

# CR00100 Test Board

## Table of contents

Overview

Refer to <https://www.intel.com/content/www/us/en/programmable/development/hardware/cr00100-test-board-overview.html> for the current online version of this manual and other available documentation.

- 1.1 Key Features
- 1.2 Revision History
- 1.3 Release Notes and Know Issues
- 1.4 Requirements
  - 1.4.1 Software
  - 1.4.2 Hardware
- 1.5 Content
  - Quartus Prime Lite 21.1
  - NIOS II
  - UART
  - SDRAM memory
  - User buttons
  - User LED
- 2 Design Flow
- 3 Launch
  - 3.1 Programming
    - 3.1.1 MAX10 Flash
    - 3.1.2 JTAG
    - 3.1.3 UART
  - 3.2 Usage
    - 3.2.1 UART

## Key Features

| Date       | Project Built                                                            | Authors     | Description                                                                       |
|------------|--------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------|
| 2021-05-20 | CR00100-test_board_noprebui-<br>lt-quartus_21.1.0-<br>20220421150346.zip | Thomas Dück | <ul style="list-style-type: none"><li>update to Quartus Prime Lite 21.1</li></ul> |
| 2021-02-25 | CR00100-test_board_noprebui-<br>lt-quartus_20.1.1-<br>20220225103813.zip | Thomas Dück | <ul style="list-style-type: none"><li>initial release</li></ul>                   |

Design Revision History

## Revision History

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

Known Issues

## Release Notes and Know 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/*_board_files.csv`

Design supports following modules:

| Module Model       | Board Part Short Name | PCB Revision Support | DDR    | QSPI Flash | EMMC | Others | Notes |
|--------------------|-----------------------|----------------------|--------|------------|------|--------|-------|
| CR00100-01-DBC82A* | 08_C8_8MB             | REV01                | 8MByte | --         | --   | --     | --    |
| CR00100-01-FBC82A  | 16_C8_8MB             | REV01                | 8MByte | --         | --   | --     | --    |

\*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 usage of the reference design, see [Project Delivery - Intel devices](#)

## Design Sources

| Type     | Location                                                  | Notes                                               |
|----------|-----------------------------------------------------------|-----------------------------------------------------|
| Quartus  | <code>&lt;project folder&gt;/source_files/quartus</code>  | Quartus project will be generated by TE Scripts     |
| Software | <code>&lt;project folder&gt;/source_files/software</code> | 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                                                             |
| Software-Application-File | *.elf          | Software application for NIOS II processor system                                  |
| Diverse Reports           | ---            | Report files in different formats                                                  |

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:

- [CR00100 "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.

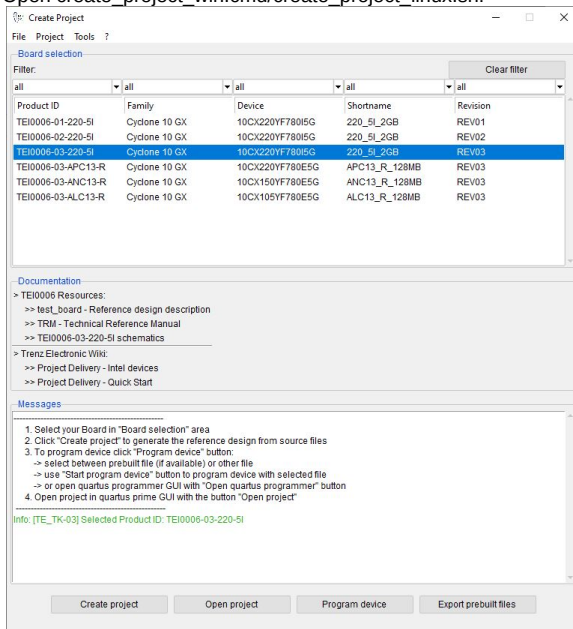
See also:

- [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 JTAG and power on carrier with module
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 HW like described on section [Programming](#)
2. Connect UART USB (most cases same as JTAG)
3. Power on PCB
4. Press user button 'S2' to toggle between two frequencies for the blinking led 'LED2'

## UART

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



Win OS: see device manager

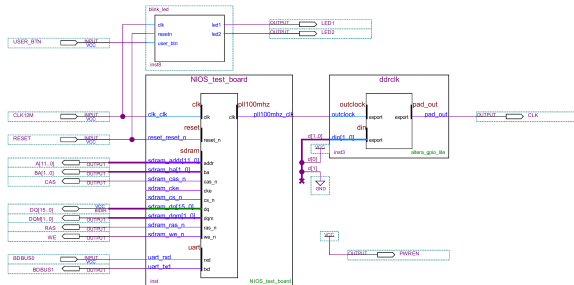
Linux OS: see `dmesg | grep tty` (UART is \*USB1)

