support@cousign.com +1 (269) 290-1222 +1 (313) 202-8200

cousign

NETWORK CONTROLLER INSTRUCTIONS

Your Cousign network controller comes preconfigured for use with your sign. This document describes the steps necessary to connect to your sign and make adjustments to the connected displays. By default the network controller will automatically receive an IP address from your network (DHCP) and the controller configuration page can be **accessed by any computer or smartphone connected to the same network**.

1. Ensure an active network cable is connected to the sign controller.
2. Apply power to your sign.
3. Once the controller has successfully connected to the network the **IP address** it has been assigned **will scroll across any attached numeric displays**. Write this IP address down.

Accessing the controller.

When your sign is first powered on, you will see the IP address that was assigned to it scroll across any attached display modules. The **IP address is in the format XXX.XXX.XXX.XXX** and will be unique to your company's network. Write down this number as it scrolls across the numeric displays and access the controller by typing it into your web browser:

*Be sure to use http:// and not https://

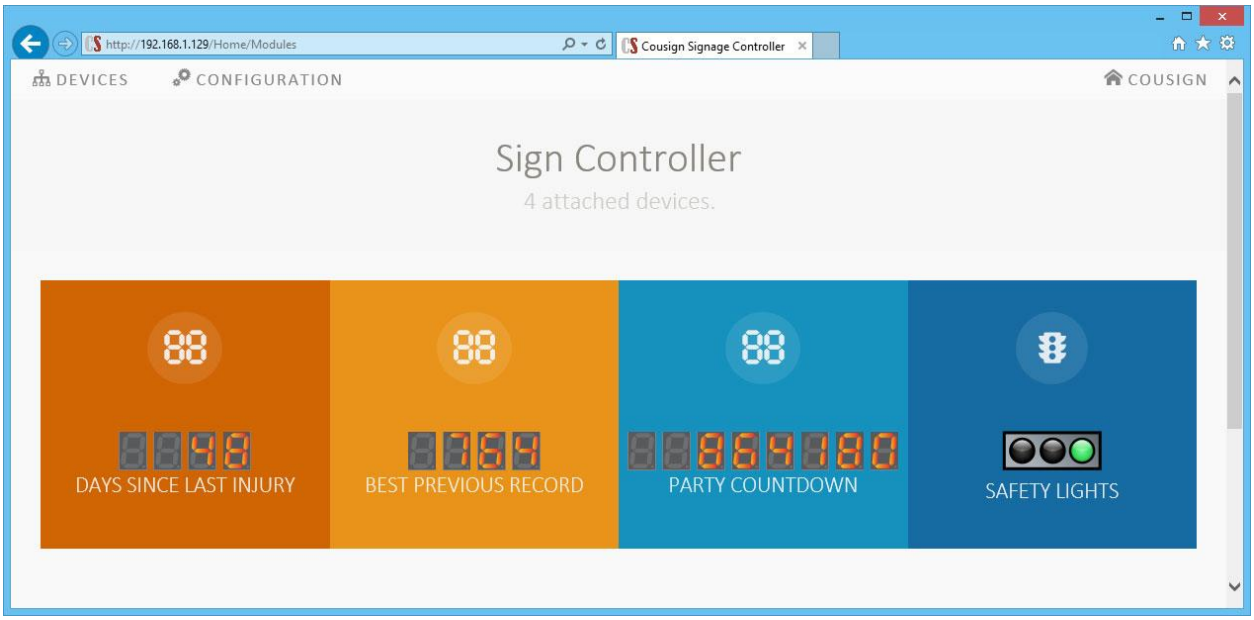
As the IP address assigned to the controller may change from time to time it is recommended that you access the sign using the friendlier DNS name. Depending on your network configuration this name may not resolve. If none of the URLs below resolve please work with your IT department and refer to **APPENDIX A: ADVANCED NETWORKING CONSIDERATIONS** and **APPENDIX B: APPENDIX B: NAME RESOLUTION SUPPORT** to configure the controller appropriately for your network.

OR (mDNS)

OR (WINS)

