

Multi-Evap Single Condenser Applications

#### **IMPORTANT:**

Please note, the configurations found in this publication are for illustration purposes only. For recommended sensor location please refer to bulletin Q.1.3 KE2 Evaporator Efficiency Installation Manual.

The KE2 Evaporator Efficiency's distributed structure has been carefully designed to facilitate the creation of custom systems while eliminating expensive overhead of unnecessary functionality. This provides an affordable solution to any project. The KE2 Evap can be applied to the most simple single evaporator system, or to larger applications with up to 8 evaporators attached to the same condenser.

When applied to larger systems, the distributed structure KE2 Evap controllers may be combined to fit the system needs though the Refrigeration Network. KE2 Therm Solution's products use Transmission Control Protocol/Internet Protocol (TCP/ IP), the future of communication technology, to provide seamless performance. Traditional refrigeration communication techniques use outdated technology, preventing the information exchange necessary for proper system control.

The use of communication provides built-in system redundancy. When networked, sensor readings are shared with all bonded controllers throughout the network, creating a system with maximum uptime.

Below are examples of how KE2 Evap controllers can be connected to create a Refrigeration Network.

#### **Additional resources:**

**KE2 Evaporator Efficiency Installation Manual** - Q.1.3 Step by step instructions on installing and setting up the KE2 Evap **KE2 Evaporator Efficiency Installation Instructions -** N.1.1 Provides better understanding of controller's operation. **KE2 MasterView Setup** - N.5.1 Setup KE2 Evap using a computer.

**KE2 Switch** - Q.5.2 Explains the functioning of the Switch and provides basic configuration of router with controller. **KE2 Establishing Gmail** - Q.5.3 Steps to setup an e-mail account that can later be used to receive notifications from the controller. **KE2 SmartGate** - Q.5.24, Q.5.25, B.5.2 bulletins cover the configuration, VPN setup and general information on the KE2 SmartGate.

#### Legend:



## **KE2** Evaporator Efficiency

p/n 20178

KE2 SmartGate p/n 20695



**KE2 Switch** p/n 20166



#### **Coil/Air Temperature Sensor** NTC Thermistor assembly - 40 ft p/n 20200

**CAT5e Shielded Ethernet Cable** 

50 ft. with connectors p/n 20185 100 ft. with connectors p/n 21067 1000 ft. bulk box - solid p/n 21087 thermsolutions

# **KE2 Evap Advanced Configuration**

Multi-Evap Single Condenser Applications

## Medium temperature with even loading



## Low temperature or larger medium temperature

**Two directly linked controllers** - No external communication



Once the controllers have been bonded, the router can be removed. The controllers will now operate as configured in setpoints.





Multi-Evap Single Condenser Applications

## Controlling systems with 3 or 4 KE2 Evap controllers on a single condenser



Controlling system with 4 to 8 KE2 Evap controllers



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Multi-Evap Single Condenser Applications

### Networking KE2 Evaporator Efficiency Controllers for two evaporator, one condenser setup.

Connect your KE2 Evap controllers to a KE2 SmartGate (SKU 20695) and connect your computer either wirelessly or using a wired connection (to ports 2-10)

Open a browser window (e.g. Internet Explorer or Google Chrome). Type the IP address of one of the controllers into the browser address field, (the IP address can be found on a sticker on the inside of the controller). You should see a screen similar to the one at right.

When the screen is loaded, click **Network** at the bottom of the screen.

Cog into the controller by clicking the **Login** button in the lower right corner.



KE2 Therm Solutions (888) 337 3358#	#	IP Address: 10 MAC Address:	.1.0.179 : 00:04:A3:52:C8:47	Location: 20302V33	BR301	Network Page
Controller #1 — Controller Name: Mac Address: IP Address:	NC-170 Evap Tester 00:04:A3:52:C8:47 10.1.0.179	Bond State: Group 1	Controller #5 - Controller Name: Mac Address: IP Address:	00:00:00:00:00:00	Bond State:	Controller Network Subnet Mask: 255.255.0 Gateway:
Controller #2 — Controller Name: Mac Address: IP Address:	00:00:00:00:00	Bond State:	Controller #6 - Controller Name: Mac Address: IP Address:	00:00:00:00:00:00	Bond State:	10.1.0.254 Primary DNS: 10.1.0.2
Controller #3 — Controller Name: Mac Address: IP Address:	00:00:00:00:00	Bond State:	Controller #7 - Controller Name: Mac Address: IP Address:	00:00:00:00:00:00	Bond State:	Discover
Controller #4 — Controller Name: Mac Address: IP Address:	00:00:00:00:00	Bond State:	Controller #8 - Controller Name: Mac Address:	00:00:00:00:00:00	Bond State:	Bond/Unbond Save/Group

Prior to Version 3.3: A password prompt will appear, enter "2222" for the password.

Version 3.3: User Name and Password prompt will appear, enter "ke2admin" for both.

5 Then click Submit, or press Enter	KE2 Therm Solutions# (888) 337 3358#	IP Address: 10.1.0.179 MAC Address: 00:04:A3:52:C8:4	Location: 20302V33R301 7	Login Page	
(Return) on your keyboard.					
KE2 Therm Evapora	tor Effici				
KE2 Therm Solutions         IP Address: 10.1.0.81           (888) 337 3358         MAC Address: 00.04:A3:14:E0	Locati :F5	Password			
4a Password	Page Settings	Network Setpoints		5 Submit	
I					

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Multi-Evap Single Condenser Applications



The IP address of the other controller(s) will populate under **Controller 2 - 8**.

B From the **Bond State** dropdown select **Group 1** to bond the controller.

