Climate Guard

Installation and Operation Manual

BURK TECHNOLOGY

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INTRODUCTION

Welcome

Thank you for purchasing Climate Guard.

Climate Guard monitors temperature, humidity and many other environmental conditions that can pose a serious threat to mission-critical IT equipment. Climate Guard includes built-in temperature, light and sound sensors, and is expandable to 64 sensors.

Climate Guard will automatically alert relevant personnel when a sensor detects an out-of-tolerance condition using email, SMS and SNMP traps.

For added security and peace of mind, Climate Guard integrates with many popular IP-based security cameras.

To learn more about accessories and enhancements available for Climate Guard, visit www.burk.com.

Unpacking

The following items are included with your purchase of Climate Guard:

- Climate Guard Server Room Environmental Monitor, rack mount unit
- 10’ Cat5 cable
- Power adapter (12VDC, 1A)
- 16-terminal “Phoenix” type connector (male)

Hardware Overview

Climate Guard is designed for installation in a standard 19” equipment rack. The Ethernet jack, sensor inputs, modules, indicator LEDs and onboard sensors are located on the front panel of the unit. The switch inputs and power input are located on the rear panel.

Onboard Sensors

Climate Guard includes the following built-in sensors:

- Internal temperature
- Sound
- Light

Front Panel

Item	Description
Light Sensor	Built-in light sensor
Ethernet Jack	RJ45 Ethernet jack with link and activity LEDs
Sensor Inputs	RJ12 (6P6C) jacks for use with digital sensors and powered switch inputs
Expansion Modules	Bays for expansion modules
Power LED	Indicates when Climate Guard is powered on
Fault LED	Indicates when any sensor is in the alert state
Sound Sensor	Built-in sound sensor
Reset Button	Recessed button for resetting Climate Guard to factory default settings

Rear Panel

The rear panel of Climate Guard includes a jack for a 12VDC 1A power adapter (included) and eight switch inputs. For more information about wiring switch inputs, refer to ***Switch Inputs.***

Climate Guard Rear Panel

Measurement Units

Climate Guard supports several different types of sensors, each with a different unit of measurement and range of values.

Sensor Type	Unit	Minimum Value	Maximum Value
Temperature	Degrees Fahrenheit	-50.0	257.0
Humidity	Percent	0.0	100.0
Light	Percent[1]	0.0	100.0
Sound	dBFS[2]	-70.0	0.0

Web Interface Overview

All of Climate Guard's software features are available on its built-in web interface. To access the web interface, use your web browser to navigate to the IP address assigned to your Climate Guard unit.

Web Browser Requirements

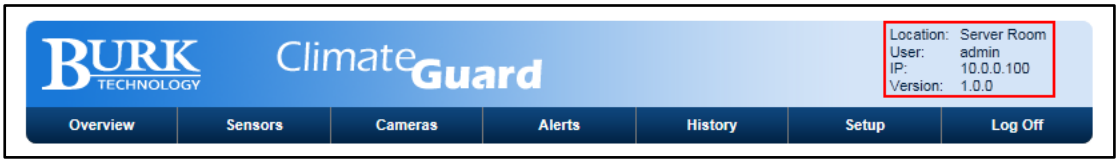
Climate Guard works with most modern web browsers.

Note: Climate Guard requires JavaScript.

Page Header

The web interface page header shows the following system values:

- Location name (see ***Basic Settings***.)
- Username
- IP address
- Version number

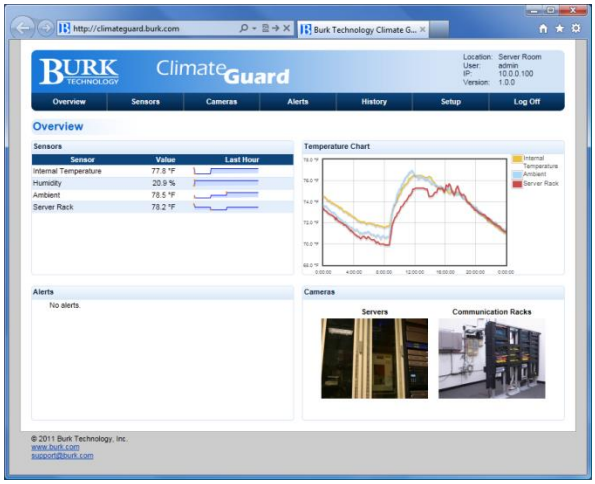


Page Header

[1] Climate Guard measures light using a scale where 0% is complete darkness and 100% is a very well lit room.
[2] dBFS (Decibels relative to full scale) measures sound in decibels relative to the maximum measurable value (0dBFS).

Overview Page

The *Overview* page shows summary information about your Climate Guard system, allowing you to see a top-level view of your system at a glance. The Overview page includes information about your sensors, including the built-in light, sound and temperature sensors as well as any external sensors you have installed. Climate Guard will automatically plot your temperature sensors on the Overview page temperature chart.



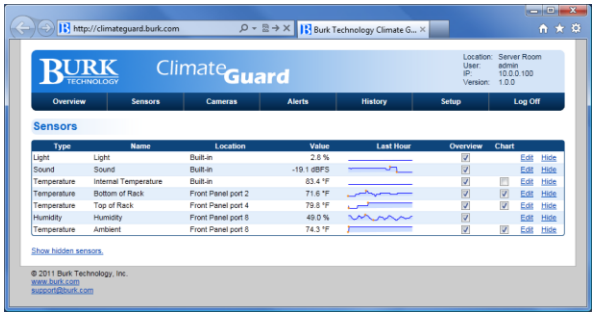
Overview Page

If any sensors have exceeded the thresholds you have defined, Climate Guard will display alerts on the Overview, explaining which sensors are out of tolerance and when the condition began.

If you have installed IP security cameras for use with Climate Guard, thumbnail images will also appear on the Overview.

Sensors

The sensors page shows a complete list of the sensors you have installed on this Climate Guard system. Each sensor's current value is displayed, along with a "spark line" showing its activity over the last hour. The sensor chart also shows the type and location of each sensor, and its user-defined name.



Sensors Page

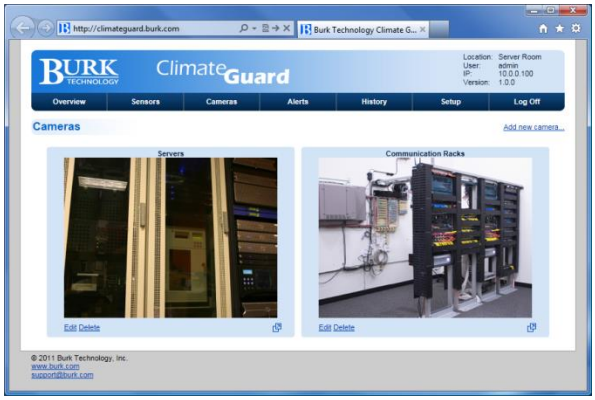
Unused sensors may be hidden, if desired. Use the *Hide* link on the right-hand side of the table to hide a sensor. To view hidden sensors, use the *Show hidden sensors* link at the bottom of the page. If hidden sensors are visible, you can unhide them by clicking the *Unhide* link for the desired sensor.

To configure your sensors, see ***Sensors***.

Cameras

The *Cameras* page shows 320 x 240 pixel images for up to four IP security cameras. To view a camera's web page, click the icon (⧉) in the bottom right corner of the camera's box.

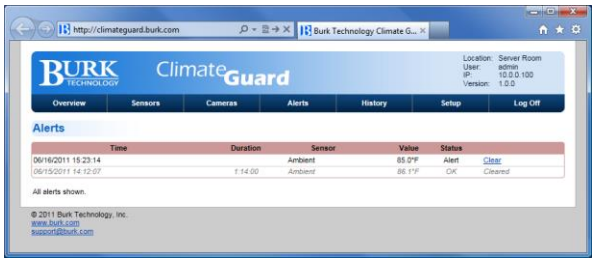
To configure your cameras, see ***Cameras***.



Cameras Page

Alerts

The *Alerts* page displays all alerts – cleared and uncleared – for this Climate Guard system. The following fields are available for each alert:



Alerts Page

Item	Description
Time	The date and time when the alert occurred
Duration	The duration (days hh:mm:ss) of the alert. If the alert is still active, the duration is blank.
Sensor	The name of the sensor
Value	The value of the sensor when it went into alert
Status	The state of the sensor (OK, Missing, etc)

To clear an alert, use the *Clear* link. Cleared alerts are displayed in gray text and are hidden from the Overview page.

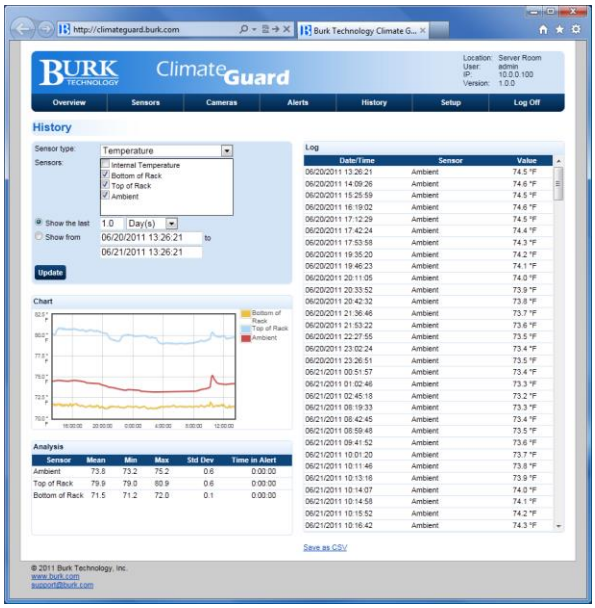
The Alerts page will show the most recent 25 alerts. To view more alerts, use the *Show more* or *Show all* link at the bottom of the page.

