



iVW-FH233 Video Wall Controller

User Manual

Version 1.02

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Table of Contents

Table of Contents	2
Legal Notice and Disclaimer	5
LEGAL NOTICE	5
DISCLAIMER.....	5
REGULATORY NOTICE	7
SAFETY WARNINGS	10
1. Introduction	11
1.1 INTRODUCTION.....	11
1.2 BENEFITS	11
1.3 FEATURES.....	12
2. Hardware Specifications.....	13
2.1 FRONT PANEL.....	13
2.2 REAR PANEL	14
2.3 TECHNICAL SPECIFICATIONS	15
2.4 DIMENSIONS	15
2.5 POWER SWITCH AND RESET BEHAVIOR.....	17
2.6 LED SPECIFICATIONS	17
3. Getting Started.....	18
3.1 INSTALLATION STEPS.....	18
3.2 INSTALL DISPLAY DEVICES	18
3.3 MOUNTING.....	18
3.4 CONNECT CABLES	19
3.4.1 <i>Connect the Video Source and iVW-FH233</i>	<i>19</i>
3.4.2 <i>Connect iVW-FH233 and the Display Devices</i>	<i>19</i>
3.4.3 <i>Connect the Power Adapter to iVW-FH233</i>	<i>20</i>
4. Input and Output Resolution	21
4.1 ASPECT RATIO	21
4.2 INPUT RESOLUTION.....	21
4.3 OUTPUT RESOLUTION	21
5. Display Mode	22
5.1 3 x 3 DISPLAY MODE	23
5.2 2 x 2 DISPLAY MODE	23

5.3 1 x 1 DISPLAY MODE 24

5.4 3 x 2 DISPLAY MODE 25

5.5 2 x 3 DISPLAY MODE 26

6. OSD Menu Functions 27

6.1 OSD BUTTONS..... 27

6.2 OSD MENU STRUCTURE 28

6.3 OUTPUT RESOLUTION MENU 29

6.4 DISPLAY MODE MENU 30

6.5 BEZEL COMPENSATION MENU 31

6.6 SYSTEM OPTION MENU 32

6.7 SYSTEM INFORMATION MENU 33

6.8 REMOTE CONTROL 34

7. Technical Support..... 35

List of Figures

Figure 1-1: iVW-FH233..... 11

Figure 2-1: iVW-FH233 Front Panel..... 13

Figure 2-2: iVW-FH233 Rear Panel 14

Figure 2-3: iVW-FH233 Dimensions..... 16

Figure 3-1: Cable Connection 19

Figure 5-1: Display Mode 22

Figure 5-2: 3 x 3 Display Mode Setup 23

Figure 5-3: 2 x 2 Display Mode Setup 23

Figure 5-4: 1 x 1 Display Mode Setup 24

Figure 5-5: 3 x 2 Display Mode Setup 25

Figure 5-6: 2 x 3 Display Mode Setup 26

Figure 6-1: OSD Buttons 27

Figure 6-2: Output Resolution Menu 29

Figure 6-3: Display Mode Menu 30

Figure 6-4: Bezel Compensation Menu 31

Figure 6-5: System Option Menu 32

Figure 6-6: OSD Position Window 32

Figure 6-7: System Information Menu..... 33

Figure 6-8: Remote Controller..... 34

List of Tables

Table 2-1: Technical Specifications	15
Table 2-2: Power Switch Behavior	17
Table 2-3: LED Indicators Behavior	17
Table 6-1: OSD Menu Structure	28

Legal Notice and Disclaimer

Thank you for choosing QNAP products! This user manual provides a description of the iVW Video Wall Controller's hardware and relevant guidelines for key functions. Please read this document carefully and adhere to its instructions.

This manual provides the description of all the functions of the iVW Video Wall Controller. The product you purchased may not support certain functions dedicated to specific models.

Legal Notice

- All features, functionality, and other product specifications are subject to change without prior notice or obligation.
- Information presented is subject to change without notice.
- No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, mechanical, electronic, photocopying, recording, or otherwise, without prior written permission of QNAP Systems, Inc..
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Disclaimer

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Note:

1. Back up your system periodically to avoid any potential data loss. QNAP disclaims any responsibility of all sorts of data loss or recovery.
2. Should you return any components of the iVW-FH233 package for refund or maintenance, make sure they are carefully packed for shipping. Any form of damage caused by improper packaging will not be compensated.

Regulatory Notice



FCC Notice

All of the QNAP iVW video wall controllers comply with FCC Class A.

=====

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.



Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

Modifications: Any modifications made to this device that are not approved by QNAP Systems, Inc. may void the authority granted to the user by the FCC to operate this equipment.



All of the QNAP iVW video wall controllers comply with CE Class A.

Symbols in this document

 Warning	This icon indicates instructions that must be strictly followed. Failure to do so may result in injury or death.
 Caution	This icon indicates the action may lead to disk clearance/loss OR failure to follow the instructions could result in data damage, disk damage, or product damage.

