



Pushing Performance

Development Container



People | Power | Partnership

## HARTING MQTT Broker for HAIC MICA

---

HARTING IT Software Development  
Marienwerder Str. 3, 32339 Espelkamp, Germany  
Phone: +49 5572 47-97300, Fax: +49 5772 47-482  
[mica@HARTING.com](mailto:mica@HARTING.com)



---

## MQTT Broker v1.2 for HAIC MICA Guide

### Content

<b>1.</b>	<b>MQTT BROKER CONTAINER BASICS .....</b>	<b>3</b>
<b>1.1.</b>	<b>OVERVIEW.....</b>	<b>3</b>
<b>1.2.</b>	<b>INSTALLATION OF THE MQTT BROKER CONTAINER .....</b>	<b>3</b>
<b>2.</b>	<b>DESCRIPTION OF THE MQTT BROKER CONTAINER.....</b>	<b>4</b>
<b>2.1.</b>	<b>OVERVIEW OF THE USER INTERFACE .....</b>	<b>4</b>
<b>2.2.</b>	<b>UPLOADING A MQTT BROKER CONFIGURATION FILE .....</b>	<b>5</b>
<b>2.3.</b>	<b>DOWNLOADING THE CURRENT MQTT BROKER CONFIGURATION .....</b>	<b>6</b>
<b>2.4.</b>	<b>USING THE BROKER LOG.....</b>	<b>6</b>
<b>3.</b>	<b>USAGE EXAMPLE .....</b>	<b>7</b>
<b>3.1.</b>	<b>LOG INTO THE MQTT BROKER CONTAINER.....</b>	<b>7</b>
<b>3.2.</b>	<b>SUBSCRIBING TO A TOPIC .....</b>	<b>7</b>
<b>3.3.</b>	<b>PUBLISHING A TOPIC.....</b>	<b>8</b>
<b>4.</b>	<b>SERVICES PROVIDED BY THE MQTT BROKER CONTAINER .....</b>	<b>8</b>
<b>4.1.</b>	<b>OVERVIEW.....</b>	<b>8</b>
<b>4.2.</b>	<b>USAGE OF THE SERVICES.....</b>	<b>8</b>

## 1. MQTT Broker container basics

### 1.1. Overview

MQTT stands for MQ Telemetry Transport. It is a publish/subscribe, extremely simple and lightweight messaging protocol, designed for constrained devices and low-bandwidth, high-latency or unreliable networks. The design principles are to minimise network bandwidth and device resource requirements whilst also attempting to ensure reliability and some degree of assurance of delivery.

Note that the MQTT Broker Container is based on the open source MQTT broker project Mosquitto v1.4. For more information visit the MQTT project page <http://mqtt.org/> and the Mosquitto project page <http://mosquitto.org/>.

