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MM-SSR16

Conduction-Cooled Solid State Relay Board for VMEbus

- Sixteen High Current FET Driver Channels Provide:
  - High-Side Switching
  - Independent Source Input Voltage from 14 to 40 VDC
  - Open-Load Detection Capability
  - Current Monitoring with10-bit Resolution
  - Current Slew Rate Limiting to Reduce Voltage Transients in External Wiring
  - Over-Current Shut-Off in Hardware to Protect Both Drivers and Loads
- VMEbus Slave (A16/D16)
- P2-side I/O through an AirBorn, Inc. WG50 Connector
- Operating Temperature Range of -40ç to +85çC, Conduction-Cooled
- Operating Relative Humidity Range of 5% to 95%, Non-Condensing
- Manufactured to the Following Specifications:
  - MIL-STD-275F
  - MIL-STD-454
  - MIL-STD-462
  - MIL-STD-810E
  - MIL-STD-975M
  - MIL-STD-2000A
  - MIL-STD-2036A
  - MIL-I-46058
  - MIL-P-55110
  - IEEE 1101.2-1992

Product Description

The MM-SSR16 is a 6U VMEbus-based, sixteen channel, high-side digital output board that directly drives DC solenoids and other high current devices. Each digital output provides load current monitoring with automatic current limiting if the load tries to exceed five amps, and delayed channel shut down if the load exceeds three amps. The state of the output driver may be read by a VMEbus master. Signal and power isolation between the control-side and VMEbus-side electronics protects the VMEbus system from damage.

All sixteen output channels are identical, each with its own input voltage source pin and output pin. These pins may be routed through external safety switches. There are also dedicated pins for the flyback return. The I/O lines route through a 50-pin AirBorn WG50PR7SY connector centered over the standard P2 centerline.

Channels 0...15

A channel consists of a high current driver and a current sense circuit with current limiting and over current shut-down. The channel is turned on and off by a VMEbus master writing to an onboard register. The control information crosses the isolation barrier to the channel and turns the drive on or off. Even though a driver may be turned on, it will not source current if power is not applied to its voltage input line.

Response to over-current begins when the current into the load exceeds three amps. The sensing is low pass filtered so that transient currents of up to five amps may be provided. Above five amps the channel enters into constant current mode to limit power supply current through the channel into a short-circuited load.

If the driver stays in the over-current condition long enough, the channel's current sense circuit automatically turns the channel off and sets a fault flag in a register. A fault condition can be programmed to generate a VMEbus interrupt.

If a load requires a higher inrush current than the channel allows, two or more channels may be connected in parallel so that the current is shared among the connected channels without compromising the over-current protection. Channels may also be wired in series for redundancy.

Analog to Digital Converter

A current monitor provides a current sense signal from each channel to the ADC. The current being supplied to the load

gives a good indication of the load characteristics, including both open and short circuited. The ADC also measures the equipment-side voltage supplied to the board.

A second circuit provides a low voltage trickle current through the load. When the driver is turned off, an open circuited load may be detected by reading the load current via the ADC. Software selects the channel to be monitored, triggers the ADC to take a reading, then reads the result. Software may program the ADC to generate an interrupt when the conversion completes.

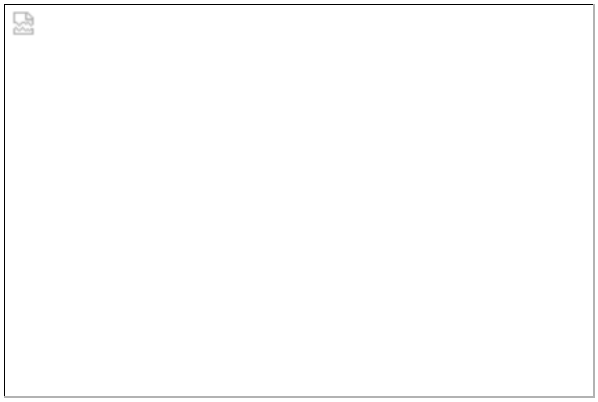
Isolation Barrier Optocouplers provide the signal isolation barrier between the VMEbus and the rest of the board. In addition, the high current circuitry on the machinery side of the isolation barrier is powered from the machinery's voltage source thereby isolating the VMEbus system power from the machinery's power. The power supply for the channel control logic and ADC is also powered from the machinery's voltage source. The total isolation for the board is >100 VRMS. Software may program a status bit to generate a VMEbus interrupt when equipment-side power is on, is off, or changes from one state to the other.

VMEbus Interface

The board is accessible in the A16 address space. It occupies 256 bytes of address space and supports both an 8- and 16-bit data path. The board control and status registers are used to control all functions of the board. The interrupt sources are FAULT, ADC end-of-conversion, and the state of the power supply.

Environmental

The MM-SSR16 operates from -40ç to +85çC and is fully militarized.



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