PRODUCT OVERVIEW

Boards ▪ Systems ▪ Software

MODULbus I/O

Industrial PC
Embedded PC

CAN

VMEbus

janz

Solutions for Automation

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

Company Profile

CAN

MODULbus

Industrial PC/Embedded PC

VMEbus

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.

International Representatives

Europe

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

SCANDINAVIA
VSYSTEMS AB
www.vsystems.se

SCANDINAVIA
Lönne Scandinavia AB
www.lonne.com

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

INDIA
Epsilon Control & Automation
epsiloncontrol@vsnl.com

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

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

TAIWAN
Spinel Technology Corp.
www.spinel.com.tw

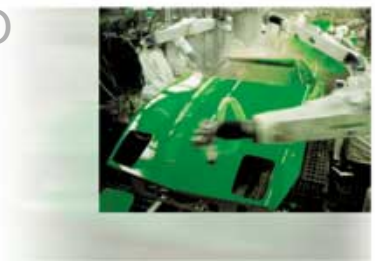
USA
Saelig Co. Inc.
www.saelig.com

CAN
Controller Area Network

Host Interfaces

OEM Modules

Field I/O



Software

Characteristics

CAN StarterKit

OEM Modules

Host Interfaces

Embedded CAN-IPC/ Field I/O

Software

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.

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

- 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-PC/K2O for ISA systems
  - CAN-PCI2/2O for PCI systems
  - CAN-104/1O for PC/104 systems
  - CANcard for PCcard (PCMCIA)
  - CAN-VME6/K2O for 6U VMEbus systems
  - CAN-CP6/K2O for 6U CompactPCI systems
  - 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 on CD-ROM:
  - Windows NT/2000/XP
  - Linux
  - VxWorks

StarterKit

Easy StarterKit for CAN/CANopen

VMOD-ICAN3
Intelligent CAN Controller

VMOD-ICAN3

- by using the VMOD-ICAN3 host system does not need to handle the high interrupt load in a busy CAN network
- the processing of higher layer protocols is carried out by the intelligent module
- these features are important when a single host system has to maintain several independent CAN networks
- ICANOS firmware provides several services that deal with CAN bus layer 2
- CANopen firmware enables access to networks that use CANopen as a higher level protocol
- by featuring the MODULbus mezzanine concept, the VMOD-ICAN3 itself can be used on a wide variety of platforms, including VMEbus, CompactPCI, PCI and ISA
- equipping own boards with a MODULbus socket, developers are able to use the VMOD-ICAN3 power even in these configurations

Features

- 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

- VMOD-FCAN is designed for a cost effective CAN connection
- the on-board CAN controller will interrupt the host for every accepted CAN frame
- by featuring the MODULbus mezzanine concept, the VMOD-FCAN itself can be used on a wide variety of platforms, including VMEbus, CompactPCI, PCI and ISA

Features

- 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

CAN-PC and CAN-PCI

Modular CAN Connection for

CAN-PC/K2

- intelligent CAN host interface based on VMOD-ICAN3 and MODULbus carrier board MOD-ATS
- 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/K3

- Full-CAN interface based on VMOD-FCAN and MODULbus carrier board MOD-ATS
- 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-PC

CAN-PCI/K2

- intelligent CAN host interface based on VMOD-ICAN3 and MODULbus carrier board MOD-PCI
- 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

ISA or PCI Systems

CAN-PC/K3

- Full-CAN interface based on VMOD-FCAN and MODULbus carrier board MOD-PCI
- 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-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

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

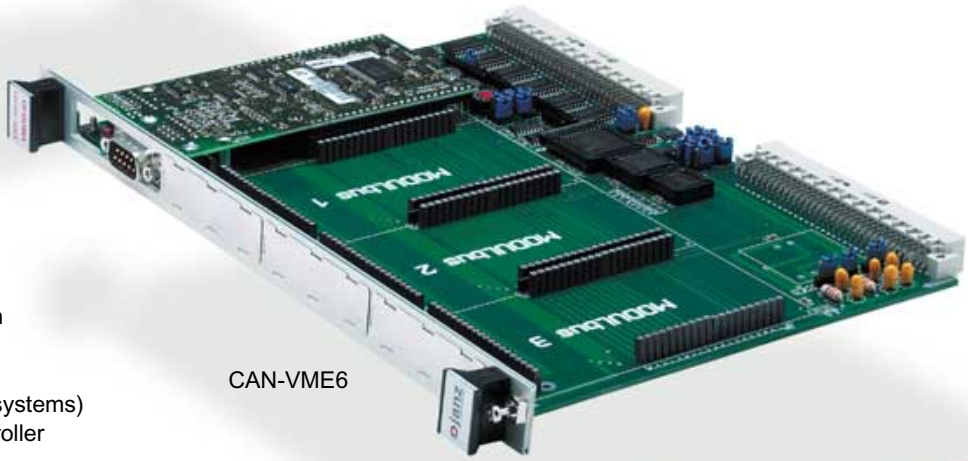
Intelligent CAN Connection for PCI Systems

CAN-PCI2

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

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)

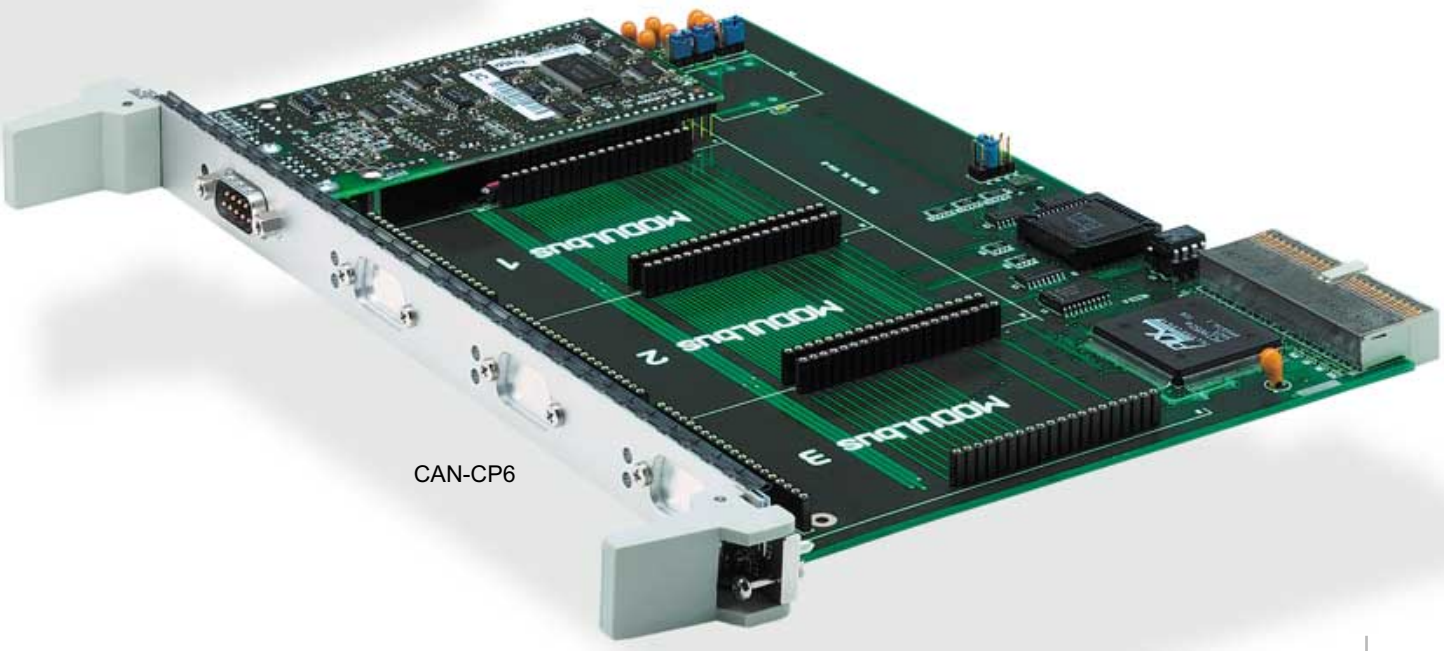
- Full-CAN interface based on VMOD-FCAN
- MODULbus carrier board CMOD-3U (for 3U systems) or CMOD-IO (for 6U systems)
- Intel 82527 Full-CAN controller
- supports CAN protocol V2.0A and V2.0B
- optionally opto-isolated CAN interface
- ISO/DIS 11898
- 9-pin D-SUB connector
- software drivers for various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

