



Installation Manual V2.4

SBW Series Wi-Fi Clock



SBW Series Wi-Fi Clocks

Table of Contents

Table of Contents	2	- Daylight Saving Time	51
Important Safety Instructions	3	- Servers	52
Identify Your Clock	4	- Display Settings	53
Preparing to Install - System/Network Requirements	5	- Elapsed Timer	54 □
Synchronization System Setup	6 - 7	- Login Settings	55
Configure multiple clocks with wifiDirectLoader	8 - 9	- Diagnostics	56
Wall Mount Installation	10 - 15	- Troubleshooting	57
Flag Mount Installation	16 - 23	- Input and Relay Settings	58 ■
Double Mount Installation	24 - 30	- Inputs	59 - 60 ■
Connecting to the Clock	31	- Outputs	61 - 62 ■
Adjustable Jumper Settings	32	- End Countdown	63 ■
Temperature Sensor Installation	33 □	- Software Update	64
Buzzer Installation	34 ■	Manual Controls	65
User Inputs Installation	35 ■	Frequently Asked Questions	66
Outputs Installation	36 ■	Troubleshooting	67 - 68
IP Monitor Software - Main Screen	37	Warranty	69
- Task Bar Options	38 - 41	FCC Statement	70
- Quick Access Menu	42 - 43		
- Error Messages	44		
Web Interface			
- Log In	45		
- Home Page	45		
- Network Settings	46-47		
- Enterprise Encryption Settings	48		
- General Settings	49		
- Time Settings	50		

- ☐ Available with 3200 and 3300 models
☒ Available with 3300 model only

VERY IMPORTANT:

CONFIGURE YOUR CLOCK BEFORE MOUNTING IT TO A WALL OR HOUSING. REFER TO THE SYNCHRONIZATION SYSTEM SETUP SECTION OF THIS MANUAL FOR INSTRUCTIONS.

All network equipment must be powered and configured before you install the clock. If the network equipment is not properly installed and powered, and if the clocks have not been configured to communicate with the network equipment, the secondary clocks will not synchronize.

Important Safety Instructions

DANGER



SHOCK HAZARD

- Keep the electricity to this device turned OFF until the clock installation is complete.
- Do not expose the clock circuits to water, or install the clock in a location where it may be exposed to water.

NOTICE

- Do not install the clock outdoors. Damage to the clock if placed outdoors voids the warranty.
- Do not hang objects from the clock or clock mounting parts. The clocks are not designed to support the weight of other objects.
- The clock face and housing may be cleaned with a damp cloth or disinfectant. Test other cleaning products on a small part of the clock housing before attempting to use on the rest of the clock. Avoid bleach and chemicals known to dissolve plastics.

WARNING



FIRE HAZARD

- Always follow your national and regional electrical codes or ordinances.
- The AC power circuit for the clock must be attached to a circuit breaker that can be reset by the user.



PHYSICAL INJURY HAZARD

- If you are standing on an object while installing your clock, make sure that the object can support your weight, and will not sway or move as you stand on it.
- Take precautions to avoid injury by potential safety hazards near the point of installation including (but not limited to) heavy machinery, sharp objects, hot surfaces, or exposed cables carrying an electric current.
- Follow all mounting instructions exactly as stated in this manual. Failure to do so may result in the device falling off the point of installation.
- Packaging materials and mounting items include plastic bags and small pieces, which pose a suffocation hazard to young children.

Identify Your Clock

A label containing the part number of your clock is attached to the clock packaging

If your part number begins with SBW-31, you own a 3100 Series clock

If your part number begins with SBW-32, you own a 3200 clock

If your part number begins with SBW-33 you own a 3300 clock*

If the second group in your part number ends in S (31S, 32S, 33S), you own a Surface Mount Clock, which can be attached to a pole as a Flag Mount or a Double Mount.

If you wish to change the mounting type, contact your dealer.

Preparing to Install - System/Network Requirements

To be able to set up an IP-based synchronized clock network, you will need the following items:

- This manual
- A Wireless Local Area Network (WLAN) that has access to at least one of the following:
 - An in-house NTP server
 - The Internet
- A local firewall that is open on Ports 80 (TCP), 123 (UDP), and 1777 (UDP)
- At least one laptop or desktop computer with access to the following:
 - The same LAN as the clocks
 - The same subnet as the clocks
 - A web browser such as Internet Explorer, Microsoft Edge, or Mozilla Firefox.
 - An internal or external Wi-Fi network card.
- A wireless router or wireless access point for the LAN that operates on the subnet 192.168.0.##, and broadcasts using an 802.11 b/g/n protocol.
 - Depending on the size of the network, you may need to install additional Wireless Access Points.
- A copy of the monitor.exe program.
- Security access to all of the above items.
- A means of keeping a record of the clock serial numbers, locations, and IP addresses. Create a table like the one shown below:

SERIAL #	LOCATION	IP ADDRESS

Synchronization System Setup

Positioning the Wireless Router or Wireless Access Point (WAP):

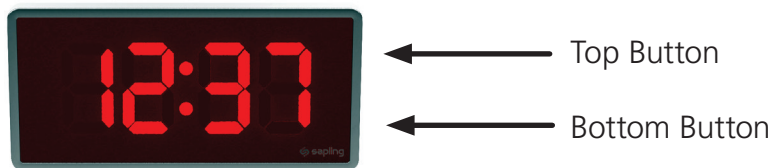
The main router or WAP should be installed in a central location. Depending on the transmission protocol of your router, the clocks must be located within the following ranges:

Wi-Fi Protocol	Range (Feet)	Range (Meters)
802.11 b	115 feet	35 meters
802.11 g	125 feet	38 meters
802.11 n	230 feet	70 meters.

Check with the access point or router manufacturer, as some transmitters offer boosted ranges.

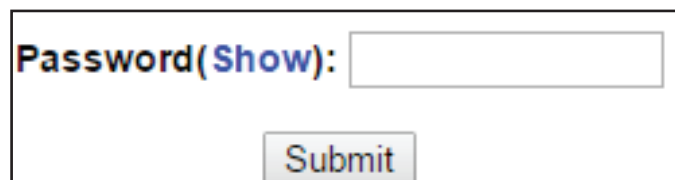
*NOTE: This clock is not compatible with 802.11a or 802.11ac protocols. Many AC-compatible routers and access points are backwards compatible with 802.11n. Check your router settings for more information.

Be aware of walls or other obstructions made of thick concrete or sheet metal, as these may block the signal entirely.



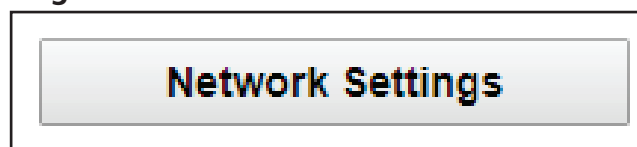
Logging into the SBW for the first time:

1. Power the clock. Press and release the Top Button on the front panel twice.
2. On a Wi-Fi enabled computer, check the available Wireless Networks. Refresh the available networks until a network named Wifi-DIGITAL-#### appears (where #### is the serial number of the clock). This may take up to 30 seconds. Once it appears, connect to this network.
3. Open a web browser and enter the following web address into the URL field:
192.168.240.1/login.html
4. On the login page, use the password **6063** and click on **Submit** to log into the clock.



The screenshot shows a web form with the label 'Password(Show):' followed by a text input field. Below the input field is a button labeled 'Submit'.

5. Click on the **Network Settings** button.



The screenshot shows a single button with the text 'Network Settings' in bold black font.

Synchronization System Setup (ctd.)

NETWORK SETTINGS

	Clock Name:	Room 302
	Serial Number:	1109
	MAC Address:	60:36:96:0a:00:6d
	Select Network:	Series1 ▼
6	Network:	Series1
7	Network Password (Show):	
	DHCP Auto On:	On ▼
	IP Address:	192.168.4.4
8	Subnet Mask:	255.255.255.0
	Gateway Address:	192.168.4.1
9	Auto DNS:	On ▼
	DNS Address:	192.168.0.31
	Broadcast to Monitors:	On ▼
	Send Specific Monitor IP:	Off ▼
	Monitor IP Address:	0.0.0.0
10	<input type="button" value="Enterprise Settings"/> <input type="button" value="Submit"/> 11	

6. In the **Network** field, enter the SSID of your preferred Wi-Fi network. This is the name that appears if you try to connect to that Wi-Fi network on any other computer, tablet, or smart phone. If you do not remember the name of your network, check to see if it has appeared in the **Select Network** list. A network that does not broadcast its SSID will not appear in this list. **SSIDs must use only English letters, numbers, and spaces. No symbols.**

7. In the **Network Password** field, enter the password of your preferred Wi-Fi network. Network passwords must be 32 characters or fewer, and are case-sensitive.

8. If you wish to set a static IP address, change DHCP Auto On from ON to OFF, then enter information for the Static IP address, Subnet Mask, and Gateway Address. To acquire this information, contact your network administrator.

9. If you wish to set a DNS server other than the one provided through DHCP, change DHCP Auto On from ON to OFF, change Auto DNS from ON to OFF, then enter an IP address for a new DNS server in the DNS Address field.

10. If your network does not use Enterprise Encryption, skip this step. If your network uses WPA2-Enterprise Encryption, click on the **Enterprise Settings** button and fill in the fields appropriate to your network. To acquire this information, contact your network administrator. When finished, press **Submit** to return to this page.

11. Press the **Submit** button, followed by the **Log Out** button.

12. The clock should connect to the new Wi-Fi network. Confirm by accessing the clock with the Wi-Fi Monitor (If clock DHCP is on and the computer is on the same subnet as the Access Point) or the new static IP address (if clock DHCP is off). If the clock is still not accessible, refer to the section of this manual labeled "Troubleshooting"

Configuring multiple clocks with wifiDirectLoader

wifiDirectLoader.exe is a piece of software that lets a user rapidly duplicate existing clock settings to other clocks of the same type (analog or digital). This is useful for large clock systems, where a user may not have the time to configure many clocks individually.

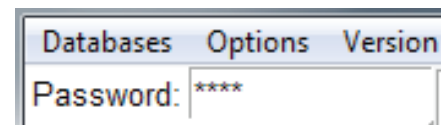
NOTICE: Starting wifiDirectLoader.exe will take your computer off of its current Wi-Fi network. If you need to access your network while simultaneously running this software, connect the computer to the network using a LAN cable.

Obtaining the configuration file:

1) **DO NOT Start wifiDirectLoader.exe.** First, set up one clock using the steps described in the Synchronization Setup section of this manual.

2) Once you have completed all the steps, exit the clock.

3) Start wifiDirectLoader.exe by double-clicking on it.. Enter the value **6063** in the password field.

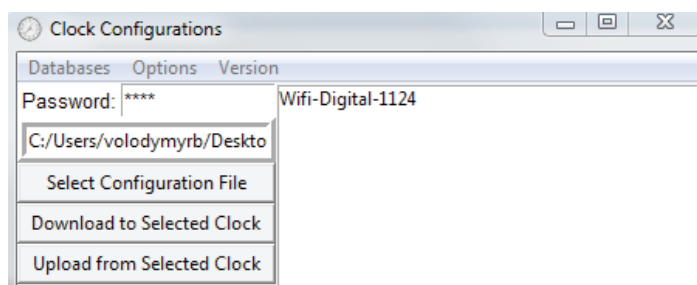


4) Power the clock. **Press and release the Top Button on the front panel twice.**

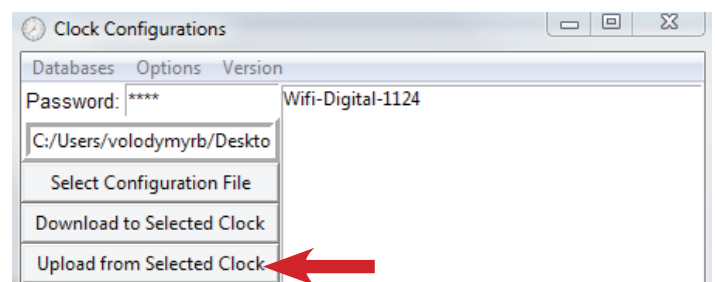


← Top Button

← Bottom Button



5) In the wifiDirectLoader.exe window, an entry should appear for the clock.



6) Click on the entry name for the clock, then press on the Upload from Selected Clock button.

7) Save the configuration file to an easily-accessible location, like your My Documents or Desktop folder.

Configuring multiple clocks with wifiDirectLoader

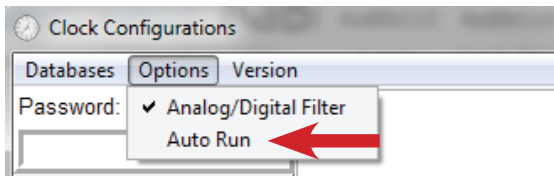
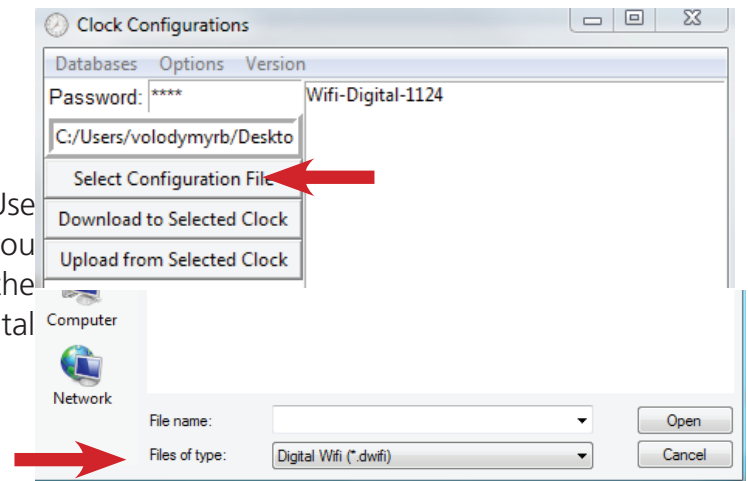
Before Applying the configuration file:

The fastest way to perform this process is to collect all of the Wi-Fi clocks in a single room and run this program.

Since Wi-Fi has a limited broadcast range, you will need to take a mobile, Wi-Fi-capable computer such as a laptop or ultrabook that runs wifiDirectLoader while you go to each clock.

Applying the configuration file:

1) Press on the Select Configuration file button. Use the window to select the configuration file that you downloaded from the first clock. If you cannot see the file, confirm that the Types of File field is set to Digital WiFi (*.dwifi).



2) Under the Options menu, select Auto Run.

3) Power additional clocks and place them into direct mode using Step 4 from the previous page.

4) wifiDirectLoader.exe will automatically program every clock that appears. Clocks can be identified by their Serial Number, which will appear as part of the name of each clock that appears in the field to the right of the buttons.

5) Once each clock is programmed, the clock may be powered down, then mounted on the wall using the instructions in the following sections.

6) Once all clocks are programmed, exit out of wifiDirectLoader. You will be unable to access any other networks if wifiDirectLoader is still running.

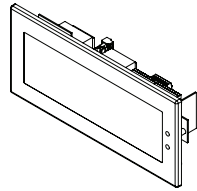
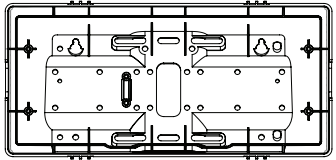
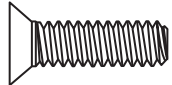


Wall Mount Installation

VERY IMPORTANT:

CONFIGURE YOUR CLOCK BEFORE MOUNTING IT TO A WALL OR HOUSING. REFER TO THE SYNCHRONIZATION SYSTEM SETUP SECTION OF THIS MANUAL FOR INSTRUCTIONS.

All network equipment must be powered and configured before you install the clock. If the network equipment is not properly installed and powered, and if the clocks have not been configured to communicate with the network equipment, the secondary clocks will not synchronize.

Included in Package

Description	Quantity	Picture
SBW Digital Clock	1	
Digital Clock Wall Housing	1	
6-19x1/2 screw	4	
6-32x1 screw	4	
Included in Wiring Kit (D-PK-3-110-S or D-PK-3-24-S)		
Power/grounding wires and connector	1	

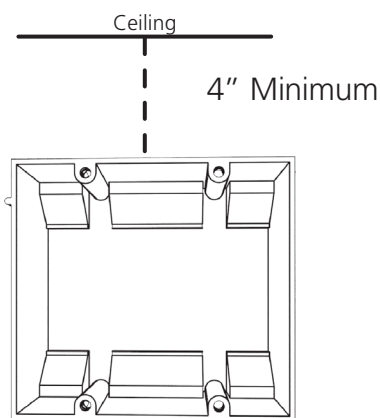
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small flat-blade screwdriver, a double gang box, any equipment needed to install the gang box, and any additional wiring needed to extend the signal, power, or ground cables. You may also need a 1/4 inch drill, 4 #8x1.5 self-tapping screws, and 4 wall anchors for those screws if you decide not to attach the clock directly to the gang box.

If any of the items listed in the wiring kit are missing, you may contact your dealer and order a replacement kit.

Wall Mount Installation

1) If you are installing a new gang box in the wall, leave at least 4 inches between the top of the gang box and ceiling. Confirm that the bottom of the gang box is level with the floor.

If you are using an existing gang box, the top of the gang box must be a minimum of three inches away from the ceiling.



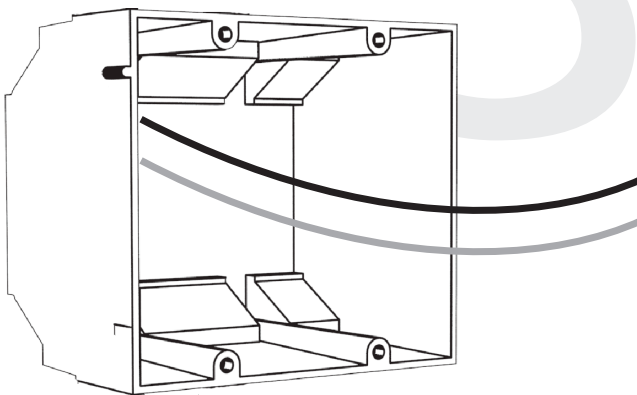
2) Run power and accessory wiring to the gang box.

CHECK YOUR WIRING

The voltage between the white and black wires should measure 105-126 volts AC in the 110 volt model, 207-253 volts AC in the 230 volt model, or Yellow & orange wires for 21.5-26.5 volts AC/DC in the 24 volt model.

If you are using the 24 volt model, make sure that the wiring leading to the clock is from an ISOLATED transformer.

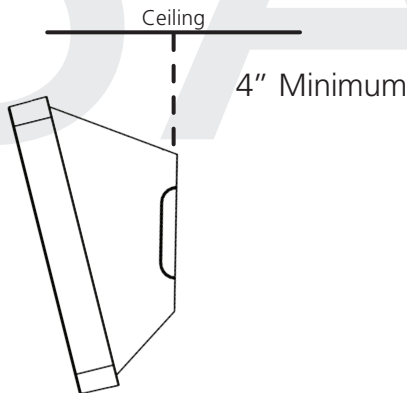
3) Attach the power wires from your kit to the communication and power wires in the gang box. See the sections of this manual labeled "Communication Wiring Information" for additional details, depending on your system.



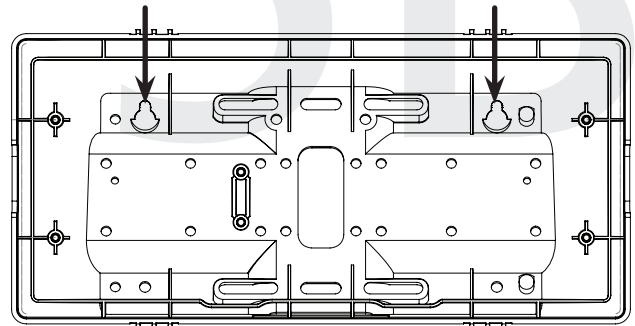
4) If you do not wish to attach the housing to the gang box, proceed to step 5A. Otherwise, go to step 6.

Wall Mount Installation

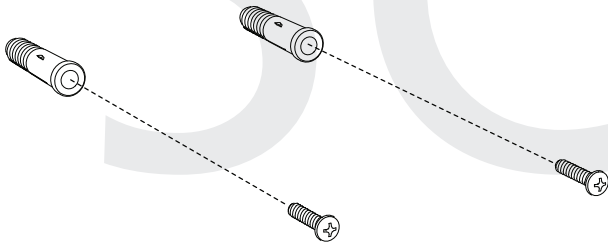
5A) If you do not wish to attach the housing to a gang box, place the mounting piece on the wall. Leave at least 4 inches between the top rear edge of the housing and ceiling. Confirm that the bottom of the mounting piece is level with the floor.



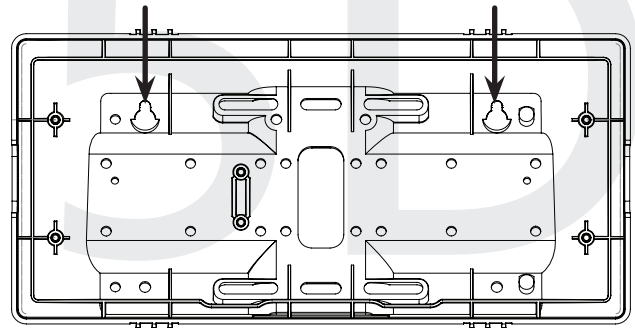
5B) Identify the keyholes towards the top of the back of the clock housing. Use a pencil to trace the top of each keyhole onto the wall, then use the 1/4 inch drill bit to drill holes at the locations of the two marks.



