OMNIS®

AV Monitoring System

User Guide

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Legal

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Safety Information

The symbols below are used throughout this manual to identify important safety information. Heed all warnings and safety information.

Symbol	Meaning
	Warning, Danger, or Caution Risk of injury to yourself or the product.
	Risk of Electrical Shock Risk of severe electrical shock.

Warranty Information

Megapixel VR warrants the OMNIS®, a hardware product, against defects in materials and workmanship under normal use for a period of one (1) year from the date of retail purchase by the original end-user purchaser.

Megapixel VR does not warrant that the operation of the product will be uninterrupted or error free. Megapixel VR is not responsible for damage arising from failure to follow product or installation instructions.

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Installation Environment

The OMNIS is designed to be rack mounted in a central control room for fixed installations or flight cased for touring applications.

The unit has been qualified to operate in a dry environment within a temperature range of 15°C to 40°C (59°F to 104°F).

⚠️ **NOTE:** Never obstruct the airflow to the side ventilation slots. The front filters need to be regularly checked and cleaned.

⚠️ **WARNING:** Below is a set of environmental conditions that must be met prior to installing Megapixel VR products. The installation and/or use of products in these environments not meeting these conditions may void all warranties.

- Installation locations must be free of moisture.

- Installation locations must be dust free.

- All heavy and dirty site work must be complete. This includes re-working or modifications to walls, ceiling and floor.

- All construction materials and debris must be removed, area swept, vacuumed cleaned, and floor wet-mopped.

- Building structure, roof, and walls are sealed and weather proofed. Roof successfully tested for leaks.

- Outside drainage system and floor drains checked and tested to protect the equipment from flooding.

- Floors sealed and cleaned.

- All doors and windows installed and operational with weather seals.

- All final wall preparation complete including all taping, joint compound and fire sealant. Walls to be primed and finish painted.

- Overhead fire sprinkler or suppression system installed and pressure tested.

- HVAC ducts blown free of debris. HVAC shall be operational/balanced and running 72 hours prior to equipment installation.

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FCC Statement

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. If the equipment is not installed and used as directed in the instruction manual, it may cause harmful interference to radio communications. It is the responsibility of the user to correct any interference.

Carrying and Handling the Equipment

Before you handle the OMNIS, disconnect all cables and cords. Do not operate the OMNIS in areas with significant amounts of airborne dust or smoke, or near a humidifier. Tiny airborne particles can damage the equipment.

Liquid Exposure

Keep the OMNIS away from all sources of liquid. Protect equipment from dampness, humidity, or wet weather, such as rain, snow, and fog.

Power

Unplug the power cord (by pulling the connector, not the cord) and disconnect all other cables if any of the following conditions exist:

- The power cord or plug becomes frayed or otherwise damaged.

- Liquid has spilled onto the equipment.

- The equipment is exposed to rain or excess moisture or humidity.

- The equipment has been dropped, and has been damaged.

- You suspect that the equipment needs service or repair.

- You want to clean the case (use only the recommended procedure, described later in this document).

IMPORTANT: The only way to completely turn off power is to unplug the power cord.

WARNING: The AC cord has a three-wire grounding connector. This connector fits only a grounded AC outlet. If you are unable to insert the connector into an outlet because the outlet isn't grounded, contact a licensed electrician to replace the outlet with a properly grounded one. Do not defeat the purpose of the grounding pin.

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Repairing

The OMNIS does not have any user-serviceable parts. Do not attempt to replace or repair any components inside the equipment. If the equipment needs service, contact the company that provided or installed the equipment. If you open the equipment or install items, you risk damaging the equipment. Such damage isn't covered by the limited warranty on the equipment.

Medical Device Interference

The OMNIS contains components that emit electromagnetic fields, which may interfere with pacemakers, defibrillators, or other medical devices. Maintain a safe distance of separation between your medical device and equipment. Consult your physician and medical device manufacturer for information specific to your medical device. If you suspect equipment is interfering with your pacemaker or any other medical device, stop using the equipment.

Medical Conditions

If you have a medical condition that could be affected by using an OMNIS (i.e., seizures, blackouts), consult with your physician prior to using the OMNIS.

High-Consequence Activities

The OMNIS is not intended to be used where failure could lead to death, injury, or severe environmental damage.

Explosive Atmospheres

Using the OMNIS in any area with a potentially explosive atmosphere (i.e. where the air contains high levels of flammable chemicals, vapors, or particles (such as grain, dust, or metal powders), may be hazardous. Obey all signs and instructions.

Using Connectors and Ports

Never force a connector into a port. When connecting a device, make sure the port is free of debris, that the connector matches the port, and that you have oriented the connector correctly in relation to the port.

Storing the Equipment

If you are going to store the OMNIS for an extended period of time, keep it in a cool and dry location (ideally, 71° F or 22° C).

Cleaning the Equipment

When cleaning the outside of the OMNIS and its components, first shut down the equipment, then unplug all cords and cables. Use canned air such as 'Turbo Blast' by ACL Staticide Inc. or a clean, soft, lint-free cloth to wipe the equipment exterior. Avoid getting moisture in any openings. Do not spray liquid on the equipment. Do not use sprays, solvents, abrasives, or cleaners.

Changes

Megapixel VR provides this manual 'as is' without warranty of any kind, either expressed or implied, including but not limited to the implied warranties or merchantability and fitness for a particular purpose. Megapixel VR may make improvements and/or changes to the product(s) and/or the program(s) described in this publication at any time without notice.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this publication; these changes are incorporated in new editions of this publication.

Certifications

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System Components

The OMNIS is a specialized rack mount network appliance designed to manage large arrays of video walls. It aggregates up to 200 video processors into a single map view. The 'at a glance' real-time system status information can monitor a wide range of system status information including monitoring the temperature, link status, power supply status, and integrity of data flowing into and out of display devices. This assists, with rapid diagnosis and in some cases resolving issues before a failure impacts the visual quality of the display.

The OMNIS provides four key services:

- System overview of all connected devices

- Notifications of events for connected devices

- Quick access to common tasks (Brightness, screen blanking)

- In depth device status details

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Overview

The OMNIS is a one RU (1.75") tall rack mount unit.

The OMNIS has eight WAN ports for connecting HELIOS, the display devices, tech laptops and wireless routers.

The system is configured remotely via a web app that can be hosted on a laptop or tablet running Chrome or Safari browsers.

Figure 1: OMNIS

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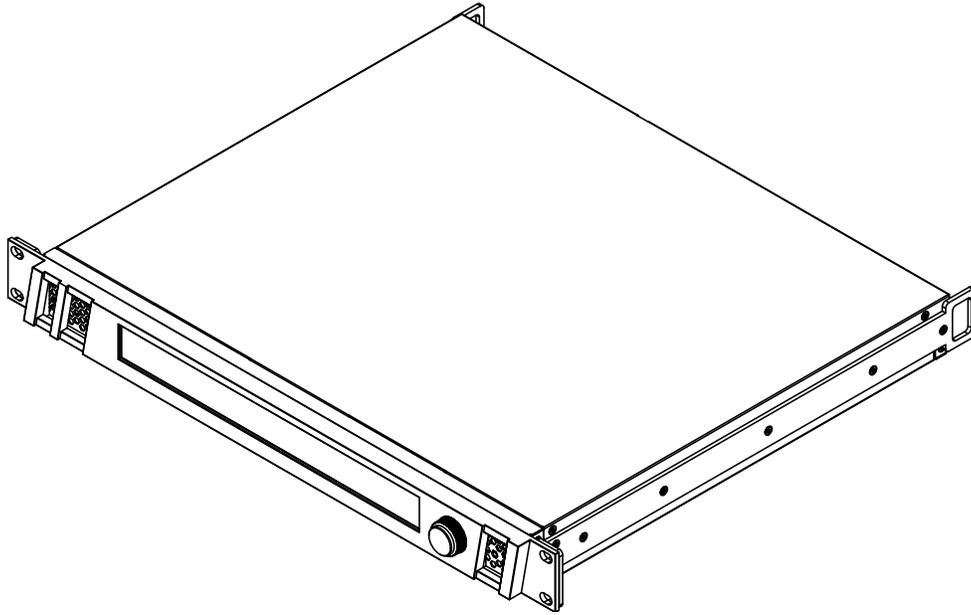
Front Panel

1 - Configuration interface - On front of the OMNIS is an LCD display and a turn/push knob interface. Turning the front encoder knob will switch the front LCD interface between two views; *Home* and *Details* (described in the section below).

2 - Air inlets - slots to the left and right of the LCD display are filtered vents for chassis airflow.
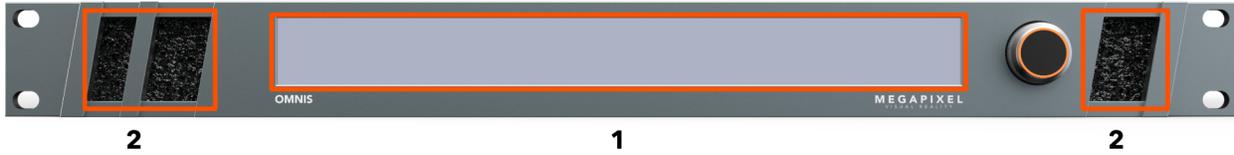
Figure 2: OMNIS front panel items

Front panel interface views

Turning the front encoder knob, without pressing it, will switch the front LCD interface between two views; *Home* and *Details*. The *Home* view displays colored rectangles as status indicators for key parts of a system. The *Details* view contains additional information regarding the OMNIS system such as firmware version and detailed IP settings.

Home

Details

Figure 3: OMNIS front LCD views

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Main Menu

Press the encoder to enter the main menu. The main menu has two options; restore *Factory Default* and *IP Address*. Please see the IP Addressing section for details on setting the IP.

Figure 4: OMNIS Menu options

Restoring to Factory Default

1. Select *Factory Default*.

2. Select from two options, after selection, the OMNIS will reboot.

- *Confirm (Defaults)* - all information will be restored to factory defaults.

- *Confirm (Keep IP)* - all information will be restored to factory defaults, except the IP address. Use this option in cases where the unit needs to rejoin the same network after the restore.

All current show information will be deleted!

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Rear Panel

1 - Debug - Serial port for development purposes.

2 - USB - Local USB device monitoring port. This port does not provide access to the user interface.

3 - Monitoring - WAN ports for connecting to the monitored display's network. HELIOS connects here.
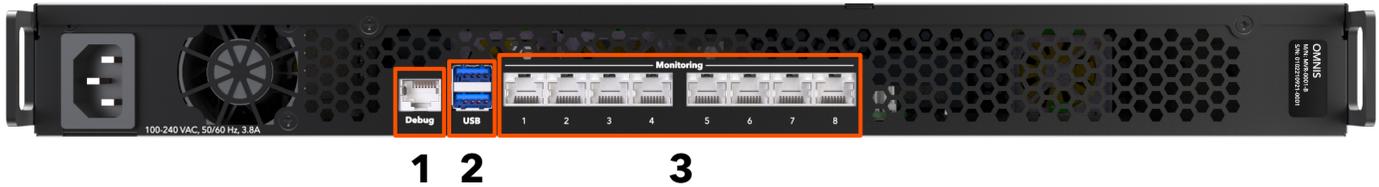
Figure 5: OMNIS rear

Connections

Overview

The OMNIS system consists of; the OMNIS processor, the system it is monitoring and the network connections in between.

Connections

Power - A/C power is supplied to the OMNIS on a C14 style IEC connector. There is no power switch. When power is applied, the system will begin to boot. After about 15 seconds the front screen will be lit. When the boot logo disappears, the OMNIS is ready for use.

Monitoring Ports - Connect the control ports of a HELIOS display processor to the monitoring ports to have the OMNIS system automatically discover the system topology. Remember to assign all devices to the same LAN manually or use DHCP if available.

User Interface - The OMNIS system can be used with a wide variety of LED display products. It is necessary to configure the system to the products in use. Configuration of the OMNIS System is accomplished with a web application. The web app runs on any remote host capable of running a modern web browser such as Chrome or Safari. In order to communicate with the OMNIS System, the web app host must be configured to be on the same LAN as the OMNIS.