Safety Warnings

1. The iVW video wall controller can operate normally in a temperature between 0°C–40°C and in a relative humidity of 0%–95%. Please ensure the operating environment is well-ventilated.
2. The power cord and devices connected to the iVW video wall controller must provide a correct supply voltage (100W, 90–264V).
3. Do not place the iVW video wall controller in direct sunlight or near chemicals.
4. Unplug the power cord and all connected cables before cleaning. To clean the iVW video wall controller, wipe it with a dry towel. Do not use chemicals or aerosols to clean the iVW video wall controller.
5. Do not cover or place any objects on the iVW video wall controller to ensure normal operation and to avoid overheating.
6. Use the flat head screws in the product package to lock the hard disks in the iVW video wall controller when installing hard disks.
7. Do not place the iVW video wall controller near any liquid.
8. Do not place the iVW video wall controller on an uneven surface to avoid it falling..
9. Make sure the voltage is correct in the location where the iVW video wall controller is installed. Contact the distributor or the local power supply company for more information.
10. Do not place any object on the power cord.
11. Under no circumstances should you attempt to repair the iVW video wall controller. Improper disassembly of the product may expose the users to electric shock and other risks. For any enquiries regarding repairing the iVW video wall controller, please contact the distributor.
12. iVW video wall controllers should only be installed in server rooms and maintained by authorized server managers or IT administrators. The server room should be secured and only accessible by authorized staff members.



Warning:

There is the possibility of an explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

DO NOT touch the system fan as it may cause injury and hardware failure.

1. Introduction

1.1 Introduction



Figure 1-1: iVW-FH233

The iVW-FH233 video wall controller box is for displaying a single video input on an array of monitors, implementing a large display without the inherent high costs of a single large monitor. The iVW-FH233 is for large displays where high definition video output is essential. The video wall controller accepts a single HDMI input, which is split over all of the monitors in the array.

1.2 Benefits

The benefits of the iVW-FH233 include:

- Accurate, high-definition image quality
- Silent operation
- HDCP support
- Simple setup
- Cost-saving implementation of a large display
- Major power saving compared to PC-based implementation
- Space saving

1.3 Features

The features of the iVW-FH233 include:

- One HDMI input
- Nine HDMI outputs
- Supports up to 1920 x 1080 output resolution per monitor
- Supports multiple display modes, including clone mode (1 x 1) and full mode (2 x 2, 2 x 3, 3 x 2, 3 x 3)
- HDCP support for compliance with Blu-ray Disc players and video game consoles
- Genimask bezel compensation technology for compensating for gaps between monitors
- RS232 for firmware upgrade and system integration
- 3.5mm audio out to support analog sound systems
- Fanless design for easy maintenance and silent operation

2. Hardware Specifications



Caution: Modifying the hardware, software, or firmware of the QNAP products will void the warranty. QNAP is not responsible for any form of damage or loss of data caused by modding QNAP products. Users will be solely responsible for the risks of possible data loss and system instabilities caused by modifying hardware, altering the default system firmware or installing unauthorized third-party applications on QNAP products.

2.1 Front Panel

The front panel has the following buttons and indicators:

- One power LED indicator
- One video input LED indicator
- Nine video output LED indicators
- Six OSD buttons
- One Infrared sensor



Figure 2-1: iVW-FH233 Front Panel

2.2 Rear Panel

The rear panel has the following connectors and switches:

- One HDMI input
- Nine HDMI outputs
- One power input
- One RS232
- One power switch



Figure 2-2: iVW-FH233 Rear Panel

2.3 Technical Specifications

Specification	Description
Model	iVW-FH233
Main Features	<ul style="list-style-type: none"> • Multiple output resolution support • Multiple display mode support • Genimask bezel compensation technology • Remote controller included
Video Input	1 x HDMI
Video Output	9 x HDMI
Input Resolution Support	1920 x 1080 (1080p), 1280 x 720 (720p)
Output Resolution Support	1920 x 1080 (1080p), 1366 x 768, 1360 x 768, 1280 x 720, 1024 x 768
Display Mode	1 x 1 (clone), 2 x 2, 2 x 3, 3 x 2, 3 x 3
Audio Output	1 x 3.5mm audio out
Serial	1 x RS232
Buttons	1 x Power button 6 x OSD buttons
Power	100~240V AC, 60W
Mounting	Wall mount
Dimensions (D x W x H)	295 x 191 x 65 mm
Weight	1.4 kg
Construction	Fanless design
Operating Temperature	0°C to 40°C with air flow
Certification	CE, FCC Class A, LVD

