** Image presents one of many options to choose from; digital or analog clocks are available in a variety of design styles*

SAPLING WIRED SYSTEM

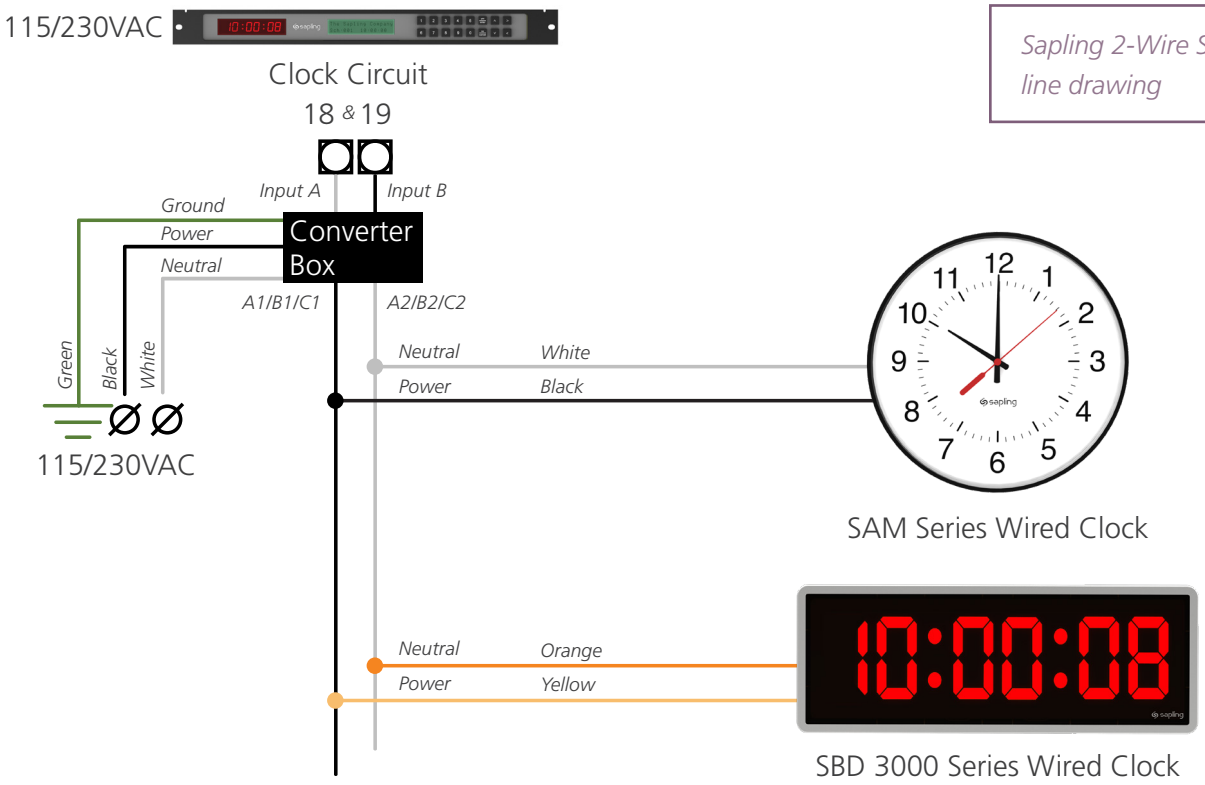
Sapling 2-Wire System

DESCRIPTION

The Sapling 2-Wire System is one of the most innovative and advanced wired systems in the synchronized time industry. It starts with the SMA Series Master Clock sending time data to a Converter Box. The Converter Box is powered locally at 110-240VAC and has two functions: it reduces the voltage to provide 24 volt power to the secondary clocks, and it sends the time data every second over the same pair of electrical wires.

Sophisticated in design and functionality, the system is simple to install and involves no regular maintenance. Both analog and digital clocks may be installed on the same run. Since there is no limit to the number of Converter Boxes that can be added to the system, the Sapling 2-Wire Clock System can serve anything from a small facility with 20 clocks to mega projects with 5,000 clocks or more.

