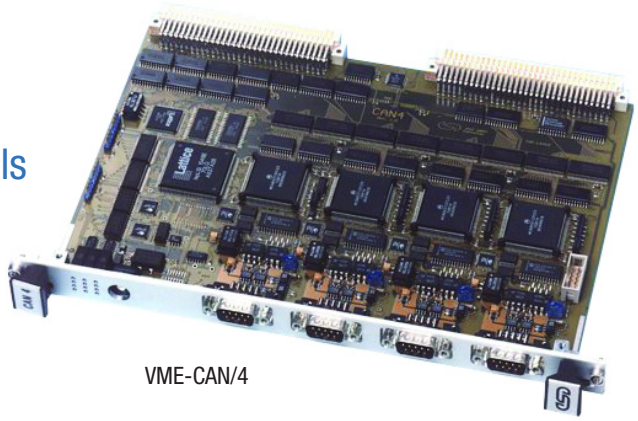
esd electronics, inc.

HARDWARE • SOFTWARE • ENGINEERING

VME-CAN4

Intelligent Board for 4 CAN or DeviceNet Channels



VME-CAN/4

Intelligent CAN Controllers
- Full CAN controller by integrated firmware for any identifier
- Each channel with separate micro controller and its own CAN controller
- Lossless data exchange with VMEbus via Shared RAM and FIFOs

CAN Layer
- CAN layer according to ISO 11898 with 9-pole DSUBs or DeviceNet interface
- Data transfer rate up to 1 Mbit/s
- Each channel opto- isolated

CAN Protocol Support
- CAL/CMS and CANopen
- DeviceNet
- SDS Smart Distributed System
- Multi-Net support

High Integration

The VME-CAN4 includes on a VMEbus 6U board 4 complete, independent CAN interfaces to the VMEbus and needs one slot.

Intelligent Control

Each interface is equipped with its own micro controller of type 68331 at 20 MHz clock frequency. Each micro controller has a working memory of 256 kbytes available. After a RESET, the micro controller program code is loaded from the local Flash EPROM. Program updates can be loaded into the Flash EPROM via the VMEbus.

The CAN data transfer from and to the VMEbus is performed via a Shared RAM with a capacity of 512 kbytes and FIFOs. Received Rx data generates a local interrupt processed by the belonging micro controller. It stores the data in the Shared RAM and the identifier is stored in the FIFO (FIFO to master).Then it generates a VMEbus interrupt. An individual interrupt vector generates for each of the four CAN channels.

To transmit CAN data, the VMEbus master enters the data into the Shared RAM. With this, automatically a pointer to the identifier is stored in the FIFO (FIFO to slave). The belonging micro controller reads FIFO and RAM and starts the data transmission.

High-Speed CAN Controller

The included CAN controller of type SJA1000 supports the standard CAN protocol (11 bits identifier) as well as the extended CAN protocol (29 bits identifier). The physical CAN layer is according to ISO 11898 for a maximum baud rate of up to 1 Mbit/s. The baud rate programming can range between 10 kbits/s and 1 Mbit/s via the VMEbus. The CAN channels are electrically isolated from each other as well as from the VME section. Four DC/DC converters perform the local supply of the four channels. With electrical isolation as a standard, esd guarantees a transfer rate of 1 Mbit/s for a bus length of 37 m, if the other CAN participants are equipped with equivalent CAN interfaces.

9-pole DSUB female connectors at the front panel perform connection of the CAN nets. For other layers or connector standards, a piggyback interface is available.

LED Display

An LED display at the front panel shows the states of the CAN controller and of the micro controllers of the particular channels, as well as the general board state.

Reliable CAN Protocol

The extremely error-tolerant CAN protocol (Hamming distance = 6) is outstandingly suitable for the construction of decentralized I/O nets, where a safe and manufacturer independent

growing with the challenge

communication protocol is necessary because of the variety of the applications. The CAN protocol includes a standardized transfer frame and a high transfer rate.

Decentralized Communication

An essential advantage of the CAN protocol is its capability of self-arbitration and its multi master capability. With this the user can interconnect in a CAN net various sensors, actuators, CAN I/O modules as well as VMEbus controllers, PCs, PLC modules or stand-alone controllers.

Software Support

The integrated firmware enables communication opportunities at OSI layer 2 or with higher layer CAN protocols.

The Shared RAM interface as well as the FIFO interface to the VMEbus section offers use of the board with various operating systems at layer 2 can.

Drivers for VxWorks, LynxOS and Linux are available.

Basic functions, such as CAN monitoring or automatic interfacing of CAN nets are easy to parameterize.

The standardized higher layer protocols CAL/CMS and CANopen are already available as master or slave package for nearly all operating systems. Moreover, complete software packages for SDS master operation and for DeviceNet are available. The firmware interface of the VME-CAN4 is compatible to the firmware of the VMECAN2.

Technical Specifications:

VMEbus:	
Access:	A32, A24: D8, D16, D32, ADO, UAT, RMW
Base address:	A16 - base address selectable via geographic address (like VME64) or via coding switches, A24/ A32 base addresses programmable for A16/D16 access, the board covers 2 Mbytes
Address modifier:	Standard supervisory and non-privileged data access, extended supervisory and non-privileged data access, short supervisory and non-privileged access
VME compatibility:	IEEE 1014 rev. D
FIFO to master:	1 kwords
Shared RAM:	512 kbytes, optionally 2 Mbytes, organization: 32 bits data width
Microcontroller sections of the four CAN channels:	
Microcontroller:	MOTOROLA 68331, 20 MHz
SRAM:	256 kbytes
FIFO to slave:	4 kbytes
Flash EPROM:	256 kbytes, organization: 16 bits data width, (only 1x existing) contains program code of the micro controllers
CAN:	
CAN controller:	SJA1000 - CAN2.0A/CAN2.0B
Physical layer:	Differential, ISO 11898, option: DeviceNet
Baud rate:	Max. 1 Mbit/s, at a max. bus length of 37 m (appropriate interface required)
Electrical Isolation:	Against VMEbus and between channels, by opto-couplers and DC/DC converters
General:	
Temperature:	0...60o C
Humidity:	Max. 90 %, non-condensing
Connector types:	P1, P2: DIN 41612-C96 P680, P780, P880, P980: DSUB9 connector or DeviceNet connectors (option)
Board size:	160 mm x 233 mm
VME dimensions:	6 U height, 1 slot width
Power supply:	Each one DC-to-DC converter for power supply of one CAN channel
Power consumption:	P1: 5.0 A +5 V ±5 %

Order Information:

Designation		Order no.
VME-CAN4	Intelligent CAN interface board with 4 independent CAN channels 11 and 29 bits CAN identifier (SJA 1000), integrated firmware with CAL/CMS and CANopen support	V.1408.02
VME-CAN4-2	As V.1408.02, but only 2 CAN channels	V.1408.04
VME-CAN4-1	As V.1408.02, but only 1 CAN channel	V.1408.06
VME-CAN4-64	Option: P1 and P2 designed as 160-pole VMEbus connector (like VME64)	V.1408.12
VME-CAN4-VxWorks	VxWorks object license	V.1408.15
VME-CAN4-Linux	Linux object license	P.1408.58
VME-CAN4-LynxOS	LynxOS object licenses	P.1408.53
VME-CAN4-Co	CANopen master/slave obj. lic	P.1408.60
VME-CAN4-DN	DeviceNet master object license	P.1408.63

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