SMQ LED

INTRODUCTION

SMQ, (Simple Message Queues), is an easy to use IoT/ M2M publish subscribe protocol designed and optimized for embedded systems providing instantaneous Edge Node connectivity. The solution allows resource constrained real-time control, analysis, and updates.

Web Based Publish-Subscribe

The SMQ protocol structure delivers a hybrid event-driven communication approach for information dissemination using WebSockets as a communication protocol within a Publish/Subscribe paradigm.

Message Structure – Event-Driven, Websockets, Pub/Sub

Pub/Sub pattern operation for propagating data close to real-time creating a practical environment, while taking advantage of Web 2.0 usage by Restful web services. Messages are coordinated and integrated among software components as software applications change over time, and are transferred from one machine to another over unreliable wireless networks.

FEATURES

- Publish-Subscribe
- Asynchronous Communication
- 1-to-1 Messaging via P2P Tunnel
- 1-to-Many Messaging
- Ephemeral Topic IDs
- RPC (Remote Procedure Call) Compatible
- Hierarchical Topic Structures
- Client Supervision
- Designed for Constrained Devices
- 1 QOS (Quality of Service) Level
- Persistent Messages
- Web of Things IoT Bridging
- Light on the Network (Fixed Headers)

Contents

The TI Launchad kit includes (from left to right) an Ethernet cable, the EK-TM4C1294XL board pre-flashed with the SMQ LED demo, and a USB cable.
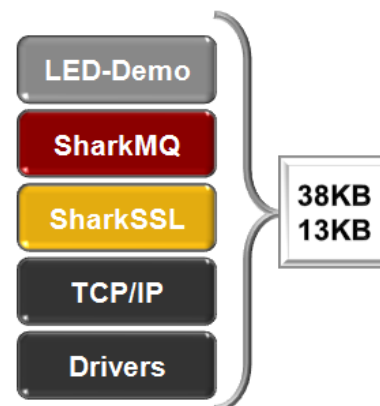

1. Ethernet Cable.
2. EK-TM4C1294XL Board (Pre-flashed with SMQ LED demo).
3. USB Cable.

About

The TI board (EK-TM4C1294XL) is pre-flashed with SharkSSL, the SharkMQ protocol stack, and a LED demonstration program that enables you to control the board's four LED's from a browser or phone.

SharkMQ is the SSL/TLS secure implementation of the SMQ C client protocol stack.

The TCP/IP stack used in this demo is the uIP networking stack. The software runs on bare metal (super loop) and does not utilize an RTOS (Real-Time Operating System). The complete reference platform is using a total of 38K ROM and 13K RAM.

INSTRUCTION

STEP 1

Insert the Ethernet cable into the Ethernet jack on the TM4C1294XL board and insert the other end into your (home) router. If you are in an office environment, insert the Ethernet cable into any active Ethernet jack in the office location.
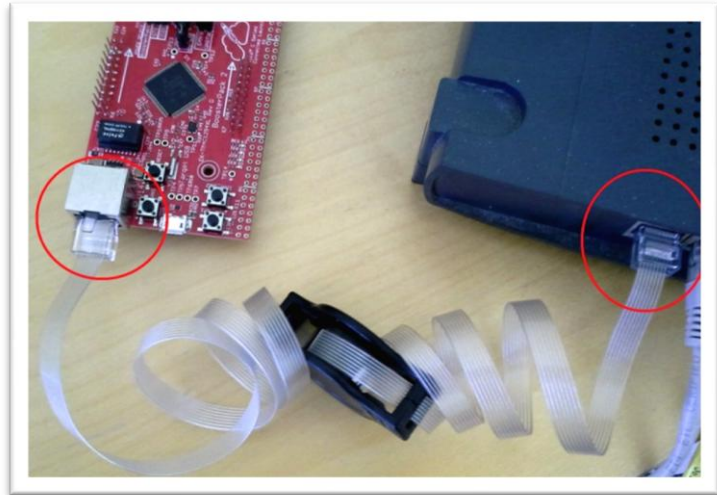

STEP 2

Connect the USB power supply cable to the Launchpad as illustrated. Here you may use a standard USB phone charger that connects to a wall outlet, or the supplied USB cable connected to any available computer port to power the board. Once connected the LEDs should turn on to indicate that the board is operational.
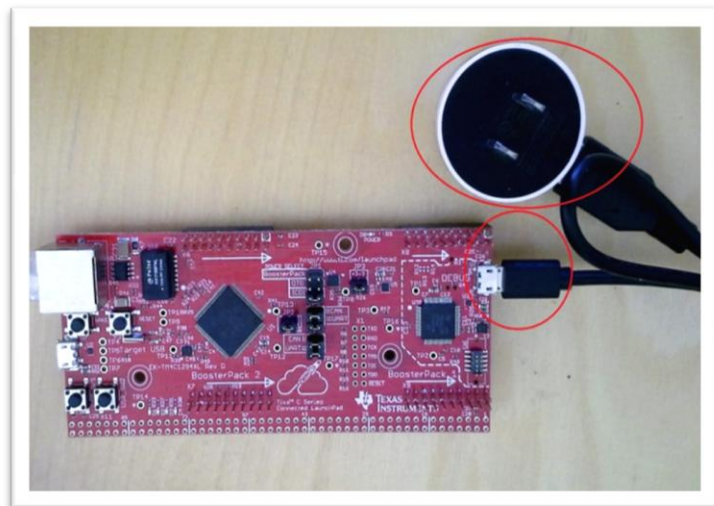
Board Response

