

ES&S

Request for Approval

ES&S EVS 5.2.4.0

January 14, 2019

Letters of Recommendation

Benton County, Arkansas

Cabell County, West Virginia

Pendleton County, West Virginia

Washington County, Arkansas

Present:

**Ben Swartz, ES&S, Sr. State Certification
Manager**

EAC – Certification Number

ES&S EVS 5.2.4.0

COPY

Tennessee Secretary of State
Tre Hargett



Elections Division
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-1102

Mark Goins
Coordinator of Elections

615-741-7956
Mark.Goins@tn.gov

January 25, 2019

Ben Swartz
State Certification Manager
11208 John Galt Boulevard
Omaha, NE 68137

Dear Mr. Swartz:

This letter is to inform you of the certification of the ES&S EVS 5.2.4.0 by the State Election Commission on January 14, 2019. Listed below is the certification of the machine bearing EAC Certification Number:

- ESSEVS5240

You gave a presentation of the changes before the SEC for January 14, 2019, and the State Election Commission reviewed the questionnaires provided by jurisdictions currently using the ES&S EVS 5.2.4.0 voting system.

As you know, the State Election Commission requires the use of ballot tote bins to be used with optical scanners and Tennessee law requires the use of ballots with serially-numbered stubs.

Thank you for your cooperation in the certification process.

Sincerely,

A handwritten signature in blue ink that reads "Mark Goins".

Mark Goins
Coordinator of Elections

Attachment: EAC Certification - ESSEVS5240

PROCEDURES FOR CERTIFYING VOTING MACHINES BY THE TENNESSEE STATE ELECTION COMMISSION

All voting machines/vendors must receive certification from the state election commission and the coordinator of elections before any voting machines or systems may be sold in the State of Tennessee.

First Step:

Any interested vendor should submit a written request to the coordinator of elections and the state election commission requesting certification of your company together with the EAC certification number, a financial report and a list of all states that have already bought your voting machines or systems. If you would like to demonstrate your product at a meeting of the state election commission, please make that request in your letter. You will be notified of the date, time, and place of the meeting where you may make your presentation.

Second Step:

A. Voting Machine Procedure

Following verification of EAC certification and an initial presentation of your product and/or services, you would need to arrange for at least two (2) State Election Commissioners (of opposite parties) and the coordinator of elections (or designee) to view your machines or system in use in an election of a substantial size in another state. An election of a substantial size involves at the minimum the following characteristics:

- The jurisdiction has a population of at least 10,000 persons;
- The jurisdiction has at least two (2) or more district races on the ballots; and
- There are at least two (2) contested races involving both at large and district races on the ballot.

B. Voting Machine Software or Hardware Upgrade

- EAC Certification;
- Presentation of upgrade before State Election Commission at a meeting; and
- Viewing of upgrade in another state (In lieu of viewing machine in another state, at the discretion of the State Election Commission, letters of recommendation from users in other jurisdiction may be used as support for approval.)

C. De Minimis Voting System Changes

- Any De Minimis change to an EAC certified voting system shall be submitted to the state election commission and coordinator of elections to be approved. For purposes of approval of the de minimis change to the voting system, all that will be required is a letter from the EAC stating the change is de minimis, unless further information is requested by the state election commission or coordinator of elections.

Third Step

The State Election Commission must vote to certify the machine in order for the machines to be used in an election in Tennessee.

You may send any correspondence for both the state election commission and the coordinator of elections to the following address:

312 Rosa L.Parks Avenue, 7th Floor
William R. Snodgrass Tower
Nashville, Tennessee 37243
(615) 741-7956

If you have any further questions regarding certification of your company, please feel free to contact the office of the state election coordinator at the phone number listed above.

Kathy Summers

From: Swartz, Benjamin <brswartz@essvote.com>
Sent: Wednesday, December 5, 2018 9:17 AM
To: Mark Goins
Cc: Kathy Summers; Pearson, Steve; Beeson, Mac; 'Wendell Moore'; Wilson, Cam
Subject: TN Request for Certification of EVS 5.2.4.0
Attachments: 20181204_TN EVS5240 Request for Certification.pdf

***** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. *****

Good Morning Mark,

Being sent to your attention via UPS is the attached formal letter requesting state certification of EVS 5.2.4.0. On June 5, 2018, the EAC certified the EVS 5.2.4.0 release and in addition to EAC Certification, we have sought and received state certification of this release in 10 states (AR, IA, ID, IN, KY, MO, MS, NE, TX, and WV).

The EVS 5.2.4.0 release is a minor update to the EAC and Tennessee certified EVS 5.2.2.0 release however it is a very important release in order to fulfill orders from Tennessee jurisdictions purchasing the ExpressVote. The key objective for the release was to improve certain processes such as moving a resistor on the Input Output Board in order to ease the manufacturing of the board and we also needed to address certain end-of-life components with the ExpressVote HW 1.0 certified in the EVS 5.2.2.0 release. As a result of the board modifications and obtaining second sources for the end-of-life components, the hardware revision level was incremented from HW 1.0 to HW 2.1. Both the existing HW 1.0 units (currently in the field) and the HW 2.1 units (those units being manufactured now) can be used interchangeably and in conjunction with each other. The exterior of the ExpressVote is the same between the two hardware revisions and there is no difference between the operation, maintenance, or voter experience of the two hardware revisions.

Please note, no tabulation firmware/hardware was modified in the EVS 5.2.4.0 release from the EVS 5.2.2.0 release.

Included with the submission being sent to you via UPS are 4 completed surveys from jurisdictions in West Virginia and Arkansas. Pursuant to item B under the Second Step of the Tennessee procedures for certification, ES&S respectfully requests the examination and approval of EVS 5.2.4.0 be scheduled at the January 7, 2019 Tennessee State Election Commission meeting.

As always, please do not hesitate to contact me with any questions or concerns.

Thank you,



Benjamin Swartz | Sr. State Certification Manager | Election Systems & Software

11208 John Galt Blvd. Omaha, NE 68137 | O: 402-970-1143

brswartz@essvote.com | www.essvote.com



December 4, 2018

Sent via UPS and Email

Mr. Mark Goins
 Division of Elections
 Tennessee Department of State
 312 Rosa L. Parks Avenue
 7th Floor, William R. Snodgrass Tower
 Nashville, TN 37243

RECEIVED
 2018 DEC -6 PM 1:46
 SECRETARY OF STATE
 ELECTIONS

RE: Request for State Certification of Election Systems & Software’s EVS 5.2.4.0 Voting System

Dear Mr. Goins:

Election Systems & Software (ES&S) is pleased to present this request to the Tennessee State Election Commission for state certification consideration of our most recent Election Assistance Commission (EAC) Certified *EVS 5.2.4.0 Voting System*. On June 5, 2018, the EAC granted certification of EVS 5.2.4.0 as an upgrade to the EAC and Tennessee state certified EVS 5.2.2.0 release and for conformance to the *Voluntary Voting System Guidelines (VVSG) v 1.0* standards.

In addition to EAC Certification, 10 states have state certified the EVS 5.2.4.0 release. Those states are Arkansas, Iowa, Idaho, Indiana, Kentucky, Missouri, Mississippi, Nebraska, Texas, and West Virginia. Included with this cover letter are 4 surveys from counties in Arkansas and West Virginia who utilized the EVS 5.2.4.0 release during the November 6, 2018 General election cycle.

The table below represents the EVS 5.2.4.0 version numbers in comparison to the EVS 5.2.2.0 version numbers. Please note none of the tabulation (DS200 and DS850) firmware and hardware has been modified since the last time the system was reviewed in EVS 5.2.2.0.