5C) Insert the wall anchors into the two holes, then place a #8 self-tapping screw into each wall anchor, leaving at least a 1/8" gap between the top of the screw and the wall.

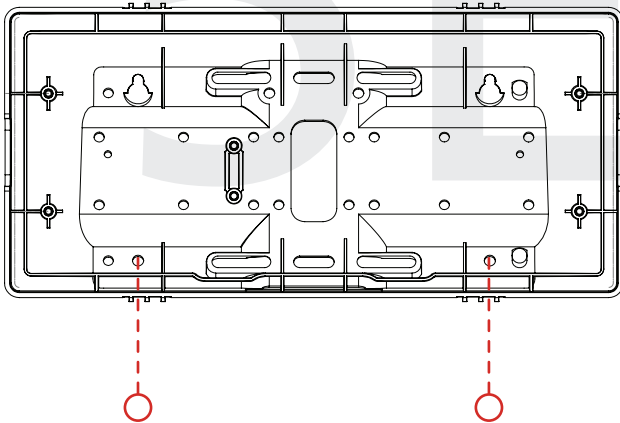


5D) Use the keyholes in the back of the housing to hang the clock onto the screws.

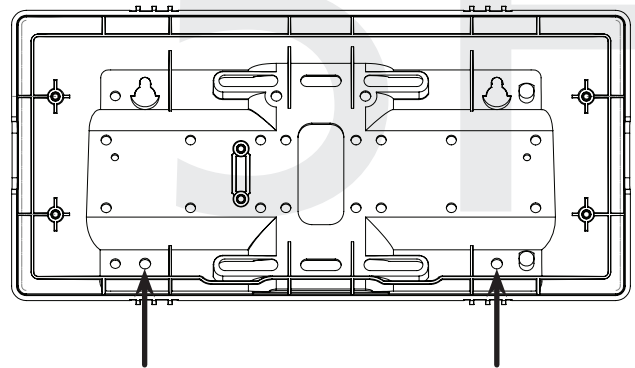


Wall Mount Installation

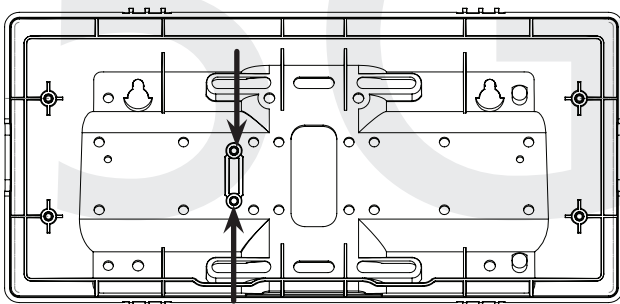
5E) Use a pencil to trace the holes beneath each keyhole onto the wall. Take the clock housing off the wall, drill holes at the marked locations, and add another two wall anchors.



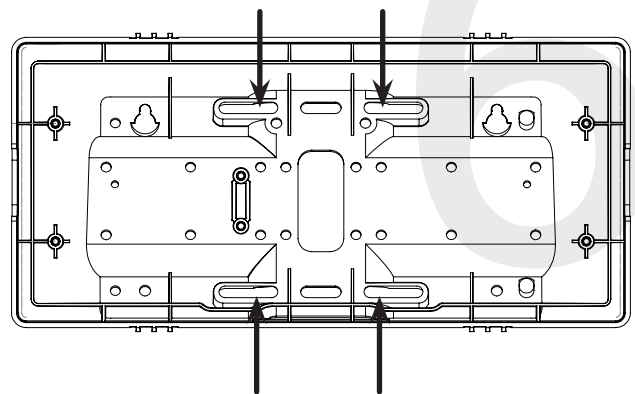
5F) Repeat step 5D, then pass another pair of #8 screws through the bottom holes and secure them in the remaining two wall anchors.



5G) Run power wires through the large hole in the back of the housing. Secure the wires by passing them through the wire clamp.

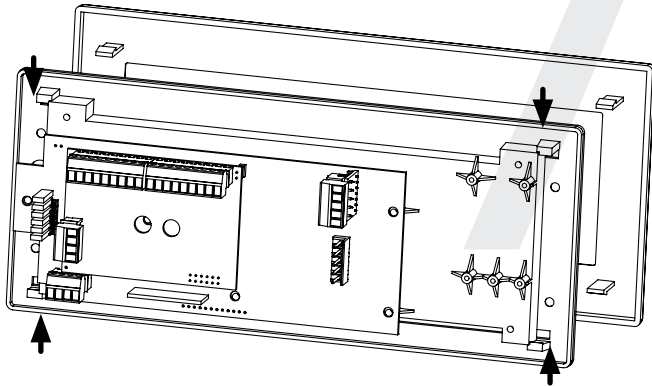


6) Perform step 5G, then attach the housing to the gang box using the #6-32x1 screws.

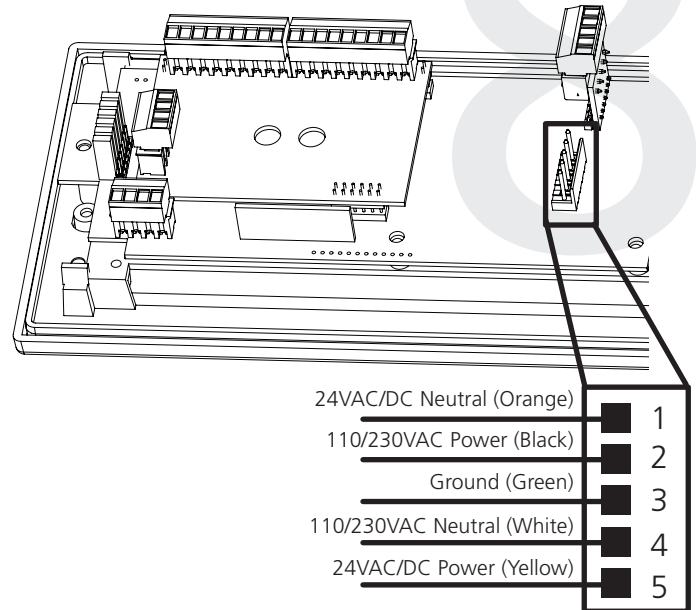


Wall Mount Installation

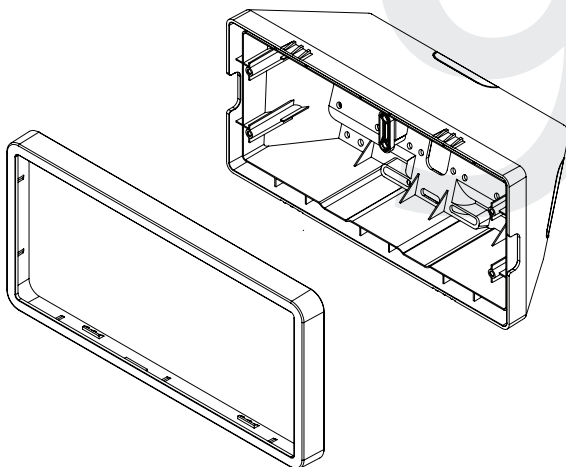
7) Detach the filter from the clock display board by pressing inward on the red tabs.



8) Attach the power wires to the ports as shown below.

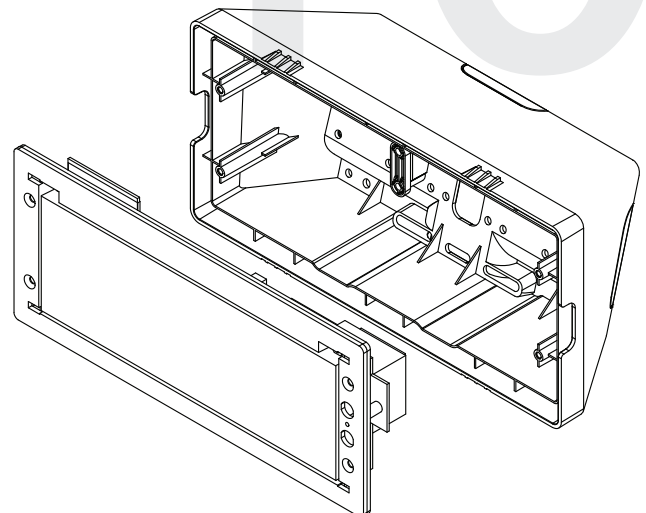


9) Detach the frame from the front of the clock housing by pulling the bottom and top edges away from the housing.



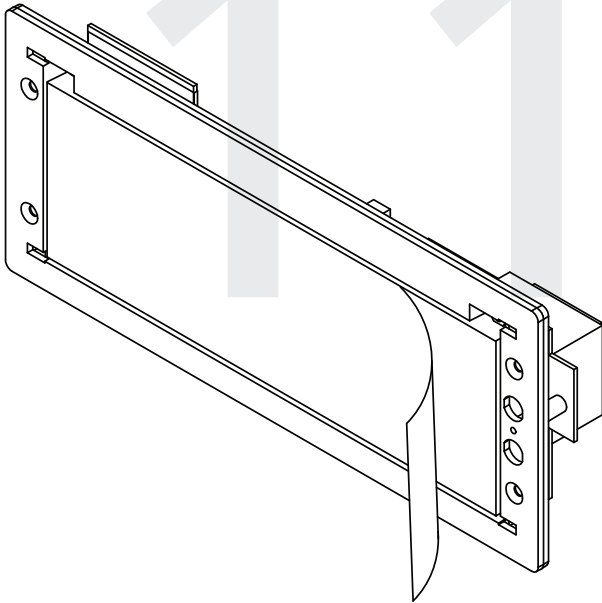
10) Use the 6-19x1/2 screws to attach the display board to the housing.

NOTE: For 2.5" Digit clocks, the holes for the screws will be on the left and right inner surfaces of the housing. For 4.0" Digit Clocks, the holes will be on the top and bottom surfaces.

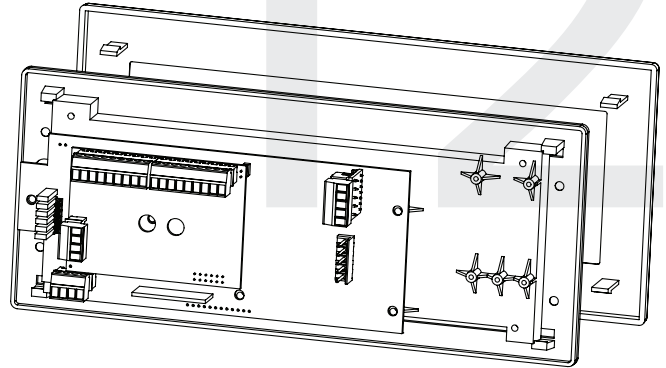


Wall Mount Installation

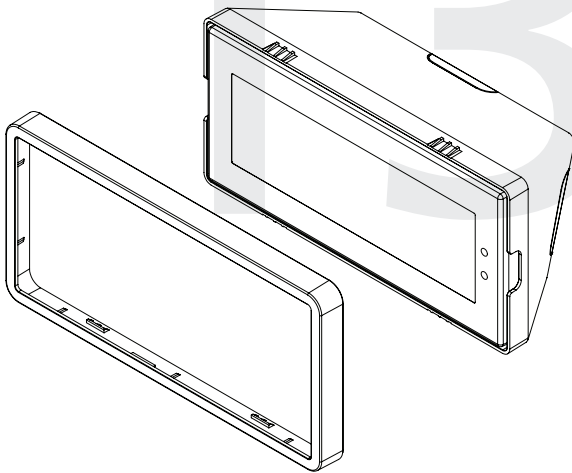
11) Remove the plastic cover from the display board.



12) Place the filter over the display board. You should hear a snapping noise as the latches drop into place.



13) Place the housing frame onto the housing. You should hear a snapping noise as the latches drop into place.



14) Power the clock. After testing the LED segments and presenting some diagnostic information, the clock will display the time based off of its internal quartz oscillator. It will correct itself to show synchronized time as soon as it receives data from a time source.

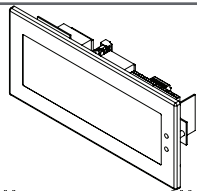
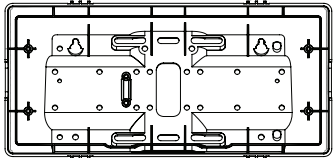
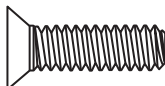
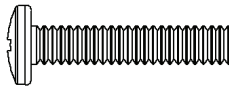
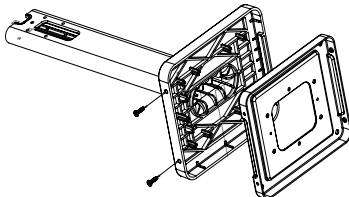
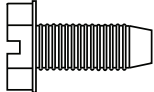

Flag Mount Installation

VERY IMPORTANT:

CONFIGURE YOUR CLOCK BEFORE MOUNTING IT TO A WALL OR HOUSING. REFER TO THE SYNCHRONIZATION SYSTEM SETUP SECTION OF THIS MANUAL FOR INSTRUCTIONS.

All network equipment must be powered and configured before you install the clock. If the network equipment is not properly installed and powered, and if the clocks have not been configured to communicate with the network equipment, the secondary clocks will not synchronize.

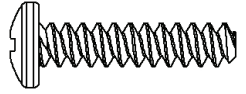

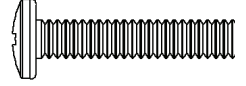
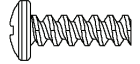

Included in Package

Description	Quantity	Picture
SBW Digital Clock	1	
Digital Clock Wall Housing	1	
6-19x1/2 screw	4	
6-32x1 screw	4	
Included in Pole Kit (SAB-1BD-00S-0)		
Dual-mount pole, including mounting plate	1	
#10-32x3/8 green screw	1	
#8-32x7/16 screw	8	

Continued on next page

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Flag Mount Installation

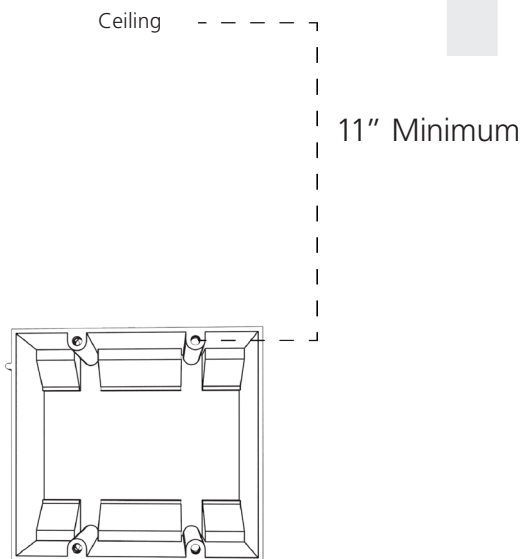
M3.5-1.0x10 screw (black)	4	
Internal-tooth washer	8	
#6-32x1 screw	4	
Adapter tab screws	4	
Included in Wiring Kit (D-PK-3-110-S or D-PK-3-24-S) - 2 kits included		
Power/grounding wires and connector	1	

PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small flat-blade screwdriver, a double gang box, any equipment needed to install the gang box, and any additional wiring needed to extend the signal, power, or ground cables. You may also need a 1/4 inch drill, 4 #8x1.5 self-tapping screws, and 4 wall anchors for those screws if you decide not to attach the clock directly to the gang box.

If any of the items listed in the wiring kit are missing, you may contact your dealer and order a replacement kit.

Flag Mount Installation

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall. The box should be installed level and plumb with the wall and ceiling.



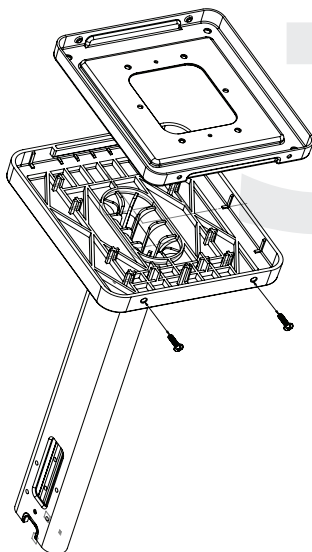
2) Run power and accessory wiring to the gang box.

CHECK YOUR WIRING

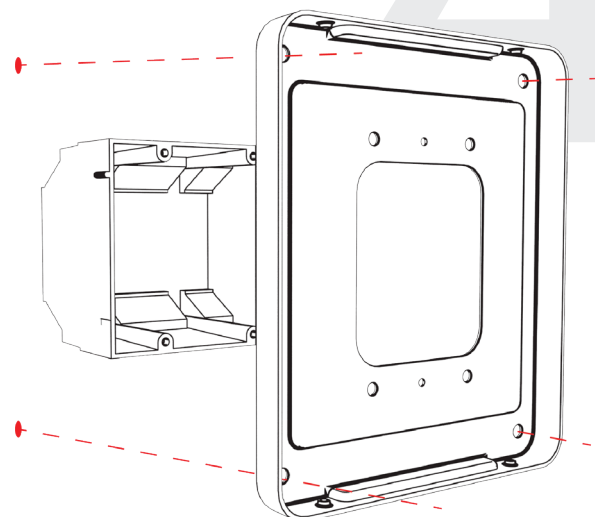
The voltage between the white and black wires should measure 105-126 volts AC in the 110 volt model, 207-253 volts AC in the 230 volt model, or Yellow & orange wires for 21.5-26.5 volts AC/DC in the 24 volt model.

If you are using the 24 volt model, make sure that the wiring leading to the clock is from an ISOLATED transformer.

3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

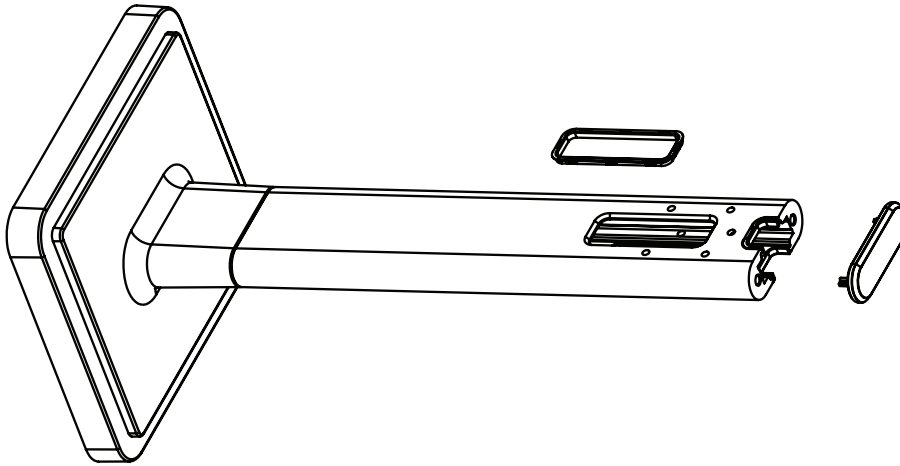


4) Attach the mounting plate to the gang box using only two of the four long, silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

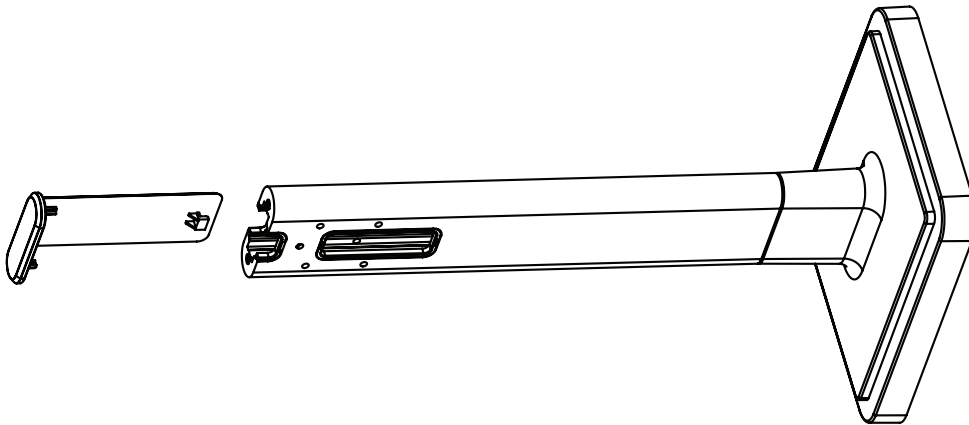


Flag Mount Installation

5) Remove the mounting pole end cap and the plastic ring from one of the holes.

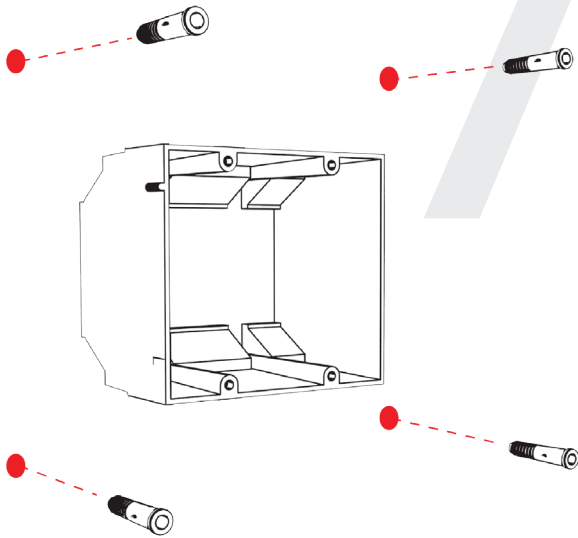


6) Attach the flag-mount end cap to the pole. Confirm that the covering flap is attached to the side where the plastic ring was removed.