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-104

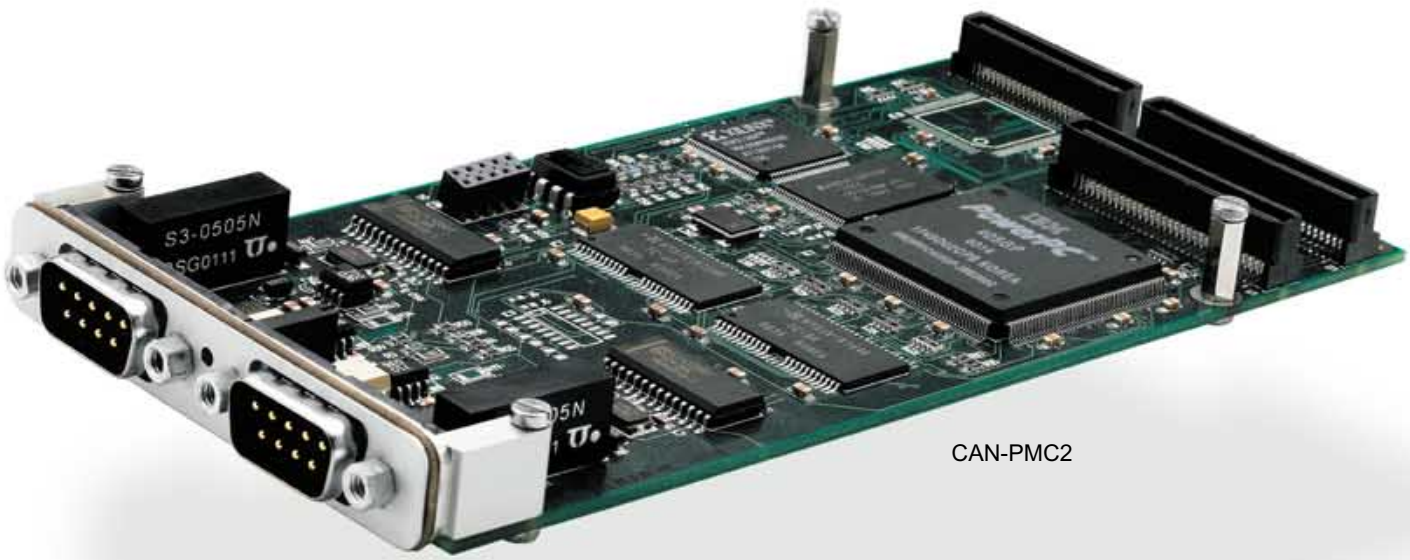
CAN Connection for PC/104 Systems

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



CAN-PMC2

CANcard

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 and Windows XP

Web-CAN

Internet Access for Production

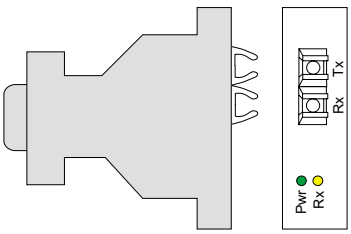
Web-CAN

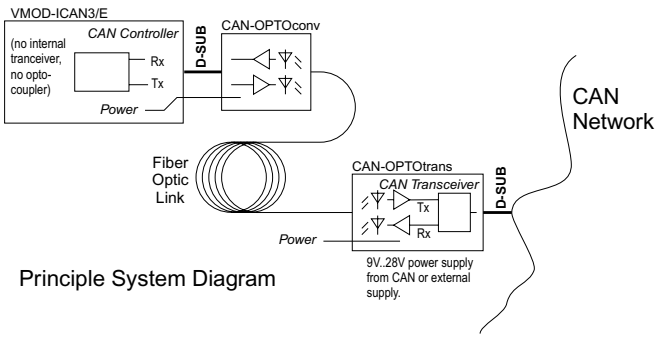
- Web-CAN based on CAN-megaBox
- Linux or QNX operating system
- standard web-server
- MySQL data base
- data logging functionality
- CANlook-server
- HTTP-server

CAN-OPTOkit

CAN Connection for Fiber Optic

NEW





Principle System Diagram

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)

CAN-megaBOX

- CPU AMD Élan SC520 with 133 MHz
- 16 kB unified L1 cache (write-through or write-back)
- integrated FPU IEEE754 standard
- up to 128 MB SDRAM
- Compact Flash socket (internal) with up to 1 GB capacity or Micro Drive
- 1 MB Boot-Flash (up to 2 MB)

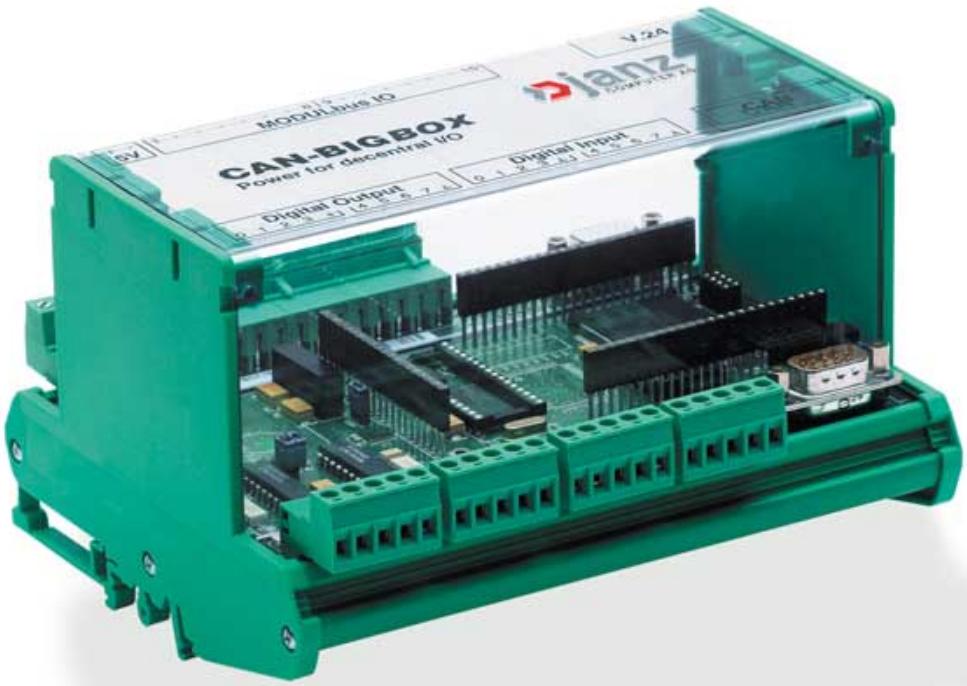
CAN-megaBOX

Embedded Computer for CAN and Ethernet

- 114 Byte NV-RAM (located in RTC)
- internal RTC and Watchdog timer
- 10/100 MBit/s Ethernet interface
- up to 2 RS232 serial port
- up to 3 CAN interface via 9-pin D-SUB (SJA1000 CAN controller)
- 8 or 16 user I/O opto-isolated (4 or 8 x Input 24 V, 4 or 8 x Output 50 mA)
- housing (h x w x d): 51 (65) x 125 x 76 mm
- operating system support for Linux, QNX, OS-9 (others on request)

optionally available:

- USB port (v1.1), replaces the 8 I/O ports
- Web-CAN for internet access on your CAN network
- web cam support for supervision of decentralized applications



CAN-BIGBOX

CAN Field I/O Node

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

OPC Server

OPC Connection for CAN Interfaces

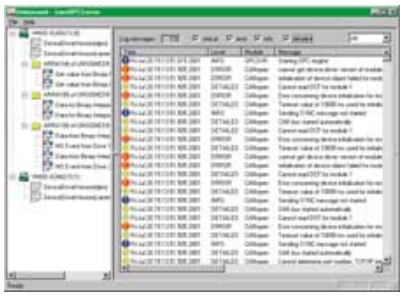
Janz OPC Server

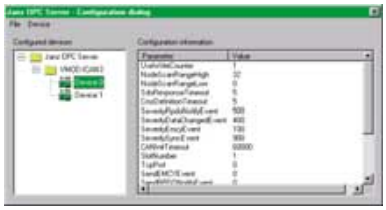
- one main OPC Server application supporting OPC Data Access 2.0 and 1.0a and OPC Alarms & Events 1.0
- capabilities to provide data from different MODULbus modules with one OPC Server using Janz hardware support DLL's
- a separate path is added in the OPC Server's namespace for every included module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

CANlook

Analysing and Monitoring Tool for CAN/CANopen Networks

CANlook

- 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

Message logging

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

Acceptance filtering

- controlling the transparency of the CAN bus hardware
- setting arbitrary filtering masks
- predefined buttons for filtering IO ranges defined in CAN specifications (EMCY, SYNC, PDO, SDO,...)

Statistics

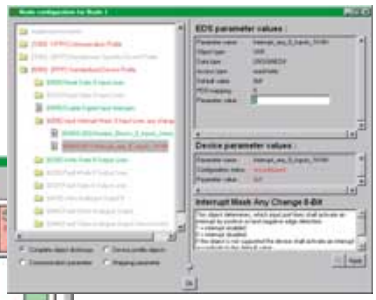
- giving an imagination of CAN bus load
- automatic detecting of a used bit rate

List of found nodes after a network scan

automatically search for nodes in a connected CANopen network
automatic detection of type of the nodes
coloured symbols shows wether a corresponding EDS was found or not

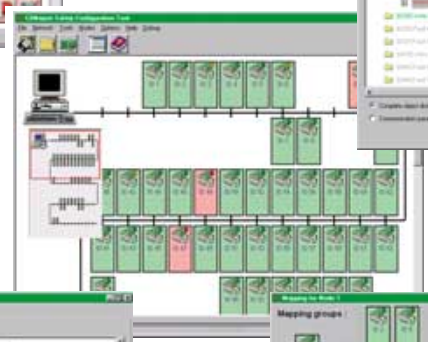
Dialog window for making configuration settings directly in the object dictionary

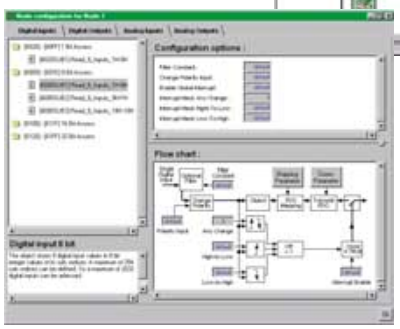
- showing object dictionary entries in a tree structure
- same colour like background of nodes in main window
- navigation from the symbol window to the configuration option



Main dialog window of the application with activated overview window

displaying inserted nodes with a graphical symbol
free placing of symbols by the user
background colour of symbol shows the user state of node

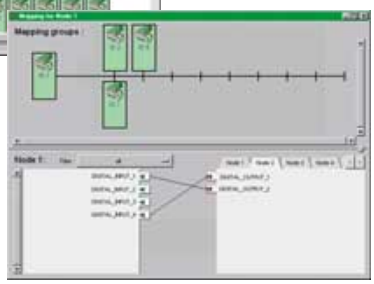




Device profile depending dialog window

(here: digital inputs of an I/O node using DS401)

automatically detection of the device profile of a node
launching the corresponding configuration dialog window via double-click