### 1.2. Installation of the MQTT Broker container

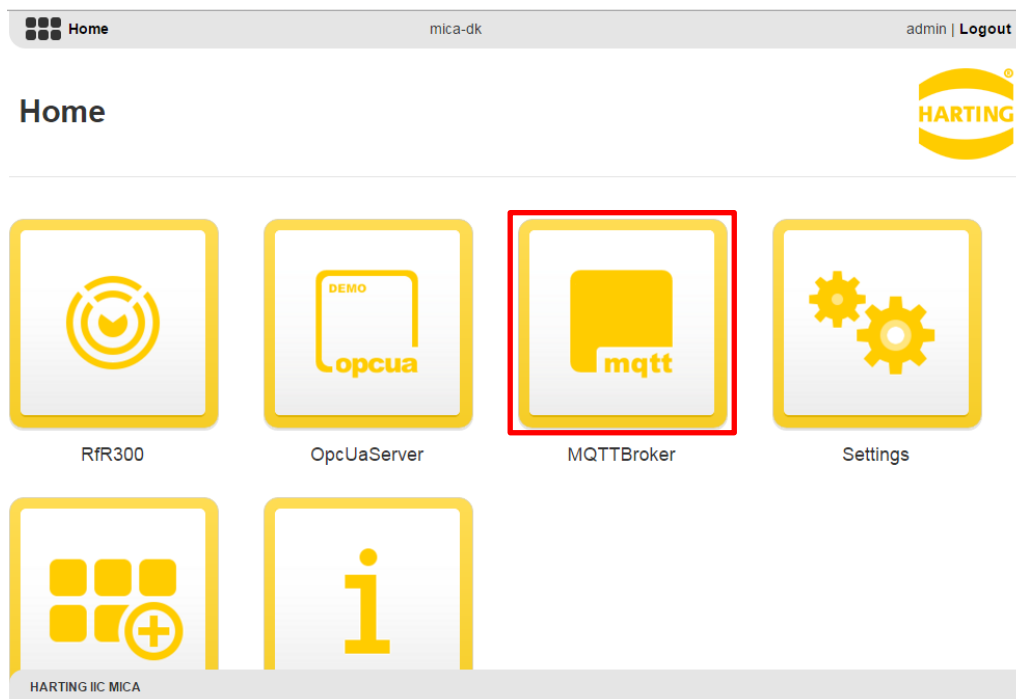


Figure 1: IIC MICA home screen including a (highlighted) MQTT Broker Container

The installation and configuration routine of the MQTT Broker Container follows the standard routine as provided by the IIC MICA and can be found in the “MICA Programming Guide”.

