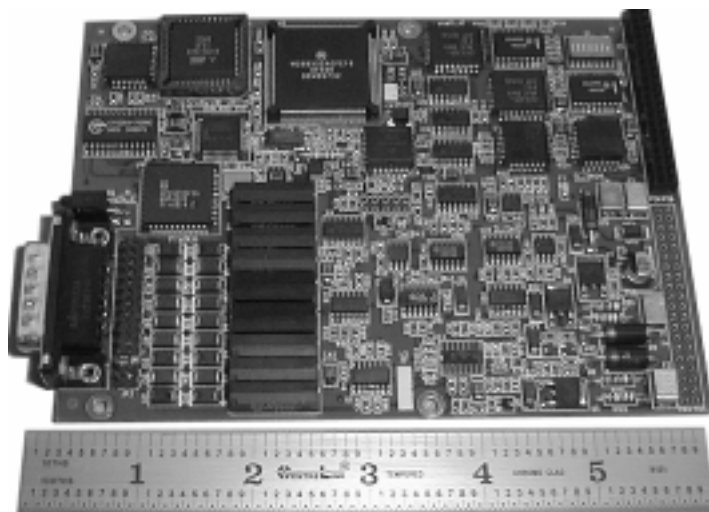


AVT-512 - M-Module Interface for Automotive Networks



Vehicle Networks

The number and types of communications networks in motor vehicles has increased dramatically in recent years. Many different network protocols can be found in wide spread use and others are gaining in popularity. Nearly all of these protocols are incompatible with the others.

Until now, VXI based data acquisition and test systems had to rely on serial (RS-232) interface units to connect to the different vehicle based networks. But serial devices are slow, their bandwidth is limited, and they are difficult to integrate into a VXI based system.

The AVT Solution

The AVT-512 M-Module Interface is a very small single unit solution for communicating with all of the most popular automotive network protocols found in-use today or destined to be found in tomorrow's vehicles.

Key Features

- Double wide M-Module.
- Electrical isolation (rev. B).
- More than one can be installed in a single VXI chassis slot.
- Very small and powerful.
- Complete unit, nothing else to buy or install.

Networks Supported

- CAN (Controller Area Network) [2-wire and GM Single Wire].
- J1850 VPW [GM Class 2 and Chrysler].
- J1850 PWM [Ford SCP].
- Keyword Protocol 2000 [ISO 14230 and 9141].
- UBP (UART Based Protocol) [Ford].

The Agilent E2251A "C" size M-Module carrier can accommodate two AVT-512 units; with two internal M-Module slots remaining available. This provides the system designer with two independent and powerful vehicle network interfaces in a single VXI chassis slot.

AVT-512 Hardware - Network Interface

The AVT-512 M-Module Interface performs the necessary protocol conversions and all required communication translations permitting the VXI based test system to easily and rapidly communicate with the selected vehicle based network.

The AVT-512 M-Module Interface supports all of the current popular network protocols. It is a complete unit with no additional modules or parts to purchase or install.

SAE standard J1850 specifies a Variable Pulse Width (VPW) version with a bit rate of 10.4 kbits/sec. and a Pulse Width Modulation (PWM) version with a bit rate of 41.6 kbits/sec.

The AVT-512 supports transmit and receive operations in VPW mode at 4 times the normal rate. (4x operations may be required for some GM Class 2 modes.)

The AVT-512 is Ford SCP compliant (J1850 PWM).

Keyword Protocol 2000 [ISO 14230] and ISO 9141 specify a maximum bit rate of 10.4 kbits/sec (special modes permit operations at 115.2 kbaud). Keyword Protocol 2000 also requires one of three 'Initialization modes' be used to establish communications between on-board computers and off-vehicle test equipment. The AVT-512 supports all of these modes of operation.

CAN (Controller Area Network) support is provided for any baud rate up to 1 Mbaud. The AVT-512 provides both a 2-wire physical layer and the new GM Single Wire CAN (SWC) [SAE J2411] physical layer. Communication speed (baud rate) and other network operational parameters are fully user programmable. Additionally, the AVT-512 supports both CAN 1.0 and 2.0B versions on the same network, at the same time.

Ford's UBP (UART Based Protocol) has a physical layer that is similar to ISO 9141 but operates at 9600 baud and has several electrical, format, and timing requirements that are unique.