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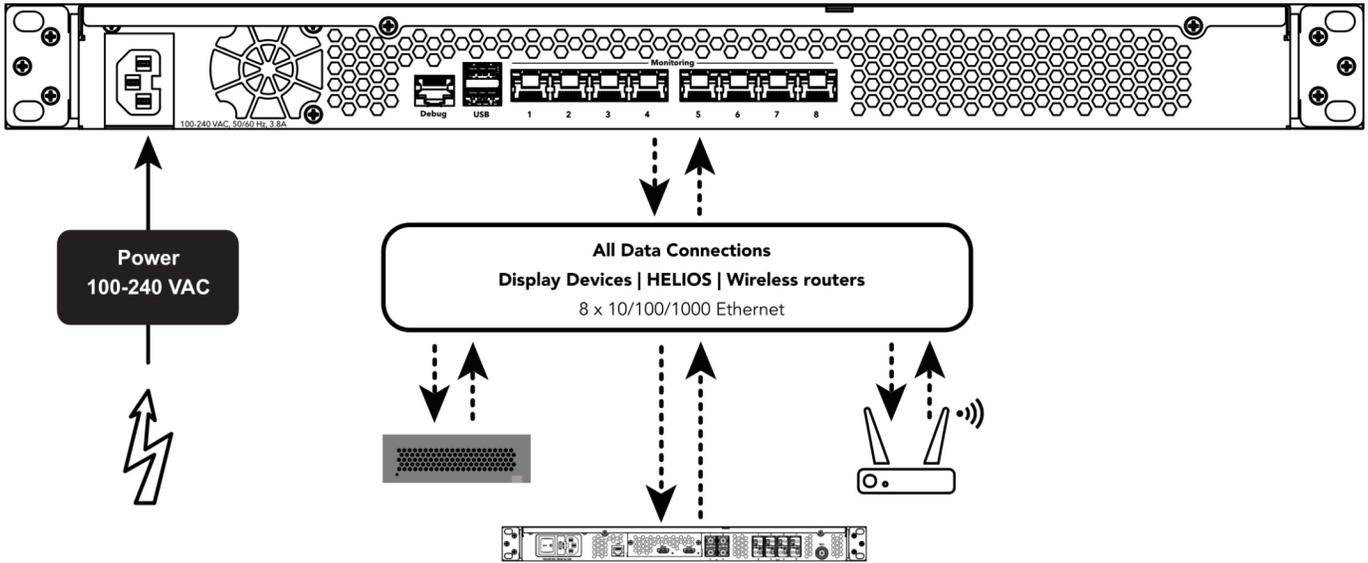
Figure 6: System connections

Note: For convenience or compatibility with wireless-only devices such as tablets, a wireless router can be used.

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IP Addressing - Front LCD

The IP address of the OMNIS is reported on the front display of the OMNIS.

A factory reset OMNIS will be set to DHCP by default. DHCP is the mode that should be used when operating the OMNIS with a wireless router attached to one of the control ports. If the OMNIS has discovered a DHCP server, the OMNIS will likely have a 192.168.XX.YY address. If it has not been served an IP address by DHCP, the OMNIS will default to an automatic private address (169.254.XX.YY). In DHCP mode, the web UI host device must also be set to DHCP in order to join the same network.

The OMNIS can be configured to a fixed IP as well. In fixed IP mode, ensure both the IP and the subnet mask for the web app host have been set to the correct range.

1. Press the encoder on the front of the OMNIS unit, then turn the encoder to select *IP Address.*
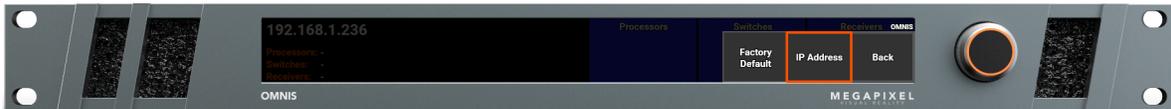
2. If the unit reports *Addressing (DHCP)* the unit is set to automatically acquire an IP from a DHCP server. Select *Addressing (DHCP)* or *Addressing (Static)* to select between DHCP or Static IP, depending on the network that the OMNIS needs to join.

3. Once the IP settings have been made, select *Apply.*

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IP Addressing - Web App

The IP address of the OMNIS can also be set from the web app interface. Select **Settings** > **General** > **Network.** If the client and the OMNIS are not on the same network the user interface will not be available. Be certain of the settings before pressing apply.
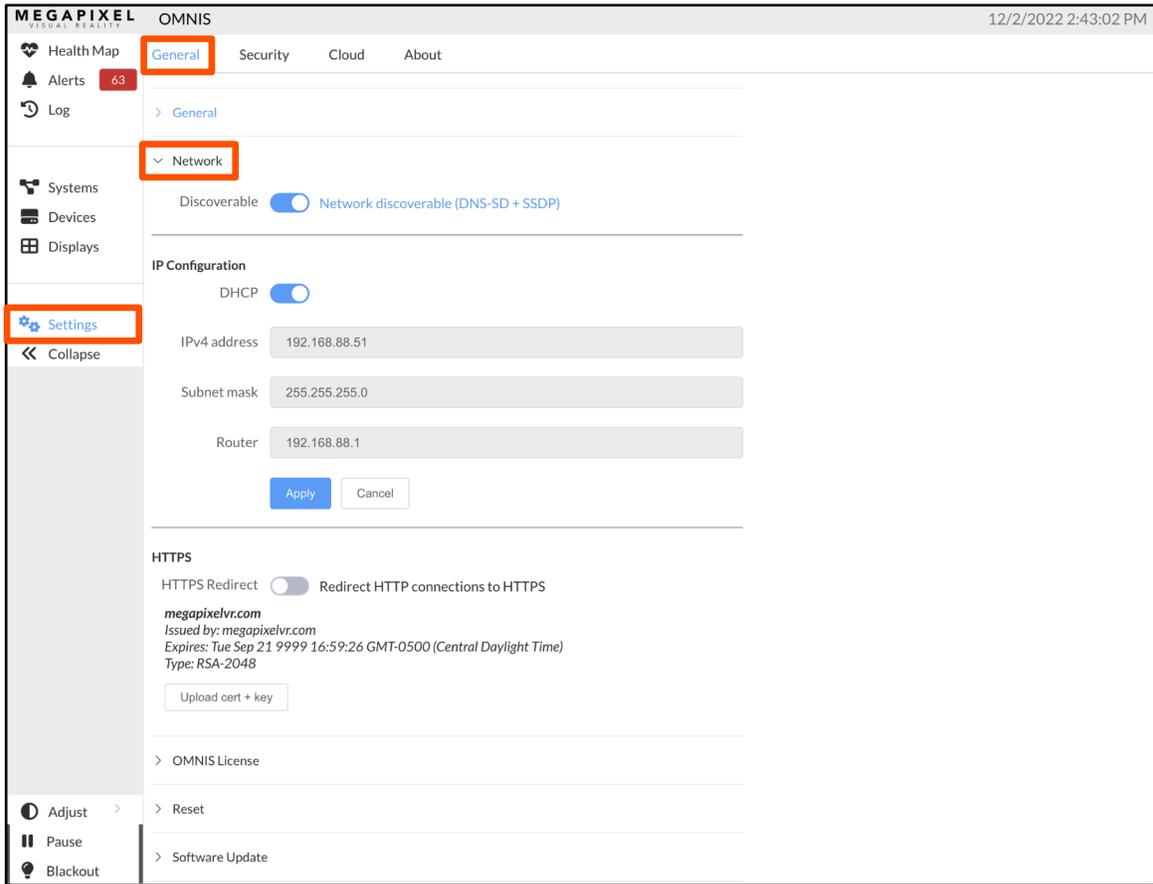
Figure 7: Web app network settings

Configuration

Overview

Prior to configuring the system, a majority of the components of the system should be physically connected. At minimum, the OMNIS should be connected to at least one monitoring target processor such as HELIOS. In the previous chapter on connections, this guide has IP addressing instructions for both the OMNIS and the client device (tech laptop). The web UI requires an IP network.

Systems

Enter the IP address of the target OMNIS into the search bar of Chrome or Safari on the tech laptop or tablet. The first steps to configuring an OMNIS processor is to navigate to the **Systems** pane and press the **Add System** button. Systems are containers for one or more devices. The example below shows four (4) systems.

Figure 8: Add System

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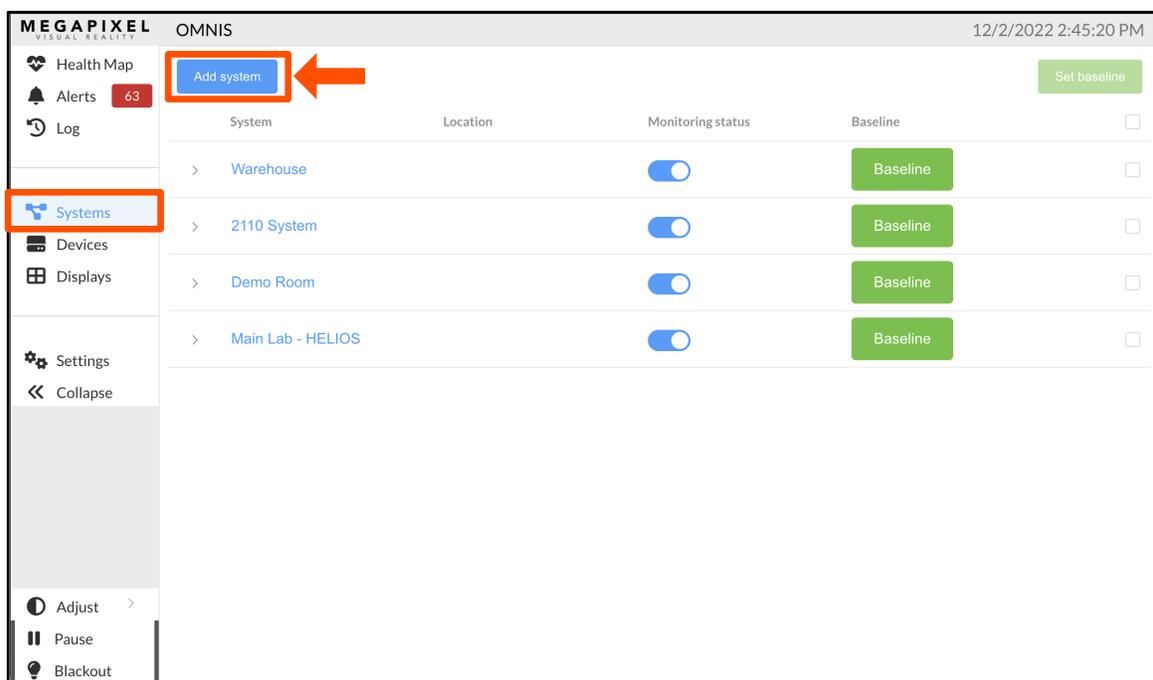
Fill in the system details then press *Add*.

Figure 9: Add new system form

Select the system name to edit the system info. Press the *Add device* button and to add a device such as a HELIOS.
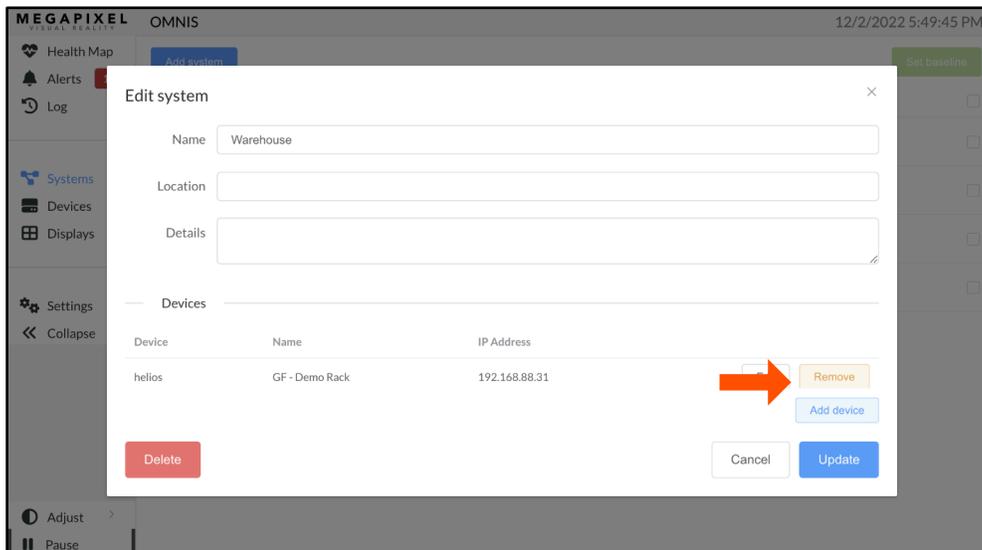
Figure 10: Add device button

Once the details have been provided to the OMNIS, press the *Add* button.
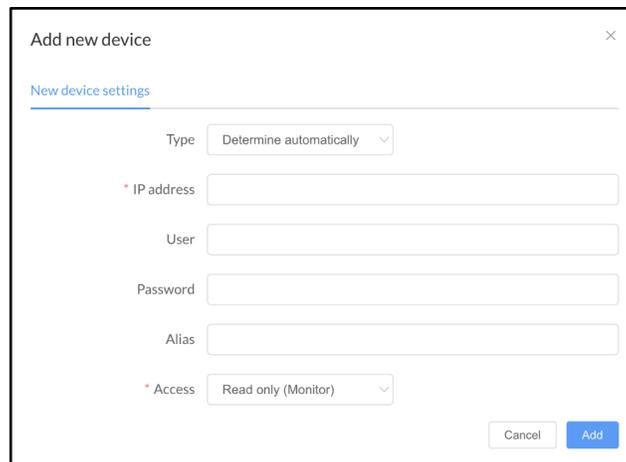
Figure 11: Add device form

