



Installation Manual V10.1

SAP Series IP Clock



SAP Series IP Clocks

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Important Safety Instructions

DANGER

SHOCK HAZARD

- Keep the electricity to this device turned OFF until the clock installation is complete.
- Do not expose the clock movement to water, or install the clock in a location where it may be exposed to water.

NOTICE

- Do not install the clock outdoors. Damage to the clock if placed outdoors voids the warranty.
- Do not hang objects from the clock or clock mounting parts. The clocks are not designed to support the weight of other objects.
- The clock face and housing may be cleaned with a damp cloth or disinfectant. Test other cleaning products on a small part of the clock housing before attempting to use on the rest of the clock. Avoid bleach and chemicals known to dissolve plastics.

WARNING

FIRE HAZARD

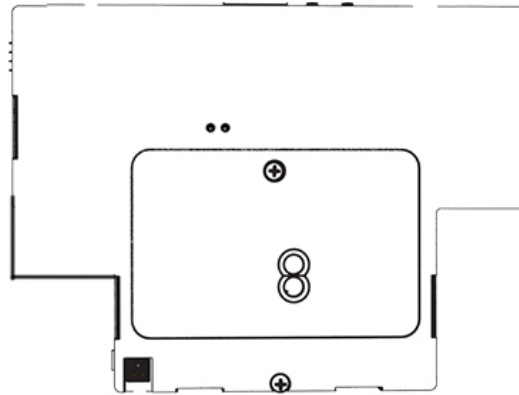
- Always follow your national and regional electrical codes or ordinances.
- The AC power circuit for the clock must be attached to a circuit breaker that can be reset by the user.

PHYSICAL INJURY HAZARD

- If you are standing on an object while installing your clock, make sure that the object can support your weight, and will not sway or move as you stand on it.
- Take precautions to avoid injury by potential safety hazards near the point of installation including (but not limited to) heavy machinery, sharp objects, hot surfaces, or exposed cables carrying an electric current.
- Follow all mounting instructions exactly as stated in this manual. Failure to do so may result in the device falling off the point of installation.
- Packaging materials and mounting items include plastic bags and small pieces, which pose a suffocation hazard to young children.

Identify Your Clock

A label containing the part number of your clock is attached to the clock movement.



If your part number begins with SAP-1, you own a METAL clock

If your part number begins with SAP-4, you own a SLIMLINE or SQUARE clock

If your part number begins with SAP-5 you own an ALUMINUM clock

If your part number begins with SAP-6 you own a WOOD clock

Example part numbers:

SAP-1BS-16R-1	(METAL clock)
SAP-4BS-12S-4	(SQUARE clock)
SAP-4BS-12R-4	(SLIMLINE clock)
SAP-5AS-09R-1	(ALUMINUM clock)
SAP-6DS-12R-2	(WOOD clock)

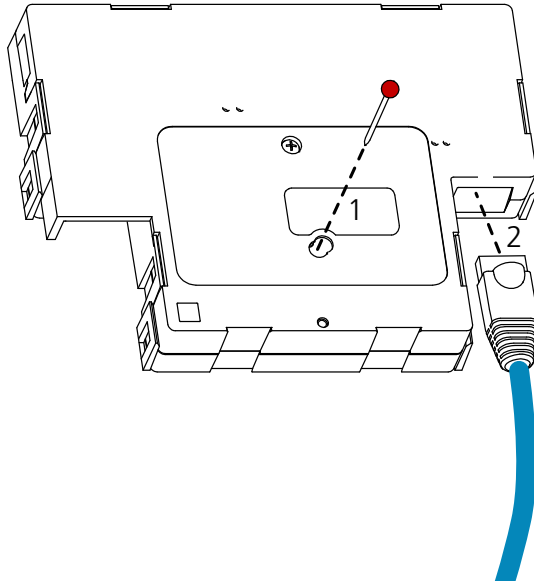
Preparing to Install - System/Network Requirements

To be able to set up an IP-based synchronized clock network, you will need the following items:

- This manual
- A Local Area Network (LAN) that either has access to at least one of the following:
 - An in-house NTP server
 - The Internet
- A local firewall that is open on Ports 80 (TCP), 123 (UDP), and 1777 (UDP)
- At least one laptop or desktop computer with access to this LAN and a web browser.
- A router for the LAN that operates on the subnet 192.168.0.##.
- A copy of the Network Monitor program.
- Security access to all of the above items.
- A crossover cable and PoE injector for programming the clocks.
- A means of keeping a record of the clock serial numbers, locations, and IP addresses. Create a table like the one shown below:

SERIAL #	LOCATION	IP ADDRESS

Preparing to Install - Power over Ethernet (PoE)



PoE Power Classification

Power-over Ethernet Devices report the particular “Power Class” back to the power source, which is useful for system-wide power management or monitoring purposes.

These IP Analog Clocks are highly efficient products and consume only 2.5 watts of power during normal operation.

This power level corresponds to the IEEE802.3af designation of “Class 1”, which is a power usage range of 0.44 to 3.84 watts.

Connecting when using a PoE Switch

- 1) Plug in the PoE switch to a power outlet.
- 2) Using a CAT5 or CAT6 patch cable, connect one end to the switch/router on the network, and the other end to the IP clock.

Connecting when using a PoE Injector

- 1) Plug in the power injector to a power outlet.
- 2) Using a CAT5 or CAT6 patch cable, connect one end to the a switch/router on the network, and the other end to the IN port on the injector.
- 3) Using another CAT5 or CAT6 patch cable, connect one end to the OUT port on the injector, and the other end to the port on the right side of the clock movement.
- 4) If using a multi-output power injector, continue to power the other IP clocks by repeating step 3.

Recommended PoE Injector Specification

48VDC @ 320mA

Preparing to Install - Network Monitor Software

- 1) Create a folder on your computer called Network Monitor
- 2) If you have the Network Monitor on a CD:
 - a) Load the CD into your computer's CD Drive
 - b) Open the file on the CD and select the Network Monitor application file.
 - c) Copy the file to your Network Monitor folder.
- 3) If you received the Network Monitor as a web download:
 - a) Locate the Network Monitor application file in your computer's Downloads folder.
 - b) Select the file and copy it to your Network Monitor folder.
- 4) If you received the Network Monitor as an email attachment:
 - a) Refer to your email provider's instructions for downloading email attachments.

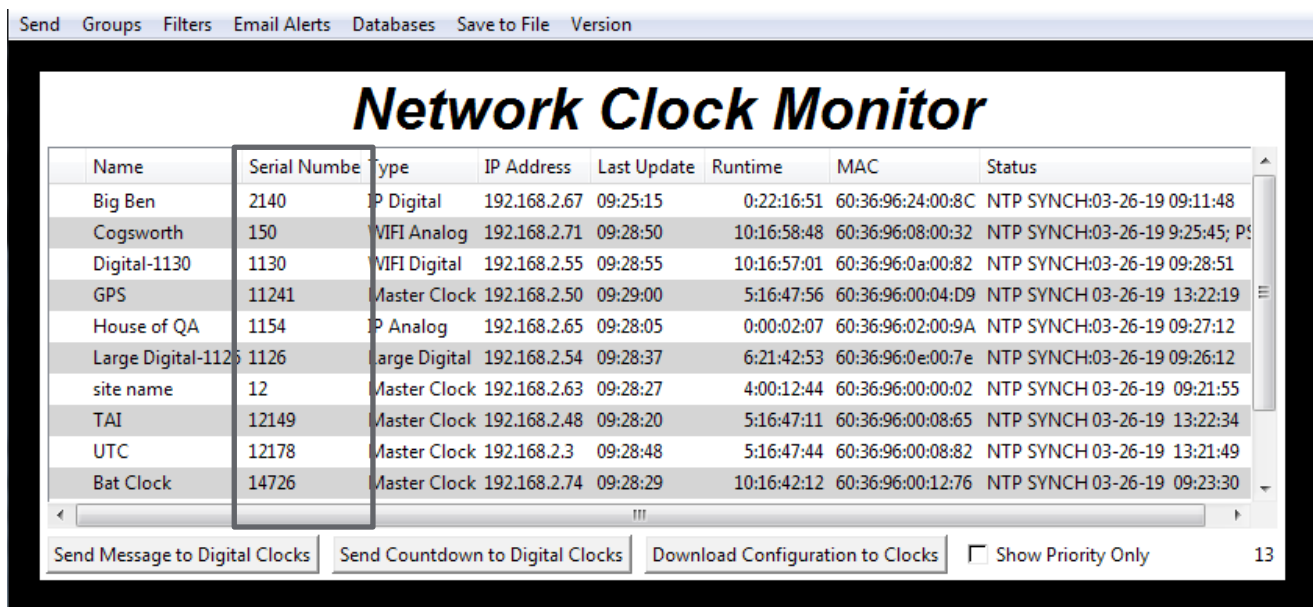
Preparing to Install - DHCP

If you are accessing an Internet NTP server, Port 123 must be open.

If you wish to be able to access the web interface from a computer that is not on the same subnet, Port 80 must be open.

If you wish to access your clock using a single, Static IP address, see the next page.

The clock is set to DHCP by default. This means that once the clock is connected to the network, it is assigned the next available IP address. If a user wishes to access the web interface while the clock is in DHCP mode, then the Network Monitor program is required. The clock can then be identified from its serial number, and then double clicked on to enter the web interface.



The screenshot shows the 'Network Clock Monitor' application window. At the top, there is a menu bar with options: Send, Groups, Filters, Email Alerts, Databases, Save to File, and Version. Below the menu bar is a title bar with the text 'Network Clock Monitor'. The main area contains a table with the following columns: Name, Serial Number, Type, IP Address, Last Update, Runtime, MAC, and Status. The table lists several clocks, including 'Big Ben', 'Cogsworth', 'Digital-1130', 'GPS', 'House of QA', 'Large Digital-1126', 'site name', 'TAI', 'UTC', and 'Bat Clock'. The 'Serial Number' column is highlighted with a mouse cursor. At the bottom of the window, there are three buttons: 'Send Message to Digital Clocks', 'Send Countdown to Digital Clocks', and 'Download Configuration to Clocks', along with a checkbox for 'Show Priority Only' and a page number '13'.

Name	Serial Number	Type	IP Address	Last Update	Runtime	MAC	Status
Big Ben	2140	IP Digital	192.168.2.67	09:25:15	0:22:16:51	60:36:96:24:00:8C	NTP SYNCH:03-26-19 09:11:48
Cogsworth	150	WiFi Analog	192.168.2.71	09:28:50	10:16:58:48	60:36:96:08:00:32	NTP SYNCH:03-26-19 9:25:45; P
Digital-1130	1130	WiFi Digital	192.168.2.55	09:28:55	10:16:57:01	60:36:96:0a:00:82	NTP SYNCH:03-26-19 09:28:51
GPS	11241	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH 03-26-19 13:22:19
House of QA	1154	IP Analog	192.168.2.65	09:28:05	0:00:02:07	60:36:96:02:00:9A	NTP SYNCH:03-26-19 09:27:12
Large Digital-1126	1126	Large Digital	192.168.2.54	09:28:37	6:21:42:53	60:36:96:0e:00:7e	NTP SYNCH:03-26-19 09:26:12
site name	12	Master Clock	192.168.2.63	09:28:27	4:00:12:44	60:36:96:00:00:02	NTP SYNCH 03-26-19 09:21:55
TAI	12149	Master Clock	192.168.2.48	09:28:20	5:16:47:11	60:36:96:00:08:65	NTP SYNCH 03-26-19 13:22:34
UTC	12178	Master Clock	192.168.2.3	09:28:48	5:16:47:44	60:36:96:00:08:82	NTP SYNCH 03-26-19 13:21:49
Bat Clock	14726	Master Clock	192.168.2.74	09:28:29	10:16:42:12	60:36:96:00:12:76	NTP SYNCH 03-26-19 09:23:30

If the user decides to use DHCP, and can confirm that they can access their clock by plugging it into the LAN with a PoE Injector/Switch, then they may proceed by installing the clock hardware at the desired location.

Preparing to Install - Static IP

If you are accessing an Internet NTP server, Port 123 must be open.

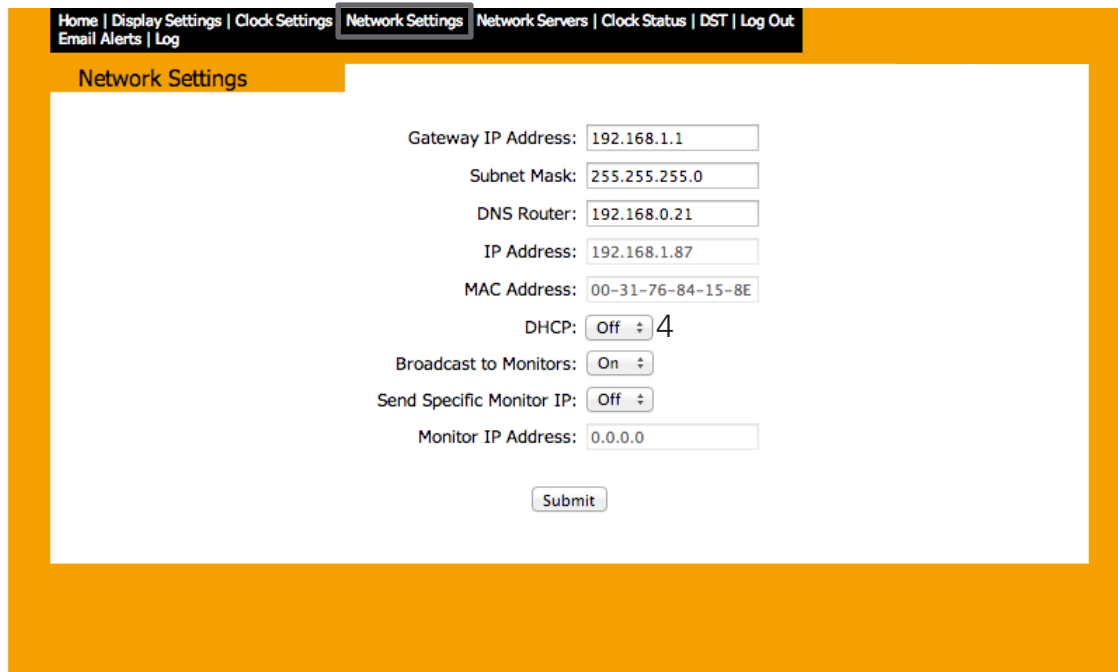
If you wish to be able to access the web interface from a computer that is not on the network, Port 80 must be open.

If you wish your clock to be assigned an IP address via DHCP, see the previous page.

If the user wants to access the clock by using the same IP address each time, otherwise known as a Static IP, then the following steps should be performed:

- 1) Use a crossover cable to attach the SAP clock to a PoE injector, and the injector to your computer.
 - a. If you are connecting from the clock to the computer using a PoE switch, the injector is not needed.
 - 2) If you know the IP address for your clock, enter it into the address bar of a web browser to access the clock's Web Interface.
 - a. If you do NOT know the IP address for your clock, power down the clock, then press and hold both buttons simultaneously
 - b. Power the clock, then release the buttons after five (5) seconds. You should now be able to access the clock at IP address 192.168.0.123.
- 3) Access the web interface using the password 6063, then click on the "Network Settings" tab.
- 4) Confirm that DHCP is set to OFF.

3



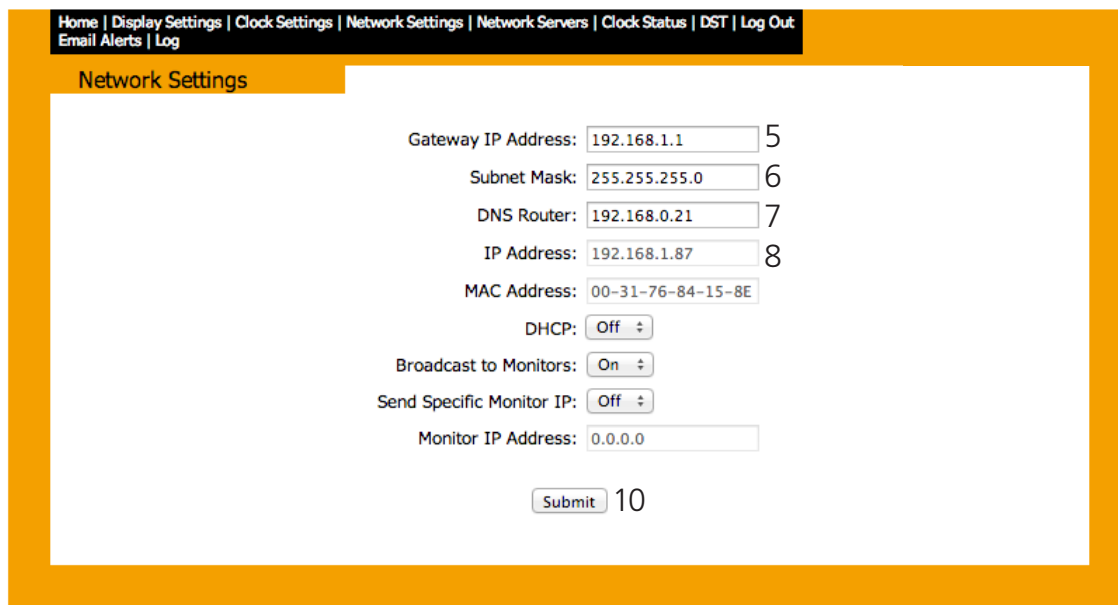
The screenshot shows a web interface for "Network Settings". At the top, there is a navigation bar with links: Home, Display Settings, Clock Settings, Network Settings (highlighted), Network Servers, Clock Status, DST, Log Out, Email Alerts, and Log. Below the navigation bar, the "Network Settings" section contains several input fields and dropdown menus:

- Gateway IP Address: 192.168.1.1
- Subnet Mask: 255.255.255.0
- DNS Router: 192.168.0.21
- IP Address: 192.168.1.87
- MAC Address: 00-31-76-84-15-8E
- DHCP: Off (with a dropdown arrow and a handwritten "4" next to it)
- Broadcast to Monitors: On (with a dropdown arrow)
- Send Specific Monitor IP: Off (with a dropdown arrow)
- Monitor IP Address: 0.0.0.0

At the bottom of the form is a "Submit" button.

Preparing to Install - Static IP (ctd.)

- 5) Next to "Gateway IP Address", set an appropriate IP address. The address you enter should be supplied by your network administrator.
- 6) Next to "Subnet Mask", enter appropriate information. . The numbers you enter should be supplied by your network administrator.
- 7) Next to "DNS Router", set an appropriate IP address. The address you enter should be supplied by your network administrator.
- 8) Next to "IP Address", set an appropriate IP address. The address you enter should be supplied by your network administrator. Do NOT use 192.168.0.123.
- 9) Write the Clock Number, IP Address, and intended installation location in your personal record.
- 10) Press Submit.
- 11) Exit the Web interface.

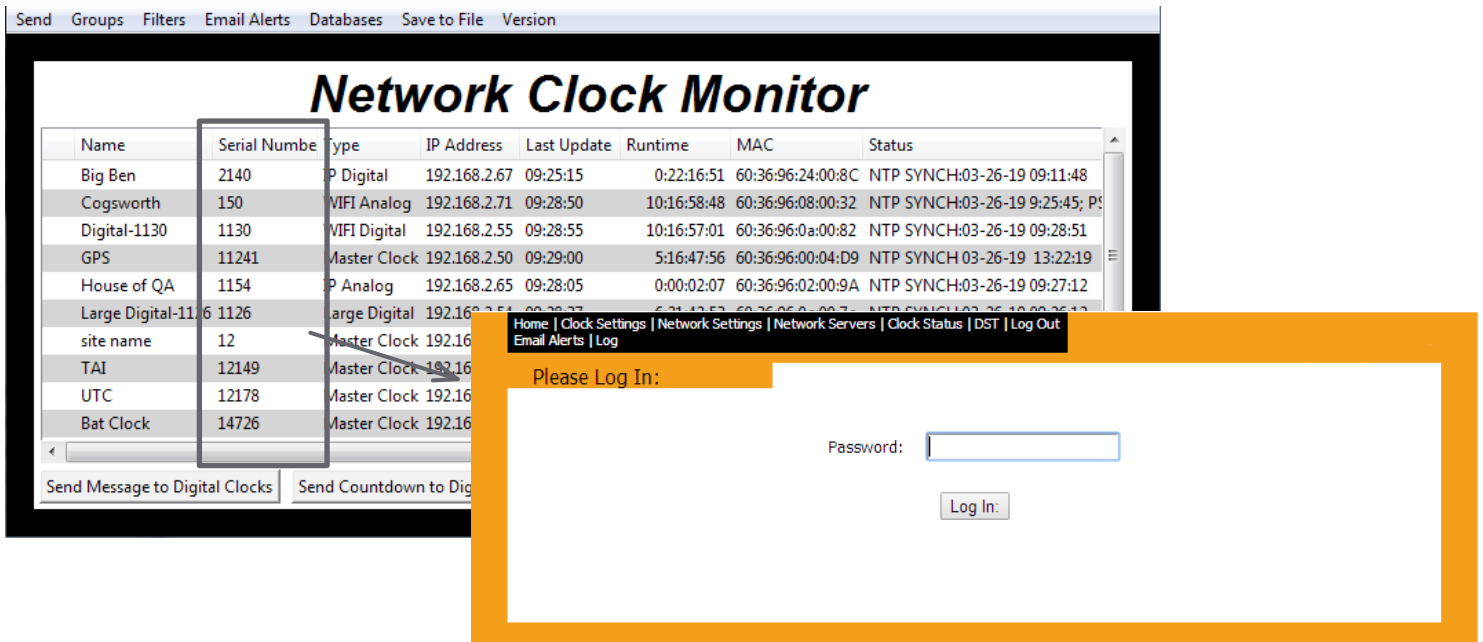


The screenshot shows a web interface for "Network Settings". At the top, there is a navigation bar with links: Home | Display Settings | Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out | Email Alerts | Log. Below the navigation bar, the "Network Settings" section contains the following fields and controls:

- Gateway IP Address: 5
- Subnet Mask: 6
- DNS Router: 7
- IP Address: 8
- MAC Address:
- DHCP: ↕
- Broadcast to Monitors: ↕
- Send Specific Monitor IP: ↕
- Monitor IP Address:
- 10

Preparing to Install - Quick Start

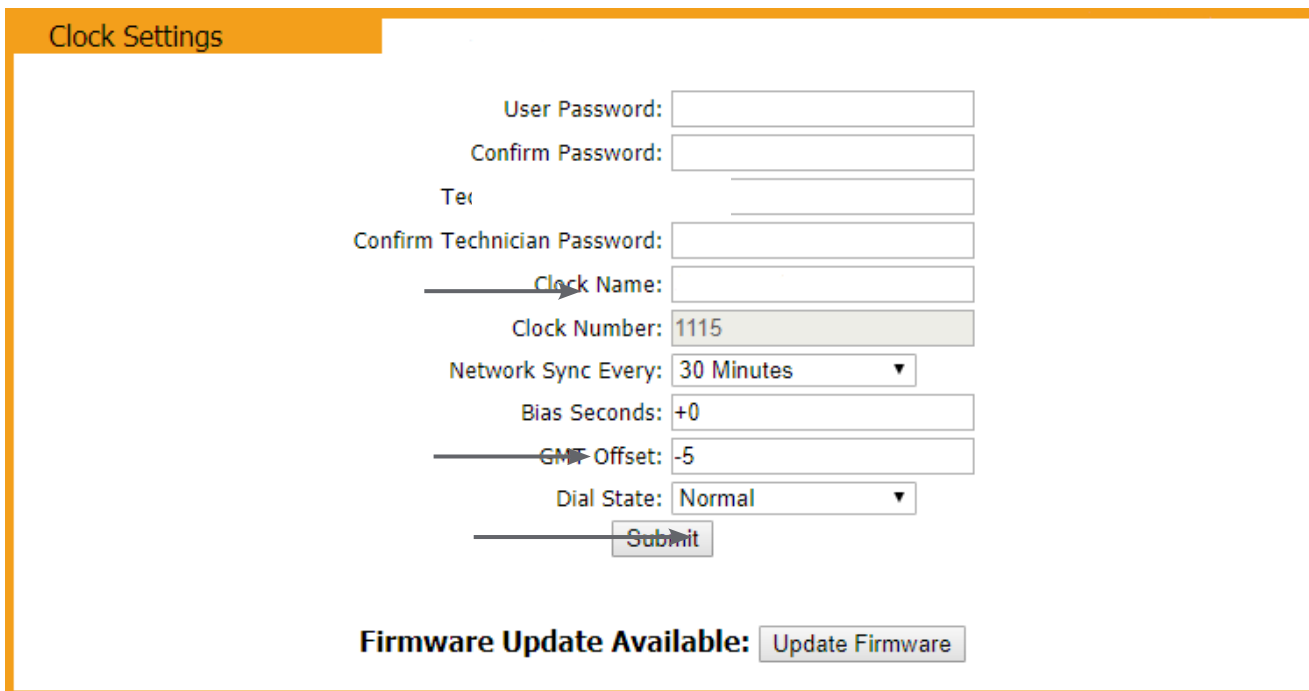
1) Double click on the serial number for the clock being installed. This should take you to the web interface for that clock. Use the password 6063 to enter.



The screenshot shows the 'Network Clock Monitor' web interface. A table lists various clocks with columns for Name, Serial Number, Type, IP Address, Last Update, Runtime, MAC, and Status. The 'Serial Number' column is highlighted, and a double-click action is indicated. An orange-bordered overlay shows a 'Please Log In:' form with a 'Password:' field and a 'Log In:' button.

Name	Serial Number	Type	IP Address	Last Update	Runtime	MAC	Status
Big Ben	2140	IP Digital	192.168.2.67	09:25:15	0:22:16:51	60:36:96:24:00:8C	NTP SYNCH:03-26-19 09:11:48
Cogsworth	150	WiFi Analog	192.168.2.71	09:28:50	10:16:58:48	60:36:96:08:00:32	NTP SYNCH:03-26-19 9:25:45; P
Digital-1130	1130	WiFi Digital	192.168.2.55	09:28:55	10:16:57:01	60:36:96:0a:00:82	NTP SYNCH:03-26-19 09:28:51
GPS	11241	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH:03-26-19 13:22:19
House of QA	1154	IP Analog	192.168.2.65	09:28:05	0:00:02:07	60:36:96:02:00:9A	NTP SYNCH:03-26-19 09:27:12
Large Digital-1116	1126	Large Digital	192.168.2.51	09:28:55	6:21:12:55	60:36:96:00:00:77	NTP SYNCH:03-26-19 09:28:13
site name	12	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH:03-26-19 13:22:19
TAI	12149	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH:03-26-19 13:22:19
UTC	12178	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH:03-26-19 13:22:19
Bat Clock	14726	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH:03-26-19 13:22:19

2) Select the Clock Settings tab, enter an easy-to-identify name for the clock (like the clock's location), select the GMT offset for your time zone (for example, New York is -5), and press the submit button.



The screenshot shows the 'Clock Settings' web interface. It contains several input fields and dropdown menus for configuring a clock. A 'Submit' button is at the bottom. A notification at the bottom indicates 'Firmware Update Available: Update Firmware'.

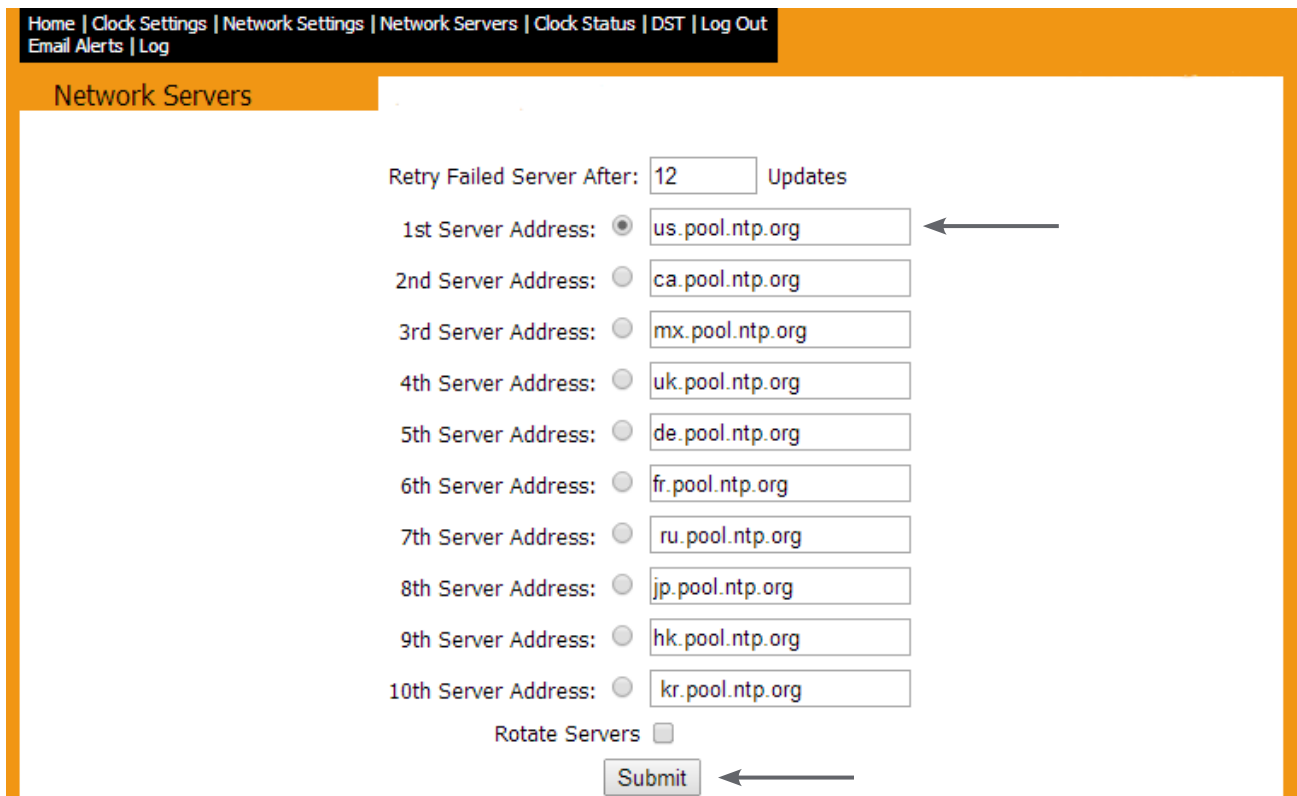
User Password:
 Confirm Password:
 Text:
 Confirm Technician Password:
 Clock Name:
 Clock Number: 1115
 Network Sync Every: 30 Minutes
 Bias Seconds: +0
 GMT Offset: -5
 Dial State: Normal
 Submit

Firmware Update Available: Update Firmware

Preparing to Install - Quick Start (ctd.)

3) Select the Network Servers tab and confirm that the NTP servers listed are the servers you wish to use. If you wish, enter the URL or IP address of an NTP server or master clock of your preference. If using a master clock or NTP server, the master clock/server must be set to a static IP address. See the master clock manual for instructions on how to set the master clock to a static IP address. Use the circle next to the textbox to select it, and make sure that the "Rotate Servers" box is unchecked. Press the submit button when finished.

Please Note: Regardless of what server or master clock you are using as a time source, you must still set the GMT Offset and DST settings in your secondary clocks separately.



Home | Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out
Email Alerts | Log

Network Servers

Retry Failed Server After: Updates

1st Server Address: ←

2nd Server Address:

3rd Server Address:

4th Server Address:

5th Server Address:

6th Server Address:

7th Server Address:

8th Server Address:

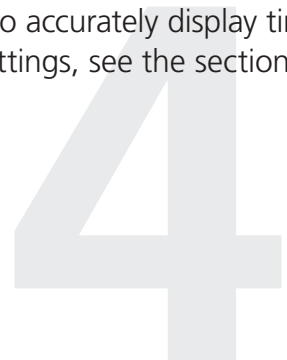
9th Server Address:

10th Server Address:

Rotate Servers

←

4) Close the web interface and Network Monitor. The clock should now be able to accurately display time when connected to your network. For information on more selectable IP clock settings, see the sections of the manual that follow.

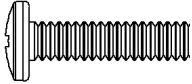

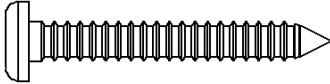
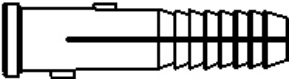


Wall Mount Installation - Round Metal Clock

Included in Package

Description	Quantity	Picture
SAP round original analog clock	1	
Mounting Bracket 12": M-MB-12-4 16": M-MB-16-2	1	

Included in Wiring Kit (A-MK-QS-1E)

#6-32x1/2 screw	2	
M4-0.5x10	2	
#10x1.5 Self-tapping screw	1	
Wall anchor	1	

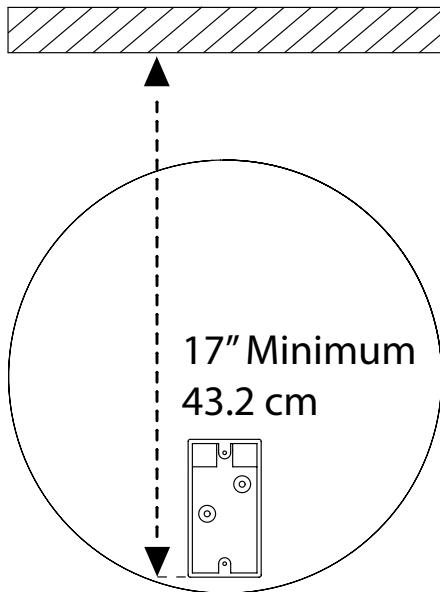
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small flat-blade screwdriver, a drill with a 1/4 inch drill bit, a pencil, a single gang box, any equipment needed to install the gang box, at least one CAT5 or CAT6 patch cable, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

If any of the items listed in the wiring kit are missing, you may contact your dealer and order a replacement kit.

Complete the section "Preparing to Install" before mounting the clock on the wall.

Wall Mount Installation - Round Metal Clock

1) Install the single gang box in the wall. Leave at least 17 inches between the bottom of the gang box and ceiling. Confirm that the bottom of the gang box is level with the floor.

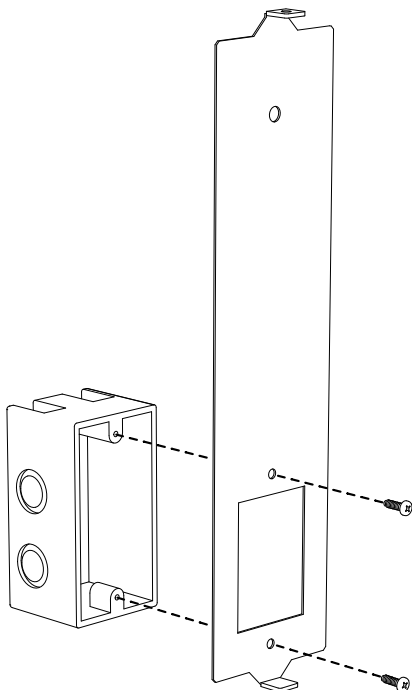


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

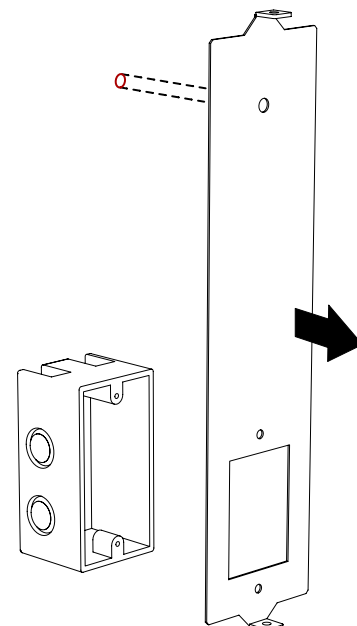
KNOW YOUR NETWORK

Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

3) Use the #6-32x1/2 screws to attach the mounting bracket to the gang box. The gang box should be at the bottom of the mounting piece.

