The connected steel plant
Extracting more value at every stage of your process
You are faced with a wide range of challenges daily. Trade wars are making the market more complex, a retiring workforce is leaving management with a skills gap to deal with and globally the steel industry is operating at high rates of capacity utilization.

Does this sound all too familiar?

Luckily, there is a way to mitigate these challenges. Optimizing and maintaining critical operations in your steel plant demands expertise and modern, integrated technologies. We offer a wide range of solutions that safeguard your operations and meet economic and performance requirements. These solutions are scalable, flexible and easy to integrate, helping you increase productivity, lower costs, reduce energy consumption and improve safety.

### GLOBAL STEEL INDUSTRY IN FACTS

- **50+**
  - The average age of major steel company workers in the US

- **300**
  - Metric tonnes per annum of excess capacity predicted for 2020 (globally)
  
  *Source: McKinsey*

- **70%**
  - Potential energy savings through steel recycling

  *Source: Worldsteel*

- **60%**
  - China’s market share objective for their top 10 steel producers by 2025

  
  *Source: Worldsteel*

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*Note: The content above is a summary of the main points discussed in the document.*
The challenges you face

With a changing world and a changing steel industry, producers are required to be agile in their operations. Companies focusing their efforts on effective change can help grow the industry as a whole while remaining productive and profitable.

Focus on controlling these variables is key to remaining competitive:

- Capital and cost management
- Product quality
- High production yield
- Maintenance costs
- Product innovation
- Flexible production plans/short lead times
- Safety
- Emissions and energy
How we overcome these challenges

Rockwell Automation® helps steel producers plan their transformation journey from start to finish. Proper planning and project management means challenges can be identified and addressed in the early stages of a project—before the entire project is derailed. Adhering to a project plan keeps your initiatives on budget and on schedule.

- Metals application engineering
- Project management
- Systems engineering design
- Machine safety assessment
- AC and DC drive controls
- Motor control centers
- Rotating equipment—motors/brakes/feedback
- Level I control system programming
- Level II operator interface/HMI
- Customer application training
- Installation/commissioning services
- Conversion and migration

Adhering to a project plan keeps your initiatives on budget and on schedule.
A connected plant offers major opportunities for companies to improve operational efficiencies, reduce safety risks and drive better decision making.
Digital technologies
How digital technologies can help steel manufacturers

- Analytics: Improving process and quality, and optimizing the production chain
- Simulation: Reducing costs, and validating strategies beforehand
- Internet of Things sensors: Better tracking of materials, people, consumables and emissions
- Artificial intelligence and machine learning: Predicting failures and increasing yield
- Mobility: Reducing maintenance costs and improving personnel productivity
- Augmented reality and virtual reality: Improving collaborating and making operations safer
- End-to-end system integration: Improving decision-making with increased supply chain and plant-to-business visibility

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Modernize and empower your workforce PG 19
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The connected steel plant

End-to-end architecture and systems integration

Enterprise systems

Third party applications and systems

IoT platform analytics visualization

ERP

Third party applications and systems

Life cycle services

Simulation

MES

Process optimization

Condition Manager

IoT gateways

Process control and power

Connected workforce

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The connected steel mill

DIGITAL TWIN CONCEPT
Enabling reduced capex and opex optimization

DIGITAL TWIN FEATURES
Mechanical CAD
Process control
Virtual commissioning
Operator training
Electrical CAD
Mathematical modeling
Mobility
Virtual training

DIGITAL TWIN BENEFITS
Better prototyping
Easily design and build the next generation of equipment with confidence.

Virtual commissioning
Design, test, validate and commission systems before they are put into service.

Validate your strategies
Optimize throughput with simple, real-time 3D simulation of complex dynamic processes.

Operator training
Reduce risk and improve operations by training workforce in a safe virtual environment.
Integrated power and control solutions help you get the most out of your process and equipment—improving your overall productivity while reducing maintenance costs.

Increase operational efficiency
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Bringing process information and business information together can lead to improved quality and increased ability to meet customer demands.
SOLUTIONS FOR ROLLING AND PROCESSING LINES

ROLLING AUTOMATION

Integrated controls, visualization and safety combine to create a reliable and easy-to-use solution for rolling applications. Our solution also supports AC and DC drive applications including drive solutions with a shared/common DC bus configuration.

