United States Election Assistance Commission

Certificate of Conformance

Unisyn OpenElect 2.2.3

VVSG 2005 VER. I

EAC CERTIFIED

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the *Voluntary Voting System Guidelines Version 1.0 (VVSG 1.0)* . 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 2.0* 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: OpenElect

Model or Version: 2.2.3

Name of VSTL: Pro V&V

EAC Certification Number: UNS10121966-2.2.3

Date Issued: 08/22/2023

Executive Director

Scope of Certification Attached

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

The Unisyn OpenElect Voting System 2.2.3, herein referred to as OVS 2.2.3, is a modified system based on the earlier certified OVS releases. The OVS 2.2.3 Voting System is a paper-ballot based optical scan voting system consisting of five major components:

1. OpenElect Central Suite (OCS)
2. OpenElect Voting Optical (OVO)
3. OpenElect Voting Interface (OVI-VC)
4. OpenElect Voting Central Scan (OVCS)
5. Freedom Vote Tablet (FVT)
6. Freedom Vote Scanner (FVS)

TDP0155

Pre-Voting - Election Center/Central Count

OVI-VC

OVO

OCS

Ballot Layout Manager (BLM)
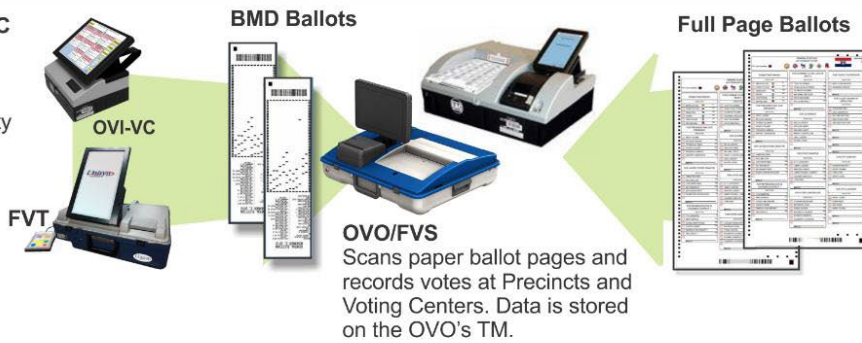- Defines Election
- Produces Ballots

Election Manager (EM)
- Sets Election Options
- Creates Election Files

Election TM
Loads the Election directly on Voting Devices

FVT

FVS

OCS

G2140

OVCS

*mini*OVCS

Voting - Poll Locations

The **FVT** and **OVI-VC** are ballot marking device (BMDs) that produces printed ballots using a variety of Input Devices:
- Touchscreen
- Keypad
- Sip and Puff

OVI-VC

FVT

BMD Ballots

Full Page Ballots

OVO/FVS
Scans paper ballot pages and records votes at Precincts and Voting Centers. Data is stored on the OVO's TM.

Post-Voting - Election Center/Central Count

OVO/FVS

Transport Media (TM) is removed from the OVO and FVS after voting has stopped and returned to Central Count.
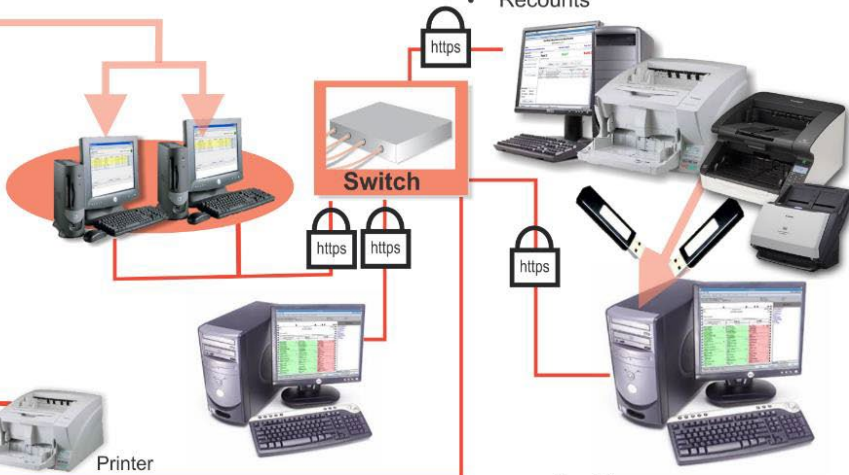
TM

OVCS
Bulk scanner used for:
- Mail In-Ballots
- Provisional Ballots
- Recounts

https

Tabulator Client
Insert Transport Media to store and upload vote files to Central Database.