Note: If necessary, you can erase all alerts. See ***Clearing Data*** for more information.

History

The *History* page allows you to view logged data for any of your sensors. Climate Guard automatically stores history data for every sensor.

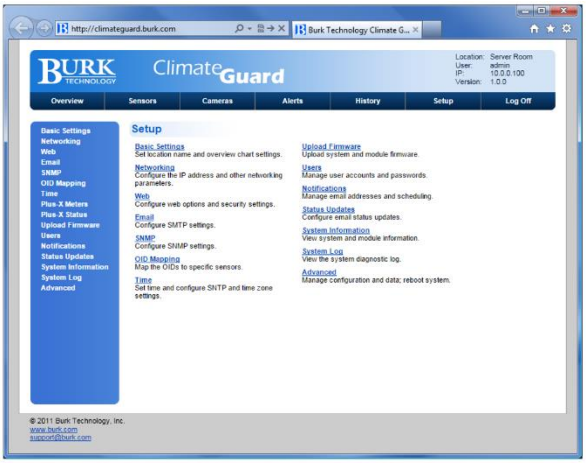
For more information on viewing history data, see ***History.***



History Page

Setup

The *Setup* page allows configuration of Climate Guard's system settings, including networking. The following options are available:



Setup Page

Item	Description	More Information
Basic Settings	Set location name and overview chart settings.	Page 17
Networking	Configure the IP address and other networking parameters.	Page 9
Web	Configure web options and security settings.	Page 19
Email	Configure SMTP settings.	Page 20
SNMP	Configure SNMP settings.	Page 21
OID Mapping	Assign SNMP Object Identifiers (OIDs) to individual sensors.	Page 21
Time	Set time and configure SNTP and time zone settings.	Page 17
Upload Firmware	Upload system and module firmware.	Page 31
Users	Manage user accounts and passwords.	Page 22
Notifications	Manage email addresses and scheduling.	Page 23
Status Updates	Configure email status updates.	Page 24
System Information	View system and module information.	Page 30
System Log	View the system diagnostic log.	Page 25
Advanced	Manage configuration and data, reboot system.	Page 25

Default Settings

Climate Guard ships with the following default settings. You may need to use these settings to access Climate Guard for the first time, or after resetting the system to its factory defaults.

Host name**	CLIMATEGUARD CLIMATEGUARDLT PLUSXEM64 PLUSXEM32
Use DHCP	ON
IP Address	192.168.0.100*
Netmask	255.255.255.0*
Gateway	192.168.0.1*
Primary DNS	192.168.0.1*
Backup DNS	192.168.0.1*
HTTP Port	80
HTTPS Port	443
Username	admin
Password	password

*if DHCP is ON, these values will be overwritten by your DHCP server if available.

**units running firmware 1.1.3 have the following default hostnames: CLIMATEGUARD, CLIMATEGUARD_LT, PLUSX_EM64, PLUSX_EM32. It is recommended that you upgrade your system to the newest firmware. Refer to page 31 for information on firmware upgrades.

Getting Help

For customer support, please email support@burk.com or call our direct customer support line at 978-486-3711. We will be glad to assist you. The customer support office is open Monday – Friday, 9AM to 5PM Eastern Time.

INSTALLATION

Installing the Hardware

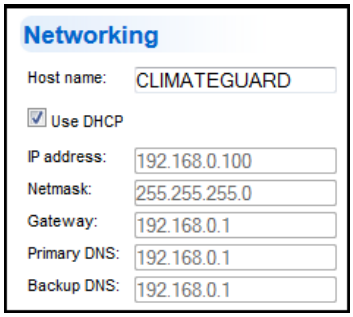
Climate Guard installs into a standard 19” rack. When selecting the rack location where you will install Climate Guard, keep in mind that the light and sound sensors are located on the front panel of the Climate Guard unit. The location where you install the hardware will affect your light and sound readings.

Connect the Ethernet port on the front panel to your 10 or 100Mbps LAN or WAN using the supplied or compatible Cat5 cable. Connect the supplied 12VDC, 1A power supply to the connector on the rear panel of the unit.

Network Configuration

Climate Guard now ships with DHCP enabled, permitting web access using the host name http://CLIMATEGUARD, http://CLIMATEGUARDLT, http://PLUSXEM64 or http://PLUSXEM32 as appropriate. (The host name can be changed from the default in the Network tab).

If DHCP is not available, you will need to access the system by navigating your web browser to http://192.168.0.100. To accomplish this you may need to change your computer’s IP address to operate on the same subnet as Climate Guard. For example, you can change your computer’s IP address to 192.168.0.10 and use the subnet mask 255.255.255.0.



Networking Settings

To restore Climate Guard to its factory default settings – including its default IP address and password – see ***Restoring Factory Default Settings.***

Log on to Climate Guard using the default administrator account and password. The username is ***admin*** and the password is ***password***.

Once logged on to Climate Guard, access the Setup page using the navigation menu at the top of the page. Select *Networking* from the list of setup choices.

Next, configure the parameters below as appropriate for your network.

If you are not the person responsible for your network, you may need assistance from that person to determine what settings are required.

Setting	Description
Hostname	Enter a hostname for Climate Guard. In many cases you will be able to access Climate Guard using its hostname rather than its IP address.
Use DHCP	Check this box if you want Climate Guard to use DHCP instead of a static IP address. When using DHCP, you may use Climate Guard's hostname to access the system. This box is checked by default. ***When this box is checked, the following settings are disabled.***
IP address	Enter the IP address you want to assign to Climate Guard.
Netmask	Enter the netmask for your network.
Gateway	Enter the gateway IP address for your network.
Primary DNS	Enter the IP address of your primary DNS server. DNS is required when using hostnames for SMTP servers and other external services.
Backup DNS	Enter the IP address of your backup (secondary) DNS server.

Press the *Save* button after you have changed your settings. Climate Guard will immediately use your new network settings.

If you temporarily changed your computer's IP address to perform the network configuration, you may now change it back.

Installing Sensors

Climate Guard supports the following types of sensors:

Type	Description	Examples
Digital Sensors	Digital sensors feed numeric readings directly to Climate Guard using the sensor inputs on the front panel or sensor expansion module.	Temperature Sensors Humidity Sensors
Powered Switch Inputs	Powered switch inputs report on/off conditions to Climate Guard using the front panel sensor inputs or sensor expansion module. Climate Guard supplies 12V to the sensor.	Motion Sensors Smoke Detectors
Unpowered Switch Inputs	Switch inputs report on/off conditions to Climate Guard using the wiring terminals on the rear panel or switch input expansion module.	Door Contacts

Sensor Capacity

Climate Guard and Plus-X EM64 systems each support a maximum of 64 sensors. This total includes three built-in sensors for light, sound and internal temperature as well as eight unpowered switch inputs on the rear panel and eight powered switch inputs, one associated with each front panel RJ12 connector. If no plug-in modules are installed in the system, up to 45 digital temperature or humidity sensors can be connected via the front panel sensor inputs.

Each Sensor Expansion Module installed in a front panel slot increases the number of powered switch inputs by four and decreases the allowable number of digital sensors by four. Each Switch Input Expansion Module installed in the system increases the number of unpowered switch inputs by eight and decreases the allowable number of digital sensors by eight.

Climate Guard LT and Plus-X EM32 systems each support a maximum of 32 sensors. This includes three built-in sensors for light, sound and internal temperature as well as eight powered switch inputs, one associated with each front panel RJ12 connector. In addition, up to 21 digital temperature or humidity sensors can be connected.

When planning digital sensor capacity, note that each humidity sensor counts as two digital sensors because it includes both humidity and temperature.

Digital Sensors and Powered Switch Inputs

Digital sensors such as temperature sensors, and powered switch inputs such as motion sensors, connect directly to the front panel *Sensor* inputs on Climate Guard. Use a 6-wire RJ12 cable (available from Burk Technology) or equivalent. See ***Appendix A – Wiring*** for more information about wiring.

Note: Once you have configured a digital sensor Climate Guard will remember your settings even if you unplug the sensor or move it to another port. Powered switch inputs, however, are identified by their port number.

Unpowered Switch Inputs

Unpowered switch inputs, such as door contacts, connect to the *Switch Inputs* wiring terminals on the rear panel of Climate Guard. Use the supplied connectors to connect the wiring for your sensors. See ***Switch Inputs*** for more information.

Note: Unpowered switch inputs are identified by their port number.

Extending Sensor Cables

Digital sensor and powered switch input cabling may be extended using RJ12 couplers, available from Burk Technology. See ***Cable Orientation and Pinouts*** for additional information.

Daisy-Chaining Sensors

Digital sensors may be daisy-chained to allow multiple sensors on a single front panel sensor input. See ***Daisy-Chain Connection of Digital Sensors*** for wiring details.

Note: While multiple digital sensors will work on a single input port, only a single powered switch input may be used on each port.

Unpowered switch inputs may also be daisy-chained. However, Climate Guard will treat all daisy-chained inputs as a single input. For example, you may connect several door contacts to the same input, and Climate Guard will report if *any* door is open, or if *all* doors are closed.

Installing Modules

Climate Guard supports two expansion modules. Modules are “hot swappable”, and do not require you to unplug Climate Guard. For more information on modules available for Climate Guard, visit www.burk.com.

