Minutes
State Election Commission Meeting
October 12, 2020

The State Election Commission meeting was called to order by Chairman Donna Barrett at 12:04 p.m., Central Standard Time, October 12, 2020. The following members and staff were present: Commissioners Barrett, Blackburn, McDonald, Wallace and Younce; Commissioners Duckett and Wheeler were connected by phone, Coordinator of Elections Mark Goins and Kathy Summers, Elections Specialist.

Commissioners Duckett and Wheeler participated by phone and were not eligible to vote due to prior meeting notification posted on website.

Commissioner Wallace made a motion to adopt the below listed minutes and to correct the April 13, 2020 minutes to include Commissioner Younce as attending; Commissioner McDonald seconded the motion.

- April 13, 2020 – Regular Meeting
- May 13, 2020 – Telephonic Meeting
- June 12, 2020 – Telephonic Meeting
- June 25, 2020 – Telephonic Meeting
- August 3, 2020 – Telephonic Meeting
- August 27, 2020 – Telephonic Meeting
- September 21, 2020 – Telephonic Meeting

(Aye votes: Barrett, Blackburn, McDonald, Wallace and Younce; No votes: None; Abstention: None.)

Commissioner Blackburn made a motion pursuant to TCA. § § 2-12-101 and 2-12-106, and seconded by Commissioner Wallace to approve any nomination(s) for county election commission appointments as submitted, and to leave the nomination process open until 4:30 p.m. Central Standard Time, Monday, October 12, 2020. (Aye votes: Barrett, Blackburn, McDonald, Wallace and Younce; No votes: None; Abstention: None.) **(See attached county election commission appointments made.)**

Old Business

- **NONE**

New Business

- **Discuss State Election Commission Voting Machine Policy**

Chairman Barrett asked Coordinator Goins to lead the discussion. Coordinator Goins discussed the need to view voting equipment on November 3, 2020, and that no Democratic commission members are available for this viewing. Coordinator Goins stated he had a previous discussion with Commissioner Wheeler who had

several suggestions and that is the reason the policy is on the agenda. The equipment to be viewed is the MicroVote EMS 4.4, which would allow a paper record of a voter's vote. If the election is not viewed on November 3, 2020, then the next election to view the equipment would be in 2022.

Bill Whitehead, Regional Sales Manager for MicroVote, addressed the commission. MicroVote is a regional based company and will not have any elections for viewing in 2021. The next date to view an election would be in May 2022. Mr. Whitehead stated several Tennessee counties are interested in buying this machine for use in 2022.

Commissioner Wheeler discussed the option of suspending the rules for viewing this machine during a pandemic. Viewing the machine is not a political matter but is a functional matter to confirm the voting machine works and functions for voting in Tennessee.

Commissioner McDonald made a motion to have a Republican member of the State Election Commission and a member of the Secretary of State's office attend the viewing of MicroVote's EMS 4.4, on November 3, 2020, due to the Covid-19 virus and other health related issues. Commissioner Wallace seconded the motion and the motion was unanimously approved. Aye votes: Barrett, Blackburn, McDonald, Wallace and Younce; No votes: None; Abstention: None.)

- **Hart InterCivic – Alli Fick, Certification Project Manager - Request for approval of de Minimis changes to Verity Voting.**
  - **De Minimis Change to Verity Voting – Headphone**
  - **De Minimis COTS - Workstation Change**

Alli Fick, Certification Project Manager for Hart InterCivic gave the presentation before the commission. **(See attached presentation provided by Hart InterCivic.)**

Ms. Fick also presented a de minimis change to update a circuit board component and clerical housekeeping on manufacturing documentation, which was not on the agenda but will be placed on the January 11, 2021, agenda for approval.

Commissioner Wallace made a motion to approve the two (2) de minimis changes submitted by Hart InterCivic, seconded by Commissioner McDonald and the motion was unanimously approved. Aye votes: Barrett, Blackburn, McDonald, Wallace and Younce; No votes: None; Abstention: None.)

- **MicroVote – Bill Whitehead, Regional Sales Manager – Demonstration of EMS 4.4 Voting Machine (Rev E Infinity with VPAT) and Firmware/Software 4.3A Upgrade**

Bill Whitehead Commissioner, Regional Sales Manager for MicroVote demonstrated the EMS 4.4 voting machine and firmware/software upgrade before the commission.

Coordinator Update

Early Voting - Coordinator Goins reminded commissioners early voting for the November 3, 2020, election starts on October 14, 2020, and he anticipates a high turnout for early voting which ends on October 29, 2020.

Absentee Ballot - Coordinator Goins advised the last date to request a by-mail absentee ballot will be October 27, 2020. In August, there was a significant increase of requests for by-mail ballots.

County Election Commissions - Coordinator Goins advised the commission of how hard the counties have worked on executing the Covid-19 Contingency Plan and stated the August election was one of the smoothest elections in recent years.

Commissioner Duckett discussed Shelby County Election Commission and their bidding process for new voting machines.

The meeting was adjourned at 1:08 p.m. Central Time.

The next scheduled meeting is set for January 11, 2021 and will be held in the William R. Snodgrass – Tennessee Tower, Nashville Room - 3rd floor at 12:00 Noon, Central Standard Time.

Respectfully submitted,

Mike McDonald

Mike McDonald - Secretary
State Election Commission

State of Tennessee

State Election Commission
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-1102

Vacant Status

October 12, 2020

Fentress R Kent Younce / D Tom Wheeler
D

Marion R Donna Barrett / D Mike McDonald
D

Morgan R Kent Younce / D Tom Wheeler
D

Total Vacancies: 3

State of Tennessee

State Election Commission
312 Rosa L. Parks Avenue, 7th Floor
Nashville, Tennessee 37243-1102

New Appointment Status

October 12, 2020

		Appointment
Fentress	R Kent Younce / D Tom Wheeler	
	D Vicky Ann McDonald	10/12/2020
Marion	R Donna Barrett / D Mike McDonald	
	D Anita Y. Tipton	10/12/2020

Total New Commissioners: 2

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.

Hart InterCivic

Request for approval – Verity Voting

De Minimis Changes

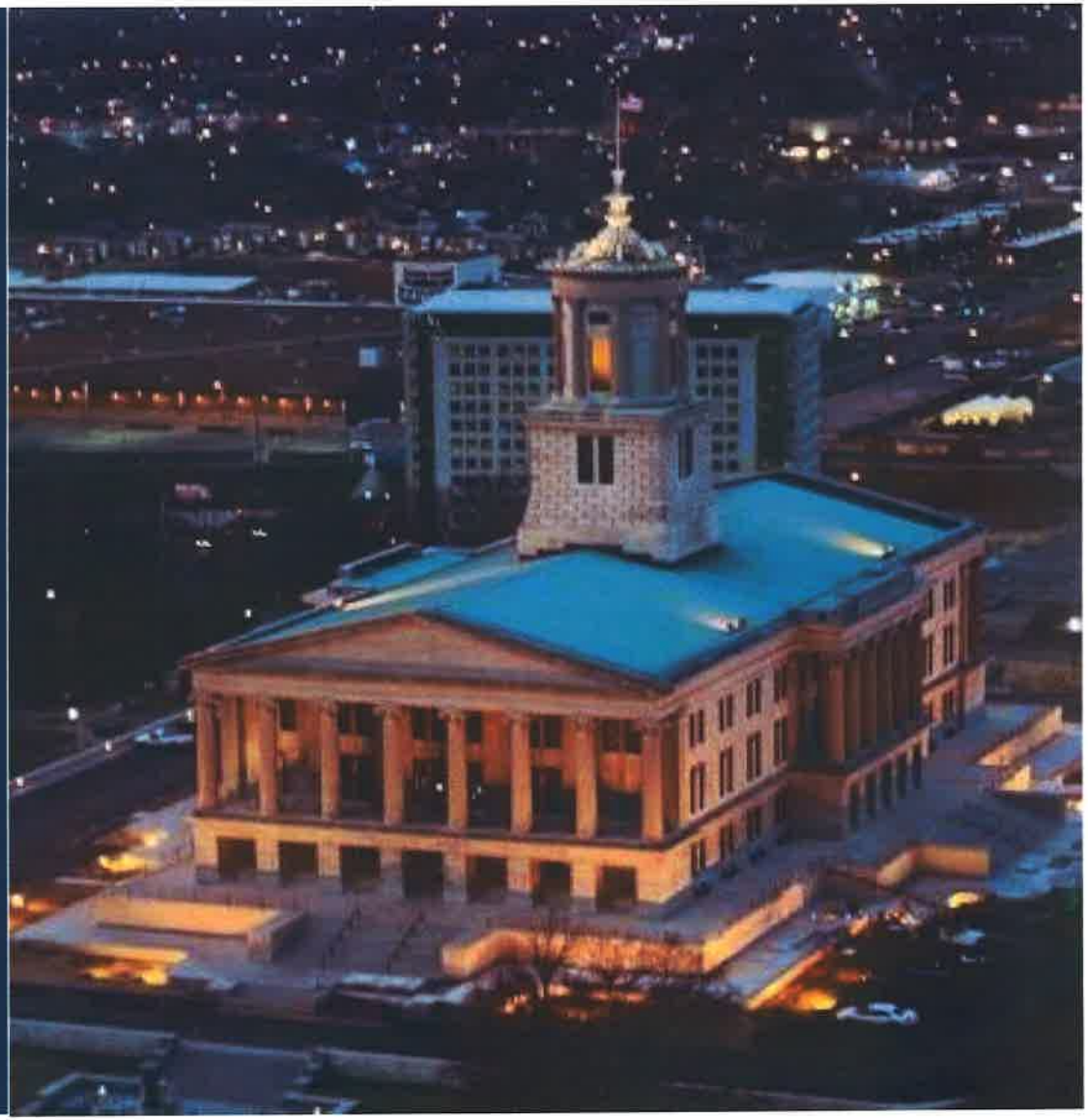
October 12, 2020

- Alli Fick, Certification Project Manager
  - **De Minimis Change to Verify Voting – Headphones**
  - **De Minimis COTS – Workstation**

HART intercivic

State of Tennessee

De Minimis Changes to Verity Voting



(1) Headphone – de minimis change

- The COTS headphone model that Hart provides with its accessible devices is no longer available.
- The manufacturer has recommended an equivalent model headphone in the same series as the approved headphone, with the same acoustic specifications.
- We'd like to be able to use the newer headphone model.

VERITY

HART intercivic

(1) Headphones – de minimis change

- Certified by the EAC as de minimis on April 21, 2020.
- Does not alter the system's reliability, functionality, capability, operation, or software.
- We are requesting approval of this de minimis change.

VERITY™

HART intercivic™

(2) Workstation & Display – de minimis change

- The COTS workstation that Hart uses for its Verity workstations, the HP Z240, is end-of-life and no longer available. Hart is moving forward with the HP Z4 G4 workstation as an equivalent replacement to the HP Z240.
- The COTS monitor for use with the HP Z240 is also end-of-life and is replaced. The manufacturer has recommended that the P232 display be replaced by the P244.

(2) Workstation & Display – de minimis change

- Certified by the EAC as de minimis on June 4, 2020.
- Does not alter the system's reliability, functionality, capability, operation, or software.
- We are requesting approval of this de minimis change.

VERITY™

HART intercivic™

(3) Alternative Part & Clerical Changes – de minimis change

This de minimis change serves two purposes:

(1) the addition of an updated circuit board component and

(2) clerical housekeeping on manufacturing documentation.

The manufacturer has released a revision of the circuit board component which offers higher reliability and performance, and which is more available for purchase than the existing part.

VERITY™

HART intercivic™

(3) Alternative Part & Clerical Changes – de minimis change

- Certified by the EAC as de minimis on October 2, 2020.
- Does not alter the system's reliability, functionality, capability, operation, or software.
- This de minimis change isn't on today's agenda, but we'd like to request approval.

VERITY™

HART intercivic™

HART intercivic

April 23, 2020

Mark Goins, Coordinator of Elections
Tennessee Secretary of State
312 Rosa L. Parks Ave., 7th Floor
William R. Snodgrass Tower
Nashville, TN 37243

Via: Electronic Mail

RE: De Minimis Change to Verity Voting – Headphones

Dear Mr. Goins,

Hart InterCivic, Inc. is seeking approval of a de minimis change to Verity Voting. This modification, ECO-01400, has already been approved as a de minimis change by the Election Assistance Commission (EAC) on April 21, 2020.

