Wisconsin Elections Commission

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MEMORANDUM

DATE: For the December 2, 2019, Commission Meeting

TO: Members, Wisconsin Elections Commission

FROM: Meagan Wolfe
Administrator

Prepared and Presented by:
Robert Williams, Elections Specialist
Cody Davies, Elections Specialist

SUBJECT: Clear Ballot
Petition for Approval of Electronic Voting System ClearVote 2.0

Introduction

Clear Ballot Group is requesting the Wisconsin Elections Commission (WEC or Commission) approve the ClearVote 2.0 voting system for sale and use in the State of Wisconsin. The Commission approved a previous Clear Ballot voting system, ClearVote 1.4, in December 2017. No electronic voting equipment may be offered for sale or utilized in Wisconsin unless first approved by the WEC based upon the requirements of Wis. Stat. § 5.91 (Appendix B). The WEC has also adopted administrative rules detailing the approval process. Wis. Admin. Code Ch. EL 7 (Appendix C). Voting systems submitted to the EAC for testing after December 13, 2007, are tested using the 2005 Voluntary Voting System Guidelines (2005 VVSG).

Recommendation

WEC staff is recommending approval of ClearVote 2.0 for sale and use in Wisconsin. Detailed recommendations are listed on pages 14-16, following the analysis of functional testing performed by WEC staff.

Background

On October 1, 2019 WEC staff received an Application for Approval of ClearVote 2.0. Clear Ballot Group submitted specifications for hardware, firmware and software related to the voting system. In addition, Clear Ballot submitted technical manuals, documentation and instruction materials necessary for the operation of ClearVote 2.0. Clear Ballot also submitted the required Voting System Test Lab (VSTL) report as testing of the system had been completed. Clear Ballot, however, did not include a certificate of approval from the Elections Assistance Commission (EAC) with the initial application materials. Despite testing having been completed by the VSTL, a full EAC certificate had not yet been granted.

WEC staff determined that it would not pursue a testing campaign related to the application from Clear Ballot Group until formal certification and approval had been granted by the EAC and the certification report had been issued. Clear Ballot Group continued to provide regular updates to WEC staff regarding the status of the EAC certification process of ClearVote 2.0. Staff began to plan the test campaign once Clear Ballot Group provided a realistic expected date for the issuance of the EAC report. The VSTL responsible for testing ClearVote 2.0, Pro V&V, recommended on September 30, 2019 that the EAC certify ClearVote 2.0. The EAC issued final certification of ClearVote 2.0 on October 21, 2019.

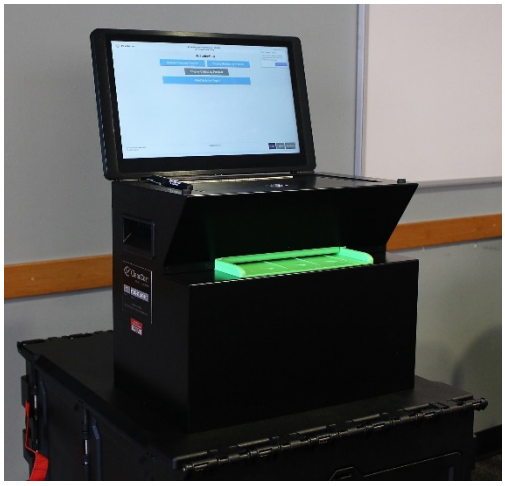
WEC staff conducted the voting system testing campaign for ClearVote 2.0 from October 28 to October 31, 2019 in the WEC office. The campaign consisted of functional testing using three different mock election configurations, which are detailed beginning on page 7. Additionally, staff conducted a meeting of the Voting Equipment Review Panel, which is a body consisting of local election officials as well as voting rights and disability advocates. A public demonstration of the equipment was held following the Review Panel meeting.

System Overview

ClearVote 2.0 is a paper based, digital scan voting system powered by the ClearDesign and ClearCount software applications. It consists of four major components: ClearDesign, an election management system (EMS); ClearAccess, an Americans with Disabilities Act compliant ballot marking device for polling place use; ClearCast, a polling place scanner and tabulator; and ClearCount, an election results software application that also works in conjunction with commercial off-the-shelf (COTS) high speed scanners as a central count scanning and tabulation system.

The following paragraphs describe the design of the ClearVote 2.0 hardware taken in part from Clear Ballot technical documentation.

ClearCast

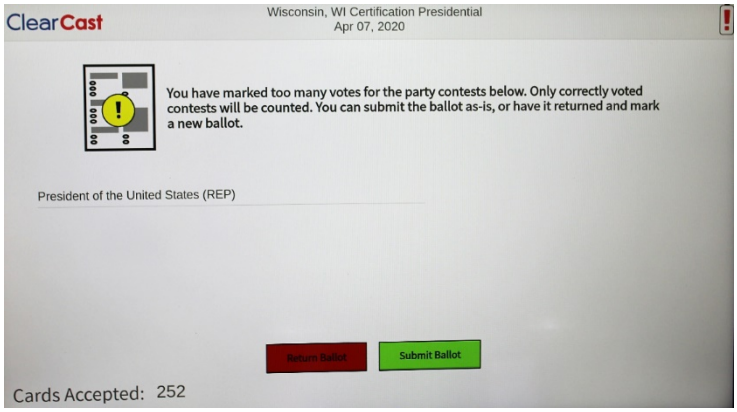


ClearCast is a digital scan paper ballot tabulator designed for polling place use. Voters insert marked ballots into the unit for processing. The tabulator uses high speed, high-resolution, commercial scan engines to simultaneously image the front and back of the ballot. Ballots used in conjunction with this system are designed with an oval next to the candidate name or ballot choice. Clear Ballot recommends that voters use a specific marking device, such as a black roller ball pen, to mark ballots processed on ClearCast. As part of ClearVote 2.0 testing, red, blue, and green pens were also used to mark ballots, all of which were correctly tabulated by ClearCast.

The system deposits the ballot into a detachable, secured storage bin. Included in ClearVote 2.0 are two options for ballot containers. The first is a secured ballot bag which attaches to the back of the unit. The second option is a collapsible ballot bin on top of which the ClearCast unit is secured. ClearCast includes an internal thermal printer for the printing of the zero reports, log reports, polling place and precinct totals as well as an optional write-in report. The ballot images and election results are stored on a removable USB flash drive. This USB flash drive may be taken to the municipal clerk's office or other central office where the ballot images and election results may be uploaded into an election results management program or transferred to another memory device or machine to facilitate storage. There is no modem or results transmission component in ClearCast. After the election is complete and the memory device is removed, ClearCast does not store any images or data in its internal memory.

Voter Information Screens: ClearCast features a 16 by 9-inch touchscreen display to provide feedback to the voter regarding the disposition of any ballot cast using the machine. The information screens are designed to alert voters to any errors on their ballot. ClearCast will provide the voter with details about the error, identifying the specific contests where errors have occurred. Voters have the option for the ballot to be returned or to cast the ballot with errors on it. ClearCast can be programmed to automatically reject ballots containing overvotes, crossover votes, and under votes. If a voter attempts to insert multiple ballots into the machine at the same time the ballots are automatically returned. Further information on specific voter information screens can be found on the next page.

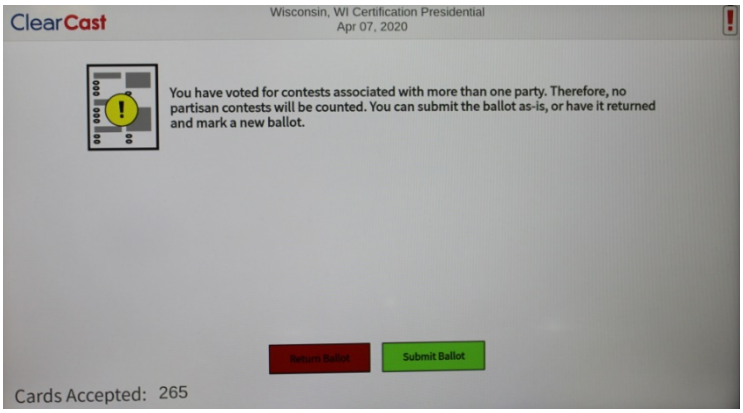
- **Overvote Notification:** If there is a ballot containing an overvote, an error message appears that identifies the contests containing overvotes. That message reads: "You have marked too many votes for the party contests below. Only correctly voted contests will be counted. You can submit the ballot as-is, or have it returned and mark a new ballot."



The voter has the option to return the ballot for review or to cast the ballot with overvotes, as indicated by the error message. If there are multiple overvotes, the contests containing errors are listed to allow the voter the opportunity to review all errors.

Voters can press "Return Ballot" if they wish to correct their ballot. Conversely, voters are able to press "Submit Ballot" if they wish to submit their ballot with overvotes. The overvote notification also advises voters that, should they choose to cast their ballot with overvotes, that only their votes in the correctly voted contests will be counted.

- **Crossover Vote Notification:** If a ballot is inserted with votes in more than one party's primary, a message appears that informs the voter that they are attempting to cast a ballot that contains crossover votes. That message reads: "You have voted for contests associated with more than one party. Therefore, no partisan contests will be counted. You can submit the ballot as-is, or have it returned and mark a new ballot."



