

M015 Uf1 IoT



MQTT per QT - Pràctica Panell (versio1)

Curs: 2019-20

CFGs: DAM2

Alumne : Arnau Subirós Puigarnau

Data : 11-02-2020

Nom i Cognoms

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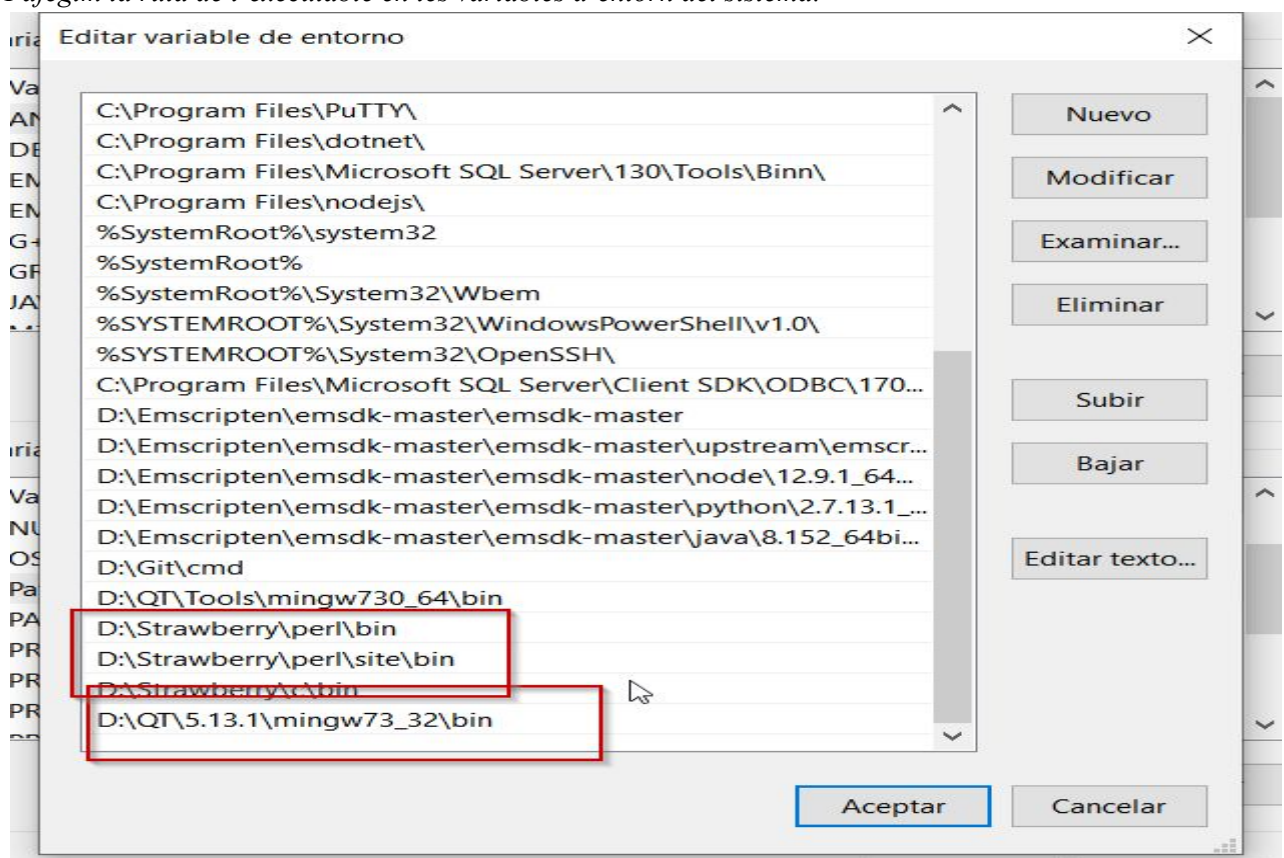
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Configuració MQTT per QT (per Windows)

NOTA: per Windows: necessitem instal·lar Strawberry Perl

- <http://strawberryperl.com/>
- I afegim la ruta de l'executable en les variables d'entorn del sistema.



- Utilitzarem el terminal de QT (MinGW 7.3.0 de 32 bits) ja que 64 bits ens va donar errors.



