Case Study

Lochinvar Android based Boiler Controller Adding native support for Modbus & BACnet

Lochinvar are utilizing an Android based controller for newer boiler models. Lochinvar wanted to add native support for Modbus and BACnet to their boiler controllers. Previously Lochinvar had supplied customers with external gateways as an add on option. Native support means that the controller does not need any additional parts or software.

Introduction

Lochinvar are using an Android based controller with an Ubuntu Linux tool chain. Chipkin developed a Linux application using c and c++. This app was integrated into the boiler controller tool chain. The purpose of the app is to provide server-side support for Modbus and BACnet for the boiler controller. The app connects to the Lochinvar database (on the same controller) and exchanges information to allow it to serve operational data to remote Modbus and BACnet automation systems and to accept commands from remote systems.

Chipkin Automation Systems

Protocol to protocol – Enabling the IOT Internet of Things

Products that support approx.. 140 major protocols. If we don't have a solution for you we will make you one. More than a dozen customers a year have a custom driver developed for them.

Chipkin are highly regarded for their outstanding support. System integration isn't always trivial even if that is what they tell you.

The Chipkin BACnet stack comes with a 100% copyright infringement indemnity to make corporate lawyers happy. Customers get direct access to the stack developers for coaching and problem solving.

Lochinvar

The Lochinvar product line offers a tremendous range of high-efficiency boilers, water heaters, pool heaters, storage tanks and packaged systems for the nearly infinite spectrum of residential and commercial applications. With every product we strive to fill the system designers' or installing contractors' needs, from small footprints to ease and versatility of venting to sophisticated controls and compatibility with building management systems. Lochinvar are part of the A.O. Smith group of brands.
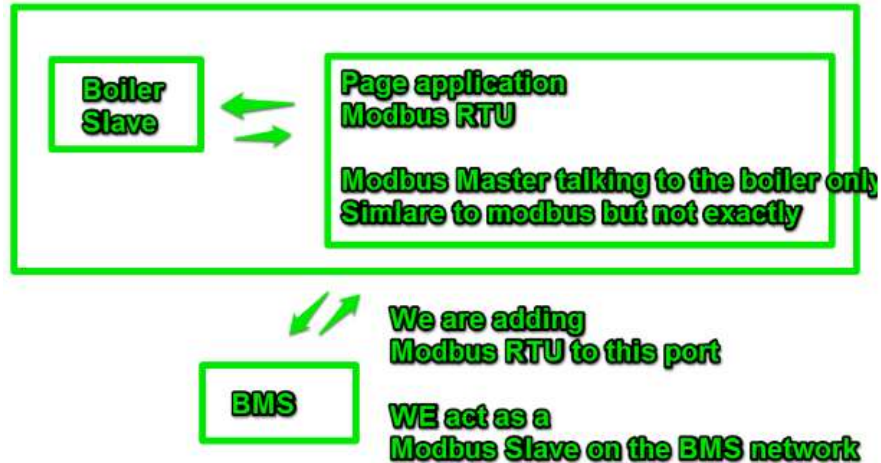
lochinvar.com

Some Details

Chipkin implement the following protocols: ● BACnet IP ● BACnet MSTP ● Modbus RTU ● Modbus TCP

Chipkin will be interacting with their data via a series of HTTP REST requests formatted in JSON. The Linux application will be running on the Ubuntu part of the Lochinvar device while the HTTP REST Server is on the android part.

Required interface to the board's serial port.

How to update the CAS Gateway app

```
cd ~/Lochinvar21BSP/BSP/external/chipkin/fse5856/fse5856-Lochinvar-application

git pull

mm

adb devices

adb shell mount -o remount,rw /system

adb shell stop cas-gateway

adb push ~/Lochinvar21BSP/BSP/out/target/product/page/system/bin/cas-gatew ay /system/bin/cas-gateway

adb shell cas-gateway
```

Examples of message formats

1. Get Device Info - Gets the device information (device_family, and model_name). Might be useful for BACnet Device model_name property.

2. Get All Parameters - Gets the parameter data from the boilers. The data points returned will vary depending on the boiler model. Query this once during setup to build the BACnet / Modbus map then poll on an interval to get data.

3. Set Multiple Parameters - Posts changes to multiple parameters. JSON objects require name and value.

4. Get Single Parameter - Gets one parameter's data.

5. Get All Commands - Gets the list of commands that can be run on the boiler

6. Execute Single Command - Posts the command to run.

7. Get All Parameter History - Gets the historical values of all the parameter data.

8. Get Single Parameter History - Gets the historical value of one of the parameters.

9. Get All Events

10. Get Single Event

Keywords

Automation using android

Android bacnet

Android modbus

Android building automation

Json bacnet

Json modbus

Lochinvar bacnet

Lochinvar modbus

Chipkin lochinvar

Custom driver development

System integration

Boiler integration

Boiler bacnet

Custom protocol development