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The device will now appear under the disclosure triangle of the system it is part of.
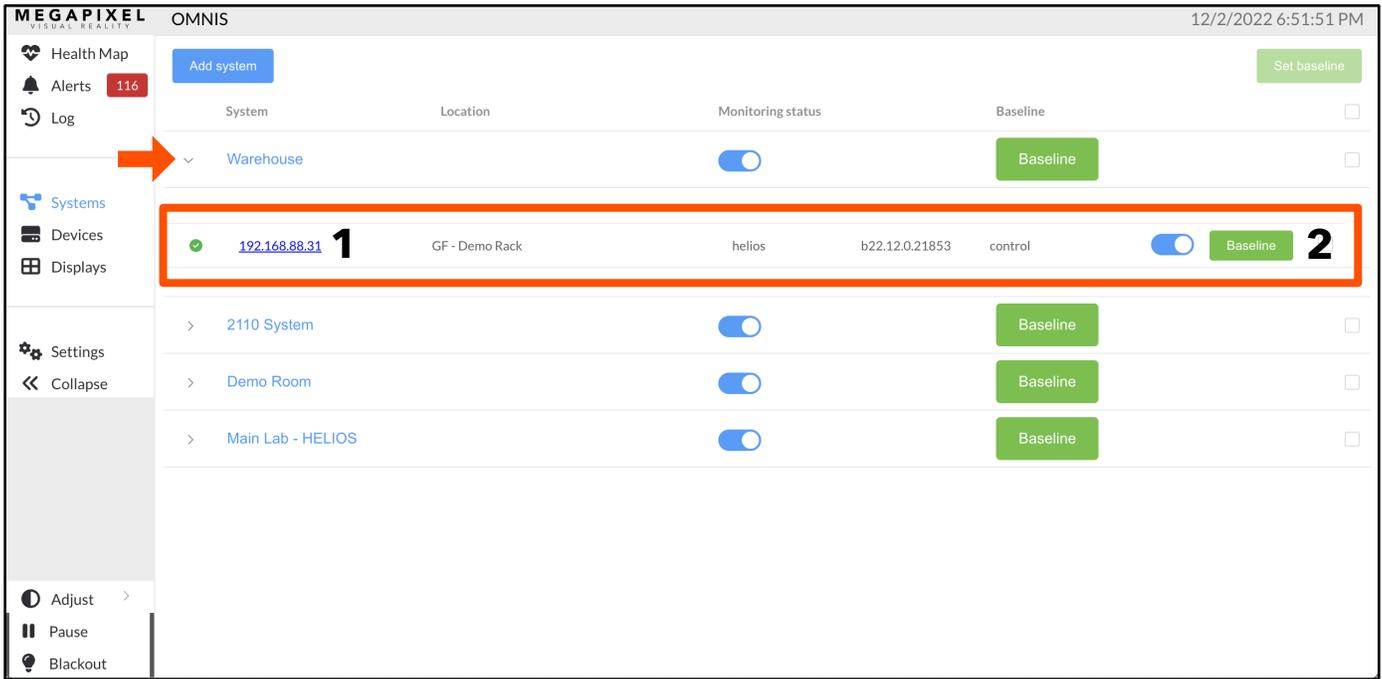
Figure 12: Device added

1. ***URL*** - Visit the UI of a HELIOS by clicking on the URL.

2. ***Baseline*** - In the OMNIS system, a baseline is a comprehensive set of data points that OMNIS stores to create a snapshot of the system. OMNIS uses the baseline as a point of comparison. A baseline is created after a system has been configured and is expected to not change. Once a new system is fully operational with no alerts or issues, press the ***Baseline*** button to have the OMNIS record the current state. The OMNIS will monitor and notify with a deviation alert if it detects a change from the baseline. As an example, a panel moving to a new location on the raster map is not an alert worthy event unless it happens after a system has been baselined. Once the baseline data points have been recorded, OMNIS has fixed points of reference to compare to. When parameters change such as map position, a baselined system will alert with a deviation for all parameters that are affected by the change. More than one deviation alert can occur for a single event if the event affects more than one parameter. Please see the Alerts section in Chapter 4 for more information on alerts and deviations.

NOTE: Novastar processors have a known issue being monitored by OMNIS while simultaneously being controlled from their proprietary software. The Novastar interface can be quite unresponsive and unreliable. This is due to the fact that the Nova processor can only support a single connection at a time. OMNIS must be temporarily disconnected to eliminate the erratic behavior. To do this, edit the Novastar system and change the access to *Disabled*.

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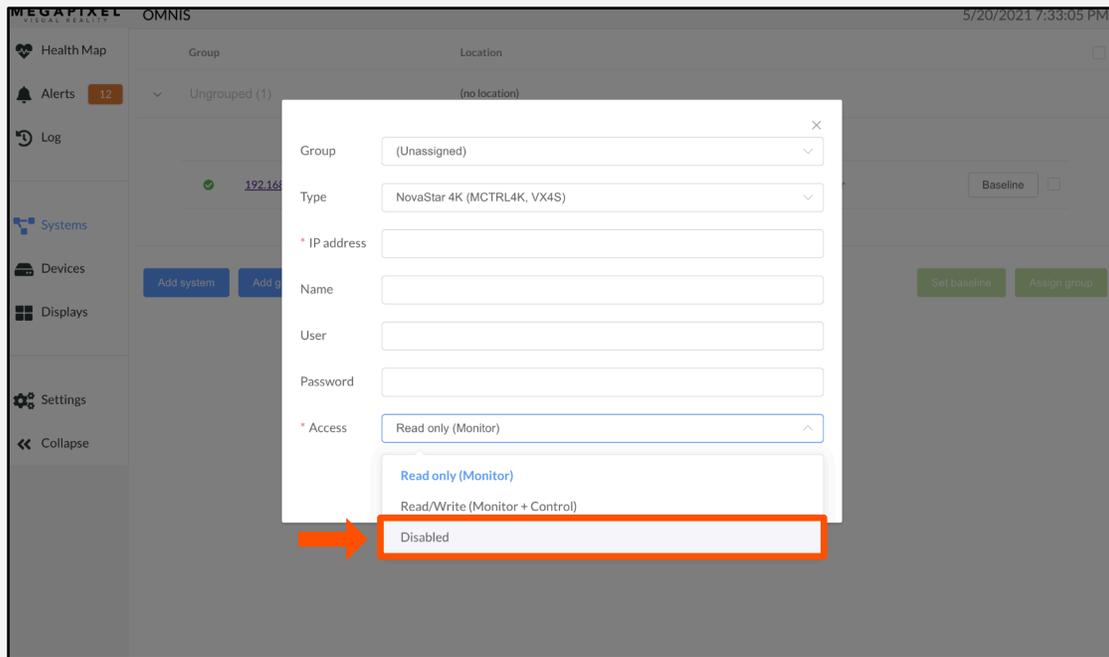
Devices

The devices pane lists all connected devices. Devices are grouped by type, **Processors** are listed first. *Tiles* have their own tab.
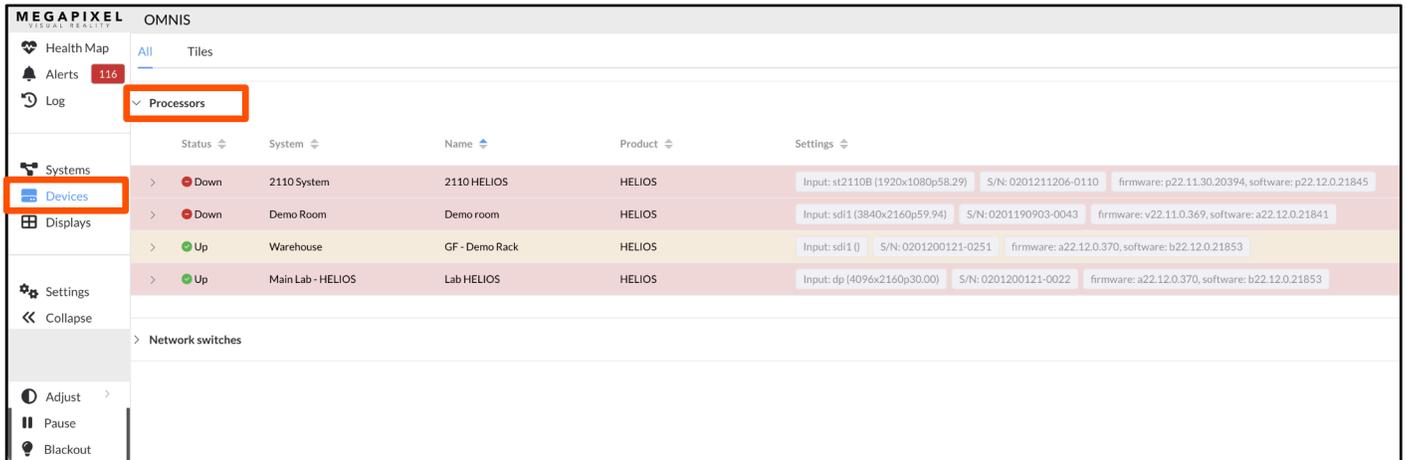
Figure 13: Devices

Network switches is a list of all network switches in a system. Expand each to view switch port information. This view gives a dashboard view of detailed information for all the ports in a system. Ports are laid out in numerical order, with each 'cell' representing one port on the switch.
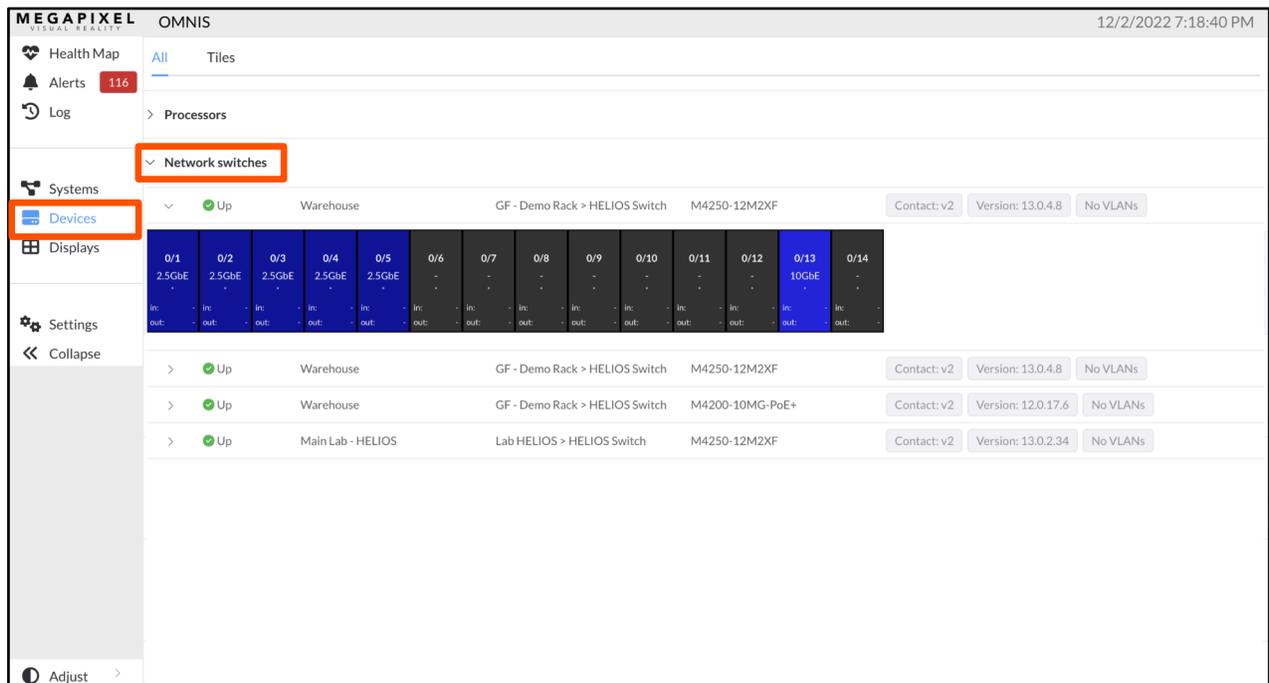
Figure 14: Network switches

Devices (Continued)
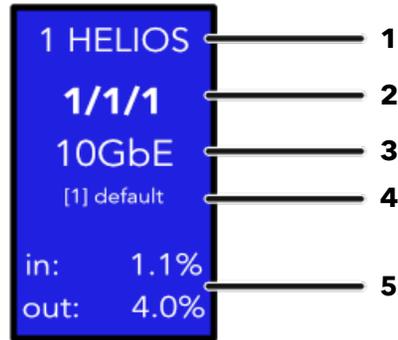
1. **Port number** - of the connected HELIOS. HELIOS units have eight (8) possible ports. The HELIOS name is automatically set by HELIOS on connecting to the switch to identify the main display data input to the switch.

2. **Port address** - standard networking equipment port addressing for NETGEAR switches. Unit number / Slot number/ Port number. Smaller switches that do not have modular slots will not have the middle slot number. If there are only two numbers here they stand for Unit / Port.

3. **Link speed** - The speed that the system is connected on this port.

4. **VLAN label** - Short names are preferable and should be named according to the function in the system.The [1] default label is reserved for inbound HELIOS data. Tile ports will be labeled with their VLAN ID and Tile Data port number. [101] Tile Data 1

5. **In / Out** bound data as percent of port link speed.