Tennessee State Certification of EVS 5.2.4.0 <small>EAC Certified: 06/05/2018 VVSG v. 1.0 Compliant</small>			
		EVS 5.2.2.0	EVS 5.2.4.0
Election Management System (EMS)	ElectionWare	4.7.1.1	4.7.1.4
	Event Log Service	1.5.5.0	1.5.5.0
	Removable Media Service	1.4.5.0	1.4.5.0
	Election Reporting Manager (ERM)	8.12.1.1	8.12.1.1
	VAT Previewer	1.8.6.1	1.8.6.1
	ExpressVote Previewer	1.4.1.2	1.4.1.7 or 2.4.2.0
ES&S Tabulators	DS200 Precinct Tabulator (HW 1.2, 1.3)	2.12.2.0	2.12.2.0
	DS850 Central Tabulator (HW 1.0)	2.10.2.0	2.10.2.0
Voter Assist Terminal	AutoMARK (HW 1.0, 1.1, & 1.3)	1.8.6.1	1.8.6.1
Universal Voting System	ExpressVote	1.4.1.2 (HW 1.0)	1.4.1.7 (HW 1.0) 2.4.2.0 (HW 2.1)

Below is a brief summary of the enhancements since EVS 5.2.2.0 that are being submitted for State Certification consideration. Please refer to the System Overview and System Change Notes for additional details pertaining to the products or the EVS 5.2.4.0 voting system.

➤ **Key Enhancement to the ExpressVote Universal Voting Device**

- **Hardware:** EVS 5.2.4.0 supports the existing HW 1.0 ExpressVote and the go forward HW 2.1 ExpressVote. Specifically, in the EVS 5.2.4.0 release we improved the manufacturing processes of the ExpressVote (HW 1.0) internal boards (the Input Output Board in particular) in order to improve the overall manufacturability of the boards used in the production of the ExpressVote. In addition to the improved processes, we had addressed end-of-life components that will allow the manufacturing of ExpressVote units for several years to come. Both the existing HW 1.0 units (currently in the field) and the HW 2.1 units (those being manufactured now) can be used interchangeably and in conjunction with each other. The exterior of the ExpressVote is the same between the two hardware revisions and there is no difference between the operation, maintenance, or voter experience of the two hardware revisions.
- **Firmware:** A couple of minor enhancements to first correct the ability to write-in a candidate while using a two-position switch in a multi-language election and secondly allow a very long candidate text (255 characters) display the entire text instead of being truncated.

➤ **Key Enhancements to the Election Management System (EMS)**

- The “commercial off the shelf” (COTS) components such as the Symantec anti-virus, Cerberus, and the Microsoft Operating System offline updates have been updated to the latest versions.

Included with this cover letter is an enclosed CD-ROM that contains Pro V&V's EVS 5.2.4.0 VSTL Test Report, the EAC Scope of Certification for EVS 5.2.4.0, ES&S' Technical Data Package which includes the system overview, system operation manuals, security documents, maintenance manuals, etc., and the completed surveys from Benton and Washington counties in Arkansas and Cabell and Pendleton counties in West Virginia.

In pursuant of item B under the Second Step of the Tennessee procedures for certifying voting systems, ES&S respectfully request the examination and approval of EVS 5.2.4.0 be scheduled at the January 7, 2019 Tennessee State Election Commission meeting.

If you require additional documentation or clarification, please do not hesitate to contact me via telephone at 402-970-1143 or email at brswartz@essvote.com.

Sincerely,



Benjamin Swartz
Sr. State Certification Manager
Election Systems & Software, LLC

Encl: Product Brochures, EAC Scope of Certification, CD Rom Containing Technical Data Package (TDP)



United States Election Assistance Commission



Certificate of Conformance

ES&S EVS 5.2.4.0

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the 2005 *Voluntary Voting System Guidelines (2005 VVSG)*. Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the *EAC Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Product Name: EVS _____

Model or Version: 5.2.4.0 _____

Name of VSTL: Pro V&V _____

EAC Certification Number: ESSEVS5240 _____

Date Issued: June 5, 2018 _____

Executive Director
U.S. Election Assistance Commission

Scope of Certification Attached

Manufacturer: *Election Systems & Software*
System Name: *EVS 5.2.4.0*
Certificate: *ESSEVSS240*

Laboratory: *Pro V&V*
Standard: *VVSG 1.0 (2005)*
Date: *June 5, 2018*



Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

ES&S EVS 5.2.4.0 is comprised of the ExpressVote® Universal Voting System version 1.0 (ExpressVote 1.0), ExpressVote® (versions 2.1.0.0, and 2.1.2.0) Universal Voting System (ExpressVote 2.1), DS200® Precinct Digital Scanner and Tabulator (DS200), DS450® Central Count Digital Scanner and Tabulator (DS450), DS850® Central Count Digital Scanner and Tabulator (DS850), AutoMARK® Voter Assist Terminal (AutoMARK) versions A100, A200 & A300, Electionware® Election Management System (Electionware), Election Reporting Manager® (ERM), ES&S Event Log Service (ELS), Removable Media Service (RMS), ExpressVote Previewer and VAT Previewer.

- The ExpressVote is a universal vote capture device designed for all voters, with independent voter-verifiable paper record that is digitally scanned for tabulation. This

system combines paper-based voting with touch screen technology. The ExpressVote includes a mandatory vote summary screen that requires voters to confirm or revise selections prior to printing the summary of ballot selections using the internal thermal printer. Once printed, ES&S ballot scanners process the vote summary card. The ExpressVote can serve all voters, including those with special needs, allowing voters to cast ballots autonomously. ES&S has fully integrated the ExpressVote with the existing suite of ES&S voting system products.

- DS200 digital scanner is a paper ballot tabulator designed for use as a polling place scanner. After the voter makes their selections on their paper ballot, their ballot or vote summary card is inserted into the unit for immediate tabulation. Both sides of the ballot are scanned at the same time using a high-resolution image-scanning device that produces ballot images.
- The DS450 is a scanner and tabulator that simultaneously scans the front and back of a paper ballot and/or vote summary card. It can also handle folded ballots and can read ballots in any of four orientations. The DS450 sorts tabulated ballots into discrete output bins without interrupting scanning. Optionally, this device may be configured to transmit tabulation results to the results server through a closed network connection rather than using physically transported USB flash drives.
- The DS850 is a digital scan central ballot tabulator that uses cameras and imaging algorithms to capture voter selections on the front and back of a ballot, evaluate results and then sort ballots into discrete bins without interrupting scanning. A dedicated audit printer generates a continuous event log. Machine level reports are produced from a second, laser printer. The scanner saves voter selections and ballot images to an internal hard disk and exports results to a USB flash drive for processing with Election Reporting Manager. Optionally, this device may be configured to transmit tabulation results to the results server through a closed network connection rather than using physically transported USB flash drives.
- AutoMARK enables voters who are visually or physically impaired and voters more comfortable reading or hearing instructions and choices in an alternative language to privately mark optical scan ballots. The AutoMARK supports navigation through touchscreen, physical keypad or ADA support peripheral such as a sip and puff device or two-position switch.
- Electionware integrates the election administration functionality into a unified application. Its intended use is to define an election and create the resultant media files used by the ExpressVote, DS200, AutoMARK, DS450, DS850, and ERM. An integrated ballot viewer allows election officials to view the scanned ballot and captured ballot data side-by-side and produce ballot reports.
- ERM generates paper and electronic reports for election workers, candidates, and the media. Jurisdictions can use a separate ERM installation to display updated election totals on a monitor as ballot data is tabulated, and send the results reports directly to the media outlets. ERM supports accumulation and combination of ballot results data from all ES&S tabulators.
- ELS is a Windows Service that runs in the background of any active EMS software application to monitor the proper functioning of the Windows Event Viewer. The ELS

closes any active ES&S software application if the system detects the improper deactivation of the Windows Event Viewer.

- RMS is an application that runs in the background of the EMS client workstation and supports the installation and removal of election and results media.

The EVS 5.2.4.0 is a modified voting system configuration that includes upgrades to the components of the EVS 5.2.3.0 and introduces a new hardware version for the ExpressVote (versions 2.1.0.0 and 2.1.2.0). EVS 5.2.4.0 adds four new ExpressVote configuration options: Quad Express Cart, MXB ExpressVote Voting Booth, ExpressVote Single Table and ExpressVote Double Table. EVS 5.2.4.0 also adds a new ADA table configuration for the AutoMARK; provides security upgrades to third-party EMS COTS products; and contains minor enhancements to Electionware and ExpressVote.