Dialog window for configuring mapping parameter

- mapping parameters for getting datas of one node to another
- mapping can be easily configured by selecting both data items with a mouse click
- a line between both items signals this connection
- additional configuration settings regarding this connection will be displayed and can also be modified

CANconfig

CANopen Configuration Tool

CANconfig

- projects with up to 127 nodes
- automatic detection of nodes in a connected CANopen network
- possibility to plan and configure a network without having a network connected
- saves configuration parameter in project files and enables the user to download saved configuration options at a later time
- coloured text and node background displaying makes it easy to detect wrong or missing configuration settings
- enables the user to make configuration settings via a tree formatted object dictionary or a device specific configuration dialog
- implements a graphical dialog window to allow mapping via drag and drop
- detailed help text will be displayed for all standard configuration options
- supports configuration of safety relevant nodes in a CANopen network (CANopen safety)
- available for several operating systems using Tcl/TK script language

CANconfig is available in different versions:

- CANconfigBasic – for setup and configuration of single CANopen nodes
- CANconfigNet – for setup and configuration of CANopen networks
- CANconfigSafety – for setup and configuration of CANopen and CANopen Safety networks

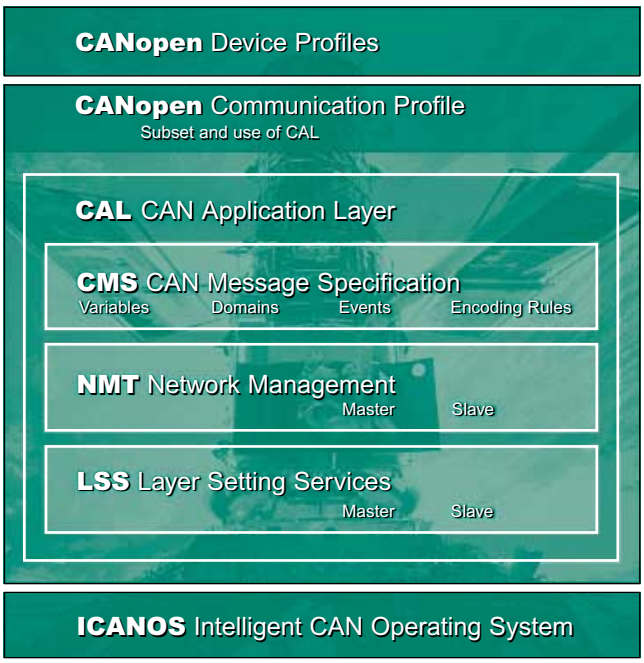
CANopen
CANopen is based on the ICANOS operating system and uses a subset of CAL (CAN Application Layer) according to the specifications of CiA DS-301. All CANopen standard communication objects (PDO, SDO, SYNC, EMCY, etc.) are supported. Each kind of master functionality can be programmed as well as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

VxWorks

OS-9

pSOS+

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

Linux

QNX

Win NT

Win 2000

Win ME/XP

WIN CE

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.

MODULbus

The Mezzanine I/O Concept

Motion Controller

Carrier Boards

I/O Modules

Communication

Counter/Special

Serial/Interfacing

MODULbus

Carrier Boards

I/O Modules

Serial/Interfacing

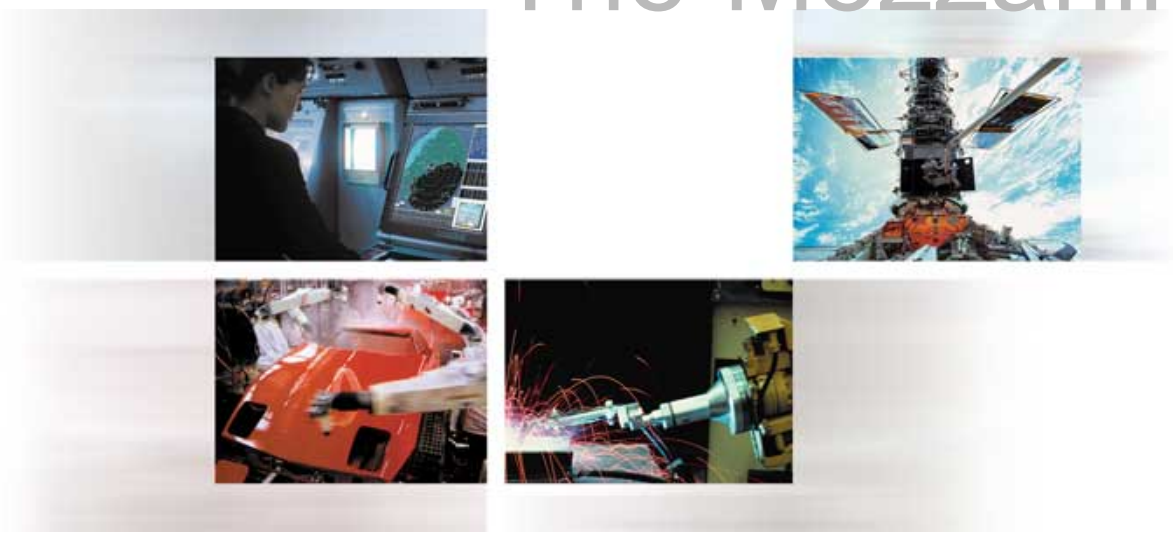
Communication

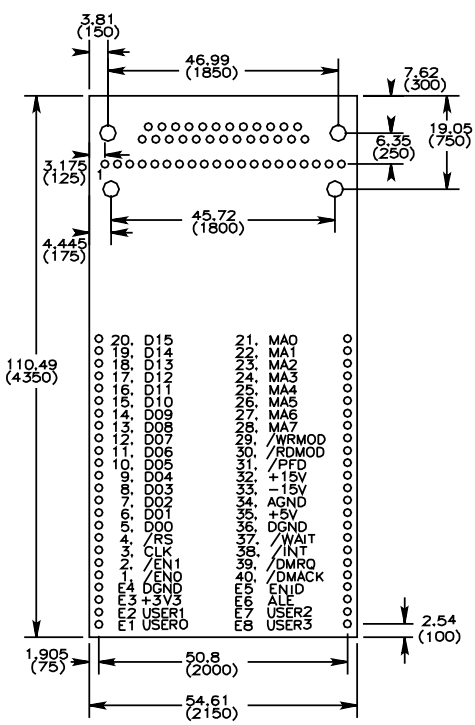
Counter/Special

Motion Controller

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.

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.

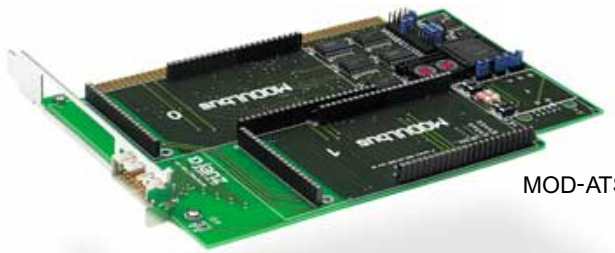
Simple to use
All this together makes the difference in the MODULbus concept. High functionality, simple to use and short design-in phases save important development time and guarantee a shorter time gap between design idea and end-product.

MOD-ATS

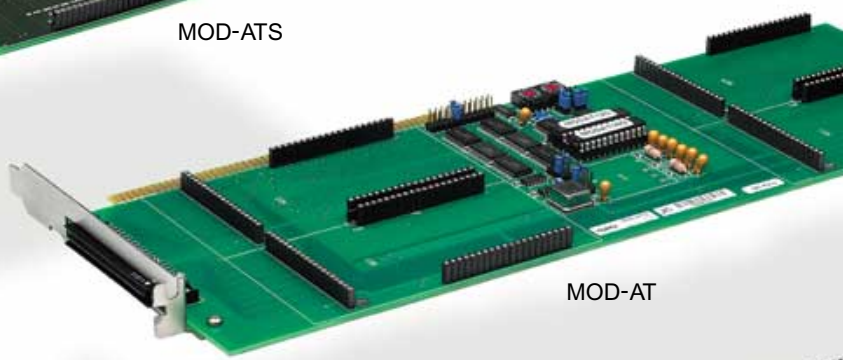
- non-intelligent ISA bus carrier board with two MODULbus+ sockets
- extended height short form 16 bit card
- front panel connector of MODULbus socket 0 available at ISAbus bracket
- I/O connector of MODULbus socket 1 available on 16-pin flat cable connector at panel bracket
- only one ISAbus slot occupied
- 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

MOD-PCI

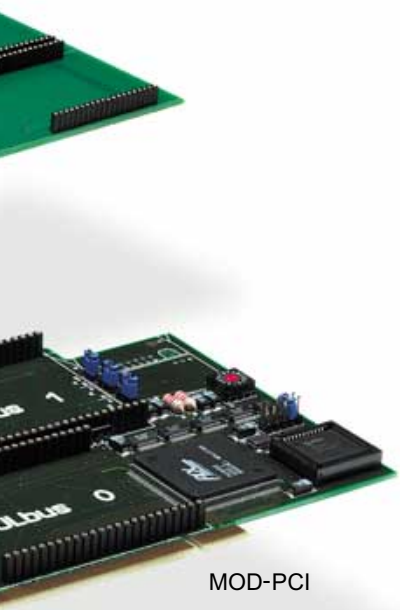
- non-intelligent PCI carrier board with two MODULbus+ sockets
- extended height short form factor
- 32 bit PCI 2.2 target interface (PLX 9030)
- 3.3V / 5V PCI interface
- only one PCI-bus slot occupied
- front panel connector of MODULbus socket 0 available at PCI bus bracket
- I/O connector of MODULbus 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

