KE2 EvapOEM
Multi Evap Applications

Q.1.45-A December 2022

Contents:

Overview

This document reviews the setup for multiple evaporator applications with the KE2 Evap OEM controller, including bonding and Lead/Lag. It serves as a supplement to the KE2 Evap OEM Quickstart Guide Q.1.45.

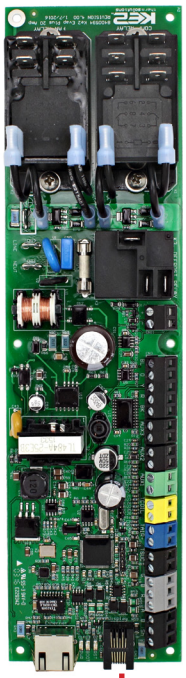
Bonding creates a link over the local network between controllers that coordinates the controllers' refrigeration and defrost cycles. It is most often used to synchronize the refrigeration and defrost of evaporators on the same condensing unit and/or evaporators in the same room.

Pairing creates a link over the local network between controllers so that both controllers are displayed on KE2 Combo Displays, or to setup the controllers for Lead/Lag control. Lead/Lag is traditionally used in the industry for redundancy in refrigerated spaces, but until now has required expensive hardware and was complicated to setup. Lead/Lag control is now standard on the KE2 Evap OEM controller, and requires no expensive hardware to implement.

Components

The following are a number of components used in bonding and pairing.

KE2 Evap OEM Controller
(typically inside evaporator cabinet)



Display Connection RJ-12 Port

Network Connection RJ-45 Ethernet Port

KE2 Edge Manager
(KE2 EM-Plus)

KE2 Switch
(8-port switch displayed)

KE2 Basic Display

KE2 Combo Display

KE2 EvapOEM
Multi Evap Applications

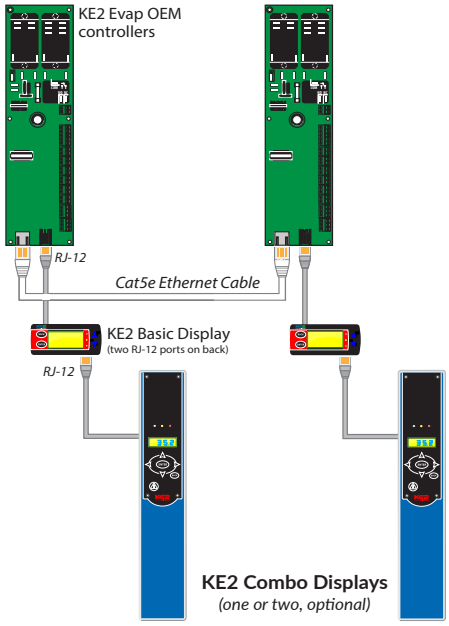
Hardware Setup

The required hardware will depend on the number of controllers, preferred level of communication, and any desired additional features. When pairing or bonding only **two** controllers, a Cat5e Ethernet cable can be run directly between the controllers and the pairing/bonding can be done from the **KE2 Basic Display** or **KE2 Combo Display**. A KE2 Basic Display is typically pre-installed at each evaporator, however, one or two KE2 Combo Displays can be added at site if a remote additional display with scrolling text, audible alarm, and/or panic button is desired.

When bonding **three or more** controllers, or, if you would like to view the controllers' built-in webpages, Ethernet cables can be run from each controller to a **KE2 Switch**. When on location, internet is ***not*** required to access the controller webpages, only a laptop with an Ethernet port is required. Adding a **KE2 Edge Manager (KE2-EM)** to the switch allows local Wi-Fi access for smartphones/tablets/PCs, and offers extended data logging among other features. Providing an internet connection to the controllers allows email/text alerts and remote access via **KE2 Smart Access**.

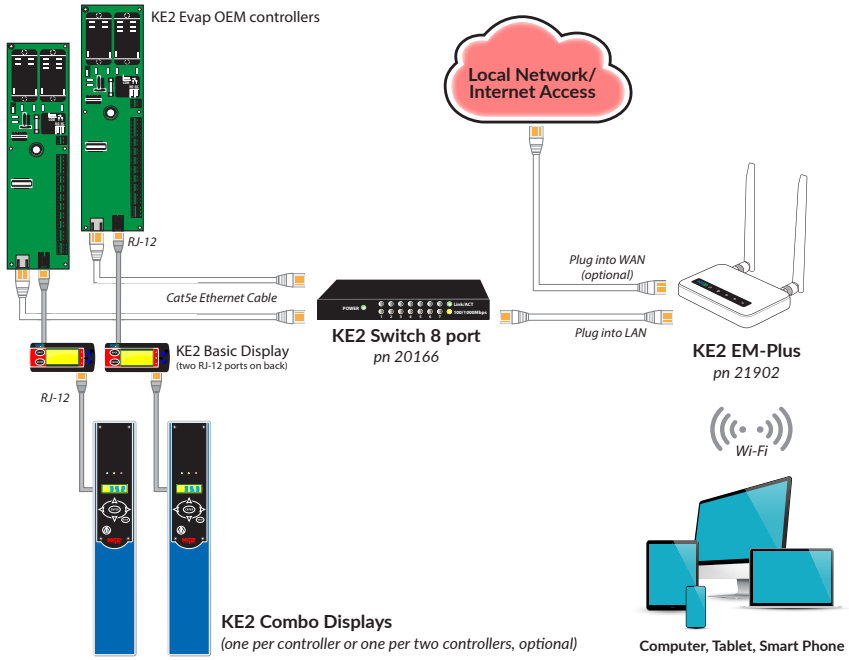
Direct Connect Option

(two controllers max)



Network Option

(two controllers w/communication, required for three or more controllers)



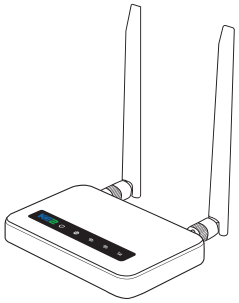
Accessories

KE2 Combo Display

- Remote Display
- Door Switch Input
- Light Control
- Audible Alarm
- Panic Alarm

The examples above are two of the most common setups for pairing/bonding, however, there are many other ways to communicate with and connect to your KE2 Evap OEM controller. Please see the next page, **Additional Ways to Communicate**, for methods that may better suite specific site requirements.

