

# Octave MQTT Toolkit 0.0.5

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MQTT functions for GNU Octave.

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To download a copy of the GNU Octave MQTT package, please visit <https://gnu-octave.github.io/octave-mqtt/>.

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# 1 Installing and loading

The toolkit must be installed and then loaded to be used.

It can be installed in GNU Octave directly from the website, or can be installed in an off-line mode via a downloaded tarball.

The toolkit has a dependency on the PAHO-MQTT-C library (<https://www.eclipse.org/paho/>), so it must be installed in order to successfully install the toolkit.

The toolkit must be then be loaded once per each GNU Octave session in order to use its functionality.

## 1.1 Online Direct install

With an internet connection available, the octave mqtt package can be installed from the octave-mqtt website using the following command within GNU Octave:

```
pkg install -forge mqtt
```

The latest released version of the toolkit will be downloaded and installed.

## 1.2 Off-line install

With the toolkit package already downloaded (<https://github.com/gnu-octave/octave-mqtt/releases/download/release-0.0.5/octave-mqtt-0.0.5.tar.gz>), and in the current directory when running GNU Octave, the package can be installed using the following command within GNU Octave:

```
pkg install octave-mqtt-0.0.5.tar.gz
```

## 1.3 Loading

Regardless of the method of installing the toolkit, in order to use its functions, the toolkit must be loaded using the pkg load command:

```
pkg load mqtt
```

The toolkit must be loaded on each GNU Octave session.

## 2 Basic Usage Overview

The overview connects to the public broker at HiveMQ (<https://www.hivemq.com/public-mqtt-broker/>) and follows this general flow:

### 2.1 Connection to a broker

Connection to the broker is done using the `mqttclient` function.

#### Example

```
brokerAddress = "tcp://broker.hivemq.com";
port = 1883;

client = mqttclient(brokerAddress, "Port", port)

client =

    Client with properties
      BrokerAddress: tcp://broker.hivemq.com
      Port: 1883
      ClientID:
      Timeout: 5
      KeepAliveDuration: 60
      Subscriptions: [0x3] table
      Connected: 1
```

Additional properties can be included for Timeout, Username, Password and more.

### 2.2 Subscribe to a Topic

To get notifications for changes to a topic, subscribe to the topic.

#### Example

```
topic = "octave/test/field1";

subscribe(client, topic)

ans =

    scalar structure containing the fields:

      Topic = octave/test/field1
      QualityOfService = 0
      Callback =
```

### 2.3 Write to a Topic

To publish data to the broker, use the `wrote` function.

## Example

```
write(client, topic, "hello world")
```

## 2.4 Read from subscribed Topics

Reading data from a topic can be done using the peek function (which will not clear the data from the received queue) or the read function (that will clear the message from the received queue)

## Example

```
# see if there is message
msg = peek(client)

msg =

    scalar structure containing the fields:

        Time = 1.6560e+09
        Topic = octave/test/field1
        Data = hello world

# read message from queue
msg = read(client)

msg =

    scalar structure containing the fields:

        Time = 1.6560e+09
        Topic = octave/test/field1
        Data = hello world
```

## 2.5 Close the client

To close the client and free any resources, use the clear function.

## Example

```
clear client
```

## 3 Function Reference

The functions currently available in the toolkit are described below;

### 3.1 MQTT Functions

#### 3.1.1 @octave\_mqtt/flush

`flush (obj)`

Flush a MQTT client connection

##### Inputs

`obj`            A previously created octave\_mqtt object

##### Outputs

None

##### Examples

Open a client and flush the input

```
client = mqttclient("tcp://127.0.0.1");
flush(client);
```

See also: `mqttclient`.

#### 3.1.2 @octave\_mqtt/peek

`msg = peek (obj)`

`msg = peek (obj, topic)`

Return the most recent message without removing it from the message queue.

##### Inputs

`obj`            A previously created octave\_mqtt object

`topic`          Topic value to match.

##### Outputs

`msg`            The most recent message.

If no topic is specified, the last message from any topic will be returned, otherwise the last matching the input topic.

##### Examples

```
client = mqttclient("tcp://127.0.0.1");
msg = peek(client);
```

#### 3.1.3 @octave\_mqtt/read

`msgs = read (obj)`

`msgs = read (obj, topic)`

Read available messages and remove from message queue.



