sapling

Installation Manual V8.7

SBT/SBTG Series TalkBack Clock

SBT and SBTG Series Wireless Clocks - Table of Contents

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□ Available with 3200 and 3300 models

■ Available with 3300 model only

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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 movement 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.

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Identify Your Clock

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

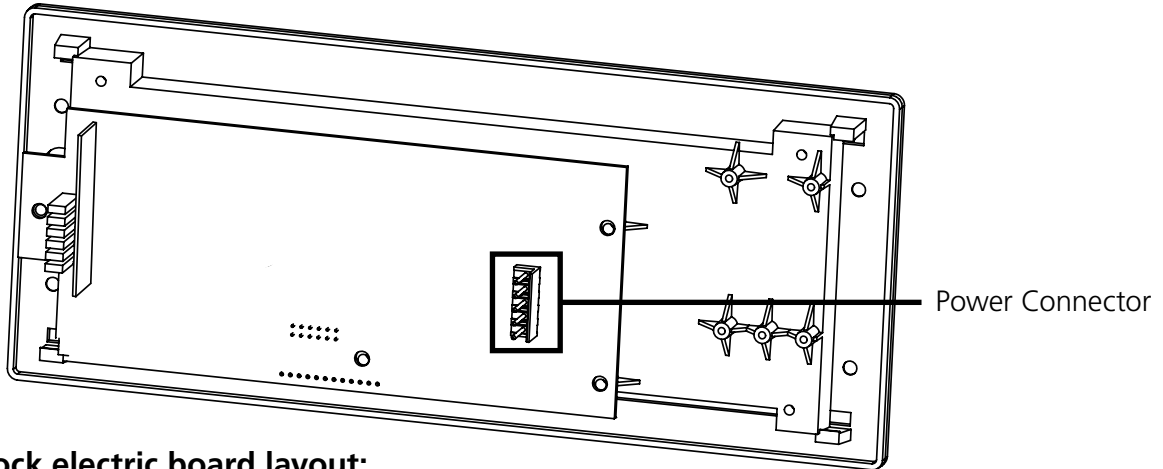If your part number begins with SBT-31 or SBTG-31, it is a 3100 Series clock

If your part number begins with SBT-32 or SBTG-32, it is a 3200 clock

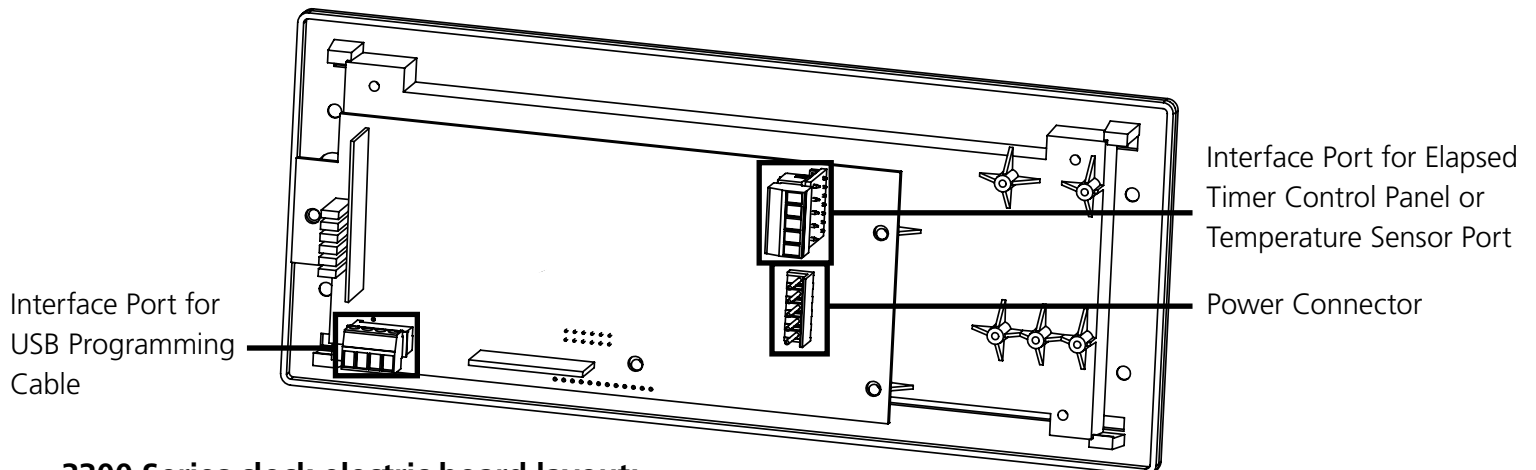If your part number begins with SBT-33 or SBTG-33, it is a 3300 clock

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Identify Your Clock

The digital clocks are offered at either 3100, 3200, or 3300 Series number. The higher the series number indicates that the clock has higher feature set and capabilities.
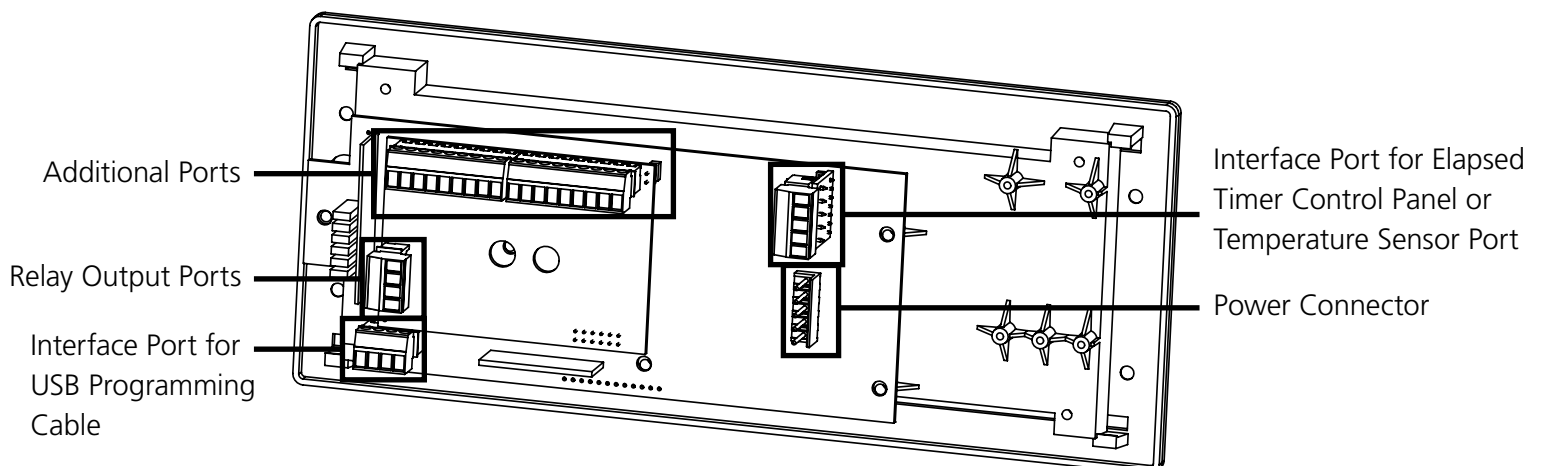
3100 Series clock electric board layout:

Power Connector

3200 Series clock electric board layout:

Interface Port for Elapsed Timer Control Panel or Temperature Sensor Port

Power Connector

Interface Port for USB Programming Cable

3300 Series clock electric board layout:

Additional Ports

Relay Output Ports

Interface Port for USB Programming Cable

Interface Port for Elapsed Timer Control Panel or Temperature Sensor Port

Power Connector

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Wireless System Setup

VERY IMPORTANT:

INSTALL, POWER, AND SET YOUR MASTER CLOCK OR REPEATER BEFORE POWERING THE SECONDARY WIRELESS CLOCKS

A Sapling Master Clock and any Repeaters must be installed, powered, and set up BEFORE you attempt to set up a wireless clock system. If the Master Clock and Repeaters are not properly installed and powered, the secondary clocks will not synchronize.

Positioning Transceivers:

The main transceiver should be installed in a central location where there is a minimum number of walls between the transmitter and clocks. After the main transceiver has been installed, begin installing the secondary clocks nearest to the main transceiver, followed by whichever clocks are nearest to the secondary clocks, and so on. Each secondary clock within range of the transceiver should receive data and begin correcting itself within five minutes of being powered on. Be aware of walls or other obstructions made of thick concrete or sheet metal, as these may block the signal entirely.

Identify an appropriate location to install the master clock.

The location should be accessible to the installer, and should be easily able to access its time base. This means that:

1) The master clock should be installed in a central location in the facility surrounded by secondary wireless clocks. This will allow optimal time signal distribution throughout the facility. Each of the secondary clocks incorporates a built-in repeater, increasing the signal coverage by re-transmitting the time signal to other wireless secondary clocks in the facility.

2) Installing the master clock prior to powering the secondary wireless clocks will allow the nearby secondary clocks to receive the time signal and synchronized, as well as to repeat the time signal to other clocks that are not in the immediate range of the master clock's transmitter range.

3) The master clock can receive NTP time from any NTP server over a Local Area Network (LAN) as a standard feature. If NTP is being used as the master clock time source, then the master clock must be installed in a place that allows it to connect to a network router/switch with CAT5 or CAT6 network cables.

4) The master clock may receive GPS time if it was ordered with an optional GPS receiver module. In this case the master clock will include a built in GPS receiver module, a GPS cable, and a GPS dome antenna. The GPS antenna must be installed in a clear sky view location, typically the facility's roof. The master clock should be installed so that the GPS cable can reach between master clock and the GPS antenna.

5) If the application requires this master clock to receive time data from a third-party master clock, then this master clock should be installed close enough to the third-party clock that the user can run data wires between both clocks. Research your communication protocol and provide an appropriate wire gauge and length to connect both master clocks.

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Wireless System Setup

6) The master clock Remote Antenna must be placed in a location where the signal is not interfered with or blocked. Be aware of large structures made of stone, concrete, bricks, or sheet metal as these materials will block a wireless signal. The installer should also be aware of other objects that may cause interference to the transmission including, but not limited to, large tanks of salt water, old microwave ovens, and large industrial machines.

7) The master clock Remote Antenna must be within range of at least one wireless secondary clock or wireless repeater. If all of the secondary clocks are positioned beyond the range of the master clock's transmitter, then the master clock must be connected to the local area network, and a network repeater must be installed. The maximum transmission distance of the master clock transmitter in an unobstructed, open space is 3300 feet (1000 meters). Obstructions will reduce this distance, particularly obstructions made of the materials mentioned in the previous paragraph.

8) The rack mounted wireless messaging master clock will have a separate transmitter box allowing it to be installed on the wall **ABOVE** the network cabinet for optimal transmission range and also to avoid any transmission shielding that may results from a metal network cabinet.

TalkBack System Pairing

READ ALL OF THE INSTRUCTIONS BEFORE ATTEMPTING TO PAIR YOUR CLOCK

Pair your clock to the master clock to allow:

1. The master clock to identify each individual clock. Each clock is paired with the master clock and should be given a name based on its designated location in the facility. For example: Room 101, Room 102, Room 103, Gymnasium, Cafeteria, etc.
2. The secondary clock can now send TalkBack data to the master clock including: signal strength, display issues, last time of synchronization, and more.

DO NOT FOLLOW THIS PROCEDURE WITH TWO OR MORE CLOCKS AT THE SAME TIME.
PAIR ONLY ONE CLOCK AT A TIME.

1. Place the secondary clock within 30 ft from the Talkback Master Clock.

2. Log on to the master clock's web interface. See the SMA 5000 or 6000 Series TalkBack Master Clock manual for instructions.

3. On the Talkback Master Clock web interface, go to the "TalkBack" tab and click on the "Add New Clock" button. Enter the name of the clock in the "clock name" box (For example: Room 101, etc.).

4. Power the secondary clock (make sure you power the clock with its correct voltage input which may be either 24VAC/VDC, 115VAC or 230VAC). Only power one clock at a time.

5. Immediately after powering the clock, press the "Start Pairing Process" button on the "Clock Pairing" page of the web interface. There is a 30 second limit to do so. If you see a status bar with the words, "in progress" on your web interface, then the pairing process has started.
• If the words change to "success," then the secondary clock has successfully paired with the master clock.
• If the words change to "time out," then the process was not successful. You will have to repeat the process by powering off the clock and starting from step 4.

6. Once the clock has been successfully paired, write its name (location in the facility) on the label located at the back of the clock. This way, once all clocks are paired, you will know where to install each one and be able to identify it if locations or settings change in the future.

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Preparing for the Installation

Consideration should be made for various factors such as their location, type of mounting (surface, dual-faced or flag mounted), electrical wiring run, and more. Please read the manual including all relevant sections for your specific installation configuration to understand the steps, how to wire, and how to install the clock. In addition, please note what hardware you may need to supply.

The clock can be **Surface (wall) Mounted**, **Dual-Faced** or **Flag Mounted.**

Mounting the clock housing for these different configurations is different from one another; however, clock display installation and wiring is similar. Therefore, each mounting will have its own initial installation instructions section followed by a "**Uniform Stage Installation**" section.

For installing the clocks, the installer will need to have the below items which are not provided with the clocks:

- A #2 Phillips-head screwdriver

- Electrical wires for power (Recommended 12, 14 or 16 AWG)

- A drill and a drill bit (size depending on wall anchor)

- A flat-head screwdriver
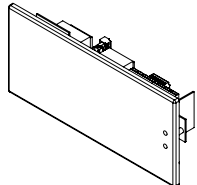
In Addition:

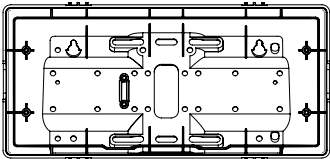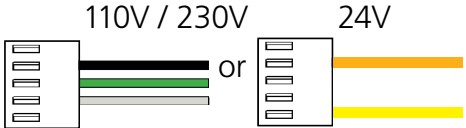**For a Surface (wall) Mounted Clock:**

- A double gang (utility) box

For a Dual-Faced or a Flag Mounted Clock:

- A double gang (utility) box

- There are 4 holes in the pole base plate that would accommodate size #8 screws for fixating it to the ceiling or to the wall. Hardware to fixate the pole base plate to the ceiling or to the wall depending on the type of wall is to be provided by the installer.

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Wall Mounted Clock Mechanical Installation

Included in Package

Description	Quantity	Picture
SBT Digital Clock	1	
Digital Clock Wall Housing	1	
#6-19x1/2 screw	4	
#6-32x1 screw	4	

Included with the Clock Wiring Kit

		110V / 230V 24V
Power/grounding wires and connector	1	

If not mounting the clock to a double gang box, the installer needs to provide:

#8 self-tapping screws	4	
Wall anchors	4	

Wall Mounted Clock Mechanical Installation

1) The digital clock surface (wall) mount housing is designed with numerous holes for the purpose of fixating it to the wall. There are two ways to mount the clock housing to the wall. Option one (the most common way) is to screw the digital clock housing to a double gang box, while the second option is to utilize its keyhole mounting holes.
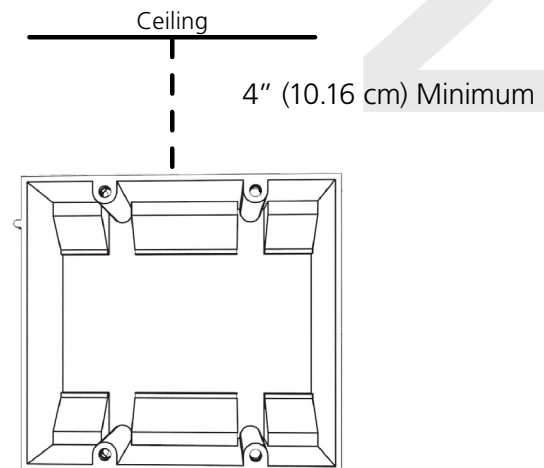
2) When installing the clock housing to a double gang box, leave at least 4 inches between the top of the gang box and ceiling. Confirm that the bottom of the gang box is level with the floor.

Option 1:
Installing to a double gang box

(go to step 2)

Option 2:
Installing using keyholes

(go to step 6A)

Wall

Ceiling

4" (10.16 cm) Minimum

3) Run power wiring to the gang box.

4) Attach the power wires from your kit to the power wires in the gang box.
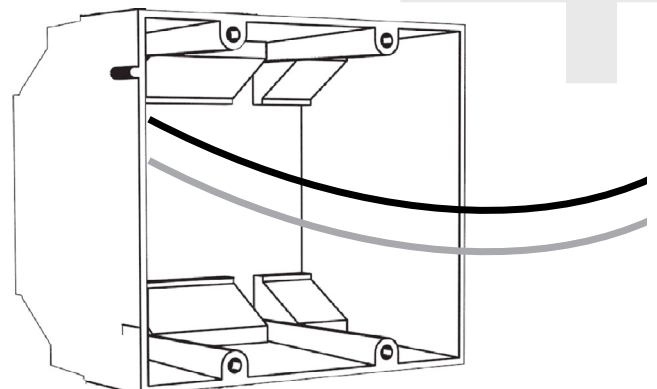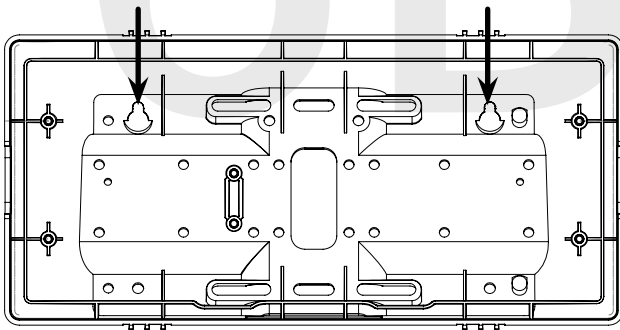
Wall Mounted Clock Mechanical Installation

5) If you do not wish to attach the housing to the gang box, proceed to step 6A. Otherwise, go to step 7.

6A) If you do not wish to attach the housing to a gang box, place the clock housing 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.

Ceiling

4" (10.16 cm) Minimum
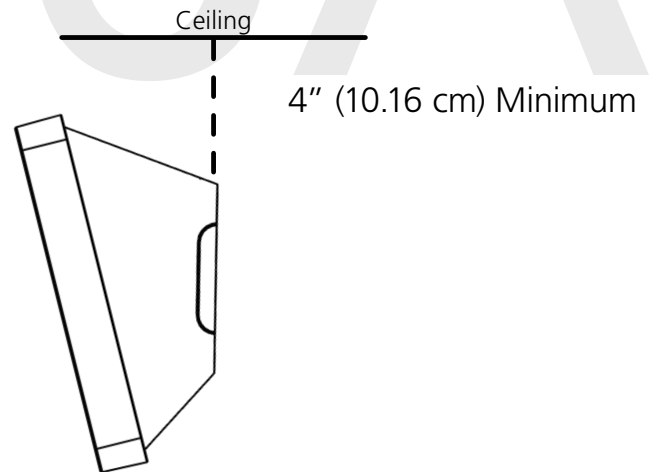
6B) Identify the keyholes towards the top of the back of the clock housing. Use a pencil to mark the top of each keyhole onto the wall, then use the 1/4 inch drill bit to drill holes at the locations of the two marks.
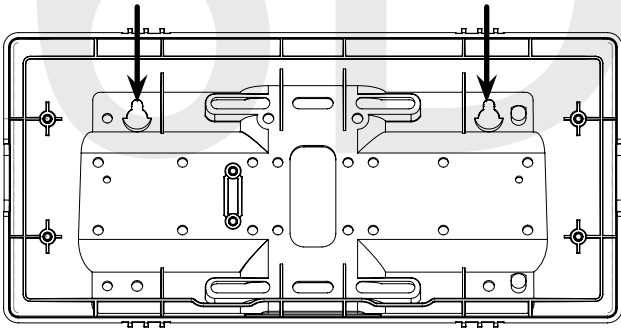

6C) Insert the wall anchors into the two holes, then place a #8 self-tapping screw into each wall anchor, leaving at least a 1/8" gap between the top of the screw and the wall.
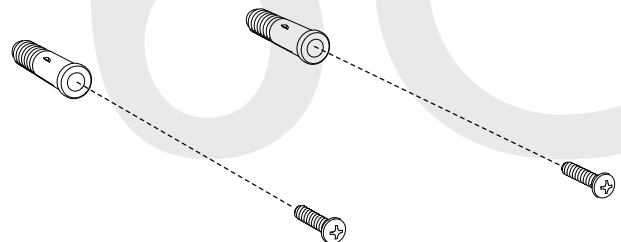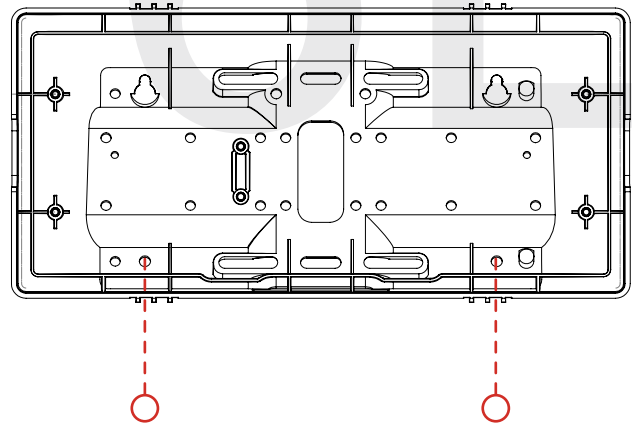
Wall Mounted Clock Mechanical Installation

6D) Use the keyholes in the back of the housing to hang the clock onto the screws.

