

# TEI0010 Test Board

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## Key Features

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## Revision History

Date	Project Built	Authors	Description
2022-04-21	TEI0010-test_board_noprebuilt-quartus_21.1.0-20220421145917.zip	Thomas Dück	<ul style="list-style-type: none"><li>update to Quartus Prime Lite 21.1</li></ul>
2021-07-09	TEI0010-test_board_noprebuilt-quartus_20.1.1-20210709102433.zip	Thomas Dück	<ul style="list-style-type: none"><li>update to Quartus Prime Lite 20.1</li><li>TE scripts update</li></ul>
2020-10-19	TEI0010-test_board_noprebuilt-quartus_19.1.0-20201019102006.zip	Thomas Dück	<ul style="list-style-type: none"><li>script update</li><li>bugfixes</li></ul>

2020-05-13	19.1 Lite	TEI0010-test_board_noprebui lt-quartus_19.1.0- 20200513105940.zip  TEI0010-test_board- quartus_19.1.0- 20200513110730.zip	Thomas Dück	<ul style="list-style-type: none"> <li>19.1 update</li> </ul>
2019-11-11	18.1	TEI0010-test_board_noprebui lt-quartus_18.1- 201911111104210.zip  TEI0010-test_board- quartus_18.1- 201911111104330.zip	Thomas Dück	<ul style="list-style-type: none"> <li>create project with TE scripts</li> <li>new board variants</li> </ul>
2019-04-17	18.1	TEI0010-02-08-C8- test_board- quartus_18.1- 20190417.zip	Thomas Dück	<ul style="list-style-type: none"> <li>initial release</li> </ul>

**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	21.1	needed
NIOS II SBT for Eclipse	---	optional

**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	DDR	QSPI Flash	Others	Notes
TEI0010-02-08-C8*	REV02	08_C8_8MB	8MByte	64MBit	---	---

\* used as reference

**Hardware Modules**

Design supports following carriers:

Carrier Model	Notes
---	---

\* used as reference

#### Hardware Carrier

Additional HW Requirements:

Additional Hardware	Notes
USB cable for JTAG/UART	Check Carrier Board and Programmer for correct type

\* 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
Programmer Object File	*.pof	FPGA configuration file
Diverse Reports	---	Report files in different formats
Software Application File	*.elf	Software application for NIOS II processor system

#### Prebuilt files (only on ZIP 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:

- [TEI0010 "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.

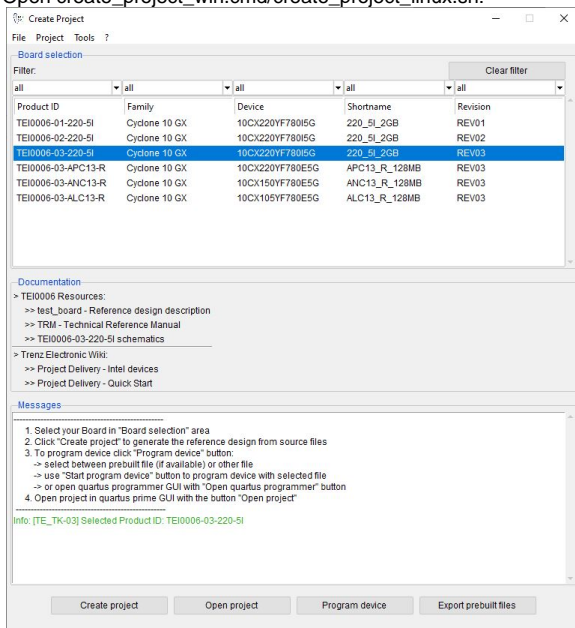
See also:

- [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:



'Create Project' GUI - example

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.

## MAX10 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"
  - b. using own generated programming file: select "Program other file" and click on "Browse ..." to open own generated programming file
  - c. (optional) click on "Open programmer GUI" to program device with Quartus programmer GUI
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 `dmesg | grep tty` (UART is \*USB1)

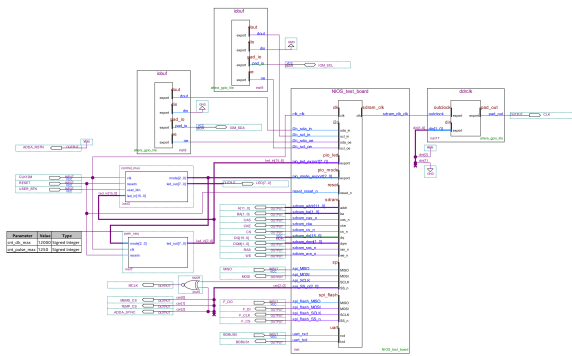
- b. Speed: 115200
2. Press reset button
  3. Console output depends on used Software project, see [Software Design - SDK#Application](#)

