

Installation and Programming Manual V8

SBD 3000 Series Wired Clock



SBD 3000 Series Wired Clock

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Included in the Kit

Below is a list of all the items included in the SBD 3000 installation kit. The items in the kit will correspond to the type of mounting and voltage option chosen.

Surface Mount – 24VAC Kit

Kit will be labeled: D-PK-3-24-S

- 24VAC Power Harness (18 AWG), Orange, Green, Yellow

Kit will be labeled: D-MK-WLL-PLTC-1

- 4 - 6-32 x 1" Machine Flat Screws
- 4 - 6-19 x 1/2" Flat Head Screws
- 4 - 8-32 x 7/19" Screws
- 2 - 8-32 x 7/16" Screws

Surface Mount - 120VAC or 240VAC Kit

Kit will be labeled: D-PK-3-110-S

- 120VAC or 240VAC Harness (18 AWG), Black, Green, White

Kit will be labeled: D-MK-WLL-PLTC-1

- 4 - 6-32 x 1" Machine Flat Screws
- 4 - 6-19 x 1/2" Flat Head Screws
- 4 - 8-32 x 7/19" Screws
- 2 - 8-32 x 7/16" Screws

Flush Mount – 24VAC Kit

Kit will be labeled: D-PK-3-24-F

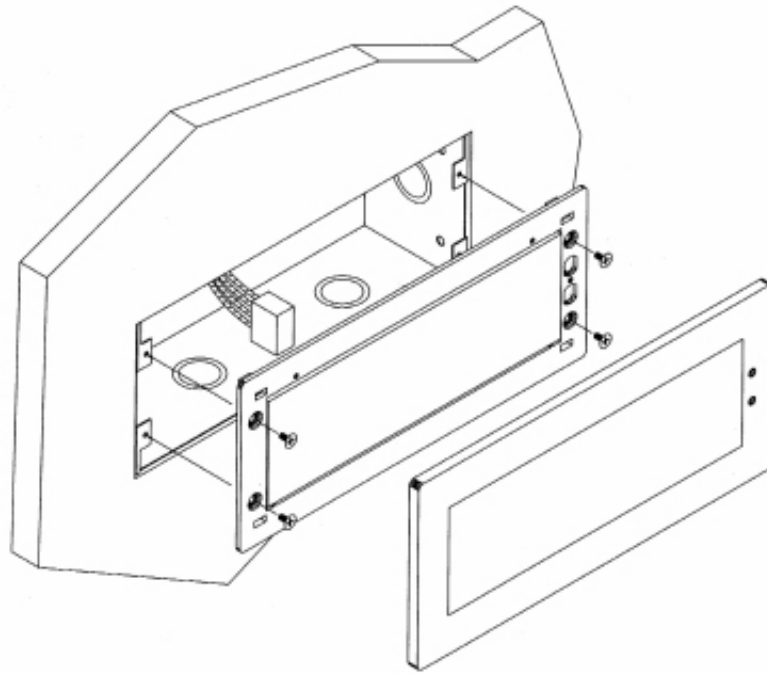
- 1 - Grounding Wire, Loop End (18 AWG), Green
- 1 - 24VAC Power Harness (18 AWG), Black, Green, White
- 4 - Machine Flat Screws 6-32x1/2, Black
- 1 – 6-32 Hex Machine Screw Nut
- 1 – Internal Tooth Lockwasher #6

Flush Mount – 120VAC or 240VAC Kit

Kit will be labeled: D-PK-3-110-F

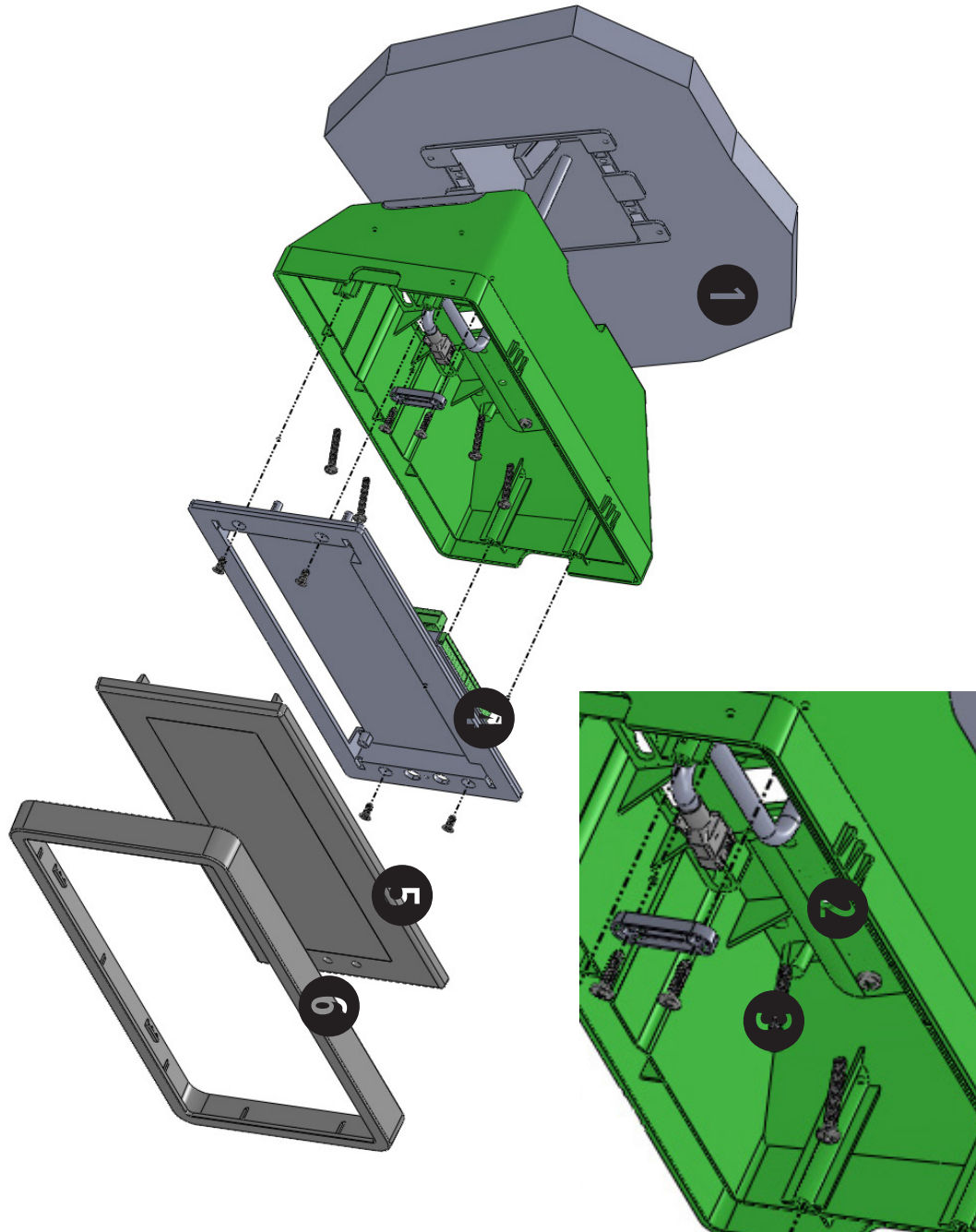
- 1 - Grounding Wire, Loop End (18 AWG), Green
- 1 - 120VAC or 240VAC Power Harness (18 AWG), Black, Green, White
- 4 - Machine Flat Screws 6-32x1/2, Black
- 1 – 6-32 Hex Machine Screw Nut
- 1 – Internal Tooth Lockwasher #6

Flush Mount Installation



1. Mount the flush mount box into the wall.
2. Connect the ground wire into the flush mount box using the tooth lockwasher and the machine screw nut (included in the kit).
3. Disconnect the red filter from the display panel.
4. Connect the wiring as shown on the wiring diagram.
- 5. IMPORTANT:** If using a low voltage system (24 volt) make sure that the transformer is an **isolated** transformer.
6. Mount the display panel into the flush mount box using the four (4) black machine screws (#6, included in the kit). Make sure the switches are on the right side.
7. Snap the red filter into the display panel.

ABS Surface (Wall) Mount Installation



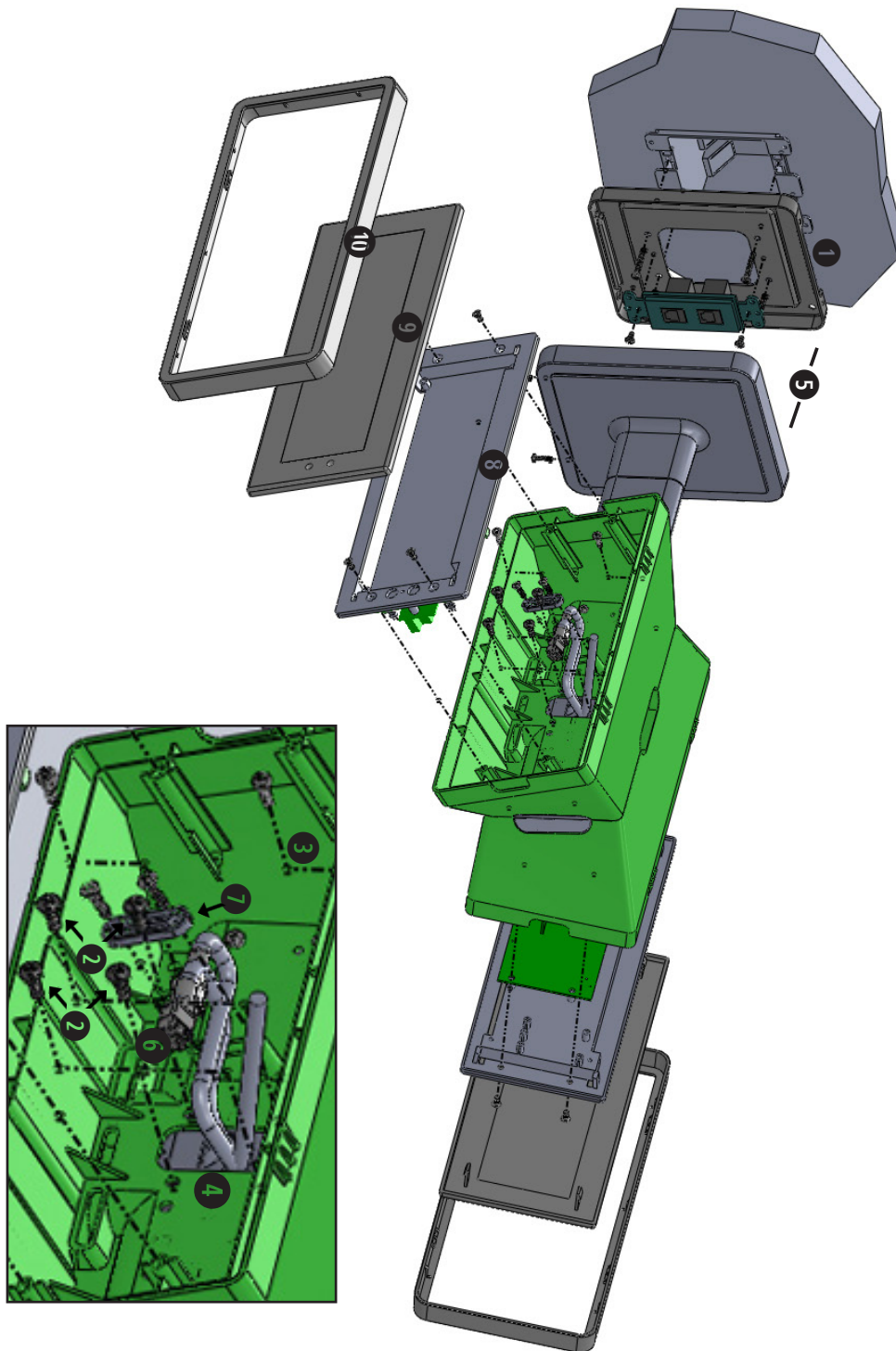
ABS Surface (Wall) Mount Installation (continued)

- 1. Mount Housing to Wall and/or Gang Box** - To mount the housing to the wall, install two (2) wall anchors into the wall (not supplied in kit) and take two pan head screws no larger than #8 (also not supplied in kit) and drive them into the anchors leaving an 1/8th inch gap between the head of the screw and the wall. Mount the housing to the wall by lining up the two keyholes in the back of the housing with the two screws with the 1/8 inch gap and slide the housing onto the heads of the screws. Next, mark the 2 mounting holes at the bottom of the housing on the wall. Remove the housing and install wall anchors at this location. Hang the housing on the keyholes and install the bottom screws. To mount the housing to the gang box, take the four (4) 6-32 x 1" screws (supplied in kit) and screw them through the four holes in the center of the inside of the housing and the four holes in the gang box.

Note: If using a metal gang box, a ground must be provided to the gang box.

- 2. Feed Wiring Into the Housing** - Take the wire coming from the inside of the gang box and feed it through the hole in the middle of the housing.
- 3. Plug and Secure Wiring** - Loosen the provided wire clamp (comes attached to the inside of the housing) and slip excess wiring through and tighten the clamp. After securing excess wiring, connect the wiring into the appropriate connector on the back of the display board. (See the Wiring and Jumper Settings on pages 10-12).
- 4. Mount Display Board to Housing** - Using the four (4) self tapping, 6-19 x 1/2" flat head screws (supplied in the assembly kit), take the display board and screw it to the front side of the clock housing (4 screws per clock).
- 5. Snap on Filter** - Take the red filter bezel and snap it on to the front side of the housing.
- 6. Snap on Frame** - Take the gray frame and snap it on to the front side of the housing.

ABS Double Mount Installation



Installation

ABS Double Mount Installation (continued)

***For metal mounting bracket: Use a wall anchor that can support 50 lbs or more with a maximum screw size of #8**

- 1. Install metal mounting bracket** - First, remove the metal mounting bracket from the inside of the double mount base by unscrewing the two (2) 6-32 x 1/2" screws located on the underside of the base (save these screws for step #5). Next, screw the metal mounting bracket to the wall or ceiling in which the clocks are being installed. To mount to the double gang switch box, screw the four (4) 6-32 x 1" screws (supplied in the assembly kit) through the inner four holes of the metal mounting bracket. Use the outer four holes to mount to the anchors in the wall (both anchors and screws are not supplied in kit).

Note: If using a plastic switch box, a ground wire must be routed through the switch box and into one (1) of the four (4) metal mounting bracket screws in order to provide ground to the metal mounting bracket. The metal mounting bracket *MUST* be secured by both the screws going to the switch box *AND* the anchors going into the wall.

- 2. Mount clock housings to pole** - Align the hole in the center each housing with one of the three holes on the mounting pole where the wiring will be routed (the installer will choose which hole at the end of the pole to use based on how far they want the clock to sit from the wall). Screw from the inside of the housing into the four holes surrounding the hole in the center of the housing using the four (4) 8-32 x 7/16" screws (supplied in the assembly kit - 4 screws per clock), securing both housings to the mounting pole.

Note: End caps from one side of each clock must be removed to mount both clocks to the mounting pole. Remove one end cap from each clock from the side in which the mounting pole enters the clock.

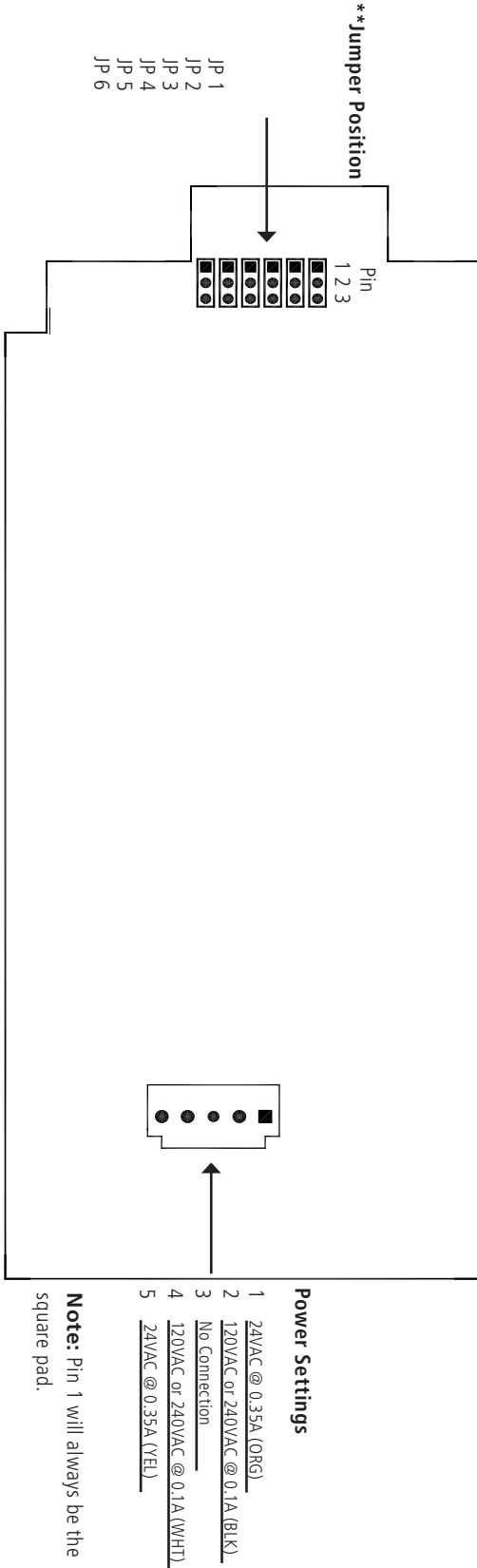
- 3. Screw both housings together** - Using the two (2) self tapping, 6-19 x 7/16" screws (supplied in the assembly kit), screw both back sides of the clock housings together (2 screws per clock).

