PLC as MQTT client

Contents

1. Common application library

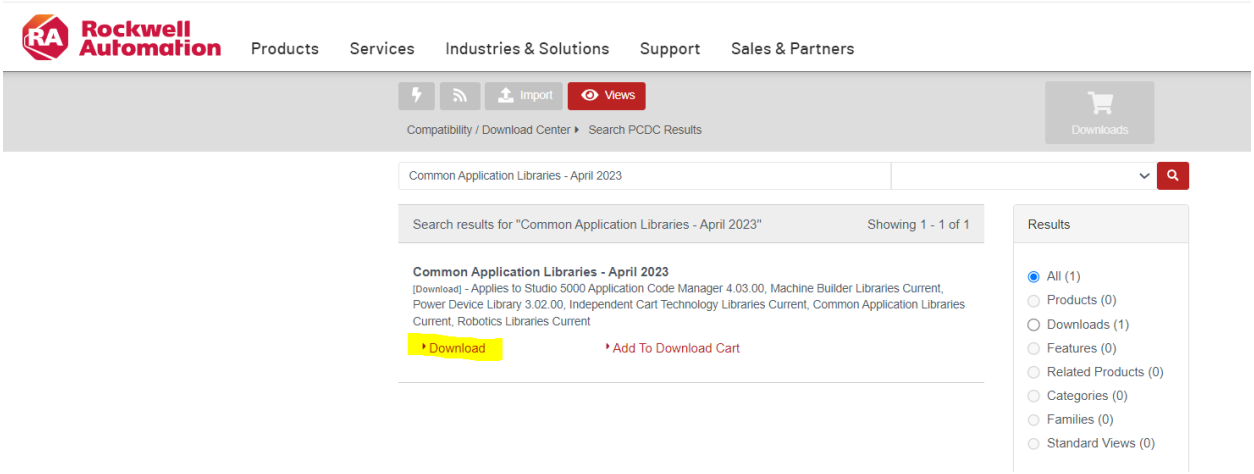
You have to use a physical PLC. This will not work with FT Logix Eco.

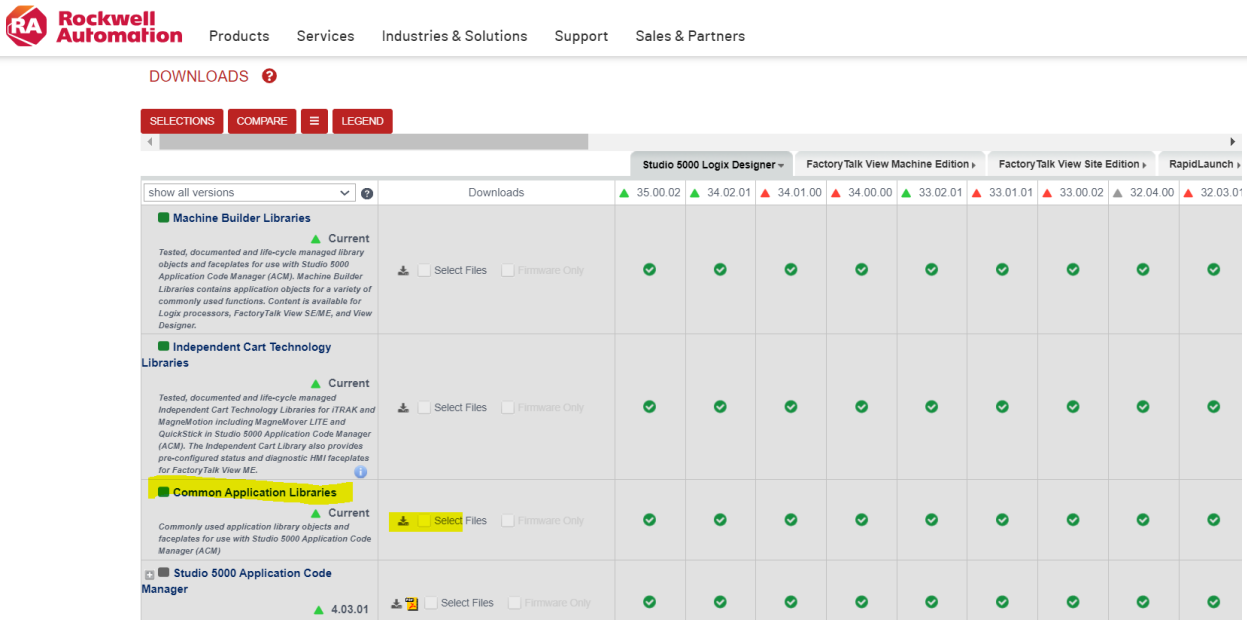
You can see the results on this video

https://youtu.be/Y6_UtErWmb4

This belongs to Common application library to be download from Rockwell download page.

https://compatibility.rockwellautomation.com/pages/search.aspx?crumb=117&q=Common%20Application%20Libraries%20-%20April%202023





You will get these content on C:\RA

ApplicationCodeManagerLibraries	4/14/2023 9:44 PM	File folder	
GeneralDocuments	4/14/2023 9:33 PM	File folder	
ReferenceManuals	4/14/2023 9:44 PM	File folder	
CommonApplicationLibraries_20230415	7/29/2023 5:38 PM	ZIP archive	15,609 KB
ReadMe	8/24/2022 7:26 PM	Text Document	1 KB
Setup	8/24/2022 7:25 PM	Windows Command ...	5 KB

First install ACM, then run Setup.

The library will be installed on your ACM environment.

You can find this AOI RM-raC_Opr_MQTT on this library “CommonApplicationLibraries_20230415”

Windows (C:) › RA › Common application libraries › ReferenceManuals

Name	Date modified	Type	Size
RM-raC_Opr_CapturePV_REAL	8/24/2022 7:05 PM	Documento Adobe A...	607 KB
RM-raC_Opr_HTTP	4/14/2023 9:08 PM	Documento Adobe A...	1,273 KB
RM-raC_Opr_MQTT	4/14/2023 9:08 PM	Documento Adobe A...	1,471 KB
RM-raC_Tec_CnvtLen	8/24/2022 7:05 PM	Documento Adobe A...	630 KB
RM-raC_Tec_CnvtVel_LinLin	8/24/2022 7:05 PM	Documento Adobe A...	695 KB
RM-raC_Tec_CnvtVel_LinRot	8/24/2022 7:05 PM	Documento Adobe A...	735 KB
RM-raC_Tec_DeadTime	8/24/2022 7:05 PM	Documento Adobe A...	762 KB
RM-raC_Tec_DINTCompress	8/24/2022 7:05 PM	Documento Adobe A...	484 KB
RM-raC_Tec_DINTExpand	8/24/2022 7:05 PM	Documento Adobe A...	484 KB

Create the program with ACM following the instructions manuals

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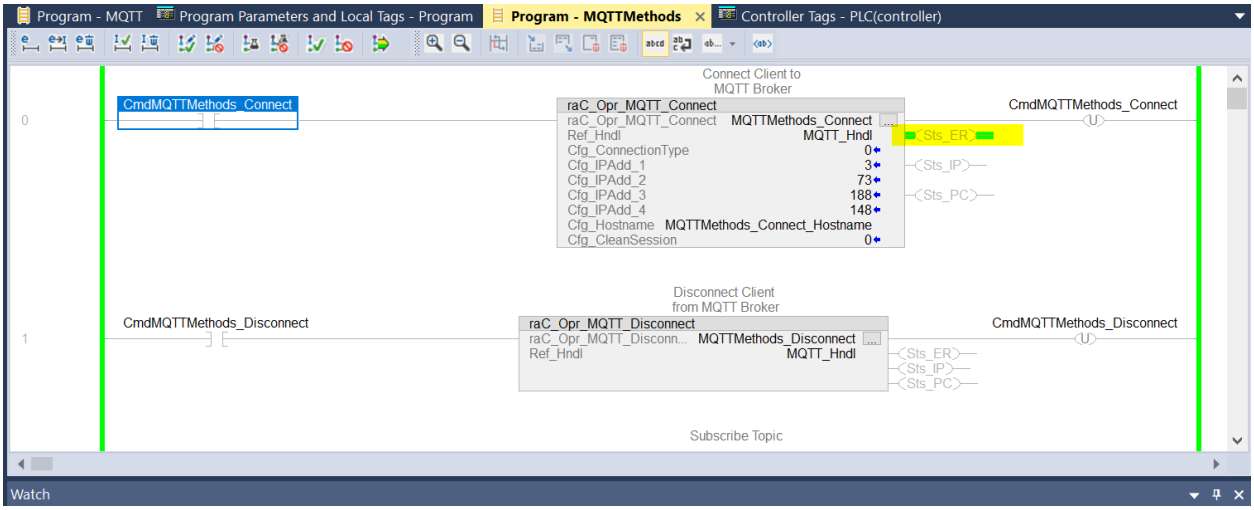
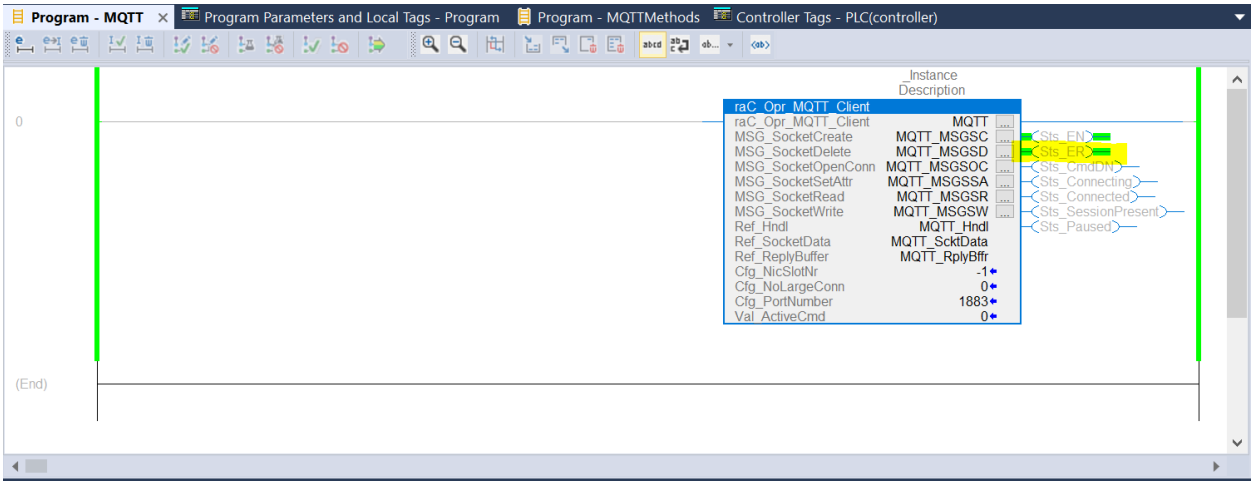
You have to use a physical PLC. This will not work with FT Logix Eco.