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- Clonem el repositori qtmqtt.git

```
Selecció Qt 5.13.1 (MinGW 7.3.0 32-bit)

C:\Users\arnau\qtmqtt\build>git clone git://code.qt.io/qt/qtmqtt.git
Cloning into 'qtmqtt'...
remote: Counting objects: 2705, done.
remote: Compressing objects: 100% (1806/1806), done.
Receiving objects: 97% (2624/2705)used 1365 (delta 870)Receiving objects: 95% (2570/2705)
Receiving objects: 100% (2705/2705), 575.63 KiB | 1.33 MiB/s, done.
Resolving deltas: 100% (1719/1719), done.
Updating files: 100% (131/131), done.

C:\Users\arnau\qtmqtt\build>cd qtmqtt2
El sistema no puede encontrar la ruta especificada.

C:\Users\arnau\qtmqtt\build>cd qtmqtt

C:\Users\arnau\qtmqtt\build\qtmqtt>mkdir build

C:\Users\arnau\qtmqtt\build\qtmqtt>cd build

C:\Users\arnau\qtmqtt\build\qtmqtt\build>D:\QT\5.13.1\mingw73_32\bin\qmake -r ..
Info: creating stash file C:\Users\arnau\qtmqtt\build\qtmqtt\build\qmake.stash
Info: creating cache file C:\Users\arnau\qtmqtt\build\qtmqtt\build\qmake.cache
Reading C:/Users/arnau/qtmqtt/build/qtmqtt/src/src.pro [C:/Users/arnau/qtmqtt/build/qtmqtt/build/src]
Reading C:/Users/arnau/qtmqtt/build/qtmqtt/src/mqtt/mqtt.pro [C:/Users/arnau/qtmqtt/build/qtmqtt/build/src/mqtt]
Project MESSAGE: perl -w D:\QT\5.13.1\mingw73_32\bin\syncqt.pl -module QtMqtt -version 5.15.0 -outdir C:/Users/arnau
rnau/qtmqtt/build/qtmqtt/build C:/Users/arnau/qtmqtt/build/qtmqtt
<srcbase> = C:/Users/arnau/qtmqtt/build/qtmqtt/build/qtmqtt
<bldbase> = C:/Users/arnau/qtmqtt/build/qtmqtt/build
<outbase> = C:/Users/arnau/qtmqtt/build/qtmqtt/build
```

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Qt 5.13.1 (MinGW 7.3.0 32-bit)

```
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Cloning into 'qtmqtt'...
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Receiving objects: 97% (2624/2705) used 1365 (delta 870)Receiving objects: 95% (2570/2705)
Receiving objects: 100% (2705/2705), 575.63 KiB | 1.33 MiB/s, done.
Resolving deltas: 100% (1719/1719), done.
Updating files: 100% (151/151), done.

C:\Users\arnau\qtmqtt\build>cd qtmqtt2
El sistema no puede encontrar la ruta especificada.

C:\Users\arnau\qtmqtt\build>cd qtmqtt

C:\Users\arnau\qtmqtt\build\qtmqtt>mkdir build

C:\Users\arnau\qtmqtt\build\qtmqtt>cd build

C:\Users\arnau\qtmqtt\build\qtmqtt\build>D:\QT\5.13.1\mingw73_32\bin\qmake -r ..
Info: creating stash file C:\Users\arnau\qtmqtt\build\qtmqtt\build\.qmake.stash
Info: creating cache file C:\Users\arnau\qtmqtt\build\qtmqtt\build\.qmake.cache
Reading C:/Users/arnau/qtmqtt/build/qtmqtt/src/src.pro [C:/Users/arnau/qtmqtt/build/qtmqtt/build/src]
Reading C:/Users/arnau/qtmqtt/build/qtmqtt/src/mqtt/mqtt.pro [C:/Users/arnau/qtmqtt/build/qtmqtt/build/src/mqtt]
Project MESSAGE: perl -w D:\QT\5.13.1\mingw73_32\bin\syncqt.pl -module QtMqtt -version 5.15.0 -outdir C:/Users/arnau/qtmqtt/build/qtmqtt/build C:/Users/arnau/qtmqtt/build/qtmqtt
<srcbase> = C:/Users/arnau/qtmqtt/build/qtmqtt
<bldbase> = C:/Users/arnau/qtmqtt/build/qtmqtt/build
<outbase> = C:/Users/arnau/qtmqtt/build/qtmqtt/build
```

[7] tcp winequality.csv gdrive/Mv\ Drive\MisColabs\data

Qt 5.13.1 (MinGW 7.3.0 32-bit)

```
programa o archivo por lotes ejecutable.

C:\Users\arnau\qtmqtt\build\qtmqtt\build>mingw32-make install
cd src\ && ( if not exist Makefile D:\QT\5.13.1\mingw73_32\bin\qmake.exe -o Makefile C:\Users\arnau\qtmqtt\build\qtmqtt\src\src.pro ) && mingw32-make -f Makefile in
mingw32-make[1]: Entering directory 'C:/Users/arnau/qtmqtt/build/qtmqtt/build/src'
cd mqtt\ && ( if not exist Makefile D:\QT\5.13.1\mingw73_32\bin\qmake.exe -o Makefile C:\Users\arnau\qtmqtt\build\qtmqtt\src\mqtt\mqtt.pro ) && mingw32-make -f Make
all
mingw32-make[2]: Entering directory 'C:/Users/arnau/qtmqtt/build/qtmqtt/build/src/mqtt'
mingw32-make -f Makefile.Release install
mingw32-make[3]: Entering directory 'C:/Users/arnau/qtmqtt/build/qtmqtt/build/src/mqtt'
++ -c -fno-keep-inline-dllexport -msse2 -mstackrealign -mfpmath=sse -O2 -std=c++1z -fno-exceptions -Wall -W -Wextra -Wvla -Wdate-time -Wshift-overflow=2 -Wduplicat
-Wno-stringop-overflow -DUNICODE -D_UNICODE -DWIN32 -DMINGW_HAS_SECURE_API=1 -DWINVER=0x0601 -D_WIN32_WINNT=0x0601 -DQT_NO_FOREACH -DQT_NO_JAVA_STYLE_ITERATORS -DQT
D_LIST -DQT_NO_NARROWING_CONVERSIONS_IN_CONNECT -DQT_BUILD_MQTT_LIB -DQT_BUILDING_QT -D_CRT_SECURE_NO_WARNINGS -D_USE_MATH_DEFINES -DQT_NO_CAST_TO_ASCII -DQT_ASCII
NINGS -DQT_MOC_COMPAT -DQT_USE_QSTRINGBUILDER -DQT_DEPRECATED_WARNINGS -DQT_DISABLE_DEPRECATED_BEFORE=0x040800 -DQT_NO_EXCEPTIONS -DQT_NO_DEBUG -DQT_NETWORK_LIB -D
IB -IC:\Users\arnau\qtmqtt\build\qtmqtt\src\mqtt -I. -I..\..\include -I..\..\include\QtMqtt -I..\..\include\QtMqtt\5.15.0 -I..\..\include\QtMqtt\5.15.0\QtMqtt -Itm
```