6E) Use a pencil to trace the holes beneath each keyhole onto the wall as shown in the below image. Take the clock housing off the wall, drill holes at the marked locations, and add another two wall anchors.

6F) Place the housing back on the wall in order to screw a second pair of #8 screws through the bottom holes and secure them in the remaining two wall anchors. This is to fixate the clock housing to the wall.
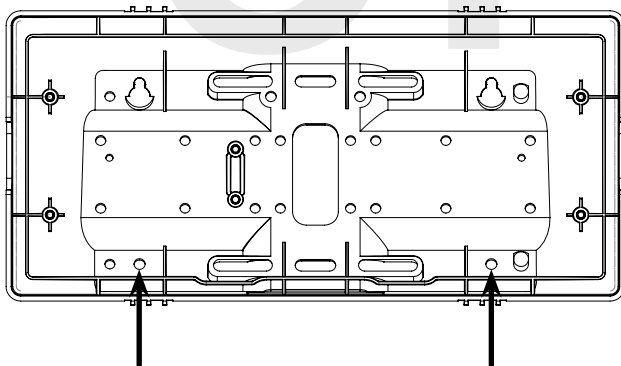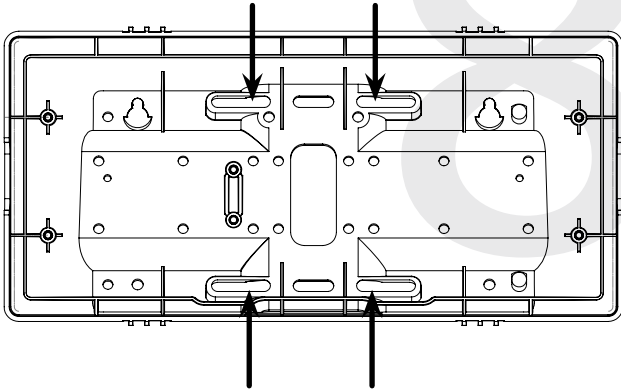

7) Run power wires through the large hole in the back of the housing. Secure the wires by passing them through the wire clamp. The wire clamp is mounted in the clock housing and can be opened by using a Phillips head screwdriver.

wire clamp
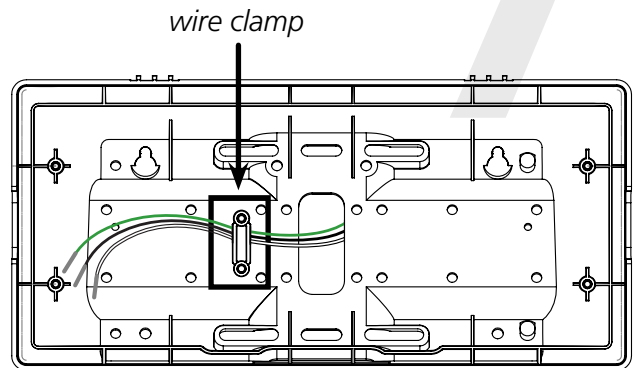
Wall Mounted Clock Mechanical Installation

8) Attach the housing to the gang box using the #6-32x1 screws.

9) To proceed with the installation instructions, please follow the "**Uniform Stage Installation**" section in this manual. Once done, to complete the wall mounted clock installation, follow the below additional steps.

10) With the clock powered and properly functioning, the next step would be to remove the adhesive clear protective film from the clock filter, as shown in the below image.
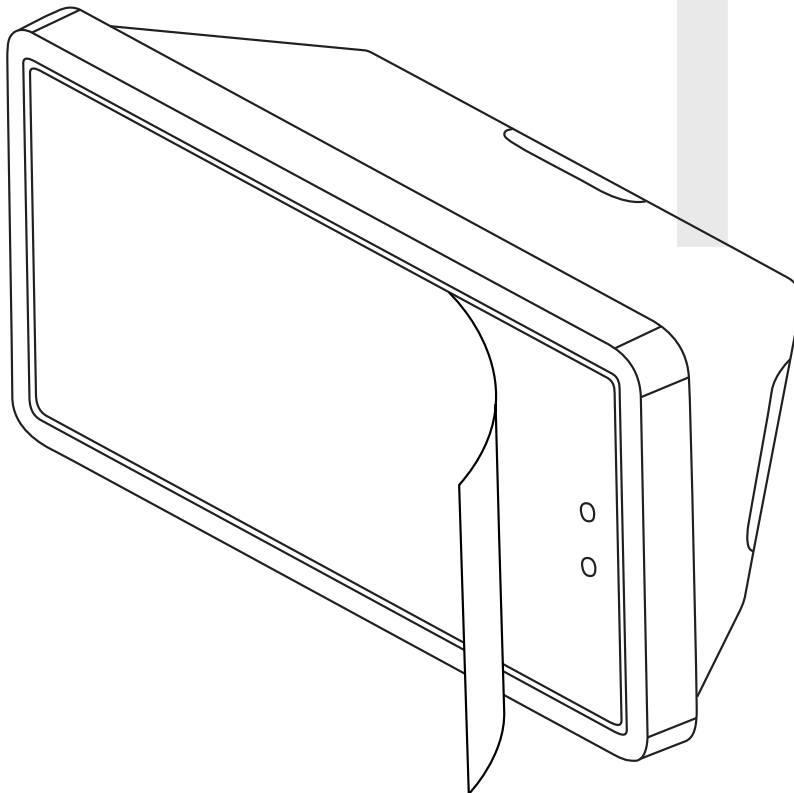
Dual-Faced / Flag Mounted Digital Clocks Overview

Dual-Faced Digital Clocks:

A dual-faced digital clock configuration will consist of one (1) pole and two (2) clocks suspended from the ceiling or from the wall. The mounting pole is available for the 2.5" or 4.0" digital clocks and is offered at two different lengths. The standard pole height allows ceiling or wall mounted configuration, while the short pole height is meant for ceiling mounting only and used at locations with low ceiling clearance. Part numbers and the heights for the standard or short pole can be found in their specifications.

Dual-faced Digital Clocks:

Mounted from the wall: **Mounted from the ceiling:**

Flag Mounted Digital Clocks:

A flag mounted digital clock configuration will consist of one (1) pole and one (1) clock suspended from the ceiling or from the wall. Since the flag mounted clock utilizes the same mounting pole as the dual-faced clock, the installer should follow the installation instructions of the dual-faced clock. The following installation instructions will include two steps that are only relevant for flag mounted installation.

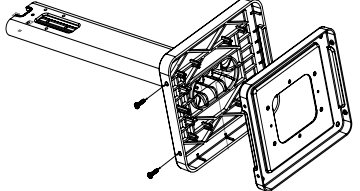**Flag Mounted Digital Clocks:**

Mounted from the wall: **Mounted from the ceiling:**

Dual-Faced / Flag Mounted Clock Mechanical Installation

Included in the Mounting Pole Package

Description	Quantity	Picture
Mounting Pole (including Mounting Base Plate)	1	
#10-32x3/8 green grounding screw (comes already screwed on the pole base plate)	1	
#6-32x1/2 Phillips round head black screw (comes already screwed on the pole base plate)	2	
#8-32x7/16 Phillips round head black screw	8	
#8 Internal-tooth lock washer	8	
#6-32x1 Phillips round head silver screw	4	
Flag Mount End Cap (only used in flag mount configuration)	1	
#6-32x1/4 Phillips round head silver screw (not used in this configuration)	2	

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

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Dual-Faced / Flag Mounted Clock Mechanical Installation

#6-19x7/16 Phillips round head black screw (not used in this configuration)

10

#6-32x5/16 Phillips round head silver screw (not used in this configuration)

6

#6 Internal-tooth lock washer (not used in this configuration)

6

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

If not mounting the clock to a double gang box, the installer needs to provide:

#8 self-tapping screws   4

Wall anchors   4
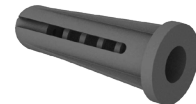
Preparing for the Dual-Faced Installation

The mounting pole has been designed to be installed on a double gang box, which will hold the mounting pole and the dual-faced clocks. As such, to install a dual-faced clock, there is a need to have the double gang box fixated and secured to the ceiling and/or to the wall and have the power wires pre-wired in the facility's wall (or ceiling) and ready to be connected to the clock.

Dual-Faced / Flag Mounted Clock Mechanical 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. This space is needed to allow proper clearance when mounting the clock. The gang box should be installed level with the wall and ceiling.

Ceiling

11.0" (27.94cm)
Minimum

11.0" (27.94cm)
Minimum

Wall

2) Run power wiring to the gang box.
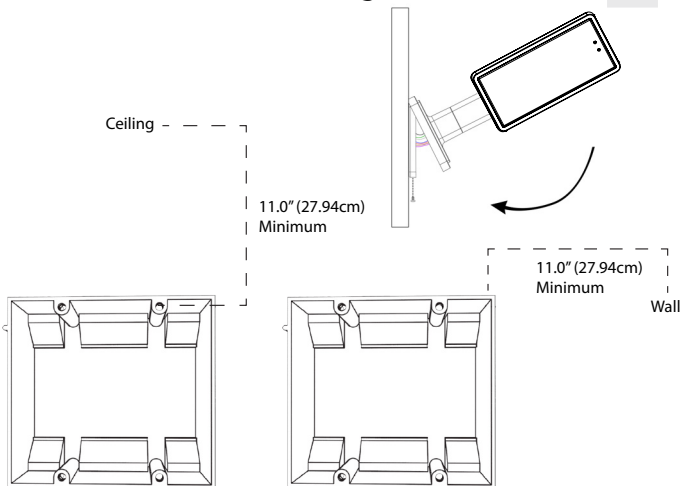
3) The mounting pole consists of a detachable metal mounting plate. The mounting plate detaches from the mounting pole by unscrewing the two #6-32x1/2 Phillips round head black screws that come already screwed on the pole base plate. Set the screws and pole aside for later.
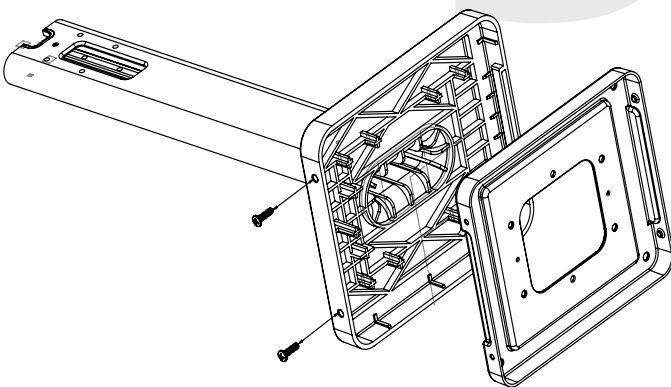
4) Attach the mounting plate to the gang box using only two of the four long, silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to mark the locations of the four larger holes at the outer corners of the base plate as shown in the image below.

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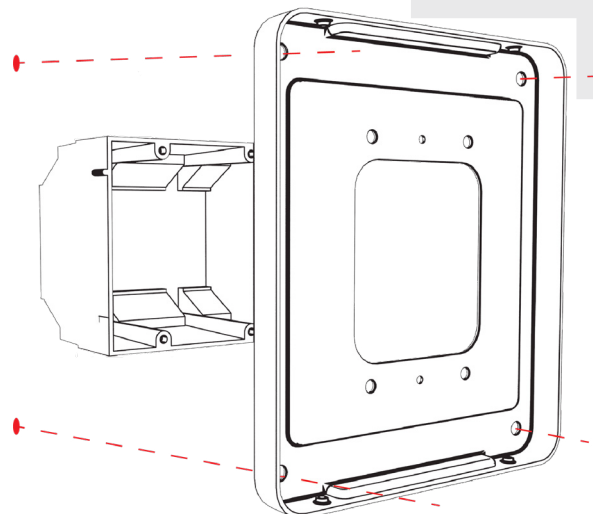
Dual-Faced / Flag Mounted Clock Mechanical Installation

5) Remove the mounting plate and drill the four holes that were just marked in the previous step. Insert the four wall anchors into the holes.
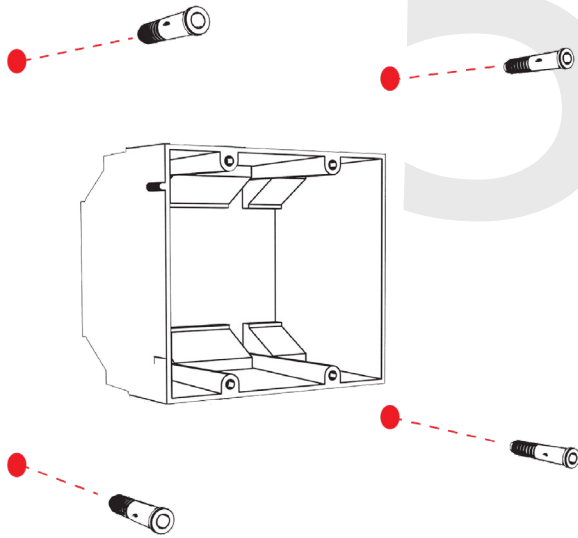
6) Reattach the mounting plate to the double gang box, this time using all four long, silver #6-32x1 screws. Then insert the four #8 screws (provided by the installer) through the mounting plate and into the anchors.
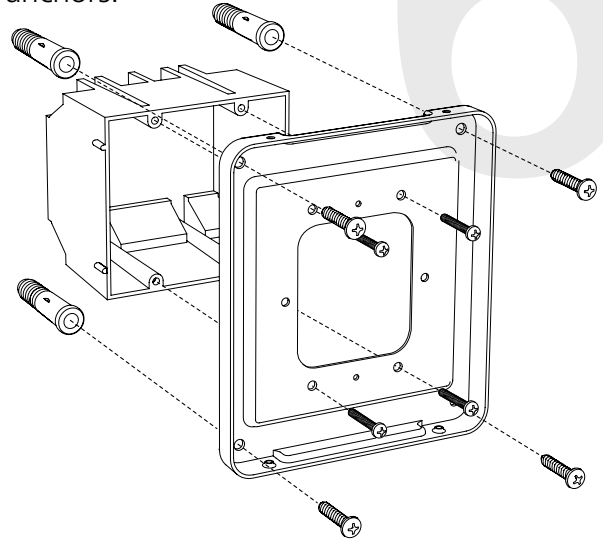
7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 green screw.
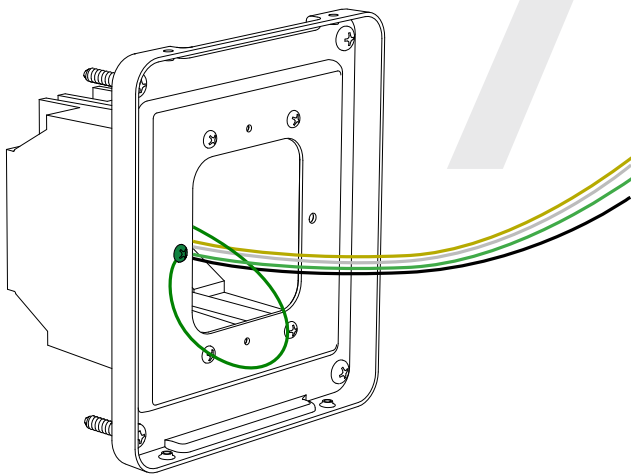
Dual-Faced / Flag Mounted Clock Mechanical Installation

8) If the clock is to be mounted to the pole and suspended from the ceiling, then the top end cap is to be removed. If the clock is to be mounted to the pole and suspended from the wall, one of the side end caps is to be removed. For doing so, use a screwdriver to remove one of the end caps located on the back of the digital clock housing based on the orientation of the digital clock that will be attached to the pole. The end cap and screw that was used to secure it will not be needed again during this installation.
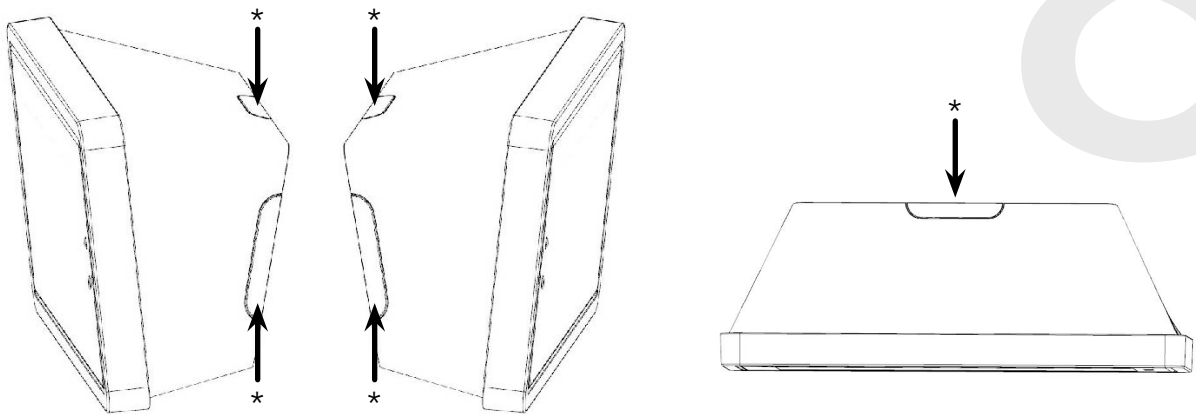
* = *end caps*

9) Removing the end cap from the clock housing will allow to place the pole flush with the back of the clock housing. Position the pole so its allocated mounting holes are aligned with the clock housing. Once in position, use the four #8-32x7/16 screws and the internal-tooth washers to mount the clock housing to the pole using a Philips screwdriver. For a dual-faced clock, repeat the same with the second clock housing so both back clock cases are mounted to the pole.
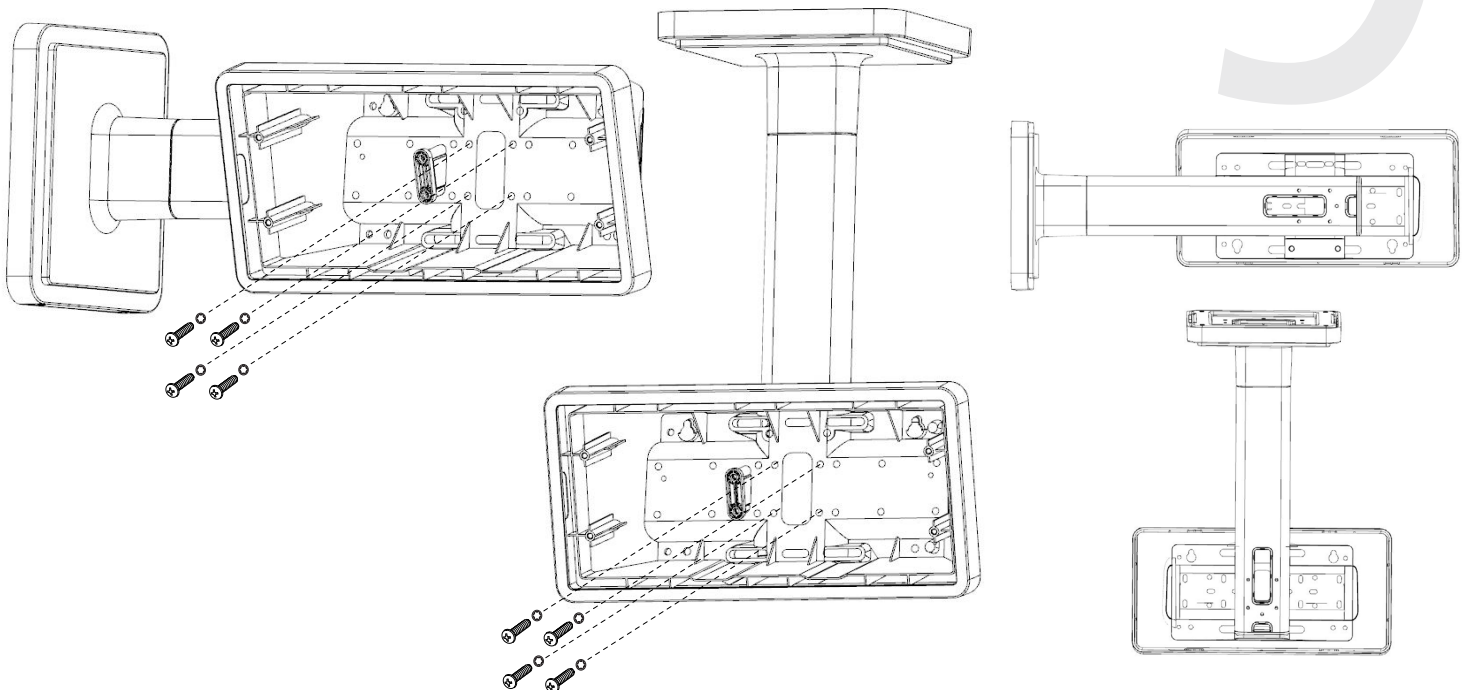
Dual-Faced / Flag Mounted Clock Mechanical Installation

10) **For Dual-Faced installation:** repeat step 9 for attaching a second clock to the other side.

