SPECTRACOM

TIMEVIEW DIGITAL DISPLAY CLOCK

MODELS TV210V, U, G, W & TV400V, U, G, W

INSTRUCTION MANUAL

SPECTRACOM LIMITED WARRANTY

LIMITED WARRANTY

Spectracom warrants each new product manufactured and sold by it to be free from defects in software, material, workmanship, and construction, except for batteries, fuses, or other material normally consumed in operation that may be contained therein AND AS NOTED BELOW, for five years after shipment to the original purchaser (which period is referred to as the "warranty period"). This warranty shall not apply if the product is used contrary to the instructions in its manual or is otherwise subjected to misuse, abnormal operations, accident, lightning or transient surge, repairs or modifications not performed by Spectracom.

The GPS receiver is warranted for one year from date of shipment and subject to the exceptions listed above. The power adaptor, if supplied, is warranted for one year from date of shipment and subject to the exceptions listed above.

THE ANALOG CLOCKS ARE WARRANTED FOR ONE YEAR FROM DATE OF SHIPMENT AND SUBJECT TO THE EXCEPTIONS LISTED ABOVE.

THE TIMECODE READER/GENERATORS ARE WARRANTED FOR ONE YEAR FROM DATE OF SHIPMENT AND SUBJECT TO THE EXCEPTIONS LISTED ABOVE.

The Rubidium oscillator, if supplied, is warranted for two years from date of shipment and subject to the exceptions listed above.

All other items and pieces of equipment not specified above, including the antenna unit, antenna surge suppressor and antenna pre-amplifier are warranted for 5 years, subject to the exceptions listed above.

WARRANTY CLAIMS

Spectracom's obligation under this warranty is limited to in-factory service and repair, at Spectracom's option, of the product or the component thereof, which is found to be defective. If in Spectracom's judgment the defective condition in a Spectracom product is for a cause listed above for which Spectracom is not responsible, Spectracom will make the repairs or replacement of components and charge its then current price, which buyer agrees to pay.

Spectracom shall not have any warranty obligations if the procedure for warranty claims is not followed. Users must notify Spectracom of the claim with full information as to the claimed defect. Spectracom products shall not be returned unless a return authorization number is issued by Spectracom.

Spectracom products must be returned with the description of the claimed defect and identification of the individual to be contacted if additional information is needed. Spectracom products must be returned properly packed with transportation charges prepaid.

Shipping expense: Expenses incurred for shipping Spectracom products to and from Spectracom (including international customs fees) shall be paid for by the customer, with the following exception. For customers located within the United States, any product repaired by Spectracom under a "warranty repair" will be shipped back to the customer at Spectracom's expense unless special/faster delivery is requested by customer.

Spectracom highly recommends that prior to returning equipment for service work, our technical support department be contacted to provide trouble shooting assistance while the equipment is still installed. If equipment is returned without first contacting the support department and "no problems are found" during the repair work, an evaluation fee may be charged.

EXCEPT FOR THE LIMITED WARRANTY STATED ABOVE, SPECTRACOM DISCLAIMS ALL WARRANTIES OF ANY KIND WITH REGARD TO SPECTRACOM PRODUCTS OR OTHER MATERIALS PROVIDED BY SPECTRACOM, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Spectracom shall have no liability or responsibility to the original customer or any other party with respect to any liability, loss, or damage caused directly or indirectly by an Spectracom product, material, or software sold or provided by Spectracom, replacement parts or units, or services provided, including but not limited to any interruption of service, excess charges resulting from malfunctions of hardware or software, loss of business or anticipatory profits resulting from the use or operation of the Spectracom product or software, whatsoever or howsoever caused. In no event shall Spectracom be liable for any direct, indirect, special or consequential damages whether the claims are grounded in contract, tort (including negligence), or strict liability.

EXTENDED WARRANTY COVERAGE

Extended warranties can be purchased for additional periods beyond the standard five-year warranty. Contact Spectracom no later than the last year of the standard five-year warranty for extended coverage.

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1 Introduction

The Spectracom TimeView digital models are synchronized display clocks visible from at least 75 feet (23 meters – TV210 series) to 150 feet (46 meters – TV400 series). Both clocks have large, easily seen LED digits – 2.3 inches (58.4 mm) in the TV210 series and 4 inches (101.6 mm) in the TV400 series.

The TimeView digital clocks are part of Spectracom Corporation's display family of products, used to distribute accurate and traceable timing throughout a single facility or across an entire community. In addition to the digital display clocks, Spectracom offers TimeView 312 wired and wireless analog display clocks.

Spectracom's digital clocks display Legally Traceable Time® in 12- and 24-hour formats when referenced to a NetClock® receiver. The synchronization options available for the TimeView digital clocks are RS-485 wired data input (210W and 400W models) and wireless (TV210V, TV400V, TV210U, TV400U, TV210G, TV400G). Check the serial tag on the rear panel of your unit to determine the model number of your equipment.
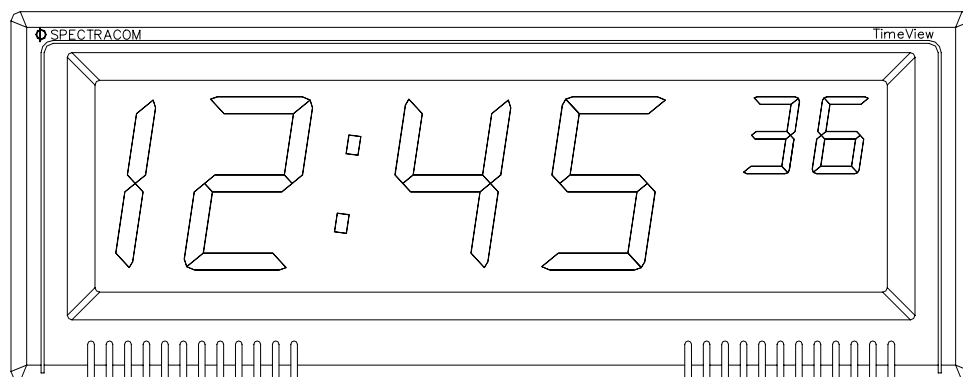
Figure 1-1: Spectracom TV210 Series (Front)

Spectracom currently offers NetClock GPS synchronized receivers and previously offered WWVB synchronized receivers. In wireless applications, the NetClock feeds a continuous time data stream to a Model 8185 TimeBurst™. The TimeBurst connects to the customer's radio console or transmitter to provide wireless synchronization. On a schedule chosen by the customer, the TimeBurst automatically keys the transmitter and sends a short coded time of day message in the form of a digital burst. TimeBurst is "polite" to voice communications and will wait for "clear air" to transmit.

The wired digital display clocks have no radio receivers.   Each Spectracom wired display product connects to an RS-485 continuous time data stream provided by a NetClock receiver or the RS-485 output of an Ethernet time server. The wired display clocks decode the time data stream and then synchronize to within 250 milliseconds of the traceable NetClock receiver.
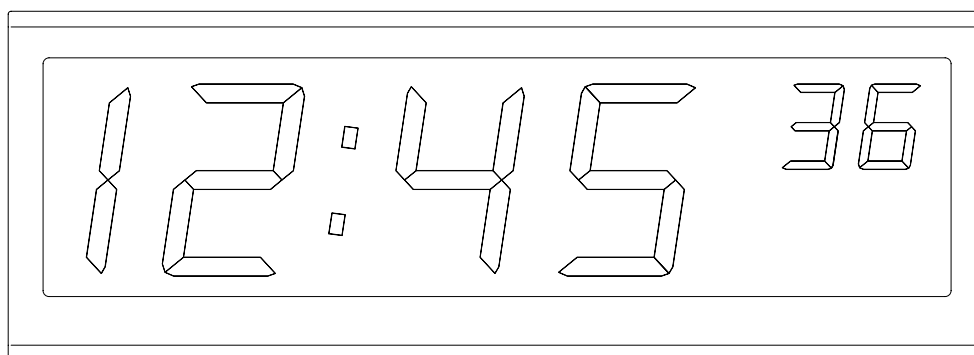
Figure 1-2: Spectracom TV400 Series (Front)

The wireless TimeView digital display clocks have internal radio receivers, built-in and optional (TV210 series) external antennas, or required and included (TV400 series) external antennas. Each wireless TimeView clock decodes the TimeBurst transmission and synchronizes to within 250 milliseconds of the traceable NetClock receiver. Spectracom offers VHF FM, UHF FM commercial, and UHF FM government band versions of the digital TimeView clocks. Specify TimeView 210V or 400V for VHF FM frequencies, TimeView 210U or 400U for UHF FM commercial, and TimeView 210G or 400G for UHF FM government band.

