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PRODUCT OVERVIEW

Boards ▪ Systems ▪ Software



Industrial PC



Embedded PC

CAN/CANopen



I/O Boards/Interfaces



VMEbus

janz

Solutions for Automation

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Software Support

Flexible solutions are very important for developers by working with different hardware platforms. If target systems are different to the series systems, the software integration must easily be portable to different system architectures.

An example of this is the development of applications on several Linux PC systems, while a much more expensive and complex target system (e.g. VMEbus) is to be used for final testing, given that the real application is only required once.

Using a hardware architecture and operating system independent field bus connection it is possible to supply a near identical Application Programming Interface (API) for the corresponding hardware.









Thus all the development work can be done in a cost effective development environment. The advantage of such system independently API is the usage of the modules with different hardware architectures. Different partnerships with software vendors like Windriver, QNX and Microsoft enables Janz Automationssysteme AG to support more different operating systems as most other companies.

The supported operating systems are:

- VxWorks
- OS-9
- pSOS+
- Linux
- QNX
- Windows
- others on request

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Janz Company Group

More than 20 Years of

The Janz Group consists of four companies:

- Janz Computer AG
- Janz Informationssysteme AG
- Janz Automationssysteme AG
- Janz Consulting AG

Janz Computer AG is the holding company which manages the three operating companies, with accounting, finance, and personnel responsibilities.

Janz Automationssysteme AG

Solutions for Automation

Janz Automationssysteme AG is product development company and manufacturer of boards, systems and software for various industrial automation solutions. If you need real-time applications based on VMEbus, standard industrial PC systems or decentralized CAN field bus systems – Janz Automationssysteme AG offers individual configured solutions with worldwide standards.

History

Solid Basis, with Continuous Growth and Development

Established as Janz Computer GmbH in 1982, Janz became the stock company Janz Computer AG in 1985. In 1994, solutions for company information systems (IT) were offered to customers, and in 2000 this operation was separated as its own company – Janz Informationssysteme AG. A further department – Janz Consulting AG – was added in 2001.

In 2001, the Automation Systems division was spin off into a company in the Janz Computer AG group – Janz Automationssysteme AG.

From the beginning, Janz AG has always been a development company specializing in sophisticated components for industrial automation. Interestingly, the VMEbus standard and Janz Automationssysteme AG were created at the same time.

With the decentralization of industrial automation and the increased use of field busses – e.g. CAN field bus – Janz Automationssysteme AG decided to concentrate on these application areas. Today, Janz Automationssysteme AG is a worldwide market leader for CAN field bus host interfaces.

The market need for standardized industrial computer systems caused Janz AG to create JIPSY systems (JIPSY – Janz Industrial PC Systems).
Janz specializes in creating customer-specific computer systems for industrial environments. These can be offered with I/O components, field bus interfaces or other solutions necessary for complete industrial automation systems.

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International Representatives

Europe

BELGIUM / LUXEMBOURG / NETHERLANDS
SI-KWADRAAT
www.si-kwadraat.nl

SCANDINAVIA
Lönne Scandinavia AB
www.lonne.com

SCANDINAVIA
VSYSTEMS AB
www.vsystems.se

FRANCE
ELTEC International S.A.R.L.
www.eltec.com

GREAT BRITAIN
ELTECH Solutions (UK) Ltd.
www.eltech.co.uk

Pristine Computer Ltd.
www.pristineuk.com

ITALY
VSYSTEMS srl
www.vsystems.it

PORTUGAL / SPAIN
TGA Ingenieria y Electronica S.A.
www.tga.es

SWITZERLAND
SpectraLab
www.spectralb.ch

RUSSIA
JSC Vital Electronics
www.vital-ic.com

Worldwide

AUSTRALIA
ASWA Embedded Strategies
aswa@tpg.com.au

KOREA
Softec Engineering Co. Ltd.
www.softec.co.kr

SINGAPORE
BAYCOM Electronics Pte. Ltd.
blbaycom@singnet.com.sg

TAIWAN
Spinel Technology Corp.
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CAN
Controller Area Network

OEM Modules



Software



I/O Systems

CAN StarterKit



Software Support

Host Interfaces

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General about CAN

CAN (Controller Area Network) is a serial bus system especially suited for networking ”intelligent” devices as well as sensors and actuators within a system or a sub-system.

The attributes of CAN

CAN is a bus system with multi-master capabilities, that is, all CAN nodes can request the bus simultaneously. The bus system CAN with real-time capabilities is the subject of the international standard ISO/DIS 11898 and covers the lowest two layers of the ISO/OSI reference model.

CAN applications

CAN networks can be used as an embedded communication system for microcontrollers as well as an open communication system for intelligent devices. The CAN serial bus system, originally developed for use in automobiles, is increasingly being used in industrial automation as well as building automation, medical equipment and maritime electronics.
If the requirements for passenger car networks are compared with those for industrial field bus systems, the similarities are remarkable. In both cases some of the major requirements are: low cost, the ability to function in a difficult electrical environment, a high degree of real-time capability and easy of use.

Controller Area Network

Characteristics of CAN



In CAN networks there is no addressing of subscribers or stations in the conventional sense, but instead, prioritized messages are transmitted. Introductory courses, function libraries, starter kits, host interfaces, I/O modules and tools are available permitting low cost implementation of CAN networks. Low-cost controller chips implementing the CAN data link layer protocol in silicon and permitting simple connection to microcontrollers have been available since 1989.
The use of CAN in most of European passenger cars and the decision by truck and off-road vehicle vendors for CAN guarantees the availability of CAN chips for the next 10 years minimum. Other high volume markets, like domestic appliances and industrial control, also increase the CAN sales figures.
One of the outstanding features of the CAN protocol is its high transmission reliability. The maximum transmission rate is specified as 1 MBit/s. This value applies to networks up to 40 m. For longer distances the data rate must be reduced: for distances up to 500 m a speed of 125 kBit/s is possible, and for transmissions up to 1 km a data rate of 50kBit/s is permitted.

Janz CAN Products – The first choice of the market leaders!

Janz CAN host interfaces are available for a wide range of different platforms, like ISA/PCI, CompactPCI, VMEbus, PCcard (PCMCIA), PMC, PC/104 and others. Software support and libraries with standard APIs for Windows, Linux, QNX, VxWorks and many other operating systems are also available.
Many companies all over the world have chosen Janz Automationssysteme AG as reliable supplier for CAN products of highest quality, with unrivalled product support.
Choosing the right system platform and the right operating system for your special project is critical.
Janz' CAN products are widely recognized as the best solution for quality projects from design and implementation and on in to production.

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Characteristics of CAN (ISO/DIS 11898)

Topology
- line terminated on both sides

Bus extension
- 40 m up to 1 km, depending on transfer rate

Bus medium
- twisted-pair cable, fiber optic

(ISO/DIS 11898)

Data transfer rate
- up to 1 MBit/s at 40 m bus extension

Transfer mode
- serial asynchronous data transfer
  - multi master capability
  - baseband transfer
  - NRZ coding with bit-stuffing

Bus access procedure
- CSMA/CD (modified)
  - bus allocation via message priority
  - arbitration on bit level
  - no destruction of messages with higher priority

Transmitter output level
- differential according to ISO/DIS 11898

Maximum number of participants
- up to 127 (CANopen)

Real time capability
- defined maximum waiting time for messages of high priority latency time < 120 µs at 1 MBit/s

High reliability
- by provisions for
  - error detection
  - error handling
  - error localization

Error detection
- each CAN controller monitors its own transmitter with its own receiver
- 15 bits CRC (Cyclic Redundancy Check)
- all participants check the observance of the bit-stuffing
- all participants check the observance of the message frame

Error handling
- all participants acknowledge a faultness message simultaneously (acknowledge slot)
- participants mark a faulty message (error frame)

Error localization
- distinguishing between constant errors and temporary error situations
- at constant error automatic disconnection of the participant

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CAN Host Interfaces

Overview of CAN Host

		VMOD-ICAN3	VMOD-FCAN	CAN-PC/K2	CAN-PC/K3	CAN-PCI/K2	CAN-PCI/K3	CAN-PCI2	CAN-PCIL
System Architecture	ISA			X	X				
	PCI					X	X	X	X
	CompactPCI, 3U								
	CompactPCI, 6U								
	VMEbus, 3U								
	VMEbus, 6U								
	PC/104								
	PCMCIA								
	USB								
	PMC								
Availablility	MODULbus	X	X						
	CAN-StarterKit			V				V	
	Catalogue Page	13	13	14	14	14	14	15	16
CAN Controller	Philips SJA1000	X		X		X		X	X
	Intel 82527		X		X		X		
	Opto-Isolation	O	O	O	O	O	O	O	O
No. of Channels	1	X	X	X	X	X	X	X	X
	2	X	X	O	O	O	O	O	O
	3			o. R.	o. R.	o. R.	o. R.		
	4			o. R.	o. R.	o. R.	o. R.		
CAN Communication	MC68332	X		X		X		X	X
	RISC								
	PowerPC405GP								
	Performance [MHz]	20		20		20		20	
Communication Profile	ICANOS	X		X		X		X	
	CAN 2.0A		X		X		X		X
	CAN 2.0B	X	X	X	X	X	X	X	X
	CANopen	O		O		O		O	O
CAN Specifications	11 Bit Identifier	X	X	X	X	X	X	X	X
	29 Bit Identifier	X	X	X	X	X	X	X	X
Memory	RAM	256 kB		256 kB		256 kB		256 kB	
	DPRAM	64 kB		64 kB		64 kB		64 kB	
	FLASH	256 kB		256 kB		256 kB		128 kB	
Physical Connection	CAN Hi-Speed (ISO/DIS 11898)	X	X	X	X	X	X	X	X
	9-pin D-SUB	X	X	X	X	X	X	X	X
	Customer Specific Connectors	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.
	Opto-Isolation	O	O	O	O	O	O	O	O
	Copper Based Connection	X	X	X	X	X	X	X	X
	Fibre Optic Connection	O	O	O	O	O	O	O	O
Operating System Support	Windows NT		X	X	X	X	X	X	X
	Windows 2000	X	X	X	X	X	X	X	X
	Windows XP	X	X	X	X	X	X	X	X
	Linux	X	X	X	X	X	X	X	X
	QNX	X	o. R.	X	o. R.	X	o. R.	X	o. R.
	VxWorks	X	X	X	X	X	X	X	o. R.
	OS-9	X	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.

X: Standard Availability O: Optionally Available V: Available (but no Standard !) o. R.: On Request

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Interfaces

CAN-104	CAN-USB	CANcard	CAN-PMC2	CPCI-CAN	CAN-CP3/K2	CAN-CP3/K3	CAN-CP6/K2	CAN-CP6/K3	CAN-VME3/K2	CAN-VME3/K3	CAN-VME6/K2	CAN-VME6/K3
				X			X	X				
									X	X		
											X	X
X												
		X										
	X											
			X									
V		V					V				V	
17	18	19	20	21	22	22	22	22	23	23	23	23
X	X	X	X	X	X		X		X		X	
						X		X		X		X
O	X	X	O	O	O	O	O	O	O	O	O	O
X	X	X	X	o. R.	X	X	X	X	X	X	X	X
O		O	O	o. R.			O	O			O	O
			O	X			O	O			O	O
			O	O			O	O			O	O
X		X		X	X		X		X		X	
	X											
			X									
20	16	20	266	20	20		20		20		20	
X		X	X	X	X		X		X		X	
X	X	X				X		X		X		X
X	X	X	X	X	X	X	X	X	X	X	X	X
O	O	O	O	O	O		O		O		O	
X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X
256 kB	64 kB	512 kB	64 MB	256 kB	256 kB		256 kB		256 kB		256 kB	
64 kB		128 kB		64 kB	64 kB		64 kB		64 kB		64 kB	
128 kB		512 kB	4 MB	512 kB	256 kB		256 kB		256 kB		256 kB	
X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X
o. R.			o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.
O	X	X	O	O	O	O	O	O	O	O	O	O
X	X	X	X	X	X	X	X	X	X	X	X	X
O	X	X	O	O	O	O	O	O	O	O	O	O
X	o. R.	X	o. R.	X	X	X	X	X	o. R.	o. R.	o. R.	o. R.
o. R.	X	X	o. R.	X	X	X	X	X	o. R.	o. R.	o. R.	o. R.
o. R.	X	X	o. R.	X	X	X	X	X	o. R.	o. R.	o. R.	o. R.
X	X	X	X	X	X	X	X	X	X	X	X	X
o. R.	X	o. R.	o. R.	X	X	o. R.	X	o. R.	X	o. R.	X	o. R.
X	o. R.	o. R.	X	X	X	o. R.	X	o. R.	X	X	X	X
o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.	o. R.

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- Digital Field Input/Output Node
  - 8 inputs 24 VDC
  - 8 outputs 24 VDC/0.5 A
  - more I/Os available



- Intelligent CAN host interface for your host system:
  - CAN-PCI2/1O for PCI systems
  - CANcard for PCcard (PCMCIA)
  - ICANOS firmware
  - CANopen on-board





CAN bus cable:
9-pin D-SUB connector
length 2 m

- CANlook – Analyzing and monitoring tool for CAN bus:
  - CAN data stream supervision for the intelligent CAN host interfaces

- Software drivers and documentation
  - Windows 2000/XP
  - Linux

CAN-StarterKit

Easy StarterKit for CAN/CANopen

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VMOD-ICAN3
Intelligent CAN Controller

VMOD-ICAN3

- intelligent high performance SJA1000 CAN controller
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available

VMOD-FCAN
Full-CAN Controller

VMOD-FCAN

- Intel 82527 FullCAN controller
- supports CAN protocol V2.0A and V2.0B
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- software drivers for various operating systems available



VMOD-ICAN3



VMOD-FCAN

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CAN-PC·CAN-PCI and CAN-PCI2

Intelligent CAN Connections

CAN-PC/K2

- intelligent CAN host interface based on VMOD-ICAN3 and MODULbus carrier board MOD-ATS for ISA systems
- intelligent high performance CAN controller SJA 1000
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available



CAN-PC

CAN-PC/K3

- Full-CAN interface based on VMOD-FCAN and MODULbus carrier board MOD-ATS for ISA systems
- Intel 82527 Full-CAN controller
- supports CAN protocol V2.0A and V2.0B
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- software drivers for various operating systems available

MOD-ATS Carrier Board

- non-intelligent ISA bus carrier board with 2 or 4 MODULbus+ sockets
- extended ISA form factor
- only one ISA bus slot occupied
- supports MODULbus+ identification mechanism



CAN-PCI/K2

- intelligent CAN host interface based on VMOD-ICAN3 and MODULbus carrier board MOD-PCI for PCI systems
- intelligent high performance CAN controller SJA 1000
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available

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CAN-PCI/K3

- Full-CAN interface based on VMOD-FCAN and MODULbus carrier board MOD-PCI for PCI systems
- Intel 82527 Full-CAN controller
- supports CAN protocol V2.0A and V2.0B
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- software drivers for various operating systems available

MOD-PCI Carrier Board

- non-intelligent PCI bus carrier board with 2 or 4 MODULbus+ sockets
- extended PCI form factor
- 32 bit PCI 2.2 target interface (PLX 9030)
- 3.3V / 5V PCI interface
- only one PCI bus slot occupied
- supports MODULbus+ identification mechanism



CAN-PCI

CAN-PCI2

- CAN host interface for PCI systems intelligent high performance CAN field bus adapter
- PCI standard height short form factor
- compatible to intelligent CAN-PCI board CAN-PCI/K2
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- 3.3V and 5V PCI interface
- up to 2 SJA1000 CAN controller for 2 independent CAN channels
- optionally opto-isolated CAN interfaces
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available



CAN-PCI2

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CAN-PCIL

Non-Intelligent CAN Connection for PCI Systems



CAN-PCIL

CAN-PCIL

- CAN field bus controller for PCI-bus systems
- PCI short form factor
- 32 bit PCI 2.2 target interface
- 3.3V and 5V PCI interface
- only one PCI-bus slot occupied
- up to 2 CAN interfaces with SJA1000 CAN controllers
- 11bit ID and 29bit ID CAN specifications supported
- ISO/DIS 11898, optionally opto-coupled
- 9-pin D-SUB connector for each CAN interface at PCI bracket

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CAN-104

- intelligent high performance CAN field bus controller
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- up to 2 SJA1000 CAN controller for 2 independent CAN channels
- optionally opto-isolated CAN interfaces
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available

CAN-104

CAN Connection for PC/104 Systems

CAN-104



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CANcard2

CAN Connection



CAN-USB

CAN Connection



for PCcard (PCMCIA)