To install a module, first remove the module blank panel (if necessary). Line up the edges of the module with the card guides inside the unit (see photo, below). Slide the card into the unit until you feel it reach the rear panel. You may need to press on the front panel of the module until it “clicks” into place. Hand-tighten the module’s thumbscrews. The module’s front panel should be flush with the Climate Guard front panel.

Once a module is installed, its ports or features will be available to Climate Guard within 30 seconds.

Installing expansion modules; card guides are circled in red

CONFIGURATION

Configuring Climate Guard requires *Administrator* level access. Log on to Climate Guard using the built-in *admin* account, or another administrator account.

Sensors

When you add a sensor to Climate Guard, it will automatically appear on the *Sensors* page (you may need to refresh the page). Switch inputs appear on the *Sensors* page as well, even if nothing is connected to the input.

Before configuring your sensors, connect the sensor to the front or rear panel, depending on the type of sensor used. See ***Installing Sensors*** for more information.

Type	Name	Location	Value	Last Hour	Overview	Chart		
Light	Light	Built-in	2.8 %		☑		Edit	Hide
Sound	Sound	Built-in	-19.1 dBFS		☑		Edit	Hide
Temperature	Internal Temperature	Built-in	83.4 °F		☑	☐	Edit	Hide
Temperature	Bottom of Rack	Front Panel port 2	71.6 °F		☑	☑	Edit	Hide
Temperature	Top of Rack	Front Panel port 4	79.8 °F		☑	☑	Edit	Hide
Humidity	Humidity	Front Panel port 8	49.0 %		☑		Edit	Hide
Temperature	Ambient	Front Panel port 8	74.3 °F		☑	☑	Edit	Hide

Sensors List

Overview Settings

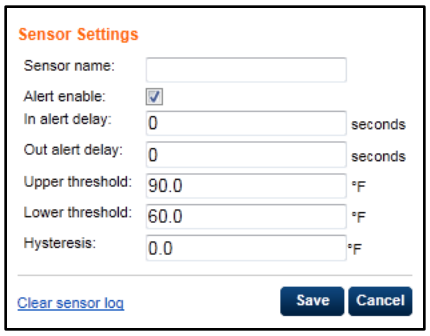
From the *Sensors* page, use the *Overview* checkbox to indicate which sensors should appear on the *Overview* page. Use the *Chart* checkbox to determine which temperature sensors should appear on the temperature chart included on the *Overview* page.

Hiding Sensors

If desired, you can hide sensors from the *Sensors* page. Use the *Hide* link to hide a sensor. Use the *Show hidden sensors* link at the bottom of the page to make the hidden sensors visible (they will appear with gray text). Use the *Unhide* link on a hidden sensor to restore it to its normal state.

Configuring Digital Sensors

Click the *Edit* button next to a digital sensor to edit its settings. The following settings are available:



Digital Sensor Settings

Setting	Description
Sensor name	Enter a name to identify this sensor. Note that you may change this name without affecting your logged data or any other functionality.
Alert enable	Check this checkbox to enable alerting for this sensor.
In alert delay	The *in alert delay* is the number of seconds this sensor must be outside its thresholds before it will cause an alert.
Out alert delay	The *out alert delay* is the number of seconds this sensor's value must be back in tolerance before it may cause another alert.
Upper threshold	Enter the upper threshold value at which this sensor should go into alert.
Lower threshold	Enter the lower threshold value at which this sensor should go into alert.
Hysteresis	Enter the amount by which this sensor must cross back into tolerance before exiting the alert state.

Click the *Save* button to save your changes.

Examples

Alert delays

Assume the *in alert delay* is set for 60 seconds and the *out alert delay* is set for 30 seconds. If the sensor exceeds a threshold at 12:00:00, it will enter the alert state at 12:01:00. If the sensor returns to normal at 12:30:00, it will not cause any further alerts until no earlier than 12:30:30.

If a sensor returns to its normal value before the *in alert delay* expires, Climate Guard will not report an alert. If a sensor that is in alert returns to normal for less than the *out alert delay* period and then exceeds its threshold again, it will *not* exit the alert state.

Using alert delays appropriately will prevent a brief condition from causing an unnecessary alert or forcing redundant alerts due to value fluctuation.

Thresholds

Assume a temperature sensor has an *upper threshold* of 78°F and a *lower threshold* of 55°F. If the temperature rises above 78°F, Climate Guard will report an alert. If the temperature drops below 55°F, Climate Guard will report an alert.

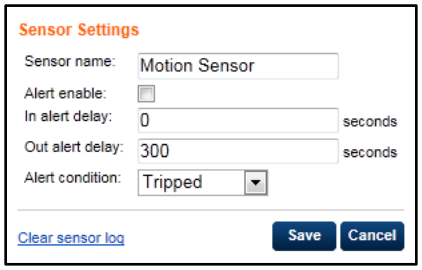
Hysteresis

Assume a temperature sensor has an *upper threshold* of 78°F and a *hysteresis* value of 2°F. If the temperature rises above 78°F, Climate Guard will report an alert. The alert will continue until the temperature drops to *below* 76°F (78 - 2).

Using hysteresis appropriately will prevent a sensor from causing multiple alerts if it is fluctuating near the alert threshold.

Configuring Switch Inputs

Click the *Edit* button next to a switch input to edit its settings. The following settings are available:



Switch Input Sensor Settings

Setting	Description
Sensor name	Enter a name to identify this sensor. Note that you may change this name without affecting your logged data or any other functionality.
Alert enable	Check this checkbox to enable alerting for this sensor.
In alert delay	The *in alert delay* is the number of seconds this sensor must be in its alert condition before it will cause an alert.
Out alert delay	The *out alert delay* is the number of seconds this sensor must be out of its alert condition before it may cause another alter.
Alert condition	The state of the switch input that will cause an alert: *Tripped*, *Normal*, or *Any Change* (*Tripped* or *Normal*).

Click the *Save* button to save your changes.

Examples

Alert Delays

Assume a door contact has an *in alert delay* of 60 seconds and an *out alert delay* of 30 seconds. If the door opens at 12:00:00 and remains open, Climate Guard will report an alert at 12:01:00. If the door closes at 12:30:00, it will not cause any further alerts until no earlier than 12:30:30.

If the door closes before the 60 second delay expires, Climate Guard will not report an alert. Once the door contact exits the alert state, if the door opens again before the 30 second out alert delay expires, it will *not* cause an additional alert at this time.

Using alert delays appropriately with switch inputs will eliminate unnecessary alerts caused by fleeting conditions.

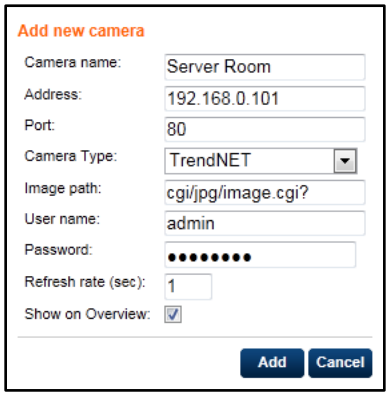
Alert Conditions

In most cases you will want Climate Guard to report an alert when a switch input has *tripped*, such as a door opening, motion detection, flood detection, etc. In some cases you may want an alert when a switch input is in its *normal* state (for example, if a door is supposed to remain open). You can also configure Climate Guard to report an alert for *any change*. In this case, a switch input will always be in the alert state, and Climate Guard will report an alert whenever the switch input changes condition.

Cameras

Climate Guard supports integration with up to four IP cameras. Climate Guard works with any IP camera that allows either streaming video or snapshot access via a URL. Built-in settings are available for cameras from TrendNET, Foscam and Panasonic. For information on accessing video or snapshot features on other cameras, please see the documentation for your camera.

To add a new camera, click the *Add new camera…* link on the *Cameras* page. The following settings are available:



Camera Settings

Setting	Description
Camera name	Enter a name for the camera (for display purposes only).
Address	Enter the IP address or hostname of the camera.
Port	Enter the HTTP (web) port number for the camera (usually 80).
Camera type	Select the type of camera you are using. If your camera's manufacturer is not in the list, select *Other*.
Image path	(Only necessary if you selected *Other* for the camera type). Enter the path used to access a snapshot or streaming image from your camera. ***Note: The image path must end with a question mark (?).***
Username	Enter the username required to access your camera (optional).
Password*	Enter the password required to access your camera (optional).
Refresh rate (sec)	Enter the frequency with which Climate Guard should refresh your camera's image.
Show on Overview	Check this checkbox if you want a thumbnail image from this camera to appear on the *Overview* page.

** Some web browsers may prompt for a username and password even if you have entered them here. Also note that some web browsers may prompt for a password if your password is blank.*

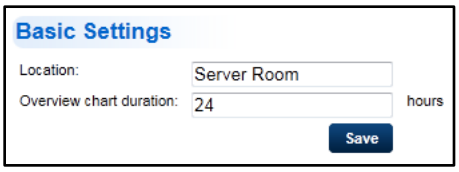
To change your settings for an existing camera, use the *Edit* link under the camera's image. To remove a camera, use the *Delete* link.

Click the icon (⧉) in the lower right corner below the camera image to navigate to the camera's web page.

System Settings

Basic Settings

Basic Settings allow you to set the location name and *Overview* chart settings. Click the *Basic Settings* link on the *Setup* page to configure the following:



Basic Settings

Setting	Description
Location	Enter a description for the location of this Climate Guard unit. This is for display purposes only and does not affect functionality.
Overview chart duration	Enter the length of time you want the *Overview* temperature chart to display.

Click the *Save* button to save your changes.

