# OG-PC-x86-A


## Integral Frame-Installed PC for openGear® Frames

# *Product Manual*

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Congratulations on choosing the Cobalt® OG-PC-X86-A Integral Frame-Installed PC for openGear® Frames. The OG-PC-X86-A is part of a full line of modular processing and conversion gear for broadcast TV environments. The Cobalt Digital Inc. line includes video decoders and encoders, audio embedders and de-embedders, distribution amplifiers, format converters, remote control systems and much more. Should you have questions pertaining to the installation or operation of your OG-PC-X86-A, please contact us at the contact information on the front cover.

| | |
|---|---|
| **Manual No.:** | OG-PC-X86A-OM |
| **Document Version:** | V1.0 |
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# *Table of Contents*

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# Chapter 1

# Introduction

## Overview

This manual provides installation and setup instructions for the OG-PC-x86-A Integral Frame-Installed PC for openGear® Frames (also referred to herein as the OG-PC-x86-A).

**This manual** consists of the following chapters:

- **Chapter 1, "Introduction"** – Provides information about this manual and what is covered. Also provides general information regarding the OG-PC-x86-A.
- **Chapter 2, "Installation"** – Provides instructions for installing the OG-PC-x86-A in a frame, and connecting interfaces to the OG-PC-x86-A.
- **Chapter 3, "Setup Instructions"** – Provides overviews of setup instructions for setting up the OG-PC-x86-A to integrate within its operating environment.

**This chapter** contains the following information:

# Manual Conventions

In this manual, the terms below are applicable as follows:

- **OG-PC-x86-A** refers to the OG-PC-x86-A Integral Frame-Installed PC for openGear® Frames unit.
- **Frame** refers to the HPF-9000, oGx, oG3-FR, 8321, or similar 20-slot frame that houses Cobalt® or other cards.
- **System** and/or **Video System** refers to the mix of interconnected production and terminal equipment in which the OG-PC-x86-A and other cards operate.
- Functions and/or features that are available only as an option are denoted in this manual like this:


## Warnings, Cautions, and Notes

Certain items in this manual are highlighted by special messages. The definitions are provided below.

### Warnings

Warning messages indicate a possible hazard which, if not avoided, could result in personal injury or death.

### Cautions

Caution messages indicate a problem or incorrect practice which, if not avoided, could result in improper operation or damage to the product.

### Notes

Notes provide supplemental information to the accompanying text. Notes typically precede the text to which they apply.

## Labeling Symbol Definitions

| | |
|---|---|
|  | Important note regarding product usage. Failure to observe may result in unexpected or incorrect operation. |
|  | Electronic device or assembly is susceptible to damage from an ESD event. Handle only using appropriate ESD prevention practices.<br><br>If ESD wrist strap is not available, handle only by edges and avoid contact with any connectors or components. |
|  | Symbol (WEEE 2002/96/EC)<br>For product disposal, ensure the following:<br>• Do not dispose of this product as unsorted municipal waste.<br>• Collect this product separately.<br>• Use collection and return systems available to you. |

# Safety and Regulatory Summary

## Warnings

**! WARNING !** **To reduce risk of electric shock do not remove line voltage service barrier cover on frame equipment containing an AC power supply. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

## Cautions

**CAUTION** **This device is intended for environmentally controlled use only in appropriate video terminal equipment operating environments.**

**CAUTION** **This device contains no user-serviceable components except where expressly stated. Refer servicing to authorized personnel.**

# OG-PC-x86-A Functional Description

Figure 1-1 shows a functional block diagram of the OG-PC-x86-A. The OG-PC-x86-A Integral Frame-Installed PC for openGear® Frames is a compact PC which is installed directly in the frame in the form of an openGear-style card pair assembly with a double-width rear I/O module.

The OG-PC-x86-A obtains its power from the frame midplane with no external cabling or sources. Using the OG-PC-x86-A, special applications of the user's choice can be conveniently collocated directly in the frame.

The OG-PC-x86-A unit installs in the same manner as any other openGear® device; the device/card is inserted into desired frame slot pair where it mates with a rear I/O module. Via a rear I/O module supplied with the device, OG-PC-x86-A external connections are provide, consisting of dual GigE, USB 2.0 and 3.0, HDMI, serial, as well as a DisplayPort.

**Note:** A third, additional GigE port is available as a per-slot GigE connection when OG-PC-x86-A is used in conjunction with the oGx frame or equivalent per-slot GigE frame.