CANcard

- CAN host interface for PCcard (PCMCIA) systems (Type II)
- intelligent high performance CAN field bus adapter
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB DP-Flash
- two SJA1000 CAN controller
- 16 bit PCcard interface (PCMCIA)
- two 25-pin IO connectors for attachment of external transceiver cables and debugging features
- Xilinx Spartan FPGA (100VQ) for user specific application
- FPGA is configured by local processor with a program that is stored in the DP-Flash
- ICANOS firmware on-board
- optionally CANopen available
- software drivers for various operating systems available
- bus line termination software-switchable
- 120 Ω (Ohm) resistor in external transceiver cable
- transceiver cable must be ordered separately for each channel

for USB Ports

CAN-USB

- CAN to USB connection
- opto-isolated SJA1000 CAN controller
- 128kB Flash
- up to 128kB SRAM for firmware
- firmware upgrade over USB
- CAN interface refers to ISO/DIS 11898
- 9-pin D-SUB male connector
- plug 'n' play
- software controlled termination of CAN line
- bus powered device, no AC adaptor necessary
- dimensions (w x d x h) 55 x 55 x 20 mm
- software drivers for Windows 2000/XP and Linux

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CAN-PMC2

CAN-PMC2

CAN Connection for PMC Sockets



CAN-PMC2

- intelligent PMC CAN field bus controller
- local intelligence with IBM PowerPC 405
- PCI interface with DMA capabilities
- 1 MB Flash
- up to 4 MB local memory
- up to 4 SJA1000 CAN controller for 4 independent CAN channels
- optionally opto-isolated CAN interfaces
- ISO/DIS 11898
- 9-pin D-SUB connector (1 or 2 channel solution)
- 25-pin D-SUB connector (4 channel solution)
- all I/Os are available at front and at Rear I/O
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available

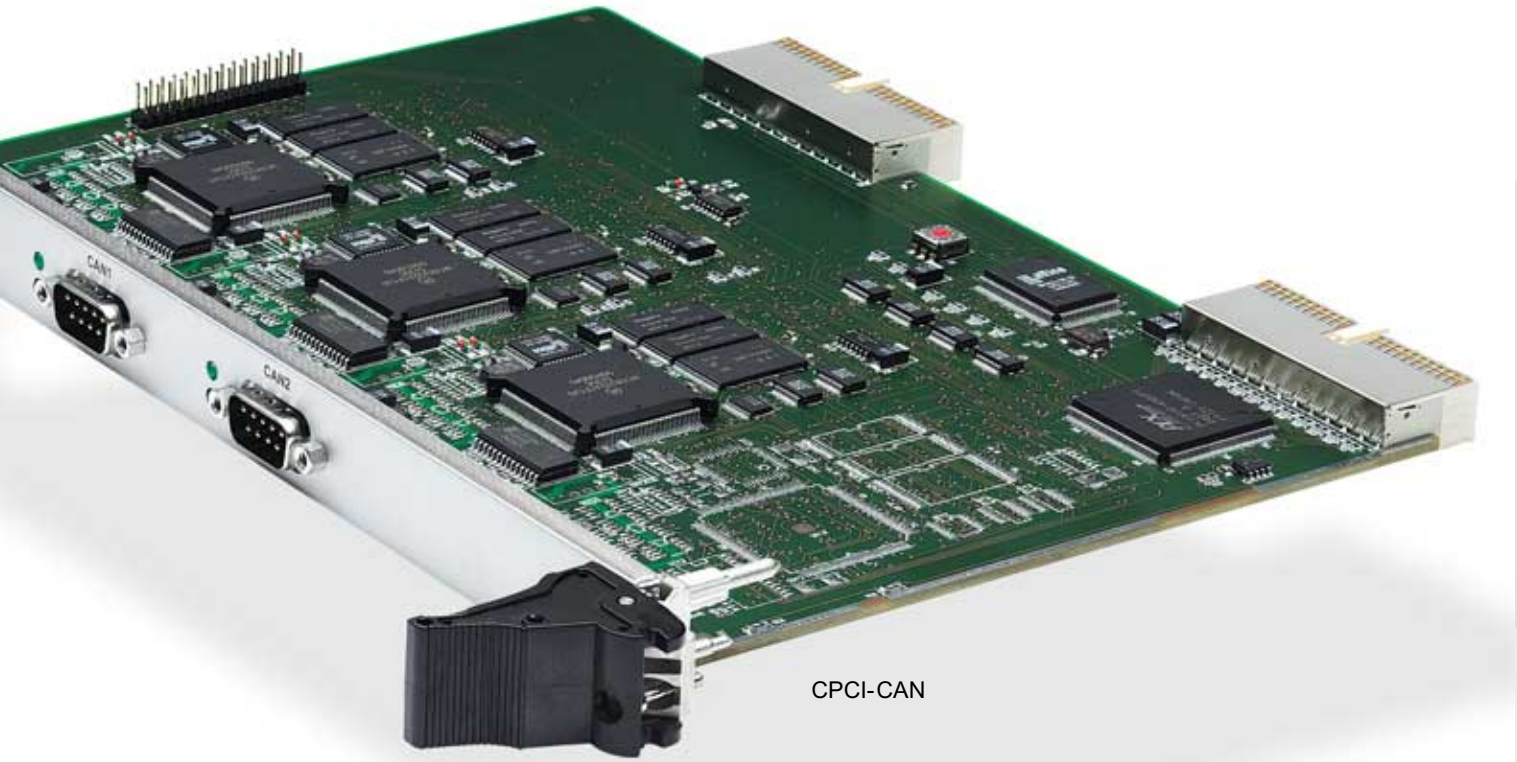
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CPCI-CAN

High-Performance CAN Connection for 6U CompactPCI

CPCI-CAN

- up to 4 intelligent CAN channels
- compatible to well-known VMOD-ICAN3
- 32 bit PCI 2.2 target interface (PLX 9030)
- 3.3V and 5V PCI interface
- single slot double Euro-Card format (6U)
- diagnostic LEDs on front panel
- front panel connection of CAN interfaces
- back panel connection of CAN interfaces via
- CompactPCI J4 connector



CPCI-CAN

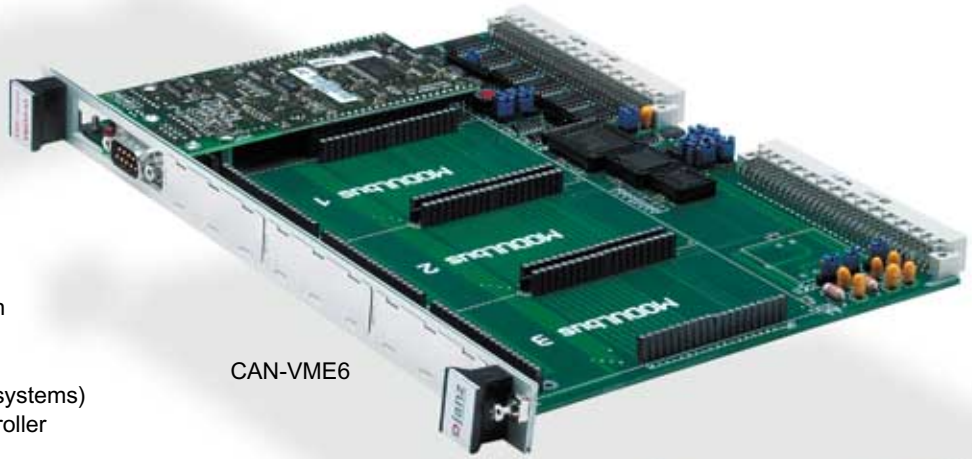
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CAN-VME3/6 and CAN-CP3/6

Modular CAN Connection for VME



CAN-VME3



CAN-VME6



CAN-CP3

CAN-VME3/K2 (for 3U)
CAN-VME6/K2 (for 6U)

- intelligent CAN host interface based on VMOD-ICAN3
- MODULbus carrier board VMOD-3U (for 3U systems) or VMOD-IO (for 6U systems)
- intelligent high performance CAN controller SJA 1000
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available

CAN-VME3/K3 (for 3U)
CAN-VME6/K3 (for 6U)

- Full-CAN interface based on VMOD-FCAN
- MODULbus carrier board VMOD-3U (for 3U systems) or VMOD-IO (for 6U systems)
- Intel 82527 Full-CAN controller
- supports CAN protocol V2.0A and V2.0B
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- software drivers for various operating systems available

VMOD-3U 3U VMEbus Carrier Board

- 3U VMEbus non-intelligent carrier board for MODULbus
- single euro-card with A24/16:D16/08 VMEbus slave interface
- 1 socket for VMOD-ICAN3 or VMOD-FCAN
- needs only one VME-slot

VMOD-IO 6U VMEbus Carrier Board

- 6U VMEbus non-intelligent carrier board for MODULbus
- double euro-card with A24/D16 VMEbus slave interface
- 4 plug-in sockets for MODULbus I/O (socket 0 for VMOD-ICAN3 or VMOD-FCAN)
- needs only one VME-slot
- front panel and P2 connection of I/O lines

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bus or CompactPCI Systems

CAN-CP3/K2 (for 3U)
CAN-CP6/K2 (for 6U)

- intelligent CAN host interface based on VMOD-ICAN3
- MODULbus carrier board CMOD-3U (for 3U systems) or CMOD-IO (for 6U systems)
- intelligent high performance CAN controller SJA 1000
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available

CAN-CP3/K3 (for 3U)
CAN-CP6/K3 (for 6U)

- Full-CAN interface based on VMOD-FCAN
- MODULbus carrier board CMOD-3U (for 3U systems) or CMOD-IO (for 6U systems)
- Intel 82527 Full-CAN controller
- supports CAN protocol V2.0A and V2.0B
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- software drivers for various operating systems available

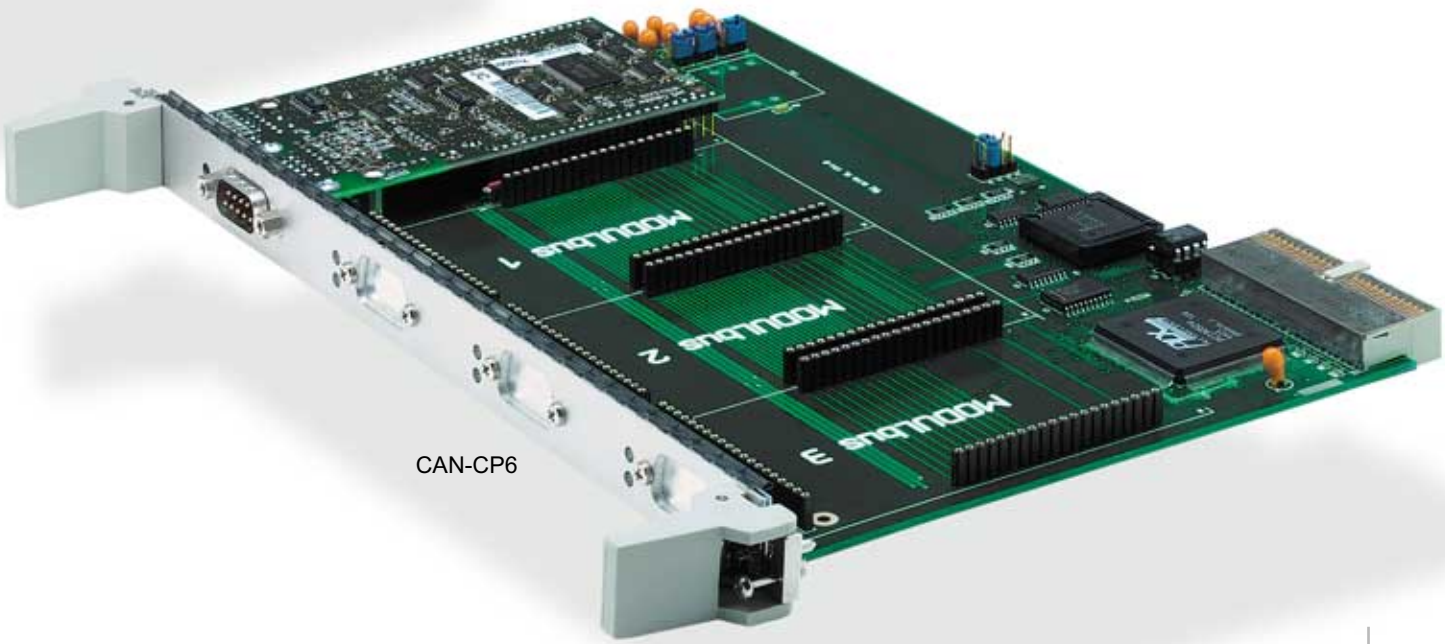
CMOD-3U 3U CompactPCI Carrier Board

- 3U CompactPCI non-intelligent carrier board for MODULbus
- 1 socket for VMOD-ICAN3 or VMOD-FCAN
- needs only one CompactPCI slot

CMOD-IO 6U CompactPCI Carrier Board

- 6U CompactPCI non-intelligent carrier board for MODULbus
- 32 bit PCI 2.1 target interface (PLX 9052) 5V PCI interface
- single slot double euro card form factor
- 4 sockets for MODULbus I/O (socket 0 for VMOD-ICAN3 or VMOD-FCAN)
- front panel connection of I/O signals
- rear panel connection of I/O signals via VG64



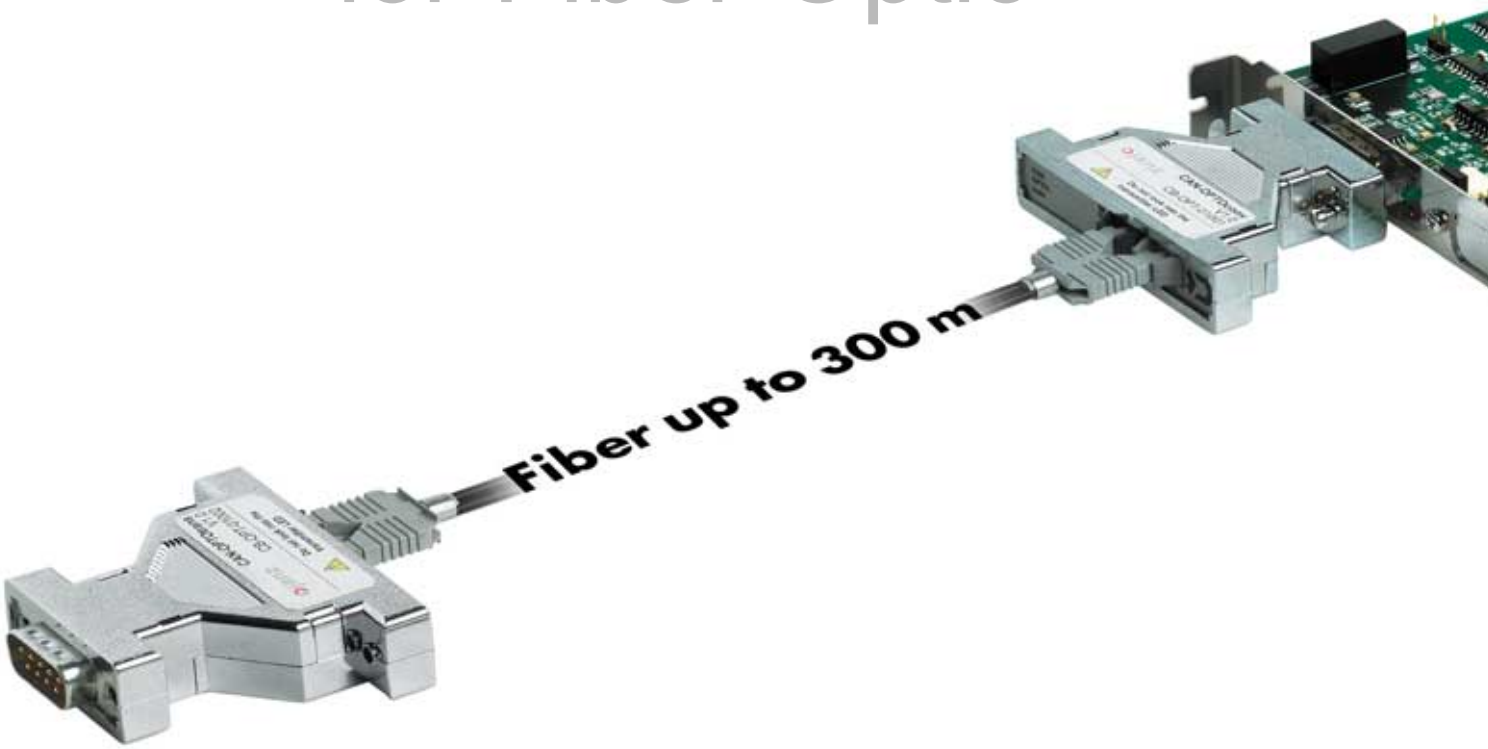


CAN-CP6

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CAN-OPTOkit

CAN Connection for Fiber Optic



CAN-OPTOkit

- fiber optic link between a CAN host interface and a copper based CAN network
- for isolated and noise immune link
- requires Janz CAN host interface without internal transceiver to minimize delays
- permissible network length is determined by the optical and electrical delays
- network length can be arbitrarily divided into copper or fiber cable length
- fiber length does not exceed the specified maximum length
- refers to ISO 11898
- 9-pin D-SUB connector
- length of optical Link 40m (POF cable) and 300m (HCS cable)
- total bus length (optical +70m (500kBit) copper length) 220m (250KBit) 520m (125KBit)
- round trip delay (CAN-OPTOkit 500ns + L * 10ns/m fiber only)

