



CONTROLLER OPERATION MANUAL

Bluetooth and Ethernet Capable

App Version: 1.26 / Hardware Version 1.46

***** Important *****

PLEASE READ this manual and follow the instructions for safe and satisfactory operation of your system. Keep this manual for future reference. Some information may not apply to all systems.

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1. Introduction

ICEqube's qubeLINK controller is an innovative ethernet and Bluetooth compatible controller that increases functionality and information access, enabling maximum optimization of your ICEqube thermal management system. This controller was designed and developed by ICEqube for the sole purpose of interfacing with ICEqube's thermal management systems. The qubeLINK controller can be interfaced through an App*, Browser Application, and/or the DIP switches located on the board. The App* is iOS and Android compatible. Soon to be available for download on the Apple App and Android store under the name "qubeLINK". Remote monitoring is made seamless through the App and the Browser Application. The qubeLINK controller is IPv4, IPv6, and SNMP capable, see below for the full list of compatible protocols. In addition, this controller can also be used for redundant operation with ICEqube's thermal management systems. Redundant operation allows for two ethernet connected units to share run time, for example two units can be programmed to run at half-day intervals or to switch weekly—the options are endless. Redundant operation also allows for second stage cooling/heating, so if the system experiences peak thermal loads two units can operate simultaneously to increase capacity until the desired climate conditions are achieved. This provides cost savings and increased energy efficiency by not having to constantly run a singular large system. Redundant operation can also increase the reliability and lifespan of the thermal management system.

Compatible Protocols: TCP/IP, Bluetooth, SNMP, Modbus, SMTP, UDP, IPv4, IPv6

2. Manual Structure Explanation

The main section of this manual, App Interface, focuses on interfacing with the qubeLINK controller through the App. The Browser Application has the same settings and functionality as the App. The main difference between the two is layout and button locations, see Addendum B for more information on the Browser Application. Interfacing with the qubeLINK controller through the DIP switches offers the least amount of settings adjustability. However, only through the DIP switches can the Bluetooth be disabled and the software updated, see Addendum C for more details.

This manual defines App as the iOS or Android program used to access the controller settings. In this manual the word click can also mean touch if you are using a touch enabled device. The navigation from one screen to another can be performed by either clicking the icons/buttons or by swiping on the App.

****The App will be for future use and is pending final approval on the respective App stores. For Android devices the APK files are available upon request from ICEqube.***

Note: If service to the unit is required for ethernet connected controllers access to the network may be required. Unless Bluetooth is enabled, access to the DIP switches is provided, or access to the ethernet cable connected to the unit with the unit IP address is provided. The password will need to be provided to change any settings on the Browser Application and App, which can be changed after service.

3 App Interface

This section explains how to interface with the qubeLINK controller through the App.

3.1 App Find Units Screen:


The first screen when opening the App is the Find Units screen. You will want to click the magnifying glass icon  in the bottom right of the Find Units screen to see all the Controller units near you. The default name for all new updated units is called "IceNet". The individual MAC address will be identified under the name of the controller (this example is FC: FA: 3D: A7: 64: AB):






Figure 1

To connect to the controller with the App, select the View button associated with the controller that you want to operate. If you do not find any units, make sure that the controller unit has power connected to it. The controller unit does have a green, red, or flashing blue LED light when power is connected (see Addendum A with more information on what the colors mean). Also, make sure that you are near the unit and that Bluetooth is turned on for the device you are trying to connect from. The range of the Bluetooth signal will vary depending on multiple factors (other signals including Wi-Fi, RF or other Bluetooth devices in the area, how many other applications you are running on your device, and your device functionality (**Note:** Bluetooth version 4.2 or higher is required)).

If you are having power or operation issues with the controller, first verify proper installation of the ICEqube unit was followed, see the unit's manual for more detail.

3.2 App Header:

After selecting a unit, the Header is the same at the top of each screen. The Header information contains the name of the controller, the version number of the firmware and three icons (tabs) showing the three screens that contain information related to your controller unit. The first screen that will appear below the application header information is the Status Screen page with the  icon (see Figure 2). You can see that this is the active screen/tab/page because there is a line under the Status Screen Page icon. The second screen is the Settings Screen.

The Settings Screen page is represented with the  icon. Please see section 3.4 for details on the use and functionality of settings on this screen/tab/page. To select this Settings Screen, please swipe to the left or click and hold on the gear  icon until the page changes to the Settings Screen screen/tab/page.



The Factory Settings screen/tab/page is represented with the  icon. Please see section 3.7 for details on use and functionality of settings on this screen/tab/page. To select the Factory Settings screen, please swipe to the left or click and hold on the tool  icon until the page changes to the Factory Settings screen/tab/page.



Figure 2

3.3 App Status Screen:

The Status Screen is displayed once a unit is selected. It displays the device name, the MAC address of the device, the current temperature reading, whether the unit is cooling/heating/off, the redundancy status, any alarm messages, the number of days before the next recommended filter change, a way to reset the filter timer, and (if equipped) the Ethernet IP Addresses of the controller and the IP address of the last device connected to the controller (if any). The App software version is the last value displayed. The firmware version remains at the top right of the screen in the header information (see Figure 3).

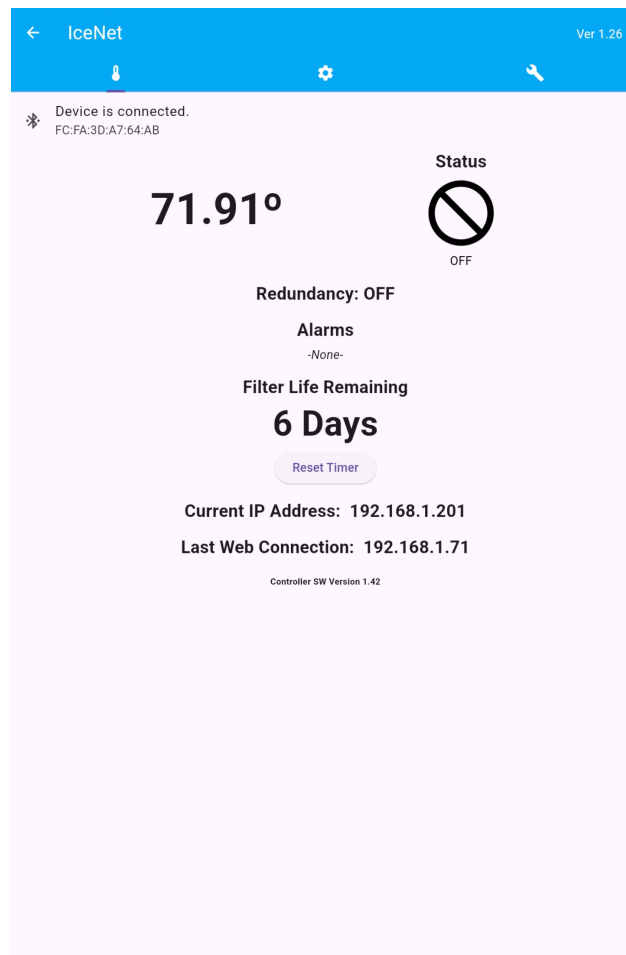



Figure 3

3.4. App Settings Screen:

The App Setting Screen page is where the Main Settings for the controller are adjusted. The icon for settings looks like a gear symbol . For a complete list of the controller range settings see Addendum E.

Note: Please press enter after inputting any alphanumeric values into any of the settings listed on the Settings Screen.

Note: See Addendum E for the full range of adjustability for the settings listed below.

Note: All setting with an asterisk (*) in their name require a reset of the controller.

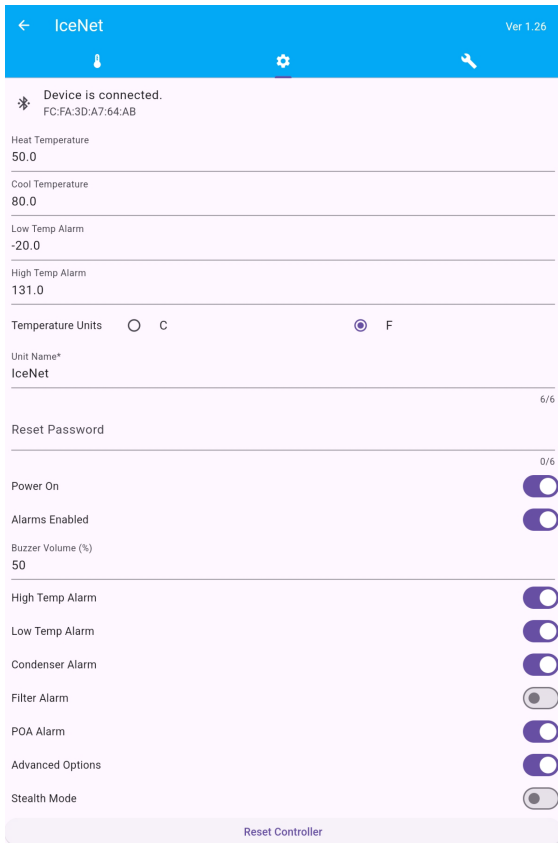


Figure 4

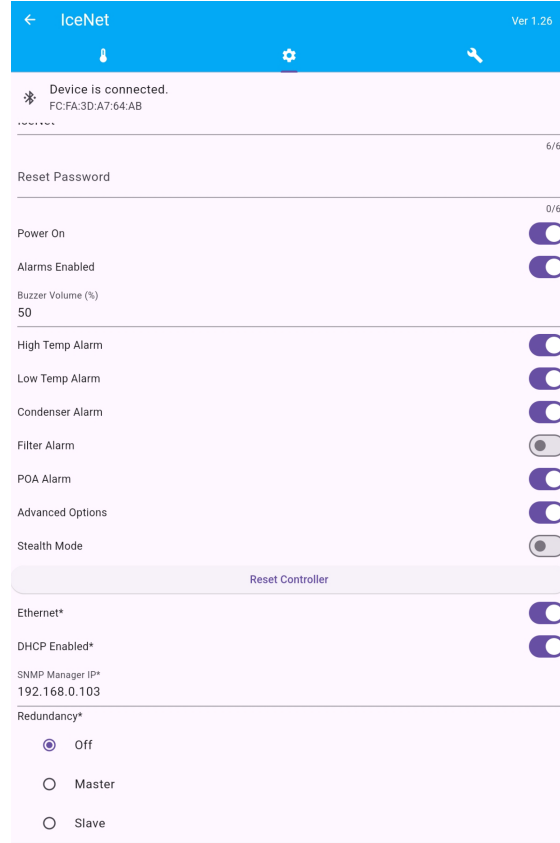


Figure 5

3.5 Main Settings:

Heat Temperature (default of 50.0°F (10°C))—The heating system (if equipped) will begin operation at this temperature and remain operating until the enclosure temperature increases approximately 7°F (4°C). If the unit is not equipped with a heating system this setpoint will still limit the Low Temp Alarm setpoint (see the Low Temp Alarm description).

