

# Protecting your people, plant and processes

The SIL3 Modicon® Quantum™ PLC safety solution for  
process automation safety solutions for industry

Make the most of your energy<sup>SM</sup>

**Schneider**  
Electric



*I want to be sure that **my plant**  
**will safely shutdown** in an emergency  
while avoiding unplanned interruptions.*



# Safety instrumented system in harmony with the process

## A global view

### Reduce engineering, operations and maintenance costs

Schneider Electric delivers the flexibility to combine both safety and process applications in one system to deliver a truly global view of your plant while reducing your total cost of ownership.

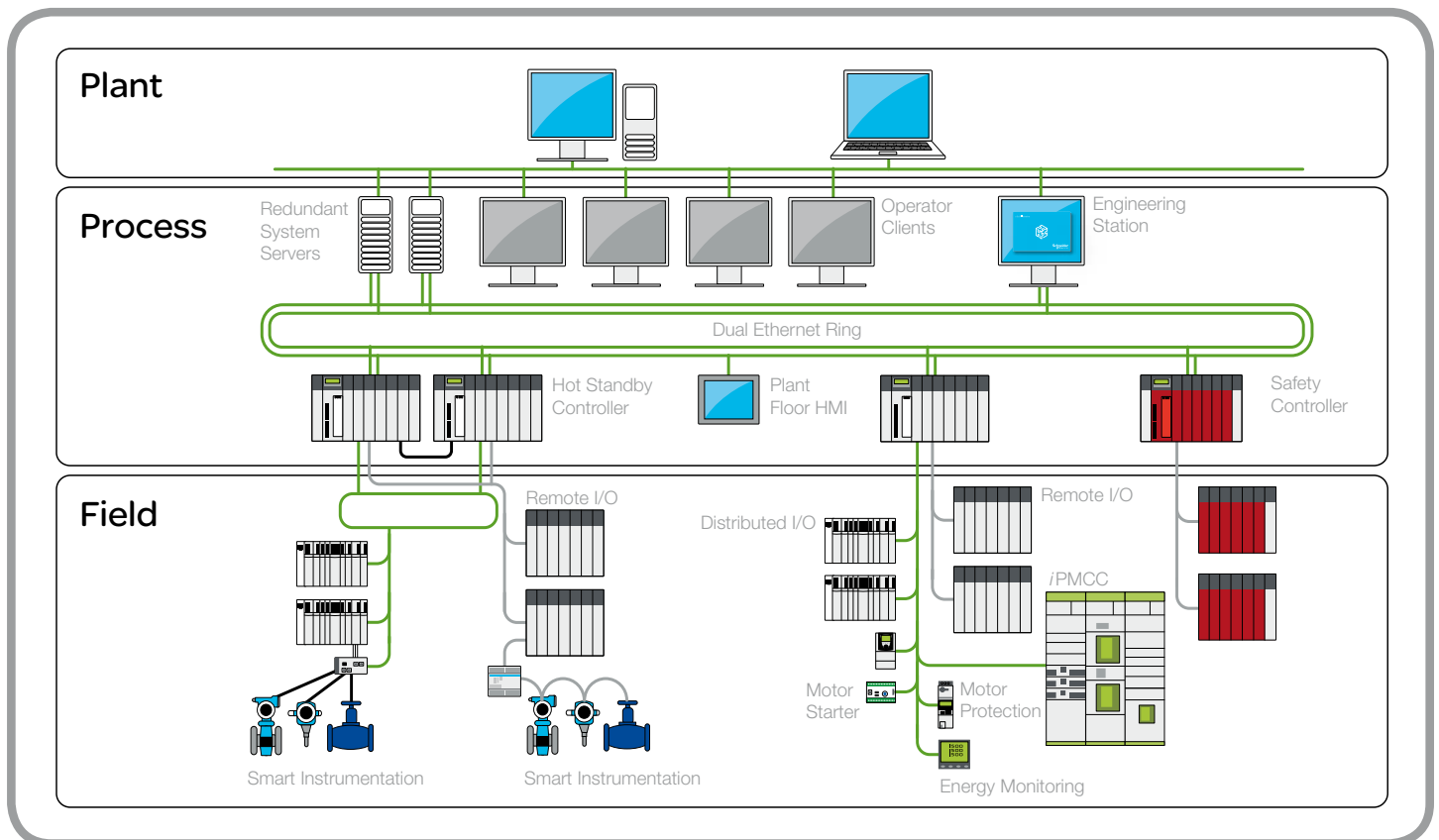
- Maximize plant and production efficiency
- Improve production quality
- Meet regulatory requirements
- Protect people, plant assets and the environment

