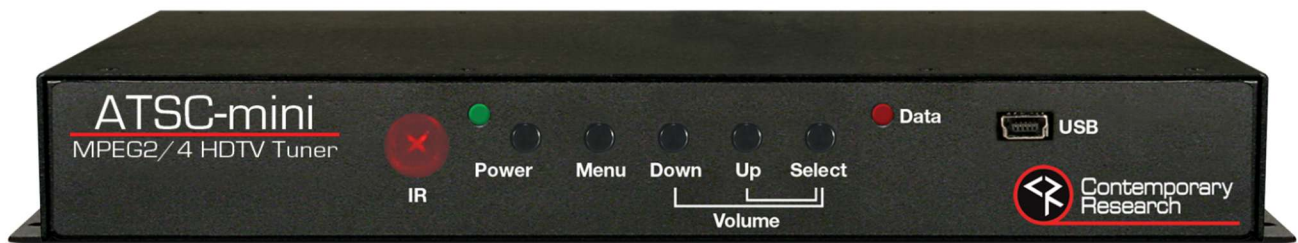




# ATSC-mini HDTV Tuner

## Product Manual



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# **1. Overview**

The Contemporary Research ATSC-mini HDTV Tuner is a full featured ATSC/NTSC HDTV tuner for professional applications. The ATSC-mini will tune ATSC air, clear QAM cable, and NTSC air and cable channels. The low-profile design allows for mounting behind flat panel displays.

The HDTV tuner supports full 2-way RS-232 control, configuration, and status monitoring via rear panel serial port, IP Telnet, and UDP for integration with third-party control systems.

Front panel controls are available for channel selection, volume, power, and menu. The unit may also be controlled by the optional HD3-RC IR remote via the front panel IR sensor or remote IR sensor connected to the rear panel IR port.

On-board web pages allow for remote configuration, control, and monitoring from a web browser.

When used as part of an Ethernet based iCC-Net control system, the tuner will respond to power, channel, and volume commands. The control interface may be the Display Express Lite application included with an ICE-HE-DXL or IP-DXL Display Control Center, Display Express software, or a third-party control system.

## **Features**

### Tuning

- ATSC air and Clear QAM cable channels
- NTSC air and cable channels
- Air channels 2-69
- Cable channels 2-135, Standard, HRC, and IRC

### Decoding

- MPEG-2 or H.264 digital channels
- Supports AC-3, MPEG-1 Layer 2, or AAC audio formats
- Supports multiple audio programs

### Video

- HDMI Type A, Version 1.4b
- Output scaling to 480i, 480p, 720p, 1080i, 1080p, and 2160p
- Adjustable overscan

### Audio

- HDMI embedded AC-3 pass-through, PCM Fixed, or PCM Variable
- S/PDIF optical digital audio output
- Variable analog stereo

### Closed Captions

- Decodes analog and digital closed captioning

### Setup and Control

- Control via front panel, on-board web pages, RS-232 commands, or optional HD3-RC IR remote
- Two-way control via RS-232, Telnet, or UDP
- One-way control via ICC-Net UDP commands
- CEC control available on HDMI output
- Setup via on-screen menus, web pages, or RS-232 serial commands
- Receives iCC-Net protocol control commands over Ethernet for power, channel selection, and volume
- Firmware updatable over Ethernet with CR Toolbox software for PC

## **2. Installing the ATSC-mini**

The slim profile of the ATSC-mini allows for mounting behind a flat panel display. The unit may be attached to the flat panel display with user provided hook and loop fastener adhesive tape or attached to the wall using the mounting ears. The unit may also be set flat on a suitable shelf or other stable flat surface.

Connect the HDMI output to a video display. Analog and S/PDIF digital audio outputs are available for connection to an amplifier or audio system processor. Connect a coaxial cable from the CATV or antenna source to the Air/Cable input connector. The ATSC-mini will need to be connected to an appropriate power source. Power may be supplied from the included PS-12-1.0 power supply or PoE from a compatible network switch or PoE injector.

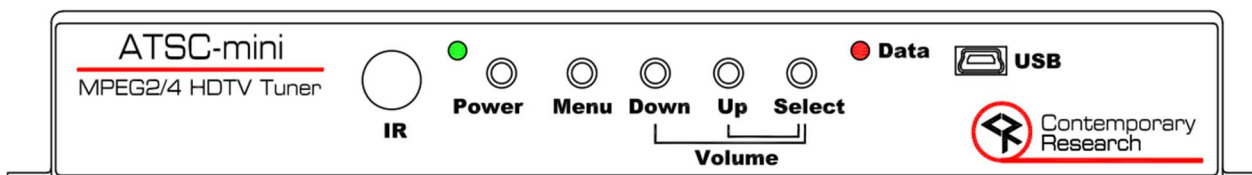
Following the completion of the physical installation of the ATSC-mini, a channel scan will need to be performed prior to viewing programs. The channel scan may be initiated in the on-screen text A/V menu, the on-screen graphical menu, control web page, or via RS-232 serial command.

## **3. ATSC-mini Control and Setup**

The control and setup functions of the ATSC-mini may be accessible by various methods.

- On-Screen graphical and text menus accessible from front panel or optional handheld IR remote
- On-board web pages
- Two-way RS-232 protocol control and configuration commands via rear panel DB-9 serial port or Telnet
- One-way iCC-Net protocol control commands delivered over the Ethernet through an ICE-HE-DXL or IP-DXL display control center, Display Express Server PC, or third-party control system processor

## 4. Front Panel Operation



### Front Panel Button Operation

Button	Operation
Power	Toggles On   Off
Menu	Push to display on-screen Graphical Audio/Video menu Hold to display on-screen Text Setup menu
Down	Channel Down
Up	Channel Up
Select	Push to select menu item Hold to display current IP address on-screen
Select + Down	Volume Down
Select + Up	Volume Up
Down + Up	Toggles Audio Mute
Menu + Up	Unlocks previously locked buttons until power cycle
Menu + Select	Restore factory default video settings

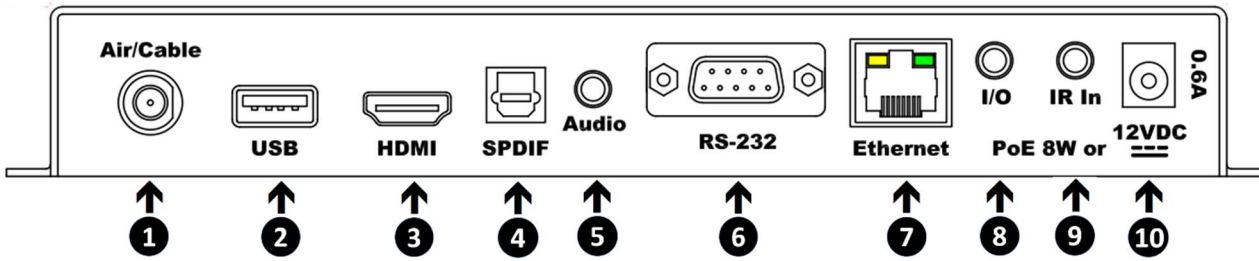
### Power LED Operation

Mode	Status
Red Solid On	Unit is Off
Green Solid On	Unit is On and channel is locked
Green Slow Blink	Unit is On and is searching for signal (1 second on, 1 second off)
Green Fast Blink	Powering up (¼ second on, ¼ second off)
Red Flash	IR remote button press
Green, Staggered Blink	On-screen Menu (Blink-Blink-Pause sequence)
Red Fast Blink	Bootloader Mode (uses RS-232 connector)
Red/Green Alternating	Firmware Update Mode

### Data LED Operation

Mode	Status
Red Flash	RS-232 Data Transmit
Green Flash	RS-232 Data Receive

## 5. Rear Panel Connections



### **1** Air/Cable

“F” female connector for RF Input to tuner.

### **2** USB

USB-A service port. May be used for tuner/decoder firmware updates.

### **3** HDMI

HDMI receptacle, Type A, Version 1.4b. The output normally automatically detects an HDMI or DVI display. The audio format follows the digital audio output format setting.

### **4** SPDIF

JIS F05 jack for optical S/PDIF digital audio output. The audio format follows the digital audio output format setting.

### **5** Audio

3.5 mm TRS jack for variable level stereo analog audio output

### **6** RS-232

DB-9 port for RS-232 data link to control system, 1200 to 230K baud, 8 data bits, no parity, 1 stop bit

- Pin 2= Data Receive
- Pin 3= Data Transmit
- Pin 5= Ground

### **7** Ethernet

RJ-45 jack, 100Mbps, PoE

### **8** I/O

For future use

### **9** IR In

3.5 mm TRS jack for optional external IR receiver or wired IR from a control system processor.