   For Flag Mount installation: follow the below two steps.

• Instead of mounting and running two sets of wires for two clocks, there is a need to run one set of wires to the clock and mount only one clock to the pole.

• The list of items which are included for a dual-faced clock configuration consists of a **Flag Mount End Cap**, which is not in use for a dual clock mounting configuration, but is needed for a Flag Mounted installation. After completion of the pole and clock installation, there is a need to install the **Flag Mount End Cap** by following the below additional steps:

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

plastic ring

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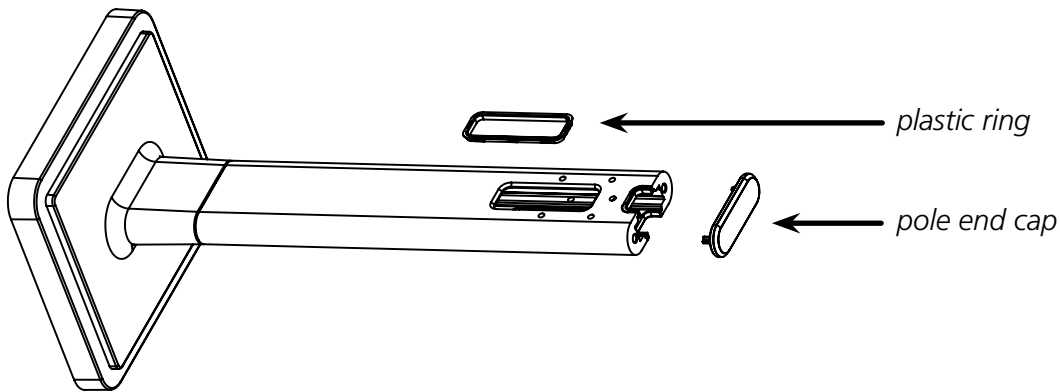
   2) Attach the flag-mount end cap to the pole. Confirm that the covering flap is attached to the side where the plastic ring was removed.

Flag Mount end cap
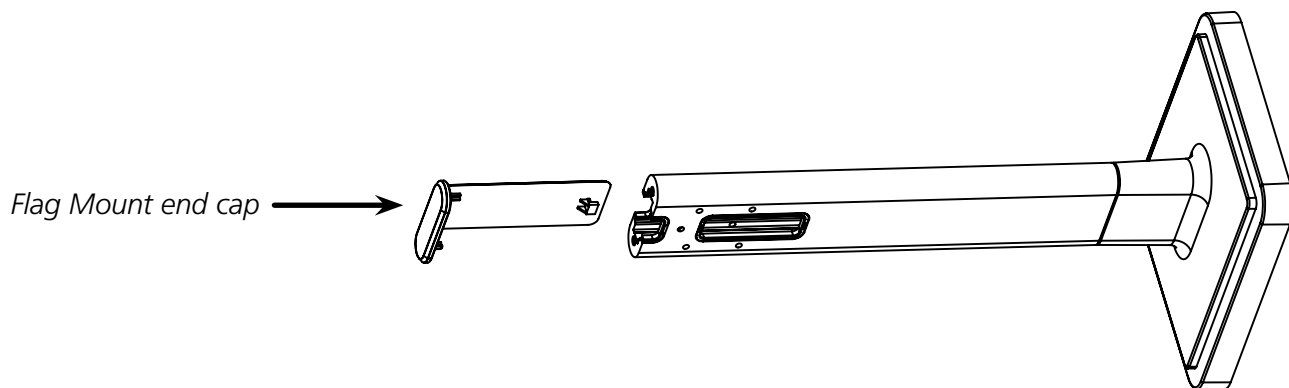
Dual-Faced / Flag Mounted Clock Mechanical Installation

11) The standard pole length is 13.7" (34.8 cm) and the short pole length is 7.75" (19.7cm). Make sure to run electrical wires with the needed length from point A to point B, as shown in the below image. The wires are to be threaded from the gang box (through the pole base plate) into the pole, and through the hole located towards the far side of the pole and into the clock.

Actual number of wires will depend on the system. Please refer to wiring diagrams.

Point B

Point A
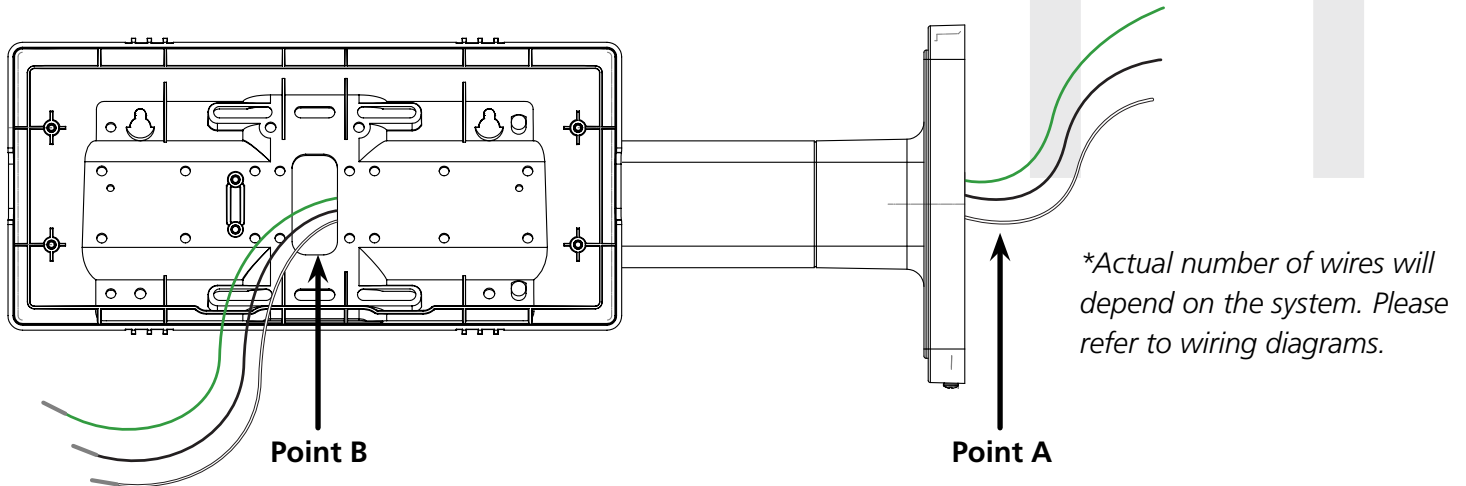
12) Once the wires are threaded through the pole and into the clock housing, use the wire clamp to secure the wires. The wire clamp is mounted in the clock housing, and can be opened by using a Phillips head screwdriver.

13) To proceed with the installation instructions, please follow the "**Uniform Stage Installation**" section in this manual. Once done, to complete the dual-faced or flag mounted clock installation, follow the next additional step.

wire clamp
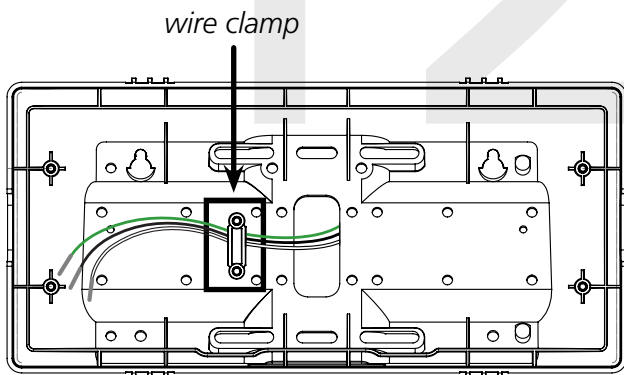
Dual-Faced / Flag Mounted Clock Mechanical Installation

14) With the clock powered and properly functioning, the next step would be to remove the adhesive clear protective film from the clock filter, as shown in the below image.
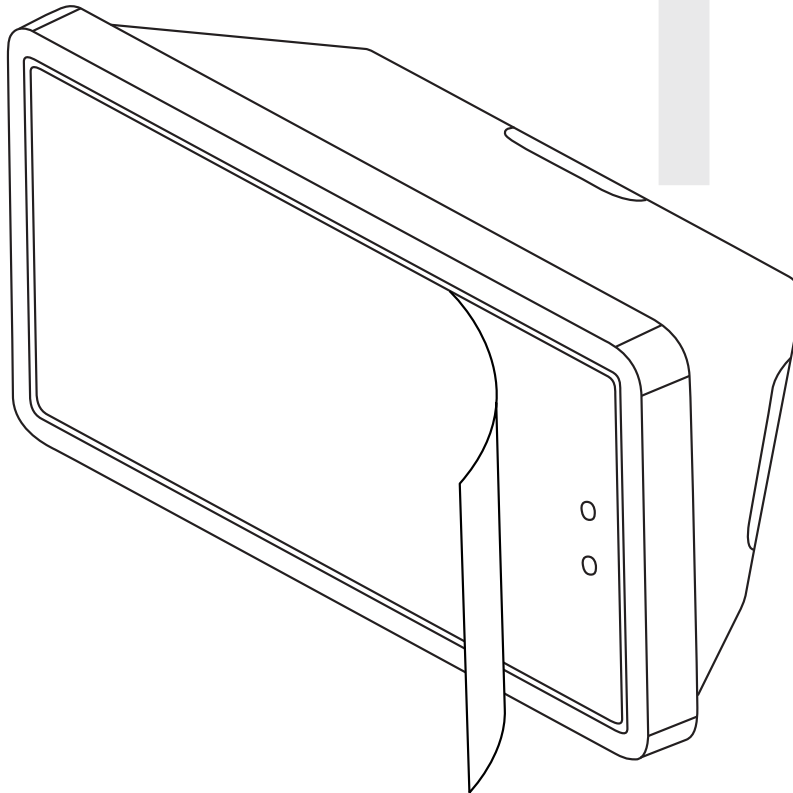
Uniform Stage Installation

1) The Digital Clock comes with a protective filter that snaps onto the clock display utilizing four flexible tabs. Detach the filter from the clock display board by pressing inward on the filter tabs. This will allow access for screwing the display to the clock housing, which will be required in one of the next steps.

z = filter tabs
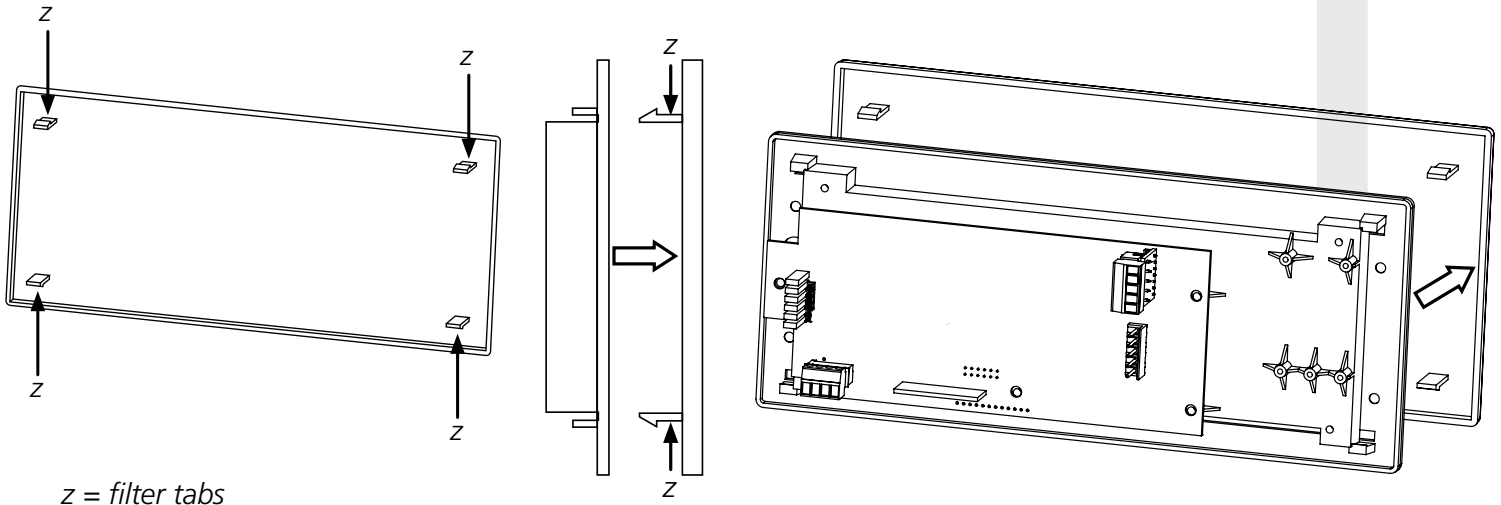
2) The clock comes with a wiring harness that will interface with the clock electric board ending with a connector. Identify the power wires coming from the wall and the wires that are coming with the clock to connect the correct wires together. To determine the wiring connection, review the wiring diagram (in this manual) that is relevant to the specific clock model. Connecting the wires together is typically done by using a wire nut.

Actual number of wires will depend on the system. Please refer to wiring diagrams.

wire nut
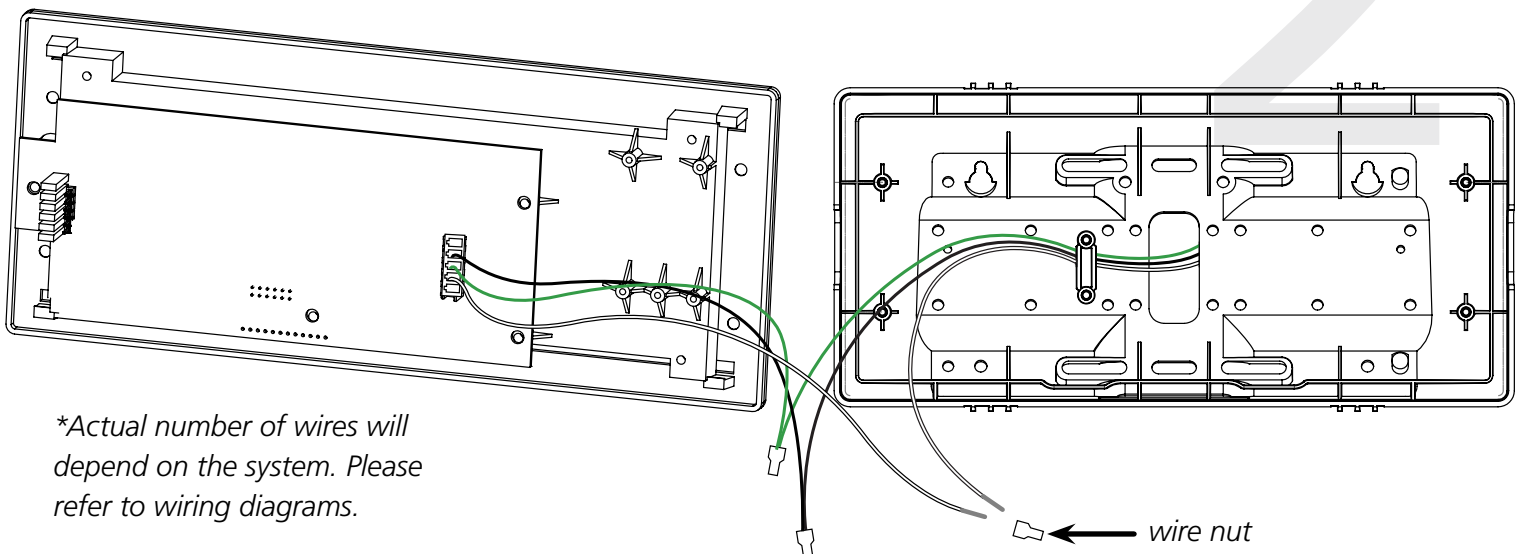
Uniform Stage Installation

3) Depending on the clock model and accessories that may have been purchased along with the clock, additional wiring might need to be run to the clock in order to interface with the accessory (elapsed timer control panel, temperature sensor, user input, etc.). For doing so, please review the installation instructions and the wiring diagram for your specific application (and/or accessory) which can be found in this manual.

4) The next step would be to wire the clocks and use the provided connectors attaching the to the clock electric board.

5) Use the four (4) #6-19x3/8 black flat head thread-forming screws that are provided with the clock in order to screw the display board to the clock housing.

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

2.5"

4.0"

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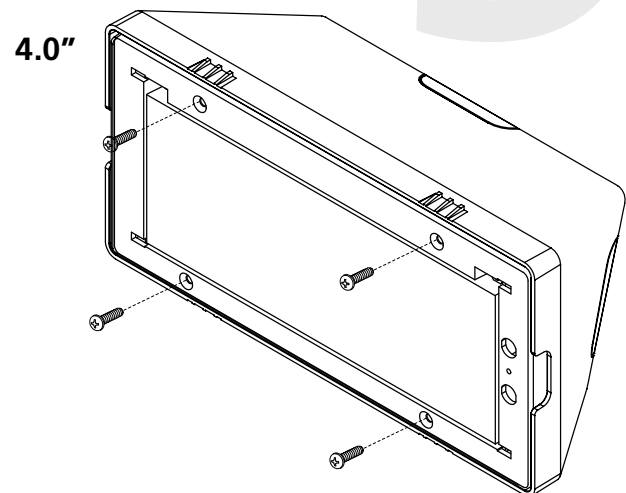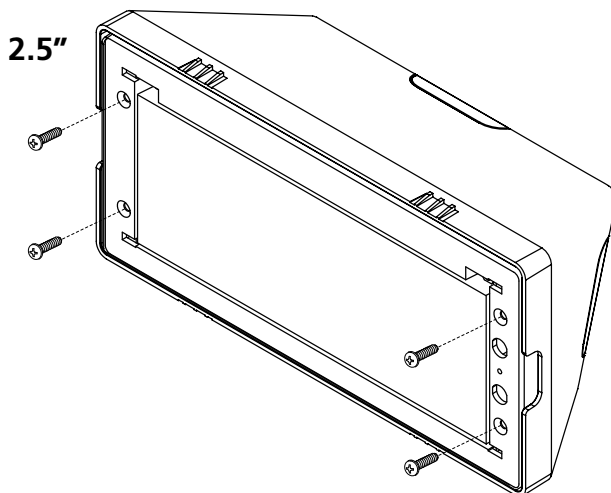
Uniform Stage Installation

6) Remove the clear plastic protective film from the display board.
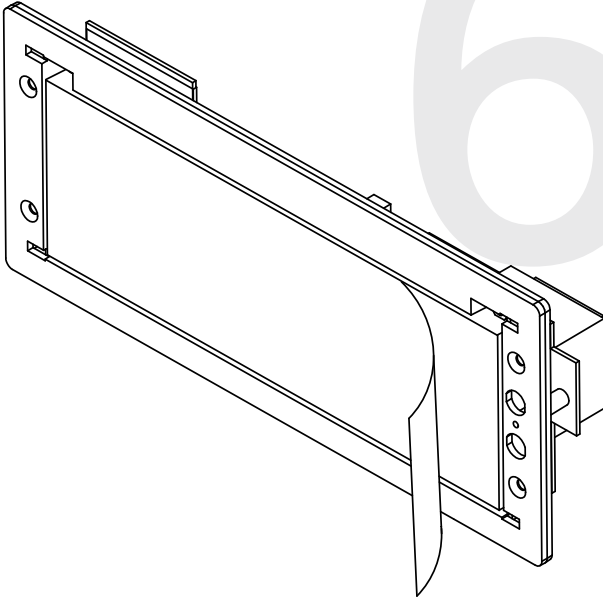
7) Place the filter over the display board by lining up the tabs with the holes. You should hear a snapping noise as the filter flex tabs latch into place.
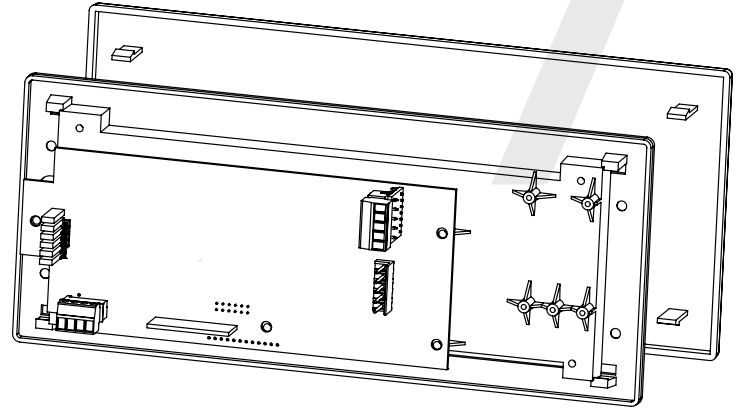
8) Once the clock receives power, it will display its software version followed by segments display testing. Once done, if the clock is receiving time data, it will present the time received. If the clock is not able to receive time data, its colons will blink and its time will be based of internal real time quartz oscillator.