Cool Temperature (default of 80°F (26.67°C))—The cooling system will begin operation at this temperature and remain operating until the enclosure temperature decreases approximately 7°F (4°C).

Note: There is a dead band programmed into the controller that prevents heating and cooling from operating simultaneously.

Low Temp Alarm (default of -20°F (-28.89°C))—At this temperature the alarm buzzer will activate (if enabled, see below) and the alarm message will display on the Status Screen. The alarm will automatically reset at 2°F (1°C) above this temperature. The Low Temp Alarm can go no higher than 10°F (5.56°C) below the Heat Temperature setpoint to avoid false alarms.

High Temp Alarm (default of 131°F (55°C))—At this temperature the alarm buzzer will activate (if enabled, see below) and the alarm message will display on the Status Screen. The alarm will automatically reset at 2°F (1°C) below this temperature. It is recommended to set the High Temp Alarm to at least 20°F (11.1°C) above the Cool Temperature setpoint to avoid false alarms (when feasible). The High Temp Alarm can go no lower than 10°F (5.56°C) above the Cool Temperature setpoint.

Temperature Units (default of F (C))—This is either “F” for Fahrenheit or “C” for Celsius. Once switching between Fahrenheit and Celsius there is a slight rounding effect. Verify values when in the units desired.

Unit Name* (default of IceNet)—This field has a limit of 6 alphanumeric characters (some special characters, e.g., @,!, \$, and spaces are allowed). After modifying the unit’s name press the Reset Controller Button. After pressing this button, close and restart the App. Once reopened the new unit name should display on the Find Units Screen.

Password (default password is “1234”(no quotes))—This field controls the ability to get into the Settings Screen. This is a required field. To change this password, enter the default password under the Settings Screen (see Figure 6). Then you can change the password where it says Reset Password (See Figure 7). The password has a limit of 13 alphanumeric characters (some special characters, e.g., @,!, \$, and spaces are allowed).



Figure 6

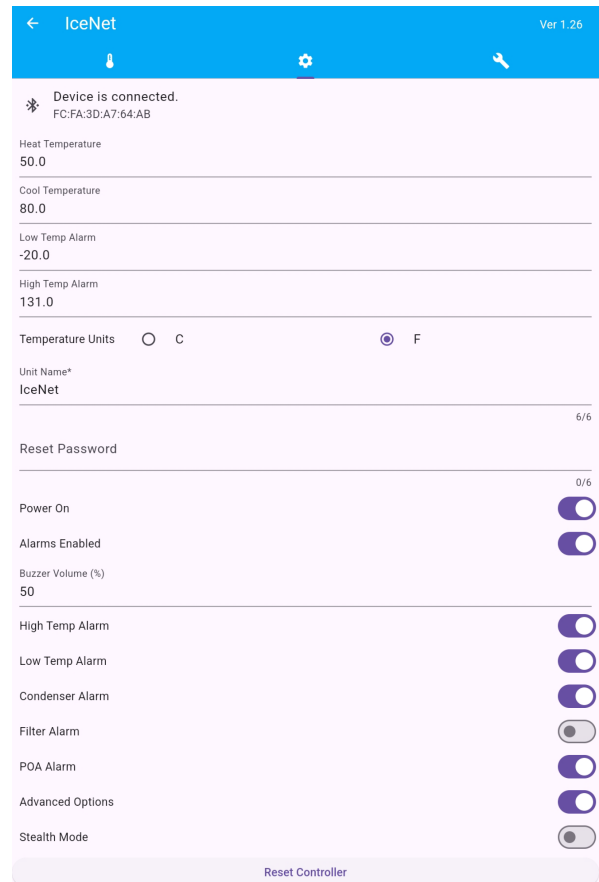


Figure 7

Power On (default of toggled On)—This serves as a manual shutoff. Toggle this to Off to power off the unit. Note that some fans may remain functioning for some time after this setting is toggled off and the crankcase heaters can remain operational.

Caution: This does not replace disconnecting the unit from power during service. (Recommendation: This checkbox is only intended for temporarily turning off the functioning of the unit remotely. If servicing the unit, then power should be disconnected from unit and verified with a multimeter. It is recommended to only use this option if necessary.)

Alarms Enabled (default of toggled On)—When this toggle is On, the alarm messages and the buzzer will sound if appropriate alarms are triggered.

Buzzer volume (default of 50)—This controls the volume level of the buzzer. The valid range is 0 – 99. At a level of 0, the buzzer will not sound. At a level of 99 the buzzer will sound at maximum volume. A value of 100 is outside the range, and the buzzer will not sound at a value of 100.

High Temp Alarm (default of toggled On)—When this toggle is On, the High temp alarm is enabled and the High temp alarm message and buzzer will sound, if enabled.

Low Temp alarm (default of toggled On)—When this toggle is On, the Low temp alarm is enabled and the Low temp alarm message and buzzer will sound, if enabled.

Condenser Alarm (default of toggled On)—If the condenser thermistor sensor reaches the Condenser Alarm setting temperature (default is 170°F (76.67°C)) then this alarm is enabled and the condenser alarm message and buzzer will sound, if toggled On.

Filter Alarm (default of toggled On)—If this is toggled On, then the Filter Alarm Days setting will be enabled and a countdown will be in effect. This toggle makes two alarms visible: the Filter Alarm Days and the Filter Warning Days alarm. A filter alarm message and buzzer will sound at each alarm, if enabled. The alarm can be turned off by clearing the alarm from the Status Screen page, toggling the Filter Alarm to the Off position, or by clicking the Reset Timer button on the Status Screen. The first time the Filter Alarm Days is set to a value other than the default of 0 the alarm will sound; clear the alarm and press the Reset Timer on the Status Screen for the counter to start.

Filter Alarm Days (default of 0 days)—This is the number of days before the filter alarm will sound. Valid values of 0 -180 days. Must be whole numbers. A day is equal to 24 hours. A value of 0 disables the alarm. Only shown when the Filter Alarm is toggled to on.

Filter Warning Days (default of 0 days)—When set to a whole number value representative of days greater than 0 a “Change Filter” and buzzer alarm will sound (if sound is enabled). The value set represents an early warning alarm that will be activated before the Filter Alarm Days alarm is activated. For example, if the Filter Alarm Days is 30 days and the Filter Warning Days is 2 days then this alarm will sound 2 days before 30 days of the last filter change. The alarm can be turned off by clearing the alarm from the Status Screen page, toggling the Filter Alarm to the Off position, or by setting this value to 0. Once the filter alarm warning is cleared, it will not trigger this alarm again until the filter countdown is reset by the Reset Timer button, or the value is set to a lower number other than 0 for this setting. Only shown when the Filter Alarm is toggled to on and the Filter Alarm Days is set to a value greater than 0.

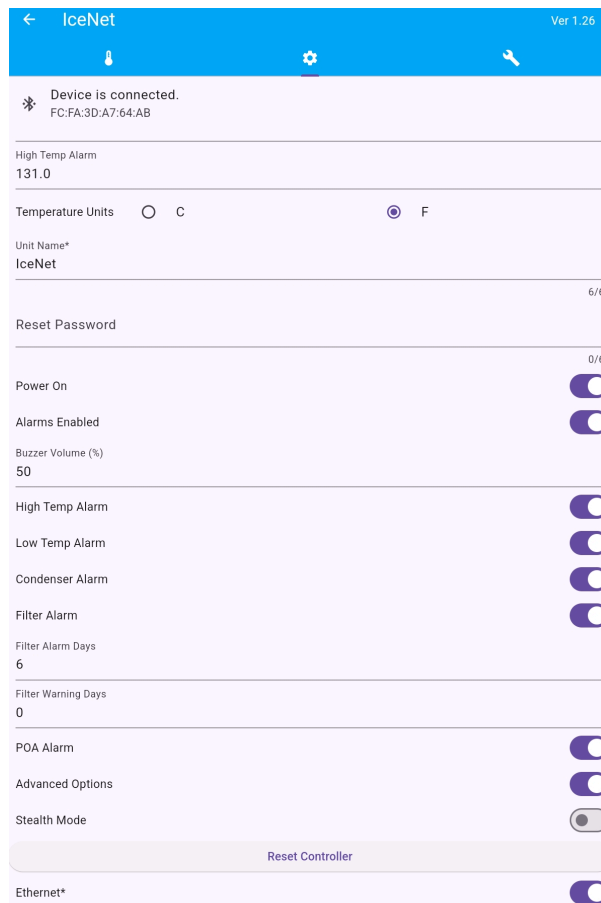


Figure 8

Note: The required number of days to set this alarm will be determined by the ambient air conditions. If rain or wash down hoods are installed on the system, no filter is supplied, and the filter alarm should be set to 0.

POA Alarm (default of toggled Off)—When the Power Off Alarm (POA) toggle is On, the POA alarm is enabled and the POA alarm message and buzzer will sound, if enabled. This is triggered when someone manually turns off the unit or toggles the Power On toggle to the Off position. This alarm can be turned off by clearing the alarm from the Status Screen page or by toggling the POA Alarm to the Off position. If the Power On toggle is turned back On, this alarm still needs to be cleared to stop the alarm message.

Advanced Options (default of toggled On)—When this is Toggled Off, you will not be able to see the advanced options or change any advanced settings.

Note: Any alarm message will also make the LED light turn to red unless the Stealth mode (see advanced settings) is set to On, in which case, no lights will be displayed. See Addendum A to learn more about the LED light color meanings.

3.6 App Settings Advanced Options:

The information below is displayed in the App when the Advanced Options toggle is selected on the Settings Screen.