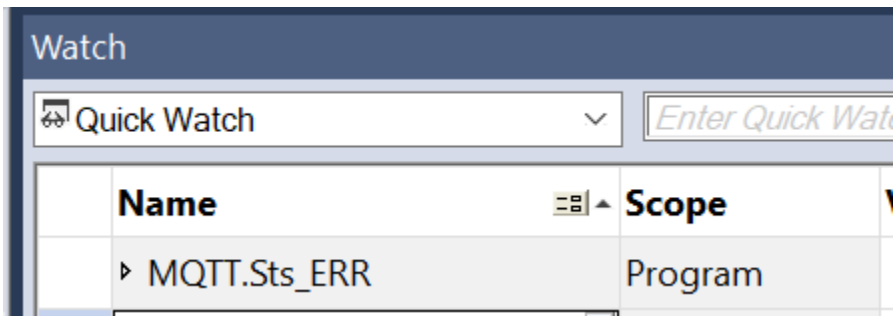
When testing the application you will probably get some error codes.

Toggle the Connect contact bit. You get an error





To see the error you can check



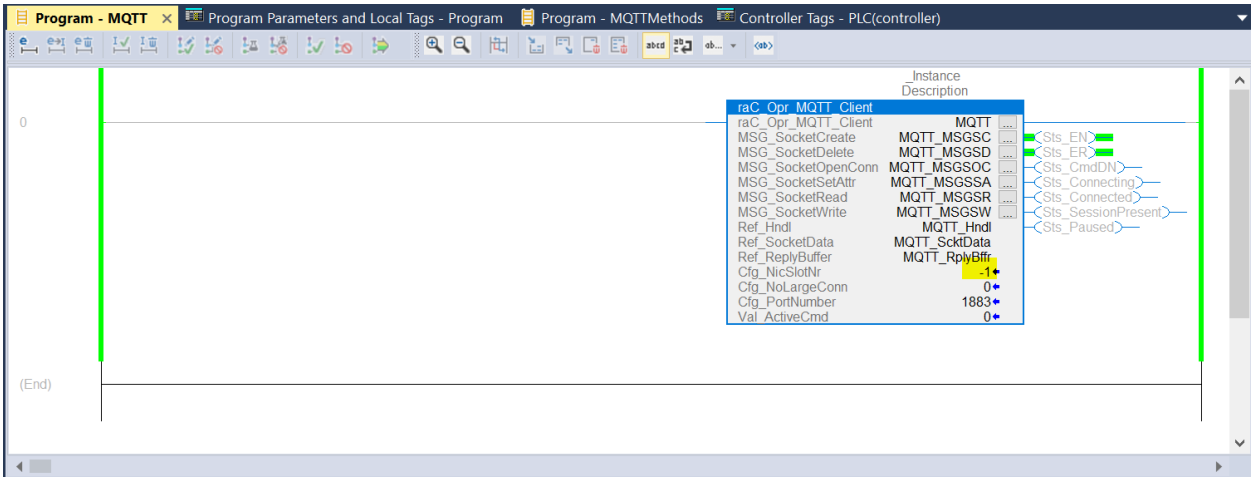
First of all is code 1015 “Unable to create Socket” on page 8 of manual

ERR value	Description
1009	Cfg_KeepAliveTime is greater than 65536 or less than 0
1010	Unsupported command in Cmd_CPT
1011	Command Timed out
1012	Payload too big to send
1014	Received more data than payload can contain
1015	Unable to create socket. Refer Socket Create Message Error Code.
1016	Unable to connect to server. Refer Socket Open Connection Message Error Code.
1017	Failed to write. Refer Socket Write Message Error Code.

We can change the NIC slot number from PLC as stated on page 7

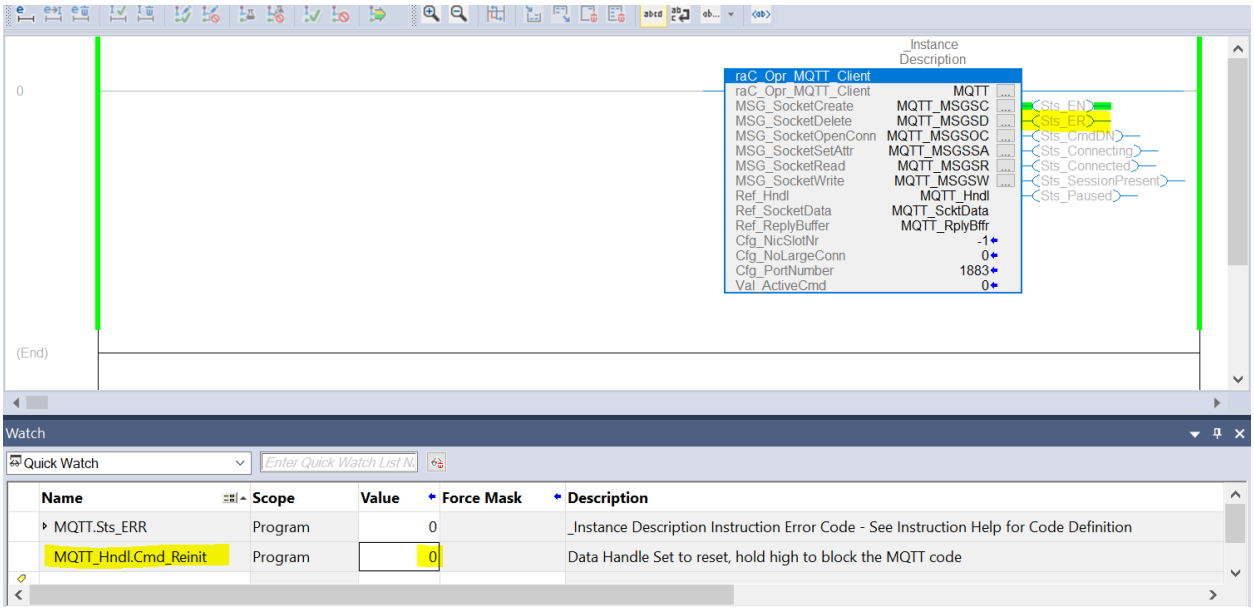
2.5 Input Data

Input	Function / Description	Datatype
Cfg_NicSlotNr	Logix slot number of the sockets capable network interface. For 1769 slot number is 0. For 5069 and 1756-L8x the slot number is -1. When using a 1756-ENxT(R), EWEB this is the slot number of the ethernet card.	DINT



