

State of Wisconsin\Government Accountability Board

212 East Washington Avenue, 3rd Floor
Post Office Box 7984
Madison, WI 53707-7984
Voice (608) 266-8005
Fax (608) 267-0500
E-mail: gab@wisconsin.gov
<http://gab.wi.gov>



JUDGE TIMOTHY L. VOCKE
Chair

KEVIN J. KENNEDY
Director and General Counsel

MEMORANDUM

DATE: For the March 20 and 21, 2013, Board Meeting

TO: Members, Wisconsin Government Accountability Board

FROM: Kevin J. Kennedy
Director and General Counsel
Government Accountability Board

Prepared and Presented by:
Sherri Ann Charleston
Voting Equipment Election Specialist
Government Accountability Board

Ross Hein
Elections Supervisor
Government Accountability Board

SUBJECT: Election Systems and Software (ES&S)
Petition for Approval of Electronic Voting System
Unity 3.4.0.0

I. Introduction

Election Systems and Software (ES&S) is requesting that the Government Accountability Board approve ES&S Unity 3.4.0.0 for sale and use in the State of Wisconsin. No electronic voting equipment may be offered for sale or utilized in Wisconsin unless the Board first approves it. Wis. Stat. §5.91. The Board has also adopted administrative rules detailing the approval process. Wis. Admin. Code Ch. GAB 7.

Unity 3.4.0.0 is a paper based Election Management System (EMS) for end-to-end election management. Unity EMS allows jurisdictions to create and maintain a central database of election information, format and print paper ballots on demand, program election equipment, and collect and report election results

The Government Accountability Board (Board) previously approved the Unity Election Management Suite, version 3.2.0.0 Rev 3, which includes the DS200 digital scanner, version 1.6.1.0, and AutoMARK Voter Assist Terminal versions 1.3.2906 and 1.3.1, on August 28, 2012. The DS 200 and AutoMARK in Unity 3.4.0.0 use identical firmware to what was previously certified with 3.2.0.0 Rev 3. The Model 100 Precinct Tabulator which is part of Unity 3.4.0.0 was not certified with the 3.2.0.0 Rev 3 system. It was most recently certified by the State Elections Board in 2006 and approved for modification via an Engineering Change Order in 2010.¹ All of the pieces of equipment tested in

¹ Approval of modification to the previously certified M100 voting system occurred August 25, 2010 pursuant to Wis. Adm. Code GAB §7.03(1) and with authorization granted by the Board to Director Kennedy to approve applications for voting systems modifications to systems previously approved for use in Wisconsin.

February 2013 were upgrades to the above equipment that are currently approved for sale and use in Wisconsin. This is not a brand new voting system, but rather a previously approved voting system with updates that are more than de minimis and which require new approval.

II. Recommendation

Based on the federal testing and certification of this system and on Board staff’s own functional testing of this equipment, Board staff is recommending approval of ES&S Unity 3.4.0.0 for sale and use in Wisconsin. More detailed recommendations are listed on pages 11-12, following the analysis of the functional testing.

III. Background

On June 13, 2012, Board staff received an Application for Approval of Unity 3.4.0.0. This initial request was rejected for two reasons: 1) Unity 3.4.0.0 had not yet obtained a U.S. EAC certification and 2) the application was submitted on an outdated application form. Furthermore, the Application for Approval sought the G.A.B.’s approval of both Unity 3.2.0.0 Rev. 3 and Unity 3.4.0.0. On July 11, 2012 ES&S resubmitted a proper Application for Approval of Unity 3.2.0.0. Rev3 and the G.A.B. staff scheduled voting system testing and demonstrations. The Board approved Unity 3.2.0.0 Rev 3 for sale and use in Wisconsin at its August 28, 2012 meeting.

ES&S resubmitted a proper Application for Approval of Unity 3.4.0.0 on December 18, 2012. ES&S submitted complete specifications for hardware, firmware and software related to the voting system. In addition, ES&S submitted technical manuals, documentation and instruction materials necessary for the operation of the voting system. ES&S initially requested certification for the DS850 high speed central scanner. On February 7, 2013 ES&S withdrew the DS850 from its Unity 3.4.0.0 Application for Approval as they did not forecast that any units would be sold during the near term sales cycle in Wisconsin.

