

Emergency
Alert
System

Encoder/Decoder

SAGE DIGITAL ENDEC

Model 3644

Quick Start Guide

Version 2.0

For use with software version 95

Technical Support:

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Sage Alerting Systems, Inc.

For update information & downloadable files:
www.sagealertingsystems.com/support

FCC Information:

FCC ID V2W3644

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

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.

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1. About this Document

This Digital ENDEC Quick Start Guide provides these basics:

- Install the ENDEC hardware
- Set up the ENDEC software options
- Set up Network Security

The manual is primarily for broadcasters; the concepts are the same for all users.

This document provides some background for new users of the ENDEC. We've placed most of this background into separate sections. You should review this entire manual, especially if you aren't familiar with the Emergency Alert System.

The early portion of this document contains step by step instructions for the barebones connection of your ENDEC to your station, and setting the common settings to meet the FCC's requirements. You will most likely want to add additional settings to trigger your ENDEC through automation systems or push buttons at the operating position. You may also want to carry some of the voluntary alerts, such as tornado warnings and Amber alerts.

For more step by step instructions, go to our web site and read the task sheets on the FAQ page:

<https://www.sagealertingsystems.com/faq.htm>

The complete manual is on the manuals page:

<https://www.sagealertingsystems.com/support-manuals.htm>

Check to see if new software has been released:

<https://www.sagealertingsystems.com/support-firmware-new.htm>

2. Installing Your ENDEC

Here are the basic steps:

- 1) Learn about the audio connections – see Hardware Connectors and Indicators on page 11, and ENDEC Audio on page 14
- 2) Learn about Network Security – see Network on page 16
- 3) Connect power on the back panel. Use the supplied 18-19V 3A power cube. **DO NOT USE THE POWER SUPPLY FROM THE ORIGINAL GRAY BOX ENDEC.**
- 4) Connect your monitor audio sources to the ENDEC monitor inputs, not to exceed 2Vrms. Connect as many audio sources as you have monitoring requirements to the monitor input terminals on the back panel of the ENDEC (one source per input terminal). Addition information on adjusting the levels is provided at https://www.sagealertingsystems.com/SB_001c.pdf, Service Bulletin #1, Audio Levels.
- 5) Follow the steps to connect your ENDEC to the network – see Connecting your ENDEC to the LAN on page 3
- 6) Change your passwords.
- 7) Download the settings file from your ENDEC. This file will include the network settings you made from the front panel. See Configuring Your ENDEC on page 5.

- 8) Use ENDECSetD to configure your ENDEC with:
 - Call sign – config tab
 - Local Area – local area tab
 - UTC Offset – config tag
 - NTP (time) servers – network tab
 - Filters for the types of messages you want to relay – incoming filter tab
- 9) Determine how you will receive CAP messages This is usually the Internet, but can also be a multicast satellite receiver, or a VPN. Always use a firewall and additional access controls when connecting your ENDEC to the Internet.
- 10) Connect the ENDEC to your air chain. We suggest that you don't do this right away, get your setup right, check the input levels, practice sending RWTs to the front panel speaker, etc.

Since an EAS alert can air automatically and unattended, the ENDEC needs to be able to switch out your program audio and switch in its alert audio. You can pass through audio through the ENDEC and use the ENDEC's internal switching:

- Main Audio IN and Main Audio Out XLR connectors. This is the easiest way to switch out the program audio and switch in the alert audio. Use 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. See Figure 2-1.
- Digital Audio AES/EBU Connectors. When you use the digital audio IN and OUT ports, the ENDEC automatically interrupts 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 provides its own clock or it can derive clock from the digital audio IN port.

You can also use an external switcher. Connect the ENDEC's digital output or analog output to the alternate input on your switch, and trigger the switch from one of the ENDEC's dry contact closures, use a relay assigned to PTT.

EAS alert data usually pass through audio processing. If you place the ENDEC in front of profanity or program delay equipment, be aware that these devices will stretch audio when they rebuild their buffer. They keep pitch while slowing time – this process will corrupt EAS data making alerts you relay not decodable. The FCC has certain minimum modulation levels in Part 11.

In a TV station:

- a. place the character generator in the video chain and
 - b. connect the ENDEC to the CGEN with a serial cable. Select the type of character generator on the DEVICE tab. Many character generator manufacturers provide an interface for Sage systems that use the serial port and an audio input port to handle both audio and video in the same box.
- 11) Connect any other options, such as remote controllers, multi-station relay panels, external switcher or LED signs.
 - 12) Enable logging. The ENDEC can log to any combination of:
 - An attached USB printer
 - a LAN-connected network printer
 - a list of email addresses
 - an FTP server

The ENDEC will always log to its internal FLASH memory.

- 13) You will need to monitor the operation of the ENDEC. You must make sure that you continue to send weekly tests if your license class is required to do so. LP radio and TV may not be required to send the data tone, however, if you have an ENDEC, there is no reason not to. You must make sure that you receive, and in some cases relay, other types of required tests. Your monitored audio sources may degrade due to outside antennas, local environment RF noises, and other reasons. Your Internet connection may change IP address, gateway, DNS, your local firewall, other IT changes. Security certificates change from time to time. You will need to occasionally install updates and make other changes. Your first hint that you have a problem will be a missed reception of a required weekly test.

