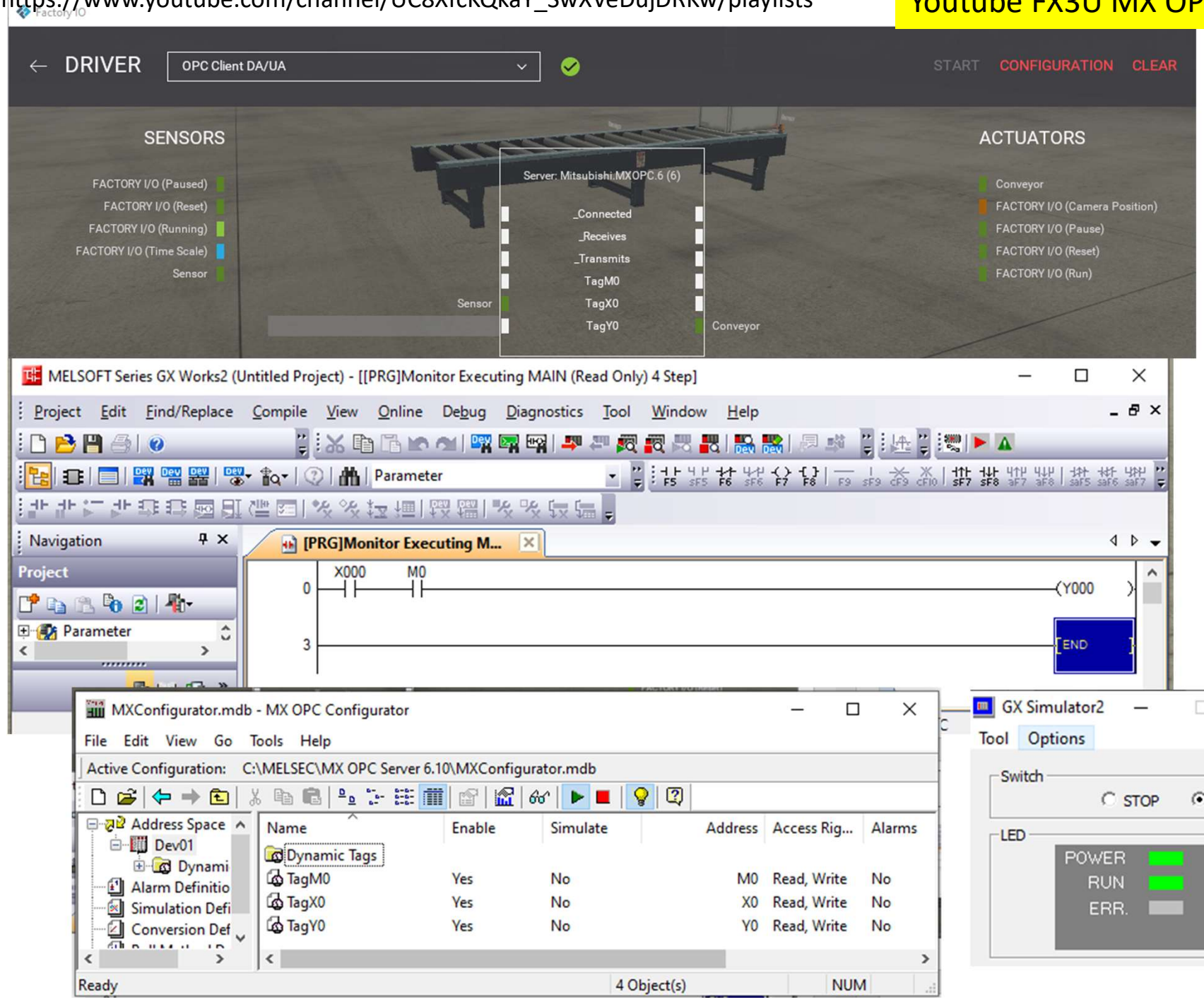
https://www.youtube.com/channel/UC8XfcKQkaY_SwXVeDujDRKw/playlists

Youtube FX3U MX OPC 01



YouTube Modbus – 07 HMI Datalogger

Datalogger and Alarm Log

Historical data collector

00:Historical data collector0

Genarel | Data Item

Name: Historical data collector0

Memory

Sampling total: 10000

Memory Required:

Note: The number of memory required = (20+ all data items in the data catego
Total number) * The total number of samples

Sampling Method

Timing Distance: 5 Second(s)

Trigger

Sample Full Processing

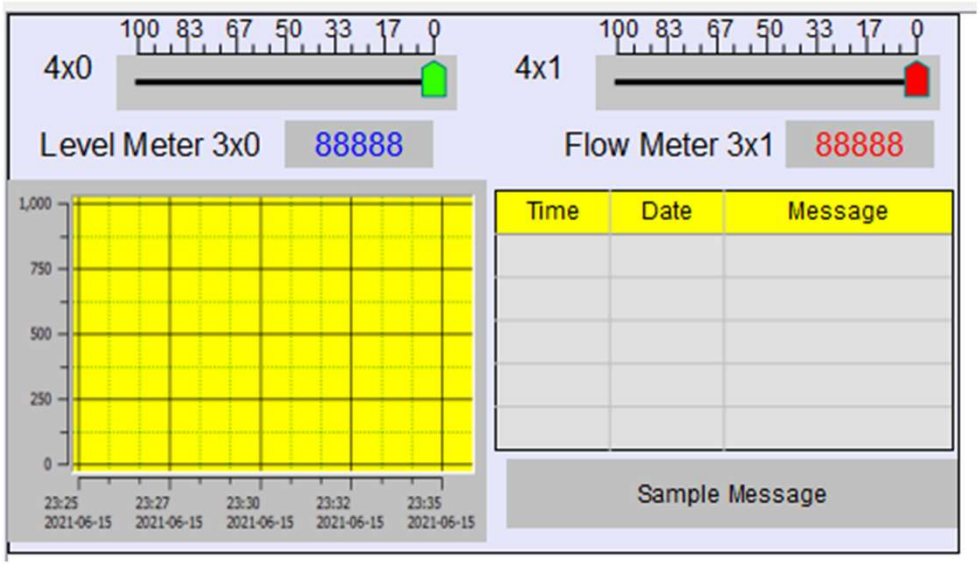
Stop Sampling

Notify

Genarel | Data Item

Language: Chinese Add Alter Delete

	Name	Address	Data type	Upload
1	LevelMeter	3x0	16-Bit Unsign...	☐
2	FlowMeter	3x1	16-Bit Unsign...	☐



Analog Alarm Block

Name: Analog Alarm Login1

Type: Numerical comparison

Read Address: 3x0

Size: 1 Scanning Time: 5 Sec

	Use	Message
3x0	☑ Low Low	<<200
	☑ Low	<300
	☑ High	>700
	☑ High High	>>800

Alarm setting

Data type: 16-Bit Int

Address: 3x0

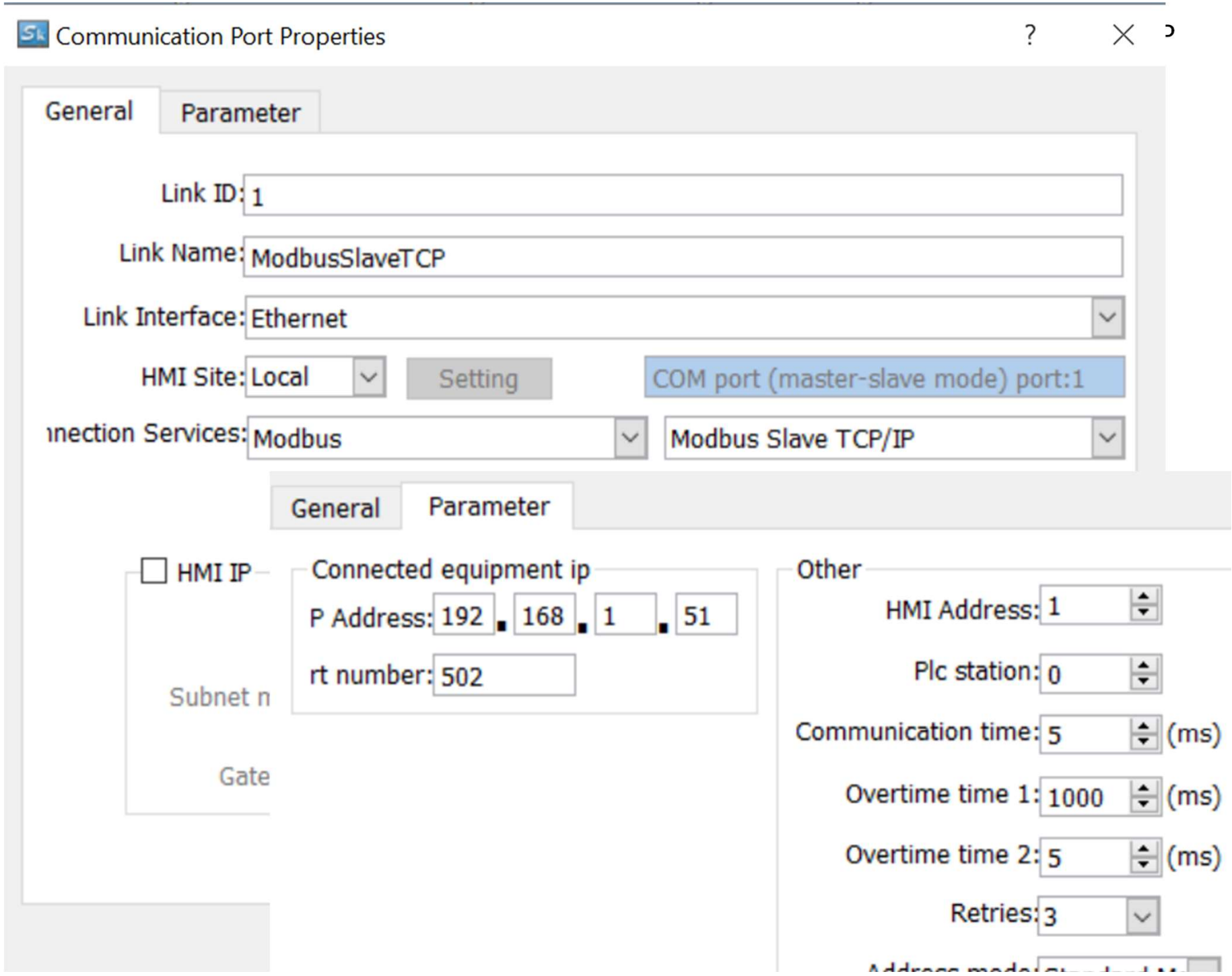
Alarm Message: Out of 100 - 900

Alarm value setting

Condition: Alarm with the outside the

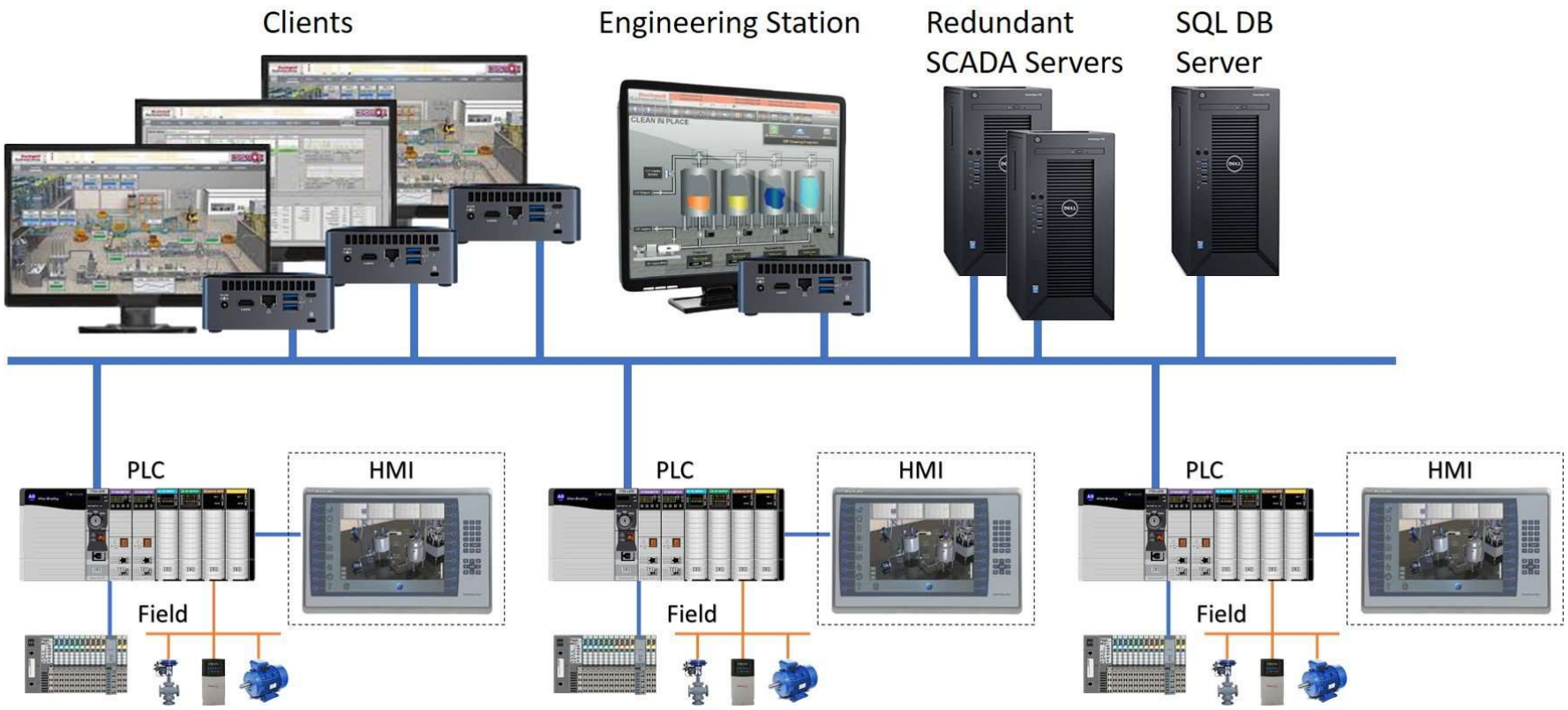
Lower limit: 100

Upper limit: 900

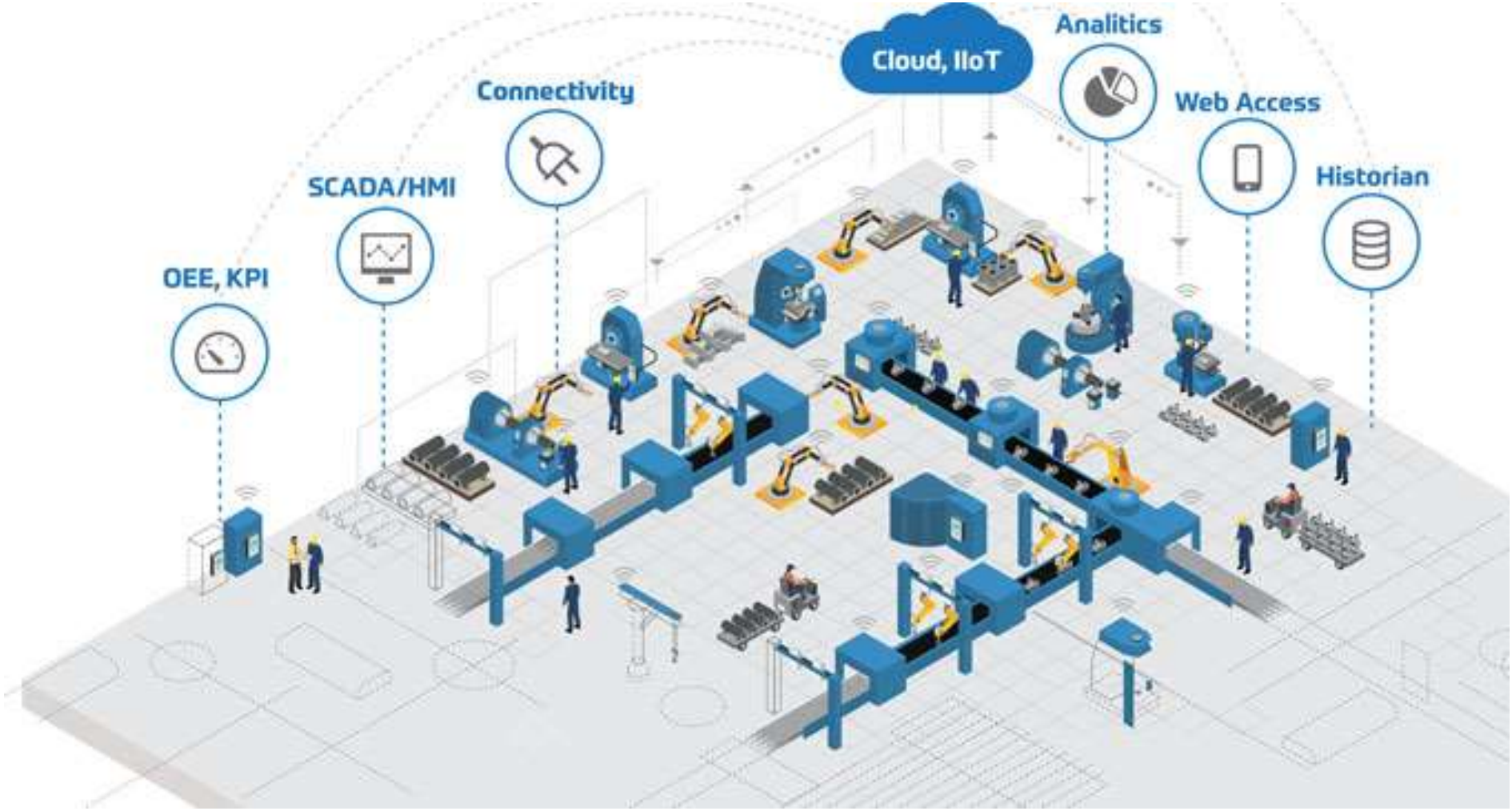

Communication Port Properties
General
Parameter
Link ID: 1
Link Name: ModbusSlaveTCP
Link Interface: Ethernet
HMI Site: Local
Setting
COM port (master-slave mode) port:1
nection Services: Modbus
Modbus Slave TCP/IP
General
Parameter
HMI IP
Connected equipment ip
P Address: 192 . 168 . 1 . 51
rt number: 502
Subnet n
Gate
Other
HMI Address: 1
Plc station: 0
Communication time: 5 (ms)
Overtime time 1: 1000 (ms)
Overtime time 2: 5 (ms)
Retries: 3

WHAT IS SCADA

- The utilization of Supervisory Control and Data Acquisition (SCADA)



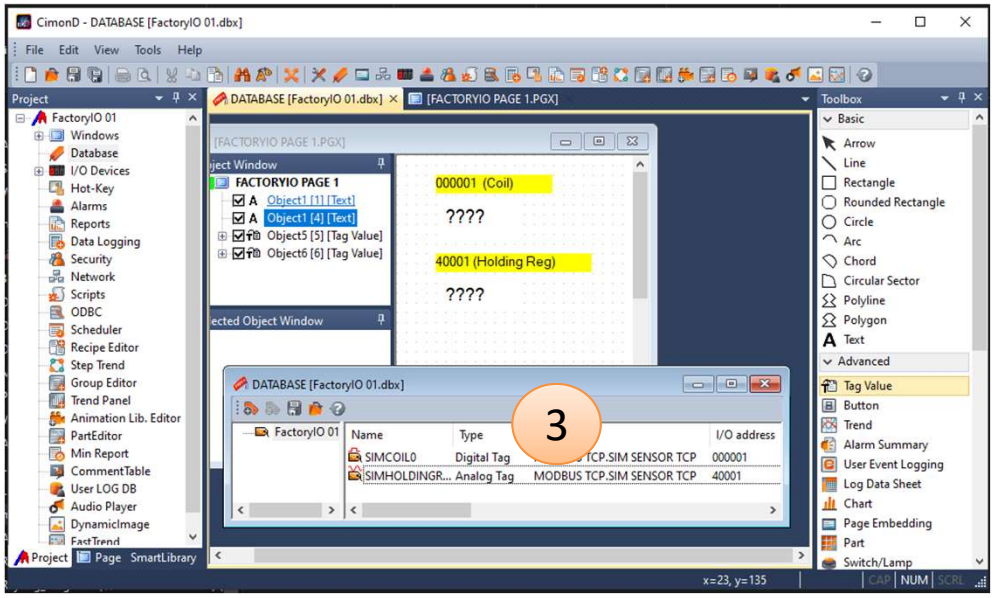
IIOT & Industrial 4.0

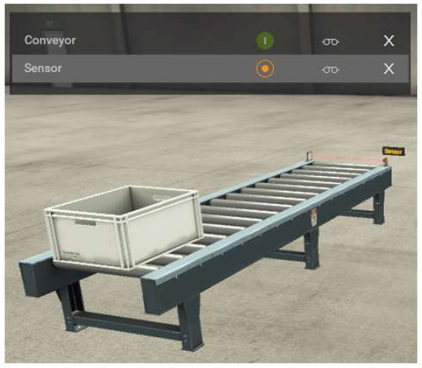


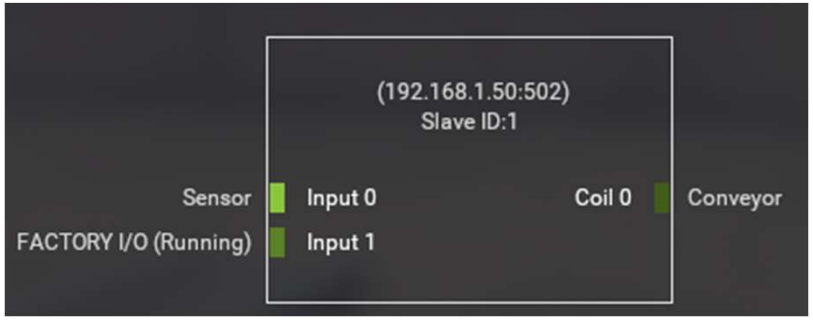
https://www.tdsthailand.com/industrial/detail.php?i=12

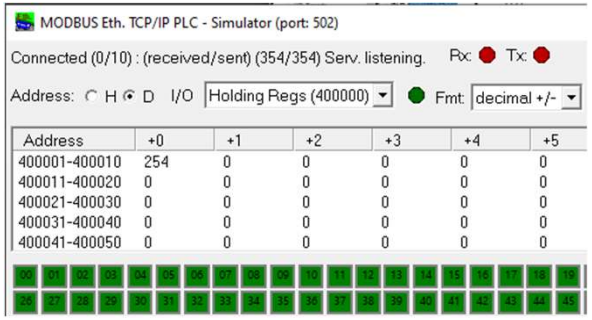
Cimon SCADA

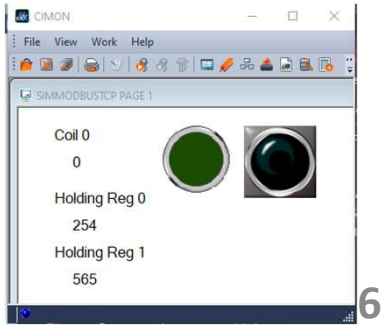
- Cimon - FactoryIO



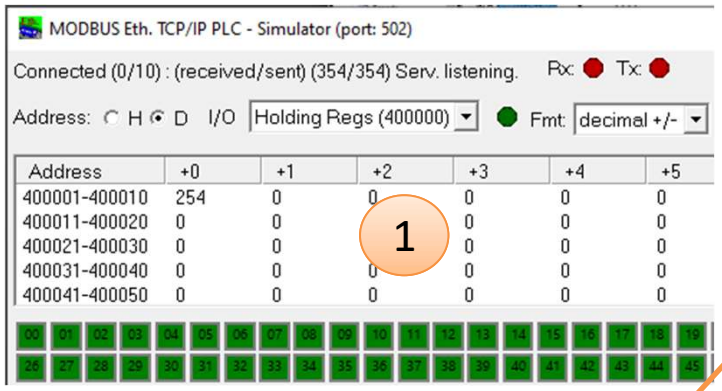


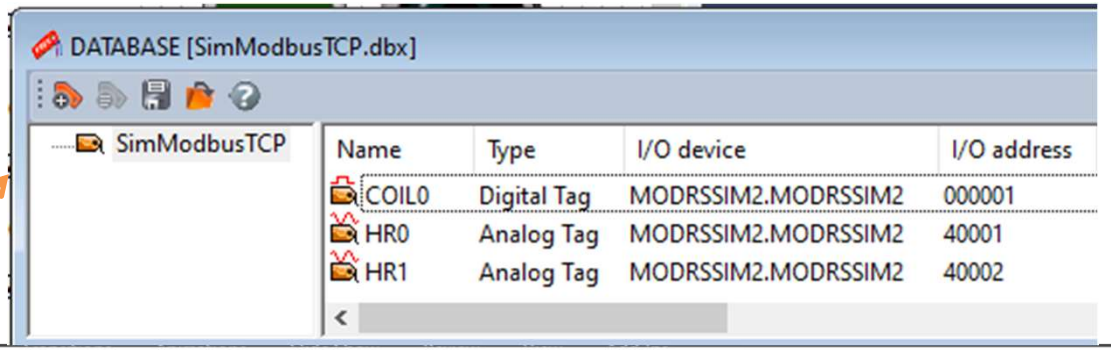


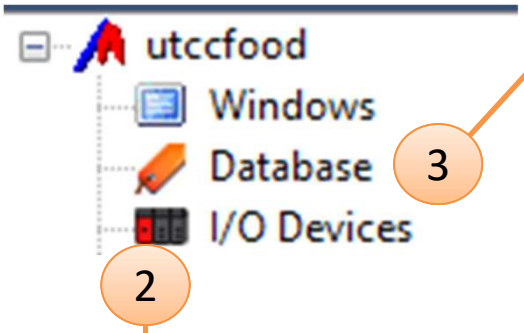


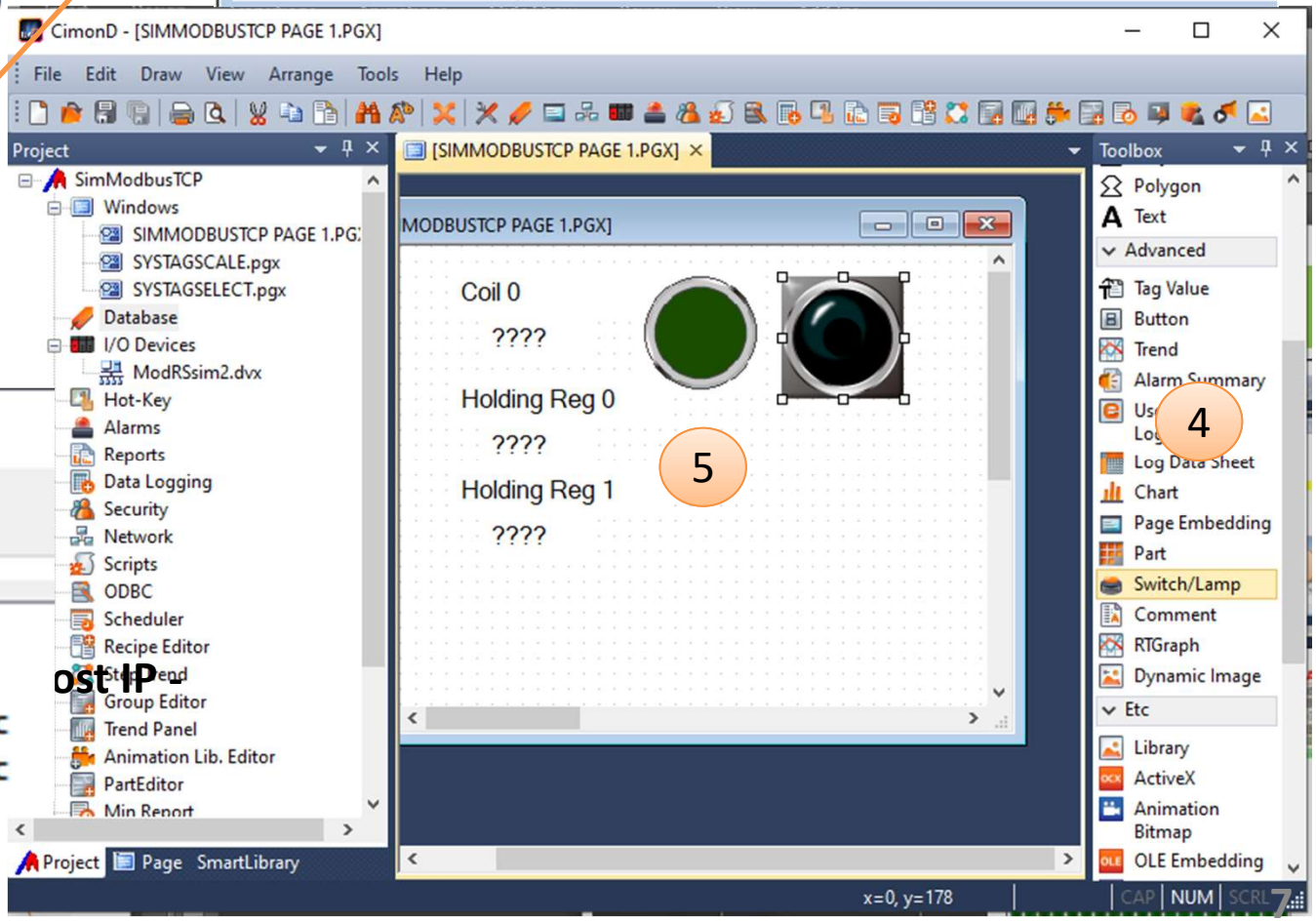


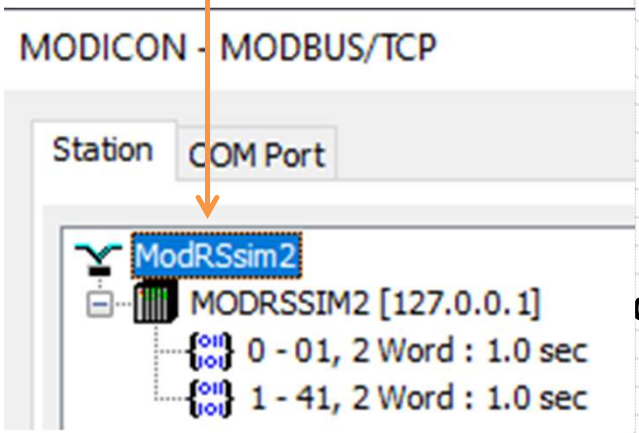
YouTube SCADA - 01 SimModbus



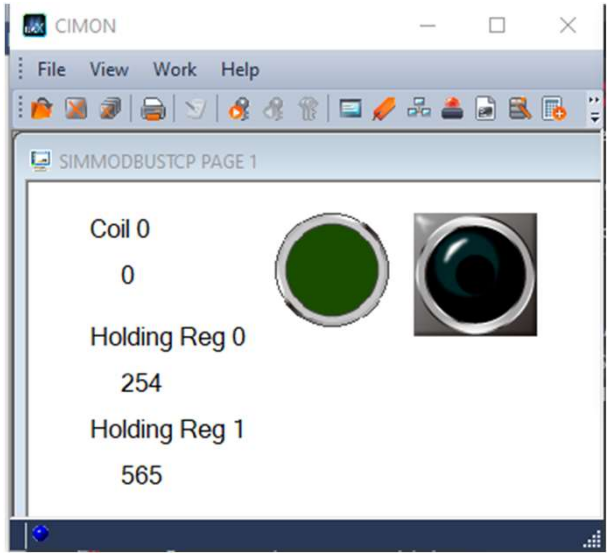


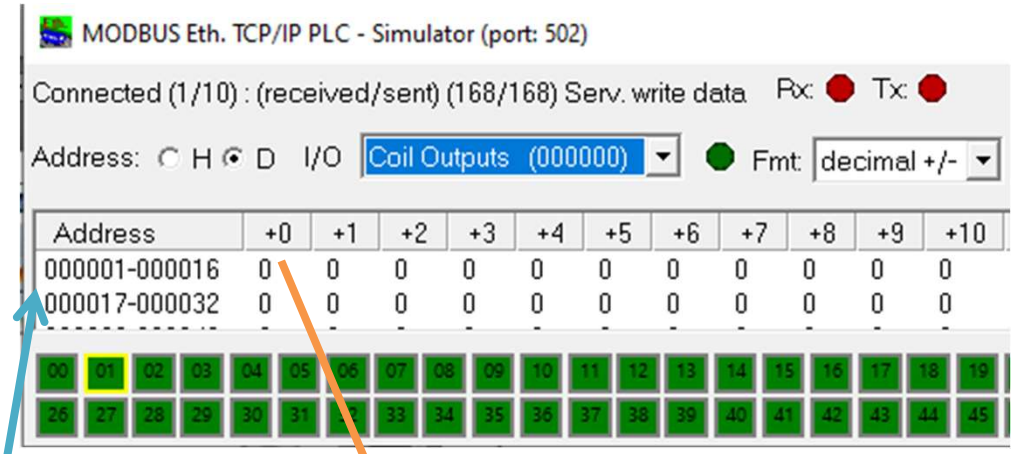


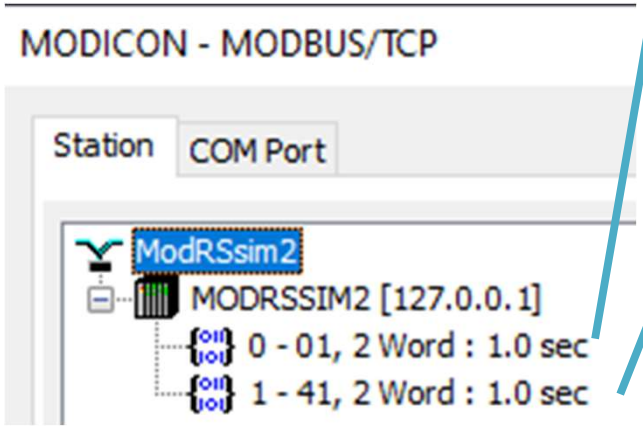


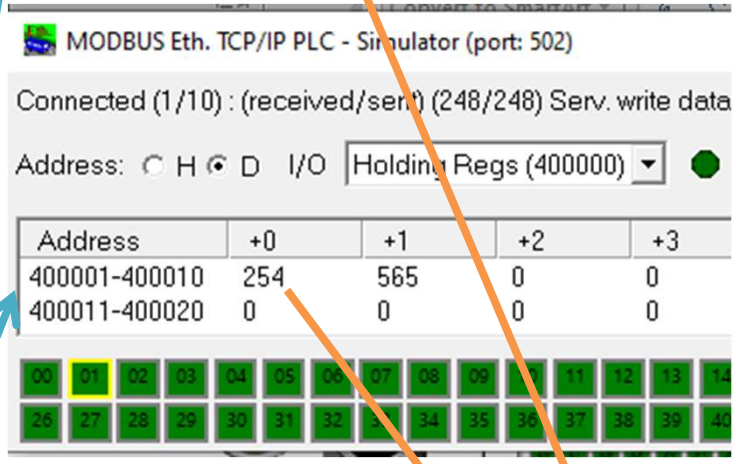


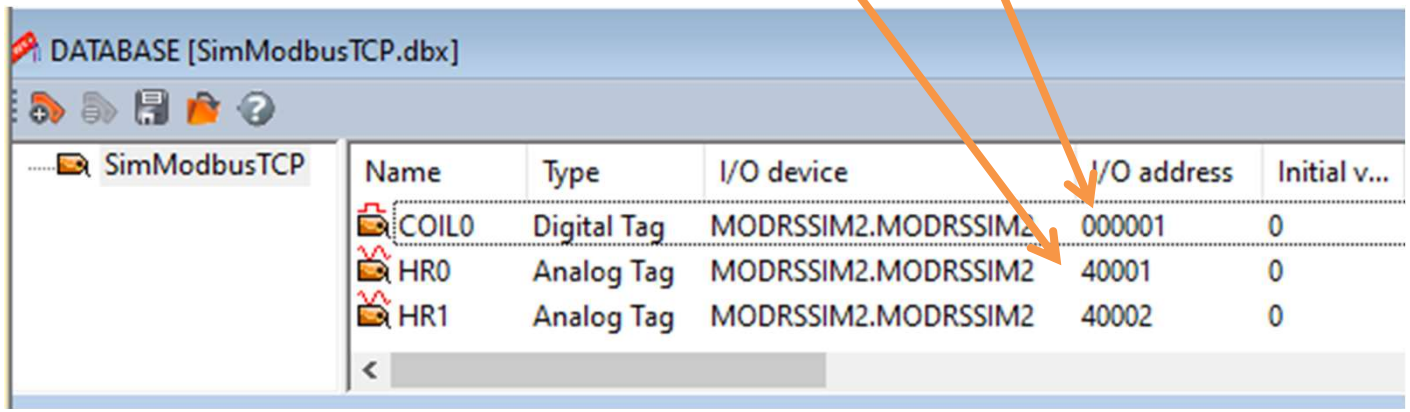
ost IP -


CIMON
File View Work Help
SIMMODBUSTCP PAGE 1
Coil 0
0
Holding Reg 0
254
Holding Reg 1
565

