KMC Commander for Growers

Application Guide

Contents

Introduction to KMC Commander

Growers face challenging environmental, control, and regulatory issues. Integrating sensors with controllers for operating lights, fans, pumps, and heaters according to schedules and varying conditions is basic to business operation. Viewing trends and alarms provides awareness and documentation of present and past conditions. Making all this accessible remotely is the final step in taking command of your business.

KMC Commander is a next-generation IoT (Internet of Things) solution that connects your equipment to the cloud and provides meaningful data in real-time to your PC or mobile device. The KMC Commander platform is an out-of-the-box solution (consisting of IoT enabled hardware plus software and cloud services) to visualize, connect, and manage greenhouse systems. With KMC Commander, you can analyze and act on your data from a mobile device in the palm of your hand.

Used with **KMC Conquest controllers and sensors**, KMC Commander can simplify setting up IoT functions for growing a great variety of plants. Status of the system components can be displayed on "cards" in a web browser. Trends of sensor readings and other conditions can be viewed. Schedules for controlling lights, pumps, and other

equipment in an area are also available. If sensor readings are outside their normal ranges, an alarm can be generated and received remotely on a computer or phones. Present values, trends, and alarms are automatically uploaded from the appliance/gateway to the KMC Commander Cloud, where they are accessible to mobile devices.

See **Sample KMC Commander Screens and Descriptions on page 5** for more information about these features.

In addition to these standard features, KMC Commander's open API (Application Programming Interface) provides for further opportunities. (See the video **KMC 101: What is an API?**) Optional API integration provides a means of using third-party packages for advanced analytics of your important data.

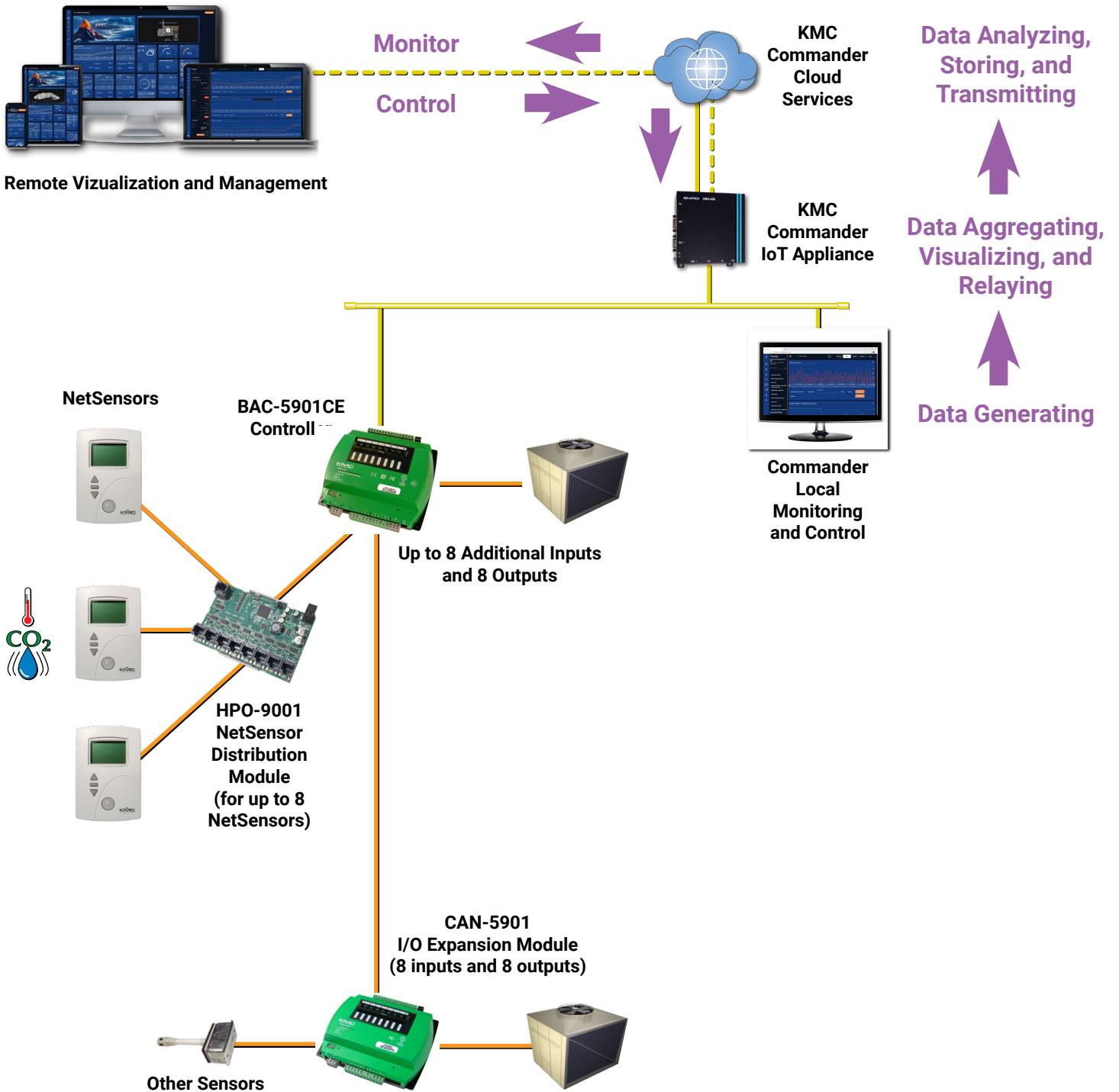## Introduction to KMC Conquest Controllers

