



SAGE DIGITAL ENDEC

Model 3644

Quick Start Guide

Firmware 95.0

For use with CAP-CP systems

Technical Support:

In Canada:

Trispec: 1-888-494-4474 Option 3

sage.endec@trispec.com

V2.0 September 25, 2023

Table of Contents

FCC Information:	3
1. ENDEC and CAP Overview	4
1.1 Introduction	4
1.2 System diagram	5
1.3 Station Connections	6
2. Introduction to the Sage Digital ENDEC	7
2.1 Front Panel	7
2.2 ENDEC Back Panel	8
3. Setup	10
3.1 Overview	10
3.2 Hookup	10
3.3 Step by Step setup	11
3.3.1 Getting Started: Prep your environment	11
3.3.2 Configure basic network operation	12
1. Determine whether you will use a dynamic address (DHCP) or a static address.	12
2. To configure the ENDEC to use a dynamic IP address.	12
3. Or, to assign the ENDEC a static IP address. Configure gateway and DNS settings.	13
4. Turn on the ENDEC's built-in web server.	13
5. Verify that you can access the ENDEC's web server.	13
6. Download ENDECSetD	14
3.3.3 Update ENDEC firmware	14
3.3.4 Configure other ENDEC parameters	15
3.4 Customizing using the ENDECSetD and the LAN/ Web Browser Interface	16
3.4.1 Passwords & PIN codes	18
4. ENDEC Audio	19
4.1 Analog Audio	19
4.2 Digital Audio	19
4.2.2 Digital Audio Clock	20
4.2.3 Digital Audio Levels	20
4.2.4 Digital Audio Menu Items	20
4.2.4.1 Enable Digital Audio	20
4.2.4.2 Relay Always On	21
4.2.4.3 Pass Through	21

4.2.4.4 Simulcast	21
4.2.4.5 External Clock	21
4.2.4.6 Clock Rate	21
5. Network	21
5.1 Network Security	21
5.2 Network Settings	23
5.2.1 Time (NTP) servers	23
5.2.2 CAP servers	23
5.2.3 Network Printer	23
5.3 Email/FTP settings.....	23
5.3.1 SMTP server	23
5.3.2 Email Addresses	24
5.3.3 FTP Server	24
6. Connector Descriptions.....	25
6.1 Serial Port Pin Out.....	25
6.2 Accessory Power	25
6.3 Microphone Connector.....	26
7. Local Test features	26
7.1 Test Email (web server/Tools/Other/Test Email)	26
7.4 Identify (webserver/Tools/Identify).....	26
7.5 Download All (webserver/Tools/Download All)	26
7.6 TEST button (front panel button, second from left)	26
8. Troubleshooting.....	26
8.1 Blink Errors.....	26
8.1.1 Incoming Alert (IN) LED Only	27
8.1.2 Outgoing Alert (OUT) LED Only.....	27
8.1.3 Automatic (AUTO) LED Only	27
8.1.4 Automatic (AUTO) and Incoming Alert (IN) LEDs.....	27
8.2 Common Problems	28
8.3 Resetting the passwords.....	28
8.4 Resetting parameters to factory defaults.....	28
8.5 Self Test.....	29
9. Warranty	30

FCC Information:

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

Note: 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. 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 their own expense.

For ENDECs sold and used in the United States only: FCC ID
V2W3644

The Sage Digital ENDEC is fully compliant with FCC Part 11.

Copyright © 2014, Sage Alerting Systems, Inc.
All Rights Reserved.

See the “Copyrights and Credits” supplement included with the hardware for additional software copyright information.

1. ENDEC and CAP Overview

1.1 Introduction

This manual is intended for Canadian broadcasters who use the ENDEC with a CAP-CP system receiving alert from the Pelmorex National Alert Aggregation and Dissemination (NAAD) Alert Ready system. Users who are using a combination of CAP with the IPAWS profile and the U.S. Emergency Alert System should refer to the ENDEC EAS Users guide.

You can obtain information about NAADS from:

English: <https://alerts.pelmorex.com/>

French: <https://alerts.pelmorex.com/?lang=fr>

If any changes are made to the CAP-CP system that require updates to the ENDEC software and documentation, the updates will be made available from the Trispec office.

The Sage Digital ENDEC is a device that will convert CAP alerts into audio messages and provide text to video character generators (CG). When properly wired into your audio chain, and interfaced to your CG, the ENDEC will automatically place “must carry” alerts for your area on the air. In some cases, the alert itself will be marked as “must carry” or “Broadcast immediate”. Some alerts will be optional, and you decide whether or not to place that type of alert on the air, based on event type, severity, location, etc.

In the case of optional alerts, the ENDEC can work with your automation system to place the alert on the air at a suitable time, or your staff can tell the ENDEC to proceed using a push button or web interface. You will build a set of “filters” that will tell the ENDEC what types of optional alerts you want to carry, and tell the ENDEC to place them on the air right away, or delay until allowed to proceed.

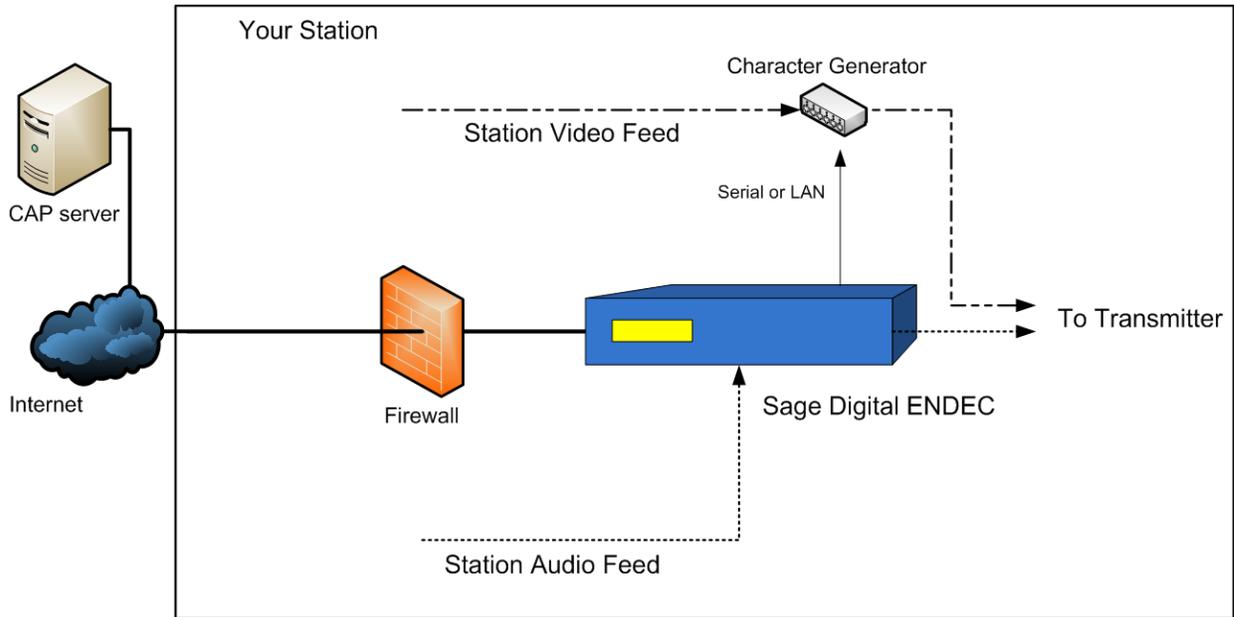
This manual provides an overview of the hardware interface, and how to configure the ENDEC. Information on the types of alerts you will receive from your CAP service provider will be available from that provider. Sometimes, the alerts you carry will be mandated by local, regional, or federal authorities, or you will have agreed to participate in a voluntary alert network that will provide a list of recommended alert types and actions. Specification of filters for alert types is provided in a regional supplement to the ENDEC Quick Start Guide. See <http://www.sagealertingsystems.com/support-manuals.htm>

The main features of the Sage Digital ENDEC are:

- LAN connection for remote control, setup, software update, notifications, monitoring.
- USB connections for printer, additional LAN, additional storage.
- Five GP inputs for triggering tests and forwarding alerts.
- Four GP dry contact closures for automation interface or status display.
- Logging via web page display, USB printer (HP), network printer (HP), email, FTP.
- Web logs include audio and text.
- Time of day synchronized with Network Time Protocol (NTP).
- All solid-state data storage.
- Not a PC, high reliability.
- Sage “Generic CGEN” industry standard character generator interface.
- Supports CAP 1.2, CAP-CP, and CLF 2.0, NAADS.
- Supports TLS 1.2 for Alert audio file download.