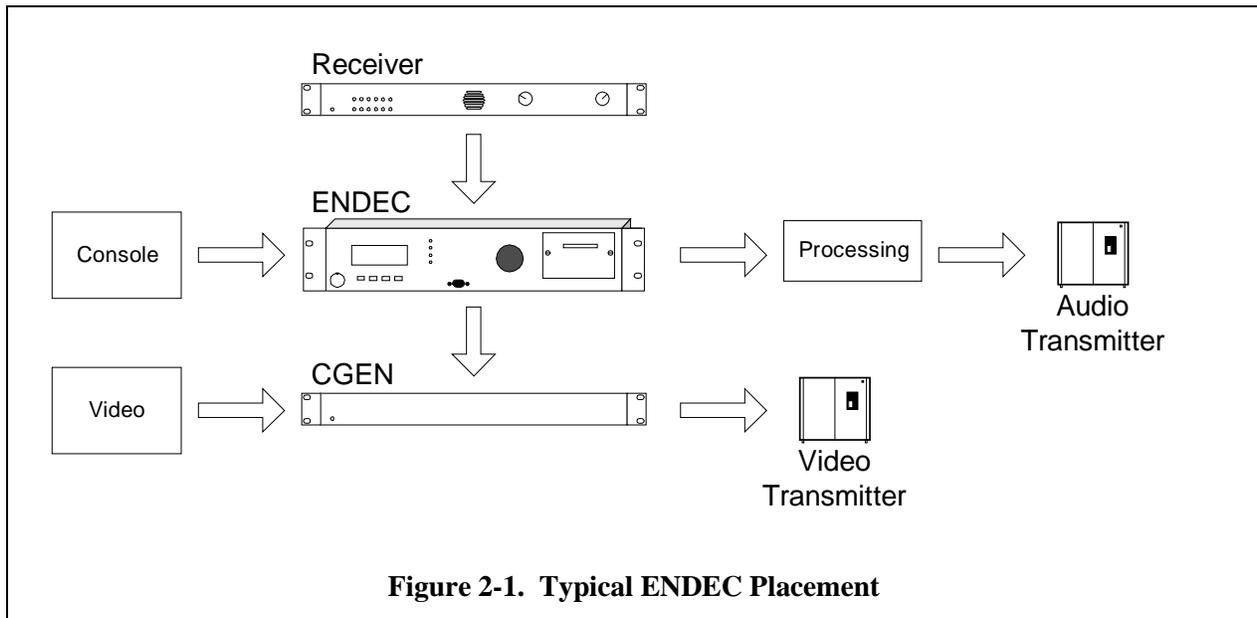


Figure 2-1. Typical ENDEC Placement

3. Bench Testing

The ENDEC includes an internal speaker. To hear alert audio from this speaker, a jumper wire must be in place between the Speaker Out and Speaker In terminals. One is installed when you receive a new ENDEC.

If you send an alert, you'll hear it through the internal speaker. You can bench test all of the ENDEC functions, except for relay of a pending message. If you have two ENDECs, you can use one to send a message to the other in a bench test by wiring the Speaker Line Out of one ENDEC to the Monitor 1 In of the other ENDEC, and a second wire from any GND pin on one ENDEC to any GND pin on the other ENDEC.

4. Connecting your ENDEC to the LAN

Short version:

Use the front panel Network menu to select the type of address you need, DHCP or Static with Network Addr Type. If static, set your IP address, DNS and Gateway as needed. Then use the Web Server menu to turn on web access by selecting Yes.

Long version with step by step key presses:

It should only take you a minute or two to make these changes. If you spend more than 10 minutes in this menu, the ENDEC will assume that something has gone wrong and reboot. If this happens, simply start over at the last step you performed.

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.

Step 1. Determine whether you will use a dynamic address (DHCP) or a static address. The correct answer depends on how your network is configured, and can be had by asking your IT person. 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, proceed to step 2a. If you will be using a static address, proceed to step 2b. Step 2a and Step 2b are EXCLUSIVE of each other.

Step 2a. Configure the ENDEC to use a dynamic IP address.

1. At the ENDEC's front panel, push the Enter button (the first button on the left).
2. 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.
3. Push the down arrow button until the arrow on the screen is pointing at Network Addr Type, then push the Enter button.
4. Push the Enter button again to select DHCP. The display will return to the Network menu.
5. Push the up arrow button to move up the list until Show IP Addr is selected.
6. Push the Enter button, and then write down the IP address shown on the display.

Step 2b. Or, configure the ENDEC to use a static IP address. Configure gateway and DNS settings.

1. At the ENDEC's front panel, push the Enter button (the first button on the left).
2. Push the down arrow button to move down the list until the arrow on the screen is pointing at the Network option.
3. Push the Enter button, then push the down arrow button until the arrow on the screen is pointing at Network Addr Type.
4. Push the Enter button, and then push the up arrow button to select STATIC. The display will return to the Network menu.
5. Push the down arrow button to move up the list until IP Address is selected, then push the Enter button.
6. 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.
7. Do not be alarmed if the ENDEC displays a warning that the gateway is not on the current network.
8. The display will return to the Network menu. Push the Down button until the Netmask option is selected.
9. Using the buttons in the same fashion as when setting the IP address, set the Netmask value, and then push the Enter button.
10. The display will return to the Network menu. Push the Down button until the Gateway option is selected.
11. Using the buttons in the same fashion as when setting the IP address, set the Gateway address, and then push the Enter button.
12. The display will return to the Network menu. Push the Down button until DNS1 is selected.
13. Set the addresses for DNS1 and DNS2, using the buttons in the same way as when setting the ENDEC's IP address.

Step 3. 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. Configuring Your ENDEC

Configuring your ENDEC requires three main actions

- 1) Get the ENDEC connected to your local area network (LAN) so you can access it.
- 2) Change your access passwords – don't use the defaults, and never connect your ENDEC directly to the Internet until you have changed the passwords. Use HTTPS to protect your passwords as you enter them.
- 3) All other settings. These include your audio connections, levels, and incoming alert filters that tell your ENDEC which alerts you want to put on the air.

Step by step instructions on configuring your ENDEC are provided in our Task Sheets, available on our website as discussed below.

5.1 ENDEC Task Sheets

The Sage web site contains several sets of step by step instructions for initial setup of your ENDEC. If you haven't done this before, go and read those documents. This manual gives an outline of what you need to do, the web Task Sheets documents will provide up to date details and pointers to the location of the latest ENDECSetD as well as any recent firmware updates.

The task sheets are at:

www.sagealertingsystems.com/faq.htm

5.2 Preparing to configure your ENDEC's settings

You will need to download and install the ENDECSetD settings file editor.

- 1) Open your web browser, and go to this address: <http://sagealertingsystems.com/support-firmware.htm> You will need to use a modern browser, see Supported Web Browsers on page 23.
- 2) Create a folder on your desktop. For convenience, simply call it "sage".
- 3) If the firmware update page has a newer version than what is on your ENDEC, you still install the new update. Read the release notes for the update and follow their instructions to make sure you need to install it. From the firmware update page you opened in 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 2). The filename will contain the firmware version and have an .x extension, e.g. 95-1.x.
- 4) Download the ENDECSetD software. From the firmware update page that should be open in your browser in 1), download the ENDECSetD utility. When prompted to run or save the file, choose to save it in the folder you created in 2). 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.

5.3 Edit Your Settings

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 utility. 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 above 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) 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. When prompted to open or save, choose to save the file, following the prompts to browse and select your Sage folder. The file will have an extension of ES2.
- 3) Launch the ENDECSetD utility. Open your Sage folder and double-click the ES2 file that's in there. ENDECSetD should automatically open, populated with all of your ENDEC's current settings. If ENDECSetD does not open when you double-click the ES2 file, you can launch the ENDECSetD utility manually, and then open the ES2 file for editing. If you don't have a ENDECSetD shortcut already on your desktop, you can find ENDECSetD in your Program Files folder. It will be inside of a subfolder called "Sage Alerting Systems." You might consider placing a shortcut on your desktop.
- 4) Edit your ENDEC's configuration settings as desired. All operational parameters, including alert handling, UTC offset and DST, relay programming, incoming alert filters, and basic callsign and station group identification, can be set within the ENDECSetD utility.
- 5) When you are finished, save your changes. Simply click the little floppy disc button, located near the upper left of the ENDECSetD window.
- 6) Update the ENDEC with your new settings. Open your web browser to the ENDEC's built-in web page, once again. From the menu down the left-hand side, click the Restore Settings button. The Restore Settings File form will appear on the right. From that form, click the Browse button, and navigate to the ES2 file in your Sage folder. Click it once to select it, then click the Open button at the lower right of the file selection window. Once the window goes away, click the Upload button on the Upload Settings File form. 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. After the ENDEC completes its update and reboot process, it will return to the operational state, with your new settings in effect.