The Internet of Things provides great benefits, but what happens if the building's Internet access goes down? A temporarily lost Internet connection does **not** threaten the crops. The KMC Conquest controllers handle schedules and other critical control functions locally. They continue to operate as "stand-alone" units until full communications are restored.

KMC Conquest BACnet® advanced application digital controllers and sensors control building systems and HVAC equipment in countless buildings. For more information about KMC Conquest equipment, see the links and illustration in **Basic KMC "Growers" Components and Sample Installation on page 3**.
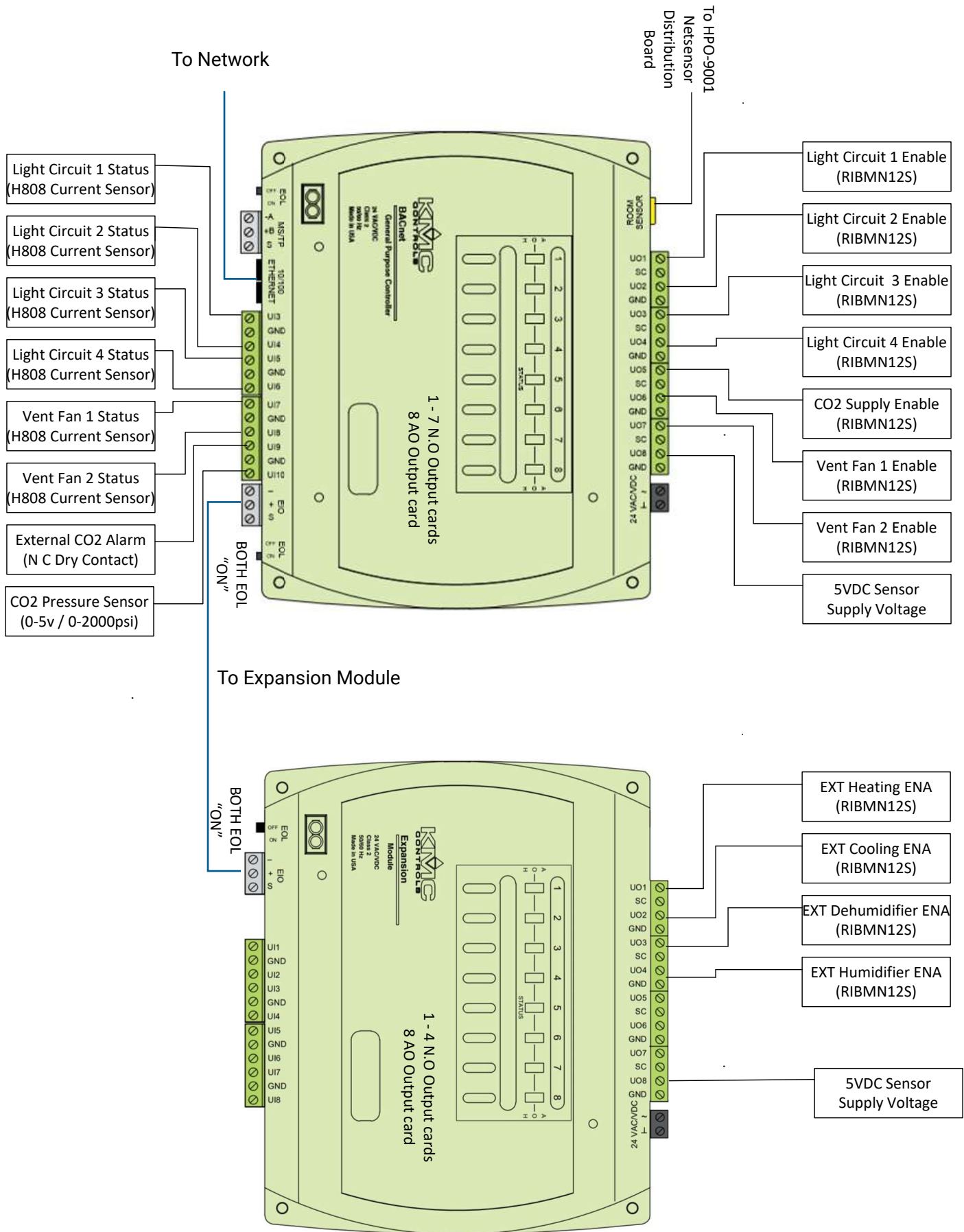
Basic KMC "Growers" Components and Sample Installation