Table 2-1: Technical Specifications

2.4 Dimensions

- Height: 65 mm (71.4mm with rubber feet)
- Width: 295 mm
- Depth: 191 mm

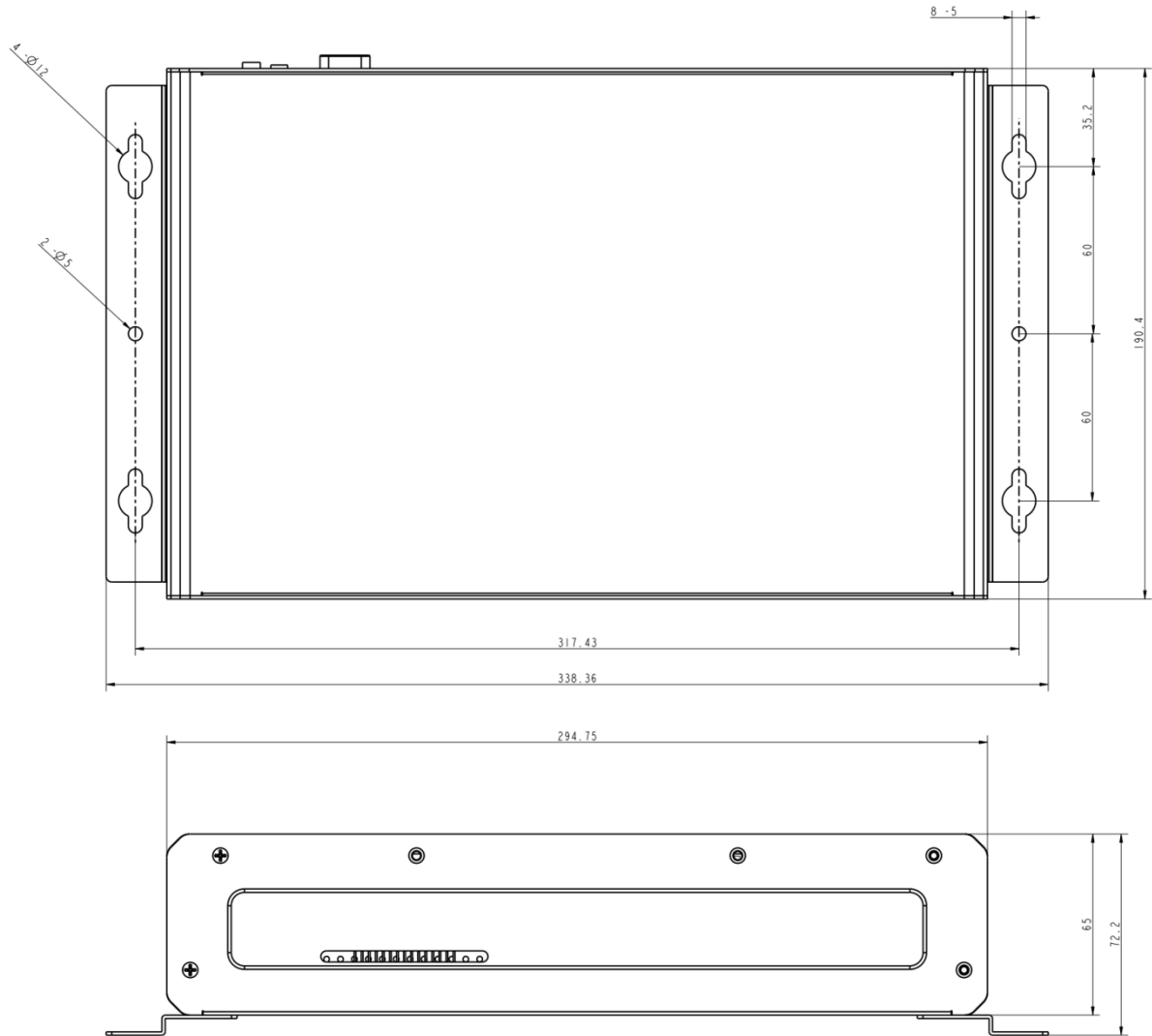


Figure 2-3: iVW-FH233 Dimensions

2.5 Power Switch and Reset Behavior

Toggle the power switch to turn on or turn off the video wall controller.

Power switch (Turn on)	Power switch (Turn off)
Toggle once	Toggle once

Table 2-2: Power Switch Behavior

To reset the device, press and hold the "Up" OSD button while toggling the power switch to start the iVW-FH233. Hold the "Up" OSD button until the power LED flashes orange then release it. The power LED will stop flashing orange when the reset process is done.

2.6 LED Specifications

This session applies to all the models in iVW Full HD series (iVW-FHxxx).

The LED indicators of the iVW video wall controllers indicate the system's status and other information. When the iVW video wall controller is turned on, check the following items to make sure the system status is normal. Note that the following LED information is applicable only when users have properly installed the device, and connected the iVW video wall controller to the power adapter.

LED	Color	LED Status	Description
Power	Green	Green	The iVW video wall controller is ready.
		Off	The iVW video wall controller is off.
	Orange	Flashes orange every 0.5 sec	The iVW video wall controller is in reset process
Video Input	Green	Green	The video input is ready.
		Off	No video input detected
Video Output	Green	Green	The video output is ready
		Off	No video output detected

Table 2-3: LED Indicators Behavior

3. Getting Started

3.1 Installation Steps

To install the iVW-FH233, please follow the installation steps below.

1. Install the display devices.
2. Mount the iVW-FH233 (optional).
3. Connect HDMI cables for video input and output, RS232 cable (optional), and power adapter to the iVW-FH233.
4. Adjust the output resolution. See **Input and Output Resolution** for more information.
5. Select a display mode. See **Display Mode** for more information.
6. Adjust the iVW-FH233 bezel compensation setting to align the images (optional).

3.2 Install Display Devices

The display devices (LCD monitors, TVs) are installed in a rectangular arrangement by following your chosen display mode.

Recommended installation procedures are:

- Use identical display devices
- Keep the gaps between panels as small as possible
- Keep all horizontal gaps between monitors in the array consistent
- Keep all vertical gaps between monitors in the array consistent

3.3 Mounting

The iVW-FH233 must be placed on a table, desk or any other firm surface. The iVW-FH233 can also be mounted using the included mounting brackets. The installation location must be:

- Out of direct sunlight
- Without anything on top of it
- On a firm surface
- Away from moisture and liquids

3.4 Connect Cables

The cables that need to be attached are listed below and their connections are shown in

Figure 3-1:

- HDMI input cable – from the video source (PC, console, player, etc) to the iVW-FH233.
- HDMI output cables – from the iVW-FH233 to the LCD panels or other video box controllers. Make sure the cables are connected to the correct monitors as shown in **Figure 3-1**.
- Power cable – from the power adapter.

