Installation Manual V3

SMA 2000 Series Master Clock

SMA 2000 Master Clock

Table of Contents

The Sapling Company, Inc.   215.322.6063 P.
1633 Republic Road   215.322.8498 F.
Huntingdon Valley, PA 19006   www.sapling-inc.com

Wall Mount Installation

Fig 1

1. Remove the cover of the wiring panel (Fig 1).

2. Mark the four drilling points on the wall based on the drawing above.

3. Drill the holes for the anchors supplied in the mounting kit at the designated markings from step 1.

4. Install the four anchors in the holes that were just drilled.

5. Install the first two screws in the top holes leaving 1/8″ of the thread exposed.

6. Line up the top key slots over the screws and lock the master clock into place.

7. Install the bottom screws through the wiring access panel and tighten into place.

8. After all wiring is complete, re-install the wiring panel cover.

Rack Mount Installation
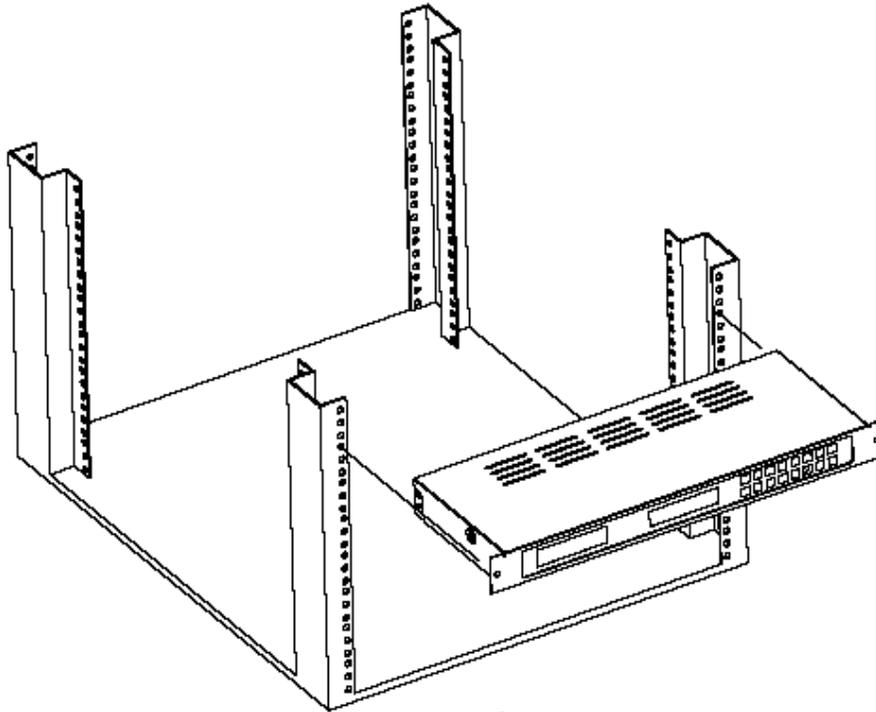
1. The master clock is 1U in size. Install the threaded nuts in the desired location in the rack rails.

2. Put the nylon washers on the two screws supplied.

3. Line up the master clock with the threaded nut.

4. Insert screws into the threaded nuts and tighten.

Before You Get Started

Installing the Master Clock with the Line Cord Receptacle

Caution! Do not plug in the power cord until the following steps are completed.

1. The square knockout on the wiring chassis must be removed.

2. The Heyco Bushing must be attached to the power cord as shown. Use pliers to push both halves of the bushing together while they lock.
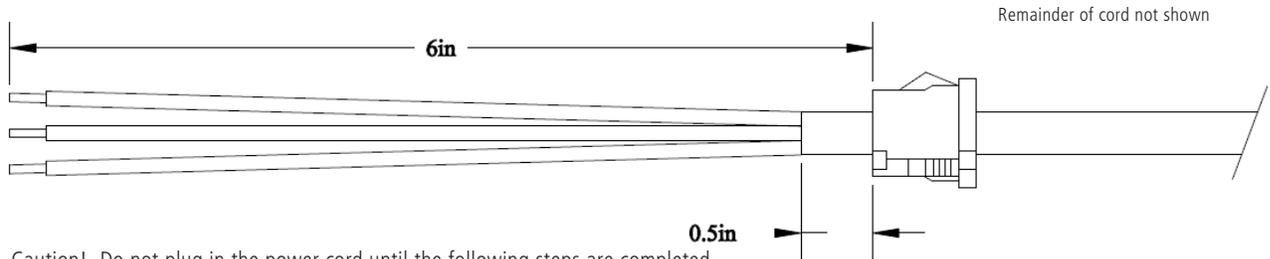
3. Put the wires through the knockout and push the bushing into the metal until it locks tightly into place. The wrod Heyco on the bushing faces up.

4. Put each wire into the supplied connector and tighten the screws. The wiring label located on the chasssis will show where to connect the wires.

AC Power Wiring using 14 AWG Romex Cable

Caution! The AC Power Source must be turned OFF.

1. Remove a round knockout on the wiring chassis, preferably one near the AC Input Connector.

2. Install a standard ½" Romex Bushing and tighten in place.

3. Pass the Romex Cable through the Bushing and clamp in place. Do Not over tighten the screws.

4. Strip back the outside cable sheathing to expose the White, Black and Ground wires.

5. Strip back the insulation on the White and Black wire ¼".

6. Put each wire into the supplied connector and tighten the screws. The wiring label located on the wiring chassis indicates where to connect the wires.

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Rear View of Unit

❶ **N/A**

❷ **N/A**
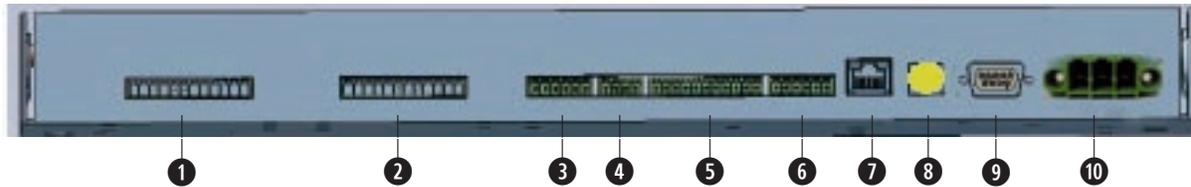
❸ **Clock 1 & 2 Sync-Wire Outputs** This terminal block is where connections would be landed for Clock 1 and Clock 2 sync-wire communication relay outputs.

❹ **RS485 Input/Output** This terminal block is where connections would be landed for RS485 communication to and from other Sapling systems.

❺ **Inputs** This terminal block is where connections would be landed to use the SMA as a slave clock when being controlled by another system.

❻ **Remote RF Antenna (Rack Mount only)** This terminal block is where the connection to an external RF antenna would terminate.

❼ **Ethernet** This RJ45 jack is used for connecting the master clock to a network for programming and/or timekeeping capabilities.

❽ **GPS Connector** This GPS connector is where the antenna for the GPS gets mounted to (GPS option only).

❾ **RS232 Port** This RS232 port is used for debugging only.

❿ **Power Input** This power outlet is used to power up the SMA master clock.

Installing the Remote Antenna
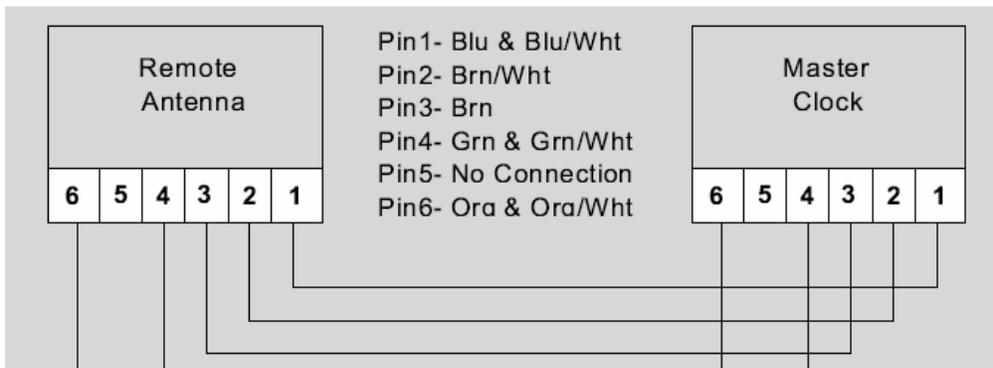
When the rack mount master clock and the wireless option are ordered, the package includes a remote antenna. In order for the clock to send out the wireless signal to the surrounding slave clocks, the remote antenna must be installed. Follow the below directions for installation.