KE2 Edge Manager (KE2-EM)



- Wi-Fi Access
- Remote Access & Control
- E-mail/Text Alerts
- Wireless Sensors
- Extended Data Logging
- Local Dashboard

KE2 thermsolutions | **KE2 Evap**OEM
Multi Evap Applications

Additional Ways to Communicate

There are many ways to communicate to your KE2 Evap OEM controller. The graphic below shows various options for communicating with the controller, and will help determine which method is best for your specific needs.

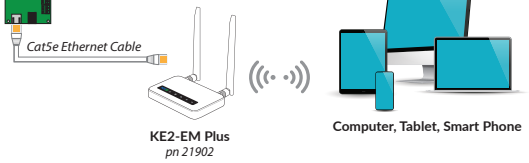
On Site - Local Access Only

Temporary

- *Initial setup*
- *Service calls*
- *Take to next site*

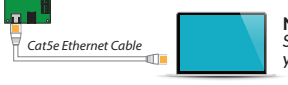
Single Controller
KE2 Edge Manager (KE2-EM)

- *Convenient Wi-Fi access*
- *Requires outlet for power and Cat5e cable to controller*



Single Controller
Direct Connect with Computer

- *Requires computer with Ethernet port*
- *Must set 'static IP' on the computer*



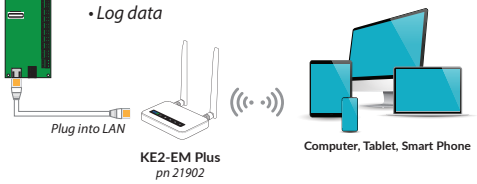
NOTE:
See bulletin Q.5.11 or Video 124 at youtube.com/ke2therm to set the static IP.

Permanent

- *Convenient access*
- *Dashboard*
- *Data logging*

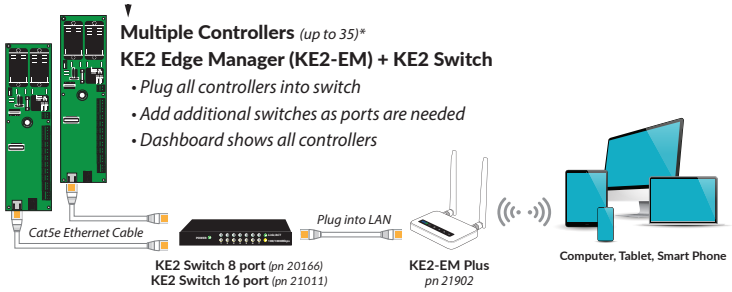
Single Controller
KE2 Edge Manager (KE2-EM)

- *Connect with smart devices*
- *Log data*



Multiple Controllers *(up to 35)**
KE2 Edge Manager (KE2-EM) + KE2 Switch

- *Plug all controllers into switch*
- *Add additional switches as ports are needed*
- *Dashboard shows all controllers*



**For 35+ controller network setup please contact KE2 Therm.*

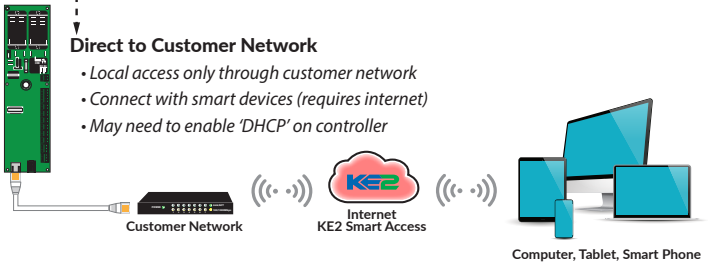
Remote Access - Access via Internet

KE2 Smart Access

- *Easy to setup and access*
- *Many sites on one dashboard*
- *Text/e-mail alerts*

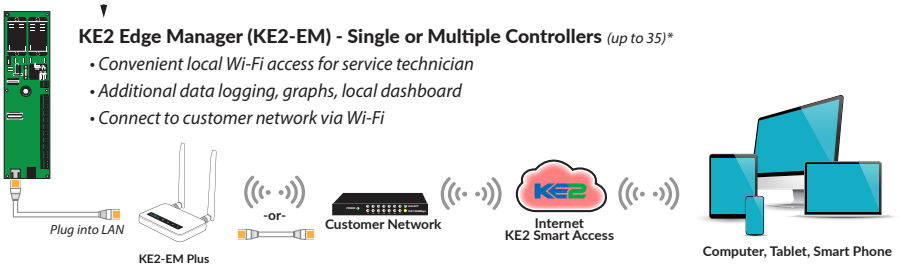
Direct to Customer Network

- *Local access only through customer network*
- *Connect with smart devices (requires internet)*
- *May need to enable 'DHCP' on controller*



KE2 Edge Manager (KE2-EM) - Single or Multiple Controllers *(up to 35)**

- *Convenient local Wi-Fi access for service technician*
- *Additional data logging, graphs, local dashboard*
- *Connect to customer network via Wi-Fi*



**For 35+ controller network setup please contact KE2 Therm.*

Customer Setup → Varies based on method

- *Access is setup and supported by end user*
- *May be difficult to access for service*
- *Customer IT to design, setup, and support*

KE2 Therm Solutions | **KE2 Evap**OEM
Multi Evap Applications

Application

Recommendations for bonding or pairing will differ depending on the number of independent systems in the refrigerated space, as well as the number of evaporators on each condensing unit. There are also several different setup options offering flexibility suited to site specific conditions or goals. Each control method is explained below. After familiarizing yourself with the available methods of control, review the example applications in the following pages and determine the best setup for your application.

Bonding

Bonded controllers have the option of setting refrigeration and defrost to *synchronized* or *independent*.

Synchronized refrigeration will force bonded controllers to start and stop refrigeration at the same time. The controllers' liquid line solenoid relays will also energize and de-energize at the same time. Refrigeration nearly always must be synchronized if the controllers share the same condensing unit. The **Multi Air Temp Control** setpoint determines whether the controllers will refrigerate based on the *warmest* value of all bonded controllers' room temperature sensors, or the *average* of all the sensors.

Independent refrigeration lets bonded controllers start and stop refrigeration separate from other controllers. It is usually used when independent systems are bonded to synchronize or coordinate defrosts, but synchronization of refrigeration is not required.

Synchronized defrost lets any bonded controller initiate a defrost, and will force other bonded controllers to also initiate a defrost at the same time. Defrost is terminated separately based on each controller's own coil temperature sensors, but the controllers will wait until ALL bonded partners also terminate defrost before moving to the next mode. This allows the defrost to be completed as quickly as possible in order to resume refrigeration.

