

The Spectracom NetClock Wireless Clocks

are cost-effective facilities clocks that display synchronized time across a campus, within a structure, or in a variety of other installations. A Wireless Clock System comprises one or more analog or digital display clocks, a wireless transceiver, and a NetClock time server.

Once connected to a synchronized time source, the Wireless Clock System transceiver transmits a signal to correct and synchronize the time shown on the individual display clocks. Spectracom NetClock Wireless Clocks cannot be set manually.

1	INVENTORY AND INSPECTION	1-1
2	INSTALLATION.....	2-1
2.1	Install the Transceiver.....	2-1
2.1.1	Mounting the Transceiver	2-2
2.1.2	Connect Transceiver Power.....	2-2
2.2	Configure for Local Time.....	2-2
2.2.1	Set DST Rule	2-3
2.2.2	Set Auxiliary Input	2-3
2.2.3	Verify Time Input	2-3
2.2.4	Set Offset (Time Zone)	2-3
2.2.5	Programming Summary	2-3
2.3	Establish the Network Connection(s).....	2-4
2.4	Configure the Transceiver Using DS Manager	2-4
2.4.1	If Your Network Supports DHCP	2-4
2.4.2	If Your Network Does Not Support DHCP	2-5
2.5	Installing Digital Display Clock(s).....	2-5
2.5.1	Synchronizing to the Transceiver	2-6
2.6	Installing Analog Display Clock(s)	2-7
2.6.1	Synchronizing to the Transceiver	2-8
2.6.2	Conserving Battery Power	2-8
2.6.3	Manually Transmitting and Receiving.....	2-8
2.6.4	Testing the Distance Between Clocks Used as Repeaters.....	2-9
3	TROUBLESHOOTING	3-9
3.1	Transceiver Troubleshooting Tips	3-9
3.1.1	Transceiver Will Not Synchronize to NetClock (Seconds Blinking).....	3-9
3.1.2	Transceiver Does Not Power Up	3-9
3.2	Clock Troubleshooting Tips	3-9
3.2.1	Digital Clock Does Not Receive Signal (Colon Blinking)	3-9
3.2.2	Digital Clock Does Not Power Up	3-9
3.2.3	Analog Clock Hands Do Not Move After Power-Up	3-9
3.2.4	Analog Clock Does Not Receive Signal.....	3-9
3.2.5	Analog Clock Displays Incorrect Time	3-9
3.2.6	Desire to Verify Analog Clock Signal Quality.....	3-9
3.2.7	Signal to Desired Clock Location Receives is Marginal	3-9
3.2.8	Distance Between Clocks is Too Great	3-9
3.3	Analog Diagnostic 1	3-10
3.4	Analog Diagnostic 2	3-10
3.5	Analog Diagnostic 3	3-10

Figure 2-1: Transceiver Mounting.....	2-2
Figure 2-2: Transceiver Wiring and Connection Pin-Outs.....	2-2
Figure 2-3: Transceiver Connections (Inside Transceiver Box)	2-3
Figure 2-4: Tibbo DS Manager Error Window	2-4
Figure 2-5: Tibbo DS Manager (Transceiver Detected)	2-4
Figure 2-6: Tibbo DS Manager Settings (All) Menu	2-5
Figure 2-7: Mounting Digital Display Clocks.....	2-6
Figure 2-8: Digital Display Clock Wiring	2-6
Figure 2-9: Digital Display Clock Alternate Wiring.....	2-6
Figure 2-10: Double-mounting Digital Display Clocks	2-6
Figure 2-11: Mounting Analog Display Clocks.....	2-7
Figure 2-12: Analog Display Clock Wiring, LEDs, and Switches	2-7
Figure 2-14: Double-mounting Analog Display Clocks.....	2-8

ECN	Revision History
2023	Rev A: First draft of Spectracom instructions.
2129	Rev B: Reformat, add reference to power cord installation.
2234	Rev C: Added alternate digital board wiring diagram, analog 200V variant wiring.

1 Inventory and Inspection

Before installing the Wireless Clock System, please verify that all material ordered has been received. If there is a discrepancy, please contact Spectracom Customer Service at US +1.585.321.5800.

CAUTION:



Electronic equipment is sensitive to Electrostatic Discharge (ESD). Observe all applicable ESD precautions and safeguards when handling the Spectracom equipment.

NOTE: If equipment is returned to Spectracom, it must be shipped in its original packing material. Save all packaging material for this purpose.

Unpack the equipment and inspect it for damage. If any equipment has been damaged in transit, please contact Spectracom Customer Service at US +1.585.321.5800.

NOTE: The Wireless Clock System is not field-serviceable. If you experience any problems with your display clocks or transceiver, these components must be shipped to Spectracom for service. Please contact Spectracom at US +1.585.321.5800 before returning any equipment and always ship the equipment in its original packaging material.

NOTE: The range of the transceiver in unobstructed space is approximately 2,000 meters.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. FCC recommends a distance of 10cm from the clock to constant human physical exposure.

2 Installation

Installing the Wireless Clock System consists of these steps:

1. Physically install the transceiver.
2. Configure local time and establish the applicable network connections, if any, to the NetClock and transceiver.
3. Configure and synchronize the transceiver using the NetClock's timing reference.
4. Install display clock(s) and synchronize the clock(s) to the transceiver signal.

2.1 Install the Transceiver

The transceiver may be installed according to three possible facilities scenarios:

Scenario 1: The transceiver has sufficient coverage for the entire campus or structure. This means the system does not depend on the display clocks for transmission.

Scenario 2: In order to cover the entire campus or structure, the display clocks (running on batteries) are used as transceivers/repeaters to augment the transceiver unit.

Scenario 3: In order to cover the entire campus or structure, the display clocks (running on 110V, 220V, or 24V power) are used as transceivers/repeaters to augment the transceiver unit.

NOTE: Spectracom highly recommends installing the transceiver before installing the display clocks. The transceiver should be located in a central location, preferably in a hallway, with the fewest possible walls between the transceiver and the display clocks. After installing the transceiver, begin installing the clocks nearest to the transceiver. Continue installing clocks, working from the transceiver as the central point, until all clocks have been installed and have corrected for the transceiver's transmitted time.

NOTE: A repeater is available from Spectracom. The repeater receives and rebroadcasts a stronger wireless signal, making it useful for bridging gaps between clocks without the purchase of an additional transceiver. Once you have determined the optimal location for the repeater, install it as you would a transceiver (refer Section 2.1.1).

2.1.1 Mounting the Transceiver

1. Find a suitable location for the transceiver, preferably a central hallway.
2. Run the wiring through the knockouts and connect it according to the wiring information.
3. Tighten the four screws on the front panel.
4. Line up the transceiver in the desired mounting location and mark the holes.
5. Mount anchors (not included) corresponding to the marked holes.
6. Mount the transceiver using four appropriate screws (not included) (Figure 2-1).

2.1.2 Connect Transceiver Power

The transceiver is supplied with a power cord. Installation personnel will need to punch out the appropriate access hole in the transceiver box in order to make the connection.