Jumper Switch Settings

The digital clock main electrical board comes with jumper switches allowing the user to change the clock basic default settings. The below chart shows each jumper and its correlating features. If advanced clock configuration is needed (such as brightness schedules, configuring duration of alternating between time and date, etc.), it is done by using the USB Programming Cable, which is compatible with the 3200 or 3300 digital clock models.

	Left Position	Right Position
	Pins 1 & 2	Pins 2 & 3
Jumper 1	12 Hour Display Mode (Default)	24 Hour Display Mode
Jumper 2	High Brightness Display Mode (Default)	Low Brightness Display Mode
Jumper 3	Display Time Only (Default)	*Alternate between Time and Date *US format only
Jumper 4	DO NOT TOUCH (Default)	DO NOT TOUCH
Jumper 5	DO NOT TOUCH (Default)	DO NOT TOUCH
Jumper 6	**ONLY USED FOR SBDCONFIG**	
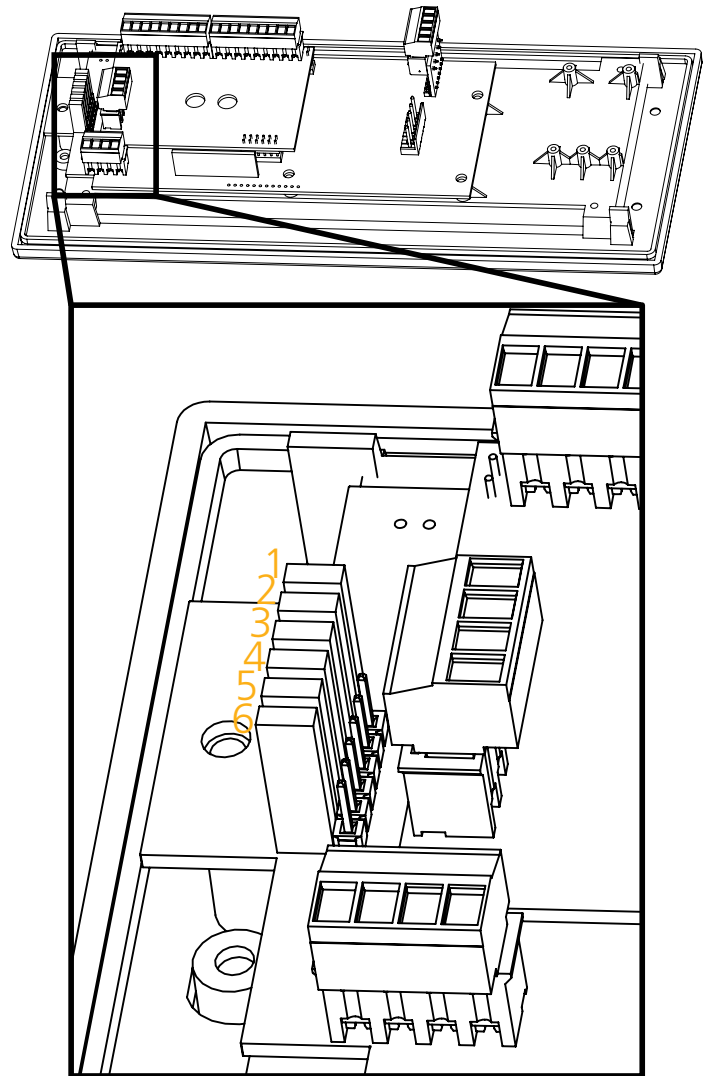
The 3300 clock model also has manual controls allowing to change some of the above settings without the use of the jumper switches (overriding the jumper switches). Please refer to the section of this manual labeled "**Manual Controls**" and refer to Setting 15.

Temperature Sensor Installation (3200/3300 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:
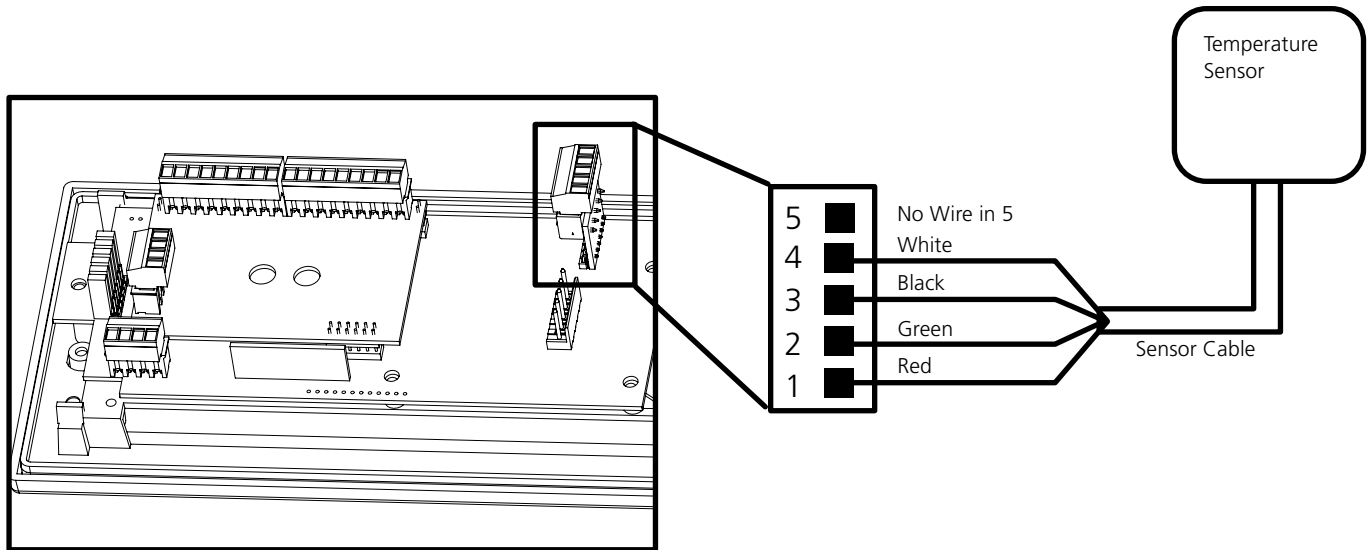
The Sensor Cable is 6 feet (1.83 meters) long, and so the sensor should be positioned within 6 feet of the clock. The cable is unshielded, 4 conductor, 22AWG (.33mm²). If longer than 6 feet is required, the wire would have to be terminated in an electrical box, and the longer wire would have to be provided 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 display temperature, please see the section labeled "**sbdconfig - 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.
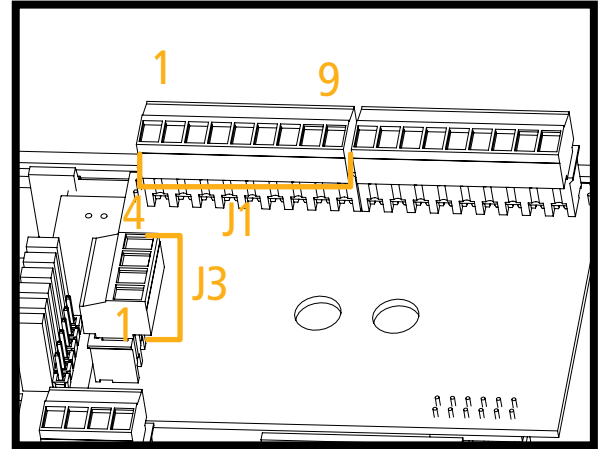
To program the buzzer, connect the USB cable to the clock, log onto sbdconfig and perform the following actions:

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 60.
4. Press the Update Clock button.

For information on sbdconfig, refer to the sections labeled "**sbdconfig - Elapsed Timer**" or "**sbdconfig - Inputs**."

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Wiring Diagram for 110VAC/230VAC

This wiring diagram is only to power the clocks since time data is received in a wireless manner

110/230VAC SAT(G) Series Wireless Clock

110/230VAC SBT(G) Series Wireless Clock

110/230VAC SAT(G) Series Wireless Clock

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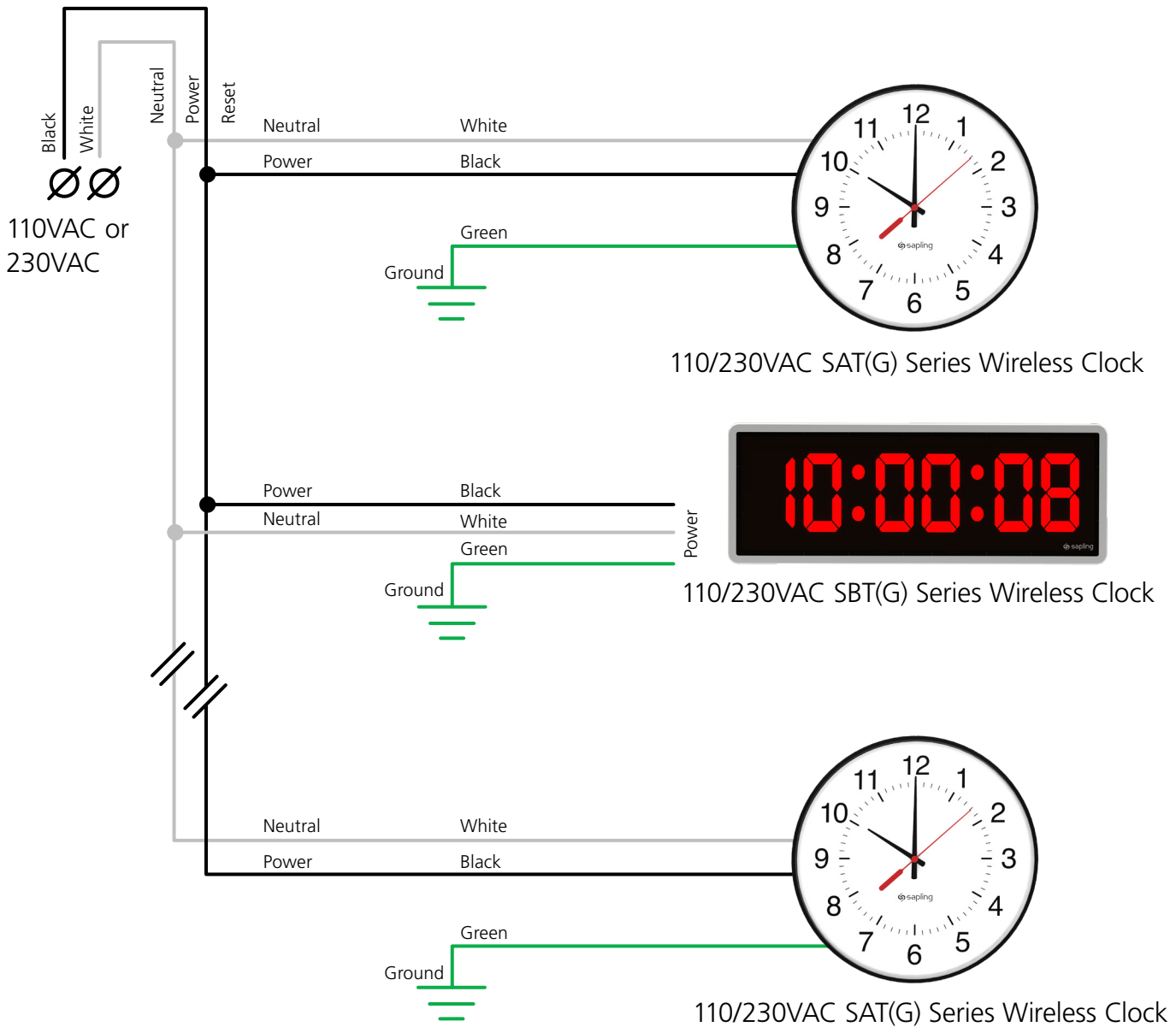
Wiring Diagram for 24VAC/24VDC

This wiring diagram is only to power the clocks since time data is received in a wireless manner

24VAC SAT(G) Series Wireless Clock

24VAC SBT(G) Series Wireless Clock

24VAC SAT(G) Series Wireless Clock

Inputs - Clock Settings - User Inputs (3300 Only)

User Inputs
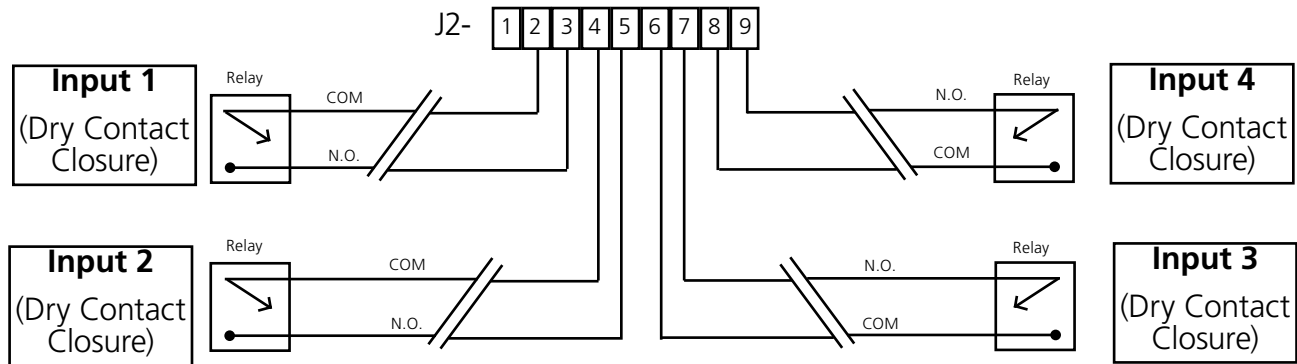
The user input(s) is a feature allowing a third-party device to interface with the 3300 digital clock model via a dry contact closure for the purpose of sending a command to the clock. For example, upon receiving a contact closure, the clock can initiate a count up, initiate a countdown, flash the time, and/or can trigger additional commands.

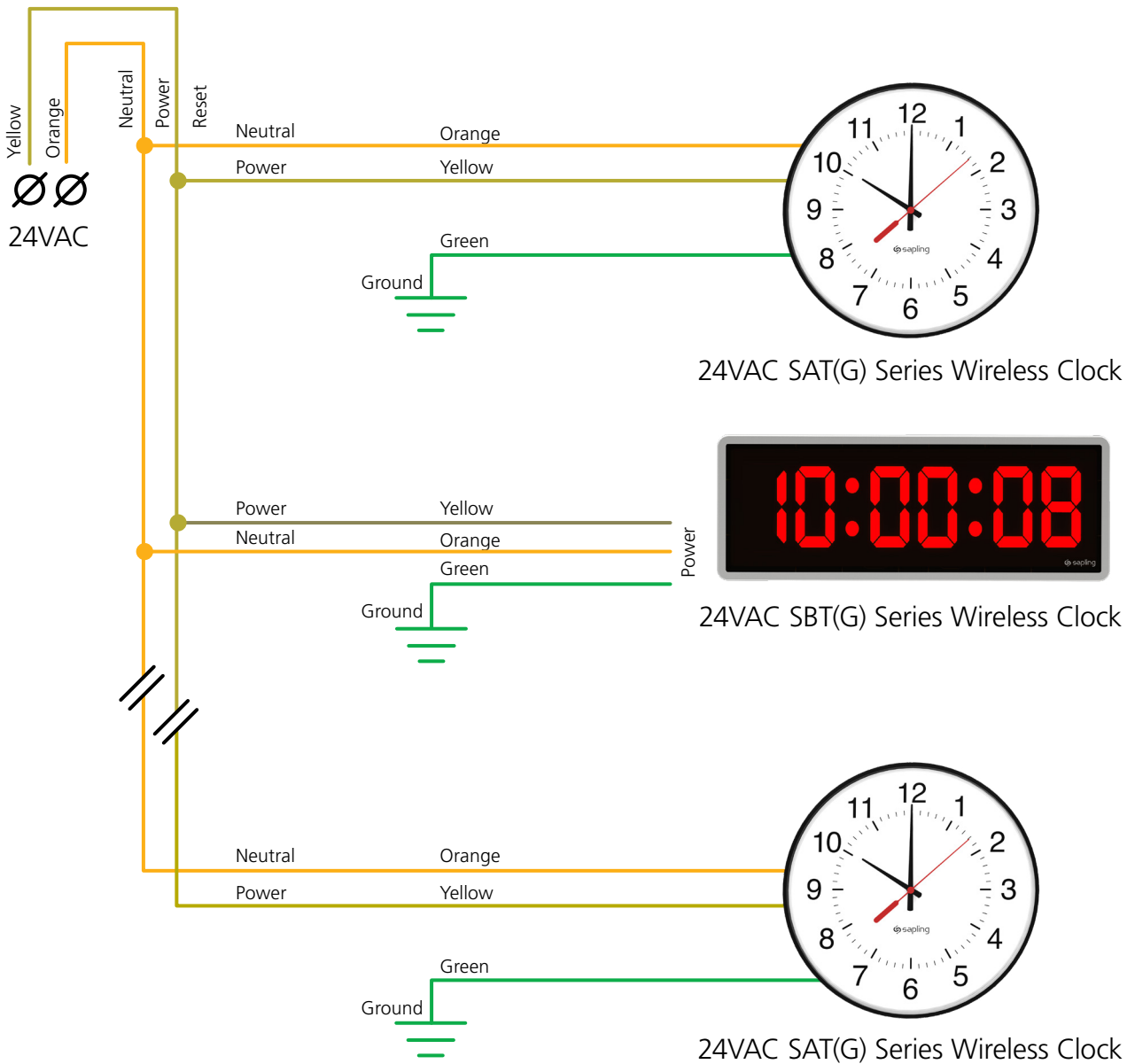Programming the clock as for which command to be triggered upon receiving the user input is done by using the USB Programming Cable and the SBD Config software. Detailed instructions for programming the clock can be found in this manual in the "**sbdconfig Installation**" section.

For utilizing the user input feature, 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 "**sbdconfig - Inputs**."

Outputs (3300 Only)

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.
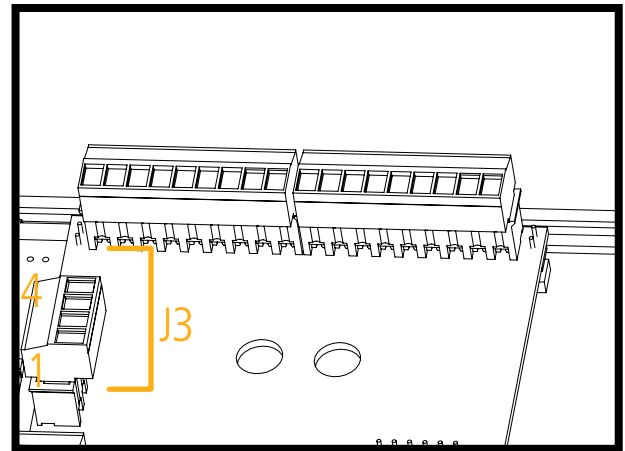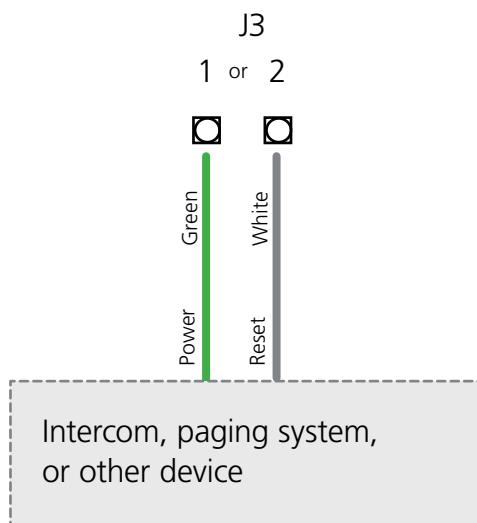
Manual Controls (3300 Only)

The 3300 digital clock comes with 2 functional push buttons located on its front panel (as shown in the below image) allowing the user to change some of the clock default settings.

