

TEI0003 Test Board

Table of contents

Overview

- 1 Overview
 - 1.1 Key Features
 - 1.2 Example with SDRAM controller (AXI4), 3-axis Accelerometer and different LED sequences.
 - 1.3 Release Notes and Know Issues
 - 1.4 Requirements
 - 1.5 Content
 - 1.5.1 Design Sources
 - 1.5.2 Prebuilt
 - 1.5.3 Download

- 2 Design Flow
- 3 Launch
 - 3.1 Programming
 - 3.1.1 Get prebuilt boot binaries
 - 3.1.2 Configuration Flash
 - 3.2 Usage
 - 3.2.1 UART
- 4 System Design - Quartus
 - 4.1 Block Design
- 5 Software Design - SDK
 - 5.1 Application
 - 5.1.1 test_tei0003
 - 5.1.2 hello_tei0003

Revision History

| 6 Appx. A: Change History and Legal Notices | | | | |
|---|---|--|-------------|---|
| Date | Quartus | Project Built | Authors | Description |
| 2023-09-13 | 22.1 Lite <ul style="list-style-type: none">6.1 Document Change History6.2 Legal Notices6.3 Data Privacy6.4 Document Warranty6.5 Limitation of Liability6.6 Copyright Notice6.7 Technology Licenses6.8 Environmental Protection6.9 REACH, RoHS and WEEE | TEI0003-test_board_noprebuild-quartus_22.1std.2-20230913161158.zip | Thomas Dück | <ul style="list-style-type: none">update to Quartus Prime Lite 22.1new board variantschange to Nios V/mTE scripts update |
| 2022-04-21 | 21.1 Lite | TEI0003-test_board_noprebuild-quartus_21.1.0-20220421150041.zip | Thomas Dück | <ul style="list-style-type: none">update to Quartus Prime Lite 21.1 |
| 2021-07-09 | 20.1 Lite | TEI0003-test_board_noprebuild-quartus_20.1.1-20210709110930.zip | Thomas Dück | <ul style="list-style-type: none">update to Quartus Prime Lite 20.1TE scripts update |

| | | | | |
|------------|-----------|---|-------------|--|
| 2020-10-19 | 19.1 Lite | TEI0003-test_board_noprebui lt-quartus_19.1.0- 20201019101802.zip TEI0003-test_board- quartus_19.1.0- 20201019101738.zip | Thomas Dück | <ul style="list-style-type: none"> script update bugfixes |
| 2020-05-13 | 19.1 Lite | TEI0003-test_board_noprebui lt-quartus_19.1.0- 20200513080815.zip TEI0003-test_board- quartus_19.1.0- 20200513081030.zip | Thomas Dück | <ul style="list-style-type: none"> 19.1 update |
| 2019-11-11 | 18.1 | TEI0003-test_board_noprebui lt-quartus_18.1- 201911111104152.zip TEI0003-test_board- quartus_18.1- 201911111104339.zip | Thomas Dück | <ul style="list-style-type: none"> add bash files for Linux OS |
| 2019-10-29 | 18.1 | TEI0003-test_board_noprebui lt-quartus_18.1- 20191029121432.zip TEI0003-test_board- quartus_18.1- 20191029121225.zip | Thomas Dück | <ul style="list-style-type: none"> create project with TE scripts new board variants |
| 2019-04-02 | 18.1 | TEI0003-02-test_board- quartus_18.1- 20190402.zip | Thomas Dück | <ul style="list-style-type: none"> initial release |

Design Revision History

Release Notes and Know Issues

| Issues | Description | Workaround | To be fixed version |
|-----------------|-------------|------------|---------------------|
| No known issues | --- | --- | --- |

Known Issues

Requirements

Software

| Software | Version | Note |
|------------------------------|---------|---|
| Quartus Prime Lite | 22.1std | Nios V license is needed. For more information see: Intel Nios V Processors |
| RiscFree IDE for Intel FPGAs | 22.1std | needed |

