BOGEN
TIME SYSTEMS

10:00

Master, Wired, and Wireless Time Systems

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M A S T E R   C L O C K S

BOGEN

TIME SYSTEMS

Bogen BCMA Master Clocks

DESCRIPTION

Bogen is proud to introduce its BCMA Series Master Clock. The standard models come loaded with many helpful features including a user friendly built-in web interface for master clock settings and monitoring, as well as many optional features to choose from, allowing system flexibility all wrapped in an elegant and stylish housing.

Bogen's Master Clock is the center of a synchronized clock system. The master clock's primary function is to receive accurate time and distribute that time to all of the secondary clocks throughout a facility. The master clock is programmed to frequently send out a time signal in order to prevent the clocks from drifting. This will allow all of the secondary clocks in the facility to always display the same time on every clock within a system.
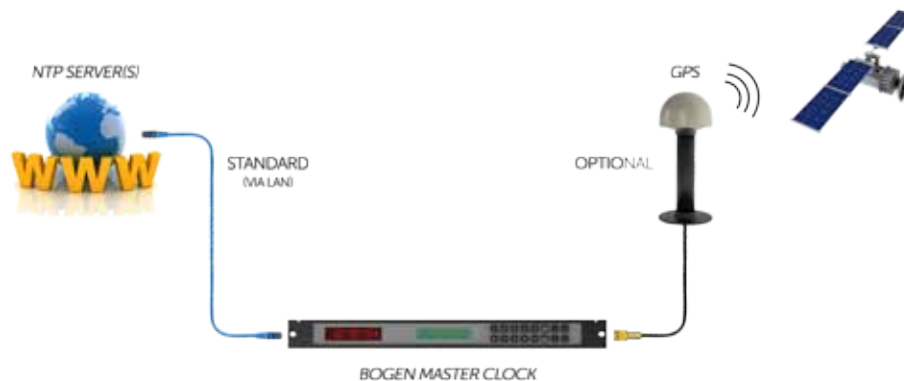
HOW DOES THE MASTER CLOCK RECEIVE TIME?

The master clock can receive the accurate time mainly from two sources:

- **NTP Server – A standard feature in each and every master clock model**
- **GPS Receiver – An optional feature**

The master clock can also receive the time by:

- **Once-a-day contact closure from a third party device**
- **Interfacing with existing clock systems (58 minute or, 59 minute protocol, National Time / Rauland or Dukane protocol)**

Additionally, the master clock has its own internal real-time (quartz) clock. In the event that communication with the accurate time source has been lost, the system will still be synchronized based on the real-time (quartz) clock, until communication with the accurate time source has been restored.

Recieving Accurate Time from an NTP Server

All Bogen Master Clocks receive accurate time from NTP servers as a standard feature. A master clock may receive its time either from an external NTP server (third party NTP server) or via an in-house NTP server (if there is one in the facility).

RECEIVING ACCURATE TIME FROM THIRD PARTY NTP SERVERS:

Sources of NTP time include government facilities, colleges and universities, and various corporations. Such institutes allow a free connection to their NTP server via the Internet as a source of accurate time. Bogen Master Clocks are designed to store up to 10 NTP server IP addresses for redundancy. This means that if communication with the first NTP server has been lost, the master clock will automatically attempt to receive accurate time from the next NTP server in the list. This unique feature provides reliability and redundancy to the system. Bogen already provides the master clock with 10 NTP server IP address inputs to get accurate time from, but at any time you are able to change all 10 default NTP server IP addresses to ones that you prefer.

INTERNET

BOGEN MASTER CLOCK

RECEIVING TIME FROM AN IN-HOUSE NTP SERVER:

IN-HOUSE NTP SERVER

DATA SWITCH

BOGEN MASTER CLOCK

Some facilities already have their own in-house NTP server. In this case, the in-house NTP server IP address should be set in the Bogen Master Clock In addition, there are still 9 other third party NTP server IP addresses that can be stored for backup and redundancy.

GPS RECEIVER OPTION

Depending on the model, the Bogen Master Clock may also receive accurate time via a GPS receiver. This optional feature allows the system to work independently without relying on LAN or a stable internet connection. In addition, some facilities require dual redundancy by having both a GPS receiver as the main source of receiving accurate time, and NTP servers as a backup. A user has the ability to choose which option will be the primary time source and which will be the backup time source.

Bogen Master Clocks with the GPS option will include a built-in GPS receiver board, a GPS cable, and a GPS dome antenna. Bogen provides a 75 foot (22.8 meters) GPS cable as standard. 150 foot (45.7 meters) and 300 foot (91.4 meters) GPS cables are also offered as options. Choosing the correct length of GPS cable should be considered ahead of time and based on the distance from the GPS dome antenna to the location of the master clock in the building. The GPS dome antenna should be installed in a location where there is a clear view of the sky for optimal signal strength.

INTERNAL TIME SOURCE

Bogen Master Clocks have a built-in real-time (quartz) clock that can be used as a time source. This internal clock is capable of providing the time to the secondary clocks within the system. In this scenario, even though the master clock is not communicating with an NTP server or GPS, all the secondary clocks in the system will still be synchronized according to the real-time (quartz) clock in the master clock.

In the event that there is a communication failure between the master clock and the accurate time source is lost (either NTP or GPS), the real-time (quartz) clock will serve as a backup and become the primary time source for the secondary clocks until communication with other time source inputs has been restored.

Master Clock Setup

It is very important to set up the master clock using the manual provided by Bogen in order to properly program the accurate time source, location, Daylight Saving Time (if applicable), and any other relevant settings.

Bogen Master Clocks will indicate a communication failure with the accurate time source by a blinking LED on the front panel of the master clock. Bogen's Master Clock can also be programmed to send an e-mail alert to the system administration in the event of a communication failure. It is very important to refer to the master clock user manual in order to make sure that the master clock is set up properly.

MASTER CLOCK OPTIONAL FEATURES:

Bogen offers many options for its master clock so that it can fit a wide variety of applications. Please review the options that are available in order to choose the master clock model that will best fit your application needs.

MASTER CLOCK HOUSING:

The first option is whether the master clock should be wall mount or rack mount. (All models offered as either).

When choosing a rack mount master clock with a transmitter, we provide an additional housing for the transmitter. This allows the master clock to be placed in a network cabinet, while the transmitter is mounted on the wall for optimal signal strength.