Mark Definition:

ES&S’ declared level mark recognition for the DS200, DS450 and DS850 is a mark across the oval that is 0.02” long x 0.03” wide at any direction.

Tested Marking Devices:

Bic Grip Roller Pen

Language Capability:

EVS 5.2.4.0 supports English, Spanish, Chinese (Cantonese), Korean, Japanese and Bengali.

Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
ExpressVote HW 1.0	1.4.1.7	1.0		Universal Voting System
ExpressVote HW 2.1	2.4.2.0	2.1.0.0 2.1.2.0		Universal Voting System
ExpressVote Rolling Kiosk		98-00049		
ExpressVote Voting Booth		87001		Stationary Voting Booth
Quad Express Cart		41404		Portable Voting Booth
MXB ExpressVote Voting Booth		95000		Stationary Voting Booth
ExpressVote Single Table		87033		Voting Table for One Unit
ExpressVote Double Table		87032		Voting Table for Two Units
ADA Table		87031		Voting Table for One Unit
DS200	2.12.2.0	1.2.1, 1.2.3, 1.3		Precinct Count Tabulator

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
DS200 Ballot Box		1.2, 1.3, 1.4, 1.5		Plastic ballot box
DS200 Ballot Box		1.0, 1.1, 1.2		Metal ballot box
DS200 Ballot Box		98-00009		Collapsible Ballot Box
DS200 Tote Bin		00074		Tote Bin Ballot Box
DS450	3.0.0.0	1.0		Central Count Scanner and Tabulator
DS450 Cart		3002		
DS850	2.10.2.0	1.0		Central Count Scanner and Tabulator
DS850 Cart		6823		
AutoMARK A100	1.8.6.1	1.0		Ballot Marking Device
AutoMARK A200	1.8.6.1	1.1, 1.3		Ballot Marking Device
AutoMARK A300	1.8.6.1	1.3		Ballot Marking Device
AutoMARK Table		87033		
Electionware	4.7.1.4			
Election Reporting Manager (ERM)	8.12.1.1			
ES&S Event Log Service	1.5.5.0			
AutoMARK VAT Previewer	1.8.6.1			
ExpressVote Previewer	1.4.1.7 (1.0) 2.4.2.0 (2.1)			
Removable Media Service	1.4.5.0			
SecureSetup	2.0.0.1			Proprietary Hardening Script
EMS Server		Dell PowerEdge T710		
EMS Client Workstation		Dell Optiplex 980 or 5040		
EMS Client Workstation		Dell Latitude E6410		
EMS Standalone Workstation		Dell Latitude E6410		
Delkin: USB Flash Drive		512MB, 1 GB, 2 GB, 4 GB, 8 GB		Election and ballot definition media
Delkin: Validation USB Flash Drive		16 GB		Validation purposes only
Delkin: Compact Flash		1 GB		Election and ballot definition media
SanDisk: Compact Flash		512 MB, 1 GB, 2 GB		Election and ballot definition media
Delkin: CF Card Reader/Writer		6381		

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
SanDisk: CF Card Reader		018-6305		
Headphones		Avid 86002		
Zebra QR code scanner		DS457-SR20009		Integrated with Rolling Kiosk
Symbol QR Code scanner		DS9208		External
DS450 Report Printer		Dell S2810dn		Laser report printer
DS850 Report Printer		OKI B431dn & Oki B431d		Laser report printer
DS450 and DS850 Audit Printer		Oki Microline 420		Dot Matrix Printer
DS450 UPS		APC Back-UPS Pro 1500		
DS450 and DS850 Surge Protector		Tripp Lite Spike Cube		
DS850 UPS		APC Back-UPS RS 1500 or Pro 1500		
Adobe Acrobat Standard	11		COTS	
Cerberus FTP	9.0.3.1 (64-bit)		COTS	
Microsoft Server 2008	R2 w/ SP1		COTS	
Microsoft Windows 7 Professional	SP1 (64-bit)		COTS	
WSUS Microsoft Windows Offline Update Utility	11.1.1		COTS	
Micro Focus RM/COBOL Runtime	12.06		COTS	
Symantec Endpoint Protection	14.0.1_MP1		COTS	
Symantec Endpoint Protection Intelligent Updater	20180227-001-core3sds5i64.exe		COTS	File-Based Anti-Virus Protection
Symantec Endpoint Protection Intelligent Updater	20180226-040-IPS_IU_SEP_14RU1.exe		COTS	Network-Based Anti-Virus Protection
Symantec Endpoint Protection Intelligent Updater	20180225-001-SONAR_IU_SEP.exe		COTS	Behavior-Based Anti-Virus Protection

System Limitations

This table depicts the limits the system has been tested and certified to meet.

System Characteristic	Boundary or Limitation	Limiting Component
Max. precincts allowed in an election	9,900	ERM
Max. count for any precinct element	500,000 (99,900 from any tabulator media)	ERM report (ERM results import)
Max. candidates allowed per election	Depends on election content (limited by 21,000 maximum counters)	ERM
Max. contests allowed in an election	Depends on election content (limited by 21,000 maximum counters)	ERM
Max. counters allowed per precinct	Limits candidates and contests assigned to a precinct to 1,000	ERM
Max. contests allowed per ballot style	200 or number of positions on ballot	N/A
Max. candidates (ballot choices) allowed per contest	175	ERM (database create)
Max. number of parties allowed	General election: 75 Primary election: 20 (including nonpartisan party)	ERM (database create)
Max. 'vote for' per contest	98	ERM (database create)
Ballot formats	All paper ballots used in an election must be the same size and contain the number of response rows.	Ballot scanning equipment
Max. Ballot Styles	9,900	ERM
Max. District Types/Groups	20	ERM
Max. districts of a given type	40	ERM
Supported Languages	<ul style="list-style-type: none"> • English • Spanish • Chinese (Cantonese) • Korean • Japanese • Bengali 	System Configuration

Component Limitations:

Paper Ballot Limitations

1. The paper ballot code channel, which is the series of black boxes that appear between the timing track and ballot contents, limits the number of available ballot variations depending on how a jurisdiction uses this code to differentiate ballots. The code can be used to differentiate ballots using three different fields defined as: Sequence (available codes 1-26,839), Type (available codes 1-30) or Split (available codes 1-40).
2. If Sequence is used as a ballot style ID, it must be unique election-wide and the Split code will always be 1. In this case the practical style limit would be 26,000.

ExpressVote

1. ExpressVote capacities exceed all documented limitations for the ES&S election management, vote tabulation and reporting system. For this reason, Election Management System and ballot tabulator limitations define the boundaries and capabilities of the ExpressVote system as the maximum capacities of the ES&S ExpressVote are never approached during testing.

DS200

1. The ES&S DS200 configured for an early vote station does not support precinct level results reporting. An election summary report of tabulated vote totals is supported.
2. The DS200 storage limitation for write-in ballot images is 3,600 images. Each ballot image includes a single ballot face, or one side of one page.
3. Write-in image review requires a minimum 1GB of onboard RAM.
4. To successfully use the Write-In Report, ballots must span at least three vertical columns. Using two columns or fewer results in the write-in area being too large to print on the report tape.

AUTOMARK Voter Assist Terminal

1. ES&S AutoMARK capacities exceed all documented limitations for the ES&S election management, vote tabulation and reporting system. For this reason, Election Management System and ballot tabulator limitations define the boundaries and capabilities of the AutoMARK system as the maximum capacities of the ES&S AutoMARK are never approached during testing.

Electionware

1. Electionware capacities exceed the boundaries and limitations documented for ES&S voting equipment and election reporting software. For this reason, ERM and ballot tabulator limitations define the boundaries and capabilities of Electionware system.
2. Limits were calculated using default text sizes for ballot and report elements. Some uses and conditions, such as magnified ballot views or combining elements on printed media or ballot displays, may result in limits lower than those listed. Check printed media and displays before finalizing the election.
3. The Electionware Export Ballot Images function is limited to 250 districts per export.
4. Special characters are not supported and may not appear properly when viewed on equipment displays or reports.
5. Electionware cannot display more than 30,000 images when filtering ballot images for display. Employ one or more filters to ensure that the number of ballots viewed is less than 30,000.

