



## ControlWorks Consulting - Roku Labs HD1000 Crestron Module – v1

*Disclaimer: You must have a basic understanding of Linux and/or another \*nix operating system to be successful with the Roku HD1000 as a product. The base functionality of this Crestron module is dependent upon your ability to login into the HD1000 as a Linux user and be able to navigate and make configuration and permission changes to the HD1000 via the command line. The purchase price of this module does not include support of any kind for the Roku Linux based OS. Be sure you have access to these resources before you purchase this module.*

Please address feature requests, bug reports, etc. to [support@controlworks.com](mailto:support@controlworks.com)

### Setup notes:

For TCP/IP – put player on network. Insert TCP/IP client symbol in Crestron program. Assign IP address or fully qualified hostname of Roku player to client (*see instructions in Appendix A or B*). Set client to port 23 and connect signals as described.

For RS232 – 2/3/5 straight cable (DB9M-DB9F); 9600 8/N/1 no CTS/RTS required.

Module developed and tested with:

Crestron PRO2 v3.088

Roku Labs HD1000 v1.5.18 [**Note:** The 2.0.35 and 2.0.36 beta firmware has been tested by ControlWorks. There are issues with the API implementation in the beta firmware that prevents proper external control. Roku has been made aware of these issues. For the module to operate correctly, you must use the 1.5.18 firmware]

### Other notes:

It is possible to play music on the MP3 Player while simultaneously displaying a slideshow. Depending on the content of the slideshow, this may be too much overhead for the Roku. Particularly when there are video files in your slideshow, you may experience some audio skipping. In order to do this, launch the MP3 session, then the slideshow session. The discrete mp3 controls, including feedback, will still function while the slideshow is playing.

## Module Parameters:

### Serial Inputs

Roku\_tcpip\_rx\$ ..... If controlling via TCP/IP, connect to RX\$ of TCP/IP client.  
Roku\_rs232\_rx\$ ..... If controlling via RS232, connect to RX\$ of COM port.

### Serial Outputs

Roku\_tcpip\_tx\$ ..... If controlling via TCP/IP, connect to TX\$ of TCP/IP client  
Roku\_rs232\_tx\$ ..... If controlling via RS232, connect to TX\$ of COM port.

### Analog Inputs

Roku\_tcpip\_connect\_status ..... If controlling via TCP/IP, connect to status of TCP/IP client

### Digital Inputs

Roku\_rs232 ..... 1 for RS232 control, 0 for TCP/IP – use only one  
Roku\_tcpip ..... 1 for TCP/IP control, 0 for RS232 – use only one  
Roku\_open\_tcpip\_session ..... pulse to begin TCP/IP session  
Roku\_close\_tcpip\_session ..... pulse to terminate TCP/IP session  
Power\_on/off/toggle ..... powers unit on, off, or toggle  
Video\_composite\_480i ..... pulse to activate composite video output  
Video\_svideo\_480i ..... pulse to activate Svideo output  
Video\_component480i/480p/720p/1080i.. pulse to activate component video output at selected format  
Video\_rgb480p/720p/768p/1080i..... pulse to activate RGB (VGA) video output at selected format  
Note: only one video output can be selected at a time. A 3s delay is required between changing formats.  
Menu ..... same as remote "menu" key  
Exit..... same as remote "exit" key  
Up ..... same as remote "up" key  
Down ..... same as remote "down" key  
Left ..... same as remote "left" key  
Right..... same as remote "right" key  
Select ..... same as remote "select" key  
Previous ..... same as remote "previous" key  
Next ..... same as remote "next" key  
Play\_pause ..... same as remote "play/pause" key  
Rotate..... same as remote "rotate" key  
Info ..... same as remote "info" key  
Zoom+ ..... Hold to zoom in  
Zoom-..... Hold to zoom out  
Pan\_up/down/left/right..... Hold to pan around image  
Show\_info\_long/short/none ..... Select amount of info to display on current image  
Info\_mode\_long/short/none ..... Select amount of info to display on future images  
Fit\_mode\_fit/fit/smart..... Select fit mode for image to fill screen  
Slideshow\_play ..... slideshow plays  
Slideshow\_pause ..... slideshow pauses  
Slideshow\_next ..... next slide in slideshow  
Slideshow\_previous..... previous slide in slideshow  
Slideshow\_builtin/compactflash/sd\_mmc/memory\_stick/smartmedia starts slideshow on selected media  
Slideshow\_share..... starts slideshow on network share

Slideshow\_end ..... ends slideshow if running  
 Mp3\_builtin/compactflash/sd\_mmc/memory\_stick/smartmedia starts mp3 player on selected media  
 Mp3\_share..... starts mp3 player on network share  
 Mp3\_next ..... next song in current directory  
 Mp3\_previous..... previous song in current directory  
 Mp3\_play ..... resume if paused, play highlighted if not paused  
 Mp3\_pause ..... pause if playing

**Parameters**

ServerName..... Name of server e.g. //servername/sharename  
 ShareName..... Name of share e.g. //servername/sharename  
 Please note: You must set the share up in the Roku setup menu in order for these to correctly launch. This is done by selecting Setup -> Network Shares, and then "Find New Shares" The share you are trying to connect to **must** have a check mark in order to launch successfully. Test the share with the IR remote before you test with Crestron.

