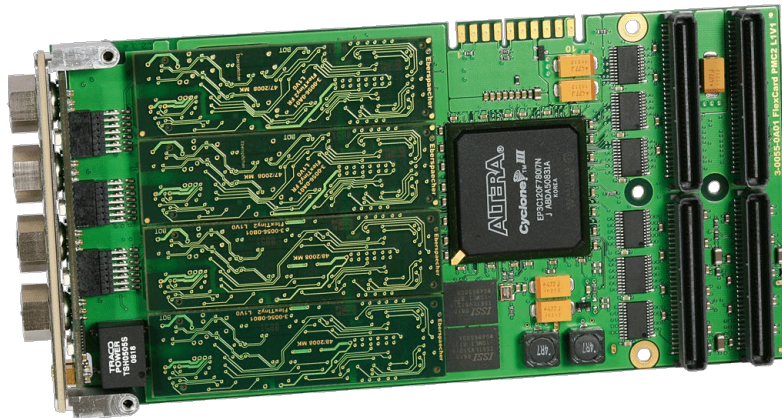


STAR COOPERATION®

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# FlexCard PMC-II

## Supported FPGA Images





## NOTICE

ESD (Electro Static Discharge) sensitive product.

Refer to chapter 1.4 and follow the safety and handling instructions.

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Any semiconductor devices have an inherent chance of failure. You have to protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions. The safety and handling instructions in this document have to be followed strictly.

## Revision History

Version	Date	Description
D1V0-F	25-Aug-2021	Initial release.

## Related Hardware / Software Versions

Product	Reference No.	Version (Major and Minor)	Remarks
FlexCard PMC-II Hardware	3-0055-0A01	H1V1	PMC II card with 2 triggers and FlexRay and CAN support depending on the available <i>FlexTiny II</i>
FlexCard PMC-II Hardware	3-0055-0A02	15	PMC II card with 2 triggers and support for FlexRay, CAN, CAN-FD, Ethernet or BRR depending on the available <i>FlexTiny II</i>

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## 1 General


### 1.1 Intended User Group

This product may only be used by expert technicians and/or engineers who are qualified and familiar with electronic components and systems.

Each person involved with setup or operation of the product must

- be a qualified technician or engineer
- strictly adhere to this manual
- receive a briefing by an authorized person

	<b>NOTICE</b>
	<p>If you are unsure of how to use the product as intended or have any questions about the use of the product, please discontinue use of the product immediately and contact the STAR ELECTRONICS GmbH &amp; Co. KG Support.</p>

	<b>⚠ WARNING</b>
	<p>The product may only be used by expert technicians and/or engineers who are qualified and familiar with electronic components and systems!</p> <p>The use of the product by non-professionals is not permitted and strictly forbidden!</p>


### 1.2 Intended use




The FlexCard PMC-II is a testing equipment. It was developed to test the communication behavior of automotive bus systems and Ethernet together with Electronics Control Units and sensors in a fully controlled testing and/or laboratory environment.

For this intended use, the FlexCard PMC-II offers the following options:

- Transmit and receive data (e.g. Use Case “Remaining Bus Simulation”).
- Exchange of data traffic between two or more bus systems (e.g. Use Case “Gateway”)
- Manipulation of data traffic (e.g. Use Case “Manipulation of signal values based on user configuration”)
- Recording of data traffic (e.g. Use Case “Logging”)

**Any deviation** from the intended use and/or installation in a testing vehicle is only permitted with specific **prior written approval** of STAR ELECTRONICS GmbH & Co. KG.