The board will automatically boot and connect to Real Time Logic's public SMQ test broker at (simplemq.com). This may take a moment depending on the network. During the process, the board will first request a local IP address from the network's DHCP server. Once assigned the board will use the IP address to connect to the SMQ broker located at simplemq.com and perform a secure SSL handshake authentication. The board LEDs will indicate its progress by initiation of a blinking pattern followed by turning off all LEDs once a complete and successful connection with simplemq.com has been established. The board will then appear as a connected device that can be controlled via a browser from any remote desktop or mobile device at the following address: https://simplemq.com/m2m-led/


Illustrated Example
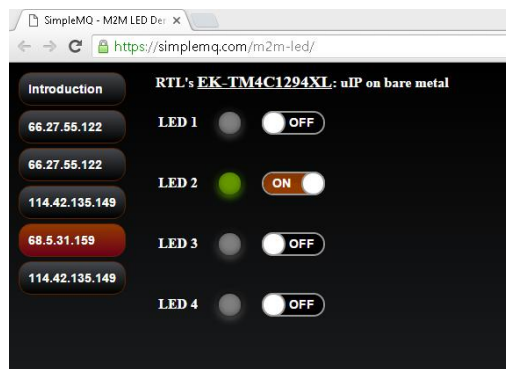
NOTE: *The board IP address will display as a tab in the browser with the newly assigned IP address of your network's public IP address (WAN address). If you do not know your network's WAN IP address and if you are uncertain to know which connected board is yours, merely navigate to the following address to learn your local WAN IP address at:* http://whatismyipaddress.com/

LED Toggles

The TI Launchpad has two LED toggles located at the bottom right corner of the target. Interaction with each toggle will turn the LED lights to their off and on position. Note that all browsers connected to the online broker will show real-time simultaneous display of the interaction from the target and users may also control the on/off state of the board to the target.
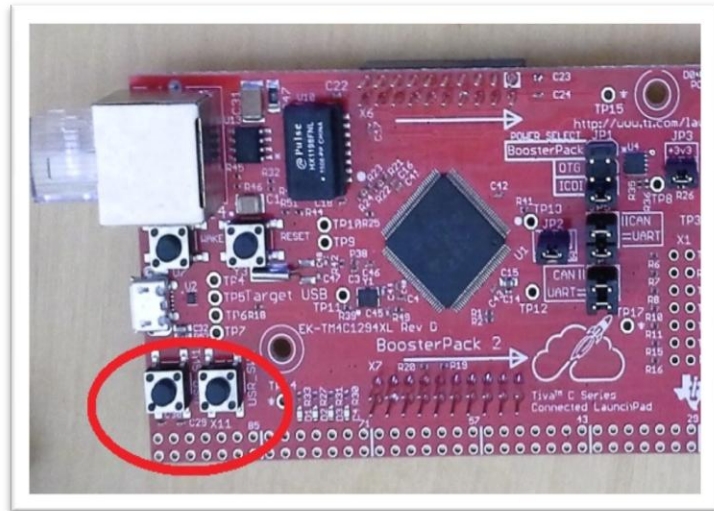
Demonstration Limitations

1. The software demonstration on the board is not designed or configured to connect to the online broker from within a network that requires a proxy access to the outside world (the Internet). If you have no available connection without proxy access, contact Real Time Logic for further assistance.
2. Some office locations may require (proprietary) authentication for connecting to the DHCP server or connecting to the Internet. The TI board will not function in these environments.
3. A network connectivity error (such as denied access) is signaled if the LEDs are not turned off (after sometime) after that the board is powered on.

SMQ References

- **SMQ Product Page**
  https://realtimelogic.com/products/simplemq/
- **SMQ LED Demo Tutorial**
  https://makoserver.net/blog/2014/12/Browser-to-Device-LED-Control-using-SimpleMQ

SMQ Related Articles

- **All About Messaging Protocols**
  http://www.eejournal.com/archives/articles/20150420-protocols/
- **Asserting Machine Control in the IoT**
  http://eejournal.com/archives/articles/20150810-control/

SMQ Native Android APP

- **IoT SMQ LED**
  https://play.google.com/store/apps/details?id=demo.smq_android