

Sage Alerting Systems
Digital ENDEC model 3644
Firmware Revision: 95
Software Released November 4, 2019
Release notes updated December 17, 2019

**Release notes for version 95, adding support for TLS 1.2 and other features.
For United States ENDECs only**

This release is to be applied to ENDECs that already have version:

- 89-30 with CR-rev4, or
- 89-32, or
- 89-34.

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1 Important!

Once you have loaded the Rev 95 update, **DO NOT** attempt to reload an older version. The resulting mismatch of 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.

2 Browsers

Rev 95 requires a more recent web browser than did older versions of the ENDEC. We have found that you will need at least these versions of web browsers.

Windows 7 or 10

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

Windows XP

The last version of Internet Explorer that runs on XP is not compatible with the Rev 95.

We have found that the last release of Firefox that runs on XP, called Firefox Extended Support Release (ESR) is able to support the ENDEC, with a minor tweak to the ENDEC software. That tweak is in the P3 version of Rev 95. If you downloaded the Rev95 release prior to December 5, you probably do not have the P3 version, and will need to read the P3 notes later in this document. Otherwise, you probably do have the P3 version. See the P3 notes later in the document.

If you need to stave off the inevitable, you could install Firefox ESR 52.9.0 on your XP system. We don't recommend this, as old versions of software, including Windows XP itself, do not receive support or security updates. Mozilla offers an archive of all of their old software, including 52.9.0esr for win32 at <https://archive.mozilla.org/pub/firefox/releases/>

Mac

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

Other

- We have been able to access Rev 95 using recent Apple and Android phones and tablets. We recommend that you get the ENDEC updated and check for proper operation before connecting with handheld touchscreen devices.

Some features, such as the waveform graphic for audio playback on the log page, are only available on Chrome, Firefox, and Edge.

3 Shortest instructions

This release installs support for new security requirements and recommendations, and also replaces an expiring certificate needed to validate IPAWS messages. To install Rev 95 you need to be on at least version 89.30 with CR-REV4, or 89.32, or 89.34.

For this release, each .x file can be installed only on the ENDEC it was purchased for. To download the update for your ENDEC, go to this page: <https://www.sagealertingsystems.com/rev95download.html>. Enter your serial number. Your download will start. Save the file on your computer, then upload the .x file into your ENDEC in the usual way.

You will also need the latest version of EndecSetD. You only need to download it once onto any PC you will use to edit ENDEC settings files. You will need the latest version of ENDECSetD to edit the new Rev95 format.

The above steps are the minimum required to update your ENDEC so that it will continue to receive alerts from FEMA. There are other things you will want to do, see “Other things you’ll want to do” later in this document.

When installing, the ENDEC checks that its serial number matches the serial number encoded in the .x file, or that its serial number is in the range of those sold after March 1, 2018 and therefore eligible for a free update. If you attempt to install an update on the wrong ENDEC, or your ENDEC is not on the required minimum version, the ENDEC will not install the update. You can see the error message by clicking the version button on the ENDEC’s web page after it reboots.

4 Summary

Complete details are provided in the installation instructions later in this document

- 1) The Rev 95 update implements support for the TLS 1.2 protocol, the method used to access web sites securely. TLS is used to access the FEMA IPAWS server. The old TLS 1.0, supported by ENDEC versions prior to Rev 95, is being removed from web sites world-wide, across all industries. FEMA is removing support for TLS 1.0 soon.
- 2) This release also includes an updated digital certificate used to verify IPAWS CAP alerts. This certificate is part of the Federal Public Key Infrastructure and expired on November 8, 2019. Its replacement was released for use with IPAWS on October 30, 2019. The replacement certificate is required to verify IPAWS CAP alerts after November 8, 2019. Part 11.56(c) of the FCC rules states “EAS Participants shall configure their systems to reject all CAP-formatted EAS messages that include an invalid digital signature”. The new certificate is required to keep your ENDEC up to date, and to allow you to follow that rule. The 11.56(c) rule went into effect on August 12, 2019. The ENDEC has always provided the ability to verify IPAWS signatures; the certificate update is required to maintain that capability.
- 3) This release includes additional security features, such as using TLS 1.2 on browser connections to the ENDEC as well as connections from the ENDEC. We’ve also added the ability to add additional user logins to the ENDEC with assignable roles. HTTP/HTTPS ports can now be changed, and a server certificate can now be built on, or uploaded to, the ENDEC. We encourage you to use HTTPS when accessing the ENDEC remotely. If you still haven’t changed the password on your default logins, the ENDEC will nag you until you do. There are several other new and modified features that are discussed in detail later in this document.
- 4) The Rev 95 update also contains the earlier 89-32 or 89-34 updates. If you are not up to date before you load Rev 95, here are some things you should know:
 - The 89-32 release added support for the Blue alert (BLU), and removed the old “new events” facility. Read about it in the [89-32 release notes](#) – but don’t install it, it’s included in Rev 95.
 - The 89-34 release supports FCC 18-94, a Report and Order that modified the method used to determine if the issue date and time of an EAS alert is valid. The rules now require that the ENDEC reject messages where the start time is more than 15 minutes in the future. You can read about it in the [89-34 release notes](#), but don’t install it, it’s included in Rev 95.