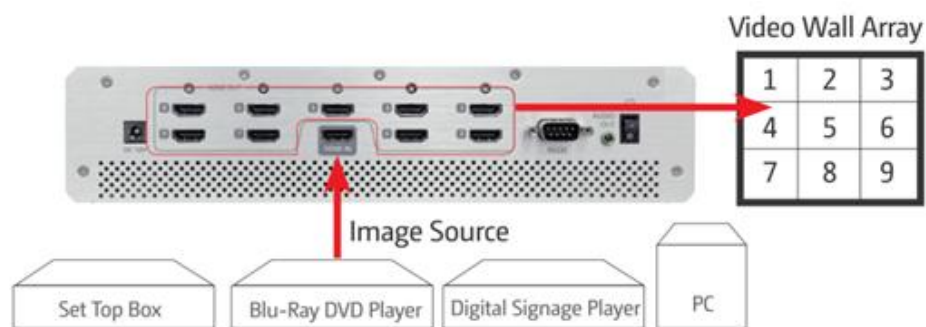


Figure 3-1: Cable Connection

3.4.1 Connect the Video Source and iVW-FH233

The video source directly connects to the iVW-FH233 through an HDMI cable. To connect the video source to the iVW-FH233, follow these steps:

1. Attach the HDMI video cable to the HDMI output of the video source.
2. Attach the HDMI video cable to the HDMI input on the iVW-FH233.

3.4.2 Connect iVW-FH233 and the Display Devices

The iVW-FH233 directly connects to the display devices through HDMI cables. To connect the iVW-FH233 to the display devices, follow these steps:

1. Attach the HDMI video cables to the HDMI output of the iVW-FH233.
2. Attach the HDMI video cables to the HDMI input on the display devices.

3.4.3 Connect the Power Adapter to iVW-FH233

Connect the included power adapter to the iVW-FH233.

4. Input and Output Resolution

Correct adjustment of the input and output resolutions gives a greater image quality. Follow the steps outlined in the subsections below to get the best image quality from the iVW video wall controller.

4.1 Aspect Ratio

With auto-scaling it is not necessary to match the input and output aspect ratios. However for the best visual experience the input and output aspect ratios should be identical.

4.2 Input Resolution

The input resolution should be set as high as possible. Pick a resolution that meets the following criteria for best visual experience:

- Matches the display device's aspect ratio
- Is the maximum possible resolution (without exceeding input resolution limits)

The iVW-FH233 supports the following input resolutions.
1920 x 1080 (1080p), 1280 x 720 (720p)

4.3 Output Resolution

The output resolution should be set as high as possible, and meet the following criteria for the best visual experience:

- Matches video input and display device aspect ratio
- Is the maximum possible resolution
- Has a minimum width greater than half input width
- Has a minimum height greater than half input height

The iVW-FH233 supports the following output resolutions.
1920 x 1080 (1080p), 1366 x 768, 1360 x 768, 1280 x 720, 1024 x 768

5. Display Mode

There are five display mode options available. The display mode can be set through the OSD menu. The modes are shown in **Figure 5-1** below.

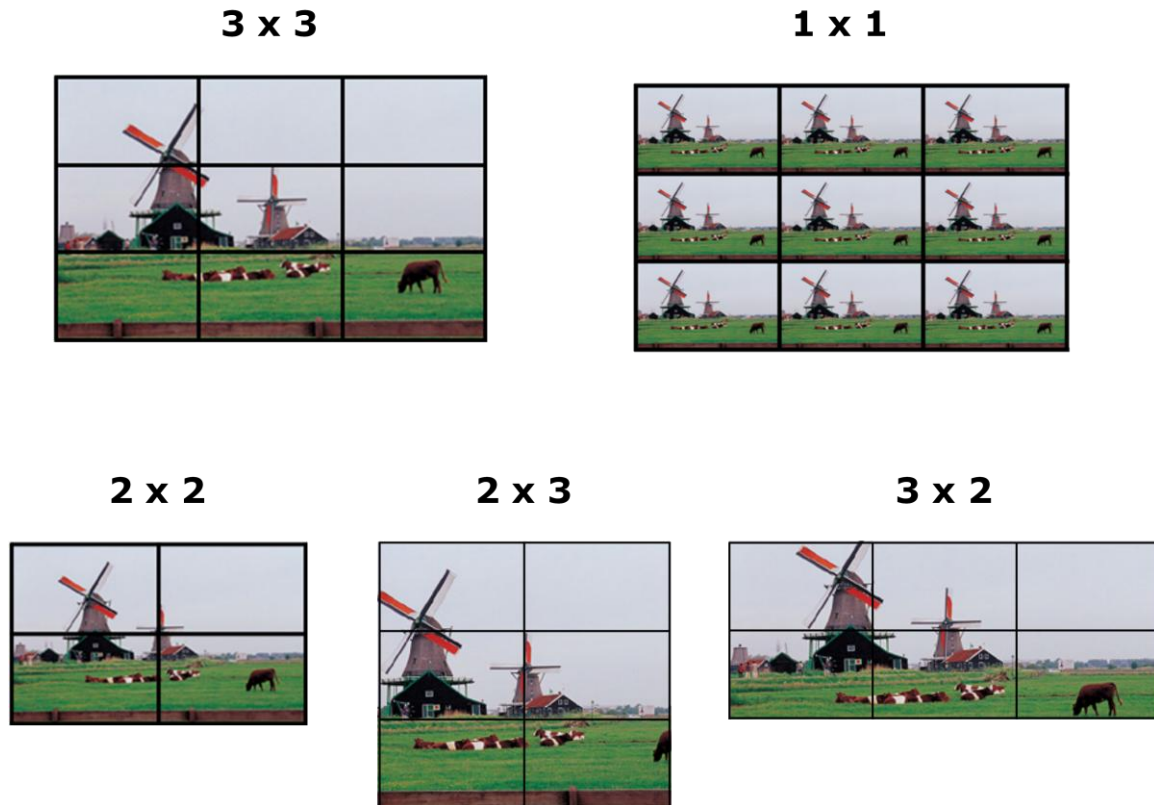


Figure 5-1: Display Mode

Note:

1. The 2 x 3 and 3 x 2 display modes retain the original aspect ratio of the output resolution for the best visual experience.
2. The 2 x 3 and 3 x 2 display modes show the center-aligned part of the video source. Please refer to **Figure 5-1** for the output result reference.