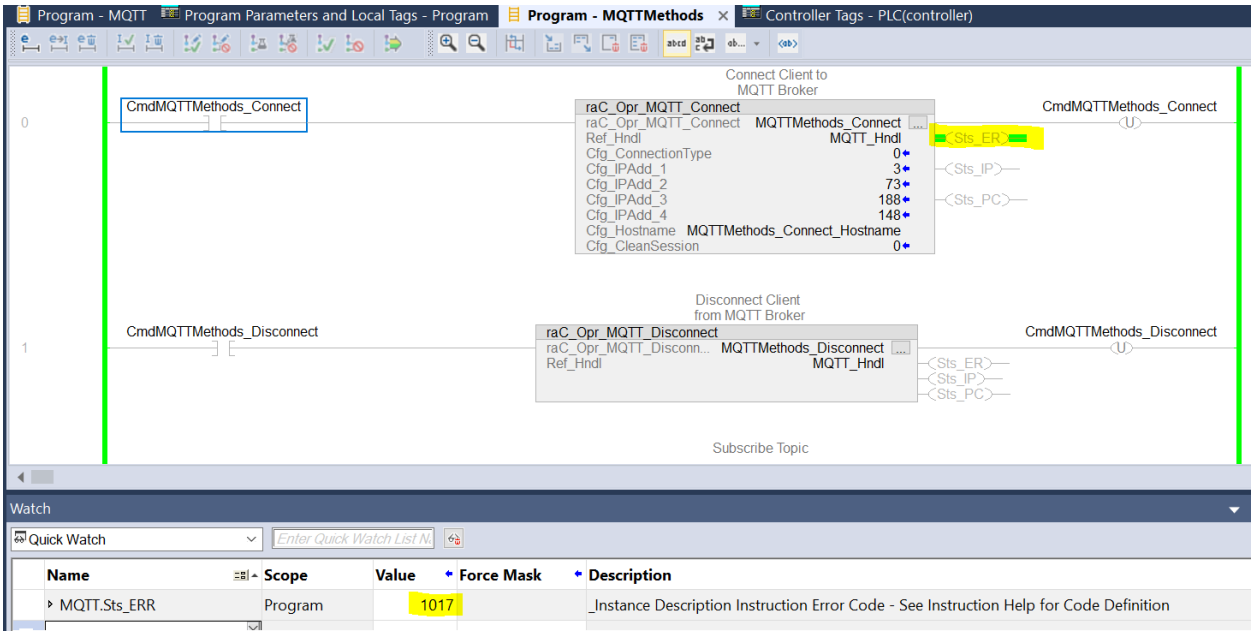
Let’s save the project and download to reset the fault.

You can also reset the fault with MQTT_Hndl.Cmd_Reinit, setting to 1



Toggle connect bit again

Now you will get another error message 1017



ERR value	Description
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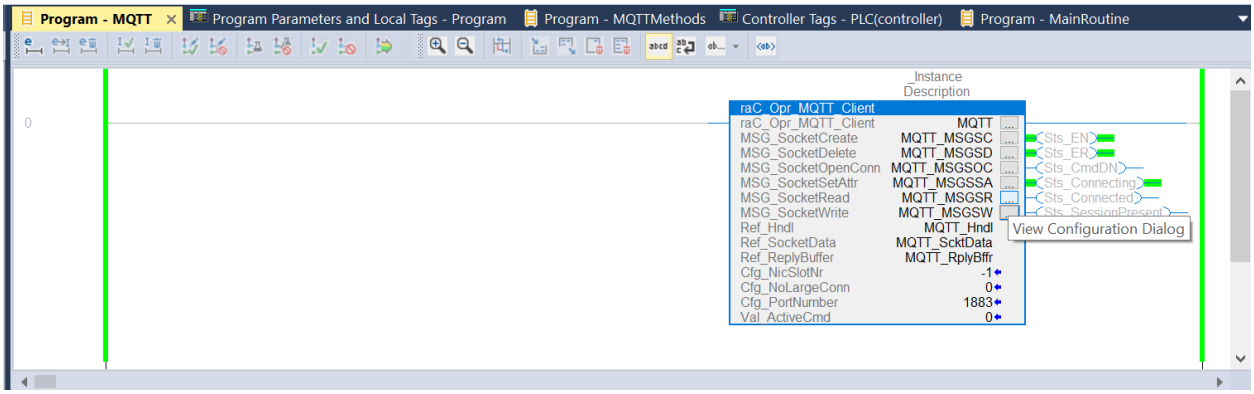
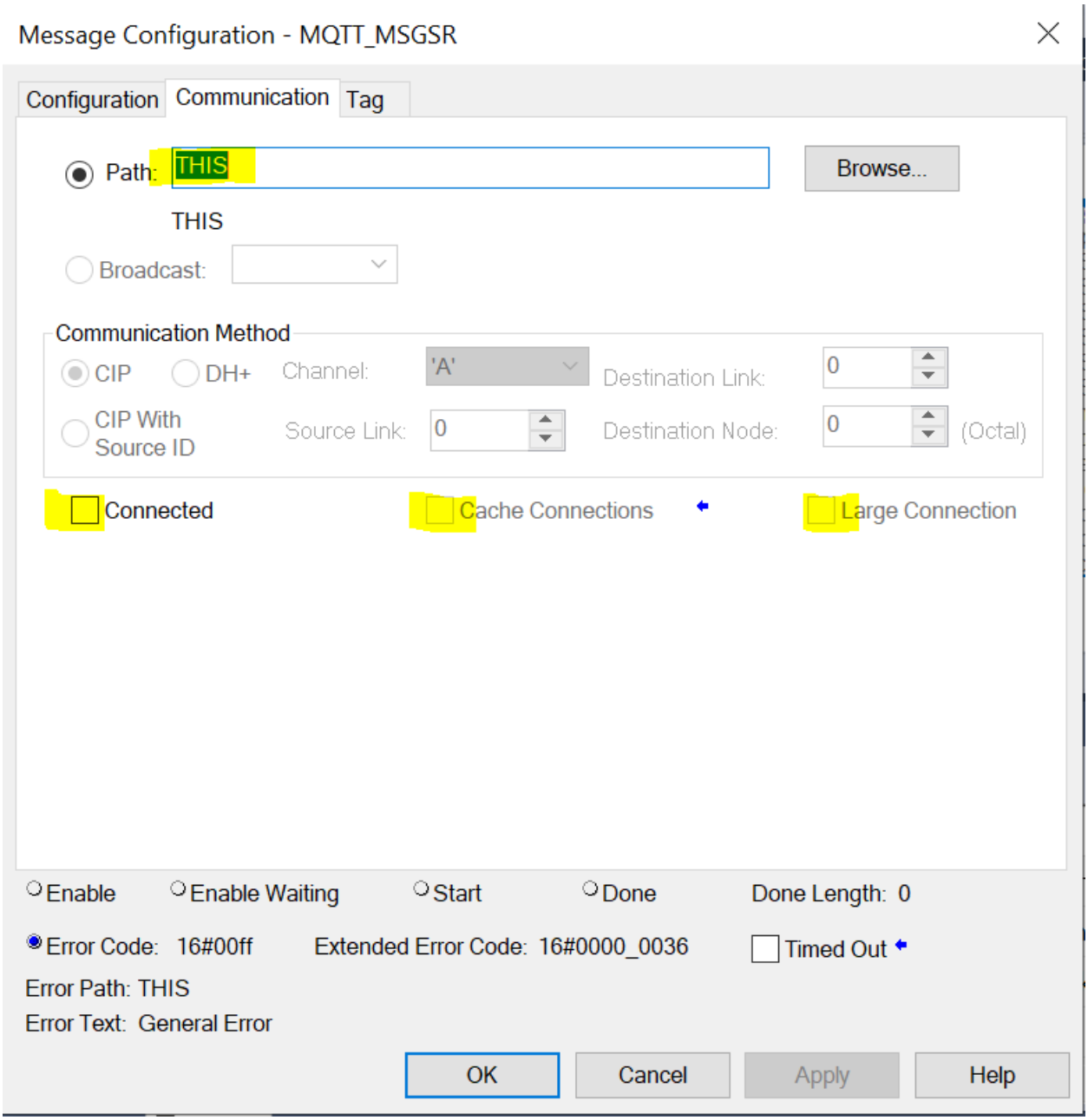
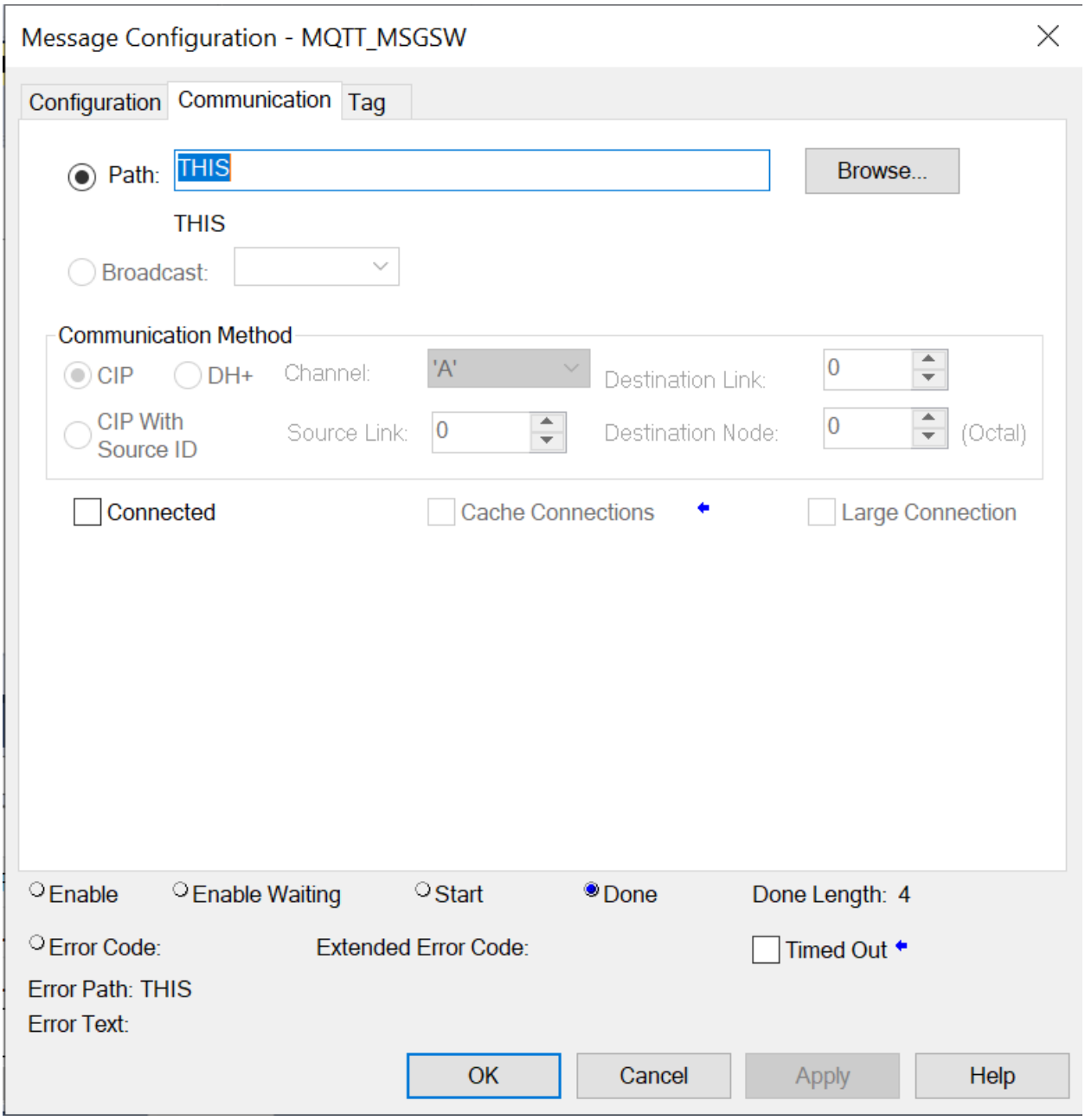
Next you have to setup read and write socket path