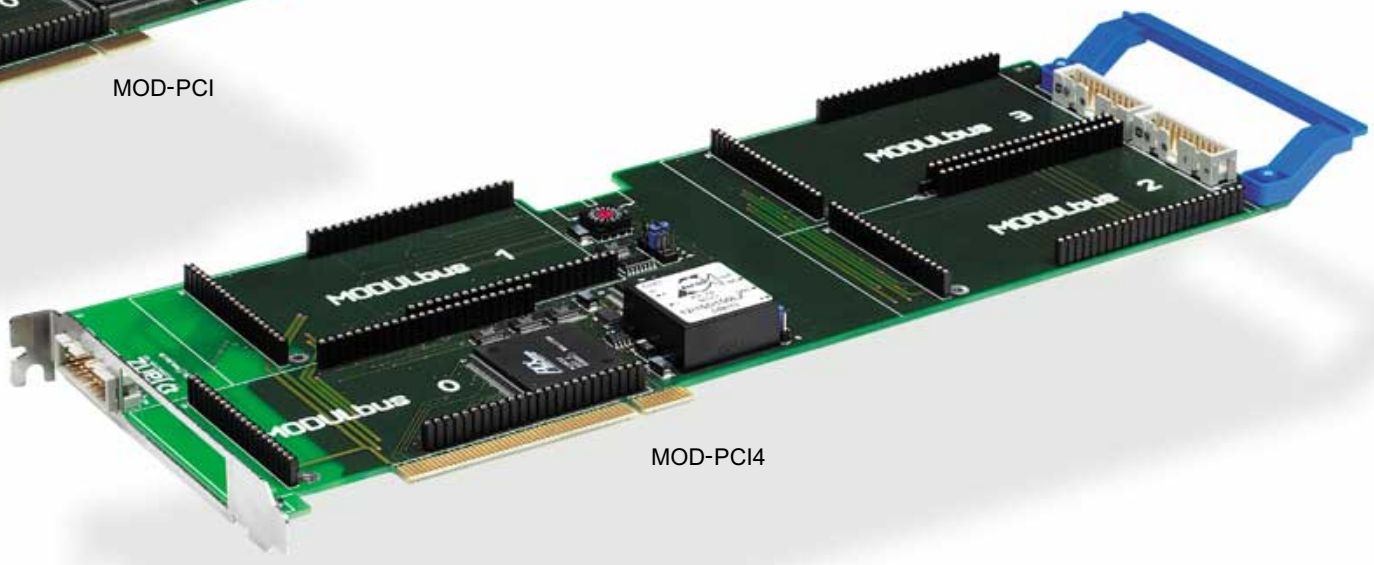
PCI Carrier Boards

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

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

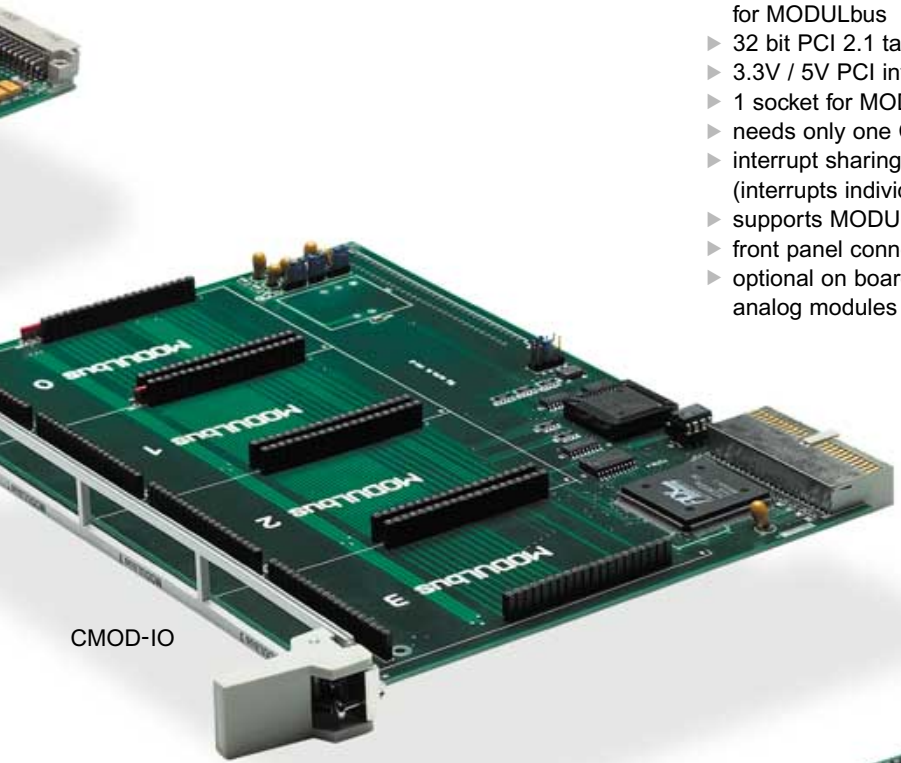
CMOD-IO

- 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

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

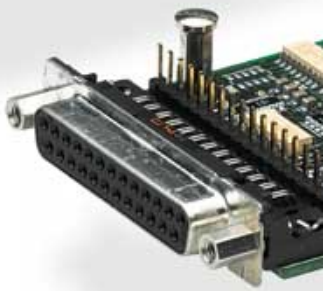
VMOD-BE20

- 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

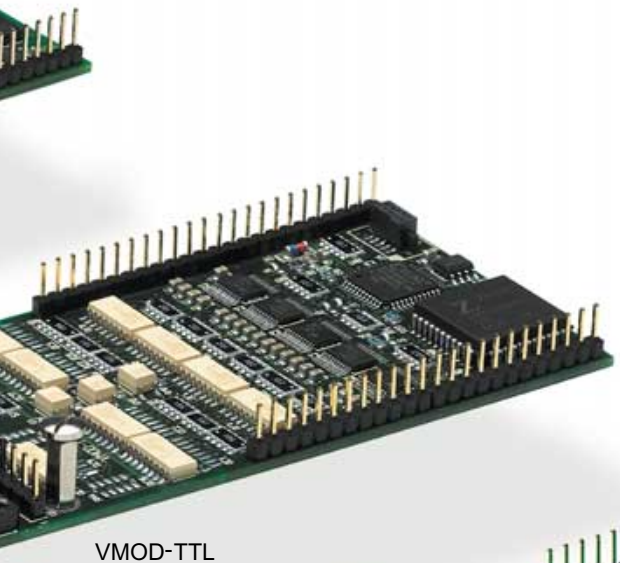
VMOD-TTL

- 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

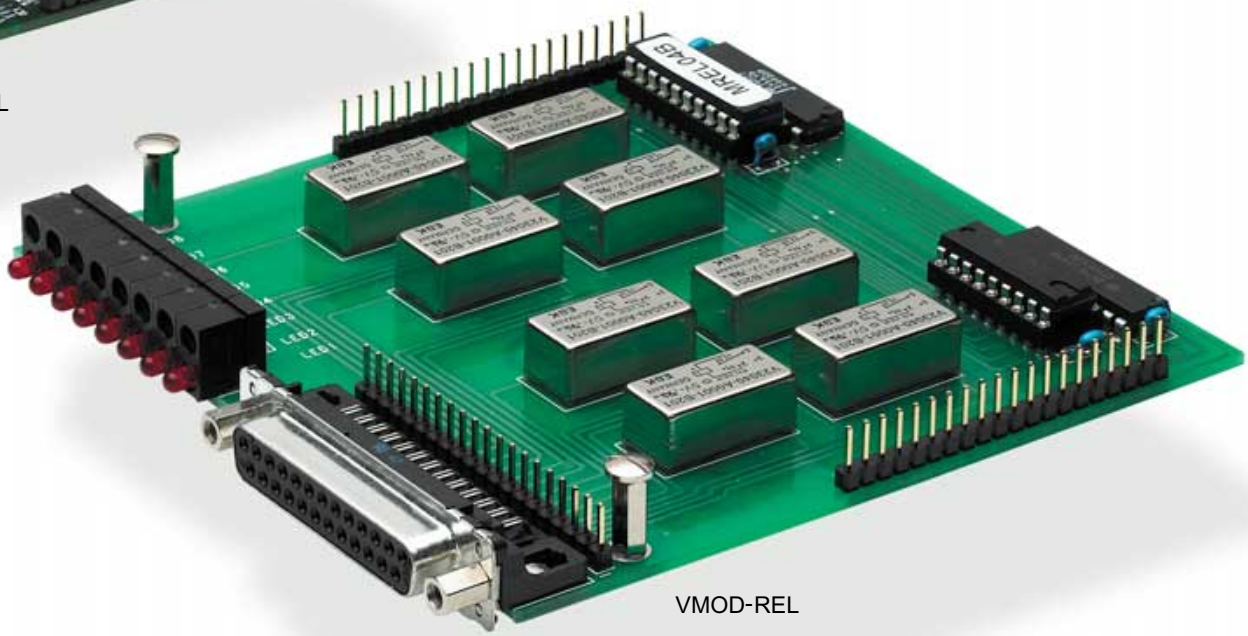
VMOD-TTL · VMOD-REL
Digital I/O Modules

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

VMOD-8E8 / VMOD-8E16

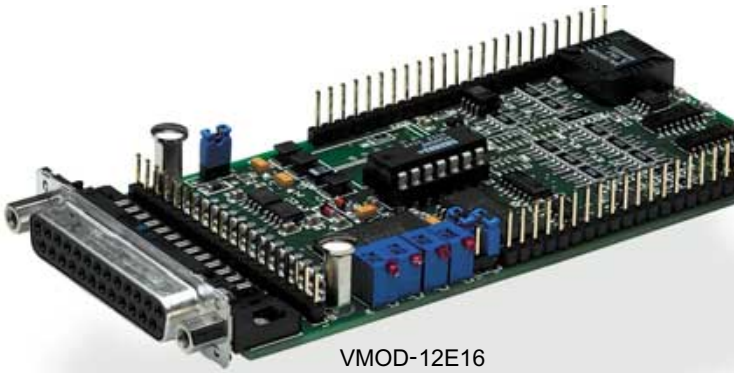
- 16 single-ended or 8 differential analog inputs
- 8 bit ADC with integrated Sample & Hold
- input ranges 0 – 5V, 0 – 10V, ±2.5V, ±5V, ±10V
- sampling rate max. 1 MHz (conversion time 1 µs)
- interrupt by end-of-conversion
- 8 bit binary code format
- software drivers for various operating systems available

