

TE0729 CPLD

Table of contents

- 1 [Table of contents](#)
- 2 [Overview](#)
- 3 [Product Specification](#)
 - 2.1 [Feature Summary](#)
 - 2.2 [Firmware Revision and supported PCB Revision](#)
- 3 [Product Specification](#)
 - 3.1 [Port Description](#)
 - 3.2 [Functional Description](#)
 - 3.2.1 [JTAG](#)
 - 3.2.2 [Power](#)
 - 3.2.3 [Boot Mode](#)
 - 3.2.4 [Watchdog](#)
 - 3.2.5 [Status / GPIO](#)
- 4 [Appx. A: Change History and Legal Notices](#)
 - 4.1 [Revision Changes](#)
 - 4.2 [Document Change History](#)
 - 4.3 [Legal Notices](#)
 - 4.4 [Data Privacy](#)
 - 4.5 [Document Warranty](#)
 - 4.6 [Limitation of Liability](#)
 - 4.7 [Copyright Notice](#)
 - 4.8 [Technology Licenses](#)
 - 4.9 [Environmental Protection](#)
 - 4.10 [REACH, RoHS and WEEE](#)

Overview

Firmware for PCB CPLD with designator U6. Second CPLD Device in Chain: LCMX02-256HC



2 Firmware variants with swapped external reset input and output direction are available. See [TE0729 CPLD#Watchdog](#) section of this document. Firmware (SC729_03_default_teb0729_02_plus.jed) for J2-89 as external reset output and J2-91 as external reset input will be used as default firmware.



Watchdog do not work correctly on all modules with Firmware released before 2017.08.22. Please update Firmware on CPLD. For questions, write to Trezz Electronic support.

Feature Summary

- Boot Mode
- JTAG connection
- Power Management
- Watchdog Management

Firmware Revision and supported PCB Revision

See Document Change History

Product Specification

Port Description

Name / opt. VHD Name	Direction	Pin	Description
BOARD_STAT	out	23	STATUS to B2B
BOOT_MODE1	in	28	Boot Mode Pin from B2B
BOOT_MODE2	in	27	Boot Mode Pin from B2B
BOOT1	out	13	Boot Mode Pin to FPGA (MIO4)
BOOT2	out	12	Boot Mode Pin to FPGA (MIO5)
EN_3V3	out	25	Enable 3.3V Switch
F_TCK	out	8	JTAG to FPGA
F_TDI	out	9	JTAG to FPGA
F_TDO	in	11	JTAG from FPGA
F_TMS	out	10	JTAG to FPGA
FPGA_IO	in	5	USR Status output from FPGA
JTAGSEL	---	26	Enable JTAG access to CPLD for Firmware update (zero: JTAG routed to FPGA, one: CPLD access)
nRST	inout	16	External Reset. Direction Firmware depends, see Watchdog section
nRST_IN	inout	4	External Reset. Direction Firmware depends, see Watchdog section
PS_POR_B	in	14	Reset from Watchdog to FPGA
TCK	in	30	JTAG from B2B
TDI	in	32	JTAG from B2B
TDO	out	1	JTAG to B2B
TMS	in	29	JTAG from B2B
WD_EN	in	21	Watchdog PL I/O
WD_HIT	in	20	Watchdog PL I/O
WDI	out	17	Watchdog trigger to external Watchdog IC

Functional Description

JTAG

JTAG signals routed directly through the CPLD to FPGA. Access between CPLD and FPGA can be multiplexed via JTAGSEL (logical one for CPLD, logical zero for FPGA) on J2-111.

Power

3.3V (EN_3V3) is enabled on power up.

Boot Mode

Boot Mode Pins routed through the CPLD. MIO2 and MIO3 are connected to GND via resistor.

Pin	FPGA IO
BOOT_MODE1 (BOOT1)	MIO4
BOOT_MODE2 (BOOT2)	MIO5

BOOT1	BOOT2	Boot Mode
0	0	JTAG
0	1	QSPI
1	0	not supported
1	1	SD

Watchdog

Watchdog (TPS3310K33DMVR) is controlled by B2B IO, CPLD, Zynq IO or 1V power supply voltage.

