

Ms Sql Database for Grafana

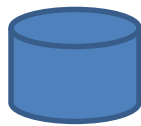
Basic Excel
Create Database
Create Table
Select From Where
Node-Red Level Control Dashboard

<https://github.com/chalermchonv/UtccFoodlotCodes>

https://www.youtube.com/watch?v=SR89A1twIDM&list=PLhgZnNDXug_KgSpvYuTVtNdK-YN4bIHh-

Grafana

- Data Source (Any Database)



	id	metric	value	time	machine
1	1	Temperature	39	2021-06-20 12:05:40.220	m01
2	2	Humidity	67	2021-06-20 12:05:40.220	m01
3	3	Temperature	72	2021-06-20 12:05:54.083	m01
4	4	Humidity	56	2021-06-20 12:05:54.083	m01
5	5	Temperature	43	2021-06-20 12:06:00.280	m01
6	6	Humidity	41	2021-06-20 12:06:00.280	m01
7	7	Temperature	37	2021-06-20 12:09:50.193	m01
8	8	Humidity	47	2021-06-20 12:09:50.193	m01

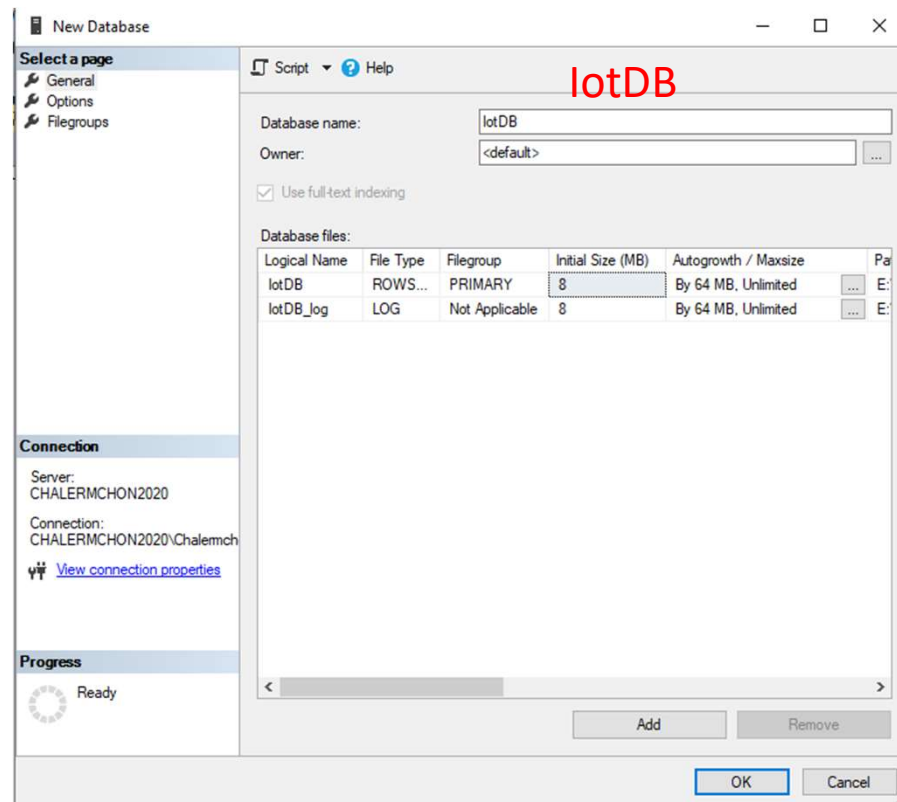
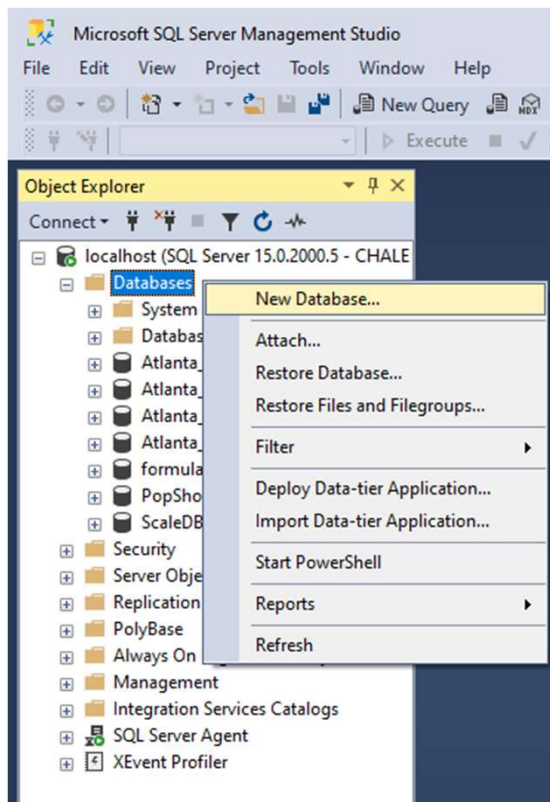
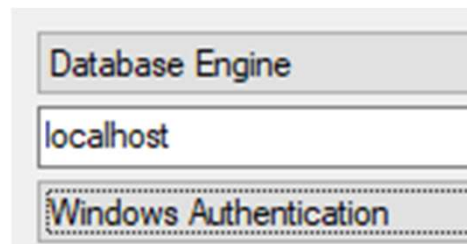
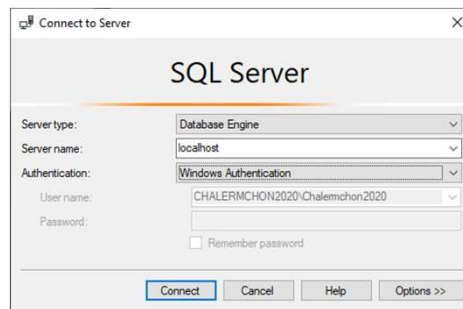
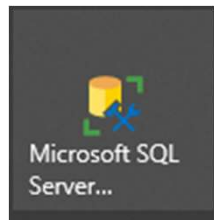
- Dashboard (SQL)



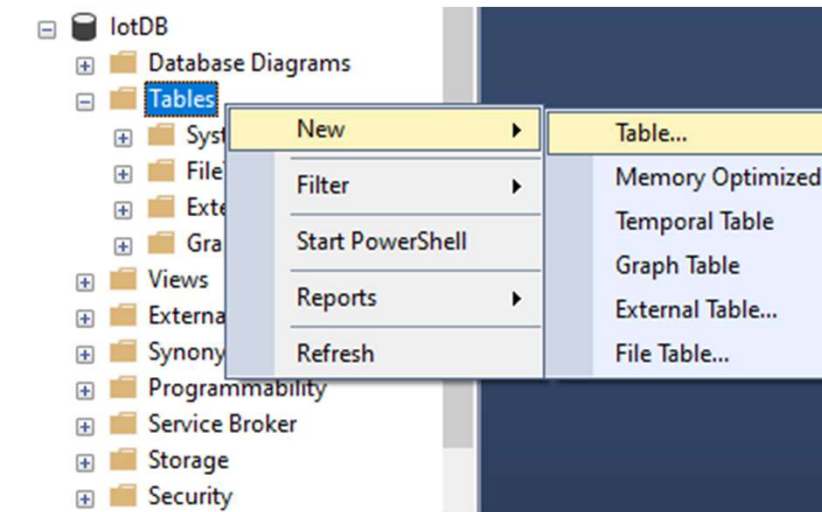
SELECT
[time], [value], [metric]
FROM [lotDB].[dbo].[lotDemo]
WHERE \$__timeFilter([time])
ORDER BY time ASC

Sql Server Management Studio

Create New Database (lotDB)



Create LevelControlData Table



CHALERMCHON2020...dbo.LevelControl			
	Column Name	Data Type	Allow Nulls
	id	int	<input type="checkbox"/>
	time	datetime	<input checked="" type="checkbox"/>
	metric	nvarchar(50)	<input checked="" type="checkbox"/>
	value	float	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

Identity Specification	Yes
(Is Identity)	Yes
Identity Increment	1
Identity Seed	1

(General)	
(Name)	time
Allow Nulls	Yes
Data Type	datetime
Default Value or Binding	(getutcdatename())

(Getutcdatename())

Edit Table

Object Explorer

Connect

localhost (SQL Server 15.0.2000.5 - CHA)

Databases

- System Databases
- Database Snapshots
- Atlanta_BillingNote
- Atlanta_Shipments
- Atlanta_SNote
- Atlanta_Warehouse
- formula
- PopShopDB
- ScaleDB
- IotDB

Database Diagrams

Tables

- System Tables
- FileTables
- External Tables
- Graph Tables
- dbo.LevelControl**

Views

External Resources

Synonyms

Programmability

Service Broker

Storage

Security

New Table...