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

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

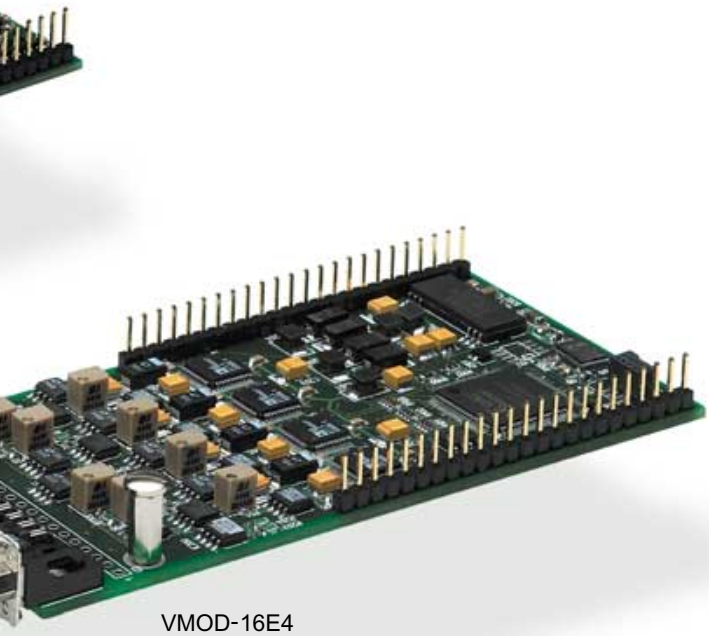
VMOD-12A8 • VMOD-16A2

VMOD-12A8

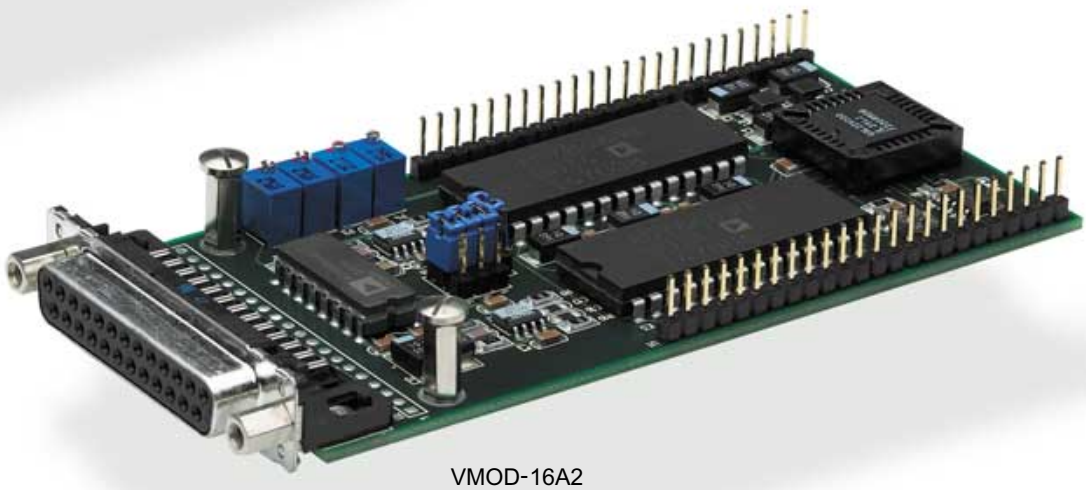
- high precision analog output module
- 8 independent channels
- 12 bit resolution and linearity
- sampling rate max. 333 kHz (conversion time 3 µs)
- output voltages ±10V, 0 – 10V
- max. 25mA output current
- double-buffered digital inputs
- software drivers for various operating systems available

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

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

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

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 seriel line connection
- 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

- fieldbus-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

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

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-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-INC2

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

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

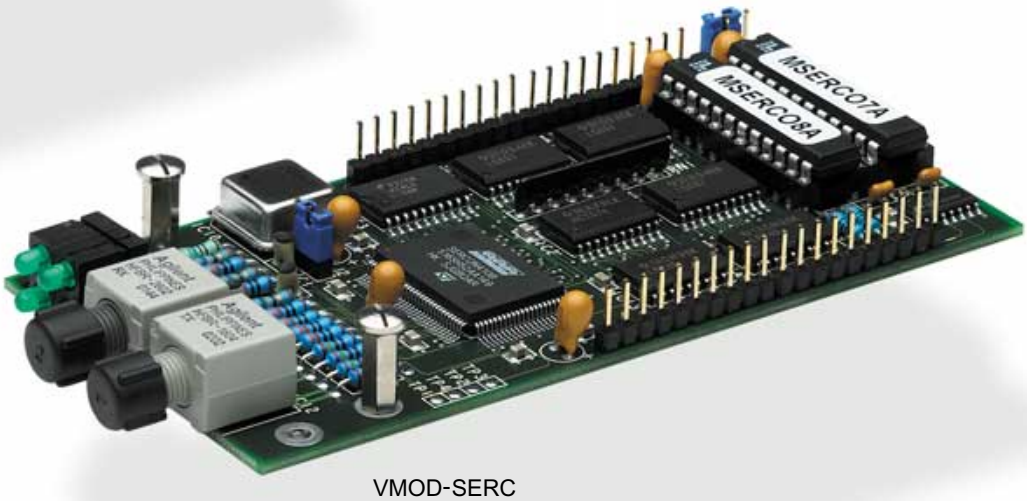
VMOD-MTC·VMOD-MTC2·VMOD-SERC

Motion Controller Modules

VMOD-SERC

- data and clock regeneration
- monitoring of the signals
- IEC61491 cycle times between 65s and 65ms
- modulation of power of the optical transmitter diode
- automatic transmission of synchronous and data telegram
- automatic service channel transmission
- supervision of the communication phases and all telegram times
- software drivers for various operating systems available

VMOD-MTC2



VMOD-SERC

Industrial PC Systems

ENDEAVOUR

DISCOVERY

CHALLENGER

ATLANTIS

Janz IPC Systems

ATLANTIS

CHALLENGER

DISCOVERY

ENDEAVOUR

Embedded PC Systems

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. New family members are the Embedded PC systems which comes in different forms and with different specifications.

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 Embedded and 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 Embedded and

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.

Industrial PC Systems

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
19" Rack-Mount Systems with up to 6U

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 (h x w x d) 380 x 130 x 310 mm. But it can be modified if necessary.

CHALLENGER
Wall-Mount System

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.

DISCOVERY

Panel PC with up to 17"

Display and Touchscreen

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.

ENDEAVOUR
Space saving

Shoebox System

Embedded PC Systems
High-Performance

The smallest PC systems available at Janz Automationssysteme AG are embedded PC systems for individual customer applications. Janz is able to deliver different systems with different specifications. So all special purposes of customers can be fit.
This is not only the hardware design of different standardized or customer-specific housings.
Also software developments for different operating systems are possible.
Most systems comes with different expansion slots so extensions with special boards can easily being installed into the chassis.

- processor types: AMD …lan SC520, Geode GX1, VIA C3-400 or Intel Celeron 400
- memory with up to 256 MB RAM
- connectors for keyboard, mouse, VGA
- serial ports for RS232/422/485
- up to two 10/100 MBit/s Ethernet ports
- one or two USB ports
- extension slots: PCcard (PCMCIA), PC/104 or PCI
- bus connections for CAN bus
- analog or digital I/O ports by different systems
- Compact Flash socket for small storage solutions
- hard disk drive bays for large storage solutions
- operating systems: Windows, Linux, QNX, others on request
- housings are available in different forms and colors

Please contact Janz office for your special embedded PC system.

Smallest Computing Systems

The 21st Century System Bus

VMEbus

VMEbus CPU

Industrial I/O

Serial I/O

VMEbus Special

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.

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.

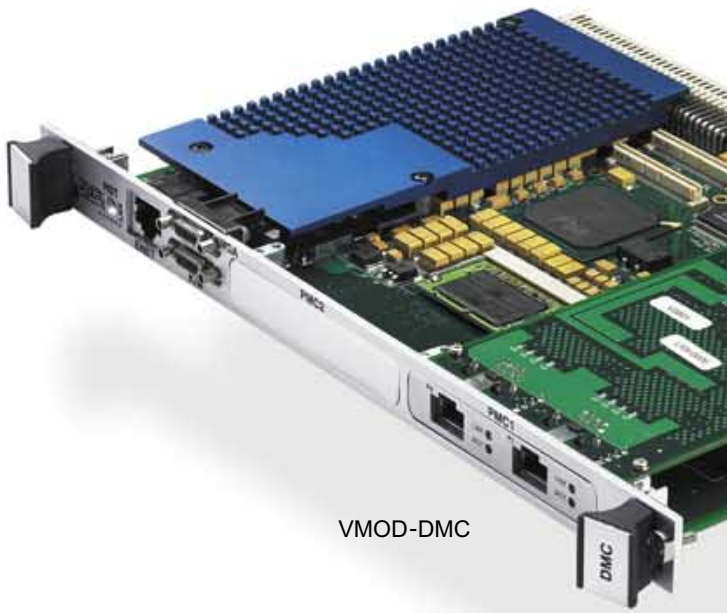
C-language libraries may also be included as examples. The license also includes free telephone support to get you going quickly. C-source code for all drivers is available for purchase on request. Please contact the Janz office for details.