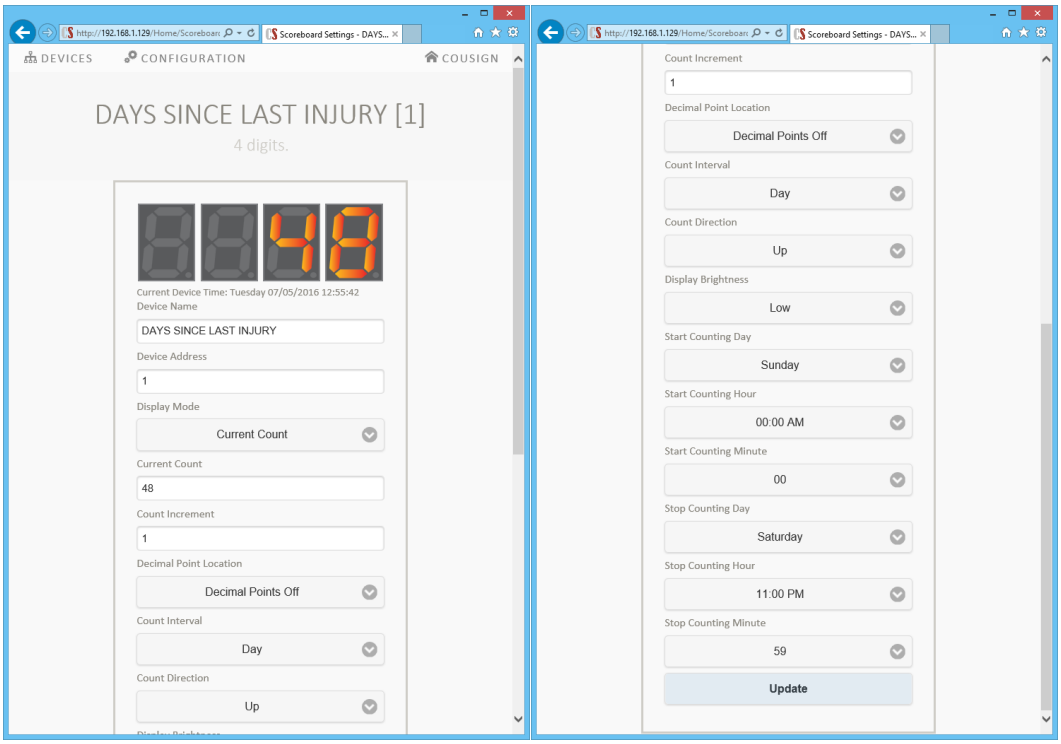
Main Page

After entering the configuration URL into your web browser you'll be presented with the device list which will display all detected modules on your sign. Icons for each device show pertinent information for the display. To modify the settings such as the current count for an attached device simply click on the icon.



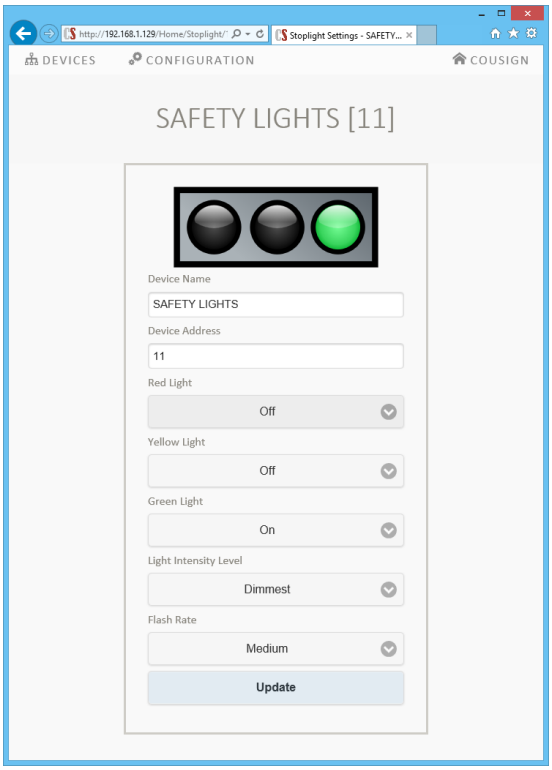
Configure Numeric Device

Available configuration settings will be displayed and can be modified by typing new values into the textboxes or selecting options from drop down menus. When finished making changes click the **Update** button at the bottom of the screen. Your changes will be saved to the device.