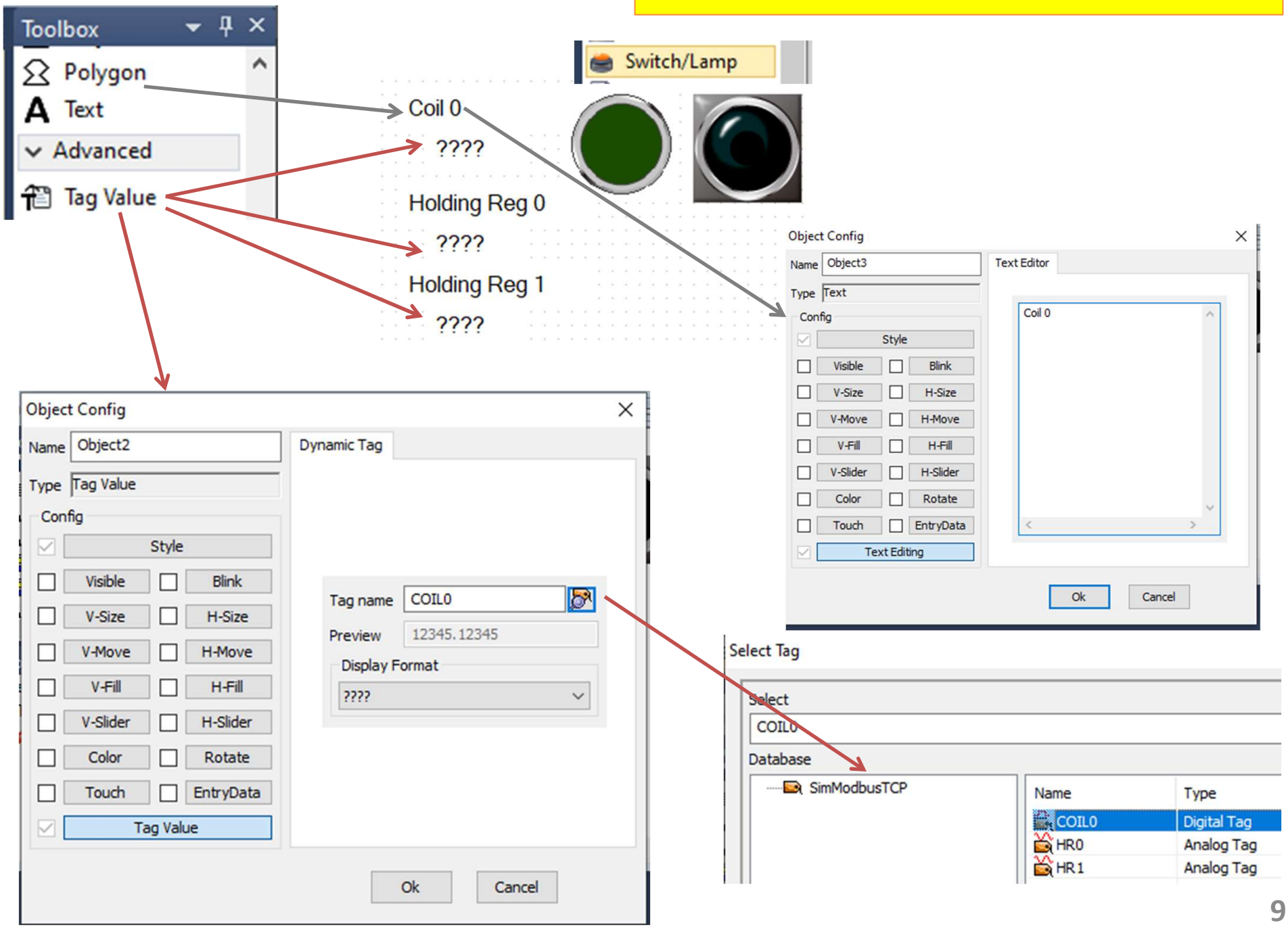

MODBUS Eth. TCP/IP PLC - Simulator (port: 502)
Connected (1/10) : (received/sent) (168/168) Serv. write data
Rx:
Tx:
Address: H D I/O
Coil Outputs (000000)
Fmt: decimal +/-
Address +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
000001-000016 0 0 0 0 0 0 0 0 0 0 0
000017-000032 0 0 0 0 0 0 0 0 0 0 0

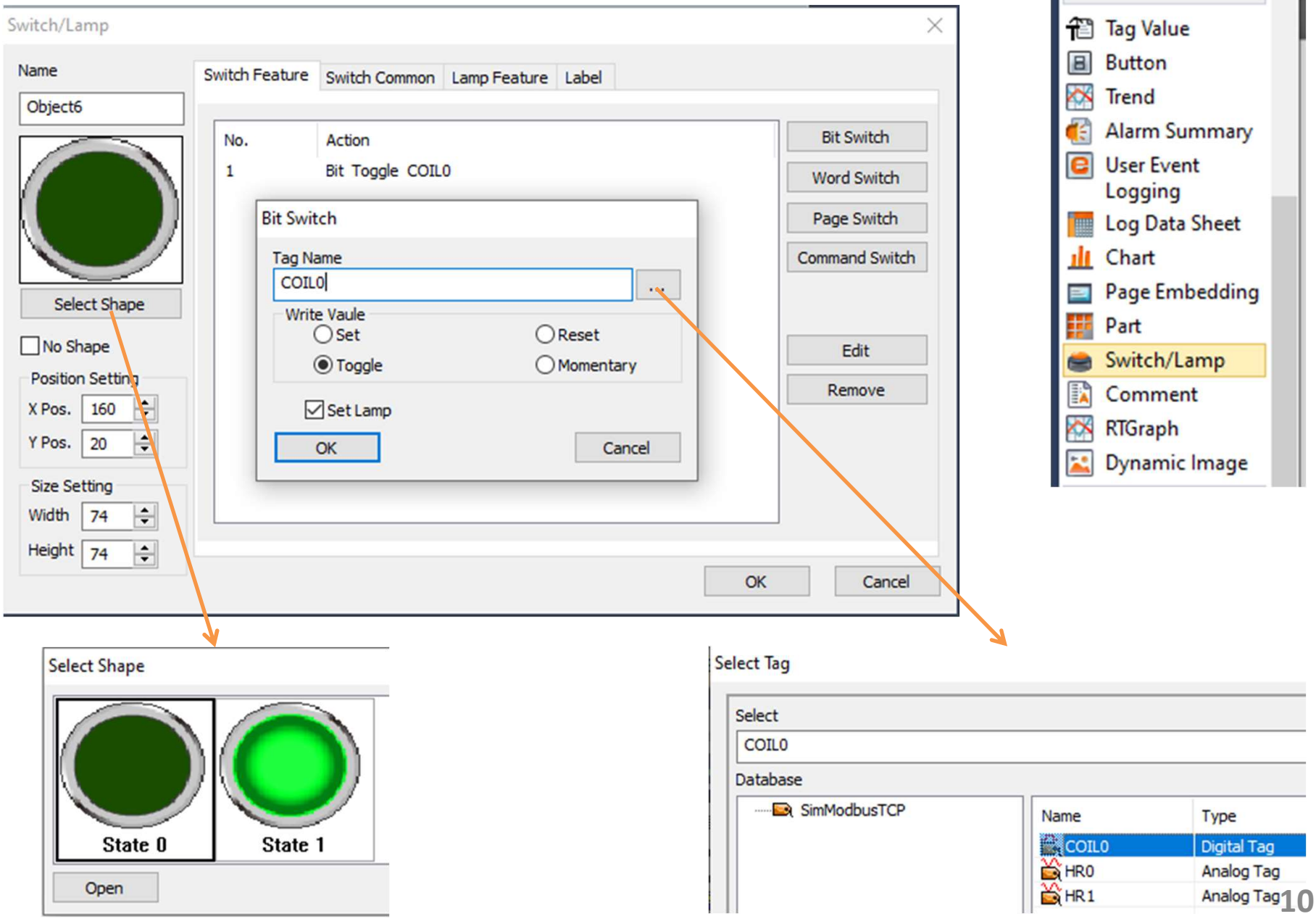

MODICON - MODBUS/TCP
Station
COM Port
ModRSsim2
MODRSSIM2 [127.0.0.1]
0 - 01, 2 Word : 1.0 sec
1 - 41, 2 Word : 1.0 sec

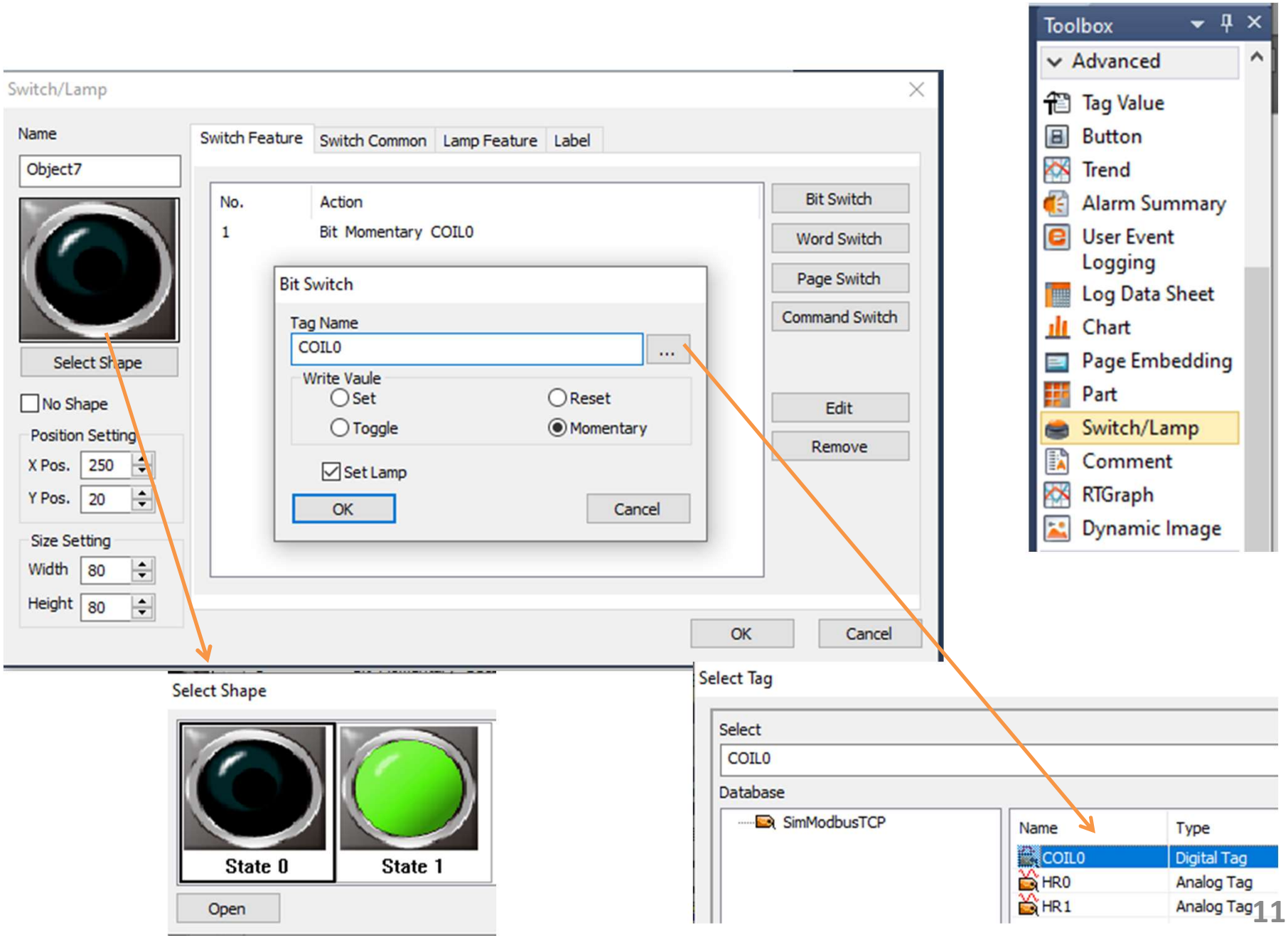

MODBUS Eth. TCP/IP PLC - Simulator (port: 502)
Connected (1/10) : (received/sent) (248/248) Serv. write data
Address: H D I/O
Holding Regs (400000)
Address +0 +1 +2 +3
400001-400010 254 565 0 0
400011-400020 0 0 0 0

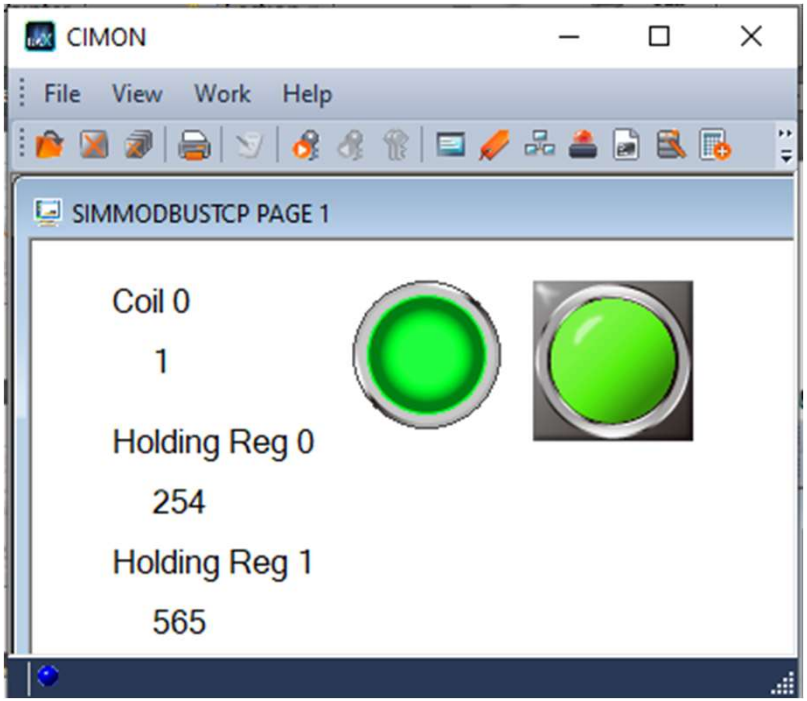

DATABASE [SimModbusTCP.dbx]
SimModbusTCP
Name Type I/O device I/O address Initial v...
COIL0 Digital Tag MODRSSIM2.MODRSSIM2 000001 0
HR0 Analog Tag MODRSSIM2.MODRSSIM2 40001 0
HR1 Analog Tag MODRSSIM2.MODRSSIM2 40002 0

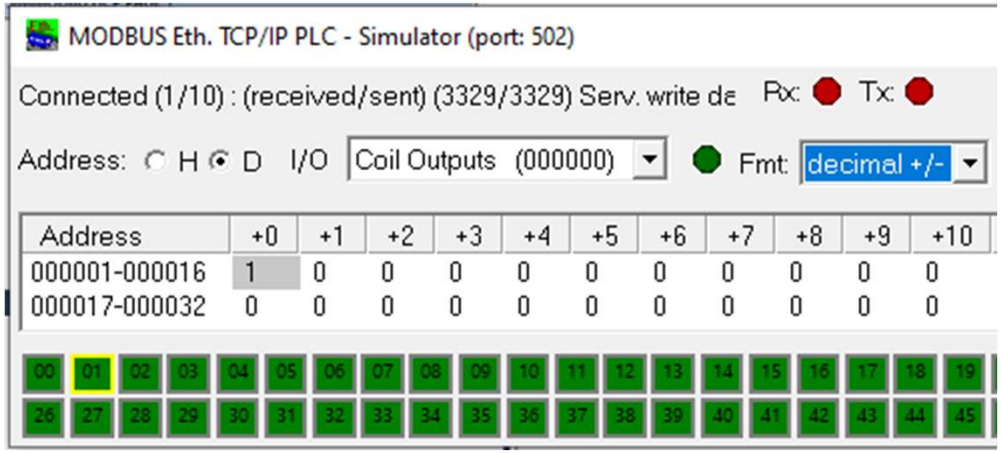
YouTube SCADA - 01 SimModbus

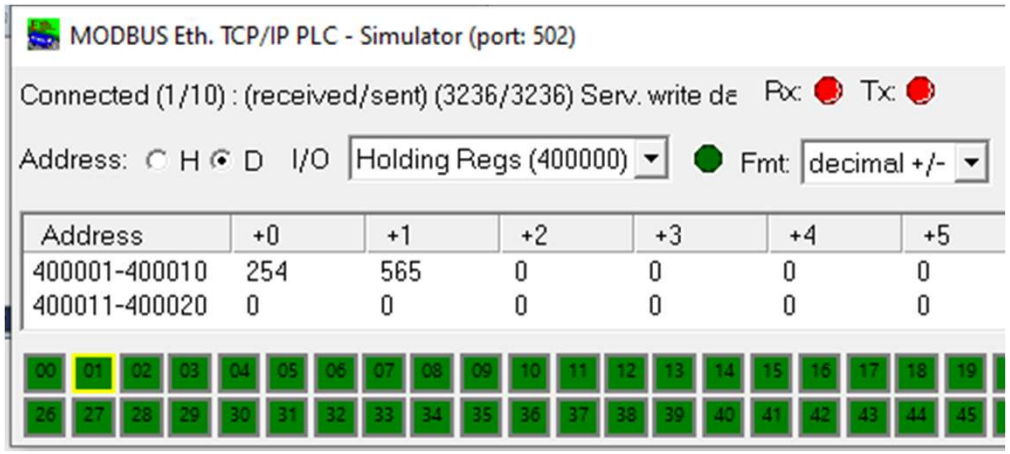



Toolbox
Advanced
Tag Value
Button
Trend
Alarm Summary
User Event Logging
Log Data Sheet
Chart
Page Embedding
Part
Switch/Lamp
Comment
RTGraph
Dynamic Image
Switch/Lamp
Name
Object6
Select Shape
No Shape
Position Setting
X Pos. 160
Y Pos. 20
Size Setting
Width 74
Height 74
Switch Feature
Switch Common
Lamp Feature
Label
No.
Action
1
Bit Toggle COIL0
Bit Switch
Word Switch
Page Switch
Command Switch
Edit
Remove
Bit Switch
Tag Name
COIL0
Write Vaule
Set
Reset
Toggle
Momentary
Set Lamp
OK
Cancel
OK
Cancel
Select Shape
State 0
State 1
Open
Select Tag
Select
COIL0
Database
SimModbusTCP
Name
Type
COIL0
Digital Tag
HR0
Analog Tag
HR1
Analog Tag


Toolbox
Advanced
Tag Value
Button
Trend
Alarm Summary
User Event Logging
Log Data Sheet
Chart
Page Embedding
Part
Switch/Lamp
Comment
RTGraph
Dynamic Image
Switch/Lamp
Name
Object7
Select Shape
No Shape
Position Setting
X Pos. 250
Y Pos. 20
Size Setting
Width 80
Height 80
Switch Feature
Switch Common
Lamp Feature
Label
No.
Action
1
Bit Momentary COIL0
Bit Switch
Word Switch
Page Switch
Command Switch
Edit
Remove
Bit Switch
Tag Name
COIL0
Write Vaule
Set
Reset
Toggle
Momentary
Set Lamp
OK
Cancel
OK
Cancel
Select Shape
State 0
State 1
Open
Select Tag
Select
COIL0
Database
SimModbusTCP
Name
Type
COIL0
Digital Tag
HR0
Analog Tag
HR1
Analog Tag


CIMON
File View Work Help
SIMMODBUSTCP PAGE 1
Coil 0
1
Holding Reg 0
254
Holding Reg 1
565

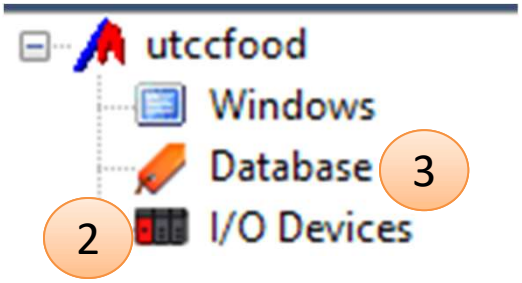

MODBUS Eth. TCP/IP PLC - Simulator (port: 502)
Connected (1/10) : (received/sent) (3329/3329) Serv. write de
Rx:
Tx:
Address: H D I/O
Coil Outputs (000000)
Fmt:
decimal +/-
Address +0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
000001-000016 1 0 0 0 0 0 0 0 0 0 0
000017-000032 0 0 0 0 0 0 0 0 0 0 0

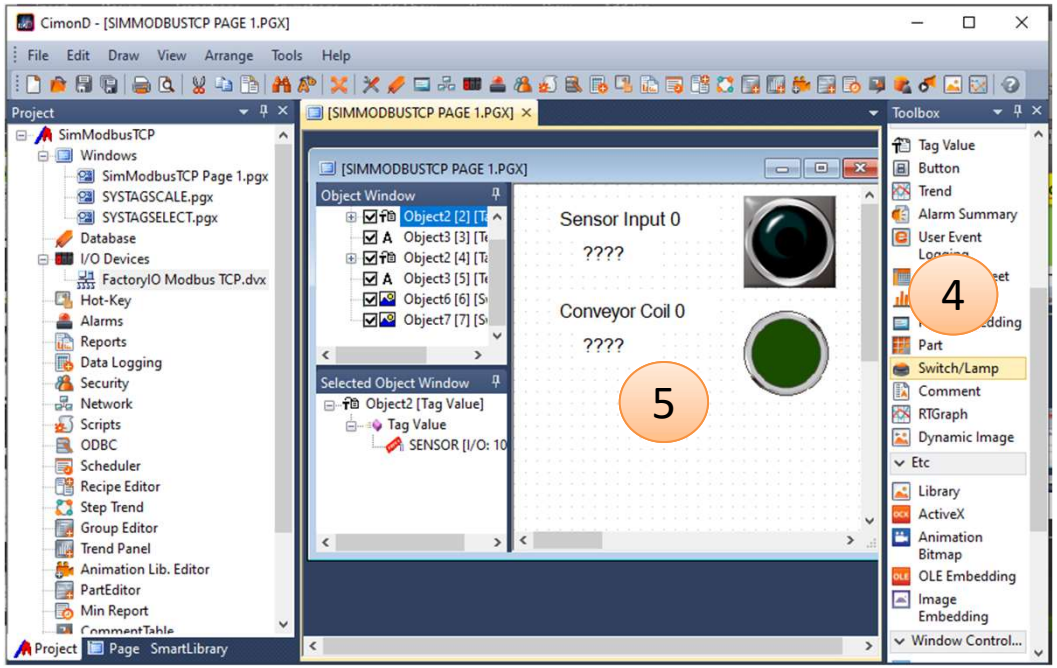

MODBUS Eth. TCP/IP PLC - Simulator (port: 502)
Connected (1/10) : (received/sent) (3236/3236) Serv. write de
Rx:
Tx:
Address: H D I/O
Holding Regs (400000)
Fmt:
decimal +/-
Address +0 +1 +2 +3 +4 +5
400001-400010 254 565 0 0 0 0
400011-400020 0 0 0 0 0 0

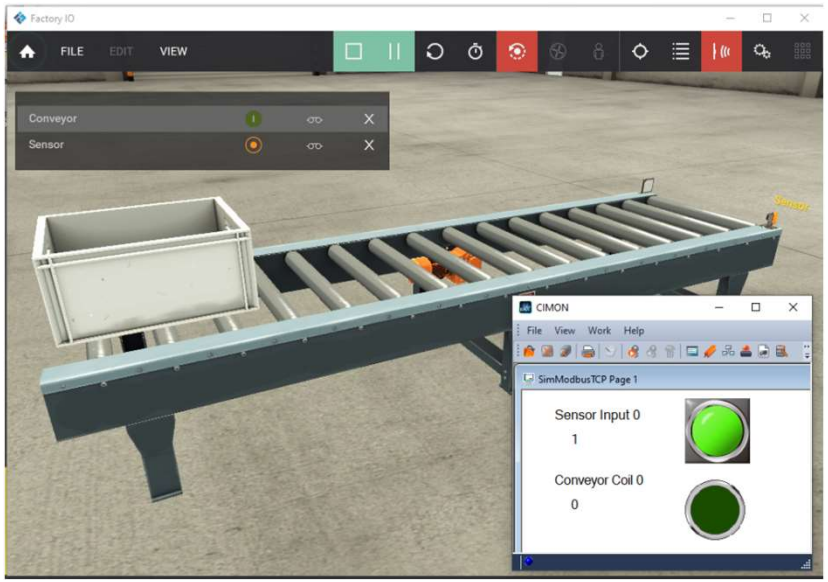
YouTube SCADA - 02 FactoryIO

SCADA Demo

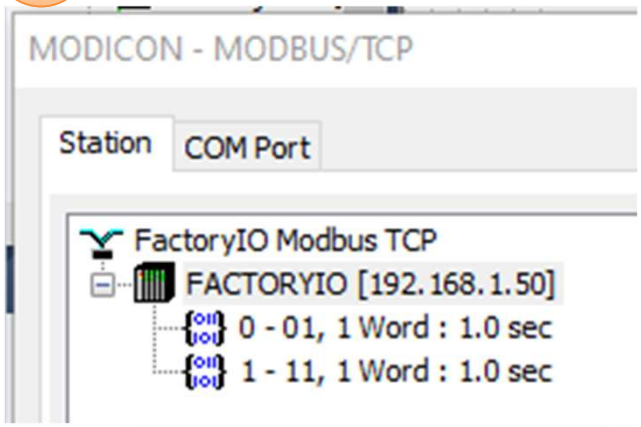
- Cimon - FactoryIO

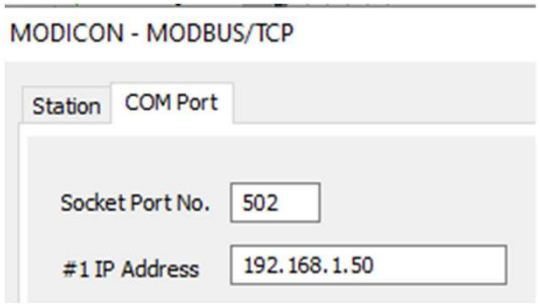


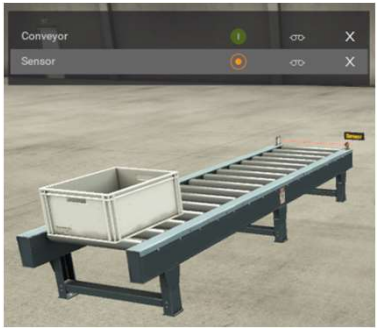


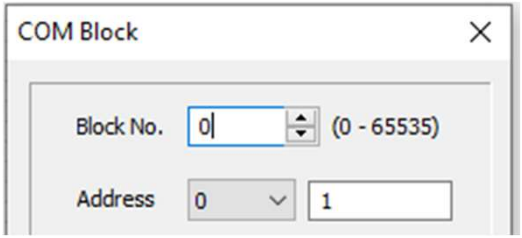


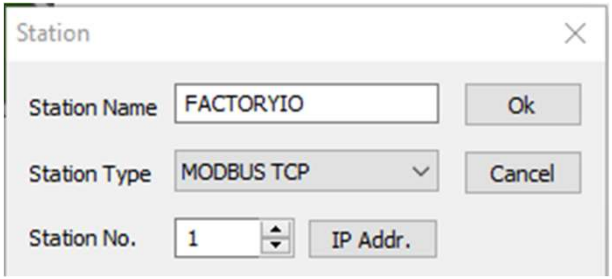
1

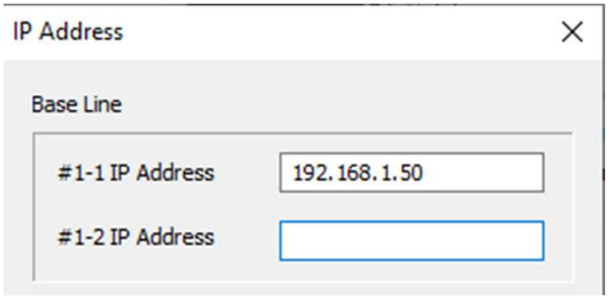

MODICON - MODBUS/TCP
Station
COM Port
FactoryIO Modbus TCP
FACTORYIO [192.168.1.50]
0 - 01, 1 Word : 1.0 sec
1 - 11, 1 Word : 1.0 sec

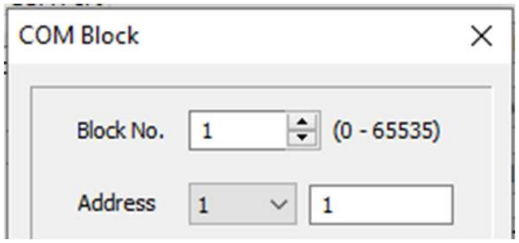

MODICON - MODBUS/TCP
Station
COM Port
Socket Port No.
502
#1 IP Address
192.168.1.50

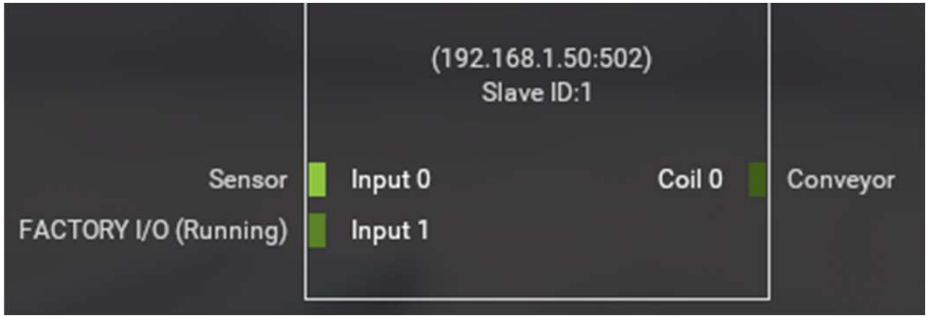

Conveyor
Sensor


COM Block
Block No.
0
(0 - 65535)
Address
0
1

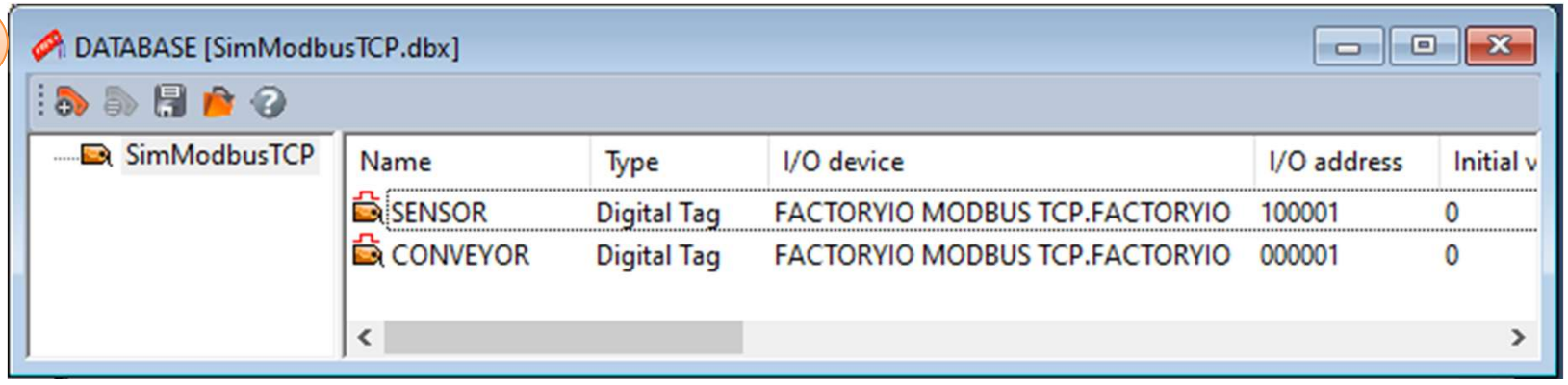

Station
Station Name
FACTORYIO
Ok
Station Type
MODBUS TCP
Cancel
Station No.
1
IP Addr.