## Basic Processing Details

The OG-PC-x86-A consists of the following architecture:

- Intel® Pentium® N3710
- 1.6 GHz (2.56 GHz burst)
- 4-Core
- 8GB DDR3

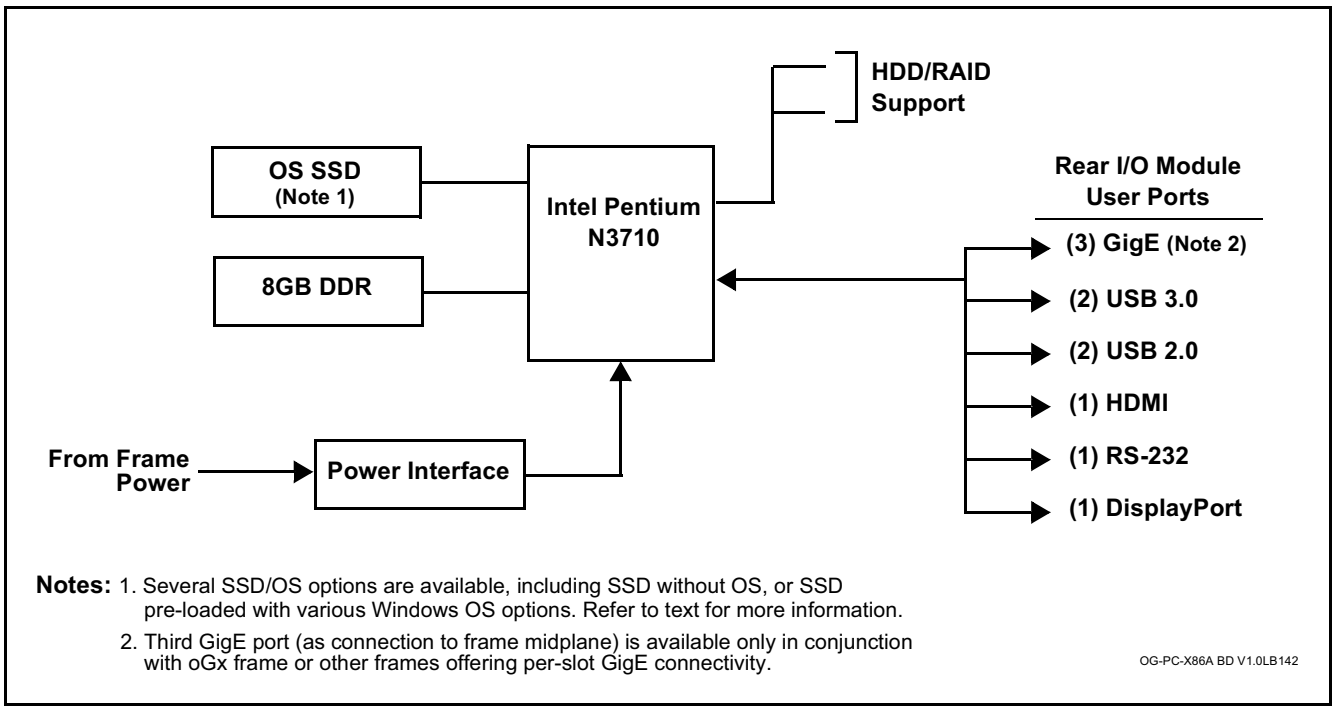


***Figure 1-1 OG-PC-x86-A Functional Block Diagram***

## User Interface

Similar to a standard PC, the OG-PC-x86-A can provide user interface via its USB ports (for mouse and keyboard) and its DisplayPort.

Hardware control features such as power on/off, reset, and sleep are accessible on the device and via DashBoard remote control. This allows these control functions to be accessed via DashBoard remote control with no need for physical collocation to invoke hard reset or similar actions.

## HDD/SSD/OS Options

The hardware/pre-loaded OS options listed below are available for the OG-PC-x86-A. When ordered with a new OG-PC-x86-A unit, the option(s) will be physically installed and ready for immediate use.

- **-OG-PC-x86-HDD-1TB** 1TB Hard Disk Drive for the OG-PC-x86-A openGear® PC. (Two (2) max per OG-PC-x86-A unit)
- **-OG-PC-x86-SSD-128GB** 128GB M.2 Solid State Drive without Operating System.
- **-OG-PC-x86-SSD-128GB-WIN10IoT** 128GB M.2 Solid State Drive with Windows 10 IoT Operating System.
- **-OG-PC-x86-SSD-128GB-WIN7** 128GB M.2 Solid State Drive with Windows 7 Embedded Operating System.

# Technical Specifications

Table 1-1 lists the technical specifications for the OG-PC-x86-A Integral Frame-Installed PC for openGear® Frames unit.