ABS Double Mount Installation (continued)

4. **Feed wiring through base and pole** - Take the wiring coming from the switch box and begin to feed it through the center of the base of the mounting assembly until it emerges from the hole in the center of the clock housing. Make sure there is roughly 1.5' of wiring coming from the switch box. Perform this task for both clocks.
5. **Snap and screw base to metal mounting bracket** - Snap the base to the metal mounting bracket by first making contact with the lip in the upper side of the base and the metal mounting bracket. When the base has been snapped onto the bracket, take the two (2) 6-32 x 1/2" pan head screws that originally came installed on the base and screw them back into the two holes on the underside of the base to secure the base to the metal mounting bracket.
6. **Connect switch box wires to clock harness** - Take the wiring harness supplied with the clock and make all necessary connections between the wiring harness and the switch box wires using wire nuts. Perform this task for both clocks.
7. **Plug and secure wiring** - Loosen and slip excess wiring through provided wire clamp (comes attached to each housing) and tighten the clamp. After securing excess wiring, connect the wiring harness into the appropriate connector on the back of the display board. Perform this task for both clocks. (See the Wiring and Jumper Settings on pages 10-12).
8. **Mount display board to housing** - Using the four (4) self tapping, 6-19 x 1/2" flat head screws supplied in the assembly kit, take the display board and screw it to the front side of the clock housing (4 screws per clock).
9. **Snap on filter** - Take the red filter bezel and snap it on to the front side of each clock housing.
10. **Snap on frame** - Take the gray frame and snap it on to the front side of each clock housing.

Wiring Information

Wiring and Jumper Settings (3100 Series)



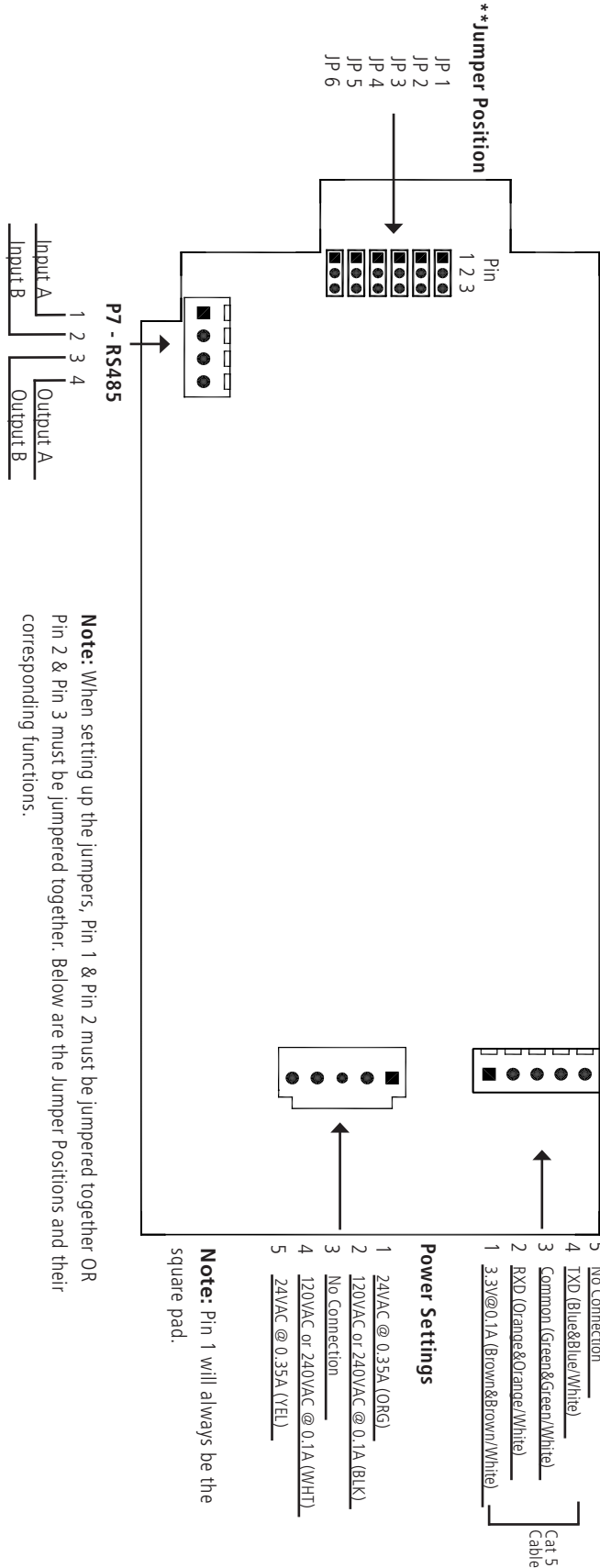
Note: When setting up the jumpers, Pin 1 & Pin 2 must be jumpered together OR Pin 2 & Pin 3 must be jumpered together. Below are the Jumper Positions and their corresponding functions.

Jumper Position	Pin 1 & Pin 2	Pin 2 & Pin 3
JP 1	12 Hour Time	24 Hour Time
JP 2	Bright	Low
JP 3	Time Display Only	Alternating Time/Date Display
JP 4	Normal	Configuration
JP 5	Real Time Clock	60Hz
JP 6	Sync	RS485 Select

Please note: With the 3100 Series, the Alternating Time/Date display is displayed in the U.S. date format (MM:DD:YY). International users are advised to purchase the 3200 Series with the RS485 to USB Programming Cable (D-USB485-INTF-1) in order to program the display to alternate to the International date format (DD:MM:YY).

Wiring Information

Wiring and Jumper Settings (3200 Series)



Elapsed Timer

- 1 No Connection
 - 2 3.3V @ 0.1A (Brown & Brown/White)
 - 3 Common (Green & Green/White)
 - 4 TXD (Blue & Blue/White)
 - 5 No Connection
- Power Settings**
- 1 24VAC @ 0.35A (ORG)
 - 2 120VAC or 240VAC @ 0.1A (BLK)
 - 3 No Connection
 - 4 120VAC or 240VAC @ 0.1A (WHT)
 - 5 24VAC @ 0.35A (YEL)

Note: Pin 1 will always be the square pad.

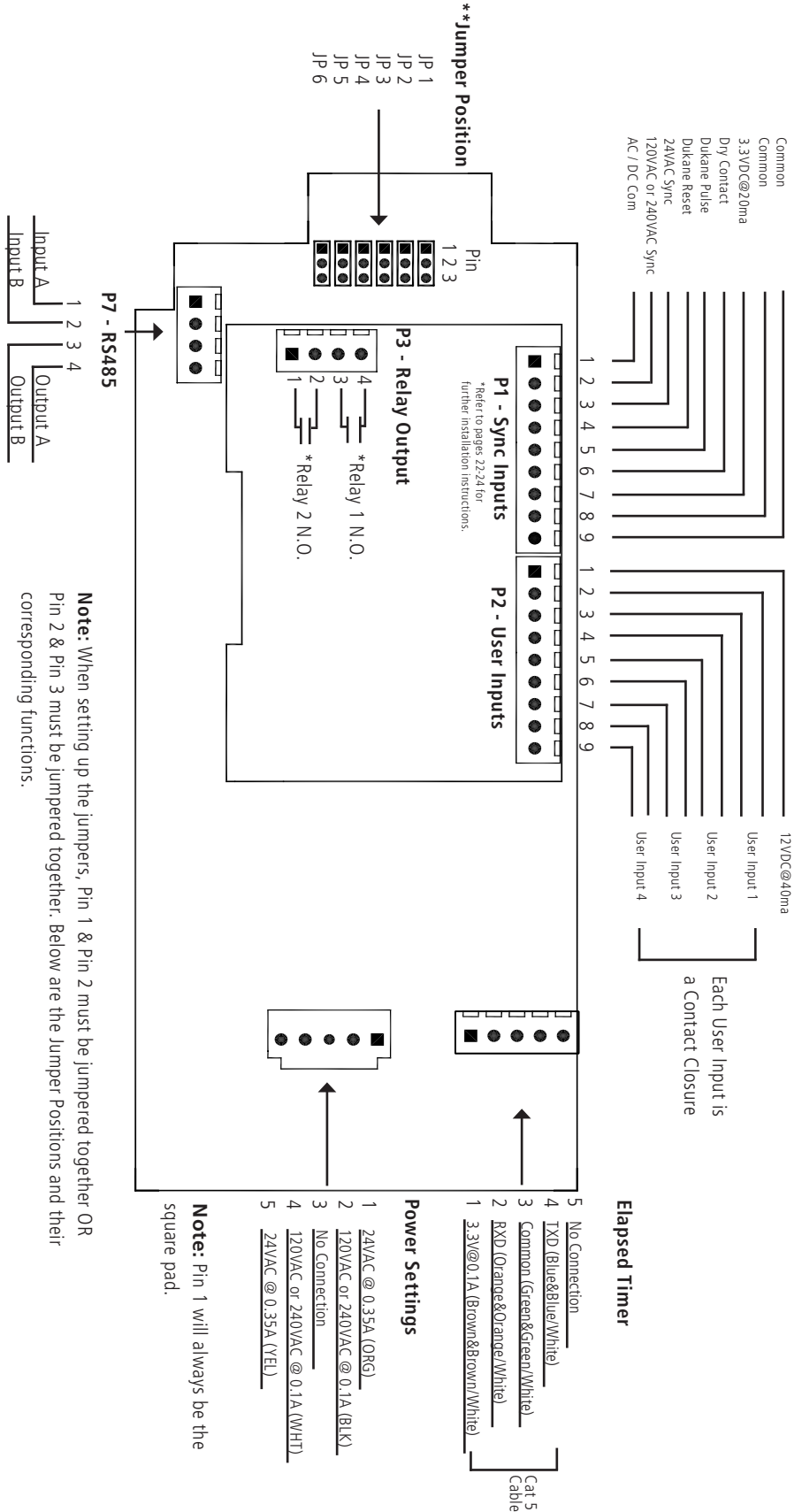
Note: When setting up the jumpers, Pin 1 & Pin 2 must be jumpered together OR Pin 2 & Pin 3 must be jumpered together. Below are the Jumper Positions and their corresponding functions.

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JP 2	Bright	Low
JP 3	Time Display Only	Alternating Date/Time Display
JP 4	Normal	Configuration
JP 5	Real Time Clock	60Hz
JP 6	Sync	RS485 Select

Please note: With the 3200 Series, the Alternating Time/Date display is in U.S. format (MM:DD:YY) when using the jumper switch. International date format (DD:MM:YY) settings is done via the RS485 to USB Programming Cable - Part number: D-USB485-INTF-1 (sold separately).

Wiring Information

Wiring and Jumper Settings (3300 Series)



***Contact Rating**
0.3A @ 120VAC
0.5A @ 24 VAC

Jumper Position	Pin 1 & Pin 2	Pin 2 & Pin 3
JP 1	12 Hour Time	24 Hour Time
JP 2	Bright	Low
JP 3	Time Display Only	Alternating Date/Time Display
JP 4	Normal	Configuration
JP 5	Real Time Clock	60Hz
JP 6	Sync	RS485 Select

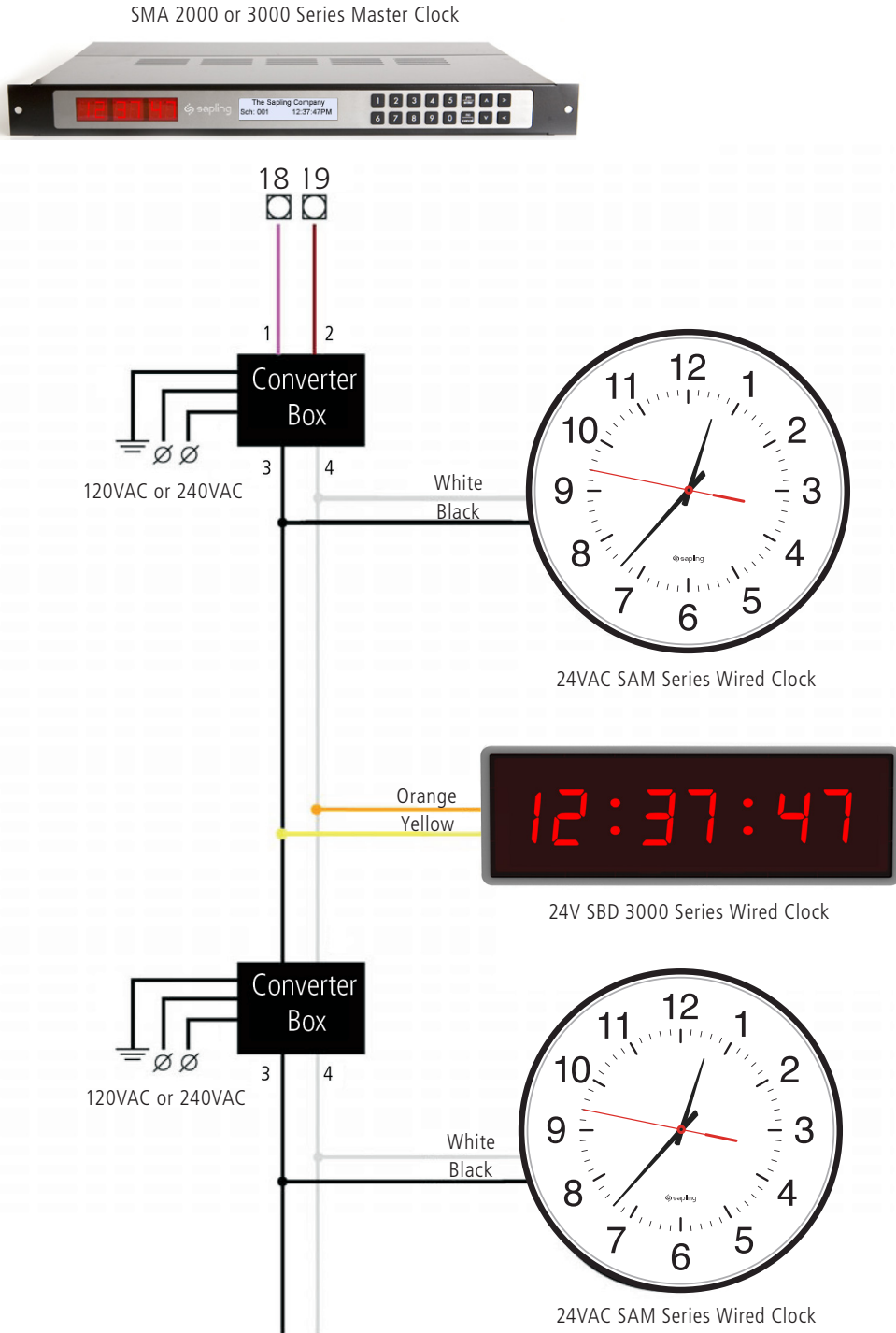
Note: When setting up the jumpers, Pin 1 & Pin 2 must be jumpered together OR Pin 2 & Pin 3 must be jumpered together. Below are the Jumper Positions and their corresponding functions.

Note: Pin 1 will always be the square pad.

Please note: With the 3300 Series, the Alternating Time/Date display is in U.S. format (MM:DD:YY) when using the jumper switch. International date format (DD:MM:YY) settings is done via the RS485 to USB Programming Cable - Part number: D-USB485-INTF-1 (sold separately).