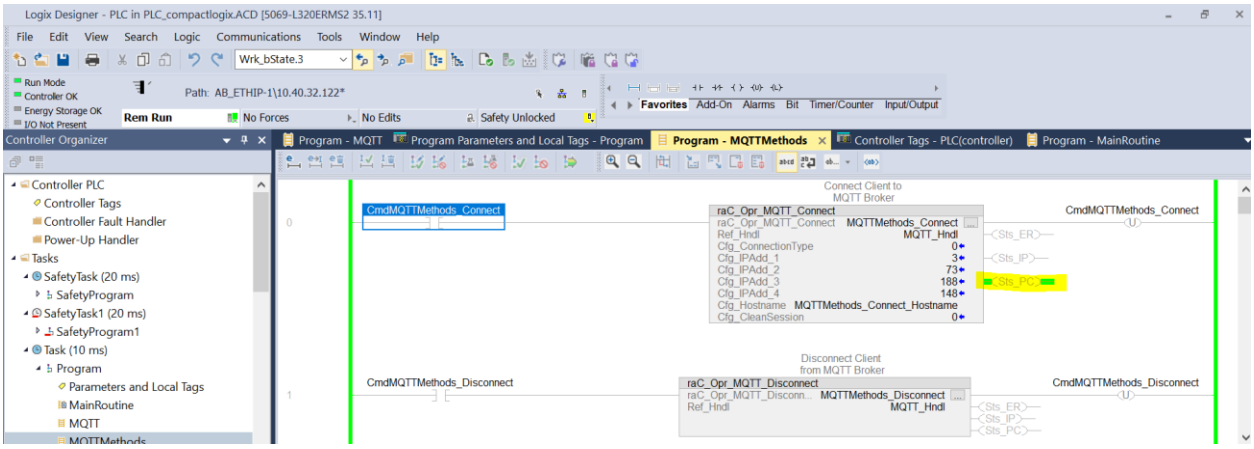
Hardware			MQTT Client Cfg		Socket Read and Write MSG Setting			
Controller	Backplane CommCard	CommCard SlotNumber	NICSlotNr	NoLargeConn	Path	Connected	Cached	Large Connection
1756-L8x	Not Used	Not Applicable	-1	0	THIS	0	0	0
1756-L8x	1756-Enxx	6	6	0	1,6	1	1	1
1756-L8x	1756-EWEB	6	6	1	1,6	0	0	0
1756-L7x	1756-ENxx	6	6	0	1,6	1	1	1
1756-L7x	1756-EWEB	6	6	1	1,6	0	0	0
5069	Not Applicable	NA	-1	0	THIS	0	0	0
1769	Not Applicable	NA	0	1	1,0	0	0	0



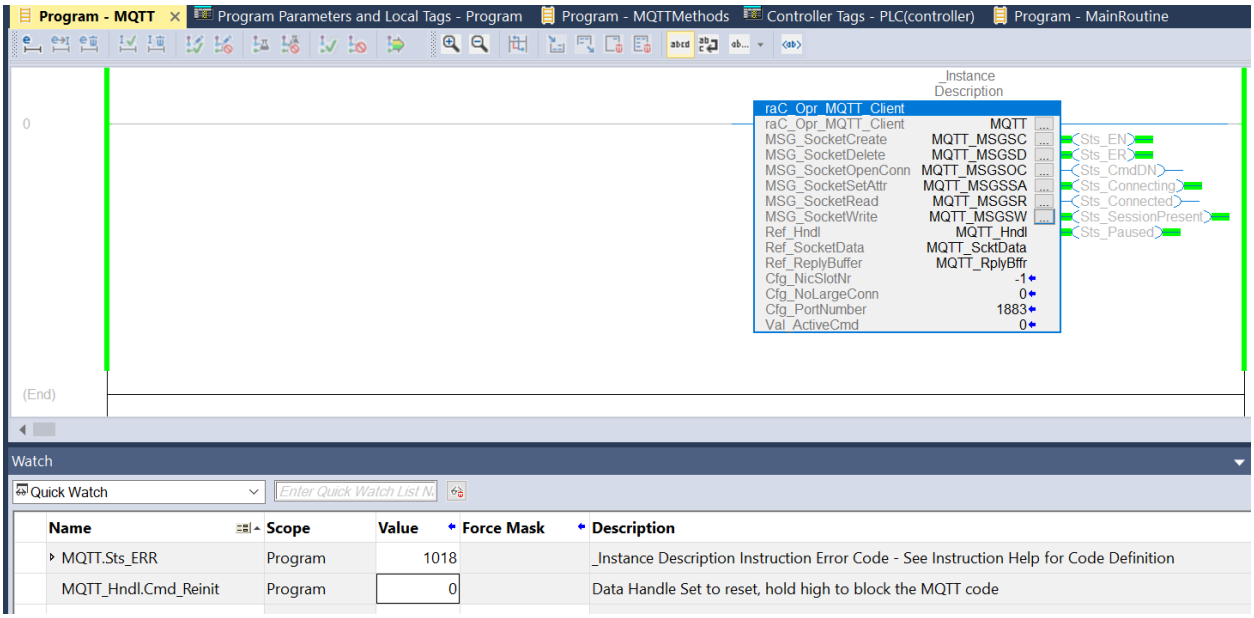

Message Configuration - MQTT_MSGSR
Configuration
Communication
Tag
Path: THIS
Browse...
THIS
Broadcast:
Communication Method
CIP
DH+
Channel: 'A'
Destination Link: 0
CIP With Source ID
Source Link: 0
Destination Node: 0
(Octal)
Connected
Cache Connections
Large Connection
Enable
Enable Waiting
Start
Done
Done Length: 0
Error Code: 16#00ff
Extended Error Code: 16#0000_0036
Timed Out
Error Path: THIS
Error Text: General Error
OK
Cancel
Apply
Help