	210 Series	**400 Series**
Wired	TV210W	TV400W
Wireless	TV210V	TV400V
	TV210U	TV400U
	TV210G	TV400G

1.1 Wired Clock Features

Spectracom's wired digital display clocks offer the following features:

- **Accuracy:** TimeView digital clocks display Legally Traceable Time when referenced to a NetClock. The time is accurate to within 250 milliseconds of the NetClock's time.

- **Exceptional Visibility**: Large LED digits – 2.3 inches (58.4 mm) in the TV210 series and 4 inches (101.6 mm) in the TV400 series – and anti-glare display filters provide optimum viewing.

- **Configurable Time Display:** Each clock can be configured to display time in either 12- or 24-hour format.

- **Ease of Installation:** Automatic data format and baud rate detection makes setup and installation easy.

1.2 Wireless Clock Features

Spectracom's wireless digital display clocks offer the following features:

- **Wireless Synchronization to NetClock via TimeBurst and Radio:** The wireless communication link eliminates costly wiring and labor expenses while simplifying installation.

- **Accuracy:** TimeView digital clocks display Legally Traceable Time when connected to a NetClock. The time is accurate to within 250 milliseconds of the NetClock's time.

- **Exceptional Visibility**: Large LED digits – 2.3 inches (58.4 mm) in the TV210 series and 4 inches (101.6 mm) in the TV400 series – and anti-glare display filters provide optimum viewing.

- **Configurable Time Display:** Each clock can be configured to display time in either 12- or 24-hour format.

- **Received Signal Strength Indicator:** A digital RF meter provides a quick method to assess radio signal coverage and simplifies installation.

- **RS-485 Output:** Serial time code data is provided to connect to products requiring RS-485 data input. This allows a wireless clock to synchronize Spectracom wired display clocks and TimeTap[®] devices.

1.3 Warranty Information and Product Support

Warranty information is found on the leading pages of this manual. Should it become necessary to exercise the warranty, contact Spectracom Corporation to obtain a replacement or service.

Spectracom continuously strives to improve its products and greatly appreciates any and all customer feedback given. Please participate in Spectracom's Customer Satisfaction Survey found on our web site, **http://www.spectracomcorp.com**.

Technical support is available by telephone, via e-mail, or online. Please direct any comments or questions regarding application, operation, or service to Spectracom's Customer Service department. Customer Service is available Monday through Friday from 8:30 a.m. to 5:00 p.m. EST. Customer Service can be reached by phone at **585.321.5800**.

Please contact Customer Service to obtain a Return Material Authorization Number (RMA#) before returning any instrument to Spectracom. Please provide the serial number and failure symptoms. Shipping to the factory is to be prepaid by the customer. After obtaining the RMA#, ship the unit back to the following address:

> **Spectracom Corporation**
> **Repair Department, RMA# xxxxx**
> **95 Methodist Hill Drive**
> **Rochester, NY 14623**

Product support is also available by e-mail. Questions on equipment operation and applications may be e-mailed to Spectracom Sales Support

> **sales@spectracomcorp.com**

Repair or technical questions may be e-mailed directly to Spectracom's technicians:

> **techsupport@spectracomcorp.com**

Visit our web page for product information, application notes, and upgrade notices as they become available:

> **http://www.spectracomcorp.com**

1.4 Manual Errata and Special Documentation

Information concerning manual corrections or product changes occurring after printing is found in the Errata Section. The Errata Section, when required, is found at the end of this manual. Please review and incorporate changes into the manual whenever an Errata Section is included.

Spectracom will make instrument modifications on special request. A documentation packet associated with the modification will be provided in addition to this manual.

1.5 Unpacking

On receipt, carefully examine the carton and its contents. If there is damage to the carton resulting in damage to the unit, contact the carrier immediately. Retain the carton and packing materials in the event the carrier wishes to witness the shipping damage. Failing to report shipping damage immediately may forfeit any claim against the carrier. In addition, notify Spectracom Corporation of shipping damage or shortages to obtain a replacement or repair services.

Remove the packing list from the envelope on the outside of the carton. Check the packing list against the contents to be sure all items have been received, including an instruction manual and ancillary kit. Table 1-1 lists the items included in the various ancillary kits.

Ancillary Kit Items Supplied with All Display Clocks		
Description	**Part Number**	**Quantity**
Plastic Anchor	HD0001	2
Screw, #6 x 1"	H100-1000-0016	2
Terminal Strip	P13006	1
Resister, 120 Ohms	R02121	1

Ancillary Kit Items Supplied with 210 Series Only		
Description	**Part Number**	**Quantity**
Power Adapter, 12 VDC	PS03-0T0J-WM01	1

Ancillary Kit Items Supplied with 400 Series Only		
Description	**Part Number**	**Quantity**
Power Adapter, 12 VDC	PS06-0E0J-DT01	1
Line Cord	W01000	1

Table 1-1: Ancillary Kits

Wireless units ordered with an optional external antenna (210 series) or shipped with a required, included antenna (400 series) receive an antenna suited for the specified frequency band. Refer to Table 1-2 and verify that the appropriate antenna has been shipped with your unit(s).

Frequency Band	**Frequency Range**	**Spectracom Part Number**
VHF	150-162 MHz	E030-0003-0150
	160-174 MHz	E030-0004-0160
UHF Commercial	400-512 MHz	E030-0005-0450
UHF Government	400-420 MHz	E030-0002-0420

Table 1-2: External Antennas

1.6 *Specifications*

Refer to sections 1.6.1, 1.6.2, 1.6.3, and 1.6.4 for digital display clock specifications.

1.6.1 TimeView 210W (Wired)

<u>**PERFORMANCE**</u>
TIMING ACCURACY:
+/- 250 milliseconds

<u>**FRONT PANEL**</u>
DISPLAY:
- Green LED standard; red LED optional; 12- or 24-hour
- 2.3" (58 mm) hours and minutes digits
- 1.0" (25 mm) seconds digits
- Visibility to 75 feet (23 meters)
- Seconds digits blink to indicate loss of time synchronization

<u>**REAR PANEL**</u>
SELECTABLE FUNCTIONS:
Set-up switches configure:
- Manual time set
- 12- or 24-hour display
- Brightness
- Settings retained in non-volatile memory

INPUT PORT:
RS-485 input three-position terminal block
- RS-485 over a balanced wire pair
- SmartBus automatically detects baud rate (1200-9600)
- SmartBus automatically detects required time code Format 0 or 1 from NetClock® master clock or computer using TimeSet TS-1 software or wireless TimeView

OUTPUT PORT:
- RS-485 output three-position terminal block
- RS-485 repeater of input port signal
- Capable of driving TimeTaps® (8179T) and wired wall clocks (TV210W/TV400W/TV312W)

POWER:
100-250 VAC, 47-63 Hz to 12 VDC @ 9.6 watts max. from external UL/CSA approved power supply. Re-order number: PS03-0T0J-WM01. Barrel-type power connector; 5.5 mm OD, 2.5 mm ID, female, center positive.

BATTERY BACK-UP:
10-yr storage/operating life lithium battery maintains internal time during power interruption.