The Voting System Test Laboratory responsible for testing the ES&S systems at the federal level, Wyle Laboratories, recommended that the US EAC certify ES&S Unity 3.4.0.0. ES&S provided the Wyle report to the Board along with the Application for Approval of Unity 3.4.0.0. Voting systems submitted to the U.S. EAC for testing after December 13, 2007 are tested using the 2005 Voluntary Voting System Guidelines. However, as this was a modification of a system previously certified to the 2002 Voting System Standards, upon successful completion of testing, the US EAC certified the new version to the 2002 Voting System Standards. The EAC certified ES&S Unity 3.4.0.0 on October 31, 2012, and issued it certification number **ESSUnity3400**.

Board staff scheduled voting system evaluations and demonstrations for ES&S during the week of February 11, 2013. ES&S submitted the following equipment for testing:

Equipment	Hardware Version(s)	Firmware Version	Type
DS200	1.2	1.6.1.0	Precinct Tabulator
AutoMark Voter Assist Terminal (VAT)	1.0 1.1 1.3.1 with Print Engineering Board 1.65 1.3.1 with Print Engineering Board 1.70	1.3.2907	Ballot Marking Device
M100		5.4.4.5	Precinct Tabulator

A. DS200

The DS200 is a digital scanner and paper ballot tabulator used primarily as a precinct counting system to tabulate paper ballots at the polling place. Each system can process ballots for up to ten wards or reporting units. After the voter makes a selection with a marker, or a ballot marking device (AutoMARK VAT), the ballot is inserted into the DS200 for immediate tabulation. The precinct count optical scanner tabulates votes and feeds inserted ballots into an attached secured storage bin.

The system includes a large touch screen display to provide feedback to the voter on the disposition of his or her ballot. If any errors or irregularities (overvote/crossover vote/blank ballot) are identified, the voter has the ability to return the ballot for review, or instruct the system to read it as-is.² Both sides of the ballots are scanned using a high-resolution image-scanning device, and the votes and ballot images of an election are stored on an external USB flash drive. The flash drive with the results and ballot images can also be removed and transported to the central tabulation location. The DS200 does not store any ballot data, election totals or election images in its internal memory. Results may not be “modemed-in” from the DS200 to a central location.

B. AutoMARK VAT

The AutoMARK VAT is comprised of a color touch screen monitor and integral ballot printer. To use the device, the voter inserts a pre-printed blank ballot into the input tray of the device. The mechanism draws in the ballot and scans a preprinted bar code on the ballot to determine which form of ballot has been inserted. The VAT then displays a series of menu-driven voting choices on its screen. The voter uses the touch screen or key pad provided to make voting selections. The VAT stores these choices in its internal memory.

When the voter has completed the selection process, the VAT provides a summary report for the voter to review his or her choices, and the AutoMARK VAT marks the ballot using its built-in printer. The print mechanism is a duplex device and can print both sides of the ballot. When the printing of the ballot is completed, the VAT feeds the ballot back to the voter. Once the ballot has been marked and is provided to the voter, the AutoMARK VAT clears its internal memory and the paper ballot is the only lasting record of the voting selections made. The voter may visually confirm his or her selections, or the ballot may be re-inserted into the VAT and the voter selections summary report will provide an audio summary for voters with visual impairments. The voter proceeds to enter the ballot into an optical scan voting system for tabulation or a secured ballot box to be hand tabulated by election inspectors after the polls have closed.