Wiring Information

2-Wire Digital Communication - Slave Mode



Wiring Information

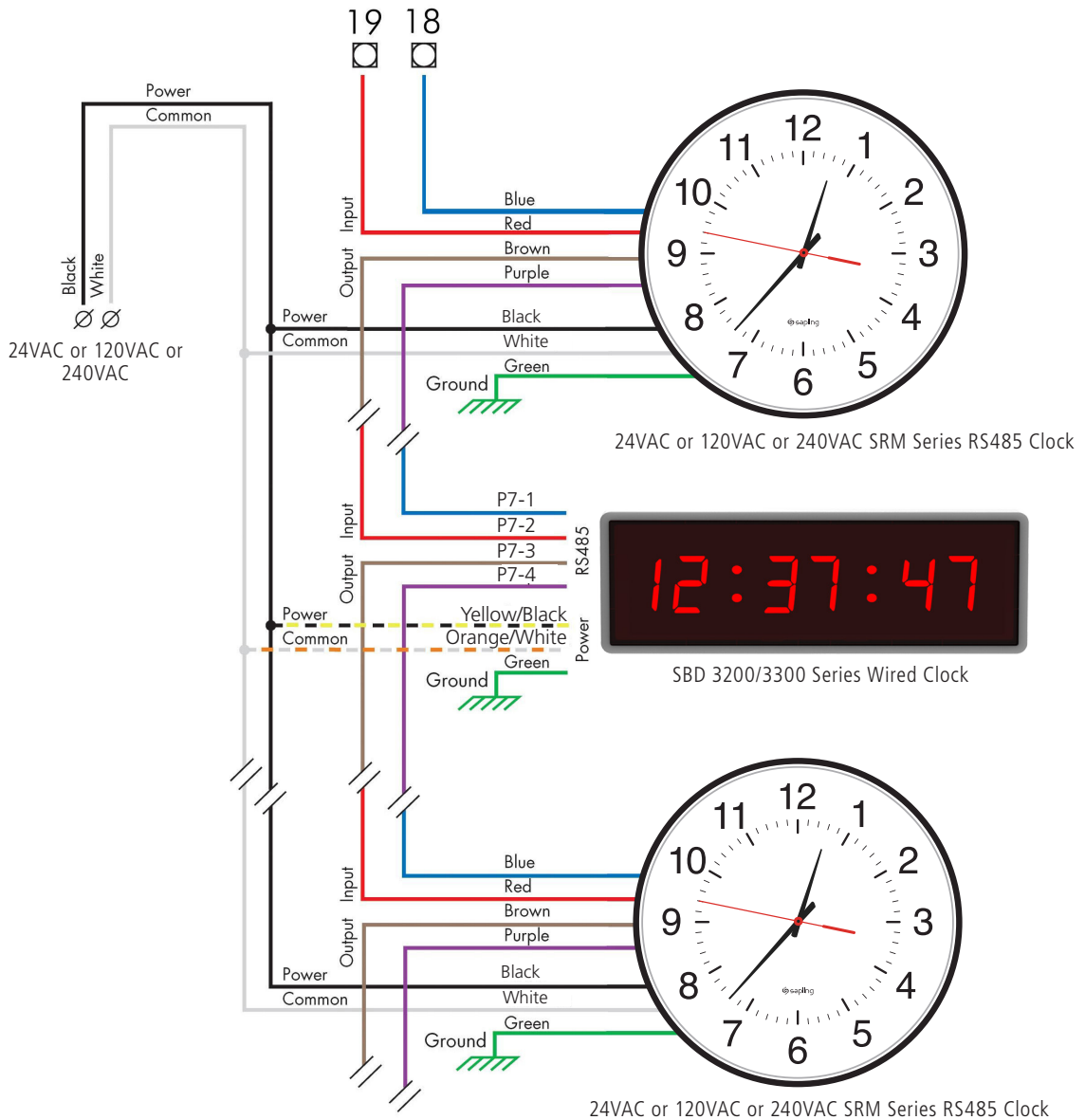
Wiring Information

RS485 Communication - Slave Mode

SMA 2000 or 3000 Series Master Clock



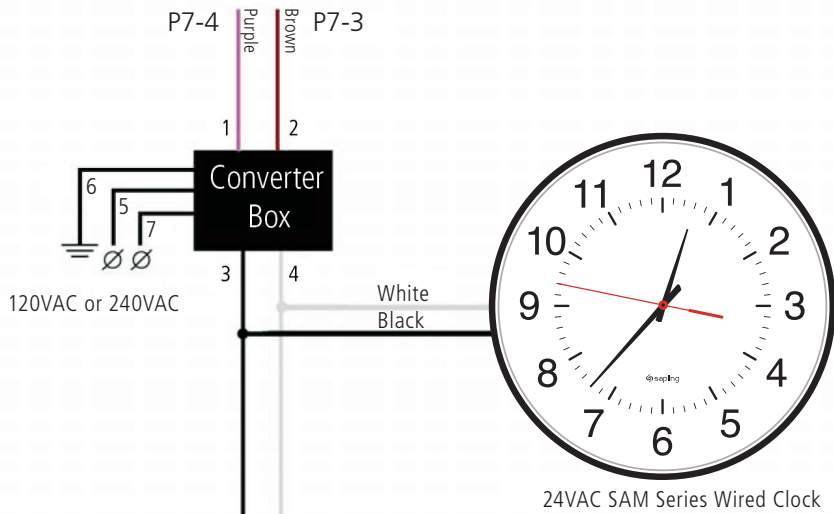
Wiring Information



Wiring Information

2-Wire Digital Communication - Master Mode

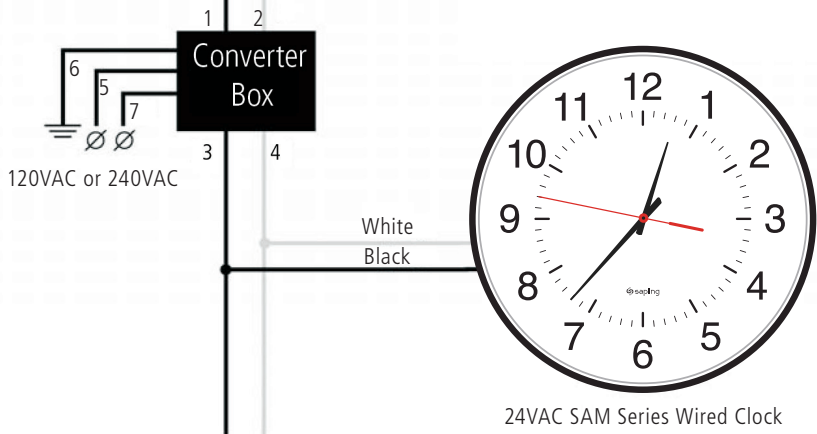
SBD 3300 Series Wired Clock



24VAC SAM Series Wired Clock



24V SBD 3000 Series Wired Clock



24VAC SAM Series Wired Clock

Wiring Information

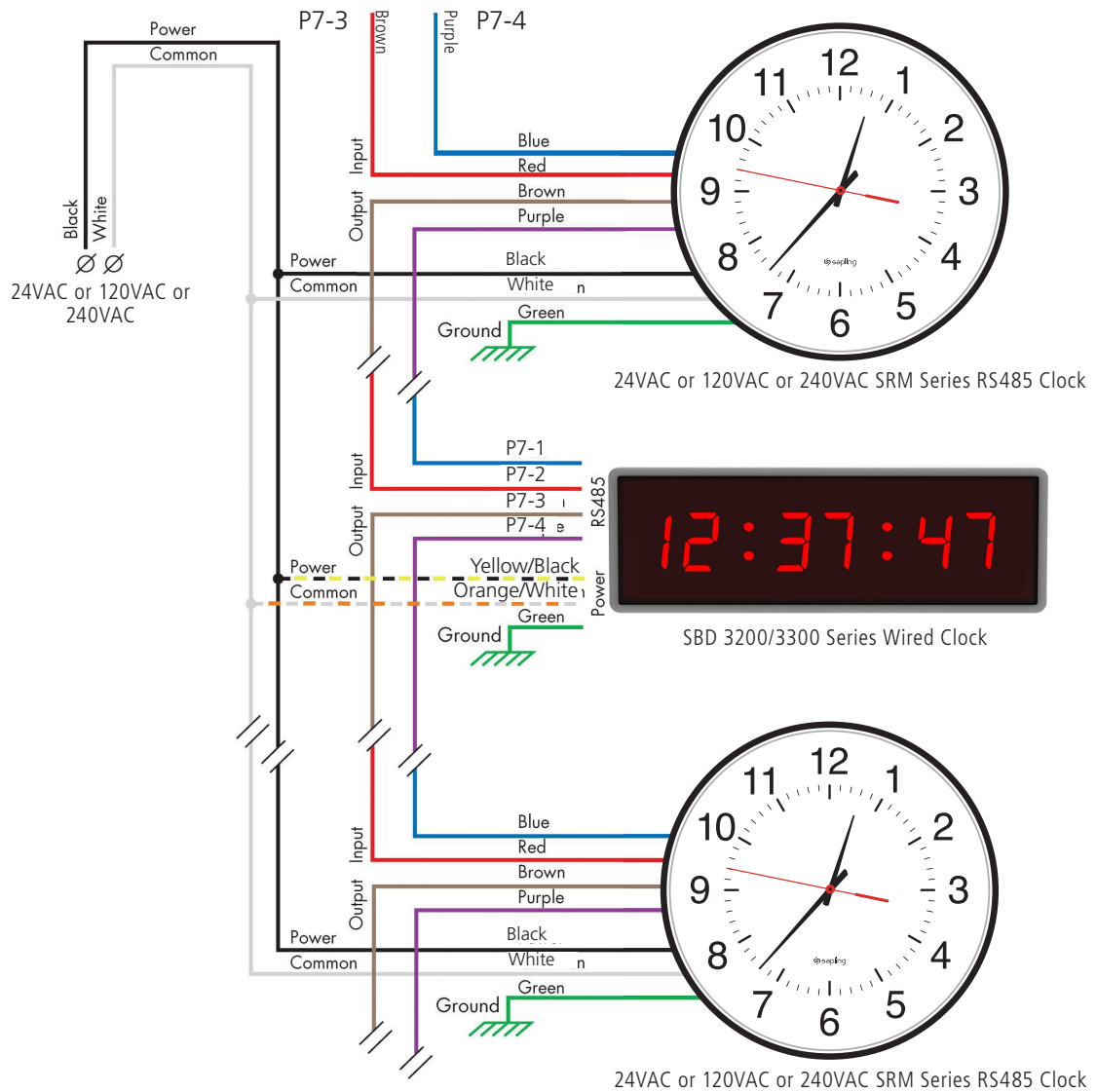
Wiring Information

RS485 Communication - Master Mode

SBD 3300 Series Wired Clock



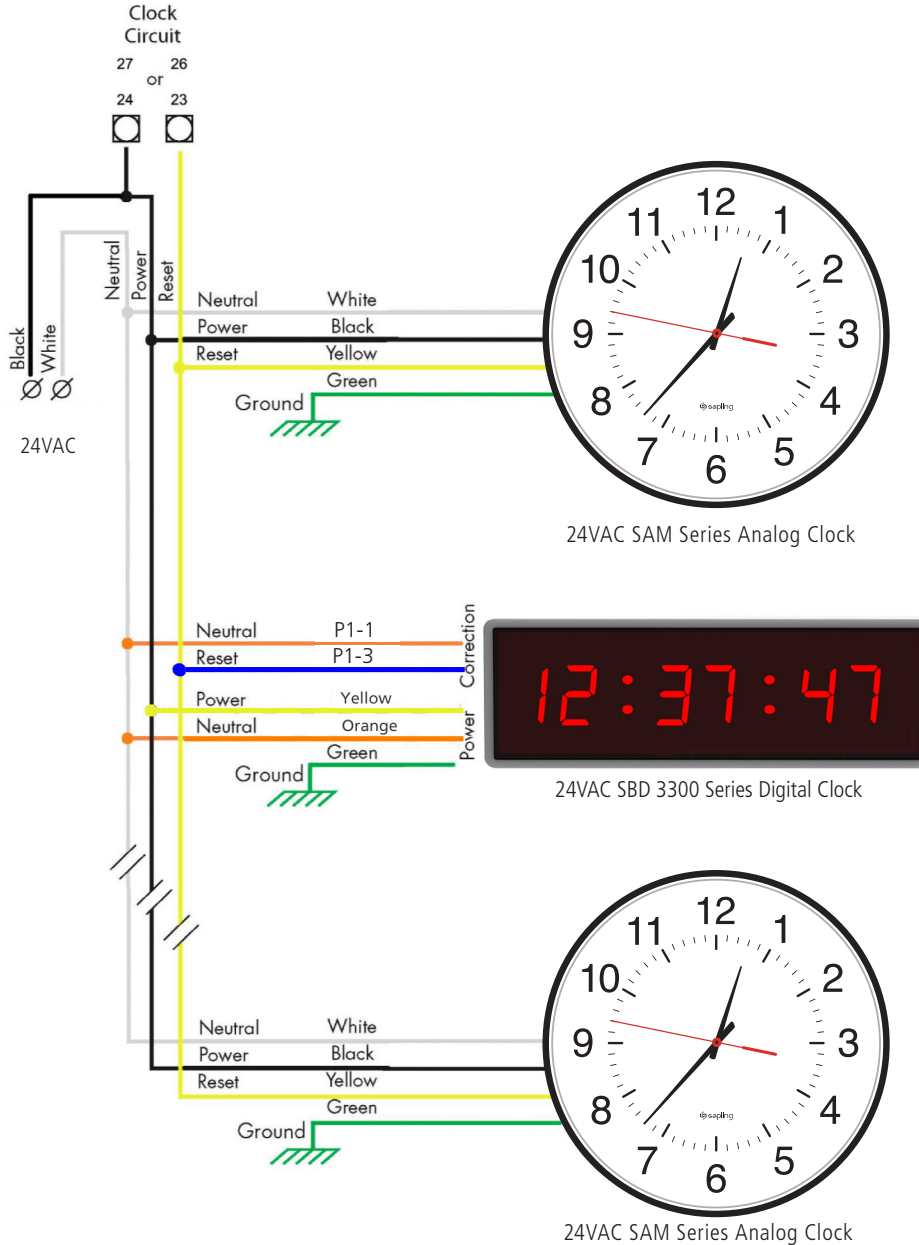
Wiring Information



Wiring Information

3-Wire Synchronous (Sync-Wire) Communication 24 Volt Wiring Information

SMA 2000 or 3000 Series Master Clock

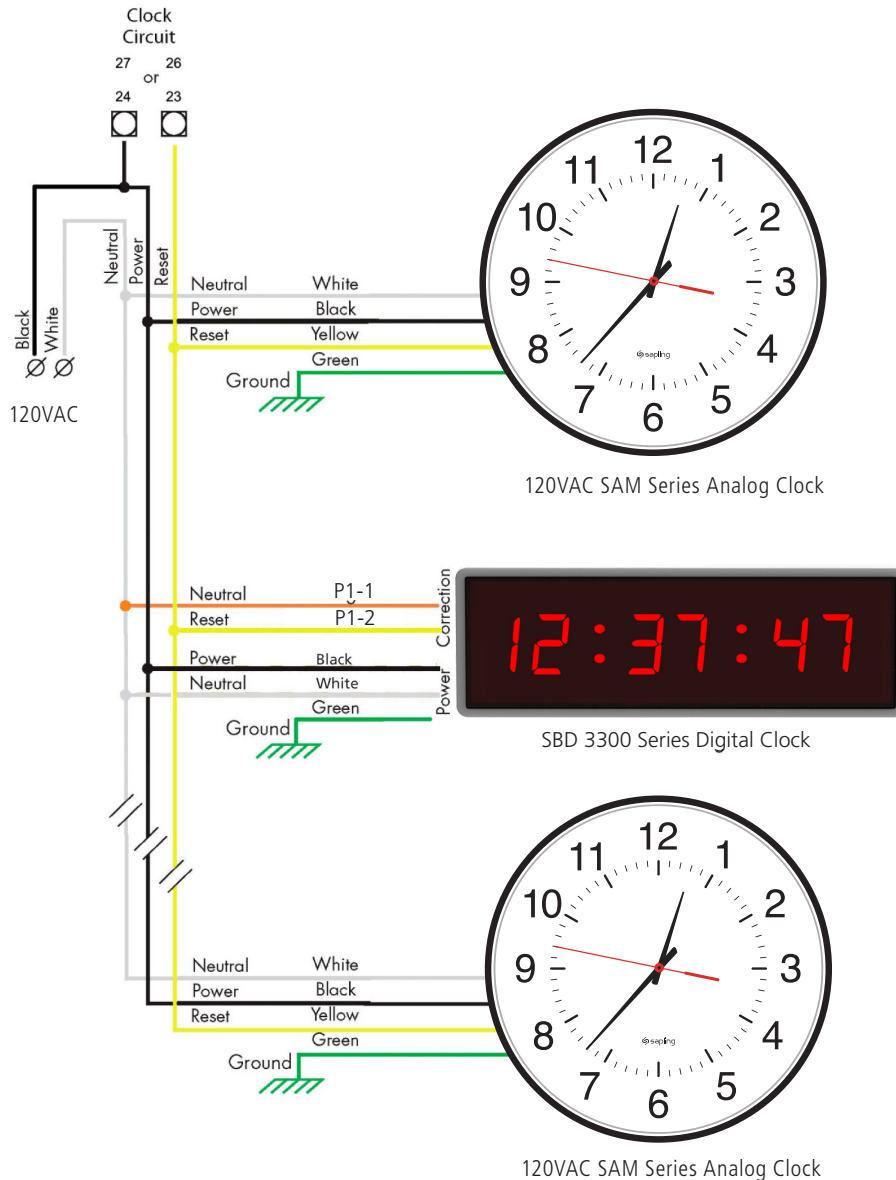


Wiring Information

Wiring Information

3-Wire Synchronous (Sync-Wire) Communication 120 Volt Wiring Information

SMA 2000 or 3000 Series Master Clock

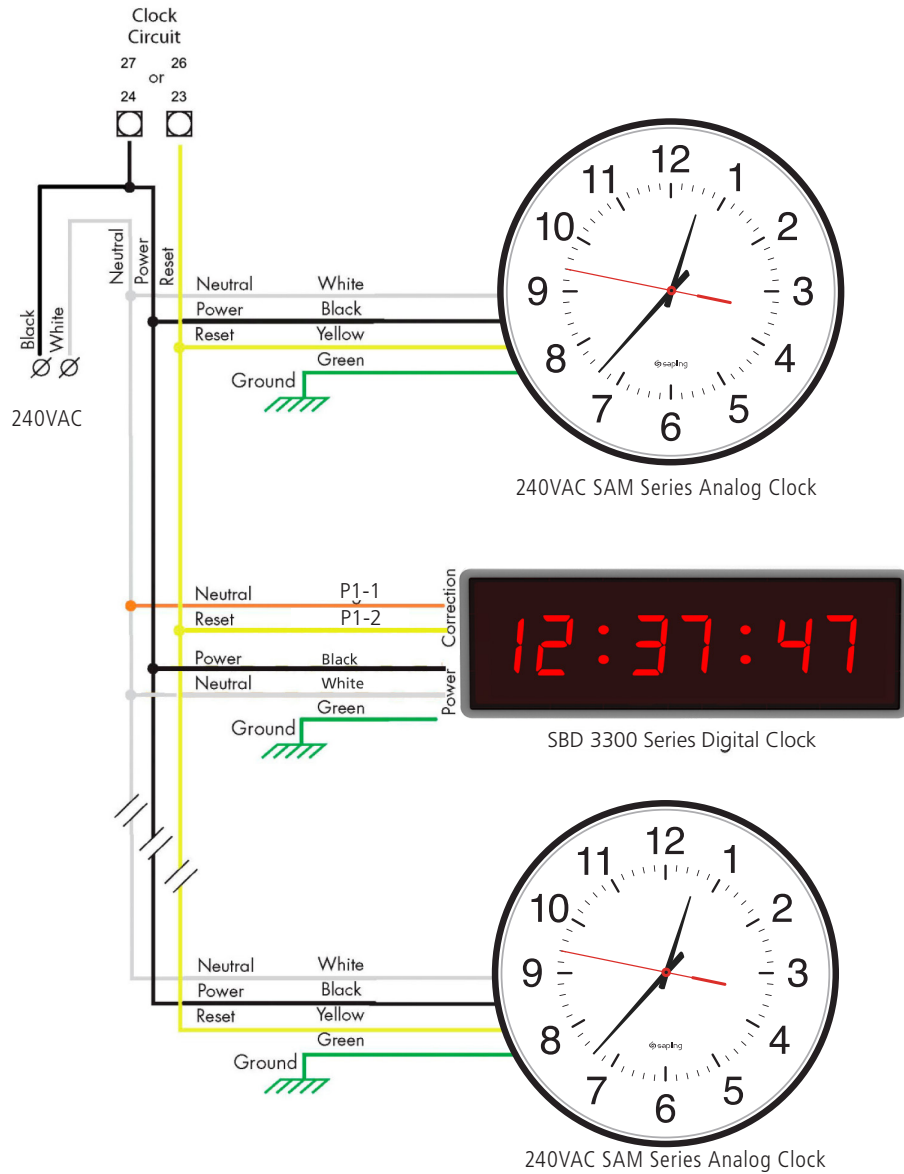


Wiring Information

Wiring Information

3-Wire Synchronous (Sync-Wire) Communication 240 Volt Wiring Information

SMA 2000 or 3000 Series Master Clock



Wiring Information

Wiring Information

Using the Output Relays on the SBD 3300



Output Relay
(Relay 1) P3 - 1 & 2
or
(Relay 2) P3 - 3 & 4



Intercom, paging system, or other device

Temperature Sensor Wiring (Optional)

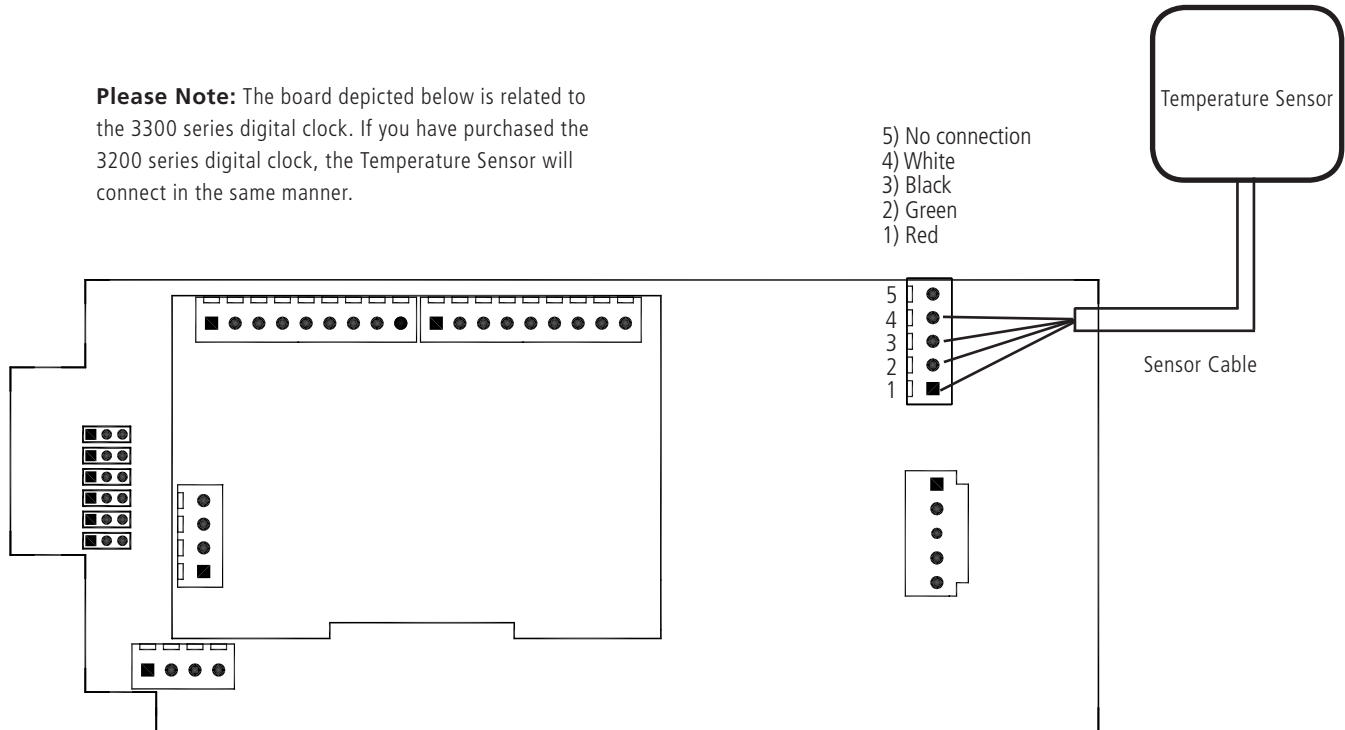
If you ordered a Temperature Sensor with your SBD 3200/3300 clock, it must be connected to a terminal on the Clock.

Connecting The Temperature Sensor

(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:

Please Note: The board depicted below is related to the 3300 series digital clock. If you have purchased the 3200 series digital clock, the Temperature Sensor will connect in the same manner.

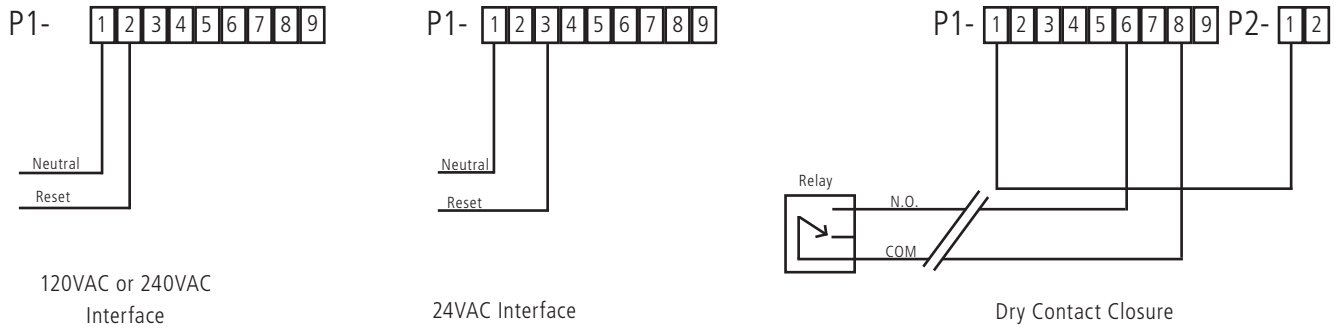


The Sensor Cable is 6 feet (1.83 meters) long, and so the sensor should be positioned within 6 feet of the clock. The cable is unshielded, 4 conductor, 22AWG (.33mm²). If longer than 6 feet is required, the wire would have to be terminated in an electrical box, and the longer wire would have to be provided 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 SBD display temperature, please see the section labeled "Web Interface - Display Settings".

Interfacing with Other Systems (Inputs)

59 Minute Correction



Description:

120VAC or 240VAC or 24VAC 60 Hz is used to run the clock normally. Applying an eight (8) second reset signal from 57 minutes and 54 seconds will cause an hourly correction. Applying a fourteen (14) second reset signal from 5:57:54 will cause a daily correction.

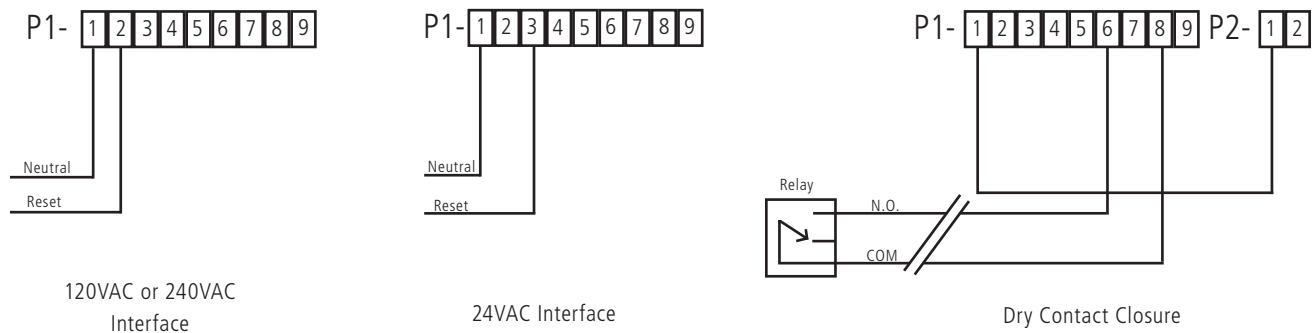
Note: To enter programming mode, simultaneously press the top and bottom buttons.

Instructions:

1. In programming mode, set Option 30 to 05.
- * To enter programming mode, simultaneously press the top and bottom buttons. For further instructions, see page 25.
2. Connect interface harness as shown in the diagram.

Note: Manually set the slave clock to the time from the master clock upon initial connection. After the slave clock receives its first daily correction, the clocks will be perfectly synchronized.

58 Minute Correction



Description:

120VAC or 240VAC or 24VAC 60 Hz is used to run the clock normally. See page 29 for the four variations of 58 Minute Correction.

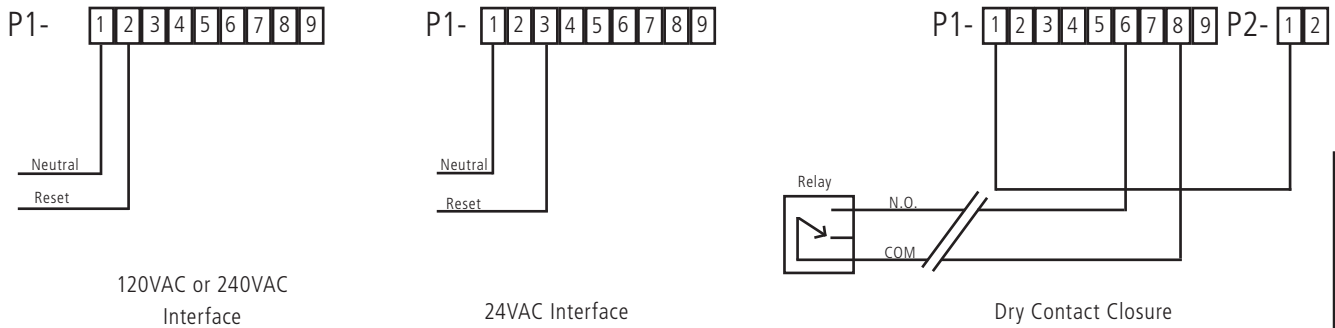
Instructions:

1. In programming mode, set Option 30 to 01, 02, 03, 04.
2. Connect interface harness as shown in the diagram.

Note: Manually set the slave clock to the time from the master clock upon initial connection. After the slave clock receives its first daily correction, the clocks will be perfectly synchronized.

Interfacing with Other Systems (Inputs)

National Time/Rauland



Description:

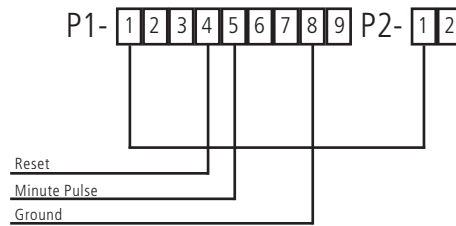
120VAC or 240VAC or 24VAC 60 Hz is used to run the clock normally. Applying a 25 second reset signal when minutes equal 00 and seconds equal 00 will cause an hourly correction. Applying a 24 minute reset signal when hours equal 06 or 18 and minutes equal 00 and second equals 25 will cause a daily correction.

