

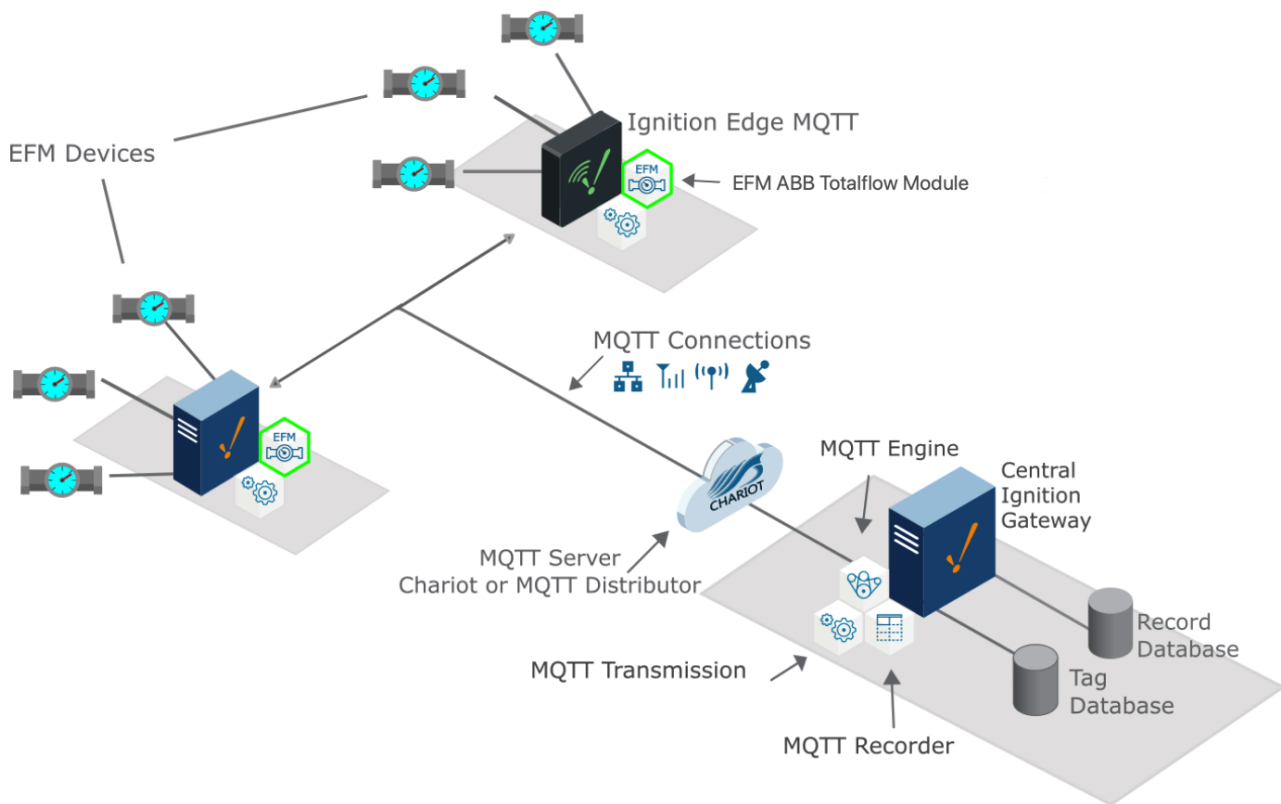
# Sending ABB Totalflow History to a Central Ignition Gateway

## Prerequisites

- [Installing the Java Runtime Environment](#)
- [Installing Ignition](#)
- [Installing the following MQTT Modules](#) on two Ignition systems
  - Ignition System 1 (Central Ignition Gateway)
    - MQTT Distributor
    - MQTT Engine
    - MQTT Recorder
  - Ignition System 2 (Remote/Edge Ignition Gateway)
    - MQTT Transmission
    - EFM ABB Totalflow driver module

## Overview

The EFM ABB Totalflow module is capable of polling history data from an ABB Totalflow device based on a specified polling rate. With MQTT Transmission, this history data can be published as Sparkplug records to an MQTT server. Any client subscribed on Sparkplug RECORD messages can receive these objects. In addition, MQTT Engine when combined with MQTT Recorder can also receive these messages and store these objects in a configured Ignition database. The following drawing shows the general architecture used to do this. This tutorial outlines the process of getting history to the central Ignition gateway.