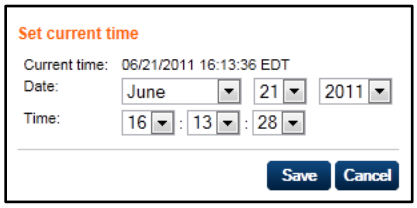
Time Settings

Use the *Time* link on the *Setup* page to configure Climate Guard's time settings and to set the time. You can set the time manually or use SNTP to automatically synchronize the time with an SNTP server.

Setting the Time

Click the *Set time* link to manually set the time. Climate Guard will display the current time and prompt you to enter the current date and time. Click the *Save* button to set the time.

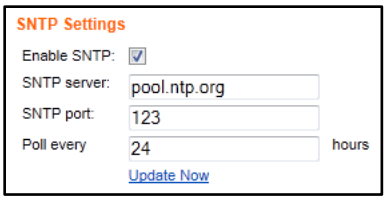
Note: Enter what the time will be when you will click the Save button. For better precision, consider using an SNTP server.



Setting the current time

SNTP Settings

Use the following settings to configure Climate Guard to use an SNTP server:



SNTP Settings

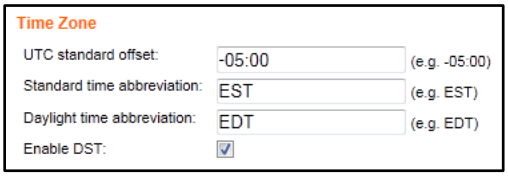
Setting	Description
Enable SNTP	Check this checkbox to enable use of an SNTP server.
SNTP server	Enter the IP address or hostname of your SNTP server.
SNTP port	Enter the TCP port used by your SNTP server (usually 123).
Poll every [n] hours	Enter how often Climate Guard should synchronize the time (in hours).

Click the *Update Now* link to force Climate Guard to synchronize with the server right now.

Click the *Save* button to save your changes.

Time Zone Settings

Use the time zone settings to configure Climate Guard for your local time zone. The following settings are available:



Time Zone Settings

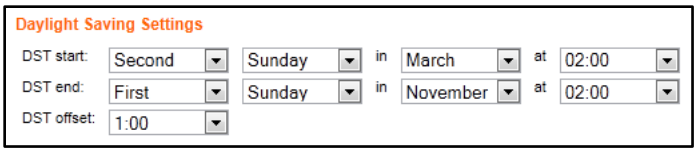
Setting	Description
UTC standard offset	Enter the offset of your local time zone (standard time) from UTC time. Use the format hh:mm. Use a minus sign (-) if your time zone falls *behind* UTC (e.g. all US time zones).
Standard time abbreviation	Enter the abbreviation for standard time (e.g. EST for Eastern Standard Time).
Daylight time abbreviation	Enter the abbreviation for daylight time (e.g. EDT for Eastern Daylight Time).
Enable DST	Check this box if your time zone observes Daylight Saving Time.

Note: Climate Guard stores date/time information internally using UTC time. Changing time zone settings will not affect your history data.

Click the *Save* button to save your changes.

Daylight Saving Time Settings

By default, Climate Guard is configured for U.S. DST rules. If the rules in your location are different, you can configure Climate Guard using these settings. Note that these settings are not used if your location does not require DST.



Daylight Saving Time Settings

Enter the DST start date and end date using the drop-down boxes. DST is configured in relative terms, i.e. *the second Sunday in March*. Select the offset your location uses for DST (30 minutes, 60 minutes or 90 minutes).

Click the *Save* button to save your changes.

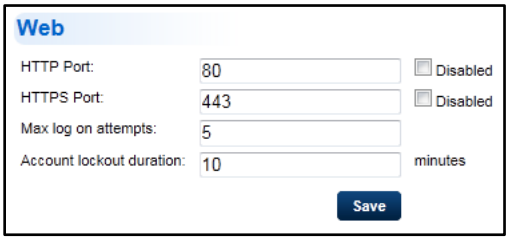
Networking

Network Settings

To set Climate Guard's basic network settings, including the unit's IP address, access the *Networking* section from the *Setup* page. For a description of the networking parameters, see ***Network Configuration***.

Web

To configure the built-in web server, use the *Web* link on the *Setup* page. The following parameters are available:



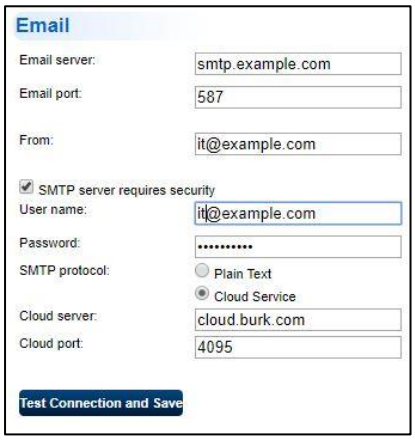
Web Settings

Setting	Description
HTTP Port	Enter the TCP port Climate Guard will use for web (HTTP) access (usually 80). Check the *disabled* checkbox to disable HTTP access.
HTTPS Port	Enter the TCP port Climate Guard will use for secure (SSL) web access (usually 443). Check the *disabled* checkbox to disable HTTPS access.
Max log on attempts	Set the maximum number of times a user may attempt (unsuccessfully) to log on before Climate Guard will lock out the user's account.
Account lockout duration	Enter the duration of time (in minutes) that Climate Guard will lock out access for a user who has exceeded the maximum log on attempts.

Click the Save button to save your changes.

Email

To set the email (SMTP) settings for Climate Guard, use the *Email* link on the *Setup* page. The following parameters are available:



Email Settings

The Burk Email Cloud Service is supported in Climate Guard firmware version 1.1.6 and higher. The Cloud Service works in conjunction with your Climate Guard system to originate encrypted emails using the STARTTLS protocol extension. If your current email server does not support STARTTLS, you can open a free email account with an Internet email service provider. The Burk Email Cloud Service is compatible with email services from a wide range of providers including Gmail, mail.com, GMX and Zoho. It is suggested that you create an email account dedicated for use with your Climate Guard systems. This will make it easier to identify and sort email received from the Climate Guard systems, and to monitor email activity. To configure the Climate Guard for use with the cloud service, complete the following additional configuration steps:

Check the “Cloud Service” radio button.

Accept the default Cloud server, cloud.burk.com.

Accept the default Cloud port, 4095

Click “Test Connection and Save” to submit the dialog box.

Setting	Description
Email server	Enter the IP address or hostname of your SMTP server.
Email port	Enter the port number used by your SMTP server or accept the default value of 587.
From	Enter the *from* address that your Climate Guard notifications should report to be from.
SMTP server requires security	Check this checkbox if your SMTP server requires you to log on to send email.
Username	Enter the username to log into the email server. Usually this is your email address.

Password	Enter your SMTP password, if applicable.
SMTP protocol	Select Cloud Service to make use of the Burk Email Cloud Service.
Cloud Server	The default address for the Burk Email Cloud server is cloud.burk.com.
Cloud port	The default port for the Burk Email Cloud server is 4095.

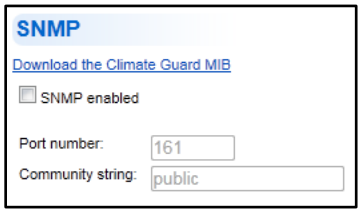
Click the *Test Connection and Save* button to test the settings and save your changes.

SNMP

To configure Climate Guard's SNMP features, use the *SNMP* link on the *Setup* page.

To download the MIB for Climate Guard, use the link labeled *Download the Climate Guard MIB*.

The following parameters are available:



SNMP Settings

Setting	Description
SNMP enabled	Check this checkbox to enable the Climate Guard SNMP agent.
Port number	Enter the UDP port number that Climate Guard will use for SNMP (usually 161).
Community string	Enter the *community string* that Climate Guard will require for read access (usually *public*).

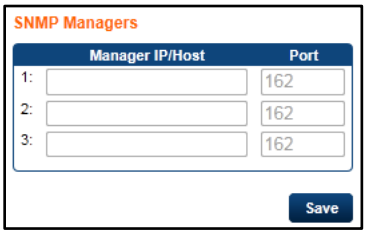
Note: Climate Guard supports SNMP version 1.

SNMP Managers

Climate Guard supports up to three SNMP managers. In the event of an alert, Climate Guard will send an SNMP trap to each manager.

For each manager, enter the IP address or hostname and port number (usually 162).

Click the *Save* button to save your settings.