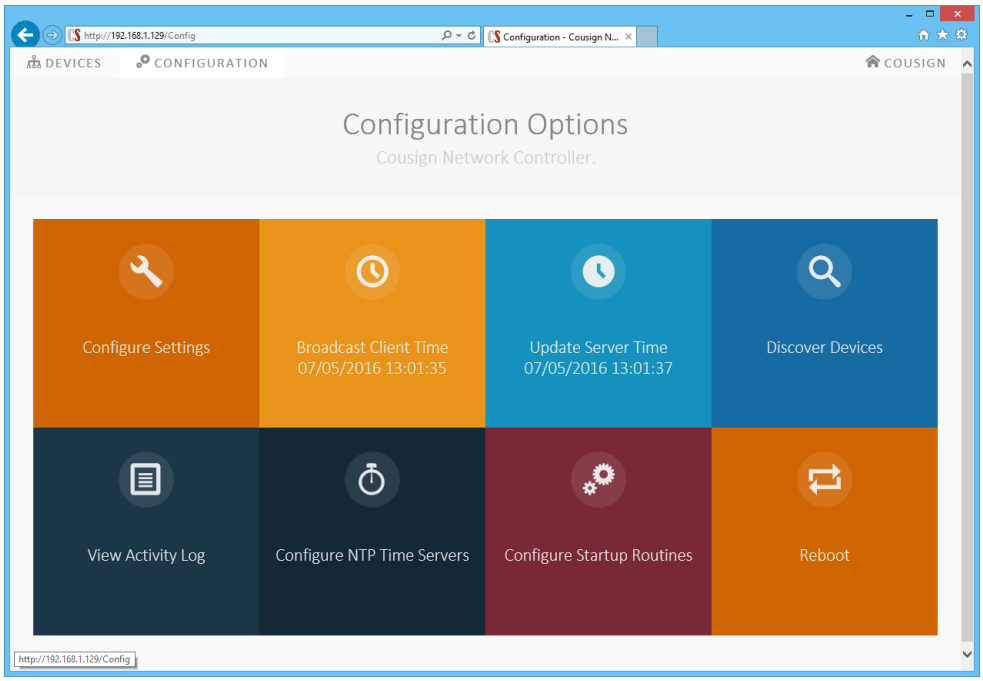
Configure Stoplight

Available configuration settings will be displayed and can be modified by typing new values into the textboxes or selecting options from drop down menus. When finished making changes click the **Update** button at the bottom of the screen. Your changes will be saved to the device.



Configure Controller

The configuration page can be accessed by clicking the Configuration link located at the top of all pages. This page allows for configuration of the controller itself. Below is a breakdown of the various options available.



Configure Settings

Configure basic settings for the controller. Aside from controller name these settings should be left at their default values.

Controller Name
Define a unique name for the controller to be displayed on the main device page.
This setting does not affect the hostname of the controller. To change the hostname of the controller please see Appendix: Advanced Networking Considerations.

Controller Address (Recommended Value: 51)
The communications address used on the RS485 bus by this controller. This setting should remain at the default value. Display devices are addressed 1-50, master devices use address 51 by default. If you have multiple master devices attached to the same bus, this address can be modified but should be done so only when required.

Communications Port (Recommended Value: /dev/ttyS0)
The hardware port used for communicating with devices on the RS485 bus. This setting should be modified only if using custom hardware.

Port Read Timeout (Recommended Value: 500)
Time in milliseconds to wait for a timeout on the bus. This setting can be increased in electrically noisy environments where device communication faults are persistent.

Enable Debug Tools (Recommended Value: Unchecked)
Enabling debug tools will display additional tools on the device specific configuration page used to troubleshoot communication issues. This setting should be unchecked unless troubleshooting is required.

Broadcast Client Time

Broadcasts the current time from your computer to all attached devices on the bus. This can be a handy tool for easily setting the current time for all modules.

Update Server Time

Update the current time of the controller with the current time of your computer.

Configure Settings (continued)

Discover Devices

If one of the devices is not appearing on the main page, you can force the controller to perform a device discovery by clicking this button. The detected devices are stored for quicker access to device information.

View Activity Log

View details of device operation and changes send to attached devices.

Configure NTP Time Servers

The controller will periodically update its clock using the NTP servers in this list. If you prefer to use an NTP server on your network you can enter it here.

Configure Startup Routines

The controller can be configured to perform several operations at system startup. These settings should not be changed unless you are familiar with the operations being performed. See **APPENDIX C** for default configuration.

Reboot

Force a reboot of the controller.

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The following information may be useful to your IT staff with advanced configuration of the sign controller to meet certain network security specifications specific to your company. In most situations you should not need to concern yourself with these details.

APPENDIX A: ADVANCED NETWORKING CONSIDERATIONS.

Note: Advanced configuration of the unit should be done only if you are familiar with and comfortable using Linux.

The network controller is a single board computer running a Linux distribution and can therefore be configured to work in any network environment. We've done our best to install support for name resolution in AdHoc networking situations as well as domain environments. Based on your network security policies you may wish to enable/disable certain features as discussed below.

1. The controller ships with an open **SSH port 22** which can be used to configure the controller suitably for your network. We recommend the Bitvise SSH client but any SSH client can be used to access the device.
2. Defaults
    a. Username: **cousign**
    b. Password: **controller**
    c. Hostname: **cousign-controller**

Change hostname

The hostname for the controller can be modified by updating the following files. Simply replace cousign-controller with your desired host name:

/etc/hosts
/etc/hostname

Use the following commands to edit the files.