Design

Select Top 1000 Rows

Edit Top 200 Rows

Script Table as

View Dependencies

Memory Optimization A

Encrypt Columns...

Full-Text index

Storage

Stretch

Policies

Facets

Start PowerShell

Reports

CHALERMCHON2020...dbo.LevelControl

	id	time	metric	value
!	NULL	NULL	level	5.5
✎	NULL	NULL	flow	3.3
*	NULL	NULL	NULL	NULL

Select Top 1000 Rows

SQLQuery1.sql - lo...alarmchon2020 (64))

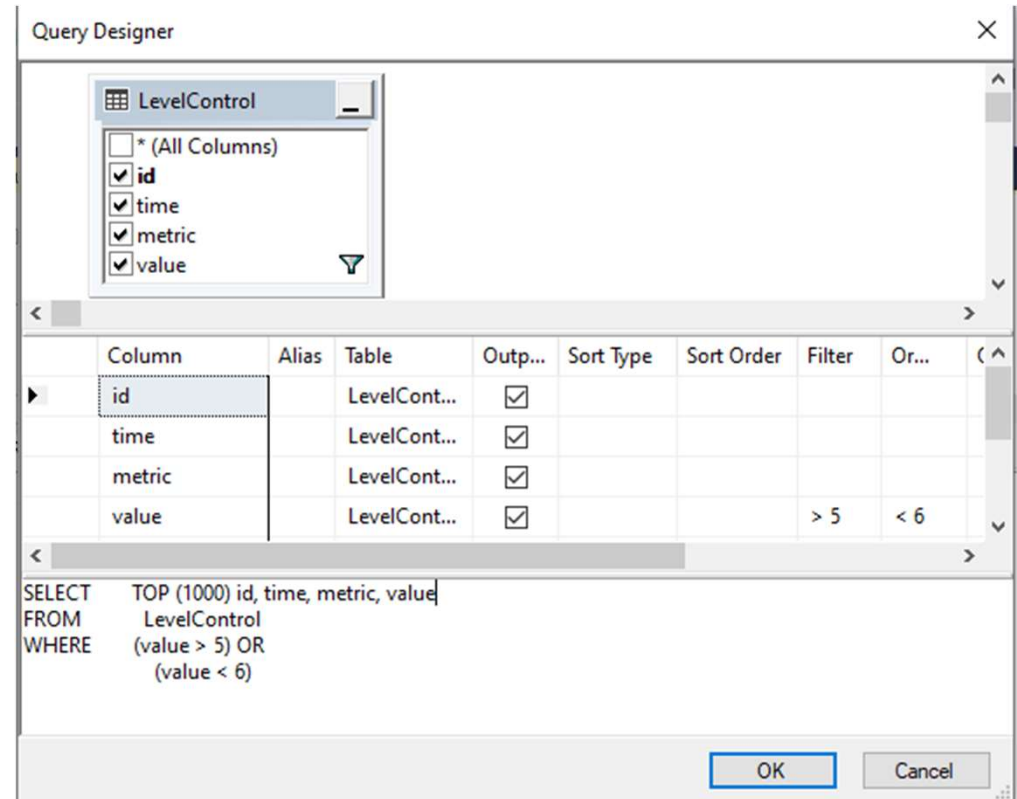
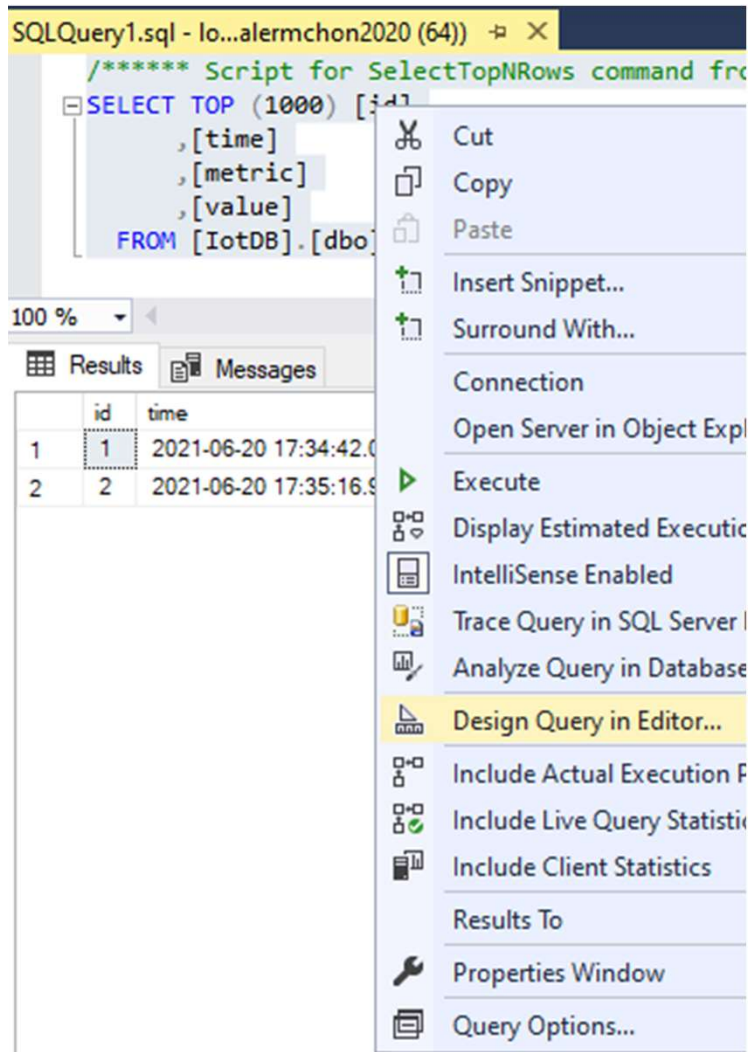
```
/****** Script for SelectTopNRows command *****  
SELECT TOP (1000) [id]  
    , [time]  
    , [metric]  
    , [value]  
FROM [IotDB].[dbo].[LevelControl]
```

100 %

Results Messages

	id	time	metric	value
1	1	2021-06-20 17:34:42.043	level	5.5
2	2	2021-06-20 17:35:16.920	flow	3.3

Design Query In Editor



```
SELECT TOP (100) id, time, metric, value
FROM LevelControl
WHERE (value > 5) OR (value < 6)
```


Update (SQL)

Query Designer

LevelControlData

- * (All Columns)
- id**
- ☐ time
- ☐ metric
- ☐ value
- ☒ machine

Execute SQL
Add Group By
Change Type >
Redo
Undo
Add Table...
Add New Derived Table
Pane >
Clear Results
Properties

Select
Insert Results...
Insert Values
Update
Delete
Make Table...