Please also note that any advanced clock configuration can be done by using the USB Programming Cable which is compatible with the 3200 or 3300 digital clock models. If you would prefer to program the clock through the convenience of a graphic interface, go to the section labeled "**sbdconfig Installation**" for an alternate programming method. This will require you to have the USB Programming Cable accessory.

Furthermore, we always recommend that this digital clock receives time data from a master clock as its accurate time source. In this scenario, there is no need to manually set the time in the clock since it will receive it from the master clock via the electrical wires. However, since this clock may also be used as a standalone non-synchronized clock (based on its internal real-time clock), there is an option to set the clock's time manually. For doing so, press the top button to advance the hour, and the bottom button to advance the minute.

Top Front Panel Push Button
Bottom Front Panel Push Button

These manual settings (using the clock front push buttons) consist of a setting number, followed by option numbers. To access the clock settings, press and release both buttons simultaneously. To return the LED display to showing the time, repeatedly press the top button until all of the setting options have been cycled through. The last setting in the sequence should be 41--99.

The numbers shown on the left are the settings criteria (topics), while the numbers on the right represent the available options to choose from. For example, Setting #2 is allocated for configuring the month of the year, while the options are: 01 – 12, allowing the user to choose a specific month. In the below section, the digit(s) on the left side represent the different settings criteria (topics), while the digit(s) on the right side will allow the user to choose the correct/desired option.

Setting 1 - Set Year

Use the bottom button to scroll from 00 through 99. This permits the user to select a year from 2000 to 2099.

Setting 2 - Set Month

Use the bottom button to scroll from 01 through 12. This permits the user to select a month from January (01) to December (12).

Setting 3 - Set Day of the Month

Use the bottom button to scroll from 01 through 31. This permits the user to select a day from the 1st of the month to the 31st of the month.

Manual Controls (3300 Only)

4 - -24

Setting 4 - 12/24 Hour Mode

Press the bottom button to switch between 12 and 24.
12 causes the master clock to display time in 12 Hour mode.
24 causes the master clock to display time in 24 Hour mode.

5 - - d

Setting 5 - Daylight Saving Time

Press the bottom button to switch between "d' or "E"
"d" disables Daylight Saving Time
"E" enables Daylight Saving Time

NOTE: Daylight Savings Time set through this method begins on the second Sunday of March at 2:00 AM, and ends on the first Sunday of November at 2:00 AM. If your state/province/country follows a different set of DST rules, please use sbdconfig to configure this setting.

6 - - d

Setting 6 - Alternate Date and Time

Press the bottom button to switch between "d' or "E"
"d" disables Alternating Time and Date
"E" enables Alternating Time and Date

NOTE: Alternating Time and Date set through this method displays the time for seven seconds, then displays the date for three seconds, then repeats. To make the time or date appear for longer or shorter periods of time, please use sbdconfig to configure this setting.

7 - - E

Setting 7 - Date Format

Allows the user to chose the Date format used when the clock is set to display alternating Date/Time. Press the bottom button to switch between "A" or "E"

"A" Stands for American Style - Month**:**Day**:**Year

"E" Stands for European Style - Day**:**Month**:**Year

On a 4-digit clock, only the day and month will be displayed.

8 - -02

Setting 8 - Display Brightness

Allows the user to choose the brightness level for the clock's main display. Press the bottom button to cycle between values 00, 01, and 02. This values correspond to Low, Medium, and High (Default)

A user has the ability to create a brightness schedule for the clock, but the parameters for this schedule must be set using the sbdconfig software.

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Manual Controls (3300 Only)

9--1

Setting 9 - Clock I.D. Number

Press the bottom button to advance the ID number of the clock. This accepts the ID numbers 1 through 999.
The ID Number is used for displaying text messages like 911, bELL, and FirE. Consult the Master Clock manual for more information.

This value can also be set through sbdconfig.

10--02

Setting 10 - Zone Number

Press the bottom button to advance the ID number of the clock. This accepts the Zone Numbers 01 through 99.
The Zone Number is used for displaying text messages like 911, bELL, and FirE. Consult the Master Clock manual for more information.

This value can also be set through sbdconfig.

11--01

Setting 11 - N/A

13--E

Setting 13 - Enable Loss of Communication Alert

Press the bottom button to switch between "d' or "E"
"d" disables Loss of Communication Alert
"E" enables Loss of Communication Alert

When Loss of Communication Alert is enabled, the colons on the display will blink if the digital clock fails to synchronize with the master clock within a set amount of time. This amount of time is set through Setting 14.

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Manual Controls (3300 Only)

14 - -06

Setting 14 - Loss of Communication Alert Additional Configuration

Allows the user to determine how much time should pass without a synchronization signal from the master clock before the Loss of Communication Alert is activated. Press the bottom button to switch between the numerical options below:

01 - Activates after 5 minutes	05 - Activates after 45 minutes	09 - Activates after 180 minutes
02 - Activates after 10 minutes	06 - Activates after 60 minutes	10 - Activates after 240 minutes
03 - Activates after 15 minutes	07 - Activates after 90 minutes	Note: Alert activates after signal loss for the time limit specified
04 - Activates after 30 minutes	08 - Activates after 120 minutes	

15 - -d

Setting 15 - Enable Circuit Board Jumpers

Press the bottom button to switch between "d' or "E"
"d" disables the jumpers
"E" enables the jumpers

NOTE: Enabling the jumpers overrides Settings 4, 6, and 8. Refer to the section of this manual labeled "**Jumper Switch Settings**" for information on the function of each jumper.

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Manual Controls (3300 Only)

20--7   **Setting 20 - N/A**

21--14   **Setting 21 - Once a Day Pulse Output - Set Hour**

This setting only appears if "9" was selected under Setting 20. Press the bottom button to scroll from 00 to 23. For example, a value of 13 is the same as 1:00PM. *Set to 0 by default.*

22--00   **Setting 22 - Once a Day Pulse Output - Set Minutes**

This setting only appears if "9" was selected under Setting 20. Press the bottom button to scroll from 00 to 59. *Set to 0 by default.*

23--30   **Setting 23 - Once a Day Pulse Output - Set Seconds**

This setting only appears if "9" was selected under Setting 20. Press the bottom button to scroll from 00 to 59. *Set to 0 by default.*

24--05   **Setting 24 - Once a Day Pulse Output - Set Pulse Duration**

This setting only appears if "9" was selected under Setting 20. Press the bottom button to scroll from 00 to 99 to set the duration in seconds. For example, a value of 98 will set a pulse duration of 1 minute and 38 seconds. *Set to 3 by default.*

30--1   **Setting 30 - N/A**

31--14   **Setting 31 - N/A**

32--00   **Setting 32 - N/A**

33--30   **Setting 33 - N/A**

40--d   For Manufacturer use only

41--60   For Manufacturer use only

Pressing the top button after Setting 41 will cause the clock to return to the normal time display.
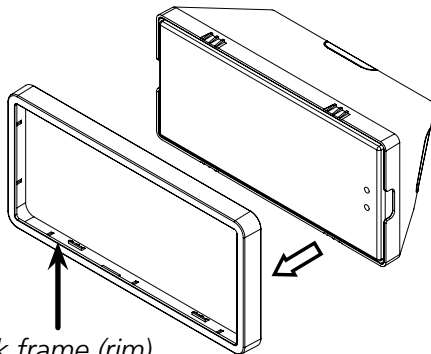
Accessing the Clock After it has been Installed

If the user observes an issue with the clock, please contact your dedicated dealer or us for support.

The below instructions are provided for accessing the clock for the purpose of changing its settings after it has been installed.
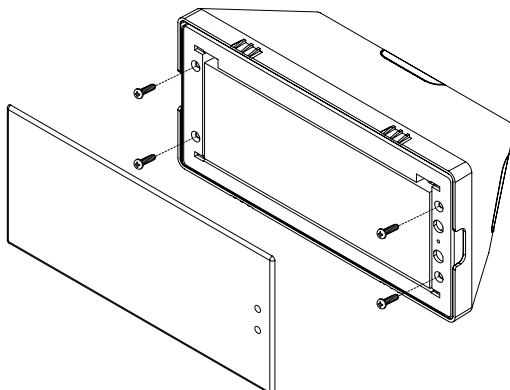
The clock housing consists of an outer frame (rim) that snaps on to the clock using mounting tabs.

1) To access the clock's electric board, there is a need to gently pull the rim out of the housing as shown in the below image.
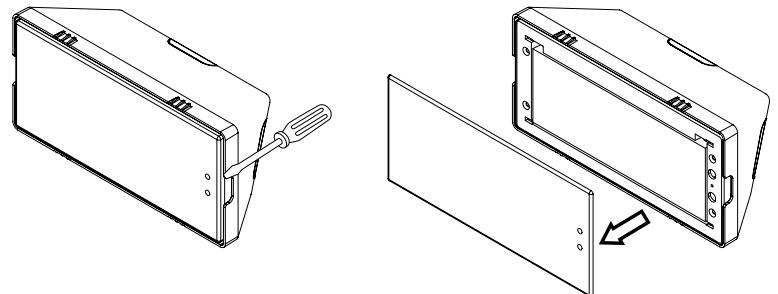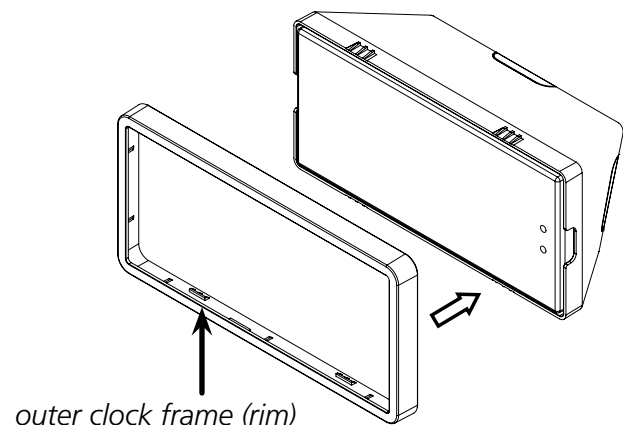
outer clock frame (rim)

2) Once the frame (rim) has been removed, gently pull off the clock filter (which is held by four tabs). You may use a flat head screwdriver to pop off the filter by wedging it between the filter and the housing, as shown in the below image.

3) Once the filter has been removed, a Phillips screwdriver should be used for unscrewing the clock display from the housing. The clock display is attached to the clock main electrical board, which consists of jumper switches, access to the power and data wires, as well as other ports and interfaces, depending on the clock model (3200 or 3300).

Placing the clock outer frame (rim) back:

Depending on the clock size, there may be 4 or 6 tabs. Gently push the outer frame (rim) onto the housing, allowing all tabs to latch into position so the rim will evenly align with the clock display.

outer clock frame (rim)

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sbdconfig Installation

Follow the below instructions ONLY IF the default settings need to be changed. If not, skip to the clock installation instructions section of this manual.

The USB Programming Cable **(D-USB485-INTF-1)** is an optional accessory allowing the user to program the clock, change one or more messages, or change any of the additional clock settings. The USB Programming Cable comes with a CD that contains a special programming software to be installed on a local computer, allowing the user to interface with and program the clock. This software can also be downloaded from our website. *(https://sapling-inc.com/software/)*

Step One:

Installing the software on the user's computer – The CD that is provided along with the USB Programing Cable contains two different kinds of software. The first software is called: "**SBDCONFIG-DRIVER**" and the second software is called: "**SBDconfig**." **First**, there is a need to install the USB programing Cable driver (called: "SBDCONFIG-DRIVER"), which is compatible with the Windows 10 operating system. Please follow the below steps:

a. Copy the USB DRIVER software ZIP folder provided on the CD to your computer's desktop.

b. Un-zip (extract) the USB DRIVER software.

c. Connect the USB connector side of the USB Programming Cable to the computer's USB port. When inserting the USB-A side into the USB-A port, confirm that the metal contacts on the adapter are facing the metal contacts on the port connector (in most computers, the metal USB contacts should be inserted facing up). The adapter is not reversible and will not function if installed upside down into the computer.

d. Go to the "**Device Manager**" located in the "Control Panel" menu on your computer. You can do so by simply typing "Device Manager" in your computer search bar.

e. In order to identify if the computer has automatically recognized the USB programming cable, scroll down to the "**Universal Serial Bus Controllers**" menu in the "Device Manager" (as shown in Image A). Expand the "Universal Serial Bus Controllers" menu by double clicking on it. Search for a line with the following name: "**USB Serial Converter**" (as shown in Image B). If this does not appear, skip to step g.
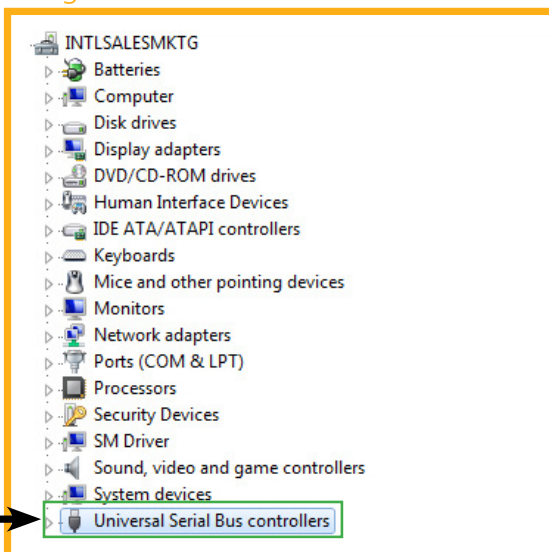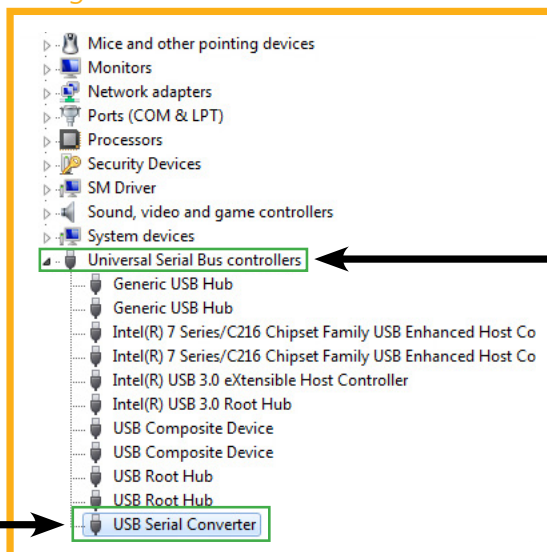
Image A

Image B

Expanded Tab

40

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sbdconfig Installation

f. If under the "Universal Serial Bus Controllers" tab, there is a line stating "**USB Serial Converter,**" it means that the computer has automatically recognized the USB programming cable. If so, please skip to step m.

g. Look under the "**Other Devices**" tab for an item titled "**FT230X USB Half UART**" as shown in image C (this tab is located above the "Universal Serial Bus Controllers" tab). There might be a need to expand the "**Other Devices**" tab in order to see the "**FT230X USB Half UART**" sub line (by double clicking on it).

h. Right click on the "**FT230X USB Half UART**" which will open its "**Properties**" tab, as shown in Image C.

i. Click on the "**Properties**" tab which will cause a menu bar to open.

j. At the top of the "**Properites**" menu bar, select the "**Driver**" tab as shown in Image D.

k. Click on the "**Update Driver**" option (shown in Image D) and browse your computer to choose the USB DRIVER software that you have previously saved on your desktop, titled "**SBDCONFIG-DRIVER**" as shown in Image E.

l. After the "**SBDCONFIG-DRIVER**" folder has been selected, click OK in the menu bar in order to have the Driver installed, as shown in Image E. Then hit "next" to start the downloading process.

Once the "**SBDCONFIG-DRIVER**" is successfully installed, the computer has identified the USB Programming Cable and is able to communicate with it.
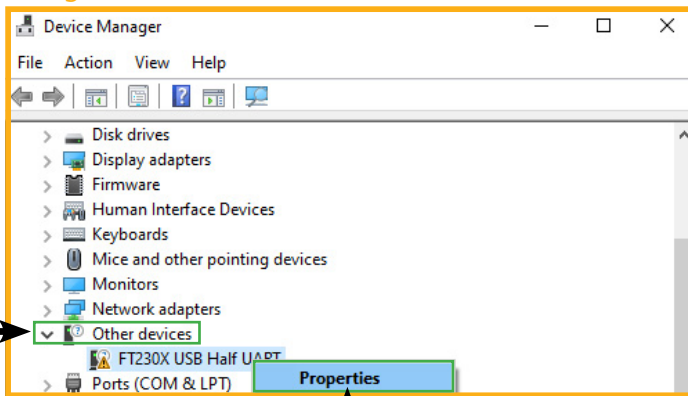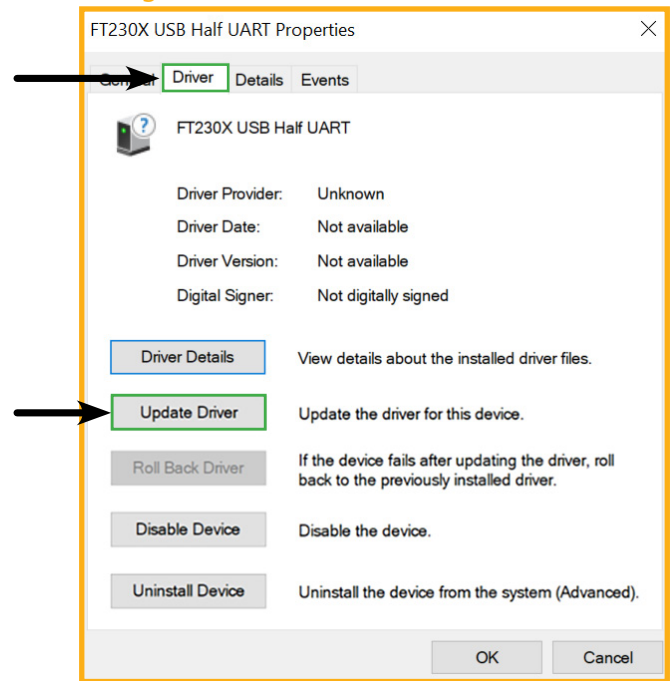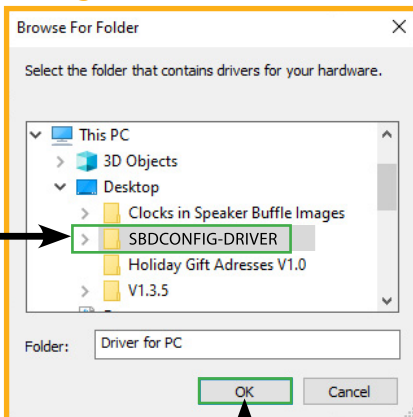
Image C

Image D

Image E

sbdconfig Installation

m. Open the "**USB Serial Converter**" by double clicking it, and a new window should appear.

n. Navigate to the "**Advanced**" tab, check the box next to "**Load VCP**," then click OK (as shown in Image F). The "Advanced" tab may not appear initially. If so, there is a need to exit out of the "Device Manager," and then re-open it.

o. Remove the USB Programming Cable from the USB port, wait 5 seconds, and plug it back in.