## Modicon Quantum PLC innovation

### Proven technology...simple operation and integration... and now SIL3-rated functionality

The SIL3 Modicon Quantum PLC is truly the next generation solution in system controllers that must function consistently at certifiable Safety Integrity Levels (SIL). And, for the manufacturing, processing, handling and storage of volatile combustible chemicals and materials – the SIL3 Quantum PLC from Schneider Electric is your cost-effective choice for these critical missions.

Designed around the proven technology and simplicity of operation of its Quantum family of programmable logic controllers, the SIL3 Quantum PLC is programmed using the robust, reliable Unity software platform. This platform can be totally integrated with Vijeo® Citect® SCADA with no learning curve involved. And, a single Unity™ Pro XLS license will allow you to program Unity-based Quantum, Unity-based Modicon Premium and M340™ platforms as well.



# [ The heart of the safety offer ]



## Applications

The Modicon Quantum PLC's safety features are certified by TÜV Rheinland for the following applications:

### Emergency shut down (ESD)

Modicon Quantum safety system satisfies requirements to protect the environment, personnel and your production tool, while helping to ensure the availability of your installation.

### Fire and gas detection (F&G)

Modicon Quantum safety system is approved to be used in applications requiring fire and gas detection and protection.

### Burner management systems (BMS)

Modicon Quantum safety system conforms to the specific requirements of BMS. It is therefore ideal for boiler, furnace and burner control and safety.

### Boiler protection systems (BPS)

Modicon Quantum safety system offers all the flexibility you need to satisfy the specific requirements of your installation.

## Safety certification

The heart of the Schneider Electric safety offer is the Modicon Quantum safety system, which is comprised of specially designed safety modules that are SIL3-certified by TÜV Rheinland and conform to IEC 61508, thereby helping to ensure your application meets IEC 61511 safety standards. It provides an optimum solution that helps to ensure the safety of critical industrial processes, especially in sectors such as oil and gas, petrochemicals, energy, and critical infrastructures.

## High availability

As part of the Quantum platform, the Quantum safety system can also be integrated within a Quantum hot standby redundant system architecture, so you not only optimize system safety, you can do it without sacrificing system availability. The result? Hot standby technology combined with safety for a totally integrated, safety-certified redundant architecture that includes processors, power supplies, input/output (I/O), remote I/O, SCADA, HMI and cabling systems.





## Solutions...

### ...that work – yesterday, today, and tomorrow

We are keenly aware that the choices you make today must still be valid tomorrow. Similarly, you need to build on the systems you already have installed in your plant...bringing them into conformity is often accompanied by modernization of your installed equipment.

### ...in detail

Schneider Electric process safety solution applications:

- IEC 61508 safety certified PLC by TÜV Rheinland Group
- Applicable up to SIL3
- 1 out of 2 (1oo2) hot repair fault tolerant system
- Integrated and collaborative solution based on standard networks and open software systems
- Scalable common Safety Instrumented System (SIS) and Basic Process Control System (BPCS) PLC platform

## Your benefits

### Master hazard, safety and environment standards and regulations

The Modicon Quantum safety PLC is certified by TÜV Rheinland Group to meet stringent industry requirements as defined in the IEC 61508 standards for safety equipment.