- Tip= +5v DC (50mA max)
- Ring= Input
- Sleeve= Ground

### **10** 12VDC

Power input 2.1mm coaxial jack (inside center conductor positive). May be used in lieu of Ethernet PoE.

## 6. Setup Notes

### Channel Scan

A channel scan will be required prior to initial use and subsequently following any changes to the received channel line-up. The channel scan may be initiated in on-screen graphical menu, on-screen text menu or by RS-232 command. The Air or Cable scan mode should be selected for the intended application prior to initiating the scan.

### Tuning Cable Channels

The ATSC-mini will skip encrypted channels automatically during a channel scan.

### Air/Cable

The ATSC-mini has separate channel memories for air and cable channels. It is possible to toggle between the two channel memories. A separate channel scan for each mode will be required. The scan of analog channels may be skipped by pressing **Select** after the scan has started.

The Air/Cable mode may be toggled by:

- **A/C** button on optional HD3-RC infrared remote control
- **A/C** button on Control web page
- **Air/Cable** button on A/V web page
- Press **Menu + Down** simultaneously on the front panel
- RS-232 command

### HDMI Output

The HDMI output conforms to HDMI Version 1.4b. The HDMI output is always active. The YPbPr/RGB colorspace follows the YPbPr/RGB configuration setting in the AV Setup menu.

The output normally automatically detects an HDMI or DVI display when the HDMI-DVI Output mode is set to Auto. Manual selection of HDMI or DVI mode is available in the front panel AV Setup menu, AV Setup web page, or via RS-232 serial command.

The default aspect ratio is 16:9. The aspect ratio of 4:3 is supported. This setting is available in the on-screen graphical A/V Setup menu.

The HDMI digital audio format follows the digital audio output format setting in the AV Setup Menu.

### Video Resolution and Frame Rate

Available video resolutions and frame rates are shown in the table below. The default setting is 720p/59.94.

Resolution \ Frame Rate	2160p	1080p	1080i	720p	480p	480i
29.97Hz	✗	✗	✓	✗	✗	✓
30Hz	✓	✗	✓	✗	✗	✗
59.94Hz	✗	✓	✗	✓	✗	✗
60Hz	✓	✓	✗	✓	✓	✗

### Audio

All audio outputs are active simultaneously. The audio format options are AC-3, PCM, and PCM variable. The volume level settings do not affect the level of digital audio when set for AC-3 or PCM. PCM Variable supports volume control on all audio outputs. The analog audio output will follow the volume level settings and is independent of the audio format selected. If there is no audio, make sure the volume is all the way up (and not muted). A “motorboat” sound may indicate that the display does not support AC-3, and the mode should be changed to PCM or PCM variable.

### IR Control

The tuner supports infrared control from the HD3-RC handheld infrared remote or equivalent. The ATSC-mini is backwards compatible with the HD2-RC IR remote. The tuner will also respond to a programmable remote with the TV type set for Sharp.

The front panel status LED will flash red when an IR command is received.

IR control data may be received via the front panel IR sensor or an IR-RXD remote IR sensor connected to the rear panel IR port. IR control may be disabled in the on-screen System Setup text menu, System web page, or RS-232 serial command.

## Web Pages

The ATSC-mini has on-board web pages for control and configuration. The web pages may be accessed by the internet browser of any device on the network by entering the unit's IP address in the browser address bar. All web page access is password protected by default. Various web page modes are available.

- Password required to access all web pages.
- Free access to tuner control web page, but password required to access configuration web pages.
- Free access to all web pages, no password required.
- Disable all web page access.

Refer to Section 11 in this document for more information.

## HDMI CEC Display Control

HDMI CEC may be enabled for controlling display power. HDMI CEC sends standardized control commands over the HDMI cable. CEC functionality is available in many TVs and displays designed for the consumer market. If control of the TV or display via HDMI CEC is desired, it is important to check the TV or display's documentation to determine if CEC is supported.

It is common for manufacturers to use their own unique term to refer to HDMI CEC. For example, Samsung refers to CEC as Anylink. LG refers to it as SimpLink.

CEC may need to be enabled in the display. Some displays will automatically detect that a CEC supported device has been connected and prompt for confirmation.

Although the industry strives for standardization relating to CEC, it is possible that some or all CEC control communication between the ATSC-mini and connected display may not function depending on display make and model.

## RS-232 Display Control

The RS-232 serial com port may be used for display control. The ATSC-mini can receive iCC-Net control commands via Ethernet from an ICE-HE-DXL Display Control Center, Display Express Server PC, or third-party control system processor. A command is available that will send custom command strings from the RS-232 serial com port. The protocol only supports one-way communication, so any responses from the display will be ignored. Refer to section 13 for details on the iCC-Net protocol.

## Restore Factory Default A/V Settings

The video and audio default settings may be restored from the front panel should a resolution be selected that is not supported by the connected display. The default output resolution is 720p/59.94 as this is supported by a wide variety of display types.

The default AV settings may be restored by simultaneously pressing **Menu** and **Select** buttons on the front panel.

## Restore Factory Default Settings

The password will be reset to the default by reloading the factory default settings. This may be performed from the **System** web page. Click on the **Restore** button next to **Restore Factory Default Values**. It is recommended to perform a hard power cycle after the default settings are restored.

If access to the web page is not available, the factory default settings may be restored from the on-screen text **System Setup** menu.

Follow the steps below to reload the factory default settings.

- Hold and release the **Menu** button to display the on-screen text menu.
- Press **Up** or **Down** to step through the menu options until **System Setup** is displayed, then press **Select**.
- Press **Up** or **Down** until **Firmware** is displayed, then press **Select**.
- Press **Up** or **Down** until **ATSC-mini V1.xx** is displayed in the lower row of text.
- Simultaneously press **Power** and **Up**.

Alternately, the factory default settings may be reloaded by RS-232 command. Refer to section 12 for additional information.

## 7. On-Screen Text Menus

The on-screen text menus contain settings for communication and control as well as some A/V related settings. The menus may be accessed by holding and releasing the **Menu** button on the front panel. The menus may also be accessed using the HD3-RC handheld IR remote by pressing the **Menu** button twice.

### On-Screen Setup Menu Button Operation

Button	Function
Power	Exit OSD Menu Mode
Menu	Hold and release to enter OSD Menu Mode Push to exit OSD Menu Mode
Down	Next menu item
Up	Previous menu item
Select	Data Entry Mode <i>See table below</i>

### Data Entry Mode Button Operation

Button	Function
Menu	Go to previous field, back to Menu, or exit Menu
Up / Down	Change selected data
Select	Go to next field or save selected data and go back to Menu



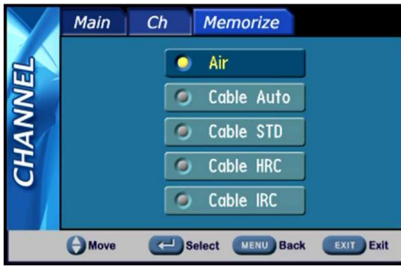
### On-Screen Text Menu Settings

Setting	Options (default settings in <b>Bold</b> )
<b>System Menu</b>	
Baud Rate	1200   2400   4800   <b>9600</b>   19.2K   38.4K   115.2K   230.4K
Pnl Lockout	<b>None</b>   Ch+Menu   Vol+Menu   CH+Vol+Menu   Power   Menu   All   Pwr+Menu
IR Receive	<b>On</b>   Off
CEC Mode	Disabled   Display On   Display OnOff
Firmware	<i>Press <b>Select</b>, then Up/Down to scroll through versions</i> ATSC-mini V1.03 – System Firmware Volt In 11.8 – Power Supply voltage HW Rev A0 – Hardware Version HD Vers V1.03 – Demodulator/Decoder Firmware Enter Boot Mode Boot Ldr V1.00 – Bootloader Version
<b>A/V Menu</b>	
HD Output	<b>YPbPr</b>   RGB
Output Resolution	480i   480p   <b>720p</b>   1080i   1080p   2160p60   Auto   2160p30
Refresh Rate	<b>59.94Hz</b>   60Hz <i>Applicable to 720p, 1080i, and 1080p only</i>
Overscan %	<i>Set the image overscan 0 – 9%</i>
HDMI-DVI	<b>Auto</b>   HDMI   DVI
HDMI Audio	<b>On</b>   Off
AC3 Cmpr Mod	<i>Set the compressor mode for the AC-3 downmix</i> <b>Line</b>   RF
Channel Box	<i>Enable the channel box on-screen graphic that appears during a channel change</i> <b>Enable</b>   Disable
Tune Mode	Off-Air   CATV   Cable Auto   HRC   IRC
Scan Mode	<i>Set the mode for the channel scan</i> Analog & Digital   Analog, Keep Digital   Analog, Del Digital Digital, Keep Analog   Digital, Del Analog
Chan Scan	<i>Press <b>Select</b> to initiate channel scan</i>

Network Menu	
IP Address	<b>192.168.1.231</b>
IP Mode	Select <b>Static</b>   DHCP <i>Gateway and Subnet Mask settings remain when toggled from DHCP to Static</i>
Gateway	<b>192.168.1.1</b>
Subnet Mask	<b>255.255.255.000</b>
IP Port	<b>23</b> <i>Set the port for Telnet communication</i>
iCC-Net Device	<b>0257</b> <i>Set the display device number for receiving iCC-Net control commands</i>
MAC/SN	<b>00:14:C8:1E:xx:xx</b>
UDP Reply	<b>Off</b>   On
HTTP Disab	<b>Off</b>   On
Reset Network Password	<i>Press <b>Select</b> to clear the password for web page access</i>

## 8. On-Screen Graphical A/V Menus

On-screen Graphical AV Menu may be accessed by **Menu** button on the front panel, Control web page, or optional HD3-RC handheld infrared remote.