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

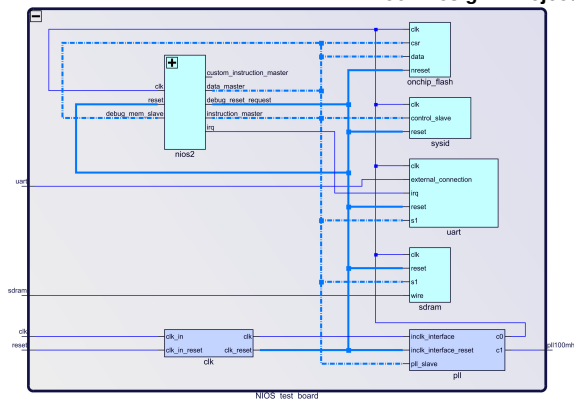
## System Design - Quartus

### Block Design

The block designs may differ depending on the assembly variant.



Block Design - Project



Block Design - Platform Designer

# Software Design - SDK

## Application

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

### hello\_cr00100

This is a Hello World example as endless loop instead of one console output.

## 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' Ambiguous method overload ing for method jdk. proxy24 1.\$Proxy 3496#hasContentLevelPermission</div> | <div>Error rendering macro 'page-info' Ambiguous method overload ing for method jdk. proxy24 1.\$Proxy 3496#hasContentLevelPermission</div> | <div>Error rendering macro 'page-info' Ambiguous method overload ing for method jdk. proxy24 1.\$Proxy 3496#hasContentLevelPermission</div> | <div>• update to Quartus Prime Lite 21.1</div> |

.  
Cannot  
resolve  
which  
method  
to  
invoke  
for [null,  
class  
java.  
lang.  
String,  
class  
com.  
atlassian  
.confluen  
ce.  
pages.  
Page]  
due to  
overlapp  
ing  
prototyp  
es  
between  
:  
[interfac  
e com.  
atlassian  
.confluen  
ce.user.  
Conflue  
nceUser  
, class  
java.  
lang.  
String,

.  
Cannot  
resolve  
which  
method  
to  
invoke  
for [null,  
class  
java.  
lang.  
String,  
class  
com.  
atlassian  
.confluen  
ce.  
pages.  
Page]  
due to  
overlapp  
ing  
prototyp  
es  
between  
:  
[interfac  
e com.  
atlassian  
.confluen  
ce.user.  
Conflue  
nceUser  
, class  
java.  
lang.  
String,

.  
Cannot  
resolve  
which  
method  
to  
invoke  
for [null,  
class  
java.  
lang.  
String,  
class  
com.  
atlassian  
.confluen  
ce.  
pages.  
Page]  
due to  
overlapp  
ing  
prototyp  
es  
between  
:  
[interfac  
e com.  
atlassian  
.confluen  
ce.user.  
Conflue  
nceUser  
, class  
java.  
lang.  
String,

|                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                      |                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| <div>class<br/>com.<br/>atlassian<br/>.<br/>confluen<br/>ce.core.<br/>Content<br/>EntityOb<br/>ject]<br/>[interfac<br/>e com.<br/>atlassian<br/>.user.<br/>User,<br/>class<br/>java.<br/>lang.<br/>String,<br/>class<br/>com.<br/>atlassian<br/>.<br/>confluen<br/>ce.core.<br/>Content<br/>EntityOb<br/>ject]</div> | <div>class<br/>com.<br/>atlassian<br/>.<br/>confluen<br/>ce.core.<br/>Content<br/>EntityOb<br/>ject]<br/>[interfac<br/>e com.<br/>atlassian<br/>.user.<br/>User,<br/>class<br/>java.<br/>lang.<br/>String,<br/>class<br/>com.<br/>atlassian<br/>.<br/>confluen<br/>ce.core.<br/>Content<br/>EntityOb<br/>ject]</div> | <div>class<br/>com.<br/>atlassian<br/>.<br/>confluen<br/>ce.core.<br/>Content<br/>EntityOb<br/>ject]<br/>[interfac<br/>e com.<br/>atlassian<br/>.user.<br/>User,<br/>class<br/>java.<br/>lang.<br/>String,<br/>class<br/>com.<br/>atlassian<br/>.<br/>confluen<br/>ce.core.<br/>Content<br/>EntityOb<br/>ject]</div> |                                                                      |
| 2022-03-01                                                                                                                                                                                                                                                                                                           | v.4                                                                                                                                                                                                                                                                                                                  | Thomas Dück                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"><li>initial release 20.1</li></ul> |
| --                                                                                                                                                                                                                                                                                                                   | all                                                                                                                                                                                                                                                                                                                  | <div>Error<br/>renderi<br/>ng<br/>macro<br/>'page-<br/>info'</div>                                                                                                                                                                                                                                                   | --                                                                   |