VMOD-DMC · VMOD-P5

High-performance VMEbus

VMOD-DMC

- Socket 370 processor with Intel Celeron or Intel Pentium III with 1.2 GHz
- Intel 815E chipset
- built-in 3D Graphics with resolutions up to 1600 x 1200
- single-slot VMEbus operation with on-board Compact Flash disk for bootable mass storage
- SO-DIMM module for 3.3 V PC133 SDRAM of up to 512 MB
- Tundra Universe IID PCI-VMEbus interface provides 64-bit
- Full Slot 1 (system controller) functions provided
- two PMC expansion slots available on DMC
- I/O is routed out to the P0 and P2 connectors on the VMEbus
- optional three-PMC carrier supports four PMC cards in two-slot configuration with the DMC (three-slot configuration with Transition Module)
- two Intel 82559 single chip Ethernet controllers, one port accessible at the front panel while the other is routed to the P2 connector on the VMEbus
- 10BaseT/100BaseTX support, full duplex
- Primary Ultra DMA IDE interface with improved transfer rates is accessible from an on-board 44-pin header
- Compact Flash connector for on-board booting via flash based and mechanical storage
- Floppy drive controller, with support for drives up to 2.88 MB
- PMC I/O (one site is routed to the outer rows of P2 connector while the other site is routed to the P0 connector)
- Rear I/O interface board provides industry standard connectors for all rear I/O
- Transition Module requires one additional slot for a two-slot configuration with the DMC, including floppy or CD-ROM drive and hard drive (includes a front panel COM1 connector)
- Board Support Packages (BSP) are available for Windows NT/2000, Linux, QNX, VxWorks
- additional software available upon request

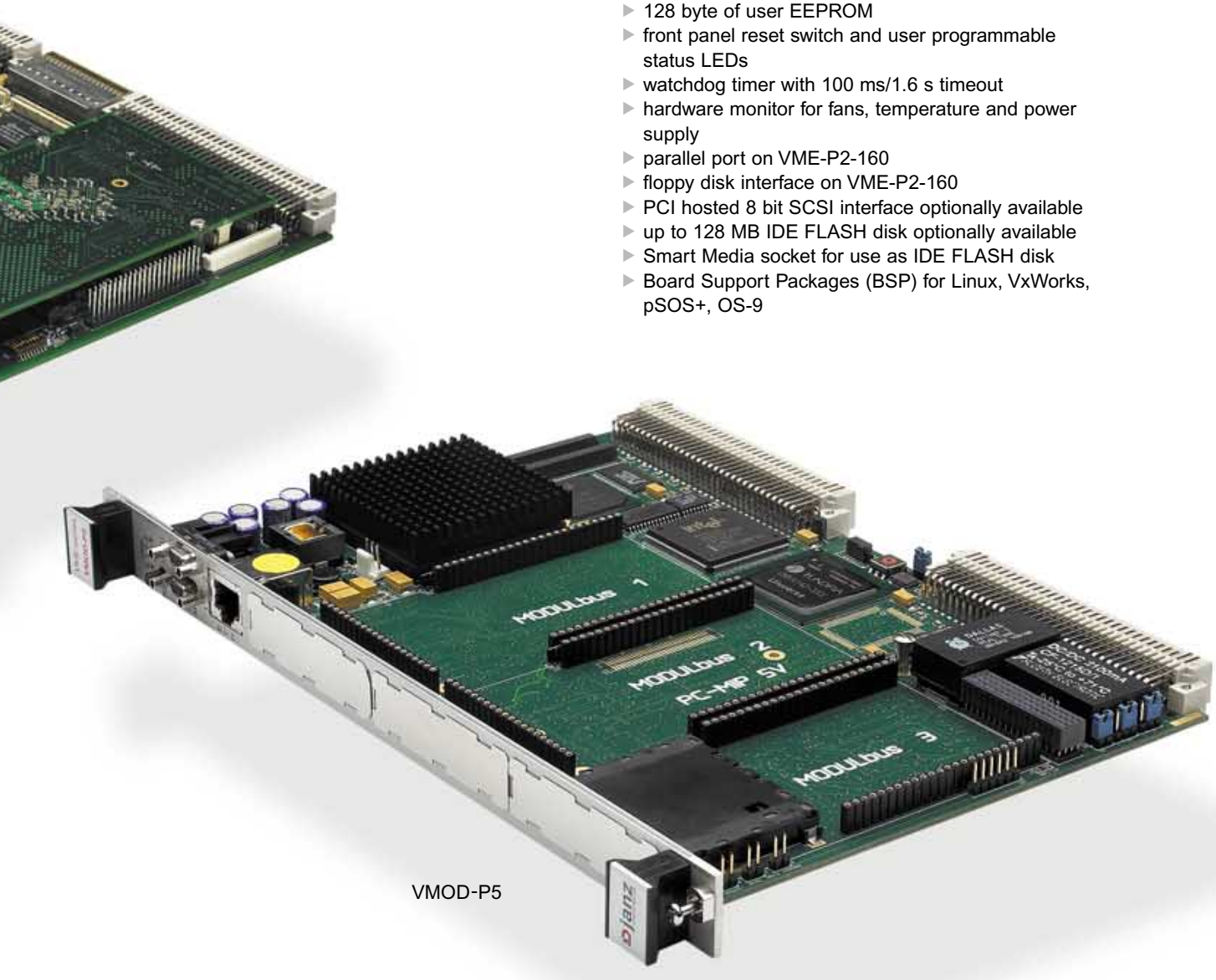


VMOD-DMC

Computer

VMOD-P5

- single slot systems (4TE)
- Intel Pentium with 133 MHz, passive cooling
- Intel 82430HX system controller (DRAM and cache control, PCI bus bridge)
- 64 bit CPU bus (DRAM and L2 cache)
- up to 128 MB DRAM
- Intel 82371SB (PIIX3) PCI bus to ISA bus bridge (contains IDE interface, USB port, DMA controller)
- interrupt controller and timer units
- 512 kB L2 cache
- 1 MB boot FLASH, expandable to 2MB
- VME64 interface with Tundra UNIVERSE bridge
- 3 MODULbus I/O sockets, 4 additional sockets with VMOD-IX expansion board (8 TE solution)
- PCI bus hosted 10/100 MBit/s Ethernet interface with 10/100 BaseT front panel connection
- PC compatible RTC with extended NVRAM (114 bytes + 4 kB)
- 2 x RS232 NS16550 compatible asynchronous serial channels with front panel connection
- 128 byte of user EEPROM
- front panel reset switch and user programmable status LEDs
- watchdog timer with 100 ms/1.6 s timeout
- hardware monitor for fans, temperature and power supply
- parallel port on VME-P2-160
- floppy disk interface on VME-P2-160
- PCI hosted 8 bit SCSI interface optionally available
- up to 128 MB IDE FLASH disk optionally available
- Smart Media socket for use as IDE FLASH disk
- Board Support Packages (BSP) for Linux, VxWorks, pSOS+, OS-9



VMOD-P5

VMOD-60FW/40FW

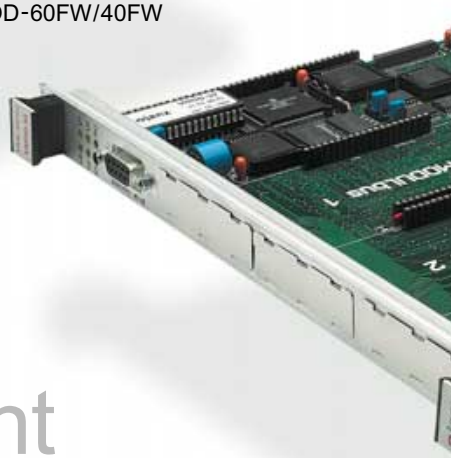
- double Eurocard form factor (6U)
- A32/D32 VMEbus master/slave interface
- VIC068 VMEbus interface controller
- -3 MODULbus I/O sockets, 4 additional sockets with VMOD-IX expansion board (8 TE solution)

VMOD-60FW/40FW

FireWire® Connection for VMEbus

- MC68EC060/040 CPU with 8 kB of cache, clocked at 50 MHz/25 MHz or 66 MHz/33 MHz
- MC68LC060/040 CPU with MMU or MC68060/040 with MMU and FPU optionally available
- up to 32 MB dual-ported DRAM
- up to 2 MB FLASH EPROM
- 2 MB battery buffered SRAM optionally available
- battery buffered realtime clock with 2 kB SRAM (up to 32 kB optionally available)
- IEEE 1394 FireWire® interface with 3 external 1394 connectors
- FireWire® data transfer rate up to 200 MBit/s
- up to 4 RS232 serial ports
- watchdog timer
- 6 programmable 16 bit timer

