

Sage Alerting Systems
Digital ENDEC Model 3644
Firmware Revision 96-1
Software Released August 2025
P1 patch issued September 3, 2025



Release notes for Rev96-1-P1, adding support for Missing and Endangered Persons event code and other features. P1 patches a problem with colors for LED signs and character generators.

For use with United States ENDECs Only.

This release is to be applied to ENDECs that already have the Rev96 firmware installed.

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1 Important!

Once you have installed the Rev96-1 update, **DO NOT** attempt to reload an older version. The resulting mismatch between old and new portions of the firmware will result in an inoperable system. If you feel you need to revert your ENDEC to an older version, contact Sage first.

For maximum security and greatest compatibility, we recommend always connecting to the ENDEC via HTTPS instead of HTTP.

2 Summary

Rev96-1 updates:

- A new Missing and Endangered Persons event code (MEP)
- Selectable week start day for conformance reports
- Broadcast Tools MSRP-3 control via TCP/IP
- Network time (NTP) improvements for faster sync and issues with server pools
- A new CA root certificate bundle (this is **not** the FEMA alert signing certificate collection)
- Removal of an expired FEMA signing certificate

Rev96-1-P1:

- This fixes a problem in Rev96-1 where character generators might color the background red for all alert types, and LED signs will show the text in red.

If you have already installed Rev96-1, and you use a character generator or LED sign:

- 1) Download the new Rev96-1-P1.x from the Rev96-1 download page.
- 2) Install the Rev96-1-P1.x file, it contains both Rev96-1 and the patch. The version status pages will show that you are starting with Rev96-01, this is expected.

If you have NOT already installed Rev96-1, take the same steps:

- 1) Download the new Rev96-1-P1.x from the Rev96-1 download page.
- 2) Install the Rev96-1-P1.x file.

Rev96-1 is not a mandatory update, but Sage recommends that you install it during your normal maintenance cycle. Your state may have plans to use the new Missing and Endangered Persons event code - you'll need this update to be able to receive and relay it. In the rest of this document, we will refer to Rev96-1, the same comments will apply to Rev96-1-P1.

To install Rev96-1, your ENDEC must already have Rev96 installed.

Rev96-1 is a free update to Rev96, and will install on any model 3644 ENDEC that already has Rev96 installed.

To begin, go to the download page. This is a free update, you won't need your ENDEC's serial number, you can upload this same file to any ENDEC with Rev96 installed.

Download Page:

<https://www.sagealertingsystems.com/rev96-1download.html>

Alternatively, you can go to your ENDEC's Version page, then click the "Check For Updates" button.

Download the rev96-1-p1.x file. Save the file on your computer, then use the "Upload Firmware" page of your ENDEC's web interface to upload the .x file.

You will also need the latest version of ENDECSetD, version 2.63. This is available on the same web page that you used to download the .x update file. You only need to install it once on any PC you will use to edit ENDEC settings files. You will need the latest version of ENDECSetD to configure the new features provided by Rev96-1.

3 Installing Rev96-1

Step 1: Verify prerequisites.

Your ENDEC must be running the Rev96 firmware and have the CR-Rev7 update installed. Click the *Version* button of the ENDEC's web interface, then check for those to be indicated as in this image:

The screenshot displays the Sage Digital ENDEC web interface. At the top, the header includes 'Sage Digital ENDEC', 'SAGE2', and 'Status: Online'. On the left is a vertical sidebar with navigation buttons: Home, Logs, Show Input Levels, Streams, Upload Firmware, Retrieve Settings, Restore Settings, Files, Tools, Access Control, Network Diag, Certificates, Version (highlighted), User Settings, and Logout. The main content area is titled 'Version Information' and features a yellow banner stating 'Your current firmware version number is 96-00.' Below this, system details are listed: 'System Startup at 03/13/25 08:05:11', 'Digital ENDEC 1.1', 'FPGA version 54', 'DSP version 1.33B', 'Board rev 4/96.00', 'SN: B305001', 'Base: 10.51 MB', and 'CR-Rev7'. A 'Check For Updates' button is present. Further down, the 'Most Recent Update Time & Status:' section shows 'Success - Wed Jan 1 14:28:10 UTC 2025' and a link to 'Show update history detail'. At the bottom left of the sidebar, it shows 'ENDEC S/N: B305001' and 'Firmware: 96-01'.

Figure 1: Version page, showing that firmware version 96 update was previously installed.

If your version page does not show a current firmware version of 96-00, you will need to first install the Rev96 firmware, and possibly older updates as well before you can proceed any further. You can contact support@sagealertingsystems.com for guidance on your next steps.