Independent defrost lets any bonded controller initiate a defrost as long as a bonded controller is not already in defrost. While a bonded controller is in defrost, the other controllers' **Room Temperature** setpoint will be ignored and they will refrigerate based on the **Room Temp Ind Def** setpoint. The controller will not initiate a defrost if any other controllers are already in defrost.

Room Temp Ind Def provides flexibility in defrost coordination. If **Multi Evap Defrost** is set to **Independent Defrost**, this value becomes the room temperature setpoint while other controllers are in defrost.

If set to the maximum value of 90.0˚F, the controller(s) not in defrost will effectively be off for the duration of the defrost.

If set to a value several degrees above the room temperature setpoint (ex. 5 F˚above the room temp setpoint), the controller(s) not in defrost will be in standby for the whole or most of the duration of the defrost, and refrigerate only if room temperature rises above **Room Temp Ind Def** + **Air Temp Differential** during defrost. Setting this value too low may cause **Defrost Termination on Time** alarms as refrigerating controllers may prevent other controllers from reaching their defrost termination temperature.

If set to the same temperature as the standard room temp setpoint, the controller will refrigerate as normal, regardless if bonded controllers are in defrost.

If necessary to force bonded controllers into refrigeration during a defrost, for example in certain hot gas applications, **Room Temp Ind Def** can be set lower than the normal room temp setpoint, down to the minimum of -50.0˚F. Do not set this value lower than the refrigerated product can tolerate.

KE2 therm**solutions** | **KE2 Evap**OEM
Multi Evap Applications

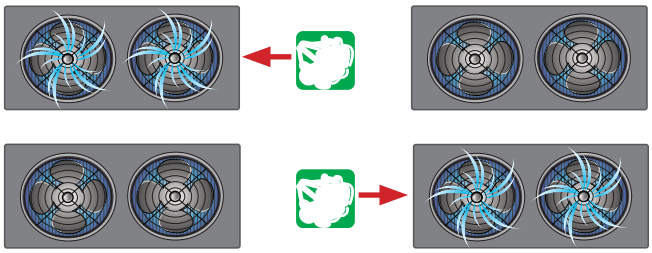
Pairing

Pairing allows both paired controllers to appear on connected KE2 Combo Displays. Pairing also allows Lead/Lag control. There are several options when setting up Lead/Lag control, which are described below.

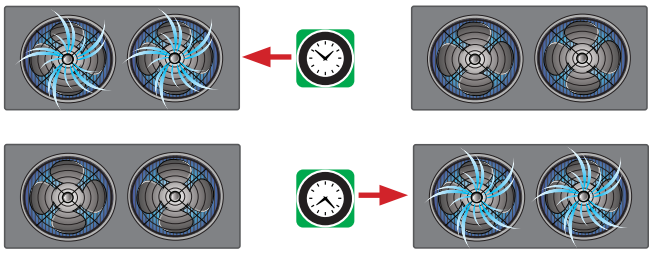
Lead/Lag Mode: Alternate will switch controllers between Lead & Lag every time the room temp setpoint is satisfied. The Lag controller will begin refrigeration if the actual room temp rises above the **2nd Room Temp** + **Air Temp Differential** setpoints, and continue to refrigerate until the **Room Temp** setpoint is achieved. A Suction Temp Sensor or Suction Pressure Sensor alarm with an EEV, or a Room Temp Sensor alarm will force the non-alarming controller to become Lead. If the controllers lose communication, both will become Lead.

Lead/Lag Mode: Redundant Cool will switch Lead & Lag based on the **Redundant Time** setpoint (default 12 hours). The Lag controller will enter refrigeration if the actual room temp rises above the **2nd Room Temp** + **Air Temp Differential** setpoints, and continue to refrigerate until the **2nd Room Temp** setpoint is achieved. A Suction Temp Sensor or Suction Pressure Sensor alarm with an EEV, or a Room Temp Sensor alarm will force the non-alarming controller to become lead. If the controllers lose communication, one of the controllers will stay lead until communications is restored, then switch as normal.

Lead/Lag Mode: Redundant Off will switch Lead & Lag based on the **Redundant Time** setpoint (default 12 hours), however, the Lag controller will **NOT** enter refrigeration if the room temp rises above **2nd Room Temp** + **Air Temp Differential**. A Suction Temp Sensor or Suction Pressure Sensor alarm with an EEV, a High Air Temp alarm, or a Room Temp Sensor alarm will cause the non-alarming controller to become lead, turning the other controller off. If the controllers lose communication, both will become Lead.



In Alternate mode, Lead/Lag switches after each run cycle.



In Redundant modes, Lead/Lag switches every set number of hours.

Pair Defrost Mode will determine what the paired controller does when its partner goes into defrost. **Forced Off** is strongly recommended as it allows defrost to terminate as quickly as possible. **Auto** allows the controller not in defrost to refrigerate to the **Room Temp** or **2nd Temp** setpoints depending on its Lead/Lag mode (see table below).

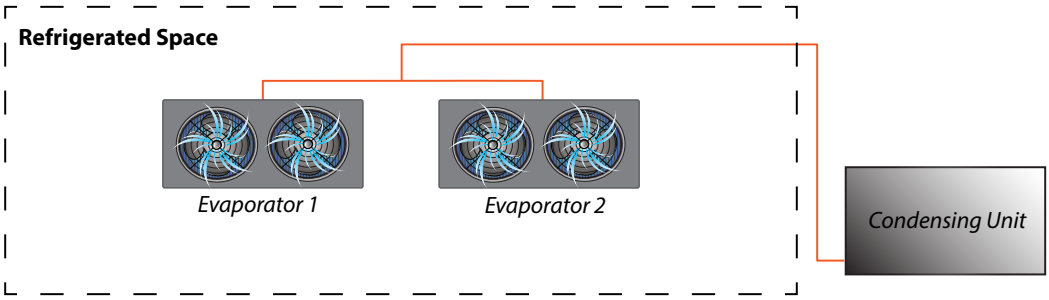
NOTE: In both Redundant Cool and Redundant Off, every time the controller switches to Lead, it initiates a defrost before beginning refrigeration. This ensures the coil is clear before beginning its run cycle.