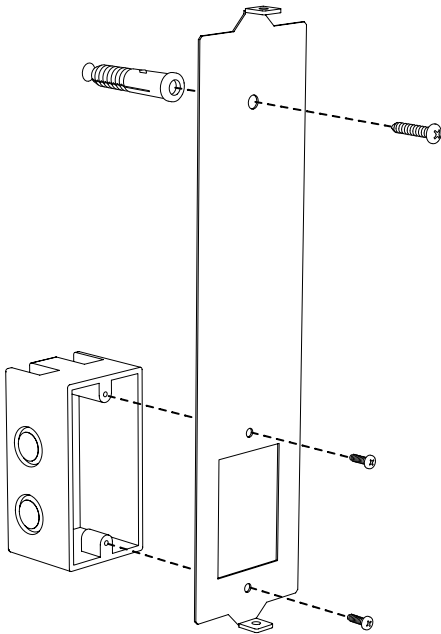


4) Use the pencil to mark the location of the large, circular hole at the top of the mounting bracket. Once finished, remove the mounting piece and drill a hole at the location you just marked.

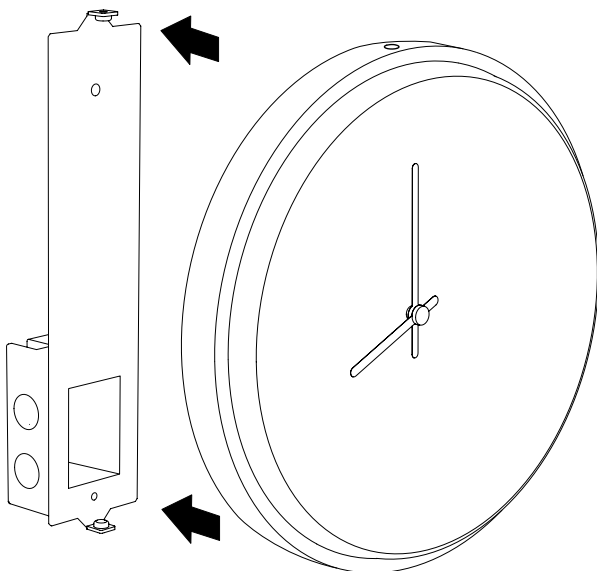


Wall Mount Installation - Round Metal Clock

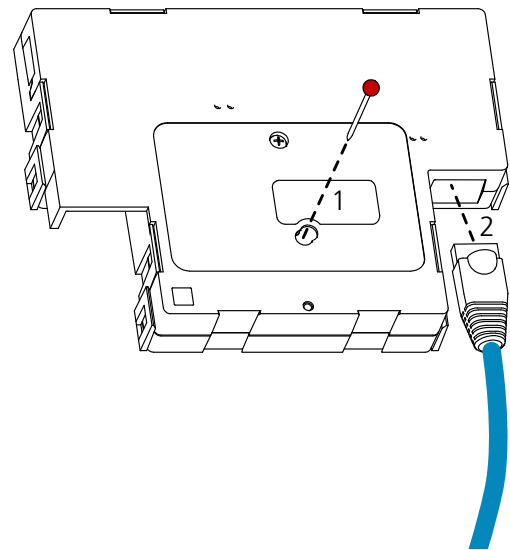
5) Insert the wall anchor into the hole, then reattach the mounting bracket. This time, also insert the #10x1.5 screw through the top of the mounting piece and into the wall anchor.



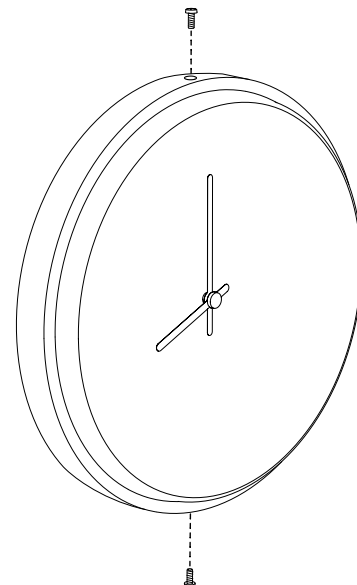
7) Attach the clock to the mounting piece so that the hole at the top of the clock lines up with the hole at the top of the mounting piece, and the hole at the bottom of the clock lines up with the hole at the bottom of the mounting piece.



6) **Remove the gearbox pin**, then attach the patch cable to the port on the right side of the movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.

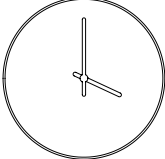
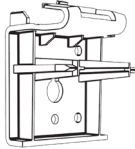


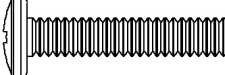

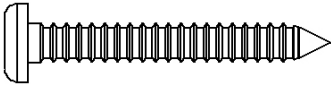
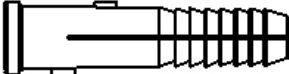


8) Use the two M4-0.5x10 screws to attach the clock to the mounting bracket. The screws should pass through the top and bottom holes on the clock, followed by the top and bottom holes of the mounting bracket.



Wall Mount Installation - Round SlimLine Clock

Included in Package

Description	Quantity	Picture
SAP round SlimLine analog clock	1	
Included in Wiring Kit (A-SLM-MK-S-1)		
Mounting Piece	1	
#6-19x7/16 screw	2	
Strain Relief	1	
Included in Gang Box Kit (A-GB-MK-1)		
#6-32x1 screw	2	
#6-19x3/8 screw	1 (not used)	
Included in Wiring Kit (A-WK-MTG-1)		
#8x1.5 Self-tapping screw	2	
Wall anchor	2	

PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small flat-blade screwdriver, a drill with a 1/4 inch drill bit, a pencil, a single gang box, any equipment needed to install the gang box, at least one CAT5 or CAT6 patch cable, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

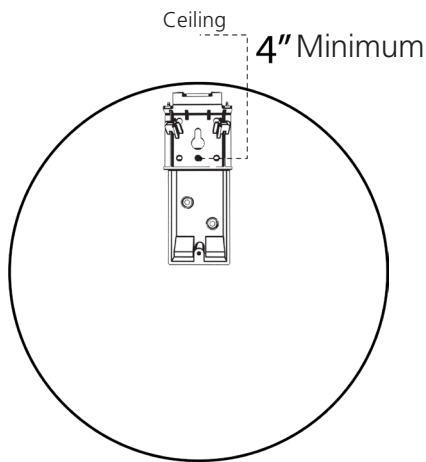
If any of the items listed in the wiring kit are missing, you may contact your dealer and order a replacement kit.

Complete the section “Preparing to Install” before mounting the clock on the wall.

Wall Mount Installation - Round SlimLine Clock

1) If you are installing a new gang box in the wall, leave at least 4 inches between the top of the gang box and ceiling. Confirm that the bottom of the gang box is level with the floor.

If you are using an existing gang box, the top of the gang box must be a minimum of four inches away from the ceiling.



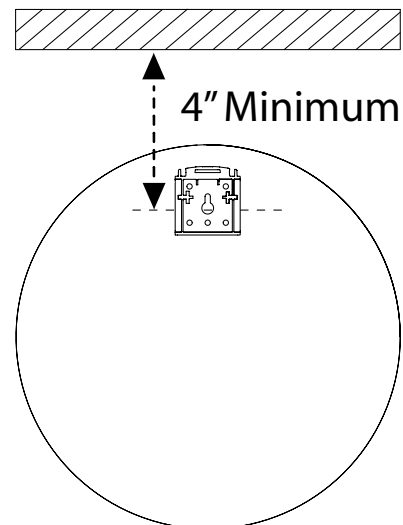
3) If you do not wish to attach the mounting piece to the gang box, proceed to step 4A. Otherwise, go to step 5.

2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

KNOW YOUR NETWORK

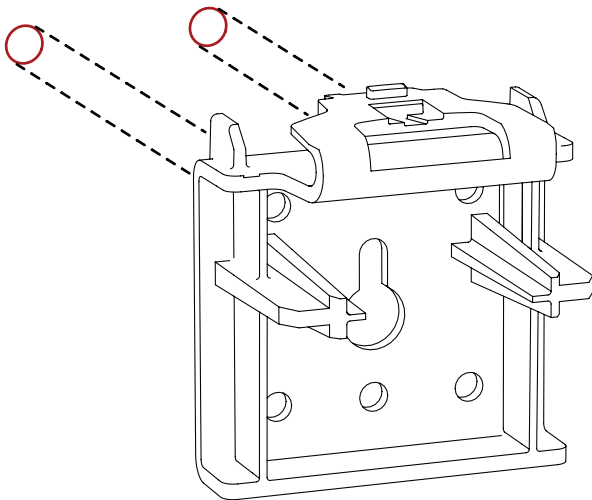
Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

4A) If you do not wish to attach the mounting piece to a gang box, place the mounting piece on the wall. Leave at least 4 inches between the middle of the mounting piece and ceiling. Confirm that the bottom of the mounting piece is level with the floor.

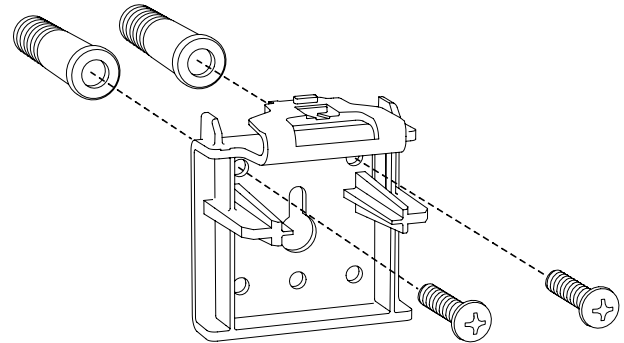


Wall Mount Installation - Round SlimLine Clock

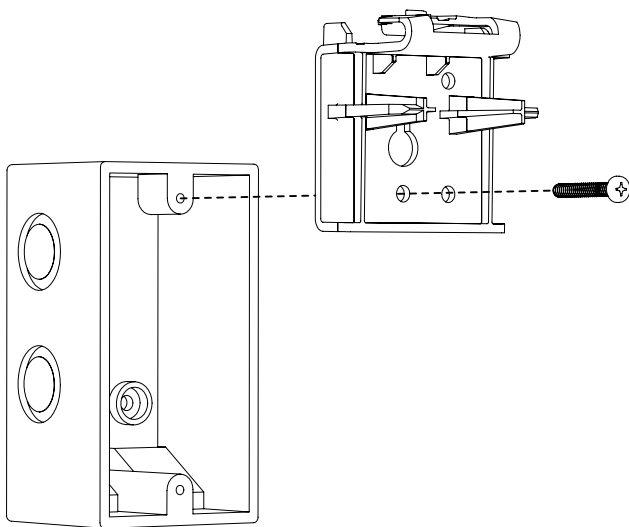
4B) Use a pencil to mark the positions of the top two holes, then use the 1/4 inch drill bit to drill holes at the locations of the two marks.



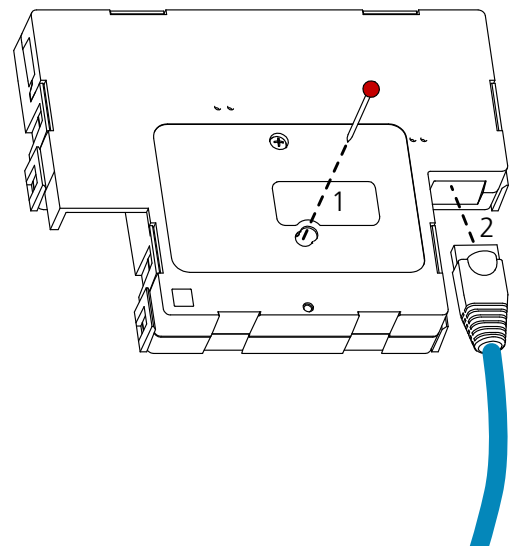
4C) Insert the wall anchors into the two holes, then place the two self tapping screws through the mounting piece and into the wall anchors. Skip step 5 and go directly to step 6.



5) Place the mounting piece on the wall above the gang box so that the bottom centered hole on the piece overlaps the top hole on the gang box. Insert a #6-32x1 screw through the bottom centered hole and into the top hole of the gang box.

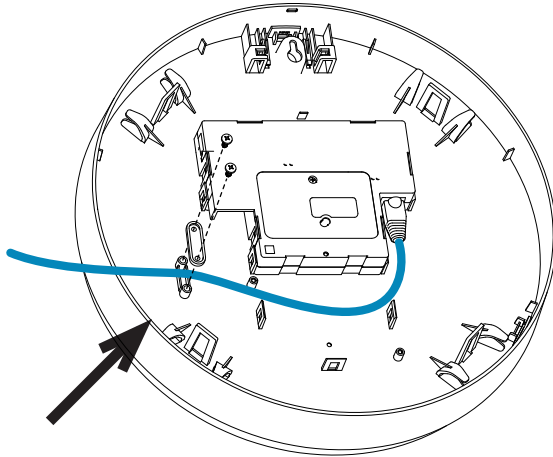


6) **Remove the gearbox pin**, then attach the patch cable to the port on the right side of the movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.

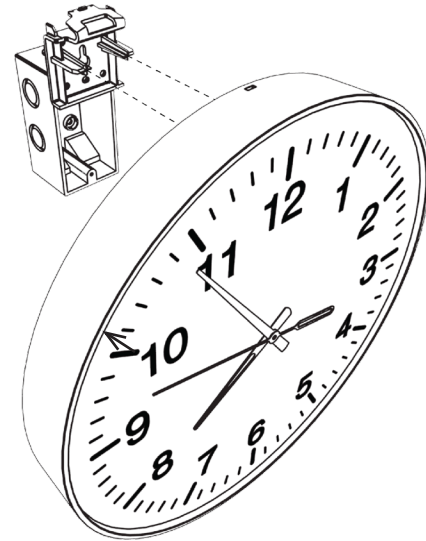


Wall Mount Installation - Round SlimLine Clock

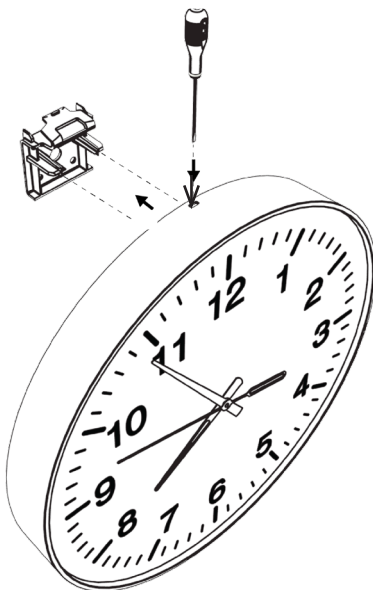
7) Lay any excess wiring across the strain relief base, then attach the strain relief to the clock with the two #6-19x7/16 screws. The strain relief should be tight enough to prevent the wire from sliding.



8) Attach the clock to the mounting piece by sliding the clock back onto it. You should hear a snapping noise as the latch engages.

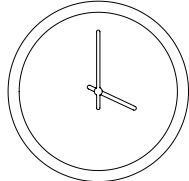
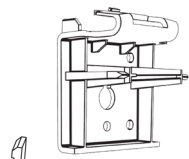
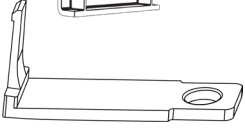


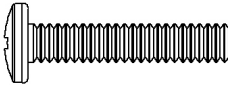

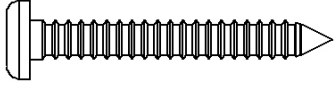
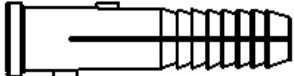


9) If you need to take the clock off the wall after the installation has been completed, use a flat-blade screwdriver or eyeglasses screwdriver to press down and release the mounting piece latch, then slide the clock off the mounting piece.



Wall Mount Installation - Round Aluminum or Wood Clock

Included in Package

Description	Quantity	Picture
SAP round SlimLine analog clock with aluminum/wood rim	1	
Included in Mounting Kit (A-SLM-MK-AW)		
Mounting Piece	1	
Release lever	1	
#6-19x7/16 screw	2	
Strain Relief	1	
Included in Gang Box Kit (A-GB-MK-1)		
#6-32x1 screw	2	
#6-19x3/8 screw	1 (not used)	
Included in Wiring Kit (A-WK-MTG-1)		
#8x1.5 Self-tapping screw	2	
Wall anchor	2	

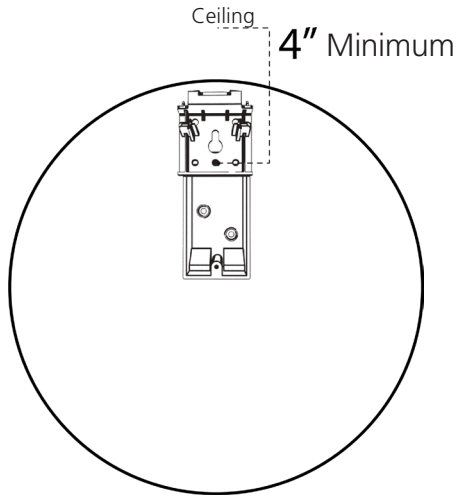
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small flat-blade screwdriver, a drill with a 1/4 inch drill bit, a pencil, a single gang box, any equipment needed to install the gang box, at least one CAT5 or CAT6 patch cable, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

If any of the items listed in the wiring kit are missing, you may contact your dealer and order a replacement kit.

Complete the section “Preparing to Install” before mounting the clock on the wall.

Wall Mount Installation - Round Aluminum or Wood Clock

1) Install the single gang box in the wall. Leave at least 4 inches between the top of the gang box and ceiling. Confirm that the bottom of the gang box is level with the floor.

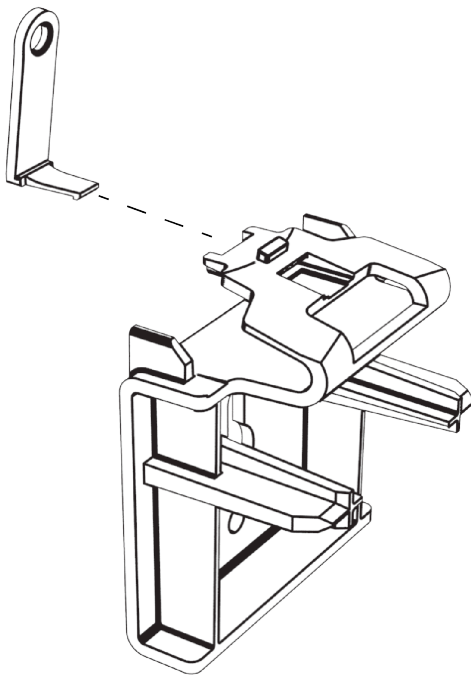


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

KNOW YOUR NETWORK

Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

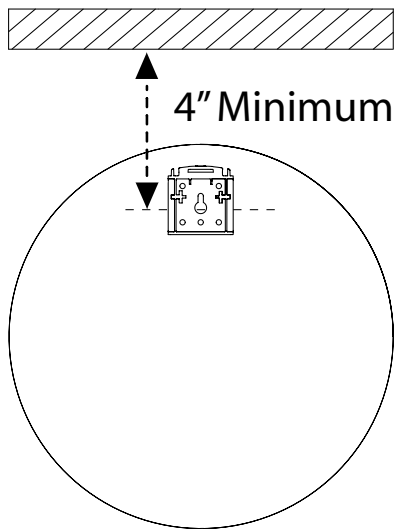
3) Insert the release lever into the hole atop the mounting piece latch.



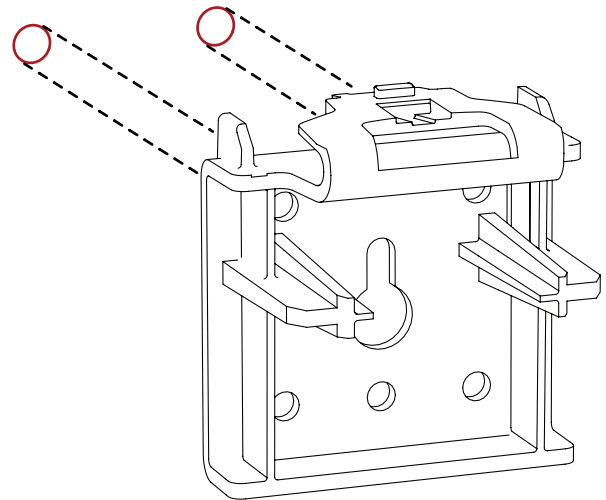
4) If you do not wish to attach the mounting piece to the gang box, proceed to step 5A. Otherwise, go to step 6.

Wall Mount Installation - Round Aluminum or Wood Clock

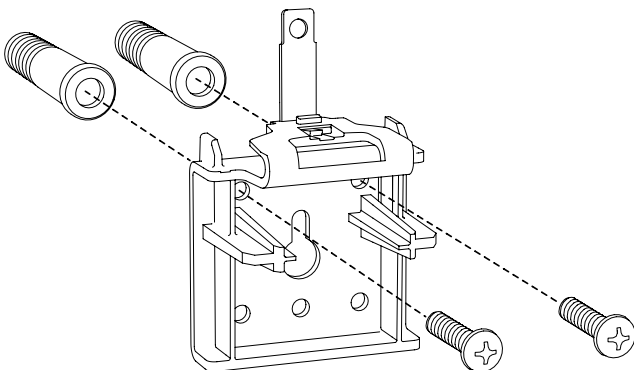
5A) If you do not wish to attach the mounting piece to a gang box, place the mounting piece on the wall. Leave at least 4 inches between the middle of the mounting piece and ceiling. Confirm that the bottom of the mounting piece is level with the floor.



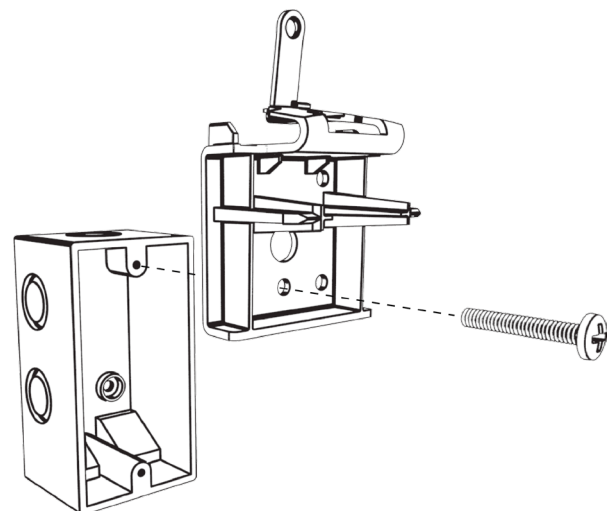
5B) Use a pencil to mark the positions of the top two holes, then use the 1/4 inch drill bit to drill holes at the locations of the two marks.



5C) Insert the wall anchors into the two holes, then place the two self tapping screws through the mounting piece and into the wall anchors. Skip step 6 and go directly to step 7.

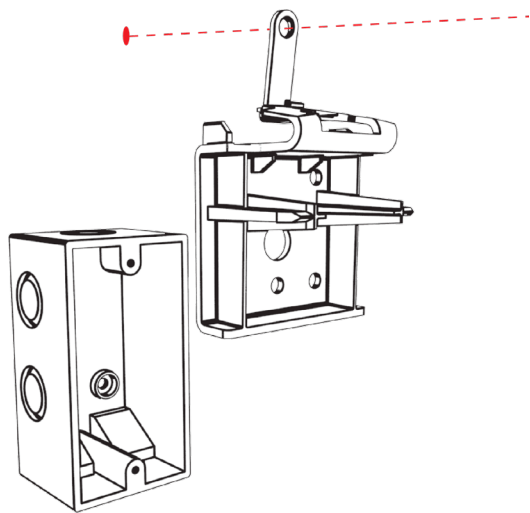


6) Place the mounting piece on the wall above the gang box so that the bottom centered hole on the piece overlaps the top hole on the gang box. Insert a #6-32x1 screw through the bottom centered hole and into the top hole of the gang box.

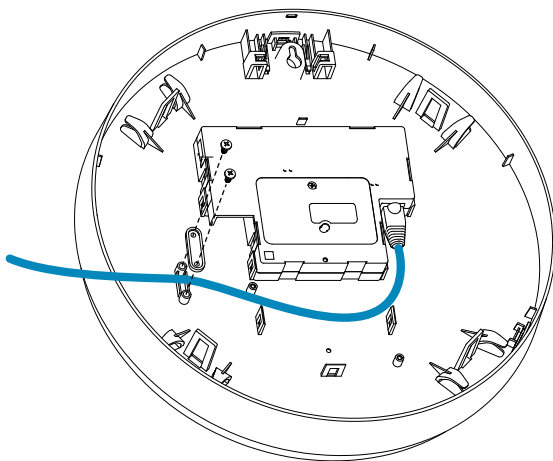


Wall Mount Installation - Round Aluminum or Wood Clock

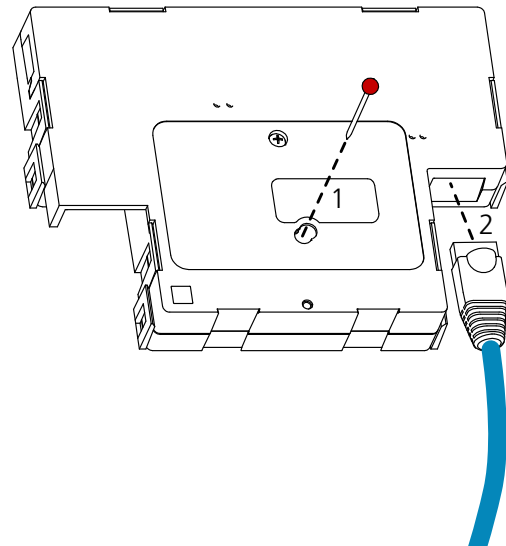
7) Temporarily attach the clock to the mounting piece (see step 9), use the pencil to mark the location of the hole at the top of the release lever, and remove the clock again (see step 11). Remove the mounting piece and make a hole at the location you just marked with the 1/8 inch drill bit. When finished, reattach the mounting piece.



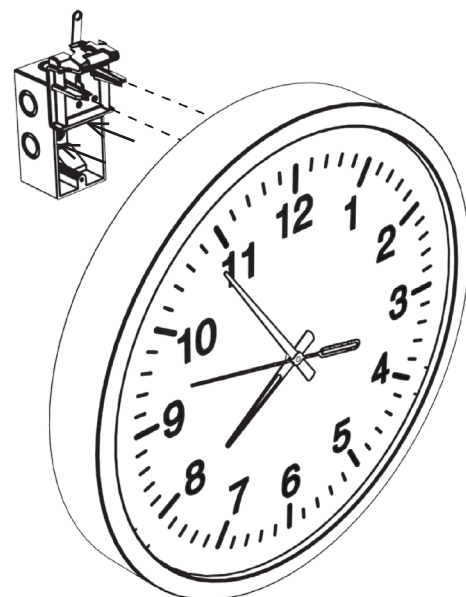
9) Lay any excess wiring across the strain relief base, then attach the strain relief to the clock with the two #6-19x7/16 screws. The strain relief should be tight enough to prevent the wire from sliding.



8) **Remove the gearbox pin**, then attach the patch cable to the port on the right side of the movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.

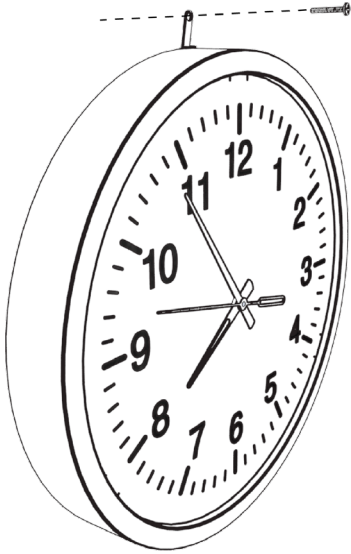


10) Attach the clock to the mounting piece by sliding the clock back onto it. You should hear a snapping noise as the latch engages.

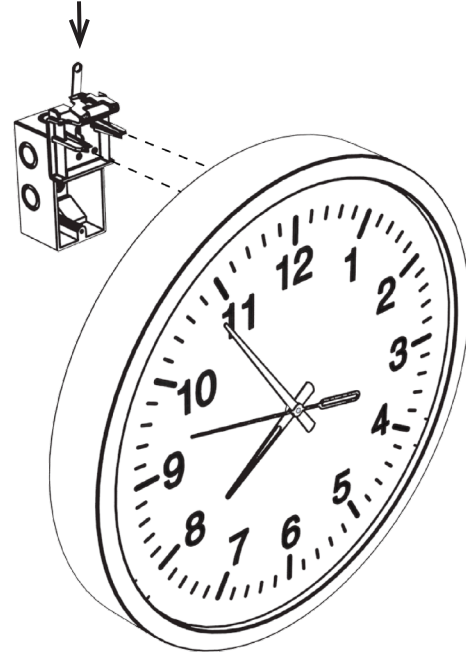


Wall Mount Installation - Round Aluminum or Wood Clock

11) Place one of the self-tapping screws through the hole in the top of the release lever.



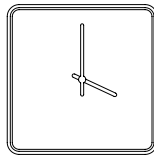
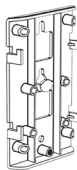
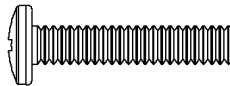



12) If you need to take the clock off the wall after the installation has been completed, remove the screw from the release lever, press the release lever down, then slide the clock off the mounting piece.



13) If you need to take the clock off the wall after the installation has been completed AND you accidentally broke off the release lever or forgot to attach it during installation, take a thin flathead screwdriver, thin ruler, or eyeglass screwdriver and insert the end between the clock and the wall. Press down on the latch until you are able to slide the clock off the mounting piece.

Wall Mount Installation - Square Clock

Included in Package

Description	Quantity	Picture
SAP square analog clock	1	
Mounting Piece (already attached to clock housing)	1	
Included in Gang Box Kit (A-GB-MK-1)		
#6-32x1 screw	2	
#6-19x3/8 screw	1	
Included in Wiring Kit (A-WK-MTG-1)		
#8x1.5 Self-tapping screw	2 (not used)	
Wall anchor	2 (not used)	

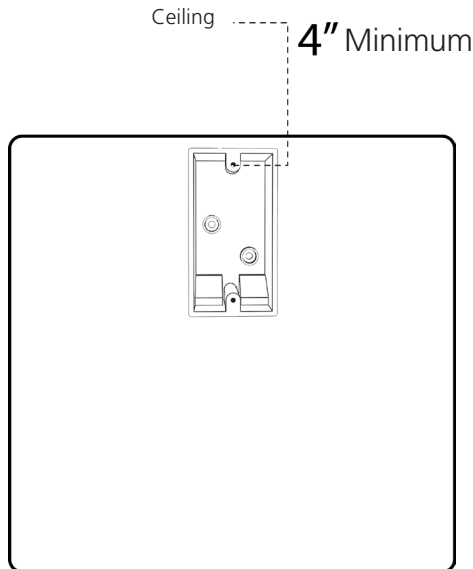
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small flat-blade screwdriver, a drill with a 1/4 inch drill bit, a pencil, a single gang box, any equipment needed to install the gang box, at least one CAT5 or CAT6 patch cable, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

If any of the items listed in the wiring kit are missing, you may contact your dealer and order a replacement kit.

Complete the section “Preparing to Install” before mounting the clock on the wall.

Wall Mount Installation - Square Clock

1) Install the single gang box in the wall. Leave at least 4 inches between the top of the gang box and ceiling. Confirm that the bottom of the gang box is level with the floor.

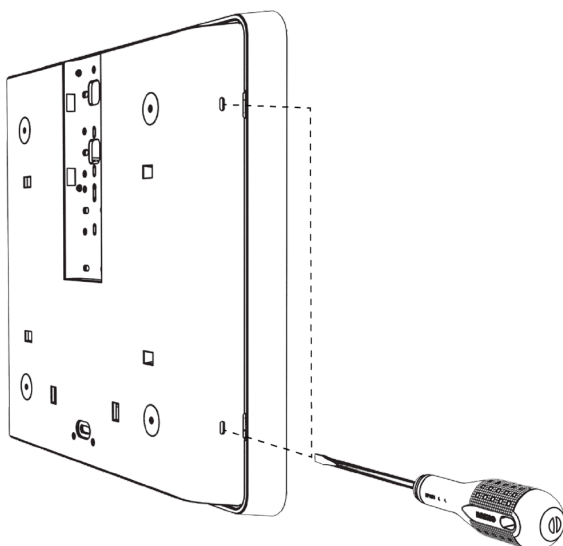


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

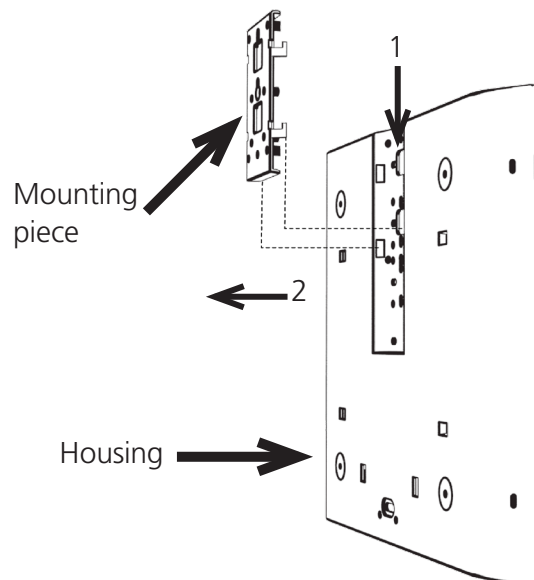
KNOW YOUR NETWORK

Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

3) Detach the housing from the back of the clock. Do this by inserting a flat-blade screwdriver about 1/8 inch into each of the slot holes until the housing detaches. You may hear a snapping noise as the latches disengage.