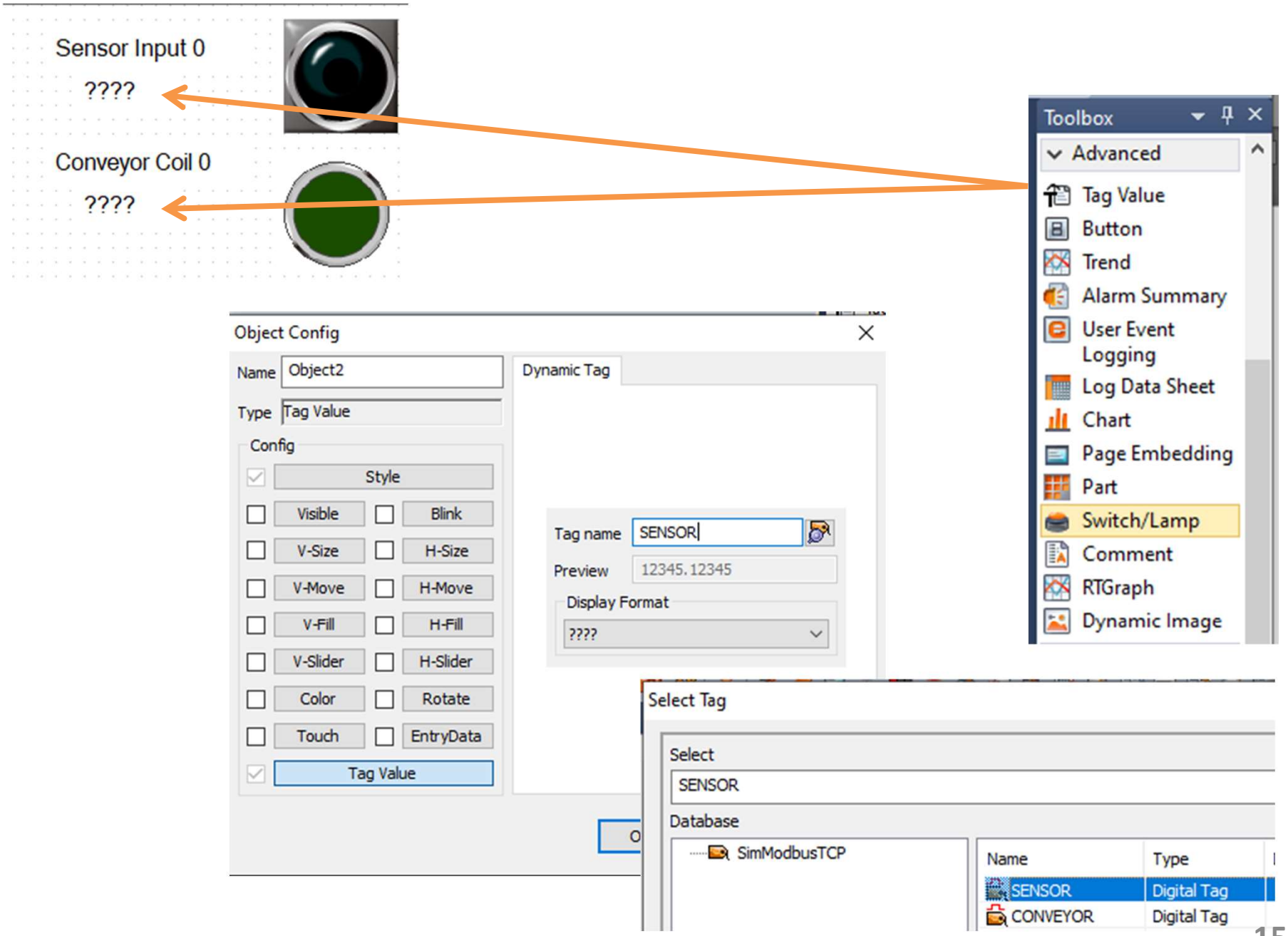

IP Address
Base Line
#1-1 IP Address
192.168.1.50
#1-2 IP Address

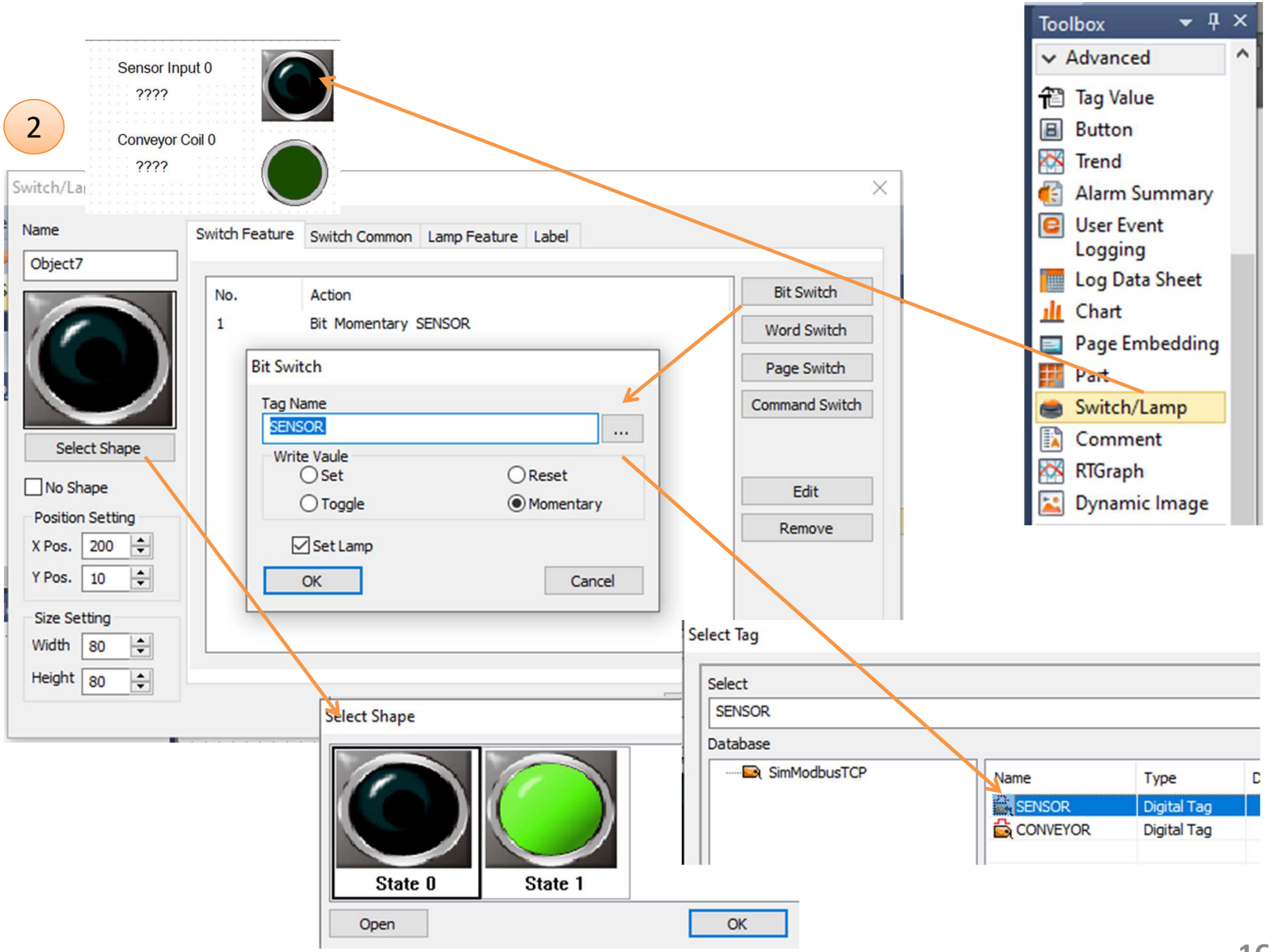

COM Block
Block No.
1
(0 - 65535)
Address
1
1

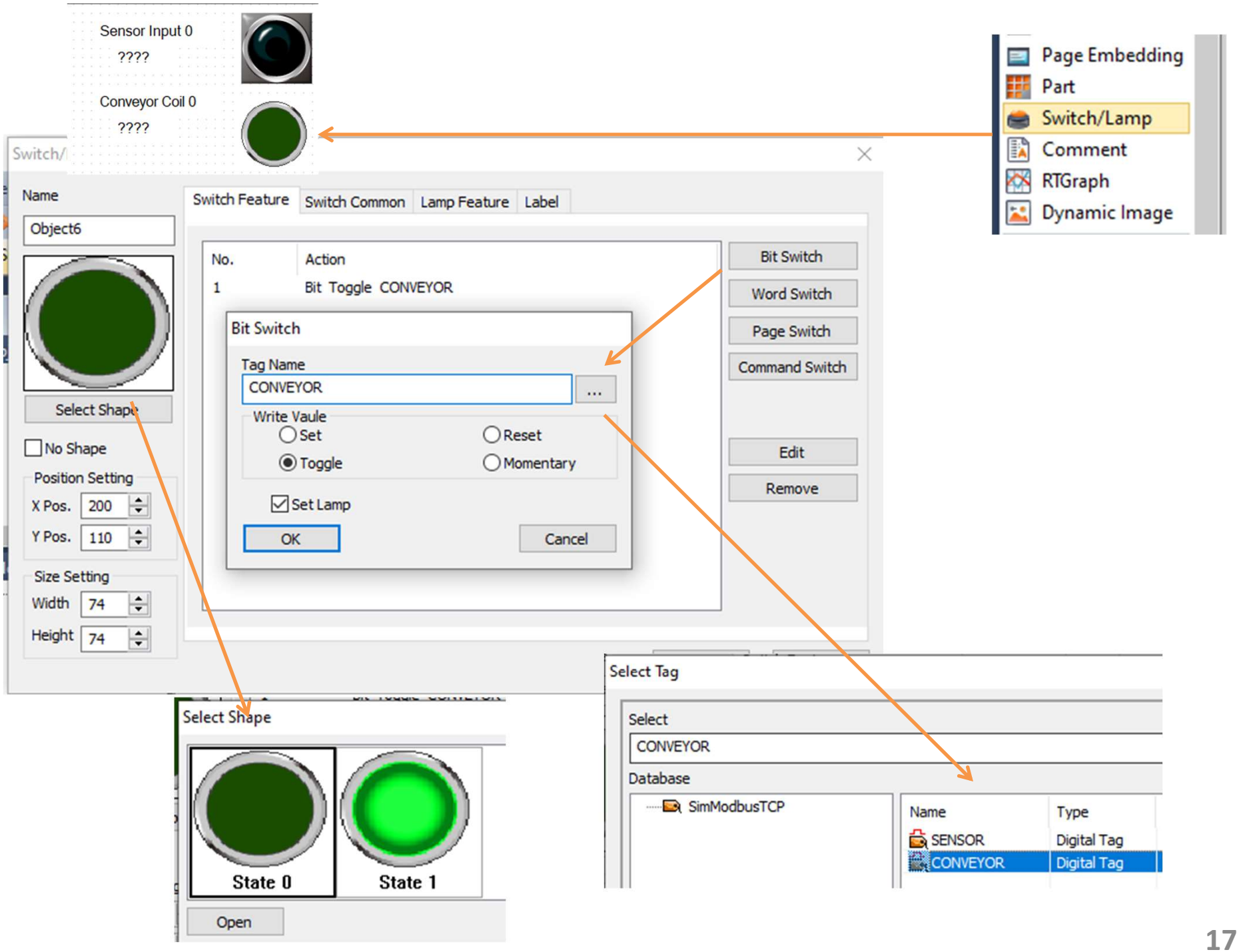

(192.168.1.50:502)
Slave ID:1
Sensor
Input 0
Coil 0
Conveyor
FACTORY I/O (Running)
Input 1

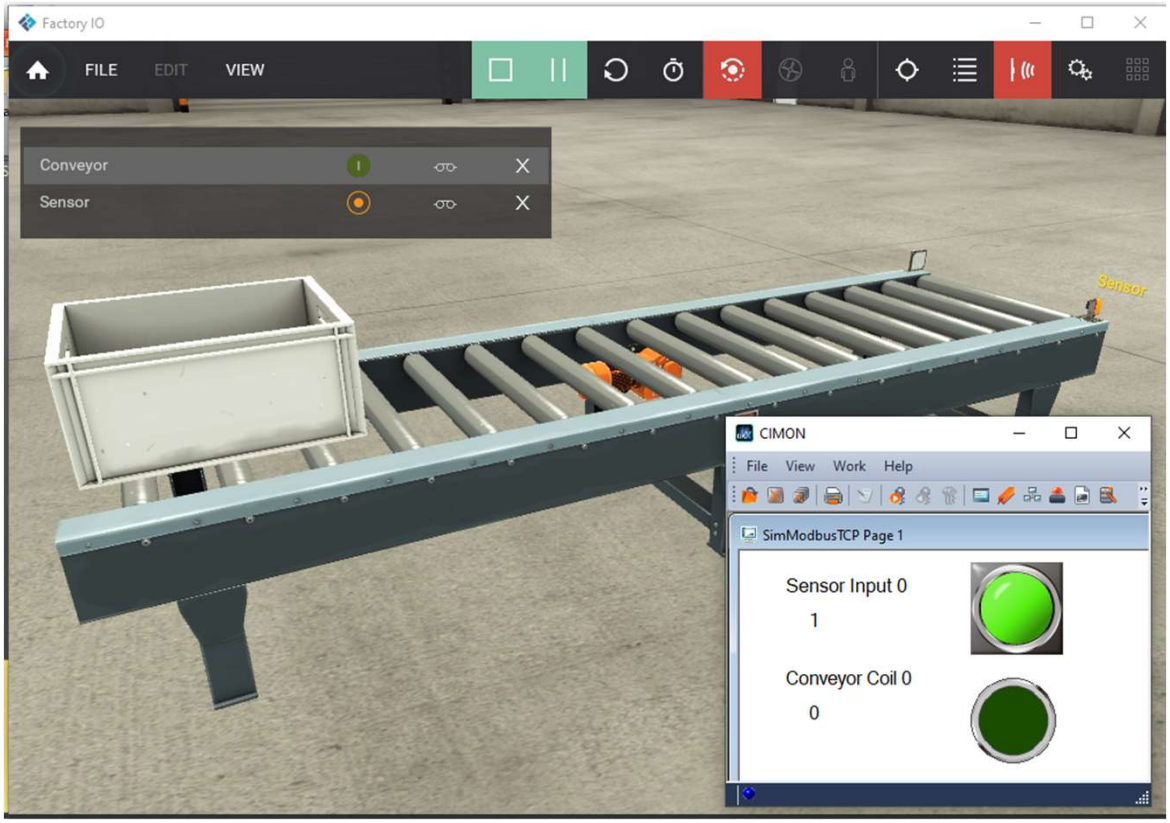
2


DATABASE [SimModbusTCP.dbx]
SimModbusTCP
Name
Type
I/O device
I/O address
Initial v
SENSOR
Digital Tag
FACTORYIO MODBUS TCP.FACTORYIO
100001
0
CONVEYOR
Digital Tag
FACTORYIO MODBUS TCP.FACTORYIO
000001
0


Sensor Input 0
????
Conveyor Coil 0
????
Toolbox
Advanced
Tag Value
Button
Trend
Alarm Summary
User Event Logging
Log Data Sheet
Chart
Page Embedding
Part
Switch/Lamp
Comment
RTGraph
Dynamic Image
Object Config
Name
Object2
Type
Tag Value
Config
Style
Visible
Blink
V-Size
H-Size
V-Move
H-Move
V-Fill
H-Fill
V-Slider
H-Slider
Color
Rotate
Touch
EntryData
Tag Value
Dynamic Tag
Tag name
SENSOR
Preview
12345.12345
Display Format
????
Select Tag
Select
SENSOR
Database
SimModbusTCP
Name
Type
SENSOR
Digital Tag
CONVEYOR
Digital Tag

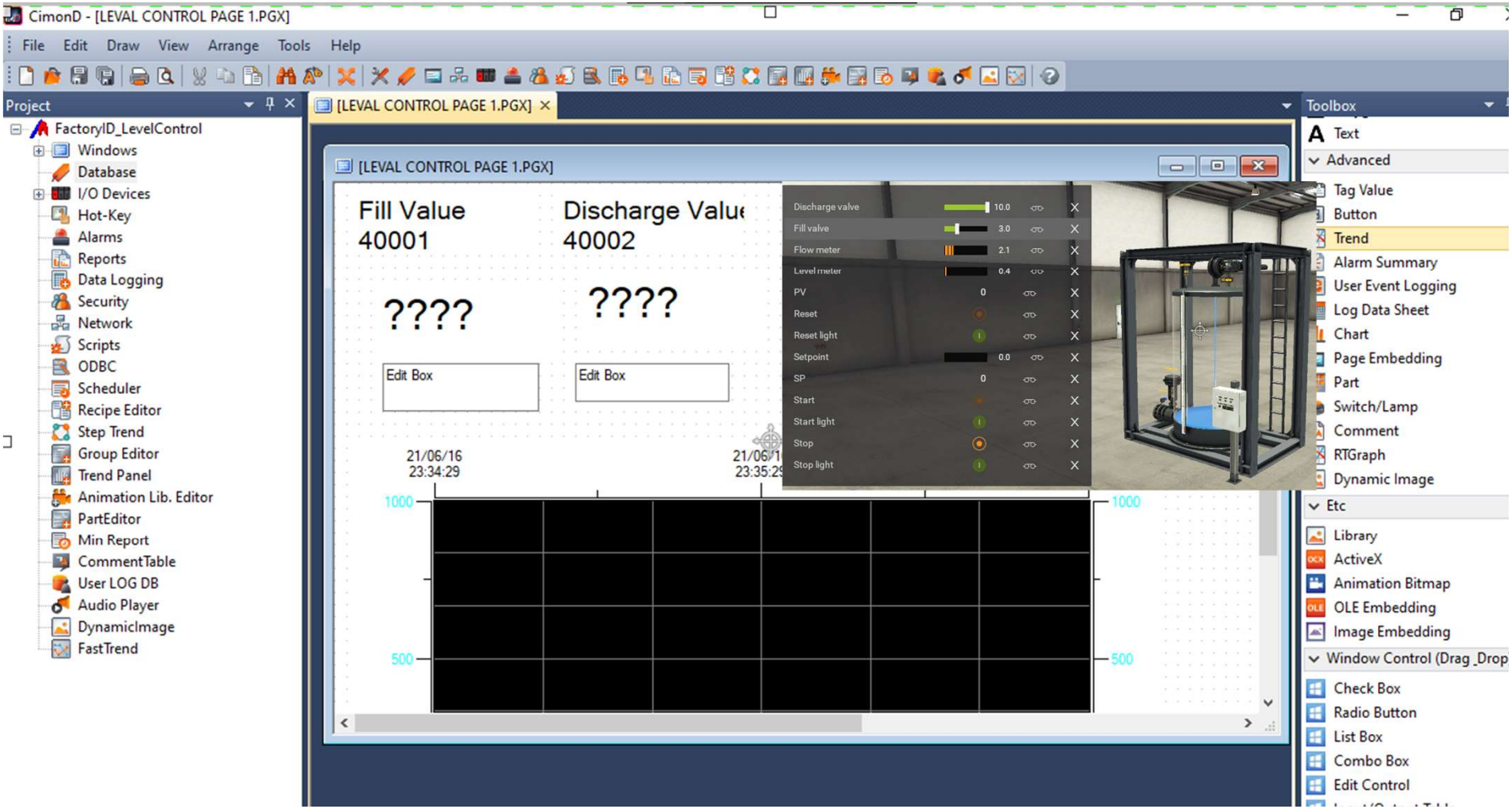

2
Sensor Input 0
????
Conveyor Coil 0
????
Toolbox
Advanced
Tag Value
Button
Trend
Alarm Summary
User Event Logging
Log Data Sheet
Chart
Page Embedding
Part
Switch/Lamp
Comment
RTGraph
Dynamic Image
Name
Object7
Select Shape
No Shape
Position Setting
X Pos. 200
Y Pos. 10
Size Setting
Width 80
Height 80
Switch Feature
Switch Common
Lamp Feature
Label
No.
Action
1
Bit Momentary SENSOR
Bit Switch
Word Switch
Page Switch
Command Switch
Edit
Remove
Bit Switch
Tag Name
SENSOR
Write Vaule
Set
Reset
Toggle
Momentary
Set Lamp
OK
Cancel
Select Shape
State 0
State 1
Open
OK
Select Tag
Select
SENSOR
Database
SimModbusTCP
Name
Type
SENSOR
Digital Tag
CONVEYOR
Digital Tag


Sensor Input 0
????
Conveyor Coil 0
????
Page Embedding
Part
Switch/Lamp
Comment
RTGraph
Dynamic Image
Switch/
Name
Object6
Select Shape
No Shape
Position Setting
X Pos. 200
Y Pos. 110
Size Setting
Width 74
Height 74
Switch Feature
Switch Common
Lamp Feature
Label
No.
Action
1
Bit Toggle CONVEYOR
Bit Switch
Word Switch
Page Switch
Command Switch
Edit
Remove
Bit Switch
Tag Name
CONVEYOR
...
Write Vaule
Set
Reset
Toggle
Momentary
Set Lamp
OK
Cancel
Select Shape
State 0
State 1
Open
Select Tag
Select
CONVEYOR
Database
SimModbusTCP
Name
Type
SENSOR
Digital Tag
CONVEYOR
Digital Tag


Factory IO
FILE
EDIT
VIEW
Conveyor
Sensor
Sensor
CIMON
File
View
Work
Help
SimModbusTCP Page 1
Sensor Input 0
1
Conveyor Coil 0
0


(192.168.1.50:502)
Slave ID:1
Sensor
Input 0
Coil 0
Conveyor
FACTORY I/O (Running)
Input 1

YouTube SCADA - 03 FactoryIO

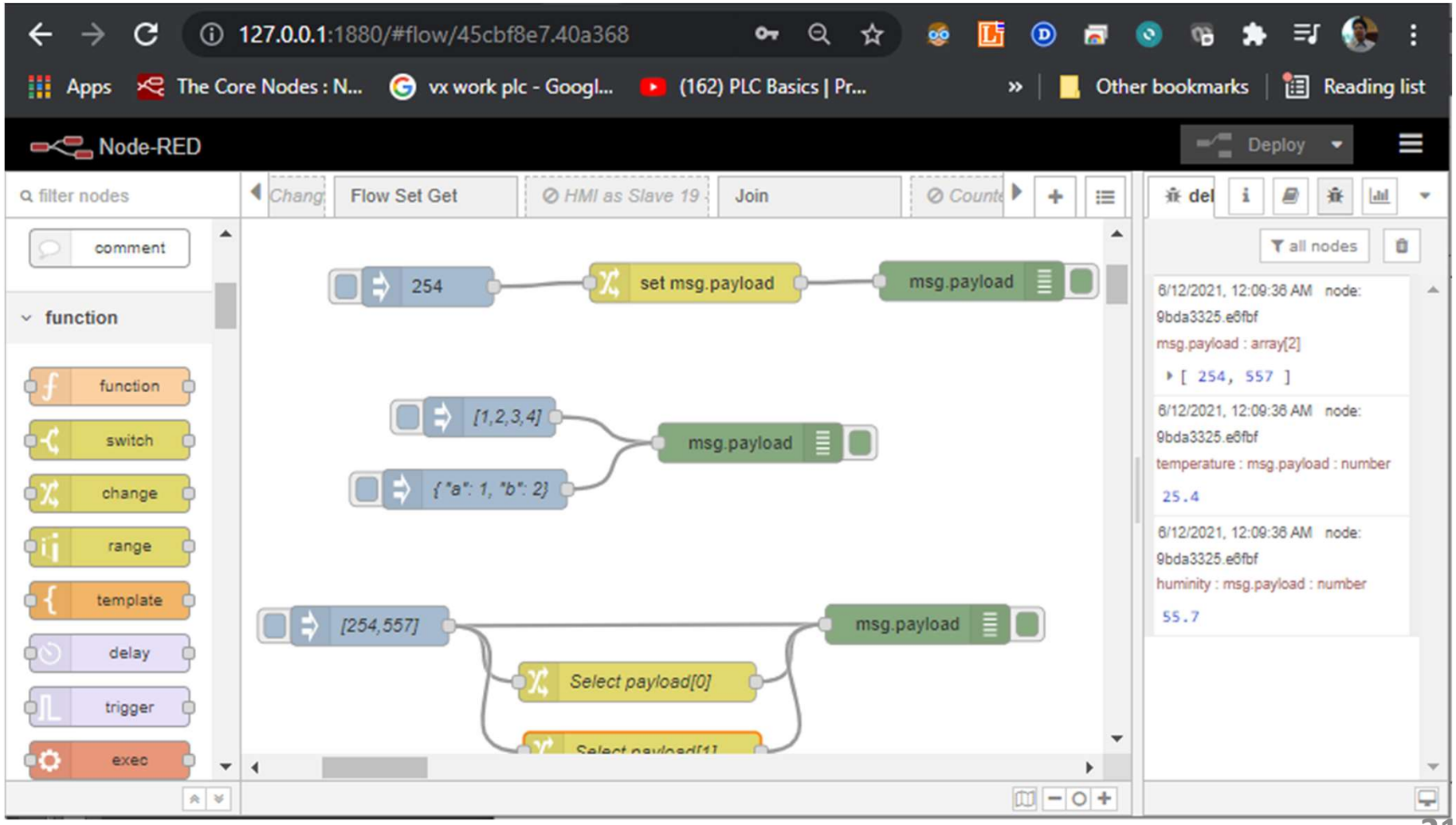


Node-Red

- *Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.*
- Cmd
  - Node-red

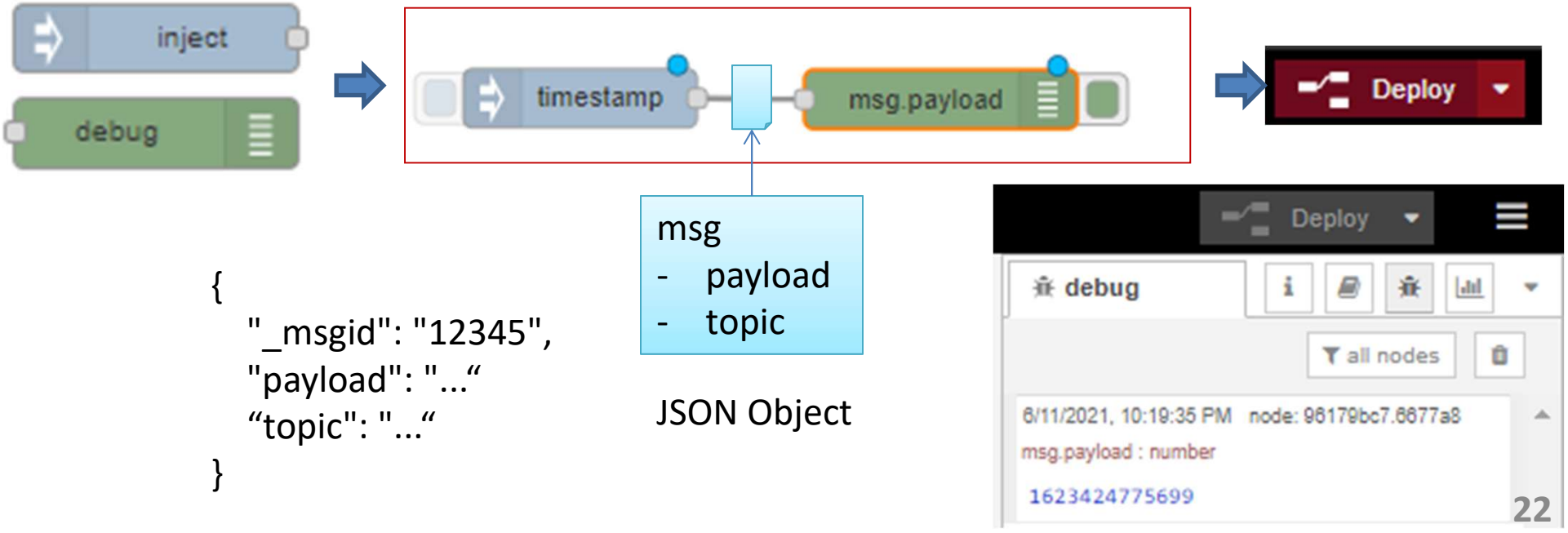
- http://localhost:1880
- 127.0.0.1:1880

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

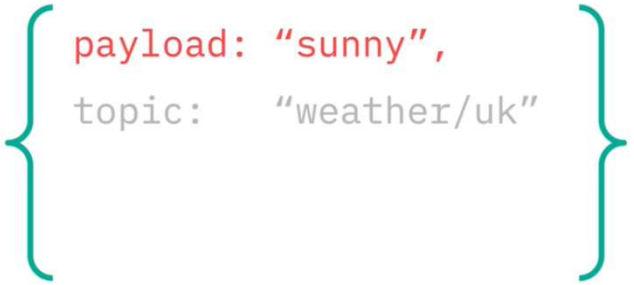


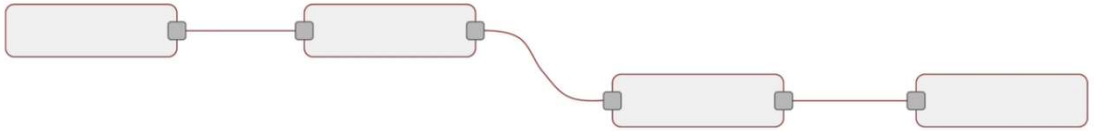
Basic Nodes

- Input Node นำข้อมูลเข้า node-red
- Function Node กำหนดการทำงาน เปลี่ยนแปลงค่า
- Output Node แสดงผลข้อมูลในรูปแบบต่าง

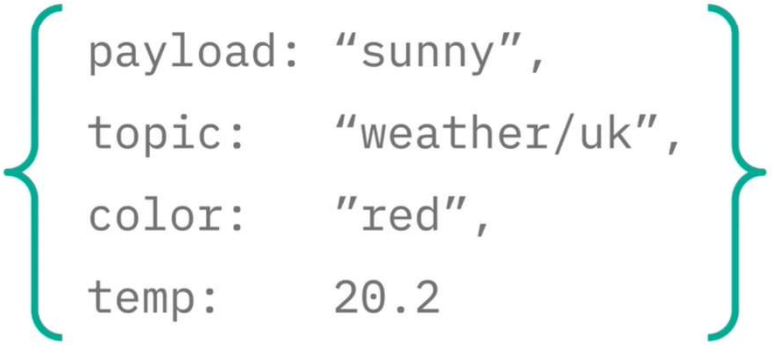


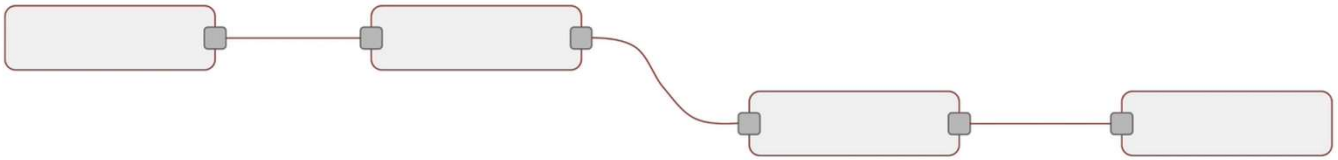
JSON Object (Data Transfer)





- Boolean - true, false
- Number - eg 0, 123.4
- String - "hello"
- Array - [1,2,3,4]
- Object - { "a": 1, "b": 2}
- Null





JSON Object Examples

ชื่อตัวแปร ค่าตัวแปร

```
{ "name " : "John"}
```
ข้อความ

```
{ "age "    : 30      }
```
ตัวเลข

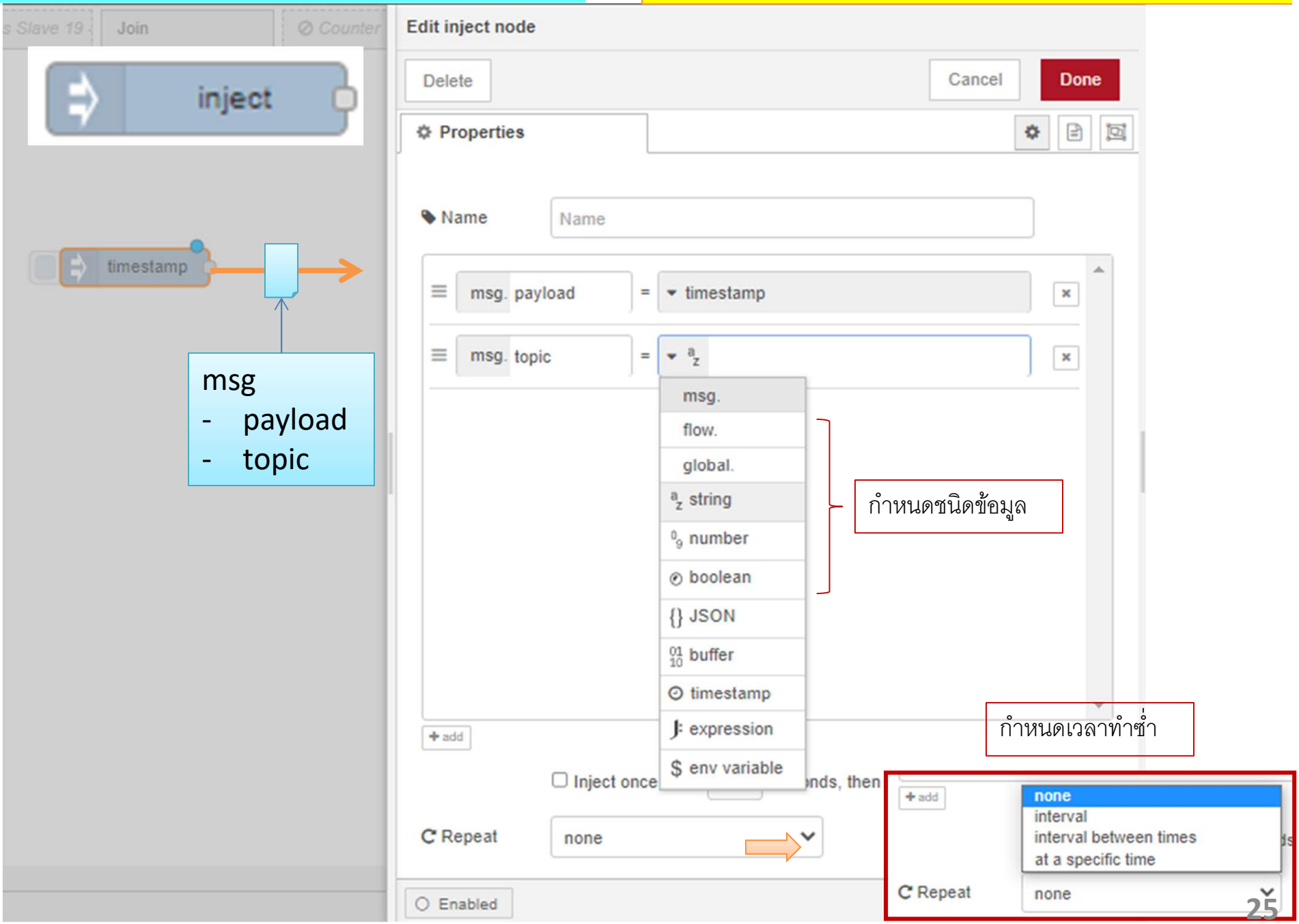
```
{"name " : "John " , "age "    : 30  }
```
หลายตัวแปร

Array Object

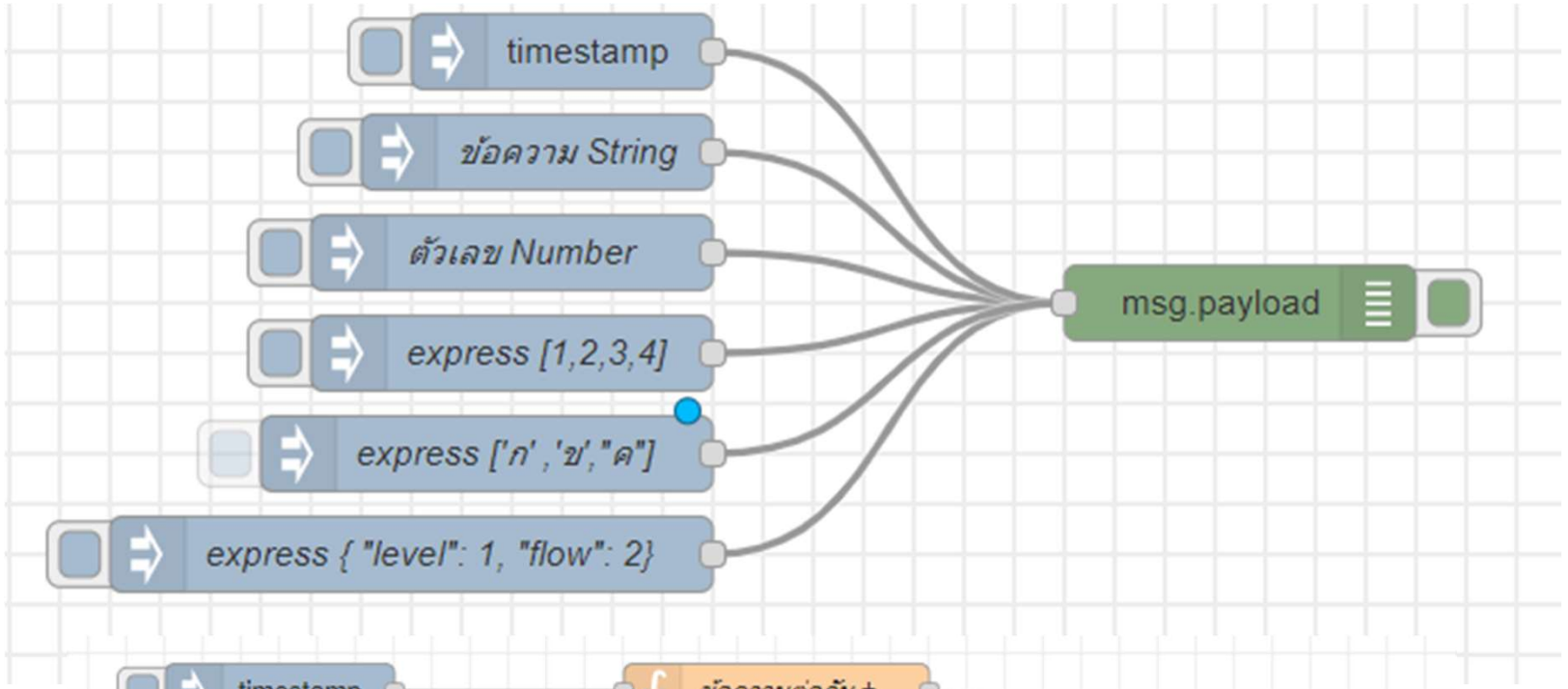
```
[ { "name":"John",  "age":30 } , { "name“ : "jenny",  "age":22 } ]
```

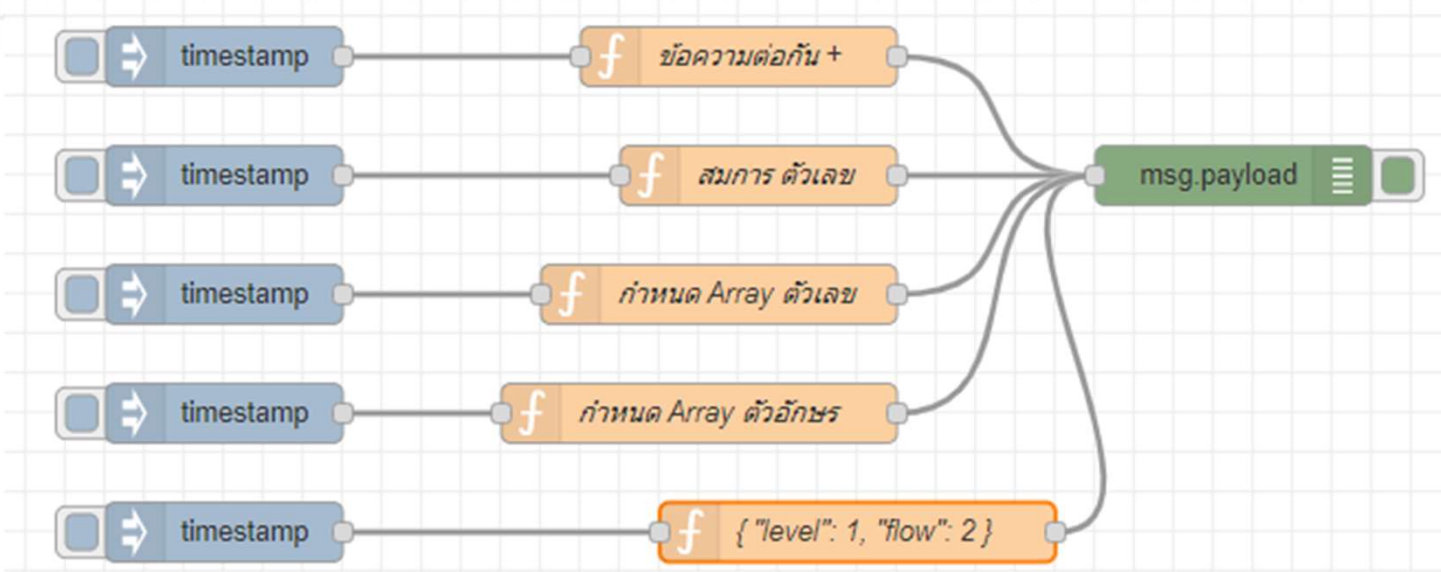
payload and topic properties (default)

