

# Process Safety Solutions

Protecting People, the Environment, and Critical Control Assets

ics triplex



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THINK.  
SOLVE.®

 Allen-Bradley • Rockwell Software

**Rockwell**  
**Automation**

# Process Safety Solutions

Hazards and risks are an inevitable feature of any industrial application and process safety is a major concern to anyone who works in the process industries. The protection of personnel, processes, and the surrounding environment remains a significant part of any automation strategy.

With over 50 years of safety expertise, Rockwell Automation® technology is utilized in safety and critical control processes throughout the world. Our ICS Triplex® brand of safety critical shutdown has been a recognized leader in process industries creating maximum availability and reliability for a host of applications.

**Rockwell Automation® technology has been utilized in many critical control applications:**

- **Emergency shutdown**
- **Fire and gas**
- **Spill prevention**
- **HIPPS**
- **Burner management**
- **Compressor control**
- **Turbine control**

## **Safety First. Safety Last.**

A Safety Instrumented System (SIS) is engineered to perform "specific control functions" to fail safe or maintain safe operation of a process when unacceptable or dangerous conditions could occur.

Rockwell Automation can help you select a process safety system – whether standalone or integrated – based on required Safety Integrity Level (SIL) and your project requirements.

Our scalable offerings, in both size and redundancy, allow you to select the system that best meets these requirements:

- SIL Capabilities
- Fail Safe and Fault Tolerance
- Performance
- Size
- Connectivity
- Flexibility



# Rockwell Automation Process Safety Offerings

Rockwell Automation provides you with multiple choices for your process safety applications allowing you to select the right-sized system without extra costs.

## AADvance System

The AADvance® solution is a truly distributed, scalable architecture which comprises both a hardware controller and a software environment that allows you to specify the level of safety integrity and availability you need throughout your plant. AADvance offers a high level of flexibility from small quantity I/O to large systems; non-safety to SIL 3, and fail-safe to multiple fault tolerant.

### Integrated Control and Safety

- CIP™ (EtherNet/IP™) communications to Logix controllers
- OPC Data Access (DA) & Alarm & Event (A&E) communications
- Modbus communications

### Scalable Architectures

- Distributed controller architecture
- Flexible processor redundancy configurations
- Flexible I/O fault tolerant configurations
- Black channel communications

### Feature Rich Hardware

- Comprehensive diagnostics
- Integrated HART communications (AI & AO)
- Channel isolation
- Electronically protected outputs
- Online replaceable

### Comprehensive Programming Environment

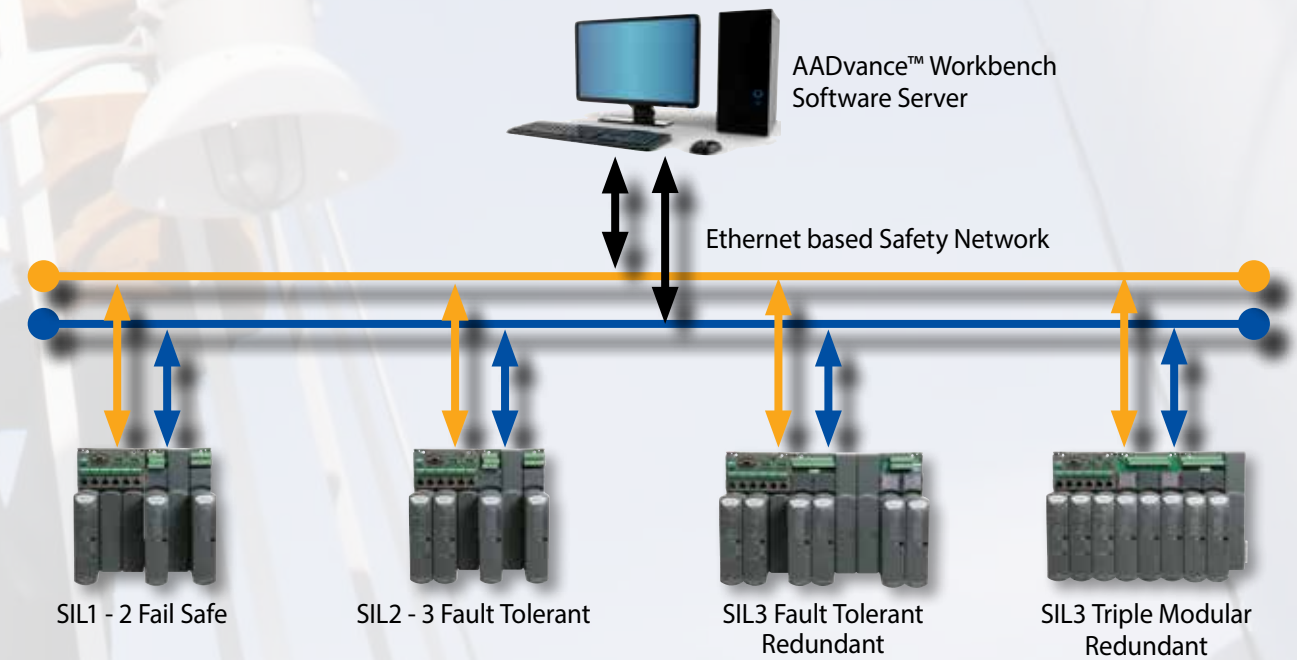
- Supports all 5 IEC 61131 programming languages
- Built in version control
- T3 compliant online modifications and expansion
- Online programming changes
- Online debugging
- Offline simulation
- Single programming environment to manage multiple controllers for distributed safety applications



