

# QUICK START GUIDE

## MediaStar 798 HDMI HD Encoder Installation Guide



The 798 HDMI Encoder is an HDMI input H264 video and audio encoder which outputs a 'live' multicast IPTV stream. An HDCP Professional enabled encoder can stream an HDCP protected HDMI source to an unlimited number of screens using the 782 Media Player, or to PCs using the MediaStar Portal Player software application.

A 'live' HDMI video source (such as a satellite settop box or PC) can be plugged into the HDMI input on the encoder. The video and audio signals will be encoded in H264 video and AAC audio formats and will be passed across an IP network as a UDP multicast or unicast MPEG2 transport stream. IP settop devices, screens and software applications can receive the IP stream and display the 'live' TV pictures to their users.

The 798 unit will accept a standard HDMI input with a TV resolution up to 1080p/60. If the HDMI source does not have HDCP encryption, then a 'standard' 798 encoder can be used. If the HDMI source is protected with HDCP, then a 798-HDCP variant encoder must be used.

The 798-HDCP encoder will distribute the stream across the network with HDCP encryption and implements the other security and locality checks that the HDCP Professional (HDCP Pro) standard requires.

### What's in the box:

- 798 HDMI HD Encoder Blade
- HDMI Cable
- CAT5 Patch cable

This includes exchanging encrypted security credentials with 'client' devices and so the 798 HDCP Pro encoder will only work with HDCP Pro enabled 782 units and MediaStar Portal Player software.

The 798 unit is configured via webpage configuration menus. The system administrator can configure a range of parameters, including the encoded picture resolution and both the video and audio data rates. The configuration menus can be password protected.

The encoder has a built-in IR blaster that can control the HDMI source device that is connected to it. The 782 media player at the user's display captures the IR keypress and passes it across the network to the 798 encoder. The encoder then replicates the IR keypress locally, so the source device sees it and updates its HDMI output accordingly.

The 798 encoder 'blade' has a HDMI output port so the HDMI input can be monitored locally. It can be used in a MediaStar 770 or 770-DR 19" 3 RU rack, or in a MediaStar 769 single 'blade' chassis.

# Installation

**This HDMI Encoder unit should only be used in a MediaStar 770 rack or a 769 Single 'Blade' chassis that has been fully installed in accordance with its safety instructions. There are no user serviceable parts within this module. Refer all servicing to qualified service personnel.**

The 798 HD Encoder 'Blade' may be installed in a 769 chassis or 770 rack with the power on or off. If the 770 rack is to be powered down to install a new module, please remember that all video/audio services being provided by the equipment in that rack will be lost while it is powered off. Electrical static discharge precautions should be taken when handling the 'Blade'.

**To install the 798 'Blade' in a 770 rack or a 769 single 'Blade' chassis, do the following:**

1. Remove the existing front panel blanking plate(s) on the 770 rack. This is done by unscrewing the finger-screw fasteners. Retain this blanking plate in case the encoder 'Blade' is removed from the rack in the future.
2. Carefully align the top and bottom edges of the 'Blade's printed circuit board into the plastic rack slides, and gently push it in. As it reaches the back of the 770 rack, the plastic aperture cover on the rear of the rack will be pushed off by the 'Blade's HDMI connector. Collect the discarded aperture cover and dispose of it. If the rack or chassis is powered up, the new module will power up as it is pushed in. If the rack has been powered down, repower it now. The status LED on the front of the encoder will show orange, then flashing orange as it boots. After a few seconds, the LCD panel will show the boot up progress of the unit, then its operational status.
3. Tighten the finger screw fasteners to hold the module in the rack/chassis.
4. Set the unit's IP address, using the front panel display and buttons as described below. Only use IP address details that have been supplied by your network administrator. Each MediaStar 'Blade' device is preconfigured with a static IP address of 172.21.51.208. This will need to be re-configured, so it is not in conflict with other MediaStar equipment. Use the front panel LCD and push buttons to set the correct IP address settings (described below).

**Press the front panel UP or DOWN buttons to move through the LCD menu options. Press the OK button to select a menu or confirm a change. Press the UP and DOWN buttons together to move back up a menu level (or allow it to time-out). Pressing the UP, DOWN and OK buttons for 5 seconds will reset the unit.**

Press the DOWN BUTTON to move to the IP Settings menu and press OK to enter the menu. Press DOWN then OK to select the static IP address settings. Press OK to edit the current static IP address. Use the UP or DOWN buttons to select the appropriate digit and press OK to set it. The next digit can then be edited in the same way. It is not possible to move back to a previous digit. Press UP and DOWN together to abort the input if necessary. Once the last digit is entered, the IP address is checked and then applied. The IP netmask, gateway and DNS server can be set in the same way.