VMOD-60FW/40FW



VMOD-32

MC68332 based Intelligent VMEbus I/O Controller

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-60/40

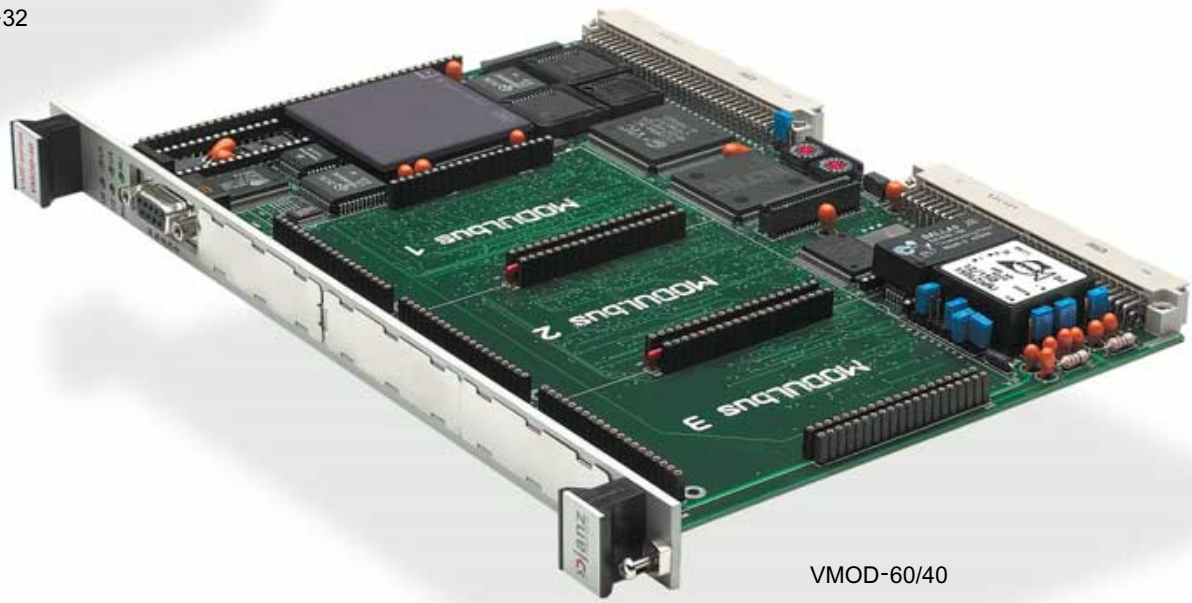
- double Eurocard form factor (6U)
- A32/D32 VMEbus master/slave interface
- VIC068 VMEbus interface controller
- 3 MODULbus I/O sockets, 4 additional sockets with VMOD-IX expansion board (8 TE solution)
- MC68EC060/040 CPU with 8 kB of cache, clocked at 50 MHz/25 MHz or 66 MHz/33 MHz

VMOD-60/40

MC68060/040 based High-performance VMEbus Computer

- MC68LC060/040 CPU with MMU or MC68060/040 with MMU and FPU optionally available
- up to 32 MB dual-ported DRAM
- up to 2 MB FLASH EPROM
- 2 MB battery buffered SRAM optionally available
- battery buffered realtime clock with 2 kB SRAM (up to 32 kB optionally available)
- up to 4 RS232 serial ports
- watchdog timer
- 6 programmable 16 bit timer

VMOD-32



VMOD-60/40

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)

- 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

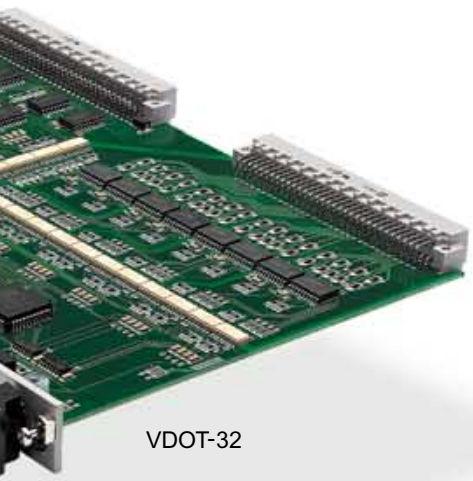
VDOT-32

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

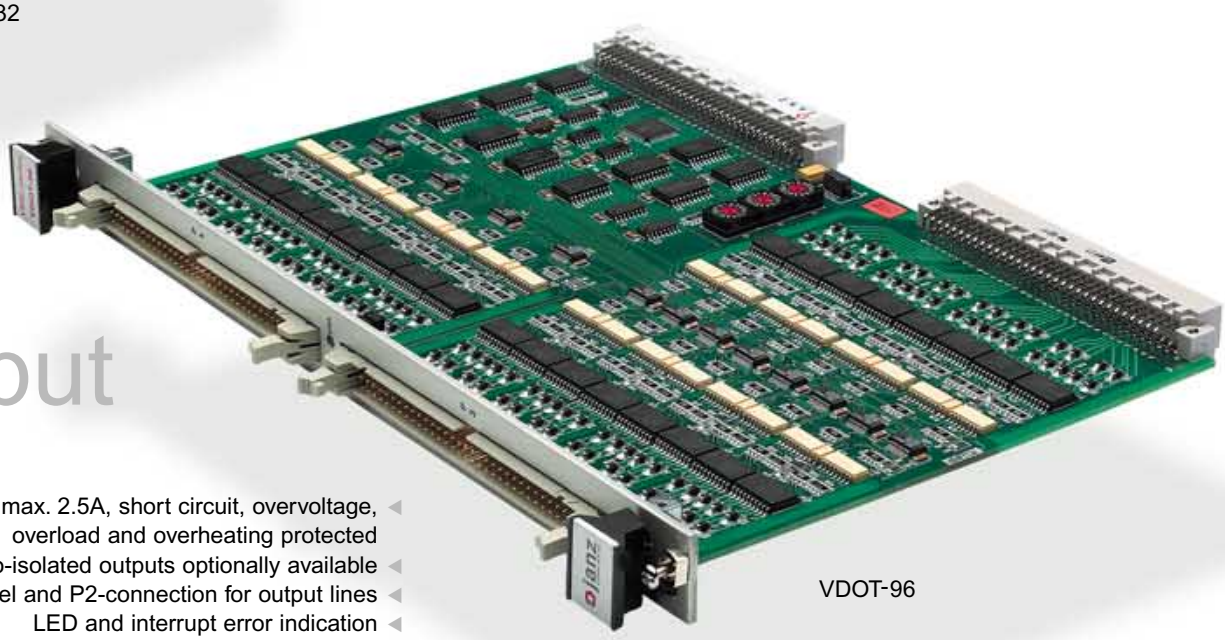
VDOT-32

32-Channel Digital Power I/O

- counter/timer with trigger/gate activation
- change-of-state and pattern recognition interrupt
- front-panel and P2 connection for input lines



VDOT-32



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

VDIO-32

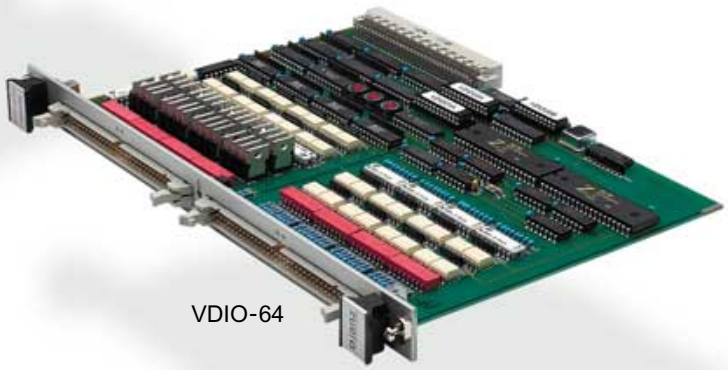
- double Eurocard form factor (6U) with VMEbus interface
- 32 opto-isolated in-/outputs
- voltage ranges 5V/12V/24V

