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ADDI-DATA GmbH
Dieselstraße 3
D-77833 OTTERSWEIER

Technical support:
+49 (0)7223 / 9493 – 0

Preliminary version

Technical information

Change to RoHS-compliant digital and counter boards

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WARNING

The following risks result from improper implementation and from use of the board contrary to the regulations:

- **Personal injury**
- **Damage to the MSX-Box, PC and peripherals**
- **Pollution of the environment**

- **Protect yourself, the others and the environment!**
- **Read carefully the safety precautions (yellow leaflet).**

  If this leaflet is not with the documentation, please contact us and ask for it.

- **Observe the instructions of the manual.**

  Make sure that you do not forget or skip any step. We are not liable for damages resulting from a wrong use of the board.

- **Used symbols:**

IMPORTANT!
designates hints and other useful information.

WARNING!
It designates a possibly dangerous situation.
If the instructions are ignored the board, PC and/or peripheral may be destroyed.

Figures

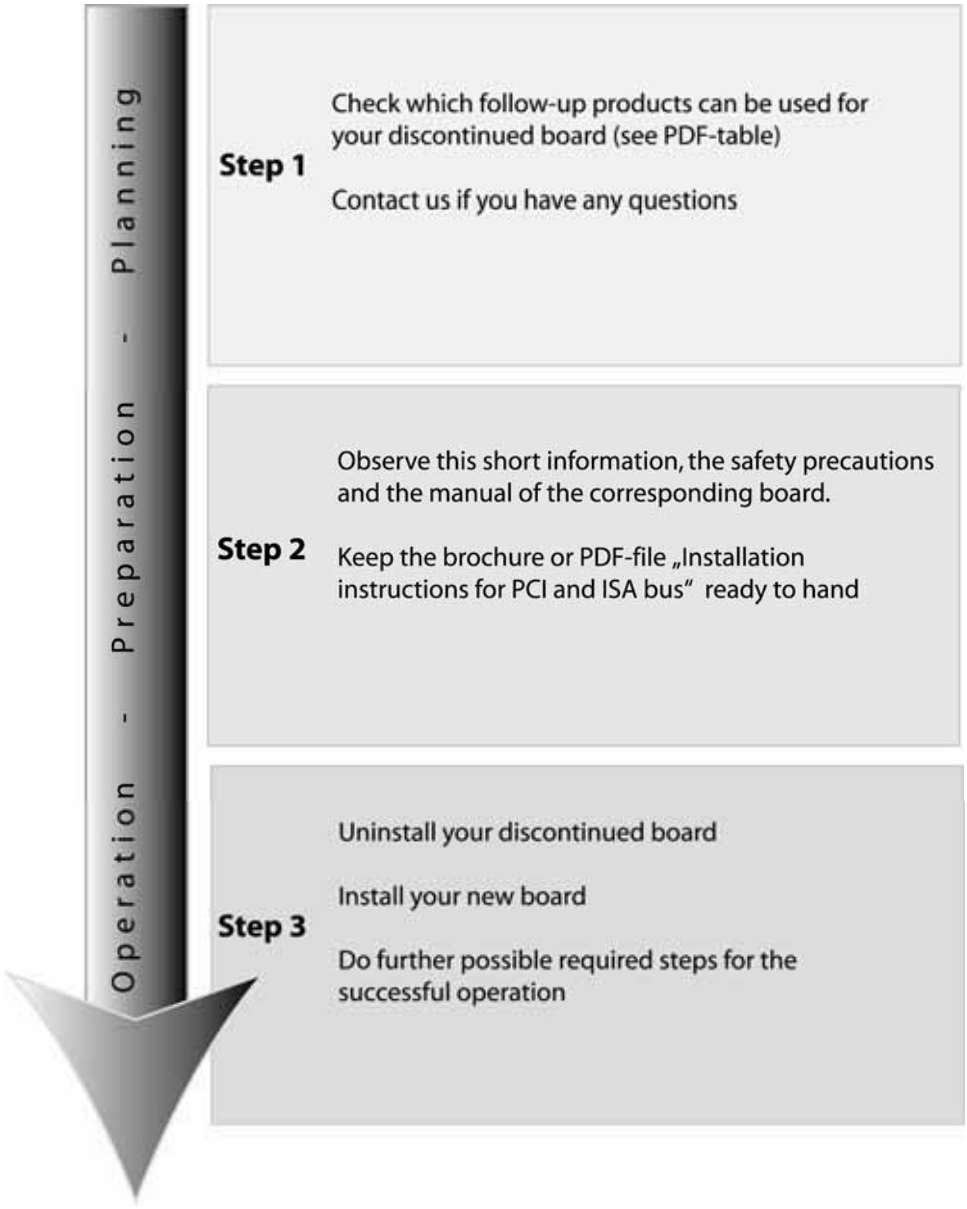
Tables

1 OVERVIEW

Due to the RoHS-Directive (German ElektroG) several boards will not be available anymore. However, we offer follow-up products for most products (see PDF-table "Follow-up products"). In the following we want to inform you how to switch-over from the discontinued products to the new products.

There are three steps when switching to a new product – the present technical information supports you in „**Step 3**".

Fig. 1-1: Overview – Change process



2 CHANGE TO DIGITAL AND COUNTER BOARDS

In the following chapters we will answer to the following questions:

- How do I switch over?
- What will be different during installation?
- Software compatibility?
- Function compatibility?
- Pin compatibility?

2.1 Basic steps

Table 2-1: Changing digital and counter boards: Basic steps

Description	Further information
1. Uninstall your old board	Brochure „Installation instructions for PCI and ISA bus“ chapter 7
2. Install your new board	Brochure „Installation instructions for PCI and ISA bus“ chapter 3