If a DHCP allocated IP address is required, navigate the menus to the IP Settings – DHCP menu and press OK to select DHCP and OK to confirm. The display will show the allocated IP address details once a lease has been obtained. If required, the MAC address of the unit can be found under the Unit Details -> MAC Address menu, or on the label on the bottom face of the unit.

5. Plug the HD Encoder into an access network port using the CAT5 patch cable supplied. It will auto-negotiate up to a 1000 Mbps link with the network switch.
6. Connect to the HD Encoder's configuration web pages using a PC/MAC and Web browser software (e.g. Edge, Chrome or Firefox), by entering the encoder's IP address into the browser's address bar. Click through any warnings and the Encoder's specification page will then be shown.

7. Click on the Network Setup page link on the left-hand side pane to enter the network configuration page. If you have not already done so, configure the network gateway and DNS server addresses. If the encoder is to be used in HDCP Pro mode, then the encoder may need access to the internet to read timestamp and SRM files from the digital-cp.com website (see HDCP Pro operation section for further details).

In the Hostname field set the name of the encoder. This name will appear in the Media Manager software as the default name of the encoder and the default name of the stream media icon the encoder produces, so it is recommended that this is associated with the name of the source video feed.

8. Click on the Date/Time page link and set up an NTP time server that will be accessible when the encoder is in use. The time is used to time-stamp event messages in the Event Log, which will assist debugging if required. If no local time server is available, the internet based pool.ntp.org server is recommended.

**NOTE:** An HDCP PRO encoder MUST be connected to an AUTHENTICATED time server (this is one which is referenced back to an official Internet based time server) OR THE ENCODER WILL NOT STREAM THE HDCP PROTECTED HDMI INPUT SIGNAL. This is so the encoder can verify it is checking an 'in-date' SRM file (see HDCP Pro operation section for further details).

9. Click on the Encoding Standard link on the left-hand side panel and set the required video and audio encoding parameters. This includes the encoding bit-rates, whether the encoding process uses Constant or Variable bit rate encoding (CBR/VBR), whether stream encryption is to be used and the output stream picture resolution.

Set the Streaming Address of the network IP stream (do not leave this at its default value). This would normally be a multicast address in the range 224.0.0.0 to 239.255.255.255. MediaStar Systems recommend using 239.192.xxx.yyy, but your network administrator should provide the correct multicast address for you, as the network must be configured separately to allow these streams to pass around the network. Ensure each IPTV stream in your system uses a different stream address.

When an HDMI source is connected to the 798 encoder:

- If the HDMI input signal is not protected with HDCP, the HDMI input will be streamed on the network without protection.
- If the HDMI input signal is HDCP protected and the encoder is NOT HDCP Pro enabled, the output stream will show a warning message saying it is not possible to stream this HDMI source.
- If the HDMI input signal is HDCP protected and the encoder is HDCP Pro enabled, the encoder will stream the live image using HDCP Pro protection.
- If the HDMI input is NOT HDCP protected but the encoder is HDCP Pro enabled, the user can optionally apply HDCP Pro protection to the stream. Please note though - only 782 Media Players and PC Portal Player software V4 and above can view HDCP Pro protected IPTV streams.

The Status and Encoding Standard pages show whether the current HDMI input source is HDCP protected or not.

10. The 798 encoder should now automatically appear as a new source device in the Media Manager software (Source Devices -> Encoders -> New Encoders folder). If it does not, create a new encoder icon (Workspace right-click -> Create -> Encoder -> 798) then on the Encoder icon enter the IP address of the encoder, then right click the icon and click on the Refresh Selected Hardware option. Media Manager will then communicate with the encoder and create a new media icon for its stream.

The stream generated by the encoder is represented as a new media icon which can be found in the Media Sources folder. You can then use Media Manager to allocate use of the new encoder TV channel to a Media Player or Portal page software viewer using the full range of Media Manager media controls (Playlists, Selection Lists etc.).

# HDCP Pro operation

HDCP Professional allows the distribution of HDCP protected content to an unlimited number of screens. This is a significant change from the traditional HDCP limited distribution model, but it is essential for legal HDCP protected content distribution in modern business IPTV systems.

Initially, the end user must sign a commercial agreement with MediaStar Systems, specifying where the equipment is going to be used, and confirming that they have signed up to an appropriate commercial agreement to legally distribute the TV content. The end user is also obliged to return all HDCP Pro enabled equipment to MediaStar Systems at the end of its life. Once this agreement is in place, MediaStar Systems will dispatch MediaStar Pro enabled 798 HDMI Encoders for installation or will provide Enablement codes to upgrade existing 798 encoders.