p. Open the "Device Manager" and scroll to "**Ports**." Make note of which port the USB Serial Port is assigned to as shown in Image G. For example: (COM 4). The "Ports" tab may not appear initially. If so, there is a need to uninstall the drivers and restart from Step One.
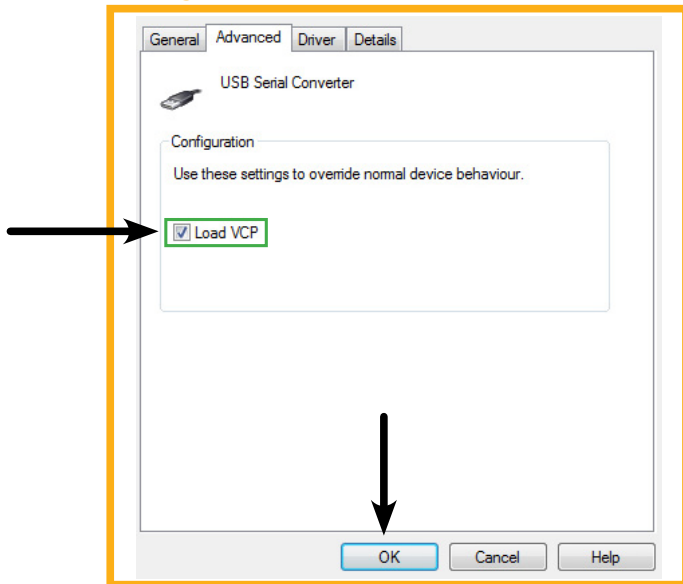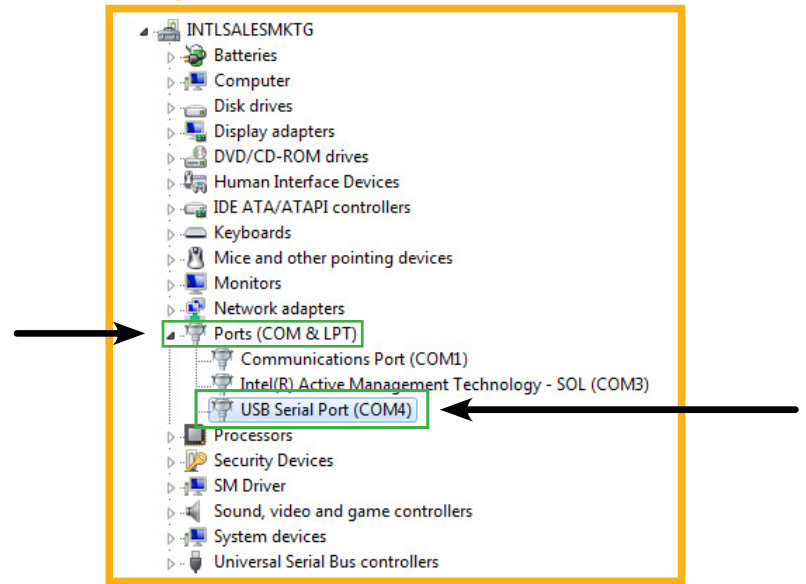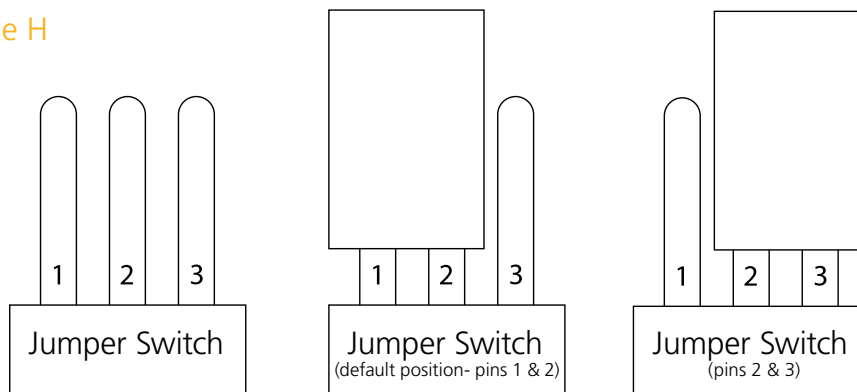
Image F

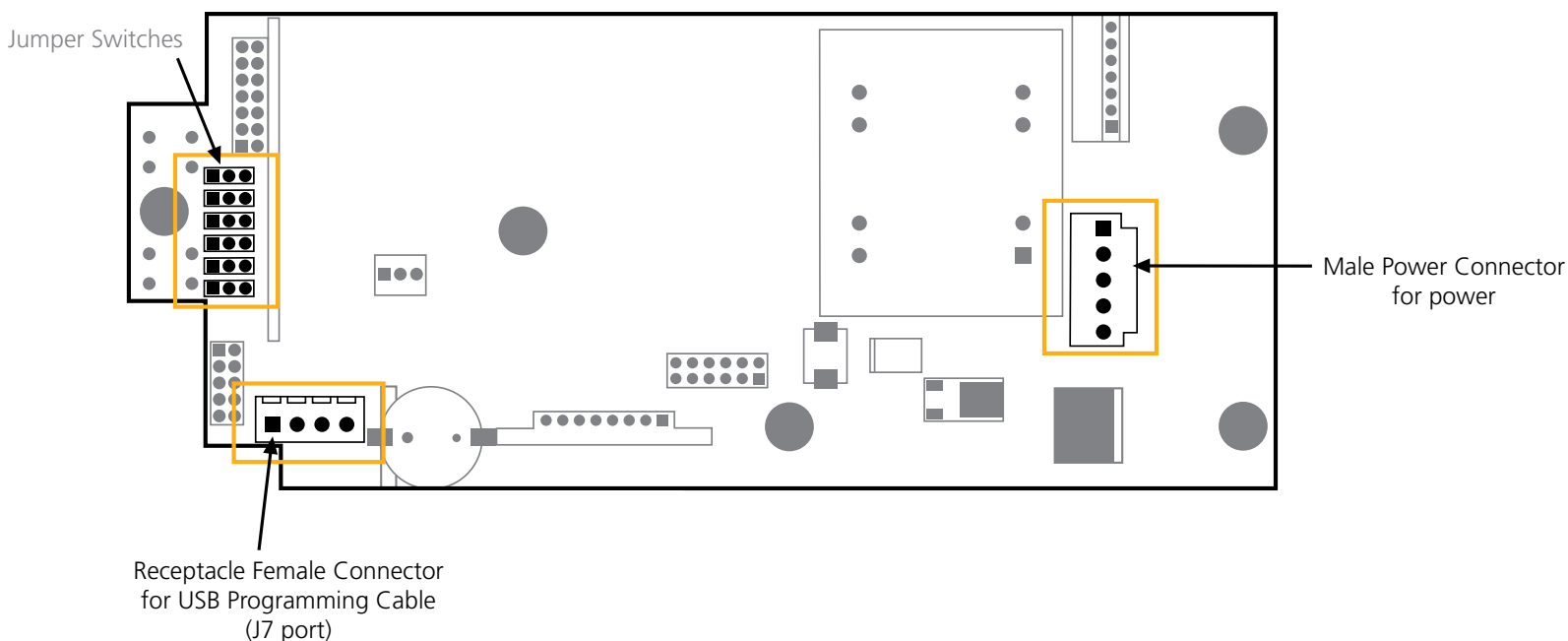Image G

sbdconfig Installation

Step Two:

Allowing data communication from the computer to the clock – The digital clock has jumper switches located on its main electrical board (shown in Image H). The jumper switches are located on the left side of the electrical board and each one is numbered: JP1, JP2, JP3... JP6. In order to allow data communication from the computer to the clock, jumper switch number 6 has to close electrical contacts of pins 2 and 3 (other jumper switches can remain in their original location). The default position of the jumper switches are to close electrical contact of pins 1 and 2, and the jumper switch would need to be moved to pins 2 and 3, as shown in Image H below:

Image H

Jumper Switch

Jumper Switch
(default position- pins 1 & 2)

Jumper Switch
(pins 2 & 3)

Clock Main Electrical Board

Image I

Jumper Switches

Male Power Connector
for power

Receptacle Female Connector
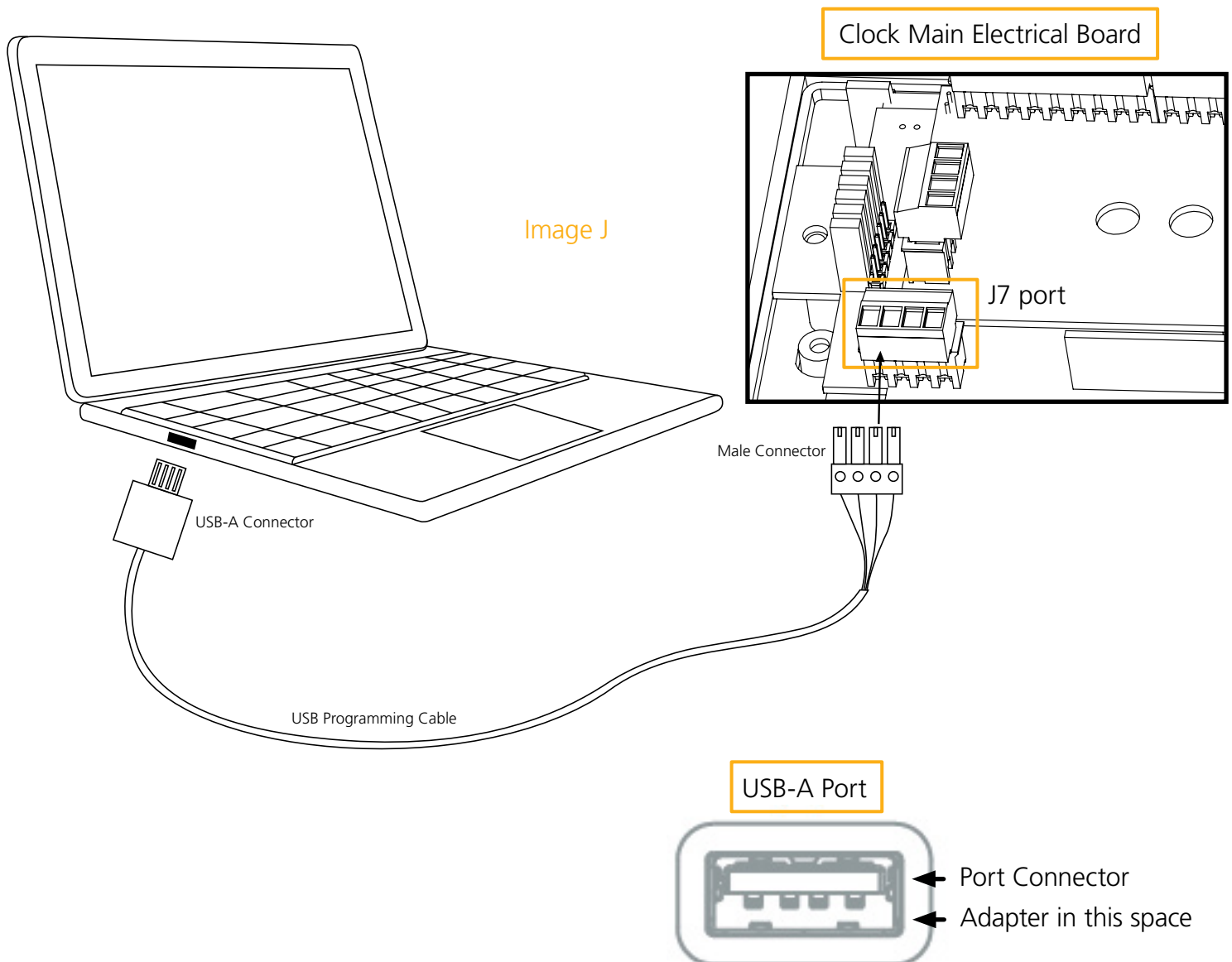for USB Programming Cable
(J7 port)

sbdconfig Installation

Step Three:

Connecting the USB Programming Cable to the clock - The USB Programming Cable has two ends. One end is a USB-A connector and will work with any USB-A port for the purpose of connecting with a computer or laptop. The other end has a male connector, allowing it to interface with a receptacle female connector (J7 port) located on the clock main electrical board. Make sure that the USB-A side of the USB Programming Cable is plugged into a computer (or laptop), and that the other side is plugged into the digital clock main electrical board as shown in Image J below.

Image J

Clock Main Electrical Board

J7 port

Male Connector

USB-A Connector

USB Programming Cable

USB-A Port

Port Connector

Adapter in this space

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sbdconfig Installation

If your clock is 110/ 230 VAC, follow Step Four (A).

Step Four (A):

Powering the clock using local 110 VAC or 230 VAC power – In order to program the clock, it needs to be powered. Each clock comes with a wire harness for powering the clock. One end of the wire harness will have a female connector, allowing it to interface with a receptacle male connector located on the right side of the clock main electrical board. The second end will have exposed electrical wires, which are meant to be wired to the electrical wires coming out of the wall (or the gang box), typically by using wire nuts. In this case, since we want to program the clock before it is being installed on the wall, instead of wiring the clock to the wall, there is a need to wire it by using a power cable. Plug the female connector side into the receptacle male connector located on the clock main electrical board, and plug the power cable to local power as shown in Image K.

If the ordered clocks are locally powered at 110 VAC or 230 VAC, follow the diagram in Image D below:
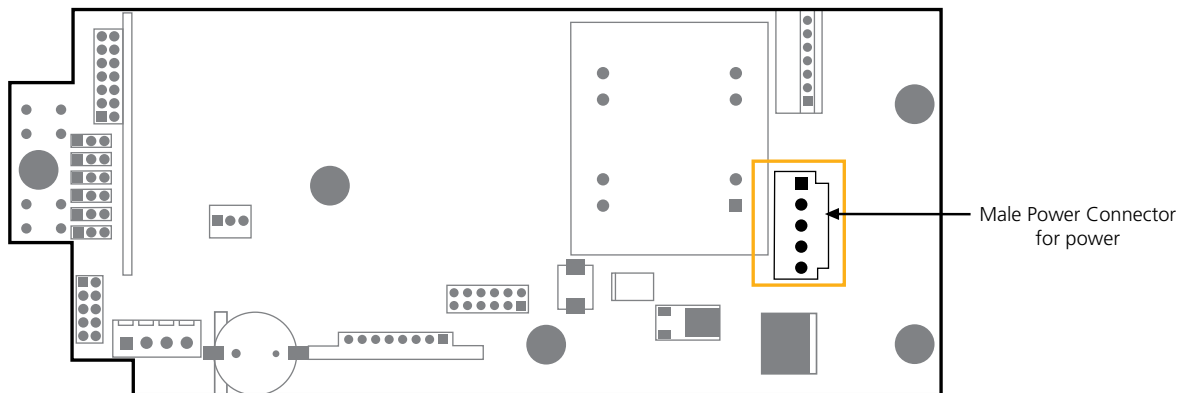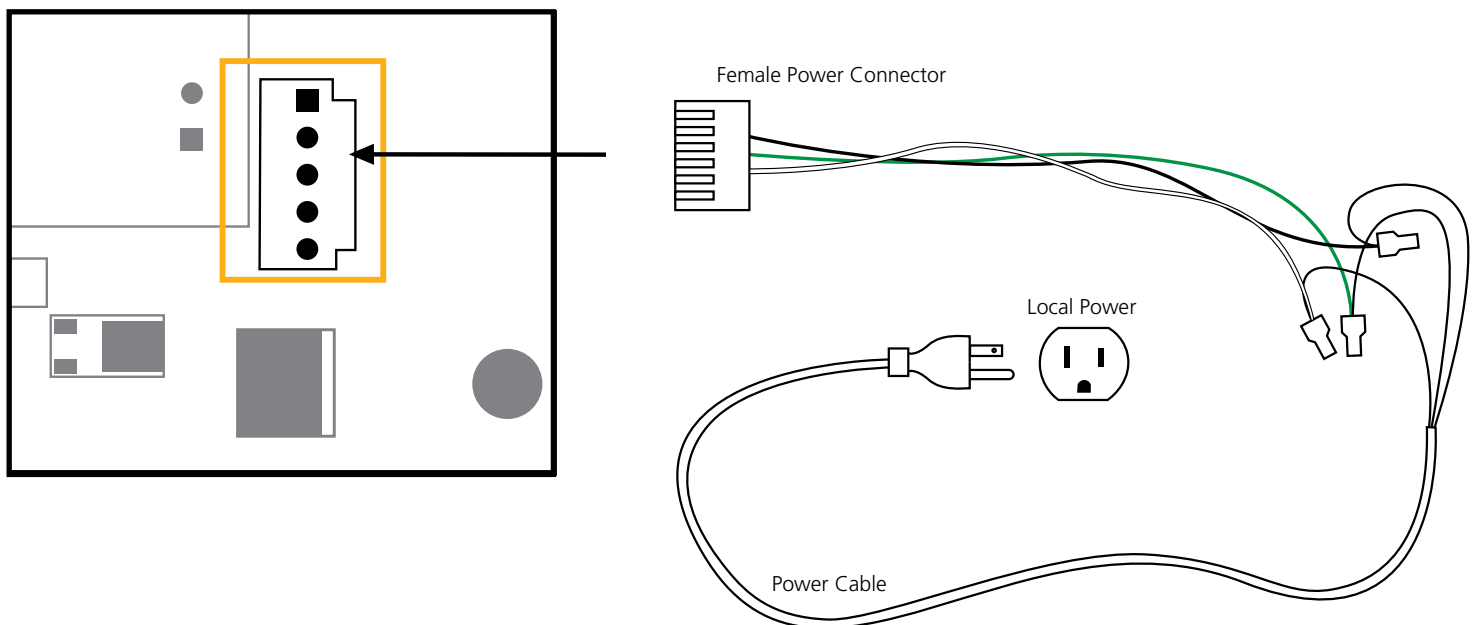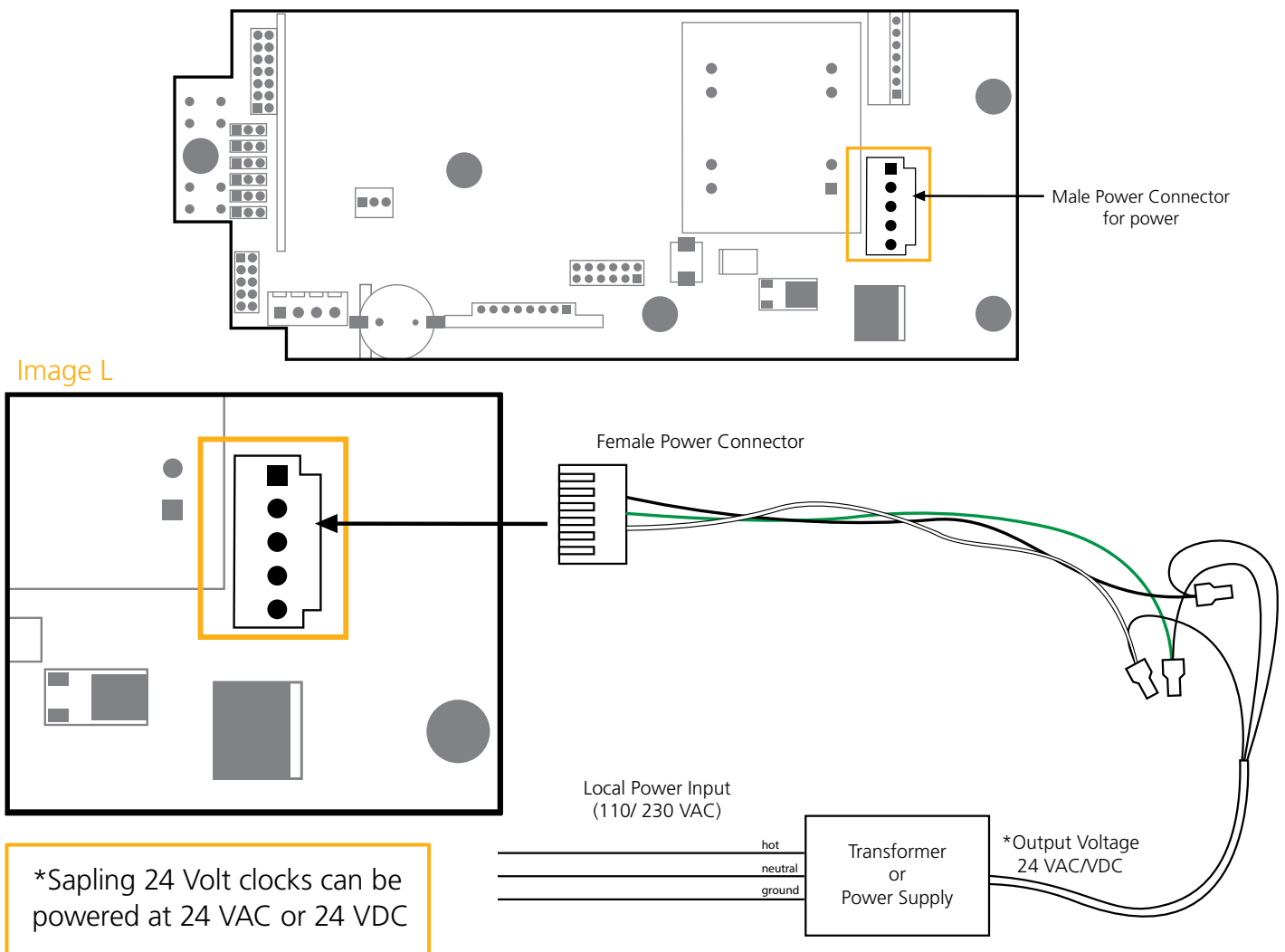
Male Power Connector for power

Image K

Female Power Connector

Local Power

Power Cable

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sbdconfig Installation

If your clock is 24 VAC/VDC, follow Step Four (B).