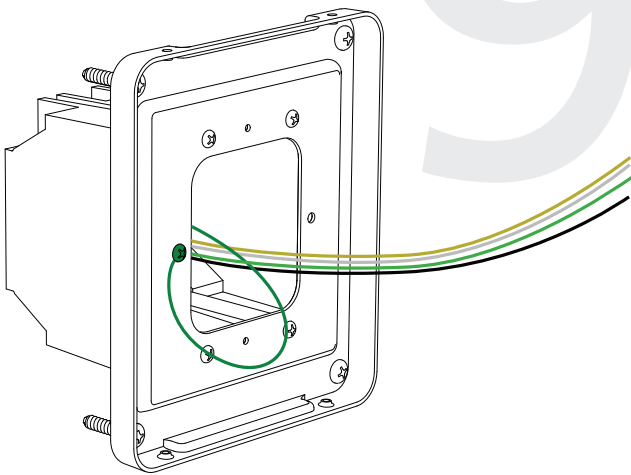


Flag Mount Installation

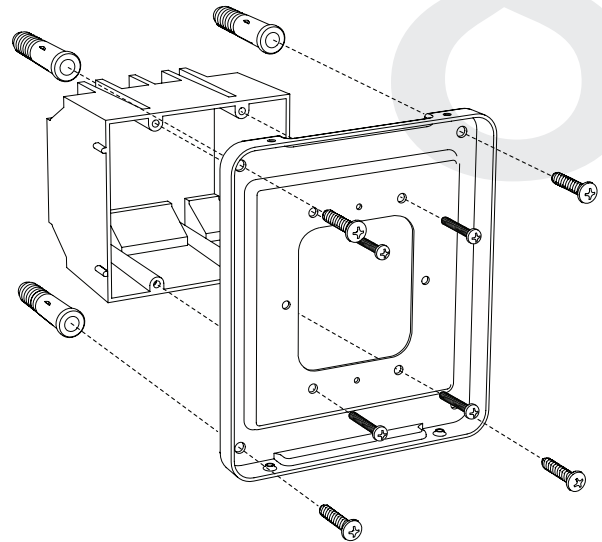
7) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



9) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.



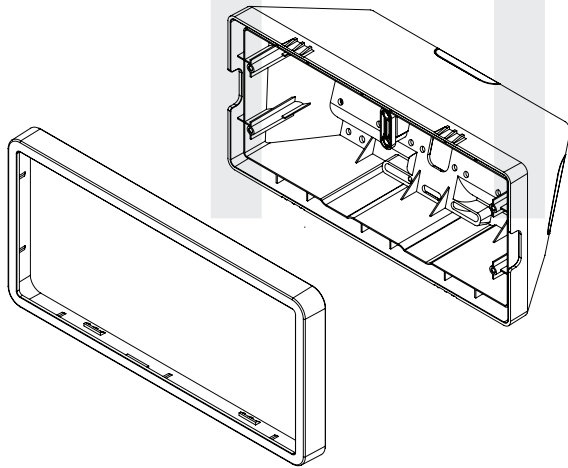
8) Reattach the mounting plate, this time using all four long, silver #6-32x1 screws, then insert the four #8 screws through the mounting plate and into the anchors.



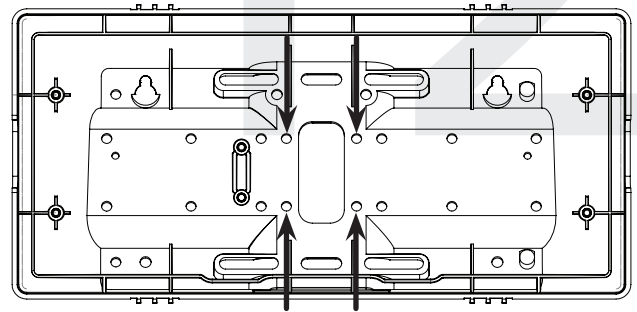
10) Use a screwdriver to remove one of the end caps. The selected end cap should match the position of the orientation of the clock on the mounting pole; for example, if you wish to attach the clock to the pole in a ceiling-mount configuration, then the top end cap should be removed. The end cap and screw that was used to secure it will not be needed again during this installation.

Flag Mount Installation

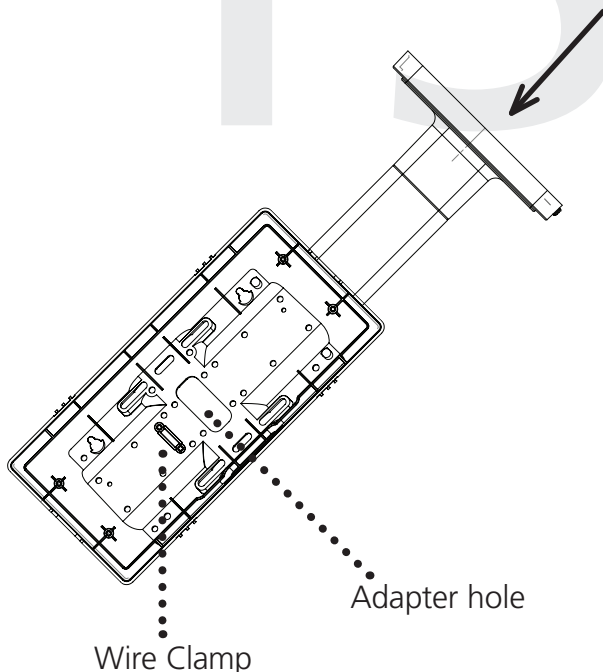
11) Detach the frame from the front of the clock housing by pulling the bottom and top edges away from the housing.



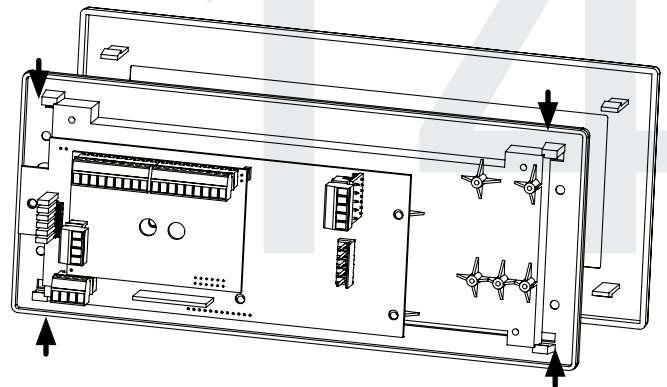
12) Insert the four #8-32x7/16 screws through the internal-tooth washers, then through the adapter, and finally into the pole. Use a screwdriver to tighten the screws so that the adapter does not move.



13) Thread at least fifteen inches (38.1cm) of wiring from the gang box through the bottom of the pole until each wire exits through the hole in the adapter. Secure the wires by passing them through the wire clamp.

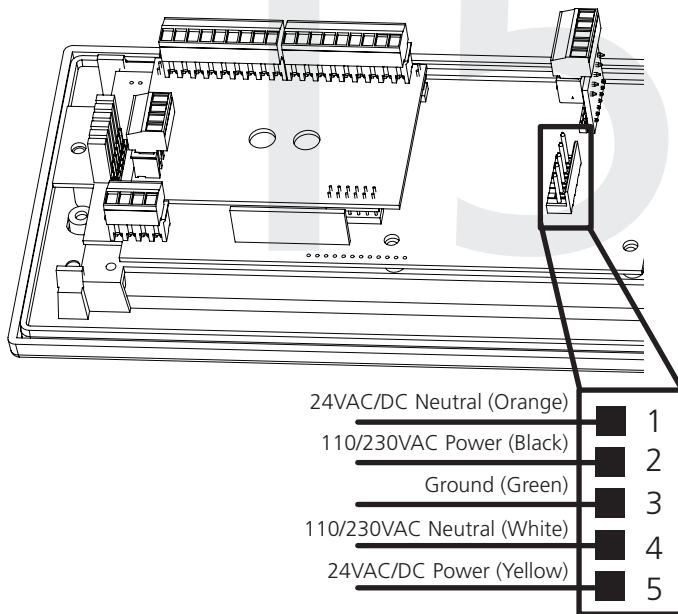


14) Detach the filter from the clock display board by pressing inward on the red tabs.



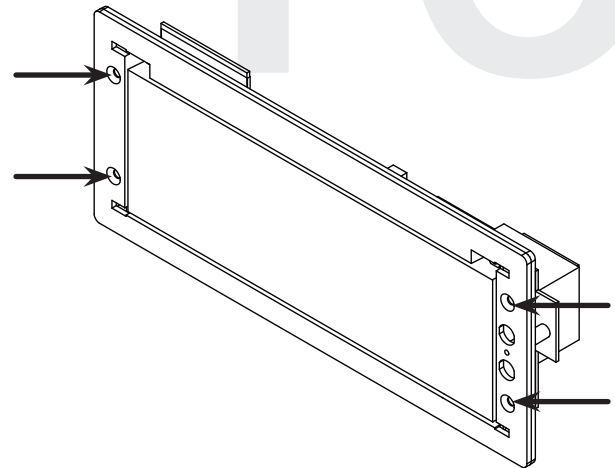
Flag Mount Installation

15) Attach the power wires to the ports as shown below.



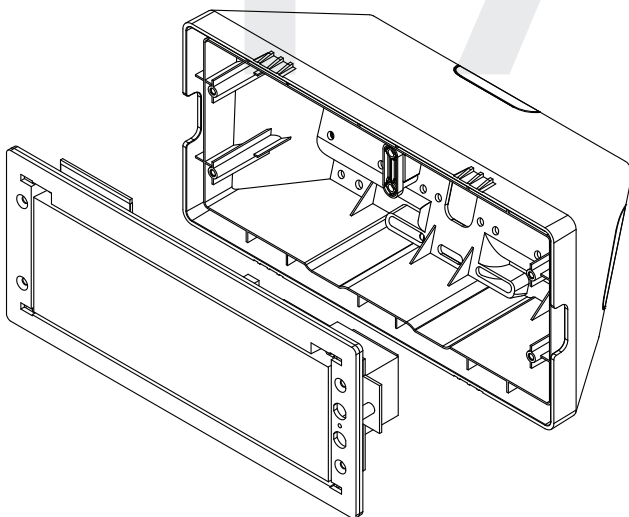
16) Use the M3/5-15x12 screws to attach the display board to the housing.

NOTE: For 2.5" Digit clocks, the holes for the screws will be on the left and right inner surfaces of the housing. For 4.0" Digit Clocks, the holes will be on the top and bottom surfaces.

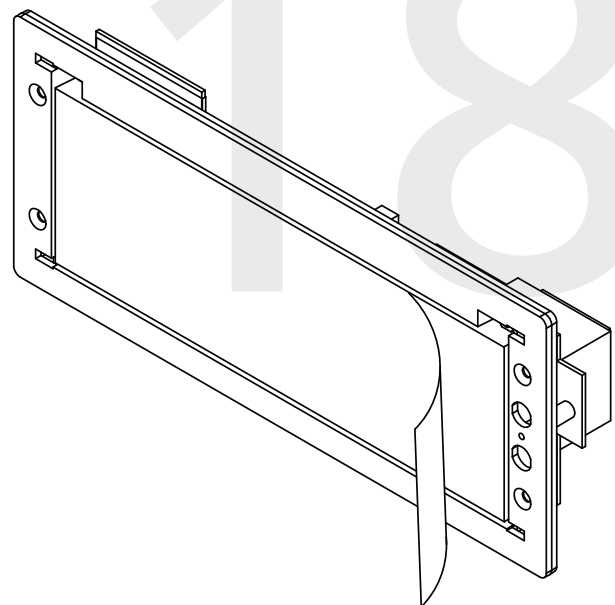


17) Use the 6-32x12 screws to attach the display board to the housing.

NOTE: For 2.5" Digit clocks, the holes for the screws will be on the left and right inner surfaces of the housing. For 4.0" Digit Clocks, the holes will be on the top and bottom surfaces.

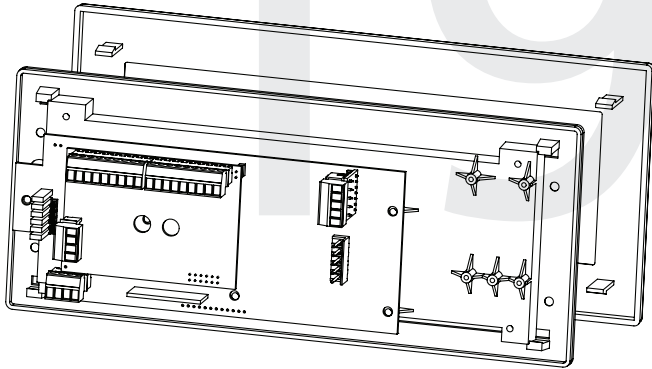


18) Remove the plastic cover from the display board.

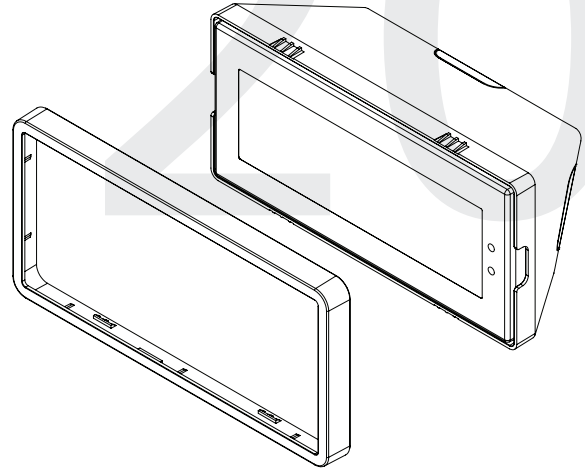


Flag Mount Installation

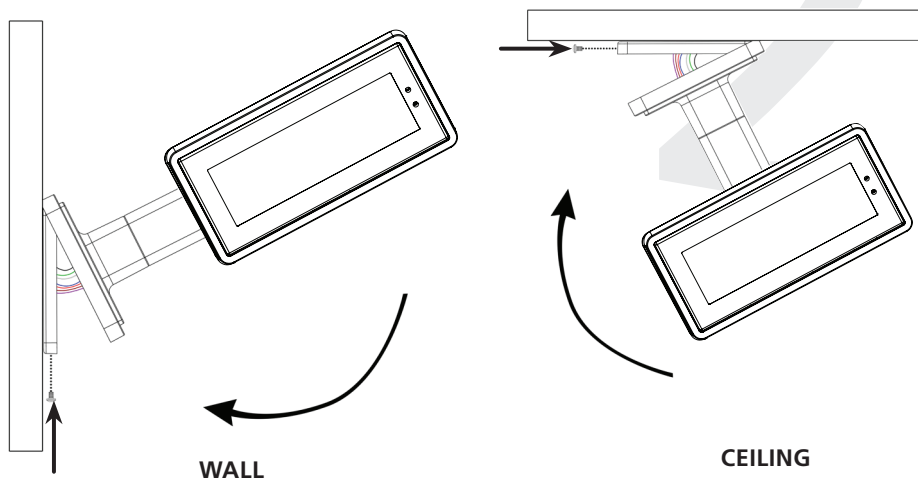
19) Place the filter over the display board. You should hear a snapping noise as the latches drop into place.



20) Place the housing frame onto the housing. You should hear a snapping noise as the latches drop into place.



21) Hang the base of the pole on the mounting plate so that the lip is on top of the base, and the holes for the screws are on the bottom of the base. Attach the wires from the pole to the wires in the gang box, then use the two black base screws to attach the other side of the base to the mounting plate.



22) Power the clock. After testing the LED segments and presenting some diagnostic information, the clock will display the time based off of its internal quartz oscillator. It will correct itself to show synchronized time as soon as it receives data from a time source.

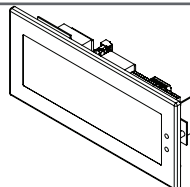
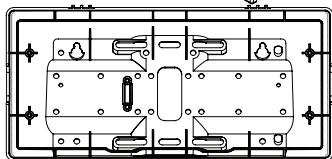
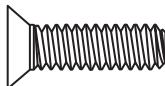
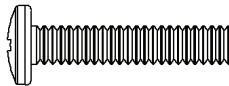
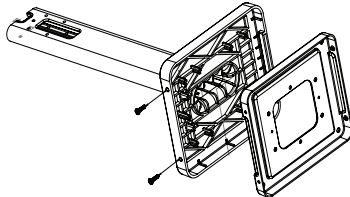
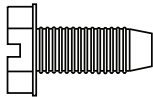

Double Mount Installation

VERY IMPORTANT:

CONFIGURE YOUR CLOCK BEFORE MOUNTING IT TO A WALL OR HOUSING. REFER TO THE SYNCHRONIZATION SYSTEM SETUP SECTION OF THIS MANUAL FOR INSTRUCTIONS.

All network equipment must be powered and configured before you install the clock. If the network equipment is not properly installed and powered, and if the clocks have not been configured to communicate with the network equipment, the secondary clocks will not synchronize.

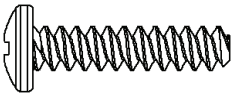

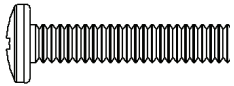


Included in Package

Description	Quantity	Picture
SBW Digital Clock	1	
Digital Clock Wall Housing	1	
6-19x1/2 screw	8	
6-32x1 screw	8	
Included in Pole Kit (SAB-1BD-00S-0)		
Dual-mount pole, including mounting plate	1	
#10-32x3/8 green screw	1	
#8-32x7/16 screw	8	

Continued on next page

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Double Mount Installation

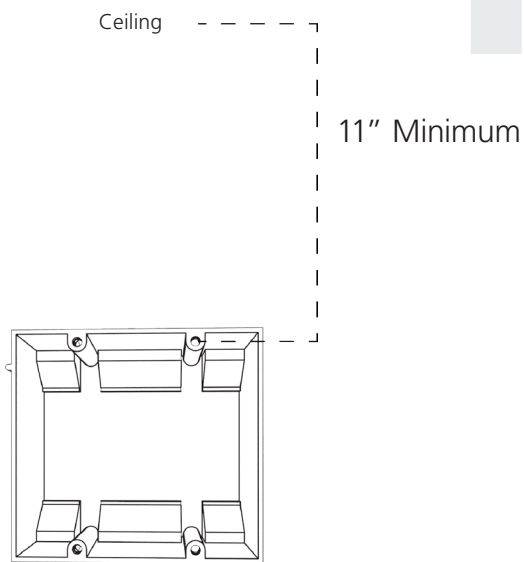
M3.5-1.0x10 screw (black)	4	
Internal-tooth washer	8	
#6-32x1 screw	4	
Adapter tab screws	4	
Included in Wiring Kit (D-PK-3-110-S or D-PK-3-24-S) - 2 kits included		
Power/grounding wires and connector	1	

PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small flat-blade screwdriver, a single gang box, any equipment needed to install the gang box, and any additional wiring needed to extend the signal, power, or ground cables. You may also need a 1/4 inch drill, 4 #8x1.5 self-tapping screws, and 4 wall anchors for those screws if you decide not to attach the clock directly to the gang box.

If any of the items listed in the wiring kit are missing, you may contact your dealer and order a replacement kit.

Double Mount Installation

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall. The box should be installed level and plumb with the wall and ceiling.



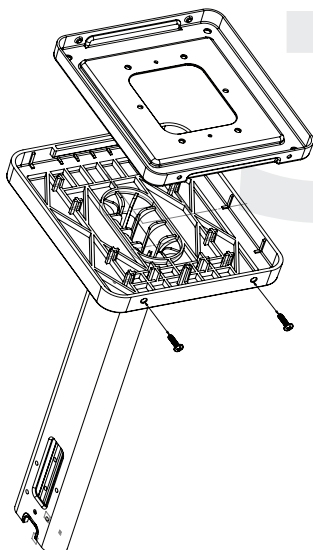
2) Run power and accessory wiring to the gang box.

CHECK YOUR WIRING

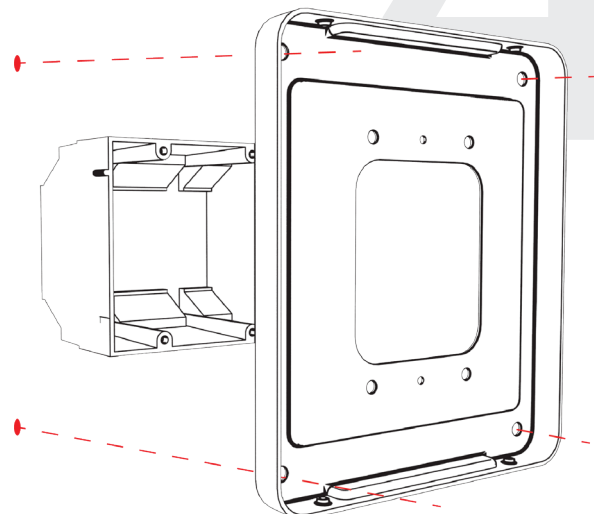
The voltage between the white and black wires should measure 105-126 volts AC in the 110 volt model, 207-253 volts AC in the 230 volt model, or Yellow & orange wires for 21.5-26.5 volts AC/DC in the 24 volt model.