***Table 1-1 Technical Specifications***

| Item | Characteristic |
|---|---|
| Part number, nomenclature | OG-PC-x86-A Integral Frame-Installed PC for openGear® Frames |
| Power Consumption | Power Consumption (no RAID HDD options): 48.6 W<br>Power Consumption (RAID; 1 HDD; typ): 53.6 W<br>Power Consumption (RAID; 2 HDD; typ): 58.6 W<br>Power Management: ACPI<br>Battery: Lithium 3 V / 210 mAH<br>**Note:** Power figures below represent worse-case (all USB ports fully loaded; HDDs (if equipped) spinning). Current draw is distributed across multiple slots using supplied rear I/O module. As such, per-slot power consumption is not exceeded for supported 20-slot frames HPF-9000 and oGx models. |
| Environmental:<br>Operational Temperature:<br>Operational Humidity:<br>Non-Operational Temperature:<br>Weight (including rear module): | <br>0° to 45° C (32° to 113° F)<br>40° C (104° F) @ 95% RH Non-Condensing<br>-40° C to 85° C (-40° to 185° F)<br>0.57 kg (1.25 lb) |
| Frame Slot Physical Allocation Space | 4 slots (unit in conjunction with Double-Wide rear I/O module) |
| Processor System | CPU: Intel® Pentium® N3710<br>Base Frequency: 1.6 GHz (burst to 2.56 GHz)<br>Core Number: 4<br>BIOS: AMI UEFI 64 Mbit<br>For detailed information on the Intel® N3710 Processor used in this product, please see **Intel Pentium Processor N3710** |
| Memory | Technology: DDR3L 1600 MHz<br>Max. Capacity: 8GB |
| Storage | 1x M.2 M-Key SATA (OS SSD specification defined by order option)<br>2x HDD 2.5in SATA |
| Display | Intel® HD Graphics 505<br>HDMI: 1.4b up to 3840 x 2160 at 30 Hz<br>DisplayPort: 1.1a up to 3840 x 2160 at 30 Hz |
| Ethernet | Speed: 10/100/1000 Mbps<br>Connectors: (2) RJ45 on rear I/O panel |

# Warranty and Service Information

## Cobalt Digital Inc. Limited Warranty

This product is warranted to be free from defects in material and workmanship for a period of one (1) year from the date of shipment to the original purchaser.

Cobalt Digital Inc.'s (“Cobalt”) sole obligation under this warranty shall be limited to, at its option, (i) the repair or (ii) replacement of the product, and the determination of whether a defect is covered under this limited warranty shall be made at the sole discretion of Cobalt.

This limited warranty applies only to the original end-purchaser of the product, and is not assignable or transferrable therefrom. This warranty is limited to defects in material and workmanship, and shall not apply to acts of God, accidents, or negligence on behalf of the purchaser, and shall be voided upon the misuse, abuse, alteration, or modification of the product. Only Cobalt authorized factory representatives are authorized to make repairs to the product, and any unauthorized attempt to repair this product shall immediately void the warranty. Please contact Cobalt Technical Support for more information.

To facilitate the resolution of warranty related issues, Cobalt recommends registering the product by completing and returning a product registration form. In the event of a warrantable defect, the purchaser shall notify Cobalt with a description of the problem, and Cobalt shall provide the purchaser with a Return Material Authorization (“RMA”). For return, defective products should be double boxed, and sufficiently protected, in the original packaging, or equivalent, and shipped to the Cobalt Factory Service Center, postage prepaid and insured for the purchase price. The purchaser should include the RMA number, description of the problem encountered, date purchased, name of dealer purchased from, and serial number with the shipment.

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# Contact Cobalt Digital Inc.

Feel free to contact our thorough and professional support representatives for any of the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

| | |
|---|---|
| **Phone:** | (217) 344-1243 |
| **Fax:** | (217) 344-1245 |
| **Web:** | www.cobaltdigital.com |
| **General Information:** | info@cobaltdigital.com |
| **Technical Support:** | support@cobaltdigital.com |

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# Chapter 2

# Installation

## Overview

This chapter provides steps for physical installation and pre-power-up setup of the OG-PC-x86-A as follows:

- Installing User-Added HDDs (p. 2-1)
- Installing Rear I/O Module (p. 2-3)
- Installing the OG-PC-x86-A Into Frame (p. 2-5)
- Rear I/O Module (Panel) Connections (p. 2-6)

## Installing User-Added HDDs

**Note:** This procedure is applicable **only** if user-added HDD(s) are to be added in a fielded OG-PC-x86-A. For factory-installed time-of-purchase options (see HDD/SSD/OS Options (see p. 1-4 in Chapter 1, Introduction), no field installation is needed.