WARNING:



Spectracom recommends the power supply be connected by qualified personnel only. Installation of the power cord by unqualified personnel may cause injury or death and will void the Spectracom product warranty.

Refer to the transceiver wiring (Figure 2-2) and the transceiver box connections (Figure 2-3).

NOTE: Wiring colors are Black (Line), Green (Ground), and Gray (Neutral), or Brown (Line), Green (Ground), and Blue (Neutral), depending on the wiring scheme used.

2.2 Configure for Local Time

When using an Ethernet connection, it is necessary to manually set the time zone offset and Daylight Saving Time (DST) preference. Setting these factors configures the transceiver for local time. If time zone offset and DST are not set in the transceiver, the unit will transmit Coordinated Universal Time (UTC) only.

NOTE: For RS-485 connections, time zone offset and DST rules may be configured in the NetClock. The NetClock remote output (RS-485) must be set to **Format 0, 1200 baud only**. Refer to the NetClock manual for NetClock setup.

To enter the transceiver setup mode, press Set Hour and Set Minutes buttons simultaneously. (These are the two buttons on the face of the transceiver. Refer to Figure 2-1.)

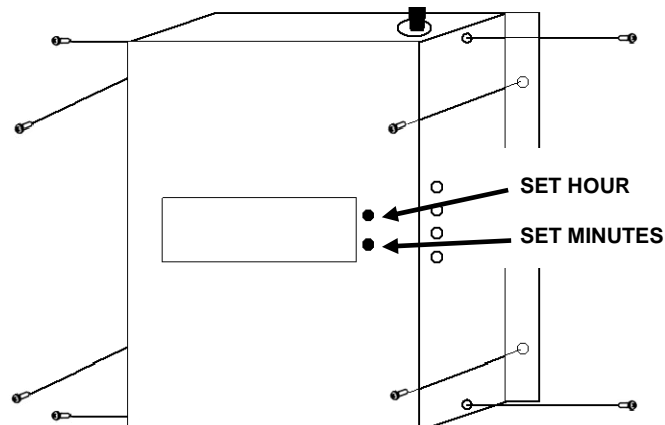


Figure 2-1: Transceiver Mounting

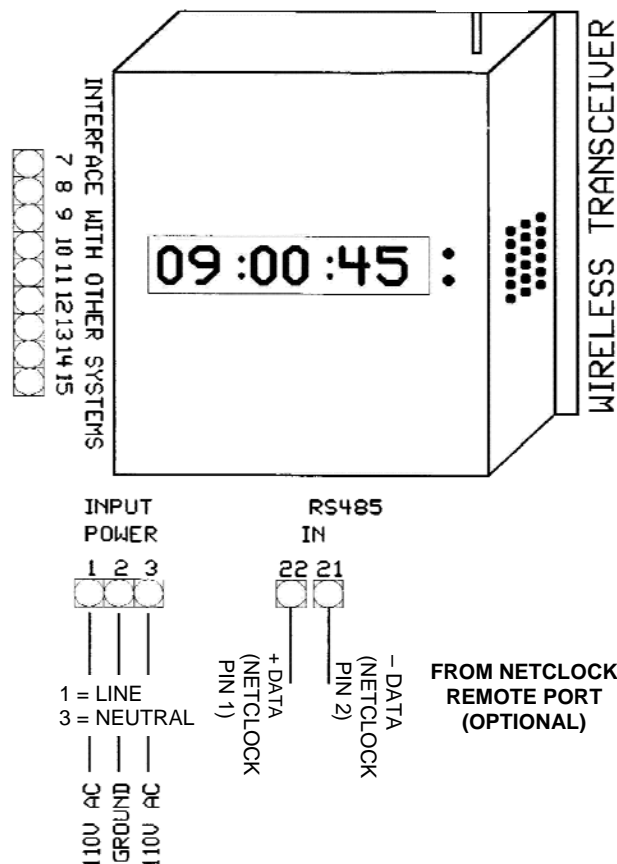


Figure 2-2: Transceiver Wiring and Connection Pin-Outs

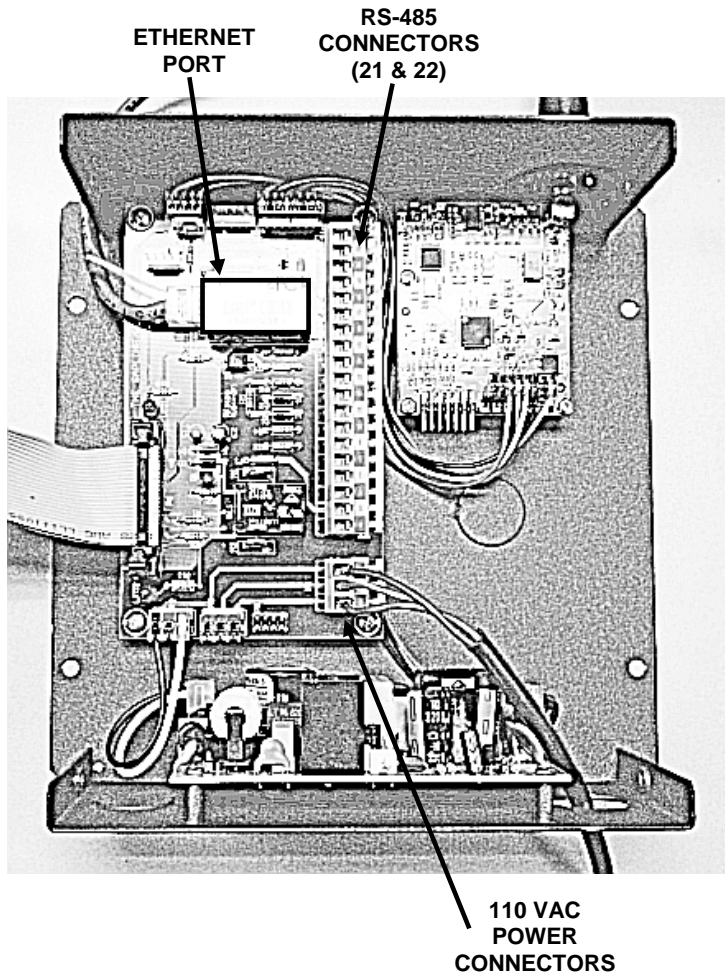


Figure 2-3: Transceiver Connections (Inside Transceiver Box)

Pressing Set Hour advances through the transceiver programming options, while pressing Set Minutes changes the setting for each option. Continue pressing Set Hour to advance through the available options in order to exit to the time display. (Pressing both buttons simultaneously while in transceiver setup mode returns to the first programming option.) Some factory options exist that are not described in this manual. The user may simply scroll past these options.

2.2.1 Set DST Rule

Press the Set Hour button until the number "10" appears on the left side of the LED display. Press Set Minutes until the number "08" displays. Press Set Hour again until the number "12" appears on the left side of the LED display. This option allows the user to enable or disable Daylight Saving Time. Press the Set Minutes button to scroll among "d", "1", or "2". Option "d" will disable DST. Option "1" will enable DST prior to 2007. Option "2" will enable DST in and after 2007.