- KMC Commander IoT Platform (CMDR-ADVT-WIFI-BASE) or (CMDR-V2-WIFI-BASE)
- BAC-5901CE General Purpose BACnet Controller
- CAN-5901 Expansion Module
- STE-9000 Series NetSensors
- HPO-9001 NetSensor Distribution Module
- HPO-6703 Output Override Boards, Normally Open Relays
- HPO-6702 Output Override Boards, 0−12 VDC Analog Outputs

Monitor

Control

KMC Commander Cloud Services

Data Analyzing, Storing, and Transmitting

Remote Vizualization and Management

KMC Commander IoT Appliance

Data Aggregating, Visualizing, and Relaying

NetSensors

BAC-5901CE Controller

Data Generating

Commander Local Monitoring and Control

Up to 8 Additional Inputs and 8 Outputs

CO₂

HPO-9001 NetSensor Distribution Module (for up to 8 NetSensors)

CAN-5901 I/O Expansion Module (8 inputs and 8 outputs)

Other Sensors

Sample Controller Details

To Network

To HPO-9001 Netsensor Distribution Board

Light Circuit 1 Status (H808 Current Sensor)

Light Circuit 2 Status (H808 Current Sensor)

Light Circuit 3 Status (H808 Current Sensor)

Light Circuit 4 Status (H808 Current Sensor)

Vent Fan 1 Status (H808 Current Sensor)

Vent Fan 2 Status (H808 Current Sensor)

External CO2 Alarm (N C Dry Contact)

CO2 Pressure Sensor (0-5v / 0-2000psi)

Light Circuit 1 Enable (RIBMN12S)

Light Circuit 2 Enable (RIBMN12S)

Light Circuit 3 Enable (RIBMN12S)

Light Circuit 4 Enable (RIBMN12S)

CO2 Supply Enable (RIBMN12S)

Vent Fan 1 Enable (RIBMN12S)

Vent Fan 2 Enable (RIBMN12S)

5VDC Sensor Supply Voltage

BOTH EOL "ON"

To Expansion Module

BOTH EOL "ON"

EXT Heating ENA (RIBMN12S)