Typical Applications*	SIL Target	Demand
Emergency Shutdown (ESD)	2 & 3	Low / High
Fire and Gas (F&G)	2	Low
High Integrity Pressure System (HIPPS)	3	Low
Burner Management Systems (BMS)	2	High
Subsea (BoP)	2	Low

\* All safety applications are unique. We encourage you to speak with a Rockwell Automation Safety Consultant to be certain the correct SIS system is selected for your application.

### AADvance Multi-SIL Configurable Architecture



# Trusted System

The Trusted® solution features a Triple Modular Redundant (TMR) controller. It is designed to provide maximum safety and system availability. Trusted® uses control to minimize system trips and provides high availability, fault tolerance and fail-safe features as part of its intrinsic, safety-related functionality.

## Trusted System

Trusted is designed to meet a wide range of safety requirements and maintain the highest integrity level, even in the presence of multiple system failures.

The Trusted TMR design uses a majority voting process to identify the source of a fault. Random hardware failures will cause one of three control 'slices' to react differently to the others. This discrepancy will be captured and reported by the voting system. The Trusted TMR system will react immediately to contain system faults, helping to ensure it meets your safety integrity requirements.

The hardware voting technology has major benefits including:

- High test coverage of potential faults
- Tolerance to multiple failures
- No restrictions on time-to-repair
- Accurate fault identification
- Reduced operating system size and complexity



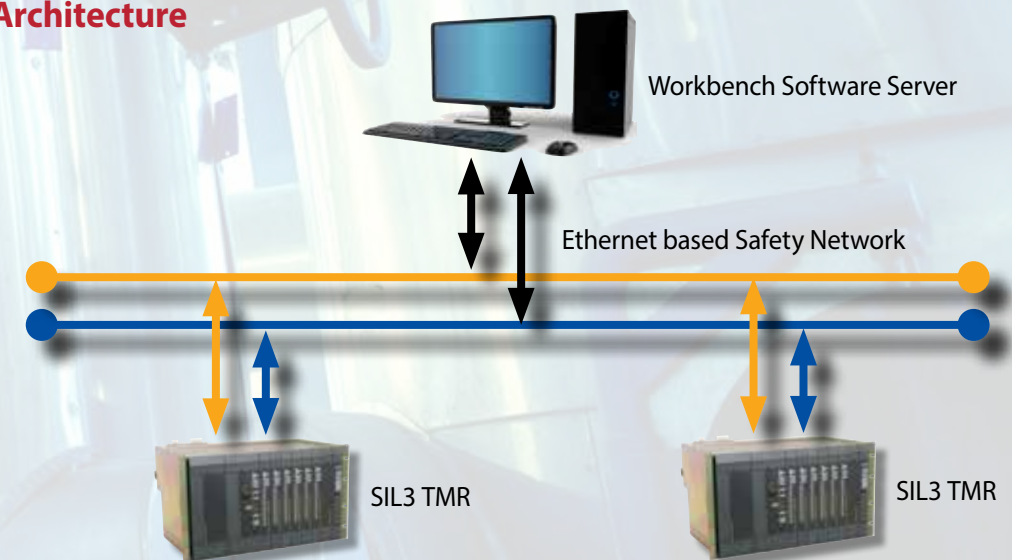
With combined Hardware Implemented Fault Tolerance (HIFT) and TMR technology, Trusted can offer you the following key capabilities:

- A Safety Integrity Level of 3 (SIL3) and fault tolerant
- Stable, predictable operation
- High capacity and high speed
- Easy to use and maintain
- High density I/O (up to 40 channels/module)

Typical Applications*	SIL Target	Demand
Emergency Shutdown (ESD)	2 & 3	Low / High
Fire and Gas (F&G)	2	Low
Turbo Machinery Control (TMC)	2	High
Burner Management Systems (BMS)	2	High
High Integrity Pressure System (HIPPS)	3	Low

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## Trusted® Architecture



# ControlLogix SIL2

The ControlLogix® SIL2 solution provides very high levels of availability for those SIL2 Basic Process Control System and/or Process Safety System applications that cannot tolerate a system shutdown.

### Reliability by Design

Sophisticated diagnostics and high levels of reliability are standard design in ControlLogix programmable automation controllers, I/O modules, and communication products. It is that same, standard design that readily provides the reliability needed to achieve SIL 2 certification.

### Standard Design Yields Exceptional Savings

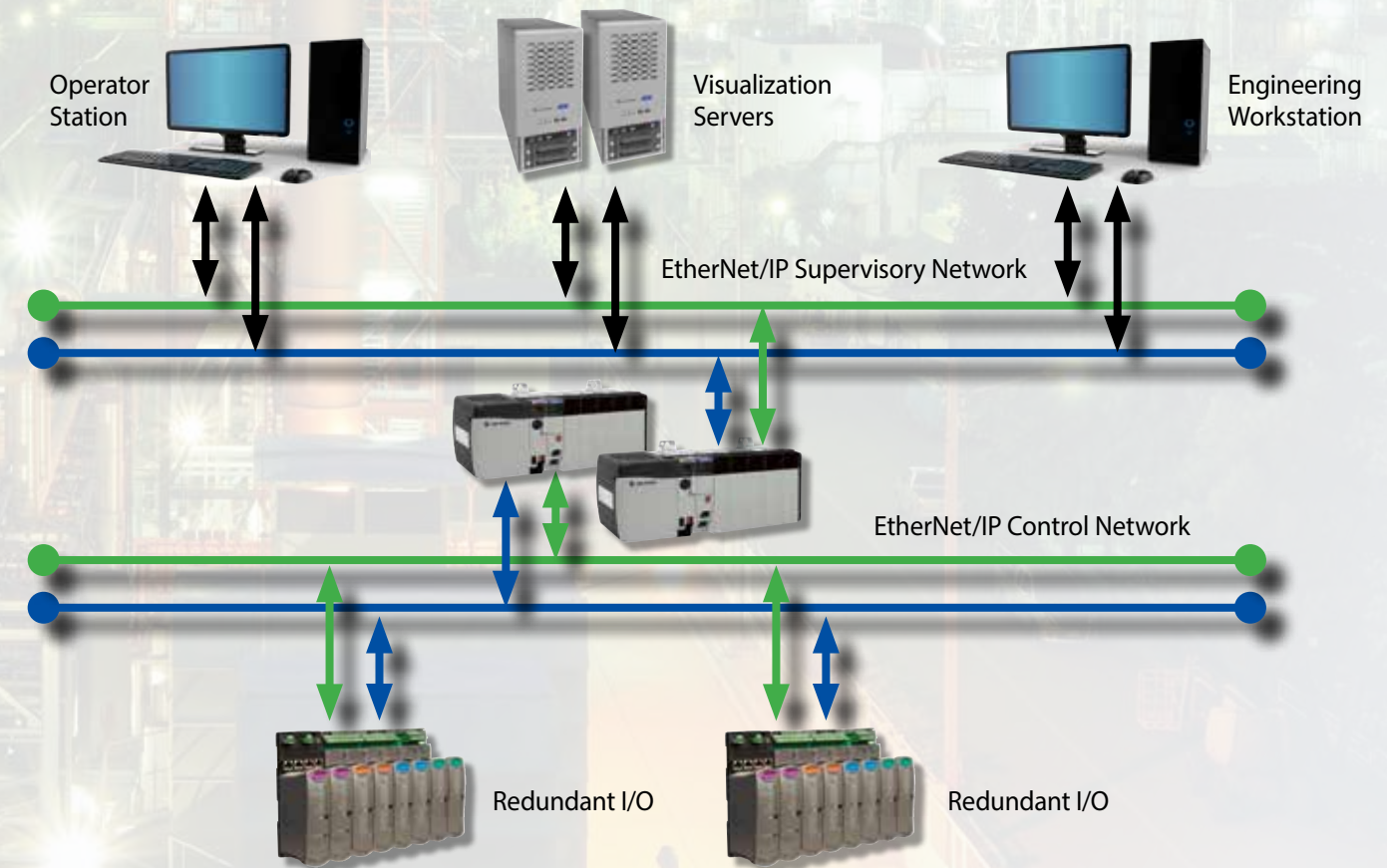
The ability to use standard, off-the-shelf ControlLogix solutions in SIL 2 applications helps eliminate the need for additional training and ensures that spare parts are readily available. That is why many major petroleum customers use ControlLogix, saving more than 80% of the cost of other solutions.