The front panel LCD and the Status web page show the part number of the encoder which indicates if the encoder is HDCP Pro enabled. If it says '798-HDCP' then it is HDCP Pro enabled. Non HDCP Pro encoders can be enabled in the field with a chargeable enablement code if required.

Once the encoder has been setup according to the instructions above, it will establish a link to an authenticated time sever to determine the current date and time. The encoder will try and download a SRM and Timestamp file from the Media Manager server. If the files are not available there, it will try and access the internet directly to download these files from the digital-cp.com website.

If the encoder is on a LAN without an internet connection, the end user must **regularly** (at least quarterly) download the timestamp and SRM files from the URLs below (you will need a file transfer program to do this) and drag the files onto the Media Manager software workspace. Media Manager will then distribute the files to all 798 HDCP Pro encoders in the system.

SRM file: <https://www.digital-cp.com/sites/default/files/resources/HDCP2.SRM>

Timestamp file: <https://www.digital-cp.com/sites/default/files/resources/HDCPro.timestamp>

The SRM file indicates to the encoder that it is an authorized HDCP Pro device, and the timestamp file indicates when this declaration was valid. Each SRM file is dated and is only valid for 3 months, so the encoder must regularly receive updates of these two files, or it will cease HDCP Pro operation. The status page of the encoder shows the date when the encoder will stop working if it does not receive updated SRM and Timestamp files, and it will issue visible on-screen warnings as the SRM expiry date approaches.

The HDCP Pro protected stream that the encoder produces will be allocated (through Media Manager software) for playout on a HDCP Pro enabled 782 unit or on a MediaStar Portal Player software installation.

When the user selects the HDCP protected stream for viewing, the 782 (or Portal Player software) will detect the stream is HDCP Pro encrypted, and it will automatically begin a 'login' session with the 798 encoder. In this process, the 782 is authenticated as a genuine MediaStar device and it is established that the 782 and 798 are in the same network 'locality'. This means the round-trip time of an encrypted communication between the two devices takes less than 7mS. Although this sounds a very short time, this does not pose a problem on most modern LANs. Once the locality check is completed, the encoder will pass decryption keys to the player, which will then start showing the live TV picture.

The HDCP Pro Info web page on the encoder shows a list of all the devices that are currently watching the HDCP Pro protected stream, along with their locality time check periods. If these exceed 7mS then intermittent stream access will result.

# Browser based Configuration Menus

The HDMI Encoder's web page configuration menus allow the full range of operational parameters to be set. When using the web pages, full contextual help is provided on the right side of the screen. When changes have been made, press the APPLY button at the bottom of the page to ensure these take effect.

**Specification** - The specification page includes details of the capabilities of the product. Please note that this unit may not have all the options mentioned. The Status page shows all the optional features currently enabled.

**Status** - Shows the full operational status of the encoder, including the Part number, Serial Number, and Unit name (also the DHCP name identifier).

**Encoding standard** – This is where the encoding and output stream configuration is specified.

**HDCP Pro Info** – Details of the currently connected HDCP Pro clients are shown here. This includes the IP address of the client and the locality time check period.

**Date/Time** – Set up the NTP time server here (pool.ntp.org recommended).

**RS232 Port** – Configure the port settings for the IP to RS232 link or for the SIPI command interface.

**Network Setup** - Allows specification of the Network Connection; Static or DHCP addressing, device Hostname, IP Address, Subnet Mask, and Gateway settings. Confirm these with the network administrator before configuring.

**Update Locations** – This is the URL of the MediaStar http server and folder that the encoder will look at for software updates and configuration files. It will normally automatically be set by the Media Manager server. The encoder will only accept new software that has been digitally signed by MediaStar Systems.

**Enablement Code** – Enter enablement codes here to reconfigure or expand the capabilities of your unit. Details can be obtained from your reseller or MediaStar Systems. Reset checkboxes are also located here.

**Set Password** - A password may be set to prevent the unauthorised modification of the unit's configuration. This can be done locally or via Media Manager software (recommended). If the password gets lost, contact MediaStar for assistance, quoting the serial number of the unit affected.

**SAP** - The encoder can produce Session Announcement Protocol (SAP) messages if required. This allows networked devices to detect the presence of the stream on the IP network (if they support this detection method).

**SNMP** – Configure to send SNMP 'event' warning messages, and set-up the servers to send the messages to.

**Email Logs** – Event logs can be periodically emailed to a recipient. Specify the email server and recipient email address here.

**Event Log** – This shows a full list of the 'events' that the encoder has experienced. These include notifications such as loss of streams. Significant messages will also produce an SNMP traps when enabled.