## Sending ABB Totalflow History to a Central Ignition Gateway

We must configure a total of five Cirrus Link modules on two different Ignition gateways to get history data flowing from an ABB Totalflow device to a central database. These are:

- Central Ignition Gateway
  - MQTT Distributor
  - MQTT Engine
  - MQTT Recorder
- Remote/Edge Ignition Gateway

- MQTT Transmission
- EFM ABB Totalflow

The configuration of each of these modules is covered below based on the Ignition gateway they're installed on.

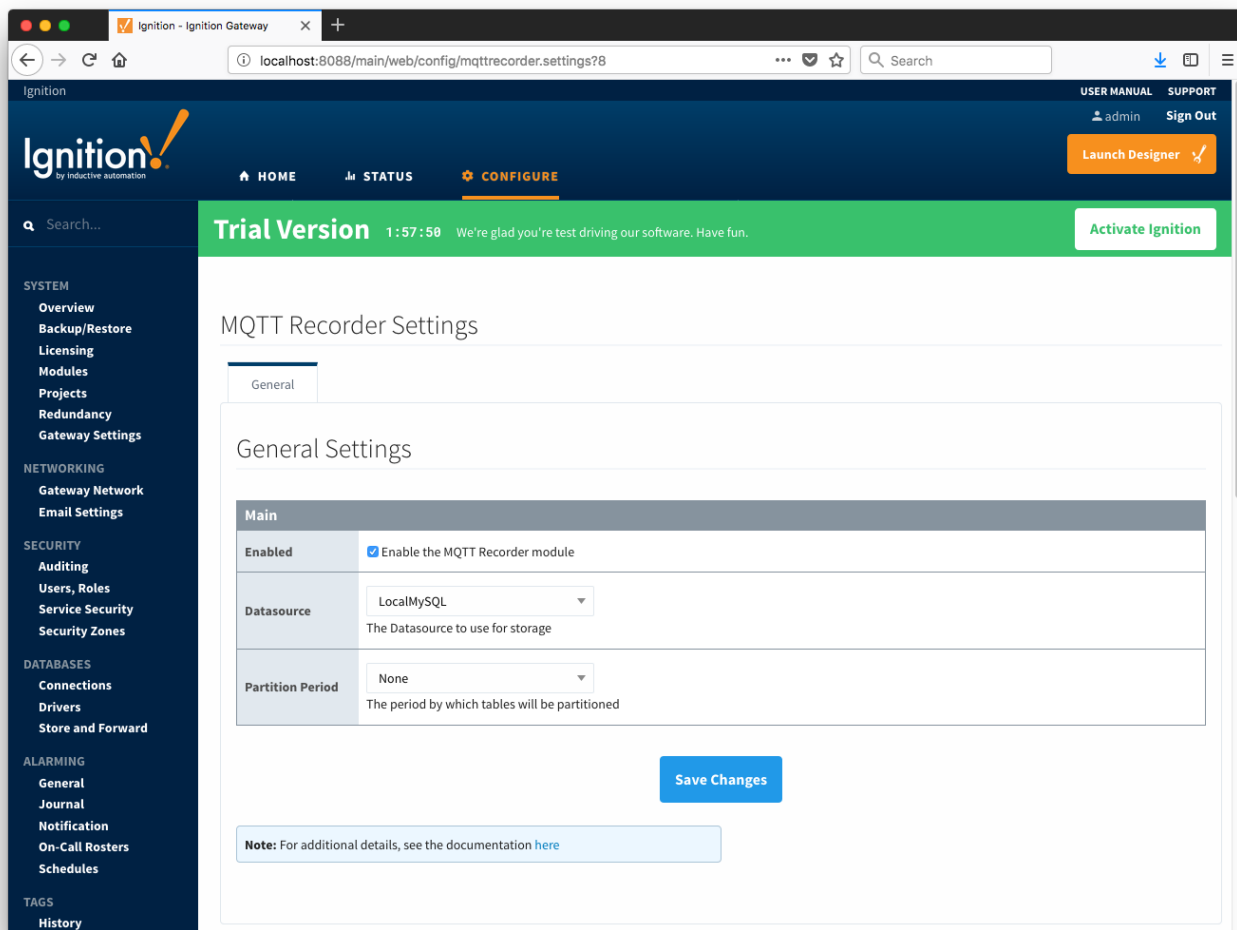
## Central Ignition Gateway Setup

MQTT Distributor can be left in its default configuration.

MQTT Engine can also be left in its default configuration.