♦ **If you install your computer by an image, please create an image-CD.**

2.2 Further information

2.2.1 PA 100

You can switch the digital input board **PA 100** (ISA bus) either to the follow-up product **PA 1000** (ISA bus) or **APCI-1032** (PCI bus).

For changing please follow the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-2: Changing the PA 100: Further information

	PA 100	PA 1000	APCI-1032
Functionality	- ISA bus digital input board - 32 inputs, 24 V	- ISA bus digital input board - 32 digital inputs, 24 V, incl. 14 interruptible -Optical isolation 1000 V -Timer	- 32 digital inputs 24 V or 5 Vm incl. 16 o interruptible inputs - Optical isolation 1000 V - Input filter
Connector	37-pin SUB-D male connector Compatible 2 pin common ground	37-pin SUB-D male connector Compatible 2 pin common ground	37-pin SUB-D male connector Compatible 4 separated grounds
IO Mapping	Board address space: 4 x 8-bit DI address space: 4 x 8-bit	Board address space: 4 x 8-bit DI address space: 4 x 8-bit	Board address space: 5 x 32-bit DI address space: 1 x 32-bit
Operating system	16- and 32-bit available	16- and 32-bit available	32-bit available (16-bit available on request)
Software compatibility (initialisation and function name)	i_PA100_SetBoardAddress()... i_PA100_Read1DigitalInput() i_PA100_Read16DigitalInput() i_PA100_CloseBoardHandle()	i_PA1000_InitCompiler() i_PA1000_SetBoardInformation() … i_PA1000_Read1DigitalInput() i_PA1000_Read16DigitalInput() i_PA1000_CloseBoardHandle()	i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Read1DigitalInput() b_ADDIDATA_Read16DigitalInputs() b_ADDIDATA_CloseWin32Driver()
Find further information in the manual	Description of the **PA 100** (see link in the bookmarks)	Description of the **PA 1000** (see link in the bookmarks)	Description of the **APCI-1032** (see link in the bookmarks)

2.2.2 PA 110

You can switch the digital input board **PA 110** (ISA bus) either to the follow-up product **PA 1000** (ISA bus) (two boards are required!) or **APCI-1032** (PCI bus).

For changing please follow the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-3: Changing the PA 110: Further information