UPDATE
[LevelControlData]
SET
[machine] = 'm02'

	id	time	metric	value	machine
1	1	2021-06-21 08:46:41.080	level	5.5	m01
2	2	2021-06-21 08:46:51.877	flow	2.3	m01

	Column	Table	Set	New Value	Filter	Or.
▶	machine	LevelControlData	<input checked="" type="checkbox"/>	N'm02'		
			<input type="checkbox"/>			

UPDATE TOP (1000) LevelControlData
SET machine = N'm02'

OK Cancel

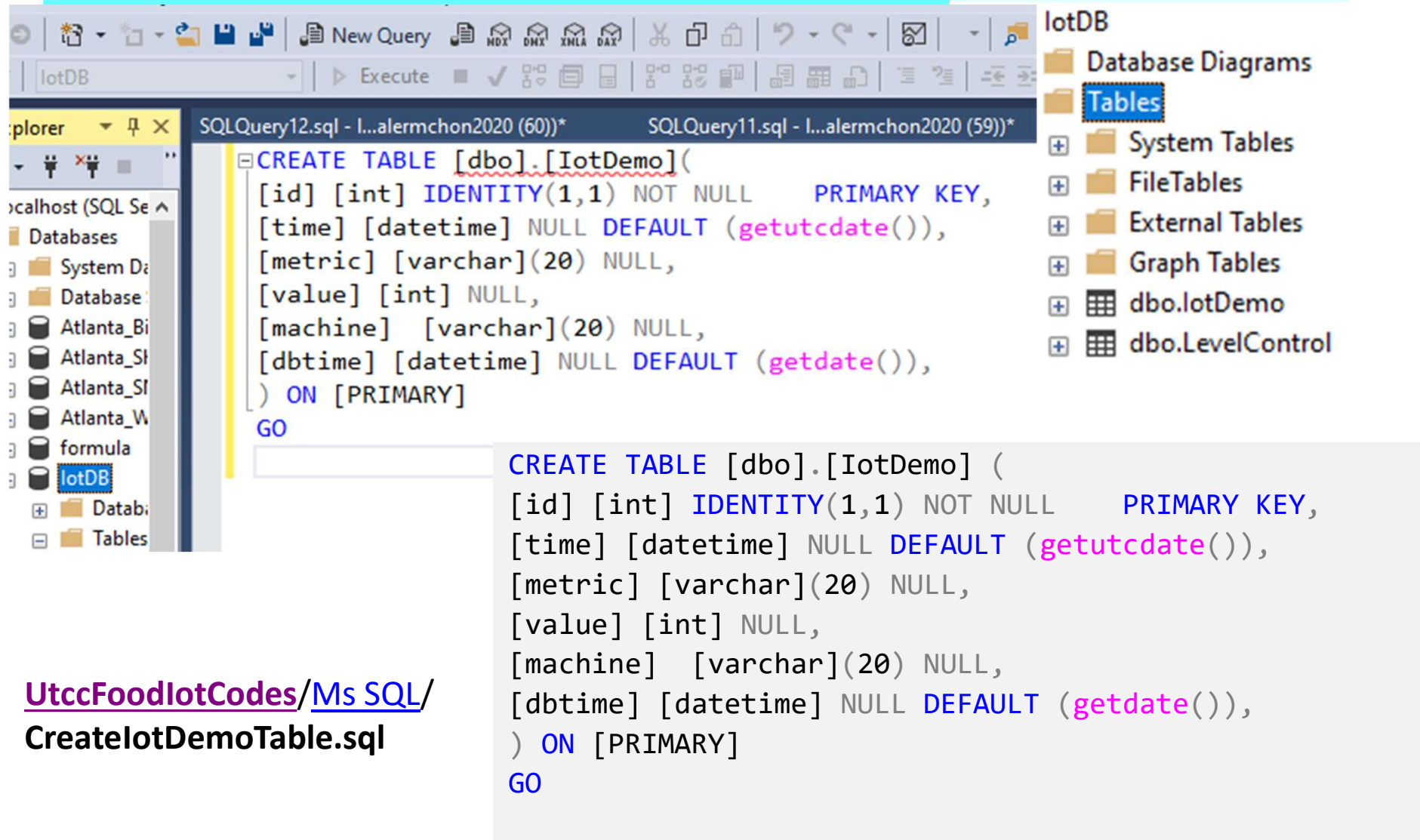
	id	time	metric	value	machine
1	1	2021-06-21 08:46:41.080	level	5.5	m02
2	2	2021-06-21 08:46:51.877	flow	2.3	m02

```
UPDATE [LevelControlData] SET [machine] = 'm01' Where id = 1
```

Basic SQL Language

- SELECT -- Column names
- FROM -- Table or View name
- WHERE -- Filter criteria
- GROUP BY -- Logic to roll-up records
- HAVING -- Criteria for GROUP BY logic
- ORDER BY – Sort column name data either
 - ASC (ascending) or
 - DESC (descending)

Create Table (SQL Script)



The screenshot shows the SQL Server Enterprise Manager interface. On the left, the 'lotDB' database is selected in the 'Database Explorer' pane. The 'Tables' folder is expanded, showing a list of tables including 'dbo.IotDemo' and 'dbo.LevelControl'. The main window displays the SQL script for creating the 'IotDemo' table. The script is as follows:

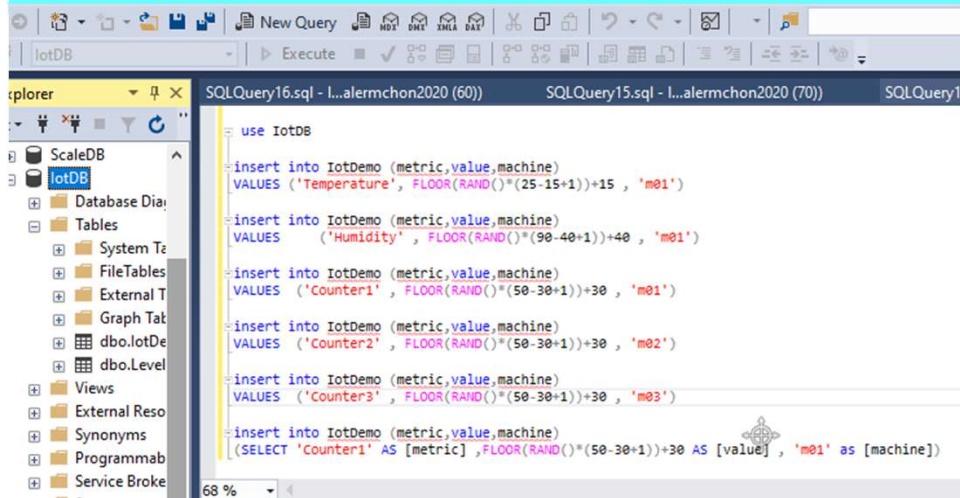
```
CREATE TABLE [dbo].[IotDemo](
[id] [int] IDENTITY(1,1) NOT NULL PRIMARY KEY,
[time] [datetime] NULL DEFAULT (getutcdate()),
[metric] [varchar](20) NULL,
[value] [int] NULL,
[machine] [varchar](20) NULL,
[dbtime] [datetime] NULL DEFAULT (getdate()),
) ON [PRIMARY]
GO
```

The script is highlighted in the SQL Query window, and the same script is also shown in a separate text box below the screenshot.

[UtccFoodlotCodes](https://github.com/chalermchonv/UtccFoodlotCodes)/Ms SQL/
CreatelotDemoTable.sql

<https://github.com/chalermchonv/UtccFoodlotCodes>

Insert IotDemo Table (SQL Script)



Delete FROM
[IotDB].[dbo].[IotDemo]

[UtccFoodlotCodes/Ms SQL/](#)
Insert Data to IotDemo.sql

```
use IotDB
insert into IotDemo (metric,value,machine)
VALUES ('Temperature', FLOOR(RAND()*(25-15+1))+15 , 'm01')
insert into IotDemo (metric,value,machine)
VALUES ('Humidity' , FLOOR(RAND()*(90-40+1))+40 , 'm01')
insert into IotDemo (metric,value,machine)
VALUES ('Counter1' , FLOOR(RAND()*(50-30+1))+30 , 'm01')
insert into IotDemo (metric,value,machine)
VALUES ('Counter2' , FLOOR(RAND()*(50-30+1))+30 , 'm02')
insert into IotDemo (metric,value,machine)
VALUES ('Counter3' , FLOOR(RAND()*(50-30+1))+30 , 'm03')
insert into IotDemo (metric,value,machine)
(SELECT 'Counter1' AS [metric] ,FLOOR(RAND()*(25-15+1))+15 AS [value] , 'm01' as [machine])
```

```
/****** Script for SelectTopNRows command from SSMS
```

```
SELECT TOP (1000) [id]
               , [time]
               , [metric]
               , [value]
               , [machine]
               , [dbtime]
FROM [IotDB].[dbo].[IotDemo]
```