**CAUTION**

| | |
|---|---|
|  | **This device contains semiconductor devices which are susceptible to serious damage from Electrostatic Discharge (ESD). ESD damage may not be immediately apparent and can affect the long-term reliability of the device.**<br><br>**Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always use proper ESD handling precautions and equipment when working on circuit boards and related equipment.** |
|  | **When disassembling to access HDD mounting area, the OG-PC-x86-A component side of PCB will be positioned against work surface. Make certain surface is prepped with soft anti-static material to avoid damaging or dislodging surface-mount components.** |

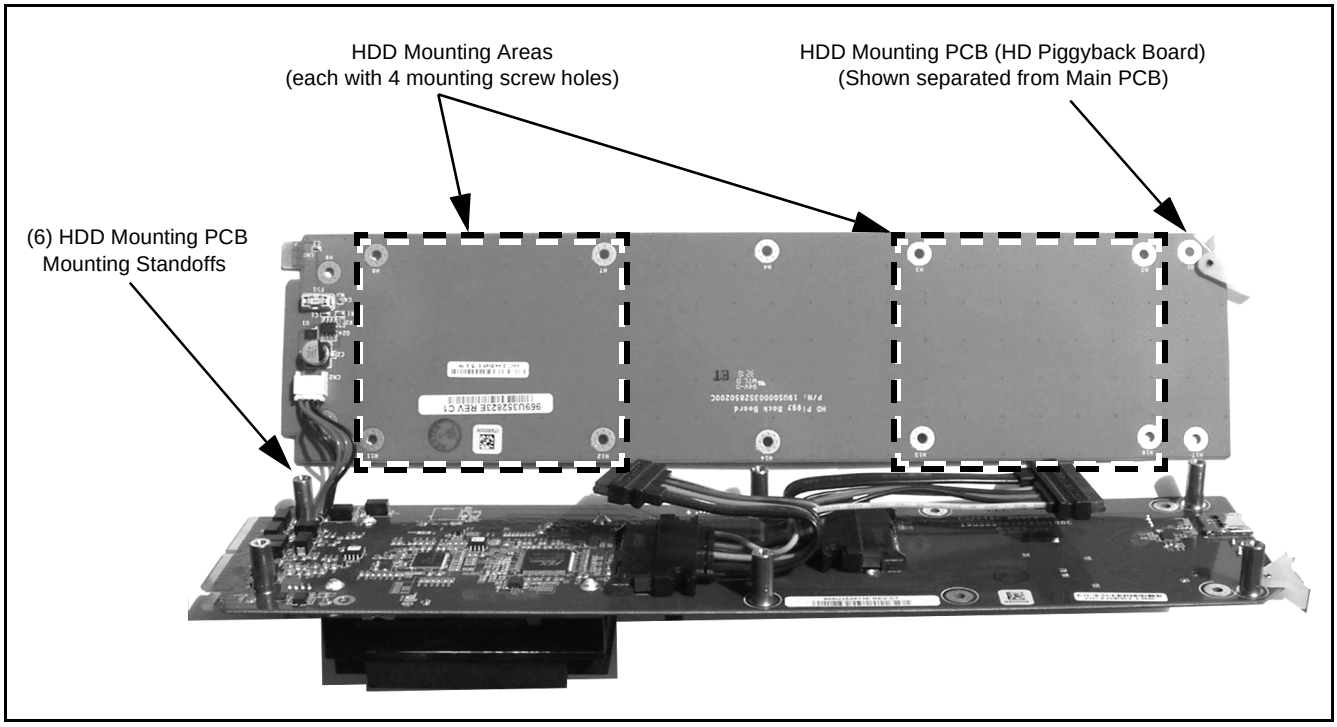



***Figure 2-1 HDD Mounting Area and Details***

1. (See Figure 2-1) Around periphery of OG-PC-x86-A assembly, remove six (6) screws securing HD Piggyback Board (HDD mounting PCB) from OG-PC main board. Tilt HD Piggyback Board away from main PCB.

**CAUTION**

**When installing HDD(s), avoid allowing HDD case from contacting surface-mount components on OG-PC main PCB. Components can be damaged if HDD case strikes component(s).**

2. Prep threads of each of four (4) HDD securing screws (supplied with HDD) with a small drop of blue threadlock compound (Loctite® 243 or equivalent).
3. Secure HDD to HD Piggyback Board using four (4) screws supplied with HDD.
4. Position HDD (along with piggyback PCB) to align with its interconnect cable. Connect interconnect cable to HDD.
5. Repeat steps 2 thru 4 for second HDD (if used).
6. Prep threads of each of six (6) HD Piggyback Board securing screws with a small drop of blue threadlock compound (Loctite® 243 or equivalent).

**CAUTION**

**Make certain HD Piggyback Board power harness leads are positioned around standoff and not pinched between standoff and piggyback PCB.**

7. Carefully align HD Piggyback Board in mounting position on the six (6) peripheral mounting standoffs. Start six (6) securing screws.

