

## Installation Manual V1

# SMA 1000 Network Repeater



# SMA 1000 Series Network Repeater

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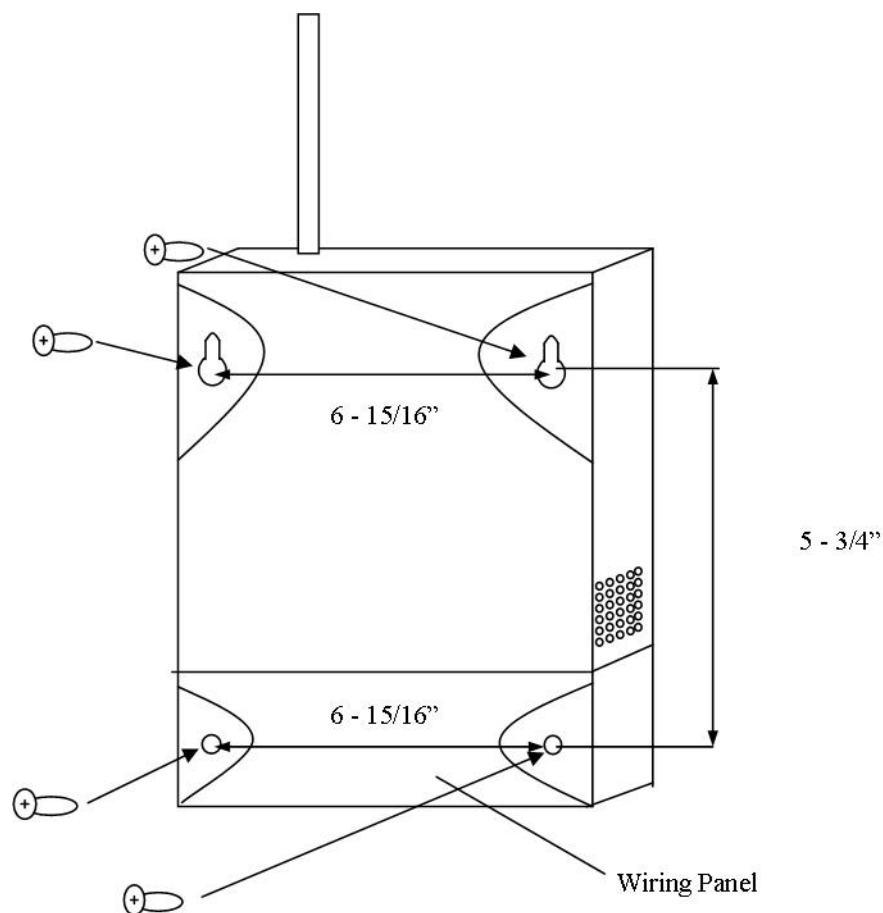
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### **FCC**

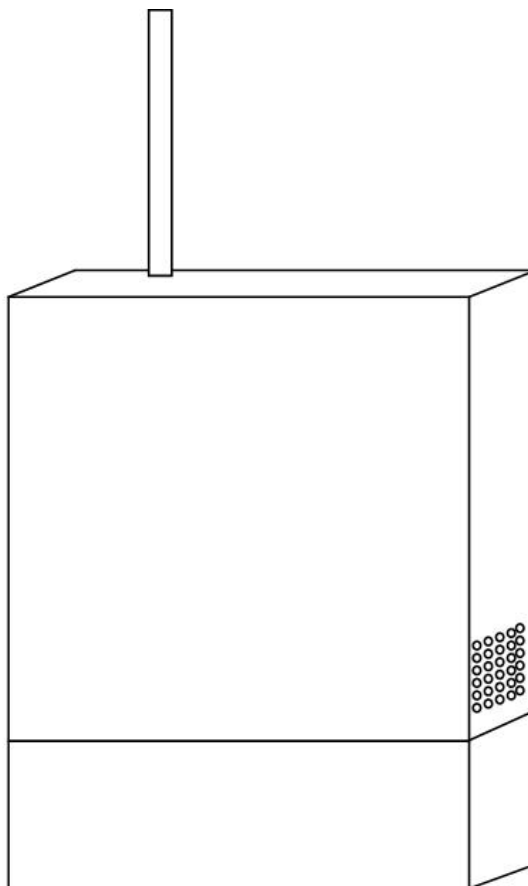
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## Mounting Instructions



1. Remove the cover of the wiring panel.
2. Mark the four drilling points on the wall based on the drawing above.
3. Drill the holes for the anchors supplied in the mounting kit at the designated markings from step 1.
4. Install the four anchors in the holes that were just drilled.
5. Install the first two screws in the top holes leaving 1/8" of the thread exposed.
6. Line up the top key slots over the screws and lock the master clock into place.
7. Install the bottom screws through the wiring access panel and tighten into place.
8. After all wiring is complete, re-install the wiring panel cover.