The update uses a new web interface that provides a base for us to add on additional new features in the near future. We’ve attempted to keep existing features in similar places with the same names to minimize any impact on your day to day operations, while adding new features.

Please read the rest of this document for important information. If, after you install the update, your AUTO led is blinking, and you see the message “New Events detected in settings file, see release notes”, you will need to read the section in this document titled “New Events”.

5 Introduction to Rev 95

Rev 95 concentrates on security features and on encouraging you to implement them in your standard EAS operations. In addition to required changes in how the ENDEC accesses the IPAWS system, this release allows you to change how you access the ENDEC.

Using the certificates menu button, you can upload a server certificate you want the ENDEC to use, or you can have the ENDEC build a certificate to your specifications. With a custom server certificate, you can connect to the ENDEC with HTTPS and avoid the red and yellow banners, proceed at your own risk buttons, and other warnings about accessing a system without a proper server certificate.

Use the access control button to build additional user names, passwords, and roles, and also to remove the old default user and admin web logins.

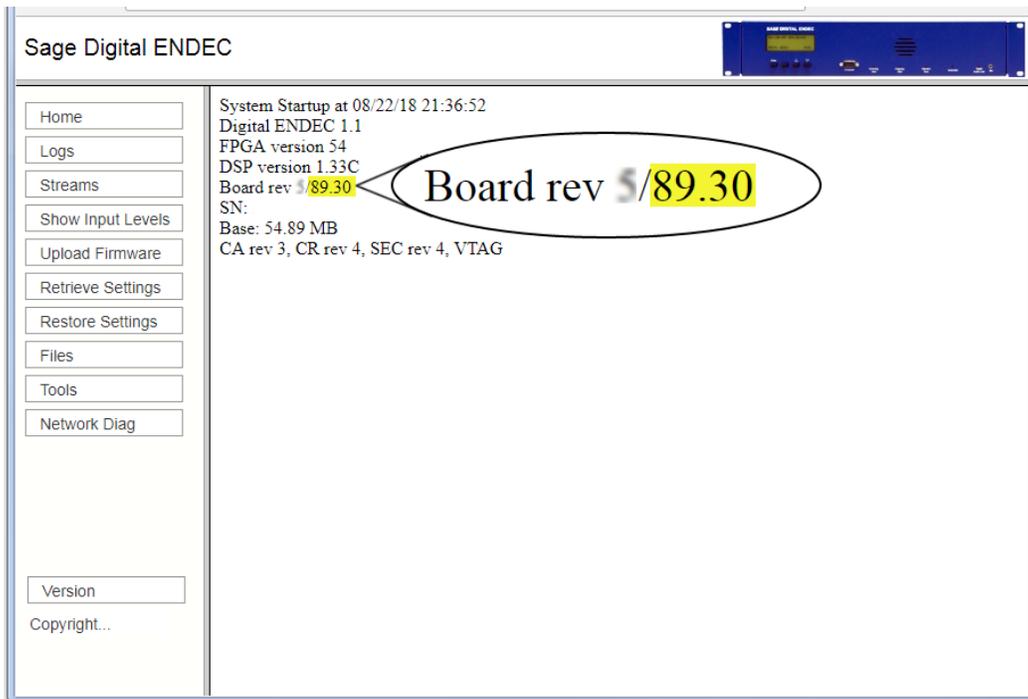
Prerequisites.