TPS3310K33DMVR WDI Timing Requirements:

Time-out period	$t_{T(OUT)}$	at WDI	min 0,55s, typ 1,1s, max 1,65s
Pulse width	t_w	at WDI	300ns

Firmware Variants:

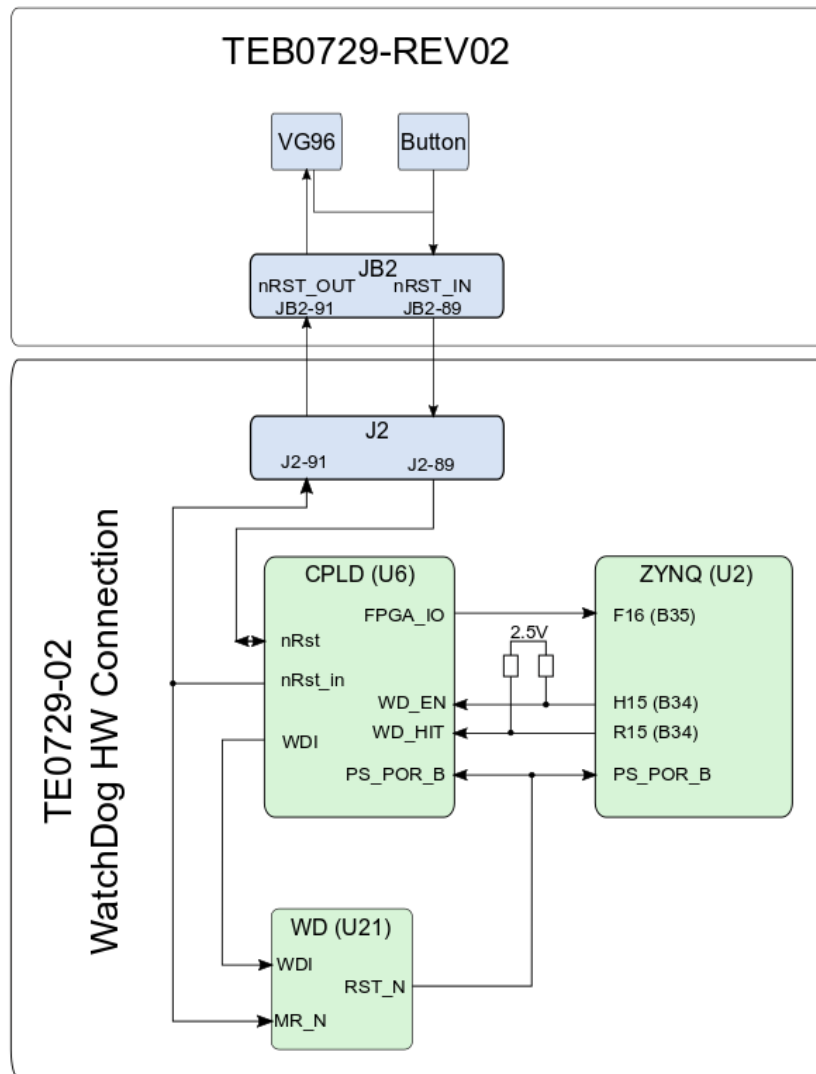


Figure1: Firmware (SC729_03_teb0729_02_org.jed) for TEB0729 without HW modification,

- J2-89 external reset input
- J2-91 external reset output

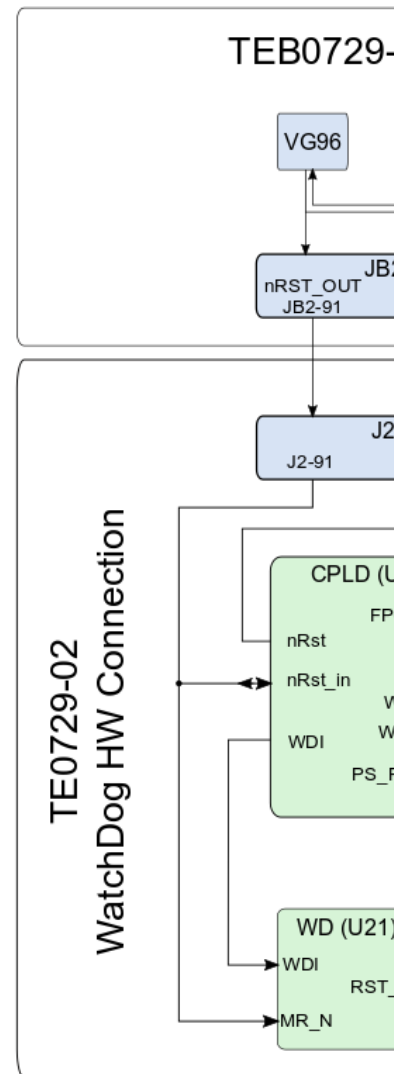


Figure2: Firmware (SC729_03_default_teb0729_

- J2-89 external reset output
- J2-91 external reset input

B2B Control:

2 Variant available,depends on carrier board connection, see Figure 1 and 2. The swapped signals and nRST_IN pulse limitation on variant 1 are the only difference between this two variants.

Variant 1 (Figure 1, SC729_rev02org.jed):

IOs	B2B	Direction	Description
nRST	J2-89	inout	Main Reset to module
nRST_IN	J2-91	out	Main reset to carrier and PS_POR_B for approx. 1,9 us.