8. Fully tighten six (6) HD Piggyback Board securing screws.

## Installing Rear I/O Module

**CAUTION**

**Make certain Rear I/O Module is installed before installing the OG-PC-x86-A into the frame slot. Damage to card and/or Rear I/O Module can occur if module installation is attempted with card already installed in slot.**

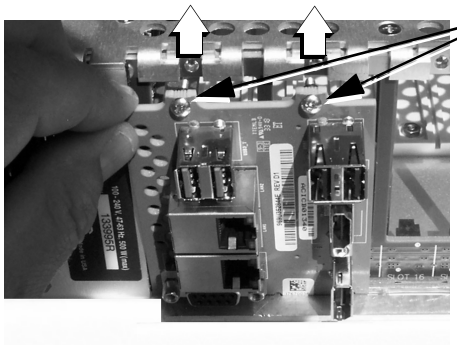
The Rear I/O Module provides the user "rear panel" connection breakouts for the OG-PC-x86-A assembly. Install Rear I/O Module as follows:

1. On the frame, determine the slot in which the OG-PC-x86-A is to be installed.

**Note:** Although an OG-PC-x86-A can be installed anywhere in the frame, typically it is recommended to select a group of slots at the left-most or right-most of available slots. The OG-PC-x86-A and its mating rear I/O module will require four (4) slots (example: OG-PC-x86-A and rear I/O module positioned to use slots 17 thru 20 in the 20-slot frame).

2. In the mounting area corresponding to the slot location, install Rear I/O Module as shown in Figure 2-2.


1 Align and engage mounting tabs on Rear I/O Module with the module seating slots on rear of frame chassis.



2 Hold top of Rear I/O Module flush against frame chassis and start the captive screws. Lightly tighten each captive screw.

**Note:** Screws are captive retained on unmounted Rear I/O Module using O-rings. Pushing the screws backwards into the O-rings (allowing only a few threads to protrude in front of O-rings) allows the screws to more easily thread into the chassis threaded holes.

***Figure 2-2 Rear I/O Module Installation***

# Installing the OG-PC-x86-A Into Frame

**CAUTION**

**Heat and power distribution requirements within a frame may dictate specific slot placement of cards. Cards with many heat-producing components should be arranged to avoid areas of excess heat build-up, particularly in frames using only convection cooling. The OG-PC-x86-A has a high power dissipation of up to 60 W. As such, avoiding placing the device adjacent to other devices/cards with similar dissipation values if possible. Also, frame power budget must be considered if multiple OG-PC-x86-A devices are to be installed, or other devices/cards are to be collocated in the same frame.**

**CAUTION**

| | |
|---|---|
|  | **This device contains semiconductor devices which are susceptible to serious damage from Electrostatic Discharge (ESD). ESD damage may not be immediately apparent and can affect the long-term reliability of the device.**<br><br>**Avoid handling circuit boards in high static environments such as carpeted areas, and when wearing synthetic fiber clothing. Always use proper ESD handling precautions and equipment when working on circuit boards and related equipment.** |

**CAUTION**

**Make certain Rear I/O Module supplied with the OG-PC-x86-A is installed before installing the OG-PC-x86-A into the frame slot. Damage to device and/ or Rear I/O Module can occur if module installation is attempted with device already installed in slot.**

Install the OG-PC-x86-A into a frame slot as follows:

1. Open the frame front access panel.
2. Noting the four slots occupied by the rear I/O module, determine the slots in which the OG-PC-x86-A will mate with the rear I/O module.
3. While holding the OG-PC-x86-A assembly by its front edges, align the assembly such that the plastic ejector tabs are on the bottom.
4. Insert the OG-PC-x86-A such that its card-edge connector on rear of assembly is aligning with corresponding female connector on its rear I/O module, aligning the assembly with the top and bottom guides of the slots in which the assembly is being installed.
5. **When certain assembly is aligning with connector on rear I/O module**, gradually slide the assembly into the slot. When resistance is noticed, gently continue pushing the assembly until its rear printed circuit edge terminals engage fully into the rear I/O module mating connector.

**CAUTION**

**If assembly resists fully engaging in rear I/O module mating connector, check for alignment and proper insertion in slot tracks. Damage to assembly and/or rear I/O module may occur if improper insertion is attempted.**

6. Verify that the assembly is fully engaged in rear I/O module mating connector.

7. Close the frame front access panel.

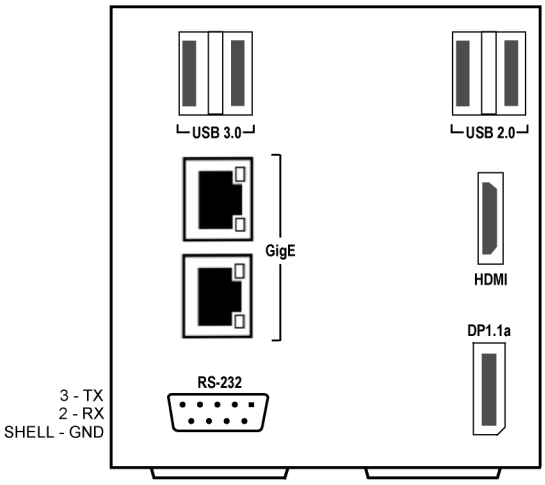
8. Connect cabling as shown in Rear I/O Module (Panel) Connections (p 2-6).