5.4 Passwords

There are two types of user access passwords: front panel, and web access.

5.4.1 Front Panel

- user: a user level password. The user password allows you to originate or relay an alert.
- admin. The admin password allows you to configure or reconfigure the ENDEC.

The passwords that control access to the front panel can be entered from the front panel, or using ENDECSetD. A password is from 0 to 8 digits long; the digits are 1, 2, 3, or 4. At the prompt, "enter password" or "enter admin" press the numbered key(s) to enter the password. The password provides access to the appropriate levels of the menu. Access remains open until you exit the menus and go back to the default screen

The default front panel password for both user and admin is 1111.

5.4.2 Web Access

Your account names must be 20 characters or less. Select appropriately complex passwords for web page access. Do not use your station's call letters or anything else you periodically mention on the air. Your password:

- Cannot be "admin" or "user", or contain the user name.
- Passwords must be at least 8 to 20 characters long.
- Each account can have different roles assigned to perform different tasks.

6. Is the ENDEC Set Up Correctly?

Correctly is a combination of your settings and filters, all the hardware connections, and access to your LAN. These seems complicated, but the ENDEC is accepting alert messages from other local stations via audio inputs, as well as using the Internet to find alerts and download audio. The ENDEC needs to check any alerts it finds against your list of optional alerts, as well as the FCC's list of required alerts. It interacts with other equipment at your station to get the alert on the air.

You need to check to see if all this has the desired result, and you need to check it periodically to make sure it is still working as expected.

Here is a typical checklist.

- 1) Are alerts getting on the air? Even if you hear the alerts on the ENDEC's front panel speaker, you need to check to see if they actually get on the air –can you hear the data tones? You can send a weekly test any time you like. You must send a weekly test each week unless you relayed another alert in that week.
- 2) Is the ENDEC receiving alerts and relaying them correctly? Are you monitoring the sources required by your State EAS Plan. You must relay the Required Monthly Test. These tests are almost always scheduled in advance on a State or local level. Find out when they occur in your area.
- 3) You must relay the National Periodic Test. This has occurred yearly since 2016, but might not happen every year. The FCC announces the test two months in advance.

Alerts should appear in your log. The ENDEC should receive a weekly test or any other alert from each of your monitor assignments once a week. If an alert is missed, you need to find out why. It might be that one wasn't sent, or that it was and you didn't receive it.

The ENDEC can email log reports, but the ENDEC also keeps an internal log of each received alert. Access this from the ENDEC's web page, click the "logs" button. It will show you each alert sent, and each alert you receive from an analog monitor source. Audio alerts that don't match your filters will show up with a type of "ignored". Alerts from CAP are logged only if they are specifically selected by a filter.

FEMA sends a Required Weekly Test each Monday, usually at 11:00am local time for your state.

FCC rules require that you maintain a log of EAS activities, review it regularly, noting missed alerts and why they were missed.

The ENDEC's home page will also give you an indication of problems. The top status line should always show "CAP: OK". If not, you need to find out why – use the displays on the Tools page to help.

The dashboard on the right side of the main page will also show if there are any error conditions such as self test failure, the last alert sent and received, the local and UTC time at the ENDEC, and other items.

7. About the Emergency Alert System

The Emergency Alert System (EAS) allows the President of the United States to automatically access the nation's broadcast outlets and directly speak to the country in times of national disaster. Other originators are:

- the National Weather Service and
- State and Local officials to disseminate other types of emergency information.

Your EAS encoder/decoder (ENDEC) receives alerts from:

- Over the air directly from the source of the emergency information, or from other broadcasters in your area that relay information from the primary source
- At least one Common Alerting Protocol alert server

FCC licensed EAS Participants are required to monitor and process alerts from both input types.

7.1 Over the Air

Your ENDEC receives alerts via the analog audio inputs on the back of the unit. Your state's EAS plan will define what your monitor assignments are. The audio relay of alerts is an important backup capability to CAP delivered messages, and is a critical part of FEMA's mandate to provide the President with communications capability to address the American people within 10 minutes during a national emergency.

Some messages are not originated as CAP messages and always only use the audio relay method of dissemination.

7.2 Common Alerting Protocol

The Common Alerting Protocol (CAP) is an international standard for sending alert information. The CAP allows a consistent alert message to be disseminated simultaneously over many different communications systems. A CAP message is not sent on the main audio output of a broadcaster like an EAS alert. CAP delivery varies from state to state, but typically includes one or more of:

- over the Internet from FEMA's IPAWS system,
- over the Internet from a state or local alert originator via a 3rd party alert aggregator,
- via an IP data stream from satellite.

In any case, the last hop is via the LAN connector on the ENDEC.

It is important to note, however, that a CAP message is always converted to an EAS message before it is broadcast by an EAS participant.

There are a few major differences between a CAP message and an EAS message:

- CAP contains free-form text. For example, rather than a simple "Child Abduction Warning issued for Allegheny County", the alert contains specific information. If a missing child, the text could include a description of the child, last known location, what type of car is involved, and other important information. This information is available to any of the text outputs of the ENDEC, such as printer, email, LED sign, video crawl, HD radio, etc. The additional text information is lost when the alert is turned into EAS for relay, but stations that receive the CAP message can make use of the text.
- CAP contains digital audio. This is usually in the form of a pointer to an audio file on a web server. The ENDEC can then fetch the audio and use it when sending the alert. In most cases, the quality of audio in the digital file will be better than the quality of audio that is received from an over-the-air source and relayed.
- In some cases, if the CAP alert does not contain audio from the originator, the ENDEC can provide audio by converting the CAP text to speech.

As with EAS messages, the ENDEC uses the filter information you provide to decide what types of CAP alerts to put on the air. The ENDEC automatically converts a CAP message into an EAS message for broadcast.

To read more about CAP, see also:

- the Sage web site (www.sagealertingsystems.com)
- the FEMA web site: <https://www.fema.gov/common-alerting-protocol>.

8. Meeting FCC Requirements

This section describes the Emergency Alert System (EAS) as mandated by the FCC rules, [Part 11](#). You should review [Part 11](#) and any updates.

