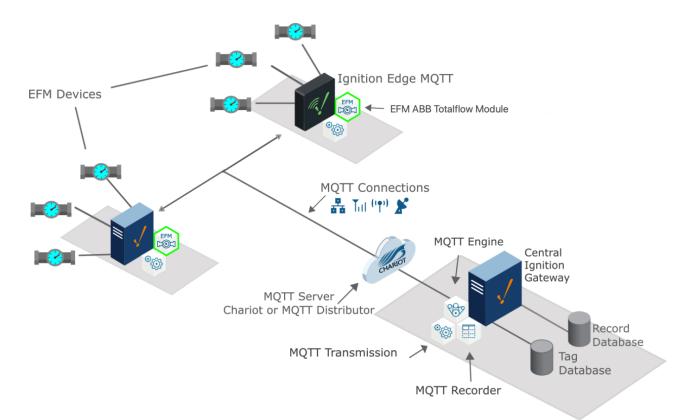
Sending ABB Totalflow History to a Central Ignition Gateway

Prerequisites

- · Knowledge of Ignition and Module installation process: Cirrus Link Module Installation
 - Install 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. 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.

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🖾 Ignition	1				≗admin Log Out→
Ignit	ion			Help 😮	Get Designer
. ♠	SYSTEM	Config > > MQTT Record	er Settings		
Home	Overview	Trial Mode 1:57:28 We're gl	ad you're test driving our software. Have fun.		Activate Ignition
հո	Backup/Restore				
Status	Ignition Exchange Licensing	General Ta	bles		
Config	Modules				
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	Redundancy	Main			
	Gateway Settings	Enabled	☑ Enable the MQTT Recorder module		
	NETWORKING		LocalMySQL v		
	Web Server	Datasource	The Datasource to use for storage		
	Gateway Network				
	Email Settings	Partition Period	None		
	SECURITY		The period by which tables will be partitioned		
	General				
	Auditing		Save Changes		
	Users, Roles Service Security		Save changes		
	Identity Providers				
	Security Levels	Note: For additional documentation here	details on configuring MQTT Recorder, see the		
	Security Zones	documentation nere			
	Q Search				

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.

• • •		- Ignition-Mac	Book-Pro.local - Ignition Designer	
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Q- Filter	Project Properties 🔏	Scripting	🛄 Learn more 🛛 🖾 Gateway St	tatus
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Service Perspective Image: Transaction Groups			create a new script	► 💼 SUAGA3-2
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	J			169 / 1024 mb
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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.

ightarrow C $rightarrow$	Iocalhost:8088/w	/eb/config/mqtttransmi	ssion.settings?42				ເ ☆	<u>↓</u> ≫
nition-MacBook-Pro.local								Log Out
nition							Help 🛿	Get Designer
SYSTEM	Config > Mqtttransmissi	on > MQTT Transmissio	on Settings					
Overview	Trial Mode 1:35:05 W	e're glad you're test driving ou	ır software. Have fun.					Activate Ignitic
Backup/Restore								
^S Ignition Exchange								
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g Modules								
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NETWORKING	Name	URL		Server Set	t Userr	name Connected		
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Gateway Network								
Email Settings	→ Create ne	ew MQTT Server						
SECURITY	Note: For ad	ditional details on config	uring MOTT Transmiss	ion see the				
General	documentat	-		ion, see the				
Auditing								
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Identity Providers								
Security Levels								
Security Zones								
Q Search								

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.
 ^o 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 en 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 it 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 it 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.

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	🌣 Config > Opcua > Devic	es		
	Trial Mode 1:20:16 We're	glad you're test driving our software. Have fun.	A	ctivate Ignii
	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. Se scanner. (default: -1)	t to 0 to poll on notification from the 'Record Info'	
	Event Scan Rate	0 The rate in seconds that Event Records are scanned. To disable Event polls, set to -1. Set to ((default: 0)) to poll on notification from the 'Record Info' scan	ner.
	Periodic History Scan Rate	60 The rate in seconds that Periodic History Records are scanned. To disable Periodic History p Record Info' scanner. (default: 0)	olls, set to -1. Set to 0 to poll on notification from t	ne
	Daily History Scan Rate	60 The rate in seconds that Daily History Records are scanned. To disable Daily History polls, se Info ⁶ scanner. (default: 0)	t to -1. Set to 0 to poll on notification from the 'Re	ord
	Record Info Scan Rate	-1 The rate in seconds for 'Record Info Registers' (i.e. History, Event and Alarm record capacity, If new Event, History, or Alarm Log records are detected, respective poller(s) will be notified shot 'Record Info' poll. (default: -1)	last sequence number, etc.) to be scanned. To disable 'Recordinfo' polls, set to -1. Set to 0 for	one-
	Max Records To Read	100 Maximum number of records to read in one poll. (default: 100)		
	Periodic Mapping	Meter Periodic Mapping	sactions	