	<b>⚠ WARNING</b>
	<p>The FlexCard PMC-II may be used to communicate with networked electronic systems. E.g. FlexRay, CAN or Ethernet.</p> <p>Any use of the product outside a fully controlled testing and/or laboratory environment may result in death or serious injury due to unpredictable behavior of a vehicle and/or potentially missing, deactivated, or malfunctioning safety devices on a vehicle!</p> <p>The user is responsible to ensure the safety of the entire system. This includes amongst other things a safety shutdown.</p>

	<div data-bbox="392 273 1442 336" data-label="Section-Header"> <h2>NOTICE</h2> </div> <div data-bbox="392 336 1442 443" data-label="Text"> <p>The device is not a calibrated measurement device. STAR ELECTRONICS GmbH &amp; Co. KG accepts no liability whatsoever for the correctness of any measurement results.</p> </div>
	<div data-bbox="392 488 1442 555" data-label="Section-Header"> <h2>⚠ WARNING</h2> </div> <div data-bbox="392 555 1442 896" data-label="Text"> <p>The FlexCard PMC-II is <b>NOT</b> designed, intended, or authorized and may <b>NOT</b> be used for or in connection with the following purposes and/or devices:</p> <ul style="list-style-type: none"> <li>- use as part of medical systems</li> <li>- life support applications</li> <li>- aviation, space, nuclear, or military applications</li> <li>- use in areas where combustible or explosive gas mixtures are likely to occur</li> <li>- any other purposes / devices deviating from the intended use of the product specified by STAR ELECTRONICS GmbH &amp; Co. KG.</li> </ul> </div>
	<div data-bbox="392 940 1442 1008" data-label="Section-Header"> <h2>⚠ WARNING</h2> </div> <div data-bbox="392 1008 1442 1131" data-label="Text"> <p>The product may only be used by expert technicians and/or engineers who are qualified and familiar with electronic components and systems!</p> <p>The use of the product by non-professionals is not permitted and strictly forbidden!</p> </div>

### 1.3 Used Pictograms

The meaning of used pictograms is shortly described below.

Follow the specific instructions in the document where these pictograms are placed.

	<b>WARNING</b> Used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	<b>CAUTION</b> Used to indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
	<b>NOTICE</b> Used to indicate a situation which may result in an operating failure. Damage of the product may occur, but there is no hazard of injury if not avoided.
	<b>NOTICE</b> Used to indicate an electrostatic discharge sensitive product. The product is subject to damage by ESD, if no precautions are taken.
	<b>Information</b> Used to indicate information provided only for purposes of clarification, illustration, and general information.
	<b>Reference</b> References to other documents.

## 1.4 Safety and Handling Instructions


Please read the instructions for use carefully. To protect the device or the application against damage or to avoid personal injury the *FlexCard PMC-II* has to be handled as described herein.


Changes or modifications of the *FlexCard PMC-II* are not allowed for safety and warranty reasons!


STAR ELECTRONICS GmbH & Co. KG is not liable for any damages arising from non-observance of the product information.

Follow the

- specific safety and handling instructions placed at dedicated document positions
- general safety and handling instructions below:

	<b>WARNING</b> MAINS VOLTAGE UP TO 110 / 230 VAC AT THE COMPUTER CHASSIS  ELECTRICAL SHOCK HAZARD!  TO PREVENT DEATH, PERSONAL INJURY OR DAMAGE: DISCONNECT THE POWER CABLE OF THE COMPUTER BEFORE OPENING THE CHASSIS.
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	<b>⚠ CAUTION</b>
	<p>TO PREVENT PERSONAL INJURY, TO PREVENT DAMAGE TO THE <i>FlexCard PMC-II</i> OR TO PREVENT CONSEQUENTIAL DAMAGES:</p> <ul style="list-style-type: none"> <li>➤ PLEASE OBSERVE THE ESD-PROTECTION INSTRUCTIONS BEFORE GETTING IN CONTACT WITH THE CONNECTORS. OTHERWISE THE <i>FLEXCARD PMC-II</i> MAY GET DAMAGED. SEE CHAPTER 3.1.</li> <li>➤ DO NOT CONNECT ANY OTHER SIGNALS TO THE INTERFACES AS DESCRIBED IN THE CHAPTER "INTERFACES AND CONNECTORS".</li> <li>➤ ENSURE THAT ALL SIGNALS ARE WITHIN THE SPECIFIED RANGE.</li> <li>➤ IT IS RECOMMENDED TO ONLY USE PRODUCTS FROM STAR ELECTRONICS GMBH &amp; CO. KG TO ENSURE PROPER FUNCTION!</li> <li>➤ HIGH TEMPERATURES CAN DAMAGE THE <i>FLEXCARD PMC-II</i>. KEEP THE <i>FLEXCARD PMC-II</i> AWAY FROM HEATERS, STOVES, FIREPLACES, AND OTHER SOURCES OF HEAT.</li> <li>➤ DO NOT EXPOSE THE <i>FLEXCARD PMC-II</i> TO RAIN OR USE IT NEAR WATER.</li> <li>➤ DO NOT USE THE <i>FLEXCARD PMC-II</i> IN AREAS OF EXPLOSION HAZARD.</li> </ul>