**Note:** To remove the assembly, press down on the ejector tabs to unseat the assembly from the rear I/O module mating connector. Evenly draw the assembly from its slots.

# Rear I/O Module (Panel) Connections

Perform rear I/O module panel cable connections as shown in Figure 2-3.

**OG-PC-x86-A Rear Panel**




| Connector | Function |
|---|---|
| **GigE** | Two (2) GIgE Ethernet RJ-45 ports for OG-PC-x86-A network connections |
| **USB 2.0** | Two (2) USB 2.0 ports (Standard connector type) |
| **USB 3.0** | Two (2) USB 3.0 ports (Standard connector type) |
| **HDMI** | One (1) HDMI port (Type A connector) |
| **DP1.1a** | One (1) DisplayPort connector (DP1.1a) |
| **RS-232** | One (1) RS-232 COMM port (Dsub-9(F) connector |

***Figure 2-3 OG-PC-x86-A Rear I/O Module Panel Connectors***

# Chapter 3

# Setup Instructions

## Overview

This chapter contains the following information:



**Note:** All instructions here assume OG-PC-x86-A is physically installed in a powered 20-slot frame and interconnected to user interface assets as described in Chapter 2. Installation.

## Accessing and Editing BIOS Settings

Figures 3-1 thru 3-3 show the AMI BIOS used on the PC module within the OG-PC-x86-A. Using the BIOS Setup Utility shown, BIOS settings can be modified as desired.

**Note:** Some menus are available from the BIOS Main menu but are not described here. Many of the functions within these tabs are pre-configured to adapt the PC module to conform with specified OG-PC-x86-A functionality and should not be modified. If changes or more information regarding these functions are desired, contact Cobalt Digital for assistance and further information.

## BIOS Main Menu

The BIOS Main menu provides access to basic setup functions such as date and language, and also provides access to other menus such as Advanced and specific configuration menus.

With OG-PC-x86-A in powered-up frame, press <**F2**> or <**DEL**> to enter the Main Setup menu (shown below).

When in the Main menu, other menus can be accessed. The Main tab is always accessible from other menus for returning to the Main menu.


The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany the selected item.

