CONTRIVE

# Q2 SERIES: Connected by Design

## Bridging the Gap between Combustion Safety and IIoT Connectivity

**Introduction**

Modern industrial combustion systems are increasingly expected to be integrated into plant-wide supervisory architectures, SCADA systems, and cloud-based monitoring platforms.

The Q2 Series implements a layered connectivity architecture. This ensures that while the core safety functions remain isolated and certified, the system can participate in complex Industrial IoT ecosystems.

**Tier 1: Built-in Connectivity (TraxBus)**

Every Q2 unit comes standard with TraxBus, a proprietary fieldbus engineered for deterministic and interference-resistant communication in harsh combustion environments. To connect this native bus to standard plant networks, three primary conversion interfaces are available:

- **TraxInterface3** (Physical Media Converter):
  - Adapts the proprietary TraxBus physical layer to standard RS232 or RS422.
  - Serves as a straightforward media converter without protocol translation.
- **TraxInterface4** (Physical Media Converter & Modbus Translator):
  - Adapts the proprietary TraxBus physical layer to standard RS232 or RS485.
  - Transparently translates TraxBus into Modbus ASCII/RTU.
- **TraxGateway.ETH** (PROFINET & Webserver):
  - Bridges TraxBus to Ethernet.
  - Simplifies installations by presenting up to 99 burners as a single PROFINET node.
  - Features an integrated webserver for browser-based monitoring without requiring client software.

**Tier 2: Optional Expansion Boards**

For applications requiring deeper integration, Q2 supports field-installable expansion boards. These boards communicate via an internal optical interface to maintain the electrical isolation of the certified safety core.

- **QNET** (PROFINET & Webserver):
  - Enables plug-and-play integration with Siemens TIA Portal using standard GSDML files.
  - Provides both real-time cyclic I/O (status, flame signals) and acyclic data (historical logs, statistics).
  - Includes an independent Ethernet webserver for remote monitoring.
- **QIO** (Traditional I/O & WiFi):
  - Digital I/O for legacy architectures.
  - Features a WiFi access and webserver, allowing monitoring via browsers.

**No PLC? No problem.**

Not every installation justifies a PLC — whether for technical constraints, budget reasons, or simply because the automation scope is limited to burner management. In these cases, the TCU6 provides a compelling alternative.

The TCU6 is a dedicated burner group controller that connects directly to the TraxInterface4, supervising and commanding multiple units via TraxBus without requiring any external programmable logic controller.

The result is a complete, cost-effective burner supervision architecture: TraxBus as the backbone, TCU6 as the intelligence, TraxInterface4 as the interface to the plant.

### Cybersecurity

Q2 applies a zone-based security model aligned with CRA and EN 18031: each communication interface is individually classified according to its role and associated risk.

- Interfaces used within isolated network segments operate in segregated mode and are considered secure by design.
- Interfaces required to exchange data with external or untrusted networks must be routed through a dedicated conduit, which enforces controlled and auditable communication boundaries.
- Interfaces that are not operationally necessary or that present an unacceptable risk exposure can be completely disabled, eliminating the associated attack surface.

This granular classification allows integrators to define a coherent security architecture appropriate to the plant's risk profile.

### Quick decision guide

Q2 covers a wide range of integration scenarios. Use the guide below to select the most appropriate solution based on the specific plant requirements.

**TraxBus — via TraxInterface3 or TraxInterface4**

- **Application**: Multiple units grouped and supervised as a dedicated burner network
- **Requirements**: TraxBus protocol must be implemented in the supervisor PLC
- **Hardware**: Use TraxInterface3 or TraxInterface4 for media conversion
- **Standalone Option**: TCU6 + TraxInterface4 for supervision of up to 6 zones/burners without PLC

**Modbus RTU — via TraxInterface4**

- **Application**: Up to 247 units grouped and supervised as a dedicated burner network
- **Requirements**: Modbus RTU protocol available on the supervisor PLC or SCADA
- **Hardware**: TraxInterface4 acts as the protocol translator

**PROFINET — grouped (TraxGateway.ETH)**

- **Efficiency**: Up to 99 burners appear as a single PROFINET node, simplifying network topology
- **Cost-Effective**: Ethernet-based plant-wide monitoring without requiring optional boards on every Q2
- **Supervision**: Webserver for monitoring burners from any networked device, independently of the PLC

**PROFINET — per burner (QNET)**

- **Integration**: Direct PROFINET integration into Siemens TIA Portal for each individual burner
- **Data Management**: Cyclic I/O for real-time control and acyclic data for on-demand diagnostic info
- **Supervision**: Dedicated Webserver for each burner via Ethernet, independent of the PLC

**Hardwired electrical interface (QIO)**

- **Control**: Conventional hardwired electrical control for legacy systems
- **Compatibility**: Backward compatibility with existing relay-based or analog control architectures
- **Wireless Access**: Webserver for each burner accessible via WiFi

## Frequently Asked Questions

*How many Q2 units can be connected on a TraxBus network?*

The capacity of a TraxBus network depends on the interface used to access it. TraxInterface3 supports up to 300 connected units; TraxInterface4 up to 250. TraxGateway.ETH can supervise up to 99 units, presenting them as a single PROFINET node. The logical address space of TraxBus allows up to 3,844 addressable nodes.

*If the network connection is lost, does the burner continue to operate safely?*

Yes. Q2 safety functions are fully autonomous and operate independently of any communication interface. The burner control logic, flame supervision, and safety shutdown sequences are executed by the certified safety core, which is optically isolated from all network interfaces. A network failure affects monitoring and remote access only, never the safety function. Behavior in case of lost connectivity is configurable: depending on the installation requirements, the Q2 can be set to continue normal operation, hold the current state, or trigger a controlled shutdown — allowing system designers to match the response to the process safety requirements and applicable plant procedures.

*Does Q2 work with non-Siemens PLCs?*

Yes. PROFINET is an open standard supported by a wide range of manufacturers. The QNET expansion board includes a standard GSDML device description file compatible with any PROFINET-capable engineering tool, not only TIA Portal. For installations based on other fieldbus technologies, TraxInterface4 provides Modbus ASCII and Modbus RTU, which are supported by virtually all industrial PLCs and SCADA systems.

*Can the webserver be accessed without a PLC?*

Yes. Both QNET and TraxGateway.ETH include integrated webservers that operate independently of the PROFINET PLC connection. As long as the device has Ethernet connectivity, any browser on the same network can access the monitoring interface without requiring the PLC to be active or any client software to be installed.

*Is the WiFi interface suitable for permanent plant monitoring?*

The QIO WiFi interface is designed primarily for on-site maintenance, operating as an isolated access point, not bridged to the plant LAN. For permanent plant-wide monitoring over Ethernet, QNET or TraxGateway.ETH are the appropriate solutions.

*What cybersecurity standards does Q2 comply with?*

The Q2 communication architecture is designed in alignment with the European Cyber Resilience Act (CRA) and EN 18031 requirements for connected industrial products. The security model follows the principles of defense-in-depth and least privilege, with each interface configurable as segregated, conduit, or disabled according to the installation's risk profile.

For technical specifications, integration support, and GSDML files:
www.burner-control.com

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