Sapling Time Zone Clock

The Time Zone Clock shall be a Sapling Time Zone Clock, which is available in IP-based, Wireless, or 2-Wire Digital Communication.

The Sapling Zone Clock Mounting Assembly shall be designed to be used with any Sapling digital or analog clock shape. It shall support a minimum of three and a maximum of seven clocks, depending on the clock size. The Mounting Assembly shall be mounted to a pair of standard double gang boxes. The Mounting Assembly shall include an attachable metal name plate for each clock. Each name plate shall include a custom-printed label which shall contain the name of a city, state/province, or country. The Assembly shall be designed to work with clocks that communicate using Sapling encrypted IP protocol, Sapling Wireless protocol, Sapling 2-Wire Digital protocol, or (S)NTP protocol.

IP Time Zone Clock Requirements

The IP Time Zone Clock shall feature Sapling analog IP (SAP series) and/or Sapling digital IP clocks (SBP series) that are PoE (Power over Ethernet) powered and can take the time data from any (S)NTP server via LAN and internet. If internet is not reliable in the facility, the IP Time Zone Clock shall include a Sapling Master Clock with a GPS receiver. The IP clocks shall come pre-programmed with the IP addresses of 10 free third-party (S)NTP servers from which they can take the time data, with these addresses being user-changeable as desired. The IP clocks shall be capable of taking the time from 10 (S)NTP servers to ensure maximum redundancy. The IP clocks shall come equipped with a built-in web interface allowing the user to change the clocks' settings, including the UTC/GMT offset, from any computer connected to the same LAN. The IP Clocks shall be compatible with Sapling's IP Monitoring Software, allowing the user to monitor the entire IP clock system and make system-wide changes as needed.

IP Secondary Time Zone Clocks

A.   Analog Clocks: Compliant to UL and cUL, designed for IP (PoE) system with fully automatic plug and play capability.
  1. Ensure secondary clock is capable of receiving NTP protocol through CAT5 or CAT6:
  2. Clock display: 12 or 24 hour dial with white face with black numbers or as needed per the project application.
      a. Size: Round 12.90 inches (32.7 cm) diameter, Round 16.70 inches (42.3 cm) diameter, Square 9.79 inches (24.9 cm), or Square 12.76 inches (32.4 cm) as per the project application.
  3. Built-in Web Interface includes features such as:
      a. Password protected interface. Open access is unacceptable;
      b. Naming of the clock;
      c. Selecting time interval clock receives NTP time;
      d. Bias seconds configuration for altering correct time +/- 9999 seconds;
      e. Setting GMT offset for time zone configuration;
      f. Built-in diagnostic mode;

      g.   Select all IP settings;

      h.   DHCP capability;

      i.   Server redundancy capability. Up to 10 servers can be used as backup in case of failure.

      j.   Domestic and International Daylight Saving Time capability;

      k.   E-mail alerts for situations as follow:

          1) If NTP synchronization received is larger than specified interval.

          2) If time sync received is larger than specified interval.

          3) If clock has been reset.

4. Materials:

      a.   Dial: Polystyrene

      b.   Case: Low profile reinforced ABS with an optional brushed aluminum finish as per the project application.

      c.   Crystal: Shatter-proof, side-molded, polycarbonate.

5. Hand tolerance:

      a.   Hour and minute hands: ± 1/4 minute.

      b.   Second hand: ± 1/2 minute.

6. Power Requirements: Power over Ethernet (PoE), 48 V DC.

7. Basis of design: Sapling Inc., SAP Series Clock.

B. Digital Clocks: Compliant to UL and cUL, designed for IP (PoE) system with fully automatic plug and play capability.

1. Display: High-efficiency red LED numeral display with 4 or 6 digits as per the project application.

      a.   Display size: 2.5 inches (6.35 cm) or 4.0 inches (10.16 cm) as per the project application.

      b.   Format: 12 or 24 hour user changeable.

      c.   Brightness: Ensure display has four level of brightness adjustment.

      d.   Bezel:

          1) Smooth Surface, red colored.

          2) Bezel size: 4.69 inches (11.91 cm) x 10.31 inches (26.19 cm); 6.75 inches (17.15 cm) x 13.31 inches (33.81 cm); 4.69 inches (11.91 cm) x 13.56 inches (34.44 cm); or 6.75 inches (17.15 cm) x 18.31 inches (46.51 cm) as per the project application.

          3) Visibility: 100 feet (30.48 meters) or 250 feet (76.20 meters) minimum depending on the clock size selected.

      e.   Alternating Time/Date functionality.

2. Power Requirements: Power over Ethernet (PoE), 48 V DC.

3. Clock mounting: ABS surface mount housing

4. Built-in Web Interface includes feature options as follow:

      a.   Password protected interface. Open access is unacceptable;

      b.   Naming of the clock;

      c.   Selecting time interval clock receives NTP time;

      d.   Bias seconds configuration for altering correct time +/- 9999 seconds;

      e.   Setting GMT offset for time zone configuration;

      f.   12/24 hour mode;

The Sapling Company, Inc.

670 Louis Drive

Warminster, PA 18974

U.S.A.

Tel. +1.215.322.6063

Fax. +1.215.322.8498

www.sapling-inc.com

g. Select all IP settings;
h. DHCP capability;
i. Server redundancy capability. Up to 10 servers can be used as backup in case of failure.
j. Domestic and International Daylight Saving Time capability;
k. E-mail alerts for situations as follow:
    1) If NTP synchronization received is larger than specified interval
    2) If time sync received is larger than specified interval
    3) If clock has been reset
    4) If count up has been activated
    5) If countdown has been activated.
        a) Alternating time/date functionality
a. Four levels of brightness;
b. American (MM:DD:YY) or European (DD:MM:YY) date format
c. Brightness scheduling capability:
    1) Ensure clock is capable of changing brightness level two times throughout day
    2) Ensure clock brightness is selectable for four settings: Off, Low, Medium, and High.
5. Basis of design: Sapling Inc., SBP 3100 Series Digital Clock.

Master clock

For an IP Time Zone Clock, a master clock will not be required so long as internet is reliable in the facility. Should the facility's internet be deemed unreliable, the IP Time Zone Clock shall include a Sapling Master Clock with a GPS receiver as per the below standards. For a Wireless Time Zone Clock, the master clock shall be a Sapling Master Clock including a wireless transmitter operating on either the 900 MHz or 2.4 GHz frequency range, depending on the type of transmitter ordered, as per the below standards. For a 2-Wire Digital Communication Time Zone Clock, the master clock shall be a Sapling Master Clock which shall provide the time data to a converter box. The master clock shall adhere to the following standards:

A. Master Clock: Compliant to UL and cUL 863.

1. Ensure master clock includes 10 pre-programmed (S)NTP backup addresses for redundancy.

2. Ensure master clock is capable of acting as (S)NTP server which other devices can point to receive time through (S)NTP protocol if needed as per the project application.

3. Ensure master clock is capable of receiving (S)NTP time signal via Ethernet.

4. Ensure master clock is capable of receiving and outputting digital signals through RS485 connection.

5. Ensure master clock is capable of correcting secondary clocks for Daylight Saving Time

6. Ensure master clock is capable of customizing Daylight Saving Time, in the event of international use or a change in government regulations.

7. Ensure master clock has two clock circuits capable of outputting signals including:

    a. 59 minute correction;

    b. 58 minute correction;

    c. National Time or Rauland correction;

    d. Once a day pulse;

    e. Rauland digital correction.

8. Communications Interface: Ensure master clock system is capable of being programmed remotely through online interface accessible through LAN and compatible with Microsoft Internet Explorer and Mozilla Firefox web browsers.

    a. Ensure interface includes functions as follows:

        2) Allow users to schedule bells and other events;

        3) Display features;

        4) Show IP settings;

        5) Show other master clock settings;

        6) Set time and date;

        7) Download or upload master clock settings;

        8) Configure e-mail alerts for various instances.

9. Display: Two row, 20 character LED and backlit LED display and 2 x 8 inch rubber keypad for operator programming.

10. <u>Optional relays</u>: Depending on the application's needs, the master clock shall include 0, 4, or 8 programmable relays, which can control other systems via a contact closure.

    d. Allow for programming of master clock through 16-button rubber tactile keypad or built-in web interface.

    e. Ensure master clock can contain up to 800 events.

    f. Ensure master clock can contain up to 255 schedule changes.

    g. Ensure system is capable of interfacing with GPS, Internet and intranet systems.

11. If needed as per the project application, a Wireless Clock System shall include: Wireless with transmitter to FCC, Part 15.

    a. Transmitter: Capable of transmitting data to SAL(G) wireless analog and SBL(G) wireless digital clocks, and receiving signal from (S)NTP time server.

        1) Transmitter shall be capable of transmitting the time data on either the 900 MHz or 2.4 GHz frequency range as needed per the project location.

12. Power Requirements: 110 VAC, 50/60 Hz; or 230 VAC, 50/60 Hz.

     a. Ensure master clock is capable of 10 years battery to save system settings in event of power failure.

13. GPS: Built-in GPS receiver capable of receiving synchronization signal from satellites with roof mounted antennae and connected with 75 foot long cable with options for 150 or 300 foot cable.