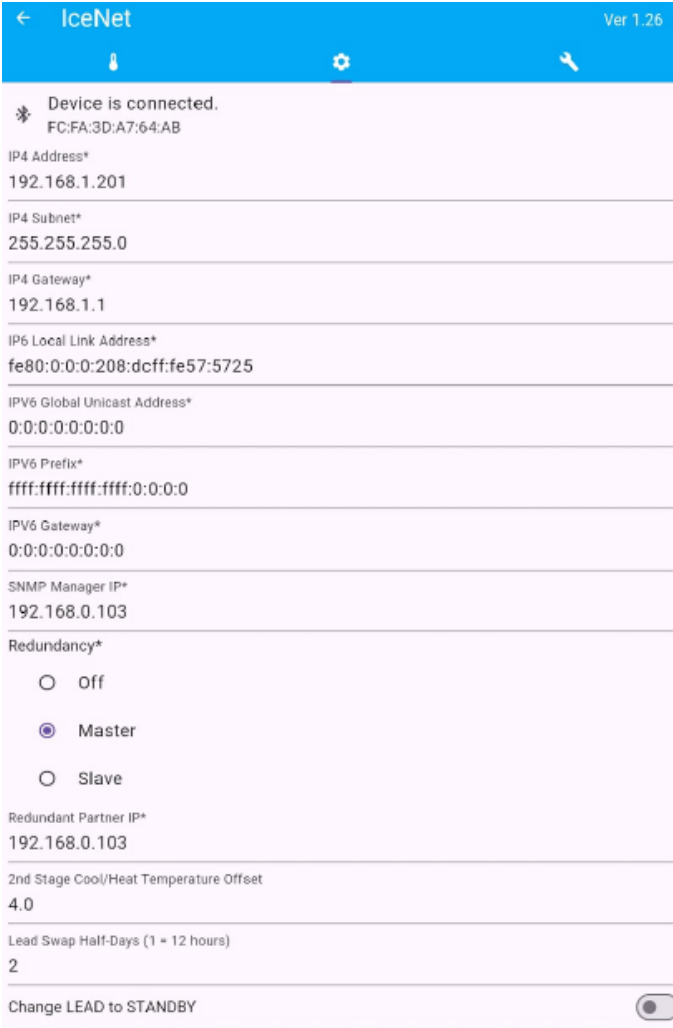


Figure 9

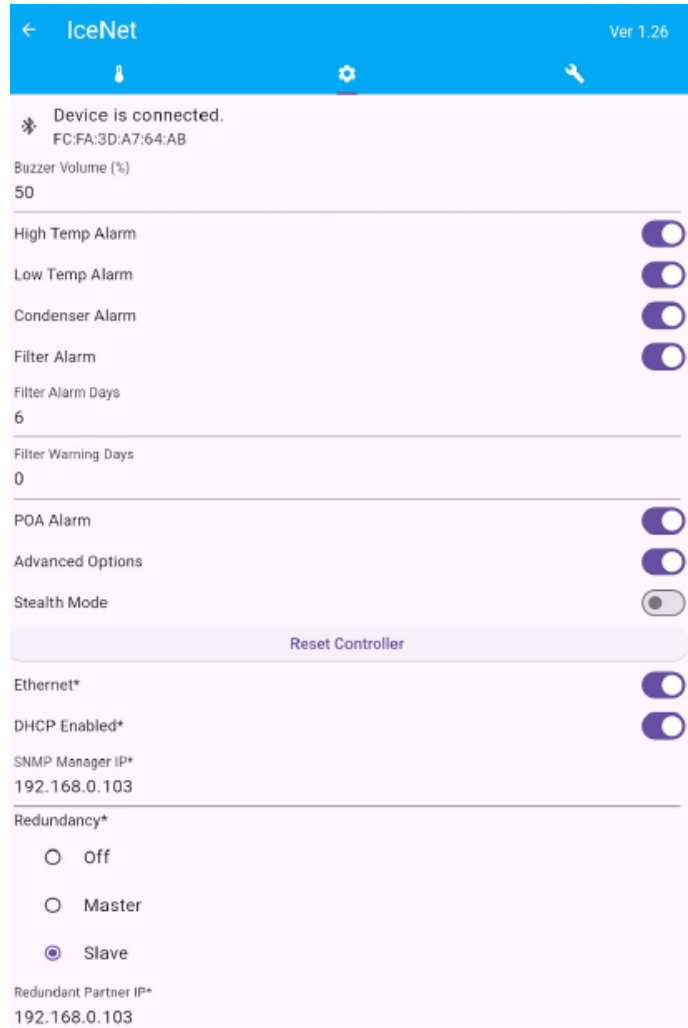


Figure 10

Reset Controller (Button)—This should be clicked when any network or advanced settings are changed (all settings with an asterisk indicate a reset is required). After clicking this button, the unit will restart and power cycle. The unit should shut off and return to power taking multiple seconds (can take upwards of 20 seconds).

Stealth Mode (default of toggled Off)—When toggled On, no buzzer will sound or LED lights will display except the blinking blue light will occur when a Bluetooth device is connected to the controller and within range of the controller. Once the Bluetooth connected device goes out of range of the controller, the LED blinking, blue light will turn off.

Ethernet* (default toggle of On)—This toggle enables or disables ethernet activity. When this is Off, the unit cannot be connected through an ethernet IP address or through ethernet connectivity. Only use these features when you have a working knowledge of networks, and/or SNMP (see addendum D), and/or redundant functionality, otherwise you could lose connectivity or functionality of the controller. (Please note - the SNMP functionality and redundant functionality will not be enabled unless this toggle is set to On. Also, changes to the IP address settings require a power cycle to the unit before the complete implementation of the change. The Ethernet toggle is only available in the App or through the DIP switch setting (see Addendum C); it is not available on the Browser Application or through the SNMP settings.)

DHCP Enabled* (default of toggled Off)—When toggled On, this allows your network DHCP server to assign an IP address from available IP addresses on your network, if equipped. Only use these features when you have a working knowledge of networks, otherwise you could lose connectivity to your controller. If you are having problems identifying the IP address of the controller, you can use any Advanced IP Scanner tool or software to verify the IP address. Please contact your network administrator or IT advisor for help with identifying the IP address (see MAC and IP defaults below).

IP4 Address* (default of 192.168.1.201)—This is only active if the DHCP Enabled toggle is toggled Off. This allows the user to set the specific IP address of the controller. It is recommended to reserve an IP address for each controller if using a static IP address.

IP4 Subnet* (default of 255.255.255.0)—This is only active if DHCP Enabled is toggled Off. This allows the user to set the specific IP subnet address of the controller.

IP4 Gateway* (default of 192.168.1.1)—This is only active if DHCP Enabled is toggled Off. This allows the user to set the specific IP Gateway address for the controller.

IP6 Local Link Address* (default fe80:0:0:0:208:dfff:fe57:5725)—This is only active if DHCP Enabled is toggled Off. Do not modify unless you are connecting the qubeLINK controller to an IPv6 network.

IP6 Global Unicast Address* (default 0:0:0:0:0:0:0:0)—This is only active if DHCP Enabled is toggled Off. Do not modify unless you are connecting the qubeLINK controller to an IPv6 network.

IPv6 Prefix* (ffff:ffff:ffff:ffff:0:0:0:0)—This is only active if DHCP Enabled is toggled Off. Do not modify unless you are connecting the qubeLINK controller to an IPv6 network.

IPv6 Gateway* (0:0:0:0:0:0:0:0)—This is only active if DHCP Enabled is toggled Off. Do not modify unless you are connecting the qubeLINK controller to an IPv6 network.

SNMP Manager IP* (default of 192.168.0.103)—This is only active if DHCP Enabled is toggled Off. This allows the user to set the specific SNMP Manager IP address for the controller. This is only used with SNMP trap configuration. See Addendum D for additional information on the SNMP functionality.

Redundancy* (values of Off, Master, or Slave – Default is Off)—If this value is Off, then this unit behaves independently to any other unit(s). If toggled to Master, then this controller is intended to be used with another controller in redundant mode. The Master controller (initially the Standby) is the primary controller, and settings (like setpoint and redundancy offset) will be communicated to the Slave (initially Lead) controller. The controller set to Master controls the current running unit and will control the settings on the Slave unit (identified below through the “Redundant Partner IP”). This unit will continue to run based on its setpoints until either the number of Lead Swap Half-Days is reached, or the Make Slave Lead option is selected on this controller. Some settings can only be changed from the Master controller. If Redundancy is toggled to Slave, this unit will only run if the setpoint temperature reaches the high or low setpoint plus/minus the 2nd Stage Cool/Heat Temperature Offset, the Change LEAD to STANDBY option is selected and either the high or low setpoint is reached with all-time delays satisfied (see Factory Settings screen for time delays), or if the number of Lead Swap Half-Days is reached and the setpoints are triggered.

Note: Redundancy status of LEAD—means this is the current unit that responds to the setpoints not including any offsets. The STANDBY controller uses the high or low setpoint plus/minus the 2nd Stage Cool/Heat Temperature offset to determine when to cool or heat. The Lead and Standby will change based on a countdown of half days from the Lead Swap Half-Days setting (see below). The Lead and Standby can also be changed by using the Change LEAD to STANDBY toggle.

Note: Redundancy status is either: OFF, LEAD, STANDBY, COMMS LOSS (COMMS LOSS registers if a partner unit does not respond within a two minute window. The COMMS LOSS message may occur temporarily if one unit is turned off, the units are on a different network or sub-network, ethernet settings are updated without a power cycle of the unit, or a non-response communication issue occurs after two minutes. If the Standby unit does not receive a response back from the lead unit after the two minute window, it may display a COMMS LOSS message - but it will function as the Lead and continue to function in this situation).

Redundancy Partner IP* (default of 192.168.0.103)—This is only active if the DHCP enabled is toggled Off. This allows the user to set the specific Redundant Partner IP address for the controller. To use redundant mode, this must be set to the partner IP address of the associated redundant controller.

2nd Stage Cool/Heat Temperature Offset (default of 4°F(2.22°C))—This sets the offset at which the Redundant Partner unit will either cool or heat based on the setpoint of the Master unit. Must be whole numbers.