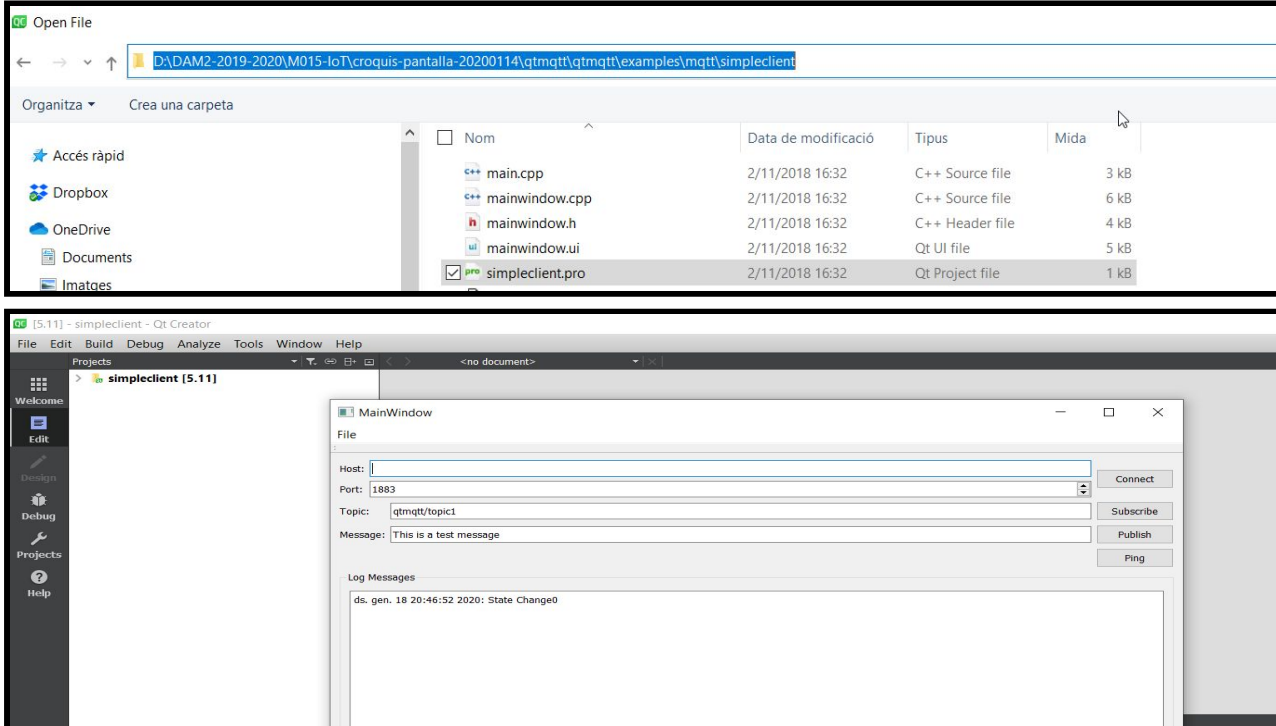

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- Obrim un exemple per confirmar que el protocol MQTT funciona en les QT



NODE-RED :

- Iniciem Node-Red , utilitzarem un flux senzill per fer les proves i confirmar que hi ha comunicació entre les QT i Node-Red