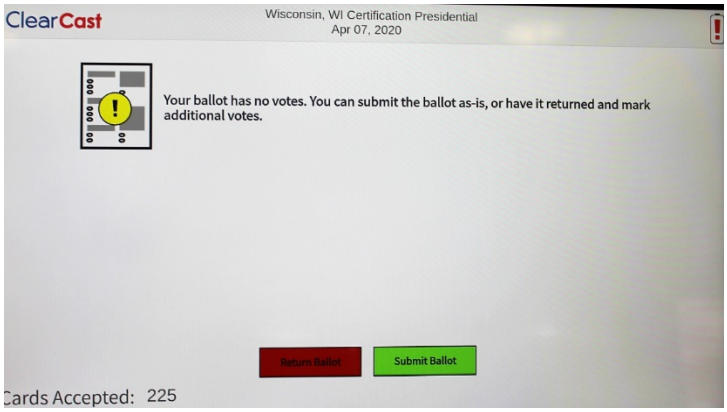
Staff recommendation is to include the prescribed language included in Appendix D: "Cross Over Votes Detected. You selected candidates from different parties. IF the ballot is cast as marked, no votes in any partisan contests will count." Clear Ballot has confirmed that the language will be updated prior to implementation.

As with an overvoted ballot, the voter may choose to return the ballot for further review or to cast the ballot as originally marked. Voters can press "Return Ballot" on the screen if they wish to correct their ballot to reflect their party preference or to correct any crossover votes. Conversely, voters can press the "Submit Ballot" button to cast the crossover-voted ballot. In a crossover vote scenario, ClearCast informs the voter

that no votes in partisan contests will count. The crossover vote notification does not, however, notify a voter as to which specific contests contain crossover votes.

- **Blank Ballot Notification:** If the ballot contains no votes, a message appears that states the ballot is blank. This screen reads: Your ballot has no votes. You can submit the ballot as-is, or have it returned to mark additional votes."

  The voter is allowed to press "Return Ballot" to correct their ballot and see a poll worker for help. The voter may also press "Submit Ballot" to submit their ballot with no selections made.



ClearCount

ClearCount is a high-speed, optical scan ballot tabulator coupled with ballot processing applications designed for use at central count locations. ClearCount software runs on unmodified COTS laptop or desktop computers running the Windows 10 or Ubuntu Linux operating system and supports specific models of Fujitsu scanners. The ClearCount system is capable of processing between 50 and 70 ballots per minute, or roughly 4,100 ballots per hour when using a 14-inch ballot. Throughput capabilities are dependent upon the model of scanner implemented. All of the components are unmodified COTS that are connected via a wired, closed, and isolated network which is not connected to any other systems or the Internet. All files that make up the ClearCount system reside on a single scan server that is shared by a municipality's scan stations. The only software programs installed on the scan stations are the Windows or Linux operating system, the Fujitsu ScandAll Pro software and drivers required by the scanner hardware.

ClearCount also includes software features that support central count tabulation, election results consolidation and election results reporting. This system also includes ballot and vote adjudication features that allow for the review of each ballot cast on the ClearVote 2.0 system. Both the precinct scanner and central count system create an image of both sides of each ballot processed by those components. The ballot images are reviewed by ClearCount based on election definitions created in the EMS and a report is available that indicates how votes on each ballot were counted. The adjudication component allows for the review of each vote on a ballot and the user can alter the disposition of votes on a ballot if they feel the system did not correctly determine voter intent. Election officials are also able to adjudicate and reconcile

problem ballots by evaluating individual errant marks, overvotes, and crossover votes. ClearCount results can be printed or exported in a variety of formats.

ClearAccess

ClearAccess is an accessible touchscreen ballot marking device primarily designed for use by voters who have visual, auditory, or physical limitations or disabilities. ClearAccess printers create paper ballots that can be scanned and tabulated by ClearCast and ClearCount. Like other components of the ClearVote 2.0 voting system, ClearAccess uses unmodified, commercially available off the shelf hardware such as laptop and desktop computers, combined with personal assistive devices and printers, to form a ballot marking device.

An election inspector must assist the voter to access the correct ballot style for the election. Once that has been completed, the voter is left to navigate the ballot and cast their votes privately. Voters have the option to use the touchscreen or an integrated tactile keypad to navigate the ballot and make their selections. Instructions that guide the voter through the process appear on the screen or can be accessed via the audio ballot function. Voters have the option to adjust the text display contrast and text size to suit their preferences. Each button on the tactile keypad has both Braille and printed text labels designed to indicate function and a related shape to help the voter determine its use. Voters may also use headphones to access the audio ballot function that provides a recording of the ballot instructions and lists candidates and options for each contest. The volume and tempo of the audio can be adjusted by voters, who have the option of using the touchscreen, a tactile keypad, or other assistive technology to make their selections.

ClearAccess provides a ballot summary screen on which voters can review their selections before the ballot is marked by the attached printer. A party preference selection on partisan primary and presidential preference ballots is required to be made by the voter before viewing contests so that crossover votes cannot occur. Once voters confirm their selections, those selections are sent to an attached printer which utilizes blank ballot stock to produce a marked ballot containing all of the voter's selections. This system uses Oki brand printers that can accommodate up to a 22-inch ballot.

After the voter completes the process, the paper ballot is the only record of the voting selections made. ClearAccess does not save any vote or ballot information to its internal memory. Ballots marked using ClearAccess can be processed by ClearCast or deposited into a secured ballot box to be hand tabulated by election inspectors after the polls have closed. Ballots marked using ClearAccess also may be tabulated using the ClearCount central count scanner units.

ClearDesign

ClearDesign is a Windows 10 based Election Management System consisting of an interactive set of applications which are responsible for all pre-voting activities necessary for defining and managing elections. This includes ballot design, ballot proofing, ballot layout and ballot production. The ClearDesign system consists of a laptop or desktop computer running ClearDesign software and connected to the DesignServer, and a router used to connect other DesignStation computers to the DesignServer using a wired, closed connection. All the components used for the creation of voting machine election definitions are off-the-shelf products that are connected via a wired, closed, and isolated network which is not connected to any other systems or the internet.

System Software Components

ClearVote 2.0 supports election administration functions through the use of three main software programs. ClearDesign is used to create the ballot layout and the programming definitions for an election and to create the files used by ClearCast, ClearCount and ClearAccess. ClearCount provides for vote tabulation, and results consolidation and reporting, while the ClearAccess software powers the ADA-compliant ballot marking device.

The software components used during this test campaign were as follows:

Software	***Version***
ClearDesign	2.0.1
ClearCount	2.0.1
ClearAccess	2.0.1
ClearCast	2.0.0

WEC staff visually verified the software version numbers for each component of the ClearVote 2.0 by checking the component's configuration display.

In addition to the verification of software version numbers, WEC staff also had the opportunity to interact with several functionalities of the software components of ClearVote 2.0. Clear Ballot Group staff provided a demonstration of the ClearDesign functionality and WEC staff were able to interact with several aspects of the ClearCount software, including the ballot auditing and vote adjudication functionalities.

Ballot images captured by either ClearCast or ClearCount scan stations can be made publicly available via a county or municipal website, in lieu of copies of paper ballots. These ballot images can be exported to ClearCount and a report listing the disposition of each vote on a ballot can be viewed. This feature can be used to verify how a tabulator treated a vote or ballot if questions arise as to how the machine counted votes for a contest or on a specific ballot, or series of ballots. The ballot image files serve as a reliable backup in the event that original ballot images are lost or damaged.

Functional Testing

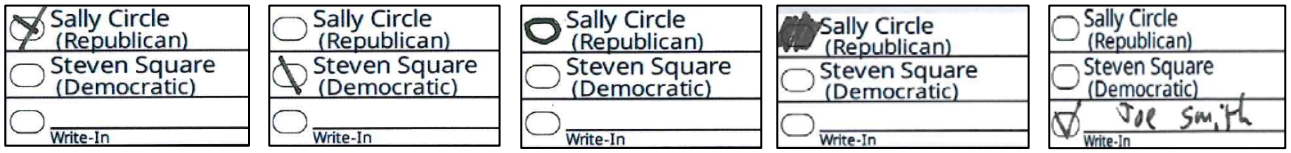
As required by Wis. Admin. Code EL § 7.02(1), WEC staff conducted three mock elections with each component of ClearVote 2.0 to ensure the voting system conforms to all Wisconsin requirements. These mock elections included: A partisan primary with a special nonpartisan school board election, a general election with both a presidential and special gubernatorial contest, and a presidential preference vote combined with a partisan Assembly Representative special election.

WEC staff designed a test deck of 1,200 ballots using various configurations of votes over the three mock elections to verify the accuracy and functional capabilities of the ClearVote 2.0 system. A three-person team of WEC staff hand marked 900 paper ballots based on a test deck spreadsheet for each mock election. Blank ballots were provided by Clear Ballot. The functionality of ClearAccess was tested by marking 300 ballots with the equipment across the three mock elections. The votes captured on the ballots created by ClearAccess were verified by WEC staff before being scanned and counted by the ClearCast and ClearCount. When the votes on all ballots were confirmed, WEC staff utilized ClearCast and three different COTS scanners that work in conjunction with the ClearCount software to count and tabulate all of the votes. WEC staff determined the results produced by the two tabulator components were accurate and matched the test deck script.

Votes were recorded on test deck ballots in a variety of configurations in all contests to ensure that the programming of the tabulation equipment was compatible with Wisconsin election law, and that the equipment processed ballot markings in accordance with statutory requirements. Ballots were purposefully marked with overvoted contests and the equipment was able to consistently identify those scenarios and inform the voter about the specific contest, or contests, that were problematic. Ballots for both the Partisan Primary and Presidential Preference mock elections were also marked with votes that crossed party lines and, in each instance, the machines were able to identify those crossover votes and display the warning screen to the voter. Two different ballot styles were used for each mock election and one ballot style in each election contained a special election contest. This inclusion was used to determine if the equipment could be programmed to accommodate multiple election definitions on the same ballot style and produce accurate results. In all instances, the equipment was found to have accurately tabulated votes and correctly reflected Wisconsin election law in the programming.