Typical Applications*	SIL Target	Demand
Burner Management Systems (BMS)	2	High
Turbo Machinery Control (TMC)	2	High
Power Equipment	2	Low

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### ControlLogix SIL2



## OptiSIS Packaged Solutions

Compliant with ISA 84/IEC61511, the OptiSIS™ safety instrumented system is an ideal solution for diverse SIS replacement/upgrade projects, utilizing an “off the shelf” common solution. Featuring a standard logic solver capable of meeting SIL requirements up to SIL 3, it is simpler, faster, and more cost-effective to deploy than a custom-designed SIS solution.

### Reduce Lead Times

The OptiSIS packaged solution helps reduce lead times associated with customized safety solutions. The focus is on configuring safety functions, rather than engineering and safety manual compliance tasks.

- Configured from a Cause and Effect Matrix (no programming)
- Rapid deployment to the field
- Quick installation, easy upgrades
- Reduced risk at installation (rapid verification)
- Connectivity to smart field devices and asset management systems



Typical Applications*	SIL Target	Demand
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High Integrity Pressure System (HIPPS)	3	Low
Burner Management Systems (BMS)	2	High

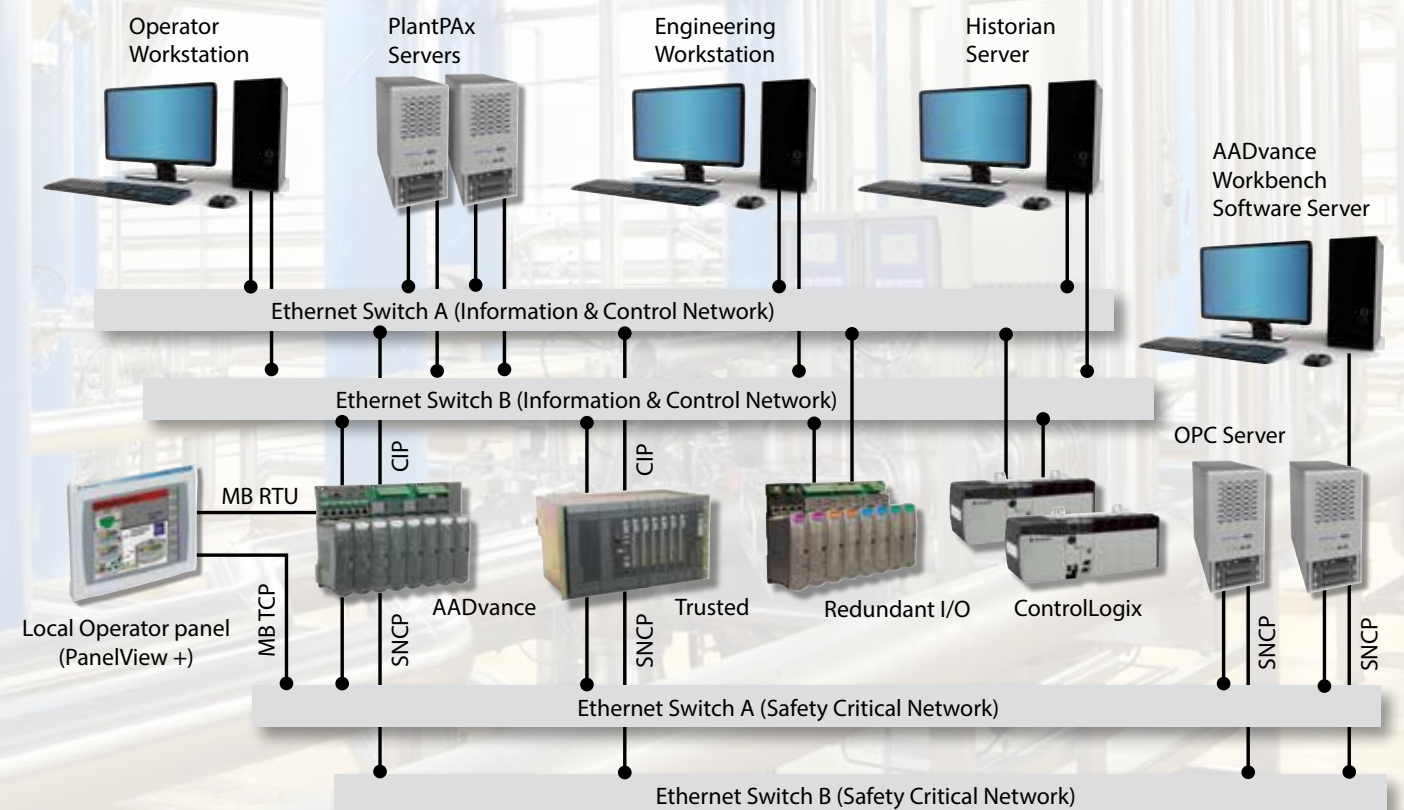
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## Integrated Control and Safety System (ICSS)