Instructions:

1. In programming mode, set Option 30 to 05.
2. Connect interface harness as shown in the diagram.

Note: Manually set the slave clock to the time from the master clock upon initial connection. After the slave clock receives its first daily correction, the clocks will be perfectly synchronized.

Dukane



Description:

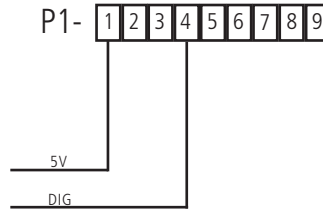
Applying a 4-10 millisecond pulse on the minute line will increment the clock in one minute. Applying a 12-50 millisecond pulse on the reset line will bring the clock back to 12:00 a.m.

Instructions:

1. In programming mode, set Option 30 to 07.
2. Connect interface harness as shown in the diagram.

Interfacing with Other Systems (Inputs)

Rauland Digital



Description:

Applying a half second pulse for every minute to the Dig. Line will bring the clock to the correct time. The clock will jump to the correct time at the end of the correction pulse.

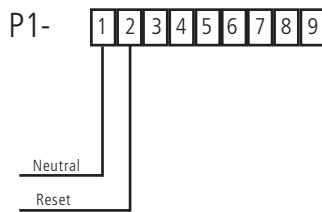
Note: For better synchronization, it is recommended to work on a 60 Hz time base.

Note: Use only an isolated transformer to run the clock in 24 volt mode.

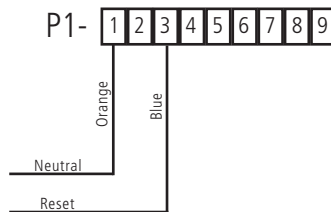
Instructions:

1. In programming mode, set Option 30 to 0B.
2. Connect the interface harness as shown in the diagram.

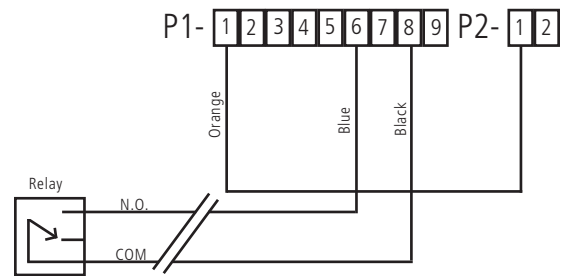
Midnight Reset or Once a Day Pulse



120VAC or 240VAC Interface



24VAC Interface



Dry Contact Closure

Description:

Applying a minimum of two (2) second pulse will bring the clock to the correct time.

Note: Please refer to Option 30 (Auxiliary Input Control for programming the buttons on the SBD 3300) and/or page 41 (Sbdconfig Software - Clock Settings) for directions on how to set the time of the pulse.

Instructions:

1. Set Option 30 to 09.
2. Connect the harness as shown in the diagram.

Programming

Setting the Time on the SBD 3300

1. To set the time, press the top button to set the hour and the bottom button to set the minute.



Programming the SBD 3300

1. To enter programming mode, simultaneously press the top and bottom buttons.
2. Press the top button to select an Option. Hold the button down to scroll through the Options.
3. Press the bottom button to select a Setting. Hold the button down to scroll through the Settings.
4. To return to time while in an Option, simultaneously press the top and bottom buttons.

OPTION

SETTING

1

12

Option 1 - Set Year:

This option will allow the user to set the current year.

Press the bottom button to scroll between "01-99" on the display in order to set the year.

Once the year is selected, press the top button to continue on to Option 2.

2

12

Option 2 - Set Month:

This option will allow the user to set the current month.

Press the bottom button to scroll between "01-12" on the display to set month.

Once the month is selected, press the top button to continue on to Option 3.

OPTION

SETTING

3

21

Option 3 - Set Day:

This option will allow the user to set the current date.

Press the bottom button to scroll between "0 1-3 1" on the display to set the date.

Once the date is selected, press the top button to continue on to Option 4.

4

24

Option 4 - Set 12/24 Hour Format:

This option will allow the user to select the mode the time is displayed in. There are two options: 12 hour format or 24 hour format.

Press the bottom button to scroll between "12" or "24."

Once 12 hour format or 24 hour format is selected, press the top button to continue on to Option 5.

5

d

Option 5 - Daylight Saving Time:

This option will allow the user to select the Daylight Saving Time setting. Press the bottom button to scroll between "E or d."

Option "E" will enable the current USA Daylight Saving Time schedule seen below:

- DST starts 2nd Sunday of March at 2:00 am
- DST ends 1st Sunday of November at 2:00 am

Option "d" will disable the Daylight Saving Time setting. **Note:** If a different Daylight Saving Time setting is needed, it must be configured via the web interface. See page 48 for more information.