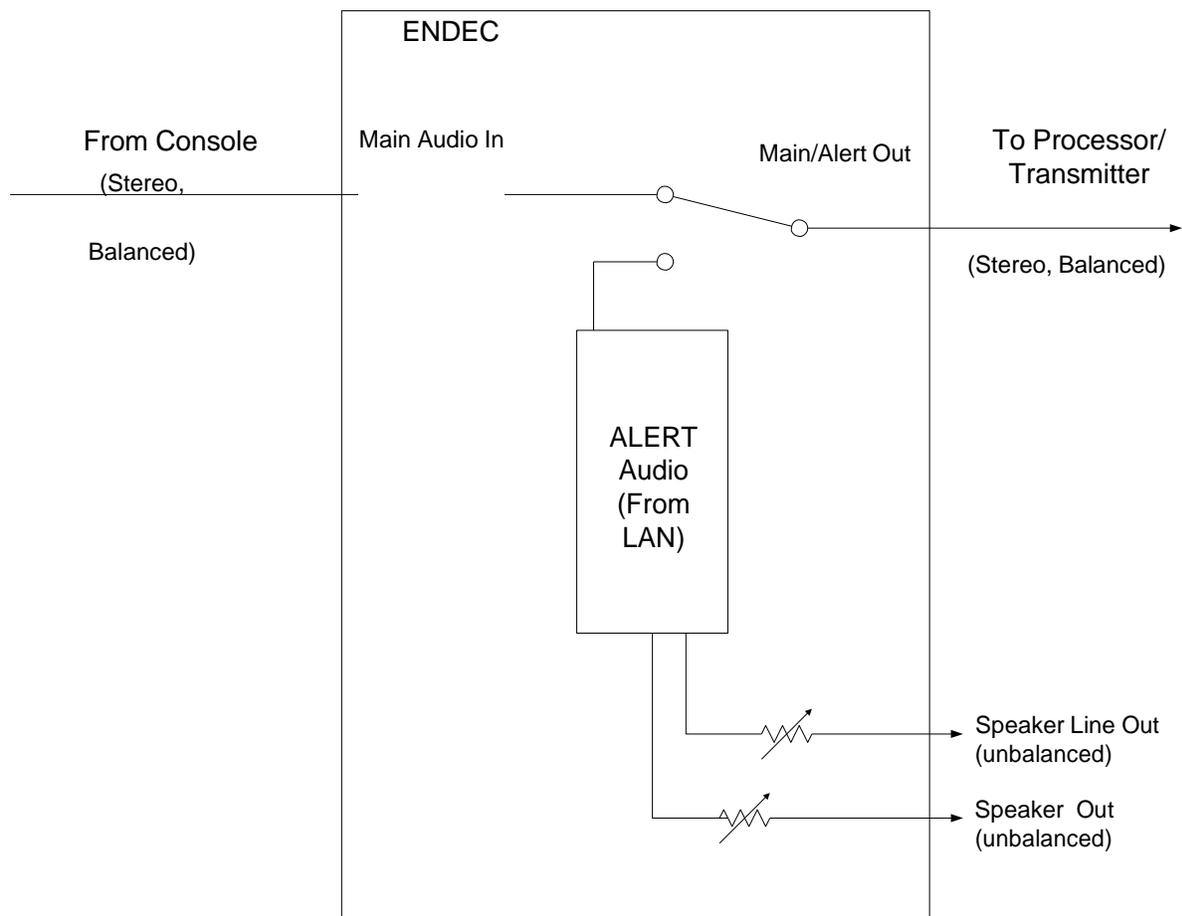
1.2 System diagram

The following diagram shows the relation between the ENDEC and the other major components of a CAP based alerting system for radio or TV stations.



1.3 Station Connections

The following diagram shows one method for connecting the ENDEC to your station. Station audio passes through the ENDEC, the ENDEC switches automatically as required when an alert arrives.



You may also run the Main/Alert audio output from the ENDEC to a switcher and use the Enc Rly dry contact pair on the back of the ENDEC as a switch signal. See section 2.2 ENDEC Back Panel, for pin-outs and details.

You may also use the Digital Audio In and Out connectors for AES/EBU digital audio, either pass-through with the ENDEC providing the insertion, as shown above for analog audio, or with an external switcher using the EncRly dry contact pair as the switch control.

2. Introduction to the Sage Digital ENDEC

2.1 Front Panel

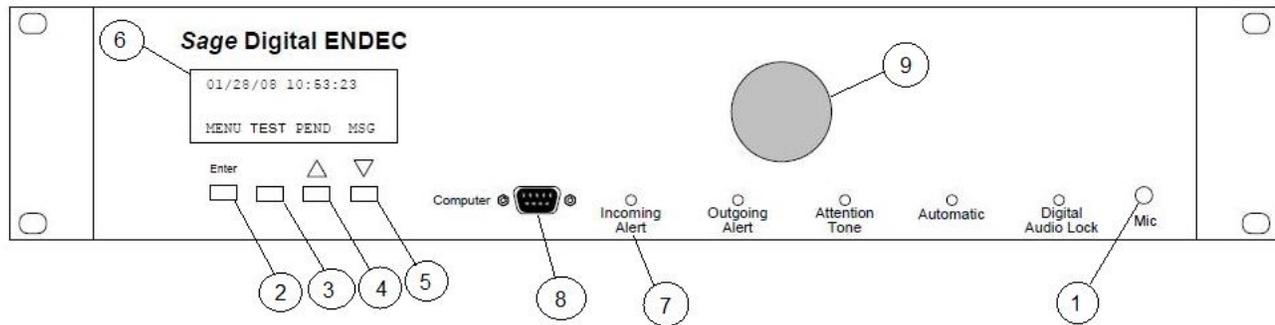


Figure 2-1. ENDEC Front Panel.

Item	Name	Description
1	Mic Jack	For public safety applications, a connector for a microphone. For low level input (15mv - 150mv). See section 4.1, “Analog Audio”, and section 6.3, “Microphone Connector”. Not typically used for broadcast applications.
2	Enter Button	Used to select an item in menu navigation, or as a soft key.
3	Soft Key	Used as a soft key button. In menu navigation, will go up one level in the menu.
4	Up Button	Used as a soft key button. In menu navigation scrolls up.
5	Down Button	Used as a soft key button. In menu navigation scrolls down.
6	4 x 20 LCD display	Used for programming the ENDEC and to read the content of alert messages. The contrast can be adjusted with <code>MENU.LCD CONTRAST</code> .
7	LEDs	<ul style="list-style-type: none"> • Incoming Alert. Lit when an incoming alert is detected. Stays lit if that alert is selected for relay until the alert is relayed or deleted. • Outgoing Alert. Lit when an alert is being sent. • Attention Tone. Lit when an Attention signal is being received. • Automatic. Lit when the ENDEC is in automatic mode. • Digital Audio Lock. Lit when the ENDEC is receiving digital bit clock from the AES/EBU digital input. <p>If any of the LEDs are blinking, an error has occurred. See section 7.1, Blink Errors, for details</p>
8	Serial Port	The “Computer” port. It can be assigned to any device. This port is on the front for convenient access if the ENDEC is rack mounted.
9	Internal Speaker	The internal speaker carries alert audio. It is fed from the back panel “Spkr In” terminal - usually jumpered to the “Spkr Out” terminal, it can also be routed through the console to allow muting.

Table 2-1. Front Panel Descriptions.

2.2 ENDEC Back Panel

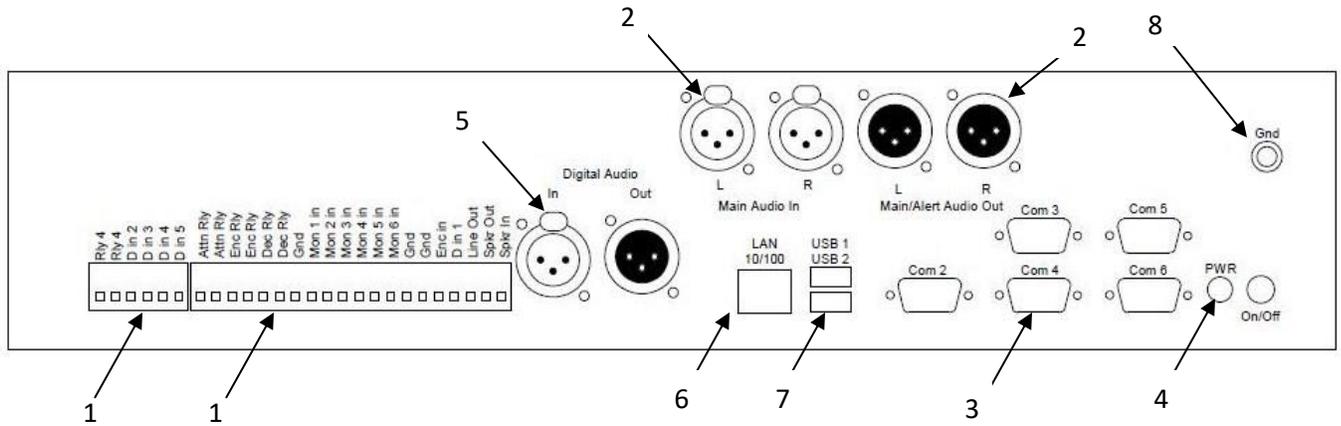


Figure 2-2. ENDEC Back Panel .