Description of Change:
This is a change to the headphones used with Hart InterCivic's accessible devices only. The COTS (Commercial Off the Shelf) headphone model that Hart InterCivic provides with its accessible devices is no longer available. The manufacturer has recommended an equivalent model headphone in the same series as the approved headphone, with the same acoustic specifications.

The proposed change does not alter the system's reliability, functionality, capability, or operation and does not affect software.

Additional Documentation:
I have included the following documentation with this request:

- ***ECO-01400 Summary - Updated Headphones for Accessible Devices 4005665 A00*** – Hart's full description of the change, as submitted to the VSTL and EAC.
- ***Hart ECO 01400 Approval 4-21-20*** – Correspondence from the EAC approving the change as de minimis.

Hart InterCivic looks forward to your favorable review of this request. For questions or additional information, please feel free to contact me.

Respectfully submitted,

alli fick

Alli Fick
Certification Project Manager
Hart InterCivic
(561) 628-9273
afick@hartic.com

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

April 21, 2020

Sent via e-mail

Pam Geppert, Director of Certification
Hart InterCivic
15500 Wells Port Drive
Austin, TX 78728

Re: ECO 01400

Dear Ms. Geppert,

This correspondence is to inform you that Hart ECO 01400 is approved.

Sincerely,

Jerome Lovato
Director, Voting System Testing and Certification

Cc: SLI Compliance

HART intercivic

April 23, 2020

Mark Goins, Coordinator of Elections
Tennessee Secretary of State
312 Rosa L. Parks Ave., 7th Floor
William R. Snodgrass Tower
Nashville, TN 37243

Via: Electronic Mail

RE: De Minimis Change to Verity Voting – Headphones

Dear Mr. Goins,

Hart InterCivic, Inc. is seeking approval of a de minimis change to Verity Voting. This modification, ECO-01400, has already been approved as a de minimis change by the Election Assistance Commission (EAC) on April 21, 2020.

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Additional Documentation:
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Hart InterCivic looks forward to your favorable review of this request. For questions or additional information, please feel free to contact me.

Respectfully submitted,

alli fick

Alli Fick
Certification Project Manager
Hart InterCivic
(561) 628-9273
afick@hartic.com

Kathy Summers

From: Alli Fick <afick@hartic.com>
Sent: Thursday, April 23, 2020 10:55 AM
To: Kathy Summers
Subject: [EXTERNAL] Hart InterCivic - de minimis change to Verity Voting
Attachments: ECO-01400 Summary - Updated Headphones for Accessible Devices 4005665 A00.pdf; Hart ECO 01400 Approval 4-21-20.pdf; Hart InterCivic - Request for Approval.pdf

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Kathy,

Thanks for adding the de minimis change to Verity Voting to the July 13th agenda.

The COTS headphone model that Hart provides with its accessible devices is no longer available. The manufacturer has recommended an equivalent model headphone in the same series as the approved headphone, with the same acoustic specifications.

The following supporting documents are attached to this email:

- Hart InterCivic – Request for Approval
- ECO-01400 Summary – Updated Headphones for Accessible Devices
- Hart ECO-01400 Approval 4-21-20

Thanks!
Alli

Alli Fick
Certification Project Manager
Hart InterCivic
15500 Wells Port Drive | Austin, TX | 78728
512.252.6427 (direct) | 561.628.9273 (cell) | 800.223.HART
afick@hartic.com | www.hartintercivic.com

HART intercivic

June 4, 2020

Mark Goins, Coordinator of Elections
Tennessee Secretary of State
312 Rosa L. Parks Ave., 7th Floor
William R. Snodgrass Tower
Nashville, TN 37243

Via: Electronic Mail

RE: De Minimis Change to Verity Voting – HP Workstation and Display

Dear Mr. Goins,

Hart InterCivic, Inc. is seeking approval of a de minimis change to Verity Voting. This modification, ECO-01393, has already been approved as a de minimis change by the Election Assistance Commission (EAC) on June 4, 2020.

Description of Change:
The COTS (Commercial Off the Shelf) workstation that Hart uses for its Verity workstations, the Hewlett Packard Z240, is EOL (End-of-Life) and no longer manufactured. Hart will move forward with the HP Z4 G4 workstation as an equivalent replacement to the HP Z240. The COTS display for use with the HP Z240 is also EOL and is replaced. The manufacturer, Hewlett Packard has recommended that the P232 display be replaced by the P244. The proposed change does not alter the system's reliability, functionality, capability, or operation and does not affect software.

Additional Documentation:
I have included the following documentation with this request:

- ***ECO-01393 Summary - HP Z240 Workstation and P232 Display Replaced by HP Z4 G4 Workstation and P244 Display*** – Hart's full description of the change, as submitted to the VSTL and EAC.
- ***Hart ECO-01393 Approval 06-04-2020*** – Correspondence from the EAC approving the change as de minimis.

Hart InterCivic looks forward to your favorable review of this request. For questions or additional information, please feel free to contact me.

Respectfully submitted,

alli fick

Alli Fick
Certification Project Manager
Hart InterCivic
(561)628-9273
afick@hartic.com

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

June 4, 2020 **Sent via e-mail**

Pam Geppert, Director of Certification
Hart InterCivic
15500 Wells Port Drive
Austin, TX 78728

Re: ECO 01393

Dear Ms. Geppert,

This correspondence is to inform you that Hart ECO 01393 is approved.

Sincerely,

Jerome Lovato
Director, Voting System Testing and Certification

Cc: SLI Compliance

ECO-01393 Change Summary

HP Z240 Workstation and P232 Display Replaced by HP Z4 G4 Workstation and P244 Display

Doc. 4005664

CONFIDENTIAL AND PROPRIETARY

Hart InterCivic	
Document Number: 4005664	Revision: A.00
Document Name: ECO-01393 Change Summary: Workstation and Display EOL and replaced	
	Page 1 of 7

Change History

Version	Date	Author(s)	Description
A.00	04-27-20	J. Bernal	Initial release.

Owners and List of Contacts

Name	Email	Phone	Role
Jim Canter	jcanter@hartic.com	512.252.6410	Chief Technology Officer
Dan Gately	dgately@hartic.com	512.252.6817	Director, SCM
Jared Bernal	jbernal@hartic.com	512.252.6462	Sr. Regulatory Compliance Engineer
Lynn Simpson	lsimpson@hartic.com	512.252.6637	Sr. Mechanical Engineer

Table of Contents

1 SUMMARY

The COTS (Commercial Off the Shelf) workstation that Hart uses for its Verity workstations, the Hewlett Packard Z240, is EOL (End-of-Life) and no longer manufactured. Hart will move forward with the HP Z4 G4 workstation as an equivalent replacement to the HP Z240. Hart has selected the HP Z4 G4 after consulting with COTS workstation manufacturers and performing product evaluations. The HP Z4 G4 workstation supports all features utilized by the Verity system and has equivalent or better regulatory specifications and performance.

The COTS display for use with the HP Z240 is also EOL and is replaced. The manufacturer, Hewlett Packard has recommended that the P232 display be replaced by the P244. The P244 display supports all features utilized by the Verity system and has equivalent or better regulatory specifications and performance.

The Windows operating system build and Verity Software will not be modified whatsoever by the change, however new drivers will be required to be added to the OS image to support the equivalent workstation hardware.

2 REASON / JUSTIFICATION FOR CHANGE

The Hewlett Packard Z240 workstation and P232 display are no longer available. Hewlett Packard has suggested the Z4 G4 workstation and P244 display as equivalent replacements.

3 DESCRIPTIONS OF CHANGES

3.1 New Workstation and Display Description

The HP Z4 G4 workstation is a replacement for the HP Z240. The workstation is the same tower form factor, and was suggested by the manufacturer as the replacement.

The HP P244 display is a replacement for the HP P232. The displays are the same size class, contrast ratio, brightness, and resolution.

The new workstation and display will receive new Item Numbers that call out the new manufacturer part numbers. The new workstation will receive new workstation kits. Displays do not receive kits, so no BOMs will be created or modified as a result of the display change.

Datasheets for the workstation and display are included in the following zip file:

4005664A_Supporting_Documents.zip

3.2 New Item Numbers

New item numbers will be created for the Z4 G4 model workstation and the P244 model display.

Hart Item Number	Manufacturer Name	Manufacturer Part Number
2005870	Hewlett Packard	Z4 G4
2005880	Hewlett Packard	P244

Table 1 – New Part Numbers

3.3 Configured Workstation Kits

New workstation kits will be created. These will be the same as the existing kits for the Z230, except the Z230 hardware (2005340) will be replaced with the Z240 hardware (2005348).

Hart P/N	Rev	Equivalent kit with Z240	Description	ECO
3005445	A	3005408	WORKSTATION, 64GB, VERITY DATA/BUILD (SERVER), HP Z4 G4 (IN CARTON)	ECO-01393
3005446	A	3005409	WORKSTATION, 64GB, VERITY DATA/BUILD (CLIENT), HP Z4 G4 (IN CARTON)	ECO-01393
3005447	A	3005410	WORKSTATION, 64GB, VERITY DATA/BUILD (CLIENT), HP Z4 G4 (IN CARTON)	ECO-01393
3005448	A	3005411	WORKSTATION, 64GB, VERITY COUNT (CLIENT), HP Z4 G4 (IN CARTON)	ECO-01393
3005449	A	3005412	WORKSTATION, 64GB, VERITY DATA/BUILD (STANDALONE), HP Z4 G4 (IN CARTON)	ECO-01393
3005450	A	3005413	WORKSTATION, 64GB, VERITY COUNT (STANDALONE), HP Z4 G4 (IN CARTON)	ECO-01393
3005451	A	3005414	WORKSTATION, 64GB, VERITY CENTRAL (STANDALONE / SERVER), HP Z4 G4 (IN CARTON)	ECO-01393
3005452	A	3005415	WORKSTATION, 64GB, VERITY CENTRAL (CLIENT), HP Z4 G4 (IN CARTON)	ECO-01393
3005453	A	3005416	WORKSTATION, 64GB, VERITY DATA/BUILD/COUNT (STANDALONE), HP Z4 G4 (IN CARTON)	ECO-01393
3005454	A	3005417	WORKSTATION, 64GB, VERITY CENTRAL (SERVER), HP Z4 G4 (IN CARTON)	ECO-01393
3005455	A	3005444	WORKSTATION, 64GB, VERITY RELAY, HP Z4 G4 (IN CARTON)	ECO-01393

Table 2 – New Workstation Kits

3.4 Workstation Manufacturing Procedure

A Workstation Manufacturing Process Document for Z4 G4 workstation deployments on Verity 2.4 has been created (4005667). The document content is parallels the Verity Workstation Manufacturing document (4005525) included in the Verity 2.4 TDP. Some topics this document describes are how to deploy a Verity workstation image, verify BIOS settings, and where to apply license labels and tamper seals.

The document can be found in the following zip file:

4005664A_Supporting_Documents.zip

3.5 Workstation OS Image Update

There is no change to the build of the OS: MS Windows Embedded 7, Service Pack 1 6.1.7601 and there is no change to the Verity software. The OS image will be updated to include updated drivers required to integrate the equivalent hardware devices. The following drivers replace existing drivers on the OS image.

Driver added to Z4 G4 Image	Equivalent Driver Removed from Image
NVIDIA Quadro P400 **Version: 26.21.14.4166**	Intel(R) HD Graphics 530 **Version: 21.20.16.4541**
Realtek High Definition Audio **Version: 6.0.1.8544**	Realtek High Definition Audio **Version: 6.0.1.7548**
Intel(R) I210 Gigabit Network Connection **Version: 12.13.27.0**	Intel(R) Ethernet Connection (2) I219-LM **Version: 12.15.23.7**
Intel(R) C600+/C220+ series chipset SATA RAID Controller **Version: 5.3.1.1020**	Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller **Version: 12.8.2.1000**
Intel(R) USB 3.0 eXtensible Host Controller **Version: 5.0.4.43**	Intel(R) USB 3.0 eXtensible Host Controller **Version: 4.0.0.36**

New product and OS images that include the changes described above will be delivered to SLI Compliance for their archives.