YouTube Node-Red - 01 Basic Debug



GitHub Node-Red - 01 Basic Debug





https://github.com/chalermchonv/UtccFoodIotCodes/tree/main/Node-Red

กำหนดค่า payload และการแสดงค่า Debug

JavaScript Types

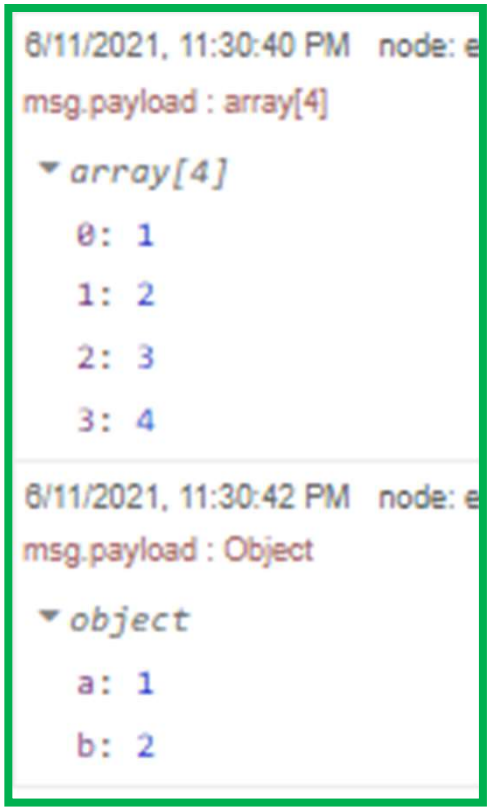
boolean : `true / false`

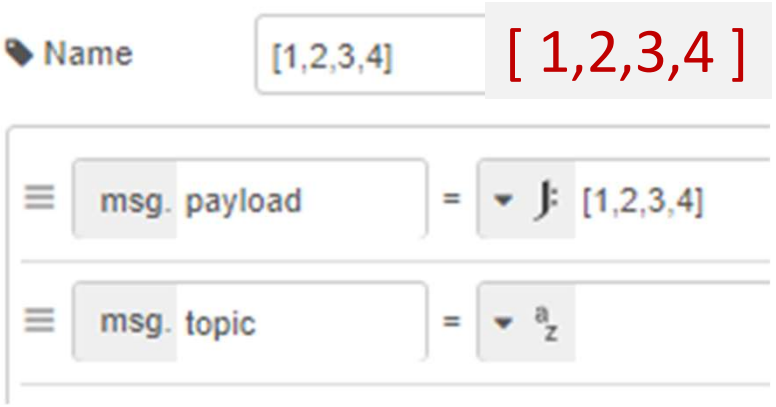
number : `123`

string : `"hello"`

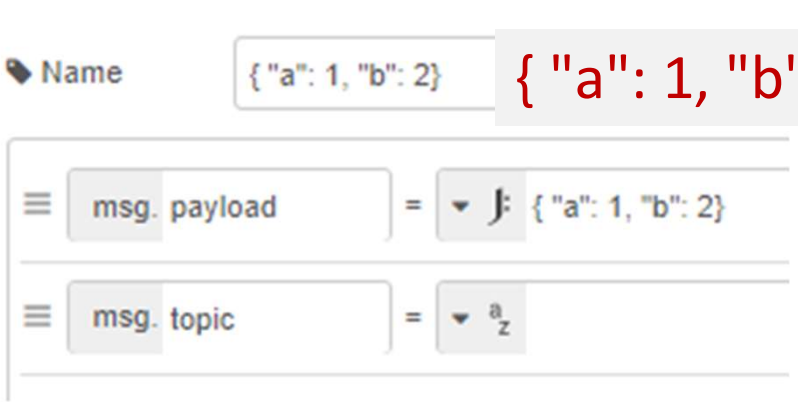
array : `[ 1, 2, 3, 4 ]`

object : `{ "color": "red" }`

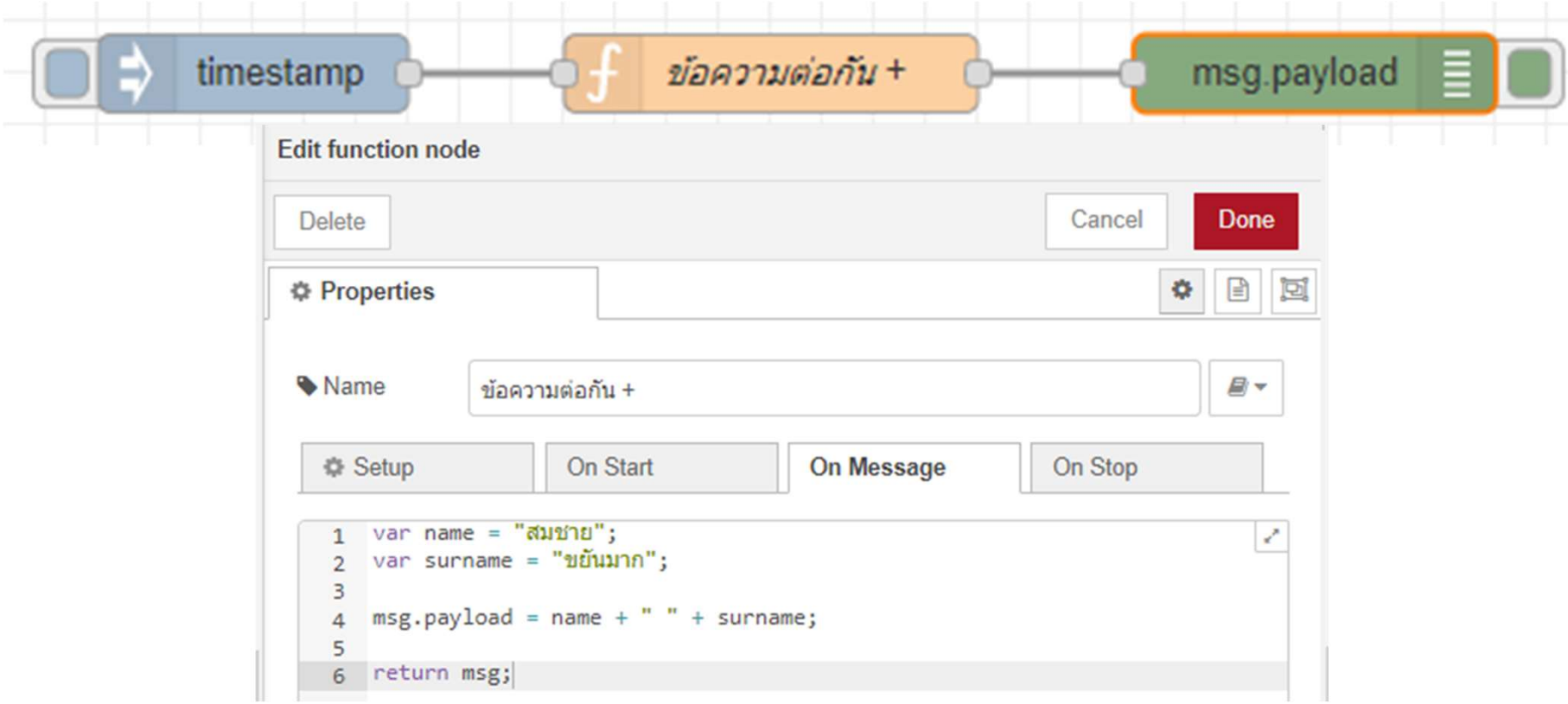




[1,2,3,4]



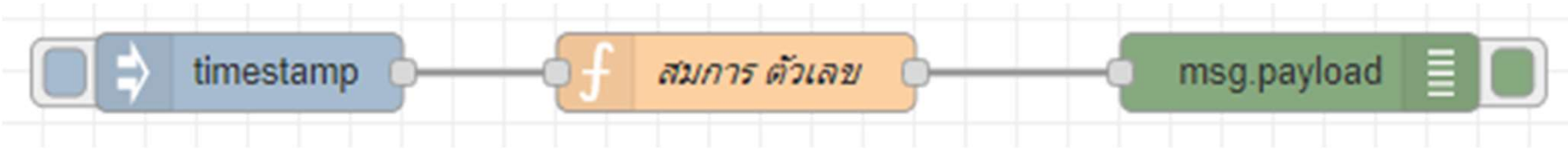
{ "a": 1, "b": 2}

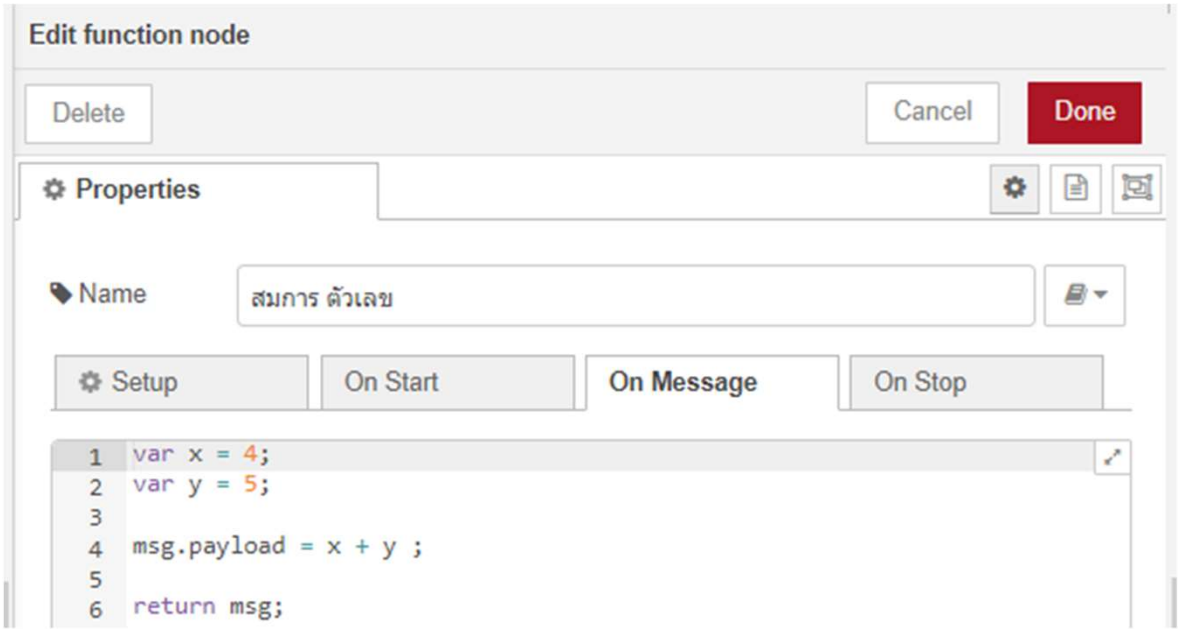


Msg
.topic
.payload

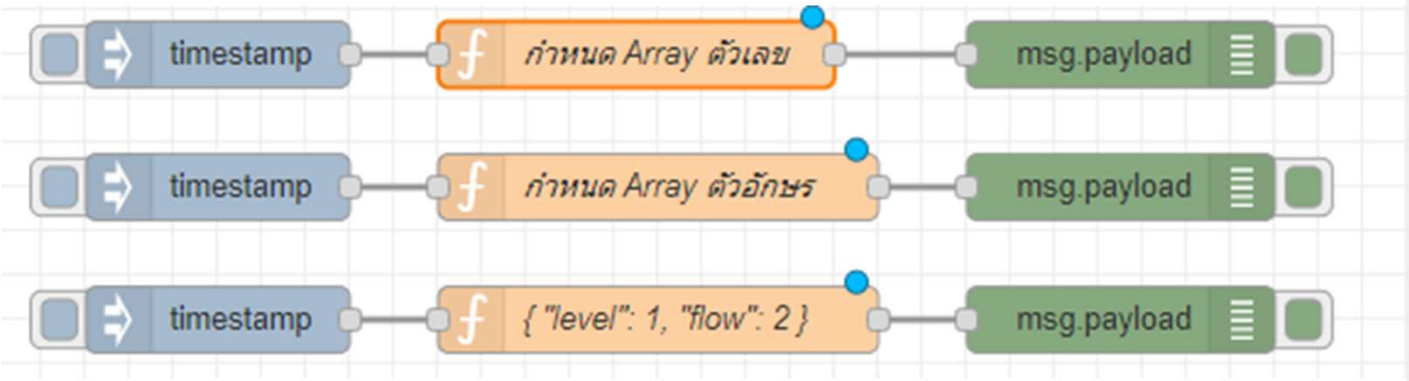
Msg : { topic , payload}

```
var name = "สมชาย" ;
var surname = 'ขยันมาก' ;

msg.payload = name + " " + surname ;

return msg ;
```






```
var x = 4 ;
var y = 5 ;

msg.payload = x + y ;

return msg ;
```




```
msg.payload = [1,2,3,4];
return msg;
```

```
msg.payload = [‘ก’ ,’ข’ , ‘ค’] ;
return msg;
```

```
msg.payload = { "level": 1, "flow": 2 };return
msg;
```

6/16/2021, 9:18:57 PM node
msg.payload : array[4]

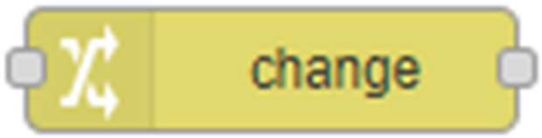
```
▾ array[4]
    0: 1
    1: 2
    2: 3
    3: 4
```

6/16/2021, 9:18:58 PM node
msg.payload : array[3]

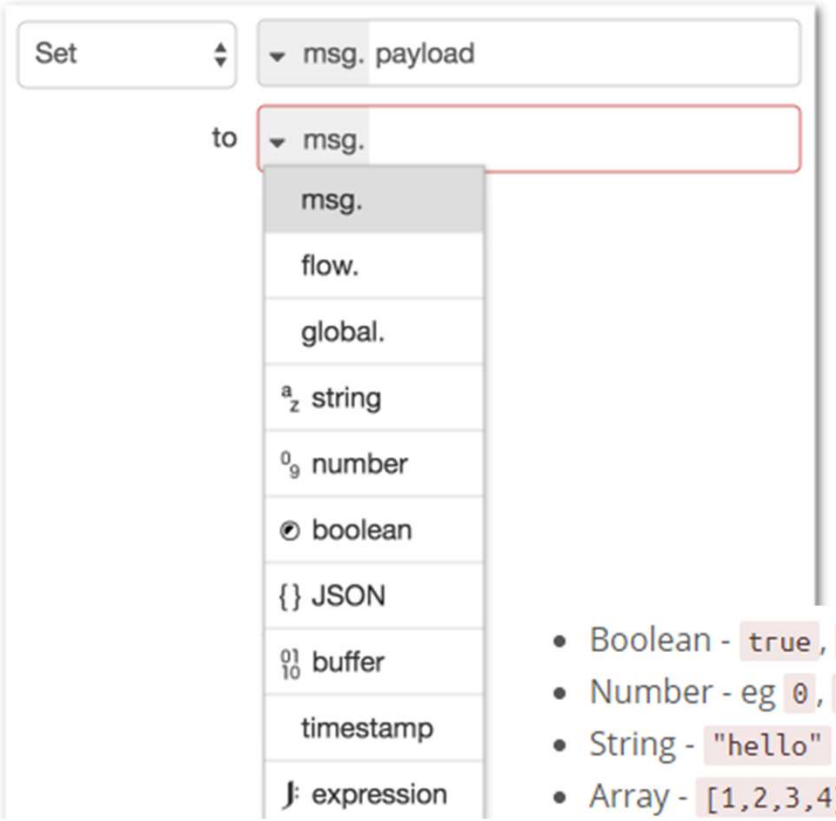
```
▾ array[3]
    0: "ก"
    1: "ข"
    2: "ค"
```

6/16/2021, 9:18:59 PM node
msg.payload : Object

```
▾ object
    level: 1
    flow: 2
```



- `Set` a property to a value,
- `Change` a String property by performing a search and replace,
- `Delete` a property,
- `Move` a property.

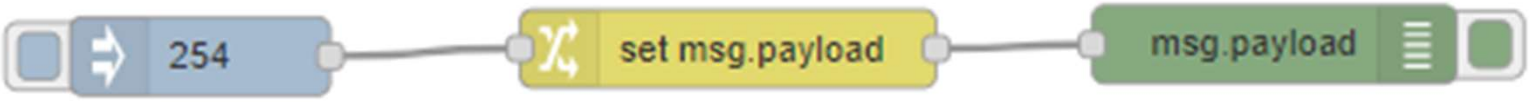



```
{
    "payload": {
        "temperature": 90,
        "temperature_c": 32.22222
    }
}
```

- Boolean - `true`, `false`
- Number - eg `0`, `123.4`
- String - `"hello"`
- Array - `[1,2,3,4]`
- Object - `{ "a": 1, "b": 2}`
- Null

Change กำหนดค่า payload / 10

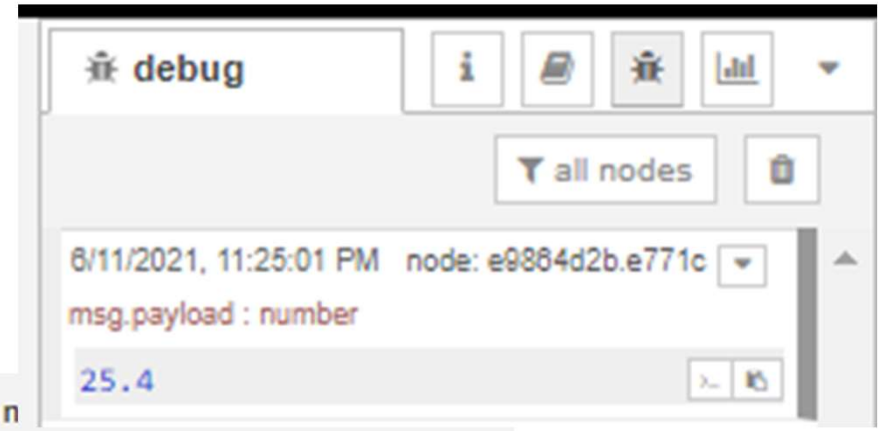
GitHub Node-Red - 02 Basic Change

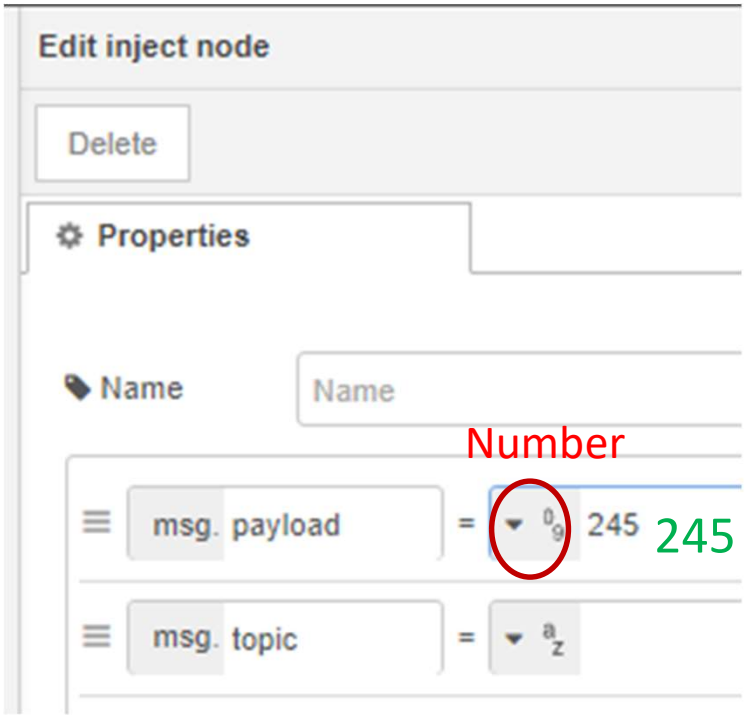


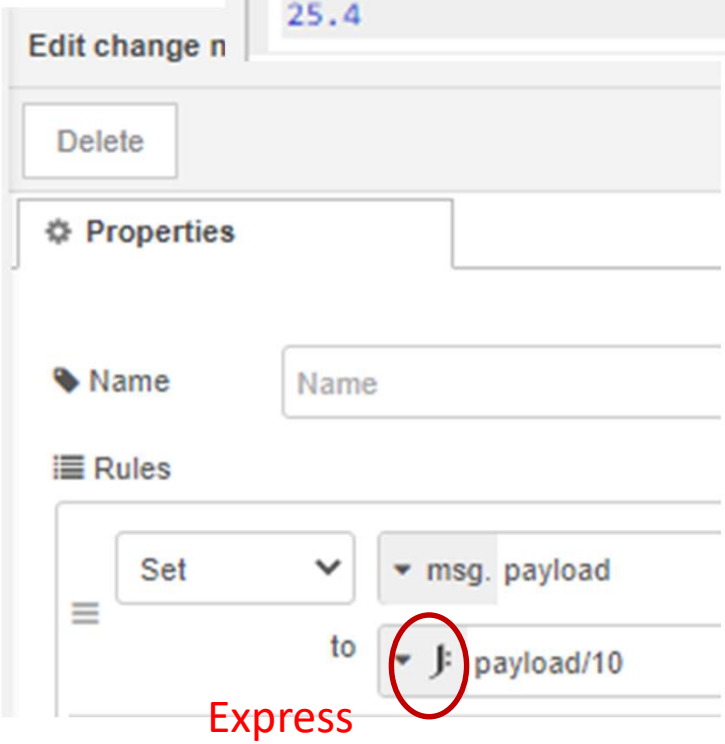
payload (254) - input

Change (254/10)

Payload 25.4 - output

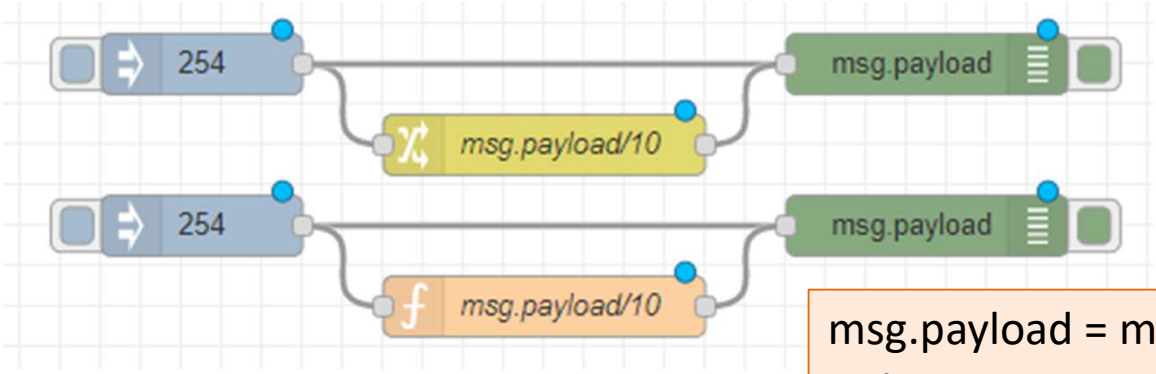




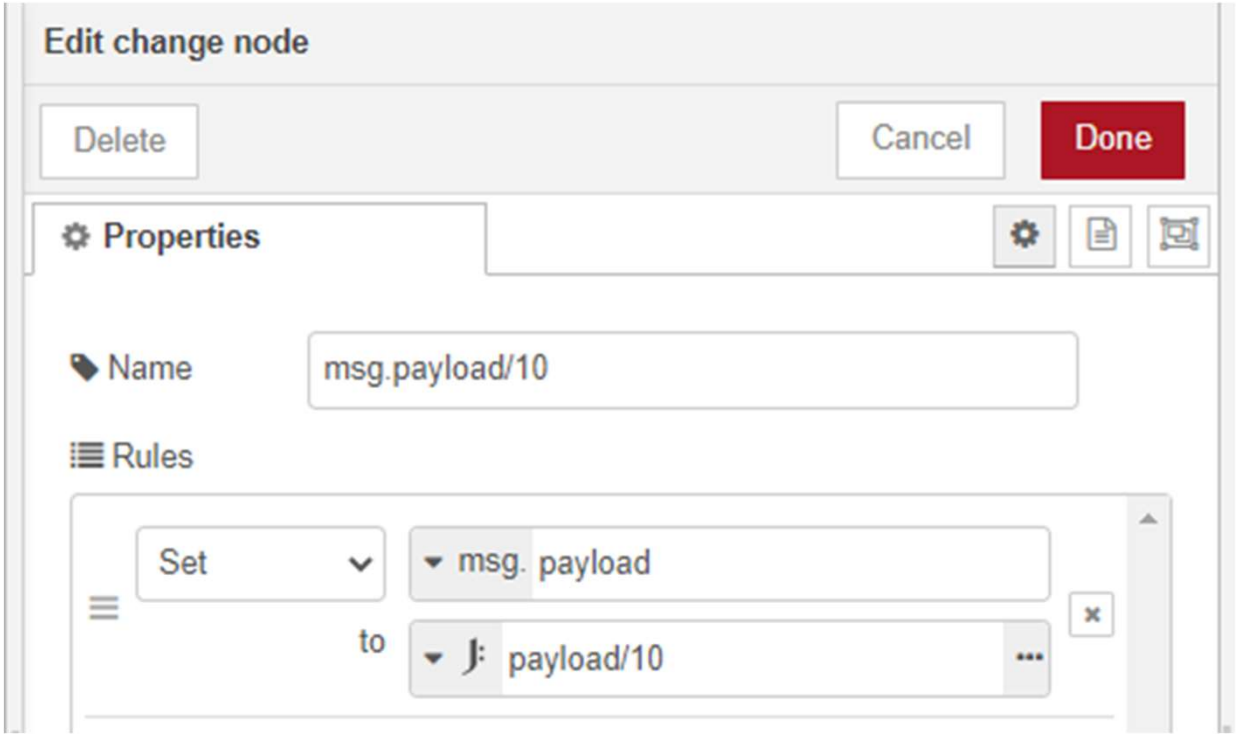


Payload/10

https://github.com/chalermchonv/UtccFoodIotCodes/tree/main/Node-Red

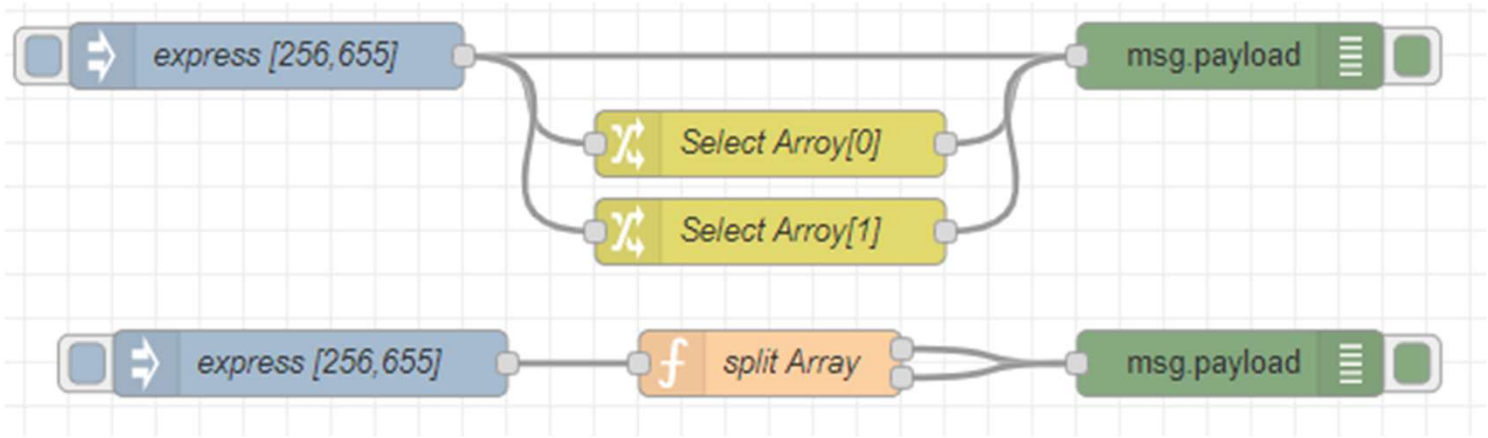


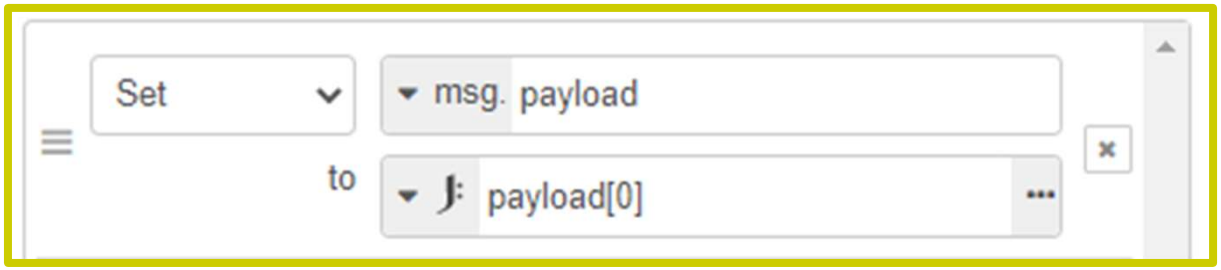
msg.payload = msg.payload/10
;return msg;

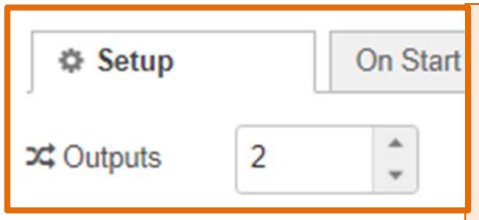


6/16/2021, 9:25:53 PM node: 1d98376f.4e0a19
msg.payload : number
254

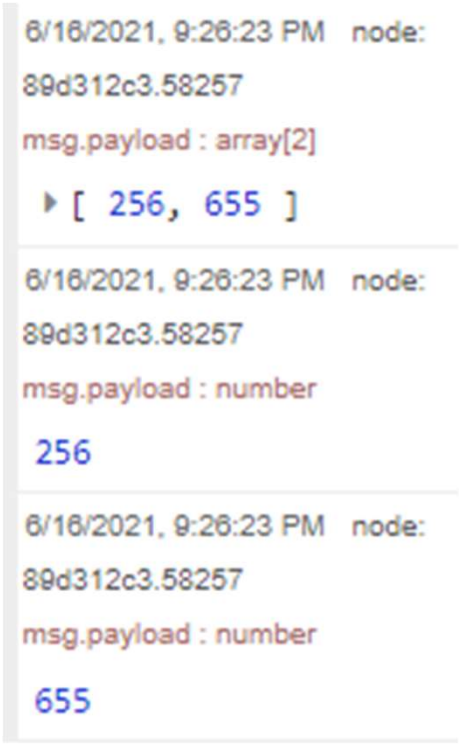
6/16/2021, 9:25:53 PM node: 1d98376f.4e0a19
msg.payload : number
25.4

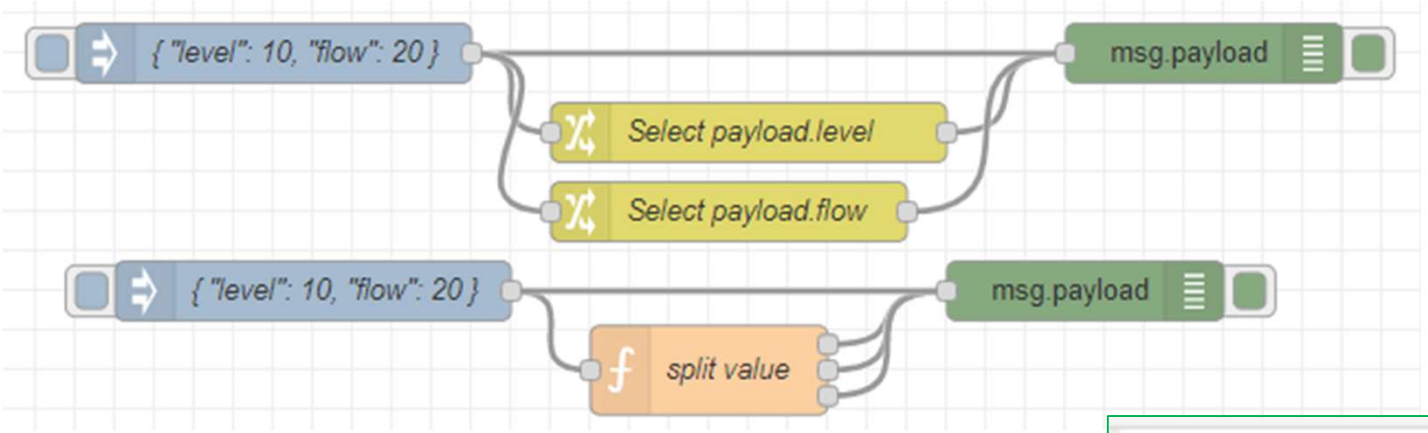


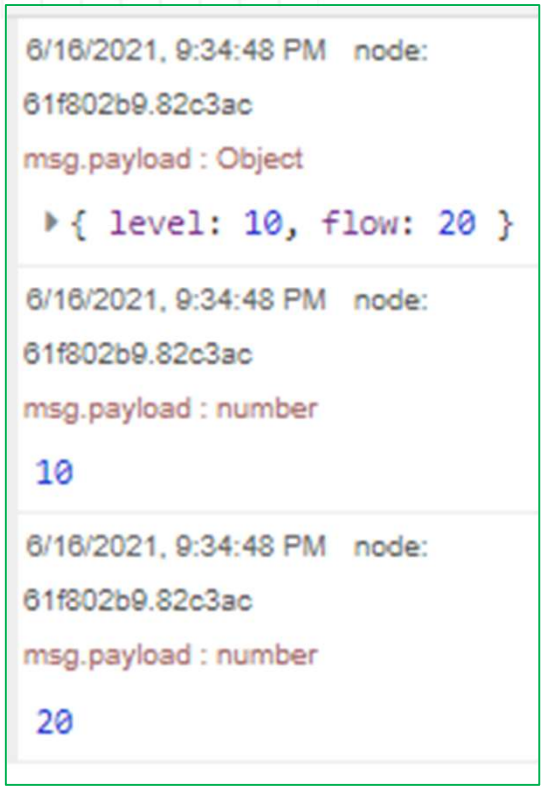


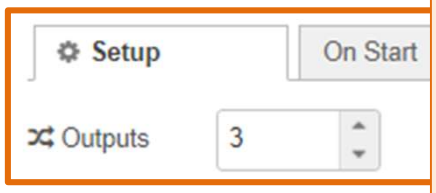



```
var msg1 = {};
var msg2 = {};
msg1.payload = msg.payload[0] ;
msg2.payload = msg.payload[1] ;
return [ msg1, msg2 ];
```