sudo nano /etc/hosts

CTR-X and Y to save file

sudo nano /etc/hostname

CTR-X and Y to save file

sudo reboot to reboot

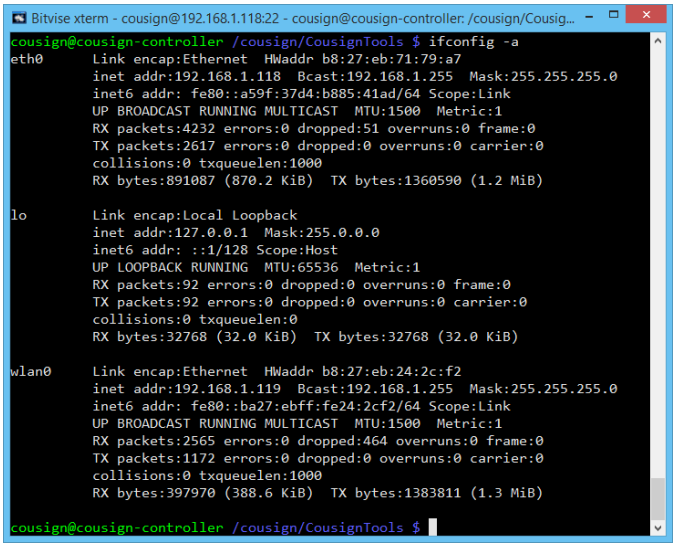
Configure Wireless Networking Interface

Most versions of the network controller ship with a Raspberry Pi 3 single board computer which contains an onboard WiFi Adapter. The following instructions will allow you to configure the device.

Verify the wlan0 device is available using the command

ifconfig –a

wlan0 should be displayed as one of the network interfaces, if it is not, your board does not support onboard wifi. A usb wifi dongle may be used instead.



Configure the network name and passphrase by editing the wpa_supplicant.conf file using the following command.

sudo nano /etc/wpa_supplicant/wpa_supplicant.conf

Add the following lines to the bottom of the file:

```
network={
    ssid="YOUR WIRELESS NETWORK NAME"
    psk="YOUR PASSWORD"
}
```

Press CTR-X to save the file and Y to save changes

It is also recommended that you add the following line to the startup routines in /etc/rc.local. This will prevent the wireless adapter from going into power save mode which might prevent requests to the webpage from being acknowledged. You may modify this file directly using sudo nano /etc/rc.local or by clicking the 'Configure Startup Routines" icon in the Configuration Section of the web controller website.

Line to add:

sudo iwconfig wlan0 power off

Finally, reboot the controller using:

sudo reboot to reboot

Configure Static IP Address

The controller comes preconfigured to use DHCP for obtaining an IP address from your network automatically. Should you wish to configure the device with a static IP address it can be accomplished by editing a single file.

Run the following command

sudo nano /etc/dhcpcd.conf

Add the following to the bottom of the file (adjust the addresses to match your network configuration):

```
interface eth0

 static ip_address=192.168.0.10/24
 static routers=192.168.0.1
 static domain_name_servers=192.168.0.1
```

The above example configure the static IP address for the Ethernet Interface (eth0). Use wlan0 to set a static IP for the wireless interface. To configure both, multiple entries can be made.

APPENDIX B: NAME RESOLUTION SUPPORT

If your DHCP server automatically updates DNS with a record of attached devices you can safely remove support for mDNS name resolution. The following is a list of components installed to support various types of network name resolution

1. PCS with WINS support can access the sign using the WINS name cs-sign

   WINS support is provided via SAMBA. See **/etc/samba/smb.conf** for configuration options.
   To remove SAMBA support completely run: **sudo apt-get purge samba**

2. Apple OS/Linux/Windows machines with LLMNR Network Discovery (AVAHI or Bonjour) support can access the sign using the following

   Note: Windows machines will often, but not always have software installed that supports AVAHI or Bonjour name resolution. If your Windows machine cannot resolve the website using this name you can install the Apple Bonjour client to allow name resolution.

   https://support.apple.com/kb/DL999?locale=en_US

   LLMNR discovery of the controlled is provided by AVAHI. See **/etc/avahi/avahi-daemon.conf** for configuration options.

   To remove AVAHI support completely run: **sudo apt-get purge avahi-daemon**

APPENDIX C: Default Configuration for Startup Routines

```
# rc.local

# give time to get current time
sleep 10

# performs device discovery, scrolls the ip address of this server and broadcasts current date/time to all attached devices
sudo mono /cousign/CousignTools/CousignTools.exe --port /dev/ttyS0 --timeout 500 --baud 38400 --iptype Ethernet --
discover --log /cousign/CousignTools.log --settings /cousign/CousignWebController/MasterSettings.xml --time --maxaddress
10 --scroll 1

#starts the webserver on port 80
cd /cousign/CousignWebController
sudo xsp4 --port 80 --nonstop &

#force init of website for quick loading
sleep 15
sudo wget http://localhost/ -O /dev/null &> /dev/null
sudo wget http://localhost/Config -O /dev/null &> /dev/null
exit 0
```