	Alternate	Redundant Cool	Redundant Off
Lead/Lag Switch	Every refrigeration cycle	By time, adjustable 1 to 168 hours	By time, adjustable 1 to 168 hours
Lag Control	Refrigerate to **Room Temp** setpoint if actual room temp rises above **2nd Temp** + **Air Temp Differential**	Refrigerate to **2nd Temp** setpoint if actual room temp rises above **2nd Temp** + **Air Temp Differential**	Lag system is not allowed to run
Defrost Options	Off, or act as Lead (Auto)	Off, or act as Lag (Auto)	Off
Alarms that trigger Lead/Lag Switch	Room Temp Sensor, Suction Temp (w/ EEV), Suction Pressure (w/ EEV)	Room Temp Sensor, Suction Temp (w/ EEV), Suction Pressure (w/ EEV)	High Air Temp, Room Temp Sensor, Suction Temp (w/ EEV), Suction Pressure (w/ EEV)
On Comm Loss	Both act as Lead	Both act as Lead	One controller acts as Lead
Defrost on Switch	No	Yes	Yes
Use when	Want superior temperature control and even runtime	Want to switch lead/lag systems based on time	Systems cannot run together due to electrical or other restrictions

KE2 Evap OEM
Multi Evap Applications

Single Condensing Unit with Multiple Evaps

Controllers almost always must be bonded and synchronized for multiple evaporators in the same room sharing a single condensing unit. Synchronizing the refrigeration and defrost prevents the system from running with an unbalanced load (ex. one evaporator off, one evaporator calling for refrigeration).



Defrosting **simultaneously** allows the controllers to complete defrost quickly and return to refrigeration. It is often the best option for air defrost applications. Multi Evap Defrost set to **independent** will cause the controllers to defrost separately. This can lower energy cost, and may be helpful where excess frost or ice in the space is an issue. When defrosting separately, the **Room Temp Ind Def** setpoint determines whether to stay off during other controllers' defrost, or act as standby, ready to refrigerate if the room temp rises above a set temperature. In this application, the **Room Temp Ind Def** must be set to 90.0˚F to keep the controller off for the duration of the defrost. After bonding, see the list of suggested setpoints below, but adjust as necessary for any site specific requirements.

Bond - Defrost Simultaneously

Setpoint	Settings
Multi Air Temp Control	Warmest or Average
Multi Evap Cool	Synchronized
Multi Evap Defrost	Synchronized
Multi Evap Sensor	Shared
Room Temp Ind Def	N/A*

*Only applicable when Multi Evap Defrost = Independent

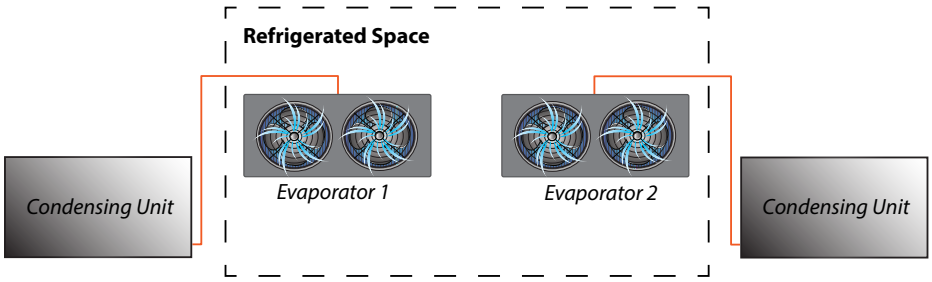
Bond - Defrost Separately (Off)

Setpoint	Settings
Multi Air Temp Control	Warmest or Average
Multi Evap Cool	Synchronized
Multi Evap Defrost	Independent
Multi Evap Sensor	Shared
Room Temp Ind Def	Off = 90.0˚F

KE2 EvapOEM
Multi Evap Applications

Multiple Condensing Units with Single Evaps

While it may be possible to run two independent systems in the same refrigerated space without bonding or pairing, it is strongly recommended to either bond or pair. This allows defrost to complete as quickly as possible by either synchronizing defrosts, or pausing refrigeration while the other is in defrost. ***Two*** independent systems in the space may be paired *or* bonded. ***Three or more*** independent systems can only be bonded together.



Defrosting **simultaneously** allows the controllers to complete defrost quickly and return to refrigeration. It is often the best option for air defrost applications. Multi Evap Defrost set to **independent** will cause the controllers to defrost separately. Defrosting **separately** can lower energy cost, and may be helpful where excess frost or ice in the space is an issue. When defrosting separately, the **Room Temp Ind Def** setpoint determines whether to stay off during other controllers' defrost, or act as standby, ready to refrigerate if the room temp rises above a set temperature.

In addition to offering redundant control, pairing with Lead/Lag control provides further opportunity for energy savings and less equipment runtime, particularly if the systems are evenly loaded and have extra capacity. After bonding or pairing, see below for a list of suggested setpoints, but adjust as necessary for any site specific requirements.

Bond - Defrost Simultaneously

Setpoint	Settings
Multi Air Temp Control	Warmest or Average
Multi Evap Cool	Independent
Multi Evap Defrost	Synchronized
Multi Evap Sensor	Not Shared
Room Temp Ind Def	N/A*

*Only applicable when Multi Evap Defrost = Independent

Bond - Defrost Separately (Off or Standby)

Setpoint	Settings
Multi Air Temp Control	Warmest or Average
Multi Evap Cool	Independent
Multi Evap Defrost	Independent
Multi Evap Sensor	Not Shared
Room Temp Ind Def	Off = 90.0˚F Standby Temp*

*Set to a suitable standby temperature, ex. 5.0˚F above the main room temperature setpoint.

Lead/Lag (Pairing)

Setpoint	Suggested Setting
Multi Evap (Lead/Lag) Mode	Alternate
Redundant Time	6 Hours, 12 Hours etc.*
Pair Defrost	Forced Off
2nd Room Temp	Set to standby/backup temp

*Only relevant if Lead/Lag Mode set to Redundant Cool or Redundant Off.