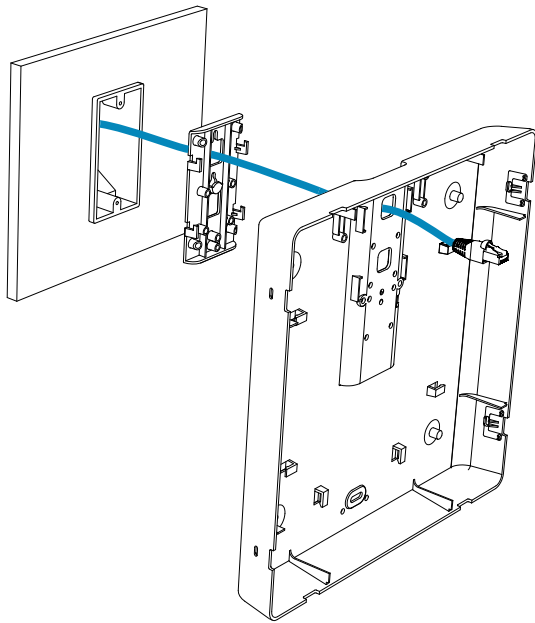


4) Release the mounting piece from the back of the housing by sliding it towards the center of the housing, then pulling it back and away from the housing.

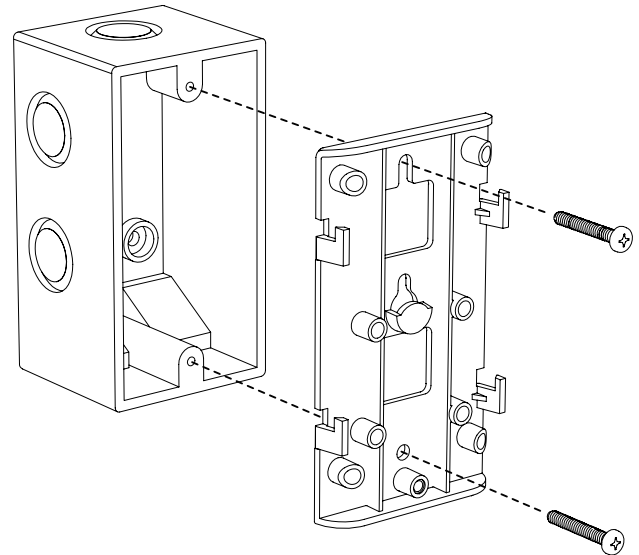


Wall Mount Installation - Square Clock

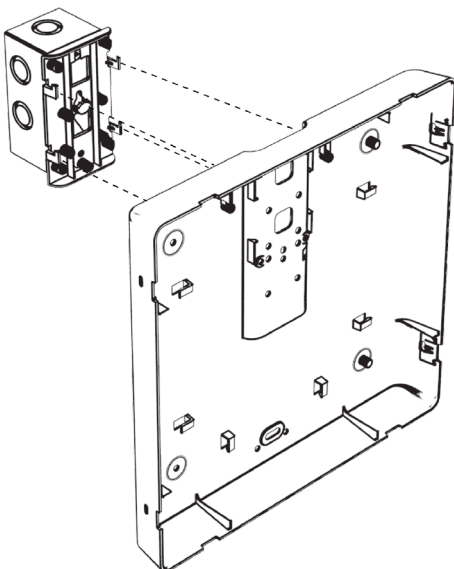
5) Thread the patch cable through the hole at the top of the mounting piece, followed by the top hole of the housing.



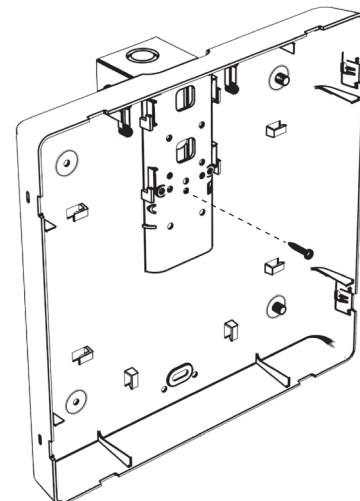
6) Attach the mounting piece to the gang box using both of the #6-32x1 screws and a Phillips-head screwdriver.



7) Slide the clock housing onto the mounting piece. If the housing does not slide on properly, tighten the screws that attach the mounting piece to the gang box.

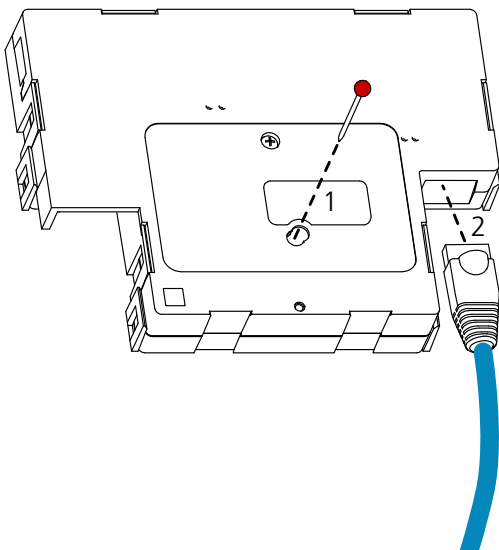


8) If you wish to prevent the clock from sliding off the mounting piece, use the small, silver 6-19x3/8 screw on the bottom centered hole. Once the screw is in place, test it by attempting to slide the housing up. The housing should not move.

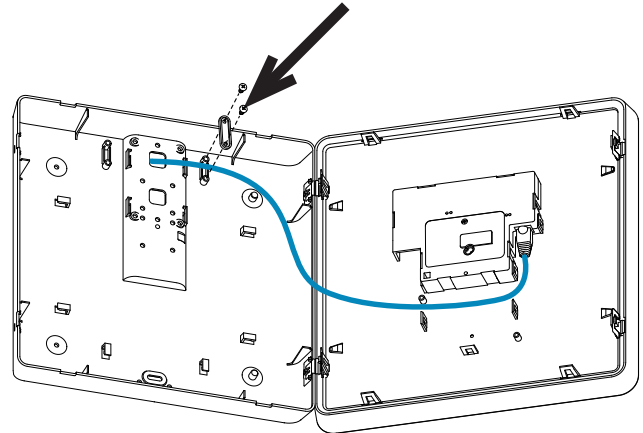


Wall Mount Installation - Square Clock

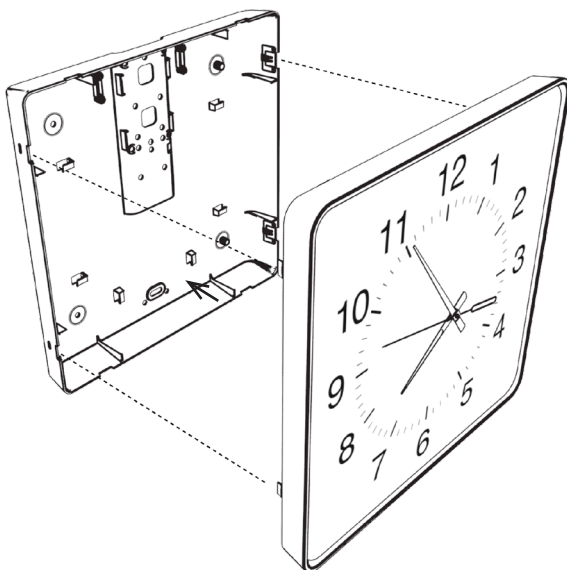
9) **Remove the gearbox pin**, then attach the patch cable to the port on the right side of the movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.



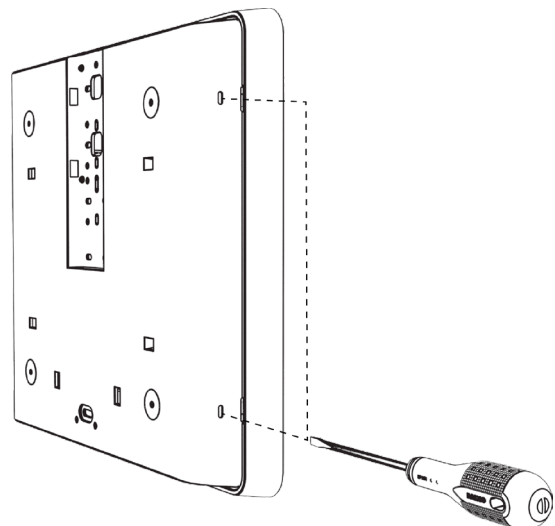
10) Loosen the strain relief by unscrewing the two screws. Slip any excess wiring through it, then tighten the strain relief by reinserting and tightening the screws.



11) Slide the clock back into the housing. You should hear a snapping noise as the latches reengage.

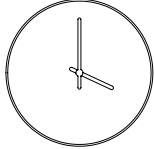

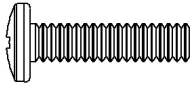


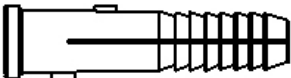


12) If you feel the need to take the clock off the wall after the installation has been completed, use a flat-blade screwdriver to detach the housing from the back of the clock, then use a Phillip's-head screwdriver to detach the mounting piece from the housing and gang box.



Flag Mount Installation - Round Metal Clock

Included in Package

Description	Quantity	Picture
SAP round metal analog clock	1	
Mounting Bracket	1 (not used)	
Included in Wiring Kit (A-MK-QS-1E)		
#6-32x1/2 screw	2 (not used)	
M4-0.5x10	2 (not used)	
#10x1.5 Self-tapping screw	1 (not used)	
Wall anchor	1 (not used)	

Continued on next page

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Flag Mount Installation - Round Metal Clock

Included in Double Mount Kit (SAB-1BD-12R-0M or SAB-4BD-16R-0M)

Dual-mount pole, including mounting plate.	1	
#10-32x3/8 green screw	1	
#8-32x7/16 screw	8 (not used)	
M3.5-1.0x10 screw (black)	4	
Internal-tooth washer	8 (not used)	
#6-32x1 screw	4	
Flag Mount Endcap	1	

PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small slot-head screwdriver, a drill with a 1/4 inch drill bit, a pencil, a double gang box, four wall anchors (must support 50 lbs, #8 screw size, 1.5”(3.8cm) screw length), four #8 screws for the wall anchors, four #6-32x1 screws for attaching the mounting plate to the gang box, any equipment needed to install the gang box, at least one CAT5 or CAT6 patch cable, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

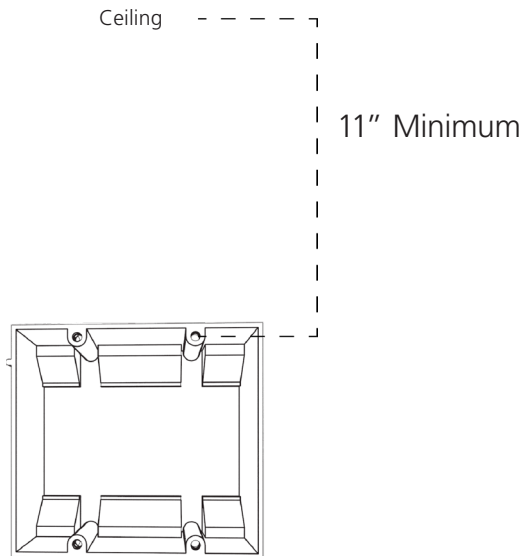
If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Complete the section “Preparing to Install” before mounting the clock on the wall.

SlimLine and Aluminum Clocks use the same installation procedures for flag mount housings.

Flag Mount Installation - Round Metal Clock

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall.

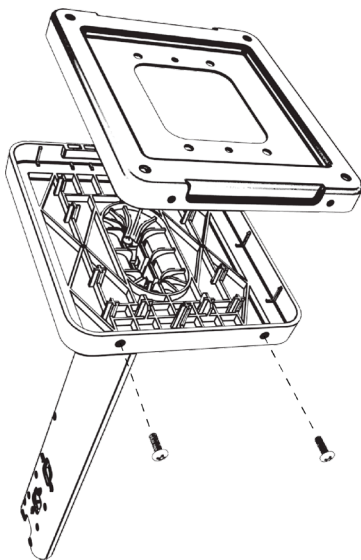


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

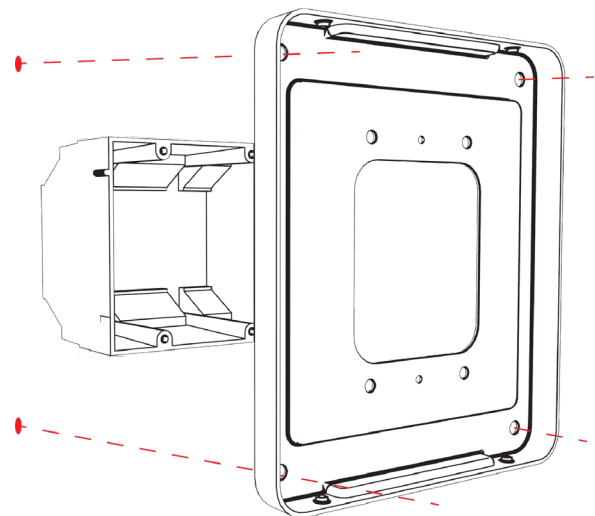
KNOW YOUR NETWORK

Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

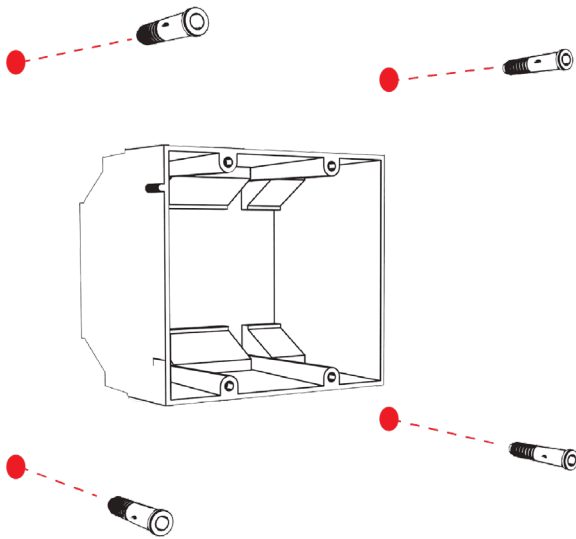


4) Attach the mounting plate to the gang box using only two of the four long silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

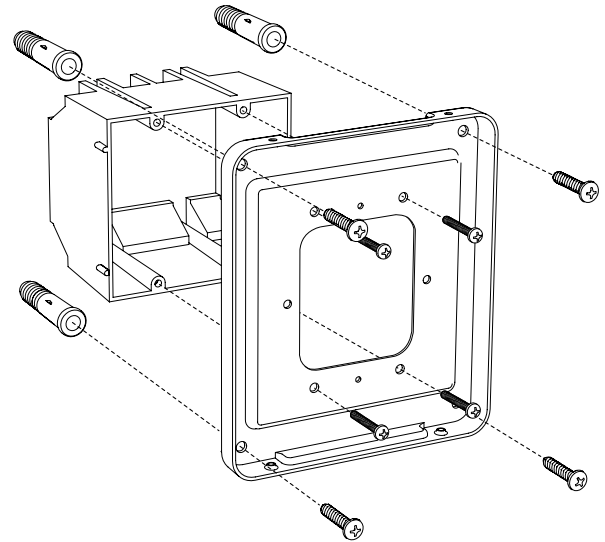


Flag Mount Installation - Round Metal Clock

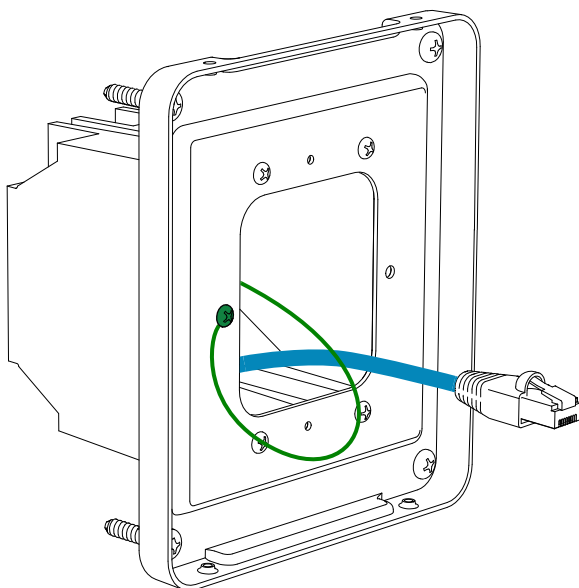
5) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



6) Reattach the mounting plate, this time using all four long, silver #8 screws, then insert the four #6-32x1 screws through the mounting plate and into the anchors.

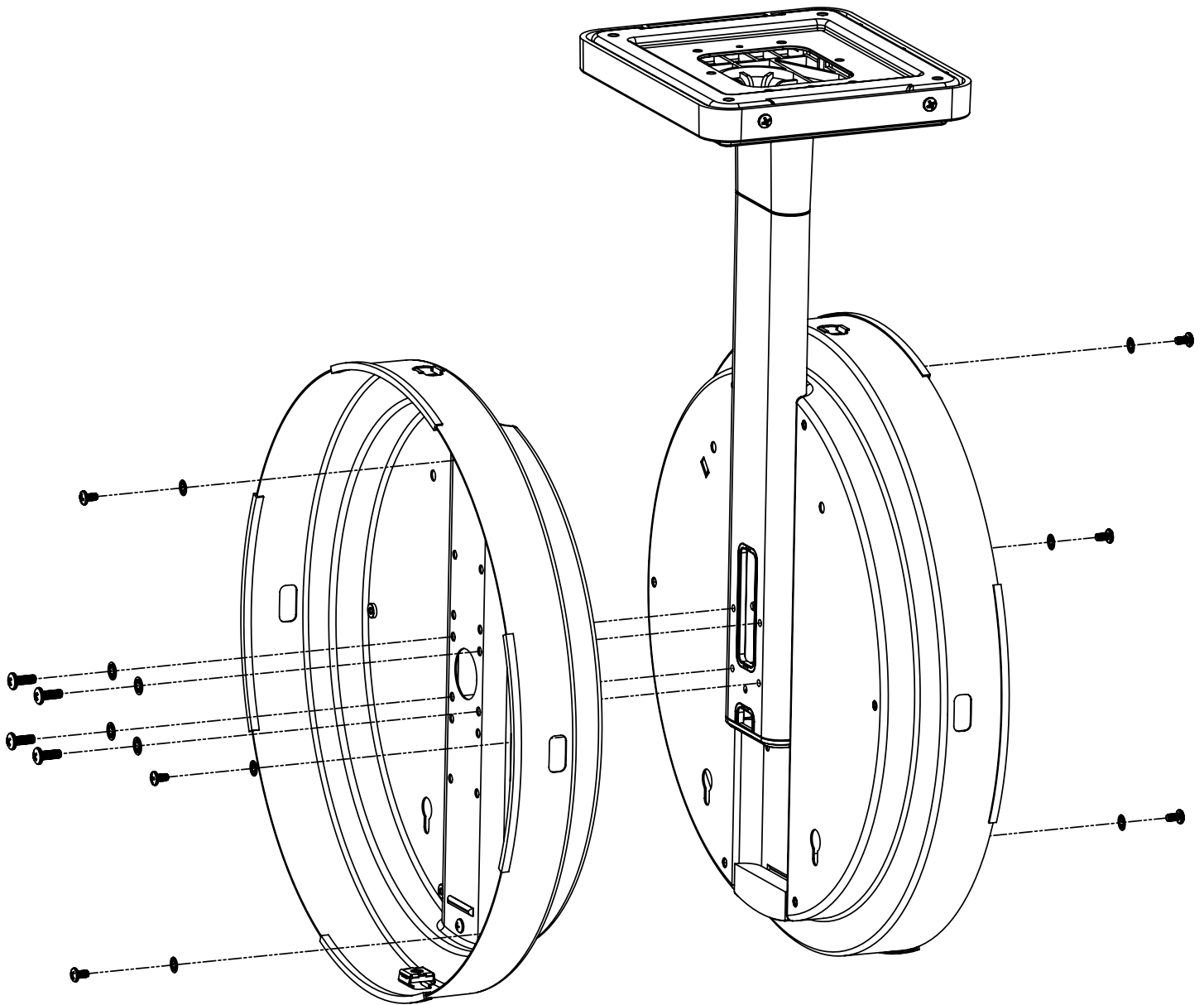


7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.



Flag Mount Installation - Round Metal Clock

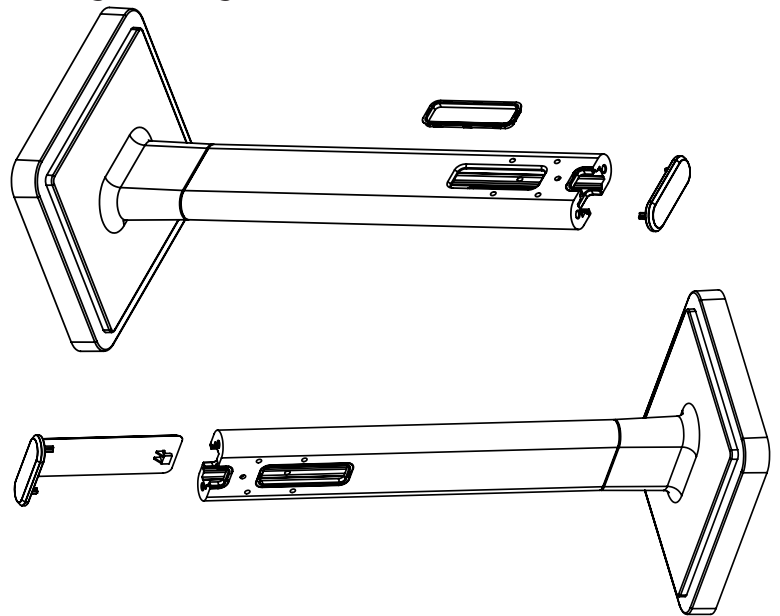
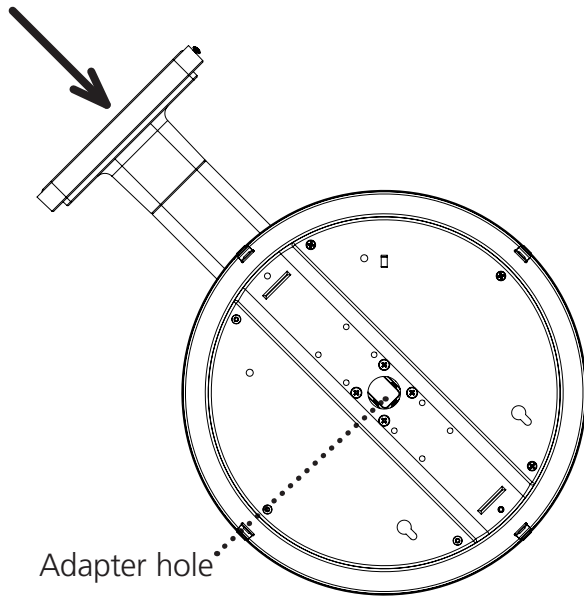
8) Remove one of the included adapters. Unscrew the four screws that connect the adapter to the pole, and the eight screws that hold the two adapters to each other. You may keep the removed adapter and screws or throw them away, at your preference.



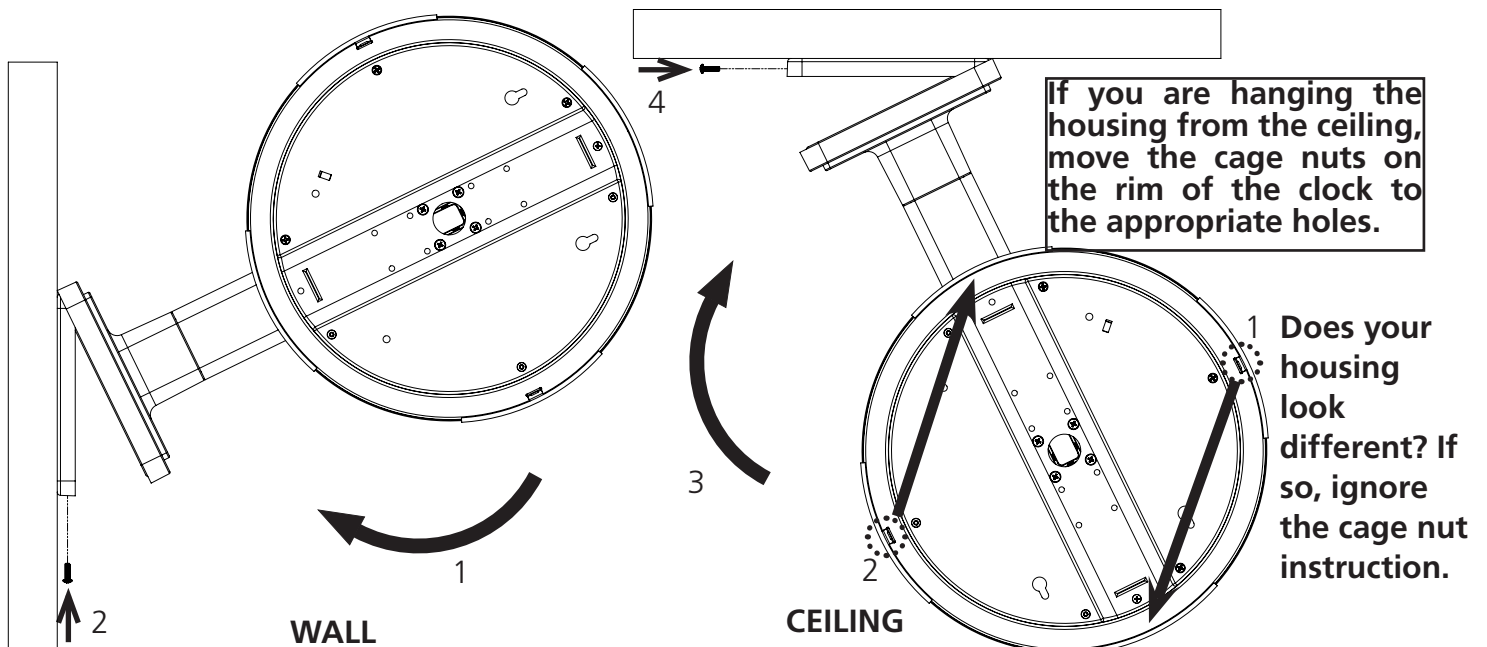
Flag Mount Installation - Round Metal Clock

9) Thread at least fifteen inches (38.1cm) of cable from the gang box through the bottom of the pole until the cable exits through the hole in the adapter.

10) Remove the pole endcap and plastic ring from the exposed pole side. Place the flag mount endcap on the end of the pole so that it covers the exposed large rectangular hole.

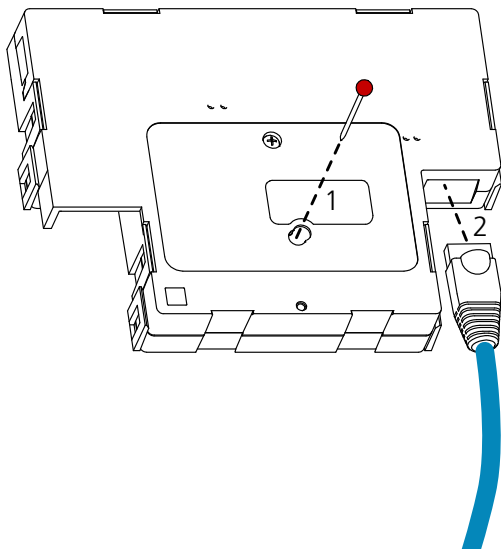


11) Attach the base of the pole to the mounting plate so that the lip is on the top of the base, and the holes for the screws are on the bottom of the base. Hang the base on the mounting plate, attach the wires from the bottom of the pole to the wires in the gang box, then screw the other side of the base onto the mounting plate using the two black screws you set aside before.

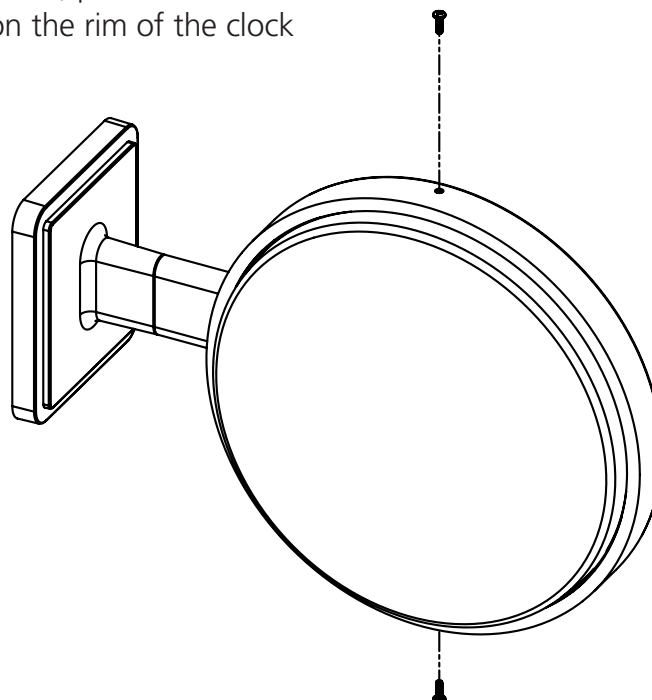


Flag Mount Installation - Round Metal Clock

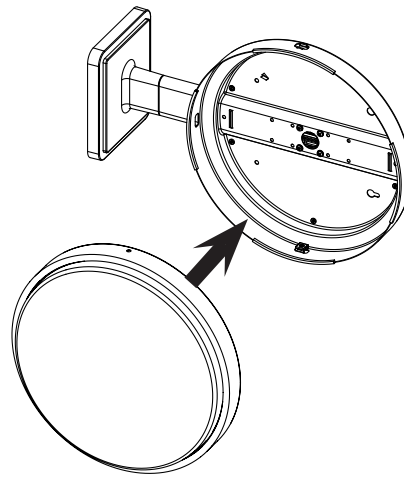
12) **Remove the gearbox pin**, then attach the patch cable to the port on the right side of the movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.



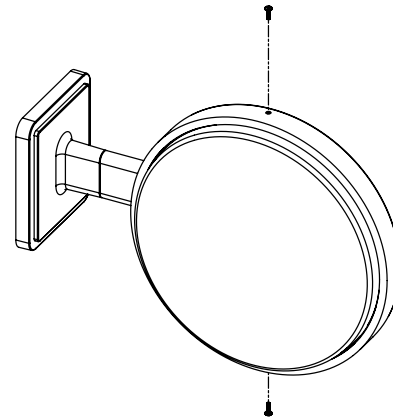
14) If you feel the need to detach the clock from the housing after the installation has been completed, remove the outer adapter screws, press down on the latches, and gently pull on the rim of the clock until the clock detaches.



13) Place the clock onto the adapter, then insert the screws through the holes on the top and bottom of the clock into the cage nuts on the adapter.



Does your housing look different? If so, refer to the section of this manual titled "Legacy Housing"

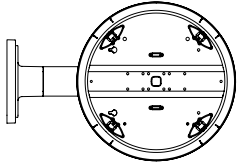
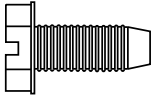
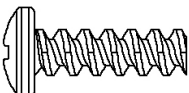
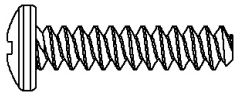

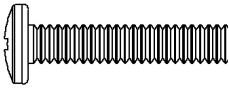

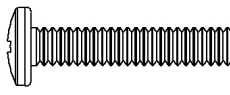



Flag Mount Installation - Round SlimLine/Aluminum Clock

Included in Package

Description	Quantity	Picture
Round SlimLine analog clock	1	

Included in Double Mount Kit (SAH-1BD-12R-0 or SAH-1BD-16R-0)

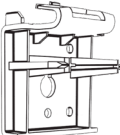
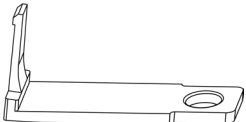


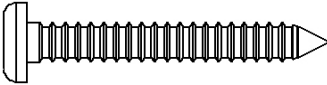
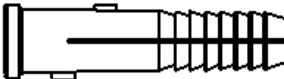
Dual-mount pole, including mounting plate.	1	
#10-32x3/8 green screw	1	
#8-32x7/16 screw	8 (not used)	
M3.5-1.0x10 screw (black)	4	
Internal-tooth washer	8 (not used)	
#6-32x1 screw	4	
Flag Mount Endcap	1	
Included in Gang Box Kit (A-GB-MK-1)		
#6-32x1 screw	4	
#6-19x3/8 screw	2 (not used)	

Continued on next page

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Flag Mount Installation - Round SlimLine/Aluminum Clock

Included in Mounting Kit (A-SLM-MK-S-1) or (A-SLM-MK-AW)

Description	Quantity	Picture
Mounting Piece	1 (not used)	
Release lever	0 or 1 (not used)	
#6-19x7/16 screw	2	
Strain relief	1	
Included in Wiring Kit (A-WK-MTG-1)		
#8x1.5 Self-tapping screw	2 (not used)	
Wall anchor	2 (not used)	

PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small slot-head screwdriver, a drill with a 1/4 inch drill bit, a pencil, a double gang box, four wall anchors (must support 50 lbs, #8 screw size, 1.5”(3.8cm) screw length), four #8 screws for the wall anchors, four #6-32x1 screws for attaching the mounting plate to the gang box, any equipment needed to install the gang box, at least one CAT5 or CAT6 patch cable, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

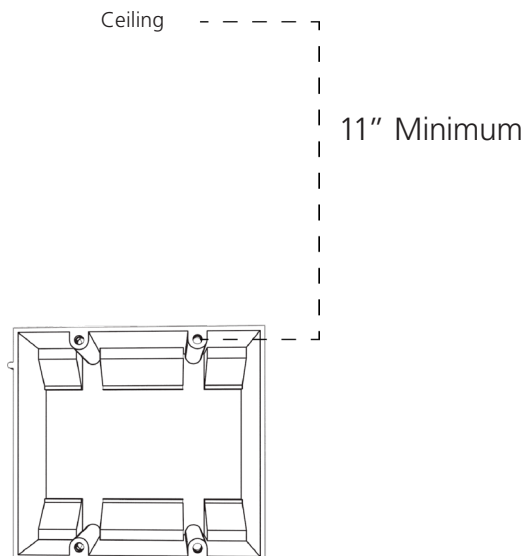
If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Complete the section “Preparing to Install” before mounting the clock on the wall.

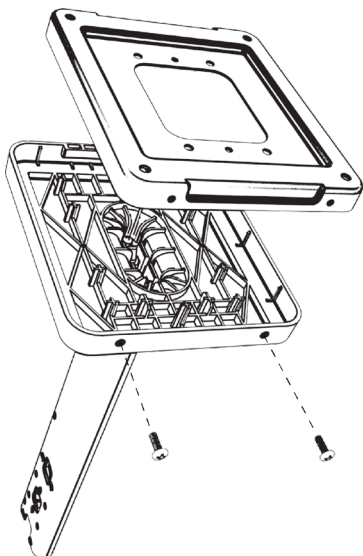
SlimLine and Aluminum Clocks use the same installation procedures for flag mount housings.

Flag Mount Installation - Round SlimLine/Aluminum Clock

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall. The box should be installed level and plumb with the wall and ceiling.