	PA 110	PA 1000	APCI-1032
Functionality	- ISA bus digital input board - 64 inputs, 24 V	- ISA bus digital input board - 32 digital inputs, 24 V, incl. 14 interruptible -Optical isolation 1000 V -Timer	- PCI bus digital input board - 32 digital inputs, 24 V or 5 V, incl. 16 interruptible - Optical isolation 1000 V - Input filter
Connector	37-pin SUB-D male connector Compatible 2 pin common ground	37-pin SUB-D male connector Compatible 2 pin common ground	37-pin SUB-D male connector Compatible 4 separated grounds
IO Mapping	Board address space: 4 x 8-bit DI address space: 4 x 8-bit	Board address space: 4 x 8-bit DI address space: 4 x 8-bit	Board address space: 5 x 32-bit DI address space: 1 x 32-bit
Operating system	16- and 32-bit available	16- and 32-bit available	32-bit available (16-bit available on request)
Softwar compatibility (initialisation and function name)	i_PA110_SetBoardAddress()... i_PA110_Read1DigitalInput() i_PA110_Read16DigitalInput() i_PA110_CloseBoardHandle()	i_PA1000_InitCompiler() i_PA1000_SetBoardInformation() … i_PA1000_Read1DigitalInput() i_PA1000_Read16DigitalInput() i_PA1000_CloseBoardHandle()	i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Read1DigitalInput() b_ADDIDATA_Read16DigitalInputs() b_ADDIDATA_CloseWin32Driver()
Find further information in the manual	Description of the **PA 110** (see link in the bookmarks)	Description of the **PA 1000** (see link in the bookmarks)	Description of the **APCI-1032** (see link in the bookmarks)

2.2.3 PA 150

You can switch the digital input/output board **PA 150** (ISA bus) either to the follow-up product **PA 1500** (ISA bus) or **APCI-1500** (PCI bus).

For changing please follow the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-4: Changing the PA 150: Further information

	PA 150	PA 1500	APCI-1500
Functionality	- ISA bus digital I/O board, - 32 inputs/outputs, 24 V	- ISA bus digital I/O board - 32 inputs/outputs, 24 V - input/output filter - Optical isolation 1000 V - Watchdog, timer	- PCI bus digital I/O board - 32 inputs/outputs, 24 V - Input/output filter - Optical isolation 1000 V - Watchdog, timer
Connector	37-pin SUB-D male connector Compatible 1 pin 24 V Voltage supply connection	37-pin SUB-D male connector Compatible 2 pin 24 V Voltage supply connection	37-pin SUB-D male connector Compatible 2 pin 24 V Voltage supply connection
IO Mapping	Board address space: 4 x 8-bit DI address space: 4 x 8-bit	Board address space: 8 x 8-bit DI address space: 4 x 8-bit	Board address space: 8 x 8-bit DI address space: 4 x 8-bit
Operating system	16- and 32-bit available	16- and 32-bit available	16- and 32-bit available
Software compatibility (initialisation and function name)	I_PA150_SetBoardAddress()... i_PA150_Read1DigitalInput() i_PA150_Read16DigitalInput() i_PA150_CloseBoardHandle()	i_PA1500_InitCompiler() i_PA1500_SetBoardInformation() … i_PA1500_Read1DigitalInput() i_PA1500_Read16DigitalInput() i_PA1500_Set1DigitalOutputOn() i_PA1500_Set16DigitalOutputOn() i_PA1500_CloseBoardHandle()	i_APCI1500_InitCompiler() i_APCI1500_SetBoardInformation() … i_APCI1500_Read1DigitalInput() i_APCI1500_Read16DigitalInput() i_APCI1500_Set1DigitalOutputOn() i_APCI1500_Set16DigitalOutputOn() i_APCI1500_CloseBoardHandle()
Find further information in the manual	Description of the **PA 150** (see link in the bookmarks)	Description of the **PA 1500** (see link in the bookmarks)	Description of the **APCI-1500** (see link in the bookmarks)

2.2.4 PA 160

You can switch the digital input/output board **PA 160** (ISA bus) to the follow-up product **APCI-1648** (PCI bus).

For changing please follow the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-5: Changin the PA 160: Further information

	PA 160	APCI-1648
Functionality	- ISA bus digital I/O board, - 32 inputs/outputs, TTL	- PCI bus digital I/O board - 48 inputs/outputs, TTL, bidirectional - Filter on each I/O line - Timer
Connector	37-pin SUB-D male connector	50-pin SUB-D male connector
IO Mapping	Board address space: 32 x 32-bit	Board address space: 32 x 32-bit
Operating system	16- and 32-bit available	32-bit available (16-bit available on request)
Software compatibility (initialisation and function name)	i_PA160_InitCompiler() i_PA160_SetBoardAddress()... i_PA160_Read1DigitalInput() i_PA160_CloseBoardHandle()	i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Read1DigitalInput() b_ADDIDATA_Read16DigitalInputs() b_ADDIDATA_CloseWin32Driver()
Find further information in the manual	Description of the **PA 160** (see link in the bookmarks)	Description of the **APCI-1648** (see link in the bookmarks)

2.2.5 PA 1610, PA 1611 and PA 1612

You can switch the digital input/output board **PA 1610, PA 1611** and **PA 1612** (ISA bus) to the follow-up product **APCI-1648** or **APCI-1696** (PCI bus).