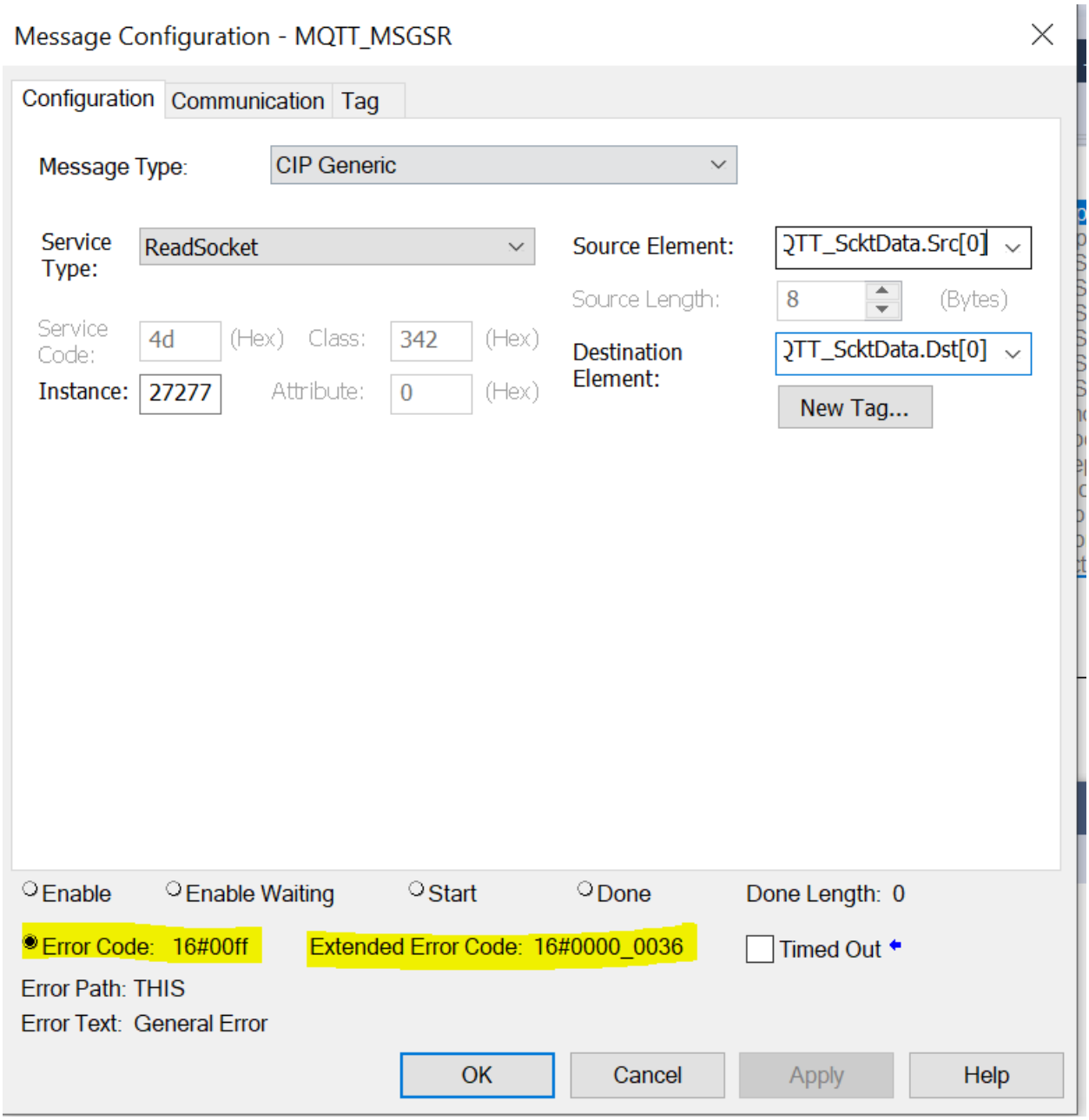
Success on connecting



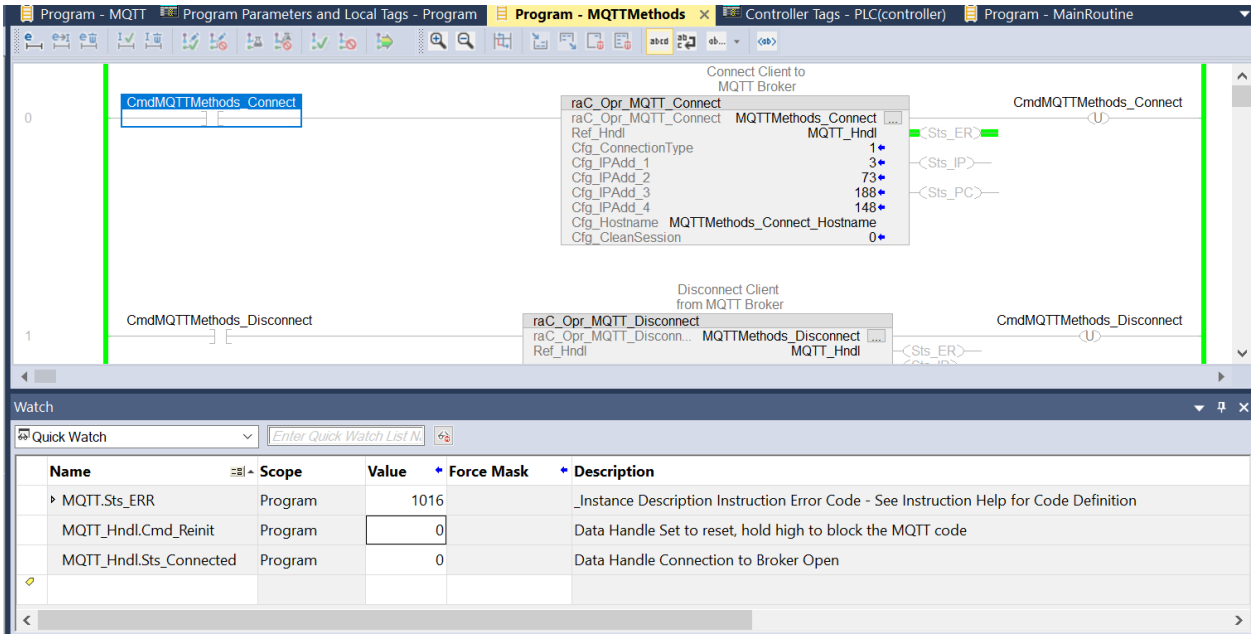
But error



1016	Unable to connect to server. Refer Socket Open Connection Message Error Code.
1017	Failed to write. Refer Socket Write Message Error Code.
1018	Failed to read. Refer Socket Read Message Error Code.
1019	Error in stream, disconnecting
1020	Unable to set socket buffer size. Refer Socket Set Attribute Message Error Code.



Let's try Connection type to use server address name instead of server address IP.



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Let's try with a local broker

2. Mosquitto local broker

You have to use a physical PLC. This will not work with FT Logix Eco.

Let's use the wifi IP address of computer as the mosquito local broker

For instance

10.40.32.117

Let's use this config file

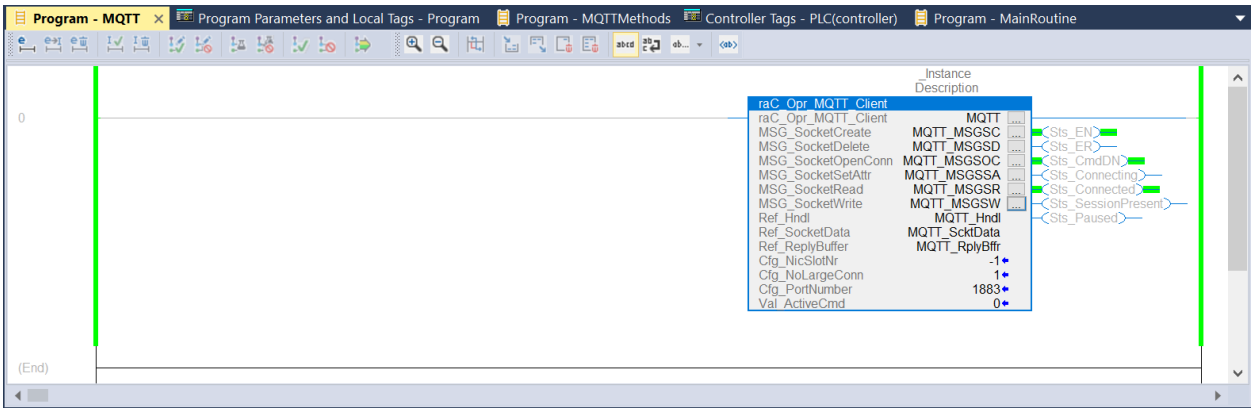
```
listener 1883 10.40.32.117
allow_anonymous true
```