Note: When using the SBDconfig software, an \square will appear on the SBD 3000 display. The \square stands for other, meaning DST was configured through the SBDconfig software.

Once the Daylight Saving Time option is selected, press the top button to continue on to Option 6.

6

d

Option 6 - Alternating Date/Time:

This option will allow the user to enable or disable the Alternating Date/Time display. Press the bottom button to scroll between "E or d."

When enabled (E), the display will switch between showing the time (HH:MM:SS) and the date (MM:DD:YY) for 6 digit, (HH:MM) and (MM:DD) for 4 digit. When disabled (d), the display will show only the time.

Once the Alternating Date/Time display option is selected, press the top button to continue on to Option 7.

OPTION

SETTING



Option 7 - Date Format:

This option will allow the user to choose what style the date is displayed on the digital clock. Press the bottom button to scroll between "A" or "E."

"A" stands for American style and displays the date as follows: month, day and year (ex. 10 28 12). "E" stands for European style and displays the date as follows: day, month and the year (ex. 28 10 12).

The date will be displayed during normal operation only if the "Alternate Time/Date" option has been enabled in Option 5.

Once the date style is selected, press the top button to continue on to Option 8.



Option 8 - Brightness:

This option allows the user to choose the brightness level the digital clock will display. Press the bottom button to scroll between "00," "01" and "02."

- Level "02" is High (default)
- Level "01" is Medium
- Level "00" is Low

Note: The user has the ability to create a Brightness Schedule for the clocks. Refer to page 40 for more information.

Once the brightness level is selected, press the top button to continue on to Option 9.



Option 9 - Set the Clock Number:

This option allows the user to choose a specific clock number in order to easily identify a specific clock within the system. Use the bottom button to scroll between "1-999."

An example of a clock number is "123."

Once the clock number is selected, press the top button to continue on to Option 10.

Options 9 also allows a user to address a specific clock for displaying messages, such as 9 11, bELL or F irE using a Sapling Master Clock. Option 9 sets the clock number. This is step 1 of 2. Step 2 of this process can be completed in Option 10.



Option 10 - Zone Number:

This option allows the user to choose a zone number for a specific clock. A zone number is a collection or grouping of clocks within a certain section of a facility. Press the bottom button to scroll between "0-99."

An example of a zone number is "12."

Once the zone number is selected, press the top button to continue on to Option 11.

Option 10 programs the zone number in order to display messages to each clock in a zone, such as 9 11, bELL or F irE.

Note: The message feature must be programmed via the master clock. Refer to the specific master clock manual for more information.

OPTION

SETTING

11

01

Option 11 - RS485 Data Rate:

This options allows a user to set the RS485 Data Rate. The RS485 Data Rate is the rate at which data (for example the time and/or date) is sent to the clock.

Press the bottom button to scroll between "00- 12." See Table 1 for RS485 Data Rate settings.

Table 1

00 - Data is off	07 - Data is transmitted every 2 minutes
01 - Data is transmitted every second	08 - Data is transmitted every 5 minutes
02 - Data is transmitted every 5 seconds	09 - Data is transmitted every 10 minutes
03 - Data is transmitted every 10 seconds	10 - Data is transmitted every 15 minutes
04 - Data is transmitted every 15 seconds	11 - Data is transmitted every 30 minutes
05 - Data is transmitted every 30 seconds	12 - Data is transmitted every hour
06 - Data is transmitted every minute	

Once the RS485 Data Rate is selected, press the top button to continue on to Option 13.

Option 13 - Loss of Communication Alert:

This option allows the user to enable or disable the Loss of Communication Alert on the digital clock display. The digital clock will signal a loss of communication with the master clock by blinking the colons on the display. Press the bottom button to scroll between "E - d."

Enabling this Option (E) will allow the user to proceed to Option 14 to configure the loss of communication alert. Disabling this Option (d) will keep the colons solid and not show a loss of communication. Disabling should be used when the clock is in independent mode.

If a user has chosen to enable (E) the Loss of Communication Alert, when the top button is pressed, the user will be taken to Option 14. If a user chooses to disable (d) the Loss of Communication Alert, when the top button is pressed, the user will be taken to Option 15.

Option 14 - Set the Loss of Communication Alert:

This option will allow the user to choose at what point the colons will blink after communication with the master clock is lost. Press the bottom button to scroll between "01- 10."

See Table 2 below for settings.

Table 2

01 - Data is lost after 5 minutes	06 - Data is lost after 60 minutes
02 - Data is lost after 10 minutes	07 - Data is lost after 90 minutes
03 - Data is lost after 15 minutes	08 - Data is lost after 120 minutes
04 - Data is lost after 30 minutes	09 - Data is lost after 180 minutes
05 - Data is lost after 45 minutes	10 - Data is lost after 240 minutes

Once the Loss of Communication Alert setting is selected, press the top button to continue on to Option 15.

13

E

14

06

OPTION

SETTING

15

d

Option 15 - Enable Jumpers:

This option will allow the user to enable or disable the jumpers. There are 3 jumpers located inside the clock that are associated with this option:

Press the bottom button to scroll between "E-d." Selecting (E) will allow the user to set the following jumpers:

- JP1 - 12/24 Hour Format
- JP2 - Brightness Level
- JP3 - Alternating Time/Date

Selecting (d) will disable the jumpers. Once a user enables or disables the jumpers, press the top button to continue on to Option 20. See pages 10-12 for more information.

Note: Enabling this option will override the previously configured settings for Options 4, 5 and 8.

Option 20 - Set the Programmable Relays:

This option will allow the user to set the programmable relays. The programmable relays allow a user to choose the type of time correction the clocks will conduct when the clocks reach a certain time. Press the bottom button to scroll between "d" and "0 1-09."

If Option 20 is set to "d" (disable) or "0 1-09," when the top button is pressed, the user will be taken to Option 30. If option "09" is selected, the user will be taken to option "2 1-24" to configure the Once a Day Pulse settings.

See Table 3 below for explanation of relay selection mode for time correction.

Note: Refer to page 20 for wiring information.

20

09

Table 3 - Relay Selection Mode

d	Disable the relay selection mode.
01	58th minute (1) - The hourly correction for 55 seconds every hour from XX:58:05 to XX:59:00. The daily correction (5 a.m. & 5 p.m.) is ten correction cycles sent to the relay (each for 95 seconds) beginning at 5:05:00, 5:07:00, 5:09:00, 5:11:00, 5:13:00, 5:15:00, 5:17:00, 5:19:00, 5:21:00, and 5:23:00.
02	58th minute (2) - The hourly correction for 60 seconds every hour from XX:58:00 to XX:59:00. The daily correction (5 a.m. & 5 p.m.) is twelve correction cycles sent to the relay (each for 65 seconds on and 25 seconds off) beginning at 5:05:00 to 5:22:35.
03	58th minute (3) - The hourly correction for 60 seconds every hour from XX:58:00 to XX:59:00. The daily correction (5 a.m. & 5 p.m.) is twelve correction cycles sent to the relay (each for one minute on and two minutes off) beginning at 5:06:00.
04	58th minute (4) - The hourly correction for 55 seconds every hour from xx:58:05 to XX:59:00. The daily correction (5 a.m. & 5 p.m.) is 12 correction cycles for 55 seconds. The timings will be 05:03:05, 05:07:05, 05:11:05, 05:15:05, 05:19:05, 05:23:05, 05:27:05, 05:31:05, 05:35:05, 05:39:05, 05:43:05 and 05:47:05.
05	59th minute - The hourly correction for 8 seconds every hour from XX:57:54 to XX:58:02. The daily correction (5 a.m. & 5 p.m.) is a 14 second pulse from 5:57:54 to 5:58:08.
06	National Time & Rauland (1) - The hourly correction is for 25 seconds every hour from XX:00:00 to XX:00:25. This daily correction is a 24 minute pulse from 6:00:25 to 6:24:25 AM and PM.
07	National Time & Rauland (2) - The hourly correction is for 25 seconds every hour from XX:00:00 to XX:00:25. The daily correction (6 a.m. & 6 p.m.) is 25 seconds on, 35 seconds off every minute for 24 minutes.
08	Rauland Digital - Every .5 second advances the time 1 minute from 12:00:00 a.m.
09	Once a Day Pulse - If selected, this option will allow the user to set the hours, minutes, and seconds for relay closure.

OPTION

SETTING

21

23

Option 21 - Once a Day Pulse Output - Hour:

If the Once a Day Pulse setting is selected in Option 20, a user will need to set the hour for relay closure. Press the bottom button to scroll between "00-23."

Once a user selects the Once a Day Pulse Output - Hour, press the top button to continue on to Option 22.

22

59

Option 22 - Once a Day Pulse Output - Minute:

If the Once a Day Pulse setting is selected in Option 20, a user will need to set the minute for relay closure. Press the bottom button to scroll between "00-59."

Once a user selects the Once a Day Pulse Output - Minute, press the top button to continue on to Option 23.

23

59

Option 23 - Once a Day Pulse Output - Second:

If the Once a Day Pulse setting is selected in Option 20, a user will need to set the second for relay closure. Press the bottom button to scroll between "00-59."

Once a user selects the Once a Day Pulse Output - Second, press the top button to continue on to Option 24.

24

99

Option 24 - Once a Day Pulse Output - Set Duration:

This option allows the user to set the duration in second for relay closure. Press the bottom button to scroll between "01-99."

Once a user selects the duration number, press the top button to continue on to Option 30.

OPTION

SETTING

30

d

Option 30 - Auxiliary Input Control:

This option allows the user to choose which time protocol input the clock will receive. Press the bottom button to scroll between "d" and "0 1-09."

See Table 4 below for the Auxiliary Input Control settings. **Note:** For an explanation of each time protocol, refer to page 29.

If the option is set to "d" (disable) or "0 1-08," when the top button is pressed, the user will be taken to option 40. If option "09" (Once a Day Pulse) is selected, the user will be taken to option "3 1-34" to configure the Once a Day Pulse settings.

Table 4

d - Disable Auxiliary Input	05 - 59 Minute Correction
0 1 - 58 Minute Correction (1)	06 - National Time/Rauland
0 2 - 58 Minute Correction (2)	0 7 - Dukane Digital
0 3 - 58 Minute Correction (3)	0 8 - Rauland Digital
0 4 - 58 Minute Correction (4)	0 9 - Once a Day Pulse

31

23

Option 31 - Once a Day Pulse Input - Hour:

If the Once a Day Pulse (Option 9) setting is selected in Option 30, a user will need to set the hour(s) for relay closure. Press the bottom button to scroll between "00-23."

Once a user selects the Once a Day Pulse Input - Hour(s), press the top button to continue on to Option "32."

32

59

Option 32 - Once a Day Pulse Input - Minute:

If the Once a Day Pulse (Option 9) setting is selected in Option 30, a user will need to set the minute(s) for relay closure. Press the bottom button to scroll between "00-59."

Once a user selects the Once a Day Pulse Input - Minute(s), press the top button to continue on to Option "33."

33

59

Option 33 - Once a Day Pulse Input - Second:

If the Once a Day Pulse (Option 9) setting is selected in Option 30, a user will need to set the second(s) for relay closure. Press the bottom button to scroll between "00-59."

Once a user selects the Once a Day Pulse Input - Second(s), press the top button to continue on to Option "40."

Note: Options 40 and 41 are only applicable if the wired clock system includes analog clocks. If your system does not include the SAM or SRM analog clocks, please disregard the following options.

OPTION

SETTING

40

d

Option 40 - Activation Diagnostic Mode:

This option allows a user to choose which diagnostic mode they would like to send to all applicable clocks. Press the bottom button to scroll between "d," "01-05" and "09."

See Table 5 below for the diagnostics settings. If the option is set to "d" (disable), clock will return to time.

Table 5

d - Disable diagnostic mode	*04 - Diagnostic 4 - Full Mechanical and Electrical Test
01 - Diagnostic 1 - Protocol Verification	05 - Diagnostic 5 - Full Mechanical and Electrical Test
02 - Diagnostic 2 - Comprehensive Test	09 - Diagnostic 9 - Overrides diagnostics and returns to master clock time

Once a user selects the - Second(s), press the top button to continue on to Option "41."

***Note:** Must press button on SAM/SRM to begin test.

Note: Refer to the Diagnostic Testing section of the appropriate analog clock manual (SAM or SRM) for a more detailed description.

41

99

Option 41 - Duration of Diagnostics until the Clock Resumes Normal Operation:

This option allows the user to choose how many minutes the results of Diagnostic 1 and 2 will display on the analog (SAM or SRM), before resuming normal operation. Press the bottom button to scroll between "00-99."

Installing the sbdconfig.exe Software

Please Note:

- The sbdconfig.exe software only works with the SBD 3200 or 3300 series.
- Sapling's USB to RS485 converter needs to be purchased separately. Other USB to RS485 converters will not work.
- When using the SBDCOnfig software, move JP6 to Pins 2&3 on the back of the digital clock board.
- SBD 3200/3300 clocks shipped before March 27, 2014 require an older version of the SBDCOnfig software, while SBD 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 download both versions of the program at: <http://www.sapling-inc.com/digital-clock-programming/>.

Windows 7

1. Insert the USB to RS485 converter into a USB connector port.

Note: If computer does not recognize the USB to RS485 converter after it is plugged in, unplug the converter, rotate it, and plug it back into the USB port.

2. Plug in the USB to RS485 converter into the J7 port on the board, located on the back of the digital clock.

3. Power up the digital clock.

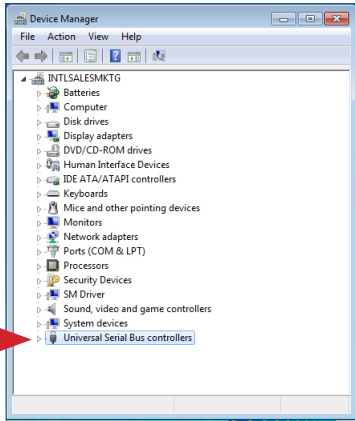
4. Computer will indicate 'Found New Hardware.'

5. It will then display, 'New Hardware Installed.'

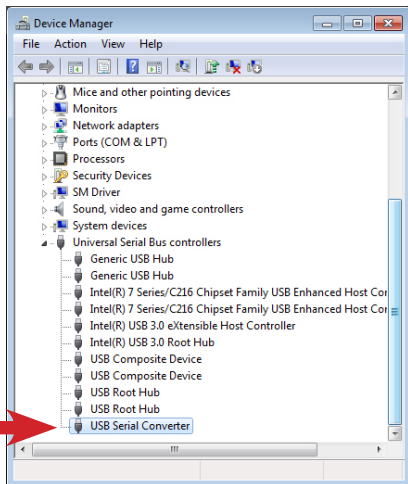
6. Next, click on Start menu --> Control Panel --> Hardware and Sound.

7. Click on "Device Manager" under Devices and Printers.

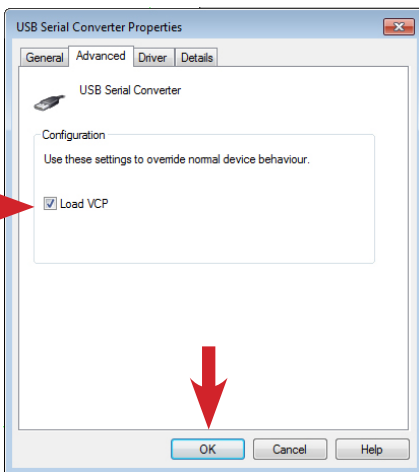
Installing the sbdconfig.exe Software (continued)



8. Scroll down to Universal Serial Bus controllers and click the + sign to open.



9. Double-click on the USB Serial Converter. A new window will open.

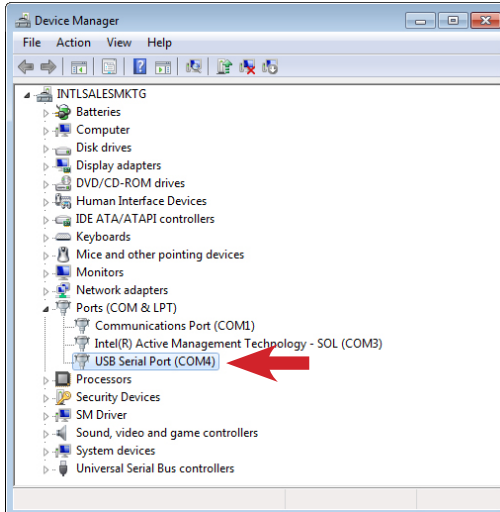


10. Click in the Advanced tab and check the box next to 'Load VCP' and click OK.

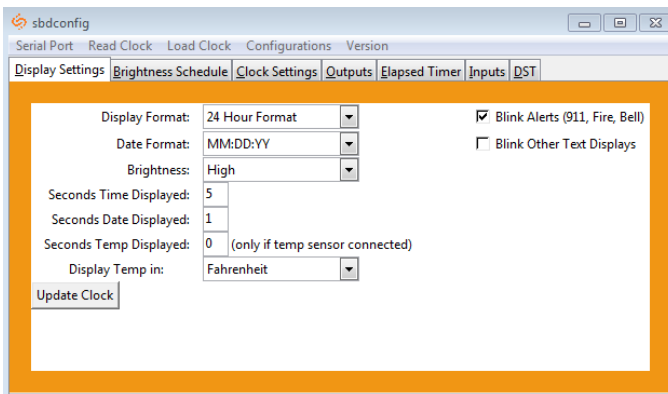
sbdconfig.exe
Software

Installing the sbdconfig.exe Software (continued)

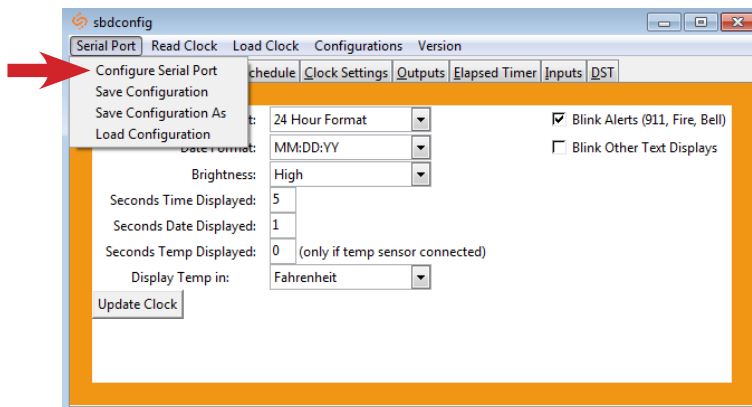
11. Remove RS485 device from the USB port, wait 5 seconds, and plug back into USB port.