<u>**PHYSICAL & ENVIRONMENTAL**</u>
SIZE/WEIGHT:
13" L x 4.9" H x 2.7" D, 2.2 lbs
(330 mm L x 124 mm H x 69 mm D, 1.0 kg)

ENVIRONMENTAL:
Operating Range: 32° F to 140° F (0° C to 60° C)
Storage Range: -40° F to 185° F (-40° C to 85° C)
Relative Humidity: 10-95%, non-condensing

AGENCY APPROVALS:
UL/CSA (power supply)

<u>**WARRANTY**</u>
FIVE YEAR LIMITED WARRANTY

<u>**ORDERING INFORMATION**</u>
1. TimeView® Display Clock
TimeView 210 Display Clock – Model TV210W

2. Option 05: Red Digits

<u>**ADDITIONAL ACCESSORIES**</u>
3. Cable – CW04xxx, a twisted pair wire to connect TV210W to 91XX or other clocks; and CA14xxx, and RS-485 cable (where xxx = length in feet)

4. Software
TimeSet-TS-1 to synchronize TimeView Display Clocks from Win 95/98/NT or DOS computers.

1.6.2 TimeView 210V, U, G (Wireless)

<u>PERFORMANCE</u>
TIMING ACCURACY:
+/- 250 milliseconds

RADIO RECEIVER:
- FM receiver; supports standard and narrow-band FM voice channels
- 6.25 KHz channel spacing
- 2.5 or 5 KHz FM deviation
- Operates on 25 or 12.5 KHz channels
- VHF: 150-174 MHz (programmable)
- UHF (commercial band): 440-470 MHz (programmable)
- UHF (government band): 406-420 MHZ (programmable)

SENSITIVITY
-107 dBm (1 uV) typical at receiver RF input

<u>FRONT PANEL</u>
DISPLAY:
- Green LED standard; red LED optional; 12- or 24-hour
- 2.3" (58 mm) hours and minutes digits
- 1.0" (25 mm) seconds digits
- Visibility to 75 feet (23 meters)
- Seconds digits blink to indicate loss of time synchronization
- Decimal point of hours digit flashes for one second when time data is received

<u>REAR PANEL</u>
SELECTABLE FUNCTIONS:
Set-up switches configure:
- Manual time set
- 12- or 24-hour display
- Brightness
- RF frequency
- RF signal strength
- Grouping
- Buzzer volume for options 01, 02, 03
- Settings retained in non-volatile memory

OUTPUT PORTS:
Two RS-485 output three-position terminal blocks
- Once per-second serial time code (format 0), 9600 baud

- Format 5 output included for event alert options
- Capable of driving TimeTaps® (8179T) and wired wall clocks (TV210W/TV400W/TV312W)
- Accurate to +/- 75 msec (updated once per hour)

POWER:
100-250 VAC, 47-63 Hz to 12 VDC @ 9.6 watts max. from external UL/CSA approved power supply. Re-order number: PS03-0T0J-WM01. Barrel-type power connector; 5.5 mm OD, 2.5 mm ID, female, center positive.

BATTERY BACK-UP:
10-yr storage/operating life lithium battery maintains internal time during power interruption.

<u>PHYSICAL & ENVIRONMENTAL</u>
SIZE/WEIGHT:
13" L x 4.9" H x 2.7" D, 2.2 lbs
(330 mm L x 124 mm H x 69 mm D, 1.0 kg)

ENVIRONMENTAL:
Operating Range: 32° F to 140° F (0° C to 60° C)
Storage Range: -40° F to 185° F (-40° C to 85° C)
Relative Humidity: 10-95%, non-condensing

AGENCY APPROVALS:
UL/CSA (power supply)
FCC Part 15 Class B

<u>WARRANTY</u>
FIVE YEAR LIMITED WARRANTY

<u>ORDERING INFORMATION</u>
1. TimeView® Display Clock
     TimeView 210 Display Clock – Model TV210V
     TimeView 210 Display Clock – Model TV210U
     TimeView 210 Display Clock – Model TV210G
2. Option 01: Event Alert – top lights (LEDs) and internal buzzer
3. Option 02: Event Alert – bottom lights (LEDs) and internal buzzer
4. Option 03: Event Alert – top & bottom lights (LEDs) and internal buzzer
5. Option 04: External antenna and connector
6. Option 05: Red Digits (TV210U only)

1.6.3 TimeView 400W (Wired)

PERFORMANCE
TIMING ACCURACY:
+/- 250 milliseconds

FRONT PANEL
DISPLAY:
- Green LED standard; red LED optional; 12- or 24-hour
- 4" (101 mm) hours and minutes digits
- 2.3" (58 mm) seconds digits
- Visibility to 150 feet (46 meters)
- Seconds digits blink to indicate loss of time synchronization

REAR PANEL
SELECTABLE FUNCTIONS:
Set-up switches configure:
- Manual time set
- 12- or 24-hour display
- Brightness
- Settings retained in non-volatile memory

INPUT PORT:
RS-485 input three-position terminal block
- RS-485 over a balanced wire pair
- SmartBus automatically detects baud rate (1200-9600)
- SmartBus automatically detects required time code Format 0 or 1 from NetClock® master clock or computer using TimeSet TS-1 software or wireless TimeView

OUTPUT PORT:
- RS-485 output three-position terminal block
- RS-485 repeater of input port signal
- Capable of driving TimeTaps® (8179T) and wired wall clocks (TV210W/TV400W/TV312W)

POWER:
100-250 VAC, 47-63 Hz to 12 VDC @ 18 watts max. from external CE/UL/CSA approved power supply. Re-order number: PS06-0E0J-DT01. Barrel-type power connector; 5.5 mm OD, 2.5 mm ID, female, center positive

BATTERY BACK-UP:
10-yr storage/operating life lithium battery maintains internal time during power interruption.

PHYSICAL & ENVIRONMENTAL
SIZE/WEIGHT:
21" L x 7.5" H x 3.4" D, 8.5 lbs
(533 mm H x 191 mm W x 86 mm D, 3.9 kg)

ENVIRONMENTAL:
Operating Range: 32° F to 122° F (0° C to 50° C)
Storage Range: -40° F to 185°O F (-40° C to 85° C)
Relative Humidity: 10-95%, non-condensing

AGENCY APPROVALS:
CE/UL/CSA (power supply)

WARRANTY
FIVE YEAR LIMITED WARRANTY

ORDERING INFORMATION
1. TimeView® Display Clock
TimeView 400 Display Clock – Model TV400W

2. Option 05: Red Digits

ADDITIONAL ACCESSORIES
3. Cable – CW04xxx, a twisted pair wire to connect TV400W to 91XX or other clocks; and CA14xxx, and RS-485 cable (where xxx = length in feet)

4. Software
TimeSet-TS-1 to synchronize TimeView Display Clocks from Win 95/98/NT or DOS computers.

1.6.4   *TimeView 400V, U, G (Wireless)*

PERFORMANCE
TIMING ACCURACY:
+/- 250 milliseconds

RADIO RECEIVER:
- FM receiver; supports standard and narrow-band FM voice channels
- 6.25 KHz channel spacing
- 2.5 or 5 KHz FM deviation
- Operates on 25 or 12.5 KHz channels
- VHF: 150-174 MHz (programmable)
- UHF (commercial band): 440-470 MHz (programmable)
- UHF (government band): 406-420 MHZ (programmable)

SENSITIVITY
-107 dBm (1 uV) typical at receiver RF input

FRONT PANEL
DISPLAY:
- Green LED standard; red LED optional; 12- or 24-hour
- 4" (101 mm) hours and minutes digits
- 2.3" (58 mm) seconds digits
- Visibility to 150 feet (46meters)
- Seconds digits blink to indicate loss of time synchronization
- Decimal point of hours digit flashes for one second when time data is received

REAR PANEL
SELECTABLE FUNCTIONS:
Set-up switches configure:
- Manual time set
- 12- or 24-hour display
- Brightness
- RF frequency
- RF signal strength
- Grouping
- Buzzer volume for options 01, 02, 03
- Settings retained in non-volatile memory

OUTPUT PORTS:
Two RS-485 output three-position terminal blocks
- Once per-second serial time code (format 0), 9600 baud

- Format 5 output included for event alert options
- Capable of driving TimeTaps® (8179T) and wired wall clocks (TV210W/TV400W/TV312W)
- Accurate to +/- 75 msec (updated once per hour)

POWER:
100-250 VAC, 47-63 Hz to 12 VDC @ 18 watts max. from external CE/UL/CSA approved power supply. Re-order number: PS06-0E0J-DT01. Barrel-type power connector; 5.5 mm OD, 2.5 mm ID, female, center positive.

BATTERY BACK-UP:
10-yr storage/operating life lithium battery maintains internal time during power interruption.

PHYSICAL & ENVIRONMENTAL
SIZE/WEIGHT:
21" L x 7.5" H x 3.4" D, 8.5 lbs
(533 mm L x 191 mm H x 86 mm D, 3.9 kg)

ENVIRONMENTAL:
Operating Range: 32° F to 122° F (0° C to 50° C)
Storage Range: -40° F to 185° F (-40° C to 85° C)
Relative Humidity: 10-95%, non-condensing

AGENCY APPROVALS:
CE/UL/CSA (power supply)

WARRANTY
FIVE YEAR LIMITED WARRANTY

ORDERING INFORMATION
1. TimeView® Display Clock
        TimeView 400 Display Clock – Model TV400V
        TimeView 400 Display Clock – Model TV400U
        TimeView 400 Display Clock – Model TV400G
2. Option 01: Event Alert – top lights (LEDs) and internal buzzer
3. Option 02: Event Alert – bottom lights (LEDs) and internal buzzer
4. Option 03: Event Alert – top & bottom lights (LEDs) and internal buzzer
5. Option 04: External antenna and connector
6. Option 05: Red Digits (TV400U only)

2 Installation

The following sections describe mounting, set up configuration and verification of operation for the TimeView 210 series and TimeView 400 series digital display clocks. To ensure proper operation, please read the applicable sections for your equipment prior to installation and use of the product(s).