MQTT Recorder requires that a database be set up in Ignition. That can be done as described in the 'Connect to a Database' section [here](#). Note Ignition supports additional database types. For more detailed information about supported types, take a look at the information provided [here](#). Once a database is set up, MQTT Recorder can be configured. Do so by opening the Ignition Gateway Web UI and browsing to the Configure tab at the top of the screen and then selecting 'MQTT Recorder Settings' as shown in the lower left below.

Once there, select a Datasource as shown in the image below. This drop-down will be populated with any database connections set up in Ignition. Optionally, a Partition Period can be selected to segregated tables by time periods.

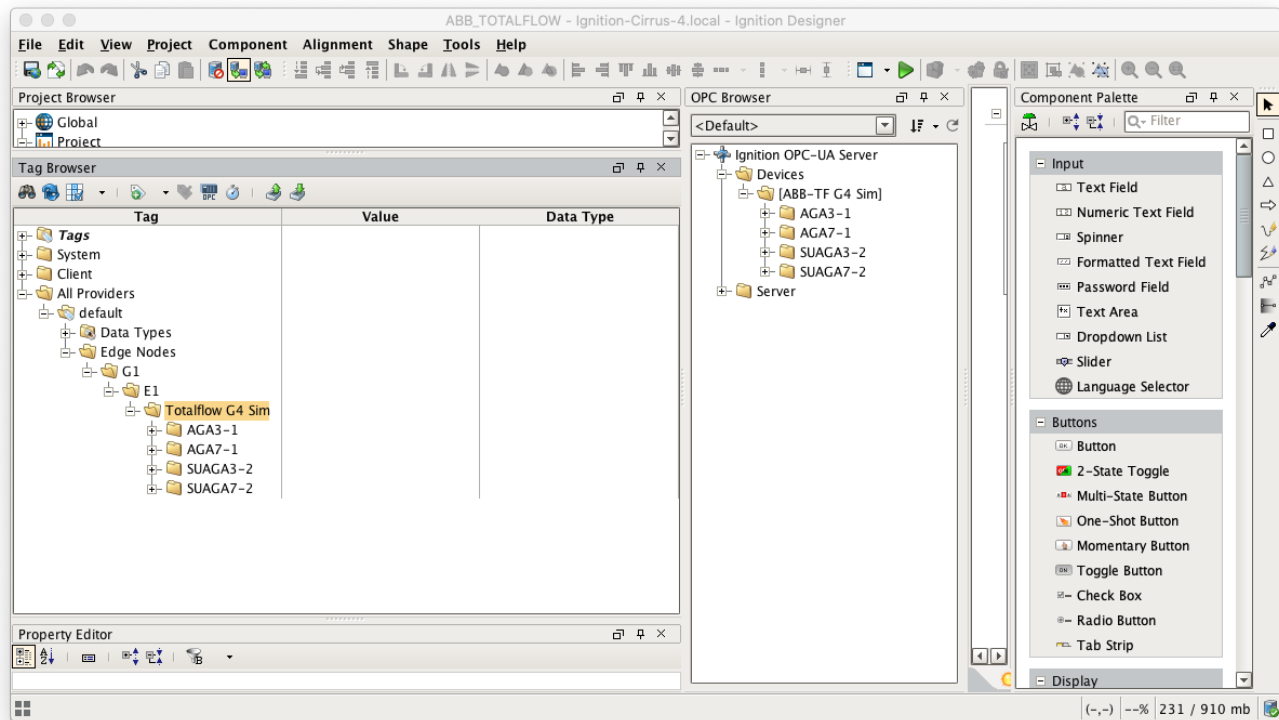


At this point, the Central Ignition Gateway with MQTT Distributor, MQTT Engine, and MQTT Recorder is fully configured and ready to receive MQTT Sparkplug messages from the Remote/Edge Ignition Gateway. MQTT Distributor listens on TCP port 1883 by default for inbound MQTT connections. Make sure the Operating System's Firewall, Antivirus, and Malware protection services allow inbound connections on port 1883/TCP before proceeding.

## Remote/Edge Ignition Gateway Setup

With the Central Ignition Gateway ready to receive MQTT/Sparkplug RECORD objects, the EFM ABB Totalflow and MQTT Transmission modules can be configured on the Remote/Edge Ignition Gateway.

Start by configuring the MQTT Transmission module. Do so by opening Ignition Designer and creating a tag structure similar to what is shown below.



Note this structure is based on usage of the 'Default Transmitter' in MQTT Transmission. So, the directory structure is very important. Note the structure.

- tag provider/Edge Nodes/[Group ID]/[Edge Node ID]/[Device ID]/...