Notes: Use CAT5 ethernet cable. 50 foot maximum length. Use the wire colors as shown above. Note that Pin 1, Pin 4 and Pin 6 use a wire pair and Pin 2 and 3 are single wires.

1) Strip the insulation back 1/4 inch on all wires and twist the 2 wires together of each pair.

2) Pass the cable through a bushing in the wiring chassis.

3) Insert the wires into the connector and tighten the screws.

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Remote Antenna Mounting Instructions

6 - 15/16"

5 - 3/4"

6 - 15/16"
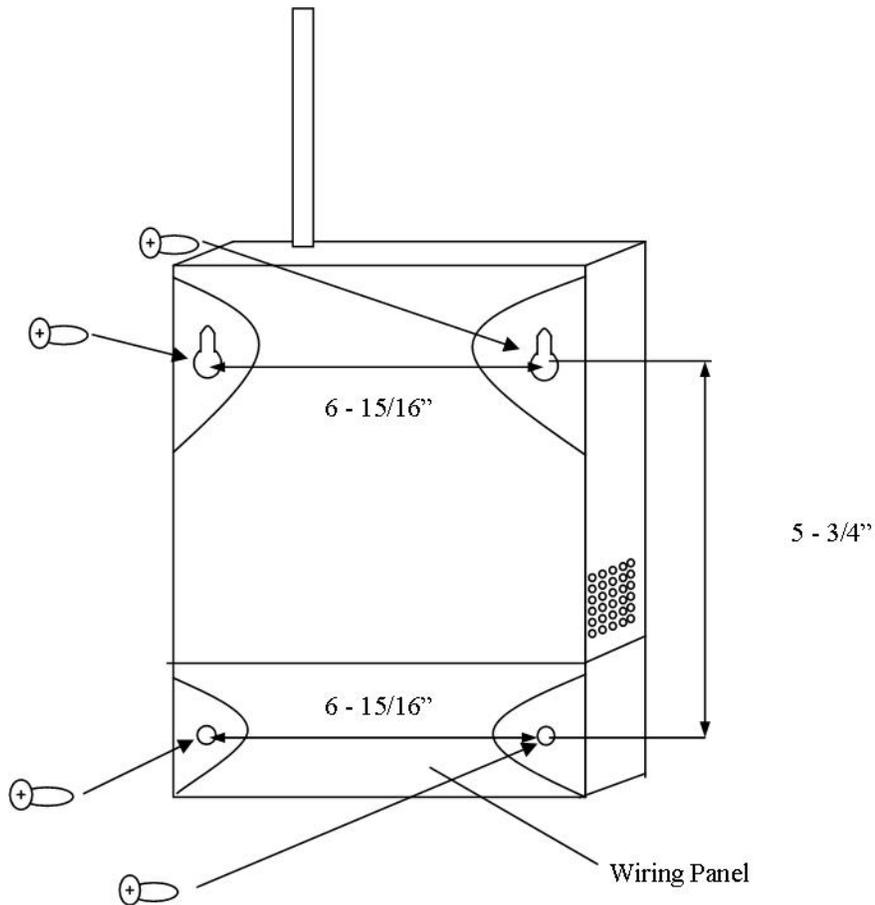
Wiring Panel

1. Remove the cover of the wiring panel.
2. Mark the four drilling points on the wall based on the drawing above.
3. Drill the holes for the anchors supplied in the mounting kit at the designated markings from step 1.
4. Install the four anchors in the holes that were just drilled.
5. Install the first two screws in the top holes leaving 1/8" of the thread exposed.
6. Line up the top key slots over the screws and lock the master clock into place.
7. Install the bottom screws through the wiring access panel and tighten into place.
8. After all wiring is complete, re-install the wiring panel cover.

![Sapling logo]

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System Connections – Wired Systems

2 Wire Digital Communication

24 V SAM Series Analog Clock

24 V SBD 1000 Series Digital Clock
or
SBD 2000 Series Digital Clock

24 V SAM Series Analog Clock
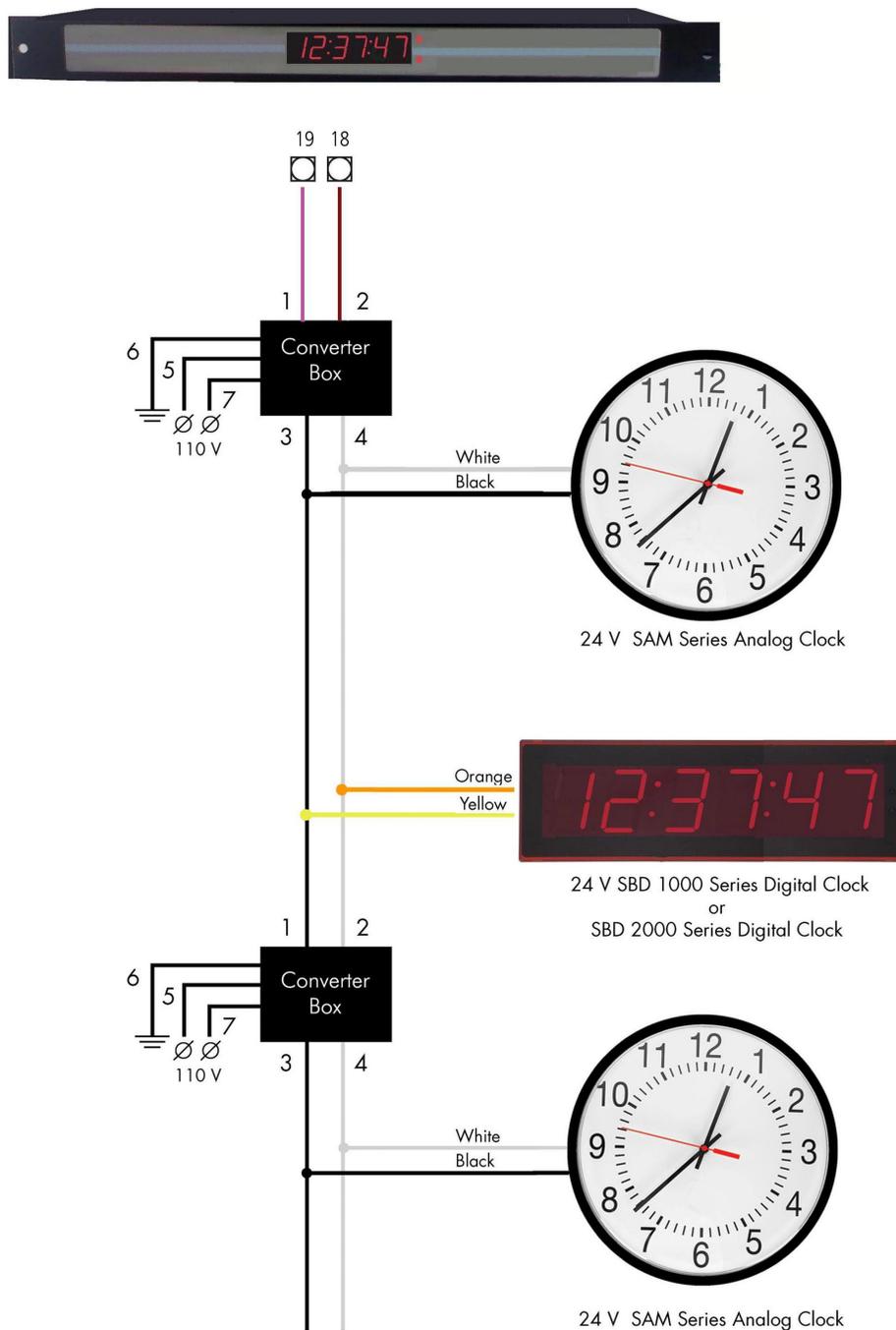
System Connections – Wired Systems

RS485 Communication

110 / 24V SRM Series Analog Clock

110 / 24V SBD 1000 Series Digital Clock
or
SBD 2000 Series Digital Clock

110 / 24V SRM Series Analog Clock

System Connections – Wired Systems

Sync-Wire Communication

Clock
Circuit

26   25
  or
23   22

Neutral
Power
Reset

Black
White
110 / 24 VAC

Neutral	White
Power	Black
Reset	Yellow
	Green
Ground	

110V / 24V SAM Series Analog Clock

Neutral	White
Power	Black
Reset	Yellow
	Green
Ground	

110V / 24V SAM Series Analog Clock

Neutral	White
Power	Black
Reset	Yellow
	Green
Ground	

110V / 24V SAM Series Analog Clock

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Inputs – Sync-Wire Inputs Installation