### Optimize operations: safety in continuity with the process

The design of safety applications is simplified with the Modicon Quantum PLC safety features being a direct extension of the existing Modicon Quantum platform. The common hardware, communication and software simplifies maintenance and minimizes training, and Quantum hot standby offers the ability to repair any fault without interrupting the process. This redundancy also helps you meet two critical safety objectives: bringing a process to a safe state when an unsafe situation is detected, and not interrupting the process at any other time.

### Reduce asset cost and protect your investment

With this common PLC platform approach, you can capitalize on your existing experience when introducing safety functionality into an existing system. In addition, you will also benefit by keeping your normal maintenance and operation practices for your previously installed and commissioned PLC equipment.



The Modicon Quantum safety system is a certified safety solution that can be easily and affordably integrated into your process control system.

# Confidence in your safety system

## Versatility

### Hot standby

The value of high availability, hot standby systems and controls is measured by their increased functionality under challenging conditions. This means that the application continues to monitor the system without shutting it down...and it means that the Quantum PLC consistently measures up in critical situations.

In addition to standard Quantum hot standby functions, this new Quantum PLC can be utilized for SIL3 hot standby systems...to provide high availability for the central processing unit (CPU). Controlling the ability of the standby PLC – to take over from the primary – is accomplished in less than two scans of logic.

### Redundant I/O

Achieving high availability for the I/O is also possible with the Quantum PLC, simply by using the safety I/Os in a redundant manner.

### Diagnostics

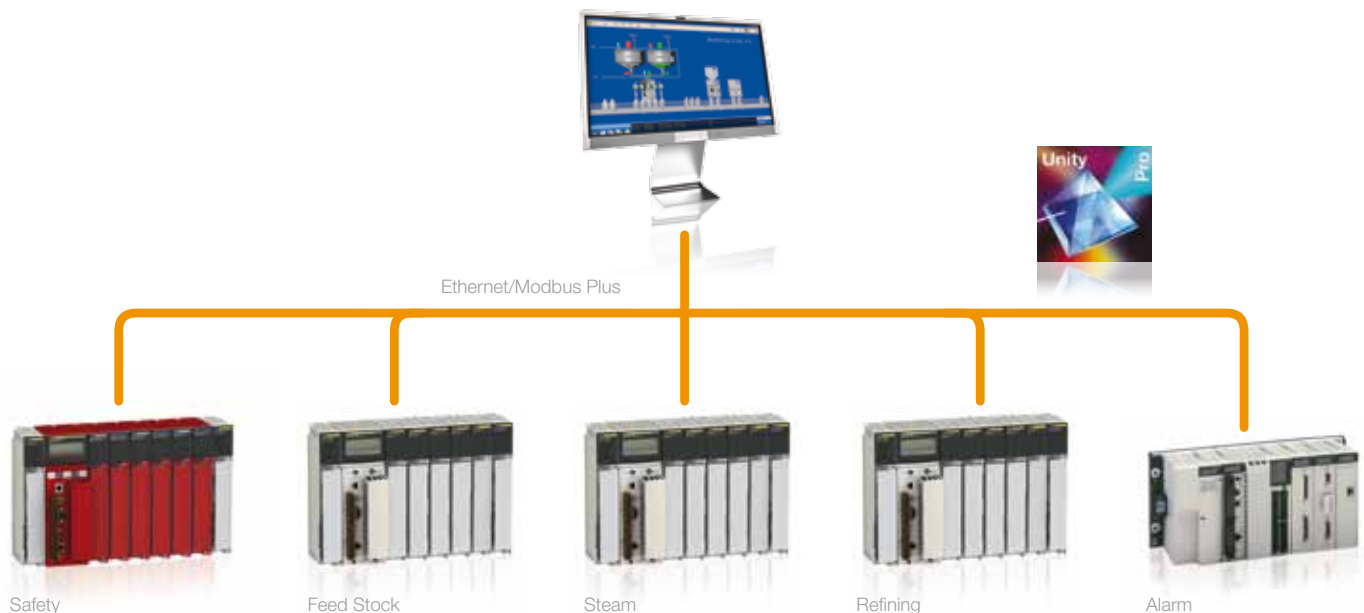
The SIL3 Quantum PLC also provides additional internal diagnostics and system testing, increasing diagnostic coverage. Its internal architecture provides two shutdown paths and allows double code generation and execution that detects both systematic errors in code generation, as well as execution and random errors in the CPU and in the random access memory (RAM).