VDIO-32

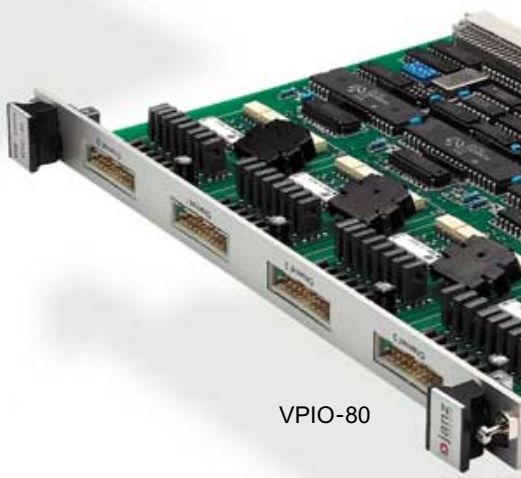
32-Channel Digital Output

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



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

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

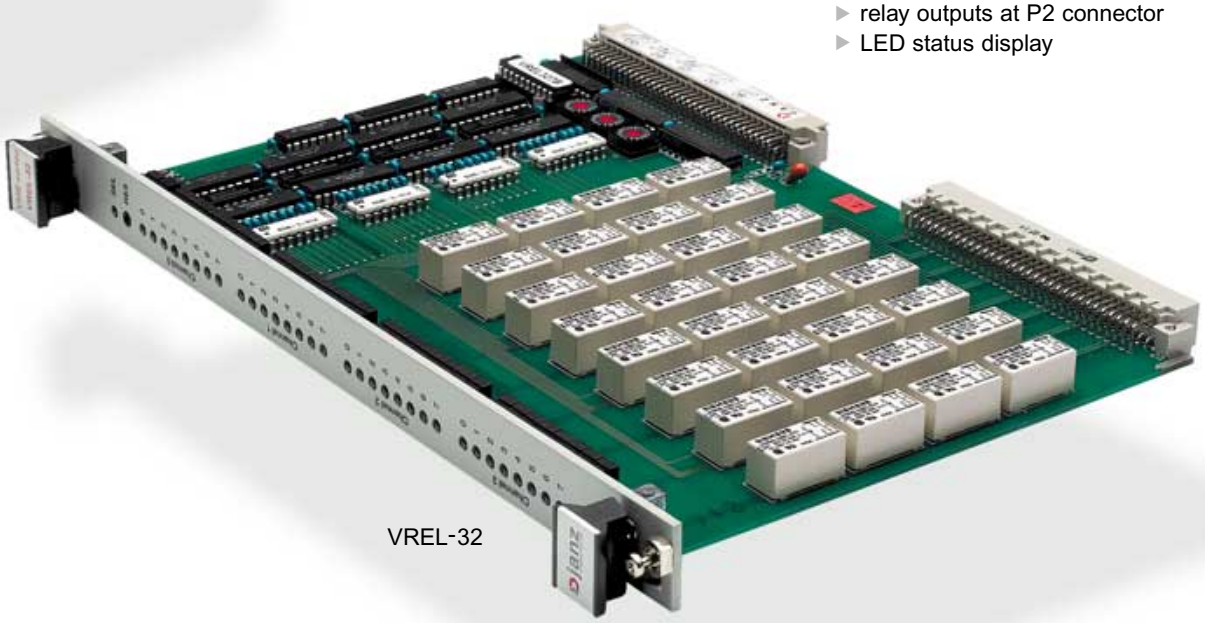
VREL-32

- 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

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

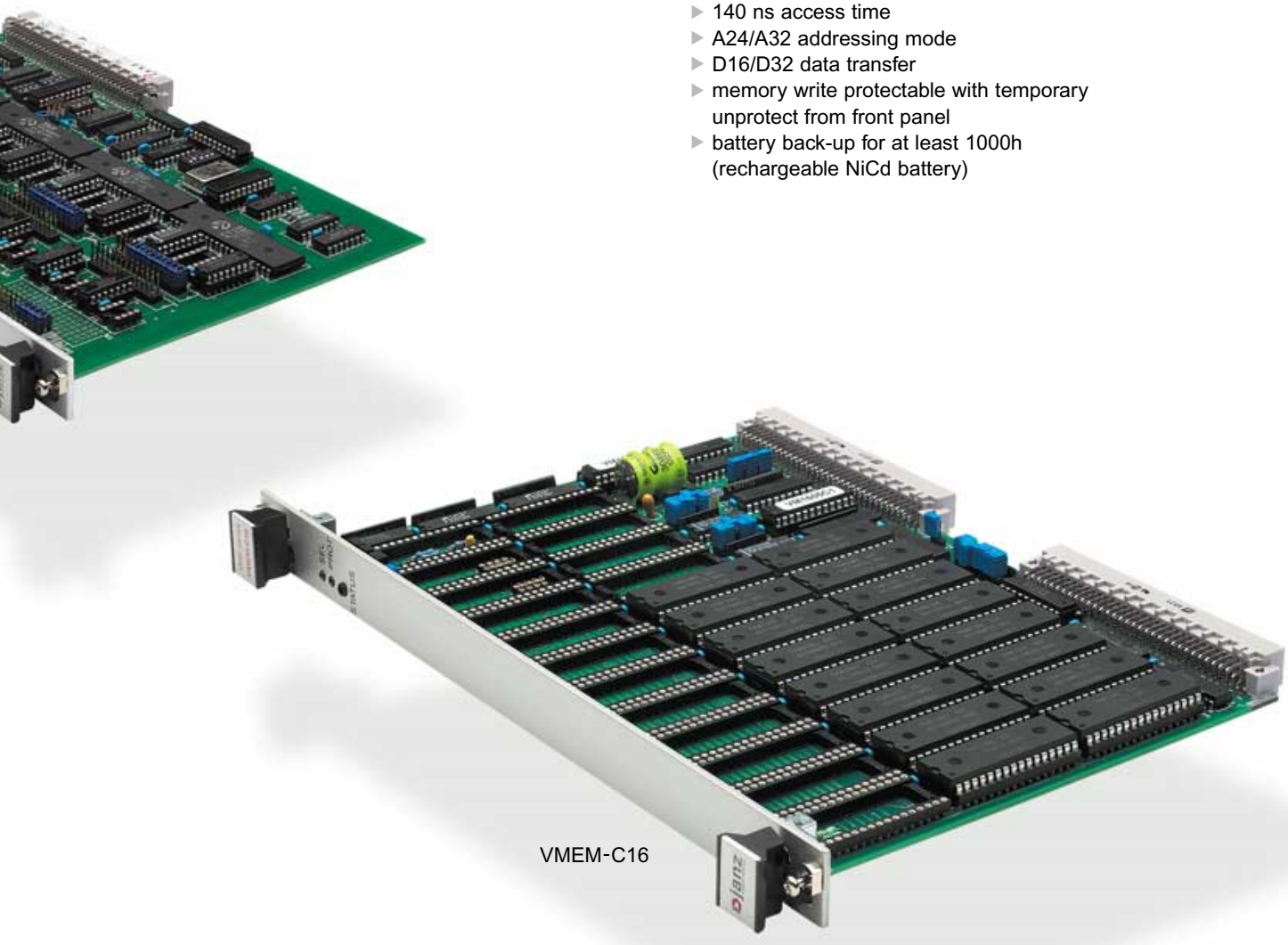
VMEM-C16

- 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)



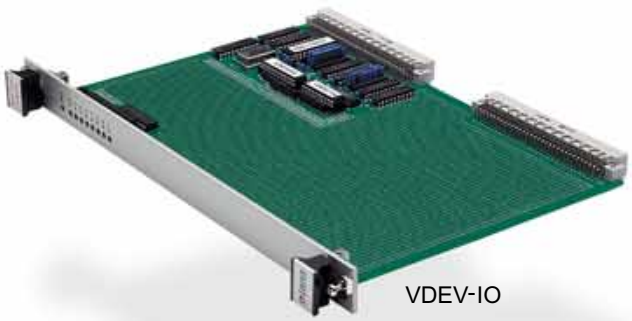
VMEM-C16

VDEV-IO

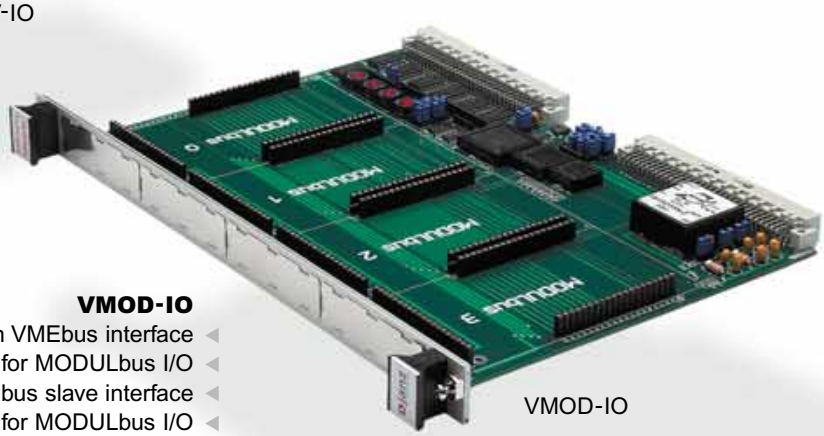
VDEV-IO
VMEbus Prototyping

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

VMOD-IO2

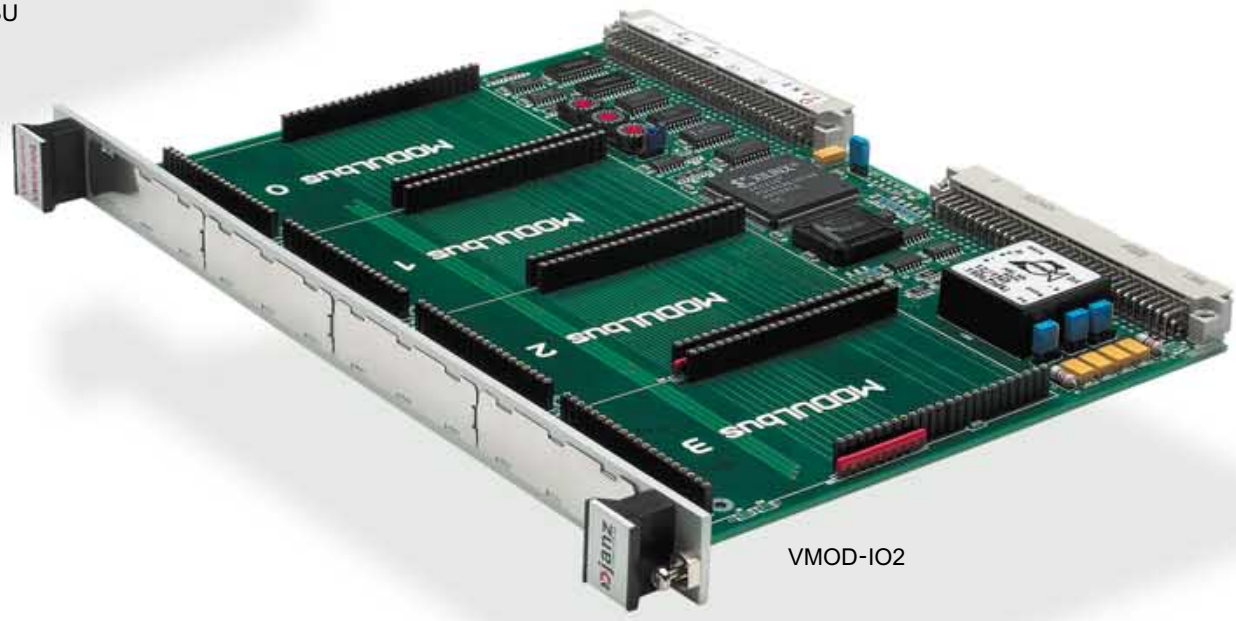
- double Eurocard form factor (6U) with VMEbus interface
- non-intelligent carrier board for MODULbus I/O
- A16/D16, A24/D16 and A32/D16 VMEbus slave interface
- 4 sockets for MODULbus I/O
- MODULbus+ extension
- performance improvement through write buffer
- VME64x compliant CR/CSR for software board 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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