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Displays

The *Displays* pane contains the controls for the visible aspects of a display such as which input is in use, test patterns, blackout etc. Select the system name from the tab at the top to begin controlling a display. The health map offset at the bottom of the pane, controls the position of the display in the health map view of OMNIS.
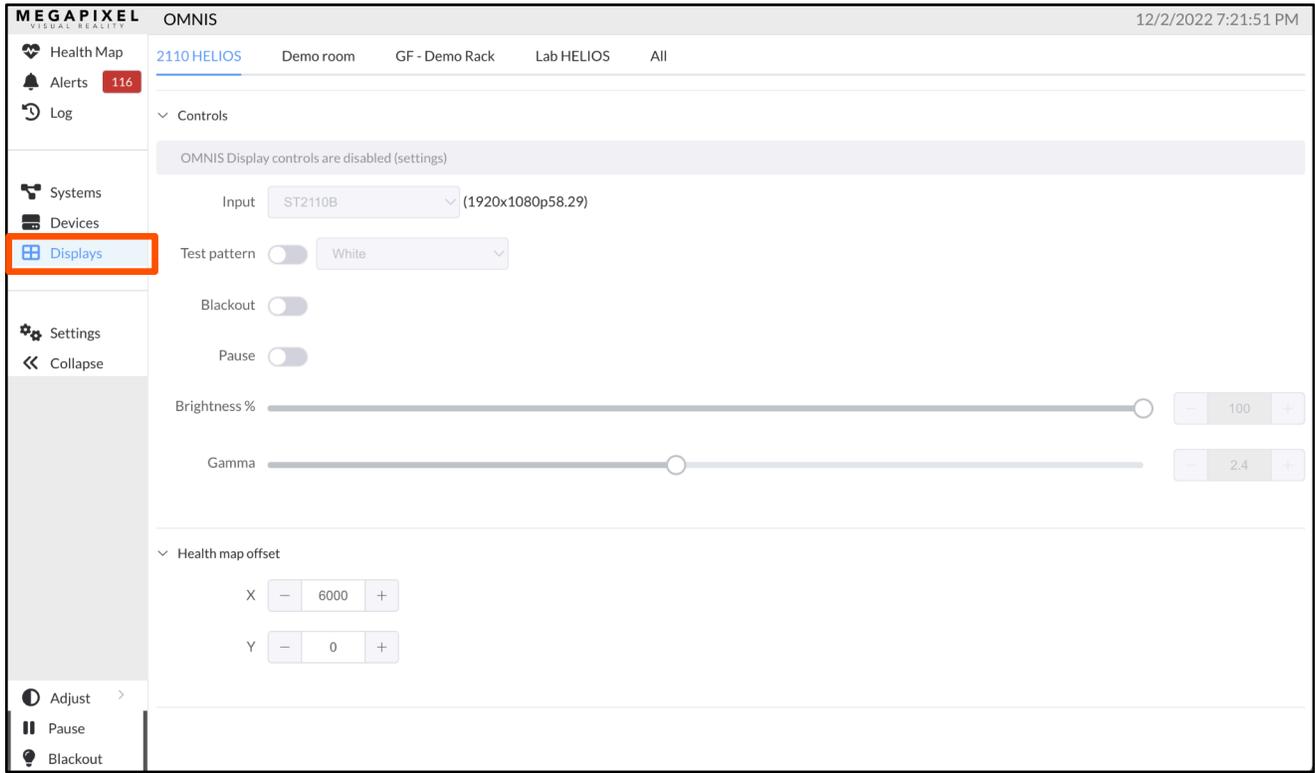
Figure 15: Devices

Settings

The **Settings** pane contains four (4) tabs; **General**, **Security**, **Cloud** and **About**.
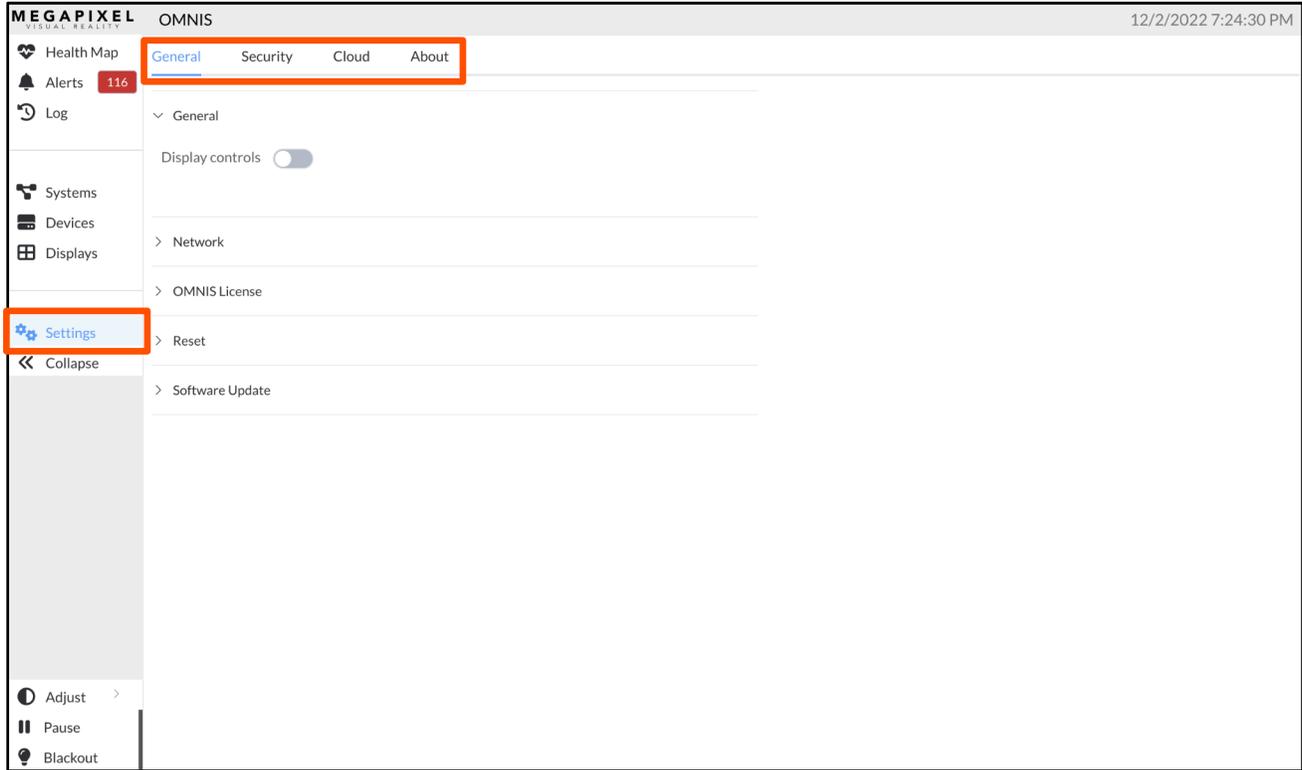
Figure 16: Settings

General - Tab

The **General** accordion contains a toggle for enabling **Display controls**. This toggle will disable the **Displays** > **Controls** for systems ensuring that accidental changes are not made.
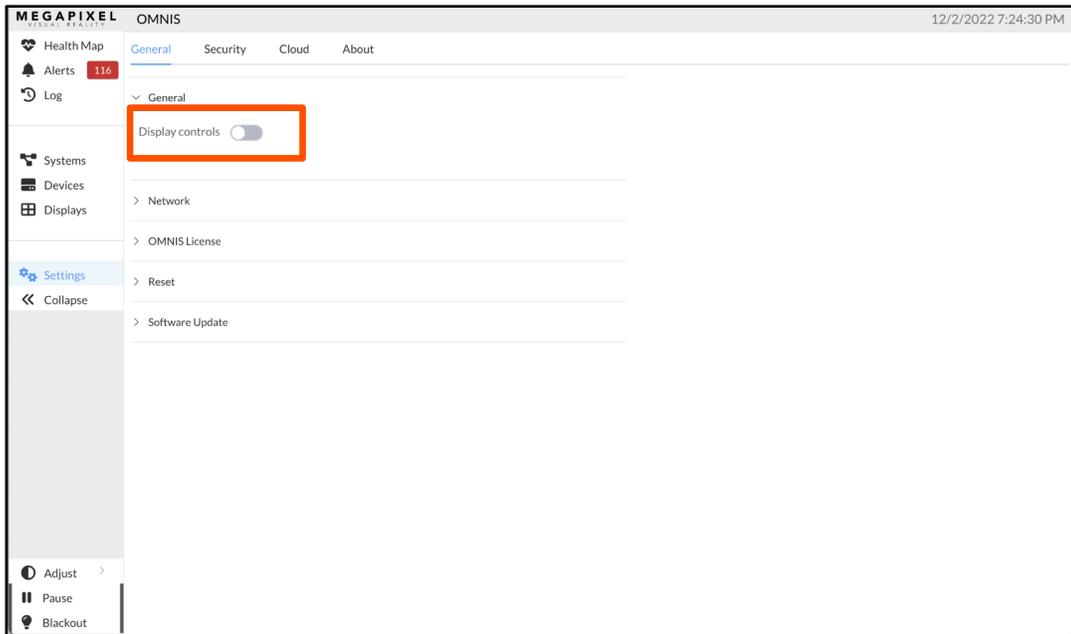
Figure 17: Settings > Display controls disabled
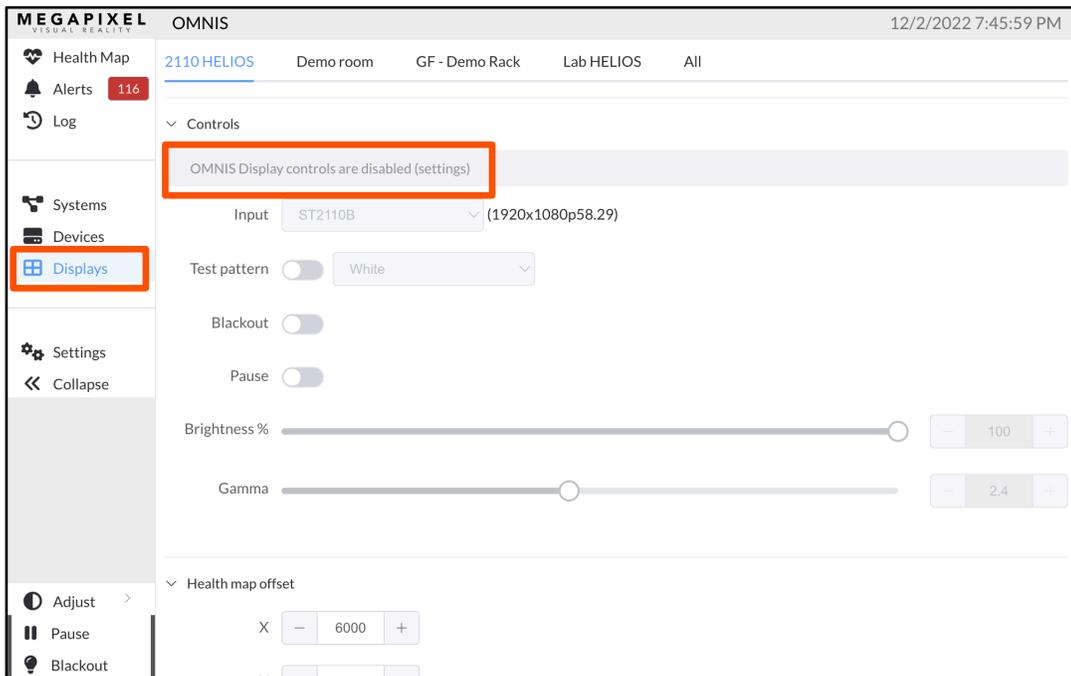
Figure 18: Displays controls disabled

General - Tab (Continued)

The **Network** accordion contains a **Discoverable** toggle that enables protocols to advertise OMNIS on a network. Use **DHCP** to automatically connect to a router. With **DHCP** disabled, the IP information needs to be manually entered. In security conscious environments, OMNIS can be set to redirect to a HTTPS URL.
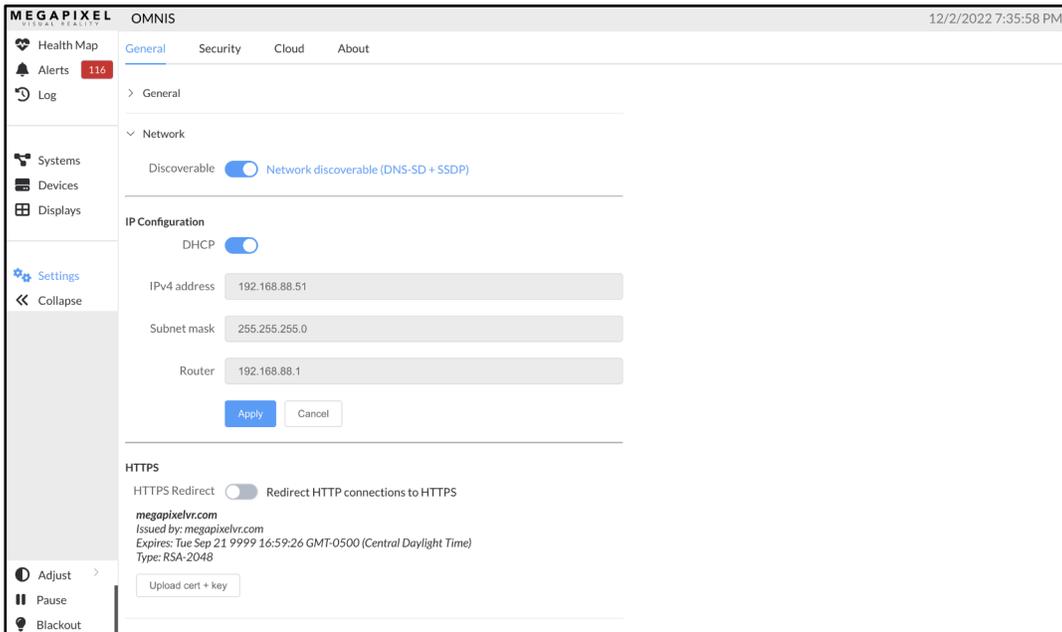
Figure 19: Network settings