If you are using the 24 volt model, make sure that the wiring leading to the clock is from an ISOLATED transformer.

3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

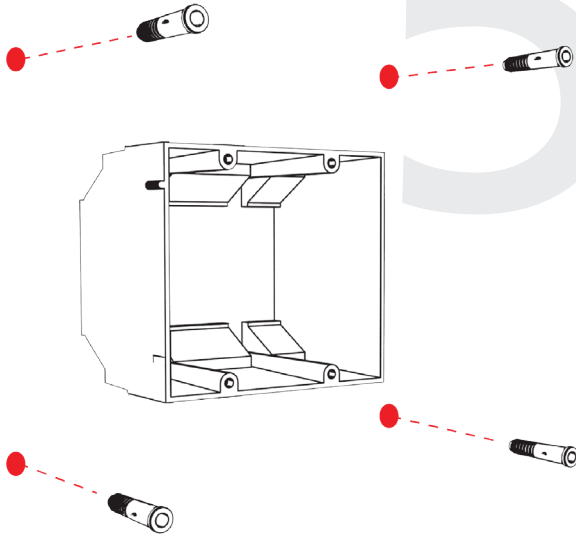


4) Attach the mounting plate to the gang box using only two of the four long, silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

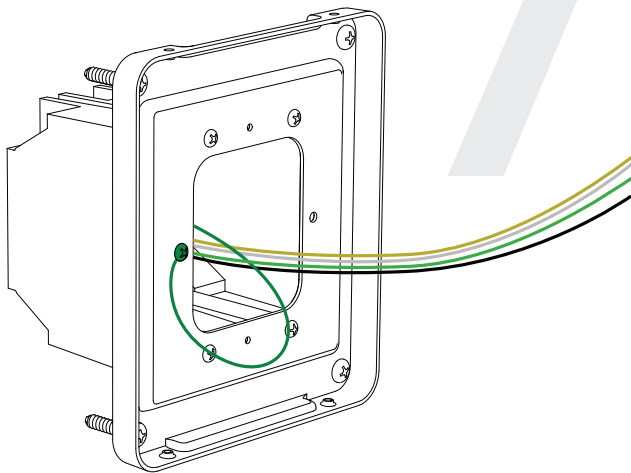


Double Mount Installation

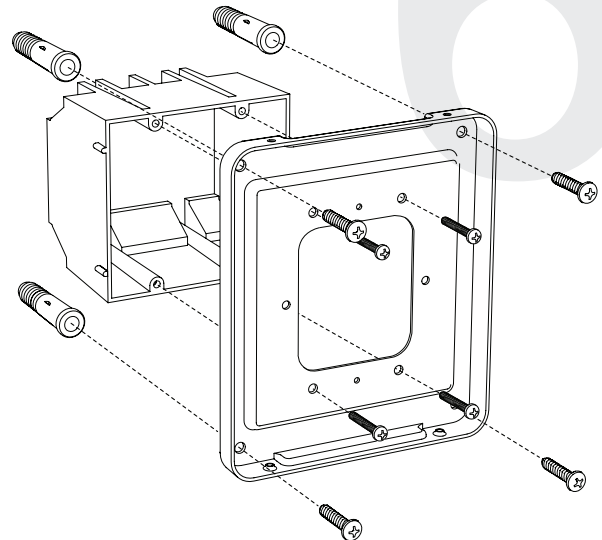
5) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.



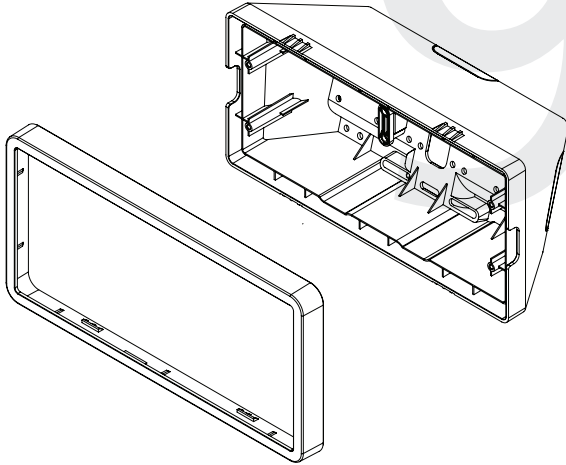
6) Reattach the mounting plate, this time using all four long, silver #6-32x1 screws, then insert the four #8 screws through the mounting plate and into the anchors.



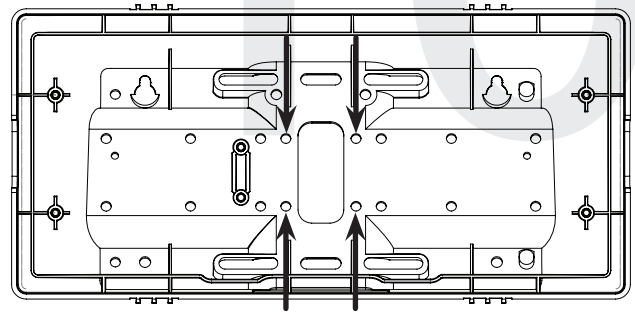
8) Use a screwdriver to remove one of the end caps. The selected end cap should match the position of the orientation of the clock on the mounting pole; for example, if you wish to attach the clock to the pole in a ceiling-mount configuration, then the top end cap should be removed. The end cap and screw that was used to secure it will not be needed again during this installation.

Double Mount Installation

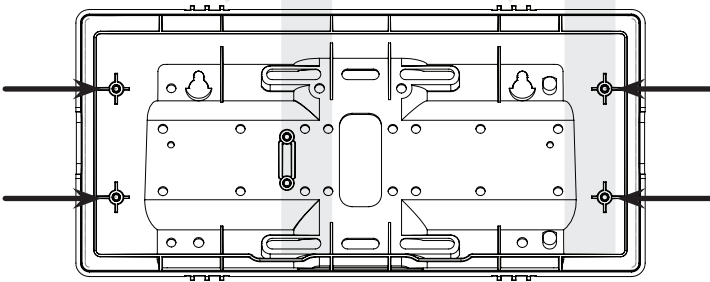
9) Detach the frame from the front of each clock housing by pulling the bottom and top edges away from the housing.



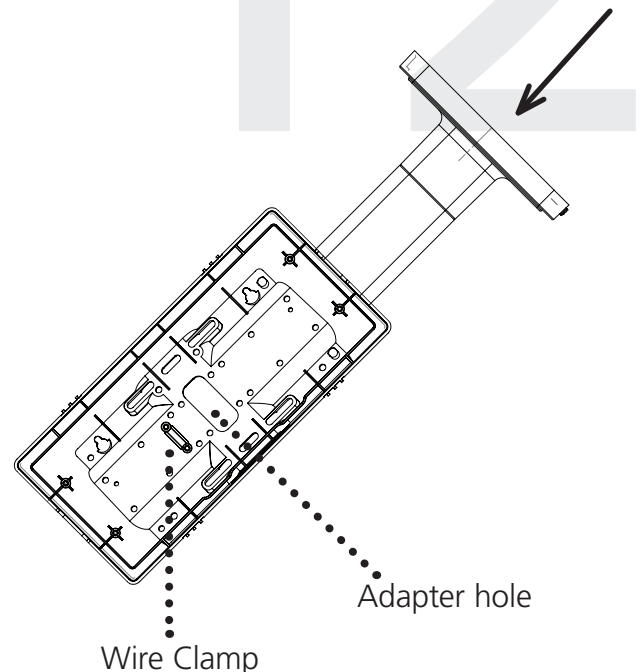
10) Insert the four #8-32x7/16 screws through the internal-tooth washers, then through each adapter, and finally into the pole. Use a screwdriver to tighten the screws so that the adapters do not move.



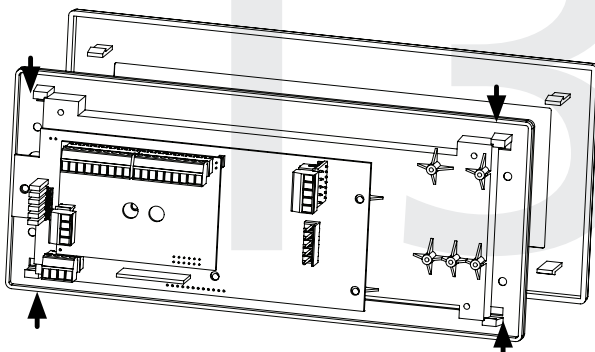
11) Attach adapters to each other using adapter tab screws, two on each side.



12) Thread at least fifteen inches (38.1cm) of wiring from the gang box through the bottom of the pole until each wire exits through the hole in each adapter. Secure the wires by passing them through the wire clamp.

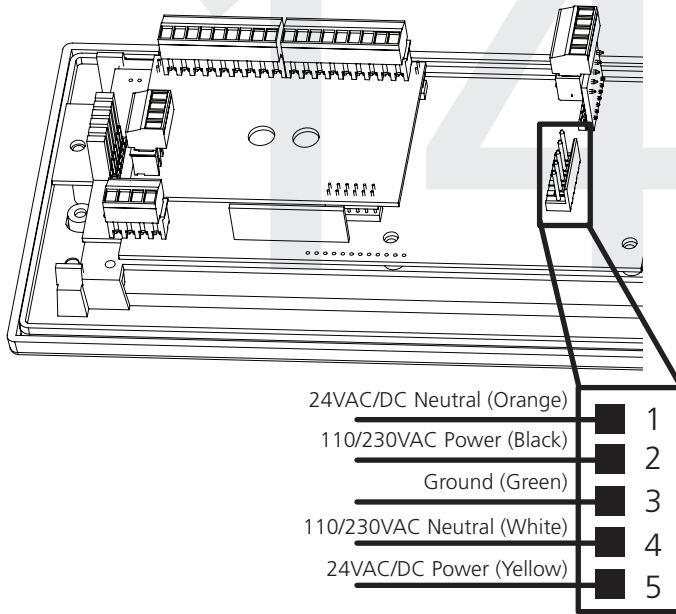


13) Detach the filter from the clock display board by pressing inward on the red tabs.



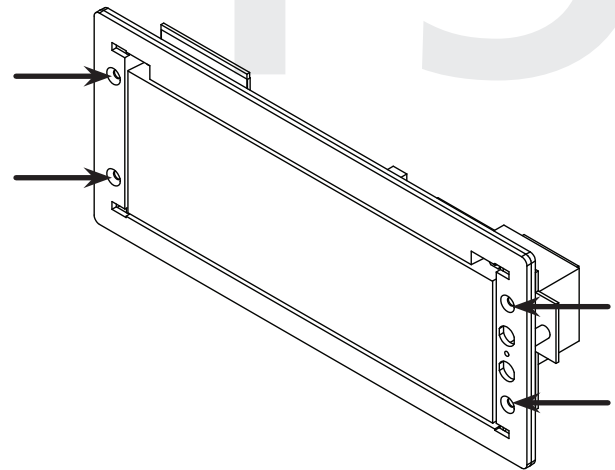
Double Mount Installation

14) Attach the power wires to the port as shown below.



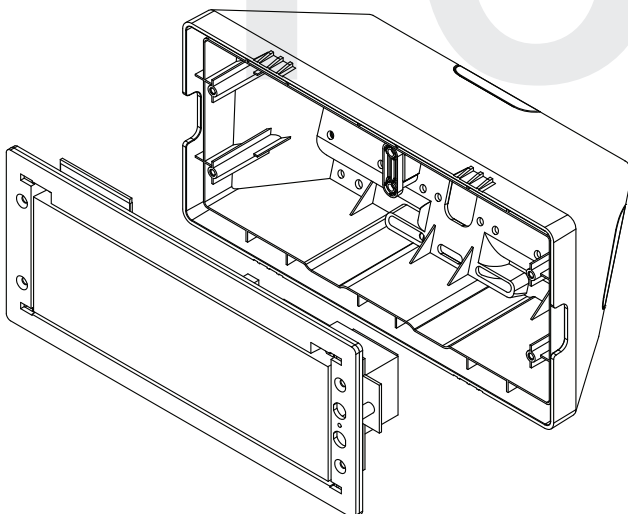
15) Use the M3/5-15x12 screws to attach each display board to the housing.

NOTE: For 2.5" Digit clocks, the holes for the screws will be on the left and right inner surfaces of the housing. For 4.0" Digit Clocks, the holes will be on the top and bottom surfaces.

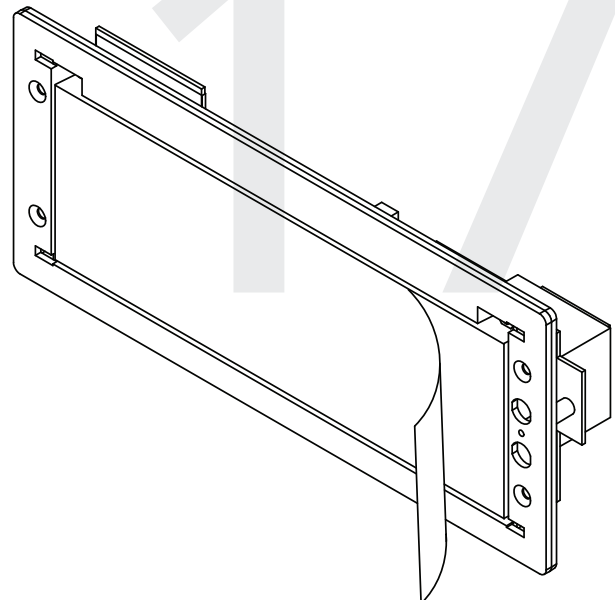


16) Use the M3.5-1.5x12 screws to attach a display board to each housing.

NOTE: For 2.5" Digit clocks, the holes for the screws will be on the left and right inner surfaces of the housing. For 4.0" Digit Clocks, the holes will be on the top and bottom surfaces.

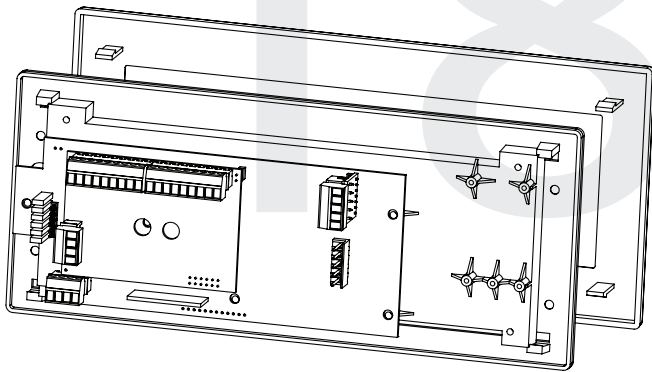


17) Remove the plastic cover from each display board.

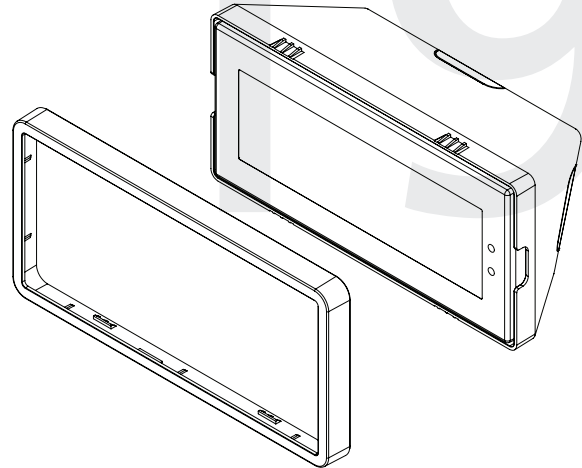


Double Mount Installation

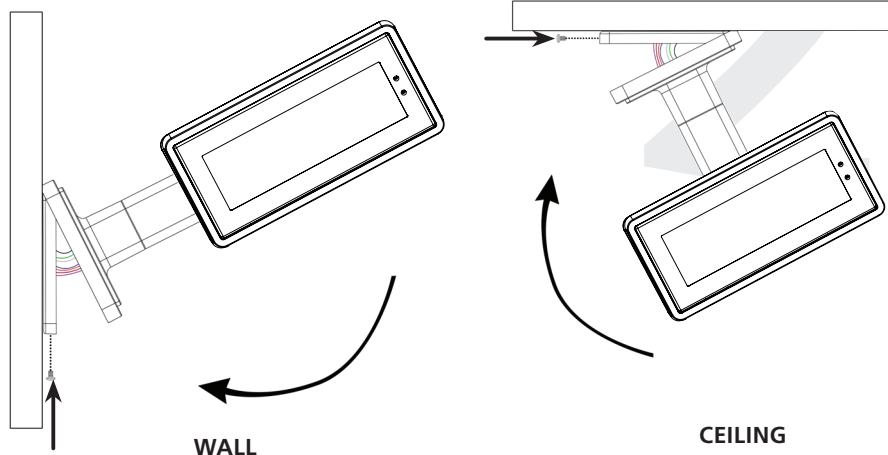
18) Place a filter over each display board. You should hear a snapping noise as the latches drop into place.



19) Place a housing frame onto each housing. You should hear a snapping noise as the latches drop into place.



20) Hang the base of the pole on the mounting plate so that the lip is on top of the base, and the holes for the screws are on the bottom of the base. Attach the wires from the pole to the wires in the gang box, then use the two black base screws to attach the other side of the base to the mounting plate.



21) Power the clock. After testing the LED segments and presenting some diagnostic information, the clock will display the time based off of its internal quartz oscillator. It will correct itself to show synchronized time as soon as it receives data from a time source.

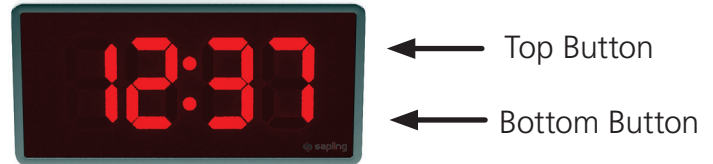
Connecting to the Clock

Access to the clock can be controlled by changing the clock's connection mode. There are two modes:

Connection Mode and Direct Mode

The clock is shipped in Direct Mode. Once a network has been set by the user, the clock will always start in Connection Mode.

The clock can be placed into Direct Mode by pressing the top button twice. If performed correctly, the word "DIRECT" will appear on the display. On a 4-digit clock, only the letters "DIRE" will appear.



The functions of each mode are as follows:

Connection Mode - In connection mode, a properly configured Wi-Fi clock is accessible over the facility's network, and will appear on a Wi-Fi Monitor located on the same subnet.

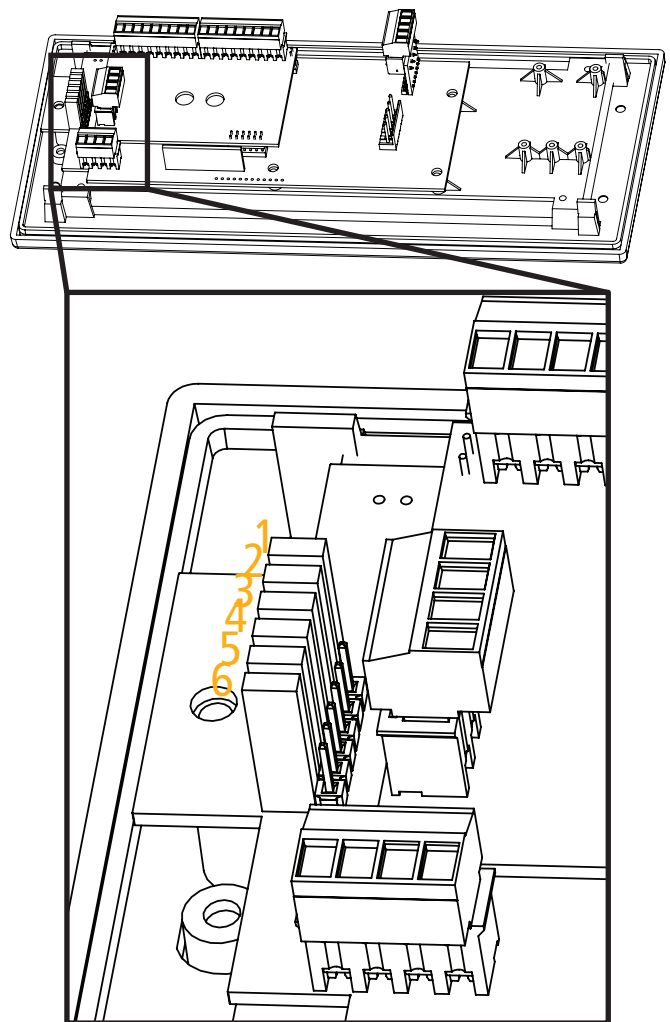
Direct Mode - In Direct mode, a Wi-Fi clock acts as its own Wireless Access Point and can be accessed directly from any Wi-Fi capable computer in range of it. In this mode, a clock will wait four minutes for the user to access it before reverting to connection mode.

While in Direct mode, the clock will temporarily change its IP address to 192.168.240.1. It will revert to whichever IP address is listed on the Network Settings address page once Direct mode has been ended.