Click the Save/Group button to view the controllers to be Bonded. Controllers with a blank Bond State field will be deleted from the list.

Then click the **Bond/Unbond** button. The controllers will cycle power. They are now networked.

Next you will want to ensure the controllers are in synchronous mode for a two evaporator, one condenser setup. At the bottom of the screen, click on the **Home Page** button,



KE2 Therm Solutions (888) 337 3358		IP Address: 10.1.0.179 MAC Address: 00:04:A3:52:C8:47		Location: (Set Location)		Network Page	
Controller #1 Controller Name: Mac Address: IP Address:	NC-170 Evap Tester 00:04:A3:52:C8:47 10.1.0.179	Bond State:	Controller #5 - Controller Name: Mac Address:	00:00:00:00:00:00	Bond State:	Controller Network - Subnet Mask: 255.255.0 Gateway:	
Controller #2 Controller Name: Mac Address: IP Address:	00:00:00:00:00	Bond State:	Controller #6 Controller Name: Mac Address:	00:00:00:00:00:00	Bond State:	10.1.0.254 Primary DNS: 10.1.0.2	
Controller #3 — Controller Name: Mac Address:	00:00:00:00:00	Bond State:	Controller #7 -	00:00:00:00:00:00	Bond State:	Discover	
IP Address:	0.0.0.0		IP Address:	0.0.0.0			
Controller Name: Mac Address: IP Address:	00:00:00:00:00	Bond State:	Controller Name: Mac Address: IP Address:	00:00:00:00:00:00	Bond State:	9 Save/Group	



Multi-Evap Single Condenser Applications

To put the controllers in **Multi Evap Cool Mode**, find the Bonded Controller section of the page,

Click the drop down arrow at **Multi** Evap Cool Mode and select **Synchro**nized. This will cause the controllers to go into cooling mode at the same time.

Multi Evap Defrost will either make all the bonded controllers go into defrost at the same time (Synchronized) or limit the system to only one evaporator at a time (Independent).

Multi Evap Sensor tells the controller whether or not to share sensor information. For example, if the controllers are "Shared" and one controller was to lose its air temperature sensor, then it could continue running using the temperature read by the other bonded controllers. This should be the default mode. If the controllers are located in different spaces, therefore controlling at different temperatures, then "Independent" mode should be selected. If a controller loses a sensor, the controller will continue to run based the default safety mode for the current alarm.

Next, find the Refrigeration section of the page.

Select the type of **Multi Air Tmp Ctrl** (Warmest or Average air). This tells the controller which method to use to control the temperature.



then click Home Page.

The second controller and subsequent controllers must be configured to match the "Multi" settings of the first controller. This is accomplished by entering the IP address of the second controller in the browser, and navigating to the Setpoints page and completing steps 14 - 17.

**NOTE:** Make sure you **Login** before making changes, and then click **Save** after changing any settings on each page before navigating away from that page, otherwise your settings will not take effect.

Your bonded KE2 Evaporator Efficiency controllers will now be operating in Synchronized mode. You can view the current operating status for each controller by connecting to the router and navigating to the IP address of each.

KE2 Therm Evaporator Efficiency					
KE2 Therm Solutions# (888) 337 3358#	IP Address: 10.1.0.179 MAC Address: 00:04:A3:52:C8:47	Location: 20302V33R301 Setpoints Page			
(888) 337 33589 Refrigeration Room Temp: Refrigerant: Min Comp Runtime: Z min Min Comp Offtime: Z min Min Comp Offtime: S min Air Temp Diff: 1.0 F Znd Room Temp: -50.0 F Aux Temp 1: T i Suct Temp 0: Aux Temp 1: T i Suct Temp 0: Aux Temp 4: Monitor Fan Speed: Units: Fahrenheit Multi Air Tmp Ctrl: Warmest Air 0: Expansion Valve	WAC Address: 00:04/sA3:52:08:47         Defrost         Defrost Type:       Electric         Defrost Term Temp:       50.0 F         Drain Time:       2 min         Fan Delay Temp:       20.0 F         Max Fan Delay Time:       2 min         Defrost Fan State:       Off         Defrost Mode:       Demand         Electric Defrost Mode:       Pulse         Defrost Prop Dwn Time:       30         Schedule Defrost	Setpoints Page         Digital Inputs       Dig In 1 State:       Closed 4         Dig In 2 Mode:       Disabled 2       Dig In 2 State:       Closed 4         Dig In 3 Mode:       Disabled 2       Dig In 3 State:       Closed 4         Sensor Offsets       PID       Proportional:       3         Air Temp Offset:       0.0 F       Pid       Proportional:       3         Suct Pressure Offset:       0.0 F       Aux Relay       Aux Relay       4         Aux Temp Offset:       0.0 F       Aux Relay       Aux Relay       4         Hi Temp Alarm Offset:       10.0 F       Hi Temp Alarm Offset:       10.0 F         Hi Temp Alarm Offset:       10.0 F       Hi Temp Alarm Offset:       10.0 F			
Valve Type: KE2 + Superheat: 8.0 F Max Oper Press: 150.0 psi	First Defrost Delay: 120 min RunTime Defrost Tomp Run Time: 6 hr	Low Temp Alarm Ottset: 4.0 F Low Temp Alarm Delay: 10 min Door Alarm Delay: 30 min			
Motor Step Rate: 200 Max Valve Steps: 1300 B Home Page Settings	Multi Evap Cool:     Synchronized       Multi Evap Defrost:     Synchronized       Multi Evap Sensor:     Shared       Network     Setpoints	Current Mode: Go To: Off Defrost			