2.2.2 Set Auxiliary Input

Press the Set Hour button until the number "30" appears on the left side of the LED display. This option permits the use of an auxiliary input control. Press the Set Minutes button to scroll between options "E" and "d". Set the option to "E". (Skip setting option 40 for RS-485 installations.)

NOTE: For RS-485 connections, time zone offset and DST rules are configured in the NetClock unit and NOT configured in the transceiver. SKIP SECTIONS 2.2.1, 2.2.3, and 2.2.4 for RS-485 installations.

2.2.3 Verify Time Input

Press the Set Hour button until the number "31" appears on the left side of the LED display. This option allows the user to select the input. Pressing the Set Minutes button allows the user to scroll among several options. Make sure the Time Input option is set to "01".

2.2.4 Set Offset (Time Zone)

Pressing the Set Hour button when option 31 is set to "01" allows the user to cycle through to option 33. The number "33" will appear on the left side of the LED display. This option allows the user to set the negative offset for the local time zone. Press the Set Minutes button to scroll through "00-14". The negative offset number corresponds to the number of hours difference. For example, the offsets for North American time zones are Eastern, 5; Central, 6; Mountain, 7; and Pacific, 8. (Option 33 is negative offset only. Set option 33 for negative offset; Option 32 is positive offset and unlikely to be used.)

2.2.5 Programming Summary

Mode	Description	Value
1	Year	Two digit year
2	Month	Two digit month
3	Day of Month	Two digit day
10	Enter DST mode	08 (Any other value skips to mode 20)
11	N/A	01 (default)
12	DST rule	d: disable 01: USA pre 2007 02: USA post 2007
20	Programmable relay output (contact factory for more information)	d: Disable
30	Auxilliary input	e: Enable
31	Input (contact factory for more information)	01
32	Positive time zone offset from UTC	00-14
33	Negative time zone offset from UTC	00-14 e.g. 5: Eastern USA 6: Central USA 7: Mountain USA 8: Pacific USA
40	Read-only diagnostic — time of last sync	00-99 (in hours)
41	Read-only diagnostic — internal temperature	Degrees C
44	Read-only diagnostic — network connection established	00: No connection 01: Connection
50	N/A	00 (default)
60	N/A	D (default)

2.3 Establish the Network Connection(s)

Connect the transceiver to the NetClock and to your network. There are three ways to establish this connection (Figure 2-3):

1. Use an Ethernet cable to connect the transceiver to the network through the Ethernet port within the transceiver box. Connect the NetClock to your network separately through its Ethernet port.
2. Use a crossover cable to connect the transceiver directly to the NetClock using the Ethernet port within the transceiver box.
3. Use an RS-485 cable to connect the transceiver to the RS-485 output on the Netclock using the RS-485 connectors within the transceiver box (instead of using an Ethernet connection). Connect the NetClock to your network through its Ethernet port. *If you use this method, you do not need to configure the transceiver with DS Manager.*

Once all connections have been made, power-up the NetClock.

2.4 Configure the Transceiver Using DS Manager

After the transceiver and the NetClock are connected to your network and powered up, make sure the NetClock has an IP address. You will have to assign an IP address and network mask if your network does not run DHCP. The timing reference from the NetClock should synchronize (indicated by a green sync LED on the front of the NetClock) within a few minutes. For more information regarding network configuration and operation of the Spectracom NetClock, refer to the NetClock instruction manual (supplied with the NetClock unit).

NOTE: DHCP must be disabled for non-DHCP networks and for crossover cable installations. DS Manager is used only for installations using the transceiver's Ethernet port.

To configure the transceiver, install the provided Tibbo DS Manager software on a networked Windows PC. Once the software is installed, make sure the transceiver and NetClock are powered-up and properly connected to the network. Run the software from the Start menu.

If the software fails to detect the transceiver, an error message will be displayed (Figure 2-4). Make sure the transceiver is powered-up, functioning properly, and connected to the network/subnet accessible by the networked PC on which the software is installed and running.



Figure 2-4: Tibbo DS Manager Error Window

With the DS Manager's Access mode set to *Local Device Servers (auto-discovery by broadcast)*, click Refresh to automatically detect the networked transceiver (Figure 2-5). The device list will refresh and the transceiver should be displayed in the DS Manager window with its network address.

2.4.1 If Your Network Supports DHCP

If your network supports DHCP, perform the following steps to complete the necessary transceiver configuration in DS Manager (click OK to close the window shown in Figure 2-6).

NOTE: Make sure your network firewall is temporarily disabled when searching for the transceiver on the network.

1. Double-click on the address of the transceiver displayed in the DS Manager window. This will call up the Settings menu (Figure 2-6).
2. Click on the Destination IP-Address field to edit it. Change it to the IP address of the NetClock.
3. Make sure the Destination port is set to 123. Click on the field to change it if necessary.

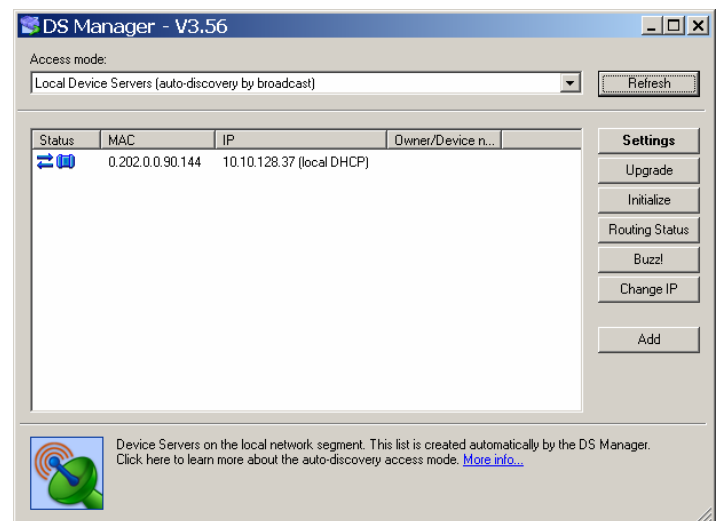


Figure 2-5: Tibbo DS Manager (Transceiver Detected)

Figure 2-6: Tibbo DS Manager Settings (All) Menu

NOTE: Your settings MUST match those in the Tibbo DS Manager Settings (All) Menu pictured here, with the exceptions noted. (Some settings vary per system as indicated.) When you are finished making changes to the settings, click "OK" to apply them.

NOTE: Tibbo DS Manager may be incompatible with your Windows Vista operating system.

2.4.2 If Your Network Does Not Support DHCP

If your network does not support DHCP, perform the following steps to complete the necessary transceiver configuration in DS Manager:

1. Double-click on the address of the transceiver displayed in the DS Manager window. This will call up the Settings menu (Figure 2-6), which has multiple tabs.
2. Click on DHCP and set it to 0-Disabled.
3. Click on the IP-Address field to edit it. Change it to an available static IP address.
4. Click on the Destination IP-Address field to edit it. Change it to the IP address of the NetClock.
5. Click on the Subnet mask field and change it to the subnet mask for your network.
6. Make sure the Destination port is set to 123. Click on the field to change it if necessary.