Switch

https   https

https

https

Printer

Tabulator Reports
Report consolidated results.

Tabulator & Database
Track uploads and consolidated results.

Auditor
Evaluate and update questionable or erroneous marks on Ballots.

OpenElect Central Suite (OCS)

The OCS consists of the six components running as either a front-end/client application or as a back-end/server application: Ballot Layout Manager (BLM), Election Manager (EM), Tabulator Client (TC), Tabulator, Auditor and Tabulator Reports (TR).

OpenElect Voting Optical (OVO)

The OVO device is a precinct-level optical scan ballot counter (tabulator) designed to perform the following major functions: ballot scanning, tabulation, and second chance voting.
The OVO is a full-page, dual-sided optical scan ballot system which scans and validates voter ballots and provides a summary of all ballots cast. The election is loaded via a USB thumb drive. On Election Day, an OVO at each polling location scans and validates voters' ballots and provides precinct tabulation and reporting. The OVO unit is also paired with the OVI-VC and/or the FVT for early voting to scan and tabulate early voting ballots. OVO units can also be used at election headquarters to read absentee, provisional, or recount ballots in smaller jurisdictions.

OpenElect Voting Interface (OVI-VC)

The OVI-VC supports both ADA and Early Voting requirements. The OVI-VC enables voters during early voting to cast regional ballots and voters with special needs to prepare their ballots independently and privately on Election Day. The OVI-VC unit features a 15-inch full-color touch-screen display. The OVI-VC will present each contest on the correct ballot to the voter in visual and (optionally) audio formats. The voter with limited vision navigates through the ballot using the audio ballot and the ADA keypad or touchscreen input to make their selections. The voter validates his or her selections by listening to the audio summary, printing the ballot, and inserting it into the OVO or FVS.

The OVI-VC facilitates special needs voters through a variety of methods including wheelchair access, sip & puff, zoom-in ballot function, and audio assistance for the visually impaired. The OVI-VC provides for write-in candidates when authorized by the jurisdiction. Voters input candidates' names via the ADA keypad, touchscreen or sip & puff device. Each OVI-VC can support multiple languages for both visual and audio ballots, allowing the voter to choose their preferred language.

OpenElect Voting Central Scanner (OVCS)

The OVCS resides at election headquarters designated to read absentee, provisional, or recount ballots in large jurisdictions, or read the entire election's ballots at a central count location in smaller jurisdictions. The OVCS also captures write-in data images and produces a write-in image report for manual processing upon request. The OVCS system consists of the following components: OVCS Workstation and either a Canon DR-X10C Scanner, Canon DR-G2140 or a Canon M-160II Scanner.

FreedomVote Tablet (FVT)

The FVT is a tablet ballot marking device that enables voters make their vote selections and to print their voted ballot. The FVT can be used on Election Day or during an early voting period. Like the OVI-VC, the FVT is ADA compliant. It assists voters, with varying levels of ability, through the voting process, ballot review, and printing functions. The FVT presents each contest on the ballot style to the voter in visual and/or audio formats. It facilitates special needs voters through a variety of methods including wheelchair access, sip and puff, zoom-in ballot function and audio assistance for the visually impaired. The voter with limited vision can navigate through the ballot using an audio ballot and the ADA keypad or touchscreen to input their selections. Once the ballot is printed, it is taken to the OVO or FVS to be cast. Each FVT can support multiple languages for both visual and audio ballots, allowing the voter to choose their preferred language.

FreedomVote Battery (FVT-B)

The FVT-B is a FreedomVote Tablet with a battery backup unit installed that provides two hours of continuous power to the system in the event of a power outage. The FVT and FVT-B's look and function the same.