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```

C:\Indicador d'ordres - mosquitto_sub -d -h localhost -p 1883 -t "/dam2/arnau"
D:\mosquitto>mosquitto_sub -d -h localhost -p 1883 -t "/dam2/arnau"
Client mosq-WAxOLL7iWzKzFgOYZe sending CONNECT
Client mosq-WAxOLL7iWzKzFgOYZe received CONNACK (0)
Client mosq-WAxOLL7iWzKzFgOYZe sending SUBSCRIBE (Mid: 1, Topic: /dam2/arnau, QoS: 0, Options: 0x00)
Client mosq-WAxOLL7iWzKzFgOYZe received SUBACK
Subscribed (mid: 1): 0
Client mosq-WAxOLL7iWzKzFgOYZe sending PINGREQ
Client mosq-WAxOLL7iWzKzFgOYZe received PINGRESP
Client mosq-WAxOLL7iWzKzFgOYZe received PUBLISH (d0, q0, r0, m0, '/dam2/arnau', ... (4 bytes))
hola
Client mosq-WAxOLL7iWzKzFgOYZe received PUBLISH (d0, q0, r0, m0, '/dam2/arnau', ... (4 bytes))
adeu
Client mosq-WAxOLL7iWzKzFgOYZe sending PINGREQ
Client mosq-WAxOLL7iWzKzFgOYZe received PINGRESP
Client mosq-WAxOLL7iWzKzFgOYZe sending PINGREQ
Client mosq-WAxOLL7iWzKzFgOYZe received PINGRESP
Client mosq-WAxOLL7iWzKzFgOYZe sending PINGREQ
Client mosq-WAxOLL7iWzKzFgOYZe received PINGRESP
Client mosq-WAxOLL7iWzKzFgOYZe received PUBLISH (d0, q0, r0, m0, '/dam2/arnau', ... (4 bytes))
Com anem

```

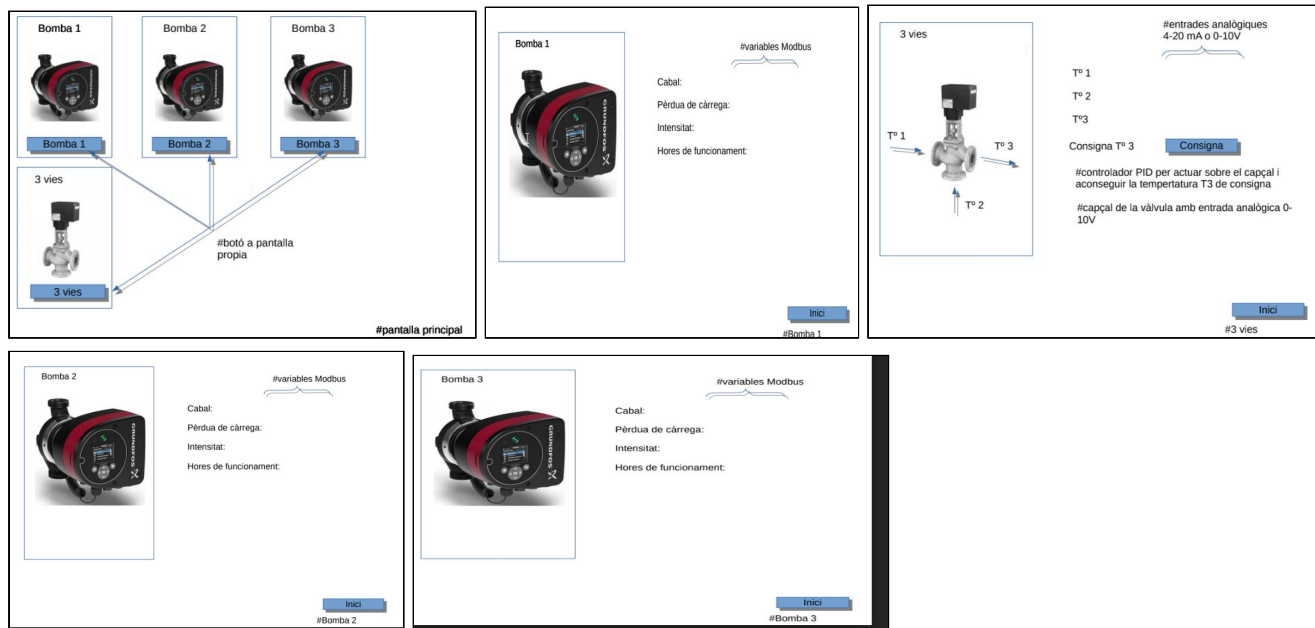
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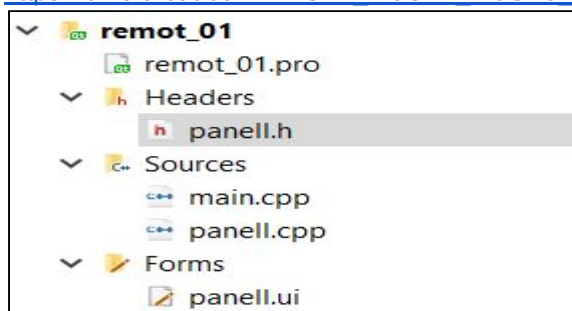
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PRACTICA -



- Obrirem un projecte QT anomenat : "remot_01" (en basarem en un que ja està fet per poder-lo analitzar com funciona)

https://binefa.cat/dam/M7UF1_M9UF2_M9UF3_M15UF1/20200128_m07uf1_m09_uf3/



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- Arxiu : [remot_01.pro](#)

s'ha d'afegir si volem utilitzar el protocol mqtt

```

1 QT += core gui network mqtt
2
3 greaterThan(QT_MAJOR_VERSION, 4): QT += widgets

```

- Headers

- arxiu: [panell.h](#)

Definim els temes subscrits (utilitzant Mqtt). Com que ens estem basant en un codi, ens interessa modificar els topics per evitar errors.

