

## Metal Products

ActiveFactory software, InTouch HMI for Terminal Services,  
Wonderware Historian

Arcelor Bremen

# Enhanced performance and quality thanks to a centralized standard solution for process data acquisition and visual display

by Wonderware GmbH

*“Thanks to the technology from Wonderware, we have succeeded in meeting the flexibility operation and monitoring requirements of modern production facilities.”*

Stefan Jaschke, Plant Manager TSE,  
Arcelor Bremen GmbH



### Company Overview

Arcelor Bremen GmbH - Bremen, Germany  
The Arcelor Bremen GmbH, a business unit of the Luxembourg-based Arcelor Corporation, produces around 4 million tons of crude steel each year. Covering all production steps from iron making up to a rolled steel plate, Arcelor Bremen manufactures a broad range of flat steel products.

The Arcelor Bremen GmbH extensively modernized five main areas within the actual steel work area with regard to automation, connectivity and visualization. Since 1999, the facilities have been continuously improved. The objective of this large-scale project was to use the existing systems more effectively by means of a detailed analysis of the operating parameters and system errors and by replacing isolated visualization applications with a uniform standard.

### Main Objectives

The objectives included reducing cost, boosting productivity and product quality, increasing system availability and minimizing errors. These targets can only be achieved by using advanced and standardized solutions.

The company SEGNO Industrie Automation GmbH has a proven track record in similar projects comparable in scale. Consequently, this company was brought in as a strategic partner to standardize the visualization system.

### Planning and Concept

As part of the modernization process, the standardization of project planning was to be introduced to allow the standard use of equipment by various operators. Therefore a specifications catalogue was developed by Arcelor Bremen and SEGNO, defining standards for visualizing equipment and production messages.

Additionally, the entire project planning and system maintenance was to be centralized. It was necessary to ensure that all changes to the application could be carried out during operation - without restarting the system.

For the data collection, a system was developed that is capable of recording large volumes of data on a daily basis for each equipment without any data-loss. Due to the strict requirements in terms of availability, the server architecture was to be redundant in design to permit continuous operation.

### Production Workflow

Liquid hot metal coming from the furnace is

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Alloyed steel is cast into slaps continuously

processed and refined:

### Desulfurization

By infusing CaC<sub>2</sub> and Mg, any unwanted sulfur is extracted from the pig iron.

### Converter (Linz-Donawitz-Process)

By blowing oxygen onto the pig iron through a water-cooled lance, unwanted carbon is burnt. To create specific steel properties, alloying elements are added during the tapping.

### Metallurgic Center

In a vacuum, carbon is extracted from the steel. At the conditioning stands, special alloying elements are added to achieve specific properties in the steel according to the customer's requirements.

### Continuous Casting

Once alloyed, the steel is cast into slabs. If necessary, these are also cut before being delivered to the rolling mill for further processing.

## Project Solution

From as early on as the initial selection and product finding phase, Arcelor Bremen was advised by SEGNO, which resulted in the implementation of a pilot system using InTouch HMI (Human Machine Interface) visualization from Wonderware.

Convincing arguments were e.g. the simple and intuitive use that enables know-how to be increased in-house and the security of knowing that the product is constantly developed further by an international software provider such as Wonderware.

Consequently, the five independent production areas desulphurization, metallurgic center, converter (LD plant), continuous casting and slitter were each equipped

with visualization systems based InTouch for Terminal Services in order to ensure the unified management of all equipment parts. All five applications were developed on the basis of factory standards, and therefore can be maintained centrally without interrupting operation. The entire system is redundant in design.