For changing please follow the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-6: Changing the PA 1610/1611/1612: Further information

	PA 1610, PA 1611 and **PA 1612**	**APCI-1648**	**APCI-1696**
Functionality	- ISA bus digital I/O board, - 128 inputs/outputs, TTL	- PCI bus digital I/O board - 48 inputs/outputs, TTL, bidirectional - Filter on each I/O line - Timer	- PCI bus digital I/O board - 96 inputs/outputs, TTL, bidirectional - Filter on each I/O line - Timer
Connector	4 x 37-pin SUB-D male connector	50-pin SUB-D male connector	2 x 50-pin SUB-D male connector
IO Mapping	Board address space: 8 x 16Bit	Board address space: 32 x 32-bit	Board address space: 32- x 32-bit
Operating system	16- and 32-bit available	32-bit available (16-bit available on request)	32-bit available (16-bit available on request)
Software compatibility (initialisation and function name)	i_PA1610_SetBoardAddress()... i_PA1610_Read16DigitalInputs() i_PA1610_CloseBoardHandle()	i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Read1DigitalInput() b_ADDIDATA_Read16DigitalInputs() b_ADDIDATA_CloseWin32Driver()	i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Read1DigitalInput() b_ADDIDATA_Read16DigitalInputs() b_ADDIDATA_CloseWin32Driver()
Find further information in the manual	Description of the **PA 1610/PA1611** (see link in the bookmarks)	Description of the **APCI-1648** (see link in the bookmarks)	Description of the **APCI-1696** (see link in the bookmarks)

2.2.6 PA 200

You can switch the digital output board **PA 200** (ISA bus) either to the follow-up product **PA 2000** (ISA bus) or **APCI-2032** (PCI bus).

For changing please follow the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-7: Changing the PA 200: Further information

	PA 200	PA 2000	APCI-2032
Functionality	-ISA bus digital output board - 32 outputs, 24 V	- ISA bus digital output board - 32 outputs, 24 V - Optical isolation 1000 V - Short-circuit protection - Timer, watchdog	- PCI bus digital output board - 32 digital outputs, 24 V or 5 V - Optical isolation - short-circuit/overvoltage protection - Watchdog
Connector	37-pin SUB-D male connector	37-pin SUB-D male connector Compatible	37-pin SUB-D male connector Not compatible
IO Mapping	Board address space: 4 x 8-bit DO address space: 4 x 8-bit	Board address space: 16 x 8-bit DO address space: 4 x 8-bit	32 x 8-bit
Operating system	16- and 32-bit available	16- and 32-bit available	32-bit available (16-bit available on request)
Software compatibility (initialisation and function name)	i_PA200_SetBoardAddress()... i_PA200_Set1DigitalOutputOn() i_PA200_Set16DigitalOutputOn() i_PA200_CloseBoardHandle()	i_PA2000_InitCompiler() i_PA2000_SetBoardInformation() … i_PA2000_Set1DigitalOutputOn() i_PA2000_Set16DigitalOutputOn() i_PA2000_CloseBoardHandle()	i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Set1DigitalOutputOn() b_ADDIDATA_Set16DigitalOutputsOn() b_ADDIDATA_CloseWin32Driver()
Find further inforamtion in the manual	Description of the **PA 200** (see link in the bookmarks)	Description of the **PA 2000** (see link in the bookmarks)	Description of the **APCI-2032** (see link in the bookmarks)

2.2.7 PA 2200

You can switch the digital relay board **PA 2200** (ISA bus) to the follow-up product **APCI-2200** (PCI bus).

