DMM-16-AT vs. DMM-16R-AT
Product Comparison and Migration Guide
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The new DMM-16R-AT PC/104 analog I/O module is offered as a drop-in replacement for the current DMM-16-AT. DMM-16R-AT addresses the issue of DMM-16-AT's aging Actel FPGA which is impacted by increased prices and increasingly long leadtimes. These issues affect the overall price and availability of the product. Customers who switch to the DMM-16R-AT may achieve the benefits of reduced leadtime for volume orders and lower purchase price at all quantities.

- DMM-16R-AT was designed to be fully backward compatible with the original DMM-16-AT.
- The features, physical design of the board, I/O connector location and pinout, and jumper settings are all identical between the two products.
- The register map is fully backward compatible with the original board, so it will work with existing software for the DMM-16-AT, including Diamond's Universal Driver.
- Laboratory testing was conducted to ensure that the DMM-16R-AT performs identically to the DMM-16-AT when used with Diamond's Universal Driver and related demo programs.

To facilitate full backward compatibility, legacy mode must be selected on Jumper Block J8. For more information, please refer to the DMM-16R-AT user manual.

DMM-16R-AT offers some enhanced features that may be of value to existing customers who are interested to update their products. These enhancements are listed below.

Digital I/O
The original DMM-16-AT has one 8-bit fixed input port and one 8-bit fixed output port. These ports operate with 5V logic levels. The new DMM-16R-AT maintains this configuration by default, but it also allows programmable direction of both ports, so users have a choice of 8 in + 8 out, 16 out, or 16 in. In addition, the new DMM-16R-AT offers 5V/3.3V logic level operation. Finally, the original board has 10K pull-up resistors on the inputs, while the new DMM-16R-AT offers jumper-selectable pull-up or pull-down on both ports. All these features are configured with a new jumper block.

A/D sample FIFO
Both original and new boards use a 512-sample FIFO to hold A/D data for high-speed A/D sampling operations. The original DMM-16-AT provides empty, half-full, and overflow flags to monitor the FIFO status. The DMM-16R-AT offers additional Full flag and Underflow flag for better monitoring. Note: The current Universal Driver for the DMM-16R-AT does not use these new flags, since it is designed to maintain full compatibility with the old board. In addition, the DMM-16R-AT includes a register that indicates the current number of samples in the FIFO. This may be used by software to determine how many samples to read out of the FIFO, especially at the end of an interrupt-based data acquisition sequence.

LED
The DMM-16R-AT includes a user-programmable blue LED controlled with a bit in one control register. This is typically used during system development or debug activity to verify that the board and software are communicating properly.

Register map

The DMM-16R-AT contains the same registers as the original DMM-16-AT. In addition it includes a new page 2 that provides access to all the new programmable features described above. Under operation with Diamond's DMM-16-AT driver and demo software, the DMM-16R-AT's new page will never be accessed, thus ensuring that the board will operate identically to a DMM-16-AT. These registers are accessible by using Diamond's Universal Driver version 7.0.1 or later with support for the DMM-16R-AT.

PC/104-Plus PCI interface

DMM-16R-AT is also available in a PC/104-Plus configuration with the PCI-104 PCI bus connector, enabling the board to work in both ISA bus and PCI bus systems. Both ISA and PCI buses offer the same 100KHz A/D performance. On boards with the PCI-104 connector, a jumper block allows selection of either ISA or PCI operation.