4 DATA JUSTIFYING CHANGE

The COTS workstation and displays are the direct replacement suggested by the manufacturer, Hewlett Packard. The workstation is the same tower form factor with equivalent operating temperature and regulatory certifications as the device it is replacing. The display is the same size class, contrast ratio, brightness, resolution, and has equivalent regulatory certifications as the device it is replacing.

Complete end-to-end Quality Assurance testing has been completed internally by Hart InterCivic using the workstation images described in Section 3.5. A description of testing performed and record of test results may be found in the QA test report, **HP Z4 G4 with Verity 2.4.2 QA Test Report.pdf**.

The document can be found in the following zip file:

4005664A_Supporting_Documents.zip

5 JUSTIFICATION OF DE MINIMIS CHANGE STATUS

The replacement COTS workstation and displays are equivalent to the existing devices, as defined in *EAC NOC-01: Clarification of COTS Product Equivalency for De Minimis Change.*

- These changes do not alter the system's reliability.
- These changes do not alter the system's functionality.
- These changes do not alter the system's capability.
- These changes do not alter the system's operation.
- These changes do not affect software.

6 DE MINIMIS CHANGE DEFINITION

From the United States Election Assistance Commission's Document titled: Voting System Testing & Certification Program Manual, Version 2.0.

> **3.4.2. De Minimis Change—Defined.** A de minimis change is a change to a certified voting system's hardware, software, TDP, or data, the nature of which will not materially alter the system's reliability, functionality, capability, or operation.

End of Document

Kathy Summers

From: Alli Fick <afick@hartic.com>
Sent: Thursday, June 4, 2020 12:28 PM
To: Kathy Summers
Subject: [EXTERNAL] Hart - de minimis change
Attachments: ECO-01393 Summary - Verity 2.4 Support for Updated HP Workstation and Display 4005664 A00.pdf; Hart ECO 01393 Approval 06-04-2020.pdf; Hart InterCivic - Request for Approval.pdf

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Kathy,

Thanks for adding this de minimis change to the July 13th agenda.

The Commercial Off the Shelf workstation that Hart uses for its Verity workstations, the Hewlett Packard Z240, is end-of-life and no longer manufactured. Hart will move forward with the HP Z4 G4 workstation as an equivalent replacement to the HP Z240. The COTS display for use with the HP Z240 is also end-of-life and is replaced. The manufacturer, Hewlett Packard has recommended that the P232 display be replaced by the P244.

The following supporting documents are attached to this email:

- Hart InterCivic – Request for Approval
- ECO-01393 Summary – Verity 2.4 Support for Updated HP Workstation and Display
- Hart ECO-01393 Approval 06-04-2020

Thanks!
Alli

HART Intercivic
Alli Fick
Certification Project Manager
Hart InterCivic
15500 Wells Port Drive | Austin, TX | 78728
512.252.6427 (direct) | 561.628.9273 (cell) | 800.223.HART
afick@hartic.com | www.hartintercivic.com

MicroVote

Request for Approval

October 12, 2020

- Bill Whitehead, Regional Sales Manager
- Debra Maggart - MicroVote Representative
  - **EMS 4.4 (Rev E Infinity Voting System Version 4.4 with VVPAT)**
  - **Firmware/Software 4.3A Upgrade**

United States Election Assistance Commission

Certificate of Conformance

MicroVote EMS 4.4

VVSG 2005 VER. 1

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* 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: EMS

Model or Version: 4.4

Name of VSTL: Pro V&V

EAC Certification Number: MVTEMS44

Date Issued: 05/01/2020

Mona Harrington

Executive Director

Scope of Certification Attached

Manufacturer: *MicroVote General Corporation*
System Name: *EMS 4.4*
Certificate: *MVTEMS44*

Laboratory: *Pro V&V*
Standard: *2005 VVSG*
Date: *05/01/2020*

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.

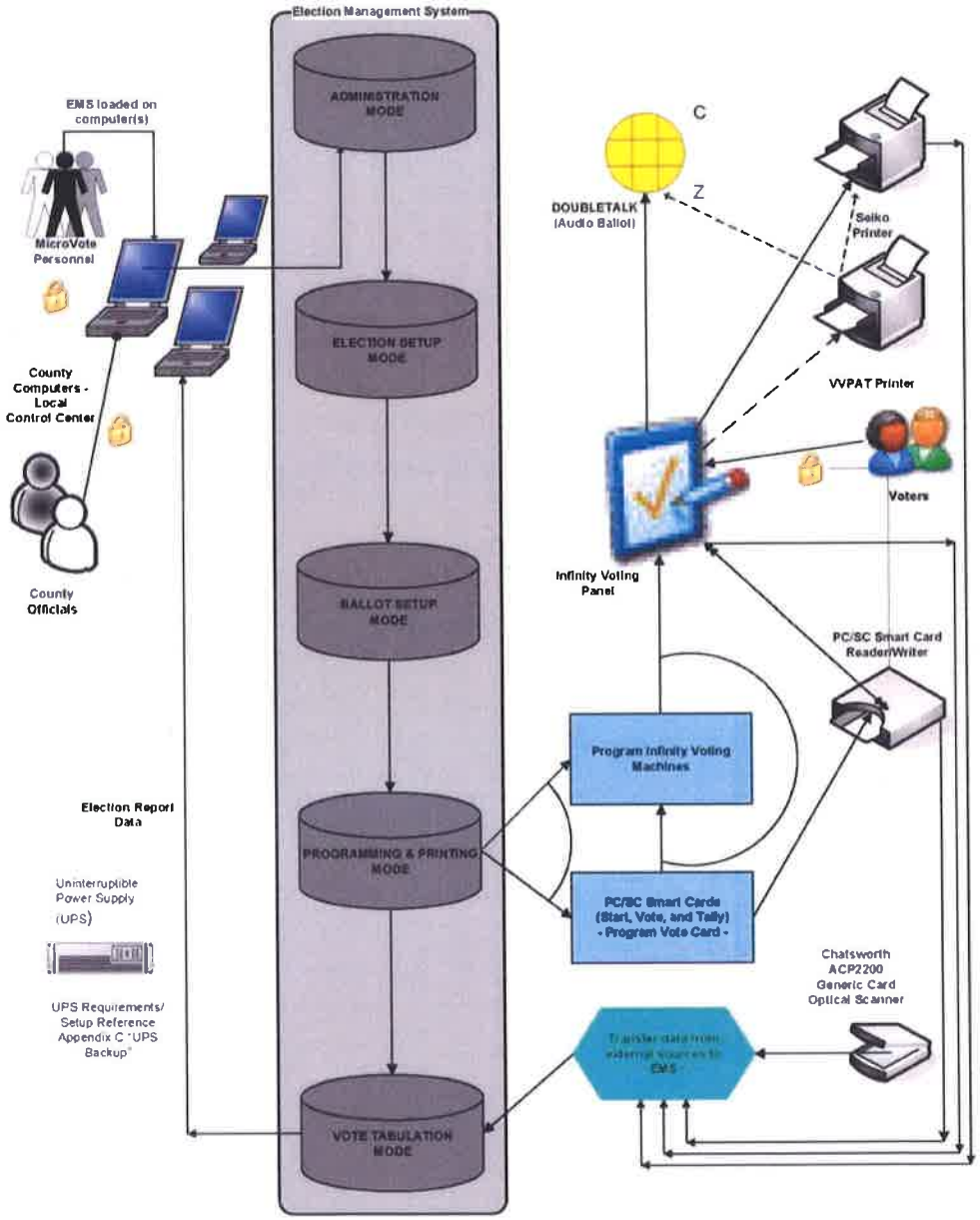
System Overview:

The MicroVote EMS 4.4 software functionality is divided by activity, based on each stage of the election. These activities are further divided into five modes, all building on each other to complete the election process: Administration, Election Setup, Ballot Setup, Programming & Printing, and Vote Tabulation.

The EMS software supports the MicroVote Infinity voting panel. This panel is a direct recording electronic (DRE) device, and is connected to EMS via a serial port. Data/Vote tabulations exchange between the EMS and the Infinity machine is done directly through the serial port or

via a Smart Card programmed for each election. OMR Ballot Cards, sometimes referred to as Absentee Cards, are optically scanned by a Chatsworth ACP 2200 reader.
Several COTS hardware items and software are used with the EMS software. EMS is designed to be used with Microsoft Windows 10 Pro X86/X64, and is installed on a Dell computer desktop and/or laptop. The database software is SQL Server 2017 Express. There is a COTS DOUBLETALK LT text-to-speech converter box attached to the Infinity machine. There are also COTS Smart Cards and Smart Card readers/writers. All OMR/Absentee ballot cards are optically scanned by the ACP 2200 reader.

System Diagram



Certified System before Modification (If applicable):

- EMS Release 4.0 Certificate ID: MVTEMS40
- EMS Release 4.0B Certificate ID: MVTEMS40B
- EMS Release 4.1 Certificate ID: MVTEMS41
- EMS Release 4.2 Certificate ID: MVTEMS42
- EMS Release 4.3-A Certificate ID: MVTEMS43A

Language capability:

English, Spanish and an optional third language (including pictographic / character languages)

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 Revision	Hardware Revision	COTS Information	Dependency Notes
EMS Software MicroVote 4.4	EMS Software V4.4	N/A	--	MicroVote EMS 4.2
EMS Server Dell Desktop		Dell Optiplex GX520, 3010, or 3020		MicroVote EMS 4.2
Microsoft SQL Server Express 2017	Express 17		--	
Microsoft Windows 10 Professional	10 Professional ver 1909		--	
Laptop(s) Dell		Dell Latitude E5440, E5570, E5580		
Infinity Model VP 1 Voting Panel	Firmware V4.3 (Rev D) V4.4 (Rev E)	Rev D or Rev E	--	Rev D – 4.2
VVPAT Printer	N/A	Rev A		
Scanner Dual Sided Chatsworth ACP 2200	N/A	Model 605000-190	--	All Certified Systems

System Component	Software or Firmware Revision	Hardware Revision	COTS Information	Dependency Notes
Printer Seiko	N/A	COTS Model DPU-414 or DPU-3445	--	All Certified Systems
Doubletalk Model LT3	BIOS0212	V1.0 LT RC8650	--	All Certified Systems
Smartcard Reader		HWP109380 B	PC/SC compatible USB contact reader/writer	MicroVote EMS 4.2
Smart Cards	N/A	16K or 115K	--	
Voting Booth	N/A	Model 2000	--	All Certified Systems
MinuteMan UPS	N/A	EP1000LCD	UPS	
APC Back-UPS Pro	N/A	BN110M2	UPS	
Hamilton Buhl Headphones	N/A	PRM100B	Headphones	
Head Stick	N/A		Pointer for ADA voters.	

