

DIMM-PC/MD

Product Manual

Document Revision 1.0

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1. USER INFORMATION

1.1 About This Manual

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In this document Kontron Embedded Modules GmbH will also be referred to by the short form "Kontron".

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Kontron 1996Standards

1.3 General

For the circuits, descriptions and tables indicated no responsibility is taken as far as patents or other rights of third parties are concerned.

The information in the technical descriptions describes the type of the boards and shall not be considered as assured characteristics.

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1.4 Warranty

Each board is carefully and thoroughly tested before being shipped. If, however, problems should occur during the operation, please check your user specific settings of all boards included in your system. That is often the source of the error. If a board is defect, it can be sent to your supplier for repair. Please take care of the following steps:

1. The board returned should correspond to the factory default settings since a test is only possible under these settings.
2. Upon receipt of the board, please be aware that your user specific settings were changed during the test.

Within the guarantee, the repair is free as long as the guarantee conditions were held. If no error has been found, you will be charged with the test costs due to the high test expenditure. Repairs outside of duration of the guarantee will be charged.

This Kontron product is warranted against defects in material and workmanship for our guaranteed warranty period from the date of shipment. During the warranty period, Kontron will, at its option, either repair or replace products which prove to be defect.

For warranty service or repair, the product must be returned to a service facility designated by Kontron.

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance or handling by buyer, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper installation or maintenance.

Kontron will not be responsible for any defects or damages due to a faulty Kontron product other than the products supplied by Kontron

1.5 Technical Support

Technicians and engineers from Kontron and/or its subsidiaries are available for technical support. We are committed to making our product easy to use and will help you use our products in your systems.

Before contacting Kontron technical support, please consult our Web site for the latest product documentation, utilities, and drivers. If the information does not help to solve the problem, contact us by email or telephone. The table below lists Kontron technical support contacts and service facilities.

Asia	Europe	North/South America
Kontron ® Embedded Modules Asia Ltd.	<u>Kontron Embedded Modules GmbH</u>	<u>Kontron</u>
5F-1, 341, Sec 4 Chung Hsiao E. Road Taipei, Taiwan	Brunnwiesenstr. 16 94469 Deggendorf Germany	3988 Trust Way Hayward, CA 94545 USA
Tel: +886 2 2751 7192	Tel: +49 (0) 991-37024-0	Tel: 510-732-6900
Fax: +886 2 2772 0314	Fax: +49 (0) 991-37024-104	Fax: 510-732-7655
	<u>Support-kem@kontron.com</u>	<u>techsupport@adastra.com</u>

2. INTRODUCTION

2.1 Kontron DIMM-PC-Concept

It is likely that anyone who deals with micro-controller-development, has already thought of the application of PC-architecture and considered the PC as the engine for an application. However, most design engineers will get back to the old 87C51 or a similarly more or less efficient micro-controller. The reasons why the Embedded PC was not yet able to push away the micro-controllers from the printed boards, are many.

Embedded PCs are mechanically larger than a solution with a micro-controller.

The hardware of an Embedded PC is much more expensive than the micro-controller solution.

The power consumption of an Embedded PC is usually higher than the one of a micro-controller circuit.

A lot of times PCs have to be used with ribbon cables which are a possible cause of error.

Micro-controllers are available with a large number of peripheral functions, the PC, however only has a standard periphery.

On the other hand there are some serious disadvantages of micro-controller solutions.

The software-development is much more complicated and expensive than under a standard operating system.

Connection to standard-interfaces such as LANs and modems requires complicated driver software.

Graphical user interfaces can be realized only by large programming efforts.

The development tools are by far not as powerful as PC-programming systems.

Micro-controllers do by far not have as many different PC-SW development tools available.

This is why the purchase price is usually considerably higher for micro-controller development tools.

Ready-made software solutions for standard tasks are only available in a very limited extent.

The specified reasons are only a few of the more common ones, which are important in deciding whether to implement a micro-controller or to change to PC-architecture.

It is a matter of fact, that these points are not always estimated objectively. Who knows for sure at the beginning of a project how much programming efforts will have to be made for realizing the application? In most cases, this can only be rated afterwards which means, too late. Also the problematic nature/software care within the course of the product life-span is often ignored.

If the Embedded PC is to be implemented in today's micro-controller applications, the advantages of the PC-architecture have to prevail, compared to a micro-controller solution.

With the DIMM-PC, JUMPtec has aimed at the micro-controller market and has presented a completely new concept for the Embedded PC-solution.