EXT Cooling ENA (RIBMN12S)

EXT Dehumidifier ENA (RIBMN12S)
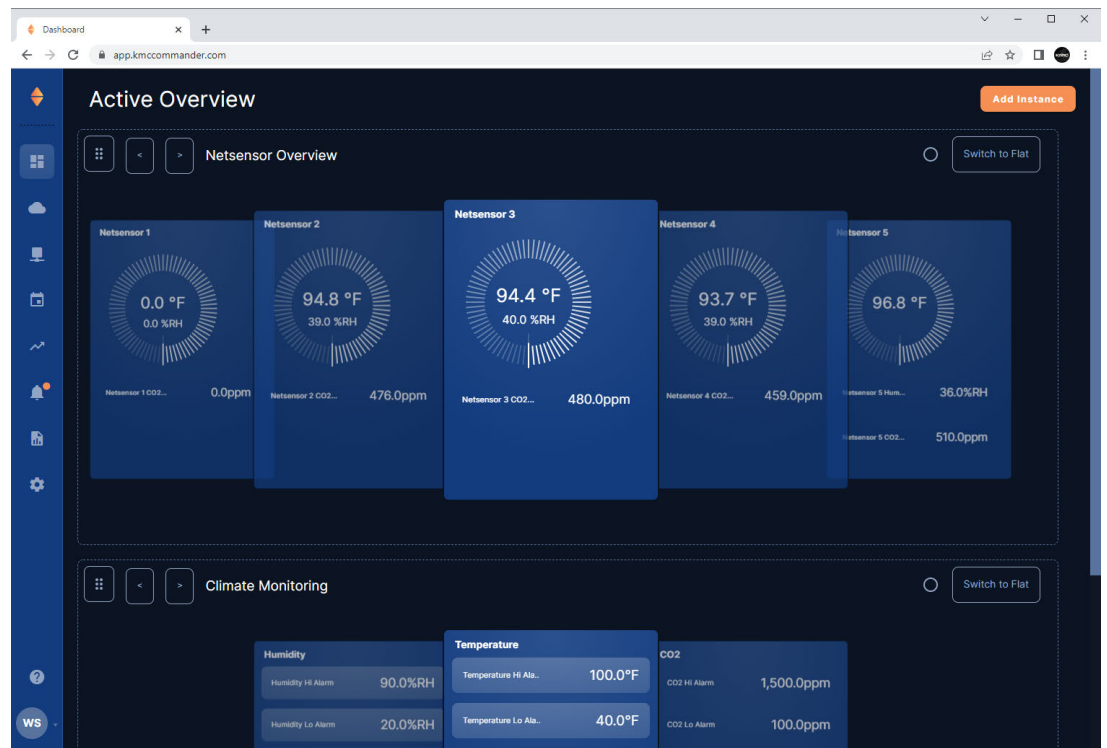
EXT Humidifier ENA (RIBMN12S)

5VDC Sensor Supply Voltage

Sample KMC Commander Screens and Descriptions

Dashboards

On a (home screen) dashboard, cards allow users to view equipment point values and to change setpoints and other control functions. Cards are the primary means to visualize network data and control equipment from a web browser.

Cards (such as the most critical cards or all the cards related to a particular zone) can optionally be organized into decks. Decks show a "carousel" of the included cards.

Dashboards and dashboard elements are specific to user logins. Different users (if desired) can view and control different things.