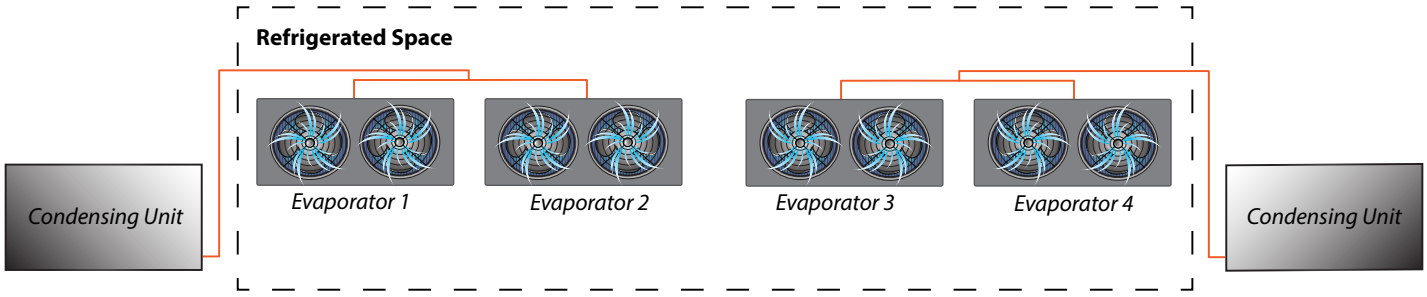
2nd Room Temp is used when the controller is acting as the Lag controller, and along with **Air Temp Differential** determines when the Lag controller will initiate refrigeration as the backup system. Setting this to 5.0˚F above the regular Room Temperature setpoint is suitable for many applications, but it can be set closer to the main Room Temperature setpoint if desired.

Please note that room temperature must rise above the 2nd Room Temp PLUS the Air Temp Differential before the Lag system will begin to refrigerate.

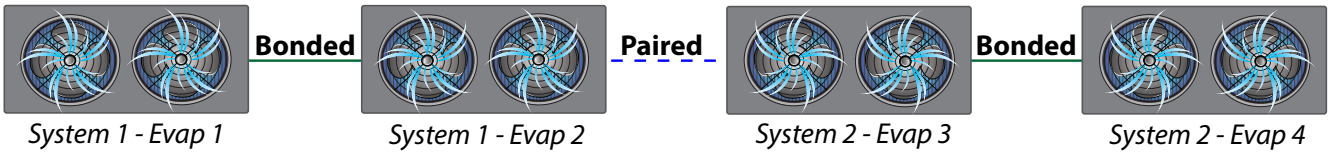
KE2 Evap OEM
Multi Evap Applications

Multiple Condensing Units with Multiple Evaps

For larger refrigerated spaces, a combination of bonding and pairing is recommended. Controllers on the same condensing unit must be bonded, with refrigeration and defrost synchronized. ***One*** controller from the bonded group should be paired with the ***one*** controller from the other group. The remaining bonded controllers will follow the lead of the paired controller in their group.



In the above example, pair one evaporator from each system, then bond the evaporators on the same condensing unit. Select a **Lead/Lag Mode** (Alternate is recommended) and **Pair Defrost** should be set to Forced Off. This will cause the opposing system to pause refrigeration during defrost and allow the defrosting controllers to reach termination temperature as quickly as possible. **2nd Room Temp** can be set to a backup standby temperature for Lead/Lag control, or set to the same value as the normal Room Temperature setpoint to have both sets of bonded controllers refrigerate to the main Room Temperature setpoint regardless of Lead/Lag status.



Bonding Setpoints

Setpoint	Settings
Multi Air Temp Control	Warmest or Average
Multi Evap Cool	Synchronized
Multi Evap Defrost	Synchronized
Multi Evap Sensor	Shared
Room Temp Ind Def	N/A*

*Only applicable when Multi Evap Defrost = Independent

Lead/Lag (Pairing) Setpoints

Setpoint	Suggested Setting
Multi Evap (Lead/Lag) Mode	Alternate
Redundant Time	6 Hours, 12 Hours etc.*
Pair Defrost	Forced Off
2nd Room Temp	Set to standby/backup temp

*Only relevant if Lead/Lag Mode set to Redundant Cool or Redundant Off.

2nd Room Temp is used when the controller is acting as the Lag controller, and along with **Air Temp Differential** determines when the Lag controller will initiate refrigeration as the backup system. Setting this to 5.0˚F above the regular Room Temperature setpoint is suitable for many applications, but it can be set closer to the main Room Temperature setpoint if desired.

Please note that room temperature must rise above the 2nd Room Temp PLUS the Air Temp Differential before the Lag system will begin to refrigerate.

KE2 Therm Solutions | **KE2 Evap**OEM
Multi Evap Applications

How to Bond/Unbond Controllers

If bonding **two** controllers, it can be done from the KE2 Basic Display, the KE2 Combo Display, or from the webpages. If bonding **three or more** controllers, it must be done from the controller webpage. After bonding, please review **Bonding Setpoints** and confirm proper operation.

Bonding from the KE2 Basic Display

1. Bonding only needs to be performed on one of the controllers. From either controller's display, press and hold BACK until ES appears.
2. Press ▲ several times to display bnd. Press and hold ENTER until the red LED is blinking, then release.
3. Wait several seconds. PAS means the bond was successful and both controllers will restart. FAI means the bond failed, see **Bonding/Pairing Troubleshooting** before trying again.

Unbonding from the KE2 Basic Display

1. Unbonding only needs to be performed from one of the controllers, unless there is no longer a network connection between the controllers. From the controller's display, press and hold BACK until ES appears.
2. Press ▲ several times to display Unb. Press and hold ENTER until the red LED is blinking, then release.
3. Wait several seconds. PAS indicates the unbonding is complete. Controller(s) will restart.

Bonding from the KE2 Combo Display

1. If controller is paired, press ◀ or ▶ several times to navigate to SELECT CONTROLLER. If SELECT CONTROLLER does not appear, controller is not paired. Use ▲ ▼ to choose controller and press ENTER.
2. Press ◀ several times to navigate to MANUAL MENU.
3. Press ENTER, LOGIN will be displayed if not already logged in. Press ENTER again, 0000 will be displayed.
4. Use ▲ ▼ ◀ ▶ to enter the password 2222. Press and hold ENTER until the screen changes.
5. Press ▼ to navigate to BOND. Press ENTER to display BEGIN BONDING.
6. Press and hold ENTER until BOND appears, then release. PASS indicates the bond was successful, both controllers will restart. FAIL indicates the bond was not successful, see **Bonding/Pairing Troubleshooting** before trying again. Press BACK to return to the Manual Menu/default display.

Unbonding from the KE2 Combo Display

1. If controller is paired, press ◀ or ▶ several times to navigate to SELECT CONTROLLER. If SELECT CONTROLLER does not appear, controller is not paired. Use ▲ ▼ to choose controller and press ENTER.
2. Press ◀ several times to navigate to MANUAL MENU.
3. Press ENTER, LOGIN will be displayed, if not already logged in. Press ENTER again, 0000 will be displayed.
4. Use ▲ ▼ ◀ ▶ to enter the password 2222. Press and hold ENTER until the screen changes.
5. Press ▼ to navigate to UNBOND. Press ENTER to display BEGIN UNBONDING.
6. Press and hold ENTER. The controller(s) will restart.