## Inputs

**obj**            A previously created octave\_mqtt object

**topic**        Topic to match.

## Outputs

**msgs**        Messages from the message queue

If no topic is specified, messages from any topic will be returned, otherwise from the matching input topic.

## Examples

```
client = mqttclient("tcp://127.0.0.1");
msgs = read(client, "test");
```

### 3.1.4 @octave\_mqtt/subscribe

```
subs = subscribe (obj, topic)
subs = subscribe (obj, topic, [propname, propvalue ....])
```

Subscribe to a topic

## Inputs

**obj**            A previously created octave\_mqtt object

**topic**        String topic to subscribe to.

**propname, propvalue**  
Optional property name / value pairs.

Known property name / value pairs:

**QualityOfService**  
Numeric QualityOfService [0-2] (default 0)

**Callback**    Callback function name or handle (default "")  
If provided, the callback will be called with the topic name and message as arguments.

## Outputs

**subs**        a list of current subscriptions for this client.

## Examples

Subscribe to topic 'Test':

```
client = mqttclient("tcp://127.0.0.1");
subs = subscribe(client, "Test");
```

Subscribe to topic 'Test' and display any changed via callback:

```
# define simple function to show callback data
function showmessage(t,v), printf("Topic: %s Message: %s\n", t, v); endfunction
```

```
client = mqttclient("tcp://127.0.0.1");
subs = subscribe(client, "Test", "Callback", @showmessage);
```

**See also:** mqttclient, unsubscribe.

### 3.1.5 @octave\_mqtt/unsubscribe

**unsubscribe** (*obj*, *topic*)  
Unsubscribe from *topic*

#### Inputs

*obj*            A previously created octave\_mqtt object  
*topic*        string topic name.

#### Outputs

None

#### Examples

```
client = mqttclient("tcp://127.0.0.1");
subscribe(client, "test1");
unsubscribe(client, "test1");
```

**See also:** mqttclient, subscribe.

### 3.1.6 @octave\_mqtt/write

**write** (*obj*, *topic*, *value*)  
**write** (*obj*, *topic*, *value*, [*propname*, *propvalue* ....])  
Write *value* to *topic*.

#### Inputs

*obj*            A previously created octave\_mqtt object  
*topic*        String topic to write to.  
*value*        String value to write to topic.  
*propname*, *propvalue*  
              Optional property name / value pairs.

Known property options are:

**QualityOfService**  
              Numeric QualityOfService [0-2] (default 0)  
**Retain**        Boolean flag value for retaining message (default false)

#### Outputs

*client*        A octave\_mqtt object.

## Examples

Open a client connection and write some values.

```
client = mqttclient("tcp://127.0.0.1");
write(client, "mytopic", "test1");
write(client, "mytopic", "test1", "QualityOfService", 1);
```

See also: `mqttclient`.

### 3.1.7 mqttclient

```
client = mqttclient (brokerAddr)
client = mqttclient (brokerAddr, [name, value ....])
```

Create a MQTT client connection

#### Inputs

**brokerAddr**

Name or IP address with protocol. ie: `tcp://127.0.0.1`.

**name, value**

Optional name / value pairs.

Known options are:

**Port**        Numeric port number to connect to (default 1883)

**Timeout**    Numeric timeout value in seconds (default 5)

**KeepAliveDuration**

Numeric keep alive value in seconds (default 60)

**ClientID**   String client Id

**Username**   String username

**Password**   String password

**CARootCertificate**

String full file path to a root certificate file when using a secure connection

**ClientCertificate**

String full file path to a client certificate file when using a secure connection

**ClientKey**

String full file path to a private client key file when using a secure connection

**SSLPassword**

String Password to decrypt the client key file

#### Outputs

**client**       a `octave_mqtt` object

#### Properties

A `octave_mqtt` object has the following properties:

**BrokerAddress**

Broker URL

<b>Port</b>	Numeric port number to connect to (default 1883)
<b>Timeout</b>	Numeric timeout value in seconds (default 5)
<b>KeepAliveDuration</b>	Numeric keep alive value in seconds (default 60)
<b>ClientID</b>	String client Id
<b>Connected</b>	logical 0 1 for connection status
<b>Subscriptions</b>	List of topics currently subscribed to

## Examples

Create a new mqttclient

```
client = mqttclient("tcp://127.0.0.1");
```

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