The Sapling Master Clock can provide time data to a 2-Wire System and most third-party sync-wired systems **simultaneously**, allowing a seamless upgrade or transition to the cutting-edge Sapling solution.



Sapling 2-Wire System simple line drawing

Sapling 2-Wire System Advantages

Instant Correction - Once-a-second correction signal ensures that the 2-Wire System is always on time.

Power and Data on the Same Wires - The system integrates the power and time data on the same two electrical wires, eliminating the need for a third wire and saving time during installation.

Low Voltage - Since the clocks are powered by 24V, in most countries there is no need for a certified electrician to install the clocks or follow strict high voltage wiring regulations

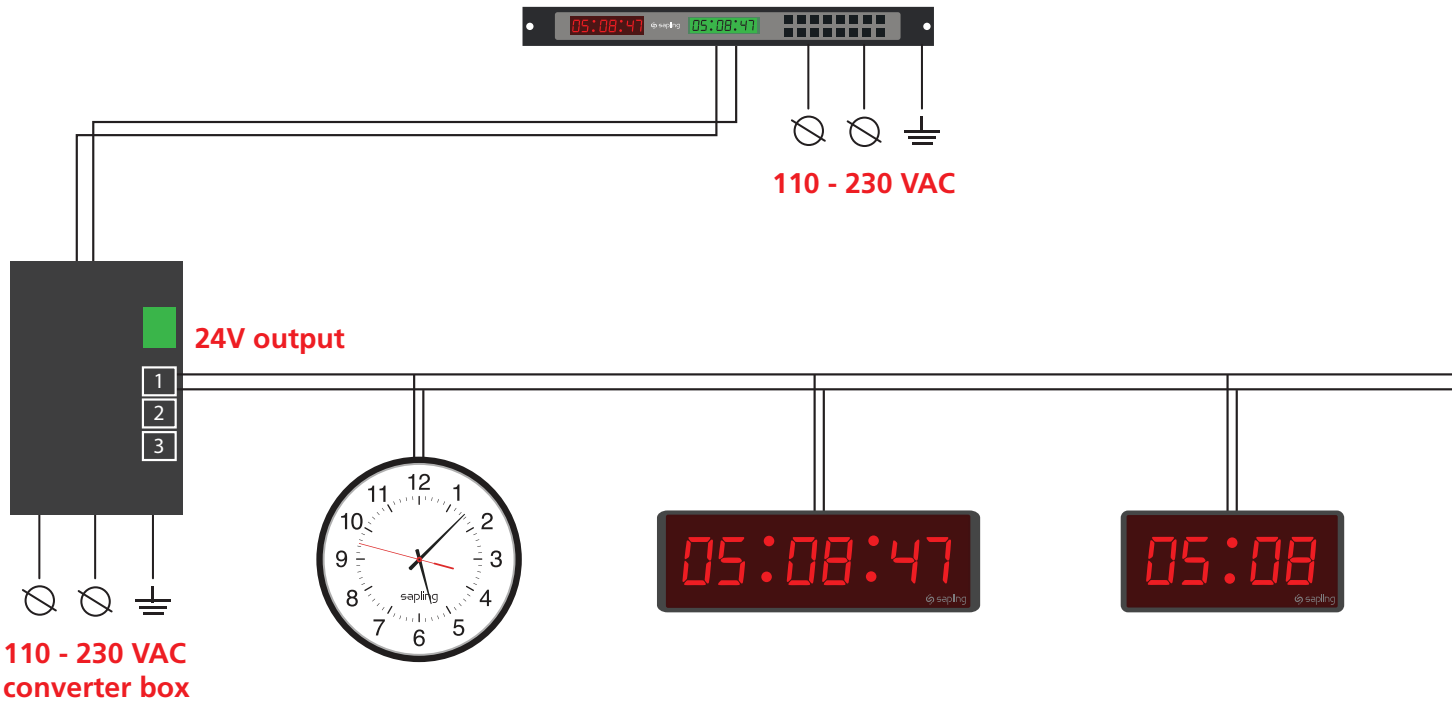
Worry-Free Installation - Clocks feature a unique automatic polarity detection feature, allowing the clock to correct itself if wiring errors occur during installation. Even if the wires are installed incorrectly, the clock will automatically detect the wrong polarity and reverse it, allowing the clock to function properly.