## System Design - Quartus

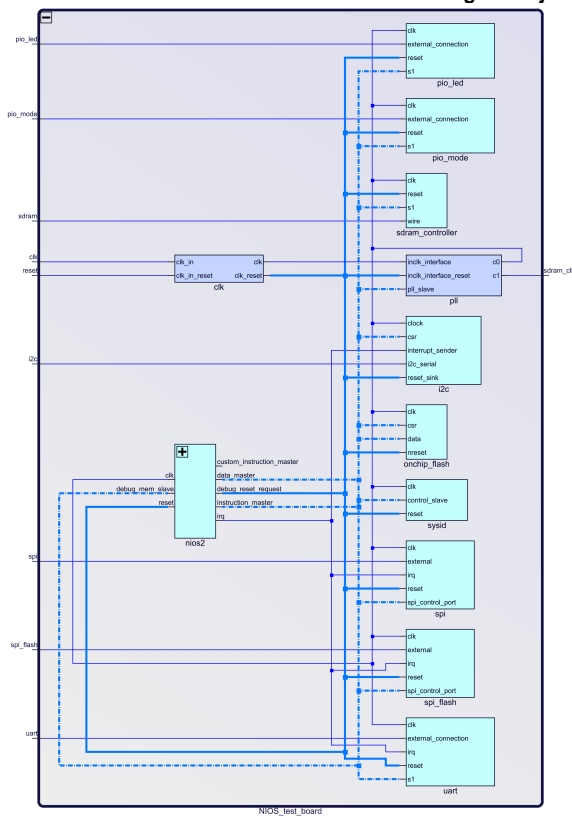
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## Block Design

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\_board

Software example to test TEI0010 module.

- You can toggle between following modes by pressing user button
  - Spirit level
  - Winbond SPI flash memory test
  - Temperature measurement
  - Smoke detector
  - ADC - AD5592R

## 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
<div>Error rendering macro 'page-info'</div> <div>Ambiguous us method overloading for method jdk. proxy24 4.\$Proxy</div>	<div>Error rendering macro 'page-info'</div> <div>Ambiguous us method overloading for method jdk. proxy24 4.\$Proxy</div>	<div>Error rendering macro 'page-info'</div> <div>Ambiguous us method overloading for method jdk. proxy24 4.\$Proxy</div>	<div><ul style="list-style-type: none"><li>update to Quartus Prime Lite 21.1</li></ul></div>

3589#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

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Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.ce.user.ConfluenceUser

3589#hasContentLevelPermission.  
Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.ce.user.ConfluenceUser



, class java. lang. String, class com. atlassian . confluen ce.core. Content EntityOb ject] [interfac e com. atlassian .user. User, class java. lang. String, class com. atlassian . confluen ce.core. Content EntityOb ject]	, class java. lang. String, class com. atlassian . confluen ce.core. Content EntityOb ject] [interfac e com. atlassian .user. User, class java. lang. String, class com. atlassian . confluen ce.core. Content EntityOb ject]	, class java. lang. String, class com. atlassian . confluen ce.core. Content EntityOb ject] [interfac e com. atlassian .user. User, class java. lang. String, class com. atlassian . confluen ce.core. Content EntityOb ject]	
2021-07-09	v.8	Thomas Dück	<ul style="list-style-type: none"> <li>• update to Quartus Prime Lite 20.1</li> <li>• document style update</li> <li>• script update</li> </ul>
2020-10-19	v.6	Thomas Dück	<ul style="list-style-type: none"> <li>• script update</li> <li>• bugfixes</li> </ul>

2020-05-13	v.4	Thomas Dück	<ul style="list-style-type: none"> <li>• 19.1 release</li> </ul>
2019-11-11	v.3	Thomas Dück	<ul style="list-style-type: none"> <li>• change design to TE scripts</li> <li>• new variants</li> </ul>
2019-04-17	v.1	Thomas Dück	<ul style="list-style-type: none"> <li>• Initial release 18.1</li> </ul>
--	all	<div> <div> <div>Error rendering macro 'page-info'</div> <div>Ambiguous method overload ing for method jdk.proxy24.\$Proxy4.\$Proxy3589#hasContentLevelPermission.</div> <div>Cannot resolve which method to invoke for [null, class java.</div> </div> </div>	--

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Document change history.

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Please also note our data protection declaration at <https://www.trenz-electronic.de/en/Data-protection-Privacy>

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#### **Error rendering macro 'page-info'**

Ambiguous method overloading for method jdk.

proxy244.\$Proxy3589#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]