NOTE: After the NetClock and transceiver are connected and properly configured, the timing signal from the NetClock will synchronize the time on the transceiver at the "top" of the next minute. Once the transceiver is synchronized, display clocks may be synchronized to the transceiver signal. (When the transceiver is synchronized to the NetClock, the transceiver's seconds digits will stop blinking.)

2.5 Installing Digital Display Clock(s)

Display clocks can be wall-mounted (Figure 2-7) or double-mounted (Figure 2-10). Spectracom recommends the following installation procedure:

1. Wireless Clocks can be powered from a 24 volt source or from a 110 volt source. Connect the wiring as shown in Figures 2-8 and 2-9 as applicable depending on your unit.
2. Mount the wall mount box into the double gang box using four machine screws.
3. Connect the ground wire into the flush mount box using a tooth lockwasher and machine screw nut.
4. Disconnect the red filter from the display panel.
5. Complete the wiring connections as shown herein.

NOTE: For 24 volt installations, make sure the transformer is ISOLATED.

6. Mount the display panel into the flush mount box using four black machine screws. Make sure the switches are on the right side.
7. Snap the red filter into the display panel.

To double-mount digital display clocks (Figure 2-10), Spectracom recommends the following procedure:

1. Screw the hanger/mounting rod into the crossbar.
2. Insert the wires through hanger/mounting rod.
3. Install the crossbar into the double gang box using two screws.

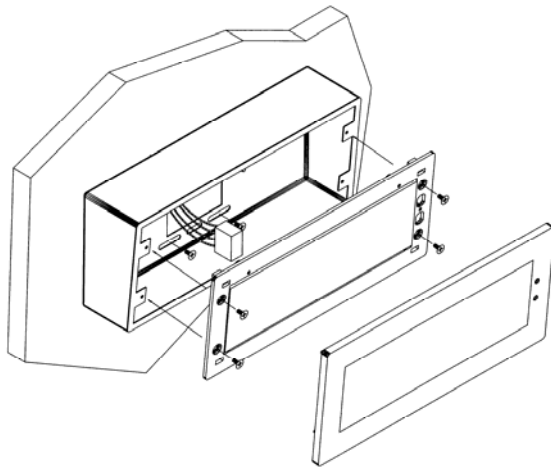


Figure 2-7: Mounting Digital Display Clocks

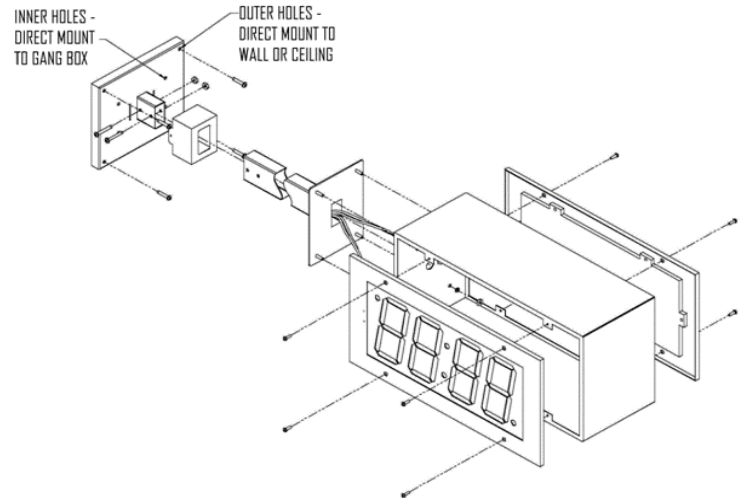
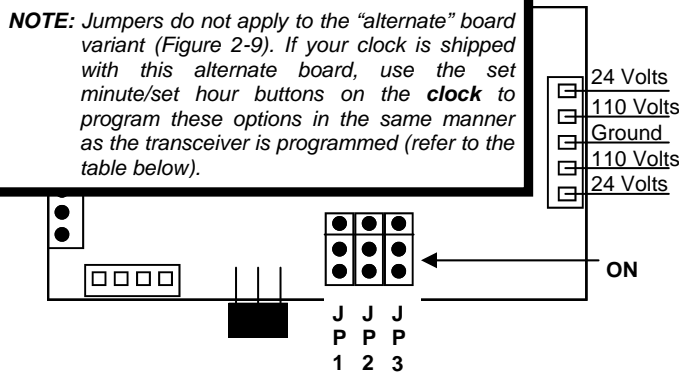


Figure 2-10: Double-mounting Digital Display Clocks



JP1	JP2	JP3
12/24 Hour Mode Alternate: Option 04 (toggles between modes)	Brightness Alternate: Option 08 (1 is brightest; 0 less bright)	Loss of Comm. Alert Alternate: Option 13 enables
ON: 12 hour mode OFF: 24 hour mode		ON: 5 minutes OFF: 30 minutes Alternate: Option 14 = time

Figure 2-8: Digital Display Clock Wiring

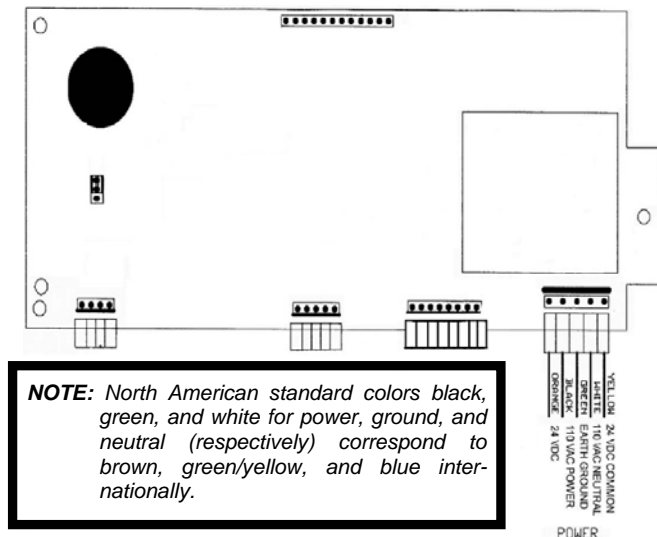


Figure 2-9: Digital Display Clock Alternate Wiring

4. Mount the double mount box into the clock base using two nuts and a tooth lockwasher. The double mount can be mounted on a wall or ceiling.
5. Insert the two 0.187" locking hole plugs and the 0.562"locking hole plug into the unused holes.
6. Insert the double mount case onto the hanger/mounting rod.
7. Insert the support bracket onto the hanger/mounting rod.
8. Screw the two nuts onto the hanger/mounting rod and secure the clock base to the wall.
9. Connect the ground wire into the double mount box using a tooth lockwasher and machine screw nut.
10. Disconnect the red filter from the display panel.
11. Complete the wiring connections as detailed herein.

NOTE: For 24 volt installations, make sure the transformer is ISOLATED.

12. Mount the display panel on one side of the double mount box using four black machine screws. Make sure the switches are on the right side.
13. Snap the red filter into the display panel.
14. Repeat steps 9-13 for the second clock.