5.1 3 x 3 Display Mode

The 3 x 3 display mode splits the video source and outputs it across 9 display devices.

The implementation of a 3 x 3 array is shown below.



Figure 5-2: 3 x 3 Display Mode Setup

5.2 2 x 2 Display Mode

The 2 x 2 display mode splits the video source and outputs it across 4 display devices.

The implementation of a 2 x 2 array is shown below.



Figure 5-3: 2 x 2 Display Mode Setup

5.3 1 x 1 Display Mode

The 1 x 1 display mode duplicates the video source to each display device.

The implementation of a 1 x 1 (for 9 displays) array is shown below.



Figure 5-4: 1 x 1 Display Mode Setup

5.4 3 x 2 Display Mode

The 3 x 2 display mode splits the video source and outputs it across 6 display devices.

The implementation of a 3 x 2 (for 6 displays) array is shown below.



Figure 5-5: 3 x 2 Display Mode Setup

5.5 2 x 3 Display Mode

The 2 x 3 display mode splits the video source and outputs it across 6 display devices.

The implementation of a 2 x 3 (for 6 displays) array is shown below.



Figure 5-6: 2 x 3 Display Mode Setup

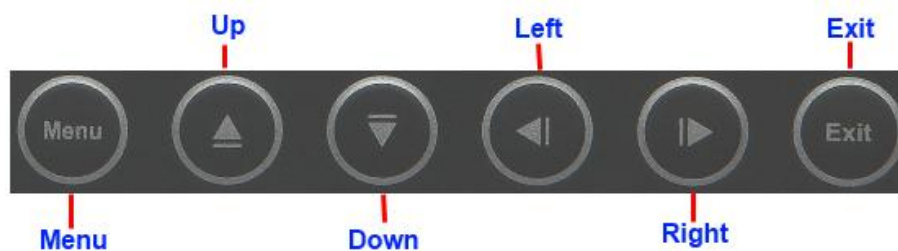
6. OSD Menu Functions

iVW-FH233 provides an On-Screen-Display (OSD) menu that enables you to easily make adjustments to your settings.

6.1 OSD Buttons

- There are several OSD control buttons on the iVW-FH233 front panel. **Menu:** Enters the OSD, selects items and confirms new values.
- **Left:** Moves the selection left.
- **Right:** Moves the selection right.
- **Up:** Moves the selection up.
- **Down:** Moves the selection down.
- **Exit:** Exits from any menu.

Figure 6-1 shows the OSD button functionality.



- **Menu:** Enters the OSD, selects items and confirms new values.
- **Left:** Moves the selection left.
- **Right:** Moves the selection right.
- **Up:** Moves the selection up.
- **Down:** Moves the selection down.
- **Exit:** Exits from any menu.

Figure 6-1: OSD Buttons

6.2 OSD Menu Structure

The **Table 6-1** below shows the OSD menu structure.

Menu	Submenu	Option
Output Resolution	■ Resolution List	
Display Mode	■ Display Mode List	
Bezel Compensation	■ Bezel Compensation Settings	
Option	■ Reset to Factory Default	■ Reset Confirmation
	■ OSD Position	■ Position Adjustment
Information	■ Input Resolution	
	■ Output Resolution	
	■ Firmware Version	
	■ OSD Version	
	■ EDID Version	

Table 6-1: OSD Menu Structure

6.3 Output Resolution Menu

For the best visual experience, users can change the output resolution of iVW-FH233 to fit the display's native resolution.

The output resolutions available are listed below.

- **1024 x 768**
- **1280 x 720 (720p)**
- **1360 x 768**
- **1366 x 768**
- **1920 x 1080 (1080p, default)**

The Output Resolution menu is shown in **Figure 6-2**, please follow the instructions at the bottom of the OSD menu to use it.