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CAN-BIGBOX

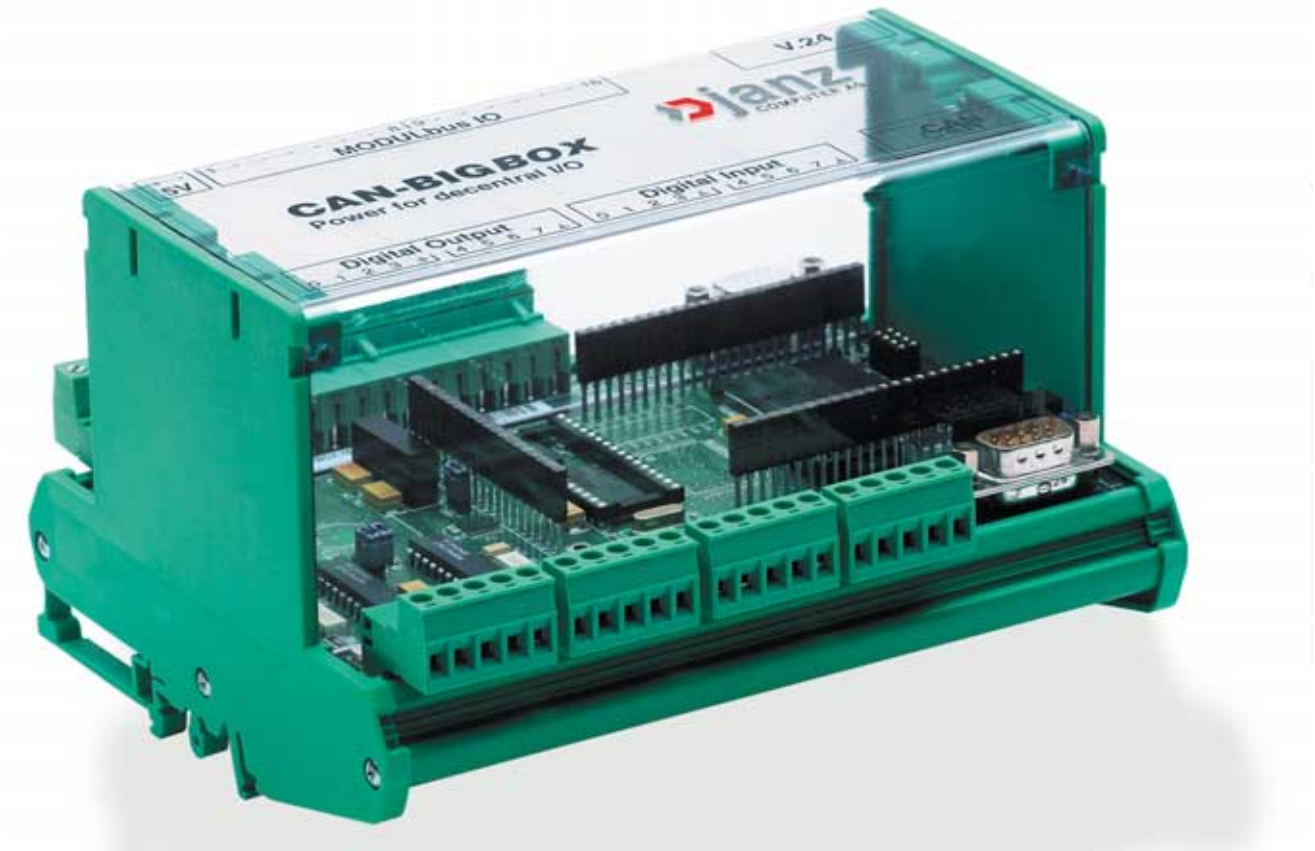
- powerful MC68332 controller
- SJA1000 CAN controller
- 128 kB Flash EPROM (up to 512 kB)
- 1 MB SRAM
- 2 kB battery buffered Standby RAM
- 1 MBit/s high speed transfer rates
- ISO/DIS 11898 interface - compatible to CAN Spec. 2.0A/2.0B
- RS232 serial interface
- QSPI interface
- 8 isolated 6 - 28 V/0.5 A high-side or TTL/ 50 mA outputs
- 8 isolated 5 - 28 V inputs
- single MODULbus socket for flexible I/O configuration
- rail mounted industrial housing
- 5 VDC power supply (optionally 24 V)

optionally available:

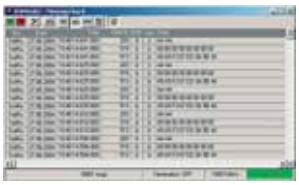
- 10 MBit/s Ethernet interface (10BaseT)
- 24 V/ 5 V on-board DC/DC converter
- CANopen
- GNU-DPACK development kit for own applications

CAN-BIGBOX

CAN Field I/O Node



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Message logging
- timestamped overview about CAN bus activities
- arrival time in h:m:s:ms format
- contents can be written into a log-file

CANlook2

Analysing and Monitoring Tool for CAN/CANopen Networks



Statistics
- giving an imagination of CAN bus load
- automatic detecting of a used bit rate

CANlook2
- enables easy access to your CAN data
- statistic evaluation on the CAN messages
- sending free configurable CAN messages
- receiving CAN messages inside a message log windows
- sending messages from several message send windows
- setting the acceptance filtering to customer-specific needs
- watching the ”message traffic” on the CAN bus
- counting the occurance of CAN bus messages dependent on their IDs
- AutoBaud function for automatic detecting of the bit rate
- examination of the accumulation of CAN bus messages by ID
- checking out the ID-usage/ID-spread of the CAN bus
- software support for various operating systems



Online bus load calculation
- calculates bus load while divice is connected to the bus
- bus load is displayed in coloured bars distinguishing incoming and outgoing messages, extended and standard identifier



Acceptance filtering
- controlling the transparency of the CAN bus hardware
- setting arbitrary filtering masks

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Janz OPC Server

- one main OPC Server application supporting OPC Data Access 2.0 and 1.0a and OPC Alarms & Events 1.0
- capabilities to provide data from different MODULbus modules with one OPC Server using Janz hardware support DLL's
- a separate path is added in the OPC Server's namespace for every included module
- an own configuration dialog window is provided for each module

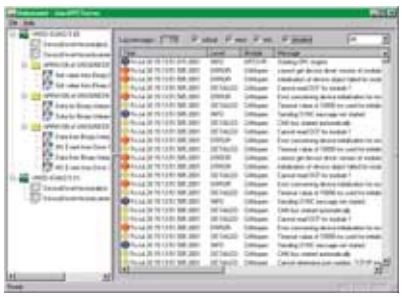
CAN OPC Server

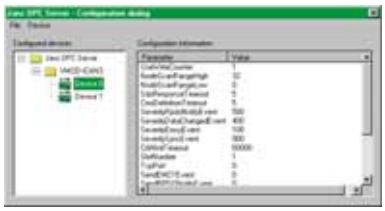
- connects OPC world with CANopen networks via Janz CAN interfaces
- searches most of needed configuration data automatically
- own namespace path is created for each connected CANopen network in the Janz OPC Server
- Janz OPC Server is working as CANopen slave for data exchange
- supports CANopen Communication Profile (CiA Draft Standard 3.01)
- uses device configuration files (DCF) to create tag names in its own namespace area
- creates its data entries from the manufactorer specific area of the CANopen object dictionary as well as from the device profile area
- supports synchronous and asynchronous PDO communication
- can act as NMT master also limited master capabilities
- can be SYNC server and/or client
- support most of CANopen standard data types
- enables CAN bus access via an additional TCP/IP interface (e.g. for configuration)

OPC Server

OPC Connection for CAN Interfaces

OPC Server main dialog window
contains the complete namespace in tree format
list of log messages displaying
OPC serverstatus messages





OPC Server configuration dialog window

- enables easy access to configuration parameter stored in the windows registry database

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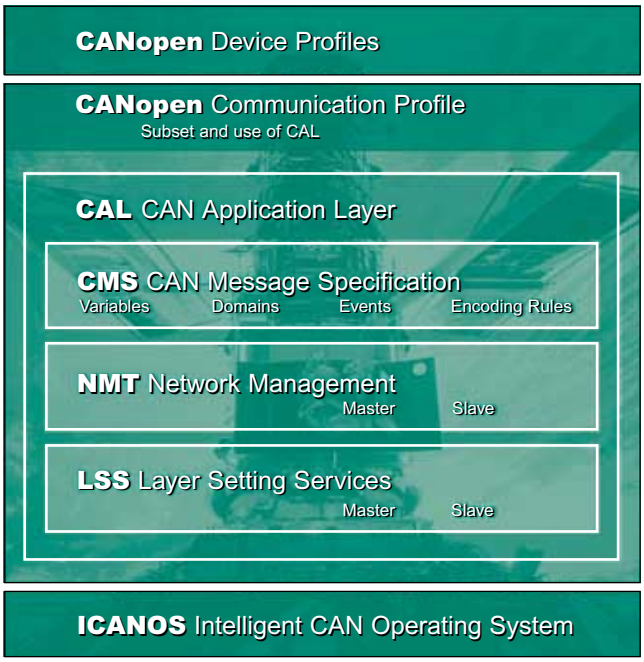
CANopen
CANopen is based on the ICANOS operating system and uses a subset of CAL (CAN Application Layer) according to the specifications of CiA DS-301. All CANopen standard communication objects (PDO, SDO, SYNC, EMCY, etc.) are supported. Each kind of master functionality can be programmed as well as slave nodes. Messages are transferred to the application in an event-driven way.

CANopen
Communication Profile for Industrial Systems

By using CANopen, it is easily possible to connect devices from different manufacturers who implements CANopen in their products in one network.

CANopen allows configuration of CAN networks and comfortable access to all device parameters, either synchronization between devices is possible.

Janz offers its intelligent CAN controllers with an on-module implementation of CANopen. It runs on-board so that the host CPU is not occupied with the work of the protocol.



ICANOS
Intelligent CAN Operating System

ICANOS is a basic operating system for Janz CAN devices, which offers a higher level platform for CAL, CANopen, drivers and direct application software.
ICANOS provides CAN bus access on layer 2 basis.

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VxWorks

OS-9

pSOS+

Linux

Application Programming Interface (API)
Integrating a new fieldbus system or concept into a hardware or operating system environment shows that a decision once made for a specific operating system or a specific hardware architecture must not be last longing. An example of this is the present discussion about the PROs and the CONs of VMEbus based systems against CompactPCI based systems. To react to changing markets or customer needs one has to focus on flexible solutions, especially in software investments. Through this flexibility it should not only be possible to change the hardware architecture from e.g. VMEbus to CompactPCI (or vice versa) but also to switch to a different operating system without undue effort. Due to market requests it might be necessary to use VxWorks instead of OS-9, or Windows 2000 instead of Windows NT.

Flexible solutions in regard to portability are also very important if development and target systems are, out of cost reasons, to be used on different platforms.

CAN Software Concept

Multi Platform and Operating System Independent API

QNX

Windows NT

Windows 2000/XP

Windows XPembedded

Windows CE.net

An example of this is the development of the application on several Linux PC systems, while a much more expensive and complex target system (e.g. VMEbus) is to be used for final testing, given that the real application is only required once. Using a hardware architecture and operating system independent fieldbus connection it is possible to supply a near identical application programming interface (API) for the corresponding hardware. Thus all the development work can be done in a cost effective ”emulation” development environment.

Requirements for flexibility:

- identical hardware for the field bus connection, respectively emulation possibility of the hardware to ensure identical behavior
- possibility to integrate the field bus connection hardware onto different hardware platforms
- identical API of the field bus connection (Libraries)
- possibility of integrating the APIs into the operating system environment (IRQ- /Callback-mechanisms)

Advantage
A CAN host interface is simple to install and work with. The common Multi Platform And Operating System Independent API provides the same software interface for the CAN connection to different hardware platforms under different operating systems and save time when changing between them.

Please ask for the supported operating systems.

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Embedded PC Systems



Systems





Boards

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Embedded PC Systems

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Embedded PC with CAN and Ethernet 34

emPC-X266

Embedded PC with AMD Geode, 266 MHZ 36

emPC-X400/650

Embedded PC with Intel Celeron ULV 37

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emPC

Flexible and Fanless Embedded PC Systems

		emPC-X133 System				
		emPC-X133/1	emPC-X133/1U	emPC-X133/2	emPC-X133/2U	emPC-X133/3
System	CPU Type	Èlan SC520				
	CPU	133 MHz				
	Cooling	Passive				
	On-Board RAM [max.]	128 MB				
	Battery backup RAM	114 Bytes				
Ports	VGA	–				
	Serial Ports	1 x RS232				
	CAN Interfaces	1	1	2	2	3
	Ethernet Ports	1 x 10/100 MBit/s				
	USB (v1.1) Ports	–	1	–	1	–
	PCMCIA Ports	–				
	Printer Ports	–				
Extensions	PC/104 Extensions	–				
	PCI Extensions	-				
	On-Board I/O	4 DI / 4 DO	–	4 DI / 4 DO	–	–
	Watchdog Timer	Yes				
	CompactFlash Slots	internal				
	2.5" Hard Disk Extension	–				
Operating Systems		Linux, QNX, VxWorks				
Physical	Mounting	DIN Rail				
	Power Input Range	10 ~ 28VDC				
	Operating Temperature	0 ~ 50°C				
	Related Humidity	80% @ 40°C				
	Power Consumption	TBD				
	Power Requirements	6W				
	Dimensions in mm (WxLxH)	76 x 120 x 52				
	Weight	0.4 kg				

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Embedded PC systems will replace industrial PC systems in many environments in future. In many cases smallest systems are required and these small systems are also very performant for decentralized tasks.
Janz Automationssysteme AG has experiences since many years in developing own embedded PC systems, which can be designed especially for customer's environments. Also performant systems, which can be installed with Windows XP and which offers expansion slots for PC/104 or PCI board, can be offered.

Available processors are actually AMD Élan SC520, Geode processors or VIA CPU. Other more important for some environments are Intel Celeron or Intel Pentium III & IV processors. Additionally all systems offers the standard interfaces for USB, RS232 etc. All systems come fanless and can operate with CompactFlash mediums, so that no rotating components are being installed.
A fully autarkic insert of the system in environments without service is so possible.

emPC-X266 System			emPC-X400 System		emPC-X650 System			
emPC-X266/1	emPC-X266/2	emPC-X266/3	emPC-X400/256	emPC-X400/512	emPC-X650/42	emPC-X650/45	emPC-X650/62	emPC-X650/65
Geode SC1200			Intel Celeron Low Voltage		Intel Celeron Low Voltage			
266 MHz			400 MHz		400 MHz		650 MHz	
Passive			Passive		Passive			
128 MB			256 MB	512 MB	256 MB	512 MB	256 MB	512 MB
114 Bytes			512 Bytes		512 Bytes			
Yes			Yes		Yes			
1 x RS232, 1 x RS485	1 x RS232	1 x RS485	2 x RS232, 2 x RS232/422/485		2 x RS232, 2 x RS232/422/485			
–	1	1	Optionally		Optionally			
1 x 10/100 MBit/s			2 x 10/100 MBit/s		2 x 10/100 MBit/s			
1			2		4			
–			1		–			
–			1		–			
–			2		–			
–			–		2			
–			–		4 x DI, 4 x DO, 2 x 16 bit counters			
Yes			Yes		Yes			
internal			internal		1 x internal, 1 x external			
–			–		–			
Windows 2000/XP (embedded), Linux			Windows 2000/XP (embedded), Linux		Windows 2000/XP (embedded), Linux			
DIN Rail			Wall / Panel Mounting		Wall / Panel Mounting			
9 ~ 40VDC			9 ~ 36VDC		16 ~ 36VDC			
0 ~ 50°C			-10 ~ +50°C		-10 ~ +50°C			
80% @ 40°C			95% @ 40°C		95% @ 40°C			
TBD			0.6A @ 24VDC		2A @ 24VDC			
TBD			max. 35W		max. 48W			
45 x 106 x 45			220 x 160 x 50		140 x 237 x 177			
0.5 kg			1.6 kg		3.0 kg			

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emPC-X133

- 133 MHz x86 compatible AMD Élan SC520 CPU
- a maximum of 128 MB SDRAM
- 32 bit memory bus with 66 MHz bus clock
- up to 2 MB on board boot flash (e.g. for containing the Linux boot kernel)
- internal compact flash socket (Type I/II) for true-IDE mode compatible CompactFlash cards
- 10 / 100 MBit/s AM79C973 PCI Ethernet controller
- up to three CAN interfaces with individual SJA1000 CAN controller
- RS-232 serial port (16550 compatible)
- up to two general purpose IO-ports each with 4 optical decoupled Inputs and 4 optical decoupled
- outputs for 5V or 24V level (ordering option, default is 24V)
- optional USB 1.1 interface using OPTi 82C861 PCI
- USB controller (compatible to OHCI standard)
- 4 front panel LEDs indicate the status of the network controller
- 1 status LEDs for system
- 3 user programmable LED

emPC-X133

Embedded PC System with



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- integrated real time clock with 114 bytes non volatile SRAM and battery backup
- 4 kB serial EEPROM for non volatile user data
- internal power regulation, only a 10... 28V (AC or DC) power source is needed
- internal LM75 temperature sensor with programmable thermal watchdog function

CAN and Ethernet



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emPC-X266
The emPC-X266 is a small form factor embedded rail mount PC. It is powered by a 266 MHz X86 compatible CPU, and hence is powerful enough for sophisticated embedded applications.
Due to compatibility with x86 architecture, it can run all commonly known operating systems. So users can migrate their existing software solutions easily.
The emPC-X266 runs from industrial power supply (9...40 VDC).