Reliability - The Sapling 2-Wire System is designed to run in parallel and does not rely on getting power or data from any other clock. If one clock has a problem, only that single clock will have the issue and all other clocks in the system will still continue to operate normally.

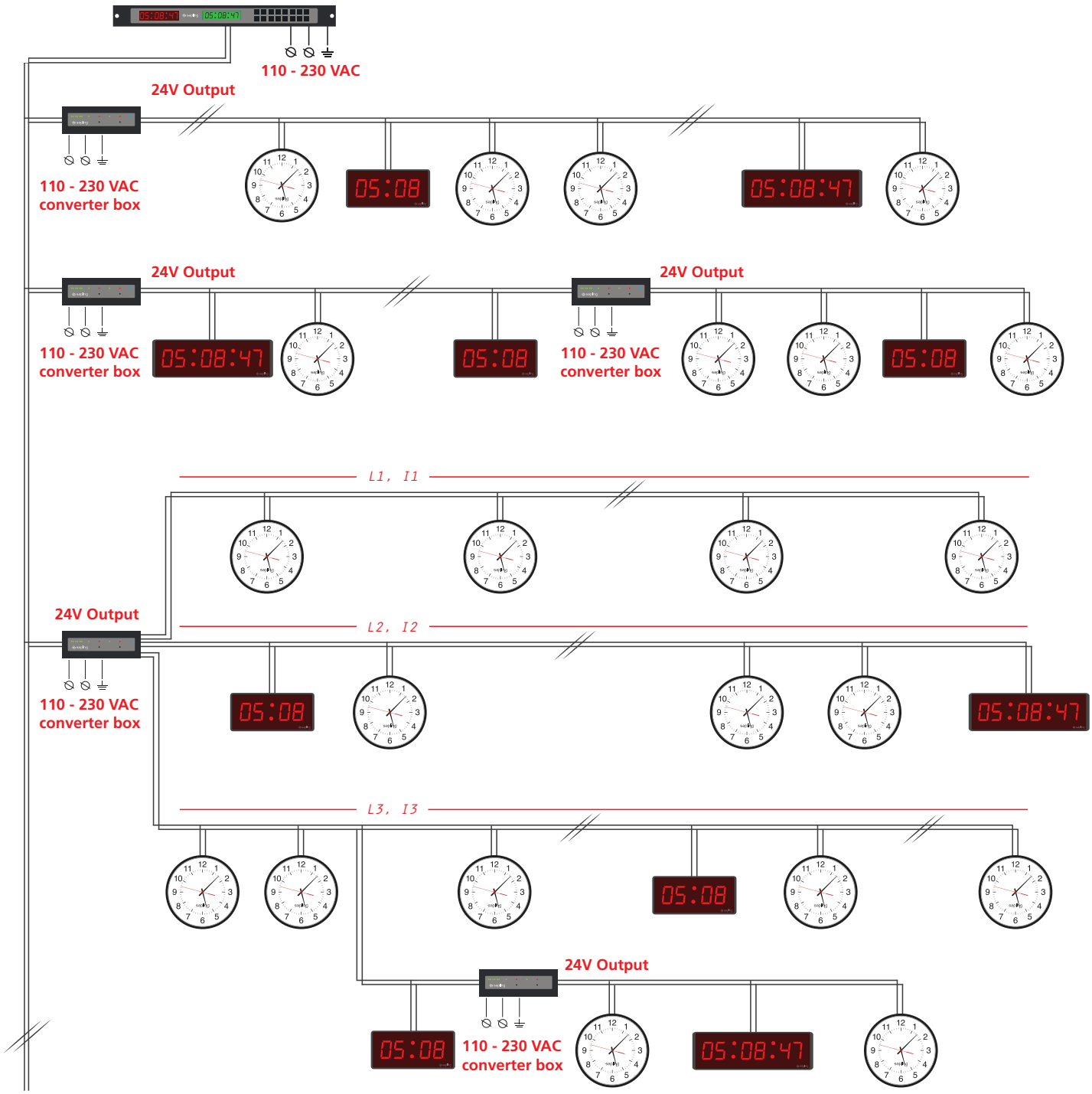
Safety Standard Compliance - Sapling Master Clocks, the Converter Box, and secondary clocks are designed to meet strict international safety standards and are (c)UL listed.