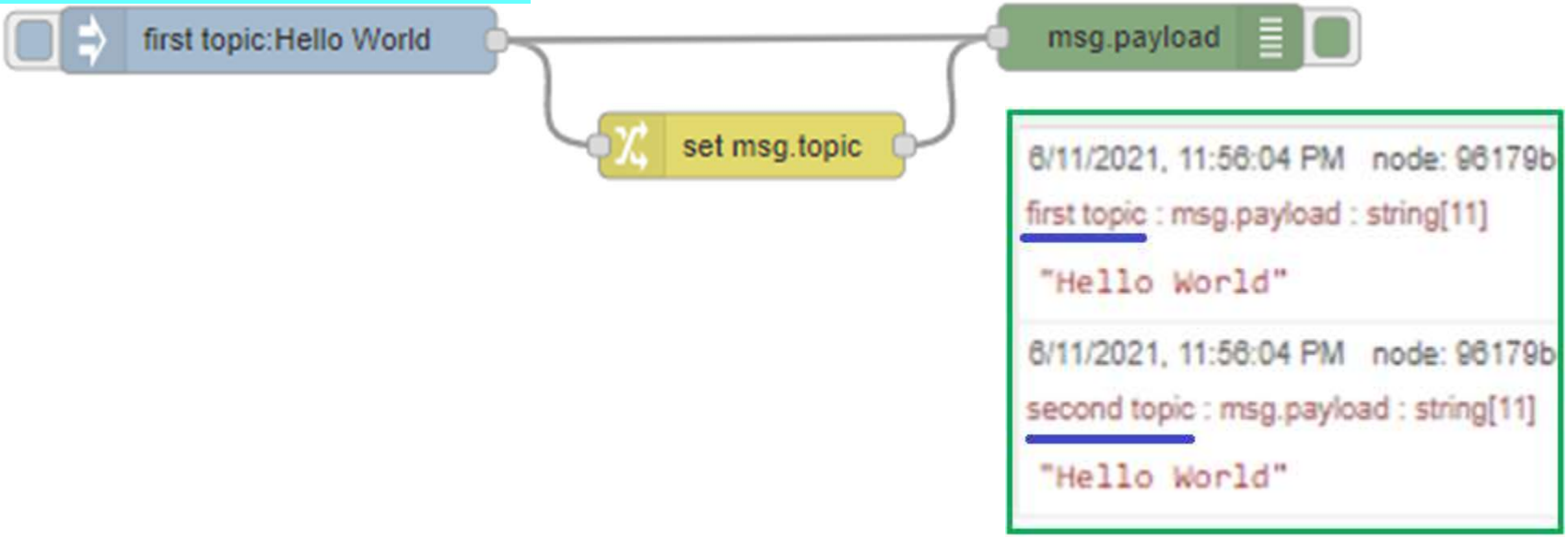


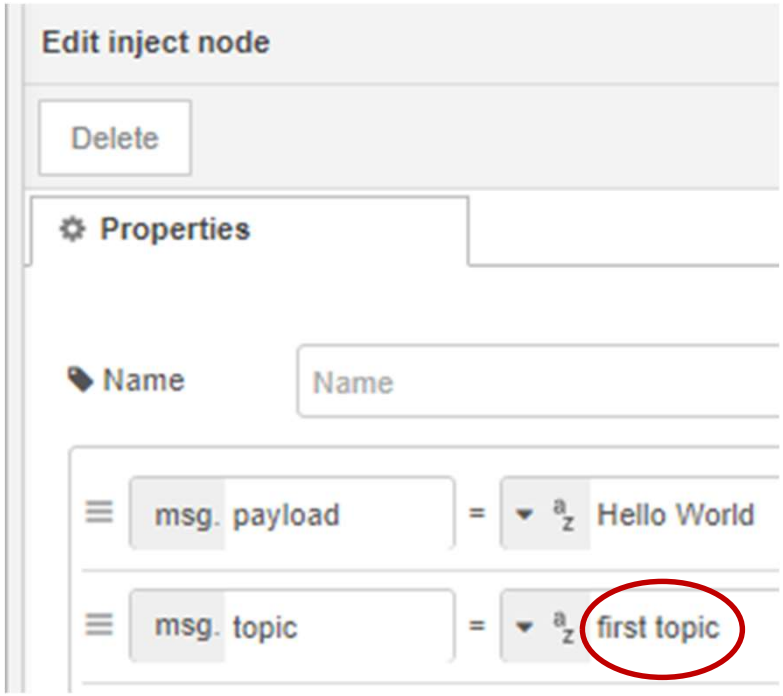


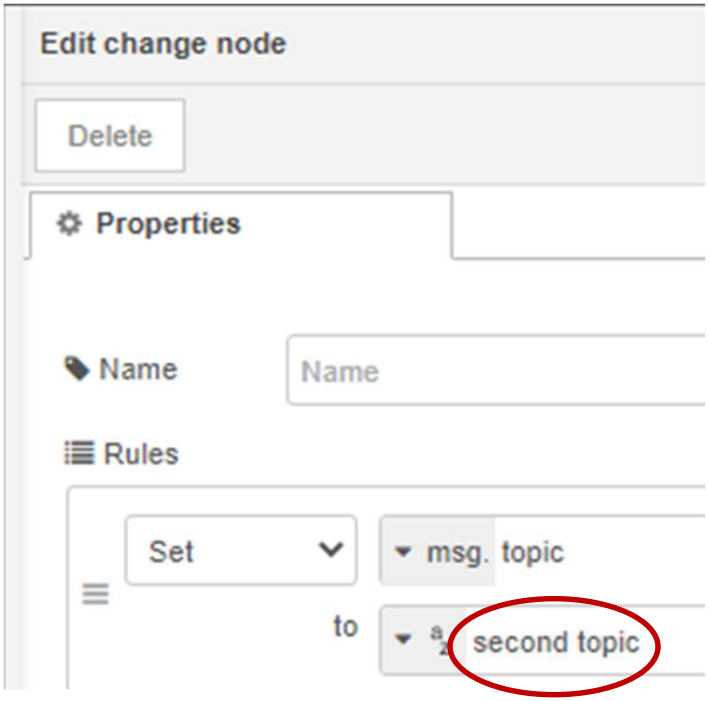

```
var msg1 = {};
var msg2 = {};
msg1.payload = msg.payload.level;
msg2.payload = msg.payload.flow ;
return [ msg1, msg2 , null ];
```

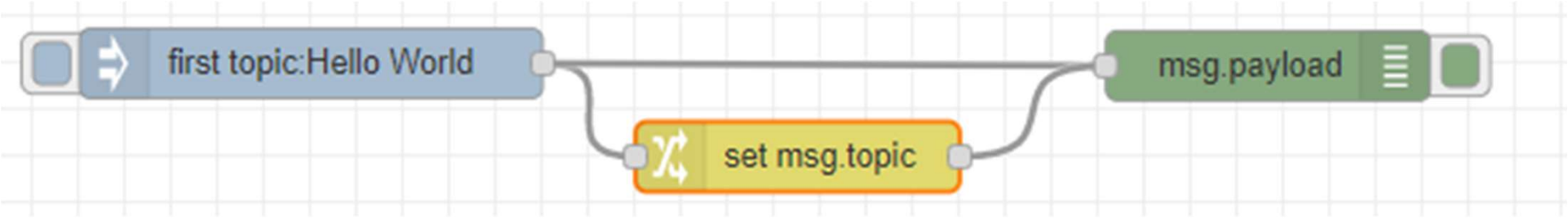
Change กำหนดค่า topic

GitHub Node-Red - 02 Basic Change









Rules

Change msg. payload

Search for @1

Replace with สมชาย

Change msg. payload

Search for @2

Replace with ขยันมาก

+ add

6/16/2021, 9:44:06 PM node: 1cc46d5c.078543

msg.payload : string[16]

"My name is @1 @2"

6/16/2021, 9:44:06 PM node: 1cc46d5c.078543

msg.payload : string[24]

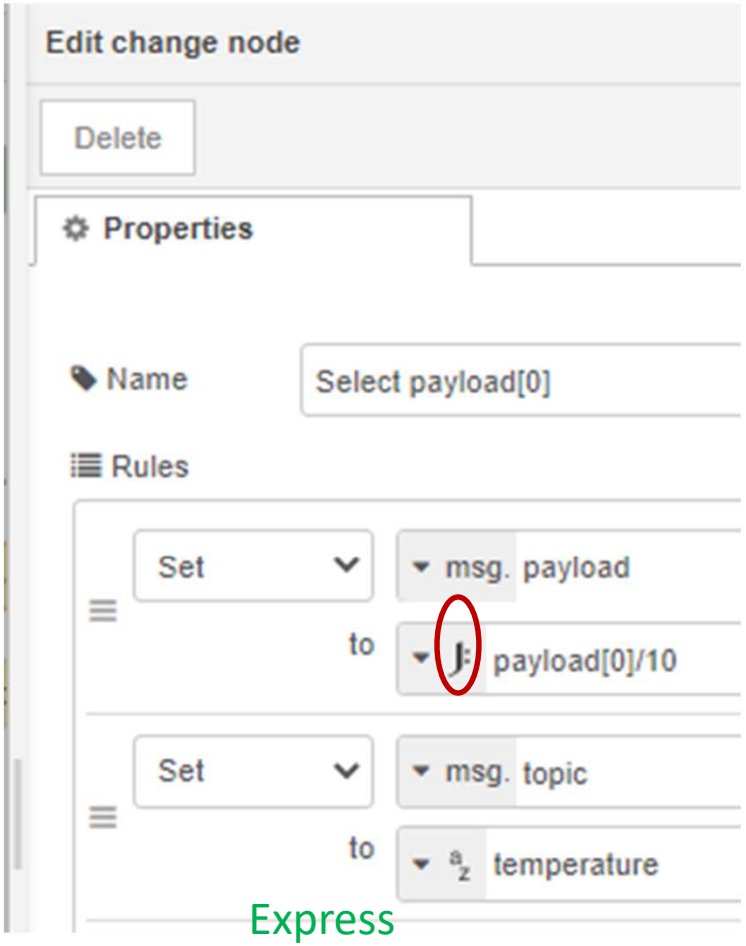
"My name is สมชาย ขยันมาก"

แยกค่าเป็น สองทางและกำหนด topic ใหม่

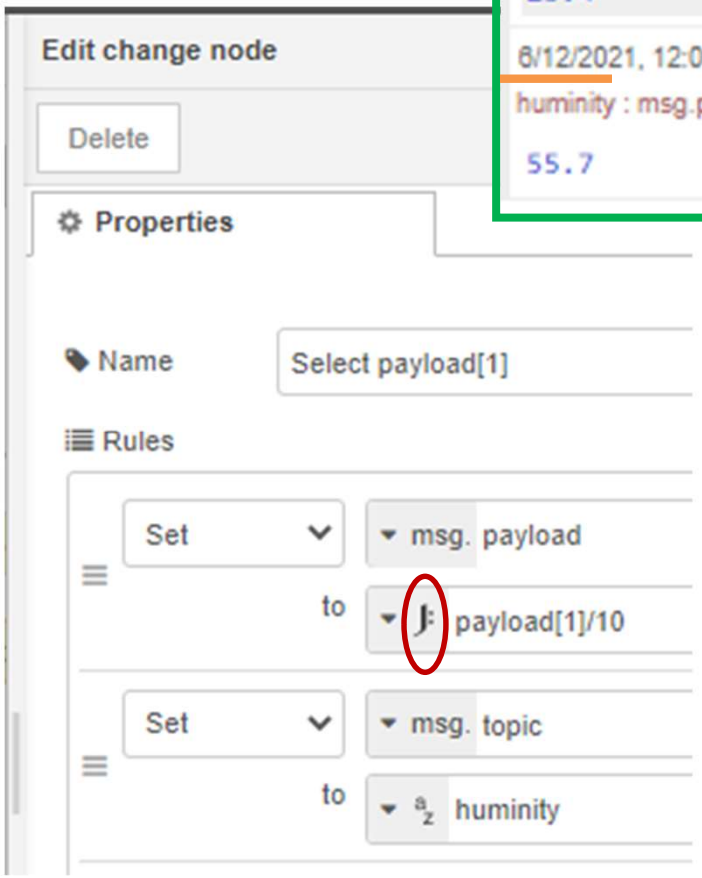
GitHub Node-Red - 02 Change-Function

payload[0] , payload[1]

6/12/2021, 12:09:36 AM node: 9bda3
msg.payload : array[2]
[254, 557]
6/12/2021, 12:09:36 AM node: 9bda3
temperature : msg.payload : number
25.4
6/12/2021, 12:09:36 AM node: 9bda3
huminity : msg.payload : number
55.7



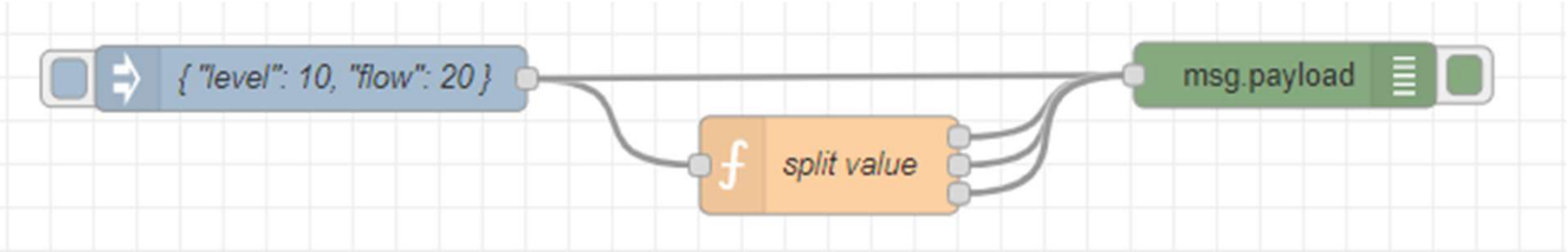
Express
Payload[0]/10

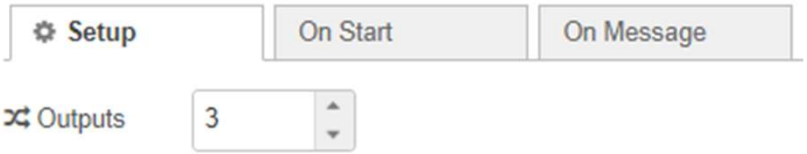


Express
Payload[1]/10

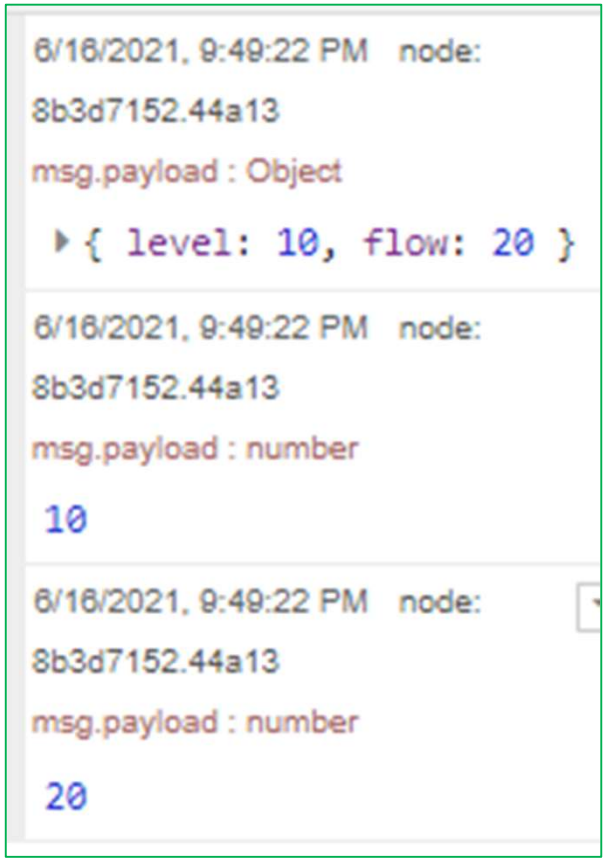

```
if (msg.payload < msg.topic ) return null ;

return msg;
```

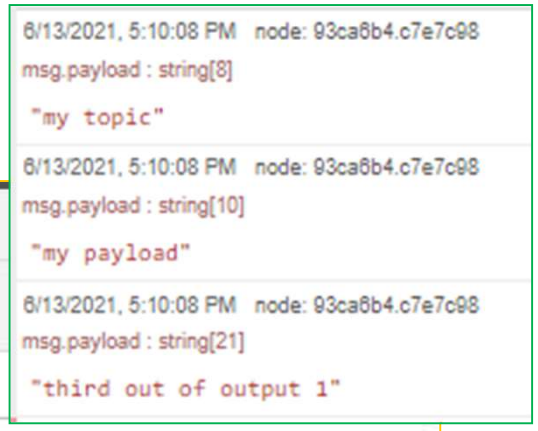
6/16/2021, 9:46:59 PM node: 17f32694.c92379
2 : msg.payload : number
6

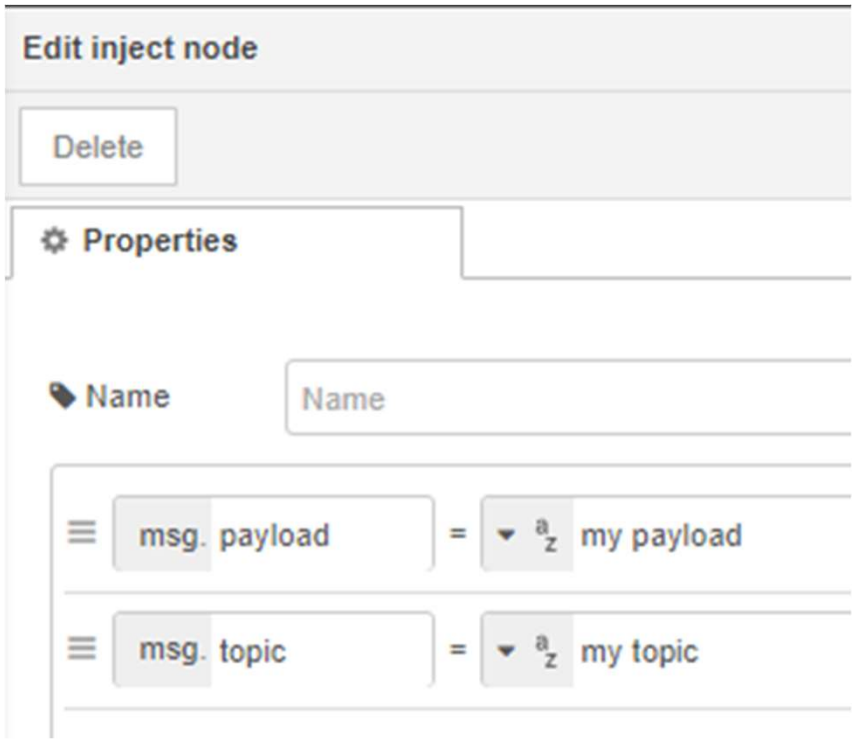


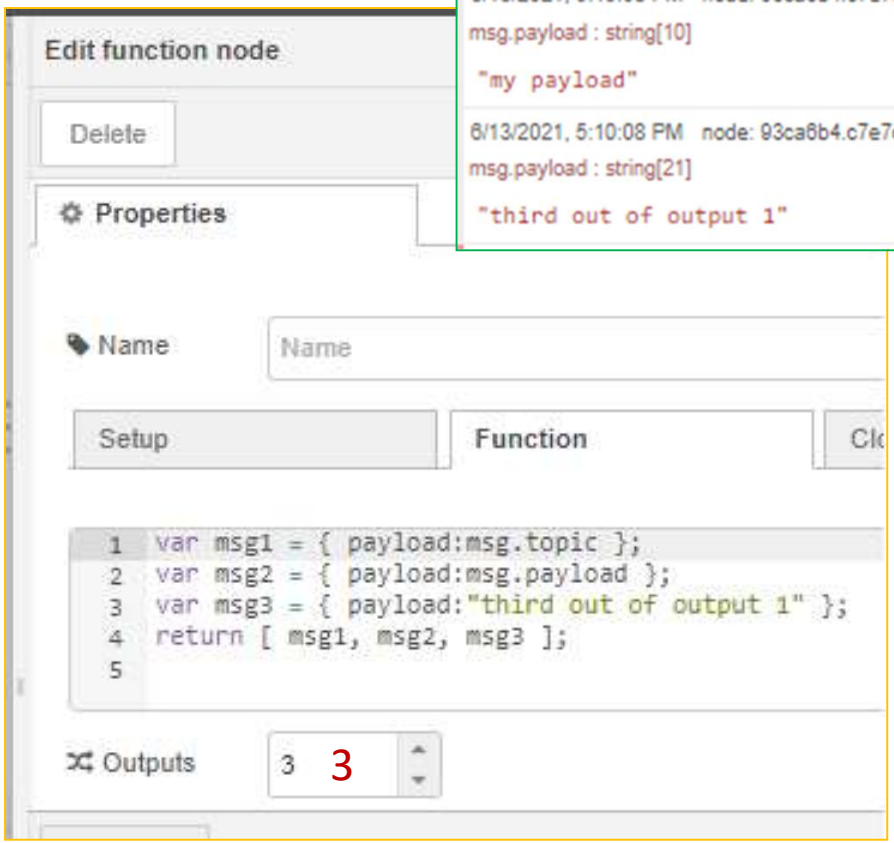



```
var msg1 = {};
var msg2 = {};
var msg3 = null;

msg1.payload = msg.payload.level;
msg2.payload = msg.payload.flow ;

return [ msg1, msg2 ,msg3 ];
```

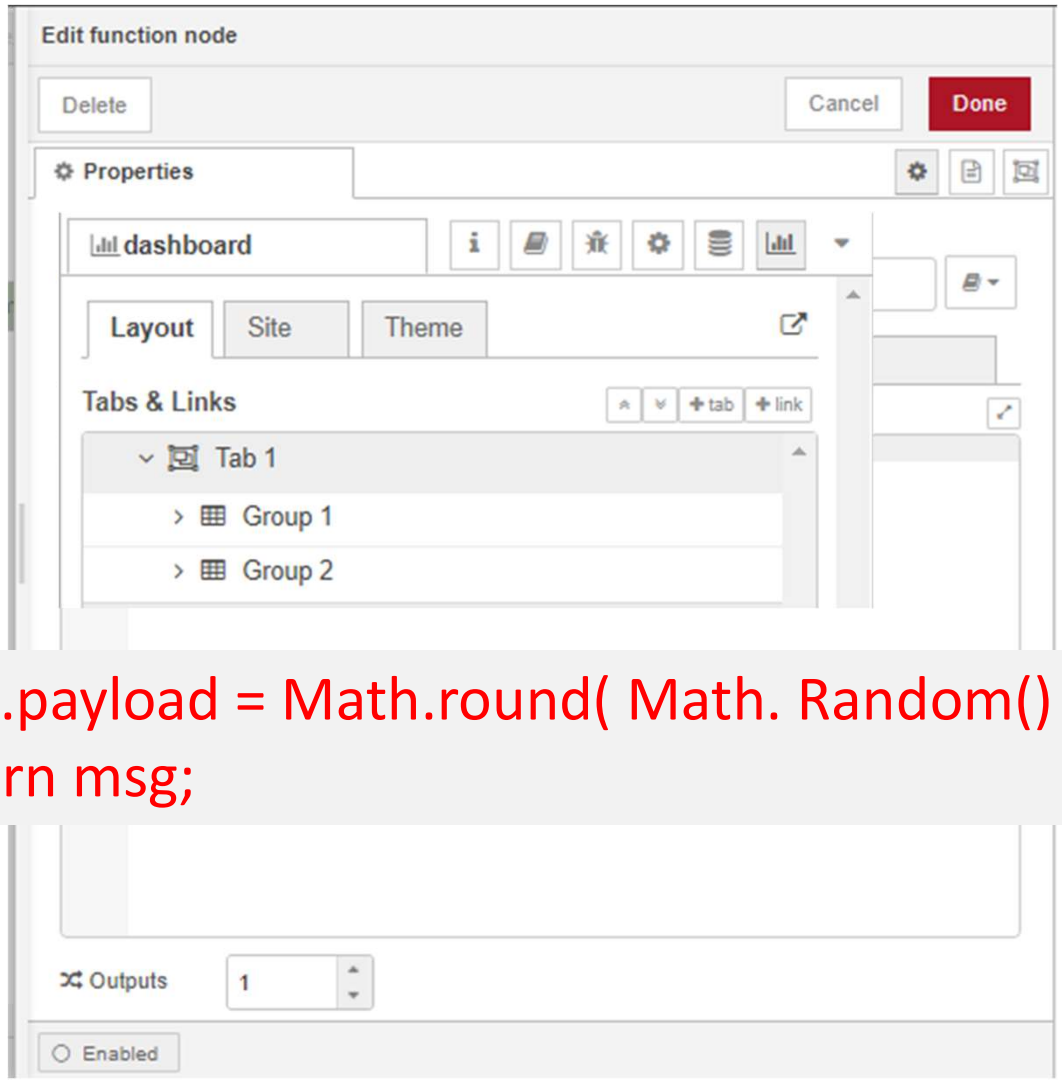






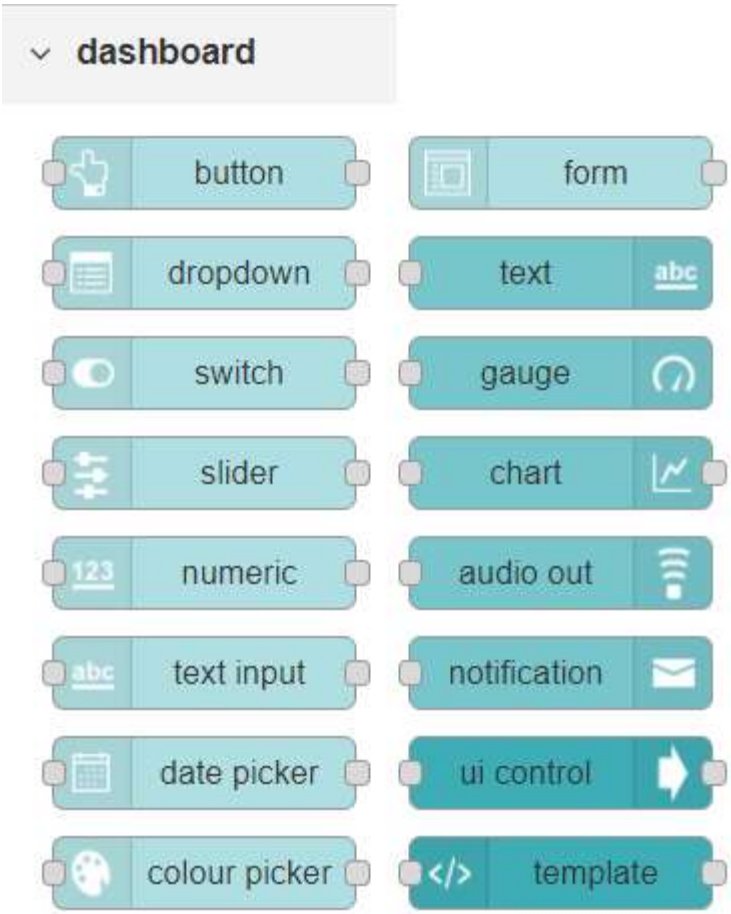



```
var msg1 = { payload:msg.topic };
var msg2 = { payload:msg.payload };
var msg3 = { payload:"third out of output 1" };
return [ msg1, msg2, msg3 ];
```

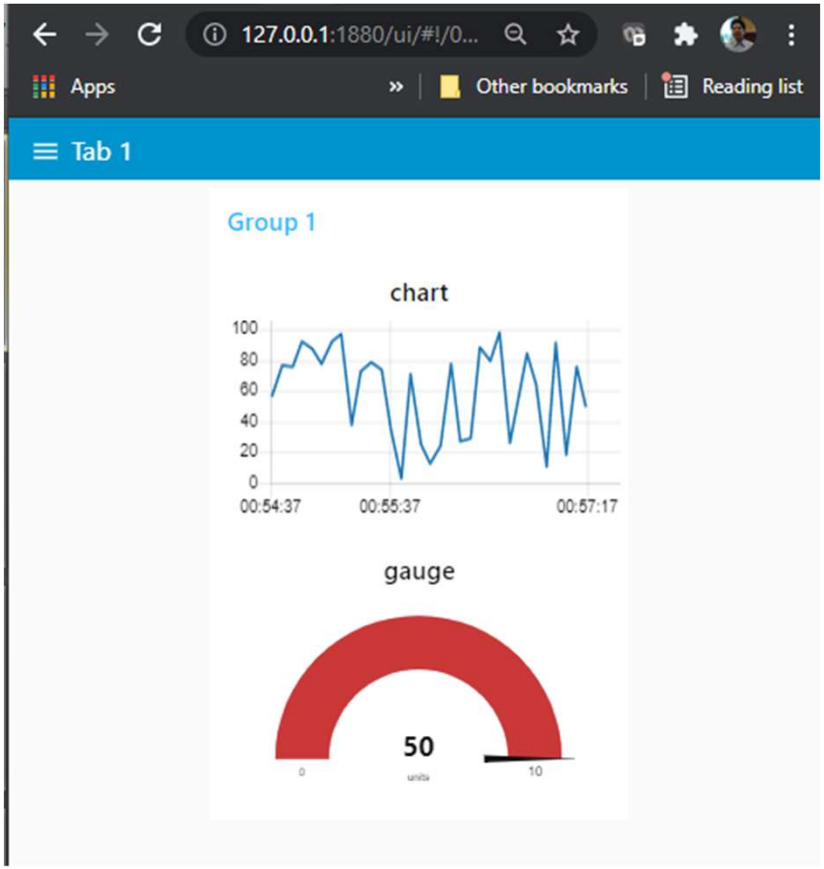



```
msg.payload = Math.round( Math. Random() *100)
return msg;
```

Dashboard Module

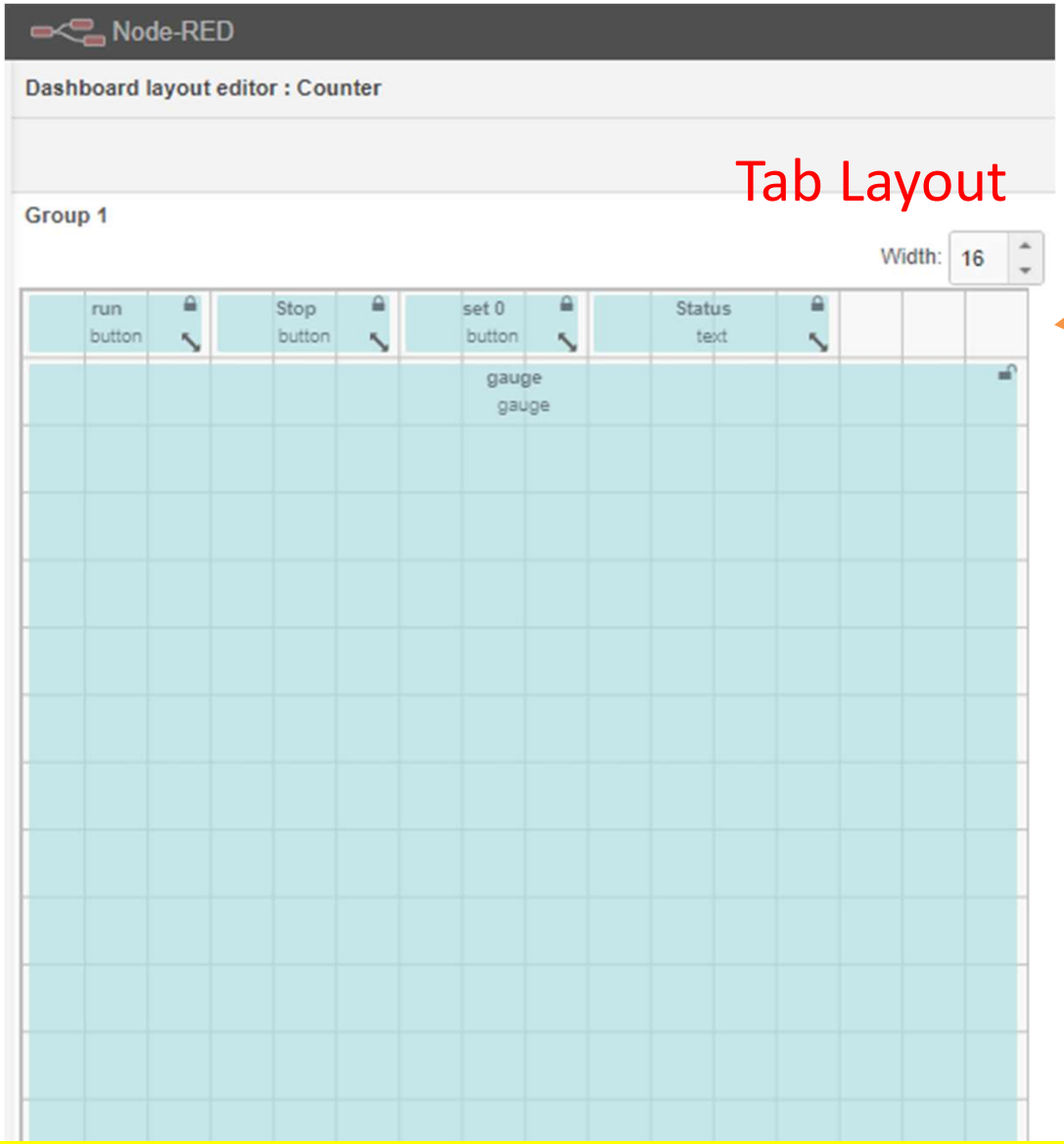


http://127.0.0.1:1880/

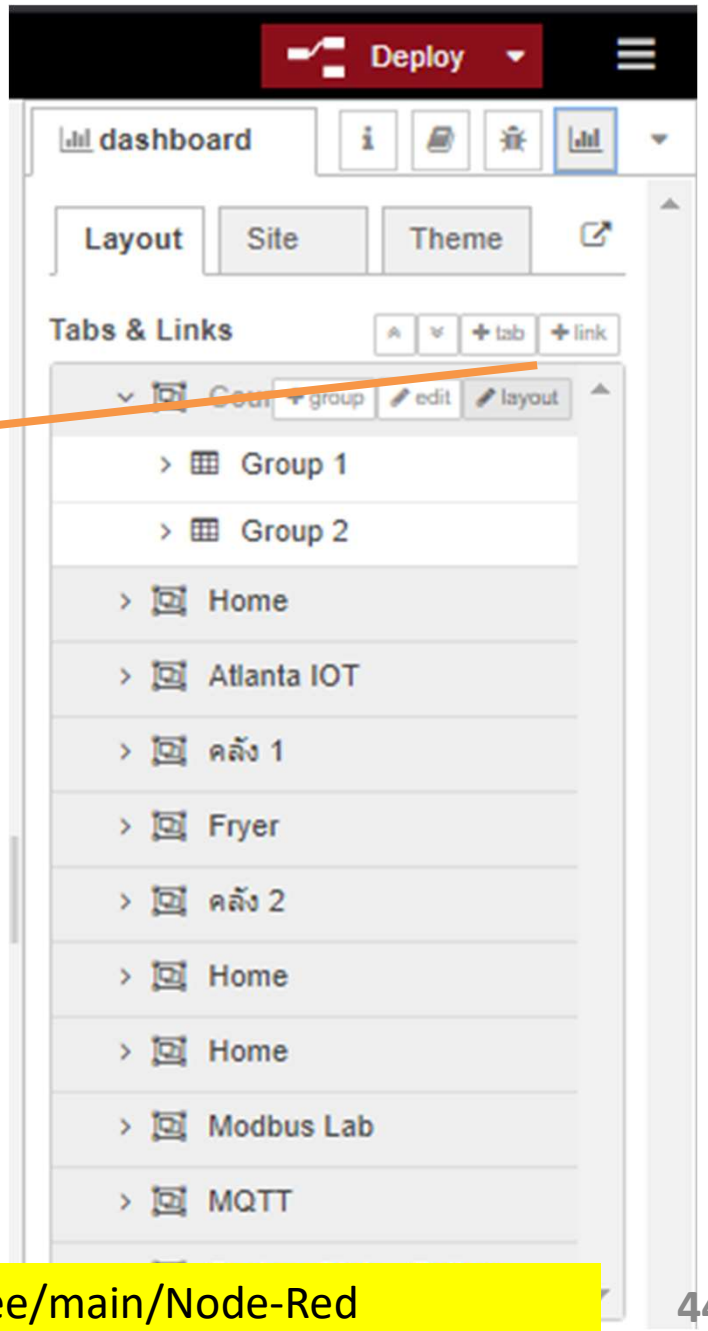


สร้าง Tab และ Group เพื่อกำหนดพื้นที่แสดง

GitHub Node-Red 03 Basic Dashboard



Tab Layout

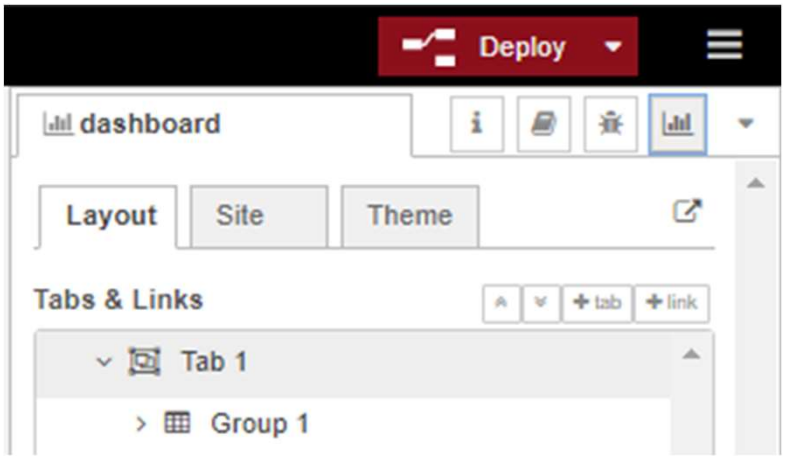


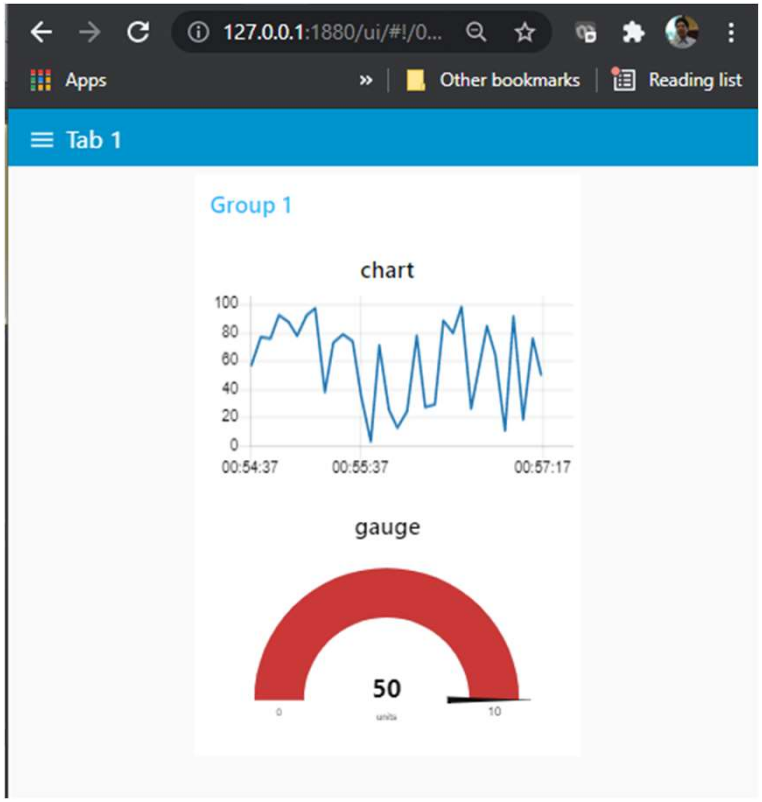
https://github.com/chalermchonv/UtccFoodIotCodes/tree/main/Node-Red

