

Wavefront Quadrature Modulator Installation Guide

The logo for Red Rapids, featuring the text "Red Rapids" in white, bold, sans-serif font, centered within a black rounded rectangle with a red border.

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1.0 Introduction

1.1 Contents and Structure

The focus of this manual is the installation of hardware and software for the Wavefront Quadrature Modulator product. It is one component of the complete product documentation suite. Supporting publications are listed in Section 1.2.

Section	Description
Section 1	Introductory information about the manual.
Section 2	Overview of the software suite.
Section 3	Hardware installation instructions for all card types.
Section 4	Note about verifying the installation.

The latest product documentation and software is available for download from the Red Rapids website (www.redrapids.com).

1.2 Related Publications


Author	Number	Title
Red Rapids	REF-150-000	Wavefront Quadrature Modulator Hardware Reference Manual
Red Rapids	REF-150-002	Wavefront Quadrature Modulator Operating Guide
Red Rapids	REF-806-902	Adapter Device Driver and API Reference Manual
PCI SIG	PCI Express Base Rev 2.0	PCI Express Base Specification Revision 2.0
PCI SIG	PCI Express CEM Rev 2.0	PCI Express Card Electromechanical Specification Revision 2.0

1.3 Conventions

This manual uses the following conventions:

- Hexadecimal numbers are prefixed by “0x” (e.g. 0x00058C).
- **Blue** font is used for names of directories, files and OS commands.
- **Green** font is used to designate source code.
- Active low signals are followed by ‘#’, For example, TRST#.

	Text in this format highlights useful or important information.
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	Text shown in this format is a warning. It describes a situation that could potentially damage your equipment. Please read each warning carefully.
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The following are some of the acronyms used in this manual.

- **API** Application Program Interface
- **PCIe** PCI Express
- **Rxx** Revision number, xx is the placeholder for current revision

1.4 Manual Compatibility

The applicable hardware part numbers are defined as follows:

- Model 150-XXX *Wavefront Quadrature Modulator*

1.5 Distribution Disks

All Channel Express products are supported by the following disk archives:

DSK-806-902-Rxx Adapter Device Driver and API

DSK-150-001-Rxx Wavefront Quadrature Modulator Application Software

These archives can be downloaded from the Red Rapids website (www.redrapids.com).

1.6 Revision History

Version	Date	Description
R00	11/5/2008	Initial release.
R01	2/16/2009	Added section on device enumeration.
R02	7/23/2014	Switch to Adapter device driver and API.

2.0 Software Installation

The Wavefront software suite consists of two disk archives:

DSK-806-902-Rxx Adapter Device Driver and API

DSK-150-001-Rxx Wavefront Quadrature Modulator Demonstration Software

These archives can be downloaded from the Wavefront product page on the Red Rapids website (www.redrapids.com). Each archive is accompanied by a reference manual that describes the function and operation of the software distributed on that disk.

The distribution number of each archive is also the name of the root directory for that disk. Both archives must be extracted into the same working directory so that they share a common folder on the host. This is necessary for path names between the subdirectories to cross reference correctly.

The Adapter Device Driver needs to be installed on the host computer before the demonstration software will execute. Consult the *Adapter Device Driver and API Reference Manual* for detailed installation instructions.

3.0 Hardware Installation

The Wavefront Quadrature Modulator conforms to the PCI Express (PCIe) half length form factor. The hardware ships with a x4 physical and x1 electrical PCIe connector.

3.1 PCIe Hardware Installation

The following instructions provide a general guide for PCIe expansion card installation. Consult your host documentation for product specific guidance.

!	This is a static sensitive electronic device; please follow standard ESD guidelines when installing the device.
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Load Drivers: Load the appropriate software drivers prior to installing the hardware.

Power Down: Power to the host must be off during hardware installation. Permanent damage may result if the card is plugged into a hot socket.

Identify Slot: Find an open PCIe slot on the host backplane and verify that the socket is compatible with the card you are installing. The PCIe specification defines each slot by a physical size and electrical size. It is not uncommon to find a socket electrically wired to fewer lanes than the physical size allows. The specific configuration is usually silkscreened on the motherboard.

The interoperability of PCIe cards and slots is summarized in Table 3-1.

Table 3-1 PCIe Card Interoperability

Slot Card	x1	x4	x8	x16
x1	Required	Required	Required	Required
x4	No	Required	Allowed	Allowed
x8	No	No	Required	Allowed
x16	No	No	No	Required

Remove Metal Insert: The expansion slot opening will typically be covered by a metal insert held in with a single screw. The metal insert may have to be punched out of some cases. Unscrew or punch out the appropriate metal insert. It may help to align the expansion card over the slot to determine which insert to remove.

Insert Card: Align the expansion card edge connector with the PCIe slot making sure the bottom edge of the metal faceplate clears the edge of the backplane motherboard. Apply firm pressure to seat the card in the slot. You may need to rock the card slightly from front to back to get the unit seated properly. *Do not force the card or significantly flex the motherboard.* The expansion board should not require much force to insert provided everything is lined up correctly.

Secure Card: The top side of the faceplate should be flush or close to flush with the card retention bar. If the plate is not close to the bar verify that the board is not canted in the slot. Secure the expansion card to the chassis by inserting a screw into the top of the metal faceplate.

Check Obstructions: Verify that the card is securely mounted in the PCIe slot and not in contact with other items inside the chassis.

Boot Computer: The host will detect the presence of new hardware the first time power is applied. Consult the driver installation instructions if prompted for additional information.



The expansion card can pick up electrical interference from other devices or directly through the host power supply. Try moving the card away from other devices or try a different host platform if you are experiencing interference.

4.0 Installation Verification

The Wavefront Quadrature Modulator product ships with application software that can be used to quickly verify the hardware and software installation. Refer to the *Wavefront Quadrature Modulator Operating Guide* for detailed instructions.



It is highly recommended that the user successfully execute the verification procedure outlined in the *Wavefront Quadrature Modulator Operating Guide* before proceeding with custom software development.