Adjustable Jumper Settings

Every version of the digital clock contains a set of jumpers which can be moved to change a particular setting. The functions and positions of each jumper are described below:

	Left Position	Right Position
	Pins 1 & 2	Pins 2 & 3
Jumper 1	12 Hour Time (Default)	24 Hour Time
Jumper 2	Display High Brightness (Default)	Display Low Brightness
Jumper 3	Display Time Only (Default)	Alternate display between Time and Date
Jumper 4	DO NOT TOUCH (Default)	DO NOT TOUCH
Jumper 5	DO NOT TOUCH (Default)	DO NOT TOUCH
Jumper 6	DO NOT TOUCH (Default)	DO NOT TOUCH (Default)

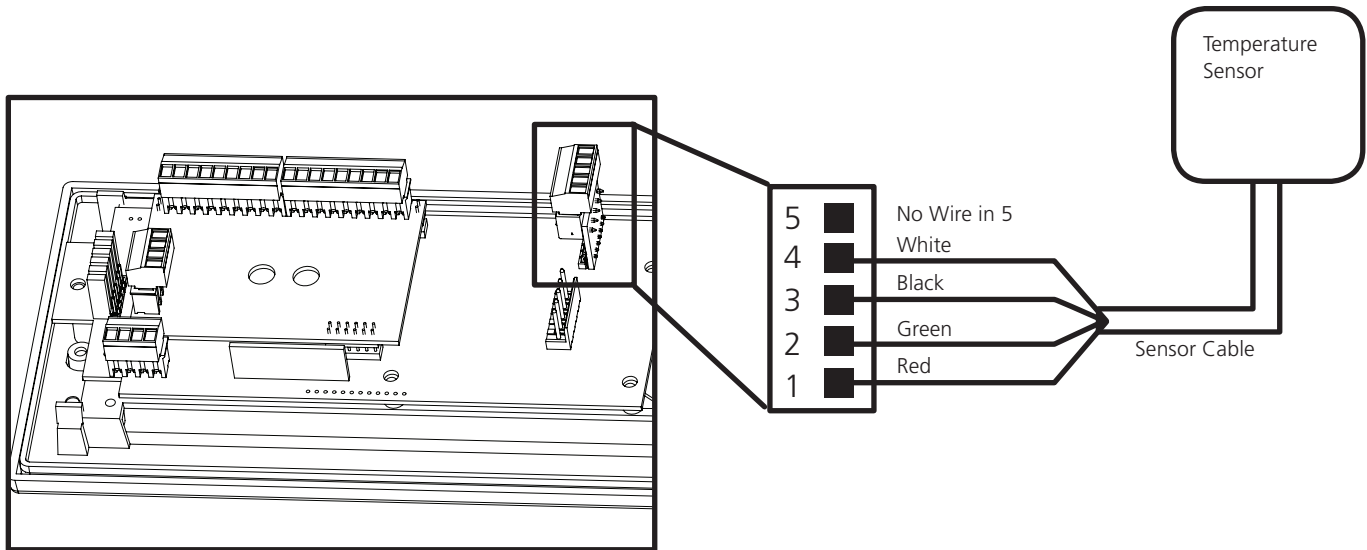


To manually enable or disable the first three jumpers, refer to the section of this manual labeled "Manual Controls" and refer to Setting 15.

Temperature Sensor Installation (3200 Only)

(IMPORTANT: Detach clock from power source before installing new circuitry. DO NOT add new circuitry while the clock is operating)

Attach the end of the Temperature Sensor Wire to the circuit board in the following manner:



The Sensor Cable is 6 feet (1.83 meters) long, and so the sensor should be positioned within 6 feet of the clock. The cable is unshielded, 4 conductor, 22AWG (.33mm²). If longer than 6 feet is required, the wire would have to be terminated in an electrical box, and the longer wire would have to be provided by the customer.

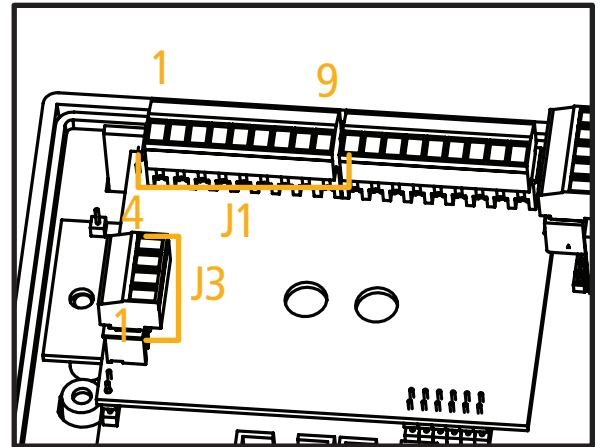
Data from the temperature sensor will be sent to your clock when the clock is powered on. For more information on how to make the digital clock display temperature, please see the section labeled "Web Interface - Display Settings".

Buzzer Installation (3300 Only)

(IMPORTANT: Detach clock from power source before installing new circuitry. DO NOT add new circuitry while the clock is operating)

During installation, there are two port blocks mentioned. The block on the upper-left will be called J1, while the block on the bottom left will be called J3. Refer to the diagram for details. For J1, the ports in the block are listed as 1-9, starting with port 1 on the left, and ending with port 9 on the right. For J3, the ports in the block are listed as 1-4, starting with port 1 on the bottom and port 4 on the top.

The Buzzer can be installed on the clock circuit board with four easy steps:



1. Attach the long green connector to the J1 Sync Input ports.
2. Confirm that the wires are attached to holes 7 and 8. The red wire should be in hole 7. The black wire should be in hole 8.
3. Attach the short green connector to the J3 Relay Output ports.
4. Confirm that the wires are attached to holes 1 and 2. The yellow wire should be in hole 1. The black wire should be in hole 2.

To program the buzzer, use a web browser on the same network as the clock to connect to it, log onto web interface and perform the following actions:

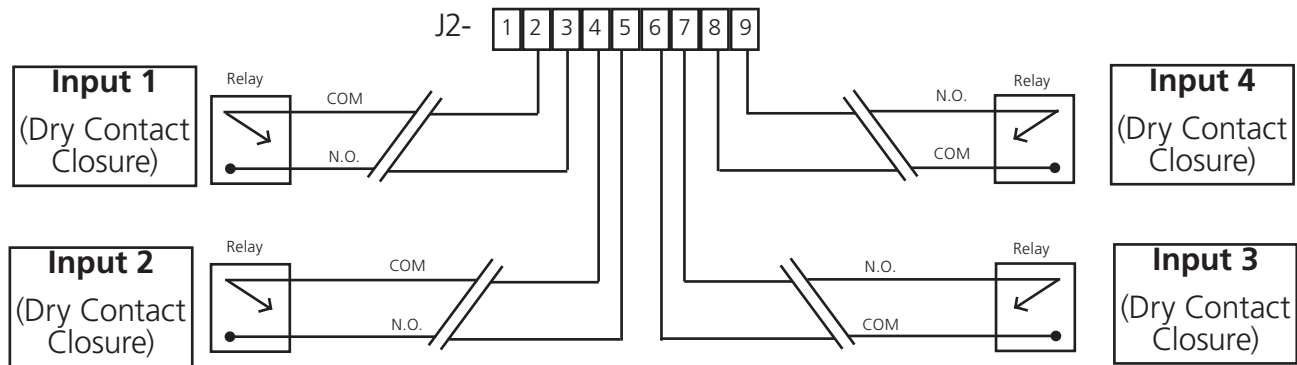
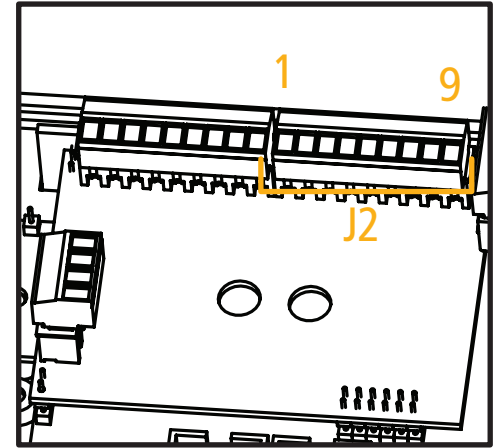
1. Click on the Elapsed Timer or Inputs tab.
2. Find the drop-down menu next to "On Countdown complete, close" and select "Relay 2"
3. In "for ____ seconds" set the amount of time that you wish the buzzer to sound when the countdown ends. The number must be a whole number from 1 to 30.
4. Press the Submit button.

For information on the Web Interface, refer to the sections labeled Web Interface - Elapsed Timer" or "Web Interface - Inputs"

User Input Installation (3300 Only)

(IMPORTANT: Detach clock from power source before installing new circuitry. DO NOT add new circuitry while the clock is operating)

During installation, there is one port blocks mentioned. The block on the upper-right will be called J2. Refer to the diagram on the right for details. The four available inputs are assigned per the diagram below.



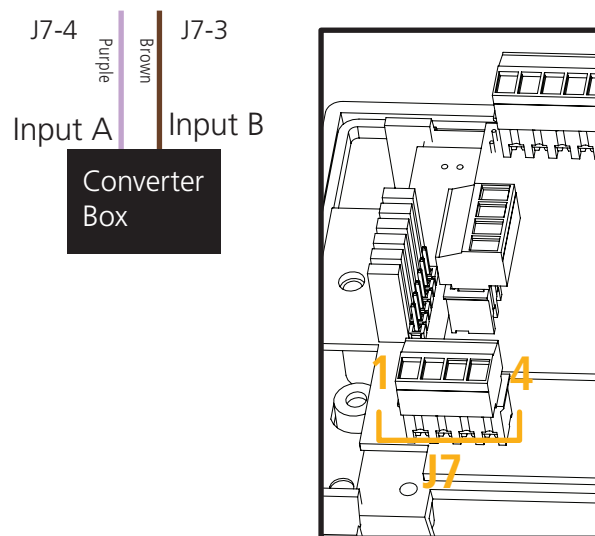
Use a dry contact closure between any of the two lines shown above to activate one of the numbered user inputs. This input is a *dry contact closure*, which means that **the user should not be providing external power on either of the lines leading from the relay to the clock**. The dry contact closure only needs to complete the circuit when activated, and can be a simple switch or button.

To configure what a given input does to the clock when activated, refer to the section of this manual labeled "Web Interface - Inputs."

Outputs (3300 Only)

RS485 and 2-Wire Digital - Master Mode

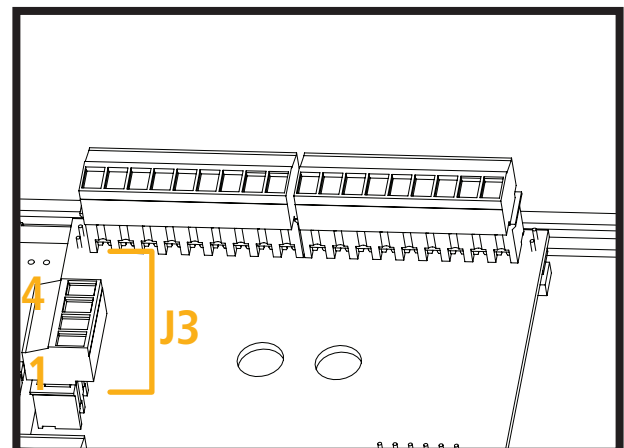
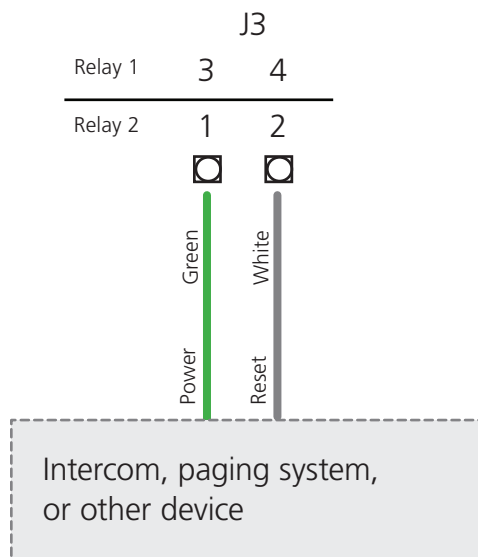
During a loss of communication with the Master Clock, the 3300 digital clock can act as a temporary, backup master clock for other clocks in the system. The port block on the bottom left side of the circuit board will be called J7. Refer to the diagram for details. For J7, the ports in the block are listed as 1-4, starting with port 1 on the left and port 4 on the right.



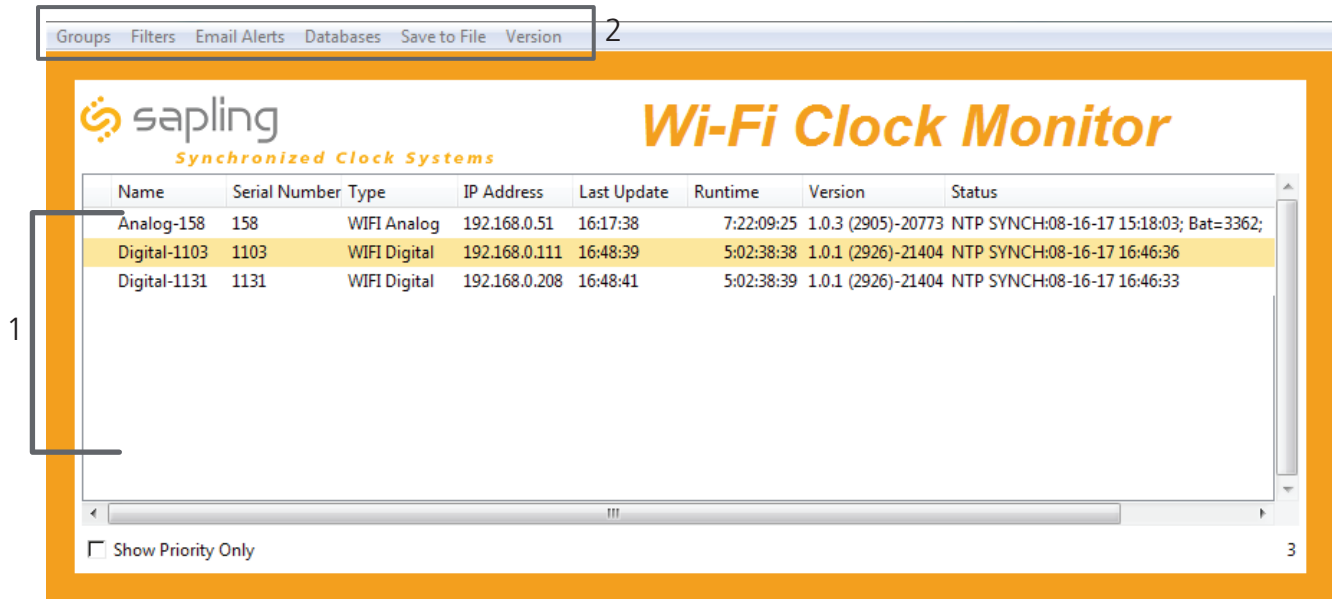
Output Relays

(IMPORTANT: Detach clock from power source before installing new circuitry. DO NOT add new circuitry while the clock is operating)

The port block on bottom left will be called J3. Refer to the diagram for details. For J3, the ports in the block are listed as 1-4, starting with port 1 on the bottom and port 4 on the top.



Wi-Fi Monitor Software - Main Screen



1. **Device List** - Displays all of the Sapling IP devices that are active on the system subnet. The monitor screen displays the name of the clock, serial number, type of clock, IP address, last updated time, how long the clock has been running, the clock's software version number, and the status of the clock. Double clicking on a device in the device list will open the web interface for that device.

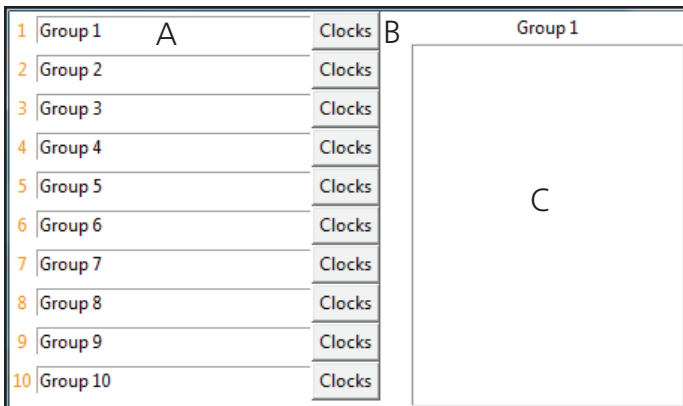
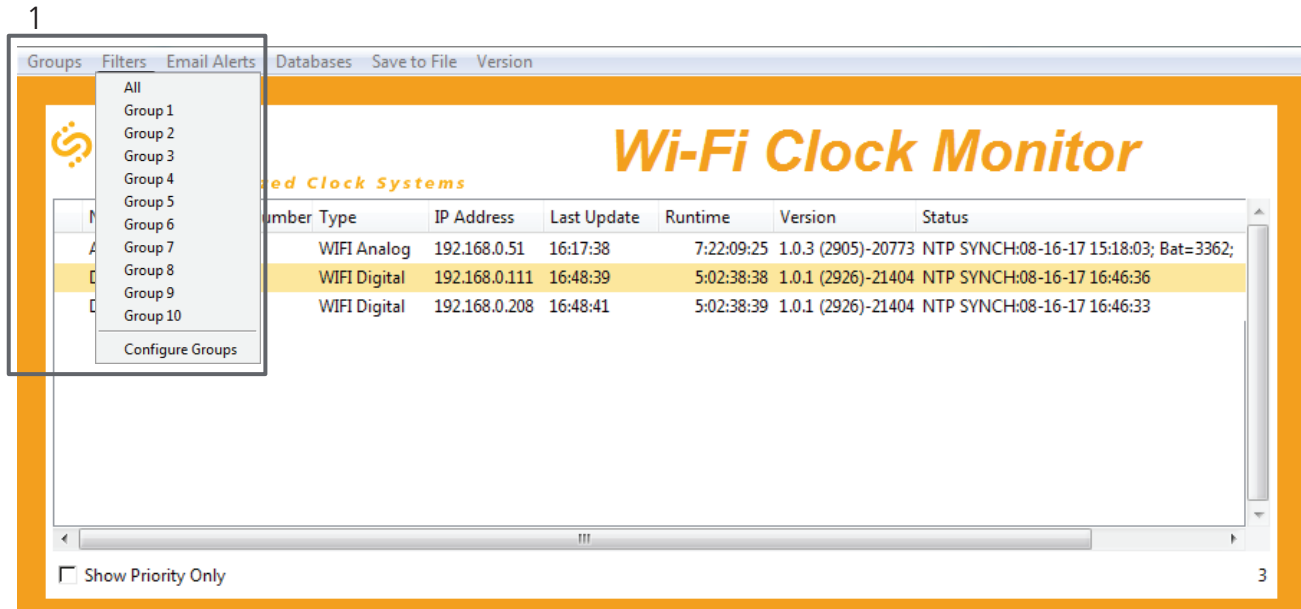
Using a right-handed mouse to right-click on any row in the Device List will open the **Quick Access Menu**. See the section in this manual labeled "Wi-Fi Monitor Software - Quick Access Menu" for more information.

2. **Task Bar** - See the section in this manual labeled "Wi-Fi Monitor Software - Task Bar Options"

3. **Show Priority** - By selecting this option, the IP device(s) that the user previously "marked as priority" will be the only clocks shown in the program window.

4. **Device Count** - This number is the amount of IP devices that are displayed on the Wi-Fi Monitor Software.

Wi-Fi Monitor Software - Task Bar Options



1. Groups - When clicked, this button will open the Groups drop-down menu.

All - Clicking on this option will cause the monitor to display all compatible IP devices on the network.

"Group Name" - Clicking on the name of a group will cause the monitor to display all of the IP devices in that group. Example: Clicking on "Group 1" will cause the monitor to show only the devices that have been added to Group 1 through the Configure Groups menu.

Configure Groups - Opens the group configuration menu (see below).