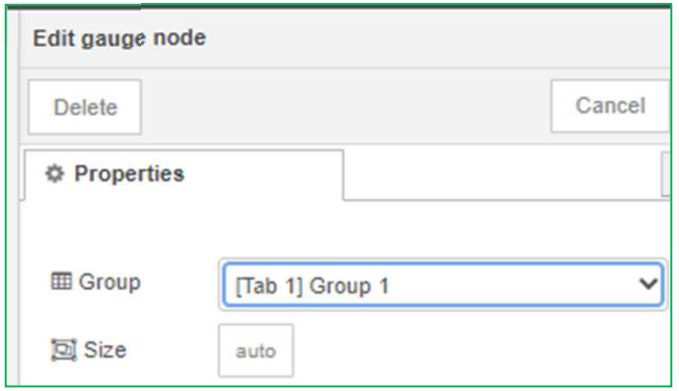
Basic Dashboard Control

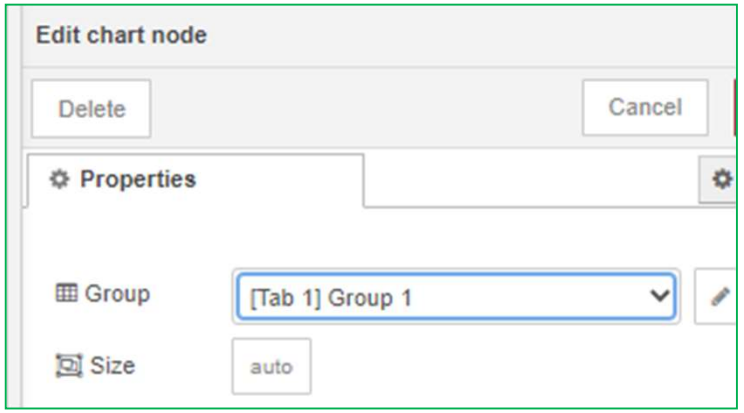
GitHub Node-Red 03 Basic Dashboard

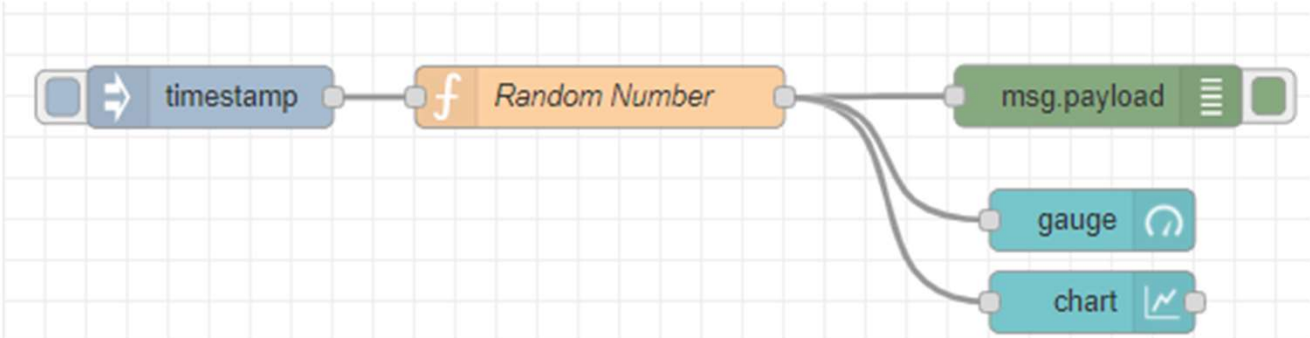
```
msg.payload = Math.round( Math. Random() *100)
return msg;
```

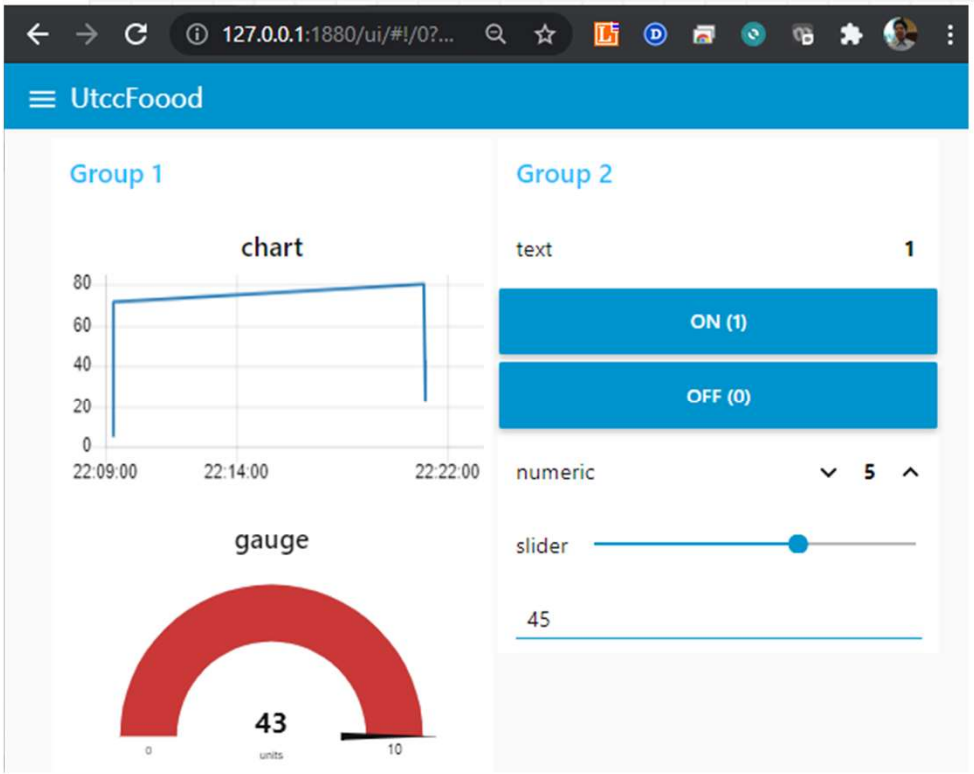


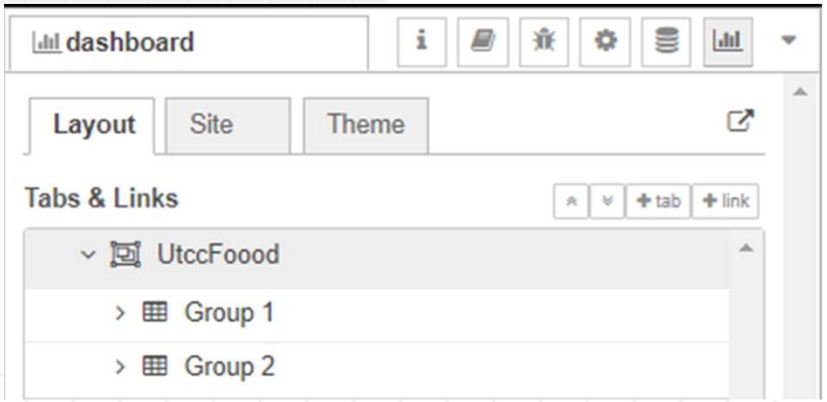


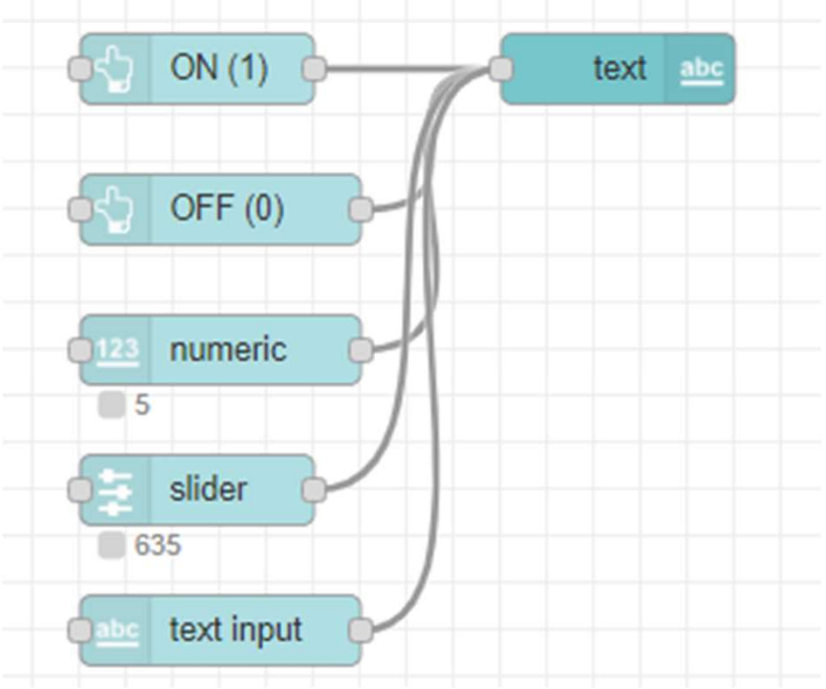





timestamp
Random Number
msg.payload
gauge
chart

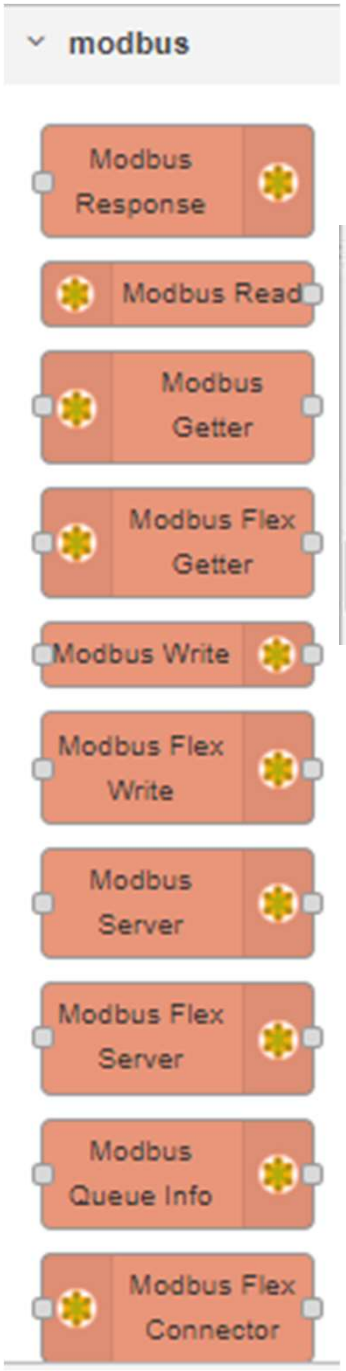

127.0.0.1:1880/ui/#!/0?...
UtccFoood
Group 1
chart
80
60
40
20
0
22:09:00
22:14:00
22:22:00
gauge
43
0
units
10
Group 2
text
1
ON (1)
OFF (0)
numeric
5
slider
45

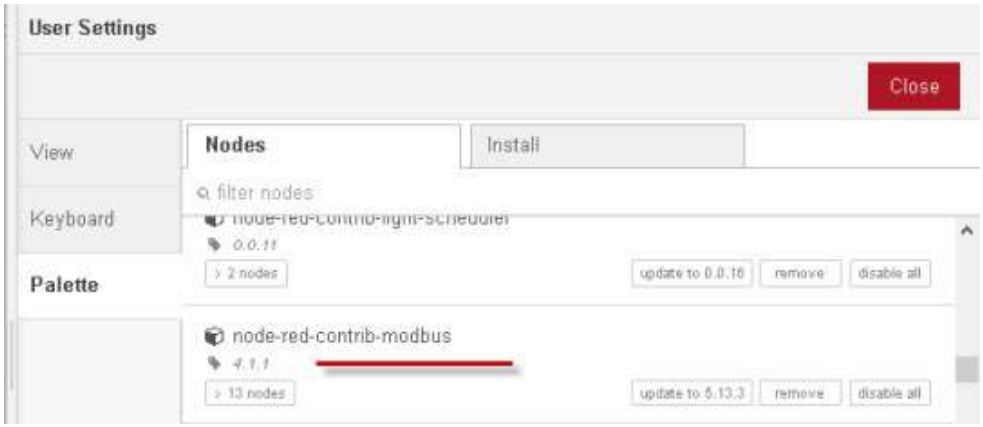

dashboard
Layout
Site
Theme
Tabs & Links
+tab
+link
UtccFoood
Group 1
Group 2


ON (1)
text
abc
OFF (0)
123
numeric
5
slider
635
abc
text input

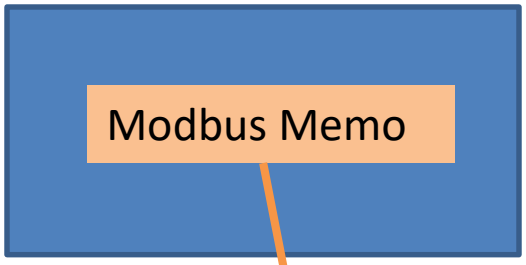
YouTube Node-Red 04 Modbus

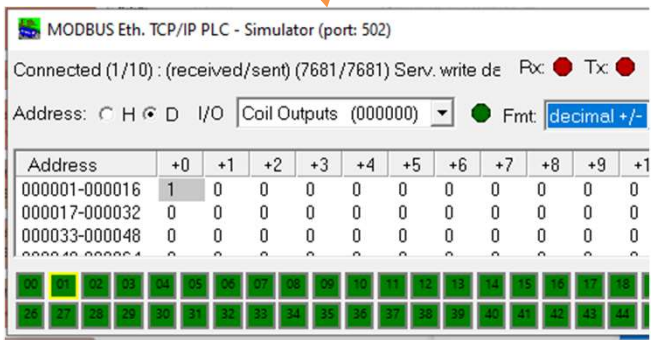
Modbus

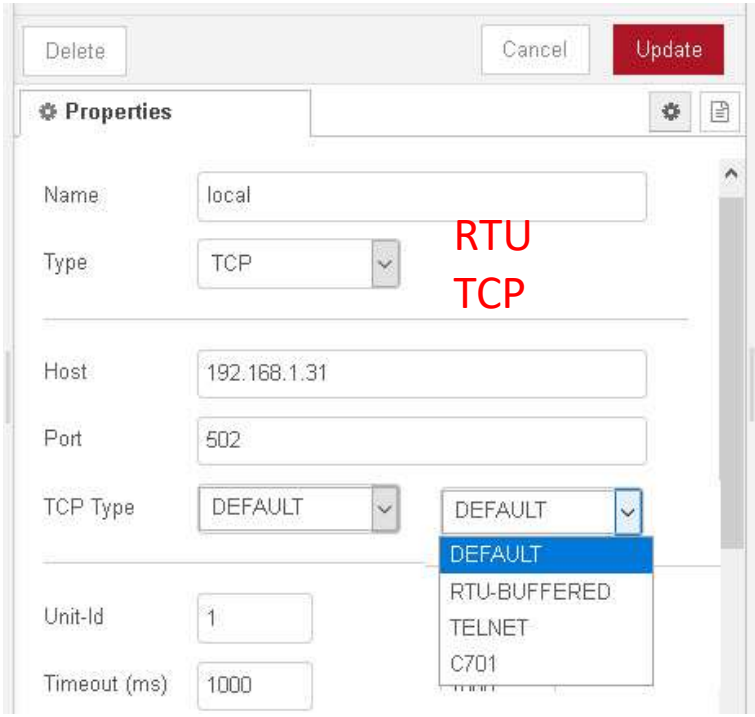


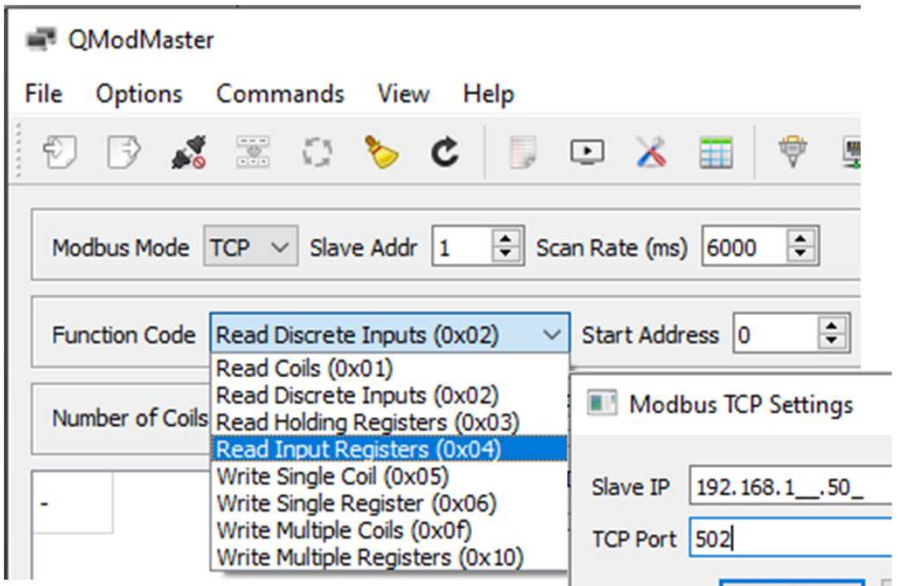


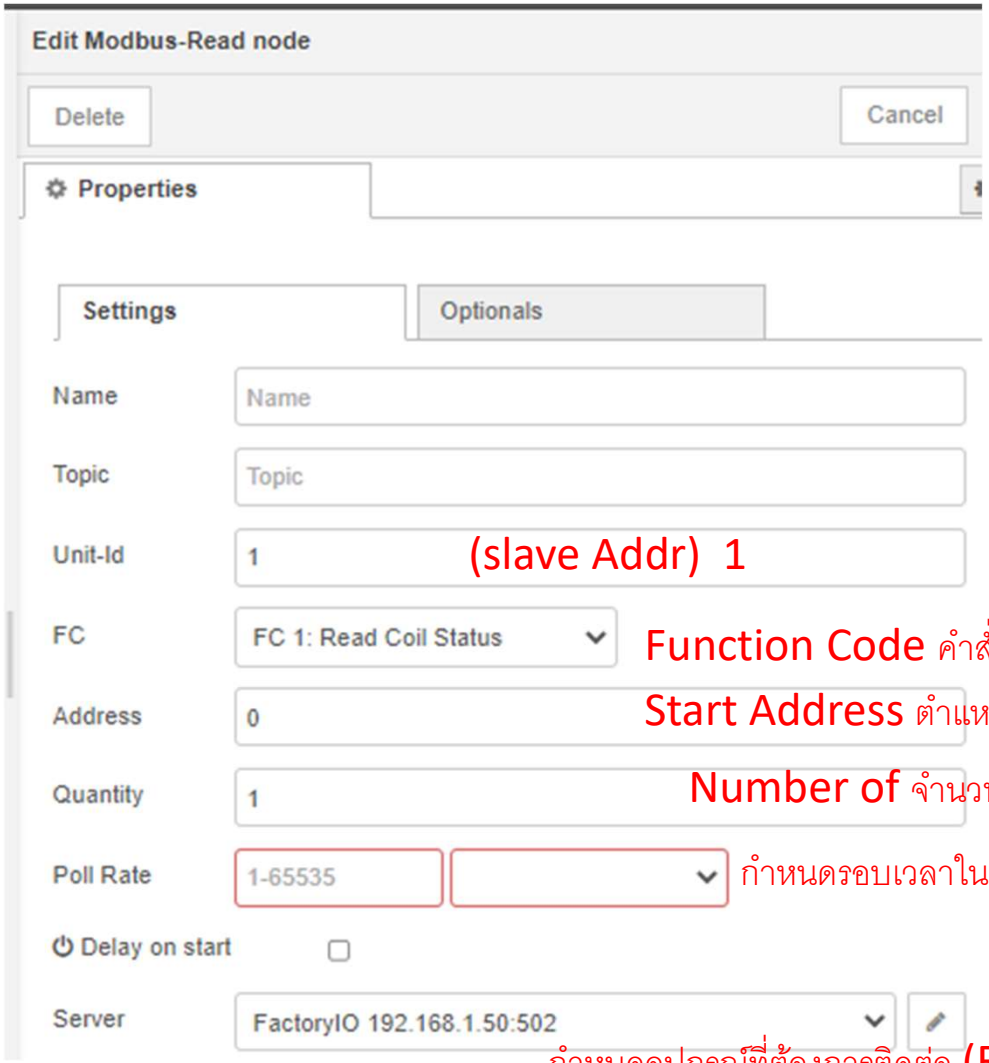
Sensor , Machine, PLC,HMI











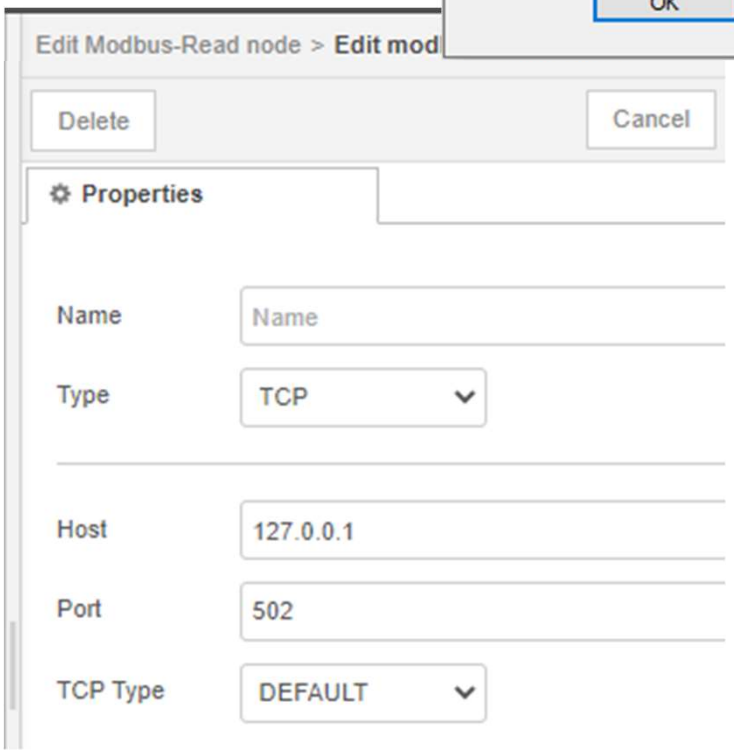
(slave Addr) 1

Function Code คำสั่ง

Start Address ตำแหน่งข้อมูล

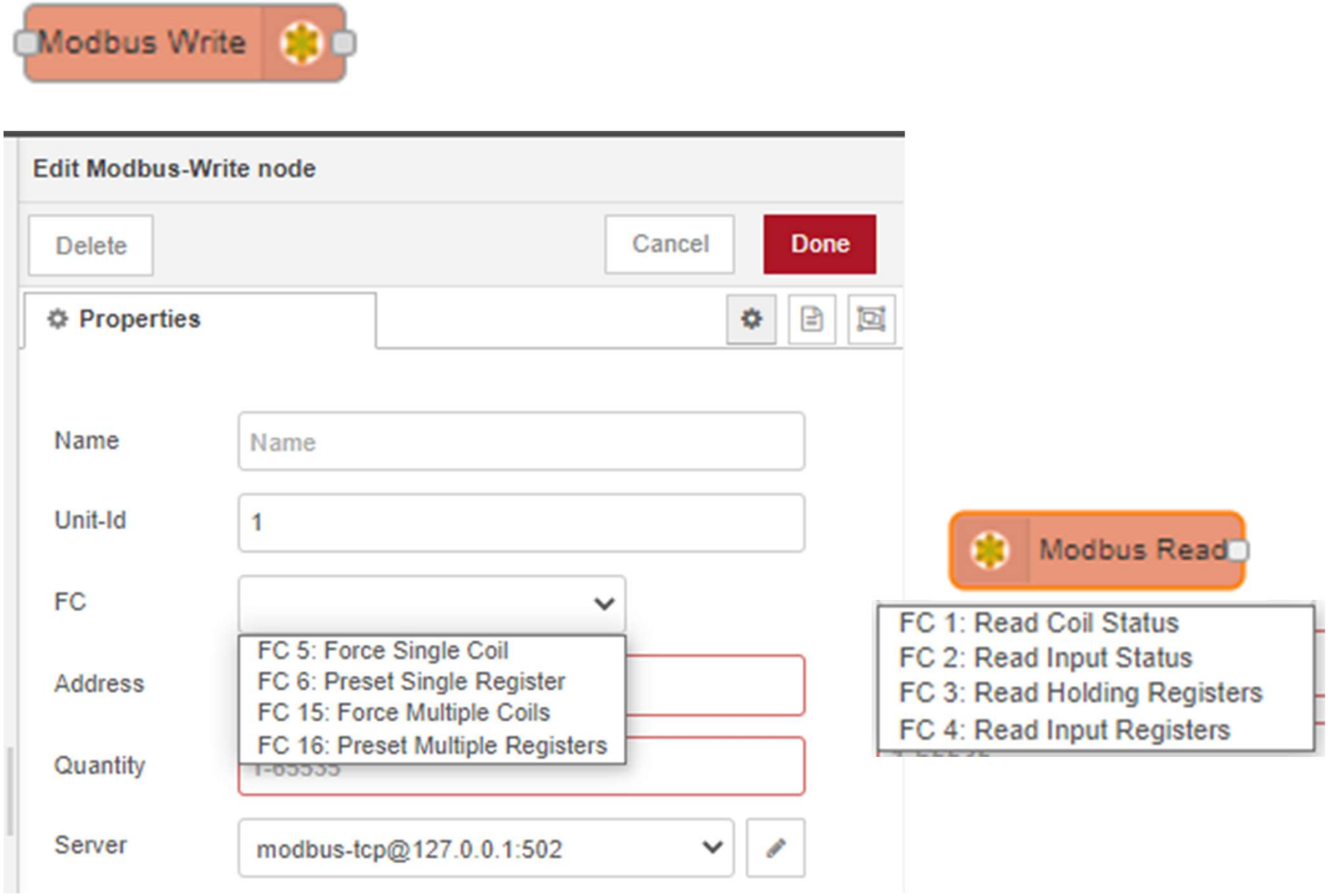
Number of จำนวนข้อมูล

กำหนดรอบเวลาในการอ่าน



กำหนดอุปกรณ์ที่ต้องการติดต่อ (RTU,TCP)

YouTube Node-Red 05 Modbus



YouTube Node-Red 04 Modbus FactoryIO

Modbus Read

FC 1: Read Coil Status
FC 2: Read Input Status
FC 3: Read Holding Registers
FC 4: Read Input Registers

Modbus Write

FC 5: Force Single Coil
FC 6: Preset Single Register
FC 15: Force Multiple Coils
FC 16: Preset Multiple Registers

คำสั่ง FC 1 (Re

Factory IO

ควบคุมจาก Server (Master) ภายนอก (Note-Red , QModMaster, PLC, HMI)

DRIVER | Modbus TCP/IP Server | START CONFIGURATION CLEAR

SENSORS

FACTORY I/O (Paused)
FACTORY I/O (Reset)
FACTORY I/O (Running)
FACTORY I/O (Time Scale)
Sensor

Input

(192.168.1.50:502)
Slave ID:1

Sensor
I/O (Running)
Input 0
Input 1

FC 2 (Read only)

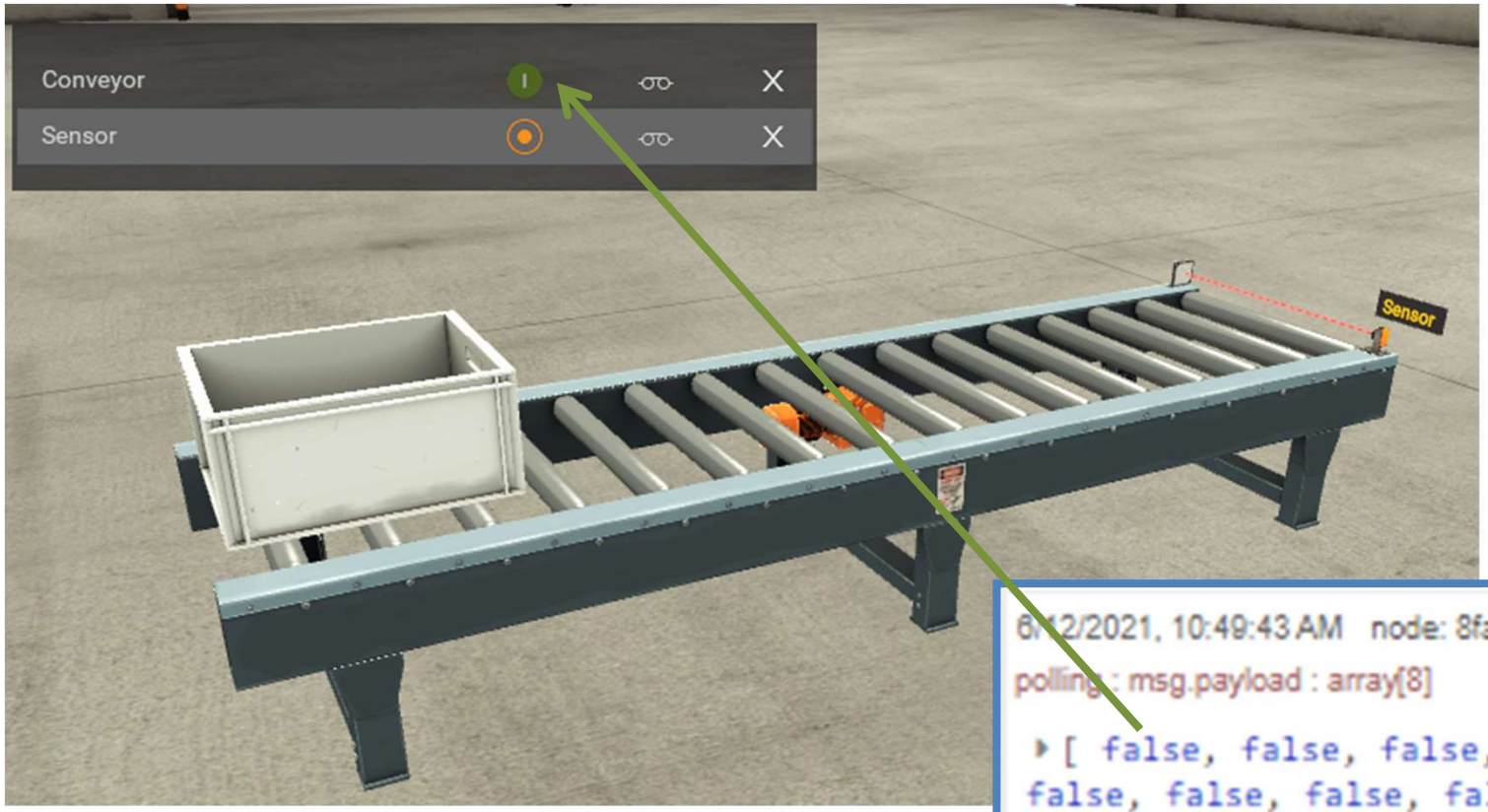
Output -Coil

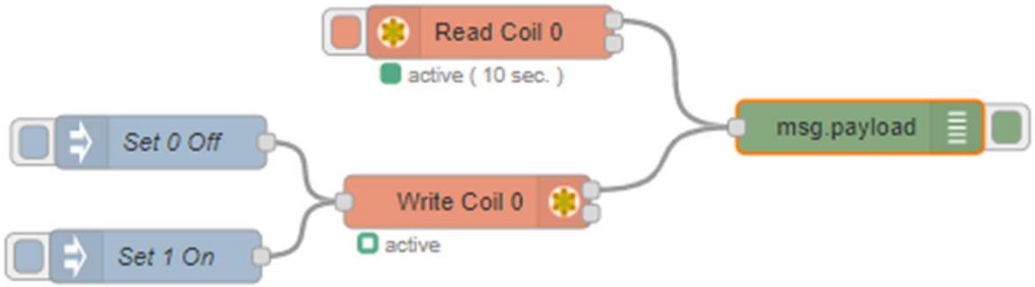
Coil 0
Conveyor

FC 1 (Read)
FC 5 (Write)

ACTUATORS

Conveyor
FACTORY I/O (Camera Position)
FACTORY I/O (Pause)
FACTORY I/O (Reset)
FACTORY I/O (Run)



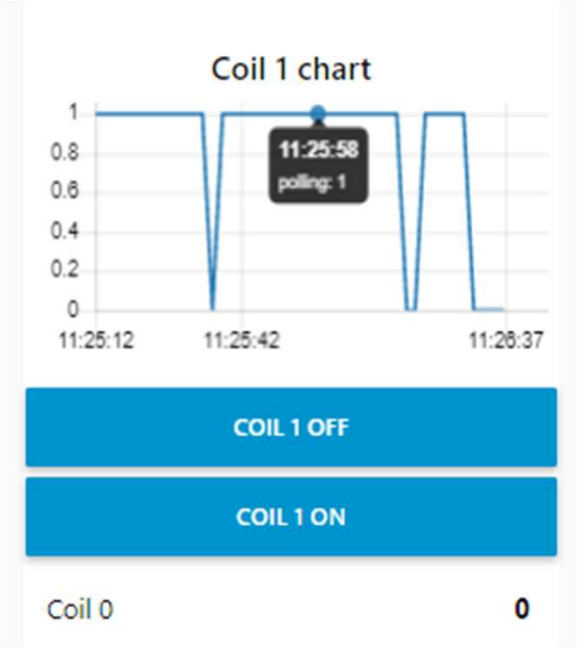


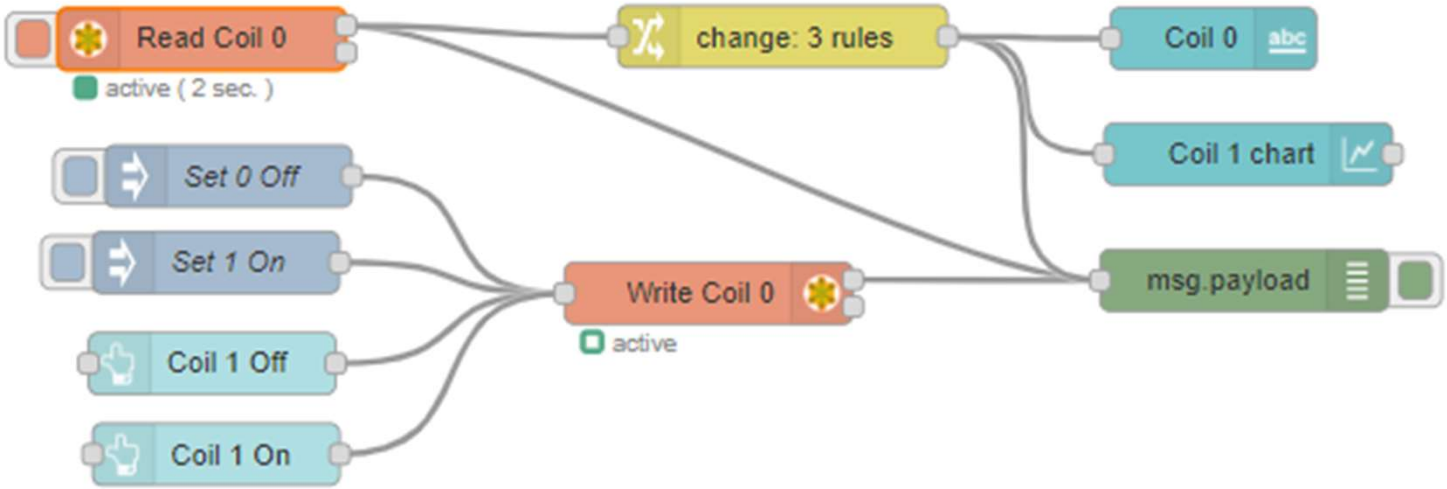
6/12/2021, 10:49:43 AM node: 8fad0f3b.89d87
polling : msg.payload : array[8]
▸ [false, false, false, false, false, false, false, false]