100 %



Results

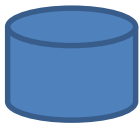


Messages

	id	time	metric	value	machine	dbtime
1	1	2021-06-21 04:31:37.860	Temperature	24	m01	2021-06-21 11:31:37.860
2	2	2021-06-21 04:31:37.870	Humidity	71	m01	2021-06-21 11:31:37.870
3	3	2021-06-21 04:31:39.040	Temperature	11	m01	2021-06-21 11:31:39.040
4	4	2021-06-21 04:31:39.040	Humidity	48	m01	2021-06-21 11:31:39.040

Grafana

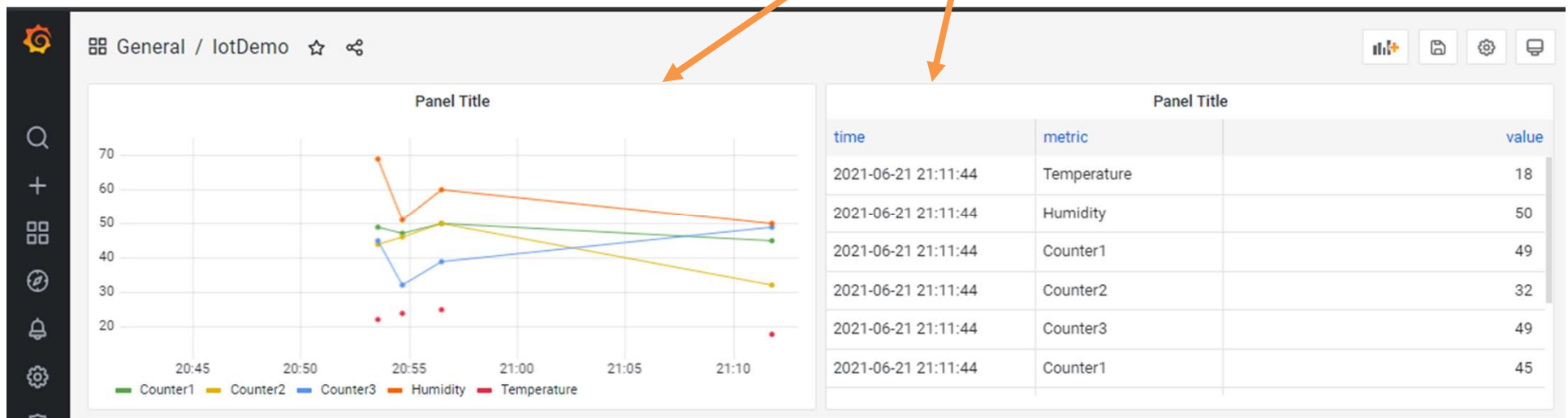
- Data Source (Any Database)



	id	metric	value	time	machine
1	1	Temperature	39	2021-06-20 12:05:40.220	m01
2	2	Humidity	67	2021-06-20 12:05:40.220	m01
3	3	Temperature	72	2021-06-20 12:05:54.083	m01
4	4	Humidity	56	2021-06-20 12:05:54.083	m01
5	5	Temperature	43	2021-06-20 12:06:00.280	m01
6	6	Humidity	41	2021-06-20 12:06:00.280	m01
7	7	Temperature	37	2021-06-20 12:09:50.193	m01
8	8	Humidity	47	2021-06-20 12:09:50.193	m01

```
SELECT
  [time], [value] , [metric]
FROM [lotDB].[dbo].[lotDemo]
WHERE $__timeFilter([time])
ORDER BY time ASC
```

- Dashboard (SQL)



Download Grafana

<https://grafana.com/grafana/download?edition=oss&platform=windows>

Download Grafana

Version: 8.0.3 ▾

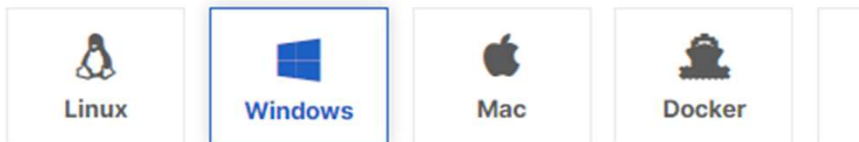
Edition: Open Source ▾

License: [AGPLv3](#)

Release Date: June 18, 2021

Release Info: [What's New In Grafana 8.0.3](#)
[Release Notes](#)

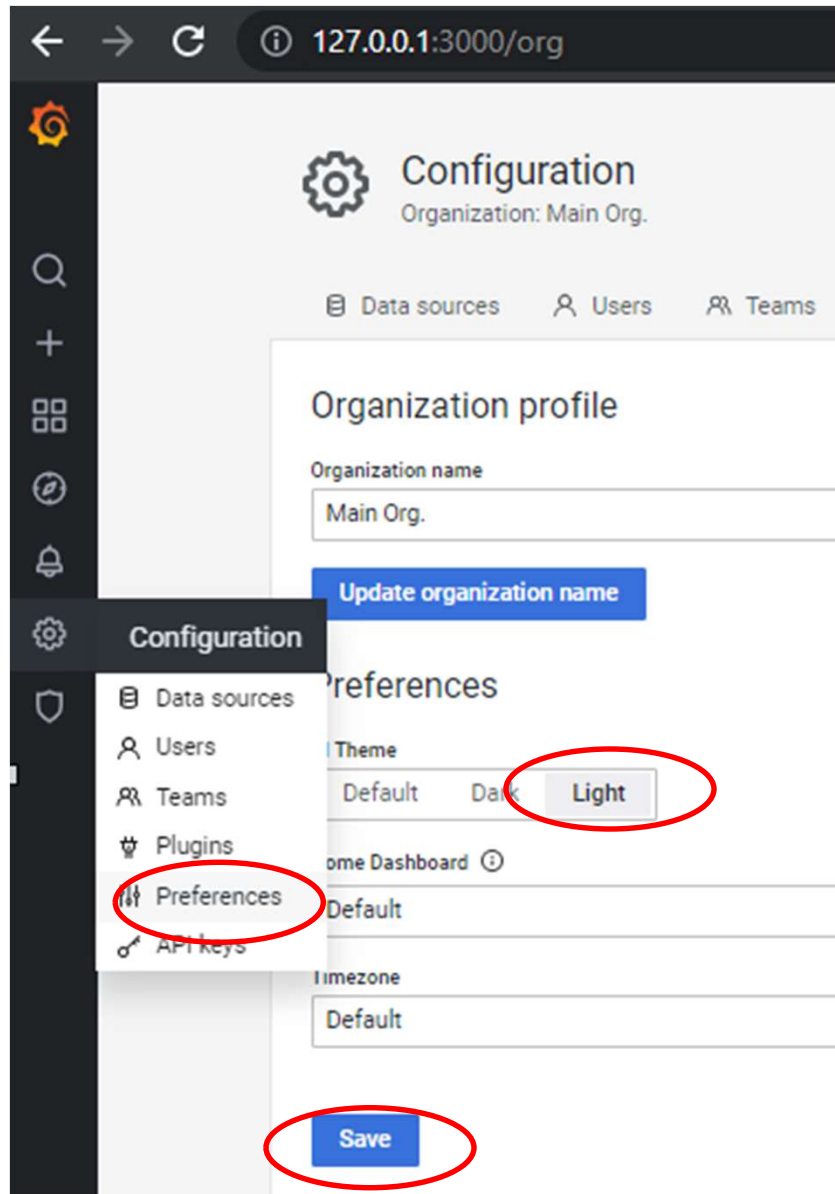
The [Enterprise Edition](#) includes all the features of the [Open Source Edition](#), the full paid Enterprise feature set, including support for [Enterprise plugins](#)



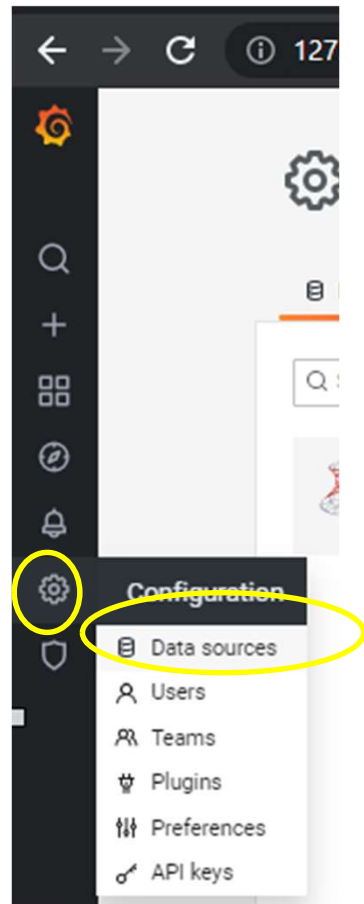
Windows Installer (64 Bit) SHA256: 97f6760498641e0e8b07d4dd098b514

[Download the installer](#) (grafana-8.0.3.windows-amd64.msi) and run it.