NTP MASTER CLOCK UPGRADE:

Standard master clocks will only communicate the time signal to the secondary clocks in the system. Some facilities require an in-house NTP Server in order to provide NTP time to other IP devices such as: security cameras, IP phones, intercom systems, time and attendance systems, or any other IP system that can receive NTP time. Depending on the model, Bogen Master Clocks can also act as an NTP server and in this case, they will communicate the accurate time to other IP devices in addition to the secondary clocks in the system, so all devices will be operating with the same exact time. This saves money eliminating the need to buy a separate NTP server for the facility.

PROGRAMMABLE RELAYS:

Another great optional feature for Bogen Master Clocks is the ability to control other devices at pre-determined times. The master clock has relays, also known as zones, that can be activated by the master clock scheduling feature. Scheduling is done easily via the built-in web interface, or by using the front panel keypad. This will allow you to connect any system containing a relay closure input to the master clock and turn it off and on at pre-determined times. This is useful for school bells, air conditioning, lights, and more. Bogen Master Clocks are offered with no relays, 4 relays, or 8 relays.

COUNTDOWN COMMANDS:

Another optional feature that can be added to master clocks is countdown capability. This feature gives the user the ability to schedule a countdown at pre-determined times. The master clock will send a countdown command to all connected digital clocks. This feature is mostly used for breaks in between classes at schools or between shifts in the work place. Please do not confuse this **prescheduled** master clock countdown command with the **real-time** elapsed timer, which is a clock function. When using an Elapsed Timer Control Panel, it is hard wired to one specific digital clock commanding it to count up or down as needed. When ordering the countdown command feature, at least 4 zone relays are also needed. In addition, please note that the master clock countdown feature is not applicable when using IP clocks or a sync-wired system. A real-time countdown feature for the IP system is available with the Bogen IP Monitoring Software.

RELAYING TIME TO SECONDARY CLOCKS

One of the main functions of a master clock is to relay accurate time to the secondary clocks in the system either via wires or wirelessly (depending on your clock system). While all of Bogen's Master Clocks can relay time to the secondary clocks in a wired manner, a master
clock with a wireless transmitter is needed for wireless clocks. All Bogen Master Clock models are offered with or without a transmitter.
Master clocks with a transmitter will support both wired and wireless clocks, while a master clock without the transmitter will only support wired clocks.
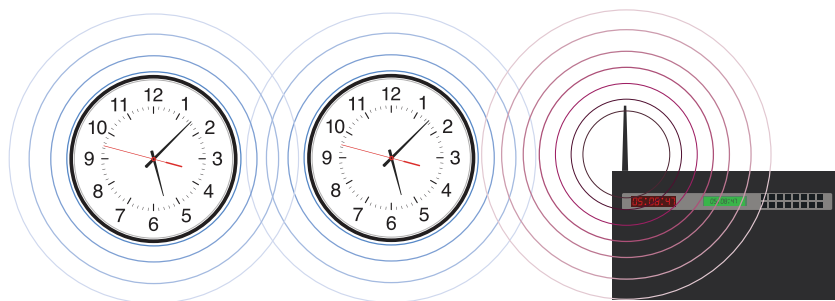
BCMA Series Master Clock

The following pages will provide you with information about the different master clock models that Bogen offers. Each model includes certain standard features as well as optional features to select from.

BCMA 2000 SERIES STANDARD FEATURES

- Available in rack or wall mount housing
- LED display for a clear, accurate read out
- 12 or 24 hour display
- Two buttons for programming
- Intuitive built-in web interface that allows the system administrator to configure all the settings of the BCMA Series Master Clock easily from the convenience of any computer on the same network
- RJ45 input for web interface and synchronization to any (S)NTP/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

- Control wired clock systems or wired and wireless clock systems simultaneously, if equipped with a transmitter
- 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
- Two relays for simultaneous correction of two synchronized wired systems:
  - EX: 58 minute, 59 minute protocol, National Time / Rauland or Dukane protocol
- Proprietary RS485 input and output for time synchronization
- Can command digital clocks to say "Fire" when the alarm system interfaces with the master clock (not applicable when using a sync-wired or IP system)
- Microprocessor based
- Ten year battery backup for keeping time and master clock settings

BCMA 2000 SERIES OPTIONAL FEATURES

- GPS input for accurate time synchronization
- Transmitter for the Bogen Wireless System
- NTP server upgrade

BCMA 3000 SERIES STANDARD FEATURES

- Includes all of the BCMA 2000 Series' capabilities
- LED and a backlit LCD display for a clear, accurate read out
- 2 x 8 rubber button keyboard for easy programming
- Can command digital clocks to display "Bell" at user defined times. In this case the master clock must have at least four relays (not applicable when using a sync-wired system or an IP system)

BCMA 3000 SERIES OPTIONAL FEATURES

- Four or eight configurable AUX relays which control other systems by closing a relay at predetermined times.
  - 255 schedule (group of events) and 800 event capabilities (such as triggering bells)
  - Two programmable closure durations per relay
- Pre-scheduled 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.
- GPS time signal input for accurate time synchronization
- Transmitter for the Bogen Wireless System
- NTP server upgrade

The Bogen Advantage

- **Fully Functional Web Interface -** Bogen's web interface allows the system administrator to have total control of the master clock's settings through an easy-to-use built-in web interface. This will allow the system administrator to control settings such as Daylight Saving Time, E-mail-alerts, NTP server settings, and so much more from any computer on the same network.

- **Automatic Daylight Saving Time Update -** Depending on the size of a facility, it would be a difficult and time consuming task to adjust each clock when Daylight Saving Time occurs.

   With a Bogen Master Clock controlling the system, there is no need to worry about adjusting the time on each clock by hand, as the clocks will automatically update themselves. This feature not only saves time, but also saves money in maintenance fees over the life of the system.

- **NTP Server Redundancy -** To ensure complete accuracy within a system, Bogen's Master Clock allows a user to input up to 10 NTP server IP addresses for redundancy purposes. If communication with one NTP server is lost, Bogen's Master Clock will automatically move to the next NTP server IP address that is on the list.

- **E-mail Alerts -** A user is able to receive automatic e-mail alerts when specific changes have been made to the master clock or if communication with the accurate time source has been lost. This feature allows a user to always be aware of the status of the master clock.

- **Interfacing with Other Systems -** Here at Bogen, we want to make integrating our clock system within a facility as simple as possible. Bogen's master clock is capable of interfacing and receiving various time protocols such as 58 minute correction, 59 minute correction, National Time / Rauland correction, or Dukane protocol.

- **System Flexibility -** A master clock equipped with a transmitter can provide time to both wired clocks, as well as to wireless clocks in the system. This allows users to replace old clocks with new clocks in stages. In this case, while the master clock is providing the wired clocks with the time signal in a wired manner, it is also transmitting the time signal wirelessly. Bogen's Synchronized Clock System also provides the flexibility to mix between analog and digital clocks offered in different shapes and sizes.