## Wiring Information



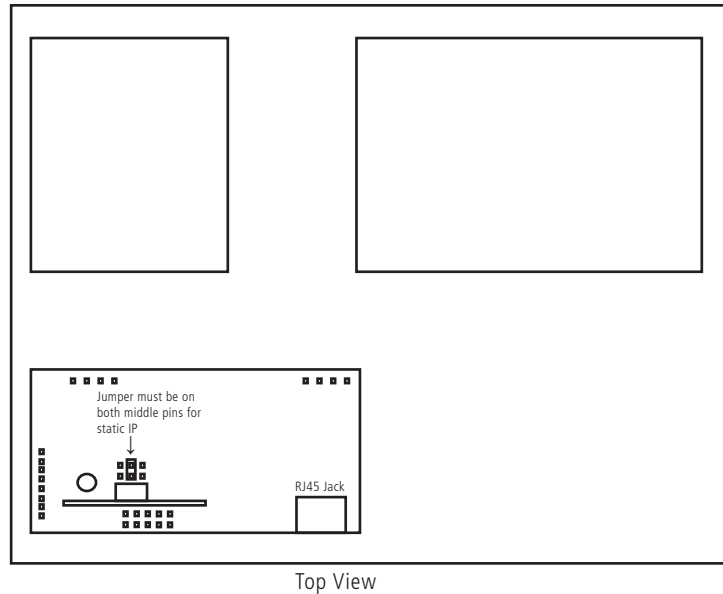
**Note: 14 AWG is the smallest conductor acceptable for power input.**

Blue	Yellow/ Green	Brown	Europe
White	Green	Black	USA
L2 Neutral	Ground	L1 Hot	
120VAC @ .2 amp			

# Setting up the Network Repeater

## Initial Setup

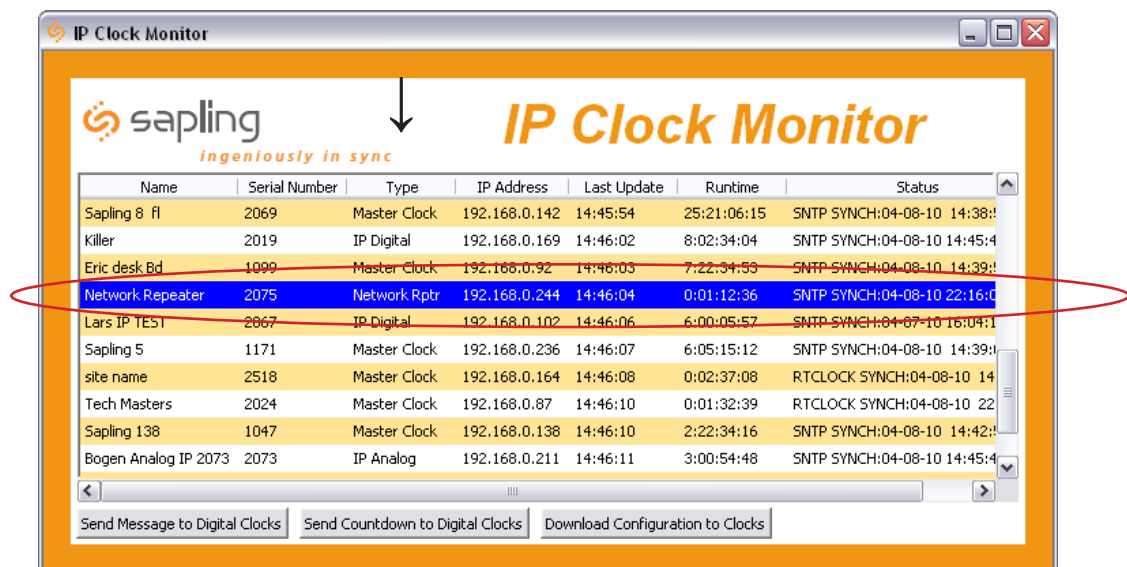
1. The Network Repeater is set up to use DHCP by default. Once the Network Repeater is plugged into the switch/router, it will try to get an IP address automatically.
2. If DHCP is not being used, and a static IP or crossover connection is preferred, then a jumper must be installed on the main board in the following orientation:



3. **Static IP** - If using a static IP, the IP address will be defaulted to 192.168.0.123. Go to a web browser and type in 192.168.0.123 to load the web interface. Once this is done, follow the instructions on page 8 to find the Network Settings page. Turn off DHCP and enter the new IP address and click submit. Then power down the Network Repeater, remove the jumper, and reboot the Network Repeater. To access the web interface, type in the new IP address in the web browser.

**DHCP** - If DHCP is being utilized, load the Sapling Monitor software on a PC that is connected to the network. Launch the Monitor.exe file and follow step 4.

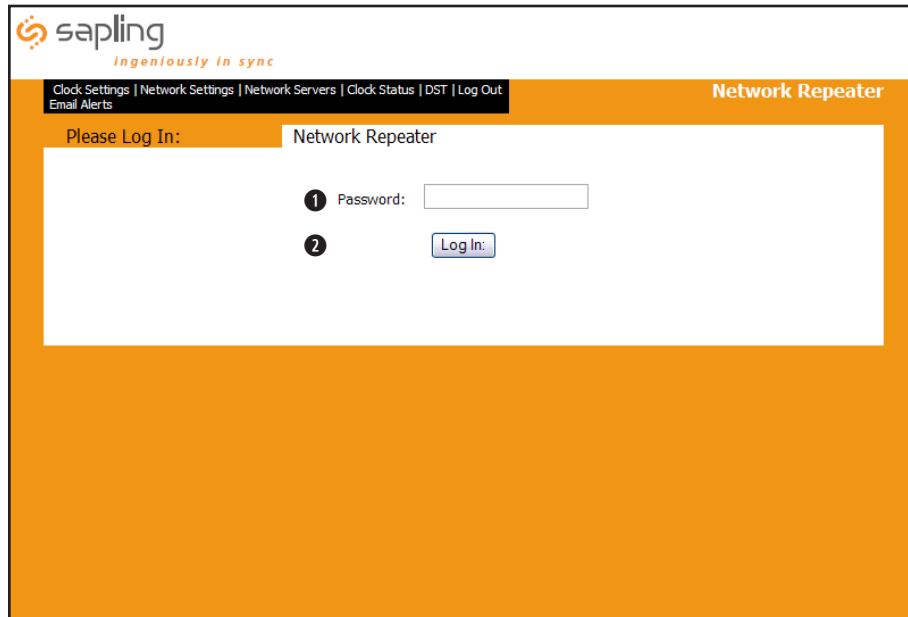
4. Locate the Network Repeater by searching under the "Type" heading. Once it's located, double click on it to open its web interface.



## Web Interface

### Login

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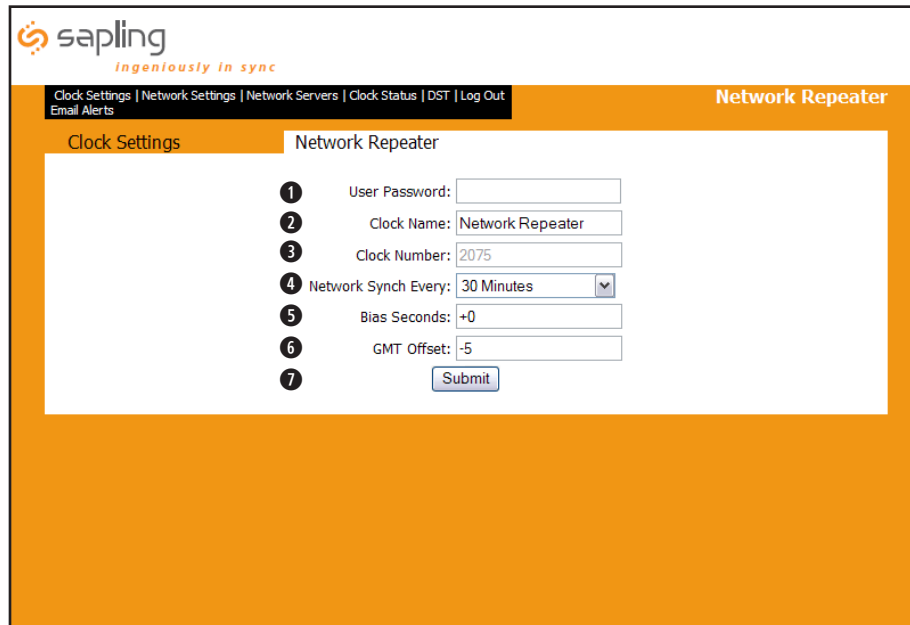


