SmartSwarm 351

Modbus Eavesdrop to MQTT IIoT Gateway

Features

- Transparently connects to existing serial Modbus RTU networks
- Provides parallel data feed into Enterprise IIoT systems while the existing Modbus network continues to operate
- User configurable data enrichment and event triggers
- Extensive configuration options for interpretation of Modbus data
- Cellular or Ethernet connection to IIoT system
- Also acts as LAN to WAN bridge for 3rd party device connection

Introduction

Seamlessly connect existing Modbus process systems into the IoT

While a number of "Modbus to MQTT" gateways exist, most act as the local Modbus master devices, recovering information from a network of connected slaves. This presents a problem for operators of existing process control systems as a Modbus network can only have a single master device. The SmartSwarm 351 overcomes this limitation by transparently "eavesdropping" on communications between the existing master device and the connected slaves. It non-disruptively derives the I/O status of connected devices and uses this information to provide a real time data feed to a connected IIoT architecture.

Data Filtering

Much of the data that the gateway will see in the Modbus network is of little value. If a temperature reading rarely changes, for example, there is no point in reporting it every time it is sampled. For this reason, in addition to enriching the data, SmartSwarm 351 also allows users to configure the triggers that will cause a monitored value to be published. Users can also configure what is published once an event trigger condition is met – this might be just the changed value, a range of data, or all data from the same register type within the RTU. This lets users optimize the traffic across the communications network. At the same time, the gateway decreases the communications overhead and the processing bandwidth needed to handle it.

Specification

Power

- **Voltage**   10 ~ 60 V_{DC}; PoE PD optional
- **Power**   4W typical; 11W peak

Environmental

- **Operating Temperature**   -40 °C to 75 °C (-40 °F to 167 °F)
- **Cold Start Temperature**   -35 °C (-31 °F)
- **Storage Temperature**   -40 °C to 85 °C (-40 to 185 °F)
- **Operating Humidity**   0% to 95% (non-condensing)
- **Storage Humidity**   0 to 95% non condensing
- **Ingress Protection**   IP42

Mechanical

- **Dimensions**   55 x 97 x 125mm (2.17 x 3.82 x 4.9)
- **Weight**   375g
- **Mounting**   Flat Surface or DIN rail

Ports & Interfaces

- **Serial Modbus RTU interface**   RS-232 or RS-485
- **Ethernet**   2 x 10/100 Mb via RJ45
- **SIM**   Mini SIM (2FF)
- **ANT & DIV antennae**   SMA
- **Cellular**   LTE, UMTS/HSPA+, GPRS/EDGE

Modbus Commands Supported

- **01 Read Coil Status**
- **02 Read Input Status**
- **03 Read Holding Registers**
- **04 Read Input Registers**
- **05 Force Single Coil* ***
- **06 Preset Single Register***
- **15 Force Multiple Coils***
- **16 Preset Multiple Registers***
- **22 Mask Write 4X Register***
- **23 Read/Write 4X Registers***

* Note that for output command types, the unit interprets these as inputs to the IoT enrichment process. It does not support output of data from the IoT system

Modbus Data Types Supported

- **Boolean**
- **Multi-bit Encoded Boolean (e.g. 2 bits provide 4 states for one point)**
- **16 Bit Packed Boolean**
- **16 Bit Integer (signed/ unsigned)**
- **16 Bit Counter**
- **32 Bit Integer (signed/unsigned) (single 32 bit or 2x16 bit registers)**
- **32 Bit Counter (single 32 bit or 2x 16 bit registers)**
- **32 Bit Float (single 32 bit or 2x 16 bit registers)**
- **32 Bit Packed Boolean (single 32 bit or 2x 16 bit registers)**
- **Multi-register Text**
- **Endian order is configurable both within and between registers**

Ordering Information

- **BB-SG30300320-51**   EMEA Cellular, no accessories
- **BB-SG30300325-51**   EMEA Cellular, with accessories
- **BB-SG30000320-51**   no Cellular, no accessories
- **BB-SG30000325-51**   no Cellular, with accessories
- **BB-SG30500320-51**   NAM (AT&T) Cellular, no accessories