The DIMM-PC solves the problems of size and cabling. The prices have been drastically reduced thanks to new technical designs, making the solution of using a DIMM-PC possible for many applications. The driving of peripheral functions was also made easier by the expansion towards the ISA-bus-standard.

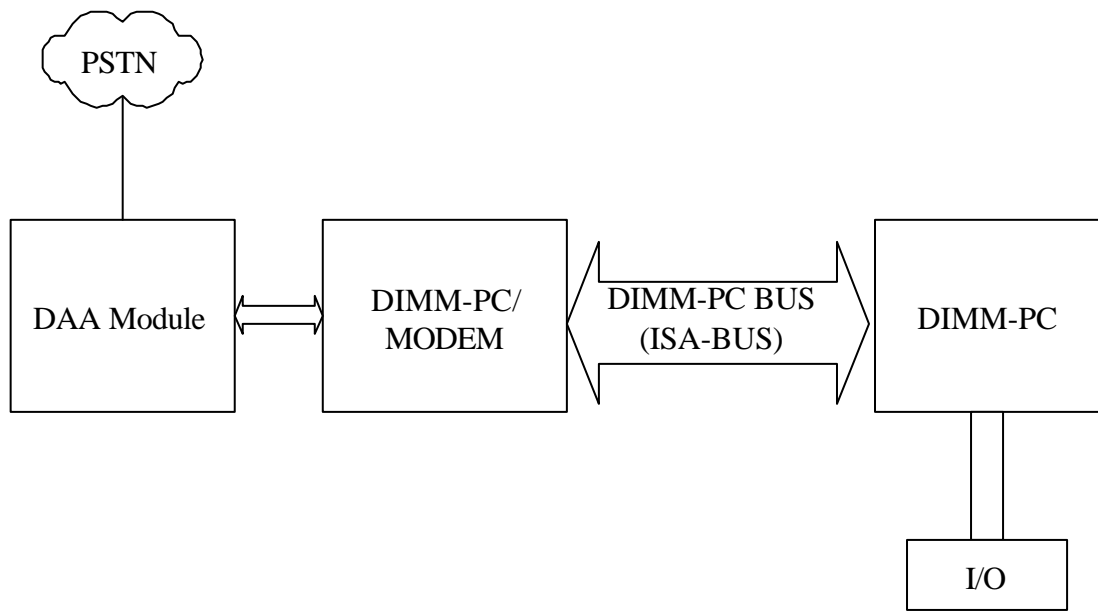
3. FEATURES OF THE DIMM-PC/MODEM

The DIMM-PC/Modem incorporates following features:

- Low power CMOS technology.
- 5V only power supply.
- Signal pinning according DIMM-PC specification
- Different selectable I/O-Addresses and IRQs
- Board size : Modem-module 68 x 40 mm (2,68" x 1,57")
DAA-module 30 x 50 mm (1,18" x 1,97")
- support for:
V.21, V.22(1200bps), V.22bis(2400bps),V.23, Bell 103, Bell 212, V.32, V.32bis,
V.34, V.34+, K56flex, V.90, V.92, V.17, V.29, V.27ter and V.21 channel 2

4. BLOCK DIAGRAMM DIMM-PC/MODEM

The modem may be connected directly to the ISA BUS signals of the DIMM-PC.