Election Reporting Manager (ERM)

1. Election Reporting Manager requires a minimum monitor screen resolution of 800x600.
2. ERM Database Create allows 1,600 Precincts per Ballot Style.
3. There is a limit of 3,510 precincts in the precincts counted/not counted display.
4. There is a limit of 3,000 precincts in the precincts counted/not counted scrolling display.
5. Contest/Precinct selection pop up display limited to 3,000 contests/precincts.
6. Non-English characters are not supported in ERM. This has to do with the creation of the XML results file out of ERM.
7. ERM's maximum page size for reports is 5,000 pages.

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	No	
Accessibility		
Forward Approach	Yes	
Parallel (Side) Approach	Yes	
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open Standard (provide definition of how supported)	Yes	
Primary: Open Blanket (provide definition of how supported)	No	
Partisan & Non-Partisan:		
Partisan & Non-Partisan: Vote for 1 of N race	Yes	
Partisan & Non-Partisan: Multi-member ("vote for N of M") board races	Yes	
Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	Yes	
Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	Yes	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	Yes	
Write-in Voting: Without selecting a write in position.	Yes	
Write-in: With No Declared Candidates	Yes	
Write-in: Identification of write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	No	
Slate & Group Voting: one selection votes the slate.	No	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	Yes	
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	Yes	
Straight Party: Vote for each candidate individually	Yes	

Feature/Characteristic	Yes/No	Comment
Straight Party: Modify straight party selections with crossover votes	Yes	
Straight Party: A race without a candidate for one party	Yes	
Straight Party: N of M race (where "N">1)	Yes	
Straight Party: Excludes a partisan contest from the straight party selection	Yes	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	Yes	
Split Precincts:		
Split Precincts: Multiple ballot styles	Yes	
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	Yes	
Split Precincts: DRE matches voter to all applicable races.	No	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	Yes	It is possible to list the number of voters.
Vote N of M:		
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	Yes	
Vote for N of M: Invalidates all candidates in an overvote (paper)	Yes	
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	No	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	No	
Recall Issues with Options: Two contests with access to a second contest conditional upon a specific vote in contest one. (Must vote Yes to vote in 2 nd contest.)	No	
Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2 nd contest.)	No	
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	No	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	No	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	No	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	No	

Feature/Characteristic	Yes/No	Comment
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	No	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	No	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	No	
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	Yes	
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	Yes	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	Yes	
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	Yes	
Overvotes: DRE: Prevented from or requires correction of overvoting.	No	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	No	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	Yes	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	Yes	
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	Yes	
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	Yes	
Networking		
Wide Area Network – Use of Modems	No	
Wide Area Network – Use of Wireless	No	
Local Area Network – Use of TCP/IP	No	
Local Area Network – Use of Infrared	No	
Local Area Network – Use of Wireless	No	
FIPS 140-2 validated cryptographic module	Yes	
Used as (if applicable):		

Feature/Characteristic	Yes/No	Comment
Precinct counting device	Yes	DS200
Central counting device	Yes	DS450 and/or DS850

Baseline Certification Engineering Change Order's (ECO)

There are not any ECO's certified with the voting system.



U. S. ELECTION ASSISTANCE COMMISSION
VOTING SYSTEM TESTING AND CERTIFICATION PROGRAM
1335 East West Highway, Suite 4300
Silver Spring, MD 20910

June 5, 2018

Sue McKay
Election Systems and Software
11208 John Galt Blvd
Omaha, NE 68137

Sent via mail and e-mail

Re: Agency Decision – Grant of Certification

Dear Ms. McKay,

As required under §5.9 of the EAC's Voting System Testing and Certification Program Manual, ES&S and Pro V&V have provided the necessary documentation for the EVS 5.2.4.0 voting system verifying that 1) the trusted build has been performed, 2) software has been deposited in an approved repository, 3) system identification tools are available to election officials, and 4) signed a letter stating, under penalty of law, that you have:

1. Performed a trusted build consistent with the requirements of §5.6 of the EAC's Certification Manual;
2. Deposited software consistent with §5.7 of the EAC's Certification Manual;
3. Created and made available system identification tools consistent with §5.8 of the EAC's Certification Manual (a copy and description of the system identification tool developed must be provided with the letter); and
4. Upon a final decision to grant certification, the manufacturer accepts the certification and all conditions placed on the certification.

Based on the review of the documentation above and the fact that ES&S EVS 5.2.4.0 successfully completed conformance testing to the 2005 Voluntary Voting System Guidelines (2005 VVSG), the Voting System Testing & Certification Program Director has recommended EAC certification of this system.

I have reviewed all of the documentation and concur with the Program Director's recommendation. As such, I hereby grant EAC Certification to ES&S EVS 5.2.4.0 to the 2005 Voluntary Voting System Guidelines.

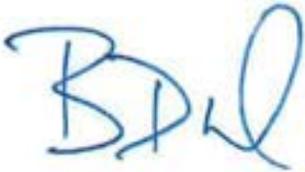
The EAC certification number issued for this system is: **ESSEVS5240**. In addition, a Certificate of Conformance shall be provided to ES&S as evidence of the EAC certification of the EVS 5.2.4.0. The Certificate of Conformance shall be provided to

ES&S no later than five business day from the date of this letter, and it shall be posted on the EAC's Web site.

As stated in §5.11 of the EAC's Certification Manual, the EAC certification and certificate apply only to the specific voting system configuration(s) identified, submitted, and evaluated under the Certification Program. Any modification to the system not authorized by the EAC shall void the certificate.

If you have any questions or need further information, please do not hesitate to contact Brian Hancock or Ryan Macias at your earliest convenience. I thank you in advance for your time and attention to this matter and congratulate on this achievement.

Sincerely,



Brian D. Newby
Executive Director
Decision Authority

Cc: Brian Hancock, U.S. Election Assistance Commission
Michael Walker, Pro V&V



ELECTION Systems & Software

Election Systems & Software takes great pride in supporting our clients' elections administration needs. Every election reinforces the cornerstone of our nation's democracy – a citizen's right to vote.

Our customers carry the responsibility to administer fair and accurate elections. They benefit from ES&S' unwavering pledge to support their voters and taxpayers.

To fulfill our promise, we assign teams of passionate, knowledgeable and talented election professionals to support the management of your elections. We work diligently to help achieve a shared mission of **maintaining voter confidence and enhancing the voting experience.**

We stand behind the quality of our unrivaled work and guarantee our service. Providing our customers with trusted, quality and timely election services and products is our purpose, promise and passion.



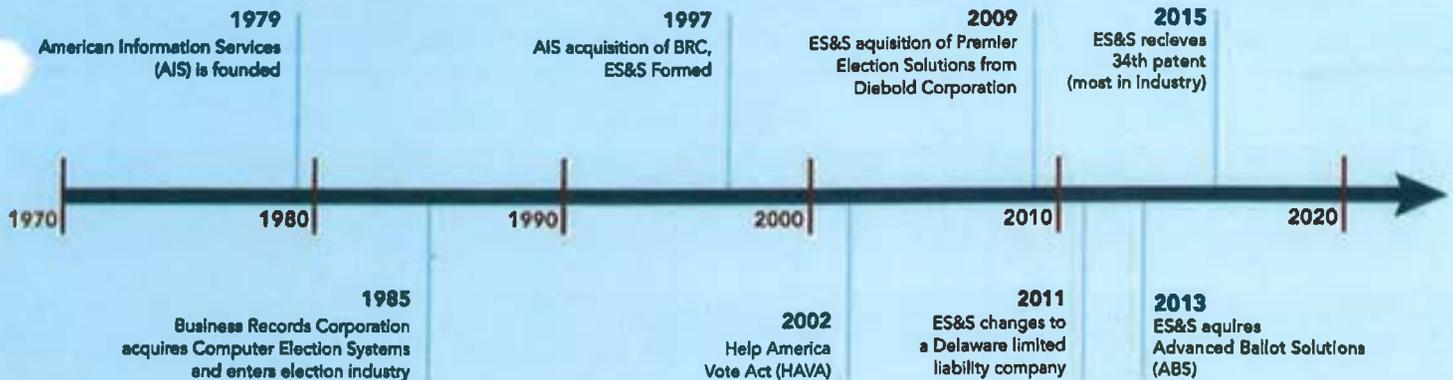
History of Election Systems & Software



Election Systems & Software's visionary approach to election equipment, software and solutions has helped improve the voting experience throughout North America for nearly 40 years.