**Digital Outputs**

Roku\_tcpip\_connect ..... if controlling via TCP/IP, connect to connect line of Client  
 Power\_on/off\_fb ..... feedback for power state. Polled upon any power command change, system reboot, or TCP/IP session opening  
 Video...fb ..... feedback for video format state. Polled upon any video command change, system reboot, or TCP/IP session opening

**Serial Outputs**

Mp3\_filename\$ ..... currently playing song's filename  
 Mp3\_title\$ ..... currently playing song's ID3 tag Title  
 Mp3\_album\$ ..... currently playing song's ID3 tag Album  
 Mp3\_artist\$ ..... currently playing song's ID3 tag Artist  
 Mp3\_year\$ ..... currently playing song's ID3 tag Year



## Packing List

Roku HD1000 Module Help v1.pdf ..... this help file  
Roku HD1000 v1.umc..... Crestron user module to insert in program  
Roku HD1000 Demo TPS3000 v1.vtp..... example touchpanel (TPS-3000)  
Roku HD1000 Test Program v1.smw..... example program (PRO2)

## Revision History

V1 [tom@controlworks.com](mailto:tom@controlworks.com) 2004.03.26  
- first release



## Appendix A – Assigning a Static IP via RS-232

1. Connect a straight through DB9F to DB9M serial cable to the Roku HD1000. Allow the HD1000 to fully boot.
2. Launch Crestron Viewport and hit ALT+D. Setup the connection for 9600, N,8,1 with no hardware or software handshaking.
3. At the \$ prompt, type **su**↵ to be given root shell access. You will know you have root access when the prompt changes to #
4. At the # prompt, type the following:  
**cd /etc/sysconfig/network-scripts**↵  
**cp ifcfg-eth0.orig ifcfg-eth0**↵  
**chmod 755 ifcfg-eth0**↵  
**vi ifcfg-eth0**↵

You are now in the Unix text editor VI. VI was written before the advent of arrow keys on the computer keyboard, so the interface takes a bit of getting used to for the uninitiated. You need to change the IPADDR, NETMASK and GATEWAY values to reflect your desired static IP setup.

Essentially, you are not entering text with the keyboard until you press **i** to launch the “insert” mode. You are navigating around the screen with commands such as **h j k & l**. Once you are in the “insert” mode, you can type text as you normally would until you press **<esc>**.

Here are some commands to help you navigate through VI:

<b>h</b>	move left
<b>j</b>	move down
<b>k</b>	move up
<b>l</b>	move right
<b>i</b>	insert mode (everything you type goes in file rather than performing commands until you press escape)
<b>x</b>	delete one character
<b>dd</b>	delete entire line
<b>:q!</b>	quit without saving changes
<b>:w!</b>	save
<b>:q</b>	quit

5. Save the file by typing **:w!**↵ and then quit VI by typing **:q**↵
6. Type **sync**↵ at the # prompt.
7. Reset the HD100 by holding down the front panel power button for 5 seconds. The HD1000 will come up with the static IP address you set.

# Appendix B – Assigning a Static IP via Telnet

## Static IP Setup Instructions via Telnet

1. Allow the HD100 to boot
2. At the command prompt type **telnet**↵ **open xxx.xxx.xxx.xxx**↵ where the “xxx.xxx.xxx.xxx” represents the current DHCP assigned IP address of the HD1000. This address is available on the top of the setup page of the HD1000.
3. At the login prompt type **root**↵ which will grant you shell access without a password. You will know you have root access when the prompt changes to #
4. At the # prompt, type the following:  
**cd /etc/sysconfig/network-scripts**↵  
**cp ifcfg-eth0.orig ifcfg-eth0**↵  
**chmod 755 ifcfg-eth0**↵  
**vi ifcfg-eth0**↵

You are now in the Unix text editor VI. VI was written before the advent of arrow keys on the computer keyboard, so the interface takes a bit of getting used to for the uninitiated. You need to change the IPADDR, NETMASK and GATEWAY values to reflect your desired static IP setup.