You must have previously installed version 89-30 with the CR-rev4 update to install Rev95. You do not need to install the 89-32 or 89-34 releases, that content is included in Rev 95. If you are currently receiving IPAWS CAP messages, then you already have at least 89-30 (released in July 2016) and CR-rev4 (released in May, 2018).

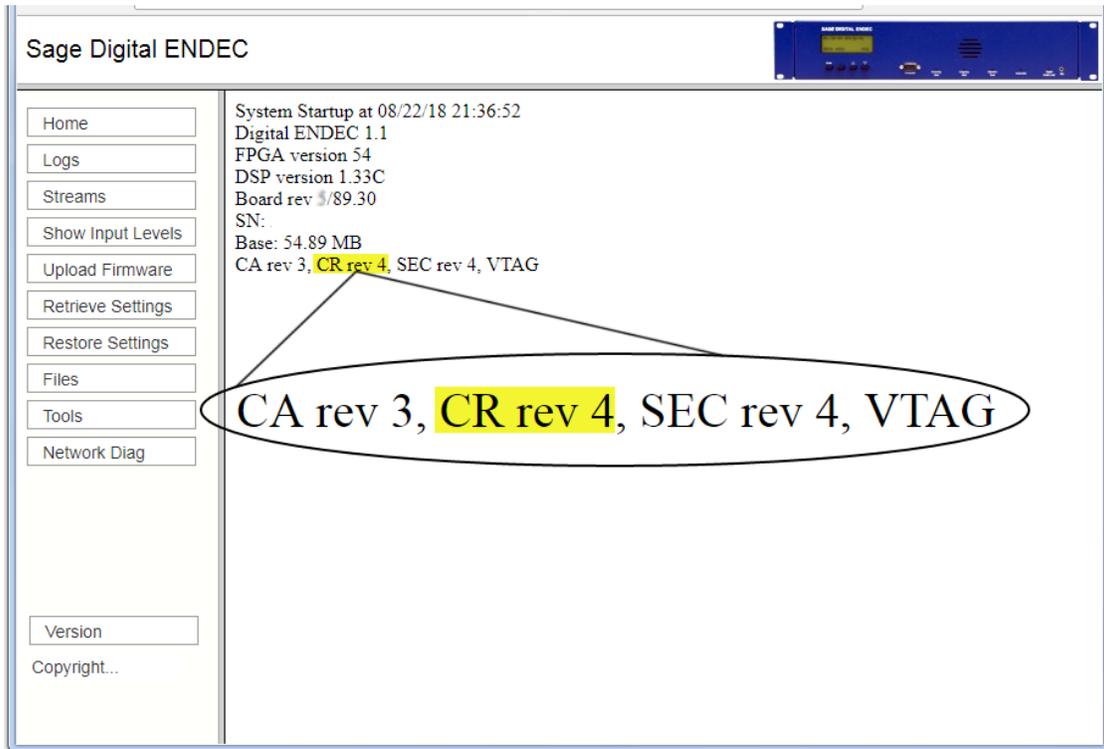
Installing

Step 1. Verify that your ENDEC is on version 89-30 or 89-32, or 89-34, and is ready for this update. Check your version by clicking the version button on the ENDEC's web page. If you see version 89.30 or 89.32, or 89.34 where shown below, continue to step two, otherwise see the details section to add the 89-30 update. Ignore the number in front of the '/'. If you are on a release that is older than 89-30, for example, 89-1, 89-8, etc, contact Sage for assistance.

Look for 89.30, 89.32, or 89.34 in the highlighted area below:



Then, look for CR rev 4 in the highlighted area below:



If you need assistance, email us with a screen shot of your version page and we can help determine your next steps.

Step 2. Download the firmware, and upload to the ENDEC

Download the firmware from the Sage web site here:

Go to the Sage Rev 95 download page: <https://www.sagealertingsystems.com/rev95download.html>

Enter your serial number and receive your file. Save it on your PC, and then upload it to your ENDEC using the Upload Firmware button on the ENDEC's web page.

Step 3. Once the ENDEC has rebooted, you will need to manually refresh the web page after about two minutes. Don't click the home or any other button on the web page until you have refreshed the page. Then click the version button. Check to make sure you now have version 95-00 installed as shown by clicking the version button and looking for the version on that page:

Version Information

Your current firmware version number is **95-00**.

If you don't see version 95-00, then you should see a failure report in the version window, most likely a message that your ENDEC did not meet the minimum version number, or that your serial number did not match.