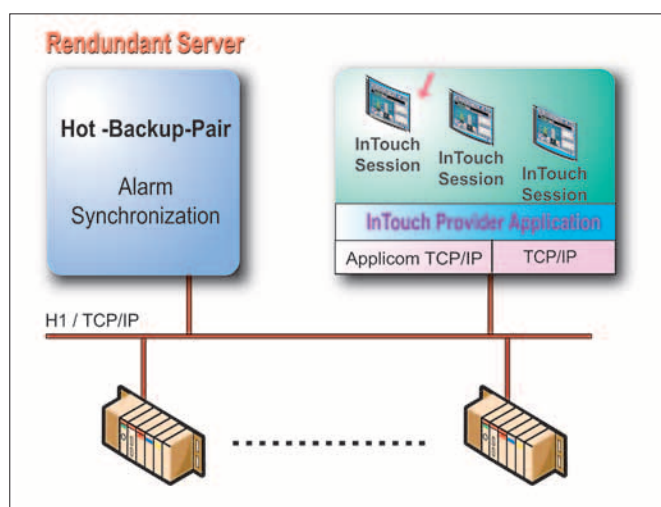
### InTouch for Terminal Services

InTouch for Terminal Services can be used on one central server, with all the applications being executed on the terminal server. The Terminal Services protocol is installed on the client systems. This in turn allows these clients to access a thin client version of the InTouch application - otherwise known as a session. The InTouch session provides the full InTouch functionality and is administered from the operating system of the terminal server. The InTouch session is totally independent from other client sessions. Consequently, each user can log-on to the terminal server and access his own session of the InTouch application.

The connection to the process bus TCP/IP and H1, which is equipped with Simatic S7 and S5 controllers, is realized by communication cards from Applicom / Woodhead.

### Performance

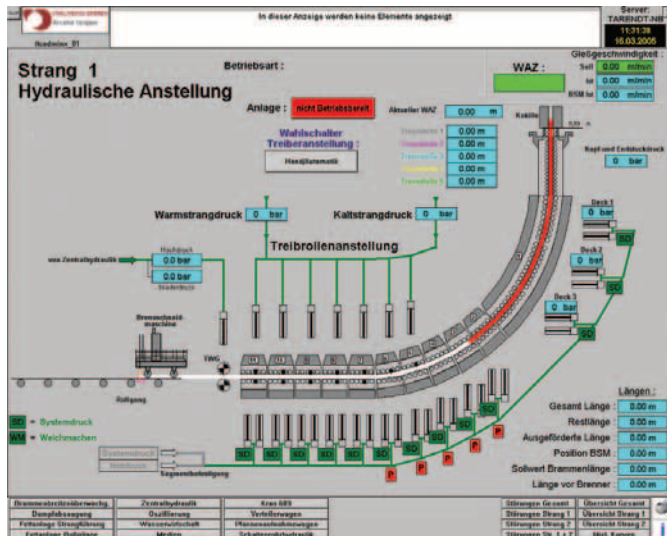
At the end of the project, about 110 InTouch terminal clients and 10 redundant InTouch servers are used in continuous operation in the five production areas. One Wonderware Historian per area handles data recording and archiving of process- and measurement values.



Functional principle of InTouch for Terminal Services

Due to special compression process of the Wonderware Historian, production data are compressed to a low data volume, thereby permitting a more economical utilization of storage space and faster access of data.

The Wonderware Historian retrieves system data a hundred times faster than conventional relational databases; it stores that data in a fraction of the storage

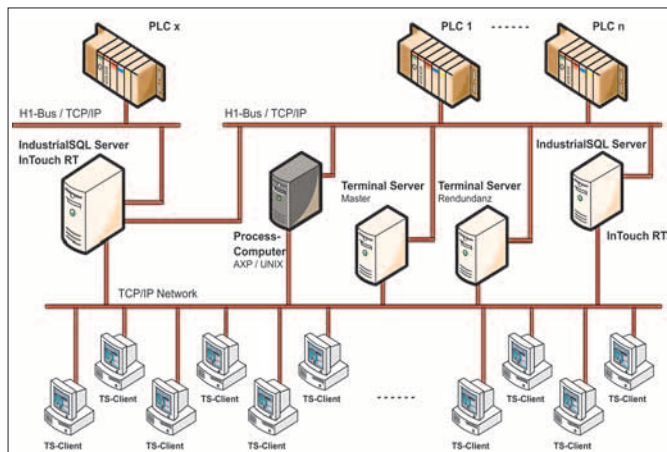


Process diagram, continuous casting plant: Hydraulic activation strand 1

space and, as such, opens up possibilities for using relational databases in the industrial sector. The “running” of the individual systems is based on a large number of values and parameters, which have to be supplied to the process manager without a time delay.

For this, Arcelor Bremen uses the ActiveFactory software from Wonderware, which permits real-time access to the required information stored in the Wonderware Historian database via customizable curve diagrams.