You can find [Part 11](#) in the Electronic Code of Federal Regulations [here](#), at <https://www.ecfr.gov/cgi-bin/text-idx?mc=true&node=pt47.1.11&rgn=div5>

This section discusses the EAS rules and testing.

8.1 EAS Rules

Note: This manual, and other documentation from Sage, is not legal advice.

The broadcaster is ultimately responsible for complying with the FCC rules. Staying within the rules is a combination of the EAS 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 EAS equipment by verifying that the weekly tests go on the air as expected, and that you receive weekly tests from your monitored stations, and that you relay the Required Monthly Tests and the National Periodic test. The FCC changes the rules from time to time through its Report and Order process. Check the Sage web site at www.sagealertingsystems.com periodically to check for software updates.

You are responsible for meeting FCC requirements as defined for your type of EAS Participant. The rules for LP radio and TV are slightly different than other types of radio and TV.

The FCC provides a handbook that gives guidance for the various types of EAS Participants. It can be found at <https://www.fcc.gov/general/eas-test-reporting-system#eas-operating-handbook>, referenced by the main EAS page at <https://www.fcc.gov/general/emergency-alert-system-eas-0>

To meet the requirements of [CFR 47 Part 11](#), do at least the following:

- 1) Place the ENDEC (directly or via an audio switch) in the audio chain. TV stations also need to have a character generator in the video chain. Many character generator manufacturers provide an interface for Sage systems that use the serial port and an audio input port to handle both audio and video in the same box.
- 2) Hook up receivers to the ENDEC monitor inputs.
- 3) Connect your ENDEC's LAN connector to your source for CAP messages. This is usually the Internet, but can also be a multicast satellite receiver, or a VPN. Always use a firewall and additional access controls when connecting your ENDEC to the Internet.
- 4) Configure your ENDEC with
 - Call sign
 - Local Area
 - UTC Offset
 - Time of Day (or provide a list of NTP servers accessible from the ENDEC)
 - Filters for the types of messages you want to relay
- 5) Monitor the operation of the ENDEC. You must make sure that you continue to send weekly tests if your operation class is required to do so. You must make sure that you receive, and in some cases relay, other types of required tests. Your monitored audio sources may degrade due to outside antennas, local environment RF noises, and other reasons. Your Internet connection may change IP address, gateway, DNS, your local firewall, other IT changes. Security certificates change from time to time. You will need to occasionally install updates and make other changes. Your first hint that you have a problem will be a missed reception of a required weekly test.

8.2 FCC Testing: On the Air

Test the equipment on the air as follows.

Weekly	at a random time and day of your choice each week. Send the weekly test from the ENDEC's web page or front panel.
Monthly	relay the required monthly test once a month, probably issued by one of the primary emergency sources in your area.
as needed	automatically relay any Presidential messages or the National Periodic test messages. You can also configure the ENDEC to relay other types of EAS messages, such as tornado warnings and civil emergency messages.

9. EAS/CAP Message Processing

The ENDEC processes all EAS messages as follows:

1. Detects an EAS message and records the audio portion if received from an analog audio source, or downloads the audio using information in the CAP message.
2. Decides whether to put it on the air. The ENDEC may do this automatically or it may wait for operator input, depending on the options you've selected.
3. Puts the alert on the air. To do this, the ENDEC:
 - a. regenerates the EAS digital codes and the two-tone Attention Signal,
 - b. relays the recorded audio
 - c. sends the end of alert digital codes.

10. Hardware Connectors and Indicators

This section describes the front and back panels.

10.1 Front Panel

This section describes the front panel of the ENDEC.

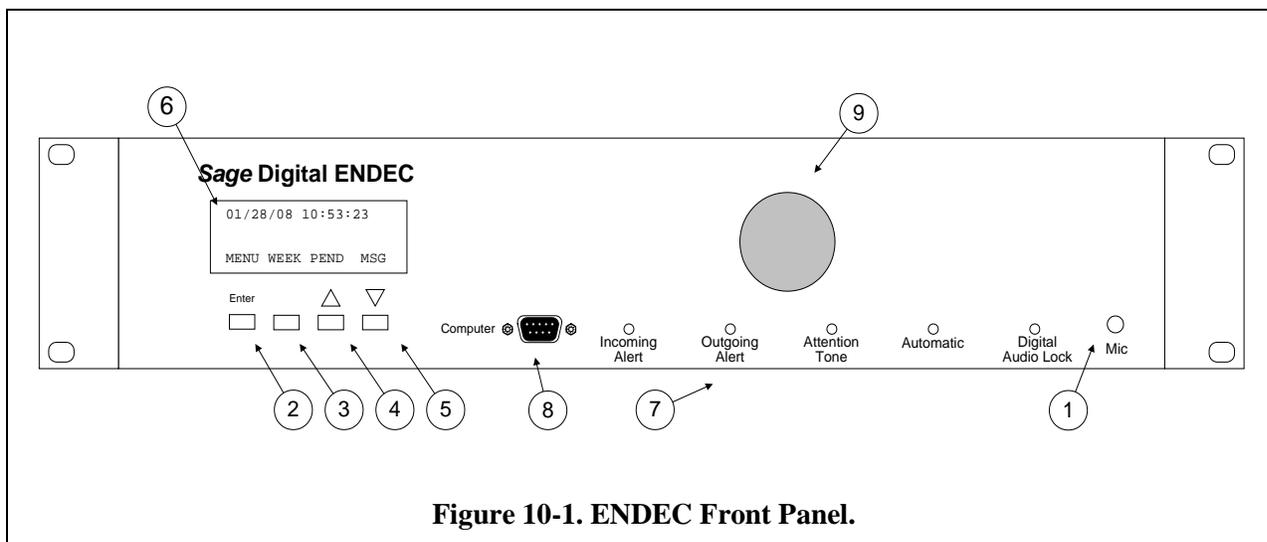


Figure 10-1. ENDEC Front Panel.

Item	Name	Description
1	Mic Jack	For public safety applications, a connector for a microphone. For low level input (15mv - 150mv). See Public Safety: Connecting a Microphone on page 22
2	Enter Button	Selects a menu item or a soft key.
3	Soft Key	Soft key button. It goes up one level in the menu.
4	Up Button	Soft key. Scrolls up in a menu.
5	Down Button	Soft key. Scrolls down in a menu.
6	4 line by 20 character back lit LCD display	Allows you to program the ENDEC and to read the contents of alert messages. The contrast can be adjusted using MENU.LCD CONTRAST .
7	LEDs	<ul style="list-style-type: none"> • Incoming Alert. On when an incoming alert is detected. Stays on if that alert is selected for relay until the alert is relayed or deleted. • Outgoing Alert. On when an alert is being sent. • Attention Tone. On when an Attention signal is received. • Automatic. On when the ENDEC is in automatic mode. • Digital Audio Lock. On when the ENDEC is receiving digital bit clock from the AES/EBU digital input.
8	Serial Port	The Computer port, which you can assign to any device. See 14.1 Serial Port Pin Out on page 21. This port is on the front for convenient access if the ENDEC is rack mounted.

