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: *ESSEVS5240*

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.

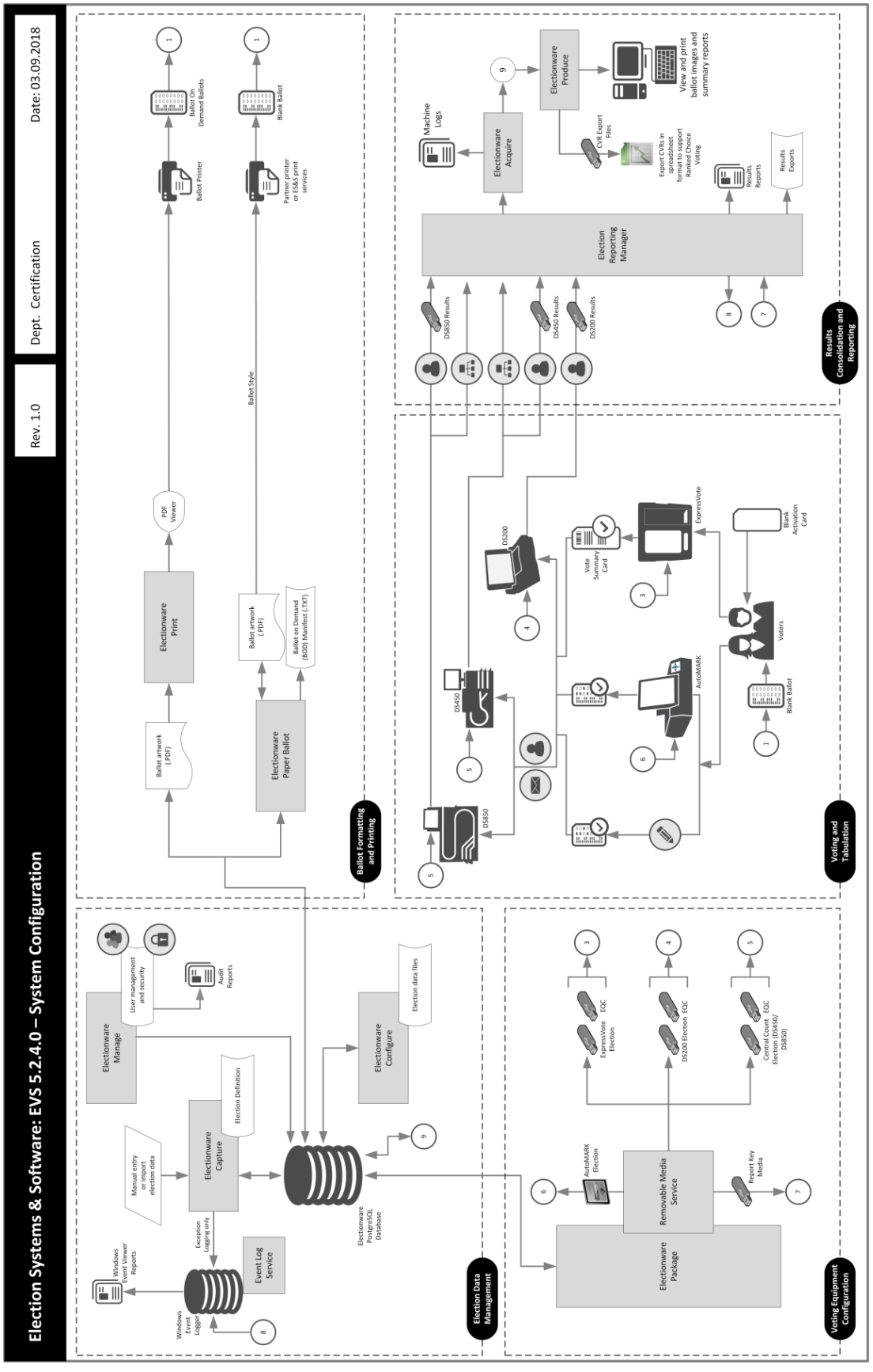
Components Included:

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-core3sdsv5i64.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


Election Systems & Software: EVS 5.2.4.0 – System Configuration
Rev. 1.0
Dept. Certification
Date: 03.09.2018
Ballot Formatting and Printing
Voting and Tabulation
Results Consolidation and Reporting
Election Data Management
Voting Equipment Configuration
Ballot On Demand Ballots
Blank Ballot
Ballot Printer
Partner printer or ES&S print services
PDF Viewer
Electionware Print
Electionware Paper Ballot
Ballot artwork (.PDF)
Ballot artwork (.PDF)
Ballot on Demand (BOD) Manifest (.TXT)
Ballot Style
DS850
DS450
DS200
Vote Summary Card
ExpressVote
AutoMARK
Blank Activation Card
Voters
Blank Ballot
DS850 Results
DS450 Results
DS200 Results
Election Reporting Manager
Machine Logs
Electionware Acquire
Electionware Produce
CVR Export Files
Export CVRs in spreadsheet format to support Ranked Choice Voting
View and print ballot images and summary reports
Results Reports
Results Exports
Electionware Manage
User management and security
Audit Reports
Electionware Capture
Election Definition
Manual entry or import election data
Exception Logging only
Windows Event Logger
Event Log Service
Windows Event Viewer Reports
Electionware PostgreSQL Database
Electionware Configure
Election data files
ExpressVote Election EDC
DS200 Election EDC
Central Count Election (DS450/ DS850) EDC
AutoMARK Election
Removable Media Service
Report Key Media
Electionware Package

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	• 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 2nd 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 2nd 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.