BCMA Controlling a Third Party Wired System

Easily replace an existing master clock with a Bogen Master Clock. Depending on the sync wire protocol being used, Bogen's Master Clocks can synchronize current clocks allowing a seamless transition by providing the time data existing sync wired non-Bogen secondary (slave) clocks.

Third party sync wire clock
24V or 110VAC or 230VAC

Third party sync wire clock
24V or 110VAC or 230VAC

Third party sync wire clock
24V or 110 VAC or 230VAC

White | Black | Yellow | Green | Ground
Neutral | Power | Reset
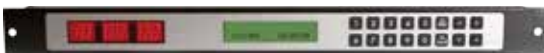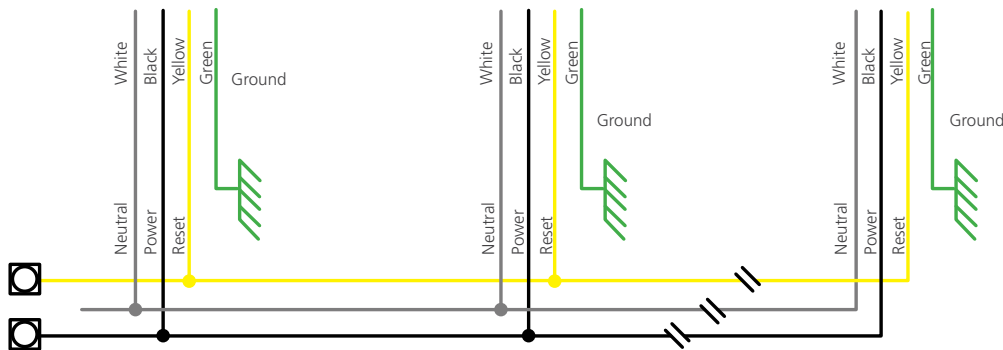
Bogen BCMA Master Clock

*Bogen BCMA Master Clock may synchronize third party sync wire **analog or digital** clocks. The diagram shows a Bogen Master Clock wired to third party sync wire analog clocks.*

Wireless BCMA Synchronizing a Third Party Wired System & Bogen's Wireless Clocks

Providing a hybrid solution, Bogen's Wireless Master Clock with a transmitter, can simultaneously provide various sync wired corrections to the existing wired system and to Bogen Wireless Clocks. Effortlessly upgrade to a Bogen Wireless system as older wired system clocks begin to fail. For installation flexibility, wireless clocks can utilize the existing power or replace them with a battery option.

Third party sync wire clocks

Bogen BCMA Master Clock

Bogen Wireless Clocks
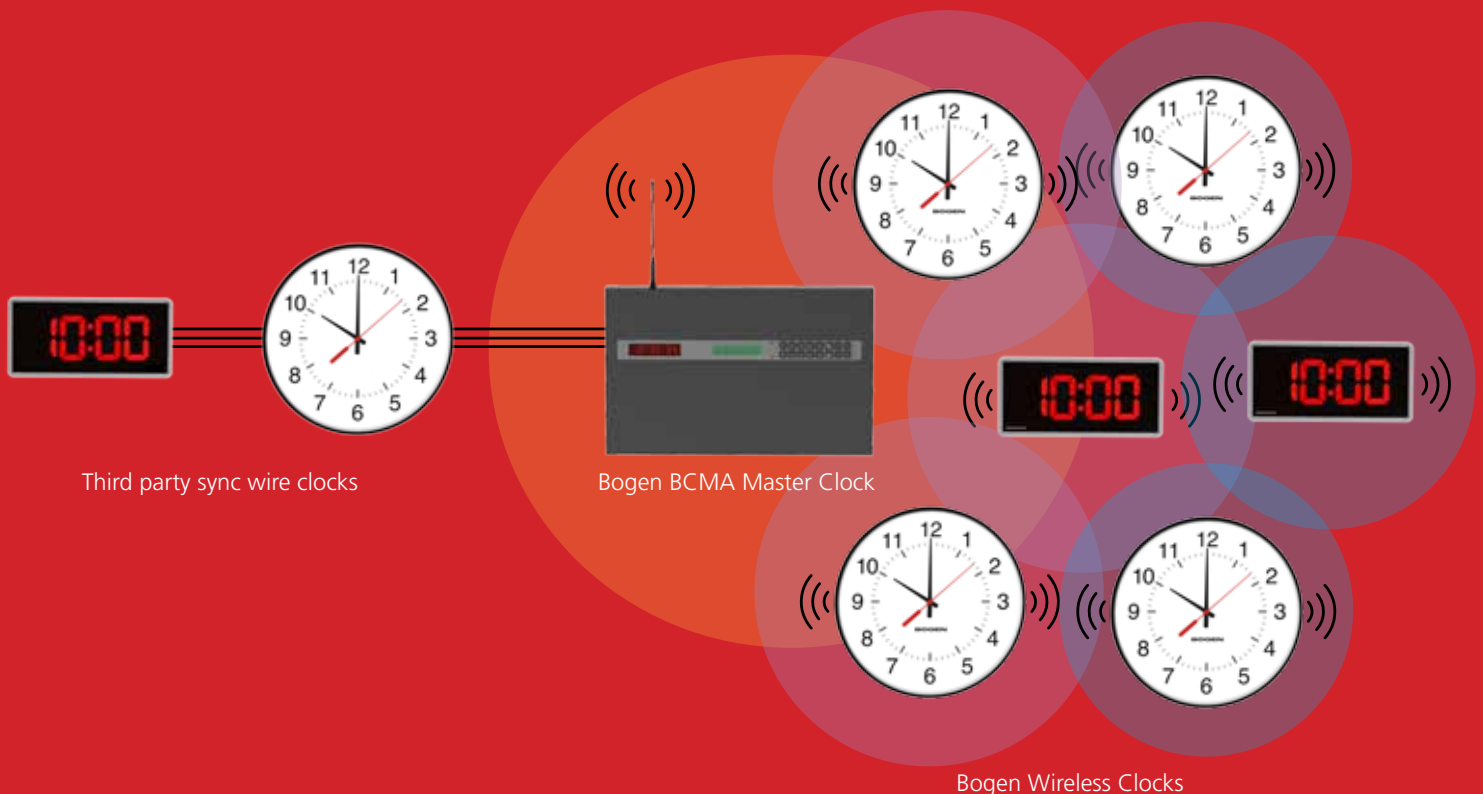
Bogen Master Clock transmits time signal using frequency hopping technology & then each clock with built in transmitters will retransmit the signal to clocks out of range of the Master Clock.