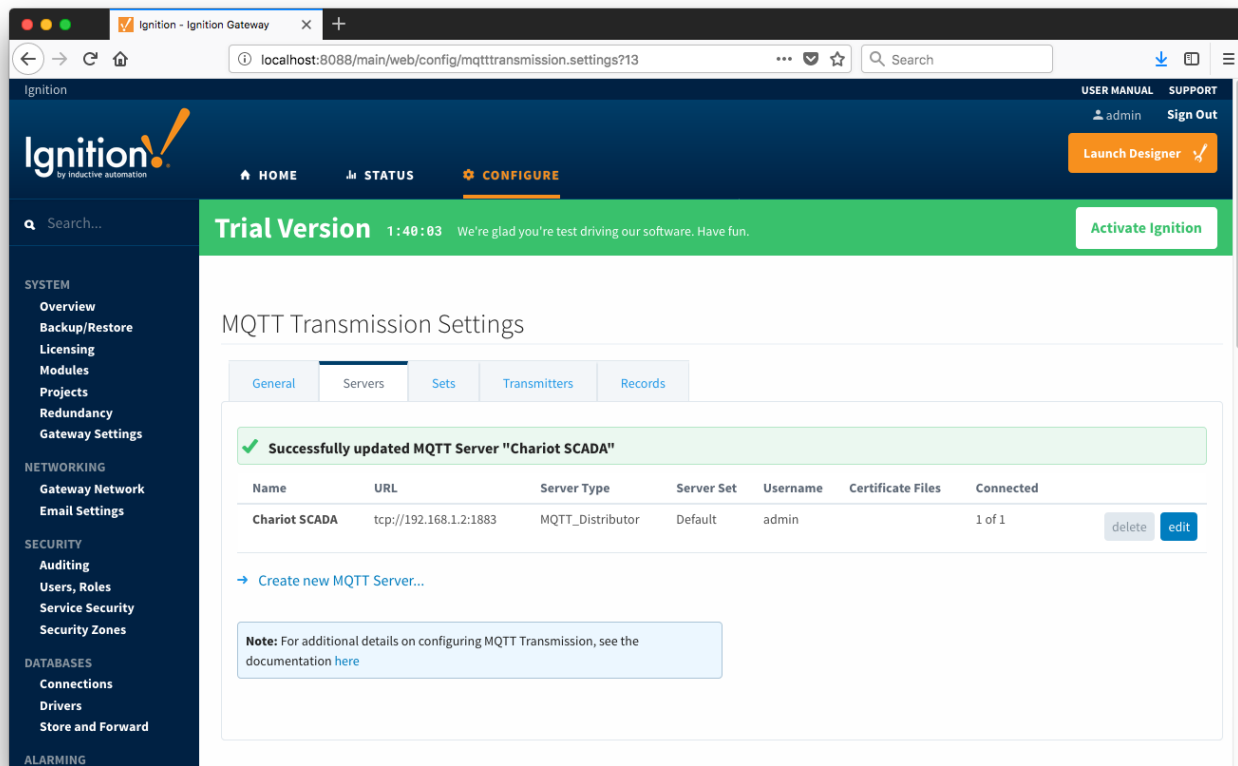
In the example below this implies the following definitions:

- [Group ID] = G1
- [Edge Node ID] = E1
- [Device ID] = Totalflow G4 Sim

These exact values will be used for the EFM ABB Totalflow connection Sparkplug parameters to tell the EFM ABB Totalflow which MQTT Transmission Transmitter configuration to use and, in turn, which MQTT connection to use to send the history data on.

Next the MQTT Transmission server configuration must be modified to point to the Central Ignition Gateway we set up earlier. To do so, in the Ignition Gateway Web UI browse to the Configure tab on the top and then to MQTT Transmission Settings in the lower left as shown below.

In the MQTT Transmission Settings configuration, click the Servers tab. Then click 'edit' on the Chariot SCADA MQTT Server definition. Modify the URL to match the URL of the Central Ignition Gateway. In this example, MQTT Distributor is installed on a Central Ignition Gateway at the IP address of 192.168.1.2. Once the URL is modified to match the configuration, there should be a '1' of '1' in the Connected column as shown below.



