VMIVME-6015
Quad-Serial Input/Output Interface Board

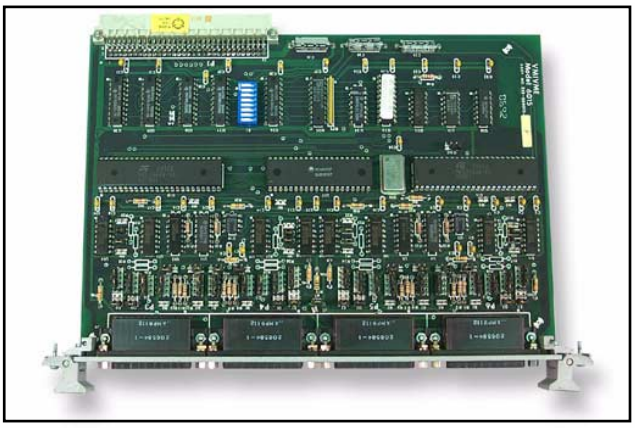
- A16:D8
- Four full-duplex channels
- Fully programmable synchronous/asynchronous operation
- RS-232C, RS-423, RS-422A, and RS-485 compatible
- 0 to 1 Mbaud data rate
- Self-test capability
- Programmable interrupt capability
- Modem control lines for each channel
- Uses four industry-standard 25-pin subminiature D connectors
- Double Eurocard form factor
- Four programmable baud rate generators
- Asynchronous features
  - — 5, 6, 7, or 8 bits/character
  - — 1, 1 1/2, or 2 stop bits
  - — Even, odd, or no parity
  - — Break generation and detection
  - — Parity, overrun, and error detection
- Synchronous features
  - — Compatible with byte-oriented protocols such as IBM BiSync
  - — Compatible with byte-oriented protocols such as HDLC and IBM SDLC
  - — Internal CRC generation
- Supports half-duplex 1 Mbaud RS-485 LAN (local area network)
- Sample software available

INTRODUCTION — The VMIVME-6015 Serial Input/Output (SIO) is a quad-channel multifunctional peripheral interface board, designed to satisfy a wide variety of serial data communications requirements in VMEbus systems. The basic function of the VMIVME-6015 is a serial-to-parallel, parallel-to-serial controller; however, it is software configurable so that its "characteristics" may be optimized for any given serial data communications application.

The VMIVME-6015 is capable of handling asynchronous protocols, synchronous byte-oriented protocols (such as IBM BiSync), and synchronous bit-oriented protocols (such as HDLC and IBM SDLC). This SIO Controller can also be used to support virtually any serial protocol for applications other than data communications (cassette or floppy disk interface, for example).

The VMIVME-6015 can generate and check CRC codes in any synchronous mode and may be programmed to check data integrity in various modes. The controller also has facilities for modem controls, and in applications where these controls are not needed the modem controls may be used for general-purpose I/O.

The VMIVME-6015 is designed with two MK68564 SIO dual-channel multifunctional peripheral circuits that support a self-test capability. When the loop mode bit is set in the command register, the loop mode is activated to support Built-in-Test functions.



Asynchronous features
— 5, 6, 7, or 8 bits/character
— 1, 1 1/2, or 2 stop bits
— Even, odd, or no parity
— x1, x16, x32, and x64 clock modes
— Break generation and detection
— Parity, overrun, and framing error detection

Byte synchronous features
— One or two sync characters in separate registers
— Automatic sync character insertion
— CRC-16 or CRC-CCITT block check generation and checking

Bit synchronous features
— Abort sequence generation and detection
— Automatic zero insertion and deletion
— Automatic flag insertion between messages
— Address field recognition
— I-field residue handling
— Valid receive messages protected from overrun
— CRC-CCITT block check generation and checking

SIGNAL CONDITIONING OPTIONS — The VMIVME-6015 Quad-SIO Board is designed to support a wide variety of signal conditioning options, such as EAI, RS-232, RS-422, RS-423, and RS-485. Jumpers are provided to allow the user to independently configure each I/O channel. In addition to the signal conditioning options listed above, each channel of the SIO Board may be configured as an RS-485 token passing network.

Ordering Options
November 11, 1996 800-006015-000 E
VMIVME-6015
For Ordering Information, Call: 1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859 E-mail: info@vmic.com Web Address: www.vmic.com Copyright © January 1986 by VMIC Specifications subject to change without notice.

SELF-TEST — The MK68564 SIO chip is designed with internal self-test logic that supports a loop test on each SIO channel. When the loop mode bit is set in the command register, the receiver shift clock input pin (RxC) and the receiver data input pin (RxD) are electrically disconnected from the internal logic. The transmit data output pin (TxD) is connected to the internal receiver data logic, and the transmit shift clock pin (TxC) is connected to the internal receiver shift clock logic. All other features of the SIO are unaffected.

RS-485 TOKEN PASSING NETWORK — VMIC's Model VMIVME-6015 SIO interface provides an easy connection to the new RS-485 interface standard. RS-485 is an upgraded version of the earlier RS-422 standard for balanced voltage digital interface circuits. Up to 32 RS-485 devices can be multidropped onto a single low-cost 24-gauge twisted-pair cable, forming a half-duplex network. The RS-485 transmitter in the VMIVME-6015 is controlled via the RS-232 request-to-send signal. The RS-485 interface is typically capable of 0 to 100 kbaud at distances up to 4,000 feet.

A network of RS-485 devices would normally be implemented in a token bus topology. All devices would be wired in line, one after another, forming a single main bus. One device would have the imaginary token, and thereby the ability to transmit onto the bus. All the RS-232 devices connected to the bus via a VMIVME-6015 need to share some common software in order to determine which device has possession of the token, and to control their request-to-send signals.