3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

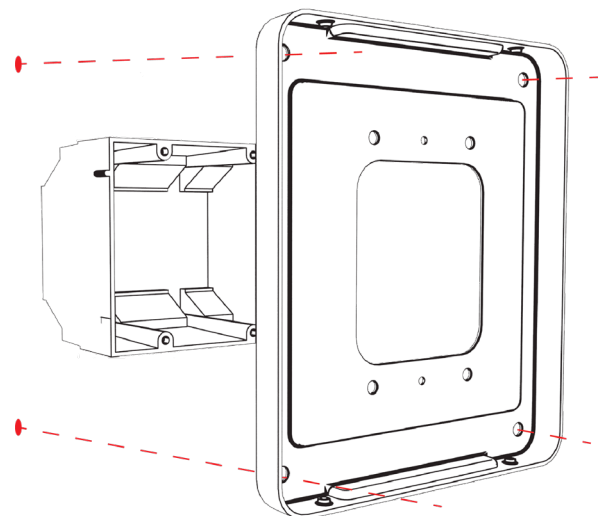


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

KNOW YOUR NETWORK

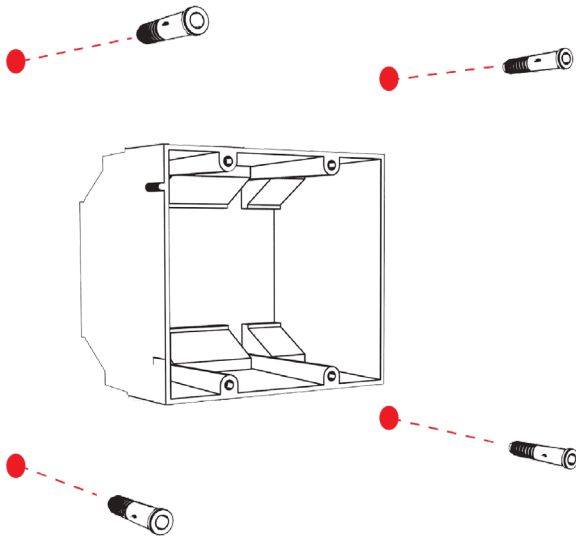
Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

4) Attach the mounting plate to the gang box using only two of the four long, silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

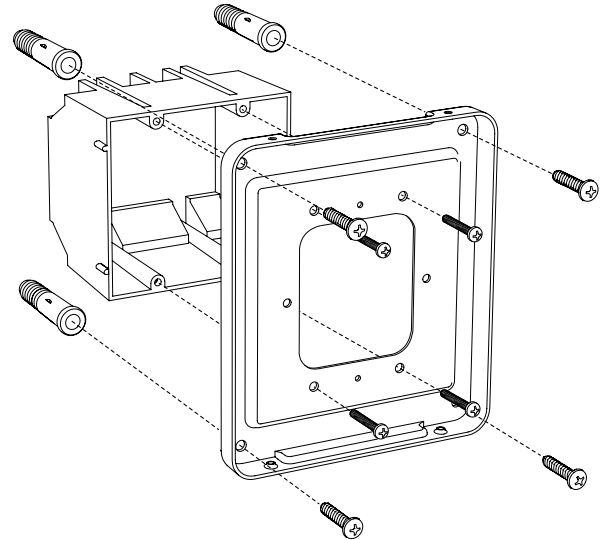


Flag Mount Installation - Round SlimLine/Aluminum Clock

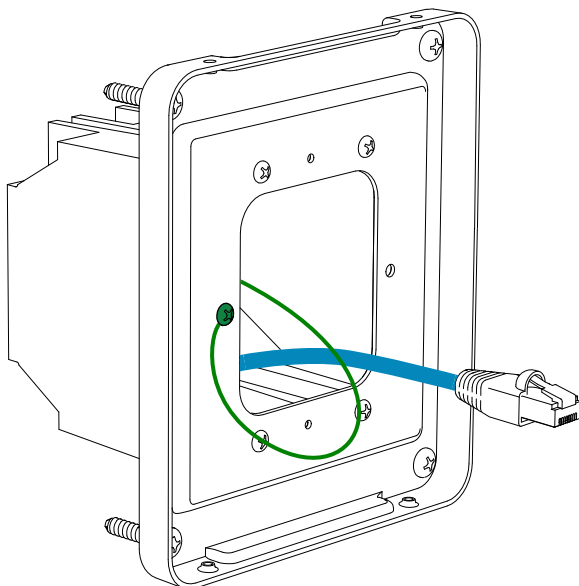
5) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



6) Reattach the mounting plate, this time using all four long, silver #6-32x1 screws, then insert the four #8 screws through the mounting plate and into the anchors.

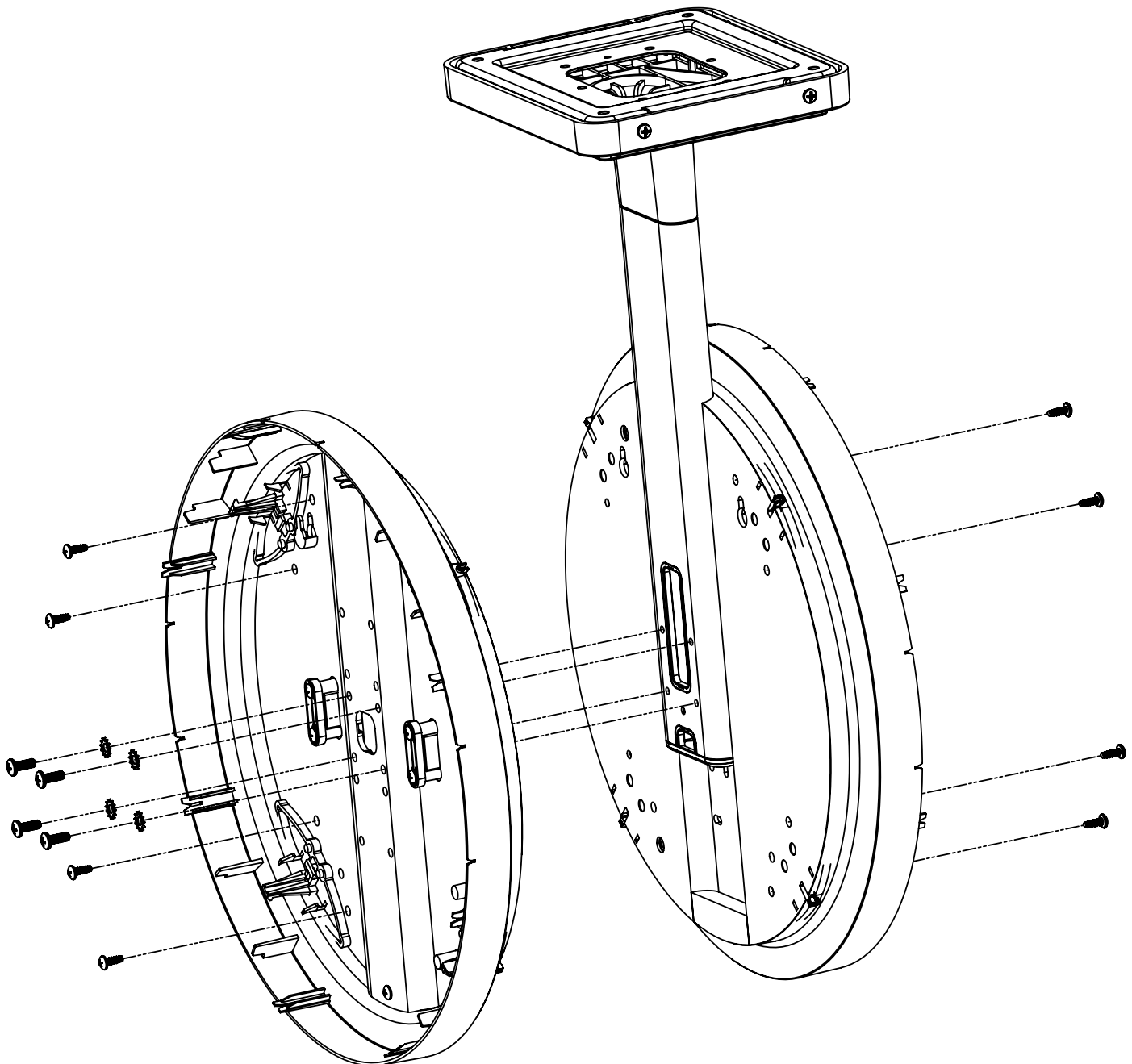


7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.



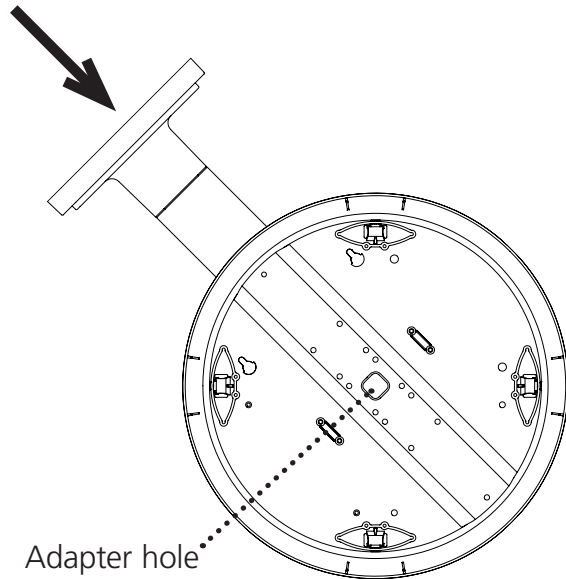
Flag Mount Installation - Round SlimLine/Aluminum Clock

8) Remove one of the included adapters. Unscrew the four screws that connect the adapter to the pole, and the eight screws that hold the two adapters to each other. You may keep the removed adapter and screws or throw them away, at your preference.

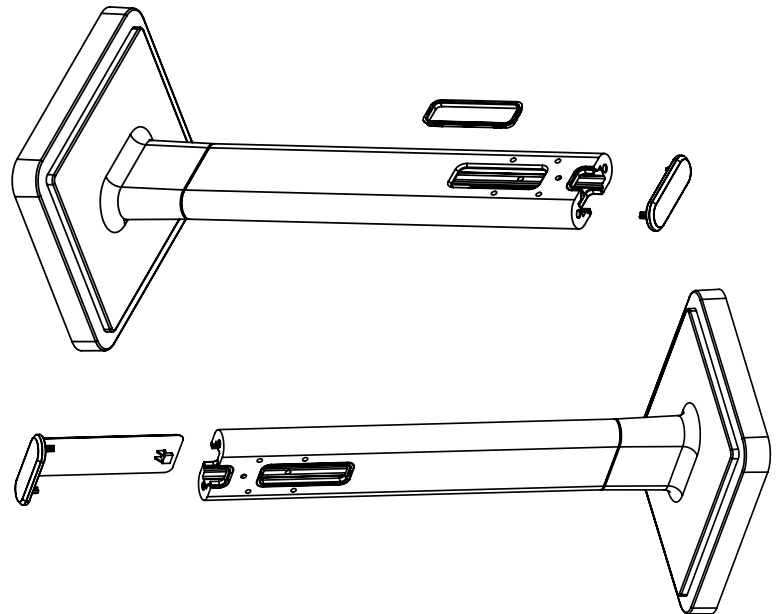


Flag Mount Installation - Round SlimLine/Aluminum Clock

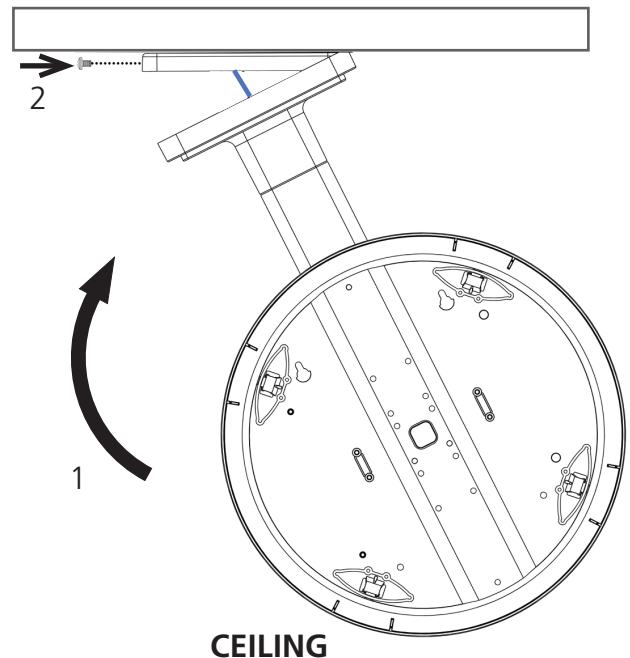
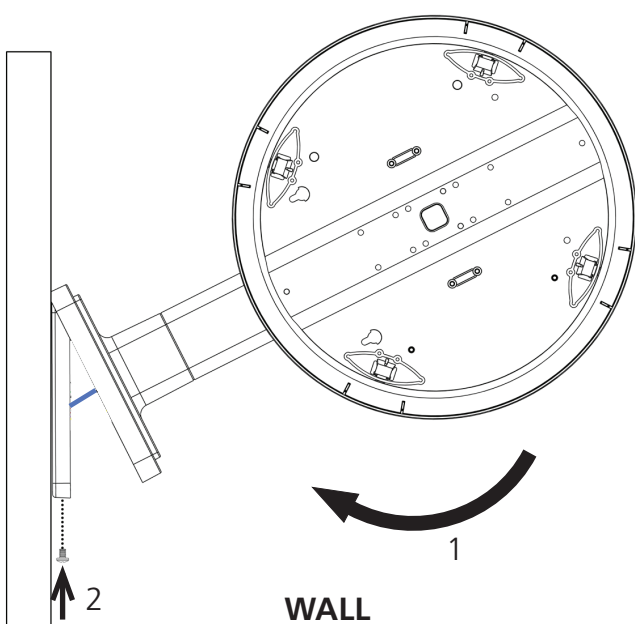
9) Thread at least fifteen inches (38.1cm) of cable from the gang box through the bottom of the pole until each cable exits through the hole in the adapter.



10) Remove the pole endcap and plastic ring from the exposed pole side. Place the flag mount endcap on the end of the pole so that it covers the exposed large rectangular hole.

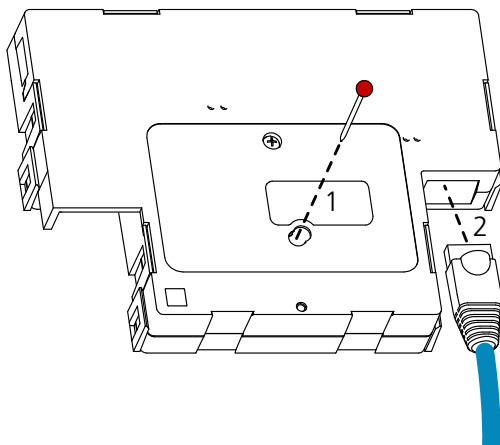


11) Attach the base of the pole to the mounting plate so that the lip is on the top of the base, and the holes for the screws are on the bottom of the base. Hang the base on the mounting plate, attach the wires from the bottom of the pole to the wires in the gang box, then screw the other side of the base onto the mounting plate using the two black screws you set aside before.

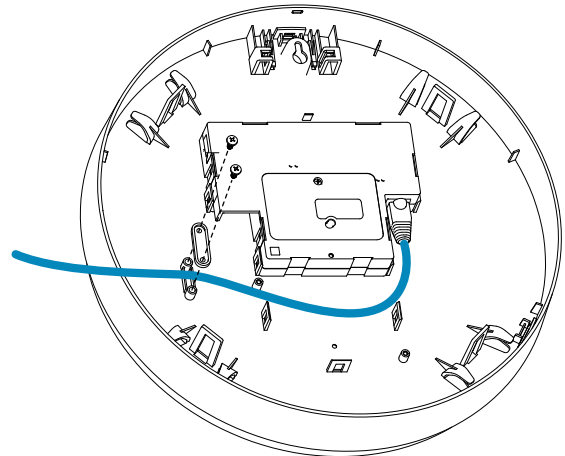


Flag Mount Installation - Round SlimLine/Aluminum Clock

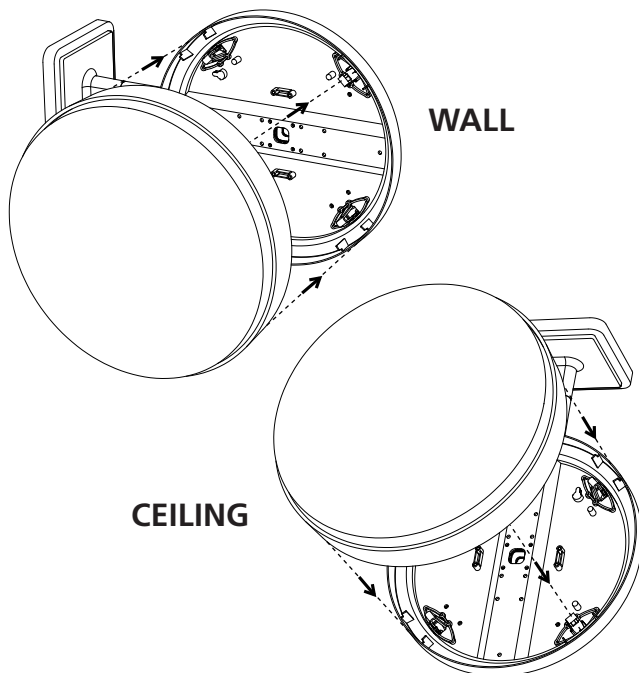
12) **Remove the gearbox pin**, then attach the patch cable to the port on the right side of the movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.



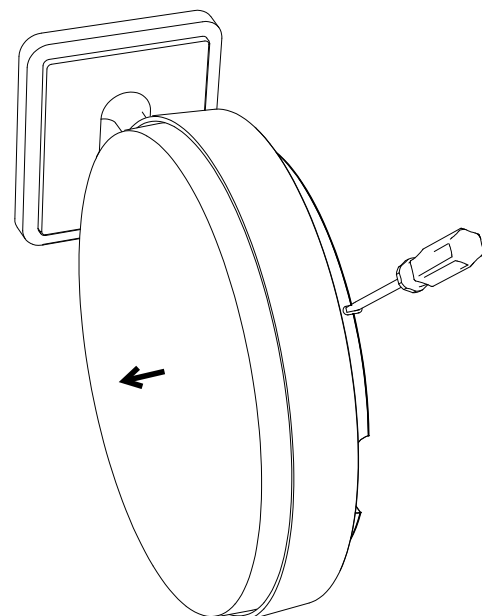
13) Lay any excess wiring across the strain relief base, then attach the strain relief to the clock with the two #6-19x7/16 screws. The strain relief should be tight enough to prevent the wire from sliding.



14) Slide the clock onto the adapter in the rotation that you wish it to be viewed. You should hear a snapping noise as the four clips on the adapter secure the clock in place.

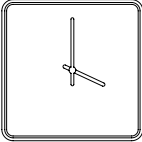
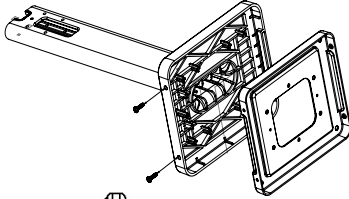
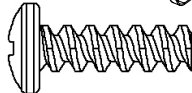
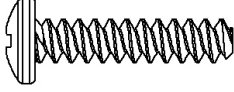

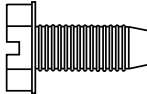
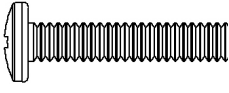
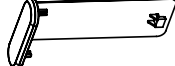


15) If you feel the need to detach the clock from the housing after the installation has been completed, use a flat-blade screwdriver on the four slots around the outside of the housing. You may hear a snapping noise as the internal latches disengage.



Flag Mount Installation - Square Clock

Included in Package

Description	Quantity	Picture
Square analog clock	1	
Included in Pole Kit (SAB-1BD-00S-0 or SAB-1BD-01S-0)		
Dual-mount pole, including mounting plate.	1	
#8-32x7/16 screw	8 (4 used)	
M3.5-1.0x10 screw (black)	4 (not used)	
Internal-tooth washer	8 (4 used)	
#10-32x3/8 green screw	1	
#6-32x1 screw	4	
Flag Mount Endcap	1	

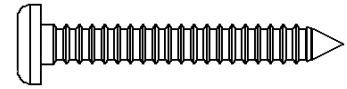
Continued on next page

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

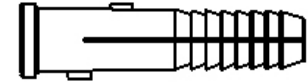
Flag Mount Installation - Square Clock

Included in Wiring Kit (A-WK-MTG-1)

#8x1.5 Self-tapping screw 2 (not used)



Wall anchor 2 (not used)



Included in Gang Box Kit (A-GB-MK-1)

#6-32x1 screw 2



#6-19x3/8 screw 1 (not used)



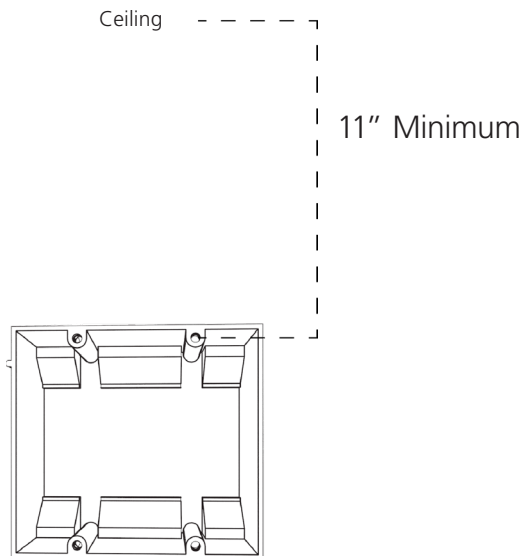
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small slot-head screwdriver, a drill with a 1/4 inch drill bit, a pencil, a double gang box, four wall anchors (must support 50 lbs, #8 screw size, 1.5”(3.8cm) screw length), four #8 screws for the wall anchors, four #6-32x1 screws for attaching the mounting plate to the gang box, any equipment needed to install the gang box, at least one CAT5 or CAT6 patch cable, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Complete the section “Preparing to Install” before mounting the clock on the wall.

Flag Mount Installation - Square Clock

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall. The box should be installed level and plumb with the wall and ceiling.

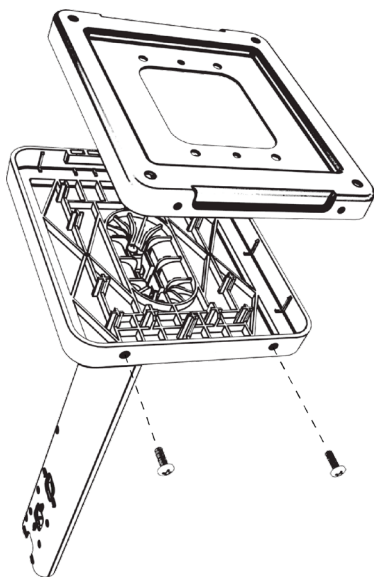


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

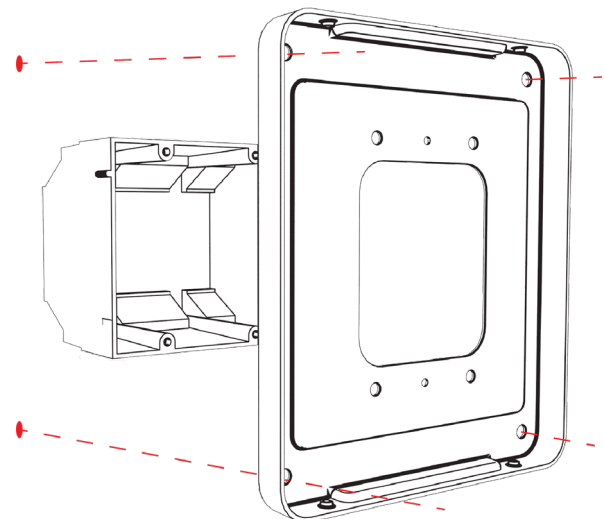
KNOW YOUR NETWORK

Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

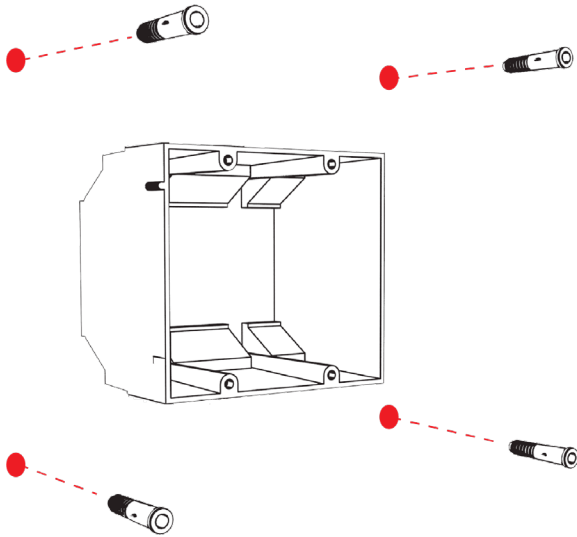


4) Attach the mounting plate to the gang box using only two of the four long, silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

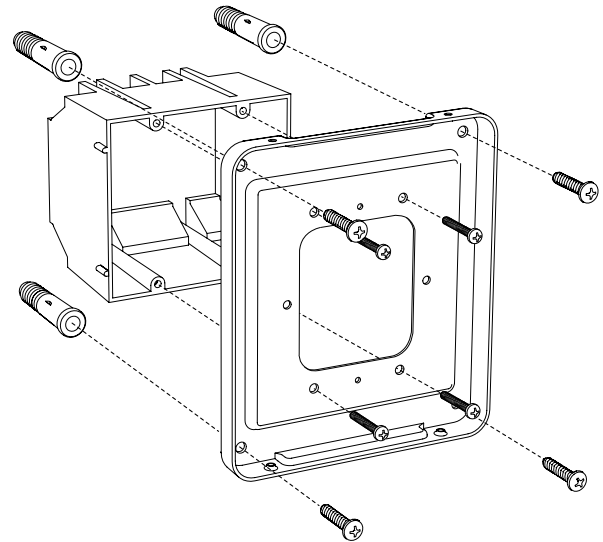


Flag Mount Installation - Square Clock

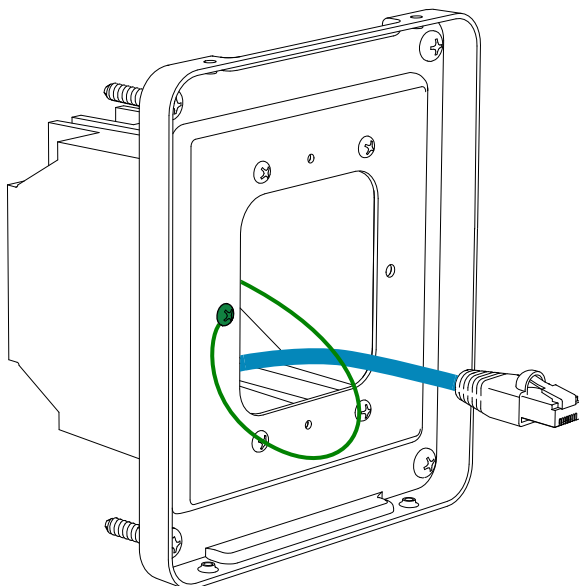
5) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



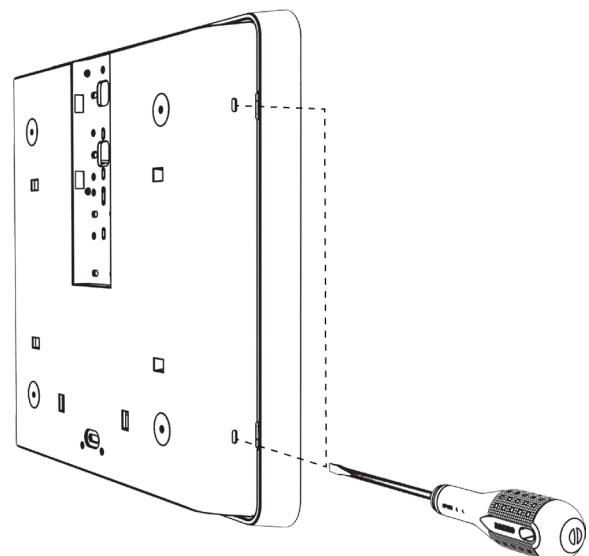
6) Reattach the mounting plate, this time using all four long, silver #6-32x1 screws, then insert the four #8 screws through the mounting plate and into the anchors.



7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.

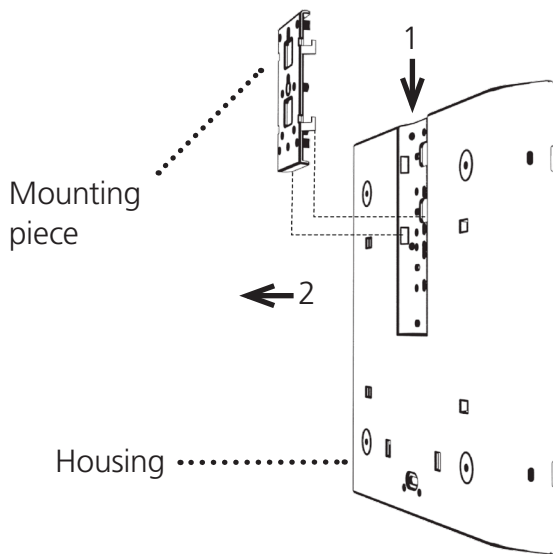


8) Detach the housing from the back of each clock. Do this by inserting a flat-blade screwdriver about 1/8 inch into each of the slot holes until the piece detaches. You may hear a snapping noise as the latches disengage.

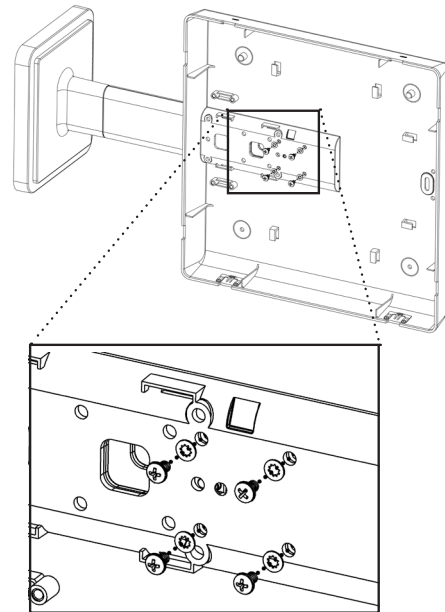


Flag Mount Installation - Square Clock

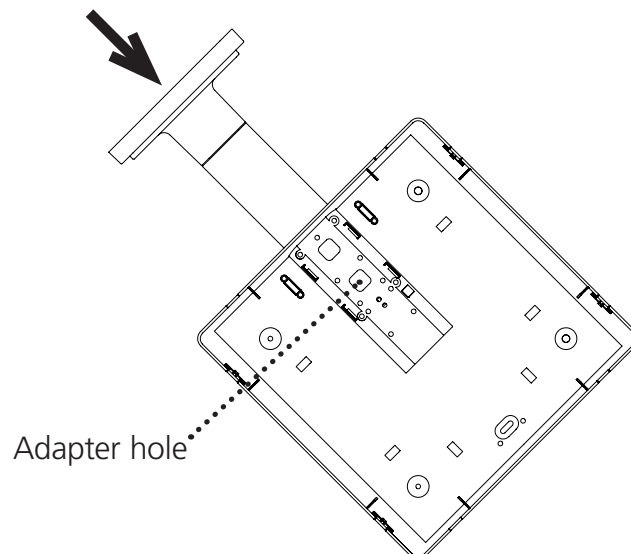
9) Release the mounting piece from the back of the housing by sliding it towards the center of the housing, then pulling it back and away from the housing. You will not need the mounting pieces later; either store them or throw them away at your discretion. **DO NOT THROW AWAY THE HOUSINGS.**



10) Attach the clock housing to the pole using four black #8-32x7/16 screws and four internal-tooth washers.

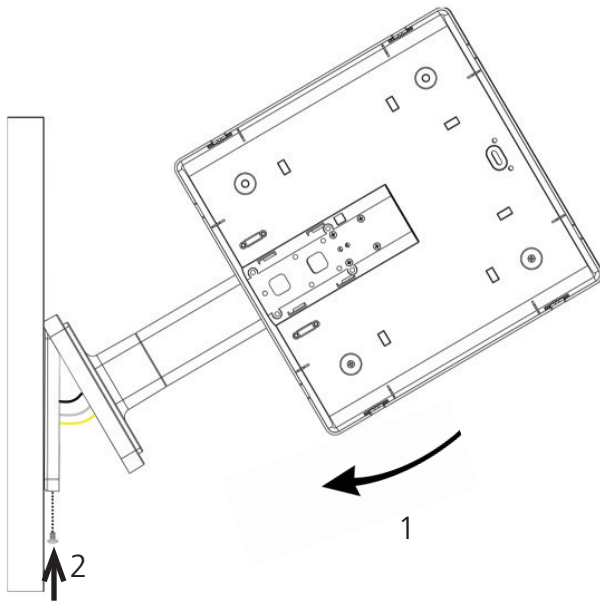


11) Thread at least fifteen inches (38.1cm) of wiring from the gang box through the bottom of the pole until the cable exits through the hole in the adapter.

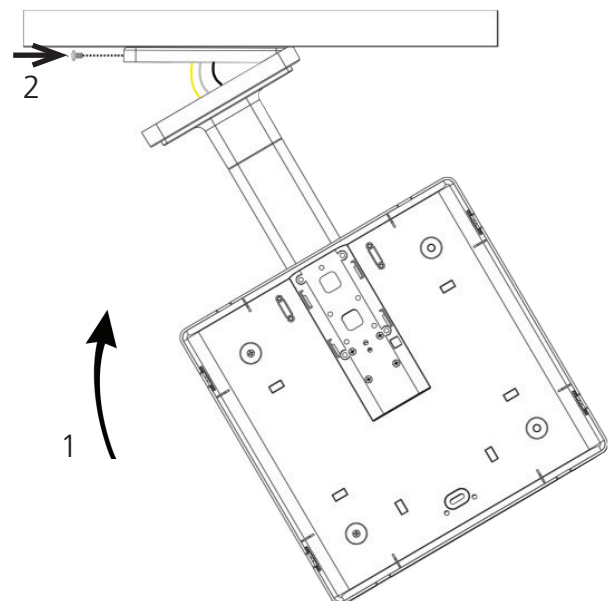


Flag Mount Installation - Square Clock

12) Attach the base of the pole to the mounting plate, so that the lip is on the top of the base, and the holes for the screws are on the bottom of the base. Hang the base on the mounting plate, attach the wires from the bottom of the pole to the wires in the gang box, then screw the other side of the base onto the mounting plate using the two black screws you set aside before.

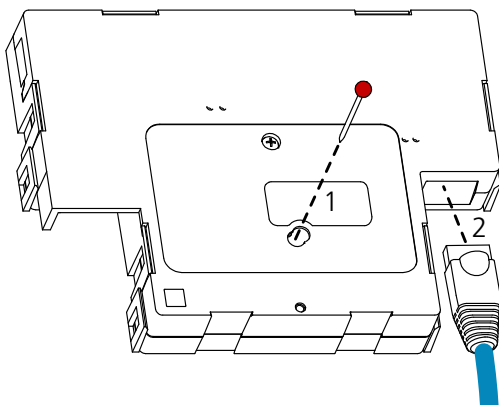


WALL

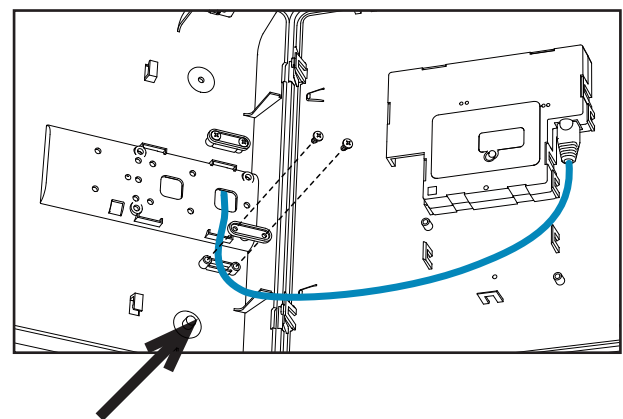


CEILING

13) **Remove the gearbox pin**, then attach the patch cable to the port on the right side of the movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.

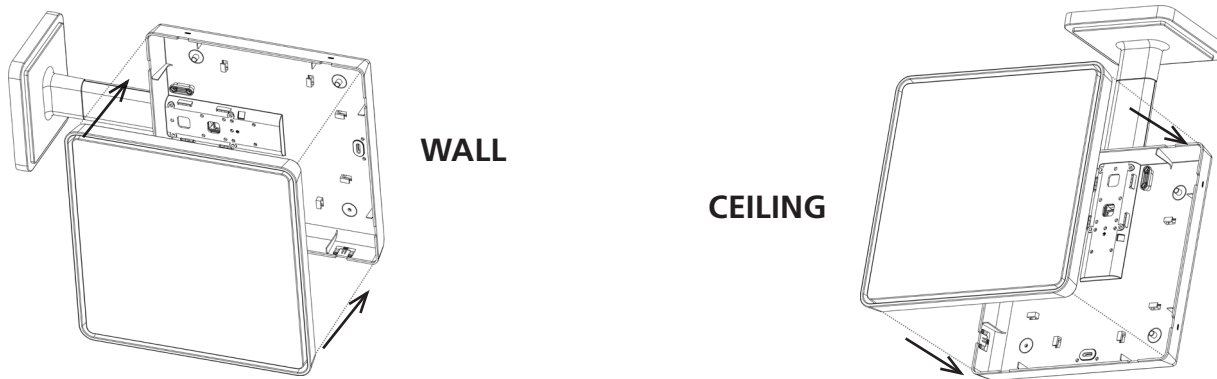


14) Loosen the strain relief by unscrewing the two screws. Slip any excess wiring through them, then tighten the strain relief by reinserting and tightening the screws.

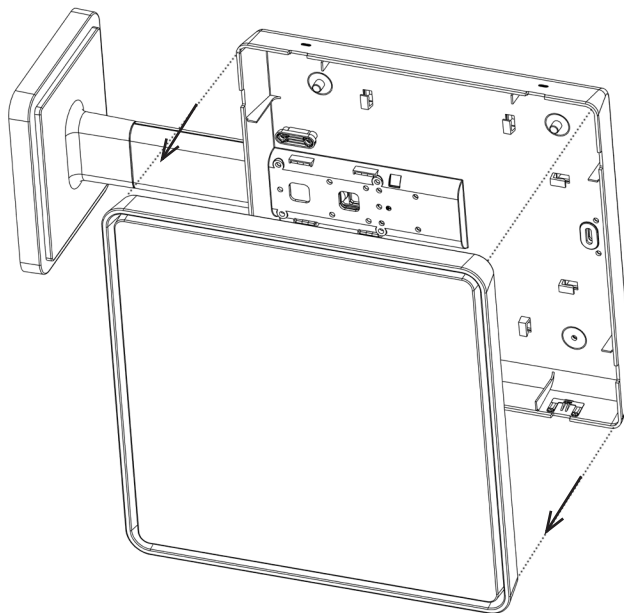


Flag Mount Installation - Square Clock

15) Rotate the clock so that it is right-side up. Slide the clock back into its housing. You should hear a snapping noise as the latches reengage.

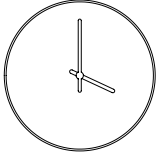



16) If you feel the need to detach the clock from the housing after the installation has been completed, use a flat-blade screwdriver on the four slots around the outside of the housing. You may hear a snapping noise as the internal latches disengage.

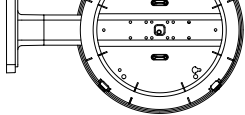
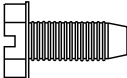


Double Mount Installation - Round Metal Clock



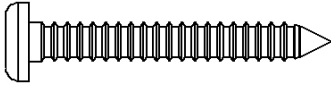
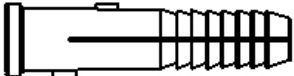
Included in Package

Description	Quantity	Picture
SAP round analog clock	2	
Mounting Bracket	2 (not used)	

Included in Double Mount Kit (SAB-4BD-12R-0M or SAB-4BD-16R-0M)

Dual-mount pole, including mounting plate and adapters	1	
#10-32x3/8 green screw	1	

Included in Wiring Kit (A-MK-QS-1E)

#6-32x1/2 screw	4 (not used)	
M4-0.5x10	4 (not used)	
#10x1.5 Self-tapping screw	2 (not used)	
Wall anchor	2 (not used)	

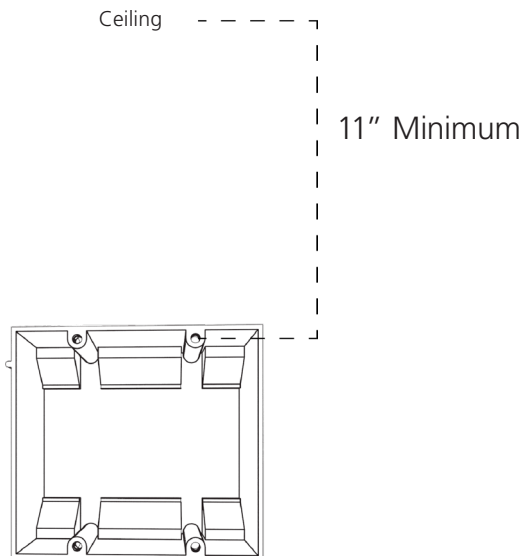
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small slot-head screwdriver, a drill with a 1/4 inch drill bit, a pencil, a double gang box, four wall anchors (must support 50 lbs, #8 screw size, 1.5" (3.8cm) screw length), four #8 screws for the wall anchors, four #6-32x1 screws for attaching the mounting plate to the gang box, any equipment needed to install the gang box, at least two CAT5 or CAT6 patch cables, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Complete the section "Preparing to Install" before mounting the clock on the wall.

Double Mount Installation - Round Metal Clock

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall.

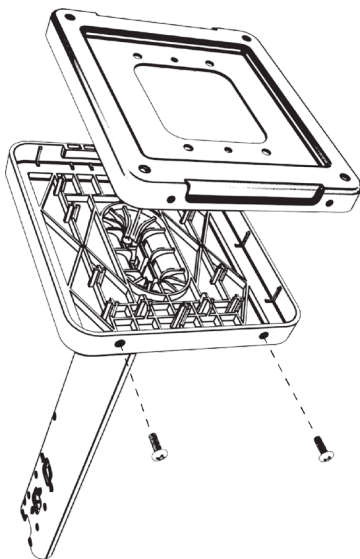


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

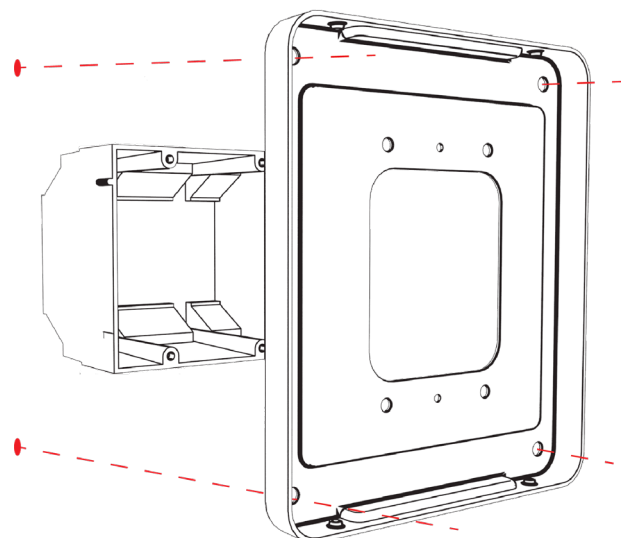
KNOW YOUR NETWORK

Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

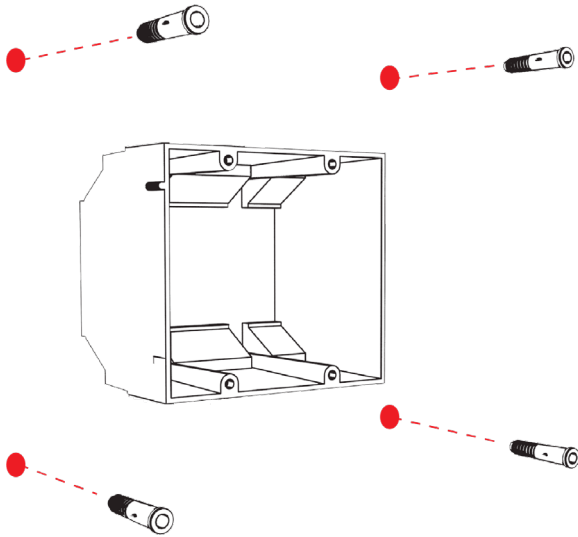


4) Attach the mounting plate to the gang box using only two of the four long silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

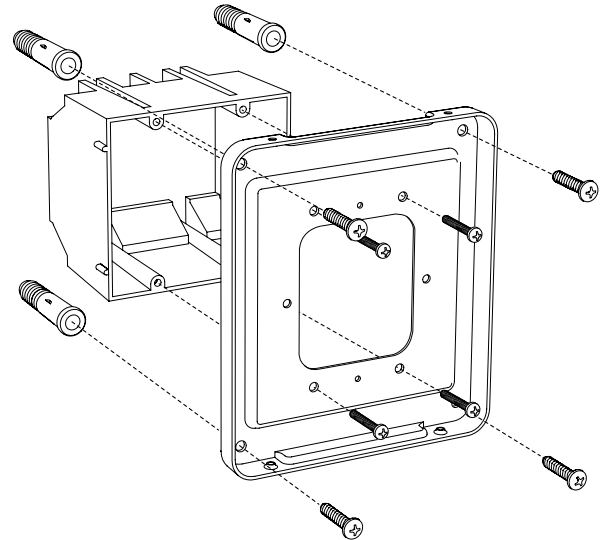


Double Mount Installation - Round Metal Clock

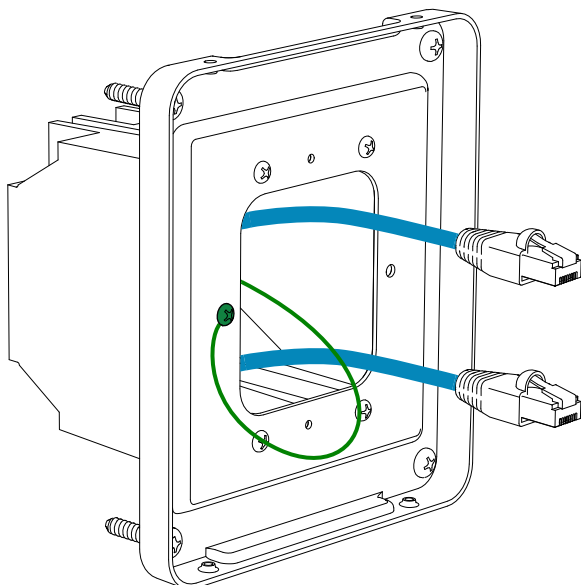
5) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



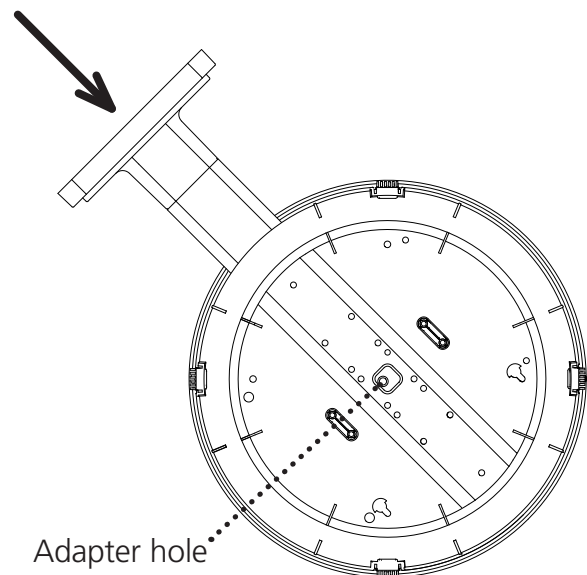
6) Reattach the mounting plate, this time using four long, silver #8 screws, then insert the four #6-32x1 screws through the mounting plate and into the anchors.



7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.



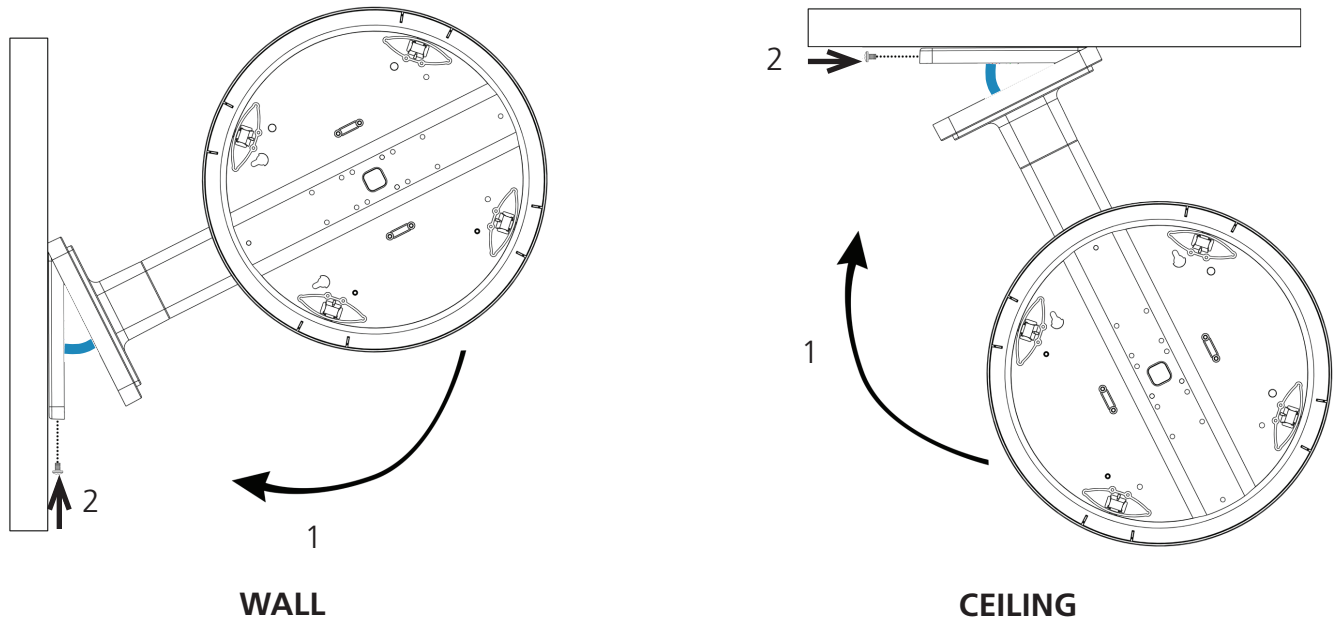
8) Thread at least fifteen inches (38.1cm) of wiring from the gang box through the bottom of the pole until each wire exits through the hole in the adapter.



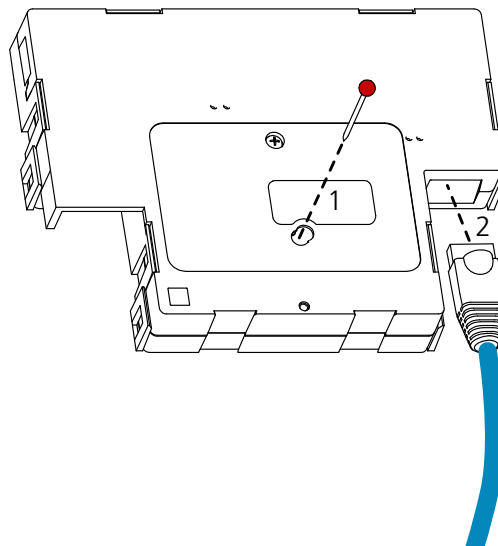
If you are using a metal adapter and are planning on mounting the housing from the ceiling, use pliers to remove the cage nuts and reinstall them in the other two open holes on the housing.

Double Mount Installation - Round Metal Clock

9) Attach the base of the pole to the mounting plate so that the lip is on the top of the base, and the holes for the screws are on the bottom of the base. Hang the base on the mounting plate, attach the wires from the bottom of the pole to the wires in the gang box, then screw the other side of the base onto the mounting plate using the two black screws you set aside before.

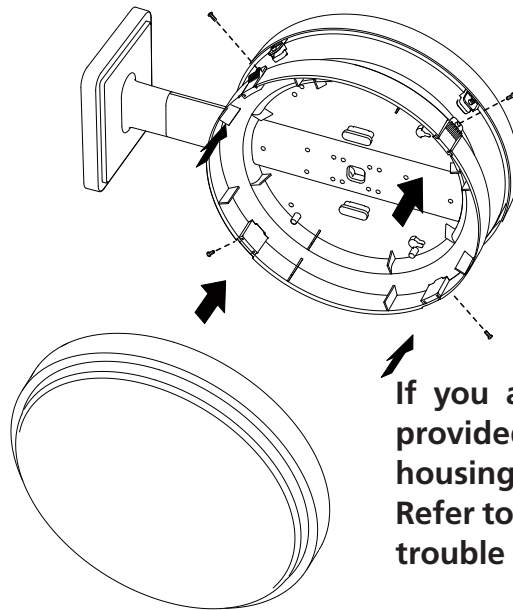


10) **Remove the gearbox pin**, then attach a patch cable to the port on the right side of each movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.



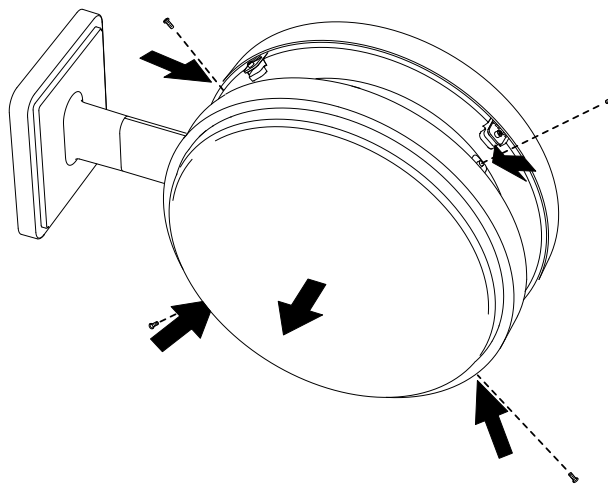
Double Mount Installation - Round Metal Clock

11) Remove the outer adapter screws, then slide each clock onto the adapter in the rotation that you wish it to be viewed. You should hear a snapping noise as the four clips on the adapter secure the clock in place. Insert the screws again to complete the installation.



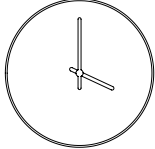
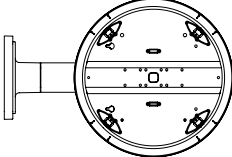
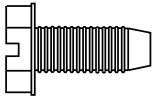
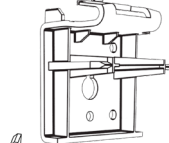
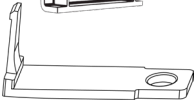


If you are using a metal adapter, install the provided screws through the holes in the clock housing and into the cage nuts on the adapter. Refer to the wall mount instructions if you have trouble locating the holes.

12) If you feel the need to detach the clock from the housing after the installation has been completed, remove the outer adapter screws, press down on the latches, and gently pull on the rim of the clock until the clock detaches.



Double Mount Installation - Round SlimLine/Aluminum Clock

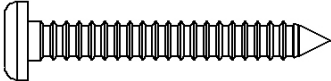
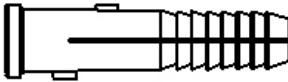
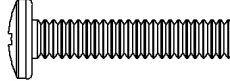

Included in Package

Description	Quantity	Picture
SAP round SlimLine analog clock	2	
Included in Double Mount Kit (SAH-4BD-12R-0 or SAH-4BD-16R-0) (SAH-1BD-12R-0 or SAH-1BD-16R-0)		
Dual-mount pole, including mounting plate.	1	
#10-32x3/8 green screw	1	
Included in Mounting Kits (A-SLM-MK-S-1) or (A-SLM-MK-AW)		
Mounting Piece	2 (not used)	
Release lever	0 or 2 (not used)	
#6-19x7/16 screw	4	
Strain relief	2	

Continued on next page

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Double Mount Installation - Round SlimLine/Aluminum Clock

Description	Quantity	Picture
Included in Wiring Kit (A-WK-MTG-1)		
#8x1.5 Self-tapping screw	4 (not used)	
Wall anchor	4 (not used)	
Included in Gang Box Kit (A-GB-MK-1)		
#6-32x1 screw	4	
#6-19x3/8 screw	2 (not used)	

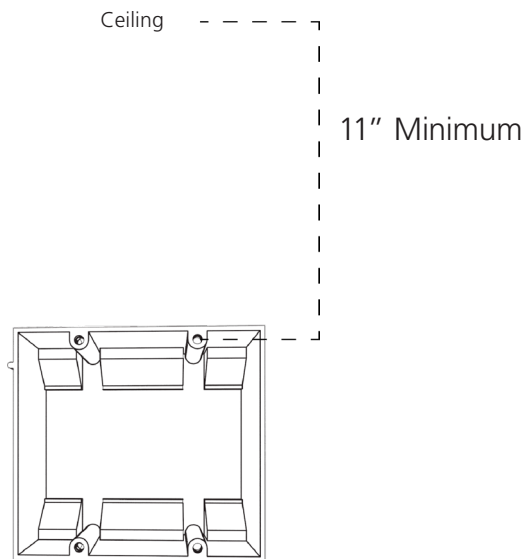
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small slot-head screwdriver, a drill with a 1/4 inch drill bit, a pencil, a double gang box, four wall anchors (must support 50 lbs, #8 screw size, 1.5”(3.8cm) screw length), four #8 screws for the wall anchors, any equipment needed to install the gang box, at least two CAT5 or CAT6 patch cables, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Complete the section “Preparing to Install” before mounting the clock on the wall.

Double Mount Installation - Round SlimLine/Aluminum Clock

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall. The box should be installed level and plumb with the wall and ceiling.

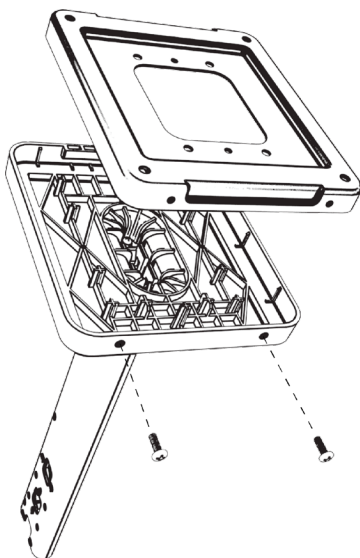


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

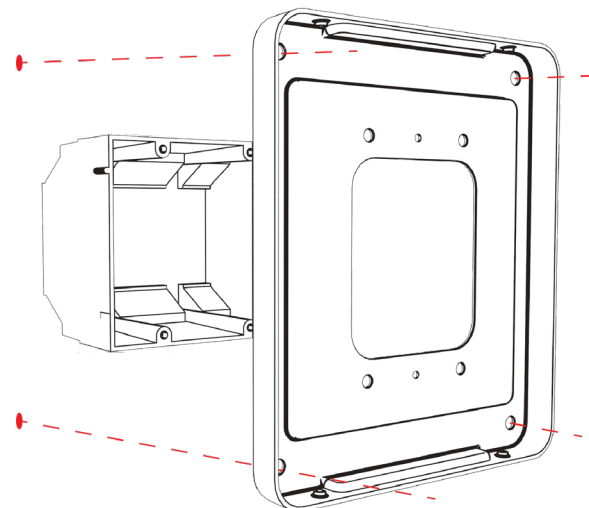
KNOW YOUR NETWORK

Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

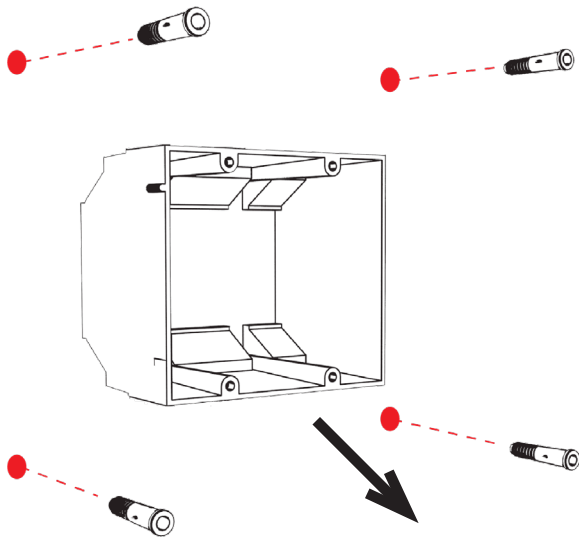


4) Attach the mounting plate to the gang box using only two of the four long, silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

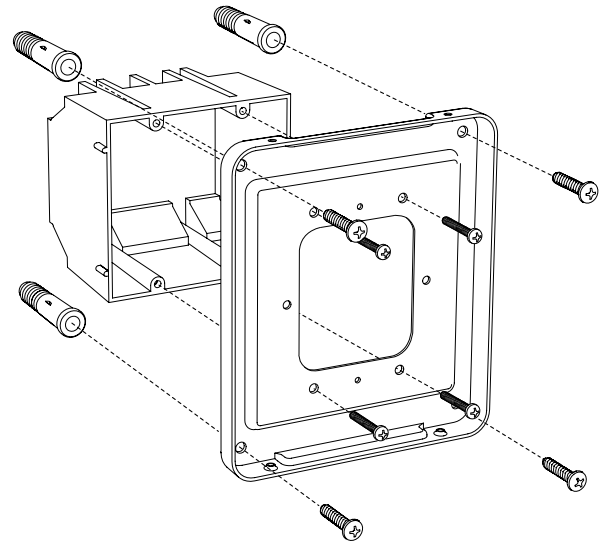


Double Mount Installation - Round SlimLine/Aluminum Clock

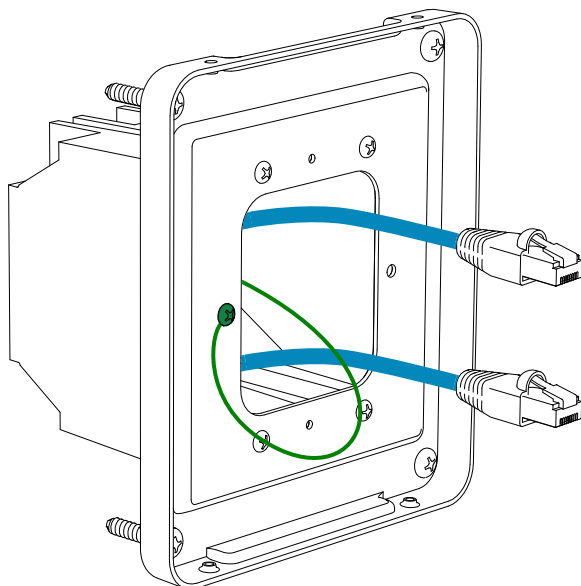
5) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



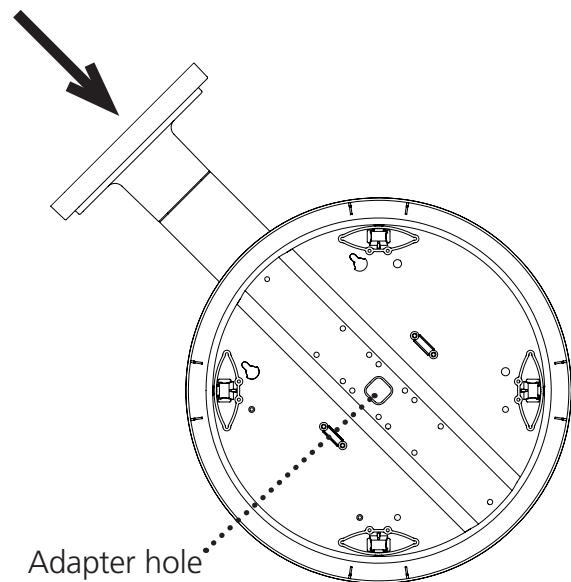
6) Reattach the mounting plate, this time using all four long, silver #6-32x1 screws, then insert the four #8 screws through the mounting plate and into the anchors.



7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.

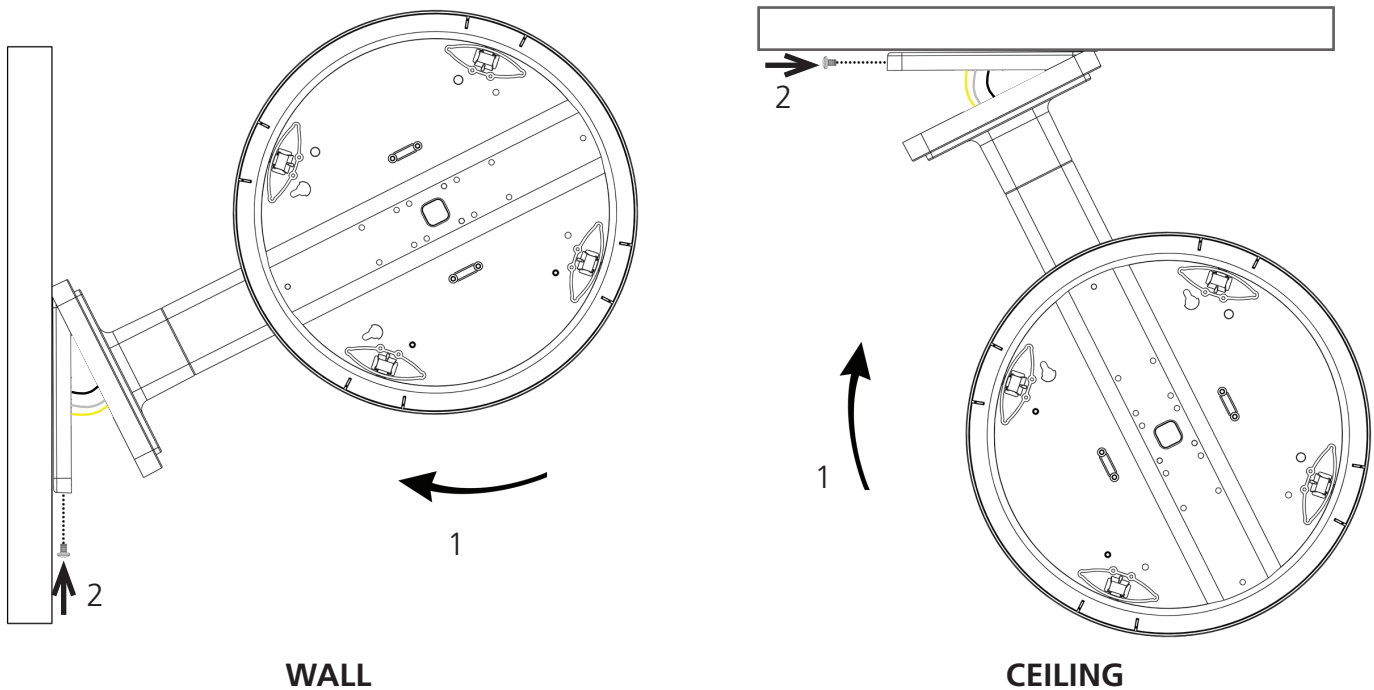


8) Thread at least fifteen inches (38.1cm) of wiring from the gang box through the bottom of the pole until each cable exits through the hole in the adapter.

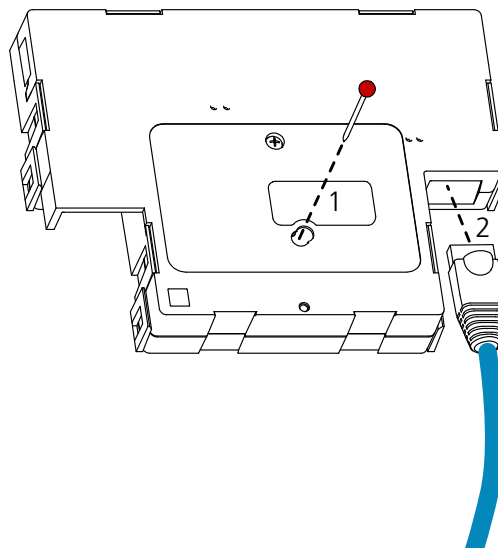


Double Mount Installation - Round SlimLine/Aluminum Clock

9) Attach the base of the pole to the mounting plate so that the lip is on the top of the base, and the holes for the screws are on the bottom of the base. Hang the base on the mounting plate, attach the wires from the bottom of the pole to the wires in the gang box, then screw the other side of the base onto the mounting plate using the two black screws you set aside before.

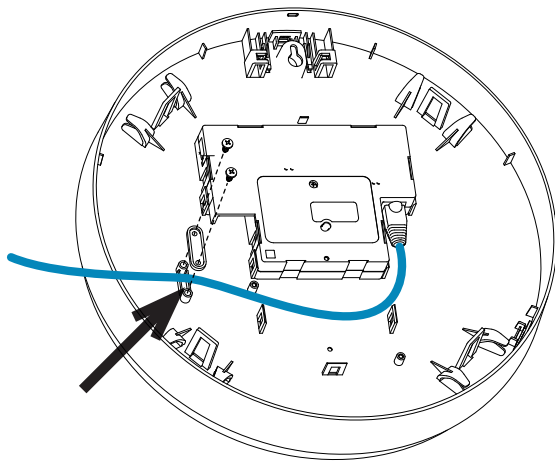


10) **Remove the gearbox pin**, then attach a patch cable to the port on the right side of each movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.