Main Menu	
	<p>Select Sub Menu</p> <ul style="list-style-type: none"> <li>• <b>Down</b> or <b>Up</b> highlights option</li> <li>• <b>Select + Down</b> moves left (front panel control only)</li> <li>• <b>Select + Up</b> moves right (front panel control only)</li> <li>• <b>Select</b> chooses Option</li> <li>• <b>Menu</b> steps back or exits menu</li> </ul>
Channel Menus	
	<p>Sub menu for Channels offers options for:</p> <ul style="list-style-type: none"> <li>• Channel Auto Scan</li> <li>• Favorite Channels</li> <li>• Channel Add/Delete</li> <li>• Fine Tune Channel (Analog Channels Only)</li> <li>• Signal Strength (Digital Channels Only)</li> </ul>
	<ul style="list-style-type: none"> <li>• Press <b>Up/Down</b> to highlight scan mode</li> <li>• Press <b>Select</b> to initiate channel scan</li> </ul> <p>Analog channels will be scanned first, then digital channels. The channel list will be populated as channels are found. Press Select during scan to skip analog channels.</p>

## Favorite Channels



Menu page for creating a list of favorite channels. Channels will be advanced by FAV button or favorite channel command

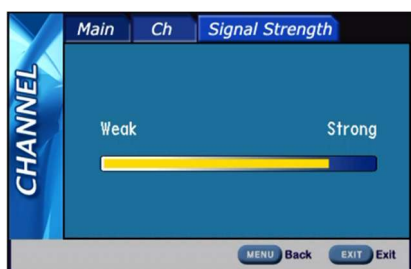
- Press Up/Down to highlight channel
- Press Select to Add//Delete from list

## Channel Add/Delete



Channels may be added or deleted from the list of memorized channels. **Channel Up/Down** will step through the physical RF channels displaying the virtual channel numbers of received channels. **Select** will add or delete the selected channel. Note that in the case of multiple sub channels on a physical channel, only the displayed sub channel will be added or deleted.

## Signal Strength



This page can also be displayed from the **Signal** remote command. The graphic shows the current signal strength and changes in real time. The strength of a channel may be monitored as the antenna positioning is adjusted for optimum reception.

## Caption Menus



This menu accesses captioning features:

- On/Off — turns captions on/off
- Note: Other options are not available if captions are off.
- Analog Mode — CC 1-4 and Text 1-4
  - Digital Mode — Service 1-6
  - Digital Font Options
    - Size — Standard (15 pixels), Large (21 pixels), or Small (11 pixels)
    - Style — 1-6
    - Color — 8 shades of background, foreground, and edge colors
    - Opacity — foreground and background
    - Edge — 6 style options





## Version Info




Displays the hardware type of the decoder/demodulator board and HD firmware version. Also displays the AC-3 firmware version.

V-Chip Menu	
	<p>This menu manages access to programming based on US and Canadian ratings standards. A PIN number is required to access any of the sub menus. The default PIN number for access is 0000 (four zeros).</p> <ul style="list-style-type: none"> <li>• Changing PIN accesses menu to create new PIN</li> <li>• Open V-chip Setting clears all rating settings</li> </ul>
	<p>Use navigation and Select buttons to select/deselect options. The padlock symbol indicates channels with the selected rating will be blocked and the PIN will be required for viewing.</p>
	<p>Sub menu equivalent to US Rating setting for Canadian applications.</p>

Setup Menus	
	<p>This series of menus select the options for tuner operation:</p> <ul style="list-style-type: none"> <li>• Screen Format — 16:9 or 4:3</li> <li>• Time</li> <li>• Sound Settings</li> <li>• Video Noise Reduction — Available only for analog channels</li> <li>• Menu Language</li> </ul>
	<p>Select the appropriate aspect ratio for the connected display.</p>

<p><b>Time</b></p> 	<p>Sub menus for time settings.</p> <p>Time data is extracted from the System Time Table in the digital channel's transport stream if available.</p> <p>When Daylight Saving is enabled, the tuner will adjust the time as needed if the daylight savings flag is enabled in the System Time Table.</p>
<p><b>Time Zone</b></p> 	<p>Move cursor left and right to select the time zone. <b>Select</b> stores the highlighted zone.</p> <p>Front panel navigation</p> <ul style="list-style-type: none"> <li>• <b>Select + Down</b> to move left</li> <li>• <b>Select + Up</b> to move right</li> </ul>
<p><b>Sound</b></p> 	<p>Select from a variety of options:</p> <ul style="list-style-type: none"> <li>• Analog MTS — Mono, Stereo, SAP</li> <li>• Multi-Track Sound — English, French, Spanish</li> <li>• Digital Out — Digital Pass, PCM, or variable-level PCM.</li> <li>• Auto Volume — On or Off</li> </ul>
<p><b>Menu Language</b></p> 	<p>Select the language for the on-screen A/V graphical menus.</p>

<p><b>Info Banner</b></p>	
	<p>On-screen Info banner may be accessed by the following:</p> <ul style="list-style-type: none"> <li>• <b>Info</b> button press on IR remote or control web page</li> <li>• Hold <b>Select</b> button on the front panel</li> <li>• RS-232 command</li> </ul>

Guide



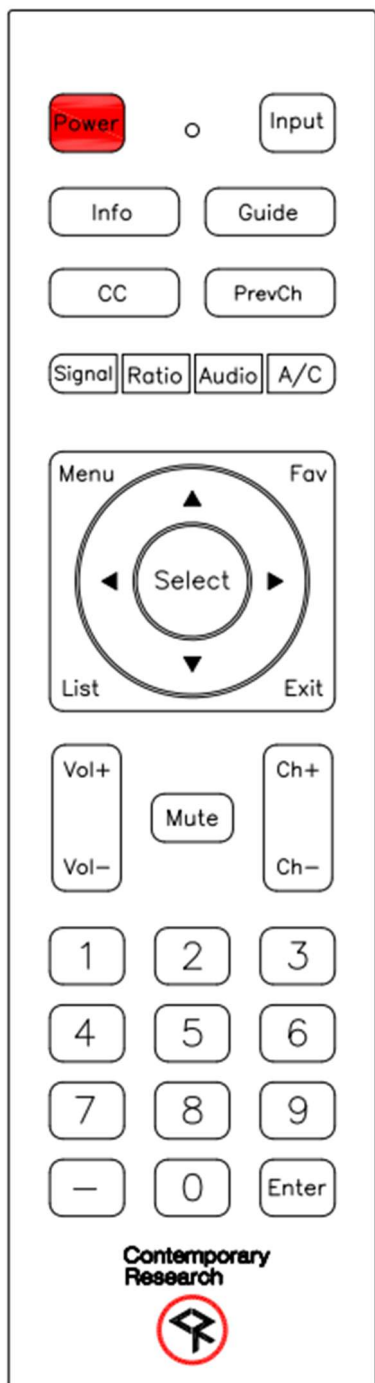
On-screen Guide with a list of upcoming programs may be accessed by the following:

- **Guide** button press on IR remote
- RS-232 command

Use **Up/Down** to highlight a program. **Info** button press or equivalent will bring up a program description. Guide list is limited to twelve hours of programming.

## 9. HD3-RC Handheld IR Remote

The optional HD3-RC IR Remote (5024-004) may be used for setup of the ATSC-mini and for daily operation. The ATSC-mini is equipped with a front panel IR sensor and a rear panel IR input jack for connection to an optional IR-RXD (5034-001) or compatible remote IR receiver. Each of the functions on the remote have equivalent commands in RS-232 and wired IR formats. The front panel status LED will flash red indicating that the unit is receiving IR control data.