- fanless 266 MHz AMD Geode SC1200 CPU
- 16 kB L1 cache
- 128 MB DRAM
- internal CompactFlash socket (Type I/II) for true-IDE mode compatible compact flash cards
- 10 / 100 MBit/s Intel Ethernet controller
- 2 x RS-232 serial port (16550 compatible)
- general purpose IO-ports with 20 optical decoupled input or output lines for 24V level
- USB 1.1 interface
- 2 front panel LEDs indicate the status of the network controller
- 2 status LEDs for network, one for disk activity
- 1 user programmable LED
- integrated real time clock with 114 bytes non volatile SRAM and battery backup
- internal power regulation, only a 9...40VDC power source is needed
- internal watchdog function
- dimensions (h x w x d): 105 x 45 x 106 mm
- weight approx. 500 g
- operating temperature range 0...+50°C (non operating -20...+75)
- humidity 0 %...80 %, non condensing

emPC-X266
Embedded PC System with AMD Geode



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emPC-X400/650

Embedded PC with Intel Celeron ULV

emPC-X400

- Intel Celeron with 400 MHz (ultra low voltage version)
- 256 or 512 MB SDRAM on board
- 512KB battery-backup RAM
- 2 x RS-232 and 2 x RS-232/422/485
- automatic RS-485 data flow control
- two 10/100 Base-T RJ-45 ports
- two USB ports v 1.1
- one printer port
- one PCcard slot
- one internal Compact Flash slot (Type I/II)
- power LED and IDE LED on front
- PC/104 extension slot
- HDD extension kit for installation of one standard 2.5" HDD
- power consumption max. 35W @ 9 ~ 36 VDC
- operating temperature: -10~50°C (14~122° F) @ 5~85% related humidity
- relative humidity: 95% @ 40°C
- dimensions (w x l x h) 255 x 152 x 50 mm
- weight 1.6 kg
- operating system support for Linux, Windows XP Embedded, Windows 2000/XP Windows CE

emPC-X650

- Intel Celeron with 400/650 MHz (ultra low voltage version)
- 256 or 512 MB SDRAM on board
- 512KB battery-backup RAM
- 2 x RS-232 and 2 x RS-232/422/485
- two 10/100 Base-T RJ-45 ports
- four USB ports v 1.1
- one internal and one external Compact Flash slot (Type I/II)
- one PCcard slot
- two PCI extension slots
- HDD extension kit for installation of one standard 2.5" HDD
- power consumption max. 48W @ 16 ~ 36 VDC
- operating temperature: -10~50°C (14~122° F) @ 5~85% related humidity
- relative humidity: 95% @ 40°C
- dimensions (w x h x d) 140 _ 177 _ 237 mm
- weight 3 kg
- operating system support for Linux, Windows XP Embedded, Windows 2000/XP Windows CE

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Industrial PC Systems

Panel PC System





Wall Mounting System



19" Rack Mounting System

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Janz IPC Systems

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ENDEAVOUR

ENDEAVOUR – Flexible Wall Mount System 47

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When it comes to Industrial PC systems, the Janz Industrial PC System family includes flexible and configurable solutions, such as 19" rack systems, TFT-Panel PCs with or without touch-screen, Wall-Mount or other systems like our Shoebox system.

A special focus of Janz Automationssysteme AG is the capability of providing our customers with complete custom solutions, including special housings and the implementation and integration of whole installations. An advantage of choosing Janz systems is the ability to get Ready-To-Run systems with the complete installation of all I/O components, field bus interfaces etc. With our flexible MODULbus mezzanine concept, Janz Automationssysteme AG is able to implement over 50 different modules for your individual industrial solution.

Janz Industrial PC systems need to demonstrate particular reliability and robustness for their use in automation engineering. Only careful selection from the huge range of components on the standard PC market, making use of extensive testing, ensures that these demands are satisfied. Janz have years of experience behind them in the selection, integration and in-house development of PC components fit for industrial application. When implementing all-in-one Industrial PCs with main boards, interface cards, low-voltage power supply units, keyboard controllers, UPS controllers and other electronic modules, Janz satisfy the most stringent demands that are called for Industrial PC components if long-term secure operation under tough industrial conditions is to be ensured.

Before dispatch, Janz Industrial PCs must prove their readiness for use through quality control checks. Every PC is subjected to extensive functionality tests over a period of 24 hours.
The housings are realized as rugged zinc plated steel chassis suitable for industrial environment.

All components are mounted shock resistant with hold down clamps. In some housings lockable front doors for protecting disk drives against dust are available. A customer specific design e.g. color of front panel or customer specific logo is also possible. The standard components like Floppy, CD-ROM, Harddisk etc. can as well be installed like special components for field bus interfaces, MODULbus IO, controller etc. All components are high quality and designed for industrial environments.

Flexibility

Janz Industrial PC



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All systems are CE certified (safety EN 60950). Other corresponding EMC standards or other norms are optionally available. The standard operating temperature is 0°C to +50°C (non operating -40°C to +70°C). The humidity is 5–95%@40°C (non-condensing). Special requirements could be possible.

Cooling fans with replaceable filter cools the systems. It is possible to get a system with passive cooling, so that no dust can get into the housing.
Different standard components of different manufacturers could be installed in the JIPSY models, like these:

- power supply with 400 Watts and more
- main board or Slot-CPU systems with passive backplane
- single-, dual- or quad-Systems
- performance up to Intel Pentium IV with 3.0 GHz
- memory up to 2 GB
- hard disk drives
- other drives (Floppy, ZIP, CD-ROM, CD-RW, DVD, DVD-RW etc.)
- expansion slots (ISA/PCI) for I/O cards, interfaces etc.
- graphic on-board or AGP/PCI
- 10/100/1000 MBit/s Ethernet interface
- SCSI (Ultra Wide SCSI, LVD) controller
- modem or ISDN adapter
- Uninterruptible Power Supply (UPS)
- MODULbus I/O from Janz, CAN interfaces or customer specific boards

For all other components or your individual chassis do not hesitate to contact the Janz office.

Different operating systems would be supported like Windows, Linux, QNX, VxWorks and other.
All drivers for the installed components could be installed by Janz. Janz is able to realize your individual system with your preferred configuration.

Systems



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APOLLO

The APOLLO Panel PC is designed for ROLEC suspension system. It can also be wall mounted or installed in racks. It is a main board system equipped with an Intel Pentium M processor.
It is a completely fanless system and all drive bays and connectors are behind a dust proof front door.
The storage medium is a standard hard disk.
And so the system is fast enough to being used with operating systems like Windows or Linux.

Specifications Housing

- rugged Al housing for industrial environments
- dimensions (w x h x d) 360 x 320 x 130 mm
- weight 12 kg
- IP65 compliant
- drive bays behind lockable door

Specifications Display / Touchscreen

- 15" TFT Color display
- max. resolution 1024 x 768 dpi
- luminance 300 cd/m^2
- analog resistive Touchscreen (other types e.g. capacitive or SAW are optionally available)

Specifications System

- main board with Intel Pentium M with 1.7 or 2.2 GHz
- 512 MB DDR RAM
- 10/100 MBit/s Ethernet port
- 5.1 channel audio port
- two PCI expansion slots (max. 300 mm)
- 3.5" hard disk, IDE, 4.200 rpm
- CD or DVD and floppy drive
- 1 x RS232, 1 x LPT1, 4 x USB (v2.0), PS/2
- hardware monitor, watchdog, Wake-On-LAN
- IEEE FireWire® port

APOLLO
Panel PC for Rugged Environments







Please choose your special system color (RAL codes)

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DISCOVERY
The DISCOVERY Panel PCs are designed for built-in or rack mounting systems. They are being equipped with passive backplane with Slot-CPU board. Some systems have fanless cooling and comes default without any drives. The storage medium is a Compact Flash medium for small operating systems.
Other systems comes with different drives and hard disk options. Different systems are also available with chassis integrated keypads. So customers are able to choose the right Panel PC system for their applications.

Specifications:
- power supply with 300 Watts and more
- display size between 10" and 19"
- Slot CPU board system with passive backplane
- performance up to Intel Pentium IV
- memory up to 2 GB
- hard disk drives
- other drives (Floppy, ZIP, CD-ROM, CDRW, DVD, DVD-RW etc.)
- expansion slots (ISA/PCI) for I/O cards, interfaces etc.
- graphic on-board or AGP/PCI
- 10/100/1000 MBit/s Ethernet interface
- SCSI (Ultra Wide SCSI, LVD) controller modem or ISDN adapter

DISCOVERY
Flexible Panel PC with Expansion Slots



Please choose your special system color (RAL codes)

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SPIRIT/P3

- supports Intel Celeron or Intel Pentium III CPU up to 1.26 GHz
- up to 1 GB SD RAM
- IDE HDD interface (2.5" HDD bay)
- Slim Line CD or DVD drive
- Floppy disk drive included
- 10/100 Base-T Ethernet interface
- 3 x RS-232; 1 x RS-232/422/485; 1 x parallel port; 2 x USB ports
- 2 x PCMCIA Type II
- 1 x PS/2 mouse and keyboard interface
- MIC-in, Line-in, Line-out, and game port
- one expansion slot for half-size PCI/ISA card
- 15" TFT color LCD
- maximum resolution 1024 x 768
- luminance 250 cd/m^2
- Touchscreen controller via RS232
- Touchscreen technologies: analog resistive / capacitive or surface acoustic wave
- supports DOS and Windows operating systems
- 80 W @ 100 ~ 250 VAC
- auto-switching @ 50 ~ 60 Hz
- 12/24/48 VDC power supply optional available

SPIRIT/P4

- supports Socket 478 Intel Pentium IV CPU up to 3.06 GHz
- up to 2 GB DDR-RAM
- IDE HDD interface (2.5" HDD bay)
- Slim Line CD or DVD drive
- Floppy disk drive included
- 10/100 Base-T Ethernet interface
- 2 x RS-232; 1 x RS-232/422/485; 1 x parallel port; 2 x USB ports (v2.0)
- 2 x PCMCIA Type II
- 1 x PS/2 mouse and keyboard interface
- MIC-in, Line-in, Line-out, and game port
- 2 x IEEE 1394 ports
- one PCI expansion slot, one Mini PCI card
- 15" TFT XGA LCD
- maximum resolution 1024 x 768
- luminance 250 cd/m^2
- Touchscreen controller via RS232
- Touchscreen technologies: analog resistive / capacitive or surface acoustic wave
- 180 W @ 100 ~ 240 VAC
- auto-switching @ 50 ~ 60 Hz

SPIRIT

Standard Panel PC Systems





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ATLANTIS

The ATLANTIS systems are standard systems to be mounted in 19" racks. The customer can choose between the standard main board technology or passive backplane with Slot-CPU board.
It is optionally available with up to four independent CPU systems (Quad-System).
The systems height depends to the specifications of individual requirements. ATLANTIS systems are available between 1U and 6U. So customers can choose the special housing for their special requirements. Colors and customer specific signs are optional available.



ATLANTIS

Flexible 19" and up to 6U Rack Mounting System



Please choose your special system color (RAL codes)

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CHALLENGER

The CHALLENGER systems can be wall mounted in machines or all other special environments. The system comes equipped with standard main board technology. All slots, drives, LEDs and connectors are available at the front panel. So customers use this system for environments with difficult access. The standard dimension of the system is 380 x 130 x 310 mm (h x w x d). But it can be modified if necessary.

Specifications:

- power supply with 300 W and more
- main board system
- performance up to Intel Pentium IV
- memory up to 2 GB
- hard disk drives
- other drives (Floppy, ZIP, CD-ROM, CDRW, DVD, DVD-RW etc.)
- expansion slots (ISA/PCI) for I/O cards, interfaces etc.
- graphic on-board or AGP/PCI
- 10/100/1000 MBit/s Ethernet interface
- SCSI (Ultra Wide SCSI, LVD) controller modem or ISDN adapter

CHALLENGER

Flexible Wall Mount System





Please choose your special system color (RAL codes)

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ENDEAVOUR / ENDEAVOUR'
ENDEAVOUR systems are special systems with passive backplane and Slot-CPU. The newest housing of ENDEAVOUR' (with complete slots, drives and LEDs at the front panel) is special designed for being equipped with Intel Pentium IV processor.
So customers have a very space saving system with high performance. ISA and PCI extension slots enables customers to use additional boards with special functions.

Specifications:
- power supply with 400 Watts and more
- Slot-CPU systems with passive backplane
- performance up to Intel Pentium IV
- memory up to 2 GB
- hard disk drives
- other drives (Floppy, ZIP, CD-ROM, CDRW, DVD, DVD-RW etc.)
- expansion slots (ISA/PCI) for I/O cards, interfaces etc.
- graphic on-board or AGP/PCI
- 10/100/1000 MBit/s Ethernet interface
- SCSI (Ultra Wide SCSI, LVD) controller modem or ISDN adapter
- uninterruptible Power Supply (UPS)

ENDEAVOUR/ENDEAVOUR'
Flexible Wall Mount System

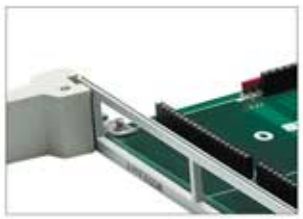


Please choose your special system color (RAL codes)

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MODULbus

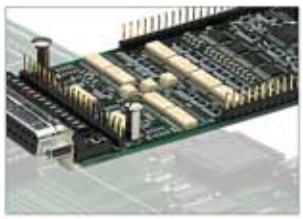
The Mezzanine I/O Concept



Digital I/O

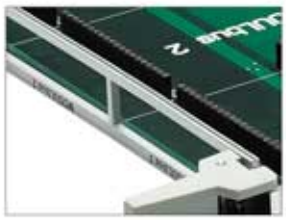
Analog I/O

Interfaces



Carrier Boards

Communication Modules





Motion Controller

Counter

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MODULbus

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Motion Controller

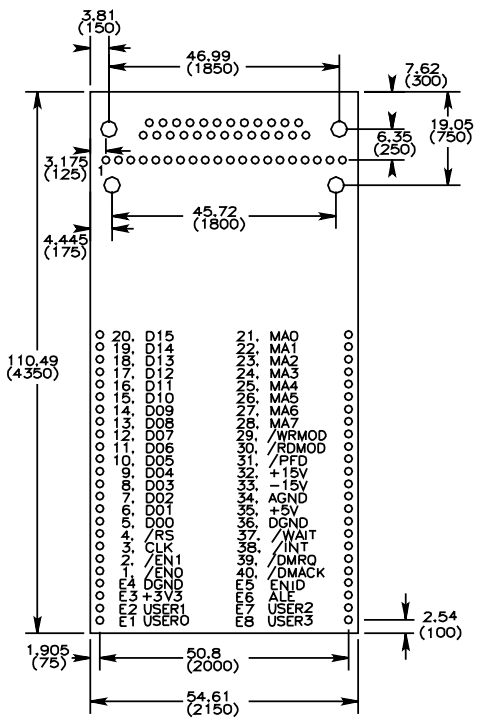
VMOD-MTC • VMOD-MTC2 65

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MODULbus

The Mezzanine





General

The MODULbus I/O concept is a system independent flexible modular input/output solution for industrial applications.