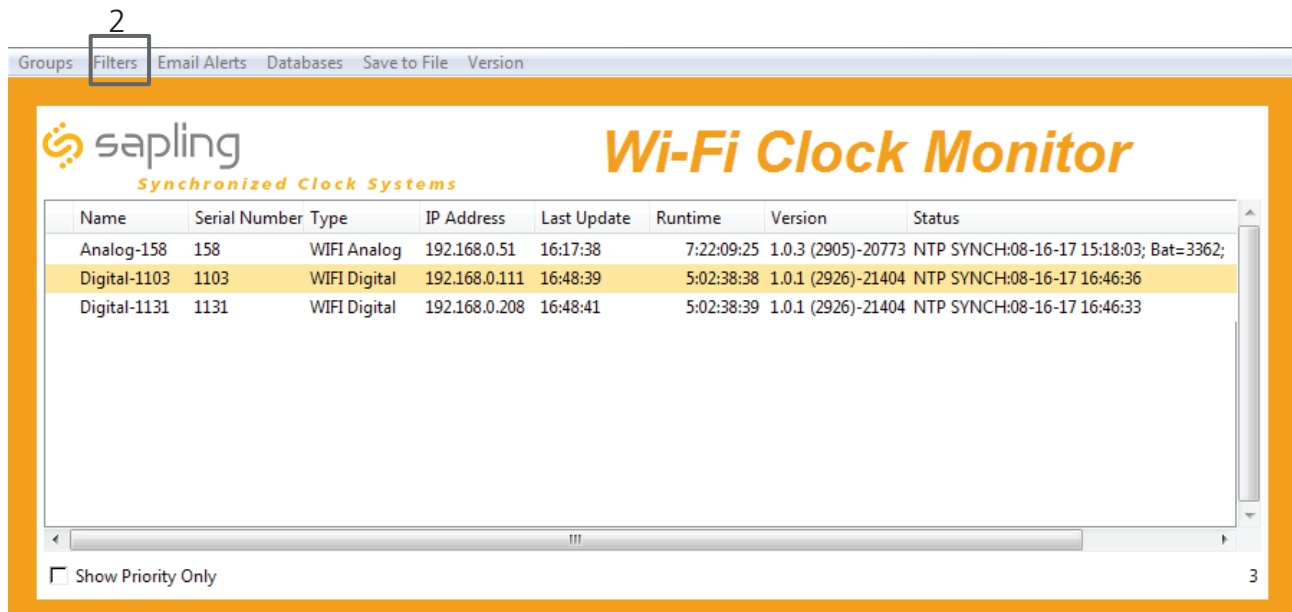
A. Text Boxes - Entering a name into the text box will change the name of the group. For example, the first text box currently contains the name "Group 1". This will cause the first group to be shown as "Group 1" in the drop-down menu.

B. Clocks buttons - Clicking on a Clocks button will display each of the group's devices in the box to the right.

C. Device Box - Displays the devices for the selected group. The name of the selected group will appear above the device box. To add a device to the group, click on a device on the Wi-Fi Monitor. While holding down the button on the mouse, drag the name of the device over to the device box, then release the button on the mouse.

To remove a device from the group, click on a device in the device box. While holding down the button on the mouse, drag the name of the device outside of the device box, then release the button on the mouse.

Wi-Fi Monitor Software - Task Bar Options



2. **Filters** - When clicked, this button will display the following options:

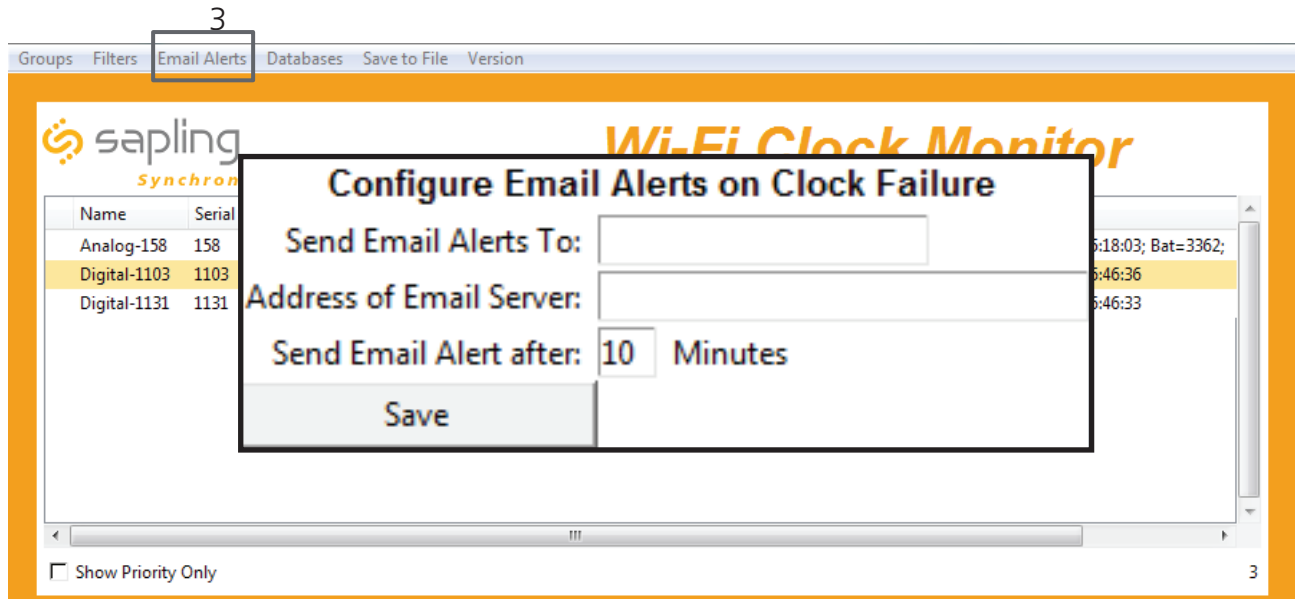
Filter By Clock Type - By selecting this option, the user is able to view specific clock types on the Monitor Screen. The clock types users can filter through are: Master Clocks, Network Repeaters, Wi-Fi Analog, Wi-Fi digital, IP Analog, and/or IP Digital clocks. When the box next to the clock type is checked, the user will be able to view that clock type on the Monitor Screen.

Filter By Name - By selecting this option, the user is able to search for specific clocks by name on the Monitor Screen. The user must type in the name of a clock and check the box next to the word Enable. Once checked, the clocks that match the name will appear.

Please Note: When using this option, the submitted name must be identical to the name of the clock in order to receive a match. There are a few special sequences/characters listed below that may be used when filtering by name:

*	Matches any sequence of 0 or more characters in the name
?	Matches any single character in the name
[chars]	Matches any character in the set given by chars. If a sequence of the form x-y appears in chars, then any character between x and y, inclusive, will match.
{[A-Za-z]}	Will match any alphabetical character.
\x	Matches the single character x. This provides a way of avoiding the special interpretation of the characters *?[\] in pattern.

Wi-Fi Monitor Software - Task Bar Options



1. **Email Alerts** - When clicked, this button will display the following options:

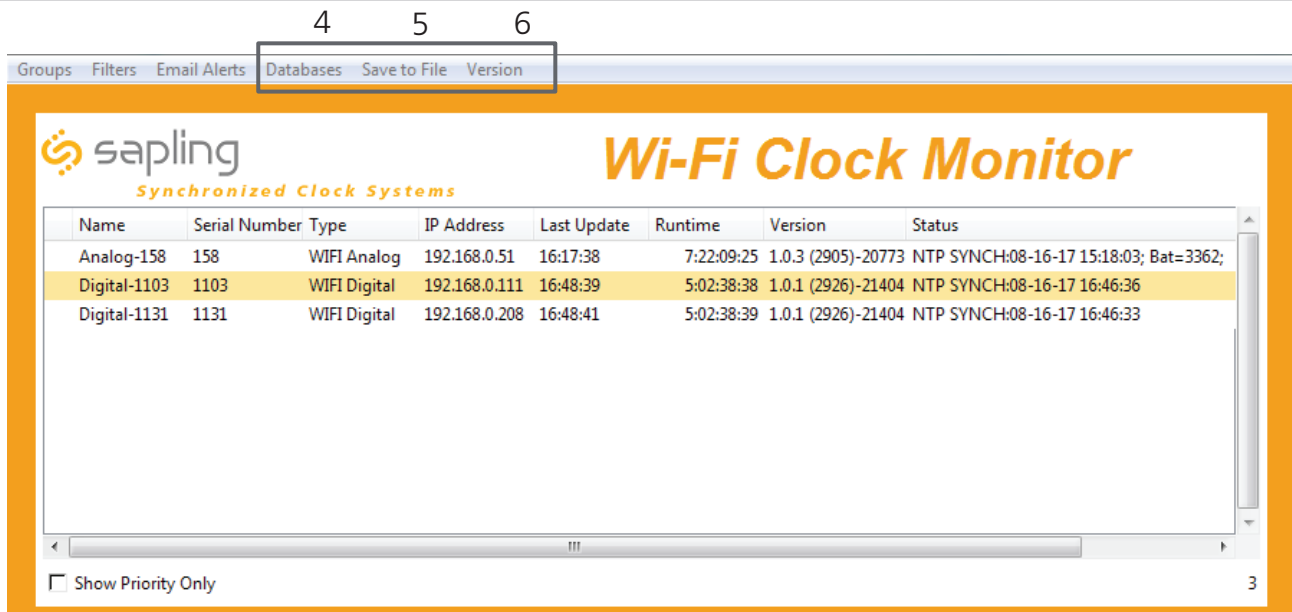
Enable Missing Clock Email Alerts - By selecting this option, the user will receive an email alert if the Wi-Fi Monitor Software hasn't heard from a selected group of clocks in a certain amount of time. This function will not work if the monitor is turned off.

Enable Low Battery Email Alerts - By selecting this option, the user will receive an email alert if a battery-powered Wi-Fi Analog clock is synchronizing while low on batteries. This function will not work if the monitor is turned off.

Configure Email Alerts - By selecting this option, the user is able to choose which email address the alerts are sent to, the address of the email server, and the amount of time between an event and the email being sent. Once the information is filled in, click the save button. When pressed, this will save all of the settings that were entered.

Send Test Email - By selecting this option, the user is able to send a test email to the email address specified in the Configure Email Alerts option.

Wi-Fi Monitor Software - Task Bar Options



4. **Databases** - When clicked, this button will display the following options:

Download Configuration - By selecting this option, the user can load a clock's setting from a PC to another clock of the same type.

Upload Configuration - By selecting this option, the user can load the settings from a Wi-Fi clock and save them to a PC.

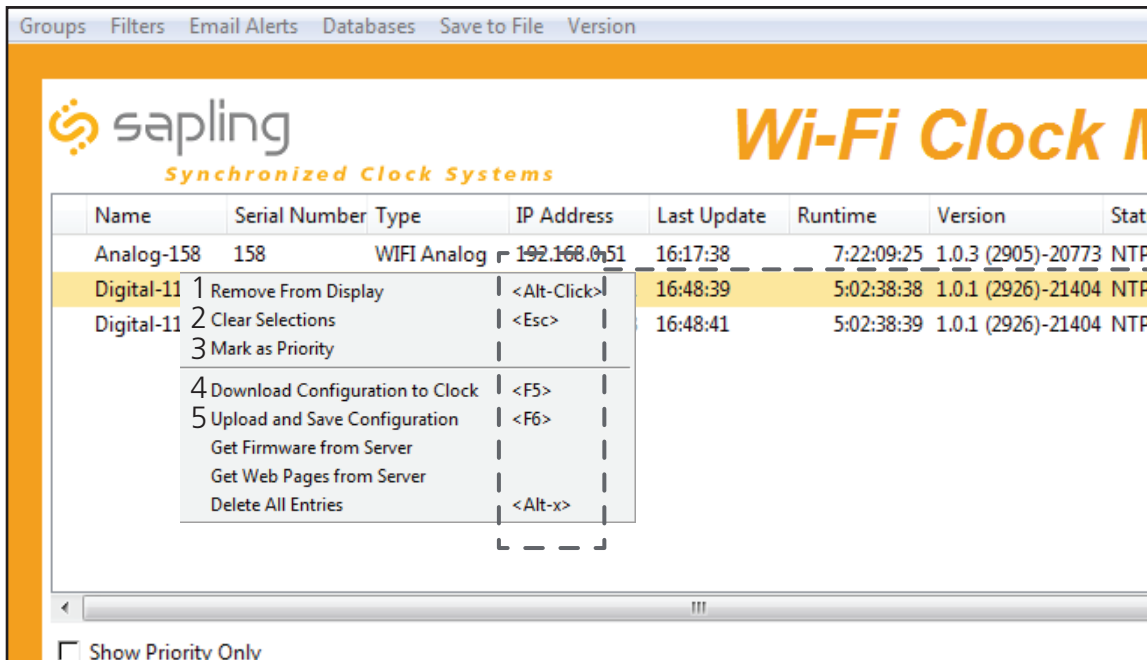
Get Firmware From Server - Updates software on the selected clock by downloading the latest version from Sapling's servers.

Get Web Pages From Server - Updates software on the selected clock's network card and web interface by downloading the latest version from Sapling's servers.

5. **Save to File** - When clicked, allows the user to save the all of the information in the Wi-Fi Monitor device list as a .CSV file, which can be printed from Microsoft Excel. If the monitor is showing devices from a specific Group, then the .CSV file will contain only the devices in that group.

6. **Version** - When clicked, this button will display version number information of the Wi-Fi Monitor Software and the Software Version Number (SVN). This information is needed only when contacting Sapling technical support and will not affect your usage of the Wi-Fi Monitor Software.

Wi-Fi Monitor Software - Quick Access Menu



Please note: These options can also be accessed by using the keyboard shortcuts noted in the Quick Access Menu.

Using a right-handed mouse to right-click on any row in the Device List will open the Quick Access Menu.

- 1. Remove from Display** - When clicked, this option will remove the selected clock from the Device List.
- 2. Clear Selections** - This option will deselect any highlighted items on the Device List.
- 3. Mark as Priority** - Marking a clock(s) as priority is another filtering option for a user to segment the clocks. Once a clock is marked as priority, there will be an asterisk (*) next to the chosen clock.
- 4. Download Configuration to Clock** - If a configuration file was created using "Upload and Save Configuration" on the Quick Access Menu, this option lets the user apply the configuration file to other clocks highlighted within the monitor. This function will not work if the clock is in Direct Mode. Clicking on this item will cause the Download Configuration window to appear:



A. Enter Password - The default password is 6063

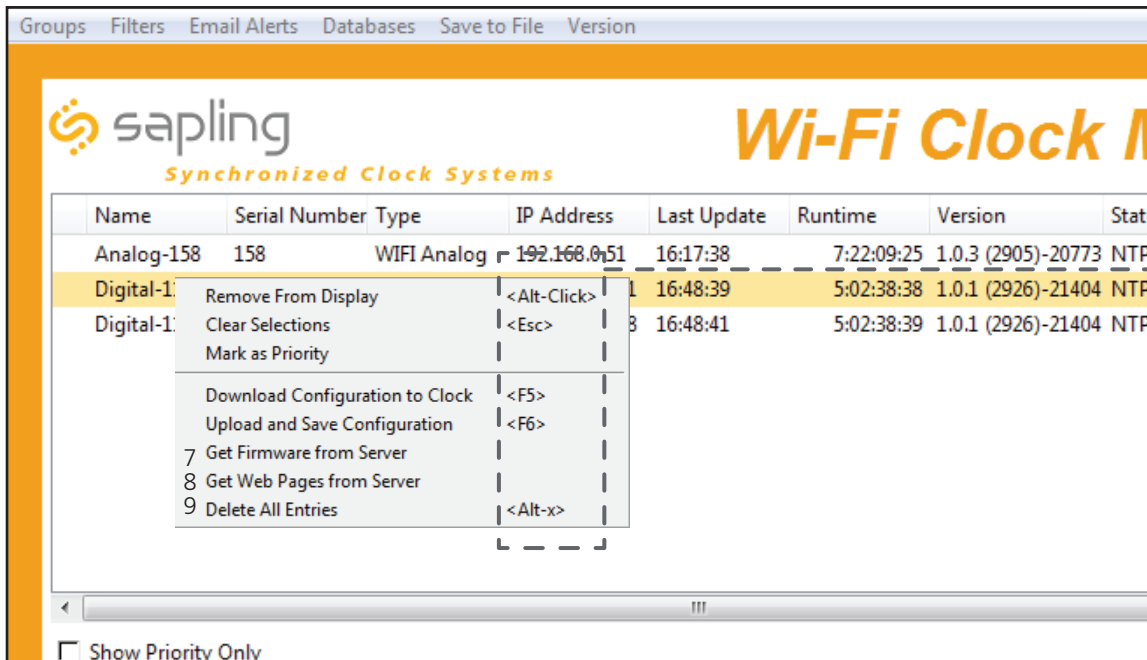
B. Select Configuration - Pressing the button allows the user to browse their computer for a previously-saved configuration file.

C. Send to Selected Clocks - Applies the configuration file to whichever clocks have been highlighted on the Device List.

D. Send to All Valid Clocks - Applies the configuration file to all applicable devices on the Device List. For instance, a Digital IP clock configuration file would be applied to every Digital IP clock on the Device List.

- 5. Upload and Save Configuration** - By selecting this option, the user can copy the settings from an IP device and save them to whichever computer is running the Wi-Fi Monitor. Your computer will automatically prompt you for the location of the saved configuration file. This function will not work if the clock is in direct mode.

Wi-Fi Monitor Software - Quick Access Menu



The screenshot shows the 'Wi-Fi Clock Monitor' software interface. At the top, there are tabs for 'Groups', 'Filters', 'Email Alerts', 'Databases', 'Save to File', and 'Version'. Below the tabs is the 'sapling' logo and the text 'Synchronized Clock Systems'. The main area displays a table of clock systems. The table has columns: Name, Serial Number, Type, IP Address, Last Update, Runtime, Version, and Status. The first row is 'Analog-158' with serial number 158, type 'WIFI Analog', IP address '192.168.0.51', last update '16:17:38', runtime '7:22:09:25', version '1.0.3 (2905)-20773', and status 'NTP'. The second row is 'Digital-1' with serial number 1, type 'Digital', IP address '16:48:39', last update '5:02:38:38', runtime '1.0.1 (2926)-21404', and status 'NTP'. A context menu is open over the second row, showing options: 'Remove From Display' (Alt-Click), 'Clear Selections' (Esc), 'Mark as Priority', 'Download Configuration to Clock' (F5), 'Upload and Save Configuration' (F6), '7 Get Firmware from Server', '8 Get Web Pages from Server', and '9 Delete All Entries' (Alt-x). At the bottom, there is a checkbox labeled 'Show Priority Only'.

Name	Serial Number	Type	IP Address	Last Update	Runtime	Version	Status
Analog-158	158	WIFI Analog	192.168.0.51	16:17:38	7:22:09:25	1.0.3 (2905)-20773	NTP
Digital-1	1	Digital	16:48:39	5:02:38:38	1.0.1 (2926)-21404	NTP	

Please note: These options can also be accessed by using the keyboard shortcuts noted in the Quick Access Menu

Using a right-handed mouse to right-click on any row in the Device List will open the Quick Access Menu.

7. Get Firmware From Server - Updates software on the clock by downloading the latest version from the manufacturer's cloud server.

8. Get Web Pages From Server - Updates software on the network card and web interface by downloading the latest version from the manufacturer's cloud server.

9. Delete All Entries - Clears all clocks from the Monitor. Clocks will be re-added to the monitor as they check in.

Wi-Fi Monitor Software - Error messages

1. **Characters are Red** - When the characters of a clock have turned red, then the clock has not sent its status within the last 10 minutes.
2. **Characters are Gray** - When the characters of a clock have turned gray, then the clock was once displayed on the Wi-Fi Monitor, but upon launching the Wi-Fi Monitor program this most recent time, the clock cannot be found on the network.
3. **Characters are Black** - When the characters of a clock are black, this means that the clock is working normally.

Using the Wi-Fi Monitor with IP Clocks, Master Clocks, and Network Repeaters

The Wi-Fi Monitor can be used with devices other than Wi-Fi clocks. Please note that these other devices are sold with separate "IP Monitor" software. "IP Monitor" contains some features that are not compatible with Wi-Fi Clocks, but which are compatible with some of these other devices.

The Wi-Fi Monitor and IP Monitor cannot run at the same time. If managing Wi-Fi clocks and a mixture of other devices at the same time, use the IP Monitor instead of the Wi-Fi Monitor. Be aware, not all features on the IP Monitor will function on Wi-Fi clocks.

