Ensuring Reliable Networks TTTech

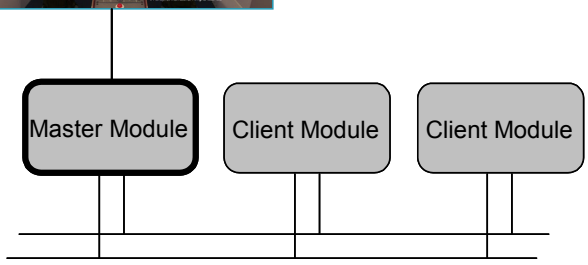
# TTP Loading Library

*Certifiable Data Loading Solution*

**The TTP Loading Library supports the data loading process over the TTP® network. This COTS-based certifiable data loading solution distributes application software and configuration updates throughout the network. The loading process is managed by the single master node which plays also the role of the gateway between a data storage and the TTP network.**

## KEY FEATURES/BENEFITS

- Reliable data download over the TTP network
- Loading of application image and configuration data
- One node (master node) manages the download process among the other nodes in the network
- DO-178B, Level A certification artefacts
- Mature COTS solution




Loading via standard module

## COTS Approach for Distributed Platforms

In recent years there has been a migration toward generic computing platforms that can be used in a large variety of applications. In some cases, they can run multiple applications concurrently. This approach, known as Modular Avionics, results in a reduced number of subsystems, reduced weight, and platform redundancy.
Aerospace manufacturers take advantages of commercial off-the-shelf (COTS) platforms in order to reduce high life-cycle costs. The COTS approach improves portability of applications between different platforms and facilitates the introduction of new hardware and software to replace obsolete subsystems. This COTS approach is fully supported by the Time-Triggered Protocol (TTP).

TTP is a communication technology for fault-tolerant distributed hard real-time systems. TTP and loading library have been already deployed in an aircraft programme.

## The Loading Process over the TTP Network

TTTech provides a COTS-based solution for loading software via a TTP network by adding data loading capability to a standard node. The loaded data can be the system application or configuration data, such as the Message Descriptor List (MEDL), which is the scheduling table within the communication controller.

The loading library consists of the loading master and the loading client. The loading master performs the task of a gateway that receives data from an external component (e.g., storage device like a dongle, Ethernet connection to the maintenance computer or some other ARINC 615A data connection). After the loading master has established a peer to peer connection to a certain loading client, the client receives the data packets over the TTP bus and stores in its memory. For loading, every TTP controller is loaded with a special firmware.

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## Safety and Certification

System design has to start from a high safety standard. TTP, therefore, has the highest safety requirements of the aerospace and automotive industries built into it as an integral part of its design. This is a very important aspect of making an architecture future-proof.

COTS software components can reduce development times for safety-critical applications. They must, of course, be certifiable in compliance with the RTCA software standard DO-178B. TTTech's complete loading library is certifiable since it was developed according to DO-178B. The documentation papers and processes of TTTech form the basis for the product certification in accordance with the FAA standards. A complete certification data package for the loading library is available from TTTech.

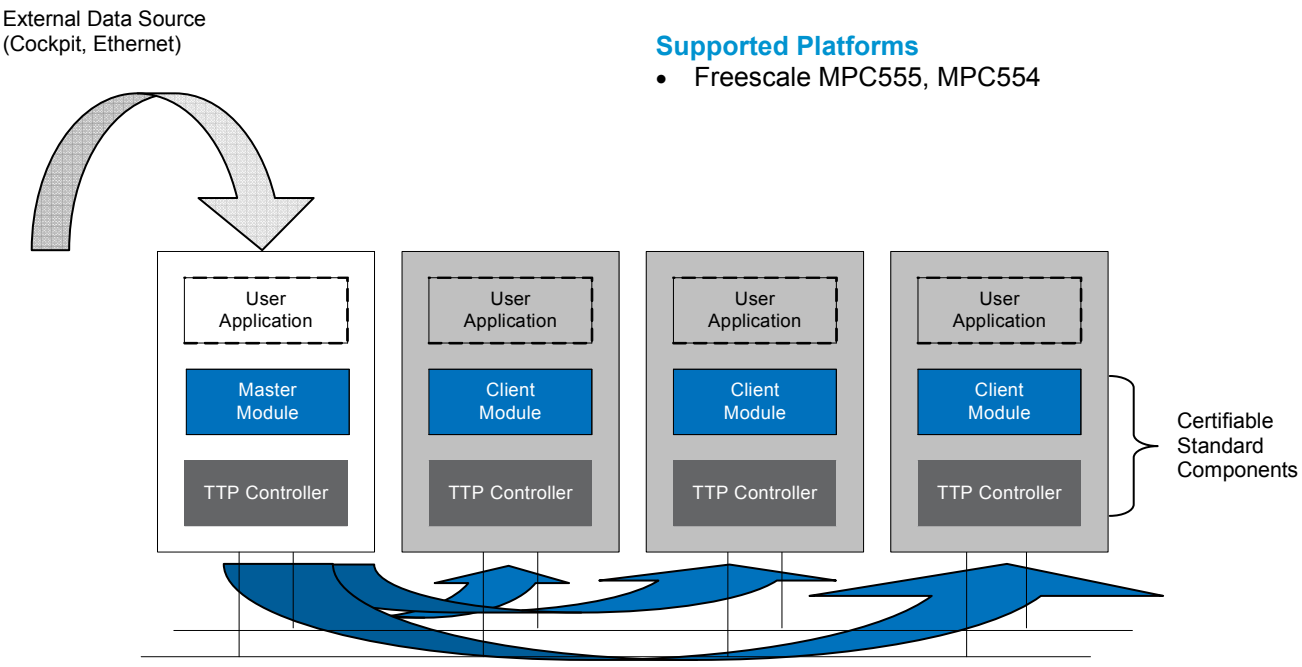
## Features

The loading library is a complete loading solution with the following features:

- Reliable point-to-point connections between the master and each client node. Communication faults are handled transparently
- A buffer interface on the master and the client. Any data can be transferred over this interface: new application software, configuration data for the application, or a large database
- The library operates in a non-blocking event-driven mode
- The library is hardware-independent
- Data is transferable in both directions; download and upload are possible
- Hundreds of megabytes of data can be loaded in a short period of time
- No restrictions with respect to the amount of download data
- Higher-level protocols can be implemented on top of the loading library

## Supported Platforms

- Freescale MPC555, MPC554




TTTech Contact Information

www.tttech.com

Europe, Austria - Headquarters
Tel.: +43 1 585 34 34-0

North America, USA
Tel.: +1 978 933 7979

Japan
Tel.: +81 52 485 5898

China
Tel.: +86 21 5015 2925

E-mail: products@tttech.com

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