Item	Name	Description
1	Terminal Strip 1&2	These terminal strips are removable. The signals found here are listed below.
1	Rly 4	A relay that opens and closes according to an assigned program.
1	D in 2 through 5	A digital input that can be read by the ENDEC as open (floating) or closed (ground). Used for various options such as alert hold off or sending a Weekly Test.
1	Attn Rly	A relay that opens and closes according to an assigned program, the default action is to close when an Attention Signal is being received. When closed, these two terminals are shorted together. The ATTN signal is not used for CAP-CP systems.
1	Enc Rly	A relay that opens and closes according to an assigned program, the default is to close when the ENDEC is sending an alert. When closed, these two terminals are shorted together.
1	Dec Rly	A relay that opens and closes according to an assigned program. The default action is to close when an alert is being received, or is pending. When closed, these two terminals are shorted together.
1	Gnd	Grounds for the various unbalanced audio inputs.

Item	Name	Description
1	Mon <i>n</i> in (1 – 6)	Unbalanced 600 ohm inputs for alert audio sources, .75Vrms typical, do not exceed 2Vrms. Not used for CAP only systems.
1	Enc In	A 600 ohm unbalanced audio input for locally originated audio. Not used for CAP only systems.
1	D in 1 (previously called Manual Override)	A digital input that can be read by the ENDEC as open (floating) or closed (ground). Used for various options such as alert hold off or sending a local Test.
1	Line out	Unbalanced 600 ohm output for alert audio or monitoring the inputs.
1	Spkr Out	Separate unbalanced 600 ohm output, can be used for an external speaker or to feed the internal speaker through Spkr In.
1	Spkr In	The internal speaker, usually fed from Spkr Out. The path is made available on the back panel to allow routing through a console for muting.
2	XLR In and Out	<p>Stereo input and output connectors for station audio. The ENDEC normally passes this through on a hard relay (no audio processing). During an alert, the output is switched to the ENDEC's internal sources. Two connectors are provided for left and right channel audio.</p>
3	Serial Ports	Five serial ports, Com2 through Com6. They can be assigned to any device, see the section on “Serial Port” in the Sage Digital ENDEC Users Guide and Reference manual, available at http://www.sagealertingsystems.com/support-manuals.htm , and section 6.1, “Serial Port Pin Out”.
4	Power	Power input and power switch. Use the power cube supplied with the ENDEC, 18 or 19v, 3A. Do not use the power cube from the original “grey box” model 1822 ENDEC.
5	Digital Audio	AES/EBU digital input and output for station audio.
6	LAN	10/100 LAN connection.
7	USB 1 and 2	USB connection, used for flash drive, printer, etc.
8	Gnd Post	Chassis ground. Connect to facility ground.

Table 2-2. Back Panel Descriptions.

3. Setup

3.1 Overview

To place a CAP alert on the air, you need to do at least the following:

- 1) Place the ENDEC (or a remote relay) in the audio chain. TV stations need to have a character generator in the video chain.
- 2) Connect the ENDEC's LAN connector to your source of CAP alerts. In most cases, this will be an internet connection to the NAAD server. It might be a VPN connection to a provincial server. It might be a multicast connection to satellite delivered data.
- 3) Configure your ENDEC with the locations your station serves, and optionally, the types of non-mandatory messages you want to relay. See the full ENDEC User's Guide for additional details on message filters, and the "hookup" and "customizing" sections below. Use the ENDECSetD V2.56 program and the LAN interface to the ENDEC.
- 4) Configure your ENDEC as needed for your source of CAP alerts. Check the Sage web site at <http://www.sagealertingsystems.com/faq.htm> for a task sheet describing the setup for your CAP provider.

Note: Compliance with your country's rules is ultimately the responsibility of the broadcaster. Staying within the rules is a combination of the ENDEC hardware and software, other hardware and software at your facility, and the various procedures for use of the hardware and software. You need to continue to monitor the proper operation of your ENDEC equipment by verifying that alerts go on the air as expected, and that you receive and relay any required tests. Visit the Sage website at www.sagealertingsystems.com periodically to check for software updates.

3.2 Hookup

Annotated diagrams of the ENDEC front and back panels are provided in section 2. Refer to them if you need additional information. You'll need to:

- 1) Install the ENDEC in a 19" rack. Make sure the ENDEC's ground lug is connected to a good ground.
- 2) Connect power. Use the supplied 18V or 19V 3A power supply.
- 3) Put the ENDEC into the audio chain (after you have set the parameters and done some bench testing and familiarization). If an alert is to go on the air automatically, the ENDEC will need to be able to switch out your program audio and switch in its alert audio. The easiest way to do this is to use the included Main Audio IN and Main Audio Out XLR connectors on the back of the ENDEC to place the ENDEC between the console and other station audio sources and the transmitter (or STL). The ENDEC is usually placed before any audio processing. The ENDEC also has a digital audio AES/EBU in and out connector. When the digital audio IN and OUT ports are used, the ENDEC will automatically interrupt digital audio. If you use an external switch, you can use the digital audio OUT port to provide digital audio to the switcher. In either case, the ENDEC can provide its own clock, or it can derive clock from the digital audio IN port. See section 4.2, Digital Audio.
- 4) If you are a TV station, place the character generator in the video chain and connect the ENDEC to the CG with a serial cable or use a LAN connection, depending on the type of CG used. Cable pin descriptions are in section 6. Use the Device and CGEN tabs on the ENDECSetD program to configure the ENDEC's interface to your character generator.
- 5) Connect any other options, such as hand held remote controllers or LED signs.

-
- 6) Enable logging. The ENDEC can log to any combination of
 - an attached USB printer
 - a LAN-connected network printer
 - a list of email addresses
 - internal FLASH memory, accessible through the ENDEC's internal web server (always enabled)
 - 7) Configure the ENDEC software options as discussed below.

3.3 Step by Step setup

NOTE: If your Endec was shipped pre-programmed, there will be a copy of the configuration form which was provided at the time of ordering. Please use the network login information from this form when accessing the Endec web server.

3.3.1 Getting Started: Prep your environment.

Power up the ENDEC. Connect it to your local network, using the modular jack on the rear of the box. Launch the web browser on your computer. Firefox, Chrome, or IE (modern versions) will work fine.

Create a folder on your computer to store the files you are going to use - one file for the firmware update (if any), and one file for the ENDECSetD installer – and then download the files. Each of these steps will take place at your computer.

1. Create a folder on your desktop. For convenience, simply call it “sage”.
2. Open your web browser, and go to this address:
<http://sagealertingsystems.com/support-firmware.htm>
and select your country. Be sure to use only the update path for your country, as the software installed in the ENDEC is different.

Any modern web browser should do the trick, e.g. Internet Explorer 7 or greater, Firefox, etc. Check to see if new firmware has been released. The configuration sheet that was included in the box your ENDEC was shipped in will tell you what version your ENDEC currently has. If there is newer firmware, download it. From the firmware update page you opened in Step 1, click the link for the firmware file. When prompted to run or save the file, choose to save it in the folder you created in Step 2 of this section. The filename will be the firmware version and have an .x extension, e.g. 95.x.

3. Download the ENDECSetD V2.56 software. From the firmware update page that should be open in your browser from Step 1, download the ENDECSetD utility. When prompted to run or save the file, choose to save it in the folder you created in Step 2 of this section. Once the download process has completed, open the folder and double-click the EndecSetD.msi file. Answer all questions in the affirmative, stepping through the installation process just as you would when installing any program.
4. You have now downloaded the files you need to continue.
5. Set up EndecsetD for Canadian CAP-CP using the document “EndecSetD User Guide V2.56”.

3.3.2 Configure basic network operation.

In these steps, you will tell the ENDEC whether it will have a static or dynamic IP address and activate the built-in web server. Each of these steps will take place at the front panel of the ENDEC. If at any time the ENDEC display prompts you for the admin password, use the default value of 1111 - simply push the far-left button four times.