Let's start mosquito

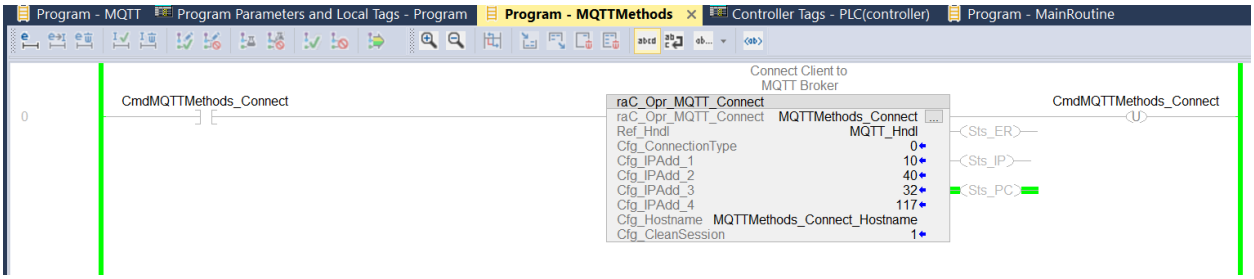
mosquito -c localip.conf -v

```
Command Prompt - mosquitto  -c localip.conf -v
C:\mos>mosquitto -c localip.conf -v
1693317758: mosquitto version 2.0.10 starting
1693317758: Config loaded from localip.conf.
1693317758: Opening ipv4 listen socket on port 1883.
1693317758: mosquitto version 2.0.10 running
1693317788: New connection from 10.40.32.117:62236 on port 1883.
1693317788: New client connected from 10.40.32.117:62236 as nodered_dd5d462a7517895e (p2, c1, k60).
1693317788: No will message specified.
1693317788: Sending CONNACK to nodered_dd5d462a7517895e (0, 0)
1693317788: Received SUBSCRIBE from nodered_dd5d462a7517895e
1693317788:     plc (QoS 2)
1693317788: nodered_dd5d462a7517895e 2 plc
1693317788: Sending SUBACK to nodered_dd5d462a7517895e
1693317796: Received PUBLISH from nodered_dd5d462a7517895e (d0, q0, r0, m0, 'plc', ... (11 bytes))
1693317796: Sending PUBLISH to nodered_dd5d462a7517895e (d0, q0, r0, m0, 'plc', ... (11 bytes))
1693317856: Received PINGREQ from nodered_dd5d462a7517895e
1693317856: Sending PINGRESP to nodered_dd5d462a7517895e
1693317872: New connection from 10.40.32.122:56181 on port 1883.
1693317916: Received PINGREQ from nodered_dd5d462a7517895e
1693317916: Sending PINGRESP to nodered_dd5d462a7517895e
1693317962: Client <unknown> has exceeded timeout, disconnecting.
1693317976: Received PINGREQ from nodered_dd5d462a7517895e
1693317976: Sending PINGRESP to nodered_dd5d462a7517895e
1693318036: Received PINGREQ from nodered_dd5d462a7517895e
1693318036: Sending PINGRESP to nodered_dd5d462a7517895e
1693318069: New connection from 10.40.32.122:62886 on port 1883.
1693318069: New client connected from 10.40.32.122:62886 as MQTT (p2, c1, k1000).
1693318069: No will message specified.
1693318069: Sending CONNACK to MQTT (0, 0)
1693318096: Received PINGREQ from nodered_dd5d462a7517895e
1693318096: Sending PINGRESP to nodered_dd5d462a7517895e
1693318113: Received UNSUBSCRIBE from nodered_dd5d462a7517895e
1693318113:     plc
1693318113: nodered_dd5d462a7517895e plc
1693318113: Sending UNSUBACK to nodered_dd5d462a7517895e
1693318113: Received DISCONNECT from nodered_dd5d462a7517895e
1693318113: Client nodered_dd5d462a7517895e disconnected.
1693318113: New connection from 10.40.32.117:63135 on port 1883.
1693318113: New client connected from 10.40.32.117:63135 as nodered_e8bf7c5a27b22329 (p2, c1, k60).
1693318113: No will message specified.
1693318113: Sending CONNACK to nodered_e8bf7c5a27b22329 (0, 0)
```