The solution incorporates solutions like gauge control, production scheduling and specialty instrumentation.

PROCESSING LINES

Our power and control systems provide high performance solutions for finishing lines.

THIS INCLUDES:

- Drive control
- Tension control
- Welding monitoring
- Cleaning and coating
- Furnace process control
- Auxiliary systems control
- System-wide data analysis
  (tracking of equipment performance trends and product quality)

We have application expertise in annealing and pickling, hot dip galvanizing, plate leveler, slitting lines, cut-to-length and rewind lines.
SOLUTIONS FOR MATERIAL HANDLING

CRANE AUTOMATION

Automating your crane applications leads to faster and more efficient operations and can increase the life of your equipment by providing real-time diagnostics and alerts about equipment productivity.

Advanced drive systems deliver smoother and more precise crane movement that, combined with automation, can enhance operational performance, improve people safety, and reduce operator stress and fatigue.

STORAGE MANAGEMENT SYSTEMS

Improve operational efficiency with a better coil management system.

IMPROVED MATERIAL IDENTIFICATION CAN:
- Reduce errors and make sure customer orders are filled correctly every time
- Eliminate product damage that occurs as a result of unnecessary movement of product

OPTIMIZED CRANE UTILIZATION CAN:
- Reduce wear and tear on cranes
- Improve throughput

BETTER INVENTORY MANAGEMENT CAN:
- Increase ability to track products
- Better productivity and inventory management
Precise motor control
Metals applications require powerful integration between motor control and automation

Our integrated approach for motor control and automation enables design productivity, safety, visualization, predictive analytics and an easier replacement of a faulty device.

Fast and precise design
Suite of control and HMI objects to accelerate project engineering including faceplates designed around user roles (operator, maintenance)

Integrated configuration
Configure the controller, motor control devices and I/O simultaneously

Smart commissioning
Startup wizards will guide you through the entire commissioning process

Predictive maintenance
Monitor drive and system components, and extract data upstream so it’s accessible through the controller and HMI sets

Automatic device configuration
When a device is replaced, helps users automatically assign the operational configuration of the original device to the replacement
When you collect, aggregate and analyze data across operations, you can spot trends and interdependencies that are missed when data lives in silos. With this type of information, you can make more informed decisions.
Integration from **raw material to market**

### Key Features
- **InnovationSuite** powered by PTC
  - Metrics / KPIs
  - Inventory
  - Downtime
  - Quality
  - OEE
  - Energy
- **OperationSuite**
  - Performance management
  - Recipe and order management
  - Material and product tracking
  - Knowledge management
- **Historian**
  - Visualization consolidation
  - Human interfaces
  - Remote monitoring

### Solutions to meet steel needs
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Scalable analytics from devices to enterprise

Our scalable analytics solutions include our LogixAI™ module, which provides embedded analytics that empower users to apply machine learning at the controller level. No need for a data scientist.

Our controller-based artificial intelligence enables optimization at the operation level. This means reduced downtime, lower maintenance costs, improved product quality, and increased energy efficiency.

Auto-discovery
Immediate value from managing data at the edge

Self-configuration
The user defines the problem and the system defines the solution

Self-learning
AI module that plugs into the backplane of the controller

Self-maintenance
Specific AI engines addressing different needs and applications
Process and energy optimization

Model predictive control simultaneously improves productivity and optimizes use of energy and raw materials.
MANUFACTURING EXECUTION SYSTEMS

IMPROVE PRODUCTION EFFICIENCY
An MES links business data from systems like an ERP with real-time operational data from plant-control systems. This connection means your manufacturing process becomes information-driven:

- Trigger business actions based on real-time operational data
- Trigger operational activities and rules based on business data
- Manage performance, recipes, and orders in one place
- Improve quality control
- Maximize equipment utilization