12. Open the Device Manager and scroll to Ports. Make note of what port the USB Serial Port is assigned to. For example: (COM 4).

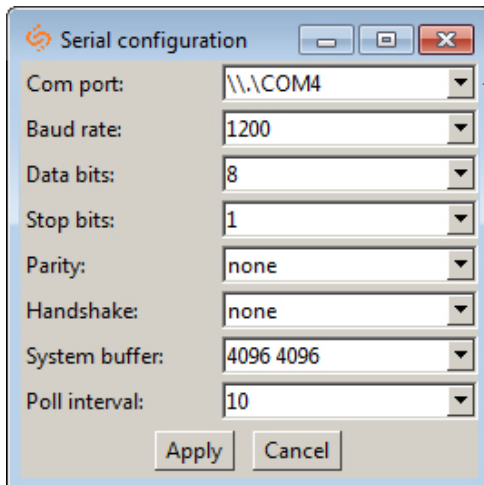


13. Load the sbdconfig.exe software from disk (provided with the digital clock) or copy the software to the desktop.

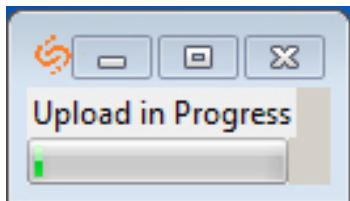


14. Open the SBD config software, click on Serial Port (in the menu bar) --> Configure Serial Port. Match the Com port on the SBDconfig software to the USB Serial Port in the Device Manager.

Installing the sbdconfig.exe Software (continued)



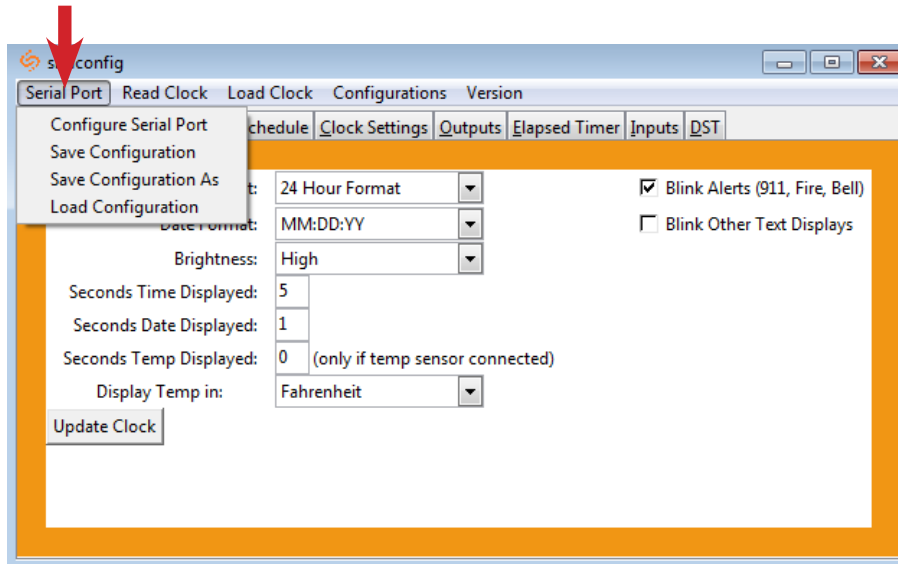
15. Make sure that the Com port number matches the number you saw on the Device Manager, then click apply. The SBD settings are ready to be configured.



16. Click the 'Read Clock' button. 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

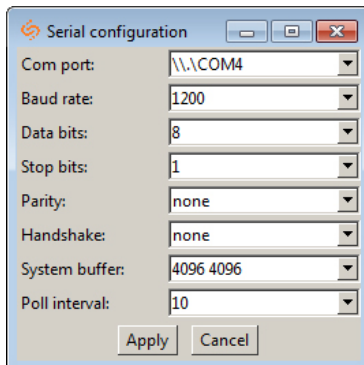
Sbdconfig Software - Task Bar Functionality

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.



1. Serial Port

- **Configure Serial Port:** When clicked, this option will open the settings for the serial port (Fig. 1). This is where a user can manage the settings that connect a PC to the digital clock.



(Fig. 1)

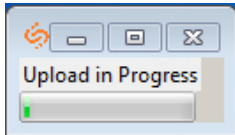
- **Save Configuration:** After a user sets the serial port's settings on the Sbdconfig software, this option will save a particular configuration to a computer in order to upload it to a different clock.
- **Save Configuration As:** If a user modifies the serial port's settings, this option will save 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 to RS485 converter, 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 Software - Task Bar Functionality (continued)

2. Read Clock

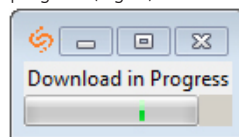
- If a user has a previously configured clock and connects it to a computer, this option will read and upload the settings to the Sbdconfig software program. Once the 'Read Clock' button is clicked, another window will open that will signify the upload process (Fig. 2).



(Fig. 2)

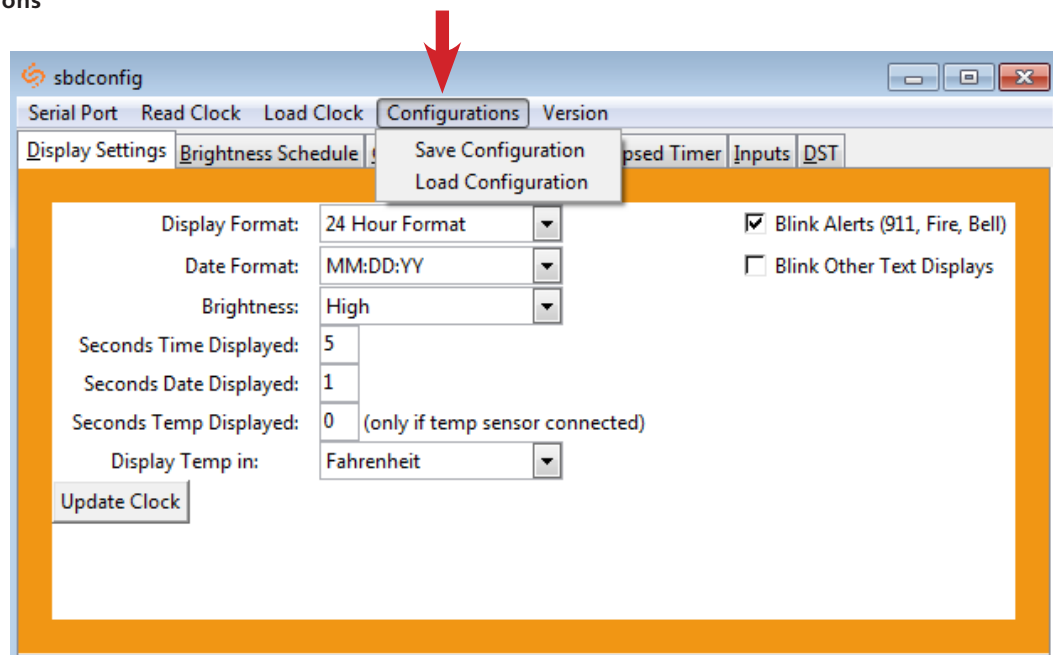
3. Load Clock

- 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 (Fig. 3).



(Fig. 3)

4. Configurations

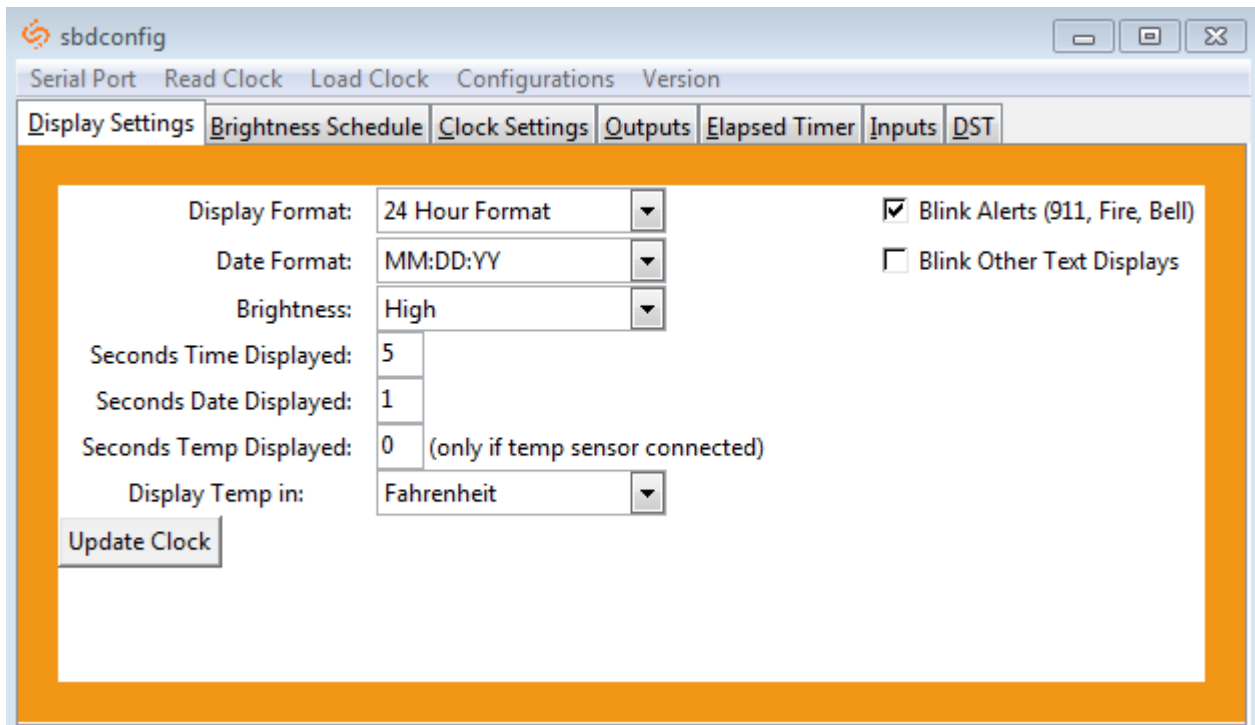


- Save Configuration:** After the clock's settings are chosen, this option will save the configuration to the computer.
- Load Configuration:** This option will allow a user to load the previously saved configuration from the computer.

5. Version

- The Version button displays the number of the software version.

Sbdconfig Software - Display Settings



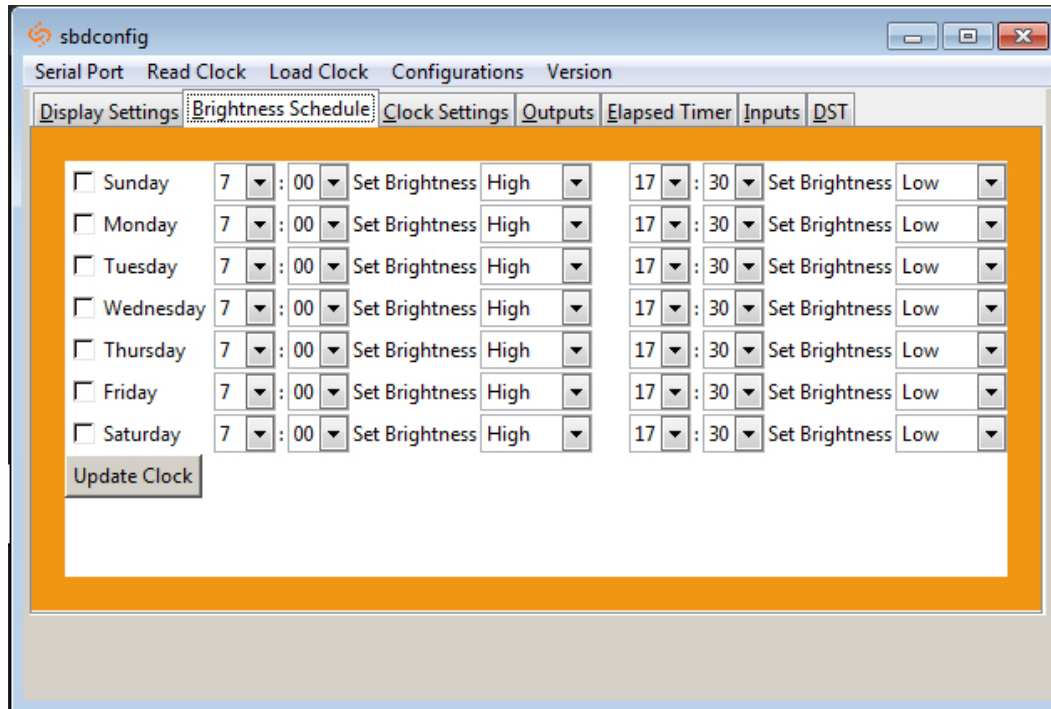
1. Clicking on the Display Settings tab will allow a user to program the following settings:

- **Display Format:** This option will allow the user to select how the time is displayed on the clock. There are two options: 12 hour format or 24 hour format.
- **Date Format:** This option 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.
- **Brightness:** This option sets the brightness level that the clock will display. There are four options to choose from: High, Medium, Low or Off.
- **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 time will not be displayed. If Date and Temp Displayed are set to 0, the clock will only display the time.
- **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 date will not be displayed. If Time and Temp Displayed are set to 0, the clock will only display the date.
- **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 temperature will not be displayed. If Time and Date Displayed are set to 0, the clock will only display the temperature.
- **Display Temp In:** If a temperature sensor was installed on the clock, this option allows a user select whether the temperature appears in Fahrenheit or Celsius.
- **Blink Alerts (911, 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.
- **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.

2. 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.

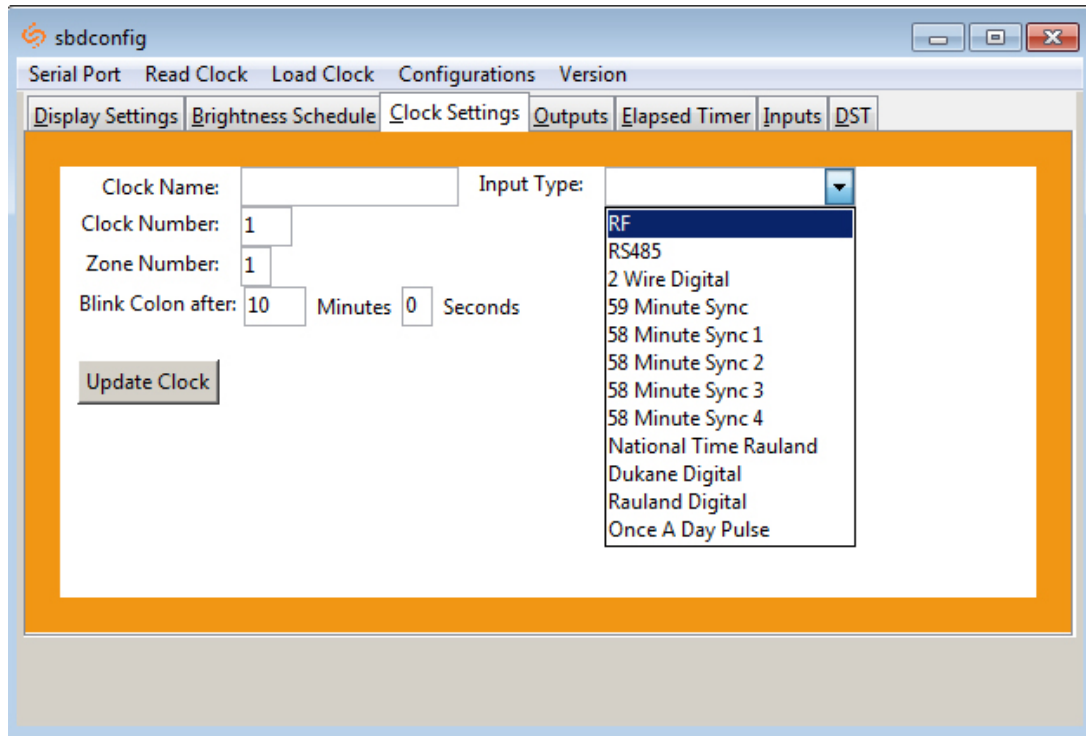
***Note:** If the Time, Date, and Temp Displayed are ALL set to 0, the display will turn completely blank.