Step Four (B):

Powering the clock using a transformer or a power supply at 24 VAC/VDC – In order to program the clock, it needs to be powered. Each clock comes with a wire harness for powering the clock. One end of the wiring harness will have a female connector, allowing it to interface with a receptacle male connector located on the right side of the clock main electrical board. The second end will have exposed electrical wires, which are meant to be wired to the electrical wires coming out of the wall (or the gang box), typically by using wire nuts. In this case, since we want to program the clock before it is being installed on the wall, instead of wiring the clock to the wall, there is a need to wire it to a 24 VAC/VDC power source. Plug the female connector side into the receptacle male connector located on the clock electric main board, and wire the clock to a 24 VAC/VDC power source as shown in Image L.

If the ordered clocks are powered at 24 VAC/ VDC, follow the diagram in Image E below:

Male Power Connector for power

Image L

Female Power Connector

Local Power Input
(110/ 230 VAC)

hot
neutral
ground

Transformer
or
Power Supply

*Output Voltage
24 VAC/VDC

*Sapling 24 Volt clocks can be powered at 24 VAC or 24 VDC

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sbdconfig Installation

Step Five:

Installing the USB Programming software on the user computer – In order to program the clock, there is a need to install the clock programming software, which is also provided on the CD. For doing so, please follow the below steps:

a. Copy the clock programming software "**SBDconfig**" ZIP folder provided on the CD to your computer desktop. This software can also be downloaded from our website. *(https://sapling-inc.com/software/)*

b. Un-zip (extract) the "**SBDconfig**" software.

c. Make sure that the USB connector of the USB Programming Cable is properly connected to your computer, and that the other end of the USB Programming Cable is connected to the clock (as previously explained). Please also make sure that the clock is powered (as previously explained).

d. Once the clock is properly connected to the computer and powered, and after both software are installed, go to the "**SBDconfig**" folder on your desktop. In this folder, various file types will be visible, but only the application file should be opened by double clicking it. Doing so will open the programming software. This will allow you to browse between the different clock programming tabs that contain different settings depending on the application needs.

e. After opening the programming software, click on "**Serial Port**" (on the menu bar) and then "**Configure Serial Port**" as shown in Image M.

f. Make sure that the COM port matches the number you saw on the "Device Manager," then click "Apply," as shown in Image N.
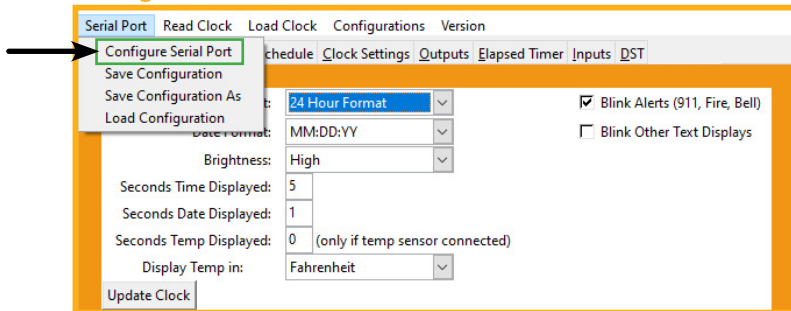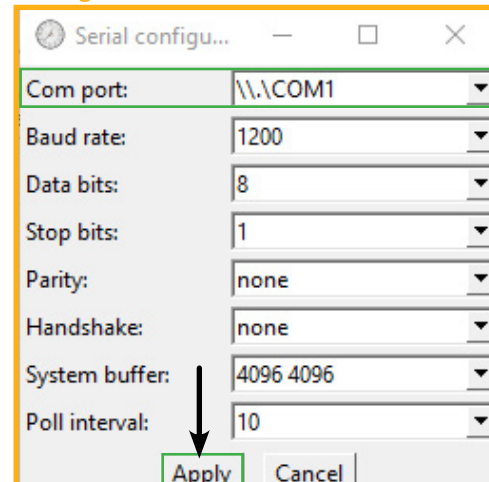
Image M
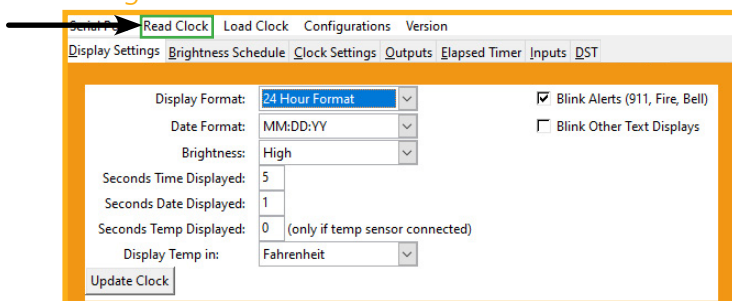

Image N

sbdconfig Installation

At this stage, the USB programming cable has been configured and is ready to be used.

The USB programming cable, along with the "**SBDconfig**" Software, allows the user to program the clock with any of its advanced settings per user preferences.

This section will cover these advanced clock settings such as: Brightness Schedules, alternating between time and date, and setting the duration of how long the time is to be displayed versus the date (for example: display the time for 7 seconds and display the date for 3 seconds). If a clock was purchased with a temperature sensor, the user can also program the display intervals, and any additional advanced settings may be applicable, as explained in the manual.

The first step would be to have the USB programming cable, along with the "SBDconfig" software, identify the clock by selecting "**Read Clock**," as explained below. Please note that one clock can be programmed with the desired settings, and if these same settings are desired to be programmed in more or all of the clocks, these settings can be saved on the user's computer. Then, this settings file can be downloaded on the following clocks. There is still a need to apply these settings by downloading the saved file to each clock, but this will eliminate the need to program all settings again in each clock. This process is explained later in this manual.

Image O

1. Click the "**Read Clock**" button, as shown in Image O. The default settings will populate the tabs on the "SBDconfig" software. Once the "**Read Clock**" button is clicked, another window will open that will signify the upload process.
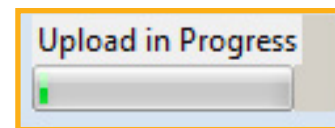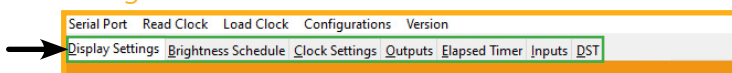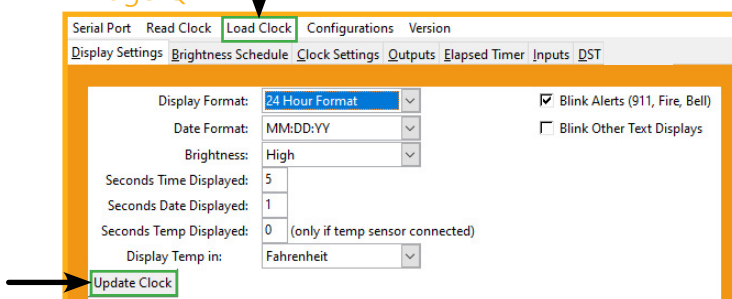

Image P

2. The clock software will contain different tabs depending on the settings that need to be changed. These tabs are highlighted in Image P.

Image Q

3. You may now edit the clock settings with the "SBDconfig" Software. Once new settings have been configured, they can be applied to the clock by pressing the "**Update Clock**" button on each tab, as shown in Image Q. Alternatively, "Load Clock" can also be used to apply settings.
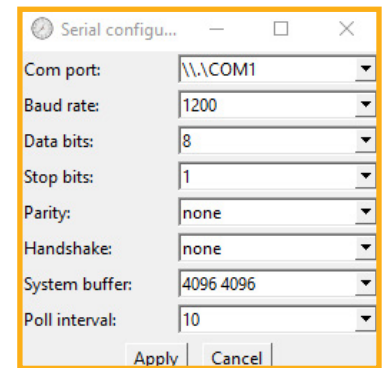
sbdconfig - Task Bar

Located on the task bar of the sbdconfig software, there are five options to choose from: Serial Port, Read Clock, Load Clock, Configurations, and Version.
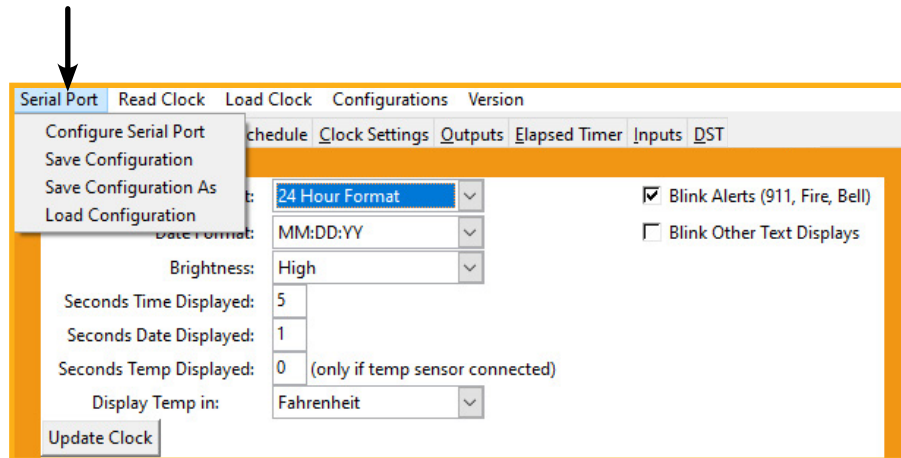
Serial Port

- **Configure Serial Port:** When clicked, this option will open the settings for the serial port. This is where a user can manage the settings that connect a PC to the digital clock.

- **Save Configuration:** After a user sets the serial port's settings on the sbdconfig software, this option will save a particular configuration to a computer in order to upload it to a different clock.

- **Save Configuration As:** If a user modifies the serial port's settings, this option will save a copy of the reconfigured clock to a computer.

- **Load Configuration:** This option allows a user to upload a previously saved serial port's configuration to the sbdconfig software. Once a digital clock is connected to a computer via the USB Programming Cable, click the "Load Configuration" option.

Note: When any of the above options listed under the Serial Port tab are selected, they only apply to the Serial Configuration settings.

sbdconfig - Task Bar

Read Clock

• If a user has a previously configured clock and connects it to a computer, this option will read and upload the settings to the "SBDconfig" software program. Once the "Read Clock" button is clicked, another window will open that will signify the upload process.
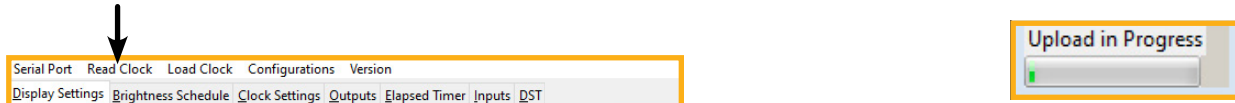

Load Clock

• The "Load Clock" button will allow a user to change multiple settings within the "SBDconfig" software tabs. This eliminates the need to click "Update Clock" on each screen. When the "Load Clock" button is clicked, another window will open showing that the download is in progress.


Configurations

• **Save Configuration:** This option will save the configuration to the computer.
• **Load Configuration:** This option will allow a user to load the previously saved configuration from the computer.
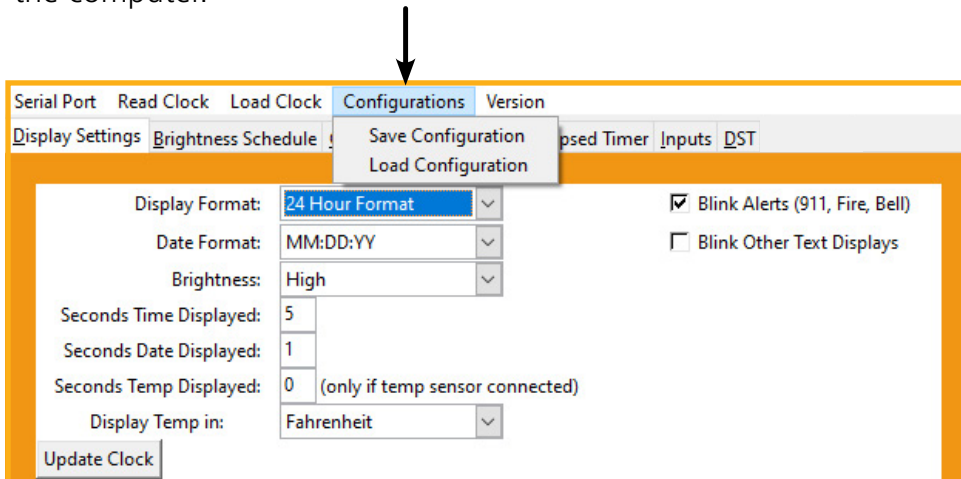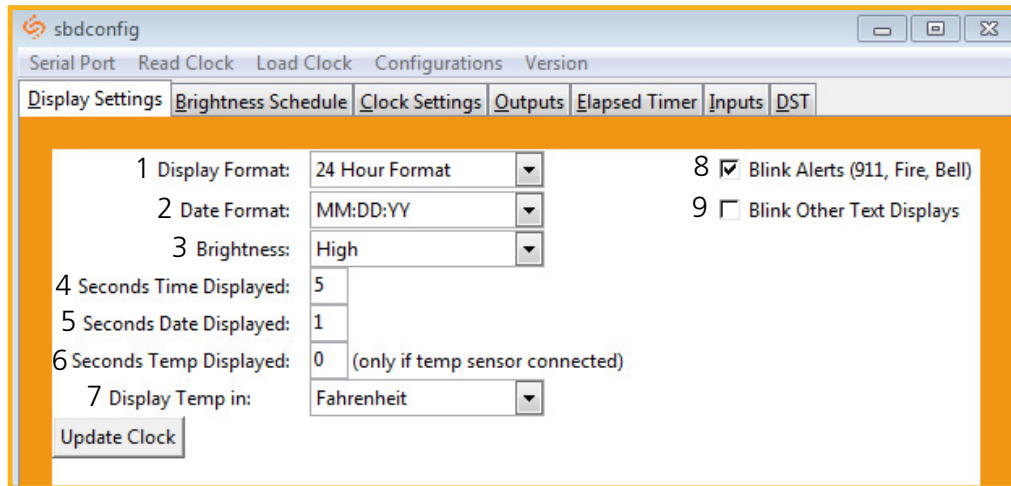

Version

• The Version button displays the number of the software version. Current version may be different from what is listed in the manual. Check with Support team for current version.
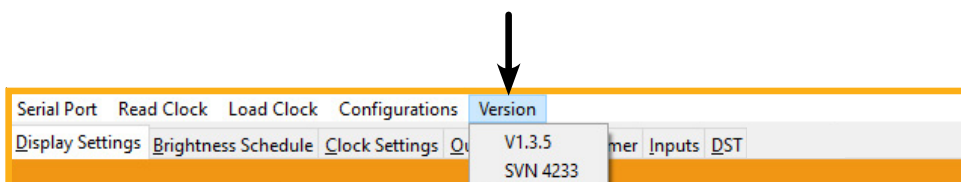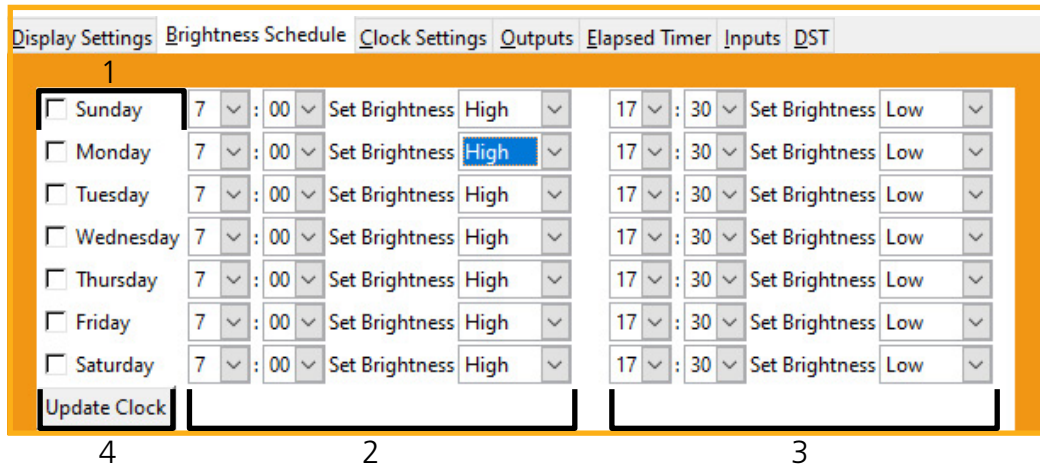
sbdconfig - Display Settings

Clicking on the Display Settings tab will allow a user to program the following settings:

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. Brightness - Sets the brightness level that the clock will display. There are four levels to choose from: High, Medium, Low or Off.

4. 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.

5. 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.

6. 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.

7. Display Temp In - If a temperature sensor was installed on the clock, this option allows a user to select whether the temperature appears in Fahrenheit or Celsius.

8. Blink Alerts (Fire, Bell) - When checked, this option will enable the emergency alert messages programmed with the master clock to blink when activated (see the specific master clock user manual for more information). Leaving the message unchecked will result in the message being sent in text that does not blink.

9. Blink Other Text Displays - When checked, this option will enable any other messages programmed with the master clock to blink when activated (see the specific master clock user manual for more information). Leaving the message unchecked will result in the message being sent in text that does not blink.

Once all of the Display Settings are chosen, click the 'Update Clock' button to store the selected options or, when all the tabs have been programmed, click the 'Load Clock' button located on the menu bar to store all options.

Note: If the Time, Date, and Temp Displayed are ALL set to 0, the display will turn completely blank. Will turn on for count down/up, and off again once the counting has been cleared.
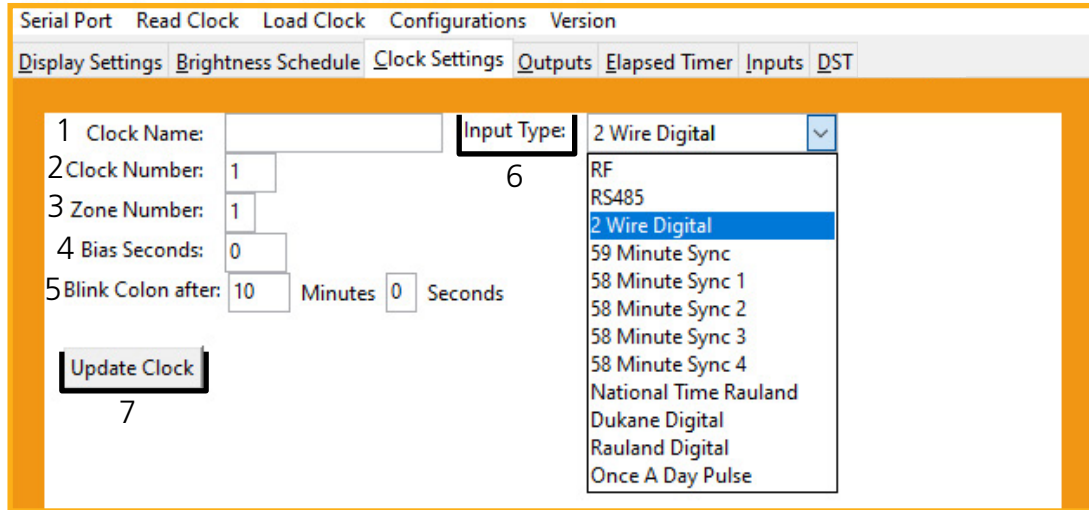
sbdconfig - Brightness Schedule

1. Date Column - Allows the user to select dates where changes to the brightness schedule are active. If a date is not selected, the actions in the adjustment columns will not be applied to the clock.

2. Adjustment 1 - Allows the user to select a new brightness level for the clock, and the time when the new brightness level will take effect. Times are entered in 24 hour mode. Brightness options are High, Medium, Low, and Off.

3. Adjustment 2 - Allows the user to set a second time during a given day where the brightness level will change.

   The time for Adjustment 2 may be set for any time before or after Adjustment 1 during the same day. For example, if Adjustment 1 is set to activate at 11:00 AM and Adjustment 2 is set to activate at 8:00 AM, Adjustment 2 will activate first at 8 AM, followed by Adjustment 1 at 11 AM.

   If you wish for the brightness to only change once on a given day, set Adjustment 1 and Adjustment 2 to the same brightness level and time.

4. Once the Brightness Schedule has been programmed, click the "Update Clock" button to store the selected options or, when all the tabs have been programmed, click the "Load Clock" button located on the menu bar to store all options.

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sbdconfig - Clock Settings

Clicking on the Clock Settings tab will allow a user to program the following settings:

1. **Clock Name** - This field allows a user to assign the clock a unique name, such as its location in a facility. The name cannot exceed 24 characters.