### Power

Press to toggle on and off.

### Volume Control

Use the **Vol+**, **Vol-** and **Mute** buttons to control volume.

### Channel Selection

Two-part major/minor channel numbers are separated by a – (dash). Example 21-3

One-part channels are accessed by entering the channel number

**Ch+**, **Ch-** and **PrevCh** can be used to access and recall channels.

### Menu Operation

Press **Menu** to access the on-screen graphical menus.

- Use the directional arrows, **Select** and **Exit** to navigate the on-screen menus.
- **Exit** closes the on-screen menu.
- **Menu** reverts to the previous menu or closes the on-screen menu from the Main Menu.
- **Enter** selects the menu choice.

### Special Functions

- **CC** steps through available closed-captioning options.
- **Audio** steps through main and SAP audio options.
- **Signal** launches up on-screen signal strength meter (digital channels only).
- **Ratio** steps through aspect ratio options.
- **Info** launches on-screen information banner.
- **A/C** toggles air or cable tuning.
- **Fav** displays list of favorite channels.
- **Guide** launches on-screen guide, select a program and press **Info** to display program information.

Some features of the special function commands may only be available if supported by the received channel.

## 10. Edit IP Address Settings

The IP address settings may be edited using the on-screen text menu. The IP mode is set to static by default with an address of 192.168.1.231..

Follow the steps below to edit the static IP address settings.

- Hold and release the **Menu** button to display the on-screen text menu.
- Press **Up** or **Down** to step through the menu options until **Network Setup** is displayed, then press **Select**.
- Press **Down** if needed to step through the menu until **IP Address** is displayed.
- Press **Select** to activate the cursor. Press **Up** or **Down** to edit each digit, then press **Select** to move to the next digit to continue the process. Press **Menu** to back up if needed.
- Scroll down and repeat the process for the Subnet and Gateway.
- Press **Menu** twice to exit the on-screen menu.

Follow the steps below to enable DHCP.

- Hold and release the **Menu** button to display the on-screen text menu.
- Press **Up** or **Down** to step through the menu options until **Network Setup** is displayed, then press **Select**.
- Press **Up** or **Down** to step through the menu until **IP Mode** is displayed.
- Press **Select** to activate the cursor. Press **Up** or **Down** to toggle from Static and DHCP, then press **Select**.
- Press **Menu** twice to exit the on-screen menu.

The IP address settings may also be edited using RS-232 serial command strings. Refer to Section 12 for more information.

## 11. Web Pages

The ATSC-mini has on-board web pages for control, monitoring, and configuration. The web pages may be accessed using a web browser by entering the unit's IP address in the browser's address field. The web pages may also be accessed through CR Toolbox. Double-clicking on a tuner in the equipment list will launch the default web browser and navigate to the tuner.

The default IP address is 192.168.1.231. The unit's current IP address may be found in the on-screen text **Network Setup** menu. Press and hold the front panel **Menu** button and select the **Network** menu. If needed, scroll up or down until the IP address is displayed.

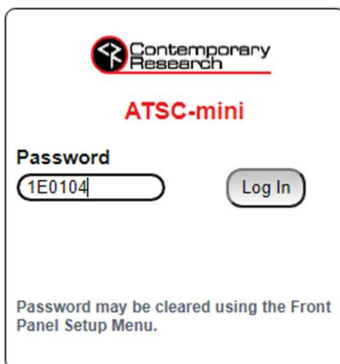
The web pages may be disabled if desired. Two methods are available for disabling access to the web pages.

- HTTP Disable setting in on-screen Network Setup text menu.
- >DH=1 RS-232 serial command. Refer to Section 12 for more information.

Beginning with Application firmware v1.10, access to the on-board web pages will be password protected by default.

Three modes of protection are available.

- Password will be required to access all web pages (default).
- Free access to the Control web page, but password will be required to access all other web pages.
- Free access to all web pages.



For increased security when password protection of the web pages is desired, it is recommended to lock out the **Menu** button on the front panel of the tuner.

### Default Password

The default password is based on the last six digits of the unit's MAC address. The MAC address may be found on the SN/MAC sticker on the rear of the tuner. The MAC address information is also available in the on-screen text **Network Setup** menu. To access the on-screen text **Network Setup** menu, follow these steps below.

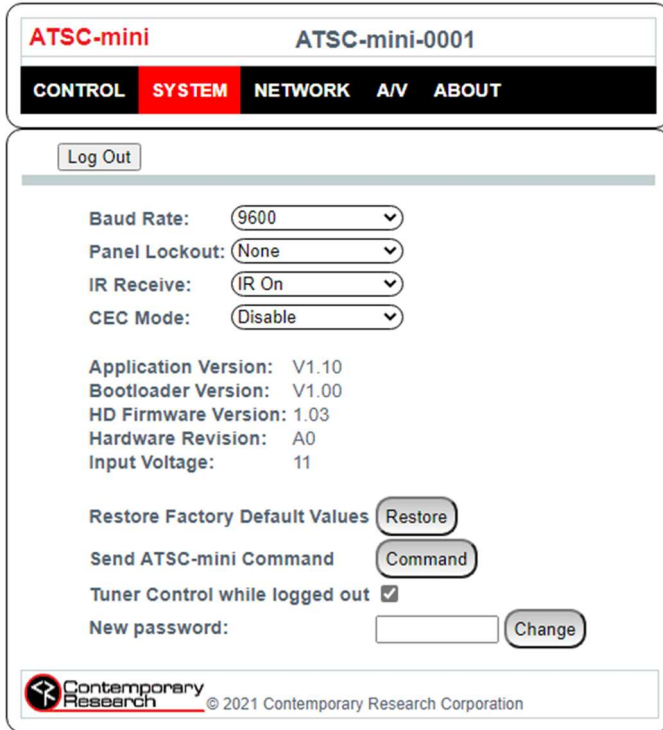
- Hold and release the **Menu** button to display the on-screen text menu.
- Press **Up** or **Down** to step through the menu options until **Network Setup** is displayed, then press **Select**.
- Press **Up** or **Down** to step through the menu until **MAC/SN** is displayed.

When the web page is first accessed, the browser will be directed to the login page. Enter the last six digits of the MAC address in the password field, then click the **Log In** button. The characters should be entered with no punctuation or spaces. Letters should be entered as upper case. i.e.: 1E0104

### Update Password

The password can be updated in the **System** web page. Enter the new password in the **New Password** field and click the **Change** button. The password may consist of up to 20 characters. The characters can be any combination of numbers, upper- and lower-case letters, and special characters.

### Free Access to Control Web Page Only



An option is available that will allow password free access to the Control web page while maintaining password protected access to the web pages related to setup and configuration. To enable this option, log in and navigate to the **System** web page. Click the checkbox next to **Tuner Control while logged out** near the bottom of the page.

If this option is enabled, a **Tuner Control** button will appear on the log-in page. Clicking on the **Tuner Control** button will navigate to the **Control** web page without entering a password. Log in will be required to navigate to any other web page.

### Free Access to All Web Pages

Clearing the password will allow password free access to all web pages.

The password may be cleared in the **System** web page. Clear the contents of the **New Password** field and click the **Change** button.

The password may also be cleared in the tuner's on-screen text **System Setup** menu. Follow the steps below.

- Hold the **Menu** button to display the on-screen text menu.
- Press **Up** or **Down** to step through the menu options until **Network Setup** is displayed, then press **Select**.
- Press **Up** or **Down** until **Clear Network Password** is displayed.
- Press the **Select** button to clear the password.

### Reset Default Password

The password will be reset to the default by reloading the factory default settings. This may be performed from the **System** web page. Click on the **Restore** button next to **Restore Factory Default Values**. It is recommended to perform a hard power cycle after the default settings are restored.

If access to the web page is not available, the factory default settings may be restored from the on-screen text **System Setup** menu. Follow the steps below to reload the factory default settings.

- Hold the **Menu** button to display the on-screen text menu.
- Press **Up** or **Down** to step through the menu options until **System Setup** is displayed, then press **Select**.
- Press **Up** or **Down** until **Firmware** is displayed, then press **Select**.
- Press **Up** or **Down** until **ATSC-mini V1.xx** is displayed in the lower row of text.
- Simultaneously press **Power** and **Up**.

Alternately, the factory default settings may be reloaded by RS-232 serial command string. Refer to Section 12 for additional information.