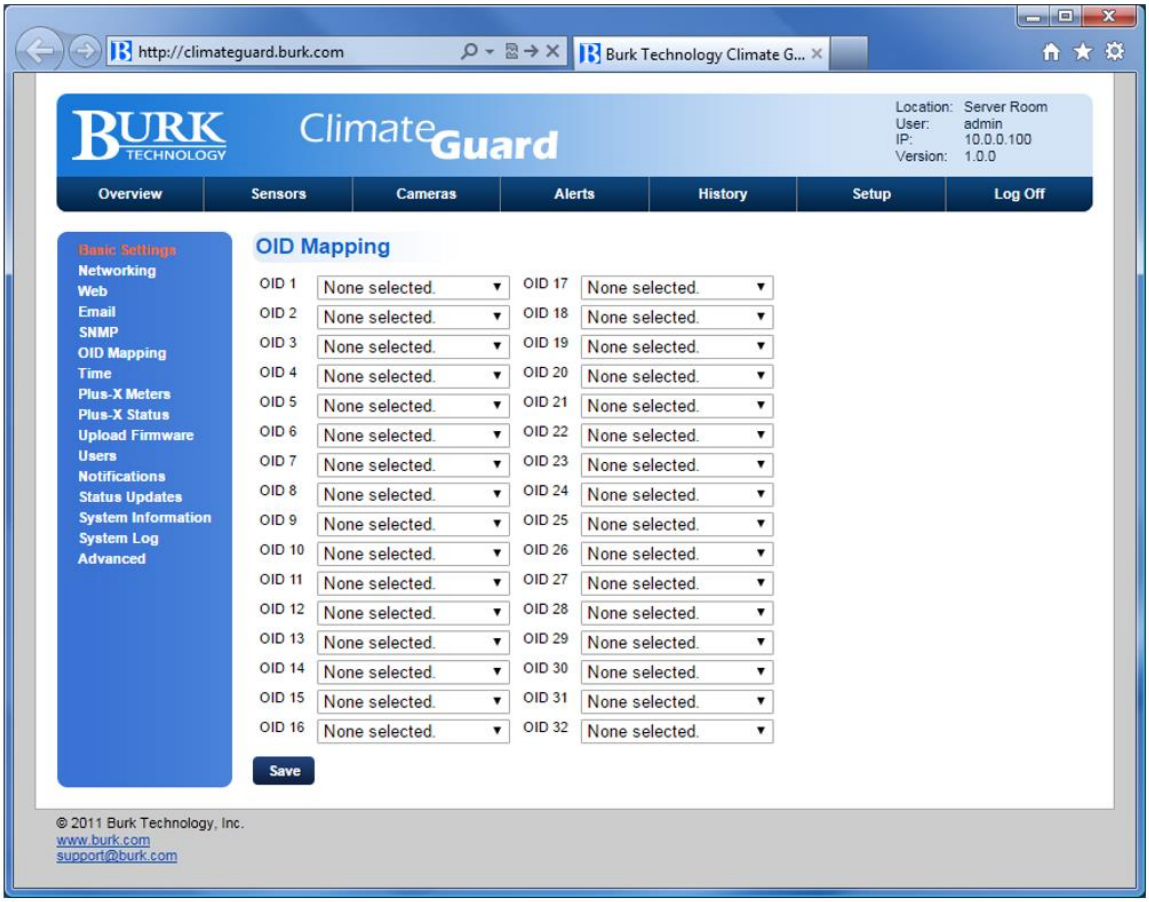


SNMP Manager Settings

Assigning SNMP OIDs to Individual Sensors

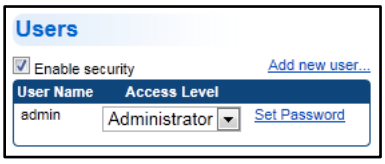
Select *OID Mapping* from the *Setup* page to assign specific SNMP Object Identifiers to individual sensors. Depending on your unit type, either 32 or 64 OID selection boxes will be displayed as shown below. The OID numbers on this page correspond to the index numbers used in the OID table "cgSenTable" identified in the Climate Guard MIB file.

This OID assignment capability allows you to directly control which sensors are associated with particular functions when integrating Climate Guard with third party SNMP management systems.



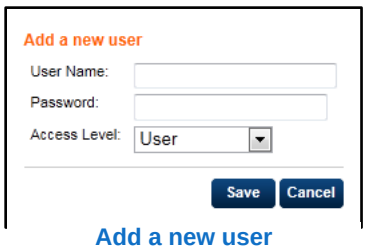
User Accounts

Climate Guard supports up to 10 user accounts, including the built-in *admin* account. To configure user accounts, click the *Users* link on the *Setup* page.



Users List

To add a new user, click the *Add new user…* link. Enter the username and password for the new user and select either *User* or *Administrator* access level. *Administrator* users have access to Climate Guard's configuration options, while standard users do not.



Add a new user

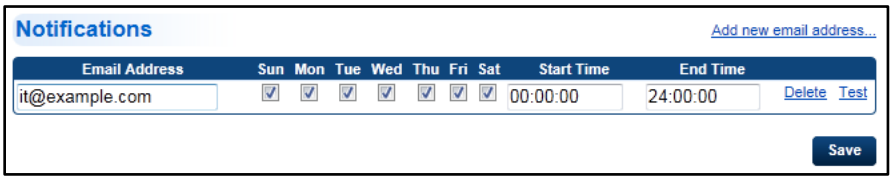
Use the user list to change an existing user's access level and click the *Set Password* link to change a user's password. To delete a user, click the *Delete* link next to the account.

Note: you cannot delete the "admin" user.

If desired, you may disable security entirely by unchecking the *Enable security* checkbox (not recommended).

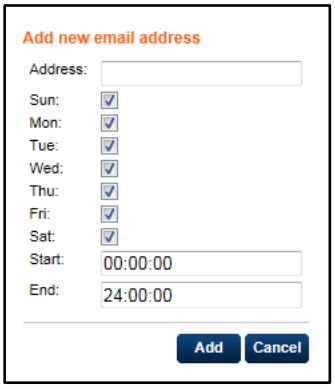
Notifications

Climate Guard supports email notifications for up to 10 email address. Climate Guard will email alert messages to the addresses that you specify, according to the schedules that you configure. To configure notifications, use the *Notifications* link on the *Setup* page.



Notifications List

To add a new email address, use the *Add new email address…* link. Enter the address and check/uncheck the days of the week according to when this address should receive notifications. Use the start and end fields to enter the starting and ending times when this user should receive notifications.



Add new email address

To edit an existing user, simply update the fields in the grid and click the *Save* button. Use the *Delete* link to delete a user.

To test that an address is correctly entered, use the *Test* link to send a test email.

Testing email functionality is strongly recommended to ensure critical alerts are received as desired.

Example

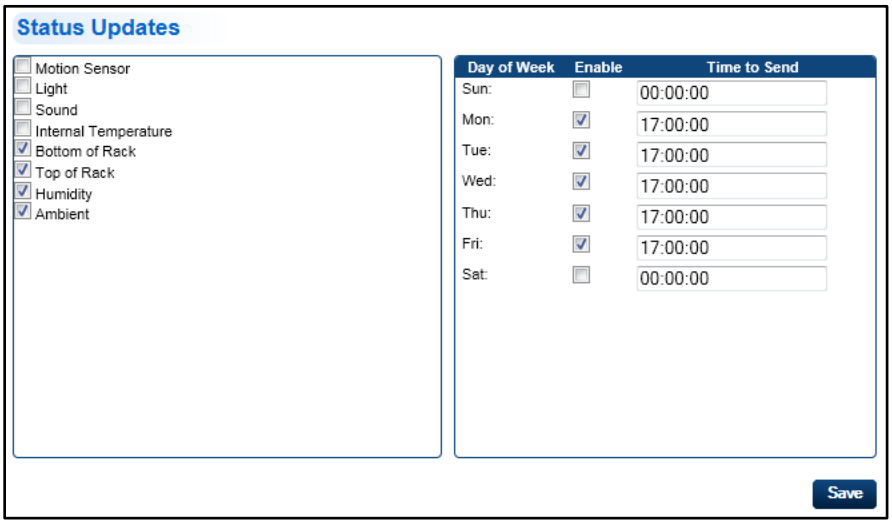
To have Climate Guard send alert emails to *it@example.com* Monday through Friday, 9:00AM to 5:00PM:

1. Click the *Add new email address…* link.
2. Enter *it@example.com* as the address.
3. Uncheck *Sun* and *Sat* so that only the weekday checkboxes remain checked.
4. Enter *09:00:00* as the start time.
5. Enter *17:00:00* as the end time.
6. Click the *Save* button.

Note: For complex scheduling, you may enter the same email address multiple times, each with a different schedule.

Status Updates

Climate Guard can periodically email the values of selected sensors to the email addresses in the *Notifications* list (see ***Notifications*** to configure notifications). To configure status updates, click the *Status Updates* link on the *Setup* page.



Configuring Status Updates

Using the list of sensors on the left side of the page, check the sensors that you want to include in the email updates. Schedule the email updates by checking the *Enable* column for each day of the week when you want to send an update and entering the time of day when you want Climate Guard to send the email. Use the format *hh:mm:ss* to enter time of day.

Click the *Save* button to save your settings.

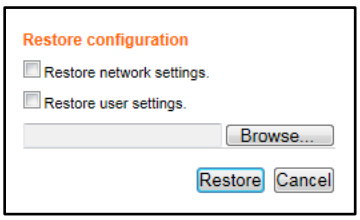
Backing Up and Restoring Configuration

You can back up and restore your Climate Guard configuration from the *Advanced* page, available from the *Setup* page.

Backing up your configuration is strongly recommended.

Use the *Download configuration* link to download a copy of your configuration.

Use the *Restore configuration…* link to upload a previously saved copy of your configuration. When restoring configuration, you can optionally restore network and/or user settings by using the appropriate checkboxes when prompted.



Restoring Configuration

Warning: Restoring configuration will overwrite your current settings. This operation cannot be undone.

Note: When Climate Guard generates a configuration file, it will encrypt all password information to prevent tampering and unauthorized access.

Advanced Settings

Rebooting

Although rebooting Climate Guard is not normally necessary, you can do so by using the *Reboot* link on the *Advanced* section of the *Setup* page.

System Log

The *System Log* page, available from the *Setup* page, contains diagnostic information about Climate Guard. This information is not required for regular use of Climate Guard, and is primarily intended for advanced troubleshooting with assistance from Burk Technology.

Clearing Data

There are several types of data stored on Climate Guard that you can clear if desired:

Data	Page	Instructions
Individual sensor history	Sensors	To delete a sensor's history data, click the *Edit* link next to the sensor, then click the *Clear sensor log* link.
All sensor history	Setup/Advanced	To delete history data for ALL sensors, click the *Clear all logged data* link.
System log	Setup/Advanced	To clear the system log, click the *Clear the system log* link.
Alerts	Setup/Advanced	To erase all alert data, click the *Delete all alerts* link.