1. Determine whether you will use a dynamic address (DHCP) or a static address.

The correct answer depends on how your network is configured, if you don't know, check with your IT department or internet service provider. Note also that DHCP provides netmask, gateway and DNS details automatically. If you choose to use a static address, you will need to enter these details manually. Netmask, gateway and DNS values are also network-dependent.

Important!

By default, the ENDEC will attempt to obtain an address using DHCP. If you need to change from a static address to DHCP, perform step 2. If you will be using a static address, proceed to step 3. Do only one. Step 2 and Step 3 are EXCLUSIVE of each other.

2. To configure the ENDEC to use a dynamic IP address.

a) The ENDEC's front panel should look like this:



Figure 3. Endec Front Panel

- b) At the ENDEC's front panel, push the Enter button (the first button on the left).
- c) Push the down arrow button to move down the list until the arrow on the screen is pointing at the Network option, then push the Enter button.
- d) Push the down arrow button until the arrow on the screen is pointing at Network Addr Type, then push the Enter button.
- e) Push the Enter button again to select DHCP. The display will return to the Network menu.
- f) Push the down arrow button until the arrow on the screen is pointing at Restart Network. Push enter to restart the network. The display will return to the main menu with the arrow pointing at Network. Press enter.
- g) The arrow is now pointing at Show IP Addr.
- h) Push the Enter button, and then write down the IP address shown on the display.
- i) Go to step 4.

3. Or, to assign the ENDEC a static IP address. Configure gateway and DNS settings.

- a) At the ENDEC's front panel, push the Enter button (the first button on the left).
- b) Push the down arrow button to move down the list until the arrow on the screen is pointing at the Network option.
- c) Push the Enter button, then push the down arrow button until the arrow on the screen is pointing at Network Addr Type.
- d) Push the Enter button, and then push the up arrow button to select STATIC. The display will return to the Network menu.
- e) Push the down arrow button to move up the list until IP Address is selected, then push the Enter button.
- f) Set the ENDEC's IP address. Push the up arrow to increment the value above the cursor, the down arrow to decrement, and the unlabeled button (second from the left) to move the cursor to the next position. When you have finished, push the Enter button.
- g) Do not be alarmed if the ENDEC displays a warning that the gateway is not on the current network.
- h) The display will return to the Network menu. Push the Down button until the Netmask option is selected.
- i) Using the buttons in the same fashion as when setting the IP address, set the Netmask value, and then push the Enter button.
- j) The display will return to the Network menu. Push the Down button until the Gateway option is selected.
- k) Using the buttons in the same fashion as when setting the IP address, set the Gateway address, and then push the Enter button.
- l) The display will return to the Network menu. Push the Down button until DNS1 is selected.
- m) Set the addresses for DNS1 and DNS2, using the buttons in the same way as when setting the ENDEC's IP address. If you don't know your DNS address, use 8.8.8.8 and 8.8.4.4. This is a public DNS service offered by Google.
- n) Push the down arrow button until the arrow on the screen is pointing at Restart Network. Push enter to restart the network.

4. Turn on the ENDEC's built-in web server.

From the Network menu, use the Up and Down buttons to select the Web Server option, then push the Enter button. The display will ask whether Web Server should be Yes or No. Push the Enter button to choose Yes.

5. Verify that you can access the ENDEC's web server.

Open your web browser. In the address bar, type in the IP address of the ENDEC, then hit Enter. You will see a prompt for a password from the Sage Digital ENDEC. The default user name and password are admin. Enter then, and the ENDEC's built-in web page will appear in your browser. Make sure you change the default password by entering new passwords on the ENDECSetD network tab.

6. Download ENDECSetD.

If you have not already done so, download and install the ENDECSetD program from www.sagealertingsystems.com. Use the links on the left side of that page to navigate to support, and then to PC Software.

3.3.3 Update ENDEC firmware.

It's good to begin an initial installation with the latest firmware. This section will help you accomplish that and serves as the steps you'll follow anytime you update the ENDEC's firmware in the future. Each of these steps will take place at your computer. You will need to know the current IP address of the ENDEC. If you don't know the address, refer to the section above on configuring your network operation. You will also need to know where the firmware file is located on your computer. You downloaded it in the Prep your environment section above.

Important!

Make sure the power to the ENDEC does not go out during this process. You may not, for instance, want to do this during a thunderstorm.

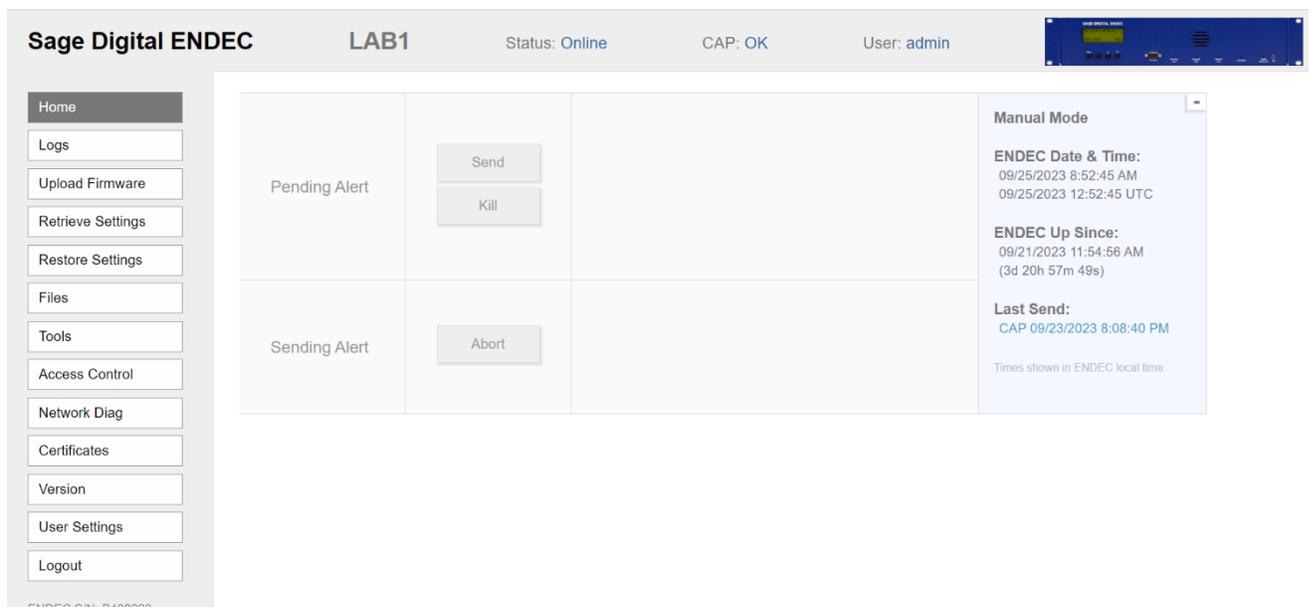
1. Open your web browser. In the address bar, type in the IP address of the ENDEC, then hit Enter. The ENDEC's built-in web page will appear in your browser.
2. From the buttons on the left-hand side of the page, click Upload Firmware. The Upload Firmware Update form will appear on the right-hand side of the page.
3. Click the Browse button on the form. Using the file selection window that pops up, navigate to the folder containing the firmware file.
4. Click the firmware file to select it.
5. Click the Open button at the bottom of the file selection window. The file selection window will disappear, and you will see the firmware update form again.
6. Click the Upload button in the bottom-center of the firmware update form.
7. A message will be displayed, indicating that the update is underway, and that you must not disturb the ENDEC until the update process has completed.

The ENDEC will automatically reboot and return to an operational state once the firmware update process has finished.

3.3.4 Configure other ENDEC parameters.

Quick changes to basic settings can be made at the ENDEC's front panel, but more involved procedures (incoming alert filters, for example) are best handled using the ENDECSetD V2.56 utility. If you haven't yet installed the ENDECSetD utility on your computer, refer to Section 3.3.1. This section provides the basic steps to retrieve your ENDEC's settings, edit them on your computer, and then upload your changes back into the ENDEC. You will also need a folder to store the ENDEC settings file - the Sage folder you created in Section 3.3.1 is a good place for this purpose, and we'll refer to it here as your Sage folder.

1. Open your web browser to the ENDEC's built-in web page.
Open your web browser. In the address bar, type in the IP address of the ENDEC, then hit Enter. The ENDEC's built-in web page will appear in your browser.
2. Log in to the Endec web page using the Administrator username and password for your unit, then get the current settings from the ENDEC.