## Control Web Page

ATSC-mini
ATSC-mini-0001

CONTROL
SYSTEM
NETWORK
A/V
ABOUT

[Log Out](#)

---

**Power** On

**Channel** 44-1 720p NTD TV  
**Program** NTD Business News

1	2	3	Ch+
4	5	6	Ch-
7	8	9	
0	-	Enter	PrevCh

**Volume**

Vol- 80 Vol+ Mute UNMUTED

Menu	^		
<	Select	>	
List	v	Exit	
CC	Audio	Signal	Ratio
Info	Air/Cbl	Fav	Guide

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## Network Web Page

ATSC-mini
ATSC-mini-0001

CONTROL
SYSTEM
NETWORK
A/V
ABOUT

[Log Out](#)

---

**Browser Address:** 192.168.001.014  
**IP Address:** 192.168.001.231  
**IP Mode:** Static  
**Gateway Address:** 192.168.001.001  
**Subnet Mask:** 255.255.255.000  
**IP Port (telnet):**   
**iCC-Net Device:**   
**MAC Address:** 00:14:C8:1E:00:01  
**UDP Reply:**

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## A/V Web Page

ATSC-mini
ATSC-mini-0001

CONTROL
SYSTEM
NETWORK
A/V
ABOUT

[Log Out](#)

---

Screen Display:  16:9  4:3

Box  Full  Zoom

**HD Output:**

**HD Resolution:**

**Tune Mode:**

**Output Refresh Rate:**

**Digital Audio:**

**Captions:**

**Analog Captions:**

**Digital Captions:**

**Overscan:**

**HDMI Output Mode:**

**HDMI Audio:**

**AC3 Compression Mode:**


**Channel Change Box:**

**Channel Scan Mode:**

Air

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## About Web Page

<b>ATSC-mini</b> <b>ATSC-mini-0001</b>	
<b>CONTROL</b> <b>SYSTEM</b> <b>NETWORK</b> <b>A/V</b> <b>ABOUT</b>	
<b>ATSC-mini</b> Version: V1.10 <a href="http://contemporaryresearch.com">http://contemporaryresearch.com</a>	<b>Libraries used by this product</b> <b>FNET</b> Copyright © 2005-2018 by Andrey Butok, FNET Community Licensed under Apache 2.0
 <b>Contemporary Research</b> © 2021 Contemporary Research Corporation	

## 12. Bidirectional RS-232/Telnet/UDP Control Protocol

The ATSC-mini full duplex RS-232/Telnet protocol enables a system programmer to control all tuner functions, configure the tuner, and monitor tuner status. All commands are sent as ASCII strings. No delays between characters or commands are required, as data is interrupt driven and buffered.

Communications parameters are 1200 to 230,400 baud, 8 data bits, no parity, and 1 stop bit. Factory default is 9600 baud. All settings are saved to NVRAM in the ATSC-mini tuner. The RS-232 port will accept non-standard control such as voltage that swings from 0 to +5 VDC, commonly found when IR ports are used to send RS-232 commands.

The same commands can be sent over IP Telnet (up to two sessions) and via UDP to the tuner's IP address to port 31931 (fixed). UDP responses are disabled by default. Responses will be sent to port 31932 at the directed broadcast IP address of the tuner's subnet. UDP responses may be enabled in the on-screen text menu, web page Network Settings menu, or RS-232 command. See our Support Blog Testing 232-ATSC Series UDP Control at <https://contemporaryresearch.com/testing-232-atsc-udp-control/> to learn more about UDP control.

### General Protocol Specifications

Characters in command strings to the ATSC-mini are common ASCII keyboard characters. Command strings sent to the ATSC-mini begin with the ASCII > (greater than symbol) as an 'Attention' character and end with carriage return - ASCII CR, Hex \$0D, or keyboard Enter - as an 'End-of-command' character.

For commands that require a parameter value, the = (equals symbol) shown in the examples is optional.

Responses from the ATSC-mini begin with the ASCII < (less than symbol) as an 'Attention' character and end with a carriage return followed by a line feed - ASCII LF or Hex \$0A as an 'End-of-command' character.

A carriage return is required at the end of each command and is assumed in all examples.

### Command String Structure

[Attention] [Command] (Parameters) [Return]

Attention Single character (>) starts the string

Command A two-character command

Parameters Added attributes to some commands

Return A carriage return ends the command string. ASCII CR, Hex \$0D, or keyboard 'Enter' may be used in programming. For simplicity, the programming examples in the manual will not show the 'CR'.

### Command and Status Response

Commands can be sent back-to-back at any time without any delay. To allow for rapid, multiple commands, status responses are intentionally delayed by about 125 mS, sending the most recent status in response to control commands or user actions.

### String Example

The example below is a command for a channel change to 6-2 followed by the response string.

```
>TC=6-2  
<1TU006Uxx1002x0
```

The status of a setting may be queried by omitting the = (equals symbol) and the parameter value. The following command queries the 63 step volume level.

```
>VL  
<VL=62
```



Code	Function	Operation
<b>Tuning</b>		
LC	Channel List	Returns a list of all channels in the current channel memory. Channels listed in the following format: <digital virtual channel or analog channel>:<RF channel-program number>:<digital channel name>  Example: >LC < Start of Channel List- Cable:4 D15-1:98-1:CNBC D15-2:98-2:NTD D16-1:99-1:CNN D16-2:99-2:Fox End of Channel List
<b>Video Output</b>		
D4=	Overscan	Select Overscan percentage 0-9
Q0=	Display Closed Captions	0=Captions off                    1=Captions on
Q1=	Analog Caption Service	Select analog caption service 1-8 1=Caption 1                    5=Text 1 2=Caption 2                    6=Text 2 3=Caption 3                    7=Text 3 4=Caption 4                    8=Text 4
Q7=	Digital Caption Service	Select digital caption service 1-6 1=Service 1                    4=Service 4 2=Service 2                    5=Service 5 3=Service 3                    6=Service 6
R6	Refresh Rate	Set to 59.94 Hz
RM	Refresh Rate	Set to 60 Hz
KK=149	Output RGB	Set colorspace to RGB
KK=151	Output YpBpR	Set colorspace to Component
HD=	HDMI/DVI mode	0=Auto    1=HDMI    2=DVI
<b>Audio Output</b>		
VU	Ramp volume up	Start volume ramping up
VD	Ramp volume down	Start volume ramping down
VV	Stop volume ramp	Stop volume ramping
VH=	Set volume level	Volume level, scaled 0 to 100
VL=	Set volume level	Volume level, scaled 0 to 63 (compatibility mode)
VM	Volume Mute Enabled	Mute all audio outputs
VX	Volume Mute Disabled	Restore audio to previous level
VT	Toggle Volume Mute	Toggle mute mode
KK=158	AC-3	Set the digital audio outputs to AC-3
KK=159	PCM	Set the digital audio outputs to PCM fixed
KK=160	PCM Variable	Set the digital audio outputs to PCM Variable
HA=	HDMI Audio Mute	0=Audio mute disabled    1=Audio mute enabled
<b>Status Request</b>		
ST	Request T Mode status	Return T Channel/Source status string
SV	Request V mode status	Return V Audio status string
SS	Request S Mode status	Return S Front Panel status string
SQ	Request Q Mode status	Return Q Mode status string



Code	Function	Operation	
<b>HD3-RC IR Remote Control Emulation</b>			
KK=	Emulate IR Remote Function	9=Power Toggle	105=Menu
		10=0	106=Right
		11=1	107=Left
		12=2	108=Up
		13=3	109=Down
		14=4	110=Enter/Select
		15=5	111=Exit
		16=6	115=CC
		17=7	141=Output Resolution 1080i
		18=8	142=Output Resolution 720p
		19=9	143=Output Resolution 480p
		21=Enter/Select	144=Output Resolution 480i
		22=Channel Up	145=Output Resolution 1080p
		23=Channel Down	146=Output Resolution 2160p
		24=Volume Up	147= Output Resolution Auto
		25=Volume Down	148=Output Resolution 2160p/30
		26=Mute Toggle	149=Output RGB
		27=Power On	151=Output YPbPr
		28=Power Off	153=Air
		29=Menu	154=Cable
		63=Guide	155=16:9 Ratio Pillar Box
		81=Signal	4:3 Ratio Letterbox
		82=Ratio	156=16:9 Ratio Full Wide
		85=Audio	4:3 Ratio Full
		88=Favorite	157=16:9 Ratio V Zoom
		95=List	4:3 Ratio H Zoom
		96=Add/Delete Channel	158=AC=3
		98=Air/Cable	159=PCM
		99=Dash	160=PCM Variable
		100=Info	161=Display 16:9
		101=Previous Channel	162=Display 4:3

## Response Strings

Typical: [Attention] [Unit#] [data ...data] [cr] [lf]

ATSC-mini status response strings contain ASCII characters similar to those used for the same functions in command strings. An ASCII 'carriage return' and 'line feed' follow each response string. Functions shown as N/A are not applicable or available in the ATSC-mini. Characters will appear in status strings as lowercase 'x'.