OMNIS License accordion contains a unique **System ID** that is required when obtaining a license. This is also the location to upload a license file. License files can be obtained directly from MVR. Please contact your MVR representative for more information.
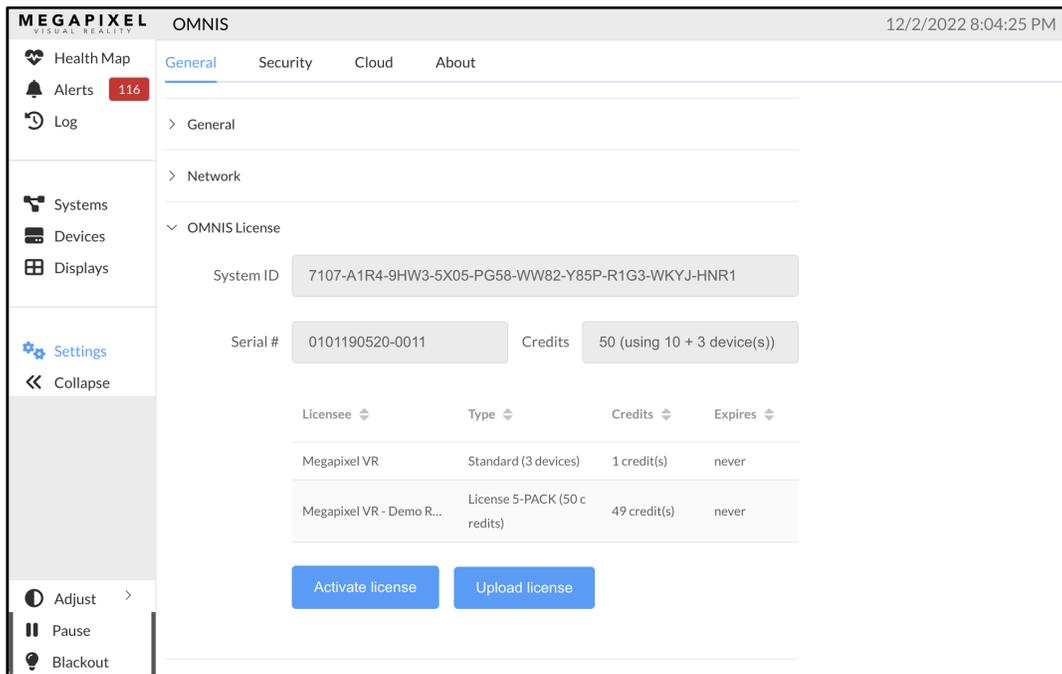
Figure 20: OMNIS License

General - Tab (Continued)

The *Reset* accordion contains two buttons.

Reboot OMNIS - restart the unit with existing settings

Reset to factory defaults - erase existing settings and reset to factory default.
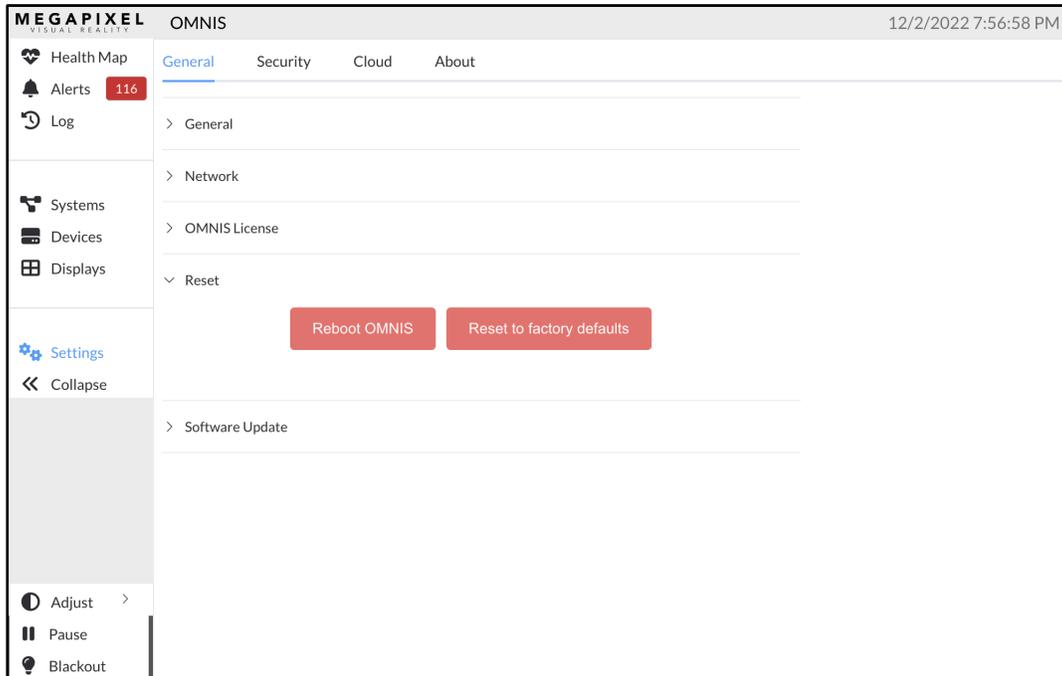
Figure 21: Reboot and Factory reset

General - Tab (Continued)

Software update accordion reports the current version and provides the ***Upgrade from package*** function. Press the button and navigate top the OMNIS .mvrp package to be installed.
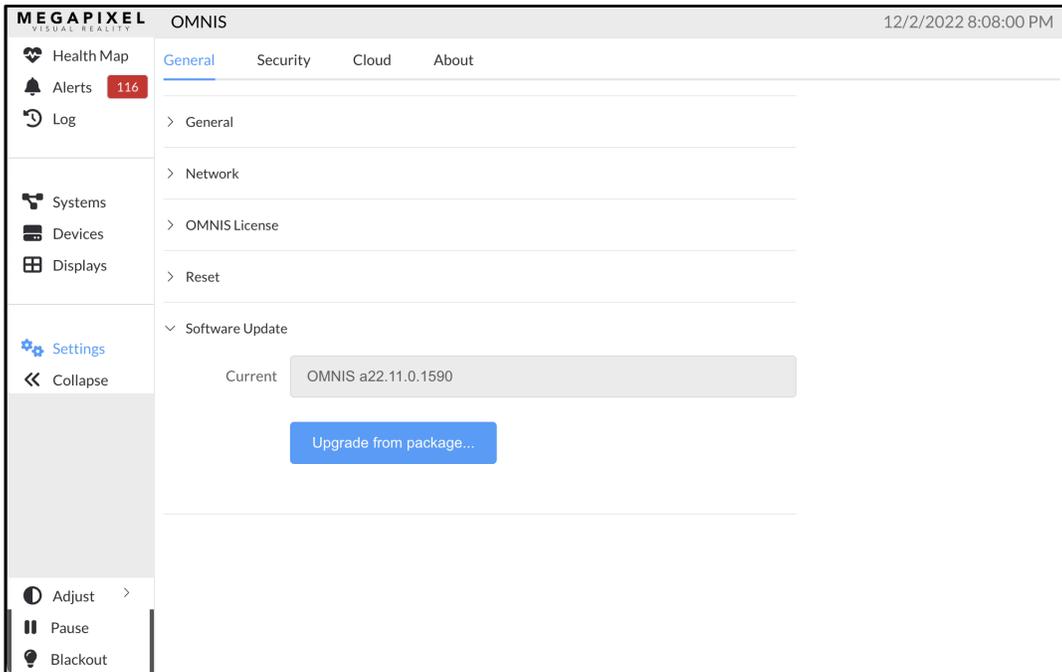
Figure 24: Software update

NOTE: Once the .mvrp package is selected, the OMNIS will warn that the system will go offline as part of the upgrade process.

Security - Tab

In the Security tab, OMNIS can be configured to require a user and password for access. Press the **Create User** button to open a form window for the user info. It is good practice to create an Admin account first. Once security is enabled, standard users will only see a list of logged in users.
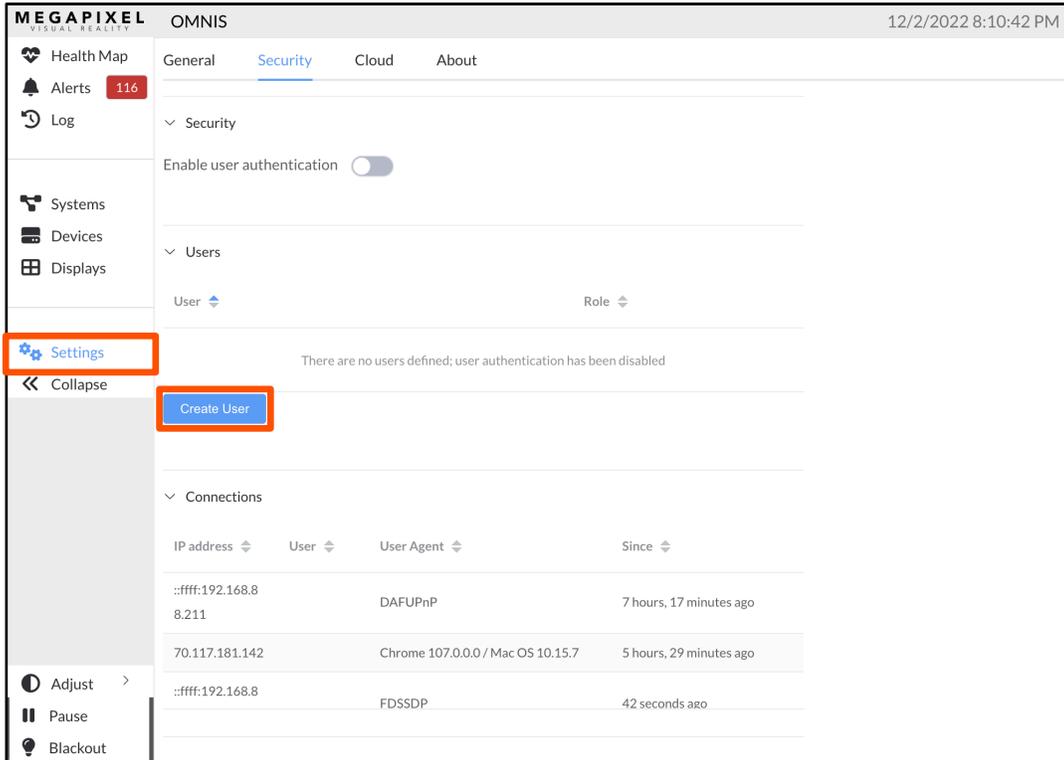
Figure 22: Security tab

Complete the fields, then press **Add User** to create the account.

Figure 23: Create user

NOTE: Google maintains a list of compromised passwords. If a user is created with a simple password such as 'test' or 'password' expect a Chrome warning.