WIRED CLOCKS

BOGEN®
TIME SYSTEMS

Bogen 2-Wire System

DESCRIPTION

The Bogen 2-Wire System is one of the most innovative and advanced wired systems in the synchronized time industry. It starts with the BCMA 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 Bogen 2-Wire Clock System can serve anything from a small facility with 20 clocks to mega projects with 5,000 clocks or more.

The Bogen 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 Bogen solution.

Bogen 2-Wire System simple line drawing

115/230VAC

Clock Circuit
18 *or* 19

Input A   Input B
Ground
Power
Neutral

Converter Box

A1/B1/C1   A2/B2/C2

Green   Black   White

115/230VAC

Neutral   White
Power   Black

BCAM Series Wired Clock

Neutral   Orange
Power   Yellow

BCBD 3000 Series Wired Clock
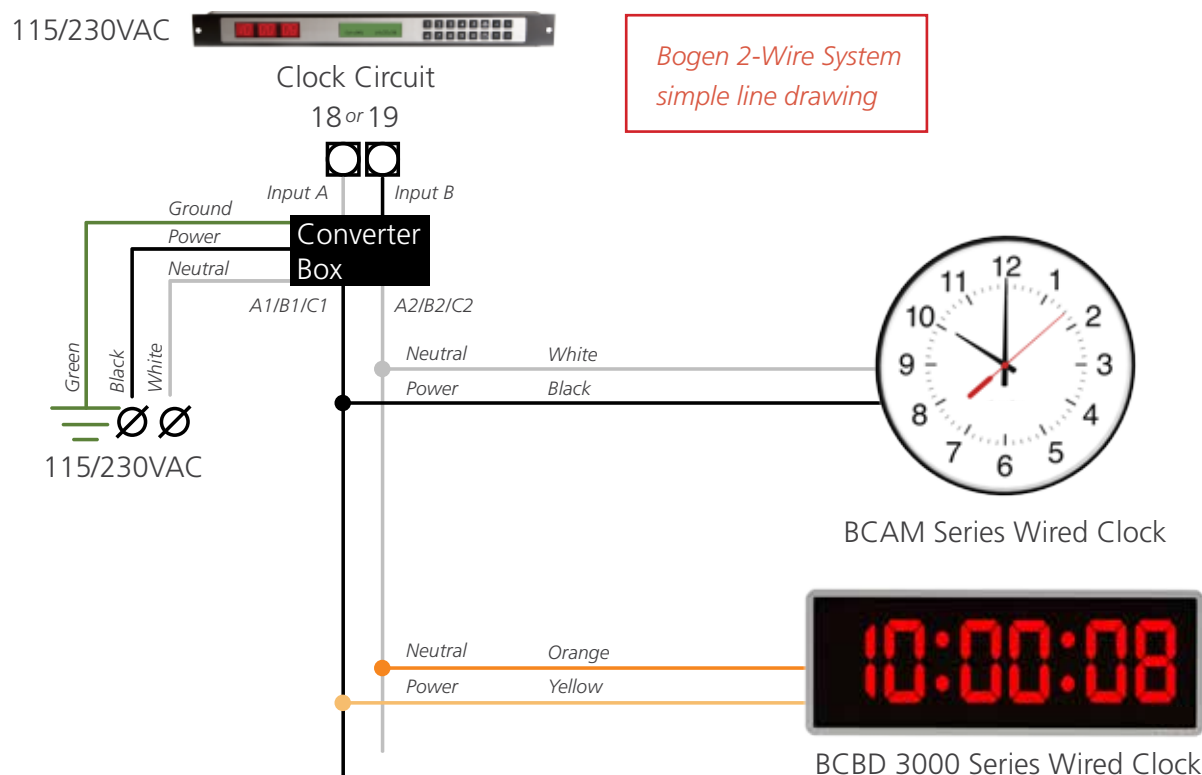
Bogen 2-Wire System Advantages

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 Bogen 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 - Bogen 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 Bogen 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

110 - 230 VAC

24V output

1
2
3

110 - 230 VAC converter box

05:08:47

05:08
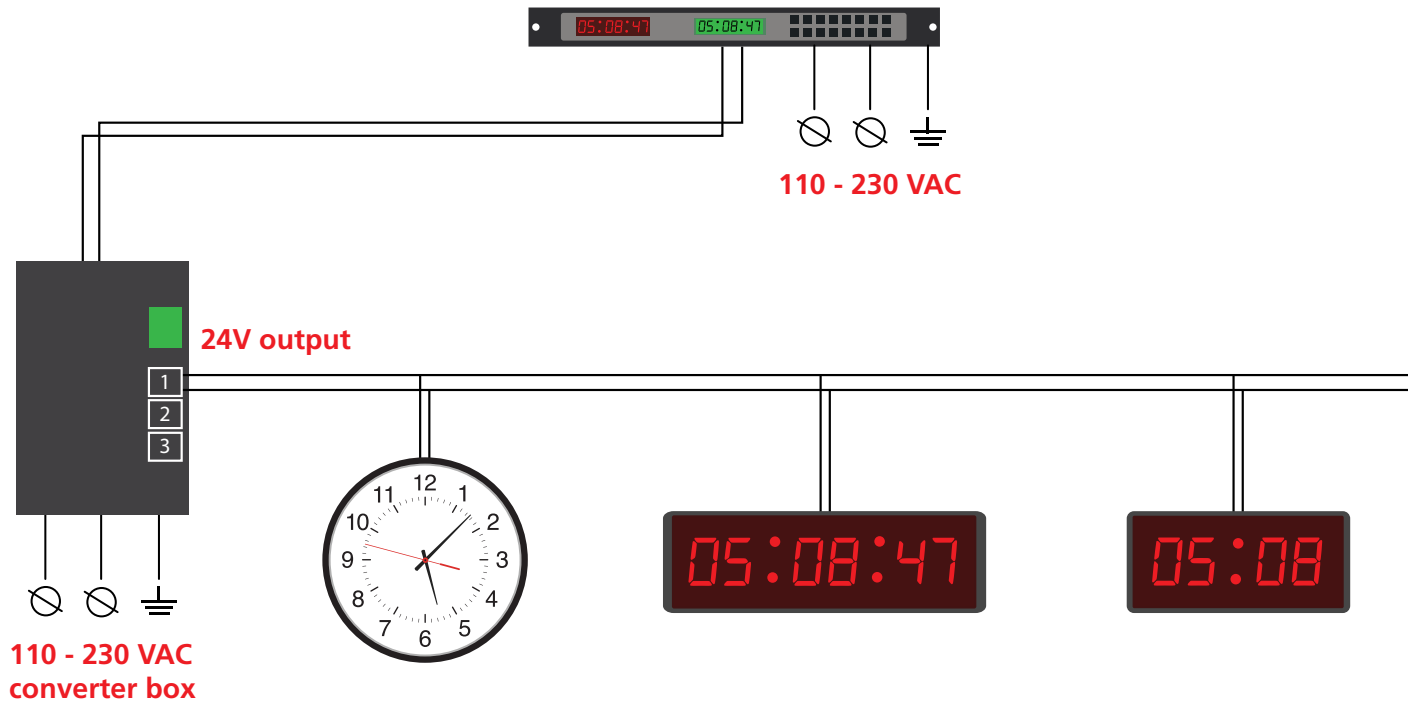
2-Wire System - Multiple Runs Line Drawing