2.1 Mounting Instructions

The TimeView clocks are designed to mount over a duplex outlet to completely conceal the power adapter. For installations where this is not possible, clearance is provided along the top and bottom edges for routing the power cable. The 210 series clocks have mounting holes that allow for wall or bulkhead mounting. The 400 series clocks have mounting holes that allow for wall mounting only.

2.1.1 Wall Mounting – TimeView 210 Series

The ancillary kit includes screws and plastic anchors for wall mounting the clock. Tools needed for wall mounting are a Phillips screwdriver, a ruler, and a ¼" inch drill.

To wall mount the TimeView 210 over a duplex outlet, lay a reference line through the center of the cover plate as shown in Figure 2-1. Mark and drill two holes 8.25 inches apart and centered on the outlet.
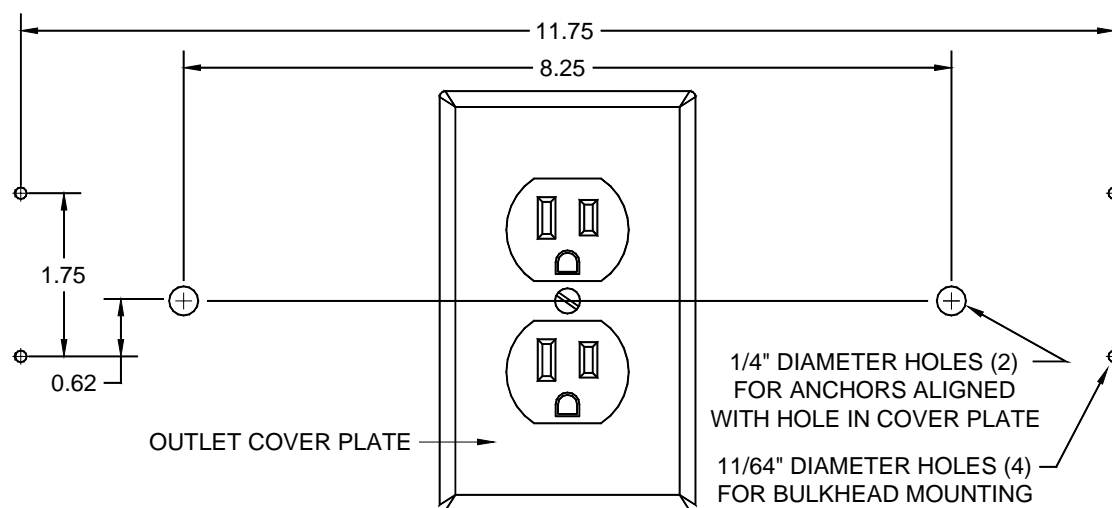
Figure 2-1: Duplex Mounting Holes

2.1.2 Bulkhead Mounting – TimeView 210 Series

The TimeView 210 can be bulkhead mounted using the threaded holes found on the rear panel. These holes accept #8-32 screws. Locate the four bulkhead mounting holes as shown in Figure 2-1.

The four holes form a rectangle measuring 11.75 inches long and 1.75 inches high. Drill 11/64-inch holes at each corner of the rectangle. Secure the clock to the mounting surface using #8-32 screws.

NOTE: The bulkhead mounting screws may protrude into the clock a maximum of ½ inches. Longer screws will not fully tighten the clock against the mounting surface.

2.1.3 Wall Mounting – TimeView 400 Series

The TimeView 400 series clock is designed to mount over a duplex outlet to completely conceal the power adapter and line cord. For installations where this is not possible, clearance is provided along the top and bottom edges for routing the power and data cables.

The ancillary kit includes screws and plastic anchors for wall mounting the clock. Tools needed for wall mounting are a Phillips screwdriver, a ruler, and a ¼" inch drill.

To wall mount the TimeView 400 over a duplex outlet, lay a reference line over the cover plate as shown in Figure 2-2. Mark and drill two holes 16.0 inches apart and centered on the outlet.
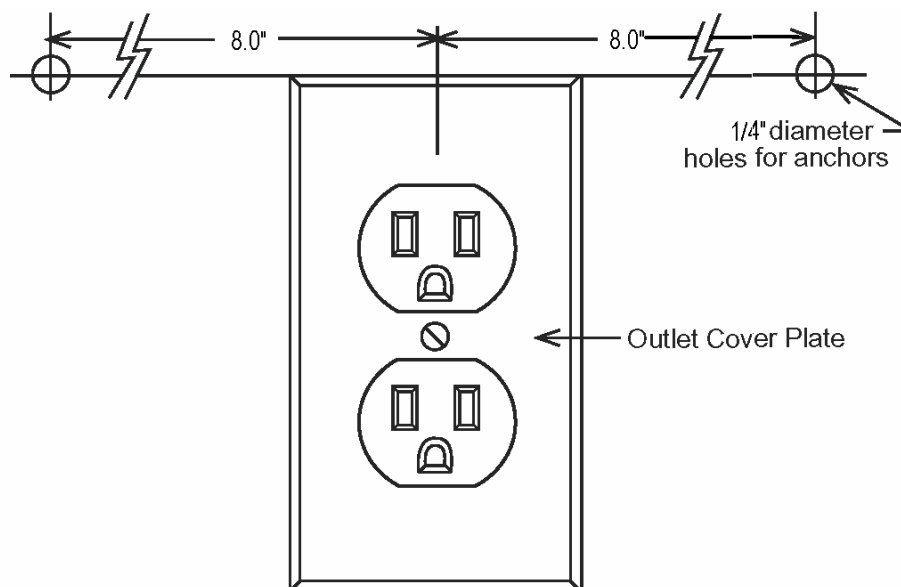
Figure 2-2: Duplex Mounting Holes

2.2 Power – TimeView 210 Series

Plug the AC adapter into the top outlet with the cord facing downward. Initially the seconds digits will blink to indicate the clock has not time-synchronized to the NetClock. The seconds will continue flashing until the clock receives a synchronizing data stream.

An international power supply (supplied with 400 series clocks) is available for purchase with 210 series clocks under part number PS06-0E0J-DT01. This adapter operates on 100-250 VAC 50/60 HZ power.

NOTE: The PS06-0E0J-DT01 adapter requires additional mounting space, such as in an 8" x 8" electrical box, because it is too large to fit behind the 210 series clocks.

2.3 Power – TimeView 400 Series

The power pack and line cord are packaged in the ancillary kit. The power adapter operates on 100-250 VAC 50/60 Hz power. The provided line cord is compatible with AC receptacles (NEMA 5-15R) commonly found in the United States and Canada. Alternate type line cords must be obtained locally.

Initially the seconds digits will blink to indicate the clock has not time-synchronized to the NetClock. The seconds will continue flashing until the clock receives a synchronizing data stream.

2.4 Wired Clock Configuration

Before placing the TimeView wired clocks into service, the clocks must be configured to suit the application(s). The clocks' configuration options include 12- or 24-hour display format, display brightness, and manual time setting for stand-alone clock operation. Optionally, the TimeView can be equipped with LED status lamps and a buzzer that can be activated over the RS-485 data stream.   In most applications only the display format (12- or 24-hour) will need to be configured.

Configuration selections are made using the Mode and Set switches located near the center of the rear panel. (Refer to Figure 2-3 to assist in locating the switches in the 210 series clocks.) The switches are momentary push buttons and are recessed to prevent accidental actuation. Use a narrow, blunt-tipped object (such as a "Q"-tip) to actuate the push button switches.