Advanced Master Clock - The Sapling Master Clock comes with a built-in web interface to allow easy access and easy setup from any computer in the facility via LAN.

2-Wire System - One Run Line Drawing



2-Wire System - Multiple Runs Line Drawing



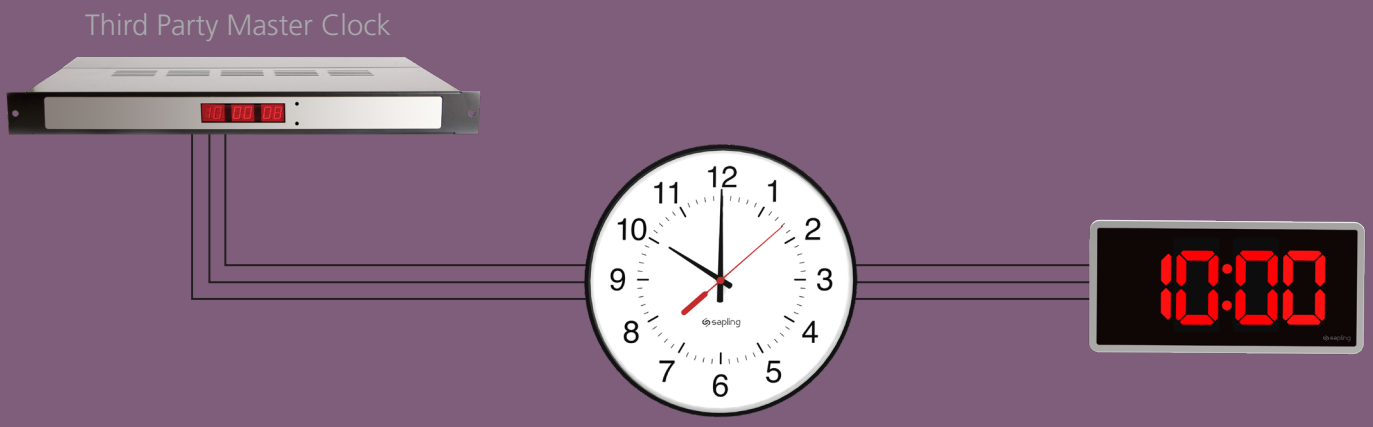
Sapling Sync-Wire System

DESCRIPTION

Sync-Wire Systems were popular for many years, before new technologies became available. As such, many facilities still have Sync-Wire Systems. In a Sync-Wire System, the secondary clocks receive an hourly time correction from the master clock that synchronizes the minute and second, while the hour is corrected twice a day, so the entire clock system is fully synchronized once every 12 hours. Providing maximum adaptability, Sapling Clocks are compatible with many sync-wire protocols and can be powered using either 24V, 110 VAC, or 230 VAC.

