFIBUS DP can also be implemented for the process sensors and actuators using PROFIBUS PA. The transparent nature of the FieldConnex® Segment Coupler 3 makes this consistent integration possible.

Involving the owner in the project at an early stage is critical to its success. This means that additional functions such as remote diagnostics and parameterization provided using digital communication can be used to optimal effect in the work packages and subsequent processes and procedures. Particular attention should be paid to the shielding and grounding concept for automation: The design must be suitable to the grounding concept chosen for energy distribution system.

## The Benefits

Fieldbus handles long cable runs and connects many nodes using one shielded, two-wire cable. A completely digital communication system provides access to diagnostics from all system components, enabling maintenance to be managed predictively and proactively. FieldConnex® components are reliable and durable and therefore well-suited for use in steel mills.

Digital communication via PROFIBUS PA is used throughout this steel mill: The coke oven plant at the same site uses a control system from another manufacturer, but that also uses the FieldConnex® fieldbus infrastructure. Fieldbus offers benefits for plants of all types.

For more information, visit: [pepperl-fuchs.com/fieldconnex](https://pepperl-fuchs.com/fieldconnex)