FAILED - Minimum firmware version not met (rev95).

or

FAILED - Update file is not for this ENDEC (rev95).

Correct the condition and try again.

The version page will now also show an update status, letting you know what the previous version was and various other installation results.

Step 4. Some users might see a message at the end of the version information if “new events” were detected. You will also see the message on the MSG display on the ENDEC’s front panel, and in the startup email sent by the ENDEC. The version information will look like this:

```
System Startup at 10/04/19 00:26:42
Digital ENDEC 1.1
FPGA version 54
DSP version 1.33C
Board rev 4/95.00
SN:
Base: 59.38 MB
P3
New Events detected in settings file, see release notes
```

The ENDEC’s front panel AUTO light will also be blinking. The ENDEC is trying to get your attention. This means that your settings file has used the old “new event” feature. We explain what this all means in a later section called “New Events”. You will need to review your settings file with the new version of ENDECSetD, and upload a new settings file.

Step 5. ENDECSetD

Rev 95 uses a different format for the settings file. ENDECSetD will handle both the old and new, should you need to maintain older ENDECs during the transition to Rev 95. If you are using the old-format settings file, ENDECSetD will ask if you want to save it as a new format file. You must be using the new format to access the HTTP/HTTPS port number settings on the network tab. Note that web passwords and user roles are now entered using the Access Control button on the ENDEC’s web page, web passwords are no longer entered into ENDECSetD.

To download the latest ENDECSetD:

<https://s3.amazonaws.com/sagealertingsystems/release/EndecSetD56.msi>

and run it to install.

Step 6. Other settings to check for

See the section on other things you will want to do. This includes adjusting your levels, making it more likely that your ENDEC will detect incoming attention tones and use the new security features.

6 Other things you will want to do

Attn Threshold

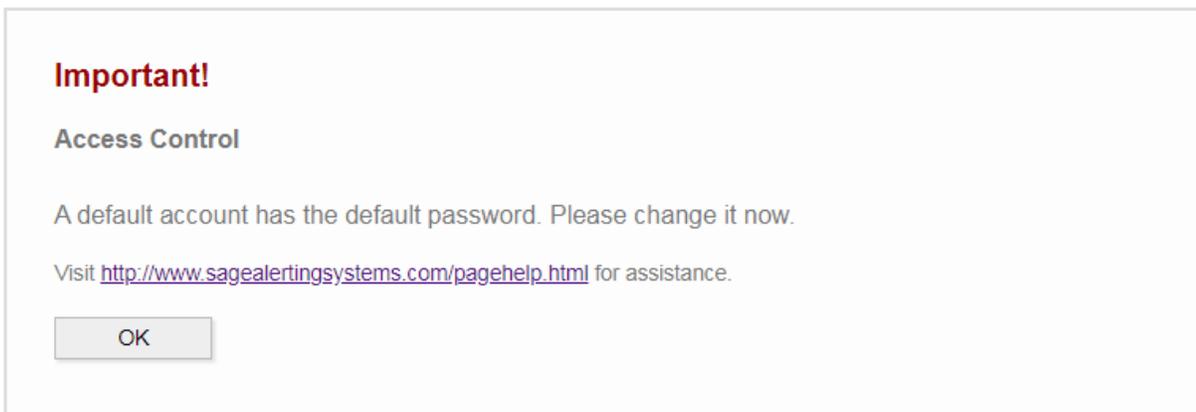
The ENDEC uses a threshold setting to keep the attention tone detector from seeing false signals. Our algorithm changed several years ago, and we have found that a much lower threshold will help the ENDEC detect low level signals. We recommend that you set the ATTN Threshold to 4 if you sometimes have more than one set of attention tones in alerts that you relay.

Audio Levels

On your ENDEC's web page, use the tools button, then click Levels. Click the refresh button below the settings table several times. If you see any lines in red, you need to read our service bulletin on how to set audio levels. This will usually solve problems with alerts that are too loud and end up compressed by processing, clipped by receivers, and can add to the problem of undetectable ATTN tones when your alerts are received by others. https://www.sagealertingsystems.com/SB_001c.pdf.