The test decks used for this campaign were also designed to determine what constitutes a readable mark by each piece of tabulation equipment included in this system. A subset of ballots in the test deck were marked using “special marks,” ambiguous marks and hesitation marks. These ballots were processed by the tabulation equipment and WEC staff reviewed the results to determine which of the special marks were read by the different pieces of voting equipment. The chart below illustrates actual marks from test deck ballots that were successfully read and counted as “good marks” by the ClearCast precinct scanner and tabulator and the three different COTS scanners that work in conjunction with ClearCount as a central count scanning and tabulation system.

Examples of Marginal Marks Read by the ClearVote 2.0 Components During Testing



All four pieces of equipment were able to correctly read marks in pencil, black pen, blue pen, red pen and green pen as well as those made by markers recommended for use by the vendor. The test decks also included ballots folded to simulate absentee ballots and ballots with slight tears in them. Blank ballots were also included to determine how each of the three different tabulators would treat these ballots. Ballots purposefully marked with slight resting marks within the oval were treated consistently by all components of ClearVote 2.0 and were not counted. Folded ballots were able to be processed without issue on the ClearCast and the central count scanners, while these pieces of equipment also processed the slightly torn ballots without incident. The ClearCast tabulator was able to identify the blank ballots and provide a warning message to the voter that indicated the ballot was blank and provide options to return the ballot or cast it as is. This functionality is not available with the ClearCount system used at central count locations where voters are not present to correct ballot errors.

This system includes a write-in report feature that captures digital images of all write in votes where the write-in oval was filled in on the ballot. A write-in report can be printed along with the results tapes that includes images of the actual write-in lines and organizes all write-in votes by office. However, ballots with write-in votes where the oval was not filled in are not captured on the report. The ClearCast write-in report would not replace the need for inspectors to manually inspect each ballot to detect write-in votes where the voter did not fill in the target area next to the write-in line, but still used the write-in line.

There were only two issues experienced by staff during testing. The first relates to the ClearAccess ballot marking device. When marking accessible ballots, staff observed that, if the extreme lower right corner of the next contest button is touched, the subsequent contest will be flashed onscreen but skipped over and the second contest following will be the next contest presented on the screen. The voter is able to return and correctly vote this contest by pushing the back button. The second issue concerned the ClearCount central count scanner model 7180. An unnoticed smudge on one of the scanner heads resulted in several ballots being deemed unreadable. This was corrected by ClearBallot staff cleaning the scanner and a rerun on the ballots. Purchasing municipalities sign up for a service plan with Fujitsu at the time of purchase that includes such cleanings. Service intervals are decided upon by the municipality as part of that agreement.

Testing results and staff observation of the system indicate that ClearVote 2.0 consistently identifies and tabulates correctly marked votes in a uniform fashion. The system is also flexible enough to correctly interpret special marks made within an oval while not considering resting or stray marks made outside of an oval.

Wisconsin Elections Commission Voting Equipment Review Panel Meeting

In an effort to continue to receive valuable feedback from election officials and community advocates during the voting equipment approval process, the Wisconsin Elections Commission formed a Voting Equipment Review Panel that serves in a similar capacity as the former Wisconsin Election Administration Council which was eliminated as part of the 2016 legislation that created the Wisconsin Elections Commission. Wis. Admin. Code EL s. 7.02(2), permits the agency to use a panel of local election officials and electors to assist in the review of voting systems.

Six of the invited participants attended the Voting Equipment Review Panel Meeting which is composed of municipal and county clerks, advocates for voters with disabilities, and advocates for the interests of the voting public. The meeting took place at the WEC office in Madison on October 30 from 2:00 p.m. to 3:30 p.m., and representatives from Clear Ballot Group provided a demonstration of the ClearVote 2.0 with attendees encouraged to test the equipment. In addition to the Review Panel participants, one member of the public and WEC staff attended the meeting. Comments and feedback from the Voting Equipment Review Panel meeting are included in Appendix E.

Public Demonstration

A public demonstration of the ClearVote 2.0 was held on October 30, 2019, from 4:00 p.m. to 5:30 p.m. at the WEC office in Madison. The public meeting is designed to allow members of the public the opportunity to use the voting system and offer comment. While representatives from Clear Ballot and WEC staff were present to demonstrate the functionality of all system components, no members of the public attended the demonstration.

Statutory Compliance

Wis. Stat. §5.91 provides the following requirements voting systems must meet to be approved for use in Wisconsin. Please see the below text of each requirement and staff's analysis of the ClearVote 2.0 compliance with the standards.

§ 5.91 (1)
The voting system enables an elector to vote in secret.
Staff Analysis
The Clear Ballot voting systems meet this requirement by allowing a voter to vote a paper ballot in the privacy of a voting booth or at the accessible voting station without assistance.

§ 5.91 (3)
The voting system enables the elector, for all elections, except primary elections, to vote for a ticket selected in part from the nominees of one party, and in part from nominees from other parties and write-in candidates
Staff Analysis
The Clear Ballot voting system allows electors to split their ballot among as many parties as they wish during any election that is not a partisan primary. It also allows the elector to write in the allowable number of candidates for each office on the ballot.

§ 5.91 (4)
The voting system enables an elector to vote for a ticket of his or her own selection for any person for any office for whom he or she may desire to vote whenever write-in votes are permitted.
Staff Analysis
The Clear Ballot voting system allows write-in votes where permitted.

§ 5.91 (5)
The voting systems accommodate all referenda to be submitted to electors in the form provided by law.
Staff Analysis
The Clear Ballot voting system meets this requirement. Referenda were included on several different ballot styles used during this test campaign.

§ 5.91 (6)
The voting system permits an elector in a primary election to vote for the candidates of the recognized political party of his or her choice, and the system rejects any ballot on which votes are cast in the primary of more than one recognized political party, except where a party designation is made or where an elector casts write-in votes for candidates of more than one party on a ballot that is distributed to the elector.
Staff Analysis
The Clear Ballot voting system can be configured to always reject crossover votes without providing an opportunity for the voter to override. The system can also be programmed to provide a warning screen to the voter that identifies any contest with crossover votes. Either one of these programming options allows this system to meet this requirement. The warning screen provides options where the elector can choose to have the ballot returned to them or they can cast the ballot without correcting the crossover vote. The use of the override function was previously prohibited by statute, but Wis. Stats. §5.85(2)(b) expressly allows for the optional use of the override function in event of an overvote and the WEC has applied the same standard to the use of the override function in the event of crossover vote.

§ 5.91 (7)
The voting system enables the elector to vote at an election for all persons and offices for whom and for which the elector is lawfully entitled to vote; to vote for

as many persons for an office as the elector is entitled to vote for; to vote for or against any question upon which the elector is entitled to vote; and it rejects all choices recorded on a ballot for an office or a measure if the number of choices exceeds the number which an elector is entitled to vote for on such office or on such measure, except where an elector casts excess write-in votes upon a ballot that is distributed to the elector.
Staff Analysis
The Clear Ballot voting system can be configured to always reject overvotes without providing an opportunity for the elector to override. The system can also be programmed to provide a warning screen to the elector that identifies any contest with an overvote. Either one of these programming options allows these systems to meet this requirement. The warning screen provides options where the elector can choose to have their ballot returned to them or they can cast the ballot without correcting the overvote. The use of the override function was previously prohibited by statute, but Wis. Stats. §5.85(2)(b) expressly allows for the optional use of the override function in event of an overvote.

§ 5.91 (8)
The voting system permits an elector at a General Election by one action to vote for the candidates of a party for President and Vice President or for Governor and Lieutenant Governor.
Staff Analysis
The Clear Ballot voting system meets this requirement by placing Presidential or Gubernatorial candidates and running mates within the same contest.

§ 5.91 (9)
The voting system prevents an elector from voting for the same person more than once, except for excess write-in votes upon a ballot that is distributed to the elector.
Staff Analysis
The Clear Ballot voting system meets this requirement.

§ 5.91 (10)
The voting system is suitably designed for the purpose used, of durable construction, and is usable safely, securely, efficiently and accurately in the conduct of elections and counting of ballots.
Staff Analysis
The Clear Ballot voting system meets this requirement.

§ 5.91 (11)
The voting system records and counts accurately every vote and maintains a cumulative tally of the total votes cast that is retrievable in the event of a power outage, evacuation or malfunction so that the records of votes cast prior to the time that the problem occurs is preserved.
Staff Analysis
The ClearCast component contains a battery backup with multiple hours of battery life to allow for time to find an adequate power source. ClearCount saves

ballot images and files to a server in real time.

§ 5.91 (12)
The voting system minimizes the possibility of disenfranchisement of electors as the result of failure to understand the method of operation or utilization or malfunction of the ballot, voting system or other related equipment or materials.
Staff Analysis
The Clear Ballot voting system can be programmed to provide warning screens to the voter that identifies any problem with their ballot. The warning screens provide an explanation of the problem and allow the voter to have their ballot returned to them to review and correct the error. The systems can be configured to always reject overvotes and crossover votes without providing an opportunity for the voter to override. The language on the warning screens can be customized to a format prescribed by the WEC.

§ 5.91 (13)
The automatic tabulating equipment authorized for use in connection with the system includes a mechanism which makes the operator aware of whether the equipment is malfunctioning in such a way that an inaccurate tabulation of the votes could be obtained.
Staff Analysis
The Clear Ballot voting system meets this requirement.

§ 5.91 (14)
The voting system does not use any mechanism by which a ballot is punched or punctured to record the votes cast by an elector.
Staff Analysis
The Clear Ballot voting system does not use any such mechanism to record votes.