6/12/2021, 10:49:47 AM node: 8fad0f3b.89d87
fa84ffb4.b3eb3 : msg.payload : Object
▸ { value: true, unitid: "1", fc: 5, address: 0, quantity: "1" … }

6/12/2021, 10:49:53 AM node: 8fad0f3b.89d87
polling : msg.payload : array[8]
▸ [true, false, false, false, false, false, false, false]


Conveyor
Sensor
Sensor


Coil 1 chart
1
0.8
0.6
0.4
0.2
0
11:25:12
11:25:42
11:26:37
11:25:58
polling: 1
COIL 1 OFF
COIL 1 ON
Coil 0
0

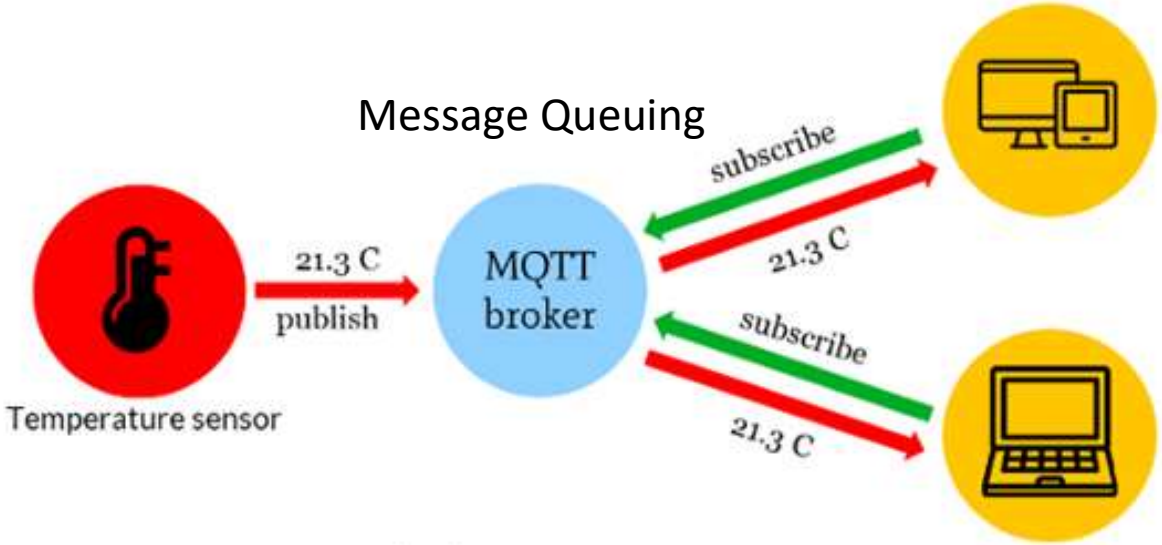

Read Coil 0
active (2 sec.)
change: 3 rules
Coil 0
abc
Coil 1 chart
Set 0 Off
Set 1 On
Write Coil 0
active
msg.payload
Coil 1 Off
Coil 1 On

MQTT

- Message Queuing Telemetry Transport (MQTT)
- เป็น Protocol ที่ออกแบบมาเพื่อการเชื่อมต่อแบบ M2M (machine-to-machine) คือ อุปกรณ์ติดต่อหรือสื่อสารกับอุปกรณ์ โดยเป็นส่วนหนึ่งของเทคโนโลยี IoT (Internet of Things) ซึ่งเป็นเทคโนโลยีที่อินเทอร์เน็ตเชื่อมต่อกับอุปกรณ์ต่าง ๆ เช่น โทรศัพท์มือถือ รถยนต์ โทรทัศน์ ตู้เย็น เข้ากับอินเทอร์เน็ตทำให้สามารถเชื่อมโยงสื่อสารกับอุปกรณ์ต่าง ๆ ได้ โดยผ่านเครือข่ายอินเทอร์เน็ต ซึ่งจะทำให้มนุษย์สามารถ ควบคุมอุปกรณ์ต่าง ๆ จากที่อื่นได้ เช่นการสั่งปิดเปิดไฟในบ้านจากที่อื่น ๆ

MQTT Protocol

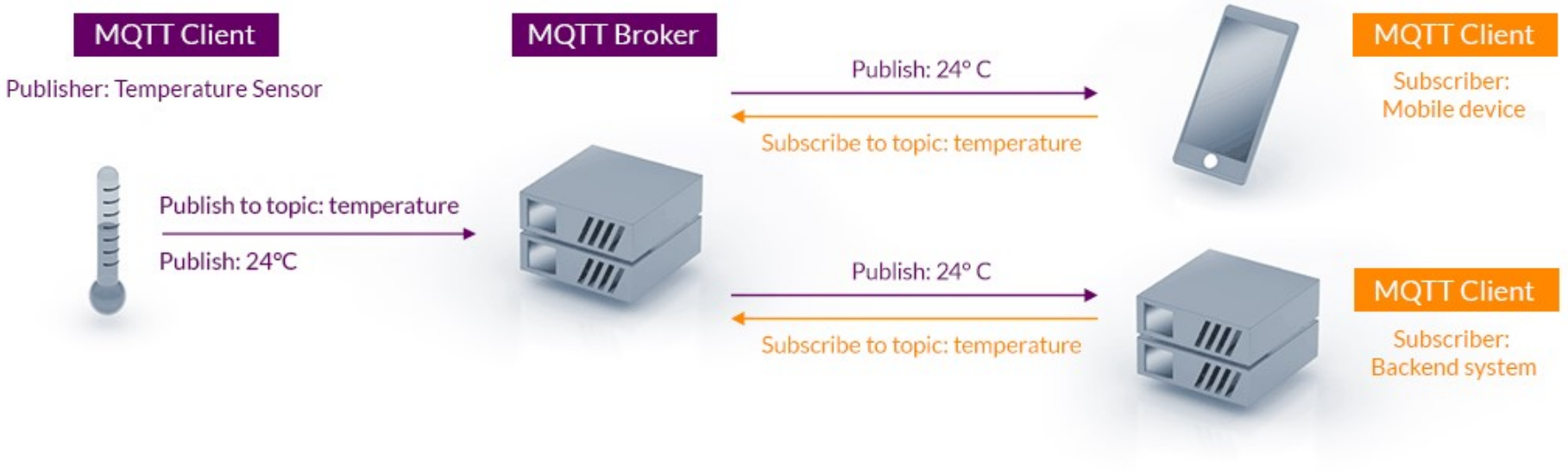
- การส่งข้อความ (publish) ผู้ส่ง (อุปกรณ์ IOT, Software)
- ผู้บริการรับส่งข้อความ (MQTT broker) ตัวกลาง Server , Cloud
- การรอรับข้อความ (subscribe) ผู้รับ (อุปกรณ์ IOT, Software)



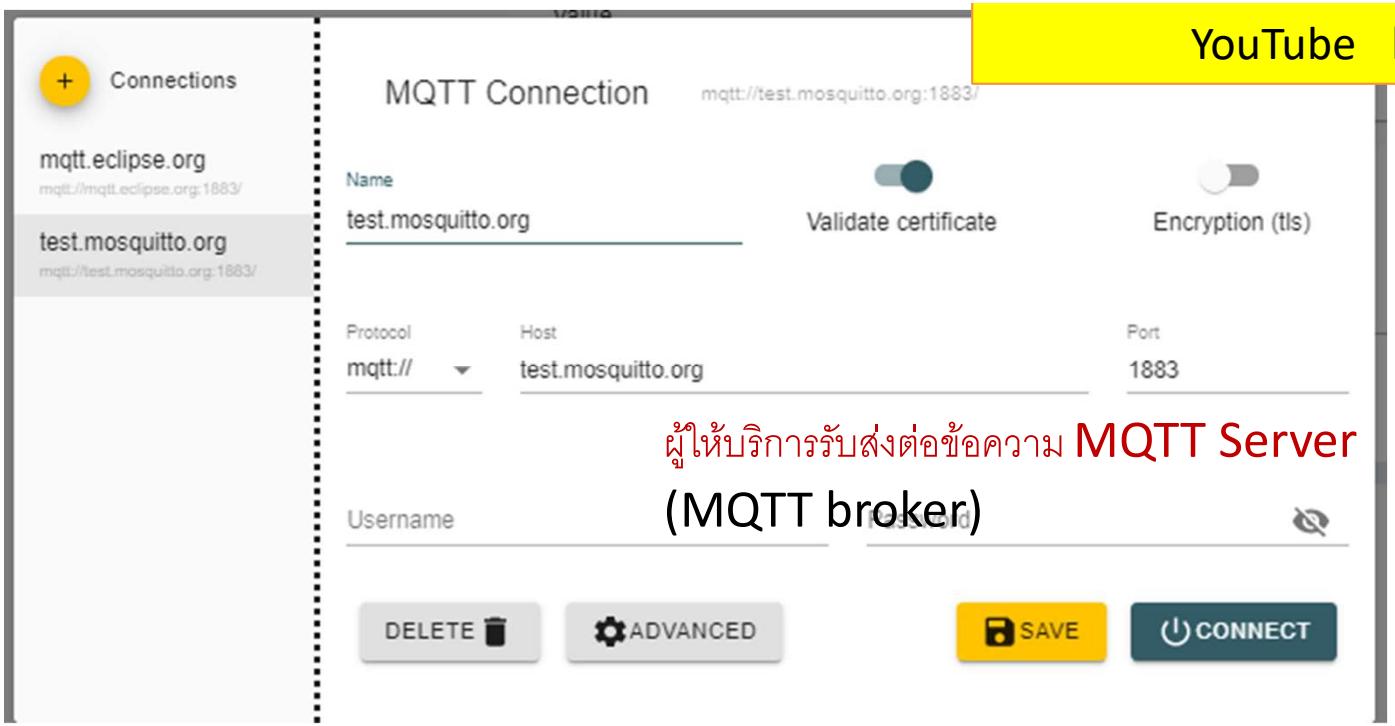
Schematic data flow from sensor (machine) to devise (machine)

Mobile , PC ,PLC,IOT

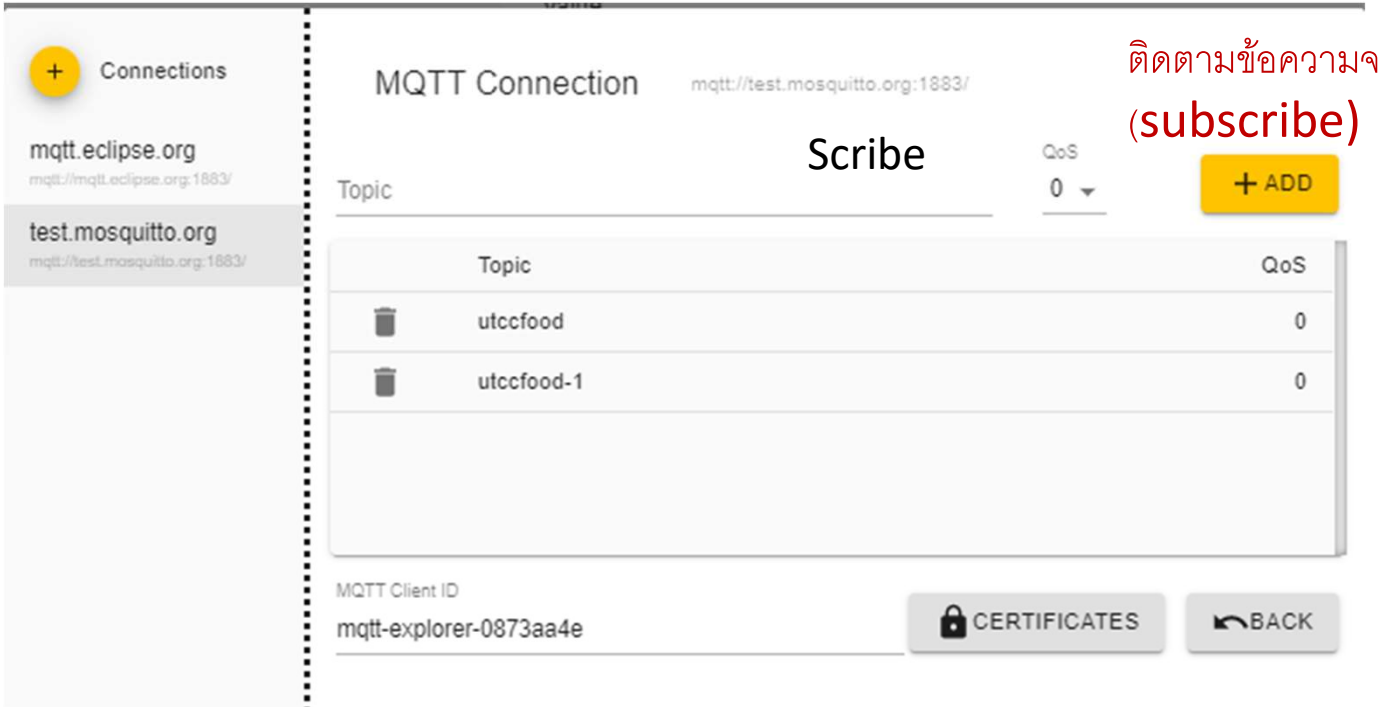
- สามารถรับ และส่ง ได้ในอุปกรณ์เดียวกัน
- เป็นการสื่อสารสองทาง


MQTT Client
Publisher: Temperature Sensor
MQTT Broker
Publish: 24° C
Subscribe to topic: temperature
MQTT Client
Subscriber:
Mobile device
Publish to topic: temperature
Publish: 24°C
Publish: 24° C
Subscribe to topic: temperature
MQTT Client
Subscriber:
Backend system

YouTube MQTT 01 Basic

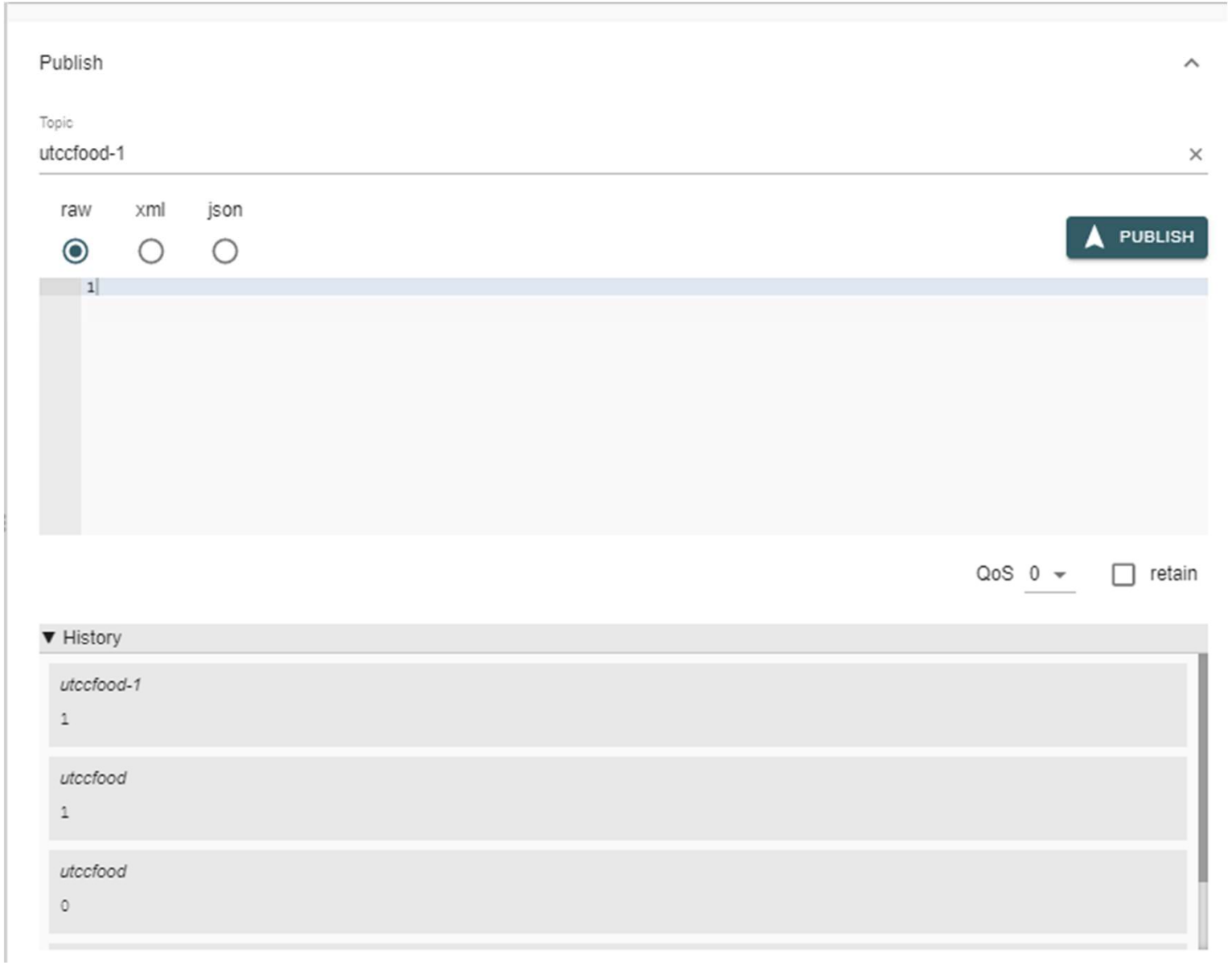


ผู้ให้บริการรับส่งต่อข้อความ MQTT Server (MQTT broker)

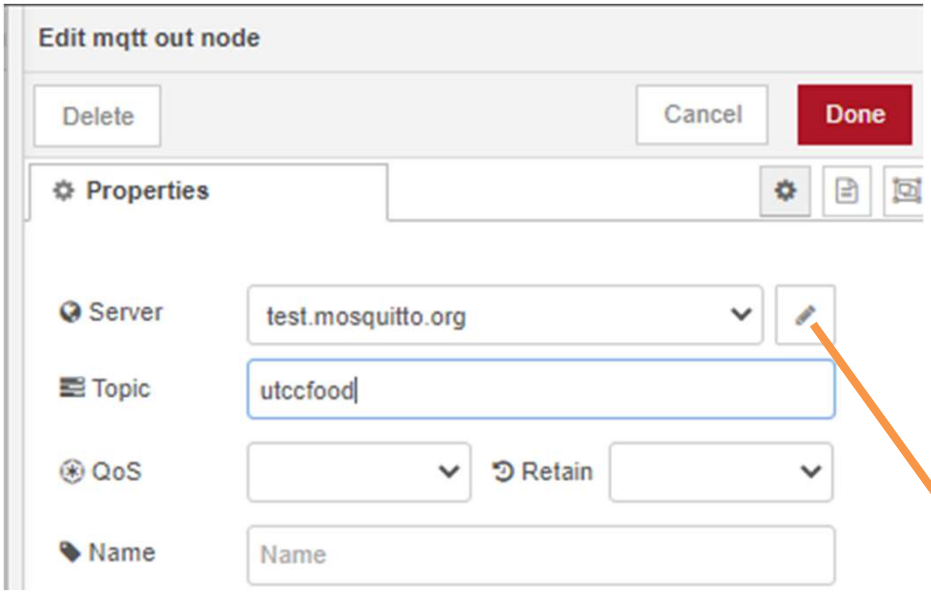


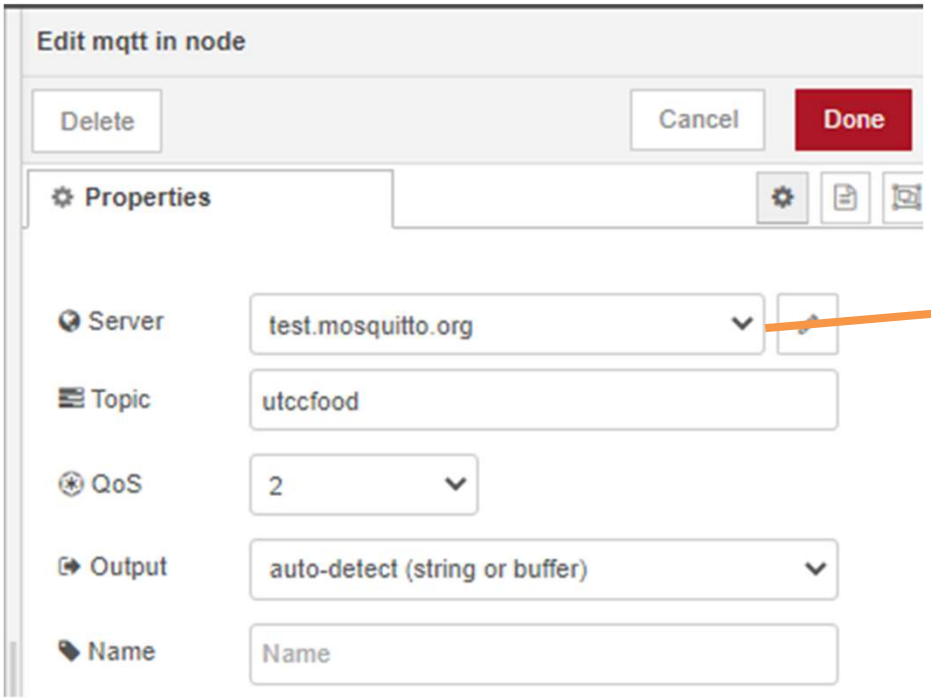
Scribe

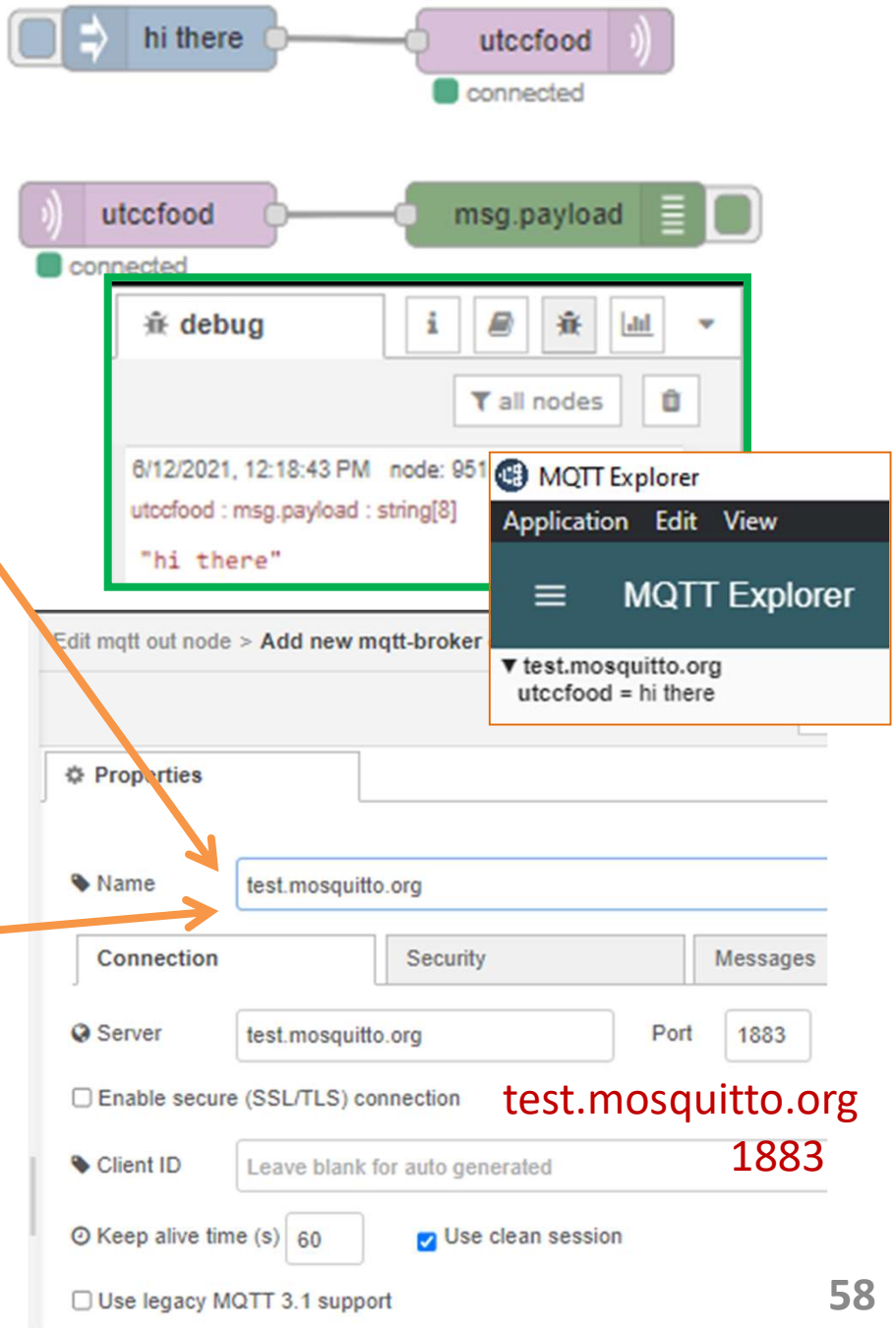
ติดตามข้อความจาก Topic (subscribe)


Publish
Topic
utccfood-1
raw
xml
json
PUBLISH
1
QoS 0
retain
History
utccfood-1
1
utccfood
1
utccfood
0

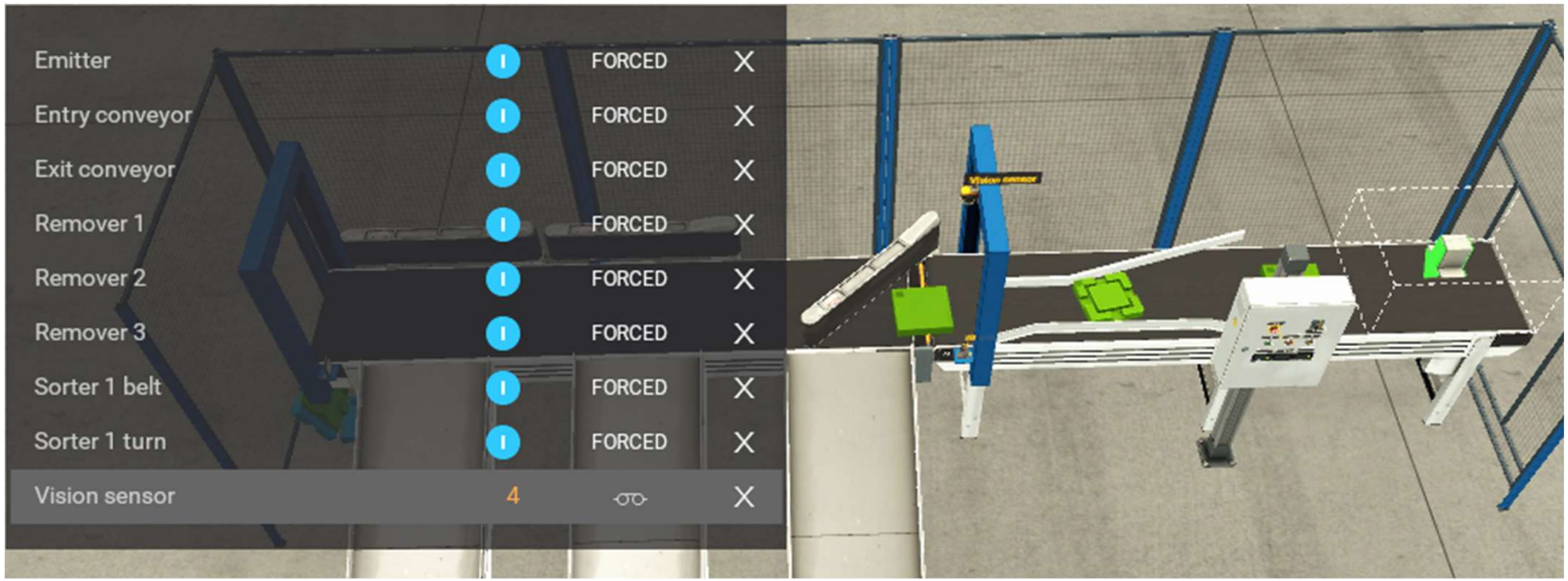
YouTube MQTT 02 Node-Red

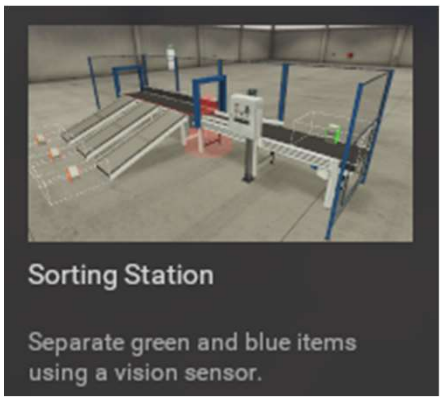


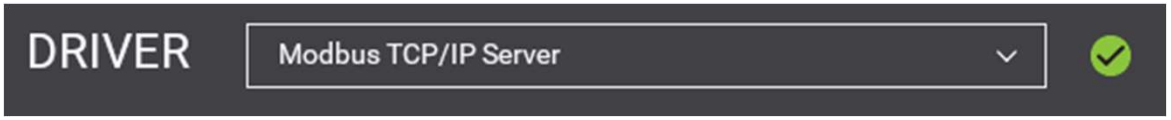


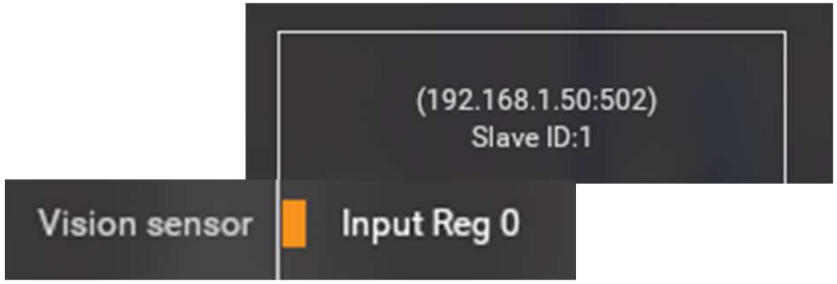


YouTube MQTT 03 FactoryIO

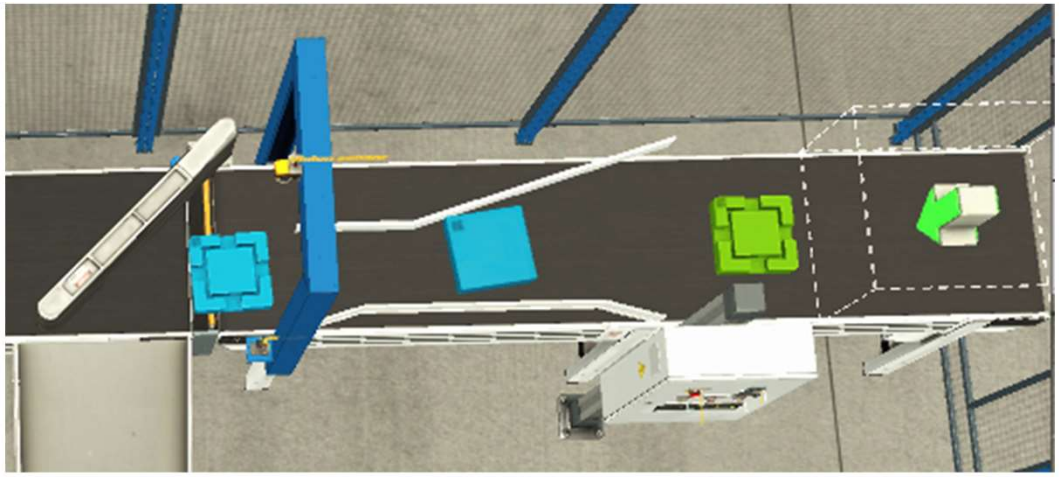








YouTube MQTT 03 FactoryIO




```
msg.payload = {
    'fc': 4,
    'unitid': 1,
    'address': 0 ,
    'quantity': 1 };

 return msg;
```


```
msg.payload = msg.payload[0];

if (msg.payload == 1)
        {   msg.payload ="Error 1" ; }
else if (msg.payload == 4)
        {    msg.payload = "Error 4"; }
else {  msg =null;}

return   msg ;
```

Subscriptions

Topic: "utccfood" Showing the last 5 messages — +

#	Time	Topic	QoS
46	9:11:58	utccfood	0

Message: Error 1

#	Time	Topic	QoS
47	9:12:04	utccfood	0

Message: Error 4

#	Time	Topic	QoS
48	9:12:08	utccfood	0

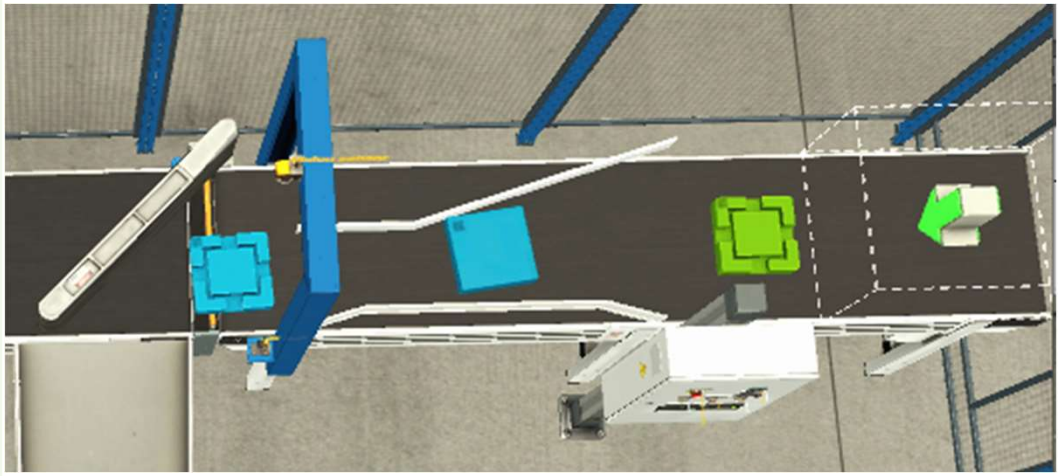
Message: Error 1

#	Time	Topic	QoS
49	9:12:14	utccfood	0

Message: Error 4

#	Time	Topic	QoS
50	9:12:16	utccfood	0

Message: Error 1



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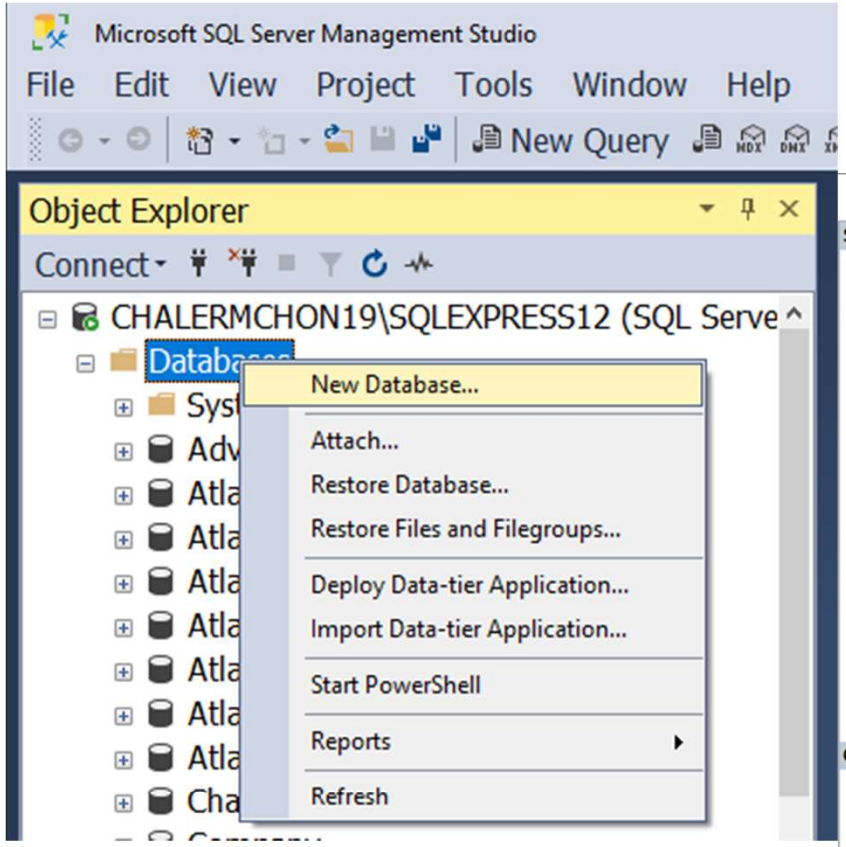
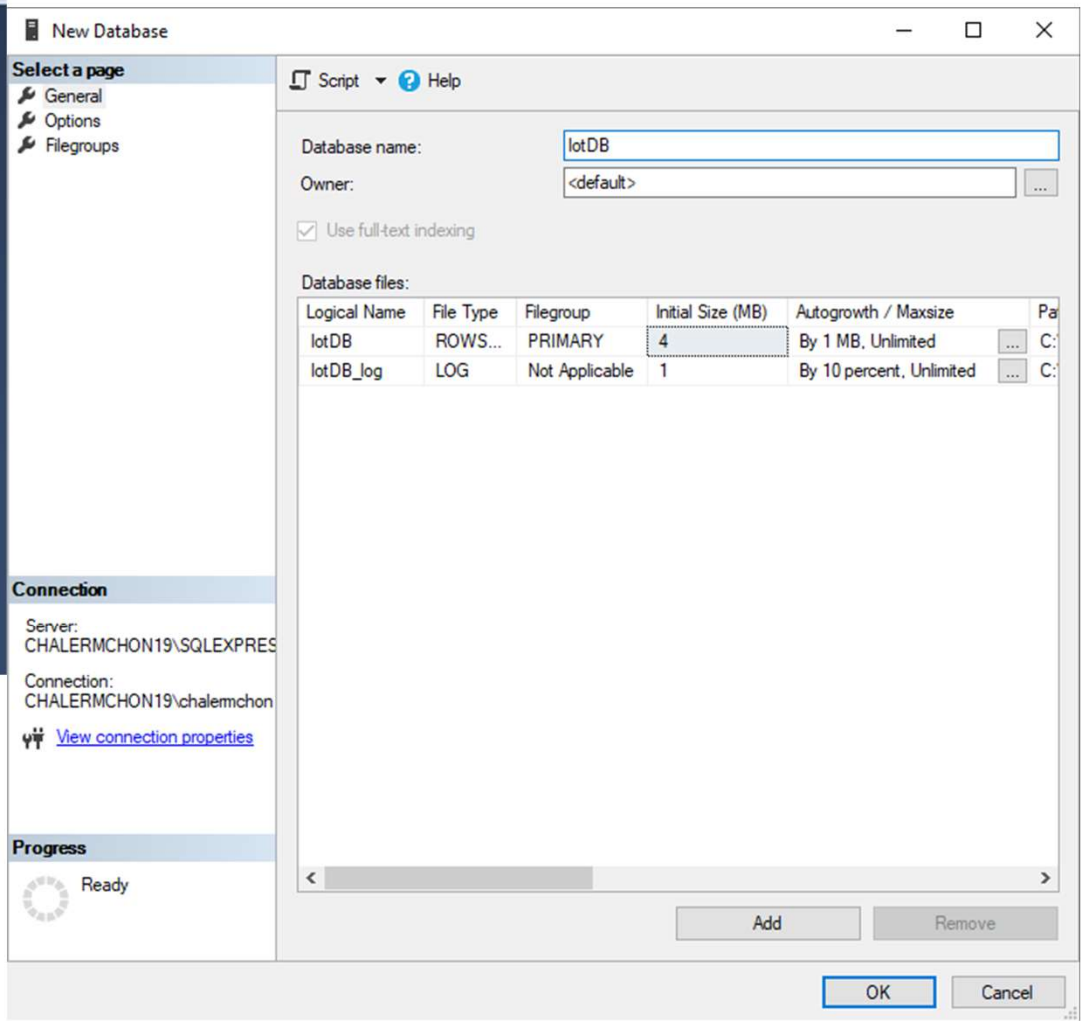
สร้างระบบฐานข้อมูลใหม่ (Mssql)



