United States Election Assistance Commission

VVSG 2005 VER. I

EAC

CERTIFIED

Certificate of Conformance

Hart Verity Voting 2.3

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: Verity Voting

Model or Version: 2.3

Name of VSTL: SLI Compliance

EAC Certification Number: HRT-VERITY-2.3

Date Issued: March 15, 2019

Executive Director
U.S. Election Assistance Commission

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:

Verity Voting is a comprehensive voting system that includes software and hardware components to support paper-based, electronic, and by-mail voting. These components allow election professionals to accomplish the following high-level tasks:

- Input of election data

- Definition and maintenance of election databases

- Formatting of ballots

- Setup and deployment of voting devices

- Counting of votes

- Consolidation and reporting of results and election audits

Verity Scan is a scanning device (tabulator) that is used in conjunction with an external ballot box. The unit is designed to scan marked paper ballots, interpret and record voter marks on the paper ballot and deposit the ballots into the secure ballot box. Verity Scan is capable of tabulating votes, or producing a ballot count report which includes quantities of ballots scanned.

Verity Touch Writer is a standalone Ballot Marking Device (BMD) which also includes an Audio Tactile Interface (ATI). Touch Writer allows voters who cannot hand-mark a paper ballot to generate a machine-readable and human readable paper ballot, based on vote selections made through the accessible electronic interface.

Verity Touch Writer Duo is a Ballot Marking Device (BMD) which may include a Verity Access Audio Tactile Interface (ATI), has an integrated printer, and is configured for use in a daisy-chained network with Verity Controller. Touch Writer Duo generates a machine-readable and human-readable printed vote record, based on vote selections made through the electronic interface.

Verity Print is an on-demand ballot production device for unmarked paper ballots.

Verity Election Management allows users to manage and import elections. Elections are available through the "Elections" chevron in Verity Build. Users can also delete, archive, restore, and rename the elections.

Verity User Management enables users with the correct role and permissions to create and manage user accounts within the Verity Voting system for the local workstation in a standalone configuration, or for the network in a networked configuration.

Verity Desktop enables users with the correct roles to set the workstations' date and time, gather Verity software application hash codes (in order to validate the correctness of the installed applications), and access to Windows desktop.

Verity Data provides users capabilities to input jurisdiction- and election-specific data for paper and accessible electronic ballots, as well as audio for accessible electronic ballots. Verity Data also includes capabilities to allow proofing of data, layout, and audio that has been created. Verity Data also performs validation on the entered information to ensure that it is ready for use in Verity Build.

Verity Build allows users to proof data, view reports, create election definitions, print ballots, and create election media (vDrives). Build also allows users to configure settings for Verity Scan digital scanners and Verity Touch Writer BMD devices.

Verity Central is a high-speed, central digital ballot scanning system used for high volume processing of ballots (such as vote by mail). Verity Central is based on COTS scanning hardware coupled with the custom Hart-developed ballot processing application software, which resides on an attached COTS work-station.

Verity Count is an application that tabulates election results and generates reports. Verity Count can also be used to collect and store all election logs from every Verity component/device used in the election, allowing for complete election audit log reviews.

Verity Controller is a polling place device used by the poll worker to monitor the operation and create access codes for Verity Touch, Touch with Access, and Touch Writer Duo systems. Access codes allow each voter to activate a ballot session and cast a vote (or mark a ballot, for Touch Writer Duo) in private. The poll worker uses the Verity Controller to manage up to 12 devices that are connected via a daisy-chain network.

Verity Touch is a Direct Recording Electronic (DRE) device controlled via a touch screen. It is networked to Controllers and other DRE devices via a daisy-chain network. After the voter privately and independently marks and reviews the ballot, that ballot is electronically cast.

Verity Touch with Access is a DRE device identical to the Verity Touch device, except that it adds a Verity Access Audio Tactile Interface (ATI) to provide additional options for accessible voting. Access has three tactile buttons, one audio port, and one port for two-switch adaptive devices (such as "jelly switches" or sip-and-puff devices). Jacks for headphones and adaptive devices are located on the top edge of the ATI device.

Verity AutoBallot is an optional barcode scanning kit for Verity Controller, Verity Print, and Verity Touch Writer that allows air-gapped integration between an e-pollbook check-in process and the task of selecting the proper ballot style for the voting system.

vDrive is a required Verity Voting component, used as a portable media device generated by Verity Build. vDrive allows election definitions to be moved from Verity Build to Verity Controller, Verity Scan, Verity Touch Writer, and Verity Print. vDrive supports the transfer of Cast Vote Records (CVRs) in Verity Controller (DRE configuration), Verity Scan, and Verity Central.

Verity Key is an electronic media that is created by Verity Build for a specific election. Verity Key is the electronic media that provides user authentication and configures election security throughout the Verity voting system.