Software

Hardware

Complete List is available on <project folder>/board_files/*_devices.csv

Design supports following modules:

| Module Model | PCB Revision Support | Board Part Short Name | SDRAM | Configuration flashers | Notes |
|--------------------|----------------------|-----------------------|--------|------------------------|-------|
| TEI0003-02 | REV01, REV02 | QFCR1 | 8MByte | 2MByte | -- |
| TEI0003-02A | REV2 | QFCR1 | 8MByte | 2MByte | -- |
| TEI0003-03A-S001 | REV03 | QFCR4_S1 | 8MByte | 8MByte | -- |
| TEI0003-03-QFCR1A | REV03 | QFCR1 | 8MByte | 2MByte | -- |
| TEI0003-03-QFCR4A* | REV03 | QFCR4 | 8MByte | 8MByte | -- |

*used as reference

Hardware Modules

Design supports following carriers:

| Carrier Model | Notes |
|---------------|-------|
| --- | |

*used as reference

Hardware Carrier

Additional HW Requirements:

| Additional Hardware | Notes |
|-------------------------------|-------|
| Micro USB cable for JTAG/UART | -- |

*used as reference

Additional Hardware

Content

For general structure and of the reference design, see [Project Delivery - Intel devices](#)

Design Sources

| Type | Location | Notes |
|----------|--|---|
| Quartus | <project folder>/source_files /quartus/ | Quartus project will be generated by TE Scripts |
| Software | <project folder>/source_files /software/ | Additional software will be generated by TE Scripts |

Design sources

Prebuilt

| File | File-Extension | Description |
|----------------------------------|----------------|---|
| SOPC Information File | *.sopcinfo | File with description of the *.qsys file to create software for the target hardware |
| SRAM Object File | *.sof | Ram configuration file |
| JTAG indirect configuration file | *.jic | Flash configuration file |
| Diverse Reports | --- | Report files in different formats |
| Software Application File | *.elf | Software application for Nios V processor system |

Prebuilt files (only in ZIP file with prebuilt content)

Download

Reference Design is only usable with the specified Quartus version. Do never use different versions of Quartus software for the same project.

Reference Design is available on:

- [TEI0003 "Test Board" Reference Design](#)

Design Flow



Reference Design is available with and without prebuilt files. It's recommended to use TE prebuilt files for first launch.

Trenz Electronic provides a tcl based built environment based on Quartus Design Flow.

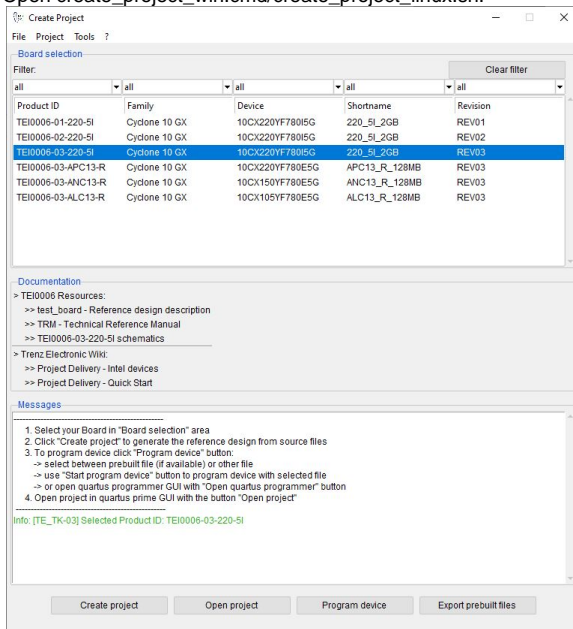
See also:

- [Project Delivery - Intel devices](#)

The Trenz Electronic FPGA Reference Designs are TCL-script based projects. To create a project, open a project or program a device execute "create_project_win.cmd" on Windows OS and "create_project_linux.sh" on Linux OS.

TE Scripts are only needed to generate the quartus project, all other additional steps are optional and can also be executed by Intel Quartus/SDK GUI. For currently Scripts limitations on Win OS and Linux OS see: [Project Delivery - Intel devices](#) [Currently limitations of functionality](#)

1. Open `create_project_win.cmd/create_project_linux.sh`:



2. Select Board in "Board selection"
3. Click on "Create project" button to create project
 - a. (optional for manual changes) Select correct quartus installation path in "`<project folder>/settings/design_basic_settings.tcl`"

Launch

Programming



Check Module and Carrier TRMs for proper HW configuration before you try any design.

Get prebuilt boot binaries



Reference Design is also available with prebuilt files. It's recommended to use TE prebuilt files for first launch.