14. Basis of design: Sapling Inc., SMA 3000 Series Master Clock.

Wireless Time Zone Clock Requirements

The Wireless Time Zone Clock shall feature SAL(G)* series Sapling analog wireless clocks and/or SBL(G)** series Sapling digital wireless clocks. Analog clocks shall be battery powered, powered at 24 Volts, powered at 110 VAC, or powered at 230 VAC subject to the application's needs. The master clock shall be a Sapling Master Clock equipped with a transmitter and provide the time data to the secondary clocks utilizing the 900 MHz or 2.4 GHz frequency range depending on the type of transmitter ordered. All clocks shall be compatible with Sapling Wireless Protocol. The secondary clocks shall utilize frequency-hopping technology to both receive and retransmit the time data on the 900 MHz or 2.4 GHz frequency range depending on the type of transmitter ordered. Analog and digital clocks shall automatically correct themselves upon receipt of time data.

*(G) is used for 2.4GHz models, in which case the model code is SALG. In 900MHz models, the model name is SAL.

**(G) is used for 2.4GHz models, in which case the model code is SBLG. In 900MHz models, the model name is SBL.

Wireless Secondary Time Zone Clocks

A. Analog Clocks: Compliant to UL and cUL 863, designed for wireless system with fully automatic plug and play capability.
1. Ensure secondary clock is capable of receiving wireless signals from master clock.
    a. Operation frequency range: 915 – 928 MHz or 2.4 – 2.5 GHz frequency-hopping technology, depending on the type of transmitter selected.
2. Ensure each secondary clock works as an RF signal repeater, establishing a Mesh Network.
3. Clock display: 12 or 24 hour dial with white face with black numbers or as needed per the project application.
    a. Size: Round 12.90 inches (32.7 cm) diameter, Round 16.70 inches (42.3 cm) diameter, Square 9.79 inches (24.9 cm), or Square 12.76 inches (32.4 cm) as per the project application.
4. Ensure analog secondary clock is capable of receiving Sapling wireless signals every two (2) or four (4) hours for battery models and every minute for 24 Volt/110 VAC and 230 VAC models.
5. Materials:
    a. Dial: Polystyrene
    b. Case: Low profile reinforced ABS with an optional brushed aluminum finish as per the project application.
    c. Crystal: Shatter-proof, side-molded, polycarbonate.

The Sapling Company, Inc.
670 Louis Drive
Warminster, PA 18974
U.S.A.

Tel. +1.215.322.6063
Fax. +1.215.322.8498
www.sapling-inc.com

6.   Hand tolerance:
   a. Hour and minute hands: ±1/4 minute.
   b. Second hand: ± 1/2 minute.
7. Power Requirements: Battery operated; 24 V/110 VAC, 50/60 Hz; or 230 VAC, 50/60 Hz.
   a. Batteries: 2 "D" cell batteries.
      1) Basis for design: Duracell Procell "D" Cell batteries.
8. Basis of design: Sapling Inc., SAL-2 Series Wireless Round Clock and SAL-2 Series Wireless Square Clock.

B. Digital Clocks: Compliant to UL and cUL 863, designed for wireless system.
   1. Ensure secondary clock is capable of receiving wireless signals from master clock.
      a. Operation frequency range: 915 – 928 MHz or 2.4 – 2.5 GHz frequency-hopping technology, depending on the type of transmitter selected.
   2. Ensure each secondary clock works as an RF signal repeater, establishing a Mesh Network.
   3. Display: High-efficiency red LED numeral display with 4 or 6 digits as per the project application.
      a. Display size: 2.5 inches (6.35 cm) or 4.0 inches (10.16 cm) as per the project application.
      b. Format: 12 or 24 hour user changeable.
      c. Brightness: Ensure display has four levels of brightness adjustment.
      d. Bezel:
         1) Smooth surface, red colored.
         2) Bezel size: 4.69 inches (11.91 cm) x 10.31 inches (26.19 cm); 6.75 inches (17.15 cm) x 13.31 inches (33.81 cm); 4.69 inches (11.91 cm) x 13.56 inches (34.44 cm); or 6.75 inches (17.15 cm) x 18.31 inches (46.51 cm) as per the project application.
         3) Visibility: 100 feet (30.48 meters) or 250 feet (76.20 meters) minimum depending on the clock size selected.
            a) "BELL", "FirE" messaging capabilities.
            b) Alternating Time/Date functionality.
   4. Ensure system is capable of receiving wireless signals every minute.
   5. Ensure digital clock has brightness scheduling capabilities for setting the display vibrance at different times during the day.
   6. Power Requirements: 24 V, 50/60 Hz; 110 VAC, 50/60 Hz; or 230 VAC, 50/60 Hz.
   7. Clock mounting: ABS surface mount housing.
   8. Elapsed Timer Interface: Input for receiving pulses to activate count up or countdown functions as per the project application (SBL 3200 model or 3300 model).
   9. Basis of design: Sapling Inc., SBL 3100 Series Digital Wireless Clock, SBL 3200 Series Digital Wireless Clock, and SBL 3300 Series Digital Wireless Clock.

2-Wire Digital Communication Time Zone Clock

The wired Time Zone Clock shall feature SAM series Sapling analog clocks and/or SBD series Sapling digital clocks. The SAM analog and SBD digital clocks shall be powered at 24 Volts via a Sapling Converter Box, which shall provide both power and time data utilizing two wires. The master clock shall be a Sapling Master Clock and shall provide the time data to the converter box. All clocks and converter boxes shall be

compatible with Sapling 2-Wire Digital Communication Protocol. Analog and digital clocks shall automatically correct themselves on receipt of time data.

2-Wire Digital Communication Secondary Time Zone Clocks

A. Analog Clocks: Compliant to UL and cUL 863, designed for 2-Wire Digital Communication System with fully automatic plug and play capability.

1. Ensure secondary clock is capable of receiving digital signals through a wired connection, and has automatic communication protocol identification recognizing:
    a. 2-wire digital communication;
    b. 59 minute correction;
    c. 58 minute correction;
        d. National Time or Rauland correction.
2. Clock display: 12 or 24 hour dial with white face with black numbers or as needed per the project application.
    a. Size: Round 12.90 inches (32.7 cm) diameter, Round 16.70 inches (42.3 cm) diameter, Square 9.79 inches (24.9 cm), or Square 12.76 inches (32.4 cm) as per the project application.
3. Materials:
    a. Dial: Polystyrene
    b. Case: Low profile reinforced ABS with an optional brushed aluminum finish as per the project application.
    c. Crystal: Shatter-proof, side-molded polycarbonate
4. Hand tolerance:
    a. Hour and Minute hand: ± ¼ minute;
    b. Second hand: ± ½ minute.
5. Power Requirements: 24 VDC.
6. Basis of design: Sapling Inc., SAM Series Smart Wired Round Clock.

B. Digital Clocks: Compliant to UL and cUL 863, designed for 2-Wire Digital Communication System with fully automatic plug and play capability.

1. Ensure secondary clock is capable of receiving digital signals from master clock.
2. Display: High-efficiency red LED numeral display with 4 or 6 digits as per the project application.
    a. Display size: 2.5 inches (6.35 cm) or 4.0 inches (10.16 cm) as per the project application.
    b. Format: 12 or 24 hour user changeable.
    c. Brightness: Ensure display has two levels of brightness.
    d. Bezel:
        1) Smooth surface, red colored.
        2) Bezel Size: 4.69 inches (11.91 cm) x 10.31 inches (26.19 cm); 6.75 inches (11.15 cm) x 13.31 inches (33.81 cm); 4.69 inches (11.91 cm) x 13.56 inches (34.44 cm); or 6.75 inches (17.15 cm) x 18.31 inches (46.51 cm) as per the project application
        3) Visibility: 100 feet (30.48 meters) or 250 feet (76.20 meters) minimum depending on the clock size selected.

The Sapling Company, Inc.

670 Louis Drive

Warminster, PA 18974

U.S.A.

Tel. +1.215.322.6063

Fax. +1.215.322.8498

www.sapling-inc.com

  e. "BELL", "FirE" messaging capabilities;

  f. Alternating Time/Date functionality;

3. Ensure digital clock can receive signals as often as once a second.

4. Ensure digital clock has brightness scheduling capabilities for setting the display vibrancy at different times during the day.

5. Power Requirements: 24 VDC.

6. Clock mounting: ABS, surface mount housing

7. Elapsed Timer Interface: Input for receiving pulses to activate count up or countdown functions as per the project application (SBL 3200 model or 3300 model).

8. Basis of design: Sapling Inc., SBD 3100 Series Digital Wireless Clock, SBD 3200 Series Digital Wireless Clock, and SBD 3300 Series Digital

Accessories

A. Converter Box: 7.75 inches (19.69 cm) x 12.36 inches (31.39 cm) x 2.63 inches (6.60 cm), galvanized metal casing, capable of converting RS485 to 24 V, 2-Wire Digital Communication System.

1. Power requirements: 110 VAC, 50/60 Hz; or 230 VAC, 50/60 Hz.

2. Output: 5.5 Amp, 24 V.

3. Ensure converter box is capable of driving both analog and digital clocks on same run.

4. Comply with FCC, Part 15.

5. UL, cUL listed.

Warranty

A. Project Warranty: Refer to Contract Conditions for project warranty provisions.

B. Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

C. Warranty period: 2 years commencing on Date of Manufacturing.

END OF SECTION – Time ZONE CLOCK SYSTEM