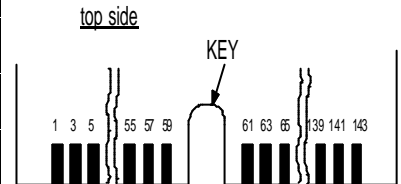


5. MECHANICAL SPECIFICATION

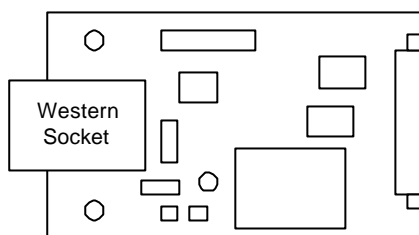
Pinout of DIMM-PC/Modem

Pin number	Signal
1	SA0
3	OSC
5	SA1
7	SA2
9	MASTER#
11	SA3
13	BALE
15	SD15
17	SA4
19	TC
21	SD14
23	SA5
25	DACK#2
27	SD13
29	SA6
31	IRQ3
33	DRO7
35	DACK#7
37	IRQ4
39	SA7
41	SD12
43	IRQ5
45	SA8
47	SD11
49	IRQ6
51	SA9
53	SD10
55	IRQ7
57	SA10
59	SD9
KEY	
61	SYSCLK
63	SA11
65	SD8
67	REF#
69	SA12
71	I2DAT
73	SA13
75	I2CLK
77	SA14
79	DRO0
81	SA15
83	DACK#0
85	IRQ14
87	IOR#
89	SA17
91	IRQ15
93	IOW#
95	SA18
97	IRQ12
99	SMEMr#
101	SA19
103	IRQ11
105	SMEMW#
107	AEN
109	IRQ10
111	IOCHRDY
113	SBHE#
115	SD0
117	IOCS16#
119	ZWS#
121	SD1
123	MEMCS16#
125	SD2
127	SD3
129	DRO2
131	SD4
133	SD5
135	IRQ9
137	SD6
139	SD7
141	RSTDRV#

Pin number	Signal
2	GND
4	BATT
6	VCC
8	RI4#
10	DCD4#
12	DTR4#
14	DSR4#
16	RTS4#
18	CTS4#
20	TXD4 / DO
22	RXD4 / DI
24	RI3#
26	DCD3#
28	DTR3#
30	DSR3#
32	RTS3#
34	CTS3#
36	TXD3
38	RXD3
40	
42	
44	TXD+
46	TXD-
48	RXD+
50	RXD-
52	LNLED
54	LKLED
56	GND
58	MD14
60	MD13
KEY	
62	MD12
64	
66	
68	BLUE
70	GREEN
72	RED
74	VCC
76	VSYNC
78	GND
80	HSYNC
82	FPBACK
84	MODUL
86	SA16
88	GND
90	FPVDD
92	BLANK#
94	P17
96	P16
98	P15
100	P14
102	P13
104	P12
106	P11
108	P10
110	P9
112	P8
114	P3
116	P2
118	GND
120	P1
122	P0
124	P7
126	P6
128	P5
130	P4
132	VPANEL
134	FPVEE
136	VDCLK
138	LLCLK
140	VCC
142	LFS



Pinout of the western socket on the Modem-Module

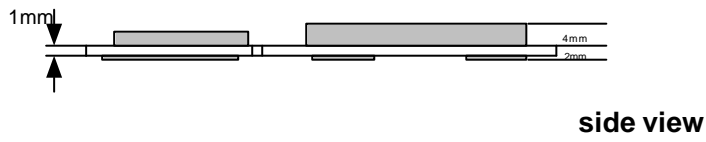
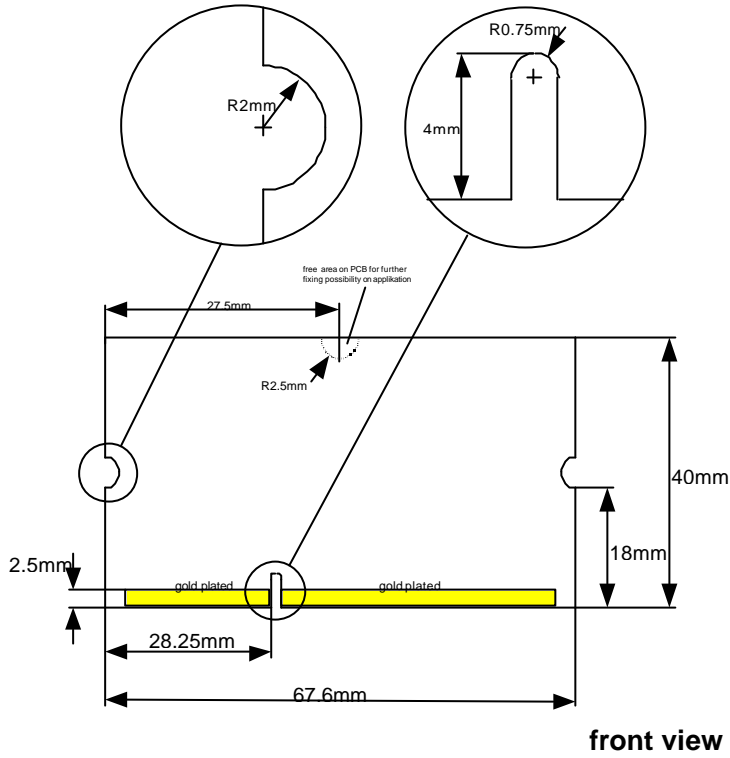