59 Minute Correction

Dry Contact Closure	110VAC Interface	24VAC Interface

58 Minute Corrections 1–4

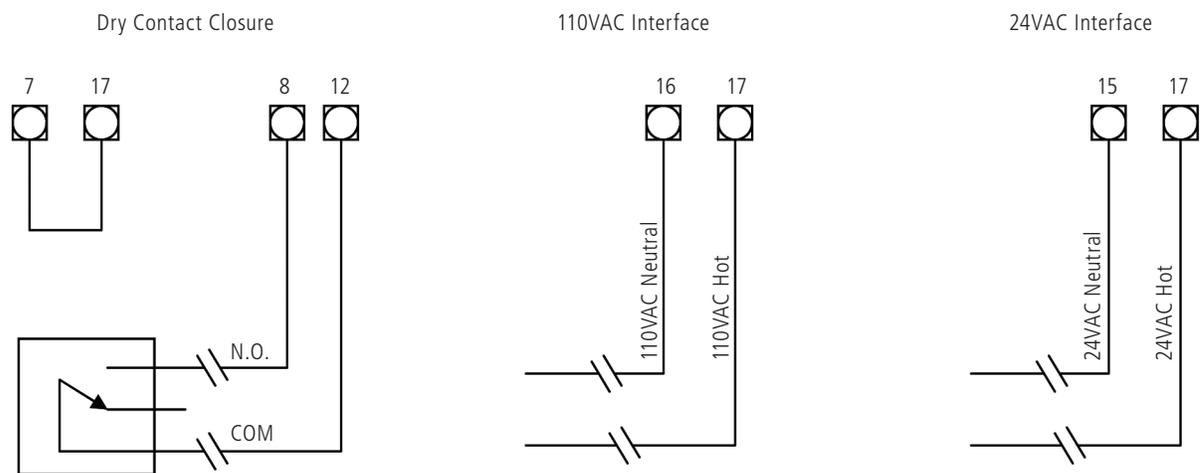| Dry Contact Closure	110VAC Interface	24VAC Interface

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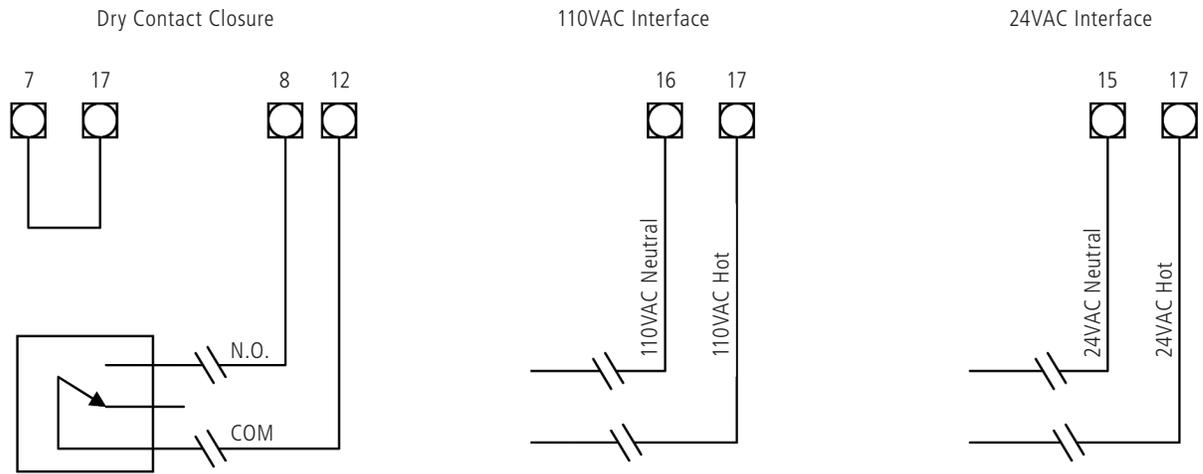
Inputs – Sync-Wire Inputs Installation

National Time/Rauland

Dry Contact Closure

| 7 | 17 | | 8 | 12 |

N.O.

COM

110VAC Interface

| 16 | 17 |

110VAC Neutral

110VAC Hot

24VAC Interface

| 15 | 17 |

24VAC Neutral

24VAC Hot

Rauland Digital

Input

| 11 | 17 |

Dig Line

+5V

Output

| 8 | 22 |

| 7 | 23 | 24 |

+5V Out

Dig Out

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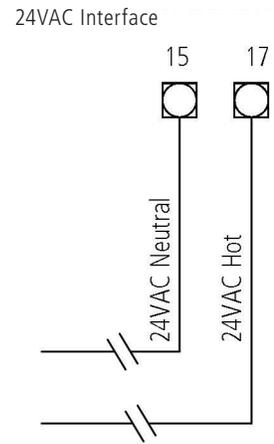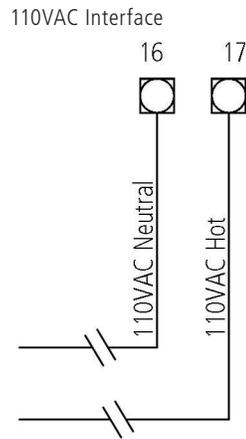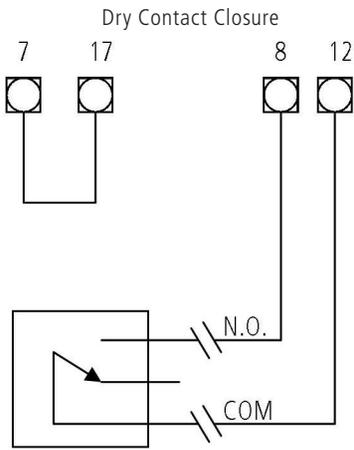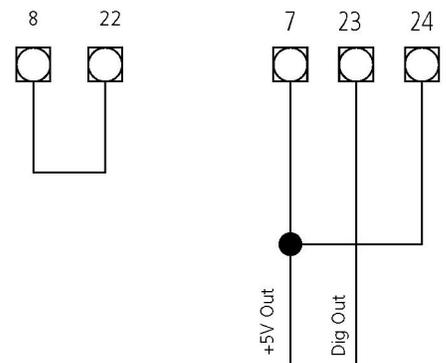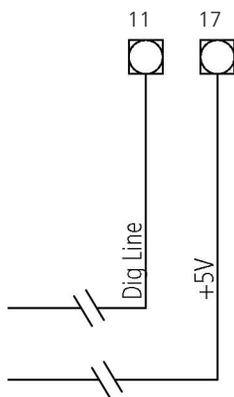
Inputs – Sync-Wire Inputs Installation

Dukane Digital

7   17   14   13   8

Reset

Minute Pulse

Ground
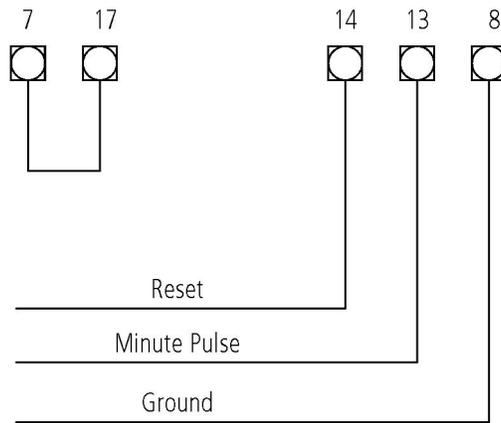
Once a Day Pulse

Dry Contact Closure

7   17   8   12

N.O.