Groups Filters Email Alerts Databases Save to File Version

sapling
Synchronized Clock Systems

Wi-Fi Clock Monitor

Name	Serial Number	Type	IP Address	Last Update	Runtime	Version	Status
Analog-158	158	WiFi Analog	192.168.0.51	16:17:38	7:22:09:25	1.0.3 (2905)-20773	NTP SYNCH08-16-17 15:18:03; Bat=3362;
Digital-1103	1103	WiFi Digital	192.168.0.111	16:48:39	5:02:38:38	1.0.1 (2926)-21404	NTP SYNCH08-16-17 16:46:36
Digital-1131	1131	WiFi Digital	192.168.0.208	16:48:41	5:02:38:39	1.0.1 (2926)-21404	NTP SYNCH08-16-17 16:46:33

☐ Show Priority Only

Send Groups Filters Email Alerts Databases Save to File Version

sapling
Synchronized Clock Systems

Sapling IP Clock Monitor

Name	Serial Number	Type	IP Address	Last Update	Runtime	MAC	Status
Hong Kong	1198	IP Digital	192.168.0.164	11:05:02	38:00:56:19	60:36:96:04:00:C6	NTP SYNCH06-04-15 22:53:17 D
Eng Drift Test 7	4469	Master Clock	192.168.0.96	11:03:49	11:23:23:04	Unknown	NTP 06/04/15 10:53:49
Poseidon	9104	Network Rptr	192.168.0.137	11:05:07	0:23:28:36	Unknown	NTP SYNCH06-04-15 09:37:01
Zeus	5456	Master Clock	192.168.0.177	11:04:00	4:22:24:39	Unknown	RS485 06/03/15 15:25:23
Eng Drift Test 5	4467	Master Clock	192.168.0.221	11:04:00	11:23:21:51	Unknown	NTP 06/04/15 10:59:02
Hai	13617	IP Digital	192.168.0.55	10:54:13	0:20:59:36	60:36:96:04:00:C7	NTP SYNCH06-04-15 10:48:42 D
Dubai	1187	IP Digital	192.168.0.217	11:04:30	0:17:33:07	60:36:96:04:00:C5	NTP SYNCH06-04-15 19:04:23 D
Sydney	1196	IP Digital	192.168.0.142	11:04:36	37:18:40:55	60:36:96:04:00:C4	NTP SYNCH06-05-15 01:01:22 D
Los Angeles	1192	IP Digital	192.168.0.198	11:04:41	6:14:34:38	60:36:96:04:00:C0	NTP SYNCH06-04-15 07:57:09 D
London	1193	IP Digital	192.168.0.56	11:04:42	6:14:34:38	60:36:96:04:00:C1	NTP SYNCH06-04-15 16:00:35 D

Send Message to Digital Clocks Send Countdown to Digital Clocks Download Configuration to Clocks ☐ Show Priority Only

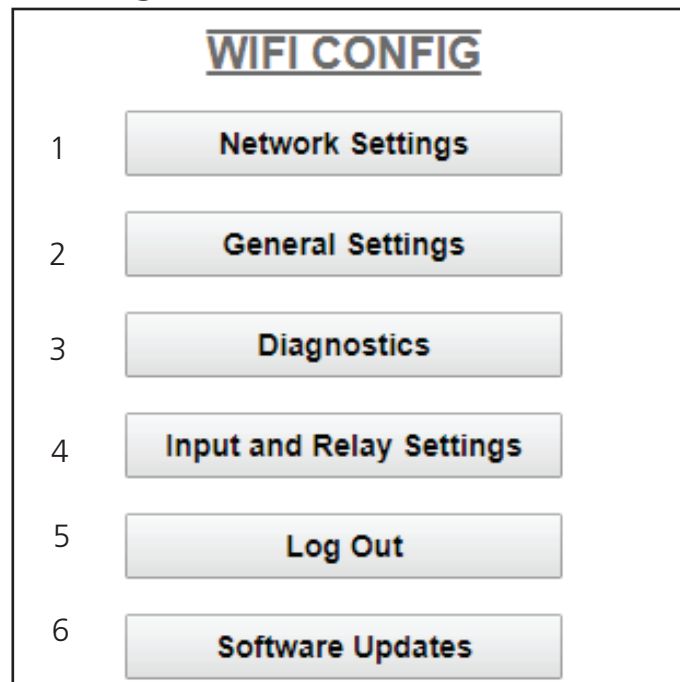
Web Interface - Log In



The screenshot shows a web interface titled "SAPLING WIFI CONFIG". It contains two numbered items: 1. "Password(Show):" followed by a text input field. 2. A "Submit" button.

1. **Password** - Location where the password is entered. The default password is 6063, but this can be changed within the settings.
2. **Submit** - When pressed, the program will check the password. If the password is correct, it will grant the user access to the Web Interface.

Web Interface - Home Page



The screenshot shows a web interface titled "WIFI CONFIG". It contains six numbered items, each with a button: 1. "Network Settings" 2. "General Settings" 3. "Diagnostics" 4. "Input and Relay Settings" 5. "Log Out" 6. "Software Updates"

1. **Network Settings** - Takes the user to the Network Settings page. Network Settings includes any setting used by the clock to communicate with the network.
2. **General Settings** - Takes the user to the General Settings page. General Settings includes settings for Time Configuration, Daylight Saving Time, NTP Servers, and Login Settings.
3. **Diagnostics** - Takes the user to the Diagnostics page.
4. **Input and Relay Settings** - Takes the user to the Input and Relay Settings page.
5. **Log Out** - Logs the user out of the clock software. The user will need to log back in before they are able to change any settings.
6. **Software Updates** - Takes the user to the Software Updates page.

Web Interface - Network Settings

NETWORK SETTINGS

1	Clock Name:	Room 302
2	Serial Number:	1109
3	MAC Address:	60:36:96:0a:00:6d
4	Select Network:	Series1 ▼
5	Network:	Series1
6	Network Password (Show):	
7	DHCP Auto On:	On ▼
8	IP Address:	192.168.4.4
	Subnet Mask:	255.255.255.0
	Gateway Address:	192.168.4.1
	Auto DNS:	On ▼
	DNS Address:	192.168.0.31
	Broadcast to Monitors:	On ▼
	Send Specific Monitor IP:	Off ▼
	Monitor IP Address:	0.0.0.0

Enterprise Settings

Submit

- Clock Name** - This field allows the user to set a name used to identify the clock on the Wi-Fi Monitor. This name is also used to identify the clock in a network list while the clock is in Direct-Connect mode. The name must be fewer than 26 characters.
- Serial Number** - The clock's serial number. It cannot be changed.
- MAC Address** - This field shows the clock's permanent machine address. It cannot be changed.
- Select Network** - The clock scans for access points that are broadcasting their network name (SSID), and allows the user to select one instead of manually entering the name in the Network box. You may need to refresh the web page for more network names to appear. **SSIDs must use only English letters, numbers, and spaces. No symbols.**
- Network** - This field allows the user to connect the clock to a wireless network by entering the network name (SSID). The information in this field is overridden if a value was selected in the Select Network field. **SSIDs must use only English letters, numbers, and spaces. No symbols.**
- Network Password** - This field allows the user to connect the clock to a wireless network by entering the network password. Network passwords must be 32 characters or fewer. The characters of the password can be shown by placing the computer's cursor over the word "show"**THIS IS ALSO USED AS THE PASSWORD FIELD FOR WPA2-Enterprise NETWORKS.**
- DHCP Auto On** - Allows the user to set whether or not the clock will use a DHCP server to determine the IP address for the clock.
- IP Address** - This field will display the clock's IP address. If DHCP Auto On is enabled, this address will be assigned by the DHCP server. If DHCP Auto On is disabled, then the user may set their own static IP address.

Web Interface - Network Settings (ctd.)

NETWORK SETTINGS

	Clock Name:	Room 302
	Serial Number:	1109
	MAC Address:	60:36:96:0a:00:6d
	Select Network:	Series1 ▼
	Network:	Series1
	Network Password (Show):	
	DHCP Auto On:	On ▼
	IP Address:	192.168.4.4
9	Subnet Mask:	255.255.255.0
10	Gateway Address:	192.168.4.1
11	Auto DNS:	On ▼
12	DNS Address:	192.168.0.31
13	Broadcast to Monitors:	On ▼
14	Send Specific Monitor IP:	Off ▼
15	Monitor IP Address:	0.0.0.0
16	Enterprise Settings Submit	
17		

9. Subnet Mask - This field allows the user to set the subnet mask for their clock. If DHCP Auto On is enabled, this address will be assigned by the DHCP server. If DHCP Auto On is disabled, then the user may set their own subnet mask.

10. Gateway Address - This field allows the user to set the gateway IP address. If DHCP Auto On is enabled, this address will be assigned by the DHCP server. If DHCP Auto On is disabled, then the user may set their own Gateway Address.

11. Auto DNS - Allows the user to set whether or not the clock will obtain an Domain Name Server (DNS) address from the network's DHCP server.

12. DNS Address - This field allows the user to set the DNS Server IP address. If Auto DNS is enabled, this address will be assigned by the DHCP server. If Auto DNS is disabled, then the user may set their own DNS Address.

13. Broadcast to Monitors - Broadcasts the clock's presence to all instances of Wi-Fi Monitor Software running on the network.

14. Send Specific Monitor IP - When set to ON, broadcasts the clock's presence to an instance of the Wi-Fi Monitor Software running on a specific IP address.

15. Monitor IP Address - When Send Specific Monitor IP is set to ON, the clock will broadcast its presence to the IP address entered in this field. If Send Specific Monitor IP is set to off, this field is not accessible.

16. Enterprise Settings - Takes the user to a page for WPA2 Enterprise Encryption Settings.

17. Submit - Applies any changes to the previous options when pressed. Note that changes to some fields, including IP Address, Subnet Mask, and DNS Address will not be applied until the clock is power-cycled.

Web Interface - Enterprise Encryption Settings

WPA ENTERPRISE SETTINGS

1 **User Name:**

2 **Outer Authentication:** ▼

3 **Inner Authentication:**

THIS SECTION IS REQUIRED ONLY IF YOUR NETWORK USES **WPA2-ENTERPRISE ENCRYPTION**

WPA2-PSK NETWORKS DO NOT REQUIRE USE OF THESE SETTINGS. IF YOUR WI-FI NETWORK PROMPTS YOU FOR A PASSWORD BUT NO USER NAME WHEN CONNECTING, YOU ARE LIKELY USING A WPA2-PSK NETWORK. CONSULT WITH YOUR ORGANIZATION'S NETWORK ADMINISTRATOR FOR QUESTIONS ABOUT YOUR NETWORK SECURITY SETTINGS.

1. User Name - This field allows the user to enter a username for RADIUS Authentication.

Password - Is entered on the main network page.

2. Outer Authentication - Allows the user to set the outer authentication scheme. The available protocols are EAP-FAST, EAP-TTLS EAP-PEAP

3. Inner Authentication - Allows the user to see the inner authentication scheme. The only available protocol is EAP-MSCHAP.

4. Submit - Applies any changes to the previous options when pressed.

WPA2-PSK Networks will ignore all settings entered on this page.

Web Interface - General Settings

GENERAL SETTINGS

- 1 **Time Settings**
- 2 **Daylight Saving Time**
- 3 **Servers**
- 4 **Display Settings**
- 5 **Elapsed Timer**
- 6 **Login Settings**

1. **Time Settings** - Takes the user to the Time Settings page.
2. **Daylight Saving Time** - Takes the user to the Daylight Saving Time page.
3. **Servers** - Takes the user to the Servers page.
4. **Display Settings** - Takes the user to the Display Settings page.
5. **Elapsed Timer** - Takes the user to the Elapsed Timer page. This button will only appear if the Elapsed timer is attached to the clock.
6. **Login Settings** - Takes the user to the Login Settings page.

Web Interface - Time Settings

TIME SETTINGS

1	Set Time	<input type="text" value="02"/> : <input type="text" value="08"/> <input type="text" value="PM"/>
2	Set Date	<input type="text" value="09/27/2016"/>
3		<input type="button" value="Change Time"/>
4	GMT Offset	<input type="text" value="-4"/>
5	Bias Seconds	<input type="text" value="0"/>
6		<input type="button" value="Change Bias/Offset"/>

1. **Set Time** - This setting allows the user to set the clock to a specific time. Fields for each portion of the time may be accessed via the drop-down menu. New NTP data will override this information.
2. **Set Date** - This setting allows the user to set the clock to a specific date. The date must be entered in the following multi-digit format: mm/dd/yyyy where m is a month digit, d is a day of the month digit, y is a digit of the year. New NTP data will override this information.
3. **Change Time** - Applies the information configured in the Set Time and Set Date settings.
4. **GMT Offset** - This setting allows the user to set which time zone the clock will use when displaying the time. For instance, London is an offset of 0, New York is an offset of -5 and Hong Kong is an offset of +8. The clock may be configured to function as part of a Zone Clock through this option.
5. **Bias Seconds** - This setting allows the user to alter how much faster or slower the IP clock will run in relation to synchronized time. The range permits -3600 seconds to +3600 seconds. (This translates to a range of one hour either way, but the time must be entered as a number of seconds).
6. **Change Bias/Offset** - Applies the information configured in the GMT Offset and Bias Seconds settings.

Web Interface - Daylight Saving Time

DST SETTINGS

1 Day of Week in Month ▼

Daylight Saving Time Starts

Second ▼ Sunday ▼

Of: March ▼ at: 2:00 ▼

Daylight Saving Time Ends

First ▼ Sunday ▼

Of: November ▼ at: 2:00 ▼

2 Submit

DST SETTINGS

1 Day of Month ▼

Daylight Saving Time Starts

▼ January ▼ at: 0:00 ▼

Daylight Saving Time Ends

▼ January ▼ at: 0:00 ▼

2 Submit

DST SETTINGS

1 By Country ▼

North American Group ▼

North American Group

US

Canada (most)

Baja California

Bermuda

Turks and Caicos

2 Submit

1. **Method for Defining DST** - There are four methods for defining Daylight Saving Time. The method can be selected from the drop-down menu. Clicking on the Select button displays additional options for that method.

- **Day of the Week in the Month** - This mode allows the user to select the day of the week, month, and time for when the clock will switch to daylight Saving Time. Once the day, month, and time have been set, click Submit to apply the settings to the clock. Example: Second Sunday of March at 2:00.
- **Day of the Month** - This mode allows the user to select the specific day of the month and time for when the clock will switch to daylight saving time. Once the date, month, and time are set, click Submit to apply the settings to the clock. Example: March 1st at 2:00.
- **By Country** - This mode allows the user to select preset Daylight Saving Time information associated with a specific country or group of countries. Select the preset from the drop-down menu, then click Submit to apply the settings to the clock.
- **None** - This mode does not change the clock for Daylight Saving Time.

2. **Submit** - Applies any changes to the previous options when pressed.

Web Interface - Servers

SERVER SETTINGS

1	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">1st Server Address:</td> <td><input type="text" value="us.pool.ntp.org"/></td> </tr> <tr> <td>2nd Server Address:</td> <td><input type="text" value="ca.pool.ntp.org"/></td> </tr> <tr> <td>3rd Server Address:</td> <td><input checked="" type="radio"/> <input type="text" value="de.pool.ntp.org"/></td> </tr> <tr> <td>4th Server Address:</td> <td><input type="text" value="ru.pool.ntp.org"/></td> </tr> <tr> <td>5th Server Address:</td> <td><input type="text" value="uk.pool.ntp.org"/></td> </tr> </table> </div>	1st Server Address:	<input type="text" value="us.pool.ntp.org"/>	2nd Server Address:	<input type="text" value="ca.pool.ntp.org"/>	3rd Server Address:	<input checked="" type="radio"/> <input type="text" value="de.pool.ntp.org"/>	4th Server Address:	<input type="text" value="ru.pool.ntp.org"/>	5th Server Address:	<input type="text" value="uk.pool.ntp.org"/>	Server Performance EXCELLENT EXCELLENT EXCELLENT EXCELLENT EXCELLENT
1st Server Address:	<input type="text" value="us.pool.ntp.org"/>											
2nd Server Address:	<input type="text" value="ca.pool.ntp.org"/>											
3rd Server Address:	<input checked="" type="radio"/> <input type="text" value="de.pool.ntp.org"/>											
4th Server Address:	<input type="text" value="ru.pool.ntp.org"/>											
5th Server Address:	<input type="text" value="uk.pool.ntp.org"/>											
2	Rotate Servers: <input checked="" type="checkbox"/>	Server Performance 1-20% POOR 20-40% SATISFACTORY 40-60% FAIR 60-80% GOOD 80-100% EXCELLENT										
3	Network Sync Every: <input type="text" value="4 Hours"/>											
4	<input type="button" value="Submit"/>											

Sapling Web Server: V.0.0.0

1. **Server Addresses** - These fields allow a user to set the address that the clock will use to obtain NTP time. Web addresses may be entered as a URL or IP number. The active server is identified by the red dot.
2. **Rotate Servers** - When left unchecked, the clock will only attempt to obtain time from the selected NTP server, and will only attempt to try other servers if the selected server fails. When checked, the clock will rotate through the listed addresses each time the clock performs a synchronization check.
3. **Network Sync Every** - Allows the user to decide how often the clock will attempt to acquire NTP time.
4. **Submit** - Applies any changes to the previous options when pressed.

If a Server Address entry is left blank, that entry will be skipped. If all entries are set to blank, the clock will function as an unsynchronized quartz clock. It will leave the network adapter powered down unless it has been activated by a front-panel button-press command.

Web Interface - Display Settings

DISPLAY SETTINGS

1	Time Format:	<input type="text" value="24 Hour"/>
2	Date Format:	<input type="text" value="MM:DD:YY"/>
3	Temperature Format:	<input type="text" value="Fahrenheit"/>
4	Brightness:	<input type="text" value="High"/>
5	Seconds Time Displayed:	<input type="text" value="100"/>
6	Seconds Date Displayed:	<input type="text" value="0"/>
7	Seconds Temp Displayed:	<input type="text" value="0"/>
8	<input type="button" value="Submit"/>	

1. **Display Format** - Allows the user to select how the time is displayed on the clock. There are two options: 12 hour format (3:00AM/3:00PM) or 24 hour format (3:00/15:00).
 2. **Date Format** - Sets the date to display in either American style: MM:DD:YY or European style: DD:MM:YY. For 4 digit clocks, the date will display in either American style: MM:DD or European style: DD:MM.
 3. **Temperature Format** - If a temperature sensor was installed on the clock, this option allows a user to select whether the temperature appears in Fahrenheit or Celsius.
 4. **Brightness** - Sets the brightness level that the clock will display. There are four levels to choose from: High, Medium, Low or Off.
 5. **Seconds Time Displayed*** - The clock will display the time for the number of seconds entered in the box. After the selected amount of time passes, the clock will change to show Date or Temperature. If a time of 0 is selected, the clock will not display the time. If Date and Temp Displayed are set to 0, the clock will only display the time.
 6. **Seconds Date Displayed*** - The clock will display the date for the number of seconds entered in the box. After the selected amount of time passes, the clock will change to show the Time or Temperature. If a time of 0 is selected, the clock will not display the date. If Time and Temp Displayed are set to 0, the clock will only display the date.
 7. **Seconds Temp Displayed*** - If a temperature sensor was installed on the clock, the clock will display the temperature for the number of seconds entered in the box. After the selected amount of time passes, the clock will change to show the Time or Date. If a time of 0 is selected, the clock will not display the temperature. If Time and Date Displayed are set to 0, the clock will only display the temperature.
 8. **Submit** - Applies any changes to the previous options when pressed.
- *Note:** If the Time, Date, and Temp Displayed are ALL set to 0, the display will turn completely blank. It will turn on for count down/up, and off again once the counting has been cleared.

Web Interface - Elapsed Timer

ELAPSED TIMER SETTINGS

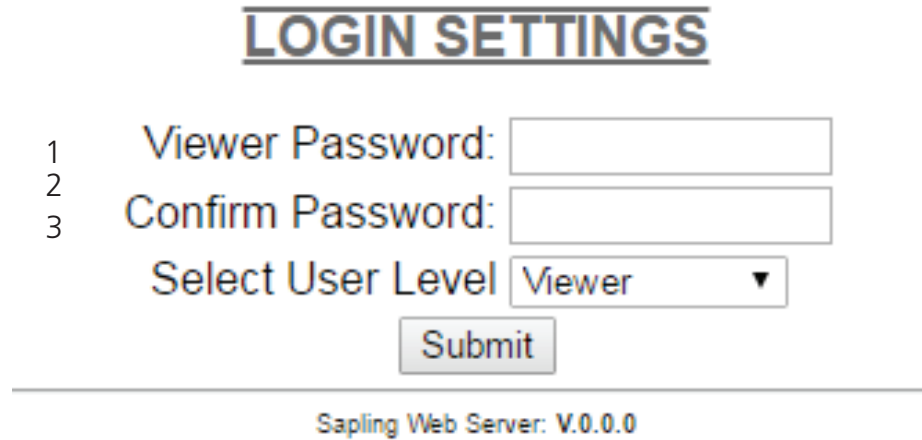
	Button Lights	Action	Seconds
1	Lights	Go to CountUp and Start ▼	0
2	Lights	Start/Stop ▼	0
3	Lights	Return to Time Display ▼	0
4	Lights	Go to Countdown and Start ▼	600

Submit

REFER TO THE ELAPSED TIMER MANUAL FOR ADDITIONAL SETUP INSTRUCTIONS

A user may set up and configure the Elapsed Timer control panel through this page. For detailed instructions on the many functions and uses of the Elapsed Timer, refer to the Elapsed Timer Manual.

Web Interface - Login Settings



The screenshot shows a web interface titled "LOGIN SETTINGS" in a large, bold, blue font. Below the title, there are three numbered items: 1. "Viewer Password:" followed by a text input field; 2. "Confirm Password:" followed by a text input field; 3. "Select User Level" followed by a dropdown menu currently showing "Viewer" with a downward arrow. Below these fields is a "Submit" button. At the bottom of the interface, it says "Sapling Web Server: V.0.0.0".

1. **Viewer/Technician/Administrator Password** - Allows the Administrator to set up a new password to the web interface.
2. **Confirm Password** - The new password must also be entered here for a change to be made.
3. **Select User Level** - Allows the Administrator to select an access level for the new password to be applied to. The user levels have the following permissions:
 - Viewer - Allows the user to view all of the settings in the clock Web Interface, but does not allow the user to add, remove, or change any setting. The default Viewer password is 1111
 - Technician - Allows the user to view all of the settings in the clock Web Interface and allows the user to change any setting except for those listed on the Login Settings page. The default Technician password is 6063.
 - Administrator - Allows the user to view and change any setting in the clock Web Interface, including the passwords on the Login Settings page. The default Administrator password is 8085.
4. **Submit** - Applies any changes to the previous options when pressed.