สร้างฐานข้อมูลใหม่ (IotDB)



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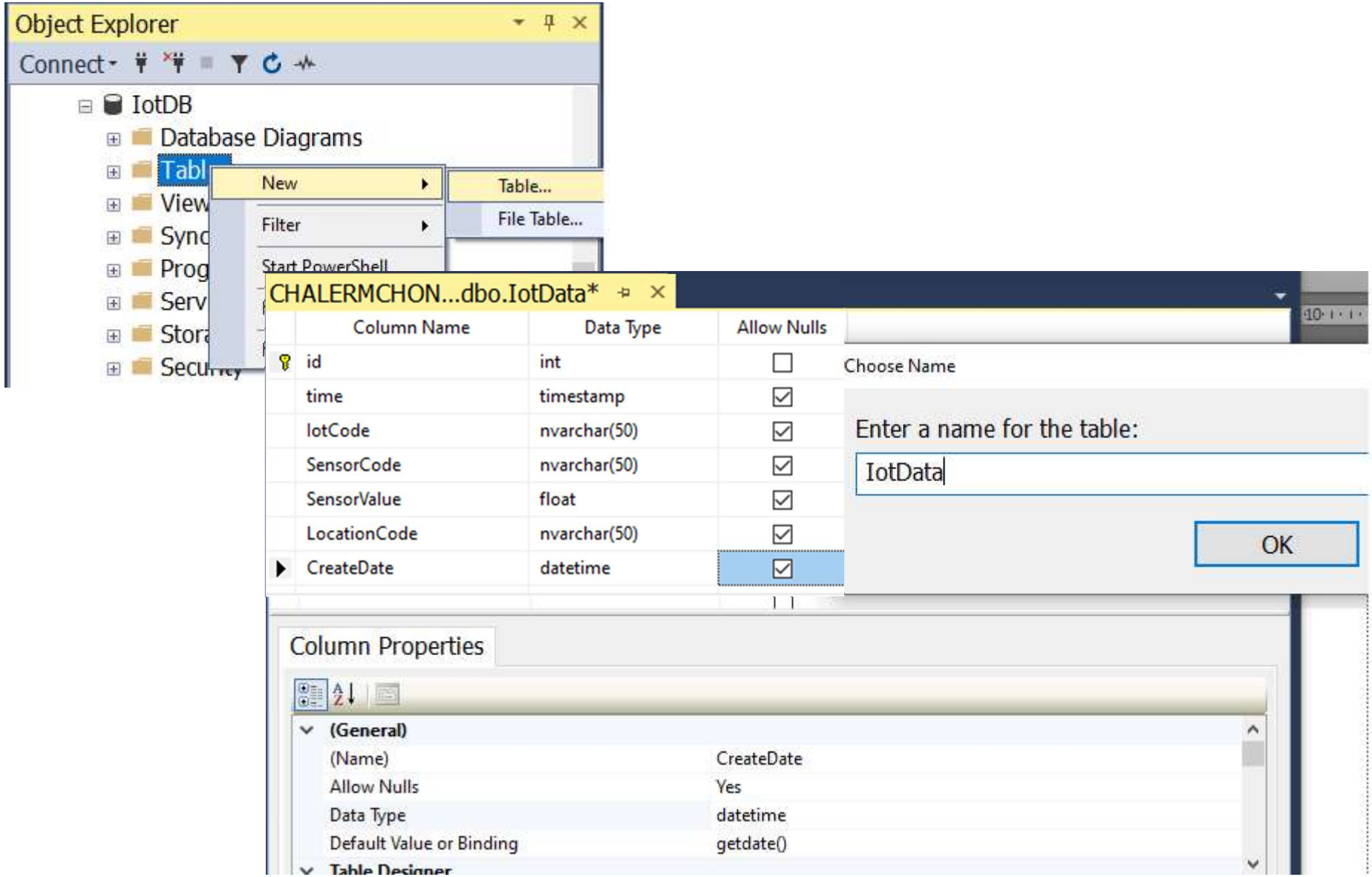
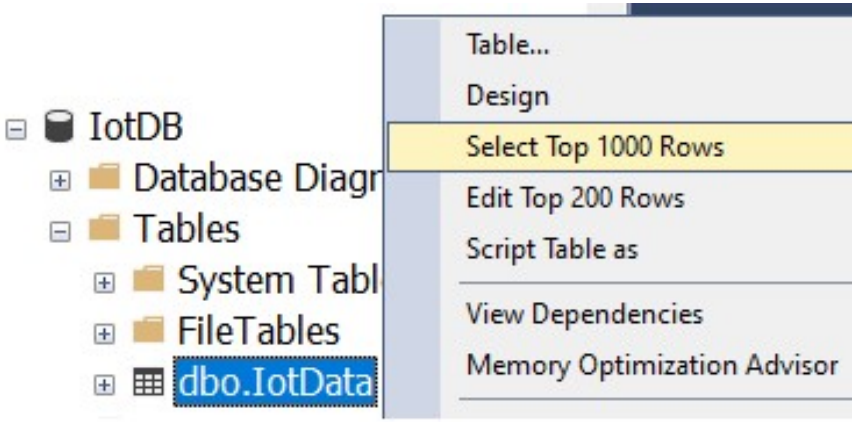
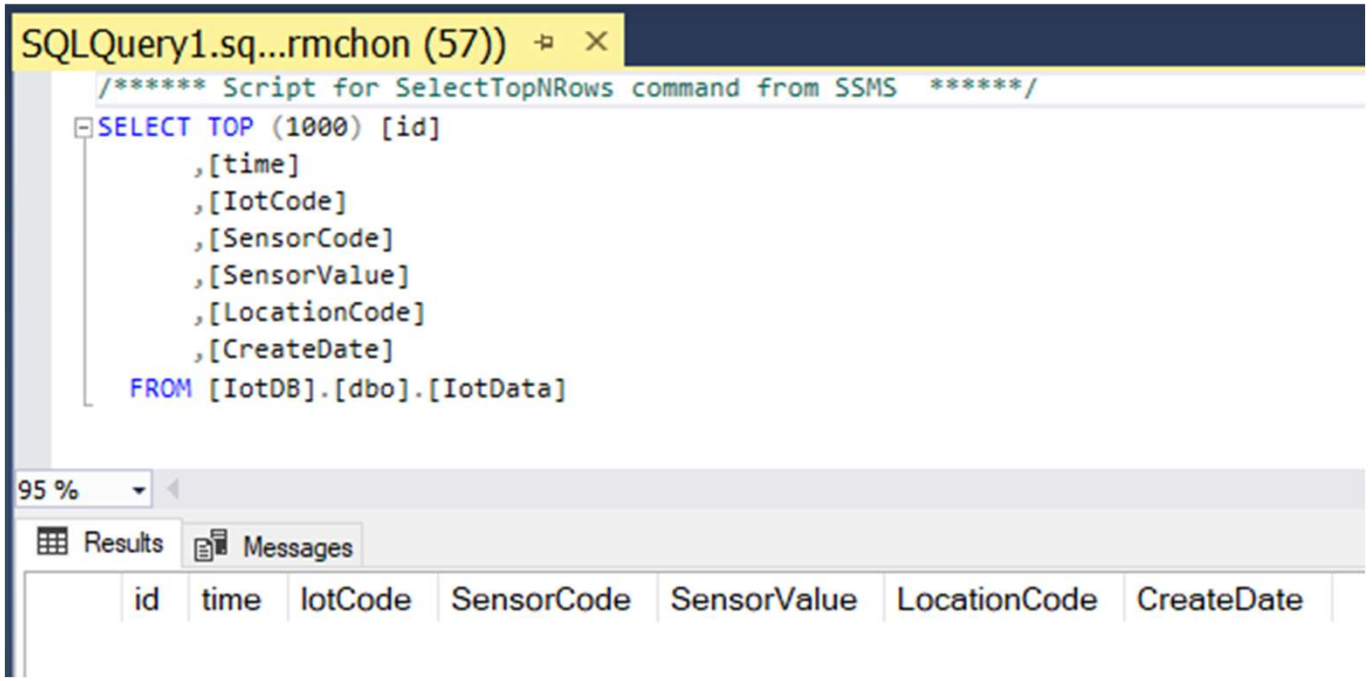
สร้างตารางข้อมูลใหม่ ใน IotDB



Select Data (Sql)





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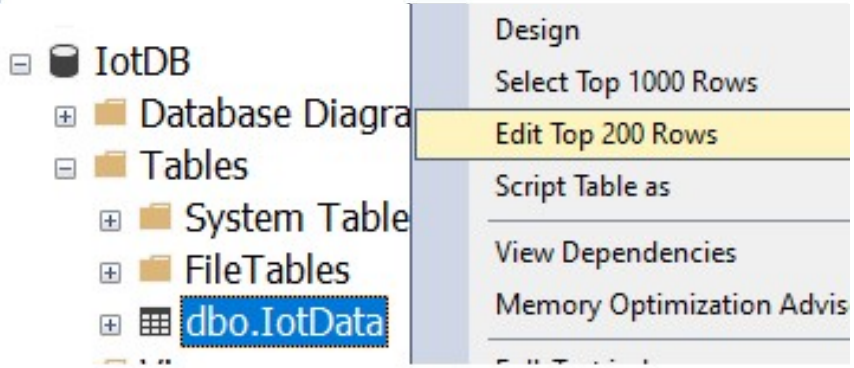
Insert New Data

CHALERMCHON...dbo.IotData

	id	time	IotCode	SensorCode	SensorValue	LocationCode	CreateDate
	NULL	NULL	iot01	t01	25.4	wh01	NULL
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL




```
SELECT TOP (1000) [id]
      ,[time]
      ,[IotCode]
      ,[SensorCode]
      ,[SensorValue]
      ,[LocationCode]
      ,[CreateDate]
  FROM [IotDB].[dbo].[IotData]
```

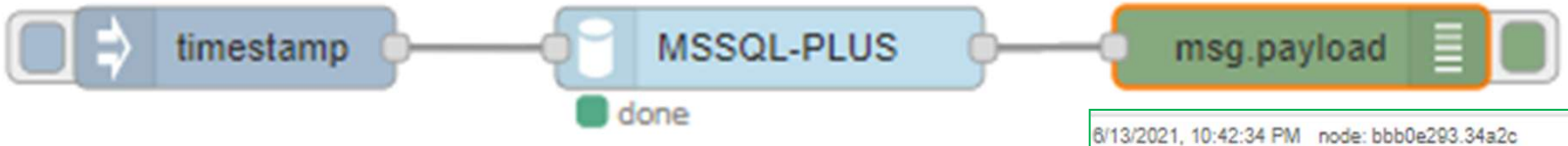
95 %

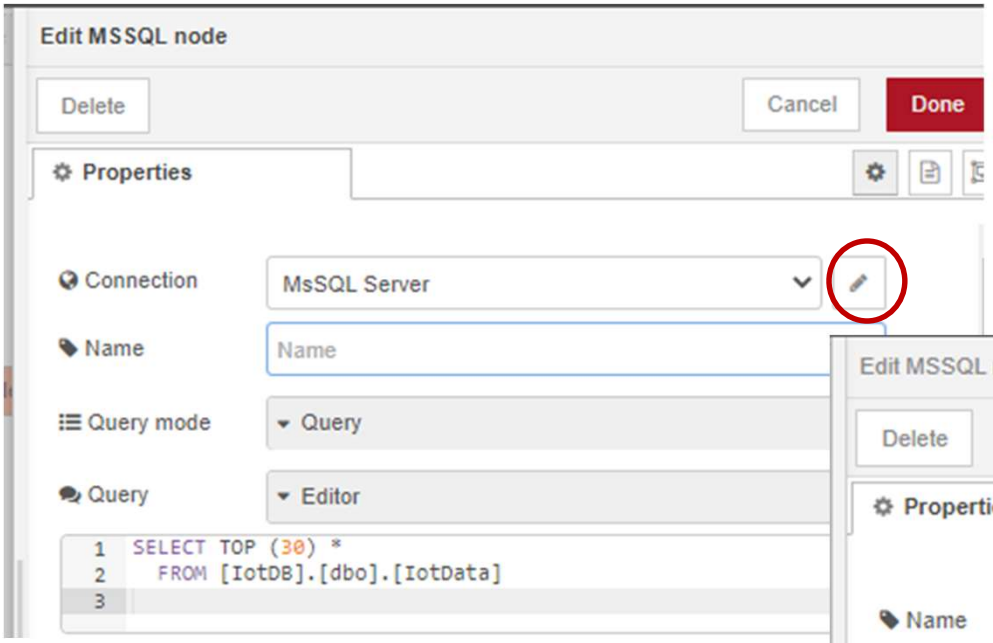
Results | Messages

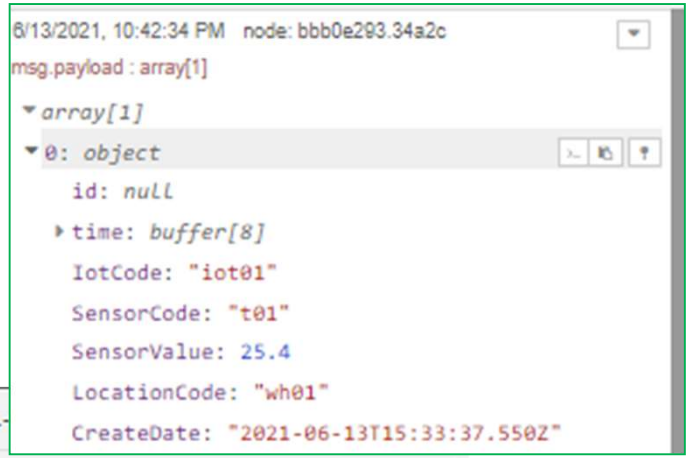
	id	time	IotCode	SensorCode	SensorValue	LocationCode	CreateDate
1	NULL	0x00000000000007D1	iot01	t01	25.4	wh01	2021-06-13 22:33:37.550

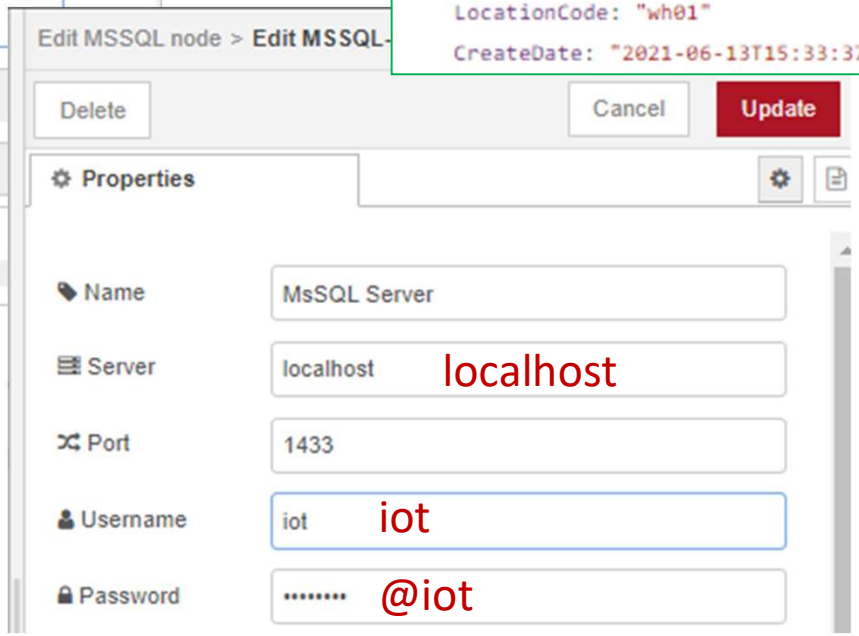
YouTube MsSQL 02 Node Red

Select IotData table by Node-Red







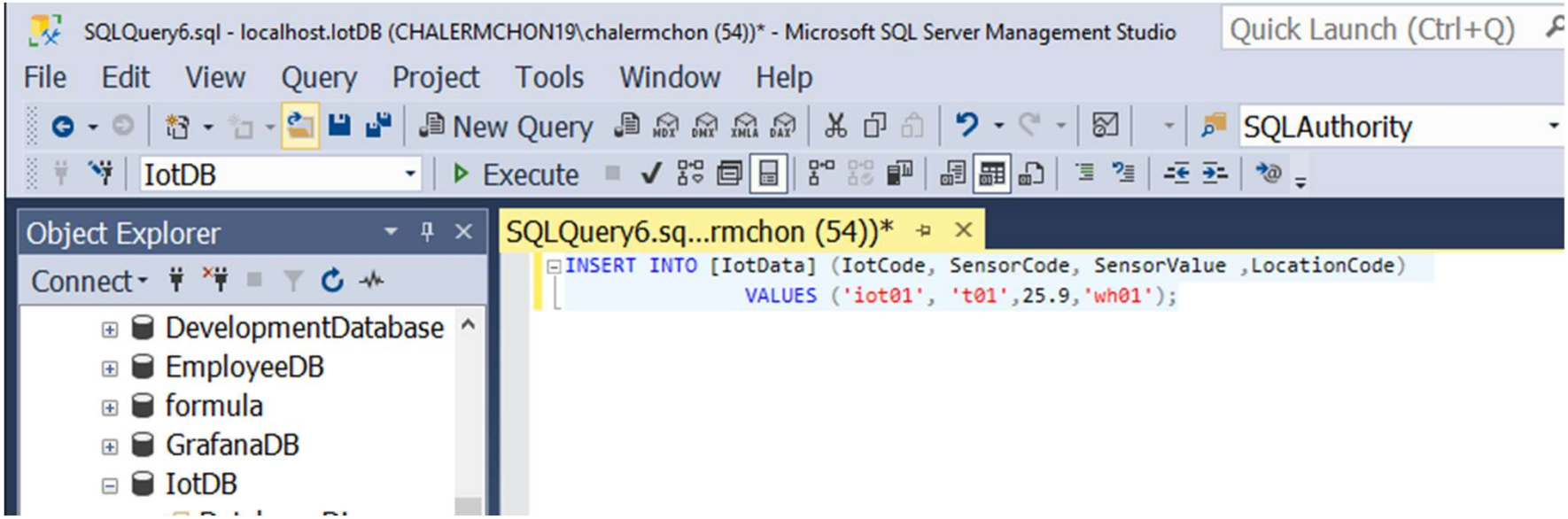


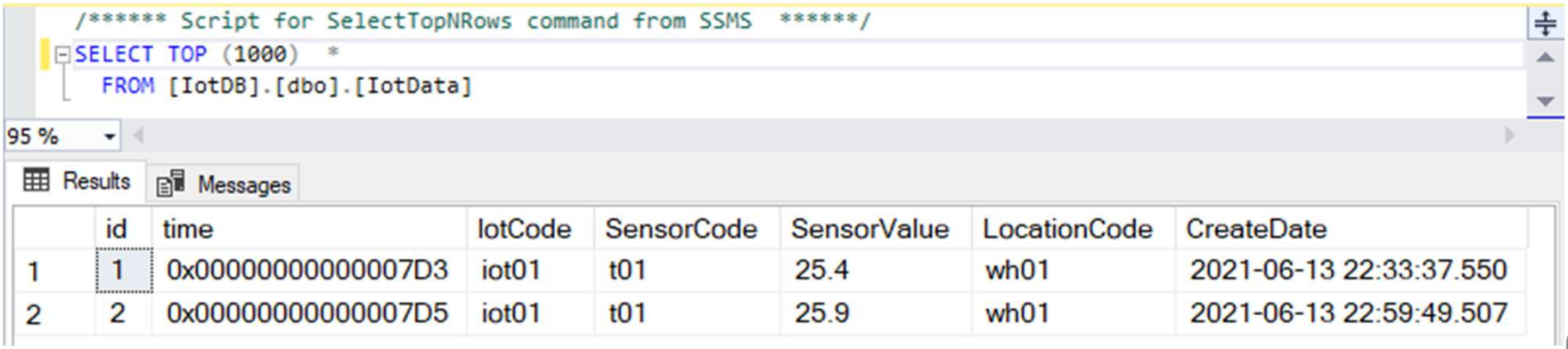
SELECT TOP (30) *

FROM [IotDB].[dbo].[IotData]

YouTube MsSQL 02 Node Red

```
INSERT INTO [IotData] (IotCode, SensorCode, SensorValue ,LocationCode)
        VALUES ('iot01', 't01',25.9,'wh01');
```

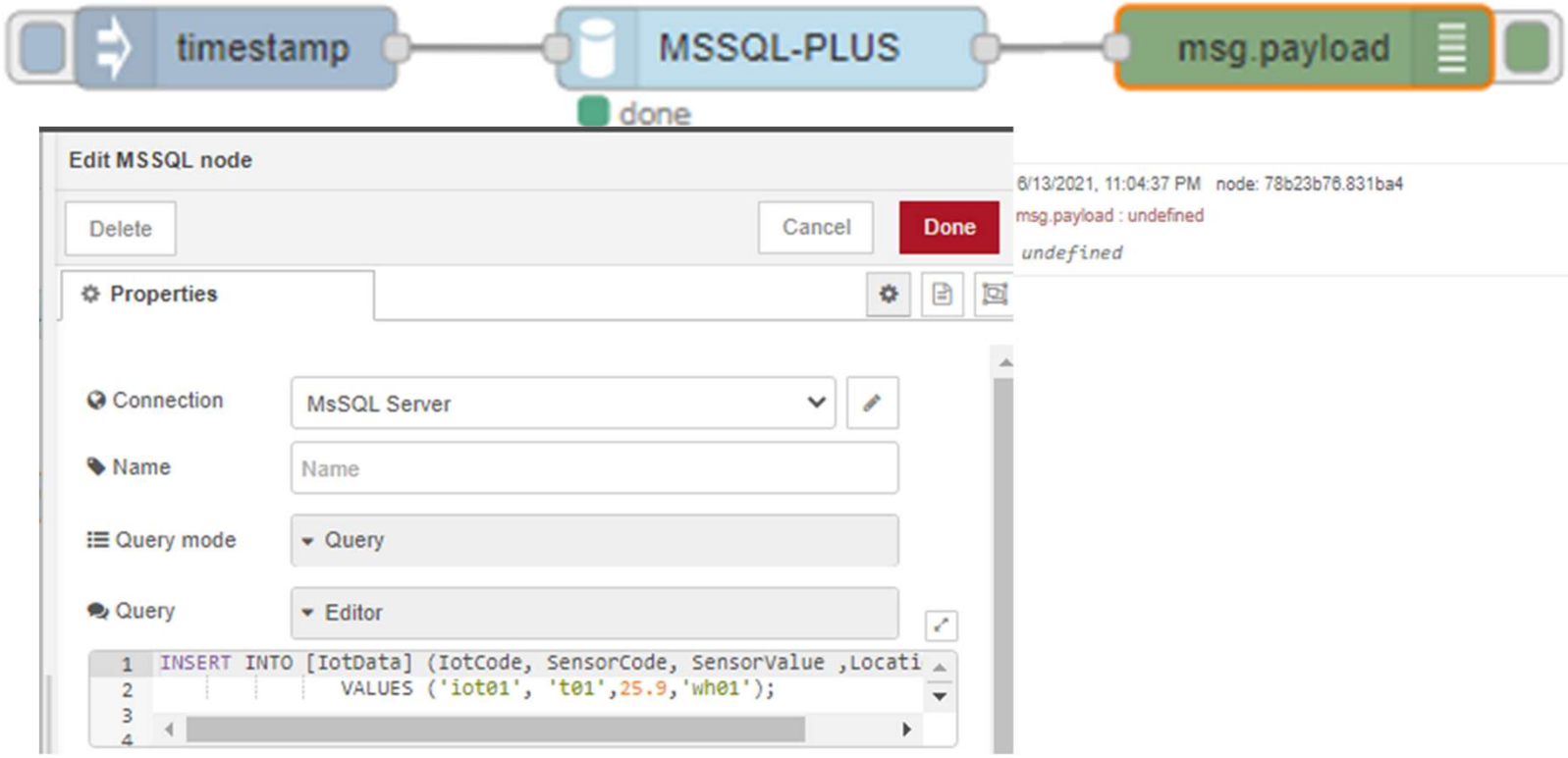




	id	time	IotCode	SensorCode	SensorValue	LocationCode	CreateDate
1	1	0x00000000000007D3	iot01	t01	25.4	wh01	2021-06-13 22:33:37.550
2	2	0x00000000000007D5	iot01	t01	25.9	wh01	2021-06-13 22:59:49.507

YouTube MsSQL 02 Node Red

Select IotData table by Node-Red



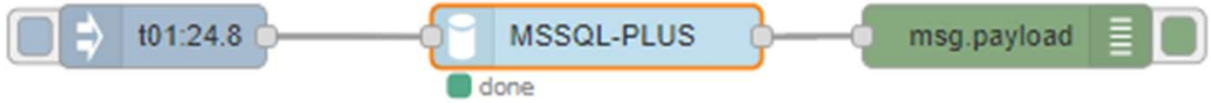

```
INSERT INTO [IotData] (IotCode, SensorCode, SensorValue ,LocationCode)
        VALUES ('iot01', 't01',25.9,'wh01');
```

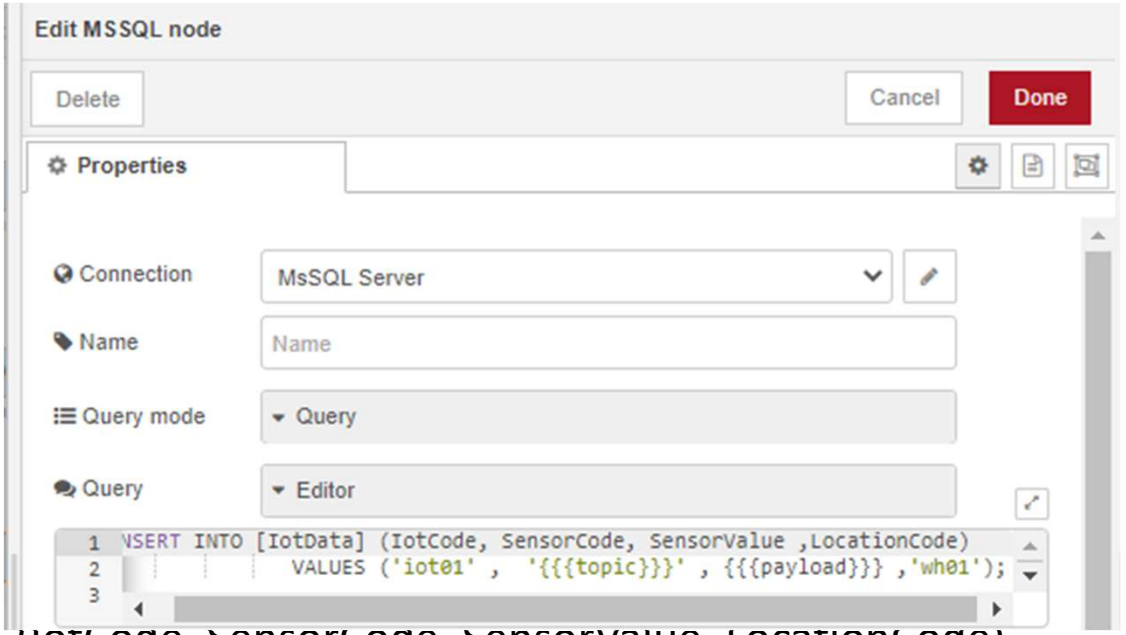
Results | Messages

	id	time	IotCode	SensorCode	SensorValue	LocationCode	CreateDate
1	1	0x00000000000007D3	iot01	t01	25.4	wh01	2021-06-13 22:33:37.550
2	2	0x00000000000007D5	iot01	t01	25.9	wh01	2021-06-13 22:59:49.507
3	3	0x00000000000007D6	iot01	t01	25.9	wh01	2021-06-13 23:04:37.707

YouTube MsSQL 02 Node Red

Insert IotData by topic and payload



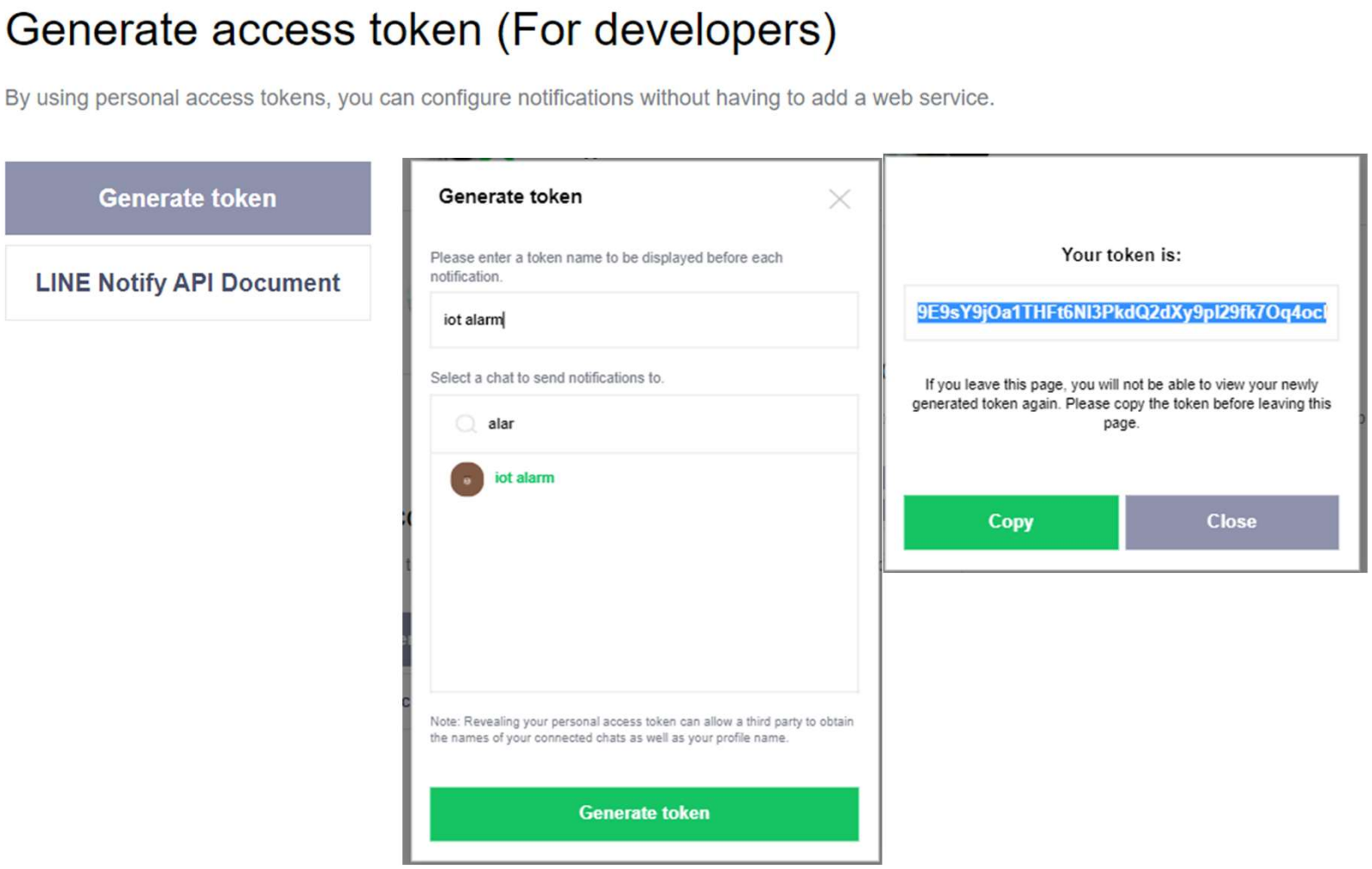


INSERT INTO [IotData] (IotCode, SensorCode, SensorValue ,LocationCode)
VALUES ('iot01' , '{{{topic}}}' , {{{payload}}} ,'wh01');

Results | Messages

	id	time	IotCode	SensorCode	SensorValue	LocationCode	CreateDate
1	1	0x00000000000007D3	iot01	t01	25.4	wh01	2021-06-13 22:33:37.550
2	2	0x00000000000007D5	iot01	t01	25.9	wh01	2021-06-13 22:59:49.507
3	3	0x00000000000007D6	iot01	t01	25.9	wh01	2021-06-13 23:04:37.707
4	4	0x00000000000007D7	iot01	t01	24.8	wh01	2021-06-13 23:10:22.693

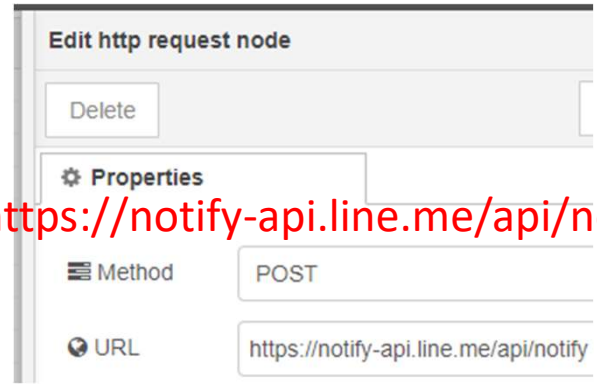
Line Notify



9E9sY9jOa1THFt6NI3PkdQ2dXy9pl29fk7Oq4ocNxcA


```
msg.headers = {'content-type':'application/x-www-form-urlencoded'
      ,'Authorization':'Bearer YourLineToken'};
msg.payload = {"message":"alarm " + msg.payload };
return msg;
```

msg.headers = {'content-type':'application/x-www-form-urlencoded','Authorization':'Bearer 9E9sY9jOa1THFt6NI3PkdQ2dXy9pl29fk7Oq4ocNxcA'};
msg.payload = {"message":"alarm " + msg.payload };
return msg;



https://notify-api.line.me/api/notify