From the menu down the left-hand side of the screen, click the Retrieve Settings button. Once the Retrieve Settings form appears on the right-hand side, click the gray Retrieve Settings button in the form. The Endec Settings file and filter file will be downloaded to your “Downloads” folder with file name CALLSIGN_date_time as shown below.

Open your Downloads folder and copy the files (Settings file ends with .es2, Filter file ends with .filter) to your Endec folder.

Folder	File Name	Date	Type	Size
Downloads	LAB1_20230925125459.es2	2023-09-25 8:55 AM	ES2 File	11 KB
Downloads	LAB1_20230925125459.es2.filter	2023-09-25 8:55 AM	FILTER File	3 KB

3. Edit your ENDEC's configuration settings as desired. See section 3.4, “Customizing using the ENDECSetD and the LAN/ Web Browser Interface” for details.
4. When you are finished, save your changes.
Simply click the little floppy disc button, located near the upper left of the ENDECSetD window.
5. Update the ENDEC with your new settings.

3.4 Customizing using the ENDECSetD and the LAN/ Web Browser Interface

ENDECSetD provides access to each setting on the ENDEC, including incoming and outgoing filters and headers, custom event, and location names.

ENDECSetD includes item by item help, accessed with the  toolbar item.

When using the CAP-CP version of the ENDEC software in Canada, ENDECSetD must be placed in the proper mode:

- 1) Start ENDECSetD.
- 2) On the menu, select Mode, then EAS/CAPCP...
- 3) Select CAP-CP and click OK.
- 4) Exit ENDECSetD.

This setting will be remembered on your PC. Changing to the CAP-CP mode hides many of the settings not used for CAP-CP and shows the CAP-CP filter menus.

To use the ENDECSetD program with the LAN:

- 1) Fetch the settings file from the ENDEC using the “retrieve settings” menu item on the ENDEC’s web page. This will download a copy of the current Settings file and Filter file. Be sure to keep both files in the same directory. When you open the Settings file with EndecsetD it will also open the matching filter file.
- 2) Start ENDECSetD, open the saved file using the “File” menu.
- 3) Edit the file. Unless you want to disable the Web server, make sure you have the Web server enabled on the Network tab.

NOTE: Starting with Rev 95.0, all user accounts for web access are controlled from the web page. They are no longer configured in the settings file. To update or add user accounts, log in to the Endec web page and select the “Access Control” page from left tool bar.

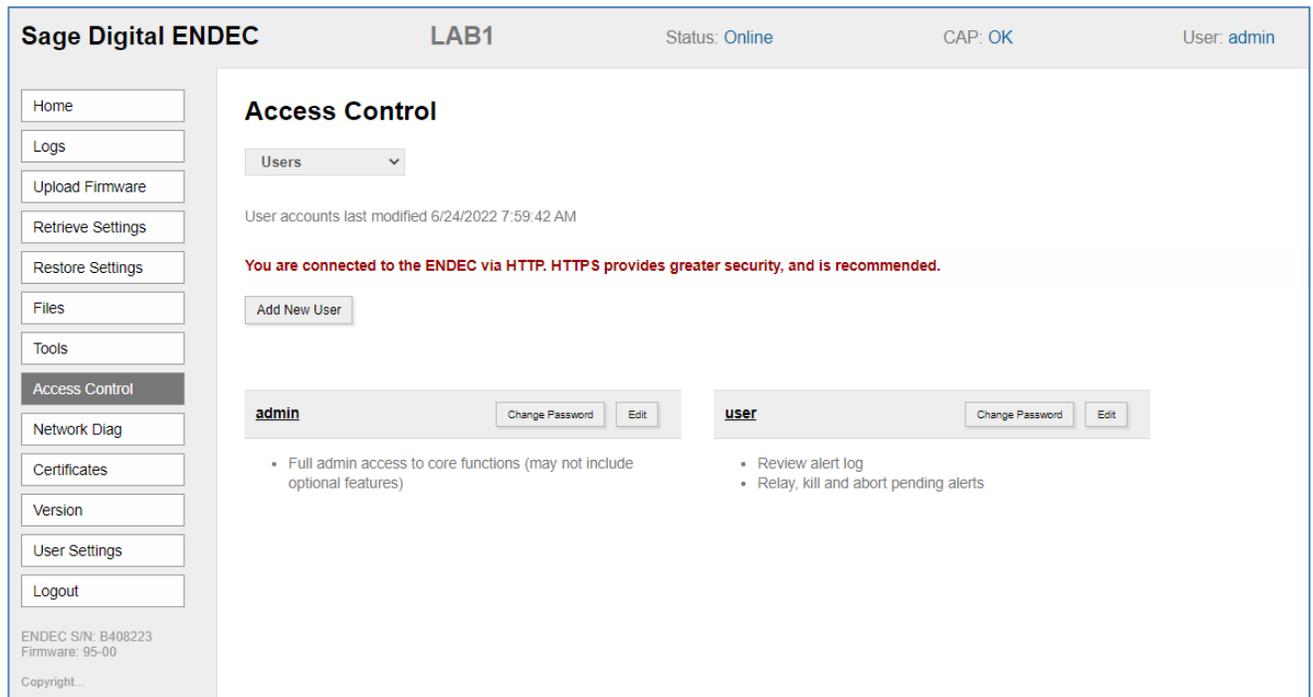


Figure 4. Endec Access Control page.

-
- 4) Upload the file to the ENDEC using the “restore settings” menu item on the ENDEC’s web page.
 - 5) The ENDEC will reboot.
 - 6) If you have made changes to your CAP filter settings, you must also upload the CAP filter file. This is now uploaded from the same page as the Settings file.

You need to set a few parameters to localize your ENDEC. At a minimum, you will need to :

- 1) Set the UTC offset on the config tab.
 - 2) Set the Daylight-Saving Time Enable, if desired, on the config tab.
 - 3) Set your stations call sign on the config tab
 - 4) Set your NTP server on the network tab.
 - 5) Make sure you have web server enabled on the network tab if you want to continue to access the ENDEC from your LAN after uploading this settings file.
-
- 6) Set your CAP filters. You are only required to carry “Broadcast Immediate” category alerts on air. For this, use section “a”.
If desired, you can set up multiple filters to handle different levels of alerts, as shown in sections a,b,c.
 - a. Alerts; Action: Only if BI; Priority=50; Urgency =Immediate; Severity=Extreme; Certainty=Observed; Event=Any. For events that are actually occurring at this time.
 - b. Warnings; Action: Automatic Relay; Priority=40 Urgency =Immediate; Severity=Severe; Certainty=Likely; Events: as desired for events/conditions that have not yet been observed but are expected to occur soon.
 - c. LogOnly; Action: Log Only; Priority=30 Urgency=Any; Severity=Any; Certainty=Any; Events=Any. This will log any messages received that are not to be broadcast but are wanted in the log history for reference.

7) Set your CAP servers. In most cases, you will build two CAP Servers on the CAP tab.

The settings are, for the primary:

- a. Server Name NAAD1
 - b. Server Type: NAAD TCP
 - c. Server Base URL - streaming1.naad-adna.pelmorex.com
 - d. Poll rate 60 seconds
 - e. Enable Polling: checked.
 - f. Language: use en-CA for English, fr-CA for French Canadian.
 - i. For both languages with English first, then French, use en-CA,fr-CA
 - ii. For both languages with French first, then English, use fr-CA,en-CA
 - iii. For English only, but French if English not available, use en-CA,*fr-CA
 - iv. For French only, but English if French is missing use fr-CA,*en-CA
 - g. All other check boxes and text boxes should be blank.
-
- 8) Build a second CAP server entry as above, substituting:
 - a. Server Name NAAD2
 - b. Server Base URL – streaming2.naad-adna.pelmorex.com
- 8) Select the “Leadin/Out” tab and select the “NVAudio Lead in Pre” option. This will set the Endec to play the NVAudio (alert tone) file before each alert.

-
- 9) Install the Canadian National Alerting Tone.mp3 file in the Endec
 - a. Copy the file “Canadian Alerting Standard Tone.mp3” to your Sage folder from the CD packed with the Endec.
 - b. Using the Endec web server, select “Files-Restore NVAudio”, then browse to the Sage folder, select the file, and click “Open” then “Upload. The Endec will load the file then reset.
 - 10) Optional Lead Out Announcement

The Endec has an optional “Lead Out” file which can be loaded separately and selected from the “Leadin/Out” tab. The process is the same as the Lead In file above.

3.4.1 Passwords & PIN codes

The ENDEC uses two PIN codes for front panel access; a user level password, called “password”, and an administrator’s password, called “admin”. The user password will allow you some functions, while the Admin will allow other functions.