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 form the 'Record Info' poller.
- Daily History Scan Rate Set to 0 to poll on notification form 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.

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	🌣 Config > Opcua > Devi												
	Trial Mode 1:19:24 We'r	rial Mode 1:19:24 We're glad you're test driving our software. Have fun.											
	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)											
Q Search	Periodic Mapping	Meter Periodic Mapping T 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		1 🔤								< >
Select Database	Structure Content Relations Triggers Tab									Table History Users
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rs_efm_meter_alarm	rs_id rs_type	rs_group rs_edge_nor	de rs_device	rs_record_time	rs_recorder_time	rs_fields	volume	temp_avg	sp_avg	flo_rate mtr_id
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	971 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591768800000	1596671282767	volumei9.temp avgi9.sp avgi9.flo	10.06087875366211	94.5	5 109.66956329345703	3600 AGA3-1
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	972 EFM METER HISTORY PERIODIC	G1 E1	Totalflow G4 Sim	1591772400000		volume[9,temp_avg]9,sp_avg]9,flo	10.060890197753906		3 109.66976165771484	3600 AGA3-1
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	974 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591779600000		volume 9,temp_avg 9,sp_avg 9,flo	10.060905456542969			
	5 EFM METER HISTORY PERIODIC	G1 E1	Totalflow G4 Sim	1591783200000		volume 9,temp_avg 9,sp_avg 9,flo	170.19430541992188			
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	1945 EFM METER HISTORY PERIODIC	G1 E1	Totalflow G4 Sim	1591783200000		volume 9,avg base density 9,tem	5.039665222167969			
	975 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591783200000		volume 9,temp_avg 9,sp_avg 9,flo	5.033236503601074			
	6 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591862589000		volume 9,temp_avg 9,sp_avg 9,flo	269.79754638671875			
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	1946 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591862589000		volume 9,avg_base_density 9,tem	7.989078521728516			
	976 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591862589000		volume 9,temp_avg 9,sp_avg 9,flo	7.978849411010742			
	7 EFM_METER_HISTORT_PERIODIC	G1 E1	Totalflow G4 Sim	1591862589000		volume[9,temp_avg[9,sp_avg[9,flo	340.2001647949219			
	2917 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591866000000		avg base density[9,sp_avg]9,flo r	340.2003173828125			
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	977 EFM_METER_HISTORY_PERIODIC		Totalflow G4 Sim			volume 9,temp_avg 9,sp_avg 9,flo	10.060885429382324			
	8 EFM_METER_HISTORY_PERIODIC			1591869600000		volume 9,temp_avg 9,sp_avg 9,flo	340.19976806640625			
	2918 EFM_METER_HISTORY_PERIODIC		Totalflow G4 Sim	1591869600000		avg_base_density 9,sp_avg 9,flo_r	340.1997375488281			
	1948 EFM_METER_HISTORY_PERIODIC	G1 E1 G1 E1	Totalflow G4 Sim	1591869600000		volume 9,avg_base_density 9,tem	10.07375717163086			
	978 EFM_METER_HISTORY_PERIODIC		Totalflow G4 Sim	1591869600000		volume 9,temp_avg 9,sp_avg 9,flo	10.06087589263916			
	9 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591873200000		volume 9,temp_avg 9,sp_avg 9,flo	340.2001037597656			
	2919 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591873200000		avg_base_density 9,sp_avg 9,flo_r	340.1997985839844			
INFORMATION	1949 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591873200000		volume 9,avg_base_density 9,tem	10.073759078979492			
created: 8/5/20	979 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591873200000		volume 9,temp_avg 9,sp_avg 9,flo	10.060872077941895			
updated: 8/7/20	10 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591876800000		volume 9,temp_avg 9,sp_avg 9,flo	340.2002868652344			
engine: InnoDB	2920 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591876800000		avg_base_density 9,sp_avg 9,flo_r	340.2001647949219			
ows: 3,988	1950 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591876800000		volume 9,avg_base_density 9,tem	10.073755264282227			
size: 1.5 MiB	980 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591876800000		volume 9,temp_avg 9,sp_avg 9,flo	10.060903549194336			
encoding: latin1	11 EFM_METER_HISTORY_PERIODIC	G1 E1	Totalflow G4 Sim	1591880400000		volume 9,temp_avg 9,sp_avg 9,flo	319.4097900390625			