§ 5.91 (15)
The voting system permits an elector to privately verify the votes selected by the elector before casting his or her ballot.
Staff Analysis
The Clear Ballot voting system meets this requirement by allowing a voter to review a physical hand marked or BMD marked ballot prior to placing it in a ballot box or tabulator.

§ 5.91 (16)
The voting system provides an elector the opportunity to change his or her votes and to correct any error or to obtain a replacement for a spoiled ballot prior to casting his or her ballot.
Staff Analysis
The Clear Ballot voting system meets this requirement by including an option for the return of the ballot to the voter from the notification screens on the tabulator.

§ 5.91 (17)

Unless the ballot is counted at a central counting location, the voting system includes a mechanism for notifying an elector who attempts to cast an excess number of votes for a single office the ballot will not be counted, and provides the elector with an opportunity to correct his or her ballot or to receive a replacement ballot.
Staff Analysis
The Clear Ballot voting system meets this requirement by including an option for the return of the ballot to the voter from the notification screens on the tabulator.

§ 5.91 (18)
If the voting system consists of an electronic voting machine, the voting system generates a complete, permanent paper record showing all votes cast by the elector, that is verifiable by the elector, by either visual or nonvisual means as appropriate, before the elector leaves the voting area, and that enables a manual count or recount of each vote cast by the elector.
Staff Analysis
The Clear Ballot voting system meets this requirement.

The Help America Vote Act of 2002 (HAVA) also provides the following applicable requirements that voting systems must meet:

HAVA § 301(a)(1)(A)
The voting system shall: (i) permit the voter to verify (in a private an independent manner) the votes selected by the voter on the ballot before the ballot is cast and counted; (ii) provide the voter with the opportunity (in a private and independent manner) to change the ballot or correct any error before the ballot is cast and counted (including the opportunity to correct the error through the issuance of a replacement ballot if the voter was otherwise unable to change the ballot or correct any error); and (iii) if the voter selects votes for more than one candidate for a single office – (I) notify the voter than the voter has selected more than one candidate for a single office on the ballot; (II) notify the voter before the ballot is cast and counted of the effect of casting multiple votes for the office; and, (III) provide the voter with the opportunity to correct the ballot before the ballot is cast and counted
HAVA § 301(a)(1)(C)
The voting system shall ensure than any notification required under this paragraph preserves the privacy of the voter and the confidentiality of the ballot.
HAVA § 301(a)(3)(A)
The voting system shall—

(A) be accessible for individuals with disabilities, including nonvisual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as other voters
Staff Analysis
The Clear Ballot voting system meets these requirements.

Recommendations

Staff has reviewed the application materials, including the technical data package and testing lab report, and examined the results from the functional test campaign to determine if this system is compliant with both state and federal certification laws. ClearVote 2.0 complies with all applicable state and federal requirements. The voting system met all standards over three mock elections and staff determined they can successfully run a transparent, fair and secure election in compliance with Wisconsin Statutes. The systems also enhance access to the electoral process for individuals with disabilities with the inclusion of the ClearAccess vote capture system.

1. WEC staff recommends approval of Clear Ballot voting system ClearVote 2.0 and components set forth in the table on page 7 and in Appendix A. This voting system accurately completed the three test elections and was able to accommodate the voting requirements of the Wisconsin election process.

2. WEC staff recommends that as a continuing condition of the WEC's approval, that Clear Ballot may not impose customer deadlines contrary to requirements provided in Wisconsin Statutes, as determined by the WEC. In order to enforce this provision, local jurisdictions purchasing Clear Ballot equipment shall also include such a provision in their respective purchase contract or amend their contract if such a provision does not currently exist.

3. WEC staff recommends that as a continuing condition of the WEC's approval, that this system must always be configured to include the following options:

   a. Automatic rejection of crossover and overvoted ballots with or without the option to override.
   b. Automatic rejection of all improper ballots except blank ballots.
   c. Digital ballot images to be captured for all ballots tabulated by the system.

4. WEC staff recommends that as a continuing condition of the WEC's approval, that voting systems purchased and installed as part of ClearVote 2.0 be configured in the same manner in which they were tested, subject to verification by the Commission or its designee. Once installed, the configuration must remain the same and may not be altered by Clear Ballot nor by state, county, or municipal officials except as approved by the Commission.

5. Staff recommends that, as a continuing condition of the WEC's approval, that the language on the information screen displayed to a voter when a ballot with crossover votes is inserted into a tabulator is updated to conform with the verbiage previously prescribed by the Commission.

6. Only the hardware and software versions included in this system version can to be used together to conduct an election in Wisconsin. Any updates to the hardware or software included in this system must be brought before the Commission for review and approval. As part of US EAC certificate: CBG-CV-20, only equipment included in this certificate can be used together to conduct an election in Wisconsin. Previous versions that were approved for use by the Elections Commission are not compatible with the new Clear Ballot voting system and are not to be used together with the equipment seeking approval by the WEC, as this would void the US EAC certificate. If a jurisdiction upgrades to ClearVote 2.0, it needs to upgrade each and every component of the voting system to the requirements of what is approved herein

7. WEC staff recommends that as a condition of approval, Clear Ballot shall abide by applicable Wisconsin public records laws. If, pursuant to a proper public records request, the customer receives a request for matters that might be proprietary or confidential, customer will notify Clear Ballot, providing the same with the opportunity to either provide customer with the record that is requested for release to the requestor, or shall advise customer that Clear Ballot objects to the release of the information, and provide the legal and factual basis of the objection. If for any reason, the customer concludes that Clear Ballot is obligated to provide such records, Clear Ballot shall provide such records immediately upon customer's request. Clear Ballot shall negotiate and specify retention and public records production costs in writing with customers prior to charging said fees. In absence of meeting such conditions of approval, Clear Ballot shall not charge customer for work performed pursuant to a proper public records request, except for the "actual, necessary, and direct" charge of responding to the records request, as that is defined and interpreted in Wisconsin law, plus shipping, handling, and chain of custody.

8. The Wisconsin application for approval contains a condition that requires the vendor to reimburse the WEC for all costs associated with the testing campaign and certification process. Clear Ballot agreed to this requirement on the application submitted to WEC on October 1, 2019 requesting the approval of ClearVote 2.0.

Proposed Motion

MOTION: The Wisconsin Elections Commission adopts the staff recommendations for approval of Clear Ballot Group's Application for Approval of ClearVote 2.0 voting system in compliance with US EAC certification number CBG-CV-20, including the conditions described above.

Appendices

- Appendix A: Hardware Components
- Appendix B: Wisconsin Statutes § 5.91
- Appendix C: Wisconsin Administrative Code EL 7
- Appendix D: Prescribed Language for Voter Information Screens
- Appendix E: Wisconsin Voting Equipment Review Panel Feedback
- Appendix F: Clear Ballot 2.0 EAC Report

Appendix A: Hardware Components

Clear Ballot Group submitted the following equipment for testing as part of ClearVote 2.0:

Equipment	***Hardware Version(s)***	***Firmware Version***	***Type***
ClearCast	**Revision 4**	**D**	**Polling Place Digital Scanner and Tabulator**
ClearCount			**Central Count Digital Scanner**
Dell Latitude Laptop	5580, 5590		
Dell PowerEdge Server	T130, T140, T330, T440		
Dell OptiPlex AIO	7440		
Dell Precision Tower	T3620		
Fujitsu Scanner	fi-7180		
Fujitsu Scanner	fi-6800		
Fujitsu Scanner	fi-6400		
ClearDesign			**Election Management System**
Dell Latitude Laptop	5580, 5590		
Dell PowerEdge Server	T130, T140, T330, T440		
Dell 24-inch Monitor	SE2416H		
Dell 22-inch Monitor	E2216HV		
Dell Mini Tower	T3620		
TP-LINK VPN Router	TL-R600VPN		
Lenovo USB Portable DVD Burner	LN-8A6NH11B		
Brother Printer	HL-L2340DW		
ClearAccess			**Ballot Marking Device**
Dell OptiPlex AIO	5250		
Dell 15” Inspiron	E-Series		
Brother Laser Printer	HL-L2340DW		
Oki Data Laser Printer	B432dn		

Appendix B: Wis. Stat. § 5.91

5.91 Requisites for approval of ballots, devices and equipment. No ballot, voting device, automatic tabulating equipment, or related equipment and materials to be used in an electronic voting system may be utilized in this state unless it is certified by the commission. The commission may revoke its certification of any ballot, device, equipment, or materials at any time for cause. The commission may certify any such voting device, automatic tabulating equipment, or related equipment or materials regardless of whether any such item is approved by the federal election assistance commission, but the commission may not certify any ballot, device, equipment, or material to be used in an electronic voting system unless it fulfills the following requirements:

(1) It enables an elector to vote in secrecy and to select the party for which an elector will vote in secrecy at a partisan primary election.

(3) Except in primary elections, it enables an elector to vote for a ticket selected in part from the nominees of one party, and in part from the nominees of other parties, and in part from independent candidates and in part of candidates whose names are written in by the elector.

(4) It enables an elector to vote for a ticket of his or her own selection for any person for any office for whom he or she may desire to vote whenever write-in votes are permitted.

(5) It accommodates all referenda to be submitted to the electors in the form provided by law.

(6) The voting device or machine permits an elector in a primary election to vote for the candidates of the recognized political party of his or her choice, and the automatic tabulating equipment or machine rejects any ballot on which votes are cast in the primary of more than one recognized political party, except where a party designation is made or where an elector casts write-in votes for candidates of more than one party on a ballot that is distributed to the elector.