System Limitations

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

Characteristic	Limiting Component	Evaluated	EMS	Infinity	ACP 2200
Maximum Ballot Positions	Ballot Design Form	150	600	600	402
Maximum Precincts in Election	Precinct Number	600	9,999	9,999	9,999
Maximum Contests in Election	Contests in Ballot Style * Ballot Styles/Election	100	300,000	2,999,700	2,009,799
Maximum Candidates/ Counters in Election	Precinct Counters * Total Precincts	300	5,989,401	5,989,401	4,019,598
Maximum Candidates/ Counters in Precinct	Ballot Design Form	300	599	599	402
Maximum Candidates/ Counters in Activation	Ballot Design Form	300	599	599	402
Maximum Ballot Styles in Election	Ballot Style Number	300	1000	9999	1000

Characteristic	Limiting Component	Evaluated	EMS	Infinity	ACP 2200
Maximum Contests in a Ballot Style	Ballot Design Form	100	300	300	201
Maximum Candidates in a Contest	Ballot Design Form	10	599	599	401
Maximum Count for any Precinct Element	Transact-SQL Bigint	600	See Note 1	65,000	See Note 1
Maximum Ballot Styles in a Precinct	Precinct Style Assignment Form	1	1	1	1
Maximum Activations per Ballot Style	Build Activations Form	25	99	30	99
Maximum Activations per Election	Act/Ballot Style * Ballot Style/Elec	1500	99,000	299,970	299,970
Maximum Number of Parties	Party Code Combinations	10	50,653	598	400
Maximum Vote For in Contest	Office Vote Limit	60	99	64	99

Note 1: 9,223,372,036,854,770,000

Functionality

2005 VVSG Supported Functionality Declaration

Feature / Characteristic	Yes / No	Comment
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open - Public Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. Choice of party ballot at the polling place, after which the poll worker provides or activates the appropriate ballot.	Yes	
Primary: Open - Private Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. The voters chooses the party ballot within the privacy of the voting booth.	No	
Partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	
Handles partisan contests in a primary election	Yes	

Feature / Characteristic	Yes / No	Comment
Handles partisan contests in a general election	Yes	
Non-partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	
Handles non-partisan contests in a primary election	Yes	
Handles non-partisan contests in a general election	Yes	
Write-In Voting:		
A separate voting position is identified for write-ins.	Yes	
Write-in for an N of M contest has M write-in positions.	Yes	
Write-in with no candidates (partisan & non-partisan contests)	Yes	
Method to flag write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations		
Slates of delegates are displayed for each presidential primary candidate	Yes	Use the Ballot text features to create a slate
Slates of delegates are chosen with one selection.	Yes	
Ballot Rotation:		
Names of candidates rotate.	No	
Straight Party Voting:		
Make one selection to vote for all candidates of one party in a general election	Yes	
Undervote the straight party selection and choose each candidate individually	Yes	
Vote straight party and then change votes to cross over to another party's candidate.	Yes	
Vote straight party for a party without a candidate in one of the races.	Yes	
Votes straight party in an: N of M contest (N>1)	Yes	
Cross-Party Endorsement:		
One candidate is endorsed by multiple parties.	Yes	Set up the candidate for each party. Manually combine votes in the canvas.
Cross Party Endorsement is supported in straight party contests	Yes	
Split Precincts:		

Feature / Characteristic	Yes / No	Comment
Precincts splits with multiple ballot styles	Yes	
The number of voters is identified for the precinct split.	Yes	
The vote totals are not reported for the precinct split.	Yes	
Ballot faces match the correct contests and ballot identification for each split.	Yes	
The correct contests are presented for the appropriate ballot split.	Yes	
Vote N of M:		
Counts each selected candidate, if less than or equal to "M" candidates are selected. (Overvote if >M)	Yes	
Identifies an undervote if less than "M" candidates are selected.	Yes	
Recall Issues, with options:		
The recall vote is a Yes or No question.	No	
The recall is a vote for 1 of M vote with the Retain one choice and each replacement candidate a separate choice.	No	
Two contests are on the ballot. The voter must vote Yes to recall in order to vote in the second contest for the replacement candidate. A No, undervote or overvote will not allow a vote in the second contest to be counted.	No	
Two contests are on the ballot. If a voter votes Yes or No they may vote in the second contest for the replacement candidate. An undervote or overvote will not allow a vote in the second contest to be counted.	No	Functionality overturned - US District Court 7/29/03: CA Election Code sect. 11383
Cumulative Voting		
Voting method exclusive to multi-member boards. Each voter may cast as many votes as there are seats to be filled and may cast two or more of those votes for a single candidate.	No	
Ranked Order Voting		
Voters rank candidates in a contest in order of choice (1,2,3,etc.)	No	
A write in vote can be ranked.	No	
Tabulation of Ranked Order Votes		
Ballots are sorted according to the 1st ranked choice. If no candidate receives a majority of first ranked choice the candidate with the least 1st ranks is eliminated. Votes are recounted and are distributed to the remaining candidates according to the 2nd ranked choice. If still no candidate has a majority the candidate with the process repeats to next rank choice s until a candidate has obtained a majority.	No	

Feature / Characteristic	Yes / No	Comment
A ballot is no longer counted if all ranked choices have been eliminated	No	
Once candidates are eliminated no votes can be transferred to them. Ballots being recounted which identify an eliminated candidate go to the next ranked candidate.	No	
If a rank is skipped the vote for the next rank is counted.	No	
Provisional or Challenged Ballots		
Provisional ballots maintain the secrecy of the ballot.	Yes	
A voted provisional ballot that is not included in the poll close report can be identified for determination.	Yes	
Valid provisional votes can be added in the central count report.	Yes	
A voted provisional ballots which is included in the poll close report can be identified and subtracted in the central count.	Yes	
Secondary Vote Limit		
A voting variation outside the VVSG, which is supported by an additional vote limit that can be placed on grouped contests, so that multiple limits are placed on the vote.	Yes	

Baseline Certification Engineering Change Orders (ECO)

This table depicts the ECOs certified with the voting system:

Change ID	Date	Component	Description	Inclusion
ECO 125	04/29/20	UPS for Infinity Panel	Replace APC BN1100M2 with BX1000M due to EOL	DeMinimis Optional

Kathy Summers

From: Bill Whitehead <bwhitehead@microvote.com>
Sent: Wednesday, May 6, 2020 12:22 PM
To: Mark Goins
Cc: Andrew Dodd; Beth Henry-Robertson; Kathy Summers; Mandy Miller; Mike Miller; Steve Shamo; Debra Maggart
Subject: [EXTERNAL] MicroVote Rev E Infinity Voting System (Ver. 4.4) with VVPAT - EAC Certification
Attachments: Microvote EMS 4.4 Certificate of Conformance and Scope.pdf

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Mark,

We are pleased to inform you that our Rev E Infinity Voting System Version 4.4 with VVPAT is now certified with the EAC. Attached is our Certificate of Conformance as well our Scope of Work documentation.
With a total understanding of the current events and upcoming elections in Tennessee, we still look forward to the next step in the process of certifying this product for sale and use in Tennessee.
Please advise what else you may need from us as well as what we can do next to keep this moving forward.
I appreciate your help and hope this finds you all safe and healthy.

Regards,

Bill Whitehead
Regional Sales Manager
MicroVote General Corporation
6366 Guilford Avenue
Indianapolis, IN 46220

Cell
317-414-2823
Office
800-257-4901
Fax
888-544-9046

United States Election Assistance Commission

Certificate of Conformance

MicroVote EMS 4.41

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* 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: EMS

Model or Version: 4.41

Name of VSTL: Pro V&V

EAC Certification Number: MVTEMS441

Date Issued: 09/18/2020

Mona Harrington

Executive Director

Scope of Certification Attached

Manufacturer: *MicroVote General Corporation*
System Name: *EMS 4.41*
Certificate: *MVTEMS441*

Laboratory: *Pro V&V*
Standard: *2005 VVSG*
Date: *09/11/2020*

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.
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- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

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System Overview:

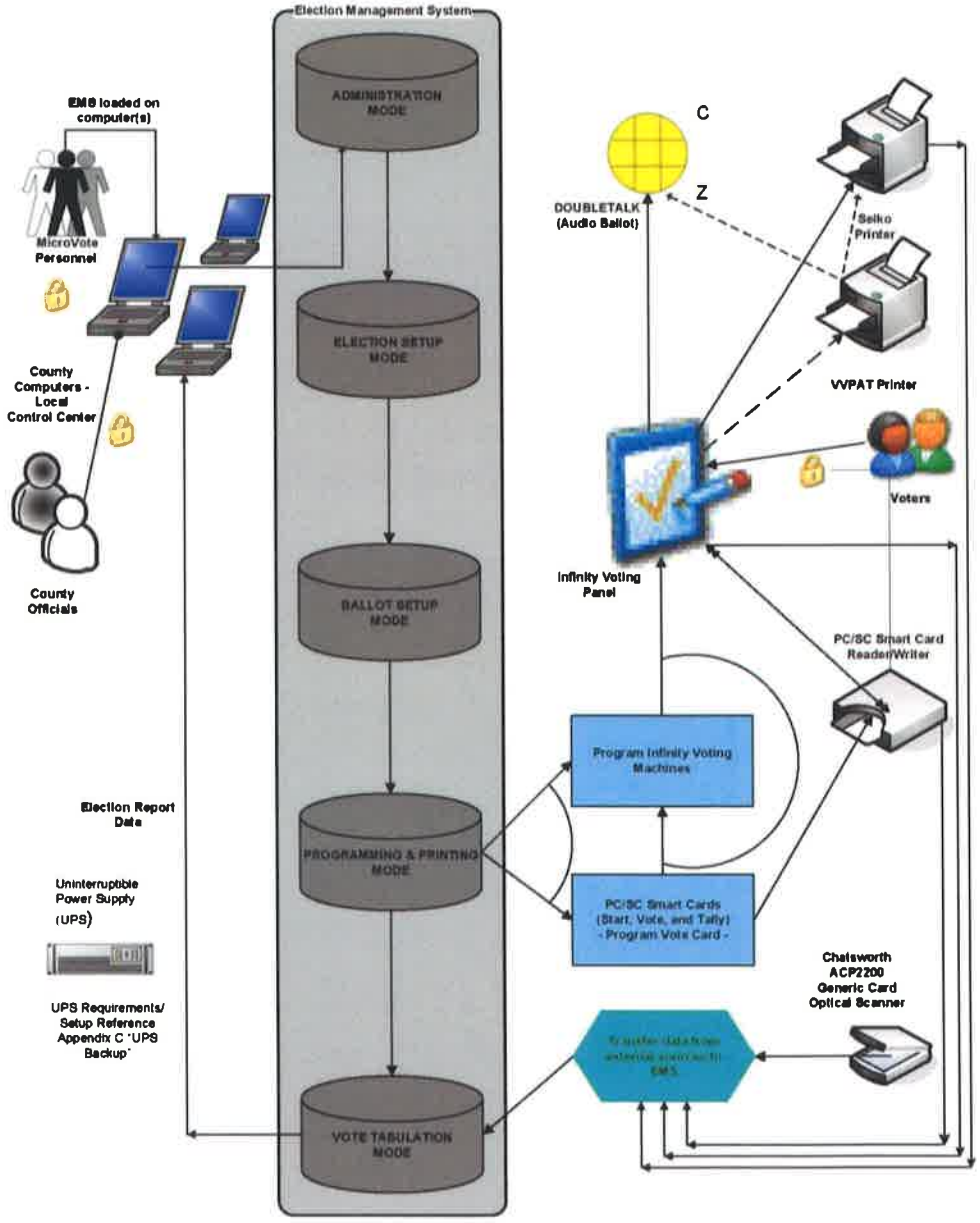
The MicroVote EMS 4.41 software functionality is divided by activity, based on each stage of the election. These activities are further divided into five modes, all building on each other to complete the election process: Administration, Election Setup, Ballot Setup, Programming & Printing, and Vote Tabulation.

The EMS software supports the MicroVote Infinity voting panel. This panel is a direct recording electronic (DRE) device, and is connected to EMS via a serial port. Data/Vote tabulations exchange between the EMS and the Infinity machine is done directly through the serial port or

via a Smart Card programmed for each election. OMR Ballot Cards, sometimes referred to as Absentee Cards, are optically scanned by a Chatsworth ACP 2200 reader.

Several COTS hardware items and software are used with the EMS software. EMS is designed to be used with Microsoft Windows 10 Pro X86/X64, and is installed on a Dell computer desktop and/or laptop. The database software is SQL Server 2017 Express. There is a COTS DOUBLETALK LT text-to-speech converter box attached to the Infinity machine. There are also COTS Smart Cards and Smart Card readers/writers. All OMR/Absentee ballot cards are optically scanned by the ACP 2200 reader.

System Diagram



Certified System before Modification (If applicable):

- EMS Release 4.0 Certificate ID: MVTEMS40
- EMS Release 4.0B Certificate ID: MVTEMS40B
- EMS Release 4.1 Certificate ID: MVTEMS41
- EMS Release 4.2 Certificate ID: MVTEMS42
- EMS Release 4.3-A Certificate ID: MVTEMS43A
- EMS Release 4.4 Certified ID: MVTEMS44

Language capability:

English, Spanish and an optional third language (including pictographic / character languages)

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 Revision	Hardware Revision	COTS Information	Dependency Notes
EMS Software MicroVote 4.4	EMS Software V4.4.8.0	N/A	--	MicroVote EMS 4.4
EMS Server Dell Desktop		Dell Optiplex GX520, 3010, or 3020		MicroVote EMS 4.2
Microsoft SQL Server Express 2017	Express 17		--	
Microsoft Windows 10 Professional	10 Professional ver 1909		--	
Laptop(s) Dell		Dell Latitude E5440, E5570, E5580, 3500		
Infinity Model VP 1 Voting Panel	Firmware V4.3 (Rev D) V4.4 (Rev E)	Rev D or Rev E	--	Rev D – 4.2
VVPAT Printer	N/A	Rev A		
Scanner Dual Sided Chatsworth ACP 2200	N/A	Model 605000-190	--	All Certified Systems

System Component	Software or Firmware Revision	Hardware Revision	COTS Information	Dependency Notes
Printer Seiko	N/A	COTS Model DPU-414 or DPU-3445	--	All Certified Systems
Doubletalk Model LT3	BIOS0212	V1.0 LT RC8650	--	All Certified Systems
Smartcard Reader		HWP109380 B	PC/SC compatible USB contact reader/writer	MicroVote EMS 4.2
Smart Cards	N/A	16K or 115K	--	
Voting Booth	N/A	Model 2000	--	All Certified Systems
MinuteMan UPS	N/A	EP1000LCD	UPS	
APC Back-UPS Pro	N/A	BN1100M2, BX1000M	UPS	
Hamilton Buhl Headphones	N/A	PRM100B	Headphones	
Head Stick	N/A		Pointer for ADA voters.	