```

1 #ifndef PANELL_H
2 #define PANELL_H
3
4 #include <QWidget>
5 #include <QMQTTClient>
6
7 QT_BEGIN_NAMESPACE
8 namespace Ui { class Panell; }
9 QT_END_NAMESPACE
10
11 #define TEMA_T1 "/asp/mesura/T1"
12 #define TEMA_T3 "/asp/mesura/T3"
13 #define TEMA_CABAL "/asp/mesura/cabal"
14

```


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- Sources

- arxiu: [main.cpp](#) (l'executable)
- arxiu: [panell.cpp](#)

```
1 ui->setupUi(this);  
2  
3 m_client = new QMqttClient(this);  
4 m_client->setHostname(ui->lineEditUrlBroker->text());  
5 m_client->setPort(ui->lineEditBrokerPort->text().toInt()); // Δ implicit conversion loses integer precision: 'int' to 'qu  
6  
7 connect(m_client, &QMqttClient::stateChanged, this, &Panell::updateLogStateChange);  
8 connect(m_client, &QMqttClient::disconnected, this, &Panell::brokerDisconnected);  
9 connect(m_client, &QMqttClient::messageReceived, this, [this](const QByteArray &message, const QMqttTopicName &topic) {  
10     const QString content = QDateTime::currentDateTime().toString()  