Sbdconfig Software - Brightness Schedule



1. Clicking on the Brightness Schedule tab will allow a user to establish a Brightness Schedule for the digital clock(s). This includes choosing the day(s) of the week to set alternate brightness levels, the time of day that the brightness level will change, and the level of brightness the clock will display (High, Medium, Low or Off). In addition, a user has the option to schedule a second time during a selected day to automatically adjust the brightness level of the clocks.
2. 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.

Sbdconfig Software - Clock Settings



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

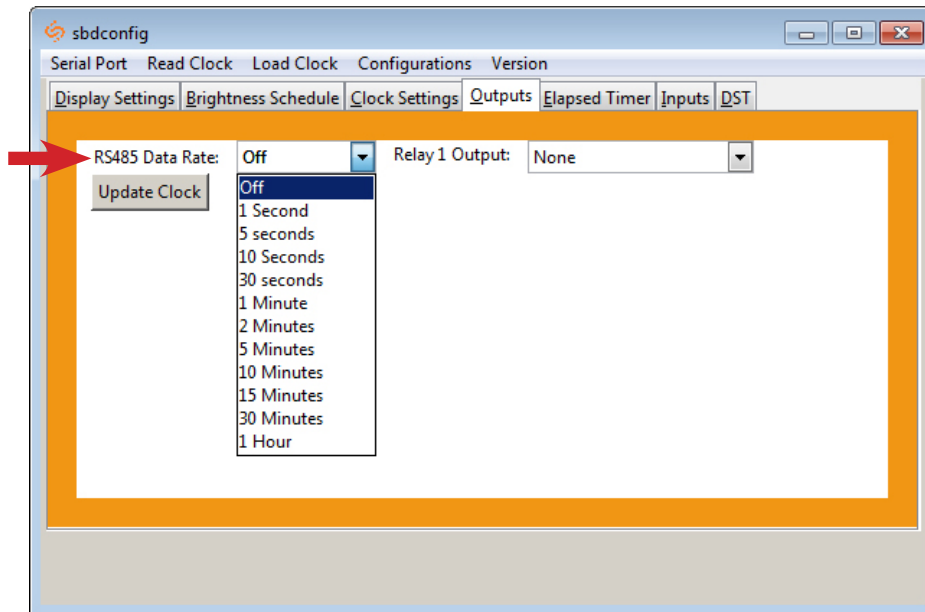
- **Clock Name:** This option allows a user to assign the clock a unique name, such as its location in a facility. The name cannot exceed 24 characters.
- **Clock Number:** This option allows a user to assign a unique number to a clock. The user can choose the clock number. Please reference the master clock manual associated with your system for more information.
- **Zone:** This option allows a user to choose the clock's zone. A zone is a collection or grouping of clocks within a certain section of a facility. Here, a user will input a number (1-99) to designate the zone of the clock.
- **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. This option will let the user choose how long after a loss of communication the clock will wait before the colon starts to blink.
- **Input Type:** This option allows a user to choose what type of sync input for correction mode on the clock.

2. 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.

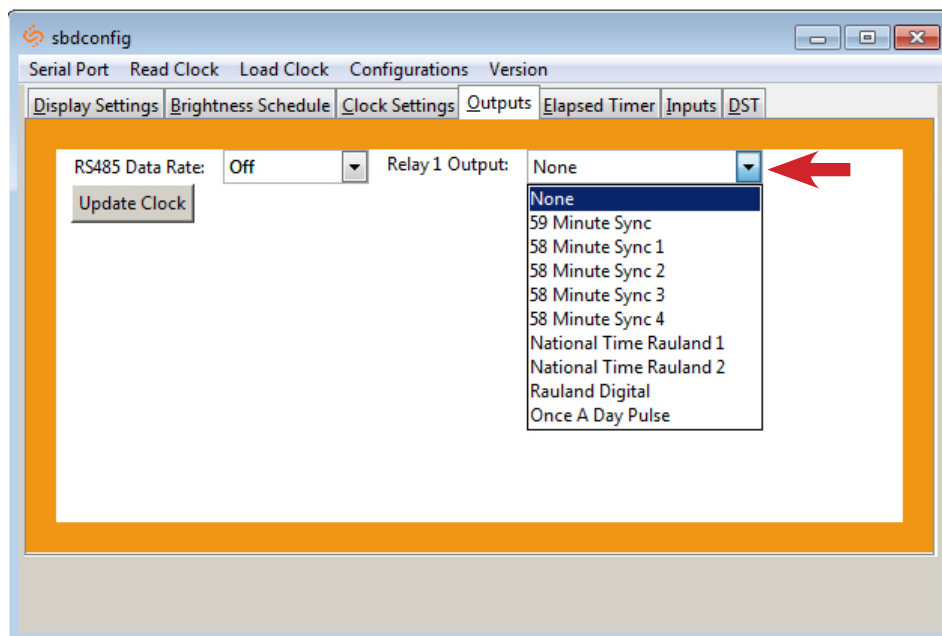
Sbdconfig Software - Outputs

1. 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.



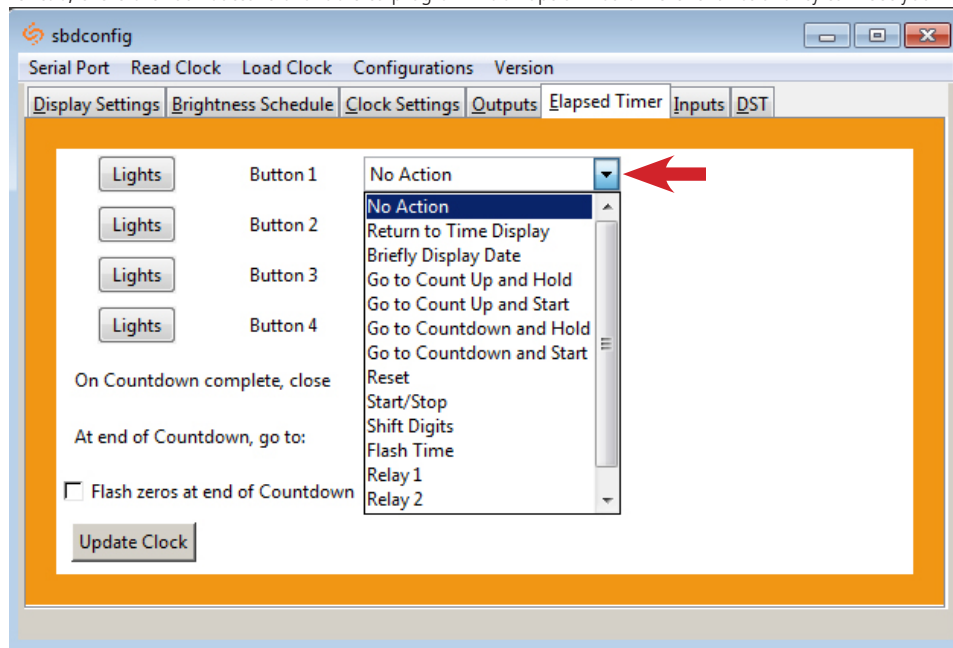
- Relay 1 Output:** This option allows a user to choose the time sync the clock uses to correct other time keeping devices, such as paging systems, an existing master clock, or other devices manufactured by different companies. Refer to page 20 for wiring information and page 29 for an explanation of each output type.



2. 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.

Sbdconfig Software - Elapsed Timer (3200/3300 Versions)

On the Elapsed Timer tab, there are four buttons available to program. Each option has different functionality to meet your needs.



Note: The default option for the Elapsed Timer buttons is No Action.

1. Program the first button on the Elapsed Timer by selecting one of the options in the drop down list next to Button 1. Listed below are the options and what their functions are:

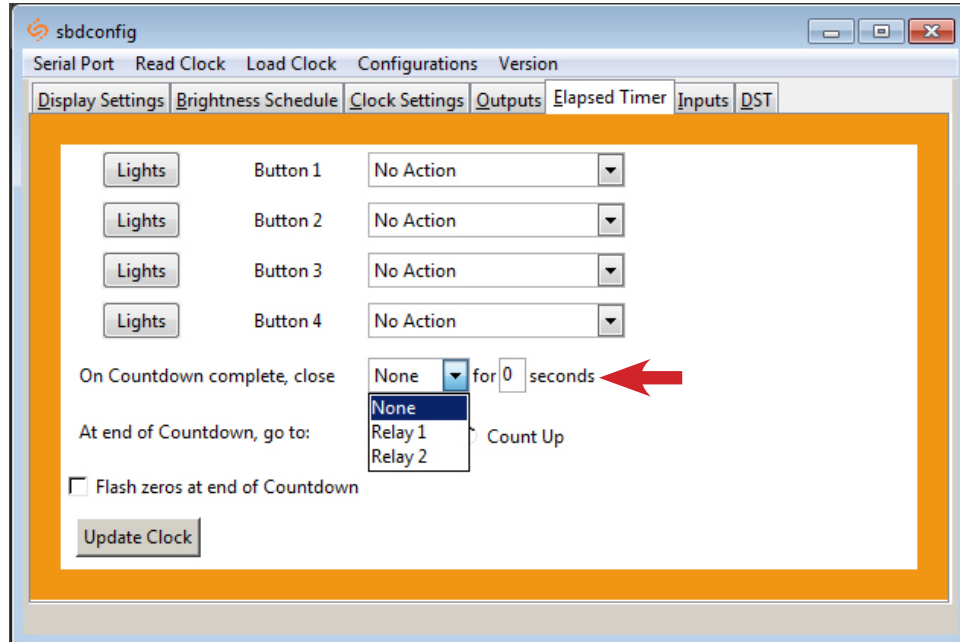
- **No Action:** The timer button will not perform any function when this option is selected.
- **Return to Time Display:** This option will cause the digital clock to return to the current time display, regardless of what function it is currently displaying.
- **Briefly Display Date:** This option will change the clock's display to briefly show the date when the current time is on display. This option will not work in count up or count down mode.
- **Go to Count Up and Hold:** This option will cause the digital clock to hold at zero and wait for the count up to start. Press the button programmed for Start/Stop to begin Count Up.
- **Go to Count Up and Start:** This option will make the clock display the count up function and begin counting up from zero as soon as the button is pushed.
- **Go to Count Down and Hold:** This option will cause the digital clock to hold at the specified count down start time and wait for the function to start. Press the button programmed for Start/Stop to begin Count Down.
- **Go to Count Down and Start:** This option will make the clock display the count down function and begin counting down from a specified time, as soon as the button is pushed.
- **Reset:** This option will cause the timer to rest the last-used Count Down or Count Up.
- **Start/Stop:** This option will cause the timer to start or stop its counting function.
- **Shift Digits:** This option will cause the digits to shift from an Hour/Minutes display to a Minutes/Seconds display (4 digit digital clocks only).
- **Flash Time:** This option will enable the time to flash for 2 seconds when a count down is in progress.
- **Relay 1:** This option will cause the relay contact closure to close for a specified number of seconds (3300 Series Only).
- **Relay 2:** This option will cause the relay contact closure to close for a specified number of seconds (3300 Series Only).
- **Code Blue:** This option enables a special purpose Count Up. When the designated button is pressed the first time, a Count Up will begin. When pressed again, the Count Up will pause. When pressed and held, the Count Up will clear and the display will go back to showing the time. This overrides the interface lights, so that the interface is green while the time is running, and red when the timer has been paused.

Note: It is recommended that a user program one of the buttons with the Start/Stop option.

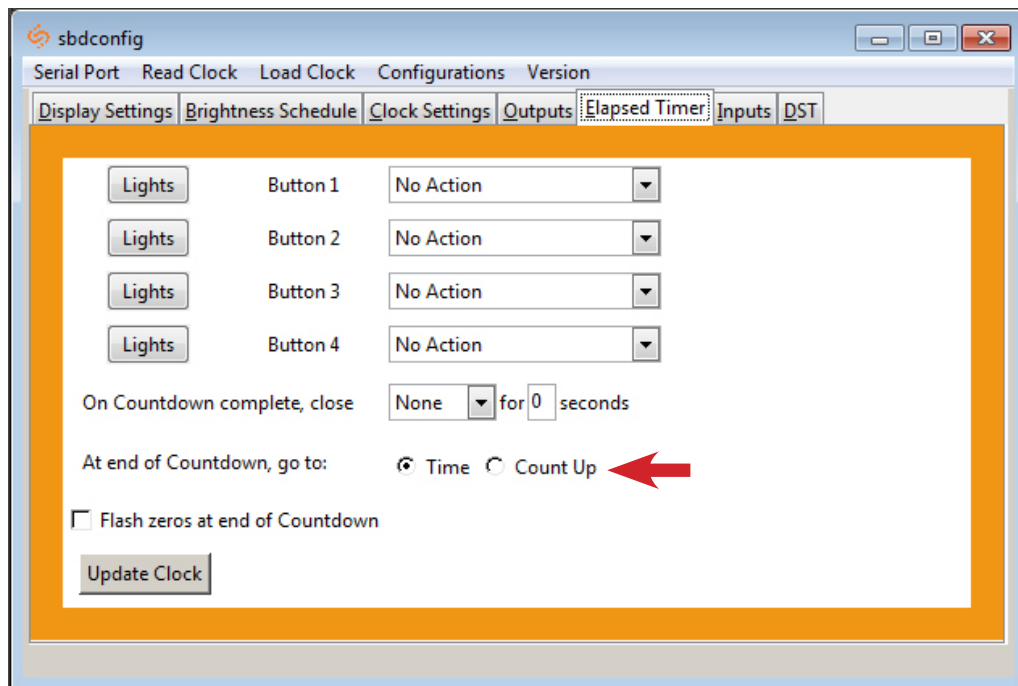
Note: If Relay 1 is used for an Output Sync, it cannot be used with the Elapsed Timer.

*Instructions continued on next page

Sbdconfig Software - Elapsed Timer (3200/3300 Versions) (continued)



- **On countdown complete, close:** This option allows a user to choose how many seconds the relay will be closed for. The maximum number of seconds is 9.

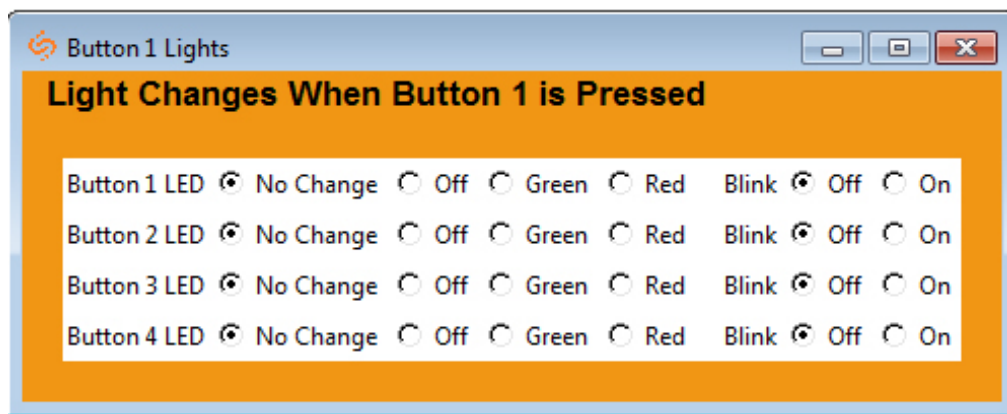


- **At end of Countdown, go to:** This option allows a user to choose between having the clock display the time or start a count up when a countdown completes.
- **Flashes zeros at end of countdown:** When checked, this option enables zeros to flash on the clock's display after a countdown has completed. The zeros will flash for 5 seconds after countdown is complete.

Sbdconfig Software - Elapsed Timer (3200/3300 Versions) (continued)

2. Program the 'Lights' settings. These control which colored light will display on the Elapsed Timer when a particular button has been pushed. The lights on the Elapsed Timer must be programmed separately for each button. The lights on the Elapsed Timer will only turn off if the user configures it into the buttons. Listed below are the options and their functionality:

Note: When configuring the lights for a specific button, any changes made to the light functions of the remaining three buttons are only affected when the selected button is pushed. E.g. If the button 1 lights dialog box is open, adjusting the lights on buttons 2,3 and 4 will only have an affect when button 1 is pushed.