The screenshot shows the login page for the Sapling Network Repeater. At the top left is the Sapling logo with the tagline "ingeniously in sync". Below it is a navigation bar with links: "Clock Settings", "Network Settings", "Network Servers", "Clock Status", "DST", "Log Out", and "Email Alerts". The title "Network Repeater" is on the top right. The main content area has a heading "Please Log In:" followed by "Network Repeater". Below this is a form with two steps: 1. "Password:" followed by a text input field. 2. A "Log In:" button.

- ❶ **Password** - Type in the password in this field to access the Network Repeater's Web Interface. The default password is 6063.
- ❷ **Log In** - Click this button after the password is entered.

## Web Interface

### Clock Settings



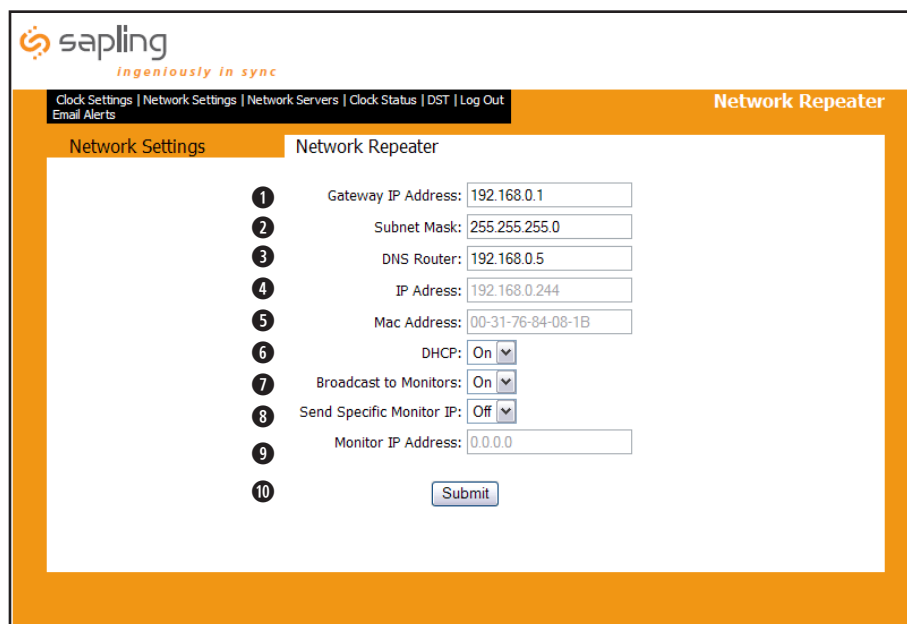
The screenshot shows the Sapling web interface for the 'Network Repeater' settings. The page has an orange header with the Sapling logo and navigation links: 'Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out | Email Alerts'. The main content area is white with an orange border. It contains a 'Clock Settings' tab and a 'Network Repeater' section. The 'Network Repeater' section has seven numbered callouts pointing to specific fields:

- 1. User Password:
- 2. Clock Name:
- 3. Clock Number:
- 4. Network Synch Every: - 5. Bias Seconds:
- 6. GMT Offset:
- 7. Submit:

- 1 **User Password** - To reset the password, type in the new one in this field and click Submit.
- 2 **Clock Name** - Change the name of the device in this field and click Submit.
- 3 **Clock Number** - This is a read only option. The serial number of the clock is displayed.
- 4 **Network Synch Every** - This option allows the user to set how often the Network Repeater synchronizes to the master clock.
- 5 **Bias Seconds** - This option offsets the time on the clocks while still receiving an input. This value should match the value used on the SMA Series Master Clock to ensure synchronized time.
- 6 **GMT Offset** - This option sets the offset from Greenwich Mean Time. This value should match the value used on the SMA Series Master Clock to ensure synchronized time.
- 7 **Submit** - This button, when clicked, will save and activate all settings on the Clock Settings page.