### Channel/Source Status Response String (T):

Start	Unit	CMD	Power	Major Channel	Video Mute	Input	RF	Received Resolution	Minor Channel	NA	Function
	Fixed		U=On M=Off	3 digits	Unmuted	0=RF	A=Air C=Cable	0=1080i 1=720p 2=480p 3=480i 4=1080p N=No Sig	3 digits		0=None
<	1	T	U	032	U	0	C	0	002	x	0

The ATSC-mini channel status is split into Major Channel and Minor Channel sections. The Minor Channel will always be 000 for analog channels. The Minor Channel status will display "F00" if the Major channel is a special "one-part" digital channel. Also, as one-part channels can go higher than 999, the Minor status will indicate how many thousands (up to 63) should be added to the Major number. Example: Channel 1032 would return 032 for the Major Channel and F01 for the Minor Channel. Two-part channels are limited to 999-999.

### Audio Status Response String (V):

Start	Unit	CMD	Power	Volume 1	Volume Mute	Stereo	Volume 2
	Fixed		U=On M=Off	0-63 Emulated level 2 digits	U=Unmuted M=Mute	N/A	0-100 Actual level 3 digits
<	1	V	U	63	U	x	100

Volume 1 emulates legacy 232-series volume level for compatibility with existing applications.

Volume 2 shows actual ATSC-mini level, from 0-100. Audio status will be sent automatically following a volume toggle command from front panel control, IR remote, or RS-232- command.

### Front Panel Mode Status Response String (S):

Start	Unit	CMD	Audio	Tune Mode	Lockout	Bass	Treble	Output	Output Resolution	Output Setting	NA
	Fixed		N/A	0=Cable 1=Air 2=IRC 3=HRC 4=Auto	0-9	Fixed 2 digits	Fixed	0=RGB 2=YpPr	0=1080i 1=720p 2=480p 3=480i 4=1080p 5=2160p/60 7=2160p/30	0=1080i 1=720p 2=480p 3=480i 4=1080p 5=2160p/60 6=Auto 7=2160p/30	4 digits
<	1	S	x	x	0	08	4	2	0	0	xxxx

### Q Mode Response String (Q):

Start	Unit	CMD	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	NA
	Fixed		CC 0=Off 1=On	CC Type 1-8	Video Detect (fixed)	AV Detect (fixed)	Label (fixed)	IR 0=Off 9=Normal	1 digit	Digital CC 0=Off 1=On	Digital CC Services 1-6	2 digits
<	1	Q	1	1	3	0	2	9	0	1	1	xx

## **13. Unidirectional iCC-Net Control Protocol**

The ATSC-mini will respond to ICC-Net protocol command strings sent from an ICE-HE-DXL, IP-DXL, Display Express Server, or third-party control system processor. The ATSC-mini is compatible with iCC-Net commands sent via Ethernet. The unit is not compatible with iCC-Net commands sent over the RF network.

The ATSC-mini does not have a built-in display controller, so a limited set of commands is supported.

The ATSC-mini will receive the iCC-Net commands via Ethernet at UDP port 31934.

The iCC-Net command string is composed of segments that include the display device number, the command, and command parameters if required.

## Display Device Numbers

A unique display device number from 1 to 4094 is assigned to each TV controller, tuner/controller, QIP-D decoder/controller, QIP-DVX decoder/controller, or tuner to which control commands are addressed. The displays are organized into 16 zones of up to 255 devices each.

The Zone/Unit concept is used with Display Express, Display Express Lite, and when writing command strings for third-party control systems. Display Express Lite is limited to 128 display devices in zone 1. Unit numbers are restricted to the range of 1 to 128 corresponding to display device numbers 257 to 384.

The display device number is represented in the iCC-Net command string by the zone number and the unit number. The hex equivalent of the zone number and the unit number is equal to the hex equivalent of the display device number.

### Example:

Zone 3 = hex 03

Unit 201 = hex C9

Display Device 969 = Hex 03 C9

The device number can be calculated in decimal using the formula '(zone number x 256) + unit number = display device number'.

All display controllers in a zone will respond to a command sent to unit number 0. All display controllers will respond to a command sent to Zone 15, Unit 255.

Zone #	Zone x 256	Unit #	Display Device #
0	0	1-255	1-255
1	256	1-255	257-511
2	512	1-255	513-767
3	768	1-255	769-1023
4	1024	1-255	1025-1279
5	1280	1-255	1281-1535
6	1536	1-255	1537-1791
7	1792	1-255	1793-2047
8	2048	1-255	2049-2303
9	2304	1-255	2305-2559
10	2560	1-255	2561-2815
11	2816	1-255	2817-3071
12	3072	1-255	3073-3327
13	3328	1-255	3329-3583
14	3584	1-255	3585-3839
15	3840	1-254	3841-4094
All Zones	4095		

### Reserved Device Numbers – Send Command to All Display Controllers in a Zone

Display device numbers that have a valid zone number and a unit number of 0 are reserved and should not be assigned to a display controller. Display device numbers that have a unit number of 0 have a special purpose. All display controllers in a zone will respond to a command sent to that zone number and unit number 0.

### Reserved Device Numbers – Send Command to All Display Controllers in All Zones

Display device number 4095 (Zone 15, Unit 255) is reserved and should not be assigned to a display controller. This display device number has a special purpose. All display controllers will respond to a command sent to this display device number.

### Setting the Display Device Number via Web Page

The device number may be set in the **Network** web page. The display device number is entered in four-digit decimal format.

## Setting the Display Device Number via On-Screen Text Menu

The display device number may be set in the on-screen text menu. The display device number is entered in four-digit decimal format.

Follow these steps below to set the display device number.

- Hold and release the **Menu** button on the front panel to display the on-screen text menu.
- Press **Up** or **Down** to scroll through the menu categories. When **Network Setup** is displayed, press **Select**.
- Scroll down until **iCC Net Device** is listed. Press **Select** and enter the desired display device number.
- Press **Menu** to back out of the menus.

## iCC-Net Command String Protocol

“\$A5,<dh>,<dl>,<ncb>,<cmd1>,<parameter>[<cmdN>]”

<b>\$A5</b>	Starts the command
<b>&lt;dh&gt;</b>	The zone or high order byte of the display device
<b>&lt;dl&gt;</b>	The unit or low order byte of the display device (0 for global zone)
<b>&lt;ncb&gt;</b>	The number of command bytes to follow
<b>&lt;cmd1&gt;</b>	The first two-character command
<b>&lt;parameter&gt;</b>	Command parameters (not used in all commands)
<b>[&lt;cmdN&gt;]</b>	Multiple commands can be concatenated, with byte count added to <ncb>

Characters in command strings are expressed in a combination of hex and ASCII characters. For clarity, the following protocol examples use the following conventions:

- Single-byte hex numbers are preceded by the '\$' symbol.
- ASCII characters or strings are enclosed in single quotes.
- Numbers not marked as hex or ASCII are the decimal equivalent of a single hex byte.
- Parameters shown in < > brackets are single byte.
- A series of multiple commands or parameters are set apart by [ ] brackets.
- Commas separate the bytes, but they are not part of the protocol.
- Double quotes enclose the command string, but they are not part of the protocol.

## String Format

Every software application has a different denotation for handling hex, ASCII, and decimal formats. The examples in this manual are in AMX format, which is understood by many in the control industry:

- Hex values begin with a dollar (\$) symbol
- ASCII values are enclosed in single quotes
- Decimal values are shown as normal

When planning to use a mixed-format structure for commands, convert the symbols to the types required by your specific software application. For example, a **Tune Digital Channel 12-3** command to display device 280 could be shown several ways:

- AMX Mixed Format = “\$A5,1,24,5,'TH',2,12,3”
- AMX Hex Format “\$A5,\$01,\$18,\$05,\$54,\$48,\$02,\$0C,\$03”
- Standard Hex (no denotation) = A5 01 18 05 54 48 02 0C 03
- Crestron Hex Format = \0xA5\0x01\0x18\0x05\0x54\0x48\0x02\0x0C\0x03
- RTI = Select port, Hex mode, enter A5 01 18 05 54 48 02 0C 03 - Note that when you go back to normal editing mode, the app inserts a \x before each Hex character.