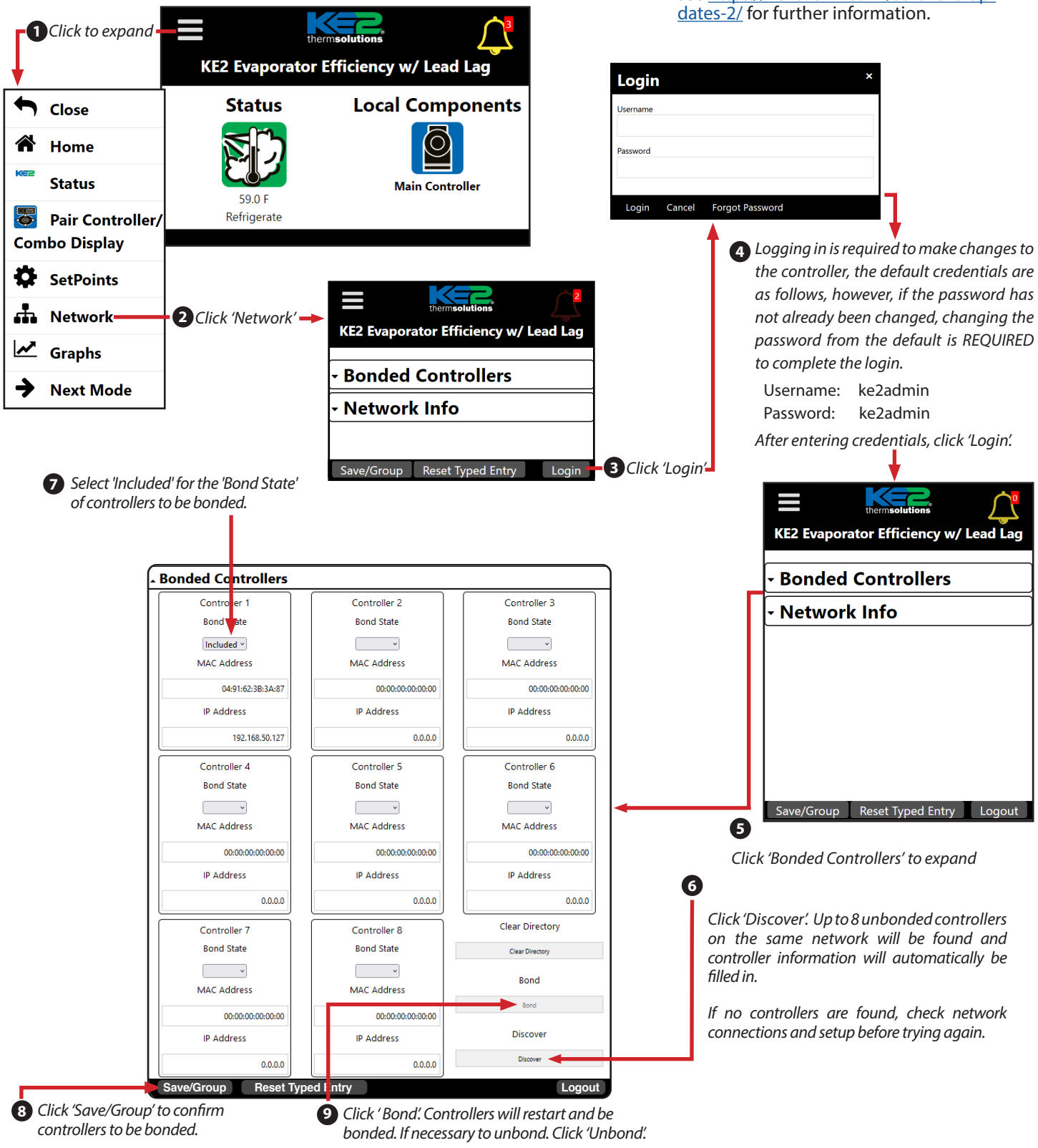
KE2 Evap OEM
Multi Evap Applications

Bonding from the Controller Webpage

Follow the steps below to bond controllers from the controller webpage. Staring from the Home Page:

NOTE: KE2 Evap OEM v2.05 should only be bonded with other KE2 Evap OEM v2.05 controllers.

Controller firmware can be updated, please see https://ke2therm.com /software-updates-2/ for further information.



KE2 Therm Solutions | **KE2 Evap**OEM
Multi Evap Applications

Bonding Setpoints

The following setpoints should be reviewed after bonding controllers. These setpoints are only available from the KE2 Combo Display and the controller webpage. Instructions for how to view and change setpoints can be found in **Q.1.63 KE2 Combo Display** and **Q.1.46 KE2 Evap OEM Webpage Screens** respectively. Please note setpoints are intentionally NOT automatically applied across bonded controllers, each controller must be set individually.

KE2 Combo Display Scrolling Text	Webpage	Default	Description
MULTI AIR TEMP CTRL	Multi Air Temp Control	Warmest Air	Options are ***Warmest Air*** or ***Average Air***. Only applies if Multi Evap Cool is set to Synchronized. ***Warmest Air*** will control refrigeration using the warmest air temperature value of all bonded controllers. ***Average Air*** will control refrigeration using the average room temperature value of all bonded controllers.
MULTI EVAP COOL	Multi Evap Cool	Synchronized	Options are ***Synchronized*** or ***Independent***. ***Synchronized*** causes all bonded controllers to start and stop refrigeration at the same time based on their warmest or average room temperatures. ***Independent*** controllers will refrigerate based only on their own local room temperature sensor(s).
MULTI EVAP DEFROST	Multi Evap Defrost	Synchronized	Options are ***Synchronized*** or ***Independent***. ***Synchronized*** causes all bonded controllers to defrost at the same time. Any bonded controller can initiate a defrost. Controllers will stop defrosting once local coil temperatures exceed the defrost termination setpoint and wait until all bonded controllers finish defrost before moving to the next mode. ***Independent*** will cause controllers to utilize ***Room Temp Ind Def*** as the room temp setpoint whenever a bonded controller is in defrost. See ***Room Temp Ind Def*** description below..
MULTI EVAP SENSOR	Multi Evap Sensor	Shared	Options are ***Shared*** or ***Not Shared***. ***Shared*** allows controllers access to the sensor data of other bonded controllers and should be used whenever bonded controllers are on the same condensing unit.. ***Not Shared*** should be used if bonded controllers are on separate condensing units.
ROOM TMP IND DEF	Room Temp Ind Def	0.0˚F	Range is -50.0˚F to 90.0˚F. Only applies if Multi Evap Defrost is set to Independent. Functions as the room temperature setpoint when a bonded controller is in defrost. This permits controllers to pause refrigeration while a bonded controller is in defrost, allowing the defrost to complete as quickly as possible without other evaporators refrigerating. Use 90.0˚F to keep controller off, or set a standby temperature to refrigerate if room temperature rises above a set value.