## Web Interface

### Network Settings

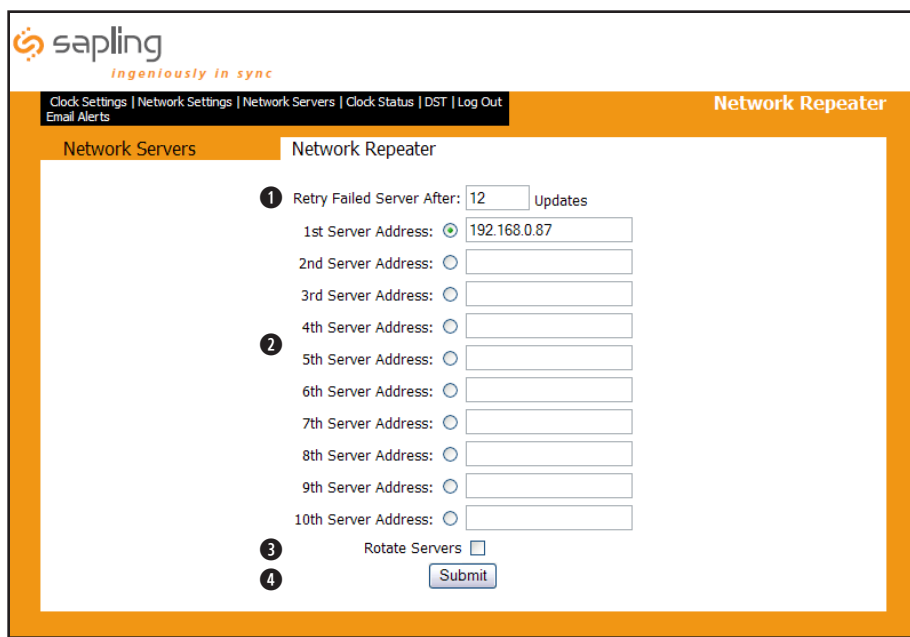


- ❶ **Gateway IP Address** - This field is where the IP address of the Gateway is inserted.
- ❷ **Subnet Mask** - This field sets the Subnet Mask being used.
- ❸ **DNS Router** - This field allows for the DNS router address to be set.
- ❹ **IP Address** - This field will display the IP address that was given by the DHCP server. If DHCP is disabled, then the user will be able to set the clock's IP address.
- ❺ **MAC Address** - This read only option is the clock's physical address.
- ❻ **DHCP** - This setting allows the user to choose whether the clock is on a DHCP server or not.
- ❼ **Broadcast to Monitors** - This setting allows the clock to send out its data in broadcast mode.
- ❽ **Send Specific Monitor IP** - This setting allows the clock to send the IP address to the monitor program through a gateway.
- ❾ **Monitor IP Address** - This field sets the IP address that the clock will use to send it to a particular gateway or subnet.
- ❿ **Submit** - This button, when pressed, clears all of the settings that were changed.