COM

sapling

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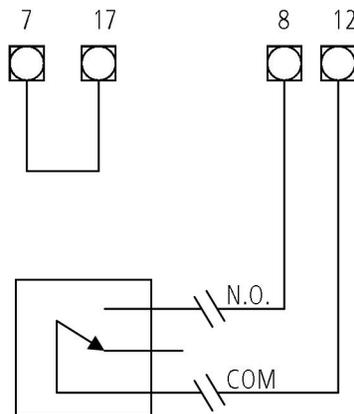
Fire Alarm Interface Installation / Patch Cable Installation

Fire Alarm Interface Installation

The Fire Alarm Interface allows a relay closure to be connected to the SMA master clock that allows the user to interface the existing fire alarm with the Sapling SBD 1000 or SBD 2000 series digital clocks.
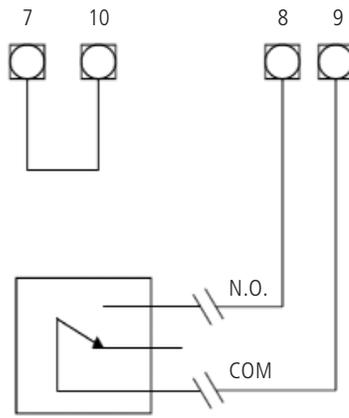
When a relay closure occurs on pins 9 and 10, "FirE" will display on the digital slave clocks connected using RS485 or two wire digital communication.

Patch Cable Installation

Wall Jack to Network

Fig 1.1

1) Connect a patch cable to the RJ45 port on the SMA Master Clock as shown in Fig 1.1.

2) Connect the other end of the patch cable to an Ethernet jack connected to the network.

User Level Programming

Setting the Time from the LED Display

To set the time, press the top button to change the hour and/or the bottom button the set the minute.
See Fig 2.1.

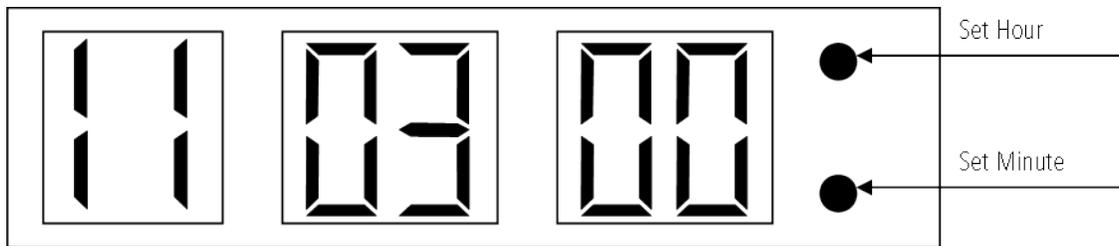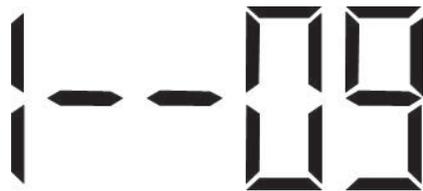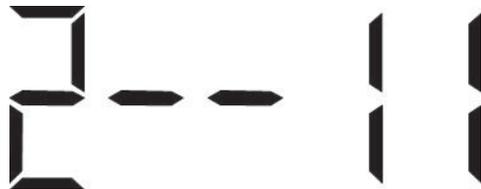Fig 2.1

Programming the SMA 2000

To enter programming mode, press both the top and bottom button together simultaneously. The top button advances through the options while the bottom button changes the option.
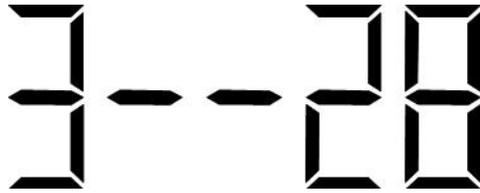

Option 1 - Set Year:

Use the bottom button to scroll from "00-99" on the display and set the year.

Option 2 - Set Month:

Use the bottom button to scroll between "01-12".

User Level Programming

Option 3 - Set Day:

Use the bottom button to scroll between "01-31".
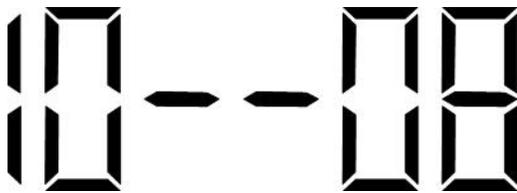
Option 10 - Technical Mode:

If technical mode is desired, press the bottom button until "08" is reached. Setting option 10 to "08" will allow the user access to options 11-13 when the top button is pressed. Any other value will go directly to option "20" when the top button is pressed.
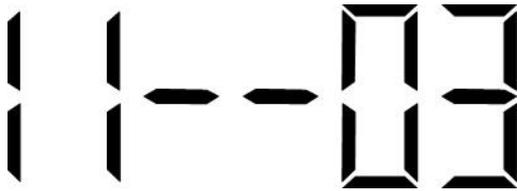
Option 11 - RS485 Data Rate:

Press the bottom button to scroll between "01-12".

01 - Data is transmitted every second	07 - Data is transmitted every 2 minutes
02 - Data is transmitted every 5 seconds	08 - Data is transmitted every 5 minutes
03 - Data is transmitted every 10 seconds	09 - Data is transmitted every 10 minutes
04 - Data is transmitted every 15 seconds	10 - Data is transmitted every 15 minutes
05 - Data is transmitted every 30 seconds	11 - Data is transmitted every 30 minutes
06 - Data is transmitted every minute	12 - Data is transmitted every hour
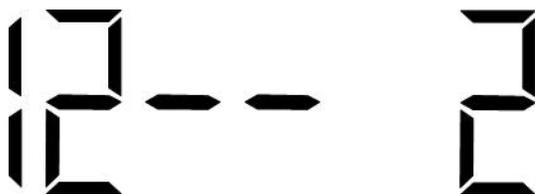
Option 12 - Daylight Savings Time:

Press the bottom button to scroll between "d", "1", or "2".

 "d" will disable this option.
 "1" will enable daylight savings pre 2007.
"2" will enable daylight savings post 2007.
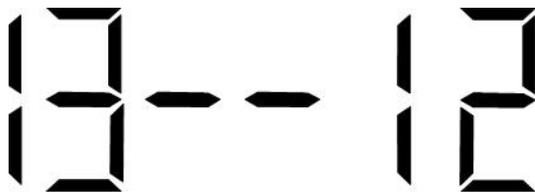
Option 13 - 12/24 Hour Mode:

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

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User Level Programming
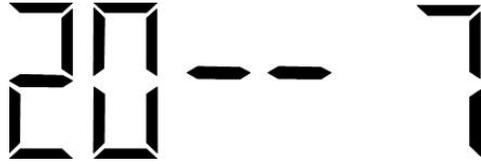
Option 20 - Programming the Clock #1 Circuit:

Press the bottom button to scroll through "1", "2", "3", "4", "5", "6", "7", "8" & "9". Please refer to relay selection mode on page 21.
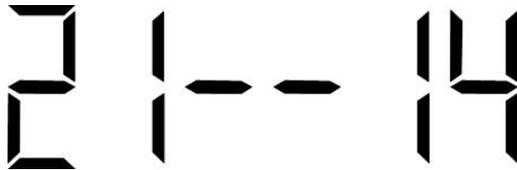
Option 21 - Once a Day Pulse - Set Hour:

This option is only available if "8" is selected in option 20 for once a day pulse. Press the bottom button to scroll through "00-23".
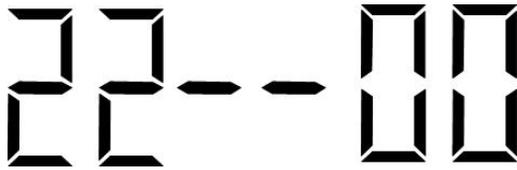
Option 22 - Once a Day Pulse - Set Minutes:

This option is only available if "8" is selected in option 20 for once a day pulse. Press the bottom button to scroll through "00-59".
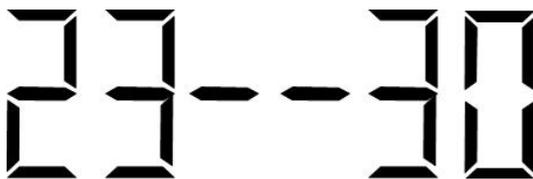
Option 23 - Once a Day Pulse - Set Seconds:

This option is only available if "8" is selected in option 20 for once a day pulse. Press the bottom button to scroll through "00-59".
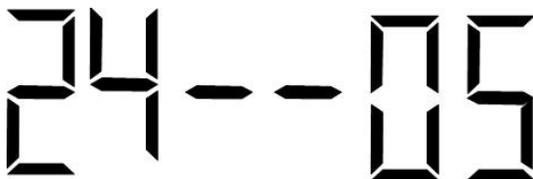
Option 24 - Once a Day Pulse - Set Duration (in seconds):

This option is only available if "8" is selected in option 25 for once a day pulse. Press the bottom button to scroll through "00-99".