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<b>x</b>	delete one character
<b>dd</b>	delete entire line
<b>:q!</b>	quit without saving changes
<b>:w!</b>	save
<b>:q</b>	quit

4. Save the file by typing **:w!**↵ and then quit VI by typing **:q**↵
5. Type **sync**↵ at the # prompt
6. Type **exit**↵ at the # prompt to terminate your telnet session.
7. Reset the HD100 by holding down the front panel power button for 5 seconds. The HD1000 will come up with the static IP address you set.

## Appendix C – Problems with Permissions

**SYMPTOM A:** Roku HD1000 completely crashes when I try to launch a slide show off of a particular media directly from the Crestron module.

**SYMPTOM B:** Roku HD1000 completely crashes when I try to launch the MP3 player off of a particular media directly from the Crestron module.

**PROBLEM:** The Roku doesn't like something about one of the files or folders on that media. For instance, the "built-in" memory contains a folder called "lost+found" that may have improper permissions set.

**SOLUTION:** It is assumed that you have a basic understanding of \*nix operating systems in order to successfully integrate a Roku HD1000. If you do not, these instructions **may** be of assistance in attempting to resolve issues with permissions. If you do not have a \*nix background, **proceed at your own risk**. A copy of [Linux in a Nutshell: Fourth Edition](#) by Ellen Siever, Aaron Weber, and Stephen Figgins (ISBN 0596004826) is a highly recommended companion.

1. Determine what file is causing the crash.
  - a. While connected to your Crestron processor, open test manager. Set a watch on the RX\$ signal coming back from the Roku HD1000
  - b. Launch the offending slide show.
  - c. Watch in Test Manager for the dying transmissions of the HD1000. It may indicate a failure

of the ScanDirectory() call, as follows:

```
roku_rs232_rx$ = ecp photoApp SLIDESHOW /mnt/flash0[0Dh][0Ah] (05/14/04 - 08:50:17 AM)
roku_rs232_rx$ = 2 not found on VIP bus.[0Dh][0Ah][0Dh][0Ah]Core Version: 14.0.0.0[0Dh][0Ah]LLD Version: 14.0.0.0[0Dh][0Ah]HKD Version: (05/14/04 - 08:50:18 AM)
roku_rs232_rx$ = 14.0.0.0[0Dh][0Ah][0Dh][0Ah]Core initialization completed.[0Dh][0Ah][0Dh][0Ah]ecp photoApp IMAGEDIR /mnt/flash0 (05/14/04 - 08:50:18 AM)
roku_rs232_rx$ = [0Dh][0Ah] (05/14/04 - 08:50:18 AM)
roku_rs232_rx$ = ScanDirectory(): (05/14/04 - 08:50:18 AM)
roku_rs232_rx$ = stat of /mnt/flash0/lost+found/ (05/14/04 - 08:50:18 AM)
roku_rs232_rx$ = .. failed[0Dh][0Ah]ScanDirectory() recursive cal (05/14/04 - 08:50:19 AM)
roku_rs232_rx$ = l failed; aborting.[0Dh][0Ah] (05/14/04 - 08:50:19 AM)
```

- d. The directory or file indicated after **stat**, in this cast the directory /mnt/flash0/lost+found/, has improper permissions.
2. Change directory into the directory containing the file or directory you are having problems with. In this case, you would type **cd /mnt/flash0**← flash0 is the builtin flash, flash1 is the compact flash card slot, etc.
  3. Type **ls -l** for a verbose listing of the contents of the directory. You will see a listing of the files and directories contained on the built-in flash (/mnt/flash0):

```
# ls -l
----- 1 root    root          0 Dec 31  1999 YAFFS
drwxr-xr-x 1 root    root         512 Sep 25  2003 etc
drwxr-xr-x 1 root    root         512 Sep 25  2003 home
dr-x-wx-wx 1 root    root         512 Dec 31  1999 lost+found
```

4. The permissions are the flags on the left. As you can see, the directory **lost+found** does not have the same permissions as the others in this example. You can change permissions by typing **chmod 755 lost+found**← Then type **ls -l** again to check your progress:

```
# chmod 755 lost+found
# ls -l
----- 1 root    root          0 Dec 31  1999 YAFFS
drwxr-xr-x 1 root    root         512 Sep 25  2003 etc
drwxr-xr-x 1 root    root         512 Sep 25  2003 home
drwxr-xr-x 1 root    root         512 Dec 31  1999 lost+found
```

5. The permissions have now been set correctly to **drwxr-xr-x**. You are now ready to launch the slideshow. Continue this process until you have found all incorrect permissions on the desired media.



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Software refers to all files provided as a part of a project for use with Crestron hardware including, but not limited to: all network devices, CNX generation platforms, 2-series platforms, Ethernet devices and the Crestron line of wired and wireless Touchpanels, as well as any future hardware that may support the use of these files.

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