

# Start your job with future at DOLD.



DOLD is a leading automation technology company. Offering solutions based on over 90 years of experience DOLD manufacture high quality products using state-of-the-art production plant in Furtwangen, Germany. As experts in the safety of human, machine and the environment DOLD provides worldwide, customer-oriented solutions for all industries. This includes innovative products in the area of safety relays, interlocking, monitoring, controlling and power electronics.

## Master Thesis -“MQTT development board”

Industry 4.0 is a subset of the fourth industrial revolution. The concept of industry 4.0 includes smart manufacturing, smart factory and industrial internet of things, also called internet of things for manufacturing. The internet of things are devices with unique identifiers and the ability to transfer data over network without requiring human interaction. Making things to be smart is the next challenge in industry. One milestone to get devices smart is to make it connectable via network, in this case the internet network. In order to be interoperable with clouds and other devices a new language platform “MQTT” (Message Queuing Telemetry Transport) was introduced. MQTT is an ISO standard (ISO/IEC PRF 20922). It works on top of the TCP/IP protocol and is designed for connections with remote locations. The message protocol system MQTT is the de-facto standard in cloud technologies, like Microsoft Azure, Google Cloud Platform, Cumulocity, IBM Cloud and so on. The MQTT protocol defines two types of network entities: a message broker and a number of clients. The MQTT broker receives all messages from the clients and routes them to the appropriate clients.

### Goal:

The goal of the master thesis is to develop a MQTT message client. The client receives message information via serial interface and forwards information to MQTT broker via TCP/IP. The master thesis concerns the hardware and software development of MQTT message client. The hardware can either be implemented in DOLD product directly or works like a gateway for DOLD products containing Modbus interfaces.

### Tasks:

- Training
- Evaluation of MQTT clouds and comparison
- Development of system concept
- Development of circuit diagram
- Commissioning of hardware platform
- Developing firmware of hardware platform
- Commissioning of system and connecting to MQTT broker/cloud

### Knowledge/What you learn:

- Embedded development
- Language C
- Knowledge MQTT
- Cloud connectivity

Are you interested? Then do not hesitate and send your application to [bewerbung@dold.com](mailto:bewerbung@dold.com)



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