Item	Name	Description
9	Internal Speaker	The internal speaker carries alert audio. You can use it to monitor any of the incoming audio channels. It is fed from the back panel Spkr In terminal, which is usually jumpered to the Spkr Out terminal. You can also route it through an external relay to allow muting.

10.2 ENDEC Back Panel

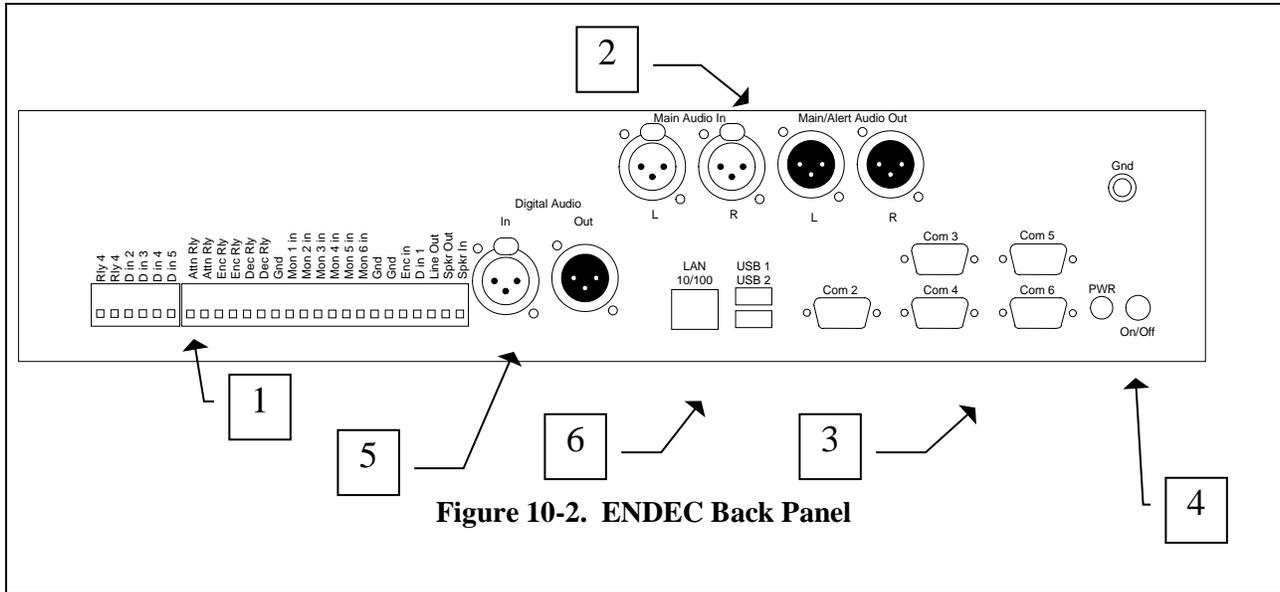


Figure 10-2. ENDEC Back Panel

Item	Name	Description
1	Terminal Strip	The terminal strips are removable. The signals are listed below.
	Rly 4	A relay that opens and closes according to an assigned program.
	D in 2 through 5	A digital input that the ENDEC reads as open (floating) or closed (ground). Used for various options such as alert hold off or sending a Weekly Test.
	Attn Rly	A relay that opens and closes according to an assigned program. By default, the relay closes when it receives an Attention Signal. When closed, these two terminals are shorted together. In the User's Guide, see also the sections on Relays and Relay Programming.
	Enc Rly	A relay that opens and closes according to an assigned program. By default, the relay closes when an alert is being sent. When closed, these two terminals are shorted together. In the User's Guide, see also the sections on Relays and Relay Programming.
	Dec Rly	A relay that opens and closes according to an assigned program. By default, the relay closes when it receives an alert or is pending. When closed, these two terminals are shorted together. In the User's Guide, see also the sections on Relays and Relay Programming.

Item	Name	Description
	Gnd	Grounds for the various unbalanced audio inputs.
	Mon <i>n</i> In (1 – 6)	Unbalanced 600 ohm inputs for alert audio sources, .75Vrms typical, do not exceed 2Vrms.
	Enc In	A high-level audio input for locally originated audio.
	D in 1 (previously called Manual Override)	A digital input that the ENDEC reads as open (floating) or closed (ground). Used for various options such as alert hold off or sending a Weekly Test.
	Line Out	Unbalanced 600 ohm output for alert audio or monitoring the inputs.
	Spkr Out	Separate unbalanced 600 ohm output, can be used for an external speaker or to feed the internal speaker through Spkr In.
	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	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.
3	Serial Ports	Five serial ports, COM2 through COM5, that you can assign to any device. See section 14.1 Serial Port Pin Out on page 21.
4	Power	Power input and power switch. Use the power cube supplied with the ENDEC, 19v, 2A. Do not use the power cube from the original "gray box" ENDEC.
5	Digital Audio	AES/EBU digital input and output.
6	LAN	10/100 LAN connection.
	USB 1 and 2	USB connection, used for flash drive, printer, etc.

11. Powering Up the ENDEC

When you power up the ENDEC:

- The red LED labeled Automatic on the front panel flashes. This indicates that at least one error message is in the message buffer. The error message for first time power up is “Local Area not defined”. To define a local area, use the Local Area tab in ENDECSetD.
- The ENDEC performs a self-test. If there are any errors, the Incoming Alert LED will blink. Use the MSG soft key to read the errors (scroll the messages with the up and down keys).

12. ENDEC Audio

12.1 Analog Audio

The Mon1 through 6 inputs are used to send audio alerts to the ENDEC. These are typically connected to radio receivers, although they will sometimes be TV or Cable receivers, satellite audio channels, or any other analog source. **The Mon in and Enc in inputs are limited to 2Vrms. Exceeding the 2Vrms level will result in poor audio, exceeding 4Vrms will damage the ENDEC.**

The front panel microphone input level can be as low as 16mv for high settings of MENU.LEVEL.MIC or as high as 170mv for low settings of MENU.LEVEL.MIC. See Public Safety: Connecting a Microphone on page 22 for a description of the connector.

12.2 Digital Audio

12.2.1 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 hardwire 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 (hardwire 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 switcher 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 switcher 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.

12.2.2 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.

12.2.3 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.