Lead Swap Half-Days (1=12 hours) (default of 2 half-days (24 hours))—This sets the number of half-days (1 half-day increment = 12 hours) to which the Lead and Standby will switch. When this time countdown is reached, the unit that was marked as the Lead will become the Standby and the unit that was marked as Standby will become the Lead. The countdown will then start over again. This value must be whole numbers. Note: On the very first changeover between the Lead and Standby unit the timer can be up to 0-59 minutes off from the Lead Swap Half-Days setting. This is due to the timer needing to set a reference in which every other changeover can be referenced from. All other changeovers after this initial one will be exactly what the Lead Swap Half-Days value is set to

Change LEAD to STANDBY (default toggle of Off)—This allows the Lead and Standby units to swap, the unit that was marked as the Lead will become the Standby and the unit that was marked as Standby will become the Lead.

Note: Time from the previous Lead unit from the Lead Swap Half-Days setting will not reset, so if the swap was to occur in 1 more hour, then that swap based on the Lead Swap Half-Days will still occur.

3.7 Factory Settings Screen:

The Factory Setting Screen is only available for special circumstances. Please call ICEqube to request a password to modify the settings on this screen. The settings should rarely be changed. It is not recommended to adjust these settings. The longevity and reliability of the unit can be impacted by modifying these settings.

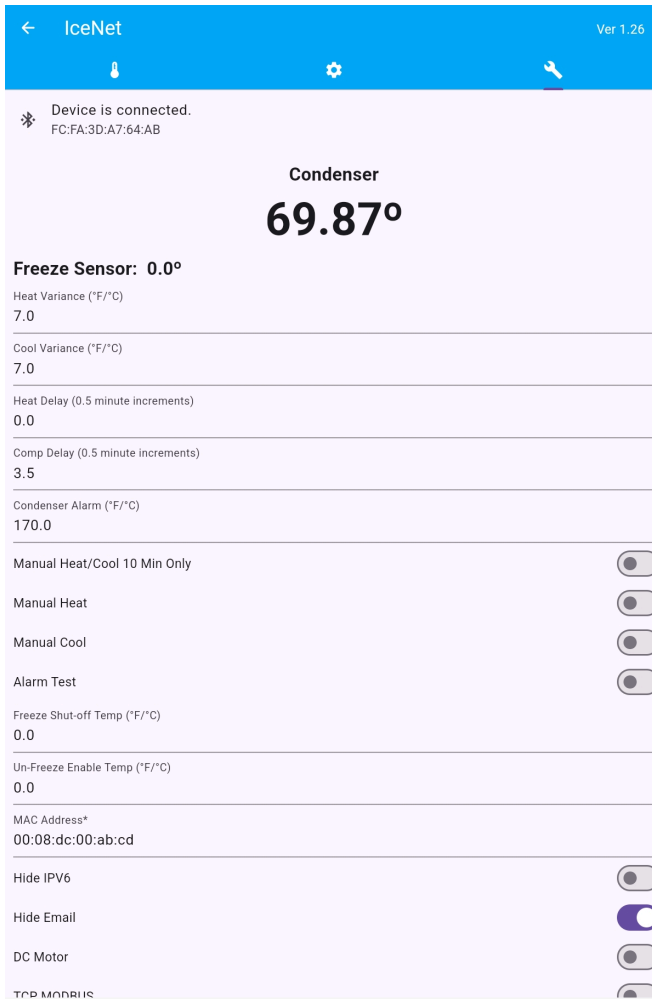


Figure 11

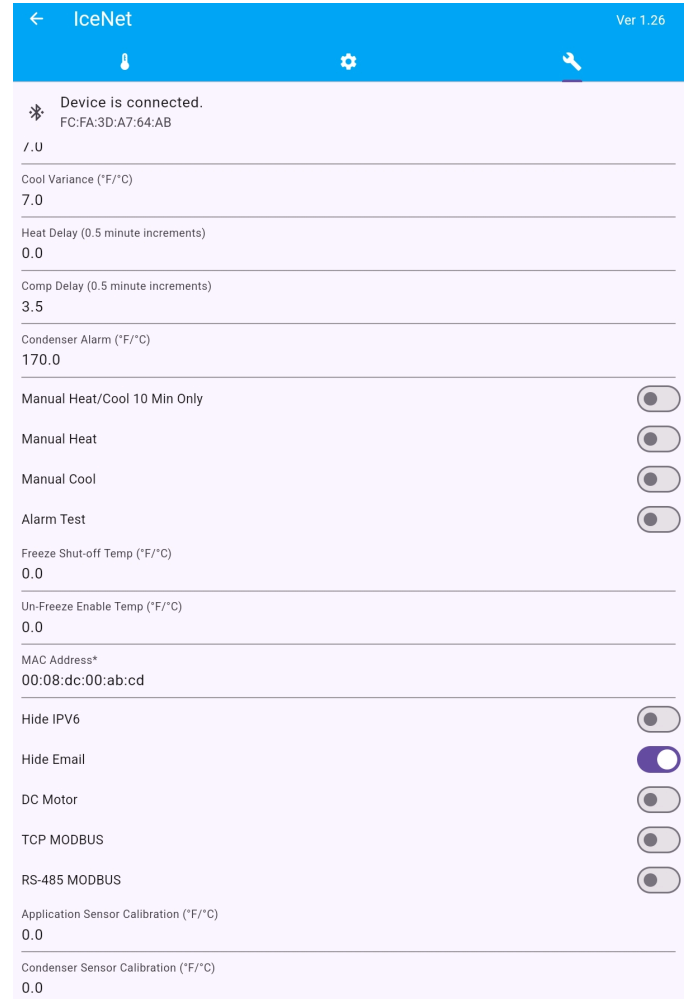


Figure 12

Manual Heat/Cool 10 Min Only (default toggle of On)—If the Manual Heat or Manual Cool are enabled this setting will allow the unit to manually heat or cool for 10 minutes. This serves as an automatic shutoff to protect the unit from continuously running in manual mode.

Manual Heat (default toggle of Off)—If this is toggled to On, the unit will enter heat mode. All setpoint settings will be overridden. The unit will continuously run until toggled Off or if the Manual Heat/Cool 10 Min Only setting is toggled to On, in which cause the unit will return to normal operation(setpoints) after 10 minutes.

Manual Cool (default toggle of Off)— If this is toggled to On, the unit will enter cool mode. All setpoint settings will be overridden. The unit will continuously run until toggled Off or if the Manual Heat/Cool 10 Min Only setting is toggled to On, in which case the unit will return to normal operation(setpoints) after 10 minutes.

Heat Variance (°F/° C) (default of 7°F (3.89°C))—This is the temperature the unit will need to reach beyond the Heat Temperature setpoint before the heater will turn off.

Cool Variance (°F/° C) (default of 7°F (3.89°C))—This is the temperature the unit will need to cool below the Cool Temperature setpoint before the unit will stop cooling. Short cycling and coil freeze ups can occur by varying these values—effecting unit operation and lifespan.

Heat Delay (0.5 minute increments) (default of 0.0 minutes)—When the Heat Temperature setpoint is reached this is the amount of time before the heater will begin operation. The range of adjustability is 0.0 to 10 minutes (0.5 minute increments).

Comp Delay (0.5 minute increments) (default of 3.5, 5, or 7 minutes*)—This is the amount of time before the cooling operation will commence after reaching the cool setpoint. This is a safeguard to prevent damage to the unit. It is strongly recommended to not adjust this setting. The range of adjustability is 0.0 to 10 minutes (0.5 minute increments).

Condenser Alarm (°F/° C) (default is 170°F (76.67°C))—If the internal temperature reading of the unit reaches this temperature setting, then the unit will shut down and an alarm with message will register.

Freeze Shut-off Temp (°F/° C) (default off which is 0.0°F)—Used with special temperature sensor if sensor reading reaches this point, it will shut off cooling until it reaches the Un-Freeze Enable Temp (see below).

Unfreeze Enable Temp (°F/° C) (default off which is 0.0°F)—Used with special temperature sensor if Freeze Shut-off Temp is reached, then Cooling will stop until this setting temperature is reached. Example: if the Freeze shut-off is set to 33°F, then this might be set to 50°F so the unit/coils have time to warm back up to help avoid freezing of the unit.

MAC Address* (default of unique MAC Address for each controller)—This is the Mac Address of the unit. This Mac Address can be used with network settings to identify your device on your network or to uniquely identify your device.

Hide IPV6 Toggle (default is Off)— If IPv6 is not needed, this toggle can be turned on. These settings are only used if the controller is connected to a network requiring IPv6 access.

Hide email (default is On)—If the email function is requested, this toggle can be turned off to reveal the email configuration tab on the browser/GUI screen only.

DC Motor Toggle (default Off)—For future use - currently not used.

TCP MODBUS (default is Off)—For future use - currently not used.

RS-485 MODBUS (default is Off)—For future use - currently not used. When toggled On, the Baud Rate, Parity, Stop Bits, and Slave Address configuration need setup.

Enclosure Sensor Calibration (default varies)—This allows for a temperature sensor adjustment if the enclosure thermistor sensor is reading an incorrect temperature. There is no limit of adjustability.

Condenser Sensor Calibration (default varies)—This allows for a temperature sensor adjustment if the condenser thermistor sensor is reading an incorrect temperature. There is no limit of adjustability.

Addendum A:

LED Light Explanation

Solid green—A solid green light means the unit is powered on and not connected by Bluetooth to any device.

Blinking Blue—A steady blinking blue light means the unit is powered on and is connected to a Bluetooth device.

Red light—A solid red light means there is an alarm or filter needs changed (see settings above to see how to clear the alarm or change the settings to stop the alarm from occurring).

No light—There is either no power to the unit, the unit is in Stealth mode (see advanced settings above), or the unit is in bootloader mode and the firmware is not currently being updated. (See note below for description of bootloader mode)

Note: A slow blinking blue light means the unit is in bootloader mode, which is the mode that is ready for a firmware update. This would be when DIP switch #8 on the controller board is in the “ON” position and the device is either powered on or connected with power through the Micro USB port. A quickly blinking blue light means that the unit is receiving a firmware update (this would only occur if the unit was connected through the Micro USB port and connected to a device capable of performing the firmware update).

Addendum B:

Browser Application

The Browser Application has the same settings and functionality as the App. The main difference between the two is layout and the button locations may differ. This addendum clarifies these minor differences and illustrates the various screens within the Browser Application.