## 2. Description of the MQTT-Broker container

### 2.1. Overview of the user interface

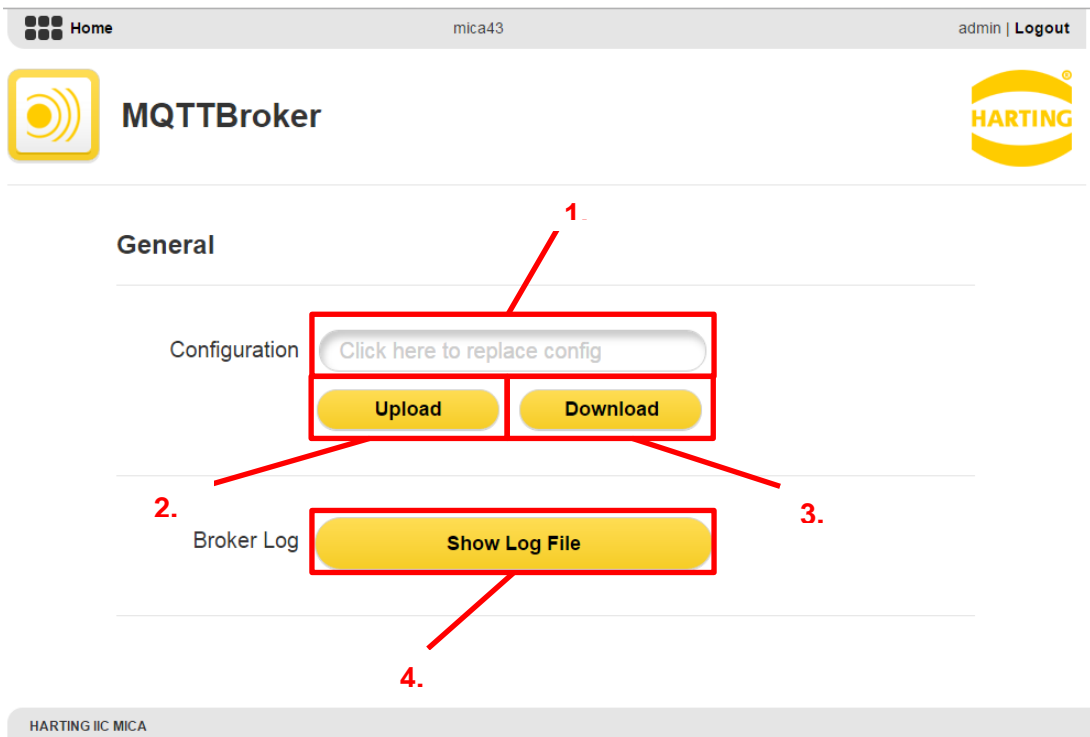


Figure 2: MQTT Broker Container user-interface

The user-interface of the MQTT Broker Container consists of a single section “General” including the entries “Configuration” and “Logging”, which can be used to import/export the broker configuration file to/from the container and to show the broker logs. The user-interface structure can be described as follows:

- 1.) **Configuration file text field:** The text field can be used to set the MQTT broker configuration file you want to upload to the container.
- 2.) **Upload:** The upload button engages the upload of the configuration file that has been specified in 1.)
- 3.) **Download:** The download button engages the download of the current broker configuration file to your file system.
- 4.) **Show Log File:** The log file button lets you enter the log window as shown in Figure 5.

## 2.2. Uploading a MQTT broker configuration file

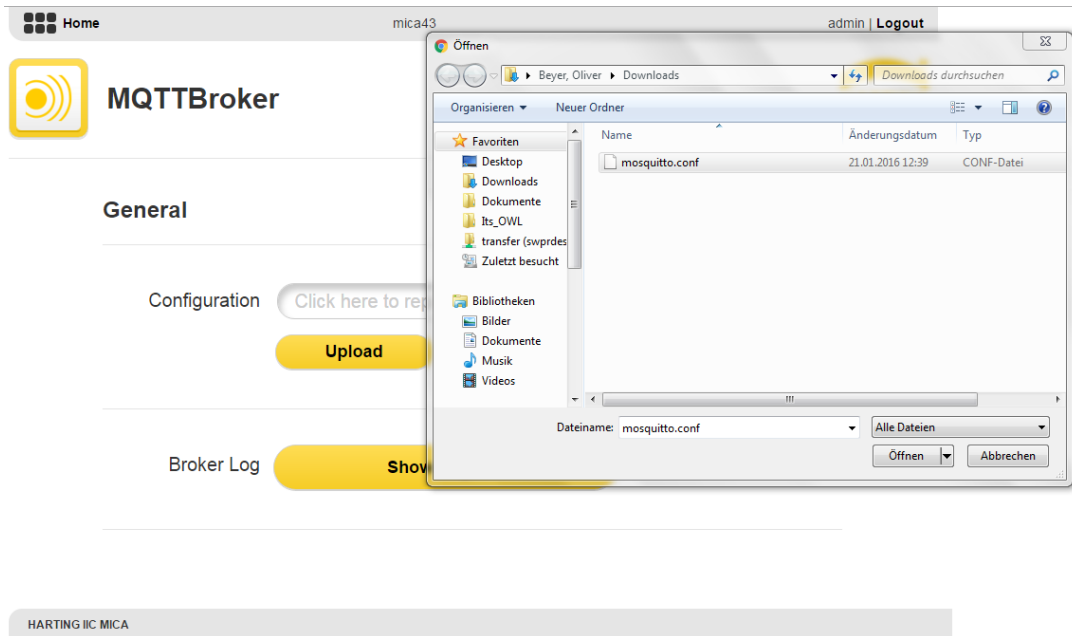


Figure 3: Uploading a configuration to the MQTT broker

In order to upload a new configuration to the container you have to either click the configuration file text field (see Section 2.1) and select the new mqtt broker file as shown in Figure 3, or you simply drag & drop the file into the text field. After selecting a file the file name is shown in the configuration file text field.

When pressing the button “Upload” the selected file will be sent to the container and stored internally. After the transmission ended a symbol to the right side of the configuration file text field will indicate if the transmission was successful or failed, as shown in Figure 4. The container will furthermore restart the MQTT broker as soon as the file transmission ended.