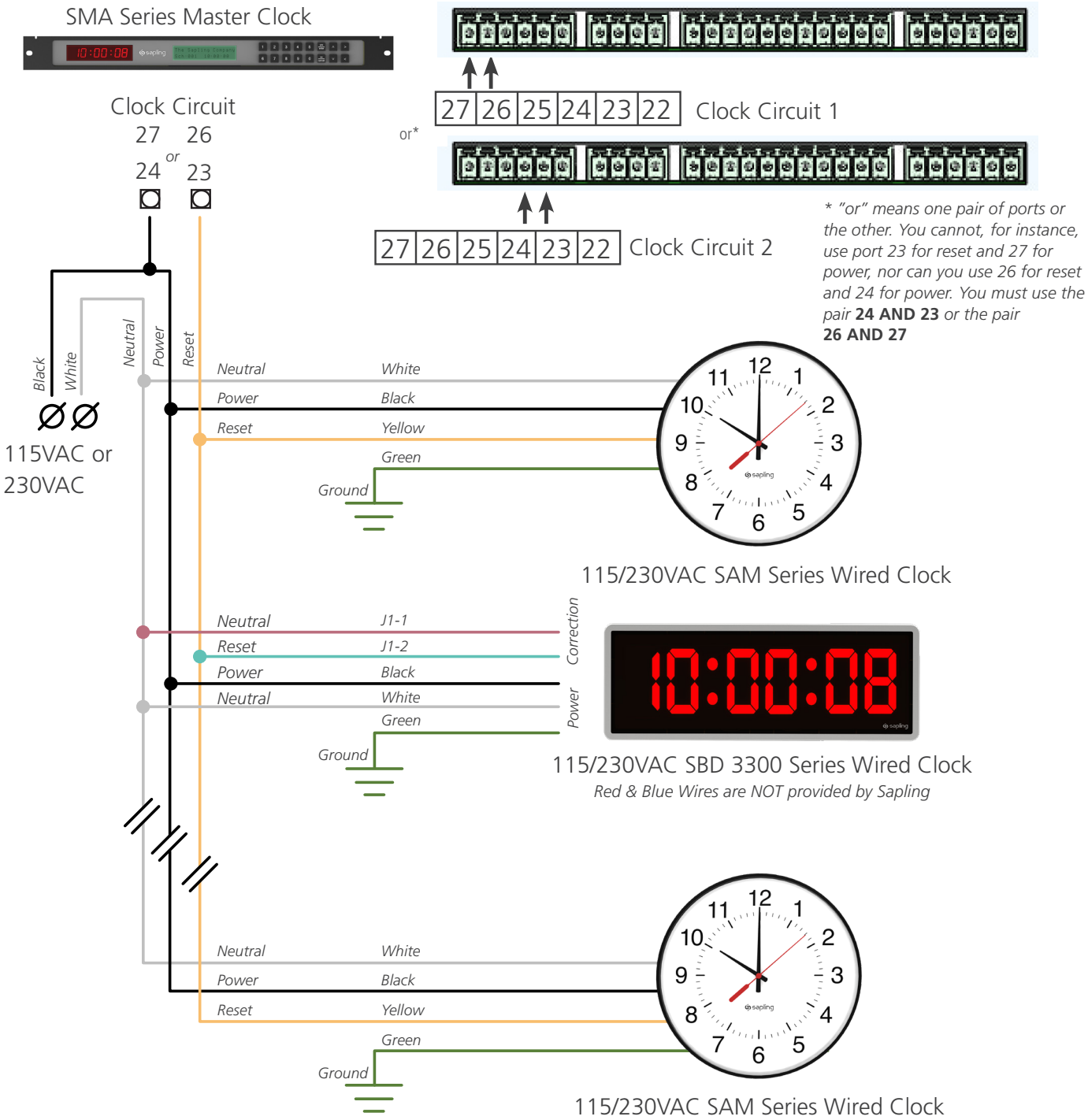
A typical Sapling Sync-Wire System begins with a Sapling Master Clock, which provides the time data to Sapling Secondary Clocks. A Sapling Master Clock may also correct third-party sync-wire clocks, and Sapling SAM and SBD series wired clocks may be corrected by third-party master clocks, depending on the supported sync-wire protocols. In addition, Sapling Master Clocks are capable of synchronizing both Sapling Clocks and third-party sync-wire clocks at the same time.