Rockwell Automation can provide flexible and scalable process control and safety solutions that easily allow implementation strategies to best meet your integrated control and safety system needs.

### AADvance, Trusted and ControlLogix SIL2 can be configured:

- As standalone SIS systems that can communicate to all major DCS and PLC (BPCS) vendors thru Modbus Serial, Modbus TCP/IP, or EtherNet/IP.
- As standalone SIS systems that can be integrated into the PlantPAx distributed control system control strategy
- As part of an overall Integrated Control and Safety System (ICSS)



## A World of Process Safety Experience

Rockwell Automation has a global safety team of consultants ready to assist end users, integrators and OEMs. Our aim? To provide your organization with the solutions and services you need to maximize production throughout your automation lifecycle – from design and installation through operation and migration.

We'll help you achieve your functional safety targets for the entire process, while helping to maintain your productivity goals.

- Functional Safety Management Systems
- Hazard and Operability (HAZOP) Study
- Safety Integrity Level (SIL) Targeting
- SIL Assessment
- Product Certification
- Quantified Risk Assessment (QRA)
- Dispersion Modeling / Consequence Analysis
- General Reliability / Availability Studies

## Delivering Value – and Confidence

When you work with Rockwell Automation, you engage a team focused on listening to you – and learning about your issues and objectives. Then, we apply our domain expertise, global execution ability and certified project management methodology to help you create and execute process safety solutions that meet or exceed your business goals.

Our expertise spans a wide range of industries and includes complete solution delivery capabilities that complement and enhance our product offerings. We will draw on our expertise and partner resources to deliver repeatable, scalable and maintainable solutions to help increase productivity, optimize plant assets and improve overall financial performance across your enterprise.

## Certifications

- **IEC 61508** – Functional safety of electrical/electronic programmable safety-related systems
- **IEC 61511** – Functional-safety: Safety instrumented systems for the process industry sector
- **NFPA 72** – National fire alarm and signaling code
- **NFPA 85** – Boiler and combustion systems hazard code
- **NFPA 86** – Standards for ovens and furnaces
- **EN54** – Fire Alarm control panels
- **EN298** – Automatic gas burner control systems for gas burners and gas burning appliances with or without fans
- **EN50156** – Electrical equipment for furnaces and ancillary equipment: Requirements for application design and installation
- **UL 508** – Industrial control equipment.

Rockwell Automation, Inc. (NYSE:ROK), the world's largest company dedicated to industrial automation, makes its customers more productive and the world more sustainable. Throughout the world, our flagship Allen-Bradley® and Rockwell Software® product brands are recognized for innovation and excellence.

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