

# AN037: TRINAMIC Technology Access Package

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**This application note describes TRINAMIC's Technology Access Package (TTAP) and its content in detail. It provides extensive design-in support.**

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## 1 Introduction

This application note describes TRINAMIC Technology Access Package (TTAP) and its content in detail. The TTAP is a comprehensive collection of technical support information and tools for TRINAMIC's chip and module solutions. The intention of TTAP is to simplify (physical) design-in & bring-up and to speed up own firmware development.



## 2 TTAP Structure

The comprehensive collection of information in the TTAP is divided into several sections and types covering software, hardware, example scripts, tools, product data sheets, and application notes.

### 2.1 Types of Information

Type	Description
Hardware	The hardware section includes detailed descriptions of the evaluation boards and reference designs. Both are typically available as design files for the Eagle PCB CAD tool. Bill of materials and minimum circuits are provided. To help with integration of TRINAMIC chips into own board designs each chip product comes with free libraries for the following PCB CAD tools: Altium Designer, Mentor PADS, Pulsonix, and Autodesk Eagle (formerly by Cadsoft).
Firmware / Code	Software is provided in terms of complete ECLIPSE projects for TRINAMIC's evaluation board system as well as code snippets to support own firmware development and integration of TRINAMIC chip components. The software is written in C.
Example Scripts	Example scripts for TMCL PC and TMCL
Tools	With the latest version of the TMCL-IDE as primary support tool, the tools section provides a couple of helpful programs which let a design engineer automate, verify or simplify things.
Product data sheets	The latest product data sheets of the TRINAMIC products are integrated in the TTAP as well as condensed getting started guides.
Application notes	All application notes are available in the TTAP covering different aspects of how to make optimal use of TRINAMIC solutions.

### 2.2 Directory Structure

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TTAP\
├─ AppNotes\ ..... contains all application notes
├─ Chips\.....contains all hardware information on TRINAMIC chip products
├─ Encoder\ ..... contains all information on TRINAMIC encoder products
├─ Firmware\.....contains the firmware of the chips' evaluation boards and the chip API
├─ Grab_Bag\..... contains various projects which are provided "as is"
├─ Module\..... contains information about TRINAMIC module products
├─ TMCL\ ..... contains information about TMCL, TMCL examples and scripts
├─ Tools\ ..... contains all kinds of helpful tools

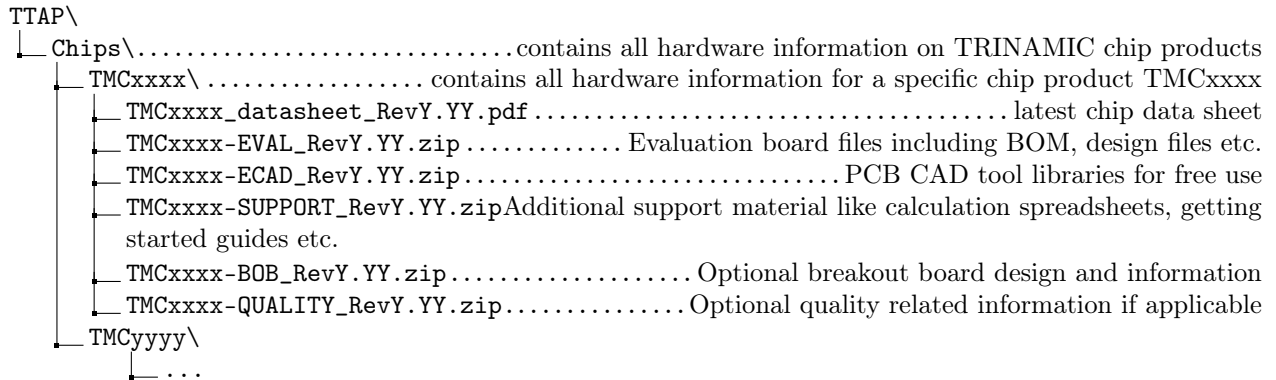
```



## 3 Chip Solutions – Design-In Support

### 3.1 Chip Solutions – Hardware Support

A specific folder exists in the "Chips" directory for every TRINAMIC chip product. It contains the following structure and information regarding hardware support of the products.



### 3.2 Chip Solutions – Software API

#### 3.2.1 Firmware and API for the Modular Evaluation Board System

The complete firmware project for TRINAMIC's Startrampe and Landungsbruecke is available. In this project the complete API to TRINAMIC's chip solution is available for free use and adaptation. The project uses the Eclipse IDE for C/C++ developers. The project can be compiled for two different microcontrollers:

- ST Microelectronics STM32F205VCT6TR:  
<http://www.st.com/en/microcontrollers/stm32f205vc.html>
- Freescale (NXP/Qualcomm) Kinetis MK20DN512VLL10:  
[http://www.nxp.com/webapp/search.partparamdetail.framework?PART\\_NUMBER=MK20DN512VLL10](http://www.nxp.com/webapp/search.partparamdetail.framework?PART_NUMBER=MK20DN512VLL10)

More information on the API and how it can be used and installed is available on TRINAMIC's Website:

- Application Note AN038: <https://www.trinamic.com/support/help-center/downloads/>
- Landungsbruecke: <https://www.trinamic.com/support/eval-kits/details/landungsbruecke/>
- Startrampe: <https://www.trinamic.com/support/eval-kits/details/startrampe/>
- Chip API: <https://www.trinamic.com/support/software/>

#### 3.2.2 Additional Firmware/Software Packages

The following firmware packages are available in the TTAP. They do not focus on a specific chip or module product but provide general application layer functionality.

- Simple EtherCAT State Machine
- Simple ramp generator with step and direction output
- UART CRC example



## 4 Module Solutions – Hardware and Software Support

This directory contains data sheets for all our standard modules.

## 5 Additional Information and Tools

- TMCL-IDE & TMCL (TRINAMIC Motion Control Language)
- Calculation tools
- Configuration tools
- Helpful PCB CAD tools
- All TRINAMIC Application Notes

## 6 Grab Bag

The grab bag contains a large and growing selection of things we made in the past. Little helpers, test designs, code snippets, and so on.

These things are provided "as is". There is no support for these items. You may use them however it fits best to you.

## 7 Conclusion

With all the information provided the TTAP helps engineers designing-in TRINAMIC products into their boards and systems. Hardware design is supported with free PCB CAD tool libraries and reference designs. Cost calculation is supported using the minimal BOM required of a chip product. Software implementation is simplified by providing a software API for all chips on different abstraction levels as a sample Eclipse project, which is also used for TRINAMIC's evaluation boards.

## 8 Revision History

Version	Date	Author	Description
V0.10	15.10.2016	SK	Initial Template
V0.20	23.11.2016	SK	Added first content and structure
V1.00	20.05.2017	SK	V1.00 release version

*Table 1: Document Revision*