The next step is configuring the ABB Totalflow module. This is done as described in the [ABB Totalflow Configuration](#) manual. In going through the basic setup and configuration for History configuration the following steps must be performed:

- Define the global Array-Registers definitions available for all ABB Totalflow devices in this Ignition instance.
  - This step can be skipped if not configuring the driver to poll for AAR data.
- Upload the Periodic Mappings for all ABB Totalflow devices in this Ignition instance.
  - This step can be skipped if default mapping provided by the driver is ok.
- Create the base device connection to the ABB Totalflow device.
- Specify the subset of global Array-Register definitions that this specific ABB Totalflow device uses.
  - This step can be skipped if not configuring the driver to poll for AAR data.
- Reconfigure device connection to enable polling desired history data (i.e. Periodic, Daily or both).

As an example, let's configure the driver to poll for Periodic and Daily History and disable polling for Alarms and Events. This can be done in two ways:

The first way to do it is to configure scan rates as shown below:

- **Alarm Scan Rate**
  - Set to -1 to disable polling for Alarms. If Alarms are not needed it is the best practice to set the 'Alarm Scan Rate' to -1. With this setup, alarm records are not going to be pushed to the rs\_efm\_meter\_alarm database table regardless of the alarm source setting (i.e. PERIODIC\_HISTORY or ALARM\_LOG\_RECORDS).
  - If the 'Alarm Source' is set to the 'ALARM\_LOG\_RECORDS' and the 'Record Info Scan Rate' is set to -1, the 'Alarm Scan Rate' can be set to 0. With this setup, the AlarmPoller will not run on its own nor will it poll on notifications from the RecordInfoPoller.
- **Event Scan Rate**
  - Set to -1 to disable polling for Events.
  - If the 'Record Info Scan Rate' is set to -1, the 'Event Scan Rate' can be set to 0. With this setup, the EventPoller will not run on its own nor will it poll on notifications from the RecordInfoPoller.
- **Periodic History Scan Rate**
  - Set to a positive number to launch the PeriodicHistoryPoller with specified poll rate.
- **Daily History Scan Rate**
  - Set to a positive number to launch the DailyHistoryPoller with specified poll rate.
- **Record Info Scan Rate**
  - Set to -1 to disable the RecordInfoPoller so that there will be no notifications to Alarm, Events and History pollers on any 'RecordInfo' change such as 'Last Record Sequence number Used', etc.

Records	
Alarm Source	PERIODIC_HISTORY_RECORDS Alarm Source Selector (i.e. Periodic History or Alarm Log record). (default: PERIODIC_HISTORY_RECORDS)
Alarm Scan Rate	-1 The rate in seconds that Alarm Log Records are scanned. To disable Alarm polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner. (default: -1)
Event Scan Rate	0 The rate in seconds that Event Records are scanned. To disable Event polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner. (default: 0)
Periodic History Scan Rate	60 The rate in seconds that Periodic History Records are scanned. To disable Periodic History polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner. (default: 0)
Daily History Scan Rate	60 The rate in seconds that Daily History Records are scanned. To disable Daily History polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner. (default: 0)
Record Info Scan Rate	-1 The rate in seconds for 'Record Info Registers' (i.e. History, Event and Alarm record capacity, last sequence number, etc.) to be scanned. If new Event, History, or Alarm Log records are detected, respective poller(s) will be notified. To disable 'RecordInfo' polls, set to -1. Set to 0 for one-shot 'Record Info' poll. (default: -1)
Max Records To Read	100 Maximum number of records to read in one poll. (default: 100)
Periodic Mapping	Meter Periodic Mapping The mapping of Totalflow LOG_PERIOD and DAILY structures to Flowcal Meter Periodic Transactions.

The second way to do it is to configure scan rates as shown below:

- **Alarm Scan Rate**
  - Set to -1 to disable polling for Alarms.
- **Event Scan Rate**
  - Set to -1 to disable polling for Events.
- **Periodic History Scan Rate**
  - Set to 0 to poll on notification from the 'Record Info' poller.
- **Daily History Scan Rate**
  - Set to 0 to poll on notification from the 'Record Info' poller.
- **Record Info Scan Rate**
  - Set to a positive number to launch the RecordInfoPoller with specified poll rate. With this setup, Periodic and Daily History pollers will be notified on any 'RecordInfo' change such as 'Last Record Sequence number Used', etc.