Overvotes and crossover votes cannot occur on this equipment and a voter is warned about undervotes prior to the completion of voting. The AutoMARK VAT generates audio voting instructions that guide a visually impaired voter through the election sequence. The voter wears headphones to hear the spoken instructions. The voter makes his or her selections by pressing on a specially designed switch panel. The voter can adjust the volume and the screen may be “blacked out” to deactivate the LCD screen, to provide enhanced privacy. The voter may adjust the tempo (speed) of the audio instructions and the VAT accommodates a sip-puff device for voters who do not have use of their hands. The VAT can be programmed in multiple languages, although languages other than English are not currently required in most Wisconsin municipalities. The City of Milwaukee is subject to a Spanish language requirement under Section 203 of the Voting Rights Act and the VAT accommodates that requirement.

² ES&S preprogrammed the DS200 to automatically reject overvotes and crossover votes. Voters were given the option to accept or reject blank ballots.

C. Model 100 (M-100)

The M100 is an optical precinct ballot scanner and tabulator. ES&S upgraded the M100 to function with the Unity 3.4.0.0 package. Specifically, ES&S expanded the number of precincts that could be counted on Election Day from 10 to a maximum of 18. Early voting precincts were also expanded from 10 to a maximum of 450. Finally, ES&S enhanced support for 2007 Daylight Savings Rules, audit log messaging, and voter/poll worker messaging.

Voters make their selections and then insert their ballots directly into the M100 at the polling place. As soon as a voter inserts the ballot, the scanner tabulates votes, sorts the ballot, and then feeds it into the attached ballot storage bin. The system includes a small screen display that is manually operated to provide feedback to the voter on the disposition of their ballot. If any errors or irregularities (overvote /crossover) are identified, the M100 offers the voter the opportunity to reject or accept the ballot.³ Both sides of the ballots are scanned using a high-resolution image-scanning device. The system tabulates the votes and produces a printed report of the vote count together with report data stored on a battery backed-up PCMCIA memory card. The PCMCIA memory card with the results can also be removed and transported to the central tabulation location.

D. 3.4.0.0 Election Management System Software

The Unity 3.4.0.0 suite also includes the following software, which was verified by staff:

Software	Unity 3.2.0.0 R3	Unity 3.4.0.0
Audit Manager	7.5.2.0	7.5.2.0
Election Data Manager	7.8.1.0	7.8.1.0
ESS Image Manager	7.7.1.0	7.7.1.0
Hardware Programming Manager	5.7.1.0	5.8.0.0
Election Reporting Manager	7.5.4.0	7.8.0.0
AutoMark Information Management System (AIMS)	1.3.157	1.3.257
VAT Previewer	1.3.2906	1.32907
Log Monitor	1.0.0.0	1.0.0.0

³ ES&S preprogrammed the M-100 to automatically reject overvotes and crossover votes. Voters were given the option to accept or reject blank ballots.

IV. Functional Testing

As required by GAB 7.02(1), staff conducted three mock elections with each component of the voting system: a partisan primary, a general election with both a presidential and gubernatorial vote, and a nonpartisan election combined with a presidential preference vote. The mock elections offered an opportunity for staff to perform functional testing to ensure the system conforms to all Wisconsin requirements.

Staff designed a test deck of approximately 1,000 test ballots using various configurations of ballot positions over the three separate mock elections to verify the accuracy and functional capabilities of the system. The four AutoMARK hardware configurations were tested by marking approximately 80 ballots with the equipment using various ballot marking configurations and ballot styles. The Auto-MARKed ballots were then verified by staff before being tabulated by the DS200 and M100 tabulation equipment. Staff determined the results produced by each tabulator matched the expected results from the test plan.⁴

V. Public Demonstration

Following the mock elections, an evening public demonstration of the voting system was conducted February 13, 2013 from 5:00 – 7:00 p.m. and members of the public were able to use the system and provide comment. Three members of the public attended. The participants included one citizen, a representative from State Senator Lazich’s office, and a representative from the office of Brown County Clerk Sandy Juno.

Comments from the public demonstration are included in the appendices.

VI. Wisconsin Election Administration Council Demonstration

Also, on February 14, 2013 from 9:30 a.m. – 12:00 p.m., the Wisconsin Election Administration Council (WI-EAC), which is made up of municipal and county clerks, representatives of the disability community, and community advocates, participated in a demonstration by the manufacturer and evaluated the equipment.