2.5.1 Synchronizing to the Transceiver

1. Place transceiver in a central location (hallway recommended).
2. Pick the location of the digital display clock(s).

3. Place each display clock in a location where the signal is available from the transceiver. In order to verify that the clock is receiving a signal from the transceiver, power up the clock. The display clock should indicate the transceiver's transmitted time within a few minutes of power-up and will search for a signal for 30 minutes after initial startup. If the clock does not correct to the transceiver time, choose a different location for the clock.
4. Repeat steps 2 and 3 for each display clock. Remember as you test each clock that display clocks can receive and repeat signals from and to each other, not just from the transceiver unit.

2.6 Installing Analog Display Clock(s)

Display clocks can be wall-mounted or double-mounted. For simple wall mounting, refer to

Figure 2-11. Spectracom recommends the following installation procedure:

NOTE: Before installing display clocks, remove the pin used to immobilize the clock hands for shipping. The pin is clearly designated with the label, "Remove Pin Before Installation."

1. Wireless Clocks can be powered using two D-cell batteries, from a 24 VAC source, or from a 110 VAC source. Install the batteries before mounting the display clock(s). If you are directly wiring power to the display clock(s), connect the wiring as shown in Figure 2-11.
2. Mount both plastic anchors in the wall.
3. Insert the sheet metal screws (#10) through the mounting bracket into the plastic anchors.
4. Plug the connector into the movement (220V, 110V, and 24V installations only).
5. Hang the clock on the mounting bracket.
6. Install the screw (4mm) through the hole on the top of the clock into the hole at the top of the mounting bracket.

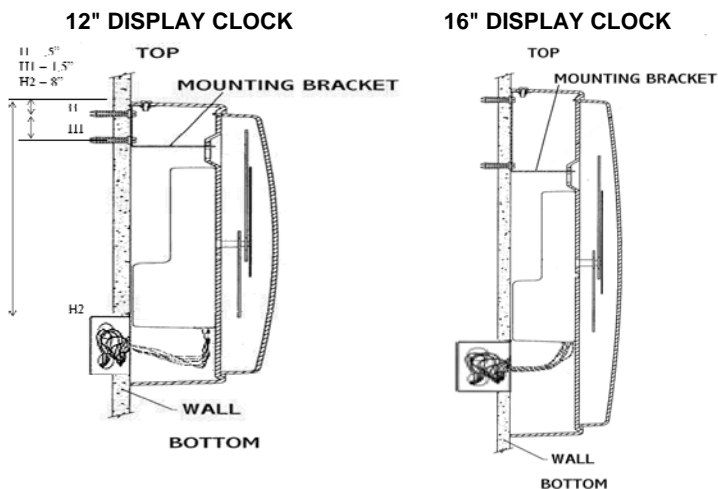


Figure 2-11: Mounting Analog Display Clocks

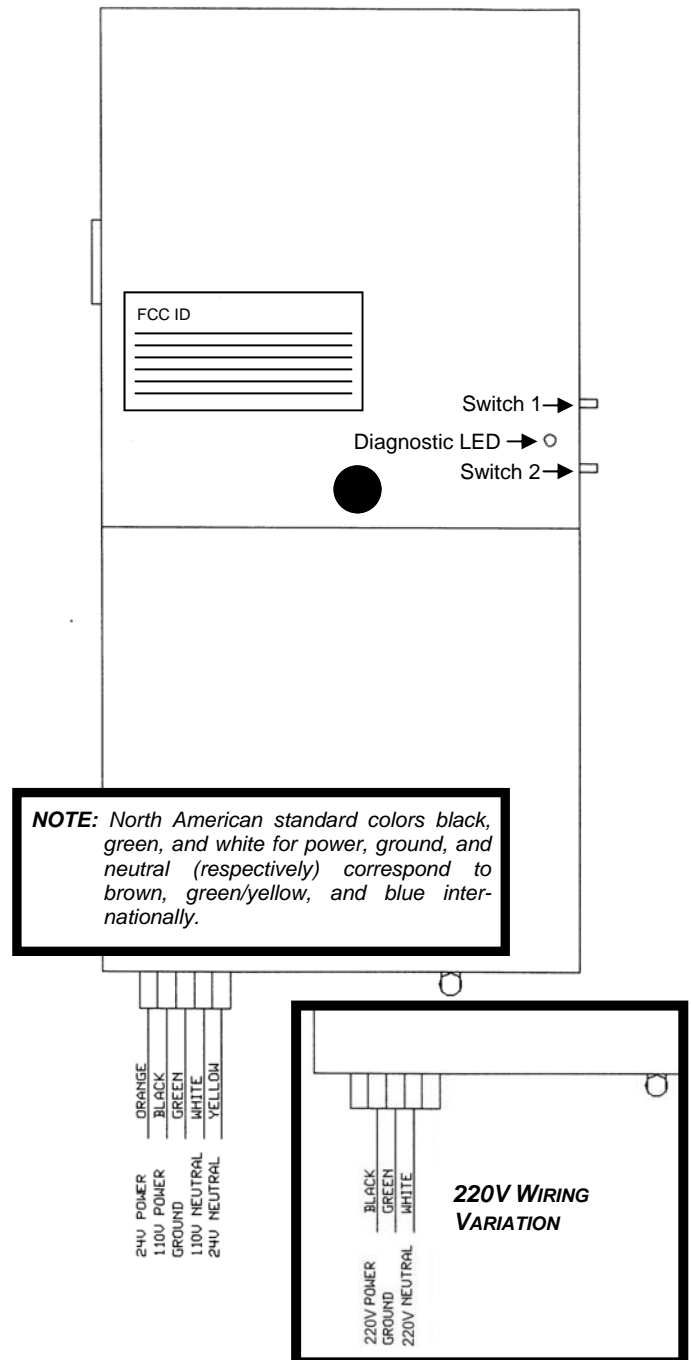


Figure 2-12: Analog Display Clock Wiring, LEDs, and Switches

To double-mount display clocks (Figure 2-12), Spectracom recommends the following procedure:

1. Wireless Clocks can be powered using two D-cell batteries, from a 24 VAC source, from a 110 VAC source, or from a 220 VAC source. Install the batteries before mounting the display clock(s).
2. Screw the mounting bracket to the double gang box using the four inner holes on the mounting bracket, or mount the

mounting bracket directly to the wall or ceiling using the four outer holes.

repeat signals from and to each other, not just from the transceiver unit.