FreedomVote Scanner (FVS)

The FVS is a full-page dual-sided optical scan precinct scanner that scans and validates voter ballot pages and provides a summary of all ballot pages cast. The election is loaded from an Election TM. On Election Day, an FVS at each poll location scans and validates voters' ballots and provides precinct tabulation and reporting. The FVS runs Logic Tests and Training Elections in addition to General and Primary Elections. The FVS unit can also be paired with FVT and/or OVI-VC units for early voting to scan and tabulate early voting ballots and election support at voting centers. Additionally, FVS units can be used at election headquarters to read absentee, provisional, or recount ballots in smaller jurisdictions.

Certified System before Modification

OpenElect 2.2

Changes Addressed by Modification

The submitted modifications include the following changes from OVS version 2.2 to 2.2.3:

- **FreedomVote Tablet (FVT)**
  Additional tablet added to COTS hardware list to replace previous tablet which has reached its end-of-life.
  Make the Close with Barcode process on FVT match the Close with Button process, so that they have the same end point.

- **FreedomVote Tablet - Battery Backup (FVT-B)**

Upgraded processor and RAM for the FVT tablet.
The Diagnostic Printer Test was updated to prevent printing interruption in the event of an electromagnetic pulse (EMP).

- **Tabulator Reports**
  When determining the number of ballots cast in an election with multiple page ballots base the number of ballots cast on the first page. This modification also creates a Desktop Shortcut to Reports directory when new "Run" is created.

- **Tabulator**
  When determining the number of ballots cast in an election with multiple page ballots base the number of ballots cast on the first page.

Mark Definition

The Unisyn OpenElect system will consistently recognize a 60% fill of the target area. Marks must be made with a marking device with sufficiently low reflectance in the visible red band and is of sufficient density/color such that the scanner registers it as black. Most blue, black and green ballpoint pens and markers also meet necessary reflectance requirements and may be used.

Tested Marking Devices
- BIC Grip Roller
- EF Felt Tip Pen

Language Capability

System supports Hindi, Chinese, English, Japanese, Korean, Navajo, Spanish, and Thai as well as bilingual (English and one other language on a single ballot page).

Components Included

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

Proprietary Software Components

Proprietary Software	Version
[OCS] Adjudicator Application	2.2
[OCS] Ballot Layout Manager Application	2.2
[OCS] Cast Vote Record Utility	2.2
[OCS] Election Manager	2.2
[OCS] OVCS Application	2.2
[OCS] Tabulator Client	2.2
[OCS] Tabulator Monitor	2.2.3
[OCS] Tabulator Reports	2.2.3
[OCS] Write-In Extractor Utility	2.2

[OCS] Write-In Manager Utility	2.2
[OCS] Common Files	2.2.3
[OCS] OCS Installer Application	2.2.3
OVI	2.2
FVS	2.2
FVT	2.2.3
OVO	2.2.2

COTS Software Components

FVT, FVS, OVO, and OVI-VC Device Software	Version
CentOS Linux (OVO1 and OVI-VC1)	5.0
CentOS Linux (OVO2 and OVI-VC2)	6.3
CentOS Linux (FVS)	8.0
Java JRE + Unlimited Cryptographic Extension (OVO and OVI-VC)	1.6.0_02
Java JRE + Unlimited Cryptographic Extension (FVS)	1.6.0_45
Android OS (FVT)	4.4.4

OCS and OVCS Device Software	Version
CentOS Linux	6.5, 6.8, 7.6 and 7.9
Java JRE + Unlimited Cryptographic Extension	1.6.0_02
Apache-Tomcat Application Server	6.0.13
MySQL Database (BLM. EM, A, and Tab only)	5.0.45-7 5.7 (on CentOS 7.6 and 7.9)
JasperReports	2.0.5
OpenVPN	2.4.4
OpenSSL	1.0.1f-fips

COTS Hardware Components

Hardware	Make	Model
OVO		
Duplex Ballot Scanner	PDI Scan	Pagescan III
Scanner Power Adapter	eUrasia Power	uA36-1024
58mm Thermal Printer	Citizen Printer	CT-5281
Printer Power Adapter	Citizen Printer	28AD4
Chassis	Morex	Morex 2699
DC/DC converter	Morex	MX-0608F
Chassis Fans	Young Lin Tech	DFB404012M
Motherboard	Jetway	JNF9D-2550
Memory	SuperTalent – Onboard RAM	W1333SA2GV
Hard Drive	Western Digital	WD5000AZLX
AC Adapter	EDAC	EA 10951C-120

