CHIPKIN

Case Study

ABB ACH580 Modbus to enteliWEB BMS Integration

Overview

Ainsworth Inc. needed to bring operational data from seventeen ABB ACH580 variable-frequency drives into their Delta Controls enteliWEB management system. Each drive communicated over Modbus TCP using an FMBT-21 adapter module and was networked through an ABB BACnet/IP HVAC controller, which acted as the BACnet/IP interface feeding data into enteliWEB.

To unify the system, Chipkin deployed a FieldServer QuickServer gateway capable of converting all Modbus TCP data from the ACH580 drives into structured BACnet/IP objects for the ABB BACnet/IP HVAC controller and enteliWEB. The goal was to provide reliable, centralized visibility of all drive data through the existing BMS.

This approach delivered a stable and fully validated data path from the ACH580 drives into enteliWEB, ensuring accurate and consistent VFD monitoring across the site's BACnet/IP infrastructure.

Chipkin's Challanges

Ainsworth's primary challenge was achieving clean, accurate, and centralized visibility of Modbus-based VFD data inside a BACnet/IP environment. Several technical issues had to be solved to make this possible:

- Two incompatible protocols: The ACH580 VFDs communicated using Modbus TCP only, while enteliWEB required BACnet/IP. Without conversion, operators would need two separate systems to monitor HVAC performance.
- Incorrect values inside the BMS: The ACH580 reported key parameters—such as speed, torque, and frequency—as raw Modbus integers (e.g., 0–20,000). If passed directly to BACnet, enteliWEB would display numbers that were scaled incorrectly or unreadable.
- Alarms not visible to operators: The drives encoded multiple alarm and status conditions inside single Modbus registers. Without decoding, the BMS would show no useful alarm information.
- Seventeen drives to manage: Operators requested a unified, clean BACnet structure where all VFDs appeared under one device instance with consistent naming and navigation.

Ainsworth needed a reliable, properly engineered protocol integration that would produce real, usable, operational data—not raw registers and opaque status flags.

Chipkin's Solution

Using the FS-8790-33 Configuration & Support Service, Chipkin engineered a clean, fully validated Modbus TCP–to–BACnet/IP integration designed specifically for the ACH580 series.

Key Elements of the Solution
- Conversion of raw Modbus values into engineering units: Speed feedback, demand, frequency, and torque values were correctly scaled into percentages or real-world units so they displayed properly inside enteliWEB.
- Decoding ABB bit-packed status registers: Critical indicators—including alarm active, tripped, hand/auto mode, and at setpoint—were extracted from their Modbus bit positions and converted into individual BACnet Binary Values.
- Consistent object naming and organization: All seventeen VFDs were grouped into a single BACnet/IP device instance with structured folders, readable labels, and standardized point naming—matching Ainsworth's requirements.
- Remote commissioning and validation: Chipkin verified end-to-end communication across the entire network chain:
    - ACH580 (Modbus TCP) → FieldServer → ABB BACnet/IP HVAC Controller → enteliWEB
    - All required points were confirmed to be read correctly and consistently.

The result was a stable, operator-friendly dataset that accurately represented each VFD's real-time performance and alarm state. Below is a Network diagram of the integration.
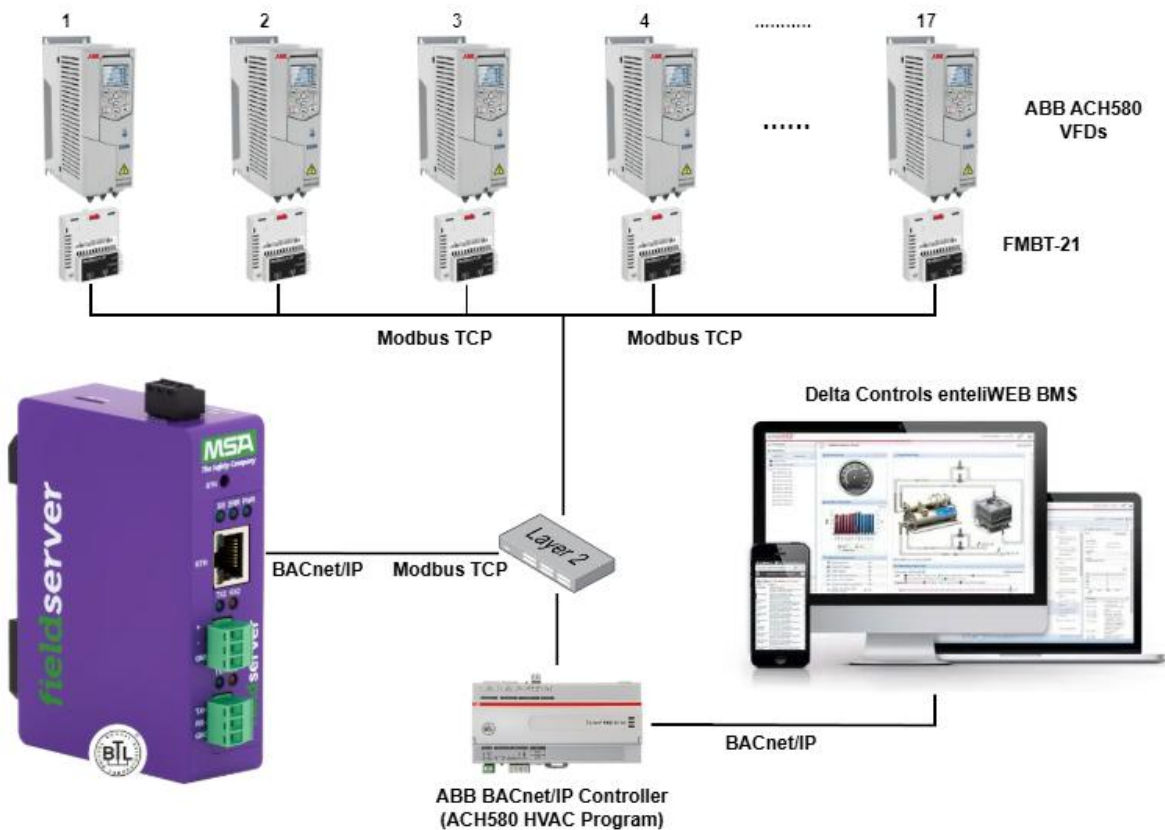
Outcome & Real-World Impact

The completed integration provided Ainsworth with a unified BACnet/IP view of all seventeen ACH580 drives, enabling accurate monitoring of speed, alarms, operating states, and performance data directly through enteliWEB. With validated scaling, stable Modbus TCP polling, and structured BACnet objects, the FieldServer solution ensured dependable long-term operation without requiring changes to existing site infrastructure.

Ainsworth now benefits from centralized HVAC visibility, improved maintenance and diagnostics workflow, and seamless compatibility with their Delta Controls BMS.

About Chipkin

Chipkin Automation Systems specializes in protocol integration, gateway configuration, and legacy system modernization across HVAC, industrial, and building automation sectors.

We provide FieldServer configuration services and engineering expertise for seamless communication with platforms such as:

- Delta Controls enteliWEB
- Schneider Electric EcoStruxure
- Johnson Controls Metasys
- Tridium Niagara
- Siemens Desigo
- and other BACnet/IP, Modbus, and proprietary systems

Chipkin helps clients reduce risk, streamline commissioning, and unlock the full potential of existing equipment.