We are committed to developing integrated voting solutions that improve the marketplace and are flexible enough to meet multiple jurisdictions' needs and voter preferences.

OUR HISTORY



OUR BUSINESS

ES&S entered the elections industry as a vote tabulation company, when the development of optical-mark reader technology was in its infancy. As our clients' election needs have evolved, we have consistently expanded our offerings to provide high-quality innovation election solutions that improve the democratic process.

We understand and manage all aspects of the election process. From voter registration and ballot layout to Election Day reporting, ES&S provides our customers with the world's most-robust election support.

Today, we not only work with many of the same customers we have served for nearly 40 years, but our business has also grown to service four nations and 41 U.S. states with more than 4,500 election offices.





ExpressVote®

Universal Voting System as a Marker



Multilingual

Touch Screen and Display

Allows voters to easily make vote selections and review their selection.



Instruction Panel

A visual guide that shows voters how to use the ExpressVote.

Card Slot

Where the voter inserts their card to activate selections.

Visual Aids

High contrast and zoom functionality.

Front Access Panel

Headphone jack, a port for a Sip-and-Puff device or two-position rocker switch, and Audio-Tactile Keypad make the unit ADA friendly.



Audio-Tactile Keypad

Enables ADA voters to control audio and navigate the ballot.



ACTIVATING THE VOTE SESSION:

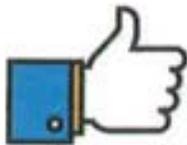
Election officials can configure the ExpressVote to best fit their needs. The voter receives an activation card to begin the process.

- If only one ballot style is programmed for the election, a blank card activates the vote session.
- Multiple ballot styles with a blank card prompt poll workers to select the correct ballot style for the voter.
- A card with an activation barcode displays the correct options for the voter if the election has multiple ballot styles.

ExpressVote Key Features

As a marker, the ExpressVote handles the entire marking process, eliminating marginal marks and the need for voter mark interpretation. Voters utilize the touch screen to mark their vote selections, receiving a verifiable paper vote record upon completion. Used in early vote centers and on Election Day in precincts or vote centers, the ExpressVote can serve every eligible voter, including those with special needs.

EASY TO SET UP AND USE



The one-step startup and poll-closing procedure make the ExpressVote an ideal device for poll workers. The intuitive design offers streamlined simplicity for poll workers and election staff. The ExpressVote is also small, lightweight and easy to move.

CONTROLLED AND REDUCED COSTS



Traditional ballot printing costs can be significantly reduced by eliminating the need for pre-printed paper ballots. Voters activate their vote session, make their selections and receive a paper record to cast. This process consumes 70 percent less paper than traditional ballots.

INNOVATIVE DESIGN



Voters review a summary page and can make changes before receiving their verifiable paper vote record. The ExpressVote prevents overvotes and undervoting with prompts and on-screen feedback. ExpressVote in marking mode neither stores nor tabulates vote counts. The system produces a verifiable paper record for each voter.

VERIFIABLE PAPER RECORD



After all selections are made, a human- and machine-readable paper record is produced that includes text and an optical scan barcode. Votes are digitally scanned for tabulation on an ES&S DS200®, DS450® or DS850® device.

SECURE



The ExpressVote Universal Voting System utilizes a variety of functions to ensure election data and cast vote records are secure. In its current certification as a marking device, no vote data is stored in the device. Its system functions are only executable during election events, in the manner and order intended by election officials performing their duties.

For more information visit www.esvote.com



DS200[®]

Precinct Scanner & Tabulator



Protective Cover

Cover has heavy-duty rubber seal to shelter DS200 from elements during transport.

Easy to Set Up

Lid-up, power-on approach allows poll workers to easily open polls in one simple step.

Touch Screen and Display

Provides voters with instructions and immediate feedback. Tension bearings hold screen in place for custom positioning.

Ballot/Card Slot

Voters cast both ballots and vote summary cards here; accommodates up to 19-inch ballots.

Auxiliary Ballot Compartment

Main Ballot Compartment

Easy, hassle-free storage of up to 2,500 ballots.

11

The number of 14-inch flat ballots processed per minute

DS200 Key Features

The DS200 is a precinct-based scanner and vote tabulator equipped with the latest in ES&S' patented technology. Fully certified and compliant with EAC guidelines, the DS200 enhances the voting experience for voters and election officials alike. Our patented IMR™ and PTRAC™ technology ensures even the most poorly marked ballots are read accurately and consistently — protecting voter intent. All of this is designed to make everyone's job easier.

ACCURATE



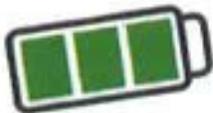
The DS200 combines the ES&S-patented Intelligent Mark Recognition (IMR™) and patented Positive Target Recognition & Alignment Compensation (PTRAC™) systems to accurately track and pinpoint target locations. This technology accommodates ballots inserted at angles or with erroneous marks to uphold voter intent. This precision improves the reliability of elections.

SECURE



Like all ES&S tabulation equipment, the DS200 includes physical security features such as locking panels and security seals to secure sensitive components and election files, and a key-locked case for transport and shipping. The DS200 operating system controls, limits and detects unauthorized access to all critical data. The system also includes safeguards, such as data encryption and digital signatures, that help protect sensitive data and verify authenticity, including certification of all firmware.

RELIABLE



Having both battery backup and thermal paper means you never have to worry about power outages or printer ink.

COMPATIBLE



Works in conjunction with:

- ExpressVote® Universal Voting System
- DS450® High-Throughput Scanner & Tabulator
- DS850® High-Speed Scanner & Tabulator
- Electionware® Election Management Software
- AutoMARK® Ballot Marking Device
- Election Reporting Manager®

COMPREHENSIVE



- Optional wireless modem results transfer with encryption
- Primary data storage device
- Backup data storage
- Data sent via Secure File Transfer Protocol (SFTP) server

For more information visit www.essvote.com



DS850[®]

High-Speed Scanner & Tabulator

Patented IMR[™] and PTRAC[®]

IMR[™] and PTRAC[®] technology provides unparalleled accuracy that reduces time-consuming manual ballot adjudication.

Touch Screen Display

Walks the operator through every step of the tabulation process.

TruGrip[™] Rollers

Provides constant contact, ensuring each ballot - even those folded or damaged - are individually processed.

S-Curve

Patented design enables lighting-quick scanning and smooth ballot flow.

Output Bins

Sorts ballots into:

- Counted
- Requires Further Review
- Write-Ins



300

The number of 14-inch flat ballots processed per minute

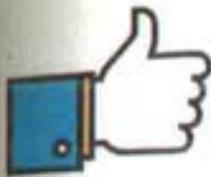
DS850 Key Features

Your elections require a centralized vote scanner and tabulator that is quick and accurate. With its high-speed digital image processing, the DS850 continuously scans ballots to save you valuable time when tabulating election results.



SECURE

System integrity and electronic audits make the DS850 part of the most dependable family of central vote scanners and tabulators on the market. Safeguards, such as data encryption and digital signatures, help protect sensitive data and verify authenticity, including certification of all firmware.



USER-FRIENDLY

Designed specifically for the election process, the DS850 features a user-friendly software interface on a 15-inch LCD color touch screen. The S-shaped transporter allows for a natural flow, creating separation between individual ballots.



ACCURATE

ES&S' patented IMR™ and PTRAC® technology ensures that ballots are read accurately and consistently, protecting voter intent and eliminating manual adjudication time.