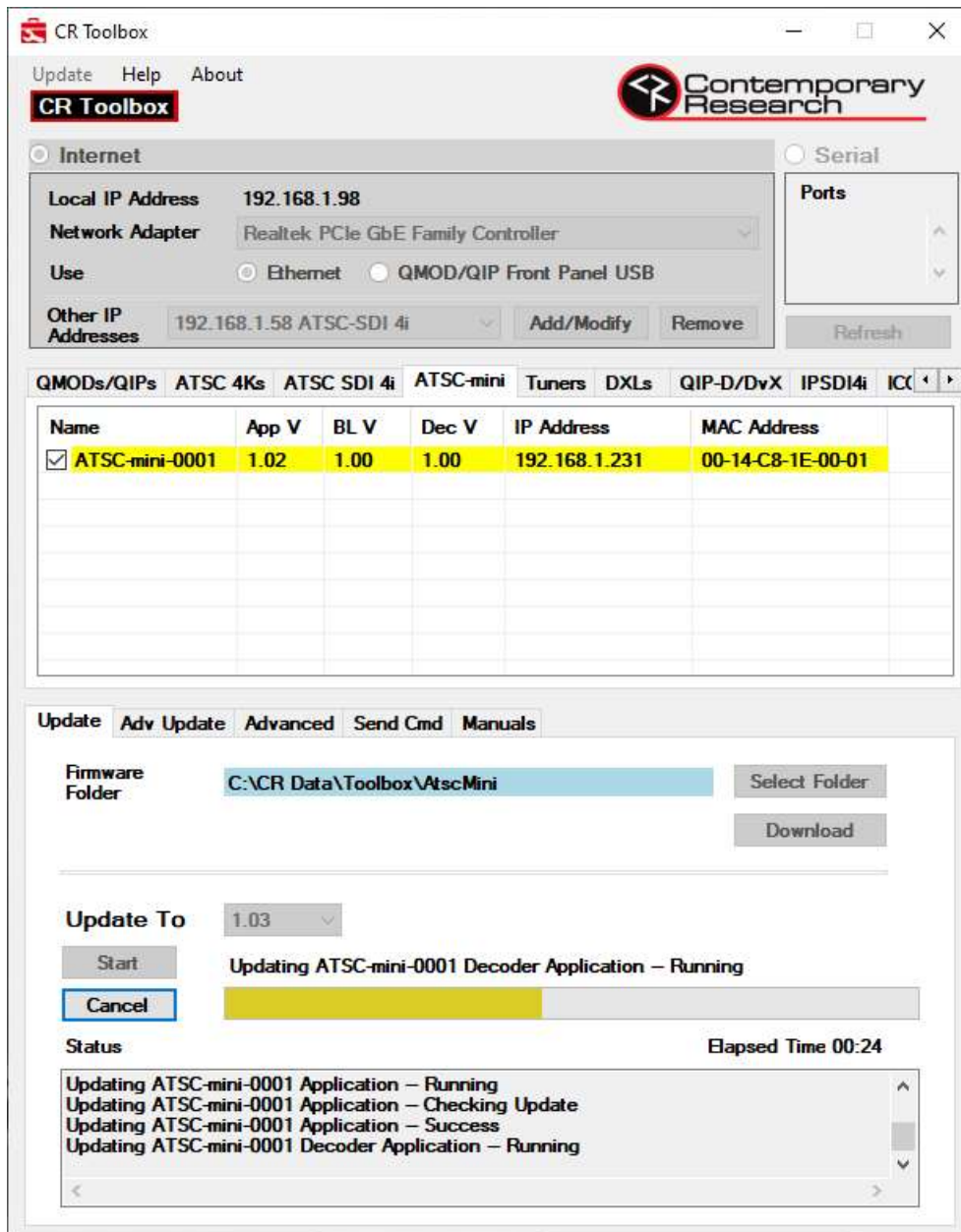
Go to [www.asciitable.com](http://www.asciitable.com) for a handy Decimal/ASCII/Hex conversion chart.

## Table of iCC-Net Control Commands

Code	Function	Operation
<b>Power</b>		
<b>P1</b>	Power On	"\$A5,<dh>,<dl>,2,'P1'" (6 bytes)
<b>P0</b>	Power Off	"\$A5,<dh>,<dl>,2,'P0'" (6 bytes)
<b>PT</b>	Power Toggle	"\$A5,<dh>,<dl>,2,'PT'" (6 bytes)
<b>Channel Selection</b>		
<b>TH=</b>	Set Digital Channel	<p>"\$A5,&lt;dh&gt;,&lt;dl&gt;,5,'TH',&lt;H1&gt;,&lt;Major&gt;,&lt;Minor&gt;" (9 bytes)</p> <p>Set digital channel with one-part virtual channel numbers and two-part channel numbers up to 255-255.</p> <p>&lt;H1&gt; Tuning Style            0=No Change in tuning style            1=Five digit one-part channel (Major=high byte, Minor=low byte)            Formula: (high byte x 256) + low byte = channel number            2=Two-part virtual channel number (Major-Minor)</p> <p><i>Examples:</i>            "\$A5,1,4,5,'TH',2,2,3" Device 260, virtual channel 2-3            "\$A5,1,4,5,'TH',1,1,69" Device 260, channel 325 (256+69)</p>
<b>TJ=</b>	Set Digital Channel	<p>"\$A5,&lt;dh&gt;,&lt;dl&gt;,6,'TJ',&lt;Major high&gt;,&lt;Major low&gt;,&lt;Minor high&gt;,&lt;Minor low&gt;" (10 bytes)</p> <p>Set digital channel with two-part virtual channel numbers up to 999-999            Formula: (high byte x 256) + low byte = channel number</p> <p><i>Example:</i>            "\$A5,2,44,6,'TJ',1,40,0,1" Device 580, channel 296-1</p>
<b>H1=</b>	Tuning Style	<p>"\$A5,&lt;dh&gt;,&lt;dl&gt;,3,'H1',&lt;Style&gt;" (7 bytes)</p> <p>Set the tuning style used with the TH channel command. This setting is stored in memory and only needs to be sent one time. Subsequent TH channel commands may have the &lt;H1&gt; byte set to 0.</p> <p>&lt;Style&gt;            1=Five digit one-part virtual channel number            2=Two-part major-minor virtual channel number</p>
<b>TU</b>	Channel Up	"\$A5,<dh>,<dl>,2,'TU' " (6 bytes)
<b>TD</b>	Channel Down	"\$A5,<dh>,<dl>,2,'TD' " (6 bytes)
<b>TP</b>	Previous Channel	"\$A5,<dh>,<dl>,2,'TP' " (6 bytes)
<b>Audio</b>		
<b>VL=</b>	Volume	<p>"\$A5,&lt;dh&gt;,&lt;dl&gt;,3,'VL',&lt;Level&gt;" (7 bytes)</p> <p>Set volume in 64 steps 0 - 63.</p>
<b>Miscellaneous</b>		
<b>UX</b>	Send String	<p>"\$A5,&lt;dh&gt;,&lt;dl&gt;,2+string length,'UX',&lt;String&gt;" (variable bytes)</p> <p>Send an RS-232 string directly from the RS-232 serial port to the display</p> <p><i>Example:</i>            "\$A5,1,183,10,'UX','m c ', \$00,\$20,\$AF,\$0D" Display 439, sends command in hex 6D 63 20 00 20 AF 0D. This is the string for an LG TV to set the display mode to zoom.</p>

## 14. Firmware Update

CR Toolbox software for Windows will be required for full firmware updates to the ATSC-mini as well as other supported Contemporary Research products. CR Toolbox is available for download free of charge at <https://www.contemporaryresearch.com/products/cr-toolbox/>.



It is best for an internet connection be available when using CR Toolbox. Upon launch, CR Toolbox will scan the local subnet for supported Contemporary Research devices. When a device tab is selected, CR Toolbox will compare the firmware available if any on the local hard drive with the firmware available on the Contemporary Research cloud firmware database. If newer firmware is available for download, the **Download** button will turn red.

Click on the ATSC-mini to view connected devices. If no devices are found, verify the appropriate network adaptor has been selected from the drop-down menu and that the network adaptor and ATSC-mini devices are set for the same subnet.