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Security - Tab (Continued)

Use the **Enable user authentication** toggle to turn on security. Be certain of the user and password prior to enabling security! If credentials are lost, only a factory default reset will unlock the OMNIS.
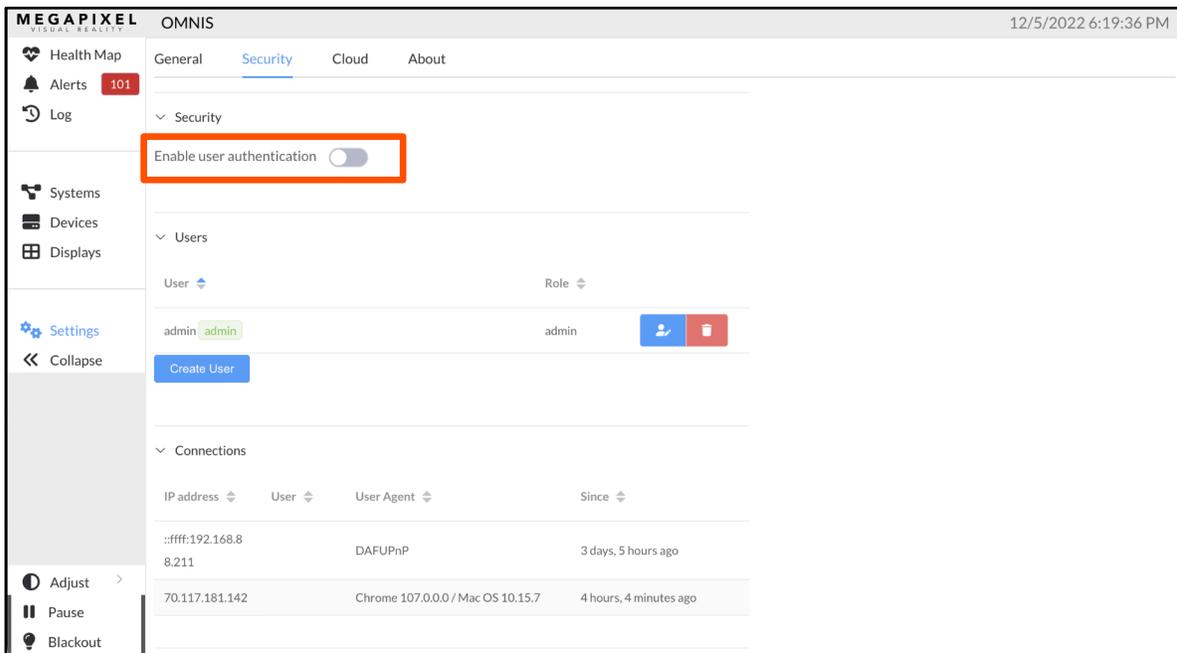
Figure 25: Enable user authentication

Authentication is required immediately after enabling Security!
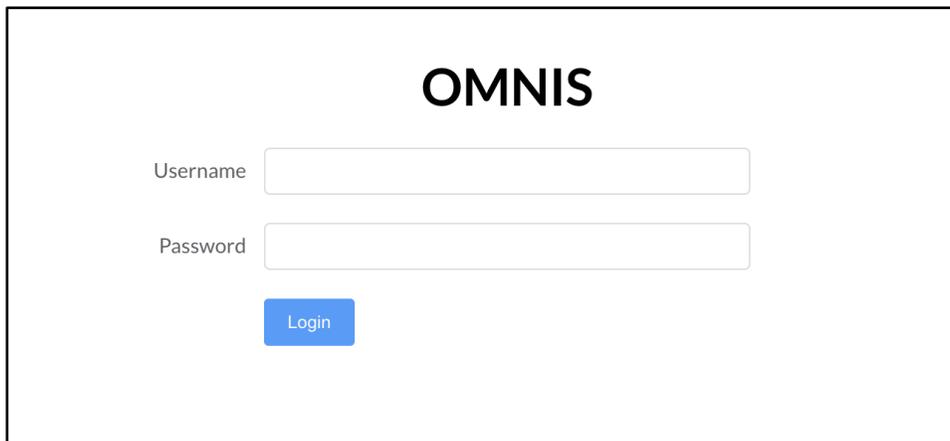
Figure 26: Authentication required

Security - Tab (Continued)

When logged on, the user name will appear in a button on the top right.
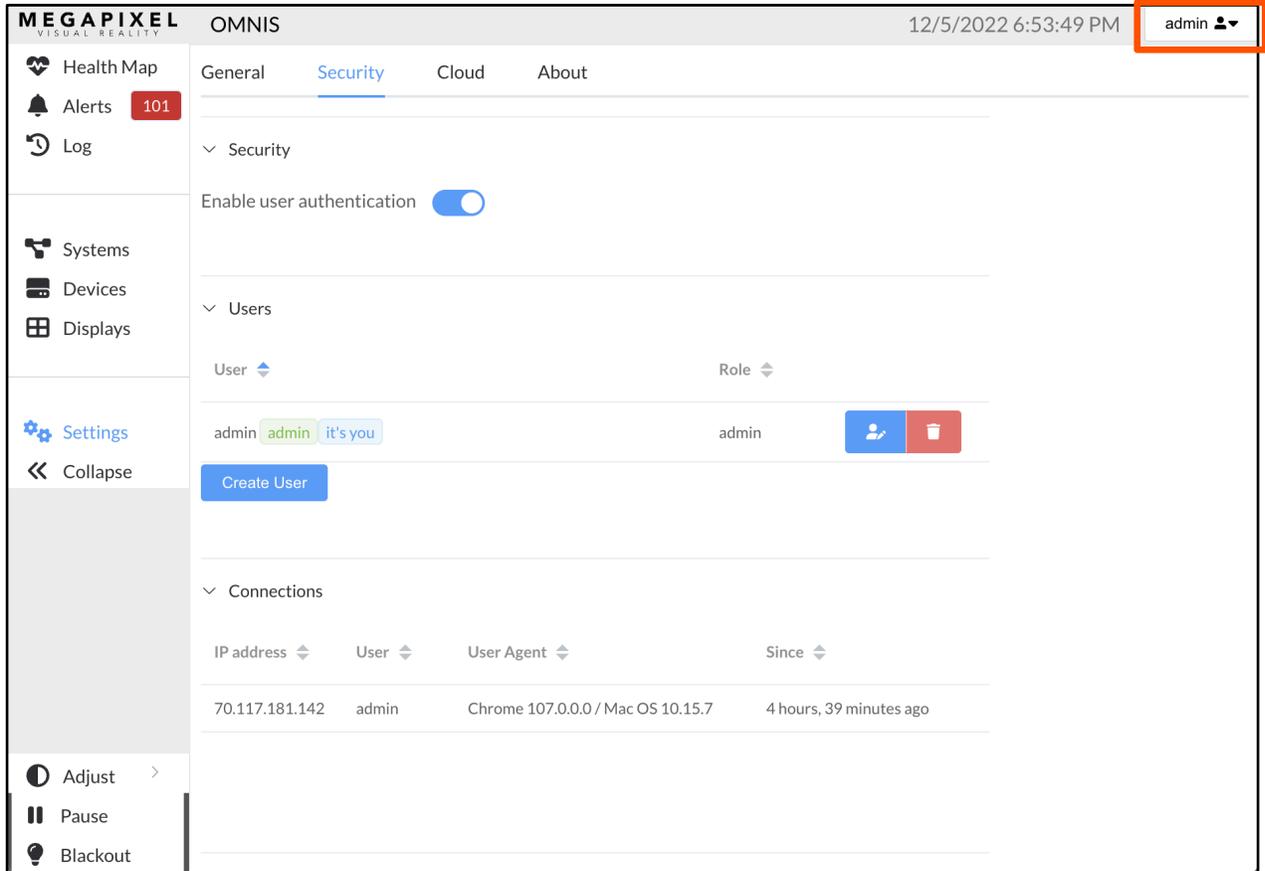
Figure 27: User list

Select the user name button to **Sign out** or change the password.
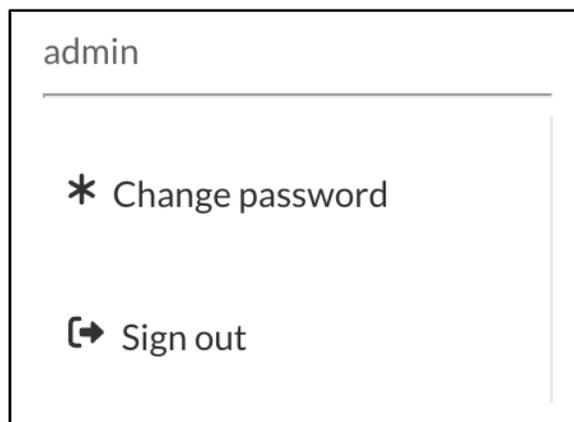
Figure 28: Sign out

Security - Tab (Continued)

Manage users with the edit and delete [icons] buttons. Use the edit icon button to open the **Edit User** form. The password can be modified and users can be blocked. If a name change is required, it must be created as a new user.
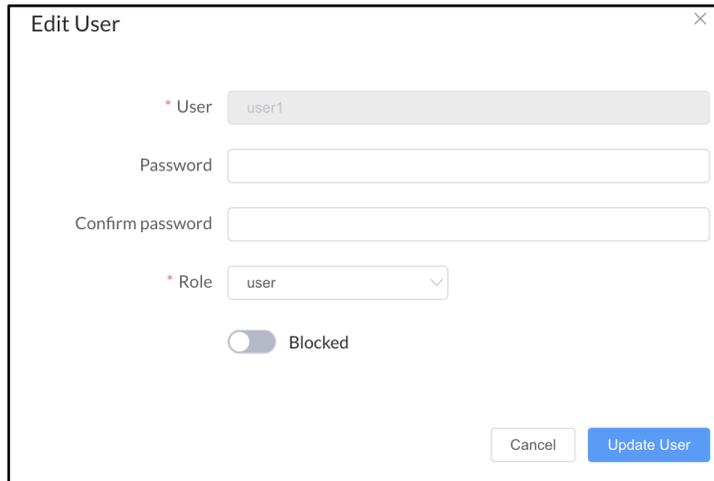
Figure 29: Edit user form

If a user has been blocked, an amber notification will appear next to the user name in the user list. Blocked users are not allowed to login.

Figure 30: Blocked user

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Cloud - Tab

Enable Cloud settings to have OMNIS accessible in a cloud environment.
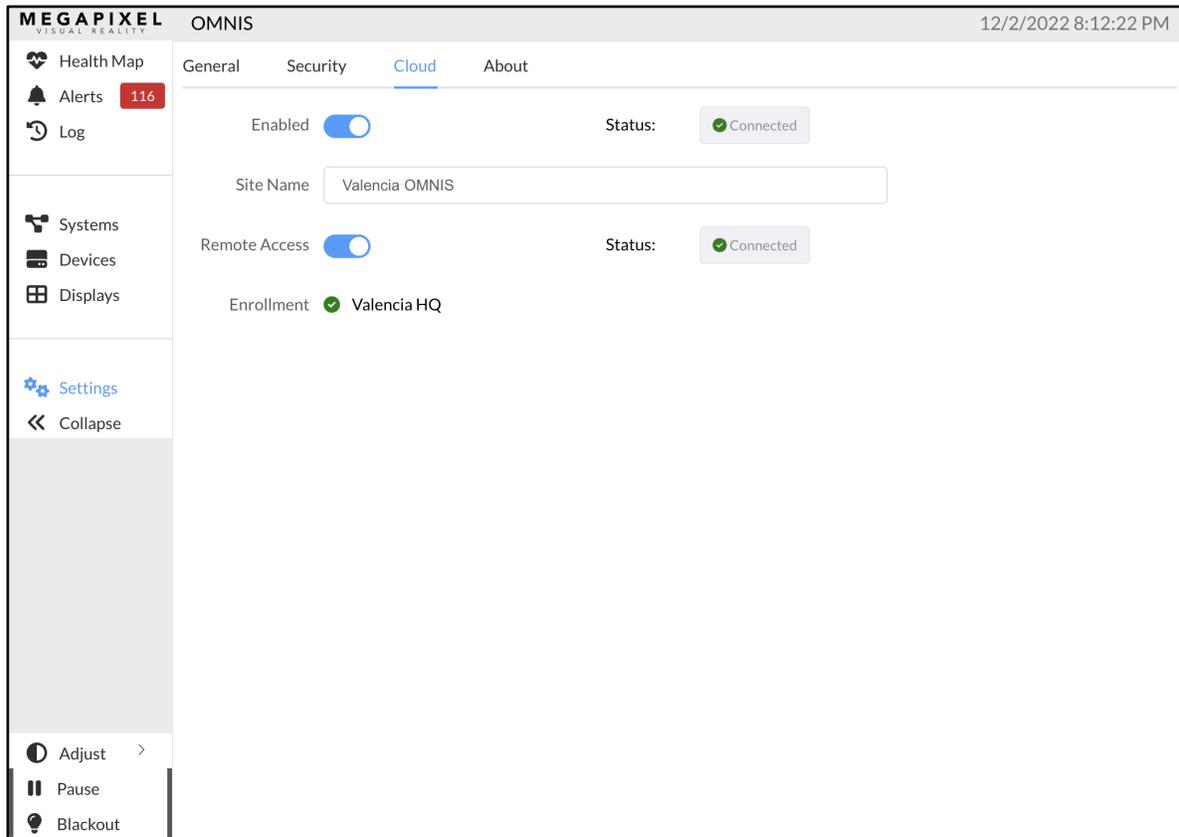
Figure 31: Settings Cloud

About - Tab

The **About** tab displays the current OMNIS version number along with some important links for contacting support. Press the **Download support archive** button to save a zip file containing OMNIS system information files that are essential to obtaining new system licenses and are helpful for troubleshooting.

Figure 32: Settings About

Monitoring

Overview

Once the system setup has been completed, OMNIS continuously monitors the connected system(s). OMNIS can display two different visualizations of system information; **Health** and **Temperature**. These views are of the display the system(s) as viewed from the front of the display. The **Health** view shows the system connectivity and alerts (if there are any). The Temperature view shows the temperature of each panel's CPU mapped to colors, plus any related alerts.

Health Map

The **Health Map** is the top item in the nav bar. In this pane, OMNIS displays the panels visually as they are mapped. Panels are shown as square or rectangular icons. The processor name for each system appears in large letters across all respective panels. Panels operating with no issues are shown in blue.