Schedules
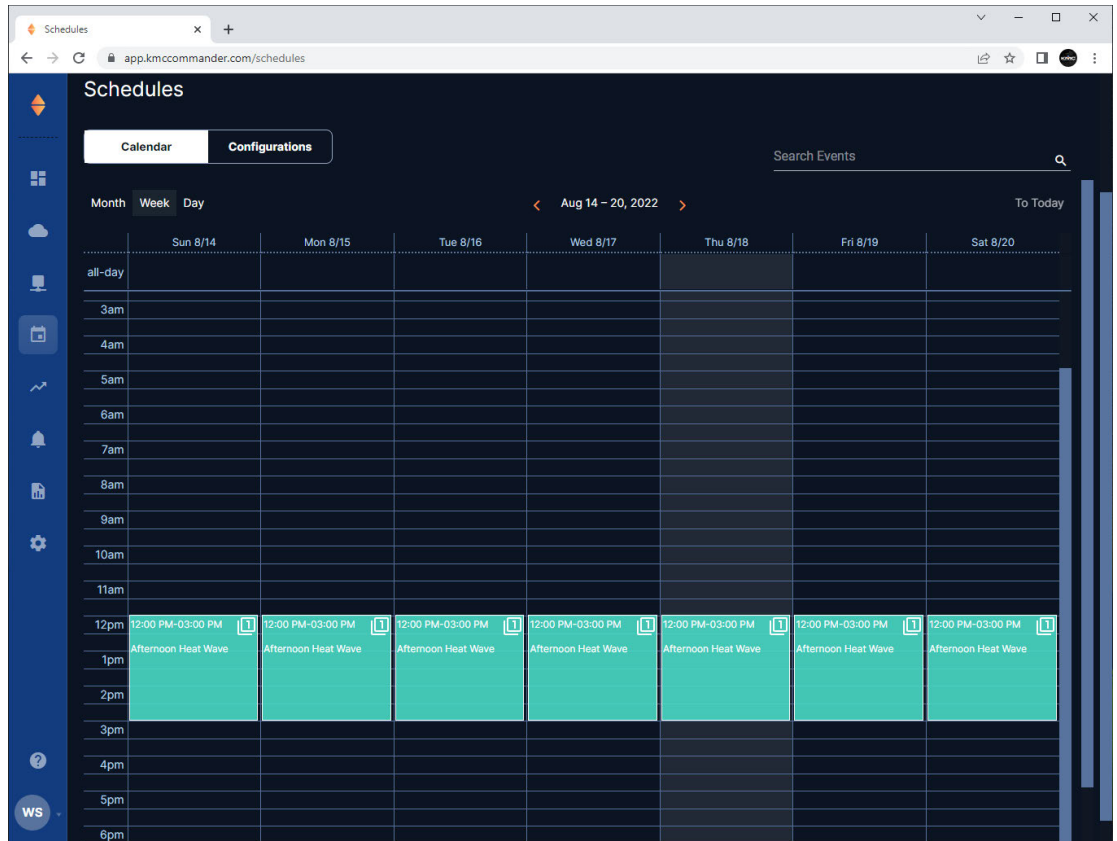
A **schedule** controls (with an optional default value) commandable points (e.g., Active Cooling Setpoint) on one or more devices on a network. Particular times for the schedule to operate are controlled by events. An **event** controls start/stop time, priority, repetition, and applicable zones of schedule actions.

The Schedule Manager shows events by day, week, or month.

NOTE: To change the **current** setpoint, command the **active** heating/cooling setpoint rather than the (scheduled) occupied or unoccupied heating/cooling setpoint.