The admin password allows you to modify the configuration parameters. A password is from 1 to 8 digits long, the digits are 1, 2, 3, or 4. When you select a menu item that starts with the asterisk * you are prompted to enter admin “password” and are given four soft keys. Press the numbered keys for the “admin” password. If you selected a menu item that does not start with the asterisk * use the “user” password.

The passwords unlock access to the appropriate levels of the menu. Access remains open until you exit the menus and go back to the default screen.

4. ENDEC Audio

4.1 Analog Audio

The Digital ENDEC has a balanced audio pass through system. When the ENDEC is not in alert mode, the inputs are connected direct to the outputs via mechanical relays. When the ENDEC is in alert mode, the ENDEC relays connect the ENDEC's DSP section to the output connectors, and the ENDEC provides the output.

The Mon in and Enc inputs are not used in CAP-CP applications. Do not connect anything to those inputs. They are unbalanced and are limited to 2Vrms. Exceeding the 2Vrms level will result in poor audio, exceeding 10Vrms will damage the ENDEC.

The front panel microphone is not used for CAP-CP applications.

4.2 Digital Audio

4.2.1 Digital Audio Input, Output, and Pass-through

The Digital ENDEC has a single AES/EBU in and out. The input is used to accept station audio. The ENDEC can be configured to actively or passively copy this data to the output. The ENDEC will also send an alert to the output. The output clock can be generated internally or derived from the input data stream. The ENDEC always sends the alert in two channel format.

Use the **MENU.DIGITAL** front panel or ENDECSetD Digital Audio tab to control how and if the ENDEC performs digital audio pass-through. Following are descriptions of how the various settings can be used to implement several pass-through types.

- 1) Active Digital Pass-through. In this mode, the ENDEC acts as an audio switch. The station audio is connected to ENDEC Digital Audio In, and the ENDEC copies the bit stream to Digital Audio Out. When an alert is sent, the station audio is replaced by the alert audio on a bit boundary, causing a minimal frame sync loss. The ENDEC's mechanical relay is ON all the time, meaning when the ENDEC is powered, it is performing the active copy function, but as a failsafe, the ENDEC is a hardware pass-through when power is removed.

Settings:

Enable Digital Audio:	Yes
Pass Through:	Yes
Relay always on:	Yes
Clock:	External

- 2) Mechanically switched pass-through. In this mode, the ENDEC's mechanical relay is OFF (hardware pass-through) unless an alert is being sent. This causes a larger break in the digital audio stream at the start and the end of an alert. This can cause an audio glitch in the output, but the ENDEC is not inline unless an alert is in progress.

Settings:

Enable Digital Audio:	Yes
Pass Through:	No
Relay always on:	No
Clock:	External or internal

-
- 3) Alert generation only. In this mode, a downstream external switcher places the ENDEC's digital audio into the station's digital signal. Switching occurs as a result of the ENDEC closing one of the four contact closures (the Push-To-Talk function). The ENDEC will generate digital data only when an alert is in progress. An input signal to the ENDEC is not needed, but if the downstream switch wants to see the ENDEC clock synchronized with house clock, then an input audio stream must be provided to the ENDEC's Digital In.

Settings:

Enable Digital Audio:	Yes
Pass Through:	No
Relay always on:	No
Clock:	External or internal

- 4) Alert generation with idle. This mode is the same as "Alert generation only" except that the ENDEC will always output a digital signal, sending silence when an alert is not in progress. This mode is used if the downstream switcher wants to see signal at all times. An input signal to the ENDEC is not needed, but if the downstream switch wants to see the ENDEC clock synchronized with house clock, an input signal must be provided.

Settings:

Enable Digital Audio:	Yes
Pass Through:	No
Relay always on:	Yes
Clock:	External or internal

Each digital control setting is described in detail below.

4.2.2 Digital Audio Clock

The ENDEC can derive digital audio clock from the input audio stream, or it can provide its own clock.

Important! Even if you set the ENDEC for external clock, you must still set the ENDEC Clock Rate parameter. The rate setting also controls the conversion of the various audio sources, both analog (from the monitor inputs) and digital (from CAP messages), to the proper digital speed. Failure to set the rate correctly will result in either a playback that is fast and high pitched, or that sounds like HAL on the last verse of Bicycle Built for Two.

4.2.3 Digital Audio Levels

The **MENU.DIGITAL LEVELS** menu or the ENDECSetD Digital Audio tab can be used to set the levels of the various tones, similar to the setting of the analog audio levels in the **MENU.LEVELS** or Levels tab.

4.2.4 Digital Audio Menu Items

The following items are available on the ENDECSetD Digital Audio tab, or on the front panel.

MENU.DIGITAL AUDIO menu.

4.2.4.1 Enable Digital Audio

If enabled, the ENDEC will send alerts to the digital output and will light the front panel Lock LED if a digital input is present.

4.2.4.2 Relay Always On

If enabled, the ENDEC digital relay is always on, meaning the ENDEC's digital audio transmitter is always driving the Digital Audio Out signal. "Always" means after the ENDEC is turned on and starts up. When the ENDEC is off, and for a short time after it is turned on, the ENDEC relay is OFF, meaning the ENDEC digital transmitter is bypassed, and Digital Audio In is hardwired to Digital Audio Out.

4.2.4.3 Pass Through

When enabled, the ENDEC copies the Digital Audio In bit stream to the Digital Audio Out bit stream, except when it is sending an alert.

4.2.4.4 Simulcast

When enabled, the ENDEC will always send an alert on the Digital Audio output at the same time that it sends an alert on the analog outputs. If Simulcast is not enabled, the digital output can be sent independently of the analog alert.

4.2.4.5 External Clock

When External Clock is enabled, the ENDEC uses the input stream to derive its digital bit clock, otherwise it will generate its own clock based on the Clock Rate setting. Note: even if External Clock is enabled, Clock Rate must also be set to the correct rate.

4.2.4.6 Clock Rate

The ENDEC supports sample rates of 32 kHz, 44.1 kHz, and 48 kHz.

5. Network

This section of the manual will discuss the features of the Sage Digital ENDEC that involve the use of the LAN connection. Read the section on network security below before using the LAN with your ENDEC. Except for setting the LAN address and enabling the web server, most of these settings cannot be made from the front panel, you must use the ENDECSetD or web browser interface. When configuring a LAN connected ENDEC for the first time, you must use the front panel to perform the following functions:

- 1) Set the addressing type (DHCP or STATIC). DHCP is the default. If DHCP, use the **MENU.NETWORK.SHOW IP ADDR** menu to see the address. If static, set the IP address, gateway, netmask, and at least one DNS address.
- 2) If desired, enable access to the ENDEC's web server by using the **MENU.NETWORK.WEB SERVER**. **IMPORTANT:** see the section on network security below before enabling Web access.

5.1 Network Security

While we have tried to provide you with the tools you need to help keep the ENDEC secure, security is ultimately the responsibility of the user.

What Sage has done:

- 1) If DHCP is enabled, the ENDEC will attempt to get an IP address. If you do not want the ENDEC on the LAN, do not connect a cable to the RJ-45 LAN port on the back of the ENDEC (labeled LAN 10/100).
- 2) NTP (Network Time Protocol) is enabled. The ENDEC does not allow remote control of the NTP settings via the NTP protocol – it only allows specification of a list of servers via ENDECSetD. See section 5.2.1, Time (NTP) servers.

-
- 3) By default, all control functions that would generate local alerts that use the LAN are disabled. This includes the Web server, the automation interface, and the ENDEC PRO/DJ LAN interface. You must enable these features on the front panel in **MENU.NETWORK** or on the ENDECSetD Network tab.
 - 4) The ENDEC’s web server requires a username and password to access the web page. There are two levels of access, the ability to change settings requires an admin name and password, and all other functions require a username and password. By default, the username is **user**, and the user password is **user**. The admin name and password are both **admin**. **Starting with V95.0** the web page access names and passwords are managed from the web page tool button “Access Control”. Once logged in you **MUST** change the default name/password to be secure. Use passwords that contain upper- and lower-case letters, numbers, and punctuation. You should also use something other than “user” and “admin” for the names. If you forget the admin password, you can reset the Web Users to factory default from the front panel.
 - 5) The ENDEC’s web server can use unencrypted (HTTP) or encrypted (HTTPS) access. The ENDEC uses a self-signed certificate² for encryption purposes. To access your ENDEC using encryption use https:// in the URL. For example, if your ENDEC’s IP address is 192.168.1.100, then you would enter https://192.168.1.100 in your browser’s address field. Note: because the ENDEC’s certificate can’t be verified against a signing authority, you will get an error from your browser. Click the “connect anyway” link to connect to the ENDEC.