In the event of a power failure, configuration selections are permanently saved in EEPROM.
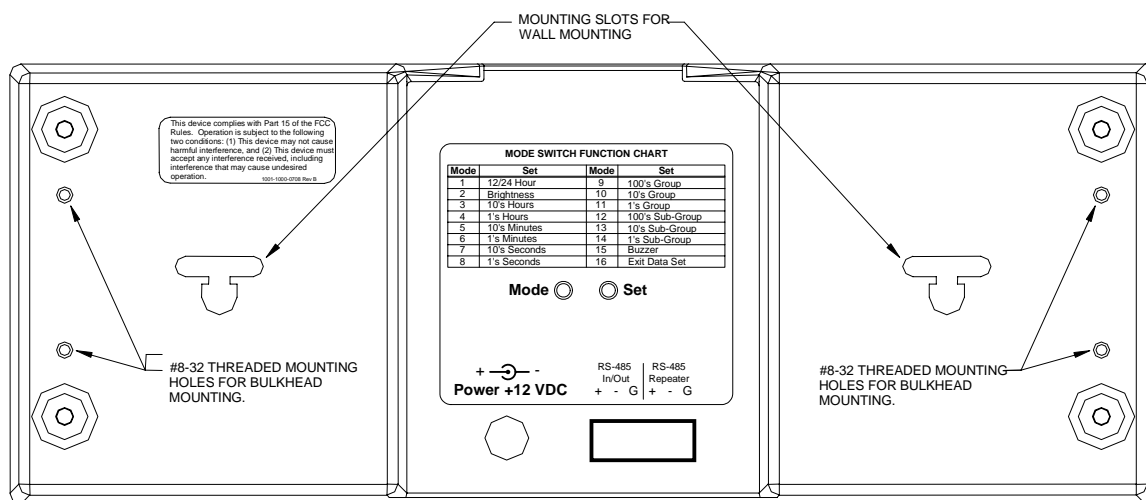
Figure 2-3: TimeView 210W Rear Panel

The Mode and Set switches are used in a manner similar to setting a digital alarm clock. The Mode switch is used to step through each setup parameter and the Set switch selects the desired variable. The Time and Group parameters are divided into several steps where each variable is set and then advanced to the next step by the Mode switch. The digit that is currently being set will flash on and off.

For example, manually setting the time requires six steps, because each display character is individually set. The first step is setting the tens of hours digit, the next is the units of hours digit, the next is the tens of minutes digit, and so on until the complete display of HH:MM:SS is configured.

In total, there are 16 steps to configure the clock. These steps are listed in Table 2-1, Mode Switch Function Chart. Pressing the Mode switch begins the configuration process. Refer to Table 2-1 and the paragraphs that follow for instructions on wired clock configuration.

MODE	SET	RANGE	MODE	SET	RANGE
1	Display	12 or 24	9	100s Group	0 or 1
2	Brightness	0..3	10	10s Group	0..9
3	10s Hours	0,1 or 2	11	1s Group	0..9
4	1s Hours	0..9	12	100s Sub-Group	0..2
5	10s Minutes	0..5	13	10s Sub-Group	0..9
6	1s Minutes	0..9	14	1s Sub-Group	0..9
7	10s Seconds	0..5	15	Buzzer	0..3
8	1s Seconds	0..9	16	Exit Setup	-

Table 2-1: Mode Switch Function Chart

2.4.1 Display Settings

Mode steps 1 and 2 are used to configure the display format and the display brightness.

MODE 1   Pressing the Mode switch once initiates the display options parameters. Mode 1 enables 12 or 24-hour display format. Press the Set button to toggle between 12 hour and 24-hour display.

MODE 2   Pressing the Mode switch for the second time advances the setup process to the display brightness selection. Four brightness settings are available, with 0 being the dimmest and 3 being the brightest. Press the Set button to toggle between the brightness settings.

2.4.2 Setting the Time

Mode steps 3 through 8 are used to set the time.

NOTE: It is not necessary to set the time when the TimeView is synchronized to a NetClock.

Time must be entered in a 24-hour format. For example, 5:00 PM is equivalent to 17:00. Therefore, enter 1 for the tens of hours digit and 7 for the units of hours digit.

MODE 3   Pressing the Mode switch again advances the setup process to the tens of hours variable. Use the set button to select the desired tens of hours value. Again, the time must be entered in 24-hour format.

MODE 4   Pressing the Mode switch again advances the setup process to the units of hours variable. Use the set button to select the desired units of hours value. Again, the time entered must reflect 24-hour format.

MODE 5   Pressing the Mode switch again advances the setup process to the tens of minutes variable. Use the Set button to select the desired tens of minutes value.

MODE 6   Pressing the Mode switch again advances the setup process to the units of minutes variable. Use the Set button to select the desired units of minute value.

MODE 7   Pressing the Mode switch again advances the setup process to the tens of seconds variable. Use the Set button to select the desired tens of seconds value.

MODE 8   Pressing the Mode switch again advances the setup process to the units of seconds variable. Use the Set button to select the desired units of seconds value.

2.4.3 Setting the Group and Sub-Group Addresses

The TimeView is a multi-purpose, multi-system clock and is individually addressable. This function is used to send commands to individual or groups of clocks but not others. Multi-purpose clocks may have Status and/or Alert Indicators or buzzers that can be controlled from a central Multi-System Controller. Mode steps 9 through 14 are used to set these addresses.

2.4.3.1   Group and Sub-Group Addressing

All clocks have two addresses: the Main Group address and the Sub-Group address.

The default setting for both the Main Group and the Sub-Group is 000, so if this feature is not to be used, it can remain zero and you can skip to the next section. All clocks receive the time broadcasts, so if your clock only displays time, you do not need to be concerned about addressing.

The Main Group address range is 000 – 127. A Main Group address of 000 sets the clock to listen to all commands.

The Sub-Group address range is 000 – 255. A Sub-Group address of 000 sets the clock to listen to all commands for the Main Group.

The Main and Sub-Group addresses can be used to control multiple clocks. For example, consider a large company with multiple buildings. An assignment can be made as follows:

Clocks located in:	Main Group Address
Building A	001
Building B	002
Building C	003

Clocks located:	Sub-Group Address
Near an Exit	001
On the Second Floor	002
On the Factory Floor	003

Configured this way, commands can be selectively sent as follows:

Selected Group	Main Address	Sub-Group Address
All Clocks in Building A	001	000
All Clocks in Building C	003	000
All 2nd Floor Clocks in Building A	001	002
Clocks in Building B Near an Exit	002	001

MODE 9   Pressing the Mode switch for the second time advances the setup process 100 place of the Main Group Address.   Use the Set button to select the desired value, 0 or 1.

MODE 10   Sets the 10s digit of the Main Group Address.

MODE 11   Sets the 1s digit of the Main Group Address.

MODE 12   Sets the 100s digit of the Sub-Group Address.

MODE 13   Sets the 10s digit of the Sub-Group Address.

MODE 14   Sets the 1s digit of the Sub-Group Address.

2.4.3.2   Setting the Buzzer Volume

The buzzer is an optional feature and may or may not be installed on your clock. If it is not present, skip this section.

MODE 15   Pressing the Mode switch for the fifteenth time advances the setup process to set the volume of the buzzer. The first two digits will display **bu** and the next digit will be 0, 1, 2, or 3. Use the Set button to select the desired value.
>   **0** – turns off the buzzer
>   **1** – lowest volume
>   **2** – medium volume
>   **3** – highest volume

NOTE: The volume or pitch of the buzzer may change depending on to what type of surface the clock is mounted and whether it is held in the hand.

2.4.4 Exit Configuration Mode
Pressing the Mode switch for the sixteenth time causes the clock to exit from the configuration mode. The clock will return to normal operation.

2.4.5 RS-485 Connection

The RS-485 interface connector, shown in Figure 2-4, is a removable six-position terminal strip. The RS-485 data stream from a NetClock connects to Pins 1, 2 and 3 of the terminal block. Connect the non-inverted RS-485 data line to Pin 1, the inverted data line to Pin 2, and the cable shield to Pin 3. TimeView wired clocks accept Data Formats 0 and 1 at baud rates from 1200 to 9600.

