CHIPKIN

Case Study

Protec Cirrus Hybrid and ProPoint Plus Integration to BACnet and Modbus BMS

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Overview

Protec Cirrus Hybrid and ProPoint Plus aspirating smoke detection panels communicate over a proprietary RS-485 token-passing protocol and do not provide native BACnet or Modbus connectivity. This can make integration difficult on projects where fire detection systems are required to report into a building management system (BMS) or SCADA platform.

Chipkin developed the FS-8705-57 Protec driver for the FieldServer QuickServer to bridge this communication gap. The gateway connects directly to the Protec RS-485 network, captures panel data and real-time fire and fault events, and makes them available through BACnet or Modbus. It also supports pipe-level monitoring, automatic panel discovery, and up to 196 panels across two RS-485 trunks.

The Challenge

Aspirating smoke detection networks are frequently specified for data centers, cold storage, warehouses, and heritage buildings, and project specifications increasingly require these systems to report into a BACnet or Modbus building management system. However, the Protec Cirrus Hybrid and ProPoint Plus panels do not offer a high-level interface. Their RS-485 protocol is proprietary, uses token passing between panels, and is not compatible with gateways developed for the previous generation of Protec detectors.

For one North Carolina fire detection manufacturer, this limitation was creating a serious commercial obstacle. The company was losing bids because the panels could not integrate with customer BMS platforms, including projects requiring dozens of gateways and a national account that required BMS integration on every system.

The site itself consisted of multiple buildings using a combination of **Protec Cirrus panels** and **Protec ProPoint Plus panels**.

The fire network was divided across two RS-485 trunks:

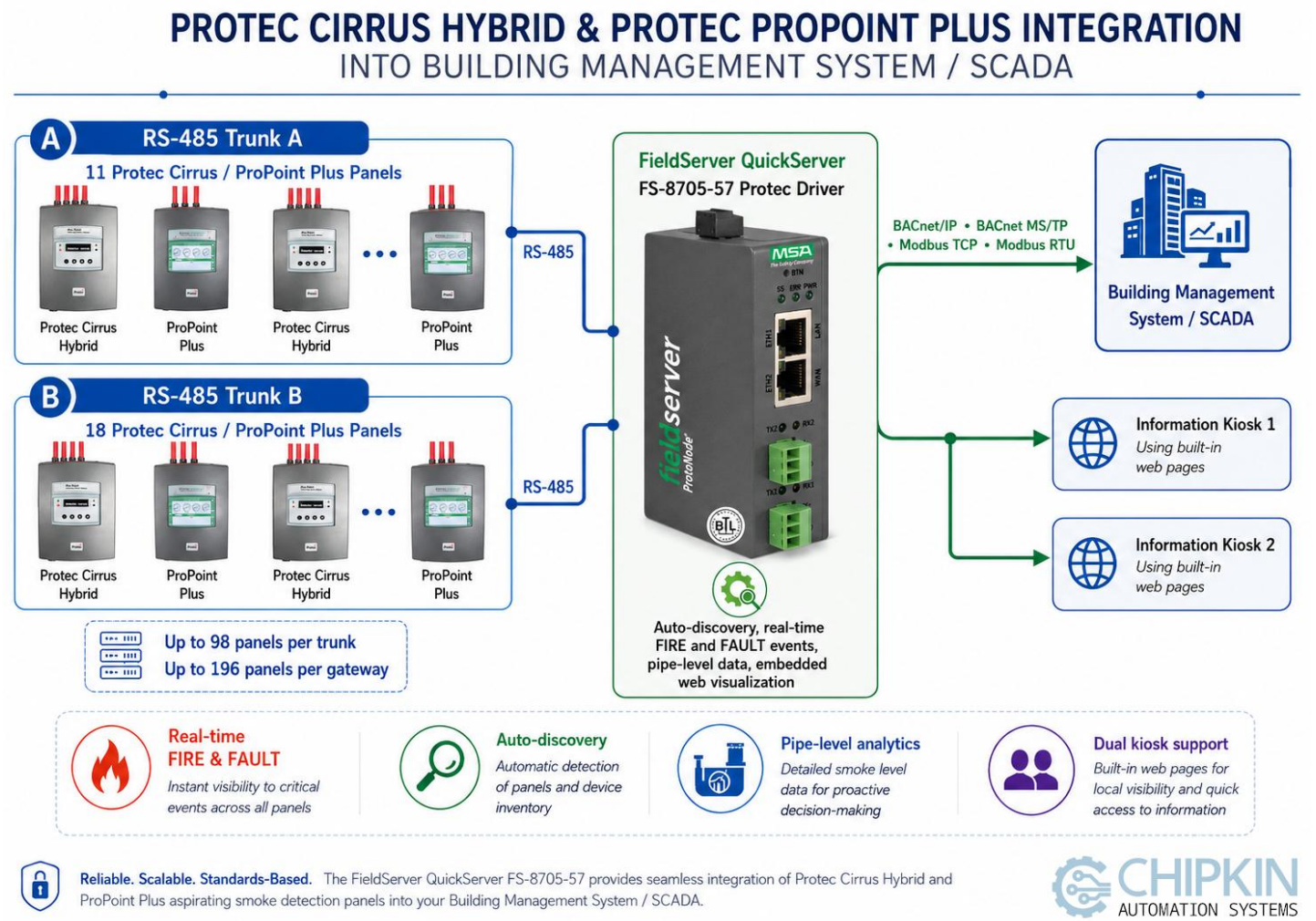
- **Trunk A – 11 panels**
- **Trunk B – 18 panels**
- **Maximum supported capacity – 98 panels per trunk**