It consists of a carrier board for the specific host computer bus system (VMEbus, CompactPCI, ISA, PCI) and a range of more than 50 different I/O modules with MODULbus interface to the carrier board.

Using the MODULbus I/O concept, the system integrator is able to develop computer systems with flexible configurations for application in industrial environments, small and low-cost solutions for e.g. test and measurement purpose can also easily be designed.

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Technical
As a mezzanine bus, the MODULbus using synchronous bus timing offers 16 data lines (for high data transfer) and 8 address lines. Socket application is provided by an enable signal. Full interrupt and power fail handling is provided on the MODULbus.
In addition to the standard READ/WRITE and power fail/system restart procedures, a DMA access can be used for fast data transfer with a transfer rate of more than 10 MBit/s.
The physical layout and dimensions of the MODULbus I/O modules are shown in the technical drawing.

I/O Concept

MODULbus+
The MODULbus+ extension to the MODULbus standard is created to add new features like more address space, easy identification and user-bussed signals for ”module to module handshaking”. The MODULbus+ extensions is designed to be electrically forward and backward compatible to the MODULbus standard.

Software Support
The MODULbus hardware platforms and I/O modules are supported by a wide range of software products. The most common real time operating system VxWorks, OS-9 and pSOS+ for the VMEbus and CompactPCI based carrier boards offers a development system level as well as target applications. Software drivers for VxWorks, OS-9, pSOS+, Linux, QNX and Windows NT/2000 are available for the corresponding non-intelligent platforms supporting all I/O modules. Thus, system integration of the complete MODULbus product family is simplified and system integration costs are reduced to a minimum. All software drivers are offered including documentation and at a low price. Please request additional information.

Simple to use
All this together makes the difference in the MODULbus concept. High functionality, simple to use and short design-in phases save important development time and guarantee a shorter time gap between design idea and end-product.

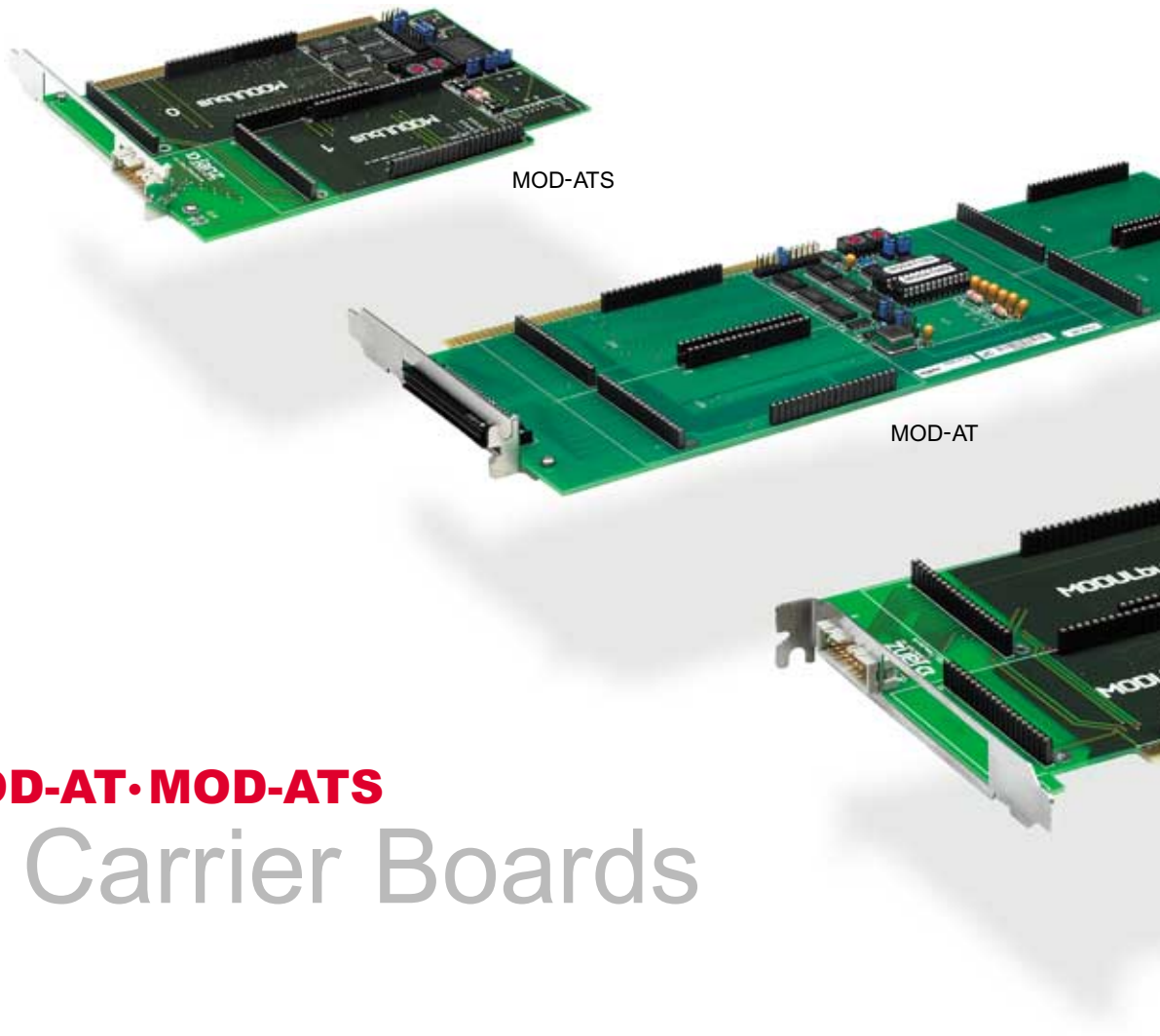
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MOD-ATS

- non-intelligent ISA bus carrier board with two MODULbus+ sockets
- extended height short form 16 bit card
- front panel connector of MODULbus socket 0 available at ISAbus bracket
- I/O connector of MODULbus socket 1 available on 16-pin flat cable connector at panel bracket
- only one ISAbus slot occupied
- board address can be placed anywhere in first MB of ISAbus memory space, consuming an address range of 4 kB
- no resources in I/O space used
- jumper selection between 11 possible interrupt lines, both modules share this interrupt
- supports MODULbus+ identification mechanism
- supports MODULbus+ user IO signals, which can also be linked to other MOD-ATS boards
- optional on board DC/DC converter to supply analog modules

MOD-AT

- non-intelligent ISA carrier board for MODULbus
- 4 plug-in sockets for MODULbus I/O
- 80-pin back panel connector for I/O (no internal cabling)
- only one ISA slot needed
- 16 bit data bus on MOD-AT
- usable for byte and word adresses
- board address switches selectable within 1 MB address space; covers 4 kB
- interruptable with jumper selectable level and on board interrupt status
- all AT-IRQs available
- power consumption < 600mA
- optional on board DC/DC converter to supply analog modules



MOD-ATS

MOD-AT

MOD-AT · MOD-ATS

ISA Carrier Boards

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MOD-PCI

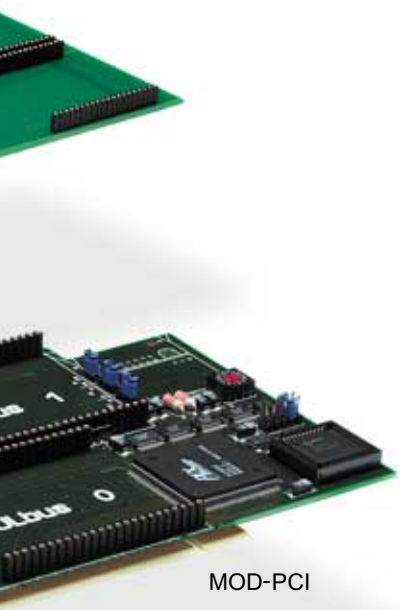
- non-intelligent PCI carrier board with two MODULbus+ sockets
- extended height short form factor
- 32 bit PCI 2.2 target interface (PLX 9030)
- 3.3V / 5V PCI interface
- only one PCI-bus slot occupied
- front panel connector of MODULbus socket 0 available at PCI bus bracket
- I/O connector of MODULbus socket 1 available on 16-pin flat cable connector at panel bracket
- interrupt sharing between the modules (each interrupt is individually maskable)
- supports MODULbus+ identification mechanism
- optional on board DC/DC converter to supply analog modules

MOD-PCI·MOD-PCI4

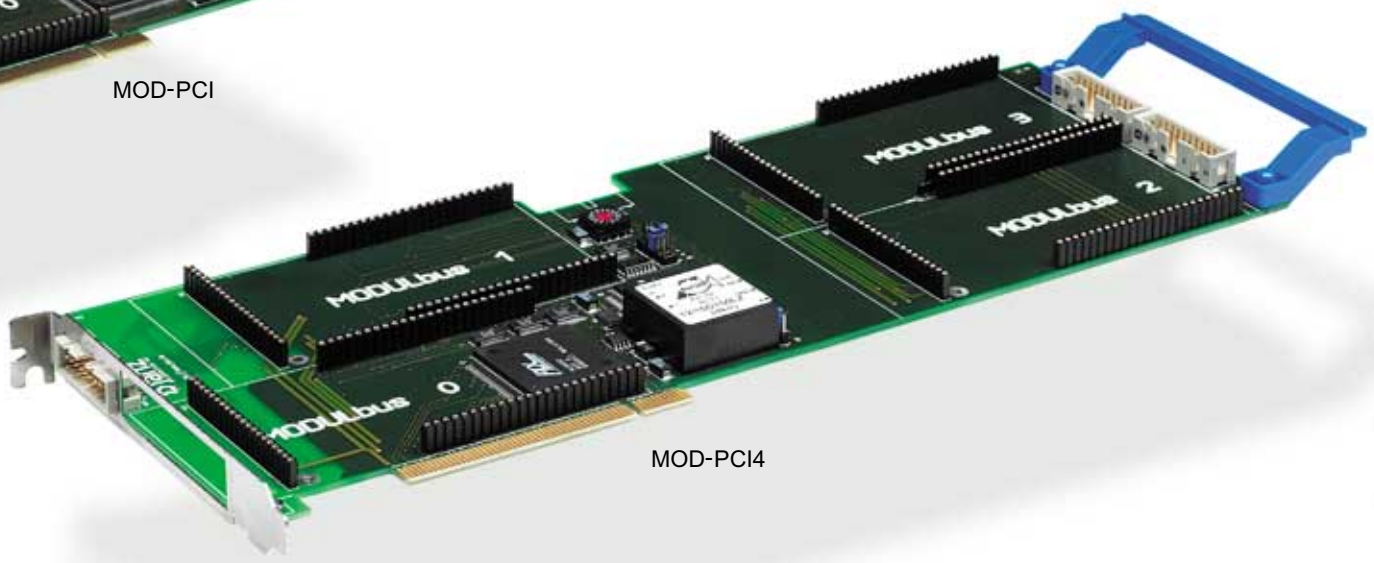
PCI Carrier Boards

MOD-PCI4

- non-Intelligent PCI-bus carrier board with four MODULbus+ sockets
- extended height long form factor
- 32 bit PCI 2.1 target interface (PLX 9052)
- 5V PCI interface
- only one PCI slot occupied
- front panel connector of MODULbus socket 0 available at ISAbus bracket
- I/O connector of MODULbus socket 1 available on 16-pin flat cable connector at ISA bracket
- I/O connector of MODULbus sockets 2 and 3 are available at 20-pin flat cable headers
- interrupt sharing between the modules (each interrupt is individually maskable)
- supports MODULbus+ identification mechanism
- supports MODULbus+ user IO signals, which can also be linked to other MOD-PCI4 boards through a link connector
- optional on board DC/DC converter to supply analog modules



MOD-PCI



MOD-PCI4

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VMOD-IO(2)·VMOD-3U

VMEbus Carrier Boards



VMOD-IO



VMOD-3U



VMOD-IO2



VMOD-IO

- 6U VMEbus non-intelligent carrier board for MODULbus
- double euro-card with A24/D16 VMEbus slave interface
- 4 plug-in sockets for MODULbus I/O
- different vector from each MODULbus socket
- 2 kB short-I/O or standard-address range
- needs only one VME slot
- front panel and P2 connection of I/O lines
- optional on board DC/DC converter to supply analog modules

VMOD-IO2

- VMEbus non-intelligent carrier board for MODULbus
- 4 sockets for MODULbus modules
- MODULbus+ extension
- double euro-card with A16/D16, A24/D16 and A32/D16 VMEbus slave interface
- performance improvement through write buffer (single stage)
- VME64x compliant CR/CSR for software board detection and address decoder configuration
- BAR register can be loaded by geographical addressing or auto slot identification
- software configuration of the boards run-time parameters (without jumpers)
- programmable IRQ level and IRQ vector for each module
- interrupt masking for each module
- modules can be individual reseted by software
- software configuration of MODULbus clock
- access time configuration via software
- needs only one VME slot
- front panel and P2 connection of I/O lines
- optional on board DC/DC converter to supply analog modules

VMOD-3U

- 3U VMEbus non-intelligent carrier board for MODULbus
- single euro-card with A24/16:D16/08 VMEbus slave interface
- 1 socket for MODULbus I/O
- jumper selectable interrupt level 1 – 7 and vector-interrupt
- short-I/O or Standard-adressing
- needs only one VME slot
- optional on board DC/DC converter to supply analog modules

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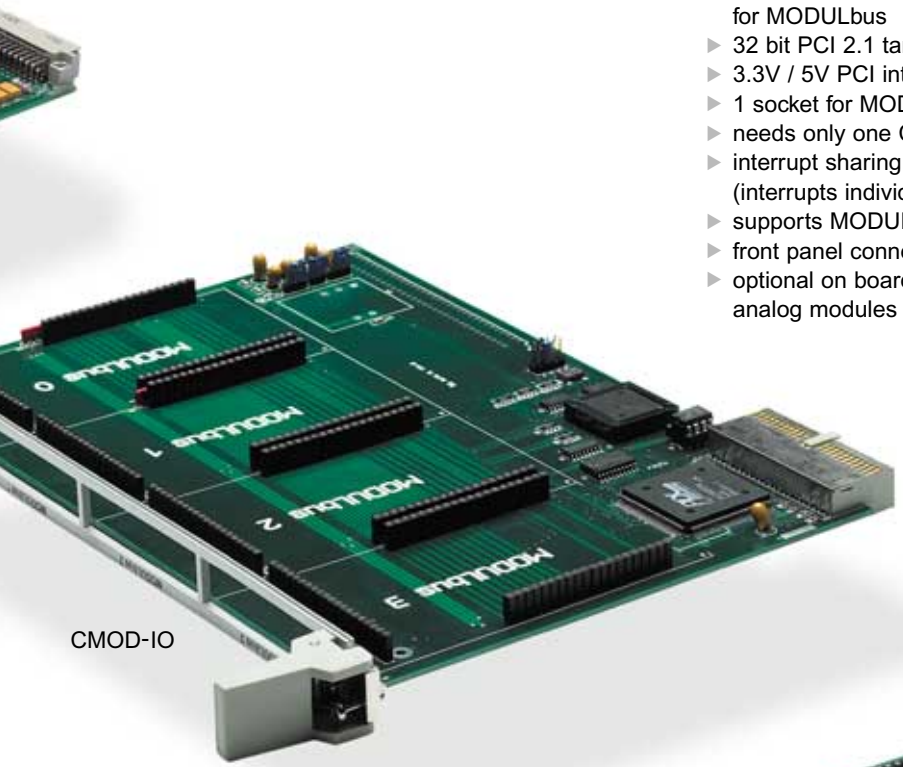
CMOD-IO

- by using the VMOD-ICAN3 host system does not need to handle the high interrupt CMOD-IO
- 6U CompactPCI non-intelligent carrier board for MODULbus
- 32 bit PCI 2.2 target interface (PLX 9030)
- 3.3V / 5V PCI interface
- single slot double euro card form factor
- 4 sockets for MODULbus I/O
- needs only one CompactPCI slot
- interrupt sharing between the four modules (interrupts individually maskable)
- supports MODULbus+ identification mechanism
- supports MODULbus+ user interconnect signals
- front panel connection of I/O signals
- rear panel connection of I/O signals via CompactPCI J4 connector
- optional on board DC/DC converter to supply analog modules