	<b>NOTICE</b>
	<p style="text-align: center;"><b>ESD (Electro Static Discharge) sensitive product</b></p> <p><i>STAR ELECTRONICS GmbH &amp; Co. KG</i> products lacking protective enclosures are subject to damage by ESD.</p> <p>Take proper ESD precautions to avoid performance degradation or loss of functionality!</p> <p>Unpack, handle or operate these products only in environments where sufficient precautionary measures have been taken in respect to ESD hazards. A guideline is available in chapter 3.1.</p> <p>Only appropriately trained personnel (such as electricians, technicians and engineers) may handle and/or operate these products.</p>


## 1.5 Meaning of Text Styles

In this document *filenames* are marked with a different text format.



## 2 Supported FPGA Images

This following table describes the supported FlexCard PMC-II FPGA images and the correct placement of the FlexTiny II modules for each FPGA image. The maximum placement is described. It is possible to mount less FlexTiny II modules. The missing communication controller will not work, but the other communication controllers will work normally.

	Information
	STAR ELECTRONICS GmbH & Co. KG does not provide a driver for every image. Please contact the STAR ELECTRONICS support team for more information.

Slot 1	Slot 2	Slot 3	Slot 4	FPGA-FW
2x CAN-HS	2x CAN-HS	2x CAN-HS	2x CAN-HS	FlexCard_PMCII_S6V5-F.fwf
2x CAN-FD	2x CAN-FD	2x CAN-FD	2x CAN-FD	FlexCard_PMCII_8CANFD_bplus_S6V5-042.fwf
FlexRay A/B (*)	2x CAN-HS	2x CAN-HS	2x CAN-HS	FlexCard_PMCII_S6V5-F.fwf
FlexRay A/B (*)	2x CAN-FD	2x CAN-FD	-	FlexCard_PMCII_1FR_4CANFD_bplus_S6V5-036.fwf
FlexRay A/B (*)	2x CAN-FD	2x CAN-FD	2x CAN-FD	FlexCard_PMCII_1FR_6CANFD_bplus_S6V5-041_(beta).fwf
FlexRay A/B	FlexRay A/B	2x CAN-HS	2x CAN-HS	FlexCard_PMCII_S6V5-F.fwf
FlexRay A/B	FlexRay A/B	2x CAN-FD	2x CAN-FD	FlexCard_PMCII_2FR_4CANFD_bplus_S6V5-036.fwf
FlexRay A/B	FlexRay A/B	FlexRay A/B	2x CAN-HS	FlexCard_PMCII_S6V5-F.fwf
FlexRay A/B	FlexRay A/B	FlexRay A/B	FlexRay A/B	FlexCard_PMCII_S6V5-F.fwf
100BASE-TX or 100BASE-T1	FlexRay A/B (*)	-	2x CAN-HS	FlexCard_PMCII_1FR_2CAN_1ETH_bplus_S6V5-063.fwf
100BASE-TX or 100BASE-T1	FlexRay A/B (*)	-	2x CAN-FD	FlexCard_PMCII_1FR_2CANFD_1ETH_bplus_S6V5-065.fwf
100BASE-TX or 100BASE-T1	FlexRay A/B (*)	2x CAN-FD	2x CAN-FD	FlexCard_PMCII_1FR_4CANFD_1ETH_bplus_S6V5-068_(beta).fwf
2x CAN-FD	2x CAN-FD	2x CAN-FD	2x CAN-FD	FlexCard_PMCII_4UARTCAN_4CANFD_bplus_S6V5-069.fwf (**)