(7) It permits an elector to vote at an election for all persons and offices for whom and for which the elector is lawfully entitled to vote; to vote for as many persons for an office as the elector is entitled to vote for; to vote for or against any question upon which the elector is entitled to vote; and it rejects all choices recorded on a ballot for an office or a measure if the number of choices exceeds the number which an elector is entitled to vote for on such office or on such measure, except where an elector casts excess write-in votes upon a ballot that is distributed to the elector.

(8) It permits an elector, at a presidential or gubernatorial election, by one action to vote for the candidates of a party for president and vice president or for governor and lieutenant governor, respectively.

(9) It prevents an elector from voting for the same person more than once for the same office, except where an elector casts excess write-in votes upon a ballot that is distributed to the elector.

(10) It is suitably designed for the purpose used, of durable construction, and is usable safely, securely, efficiently and accurately in the conduct of elections and counting of ballots.

(11) It records correctly and counts accurately every vote properly cast and maintains a cumulative tally of the total votes cast that is retrievable in the event of a power outage, evacuation or malfunction so that the records of votes cast prior to the time that the problem occurs is preserved.

(12) It minimizes the possibility of disenfranchisement of electors as the result of failure to understand the method of operation or utilization or malfunction of the ballot, voting device, automatic tabulating equipment or related equipment or materials.

(13) The automatic tabulating equipment authorized for use in connection with the system includes a mechanism which makes the operator aware of whether the equipment is malfunctioning in such a way that an inaccurate tabulation of the votes could be obtained.

(14) It does not employ any mechanism by which a ballot is punched or punctured to record the votes cast by an elector.

(15) It permits an elector to privately verify the votes selected by the elector before casting his or her ballot.

(16) It provides an elector with the opportunity to change his or her votes and to correct any error or to obtain a replacement for a spoiled ballot prior to casting his or her ballot.

(17) Unless the ballot is counted at a central counting location, it includes a mechanism for notifying an elector who attempts to cast an excess number of votes for a single office that his or her votes for that office will not be counted, and provides the elector with an opportunity to correct his or her ballot or to receive and cast a replacement ballot.

(18) If the device consists of an electronic voting machine, it generates a complete, permanent paper record showing all votes cast by each elector, that is verifiable by the elector, by either visual or nonvisual means as appropriate, before the elector leaves the voting area, and that enables a manual count or recount of each vote cast by the elector.

History: 1979 c. 311; 1983 a. 484; 1985 a. 304; 2001 a. 16; 2003 a. 265; 2005 a. 92; 2011 a. 23, 32; 2015 a. 118 s. 266 (10); 2015 a. 261; s. 35.17 correction in (intro.).

Cross-reference: See also ch. EL 7, Wis. adm. code.

Appendix C: Wis. Admin. Code Ch. EL 7

Chapter EL 7
APPROVAL OF ELECTRONIC VOTING EQUIPMENT

Note: Chapter ElBd 7 was renumbered chapter GAB 7 under s. 13.92 (4) (b) 1., Stats., and corrections made under s. 13.92 (4) (b) 7., Stats., Register April 2008 No. 628. **Chapter GAB 7 was renumbered Chapter EL 7 under s. 13.92 (4) (b) 1., Stats., Register June 2016 No. 726.**

EL 7.01 Application for approval of electronic voting system.

(1) An application for approval of an electronic voting system shall be accompanied by all of the following:

(a) A signed agreement that the vendor shall pay all costs, related to approval of the system, incurred by the elections commission, its designees and the vendor.

(b) Complete specifications for all hardware, firmware and software.

(c) All technical manuals and documentation related to the system.

(d) Complete instruction materials necessary for the operation of the equipment and a description of training available to users and purchasers.

(e) Reports from an independent testing authority accredited by the national association of state election directors (NASED) demonstrating that the voting system conforms to all the standards recommended by the federal elections commission.

(f) A signed agreement requiring that the vendor shall immediately notify the elections commission of any modification to the voting system and requiring that the vendor will not offer, for use, sale or lease, any modified voting system, if the elections commission notifies the vendor that the modifications require that the system be approved again.

(g) A list showing all the states and municipalities in which the system has been approved for use and the length of time that the equipment has been in use in those jurisdictions.

(2) The commission shall determine if the application is complete and, if it is, shall so notify the vendor in writing. If it is not complete, the elections commission shall so notify the vendor and shall detail any insufficiencies.

(3) If the application is complete, the vendor shall prepare the voting system for three mock elections, using offices, referenda questions and candidates provided by the elections commission.

History: Cr. Register, June, 2000, No. 534, eff. 7−1−00; **correction in (1) (a), (f), (2), (3) made under s. 13.92 (4) (b) 6., Stats., Register June 2016 No. 726.**

EL 7.02 Agency testing of electronic voting system.

(1) The elections commission shall conduct a test of a voting system, submitted for approval under s. EL 7.01, to ensure that it meets the criteria set out in s. 5.91, Stats. The test shall be conducted

using a mock election for the partisan primary, a mock general election with both a presidential and gubernatorial vote, and a mock nonpartisan election combined with a presidential preference vote.
(2) The elections commission may use a panel of local election officials and electors to assist in its review of the voting system.
(3) The elections commission may require that the voting system be used in an actual election as a condition of approval.
History: Cr. Register, June, 2000, No. 534, eff. 7−1−00; **correction in (1) to (3) made under s. 13.92 (4) (b) 6., Stats., and correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register June 2016 No. 726.**

EL 7.03 Continuing approval of electronic voting system.

(1) The elections commission may revoke the approval of any existing electronic voting system if it does not comply with the provisions of this chapter. As a condition of maintaining the elections commission's approval for the use of the voting system, the vendor shall inform the elections commission of all changes in the hardware, firmware and software and all jurisdictions using the voting system.
(2) The vendor shall, at its own expense, furnish, to an agent approved by the elections commission, for placement in escrow, a copy of the programs, documentation and source code used for any election in the state.
(3) The electronic voting system must be capable of transferring the data contained in the system to an electronic recording medium, pursuant to the provisions of s. 7.23, Stats.
(4) The vendor shall ensure that election results can be exported on election night into a statewide database developed by the elections commission.
(5) For good cause shown, the elections commission may exempt any electronic voting system from strict compliance with this chapter.
History: Cr. Register, June, 2000, No. 534, eff. 7−1−00; **correction in (1), (4), (5) made under s. 13.92 (4) (b) 6., Stats. and corrections in (5) made under s. 13.92 (4) (b) 7., Stats., and s. 35.17, Stats., Register June 2016 No. 726.**

Appendix D: Prescribed Language for Crossover Information Screen

Pursuant to the advice of the Commission, the informational screen displayed to voters when a ballot with crossover votes is fed into the tabulator has been updated to include more meaningful and more clear verbiage.

Figure 1 shows the language from the last Clear Ballot certification campaign in 2017 and Figure 2 shows the language from the most recent test campaign. WEC staff are in the process of discussing the necessary changes with Clear Ballot to bring the langauge from ClearVote 2.0 into compliance with previous Commission decisions.

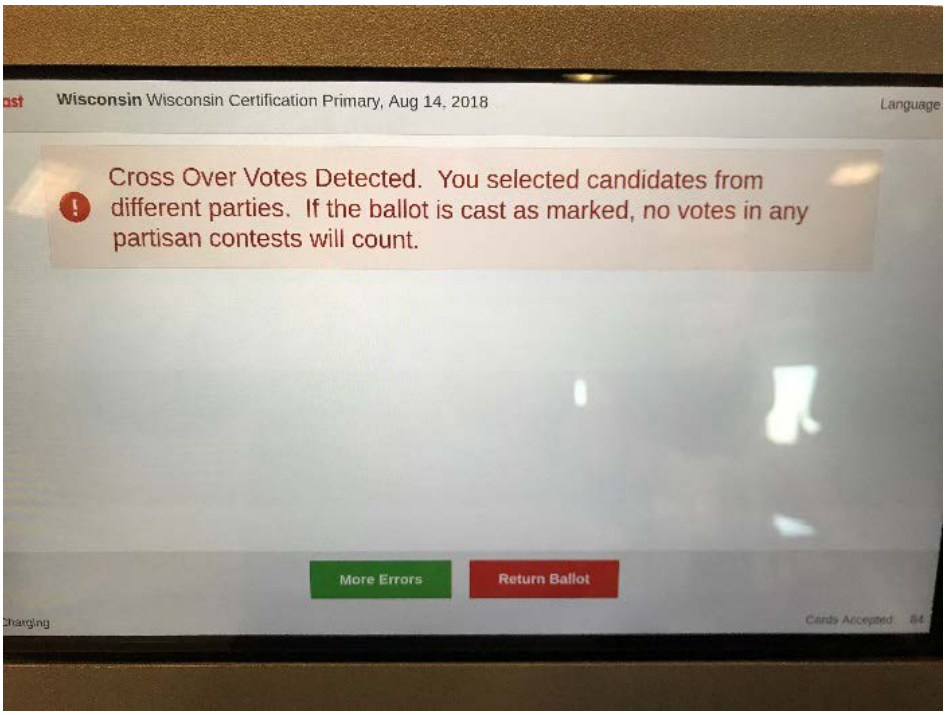


Fig. 1

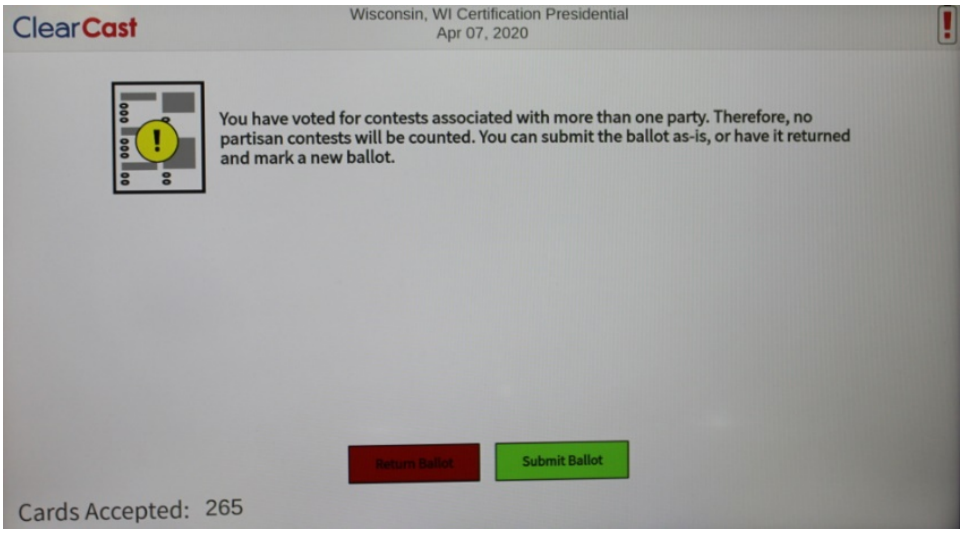


Fig. 2

Appendix E: Wisconsin Voting Equipment Review Panel's Feedback
These comments were provided via a structured feedback form.