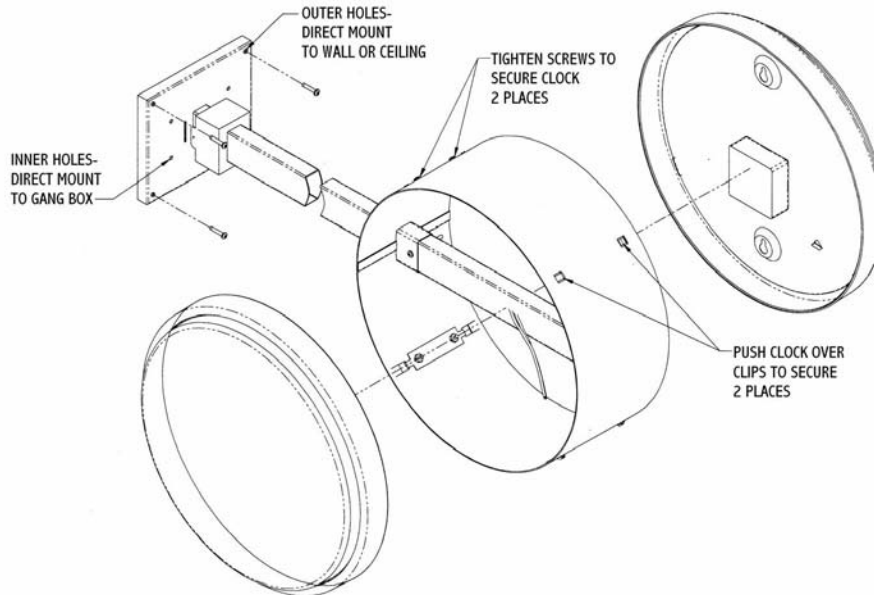


Figure 2-13: Double-mounting Analog Display Clocks

3. Insert the wires through the mounting bracket (220V, 110V, and 24V installations only).
4. Fish the wires through the clock hanging rod.
5. Secure the hanging rod to the mounting bracket with the appropriate screws. Place the cover over the connection.
6. Connect the wiring as shown in Figure 2-11 (220V, 110V, and 24V installations only).
7. Plug the connectors into the movements (220V, 110V, and 24V installations only).
8. Place the clocks on the double mount housing and tighten the screws to secure the clocks as shown above.

2.6.1 Synchronizing to the Transceiver

1. Place transceiver in a central location (hallway recommended).
2. Pick the location of the display clock(s).
3. Place each display clock in a location where the signal is available from the transceiver. In order to verify that the clock is receiving a signal from the transceiver, power up the clock. (This can be done simply by removing the clock's battery cover, installing two D-cell batteries, and replacing the battery cover.) The display clock should indicate the transceiver's transmitted time within five minutes of power-up. If the clock does not correct to the transceiver time, choose a different location for the clock.
4. Repeat steps 2 and 3 for each display clock. Remember as you test each clock that display clocks can receive and

NOTE: The transceiver transmits once per minute. Battery-powered wireless clocks transmit once every four hours only at SPECIFIC HOURS, 12-4-8. **Keep this in mind when waiting for correction for DST changes.** Clocks powered by 24 volt and 110 VAC installations transmit once per minute.

2.6.2 Conserving Battery Power

In order to conserve battery power, each display clock's receiver is enabled for a half hour on power-up. During normal operation, the clock enables its receiver every four hours. Once data is received, the clock can also transmit during normal operation every four hours or during power-up.

2.6.3 Manually Transmitting and Receiving

To synchronize display clocks after initial installation, you may wish to send or receive time signals manually:

Pressing **Switch #1** will enable the receiver manually for ten minutes, allowing the clock to receive the time signal. The second hand will move to the 20 second location until the signal is received. The clock will then resume normal operation.

Pressing **Switch #2** will enable the clock transceiver for ten minutes, allowing the clock to transmit the time signal. The clock transceiver can be enabled only if the clock has received a time signal within the last 12 hours. In this case, the second hand will move to the 40 second location. The clock will resume normal operation after ten minutes.

2.6.4 Testing the Distance Between Clocks Used as Repeaters

If display clocks distributed through a facility or across a campus are too far apart, they may fail to transmit/repeat time to each other. If during installation all clocks do not correct for the transceiver's time, find the corrected, synchronized clock closest to the first unsynchronized clock. Press Switch #2 on the synchronized clock. The second hand should move to 40 seconds and the clock should stop running. This indicates that the synchronized clock is now in transmission mode.

Go to the unsynchronized clock and press Switch #2. The second hand should move to 20 seconds until the unsynchronized clock receives the signal from transmitting, synchronized clock. The previously unsynchronized clock should correct for the master time within five minutes. Within ten minutes, the first clock (the clock used to transmit time) should resume normal operation.

Continue this troubleshooting process with all clocks that failed to correct for the transceiver's transmitted time. Remember that while one clock is transmitting, you may synchronize multiple display clocks within range of receiving the transmitted signal. Each clock you synchronize as you move farther way from the transceiver extends the range at which you can synchronize more clocks.

3 Troubleshooting

Spectracom NetClock Wireless Clocks are not field-serviceable and must be returned to the factory for repair. Users may, however, troubleshoot the system using the following guidelines.

3.1 Transceiver Troubleshooting Tips

If the following troubleshooting tips do not cover your installation issue, contact Spectracom Customer Support at US +1.585.321.5800.

NOTE: For RS-485 connections, time zone offset and DST rules are configured in the NetClock unit and NOT configured in the transceiver. The NetClock remote output (RS-485) must be set to **Format 0, 1200 baud only**. Refer to the NetClock manual for more information.

3.1.1 Transceiver Will Not Synchronize to NetClock (Seconds Blinking)

Check the connection from the NetClock to the Transceiver and verify correct pin-out. Refer to the NetClock instruction manual for more information. If necessary, contact Spectracom Customer Support at US +1.585.321.5800.

3.1.2 Transceiver Does Not Power Up

Measure the voltage between pins 1 & 3. The voltmeter should read approximately 85 - 135 VAC between the hot and the neutral (for 110V systems; approximately 200 – 240 for 220V systems).

3.2 Clock Troubleshooting Tips

If the following troubleshooting tips do not cover your installation issue, contact Spectracom Customer Support at US +1.585.321.5800.

3.2.1 Digital Clock Does Not Receive Signal (Colon Blinking)

Take the clock within close proximity to the transceiver and power up the clock. If the clock still does not synchronize, call Spectracom Customer Support at US +1.585.321.5800.

3.2.2 Digital Clock Does Not Power Up

Make sure the wiring is correct. If the clock is 24 volt, the power should be on the orange and yellow wires of the harness. If the clock is 110 volt, the power should be on the black and white wires. The middle wire is ground. If the wiring is correct, take a voltmeter and measure the voltage. For 24 volt models, the voltage should be between 14 - 28 volts. For 110 volt models, the voltage should read 85 - 135 volts.

3.2.3 Analog Clock Hands Do Not Move After Power-Up

The clock should move at normal speed upon power up. If it does not move at normal speed, check the battery and make sure the clock receives power. Also, be sure to remove the pin prior to starting up the clock. If the clocks are 24 volt or 110 volt, verify the wiring.

3.2.4 Analog Clock Does Not Receive Signal

Take the clock within close proximity to the transceiver and power up the clock. If the clock is battery operated, remove the battery and put the battery back in again.

Press Switch #2 on the clock closest to the clock that isn't working. The second hand will go to 8, notifying the user that the clock is transmitting the signal. Go to the clock that isn't working and press Switch #2. The second hand will go to 4, notifying the user that it is searching for the signal. If the clock still does not correct, call Spectracom Customer Support at US +1.585.321.5800.

3.2.5 Analog Clock Displays Incorrect Time

Perform Diagnostic #1 in order to find the last time that the clock received the time signal. Perform Diagnostic #3 to check the gears for the clock.