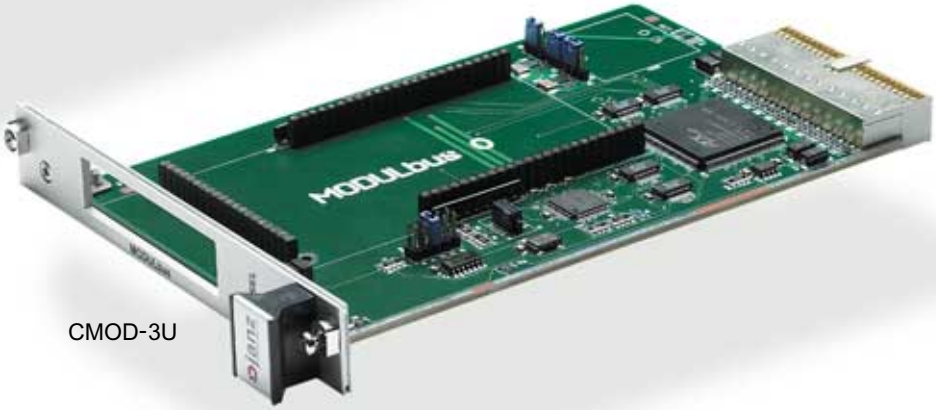
CMOD-IO·CMOD-3U
CompactPCI Carrier Boards

CMOD-3U

- 3U CompactPCI non-intelligent carrier board for MODULbus
- 32 bit PCI 2.1 target interface
- 3.3V / 5V PCI interface
- 1 socket for MODULbus I/O
- needs only one CompactPCI-slot
- interrupt sharing between the four modules (interrupts individually maskable)
- supports MODULbus+ identification mechanism
- front panel connection of I/O signals
- optional on board DC/DC converter to supply analog modules



CMOD-IO



CMOD-3U

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VMOD-BE8

- 8 independent opto-isolated inputs
- input voltage 24V
- interrupt by pattern recognition logic
- status display for each input
- input filters optionally
- software drivers for various operating systems available

VMOD-BE20

- 20 independent opto-isolated inputs
- each input line is isolated from each other
- input voltage 12V / 24V / 48V
- input low pass filters
- software drivers for various operating systems available

VMOD-BA5

- 8 independent outputs
- 24V / 0.5A opto-isolated
- short circuit protected
- load connected to ground
- status display for each output
- interrupt-generation on short circuit
- software drivers for various operating systems available



VMOD-BA20



VMOD-BE8/20 • VMOD-BA5/20

Digital I/O Modules

VMOD-BA20

- 20 independent opto-isolated outputs
- output voltage 12V / 24V / 48V
- output current max. 1.0A
- high side or low side switching capabilities
- software drivers for various operating systems available

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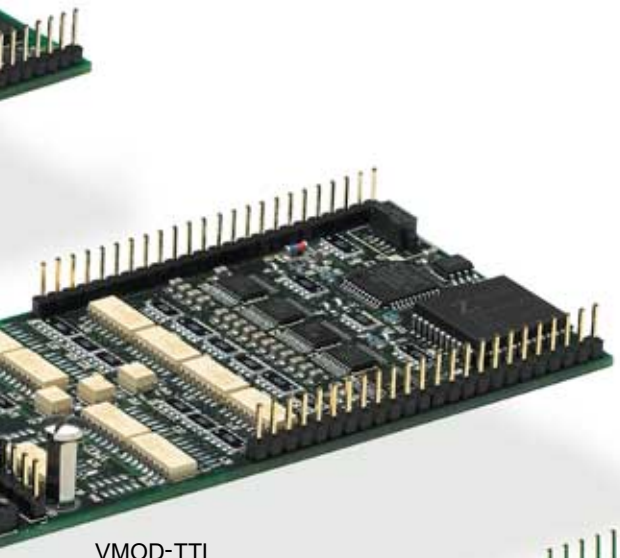
VMOD-TTL

- 20 bit TTL I/O
- optionally opto-isolated I/O
- single 4 bit and double 8 bit I/O channels
- I/O software configurable per channel
- max. 48 mA open collector outputs
- 16 bit counter/timer internally or externally controlled
- interrupt on change of input state or input pattern
- high side or open collector switching capabilities
- software drivers for various operating systems available

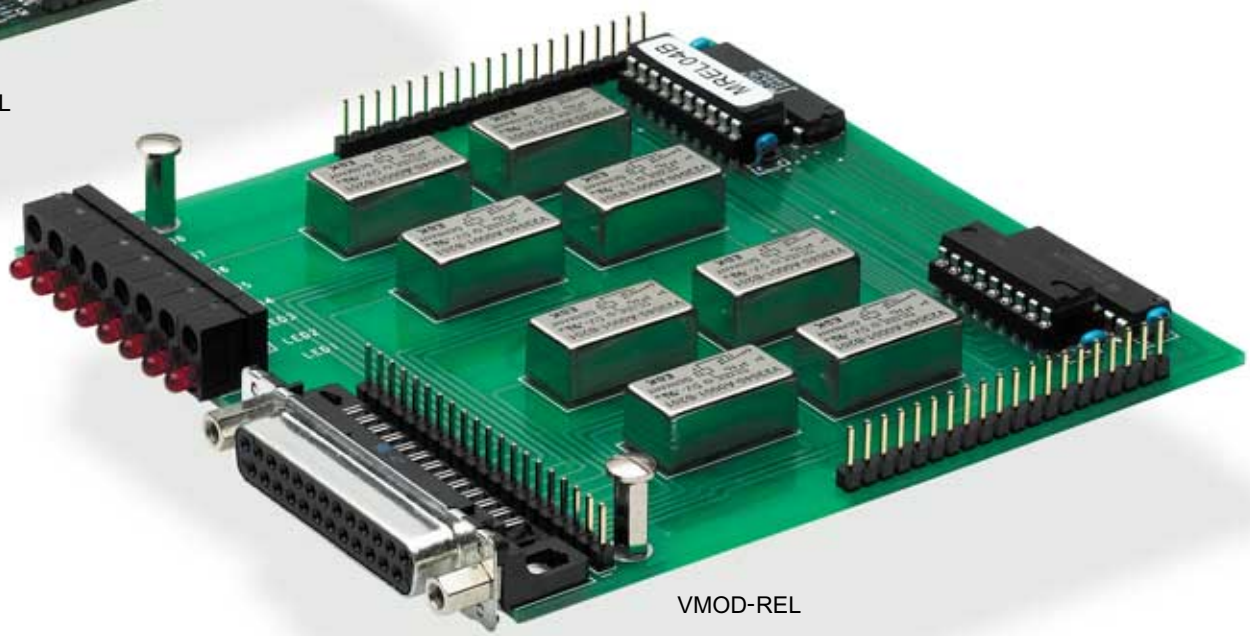
VMOD-TTL · VMOD-REL
Digital I/O Modules

VMOD-REL

- 8 relay outputs
- output characteristics 250V (AC), 110V (DC), 3A max.
- output power 30W, 60 VA
- isolation voltage (coil/contact) 1.500V
- LED state display for each output channel
- double size module
- software drivers for various operating systems available



VMOD-TTL



VMOD-REL

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VMOD-8E8 / VMOD-8E16

- 16 single-ended or 8 differential analog inputs
- 8 bit ADC with integrated Sample & Hold
- input ranges 0 – 5V, 0 – 10V, ±2.5V, ±5V, ±10V
- sampling rate max. 1 MHz (conversion time 1 µs)
- interrupt by end-of-conversion
- 8 bit binary code format
- software drivers for various operating systems available

VMOD-12E4

- 4 analog inputs
- 12 bit resolution
- sampling rate max. 333 kHz (conversion time 3 µs)
- simultaneous conversion with 4 ADC (so no time-gap of measured data)
- input voltage ranges ±5V, ± 10V, 0 – 10V
- cascadable with common trigger
- single-stage buffer for each channel
- low pass filter
- software drivers for various operating systems available

VMOD-12E16

- 16 single-ended or 8 differential analog inputs
- 12 bit resolution
- linearity error max ± 1/2 LSB
- gain error max. ± 1/2 LSB (for amplification factor 1)
- selectable input voltage ranges: ±5V, ±10V, 0 –10V
- optional: current input 0 – 20mA
- programmable amplification 1, 10 ,100, 1000 or 1, 2, 4, 8
- input section opto-isolated optionally
- programmable interrupt on end-of-conversion
- sampling rate max. 167 kHz (conversion time 15 µs)
- software drivers for various operating systems available



VMOD-12E16



VMOD-8E16·VMOD-12E4

Analog Input Modules

VMOD-12E16·VMOD-16E4

VMOD-16E4

- 4 fast and independent analog inputs
- 16 bit resolution
- conversion time 3 µs with simultaneous conversion (4 ADCs)
- input ranges: 0-10V, ±10V, 0-5V, ±5V
- external conversion trigger (MODULbus+ or DSUB)
- trigger out (MODULbus+ or D-SUB) to cascade with other modules
- timer for self triggered conversion
- FIFO of 127 words
- interrupt can be generated when configurable threshold has been reached.
- software drivers for various operating systems available

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VMOD-8A4 / VMOD-8A8

- 4 or 8 independent analog output channels
- 8 bit resolution per channel
- output voltage ranges selectable: ± 10V, 0 – 10V, ± 5V, 0 – 5V, ± 2.5V, 0 – 2.5V
- 10mA output current per channel
- double buffered input interface with one common load DAC command
- software drivers for various operating systems available

VMOD-12A2 / VMOD-12A4

- high precision analog output module
- 2 or 4 independent channels
- 12 bit resolution and linearity
- sampling rate max. 100 kHz (conversion time 10 µs)
- ±5V, ±10V, 0 – 5V, 0 – 10V output voltages
- 25mA max. drive capability
- drives large capacitive loads
- simultaneous loading of output channels
- binary code format
- power-up to zero volts
- opto-isolated outputs optionally
- software drivers for various operating systems available

VMOD-8A8 • VMOD-12A4

Analog Output Modules

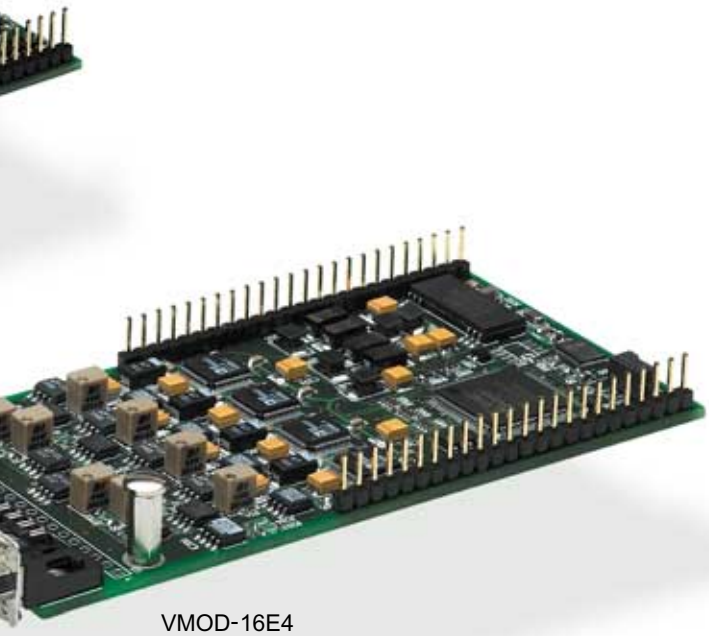
VMOD-12A8 • VMOD-16A2

VMOD-12A8

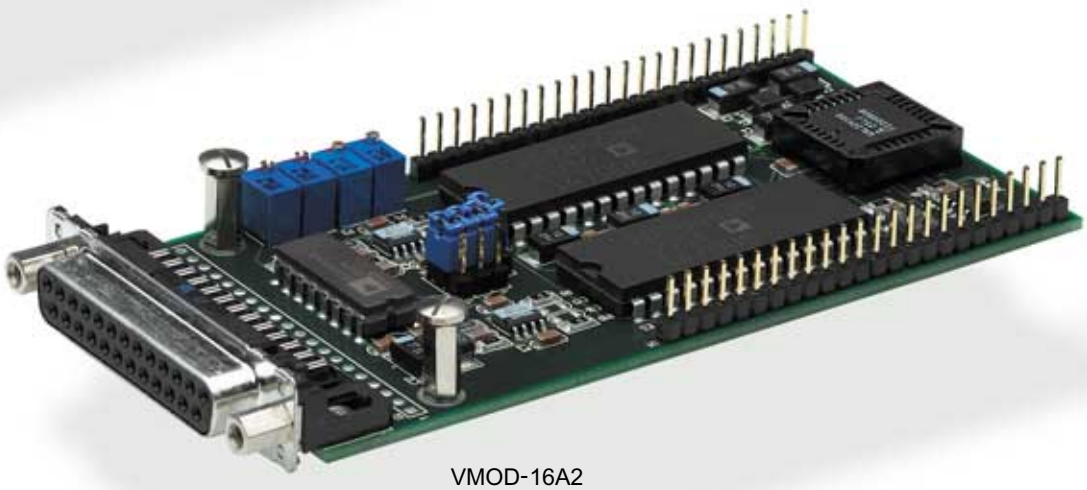
- high precision analog output module
- 8 independent channels
- 12 bit resolution and linearity
- sampling rate max. 333 kHz (conversion time 3 µs)
- output voltages ±10V, 0 – 10V
- max. 25mA output current
- double-buffered digital inputs
- software drivers for various operating systems available

VMOD-16A1 / VMOD-16A2

- high precision analog output module
- 2 independent channels
- 16 bit resolution and linearity
- sampling rate max. 111 kHz (conversion time 9 µs)
- output voltages ±5V, ±10V, 0 – 10V
- 25mA max. drive capability
- drives large capacitive loads
- simultaneous loading of output channels
- binary code format
- power-up to zero volts
- software drivers for various operating systems available



VMOD-16E4



VMOD-16A2

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VMOD-SIO2

- 2 independent opto-isolated serial channels RS232/V.24 (VMOD-SIO2/A) or
- 2 independent opto-isolated serial channels RS485 (VMOD-SIO2/B) or
- 2 independent opto-isolated serial channels RS422 (VMOD-SIO2/C)
- baud rate up to 38.4 kBaud
- supports TxD, RxD, RTS and CTS signals
- Zilog SCC Z8530
- software drivers for various operating systems available

VMOD-SIO2·VMOD-SIO4
Serial Modules
VMOD-SSI

VMOD-SIO4

- 4 independent serial channels RS232/V.24 (VMOD-SIO4/A) or
- 4 independent opto-isolated serial channels current loop (VMOD-SIO4/B) or
- 1 serial channel RS422 (VMOD-SIO4/C)
- baud rate up to 38.4 kBaud
- supports TxD, RxD, RTS, CTS, DCD and DTR signals
- Zilog SCC Z8530
- software drivers for various operating systems available



VMOD-SSI

- 2 independent SSI channels
- RS 485 compatible line drivers for clock signal
- RS 485 compatible line receivers or opto-couplers for data
- word length selectable from 1 to 32 bits
- clock rate selectable from 125kHz to 500kHz
- hardware grey-code conversion selectable
- end-of-transmission interrupt may be generated
- software drivers for various operating systems available

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VMOD-GPIB·VMOD-CEN
Interfacing Modules
VMOD-SCSI

VMOD-GPIB

- (GPIB) IEEE 488 interface module
- compatible to IEEE-488.2
- NEC uPD7210 controller (master and slave), talker, listener
- software selectable data transfer rate
- up to 15 devices
- max. 20m bus length
- transmission speed up to 500 kBit/s
- software drivers for various operating systems available

VMOD-CEN

- 20 bit TTL-I/O
- optionally opto-isolated I/O
- single 4 bit and double 8 bit I/O channels
- I/O software configurable per channel
- max. 48 mA open collector outputs
- 16 bit counter/timer internally or externally controlled
- interrupt on change of input state or input pattern
- software drivers for various operating systems available

VMOD-SCSI

- SCSI mass storage module using NCR 53C94 controller
- supports SCSI front-panel (25-pin D-SUB Apple MAC comp.) or VMEbus P2 connection
- conforming to ANSI standard X3.131–1986
- SCSI-2 tagged-queuing
- 48mA single-ended transceiver
- data transfer rate up to 5MBit/s in both synchronous and asynchronous mode
- byte swapping capability for INTEL/MOTOROLA CPU adaption
- full interrupt capability
- software drivers for various operating systems available