Ambiguous  
us  
method  
overload  
ing for  
method  
jdk.  
proxy24  
1.\$Proxy  
3496#has  
sContent  
tLevelPe  
rmission  
.  
Cannot  
resolve  
which  
method  
to  
invoke  
for [null,  
class  
java.  
lang.  
String,  
class  
com.  
atlassian  
.  
confluence.  
pages.  
Page]  
due to  
overlapping  
prototypes  
between

```
:  
[interfac  
e com.  
atlassian  
.  
confluen  
ce.user.  
Conflue  
nceUser  
, 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] |  |
|--|--|-------|--|

Document change history

## Legal Notices

### Data Privacy

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

### Document Warranty

The material contained in this document is provided “as is” and is subject to being changed at any time without notice. Trenz Electronic does not warrant the accuracy and completeness of the materials in this document. Further, to the maximum extent permitted by applicable law, Trenz Electronic disclaims all warranties, either express or implied, with regard to this document and any information contained herein, including but not limited to the implied warranties of merchantability, fitness for a particular purpose or non infringement of intellectual property. Trenz Electronic shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein.

### Limitation of Liability

In no event will Trenz Electronic, its suppliers, or other third parties mentioned in this document be liable for any damages whatsoever (including, without limitation, those resulting from lost profits, lost data or business interruption) arising out of the use, inability to use, or the results of use of this document, any documents linked to this document, or the materials or information contained at any or all such documents. If your use of the materials or information from this document results in the need for servicing, repair or correction of equipment or data, you assume all costs thereof.

### Copyright Notice

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Trenz Electronic.

### Technology Licenses

The hardware / firmware / software described in this document are furnished under a license and may be used /modified / copied only in accordance with the terms of such license.

### Environmental Protection

To confront directly with the responsibility toward the environment, the global community and eventually also oneself. Such a resolution should be integral part not only of everybody's life. Also enterprises shall be conscious of their social responsibility and contribute to the preservation of our common living space. That is why Trenz Electronic invests in the protection of our Environment.

### REACH, RoHS and WEEE

REACH

Trenz Electronic is a manufacturer and a distributor of electronic products. It is therefore a so called downstream user in the sense of [REACH](#). The products we supply to you are solely non-chemical products (goods). Moreover and under normal and reasonably foreseeable circumstances of application, the goods supplied to you shall not release any substance. For that, Trenz Electronic is obliged to neither register nor to provide safety data sheet. According to present knowledge and to best of our knowledge, no [SVHC \(Substances of Very High Concern\) on the Candidate List](#) are contained in our products. Furthermore, we will immediately and unsolicited inform our customers in compliance with REACH - Article 33 if any substance present in our goods (above a concentration of 0,1 % weight by weight) will be classified as SVHC by the [European Chemicals Agency \(ECHA\)](#).

#### **RoHS**

Trenz Electronic GmbH herewith declares that all its products are developed, manufactured and distributed RoHS compliant.

#### **WEEE**

Information for users within the European Union in accordance with Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE).

Users of electrical and electronic equipment in private households are required not to dispose of waste electrical and electronic equipment as unsorted municipal waste and to collect such waste electrical and electronic equipment separately. By the 13 August 2005, Member States shall have ensured that systems are set up allowing final holders and distributors to return waste electrical and electronic equipment at least free of charge. Member States shall ensure the availability and accessibility of the necessary collection facilities. Separate collection is the precondition to ensure specific treatment and recycling of waste electrical and electronic equipment and is necessary to achieve the chosen level of protection of human health and the environment in the European Union. Consumers have to actively contribute to the success of such collection and the return of waste electrical and electronic equipment. Presence of hazardous substances in electrical and electronic equipment results in potential effects on the environment and human health. The symbol consisting of the crossed-out wheeled bin indicates separate collection for waste electrical and electronic equipment.

Trenz Electronic is registered under WEEE-Reg.-Nr. DE97922676.

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

Ambiguous method overloading for method jdk.  
proxy241.\$Proxy3496#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]