The Microsoft Edge browser is recommended, but Google Chrome and other browsers can be used. Once connected to a browser, the controller needs to be connected to the same network as the connecting device (laptop, computer, etc.) with an RJ45 cable. The IP address of the controller is required. There is a default value for the controller IP of (192.168.1.201). The sample IP address below is 192.168.1.201 (see the top left of Figure 13). The default password is "1234" will be required to change and save settings. See Figure 13 for all the tabs available from this screen. There are tabs for Status, Controls, Set Alarms, Ethernet, Email Settings(must be enabled to be displayed), and Factory Settings.

Note: All setting with an asterisk (*) in their name require a reset of the controller.

Status Tab:

The Status Tab is the first screen that is shown once the Browser Application is loaded. Only the Filter Reset Button (underlined in blue in Figure 13) and clearing of alarms is adjustable from this screen. All other display information on this screen is view only. See section 3.3 for more details.

Clicking a red "X" on this page will clear the alarm and stop an audible sound (if equipped) for that specific alarm. Figure 13 shows an example of the Sensor Alarms that would be activated if the sensor line lost continuity.

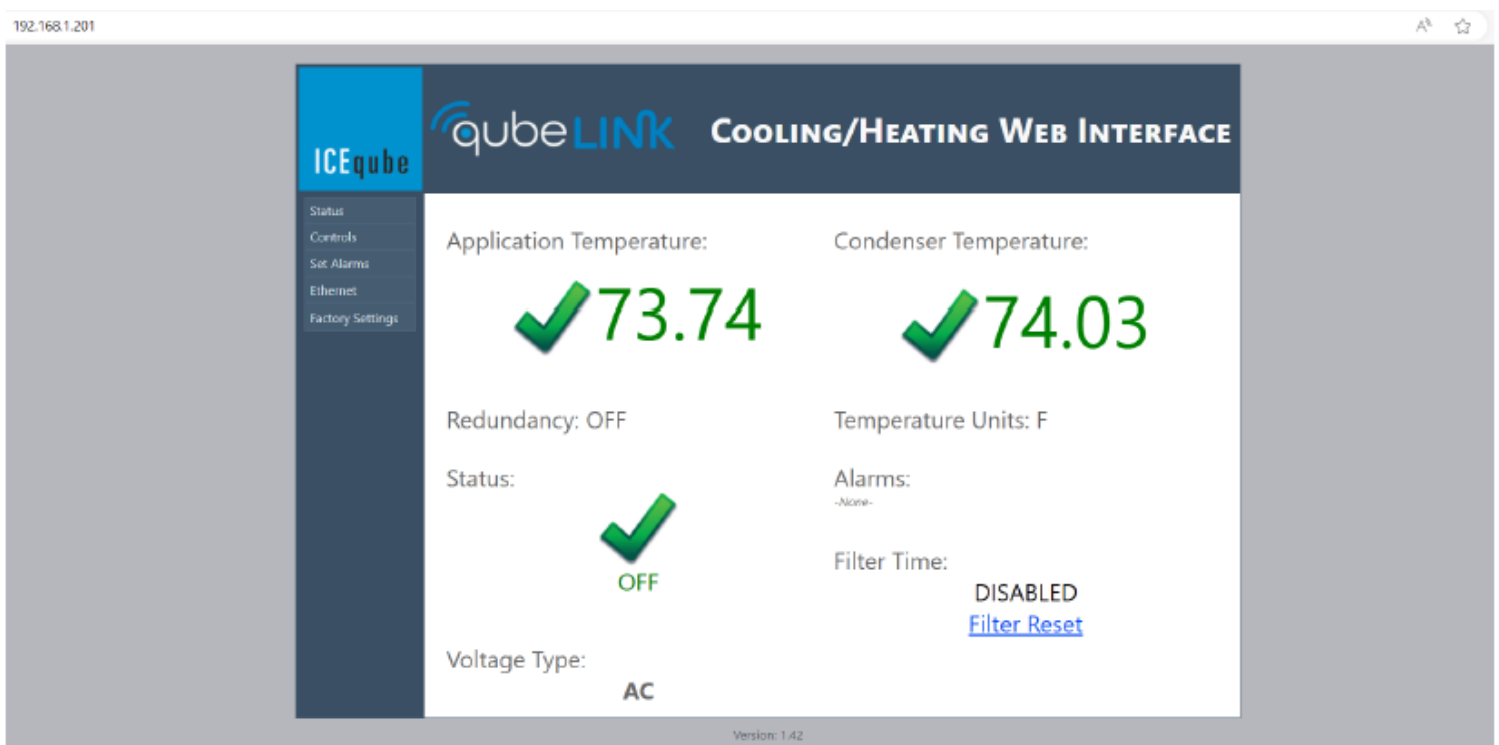


Figure 13

192.168.1.201/index.html

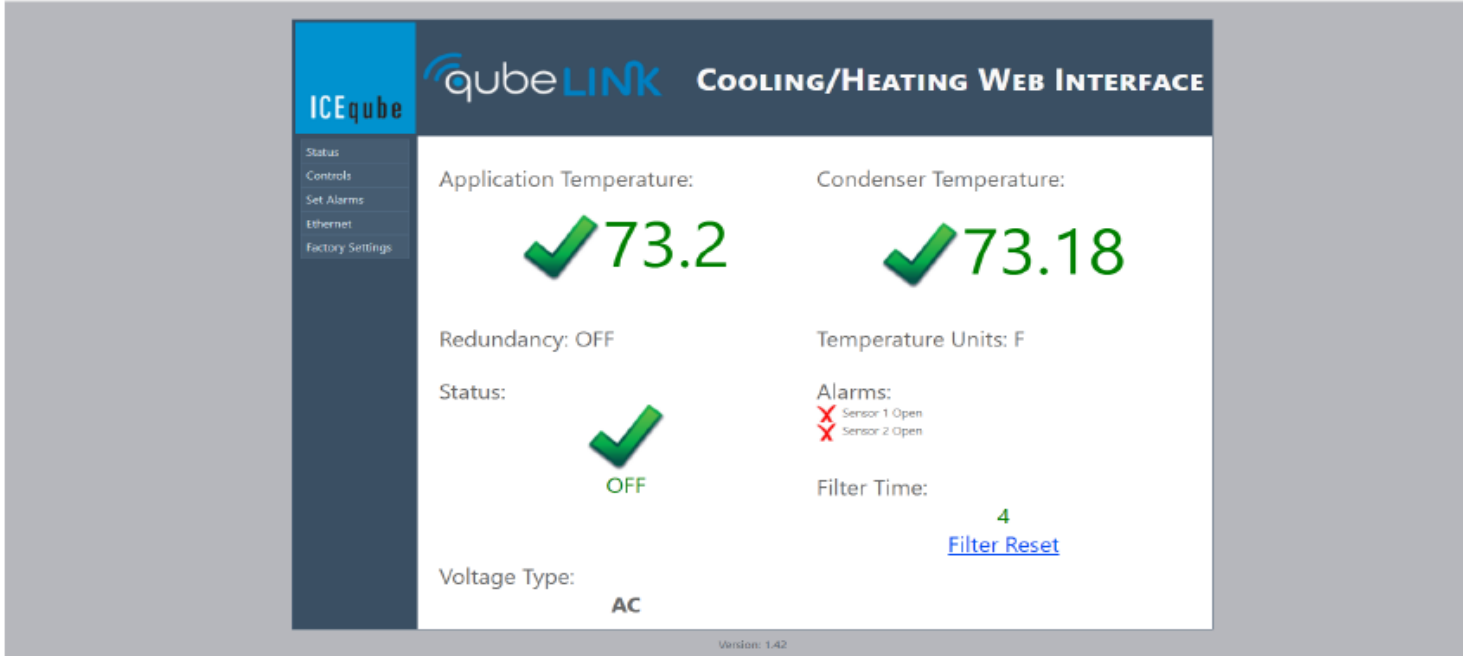


Figure 14

Controls Tab:

A detailed explanation for each setting on this tab can be found in sections 3.4 and 3.5. Once a value is changed, the current password must be entered in that field and the Save button must be clicked for the change to apply.

The New Password field has a limit of 13 alphanumeric characters (some special characters, e.g., @,!, \$, and spaces are allowed). After changing to a new password, the existing password must be entered and the Save button must be clicked for the change to apply.