Supremely flexible, the Sync-Wire System is ideal for retrofitting old facilities and correcting older or third party Sync-Wire Systems.



Shown above is a third Party Master Clock providing sync wire correction to Sapling SAM Analog Clocks and Sapling SBD 3300 digital clocks.

Sync-Wire System Line Drawing



Sapling Sync-Wire System Advantages

Automatic Protocol Detection - There is no need to preprogram the SAM clock for a specific time protocol. Sapling SAM Analog Clocks are capable of recognizing Sapling 2-Wire System time protocol as well as sync-wire 59 minute correction, most 58 minute corrections, and even National Time/Rauland correction.

Flexible Voltage Options - Sync-Wire Clocks can run on 24 VAC/VDC, 110 VAC, or 230 VAC, giving you maximum flexibility, whereas within the **2-Wire System** they run on 24 volts provided by the Sapling Converter Box.

Interfaces with Other Systems - Sapling Master Clocks, SAM series analog clocks, and SBD 3300 digital clocks are capable of interfacing with other existing systems and protocols, making Sapling Clocks a perfect choice for retrofitting old systems.

Safety Standard Compliance - Sapling Master Clocks and wired secondary clocks are designed to meet strict international safety standards and are (c)UL listed.

Advanced Master Clock - The Sapling Master Clock comes with a built-in web interface to allow easy access and easy setup from any computer in the facility via LAN.

SAM Analog

Sapling Wired Analog Clocks incorporate multi-functional software, as well as a microprocessor based movement and a real-time internal clock. The clocks include automatic calibration and time protocol detection, as well as enhanced diagnostic functionalities such as reset, sync now, find hands, and more.

FEATURES

- Available in Round or Square Shape
  - Round Clocks are available in: 9", 12", and 16" dial sizes
  - Square Clocks are available in: 9" and 12" dial sizes
- Offered in a low-profile metal or SlimLine ABS case
  - Optional Cherry Wood finish or Brushed Aluminum finish for round clocks
- Offered in 24/110VAC, 230VAC, and 24VAC/VDC models
- Provided with mounting hardware for easy installation
- Hour, minute, and second hands
- Quick correction for time change (max. 5 minutes minutes when used with digital communication protocol)
- Microprocessor based movement
- Side molded, polycarbonate crystal

HIGHLIGHTS

- Automatically recognizes many wired time data protocols:
  - 2-wire digital communication system (24V clock only)
  - 3-wire digital communication system
  - Sync-wire 59 minute correction
  - Various sync-wire 58 minute corrections
  - National Time/Rauland correction
- Correctly interprets time data protocols even if the signal wire polarity is switched
- Built–in self-diagnostic mode:
  - Communication Protocol Verification
  - Time since the last synchronization signal was received
  - Hand position error detection
- Custom Color Cases available (minimum order quantity 25)
- Designed and Produced by Sapling in Pennsylvania, United States of America

SBD Digital

Sapling Wired Digital Clocks are available with a bright red, white, green, or amber display. They incorporate microprocessor based functionality and an integrated real-time clock. All clocks feature an elegant and stylish design and are offered in different sizes with four (00:00) or six (00:00:00) digits.

FEATURES

- Available with 2.5" (6.35 cm) digits or 4.0" (10.16 cm) digits; 4 digit display or 6 digit display
- Red display standard; optional White, Green, or Amber displays
- Adjustable bright LED display (high, medium, low, off)
- 12 or 24 hour display
- Multiple power options
  - SBD 3100 offered at 24V only
  - SBD 3200 & 3300 offered at 24V, 110VAC, 230VAC
- Provided with mounting hardware for easy installation
- Immediate correction for time change when used with 2-Wire Digital Communication or RS485 input
- Microprocessor based clock
- Three models (3100, 3200, and 3300) with additional capabilities for higher models
- SBD 3100 supports 2-Wire Digital Communication Time Protocol (higher models support additional protocols)