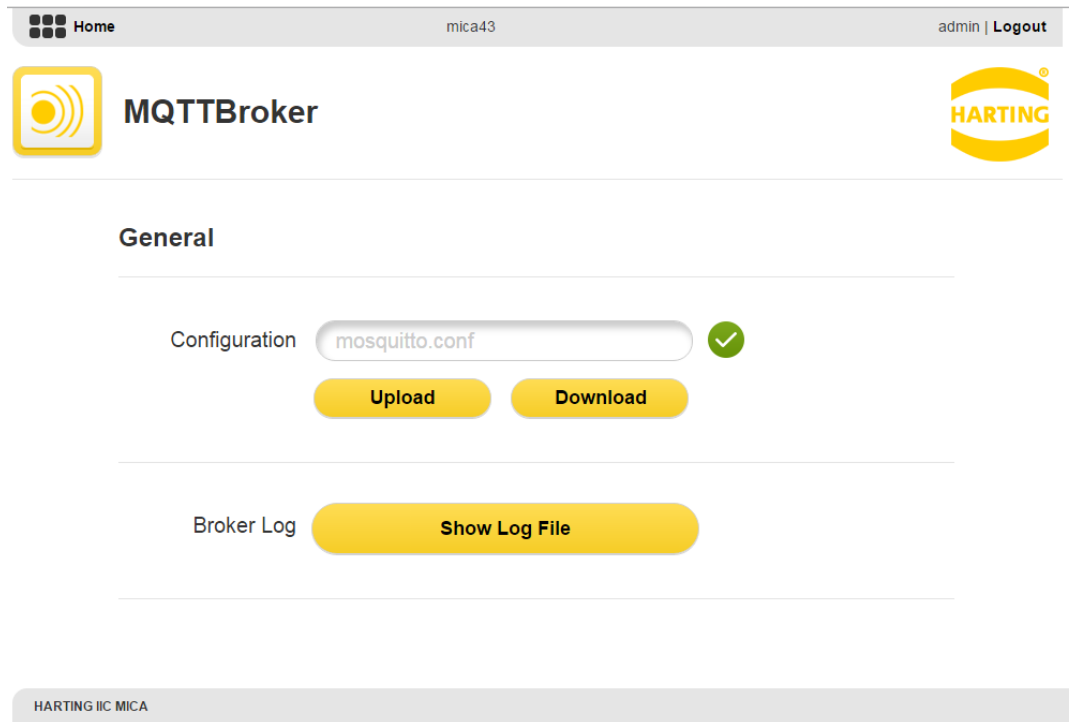


Figure 4: Successful upload of a new configuration to the MQTT Broker Container

### 2.3. Downloading the current broker configuration

You can download the current broker configuration by simply clicking the download button. After having downloaded the configuration you can open the file in a simple text editor such as “WordPad” (Windows) and “TextEdit” (OS X), in order to see/modify the broker configuration and re-upload it as described in Section 2.2.

### 2.4. Using the broker log

Log files of the MQTT broker can be inspected in the logger window (see Figure 5) by clicking the “Show Log File”. Note that in order to provide the functionality of the broker log, the log destination as specified in the broker configuration should always be set to the following file:

```
/var/log/mosquitto.log
```

For more information about how to use the MQTT broker log visit <http://mosquitto.org/>.