RS-485
IN/OUT

RS-485
REPEATER

| + | — | GND | + | — | GND |

| 1 | 2 | 3 | 4 | 5 | 6 |
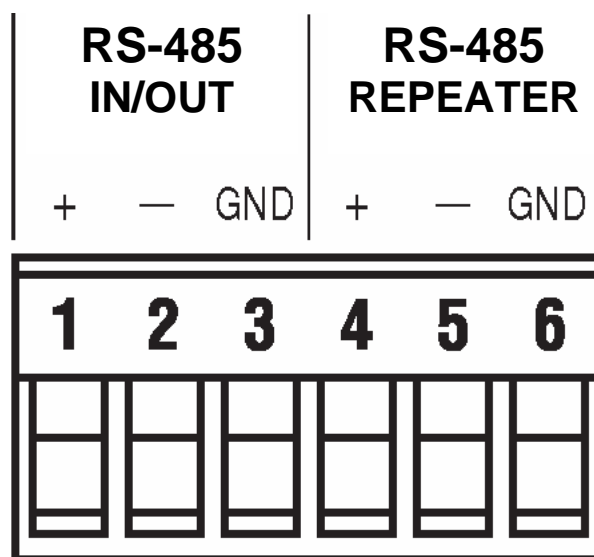
Figure 2-4: RS-485 Connection

2.4.5.1   Repeater Output

RS-485 transmission lines should be connected in a continuous daisy chain configuration. A branched or star configuration is not recommended, nor are long stub lengths to the main transmission line. If these guidelines present an installation problem, the RS-485 Repeater output can be used. The Repeater output regenerates the synchronizing data stream applied to the RS-485 Input/Output terminal block connections. The Repeater output can drive an additional 32 devices over cable lengths up to 4000 feet.

The Repeater output may be used to reduce and simplify cable runs to devices located in different portions of the building. Figure 2-5 shows an installation in which the backup dispatch consoles located in the basement require synchronized time.
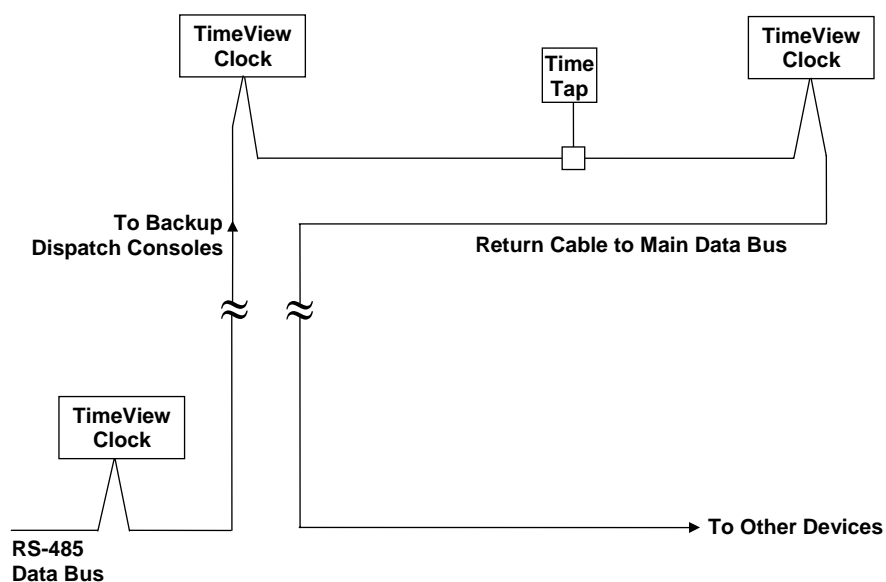
Figure 2-5: Installation Not Using Repeater Output

Figure 2-6 shows the same installation using the Repeater output. Note that the return cable to the main data bus is eliminated.
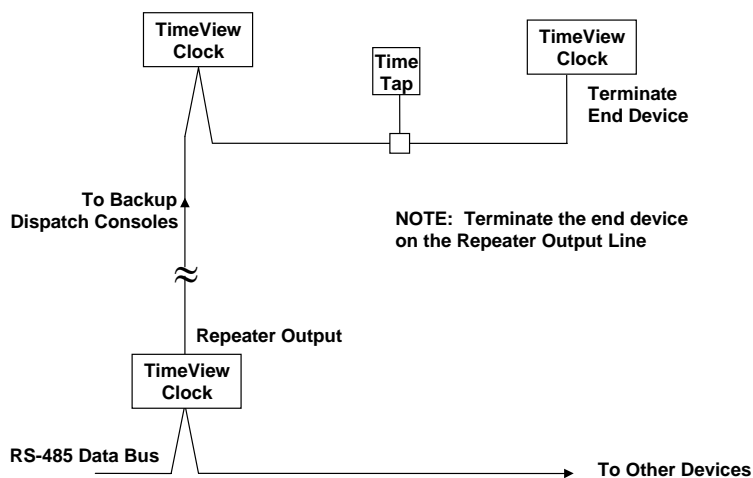
Figure 2-6: Repeater Output Use

2.4.5.2   Termination

The ends of an RS-485 transmission line must be terminated to preserve the signal waveform and prevent reflections. Whenever the TimeView wired clock is the last device on the RS-485 data bus, a 120-ohm resistor must be placed across pins 1 and 2 of the input terminal strip. (In a six-pin terminal strip, pins 1, 2, and 3 are "in," while pins 4, 5, and 6 are "out.") A termination resistor is supplied in the ancillary kit. Install the resistor as shown in Figure 2-7.
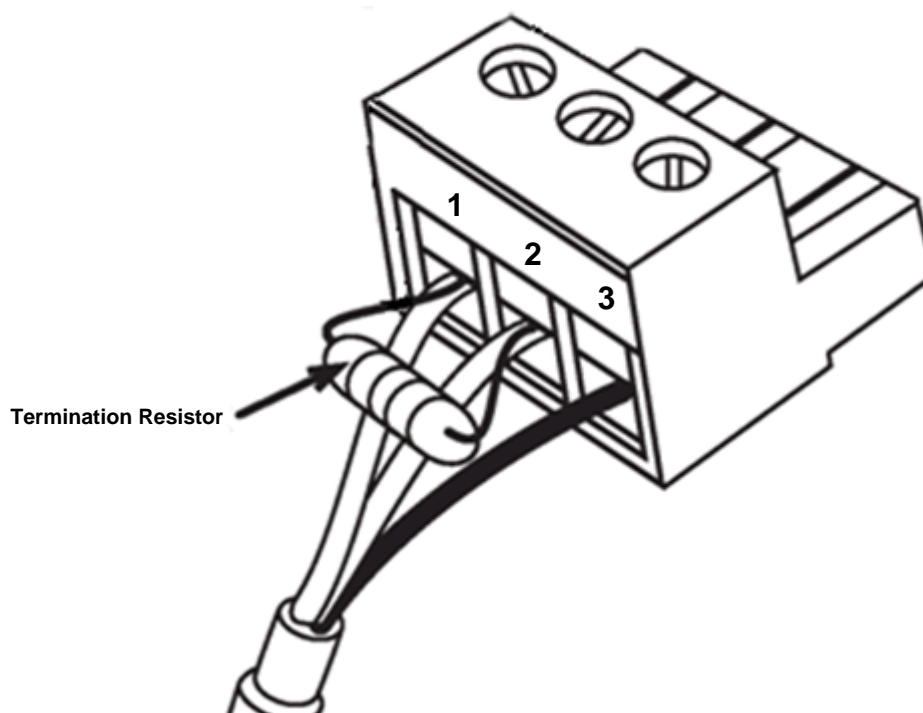
Figure 2-7: Termination Resistor

2.5 Wireless Clock Configuration

Before placing the TimeView wireless clocks into service, the clocks must be configured to suit the application(s). The clocks' configuration options include manually setting the time, selecting the radio frequency, selecting 12 or 24-display format, and setting display brightness. In most applications, only the frequency of operation and display format (12 or 24-hour) will need to be configured.

Configuration selections are made using the Mode and Set switches located near the center of the rear panel. (Refer to Figure 2-8 to assist in locating the switches on the 210 series clocks). The switches are momentary push buttons and are recessed to prevent accidental actuation. Use a narrow, blunt-tipped object (such as a "Q"-tip) to actuate the push button switches.