HIGHLIGHTS

- Programmable brightness levels
- Ten year battery backup for internal real-time clock and clock settings
- The clock features time loss notification by flashing the colon
- "BELL" and "FirE" messaging capabilities
- Capable of receiving pre-scheduled countdown command from the SMA Master Clock (optional SMA function)
- Analog and digital clocks can be mixed on the same line
- Alternating time/date display in U.S. format (MM:DD:YY)
- Designed and Produced by Sapling Inc. in Pennsylvania, United States of America

ADDITIONAL 3200 MODEL HIGHLIGHTS

- Includes all of the SBD 3100 model's capabilities
- Capable of interfacing with:
  - Sapling's Elapsed Timer Control Panel (SBD-ELT-001-0)
  - Temperature Sensor (SBD-TEMP-000-0)
  - USB Programming Cable (D-USB485-INTF-1) for additional settings
- Alternating time/date display in international date format (DD:MM:YY) set using USB Programming Cable
- Brightness scheduling capabilities when using USB Programming Cable
- Can receive Sapling RS485 protocol

ADDITIONAL 3300 MODEL HIGHLIGHTS

- Includes all of the SBD 3100 and 3200 models' capabilities
- Easy programming with two front push buttons
- Can interface with a third party system via a contact closure such as nurse call system that can automatically trigger the elapsed timer
- Can interface with a Sapling Buzzer accessory (A-BUZZ-3300-1) when the Sapling Elapsed Timer reaches 00:00:00
- Can interface with 3 wire sync protocols
- Supports 59 minute, various 58 minute, and National Time/Rauland sync-wire inputs and Once A Day closure (in addition to Sapling RS485 Time Protocol input and output and 2-Wire Digital Communication Time Protocol)

SMA Series Master Clock

The SMA 2000 Series is our standard master clock model with a front LED display and two push buttons for basic system programming. The SMA 3000 Series comes with a front LED and LCD display as well as a keypad to allow for advanced programming. The SMA 3000 model may also be offered with four or eight programmable relays (zones) to control third party systems via a contact closure (such as a school bell system).

All of Sapling's Master Clocks come with a built-in web interface to allow easy setup and programming from any computer in the facility via LAN. By default, the master clock receives the time data from third party NTP servers via the internet. The master clock is also offered with an optional GPS receiver as an additional source for receiving accurate time. In addition, the master clock has a built-in real-time clock and can send an email alert when communication with the accurate time source(s) is lost.

STANDARD FEATURES

- Available in rack or wall mount housing
- LED display for a clear, accurate read out
- Backlit LCD display (3000 model only)
- Two buttons for programming (2000 model) or 2 x 8 rubber button keyboard for easy programming (3000 model only)
- Intuitive built-in web interface allows the system admin to configure all settings of the Master Clock easily from the convenience of any computer on the same network
- RJ45 input for web interface access and synchronization to any SNTP/NTP server
- Ability to store up to 10 different NTP server IP addresses or domain names for continuous accurate time and redundancy
- Automatically switches from one accurate time source to another in case of a communication failure
- Blinking LED on master clock front panel to visually indicate a communication failure with the NTP server or GPS time source
- The master clock can be programmed to send an email alert when communication with the accurate time source has failed, when the master clock has been rebooted, when the fire alarm in the facility has been activated (if applicable), and more
- Can control wired clock systems, wireless clock systems (when equipped with transmitter), and provide the time to IP clocks simultaneously
- May synchronize third party wired clock systems
  - Supports 59 minute, various 58 minute, National Time/Rauland, and Rauland Digital sync-wire outputs and Once A Day Pulse

- 12 or 24 hour display
- Automatic, fully customizable Daylight Saving Time updates, if applicable
- Selectable UTC/GMT offset
- Bias seconds option – offsetting the master clock to adjust the time plus or minus a few seconds or minutes to fit the application, while it is still receiving accurate time input
- DHCP Capable
- Proprietary RS485 input and output for time synchronization
- Microprocessor based
- Ten year battery backup for keeping time and master clock settings in the event of a power outage