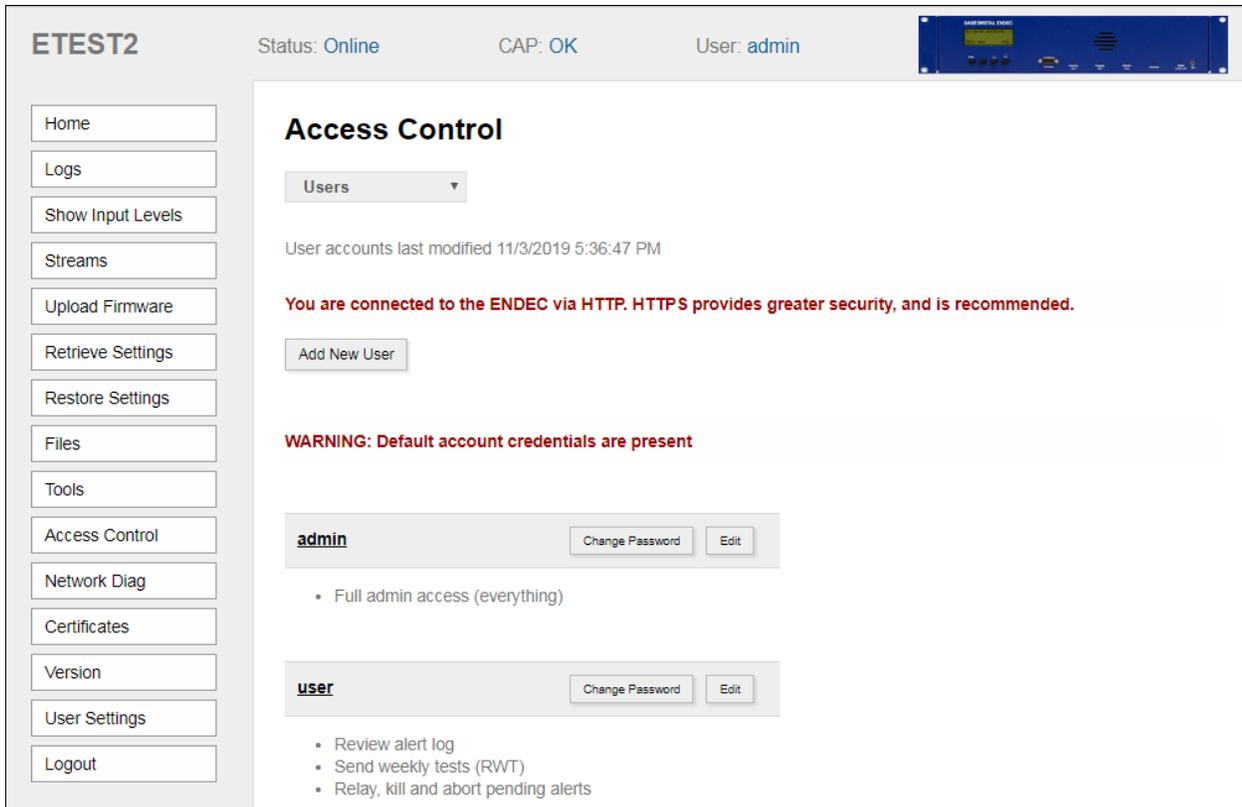
Passwords

You might see this message after you install Rev 95. It means that one or both of the default users installed on the ENDEC are still there, i.e., admin, user, or both. You must change them to keep your system secure.



If you have logged in as admin, you will be taken to the access control page (shown below). You should log out and reconnect using HTTPS. The ENDEC includes a server certificate, and though browsers will complain about it because it isn't customized for your use, they will allow you to connect. This will provide the necessary encryption to keep your changes to your password secure. You should always connect to the ENDEC with HTTPS, for example, <https://192.160.1.50>, especially when you are dealing with the security sections of the ENDEC.

Once connected, change the passwords. Better yet, build new users and set appropriate roles for each. When you are done, log in to your new admin account and delete the old default users.



You can also use the access control dropdown box to set a white list of IP addresses that can connect to the ENDEC's web page. If you accidentally lock yourself out, you can reset the white list and the web logins from the ENDEC's front panel network menu.

You can use the Certificates button to create a custom server certificate. You can set it with the IP address(es) that you use to access the ENDEC. This certificate will be self signed, so you will need to manually add it to the trusted root store in your PC. Each browser has a different way of doing this, Sage will provide a tutorial for each on the FAQ section of our web site shortly after the release of Rev 95.

You can also upload a certificate and intermediates signed by a CA for even better interaction with browsers.