pin	description
1	not connected
2	a2
3	La (TIP)
4	Lb (RING)
5	b2
6	not connected

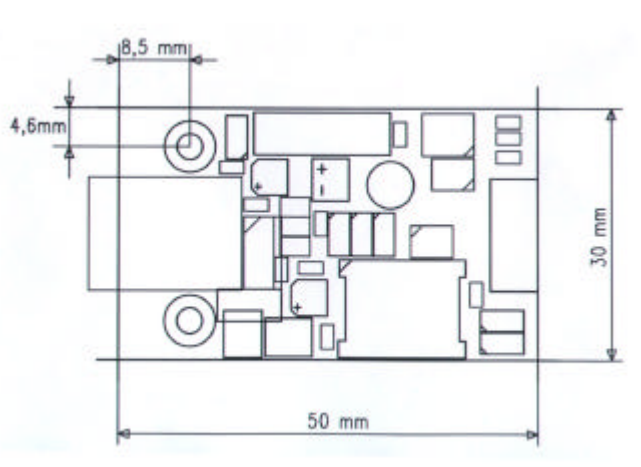
La and Lb are from PSTN. a2 and b2 are feedback for serial connected telephones. In Germany, Austria, Switzerland, France etc. the telephone can be connected in serial. In the USA, UK etc. the telephone will be connected in parallel (a2 and b2 will not be used in this case).

Please check the max. REN-number for parallel connection.

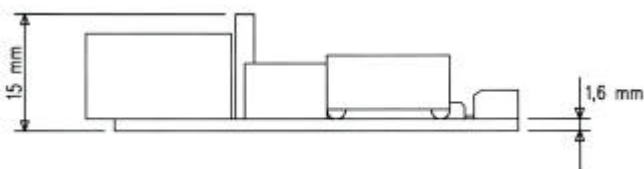
Telephone line cables are not harmonized like ISDN-cables. They are country-dependent. Please use the correct cable.



Mechanical Specification of the Modem-DAA-Modul



top view



side view

5.1 Electrical Specification

Supply voltage:	5V DC +/- 5%
Supply voltage ripple:	150mV peak to peak 0 - 20 MHz
Supply current, max:	Standby 150 mA
	On Line Mode 180 mA

5.2 Performance Specification

ITU Recommendations:

V.21, V.22(1200bps), V.22bis(2400bps),V.23, Bell 103, Bell 212, V.32
V.32bis, V.34, V.34+, K56flex, V.90, V.92
V.17, V.29, V.27ter and V.21 channel 2

Error correction and

data compression: MNP 2-4,V.42 LAPM, MNP10, MNP 10EC

Fax Group 3, Class1, Class1.0.Class2 :

Serial Interface: 300...230.400bps, Autobauding

Data format 10 / 11 bit asynchronous

Command Control Hayes (AT) commands .

Auto dial DTMF (Touchtone™), Pulsedial

Auto answer

a/b-Interface external Line-Interface (DAA)

5.3 Environmental Specifications

Temperature

operating 0°C - 60 °C see note (*1)

non-operating -40 °C - 85 °C

Thermal gradient

operating 25 °C per hour

non-operating 40 °C per hour

Relative Humidity

operating 10 % - 90 % RH non-condensing

non-operating 5 % - 95 % RH non-condensing

Mechanical

Shock 50G/20ms square wave maximum

Vibration 1G/0-600Hz, dwell not to exceed

Altitude

operating 0 - 3000 m

non-operating 0 - 5000 m

(*1) The maximum operating temperature is the maximum measurable temperature on any spot on the modules surface. It is the users responsibility to keep this temperature within the above specification.

6. HARDWARE-INSTALLATION

ATTENTION:

Please FIRST disconnect your DIMM-PC System from any power supply!

The Modem Cards are delivered with settings adjusted to the **IRQ5 and to I/O address 3E8h**. If those configuration positions are already attributed to other cards, then the hardware settings for the DIMM-PC/Modem will have to be changed.

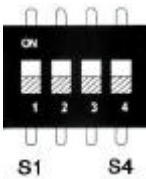
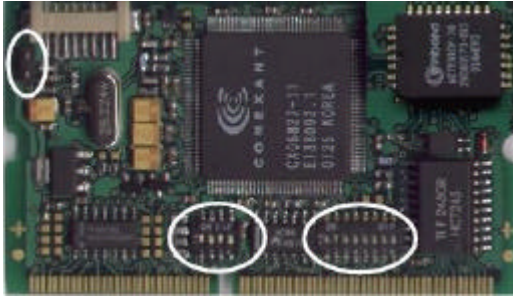
6.1 Line-Connection

Please connect the DIMM-PC/Modem with a telephone cable (country depending) to the PABX or PSTN line

6.2 Definition of the Hardware-Interrupts and of the I/O-Address

The definition of the Hardware-Interrupts and the I/O addresses is performed by means of the DIP-switches located in the middle of the card (see the picture below).