Hardware	Make	Model
1Gb USB	Innodisk	DEUA1-01G172AC1SB-B88
1 Gb USB	Delkin	UY0GTFLSY-XN000-D
7" LCD Touchscreen Display	Xenarc Technologies	700TSV
AC Power In Module	Delta	Emi 10BEEG3G
FVS		
CPU w/ Fan	Intel	G5400-LGA1151
Motherboard	Jetway	JNC8H-IH310
Memory	Crucial	CT4G48F8824A
SSD 250GB	Crucial	CT250MX500SSD1
80mm Thermal Printer	SNBC	BTS-S80
Duplex Ballot Scanner	PDI Scan	Pagescan V
Battery	RRC Power Solutions Inc.	RRC2040-2
Power Management Module	RRC Power Solutions Inc.	RRC-PMM240
Power Supply 15VDC AC/DC	Meanwell	UHD-200-15
Power Supply 12/12VDC	Meanwell	RSD-60G-12
Power Supply 12/24VDC	Meanwell	RSD-60G-24
AC Inlet Module	Schurter	4303.5013
Fuse Drawer 1P	Schurter	4303.2406
Switch On/Off DPDT	Switchcraft	EHRRSLBPKG
1 Gb USB	Innodisk	DEUA1-01GI72AC1SB-B88
1 Gb USB	Delkin	UY0GTFLSY-XN000-D
OVI-VC		
Sip and Puff (optional)	Origin Instruments	AirVoter
Headphone (optional)	Koss On-Ear Headphones	KPH7
15" LCD Touchscreen Display	GVision	P15BX-OB-4690
82.5mm Thermal Printer	Star	TSP743IID-24, serial interface
Printer Power Adapter	Star	PS60A-24B 1
Power Adapter Kit	Morex	MX-0608F, DC-DC Converter
Motherboard	Jetway	JNF9D-2550
Hard Drive	Western Digital	WD5000AZLX
AC Adapter	EDAC	EA 10951C-120
Chassis Fans	Young Lin Tech	DFB404012M
Motherboard	Jetway	JNF9D-2550
Memory	SuperTalent - Onboard RAM	W1333SA2GV
1 Gb USB	Innodisk	DEUA1-01GI72AC1SB-B88
1 Gb USB	Delkin	UY0GTFLSY-XN000-D
AC Power In Module	Delta	Emi 10BEEG3G
FVT		
Tablet Battery Charger	Sager Power System	GC30B-4P1J
13.3" Touchscreen Tablet - A	Android Tablet	GVision-T13
13.3" Touchscreen Tablet - B	Android Tablet	ENVUW

Hardware	Make	Model
Barcode Reader 1D, 2D series	Newland	FM420, FM430
USB Hub	D-Link	DUB-H4 W/+5V Power Supply and USB cable
Hub Adapter	Meanwell	PSD-15A-05
1Gb USB	Innodisk	DEUA1-01G172AC1SB-B88
1 Gb USB	Delkin	UY0GTFLSY-XN000-D
Micro SD	San Disk	4 GB Edge
Sip and Puff (optional)	Origin Instruments	AirVoter
Headphone (optional)	Koss On-Ear Headphones	KPH7
USB to Ethernet RJ45 Adapter	D-Link	DUB-E100
AC Power In Module	Delta	Emi 10BEEG3G
FVT-B (includes items above)		
Battery	RRC Power Solutions Inc.	RRC2040-2
Power Management Module	RRC Power Solutions Inc.	RRC-PMM240
Power Supply 15VDC AC/DC	Meanwell	UHD-200-15
Power Supply 12/12VDC	Meanwell	RSD-60G-12
Power Supply 12/24VDC	Meanwell	RSD-60G-24
UPS		
UPS, Minuteman Power Technologies	Para Systems, Inc.	Entrepid Series EP1500 LCD
Surgecube – Surge Protector	Belkin	F9H100-CW
OVCS		
Desktop for non-redundant solutions	Dell	OptiPlex 360, 755, 7010, D075/XE2
Desktop for redundant solutions	Dell	Precision T3500, T3600, T5810, T5820, 3420
Laptop	Dell	Dell Latitude E5500, E5540, E5570, E5590, E5500 v2, E5520, Dell XPS m1530, HP 2000
Large Volume Scanner	Canon	DR-X10C DR-G2140
Desktop Scanner	Canon	DR-M160II