² HTTPS and certificates are used for several reasons. HTTPS is used to encrypt the data so a third party can’t easily snoop on the session. Certificates allow the web client (user) to be sure that it is talking to the expected server, and not a spoofed server. Unfortunately, you can’t use HTTPS without a certificate, leading to warning messages about the self-signed certificate. If you require authentication for your environment, contact support@sagealertingsystems.com.

What you must do to enhance your security:

- 1) Use firewalls as necessary to protect access to the ENDEC. The ENDEC uses the following TCP ports. “portbase” refers to the portbase number set by **MENU.NETWORK.PORTBASE** or the portbase setting on the ENDECSetD network tab.

Port base	8080
HTTP	80
HTTPS	443

Each of these interfaces must be enabled with the ENDECSetD network tab or the front panel. **MENU.NETWORK** menu.

- 2) Select appropriately complex passwords for Web Page access. Do not use your station’s call letters.
- 3) Periodically check the www.sagealertingsystem.com/support web page. Download and install any security updates.
- 4) The ENDEC also uses port 8888 to serve audio streams to the “streams” item on the main ENDEC webserver page, and VU meter readings to the “Show Inputs Levels” item. This port cannot be disabled. Streaming monitor audio is not used by CAP-CP applications.

5.2 Network Settings

Other network settings are described below. For all address lists, addresses can be an IP address or a DNS name. If you use a DNS name, and your address type is static, you must supply a DNS server address. If your address type is DHCP, your DHCP server must provide the DNS server address. When using ENDECSetD, put one address on a line; use as many lines as you need.

5.2.1 Time (NTP) servers

The ENDEC will use this list of NTP (Network Time Protocol) servers to set its time-of-day clock. When used on a LAN, NTP will typically keep the ENDEC clock within a few milliseconds of a local time standard. When used with an internet server, the time will typically be within several tens of milliseconds. You can specify a list of NTP servers on the ENDECSetD network tab. Two public access servers are provided by default. Your facility may also have a NTP server as part of your internal web server or master clock. You can also configure most Windows or Linux systems to act as a time source. NTP is recommended – the ENDEC will typically keep its clock synced to a few tens of milliseconds when it has access to an NTP server. You must provide access to an NTP source to keep the ENDEC's time from drifting to the point where alerts are missed because they appear to be expired.

5.2.2 CAP servers

The ENDEC will poll this list of servers for CAP messages. Your CAP message provider will supply the information you need to access the CAP server.

5.2.3 Network Printer

The ENDEC will send alert logs to a supported network printer. Currently, the ENDEC supports several types of HP printers.

5.3 Email/FTP settings

See the ENDECSetD Email/FTP tab for these features:

5.3.1 SMTP server

When sending email, the ENDEC will use this address to access the SMTP server. If your SMTP server requires a password, you can enter the password on the same settings page. The ENDEC does support SSL (TLS) encryption for email.

5.3.2 Email Addresses

Receiving: Messages are sent to this list as soon as the alert is received, if the alert is one that might be forwarded. Use this list to notify you in real-time when an alert that requires action, or that will be automatically relayed, is arriving. If the alert was something other than a duplicate or Log Only, then the audio (if any) will be attached to the email message.

Received/Sent: All Alerts sent to air are sent to this list. Use this address list to collect everything you need for an activity log.

Error: Error conditions and other engineering status messages are sent to this list.

The text of the email messages can be very long, depending on the number of locations in the alert. If you send these messages to a cell phone using an SMS email address, for example, 2325551212@vtext.com, the message can be truncated, or multiple text messages can result.

To send a shorter message, place "sms://" in front of the address, for example,
sms://2135551212@vtext.com

Attachments are not sent to SMS addresses.

5.3.3 FTP Server

The same data and attachments that are emailed can also be sent to an FTP server. Each message and attachment is sent as a separate file. Use the FTP section of the ENDECSetD Email/FTP tab to set your host, username, and password.

You can specify a directory to use by placing it after the host address. For example, if your FTP server is at 192.168.4.4, and you want to use a directory called cap, then place this in the FTP

Host/Path box: 192.168.4.4/cap

6. Connector Descriptions

6.1 Serial Port Pin Out

The Sage Digital ENDECs serial port pin out is the same as the original ENDEC, except that Com 2 does not have accessory power available on pin 9.

To connect a PC to the ENDEC use a “null modem” cable, that is, swap pins 2 and 3.

6.2 Accessory Power

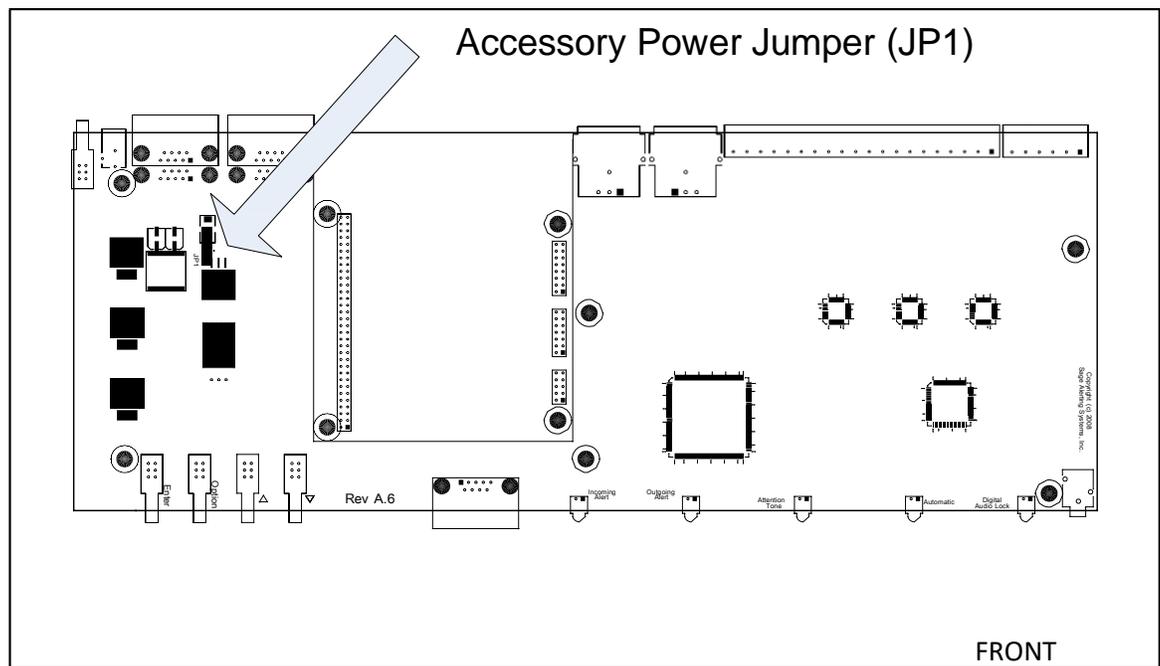


Figure 6-1. Location of Accessory Power Enable Jumper JP1.

Each ENDEC serial port except Com 2 provides regulated +9v power on pin 9. This is intended as the power source for the handheld remote control, though it can be used for any purpose.

Do not source more than 150ma from the accessory power pin, or 300ma total from any combination of Com ports. If you are using more than two handheld remote controls, you will need to power the third and fourth remotes from a 9V power cube.

The factory default is “no power” on the ACC PWR pins. To enable these pins, place a jumper on JP1 on the main board. To access JP1, you will need to remove the top cover of the ENDEC by removing the six top cover screws. Slide the cover toward the rear of the ENDEC. JP1 is on the large green circuit board covering the bottom of the case. See Figure 6-1. There will be a jumper on one pin of JP1, remove it and reinsert it so that the jumper covers both pins. Use JP1 on the main board, do not use JP1 on the red daughter card.

6.3 Microphone Connector

The ENDEC front panel microphone connector is not used for CAP-CP applications.

7. Local Test features

The Endec now has several local test features which allow the user to set and verify the audio levels, Relay switching and Text-To-Speech functions. These functions are available from the front panel “Test” button (for standard test message).

7.1 Test Email (web server/Tools/Other/Test Email)

If email services are configured, the “Test Email” button will instruct the Endec to send a test email to the addresses listed in the “Errors” section. This is used to notify the technical staff that the unit is configured correctly and has access to the email system.

7.4 Identify (webserver/Tools/Identify)

Selecting the “Blink” button in the “Identify” menu page will cause the “Attention Tone” LED to blink. This is to allow easy identification of which unit you are connected to when there are multiple Endecs in a rack.

