



**Elections Division
Office of the Secretary of State**

**Report of the Secretary of State on the Examination
of ES&S EVS 5.2.2.0 Voting System**

February 2017

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Overview

Application

On December 28, 2016 ES&S submitted an application for Washington State Certification of EVS 5.2.2.0. ES&S applied to certify the optical scan voting system software and hardware (version numbers listed under the National Certification section below). Copies of operating and maintenance manuals, training materials, technical and operational specifications were provided.

Current Voting System

This system is considered an optical scan voting system and contains ElectionWare and ERM software with the ExpressVote universal voting device, DS850 & DS450 central tabulator, DS200 precinct tabulator and AutoMARK.

This is a brand new release and is not yet in use in any other states. This is a modification of the currently certified EVS 5.2.0.0.

Modified Voting System

EVS 5.2.2.0 is a modification to the currently state certified EVS 5.2.0.0 voting system. The EVS 5.2.2.0 voting system adds the DS450 tabulation along with other small changes.

National Certification

After the completion of testing by a certified Voting System Test Lab (VSTL) the Election Assistance Commission (EAC) certified EVS 5.2.2.0 on February 27, 2017. The following hardware and software of the system have been approved by the EAC:

Software

- ElectionWare v. 4.7.1.1
- Event Log Service (ELS) v. 1.5.5.0
- Removable Media Service (RMS) v. 1.4.5.0
- Election Reporting Manager (ERM) v. 8.12.1.1
- ExpressVote Previewer v. 1.4.1.2
- VAT Previewer v. 1.8.6.1
- ExpressLink 1.3.0.0

- Toolbox 3.1.0.0

Hardware

- DS200, Precinct tabulator, Firmware v. 2.12.2.0, Hardware v. 1.2, 1.3
- DS850, Central scanner, Firmware v. 2.10.2.0, Hardware v. 1.0
- DS450, Central scanner, Firmware v. 3.0.0.0, Hardware v. 1.0
- ExpressVote, Universal voting device, Firmware v. 1.4.1.2, Hardware v. 1.0
- AutoMARK Voter Assist Terminal
 - A100 (H/W/Rev 1.0) v. 1.8.6.1
 - A200 (H/W/Rev 1.1, 1.3) v. 1.8.6.1
 - A300 (H/W/Rev 1.3) v. 1.8.6.1
- ExpressVote Activation Card Printer

Testing & Inspection

Testing and evaluation of EVS 5.2.2.0 was conducted in coordination with Adams County Elections staff and Secretary of State staff at the Adams County Courthouse in Ritzville, WA on February 9, 2017. Examining the system for the Office of the Secretary of State was Stuart Holmes, Voting Information Systems (VIS) Manager.

Due to EVS 5.2.2.0 having gone through Voting System Test Laboratory (VSTL) testing and submitted to the EAC for National Certification, a two phase testing program was developed and approved by Secretary of State staff for state certification testing.

Delivery acceptance testing of the equipment and software to determine if the correct model and versions of the equipment and software are delivered and that the equipment, software and system operate as documented by the vendor.

Election Results Testing to ensure that the equipment, software and system perform each of the functions required by federal, state and local law in order to administer an election from the beginning to the end.