KE2 therm**solutions** | **KE2 Evap**OEM
Multi Evap Applications

How to Pair/Unpair Controllers

Pairing can be done from the KE2 Basic Display, the KE2 Combo Display, or from the webpage. If setting up a Lead/Lag system, please review **Pairing Setpoints** and confirm proper operation.

Pairing from the KE2 Basic Display

1. Pairing only needs to be performed from one of the controllers. From either controller's display, press and hold BACK until E5 appears.
2. Press ▲ several times to display PAr. Press and hold ENTER until the red LED is blinking, then release.
3. Wait several seconds. PAS means the pair was successful and both controllers will restart. FAI means the pair failed, see **Bonding/Pairing Troubleshooting** before trying again. Press BACK to exit.

Unpair from the KE2 Basic Display

1. Unpairing only needs to be performed from one of the controllers, unless there is no longer a network connection between the controllers. From the controller's display, press and hold BACK until E5 appears.
2. Press ▲ several times to display UnP. Press and hold ENTER until the red LED is blinking, then release.
3. Wait several seconds. PAS indicates the unpairing was successful. Press BACK to return to the default display.

Pairing from the KE2 Combo Display

1. Press ◄ several times to navigate to MANUAL MENU.
2. Press ENTER, LOGIN will be displayed if not already logged in.
3. Press ENTER again, 0000 will be displayed. Use ▲ ▼ ◄ ► to enter the password 2222. Press and hold ENTER until the screen changes. You are now in the manual menu.
4. Press ▼ to navigate to PAIR L/L. Press ENTER to display BEGIN PAIRING L/L.
5. Press and hold ENTER until the screen changes, then release. PASS indicates the pairing was successful.

   FAIL indicates the pairing was not successful, see **Bonding/Pairing Troubleshooting**. Press BACK to exit.

Unpairing from the KE2 Combo Display

1. Press ◄ or ► several times to navigate to SELECT CONTROLLER. If SELECT CONTROLLER does not appear, controller is not paired. Use ▲ ▼ to choose controller and press ENTER.
2. Press ◄ several times to navigate to MANUAL MENU.
3. Press ENTER, LOGIN will be displayed if not already logged in. Press ENTER again, 0000 will be displayed.
4. Use ▲ ▼ ◄ ► to enter the password 2222. Press and hold ENTER until the screen changes.
5. Press ▼ to navigate to UNPAIR L/L. Press ENTER to display BEGIN UNPAIRING L/L.
6. Press and hold ENTER until PASS appears indicating the unpairing was successful. Press BACK to exit.

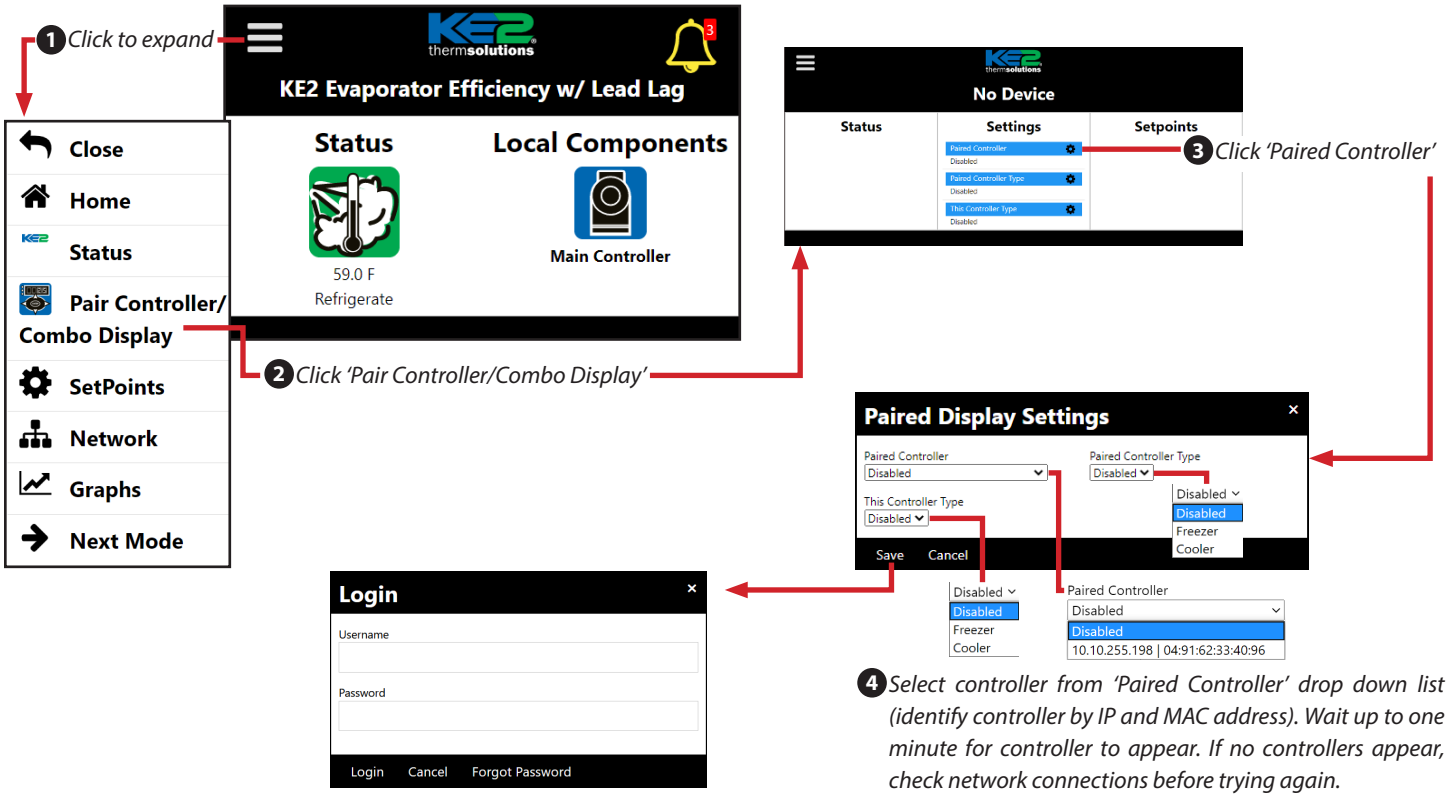
KE2 EvapOEM
Multi Evap Applications

Pairing from the Controller Webpage

Follow the steps below to pair controllers from the controller webpage.