Certified System before Modification (If applicable):
Verity Voting 2.0

Anomalies and/or Additions addressed in Verity Voting 2.3:
N/A

Mark definition:

System supports marks that cover a minimum of 4% of the rectangular marking area.
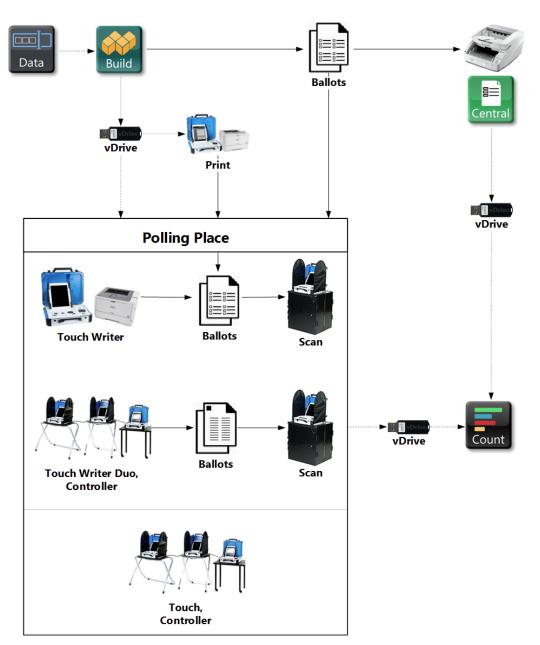
Tested Marking Devices:

System supports Black and Blue ballpoint pens; testing was performed with black, blue, dark blue, pink, light green, green, orange, and red pens, as well as #2 pencil lead.

Language capability:

System supports English, Spanish, Chinese, Japanese, Korean, Khmer, Thai, Vietnamese, Tagalog, Ilocano, and Hindi.

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
Verity Data	2.3.1			Data management software
Verity Build	2.3.1			Election definition software
Verity Central	2.3.1			High speed digital scanning software
Verity Count	2.3.1			Tabulation and reporting software
Verity Print	2.3.1			On-demand ballot printing device firmware
Verity Scan	2.3.1			Digital scanning device firmware
Verity Touch Writer	2.3.1			Accessible BMD firmware
Verity Touch Writer Duo	2.3.1			Ballot marking device, with internal COTS ballot summary printer and optional audio tactile interface
Verity Controller	2.3.2			Polling place management device
Verity Touch	2.3.1			Direct Recording Electronic (DRE) voting device
Verity Touch with Access	2.3.1			Accessible DRE voting device, with audio tactile interface
Verity Device Microcontroller	V17			Firmware for Verity devices
Verity Touch Writer Duo Microcontroller	V1			Firmware for Verity Touch Writer Duo
Application control – Data/Build, Central, Count, Print, Scan, Touch Writer, Touch Writer Duo, Controller, Touch, Touch w/ Access	6.1.1.369		COTS: McAfee Application Control for Devices	Configured for Verity workstations and devices
Database- Data/Build, Central, Count	11.00.2100		COTS: Microsoft SQL Server 2012 for Embedded Systems	
Database - Print, Scan, Touch Writer, Touch Writer Duo, Controller, Touch, Touch w/ Access	11.00.2100		COTS: Microsoft SQL Server 2012 Express	
Verity Operating System – Data/Build, Central, Count, Print, Scan, Touch Writer, Touch Writer Duo, Controller, Touch,	6.1.7601		Microsoft Operating System	Microsoft Windows Embedded Standard 7 w/ service pack 1 – 64 bit

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
Touch w/ Access				
Verity Scan		Revision H		
Verity Scan – Update for scanner mechanism and tablet electronics obsolescence		Revision A		
Verity Touch Writer		Revision G		
Verity Print		Revision D		
Verity Touch Writer Duo		Revision A		
Verity Controller		Revision D		
Verity Controller – Update for tablet electronics obsolescence		Revision A		
Verity Touch		Revision D		
Verity Touch w/ Access		Revision E		
OKI Data	N22202A		B431d Printer Driver	Data/Build, Central, Count, Print, Touch Writer
OKI Data	N22500A		B432dn Printer Driver	Data/Build, Central, Count, Print, Touch Writer
OKI Data	N35100A		C831dn Printer Driver	Print
TWAIN Working Group	2.0.1		Twacker 32 Scanner Driver	Central
Canon	M111181		DR-G1100 Scanner Driver	Data/Build, Central
Canon	M111171		DR-G1130 Scanner Driver	Data/Build, Central
	1405-8GV3		8-port Ethernet Switch	Data/Build, Central, Count
Vinpower Digital USB Duplicator 7-targets	USBShark-7T-BK			Data/Build
Vinpower Digital USB Duplicator 23-targets	USBShark-23T-BK			Data/Build
Verity Ballot Box	Revision B			Scan
Accessible Voting Booth	Revision D			Touch Writer, Touch Writer Duo, Touch Writer w/ Access
Standard Voting Booth	Revision D			Touch Writer Duo, Touch
Thermal Printer	PJ723		Brother PJ700	Touch Writer Duo
Verity Key		N/A	COTS: Maxim iButton	Security key used with voting system
Verity vDrive		N/A	COTS: Apacer	4GB USB flash drive, portable electronic media used for transportation of voting system data
Ballot/Report Printer		B431d	COTS: OKI Data	