Warning: Clearing data cannot be undone.

ALERTS

The *Alerts* page displays all alerts stored on Climate Guard.

Terminology

An *alert* indicates that a sensor has exceeded its thresholds or is otherwise not in its normal state.

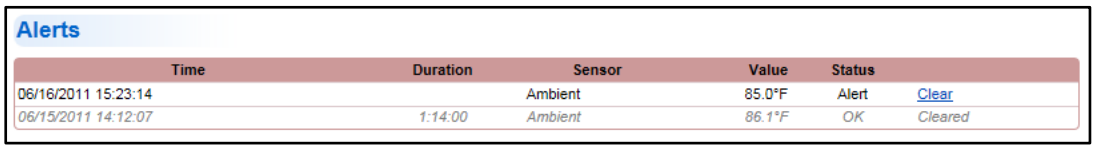
An alert is *cleared* when you use the *Clear* link to indicate that you no longer wish to see this alert listed on the overview. Cleared alerts are still visible on the *Alerts* page, but will appear on the list below uncleared alerts.

An alert is *active* when its sensor is still out of tolerance. It is important to note that clearing an alert does not make it inactive, and inactive alerts are not cleared until you mark them as cleared.

Alerts List

The alert list displays the following columns:

Column	Description
Time	The date and time when the alert occurred.
Duration	The duration of the alert (in the format days hh:mm:ss).
Sensor	The name of the sensor that caused the alert, or a description of what caused a system alert (such as removing a module).
Value	The value of the sensor at the time it caused the alert (if applicable).
Status	The status of the sensor at the time it caused the alert (usually *OK* for digital sensors, *Tripped* or *Normal* for closures, or *Missing* if the sensor was unplugged).
[Clear/Cleared]	The final column will display a *Clear* link, or the word *Cleared* if the alert is already cleared.



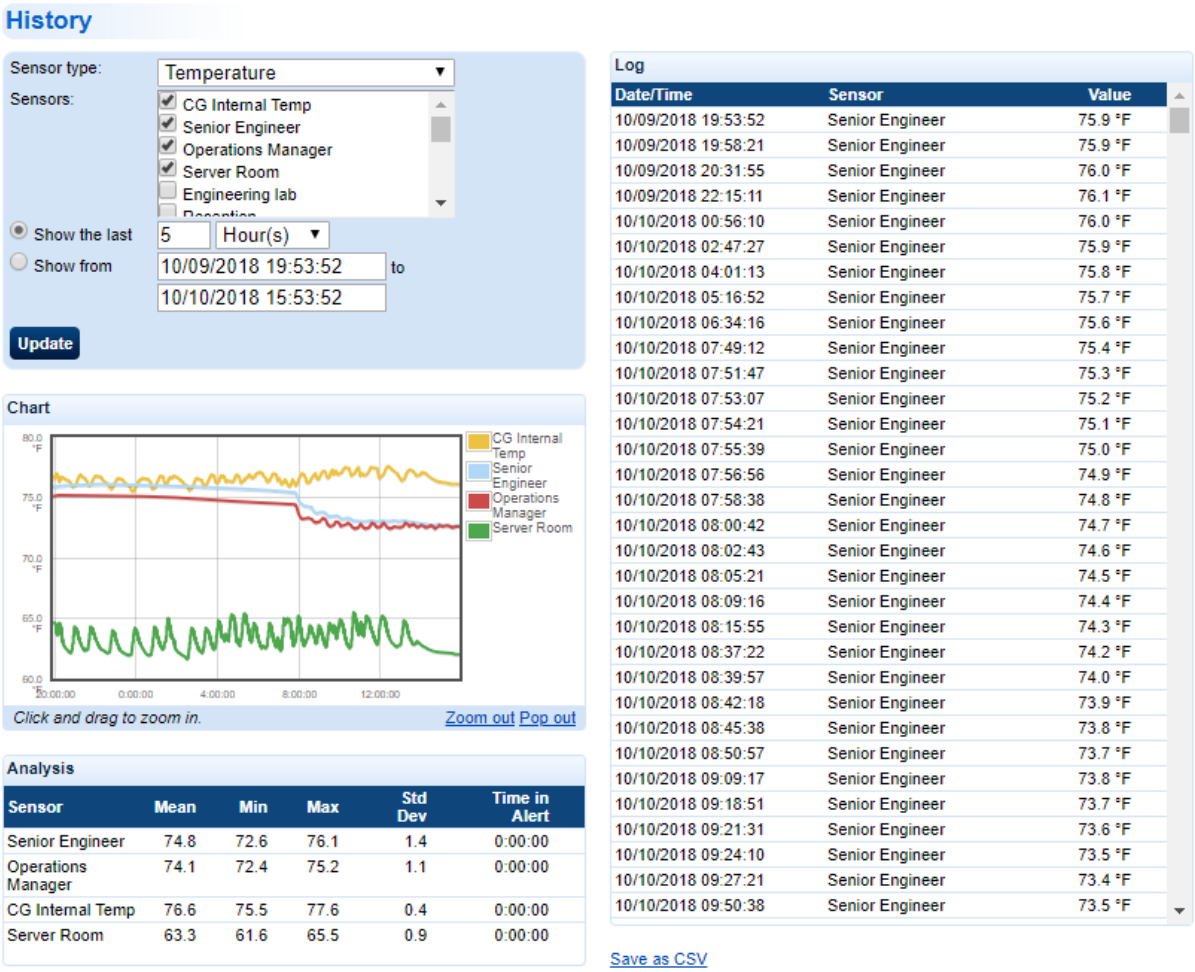
Alerts LIst

To clear an alert, click the *Clear* link next to the alert in the list.

Use the *Show more* and *Show all* links at the bottom of the page to load additional alerts. Note that these links will only appear if there are more alerts available than what you see on the screen.

HISTORY

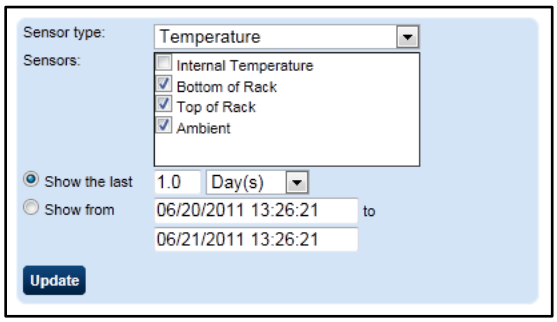
The *History* page allows you to access the data that Climate Guard has logged for your sensors. Climate Guard automatically logs sensor data whenever a sensor's value changes.



History Page

To view your history data:

1. Select the type of sensor for which you want to view data (e.g. Temperature, light, sound or closure).
2. Pick the desired sensor or sensors from the *Sensors* list. You may select as many sensors as you like.
3. Choose to either *Show the last* number of days, weeks or months, or *Show from* a specific date/time *to* another date/time. Enter date/time values in the format *mm/dd/yyyy hh:mm:ss*.
4. Click the *Update* button to load your data.

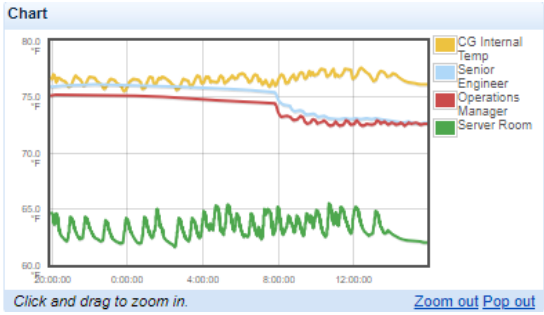


Selecting sensors and a time range to view history data

Climate guard will display your data in three ways: Chart, Analysis and Log.

Chart

The *chart* shows a graphical representation of your data over the selected time period. Note that if Climate Guard was not online or otherwise unable to log data for a period of time, it will show gaps in the chart line.



History Chart

Charting Closures

If you have selected *closure* data, the chart will show a linear representation of when each closure was in its *tripped* state. If you have selected multiple closures, each closure will appear as a different line and in a different color. If no line appears on the chart for a closure, it is because the closure was never tripped during the specified period of time. If a solid, unbroken line is displayed, the closure remained tripped for the entire duration of the chart.