Starting from the Home page:

Pairing *creates a link between controllers for Lead/Lag control, or to have both controllers display on the KE2 Combo Display.*



4 *Select controller from 'Paired Controller' drop down list (identify controller by IP and MAC address). Wait up to one minute for controller to appear. If no controllers appear, check network connections before trying again.*

Select freezer or cooler for each controller.

Note: If ***unpairing****, select 'Disabled' for 'Paired Controller' and click 'Save'.*

5 *Click Save. If not already logged in, the Login window will appear. Default credentials are as follows, however, if the password has not already been changed, changing the password from the default is REQUIRED to complete the login.*

Username: ke2admin
Password: ke2admin

After entering credentials, click 'Login'.

Pairing Setpoints

The following setpoints should be reviewed after pairing the controllers for Lead/Lag control. If only pairing to view two KE2 Evap OEM controllers via the KE2 Combo Display, these setpoints do not need to be changed from default.

Basic Display Abbreviation	KE2 Combo Display Scrolling Text	Webpage	Default	Description
tEt tEt	MULTI EVAP MODE	Mode	Disabled	Options are ***Disabled***, ***Redundant Cool***, ***Redundant Off***, or ***Alternate***. ***Disabled*** (oFF / DISABLE) turns off Lead/Lag. ***Alternate*** (ALt / ALTERNATE) will switch Lead/Lag controllers after every refrigeration run cycle. Both controllers are allowed to refrigerate if temperature rises. ***Redundant Cool*** (LGC / REDUNDANT COOL) will switch Lead/Lag controllers every time a fixed number of hours passes, determined by the *Redundant Time* setpoint. Both controllers are allowed to refrigerate if temperature rises. ***Redundant Off*** (LGF / REDUNDANT OFF) will switch Lead/Lag controllers every time a fixed number of hours passes, determined by the Redundant Time setpoint. Controllers are NOT allowed to refrigerate at the same time (the Lag system will always remain off), but will switch between Lead/Lag under certain alarm conditions such as High Temp Alarm.
LLt LLt	LEAD/LAG TIME	Redundant Time	12 Hours	Range is 1 hour to 168 hours. Only applies when Multi Evap Mode is set to Redundant Cool or Redundant Off. This determines the interval for switching controllers between Lead & Lag. Note that a defrost will occur each time the Lead & Lag controller switch.
PAd PAd	PAIRED DEFROST MODE	Pair Defrost	Forced Off	Options are ***Forced Off*** (oFF / FORCE OFF) or ***Auto*** (AUt / AUTO). ***Forced Off*** (oFF / FORCE OFF) prohibits the controller from refrigerating while the paired controller in defrost, allowing it to complete the defrost more quickly. This is the recommended setting. ***Auto*** (AUt / AUTO) when Lead/Lag mode is *Alternate*, the Lag controller will switch to Lead when its paired controller is in defrost. When Lead/Lag mode is *Redundant Cool*, the Lag controller will remain the Lag controller, and will refrigerate if the room temperature rises above the 2nd Room Temp setpoint + Air Temp Differential.
tS2 tS2	2ND ROOM TEMP	2nd Room Temp	-50.0˚F	Range is -50.0˚F to 90.0˚F. When *Alternate* or *Redundant Cool* is selected as the Lead/Lag mode, this value will automatically be set to 5˚F above the current room temperature setpoint, and becomes the target temperature when the controller is in Lag mode. The setpoint can be changed manually after selecting the Lead/Lag mode.

KE2 Evap OEM
Multi Evap Applications

Bonding/Pairing Troubleshooting

- Check Ethernet cable at both controllers and the network switch or router. Make sure connectors are pushed all the way into the Ethernet ports. See **Q.5.5 Making Ethernet Cable** for correct wire order. If the LEDs on either the switch or KE2 Evap OEM Ethernet port are not lit, and both controller and switch have power, there is a strong possibility the cable is faulty.
- If bonding or pairing from the KE2 Basic Display or KE2 Combo Display, ensure that only the two controllers are on the network. Remove additional controllers while bonding/pairing, or use the controller webpage.
- Check controller IP addresses. From the factory the controllers are preprogrammed to communicate to each other using 10.10.X.X IP addresses and no further setting is required. If the actual IP address does not start with '10.10...' (shown as 010 or 0010 on the display), enabling DHCP on both controllers and connecting them to a local network, or accessing the controllers' webpages to manually assign them correct IP addresses may be required. See below for instructions to check the IP address.

  From the KE2 Basic Display: Press ▼ to iP1 and press ENTER to display the first octet of the IP address. Press BACK, then ▼ to iP2 and press ENTER. Continue to iP3 and iP4 until all four IP address octets are noted.

  From the KE2 Combo Display: Press ◀ or ▶ to VARIABLES, then ▼ to IP OCTET 1. Press ENTER to display the first IP address octet. Press BACK, then ▼ to IP OCTET 2 and press ENTER. Continue to IP OCTET 3 and IP OCTET 4 until all four IP address octets are noted.

- Check firmware version, see below for step by step instructions. Bonding & Pairing should only be done between KE2 Evap OEM controllers of the same firmware version. Controller firmware can be updated, please see https://ke2therm.com /software-updates-2/ for further information.

  From the KE2 Basic Display: Press ▼ to Fir and press ENTER to display the controller's firmware version.

  From the KE2 Combo Display: Press ◀ or ▶ to VARIABLES, then ▼ to FIRMWARE VERSION. Press ENTER to display the controller's firmware version.

Further Information

If you have any questions or an application that does not match those outlined in this document, please feel free to contact us at via phone or e-mail:

Technical Support: (636) 266-0140 ext. 2 Mon-Fri 8AM to 5PM CST (excluding holidays)
E-mail: techsupport@ke2therm.com

Further literature on the KE2 Evap OEM can be found via the link or QR code below:

https://ke2therm.com/literature/literature-ke2-evap-oem

Please visit our YouTube channel for further information and technical videos on commonly asked questions.

YouTube

https://youtube.com/ke2therm