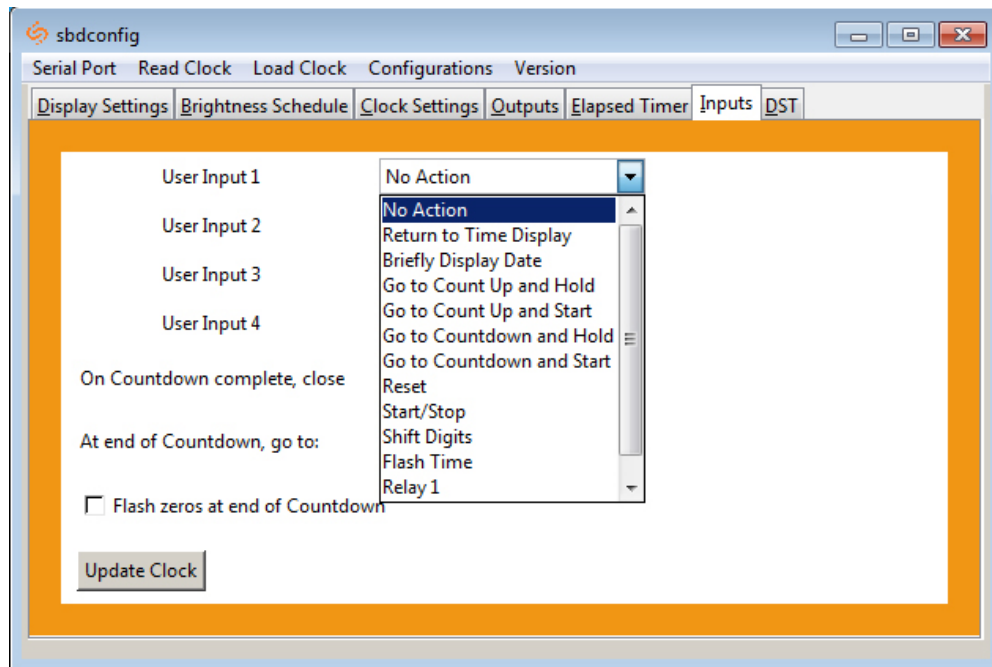


- **No Change:** When selected, a particular button's settings will remain unaltered from its previous selected state.
- **Off:** This option will turn off the lights on a particular Elapsed Timer button.
- **Green / Red:** This option allows the user to choose either green or red backlighting on the Elapsed Timer when the button is pressed.
- **Blink On / Off:** This option will allow the user to turn on or off the light blinking function. When this is set to Off, the backlight will stay on. When this is set to On, the backlight will blink.

3. Repeat steps 1 and 2 for the three remaining lights buttons.

4. After all four buttons and the lights buttons on the Elapsed Timer are set, 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 Software - Inputs (3300 Series)

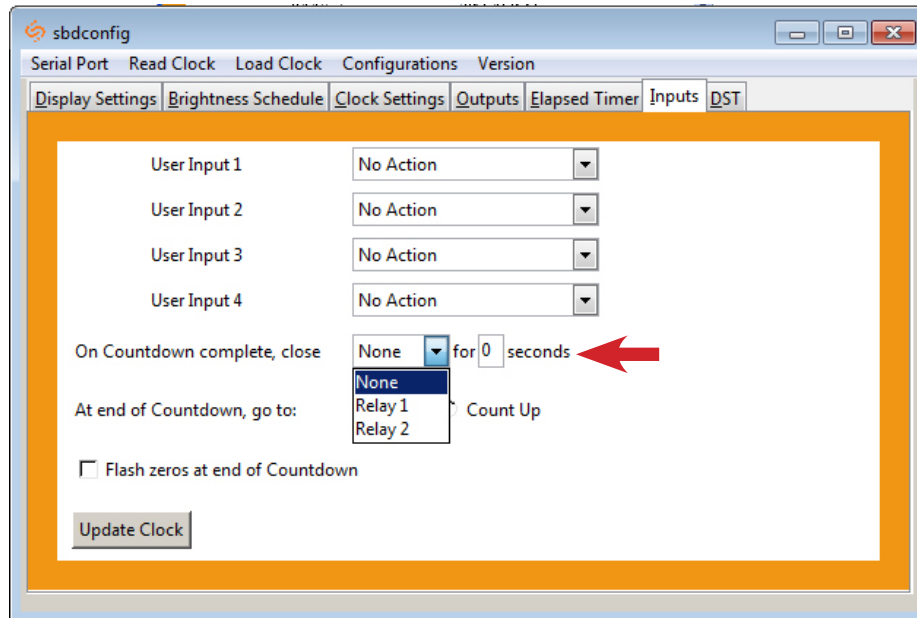


1. The 'Inputs' tab allows a user to program the clock to perform a certain function through a switch or relay contact closure from an outside device such as Code Blue, Nurses Call, etc. Program the first Input on the SBD 3300 by selecting one of the options in the drop down list next to Input 1. Listed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

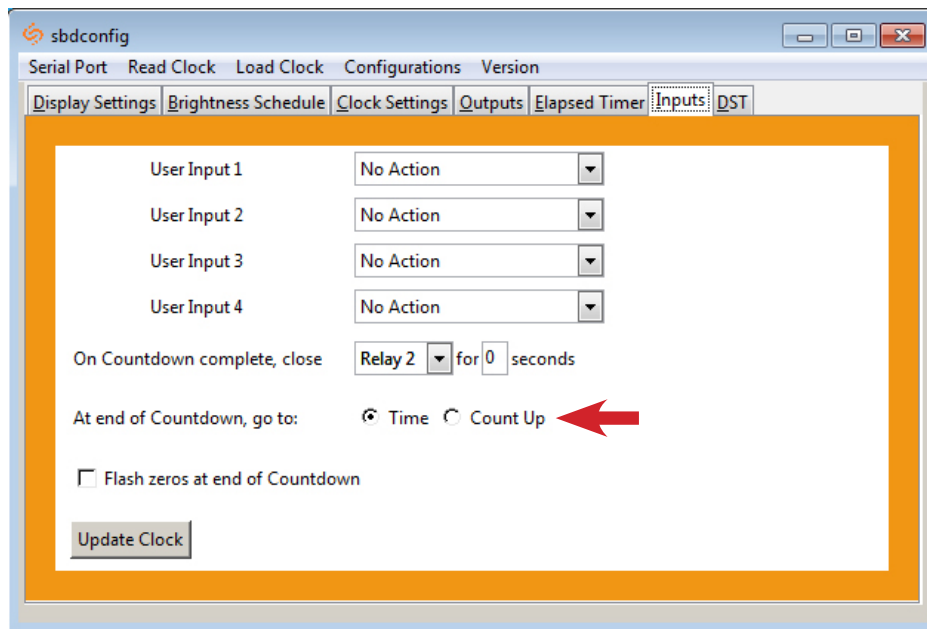
- **No Action:** Choosing this option will perform no functions on the digital clock.
- **Return to Time Display:** This option will cause the digital clock to return to the current time display, regardless of what function it is currently displaying.
- **Briefly Display Date:** This option will change the clock's display to briefly show the date when the current time is on display. This option will not work in count up or count down mode.
- **Go to Count Up and Hold:** This option will cause the digital clock to hold at zero and wait for the count up to start. A Start/Stop input needs to be applied to begin Count Up.
- **Go to Count Up and Start:** This option will make the clock display the count up function and begin counting up from zero, as soon as the button is pushed.
- **Go to Count Down and Hold:** This option will cause the digital clock to hold at the specified count down start time and wait for the function to start. A Start/Stop input needs to be applied to begin Count Down.
- **Go to Count Down and Start:** This option will make the clock display the count down function and begin counting down from a specified time, as soon as the button is pushed.
- **Reset:** Resets last used Count Down or Count Up.
- **Start/Stop:** This option will cause the timer to start or stop its counting functions.
- **Shift Digits:** This option will cause the digits to shift from an Hour/Minutes display to a Minutes/Seconds display (4 digit digital clocks only).
- **Flash Time:** This option will enable the time to flash for 2 seconds when a countdown is in progress.
- **Relay 1:** This option will cause the relay contact closure to close for a specified number of seconds (3300 Series Only).
- **Relay 2:** This option will cause the relay contact closure to close for a specified number of seconds (3300 Series Only).

*Instructions continued on next page

Sbdconfig Software - Inputs (continued)



- **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.

2. 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 Software - DST

- **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. (Fig. 4.)

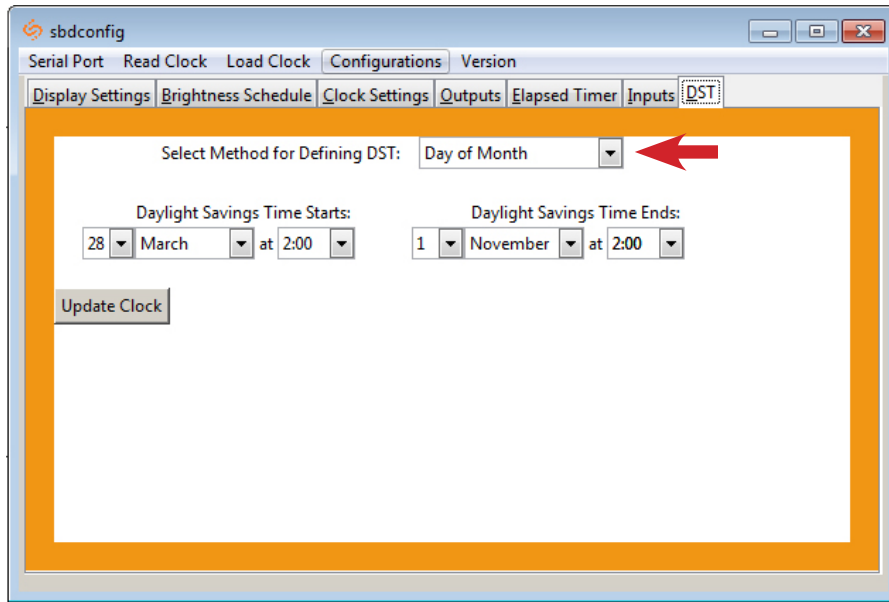


Fig. 4

- **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. (Fig. 5)

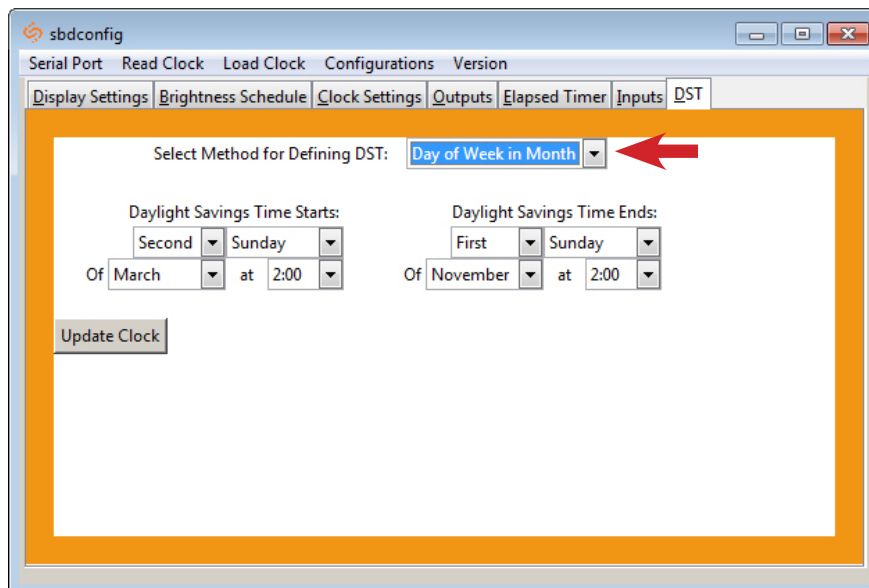


Fig. 5

Sbdconfig Software - DST (continued)

- **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. (Fig. 6)

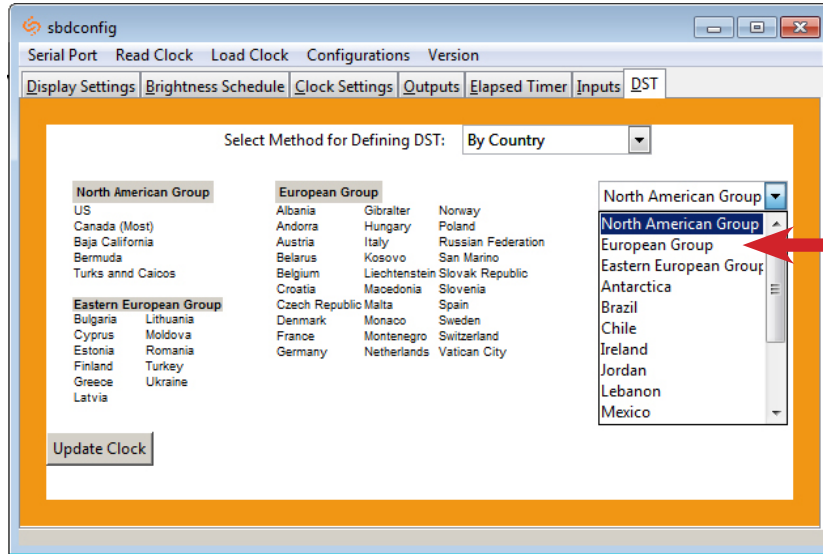


Fig. 6

- **None:** When this option is selected, Daylight Saving Time is not applied. (Fig. 7)

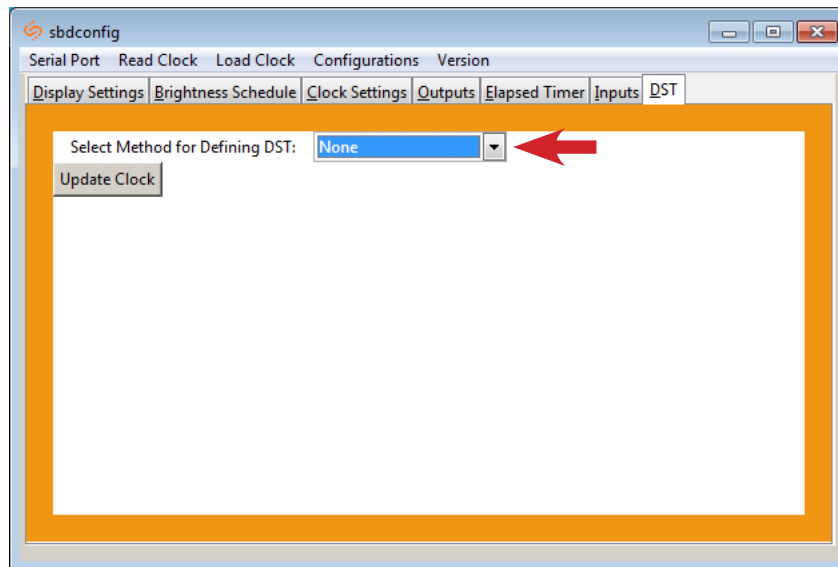


Fig. 7

2. 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.

Support

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:



The factory default 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 "Wiring and Jumper Settings", included earlier in this manual.

Support

Frequently Asked Questions

Can the SBD 3300 Series digital clock be used as an independent clock?

Yes, the SBD 3300 is capable of being used as an independent, slave, master or chronograph clock.

How can I interface the SBD 3000 with Rauland, Dukane and other systems?

The SMA 2000 or 3000 Master Clock or the SBD 3300 digital clock can be used as an interface between other systems and SBD 3000 clocks.

What happens to the SBD 3300 if a power failure occurs?

Unlike some clocks that require a 9 volt battery for time keeping, the SBD 3300 comes equipped with a 10 year battery backup (only available with the 3300 Series). Upon restoration of power, the SBD 3300 immediately corrects itself from its built-in time base. This occurs within seconds of "power-up." Clocks which do require a 9 volt battery backup risk having the battery die during extended shut downs. Each individual clock must then be opened in order to replace the battery. Since the SBD 3300 includes a 10 year battery backup, the clock never needs to be opened.

What happens to the SBD 3000 system if its input is lost?

The SBD 3300 digital clock is able to act as a master clock. If the communication input is lost to the SBD 3300, the clock will continue to run on its own internal crystal oscillator. The clock will also continue sending communication to any clocks down the line that are connected.

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

Sapling's Elapsed Timer (part# SBD-ELT-001-0) controls all chronograph functions of the SBD 3200/3300 and must be ordered for this functionality to work. The display can be programmed to show either HH:MM or MM:SS (4 digit digital clock) or HH:MM:SS (6 digit digital clock), and the readout can count up from 00:00:00 to 99:59:59 or count down with a programmable starting point from 99:59:59 to 00:00:00, with interrupt and resume capabilities.

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

"BELL" displays can be programmed by either the Sapling 2000 or 3000 Series Master Clocks. To display "FirE", a 3000 Series Master Clock, which receives a signal from an existing alarm system, must be used .

What happens if voltage on the power line drops from 24VAC to lower voltage?

The clock will still function, and will maintain the same level of brightness. However, the current consumption will increase proportionally to the decrease in voltage.

Support

Troubleshooting

The clock is not running. What do I do?

- a) Measure the input voltage to the clock. The voltage should measure 85-135 volts in the 120VAC model or 240VAC model or 10-28 volts in the 2.5"/24VAC model and 16-28 volt in the 4.0"/24VAC model.
- b) Make sure the transformer is an isolated transformer if using a 24VAC model.
- c) Make sure the ground wire is not touching other wires.

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

The clock is not receiving an input signal. What do I do?

- a) Make sure that the RS485 is connected properly when using in RS485 secondary mode. Make sure that JP5 is in the proper position.
- b) Make sure that the polarity of the communication wire is correct when using the clock in 2-wire digital communication slave mode. Make sure that JP5 is in the proper position.
- c) If interfacing with other systems, make sure that the input voltage is zero when not applying a correction signal. When taking this measurement, you must be sure that the clock is disconnected from the master clock. Also, measure both AC & DC voltage. (The current consumption needed is very low, about 3mA, and a leakage current from the master clock can be interpreted as a continuous reset signal. If you are experiencing such a problem, please install a bypass mechanical relay).

There is data noise bleeding into the intercom line. What do I do?

Increase the RS485 transmission rate from the master clock to once a minute.

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

SBD 3200/3300 clocks shipped before March 27, 2014 require an older version of the SBDCConfig software, while SBD 3200/3300 clocks shipped after March 27, 2014 require a newer version of the SBDCConfig software. If your clock does not respond to your version of SBDCConfig, you may download both versions of the program at: <http://www.sapling-inc.com/digital-clock-programming/>.