Web Interface - Diagnostics

DIAGNOSTICS

- 1 **Software Version:** 1.0.1
- 2 **Web Page Version:** 1.0.1
- 3 **SVN Revision:** 2624
- 4 **Webpage SVN:** 2622
- 5 **Run Time From Last Power Up [d h:m:s]:** 0 22:19:23
- 6 **Total Run Time [d h:m]:** 6 01:02
- 7 **Last Received Signal at [m-d-y h:m:s]:** 02-01-17 14:20:12
- 8 **Network Sync Every [m]:** 5
- 9 **Worst Server:** jp.pool.ntp.org
- 10 **WiFi Signal Strength [dBm]:** -37
- 11 **Display [date time status]:** 01-31-17 16:05:29 - OK
- 12 **Troubleshooting**
- 13 **Home**

1. **Software Version** - Lists the software version for the main processing board of the clock.
2. **Web Page Version** - Lists the software version for the clock's web interface and network card.
3. **Firmware SVN Revision** - Lists the SVN number for the Firmware.
4. **Web Page SVN Revision** - Lists the SVN number for the Web Page.
5. **Run Time From Last Power Up** - Lists the amount of time that has passed since the clock started receiving power.
6. **Total Run Time** - Lists the total amount time that the clock has been powered since it was built.
7. **Last Received Signal at** - Lists the time and date when the clock last received NTP data.
8. **Network Sync Every** - Lists the number of minutes that pass between each time that the clock powers its transmitter to get NTP data.
9. **Worst Server** - Lists the number of the NTP server that has responded the least often when contacted for NTP data. See "Web Interface - Servers" to see the server address/domain associated with each number.
10. **Wi-Fi Signal Strength** - Lists the signal strength between the clock and wireless access point or wireless router in dBm. The closer the number is to 0, the stronger the signal is.
11. **Display [date time status]** - Lists the date and time of the last instance where the display LEDs were tested, and whether or not the test was successful. This time will usually correspond to the last time that the clock was first powered on, or the last time that the Check Display button was pressed on the Troubleshooting page.
12. **Troubleshooting** - Takes the user to the Troubleshooting page. On this page, the user can have the clock check the display for errors, force a time synchronization update, or restore the clock to the factory default settings.
13. **Home** - Returns the user to the "WIFICONFIG" Home Page.

Web Interface - Troubleshooting

TROUBLESHOOTING

- 1 **Check Display**
- 2 **Force Time Update**
- 3 **Restore Default settings**

1. **Check Display** - When clicked, this button causes the clock to test the LED segments on the clock's display by flashing each one on and off individually in sequence. This will allow the user to determine if one of the segments has failed, so the clock can be sent in for repairs. The clock will return to showing the time after the test is complete.
2. **Force Time Update** - When clicked, this button causes the clock to immediately poll an NTP server and adjust its time accordingly.
3. **Restore Default settings** - When clicked, this button causes the clock to revert to the factory default settings. All data entered by the user will be lost, including network and security parameters. Once the clock has rebooted, it will go into Direct Mode, and will no longer be accessible over the network until new network settings have been entered.

Web Interface - Input and Relay Settings (3300 Only)

INPUT AND RELAY SETTINGS

- 1 **Inputs**
- 2 **Outputs**
- 3 **End Countdown**

1. **Inputs** - Takes the user to the Inputs page. This page controls what actions the clock will take when an input is activated.
2. **Outputs** - Takes the user to the Outputs page. This page controls signals outputted by the clock relays.
3. **End Countdown** - Takes the user to the End Countdown page. This page controls the actions that the clock will take whenever a countdown ends.

Web Interface - Inputs (3300 Only)

INPUT SETTINGS

Input	Action	Seconds
1	Relay 1 ▼	0
2	Relay 2 ▼	0
3	Relay 1 ▼	0
4	Relay 2 ▼	0

The 'Inputs' tab allows a user to program the clock to perform a certain function through a switch or relay contact closure from an outside device such as Code Blue, Nurses Call, etc. Program the first Input on the 3300 digital clock by selecting one of the options in the drop down list next to Input 1. Listed below are the options and the function of each one:

No Action - This function does nothing if the input is activated.

Return to Time Display - Activating the input causes the clock to display the time. If a countdown or count up is in progress, the function is reset when the input is activated.

Briefly Display Date - Activating the input causes the clock to briefly display the date. This only works if the clock is displaying the time, not a countdown.

Go to Count Up and Hold - Activating the input causes the clock to display and hold at zero.

Go to Count Up and Start - Activating the input causes the clock to switch from its current display and begin a count up from zero.

Go to Count Down and Hold - Activating the input causes the clock to display and hold at a start time specified by the user in the Seconds box.

Go to Count Down and Start - Activating the input causes the clock display to begin counting down from a time specified by the user in the Seconds box.

Reset - Activating the input restarts whichever countdown/count up is in progress.

Start/Stop - Activating the input causes the timer to pause or resume its counting functions.

Shift Digits - Activating the input causes the digits to shift from displaying Hour/Minutes to Minutes/Seconds (Applies to 4 digit clocks only).

Flash Time - Activating the input causes the clock to briefly display the time while another function, such as count up or count down, is occurring. Activating the input does not pause, stop, or reset whichever function is occurring at the same time.

Relay 1/2 - Activating the input causes the listed Output Relay to activate.

Code Blue /Code Blue 2 - Performs a special-purpose count up. Refer to the section on the next page labeled "Code Blue 1" or "Code Blue 2"

Function as Elapsed Timer Button 1/2/3/4 - Performs whatever function was programmed for the listed elapsed timer button. This option will only appear if an elapsed timer is connected to the clock.

Submit - Applies any changes to the previous options when pressed.

Web Interface - Inputs (ctd.) (3300 Only)

Code Blue is a special-purpose count up designed for use in hospitals and other medical facilities. This function overrides the control panel LED settings. The lights are green while the timer is running and red when the timer has been paused.

Code Blue 1:

When an input programmed with Code Blue is activated for the first time, the count up starts.

When the input is activated a second time, the count up pauses. If the input is activated a third time, the count up will resume.

When the input is activated for a period longer than three seconds, the count up resets to zero and the display goes back to showing the time.

If a button programmed with the Start/Stop function is pressed while Code Blue is running, the count up will pause. If Start/Stop is pressed again, the count up will resume.

Code Blue 2:

When an input programmed with Code Blue is activated for the first time, the count up starts.

When the input is activated a second time, the count up pauses. If the input is activated a third time, the count up will resume.

When the input is activated for a period longer than three seconds, the count up resets to zero and the display goes back to showing 00:00:00.

If a button programmed with the Start/Stop function is pressed while Code Blue is running, the count up will pause. If Start/Stop is pressed again, the count up will resume.

Web Interface - Outputs (3300 Only)

OUTPUT SETTINGS

1	RS485 Data Rate:	OFF ▼
2	Relay 1 Output:	None ▼
3	Relay 2 Output:	None ▼
<div>Submit</div>		

4

1. **RS485 Data Rate** - Allows the user to decide how often data will be sent by the clock's RS485 port.
2. **Relay 1 Output** - Allows the user to select which time protocol will be sent by the clock through Relay
1. Refer to the next page for output options.
3. **Relay 2 Output** - Allows the user to select which time protocol will be sent by the clock through Relay
2. Refer to the next page for output options.
4. **Submit** - Applies any changes to the previous options when pressed.

Web Interface - Outputs (3300 Only)

None - The relay is disabled. This is the default value for this function.

58th Minute (1) - The clock performs an hourly correction that takes 55 seconds and occurs between XX:58:05 and XX:59:00 of every hour. It also performs two daily corrections: one at 5:00AM and another at 5:00PM. Each daily correction is ten relay cycles, each cycle is 95 seconds long, and the cycles begin at 5:05AM/PM, 5:07, 5:09, 5:11, 5:13, 5:15, 5:17, 5:19, 5:21, and 5:23 respectively.

58th Minute (2) - The clock performs an hourly correction that takes 60 seconds and occurs between XX:58:00 and XX:59:00. It also performs two daily corrections: one at 5:00AM and one at 5:00PM. Each daily correction is made of twelve relay cycles, and each cycle consists of 65 seconds on and 25 seconds off.

58th Minute (3) - The clock performs an hourly correction that takes 60 seconds and occurs between XX:58:00 and XX:59:00. It also performs two daily corrections: one at 5:00AM and one at 5:00PM. Each daily correction is made of twelve relay cycles, and each cycle consists of 60 seconds on and 120 seconds off.

58th Minute (4) - The clock performs an hourly correction that takes 55 seconds and occurs between XX:59:05 and XX:59:00. It also performs two daily corrections: one at 5:00AM and one at 5:00PM. Each daily correction is made of twelve relay cycles, each cycle is 55 seconds long, and the cycles begin at 5:03:05AM/PM, 5:07:05, 5:11:05, 5:15:05, 5:19:05, 5:23:05, 5:27:05, 5:31:05, 5:35:05, 5:39:05, 5:43:05, and 5:47:05 respectively.

National time & Rauland (1) - The clock performs an hourly correction that takes 25 seconds and occurs between XX:00:00 and XX:00:25. It also performs two daily corrections: one at 6:00AM and one at 6:00PM. Each daily correction is made of twenty four relay cycles consisting of 25 seconds on, followed by 35 seconds off.

National Time & Rauland (2) - The clock performs an hourly correction that takes 25 seconds and occurs between XX:00:00 and XX:00:25. It also performs two daily corrections at 6:00:25AM and 6:00:25PM. Each daily correction is a single 24 minute pulse which lasts from 6:00:25AM/PM to 6:24:25.

Rauland Digital - The clock will reset the secondary clock to 12:00:00AM, then advance the time on the secondary clock by one minute for every 0.5 seconds that the Digital line is shorted to ground.

Once a Day Pulse - The clock relay will close at a specific time and for an amount of time decided by the clock circuit settings. If this is selected, boxes for Hours, Minutes, Seconds, and Duration will appear.

Web Interface - End Countdown (3300 Only)

COUNTDOWN COMPLETION

On Countdown Complete:

A Close for Seconds

B Go To ☒ Time ☐ CountUp

C Flash Zeros ☐ for Seconds

D

A. When a user schedules a countdown, they may also command a relay to close after a countdown is complete (if using a 3300 Series Digital Clock). This is configured through the configuration window or web interface. Listed below are the options for this function:

- Neither - When the countdown completes, neither relay will close.
- Relay 1 – When the countdown completes, Relay 1 will close for the number of seconds* entered into the box to the right.
- Relay 2 – When the countdown completes, Relay 2 will close for the number of seconds* entered into the box to the right.

* Relays may close for 30 seconds or less. They may not close for more than 30 seconds.

B. A user can select what the clock will do after reaching at the end of a countdown by selecting the circle next to either **Time** or **Count Up**. If Time is selected, the clock will display the time at the end of the countdown. If Count Up is selected, then the timer will begin to count up from 0 after the countdown reaches 0.

C. If the box next to **Flash Zeros at the end of Countdown** is selected, the digits on the clock will blink on and off once the timer reaches 00:00:00. The zeros will flash for the number of seconds entered into the box to the right.

D. Click Submit in order to save and apply the selected options.

Relay Contact Rating:

- 0.3A at 110 VAC
- 1A at 24 VDC

Web Interface - Software Update

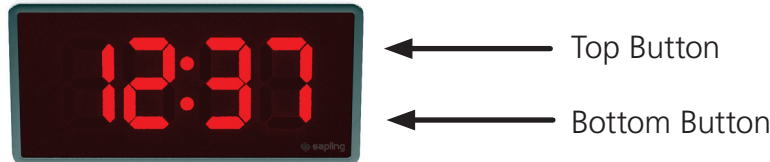
<u>FIRMWARE UPDATE</u>		<u>FIRMWARE UPDATE</u>	
<div>No Webpage Updates Avail</div>	1	<div>Update Web Pages From Sapling</div>	
<div>Choose File No file chosen</div>	2	<div>Choose File No file chosen</div>	
<div>Update Webpages From File</div>	3	<div>Update Webpages From File</div>	
<div>No Firmware Updates Avail</div>	4	<div>Update Firmware From Sapling</div>	

1. **Update Web Pages From Sapling** - Updates software on the clock's network card and web interface by downloading the latest version from Sapling's servers.
2. **Choose File** - Allows the user to select a new copy of the network card and web interface software to be uploaded to the Wi-Fi clock. This does not upload the file, it only selects the file.
3. **Update Webpages From File** - Takes whichever file was selected with the Choose File button and applies the update file to the clock.
4. **Update Firmware From Sapling** - Updates software on the clock by downloading the latest version from Sapling's servers.

Look for the latest firmware releases on our firmware page at <https://sapling-inc.com>

Manual Controls

Some functions of the Wi-Fi Digital Clock can be controlled through the two push-buttons on the face of the clock. That said, it is ALWAYS preferable to use the Web Interface and Wi-Fi Monitor software when commanding the clock, as these buttons become difficult to access when the clock has been installed on a high wall.



Display IP Address

When the top and bottom buttons are pressed at the same time, the clock will display the number groups of the IP address. For example, if the IP address of the clock is 192.168.0.80, then the following groups will appear:

[192] [168] [000] [080]

The clock will cycle through the groups twice, then automatically return to displaying the time.

Simple Count Up

A user can set the clock to simple count-up mode by pressing and releasing the bottom button. When activated, the clock will switch to 00:00:00 (or 00:00 on a 4-digit clock) and the count up will begin immediately.

Pressing the bottom button again will resume count up if the count-up is not running, or pause the count-up if the count up is running.

To exit this mode, quickly press and release the top button and the clock will show the time again.

Direct Mode

It is possible to connect to the Web Interface without connecting the clock to a network. To enable direct mode, press and release the top button twice. If successful, the message "DIRECT" will appear on the clock display. On a 4-digit clock, only the first four letters will be displayed.

In this mode, the clock's setup 'network' can be accessed the same way that you would any other wireless router or access point. On a Wi-Fi enabled computer, check the available Wireless Networks. Refresh the available networks until a network named Wifi-DIGITAL-#### appears (where #### is the serial number of the clock). This may take up to 30 seconds. Once it appears, connect to this network.

To access the clock in this mode, open a web browser and enter the following web address into the URL field: **192.168.240.1/login.html**

Reset

The option exists to reset the clock to its factory default settings. Pressing and holding the top and bottom buttons at the same time for more than ten seconds will cause the reset function to activate. The user will know that the reset has been activated, as "RESET" will appear on the clock display. On a 4-digit clock, only the first four letters will be displayed. Once the clock has rebooted, it will go into Direct Mode, and will no longer be accessible over the network until new network settings have been entered.

Frequently Asked Questions

VERY IMPORTANT:

CONFIGURE YOUR CLOCK BEFORE MOUNTING IT TO A WALL OR HOUSING. REFER TO THE SYNCHRONIZATION SYSTEM SETUP SECTION OF THIS MANUAL FOR INSTRUCTIONS.

All network equipment must be powered and configured before you install the clock. If the network equipment is not properly installed and powered, and if the clocks have not been configured to communicate with the network equipment, the secondary clocks will not synchronize.

What size utility/gang box is needed?

A standard double gang box is required for wall mounting all versions of the clock.

Will the wireless clock cause interference with other wireless devices?

No. The Wi-Fi clock operates a low-power transmitter on the 2.4GHz spectrum, and does not broadcast often enough or powerfully enough to cause interference.

Is the clock compatible with other Wireless Clock systems that use communication protocols other than Wi-Fi?

No. A Wi-Fi clock obtains data directly from an NTP server through a computer network. It does not and cannot communicate directly with other proprietary clock systems.

How long does it take for a clock to receive correction data?

On initial power up, if everything is installed and configured correctly, the clock should get NTP data and begin correcting itself within five seconds. The default clock settings will cause the clock to request new NTP data once every five minutes.

If the user wants to manually cause the clock to do this, access the web interface, enter the Diagnostics page, and press the Force Time Update button.

Can I manually set the time on the SBW?

No. A user should modify settings on the Web Interface to adjust the time displayed on an individual clock. A combination of the GMT Offset and Bias Seconds options can be adjusted to set the clock to the user's preferred time. These options are available through the Time Settings page of the General Settings category.

Troubleshooting

VERY IMPORTANT:

CONFIGURE YOUR CLOCK BEFORE MOUNTING IT TO A WALL OR HOUSING. REFER TO THE SYNCHRONIZATION SYSTEM SETUP SECTION OF THIS MANUAL FOR INSTRUCTIONS.

All network equipment must be powered and configured before you install the clock. If the network equipment is not properly installed and powered, and if the clocks have not been configured to communicate with the network equipment, the secondary clocks will not synchronize.

The clock is attached to the power source, but it is not running. What should I do?

- a. Check to make sure that the wiring in the connector complies with the installation instructions. This information is usually included in step #2.
- b. Make sure that the transformer is an isolated transformer if using a 24 volt model.
- c. Measure the voltage between the power (black) wire and the neutral (white) wire. The voltage between the white and black wires should measure 105-126 volts AC in the 115 volt model, 207-253 volts AC in the 230 volt model, or 21.5-26.5 volts AC/DC in the 24 volt model.

Failure to follow instructions c and d can result in a blown fuse.

The clock is not showing the right time. What should I do?

Enter the web interface and confirm that the GMT Offset, Bias Seconds section, DST Selection have been properly set in accordance with your nation and time zone.

If you have an in-house NTP server, confirm that the NTP server has been set as a time source, and that the server is distributing the correct time.

I am uncertain if my clock is accessing my wireless network. How do I check this?

If the clock is disconnected from the network, the colon(s) on the clock will blink.

The clock is not receiving data from the NTP server, despite the fact that other nearby clocks are receiving data and properly adjusting. What should I do?

Enter the clock's Web Interface and confirm that the network and server settings are configured correctly. Ask your network administrator to help you confirm the settings.

If the clock still does not correct, call technical support at (+1) 215.322.6063.

Troubleshooting

How can it be determined if the clock is receiving a good signal?

Refer to the Diagnostics page on the Web Interface.

The clock is in a location with a poor signal or no signal at all. What do I do?

You have two options:

1. Boost the transmitter power output of the closest Wireless Router or Wireless Access Point.
2. Install a Wireless Access Point closer to the clock.

Why isn't the Wi-Fi clock showing up on my IP Monitor?

Perform these steps in order until a step causes the clock to appear on the IP monitor:

1. Wait about two minutes. Some clocks take a few minutes before they appear on the monitor.
2. Confirm that the viewing filters on the IP monitor are set to display Wi-Fi Clocks.
3. Confirm that you have the latest version of the IP monitor software, as older versions are not able to detect Wi-Fi clocks. Older versions will not have Wi-Fi clocks available as an option on the viewing filter. Your version should be 1.3.1 or newer.
4. Log on to the Clock and, on the Network Settings page, set Broadcast to Monitors to OFF, set Send Specific Monitor IP to ON, enter your computer's IP address into the Monitor IP Address field, then press Submit followed by Log Out. Wait about two minutes for a result.
5. Confirm that the computer or network firewall is not blocking ports 80, 123, or 1777. On Windows machines, the user may receive a prompt the first time that the IP monitor is used inquiring about network access. Ensure that the monitor software has unrestricted access.
6. Confirm that the computer running the IP monitor software is on the same subnet as the Wi-Fi clocks. If the clock and computer are on different subnets, one will not see the other. For instance, assuming that a computer has IP address 192.168.1.3, a clock has IP address 192.168.0.4, and both devices have subnet masks of 255.255.255.0, then an IP monitor on the computer will not be able to see the clock.
7. If the clock has a recorded Static IP, log into the clock's Web Interface and confirm under Network Settings that the clock is broadcasting to all monitors on the network.
8. If all else fails, reconfigure the clock by following the instructions written in the section of this manual named "Synchronization System Setup." Once finished, repeat steps 1 and 2.
9. Confirm that the Wireless Access point is broadcasting using 802.11b, g, or n protocol, and that the SSID does not contain any symbols. The SSID may only consist of letters, numbers, and spaces.
10. Check with your System Administrator to confirm that your security policies permit the clock to be on your network. This includes confirmation of your encryption settings if your clock uses WPA2-Enterprise security protocols.
11. If the clock is still not communicating with the IP monitor, contact tech support.

Warranty

Sapling Limited Warranty and Disclaimer

The Sapling Company, Inc. warrants only that at the time of delivery and for a period of 24 calendar months after delivery or the period stated in this invoice, if different, the Goods shall be free of defects in workmanship and materials, PROVIDED that this warranty shall not apply:

To damage caused by Buyer's or any third party's act, default or misuse of the Goods or by failure to follow any instructions supplied with the Goods.

Where the Goods have been used in connection with or incorporated into equipment or materials the specification of which has not been approved in writing by The Sapling Company, Inc.;

To Goods which are altered, modified or repaired in any place other than a Sapling Company, Inc. factory or by persons not expressly authorized or approved in writing by The Sapling Company, Inc.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WITH RESPECT TO GOODS DELIVERED UNDER THIS CONTRACT, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The foregoing warranty runs only to Buyer. There are no oral or written promises, representations or warranties collateral to or affecting this contract. Representatives of The Sapling Company, Inc. may have made oral statements about products described in this contract. Such statements do not constitute warranties, shall not be relied on by Buyer and are not part of the contract.

Note: An extended 5 year (60 month) warranty is also available at the time of the system purchase with a surcharge.

FCC Statements

The Federal Communications Commission (FCC) wants you to know:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician.

FCC Warnings:

Changes or modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 5.78 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC ID Number: YOPGS2011MIZ