Comments from the WI-EAC are included in the appendices.

⁴ In the mock Partisan Primary election, there were voter marking errors in twelve of the ballots produced for the test deck (57, 70, 71, 141, 151, 170, 171, 266, 267, 269, 270, 27). Temporary staffers were hired to create the markings on the test deck. In entering the configurations from the test design onto the ballots, the temporary staff member assigned to produce the deck committed several marking errors, including entering votes not on the test design, creating duplicate ballots, and failing to fill in the corresponding ovals for write-in votes. Staff members discovered these errors while tabulating results using the M100. Staff members examined the test deck, corrected the incorrect ballots, and were able to effectively reconcile the test results. After completing the reconciliation, staff determined that the partisan primary tabulations were without error. In the future, temporary staff members will be asked to verify each other’s work.

Staff tabulated the Partisan Primary election test deck using the DS200. The DS200 detected and recorded votes for twelve (12) races that were identified in the test design as “voter error” entries. Staff concluded that though temporary staffers were instructed to enter “voter errors” (extraneous marks in lieu of properly filled in ovals) the DS200 was able to detect marks that were not as difficult for the machine to detect as they should have been.

In the mock general election, there were voter marking errors on three (3) ballots (319, 50, 8) discovered during the testing of the DS200. The DS200 tabulated votes from Ballot #276, which included staff designed voter errors marks in fifteen races. Staff corrected the defective ballots, but did not remake ballot #276. Staff re-tabulated the results using the M100. The results were perfect with the exclusion of the overvotes created by ballot #276. Staff concluded that the voter errors entered by temporary staffers had not been extraneous enough.

The mock presidential preference election test deck included one ballot with voter marking errors. Additionally, staff initially failed to insert a photocopied ballot in lieu of a properly marked ballot thereby creating an excess vote. Staff members corrected the incorrect ballots and were able to effectively reconcile the test results with the machine totals for both the M100 and the DS200.

VII. Board Staff's Feedback

The Unity Election Management System in Unity 3.4.0.0 was used successfully to program each of the four hardware versions of the AutoMARK Voter Assist Terminal, one DS200 digital scan ballot tabulator, and one M100 precinct tabulator. ES&S demonstrated within Unity how to create the election/ballots for each given election. After the equipment counted the ballots, ES&S demonstrated the tabulation of the election results within Unity. Staff visually verified the version numbers for each component of the Unity 3.4.0.0 EMS by checking the component's configuration display.

As part of its certification of the system, the US EAC requires all election programming and results reporting to use a "hardened system" for the Unity EMS and AIMS. A "hardened system" is a computer that contains only the Unity EMS and / or AIMS program and is used only for programming and results reporting. No other program or application is permitted on the unit.

A. AutoMARK Voter Assist Terminal

- Although there were no errors with the physical marking of the test ballot by the AutoMARK and the four hardware configurations produced accurate marks, there were some instances in which the system produced error messages that would require intervention by an election inspector. The messages displayed by the systems during testing were "paper misfeed", "error while printing", and "ballot not recognized." These errors were generally infrequent and fixed by simply re-feeding the ballot into the machine.
- The AutoMARK does not arguably provide absolute privacy and independence for voters with disabilities, especially voters with dexterity or motor disabilities, as voters may need assistance inserting the ballot, removing the ballot and placing the ballot in the ballot box or tabulator. However, it does provide substantial compliance with these objectives.