3.2.6 Desire to Verify Analog Clock Signal Quality

Perform Diagnostic #2.

3.2.7 Signal to Desired Clock Location Receives is Marginal

Reposition the transceiver or install a clock to act as a repeater.

3.2.8 Distance Between Clocks is Too Great

Install a repeater to provide additional range between clocks.

3.3 Analog Diagnostic 1

In order to enter the diagnostic mode, press Switch #1 (Figure 2-11). The duration that the switch is pressed will determine the diagnostic mode. After determining the diagnostic mode, the LED between the two switches will start flashing green. The number of flashes corresponds to the diagnostic number.

Diagnostic 1 determines how long (in number of hours) it has been since the clock last received the communication signal. In order to enter Diagnostic 1, press Switch #1 for one 1 second. The LED should indicate green and flash once every three seconds.

1. While in diagnostic modes, the clock's hour and minute hands will continue to run normally.
2. The second hand will display how long it has been since the clock received a time signal (Table 3-1).
3. After three minutes, the clock will resume normal operation.

Second Hand Position	Time Since Clock Last Received Communication Signal
12	Within the past hour
1	Between one and two hours ago
2	Between two and three hours ago
3	Between three and four hours ago
4	Between four and five hours ago
5	Between five and six hours ago
6	Between six and seven hours ago
7	Between seven and eight hours ago
8	Between eight and nine hours ago
9	Between nine and ten hours ago
10	Between ten and eleven hours ago
11	More than eleven hours ago

Table 3-1: Second Hand Positions and Time Indications

3.4 Analog Diagnostic 2

In order to enter the diagnostic mode, press Switch #1 (Figure 2-11). The duration that the switch is pressed will determine the diagnostic mode. After determining the diagnostic mode, the LED between the two switches will start flashing green. The number of flashes corresponds to the diagnostic number.

Diagnostic 2 determines the quality of the time signal. In order to enter Diagnostic 2, press Switch #1 for three seconds. The LED should indicate green and flash twice every three seconds.

1. While in diagnostic modes, the clock's hour and minute hands will continue to run normally.
2. The second hand will display the quality of the time signal as a percentage on the dial of the clock. It will move from 12 to 8. If the second hand is on 12, this indicates no signal. If the second hand is on 8, this indicates the best possible signal.
3. After three minutes, the clock will resume normal operation.

3.5 Analog Diagnostic 3

In order to enter the diagnostic mode, press Switch #1 (Figure 2-11). The duration that the switch is pressed will determine the diagnostic mode. After determining the diagnostic mode, the LED between the two switches will start flashing green. The number of flashes corresponds to the diagnostic number.

Diagnostic 3 tests the mechanical portion and some of the electronic components of the clock. In order to enter Diagnostic 3, press Switch #1 for five seconds. The LED should indicate green and flash three times every three seconds.

If an error occurs, the clock will flash the red LED to signal the error code number (Table 3-2). While in Diagnostic 3, the clock will perform the following steps:

1. Clock moves second hand to 12.
2. Clock moves second hand again to 12, to verify that the hands arrived after 60 pulses.
3. Clock moves minute and hour hands to the next known position.
4. Clock moves minute and hour hands again to the same known position in order to verify that the hands reach the position after 720 pulses.
5. Clock moves the hour and minute hands to 12.

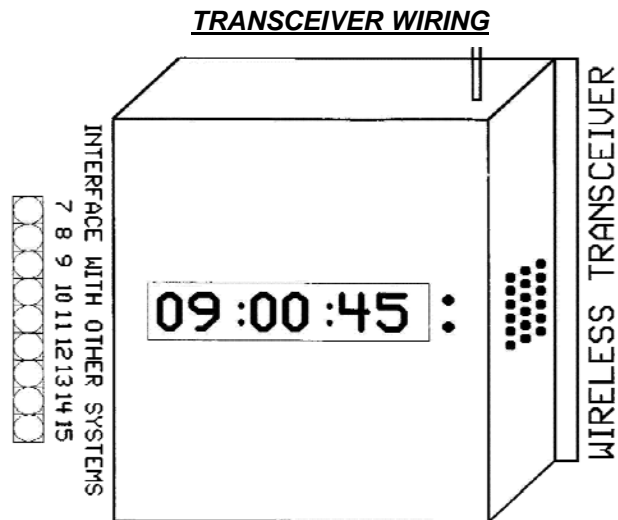
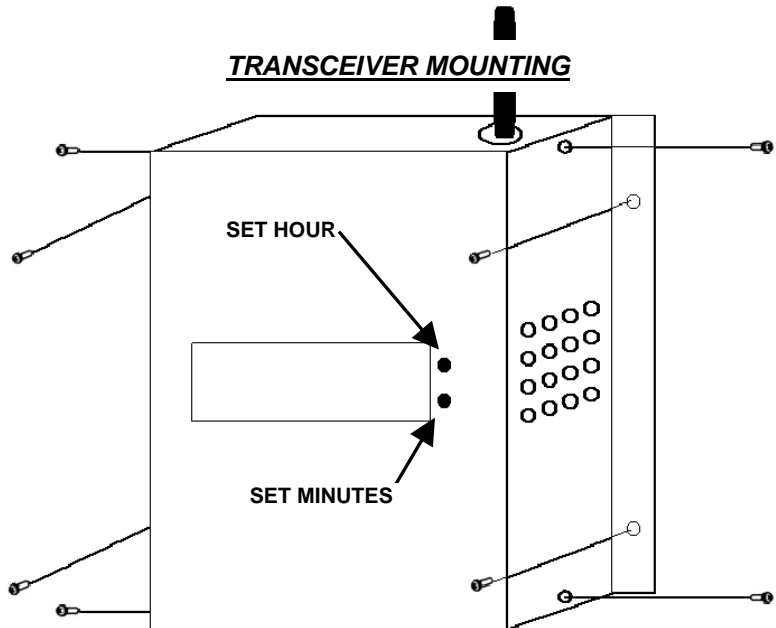
Red Flashes	Diagnosis of Error Code
1, 2	Problem with the second hand. Check to see if the hands are striking each other. Repeat the test.
3, 4, 5	Problem with the hour and/or minute hands. Check to see if the hands are striking each other. Repeat the test.
6	Call Spectracom Customer Service at US +1.585.321.5800

Table 3-2: Error Codes

Spectracom Corporation
95 Methodist Hill Drive
Rochester, NY 14623
www.spectracomcorp.com
Phone: US +1.585.321.5800
Fax: US +1.585.321.5219