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User Level Programming

Option 25 - Programming the Clock #2 Circuit:

Press the bottom button to scroll through "1", "2", "3", "4", "5", "6", "7", "8" & "9". Please refer to relay selection mode on page 21.

Option 26 - Once a Day Pulse - Set Hour:

This option is only available if "8" is selected in option 25 for once a day pulse. Press the bottom button to scroll through "00-23".

Option 27 - Once a Day Pulse - Set Minutes:

This option is only available if "8" is selected in option 25 for once a day pulse. Press the bottom button to scroll through "00-59".

Option 28 - Once a Day Pulse - Set Seconds:

This option is only available if "8" is selected in option 25 for once a day pulse. Press the bottom button to scroll through "00-59".

Option 29 - Once a Day Pulse - Set Duration (in seconds):

This option is only available if "8" is selected in option 25 for once a day pulse. Press the bottom button to scroll through "00-99".

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User Level Programming

Option 30 - Set the Primary Input:

Press the bottom button to scroll between "1-13" to select the input.

00 - Real Time Clock	08 - Dukane
01 - SNTP	09 - Rauland Digital
02 - 59 Minute Correction	10 - Wireless Repeater
03 - 58 Minute Correction (1)	11 - Once a Day Pulse*
04 - 58 Minute Correction (2)	12 - GPS
05 - 58 Minute Correction (3)	13 - RS485
06 - 58 Minute Correction (4)	
07 - National Time/Rauland	* - Selecting this allows access to options 34-36

Option 31 - Set the Secondary Input:

This option is only available if "8" is selected in option 25 for once a day pulse. Press the bottom button to scroll through "00-23".

00 - Real Time Clock	08 - Dukane
01 - SNTP	09 - Rauland Digital
02 - 59 Minute Correction	10 - Wireless Repeater
03 - 58 Minute Correction (1)	11 - Once a Day Pulse*
04 - 58 Minute Correction (2)	12 - GPS
05 - 58 Minute Correction (3)	13 - RS485
06 - 58 Minute Correction (4)	
07 - National Time/Rauland	* - Selecting this allows access to options 34-36

Option 32 - Setting the Time Zone Offset:

Press the bottom button to scroll through "-12 to 12". See Fig 3.1 on page 26 for examples of common offsets.

Option 33 - Set the Bias Seconds + 7500 seconds to - 999 seconds:
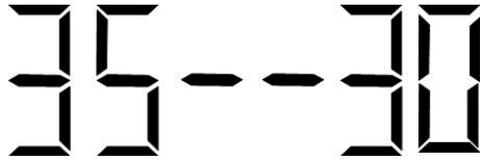
This option allows the user to set the bias seconds which allows the user to adjust the input's time plus 7500 seconds or minus 999 seconds. Press the bottom button to scroll through "0000 - 7500".

Option 34 - Once a Day Pulse Input- Set Hour

This option is only available when option 30 or 31 is set to 11. Press the bottom button to scroll through "00-23".

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User Level Programming

35--30

Option 35 - Once a Day Pulse Input - Set Minutes

This option is only available when option 30 or 31 is set to 11. Press the bottom button to scroll through "00-59".

36--00

Option 36 - Once a Day Pulse - Set Seconds

This option is only avaiable when option 30 or 31 is set to 11. Press the bottom button to scroll through "00-59".

40--76
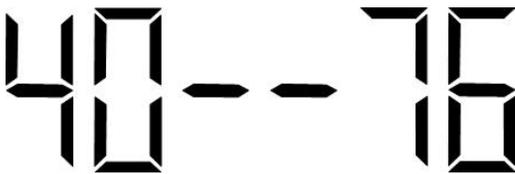
Option 40 - Last Time the Clock Received an Input Signal (in hours)

The display will be between 00 - 99. This option is read only. It cannot be modified.

44--01
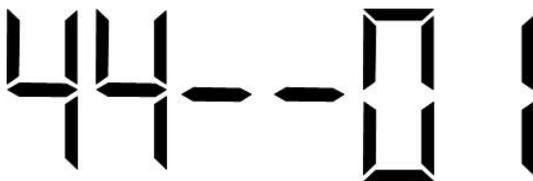
Option 44 - Displays Status of Internet Connection:

A "01" will appear on the right side if the master is receiving an Internet Connection. A "00" will appear on the right side if it is not receiving an Internet Connection. This option is a read-only option.
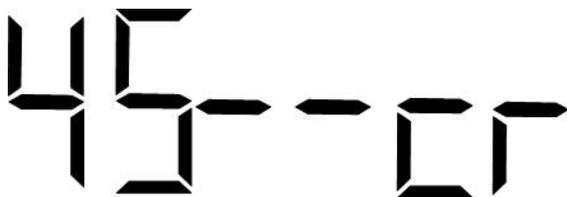
45--cr

Option 45 - Crossover/Static IP option

If the right side says "off", DHCP is being used, if the user presses the bottom button, the display will change to "cr" which means crossover mode. In cross over mode, DHCP is turned off and the IP address is fixed at 192.168.0.123. Depressing the top button advances to the next menu item. Warning, after making a change, you must wait 20 seconds and power cycle for this change to take effect. Note that the PC directly connecting with this needs to be set for a fixed IP address which is not 192.168.0.123. For changing the IP address to a static IP, it must be done from the web interface. Please see page 22 for details.

User Level Programming

Option 50 - Entering Diagnostic Mode

Press the bottom button to scroll between "E - d". Setting the option to "E" will enable the option and will enter diagnostic mode. Setting the option to "d" will disable the option and upon depressing the top button, the clock will return to the time.

Option 51 - Sends Diagnostic to Slave Clock

Pressing the bottom button will scroll from "1-5 and 9".

01 - Protocol Verification
02 - Comprehensive Test
03 - Manufacturer's Default
04 - Combination of 02 & 03 (button must be pressed on SAM)
05 - Combination of 02 & 03 (no need to press button on SAM)
09 - Overrides the Previous Diagnostic and Goes Back to the Time

Option 52 - Set Duration (in minutes) that the Results of the Diagnostic will be Viewable on the Clock

Pressing the bottom button will scroll from "00-60". Pressing the top button will go back to the displayed time.

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System Connections – Wired Systems

Sync-Wire Communication – Protocol Definitions

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.

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.

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.

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.

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.

National Time & Rauland (1)   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.

National Time & Rauland (2)   The hourly correction is for 25 seconds every hour from XX:00:00 to XX:00:25. This option only has hourly corrections.

Once a Day Pulse   The Once a Day Pulse allows the user to manually configure when the relay will close and for how long it needs to close for.

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Web Interface Programming

**The web interface is an optional feature and is not available on all units.
Please make sure that ports 123 and 80 are open on the firewall.**

Accessing the Web Interface (when connected via DHCP)

1) Plug in a patch cable to the unit, and then into a switch on your network.

2) Press the both buttons on the front of the display simultaneously, and then press them simultaneously once more. This puts the clock is the IP address view mode. The display will show the first 3 numbers of the IP address. Press both buttons simultaneously to see the second 3 digit portion of the IP address. Continue the same procedure for the third and fourth portions of the IP address. When finished, pressing both buttons together simultaneously will bring the time back onto the clock.

3) Open a web browser such as Internet Explorer or Firefox on a PC that's connected to the network.

4) In the address bar, type in the IP address and press Enter. This will access the log-in screen.

Accessing the Web Interface (when using a static IP)

1) Plug in a patch cable to the unit, and then into a switch on your network.

2) Set option 45 to "cr", as described on page 19.

3) Open a web browser such as Internet Explorer or FireFox on a PC that's connected to the network.