12.2.4 Digital Audio Menu Items

The following items are available on the ENDECSetD Digital Audio tab, or on the front panel **MENU.DIGITAL AUDIO** menu.

12.2.4.1 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.

12.2.4.2 *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.

12.2.4.3 *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.

12.2.4.4 *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. The digital output is then treated as if it were station 4 on a multi-station relay panel

12.2.4.5 *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.

12.2.4.6 *Clock Rate*

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

13. Network

While we provided tools to help keep the ENDEC secure, security is ultimately the responsibility of the user.

The ENDEC is not a security device – if you plan to make the ENDEC available on the Internet, you must also use a firewall to provide the necessary protection. You also need a firewall if your internal network is shared with other users not associated with your station, particularly in a university or large corporate setting.

This section discusses using the Sage Digital ENDEC on a LAN. Read and understand this section on network security below before using the LAN with your ENDEC.

Important. Use a firewall to protect the ENDEC from unauthorized access.

13.1 ENDEC network use notes

- If the DHCP address type is selected, the ENDEC always attempts 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).
- NTP (Network Time Protocol) is enabled. The ENDEC does not allow remote control of the NTP settings via the NTP protocol. It does allow you to specify a list of servers via ENDECSETD. Time (NTP) Servers. See section 13.2.1, Time (NTP) Servers.
- By default, all control functions that would generate EAS alerts using the LAN are disabled. This includes the Web server, the automation interface, and the ENDEC PRO/DJ LAN interface. To

enable these features, use either the front panel in **MENU.NETWORK** or the ENDECSETD Network tab.

- The ENDEC’s web server requires a user name and password to access the web page. You should issue a unique user/password combination to each person that accesses the ENDEC. Each ENDEC user has a set of roles that can be assigned. Limit the role permissions for a user to what is needed. Never have your ENDEC accessible from the Internet with the default passwords. Users should not leave the web browser logged in and unattended; use the logout button on the ENDEC’s main page.
- The ENDEC’s web server can use unencrypted (HTTP) or encrypted (HTTPS) access. The ENDEC uses a self-signed certificate¹ 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 message from your browser. Click the “connect anyway” link to connect to the ENDEC. You can and should build a server certificate for the ENDEC using the Certificates page Webserver Certificate button. You can then use the Get Webserver button to fetch a public certificate you can load into your PC’s trusted root store. This will allow users to connect to the ENDEC without bypassing web browser security notices.
- Firewalls. Inbound connections: Use firewalls as necessary to protect access to the ENDEC. The ENDEC uses the following TCP ports by default. You can change all of them. “Portbase” refers to the portbase number set by **MENU.NETWORK.PORTBASE** or the portbase setting on the ENDECSETD network tab.

80	HTTP
443	HTTPS
Portbase	Automation
Portbase+2	ENDEC DJ/PRO interface

To enable each of these interfaces, use the ENDECSETD Network tab or the front panel **MENU.NETWORK** menu.

The ENDEC uses only the NTP port for UDP, both inbound and outbound. You must use NTP to keep the ENDEC synchronized closely enough to CAP originators to permit validation of start time and expiration of alerts.

- Firewalls: outbound connections. The FEMA CAP server uses multiple addresses for its servers for load balancing and redundancy. The list of IP addresses is not published, and changes. Further, each CAP message can contain a list of URLs for external resources, such as broadcast audio. If you limit outbound connections from the ENDEC, you may block its access to CAP servers or alert audio. In general, it is not practical to determine a list of IP addresses that the ENDEC will need to connect to.

¹ SSL and certificates are used for several reasons. One is to encrypt the data so a third party can’t easily snoop on the session. Another is to allow the web client (user) to be sure that it is talking to expected server, and not a spoof server. Sage uses SSL to provide encryption. You can build a certificate in the ENDEC, then download and install the public portion of the certificate into your PC to get additional assurance that you are talking to the ENDEC you think you are.

- Passwords. Select appropriately complex passwords for web page access and “endecpro pass”. Do not use your station’s call letters and anything else you announce on the air periodically. See also [Passwords](#) on page 6.
- Periodically check the www.sagealertingsystem.com/support web page. Download and install any security updates.

13.2 Network Settings

For most settings, use the ENDECSetD or web browser interface. The exceptions are:

- setting the LAN address or
- enabling the web server,

Use the front panel when configuring a LAN connected ENDEC for the first time:

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.

13.2.1 Time (NTP) Servers

The ENDEC uses a list of NTP (Network Time Protocol) servers to set its time of day clock. On a LAN, NTP keeps the ENDEC clock within a few milliseconds of a local time standard. When used with an internet server, the time is typically within several tens of milliseconds. To specify a list of NTP servers, use the ENDECSETD network tab. NTP should be used to synchronize your ENDEC with other servers and properly determine if the start and expiration time of an alert is valid for relay.

The screenshot shows the ENDEC configuration interface with the following settings:

- Address Type:** Obtain IP address automatically (DHCP), Use Static Address:
- Static Addresses:**
 - IP Address: 192 . 168 . 1 . 50
 - Subnet Mask: 255 . 255 . 255 . 0
 - Default Gateway: 192 . 168 . 1 . 1
 - DNS server 1: 0 . 0 . 0 . 0
 - DNS Server 2: 0 . 0 . 0 . 0
- Web Server User:** Users are now managed with the Access Control button on the ENDEC's web page
- Web Server Admin:** Users are now managed with the Access Control button on the ENDEC's web page
- Ports:**
 - Port base: 8083
 - HTTP port: 80
 - HTTPS port: 443
- NTP Servers:**
 - time-a.nist.gov
 - time-b.nist.gov
- Network Printer Address:** (Empty field)
- Enable Access to Web Server:**
- Enable Access by Automation:**
- Enable Access by DJ/Pro:**

The status bar at the bottom left shows "Ready".

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. If the ENDEC time does not synchronize, use different servers, or check to make sure your firewall is not blocking NTP UDP packets.

13.2.2 CAP servers

The ENDEC polls the list of servers that you provide, looking for CAP messages. The FEMA IPAWS server is installed by default, this will be the only server that most users will need. Your State EAS plan will provide details on any other servers or CAP sources that you need to include.

The ENDEC will poll the servers using addresses you provide. The ENDEC will also attempt to fetch audio files references in CAP messages. These are provided by alert originators. FEMA, Sage, and you have no control or advance knowledge of the URL passed by the originator. Also, be aware that FEMA and other alert providers may use multiple IP addresses to host its servers, using the same host name. You will not be able to use outbound firewall limits on the ENDEC's fetch locations for audio.

13.2.3 Network Printer

The ENDEC sends alert logs to a supported network printer. Currently, the ENDEC supports several types of HP common laser and inkjet printers only.