**IR Blaster** – Configure the type of IR blaster cable being used here. You can also continuously repeat the last IR key received as an aid to IR blaster location setup.

**Locator LEDs** - Allows the front and rear panel status LEDs to be flashed RED/GREEN from the front panel or web page to help identify the physical encoder unit in a rack.

# Technical Specification

<b>PHYSICAL</b>	129 x 41 x 200 mm, 5" x 1.6" x 7.9", occupies 1 770 Rack slot or a 769 Chassis, 0.6 Kg, 1.3 Lbs.
<b>ENVIRONMENTAL</b>	0°C to 40°C, 32°F - 104°F (enclosure ambient). Internal temperature monitoring via web page.
<b>POWER</b>	17 W (from 770 rack or 769 single 'Blade' chassis)
<b>LAN</b>	RJ45 802.3 100/1000 Base-T Auto MDIX. Static or DHCP IP Addresses. TTL and DSCP QoS stream tagging.
<b>NETWORK PROTOCOLS</b>	UDP, TCP, ARP, DHCP, ICMP, IGMP V2/V3, HTTP, Telnet, SNMP, SMTP, DSCP
<b>HDMI INPUT</b>	HDMI 1.3, 480i – 1080p60, 600x480p60, 800x600 p60, 1024x768p60 HDCP 1.4
<b>VIDEO ENCODING</b>	MPEG 4-10/H.264 MP@L4, CBR/VBR encoding, supported bit rates 50 Kbps - 20 Mbps
<b>AUDIO ENCODING</b>	AAC Encoding, 32, 44.1, 48 KHz sampling, 96 – 320 Kbps
<b>OUTPUT STREAM</b>	480i – 1080p60 Unicast or Multicast UDP MPEG2 transport stream. Stream produced with HDCP Pro content protection on HDCP Pro enabled encoders.
<b>HDMI OUTPUT PORT</b>	Local HDMI monitor port
<b>USB</b>	USB 3.0 host port used for keyboard/Mouse, software upgrade via memory stick.
<b>RS232 PORT</b>	Rx, Tx, CTS, RTS up to 11,5200 Baud Configured for SIPI external configuration/control OR IP to RS232 bidirectional pass through for external device control.
<b>FRONT PANEL</b>	LCD Display and 3 push buttons for local configuration.
<b>WEB PAGE CONFIGURATION</b>	Configuration web pages for easy setup.
<b>EVENT MONITORING</b>	Key operational warnings reported via SNMP traps sent to third party SNMP manager (MIB available via link on unit's SNMP web page). Automatic e-mail of Event log files via external SMTP server.
<b>SOFTWARE</b>	Fully upgradable with ONLY protected MediaStar software from an HTTP server or local USB memory key.
<b>APPROVALS</b>	FCC, CE, RCM, CB, TUV Approved as part of 770 rack or 769 single 'Blade' chassis.



# Declaration of Conformity

Cabletime Limited (trading as MediaStar Systems) declares that the products listed below, when installed and operated as described here, conform to the requirements of the directives shown:

Product name: MediaStar HD HDMI Encoder  
Product part numbers: 798

## Directives:

2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2014/35/EU	Low Voltage Directive
2011/65/EU	RoHS2

## The standards applied are:

EN55032:2012/AC 2013	Electromagnetic compatibility of multimedia equipment – Emissions requirements.
EN55024:2010 (including corrigendum June 2011)	Information Technology equipment – Immunity characteristics.
EN61000-3-2:2014	Limits for harmonic current emissions.
EN61000-3-3:2013	Limitation of Voltage changes, voltage fluctuation and flicker
IEC 60950-1:2005 + A1:2009 + A2:2013	Information Technology Equipment. Safety Requirements.
EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 UL 60950-1:2007/R:2014-10 CAN/CSA C22.2 No. 60950-1:2007 /A2:2014-10	
IEC 62368-1:2014	Audio/video, information and communication technology equipment Safety Requirements.
EN 62368-1:2014 UL 62368-1/2014 CSA/CAN C22.2 No. 62368-1-14	

## CB Certification

Applicable to all CB scheme subscribing territories.

I hereby declare that the products listed here conform to the directives shown above when installed and used according to their respective manuals.

**Keith Watts**  
Technical Director

October 2021



# United States of America

Cabletime Limited (trading as MediaStar Systems) declares this equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules Subpart B (15.107, 15.109). These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with part 15 of the FCC Rules.

## Operation is subject to the following conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.



## Correct Disposal of this Product

This marking on the product, accessories or literature, indicates that the product and its electronic accessories should not be disposed of with other household waste at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

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