(\*) - SelfSync - Allows autonomous start of the bus without further sync nodes

(\*\*) - Slot 1: UartOverCan fcCC1, fcCC2. Slot 2: UartOverCan fcCC3, fcCC4. Slot 3: CAN fcCC1, fcCC2. Slot 4: CAN fcCC3, fcCC4.

### 2.1 CC Index

If not noted otherwise, the CC is numbered in the order in which the FlexTiny II module is mounted on the FlexCard PMC-II.

#### 2.1.1 Example 1:

Tiny slot	1	2	3	4
Mounted FlexTiny II	FlexRay A/B (*)	2x CAN-FD	2x CAN-FD	2x CAN-FD
CC	FlexRay fcCC1	CAN fcCC1, CAN fcCC2	CAN fcCC3, CAN fcCC4	CAN fcCC5, CAN fcCC6

Created by	STAR ELECTRONICS GmbH & Co. KG			
Date created	2021-08-25	Date modified	2021-08-25	Page 9 of 12

## 2.1.2 Example 2:

Tiny slot	1	2	3	4
<b>Mounted FlexTiny II</b>	100BASE-TX or 100BASE-T1	FlexRay A/B (*)	-	2x CAN-FD
<b>CC</b>	Access via NIC driver	FlexRay fcCC1	-	CAN fcCC1, CAN fcCC2

## 2.2 Related Documents

Document	Description	Ordering number
[1] FlexCard PMC-II Instructions for Use		3-0055-0P01-D05

## 3 Appendix

### 3.1 Appendix A: Guideline for handling ESD sensitive Products

- Any tester, equipment, or tool used at any production step or for any manipulation of semi-conductor devices must have its shield connected to ground.
- The product itself and the carrier system of the product respectively must be placed on a conductive table top or covered by an antistatic surface (superficial resistivity equal to or higher than  $0.5\text{M}\Omega/\text{cm}^2$ ), grounded through a ground cable (conductive cable from protected equipment to ground isolated through a  $1\text{M}\Omega$  resistor placed in series).
- All manipulation of finished goods has to be made at such a grounded worktable.
- The worktable must be free of all non-antistatic objects.
- An antistatic floor covering grounded through a conductive ground cable (with serial resistor between  $0.9\text{M}\Omega$  and  $1.5\text{M}\Omega$ ) should be used.
- It is recommended that you wear an antistatic wrist or ankle strap, connected to the antistatic floor covering or to the grounded equipment.
- If no antistatic wrist or ankle strap is worn, touch the surface of the grounded worktable before each manipulation of the ESD sensitive product.
- It is recommended that antistatic gloves or finger coats be worn.
- It is recommended that nylon clothing be avoided while performing any manipulation of parts.

### 3.2 Appendix B:

#### 3.2.1 Acronyms and Abbreviations

Item	Definition
BD	Bus driver
BG	Bus guardian
BP	Bus plus
BM	Bus minus
CAN	Controller Area Network
CC	Communication Controller
DLL	Dynamic Linked Library
DMA	Direct Memory Access
ECU	Electronic Control Unit
EMC	Electromagnetic Compatibility
ESD	Electro Static Discharge
FR	FlexRay
FW	Firmware
NC	Not Connected
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
PCle	Peripheral Component Interconnect Express
PL	Physical Layer
PMC	PCI Mezzanine Card
PXI	PCI eXtension for Instrumentation
SYS	System (Windows low level driver extension)

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