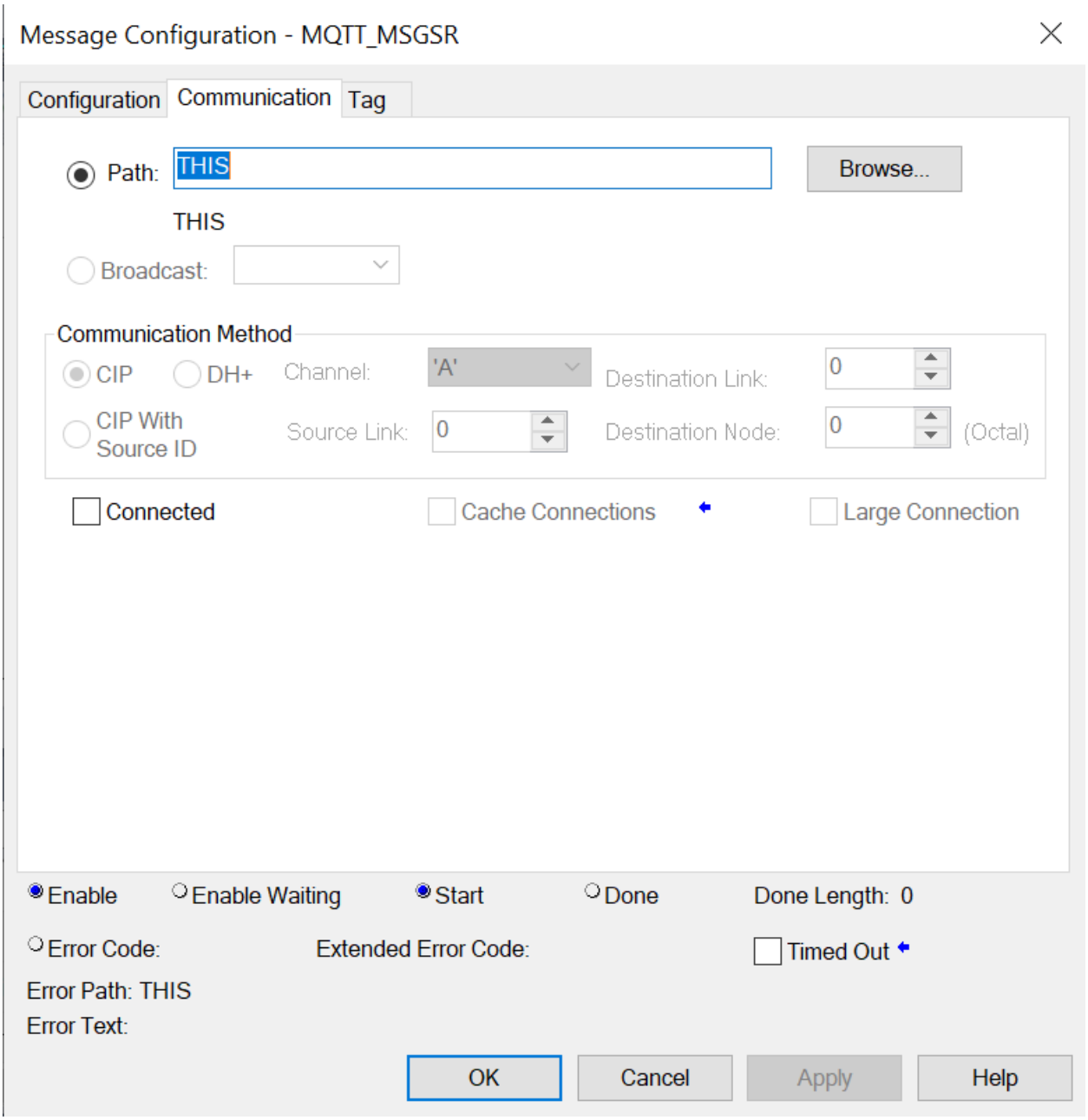
Let’s use the instruction configuration

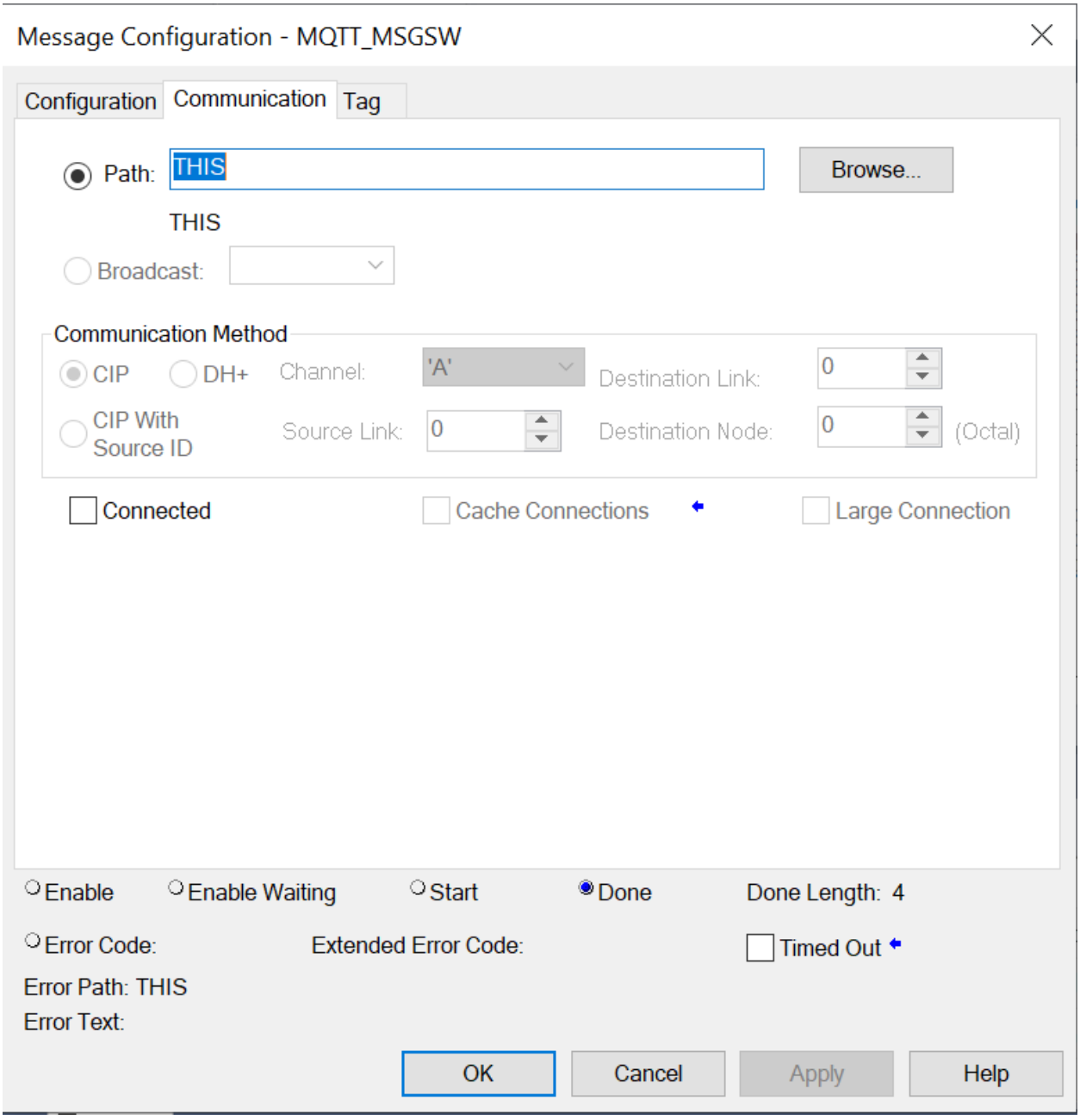


And this connect configuration

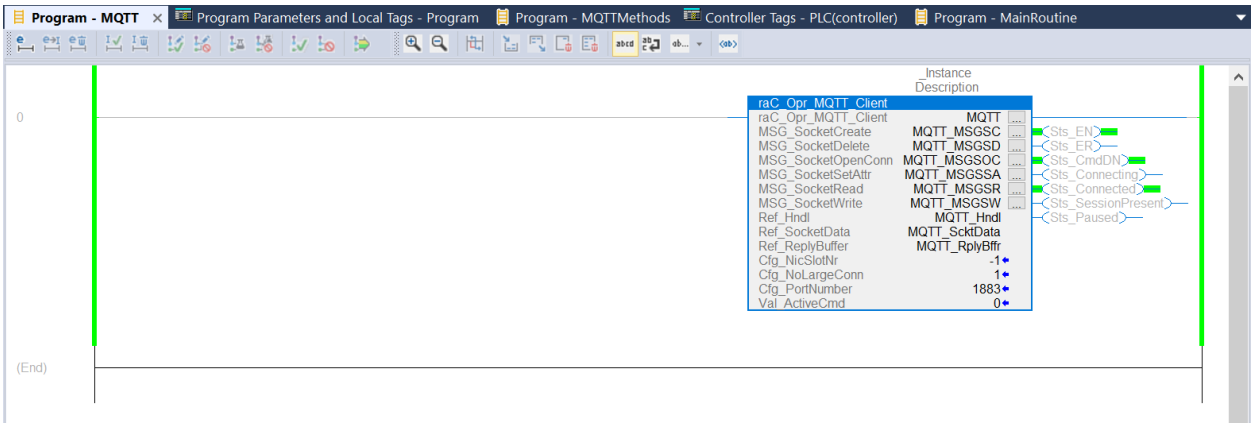


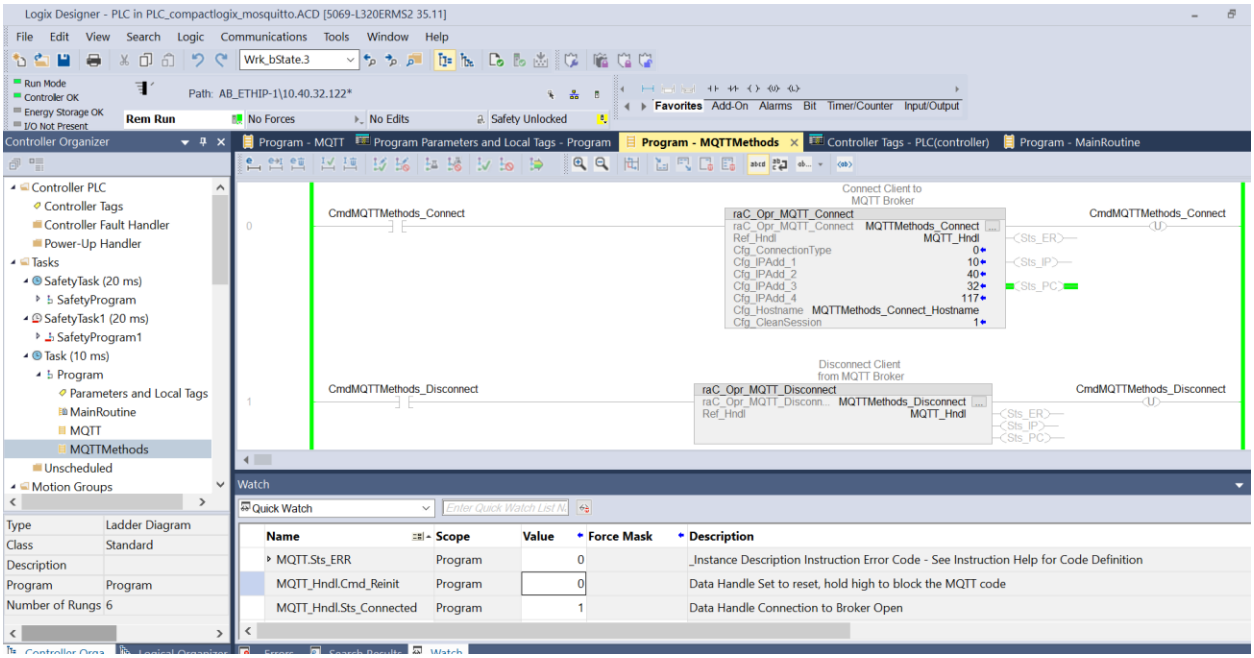
Let’s use this socket configuration



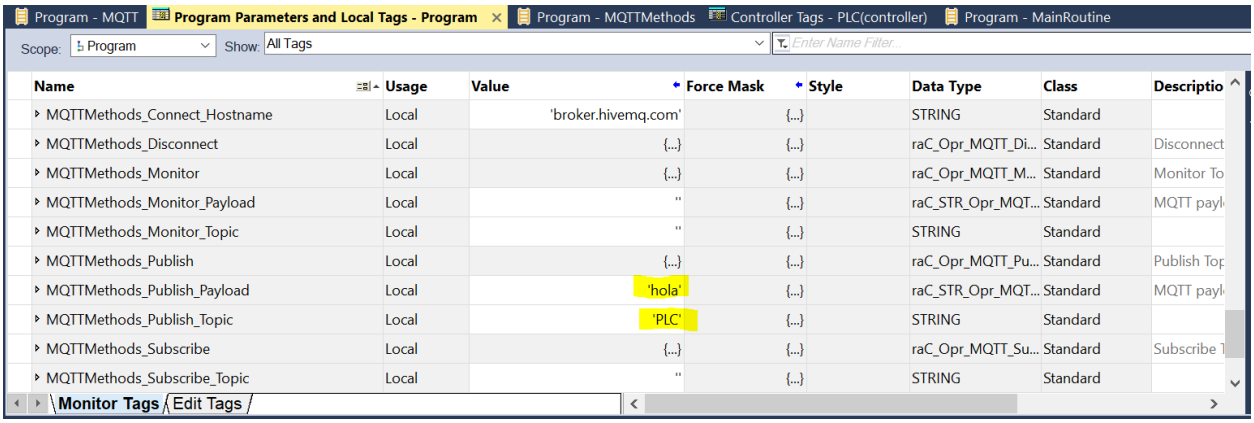


We are connected with no errors

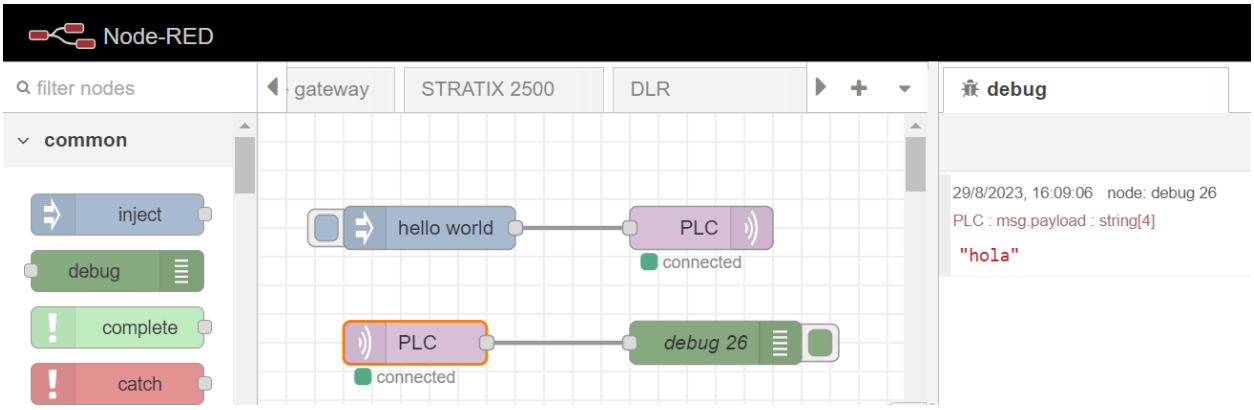