B. DS200 Digital Scan Precinct Tabulator

- Although there were no errors with the tabulation of the test ballots by the DS200, there were some instances in which the DS200 produced error messages that may require intervention by an election inspector. Among the messages by the systems during testing were "ballot too long," "ballot not inserted far enough", "ballot not recognized," and "missed orientation marks." With each of these errors, there was an audio alert notifying the voter of an issue with the ballot. These errors were generally infrequent and occasionally fixed by simply re-feeding the ballot into the machine. However, on several occasions the ballot had to be reinserted using a different orientation. This might suggest the scanner has difficulty reading ballots that are not inserted face up and top forward, but because the problem was not consistent staff could not definitely determine that this was the case.
- The DS200 was able to correctly read marks in pencil, black pen, blue pen, red pen, and green pen as well as by the ES&S-provided markers.
- The ability of the DS200 to capture digital ballot images automatically may provide a more cost-effective alternative to groups requesting to conduct post-election audits of the vote by review of the paper ballots.
- Write-in votes in the DS200 ballot bin are marked with a small pink circle and depending on the ballot box used, may or may not be separated into a separate write-in bin. The system can be easily configured to capture ballot images of ballots with write-ins and store them on the external USB flash drive, which would permit write-in votes to be easily

verified within the Unity EMS. However, this 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.

- The DS200's ballot input slot may be difficult for individuals with certain types of disabilities to insert a ballot without assistance due to the height and location of ballot input slot.
- There were a few occasions where a ballot jam occurred while inserting the ballot into the DS200. An error message is displayed on the touch screen directing the voter to contact a poll worker and there is also an audio alert notifying the voter. The ballot is returned back to the voter and can be reinserted to be counted.
- While the DS200 includes a large touch screen display to provide feedback to the voter on the disposition of their ballot, the manufacturer's default configuration allows the voter to instruct the DS200 to accept the ballot as is, even if it contains any fatal errors or irregularities such as overvotes or crossover votes. The vendor had preprogrammed the configuration to automatically reject all ballots with overvotes or crossover votes, which requires the voter to correct the error by remaking his or her ballot and so as to ensure that electors do not mistakenly process a ballot on which a vote for one candidate or all candidates will not count.
- Ballots marked with a party preference choice selection only, but no individual votes in the partisan primary, are accepted with no feedback provided to the voter on the disposition of their ballot. The DS200 reads this marking as a contest.
- The voting systems upgrades will not be compatible with other ES&S precinct-based optical scan voting equipment currently approved for sale and use in Wisconsin. Municipalities using other ES&S precinct-based optical scan voting equipment will have to either upgrade older versions of firmware or purchase equipment included within this test. Some legacy systems approved under NASED have the ability to "modem-in" their results to a central office for tabulation. Many municipalities wishing to purchase and use Unity 3.4.0.0 would need to change their process for tabulating the election results. This may create delays in how quickly unofficial results are made available to the public as flash drives will need to be physically delivered to the central tabulation site. While the ability to "modem-in" results is not a requirement for Wisconsin approval, the lack of such capacity in a voting system is noted as a drawback by many local election officials. This issue is addressed more fully in the separate Memorandum regarding ES&S Unity 3.4.0.1.

C. M100 Precinct Tabulator

- Although there were no errors with the tabulation of the test ballots by the M100, there were some instances in which the M100 produced error messages that may require intervention by an election inspector. Among the messages by the systems during testing were "no back image detected," "Unable to read time band, please re-feed ballot," "Top scanbar has blocked sensors." With each of these errors, there was an audio alert notifying the voter of an issue with the ballot. These errors were generally infrequent and occasionally fixed by simply re-feeding the ballot into the machine. However, on several occasions the ballot had to be reinserted using a different orientation. This might suggest the scanner has difficulty reading ballots that are not inserted face up and top forward, but because the problem was not consistent staff could not definitely determine that this was the case.

- The M100 was able to correctly read marks in pencil, black pen, blue pen, red pen, and green pen as well as by the ES&S-provided markers.
- The M100 does not capture electronic ballot images.
- The M100 has a small screen display to provide feedback to the voter on the disposition of their ballot. The screen may be difficult for voters with physical or visual impairments to view without assistance.
- The manufacturer’s default configuration allows the voter to instruct the M100 to accept the ballot even if it contains any fatal errors or irregularities such as overvotes or crossover votes. The vendor had preprogrammed the configuration to automatically reject all ballots with overvotes or crossover votes, which permitted the voter to correct the error by remaking his or her ballot. This also ensures that electors do not mistakenly process a ballot on which a vote for one candidate or all candidates will not count.