Step 2: Download the Rev96-1 firmware file, then upload to ENDEC.

Go to the Sage Rev96-1 download page: <https://www.sagealertingsystems.com/rev96-1.html>

Download the rev96-1-p1.x file and save it to a convenient folder on your PC, then upload it to the ENDEC via the *Upload Firmware* page of the ENDEC's web interface. Once the file has been uploaded, the update process will begin, and may take several minutes to complete. At that point, the ENDEC will reboot and your web browser will automatically refresh.

Do not close the browser tab or navigate away from the ENDEC page during the update process.

Step 3: Verify update success.

After the process completes and the web interface has automatically refreshed in your browser, click the *Version* button. The version details should indicate that the firmware version is 96-01. The P1 patch level will appear on the line with CR-Rev7

The screenshot shows the Sage Digital ENDEC web interface. The top header includes 'Sage Digital ENDEC', 'SAGE2', and 'Status: Online'. A left sidebar contains navigation buttons: Home, Logs, Show Input Levels, Streams, Upload Firmware, Retrieve Settings, Restore Settings, Files, Tools, Access Control, Network Diag, Certificates, Version (highlighted), User Settings, and Logout. The main content area is titled 'Version Information' and features a yellow banner stating 'Your current firmware version number is 96-01.' Below this, system details are listed: System Startup at 08/14/25 12:33:35, Digital ENDEC 1.1, FPGA version 54, DSP version 1.33B, Board rev 4/96.01, SN: B305001, Base: 10.51 MB, and CR-Rev7, P1. A 'Check For Updates' button is present. The 'Most Recent Update Time & Status' section shows 'Success - Mon Aug 11 19:59:56 UTC 2025' with a link to 'Show update history detail'. At the bottom left, it displays 'ENDEC S/N: B305001' and 'Firmware: 96-01'.

Figure 2: Version page showing that Rev96-1 has been successfully installed.

What If It Does Not Show 96-01 After Reboot?

If the Version page continues to show a firmware version number of 96-00 or some value other than 96-01 after the update procedure, there will be a failure report explaining why. Click the “*Show update history detail*” link. The update history will be displayed, with the most recent update attempt at the top.

You will see an indication like the following:

FAILED – Minimum firmware version not met (rev96-1).

This means that Rev96 was not on board prior to uploading the Rev96 update.

For assistance with this or any other error, please contact support@sagealertingsystems.com.

Note that the update history will show both successful and failed update attempts, indicating the time of the attempt, version tags of the update itself, and version tags of what firmware was running on the ENDEC at the time.

4 Changes

4.1 Missing and Endangered Persons event code

This is not a mandatory event code, you do not need to install this update unless you want to relay the MEP alerts. The FCC's Report and Order says:

(Para 32) The Commission also proposed to allow EAS Participants, as in the BLU Report and Order, to implement the new MEP event code “on a voluntary basis through new equipment programmed to contain the code or through a software upgrade to install the code into equipment already in place.” We adopt those approaches here.

Refer to your State Plan to see recommendations and requirements for handling the MEP alert in your area.

Sage recommends that you install this update as it contains other software improvements. Once installed, you can use the updated ENDECSetD program to update your filters to handle the MEP alert per your state plan or your station's needs.

4.2 Weekly Report Day of Week

The weekly alert log conformance report can now be sent on the weekday of your choice. This selection also defines the week start and end days for the report - for example, setting it to Monday results in a weekly report being emailed Monday morning at 12:50 am, covering alert activity from 12:00 am on the previous Monday through 11:59:59 pm Sunday night. If the weekly web access report email is enabled, it is also sent at this time.

This selection is located at the bottom of the Email tab in ENDECSetD.

4.3 MSRP-3 TCP Interface

Rev96-1 adds support for network control of the MSRP-3 multi-station relay panel from Broadcast Tools, eliminating the need for a direct serial connection, for MSRP-3 models that include an ethernet interface. Serial port control of the MSRP-3 and legacy multi-station relay panels continues to be supported.

4.4 NTP Date

Rev96-1 reduces time required to sync with an NTP server after boot and improves sync reliability when using NTP server pool addresses.

4.5 CA Root Certificate bundle

These are the latest root certificates used to access web servers where state and local audio files are stored. We are not aware of any such servers that need this update, but using the latest certs is a best practice.

4.6 Removal of Expired FEMA Intermediate Certificates

These certificates are used to validate IPAWS messages from FEMA. Two have expired since the last update, and are removed in Rev96-1. The Certificates/Certificate Management/View Cap Certs page will not have any certs highlighted in red.