11         + QLatin1String(" Received Topic: ")  
12         + topic.name()  
13         + QLatin1String(" Message: ")  
14         + message  
15         + QLatin1Char('\n');  
16     vGestionaResposta(topic.name(), message);  
17     ui->plainTextEdit->insertPlainText(content);  
18 });  
19 vEnableTopLayout(false);  
20  
21  
22  
23  
24  
25  
26  
27  
28 void Panell::brokerDisconnected()  
29 {  
30     ui->lineEditUrlBroker->setEnabled(true);  
31     ui->lineEditBrokerPort->setEnabled(true);  
32     ui->btConnect->setText(tr("&Connect"));  
33 }  
34  
35 void Panell::subscription(QString topic)  
36 {  
37     auto subscription = m_client->subscribe(topic);  
38     if (!subscription) {  
39         QMessageBox::critical(this, QLatin1String("Error"), QLatin1String("Could not subscribe. Is there a valid connection?"));  
40         return;  
41     }  
42     qDebug() << "Subscribit a " << topic;  
43 }  
44  
45 void Panell::vGestionaResposta(QString tema, QString missatge){  
46     if(tema == TEMA_T1){  
47         ui->progressBar1->setValue(missatge.toInt());  
48     }  
49     if(tema == TEMA_CABAL){  
50         ui->etCabal->setText(missatge);  
51     }  
52 }  
53
```

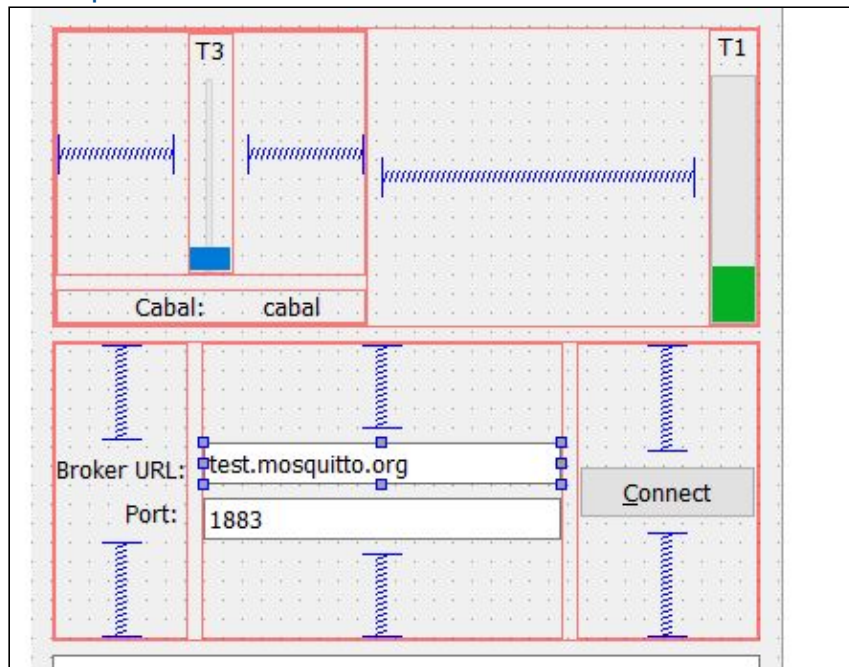
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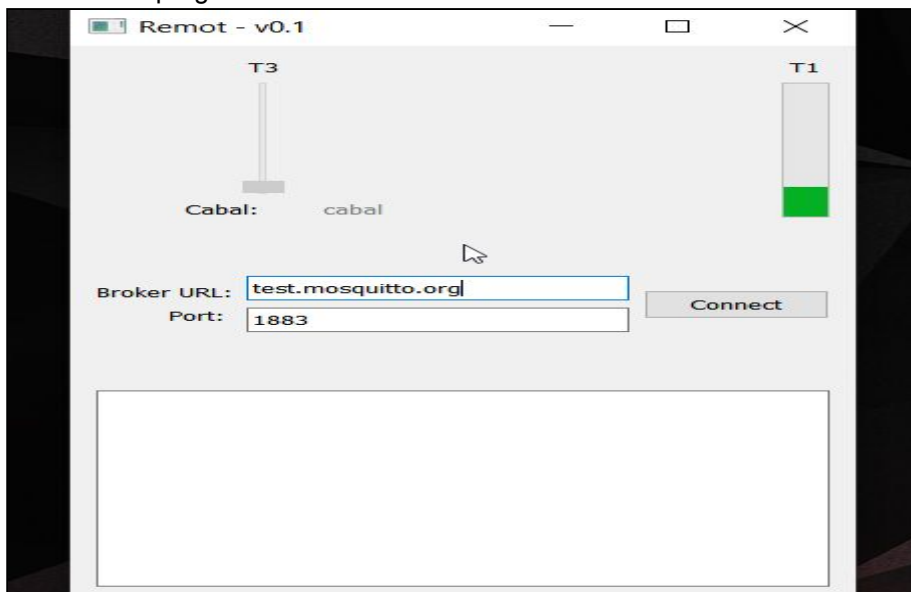
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- Forms
 - arxiu: [panell.ui](#)



- Executem el programa



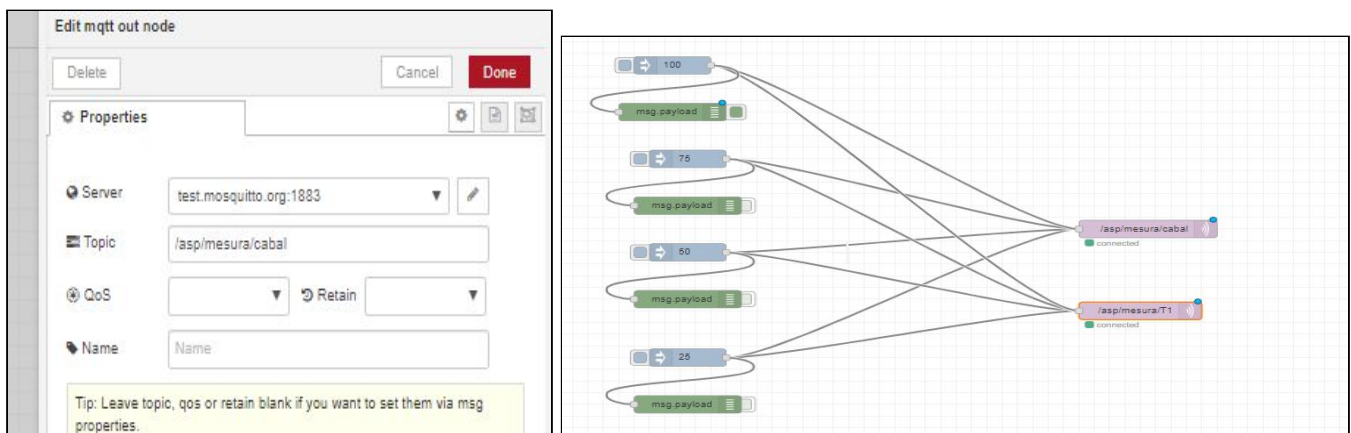
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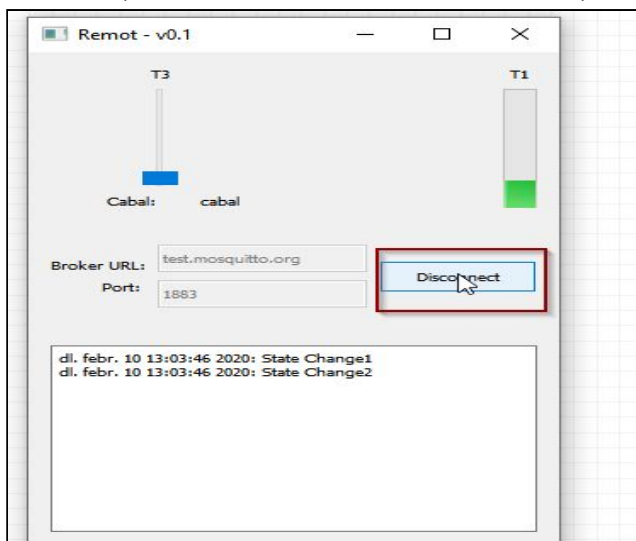
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- Vinculació de les QT amb Node-Red mitjançant MQTT
- En el Node-Red crearem un fluxe senzill tenint en compte els topics que hem creat en el programa QT i utilitzarem el mateix servidor Mqtt per defecte (test.mosquitto.org:1883)
 - En QT utilitzem els topics com a subscriptor
 - En Node utilitzarem els mateixos topics però com a publicadors. Afegirem 4 nodes "inject" de tipus number i si funciona s'haurà de veure reflexat en el programa QT