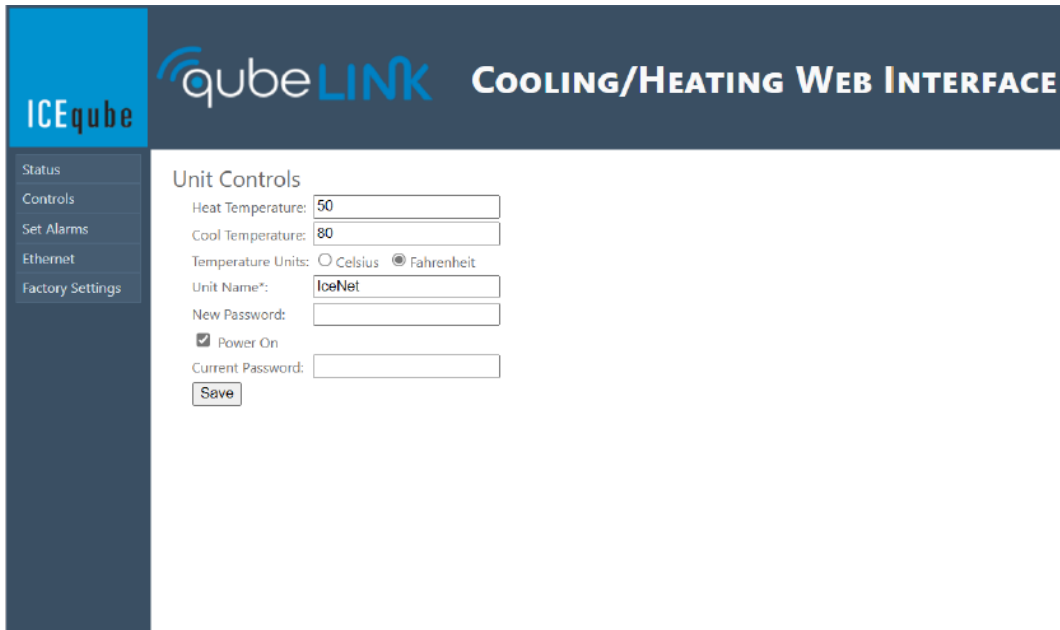
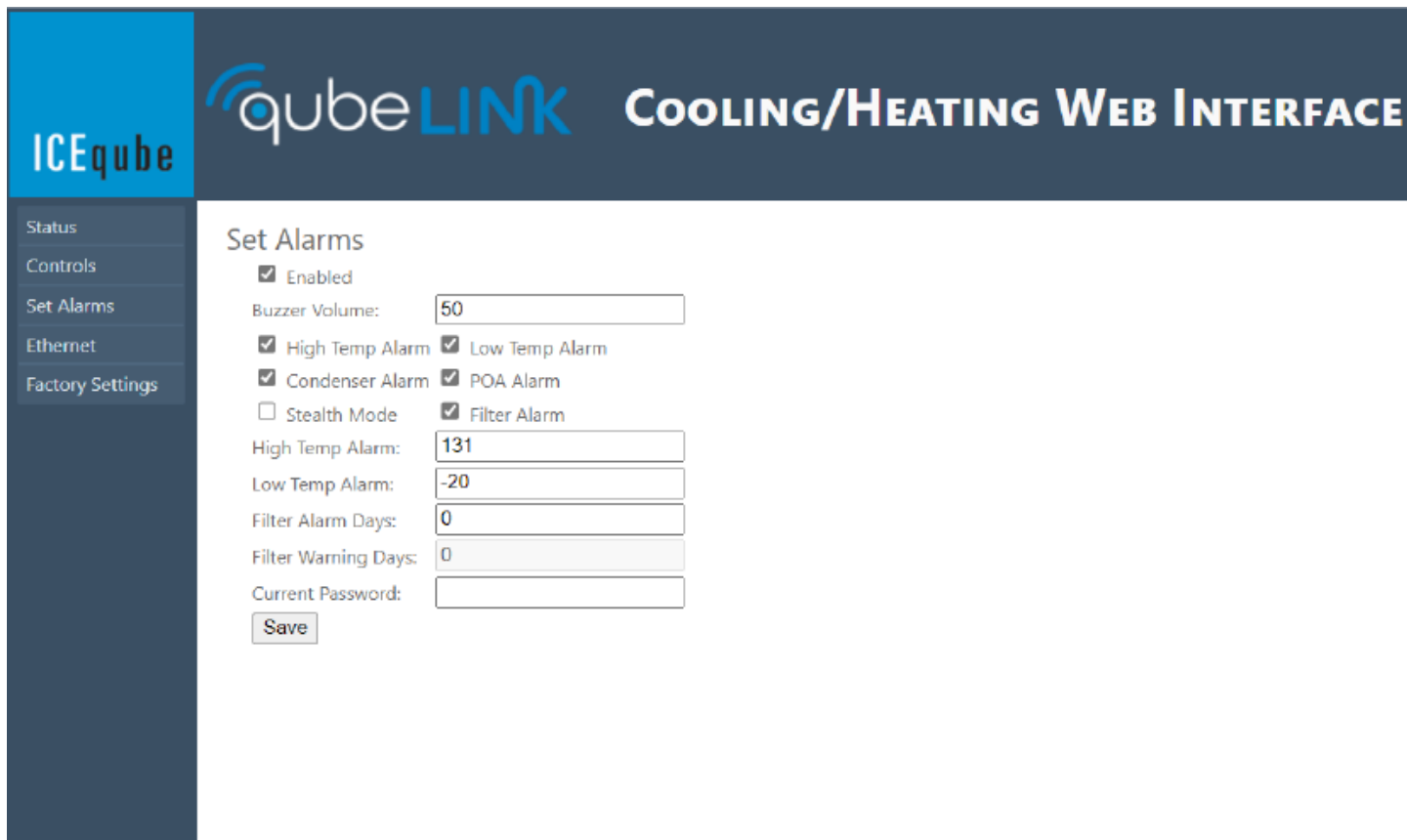


Figure 15

Set Alarms Tab:

A detailed explanation for each setting on this tab can be found in sections 3.4 and 3.5. Once a value is changed, the current password must be entered in that field and the Save button must be clicked for the change to apply.

Note: The Hot Alarm Temp and Cold Alarm Temp are equivalent to Low Temp Alarm and High Temp Alarm on the App. They just have slightly different naming conventions.



The screenshot displays the 'Set Alarms' configuration page within the ICEqube qubeLINK web interface. The interface includes a navigation sidebar on the left with options: Status, Controls, Set Alarms (selected), Ethernet, and Factory Settings. The main content area is titled 'Set Alarms' and contains the following settings:

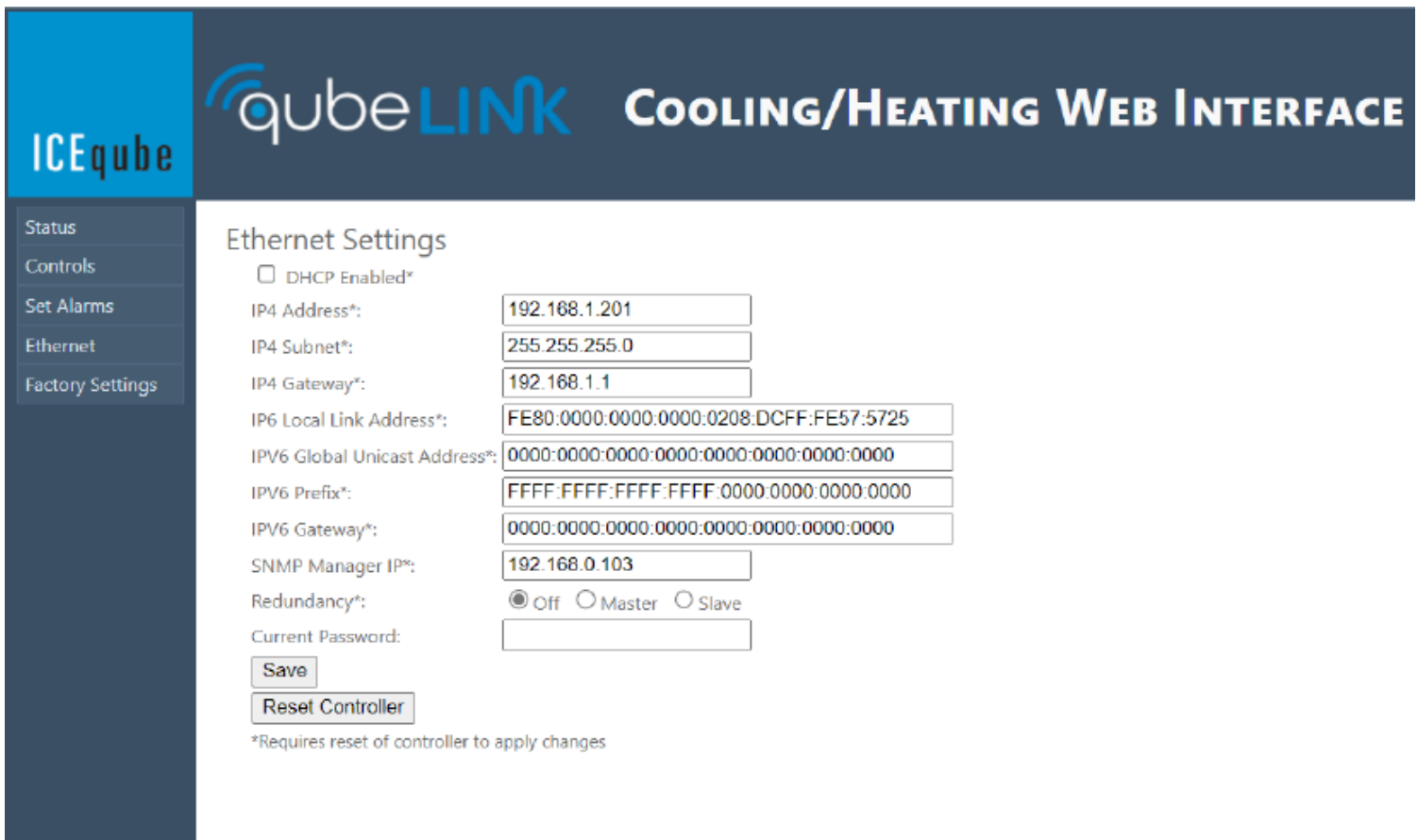
- Enabled
- Buzzer Volume:
- High Temp Alarm
- Low Temp Alarm
- Condenser Alarm
- POA Alarm
- Stealth Mode
- Filter Alarm
- High Temp Alarm:
- Low Temp Alarm:
- Filter Alarm Days:
- Filter Warning Days:
- Current Password:
-

Figure 16

Note: If the Filter Alarm Days tile is set to 0 then the Filter Warning Days will be set to 0. The Filter Alarm Days must be set to a value greater than 0 and saved before the Filter Warning Days can be inputted. The first time the Filter Alarm Days is set to a value other than the default of 0 the alarm will sound; clear the alarm and click the Filter Reset tile on the Status Tab for the counter to start.

Ethernet Tab:

A detailed explanation for each setting on this tab can be found on section 3.5 and 3.6. Once a value is changed, the current password must be entered in that field and the Save button must be clicked for the change to apply. Changes to this screen involving the IP address require a power cycle to the unit before the complete implementation of the change. Modifying the Ethernet Settings requires some knowledge of networks. If you have a Network Administrator or IT specialist, you may want to consult with them before making changes to these settings. The explanation of networks and related topics are outside the scope of this guide.



ICEqube **qubeLINK** COOLING/HEATING WEB INTERFACE

Ethernet Settings

DHCP Enabled*

IP4 Address*:

IP4 Subnet*:

IP4 Gateway*:

IP6 Local Link Address*:

IPV6 Global Unicast Address*:

IPV6 Prefix*:

IPV6 Gateway*:

SNMP Manager IP*:

Redundancy*: Off Master Slave

Current Password:

*Requires reset of controller to apply changes

Figure 17

Note: Redundancy status is either: OFF, LEAD, STANDBY, COMMS LOSS (COMMS LOSS registers if a partner unit does not respond within a two minute window. The COMM LOSS message may occur temporarily if one unit is turned off, the units are on a different network or sub-network, ethernet settings are updated without a power cycle of the unit, or a non-response communication issue occurs after two minutes. If the Standby unit does not receive a response back from the lead unit after the two minute window it may display a COMMS LOSS message – but it will function as the Lead or independent and continue to function in this situation). Some settings in redundant mode will only display on the Master device controller. You will see a message saying: “Slave Unit! Some Settings are hidden and controlled by the Master!”.