13.3 Email/FTP settings

See the ENDECSETD Email/FTP tab:

Figure 3 ENDECSETD Email/FTP tab

13.3.1 Email SMTP Server

When sending email, the ENDEC uses 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 supports SSL (TLS) encryption for email.

13.3.2 Email Address Lists

Receiving. If a given alert is one that might be forwarded, the ENDEC sends messages to this list as soon as the alert starts arriving. Use this list so you know in real-time when an alert arrives that requires action or that will be automatically relayed.

Received. All Alerts are sent to this list. If the alert was something other than a duplicate or Log Only, then the audio (if any) will be attached to the email message. Use this address list to collect everything you need for the FCC log.

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

The text of 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.

13.3.3 FTP Server

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

The screenshot shows a configuration window titled "FTP". It contains the following fields and options:

- FTP Host/Path:** A text input field.
- FTP User Name:** A text input field.
- FTP Password:** A text input field.
- Passive (PASV)**
- Send Audio**
- Style:** A dropdown menu currently set to "Legacy".

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 eas, then place this in the FTP Host/Path box:

192.168.4.4/eas

The ENDEC does not support sftp.

14. Connectors

14.1 Serial Port Pin Out

Pin	Use
2	RxD (input)
3	TxD (output)
5	Ground
9	Accessory Power. This pin provides +9v. Not available on COM2

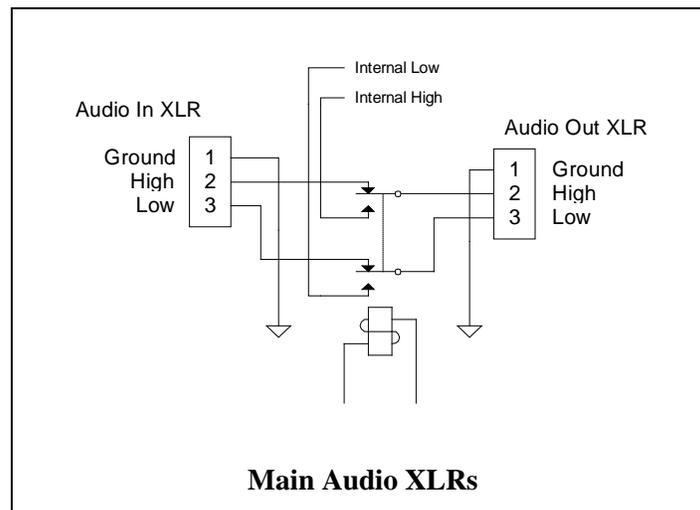
14.2 Connecting a PC to an ENDEC serial (com) port

Use a 'null' modem cable, that is, swap pins 2 and 3.

14.3 Audio XLR

The Main / Alert Audio Out right and left, balanced, 600 ohms.

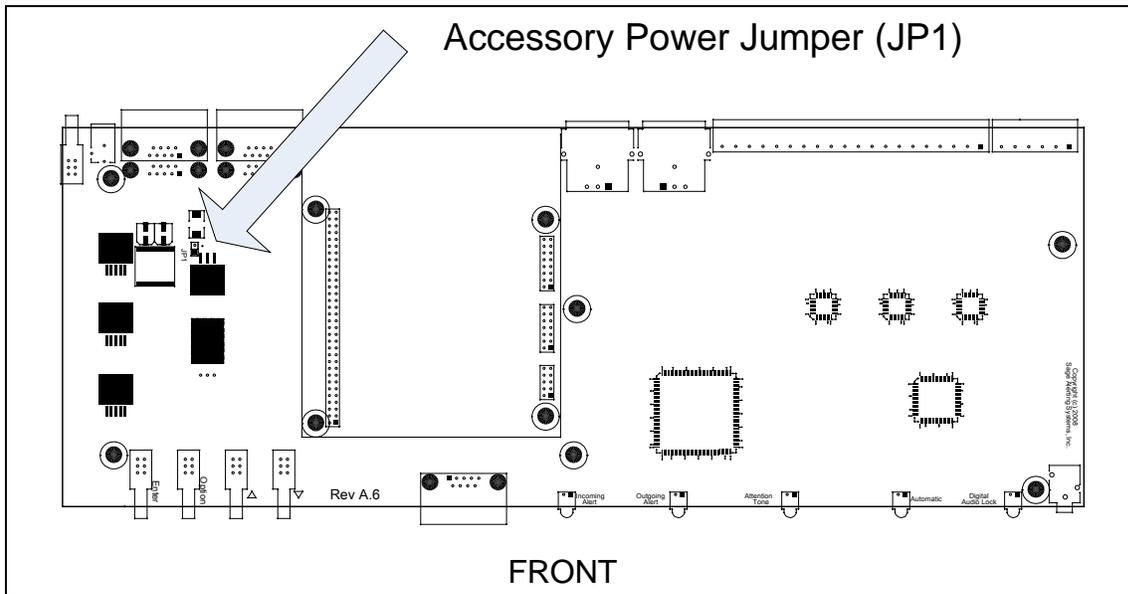
Pin	Use
1	Ground
2	High
3	Low



14.4 Accessory Power

This section describes the accessory power jumper, intended for a hand held remote control. This power source could also be used for other purposes. Note: as of 2019, the hand held remote is no longer manufactured.

Each ENDEC serial port, except Com 2, provides regulated +9v power on pin 9



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 2 hand-held remote controls, then power the third and fourth remotes from a 9V power cube.

14.4.1 Enabling ACC Power Pins

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 do so:

1. Power off the ENDEC.
2. Remove the 6 top cover screws.
3. Slide the cover toward the rear of the ENDEC.
4. Notice JP1 on the large green circuit board covering the bottom of the case. This is the main circuit board. There is a jumper on one pin of JP1. Do not use JP1 on the red daughter card,
5. Remove the jumper and reinsert it so that the jumper covers both pins.
6. Replace the cover.

14.5 Public Safety: Connecting a Microphone

The microphone connector on the front panel is intended for public safety applications. Broadcasters typically use the high level Enc In input on the back panel.

The microphone input is amplified; the gain is controlled by MENU.LEVELS.MIC. The microphone input is designed for use with a low impedance (-200 ohms) dynamic microphone providing at least 20 mV into a 1K load at 100 microbars sound pressure (e.g. Shure 527B or equal).

ENDEC MIC connector pin	Signal name
Tip	Audio In
Ring	PTT
Sleeve	Ground

15. Supported Web Browsers

You must use a recent operating system and browser to use the ENDEC's web pages.

Windows 7 or 10

- IE 11 (2013)
- Edge 16 (2015)
- Firefox 57 (2017)
- Chrome 66 (7/2018)
- Safari 12 (10/2018)

Windows XP

- Firefox ESR 52.9.0 (IE 8 is not supported)

Mac

- Safari 12 – If you can't connect via HTTP, try using HTTPS.
- Firefox 57

16. Post-installation Customizing the ENDEC

Important. Use a firewall to protect the ENDEC from unauthorized access.