## Web Interface

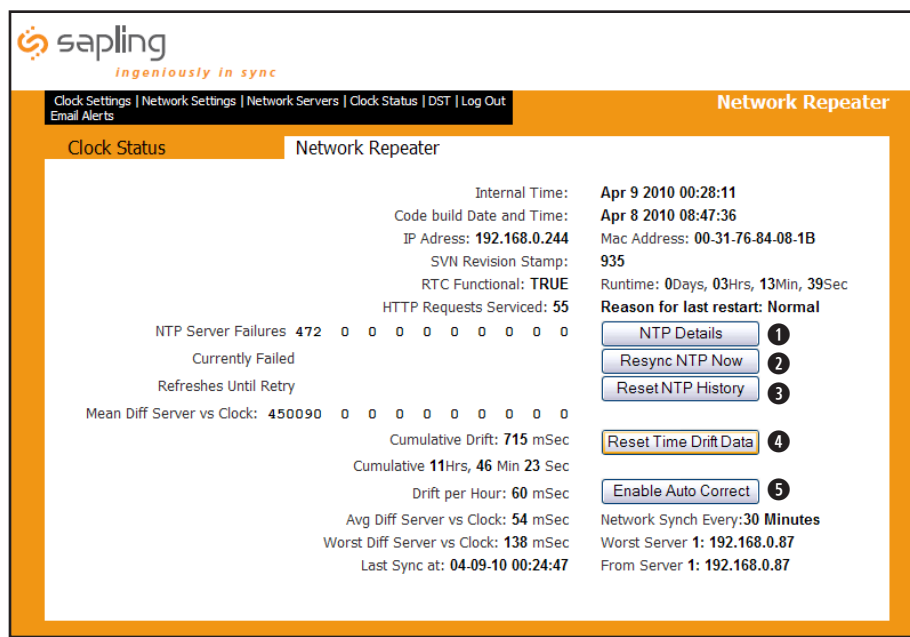
### Network Servers



- ❶ **Retry Failed Server After x Updates** - This field will allow the user to set how often it attempts to connect to a server that has not communicated with the clock. The Network Repeater will only try to synchronize to a SMA Series Master Clock.
- ❷ **Server Addresses** - This field is where the user will enter what IP address that the SMA Series Master Clock is located for synchronization. The Network Repeater will NOT synchronize to any other time servers but the SMA Series Master Clock.
- ❸ **Rotate Servers** - Not applicable.
- ❹ **Submit** - This button, when clicked, will save all changes on the Network Settings page.

## Web Interface

### Clock Status



**sapling**  
*ingeniously in sync*

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

**Network Repeater**

**Clock Status** | Network Repeater

Internal Time: **Apr 9 2010 00:28:11**  
Code build Date and Time: **Apr 8 2010 08:47:36**  
IP Address: **192.168.0.244** | Mac Address: **00-31-76-84-08-1B**  
SVN Revision Stamp: **935**  
RTC Functional: **TRUE** | Runtime: **0Days, 03Hrs, 13Min, 39Sec**  
HTTP Requests Serviced: **55** | Reason for last restart: **Normal**

NTP Server Failures **472** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  
Currently Failed  
Refreshes Until Retry  
Mean Diff Server vs Clock: **450090** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0

Cumulative Drift: **715 mSec**  
Cumulative **11Hrs, 46 Min 23 Sec**  
Drift per Hour: **60 mSec**  
Avg Diff Server vs Clock: **54 mSec**  
Worst Diff Server vs Clock: **138 mSec**  
Last Sync at: **04-09-10 00:24:47**

**Buttons:**  
NTP Details (1)  
Resync NTP Now (2)  
Reset NTP History (3)  
Reset Time Drift Data (4)  
Enable Auto Correct (5)

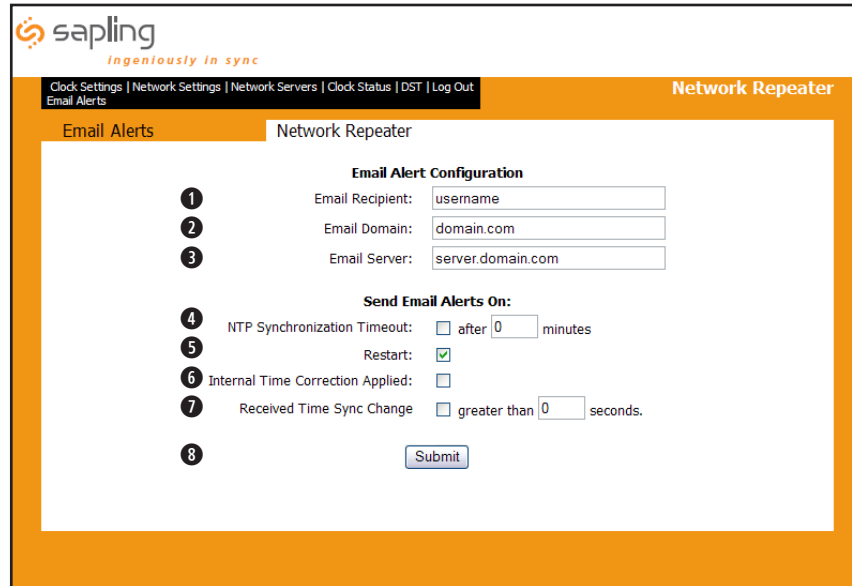
Network Synch Every: **30 Minutes**  
Worst Server **1: 192.168.0.87**  
From Server **1: 192.168.0.87**