D. 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 compliance analysis.

§ 5.91 (1)
The voting system enables an elector to vote in secret.
Staff Analysis
The ES&S voting system meets 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 ES&S voting system allows voter to split their ballot among as many parties as they wish during any election that is not a partisan primary.

§ 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 ES&S voting system allows write-ins 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 ES&S voting system meets this requirement.

§ 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 ES&S voting system can be configured to always reject crossover votes without providing an opportunity for the voter to override. It is recommended that the Board continue to require this configuration due to potential voter confusion over the error message and voter's ability to submit a ballot upon which no votes will be counted. Additionally, staff recommends that the system be configured to automatically reject all improper ballots, excluding blank votes, without giving the voter the option to override.

§ 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 voting system meets these requirements with one exception: where the elector casts excess write-in votes in addition to voting for a named candidate. All currently-certified systems will interpret this scenario as an overvote and reject such ballots and require the voter to make the necessary revisions to the ballot. To meet this requirement, election procedures require election inspectors to inspect all ballots for write-in votes that may not be properly counted and separated into the proper receptacle by the voting system; this ensures all ballots are properly accounted for.

§ 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 ES&S voting system meets this requirement.

§ 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 ES&S 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 ES&S 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 ES&S voting system meets this requirement.

§ 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 ES&S voting system meets this requirement if it is configured to automatically reject all overvote and crossover ballots like other optical scan systems currently in use in Wisconsin. Staff recommends that the system be configured to automatically reject all improper ballots, excluding blank votes, without giving the voter the option to override. This is a requirement of the Board's prior 2009 and 2012 certification.

§ 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 ES&S 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 ES&S 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 ES&S voting system meets this requirement.

§ 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 ES&S voting system meets this requirement.

§ 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 ES&S voting system meets this requirement if it is configured to automatically reject all overvote and crossover ballots like other optical scan systems currently in use in Wisconsin. Staff recommends that the system be configured to automatically reject all improper ballots, excluding blank votes, without giving the voter the option to override. This is a requirement of the Board's prior 2009 and 2012 certification.

§ 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
Since the ES&S voting system presented for approval requires paper ballots to be used to cast votes, this requirement does not apply.

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: <ul style="list-style-type: none">(i) permit the voter to verify (in a private and 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 –<ul style="list-style-type: none">(I) notify the voter that 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 that 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— <ul style="list-style-type: none">(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
<p>The ES&S voting system meets these requirements. However, concerns were stressed regarding the accessibility and privacy of the AutoMARK and the DS200 optical scan system and that the entire voting process is not completely accessible. There are approximately 1,000 AutoMARK units used in polling places to provide accessible means to the disabled voters and the upgrades would supplement these systems if the jurisdiction determined to upgrade their entire system.</p> <p>The AutoMARK voting systems for which approval is being sought, do not change the degree of accessibility currently provided by previously approved AutoMARK systems. Accessibility was determined by the former Elections Board to apply to the act of voting, not the insertion or removal of the ballot into the marking device and placing the ballot into the ballot box or optical scan voting system.</p>

VIII. Conclusion

To determine whether a voting system should be approved for use in Wisconsin, the following recommendations are based upon three goals.

1. Can the voting system successfully run an open, fair and secured Wisconsin election in compliance with Wisconsin Statutes?

Staff's Response: Yes. Each system accurately completed the mock elections and was able to accommodate the voting requirements of the Wisconsin election process.

2. Does the system enhance access to the electoral process for individuals with disabilities?

Staff's Response: This system does not enhance access to the electoral process for individuals with disabilities over previously approved Unity voting systems, and neither does it reduce or mitigate access for disabled voters. The current scope and degree of accessibility remains substantially the same as previously approved Unity voting systems.

3. Does the voting system meet Wisconsin's statutory requirements?

Staff's Response: Yes. The voting system complies with all applicable state and federal requirements. However, staff recommends that the system be configured to automatically reject all improper ballots, excluding blank votes, without giving the voter the option to override. This is a requirement of the Board's prior 2009 and 2012 certification.