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			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	1591737034000		7 avg_base_density 9,period 7,last_l				1	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA7-1	159174720000		6 period 7,sp_avg 9,last_log_period				4	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	159174720000		4 period 7,sp_avg 9,last_log_period.				4	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	159174720000		4 avg_base_density 9,period 7,last_l				4	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	159174720000		7 avg_base_density 9,period 7,last_l				4	
			R_HISTORY_DAILY	G1	El	Totalflow G4 Sim	AGA7-1	1591862589000		6 period 7,sp_avg 9,last_log_period.				15	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	1591862589000		4 period 7,sp_avg 9,last_log_period.				15	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	1591862589000		4 avg_base_density 9,period 7,last_l				15	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	1591862589000		7 avg_base_density 9,period 7,last_l				15	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA7-1	159192000000		6 period 7,sp_avg 9,last_log_period.				31	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	159192000000		4 period 7,sp_avg 9,last_log_period.				31	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	159192000000		4 avg_base_density 9,period 7,last_l				31	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	159192000000		7 avg_base_density 9,period 7,last_l				31	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA7-1	159200640000		6 period 7,sp_avg 9,last_log_period.				55	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	159200640000		4 period 7,sp_avg 9,last_log_period.				55	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	159200640000		4 avg_base_density 9,period 7,last_l				55	
	1	6 EFM_METE	R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	1592006400000		7 avg_base_density 9,period 7,last_l				55	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA7-1	159209280000		6 period 7,sp_avg 9,last_log_period.				79	
	1	57 EFM_METE	R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	159209280000		4 period 7,sp_avg 9,last_log_period.				79	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	159209280000		4 avg_base_density 9,period 7,last_l				79	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	159209280000		7 avg_base_density 9,period 7,last_l				79	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA7-1	159217920000		7 period 7,sp_avg 9,last_log_period.				103	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	159217920000		4 period 7,sp_avg 9,last_log_period.				103	
	1	08 EFM_METE	R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	1592179200000		4 avg_base_density 9,period 7,last_l				103	
	1	58 EFM_METE	R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	159217920000		7 avg_base_density 9,period 7,last_l				103	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA7-1	1592663805000		7 period 7,sp_avg 9,last_log_period.				111	
		59 EFM_METE	R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	1592663805000		4 period 7,sp_avg 9,last_log_period.				111	
E INFORMATION			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	1592663805000		4 avg_base_density 9,period 7,last_l				111	
created: 8/5/20			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	1592663805000		7 avg_base_density 9,period 7,last_l				111	
updated: 8/7/20			R_HISTORY_DAILY	G1	El	Totalflow G4 Sim	AGA7-1	159269760000		7 period 7,sp_avg 9,last_log_period				121	
engine: InnoDB			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	159269760000		4 period 7,sp_avg 9,last_log_period.				121	
rows: 204	1	LO EFM_METE	R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA3-2	159269760000	0 159667132665	4 avg_base_density 9,period 7,last_l	8640) NULL		121	
size: 144.0 KiB			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	SUAGA7-2	159269760000		7 avg_base_density 9,period 7,last_l				121	
			R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA7-1	159278400000		7 period 7,sp_avg 9,last_log_period.				145	
encoding: latin1 auto_increment: 205		51 EFM_METE	R_HISTORY_DAILY	G1	E1	Totalflow G4 Sim	AGA3-1	159278400000	0 159667132432	4 period 7,sp_avg 9,last_log_period.	8640	109.66986846923828	3 168	145	94.49

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 • Questions about this tutorial?
 - Check out the Cirrus Link Forum: https://forum.cirrus-link.com/
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