

*Control Solutions' Babel Buster® BB3-6101-MQ IoT Gateway*

turns any Modbus device into a Thing on the Internet of Things. Gain instant access to a wide range of machine learning and AI capabilities, a wide range of data storage and analytics, and a variety of event handling and notification capabilities. All of this is made possible by the BB3-6101-MQ IoT Gateway and the many features of Amazon Web Services.

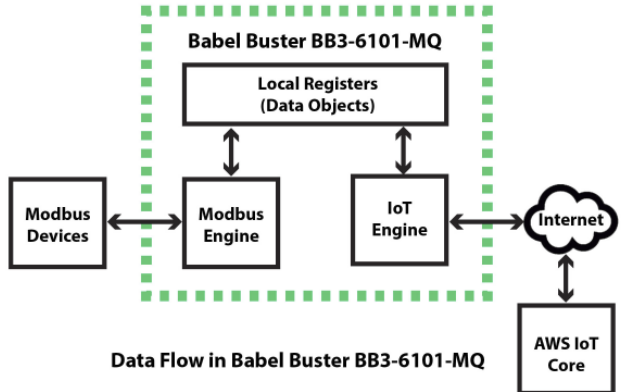
The MQTT “publish” action, in controls terms, is most closely associated with sensors. Your hardware has collected sensor data, and you want to send that sensor data to a server or to other control devices. To send that data, you “publish” it.

The MQTT “subscribe” action, in controls terms, is most closely associated with actuators. The “subscribe” action would also be associated with control setpoints. You can never force data into a device via MQTT. The device, in our case the BB3-6101-MQ, must subscribe to the source of data effectively asking to be informed of changes. Once you have subscribed to an MQTT source of data, then when received, you can use that data to control actuators or update setpoints.

The BB3-6101-MQ IoT Gateway is capable of more than just transferring data between Modbus devices and the AWS servers. It includes Script Basic built in to provide easy-to-use local programming for data analysis and local decision making. This capability is referred to as Edge Computing in IoT terminology.

One of the many things you can do with data that has been published to the AWS server by the Babel Buster BB3-6101-MQ is analyze and visualize the data. The graph illustrated above represents data published by an BB3-6101-MQ, and the steps taken to get this graph are outlined in the user guide.

The data flow in the BB3-6101-MQ is illustrated below. Data is collected from Modbus devices by the Modbus engine which stores that data in local registers or data objects. The Modbus data is automatically updated on a continual basis. Meanwhile, the IoT engine is looking at its set of publish and subscribe rules to decide when to publish data from the local registers to the AWS server. These rules are also created by the user and data will be published according to the criteria set up by the user.



The BB3-6101-MQ can be Modbus RTU master or slave (user selectable), and Modbus TCP client and server (concurrently). Maps created via templates in the BB3-6101-MQ’s web UI will read and write other Modbus devices, copying their data to local registers when read, or sending data from local registers to those devices when written. Holding registers can be integer, unsigned integer, or IEEE 754 floating point, single or double precision. The BB3-6101-MQ also supports character strings as a series of registers having two ASCII characters per register.



## FEATURES

- MQTT Client supporting AWS IoT Core
- Simple template based setup of MQTT Publish and Subscribe
- Secure local email client for local alarm notifications
- Local data logging for remote monitoring without any cloud
- Real time event scheduler
- Modbus RTU RS-485 Master or Slave
- Modbus TCP Client and Server
- Modbus TCP over Ethernet 10/100BaseT
- Up to 2000 local registers, up to 100 points mapped to IoT
- 16, 32, 64-bit integer, 32 or 64-bit IEEE 754 floating point, Mod10
- ASCII character string support (UTF-8)
- Supports Modbus “coils”, input registers, holding registers
- Modbus register mapping configured via web interface
- Modbus (master) polling interval configurable per point
- Configure via web pages, HTTP and/or HTTPS
- Flash file system for XML configuration files, SSL certificates
- Online help, Quick Help section at bottom of every web page
- Password protection for web log-on and ftp
- Field upgradeable firmware upload via ftp
- DHCP or static IP address, IPv4 and IPv6 support
- Hardened EIA-485 transceiver for Modbus RTU
- Powered by 10-30VDC or 24VAC 50/60 Hz (0.1A @ 24VDC)
- DIN rail mounting, 100mm H x 70mm W x 60mm D
- Pluggable screw terminal block for power & RTU network
- Operating temperature -40°C to +85°C; Humidity 5% to 90%
- FCC Class A, CE Mark
- Listed to UL 916 and (Canadian) C22.2 No. 205-M1983