IX. Recommendations

1. Board staff recommends approval of this ES&S voting system, Unity 3.4.0.0 and components set forth in the tables on pages 2 and 4 above. The system accurately completed the mock elections and was able to accommodate the voting requirements of the Wisconsin election process.
2. Board staff recommends that as a continuing condition of the Board's approval, that ES&S may not impose customer deadlines contrary to requirements provided in Wisconsin Statutes, as determined by the Board. In order to enforce this provision, local jurisdictions purchasing ES&S 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. Board staff recommends that as a continuing condition of the Board’s approval, that this system must always be configured to include the following options:
 - a. Automatic rejection of overvoted ballots with no opportunity for the voter to override.
 - b. Automatic rejection of crossover ballots with no opportunity for the voter to override.
 - c. Automatic rejection of all improper ballots except blank ballots.
 - d. Digital ballot images to be captured for all ballots tabulated by the system (if capable).
4. Board staff recommends election inspectors shall remake all absentee ballots automatically rejected so that the ballot count is consistent with total voter numbers.
5. As part of US EAC certificate: ESSUnity3400, only systems included in this certificate are allowed to be used together to conduct an election in Wisconsin. Previous versions that were approved for use by the former Elections Board are not compatible with the new ES&S voting system, and are not to be used together with the equipment versions seeking approval by the Board, as this would void the US EAC certificate. If a jurisdiction upgrades to Unity 3.4.0.0, they need to upgrade each and every component of the system to the requirements of what is approved herein.
6. Unity EMS 3.4.0.0. may only program the AutoMARK Voter Assist Terminal (VAT), versions 1.0, 1.1, 1.3.1 ((Print Engineering Board (PEB)1.65)), 1.3.1 (PEB 1.70).
7. Board staff recommends that as a condition of approval, ES&S 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 ES&S, 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 ES&S 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 Customer is obligated to provide such records, ES&S shall provide such records immediately upon Customer’s request. ES&S 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, ES&S 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.

X. Proposed Board Motion

MOTION: The Government Accountability Board adopts the staff’s recommendation for approval of the ES&S voting system’s Application for Approval of Unity 3.4.0.0 to be sold or used in Wisconsin, in compliance with US EAC certificate: ESSUnity3400, including the conditions described above.

Attachments

- ✓ Appendix 1: Wisconsin Election Administration Council Feedback
- ✓ Appendix 2: Public Feedback
- ✓ Wisconsin Statutes § 5.91
- ✓ Wisconsin Administrative Code GAB 7
- ✓ US-EAC Certificate of Conformance
- ✓ US-EAC Scope of Certification

APPENDIX 1: Wisconsin Election Administration Council’s Feedback
 These comments were provided via a structures feedback form.

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

Very Poor	Poor	Fair	Good	Excellent
			3	3

- Automark does take a while to print out the ballot, but screen display is good.
- It seems to work very well. During our “playing” all worked well. I like the tape, the speed, and the lighter weight.
- I like the DS200, especially that it shows the voter where the error occurred on the ballot. This gives the voter more privacy and the ability to self-correct rather than having to consult with the election inspector to determine what’s wrong. I also like that the system is much easier for poll workers to use, move, etc.
- The machines work well and are intuitive. The changes will help clerks.
- The [automark] properly marked all ballots. Automark is very slow process when compared to mark by hand but does serve voters that have problems using pen or sight.

2. How would you rate the accessible features?

Very Poor	Poor	Fair	Good	Excellent
		1	2	3

- Concerned how a person with a physical disability takes ballot from the Automark to the scanner tabulator.
- I think this serves the need. A person in wheelchair should be able to use DS200 although I would like to see the height of the unit a little lower so the voter can see where to put the ballot more easily.
- Easy to use-not much different than current equipment.
- There were no changes to the accessibility features and so I have no additional comments to make in this regard.