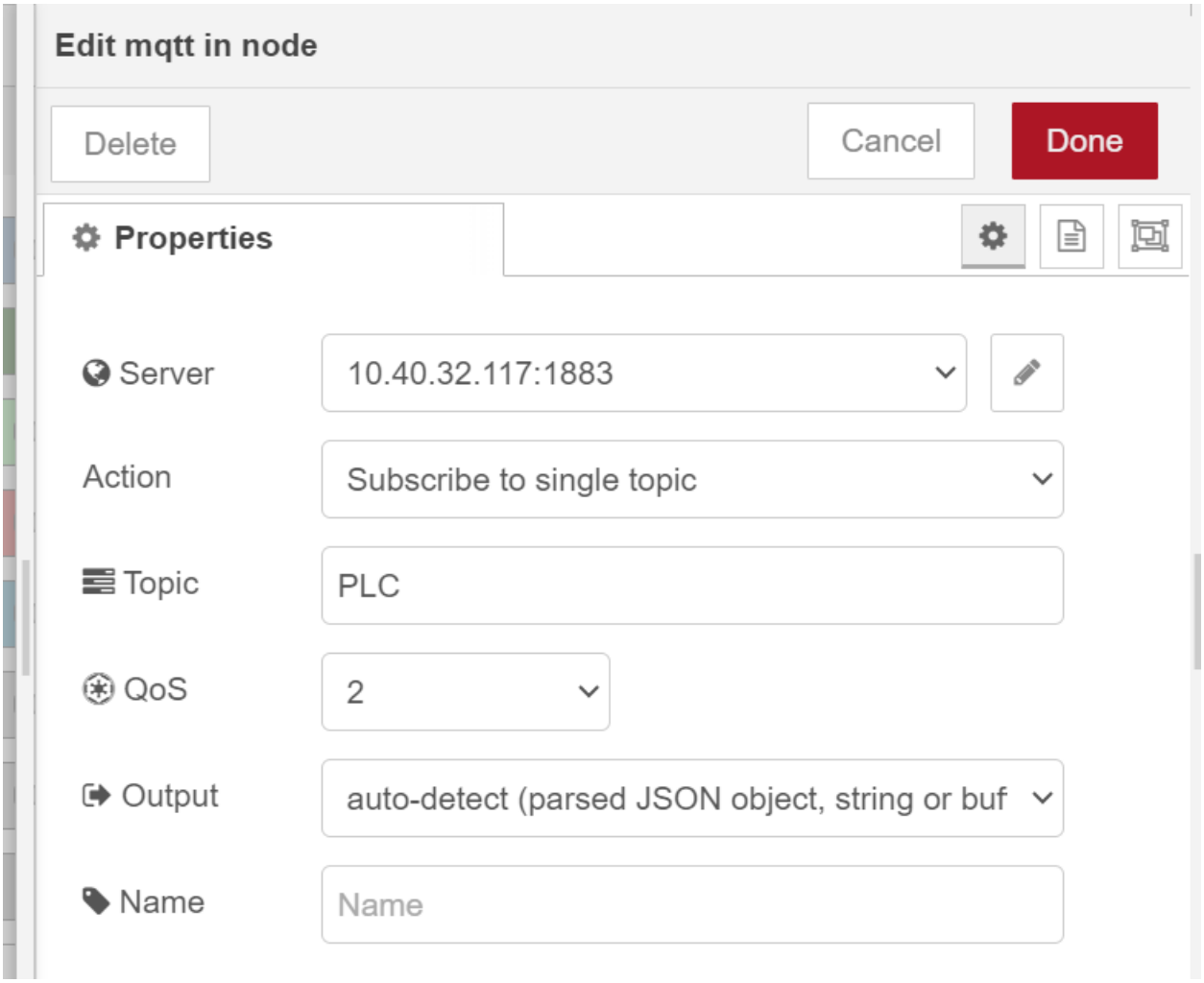
Let’s use this publish configuration



Let’s toggle the publish bit



This is the MQTT node configuration

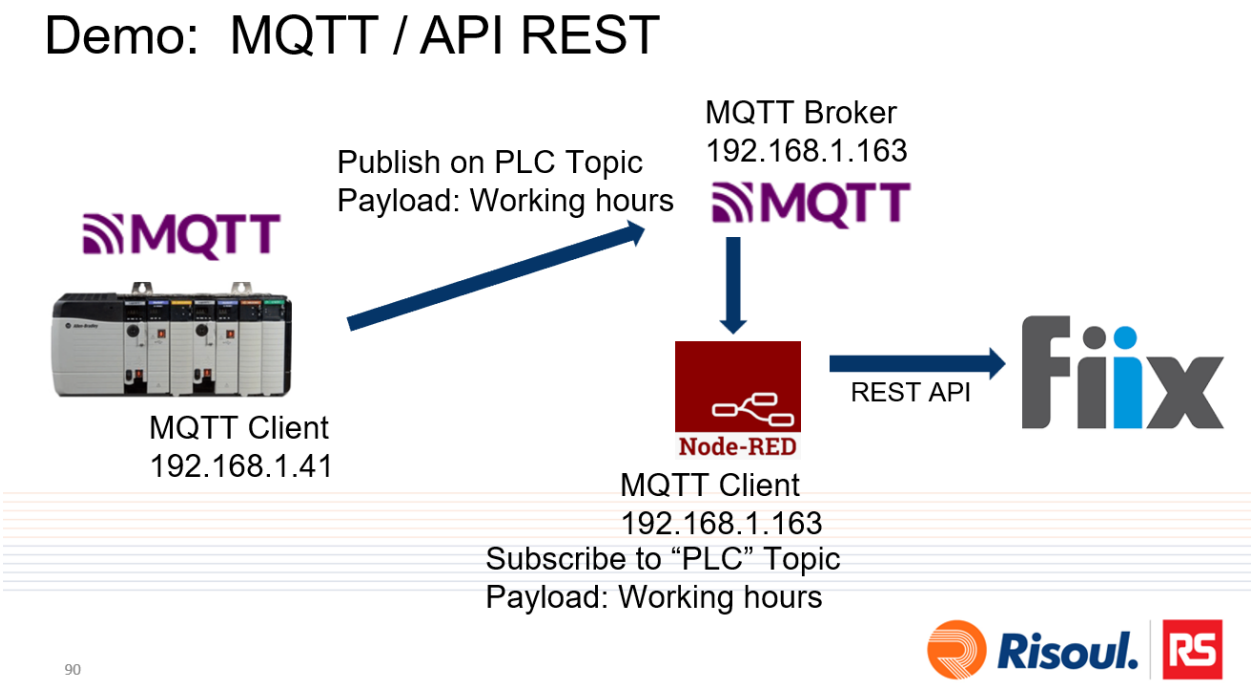


As you can see on this video

https://youtu.be/Y6_UtErWmb4

3. Sending MQTT PLC client data to Fiix

Now that you master MQTT on a PLC you are ready to perform this test



As you can see on this video

https://youtu.be/jvmQ0zi50cg