Executive Summary of Findings of Secretary of State Staff

System Limitations

System characteristic	Boundary or limitation	Limiting system component	Notes or conditions
Max. precincts allowed in an election	At least 9900	ERM	
Max. count for any precinct element	500,000 (99,990 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	Calculation of the number of counters must include a minimum of 4 counters for each contest, 3 overhead (overvote, undervote, precincts counted) and at least 1 candidate. Additional contest candidates each add a counter. If some precincts are defined as Absentee, a fourth overhead counter (absentee precincts counted) must be added to each contest. The number of statistical counters (Ballots Cast, Registered voters) must be added to the contest counters to determine the total counters.
Max. contests allowed in an election	Depends on election content (limited by 21,000 maximum counters)	ERM	Example of maximum contest calculation if all contests had 2 candidates (5 counters each, 3 overhead counters + 2 candidates) and there were 10 statistical counters (i.e. Ballots Cast-Total, Republican, Democratic, Libertarian, Nonpartisan and Registered Voters-Total, Republican, Democratic, Libertarian, Nonpartisan.) $(21000-20)/5 = 4196$ or $(\text{counter limit} - \text{statistics} \times 2) / \text{number of counters/contest} = \text{number of contests}$.
Max. counters allowed per precinct	Limits candidates and contests assigned to a precinct to 1,000	ERM	Contest counters are calculated as indicated for "Max candidates allowed per election," but two counters must be added for each statistical counter defined for the precinct. There are a minimum of 3 statistic counters assigned to each precinct (six added counters), "Ballots Cast," "Registered Voters" and "Ballots Cast Blank."
Max. contests allowed per ballot style	200 or # 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. Votable paper ballots must contain the same number of rows.	Ballot scanning equipment	
Max. Ballot Styles	9900	ERM	
Max. District Types/Groups	20	ERM	
Max. districts of a given type	40		Excludes the ElectionWide Group which contains all precincts.
Supported Languages	<ul style="list-style-type: none"> • English • Spanish • Chinese • Korean • Japanese • Bengali 	System configuration	

Voting System Accuracy

A testing environment was setup at the Adams County Courthouse with a DS850 central count scanner, a DS200 precinct tabulator and a DS450 central count scanner. 225 ballots were run through the scanners and results were compared to the predetermined testing matrix.

At each stage of the testing the results were compared to the expected results in the test matrix and no errors or discrepancies were found.

Results Reporting

As ballots are run through the central count scanners, results are being tabulated. The result reports are password protected and locked down in EVS 5.2.2.0. WAC 434-250-110 allows optical scan voting systems to begin scanning ballots after 7:00am on Election Day if the County Auditor follows a security plan that has been approved by the Secretary of State to prevent tabulation until after 8:00 p.m.. Counties that choose to use EVS 5.2.2.0 would have to have strict procedures in their security plan to prevent the release of election results prior to 8:00pm by having an administrator unlock the results at 8:00pm on Election Day.

Ballot Scanning

Ballots created using the ballot design software, ES&S Ballot Image Manager, do not include any serial number or identification on the ballot in any way. All ballots for a ballot style are printed from a single PDF file exported from the design software.

The EVS 5.2.2.0 software has no way of distinguishing if a ballot has been previously scanned by the tabulators. ES&S recommends teams of 3 to use the tabulators (1 staff jogging ballots, 1 staff loading ballots into scanner, 1 staff unloading ballots). In addition to accountability and ballot handling procedures, this 3 person team would prevent ballots from being scanned twice because each staff member only does one activity that takes place on each end of the machine. The staff member unloading ballots would never contact ballots that are being loaded and vice versa.

Presidential Primary

EVS 5.2.2.0 can perform all the functions necessary to comply with current state requirements for the Presidential Primary. It can detect cross-party voting in a Presidential Primary without manual intervention.

System Security

A hash value can be created that will ensure that the device's software has not changed since its last install. This process would most likely be done by an administrator as the creation requires pulling a series of files.

Write-ins

The EVS 5.2.2.0 software has no way of entering individual write-in votes as they are scanned by the tabulators. Only a total count of write-ins is available in the election results. Counties would have to develop a manual process of write-in accounting or review the ballots individually after they are scanned in order to report the writes-ins

for declared or undeclared candidates. This is particularly important in the Primary where only 1% of the vote is required to appear on the General Election ballot.

However, EVS 5.2.2.0 has the ability to export images of the write-in target area in the Cast Vote Record report for easier hand counting. Additionally, the DS450 and DS850 can sort out ballots with write-ins for hand counting of write-ins.

Conclusion

After an evaluation of the system as upgraded, staff believes the system and its components continue to meet current Washington State requirements for Presidential Primary, Special, Primary, and General Elections.