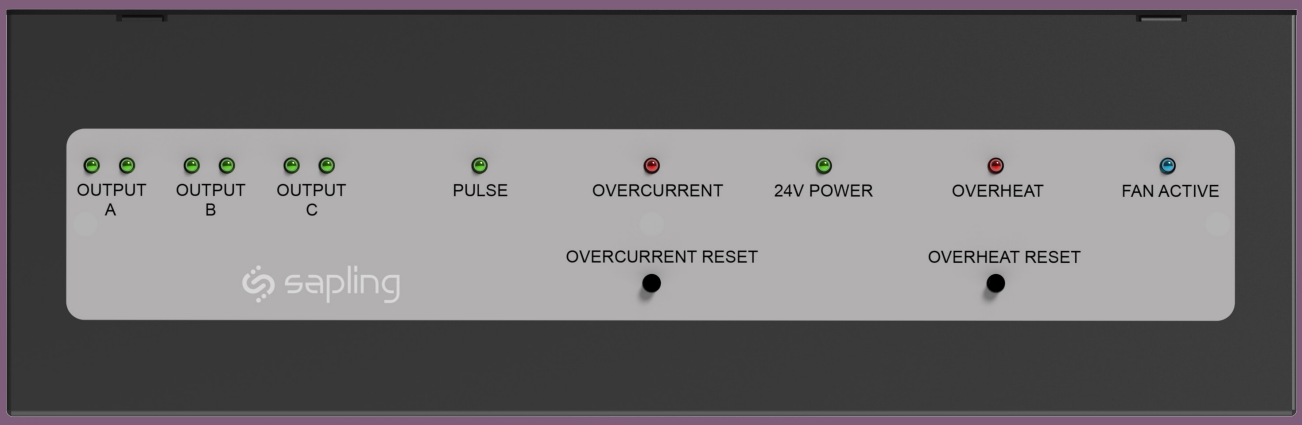
OPTIONAL FEATURES

- GPS input for accurate time synchronization
- NTP server upgrade
- Four or eight configurable auxiliary relays which control other systems by closing a relay at predetermined times (3000 model only)
  - 255 schedule (group of events) and 800 event capabilities (such as triggering bells)
  - Two programmable closure durations per relay
- Transmitter to provide time correction to a Wireless or TalkBack Wireless System
- Prescheduled countdown feature
  - The master clock sends a countdown command to all digital clocks at a predetermined time. When choosing this option, at least four programmable relays (zones) are required (3000 model only).

Accessories

Sapling offers different accessories to accommodate various project needs. These include:

- Converter Box
  - Converts RS485 time data from the Sapling Master Clock to 2-Wire Digital Communication Protocol
  - Transforms local power (110 VAC/230 VAC) to 24 Volts
  - Provides both time data and 24 Volt power to secondary clocks over two wires
  - Three outputs with a total capacity of 5.5 amps, ± 24 volts
  - Protects against overloading and shorts, as well as preventing damage from overheating
  - Diagnostic LEDs relay operating status
  - Quiet operation
  - Simple Installation
- Elapsed Timer Control Panel (can interface with 3200 and 3300 models)
- Buzzer Accessory (can interface with 3300 model)
- Temperature Sensor (can interface with 3200 and 3300 models)
- Wire Guards
- Clear Protective Covers
- Flag Mount and Double Mount Housing
- USB Programming Cable (can interface with 3200 and 3300 models)



Shown above is a Sapling Converter Box which provides both time and power to all secondary clocks in the system

About Us

The Sapling Company is a global leader in engineering and manufacturing advanced synchronized clock systems. We have earned a reputation both in the USA and international markets for our superior technology, quality and reliability. For more information about Sapling Synchronized Clock Systems and the Time Zone Clock, please visit our website: www.sapling-inc.com

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Sapling

a global leader in engineering & manufacturing quality synchronized clock systems since 1993

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Synchronized Clock Systems