Three methods of customizing the ENDEC for your use are:

- The ENDECSetD program. This GUI-based Windows program allows you to adjust all parameters off line and upload them to the ENDEC.
- The Web browser interface. This allows you to use a web browser to connect to the ENDEC's internal web server and add/edit/delete user accounts. This interface is also used for day to day operation on the ENDEC, such as sending or forward alerts, reviews logs, and uploading settings files and firmware updates.
- Front panel. You can set many, but not all, of the ENDEC parameters from the front panel. You can use the Sage Digital ENDEC front panel to enter any command that was supported by the Sage EAS ENDEC. This includes generating weekly tests, forwarding messages, etc. The intent is that any training your staff has received on the use of the original ENDEC remains valid. New, and in many cases simpler, methods can be introduced at your leisure.

Using a serial cable to upload/download settings files is still supported, but should only be used in cases when a LAN connection is temporarily unavailable.

16.1 Customizing by Web Browser

Updating your settings after you have configured your ENDEC the first time uses the same methods that are described in "Preparing to configure your ENDEC's settings" and following sections, starting on page 5.

16.1.1 Finding the IP Address

You need to know the IP address of your ENDEC. When you receive the ENDEC, it gets an IP address via DHCP, that is, it asks your network what address to use.

To see the assigned IP address, use this menu: **MENU.NETWORK.SHOW IP ADDR** menu. You can also use the **MENU.NETWORK** menu to set a static IP address.

To access these menu items, use the four buttons on the ENDEC front panel. Use the buttons discussed below.

The display looks something like this:

```
04/28/19 15:32:14
MENU WEEK      MSG
```

1. Under MENU, press the button. The arrow points at the current item.

```
04/28/19 15:32:14
  ** go back **
-->*Alert
  Printer Feed
```

2. To move down through the menu, press the key with the downward pointing arrow on the enclosure: ▾ Press it until “*network” is the current item.
3. Press the ENTER key on the enclosure.
4. Press ENTER again to select “Show IP Add”. You now see the IP address that has been assigned to the ENDEC, if any. If so, write it down. If not, check your connection to the LAN and power cycle the ENDEC using the back panel power switch.
5. Press the ENTER key to select “done”.

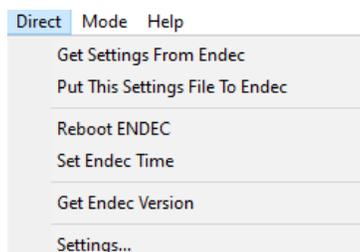
Once you know the address, you can use a PC with access to that address to show the configuration web pages. For example, assume the ENDEC’s IP address is 192.168.1.30. Enter this URL in your browser:

<https://192.168.1.30>

16.2 Customizing by Using an ENDECSETD Serial Connection

You can download files from and upload files to the digital ENDEC by its web page (recommended), or by the "direct" menu and the serial port. There are very few cases where this interface would be used. To use ENDECSetD and a direct serial connection:

1. Set one of the ENDEC com ports to ENDECSET.
2. In ENDECSET, click the `Direct` menu.
3. To download the settings, click `Get Settings from ENDEC`. This downloads the settings to a file on your PC.



4. To move the settings file from the PC to the ENDEC, go to the File menu. Click `Put this settings file to ENDEC`.
5. For your settings to take effect, you must click `Reboot ENDEC`. The ENDEC will restart with the new settings in effect.

17. Troubleshooting

17.1 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:

17.1.1 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** softkey to read it. Power cycle the ENDEC, if the problem recurs, call for service.

17.1.2 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.

17.1.3 Automatic (AUTO) LED Only

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

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 2019 or greater than 2094. Fix the time and reboot the ENDEC ² . 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.
No Local Area	You must define a local area using the MENU.PRESETS.LOCAL AREA menu.
Validate Error	An EAS header generated by the ENDEC did not pass the check for legal EAS messages. This is an internal software error.
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.
CAP server is down	One or more of your specified CAP servers can’t be reached. For details on troubleshooting CAP, refer to FAQ page on the Sage web site, in the Task Sheets section, CAP troubleshooting.

17.1.4 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.

² To reboot the ENDEC, either cycle the power, or use the **MENU.TEST.REBOOT** menu.

17.1.5 All LEDs Blinking (except digital lock)

The EAN event code is not present in any of your filters. You **MUST** have a filter for EAN to remain legal under Part 11. Add the filter. It should have EAN for events, and PEP for the originator.

17.2 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.
Alerts not received from a particular monitor input.	<ul style="list-style-type: none"> • The green terminal strips must be completely inserted in the back of the ENDEC. • The audio levels may not be high enough for error-free decoding, or they may be too high. Use the Tools/Levels menu on the ENDEC's web page to see the input levels.
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 hand held 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 alert such as an EAN, 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.

17.3 Resetting the passwords

The ENDEC has several types of passwords; the front panel passwords, web access user names and passwords, and the ENDECPRO password called "change propass" on the front panel.

If you forget your web passwords, but remember your front panel passwords, you can reset the web passwords with the front panel "network.reset web user" menu.

If you remember your web password for an admin account, you can download your settings file and change the front panel passwords in the settings files and upload it to the ENDEC.

If you don't remember any of the passwords and don't have the settings file, you will need to use the "Resetting parameters to factory defaults" procedure below to reset the front panel passwords, and then use the front panel to reset the web user accounts.

17.4 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 ENDEC, UP, and DOWN buttons on the front panel of the ENDEC. This is the first, third, and fourth buttons.
- 3) Hold them down until the front panel says “release”, or you see the time of day appear.
- 4) All stored parameters have now been reset. You must reset all of your customizations as if you had just received your ENDEC. You can use the ENDECSetD to reload your parameters if you had previously saved them – though you will probably want to set new passwords. The web user passwords are only stored in the ENDEC – you will need to reset them from the front panel using the network.reset web user menu.

17.5 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, using the attention tones and the FSK data tone as test signals. The ENDEC also routes the audio through the digital audio recorder. This tests the record/playback mechanism.

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.

18. Warranty

Sage ENDEC Limited Warranty & Service Information

US 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 accompanied by proof of purchase date in the form of a valid sales receipt.

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.

Sage shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states 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 state to state.

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 Sage at 914 872 4069 or email us at support@sagealertingsystems.com for a Return Authorization (RA) number.
4. Pack the unit in its original carton or a reasonable substitute. 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 RA number.

PLEASE NOTE: All returns must have a valid RA number. Please do not ship an ENDEC to us until you receive the correct shipping address from tech support.