110 - 230 VAC

24V Output

110 - 230 VAC converter box

05:08   05:08:47

24V Output   **24V Output**

110 - 230 VAC converter box   **110 - 230 VAC converter box**

05:08:47   05:08   05:08

L1, I1

24V Output

110 - 230 VAC converter box

L2, I2

05:08   05:08:47

L3, I3

05:08

24V Output

05:08   **110 - 230 VAC converter box**   05:08:47
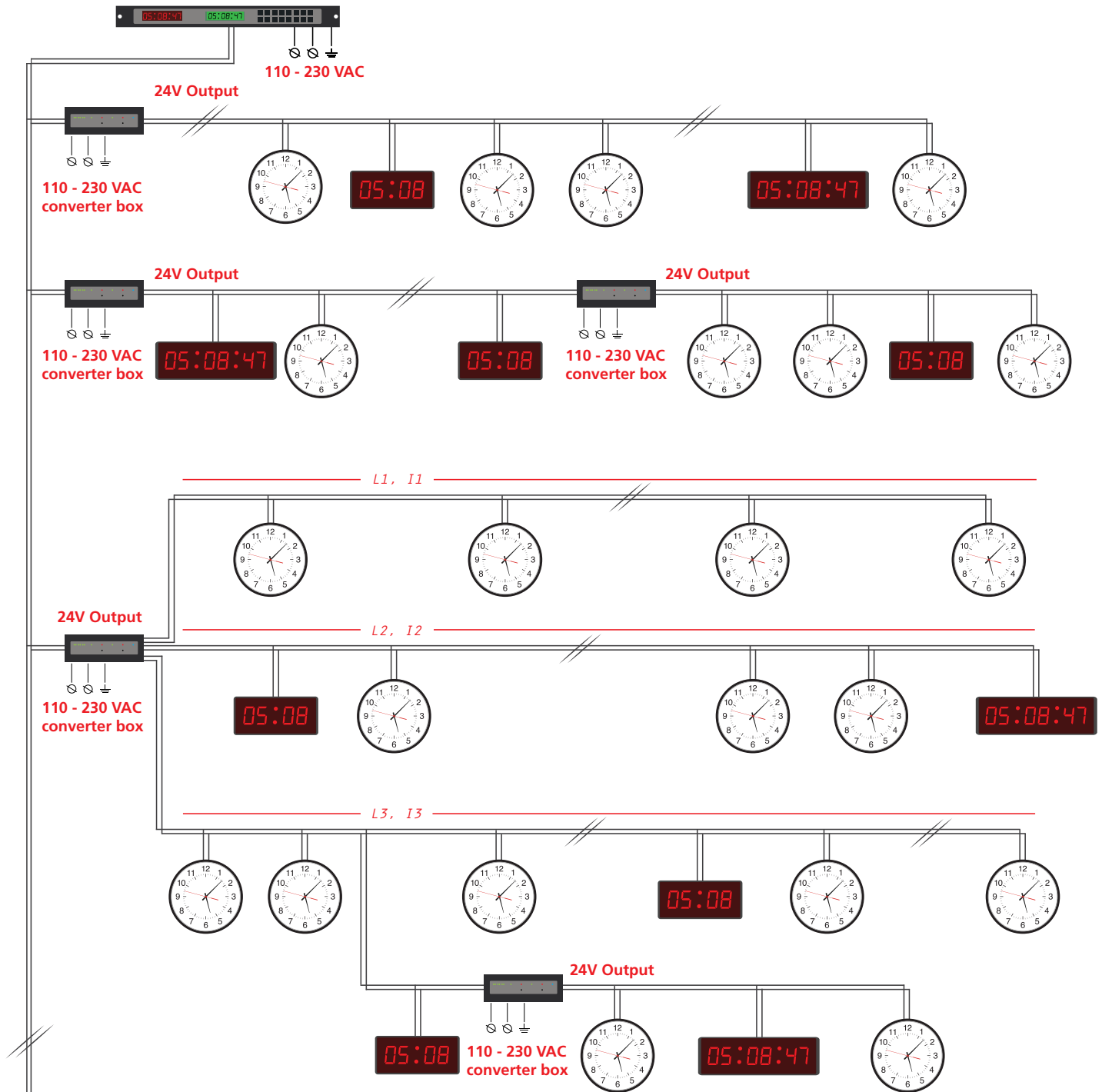
Bogen Sync-Wire System

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, Bogen Clocks are compatible with many sync-wire protocols and can be powered using either 24V, 110 VAC, or 230 VAC.

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

Third Party Master Clock

Bogen BCBD 3300 Digital Clock

Bogen BCAM Analog Clock
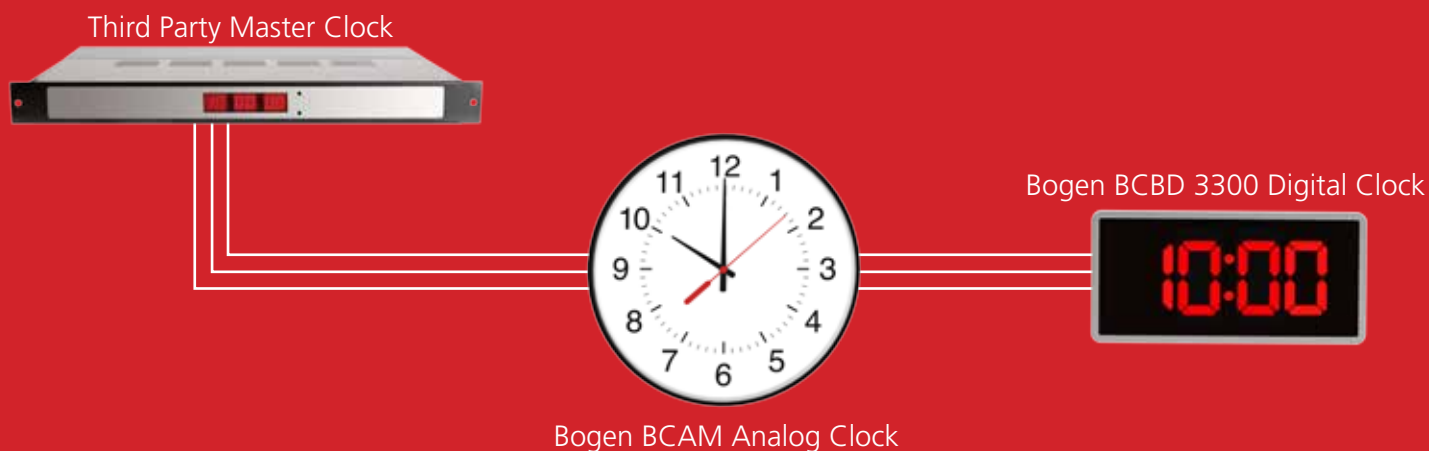
Shown above is a third Party Master Clock providing sync wire correction to Bogen BCAM Analog Clocks and Bogen BCBD 3300 digital clocks.

Sync-Wire System Line Drawing

BCMA Series Master Clock

27 | 26 | 25 | 24 | 23 | 22   Clock Circuit 1

or*

27 | 26 | 25 | 24 | 23 | 22   Clock Circuit 2

Clock Circuit
27   26
24 *or* 23

*"or" means one pair of ports or the other. You cannot, for instance, use port 23 for reset and 27 for power, nor can you use 26 for reset and 24 for power. You must use the pair **24 AND 23** or the pair **26 AND 27***

Black
White
Neutral
Power
Reset

115VAC or
230VAC

Neutral	White
Power	Black
Reset	Yellow
	Green
Ground	

115/230VAC BCAM Series Wired Clock

Neutral	J1-1	Correction
Reset	J1-2	
Power	Black	
Neutral	White	
	Green	Power
Ground		

115/230VAC BCBD 3300 Series Wired Clock
Red & Blue Wires are NOT provided by Bogen

Neutral	White
Power	Black
Reset	Yellow
	Green
Ground	

115/230VAC BCAM Series Wired Clock

Bogen Sync-Wire System Advantages

Automatic Protocol Detection - There is no need to preprogram the BCAM clock for a specific time protocol. Bogen BCAM Analog Clocks are capable of recognizing Bogen 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 Bogen Converter Box.

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

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

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

BCAM Analog

Bogen 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 in the United States of America

BCBD Digital

Bogen 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
  - BCBD 3100 offered at 24V only
  - BCBD 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

- BCBD 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 BCMA Master Clock (optional BCMA 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 in the United States of America

ADDITIONAL 3200 MODEL HIGHLIGHTS

- Includes all of the BCBD 3100 model's capabilities
- Capable of interfacing with:
  - Bogen's Elapsed Timer Control Panel (BCBD-ELT-001-0)
  - Temperature Sensor (BCBD-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 Bogen RS485 protocol

ADDITIONAL 3300 MODEL HIGHLIGHTS

- Includes all of the BCBD 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 Bogen Buzzer accessory (A-BUZZ-3300-1) when the Bogen 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 Bogen RS485 Time Protocol input and output and 2-Wire Digital Communication Time Protocol)
- Capable of acting as a standalone mini-master clock

BCMA Series Master Clock

The BCMA 2000 Series is our standard master clock model with a front LED display and two push buttons for basic system programming. The BCMA 3000 Series comes with a front LED and LCD display as well as a keypad to allow for advanced programming. The BCMA 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 Bogen'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 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