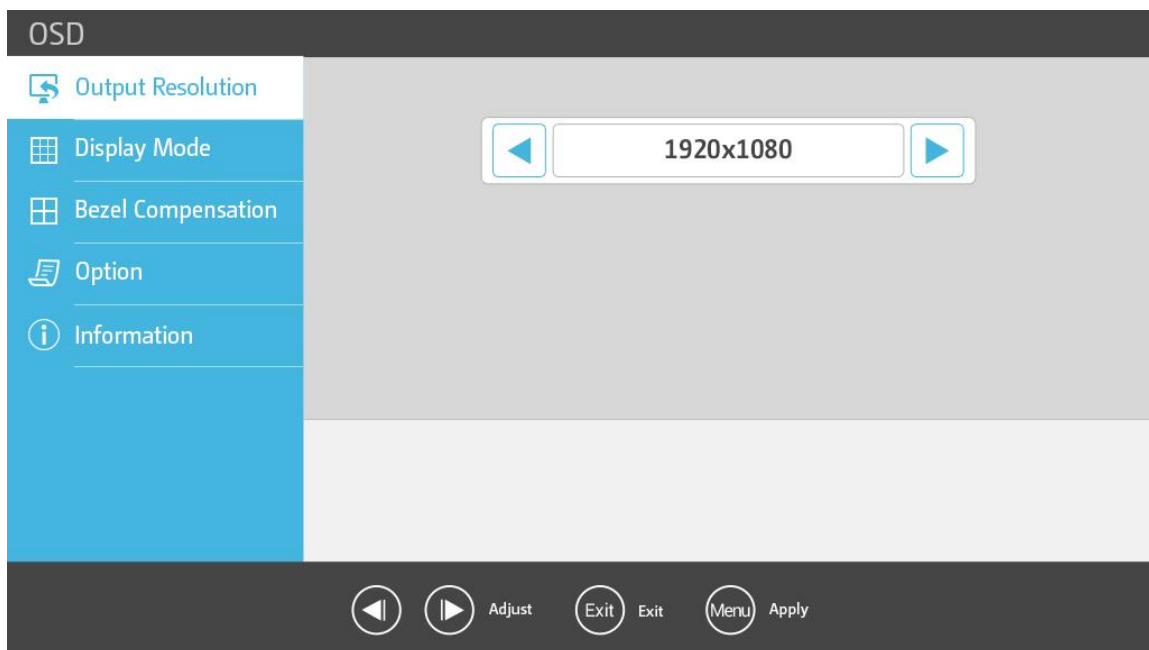


Figure 6-2: Output Resolution Menu

6.4 Display Mode Menu

iVW-FH233 supports several video wall array display modes.

The supported display modes are listed below.

- **3 x 3 (default)**
The video input is split across all 9 displays in a 3 x 3 array.
- **3 x 2**
The video input is split across 6 displays in a 3 x 2 array.
- **2 x 3**
The video input is split across 6 displays in a 2 x 3 array.
- **2 x 2**
The video input is split across 4 displays in a 2 x 2 array.
- **1 x 1**
The video input is cloned across every display.

The Display Mode menu is shown in **Figure 6-3**, please follow the instructions at the bottom of the OSD menu to use it.

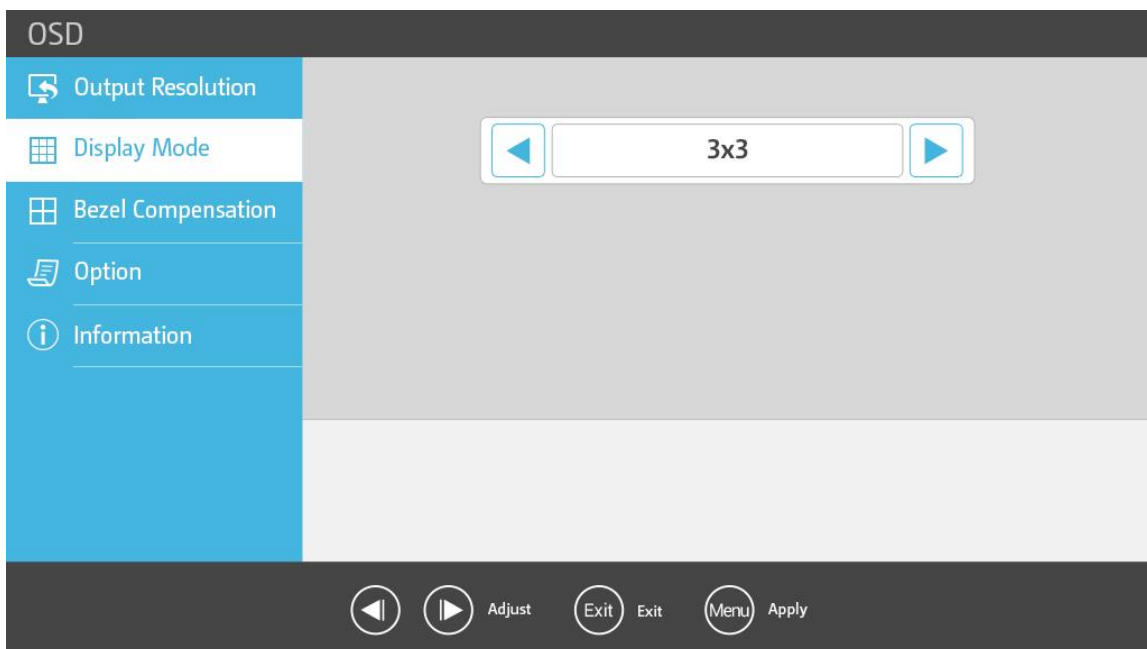


Figure 6-3: Display Mode Menu

6.5 Bezel Compensation Menu

When using displays with noticeable bezels, Bezel Compensation can be used for greater image alignment.

To find out the approximate value for each bezel compensation setting, please refer to the formulas below

- **Bezel compensation value for bezels at left/right side**

$$\text{Value} = \frac{\text{Left/Right Side Bezel Width}}{\text{Viewable Area Width}} \times \frac{\text{Horizontal Output Resolution}}{3}$$

- **Bezel compensation value for bezel at top side**

$$\text{Value} = \frac{\text{Top Side Bezel Height}}{\text{Viewable Area Height}} \times \frac{\text{Vertical Output Resolution}}{3}$$

- **Bezel compensation value for bezel at bottom side**

$$\text{Value} = \frac{\text{Bottom Side Bezel Height}}{\text{Viewable Area Height}} \times \frac{\text{Vertical Output Resolution}}{3}$$

The Bezel Compensation menu is shown in **Figure 6-4**, please follow the instructions at the bottom of the OSD menu to use it.