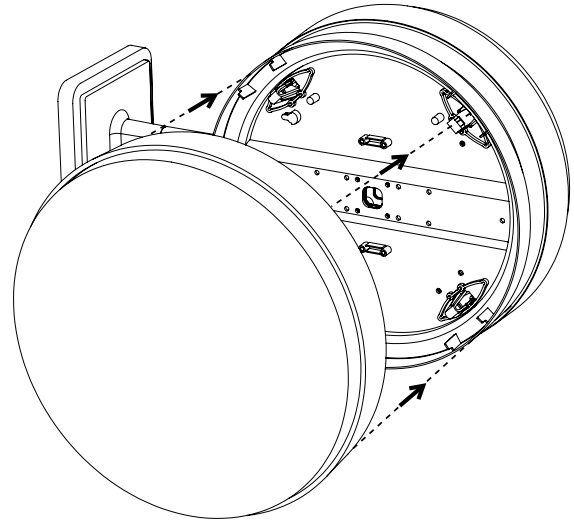


Double Mount Installation - Round SlimLine/Aluminum Clock

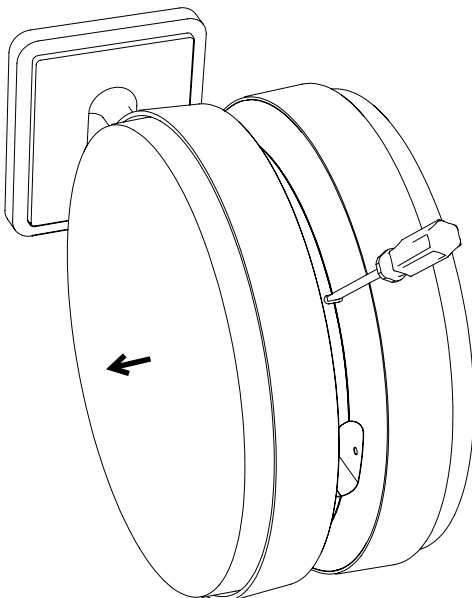
11) For each clock, lay any excess wiring across the strain relief base, then attach the strain relief to the clock with the two #6-19x7/16 screws. The strain relief should be tight enough to prevent the wire from sliding.



12) Slide each clock onto the adapter in the rotation that you wish it to be viewed. You should hear a snapping noise as the four clips on the adapter secure the clock in place.

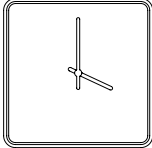
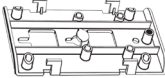
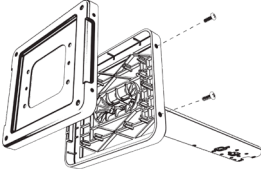
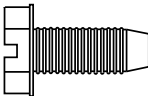
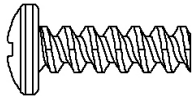
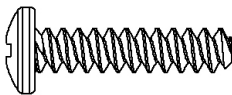



13) If you feel the need to detach the clock from the housing after the installation has been completed, use a flat-blade screwdriver on the four slots around the outside of the housing. You may hear a snapping noise as the internal latches disengage.



Double Mount Installation - Square Clock

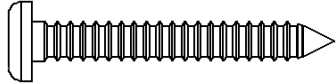
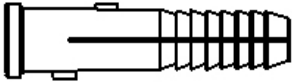
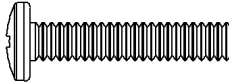

Included in Package

Description	Quantity	Picture
SAP square analog clock	2	
Mounting Piece-already attached to clock housing	2 (not used)	
Included in Pole Kit (SAB-4GD-00S-0 or SAB-1GD-00S-0)		
Dual-mount pole, including mounting plate.	1	
#10-32x3/8 green screw	1	
#8-32x7/16 screw	8	
M3.5-1.0x10 screw (black)	4	
Internal-tooth washer	8	

Continued on next page

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

Double Mount Installation - Square Clock

Description	Quantity	Picture
Included in Wiring Kit (A-WK-MTG-1)		
#8x1.5 Self-tapping screw	4 (not used)	
Wall anchor	4 (not used)	
Included in Gang Box Kit (A-GB-MK-1)		
#6-32x1 screw	4	
#6-19x3/8 screw	2 (not used)	

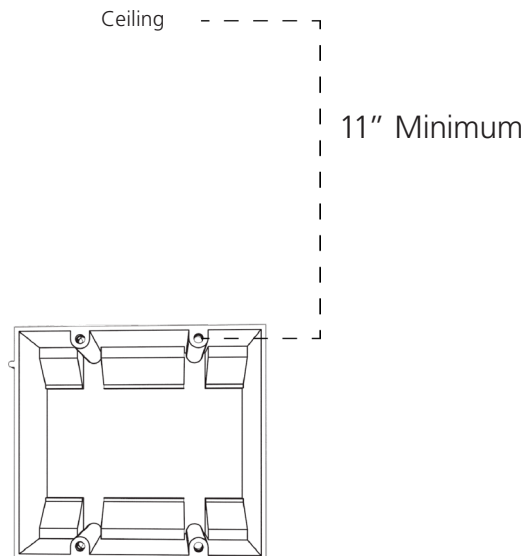
PLEASE NOTE: A user will also have to provide a Phillips-head screwdriver, a small slot-head screwdriver, a drill with a 1/4 inch drill bit, a pencil, a double gang box, four wall anchors (must support 50 lbs, #8 screw size, 1.5”(3.8cm) screw length), four #8 screws for the wall anchors, any equipment needed to install the gang box, at least two CAT5 or CAT6 patch cables, and any additional network cables or devices needed to provide Power over Ethernet, and a connection to an NTP server.

If any of the items listed in the kits are missing, you may contact your dealer and order a replacement kit.

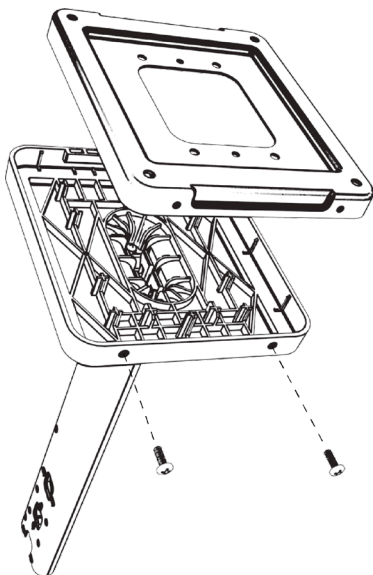
Complete the section “Preparing to Install” before mounting the clock on the wall.

Double Mount Installation - Square Clock

1) Install the double gang box in the wall or ceiling. If you are installing the gang box in the wall, leave at least eleven inches between the top of the gang box and the ceiling. If you are installing the gang box in the ceiling, leave at least eleven inches between the gang box and the wall. The box should be installed level and plumb with the wall and ceiling.



3) Detach the mounting plate from the mounting pole by unscrewing the two screws. Set the screws and pole aside for later.

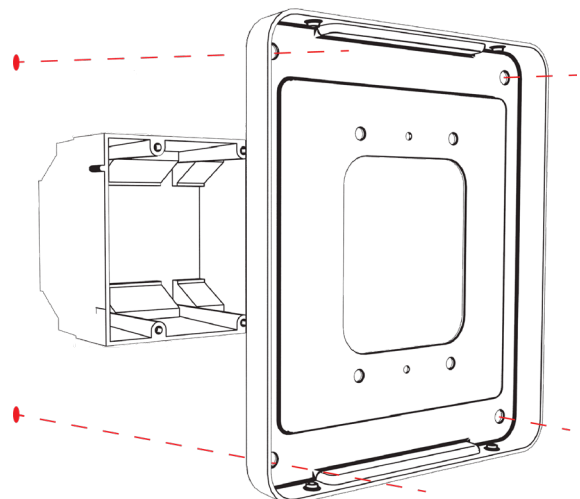


2) Run a CAT5 or CAT6 patch cable from a PoE switch or PoE injector to the gang box. Confirm that the switch or injector, as well as the master clock, are connected to your network router.

KNOW YOUR NETWORK

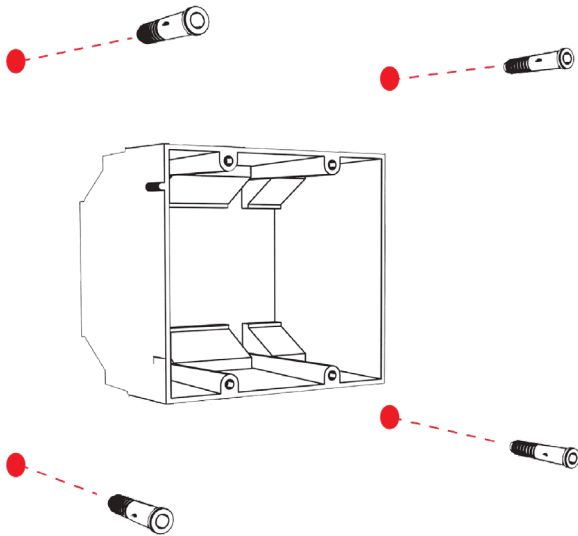
Make sure that your network firewall is set to allow communication between the clocks and NTP servers. This means that Ports 80, 123, and 1777 must be open.

4) Attach the mounting plate to the gang box using only two of the four long, silver #6-32x1 screws. With the mounting plate as a guide, use the pencil to trace the locations of the four larger holes at the outer corners.

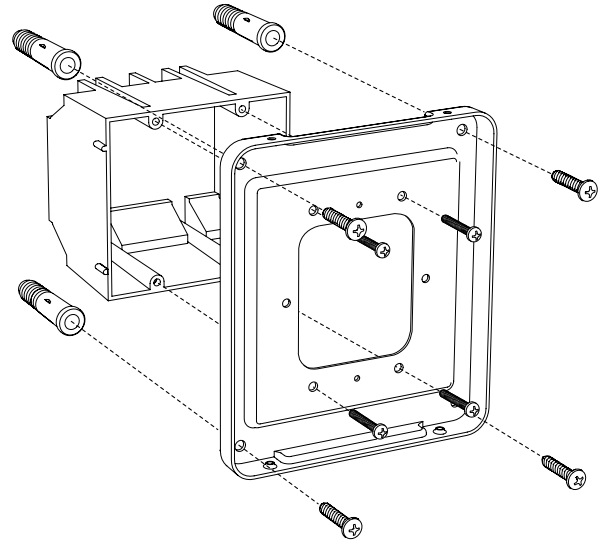


Double Mount Installation - Square Clock

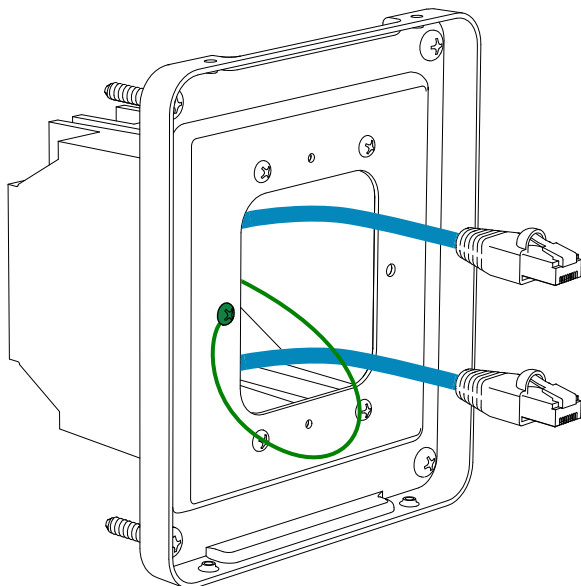
5) Remove the mounting plate and drill the four holes that were just traced. Insert the four wall anchors into the holes.



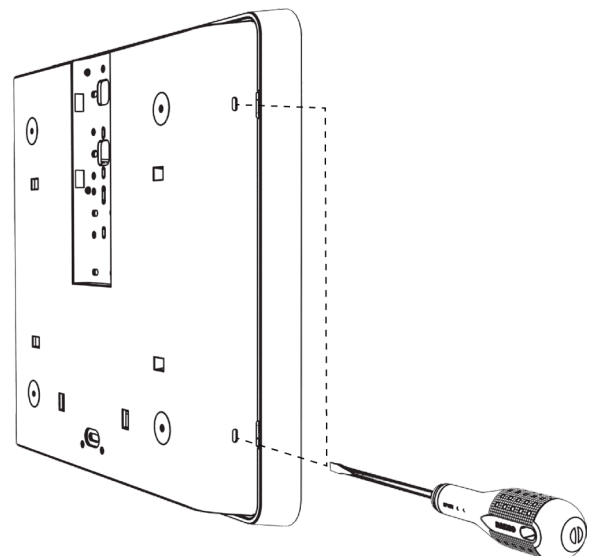
6) Reattach the mounting plate, this time using all four long, silver #6-32x1 screws, then insert the four #8 screws through the mounting plate and into the anchors.



7) Thread any wiring through the mounting plate, and attach a grounding wire to the mounting plate using one of the larger centered holes and the #10-32x3/8 screw.

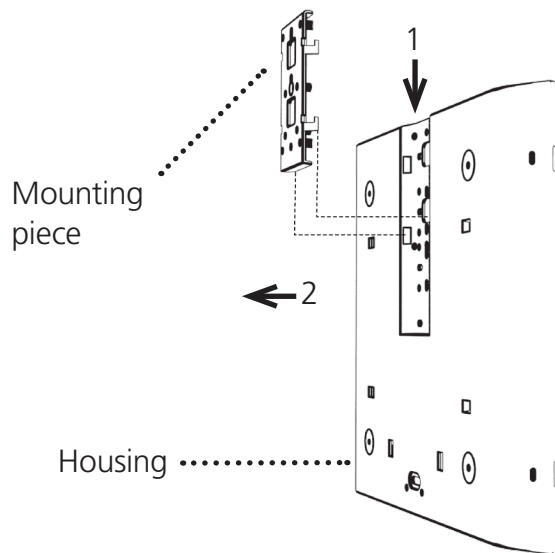


8) Detach the housing from the back of each clock. Do this by inserting a flat-blade screwdriver about 1/8 inch into each of the slot holes until the piece detaches. You may hear a snapping noise as the latches disengage.

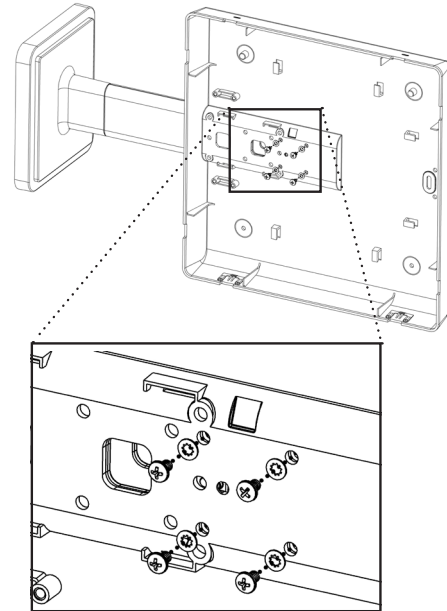


Double Mount Installation - Square Clock

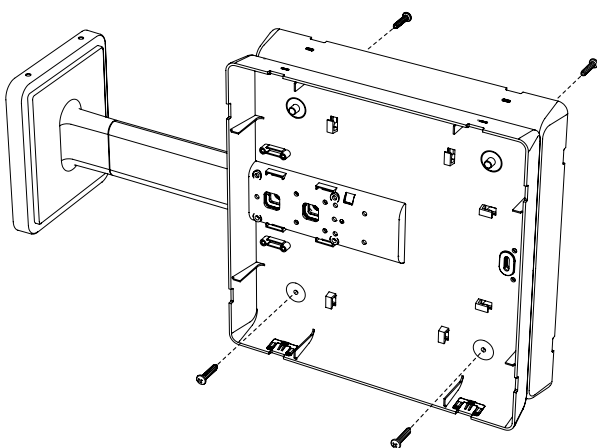
9) Release the mounting piece from the back of each housing by sliding it away from the center of the housing, then pulling it back and away from the housing. You will not need the mounting pieces later; either store them or throw them away at your discretion. **DO NOT THROW AWAY THE HOUSINGS.**



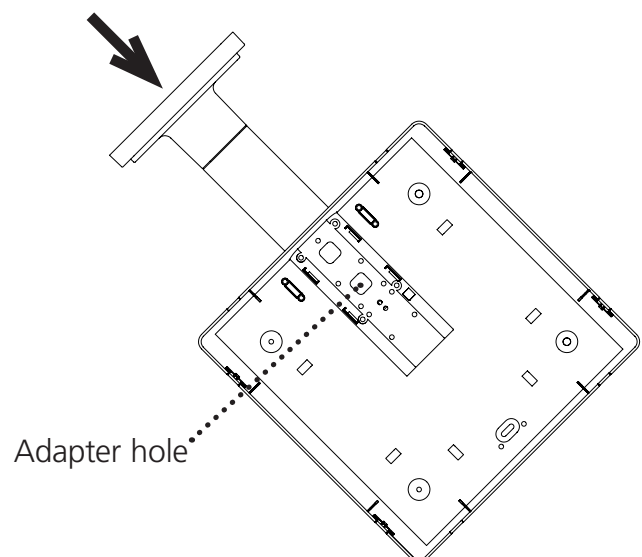
10) Attach both housings to the pole using four black 8-32x7/16 screws and four internal-tooth washers on each side.



11) Attach the housings to each other using the four black M3.5-1.0x10 screws, two on each housing.

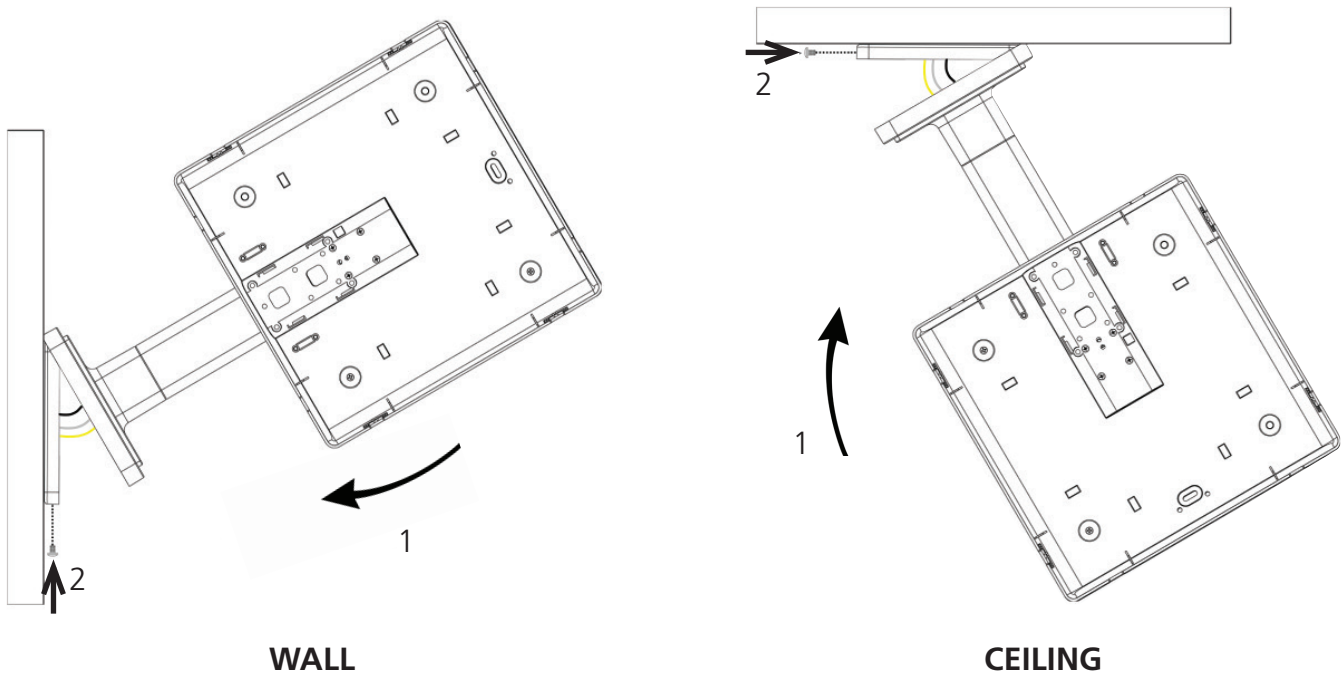


12) Thread at least fifteen inches (38.1cm) of wiring from the gang box through the bottom of the pole until each cable exits through the hole in the adapter.

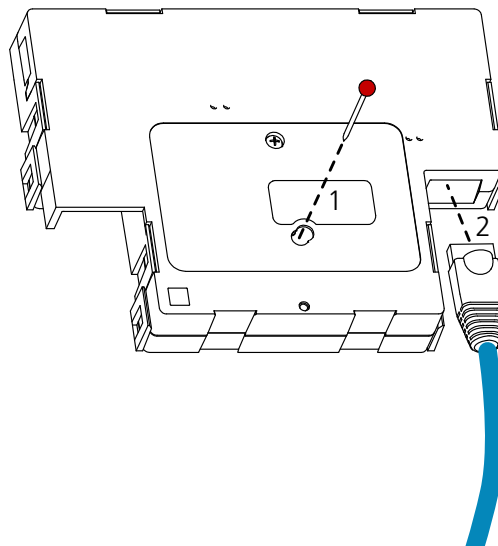


Double Mount Installation - Square Clock

13) Attach the base of the pole to the mounting plate, so that the lip is on the top of the base, and the holes for the screws are on the bottom of the base. Hang the base on the mounting plate, attach the wires from the bottom of the pole to the wires in the gang box, then screw the other side of the base onto the mounting plate using the two black screws you set aside before.

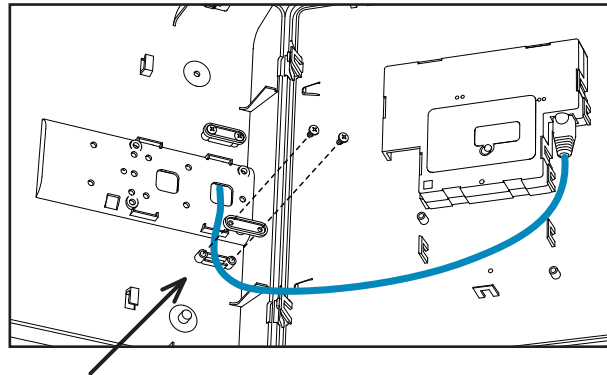


14) **Remove the gearbox pin**, then attach a patch cable to the port on the right side of each movement. If the clock is able to access the Internet, it will begin to correct itself. Make a note of the clock's Serial Number, which should be on a white sticker above the port. Add this information to your tracking chart.



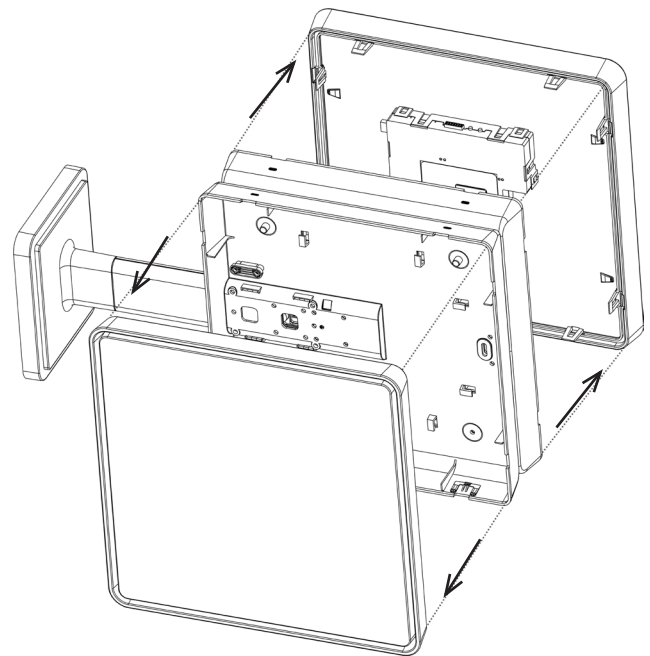
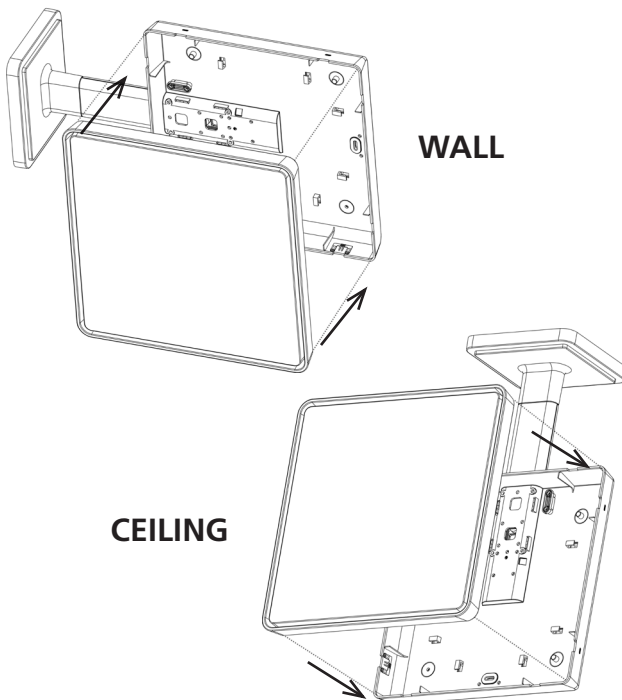
Double Mount Installation - Square Clock

15) For each clock, loosen the strain relief by unscrewing the two screws. Slip any excess wiring through them, then tighten the strain relief by reinserting and tightening the screws.



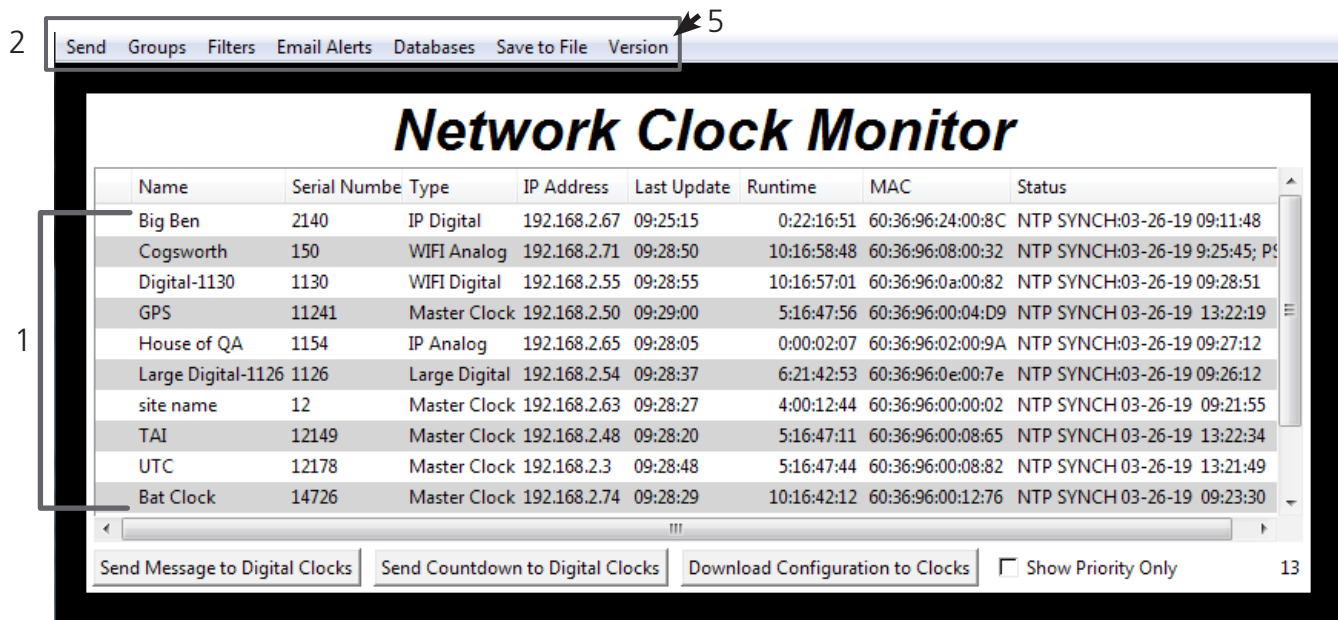
16) Slide both clocks back into their housings. You should hear a snapping noise as the latches reengage.

17) If you feel the need to detach the clock from the housing after the installation has been completed, use a flat-blade screwdriver on the four slots around the outside of the housing. You may hear a snapping noise as the internal latches disengage.



Network Monitor Software - Main Screen

YOUR COPY OF THE NETWORK MONITOR MAY HAVE ADDITIONAL COLORS OR BRANDING.
THE MONITOR SHOWN IN THIS MANUAL CONTAINS NO BRANDING OR COLORS.
ALL FEATURES REMAIN THE SAME.



1. **Device List** - Displays all of the relevant time system IP devices that are active on the system subnet. The monitor screen displays the name of the clock, serial number, type of clock, IP address, last updated time, how long the clock has been running, and the status of the clock. Double clicking on a device in the device list will open the web interface for that device.

Using a right-handed mouse to right-click on any row in the Device List will open the **Quick Access Menu**. See the section in this manual labeled "Network Monitor Software - Quick Access Menu" for more information.

2. **Task Bar** - See the section in this manual labeled "Network Monitor Software - Task Bar Options"

3. **Show Priority** - By selecting this option, the IP device(s) that the user previously "marked as priority" will be the only clocks shown in the program window.

4. **Device Count** - This number is the amount of IP devices that are displayed on the Network Monitor Software.

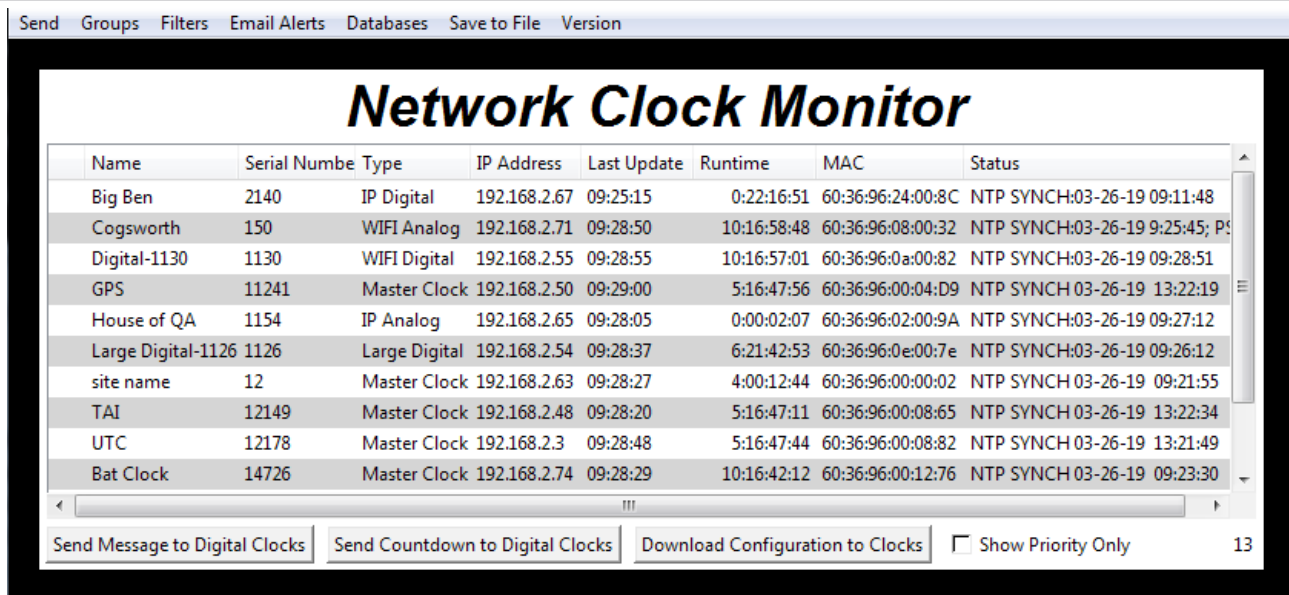
The Network Monitor has two subtypes:

CFA - Intended for use with Wi-Fi Clocks, Master Clocks, Network Repeaters, Wi-Fi Large Digital Clocks, and Network Repeaters.

CFL - Intended for use with IP-PoE Digital, Wired IP Large Digital, and IP-PoE Analog Clocks.

You can check the type by clicking on "Version" (5) at the top of the Monitor window.

Network Monitor Software - Main Screen

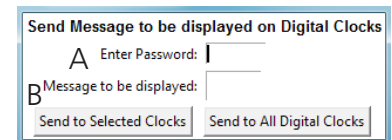


1

2

1. Send Message to Digital Clocks - Allows the user to generate a message that will be sent to digital clocks.

- Enter Password** - The default password is 6063
- Message to be displayed** - Lets the user enter a message to be displayed on digital clocks. Messages may consist of the digits 0-9 and the English letters A-Z. The message is generated in a font that matches its appearance on the clock, so you can preview the appearance of each message before sending it. The message will repeat ten times once sent.
- Send to Selected Clocks** - Applies the message to whichever clocks have been highlighted on the Device List.
- Send to All Digital Clocks** - Applies the message to all IP-PoE Digital, Wi-Fi Digital, and Large Digital Clocks.

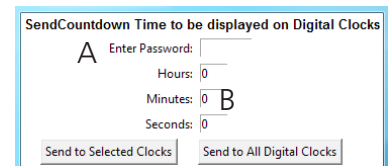


C

D

2. Send Countdown to Digital Clocks - Allows the user to generate a countdown that will be sent to digital clocks.

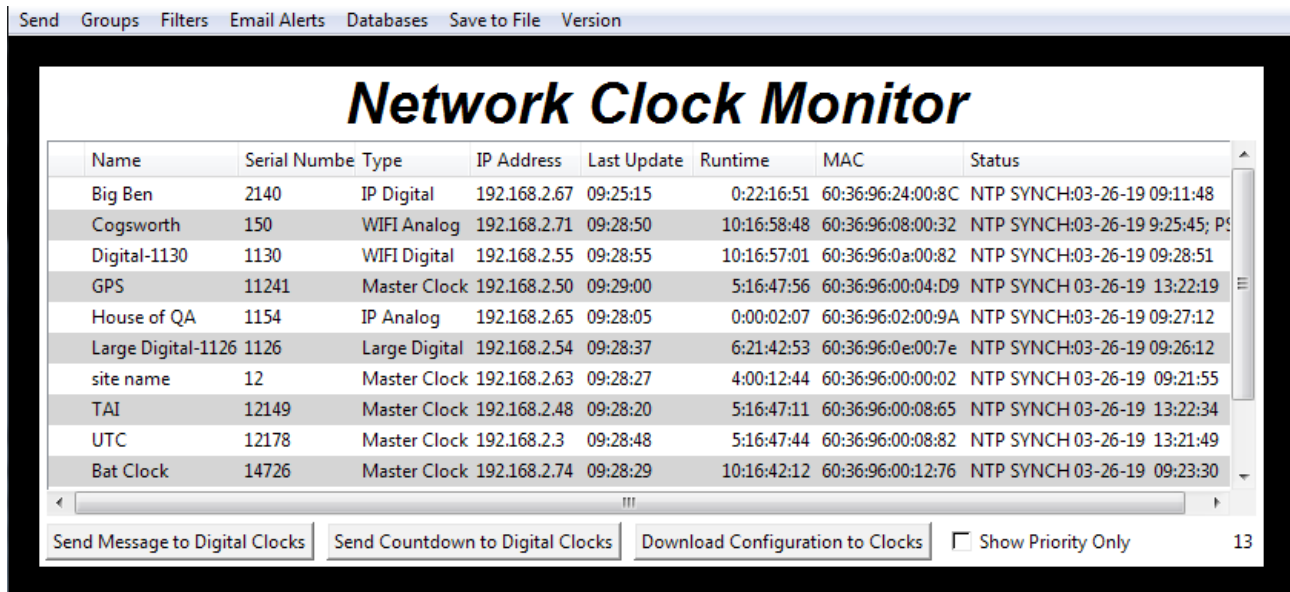
- Enter Password** - The default password is 6063
- Start values** - Enter the starting hour, minute, and second into the fields. For example, entering a 1 into each field will start a countdown from 1:01:01
- Send to Selected Clocks** - Applies the countdown to whichever clocks have been highlighted on the Device List.
- Send to All Digital Clocks** - Applies the countdown to all IP-PoE Digital, Wi-Fi Digital, and Large Digital Clocks.