The integration objective was to:

- Deliver **real-time FIRE and FAULT status** to the BACnet BMS
- Provide **detailed pipe-level data visibility**
- Deploy **two information kiosks**
- Enable **simplified commissioning through auto-discovery**

The Solution

The client shipped one panel of each type to Chipkin's Vancouver lab, allowing the driver to be developed and tested against live hardware. Chipkin then created the FS-8705-57 Protec driver for a FieldServer QuickServer, allowing mixed Cirrus Hybrid and ProPoint Plus networks to be integrated upstream to standard building automation and SCADA systems.



The gateway sits on the RS-485 trunk as a network participant, takes part in the token-passing scheme, caches panel data, and serves it upstream. BACnet and Modbus are the standard configurations, but the same driver can also serve any of the 140+ protocols in the FieldServer library, including OPC UA, LonWorks, DNP3, SNMP, and MQTT.
Event Handling

Fire and fault events are transmitted unsolicited by the panels and are captured by the gateway the moment they occur. This means the building management system does not need to wait for a poll cycle to see a FIRE 1 condition. The driver also decodes the full Protec fault table, covering 119 fault codes, from filter and airflow faults through to hardware controller failures.

Because the panels do not report when a fault clears, the driver periodically commands each panel to re-report its active faults and fire states. This keeps the gateway and the BMS synchronized.

Data Available to the BMS
For each detector, the driver reads and exposes:

- Fire state per pipe (Pre-Alarm, Fire 1, Fire 2, Fire 3) and active fault list
- Pipe status for up to 4 pipes, including airflow, optical level, CO level, temperature, and threshold histories
- Fan speed (read and write), detector time, device text, pipe text, and alarm text

This allows the BMS to display meaningful messages such as “Fire — Ballroom Pipe 1” instead of a raw numeric code.

Commands from the BMS
Writable points are exposed for: **Silence** (broadcast to all panels), **Resynch**, and **Discover**.

Additional services include reading node text, clearing logs, airflow zeroing, fault-latch control, and token regeneration if the trunk's token stops circulating.

Commissioning
On restart, the gateway discovers every panel on the trunk, provided each panel has a unique NodeID. It then generates its configuration from a template and automatically creates the corresponding BACnet server objects. Adding a panel is simply a matter of connecting it and re-running discovery from the built-in web page. Configurations can also be generated offline from a node list, and gateways can ship pre-loaded.

Point lists can be exported from the free CAS BACnet Explorer, which was also used to validate the BACnet output against both panel types.

The gateway also includes built-in web pages showing:

- A color-coded detector overview
- Per-detector pipe detail
- Floor-plan zone views

These pages are intended for testing and kiosk use and are not a fire-code-listed annunciator. The HTML and JavaScript source is available for customization.

Results

Cirrus Hybrid and ProPoint Plus networks can now be supervised from any BACnet or Modbus BMS, with no changes required to the panels themselves. One gateway can monitor up to 196 panels total, based on 98 panels per trunk across two trunks.

The integration delivered:

- Real-time synchronization of 29 fire panels
- High-speed BACnet COV updates
- Centralized FIRE and FAULT monitoring
- Dual kiosk deployment
- Automated discovery functionality
- Zone-based visualization with intuitive color coding
- Detailed pipe analytics

Operational staff gained rapid visual insight, while engineering teams benefited from scalable architecture and reduced maintenance overhead.

This deployment demonstrates a scalable and resilient way to integrate mixed Protec fire alarm panels into a BACnet BMS environment. By combining real-time event translation, embedded web visualization, automated discovery, and advanced pipe-level monitoring, the solution delivered both operational clarity and technical robustness across a distributed facility.

As a comment, the client provided Chipkin with the following kind words:

"Thank you very much for all your and Chipkin's support throughout this project! We really appreciate it.
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B. W.
Safe Fire Detection