- ❶ **NTP Details** - This button, when clicked, provides additional details about the NTP synchronization.
- ❷ **Resync NTP Now** - This button, when clicked, forces a synchronization with the NTP server.
- ❸ **Reset NTP History** - This button, when clicked, resets all the data in the NTP Details window.
- ❹ **Reset Time Drift Data** - This button, when clicked, resets the statistics of the time drifts.
- ❺ **Enable Auto Correct** - This button, when clicked, will calculate the drifts if the NTP Server is synced greater than every 15 minutes. It will automatically try to correct the time based on the drift statistics.



## Web Interface

### Email Alerts



**sapling**  
*ingeniously in sync*

Clock Settings | Network Settings | Network Servers | Clock Status | DST | Log Out

**Network Repeater**

**Email Alerts** | Network Repeater

**Email Alert Configuration**

1 Email Recipient:

2 Email Domain:

3 Email Server:

**Send Email Alerts On:**

4 NTP Synchronization Timeout: ☐ after  minutes

5 Restart: ☒

6 Internal Time Correction Applied: ☐

7 Received Time Sync Change ☐ greater than  seconds.

8

- 1 **Email Recipient** - This field is where the user name of the email recipient will be inserted. Do not enter the domain and suffix. (correct: johnsmith) (incorrect: johnsmith@domain.com)
- 2 **Email Domain** - This field is where the user will enter the domain name of the email server. (i.e. domain.com)
- 3 **Email Server** - This field is where the email server address will be placed. (i.e. server.domain.com)
- 4 **Email Alert: NTP Synchronization Timeout** - When checked, this will send an alert when the clock hasn't received a time synchronization.
- 5 **Email Alert: Restart** - When checked, this will send an alert when the clock has been reset.
- 6 **Email Alert: Internal Time Correction Applied** - When checked, this will send an alert when the clock time has been changed (only applies if receiving NTP sync greater than every 15 minutes).
- 7 **Email Alert: Received Time Sync Change** - When checked, this will send an alert when time that is synchronized is greater than x seconds.
- 8 **Submit** - This button, when clicked, will save all changes on the Email Alerts page.

# Support

## Frequently Asked Questions

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**Where is the best location for the Network Repeater to be mounted?**

Usually, the hallway is the best location because it is mostly open space in typical applications.

**How far can the Network Repeater transmit the wireless signal?**

The Transceiver can transmit up to 2000 meters in open space.

**Will the Repeater have interference from cordless or cellular phones?**

No, because with Sapling's innovative frequency-hopping technology, interference will not occur. The repeater switches frequencies automatically when the receiver and transmitter is open, thus interference is avoided.

**Can analog wireless clocks be combined with digital wireless clocks?**

Absolutely. The analog and digital wireless clocks are designed to work together, whether the clocks are running on battery (analog wireless clock only), 24 volts or 110 volts.

**My power source is 220 volts. Can the Network Repeater be powered on that voltage?**

Yes, the Repeater can work on 110 volts/50-60 Hz or 220 volts/50-60 Hz.

**How often does the Network Repeater send the wireless signal?**

The Network Repeater sends out the signal once a minute.

**Can the Network Repeater receive time from other devices besides the Sapling SMA Series Master Clock?**

No, the Network Repeater only receives time from the SMA Series Master Clock.

## Troubleshooting

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**The clocks aren't receiving the signal. What should I do?**

Make sure that the Repeater is in a place where the signal can be transmitted in open space.

**What should I do if the Repeater is not powering up?**

Measure the voltage between pins L1 & L2. The voltmeter should read 85 - 135 VAC between the hot and the neutral.

**What do I do if I cannot get an IP address from the DHCP server and want to use a static IP instead?**

See page 5 for instructions on setting the Network Repeater to use a static IP address.

## FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.

### FCC WARNING

***Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.***

Note: This equipment must be installed by professional installers only. For precautionary measures, FCC requires a minimum distance of 15cm from the clock to constant human physical exposure. The antenna has a maximum gain of 2dB.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.