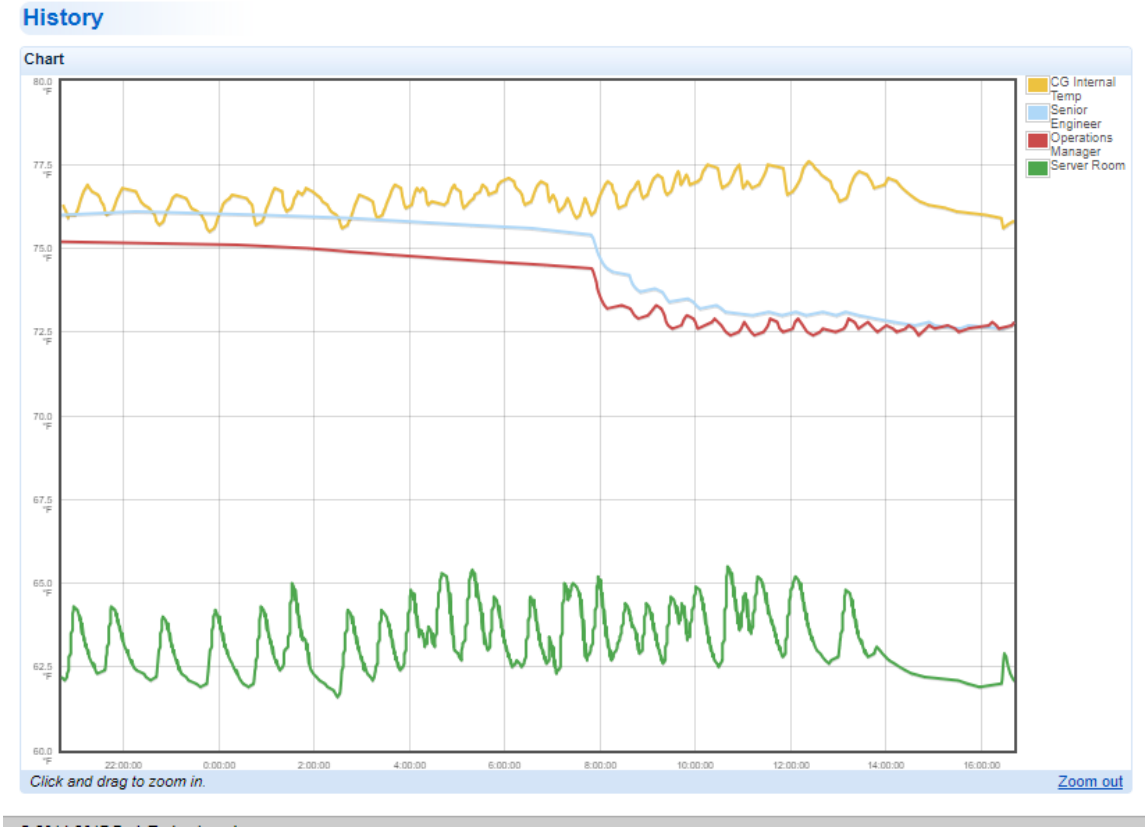
Note that closure charts will always show at least a two pixel line for a "tripped" condition of any duration.

Zoom In and Out

You can zoom in on a segment of the chart to view greater detail. Simply click on the chart and drag the mouse across the data you would like to expand. To zoom back out, click on the "Zoom out" link below the chart.

View Large Pop-Out Chart

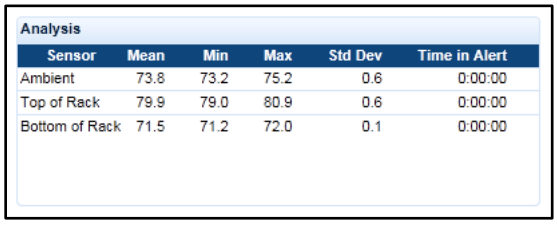
Click on “Pop-out” link below the chart to display a larger image for easy viewing.



Pop-Out Chart

Analysis

The *analysis* block shows key statistics about each sensor you are examining. These values are:



Analysis

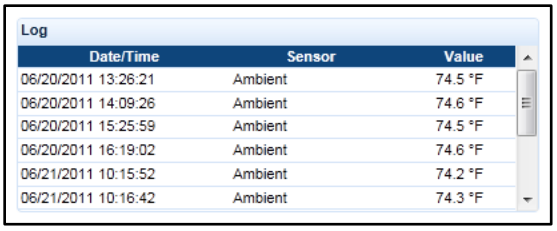
Sensor	Mean	Min	Max	Std Dev	Time in Alert
Ambient	73.8	73.2	75.2	0.6	0:00:00
Top of Rack	79.9	79.0	80.9	0.6	0:00:00
Bottom of Rack	71.5	71.2	72.0	0.1	0:00:00

History Data Analysis

Value	Description
Mean	The arithmetic mean of the logged values during the specified period of time.
Min	The minimum value logged during the specified period of time.
Max	The maximum value logged during the specified period of time.
Std Dev	The standard deviation of the sensor values during the specified period of time.
Time in Alert	The amount of time the sensor spent in alert during the specified period of time. The duration is displayed in the format *days hh:mm:ss*.

Log

The *Log* block shows each value that Climate Guard logged for each sensor. If desired, you can download this data to your computer in CSV (comma separated value) format using the *Save as CSV* link below the *Log* block.



Log

Date/Time	Sensor	Value
06/20/2011 13:26:21	Ambient	74.5 °F
06/20/2011 14:09:26	Ambient	74.6 °F
06/20/2011 15:25:59	Ambient	74.5 °F
06/20/2011 16:19:02	Ambient	74.6 °F
06/21/2011 10:15:52	Ambient	74.2 °F
06/21/2011 10:16:42	Ambient	74.3 °F

History Log

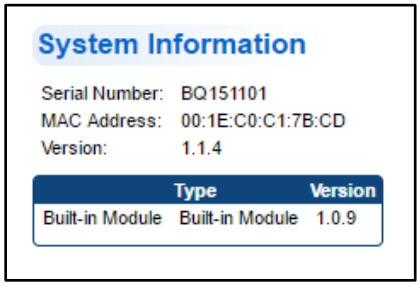
System Information

The *System Information* page shows information about your Climate Guard unit. The following parameters are displayed:

Parameter	Description
Serial Number	The serial number of this unit
MAC Address	The MAC address assigned to this unit
Version	The firmware version running on this unit
Module Types	The types of modules installed in this unit
Module Versions	The firmware version running on each module

UPGRADING FIRMWARE

There are two types of firmware updates available for Climate Guard: *main* and *module*. The *main* firmware is the firmware used to for the primary functionality and user interface. The *module* firmware controls Climate Guard's optional modules, as well as its built-in sensor ports. Select *System Information* from the *Setup* page to display the information shown at the right. In this example, the main firmware is version 1.1.4 and the firmware for the built-in sensor ports is version 1.0.9.



System Information

Note: Backing up your configuration before upgrading your firmware is strongly recommended. See ***Backing Up and Restoring Configuration*** for more information.

Upgrading Module Firmware

Visit www.burk.com/downloads, select the Climate Guard or Plus-X EM support page and download the most current module firmware for your unit. If the downloaded file is a compressed zip file, extract and save the firmware file with .bin extension.

Select *Upload Firmware* from the *Setup* page to display the information shown at the right. To upload the module firmware, click the *Choose File* button, select the .bin firmware file to upload, and click the *Upload* link. Loading firmware may take a few moments.

Upload Firmware

Upgrading Main Firmware

If your unit is currently running main firmware version 1.1.0 or newer, it can be directly upgraded to the latest firmware. To do this, skip to "Step Two: Updating Main Firmware to the Latest Version".

However, if your unit is currently running firmware Version 1.0.x, it will be necessary to first upgrade to Version 1.1.3 as described below in "Step One: Updating Main Firmware to Version 1.1.3". After updating to Version 1.1.3, you can proceed to Step Two to upgrade to the most current firmware version.

Step One: Updating Main Firmware to Version 1.1.3

Visit the Climate Guard or Plus-X EM support page at www.burk.com/downloads. In the box titled "Firmware & Downloads", right-click on the correct firmware for your unit as indicated in the table below and choose *Save Link As* to save a copy of the file on your computer.

If your unit is:	Right-click on:	And save the file as:
Climate Guard	Climate Guard 1.0.x to 1.1.3	Cpu_1_1_3_WithBootLoader.bin
Climate Guard LT	Climate Guard LT 1.0.x to 1.1.3	CpuLt_1_1_3_WithBootLoader.bin
Plus-X EM64	Plus-X EM64 1.0.x to 1.1.3	PlusXEM64_1_1_3_WithBootloader.bin
Plus-X EM32	Plus-X EM32 1.0.x to 1.1.3	PlusXEm32_1_1_3_WithBootLoader.bin

To upload the firmware, click the *Upload Firmware* link on the *Setup* page of the Climate Guard or Plus-X EM web interface. Click *Choose File* under *Main Firmware*, select the file saved above, then press Upload.

Step Two: Updating Main Firmware to the Latest Version

Visit the Climate Guard or Plus-X EM support page at www.burk.com/downloads. In the box titled "Firmware & Downloads", right-click on the most current Main Firmware file for your unit. Choose *Save Link As* to save a copy of the selected file on your computer.

On the same support page, right click on Burk Firmware Loader and choose *Save Link As* to save a copy of BurkFirmwareLoader_x_x_x.exe. Run the file to install the Burk Firmware Loader.

To upload the firmware, select *Upload Firmware* on the *Setup* page of the Climate Guard or Plus-X EM web interface and click the *Enable Firmware Upload* button. Then run the Burk Firmware Loader. Enter your unit's IP address, username and password. Select the firmware file you saved above then press Upload. Wait until the Burk Firmware Loader has completed uploading all the data.

RESTORING FACTORY DEFAULT SETTINGS

If desired, you can reset Climate Guard to its factory default settings. There are two ways to perform this operation: from the *Advanced* page on the web interface or using the *reset* button on the front panel.

***Reset* button on the front panel**

To reset Climate Guard from the web interface, use the *Factory default* link on the *Advanced* section of the *Setup* page.

To reset Climate Guard using the *reset* button:

1. Apply power to Climate Guard if it is not already powered on.
2. Press and hold the *reset* button on the front panel using a paper clip or similar object.

3. Keep the button depressed until you see the *Power* and *Fault* LEDs blink in an alternating pattern.

Note: after resetting Climate Guard to its factory default settings, the host name will be CLIMATEGUARD, CLIMATEGUARD_LT, PLUS-X_EM64 or PLUS-X_32 as appropriate. If a DCHP server is available, the unit will be assigned an IP address from the DHCP server. If no DHCP server is available, the IP address will be 192.168.0.100. The admin account password will be "password".

Warning: Resetting Climate Guard to its factory default settings will reset ALL settings and ERASE all your logged data. This operation cannot be undone.

