



# **DIAMOND SYSTEMS CORPORATION**

## **Transition Guide**

# **Diamond-MM-32X-AT**

Replacement for DMM-32-AT

Revision 0.2

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## 1. INTRODUCTION

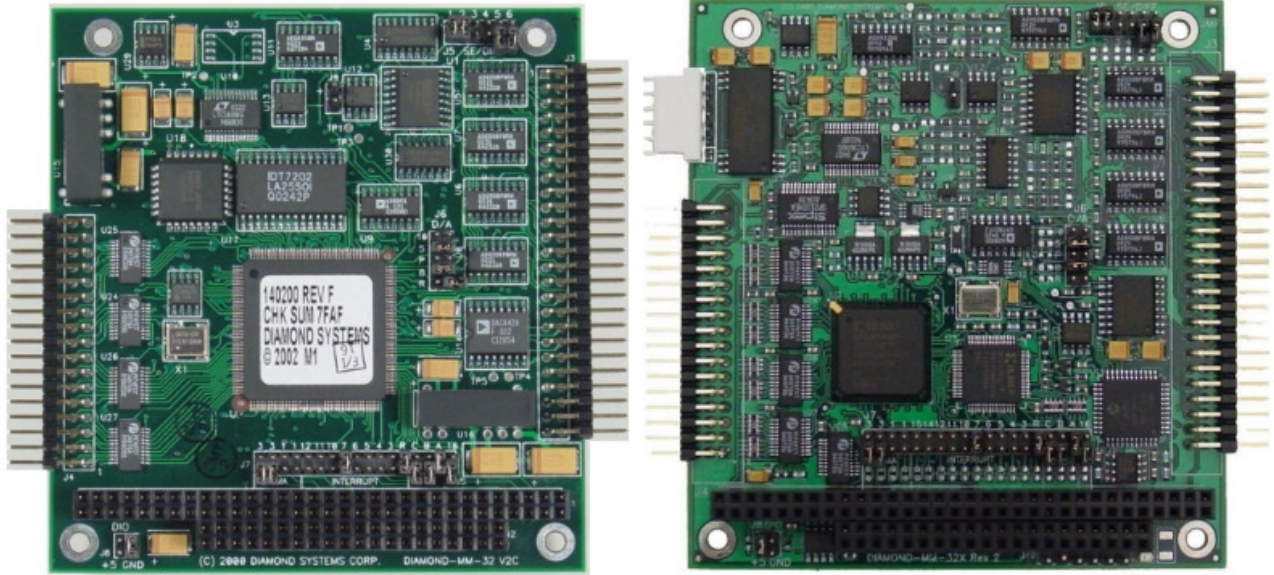
This guide is targeted for existing users of the Diamond Systems Corporation Diamond-MM-32-AT board (DMM-32-AT), who are, or will be, migrating to the Diamond-MM-32X-AT board (DMM-32X-AT.)

Care was taken to make the DMM-32X-AT backwards compatible with the DMM-32-AT. Most users will find that the DMM-32X-AT is a simple drop-in replacement for their old boards. However, before you begin the transition it is a good idea to read this guide and understand all of the differences and new features.

Customers who have not used the DMM-32-AT before may also be interested in this guide to read what improvements have been made for the DMM-32X-AT.

It is important to note that all software written for the DMM-32-AT will work on the DMM-32X-AT without modification. The DMM-32X-AT I/O register map – the means by which software interacts with the board – is identical to the DMM-32-AT at power-on. Software must write a special key value to a certain I/O location to unlock enhanced features of the board (e.g. larger FIFO, D/A waveform buffer, etc.)

## 2. VISUAL COMPARISON



**DMM-32-AT**

**DMM-32X-AT**

## 3. WHAT IS THE SAME

- ◆ Standard PC/104 form factor (same mounting holes, PCB dimensions and bus connectors [J1, J2])
- ◆ External connector J3 (50-pin header) has the same pinout.
- ◆ Jumper blocks J5, J6 and J8 are in the same physical location and perform same configuration.
- ◆ Default software I/O register map operation, including A/D, FIFO, Interrupt, D/A, Digital I/O, EEPROM, Calibration and Counter/Timer.
- ◆ Typical power consumption remains ~2W.

## 4. HOW THE EXTERNAL INTERFACE HAS CHANGED

These changes may affect the way customers interface with the DMM-32X-AT board:

- ◆ J3 has been moved 0.100 inches downwards.
- ◆ J4 (34-pin header) has been moved slightly upwards to accommodate vertical box headers.
- ◆ J7 (Configuration block) has been expanded to allow more IRQ selections, and has been moved upwards to allow space for 0Ω bypass resistors.
- ◆ J4, pins 29-32 are not “No Connection” pins anymore. They are now connected to the onboard serial transceivers.
- ◆ J10 (6-pin vertical header) has been added along the bottom of the PCB for factory programming.
- ◆ J11 (7-pin right-angle header) has been added to the upper-left portion for stand-alone interface signals.
- ◆ J9 has been moved 0.200 inches to the left to accommodate new components.

## 5. INTERNAL CHANGES AND IMPROVEMENTS

These are the significant changes that have been made to the board, but which do not affect the physical interface. Any item preceded by an asterisk (\*) is **not** enabled at power-on, in order to be backwards compatible with the DMM-32-AT. To enable these new features, they must be unlocked through the I/O register map.

- ◆ Main FPGA is now a Xilinx Spartan-II. Advanced CPLD/flash-based configuration allows the FPGA image to be reloaded through software without any programming cables
- ◆ A/D bandwidth has been increased from 200KHz to 250KHz.
- ◆ Analog noise has been reduced.
- ◆ \*Microchip dsPIC30F3014 can autocalibrate the board based on temperature differentials. This part also allows the DMM-32X-AT to operate as a stand-alone module and communicate with other devices through RS-232 or RS-485 serial ports.
- ◆ \*New DAC7715 allows true simultaneous D/A channel update.
- ◆ \*A/D FIFO increased to 1024 samples.
- ◆ \*D/A waveform generator can cycle through a 1024-sample buffer and can update all four channels – triggered off any of four inputs (External trigger, two counter/timers or software.)
- ◆ ESD protection has been put on all lines leading from J3, J4 and J11 to expensive/sensitive parts.
- ◆ 0Ω bypass resistors are available for all jumper configuration blocks to increase ruggedness.
- ◆ Support for DMA channels 1 and 3.
- ◆ DMM32X will not admit programming the counters out of specification. Consult the user manual as the DMM32 allowed for counters to be loaded with a minimum value of 1 on mode 2. This has been eliminated on the DMM32X where the minimum value to load is 2 on mode 2.