Change to Light Theme



Add Data Source



Add data source

Data Sources / Microsoft SQL Server

Type: Microsoft SQL Server

Settings

Name: Microsoft SQL Server Default ☒

MS SQL connection

Host: Localhost

Database: lotDB

Authentication: SQL Server Authentication

User: Password: configured Reset

Encrypt: false

☒ Database Connection OK

Back Delete Save & test

Database Server Name (localhost)

Database Name (lotDB)

User Password lot - @iot

Prepare Data

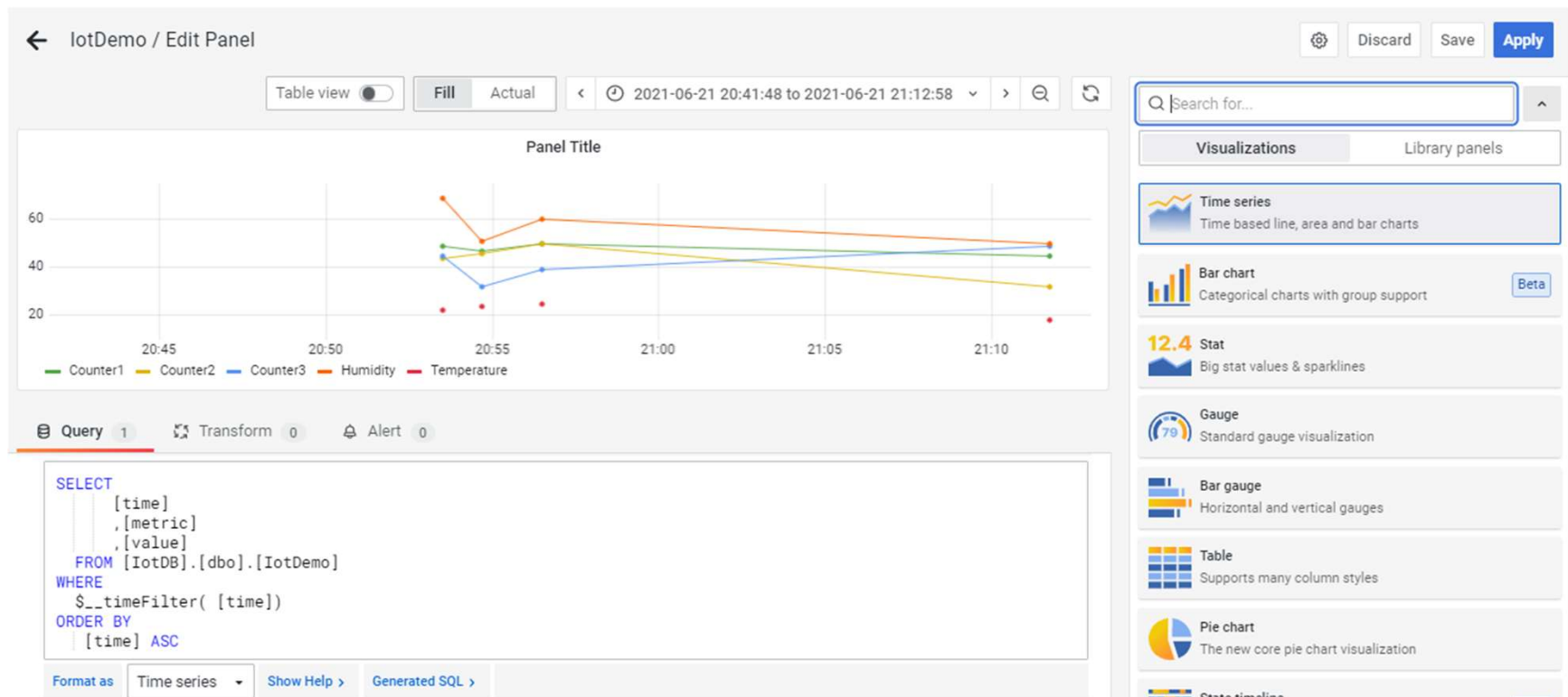
```
Delete FROM  
[IotDB].[dbo].[IotDemo]
```

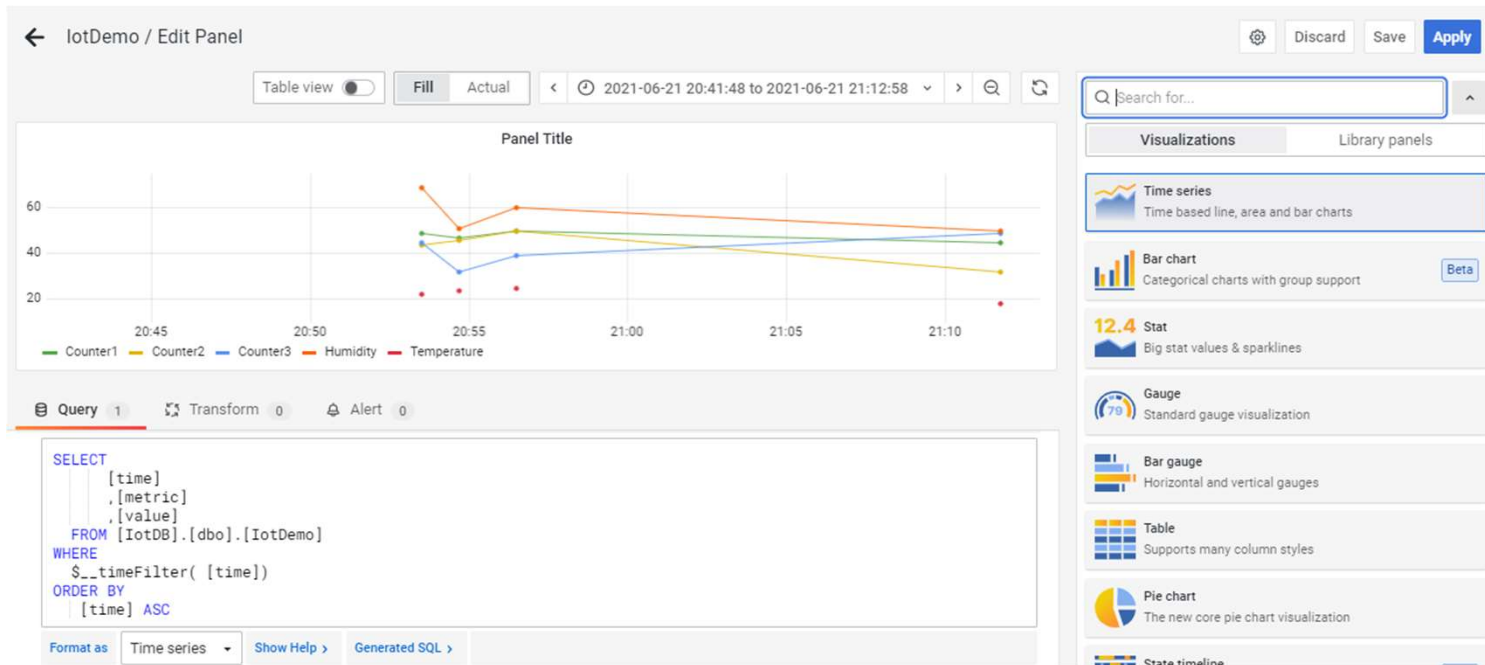
```
use IotDB  
insert into IotDemo (metric,value,machine)  
VALUES ('Temperature', FLOOR(RAND()*(25-15+1))+15 , 'm01')  
insert into IotDemo (metric,value,machine)  
VALUES ('Humidity' , FLOOR(RAND()*(90-40+1))+40 , 'm01')  
insert into IotDemo (metric,value,machine)  
VALUES ('Counter1' , FLOOR(RAND()*(50-30+1))+30 , 'm01')  
insert into IotDemo (metric,value,machine)  
VALUES ('Counter2' , FLOOR(RAND()*(50-30+1))+30 , 'm02')  
insert into IotDemo (metric,value,machine)  
VALUES ('Counter3' , FLOOR(RAND()*(50-30+1))+30 , 'm03')  
insert into IotDemo (metric,value,machine)  
(SELECT 'Counter1' AS [metric] ,FLOOR(RAND()*(25-15+1))+15 AS  
[value] , 'm01' as [machine])
```