SECURITY

Climate Guard requires a username and password to access its onboard web interface. You can add multiple user accounts, each configured as an *administrator* or *user*. For more information on creating user accounts, see ***User Accounts.***

You can access Climate Guard via HTTP or HTTPS (encrypted). HTTPS is recommended for maximum security. See ***Web*** for more information about configuring web server settings.

Note: Climate Guard uses a self-signed SSL certificate. Your web browser may present you with a warning when accessing Climate Guard via HTTPS. This is normal and does not indicate an error or security risk with Climate Guard.

If desired, security may be turned off entirely. See ***User Accounts*** for more information.

Warning: Burk Technology cannot recover a lost password. If you have lost your Climate Guard password and cannot access your unit, you will need to reset your system to its factory default settings. See Restoring Factory Default Settings for more information.

WARRANTY

Burk Technology, Inc. warrants Climate Guard to be free of defects in materials and workmanship for a period of 24 months from the date of purchase. Equipment will be repaired or replaced at the option of Burk Technology and returned freight prepaid to the customer. Damage due to abuse or improper operation or installation of the equipment or caused by fire or flood or harsh environment is not to be covered by this warranty. Damage in shipping is not the responsibility of Burk Technology. A return authorization must be obtained before returning any equipment. Materials returned under this warranty must be shipped freight prepaid and insured in the original shipping carton or suitable substitute to Burk Technology, Inc., 7 Beaver Brook Road, Littleton, MA 01460. Repairs not covered under this warranty will be made at prevailing shop rates established by Burk Technology.

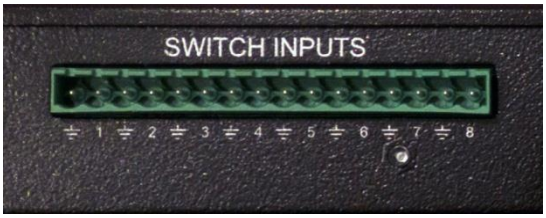
THE WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. BURK TECHNOLOGY, INC. SHALL NOT BE LIABLE TO ANY PARTY FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF THIS EQUIPMENT.

APPENDIX A – WIRING

Switch Inputs

Switch inputs are used for connection of unpowered sensors that provide a simple contact closure output, such as the DOOR CONTACT sensor.

Switch inputs, both on the rear panel of Climate Guard and on the optional Switch Input Expansion Module, require a two-wire connection. Connect one wire to ground (⏚) and the other to the numbered input terminal using the included 16-pin "Phoenix" type connector.



Switch Inputs

Climate Guard LT and Plus-X EM32 units do not provide switch inputs. However, users of these systems can connect unpowered contact-closure type sensors to pins 1 and 2 of the front panel RJ12 Sensor inputs as identified below.

Sensor Inputs

Sensor inputs on the front panel of Climate Guard and on the optional Sensor Expansion Module require a six-wire cable with an RJ12 connector. The pinouts are as follows:

Pin	Signal	Temperature Sensors	Other Digital Sensors	Powered Switch Inputs
1	Ground		✓	✓
2	Status Signal			✓
3	Data	✓	✓	
4	Ground	✓	✓	✓
5	Unused			
6	+12V		✓	✓

Note: Pin 1 is the left-hand pin as you are facing the front panel of Climate Guard.

Cable Orientation and Pinouts

The use of telephone style connectors for the front panel sensor inputs makes it possible to use standard telephone cables when connecting sensors to Climate Guard. However, it is important to verify the wiring of the cables to ensure proper operation.

The designation RJ25 or RJ12 refers to a 6-pin modular telephone connector with all six pins wired. This connector configuration is also referred to as 6P6C indicating six-position, six-conductor.

Certain telephone cables use “crossover” wiring in which pin 1 at one end of the cable connects to pin 6 at the far end, pin 2 connects to pin 5, and pin 3 connects to pin 4 as shown below:

Crossover Wiring

Burk’s 25’ SENSOR CABLE follows this convention. Several Burk sensors are supplied with female RJ12 connectors. These include the HUMIDITY SENSOR, TEMP-INDOOR and FLOOD DETECTOR. A crossover cable such as Burk’s SENSOR CABLE must be used for these sensors to operate correctly.

The RJ12 Coupler supplied by Burk also has crossover wiring from one connector to the other.

Sensor Cable

RJ12 Coupler

Certain sensors including the Burk MOTION SENSOR, SMOKE DETECTOR, TEMP-STACK, TEMP-OUTDOOR and TEMP-WALLMOUNT come pre-wired with a cable terminated in a male RJ12 connector. These connectors may be plugged directly into the front panel of the Climate Guard. If it becomes necessary to extend the length of one of these cables, care must be taken not to reverse the connector wiring. Non-reversing extension cables can be created by combining a SENSOR CABLE with an RJ12 COUPLER. Since each of these has crossover wiring, they provide a straight-through connection from end to end when connected together.

In other cases, such as the daisy-chain connection of multiple temperature or humidity sensors, a straight-through cable is required. In this type of cable, pin 1 at one end of the cable connects to pin 1 at the far end, pin 2 connects to pin 2, and so forth, as shown below:

Straight-through Wiring

The Burk 25' SENSOR CABLE – DAISY CHAIN and RJ12 SPLITTER each use straight-through wiring.

Sensor Cable – Daisy Chain

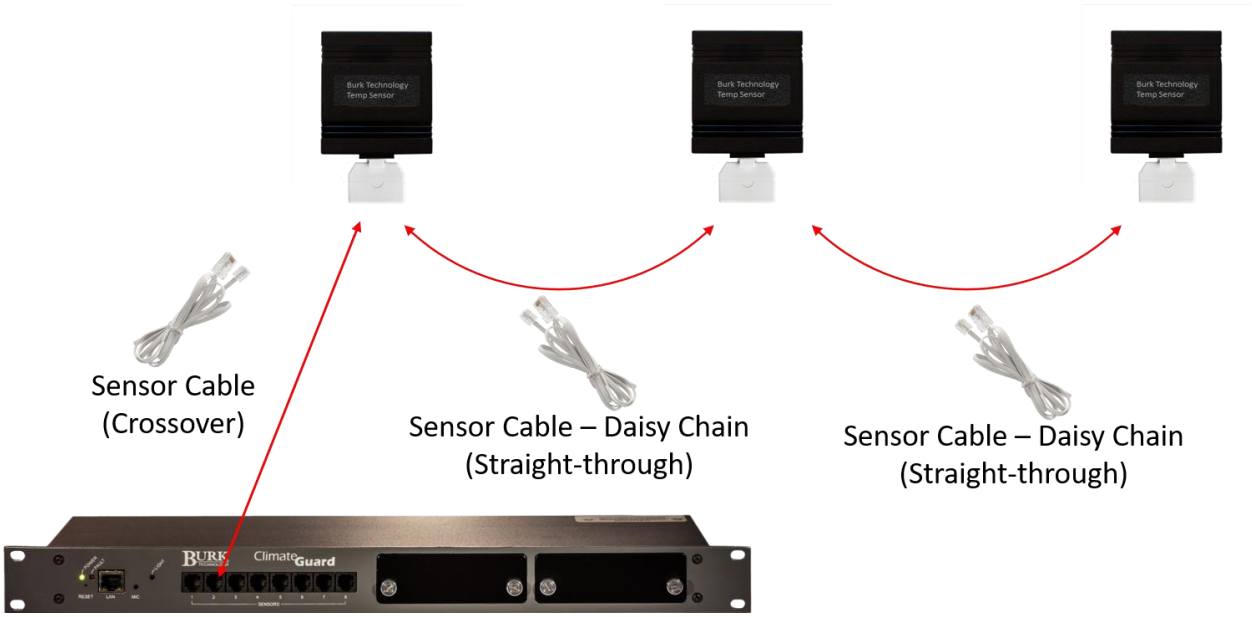
RJ12 Splitter

Daisy-Chain Connection of Digital Sensors

Multiple digital temperature and / or humidity sensors can be connected to a single front-panel sensor input using a daisy-chain arrangement. This can be accomplished by first plugging one RJ12 SPLITTER into each TEMP-INDOOR or HUMIDITY SENSOR as shown below:

Plug one RJ12 Splitter into each Temp-Indoor Sensor

To connect multiple sensors, use a single SENSOR CABLE from the Climate Guard front panel sensor input to the first digital sensor. Then use a SENSOR CABLE – DAISY CHAIN to connect each additional sensor to the daisy-chain as shown in the diagram below.



Daisy-Chain Wiring of Digital Sensors

It is recommended that no more than sixteen digital sensors be combined in a daisy-chain on one sensor input. Count each humidity sensor as two digital sensors because it includes both a humidity and a temperature sensor.

APPENDIX B – TECHNICAL SPECIFICATIONS

Dimensions

1.75” (4.45cm) H
19” (48.26cm) W
5” (12.7cm) D

Operating Temperature

-40 to 50° C

Power Requirements

12VDC, 1A

Ethernet

10/100 full or half duplex

Maximum Sensors

Climate Guard and Plus-X EM64:
64 sensors, including 3 built-in sensors and 16 switch inputs
Climate Guard LT and Plus-X EM32:
32 sensors, including 3 built-in sensors and 8 switch inputs

Expansion Modules (Climate Guard and Plus-x EM64 only)

Up to two expansion modules

Front Panel LEDs

Power, Fault; Ethernet RJ45 LEDs: Link, Activity

Digital Sensor Inputs

8 built-in ports for digital sensors and powered switch inputs

Switch Inputs (Climate Guard and Plus-x EM64 only)

8 switch inputs for contact closures

Built-In Sensors

Temperature, sound, light