FOLDED BALLOT PROCESSING

The DS850 is designed with a series of TruGrip™ rollers, which maintain constant contact with the ballot surface, ensuring quality control throughout the entire tabulation process.



HIGH-SPEED SORTING

The DS850 is the only high-speed scanner in the marketplace that can sort various ballot sizes at full speed. It scans and sorts 14-inch double-sided ballots at 300 per minute into three output bins, separating ballots into three categories: counted, requires further review, and write-ins.



Customer Data Protection Declaration

Election Systems & Software (ES&S) is a proud provider of voting system technology across the United States. We have been in the business of providing tabulation systems to local and state jurisdictions for nearly 40 years.

Election Systems & Software places significant importance on the holding and use of Customer Data. We implement appropriate security measures to safeguard Customer Data against any loss or unlawful processing as may be required by applicable law and in accordance with our Customer Data Protection policy.

Further, ES&S Representatives are subject to all provisions contained within our confidential and proprietary matters agreement, which every ES&S employee signs and that obligates them to keep all classified and proprietary information they may be exposed to while employed at ES&S, confidential during and after their employment with ES&S.

Safeguards

Any Customer Data collected, held or processed by ES&S relating to any individual or entity is subject to ES&S' Customer Data Protection Policy as well as all relevant provisions of applicable law.

There are three categories of safeguards for the holding and processing of Customer Data:

- Administrative;
- Physical; and
- Technical

These safeguards are in accordance with industry-wide security practices and correspond with the importance of the Customer Data being held, but in no event are less protective than those safeguards ES&S uses to protect our own information or information of similar importance or is required by applicable law.

Administrative safeguards:

- Background checks
- Annual reviews and termination procedures
- Training
- Proper use descriptions
- Disciplinary action

Physical safeguards:

- Facility and access controls
- Workstation use/security
- Device and media controls

Technical safeguards:

- Best practice password protection
- Backup procedures
- Transmission security



Voting System Security

Election Systems & Software (ES&S) is a proud provider of voting system technology across the United States. We have been in the business of providing tabulation systems to local and state jurisdictions for nearly 40 years.

The voters of our nation cast their ballots using a number of different methods. The types and kinds of technology in use across the nation vary from state to state and county to county, depending on the election laws and preferred voting methods for a particular jurisdiction. Depending on the jurisdiction, voters can cast their ballots by mail in advance of Election Day or in a polling location on Election Day, and in some cases in a polling location during an Early Voting period. A number of voters cast their ballots on a voting device designed to ensure that those with disabilities can vote securely and independently. The most common way to vote, however, remains in-person at a polling location on the day of the election. Polling place ballots are then tabulated at the precinct, or in some cases; they are centrally counted at the Elections Office.

At ES&S we design, build and sell voting systems that support all the aforementioned voting methods. The overriding design philosophy with all of our products is to ensure accuracy, security and reliability — a philosophy that has prevailed throughout our company's history. As such, ES&S is committed to ensuring the long-term sustainability of our products. A large part of our company is devoted to sourcing and maintaining replacement parts for our fielded systems – regardless of age. All replacement parts are tested and certified for use prior to installation. Additionally, we field hundreds of trained support personnel who perform preventative maintenance on voting systems to ensure that each piece of technology is in good working order prior to Election Day.

ES&S submits our tabulation systems to rigorous and lengthy test campaigns as part of the Election Assistance Commission's (EAC) Voting System Certification Program. This important program sets forth security and performance standards that were developed by Scientists, Academicians and Election Officials. All of our systems are tested by independent laboratories that have received federal accreditation.

In addition to adhering to the security and performance requirements of the EAC Certification Program, our voting equipment adheres to secure practices that surround the creation, transfer, and storage of important election files and data. Our products employ encryption and digital signing for all data-in-transit using cryptographic modules that meet the Federal Information Processing Standard. Our systems allow Election Officials to easily adhere to the laws of their state which mandates strict physical security and tight chain of custody of the voting machines.

In the event that a voting machine has a mechanical issue, or a human makes an error in preparing or using a voting machine, every state in the nation has protocols for the use of back-up equipment, audits of voting results and publicly documented physical tests to ensure that issues can be corrected prior to Election Day or before the final certification of voting results.

Our vision at ES&S is simple and unwavering. We believe in "maintaining voter confidence and enhancing the voting experience". We deliver on this commitment through our dedication to the research, design and manufacture of secure, accurate and reliable voting systems. In addition, we remain committed to submitting all of our systems to the EAC federal testing process that is the gold standard for our industry. Finally, our promise of accuracy, security and reliability is supported and strengthened by the dedication and attention to excellence that is a hallmark of the thousands of Election Officials across the nation whom we serve. We support each of these officials in our mutual quest to perpetually uphold the integrity of this nation's elections process.



ES&S Election Management System Hardening

What is Hardening?

Hardening of the Election Management System (EMS) is the process of configuring servers, workstations, and network equipment in an effort to minimize security vulnerabilities and have a standard configuration of the EMS for each release. Configuration settings are based on security best practices and recommendations from Federal and Industry Standards that provide specific and actionable ways to prevent malicious activity and improve the collective security of EMS systems. When an ES&S EMS system or network is hardened, the cybersecurity posture of the network is improved which lowers the risk to outside threats.

EMS hardening configures the EMS systems and network to include only the services, applications, utilities, and settings required to successfully operate the EMS. By utilizing certified scripts and updates, a standard configuration that has been developed, tested, and certified ensures a secure and reliable voting infrastructure. System hardening is aligned with Federal and Industry Standards to achieve acceptable levels of integrity and reliability of voting systems. Moreover, hardening provides many benefits to an EMS system including **Security, Reliability, and Standardization**.

Federal Guidelines recommend that security standards of voting systems include the following objectives:

- To protect critical elements of the voting system
- To establish and maintain controls to minimize errors
- To protect the system from intentional manipulation, fraud, and malicious mischief
- To identify fraudulent or erroneous changes to the voting system
- To protect secrecy in the voting process

Hardening of the EMS helps conform to Federal and Industry Standards. This is accomplished by configuring and locking down multiple areas of the voting systems. Access and functionality is restricted to only that required to operate the voting systems.

Examples of system hardening activities include:

- Modifying the Windows registry
- Configure Account Policies
- Configure Local Policies
- Configure Software restriction policies
- Removes non-essential Windows components
- Sets permissions on application folders
- Configures group based security permissions
- Creates standard configuration of Windows network

Why Should I Harden the EMS?

The benefits of EMS hardening consist primarily in the three areas:

Security

Hardened systems are locked down based on security and voting systems best practices. ES&S Certified environments are configured and built based on industry standards such as the CIS Critical Security Controls and the National Institute of Standards and Technology (NIST) Framework. Utilizing these best practices improves on the built-in security of EMS systems including encrypted data, election data validation, and using closed network environments. In this age of heightened security awareness, hardening provides an additional layer of security to lessen potentially vulnerabilities on an already secure system.

Voting systems have recently been named by the Department of Homeland Security (DHS) as Critical Infrastructure. Between hardening, following the standard configuration of the certified environment, and robust physical security at the EMS environment location, you can be confident that you are following the EAC best practices for providing secure elections.

Reliability

Certified EMS systems go through many rounds of internal testing, Quality Assurance, and 3rd party test lab review and approval. During these stages, all systems are tested against a hardened EMS network. When installing a hardened environment, you can be assured that this configuration has been thoroughly tested to ensure a reliable, secure, and functional system. Hardening allows for a known baseline configuration which limits variables that could cause system or application issues as well as enabling more efficient and accurate troubleshooting by ES&S Software Support.

Standardization

In addition to providing increased security on EMS networks, hardening also is the standard configuration for ES&S EMS systems and networks. When a system is hardened, it conforms to Federal and State security standards. Additionally, each environment is built per the certified ES&S Technical Data Package (TDP) hardening documents which provides a standard configuration for each installation. Certified scripts are used to ensure the hardened configuration is configured per the certified release specifications and the same every time. ES&S voting system networks are configured to these specifications when going through the certification process and are a known good configuration based on ES&S QA and VSTL (Voting System Test Laboratory) testing.