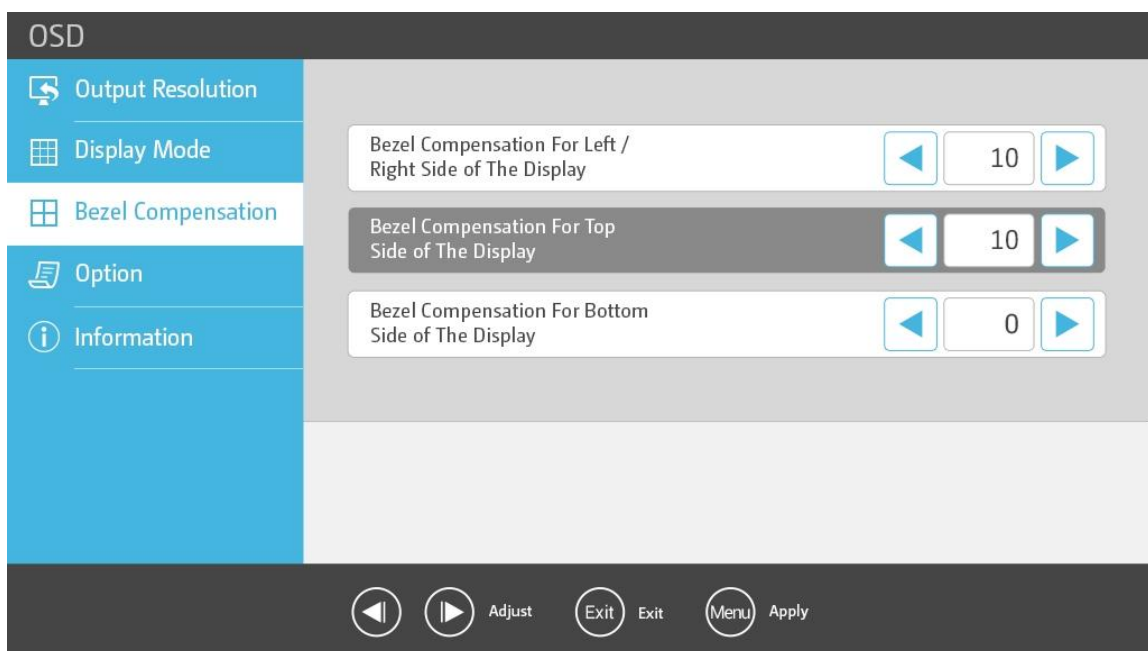


Figure 6-4: Bezel Compensation Menu

6.6 System Option Menu

The System Option menu is shown in **Figure 6-5**, please follow the instructions at the bottom of the OSD menu to use it.

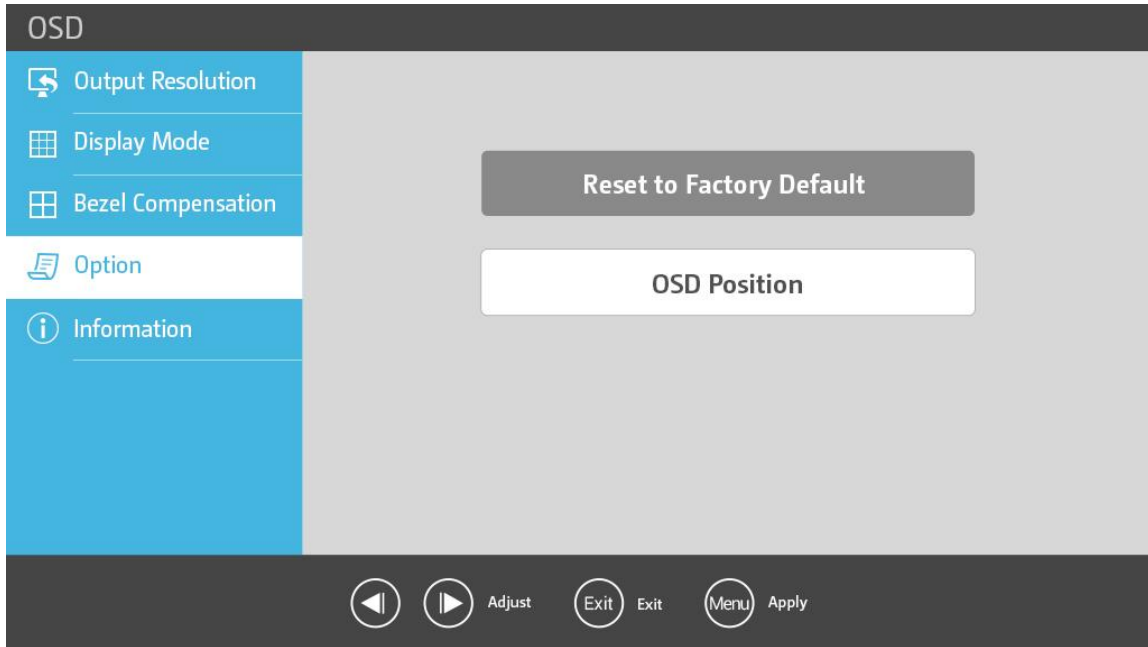


Figure 6-5: System Option Menu

The OSD position can be adjusted by using the OSD Position menu as shown in **Figure 6-6**.