The relevant switch positions for the possible I/O Addresses and Hardware-Interrupts are described in detail in the following table.



S1	S2	S3	S4	Address
OFF	OFF	OFF	OFF	2E0
ON	OFF	OFF	OFF	2E8
OFF	ON	OFF	OFF	2F0
ON	ON	OFF	OFF	2F8
OFF	OFF	ON	OFF	3E0
ON	OFF	ON	OFF	3E8 (default)
OFF	ON	ON	OFF	3F0
ON	ON	ON	OFF	3F8
X	X	X	ON	IRQ 5 (default)

S1	S2	S3	S4	S2	S5	S6	S7	S8	Interrupt
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	IRQ 3
OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	IRQ 4
OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	IRQ 7
OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	IRQ 9
OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	IRQ 10
OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	IRQ 11
OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	IRQ 12
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	IRQ 15
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	IRQ 5

NOTE:

The IRQ and I/O Address of the card should not be used by any other computer peripheral equipment. If necessary, you should define your own address and IRQ.

7. SOFTWARE SPECIFICATION

7.1 DIMM-PC/MD

For controlling the modem select a suitable COM Port address and IRQ.

The Modem appears at the ISA Bus (DIMM-IO Bus) as device with UART 16550 compliant register set according the specified settings.

The modem will be controlled by AT (Hayes) commands. The baud rate is selectable from 300...230.400 baud asynchronous. 10 and 11 bit transmission is supported (including START and STOP bit).

For modem control just use a standard terminal program (TELIx, Procom etc.).

For instance, hyper terminal or similar can be used for Windows based PCs.

The baud rate will automatically set by typing „AT CRLF“. Then the modem will answer „OK“

The AT command reference is based on the original CONEXANT documentation. The complete document can be downloaded from our webpage, section “Embedded Internet”.

Since the modem acts as standard serial device, no specific software and operating system drivers are required. Usually, the modem is directly supported by the operating system (as “modem with standard hayes command set”).

7.2 AT Commands Reference Manual

NOTE:

Take the section below as short reference to the content of the complete conexant modem chip manual (which can be downloaded from our web page). Some functions require additional hardware e.g. speaker control. Some commands for voice and speakerphone control requires code which is not part of the DIMM-PC/Modem. These commands are not supported.

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8. TROUBLESHOOTING

Before asking for support, please observe following hints if the modem doesn't behave correctly:

1. Check the appearance of the specified COM-Port in the setup summary screen.
2. Check the selected I/O address against conflicts with other devices (e.g. disable the onboard COM1/ttyS0 if you selected address 3F8h).
3. Check the selected IRQ carefully. This might be a tricky task because a misconfigured IRQ isn't always obvious:
 - a.) Be aware, that some DIMM-PCs don't support every selectable IRQ
 - b.) If you're using the modem in a PCI environment (e.g. together with the Microserver), ensure that the selected IRQ is mapped to the ISA bus (BIOS setup, IRQ resources)
 - c.) Although the IRQ is misconfigured, the device appears in the setup screen correctly
 - d.) Shareable IRQs are not supported
4. Try to get as much information about the malfunction as possible before asking for support:
 - is the modem visible in the setup summary screen
 - do the settings of your terminal program comply with the selected settings (e.g. TELIX don't support IRQs > 9)
 - does the modem respond to an AT command (e.g. "AT Z"). If not, this might hint to a misconfigured IRQ.
 - is the malfunction maybe caused due to a wrong initialization (e.g. don't wonder if your modem doesn't respond to incoming calls unless you specified a correct value in the S0 register).
 - when asking for help, please have the exact condition when the malfunction occurred:
 - a.) hardware setup: components, I/O and IRQ configuration
 - b.) software setup:
 - BIOS version of the CPU Board
 - BIOS settings (especially concerning the COM ports and IRQ resources)
 - Operation System (e.g. DOS, Windows9x, Linux, etc.)
 - Application Software (e.g. Telix, Hyper Terminal, etc.)

9. REVISION HISTORY

File-name	last alteration	author	alteration to previous version
DPC_M100.DOC	13.12.02	VK	Manual created
DMD1M110.DOC	11.02.03	SML	completely reworked