VMOD-SIO2



VMOD-GPIB

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VMOD-COMlink

- communication procedure 3964(R)
- messaging interface between host and firmware through software driver
- enables applications on the host to communicate with another station on the serial line connections
- serial data communication according to 3964(R) protocol
- software drivers for various operating systems available

VMOD-COMlink • VMOD-PROF
Communication Modules
VMOD-IBS • VMOD-ETH2

VMOD-PROF

- usable as slave to Profibus-DP
- SPC3 interface
- possible broadcast messages of 256 I/Os within one cycle
- baud rate up to 12 MBaud
- baud rate selected automatically by the module
- software drivers for various operating systems available

VMOD-IBS

- field bus Client for Interbus-S
- data length of 1 – 4 words
- ID code selectable (Standard 03hex)
- synchronization via interrupt or polling
- Interbus connection via RS 485 transceiver
- 8 bit data bus
- software drivers for various operating systems available

VMOD-ETH2

- LAN 91C94 single chip ethernet controller
- 4608 Bytes of dual ported SRAM for packet memory
- onboard EEPROM for Ethernet configuration and MAC
- address
- 10Base5 connector (VMOD-ETH2/AUI) or
- 10Base2 (Thin-Wire) connector (VMOD-ETH2/BNC) or 10BaseT (Twisted Pair) connector on front via
- RJ45 + LED (VMOD-ETH2/T) or
  4 port hub, 3 front panel 10BaseT port and 1 internal port for local Ethernet controller chip on front via 3 x RJ45 + LED (VMOD-ETH2/HUB)
- software drivers for various operating systems available



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VMOD-ICAN3

- intelligent high performance SJA1000 CAN controller
- local intelligence with MC68332
- 256 kB SRAM, 16 bit wide
- 64 kB DPRAM, 16 bit wide
- 512 kB Flash
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- ICANOS firmware on-board
- CANopen optionally available
- software drivers for various operating systems available

VMOD-ICAN3 · VMOD-FCAN
Communication Modules

VMOD-FCAN

- Intel 82527 Full CAN controller
- supports CAN protocol V2.0A and V2.0B
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- software drivers for various operating systems available



VMOD-ICAN3

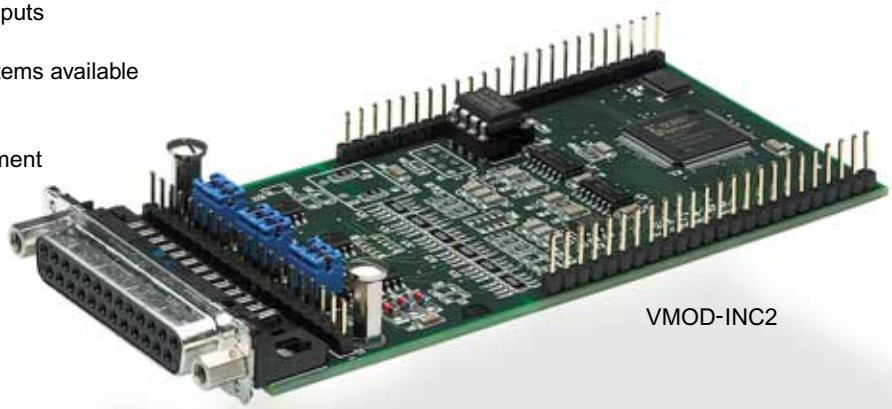


VMOD-FCAN

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VMOD-INC2·VMOD-SPEED·VMOD-RES
Counter/Special Modules
VMOD-THM·VMOD-LCA·VMOD-EXP

VMOD-INC2
- 3-axis evaluation on one module
- 3 independent 24 bit counters with 1-, 2-, or 4-times evaluation
- interrupts on reference positions
- programmable counter modes for frequency or event counting and pulse width measuring
- differential RS422 and TTL-compatible inputs
- optionally opto-isolated
- software drivers for various operating systems available



VMOD-INC2

VMOD-SPEED
- one axis evaluation and speed measurement on one module
- one 24 bit incremental encoder counter with 1-, 2-, or 4-times evaluation and movement direction recognition
- interrupts on reference positions
- counter modes for frequency or pulse width measurement
- two speed measurement modes: time over distance and distance over time
- programmable reference clock
- 4-times evaluation input channel for speed measurement
- immediate start of measurement via software or gate-signal
- event counting capability
- incremental encoder and speed measurement unit are useable independently from each other
- differential RS422 and TTL-compatible inputs
- optionally opto-isolated
- software drivers for various operating systems available

VMOD-RES
- resolver-to-digital converter module using AD2S80A
- 10, 12, 14 or 16 bit resolution set by user
- maximum tracking rate 1040 rps (10 bit resolution)
- velocity output
- isolation transformers for SIN, COS and reference inputs
- input frequency 50 Hz to 20 kHz
- 4-wire resolver format (SIN, COS) and 2-wire reference signal inputs
- software drivers for various operating systems available

VMOD-THM
- 4 thermocouple inputs or 2 RTD (PT100) sensors
- all TC-types connectable
- cold junction compensation sensor
- open thermocouple detection
- programmable gain
- 21 bit ADC with auto-calibration and programmable low-pass filter
- screw contacts for signal line connection
- software drivers for various operating systems available

VMOD-LCA
- flexible programmable SRAM based FPGA
- individual configuration
- FPGA configuration via MODULbus or on-board serial ROM
- up to 9 bi-directional RS485 user I/O signals
- software drivers for various operating systems available

VMOD-EXP
- prototyping module for MODULbus hardware developments
- 25-pin D-SUB connector
- includes MODULbus specification manual

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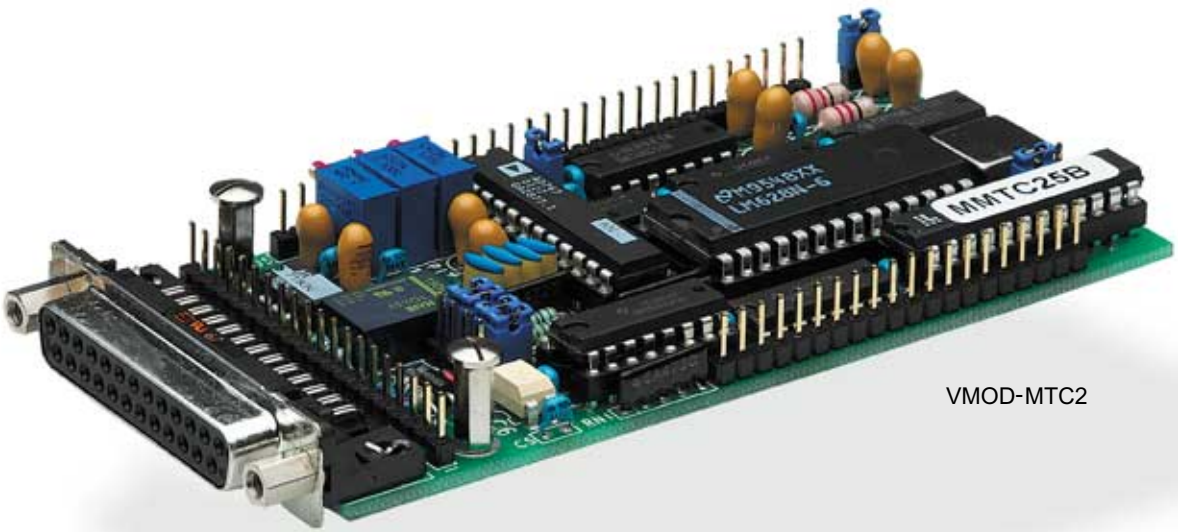
VMOD-MTC

- all functions for motor controlling of DC-and stepper-motors
- programmable position-/speed controlling
- quadrature decoder for encoder signals
- programmable digital filter
- 8 bit D/A-converter
- 24 bit position counter
- software drivers for various operating systems available

VMOD-MTC2

- all functions for motor controlling of DC servo motors
- programmable digital PID filter
- velocity, target position and filter parameters may be changed during motion
- quadrature encoder interface with index pulse input
- 12 bit D/A converter
- 32 bit position, velocity and acceleration registers
- programmable host interrupts
- software drivers for various operating systems available

VMOD-MTC·VMOD-MTC2
Motion Controller Modules



VMOD-MTC2

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The 21st Century System Bus



I/O Boards

CPU Boards

Special

Serial Interfaces

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VMEbus

VMEbus – The 21st Century System Bus 68

VMEbus CPU

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VMEbus Technology is the only computing technology which has been established in the market for more than 20 years now. Additional to the special industrial requirements the VMEbus adapted himself over the past to all new requirements at the industrial market. It permanent has been developed with new features. The most important detail must be the forward and backward compatibility. So VMEbus can be used over a period of many years. All VMEbus products can being combined with VME-bus products of different manufacturers. So all VMEbus systems are 100% compatible to each other.

VMEbus

The 21st Century System Bus









World Wide Leading Standard

VMEbus now is used in many areas of everyday applications. You can be sure that:

- your electricity, your water and gas pipes are being controlled by VMEbus systems,
- your newspapers, magazines and your paper money has been printed by VMEbus controlled printing machines,
- your worldwide video conferences are controlled via VMEbus based telecommunication systems
- the electronic components in your car has been developed and tested with VMEbus,
- VMEbus systems will control traffic lightning systems, medical systems, railway vehicles and many more machines which are being used everyday.

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Reliability

By using standard office computer systems the performance will increase every month. So applications will be faster and multicolored, but the applications will also need much more space. In industrial application reliability, long term availability and robustness are the most important items. Critical controlling tasks like exactly switching of valves and synchronous controlling of robotics must be done in real time. Real time means the exactly controlling and – mostly important – the programmable reaction of different tasks.

VMEbus is the leading computing technology (over 50 % market share) in the industrial market. Absolutely safety relevant applications like process controlling in power plants, avionic applications in military and civil aircrafts up to simple controlling of machinery are being controlled by VMEbus systems. In areas, in which the computer breakdown can hazard people or can cost a high amount, VMEbus technology is also being used.

The VMEbus At Janz Automationssysteme AG

VMEbus systems of the Janz Automationssysteme AG will be fit into many different applications all over the world. So Janz' VMEbus products are well-known in many area of controlling.

Janz Automationssysteme AG supports all board level products with software drivers for most common operating systems. These drivers are vital for making system integration time short.

Additionally, most drivers offer the full features of Janz' commercial products, so that the user can concentrate on the application without needing to understand sometimes complex hardware issues. Operating systems supported with drivers include VxWorks, OS-9, pSOS+, Linux and UNIX.

The range of software drivers is continually developing. Special drivers for other operating systems may be available. Please contact Janz or one of the international sales offices with your particular requirements. Unless otherwise specified, drivers are delivered as licensed binaries on a 3.5" disk and come with on-disk documentation.

C-language libraries may also be included as examples. The license also includes free telephone support to get you going quickly. C-source code for all drivers is available for purchase on request. Please contact the Janz office for details.

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VMOD-C6 · VMOD-PM

High-performance VMEbus



VMOD-C6



VMOD-PM

VMOD-C6

CPU

- Intel ULV Celeron processor with 400 MHz or 650 MHz
- 100 MHz system bus
- 256 kB L2 cache

SDRAM

- 128/512 MB SDRAM 100 MHz using one SODIMM

CompactFlash

- up to 1 GB of CompactFlash

Ethernet

- two Intel 82551ER Ethernet controllers
- two Ethernet ports supporting 10BaseT and 100BaseTX
- RJ45 connectors with indicators at front panel

Graphics

- Intel 815E AGP internal graphics controller
- up to 1600 x 1200 resolution

PMC Expansion

- one 5 V, 32-bit / 33 MHz PMC expansion site

Serial Interfaces

- two 16550-compatible serial ports on the front panel (via two micro pin D-SUB connectors)

Other Interfaces (front panel)

- 2 x USB v1.1 ports, 1 x PS/2 for keyboard and mouse, hardware reset at front panel
- IDE and floppy routed to P2

Operating System Support

- Windows 2000/XP, QNX, Linux, VxWorks

VMOD-PM

CPU

- Intel Pentium M processor with either 1.1 GHz, 1.6 GHz, or 1.8 GHz
- 400 MHz system bus
- up to 2 MB of advanced L2 cache

SDRAM

- up to 1.5 GB DDR SDRAM, optional ECC support

CompactFlash

- up to 1 GB bootable CompactFlash

Ethernet

- Intel 82551 (10/100 MBit/s support) and 82546EB
- (for dual 10/100/1000 MBit/s support)
- dual 10/100/1000BaseT interface options
- 10/100BaseTX Ethernet port on front panel

Serial ATA

- Serial ATA interface via P2 connector

Graphics

- Intel 855GME internal graphics controller
- up to 1600 x 1200 resolution

PMC Expansion

- 66 MHz/64-bit PCI-X PMC expansion site
- additional 3 PMC sites available with PMC237

Serial Interfaces

- four 16550-compatible serial ports
- one port available on front panel via RJ45 connector

Other Interfaces

- four USB 2.0 ports (two on front panel, two via P2 connector)
- PS/2 port for keyboard/mouse on front panel
- IDE support via P2 connector

Operating System Support

- Windows 2000/XP, QNX, Linux, VxWorks

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VMOD-32

- double Eurocard form factor (6U)
- A32/24/16:D16/08 VMEbus master; A24:D16/08 slave interface
- switchable bus width for short, standard and extended VMEbus-I/O
- VMEbus master/slave operation
- 3 MODULbus I/O sockets, 4 additional sockets with VMOD-IX expansion board (8 TE solution)
- front panel and P2 connection of MODULbus I/O lines
- MC68332 MCU with 21 MHz (programmable)
- on-board system controller with first slot detection
- interrupt handler IRQ 1-5
- interrupt generator any 1 of 7
- up to 4 MB DRAM
- up to 1 MB EPROM
- up to 1 MB FLASH EPROM
- up to 1 MB dual-ported battery buffered SRAM
- battery buffered realtime clock with 2 kB SRAM
- RS232 serial ports
- periodic interrupt timer (internal to MC68332)
- watchdog timer (internal to MC68332)
- DC/DC converter to supply analog modules

VMOD-32
Intelligent VMEbus I/O Controller



VMOD-32

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VDIN-32

- double Eurocard form factor (6U) with VMEbus interface
- 32 independent high impedance inputs
- opto-isolated inputs
- input voltage ranges (0V..100V)
- LED status display for each input

VDIN-32

32-Channel Digital



VDIN-32



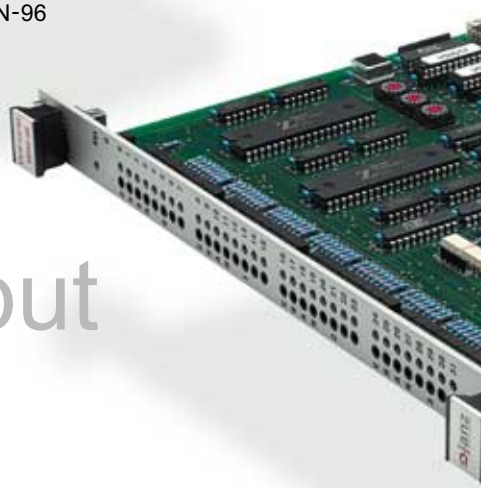
VDIN-96

VDIN-96

double Eurocard form factor (6U) with VMEbus interface
32, 64 or 96 independent high impedance inputs
(opto-isolated version)

VDIN-96

96-Channel Digital Input



opto-isolated inputs optionally available
input voltage 5V/24V (up to 100 V optionally available)
counter/timer with trigger/gate activation
change-of-state and pattern recognition interrupt
front-panel and P2 connection for input lines
30 kHz max. input frequency

VDOT-96

96-Channel Digital

VDOT-96

double Eurocard form factor (6U) with VMEbus interface
32 bit, 64 bit or 96 bit digital outputs
output voltages 12V/24V
outputs with high-side power switch (BTS721)

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- simulation sockets
- counter/timer with trigger/gate activation
- change-of-state and pattern recognition interrupt
- P2 connection of input lines
- 30 kHz max. input frequency

Input

VDIO-32

- double Eurocard form factor (6U) with VMEbus interface
- 32 opto-isolated in-/outputs
- voltage ranges 5V/12V/24V