Ignition-Cirrus-4.local - Ignition

localhost:8088/main/web/config/opcu.devices722

Records

Alarm Source

PERIODIC\_HISTORY\_RECORDS

Alarm Source Selector (i.e. Periodic History or Alarm Log record).  
(default: PERIODIC\_HISTORY\_RECORDS)

Alarm Scan Rate

-1

The rate in seconds that Alarm Log Records are scanned. To disable Alarm polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner.  
(default: -1)

Event Scan Rate

-1

The rate in seconds that Event Records are scanned. To disable Event polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner.  
(default: 0)

Periodic History Scan Rate

0

The rate in seconds that Periodic History Records are scanned. To disable Periodic History polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner.  
(default: 0)

Daily History Scan Rate

0

The rate in seconds that Daily History Records are scanned. To disable Daily History polls, set to -1. Set to 0 to poll on notification from the 'Record Info' scanner.  
(default: 0)

Record Info Scan Rate

60

The rate in seconds for 'Record Info Registers' (i.e. History, Event and Alarm record capacity, last sequence number, etc.) to be scanned.  
If new Event, History, or Alarm Log records are detected, respective poller(s) will be notified. To disable 'RecordInfo' polls, set to -1. Set to 0 for one-shot 'Record Info' poll.  
(default: -1)

Max Records To Read

100

Maximum number of records to read in one poll.  
(default: 100)

Periodic Mapping

Meter Periodic Mapping

The mapping of Totalflow LOG\_PERIOD and DAILY structures to Flowcal Meter Periodic Transactions.

At this point the EFM ABB Totalflow driver is configured and is polling for history data at the rate specified in the EFM ABB Totalflow device configuration.

MQTT Transmission is connected to the MQTT Server and as a result MQTT Engine is receiving tag change events. In addition, because an EFM ABB Totalflow device has been created and configured with the same Sparkplug Group ID, Edge Node ID, and Device ID, history data will also be pushed to the MQTT server as Sparkplug RECORD objects. When new history data is polled by the EFM ABB Totalflow driver, they will be published to the MQTT server, consumed by MQTT Engine, passed on to MQTT Recorder, and then inserted into the specified database. Below are a few views of some history records using a third party database viewing tool.

testdb													
(MySQL 5.7.12) ibinshok@127.0.0.1/testdb/rs_efm_meter_history_periodic													
TABLES													
Search: rs_id													
rs_id	rs_type	rs_group	rs_edge_node	rs_device	rs_record_time	rs_recorder_time	rs_fields	volume	temp_avg	sp_avg	flte_rate	mtc_id	flc
1	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591768000000	1596671261860	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.1999206542969	0	109.6701354980468	3600	ACA1-1	
2911	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591768800000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.2001037597656	0	109.6700579819384	3600	SUACA2-2	
1941	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591768800000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.073758125305176	94.49996948242188	109.66976928710938	3600	SUACA2-1	
971	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591768800000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.0608785366211	94.5	109.66958732945703	3600	ACA3-1	
2	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591772400000	1596671261860	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.2000732421875	0	109.66973878951125	3600	ACA7-1	
2912	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591772400000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.199951171875	0	109.66963958740234	3600	SUACA7-2	
1942	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591772400000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.073774337768555	94.5	109.669677734375	3600	ACA3-2	
972	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591772400000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.06089019753906	94.50000762939453	109.66976165771484	3600	ACA3-1	
3	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591776000000	1596671261860	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.19976806640625	0	109.6700668634961	3600	ACA7-1	
2913	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591776000000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.1999816894531	0	109.66968769883261	3600	SUACA7-2	
1943	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591776000000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.0737676204834	94.5	109.6698226528711	3600	SUACA3-2	
973	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591776000000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.060879707336426	94.49998474121094	109.66980683984375	3600	ACA3-1	
2915	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591779600000	1596671261860	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.2000427246094	0	109.66997528076172	3600	ACA7-1	
1944	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591779600000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.19989013671875	0	109.6702868652344	3600	SUACA7-2	