System Limitations

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

Characteristic	Limiting Component	Evaluated	EMS	Infinity	ACP 2200
Maximum Ballot Positions	Ballot Design Form	150	600	600	402
Maximum Precincts in Election	Precinct Number	600	9,999	9,999	9,999
Maximum Contests in Election	Contests in Ballot Style * Ballot Styles/Election	100	300,000	2,999,700	2,009,799
Maximum Candidates/ Counters in Election	Precinct Counters * Total Precincts	300	5,989,401	5,989,401	4,019,598
Maximum Candidates/ Counters in Precinct	Ballot Design Form	300	599	599	402
Maximum Candidates/ Counters in Activation	Ballot Design Form	300	599	599	402

Characteristic	Limiting Component	Evaluated	EMS	Infinity	ACP 2200
Maximum Ballot Styles in Election	Ballot Style Number	300	1000	9999	1000
Maximum Contests in a Ballot Style	Ballot Design Form	100	300	300	201
Maximum Candidates in a Contest	Ballot Design Form	10	599	599	401
Maximum Count for any Precinct Element	Transact-SQL Bigint	600	See Note 1	65,000	See Note 1
Maximum Ballot Styles in a Precinct	Precinct Style Assignment Form	1	1	1	1
Maximum Activations per Ballot Style	Build Activations Form	25	99	30	99
Maximum Activations per Election	Act/Ballot Style * Ballot Style/Elec	1500	99,000	299,970	299,970
Maximum Number of Parties	Party Code Combinations	10	50,653	598	400
Maximum Vote For in Contest	Office Vote Limit	60	99	64	99

Note 1: 9,223,372,036,854,770,000

Functionality

2005 VVSG Supported Functionality Declaration

Feature / Characteristic	Yes / No	Comment
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open - Public Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. Choice of party ballot at the polling place, after which the poll worker provides or activates the appropriate ballot.	Yes	
Primary: Open - Private Selection A primary election in which voters, regardless of political affiliation, may choose in which party's primary they will vote. The voters chooses the party ballot within the privacy of the voting booth.	No	
Partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	

Feature / Characteristic	Yes / No	Comment
Handles partisan contests in a primary election	Yes	
Handles partisan contests in a general election	Yes	
Non-partisan Offices		
Handles vote for 1 races	Yes	
Handles N of M races	Yes	
Handles non-partisan contests in a primary election	Yes	
Handles non-partisan contests in a general election	Yes	
Write-In Voting:		
A separate voting position is identified for write-ins.	Yes	
Write-in for an N of M contest has M write-in positions.	Yes	
Write-in with no candidates (partisan & non-partisan contests)	Yes	
Method to flag write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations		
Slates of delegates are displayed for each presidential primary candidate	Yes	Use the Ballot text features to create a slate
Slates of delegates are chosen with one selection.	Yes	
Ballot Rotation:		
Names of candidates rotate.	No	
Straight Party Voting:		
Make one selection to vote for all candidates of one party in a general election	Yes	
Undervote the straight party selection and choose each candidate individually	Yes	
Vote straight party and then change votes to cross over to another party's candidate.	Yes	
Vote straight party for a party without a candidate in one of the races.	Yes	
Votes straight party in an: N of M contest (N>1)	Yes	
Cross-Party Endorsement:		
One candidate is endorsed by multiple parties.	Yes	Set up the candidate for each party. Manually combine votes in the canvas.
Cross Party Endorsement is supported in straight party contests	Yes	

Feature / Characteristic	Yes / No	Comment
Split Precincts:		
Precincts splits with multiple ballot styles	Yes	
The number of voters are identified for the precinct split.	Yes	
The vote totals are not reported for the precinct split.	Yes	
Ballot faces match the correct contests and ballot identification for each split.	Yes	
The correct contests are presented for the appropriate ballot split.	Yes	
Vote N of M:		
Counts each selected candidate, if less than or equal to "M" candidates are selected. (Overvote if >M)	Yes	
Identifies an undervote if less than "M" candidates are selected.	Yes	
Recall Issues, with options:		
The recall vote is a Yes or No question.	No	
The recall is a vote for 1 of M vote with the Retain one choice and each replacement candidate a separate choice.	No	
Two contests are on the ballot. The voter must vote Yes to a recall in order to vote in the second contest for the replacement candidate. A No, undervote or overvote will not allow a vote in the second contest to be counted.	No	
Two contests are on the ballot. If a voter votes Yes or No they may vote in the second contest for the replacement candidate. An undervote or overvote will not allow a vote in the second contest to be counted.	No	Functionality overturned - US District Court 7/29/03: CA Election Code sect. 11383
Cumulative Voting		
Voting method exclusive to multi-member boards. Each voter may cast as many votes as there are seats to be filled and may cast two or more of those votes for a single candidate.	No	
Ranked Order Voting		
Voters rank candidates in a contest in order of choice (1, 2, 3, etc.)	No	
A write in vote can be ranked.	No	
Tabulation of Ranked Order Votes		
Ballots are sorted according to the 1st ranked choice. If no candidate receives a majority of first ranked choice the candidate with the least 1st ranks is eliminated. Votes are recounted and are distributed to the remaining candidates according to the 2nd ranked choice. If still no candidate has	No	

Feature / Characteristic	Yes / No	Comment
a majority, the candidate with the process repeats to next rank choice s until a candidate has obtained a majority.		
A ballot is no longer counted if all ranked choices have been eliminated	No	
Once candidates are eliminated, no votes can be transferred to them. Ballots being recounted, which identify an eliminated candidate, go to the next ranked candidate.	No	
If a rank is skipped, the vote for the next rank is counted.	No	
Provisional or Challenged Ballots		
Provisional ballots maintain the secrecy of the ballot.	Yes	
A voted provisional ballot, that is not included in the poll close report, can be identified for determination.	Yes	
Valid provisional votes can be added in the central count report.	Yes	
A voted provisional ballot, which is included in the poll close report, can be identified and subtracted in the central count.	Yes	
Secondary Vote Limit		
A voting variation outside the VVSG, which is supported by an additional vote limit that can be placed on grouped contests, so that multiple limits are placed on the vote.	Yes	

Baseline Certification Engineering Change Orders (ECO)

This table depicts the ECOs certified with the voting system:

Change ID	Date	Component	Description	Inclusion
ECN 130	09/15/20	Dell Laptop	Replace end of life laptop (3500) with current model (Dell Latitude 3510)	DeMinimis

6705 Odyssey Drive
Suite C
Huntsville, AL 35806
Phone (256)713-1111
Fax (256)713-1112

Test Report for EAC 2005 VVSG 1.0 Certification Testing MicroVote EMS 4.41 Voting System

EAC Project Number: MVTEMS441

Version: 02

Date: 09/04/2020

U.S. Election Assistance Commission
VSTL

EAC Lab Code **1501**

NVLAP®

NVLAP LAB CODE 200908-**0**

SIGNATURES

Approved by: Michael L. Walker — 09/04/2020

Michael Walker, VSTL Project Manager — Date

Approved by: Wendy Owens — 09/04/2020

Wendy Owens, VSTL Program Manager — Date

REVISIONS

Revision	Description	Date
00	Initial Release	08/25/2020
01	Updated to resolve EAC comments	08/28/2020
02	Final Version with highlights removed	09/04/2020

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this Test Report is to document the procedures that Pro V&V, Inc. followed to perform certification testing during a system modification campaign for the MicroVote EMS 4.41 Voting System to the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG), Version 1.0. Certification testing of EMS 4.41 was performed to ensure the applicable requirements of the EAC VVSG 1.0 and the EAC Testing and Certification Program Manual, Version 2.0 were met. Additionally, all EAC Request for Interpretations (RFI) and Notices of Clarification (NOC) relevant to the system under test were incorporated in the test campaign.

Prior to submitting the voting system for testing, MicroVote submitted an application package to the EAC for certification of the EMS 4.41 Voting System. The application was accepted by the EAC and the project was assigned the unique Project Number of MVTEMS441.

The EMS 4.41 EAC-approved test plan, which is available for viewing on the EAC's website at www.eac.gov, was utilized as the guiding document during test performance. Since test plan approval, and as testing progressed, minor system modifications, such as revised system documentation, were incorporated. This test report reflects all of the testing completed and details the final versions of all technical documentation and system components and supersedes the approved test plan.

Unless otherwise annotated, all testing was conducted at the Pro V&V test facility located in Huntsville, AL, by personnel verified by Pro V&V to be qualified to perform the test.

1.1 Description and Overview of EAC Certified System Being Modified

EMS 4.41 is a modification to a previously certified system and has not yet been fielded. The EMS 4.41 software functionality is divided by activity, based on each stage of the election. These activities are further divided into five modes, all building on each other to complete the election process: Administration, Election Setup, Ballot Setup, Programming & Printing, and Vote Tabulation. These modes combined, working together capture:

- Creating and maintaining default preferences and settings for a specific jurisdiction.
- Creating and maintaining preferences and settings for an election.
- Creating and maintaining security clearances for all users of EMS.
- Creating primary, general or both types of elections or municipal elections.
- Creating offices and filing candidates.
- Creating and maintaining all objects appearing on the ballot.
- Printing ballots.
- Programming voting devices.

- Printing reports of election data.
- Tallying election results.
- Generating reports of election results for state reporting systems, media displays, or printing.
- Creating and restoring backup files of election databases for archival purposes

The Administration mode is the system setup stage. This mode includes: Preferences, Political Parties, Vote Types, Precincts, Ballot Text, Ballot Graphics, Equipment, Equipment Assignment, and Security. Election Setup Reports reflecting each form are also available.

The Election Setup, Ballot Setup, and Programming & Printing modes are all pre-election activities. The Election Setup includes entering offices, filing candidates, creating secondary vote lockouts. In Ballot Setup, users create and edit ballots, build activations, and assign precincts. Programming & Printing includes programming voting machines and Smart Cards, previewing and printing ballots, and assigning voting panels to locations.

Phonetics, text-to-speech, option is built into EMS. All pronunciation of words, names or phrases can be altered for better listening comprehension. Reports are available for Election and Ballot setup for further election setup auditing.

EMS 4.41 includes support for an optional Voter Verifiable Printed Audit Trail (VVPAT) printer to be attached to the MicroVote Infinity voting panel. The EMS user can set the number of allowed voter voids (1-5) during the voting session and optional QR code printed on each ballot which contains ballot header information and ballot selections.

The Vote Tabulation mode is the final mode during which all tabulations and final results are produced. Election Night Reporting mode reports reflect the results as they are tabulated.

The EMS software supports the MicroVote Infinity voting panel with optional VVPAT printer attached. This panel is a direct recording electronic (DRE) device, and is connected to EMS via a serial port. Data/Vote tabulations exchange between the EMS and the Infinity machine is done directly through the serial port or via a Smart Card programmed for each election. OMR Ballot Cards, sometimes referred to as Absentee Cards, are optically scanned by a Chatsworth ACP 2200 reader.

Several COTS hardware items and software are used with the EMS software. EMS is designed to be used with Microsoft Windows 10 Pro X86/X64, and is installed on a Dell computer desktop and/or laptop. The database software is SQL Server 2017 Express. There is a COTS DOUBLETALK LT text-to-speech converter box attached to the Infinity machine. There are also COTS Smart Cards and Smart Card readers/writers. All OMR/Absentee ballot cards are optically scanned by the ACP 2200 reader.