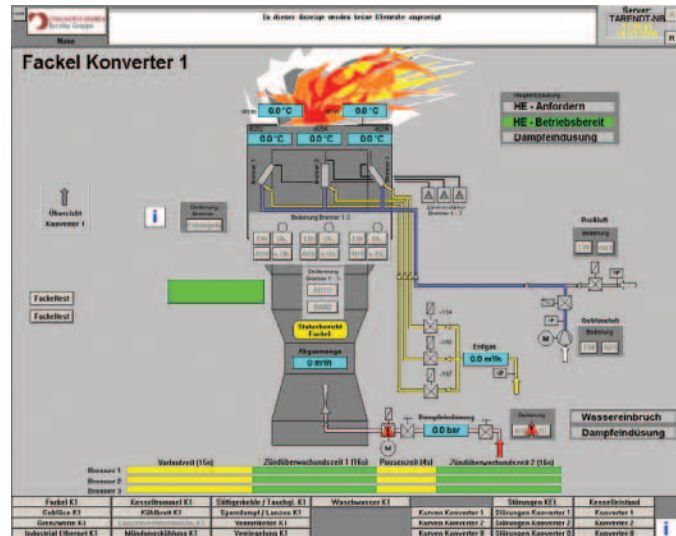
With a few mouse clicks by either the process manager or the maintenance technician, it is possible to quickly generate analyses of process data from individual batches - even in retrospect. Correlations between specific values and later recorded test results of the finished product can be generated and used to improve the quality of the steel.



Configuration concept for the area continuous casting plant

### Rapid .net Event Signaling System

The advantage of being able to record complete production messages, switching activities and alarms is the ability to trace the source of errors as well as the



Process diagram LD plant: Torch converter 1

possibility to localize that source. However, the recording of all this data means that per day up to 300,000 signal changes have to get registered and recorded.

Therefore SEGNO developed a special application. The .net event signaling system comprises the recording of alarms and events from the InTouch applications. A software developed by SEGNO collects the data from the InTouch alarm-consumer interface and writes them via temporary ASCII files into a database (MS SQL server 2000).

A web application allows the data to be displayed in a browser window. Various databases can also be viewed simultaneously, e.g. LD plant or continuous casting plant. By using variable time domains, a filter can be applied for alarms, warnings, messages, work areas and alarm groups.

Despite the immense volumes of data generated each day, it only takes a few split seconds to visualize data due to optimized database access. No installations are necessary on the client side to be able to view alarm data. Only a network connection to the web server is required.

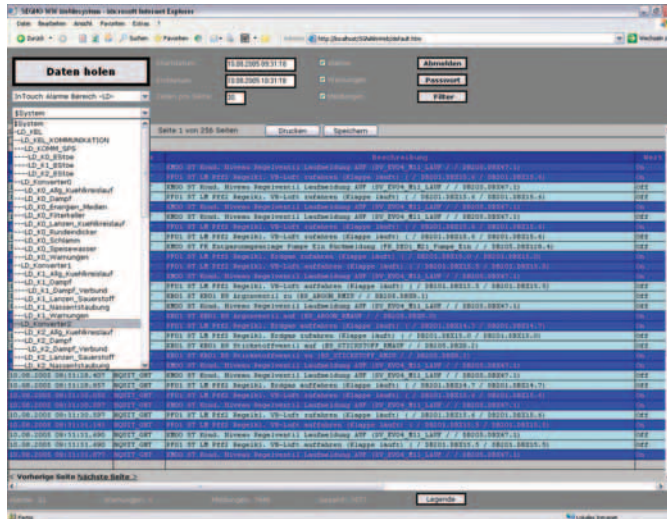
### Results

As a result of the ongoing modernization project in the steel works, a number of local operating stations have been combined and centralized, which in turn reduced work effort required. The increase in reliability is ensured by sophisticated redundant solutions. Additional savings are achieved by cutting implementation times of the clients.

Significant advantages include standardized use and central project planning, based on a centralized software administration and application maintenance during operation. In terms of maintenance and project planning, a drastic boost of effectiveness through targeted and

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Alarm group selection in the web application

rapid access to relevant data within the InTouch HMI applications was realized.

An additional advantage is the rapid data acquisition and evaluation. Precise and quick analysis of errors and downtimes is enabled through state-of-the-art technologies such as .net applications.

The causes of production losses and quality problems are detected more quickly and can be tackled more effectively.

In the case of hot-metal desulfurization, the recording of analog values has been used to optimize the control of the blowing-in plant, which again resulted in a significant stabilization of the process and a corresponding cost reduction.

*This document was realized thanks to the support of:  
Arcelor Bremen GmbH and  
SEGNO Industrie Automation GmbH*