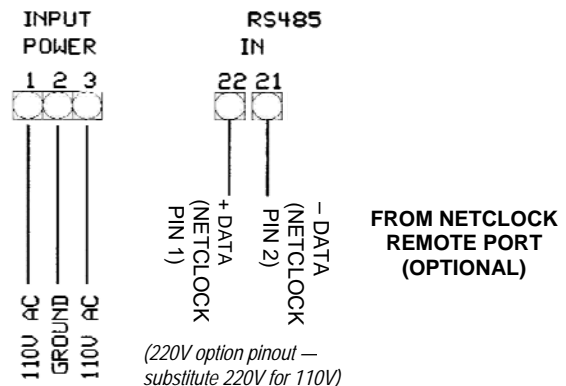
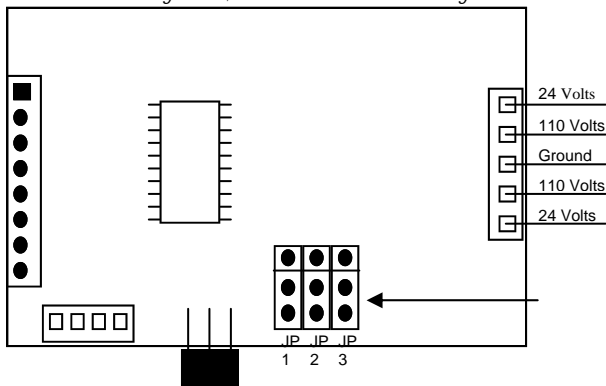
NetClock Wireless Clock System QuickStart Guide

- A. Unpack and inspect the equipment and accessories. Retain all original packaging. **Observe all ESD procedures when handling Spectracom equipment.**
- B. Find a suitable location for the transceiver. Wire and mount the transceiver per the instructions provided. Connect the power cord.
- C. Connect the transceiver to the NetClock using the Ethernet connection or an RS-485 connection. Set the time zone offset and DST preference to configure for local time. (For RS-485, set the remote output to Format 0, 1200 baud in the NetClock, not the transceiver.) Direct connections are made using a crossover Ethernet cable; use a straight-through Ethernet cable when connecting through your network.
- D. Enter the transceiver setup mode by pressing Set Hour and Set Minutes simultaneously. Continue pressing Set Hour until the following code numbers are displayed. Press Set Minutes to scroll between the setting options.
 - E. Set DST Rule: Code 10, Option 08; Code 12, Option d (disable DST); 1 (DST before 2007); 2 (DST in and after 2007)
 - F. Set Auxiliary Input: Code 30, Option d (disable) or E (enable input control mode)
 - G. Verify Time Input: Code 31, Option 01
 - H. Set Negative Offset (Time Zone): Code 33, Option 5 (Eastern); 6 (Central); 7 (Mountain); 8 (Pacific)



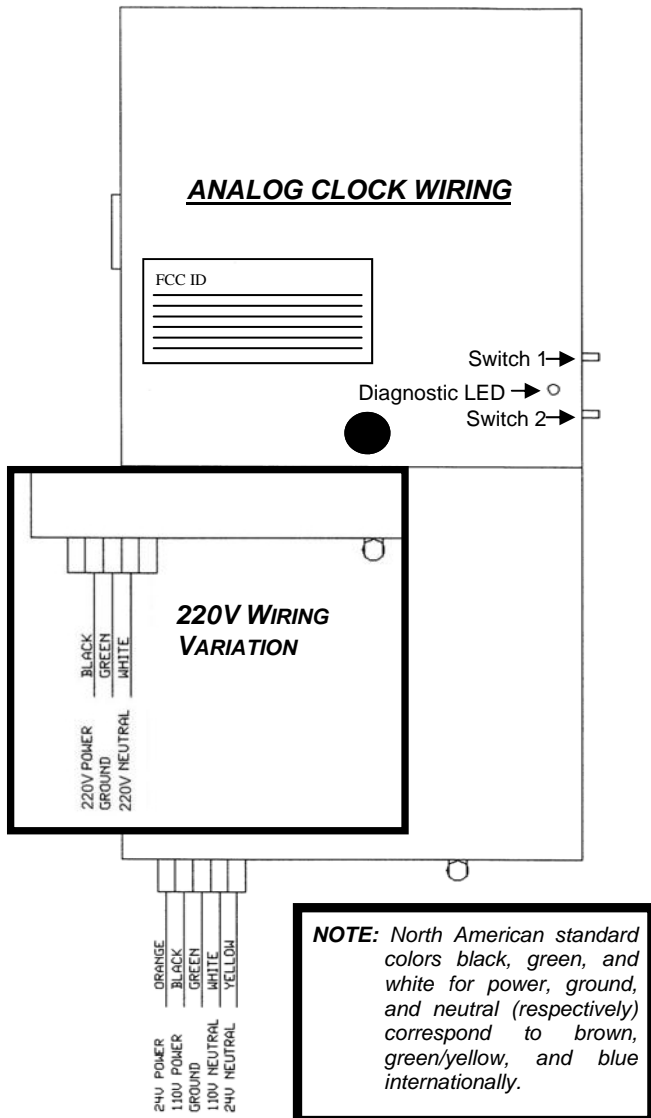
DIGITAL CLOCK WIRING

NOTE: Some boards do not have jumpers and exhibit alternate configuration; refer to user manual for wiring.



DS MANAGER SETTINGS

- I. Connect the transceiver to the NetClock and/or the network. Make sure power is applied.
- J. Configure the Transceiver using DS Manager from the supplied CD-ROM (refer to the DS Manager Settings, right). Verify that the transceiver synchronizes to the NetClock.
- K. Install wireless clocks and connect per the wiring diagrams on pages 1 and 2 of this document
- L. Synchronize wireless clocks to the transceiver.



Settings: DS <V3.56+NL>

Network Settings | Serial Settings | Outbound packets | All

Network Settings	
Owner name	
Device name	
MAC-address	0.202.0.0.90.144
DHCP	1- Enabled IP Address of the Transceiver (varies)
IP-address	10.2.128.5
Port	123
Transport protocol	0- UDP
Broadcast UDP data	0- Reject
Inband commands	(irrelevant)
Data login	(irrelevant)
Connection timeout (min)	5
Routing Mode	2- Client only
Connection mode	1- On data OR command
Link Server login	(irrelevant) IP Address of the Time Server (varies)
Destination IP-address	10.2.128.37
Destination port	123
dDNS Server login	0- Disabled
dDNS Server IP-address	(irrelevant)
dDNS Server port	(irrelevant)
Gateway IP-address	10.2.1.1
Subnet mask	255.255.0.0
Notification destination	0- Last port
Serial Settings	
Serial interface	2- Automatic
RTS/CTS flow control	0- Disabled or remote
DTR mode	0- Idle or remote This MUST be zero.
Baud rate	2- 4800 bps
Parity	0- None
Data bits	1- 8 bits
Soft entry into Serial program	0- Disabled
On-the-Fly commands	1- Enabled
Password for on-the-Fly con	0- Disabled
Notification bitmask	0
Outbound packets	
Max packet length	255
Max intercharacter delay	10 This MUST be set to 10.
Start on any char	1- Yes
Use start-character	0- No
Start character (ASCII code)	0
Use stop-character	0- No
Stop-character (ASCII code)	0
Number of post-characters	0

Save Load Password OK Cancel

Indicates that these values vary depending on the network.

QuickStart Revision Level	ECN Number	Description
A	2214	First draft of QuickStart Guide.
B	2234	Added alternate wiring diagrams for analog 220V and digital variant.