## Certification

The SIL3 Quantum PLC is certified by the prestigious TÜV Rheinland Group for use in applications up to and including SIL3 according to IEC 61508. This certification verifies that the Quantum is compliant with the following standards:

- IEC 61508: Functional safety of electrical/electronic/programmable electronic safety-related systems, Part 1-7, First edition
- IEC 61131: Programmable controllers
  - Part 2: Equipment requirements and tests, Second edition 2003-02
- Boiler protection
  - European standard: PR EN 50156
  - U.S. standards: NFPA 85 and NFPA 86
- EN 54 fire detection and fire alarm systems
- EN 298 automatic gas burner control systems for gas burners and gas burning appliances with or without fans

## Compatible with your existing Modicon PLCs





In addition to providing the needed redundancy, detecting systematic errors in code generation and random errors in the I/O modules...the internal architecture of the SIL3 Quantum PLC I/O modules provides **self-diagnostic monitoring of communications** between the I/O modules and the CPU – and the status and the health of the I/O modules.



## Flexibility

The SIL3 Quantum PLC is designed with safety modules, which perform specific safety functions. However, the system also supports TÜV Certified non-interfering modules, allowing the user to control the safety application, as well as non-safety related functions.

In contrast to safety modules, the Quantum non-interfering modules are not used to perform any safety functions. Consequently, a detected error in one of these modules does not affect the execution of the safety functions.

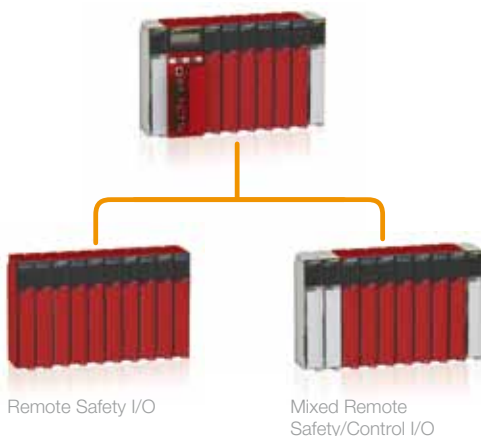
## Modicon Quantum PLC solutions

### Available SIL3 products

Schneider Electric offers the following safety modules certified for use in SIL3 safety applications:

Module type	Module reference
Stand-alone CPU	140 CPU 651 60S
Hot standby CPU	140 CPU 671 60S
Digital input	140 SDI 953 00S
Digital output	140 SDO 953 00S
Analog input	140 SAI 940 00S
Power supply (PS)	140 CPS 124 20

## Flexible configurations



### Available non-interfering products

Schneider Electric offers the following non-interfering products:

Module type	Module reference
Remote I/O head adapter	140 CRP 932 00
Remote I/O drop adapter	140 CRA 932 00
Ethernet module	140 NOE 771 11
Backplane 16 slots	140 XBP 016 00
Backplane 10 slots	140 XBP 010 00
Backplane 6 slots	140 XBP 006 00
Digital input	140 DDI 353 00
Digital output	140 DDO 353 00
Analog input	140 ACI 040 00
Analog output	140 ACO 020 00
Terminal strip	140 XTS 002 00

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