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

- Converter Box
  - Converts RS485 time data from the Bogen 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 Bogen Converter Box which provides both time and power to all secondary clocks in the system
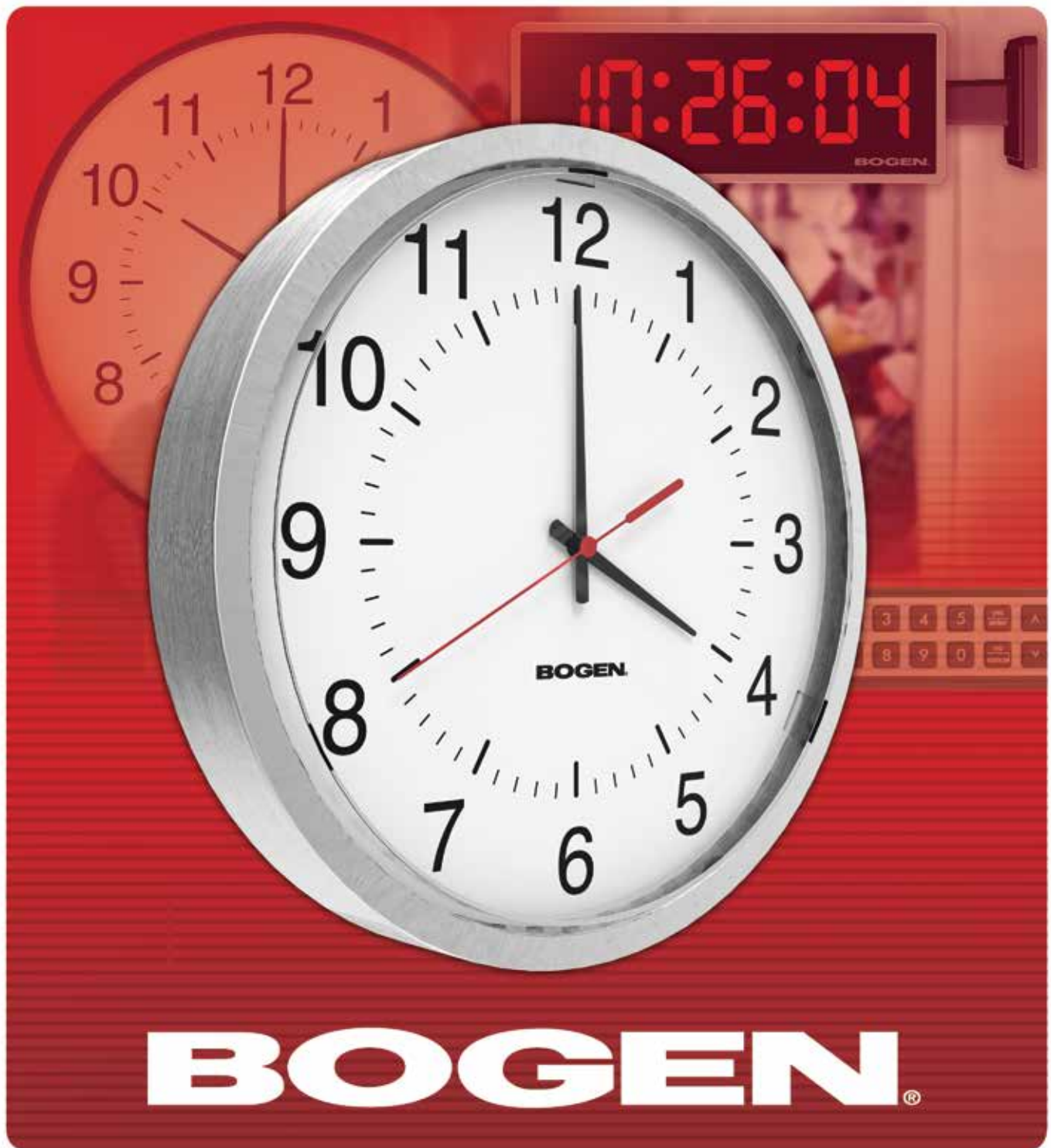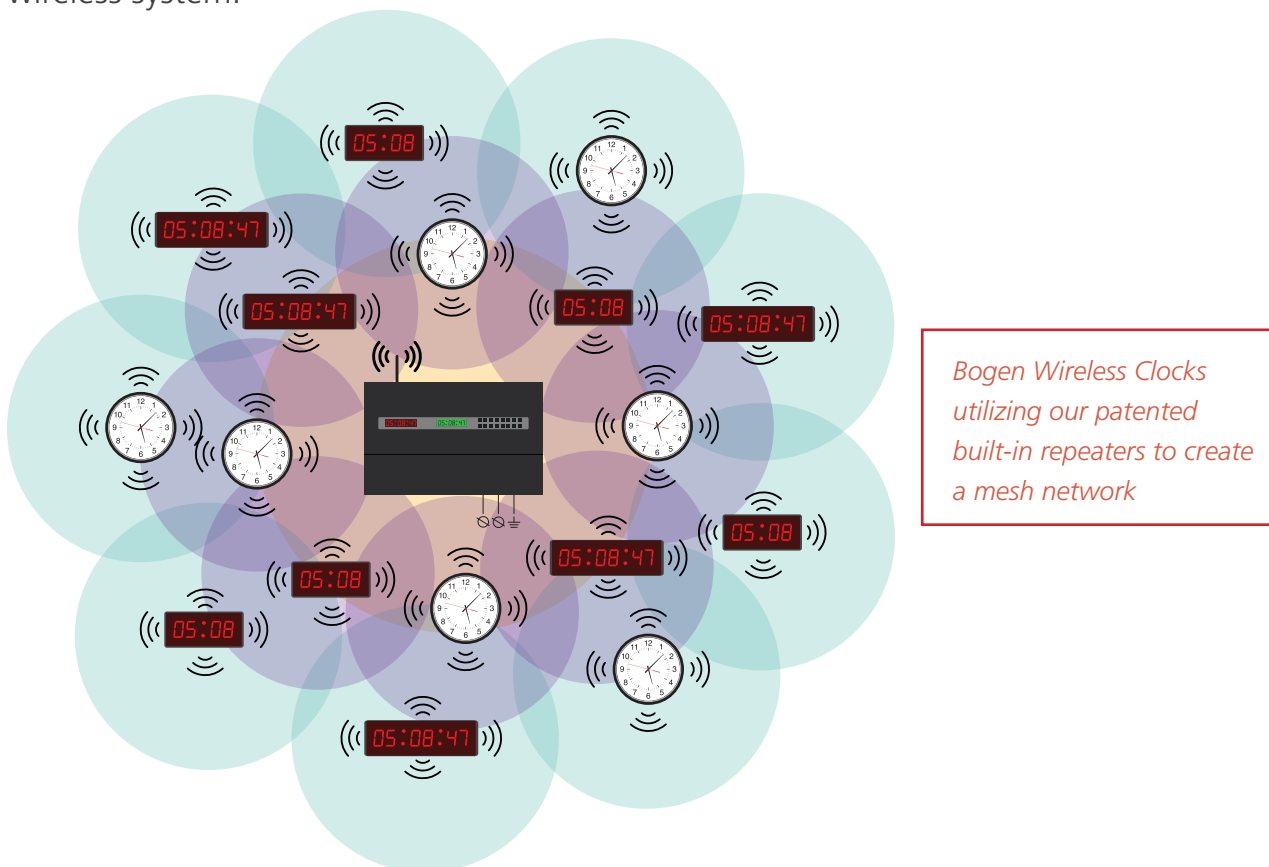
WIRELESS CLOCKS

BOGEN® TIME SYSTEMS

Bogen Wireless System

DESCRIPTION

A Wireless Clock System starts with a master clock with a transmitter. The master clock's transmitter transmits the time data to the secondary clocks in the system. Since the time data is transmitted wirelessly, there is no need to run wires between the clocks. The Bogen Wireless System works autonomously, meaning that it **does not** rely on existing Wi-Fi or Bluetooth infrastructure; at the same time, it coexists with other wireless systems that might be in the facility without interference.

The Bogen Wireless System is offered in either 900MHz (US and Canada) or 2.4GHz frequency range (approved to use worldwide) and utilizes frequency hopping technology which transmits and receives the accurate time on 51 or 76 different frequencies to ensure that all clocks in the system receive accurate time with no interference.

The Bogen Master Clock may interface with existing wired clock systems, allowing the facility to upgrade or transition from their existing clock system and benefit from the advantages of a wireless system.

Bogen Wireless Clocks utilizing our patented built-in repeaters to create a mesh network

Bogen Wireless System Advantages

Built-in Repeater in Each Secondary Clock - A **unique feature** of the system is that each wireless clock not only receives the accurate time, it also retransmits the time to the surrounding clocks in its area.

Superior Coverage - The Bogen Wireless System is not limited to the master clock's transmitter range since each clock has a built-in repeater. The time signal is relayed to remote clocks, allowing vast coverage within a facility without the need to purchase multiple master clocks or repeaters.

System Redundancy - Each clock can receive the time signal from multiple directions and sources, including secondary clocks nearby, clocks on the floors above and below, and from Bogen Repeaters and Master Clocks.

System Reliability - Bogen utilizes frequency hopping technology which transmits and receives the accurate time over 51 different frequencies within the 900 MHz or 76 different frequencies in the 2.4 GHz frequency range. This ensures that the clocks in the system receive accurate time with no interference.

No FCC License is Needed – Since the Bogen Wireless System operates in the license-free frequency range, no FCC license is required to operate the master clock transmitter or the secondary clock repeaters. This eliminates the application process and the cost associated with obtaining a license.