Figure 33: Health Map

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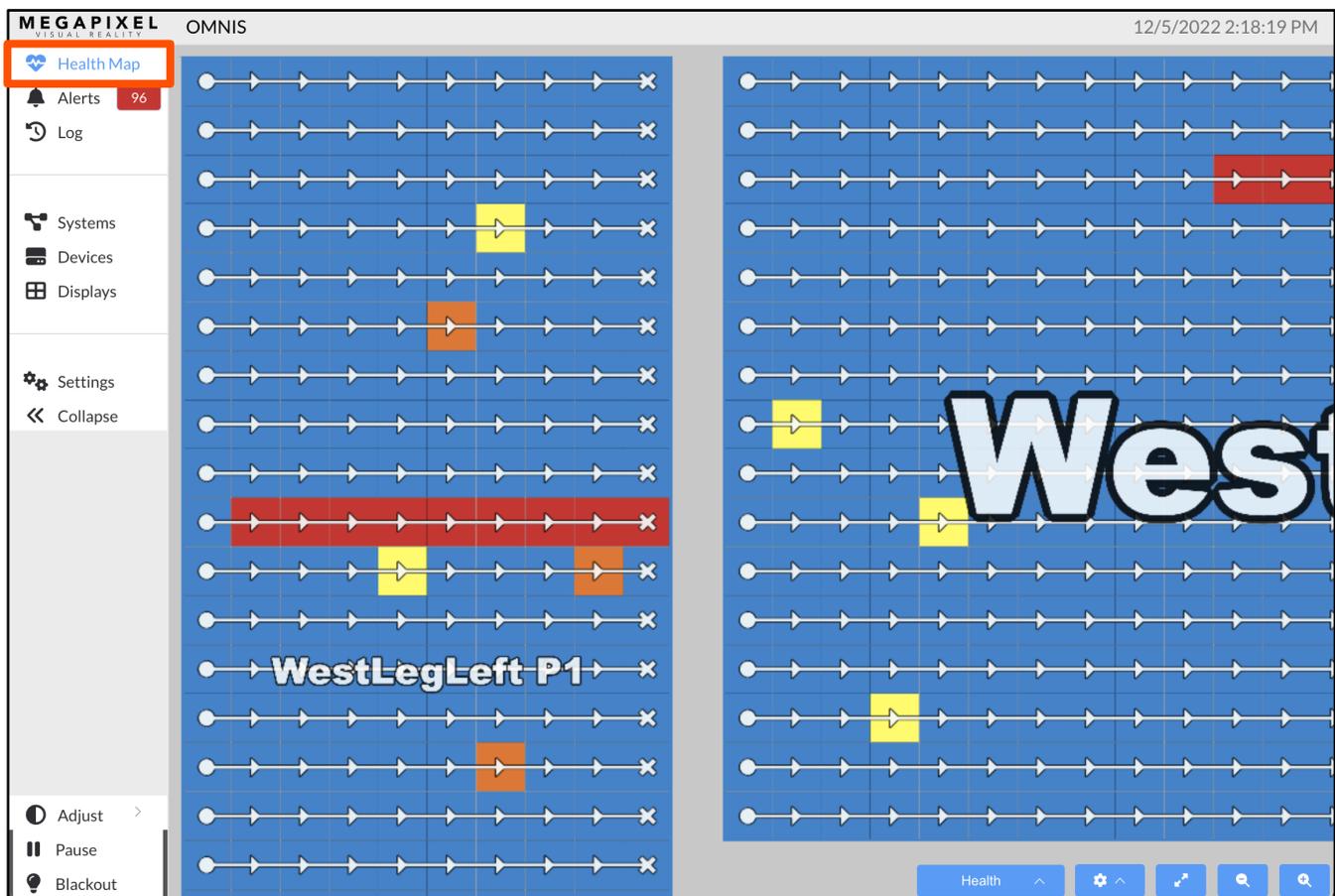
Orange panels such as the ones shown below, indicate that the system has raised an alert for that panel. Select a panel icon to reveal alert details.
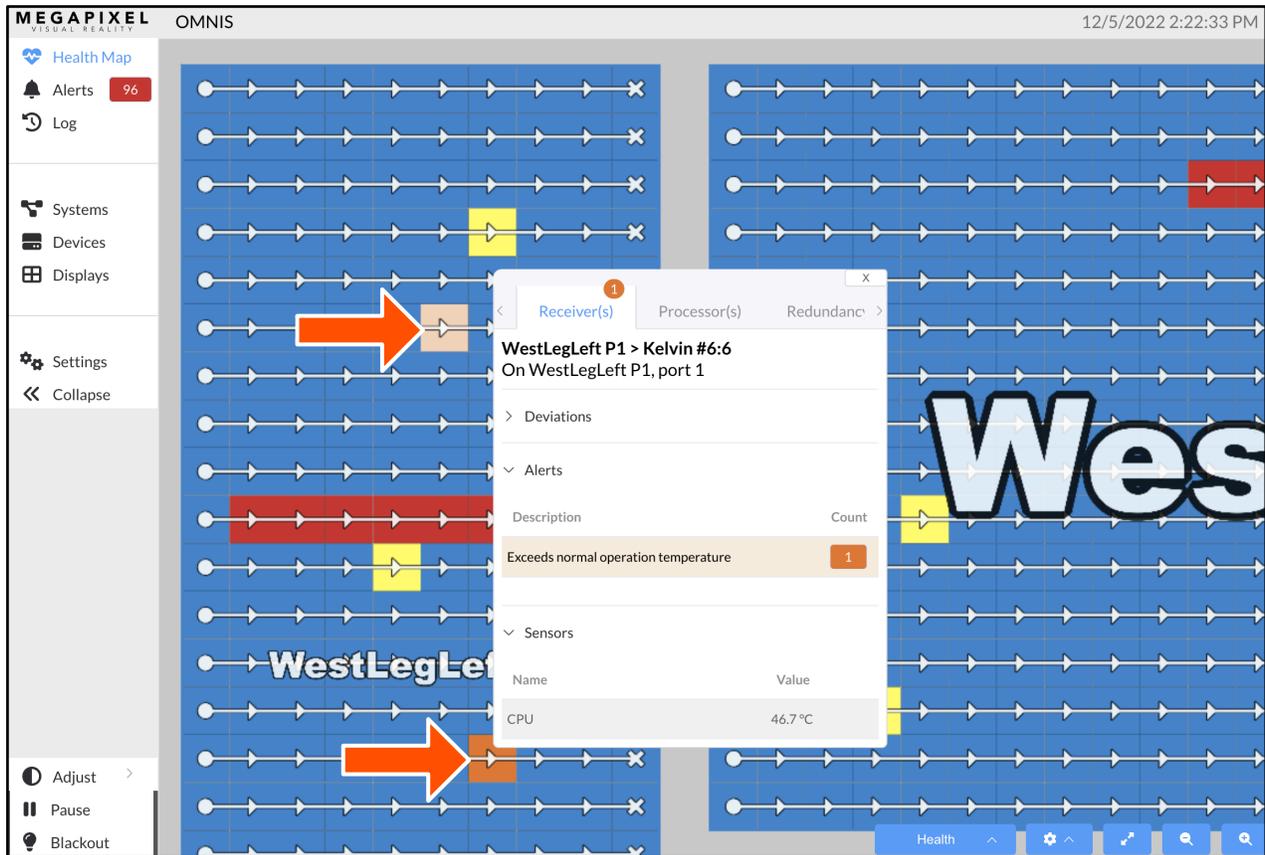
Figure 34: Alert card

Overlaid on the panel icons, are connectivity symbols. A circle represents a **Processor connection**, a triangle indicates **Passthrough** with the tip of the triangle pointing in the direction of the data flow. The X symbol represents the **End of a string** of panels.
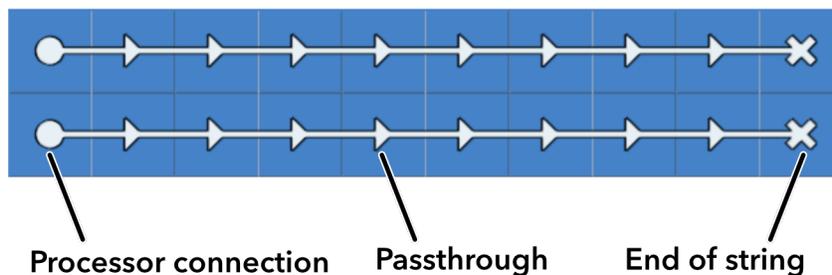
Figure 35: Connectivity symbols

Details about the display can be viewed by selecting the entire display. A pop up menu will appear with four tabs; **Receivers, Processors, Redundancy, Display,** and **Layout.**
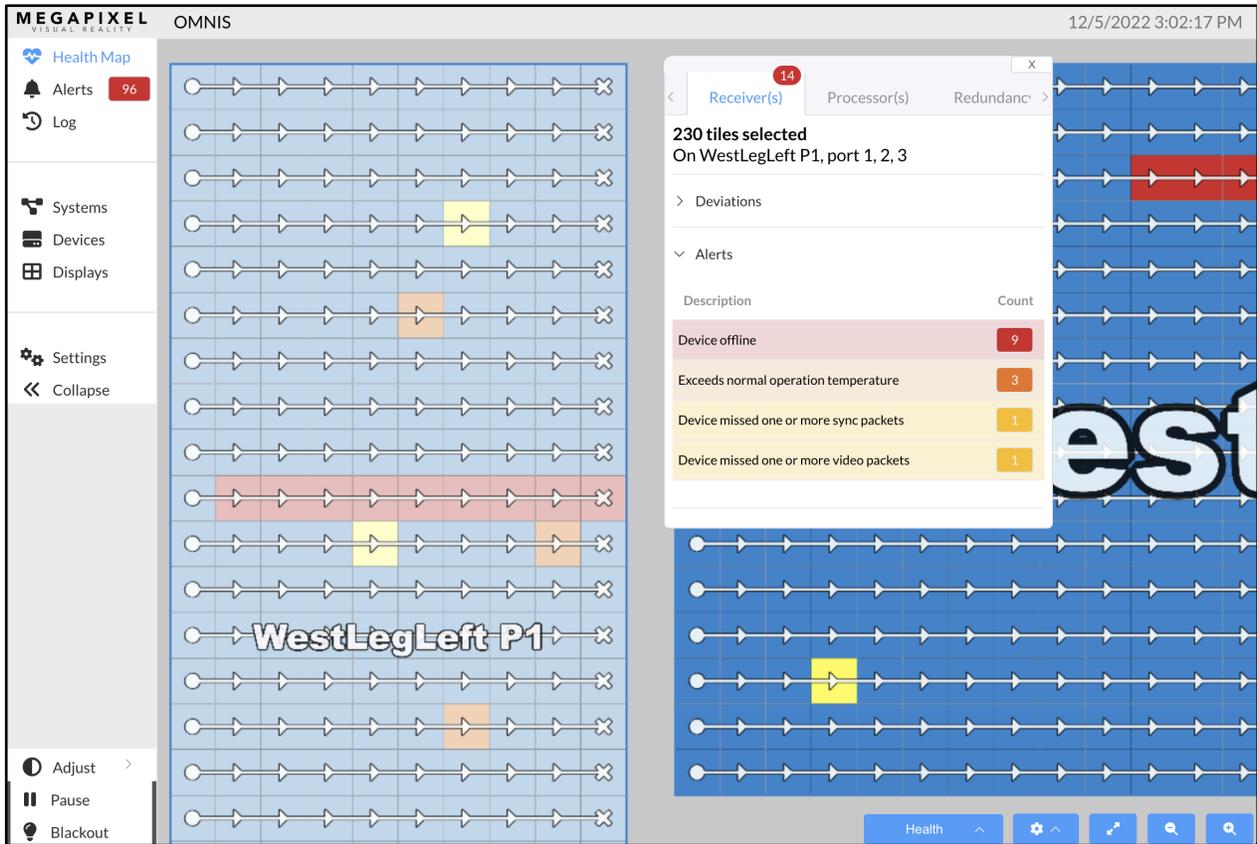
Figure 36: Offset

Temperatures Map

The **Temperatures** map shows the temperatures of panels. Temperatures are indicated in a rainbow palette that shows thermal differences in 5° degree increments.
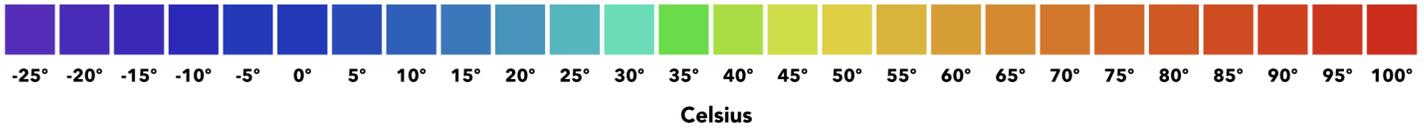
Figure 37: Color to temperature