Grafana Code

```
SELECT [time], [value], [metric]
FROM [IotDB].[dbo].[IotDemo]
WHERE $__timeFilter([time])
ORDER BY time ASC
```

	id	metric	value	time	machine
1	1	Temperature	39	2021-06-20 12:05:40.220	m01
2	2	Humidity	67	2021-06-20 12:05:40.220	m01
3	3	Temperature	72	2021-06-20 12:05:54.083	m01
4	4	Humidity	56	2021-06-20 12:05:54.083	m01
5	5	Temperature	43	2021-06-20 12:06:00.280	m01
6	6	Humidity	41	2021-06-20 12:06:00.280	m01
7	7	Temperature	37	2021-06-20 12:09:50.193	m01
8	8	Humidity	47	2021-06-20 12:09:50.193	m01





time	Counter1	Counter2	Counter3	Humidity	Temperature
2021-06-21 16:28:31					20
2021-06-21 16:30:34	37	31	46	49	17
2021-06-21 16:30:34					15
2021-06-21 16:32:04	43	45	50	56	21
2021-06-21 16:32:04					23
2021-06-21 16:52:12	45	36	48	52	15
2021-06-21 16:52:12					19
2021-06-21 16:53:21	50	45	31	81	19
2021-06-21 16:53:21					20
2021-06-21 17:02:20					15

Split 🔗 < 2021-06-21 16:41:19 to 2021-06-21 17:43:13 > 🔍

Absolute time range

From
2021-06-21 16:41:19

To
2021-06-21 17:43:13

Apply time range

It looks like you haven't used this time picker before. As soon as you enter some time intervals, recently used intervals will appear here.

[Read the documentation](#) to find out more about how to enter custom time ranges.

Relative time ranges

- Last 5 minutes
- Last 15 minutes
- Last 30 minutes
- Last 1 hour
- Last 3 hours
- Last 6 hours
- Last 12 hours
- Last 24 hours
- Last 2 days
- Last 7 days

Browser Time Cambodia UTC+07:00 Change time zone

Show time picker

Time options

Timezone

Browser Time

Auto refresh

Define the auto refresh intervals that should be available in the auto refresh list.

5s,10s,30s,1m,5m,15m,30m,1h,2h,1d

Now delay now

Enter 1m to ignore the last minute. It might contain incomplete metrics.

0m

Hide time picker



Panel options

Graph tooltip

Controls tooltip and hover highlight behavior across different panels

Default

Shared crosshair

Shared Tooltip

Dashboard settings

The screenshot shows the time picker interface with two main sections: 'Absolute time range' and 'Relative time ranges'. The 'Absolute time range' section has 'From' and 'To' input fields with values 'now-6h' and 'now' respectively, and an 'Apply time range' button. The 'Relative time ranges' section lists various time intervals: 'Last 5 minutes', 'Last 15 minutes', 'Last 30 minutes', 'Last 1 hour', 'Last 3 hours', 'Last 6 hours' (highlighted), 'Last 12 hours', 'Last 24 hours', 'Last 2 days', and 'Last 7 days'. At the bottom, there is a status bar showing 'Browser Time Cambodia', 'UTC+07:00', and a 'Change time zone' button.