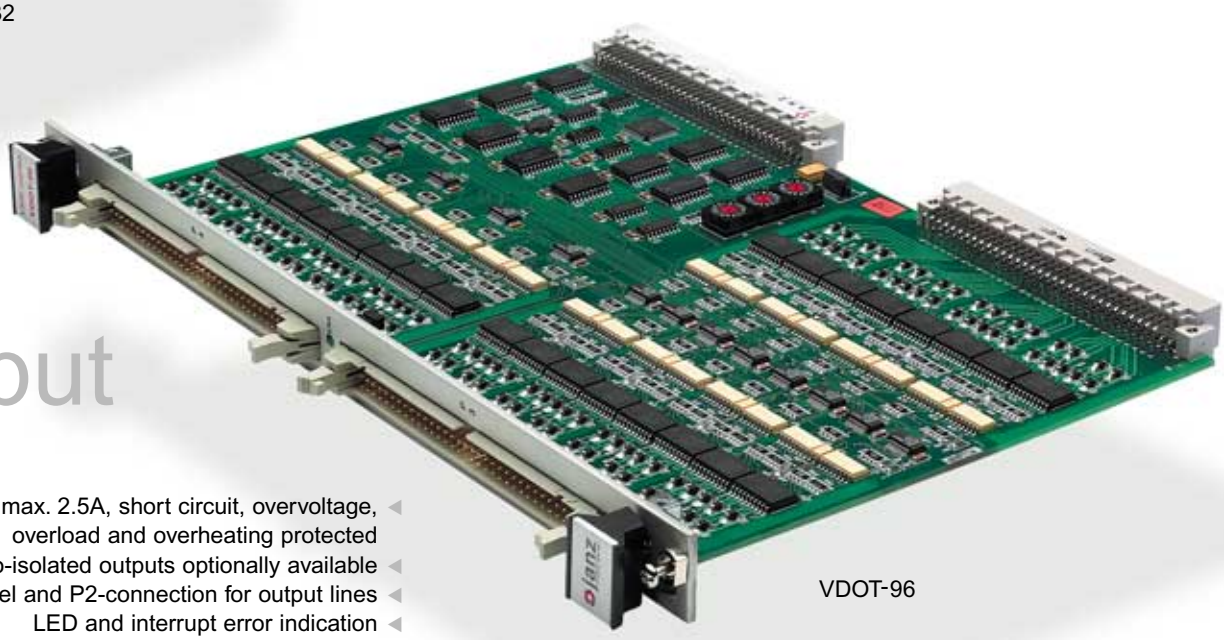
VDIO-32

32-Channel Digital Output



VDIO-32

- read-back outputs usable as inputs
- LED display simulation sockets for each channel
- counter/timer with trigger/gate activation
- change-of-state and pattern recognition interrupt
- P2 connection for I/O lines
- 30 kHz max. input frequency



VDOT-96

Output

- output current max. 2.5A, short circuit, overvoltage, overload and overheating protected
- opto-isolated outputs optionally available
- front-panel and P2-connection for output lines
- LED and interrupt error indication

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VDOT-32

- double Eurocard form factor (6U) with VMEbus interface
- 32 opto-isolated inputs/outputs
- outputs with high-side power switch (BTS721)
- voltage ranges 12V/24V

VDOT-32

32-Channel Digital Power I/O

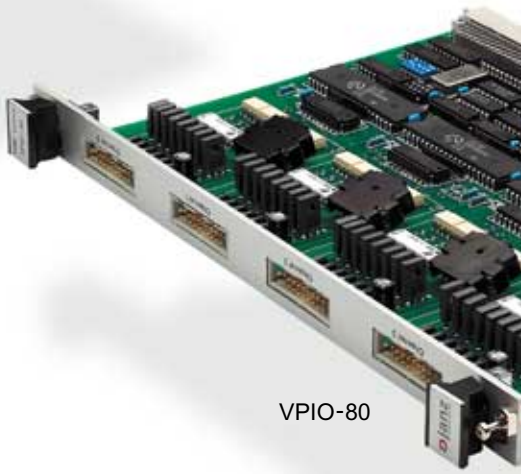
- output current max. 2.5A, short circuit, overvoltage, overload and overheating protected
- outputs can be read back; each 8 bit group usable as inputs
- LED display, simulation sockets for each channel
- each channel current-limited
- undervoltage and overvoltage shutdown with auto-restart and hysteresis
- counter/timer with trigger/gate activation
- change-of-state and pattern recognition interrupt
- front-panel and P2 connection for input lines



VDOT-32



VDIO-64



VPIO-80

VDIO-64

- double Eurocard form factor (6U) with VMEbus interface
- 32 digital inputs and 32 digital outputs
- input/output voltage ranges 12V/24V, other voltages optionally available
- opto-isolated outputs optionally available
- output current max. 2.5A, short circuit, overvoltage, overload and overheating protected

VDIO-64

64-Channel Digital I/O

- LED and interrupt error indication
- counter/timer with trigger/gate activation
- change-of-state and pattern recognition interrupt
- front panel connection of I/O lines

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VPIO-80

- double Eurocard form factor (6U) with VMEbus interface
- A24:D16 slave interface
- 32 opto-isolated in- or outputs (factory configured in 8 bit groups)

VPIO-80

80-Channel Parallel I/O

- up to 70V in-/output voltage, 0.6A output current, open collector
- 48 TTL-compatible in-/outputs, 48mA, open collector
- counter/timer with trigger/gate activation
- change-of-state and pattern recognition interrupt
- opto-isolated lines connected to front panel, TTL lines at P2
- 30 kHz max. input clock rate



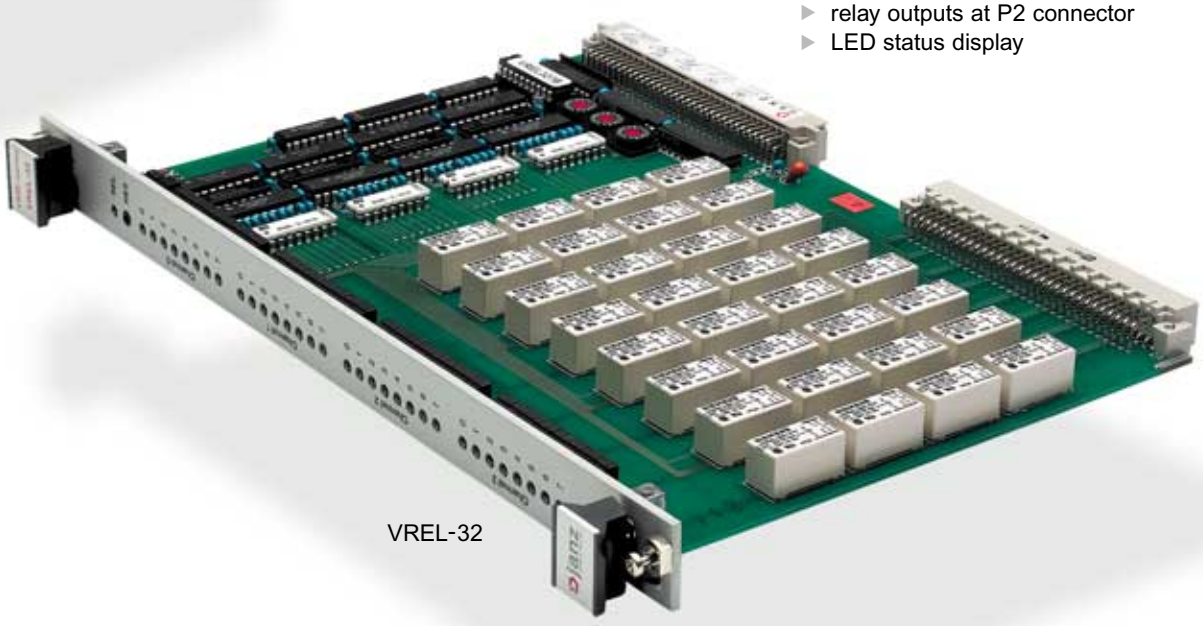
VREL-32

- double Eurocard form factor (6U) with VMEbus interface
- 32 relay outputs, active closing or opening contacts
- outputs max. 250V (AC), 110V (DC), 3A, 60VA, 30W
- isolation voltage coil/contact : 1500V

VREL-32

32 Relay Output

- max. switch frequency 500 Hz
- relay states re-readable
- relay outputs at P2 connector
- LED status display



VREL-32

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VSIO-D8

- double Eurocard form factor (6U) with VMEbus interface
- 8 independent serial channels
- configurable V.24 (RS232) or 20mA (current loop)

VSIO-D8

8-Channel Serial I/O

- opto-isolation for 20mA current loop
- signals for modem control
- transfer rates up to 38.4 kBaud asynchronous
- channel parameters independently set by software
- fully interruptable with 8 independent interrupt vectors
- P2 connection for serial lines, transition adapter optional



VSIO-D8



VSIO-A8

VSIO-A8

8-Channel RS232/RS422

VSIO-A8

- double Eurocard form factor (6U) with VMEbus interface
- 8 independent serial channels
- configurable as RS232, RS422 or 20mA
- voltage isolation using opto-isolation
- independent Baud-rates for each channel
- signals for modem-control
- transfer-rate up to 800 kBaud
- all channel parameters are software programmable and independent of each other
- full interrupt capability with 4 independent interrupt vectors
- connector signals at the interfaces are hardware wireable as needed

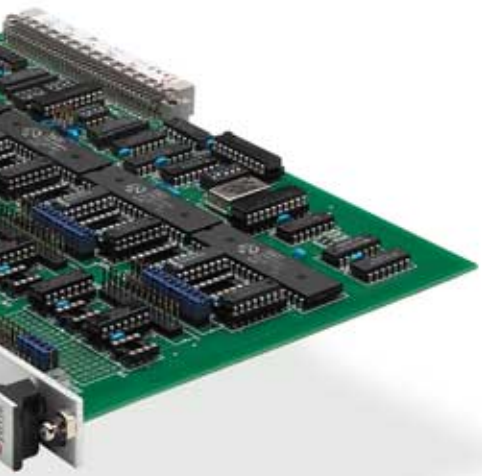
VMEM-C16

- double Eurocard form factor (6U) with VMEbus interface
- capacity up to 16MB SRAM or up to 16MB FLASH EPROM

VMEM-C16

VMEbus Static CMOS Memory

- 140 ns access time
- A24/A32 addressing mode
- D16/D32 data transfer
- memory write protectable with temporary unprotect from front panel
- battery back-up for at least 1000h (rechargeable NiCd battery)





VMEM-C16

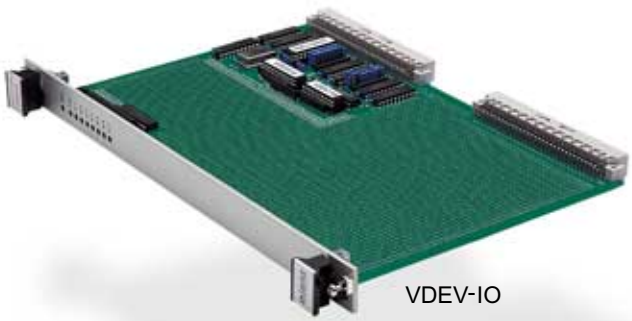
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VDEV-IO

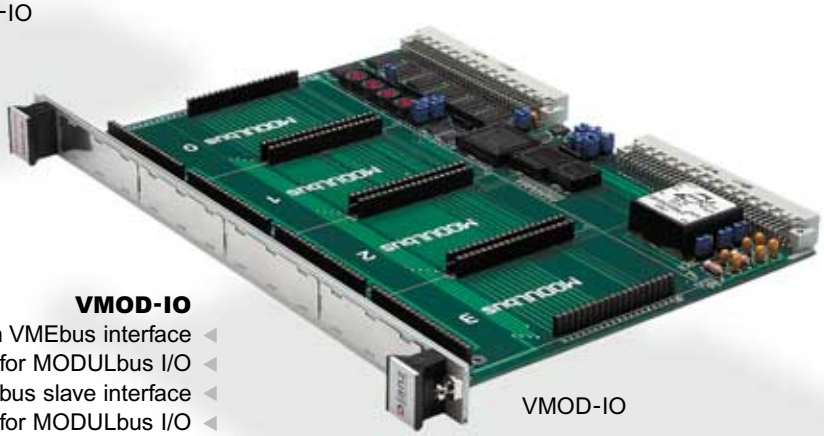
VMEbus Prototyping

VDEV-IO

- double Eurocard form factor (6U) with VMEbus interface
- A24/16:D16 VMEbus slave interface
- full interrupt capabilities
- pre-decoding of 8 address ranges
- vector register
- large matrix field with surrounding track for GND/Vcc
- 8 user definable LEDs available at the front panel



VDEV-IO



VMOD-IO

VMOD-IO

- double Eurocard form factor (6U) with VMEbus interface
- non-intelligent carrier board for MODULbus I/O
- A16/A24:D16 VMEbus slave interface
- 4 plug-in sockets for MODULbus I/O
- different interrupt vector for each MODULbus socket
- jumper selectable interrupt level
- 2 kB short I/O or standard-address range
- needs only one VMEbus slot
- front panel and P2 connection for I/O lines
- on-board DC/DC converter to supply analog modules optionally available



VMOD-IO / VMOD-3U

6U/3U Mezzanine Carrier for MODULbus I/O

VMOD-3U

- single Eurocard form factor (3U) with VMEbus interface
- non-intelligent carrier board for MODULbus I/O
- A24/16:D16 VMEbus slave interface
- 1 plug-in socket for MODULbus I/O
- jumper selectable interrupt level 1-7 and vector-interrupt
- 512 byte short I/O or standard addressing
- needs only one VMEbus slot
- front panel connection for I/O lines
- on-board DC/DC converter to supply analog modules optionally available

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VMOD-IO2

- double Eurocard form factor (6U) with VMEbus interface
- non-intelligent carrier board for MODULbus I/O
- A16/D16, A24/D16 and A32/D16 VMEbus slave interface
- 4 sockets for MODULbus I/O
- MODULbus+ extension
- performance improvement through write buffer
- VME64x compliant CR/CSR for software board detection and address decoder configuration
- BAR register can be loaded by geographical addressing or auto slot identification

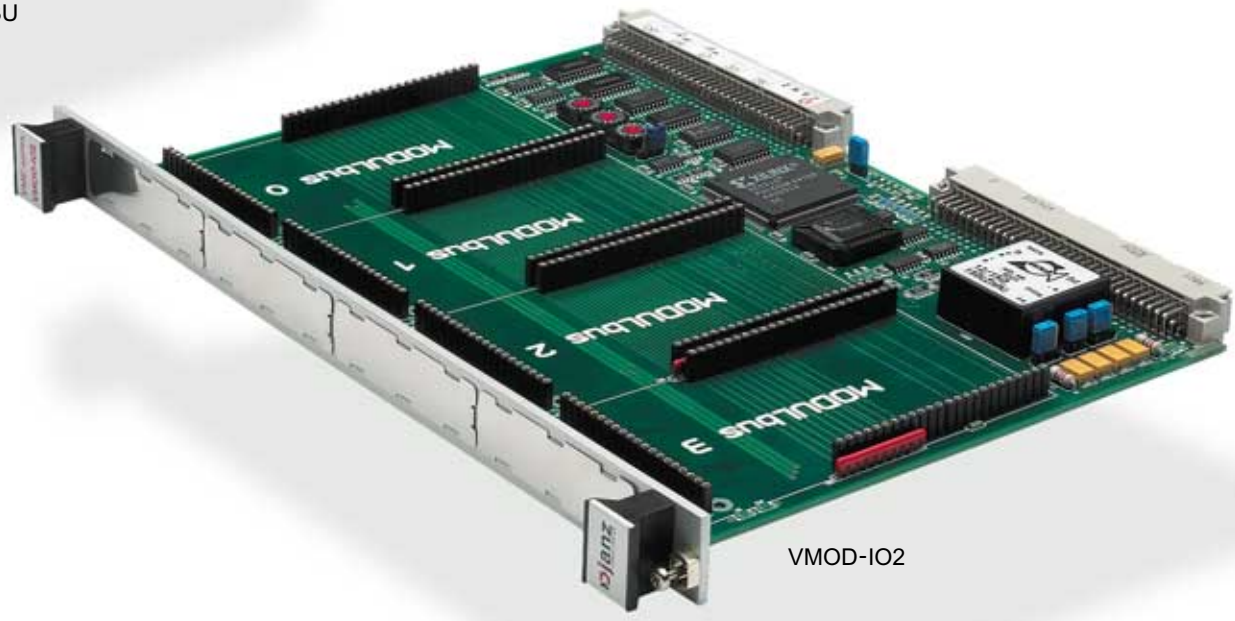
VMOD-IO2

6U VME64 Mezzanine Carrier for MODULbus I/O

- software configuration of the boards run-time parameters (without jumpers)
- programmable IRQ level and IRQ vector for each module
- interrupt masking for each module
- modules can be individual reset by software
- software configuration of MODULbus clock
- access time configuration via software
- needs only one VMEbus slot
- front panel and P2 connection for I/O lines
- on-board DC/DC converter to supply analog modules optionally available



VMOD-3U



VMOD-IO2

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