974	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591779600000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.073789596557617	94.50009151273438	109.6698769861281	3600	SUACA3-2	
5	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591783200000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.060905456542969	94.49995896484375	109.66976928710938	3600	ACA3-1	
2915	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591783200000	1596671261861	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	170.19430541992188	0	109.67028214355469	1801	ACA3-1	
1945	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591783200000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	170.1945343017578	0	109.6702296142578	1801	SUACA7-2	
975	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591783200000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	5.039661222167969	94.5000991821289	109.67077613671875	1801	SUACA3-2	
6	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591862589000	1596671261861	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	269.79754638671875	0	109.6706008911328	2855	ACA7-1	
2916	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591862589000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	269.7977294921875	0	109.67042541503906	2855	SUACA7-2	
1946	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591862589000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	7.989078521728516	94.50006866455078	109.6705398555703	2855	SUACA3-2	
976	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591862589000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	7.9784844101010242	94.50009151273438	109.67054748551536	2855	ACA3-1	
7	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591866000000	1596671261861	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.2001647945219	0	109.6700210571289	3600	ACA7-1	
2917	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591866000000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.2001373828125	0	109.66973114013672	3600	SUACA7-2	
1947	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591866000000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.073785781860332	94.50004577636719	109.6702868652344	3600	SUACA3-2	
977	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591866000000	1596671261861	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.060881429382324	94.50005340576172	109.66979217529297	3600	ACA3-1	
8	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591869600000	1596671261861	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.19976806640625	0	109.66983795166016	3600	ACA7-1	
2918	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591869600000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.1997375488281	0	109.66987528076172	3600	SUACA7-2	
1948	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591869600000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.07375717163086	94.50005340576172	109.66979217529297	3600	SUACA3-2	
978	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591869600000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.06087589263916	94.50000762939453	109.6698765136719	3600	ACA3-1	
9	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591873200000	1596671261861	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.2001037597656	0	109.66976165771484	3600	ACA7-1	
2919	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591873200000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.1997985839844	0	109.67018127441406	3600	SUACA7-2	
1949	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591873200000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.073759078979492	94.49999237060547	109.67010490846875	3600	SUACA3-2	
979	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591878200000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.06082077941895	94.5	109.66948699951172	3600	ACA3-1	
10	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591878200000	1596671261861	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.20021686652344	0	109.66967010408047	3600	ACA7-1	
2920	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591878200000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	340.2001647945219	0	109.66995239257812	3600	SUACA7-2	
1050	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591878600000	1596671299865	volume(9,avg_base_density(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.07375264282227	94.4999771118164	109.66978454589844	3600	SUACA3-2	
980	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591878600000	1596671282767	volume(9,temp_avg(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	10.060903549194336	94.49996948242188	109.66988372802734	3600	ACA3-1	
11	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591880400000	1596671261862	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	319.4097900390625	0	109.66975402820351	3380	ACA7-1	
2921	EFM_METER_HISTORY_PERIODIC	G1	E1	Totalflow C4 Sim	1591880400000	1596671316480	avg_base_density(9,sp_avg(9,flte_rate(9,mtc_id(9,flc(9	319.41000366621094	0	109.6700286662344	3380	SUACA7-2	