7 New Features

- Rev 95 includes these new features and improvements
- Security
 - Support for TLS 1.2
 - Latest FEMA intermediate certs
 - Server Certificate can be built by, or uploaded to, the ENDEC
 - For users with the tools/view IP address role, the user and IP address that initiated sending RWTs, settings or firmware uploads, and other actions, are visible in the log. A check box on the log page removes these items in case you want to cut and paste and include parts of the log in an email or other public posting
 - HTTP/HTTPS port numbers can be changed for ease of use with a firewall or NAT
 - added multiple users and roles
 - user can change password from web page
 - IP whitelist for web page access
 - Removal of port 8888 for streaming audio access, audio is now streamed via the http/https connection. One less hole in the firewall
 - Display of IPAWS intermediate and root certificates
- Updated home page, with a dashboard showing
 - countdown to alert relay
 - countdown to the end of an in-progress alert
 - UTC time
 - ENDEC's local time
 - most recently sent and received alerts (click them and the log entry appears)
 - time of the next automatic weekly test
 - Last reboot time
 - error conditions
- Updates to log display
 - more selections of what types of events to show in the log
 - conformance button
 - log includes firmware/settings uploads and startups
 - graphic display of logged audio on Chrome, Firefox, and Edge
 - added log of user/IP address for web initiated actions
 - The time that a CAP message arrived and was queued is now included in the log. Messages continue to appear in the log in the order they became actionable
 - CAP server name is included in emailed logs
 - conformance report showing required test received via CAP or monitor inputs, and required alerts sent
 - show counts of all event codes displayed
- The strict time off option has been removed
- Identify button - blinks LED on front panel for easy identification of the ENDEC when mounted with others in a rack
- Port number for HD Radio exporter can be changed
- Alert audio start/end messages added to Simple Automation API

8 Information for users who have not previously installed 89-32 or 89-34

These features, previously released in 89-32 and 89-34 are included in Rev 95.

FCC time validity rule

If your ENDEC's time is more than 15 minutes slow, that is, actual time is 10:15, but your ENDEC thinks it is 9:59, then the ENDEC will reject an alert that was originated at 10:15. Note that this is the time the alert was originated, not the time it was relayed to you. If this happens, you will see an indication in logs and status messages that the alert was "ahead".

This might also occur if the originator's equipment has an incorrect time, and is sending alerts 15 minutes ahead of the correct time.

As a practical matter, you should use the ENDEC's network time (NTP) capabilities to always keep your ENDEC on the correct time.

New Events

The following information is only of interest if your settings file contains New Event definitions. If your ENDEC's AUTO led is blinking, or you see "New Events detected in settings file, see release notes" in any messages from the ENDEC or on its front panel, then you need continue reading.

Previous versions of the ENDEC supported the ability to add new Event Codes with ENDECSetD. We have removed this feature for three reasons:

- 1) While early versions of Part 11 allowed for States to add their own event codes, this language has since been removed. Only FCC-approved codes in Part 11 are now permitted.
- 2) Some users thought they needed to add any event they wanted to use in a filter to the New Events section. This leads to confusion, and difficult-to-maintain filters.
- 3) Events added through New Events conflicted with new FCC mandated events.

The ENDEC will now ignore any events added with the New Events facility. Starting with version 2.53 of ENDECSetD, "New Events" can no longer be added.

To avoid any confusion between what is seen in the settings, and what the ENDEC is doing, the ENDEC will blink the AUTO led and send messages saying that the settings include New Events. You will need to edit the settings file with the latest version of ENDECSetD to remove those events, and to remove those events from any incoming filter or outgoing header that uses them.

Download and install ENDECSetD from here:

<https://s3.amazonaws.com/sagealertingsystems/release/EndecSetD56.msi>

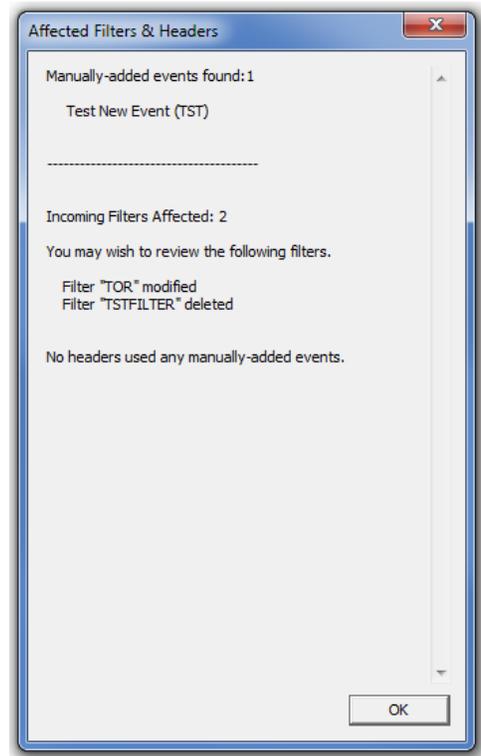
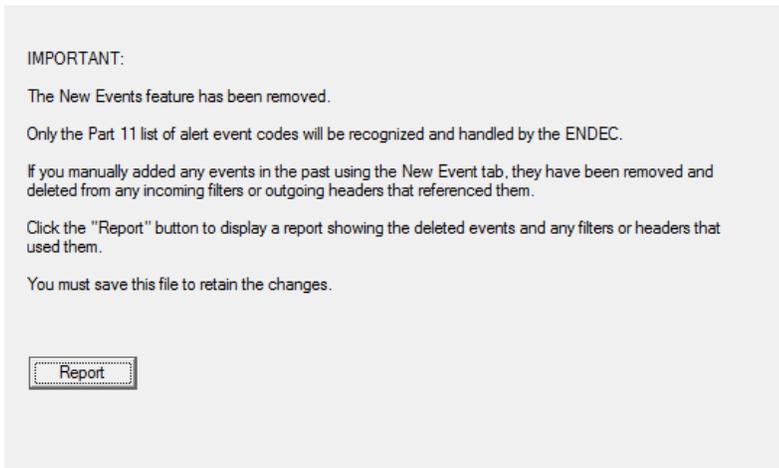
To assist in this process, ENDECSetD will check for the presence of New Events. If any are found when a settings file is opened, ENDECSetD will show you a tab explaining what happened to New Events, and if you click the report button, a window will open showing a list of the new events, along

with the filters and headers that used them. It will remove those events, and remove them from filters and headers. Any filter or header that contained only a new event will also be removed. You should review any headers and filters that are affected, and make any necessary changes.

It is possible that there is a conflict between old New Events that were added, and the new weather codes added in 2016. In that case, those weather events will have been removed from any filters that used them, and you will need to add them back to the affected filter.

Again, this only applies to the small number of users who have added New Events.

Here is the page you will see when you open a new file with New Events, and the result of clicking the Report Button.



You will need to save the settings file and upload it to the ENDEC.

9 Patches

Since the initial release of Rev95 on November 5, 2019, we have released four minor updates. These are optional, and do not affect the main operation of the ENDEC. The Rev95 release file will include the latest version of the patches available at the time the user downloads the Rev95 release. Short descriptions of the contents of the patches are:

P1 – fix to allow streaming on monitor 1 (November 5, 2019)

P2 – P1 plus fix to the conformance report on the log page (November 5, 2019)

P3 – P2 plus fix font and portrait/landscape settings for logs printed from the log web page.

Remember selection criteria settings on log page.

Support for Firefox ESR on Windows XP.

Fix MSRP station selection on the ENDEC's home page in the unusual case of having only one station defined. (December 5, 2019)

P4 – P3 plus fix of the display of outgoing message on the home page for long text messages. The problem affects only the display of the message on the web page, all other aspects of the message and its transmission are correct.

Complete descriptions are available in the patch release notes here:

<https://s3.amazonaws.com/sagealertingsystems/release/Rev-95-P4.pdf>

If you are interested in any of the above fixes or new minor features, after you install Rev95, check your patch level.

To see your patch level, look at your Version page on the ENDEC.

```
System Startup at 11/05/19 16:49:24
Digital ENDEC 1.1
FPGA version 54
DSP version 1.33C
Board rev 5/95.00
SN: Bxxxxxx
Base: 39.11 MB
```

→ P2

You might see any of the following there:

- (Nothing)
- P1
- P1,P2
- P2
- P3
- P4

If you do not see the latest, P4, then after you install Rev 95, install the P4 patch. Download the file from here:

https://s3.amazonaws.com/sagealertingsystems/release/rev2/rev95_patch_P4.x

Upload the patch using the Update Firmware button on the ENDEC.