Versions:

PA 2200-16 →	**APCI-2200-16**	=	16 relays
PA 2200-16-8 →	**APCI-2200-16-8**	=	16 relays, 8 digital inputs
PA 2200-8 →	**APCI-2200-8**	=	8 relays
PA 2200-8-8 →	**APCI-2200-8-8**	=	8 relays, 8 digital inputs

For changing please realize the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-8: Changing the PA 2200: Further information

	PA 2200	APCI-2200
Functionality	-ISA bus relay board, 24 V -Number of relays (see versions) -Number of digital inputs (see versions)	- PCI bus relay board, 24 V - Number of relays (see versions) - Number of digital inputs (see versions) - Optical isolation - Watchdog
Connector	50-pin SUB-D male connector	50-pin SUB-D male connector Compatible
IO Mapping	4 x 8-bit	32 x 8-bit
Operating system	16- and 32-bit available	32-bit available
Software compatibility (initialisation and function name)	**PA 2200-16:** i_PA2200_SetBoardInformation()... i_PA2200_Set1RelayOn() i_PA2200_Set16RelayOn() i_PA2200_CloseBoardHandle() **PA 2200-16-8:** i_PA2200_SetBoardInformation()... i_PA2200_Set1RelayOn() i_PA2200_Set16RelayOn() i_PA2200_Read1DigitalInput() i_PA2200_Read8DigitalInput() i_PA2200_CloseBoardHandle() **PA 2200-8:** i_PA2200_SetBoardInformation()...	**APCI-2200-16:** i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Set1DigitalOutputOn() b_ADDIDATA_Set16DigitalOutputsOn() b_ADDIDATA_CloseWin32Driver() **APCI-2200-16-8:** i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Set1DigitalOutputOn() b_ADDIDATA_Set16DigitalOutputsOn() b_ADDIDATA_Read1DigitalInput() b_ADDIDATA_Read8DigitalInputs() b_ADDIDATA_CloseWin32Driver() **APCI-2200-8:** i_ADDIDATA_OpenWin32Driver()

	PA 2200	APCI-2200
	i_PA2200_Set1RelayOn() i_PA2200_Set8RelayOn() i_PA2200_CloseBoardHandle() **PA 2200-8-8:** i_PA2200_SetBoardInformation()... i_PA2200_Set1RelayOn() i_PA2200_Set8RelayOn() i_PA2200_Read1DigitalInput() i_PA2200_Read8DigitalInput() i_PA2200_CloseBoardHandle()	… b_ADDIDATA_Set1DigitalOutputOn() b_ADDIDATA_Set8DigitalOutputsOn() b_ADDIDATA_CloseWin32Driver() **APCI-2200-8-8:** i_ADDIDATA_OpenWin32Driver() … b_ADDIDATA_Set1DigitalOutputOn() b_ADDIDATA_Set8DigitalOutputsOn() b_ADDIDATA_Read1DigitalInput() b_ADDIDATA_Read8DigitalInputs() b_ADDIDATA_CloseWin32Driver()
Find further information in the manual	Description of the **PA 2200** (see link in the bookmarks)	Description of the **APCI-2200** (see link in the bookmarks)

2.2.8 PA 170

You can switch the counter board **PA 170** (ISA bus) either to the follow-up product **PA 1700-2** (ISA bus) or **APCI-1710-2** (PCI bus).

For changing please realize the basic steps as described in chapter 2.1. After this step the boards differ from each other as follows:

Table 2-9: Changing the PA 170: Further information

	PA 170	PA 1700-2	APCI-1710
Functionality	- ISA bus counter board - 4 channels	- ISA bus counter board - 24 TTL I/O - 3 or 6 incremental encoders - TTL or differential signals - Pulse width/frequency measurement - Automatic direction recognition	- PCI bus multifunction counter board - Optical isolation - Incremental counter - SSI - Timer/Counter - Pulse acquisition - Frequency-, pulse width-, period duration and velocity measurement - BiSS-Master - digital I/O
Connector	37-pin -SUB-D male connector	37-pin SUB-D male connector Not compatible	50-pin SUB-D male connector
IO Mapping	Board address space: 16 x 8-bit	Board address space: 32 x 8-bit	Board address space: 64 x 32-bit and 2 x 32-bit
Operating system		16- and 32-bit available	16- and 32-bit available
Software compatibility (initialisation and function name)	i_PA170_Read16BitCounter()	i_PA1700_InitCompiler() i_PA1700_SetBoardInformation() i_PA1700_Read16BitCounterValue() i_PA1700_CloseBoardHandle()	i_APCI1710_InitCompiler() i_APCI1710_SetBoardInformation() i_APCI1710_Read16BitCounterValue() i_APCI1710_CloseBoardHandle()
Find further information in the manual	Description of the **PA 170** (see link in the bookmarks)	Description of the **PA 1700-2** (see link in the bookmarks)	Description of the **APCI-1710** (see link in the bookmarks)