



WORLDWIDE HEATING SYSTEMS

**RIXEN'S**  
ENTERPRISES, INC.

COMPLETE COMFORT CONTROL



# MCS7 Touchscreen Controller

OPERATIONS MANUAL

Patent Pending



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# MCS7 Touchscreen Controller

## Operations Manual

Getting to know the touchscreen display

### General Information

All functions for daily use are available through the 5.5" touchscreen display.

If the power supply in the vehicle is interrupted (e.g., the battery is disconnected) the system's controller retains all the basic settings.

### Product Properties

The touchscreen display is a permanently installed and works in conjunction with the primary control board, furnace ECU and other system components to provide heated air and water.

The controlling elements of the heating system (touchscreen display, control board, and furnace ECU) communicate with each other using a CANBus protocol while taking in information and controlling the other elements of the system.

Although the control system at its base is modular and expandable it has been preprogrammed and set-up to meet the needs of the RV users.

### Controller Function

The touchscreen controller icons can be configured in anyway depending on your system set up.

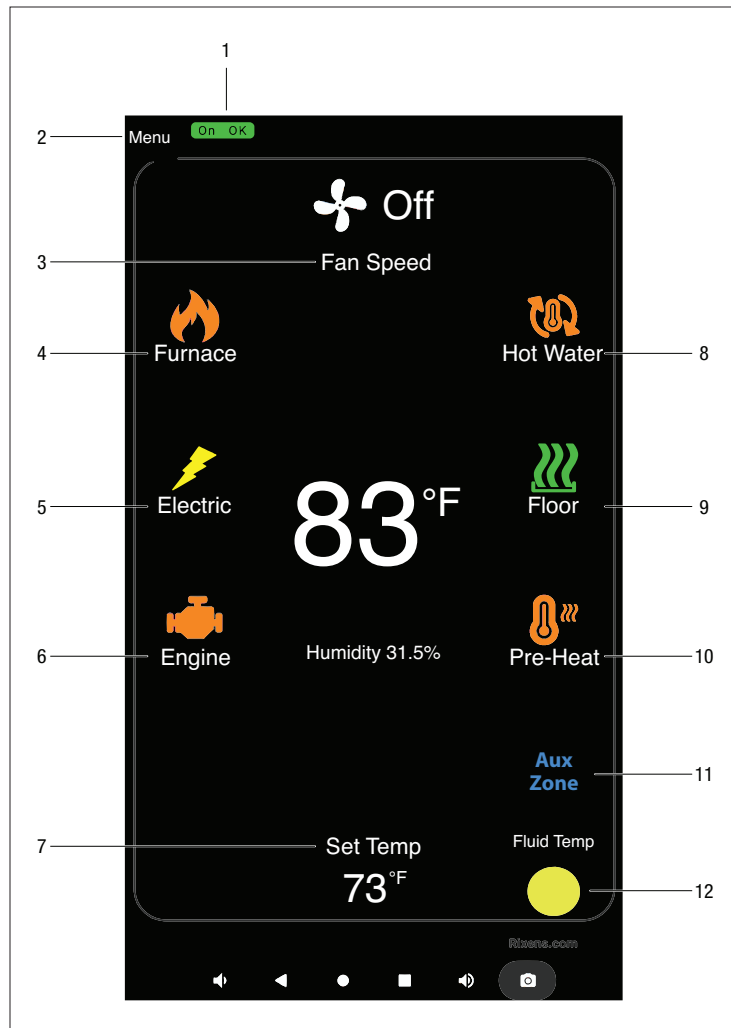
The heat source options are located on the left side of the screen (furnace, electric or engine). One of these options must be selected in order to produce hot air and water for the RV.

Fan speed, interior temperature, humidity and set temperature are displayed down the center of the screen. On the right side of the screen there is selections for heat (Hot water, floor heat option, engine preheat option, auxiliary control option and the glycol temperature indicator).

The controller works independently from any cellular or satellite signal by creating its own Wi-Fi hotspot which then communicates directly with a smart phone/laptop/tablet etc. The device offers a range of 10-30 meters, depending on obstructions.

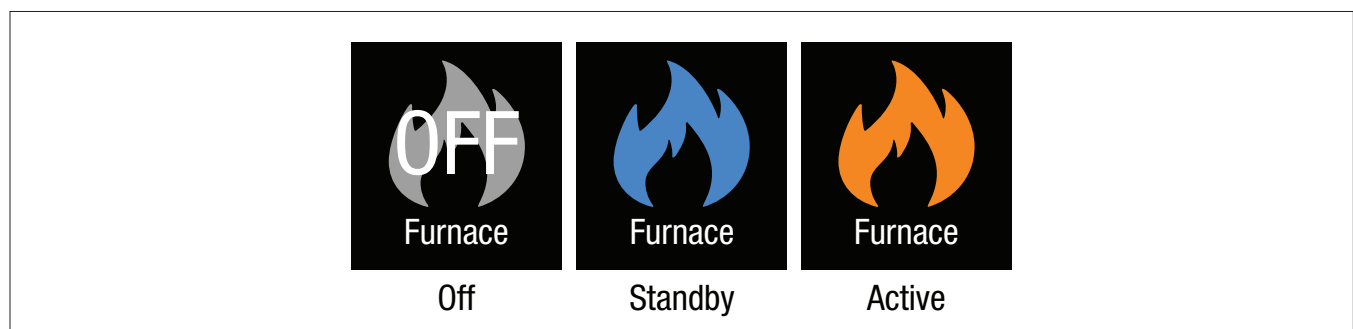
## Description of the Icons

If any of the icons do not appear on your screen they may have been removed by the builder as that option is not currently available on your installation. They can be added back if you choose to add the optional kits available. The screen will dim to rest mode after one minute of inactivity, it will reactivate by tapping the screen.



1. Furnace operation and fault code indicator
2. Menu Options
3. Fan Speed - Auto or Manual
4. Eberspaecher Furnace
5. Electric Element 1500W
6. Engine Waste Heat Capture
7. Set Temperature
8. Domestic Hot Water
9. Radiant Floor Heat
10. Engine Pre-Heat
11. Aux Zone Control
12. System Fluid Temperature

## Icon Status Colors



## 1. Furnace Operation and Fault Code Indicator

This green icon will appear in the top left and display the current status of the system and any fault codes that may appear on the furnace.

## 2. Menu Options

This drop-down menu will allow the operator to view the system operations, furnace diagnostics, Wi-Fi set up, fuel priming of the furnace and a QR code to the technical manual.

## 3. Fan Speed

Fully automatic or manual from 10-100% in 5% increments.

## 4. Furnace

Eberspaecher 5Kw (17,000btu's) Hydronic Fuel Operated Heater.

## 5. Electric Element

1500W electric element to be used when plugged into shore power.

## 6. Engine

Capture engine waste heat and add up to 30Kw of heat to the system with this available option.

## 7. Set Temperature

Choose you desired interior air temperature.

## 8. Domestic Hot Water

On demand continuous hot water for shower and sink.

## 9. Radiant Floor Heat

Circulate coolant throughout the floor for even heat distribution with this option.

## 10. Engine Pre-Heat

Use the Eberspaecher furnace to preheat the engine for cold starts with this option.

## 11. Auxiliary Zone Control

This function provides an additional analog input/output control, refer to the builder's manual to see if and how this option is utilized.

## 12. System Fluid Temperature.

This icon displays the current coolant temperature of the MCS7.



System Off



Temp Cold



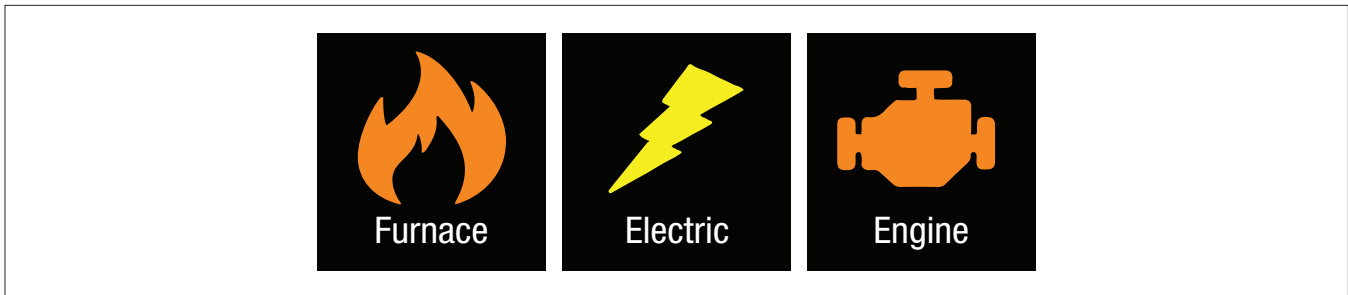
Temp 122F  
Fan Activation



Temp 158F+  
Hot Water  
Ready

## Display Functions

### Getting to know the touchscreen display



The next step is to learn how to use the heat source selection. There is a diesel/gas furnace, an electric element and an engine heat option to choose from if installed. Predominantly the operator will be using the furnace as the main heat source for the system. The electric element will supply comfortable interior heat to about 35 degrees Fahrenheit. The electric element should not be run off the inverter system as it will quickly run your batteries down. It is highly recommended the RV is plugged into a 120V power source to utilize this option. Engine heat utilizes a water-to-water heat exchanger off the engine to transfer heat to the furnace system.

The furnace icon is located on the top left of the screen, when pressed the icon will turn blue indicating that it is ready. When there is a call for heat it will turn orange, the furnace is now engaged. The furnace will now run and keep the coolant hot and ready for hot water and interior air heat. The furnace will cycle from 5Kw down to 1.3Kw (1.8Kw for gasoline) to maintain the temperature of the coolant in the system.

When the system is to heat the RV's interior, you will set the thermostat to the desired setpoint temperature. Choose your heat source, select your fan speed (manual settings run in 5% increments) and auto will run the fan on high until the interior air temperature starts to reach the setpoint temperature. At this point the fan will automatically slow down and remain on low levels maintaining the set point temperature.

The electric element is a 120-volt, 1500-watt (5000 btu) element that sits inside the expansion tank of the MCS7 system. With most manufacturers the electric element will not work unless plugged into shore power. The electric icon is located on the middle left of the screen, when engaged the element will turn blue. When there is a call for heat it will turn yellow and the element will start to generate heat for the RV.

The engine heat option is located on the lower left of the screen and will capture engine waste heat. This is possible by using a plate exchanger between the engine coolant loop and the MCS7 coolant loop. Up to 30Kw of heat can be added to the system with this available option. This option can also be used to preheat the engine with an auxiliary pump added to the engine side. The engine heat icon works in two different scenarios.

#### Engine On

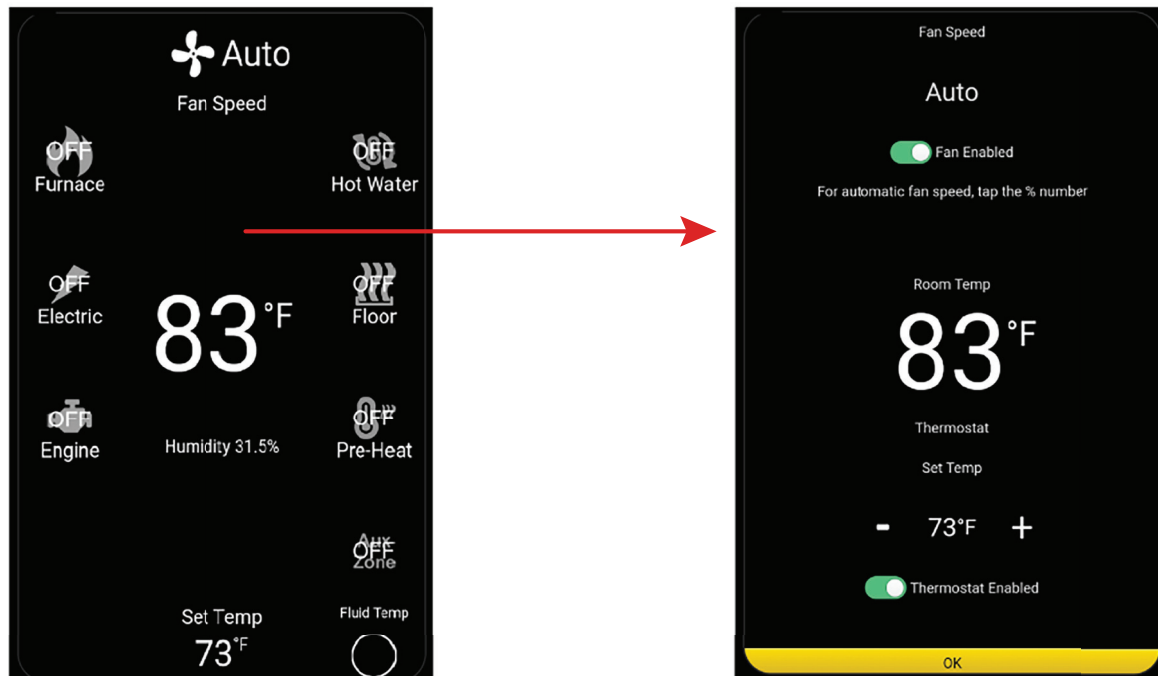
When the engine is running there will be heat transfer between the engine loop and MCS7 loop as soon as there is a demand for heat. The engine icon is a status display icon and not selectable by touching. If the engine icon is blue there is no call for heat, if the icon turns orange there is a call for heat.

#### Engine Off

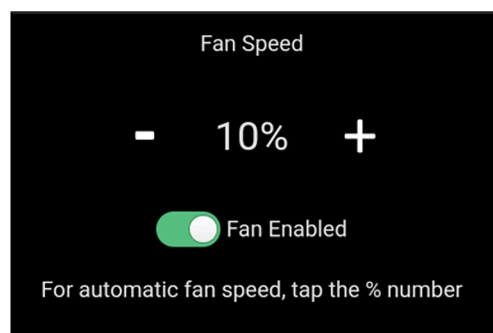
If the engine is not running the user can still capture waste heat by selecting the engine icon. The icon will turn orange and the system will run for a preset time of 20 minutes utilizing the waste heat from a hot engine.

## Temperatures and Fan Speed

The fan speed, interior temp, humidity and set point temperature are displayed in the middle of the screen. Tapping anywhere in the middle of the screen will prompt a new screen to appear to set the Fan speed and thermostat.



1. On the top of the screen is the interior fan speed. This can be controlled automatically by the MCS7 system or manually by the operator. To choose the manual or automatic fan speed tap the fan speed % number or the auto icon to toggle between the two. There is also an On/Off enable button for the fan. Note the fan will only engage if there is a heat source selected and the fluid temp system icon is yellow.



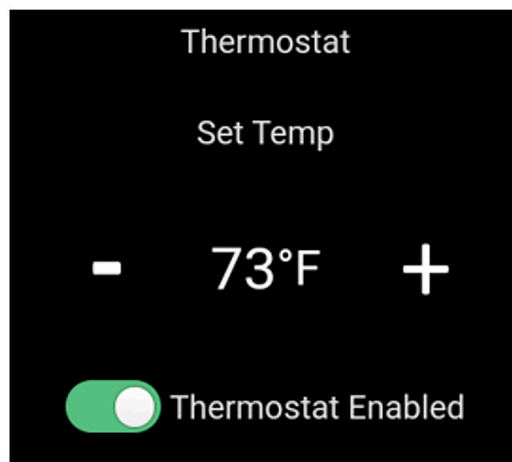
The fan speed, when in manual mode, will range from 10% to 99% in 5% increments.

2. The temperature in the middle of the screen is the reading from the external air sensor attached to the controller. This will display the current interior temperature of the RV.



83°F

3. Touching the set temperature allows you to adjust the interior temperature with the negative and plus symbols.



## Continuous Hot Water

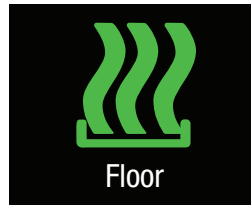


To generate continuous hot water, you will need to select the furnace icon on the top left of the screen. This is because the furnace can create 17,000btu's of heat while the electric element is capable of 5,000btu's of heat. The element alone is not enough to create continuous hot water. If you do have the engine heat option available that can be used instead of the furnace as it can supply up to 30,000btu's to the system. The engine must be hot for this option to work.

For most applications, the operator will use the furnace option as 17,000btu's is sufficient to keep up with the call for continuous hot water. The desired water flow rate is 0.8gpm for peak system performance. If you're plugged into shore power and you want the best performance, you can select both furnace and electric icons for 22,000btu's.

When you select the hot water icon, located on the top right of the screen, the furnace will run continuously to generate heat.

## Floor Radiant Heat



Selecting the Floor icon on the right side of the screen will enable the radiant floor heat option (if installed). Whenever the thermostat calls for heat a glycol pump will circulate heated coolant through the floor loop. The controller will automatically monitor temperatures between the air and floor to maintain the most comfortable interior. Like the Fan, the Floor is controlled by the thermostat. Active status is indicated by an icon showing in green.

## Engine Preheat



Selecting the Pre-Heat icon located on the lower right of the screen will start the furnace and the engine pump for a set time



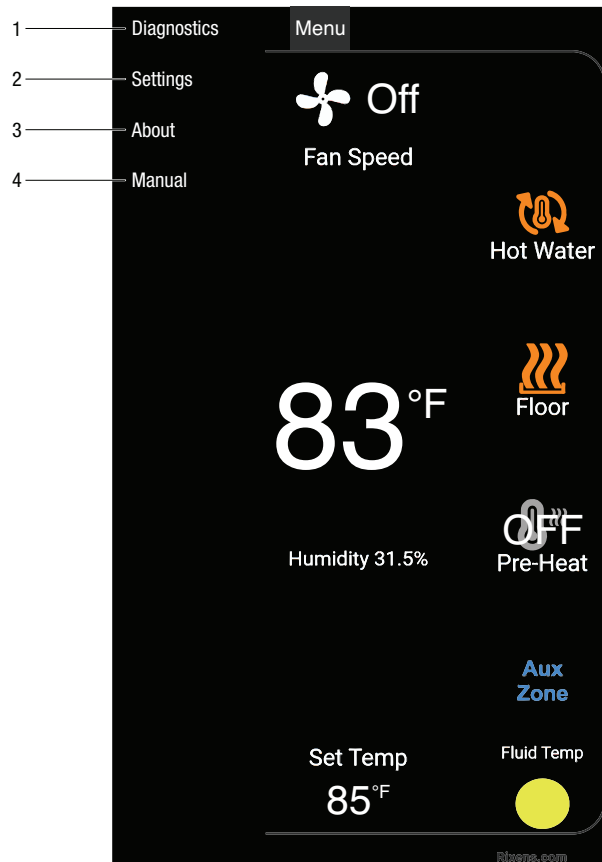
of 40 minutes. The furnace will begin to circulate hot coolant via a plate exchanger to your engine core. This ensures easier and faster engine starts during cold periods and reduces engine wear from idling. Check with your installer for this available option.

## Auxiliary Control Option

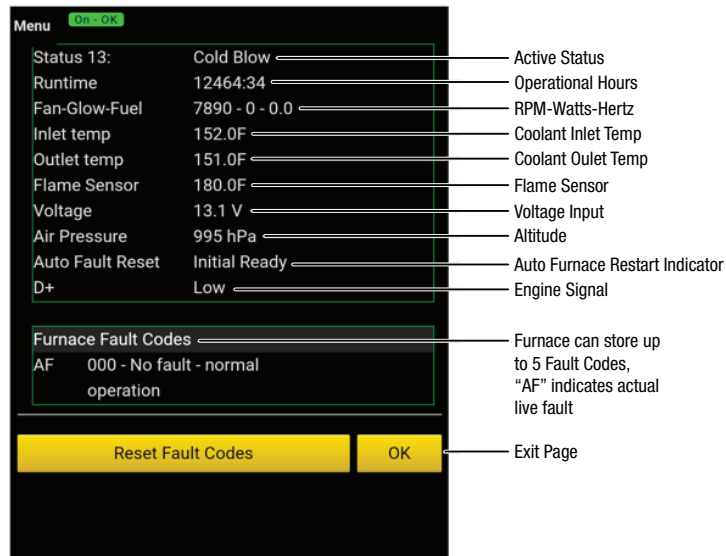


This function provides an additional analog input/output control, refer to the builder's manual to see if and how this option is utilized.

## Menu Options

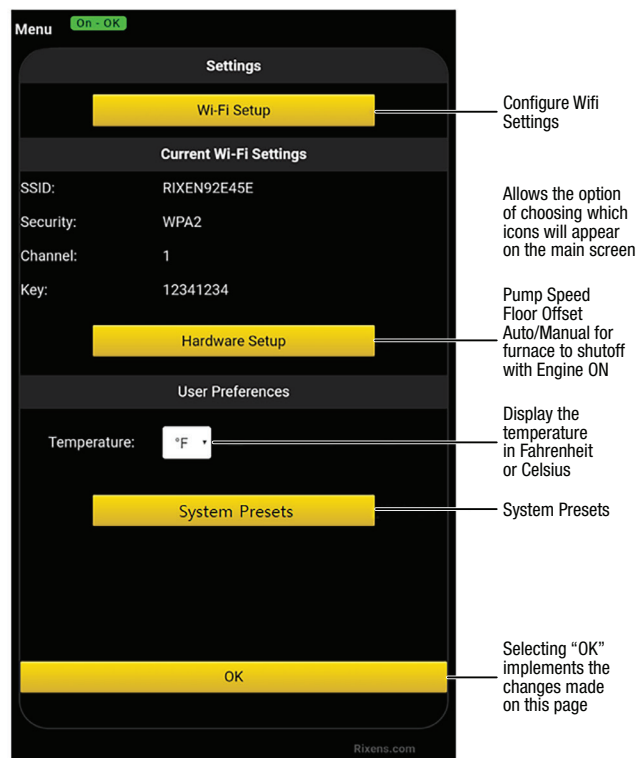


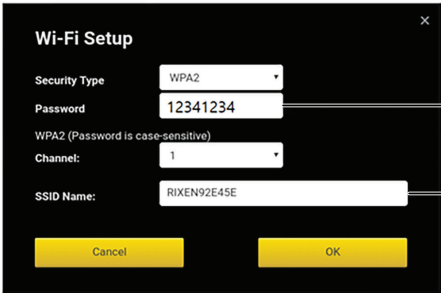
## 1. Furnace Diagnostics



Please refer to the Eberspaecher furnace manual at [Rixens.com/learningcenter](http://Rixens.com/learningcenter) for fault code descriptions and repair instructions.

## 2. Settings





**Wi-Fi Setup**

Security Type: WPA2

Password: 12341234

WPA2 (Password is case-sensitive)

Channel: 1

SSID Name: RIXEN92E45E

Buttons: Cancel, OK

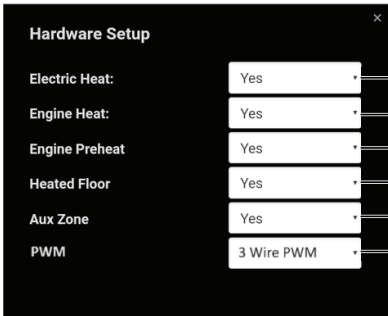
Annotations:

- Preset password, this can be changed as explained in detail in the manual
- Network Name

To log onto your Wi-Fi from your phone, tablet or computer look for the network (SSID Name) beginning with RIXEN followed by the serial number of the control board as displayed above. Once you have joined the network log into <http://10.10.10.10>

## Hardware Set Up

Based on what is installed on the RV, you can choose which icons to display on the main screen for the operator.



**Hardware Setup**

Electric Heat: Yes

Engine Heat: Yes

Engine Preheat: Yes

Heated Floor: Yes


Aux Zone: Yes

PWM: 3 Wire PWM

Buttons: Cancel, OK

Annotations:

- 1500W Electric Element
- Utilize Engine Heat
- Preheat Cold Engine
- Radiant Floor Heat
- Additional Control Option
- Choose 2 or 3 Fan wire installation



**Floor/Fan offset:** 1F / 0.5C

**Glycol Pump Speed:** Low

**Engine Heat/Furnace:** Auto

Buttons: Cancel, OK

Annotations:

- Offset Interior Temp
- Low/High
- Isolate Heat Source
- Implement Changes

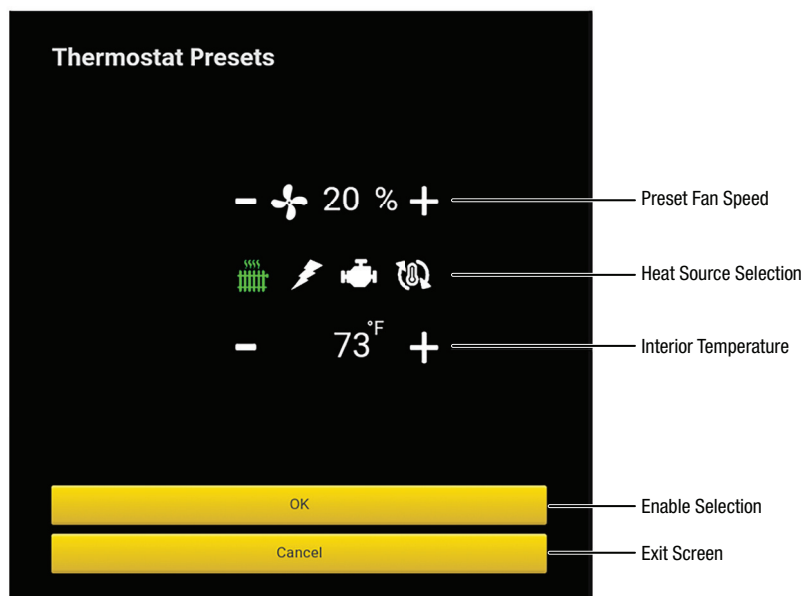
**Floor/Fan Offset** – Allow a temperature offset between the floor and fan to minimize fan use and maintain a quiet environment inside the RV.

**Glycol Pump Speed** – Only use High speed when purging the air out of the glycol system, otherwise keep the setting at Low for regular operation.

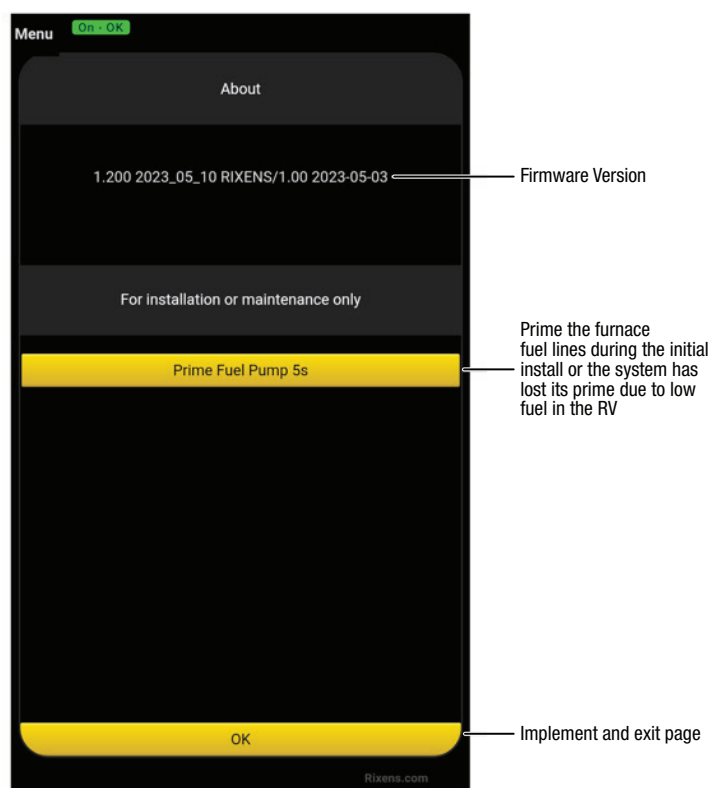
**Engine Heat/Furnace** – In auto mode, if the engine is On the furnace will be Off. In manual mode both will operate run at the same time.

## System Automatic Presets

This option will allow the user to preconfigure the heat options and temperature for ease of use.



## 3. About



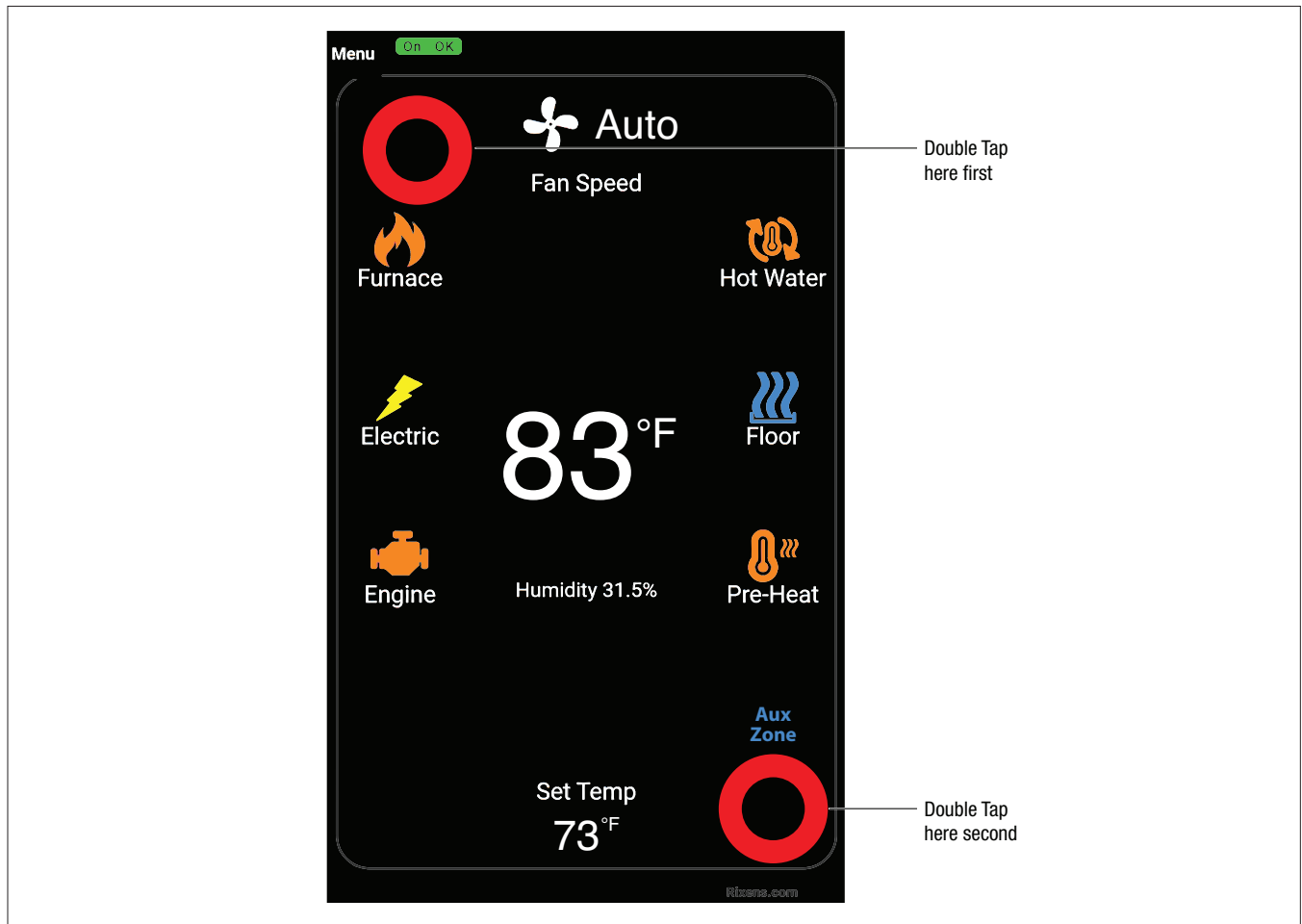
4. Manual

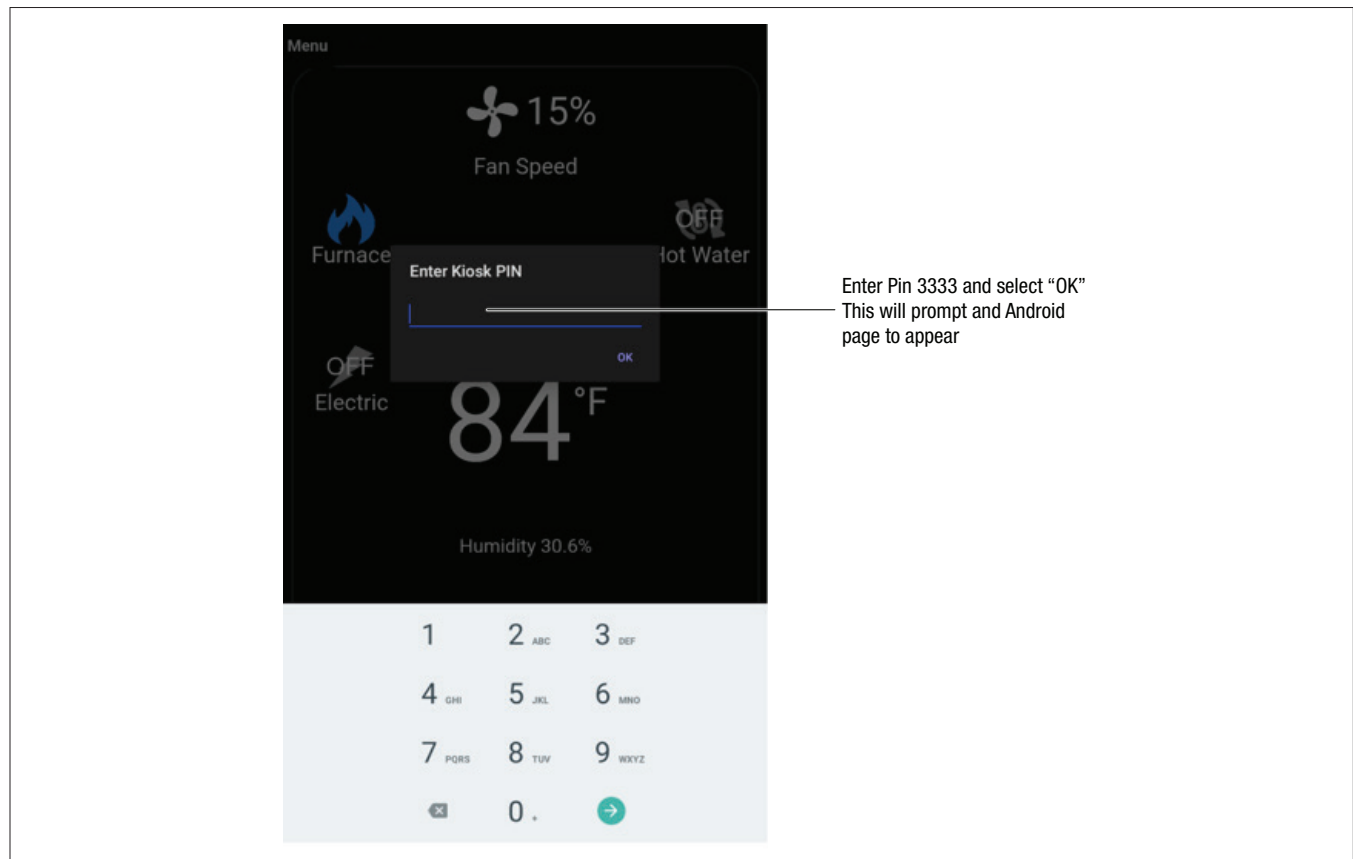


Scan with your cellphone, tablet or similar device to download manuals from Rixens.com

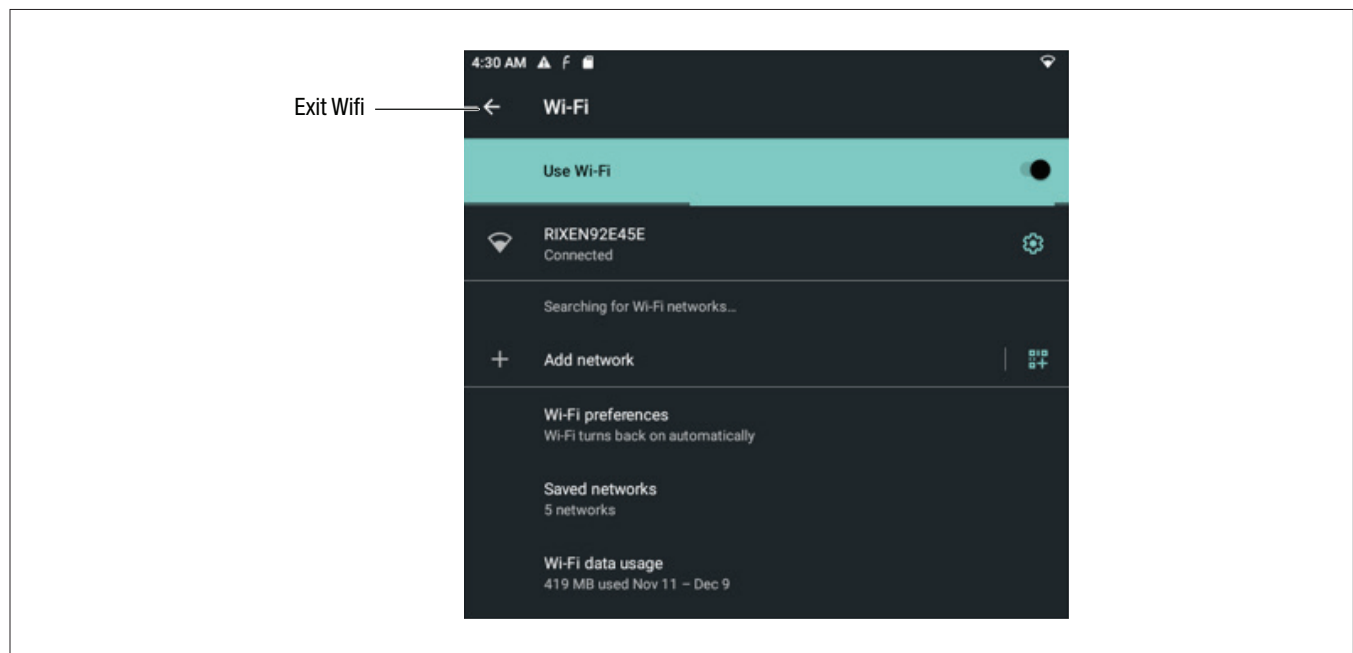
## Updating the Wifi username and password

The touchscreen of the MCS7 is connected via Wi-Fi to the control board. When changing the name and/or password, which is recommended, you must reconnect the controller to the control board. Double tap the screen on the top left and bottom right to prompt a new screen to appear. It does not matter which screen you are currently on to prompt for this.



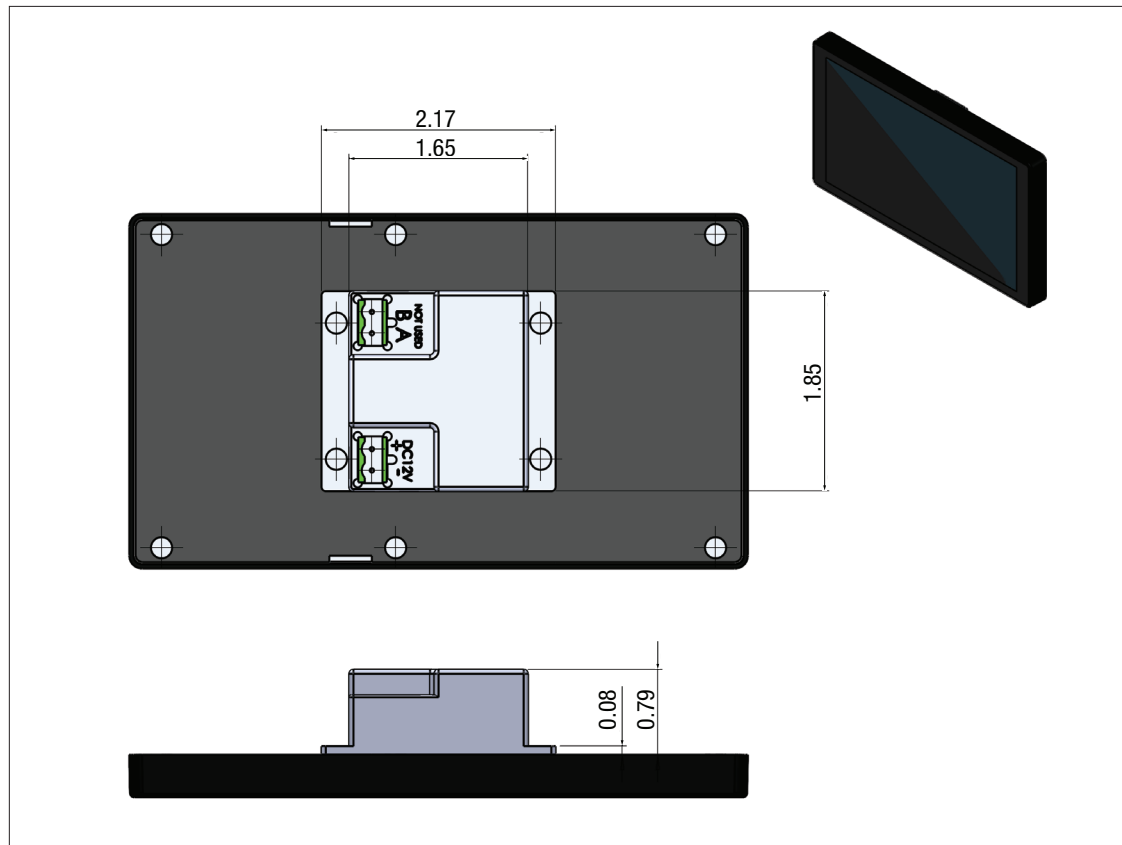


Select the Wi-Fi name of your control board and enter the password you created (default password is 12341234). When done the network should say "Connected". Tap the "Back Arrow" in the top left corner to leave the Wi-Fi set up.



## Rixen's Controller Display (Mounting Template)

The touchscreen of the Wi-Fi set up.



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