4) In the address bar, type in 192.168.0.123 and press Enter. This will access the log-in screen.

5) Once you are logged in, follow the instructions on page 28 for entering a new IP address.

Accessing the Web Interface (when using a crossover cable)

1) Set option 45 to "cr", as described on page 19.

2) If you are accessing this on a laptop, turn off any wireless connections.

3) Click the "Start" button on the taskbar, then click on "Control Panel".

4) Double Click on "Network Connections".

5) Click the right mouse button on "Local Area Connection" and click "Properties".

6) Scroll to the bottom of the connections list and single click on "Internet Protocol (TCP/IP)".

7) Click on "Properties".

8) Under the General tab, click the radio button that says "Use the following IP address".

9) Enter the IP address of "192.168.0.123".

10) Set the subnet mask to "255.255.255.0".

11) Click OK to accept the new changes, and then click OK again to exit the Network Connections screen.

12) Power cycle the master clock.

13) Open a web browser such as Internet Explorer or FireFox on a PC that's connected to the network.

14) In the address bar, type in the IP address (192.168.0.123) and press Enter. This will access the log-in screen.

![sapling logo]

The Sapling Company, Inc.   215.322.6063 P.
1633 Republic Road   215.322.8498 F.
Huntingdon Valley, PA 19006   www.sapling-inc.com

Web Browser Programming

Log In

Please Log In:

❶ Password: [   ]

❷ [Log In]   **❸** [Forgot Password]

Help page

---
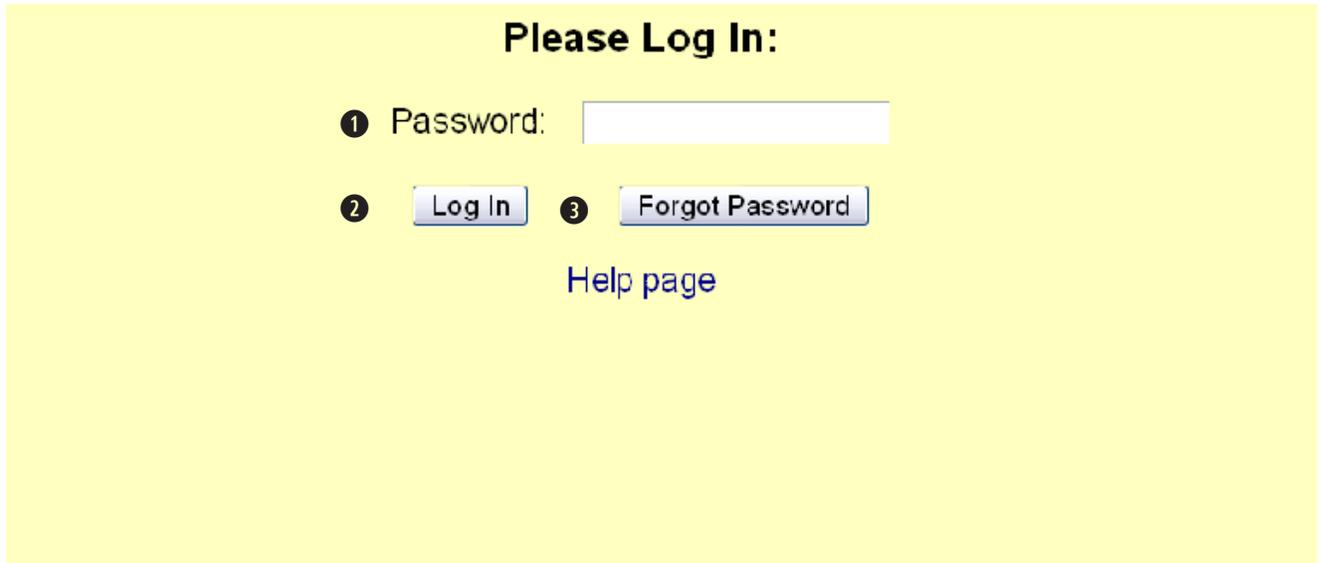
❶ Password   There are two levels of passwords that will enable the user to access features. The first level is the user level programming that includes features like setting the time, date, adding and editing events and schedule changes. The default password for the user level is 1111. It can be changed in the technician level. The technician level password is 6063 and gives you full access to all of the enabled features of the master clock.

❷ Log In   This button, when pressed, will attempt to log in to the master clock with the password that was entered in the field above.

❸ Forgot Password   This button, when pressed, will direct you to the tech support phone number.

After five minutes of inactivity once logged in, the master clock will automatically log the user out.

Web Browser Programming

Main Menu

① Technician Menu   This link will access the Technician Menu log-in page. The Technician Menu is password protected and has access to system settings, IP settings, as well as feature settings for the master clock.

② Time   This field is where the current time is displayed. The time can be edited by clicking within the field, and typing in the desired time. The time must be entered in 24 hour format (HH:MM:SS). After typing in the desired time, click the Submit button to set the time on the unit (if there is no input connected).

③ Date   This field is where the current date is displayed. The date can be edited by clicking within the field, and typing in the desired date. The date must be entered in mm/dd/yyyy format. After typing in the desired time, click the Submit button to set the date on the unit (if there is no input connected).

④ Submit   This button, when pressed, will submit the date and time shown on the screen to the master clock.

⑤ Log Out   This button, when pressed, will log the user out of the browser interface.

Web Browser Programming

Technician Level Menu

1   **System Settings**   This link, when clicked, will enter the System Settings pages. These pages include the user password, the RS485 data rate, setting the offset, the input selection, setting Clock #1 and Clock #2 sync-wire protocol outputs and resetting the unit back to manufacturer's default settings.

2   **IP Settings**   This link, when clicked, will enter the IP Settings pages. These pages include setting the IP address, gateway, subnet mask, DNS, DHCP configuration, setting the NTP servers, as well as displaying the status of the device.

3   **Feature Settings**   This link, when clicked, will enter the Feature Settings pages. These pages include setting the display format in 12 or 24 hour mode, enabling or disabling Daylight Savings Time and editing the standard durations for each zone.

4   **Database Maintenance**   This link, when clicked, will bring the user to the Database Maintenance section. This is where all of the events and schedules can be saved and backed up. Saved events and schedules can also be downloaded in this section.

5   **Diagnostic**   This drop-down list allows the user to send the appropriate diagnostics to the analog clocks via RS485 (SRM) or 2 wire digital communication (SAM). See the analog clock's manual for descriptions of each diagnostic.

6   **Duration**   This field is where the user can select how long (in minutes) that the user wants the diagnostic to display on the face of the clock.

7   **Start Diagnostic**   This button, when pressed, will start the selected diagnostic.

8   **Menu**   This button, when pressed, will bring the user back to the main menu.

Web Browser Programming

System Settings Page 1

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SYSTEM SETTINGS

Page 1

Main Clock Settings　　**Send RS485 Data Every:**

1 User Password: [   ]　　**2** Hr: [00]　Mn: [01]　Sc: [00]

3 Bias Seconds: [+0]
4 GMT Offset: [-5]
5 [Submit]　[Cancel] **6**

Page 1, 2

8 [Menu]

</div>

1 **User Password**　This field allows the user to enter a new password for the user level programming. The default is 1111.

2 **RS485 Data Rate**　These fields allow the user to set how often RS485 will be transmitted from the master clock.

3 **Bias Seconds**　This field allows the user to offset how many seconds off, plus or minus, the time will be when receiving an input. This field can range between 0 - 9999 seconds.