C

D

Network Monitor Software - Main Screen (ctd.)



Name	Serial Number	Type	IP Address	Last Update	Runtime	MAC	Status
Big Ben	2140	IP Digital	192.168.2.67	09:25:15	0:22:16:51	60:36:96:24:00:8C	NTP SYNCH:03-26-19 09:11:48
Cogsworth	150	WIFI Analog	192.168.2.71	09:28:50	10:16:58:48	60:36:96:08:00:32	NTP SYNCH:03-26-19 9:25:45; P
Digital-1130	1130	WIFI Digital	192.168.2.55	09:28:55	10:16:57:01	60:36:96:0a:00:82	NTP SYNCH:03-26-19 09:28:51
GPS	11241	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH 03-26-19 13:22:19
House of QA	1154	IP Analog	192.168.2.65	09:28:05	0:00:02:07	60:36:96:02:00:9A	NTP SYNCH:03-26-19 09:27:12
Large Digital-1126	1126	Large Digital	192.168.2.54	09:28:37	6:21:42:53	60:36:96:0e:00:7e	NTP SYNCH:03-26-19 09:26:12
site name	12	Master Clock	192.168.2.63	09:28:27	4:00:12:44	60:36:96:00:00:02	NTP SYNCH 03-26-19 09:21:55
TAI	12149	Master Clock	192.168.2.48	09:28:20	5:16:47:11	60:36:96:00:08:65	NTP SYNCH 03-26-19 13:21:34
UTC	12178	Master Clock	192.168.2.3	09:28:48	5:16:47:44	60:36:96:00:08:82	NTP SYNCH 03-26-19 13:21:49
Bat Clock	14726	Master Clock	192.168.2.74	09:28:29	10:16:42:12	60:36:96:00:12:76	NTP SYNCH 03-26-19 09:23:30

1

1. **Download Configuration to Clocks** - If a configuration file was created using "Upload and Save Configuration" on the Quick Access Menu, this option lets the user apply the configuration file to other clocks highlighted within the monitor. For more information, see the section of this manual labeled "Network Monitor Software - Quick Access Menu."

Pressing this button will cause the Download Configuration window to appear:

- a. **Enter Password** - The default password is 6063
- b. **Select Configuration** - Pressing the button allows the user to browse their computer for a previously-saved configuration file.
- c. **Send to Selected Clocks** - Applies the configuration file to whichever clocks have been highlighted on the Device List.
- d. **Send to All Valid Clocks** - Applies the configuration file to all applicable devices on the Device List. For instance, an Analog IP clock configuration file would be applied to every Analog IP clock on the Device List.

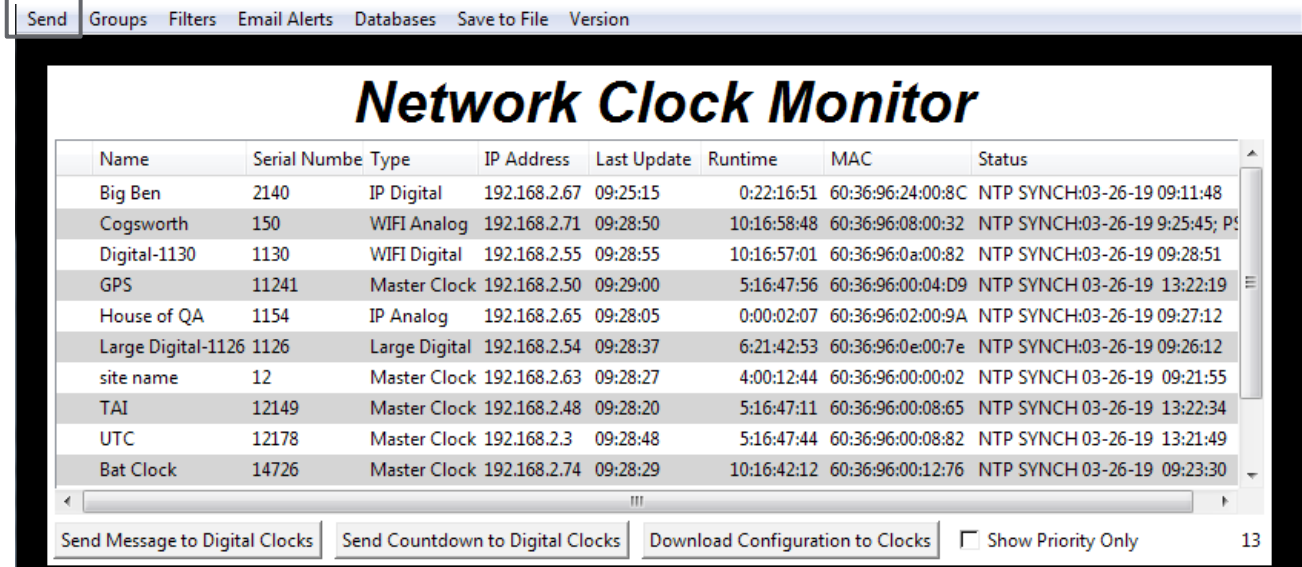


C

D

Network Monitor Software - Task Bar Options

1



The screenshot shows the 'Network Clock Monitor' interface. At the top, there is a menu bar with options: Send, Groups, Filters, Email Alerts, Databases, Save to File, and Version. The main area contains a table with the following data:

Name	Serial Number	Type	IP Address	Last Update	Runtime	MAC	Status
Big Ben	2140	IP Digital	192.168.2.67	09:25:15	0:22:16:51	60:36:96:24:00:8C	NTP SYNCH:03-26-19 09:11:48
Cogsworth	150	WIFI Analog	192.168.2.71	09:28:50	10:16:58:48	60:36:96:08:00:32	NTP SYNCH:03-26-19 9:25:45; P
Digital-1130	1130	WIFI Digital	192.168.2.55	09:28:55	10:16:57:01	60:36:96:0a:00:82	NTP SYNCH:03-26-19 09:28:51
GPS	11241	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH 03-26-19 13:22:19
House of QA	1154	IP Analog	192.168.2.65	09:28:05	0:00:02:07	60:36:96:02:00:9A	NTP SYNCH:03-26-19 09:27:12
Large Digital-1126	1126	Large Digital	192.168.2.54	09:28:37	6:21:42:53	60:36:96:0e:00:7e	NTP SYNCH:03-26-19 09:26:12
site name	12	Master Clock	192.168.2.63	09:28:27	4:00:12:44	60:36:96:00:00:02	NTP SYNCH 03-26-19 09:21:55
TAI	12149	Master Clock	192.168.2.48	09:28:20	5:16:47:11	60:36:96:00:08:65	NTP SYNCH 03-26-19 13:22:34
UTC	12178	Master Clock	192.168.2.3	09:28:48	5:16:47:44	60:36:96:00:08:82	NTP SYNCH 03-26-19 13:21:49
Bat Clock	14726	Master Clock	192.168.2.74	09:28:29	10:16:42:12	60:36:96:00:12:76	NTP SYNCH 03-26-19 09:23:30

At the bottom of the interface, there is a task bar with the following options: Send Message to Digital Clocks, Send Countdown to Digital Clocks, Download Configuration to Clocks, and Show Priority Only (with an unchecked checkbox). The page number 13 is visible in the bottom right corner.

1. **Send** - When clicked, this button will display the following options:

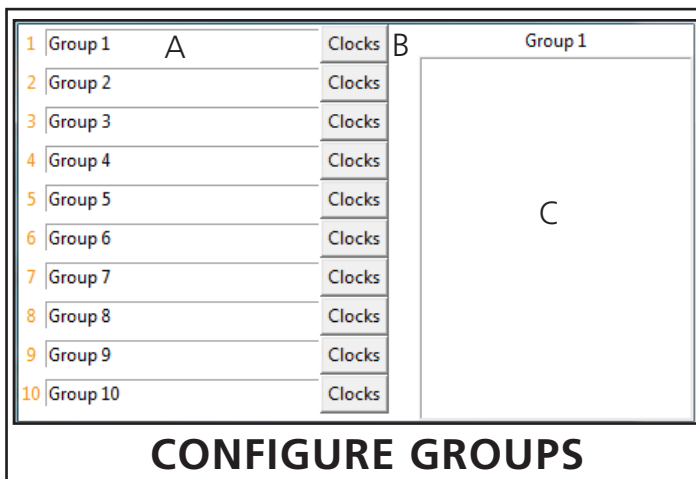
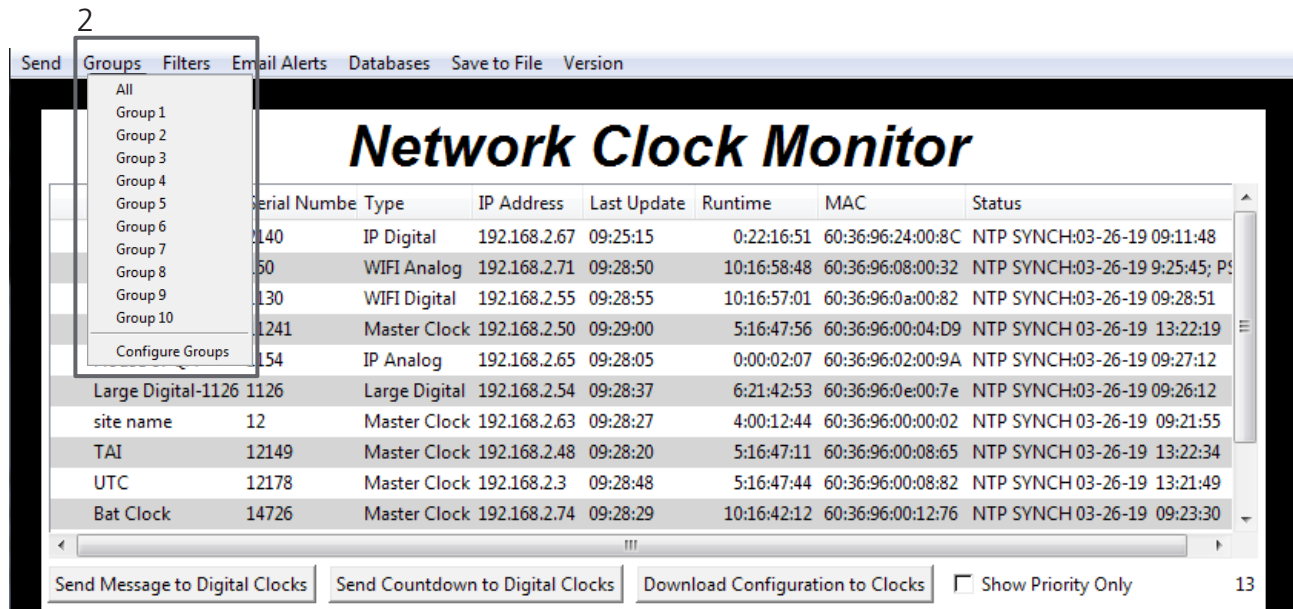
Send Message - Performs the same action as the Send Message to Digital Clocks button. Applies only to Digital Clocks.

Send Looping Message - Refer to the section of this manual, "Network Monitor Software - Quick Access Menu." Applies only to Digital Clocks.

Send Countdown - Performs the same action as the Send Countdown to Digital Clocks button. Applies only to Digital Clocks.

Find Hands - Commands Analog Clocks to resynchronize their hands. The user will be prompted to enter a password to authenticate their permissions. This command can be sent to one analog clock, a selected group of analog clocks, or all of the analog clocks in the system. Applies only to analog clocks.

Network Monitor Software - Task Bar Options



CONFIGURE GROUPS

the name of the group. For example, the first text box currently contains the name "Group 1". This will cause the first group to be shown as "Group 1" in the drop-down menu.

B. Clocks buttons - Clicking on a Clocks button will display each of the group's devices in the box to the right.

C. Device Box - Displays the devices for the selected group. The name of the selected group will appear above the device box.

To add a device to the group, click on a device on the Network Monitor. While holding down the button on the mouse, drag the name of the device over to the device box, then release the button on the mouse.

To remove a device from the group, click on a device in the device box. While holding down the button on the mouse, drag the name of the device outside of the device box, then release the button on the mouse.

2. Groups - When clicked, this button will open the Groups drop-down menu.

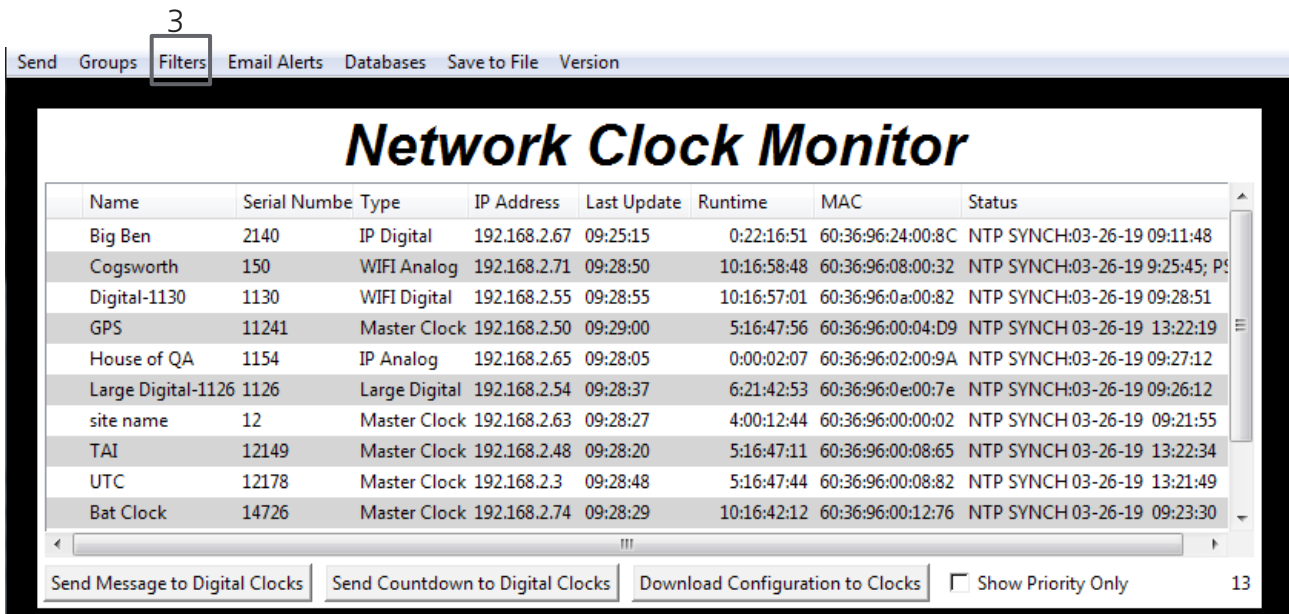
All - Clicking on this option will cause the monitor to display all compatible IP devices on the network.

"Group Name" - Clicking on the name of a group will cause the monitor to display all of the IP devices in that group. Example: Clicking on "Group 1" will cause the monitor to show only the devices that have been added to Group 1 through the Configure Groups menu.

Configure Groups - Opens the group configuration menu (see left).

A. Text Boxes - Entering a name into the text box will change

Network Monitor Software - Task Bar Options



3. **Filters** - When clicked, this button will display the following options:

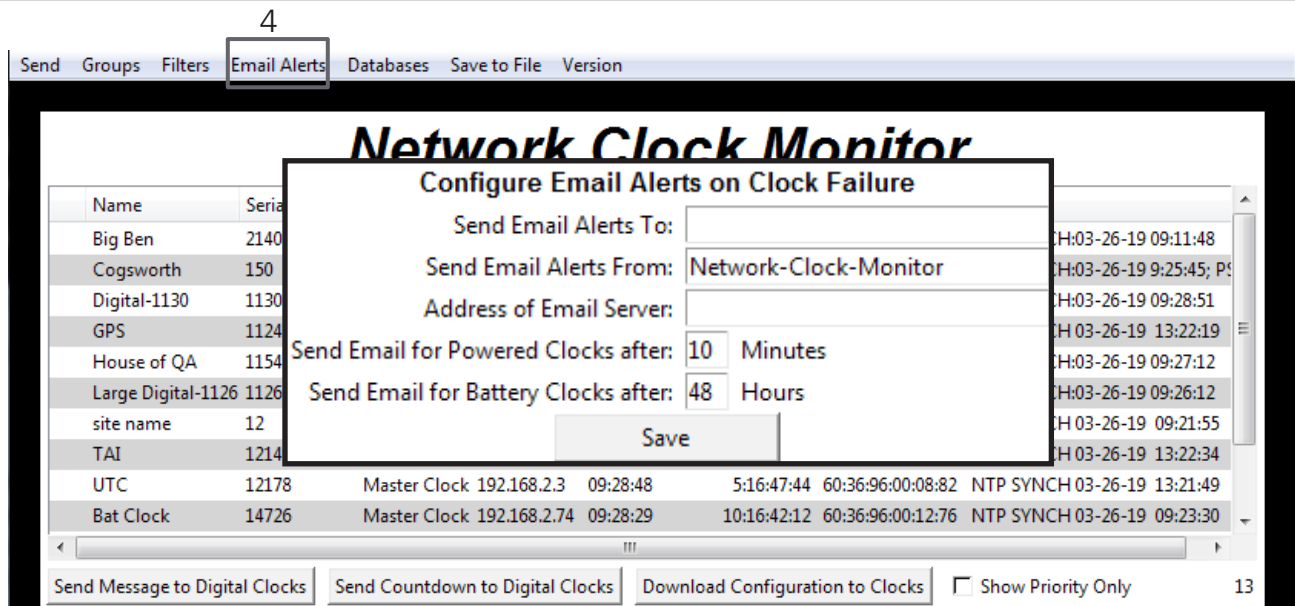
Filter By Clock Type - By selecting this option, the user is able to view specific clock types on the Monitor Screen. The clock types users can filter through are: Master Clocks, Network Repeaters, Wi-Fi Analog, Wi-Fi Digital, IP Analog, and/or IP Digital clocks. When the box next to the clock type is checked, the user will be able to view that clock type on the Monitor Screen.

Filter By Name - By selecting this option, the user is able to search for specific clocks by name on the Monitor Screen. The user must type in the name of a clock and check the box next to the word Enable. Once checked, the clocks that match the name will appear.

Please Note: When using this option, the submitted name must be identical to the name of the clock in order to receive a match. There are a few special sequences/characters listed below that may be used when filtering by name:

*	Matches any sequence of 0 or more characters in the name
?	Matches any single character in the name
[chars]	Matches any character in the set given by chars. If a sequence of the form x-y appears in chars, then any character between x and y, inclusive, will match.
{[A-Za-z]}	Will match any alphabetical character.
\x	Matches the single character x. This provides a way of avoiding the special interpretation of the characters *?[\] in pattern.

Network Monitor Software - Task Bar Options



4. Email Alerts - When clicked, this button will display the following options:

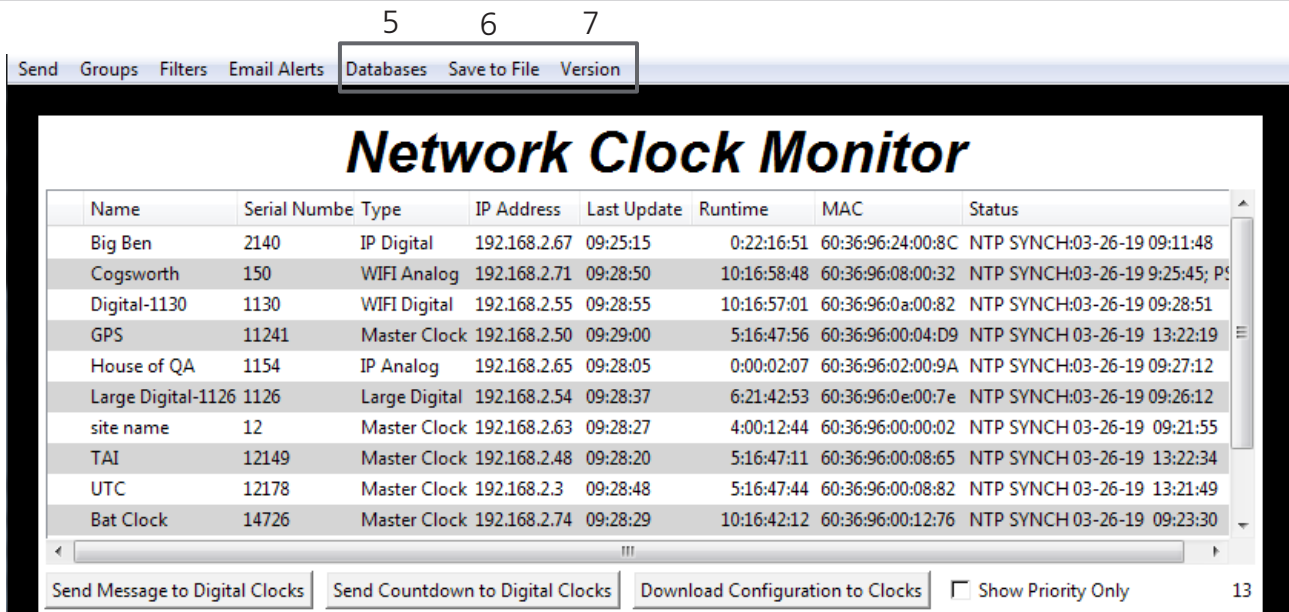
Enable Missing Clock Email Alerts - By selecting this option, the user will receive an email alert if the Network Monitor Software hasn't heard from a listed clock or other network device after a certain amount of time. This function will not work if the monitor is turned off. Does not apply to battery-powered clocks.

Enable Low Battery Email Alerts - By selecting this option, the user will receive an email alert if a battery-powered Wi-Fi Analog clock is synchronizing while low on batteries. This function will not work if the monitor is turned off. Applies only to battery-powered analog clocks. This option is not available with the CFL version of the monitor.

Configure Email Alerts - By selecting this option, the user is able to choose which email address the alerts are sent to, the email identity of the sender, the address of the email server, and the amount of time between an event and the email being sent. Once the information is filled in, click the save button. When pressed, this will save all of the settings that were entered.

Send Test Email - By selecting this option, the user is able to send a test email to the email address specified in the Configure Email Alerts option.

Network Monitor Software - Task Bar Options



5. **Databases** - When clicked, this button will display the following options:

Download Configuration - By selecting this option, the user can load a clock's setting from a PC to another clock of the same type.

Upload Configuration - By selecting this option, the user can load the settings from a Wi-Fi clock and save them to a PC.

Get Clock Firmware From Server - Updates software on the selected clock by downloading the latest version from the manufacturer's servers. This action requires Internet access.

Get Wi-Fi Clock Web Pages From Server - Updates software on the selected clock's network card and web interface by downloading the latest version from the manufacturer's servers. Applies only to Wi-Fi enabled clocks. This option is not available with the CFL version of the monitor.

6. **Save to File** - When clicked, allows the user to save the all of the information in the Network Monitor device list as a .CSV file, which can be printed from Microsoft Excel. If the monitor is showing devices from a specific Group, then the .CSV file will contain only the devices in that group.

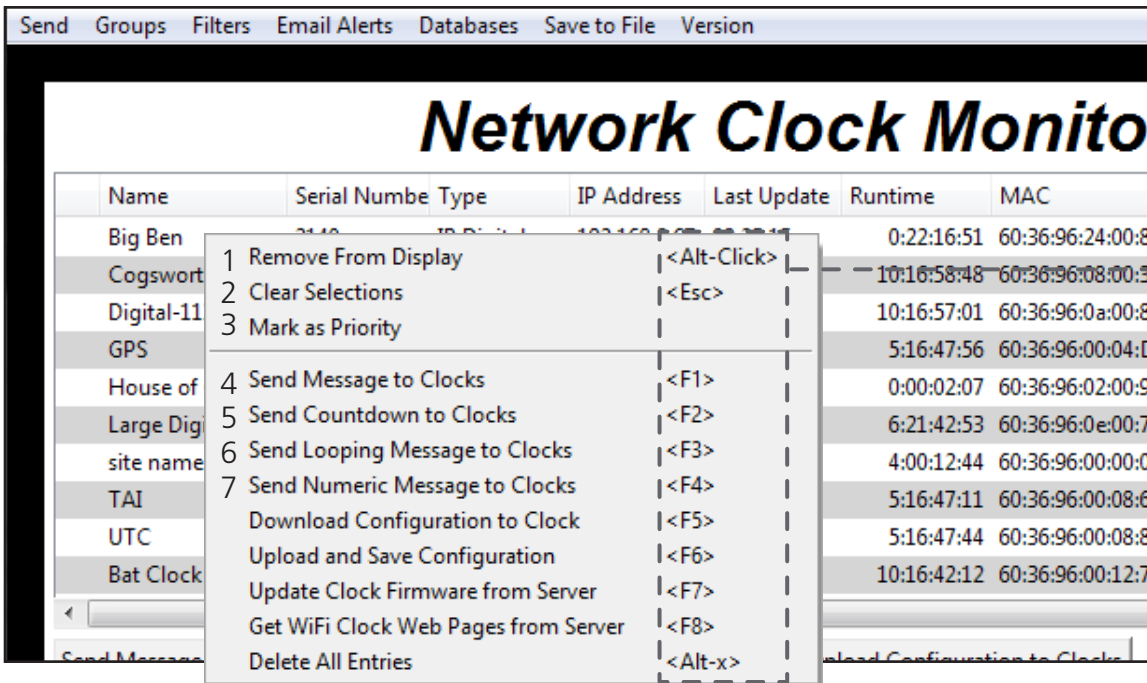
7. **Version** - When clicked, this button will display version number information of the Network Monitor Software and the Software Version Number (SVN). This information is needed only when contacting technical support and will not affect your usage of the Network Monitor Software. This button will also display the Monitor subtype.

The Network Monitor has two subtypes:

CFA - Intended for use with Wi-Fi Clocks, Master Clocks, Network Repeaters, Wi-Fi Large Digital Clocks, and Network Repeaters.

CFL - Intended for use with IP-PoE Digital, Wired IP Large Digital, and IP-PoE Analog Clocks.

Network Monitor Software - Quick Access Menu

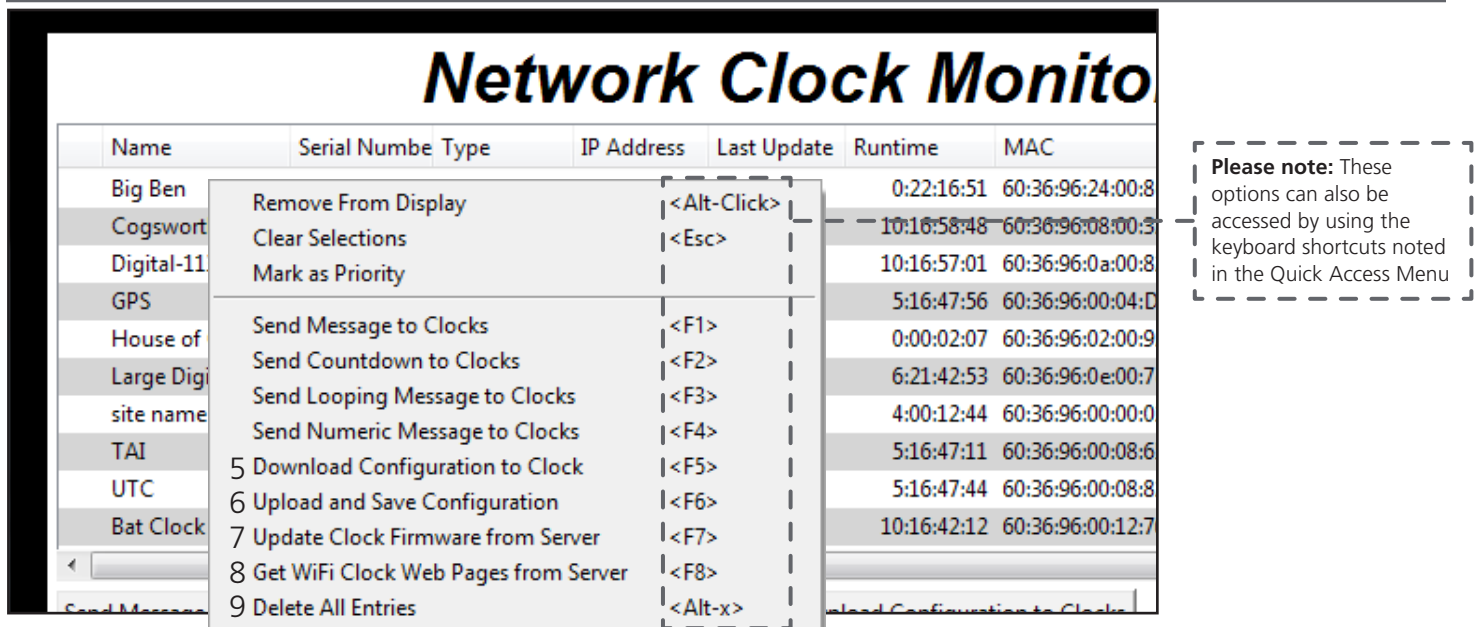


Please note: These options can also be accessed by using the keyboard shortcuts noted in the Quick Access Menu

Using a right-handed mouse to right-click on any row in the Device List will open the Quick Access Menu.

1. **Remove from Display** - When clicked, this option will remove the selected clock from the Device List.
2. **Clear Selections** - This option will deselect any highlighted items on the Device List.
3. **Mark as Priority** - Marking a clock(s) as priority is another filtering option for a user to segment the clocks. Once a clock is marked as priority, there will be an asterisk (*) next to the chosen clock.
4. **Send Message to Clocks** - Performs the same action as the Send Message to Digital Clocks button.
5. **Send Countdown to Clocks** - Performs the same action as the Send Countdown to Digital Clocks button.
6. **Send Looping Message to Clocks** - Performs a similar action to the Send Message to Digital clocks, but allows the user to select the number of times that the message will repeat. It also provides a longer text box for sending longer messages.
7. **Send Numeric Message to Clocks** - Performs the same action as the Send Message to Digital Clocks button, but messages are limited to four digits consisting of numbers 0-9.

Network Monitor Software - Quick Access Menu

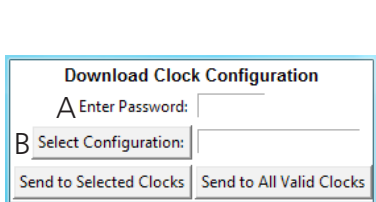


Name	Serial Number	Type	IP Address	Last Update	Runtime	MAC
Big Ben					0:22:16:51	60:36:96:24:00:8
Cogswort					10:16:58:48	60:36:96:08:00:3
Digital-11					10:16:57:01	60:36:96:0a:00:8
GPS					5:16:47:56	60:36:96:00:04:D
House of					0:00:02:07	60:36:96:02:00:9
Large Digi					6:21:42:53	60:36:96:0e:00:7
site name					4:00:12:44	60:36:96:00:00:0
TAI					5:16:47:11	60:36:96:00:08:6
UTC					5:16:47:44	60:36:96:00:08:8
Bat Clock					10:16:42:12	60:36:96:00:12:7

Please note: These options can also be accessed by using the keyboard shortcuts noted in the Quick Access Menu

Using a right-handed mouse to right-click on any row in the Device List will open the Quick Access Menu.

5. Download Configuration to Clock - If a configuration file was created using "Upload and Save Configuration" on the Quick Access Menu, this option lets the user apply the configuration file to other clocks highlighted within the monitor. This function will not work with Wi-Fi enabled clocks in Direct Mode. Clicking on this item will cause the Download Configuration window to appear:



A. Enter Password - The default password is 6063

B. Select Configuration - Pressing the button allows the user to browse their computer for a previously-saved configuration file.

C. Send to Selected Clocks - Applies the configuration file to whichever clocks have been highlighted on the Device List.

D. Send to All Valid Clocks - Applies the configuration file to all applicable devices on the Device List. For instance, a Digital IP clock configuration file would be applied to every Digital IP clock on the Device List.

6. Upload and Save Configuration - By selecting this option, the user can copy the settings from an IP device and save them to whichever computer is running the Network Monitor. Your computer will automatically prompt you for the location of the saved configuration file. This function will not work with Wi-Fi enabled clocks in direct mode.

7. Get Clock Firmware From Server - Updates software on the clock by downloading the latest version from the manufacturer's cloud server. This action requires Internet access.

8. Get Wi-Fi Clock Web Pages From Server - Updates software on the network card and web interface by downloading the latest version from the manufacturer's cloud server. Applies only to Wi-Fi enabled clocks. This option is not available with the CFL version of the monitor.

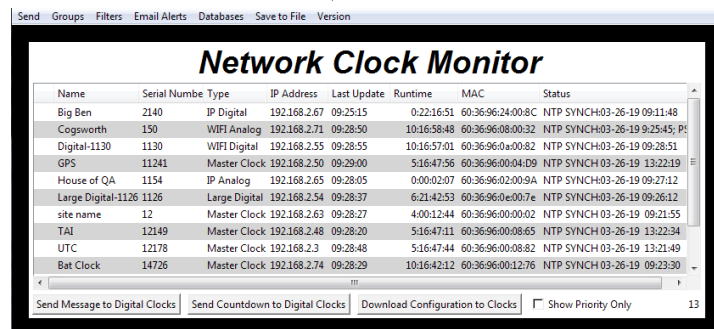
9. Delete All Entries - Clears all clocks from the Monitor. Clocks will be re-added to the monitor as they check in.

Network Monitor Software - Error messages

1. **Characters are Red** - When the characters of a clock have turned red, then the clock has not sent its status within the last 10 minutes.
2. **Characters are Gray** - When the characters of a clock have turned gray, then the clock was once displayed on the Network Monitor, but upon launching the Network Monitor program this most recent time, the clock cannot be found on the network.
3. **Characters are Black** - When the characters of a clock are black, this means that the clock is working normally.

The CFA and CFL versions of the Monitor cannot run at the same time. If managing Wi-Fi clocks and IP clocks at the same time, use the CFA Network Monitor instead of the CFL Network Monitor. Be aware, not all features on the CFA Monitor will function on IP-LAN clocks.