RS-485 improvements over RS-422 include higher receiver input impedance, increased generator drive, and a greater common-mode voltage range. The VMIVME-6015 will operate with a common-mode voltage (ground potential difference) of ±7 V peak. This means the ground voltage difference between any two VMIVME-6015s in a network can be up to 7 V. Since the signal grounds between RS-485 devices are normally not connected, problems caused by ground loop currents are virtually eliminated. This fact, along with the inherent common-mode noise rejection of differential transmission, makes RS-485 a viable interface for multipoint communication in both data processing and industrial control applications.

Other types of networks include those with a single transmitter and multiple receivers, and those with a single receiver and multiple transmitters. Both types of these networks are commonly used where there is one controlling device (master) and several devices being controlled (slaves). This network allows full duplex operation over two pairs of twisted-pair wires.

SPECIFICATIONS

Slave Data Transfer Options: A16: D8

Interrupter Options: Any one of I1 to I7 DYN for each of two-channel pairs

Power Requirements:
1.6 A maximum (0.85 A typical) at +5 VDC
100 mA maximum (0.80 mA typical) at +12 VDC
100 mA maximum (0.80 mA typical) at -12 VDC

PHYSICAL/ENVIRONMENTAL

Temperature: 0 to 60 °C, operating

Humidity: 0 to 90 percent, noncondensing

PHYSICAL CONFIGURATION

Double Eurocard: 160 x 233.4 x 12.5 mm NEXP

I/O CONNECTION

Four 25-pin subminiature D female connectors mounted on front panel

I/O SIGNAL CONDITIONING LEVEL COMPATIBILITY (Jumper-Selectable)

Data Lines: RS-232C, RS-422A, RS4-23, and RS-485

Control Lines: RS-232C

STANDARD DATA RATES SUPPORTED

76.8 K, 38.4 K, 19.2 K, 9,600, 7,200, 4,800, 3,600, 2,400, 2,000, 1,800, 1,200, 600, 300, 110

OTHER RATES SUPPORTED

1 M, 500 K, 333 K, 250 K, 167 K, 143 K, 125 K, 111 K, 100 K, 62.5 K, 50 K, 33 K, 25 K

TRADEMARKS

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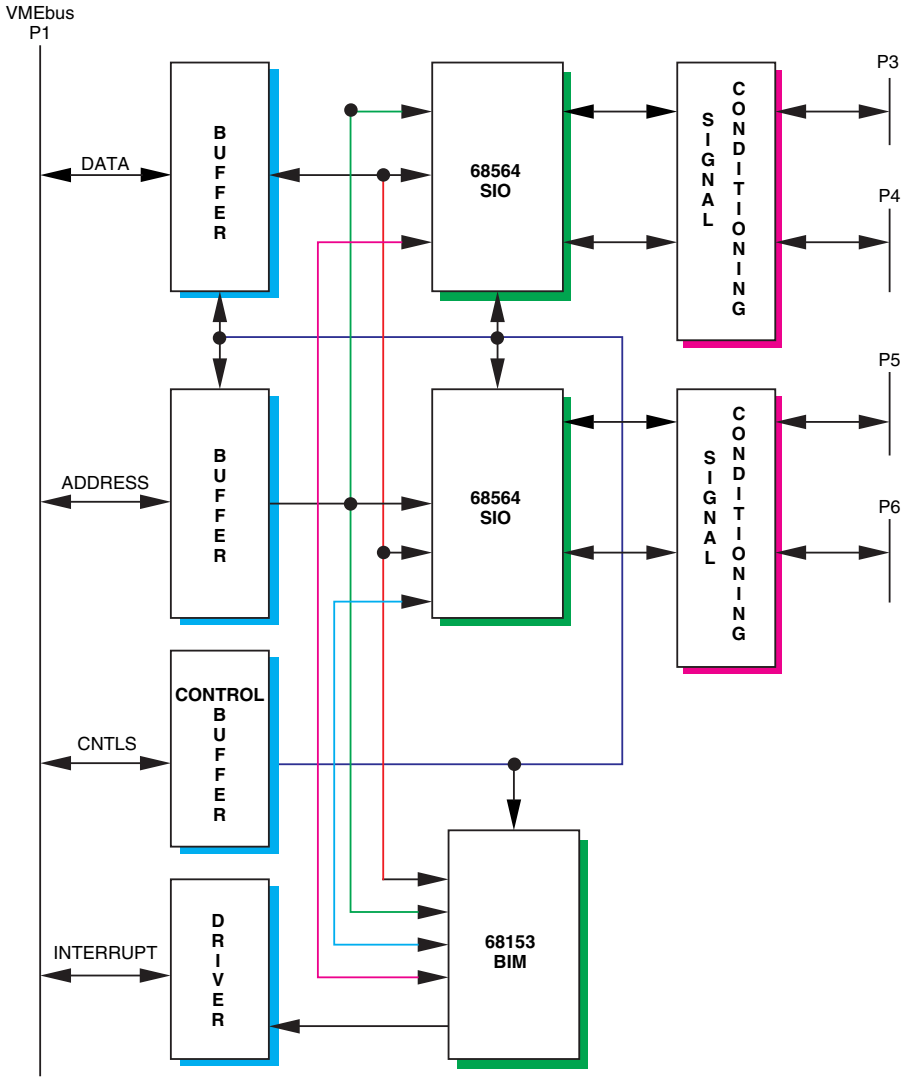

Figure 1. Functional Block Diagram