Selecting the “Stop” button will turn off the “attention Tone” LED.

7.5 Download All (webserver/Tools/Download All)

This feature allows you to download the CAP Stats, NAAD Stats, Email log and NAAD Log in one text file. The file will download to your “Downloads” folder.

7.6 TEST button (front panel button, second from left)

When you press the “TEST” button on front panel, you will be asked to enter the “User password” to access the test message.

Once the User password has been accepted, the screen will give you the option of “English” or “French”. Select the appropriate language.

Next screen will ask “Close Relay?” Select “Open” or “Close”.

NOTE: Selecting the “Close” will force the Endec to switch the audio relay on, **switching out the station audio and sending the standard test message live to air. If you do not want the test alert to play on air, select “Open”**

The next screen will display

“Test Audio TTS”

“Ready to send”

“Proceed Abort”

Select “Proceed” to send the alert, or “Abort” to cancel.

8. Troubleshooting

8.1 Blink Errors

If an error occurs in the ENDEC that requires operator action, one or more of the front panel and remote-control LEDs will blink. To turn off the blink, correct the problem and reboot the ENDEC, or use the **TEST.RESET BLINK ERROR** menu. Here is a list of all “blink” conditions:

8.1.1 Incoming Alert (IN) LED Only

If the Incoming Alert LED is blinking, there has been an error with the ENDEC's self-test. The error message is in the MSG buffer, press the **MSG** soft key to read it. Power cycle the ENDEC, if the problem recurs, call for service.

8.1.2 Outgoing Alert (OUT) LED Only

This is not an error condition. If the audio source for an alert is "console", the Outgoing Alert LED will blink during the audio portion of an alert. The ENDEC has dropped out of line and the station audio chain has been restored, that is, the operator should talk now.

8.1.3 Automatic (AUTO) LED Only

If the auto LED is blinking, an error message is in the MSG buffer, press the **MSG** soft key to read it. Messages and causes are:

Network error	Endec has lost connection to one or both NAAD servers. The Endec monitors NAAD1 and NAAD2 heartbeat messages which are sent once per minute. If Endec misses 5 consecutive heartbeats from one or both servers, it will blink the Auto light until it has received 5 consecutive heartbeats from server. Check local network connection and internet access.
Time is not set	The internal clock calendar chip has lost battery backup or was otherwise reset, or the time has been set less than 1996 or greater than 2094. Fix the time and reboot the ENDEC ³ . Note: The Digital ENDEC uses a long-life battery that will last longer than 20 years in normal use.
Configuration file corrupted	The saved parameters have been corrupted. The default parameter settings have been restored - you will need to setup the ENDEC again or download saved parameters using the ENDECSetD software.
CGEN <i>com port</i> did not respond	The VDS character generator on the named Com port did not respond to commands. This is usually a problem with the cable or the CG. Check the cables, check power to the CG. You can test the access to the CG by using the TEST.VDS CGEN VERSION menu. If a version is returned, the setup is OK, if "no response" is shown on the ENDEC display, the ENDEC and CG are not exchanging data.
EEPROM-D Corrupted	This message may also be followed by diagnostic information such as "end tag missing". The internal configuration file is not formatted correctly - Call for service.

8.1.4 Automatic (AUTO) and Incoming Alert (IN) LEDs

This is not an error, the ENDEC is in practice mode. The next alert sent will not close the XLR relays.

³ To reboot the ENDEC, either cycle the power with the on/off switch or use the **MENU.TEST.REBOOT** menu.

8.2 Common Problems

Here is a list of common problems that may save you a call to the service center.

ENDEC seems dead.	<ul style="list-style-type: none">• The LCD backlight is wired almost directly to the main power input. If the backlight is not on (it should be bright yellowish/green) suspect the power input (plugged in, right power cube, power switch on).• The backlight is on but shows one or more rows of black squares: the ENDEC CPU is not running. Call for service.
The time display is incorrect.	<ul style="list-style-type: none">• The Digital ENDEC will synchronize to a time standard using the Network Time Protocol (NTP). The ENDEC will retain time across a power outage, though the time may drift several seconds if the ENDEC is off for a long period of time. The NTP protocol can take several minutes to resynchronize the time but will typically hold the time to a few tens of milliseconds of your time standard. If the time is off by an integer number of hours, adjust your UTC time offset.
The ENDEC resets while entering commands from the front panel or handheld remote control.	<ul style="list-style-type: none">• The ENDEC contains a watchdog timer that will reset the ENDEC if it does not seem to be operating normally. If the ENDEC does not return to the highest menu level (the default screen) for ten minutes, and it is not sending a long, the ENDEC assumes that it is in a loop and resets. Thus, if you are in a lower-level menu for more than ten minutes, the ENDEC will reset. This is normal. To increase the watchdog time, use the ENDECSetD software program to set internal.softdog to a larger value.

8.3 Resetting the passwords.

The ENDEC has several passwords, the front panel passwords called user and admin, the web access passwords called Web User and Web Admin.

The front panel passwords can be changed from the front panel using the “Menu/Change Password” for user, or “Menu/Change Admin” for Admin user. The front panel passwords can also be changed using the EndecsetD software to edit the Endec settings file.

The Endec web page user and Admin credentials can be changed using the Endec web page Access Control tab. If you don’t remember the Web page user or admin passwords, you can reset these using the front panel “Menu/Network/Reset Web Users”.

8.4 Resetting parameters to factory defaults

This procedure can be used to restore the ENDEC to the factory default settings.

- 1) Turn the ENDEC off
- 2) Turn on the ENDEC, then quickly hold in the ENTER, UP, and DOWN buttons on the front panel of the ENDEC. This is the first, third, and fourth buttons.
- 3) Hold them in you see the time of day appear.
- 4) All stored parameters have now been reset except for the Web page user and Admin credentials. These must be reset using the front panel steps shown in section 8.3 above.

After factory reset, you will need to reload the last working version of your station settings file and filter file. Before reloading the file, ensure you have the correct front panel PIN passwords so you can access the menu to reset web users if required.

8.5 Self Test

The ENDEC performs a self test each time it is powered on. During the first part of the self test, each front panel LED is blinked, from left to right, then all are blinked at the same time. The self test then routes audio from the output sections internally back to the input sections, FSK data tone as test signals. If the self test fails, the Incoming Alert LED will blink rapidly, and the failed test is stored in the message buffer.

When the self test runs at power up, the speaker output is muted. When it runs from the **MENU.TEST.SELF TEST** menu, the speaker is not muted so that you can hear the tones if there is a jumper installed between Spkr In and Spkr Out.

There are no adjustments you can make to correct a problem that causes the self test to fail. Call for service if the self test fails.

9. Warranty

Sage ENDEC Limited Warranty & Service Information

Canadian Warranty Only

Sage warrants to the original end user purchaser that this product and the components thereof, will be free from defects in workmanship and materials for a period of one year from the date of purchase. Sage will, without charge, repair or replace, at its option, defective product, or component parts upon prepaid delivery to the service department of Sage.

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alteration or repairs. This warranty is void if the serial number is altered, defaced, or removed.

To the maximum extent permitted by applicable law, Sage shall not be liable for any damages, including without limitation damages resulting from loss of use. This includes special, incidental, indirect, consequential, or punitive damages whatsoever (including, without limitation, any damages for lost profits, business interruption, loss of data or information, cost of capital, claims of customers, or any other pecuniary loss) arising out of the use of or the inability to use any item supplied by Sage. Some countries do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may also have other rights which vary from county to county.

The following information is provided for the unlikely event your unit requires service and must be returned for service.

1. Be sure the unit is the cause of the problem. Check to make sure the unit has power supplied, all cables are connected correctly and the cables themselves are in working condition.
2. If you find the unit to be at fault, write down a description of the problem including how and when the problem occurs.
3. Call Trispec at 1-888-49404474 Ext 2256 or email us at sage.endec@trispec.com for a Return Authorization (RA) number. Units sent without an RA number will be returned at the owner's expense.
4. Pack the unit in its original carton or a reasonable substitute. Include the unit power supply. Put the packaged unit in another box for shipping. Print the RA number clearly under the address. NOTE: The unit is subject to damage if poorly packaged. Shipping damage may affect your warranty.
5. Include with your unit: a return shipping address (We cannot ship to a P.O. box), a copy of your purchase receipt, a daytime phone number, and the description of the problem.
6. **A shipping address will be provided with the RMA number.** PLEASE NOTE: All returns must have a valid RMA number.

Trispec Communications
1-888-494-4474 Option 3
Sage.endec@trispec.com