Cost Efficiency - Without the need to run wires between the secondary clocks, installation and maintenance costs are greatly reduced. Bogen's analog and digital clocks are offered in 24V, 110V and, 230V. To further simplify installation, Bogen also offers a battery powered analog clock. In this case, a secondary clock can be installed by simply inserting batteries into the clock and hanging it on the wall. Each battery operated analog clock is powered by two D-Cell alkaline batteries, such as Duracell ProCell or Duracell Ultra, which last between 5-8 years.

Safety Standard Compliance – The Bogen Master Clocks, Repeaters, and Secondary Clocks are designed to meet strict international safety standards and are (c)UL listed.

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

BCAL Analog

Bogen's innovative BCAL Series Wireless Clocks incorporate multi-functional software, as well as a microprocessor based movement and a real-time internal clock. The clocks include automatic calibration, 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 SlimLine ABS case
  - Optional Cherry Wood finish or Brushed Aluminum finish for round clocks
- Offered in 24/110VAC, 230VAC, and battery-powered models.
- Provided with mounting hardware for easy installation
- Hour, minute, and second hands
- Quick correction for time change (max. 5 minutes)
- Microprocessor based movement
- Internal Antenna
- Side molded, polycarbonate crystal
- FCC Compliant per FCC part 15 Section 15,247

HIGHLIGHTS

- Each clock acts as a repeater for the time data signal for superior coverage
- Energy efficient
- 900MHz or 2.4 GHz frequency hopping technology to ensure signal reliability
  - No FCC or special operating license required
- Receives and repeats the time data
  - Once every minute when powered locally at 24/110VAC or 230VAC
  - Once every two hours in standard mode, or once every four hours in economy mode when battery powered
- Built–in self-diagnostic mode:
  - Signal reception strength
  - Clock movement testing
  - Battery level if battery powered
- Custom Color Cases available (minimum order quantity 25)
- Designed and Produced in the United States of America

BCBL Digital

Bogen's BCBL wireless 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

- Receives time correction wirelessly
- 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
  - Offered in 24Volt, 110VAC, and 230VAC models
- Provided with mounting hardware for easy installation
- Immediate correction for time change
- Internal Antenna
- Microprocessor based clock
- Three models (3100, 3200, and 3300) with additional capabilities for higher models
- FCC Compliant per FCC part 15 Section 15,247

HIGHLIGHTS

- Each clock acts as a repeater for the time data signal for superior coverage
- 900MHz or 2.4GHz frequency hopping technology to ensure signal reliability
  - No FCC or special operating license required
- Receives and repeats the time data once every minute
- 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 BCMA Master Clock (optional BCMA function)
- Alternating time/date display in U.S. format (MM:DD:YY)
- Designed and Produced in the United States of America

ADDITIONAL 3200 MODEL HIGHLIGHTS

- Includes all of the BCBL 3100 model's capabilities
- Capable of interfacing with:
  - Bogen'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)
- Brightness scheduling capabilities
- Can also receive Bogen RS485 protocol

ADDITIONAL 3300 MODEL HIGHLIGHTS

- Includes all of the BCBL 3100 and 3200 model's capabilities
- Easy programming with two push buttons on the front panel
- Can interface with a third party system via a contact closure (ex: nurse call system that can automatically trigger the clock's elapsed timer)
- Can interface with a Bogen Buzzer accessory (A-BUZZ-3300-1) when the Bogen Elapsed Timer reaches 00:00:00
- Can interface with 3-wire sync protocols

BCMA Series Master Clock

The Bogen Wireless Clock System begins with Bogen's BCMA Series Master Clock. The BCMA 2000 Series is our standard master clock model with a front LED display and two push buttons for basic system programming. The BCMA 3000 Series comes with a front LED and LCD display as well as a keypad to allow for advanced programming. The BCMA 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 Bogen'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 via the internet from up to ten preprogrammed (user changeable) third party NTP Servers for superior accuracy and redundancy. 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 administrator to configure all the settings of the BCMA Series Master Clock easily from the convenience of any computer on the same network
- RJ45 input for web interface access and synchronization to any (S)NTP/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
- Less than 1 watt transmission output

- Control wired clock systems or wired and wireless clock systems simultaneously
- 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
- Can command digital clocks to display "Fire" when the alarm system interfaces with the master clock
- 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
- Can command digital clocks to display "Bell" at user defined times. In this case the master clock must have at least four relays
- Pre-scheduled 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).

Bogen Repeaters

BOGEN NETWORK REPEATER

The Network Repeater is the perfect solution for a wireless system in a campus environment with multiple buildings. The Network Repeater receives its time data from the Bogen Master Clock via LAN and transmits the time signal to clocks once every minute. This feature allows the Network Repeater to be outside the wireless range of the main transmitter in the building or in a campus environment and still receive and transmit the accurate time signal (because the time data is received via LAN). The network repeater transmitter output is less than 1 watt (same as the master clock output).

BOGEN WIRELESS REPEATER

For facilities without LAN, Bogen also offers a Wireless Repeater that receives the time data from the Bogen Master Clock or from a secondary wireless clock and boosts (amplifies) and repeats the time signal in its area. In this case, the Wireless Repeater must be within range of a time signal in order to boost it. In addition, the wireless repeater can receive the time data from the BCMA Master Clock through wires (using RS485 protocol). The transmitter output is less than 1 watt (same as the master clock output).

Accessories

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

- **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**
- **USB Programing Cable (can interface with 3200 and 3300 models)**
- **Flag Mount and Double Mount Housing**

Shown left is a Bogen six-digit digital clock with an elapsed timer control panel & a buzzer accessory. Shown above is a round analog clock, flag mounted from the ceiling.

About Us

Bogen offers the most advanced, high quality, technological solutions.

Whether you're designing a new school, hospital or office, or you're retrofitting into an existing facility, you will benefit from Bogen's Advanced Time Systems.

Bogen Communications specializes in designing control equipment to fit your exact parameters. We offer timepieces ranging from simple quartz clocks, IP Clock Systems, GPS systems (synchronized to UTC within 1 microsecond anywhere on the globe), as well as everything in between.

Our highly tooled, microprocessor based products allow us to take a unique approach to the market by providing advanced solutions at competitive prices. What's more, we'll be happy to work with you individually to find the perfect solution to your specific needs.

BOGEN®
TIME SYSTEMS

Contact

ENGINEERED SYSTEMS
BOGEN®

Office: 1200 MacArthur Blvd., Suite 304
Mahwah, NJ 07430-2331 USA

Phone: +1.201.934.8500

Fax: +1.201.934.9832

Website: www.bogen.com

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