Alarms
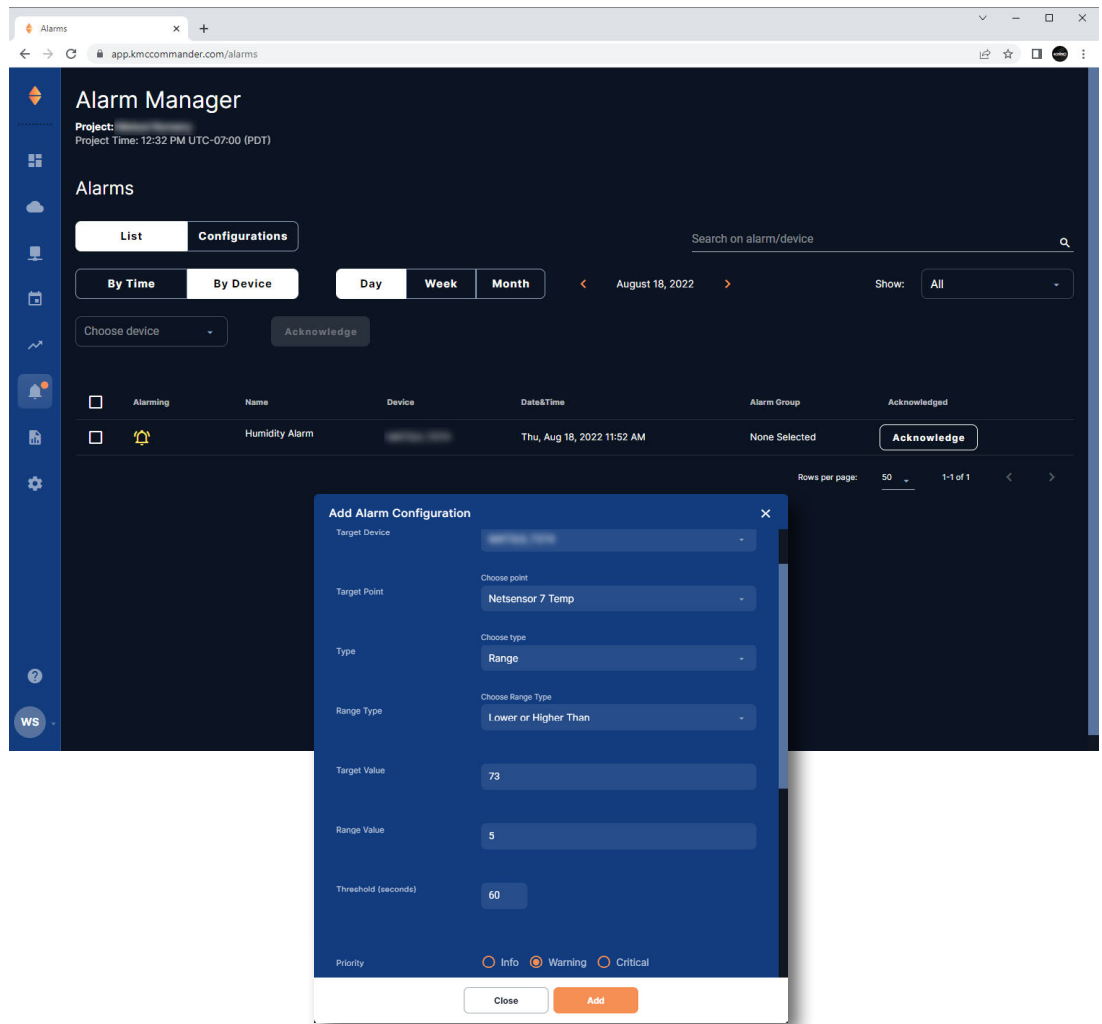
Next to the **Alarm** (bell) icon in the left-hand menu, a notification dot appears with a color corresponding to the highest alarm priority. Hover over the Alarm icon to see the alarms in a slide-out menu. Click on the Alarm icon to go to **Alarm Manager**.

Alarm Manager lists alarms by **device** (all alarms from that device) or by **time** (alarms from all devices by day, week, or month).

Alarm types include Exact Value, Range and Dynamic. **Exact Value** is for alarms based on a binary point. **Range** compares the value of an analog point to a desired range (Lower Than, Higher Than, Lower or Higher Than, or Within Range) of acceptable values. **Dynamic** compares values of two related (binary or analog) points in one or two devices (e.g., space temperature and current active setpoint).

Alarms have three levels of **Priority** (Info, Warning, or Critical). Alarms are color-coded according to priority (white for information, amber for warning, and red for critical). When an acknowledgment is required, the **Acknowledge** button must be clicked to remove the notification dot. After acknowledgment, the name of the user who acknowledged the alarm appears in the **Acknowledged** column. The user can also leave a message about what was done to address the alarm.

An optional message appears in **Alarm Manager** and in an optional email or notification. To receive alarm messages, a notification group (with email addresses and/or cell phone numbers) is created in **Settings** (the gear icon)..