Follow this procedure to perform a firmware update:

- Click the checkbox for the ATSC-mini units to be updated
- Select the desired version from the **Update To** drop down menu
- Press **Start** to initiate the update
- Status of the update will be displayed in the Status box.
- When the process is complete, the status bar will turn green.
- The status bar will turn red if any part of the firmware update fails

# 15. ATSC-mini Specifications

## Physical

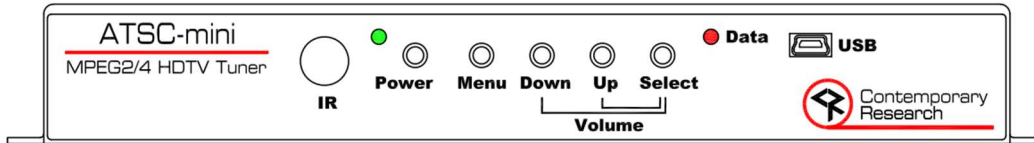
**Size (HWD):** 8" [203 mm] wide (8.6" [218 mm] including wings) x 1.150" [29 mm] height x 3.6" [91 mm] deep

**Weight:** 0.877 lbs [398 g]

**Enclosure:** Aluminum with black powder coat paint

**Mounting:** Hook-and-loop fasteners or screw attachment

## Front Panel



**IR:** IR Remote Sensor

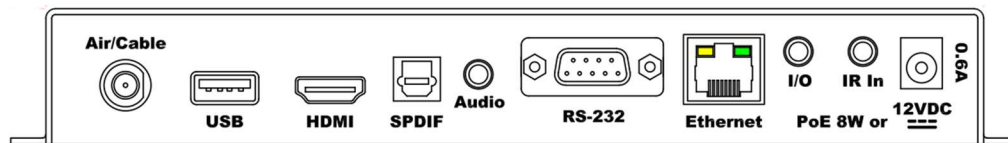
**Status:** Red/green status LED

**Control:** Five button control

**Data:** Red/green RS-232 data activity indicator LED

**USB:** Mini-B virtual com port for future use

## Rear Panel



**Air/Cable:** "F" female, 75 ohm impedance, -10 to 25 dBmV typical

**USB:** USB-A port for demodulator/decoder firmware updates

**HDMI:** HDMI receptacle, Type A, Version 1.4b

### Resolutions and Frame Rates:

- 480i — 29.97 Hz
- 480p — 60 Hz
- 720p — 59.94/60 Hz
- 1080i — 29.97/30 Hz
- 1080p — 59.94/60 Hz
- 2160p — 30/60 Hz

**SPDIF:** JIS F05 jack for optical S/PDIF digital audio output

**Audio:** 3.5mm TRS jack for analog stereo audio

**RS-232:** DB-9 male data link to control system or for display control, 1200 to 230K baud (9600 default)

**Ethernet:** RJ-45 10/100 for web page access, Telnet and UDP control, firmware updates, PoE

**I/O:** 3.5mm TRS jack for future use

**IR In:** 3.5 mm TRS jack for optional external IR receiver or wired IR

Tip= +5 VDC (50 mA max)

Ring= Input

Sleeve= Ground

**12VDC:** Power input 11.5 to 15 VDC, 12 VDC typical, 0.6 A max

2.1 mm coaxial jack (inside center conductor positive)

## Tuning

**Frequency Range:** 51.0027 to 864 MHz

**TV System:** ATSC 1.0, clear QAM, NTSC

**Channels:** Air 2-69 (8-VSB and NTSC) and CATV 2-135 (QAM-64, QAM-256, 8-VSB, and NTSC), Standard, IRC, HRC

**V-Chip:** Supports parental channel block based on US and Canadian ratings

## Decoding

**Video:** MPEG-2 (480i, 480p, 720p, 1080i), H.264 (480i, 480p, 720p, 1080i, 1080p)

**Audio:** AC-3, MPEG-1 Layer 2, AAC

## Captions

**Analog:** Decodes Line 21 captions

**Digital:** Decodes CEA-608 and CEA-708 captions, CEA-708 captions may be customized for font size and style

## Includes

PS12-1.0 Power Supply (5401-001)

## Options

HD3-RC IR Tuner Remote, 2AAA batteries (5024-005)

CC-COM-B RS-232 Null Modem Serial Cable DB-9 F to DB-9 F 6 ft. (5061-003)

IR-RXD External IR Receiver (5034-001)

## Trademarks



HDMI, the HDMI logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing, LLC

## Country of Origin

The 232-ATSC 4K is manufactured in the USA at our facility in Carrollton, Texas.

## **16. Safety Instructions and Warranty**

Read before operating equipment.

- Cleaning - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- Power Sources - Use supplied or equivalent UL/CSA approved low voltage DC plug-in transformer.
- Outdoor Antenna Grounding - If you connect an outside antenna or cable system to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
- Lightning - Avoid installation or reconfiguration of wiring during lightning activity.

Power Lines - Do not locate an outside antenna system near overhead power lines or other electric light or power circuits or where it can fall into such power lines or circuits. When installing an outside antenna system, refrain from touching such power lines or circuits, as contact with them might be fatal.

- Overloading - Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
- Object and Liquid Entry - Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts, resulting in a fire or electric shock. Never spill liquid of any kind on the product.
- Servicing - Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- Damage Requiring Service - Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - When the power supply cord or plug is damaged.
  - If liquid spills or objects fall into the product.
  - If the product is exposed to rain or water.
  - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. An improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
  - If the video product is dropped or the cabinet is damaged.
  - When the product exhibits a distinct change in performance, this indicates a need for service.
- Heat – This product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

\* Note to CATV system installer: This reminder is provided to call CATV system installer's attention to Article 820-40 of the National Electrical Code (Section 54 of Canadian Electrical Code, Part I), that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as possible.

**Warranty:** Three (3) year limited warranty on all parts and labor for Contemporary Research manufactured products. Contemporary Research warrants its manufactured products against defects in materials and workmanship for a period of three years from the day of purchase by authorized dealer. If Contemporary Research receives notice of such defects during the warranty period; Contemporary Research, at its option, will repair or replace products that prove to be defective.

**Exclusions:** The above warranty shall not apply to defects resulting from improper or inadequate maintenance by the customer, customers applied software or interfacing, unauthorized modifications or misuse, mishandling, operation outside the normal environmental specifications for the product, use of the incorrect, modified or extended power supply, acts of God, weather, or improper site operation and maintenance. Please note Contemporary Research SSV-DX Display Express PC product carries a six-month limited warranty.

**Product Service:** Contemporary Research will test, repair, or replace the product or products without charge if the unit is under warranty. If the product is out of warranty, Contemporary Research will test, and then repair the product or products. The parts and labor charge will be estimated by a technician and confirmed by the customer prior to repair. All components must be returned for testing as a complete unit. Contemporary Research will not accept responsibility for shipment after it has left the premises.

**Technical Support:** Contemporary Research technicians will determine and discuss with the customer the criteria for repair and/or replacement. Contemporary Research Technical Support can be contacted through one of the following resources: e-mail support at [support@crwww.com](mailto:support@crwww.com) or phone at: 972-931-2728

**Return Material Authorization (RMA) Number:** Before returning a product for repair or replacement, request an RMA from Contemporary Research's technical support. Provide tech support with a return phone number, e-mail address, shipping address, product serial numbers and original purchase order number. Describe the reason for repairs or returns as well as the date of purchase. See the General RMA Terms and Procedures section for more information. RMA's are valid for 30 days and will be issued to authorized Contemporary Research dealers only. End users must return products through authorized Contemporary Research dealers. Include the assigned RMA number in all correspondence with Contemporary Research. Write the assigned RMA number clearly on the shipping label of the box when returning the product. All products returned for credit are subject to a restocking charge without exception.

**Voided Warranty:** The warranty does not apply if the original serial number has been removed or if the product has been disassembled or damaged through misuse, accident, acts of God, weather, modifications, use of incorrect, modified or extended power supply, or unauthorized repair.

**Shipping and Handling:** Contemporary Research will not pay for inbound shipping transportation or insurance charges or accept any responsibility for laws and ordinances from inbound transit. Contemporary Research will pay for outbound shipping, transportation, and insurance charges for all items under warranty, but will not assume responsibility for loss and/or damage by the outbound freight carrier. If the return shipment appears damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

Products not under Warranty: Payment arrangements are required before outbound shipment for all out of warranty products.

General RMA Terms and Procedures: RMA's are valid for 30 days and will be issued only to authorized active Contemporary Research dealers and distributors.

- End users must return products through authorized Contemporary Research dealers. End users may be eligible for a RMA at the discretion of CR Technical Support.
- Before a defective product can be authorized to send in for repair, it must first go through the troubleshooting process with a member of the Contemporary Research Technical Support team.
- Products authorized for repair must have a valid RMA (Return Material Authorization) number.
- Contemporary Research Technical Support will approve the issue of an RMA number.
- An RMA number is to be included in all correspondence with Contemporary Research.
- The RMA number must appear clearly on the shipping label when the product is returned.
- Products received at Contemporary Research that do not have a valid RMA number clearly marked on the outside of the shipping container may be refused and returned to sender.
- Boxes showing external damage will be refused and sent back to the sender regardless of the clearly marked RMA number and will remain the responsibility of the sender.

Advanced Replacement Policies:

- For Contemporary Research manufactured products, advance replacement will be provided for "out-of-the-box" failures up to thirty (30) days after the initial shipment of products.

*Shipments of equipment that are refused upon attempted delivery, for any reason, are subject to restocking charges.*



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