Why Wasn't My EMS Hardened Previously?

Hardening has not always been required by Federal and State laws. In recent years with an increased visibility to computer security, hardening has become a Federal and often a State requirement for certified EMS environments. In an effort to be compliant with standard security best practices and standards such as NIST, CIS, and FIPS 140-2 encryption, hardening has been made a Federal requirement for recent voting systems.

Even though hardening is a standard practice used by ES&S and required for Certification, some states allow the hardening of EMS networks to be optional. If the system is not currently hardened in a state that allows for optional hardening, the decision was made by the customer to not harden.

Summary

Election Systems & Software is dedicated to providing valuable, trusted, and proven election equipment and services to our customers. The security landscape for voting system has changed in recent years and it is a priority for ES&S to provide our customers with the ability to hold secure elections. ES&S products utilize a multi-layered security approach in their voting systems that utilizes physical, system, network, application, and policies and procedures that put multiple security controls in place to protect the integrity of voting system and election results.

In today's world, secure elections are more important than ever and play an important role in our national security. By applying a multi-layered security approach, you can be confident in the integrity of your elections. EMS Hardening is part of this layered security approach and therefore ES&S strongly recommends that all customers harden their EMS networks as standard practice.



DS200[®]

Security Features of the Precinct Scanner & Tabulator

Accuracy, security and reliability are the cornerstones of the ES&S development process for each voting system we manufacture and sell. From concept to construction, ES&S adheres to industry-leading standards and complies with rigorous testing schedules set forth by election agencies. Upholding and perpetuating the integrity of our nation's election process is our continuing mission as a company.

Like all ES&S ballot tabulation equipment, the DS200 in precinct paper-based scanner and tabulator includes physical security features such as locking panels and security seals to secure sensitive components and election files, and a key locked case for transport and shipping. This paper-based system maintains paper vote records and takes digital images of each processed ballot.

The DS200 has received full certification and approval by the U.S. Election Assistance Commission (EAC). The unit allows election officials to easily validate that all resident firmware matches the firmware version certified for use in that jurisdiction. It also generates detailed audit and event logs to reveal all actions taking place on the unit while also digitally signing and encrypting all data to prevent malicious tampering. Each administrative function requires a password be entered for completion and units can be configured to require a passcode before the tabulator boots up.

Strong physical safety features including controlled keys with unique locks, security seals and security screws eliminate the possibility of undetected system tampering during storage, transport and use. The unit only accepts approved and certified USB drives to prevent unauthorized data transfers or uploads.

The DS200 tabulator is a single purpose voting device. As such, once an election official installs election programming, it is not possible for a separate device to interface with the DS200 in order to overwrite or change the election definition or system firmware. Additionally, when election results are transmitted, a double encryption procedure is employed that ensures results are secure from the time they are bundled by the DS200 tabulator until they are processed by the Election Reporting Manager (ERM).





EXPRESSVOTE®

Security Features of the Universal Voting System as a Marker

Accuracy, security and reliability are the cornerstones of the ES&S development process for each voting system we manufacture and sell. From concept to construction, ES&S adheres to industry-leading standards and complies with rigorous testing schedules set forth by federal and state election agencies. Upholding and perpetuating the integrity of our nation's election process is our continuing mission as a company.

The ExpressVote Universal Voting System, which has received full certification and approval by the U.S. Election Assistance Commission (EAC), utilizes a variety of functions to ensure election data and cast vote records are secure. In its current certification as a marking device, no vote data is stored in the device. Its system functions are only executable during election events, in the manner and order intended by election officials performing their duties.

As a paper-based voting system, the ExpressVote maintains verifiable paper vote records for every voter. Records contain both human readable selections and machine readable barcodes containing those same vote selections. Each vote record is subsequently tabulated by an ES&S tabulator (DS200, DS450 or the DS850) and securely stored according to each jurisdiction's election laws for recount and auditing purposes.

The operating software provides security access controls to limit or detect access to critical system components, guarding against system integrity loss and availability. This maintains confidentiality and provides accountability for each unit.

The ExpressVote hardware is designed to protect against tampering, including during system repair or interventions in system operations.

System access is limited during equipment preparation, testing and operation due to physical locks and required access codes. These security safeguards cannot be bypassed or deactivated during system installation or operation.





DS450TM / DS850[®]

Security Features Of the High-Throughput Scanner & Tabulator and the High-Speed Central Scanner & Tabulator

Accuracy, security and reliability are the cornerstones of the ES&S development process for each voting system we manufacture and sell. From concept to construction, ES&S adheres to industry-leading standards and complies with rigorous testing schedules set forth by federal and state election agencies. Upholding and perpetuating the integrity of our nation's election process is our continuing mission as a company.

Both the DS450 & DS850 use key-locks and security seals to protect the units against tampering or intervention in system operations. All data ports and the power switch are secured behind clear plastic lockable and sealable access doors to protect access and allow election officials to detect unauthorized access easily. All critical hardware components can be locked and sealed, as well. It also provides additional alerts and logs access to the back service door.

Both tabulators have no capability to write or otherwise change the election program once installed. The contents of the DS450/DS850 election media are digitally signed and verifiable using the application. The design does not include any form of manual election data entry or manipulation, thus providing a general safeguard for critical election data. All administrative functions are limited to the controls allowed through the touch screen interface, for machine operation only.

The tabulators provide options for both real-time printed and electronic logging of all activity performed, with the ability to reprint logs on demand or export electronic logs for complete review. The DS450/DS850 logs all passcode attempts, whether successful or failed, to the digitally signed audit log. In addition, all user actions (such as administrative selections and open and close poll events), whether successful or failed, are written to the audit log. Only the system can create, read, modify, and delete the audit log/inventory as the user interface is locked out of this functionality.

The units use digital encryption and signing of key configuration and data files for complete integrity of the election and results. All DS450/DS850 data is signed with FIPS-compliant digital signature algorithms. All data generated is also signed so the program receiving the data can validate it.





Voting System Reference Questions

Reference Name and Contact Information: Kim Dennison-Election Coordinator 479-271-1049
2109 W. Walnut, Rogers, AR 72756

Jurisdiction Name: Benton County, AR

Quantity, type and version of voting equipment and software installed:
475 -Express Votes, 65- DS200 EVS 5.2.4.0

How many voters are in your jurisdiction? 159,000

When did your jurisdiction purchase the system? January 2018

How many elections have you used the system? 5 Elections

Have any upgrades been made to the system since you purchased it? There has been 1
updgrade since purchasing Why? To fix an error when reading some of the bar codes on the
Express Vote Card

Are you still using the same system? Yes

Describe your overall impression of the system based on experiences in your jurisdiction. We
love the new equipment. Our voters are loving the new equipment.

Are you satisfied with the training provided to your staff? Yes

Are you satisfied with the training provided for poll officials? We trained them ourselves after we
received our training from ES&S

Are you satisfied with the support the vendor has provided for early voting (if applicable),
Election Day, and post-election activities? Yes. They have always been available when we
need them.

Are you satisfied with the cost of support? Do you feel the cost of support is competitive or too
expensive? I don't have any thing to compare this too. We have used ES&S since 2006.

Describe any issues the vendor has had meeting your jurisdiction's requirements, if any. ES&S
has always been able to meet our requirements. If not right away, they send it to their support
team and they have always been able to make it work.

Describe any issues your jurisdiction has had regarding equipment availability, if any. The
amount of equipment we have has met our needs for this election season. As we grow in
Benton County, we may need to look at purchasing more equipment in the future.

Describe any issues your jurisdiction has had regarding the accuracy of election results, if any. We have never had any issue. We even had a candidate request a recount because of a 4 vote difference, all results came out the same.

Describe any other issues your jurisdiction has had with the system, if any. I had 1 Expressvote that wouldn't take ballot stock into it. ES&S had it working in no time.

Has the vendor been responsive in addressing issues? Yes. They are very efficient in addressing any issues I may have.

