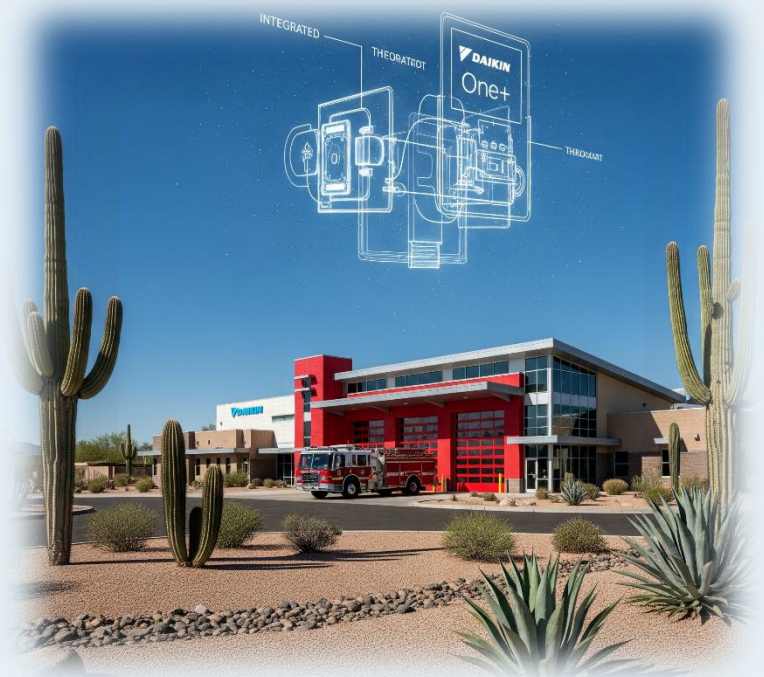# CHIPKIN

Case Study

Cloud-Controlled Daikin to BACnet Integration

Overview

Varitec Solutions, a leader in mechanical and HVAC systems integration, approached Chipkin Automation Systems with a challenging project involving the integration of two Daikin One+ Thermostats into a BACnet MS/TP network. Their goal was not only to monitor thermostat data via BACnet MS/TP, but also to write to the thermostats using a mobile application through the same BACnet MS/TP interface—an operation requiring complex interaction with the Daikin One Open API.

This was a non-trivial integration. The Daikin One+ devices communicate over a secured HTTP API—not a native building automation protocol. Adding to the challenge, the API required bearer tokens and multi-point updates in order to perform write operations.

Chipkin's approach to the solution

Chipkin proposed using a FieldServer QuickServer (CAS-QS-2010-3263) loaded with our custom-developed HTTP driver. Initially, the HTTP driver did not support bearer token handling, or the complex multi-field PUT requirements mandated by the Daikin One Open API. Recognizing this limitation, Chipkin's development team committed to expanding the driver's capabilities—custom-tailoring it for this integration.

Integration Network Diagram
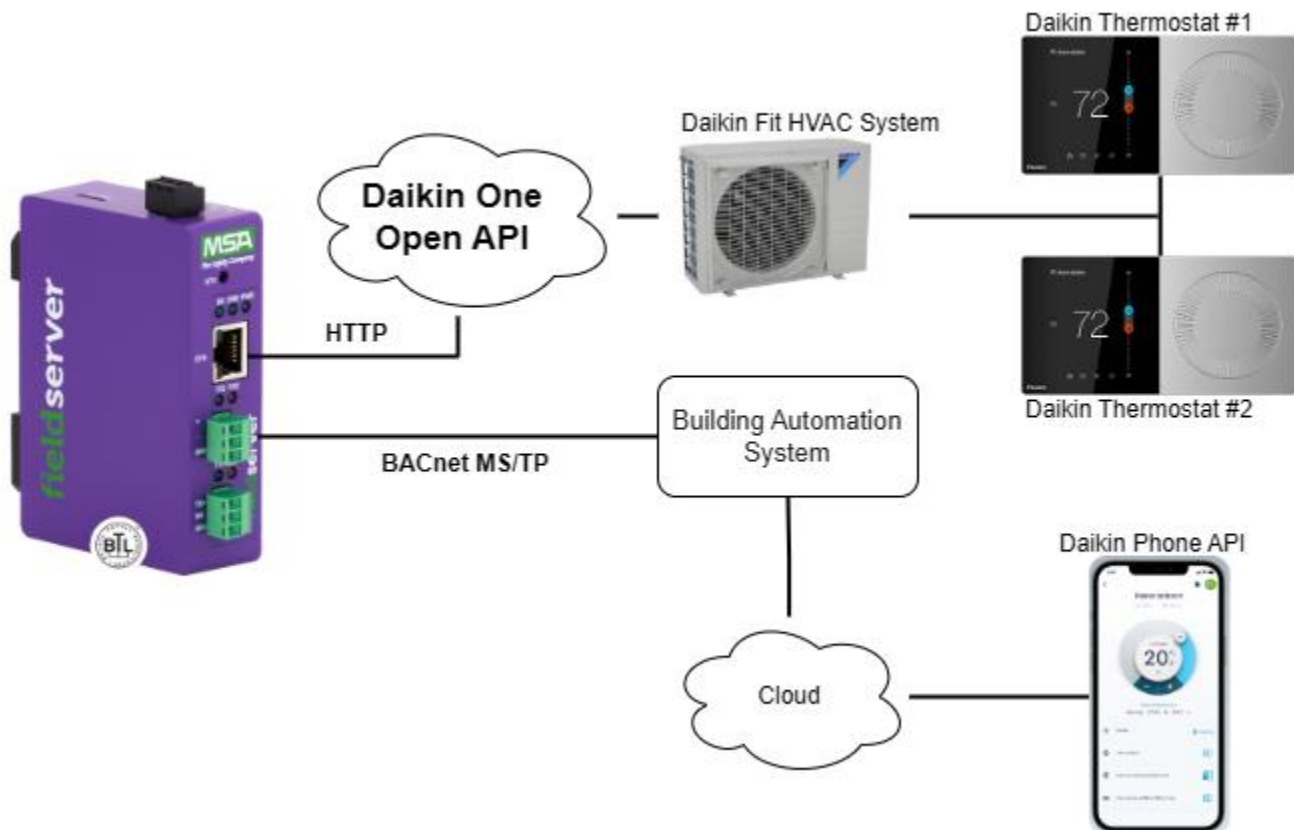
Challenges Faced