SUPPLY CHAIN SIMULATION

SIMULATE: EVALUATE THE FULL IMPLICATIONS OF BUSINESS DECISIONS BEFORE THEY ARE PUT INTO PRACTICE
Looking to make changes to your operations or supply chain? Simulation software allows you to analyze alternatives and visualize potential outcomes without the cost or risk of a real project or pilot. Especially today, as global changes in consumption patterns are forcing companies to reevaluate the role of supply chain planning, simulation software can be a powerful tool for testing and validating the implications of an operational or supply chain modification, so you can continuously improve your business without the risk.
Modernize and empower your workforce

New technologies are expanding human possibility. Incorporating these technologies into workers’ daily lives can ease workforce transitions, increase worker productivity, foster collaboration, and provide a safer, more engaging environment for all employees.
WORKER SAFETY AND EFFICIENCY

MOBILE REAL-TIME INFORMATION

Metals environments are harsh, and the processes involved in metalwork are complex and typically run out of disparate systems. When something breaks down, field workers may find themselves servicing or operating equipment without a direct view into how the specific piece of equipment is performing. This lack of visibility and information can reduce productivity and result in unsafe operations.

Our mobility solutions extend visualization and real-time decision capabilities to browser-based remote users including mobile devices. With features like voice command recognition and on-demand, real-time access from anywhere, every team member benefits from this visibility into the plant.

57% of employee productivity/efficiency will increase with mobility

Source: Motorola/mobientech.com
WORKER SAFETY AND EFFICIENCY

AUGMENTED REALITY

Superimpose digital information onto real objects or equipment, providing field personnel with real-time information in context of the true process. This technology helps metal producers enable remote expert advice for equipment maintenance and augment the training process to create customized, memorable instruction for new workers.

SEE THE RESULTS

- Better employee productivity
- Safer operations
- Remote collaboration
- Expert advice

51% of respondents said that their company had already seen a measurable ROI when it came to using AR for employee training/knowledge transfer.

Source: PTC/IDC
New projects and upgrades can be risky to undertake. Reduce your risk of overspend and delays with better up-front planning, fewer vendors, and tested project methodology and architectures.
You strive for continuous improvement to increase both productivity and profitability. As your partner, we can establish a baseline and then continuously work to unlock the potential of your investments. We envision the future together, and then together we make it happen.

- Connected enterprise & OT digital transformation consulting
- IT/OT convergence
- Feasibility studies
- Operational analytics
- Intelligent asset consulting
- Modernization

SUSTAIN
We bring together your data, systems and processes to provide you with the right information at the right time. Your business is more connected, productive and intelligent.

- Remote & on-site technical support
- OT cybersecurity
- Safety assessments and remediation
- Asset management
- Managed services
- Predictive and prescriptive analytics

DESIGN
We can help design your network, your system and your application so it's integrated and intelligent.

- System design and simulation
- Functional safety
- Automation, information and equipment requirements
- OT network
- Front-end engineering design (FEED)
- Main automation contractor
- Industrial workforce consulting
- Digital plant

BUILD
We have the domain expertise to install, start up and commission your machines and systems. We provide complete project management services so you know that your investment is protected.

- Installation
- Commissioning
- Project & program management
- Calibration
- Packaged solutions
- Startup
- OT IaaS
- OT Edge to cloud compute

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Digital consulting services
A partner focused on business outcome and problem solving

1. Operational Assessment
2. Corporate Alignment
3. Business Case
4. Business Architecture
5. Technical Architecture
6. Digital Roadmap

Strategy development
Detailed design
Deployment
Cybersecurity
Solutions and services

**Validated solutions/architectures**
Comprised of a collection of Cisco® and Rockwell Automation® validated designs, our architectures are tested for performance, availability, repeatability, scalability and security. This means you get fast, tested access to ‘future-ready’ network design.

**Cybersecurity services**
From assessment to response plan deployment, we can provide a full lifecycle service focused on industrial security. Our experts understand how to securely bring together IT and OT, and help secure your infrastructure, protect assets, and maintain network availability.
### A proactive approach to industrial cybersecurity

#### Attack continuum

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#### BUILD A SECURE, ROBUST, FUTURE-READY NETWORK FOR YOUR CONNECTED STEEL PLANT

![Diagram icons: Assess, Design, Implement, Validate, Monitor]

A holistic approach to help you design, deploy, and manage your network infrastructure