***Figure 3-1 BIOS Main Setup Screen***

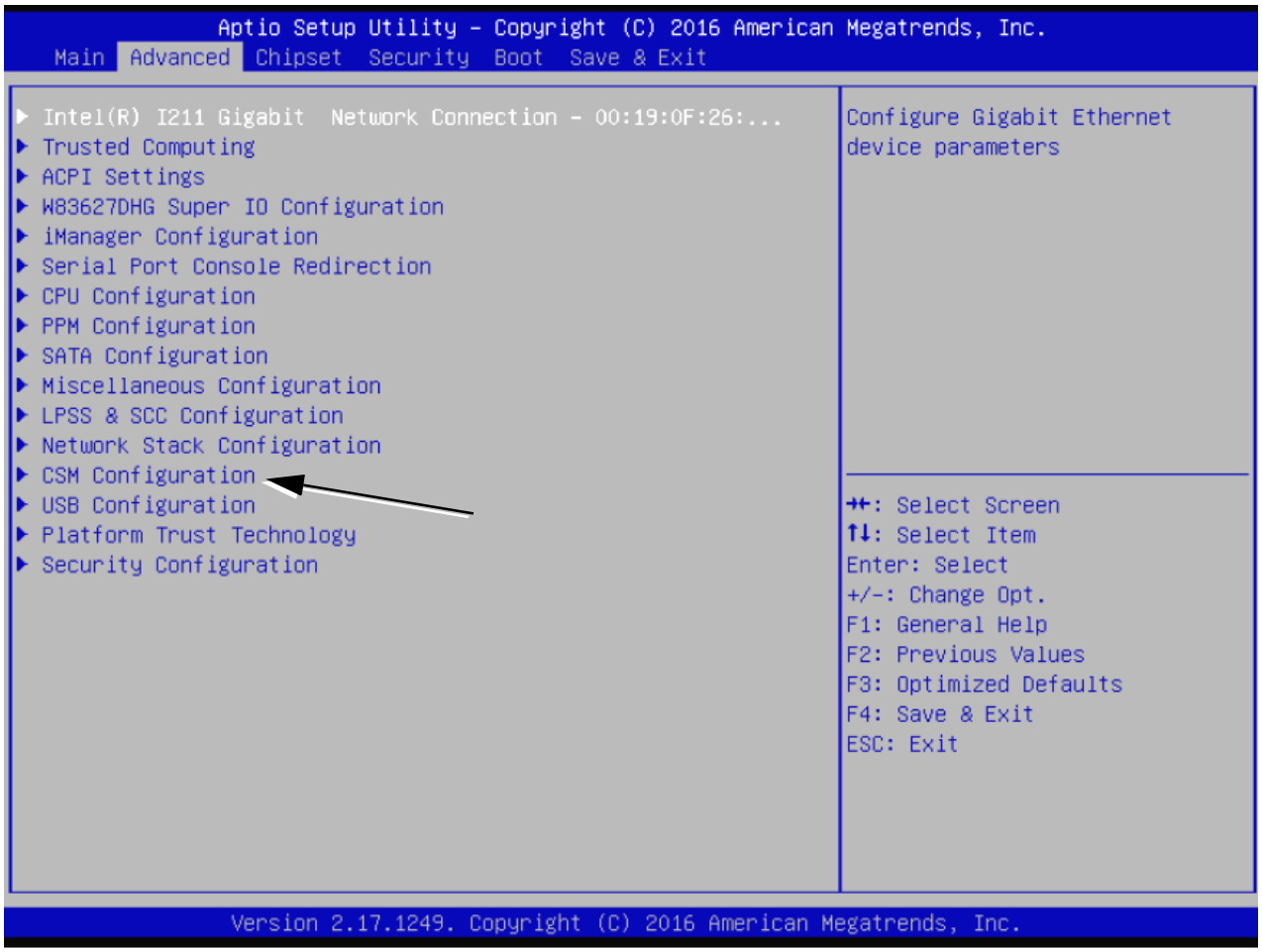
## Advanced Menu

(See Figure 3-2.) Select the **Advanced** tab from the Main setup screen to enter the Advanced BIOS Setup screen. Any item in the left frame of the screen can be selected, such as CPU Configuration, to go to the sub menu for that item. An Advanced BIOS Setup option can be displayed by highlighting it using the <Arrow> keys.

**Important Note: BIOS setting for using WES7 vs. WIN10IoT-WES7**

If Windows 7 is to be field-installed (user-installed), OG-PC-x86-A must first be set to be compatible with Windows 7 as follows:

**Before** WINPE and GHOST are loaded for WES7, you must change the compatibility setting to "**UEFI and Legacy**". This is accessed on **Advanced > CSM Configuration**.





Change default (Win10IoT) "UEFI only" setting to "**UEFI and Legacy**" setting.

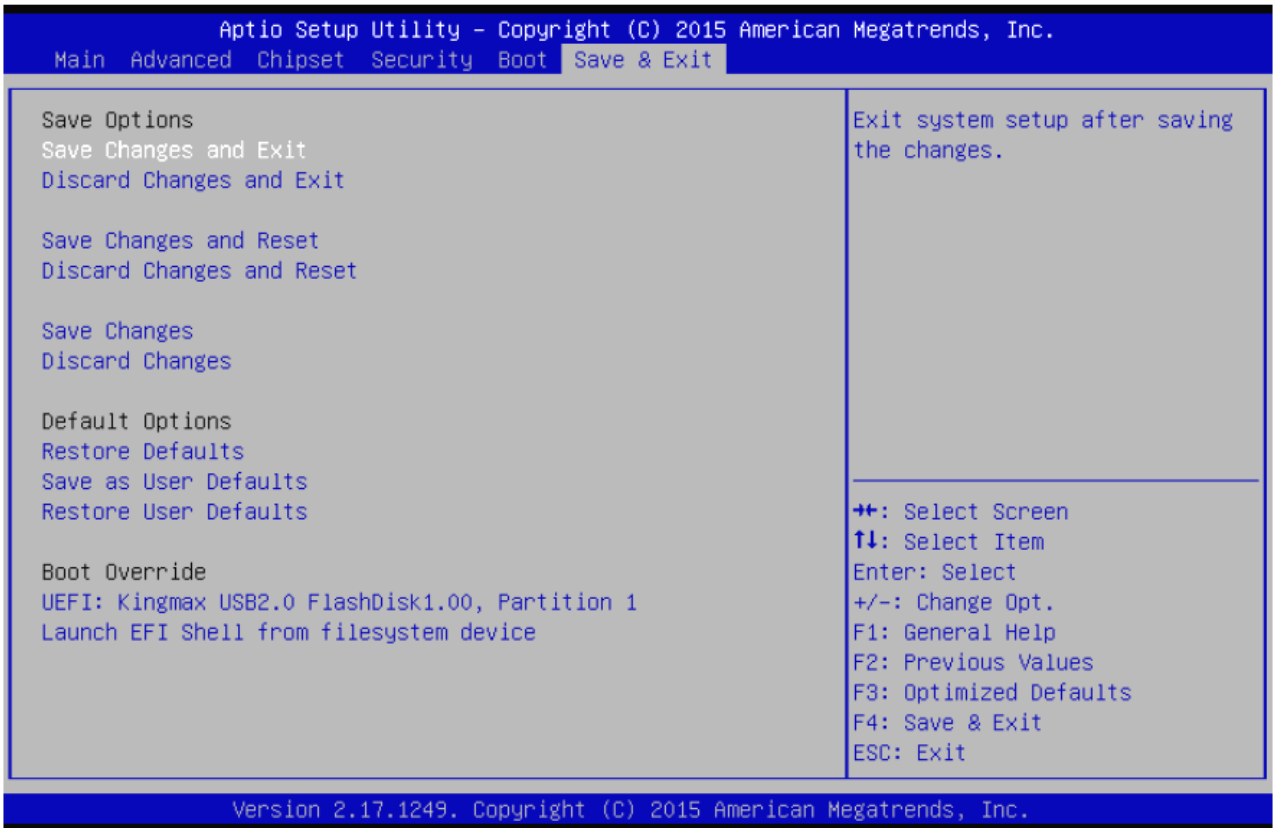
When using WINPE and ghost tool, and then loading WES7 image onto OG-PC-x86-A, the following prompt will appear:
"***The destination system appears to be UEFI, convert destination disk to GPT?***"