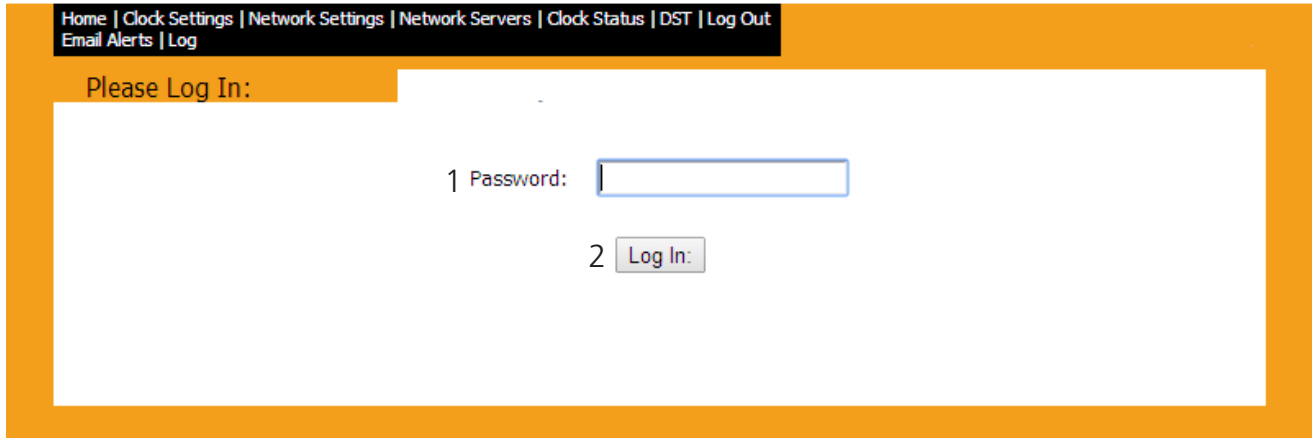
You can check if you have the CFA or CFL version by clicking on "Version" at the top of the monitor window.

The screenshot shows the 'Network Clock Monitor' application window. At the top, there is a menu bar with options: Send, Groups, Filters, Email Alerts, Databases, Save to File, and Version. Below the menu bar is a title bar with the text 'Network Clock Monitor'. The main area contains a table with the following columns: Name, Serial Number, Type, IP Address, Last Update, Runtime, MAC, and Status. The table lists several clocks, including 'Big Ben', 'Cogsworth', 'Digital-1130', 'GPS', 'House of QA', 'Large Digital-1126', 'site name', 'TAI', 'UTC', and 'Bat Clock'. At the bottom of the window, there are buttons for 'Send Message to Digital Clocks', 'Send Countdown to Digital Clocks', and 'Download Configuration to Clocks', along with a checkbox for 'Show Priority Only' and a page number '13'.

Name	Serial Number	Type	IP Address	Last Update	Runtime	MAC	Status
Big Ben	2140	IP Digital	192.168.2.67	09:25:15	0:22:16:51	60:36:96:24:00:8C	NTP SYNCH03-26-19 09:11:48
Cogsworth	150	WiFi Analog	192.168.2.71	09:28:50	10:16:58:48	60:36:96:08:00:32	NTP SYNCH03-26-19 9:25:45; P
Digital-1130	1130	WiFi Digital	192.168.2.55	09:28:55	10:16:57:01	60:36:96:a0:00:82	NTP SYNCH03-26-19 09:28:51
GPS	11241	Master Clock	192.168.2.50	09:29:00	5:16:47:56	60:36:96:00:04:D9	NTP SYNCH 03-26-19 13:22:19
House of QA	1154	IP Analog	192.168.2.65	09:28:05	0:00:02:07	60:36:96:02:00:9A	NTP SYNCH03-26-19 09:27:12
Large Digital-1126	1126	Large Digital	192.168.2.54	09:28:37	6:21:42:53	60:36:96:0e:00:7e	NTP SYNCH03-26-19 09:26:12
site name	12	Master Clock	192.168.2.63	09:28:27	4:00:12:44	60:36:96:00:00:02	NTP SYNCH 03-26-19 09:21:55
TAI	12149	Master Clock	192.168.2.48	09:28:20	5:16:47:11	60:36:96:00:08:65	NTP SYNCH 03-26-19 13:22:34
UTC	12178	Master Clock	192.168.2.3	09:28:48	5:16:47:44	60:36:96:00:08:82	NTP SYNCH 03-26-19 13:21:49
Bat Clock	14726	Master Clock	192.168.2.74	09:28:29	10:16:42:12	60:36:96:00:12:76	NTP SYNCH 03-26-19 09:23:30

Web Interface - Log In



Home | Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out
Email Alerts | Log

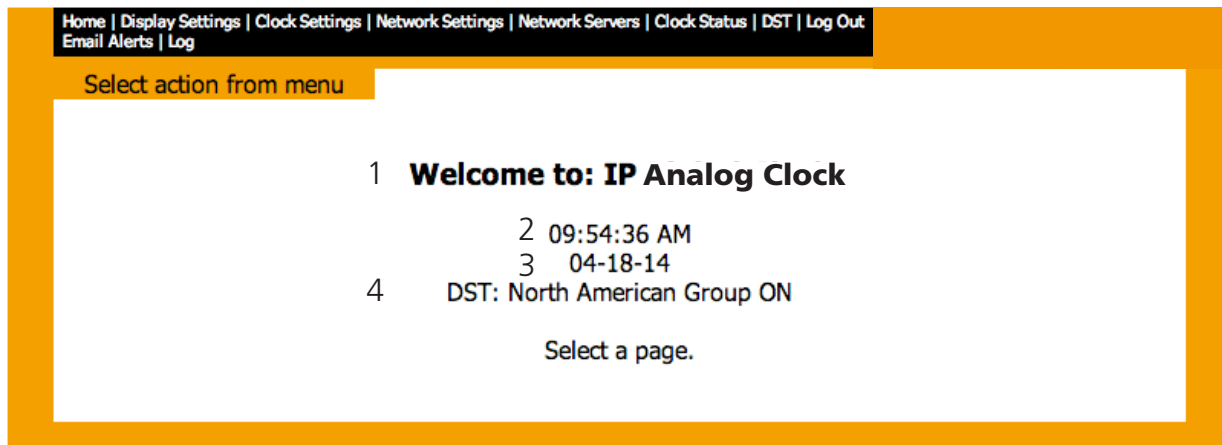
Please Log In:

1 Password:

2 Log In:

1. **Password** - Location where the password is entered. The default password is 6063, but this can be changed within the settings.
2. **Log In** - When pressed, the program will check the password. If the password is correct, it will grant the user access to the Web Interface.

Web Interface - Date and Time



Home | Display Settings | Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out
Email Alerts | Log

Select action from menu

1 **Welcome to: IP Analog Clock**

2 09:54:36 AM

3 04-18-14

4 DST: North American Group ON

Select a page.

1. **Welcome Sign** - Displays the Clock name.
2. **Time** - Displays the clock's time at the moment the web page was loaded. This information does not update unless the page is refreshed.
3. **Date** - Displays the clock's date at the moment the web page was loaded. This information does not update unless the page is refreshed.
4. **DST** - Displays the current Daylight Saving Time setting.

Web Interface - Clock Settings

Clock Settings

1 User Password:

2 Confirm Password:

3 Technician Password:

4 Confirm Technician Password:

5 Clock Name:

6 Clock Number:

7 Network Sync Every: ▼

8 Bias Seconds:

GMT Offset:

Dial State: ▼

Firmware Update Available:

1. **User Password*** - Allows the user to set up a new password to the web interface. Users may view all tabs, but cannot change settings. The default user password is 1111.
2. **Confirm Password** - The new User Password must also be entered here for a change to be made.
3. **Technician Password*** - Allows the user to set up a new password to the web interface. Technicians may change any setting. The default technician password is 6063.
4. **Confirm Technician Password** - The new Technician Password must also be entered here for a change to be made.
5. **Clock Name** - Allows the user to set a unique name for the clock, so that it can be identified on the Network Monitor. The name must be fewer than 20 characters.
6. **Clock Number** - Displays the serial number for the clock, so that it can be identified on the Network Monitor. This number cannot be modified.
7. **Network Sync Every** - Allows the user to select how often the clock should attempt to synchronize with an NTP server.
8. **Bias Seconds** - This setting allows the user to alter how much faster or slower the IP clock will run in relation to synchronized time. The range permits -9999 seconds to +9999 seconds. (This translates to a range of 2 hours, 46 minutes, and 39 seconds either way, but the time must be entered as a number of seconds). The clock may be configured to function as part of a Zone Clock through this option.

Web Interface - Clock Settings

Clock Settings

User Password:

Confirm Password:

Technician Password:

Confirm Technician Password:

Clock Name:

Clock Number:

Network Sync Every: ▼

Bias Seconds:

9 GMT Offset:

10 Dial State: ▼

11

12 **Firmware Update Available:**

9. **GMT Offset** - This setting allows the user to set which time zone the clock will use when displaying the time. For instance, London is an offset of 0, New York is an offset of -5 and Hong Kong is an offset of +8.

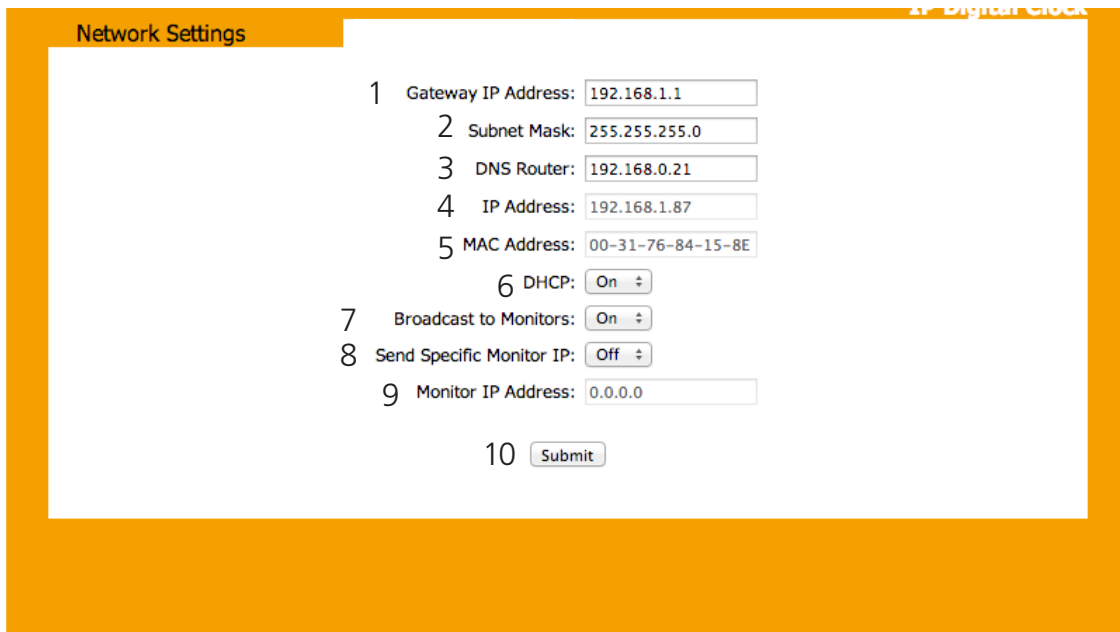
10. **Dial State** - This setting allows the user to correct the clock. The three options may be activated via the drop-down menu.

11. **Submit** - Applies any changes to the previous options when pressed.

12. **Firmware Update** - If the clock is able to access the Internet, it will automatically check to see if a firmware update is available. If a firmware update is available and you wish to update your firmware, click on the Update Firmware button. Your web browser may prompt you for additional confirmation before performing the update. This line will appear only if the clock detects that a firmware update is available.

*Passwords must be fewer than 16 characters, and may only use English uppercase letters A-Z, lowercase letters a-z, or the digits 0-9. Entering a password that uses other characters will lock down the profile.

Web Interface - Network Settings



Network Settings

1 Gateway IP Address:

2 Subnet Mask:

3 DNS Router:

4 IP Address:

5 MAC Address:

6 DHCP:

7 Broadcast to Monitors:

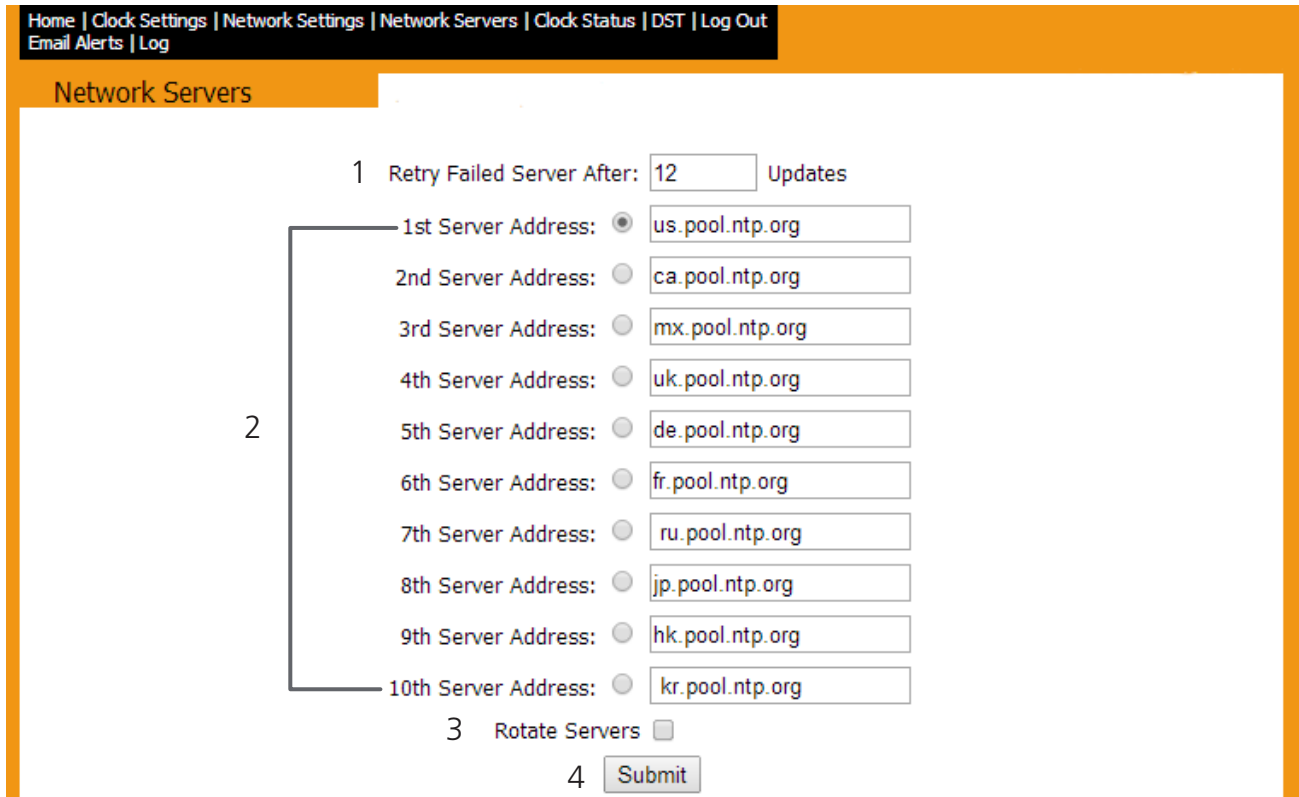
8 Send Specific Monitor IP:

9 Monitor IP Address:

10

1. **Gateway IP Address** - This field allows the user to set the gateway IP address.
2. **Subnet Mask** - This field allows the user to set the subnet mask for their clock.
3. **DNS Router** - This field allows the user to set the DNS Router IP address.
4. **IP Address** - This field will display the clock's IP address. If DHCP is enabled, this address will be assigned by the DHCP server. If DHCP is disabled, then the user may set their own static IP address.
5. **MAC Address** - This field shows the clock's permanent machine address. It cannot be changed.
6. **DHCP** - Allows the user to set whether or not the clock will use a DHCP server to determine the IP address for the clock.
7. **Broadcast to Monitors** - Allows the user to set whether or not the clock may send data to the Network Monitor
8. **Send Specific Monitor IP** - Allows the user to set an IP address that can be used to access the Network Monitor.
9. **Monitor IP Address** - This field shows the Network Monitor's IP address. It can only be changed if Send Specific Monitor IP is set to ON.
10. **Submit** - Applies any changes to the previous options when pressed.

Web Interface - Network Servers



Home | Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out
 Email Alerts | Log

Network Servers

1 Retry Failed Server After: Updates

2

1st Server Address:

2nd Server Address:

3rd Server Address:

4th Server Address:

5th Server Address:

6th Server Address:

7th Server Address:

8th Server Address:

9th Server Address:

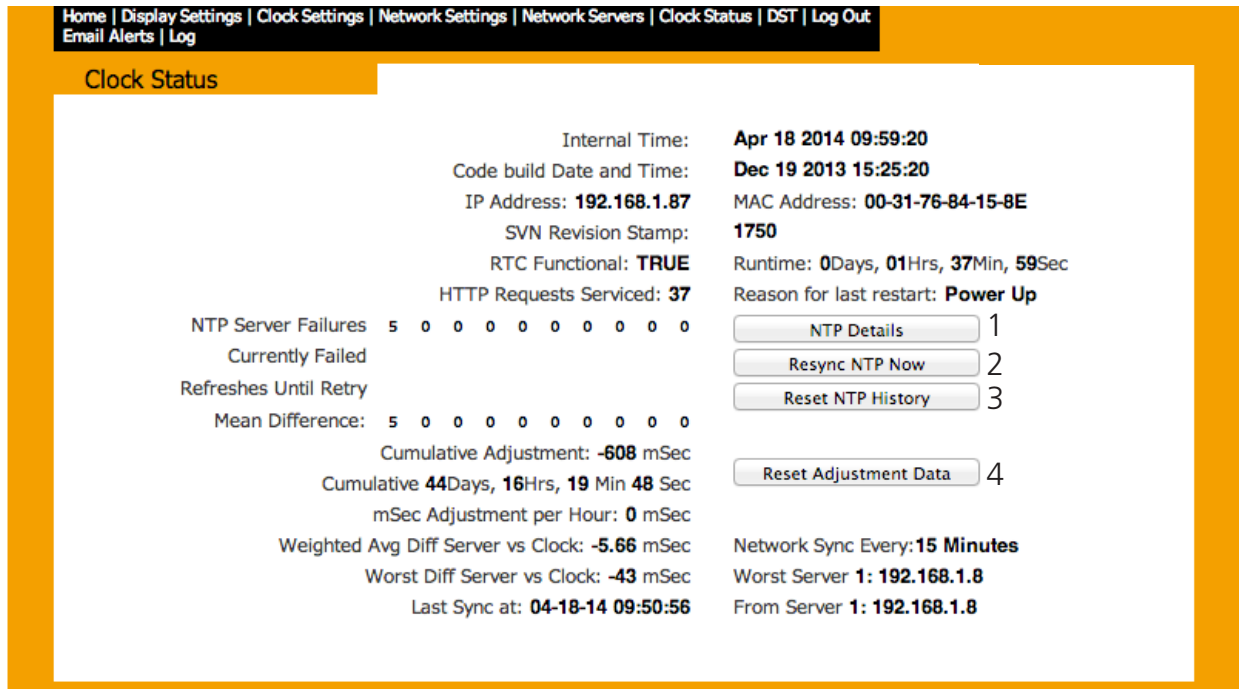
10th Server Address:

3 Rotate Servers

4

1. **Retry Failed Server After** - This field will allow the user to set how often the clock will attempt to contact a NTP server that has failed to communicate time data to the clock.
2. **Server Addresses** - These fields allow a user to set the address that the clock will use to obtain NTP time. Web addresses may be entered as a URL or IP number.
3. **Rotate Servers** - When left unchecked, the clock will only attempt to obtain time from the selected NTP server, and will only attempt to try other servers if the selected server fails. When checked, the clock will rotate through the listed addresses each time the clock performs a synchronization check.
4. **Submit** - Applies any changes to the previous options when pressed.

Web Interface - Clock Status



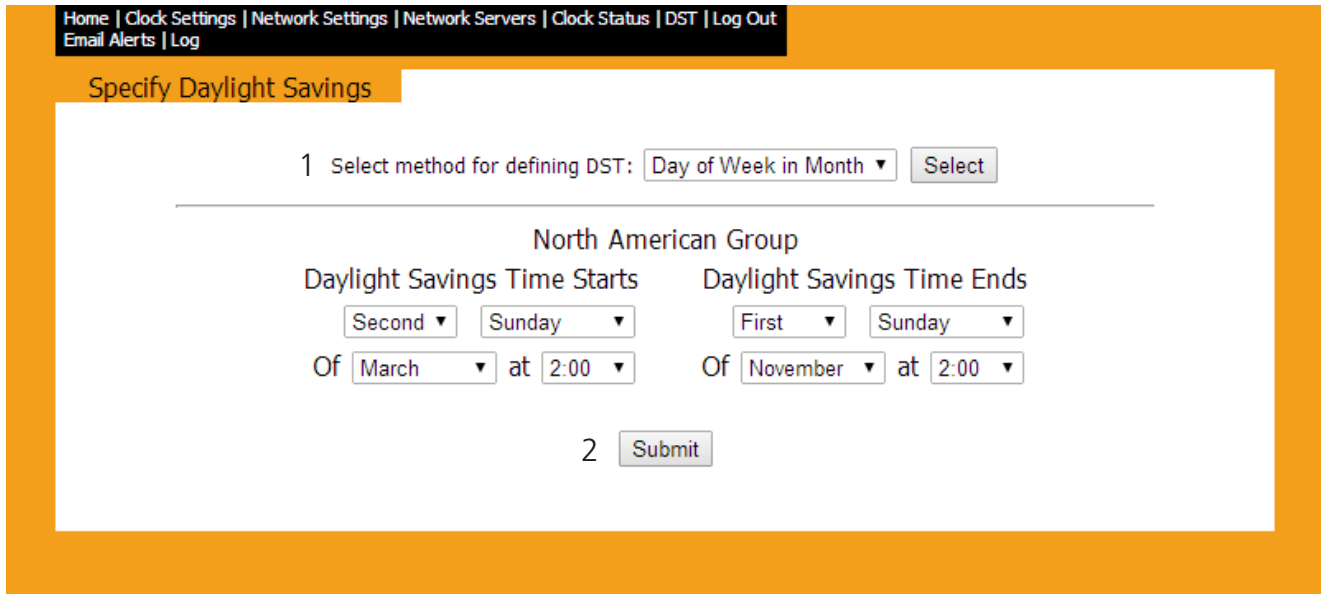
Home | Display Settings | Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out
 Email Alerts | Log

Clock Status

Internal Time:	Apr 18 2014 09:59:20
Code build Date and Time:	Dec 19 2013 15:25:20
IP Address: 192.168.1.87	MAC Address: 00-31-76-84-15-8E
SVN Revision Stamp:	1750
RTC Functional: TRUE	Runtime: 0Days, 01Hrs, 37Min, 59Sec
HTTP Requests Serviced: 37	Reason for last restart: Power Up
NTP Server Failures 5 0 0 0 0 0 0 0 0 0	<input type="button" value="NTP Details"/> 1
Currently Failed	<input type="button" value="Resync NTP Now"/> 2
Refreshes Until Retry	<input type="button" value="Reset NTP History"/> 3
Mean Difference: 5 0 0 0 0 0 0 0 0 0	<input type="button" value="Reset Adjustment Data"/> 4
Cumulative Adjustment: -608 mSec	
Cumulative 44Days, 16Hrs, 19 Min 48 Sec	
mSec Adjustment per Hour: 0 mSec	
Weighted Avg Diff Server vs Clock: -5.66 mSec	Network Sync Every: 15 Minutes
Worst Diff Server vs Clock: -43 mSec	Worst Server 1: 192.168.1.8
Last Sync at: 04-18-14 09:50:56	From Server 1: 192.168.1.8

1. **NTP Details** - This button provides additional details about NTP synchronization when clicked.
2. **Resync NTP Now** - This button forces a synchronization with the NTP server when clicked.
3. **Reset NTP History** - This button resets all of the data in the NTP details window when clicked.
4. **Reset Adjustment Data** - This button resets the statistics of previous time drifts when checked.

Web Interface - Daylight Saving Time

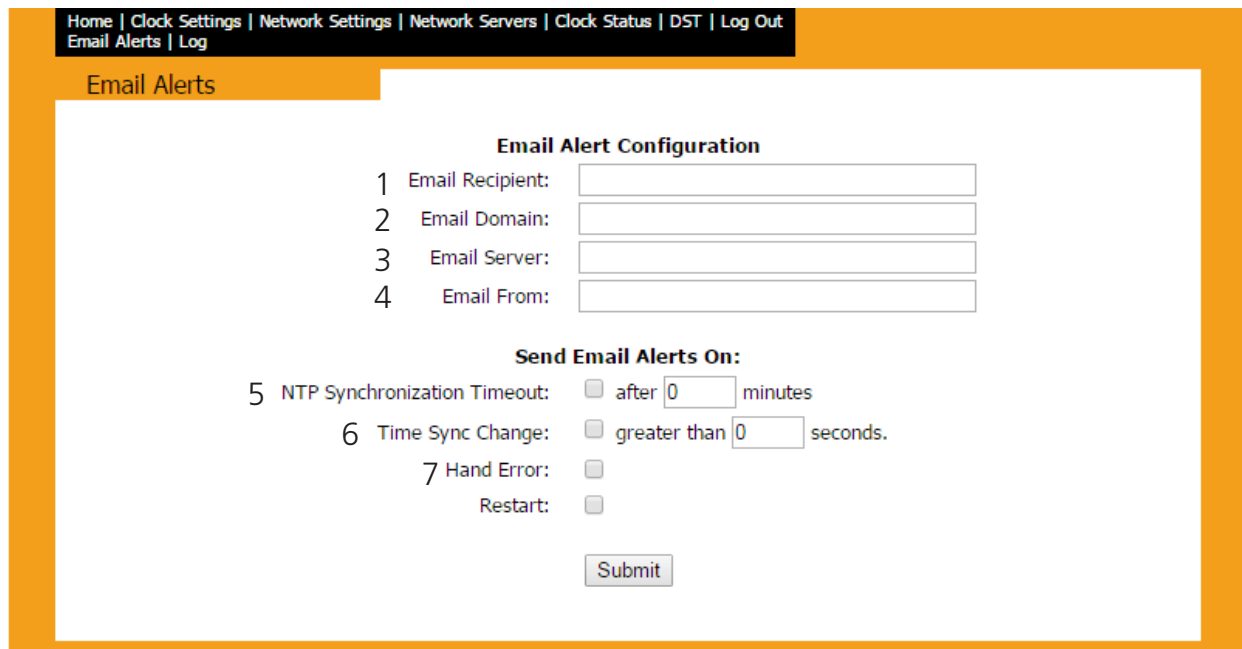


1. **Method for Defining DST** - There are four methods for defining Daylight Saving Time. The method can be selected from the drop-down menu. Clicking on the Select button displays additional options for that method.

- **Day of the Week in the Month** - This mode allows the user to select the day of the week, month, and time for when the clock will switch to daylight Saving Time. Once the day, month, and time have been set, click Submit to apply the settings to the clock. Example: Second Sunday of March at 2:00.
- **Day of the Month** - This mode allows the user to select the specific day of the month and time for when the clock will switch to daylight saving time. Once the date, month, and time are set, click Submit to apply the settings to the clock. Example: March 1st at 2:00.
- **By Country** - This mode allows the user to select preset Daylight Saving Time information associated with a specific country or group of countries. Select the preset from the drop-down menu, then click Submit to apply the settings to the clock.
- **None** - This mode does not change the clock for Daylight Saving Time.

2. **Submit** - Applies any changes to the previous options when pressed.

Web Interface - Email Alerts



1. **Email Recipient** - This field is where the user enters the name of the email alert recipient. Only the name should be entered, not the domain or suffix (*Correct:* jsmith | *Incorrect:* jsmith@domainname.com)

2. **Email Domain** - This field is where the user enters the domain of the email alert recipient. Only the domain and suffix should be entered, not the name (*Correct:* domainname.com | *Incorrect:* jsmith@domainname.com).

3. **Email server** - This field is where the user enters the address of the local outgoing email server for the email recipient. Consult with the network administrator for the email server address. Emails are sent using SMTP.

FIELDS 1, 2, AND 3 MUST BE COMPLETED FOR THE EMAIL FEATURE TO FUNCTION

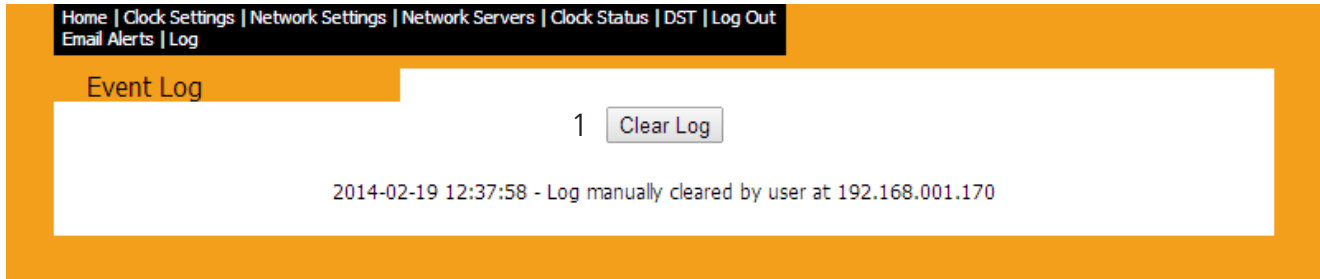
4. **Email Alert - NTP Synchronization Timeout** - When selected, the clock will send an email alert if the clock hasn't received a time synchronization after the number of minutes listed in the field next to the selection box.

5. **Email Alert: Time Sync Change** - When selected, the clock will send an email alert whenever the difference between the original time and most recent time synchronization data is greater than the listed number of seconds. The number of seconds may be changed using the field next to the selection box.

6. **Email Alert: Hand Error** - When selected, the clock will send an email alert whenever the sensors in the movement detect a problem with the position of the hands.

7. **Email Alert: Restart** - When selected, the clock will send an email alert whenever the clock has lost and regained power, either through intentional disconnection or a power outage.

Web Interface - Log



1. **Clear Log** - When clicked, this button deletes all of the information on the Log page.

Frequently Asked Questions

What size utility/gang box is needed?

A standard single gang box is required for wall mounting a locally powered version of the clock. However, if you are installing a locally powered double mount clock, then a standard double gang box is required.

How do IP clocks get their time?

IP clocks independently acquire time from a Network Time Protocol (NTP) server. Many public NTP servers are maintained by government and research institutions, and they are accessible over the Internet. It is also possible to set up an in-house NTP server for a network that is not connected to the Internet.

If a change is made on the web interface, does it affect one IP clock or all of them?

The web interface allows the user to adjust settings for only one IP clock.

If a user wishes to apply the changes from one web interface to all clocks on the system, they may do so through the Network Monitor program.

How many power injectors will I need if I am installing the clocks using Power over Ethernet (PoE)?

Each clock will need an injector, however there are products that exist, such as PoE switches, which provide multiple PoE ports.

What type of cable is used for PoE?

PoE is typically carried through a CAT5, CAT5e, or CAT6 patch cable.

May I use any NTP/SNTP server for downloading time?

Yes. Any server that sends out Network Time Protocol can be used.

Can I manually set the time on the SAP?

There is no physical input on the clock for manually setting time and attempting to open the front crystal will void the warranty.

Instead, a user can modify settings on the Web Interface to adjust the time displayed on an individual IP clock. A combination of the GMT Offset and Bias Seconds options can be adjusted to set the clock to the user's preferred time.

What is the default password for the web interface?

The default user password is 1111. The default technician password is 6063.

Troubleshooting

The clock is not powering up. What should I do?

If you are using a power injector or PoE switch, confirm that the injector or switch is powered. If you can confirm that the injector is powered, but the clock is still not powering up, confirm that the cable from the master clock or network router has been inserted into the INPUT socket, and that the cable leading to the SAP has been inserted into the OUTPUT socket.

The clock is powered, but not running. What should I do?

Detach the clock from the mounting and determine if the gearbox pin has been removed from the movement. If the pin was not removed during installation, power down the clock, remove the pin, then power up the clock again.

I cannot connect to the web interface. What should I do?

Use a cross-over cable to confirm that you are trying to access the correct IP address. If you were using the correct IP address, reexamine your network firewall for settings that could prevent you from accessing the clock.

The clock is not showing the right time. What should I do?

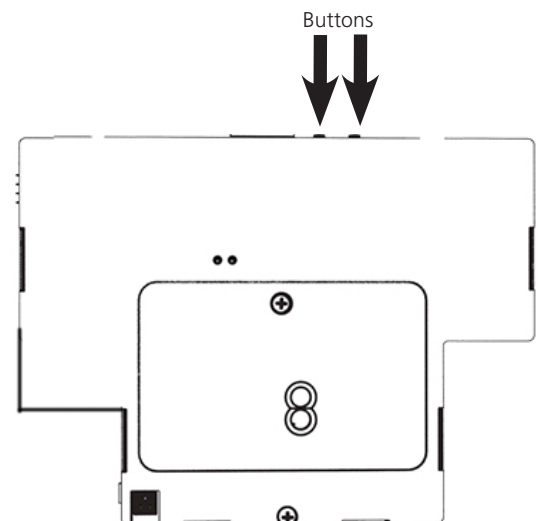
Attempt the following corrections in numerical order until the clock properly synchronizes:

1. Confirm that the clock is on the network by finding it with your Network Monitor.
2. Confirm that the clock is able to communicate over your network. Be mindful of passwords and firewalls, and be sure that Port 123 is open if you are getting NTP time via the Internet.
3. On the web interface, click on the tab 'Clock Status' and press the 'Resync NTP Now' button.
4. On the web interface, click on the tab 'Clock Settings' and review the text box labeled "GMT Offset". Confirm that the number matches your time zone. If it does not, revise the number, press submit, and then press the "Resync NTP Now" button on the 'Clock Status' page.
5. On the web interface, click on the tab 'Network Servers', confirm that the 'Rotate Servers' box is selected, then press submit. Return to the 'Clock Status' page and press the "Resync NTP Now" button.
6. If the problem persists, contact technical support.

Is there a way to reset the clock to its manufacturer default settings?

To reset the clock to its default settings:

- 1) Power on the clock.
- 2) Press and hold both buttons on the top of the clock movement.
- 3) After ten seconds, release both buttons.



Warranty

Sapling Limited Warranty and Disclaimer

The Sapling Company, Inc. warrants only that at the time of delivery and for a period of 24 calendar months after delivery or the period stated in this invoice, if different, the Goods shall be free of defects in workmanship and materials, PROVIDED that this warranty shall not apply:

To damage caused by Buyer's or any third party's act, default or misuse of the Goods or by failure to follow any instructions supplied with the Goods.

Where the Goods have been used in connection with or incorporated into equipment or materials the specification of which has not been approved in writing by The Sapling Company, Inc.;

To Goods which are altered, modified or repaired in any place other than a Sapling Company, Inc. factory or by persons not expressly authorized or approved in writing by The Sapling Company, Inc.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WITH RESPECT TO GOODS DELIVERED UNDER THIS CONTRACT, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The foregoing warranty runs only to Buyer. There are no oral or written promises, representations or warranties collateral to or affecting this contract. Representatives of The Sapling Company, Inc. may have made oral statements about products described in this contract. Such statements do not constitute warranties, shall not be relied on by Buyer and are not part of the contract.

Note: An extended 5 year (60 month) warranty is also available at the time of the system purchase with a surcharge.