Variant 2 (Figure 2, SC729_rev02plus.jed):

IOs	B2B	Direction	Description
nRST	J2-89	out	Main reset to carrier and PS_POR_B
nRST_IN	J2-91	inout	Main Reset to module

1V Power supply:

Reset PS, if 1V drop down. Connected on PCB, controlled by WD SENSE pin.

CPLD Control:

CPLD controlled WD on power up until FPGA takes control via WE_EN and WD_HIT input. CPLD WDI pulse frequency is set to approx. 1ms (Pulse width $t_{w(CPLD)}=507\mu s$)

nRST_IN is set to GND on power up for short time periode

FPGA Control:

WD_HIT pulse will be forwarded to WDI pin, if WE_EN is high and min 16 WD_HIT from FPGA was detected. WD_EN can't be disabled until module was reboot.

WDI max. pulse width: $t_{w(FPGA)} < t_{T(out)} - t_{w(CPLD)}$

Status / GPIO

BOARD_STAT is used as WD restart indicator and as user IO.

Modus	Condition
Slow Blink	If PS_POR_B is low and appr. 16s after PS_POR_B goes up
FPGA_IO	User defined, appr. 16s after PS_POR_B goes up and as long as PS_POR_B is high

Info: On TEB0729, signal is connected to XMOD LED.

Appx. A: Change History and Legal Notices

Revision Changes

CPLD REV03 to REV04

- Remove possibility to disable WD again via FPGA

CPLD REV02 to REV03

- Add power up Watchdog main reset from CPLD

CPLD REV01 to REV02

- Bugfix for TE0729-REV02 Watchdog support
- Add 2 Variants for TEB0729-REV02 and TE0729-REV02_MOD support
- Change Pin FGPA_IO direction
- Change Pin BOARD_STAT output configuration

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	CPLD Firmware Revision	Supported PCB Revision	Authors	Description
		REV04	REV02 /REV02plus		<ul style="list-style-type: none">• REV04 finished (released 2020-10-08)
<div><p>Error rendering macro 'page-info'</p><p>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]</p></div>	<div><p>Error rendering macro 'page-info'</p><p>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.core.ContentEntityObject]</p></div>			<div><p>Error rendering macro 'page-info'</p><p>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</p></div>	

pages.
Page] due
to
overlappin
g
prototypes
between:
[interface
com.
atlassian.
confluence
.user.
Confluenc
eUser,
class java.
lang.
String,
class com.
atlassian.
confluence
.core.
ContentEn
tityObject]
[interface
com.
atlassian.
user.User,
class java.
lang.
String,
class com.
atlassian.
confluence
.core.
ContentEn
tityObject]

2017-10-25	v.17	REV03	REV02 /REV02plus	John Hartfiel	<ul style="list-style-type: none">• REV03 finished (released 2017-10-25)
2017-08-31	v.14	REV02	REV02 /REV02plus	John Hartfiel	
2017-08-23	v.13	REV02	REV02 /REV02plus	John Hartfiel	<ul style="list-style-type: none">• REV02 finished
2017-06-07	v.1	REV02	REV02 /REV02plus	<div><p>Error rendering macro 'page-info'</p><p>Ambiguous method overloadin g for method jdk. proxy279.\$ Proxy4022 #hasContentLevelPer mission. Cannot resolve which method to invoke for [null, class java.lang. String, class com. atlassian. confluence .pages. Page] due</p></div>	<ul style="list-style-type: none">• Initial release

				<div>to overlappin g prototypes between: [interface com. atlassian. confluence .user. Confluenc eUser, class java. lang. String, class com. atlassian. confluence .core. ContentEn tityObject] [interface com. atlassian. user.User, class java. lang. String, class com. atlassian. confluence .core. ContentEn tityObject]</div>	
	All				

							<div>Error</div> <div>rendering</div> <div>macro</div> <div>'page-</div> <div>info'</div> <div>Ambiguou</div> <div>s method</div> <div>overloadin</div> <div>g for</div> <div>method</div> <div>jdk.</div> <div>proxy279.\$</div> <div>Proxy4022</div> <div>#hasConte</div> <div>ntLevelPer</div> <div>mission.</div> <div>Cannot</div> <div>resolve</div> <div>which</div> <div>method to</div> <div>invoke for</div> <div>[null, class</div> <div>java.lang.</div> <div>String,</div> <div>class com.</div> <div>atlassian.</div> <div>confluence</div> <div>.pages.</div> <div>Page] due</div> <div>to</div> <div>overlappin</div> <div>g</div> <div>prototypes</div> <div>between:</div> <div>[interface</div> <div>com.</div> <div>atlassian.</div> <div>confluence</div> <div>.user.</div>		
--	--	--	--	--	--	--	--	--	--

					Confluenc eUser, class java. lang. String, class com. atlassian. confluence .core. ContentEn tityObject] [interface com. atlassian. user.User, class java. lang. String, class com. atlassian. confluence .core. ContentEn tityObject]	
--	--	--	--	--	---	--

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.

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]`