1.1.1 Baseline Certified System

The EAC Certified System that is the baseline for the submitted modification is described in the following subsections. All information presented was derived from the previous Certification Test Report, the EAC Certificate of Conformance and/or the System Overview.

The EAC-certified system that is the baseline system for this modification is the EMS 4.4 Voting System. The tables below describe the certified equipment and firmware versions. Detailed descriptions of the EMS 4.4 test campaign are contained in Pro V&V Report No. TR-01-01-MVT-002-01.01, which is available for viewing on the EAC's website at www.eac.gov.

Table 1-1. EMS 4.4 System Components

EMS 4.4 SYSTEM SOFTWARE	
Firmware/Software	**Version**
Proprietary	
Election Management Software (EMS)	4.4
Infinity Panel Rev. D	4.30
Infinity Panel Rev. E	4.40
COTS	
Microsoft Windows 10 Professional	1909
Microsoft Visual Studio 2017 Professional	15.9
ComponentOne Ultimate 2014	1
Advanced Installer	16.4.1
Advanced Installer Extension for Visual Studio 2017	16.5
EMS 4.4 SYSTEM HARDWARE	
Component	**Serial Number**
Proprietary	
Infinity Voting Panel (Rev D) w/Power Supply	11588
Infinity Voting Panel (Rev E) w/Power Supply	14009, 14010
VVPAT (Rev A) w/Power Supply	001011, 001100
COTS	
Tripp Lite Portable Surge Protector (TRAVELCUBE)	[MVT-TC-001], [MVT-TC-002]
Minuteman UPS (EP1000LCD)	AK11190890004

Table 1-1. EMS 4.4 System Components (continued)

Component	Serial Number
APC Back-UPS Pro (BN1100M2)	3B1925X63177, 3B1925X63227
Dell Latitude 5580 Laptop w/Power Supply	51LG8H2, 5DL1RN2
USB Smart Card Reader (PC USB TR PIV) w/Stand (HWP109380 B)	113101316600170
EMS Download Cable	CC06789-06, [MVT-DC-001]
USB-RS232 Converter	USA000106043, USA000155787
Seiko Instruments Printer (DPU-3445) w/Power Supply	2008922A
DoubleTalk LT	[MVT-DT-001]
Hamilton Buhl (PRM100B)	[MVT-HB-001]
Chatsworth Data (ACP-2200)	CDT021901537, CDT121901544
Head Stick	[MVT-HS-001]

1.2 References

- Election Assistance Commission 2005 Voluntary Voting System Guidelines (VVSG) Version 1.0, Volume I, "Voting System Performance Guidelines"
- Election Assistance Commission 2005 Voluntary Voting System Guidelines (VVSG) Version 1.0, Volume II, "National Certification Testing Guidelines"
- Election Assistance Commission Testing and Certification Program Manual, Version 2.0
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 2.0
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-2016, "NVLAP Procedures and General Requirements (NIST Handbook 150-2016)", dated July 2016
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)", dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Pro V&V, Inc. Quality Assurance Manual, Revision 7.0
- Election Assistance Commission "Approval of Voting System Testing Application Package" letter dated August 24, 2020
- EAC Requests for Interpretation (RFI) (listed on www.eac.gov)

- EAC Notices of Clarification (NOC) (listed on www.eac.gov)
- MicroVote EMS 4.41 Technical Data Package *(A listing of the EMS 4.41 documents submitted for this test campaign is listed in Section 3.1 of this Test Report)*
- MicroVote TDP Section 2.13 System Change Notes, Election Management System, Version 1.18, dated 11/07/2019

1.3 Terms and Abbreviations

This subsection lists terms and abbreviations relevant to the hardware, the software, or this Test Report.

"COTS" – Commercial Off-The-Shelf

"DRE" – Direct Record Electronic

"EAC" – United States Election Assistance Commission

"EMS" – Election Management System

"FCA" – Functional Configuration Audit

"HAVA" – Help America Vote Act

"NIST" – National Institute of Standards and Technology

"NOC" – Notice of Clarification

"NVLAP" – National Voluntary Laboratory Accreditation Program

"PCA" – Physical Configuration Audit

"QA" – Quality Assurance

"RFI" – Request for Interpretation

"TDP" – Technical Data Package

"VSTL" – Voting System Test Laboratory

"VVPAT" – Voter Verifiable Paper Audit Trail

"VVSG" – Voluntary Voting System Guidelines

2.0 CERTIFICATION TEST BACKGROUND

EMS 4.41 is a modification of a previously certified system (EMS 4.4).

Pro V&V performed an evaluation of results from the previous test campaign to determine the scope of testing required for certification of the EMS 4.41. Based on this evaluation, Pro V&V

determined that testing from the previous test campaign would establish the baseline and that the focus of this test campaign would be on the documented system updates.

No prior non-VSTL testing of the EMS 4.41 modifications were considered for this test campaign.

2.1 Revision History

The table below details the version history of the EMS 4.41 System:

Table 2-1. EMS 4.41 System Revision History

System Version	Certification Type	Baseline System	Certification Number
EMS 4.0	New System	--- (Original System)---	MVTEMS4
EMS 4.0B	Modification	EMS 4.0	MVTEMS40B
EMS 4.1	Modification	EMS 4.0B	MVTEMS41
EMS 4.2	Modification	EMS 4.1	MVTEMS42
EMS 4.4	Modification	EMS 4.2	MVTEMS44
EMS 4.41	Modification	EMS 4.4	MVTEMS441*

*Upon grant of certification by the EAC

2.2 Scope of Testing

The scope of testing was limited to the modifications made to the previously certified EMS 4.4 Voting System. Prior to test initiation, Pro V&V performed an evaluation of the results from the previous test campaign along with the changes made to the system to determine the scope of testing required for certification of the EMS 4.41. Based on this evaluation, Pro V&V determined that testing from the previous test campaigns would establish the baseline and that the focus of this test campaign would be on the system updates.

It was determined the following tasks would be required to verify compliance of the modifications:

- Technical Data Package (TDP) Review

  A limited TDP Review was performed to ensure that all submitted modifications were accurately documented and that the documents met the requirements of the EAC 2005 VVSG.

- Physical Configuration Audit (PCA)

  A PCA was performed to compare the voting system submitted for certification testing to the manufacturer's technical documentation.

- Source Code Review, Compliance Build, Trusted Build, and Build Document Review

  A source code review was performed based on the source code changes made since the previous system was certified. To perform the source code review, Pro V&V reviewed the submitted source code to the EAC VVSG 1.0 and the manufacturer-submitted coding

standards. Prior to initiating the software review, Pro V&V verified that the submitted documentation was sufficient to enable: (1) a review of the source code and (2) Pro V&V to design and conduct tests at every level of the software structure to verify that design specifications and performance guidelines are met.

- EMS and System Functional Regression Testing

  Functional Regression Testing was conducted on the EMS to establish assurance that the modifications had no adverse impact on the compliance, integrity, or performance of the system. As part of this area of testing, a smoke test was performed by executing an election utilizing every component of the previously certified equipment.

2.2.1 Modification Overview

The submitted modification for the EMS 4.41 test campaign is a source code modification to the baseline EMS 4.4 system EMS software. This modification (V4.4.7.0 -> V4.4.8.0) allows the system to display running precinct count in addition to running batch count. Revising the frmOMR.vb module in EMS V4.4.7.0 improves batch processing for scanning large numbers of mail-in absentee ballots by displaying running total of precinct ballots scanned in addition to running total for current batch of ballots being scanned. This change will make it easier to break up large numbers of received ballots to scan into smaller batches for processing while still displaying the overall number of ballots scanned for each precinct. *Note: This modification is documented in MicroVote ECN 127, which was submitted for review following final certification of EMS 4.4.*

2.2.2 System Overview

The MicroVote EMS 4.41 Voting System is comprised of the following components: EMS Software Version 4.4, Infinity Panel Rev. E, Infinity Panel Rev. D, and optional VVPAT, as described in Section 1.1 of this report. The materials identified by the manufacturer as materials deliverable to the end user for the EMS 4.41 system are identified below

Table 2-2. EMS 4.41 System Deliverables

Material	Version	Description
EMS Software	4.4	Election Management Software
Infinity Panel	Rev E	DRE precinct count/accessible voting station
Infinity Panel	Rev D	DRE precinct count/accessible voting station
VVPAT	Rev A	Voter Verifiable Paper Audit Trail

2.2.2.1 System Diagram

The system overview of the EMS 4.41 voting system is depicted in Figure 1-1.

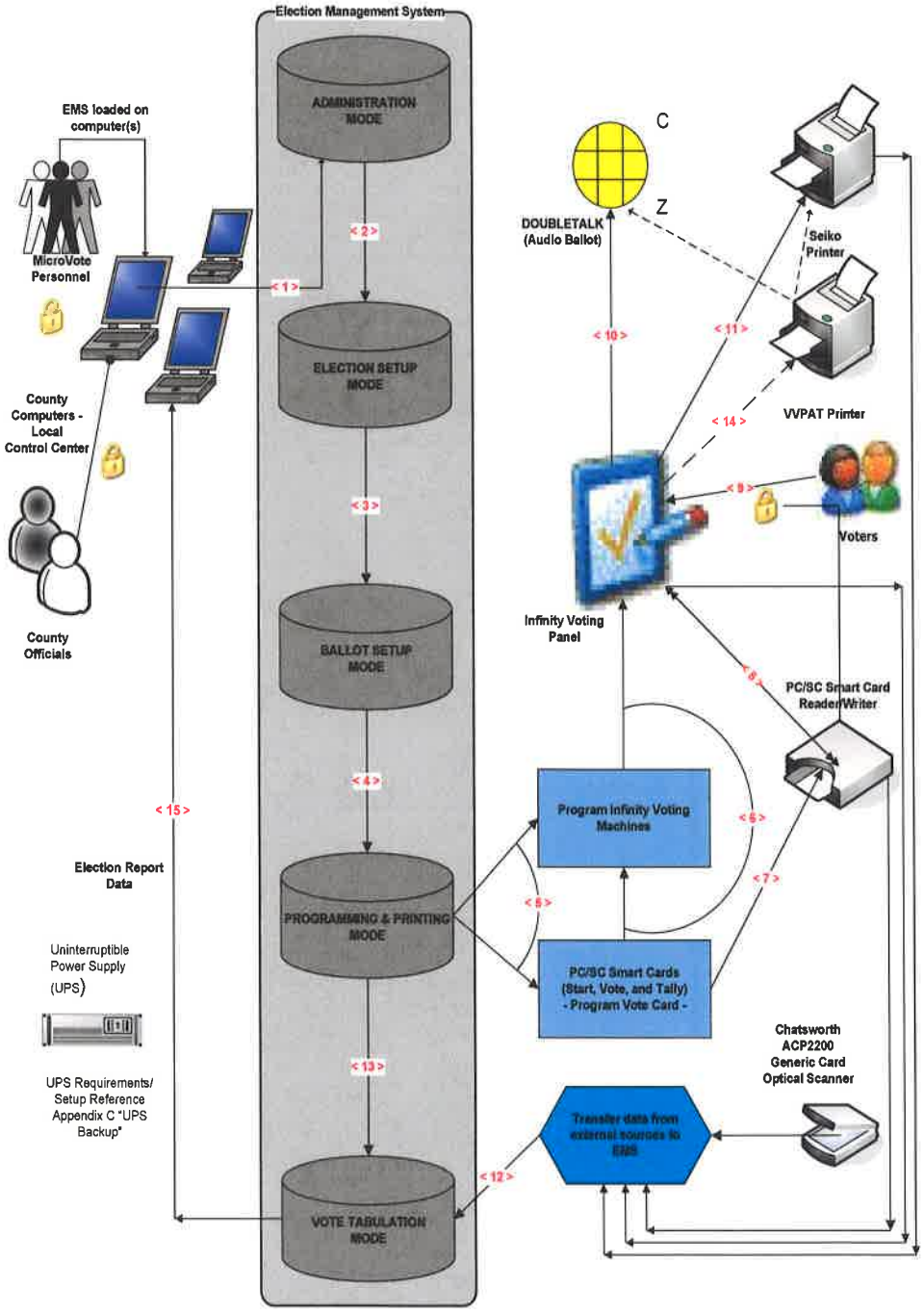


Figure 1-1. EMS 4.41 System Overview

2.2.2.2 Supported Functionality

There were no changes made to the supported functionality of the voting system. The supported functionality for the submitted voting system remains unchanged from the previously certified version.