Email Settings Tab:

The Email Settings tab is disabled from the factory. Once enabled through the Factory Settings tab the following Email Settings tab is visible (see Figure 18). The Enabled checkbox is defaulted to Off (unchecked), so by default the email functionality is deactivated. If activated, a proper email address, mail server IP and server domain is required to use this function. Relay software for email relay is required to use this functionality. Once a value is changed, the Save button must be clicked for the change to apply. Some default values may be different than displayed. Some additional configuration and knowledge of SMTP processing may be required to use this functionality.

Note: This setting can be unhidden from the App, but only modified through the browser. To enable this setting and to obtain the relay software please contact ICEqube.

The screenshot shows the 'Email Settings' configuration page in the ICEqube web interface. The page title is 'qubeLINK COOLING/HEATING WEB INTERFACE'. On the left, a sidebar lists navigation options: Status, Controls, Set Alarms, Ethernet, Email Settings (highlighted), and Factory Settings. The main content area is titled 'Email Settings' and contains the following elements:

- An unchecked checkbox labeled 'Enabled'.
- A 'Send To:' field with the value 'user1@yourcompany.com'.
- A 'Server IP:' field with the value '65.181.111.250'.
- A 'Server Domain:' field with the value 'roadofyourlife.com/function'.
- A 'Save' button.

Figure 18

Factory Settings Tab:

To modify settings on this tab a factory password is required, in special cases please contact ICEqube for access. A detailed explanation for each setting on this tab can be found on section 3.7. As stated in section 3.7 it is strongly advised not to change these factory settings as this can affect the longevity and reliability of the unit. The DC Motor, TCP MODBUS and RS-485 MODBUS settings are currently not used and for future use. Once a value is changed, the current password must be entered in that field and the Save button must be clicked for the change to apply.

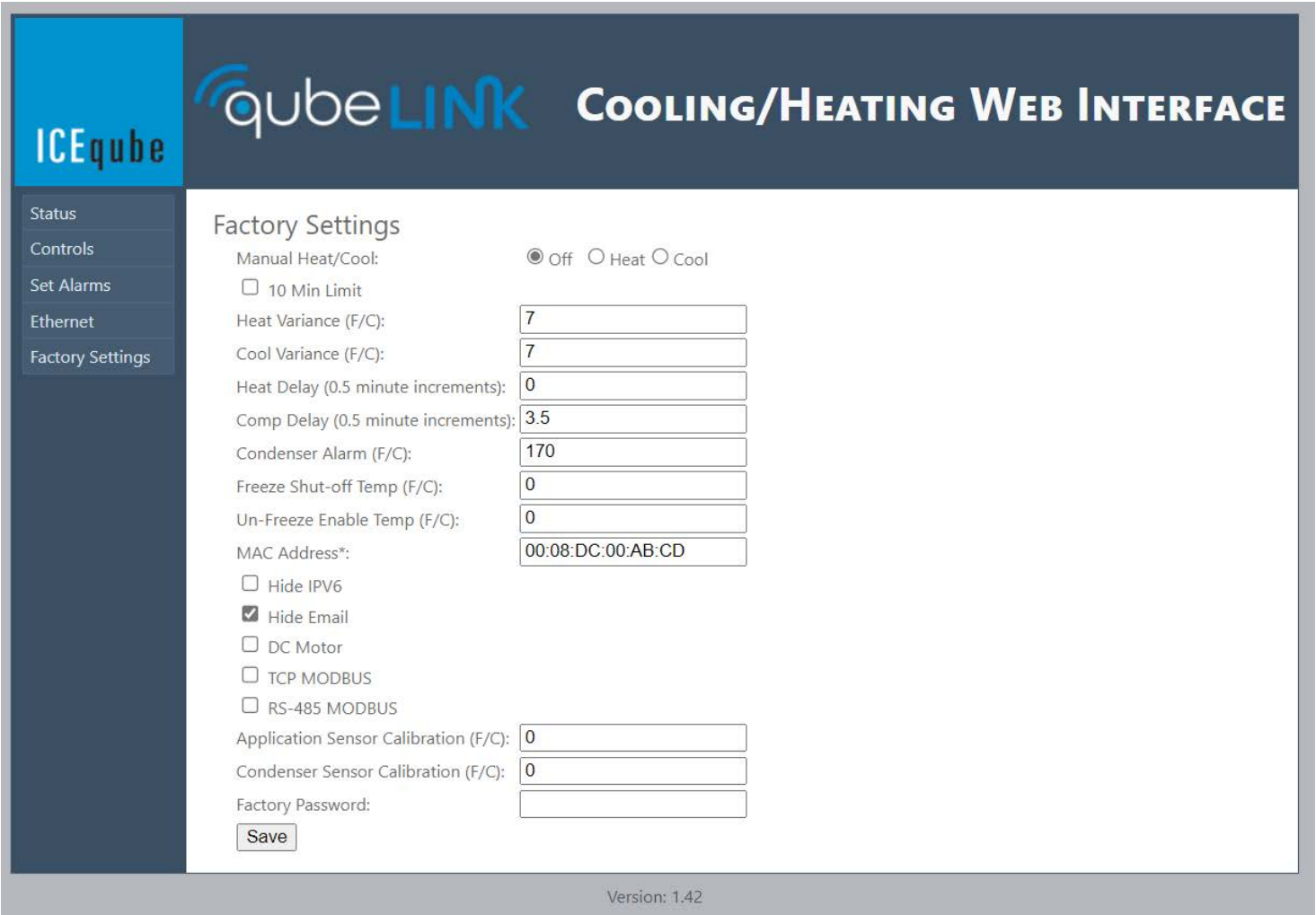


Figure 19

Note: The 10 Min Limit checkbox is equivalent to the Manual Heat/Cool 10 Min Only setting in the App. They just have slightly different naming conventions.

Addendum C:

DIP Switch Functionality

The qubeLINK controller can also be programmed through a set of DIP switches located on the rear of the printed circuit board(PCB). The range of adjustability is limited compared to the Browser Application and the App, see Table 1. If using the DIP switches (SW2-SW-5) to set either the Heat or Cool Temperature setpoints the unit will not automatically switch between heating and cooling. Automatic switching between heating and cooling is only available when programming the qubeLINK controller through the Browser Application and App. Bluetooth functionality can only be turned off through disabling DIP switch SW7, see Table 1. Unless disabling Bluetooth, it is recommended to only use the Browser Application or App to interface with the controller.

Caution: To avoid electrical shock, remove electrical power from the ICEqube system before disassembling the unit or interacting with the DIP switches.

If ordered as a remote mounted controller removal of the screws on the remote, control box cover and screws securing the PCB to the standoffs will be required. If ordered as an internally mounted controller removal of the unit cover, the electrical box cover (only applicable for the EV/EV pro Series), and the screws securing the PCB to the standoffs will be required.

Caution: If removing the unit cover, electrical wires are connected from the cover to base, ensure wires are not pulled or stressed (not applicable for the EV/EV pro Series).

ICEqube will have to perform all firmware updates on the PCB; all firmware updates are backwards compatible. The Browser Application software version is linked to the firmware version of the PCB. The App has its own software that is updated independently through the iOS or Android store. After adjusting the DIP switches to the desired configuration reinstall the PCB back onto the standoffs and all other removed components, being careful not to damage the wiring connecting the cover to the base (if applicable). Electrical power can now be restored to the unit and the adjusted settings will apply.

Note: If any one of SW2-SW5 are switched to On then the settings in the Browser Application and App are overridden. SW2-SW5 must all be switched to Off for the App and Browser Application settings to apply.

Table 1
System Switches

SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	Meaning
On								Alarms ON
Off								Alarms OFF
	Off	Off	Off	Off				All Off - do not use cooling settings from Dipswitch. Control should come from App or browser or screen if so equipped.
	Off	Off	Off	On				Cooling On: 70
	Off	Off	On	Off				Cooling On: 75
	Off	On	Off	Off				Cooling On: 80
	On	On	Off	Off				Cooling On: 85
	Off	Off	On	On				Cooling On: 90
	Off	On	Off	On				Cooling On: 95
	On	Off	Off	Off				Cooling On: 100
	Off	On	On	On				Cooling On: 110
	On	Off	On	On				Cooling On: 115
	On	On	Off	On				Cooling On: 120
	On	Off	Off	On				Heat On: 50 (cooling off - only if heat equipped)
	Off	On	On	Off				Heat On: 55 (cooling off - only if heat equipped)
	On	Off	On	Off				Heat On: 60 (cooling off - only if heat equipped)
	On	On	On	Off				Heat On: 65 (cooling off - only if heat equipped)
	On	On	On	On				Future use in this grouping
					On			Ethernet Enabled- if this dipswitch is in the ON state, the ethernet function is enabled - Default to On
					Off			If in OFF position - ethernet is disabled
						On		Bluetooth ON
						Off		Bluetooth OFF - overrides App, browser program should still work using Network only connection (connection through RJ45 only - which still allows browser screen changes/settings to be changed if so equipped - requires RJ45 LAN cable connection).
							On	Allow for Firmware Update (LCD will slowly flash blue and quickly flash when updating firmware)
							Off	

Addendum D:

SNMP Settings and Functions

There are multiple ways, using many different software programs and applications, to read and write values to the qubeLINK controller. This addendum will focus on what SNMP values you can read, write, and the information related to the definition of the SNMP values for the controller. The use and setup of any specific SNMP software is beyond the scope of this manual.