## BB3-6101-MQ Stand-Alone Remote Monitoring

The BB3-6101-MQ includes a secure local email client that will directly email you notifications of alarm events. The event rule template has all of the same power and flexibility as the MQTT publish template. The email message template lets you fully customize the message that is sent. The template includes variables which insert real time data from the BB3-6101-MQ as the email is sent.

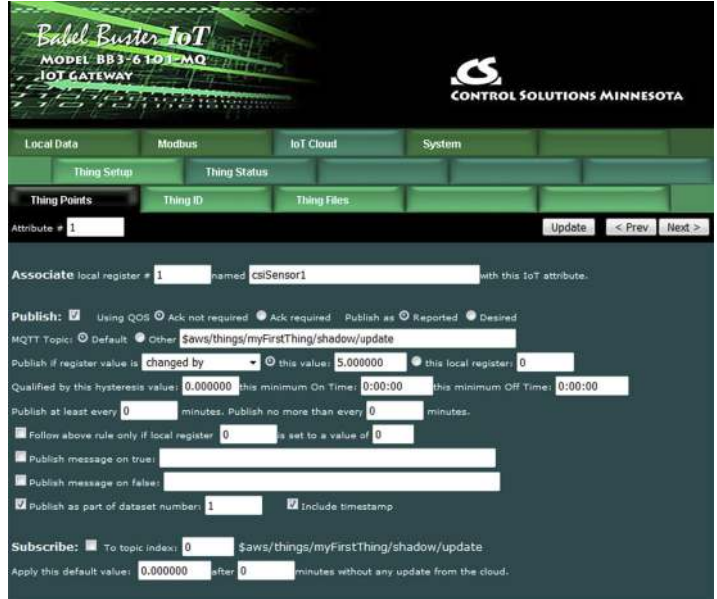
The BB3-6101-MQ includes local data logging capability that can be used instead of sending data to the cloud. You select which data points are logged to a local CSV file. This file is then emailed to you periodically. You select logging rate and when files should be sent. You also have the option of logging at a slower rate most of the time, but then log faster when an event of interest is in progress.

Local Register#	Header Label/Register Name	Include in CSV File
1	Data Value 1	<input checked="" type="checkbox"/>
3	Data Value 2	<input checked="" type="checkbox"/>
5	Data Value 3	<input type="checkbox"/>
7		
9		
11		
13		
15		
17		
19		
21		
23		

#	A	B	C	D	E
1	Timestamp	Data Value 1	Data Value 2	Data Value 5	Data Value 6
2	2021-09-21T16:01:41-05:00	8052	6913	-1562	5472
3	2021-09-21T16:01:59-05:00	7958	6819	-1658	5448
4	2021-09-21T16:02:59-05:00	8023	6859	-1641	5538
5	2021-09-21T16:03:59-05:00	8119	6952	-1545	5591
6	2021-09-21T16:04:59-05:00	8158	7002	-1445	5668
7	2021-09-21T16:05:59-05:00	8183	7041	-1418	5669
8	2021-09-21T16:06:59-05:00	8196	7125	-1370	5689

The BB3-6101-MQ includes a real time scheduler for scheduling daily events or one time events on a given date and time. The scheduler also includes exceptions for holidays.



The MQTT publish and subscribe “rules” are created with an easy to use template in conjunction with setup on the AWS side. A diagnostic page is also provided where you may view the most recently published data, and publish arbitrary JSON formatted data for testing purposes.

Configuration of the gateway is done via the secure web pages served by the internal web server. You simply fill in templates. The entire configuration is saved in the internal Flash file system in XML format. This file may be exported to replicate additional copies of the configured device, or for backup.

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