- General Election
- Closed Primary
- Open Primary
- Partisan/Non-Partisan Offices
- Write-In Voting
- Primary Presidential Delegation Nominations
- Split Precincts
- Vote for N of M
- Provisional/Challenged Ballots
- Straight Party Voting
- Cross-party Endorsement

2.2.2.3 Supported Languages

The following languages are supported by EMS 4.41:

- English
- Spanish
- optional third language, including pictographic

Support for each stated languages was verified. Both English and Spanish language ballots were cast during the performance of functional testing. Additionally, one character based language (Chinese) was tested during System Integration Testing.

Testing of the Chinese language was accomplished through the creation and execution of both a primary and general election verifying the translations could be used by Chinese minority language voters. The translations themselves were taken from an online translator (Google Translate). The translations were then copied and pasted into the qualified EMS ballot text fields using Windows Notepad. In order for the Infinity Panel to recognize the Chinese characters, a number of special reserved ballot text objects were activated, as covered in MicroVote TDP *Appendix B: Third Language Support of the EMS User Manual.*

2.2.2.4 System Limits

There were no changes to the system limits. The system limitations supporting EMS 4.41 are provided in the table below:

Table 2-3. EMS 4.41 System Limitations

Characteristic	Limiting Component	Evaluated	Manufacturer Calculated		
			EMS	Infinity	ACP 2200
Maximum Ballot Positions	Ballot Design Form	300	600	600	402
Maximum Precincts in Election	Precinct Number	600	9,999	9,999	9,999
Maximum Contests in Election	Contests in Ballot Style * Ballot Styles/Election	100	300,000	2,999,700	2,009,799
Maximum Candidates/ Counters in Election	Precinct Counters * Total Precincts	300	5,989,401	5,989,401	4,019,598
Maximum Candidates/ Counters in Precinct	Ballot Design Form	300	599	599	402
Maximum Candidates/ Counters in Activation	Ballot Design Form	300	599	599	402
Maximum Ballot Styles in Election	Ballot Style Number	300	1000	9999	1000
Maximum Contests in a Ballot Style	Ballot Design Form	100	300	300	201
Maximum Candidates in a Contest	Ballot Design Form	300	599	599	401
Maximum Count for any Precinct Element	Transact-SQL Bigint	600	*Note 1*	65,000	*Note 1*
Maximum Ballot Styles in a Precinct	Precinct Style Assignment Form	1	1	1	1
Maximum Activations per Ballot Style	Build Activations Form	25	99	30	99
Maximum Activations per Election	Act/Ballot Style * Ballot Style/Elec	1500	99,000	299,970	299,970
Maximum Number of Parties	Party Code Combinations	10	50,653	598	400
Maximum Vote For in Contest	Office Vote Limit	60	99	64	99

Note 1: 9,223,372,036,854,770,000

2.2.3 VVSG

The EMS 4.41 Voting System was evaluated against the relevant requirements contained in the EAC 2005 VVSG, Volumes I and II.

2.2.4 RFIs

There are no RFIs released by the EAC as of the date of this Test Report that pertained to this test campaign that were not in effect at the time of the baseline system certification.

2.2.5 NOCs

There are no NOCs released by the EAC as of the date of this Test Report that pertained to this test campaign that were not in effect at the time of the baseline system certification.

3.0 TEST FINDINGS AND RECOMMENDATIONS

EMS 4.41 was evaluated against the relevant requirements contained in the EAC 2005 VVSG, Volumes I and II. The focus of this test campaign was on the modification to the voting system EMS software source code. All requirements that were excluded from the previous test campaign (EMS 4.4), were also deemed not applicable to this test campaign due to the submitted modification not impacting the specific requirements.

The summary findings and recommendations for each area of testing are provided in the following sections.

3.1 Summary Findings and Recommendation

Summary findings for the System Level Testing (FCA), PCA, and Source Code Review are detailed in the relevant sections of this report. In addition to these areas of testing, a limited TDP Review was performed, as described below.

Technical Documentation Package (TDP) Review

In order to determine compliance of the modified TDP documents with the EAC VVSG 1.0, a limited TDP review was conducted. This review focused on TDP documents that have been modified since the certification of the baseline system. The review consisted of a compliance review to verify that each regulatory, state, or manufacturer-stated requirement had been met based on the context of each requirement.

Results of the review of each document were entered on the TDP Review Checklist and reported to the manufacturer for disposition of any anomalies. This process was ongoing until all anomalies were resolved. Any revised documents during the TDP review process were compared with the previous document revision to determine changes made, and the document was re-reviewed to determine whether subject requirements had been met. A listing of all documents contained in the EMS 4.41 TDP is provided in Table 3-1.

Table 3-1: EMS 4.41 TDP Documents

Section	Description	Version
---	Technical Data Package (TDP) TABLE OF CONTENTS Election Management System	1.1
2.1	SCOPE Election Management System	1.2
2.2	SYSTEM OVERVIEW Election Management System	1.16
2.3	SYSTEM FUNCTIONALITY DESCRIPTION Election Management System	1.3
2.4	SYSTEM HARDWARE SPECIFICATION Election Management System	1.4
2.5	SOFTWARE DESIGN AND SPECIFICATION Election Management System	2.11
2.6	SYSTEM SECURITY SPECIFICATION Election Management System	1.10
2.7	SYSTEM TEST AND VERIFICATION SPECIFICATION Election Management System	1.3
2.8	SYSTEM OPERATION PROCEDURES Election Management System	1.3
2.9	SYSTEM MAINTENACE PROCEDURES Election Management System	1.4
2.10	PERSONNEL DEPOYMENT AND TRAINING REQUIREMENTS Election Management System	1.1
2.11	CONFIGURATION MANAGEMENT PLAN Election Management System	1.7
2.12	QUALITY ASSURANCE PROGRAM Election Management System	1.4
2.13	SYSTEM CHANGE NOTES Election Management System	1.18
---	Appendices TABLE OF CONTENTS Election Management System	1.9

3.1.1 Source Code Review

Pro V&V reviewed the submitted source code to the EAC VVSG 1.0 and the manufacturer-submitted coding standards. Prior to initiating the software review, Pro V&V verified that the submitted documentation was sufficient to enable: (1) a review of the source code and (2) Pro V&V to design and conduct tests at every level of the software structure to verify that design specifications and performance guidelines are met.

A combination of Automated Source Code Review and Manual Source Code Review methods were used to review the changes in the source code from the previously certified EMS 4.4 voting system. In addition, 10% of the source code comments will be manually reviewed.

Summary Findings

- Automated Source Code Review: The Automated Source Code Review was performed during the EMS 4.41 Compliance and Trusted Builds. No source code issues were found during the Automated Source Code review.

- Manual Source Code Review: The Manual Source Code review was performed on 10% of the comments for compliance to VVSG Volume Section 5.2.7. No source code issues were found during the Manual Source Code review.

- Trusted Build: The trusted build consisted of inspecting customer submitted source code, COTS, and third-party software products and combining them to create the executable code. This inspection followed the documented process from the "United States Election Assistance Commission Voting System Test Laboratory Program Manual" Section 5.5 – 5.7. Performance of the trusted build includes the build documentation review. The Trusted Build was performed following the completion of the Functional Configuration Audit.

3.1.2 Physical Configuration Audit (PCA)

The Physical Configuration Audit (PCA) compares the voting system components submitted for qualification to the manufacturer's technical documentation, and shall include the following activities:

- Establish a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system

- Verify software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification

- If the hardware is non-COTS, Pro V&V shall review drawings, specifications, technical data, and test data associated with system hardware to establish system hardware baseline associated with software baseline

- Review manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests

- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination

Summary Findings

During execution of the test procedure, the components of the EMS 4.41 system were documented by component name, model, serial number, major component, and any other relevant information needed to identify the component. For COTS equipment, every effort was made to verify that the COTS equipment had not been modified for use. Additionally, each technical document submitted in the TDP was recorded by document name, description, document number, revision number, and date of release. At the conclusion of the test campaign, test personnel verified that any changes made to the software, hardware, or documentation during the test process were fully and properly documented.

3.1.3 System Level Testing

System Level Testing was implemented to evaluate the complete system. System Level Testing for this campaign included the evaluations of the following test areas: EMS and System Functional Regression Testing. This testing included all proprietary components and COTS components (software, hardware, and peripherals) in a configuration of the system's intended use.

For software system tests, the tests were designed according to the stated design objective without consideration of its functional specification. The system level software test cases were prepared independently to assess the response of the software to a range of conditions. Pro V&V reviewed the manufacturer's program analysis, documentation, and module test case design and evaluated the test cases for each module with respect to flow control parameters and entry/exit data. As test cases were utilized throughout the test campaign and were designed based on the manufacturer's design specifications and the relevant technical requirements set forth by the VVSG. Test cases were examined based on the following aspects of the voting system: Software module test case design and data, Software functional test case design, and System level test case design.

Test cases provided information regarding the sequence of actions to be performed for the execution of a test, the requirements being met, the test objective, test configuration, equipment needed, special requirements, assumptions, and pass/fail criteria. Once the test cases were finalized, they were validated and published for use in the test campaign. The validation of the test case was accomplished by technical review and approval. This validation included the following: confirmation of adequate test coverage of the requirement being tested; confirmation that test case results were not ambiguous and gave objective pass/fail criteria; and confirmation that any automated test suites would produce valid results

Pro V&V defined the expected result for each test and the ACCEPT/REJECT criteria for certification. If the system performed as expected, the results were accepted. If the system did not perform as expected, an analysis was performed to determine the cause.
If needed, the test was repeated in an attempt to reproduce the results. If the failure could not be reproduced and the expected results were not met, the system was determined to have failed the test. If the results could not be reproduced, the test continued. All errors encountered were documented and tracked through resolution.

3.1.3.1 EMS and System Functional Regression Testing

EMS and System Functional Regression Testing was performed to ensure the submitted modification did not adversely affect the EMS 4.41 system. Throughout the test campaign, Pro V&V personnel maintained a test log identifying the system and equipment under test and any records of deviations to the test plan along with the rationale for performing the deviations. Pro V&V also utilized an internal bug tracking system to record and track all issues and/or discrepancies noted during the test campaign.

3.2 Anomalies and Resolutions

When a result is encountered during test performance that deviates from what is standard or expected, a root cause analysis is performed.

Pro V&V considers it an anomaly if no root cause can be determined. In instances in which a root cause is established, the results are then considered deficiencies. No anomalies occurred during the testing of the EMS 4.41.

3.3 Deficiencies and Resolutions

Any violation of the specified requirement or a result is encountered during testing that deviates from what is standard or expected in which a root cause is established is considered a deficiency. Upon occurrence, deficiencies are logged throughout the test campaign for disposition and resolution. No deficiencies were encountered during testing.

4.0 RECOMMENDATION FOR CERTIFICATION

The EMS 4.41, as presented for testing, successfully met the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG), Version 1.0. Additionally, Pro V&V, Inc. has determined that the EMS 4.41 functioned without issue during EMS and System Functional Regression Testing. Based on the test findings, Pro V&V recommends the EAC grant the EMS 4.41 identified in Tables 4-1 and 4-2 certification to the EAC VVSG 1.0.