(Note: Integer values for temperatures are stored as value/100 to get a full 2 decimal places and are stored in Fahrenheit):

Table 2

SNMP Name/OID	SNMP Description	(R)EAD / (W)RITE	SNMP Sample Value
sysDescr.0	System Description	R	Value (OctetString): Ice Qube Controller SNMP
sysObjectID.0	System Object ID	R	Value (OID): sysObjectID.0
sysUpTime.0	System Up-time	R	Value (TimeTicks): 26 hours 44 minutes 40 seconds (9628000)
sysContact.0	System Contact Info	R	Value (OctetString): http://www.iceqube.com
sysName.0	System Name	R/W	Value (OctetString): Ice151
sysLocation.0	System Location	R	Value (OctetString): Greensburg, PA, USA
sysServices.0	System Services	R	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.1.0	"Is cooling installed? 1 for yes, 0 for no."	R	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.2.0	"Manual Cooling Enabled, 1 for yes, 0 for no."	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.3.0	"Cooling On, 2 for wait, 1 for yes, 0 for no."	R	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.4.0	"Is heating installed, 1 for yes, 0 for no."	R	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.5.0	"Manual Heating Enabled, 1 for yes, 0 for no."	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.6.0	"Heating On, 2 for wait, 1 for yes, 0 for no."	R	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.7.0	"Hot Alarm Enable, 1 for yes, 0 for no."	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.8.0	"Hot Limit"	R/W	Value (Integer): 13100
.1.3.6.1.4.1.91.2.1.9.0	"Cold Alarm Enable, 1 for yes, 0 for no."	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.10.0	"Cold Limit"	R/W	Value (Integer): -2000
.1.3.6.1.4.1.91.2.1.11.0	"Condenser Alarm Enable, 1 for yes, 0 for no."	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.12.0	"Condenser Alarm Temperature"	R/W	Value (Integer): 17000
.1.3.6.1.4.1.91.2.1.13.0	"Filter Alarm, 1 for yes, 0 for no."	R/W	Value (Integer): 1

SNMP Name/OID	SNMP Description	(R)EAD / (W)RITE	SNMP Sample Value
.1.3.6.1.4.1.91.2.1.14.0	"Filter Limit, in days"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.15.0	"Audible Alarm, 0-100%"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.16.0	"Alarm Output, 1 for yes, 0 for no"	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.17.0	"Temperature Units, F=Fahrenheit, C=Celsius"	R/W	Value (OctetString): F
.1.3.6.1.4.1.91.2.1.18.0	"The temperature reading from the controller including units."	R	Value (OctetString): 71.45F
.1.3.6.1.4.1.91.2.1.19.0	"Redundant Enabled, 1 for master, 2 for slave, 0 for no"	R/W	Value (Integer): 2
.1.3.6.1.4.1.91.2.1.20.0	"Redundant Mode, 1 = Slave is Lead, 0 = Master is Lead"	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.21.0	"Redundant Changeover Basis, 1=clock time(half days), 0=Filter time accumulated while in Lead"	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.22.0	"Cabinet Name"	R/W	Value (OctetString): IceCab
.1.3.6.1.4.1.91.2.1.25.0	"Redundant Changeover Time"	R/W	Value (Integer): 2
.1.3.6.1.4.1.91.2.1.27.0	"Controller Cool Setpoint"	R/W	Value (Integer): 8000
.1.3.6.1.4.1.91.2.1.28.0	"Controller Heat Setpoint"	R/W	Value (Integer): 5170
.1.3.6.1.4.1.91.2.1.29.0	"Alarm flag bits"	R	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.30.0	"The temperature reading for the condenser including units."	R	Value (OctetString): 70.4F
.1.3.6.1.4.1.91.2.1.31.0	"The temperature reading for the freeze sensor including units."	R	Value (OctetString): 0.0F
.1.3.6.1.4.1.91.2.1.32.0	"Power On Enabled, 1 for yes, 0 for no"	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.33.0	"POA Alarm Enabled, 1 for yes, 0 for no"	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.34.0	"Stealth Mode Enabled, 1 for yes, 0 for no"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.35.0	"Heat Variance in Deg F * 100"	R/W	Value (Integer): 700
.1.3.6.1.4.1.91.2.1.36.0	"Cool Variance in Deg F * 100"	R/W	Value (Integer): 700
.1.3.6.1.4.1.91.2.1.37.0	"Heat Delay in Minutes * 10"	R/W	Value (Integer): 35
.1.3.6.1.4.1.91.2.1.38.0	"Compressor Delay In Minutes * 10"	R/W	Value (Integer): 35

SNMP Name/OID	SNMP Description	(R)EAD / (W)RITE	SNMP Sample Value
.1.3.6.1.4.1.91.2.1.39.0	"Freeze Sensor Shut-off Setpoint"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.40.0	"Freeze Sensor Re-enable Setpoint"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.41.0	"DC Motor Enabled, 1 for yes, 0 for no"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.42.0	"Ethernet Enabled, 1 for yes, 0 for no"	R/W	Value (Integer): 1
.1.3.6.1.4.1.91.2.1.43.0	"DHCP Enabled, 1 for yes, 0 for no"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.44.0	"IPv4 Address"	R/W	Value (OctetString): 192.168.1.151
.1.3.6.1.4.1.91.2.1.45.0	"IPv4 Subnet Address"	R/W	Value (OctetString): 255.255.255.0
.1.3.6.1.4.1.91.2.1.46.0	"IPv4 Gateway Address"	R/W	Value (OctetString): 192.168.1.1
.1.3.6.1.4.1.91.2.1.47.0	"SNMP Manager Address"	R/W	Value (OctetString): 192.168.0.104
.1.3.6.1.4.1.91.2.1.48.0	"IPv6 Local-Link Address"	R/W	Value (OctetString): FE80:0000:0000:0000:0208:DCFF:FE57:5725
.1.3.6.1.4.1.91.2.1.49.0	"IPv6 Global Unicast Address"	R/W	Value (OctetString): 0000:0000:0000:0000:0000:0000:0000:0000
.1.3.6.1.4.1.91.2.1.50.0	"IPv6 Prefix"	R/W	Value (OctetString): FFFF:FFFF:FFFF:FFFF:0000:0000:0000:0000
.1.3.6.1.4.1.91.2.1.51.0	"IPv6 Gateway Address"	R/W	Value (OctetString): 0000:0000:0000:0000:0000:0000:0000:0000
.1.3.6.1.4.1.91.2.1.52.0	"The 2nd stage offset temp for redundancy"	R/W	Value (Integer): 4
.1.3.6.1.4.1.91.2.1.53.0	"Write 1 to reset filter days after filter change"	R/W	Value (Integer): 0
.1.3.6.1.4.1.91.2.1.54.0	"Redundancy Partner IP Address"	R/W	Value (OctetString): 192.168.1.166
.1.3.6.1.4.1.91.2.1.55.0	"Redundancy State (0=off, 1=lead, 2=standby, 3=comms loss)."	R	Value (Integer): 2
.1.3.6.1.4.1.91.2.1.56.0	"Manual Timer Enabled, 1 for yes, 0 for no (10 minutes only)."	R/W	Value (Integer): 0

SNMP TRAP SETTINGS:

Table 3

Capture Trap	Meaning	Example Value
<ul style="list-style-type: none"> 1.3.6.1.4.1.6691.2.1.7.0 	<ul style="list-style-type: none"> Hi Limit Alarm 	<ul style="list-style-type: none"> "Too HOT"
<ul style="list-style-type: none"> 1.3.6.1.4.1.6691.2.1.9.0 	<ul style="list-style-type: none"> Lo Limit Alarm 	<ul style="list-style-type: none"> "Too COLD"
<ul style="list-style-type: none"> 1.3.6.1.4.1.6691.2.1.11.0 	<ul style="list-style-type: none"> Conenser Alarm 	<ul style="list-style-type: none"> "Hot COND"
<ul style="list-style-type: none"> 1.3.6.1.4.1.6691.2.1.13.0 	<ul style="list-style-type: none"> Filter Alarm 	<ul style="list-style-type: none"> "Service Filter"
<ul style="list-style-type: none"> 1.3.6.1.4.1.6691.2.1.26.0 	<ul style="list-style-type: none"> Change of State 	<ul style="list-style-type: none"> Wait for Cooling", "Cool ON", "HEAT ON", "LEAD", "STANDBY", "REDUND OFF", etc.

Please contact ICEqube for full MIB file and additional SNMP functionality.

Addendum E:**Ranges of Controller Settings**

Heat Temperature: -5°F to 63°F (-20.56°C to 17.22°C). Default of 50.0°F (10°C). Decimals allowed.

Cool Temperature: 70°F to 125°F (21.11°C to 51.67°C). Default of 80°F (26.67°C). Decimals allowed.

High Temp Alarm: 80°F to 135°F (26.67°C to 57.22°C). Resets at 2°F (1°C) below this temperature. Can go no lower than 10°F (5.56°C) above Cool Temperature. Default of 131°F (55°C). Decimals allowed.

Low Temp Alarm: : -20°F to 53°F (-28.89°C to 11.67°C). Resets at 2°F (1°C) above this temperature. Can go no higher than 10°F (5.56°C) below Heat Temperature. Default of -20°F (-28.89°C). Decimals allowed.

Condenser Alarm: 100°F to 195°F (37.78°C to 90.56°C). Default is 170°F (76.67°C). Decimals allowed.

Buzzer Volume: 0 – 99. At a level of 0, the buzzer will not sound. At a level of 99 the buzzer will sound at maximum volume. A value of 100 is outside the range, and the buzzer will not sound at a value of 100. Default of 50.

Filter Alarm Days: 0 -180 days. 1 day is equal to 24 hours. A value of 0 disables the alarm. Default of 0 days. Must be whole numbers.

Filter Warning Days : 0 -180 days. 1 day is equal to 24 hours. A value of 0 disables the alarm. Default of 0 days. Must be whole numbers.

2nd Stage Cool/Heat Temperature Offset: 0°F -10°F (0°C -5.56°C). Default 4°F(2.22°C). Decimals allowed.

Lead Swap Half-Days (1=12 hours): 1 half-day increment = 12 hours. Default of 2 half days (24 hours).

Comp Delay: 0.0 to 10 minutes (in 0.5 minute increments). Default of 3.5, 5, or 7 minutes*.

Heat Delay: 0.0 to 10 minutes (in 0.5 minute increments). Default of 0.0 minutes.

Cool Variance: 0°F -10°F (0°C -5.56°C). Default 7°F(3.89°C). Decimals allowed.

Heat Variance: 0°F -10°F (0°C -5.56°C). Default 7°F(3.89°C). Decimals allowed.

*All units below 14,000BTU per hour are factory set to 3 ½ minutes and all units with a capacity of 14,000-20,000 BTU per hour may be factory set to 3 ½ minutes or 7 minutes depending on manufacture date. Units with a capacity of 27,000BTU per hour are factory set to 5 minutes.