In the event of a power failure, configuration selections are permanently saved in EEPROM.
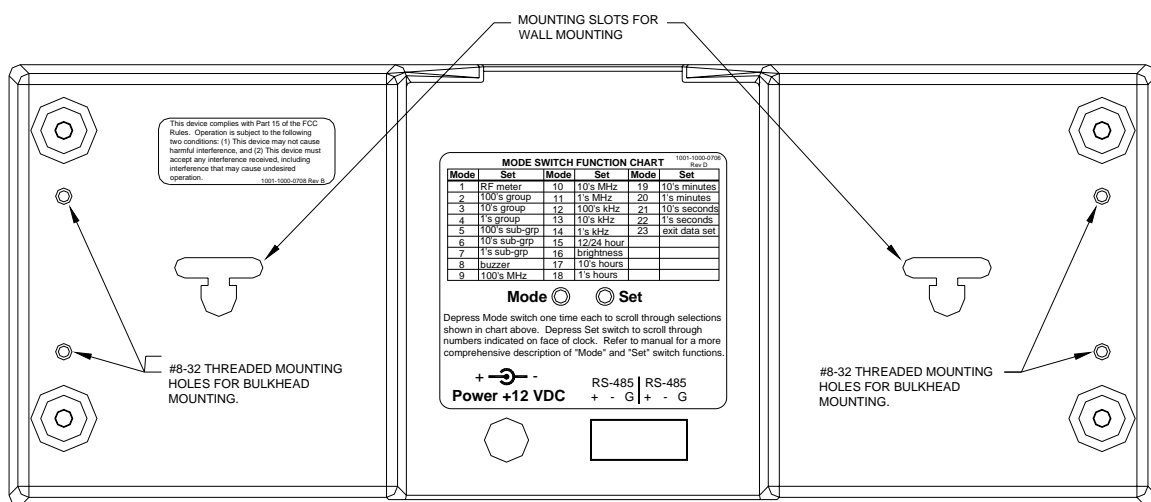
Figure 2-8: TimeView 210 Rear Panel

The Mode and Set switches are used in a manner similar to setting a digital alarm clock. The Mode switch is used to step through each setup parameter and the Set switch selects the desired variable. Each setup parameter – Time, Radio Frequency, etc. – is divided into several steps in which each variable is set and then advanced to the next step by the Mode switch. The digit that is currently being set will flash on and off.

For example, manually setting the time requires six steps, because each display character is individually set. The first step is setting the tens of hours digit, the next is the units of hours digit, the next step is setting the tens of minutes digit, and so on until the complete display of HH:MM:SS is configured.

In total, there are 22 steps to configure the clock. These steps are listed in Table 2-2. Pressing the Mode switch begins the configuration process. Refer to Table 2-2 and the paragraphs that follow for instructions on clock configuration.

MODE	SET	RANGE		MODE	SET	RANGE
1	RF Meter	00 .. 99		14	1s kHz	0,2,5 or 7
2	100s group	0..1		15	Display	12 or 24
3	10s group	0..9		16	Brightness	0..3
4	1s group	0..9		17	10s hours	0,1 or 2
5	100s sub-grp	0..2		18	1s hours	0..9
6	10s sub-grp	0..9		19	10s minutes	0..5
7	1s sub-grp	0..9		20	1s minutes	0..9
8	buzzer	0 ..3		21	10s seconds	0..5
9	100s MHz	1,4		22	1s seconds	0..9
10	10s MHz	0..9		23	Exit setup	-
11	1s MHz	0..9		24		
12	100s kHz	0..9		25		
13	10s kHz	0..9		26		

Table 2-2: Mode Switch Function Chart

2.5.1 RF Meter

MODE 1   Pressing the Mode switch once begins the configuration process. This displays the Received Signal Strength Indicator [RSSI] meter. Note that the first two digits display **rF** and the next two digits will indicate the meter value. The value is **00 – 99**, which is approximately proportional to the radio signal received strength.

2.5.1.1   How to Use This Meter

The clock should synchronize when the value is **15 – 20** or greater. A value of **99** is the strongest usable indication. If the signal becomes too great to use, the meter saturates and reads **OL** (for RF Over Load), the clock may still decode signals with the OL reading, but this is not likely.

When the RF Meter is initially displayed, it will show the RSSI level of the last TimeBurst communication for the first 6 or 7 seconds. If the clock has not yet received a TimeBurst communication, it will read **00** for the first 6 or 7 seconds. After that it will show whatever RSSI level is present at the antenna input.

Remember, however, that the TimeBurst system only transmits a brief [< 1 second] burst occasionally – for example, once every four hours. If the TimeBurst is the only device controlling your transmitter, most of the time the RF Meter will indicate zero. To have the meter indicate, you must key the transmitter. Some keying methods are:

- Press the Prompt button on the TimeBurst front panel

- Set the TimeBurst to transmit every 10 seconds

- If the transmitter is being shared with a voice or paging system, use those devices to key the transmitter. For example, for a voice system, simply key your handheld transceiver. For a paging system, dial out a page.

- Place your transmitter in constant transmit mode.

The brief TimeBurst signal will only provide a quick near-peak signal measurement. Refer to the TimeBurst set-up procedures for controlling its keying. Refer to your transmitter's manual for keying it.

NOTE: This meter is not a precision indicator. It is a relative guide to aid in installation and in determining wireless coverage. Some clocks may synchronize below a **15 – 20** value, while others may require above **20** to sync. For any clock, the meter is useful in determining the relative signal strength for one location or orientation over another.

2.5.1.2   Alternate Shortcut Entry Method to This Display

Because this display is useful when locating a clock for improved signal strength, you can quickly enter and exit this mode by pressing only the Set switch while in the Normal Operational mode.   Pressing Set a second time returns immediately to the Normal Operational mode without sequencing through the whole menu.

2.5.1.3   Setting the Group and Sub-Group Addresses

The TimeView is a multi-system clock and is individually addressable. This function is used to send commands to individual or groups of clocks and not others. Multi-purpose clocks may have Status and/or Alert Indicators or a buzzer that can be controlled from a central TimeBurst Multi-System Controller.   Mode steps 2 through 7 are used to set these addresses.

2.5.1.4   Group and Sub-Group Addressing

All clocks have two addresses: the Main Group address and the Sub-Group address.

The default setting for both the Main Group and the Sub-Group is 000 so if this feature is not to be used, it can remain zero and you can skip to the next section. All clocks receive the time broadcasts, so if your clock only displays time, you do not need to be concerned about addressing.

The Main Group address range is 001 – 127. A Main Group address of 000 sets the clock to listen to all commands. The Sub-Group address range is 001 – 255. A Sub-Group address of 000 sets the clock to listen to all commands for the Main Group.

The Main and Sub-Group addresses can be used to control multiple clocks.   For example, consider a large company with multiple buildings.   An assignment can be made as follows:

Clocks located in:	Main Group Address
Building A	001
Building B	002
Building C	003

Clocks located:	Sub-Group Address
Near an Exit	001
On the Second Floor	002
On the Factory Floor	003

Configured this way, commands can be selectively sent as follows:

Selected Group	Main Address	Sub-Group Address
All Clocks in Building A	001	000
All Clocks in Building C	003	000
All 2nd Floor Clocks in Building A	001	002
Clocks in Building B Near an Exit	002	001

MODE 2   Pressing the Mode switch for the second time advances the setup process 100 place of the Main Group Address.   Use the Set button to select the desired value, 0 or 1.

MODE 3   Sets the 10s digit of the Main Group Address.

MODE 4   Sets the 1s digit of the Main Group Address.

MODE 5   Sets the 100s digit of the Sub-Group Address.

MODE 6   Sets the 10s digit of the Sub-Group Address.

MODE 7   Sets the 1s digit of the Sub-Group Address.

2.5.2   Setting the Buzzer Volume

The buzzer is an optional feature and may or may not be installed on your clock. If it is not present, skip this step.

MODE 8   Pressing the Mode switch for the eighth time advances the setup process to set the volume of the buzzer. The first two digits will display **bu** and the next digit will be 0, 1, 2, or 3. Use the Set button to select the desired value.
    0 – turns off the buzzer
    1 – lowest volume
    2 – medium volume
    3 – highest volume

NOTE: The volume or pitch of the buzzer may change depending on the type of surface to which the clock is mounted and whether it is held in the hand.

2.5.3 Setting the Radio Frequency

Spectracom offers both VHF and UHF versions of the TimeView wireless clocks. The frequency ranges are:

> VHF: 150 to 174 MHz
> UHF Government: 406 to 420 MHz
> UHF Commercial: 440 to 470 MHz

Mode steps 9 through 14 are used to select the frequency of operation. The step size of the frequency selection is 2.5 KHz. Because there is no display digit for the tenths Kilohertz place, the 1s KHz digit will advance to approximate the channel setting. This approximation is for display indication only, however. Internally, the clock is set precisely to the 2.5 KHz channel.

MODE 9 Pressing the Mode switch for the ninth time advances the setup process to the frequency of operation parameter. Use the Set button to select the desired 100s of MHz value.

MODE 10 Pressing the Mode switch for the tenth time advances the setup process to the tens of MHz variable. Use the Set button to select the desired tens of MHz value.

MODE 11 Pressing the Mode switch for the eleventh time advances the setup process to the units of MHz variable. Use the Set button to select the desired units of MHz value.