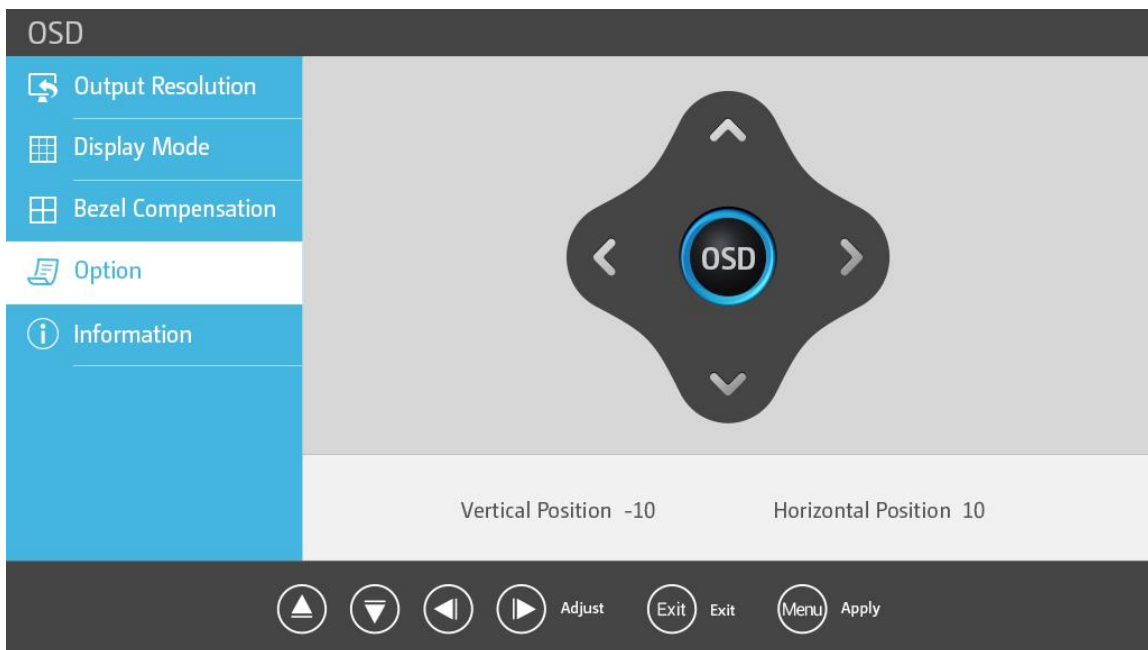


Figure 6-6: OSD Position Window

6.7 System Information Menu

The system information menu shows the input resolution, output resolution, and firmware/OSD/EDID version.

The System Option menu is shown in **Figure 6-7**.

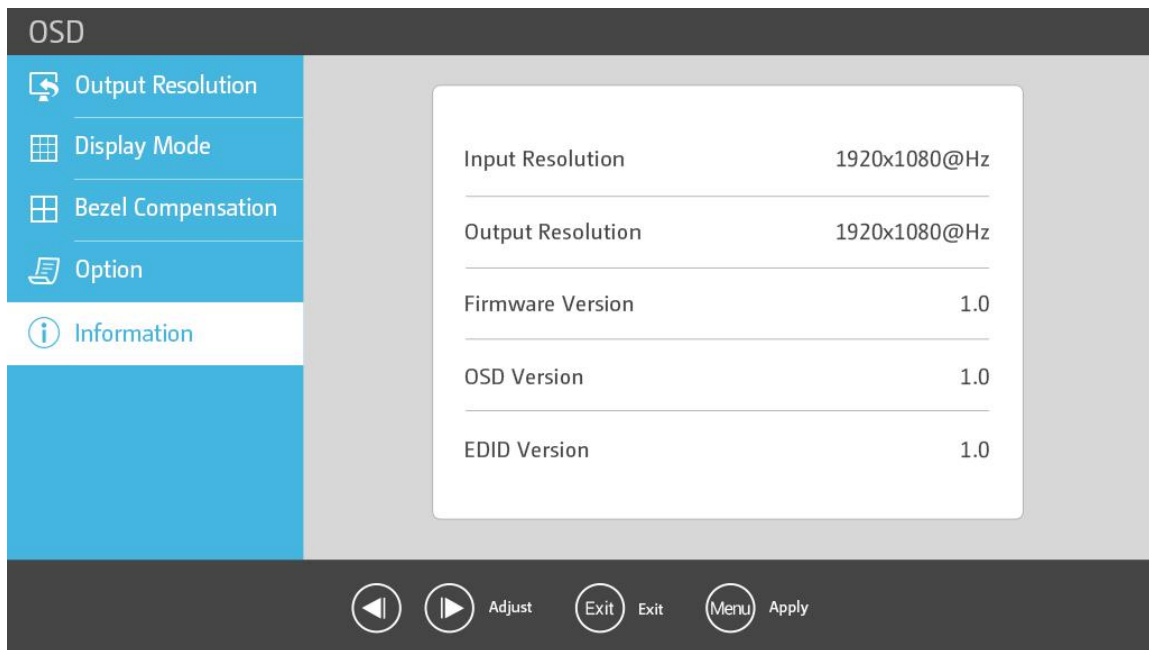
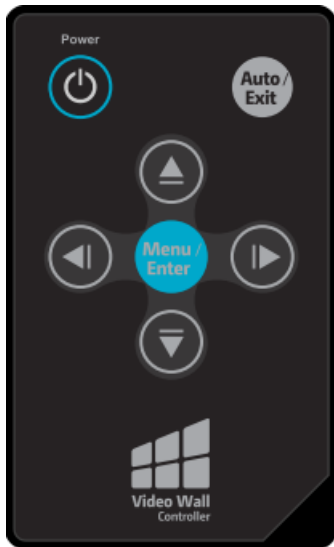


Figure 6-7: System Information Menu

6.8 Remote Control

The iVW-FH233 comes with a remote control for easier control without approaching the device. **Figure 6-8** shows the remote controller and its function keys.



- **Power:** Starts the iVW-FH233 or puts it in standby.
- **Menu:** Enters the OSD, selects items and confirms new values.
- **Left:** Moves the selection left.
- **Right:** Moves the selection right.
- **Up:** Moves the selection up.
- **Down:** Moves the selection down.
- **Exit:** Exits from any menu.

Figure 6-8: Remote Controller

7. Technical Support

QNAP provides dedicated online support and customer service. Please contact the following if you require technical support.

Phone: +886-2-26412000

Fax: +886-2-26410555

Email: ds_support@qnap.com