Answer **NO** to the prompt and continue as prompted.

***Figure 3-2 BIOS Advanced Setup Screen***

## Saving and Exiting BIOS

**Save & Exit** can be selected from any menu. Figure 3-3 shows and describes the Save & Exit utility.




**Save Changes and Exit**
Select this option to save changes, exit BIOS setup menu and reboot computer if necessary to take effect of all system config parameters.

**Discard Changes and Exit**
Select this option to quit Setup without making any permanent changes to the system configuration.

**Save Changes and Reset**
When completed as desired with system configuration, select this option to save changes, exit BIOS setup menu and force a reset.

**Discard Changes and Reset**
Select this option to quit Setup without making any permanent changes to the system configuration and rforce a reset.

**Save Changes**
Select this option to save changes **without** exiting BIOS setup menu.

**Discard Changes**
Select this option to **discard any current changes** and load previous system configuration.

**Restore Defaults**
Automatically configures all setup items to optimal settings. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, **do not** use Optimal Defaults if computer is experiencing system config problems.

**Save as User Defaults**
Select this option to save changes as user defaults **without** exiting BIOS setup menu.

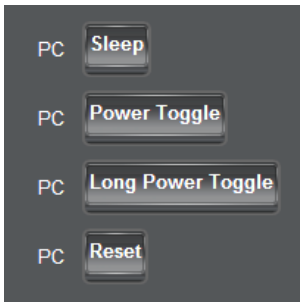
**Restore User Defaults**
Restore User Defaults to all the setup options.

**Launch EFI Shell from file system device**
This item attempts to Launch EFI Shell application (Shell.efi) from one of the available file system devices.

***Figure 3-3 BIOS Save & Exit Screen***

# DashBoard Remote Control of OG-PC-x86-A

When the frame hosting an OG-PC-x86-A is connected to DashBoard, hardware control features such as power on/off, reset, and sleep are accessible via DashBoard remote control. This circumvents needing to be collocated with the frame/PC to execute these functions.

| | |
|---|---|
|  | Provides DashBoard controls to remotely control OG-PC-x86-A hardware functions. |
| • **Output Format Select**<br>  | • **Sleep** invokes sleep when pressed, and toggles to awake/active when pressed again.<br>• **Power Toggle** behaves the same as a normal power button press (such as when routinely powering-up or powering-down the PC). The PC will start its shutdown procedure, eventually fully shutting down. After full shutdown, the button can be pressed again to again start the PC.<br>• **Long Power Toggle** behaves similarly to holding a hardware power button “in” for eight seconds for a non-graceful immediate power-down. The immediate power-off may or may not give the OS enough time to complete its normal power-down sequence. Long Power Toggle can be done if there is a crash to the OS which makes the PC unresponsive to the “normal” Power Toggle button press. To again power-up/start the PC, press the **Power Toggle** button.<br>• **Reset** functions identically to the hardware Reset button. |

# In Case of Problems

## Contact and Return Authorization

Should any problem arise with this product that was not solved by the information in this section, please contact the Cobalt Digital Inc. Technical Support Department.

If required, a Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions. If required, a temporary replacement item will be made available at a nominal charge. Any shipping costs incurred are the customer’s responsibility. All products shipped to you from Cobalt Digital Inc. will be shipped collect.

The Cobalt Digital Inc. Technical Support Department will continue to provide advice on any product manufactured by Cobalt Digital Inc., beyond the warranty period without charge, for the life of the product.

See Contact Cobalt Digital Inc. (p. 1-7) in Chapter 1, “Introduction“ for contact information.

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