4 **GMT Offset**　This field sets the positive or negative offset for GMT time. For instance, eastern time zone is a negative five hour offset. See Fig 4.1 for typical offsets.
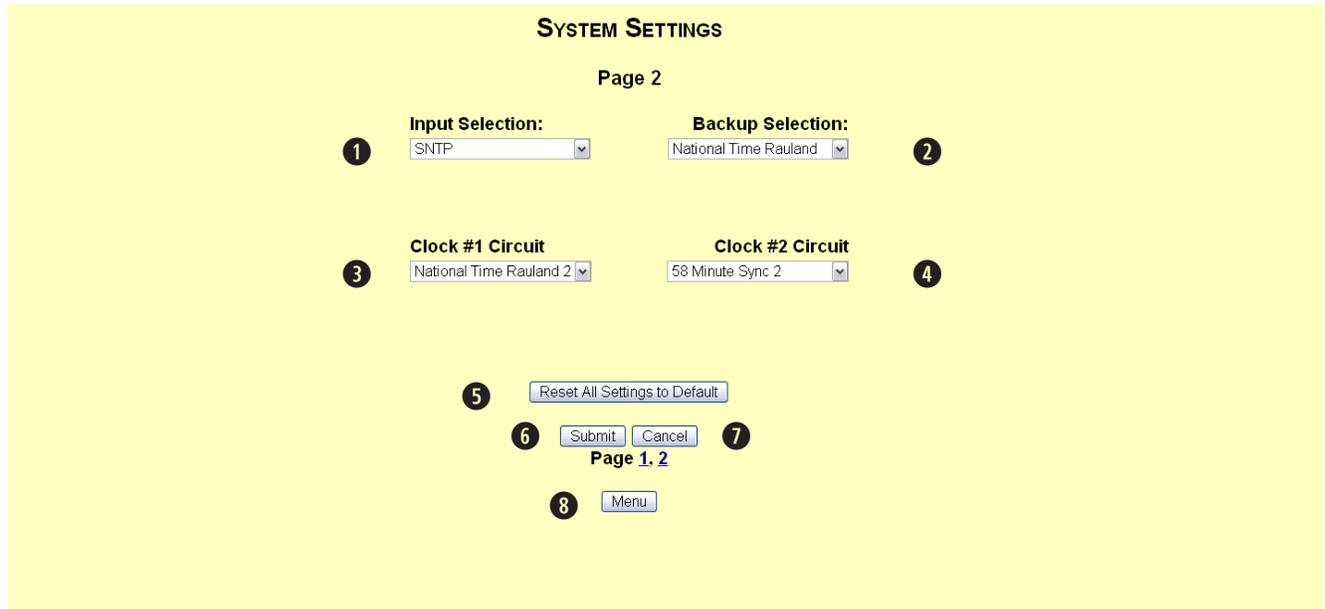
	Time in Greenwich	Local Time	Positive Offset	Negative Offset
Philadelphia (Eastern Standard Time)	12:00 p.m. (Noon)	7:00 a.m.	0	5
Chicago (Central Time)	12:00 p.m. (Noon)	6:00 a.m.	0	6
Denver (Mountain Time)	12:00 p.m. (Noon)	5:00 a.m.	0	7
Los Angeles (Pacific Time)	12:00 p.m. (Noon)	4:00 a.m.	0	8

Fig 4.1

6 **Submit**　This button, when pressed, will save any changes made on the page.

7 **Cancel**　This button, when pressed, will clear out any fields and not save any data.

8 **Menu**　This button, when pressed, will bring the user back to the main menu.

Web Browser Programming

System Settings Page 2

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SYSTEM SETTINGS

Page 2

Input Selection: **Backup Selection:**

❶ SNTP   ❷ National Time Rauland

Clock #1 Circuit   **Clock #2 Circuit**

❸ National Time Rauland 2   ❹ 58 Minute Sync 2

❺ [Reset All Settings to Default]

❻ [Submit] [Cancel] ❼

Page 1, 2

❽ [Menu]

</div>

❶ **Input Selection**   This drop-down list allows the user to select which input will control the master clock. The choices are:

- Real Time Clock
- GPS
- SNTP
- 59 Minute Sync

- 58 Minute Sync_1
- 58 Minute Sync_2
- 58 Minute Sync_3
- 58 Minute Sync_4

- National Time_Rauland
- Dukane Digital
- Rauland Digital
- Once a Day Pulse

- Wireless Repeater
- RS485

If Once a Day Pulse is selected, then fields for hours, minutes and seconds will appear. Enter the time (in 24 hour mode) that the clock is to go to when a once a day pulse is present. It must be a minimum of a two second pulse.

❷ **Backup Selection**   This drop-down list allows the user to select a backup input in case of the loss of the primary input. In order to use the Backup Selection, the following protocols cannot be used as both a primary and secondary input: 59 minute sync, 58 minute 1-4 sync, National Time/Rauland, Dukane Digital, Rauland Digital and once a day Pulse. An example of a configuration would be SNTP being the primary input and 58 minute correction being a secondary input.   Setting the primary source to 59 minute sync and the secondary source to Dukane digital would be an incorrect configuration.

❸ **Clock #1 Circuit**   This drop-down list allows the user to select the sync-wire output for the Clock #1 circuit. The choices are:

- 59 Minute Sync*
- 58 Minute Sync_1*
- 58 Minute Sync_2*

- 58 Minute Sync_3*
- 58 Minute Sync_4*
- National Time_Rauland_1*

- National Time_Rauland 2*
- Once a Day Pulse
- Rauland Digital

❹ **Clock #2 Circuit**   This drop-down list allows the user to select the sync-wire output for the Clock #2 circuit. See #3 above for the list of choices.

❺ **Reset All Setting to Default**   This button, when pressed, will revert all settings back to the default settings that were sent from the factory.

❻ **Submit**   This button, when pressed, will save all of the information to the master clock.

❼ **Cancel**   This button, when pressed, will clear out any changes made and will not save any data.

❽ **Menu**   This button, when pressed, will bring the user back to the main menu.

* See page 21 for protocol definitions

Web Browser Programming

IP Settings Page 1

① **Gateway IP Address**   This field allows the user to set the Gateway IP address for the master clock.

② **Subnet Mask**   This field allows the user set the Subnet Mask for the master clock.

③ **IP Address**   This field allows the user to set the IP address for the device.

④ **DNS Router**   This field allows the user to set the DNS Router address. The default address will typically work for most applications, however some modification may be needed for certain networks.

⑤ **DHCP**   This drop down list allows the user to turn DHCP on or off. DHCP allows the master clock to look for an IP address on its own if the network has a DHCP server.

⑥ **Device Name**   This field allows the user to name the device a unique name.

⑦ **Submit**   This button, when pressed, will save all of the information to the master clock.

⑧ **Cancel**   This button, when pressed, will clear out any changes made and will not save any data.

⑨ **Menu**   This button, when pressed, will bring the user back to the main menu.

Web Browser Programming
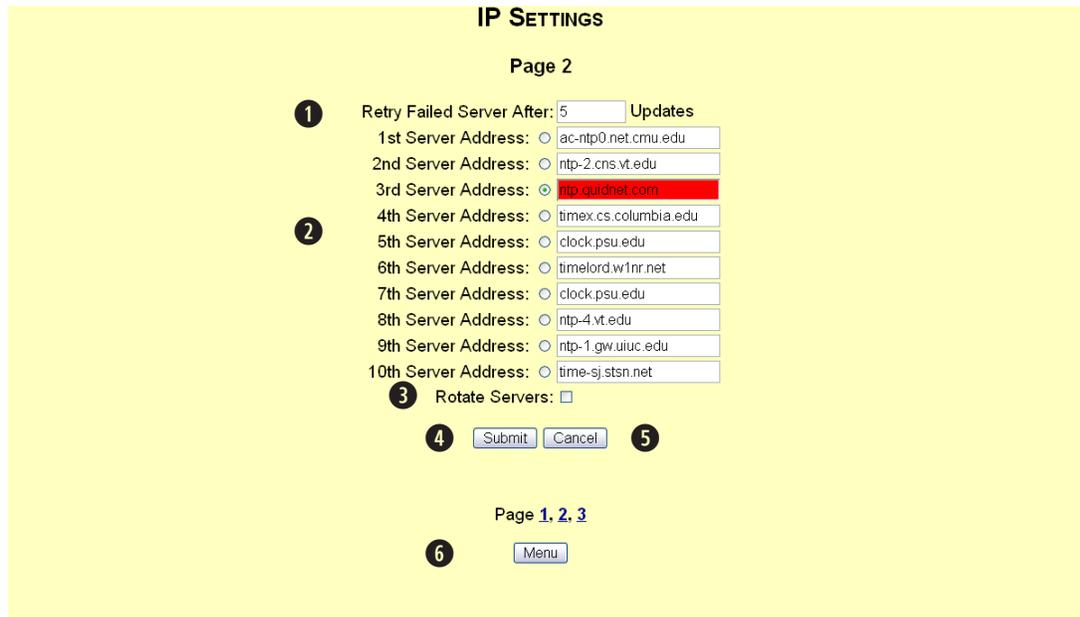
IP Settings Page 2

① **Retry Failed-Server After**   This field allows the user to specify how many times it will attempt to access the time from a server before it moves on to the next one.