Table 4-1. MicroVote EMS 4.41 Software

Firmware/Software	Version
Proprietary	
EMS	4.4
Infinity Panel Rev. D	4.30
Infinity Panel Rev. E	4.40
COTS	
Microsoft Windows 10 Professional	1909

Table 4-1. MicroVote EMS 4.41 Software *(continued)*

Firmware/Software	Version
Microsoft Visual Studio Professional 2017	15.9
ComponentOne Ultimate 2014	1
Advanced Installer	16.4.1
Advanced Installer Extension for Visual Studio 2017	16.5

Table 4-2. MicroVote EMS 4.41 Hardware

Component	Serial Number
Proprietary Hardware	
Infinity Voting Panel (Rev D) w/Power Supply	11588
Infinity Voting Panel (Rev E) w/Power Supply	14009, 14010
VVPAT (Rev A) w/Power Supply	001011, 001100
COTS Hardware	
Tripp Lite Portable Surge Protector (TRAVELCUBE)	[MVT-TC-001], [MVT-TC-002]
Minuteman UPS (EP1000LCD)	AK11190890004
APC Back-UPS Pro (BN1100M2)	3B1925X63177, 3B1925X63227
Dell Latitude 5580 Laptop w/Power Supply	51LG8H2, 5DL1RN2
USB Smart Card Reader (PC USB TR PIV) w/Stand (HWP109380 B)	113101316600170
EMS Download Cable	CC06789-06, [MVT-DC-001]
USB-RS232 Converter	USA000106043, USA000155787
Seiko Instruments Printer (DPU-3445) w/Power Supply	2008922A
DoubleTalk LT	[MVT-DT-001]
Hamilton Buhl (PRM100B)	[MVT-HB-001]
Chatsworth Data (ACP-2200)	CDT021901537, CDT121901544
Head Stick	[MVT-HS-001]

Kathy Summers

From: Bill Whitehead <bwhitehead@microvote.com>
Sent: Tuesday, September 22, 2020 7:51 AM
To: Kathy Summers
Subject: [EXTERNAL] EMS 4.41 / SEC Observation Visit 11/3 Bartholomew County
Attachments: Microvote EMS 4.41 Certificate of Conformance and Scope 09182020.pdf; MicroVote EMS 4.41 Test Report Final.pdf

Good Morning Kathy,

Per my email regarding our latest version of EMS, I am attaching the EAC Certificate of Conformance and the Pro V & V Test report.
This will be the version that we will be using in the November General Election. We made a small change to how we read in absentee ballot cards. Now EMS makes an auto select of the precinct if the county so desires. With the volume of paper ballots, we wanted to make the counting process easier.

Do yo know who will be coming from the SEC and the Division of Elections yet?

Let me know if you have any questions or need anything else form me in the meantime.

I hope that this finds you well in this otherwise crazy busy time.

Best,

Bill Whitehead
Regional Sales Manager
MicroVote General Corporation
6366 Guilford Avenue
Indianapolis, IN 46220

Cell 317-414-2823
Office 800-257-4901
Fax 888-544-9046

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MicroVote
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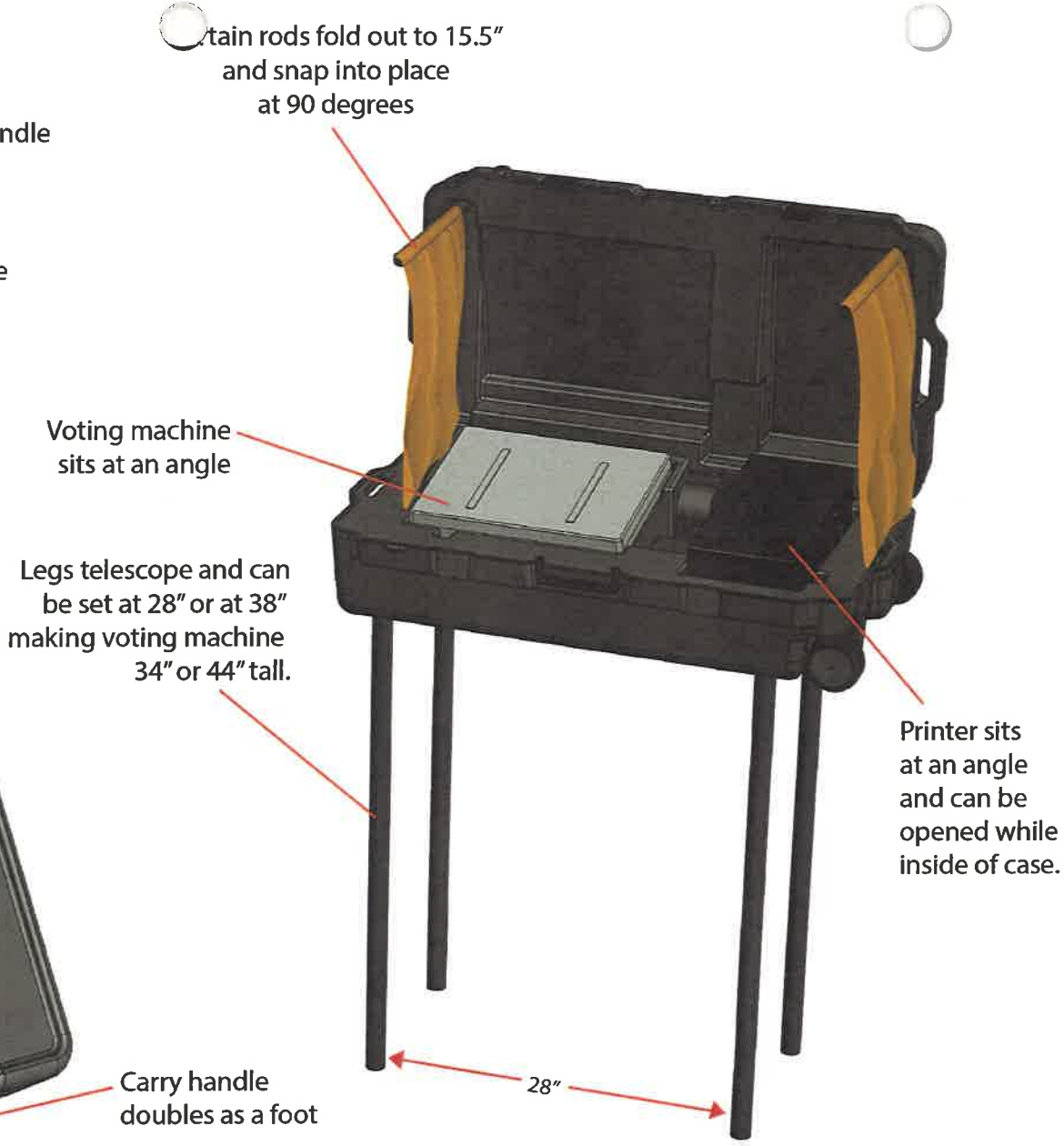
0349-0001-0000-00
8/17/20



Print Name: _____ **X:** _____ **Date:** _____

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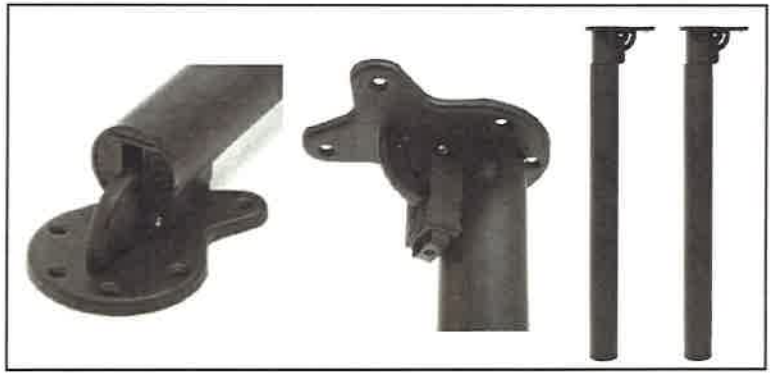
MicroVote
All in One Voting Station

0349-0001-0000-00

8/17/20

Estimated case size: 39" x 21" x 10"

Leg reference images



Loop for pad lock

Folding telescoping legs are mounted to bottom of case.

MicroVote logo
= PMS 151 Orange
= PMS 11 Cool Gray

Print Name: _____ **X:** _____ **Date:** _____

Cases BySource
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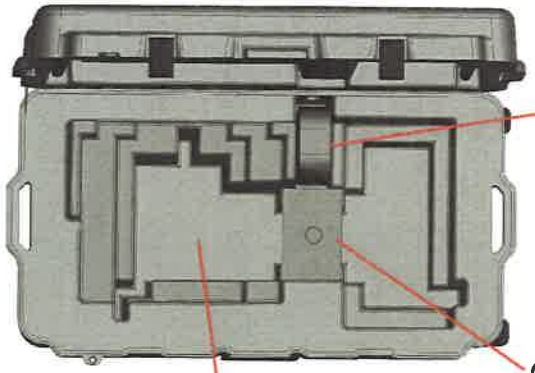
MicroVote
All in One Voting Station

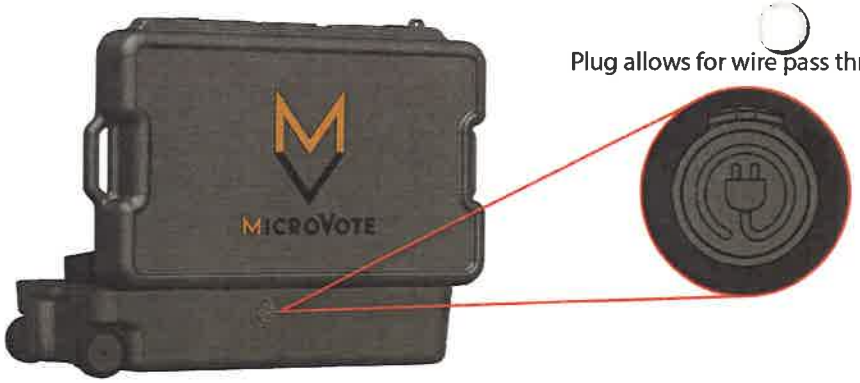
0349-0001-0000-00

8/17/20



Retractable cord reel

Area under voting machine and printer for wire storage



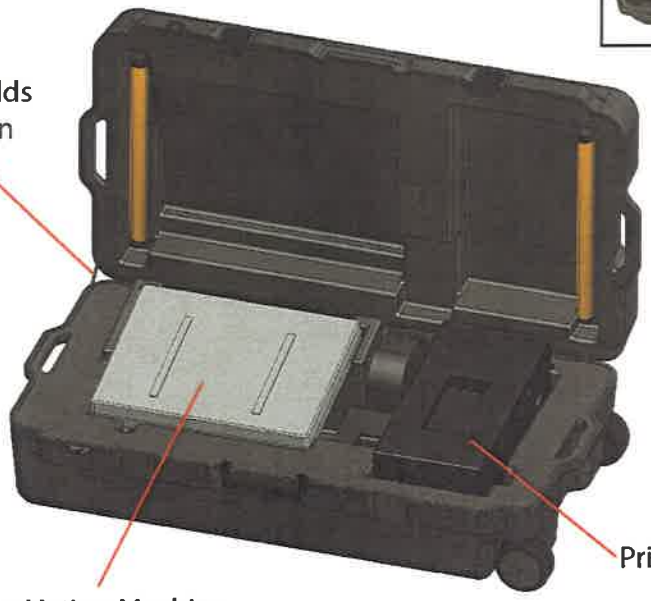
Plug allows for wire pass through

Cat.6 RJ45 Bulkhead Coupler mounted to plastic cover

Foam pad comes with peal and stick adhesive to apply into lid if using the Small Voting Machine

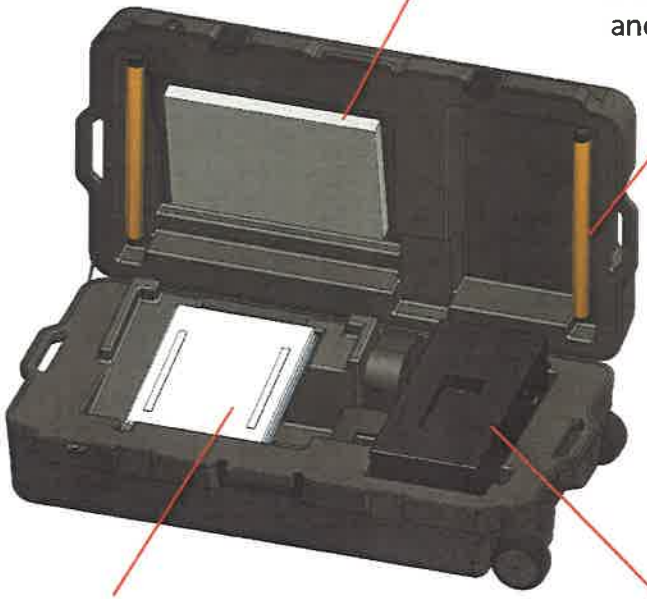
Curtains roll around rod and fold back into case

Lid stay holds case open



Printer

Large Voting Machine



Small Voting Machine

Printer

Print Name: _____ **X:** _____ **Date:** _____

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