1. **How would you rate the functionality of the equipment?**

Very Poor	Poor	Fair	Good	Excellent
		5	5	

- Version 2.0 is greatly improved from version 1.4. Feedback given by Sheboygan County municipal clerks and poll workers during training for use of 1.4 was implemented in 2.0, a definite plus for Sheboygan County and Wisconsin.
- Liked the ability to look at marked ballots in EMS software. I didn't like that device would make a judgement which mark would count in overvote situation. I think that's the inspectors' job.
- I like that the system takes voter intent into account when reading the ballots.

2. **How would you rate the accessible features?**

Very Poor	Poor	Fair	Good	Excellent
		1	5	3

- I didn't feel that the audio script helped me to work through the ballot. I didn't like that it marked the ovals perfectly and used type for the write-ins. If ballots were inspected, you could tell which ones were marked by handicapped voter.
- I really like some of the accessible features and find others could be improved upon. The system requires a poll worker to walk with the voter to the equipment so they can vote. This limits some of the independence of voters with certain disabilities who go to vote. It also requires that a poll worker has to be available to help a voter. This could disincentivize a poll worker offering the option to voters. It would also be nice if the audio gave a warning that the voter was moving on without marking a selection when undervoting. Other parts of it are very good.

3. **Rate your overall impression of the system.**

Very Poor	Poor	Fair	Good	Excellent
		4	5	1

- Version 2.0 is greatly improved from version 1.4. Feedback given by Sheboygan County municipal clerks and poll workers during training for use of 1.4 was implemented in 2.0, a definite plus for Sheboygan County and Wisconsin.
- I like the new collapsible ballot box.

Appendix F: ClearVote 2.0 Certification Report

Manufacturer: *Clear Ballot Group*
System Name: *ClearVote 2.0*
Certificate: *CBG-CV-20*

Laboratory: *Pro V&V*
Standard: *VVSG 2005*
Date: *October 21, 2019*

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 ClearVote 2.0 voting system is a paper-based optical-scan voting system consisting of the following major components: ClearDesign (ballot design and EMS), ClearCount (central count, tabulation, and election reporting), ClearCast (precinct count and tabulation), and ClearAccess (accessible voting and ballot marking device).

ClearDesign

ClearDesign is an election management system consisting of an interactive set of applications that are responsible for all pre-voting activities necessary for defining and managing elections. This includes

ballot design, ballot proofing, ballot layout, and ballot production. The ClearDesign system consists of the physical components listed below. All the components and the generation of voting machine election definition file packages are unmodified COTS that are connected via a wired, closed, and isolated network not connected to any other systems or to the Internet.

- DesignServer: A desktop computer that runs the ClearDesign software on an Ubuntu operating system and hosts the election database.
- DesignStation(s): One or more laptop or desktop computers that runs Microsoft Windows with a browser-based user interface. DesignStations connect to the DesignServer, and users with administrative privileges can define users and manage the elections.
- Router: Connects the DesignStations to the DesignServer using a wired, closed Ethernet-based network with FIPS 140-2 certified encryption.

ClearCount

ClearCount is a central, high-speed, optical-scan ballot tabulator coupled with ballot-processing applications. The ClearCount software runs on unmodified COTS laptop or desktop computers running the Linux and Windows operating systems, and supports specific models of Fujitsu scanners. The ClearCount central-count system consists of the following physical components, all of which are unmodified COTS hardware that are connected via a wired, closed, and isolated network not connected to any other systems or to the Internet.

- ScanServer: A computer running the ClearCount software and hosting its election database and the web server that serves its election reports. The ScanServer runs on the Ubuntu operating system.
- ScanStation(s): One or more computer/scanner pairs used to scan and tabulate ballots. The ScanStations run on the Microsoft Windows operating system.
- Router: Connects the ScanStations and election administration stations to the ScanServer using a wired, closed Ethernet-based network with FIPS 140-2 certified encryption.
- Election Administration Stations (Adjudication Stations): One or more laptop or desktop computers that runs Microsoft Windows with installed browser software. This station can serve multiple purposes: user administration, election administration, adjudication, and reporting. This station is also used to consolidate the vote totals and ballot images from the ClearCast precinct tabulator. The vote totals and ballot images are consolidated by the ClearCount software via the ClearCast USB drive.

All files that make up the ClearCount software reside on a single ScanServer that is shared by all client ScanStations. The only software programs installed on ScanStations, other than the Windows operating system, are the Fujitsu ScandAll Pro software and drivers required by the scanner hardware. The ClearCount software consists of the following components:

- Tabulator: The Tabulator application handles ballot tabulation. The Tabulator software is stored on the ScanServer and is executed by each ScanStation at run-time from files that reside on the ScanServer. The Tabulator program analyzes the incoming image and transfers them to the local output folder named CBGBallotImages. The ScanServer retrieves the images from the folder and

uploads them into the election database.

- Election Database: A centralized election database that resides on the ScanServer and collects the output of each Tabulator.
- Election Reports: A browser-based suite of reports that provides election results and analysis, and allows election officials to review individual ballot images. A web server on the ScanServer serves the reports.
- Card Resolutions Tool: A web application that allows election officials to review and appropriately resolve unreadable voted ballots.
- User and Election Database Management through Web Applications: From the User Administration page, the administrator can add, rename, or delete users; assign permissions; and change user passwords. From the Election Administration pages, the administrator can create or delete an election, set an election as active or inactive, back up or restore an election, merge election results, withdraw contests/choices, and export the Cast Vote Record.

ClearCast

The ClearCast tabulator is a precinct-count ballot-scanning solution suitable for early and election in-person voting, including processing ballots printed by the ClearAccess accessible ballot-marking device. The ClearCast application runs on the precinct-count-based tabulator, and is used to scan, count and tally marked ballots.

ClearCast functionality is divided into three essential modes, Election Mode (early voting and Election Day), which is used to process voter cast ballots; Pre-Election Mode, which occurs prior to Election Mode, and is used to test all system functionality subsequent to the start of the election; and Post-Election Mode, which is used to perform administrative functions following the close of the election. Ballots tabulated on the ClearCast system are transmitted via one of the redundant USB drives to the central ClearCount system for consolidation and reporting.

ClearAccess

ClearAccess is an accessible touchscreen ballot-marking device used for the creation of paper ballots that can be scanned and tabulated by ClearCast or ClearCount. Like other components of the ClearVote voting system, ClearAccess uses modified and unmodified COTS hardware, such as laptop and desktop computers, combined with personal assistive devices, printers, and uninterruptible power supplies to form a ballot-marking device.

Mark Definitions

Twenty percent or more of the voter target (oval) marked anywhere within the oval (left/right, above, or below its center) provides mark recognition. The manufacturer recommends black ink, but many colors will tally in accordance with VVSG 1.0 accuracy requirements. There are no required dropout colors.