2. **Clock Number** - This field allows a user to assign a unique number to a clock. This number is used when commanding a specific digital clock from the Master Clock Web Interface. Please refer to the master clock manual associated with your system for more information.

3. **Zone** - This field allows a user to enter a number (1-99) for the clock's zone. A zone is a collection or grouping of clocks within a certain section of a facility. This number is used when commanding a designated group of digital clocks from the master Clock Web Interface. Please refer to the master clock manual associated with your system for more information.

4. **Bias Seconds** - In some scenarios, there may be a need to adjust the time displayed by the clock. If your application requires such an offset, enter a value (in seconds) into the "**Bias seconds**" field of the needed offset.

5. **Blink Colon After** - The colon on the digital clock display has the ability to blink in order to signify a loss of communication with the master clock. These fields will let the user choose how long after a loss of communication the clock will wait before the colon starts to blink.

6. **Input Type** - Selecting an item from this drop-down menu allows the user to select a primary input source for accepting new time data. **A wireless clock should have RF set as its input.**

7. Once all of the Clock Settings are chosen, click the "**Update Clock**" button to store the selected options or, when all the tabs have been programmed, click the "**Load Clock**" button located on the menu bar to store all options.
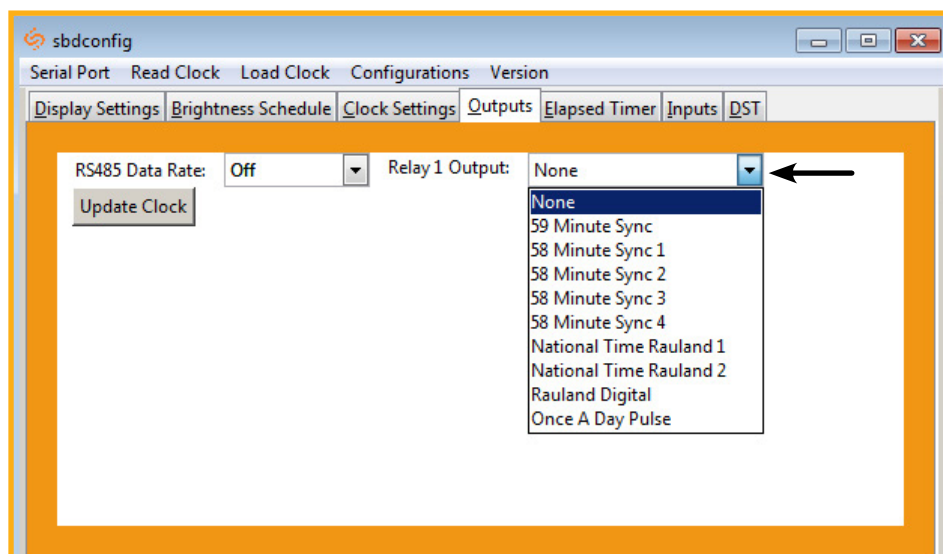
sbdconfig - Outputs

Clicking on the Outputs tab will allow a user to program the following settings:

RS485 Data Rate: This option determines how often data (time and date) is sent to the clock(s) or other Sapling devices, such as Wireless Repeaters, Converter Boxes, or other Master Clocks.
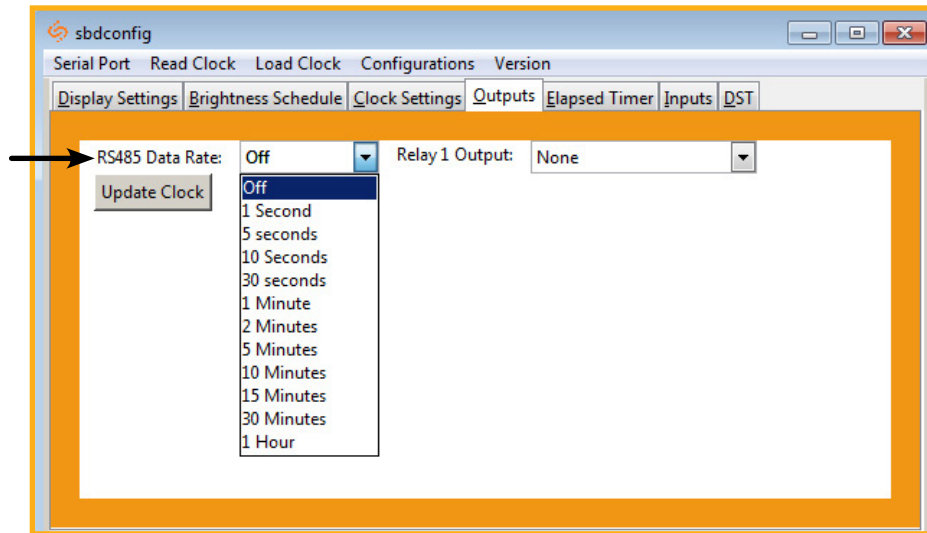

Relay 1 Output: This option allows a user to choose the time sync the clock uses to correct other time keeping devices, such as paging systems, an existing master clock, or other devices manufactured by different companies. Refer to "**Outputs (3300 Only)**" for wiring information and "**Manual Controls**" setting 20 for an explanation of each output type.

Once the Relay 1 Output settings are chosen, click the "Update Clock" button to store the selected options or, when all the tabs have been programmed, click the "Load Clock" button located on the menu bar to store all options.

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sbdconfig - Elapsed Timer

A user may set up and configure the Elapsed Timer control panel through sbdconfig. For detailed instructions, on the many functions and uses of the Elapsed Timer, refer to the Elapsed Timer Manual.
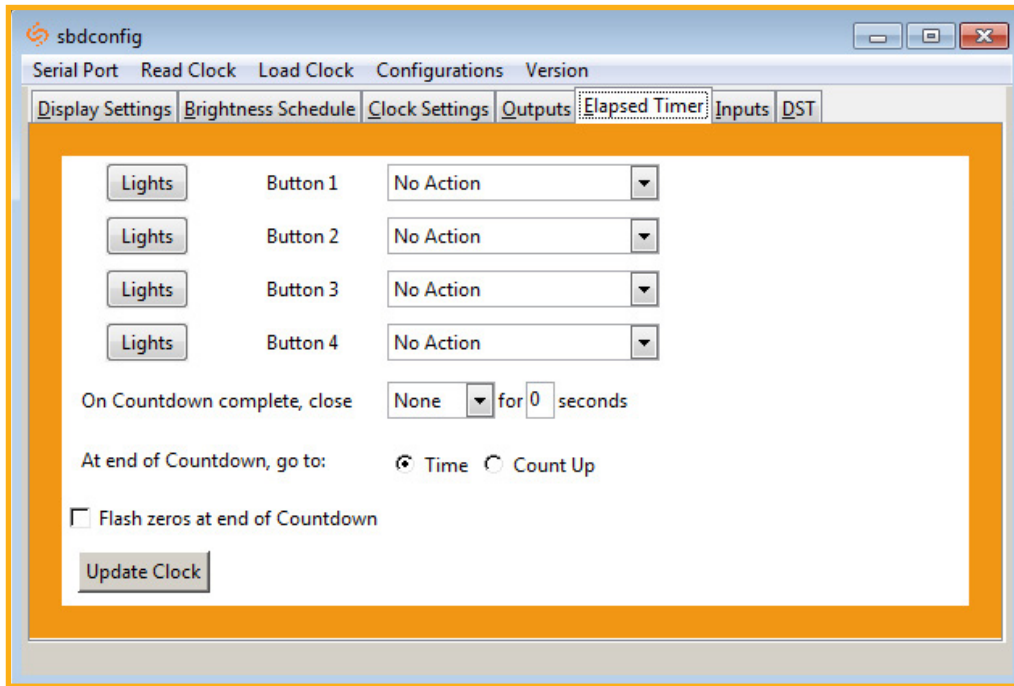
Once the settings are chosen, click the "Update Clock" button to store the selected options or, when all the tabs have been programmed, click the "Load Clock" button located on the menu bar to store all options.

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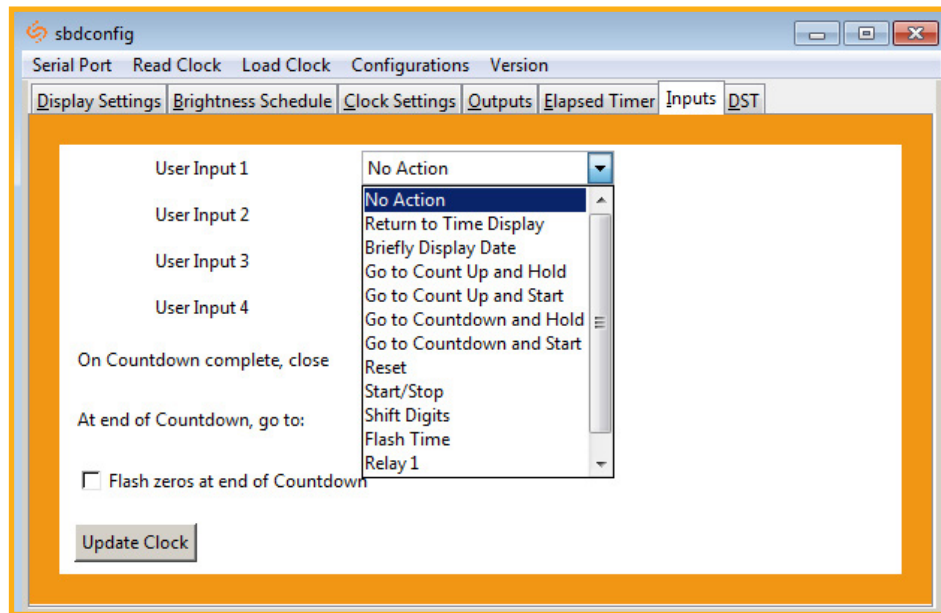
The "**Inputs**" tab allows a user to program the clock to perform a certain function through a switch or relay contact closure from an outside device such as Code Blue, Nurses Call, etc. Program the first Input on the SBL 3300 by selecting one of the options in the drop down list next to Input 1. Listed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

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

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 - Activating the input causes Output Relay 1 to activate.

Relay 2 - Activating the input causes Output Relay 2 to activate.

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

sbdconfig - Inputs

Code Blue:

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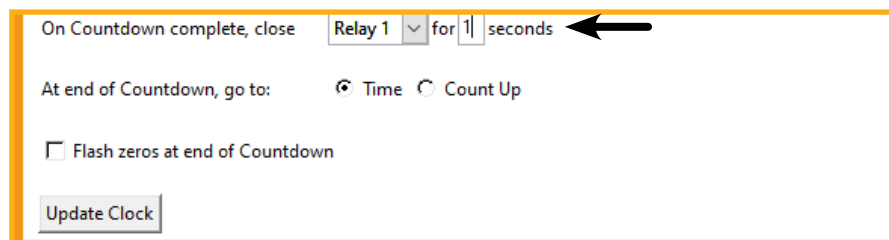
When an input programmed with Code Blue is activated for the first time, the count up starts.

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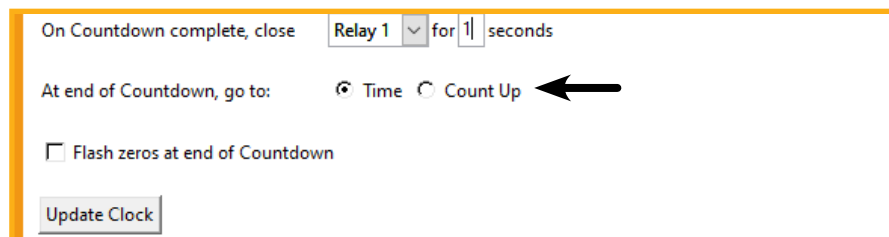
When the input is activated for a period longer than three seconds, the count up resets to zero and the display goes back to showing the time.

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.

On countdown complete, close: This option allows a user to choose how many seconds a relay will be closed for.

At end of Countdown, go to: This option allows a user to choose between having the clock display the time or start a count up when a countdown completes.

Once all of the Input settings are chosen, click the "Update Clock" button to store the selected options or, when all the tabs have been programmed, click the "Load Clock" button located on the menu bar to store all options.
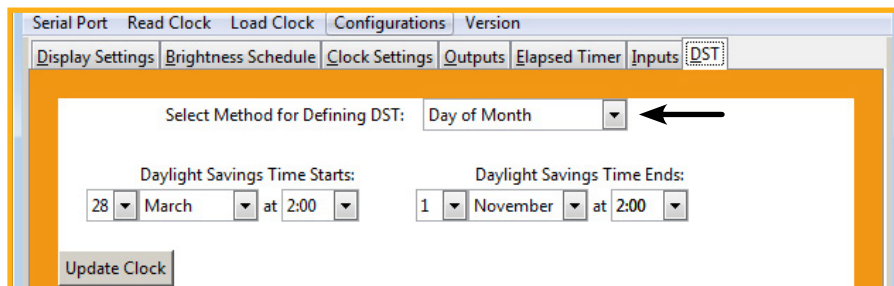
sbdconfig - Daylight Saving Time (DST)

In a typical installation, the DST is set and commanded to the clocks by the master clock. As such, programming the DST settings using the SBDconfig should be done only for a specific reason and application.

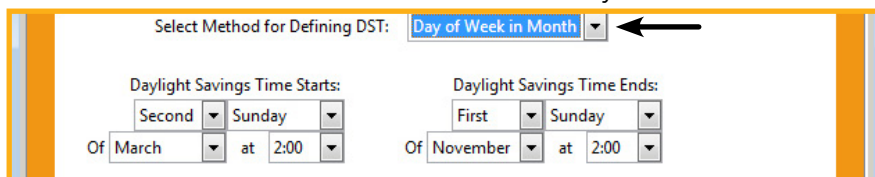The DST Tab allows a user to configure the clock for automatic Daylight Saving Time changes.

Select Method for Defining DST: This drop down allows a user to choose between four options for Daylight Savings Time.

Day of Month: When this option is selected, Daylight Saving Time can be set based on what date and time it begins and ends. For example, Daylight Saving Time can begin on March 28 at 2AM and end on November 1st at 2AM.

Day of Week in Month: When this option is selected, Daylight Saving Time can be set based on what week in what month and what time it begins and ends. For example, Daylight Saving Time can begin on the second Sunday in March at 2AM and ends on the first Sunday in November at 2AM.
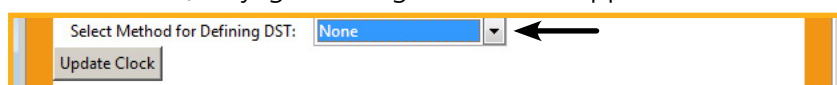

By Country: When this option is selected, Daylight Saving Time can be chosen by country. For example, Daylight Saving Time can be selected to follow the DST rules established in the United States.

None: When this option is selected, Daylight Saving Time is not applied.

Once all of the DST settings are chosen, click the 'Update Clock' button to store the selected options or, when all the tabs have been programmed, click the 'Load Clock' button located on the menu bar to store all options.

Reading the Display

The digital clock is designed to display time in either a 12-hour or 24-hour format. When the display is set to the 12-hour format, a circular light will appear in the top left corner of the display to indicate PM, or disappear to indicate AM. When the display is set to the 24 hour format, the full 24-hour time will appear on the display; no other lights should appear.

Some examples:

5:30 AM (12-hour format)

PM: ➡️

5:30 PM (12-hour format)

5:30 AM (24-hour format)

5:30 PM (24-hour format)

The factory default setting for all digital clocks is the 12-hour format. If you wish to set the clock to display time in a 24-hour format, see the section labeled "**Jumper Switch Settings**" or "**sbdconfig - Display Settings**", included earlier in this manual.

Frequently Asked Questions

What is the difference between an SBT clock and an SBTG clock?

The SBT digital clock operates in the 900MHz frequency range, while the SBTG operates in the 2.4GHz frequency range. Clocks of different frequency ranges cannot be used together in the same system.

What happens to the digital clock if a power failure occurs?

If a power failure occurs, the display will shut off but the clock will continue to keep time with its internal quartz oscillator. This oscillator will continue to run on a tiny battery backup for about ten years. In this mode, it may drift from synchronized time by a few seconds for each year that the clock is without power. Once power is restored to the clock, the display will turn on and display the time on the quartz oscillator. It will correct this to accurate, synchronized time once a signal from a master clock is received.

What happens to the digital clock if contact with the time data source is lost?

The digital clock will rely on an internal quartz oscillator for keeping the time until time data is received. While the clock is not receiving time data, its colons will blink.

How do I take advantage of the 3200/3300 chronograph functions?

The Chronograph functions can be engaged through Sapling's Elapsed Timer (part# SBD-ELT-001-0), or by using a dry contact closure with the configurable user inputs (3300 only). Refer to the respective selections of this manual for setup instructions.

How can I display "BELL" and "FirE" on the clock?

"FirE" and "BELL" are signals sent by the appropriate master clock. Refer to the master clock manual for instructions.

For 24V clocks, what happens if voltage on the power line drops from 24VAC to lower voltage?

As long as voltage is above the minimum voltage needed for the clock, it will still function. If voltage is too low, the clock display will dim, fluctuate, or not work at all. Please refer to the clock specifications, as each clock, depending on its size, will have a different minimum required voltage input.

Will the wireless clock cause interference with other wireless devices?

No. SBT Series Wireless Clocks work on 900 MHz (2.4GHz for SBTG) frequency-hopping technology, which allows the clock transmitters to avoid interfering with other devices operating on those frequencies.

Do I gain any advantages by having more than one transceiver on a locally-powered wireless clock system?

Additional transceivers are only useful if you must mount a clock beyond the range of all other wireless clocks. If all the clocks in the system are in range of each other, then there are no additional benefits from having more than one primary transceiver.

Frequently Asked Questions

How long does it take for a clock to receive a signal?

If everything is installed correctly and the transceiver is open, the clock should get the signal within a few minutes. Once the clock has been synchronized, it will attempt to acquire a time signal once every minute.

When I power my clock, it seems to be running a test instead of showing the time. What is it doing?

Immediately after power up an SBT(G) will run an LED display test to allow the user to confirm that each segment of the display is functioning properly.

How can I determine that the clock is receiving a signal?

if the clock is not receiving a signal, then the colons on the clock will blink on and off, unless configured by the user not to do so. This option is controlled through either the Manual Controls; Setting 13.

The clock is not powered. What do I do?

1. Measure the input voltage to the clock. The voltage should match one of the corresponding ranges below, depending on the digit size and power source:

	2.5" Digit size	**4.0" Digit size**
24V	11-28 V	16-28 V
110VAC	85-130 VAC	100-130 VAC
230VAC	180-260 VAC	200-260 VAC

2. Make sure that the transformer is an isolated transformer if using a 24VAC model.
3. Make sure the ground wire is not touching other wires.

NOTE: If you fail to follow instructions 2 and 3 listed above, the fuses can be blown.

The clock is in a location with a poor/no signal. What should I do?

If the clock is in a location that isn't receiving signal, or is not receiving a strong-enough signal to synchronize, install a signal repeater or add more secondary clocks in a location between clocks that are receiving the signal and clocks that are not.

Troubleshooting

The clock is not receiving a communication signal from the master clock, despite the fact that other nearby clocks are receiving a signal. What should I do?

Measure the voltage of the clock, as a low-voltage clock may not pick up master clock signals. Refer to the table above as a reference for the expected input voltage range for each clock type.

My version of the sbdconfig.exe software is not working with my clocks. What should I do?

3200/3300 clocks shipped before March 27, 2014 require an older version of the sbdconfig software, while 3200/3300 clocks shipped after March 27, 2014 require a newer version of the sbdconfig software. If your clock does not respond to your version of sbdconfig, you may request both versions of the program by contacting support at +1 (215)-322-6063.

Can this clock accept time data from wireless clocks that DO NOT have the TalkBack feature?

While the SBT(G) will accept time synchronization data from SBL(G) and SAL(G) clocks, it cannot send TalkBack data back to the master clock this way. An SBT must work with a chain of SBT and SAT clocks to get a TalkBack signal to the Master Clock or Network Repeater.

Can this clock send time data to wireless clocks that DO NOT have the TalkBack feature?

The SBT(G) can send time synchronization data to SBL(G) and SAL(G) clocks. This is a one-way form of communication and it does not turn the SAL/SBL clocks into TalkBack clocks.

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 protraction 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.

For the 900 MHz Model:

This equipment must be installed by professional installers only. For precautionary measures, the FCC requires a minimum distance of 3 cm from the unit to constant human physical exposure. The antenna has a maximum gain of 5.14 dB.

For the 2.4 GHz Model:

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.

900 MHz FCC ID Number: R73LPA1

2.4 GHz FCC ID Number: R73MOD-24G-1