The integration presented multiple technical challenges that required Chipkin to extend the capabilities of its FieldServer solution.

The first obstacle involved establishing secure communication with the Daikin One+ Thermostats via their RESTful API. Varitec Solutions provided Chipkin with the necessary credentials—an email address, API key, and integrator token—but the FieldServer's existing HTTP driver lacked support for bearer token handling, which was required to authenticate with the Daikin API.

To resolve this, Chipkin's development team updated the HTTP driver to support HTTP POST operations for token requests and bearer token storage. With these enhancements, the FieldServer was able to request, receive, and reuse an access token to authenticate subsequent API calls. Initial attempts to establish communication were met with timeout errors, which were subsequently resolved through firmware tuning.

Following successful connectivity, Chipkin's support engineers developed two configuration files:

- A **JSON configuration** to interface with the Daikin API and retrieve data from each thermostat.
- A **CSV configuration** to serve that data over BACnet MS/TP to the building automation system.

Each thermostat had to be addressed individually using its unique ID. Chipkin used HTTP GET requests to identify each device and retrieve the required data. The Daikin API returned nested JSON payloads that required careful parsing. Chipkin used advanced JSON Expressions within the FieldServer to extract and map relevant values into internal data arrays, enabling BACnet exposure.

A second major challenge emerged when the client attempted to use a mobile application to issue write commands to the thermostats—specifically to change the mode or setpoints. Standard BACnet behavior allows for single-point writes, but the Daikin API required that all related fields (e.g., mode, heat setpoint, cool setpoint) be submitted together in one HTTP PUT request.

Chipkin discovered this requirement in the Daikin API documentation and recognized that the existing HTTP driver architecture could not support grouped writes. Leveraging its in-house expertise, Chipkin enhanced the firmware once again, adding the ability to construct and transmit compound PUT requests containing multiple data fields. This solution was validated through testing and approved by the client.

Over the course of two weeks, Chipkin developed, tested, and deployed the updates required to ensure full read/write functionality between the Daikin One+ Thermostats and the BACnet MS/TP network. The result was a fully functional, reliable integration tailored to the client's specific needs.

Outcome

The completed integration enabled Varitec Solutions to fully incorporate the Daikin One+ Thermostats into their BACnet MS/TP network. As a result, their building management system and mobile application gained the ability to:

- **Continuously monitor** key data points including temperature, humidity, operating mode, and setpoints.
- **Remotely control** the thermostats by writing new setpoints via BACnet, with commands automatically translated into compliant HTTP PUT requests for the Daikin API.

This bi-directional communication delivered interoperability between modern API-driven devices and the legacy BACnet environment.

Real-World Implications

The integration was deployed at a municipal fire station in Arizona, where consistent and efficient climate control is critical. The facility's HVAC system depended on a BACnet-based BMS, but the Daikin thermostats communicated exclusively via a secured cloud API—presenting a significant compatibility hurdle.

Chipkin's custom-developed solution effectively bridged this gap, allowing full visibility and control through the existing BMS. This gave first responders and facility managers the ability to manage comfort settings from a centralized interface—improving energy efficiency, comfort, and responsiveness.

Furthermore, the integration architecture was designed with flexibility in mind. The solution can be adapted to support additional Daikin models, including the Daikin One Touch Thermostat and Daikin One Lite Thermostat, providing a scalable path forward for future deployments.

The project was successful!

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

"Really appreciate everyone's help on this, especially the persistent support we've received the past few weeks in working out all the final kinks of this API."

"Thank you for the continued help on this one! We can send commands through the BACnet site and the API is taking."