In the example below, one panel has raised an alert with a CPU at 90°C. Use this view to quickly identify any temperature anomalies in the system. The temperature map is not just useful for recognizing panels that are excessively hot. It is good practice to warm LED panels up prior to being used at full brightness. Use the temperature map to monitor progress and to confirm when panels are ready for use.
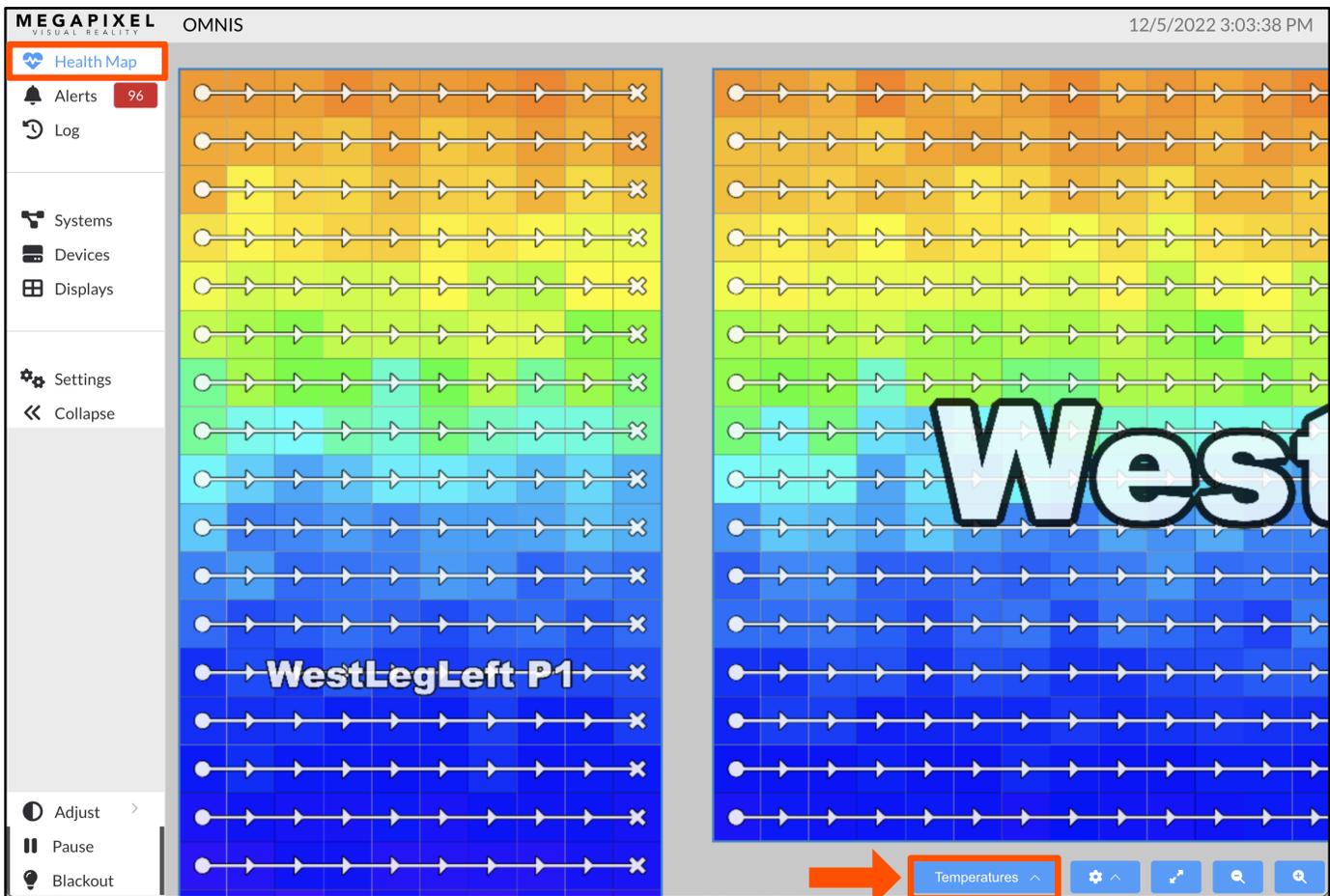
Figure 38: Temperature map

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Alerts

The OMNIS front display will show a color code for the region of the system (Processors, Switches, or Receivers) that the alert corresponds to when a system has at least one active alert.
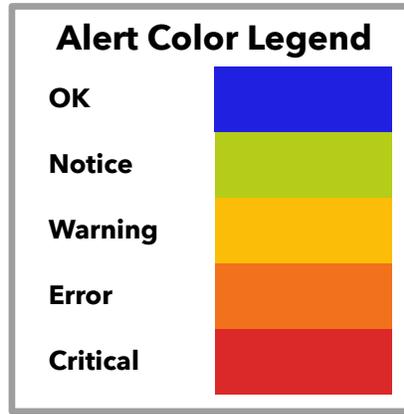
Figure 39: OMNIS front panel alert

The OMNIS UI will display all active alerts and deviations as a badge next to the alert pane select. In the alerts pane, alerts can be viewed in two different ways; **Active** and **Deviations**.

Figure 40: Alerts pane

Alerts (Continued)

Active - a list of current issues in the system. As issues are resolved OMNIS will automatically clear this list.

Deviations - a list of alerts that are generated when the OMNIS detects changes to the baseline. Please see the section on Baseline for more information about using this feature. The ***Accept*** button removes the deviation from the current list and also removes the highlight from the alert in the alert log. The ***Accept*** button also updates that associated system(s) baseline with that deviation. When panels are replaced in a system, each panel change will cause a deviation. Use the ***Accept*** button to update the system to use using the new panels. If the input type is changed (i.e. DP -> HDMI) OMNIS will flag that as a deviation. When this change is accepted, OMNIS will flag a deviation if the input changes.

Figure 41: Alerts Active / Deviations

Log

The Log pane displays a historical view of all alerts. After active alerts are cleared, they can still be found in the Log pane. When navigating long log records looking for specific types of alerts, it can be helpful to use the filters at the top of the page.

Figure 42: Log pane

Log (Continued)

Press the pencil icon to tag or comment on a line. Tagging can be very useful for adding details about system events to help set them apart from the rest. Create tags as they are needed by selecting a word or phrase that can be consistently reused. A person's name could be used to let them easily identify which alerts they need to deal with, or simply create the 'ignore' tag for items that do not need attention.

Figure 43: Notes and Tags

Global Controls

Adjust - Controls for Brightness and Gamma.

Pause - will continuously display a still image of the last input frame at the time pause was pressed. This feature is convenient to use when the input signal must be interrupted, and the live display can show a still image such as a logo. To use this feature, display the desired image and press the pause button. The input signal can now be interrupted and the HELIOS Processor will continue to display the still frame grab. When it comes time to resume, display the same image again with the connected playback device and toggle pause off to resume live playback.

Blackout - is a black generator that ensures all LEDs are completely off. This feature is ideal to use for situations when panels need to be placed on stand-by with power use at a minimum.


Figure 44: Global Controls

Maintenance & Accessories

General Maintenance

Proper maintenance of the OMNIS involves periodically checking the hardware for any parts that may have come loose or become damaged. Connectors should be checked and the unit replaced if housings have become damaged or pins are bent or deformed.

Filter Maintenance

The front filter on the air intake ducts of the OMNIS should be periodically cleaned. Gently pry the foam filter out and clean or replace the filters.
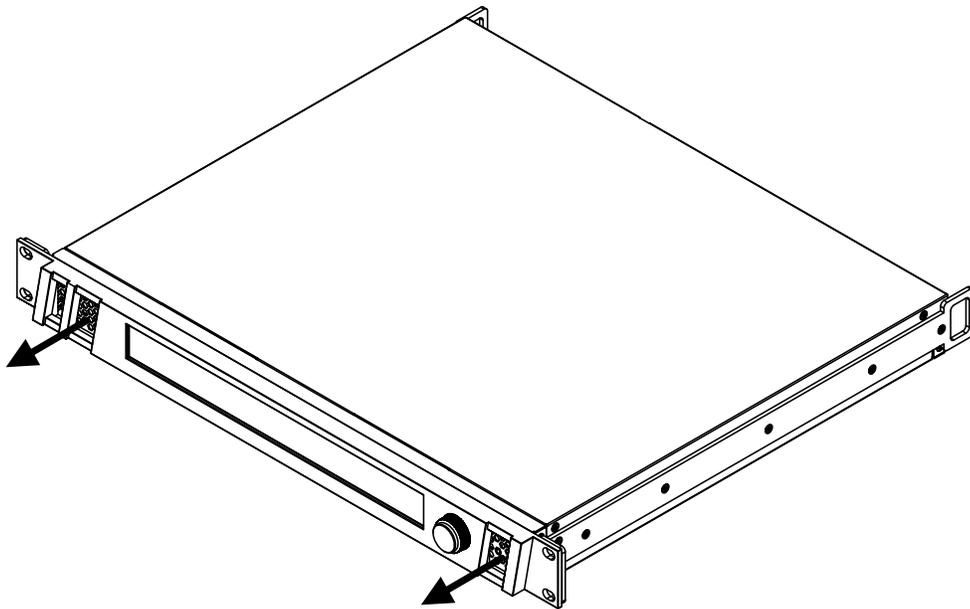

Figure 45: Remove air intake filters for service.

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Technical Specifications

|	
Dimensions	(W x H x D) 482mm (19.0") x 44mm (1.7") x 415mm (16.3")
Power Requirements	100 - 240V AC, 50Hz/60Hz, 3.8A (IEC C14 Connector)
Weight	3.9 kg (8.6 lb) shipping dimensions and weights on the next page
IP Rating	Indoor
Ambient Operating Temperature	15° - 40°C (59° - 104°F)
Certifications	ETL, FCC (Class A), CE, RoHS
Maximum Panels to monitor	TBD
Maximum Processors to monitor	200
Heat Load	256 BTU/hr thermal dissipation
OMNIS web app	1 x Gigabit Ethernet

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OMNIS Processor - Shipping Info.

Shipping box dimensions (W x H x D)	533mm (21") x 597mm (23.5") x 184mm (7.25")
OMNIS	7.8kg | 17.1 lb

OMNIS Processor Dimensions

Front View
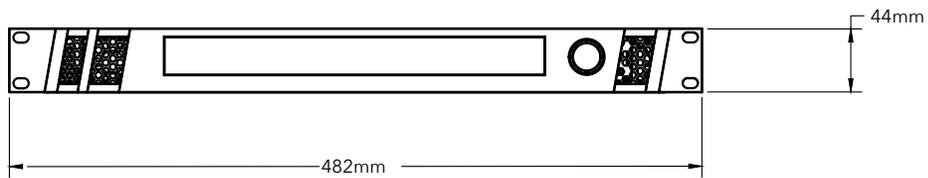
Top View
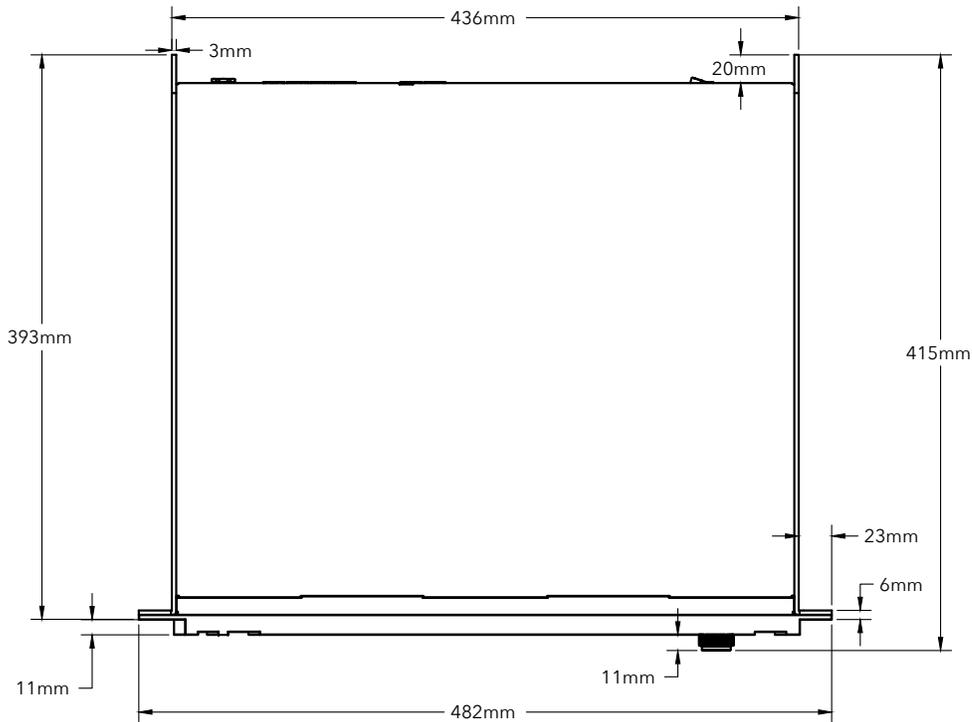
Figure 46: OMNIS dimensions

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The OMNIS is running a Linux build called MegaOS which is based on Alpine. The following network ports & services are used by the system:

Network Ports	Notes
22 (SSH)	Only through private key authentication for developers
80 (HTTP)	Main Web UI and Public API
1900 (UPnP)	Service Discovery
5353 (Multicast DNS)	Service Discovery

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