1. Run `create_project_win.cmd/create_project_linux.sh`
2. Select Module in 'Board selection'
3. Click on 'Export prebuilt files' button
 - a. Folder `<project folder>/_binaries_<Article Name>` with subfolder `programming_files` will be generated and opened

Configuration Flash

1. Connect the Module to USB-Port
2. Open `create_project_win.cmd/create_project_linux.sh`
3. Select correct board in "Board selection"
4. Click on "Program device" button
 - a. if prebuilt files are available: select "Program prebuilt file"

5. Click on "Start program device" button

JTAG

Not used on this example.

Usage

1. Prepare Hardware like described on section [Programming](#)
2. Connect UART USB (most cases same as JTAG)

UART

1. Open Serial Console (e.g. PuTTY)
 - a. select COM Port

Win OS: see device manager

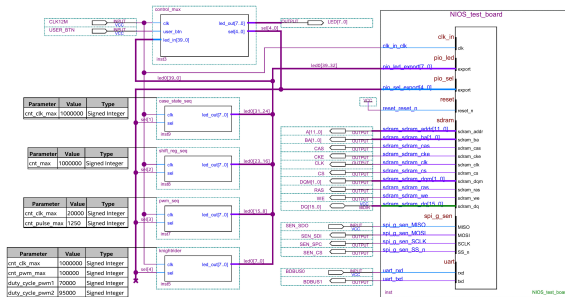
Linux OS: see `ls -l dev/serial/by-id` (UART is *USB1)

-
- b. Speed: 115200
2. Press reset button
3. Console output depends on used Software project, see [Software Design - SDK#Application](#)

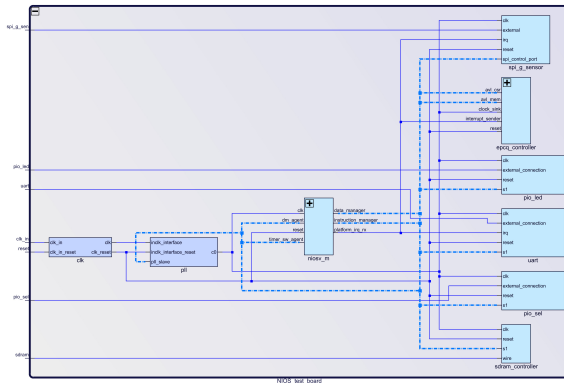
System Design - Quartus

Block Design

The block designs may differ depending on the assembly variant.



Block Design - Project



Block Design - NIOS_test_board.qsys

Block Design - Platform Designer

Software Design - SDK

Application

Used software project depends on board assembly variant. Template location: *<project folder>/source_files/software/*

test_tei0003

Software example to test TEI0003 module.

- You can select between following modes by pressing the user button:
 - Spirit level
 - Case statement sequence
 - Shift register sequence
 - Knighttrider sequence
 - Pulse-width modulation sequence

hello_tei0003

Software example with 'Hello TEI0003' console output in endless loop.

Appx. A: Change History and Legal Notices

Document Change History

To get content of older revision got to "Change History" of this page and select older document revision number.

| Date | Document Revision | Authors | Description |
|------|-------------------|---------|--|
| | | | <ul style="list-style-type: none"> update to Quartus Prime Lite 22.1 document style update |

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| 2022-04-22 | v.9 | Thomas Dück | <ul style="list-style-type: none"> • update to Quartus Prime Lite 21.1 |
| 2021-07-09 | v.8 | Thomas Dück | <ul style="list-style-type: none"> • update to Quartus Prime Lite 20.1 • document style update • script update |
| 2020-10-09 | v.7 | Thomas Dück | <ul style="list-style-type: none"> • script update • bugfixes |
| 2020-05-13 | v.6 | Thomas Dück | <ul style="list-style-type: none"> • 19.1 release |
| 2019-11-11 | v.5 | Thomas Dück | <ul style="list-style-type: none"> • add bash files for Linux OS |
| 2019-10-29 | v.3 | Thomas Dück | <ul style="list-style-type: none"> • change design to TE scripts • new board variants |
| 2019-04-03 | v.2 | Thomas Dück | <ul style="list-style-type: none"> • Initial release 18.1 |
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Error rendering macro 'page-info'

Ambiguous method overloading for method jdk.

proxy279.\$Proxy4022#hasContentLevelPermission. Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.pages.Page] due to overlapping prototypes between: [interface com.atlassian.confluence.user.ConfluenceUser, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject] [interface com.atlassian.user.User, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject]