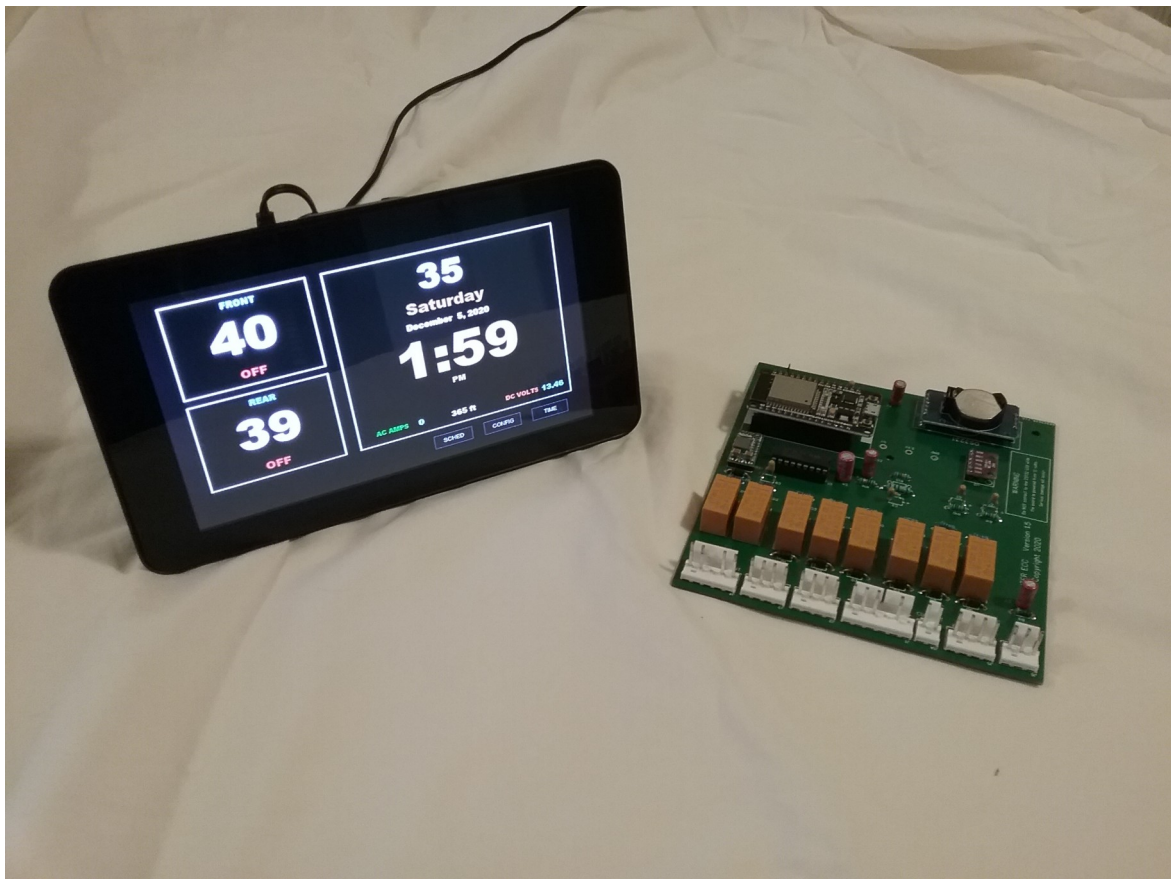


# Waiter ECC

Electronic Climate Controller

September 23, 2022  
(Version 5.0.3)

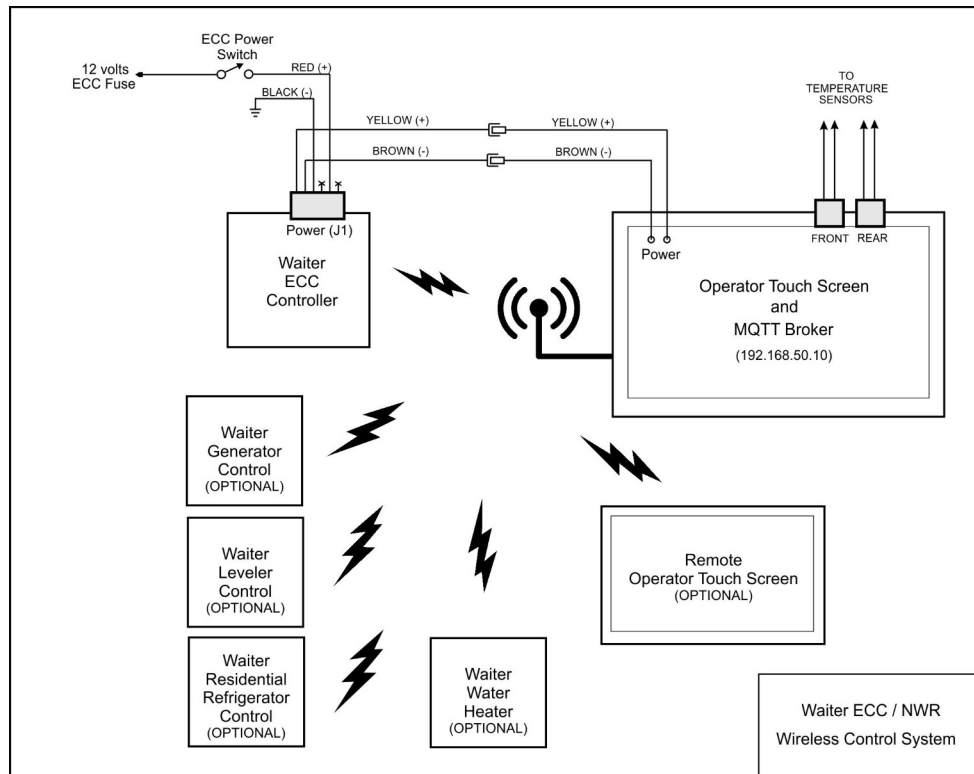


## Operation Manual

[www.WaiterECC.com](http://www.WaiterECC.com)

## INTRODUCTION

The Waiter ECC system provides similar functionality as the original Intellitec system, and then some. There are two main components to the Waiter ECC, the Controller Module and the operator touch screen. All logic and functionality is controlled within the Controller module. The Operator panel serves as an interface to the Controller module. Communications between the Operator Panel, the Controller module, and any optional modules are performed over a dedicated WiFi network with a message system called MQTT. See the Technical guide for details.



### Color Touch Screen Operator panel.

All functions and displays are programmed and set via the touch screen. The display menu will appear at the bottom of the screen if the screen is touched. If either of the two temperature windows on the left are touched (FRONT or REAR) this will also call up the MODE select screen.

If the MODE screen is displayed and no buttons are pressed for about 7 seconds, the screen automatically dims and returned to the MAIN screen. All other screens are set to 30 seconds before they return to the main screen and are dimmed to the appropriate setting (day or night), and the Menu select button tabs at the bottom may be hidden if this option is set on the CONFIG screen.

## BOOT SCREEN

When the system is booted up, the welcome splash screen displays for about 15 seconds. This shows the version number, date, and WiFi SSID and channel (6 or 11).



During the boot process, it can take 30 - 90 seconds for the control module to establish WiFi connection with the touchscreen. During that time, the MAIN screen may display a “NO CONNECTION” message and dim to the NITE setting (very dark). Once the WiFi link is established, the touchscreen receives a complete update of all the parameters and status from the controller module.

NOTE: If you're also using a remote screen, the remote may not be able to automatically re-establish a WiFi connection. Reboot the remote screen after the main screen has become fully operational. If the REMOTE touchscreen is running version 4.6.0 or higher, it has a similar WiFi watchdog that's incorporated in the main touchscreen (version 4.6.0 and higher). The REMOTE will automatically reboot if the watchdog criteria has been met.

## MAIN SCREEN



Temperature and set points can be displayed in “F” or “C” units. This is selected on the CONFIG screen.

Left side. The two smaller windows display the status for the FRONT and REAR heating and air conditioner systems. Current temperature, mode, temperature set points, furnace and A/C compressor status, and the status of the Scheduler are displayed. Press in either of these two windows to call up the front or rear MODE select screen.

Right side. Main status window. Display outside air temperature, day of week, date, time, AM/PM, alarm clock setting and mode, shore power AC amps, and the DC coach voltage.

If the Alarm clock is set, the alarm time and mode are displayed. When the Alarm clock sounds, the temperature display will alternate between the outside air temperature and the word “ALARM”.

Near the bottom of the MAIN screen is the AC AMPS, pressure altitude in FT , and DC VOLTS.

AC AMPS displays the 120 volt AC amps detected by the current sensor. This number is used in the SHED process.

“AC AMPS” text color changes depending on several factors and configuration settings

<b>SHORE AMPS AVAIL</b>	<b>WARNING (yellow)</b>	<b>SHED</b>
30	24	28
25	20	23
20	15	18
15	12	14
10	7	9

Note also that the text “AC AMPS” changes to show the currently selected “SHORE AMPS AVAILABLE on the CONFIG screen. If 30 amps is selected, the text will read “AC AMPS”. If anything other than 30 is selected, it will show the value that's selected, i.e. if “20” is selected the text will read “AC AMPS (20)”

**PRESSURE ALTITUDE** - If the control module circuit board is equipped with a pressure sensor, This is converted to an altitude that's based on atmospheric pressure. (Pilots will know exactly what I'm talking about). This altitude reading will vary depending on atmospheric pressure, i.e. the weather.

**DC VOLTS** is the 12 volts DC voltage. This number is used by the optional Waiter Generator Controller to start the generator to automatically recharge the house batteries. Because of differences in wiring and connections, the value displayed here may be slightly different than your other voltage displays.

Menu select buttons to select Water heater, Generator, Leveler, Refrigerator, Schedule, Configuration and Time screens will be displayed if those modules are installed and communicating with the touchscreen.

The lower left side will display system messages, i.e. BOOT, ERRORS, SAVING CHANGES, etc.

**DISPLAY DIMMING** - The entire display automatically dims if there's no screen touches for 30 seconds. Pressing anywhere on screen brings the display back to full brightness. There are two levels of dim, DAY and NIGHT. These brightness levels are set on the CONFIG screen.

#### COMMAND STATUS INDICATORS -

These are small indicators in the corners of the FRONT and REAR windows that show the current states of the compressor, furnace, and scheduler commands

#### UPPER RIGHT CORNER

GREEN - The compressor is being commanded to run.

BLUE - The compressor start is on hold until the hard start delay has timed out (120 seconds)

RED - The compressor has been shed.

RED+GREEN - The compressor is in a PRE-SHED mode. Not enough amps available to start it.

UPPER LEFT CORNER

GREEN - The furnace is being command to run

LOWER LEFT

GRAY - There is a SCHEDULE running for this system

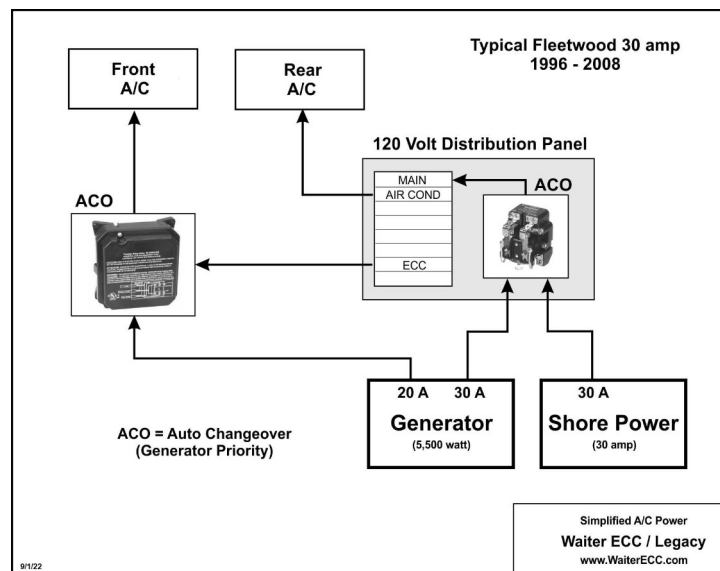
## SHED

SHED is a method to automatically turn off electrical loads so as not to exceed the SHORE AMPS capacity of the electrical system. Normally, SHORE AMPS is set to 30 amps, but the user can select lower values. (10 - 30). Shore amps is constantly monitored and displayed (AC AMPS). If an air conditioner compressor is running and the current draw exceeds the SHED value for over two seconds, the A/C compressor is shut off. See table for the specific SHED values that take place for the various SHORE AMPS selections.

If an A/C compressor is SHED, a small red rectangle appears in the upper right corner of the display to indicate the SHED took place.

Pre-shed – This is a new feature of the Waiter ECC. Before an A/C compressor is commanded to turn on, the system looks at the current shore amps, then computes what the amps will be if it starts the compressor. If the computed value exceeds the selected shore capacity (default 30 amps), the compressor is tagged as PRE-SHED. The current amps is constantly monitored, if the computed amps falls below the shore capacity, then the compressor can then be started immediately.

Note regarding generator usage. When running on generator, amps used by the front A/C unit may not show up on the screen.



On Fleetwood models that use a 5500 watt generator. The generator has output two circuits, 30 and 20. The 30 amp circuit feeds the 120 volt circuit breaker panel through an Automatic Change Over (ACO) solenoid. The front A/C unit is feed by the 20 amp circuit through its dedicated ACO. Since the front A/C units is feed directly by the generator instead of through the 30 amp circuit breaker panel, the amps used by the front A/C unit aren'tt being measured and therefore don't get displayed.

### **HARD START DELAY**

When the system is delaying a compressor start because of hard start delay, a small blue indicator will appear in the FRONT / REAR status window.

When a compressor is turned off, it has a substantial pressure built up at the output, called head pressure. Attempting to start a compressor with this high head pressure may be impossible and cause an overload. To alleviate this problem, any attempts to re-start a compressor is delayed to allow this head pressure to bleed down.

Any time a compressor is stopped, a “Hard Start Delay Timer” of 120 seconds is started. This timer counts down to zero. If the need to run the compressor happens before the timer has counted down, the compressor is not started, and marked as “Hard Start Delay”. A small blue rectangle will appear in the upper right corner of the display to indicate the compressor is being commanded to run, but cannot until the delay has counted down. Once the timer reaches zero, the compressor will be commanded to start.

### **SCHEDULE ACTIVE**

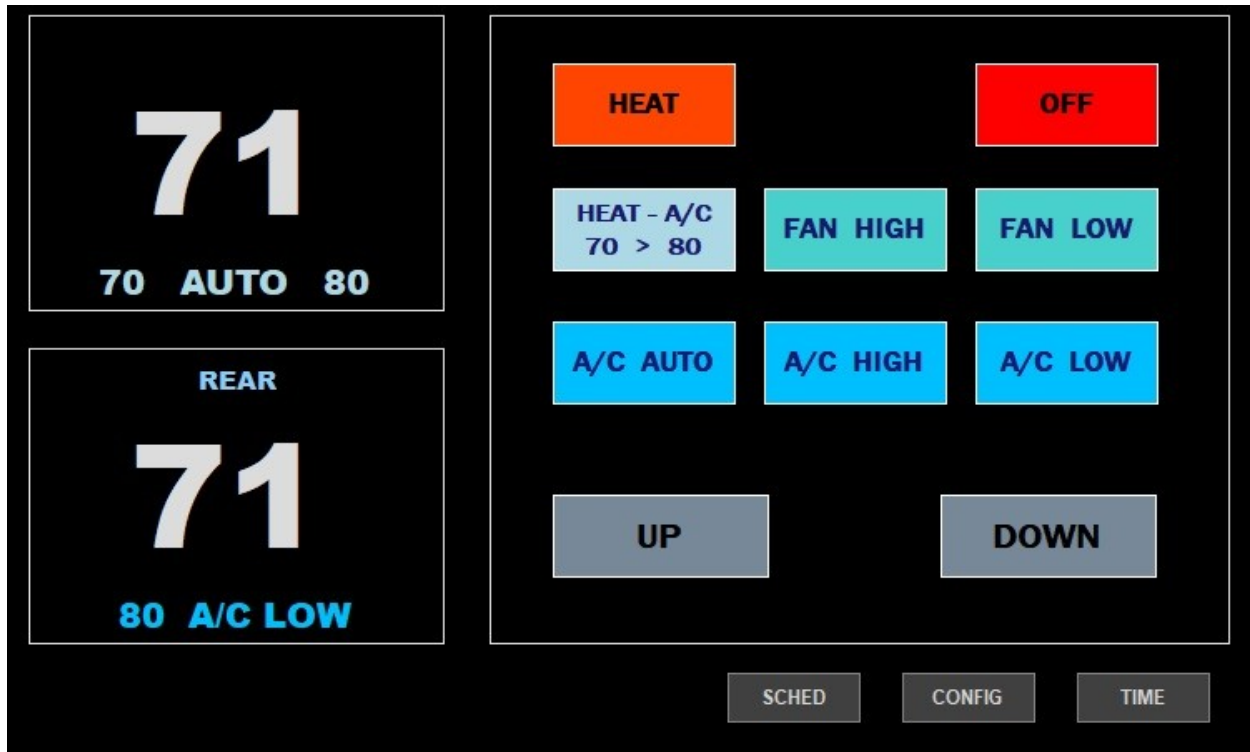
In the lower left side of the two temperature windows is the “Schedule Active” indicator. The indicator is a small white light that shows a schedule is active for that system (FRONT or REAR).

If there is no indicator lite, then the schedule is disabled for that system.

RETURN TO MAIN SCREEN – If you're on any screen and no buttons are pressed, the screen will automatically return to the MAIN screen after a delay. The delay is dependent on the screen your viewing. Most screens have a RETURN button that will return you to the MAIN screen immediately.

MODE screen delay – 10 seconds. WiFi Watchdog screen delay – 10 minutes. All other screens – 30 seconds.

## MODE SCREEN



The text “FRONT” or “REAR” blinks in the temperature windows to show what system we’re controlling.

Note: if your motor home is configured for only 1 furnace, the HEAT and HEAT – A/C buttons will not appear when you select the REAR mode screen.

If no buttons are pressed for 10 seconds, screen returns to the MAIN screen.

OFF – Performs three functions:

- 1) Turns the FRONT or REAR system OFF.
- 2) If the controller module is in the IO-TEST mode, pressing the OFF button sends the MQTT command to exit the test mode.
- 3) If any of the eight IO\_Relay modes are set to MANUAL, it’ll reset them to the AUTO mode.

HEAT - The set point limits for the HEAT system is 40 to 90 Deg F. The system calls for heat when the temperature drops below the set point. The call for heat continues until the temperature is greater than 1 degree above the set point. i.e. if the set point is 70, the heater will be turned on if the temperature drops below 70. The heater will continue to run until the temperature reaches 72 degrees or more.



If system is in the HEAT mode and the set point is at 40, this enables the “Freeze Protection” feature. See below.

HEAT A/C (70 > 80) - A new feature added in version 4.3.0 is a fully automatic temperature control. This controls both the furnace and A/C unit at the same time to hold their respective set points.

When this mode is selected, it'll show the set points and mode in the bottom of the temperature display window. In the above photo this is shown in the FRONT window and shows “70 AUTO 80”.

The HEAT and A/C set points are also displayed on the button. The set points must be at least 5 degrees apart in order to select this mode. If they're less than 5 degrees apart and you attempt to select this mode, the system will revert to the OFF mode until this is corrected.

The HEAT or A/C set points are set individually by selecting the respective mode (HEAT or A/C) and setting the set points there.

If the HEAT A/C mode is selected, the two set points can be raised or lowered as a group by using the UP and DOWN buttons. This will change both HEAT and A/C set points at the same time.

When in this mode, the HEAT will function as it normally does, and the A/C functions as if you had the A/C AUTO mode selected.

If the HEAT set point is set at 40, this also enables the “Freeze Protection” feature. See below.

FAN HI , FAN LOW - Sets the air conditioner blower speed to HI or LOW. The compressor doesn't run in these modes, only the blower.

AC HI, AC LO – Enables the air conditioner and sets the blower speed to HI or LOW. The set point limits for the A/C system is 60 to 100 Deg F. The blower runs continuously at either the HI or LO speed. The compressor will start if the temperature goes above the set point and continues to run until the temperature drops more than 1 degree below the set point. See SHED.

A/C AUTO - In this mode, the A/C blower speed is automatically changed as the temperature changes. The normal blower speed is LO. The blower will switch to HI if the temperature is greater than 5 degrees above the set point. It will switch back to LO if the temperature is less than 4 degrees above the set point.

When the temperature drops more than 1 degree below the set point, the compressor turns off, then after a 30 second delay, the blower will shut off.

When the temperature goes above the set point, the blower turns on , then after a 15 second delay, the compressor will start if there is no SHEDing or hard start delay

UP / DOWN - Raise / lower the set point for the mode that's selected. Set points are remembered during power outages. The set point limits for the HEAT system is 40 to 90 Deg F. The set point limits for the A/C system is 60 to 100 Deg F.

In the event of a temperature sensor failure, the temperature will display -99 degrees. If this happens the furnace is disabled and will not turn on.

### **NOTE FOR CELSIUS USERS**

If the display units are set to "C" all temperatures are displayed in "C".

Please note, regardless of the display units on the operators touch screen, all MQTT communications to/from the controller module are done in "F". The control module does all of its internal calculations and control functions based on degrees "F". This includes set points and current temperatures.

What does this mean for "C" users? When you change a temperature set point, there may seem to be a delay or non response when using the UP/DOWN buttons to change set point. The set point is being changed by one degree "F", not one degree "C". Since 1 degree "C" is approximately two degrees "F", you may need to tap the UP/DOWN buttons twice to alter the "C" set point by one degree.

### **NOTE ABOUT FREEZE PROTECTION**

The Waiter ECC has a unique feature called "Freeze Protection". This feature is specifically intended for coaches that have heat ducts that blow into the basement areas, i.e. basement heat.

If either system is set to HEAT and the set point is set to 40, the system monitors the outside temperature.

If the outside temperature drops below 35 degrees, the furnace cycles for at least 2 minutes every 30 minutes, even if the inside coach temperature stays above 40 and never calls for the furnace to turn on.

If your coach has "basement heat ducts", this ensures that warm air is blown into the basement area at least once every thirty minutes.

## ALARM CLOCK SOUNDING



When the alarm clock sounds, two things happen;

- 1) The display brightness automatically goes to full brightness, and,
- 2) The outside temperature portion of the display text alternates between the temperature and the word “ALARM”.

SQUELCH ALARM - To squelch the alarm, touch any part of the main status area of the screen.

If the alarm is not squelched, it'll continue to sound for the number of seconds that were entered in the DURATION setting of the ALARM SCREEN.

After being squelched or timed out, the display operation returns to normal.

On the TIME page, if the alarm REPEAT is set to OFF, the alarm time will not be displayed on the MAIN screen.

If the alarm REPEAT was set to ONCE, the alarm will sound at the next alarm time, then automatically change this setting to OFF.

If the alarm REPEAT was set to DAILY, the alarm resets and will sound at the same time tomorrow.

Alarm clock setting are retained when power is turned off.

## TIME SCREEN

The screenshot displays the 'TIME SCREEN' interface. On the left, there are two speed limit indicators: 'FRONT' and 'REAR', both showing a speed of '70' and a status of 'OFF'. On the right, there are two main sections: 'TIME SET' and 'ALARM'. The 'TIME SET' section shows the current date and time: MONTH 10, DAY 28, YEAR 2020, HOUR 9, MIN 31, and AM/PM AM. Below this is a 'SET TIME' button. The 'ALARM' section shows the alarm settings: HOUR 10, MIN 55, AM/PM AM, DURATION 60, and REPEAT OFF. Below this are 'SAVE' and 'RETURN' buttons. At the bottom of the screen, there are three navigation buttons: 'SCHED', 'CONFIG', and 'TIME'.

**TIME SET** – Used to set the clock. The clock is located in the controller module and has a battery backup so it can keep track of time even when there is no power. There are no automatic time zones or daylight savings time. If a time zone or daylight saving changes, the operator will need to update the clock.

Click on the numbers to change them. When ready, click on SET TIME and the new time is uploaded to the Controller card and its time is set.

The clock has a battery backup. The battery (CR2032) has a life of about 5-6 years.

**ALARM** – Click on the items to change them Note that the MIN number is at 5 minute intervals.

DURATION – This is the number of seconds that the alarm will sound if it's not acknowledged. The alarm is acknowledged (squelched) by touching anywhere on the main screen.

REPEAT – OFF, ONCE, or DAILY.

OFF – No alarm and there is no alarm displayed on the main screen.

ONCE – Alarm sounds at the next alarm time, then sets the REPEAT to OFF.

DAILY – Alarm sounds every day, at the specified time.

**SAVE** – save the alarm settings to memory.

**RETURN** – Return to the MAIN screen.

## CONFIGURATION SCREEN

The screenshot displays the CONFIGURATION SCREEN with the following data:

Rpi VER	IO VER	WTR HTR	LEVEL	FRIG	GENER	Display Units	SHORE AMPS	
PC 4.7.4	2.7.3	-	-	-	-	F	30	
10/11/21	10/5/21							
10.1.7.106								
A/C ( k BTU)		Num	Temp Source			Corrections		Voltage
FRONT	REAR	Furn	OAT	FRONT	REAR	FRONT	REAR	
13	13	2	1	4	4	0	0	13.34
SHED		Touchscreen Brightness						
SEQUENCE	MINUTES	Day Start	MIN	Nite Start	MAX	MIN		
REAR	30	8:30 am	100	10:00 pm	30	14		

Buttons at the bottom: QUIT, wifi / SSID, SAVE, RETURN, SCHED, CONFIG, TIME.

**Rpi VER** – Version number and date for the application software running on Operator touch screen, the version date, and the WiFi IP address that the touch screens access point has assigned to the controller circuit card module.

If this is a REMOTE add on touch screen, the WiFi IP address (DCHP) that was assigned by the main touch screen access point will be displayed.

NOTE on IP address. For the main touch screen, this will normally be 192.168.50.10. However, if a hard wired network cable is also plugged into the main touch screen, that IP address will be shown.

**IO VER** – This is the Version number and date for the Controller module firmware.

**WTR HTR - LEVEL - FRIG – GENER** – Firmware version numbers for optional controller modules, if installed.

**Display Units** – Defines what units temperature will be displayed in, Celsius or Fahrenheit.

NOTE – Regardless of what TEMP UNITS is set to, the control board always operates in F and all MQTT transactions to and from it are in F. What does this mean? EXAMPLE: When configured for C, the operator may sense a delay or what may appear as a non-responsive keypad when changing set points. When a set point UP/DOWN button is pressed, it raises/lowers the set point by one degree F, not one degree C. Since one degree C is approximately 2 degrees F, you may need to tap the UP / DOWN buttons twice in order to change the set points by 1 degree C.

**SHORE AMPS** - Amperage capacity of the shore power connection. Used for PRE-SHED and SHED operations. (10, 15, 20, 25, 30, default is 30)

This feature is useful when plugged into something less than 30 amps and you want SHED and Pre-SHED protection at a lower amperage than the standard 30 amps. i.e. Plugged into a pedestal with a weak 30 amp breaker that trips at less than 30 amps. Or, plugged into a 15/20 amp household outlet.

The chart below shows the effects for the different “SHORE AMPS” selections.

WARNING (Yellow) – The “AC AMPS” text on the main screen changes color to show a warning (Yellow color) if the amps is equal to or greater than this value.

SHED – If the amps is equal to or greater than this value for approximately 2 seconds, a compressor is shed.

<b>SHORE AMPS</b>	<b>WARNING (Yellow)</b>	<b>SHED</b>
30	24	28
25	20	23
20	15	18
15	12	14
10	7	9

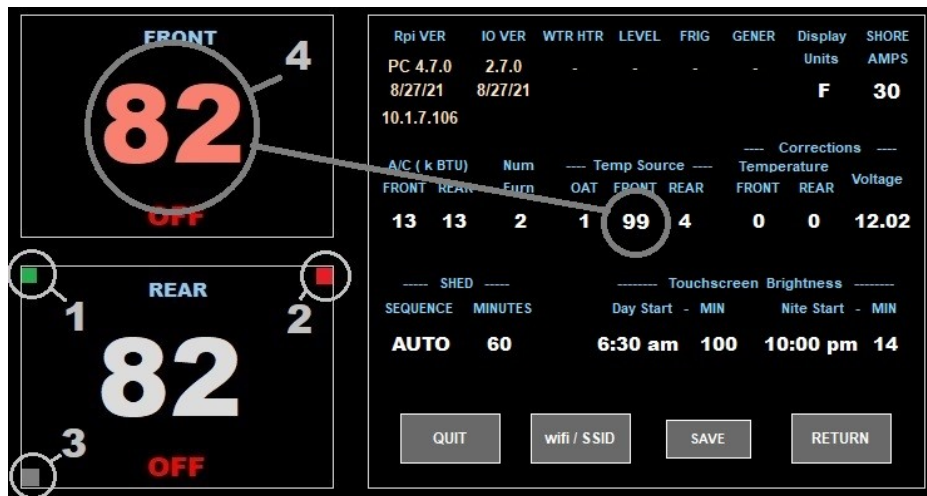
**TEMP SOURCE** – Defines what sensors or source to use for the three temperatures, Outside, Front, Rear; (0, 1, 2, 3, 4, 99) DEFAULT = 1, 4, 4

The default for most installations will be that the outside uses electronic sensor #1. The front and rear use the original thermistor sensors plugged into the back of the touchscreen, #4.

If the front and rear sensors are plugged into the control module (early versions of the Waiter ECC) then they should be set to #0.

If electronic sensors are used in place of the original thermistor for the front and/or rear, their addresses will need to be determined by trial. i.e. use an ice cube on each sensor to determine what sensor is changing, then assign its address accordingly. See the INSTALLATION manual for instructions on how to do this.

If the OAT Source is set to “0”, the OAT temperature will not be displayed on the main screen.



When the Front or Rear “Source” is set to #4 (default for front and rear), the OEM temperature sensors are plugged into the rear of the touchscreen, and the touchscreen supplies the temperature to the controller module via MQTT messages at least once every 60 seconds. See Appendix A, note 9 in the Technical manual for MQTT topics and messages that are used to supply temperatures to the controller board.

Added in version 4.3.0 is the ability to use only one sensor for both the front and rear units. This would be used in the event of a sensor failure.

Setting the TEMP SOURCE to “99” tells the system that the sensor has failed, and to use the good sensor for both front and rear control. The temperature from the good sensor will be displayed in both FRONT and REAR windows.

If a sensor is marked with a “99”, the temperature for that sensor will be shown in a light red color. This serves as a reminder that the sensor has been marked as faulty.

**TEMP CORRECTION** - (-10 to +10 degrees F) The original thermistor sensors are very accurate, and if plugged into the back of the touchscreen, rarely need a correction (Leave set to zero).

However, if the sensors are plugged into the control module (early model Waiter ECC systems) because of minor differences in wire length, quality of connections, A/D converter drift, etc., they could be off by a few degrees. This seems to be consistency about +5 degrees of correction needed.

If you'd like to check the accuracy, you can use the external temperature probe (very accurate and not effected by cable lengths) to calibrate the original thermistors. Enter this calibration factor to correct for the minor differences in the thermistors.

NOTE – The correction values are in “F”. For those users that display in “C” units, its advisable to perform the correction calibrations with the UNITS set at “F”, then switch back to “C” once the calibrations are complete and the correction values have been entered..

**VOLTAGE CORRECTION** – This allows you to calibrate the internal analog to digital converter circuits to read the DC volts accurately. This correction is performed before the board is shipped, but you can repeat it at any time.

Measure the DC volts with an accurate meter so you know what the voltage is. When you click on the correction, it increments the internal A/D scaler correction a small amount and you'll see the voltage displayed increase a small amount. The scaler correction has 30 steps. When it reaches step #30, the upper limit, the next step will be step 1, the lower limit. When that happens you'll see the voltage displayed drop by a couple volts, continuing to click on the display will once again cause the value to raise again. The range of calibration is approximately PLUS / MINUS two volts. Each step will add approximately 0.1 volts of correction.

**NUMBER FURNACES** – Some installations may only have one furnace, this configures the controller and Operator touch screen to properly interact with either configuration.

In motor homes with only one furnace (the FRONT), When a mode screen is called up for the REAR system, it will not display the HEAT or HEAT – A/C buttons. Also – HEAT and HEAT – A/C options will not be available for the REAR system in any of the SCHEDULES.

**A/C UNIT (k BTU)** – This is used for pre-shed and SHED checking. Depending on the BTU rating of the A/C unit, the compressor will draw a certain number amps after its started and running.

#### Pre-SHED TEST.

By knowing the size of the A/C unit, we can estimate how many amps it'll draw after its started. If it appears that it'll exceed the shore power capacity that's been selected (10 – 30 amps), then the compressor is tagged as “Pre-SHED” and won't start.



The pre-shed amps values used are approximate for each btu selection and are used to for the pre-shed testing only.:

15 k > 11 amps

13 k > 9 amps

11 k > 6 amps

9 k > 4 amps

OFF > No Pre-Shed testing will take place. SHED is disabled in early versions of the software, See WARNING.

## SHED TESTING

Shore amps is continuously monitored. If an A/C units size has been set to any value other than OFF, the amps is monitored. If the compressor is running and the amps exceed the shore capacity (30 amps) the compressor will be commanded to shut down, (SHED).

## **DAY START and NITE START – Added after version 4.3.0**

Defaults to AUTO. Can be selected in 30 minute increments.

DAY START – When set to anything other than AUTO. The display will dim to the DAY DIM setting after this time and until either NITE AUTO or whatever the time is entered for NITE START.

NITE START– When set to anything other than AUTO. The display will dim to the NITE DIM setting after this time and until either DAY AUTO or whatever the time is entered for DAY START.

**DAY MIN, NITE MAX and NITE MIN** – Whenever the touchscreen is touched, it will go to either full brightness (Day) or the NITE MAX level if its night. When there is no activity on the Operator touch screen, it will automatically dim after about 30 seconds. There are two dim settings, one for day and one for night. The display will dim according to what time it is.

The touch screen software computes an estimated sun-up and sun-down time based on the day of the year. The AUTO dim times are computed sun-up minus 15 minutes, and computed sun-down plus 1 hour. The display will dime based on these times (if AUTO selected) or whatever time is entered for DAY START and DIM START.

The initial DAY DIM and NITE DIM values may need to be adjusted to accommodate your particular installation. There are three factors to determine the values:

1) Every display is slightly different, so a “14” on one display may be brighter or dimmer than a

“14” on a different display. Also, the number isn’t linear, i.e. a “20” isn’t twice as bright as a “10”.

2) As the display ages, its brightness will change. After a few weeks of operation, the dim setting may need to be updated

3) The lighting condition of the room and surroundings vary. Different people may want the display brighter or dimmer. At night, the room is very dark. Set it so you can see the clock, but it doesn’t light up the room or is disruptive. The DAY value is brighter so the display can be read without the need to touch it.

If the DAY brightness value was changed, it takes effect immediately when the RETURN button is pressed so you can see the results of the setting.

**SAVE** – Most configuration parameters are utilized and saved on the controller circuit card module. However, some parameters are particular to the touch screen, and therefore saved on the touch screen, not the controller board.

This information is saved on the touch screen computer in the form of an XML file. This file is then read the next time the touch screen is booted up.

A current example of the entire CONFIG.XML file can be seen in Appendix D of the Technical manual.

**WiFi/ SSID** – Added as of version 4.5.0. Calls the WiFi / SSID screen that allows the user to select between two SSIDs and also the channel number.

**RETURN** – Returns to the MAIN screen. Requests a complete MQTT status update from the controller card. If there is no touch screen activity in a 30 second period, the screen will automatically return to the main screen.

**QUIT** – Exit the Operator Screen program. A warning screen is displayed to confirm you really want to do this.

## SCHEDULE SCREEN

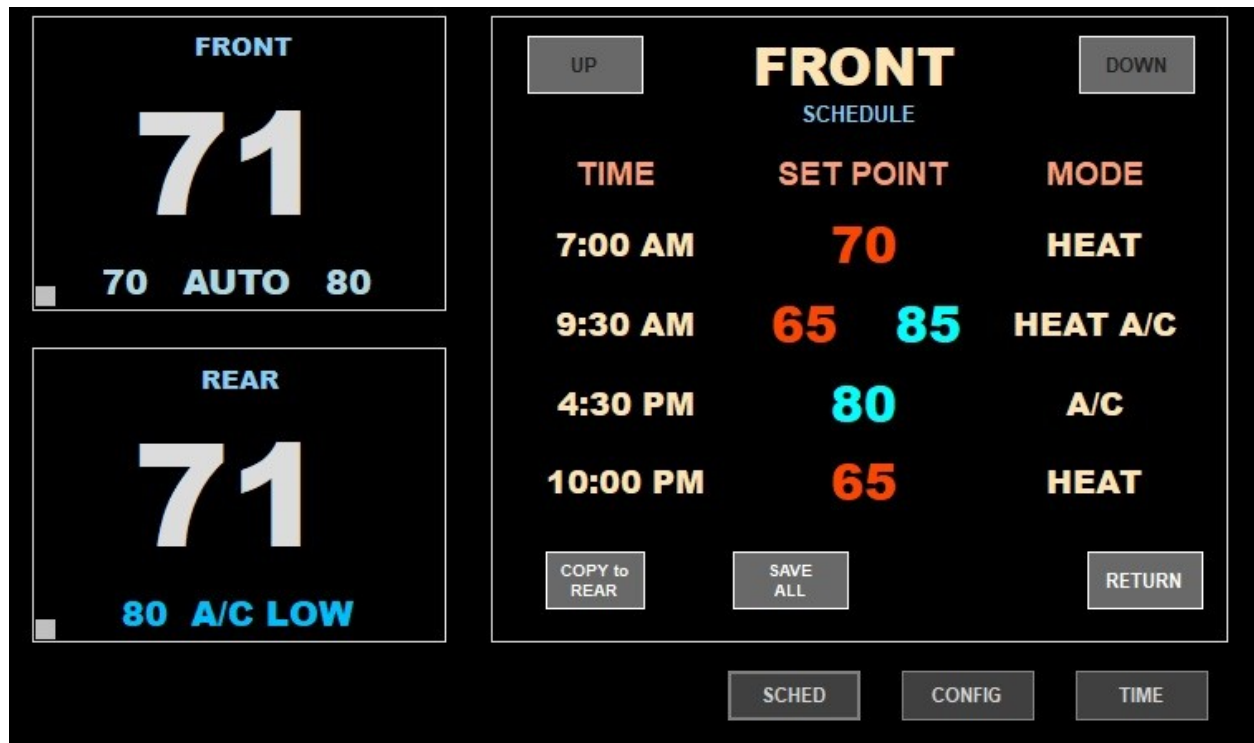


Figure 1: SCHEDULE SCREEN Version 4.3.0

Schedules allows the mode and set points to be programmed to occur at different times of the day. The FRONT and REAR systems are independent of each other. Each system can have up to 4 scheduled events. When an event is triggered, it behaves exactly as if a human being had made the changes on the MODE screen. The new MODE and SET POINT are sent to the control module.

NOTE – MODE set to A/C places the system in the A/C AUTO mode when activated.

Notice in the lower left corner of the FRONT temperature display window is a small white/gray indicator, This indicates that the FRONT system has an active schedule of events Note that the REAR system does not have an active schedule, so the light isn't illuminated in the REAR lower left corner.

Switching between FRONT and REAR schedule displays can be accomplished in two ways.

Either tap the FRONT or REAR temperature windows, OR, tap in the top center of the schedule window where it says "FRONT" or "REAR".

MODE - There are four "schedule event" lines for the FRONT and REAR. Each event can be programmed for "HEAT", "A/C", "HEAT - A/C", "OFF", or disabled "----". To change a lines MODE, simply tap on the text. It will toggle between the different modes available (NOTE: If

only one furnace is installed, then the “HEAT” and “HEAT – A/C” modes are not available in the REAR system schedules.

**TIME** – To change the time for an even, first highlight it by tapping the time, it will change color to green to show its the one being changed. Note when the TIME turns green, the UP and DOWN buttons become active. Tap on either button to raise or lower the time.

**SET POINT** – The set point changes in the same fashion as the TIME, tap on the SET POINT to and it will highlight to green. Use the UP / DOWN buttons to change the temperature.

When adjusting set points for the HEAT – A/C mode, the set point on the left is for HEAT, the set point on the right is for the A/C.

**COPY** – Copy a displayed schedule to the other system. Example – If the FRONT system is currently displayed and being edited, if the COPY button is tapped, it will copy the FRONT schedule to the REAR schedule.

If only one furnace is installed, When copying to the REAR from the FRONT, HEAT or HEAT – A/C schedules are not copied to the REAR. These will be copied as no schedule, “----”.

**SAVE** – Saves both FRONT and REAR schedules to the CONFIG.XML file. See Appendix D in the Technical manual.

The SAVE button will change to a green color if any changes are made to a schedule. Click on the SAVE button to save the schedule.

**NOTE** if no screen activity is seen for 30 seconds, the screen switches back to the main screen without saving the schedule.

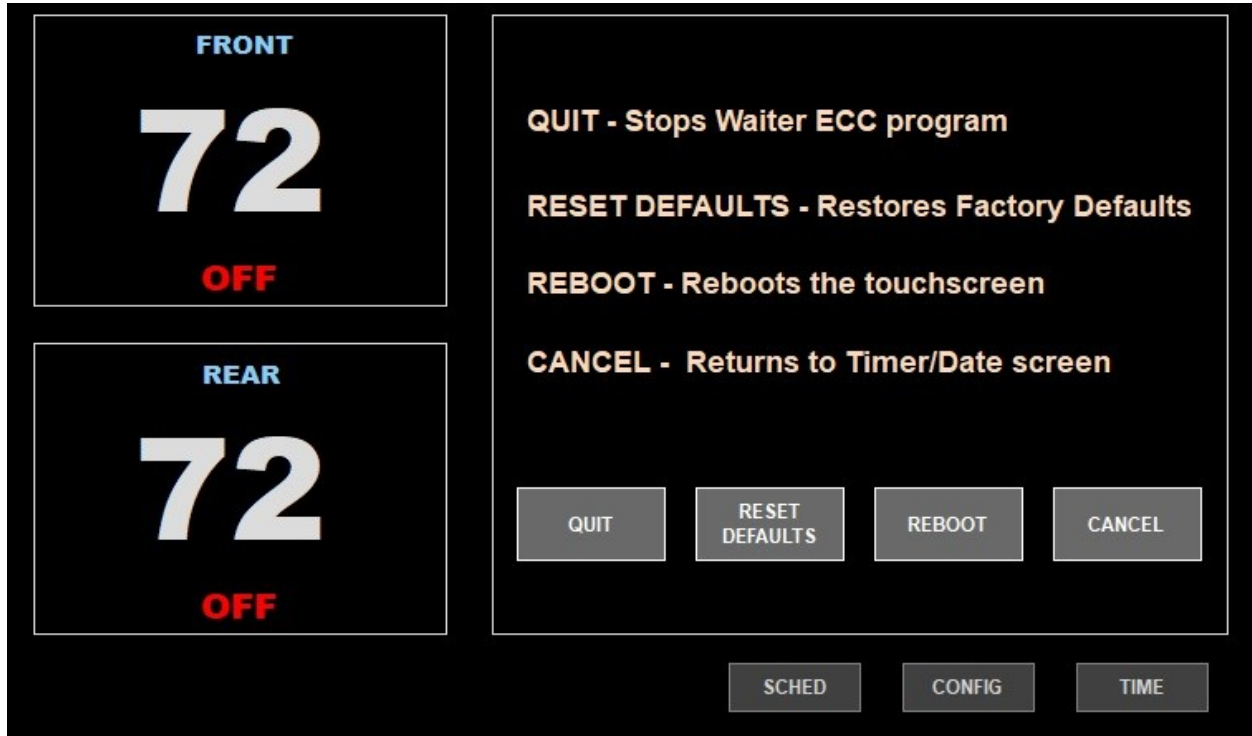
**Remote Touch Screen.**

If you have the optional remote touch screen, its schedules are completely independent of the main screen schedules. What ever is programmed on the remote screen will occur independent of the main screen.

“

If you have different events programmed for exactly the same time. Whichever touchscreen sends its MQTT message last will be the winner.

## QUIT SCREEN



The quit screen was changed in version 4.5.0 to add the ability to re-boot the touchscreen computer.

**QUIT** - Exits the program but doesn't reboot the touchscreen computer. A blank screen is displayed.

If the program is QUIT, the only way to restart it is to re-boot the entire system using the 12 volt power switch.

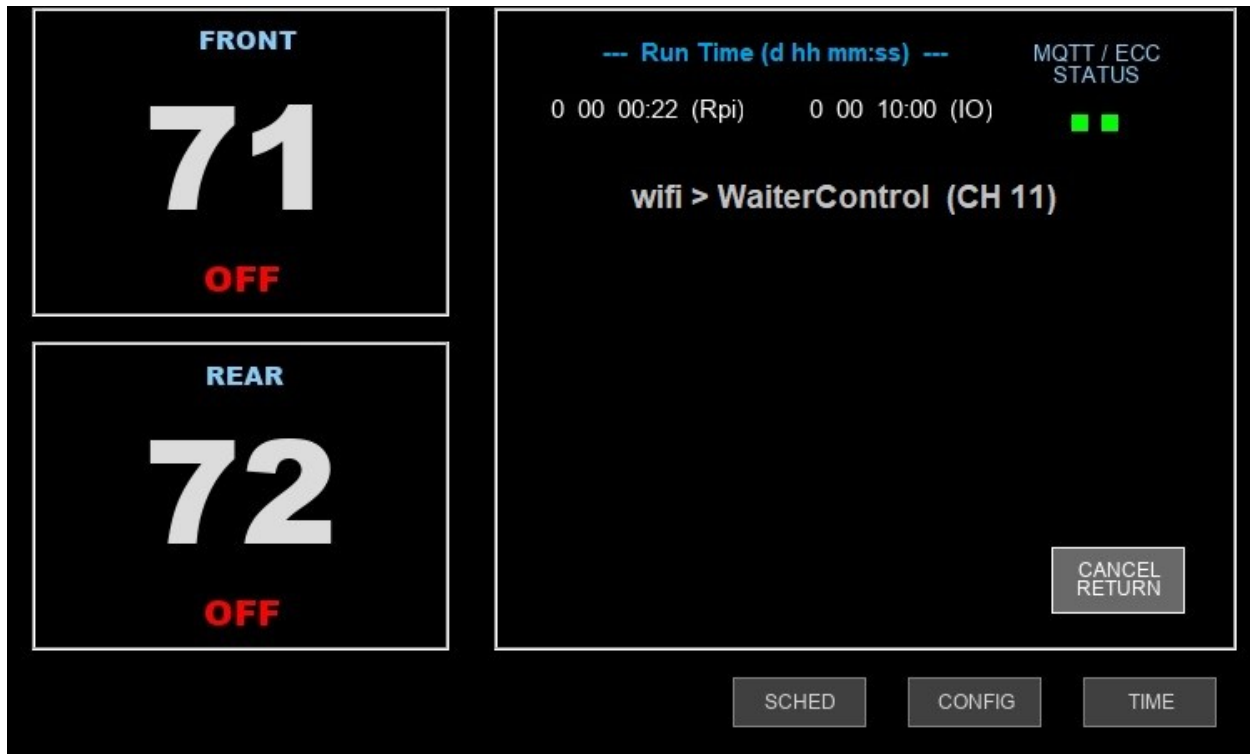
**RESET DEFAULTS** – Resets all configuration, modes, schedules, etc to factory reset. It then reboots the control module and touchscreen.

**NOTE** – Since all configuration data is saved to the control module, if there isn't a connection, then the control module configuration data will not be saved. However, the touchscreen will reboot.

**REBOOT** – Reboots the touchscreen computer.

**CANCEL** – Returns to the MAIN SCREEN of the Operator touch screen.

## WiFi / SSID SCREEN



### Run Time

Indicates the time since last reboot for both the touchscreen and the control module:  
days hours minutes:seconds

### MQTT/ECC Communications Status

The two indicators show the current status of the MQTT broker (left) and ECC communications (right).

The MQTT broker software is located in the touchscreen. The left indicator shows that MQTT messages are being properly received and re-transmitted from the MQTT broker.

ECC (control module) status shows that the control module is communicating with the MQTT broker via the WiFi connection.

SSID – WaiterControl or WaiterControl2 The SSID is assigned at time of purchase.

SSID and Channel number explained: A very good analogy: Your shipping your information in a

box.

**SSID:** The sender (touchscreen) must select one or the other, FedEx or UPS, two totally separate trucks. Which truck do you send your package on. This would be the SSIDs.

The receiver (control module) must know who it will be receiving boxes from, FedEx or UPS, one or the other, but not both. If you select FedEx it'll watch for the FedEx truck and receive boxes from FedEx only, it won't look for the UPS truck nor will it receive any packages from UPS.

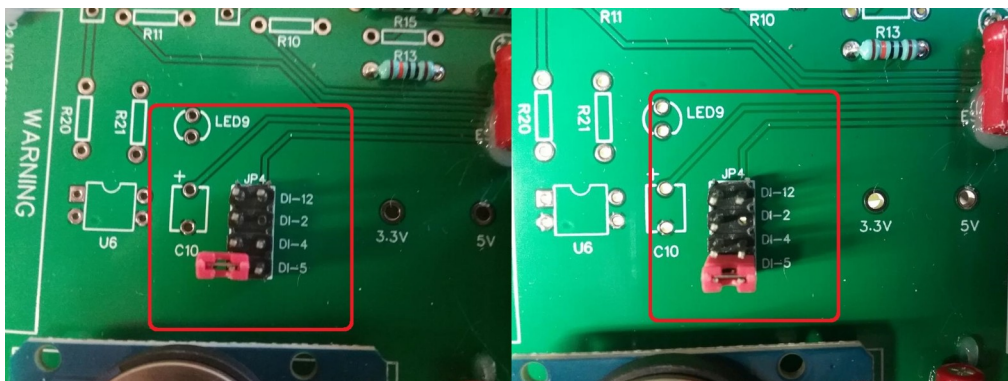
**Channel Number:** When the FedEx or UPS truck picks up your box, you get to tell them what route to take to get to the receiver. There are two different routes to choose from, ch6 or ch11, select your route based on traffic. If one route is busy, try the other route.

In early versions, you cannot select the truck (SSID), but you can select the route the truck will take (channel number 6 or 11).

The receiver (the control module) doesn't care what road the truck takes. So there is no need to select the channel number on the receiver.

How to select the SSID depends on what version control module circuit board you have.

### **Control Module circuit board prior to version 2.0**



P4–DI-5 jumper selection on the control circuit board **MUST** match the SSID selection made here or the system touchscreen and control board will not communicate with each other.

- DI-5 > not jumpered (left) = WaiterControl (default).
- DI-5 > jumpered (right) = WaiterControl2.

See the WaiterECC\_NOTES\_4\_5\_0.pdf for instructions on how to set this important jumper.

## **Control Module circuit board as of version 1.11**

ALL switches should be in the position shown for default operation.

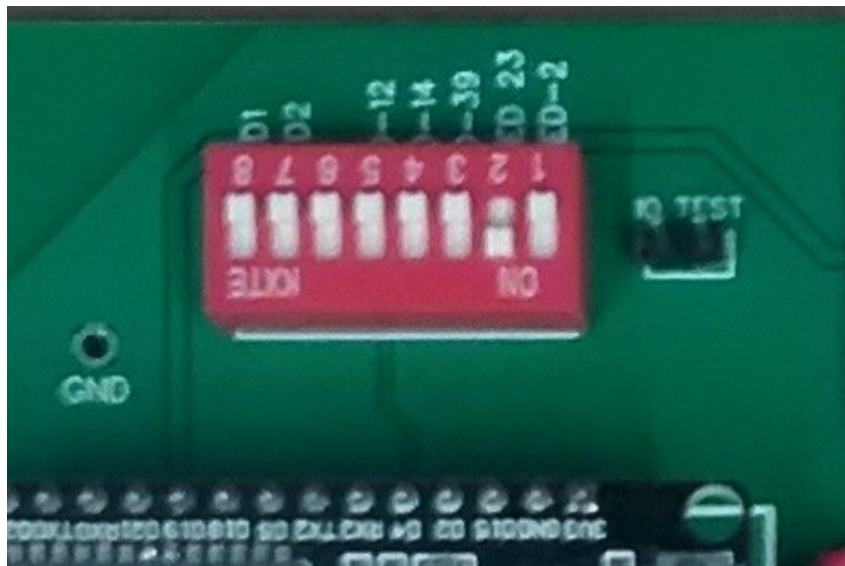
LED-2 (SW1) selects the temperature error signal to display on the SIG RX LED indicator

LED 23 (SW2) DEFAULT selects the wireless sig packet received to display on the SIG RX display.

ADD1 (SW8) selects the SSID.

SW8 > OFF = WaiterControl (default).

SW8 > ON = WaiterControl2.



## **Other features of control module circuit board Version 2.0 and up**

IO TEST - momentarily short the two pins together forces the IO board into a self test mode. Each of the 8 outputs are energized for one second, and a beep is sent from the touchscreen. To stop the self test, either reset power, OR, on the touchscreen, select OFF for either the front or rear systems.

8 LED indicators show what items are being commanded to run

Blue LED - SIG RX indicator shows when a wireless information packet has been received

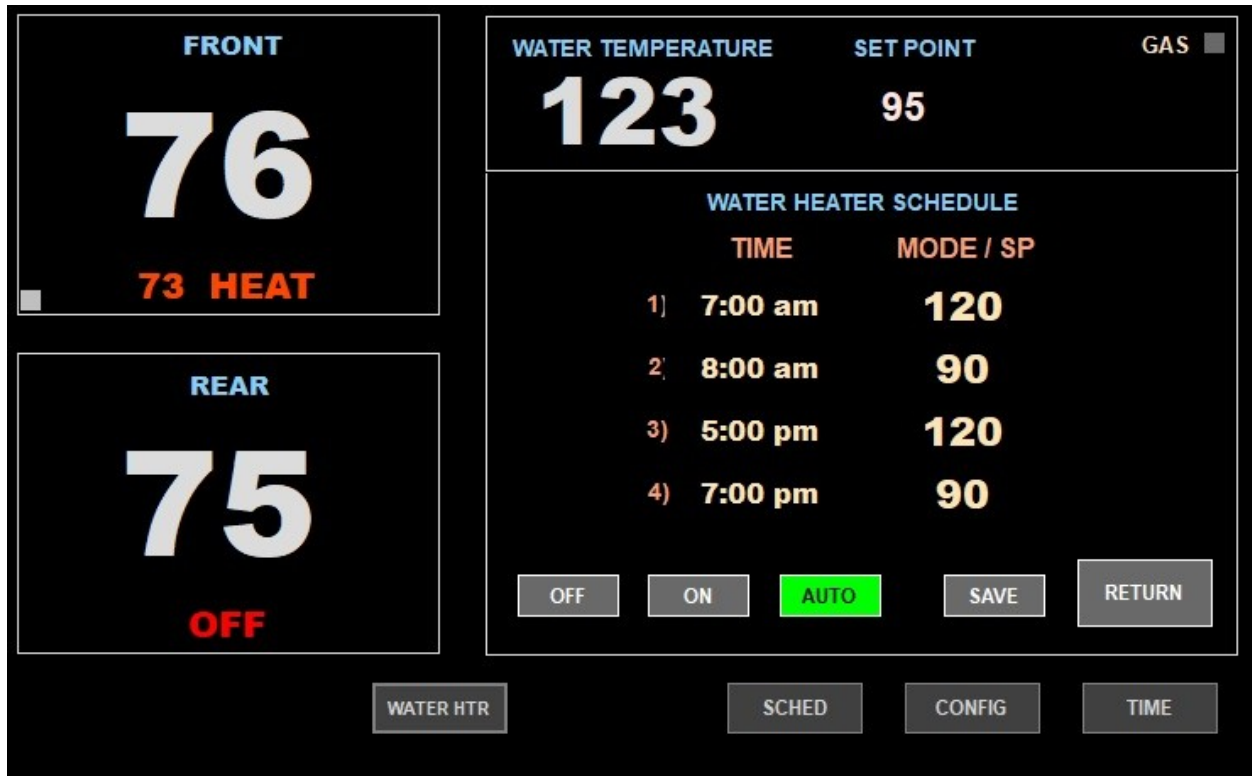


# APPENDIX A

## Optional controllers

### WATER HEATER CONTROLLER (Optional)

Requires custom Waiter Water Heater Control board.



The water heater normally has a fixed thermostat, it turns on at about 115 and turns off at about 140 deg F. Waiters ECC Water Heater IO allows the thermostat to be set at any temperature between 80 to 140 degrees.

**WATER TEMPERATURE** - Shows current temperature.

**SET POINT** – click to raise. Raises by 10 degrees, 80 – 140.

**GAS** – Displays states of burner.

GRAY > commanded OFF

GREEN > Burner gas valve ON.

RED > Ignition Error, burner did not light

## **WATER HEATER SCHEDULE**

**TIME** – one hour increments. A command will be sent at this time if enabled

**MODE / SP** – Mode or Set point,

**OFF** > Water heater will be commanded OFF

**ON** > Water heater will be commanded to operate using the OEM temperature sensor.

**XXX** > Water heater will be commanded to operate in AUTO with the temperature setting.

**----** > No commands will be sent.

**OFF** - Turn the water heater OFF.

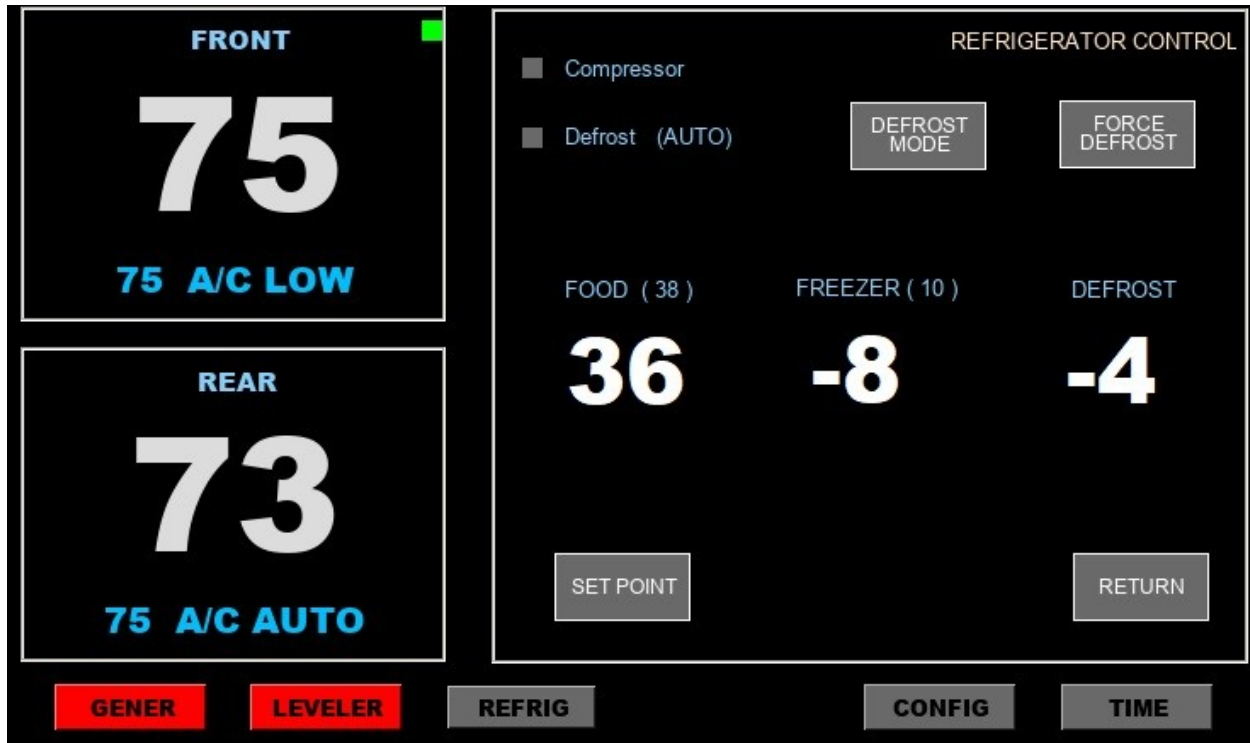
**ON** – Use the water heaters internal thermostat.

**AUTO** – Use the Water Water heater thermostat. Control temperature PLUS – MINUS 5 degrees of set point.

Water Heater schedule information is save in the CONFIG.XML file, See Appendix D in the Technical manual for descriptions of this file.

## REFRIGERATOR CONTROLLER (Optional)

Requires custom Waiter Refrigerator control module for a Clarion 10 cu ft refrigerator.



Control set point (1 – 5).

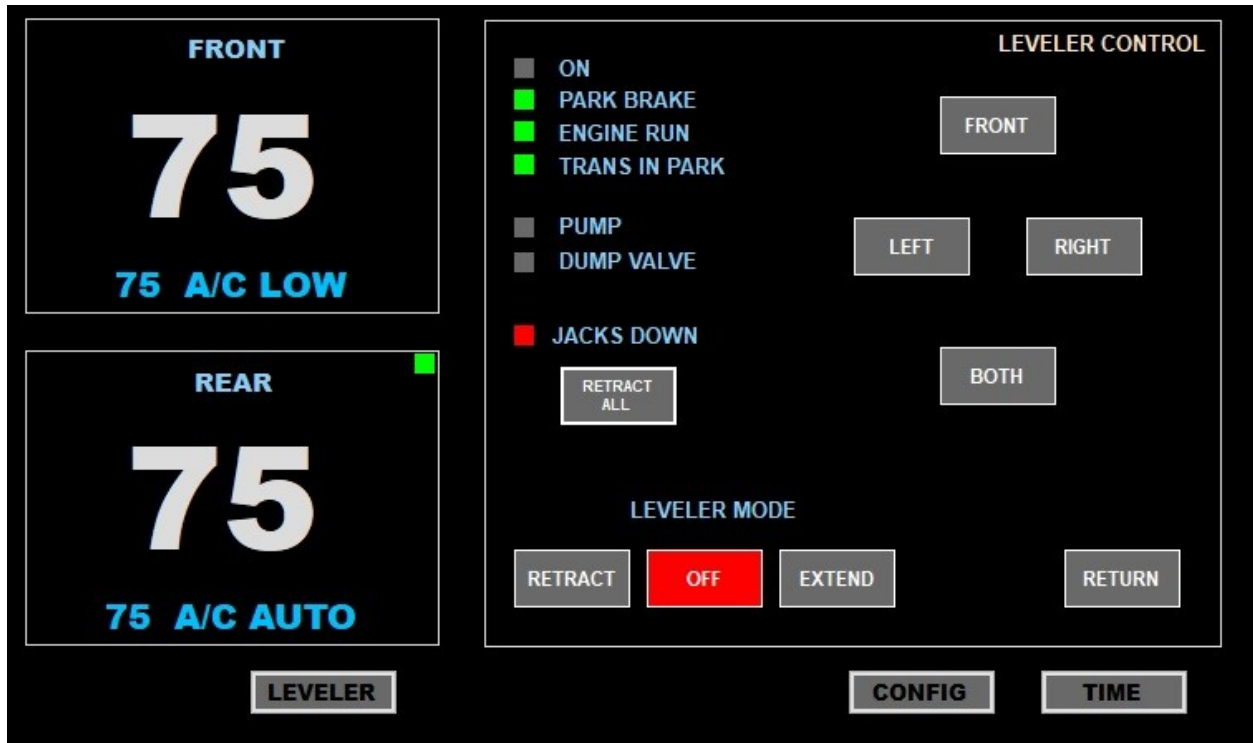
Control Defrost mode (AUTO / OFF).

Control Defrost mode ( turn Defrost ON or OFF ).

Compressor normally controlled by the food temperature set point, however, if SP5 is selected, the compressor is now controlled by both the food temperature and the Freezer temperature.

## LEVELER CONTROL (optional)

Requires custom Waiter Leveler Controller module.



Performs all functions as standard Power Gear leveler system.

Shows interlock status (parking brake, transmission, ignition).

Shows pump and solenoid status.

Allows jacks to be lowered and raised individually.

## GENERATOR CONTROL (optional)

Requires custom Waiter Generator Control module.

The screenshot displays a control interface for a generator. On the left, two panels show battery status: 'FRONT' and 'REAR', both at 67% with a '75 A/C LOW' and '75 A/C AUTO' status respectively. A 'GENER' button is below. The main panel on the right is titled 'GENERATOR START / STOP' and includes a 'START' button, a status indicator, and a 'STOP' button. Below this is a 'START ALARM' indicator. The 'START ON LOW VOLTAGE' section shows 'ON' status with '10.50' voltage and '1:00' duration. The 'SCHEDULE TO RUN AT THESE TIMES' section shows 'ON' status with a start time of '8:00 am' and duration of '1:00', and a second start time of '6:45 pm' with duration of '2:00'. The 'RESTRICT RUNNING TO THESE TIMES ONLY' section shows 'ON' status with 'BEGIN >> END' times of '8:00 am 12:00 pm' and '12:00 pm 8:00 pm'. At the bottom are 'UP', 'DOWN', and 'RETURN' buttons. A 'CONFIG' button is at the bottom right, and a 'TIME' button is at the bottom right.

Start / stop generator automatically when coach batter needs charging.

Start /stop generator at scheduled times.

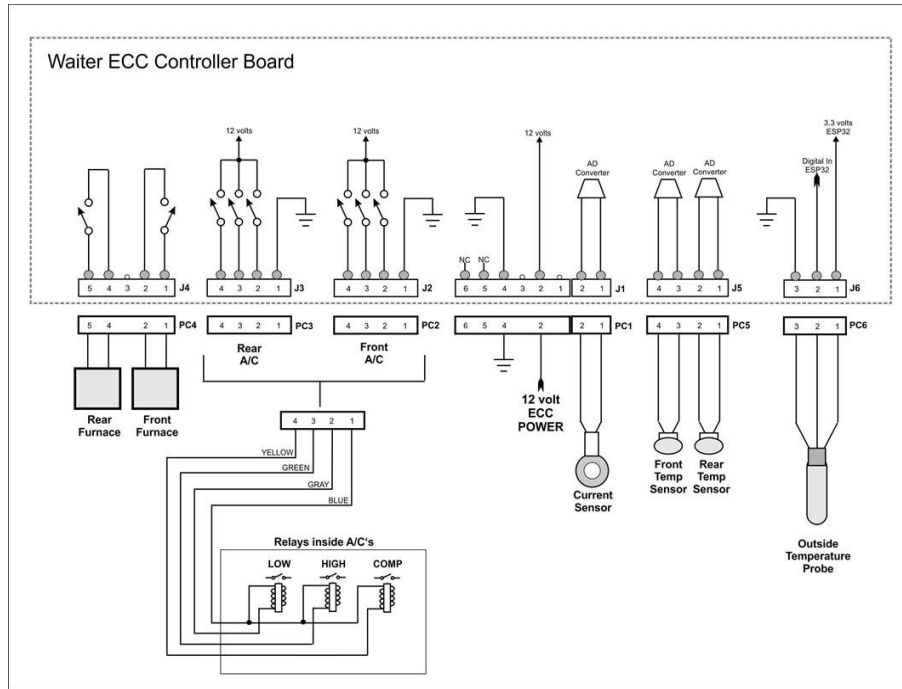
Define times generator is allowed to run (quite time).

Start Stop generator.

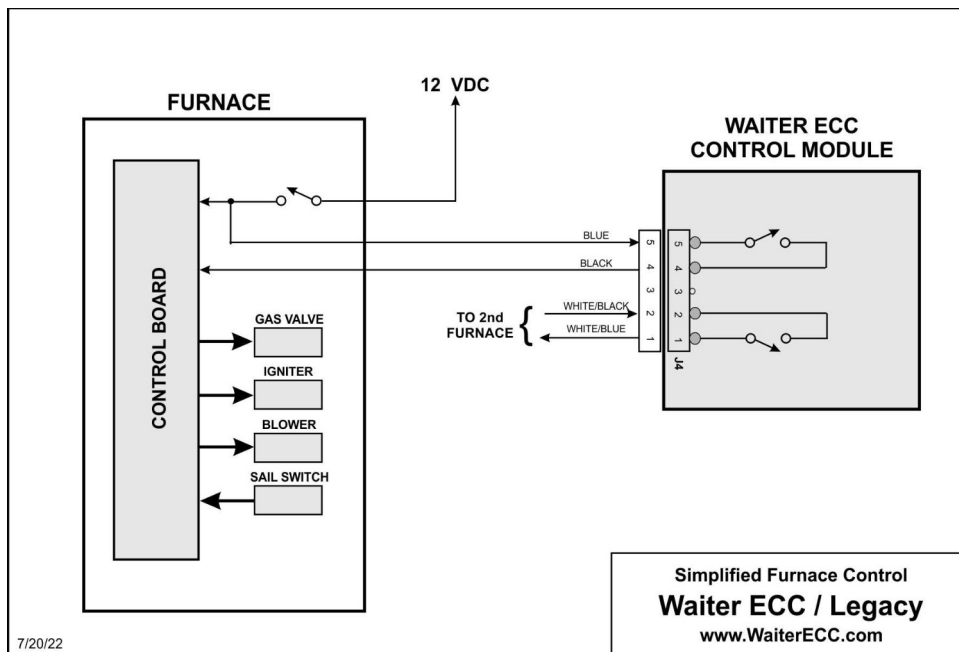
Show Generator status.

# APPENDIX B Circuit diagrams

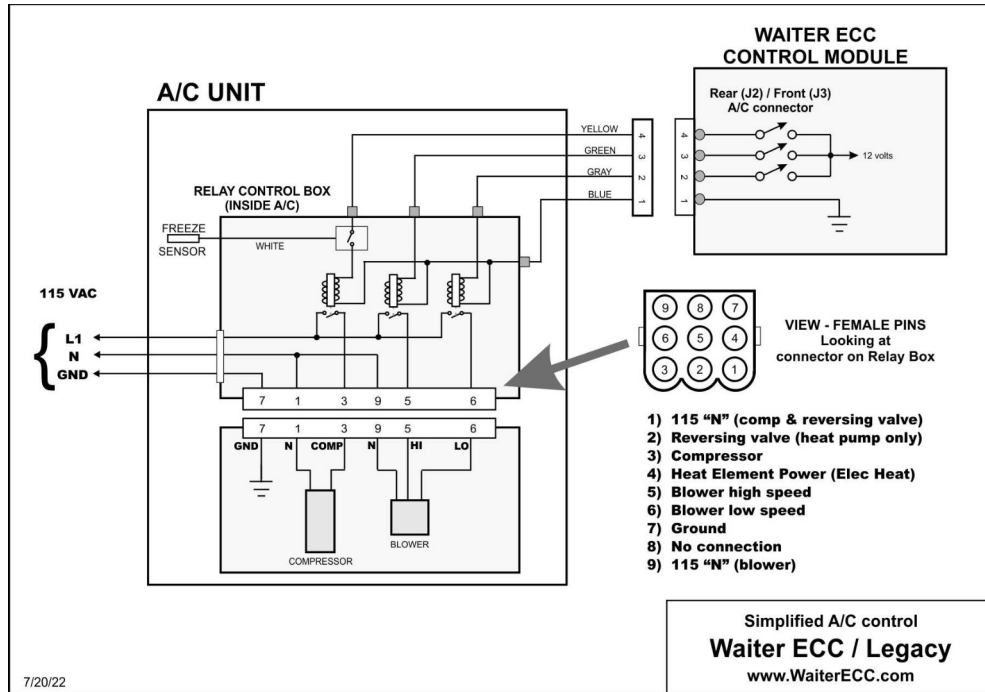
## SIMPLIFIED CONTROL MODULE DIAGRAM



## TYPICAL FURNACE WIRING



# TYPICAL A/C UNIT WIRING



# SIMPLIFIED 120volt POWER DIAGRAM