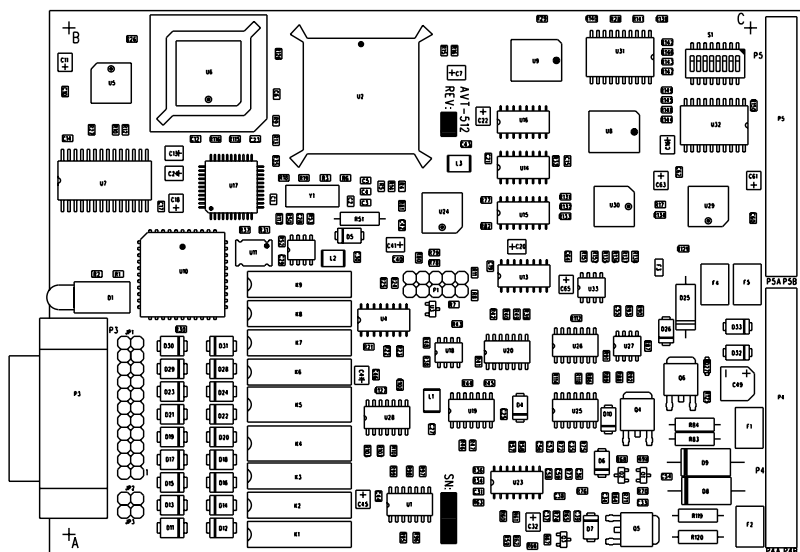
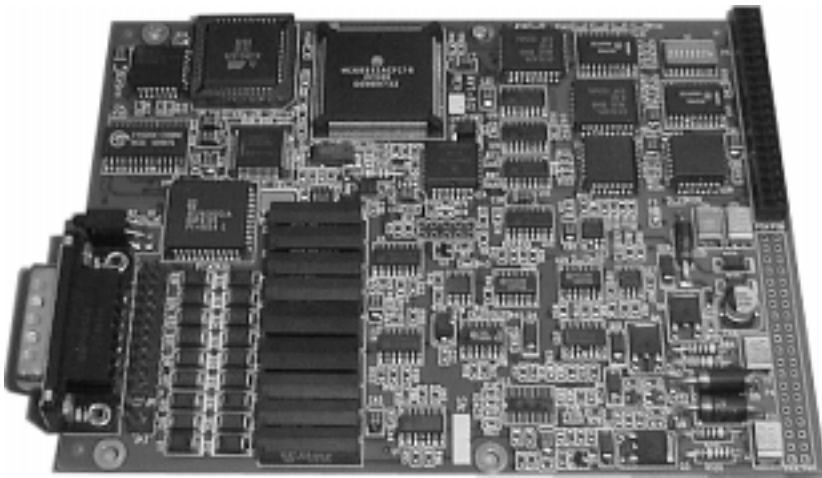
All of these protocols are different and most are not compatible.

Switching the AVT-512 between any of these protocols is easily accomplished via simple software commands.

The AVT-512 was designed to be connected directly to the subject vehicle and the host computer. Note that the AVT-512 M-Module Interface (rev. B) provides electrical isolation between the host system and the subject vehicle network.

AVT-512 Hardware - Host Interface

Communications between the AVT-512 and the host system is via two memory mapped hardware FIFOs as well as status and control registers. This architecture permits rapid transfer of data. The large FIFOs prevent data loss and reduce host loading by allowing the host to service the AVT-512 M-Module Interface when time permits (and not on-demand).



Software access to the AVT-512 is via direct register I/O. VXI Plug&Play drivers are under development. (Contact the factory for the latest information.)

The AVT-512 supports all three M-Module specification interrupt types (type A, B, and C). Additionally, the interrupt can be enabled or disabled through a simple software command. User software can utilize either interrupt or polling methods for servicing the AVT-512.

The AVT-512 utilizes FLASH technology. Field upgrades to firmware are possible without the need to remove the board from the system and no special hardware or tools are required. The latest version of firmware is always available upon request, by e-mail. Software to perform field updates to the AVT-512 FLASH memory is under development. (Contact the factory for the latest information.)

Power for the AVT-512 is provided by the host carrier board.

AVT-512 Accessories and Support

An OBD-II compatible cable (permitting direct vehicle connection) is also available. The hardware User's Manual containing technical information is included with the AVT-512.

All AVT equipment is warranted for one year from date of purchase. Prompt technical support is always available by e-mail or telephone.

Specifications

Specification: Conforms to ANSI/VITA 12, dated 1996.

Size: 148.26 x 106.24 x 12.00 mm (Overall).

Weight: 148 grams.

Voltage: +5 VDC from host.

+12 VDC from host.

+12 VDC, nominal battery, from vehicle, (diode isolated from host +12 VDC supply and jumper selected).

Power: 3 watts (nominal).

Host interface: Memory mapped, status/control register, two FIFOs.

Connectors: DA-15P to vehicle.

20 position per row, 2 row, M-Module connector to carrier board

(per ANSI/VITA specification). Only one connector is active.

Microcontroller: MC68332 @ 16 MHz (Motorola).

CAN device: AS82527 (Intel).

Information

Refer to our Web Site for the most up-to-date information including technical manuals, application notes, unit Commands and Responses, hardware and firmware revision status, and more.

Ordering Information

The AVT-512 interface board and documentation on disk

Order # 512-002

Accessories

OBD-II cable

Order # 101-002

Engineering Support Services

We provide engineering support services and custom engineering. These services are also available at your site (travel and related expenses are billed at actual costs).

Ordering Information

Engineering Support

Order # 101-007