Tested Marking Devices

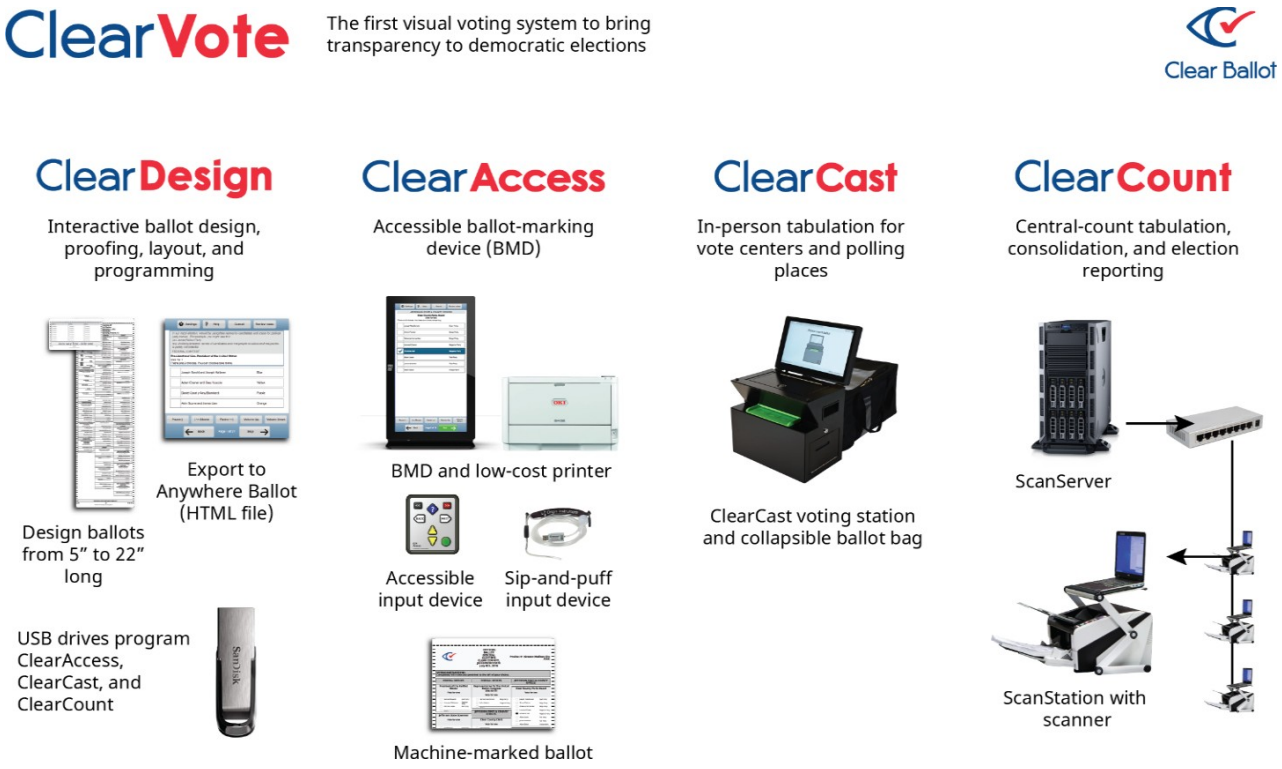
The manufacturer recommends black and blue ballpoint pens, Sharpie® markers, and number 2 pencils.

Language Capability

In addition to English, the voting system supports Chinese, Danish, Dutch, Flemish, French, German, Italian, Japanese, Korean, Norwegian, Portuguese, Spanish, Swedish and Vietnamese.

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	Comment
ClearAccess software	2.0.1			ClearAccess
ClearCast software	2.0.0			ClearCast
ClearCount software	2.0.1			ClearCount
ClearDesign software	2.0.1			ClearDesign
Brother printer driver	1.0.1.0		Windows 10 Pro	ClearAccess
Google Chrome	61.0.3163.100		COTS software	ClearAccess
jquery	1.10.2		COTS software	ClearAccess

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comment
jsmin	2003.12.04		COTS software	ClearAccess
nsis	3.01		COTS software	ClearAccess
Okidata printer driver	1.0.0.0		Windows 10 Pro	ClearAccess
pefile	2018.8.8		COTS software	ClearAccess
PyInstaller	3.2		COTS software	ClearAccess
Python	2.7.10		COTS software	ClearAccess
Python-future	0.15.2		COTS software	ClearAccess
pywin	223		COTS software	ClearAccess
webpy	0.38		COTS software	ClearAccess
Zebra Scanner Driver	3.03.0001		COTS software	ClearAccess
Windows 10 Pro	Build 1607		Windows 10 Pro	ClearAccess
DataTables	1.10.16		COTS software	ClearCast
google_chrome	76.0.3809.87-1		COTS software	ClearCast
jquery	1.12.4		COTS software	ClearCast
jQuery.NumPad	1.4		COTS software	ClearCast
jquery.ui	1.11.3		COTS software	ClearCast
JTSage DateBox	4.0.0		COTS software	ClearCast
libScanAPI.a	1.1.4		COTS software	ClearCast
OpenSSL (standard)	1.0.2g		COTS software	ClearCast
OpenSSL FIPS Object Module	2.0.10		COTS software	ClearCast
pdi_ps3_drv_scanner.ko	2.0.5		COTS software	ClearCast
Pyinstaller	3.2.1		COTS software	ClearCast
scanner_control	0.0.33		COTS software	ClearCast
Ubuntu LTS	18.04.1		COTS software	ClearCast
zeromq	4.2.3		COTS software	ClearCast
Apache	2.4.29		COTS software	ClearCount
ColVis	1.0.8		COTS software	ClearCount
Fujitsu fi-6400 PaperStream	1.30.0		Windows 10 Pro	ClearCount
Fujitsu fi-6800	10.10.710		Windows 10 Pro	ClearCount
Fujitsu fi-7180 PaperStream	1.4.0		Windows 10 Pro	ClearCount
Google Chrome	55.0.2883.87		COTS software	ClearCount

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comment
J JavaScript jQuery-migrate library	1.2.1		COTS software	ClearCount
JavaScript Bootstrap library	2.3.2		COTS software	ClearCount
JavaScript Chosen library	1.0.0		COTS software	ClearCount
JavaScript DataTables library	1.9.4		COTS software	ClearCount
JavaScript FixedHeader library	2.0.6		COTS software	ClearCount
JavaScript hotkeys library	0.8		COTS software	ClearCount
JavaScript jQuery library	1.10.2		COTS software	ClearCount
JavaScript LESS library	1.3.3		COTS software	ClearCount
JavaScript pep library	1.0		COTS software	ClearCount
JavaScript TableTools library	2.1.5		COTS software	ClearCount
JavaScript tooltip library	1.3		COTS software	ClearCount
libapache2-mod-fcgid	2.3.9		COTS software	ClearCount
MySQLdb (part of Ubuntu)	5.7.26		COTS software	ClearCount
OpenSSL (standard)	1.1.0g		COTS software	ClearCount
OpenSSL FIPS Object Module	2.0.10		COTS software	ClearCount
PollyReports	1.7.6		COTS software	ClearCount
PyInstaller	3.2.1		COTS software	ClearCount
Python (part of Ubuntu)	2.7.15		COTS software	ClearCount
Ubuntu LTS	18.04.1		COTS software	ClearCount
Windows 10 Pro	Build 1607		Windows 10 Pro	ClearCount
ZeroClipboard TableTools2	1.0.4		COTS software	ClearCount
Aptitude	1.6.11		COTS software	ClearCount
auditd	2.8.2		COTS software	ClearCount
debconf	1.5.66		COTS software	ClearCount
pmount	0.9.23		COTS software	ClearCount
Samba	4.7.6		COTS software	ClearCount
udisks	2.7.6		COTS software	ClearCount
Apache	2.4.18		COTS software	ClearDesign
Bootstrap	3.0.0		COTS software	ClearDesign

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comment
DataTable	1.10.16		COTS software	ClearDesign
DataTable Buttons	1.4.2		COTS software	ClearDesign
DataTable Buttons JSZip	2.5.0		COTS software	ClearDesign
DataTablePlugins	1.10.16		COTS software	ClearDesign
DataTable Buttons Pdfmake	0.1.32		COTS software	ClearDesign
Google Chrome	55.0.2883.87		COTS software	ClearDesign
jquery	1.10.2		COTS software	ClearDesign
jquery-impromptu	5.2.3		COTS software	ClearDesign
jquery-qrcode	1.0		COTS software	ClearDesign
jquery-splitter	0.14.0		COTS software	ClearDesign
jquery-ui	1.10.4		COTS software	ClearDesign
jscolor	1.4.2		COTS software	ClearDesign
jsmin	2003.12.04		COTS software	ClearDesign
jszip	3.1.2		COTS software	ClearDesign
libapache2-mod-fcgid	2.3.9		COTS software	ClearDesign
libmp3lame	0.5.0		COTS software	ClearDesign
MySQL	5.7.26		COTS software	ClearDesign
OpenSSL (standard)	1.0.2g		COTS software	ClearDesign
OpenSSL FIPS Object Module	2.0.10		COTS software	ClearDesign
papaparse	4.1.2		COTS software	ClearDesign
PhantomJS	1.9.8		COTS software	ClearDesign
Pyinstaller	3.2.1		COTS software	ClearDesign
Python	2.7.15		COTS software	ClearDesign
Python DBUtils	1.1		COTS software	ClearDesign
Python Flup	1.0.2		COTS software	ClearDesign
Python FontTools library	3.0		COTS software	ClearDesign
Python JSMIN	2.2.1		COTS software	ClearDesign
Python MySQL DB	1.3.10		COTS software	ClearDesign
Python Pillow	5.1.0		COTS software	ClearDesign
Python PIP	9.0.1		COTS software	ClearDesign
Python RTF	0.2.1		COTS software	ClearDesign
Python webpy	0.38		COTS software	ClearDesign
Python XLRD	0.9.4		COTS software	ClearDesign

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comment
Samba	4.7.6		COTS software	ClearDesign
SQLAlchemy	1.0.15		COTS software	ClearDesign
tinymce	4.1.9		COTS software	ClearDesign
Ubuntu LTS	18.04.01		COTS software	ClearDesign
Unzip	6.0.21		COTS software	ClearDesign
Windows 10 Pro	Build 1607		Windows 10 Pro	ClearDesign
Dell Inspiron 15"		7000 Series	COTS hardware	ClearAccess
Dell OptiPlex AIO		5250	COTS hardware	ClearAccess
ELO 15 inch AIO		E-Series (ESY15E2)	COTS hardware	ClearAccess
ELO 20 inch AIO		X-Series (ESY20X2)	COTS hardware	ClearAccess
Brother Laser Printer		HL-L2340DW	COTS hardware	ClearAccess
Brother Laser Printer		HL-L2350DW	COTS hardware	ClearAccess
Oki Data Laser Printer		B432dn	COTS hardware	ClearAccess
Micrologic Tray Kit		B432TrayKit	COTS hardware	ClearAccess
Oki Data Laser Printer		B432dn-B	COTS hardware	ClearAccess
Storm EZ Access Keypad		EZ08-222013	COTS hardware	ClearAccess
Zebra Technologies Bar Code Scanner		DS457-SR, CBL-58926-05	COTS hardware	ClearAccess
Origin Instruments Sip/Puff Breeze with Headset		AC-0313-MUV	COTS hardware	ClearAccess
Samson Over-Ear Headphones		SASR350	COTS hardware	ClearAccess
Clear Ballot Privacy Screen		CB-1097-1.5	COTS hardware	ClearAccess
APC Smart-UPS		SMT2200C	COTS hardware	ClearAccess
Ergotron Neo-Flex		Widescreen Lift Stand	COTS hardware	ClearAccess
Corsair Flash Padlock 3 32 GB		Secure USB 3.0 Flash Drive	COTS hardware	ClearAccess
SanDisk Extreme Go 64 GB USB		3.1 USB Drive	COTS hardware	ClearAccess
SanDisk Ultra Flair 32 GB USB		3.0 Drive	COTS hardware	ClearAccess
Wurth		742-711-32, 742-712-22, 742-717-22	COTS hardware	ClearAccess
Polymide Film Tape		1″ 2mil	COTS hardware	ClearAccess
Polymide Film Tape		2″ 2 mil	COTS hardware	ClearAccess