② **Server Addresses**   This field allows the user to specify which NTP servers that the master clock will try to acquire time from. Any server that is highlighted in red is not functioning after several tries.

③ **Rotate Servers**   This checkbox, when checked, allows the master clock to rotate through all the server addresses for constant time accuracy on a continual basis. There must be two server addresses for this option to work.

④ **Submit**   This button, when pressed, will save all of the information to the master clock.

⑤ **Cancel**   This button, when pressed, will clear out any changes made and will not save any data.

⑥ **Menu**   This button, when pressed, will bring the user back to the main menu.

Web Browser Programming

IP Settings Page 3

IP SETTINGS

Page 3

Status

① **MAC Address :** 00:31:76:80:03:EF
② **IP Address :** 192.168.0.8
③ **Processor Serial Number :** 1007
④ **Software Build Date :** Jan 8 200915:30:41
⑤ **Device Name :** Sapling School
⑥ **Paid Provisioned Features :** (Web,8 Zones,GPS,SNTP Server,SNTP Client,Count Down)

Page **1, 2, 3**

⑦ [Menu]

① **MAC Address**   This displays the MAC address for the master clock.

② **IP Address**   This display the IP address for the master clock.

③ **Processor Serial Number**   The displays the serial number of the master clock.

④ **Software Build Date**   This displays the date the unit was built.

⑤ **Device Name**   This displays the device name for the master clock.

⑥ **Paid Provisioned Features**   This displays the options that are enabled on your device.

⑦ **Menu**   This button, when pressed, will bring the user back to the main menu.
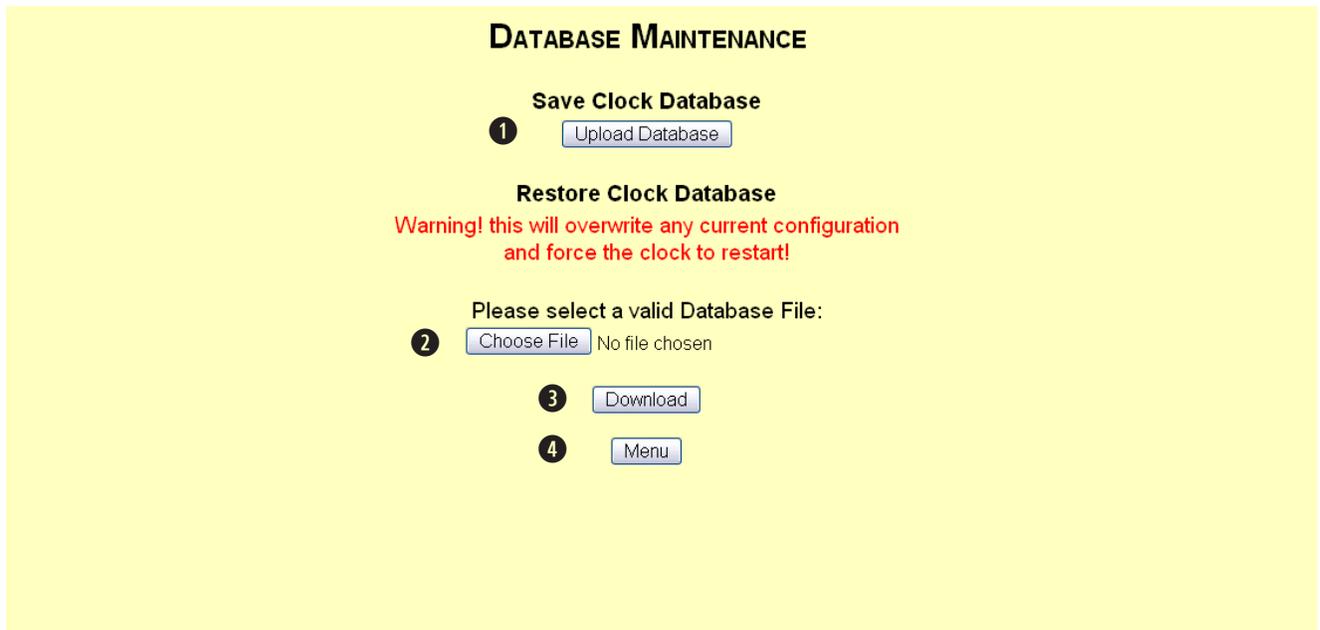
Web Browser Programming

Clock Features

① **Display Format**   This drop-down list allows the user to select whether they want 12 hour or 24 hour mode to be displayed on the LCD and LED.

② **Daylight Savings Time**   This drop-down list allows the user to select which daylight savings time option they want. The option can be disabled, pre-2007 and post-2007. Pre-2007 has the old-style daylight savings time format that was enacted prior to 2007. Post-2007 daylight savings time is the current, newer format that is followed today.

③ **Submit**   This button, when pressed, will save all of the information to the master clock.

④ **Cancel**   This button, when pressed, will clear out any changes made and will not save any data.

⑤ **Menu**   This button, when pressed, will bring the user back to the main menu.

The Sapling Company, Inc.
1633 Republic Road
Huntingdon Valley, PA 19006

215.322.6063 P.
215.322.8498 F.
www.sapling-inc.com

Web Browser Programming

Database Maintenance

① **Upload Database**   This button, when pressed, will upload the current schedules and events, and place it in a file for backup purposes.

② **Choose File**   This button, when pressed, will allow the user to browse for the saved .db file that contains the saved events and schedules.

③ **Download**   This button, when pressed, will download the selected file and reset the master clock with those events and schedules already configured.

④ **Menu**   This button, when pressed, will bring the user back to the main menu.

Support

Frequently Asked Questions

Does this master clock replace all of the existing master clocks made by Sapling?
The SMA Series will act as a direct replacement for the GPS, STR and SSM series master clocks. The SMA can have all the same functionalities of the aforementioned series depending on which options are ordered.

Can I use any SNTP server for downloading the time?
Yes, any site that sends out the SNTP protocol may be used as an input to the master clock.

What browsers are compatible with the SMA master clock browser?
The SMA browser is compatible with Microsoft Internet Explorer, Mozilla Firefox, Safari, Opera and Chrome.

Can I connect to the web browser through a cross-over cable?
Yes, the SMA can be accessed through a cross-over cable or via a LAN connection.

What is the maximum length I can go with the GPS cable?
When the GPS option is purchased, a 75 foot cable comes standard with the unit. This is Sapling's recommended longest distance.

Is there a Converter option like there was in the SSM and the GPS?
No, the Converter Box should be purchased separately from the unit when using a two wire digital communication system. The part number for the Converter Box is SCB-000-000-1.

What inputs can the SMA accept?
The SMA can accept an input from a SNTP server, 59 minute correction, four different versions of the 58 minute correction, National Time/Rauland, Dukane digital, Rauland digital, Sapling Wireless Repeater, Once a Day pulse, GPS and Sapling's RS485 protocol.

Support

Troubleshooting

The master clock will not power up. What do I do?
Make sure the power cord is securely connected to the power outlet and to the back of the SMA master clock. Upon being connected to power, the master clock should boot up instantly. There is not an on/off switch.

What do I do if I cannot connect to the browser?
Verify that the IP address your attempting to access is correct. If the IP address is correct, verify that there aren't any provisions in the firewall preventing you from accessing it. If all else fails, try connecting via a cross-over cable.

What do I do if the GPS isn't receiving a signal?
Check the antenna to make sure it is in an unobstructed area that is in complete view of the sky. Also, check to make sure the connections on each end of the cable are securely tightened. Lastly, verify that there are no kinks or breaks in the supplied GPS cable.

My sync-wire system doesn't seem to be getting the correct time. What should I do?
The clock 1 and clock 2 outputs control the sync-wire systems. Verify that the correct system is set for the designated clock circuit. Protocol details are listed on page 21.

Why didn't my SMA change for Daylight Savings Time?
A few things could cause the SMA not to change for Daylight Savings Time. The first item to check is the date to verify if it's correct. If the date is not correct, the clock will not change. If the date is correct, verify that the clock is set for the correct version of Daylight Savings Time. See page 15 for more information.