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
– Data/Build, Central, Count, Print, Touch Writer		B432dn		
Ballot Printer – Build, Print		C831dn	COTS: OKI Data	
Scanner – Central		DR-G1100	COTS: Canon	
Scanner – Central		DR-G1130	COTS: Canon	
Workstation – Data, Build, Central, Count			COTS: HP Z240 Workstation; HP Z230 Workstation	Min. Requirements: Processor – Intel Celeron D 420 3.06GHz Dual Core Memory – 2GB Hard Drive – 120 GB Removable Storage – 8xDVD+/-RW Slim line USB Ports – 4 ports Video Card - Integrated Graphics Keyboard - USB Keyboard Mouse - USB Mouse
Monitor – Data, Build, Central, Count			COTS: Monitor	Min. Requirements: Panel Size - 50.8 cm Aspect Ratio - Widescreen (16:9) Optimal Resolution - 1600 x 900 at 60Hz Contrast Ratio - 1000: 1 Brightness - 250 cd/m2 (typical)

System Limitations

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

Element	Testing Limit/Requirement Z240 64GB Systems (does not include Data/Build/Count combined system)	Testing Limit/Requirement Z230 32GB Systems (includes Z240 64GB Data/Build/Count combined system)
Precincts	3,000	2,000
Splits per Precinct	20	20
Total Precincts + Splits in an election	3,000	2,000
Districts for voting devices and applications	400	75
Parties in a General Election	24	24
Parties in a Primary Election	10	10
Contests in an election	2,000	200
Choices in a single contest	300	75
Total contest choices (voting positions) in an election	5,000	600
Max length of choice name	100 characters	100 characters

Element	Testing Limit/Requirement Z240 64GB Systems (does not include Data/Build/Count combined system)	Testing Limit/Requirement Z230 32GB Systems (includes Z240 64GB Data/Build/Count combined system)
Max write-in length	25 characters	25 characters
Voting Types	5	5
Max polling places per election	3,050	1,200
Max devices per election	N/A	N/A
vDrive capacity – Scan voting device	9,999 sheets per vDrive	9,999 sheets per vDrive
vDrive capacity – Verity Central	80,000 sheets per vDrive	80,000 sheets per vDrive
Number of voters definable per election	2,500,000	1,000,000
Number of total ballots cast per election	1,750,000	1,000,000
Max number of sheets per ballot	4 sheets	4 sheets
Max number of sheets – Verity Scan	9,999	9,999
Max number of CVRs – Verity County	7,000,000	7,000,000
Ballot Sizes	8.5"x11", 8.5"x14", 8.5"x17", 8.5"x20", 11"x17" (Central only)	8.5"x11", 8.5"x14", 8.5"x17", 8.5"x20", 11"x17" (Central only)
Number of languages in a single election (including English)	11	11

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	Supports standard closed primary and modified closed primary
Open Primary		
Primary: Open Standard (provide definition of how supported)	Yes	Open Primary
Primary: Open Blanket (provide definition of how supported)	Yes	General "top two"
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:		

Feature/Characteristic	Yes/No	Comment
Write-in Voting: System default is a voting position identified for write-ins.	No	By default, the number of write-ins available in a contest is zero, users may increment as necessary
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.	Yes	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	Yes	Rotation by precinct and precinct split
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.	No	
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.	Yes	
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:		
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.)	Yes	

Feature/Characteristic	Yes/No	Comment
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.)	Yes	
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.	Yes	
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	N/A	Tabulation rules are unique per jurisdiction
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	N/A	Tabulation rules are unique per jurisdiction
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	N/A	Tabulation rules are unique per jurisdiction
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.	N/A	Tabulation rules are unique per jurisdiction
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	If the system detects more than the valid number of marks in a contest, it is counted as an overvote
Overvotes: DRE: Prevented from or requires correction of overvoting.	Yes	

Feature/Characteristic	Yes/No	Comment
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	If the system detects more than the valid number of marks in a contest, it is counted as an overvote
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	Yes	
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	Yes	
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):		
Precinct counting device	Yes	
Central counting device	Yes	