Describe any feedback (positive or negative) received from poll officials about the system.

The poll workers in Benton County love the new equipment. The ease of setting up and closing out the polls has let me keep my seasoned poll workers that had been here when we had the Ivotronics.

I have not had any negative feedback from any of my poll officials.

Describe any feedback (positive or negative) received from voters about the system.

Voters love having the piece of paper in their hand to review their votes before casting them. I have heard many comments on how easy it is to cast your vote with this equipment.

Do you feel like you have gotten your money's worth for the system? Since we have only had them a year, I'm not sure I can make this claim yet. However, in 5 years, I really think it will have paid for itself many times over.

Would you recommend this system for use in other jurisdictions? ABSOLUTLY!



Voting System Reference Questions

Reference Name and Contact Information: Kelli Jarrell - Voter Reg. Supervisor.

Jurisdiction Name: Cabell County

Quantity, type and version of voting equipment and software installed: 315 ExpressVote, 75 2005200.

How many voters are in your jurisdiction? 54,000

When did your jurisdiction purchase the system? June 2018

How many elections have you used the system? 1

Have any upgrades been made to the system since you purchased it? Why? NO

Are you still using the same system? YES

Describe your overall impression of the system based on experiences in your jurisdiction. Excellent.

Easy to use, and easy for the poll workers.

Are you satisfied with the training provided to your staff? YES

Are you satisfied with the training provided for poll officials? YES

Are you satisfied with the support the vendor has provided for early voting (if applicable), Election Day, and post-election activities? YES.

Are you satisfied with the cost of support? Do you feel the cost of support is competitive or too expensive? Competitive. Very Satisfied.

Describe any issues the vendor has had meeting your jurisdiction's requirements, if any. None

Describe any issues your jurisdiction has had regarding equipment availability, if any. None

Describe any issues your jurisdiction has had regarding the accuracy of election results, if any. None

Describe any other issues your jurisdiction has had with the system, if any. None

Has the vendor been responsive in addressing issues?

Describe any feedback (positive or negative) received from poll officials about the system. Poll workers have told us it's the easiest system they have used and very happy with it.

Describe any feedback (positive or negative) received from voters about the system.

Do you feel like you have gotten your money's worth for the system? None

Would you recommend this system for use in other jurisdictions?

YES. Excellent System and very easy to use and to get the election results on Election Night

Yes, I highly recommend this system for the ease of use and security.



Voting System Reference Questions

Reference Name and Contact Information: Elise M. White, County Clerk, 304-358-2505

Jurisdiction Name: Pendleton County Commission, West Virginia

Quantity, type and version of voting equipment and software installed: 30 ExpressVote Terminals & 15 DS200 Scanners, Version 5.2.4.0

How many voters are in your jurisdiction? 4,994

When did your jurisdiction purchase the system? July 2018

How many elections have you used the system? One

Have any upgrades been made to the system since you purchased it? Why? None – just purchased 4 months ago

Are you still using the same system? Yes

Describe your overall impression of the system based on experiences in your jurisdiction. We have been very pleased with the ease of use with this system. We still used a paper ballot along with the ExpressVote and DS200 in the November 2018 election and we liked that the DS200 tells the voter if there is an error on their ballot (i.e., overvote, unreadable marks) before the ballot is cast so that the voter has an opportunity to correct their ballot. Also, on Election night, we would have normally still been in the office until 11:00 p.m. or later (polls close at 7:30 p.m.); this time we were done by 9:00 p.m. – ten minutes after the last precinct brought their supplies and equipment back.

Are you satisfied with the training provided to your staff? Yes

Are you satisfied with the training provided for poll officials? Manuals were provided to us to use when training our poll workers.

Are you satisfied with the support the vendor has provided for early voting (if applicable), Election Day, and post-election activities? Yes

Are you satisfied with the cost of support? Do you feel the cost of support is competitive or too expensive? We are satisfied with the cost of support.

Describe any issues the vendor has had meeting your jurisdiction's requirements, if any. None

Describe any issues your jurisdiction has had regarding equipment availability, if any. None

Describe any issues your jurisdiction has had regarding the accuracy of election results, if any. We have not had any issues with accuracy of election results. When canvassing for the November 2018 election, our hand-counted results matched the DS200 results exactly.

Describe any other issues your jurisdiction has had with the system, if any. The only issue we had on Election Day was a DS200 not turning on automatically. Tech Support was contacted (at 5:30 a.m.) and the issue was resolved quickly.

Has the vendor been responsive in addressing issues? Yes

Describe any feedback (positive or negative) received from poll officials about the system. Our poll workers were pleased with the system – they felt it was easy to use and set-up.

Describe any feedback (positive or negative) received from voters about the system. We did not receive any negative feedback from voters – all voters thought this system was much easier to use than the system we had previously. Even the voters who had consistently used paper in the past and then used this system were pleasantly surprised as to how easy it was to use. The voters were also happy that the DS200 actually told them if there was an error on their ballot and if no errors, that it had been counted.

Do you feel like you have gotten your money's worth for the system? Yes

Would you recommend this system for use in other jurisdictions? Absolutely. This system is practically foolproof for the voters. The amount of time required to test and prepare the system for an election is also substantially less and is much easier than the system we used previously.



Voting System Reference Questions

Reference Name and Contact Information: Jennifer Price, Election Coordinator, 479-444-1766/
jprice@co.washington.ar.us

Jurisdiction Name: Washington County, AR

Quantity, type and version of voting equipment and software installed: 179 ExpressPoll Books,
319 ExpressVotes, and 50 DS200's EVS 5.2.4.0

How many voters are in your jurisdiction? 132,411

When did your jurisdiction purchase the system? July 2016

How many elections have you used the system? 1 School Election (2016), 1 Primary (2018), 2
General Election (2016 and 2018) and 4 small special elections.

Have any upgrades been made to the system since you purchased it? Why? Just one,
software update.

Are you still using the same system? Yes

Describe your overall impression of the system based on experiences in your jurisdiction. Very
easy to use, both for Voters and Poll Workers. The ability for the ExpressPoll Book to print the
barcode of the voter's precinct for the ExpressVote, is a wonderful feature, since our county
offers Vote Centers, allowing voters to vote at any location.

Are you satisfied with the training provided to your staff? Yes

Are you satisfied with the training provided for poll officials? Yes

Are you satisfied with the support the vendor has provided for early voting (if applicable),
Election Day, and post-election activities? Yes, we had a couple of issues with precincts in the
wrong voting districts (not ES&S fault), and the response to correct the issue was extremely
quick. Their software support team is wonderful.

Are you satisfied with the cost of support? Do you feel the cost of support is competitive or too
expensive? N/A, we haven't paid for Election Day support.

Describe any issues the vendor has had meeting your jurisdiction's requirements, if any. None

Describe any issues your jurisdiction has had regarding equipment availability, if any. None

Describe any issues your jurisdiction has had regarding the accuracy of election results, if any.
None. We do plenty of Logic and Accuracy testing before any election, so we trust the election
results. We have had no issues with the accuracy of any election results.

Describe any other issues your jurisdiction has had with the system, if any.

Has the vendor been responsive in addressing issues? The Vendor has been extremely responsive with any types of problems that we have had, including just set up questions and programming questions.

Describe any feedback (positive or negative) received from poll officials about the system. Poll Officials have had very positive responses to the equipment. They find that it is easier to set up and the system is very integrated from start to finish, making that process easier. Opening and closing each piece of equipment is very simple, and the step by step instructions provided allow for easy set up and closing of the polls. The equipment is large, so a delivery system is needed.

Describe any feedback (positive or negative) received from voters about the system. Voters have also responded positively to the equipment. The feature, that the voters like the best is that the ExpressVote prints the voter's selections on the ExpressVote card, so that the voter is able to review on paper their selections. They find it fast and easy to use.

Do you feel like you have gotten your money's worth for the system? Yes

Would you recommend this system for use in other jurisdictions? Yes, it is a great system, and has made voting in Washington County easier and more accessible. I am happy to answer any other questions that you might have as well.