Absolute time range

From: now-6h

To: now

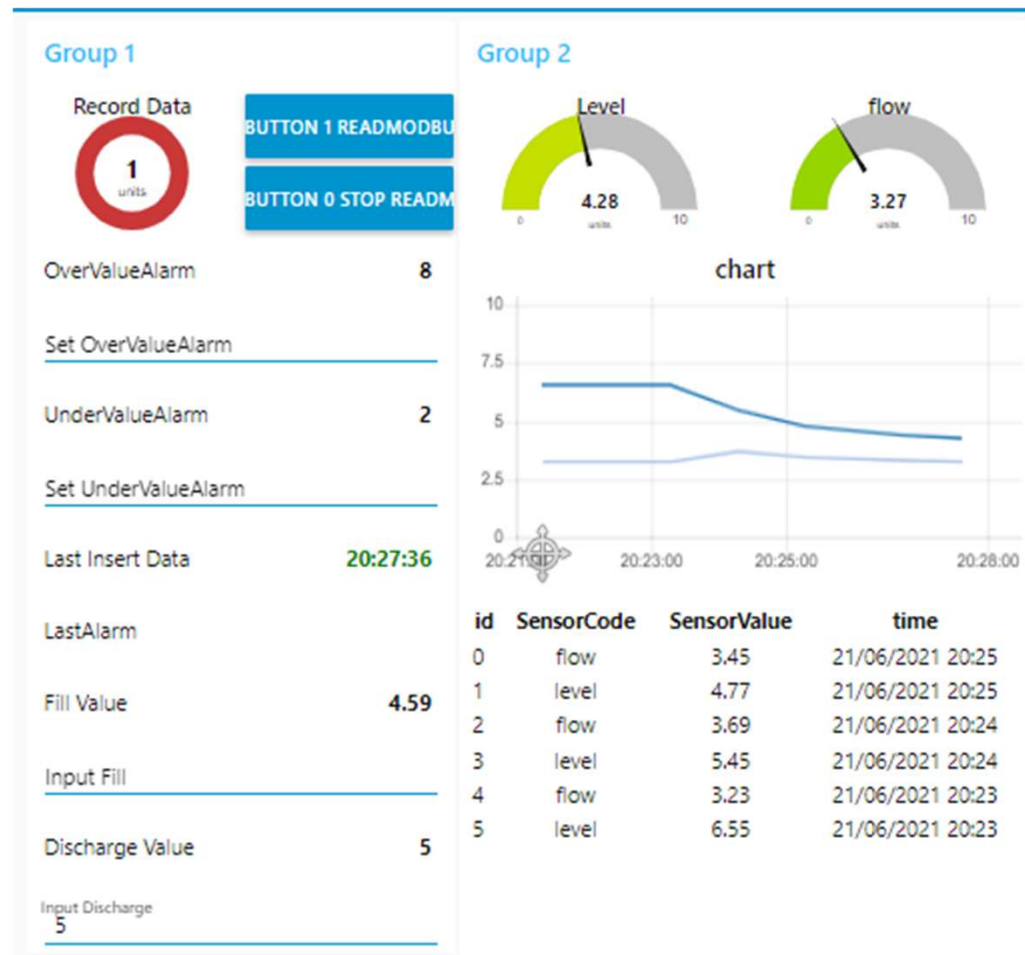
Apply time range

Relative time ranges

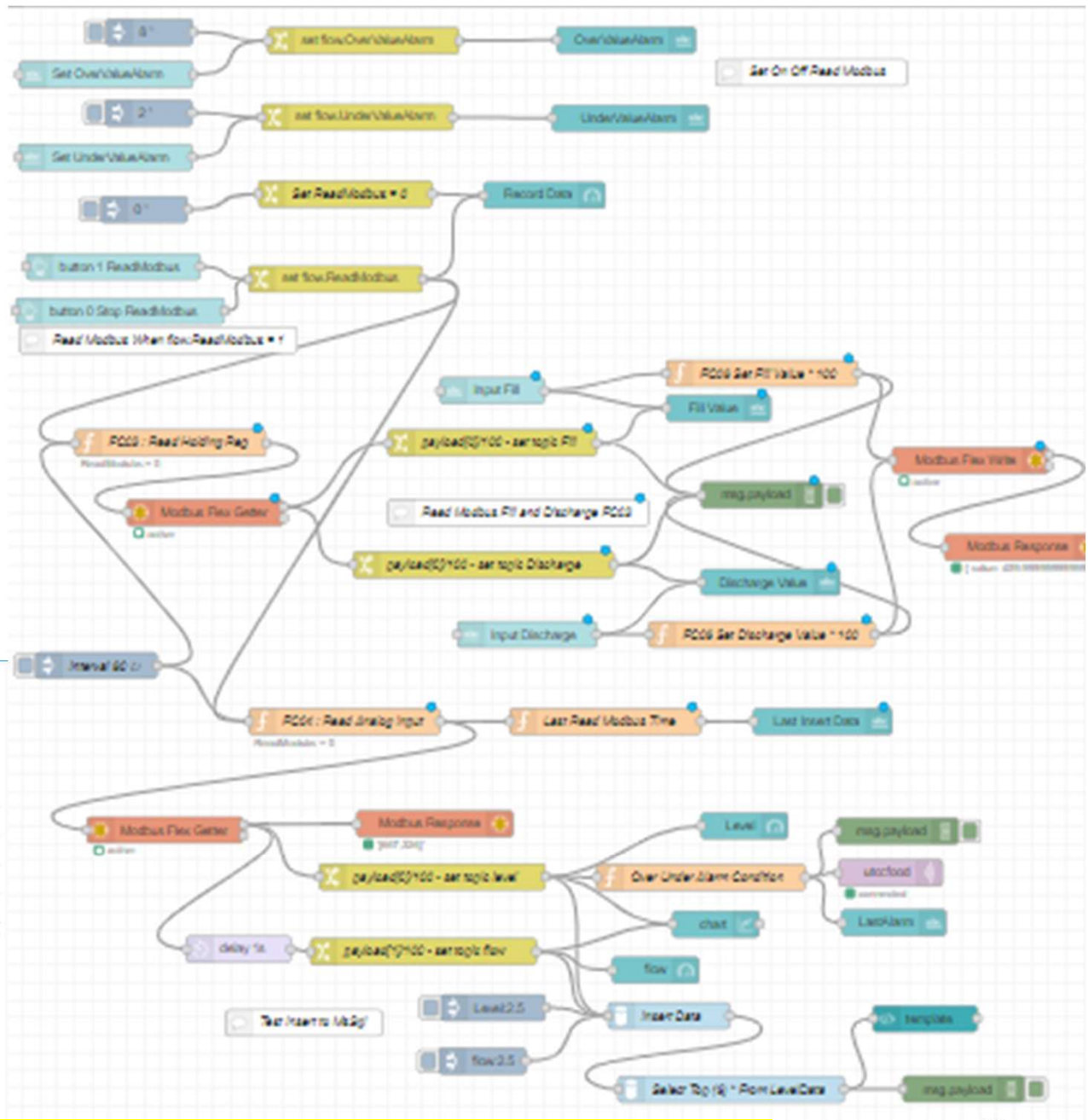
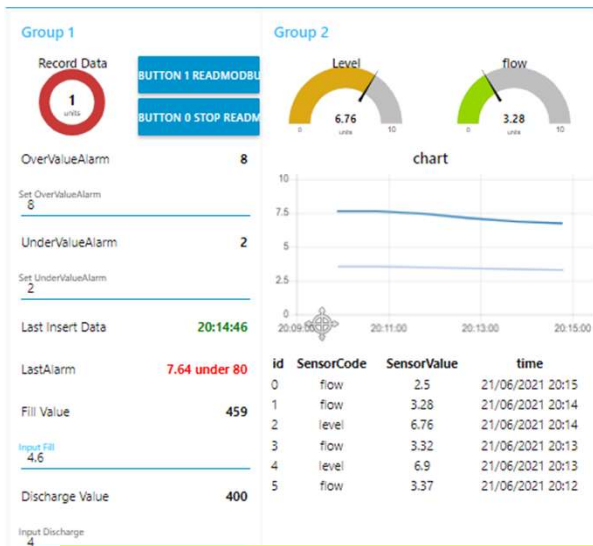
- Last 5 minutes
- Last 15 minutes
- Last 30 minutes
- Last 1 hour
- Last 3 hours
- Last 6 hours
- Last 12 hours
- Last 24 hours
- Last 2 days
- Last 7 days

Browser Time Cambodia UTC+07:00 Change time zone

Node-Red Control FactoryIO (Advanced Level Control Dashboard)



[UtccFoodlotCodes/Node-Red/Node-Red Level Control.json](#)



[UtccFoodlotCodes/Node-Red/Node-Red Level Control.json](https://github.com/UtccFoodlotCodes/Node-Red/Node-Red Level Control.json)

DATEADD , FORMAT

```
SELECT TOP (1000) [id]
, [time]
, [metric]
, [value]
, [machine]
, FORMAT( DATEADD(hour,7, [time]), 'dd/MM/yyyy HH:mm ') as lctime
FROM [IotDB].[dbo].[LevelControlData]
```

[UtccFoodlotCodes/Grafana/](#)
Show Local Datetime from UTCDate.sql

	id	time	metric	value	machine	lctime
1	1	2021-06-21 08:46:41.080	level	5.5	m01	21/06/2021 15:46
2	2	2021-06-21 08:46:51.877	flow	2.4	m02	21/06/2021 15:46

```
Select TOP (6) id, metric, value
, FORMAT( DATEADD(hour,7, [time]), 'dd/MM/yyyy HH:mm ') as [time]
From LevelControlData
Order by id Desc;
```

	id	metric	value	time
1	15	flow	2.36	21/06/2021 20:07
2	14	level	3.49	21/06/2021 20:07
3	13	flow	1.82	21/06/2021 20:07

Query

```
1 Select TOP (6) id, metric, value
2   , FORMAT( DATEADD(hour,7, [time]), 'dd/MM/yyyy HH:mm ') as [time]
3 From LevelControlData
4 Order by id Desc;
```



id	SensorCode	SensorValue	time
0	flow	3.23	21/06/2021 20:31
1	level	4.19	21/06/2021 20:31
2	flow	3.24	21/06/2021 20:30
3	level	4.2	21/06/2021 20:30
4	flow	3.24	21/06/2021 20:29
5	level	4.21	21/06/2021 20:29

Template

```
1 <table style="width:100%">
2   <tr>
3     <th>id</th>
4     <th>SensorCode</th>
5     <th>SensorValue</th>
6     <th>time</th>
7   </tr>
8   <tr ng-repeat="x in msg.payload | limitTo:20">
9     <td>{{$index}}</td>
10    <td align="center">{{msg.payload[$index].metric}}</td>
11    <td align="center">{{msg.payload[$index].value}}</td>
12    <td align="center">{{msg.payload[$index].time}}</td>
13  </tr>
14 </table>
```

6/21/2021, 8:31:54 PM node: 9754d97e.876f78

msg.payload : array[6]

▼ array[6]

▼ 0: object

id: 63

metric: "flow"

value: 3.23

time: "21/06/2021 20:31 "