TABLE INFORMATION

created: 8/5/20

updated: 8/7/20

engine: innodb

rows: 3,988

size: 1.5 MB

encoding: latin1

auto\_increment: 3,989

Rows 1 - 1,000 of 3,988 from table

MySQL 5.7.12 | ibinshok@127.0.0.1/testdb/rs\_efm\_meter\_history\_daily

testdb

Select Database Structure Content Relations Triggers Table Info Query

TABLES

- rs\_efm\_meter\_alarm
- rs\_efm\_meter\_event
- rs\_efm\_meter\_history\_daily**
- rs\_efm\_meter\_history\_periodic

Search: rs\_id

rs_id	rs_type	rs_group	rs_edga_node	rs_device	mtc_id	rs_record_time	rs_reorder_time	rs_fields	period	sp_avg	last_log_period_seq	first_log_period_seq	temp_range_lo
1	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1493855999000	1596671322146	period(7.sp_avg(9.last_log_period...	1	109.67356872558594	0	0	
51	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1493855999000	1596671324324	period(7.sp_avg(9.last_log_period...	1	109.66741180419922	0	0	
101	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1493855999000	1596671326654	avg_base_density(9.period(7.last_...	1	NULL	0	0	
151	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1493855999000	1596671328867	avg_base_density(9.period(7.last_...	1	NULL	0	0	
2	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591737034000	1596671322146	period(7.sp_avg(9.last_log_period...	10138	109.67003631591797	3	1	
52	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591737034000	1596671324324	period(7.sp_avg(9.last_log_period...	10138	109.67002868652344	3	1	94.495002
102	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1591737034000	1596671326654	avg_base_density(9.period(7.last_...	10138	NULL	3	1	94.495002
152	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1591737034000	1596671328867	avg_base_density(9.period(7.last_...	10138	NULL	3	1	
3	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591747200000	1596671322146	period(7.sp_avg(9.last_log_period...	37801	109.66996002197266	14	4	
53	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591747200000	1596671324324	period(7.sp_avg(9.last_log_period...	37801	109.66979217529297	14	4	94.495002
103	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1591747200000	1596671326654	avg_base_density(9.period(7.last_...	37801	NULL	14	4	94.495002
153	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1591747200000	1596671328867	avg_base_density(9.period(7.last_...	37801	NULL	14	4	
4	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591862589000	1596671322146	period(7.sp_avg(9.last_log_period...	51922	109.66998291015625	30	15	
54	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591862589000	1596671324324	period(7.sp_avg(9.last_log_period...	51922	109.66999053955078	30	15	94.495002
104	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1591862589000	1596671326654	avg_base_density(9.period(7.last_...	51922	NULL	30	15	94.495002
154	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1591862589000	1596671328867	avg_base_density(9.period(7.last_...	51922	NULL	30	15	
5	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591920000000	1596671322146	period(7.sp_avg(9.last_log_period...	86400	109.66988372802734	54	31	
55	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1591920000000	1596671324324	period(7.sp_avg(9.last_log_period...	86400	109.6698226928711	54	31	94.495002
105	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1591920000000	1596671326654	avg_base_density(9.period(7.last_...	86400	NULL	54	31	94.495002
155	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1591920000000	1596671328867	avg_base_density(9.period(7.last_...	86400	NULL	54	31	
6	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592006400000	1596671322146	period(7.sp_avg(9.last_log_period...	86405	109.66979217529297	78	55	
56	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592006400000	1596671324324	period(7.sp_avg(9.last_log_period...	86405	109.66986846923828	78	55	94.495002
106	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1592006400000	1596671326654	avg_base_density(9.period(7.last_...	86405	NULL	78	55	94.495002
156	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1592006400000	1596671328867	avg_base_density(9.period(7.last_...	86405	NULL	78	55	
7	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592092800000	1596671322146	period(7.sp_avg(9.last_log_period...	86403	109.66986846923828	102	79	
57	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592092800000	1596671324324	period(7.sp_avg(9.last_log_period...	86403	109.66990661621094	102	79	94.495002
107	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1592092800000	1596671326654	avg_base_density(9.period(7.last_...	86403	NULL	102	79	94.495002
157	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1592092800000	1596671328867	avg_base_density(9.period(7.last_...	86403	NULL	102	79	
8	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592179200000	1596671322147	period(7.sp_avg(9.last_log_period...	25441	109.66987609863181	110	103	
58	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592179200000	1596671324324	period(7.sp_avg(9.last_log_period...	25441	109.66991424560547	110	103	94.495002
108	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1592179200000	1596671326654	avg_base_density(9.period(7.last_...	25441	NULL	110	103	94.495002
158	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1592179200000	1596671328867	avg_base_density(9.period(7.last_...	25441	NULL	110	103	
9	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592697600000	1596671322147	period(7.sp_avg(9.last_log_period...	33795	109.66983795166016	120	111	
59	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592697600000	1596671324324	period(7.sp_avg(9.last_log_period...	33795	109.669921875	120	111	94.495002
109	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1592697600000	1596671326654	avg_base_density(9.period(7.last_...	33795	NULL	120	111	94.495002
159	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1592697600000	1596671328867	avg_base_density(9.period(7.last_...	33795	NULL	120	111	
10	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592697600000	1596671322147	period(7.sp_avg(9.last_log_period...	86400	109.66988372802734	144	121	
60	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592697600000	1596671324324	period(7.sp_avg(9.last_log_period...	86400	109.6698608394375	144	121	94.495002
110	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA3-2	1592697600000	1596671326654	avg_base_density(9.period(7.last_...	86400	NULL	144	121	94.495002
160	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUACA7-2	1592697600000	1596671328867	avg_base_density(9.period(7.last_...	86400	NULL	144	121	
11	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592784000000	1596671322147	period(7.sp_avg(9.last_log_period...	86405	109.66986846923828	168	145	
61	EFM_METER_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	ACAG-1	1592784000000	1596671324324	period(7.sp_avg(9.last_log_period...	86405	109.66986846923828	168	145	94.495002

TABLE INFORMATION

- created: 8/5/20
- updated: 8/7/20
- engine: InnoDB
- rows: 204
- size: 144.0 KiB
- encoding: latin1
- auto\_increment: 205

204 rows in table

## Additional Resources

- Inductive Automation's Ignition download with free trial
  - <https://inductiveautomation.com/downloads/>
- Azure Injector download with free trial
  - <https://inductiveautomation.com/downloads/third-party-modules>
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  - Check out the Cirrus Link Forum: <https://forum.cirrus-link.com/>
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