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comment
Polymide Film Tape		4" 2 mil	COTS hardware	ClearAccess
Lifetime 4-Foot Folding Table		4428	COTS hardware	ClearAccess
LG DVD Burner		GP65NB60	COTS hardware	ClearAccess
CyberPower Smart App UPS		PR1500RT2U	COTS hardware	ClearAccess
ClearCast		Model D, Revision 5	COTS hardware	ClearCast
Ballot Bag		CV-1032-1.5, CV-113-1.5	COTS hardware	ClearCast
Corsair Flash Padlock 3 32 GB		Secure USB 3.0 Flash Drive	COTS hardware	ClearCast
Wurth ferrites		74271142,74275812 74275813,74271132 ,74271722	COTS hardware	ClearCast
SanDisk Extreme Go 64 GB USB		3.1 USB Drive	COTS hardware	ClearCast
SanDisk Ultra Flair 32 GB USB		3.0 USB Drive	COTS hardware	ClearCast
Ballot Box		CV-1082-2.0	COTS hardware	ClearCast
Dell Latitude Laptops (Election Administration)		5580, 5590	COTS hardware	ClearCount
Dell Latitude Laptops (ScanStation)		5580, 5590	Windows 10 Pro	ClearCount
Dell Precision Tower (Election Administration)		T3620	Windows 10 Pro	ClearCount
Dell PowerEdge Server (ScanServer)		T130, T140, T330, T440	Ubuntu 18.04.1 LTS	ClearCount
Dell Optiplex (Election Administration)		7440	Windows 10 Pro	ClearCount
Fujitsu Scanner		fi-7180	COTS hardware	ClearCount
Fujitsu Scanner		fi-6800	COTS hardware	ClearCount
Fujitsu Scanner		fi-6400	COTS hardware	ClearCount
LG DVD Burner		GP65NB60	COTS hardware	ClearCount
Western Digital 4 TB External HD		WDBFJK0040HBK-NESN	COTS hardware	ClearCount
Western Digital 8 TB External HD		WDBFJK0080HBK-NESN	COTS hardware	ClearCount
Netac Keypad Encryption Portable Hard Disk		K390	COTS hardware	ClearCount
Dell 24 inch Monitor		P2415Q	COTS hardware	ClearCount

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comment
Dell 22 inch Monitor		P2217	COTS hardware	ClearCount
Cisco 8-Port Switch		SG250-08	COTS hardware	ClearCount
Cisco 26-Port Switch		SG250-26	COTS hardware	ClearCount
APC Smart-UPS		SMT-1500C	COTS hardware	ClearCount
Corsair Flash Padlock 3 32 GB		Secure USB 3.0 Flash Drive	COTS hardware	ClearCount
SanDisk Extreme Go 64 GB USB		3.1 USB Drive	COTS hardware	ClearCount
SanDisk Ultra Flair 32 GB USB		3.0 Drive	COTS hardware	ClearCount
Anker USB Hub		AK-68ANHUB-B10A)	COTS hardware	ClearCount
WorkEZ Executive Scanning Shelf		WEEs (661799222990)	COTS hardware	ClearCount
StarTech 4-Port VGA KVM Switch w/Hub		SV431USB	COTS hardware	ClearCount
Dell Latitude Laptop (client)		5580, 5590	Windows 10 Pro	ClearDesign
Dell Precision Tower (client)		T3620	Windows 10 Pro	ClearDesign
Dell PowerEdge Server (server)		T130, T140, T630, T440	Ubuntu 16.04.4 LTS	ClearDesign
Dell Optiplex (client)		7440	Windows 10 Pro	ClearDesign
Dell 24 inch Monitor		SE2416H	COTS hardware	ClearDesign
Dell 22 inch Monitors		E2216HV	COTS hardware	ClearDesign
Cisco 8-Port Switch		SG250-08	COTS hardware	ClearDesign
LG DVD Burner		GP65NB60	COTS hardware	ClearDesign
SySTOR Multiple USB Duplicator		SYS-USBD-11	COTS Hardware	ClearDesign
Corsair Flash Padlock 3 32 GB		Secure USB 3.0 Flash Drive	COTS hardware	ClearDesign
SanDisk Extreme Go 64 GB USB		3.1 USB Drive	COTS hardware	ClearDesign
SanDisk Ultra Flair 32 GB USB		3.0 Drive	COTS hardware	ClearDesign
Anker 10 port USB 3.0 Hub		AK-68ANHUB-B10A	COTS hardware	ClearDesign

System Limitations

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

System Characteristic	Boundary or Limitation	Limiting Component
Precincts in an election	3200	ClearDesign database

Contests in an election	3200	ClearDesign database
Candidates/Counters in an election	3200	ClearDesign database
Ballot Styles in an election	3200	ClearDesign database
Contests in a ballot style	60	ClearDesign database
Candidates in a contest	300	ClearDesign database
Ballot styles in a precinct	50	ClearDesign database
Number of political parties	50	ClearDesign database
"vote for" in a contest	50	ClearDesign database
Supported languages in an election	15	ClearDesign database
Number of write-ins	50	ClearDesign database
Maximum oval positions per side: 5-inch ballot	60	Ballot length
Maximum oval positions per side: 11-inch ballot	180	Ballot length
Maximum oval positions per side: 14-inch ballot	240	Ballot length
Maximum oval positions per side: 17-inch ballot	300	Ballot length
Maximum oval positions per side: 19-inch ballot	360	Ballot length
Maximum oval positions per side: 22-inch ballot	420	Ballot length

System Limits for ClearCount

Scanner Model	Sustained (not burst speed) ballots per hour						
	8.5x5	**8.5x11**	**8.5x14**	**8.5x17**	**8.5x19**	**8.5x22**	**Typical county size (central count)**
fi-6400	5592	3624	2928	2448	2350	2236	Large (>100k voters)
fi-6800	7822	5508	4155	3352	3000	2800	Large (>100k voters)
fi-7180	3396	2040	1692	1400	1300	1200	Small (<25k voters)
ClearCount can have a maximum of 10 ScanStation/Scanner pairs							

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
• Precinct and BMD accessible via Parallel (Side) and Forward Approach	Yes	
Closed Primary		
• Primary: Closed	Yes	
Open Primary		
• Primary: Open Standard (provide definition of howsupported)	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	Yes	
• Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	Yes	
• Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	Yes	
Write-In Voting:		
• Write-in Voting: System default is a voting position identified for	Yes	
• Write-in Voting: Without selecting a write in position.	Yes	
• Write-in: With No Declared Candidates	Yes	
• Write-in: Identification of write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations & Slates:		
• Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	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 district
Straight Party Voting:		
• Straight Party: A single selection for partisan races in a general	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	Yes	
Cross-Party Endorsement:		
• Cross party endorsements, multiple parties endorse one candidate.	Yes	
Split Precincts:		
• Split Precincts: Multiple ballot styles	Yes	
• Split Precincts: P & M system support splits with correct contests and ballot identification of each split	Yes	
• Split Precincts: DRE matches voter to all applicable races.	N/A	Not a DRE system
Feature/Characteristic	Yes/No	Comment
• 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.)	No	
• Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2nd contest.)	No	
Cumulative Voting		
• Cumulative Voting: Voters are permitted to cast, as many votes as	No	
Ranked Order Voting		
• Ranked Order Voting: Voters can write in a ranked vote.	No	
• Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	No	
• Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	No	
• Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	No	
• Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	No	
• Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	No	
Provisional or Challenged Ballots		
• Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in	Yes	via jurisdiction processes
• Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the	No	
Feature/Characteristic	Yes/No	Comment
• 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 votes than allowed by the vote rule, it is counted as an overvote
• Overvotes: DRE: Prevented from or requires correction of overvoting.	Yes	Yes for ClearAccess

• Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	If the system detects more votes than allowed by the vote rule, it is counted as an overvote
• Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	N/A	No method to data enter absentee via ClearAccess
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	via adjudication in ClearCount
• Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	Yes	via adjudication in ClearCount
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 and Central counting devices	Yes	
• Ballot Marking Device	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 votes than allowed by the
• Overvotes: DRE: Prevented from or requires correction of	Yes	Yes for ClearAccess
• Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	If the system detects more votes than allowed by the
• Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	N/A	No method to data enter absentee via ClearAccess
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	via adjudication in ClearCount
Feature/Characteristic	**Yes/No**	**Comment**
• Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	Yes	via adjudication in ClearCount
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	

• FIPS140-2 validated cryptographic module	Yes	
Used as (if applicable):		
• Precinct and Central countingdevices	Yes	
• Ballot Marking Device	Yes	