- Desde QT :Ens connectem al servidor MQTT : test.mosquitto.org:1883



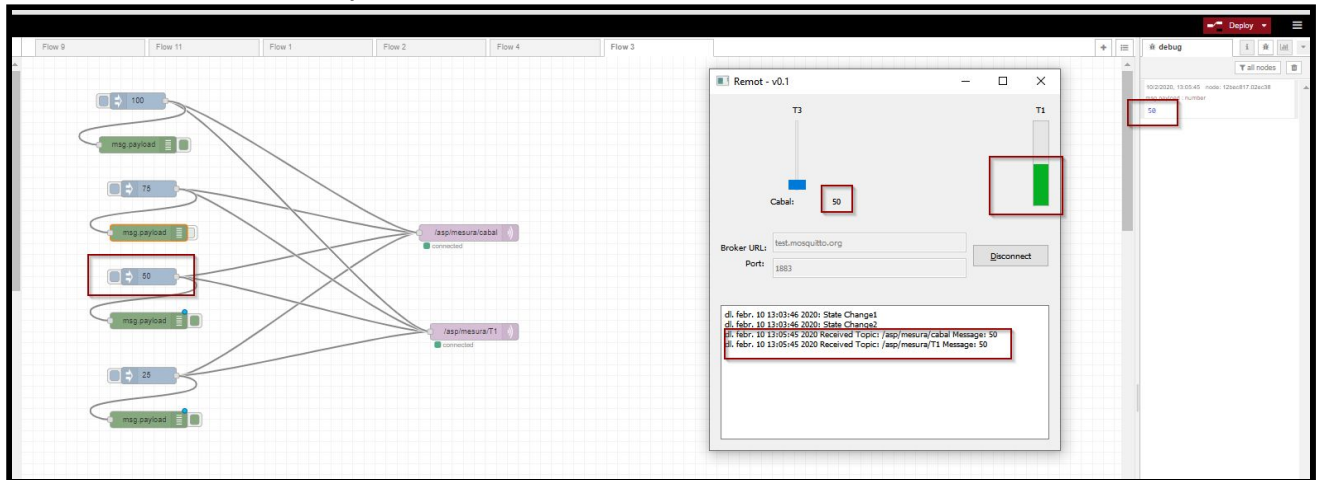
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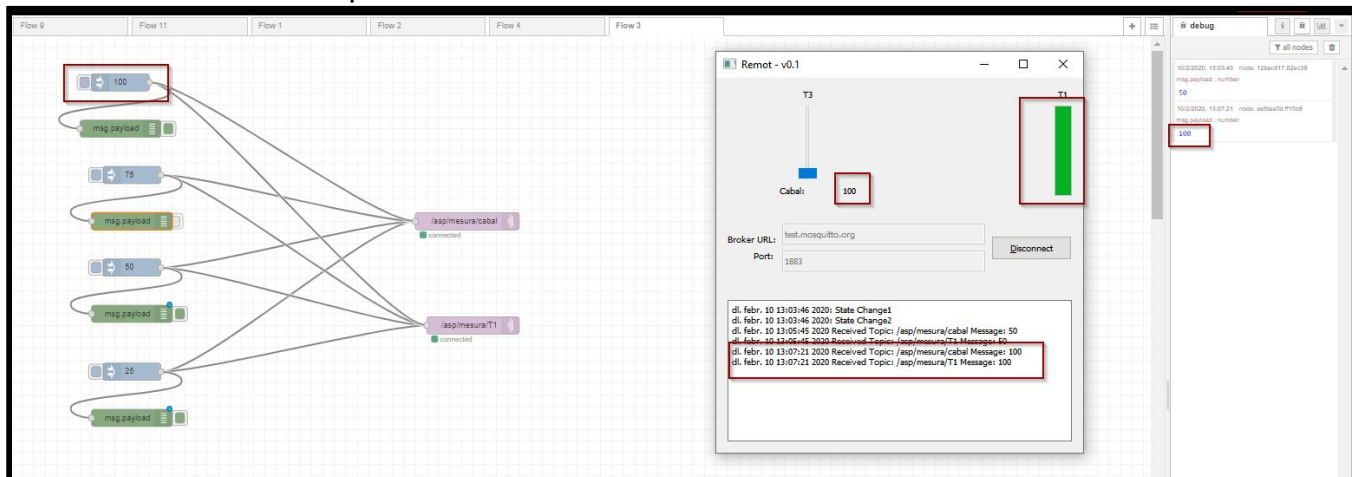
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- Desde Node-Red :Publiquem el valor de 50



- Desde Node-Red :Publiquem el valor de 100



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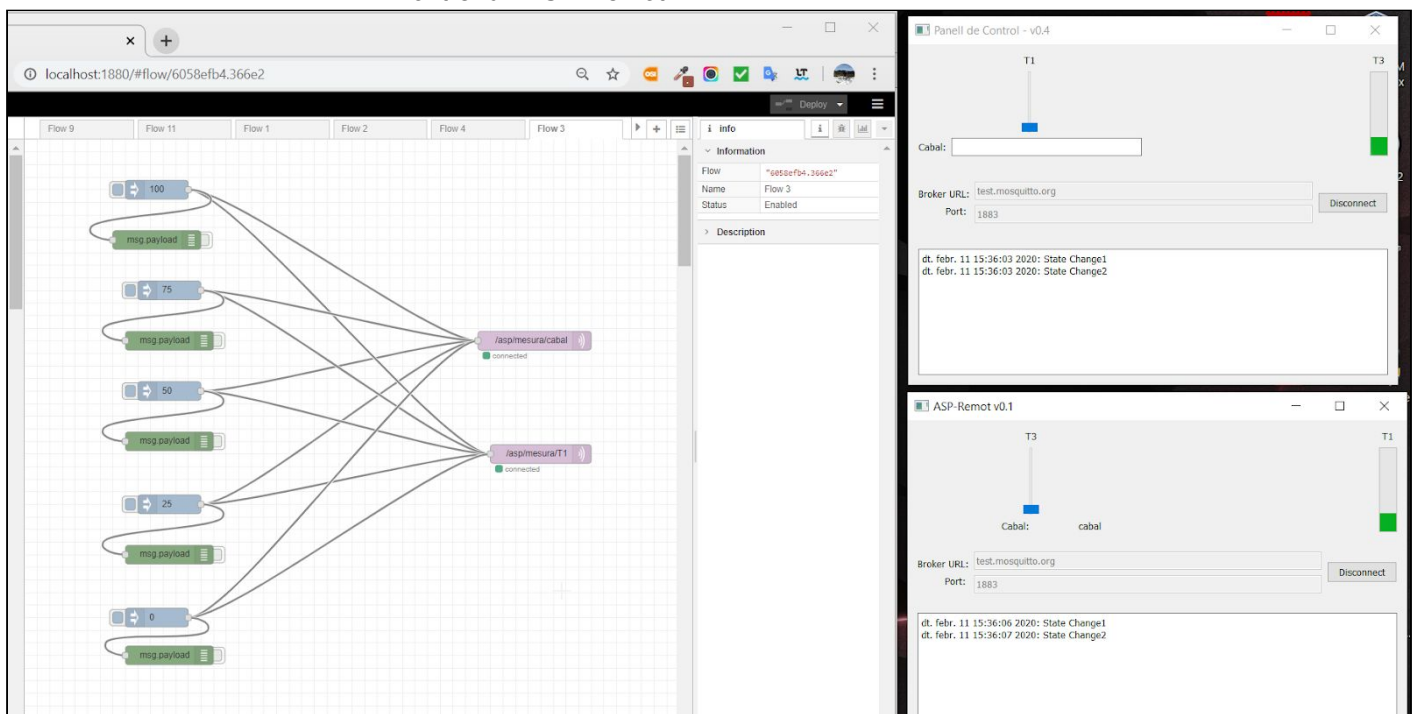
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Ampliació- FONT consultada:

- https://binefa.cat/dam/M7UF1_M9UF2_M9UF3_M15UF1/20200204_m07uf1_m09_uf3/
 - Ens descarquem els 2 programes QT
 - remot_01
 - panell_04
- (per poder analitzar el seu funcionament abans de fer modificacions)

Primer de tot accedir al fluxe de Node-Red que prèviament havíem fet proves.

- Les 2 aplicacions es connecten al mateix broker Mqtt : test.mosquitto.org
 - Back-end : Panel de Control
 - Front-end : ASP-Remot1

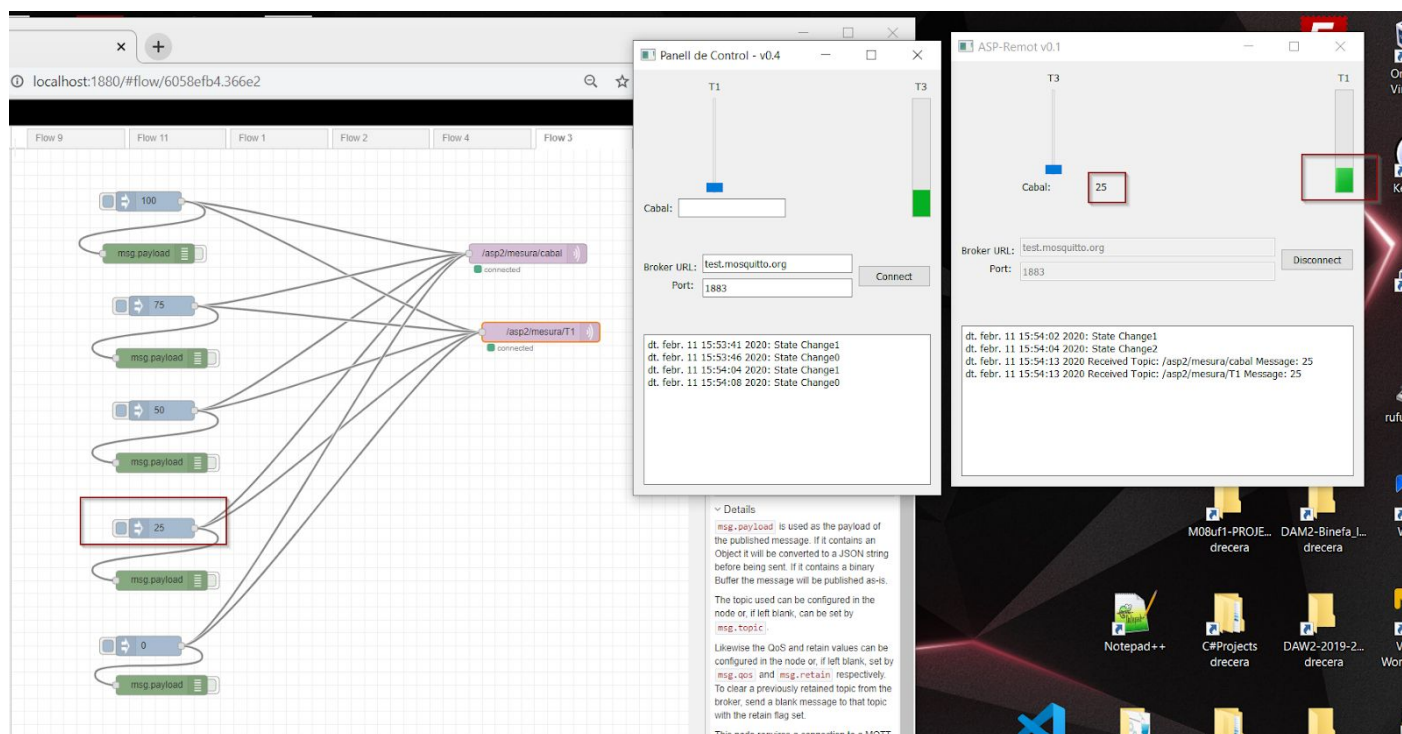


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Per acabar