▶ 1: object

▶ 2: object

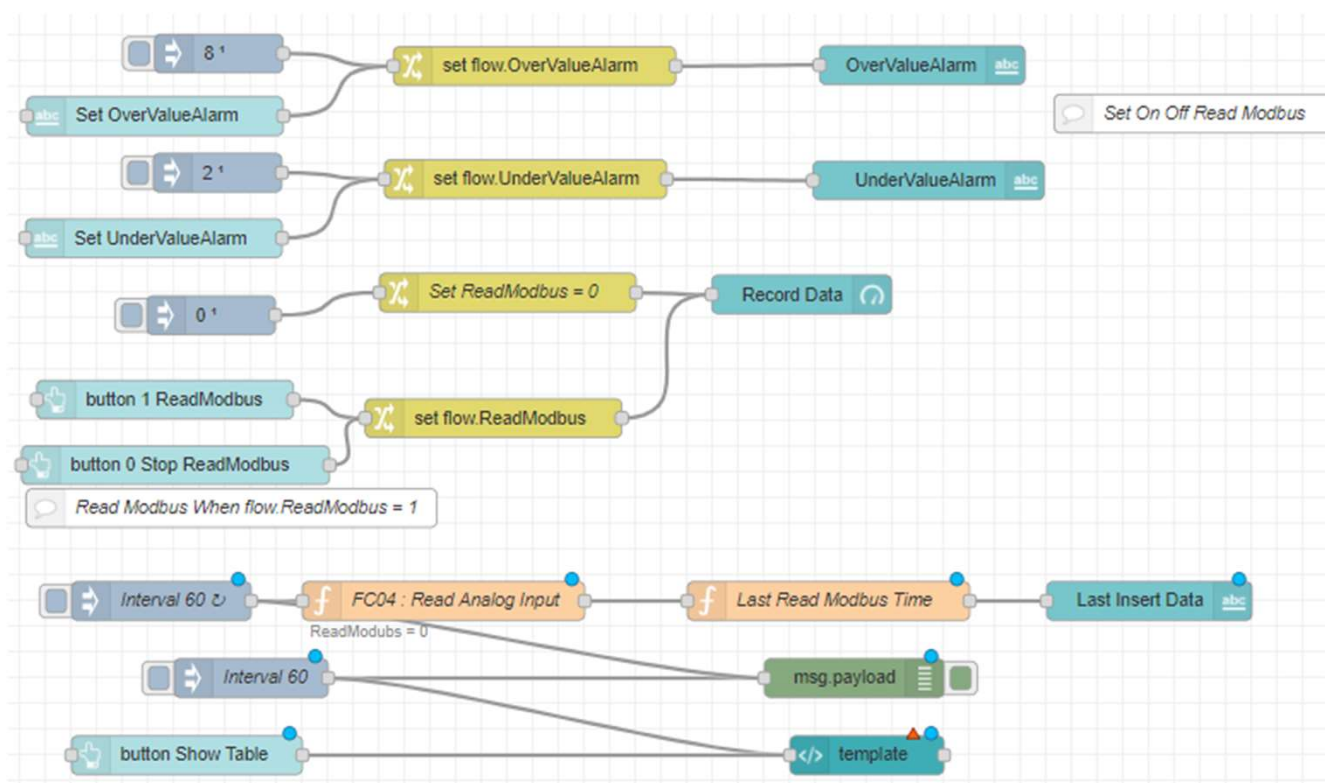
▶ 3: object

▶ 4: object

▶ 5: object

Node-Red : Flow Variable Tutorial

[UtccFoodlotCodes/Node-Red/](#)
Flow Variable Tutorial.json



Group 1

Record Data

1 units

OverValueAlarm 8

Set OverValueAlarm

UnderValueAlarm 2

Set UnderValueAlarm

Last Insert Data 22:17:09

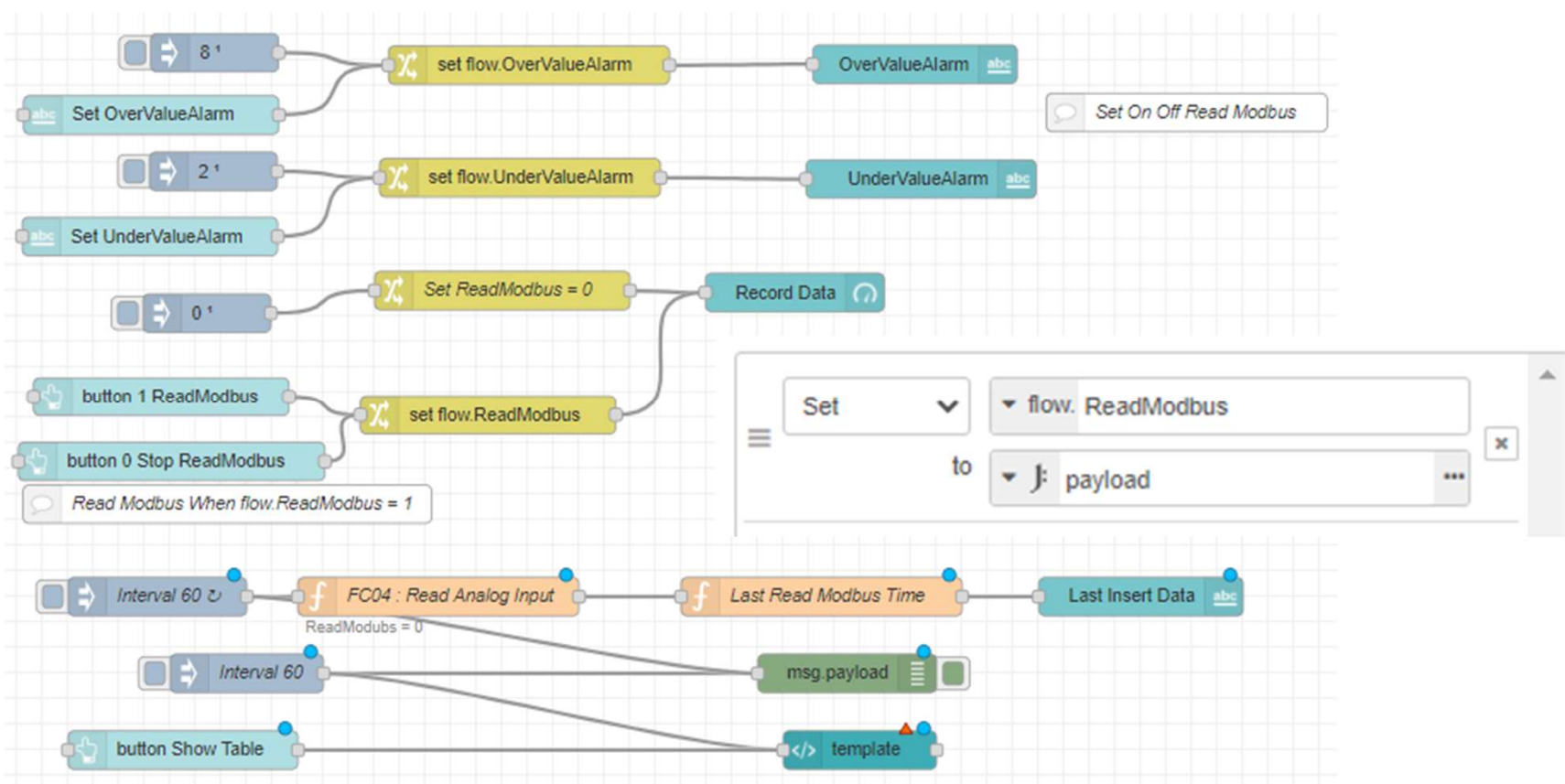
Buttons: BUTTON 1 READMODBUS, BUTTON 0 STOP READMODBUS

Group 2

BUTTON SHOW TABLE

id	SensorCode	SensorValue	time
0	flow	3.23	21/06/2021 20:23
1	level	6.55	21/06/2021 20:23
2	flow	3.23	21/06/2021 20:22
3	level	6.55	21/06/2021 20:22
4	Level	2.5	21/06/2021 20:22
5	flow	3.24	21/06/2021 20:21

Flow Variable Tutorial



```

1 var ReadModbus = flow.get("ReadModbus");
2
3 if ( ReadModbus === 0 ) {
4     node.status({text:"ReadModubs = 0"});
5     return null;
6 } else {
7     node.status({text:"ReadModubs = 1"});
8     return msg;
9 }
10 }

```