System Limitations

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

Characteristic	Limiting Component	Limit	Comment
Maximum Elections	BLM	8	
Maximum Precincts	BLM	2000	
Maximum Splits per Precinct	BLM	9	
Maximum Districts	BLM	400	

Characteristic	Limiting Component	Limit	Comment
Maximum Contests per District	BLM	20	
Maximum Parties	BLM	24	
Maximum Parties in primary	BLM	12	
Maximum Parties w/ Straight Ticket	BLM	12	
Maximum District types	BLM	25	
Maximum Languages	BLM	10	
Maximum Ballot styles per Election	BLM	400	
Maximum Contests per Election	BLM	150	
Maximum Measures per Election	BLM	30	
Maximum Instruction Blocks per Election	BLM	5	
Maximum Headers per Election	BLM	50	
Maximum Candidates per Election	BLM	3000	
Maximum Candidates per Contest	BLM	120	
Maximum Ballot Pages	BLM	3	
Maximum Votes for N of M	BLM	25	
Maximum Ranks in RCV	BLM	3	
Maximum Ballot sheets per OVO	BLM	5000	
Maximum Ballot Pages per batch (OVCS)	OVCS	500	
Maximum Ballot Pages per session	OVCS	5000	
Maximum expected scanning speed (ballot pages per hour)	OVCS	2100	
Maximum Units simultaneously loading	BLM	20	
Maximum Precincts initialized per OVO on Election Day	BLM	30	
Maximum Precincts initialized per OVI-VC/FVT on Election Day	BLM	2000	
Maximum Precincts initialized per OVO/FVS /OVI-VC/FVT in early voting	BLM	2000	
Maximum 11" Ballot positions	BLM	228 (without Rank Choice Voting) 456 (with Rank Choice Voting)	Limit (Double Sided)

Characteristic	Limiting Component	Limit	Comment
Maximum 14" Ballot positions	BLM	300 (without Rank Choice Voting) 600 (with Rank Choice Voting)	Limit (Double Sided)
Maximum 17" Ballot positions	BLM	372 (without Rank Choice Voting) 744 (with Rank Choice Voting	Limit (Double Sided)
Maximum 19" Ballot positions	BLM	420 (without Rank Choice Voting) 840 (with Rank Choice Voting)	Limit (Double Sided)

Functionality

VVSG 1.0 Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	No	Not applicable
Accessibility		
Forward Approach	No	
Parallel (Side) Approach	No	
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open Standard	Yes	A registered voter may vote in any *party primary* regardless of his own party affiliation
Primary: Open Blanket	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	

Feature/Characteristic	Yes/No	Comment
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.	No	
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	Yes	
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	Top to Bottom by Precinct grouping
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	Yes	
Straight Party: Vote for each candidate individually	Yes	
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	
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:		

Feature/Characteristic	Yes/No	Comment
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	Yes	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	Yes	
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.	Yes	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	Yes	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	Yes	
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	Yes	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	Yes	
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.	Yes	
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballot is identified but not included in the tabulation but can be added in the central count.	Yes	

Feature/Characteristic	Yes/No	Comment
Provisional/Challenged Ballots: A voted provisional ballot 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	Supported. Overvotes are tabulated for each office as an Over / Under Vote report in Vote Tabulation
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	Supported. Undervotes are tabulated for each office as an Over / Under Vote report in Vote Tabulation
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	
Demonstrates the voting system capability to handle the designated language groups		
Default language (English)	Yes	
Secondary language using a Western European font	Yes	
Ideographic language (such as Chinese or Korean),	Yes	
Non-written languages requiring audio support	Yes	