Trends
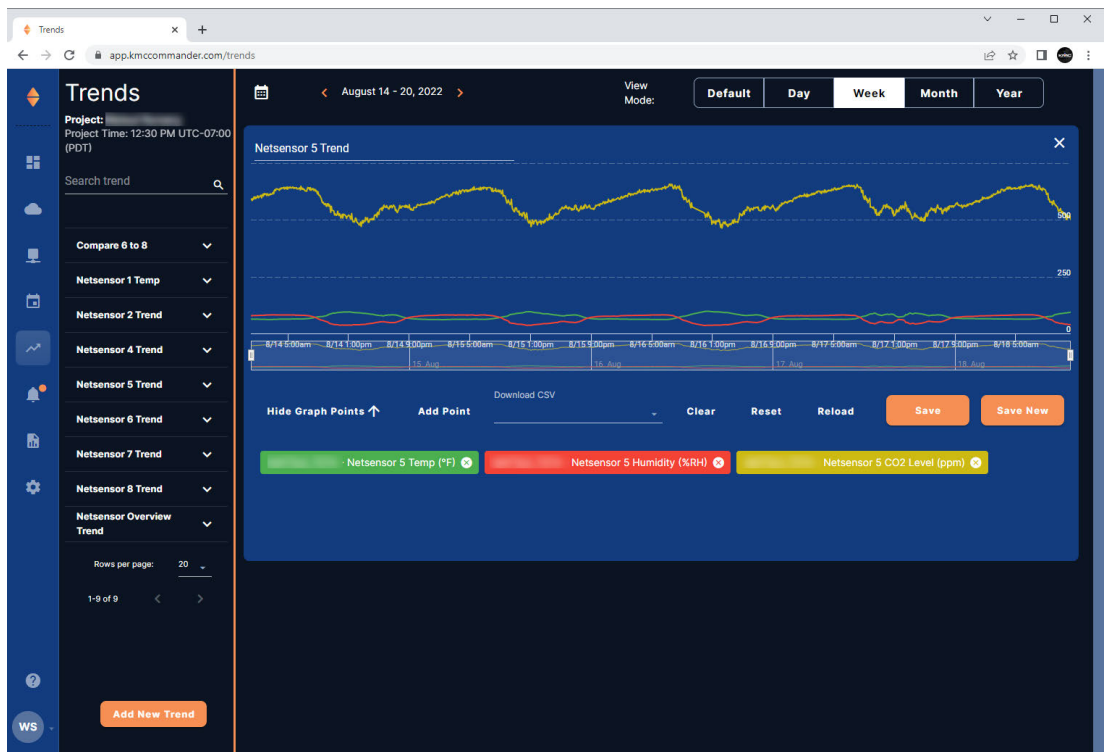
Trends track **values** of desired points on devices and present the history as **graphs**.

To view a saved trend, click on its name in the list on the left pane. To zoom in on a section of the trend graph, move the slider bars at the bottom of the graph. Click the **Reset** button to go back to the original view, or click on the **Day**, **Week**, **Month**, or **Year** buttons for alternate views.

To view values of individual points, move the cursor near any line of graph while reading the values in the box that appears next to the cursor. To simplify a graph for viewing, click the **X** beside the name of any points to temporarily remove them from view.

Trend data can optionally be exported as a **CSV** file by clicking **Download CSV** and selecting the desired option: **Current View** (all visible points) or a selected visible point.

Important Notices

KMC Controls® and NetSensor® are all registered trademarks of KMC Controls. KMC Conquest™, KMC Connect™, KMC Converge™, and TotalControl™ are all trademarks of KMC Controls. All other products or name brands mentioned are trademarks of their respective companies or organizations.

All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form by any means without the written permission of KMC Controls, Inc.

The material in this document is for information purposes only. **The contents and the product it describes are subject to change without notice.** KMC Controls, Inc. makes no representations or warranties with respect to this document. In no event shall KMC Controls, Inc. be liable for any damages, direct or incidental, arising out of or related to the use of this document.

Specifications and design are subject to change without notice.

Support

Additional KMC product information and resources are available on the web at **www.kmccontrols.com**. Log-in to see all available files.