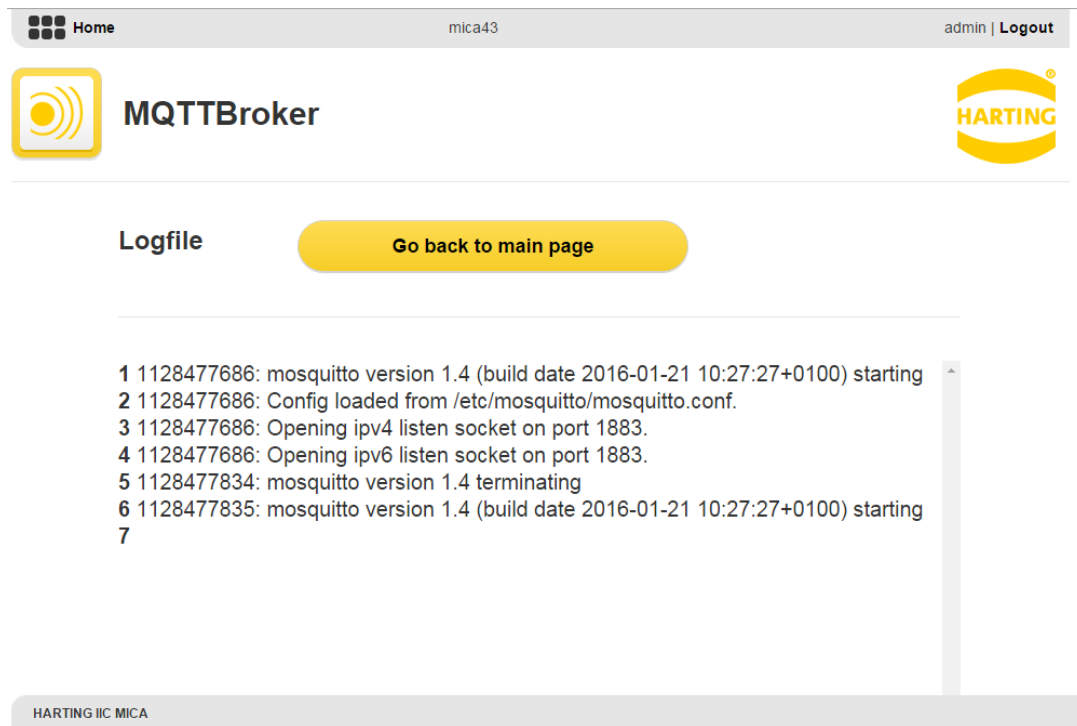


Figure 5: Broker logger window of the MQTT Broker Container

### 3. Usage Example

#### 3.1. Log into the MQTT Broker container

As the MQTT broker automatically starts when the container is started, we only need to log into the container via SSH, as described in the “MICA Programming Guide”. Besides the broker functionality, the Mosquitto framework provides a number of command line tools, such as `mosquitto_pub` (publisher) and `mosquitto_sub` (subscriber). In order to publish messages and subscribe to topics, we need two terminals connected via SSH.

#### 3.2. Subscribing to a topic

In order to subscribe to a topic, such as “topic/path”, we simply need to type the following line into the first of the two SSH terminals:

```
mosquitto_sub -t "topic/path"
```

After that we ready to receive messages published in the topic branch “topic/path”.

---

### 3.3. Publishing a message to a topic

We now use the second SSH terminal to publish a message by simply typing the following line into the terminal:

```
mosquitto_pub -t "topic/path" -m "This is my message" -q 1 -r
```

After the publisher published the message, you should see the message "This is my message" being printed in the first SSH terminal.

For more information about the mosquitto publisher command line tool visit <http://mosquitto.org/>, or simply type `mosquitto_pub -h` into the SSH terminal.

## 4. Services provided by the MQTT Broker container

### 4.1. Overview

The MQTT Broker Container allows the user to access its functionality as provided by the user-interface remotely over HTTP requests. The container therefore utilizes the token provided by the IIC MICA host to authenticate the request. For more information see the Section "Single sign-on (SSO)" of the "MICA Programming Guide".

### 4.2. Usage of the services

The following HTTP-requests are provided by the container:

1. Upload: Uploading a configuration file.  
Method: POST  
URL : `cfgupload?token=XXX`
2. Download: Receiving the content of the current active broker configuration.  
Method: POST  
URL : `cfgdownload?token=XXX`
3. Log file: Receiving the content of the broker log file.  
Method: GET  
URL : `cfglogfile?token=XXX`