MODE 12 Pressing the Mode switch for the twelfth time advances the setup process to the 100s of kHz variable. Use the Set button to select the desired 100s of kHz value.

MODE 13 Pressing the Mode switch for the thirteenth time advances the setup process to the tens of kHz variable. Use the Set button to select the desired tens of kHz value.

MODE 14 Pressing the Mode switch for the fourteenth time advances the setup process to the units of kHz variable. The minimum step size of the radio frequency set up is 2.5 kHz, so the Set button will advance this digit as follows:

> **0** => 0.0 KHz.
> **2** => 2.5 KHz.
> **5** => 5.0 KHz.
> **7** => 7.5 KHz.

2.5.4 Display Settings

Mode steps 15 and 16 are used to configure the display format and the display brightness.

MODE 15 Pressing the Mode switch for the fifteenth time advances the setup process to the display options parameters. Mode 15 enables 12- or 24-hour display format. Press the Set button to toggle between 12-hour and 24-hour display.

MODE 16 Pressing the Mode switch for the sixteenth time advances the setup process to the display brightness selection. Four brightness settings are available, with 0 being the dimmest and 3 being the brightest. Press the Set button to toggle between the brightness settings.

Mode steps 17 through 22 are used to set the time.

NOTE: If the clock is to be synchronized via radio signals, it is not necessary to manually set the Time. Skip past these parameters by pressing the Mode button seven times to exit the menu setup.

Time must be entered in a 24-hour format. For example, 5:00 PM is equivalent to 17:00. Therefore, enter 1 for the tens of hours digit and 7 for the units of hours digit.

MODE 17 Pressing the Mode switch again advances the setup process to the tens of hours variable. Use the set button to select the desired tens of hours value. Again, the time entered must reflect 24-hour format.

MODE 18 Pressing the Mode switch again advances the setup process to the units of hours variable. Use the set button to select the desired units of hours value. Again, the time entered must reflect 24-hour format.

MODE 19 Pressing the Mode switch again advances the setup process to the tens of minutes variable. Use the Set button to select the desired tens of minutes value.

MODE 20 Pressing the Mode switch again advances the setup process to the units of minutes variable. Use the Set button to select the desired units of minute value.

MODE 21 Pressing the Mode switch again advances the setup process to the tens of seconds variable. Use the Set button to select the desired tens of seconds value.

MODE 22   Pressing the Mode switch again advances the setup process to the units of seconds variable. Use the Set button to select the desired units of seconds value.

2.5.5 Exit Configuration Mode

Pressing the Mode switch for the twenty-third time causes the clock to exit from the configuration mode. The clock will return to normal operation.

2.5.6 TimeBurst Configuration

The Spectracom Model 8185 TimeBurst connects to the radio transmitter directly or through the radio console using the Audio Output, PTT (Push To Talk), and Busy (Inhibit) lines. The PTT and Busy lines can be optically isolated. The Busy (Inhibit) signal from the transmitter is monitored by the TimeBurst and holds off sending a message until the channel is clear of traffic. The hold-off does not affect accuracy because the message sent is the current time of transmission.
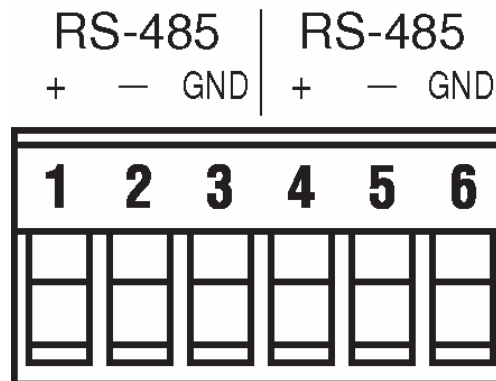
The TimeBurst sends the time message automatically on a schedule set during its installation. The minimum recommended broadcast schedule is every four hours to maintain the 250-millisecond accuracy of the TimeView wireless clock. Once per hour is a typical schedule. The TimeBurst can be manually prompted by connecting the remote prompt to a push button on the radio console or by using the front panel Prompt button.

TimeBurst's total air time is about one second. The message is a digital burst in the audio band and sounds like a chirp, similar to an ANI burst from a transceiver (Audio Minimum Shift Keying, or AMSK).

Refer to the Model 8185 TimeBurst manual for information on message scheduling and operation.

2.5.7 Wired RS-485 Ports

Two RS-485 output ports are provided on the rear of the clock as shown below. (In the wireless clocks, BOTH ports are output ports.)

```
RS-485  │  RS-485
 +  —  GND │  +  —  GND
┌─────────────────────┐
│  1  2  3  4  5  6    │
│ ┌──┬──┬──┬──┬──┬──┐  │
│ │  │  │  │  │  │  │  │
│ └──┴──┴──┴──┴──┴──┘  │
└─────────────────────┘
```

Figure 2-9: Rear Panel Ports

These ports provide serial data time code connectivity to other Spectracom Corporation products. Both ports are outputs. They can be used to drive other wired clocks that are unable to receive radio signal. They can also provide remote timing for other Spectracom products that receive serial time code data, such the wired display clocks and Spectracom's TimeTap devices.

The default format output from the wireless clock is Data Format 0. Format 5 is a factory option for use with the Status or Alerts LEDs option.

2.5.7.1   Connecting to Model 8188/9188 Ethernet NTP Time Servers

The output port from the Wireless TimeView connects to the RS-485 input of a Model 8188/9188 Ethernet NTP Time Server to provide a quick and easy way to locate a precision NTP Time Server anywhere in the wireless coverage region. The precision time code received by the clock's receiver is repeated out the data port with accuracy of +/- 100 milliseconds to the clock's internal time.

The RS-485 Time Code output from the Wireless Clock is the same as the output from any other Spectracom NetClock product, so follow the installation directions from the Model 8188 or 9188 NTP Time Server and use the wireless clock as the time source instead of a NetClock.

Once synchronized, the TimeView will output this code every second, using its own internal oscillator to keep precision time. If the Wireless Clock stops receiving the TimeBurst after 80 minutes, it will note this in the serial time code output status byte, indicating that the time code may no longer be within the 100 millisecond accuracy.

NOTE: Once an NTP Time Server receives the Time Sync Status character indicating that the accuracy is no longer 100 milliseconds, it will indicate loss of time sync. However, the TimeView 210 doesn't exceed its 250 millisecond accuracy until 8.5 hours. For this 7 hour period, the TimeView will not flash its seconds digits even though the NTP Time Server is indicating out of sync.

When using the TimeBurst wireless system to synchronize remote NTP Time Servers, it is important to set the TimeBurst for 1/2 hour or less periodic updates to keep the servers within accuracy limits.

2.5.7.2   Connecting to Other Wired Clocks

Connect the RS-485 Time Code output of a wireless clock to the input of a Spectracom wired clock to extend the range into areas that have weak or no radio coverage such as building interiors or basements.

The RS-485 Time Code output from the wireless clock is the same as the output from any other Spectracom NetClock product, so follow the installation directions of the wired clock and use the wireless clock as the time source instead of a NetClock.

When connecting to Spectracom multi-system wired clocks with LED Status or Alert Display features, the wireless clock must be configured to output Time Code Format 5, which has the LED Status and Alert data included. Configuring the clock for Format 5 output is an internal (factory) configuration step, so specify this when ordering the clock.

2.5.8   Verifying Operation

During initial operation, the seconds digits on the TimeView wireless clock will flash to indicate that it has not yet received a digital burst from the TimeBurst and is not displaying synchronized time. Because the typical broadcast schedule of the TimeBurst can be configured for up to four hours, verifying operation can take a long time. The verification process can be sped up by temporarily shortening the TimeBurst's message schedule to every 15 minutes or even to once every 10 seconds. Another method is to have an assistant press the Prompt button on the TimeBurst.

When the TimeView successfully decodes a data burst, the display time will update and the seconds will stop flashing. In addition, every time a message has been received and decoded, the decimal point of the hours digit will flash for one second. Use this illumination of the decimal point of the hours digit to verify proper TimeView operation. The decimal point will illuminate for one second whenever time data is received, scheduled or otherwise.

If the TimeView has been unable to successfully decode a sync burst within 8.5 hours, the seconds digits will flash to indicate loss of synchronization. Use the RF Signal Meter to verify that the signal level is adequate (refer to Section 2.5.1). Refer also to the individual clock specifications in Section 1 of this manual.

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