3. Rate your overall impression of the system.

Very Poor	Poor	Fair	Good	Excellent
		1	1	4

- We are waiting to upgrade to the DS200, but will not do so until we can modem results. In my case, I would have to drive to two different counties with results.
- I would like to see this board reconsider their view on over-riding ballots. All good parts of a ballot will also be counted on an override. But if you require a ballot to be remade, now you introduce human error at the end of a very long day.
- I would like the write-ins dropped into a separate bin. This will help us catch more write-ins.
- It is a huge improvement, which we need a.s.a.p. Please do what you can to include modem technology as it helps to simplify end of day processing, which is getting more and more demanding with requirements for provisional ballot tracking, posting of outstanding absentees, etc.
- GAB Board really needs to find a way to approve a modem system. Many municipalities are looking to upgrade from our old optech eagles (which have modem ability now) and are reluctant to upgrade without this feature. Approve a 3401 (modem) to be used for “unofficial results.”
- I especially like the design of the Unity 3400. The fact that there is a not modem capability would not prohibit me from purchasing it.
- If modem issue is resolved with the 3401, it would be a very good system. Not sure about the cost to change our existing county wide system to this particular system, but I would be curious to know some of the costs.
- Great system.

APPENDIX 2: Public Demonstration Feedback

These comments were provided via a structures feedback form.

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

Very Poor	Poor	Fair	Good	Excellent
				1

2. How would you rate the accessible features?

Very Poor	Poor	Fair	Good	Excellent
				1

- Greatly improved functionality based on useable ink alone.

3. Rate your overall impression of the system.

Very Poor	Poor	Fair	Good	Excellent
				1

tronic voting machines are used, the board of canvassers shall perform the recount using the permanent paper record of the votes cast by each elector, as generated by the machines.

(2) Any candidate, or any elector when for a referendum, may, by the close of business on the next business day after the last day for filing a petition for a recount under s. 9.01, petition the circuit court for an order requiring ballots under sub. (1) to be counted by hand or by another method approved by the court. The petitioner in such an action bears the burden of establishing by clear and convincing evidence that due to an irregularity, defect, or mistake committed during the voting or canvassing process the results of a recount using automatic tabulating equipment will produce incorrect recount results and that there is a substantial probability that recounting the ballots by hand or another method will produce a more correct result and change the outcome of the election.

(3) A court with whom a petition under sub. (2) is filed shall hear the matter as expeditiously as possible, without a jury. The court may order a recount of the ballots by hand or another method only if it determines that the petitioner has established by clear and convincing evidence that due to an irregularity, defect, or mistake committed during the voting or canvassing process the results of a recount using automatic tabulating equipment will produce incorrect recount results and that there is a substantial probability that recounting the ballots by hand or another method will produce a more correct result and change the outcome of the election. Nothing in this section affects the right of a candidate or elector aggrieved by the recount to appeal to circuit court under s. 9.01 (6) upon completion of the recount.

History: 1979 c. 311; 1987 a. 391; 2005 a. 92, 451; 2007 a. 96.
Cross-reference: See also ch. GAB 7, Wis. adm. code.

5.905 Software components. (1) In this section, “software component” includes vote-counting source code, table structures, modules, program narratives and other human-readable computer instructions used to count votes with an electronic voting system.

(2) The board shall determine which software components of an electronic voting system it considers to be necessary to enable review and verification of the accuracy of the automatic tabulating equipment used to record and tally the votes cast with the system. The board shall require each vendor of an electronic voting system that is approved under s. 5.91 to place those software components in escrow with the board within 90 days of the date of approval of the system and within 10 days of the date of any subsequent change in the components. The board shall secure and maintain those software components in strict confidence except as authorized in this section. Unless authorized under this section, the board shall withhold access to those software components from any person who requests access under s. 19.35 (1).

(3) The board shall promulgate rules to ensure the security, review and verification of software components used with each electronic voting system approved by the board. The verification procedure shall include a determination that the software components correspond to the instructions actually used by the system to count votes.

(4) If a valid petition for a recount is filed under s. 9.01 in an election at which an electronic voting system was used to record and tally the votes cast, each party to the recount may designate one or more persons who are authorized to receive access to the software components that were used to record and tally the votes in the election. The board shall grant access to the software components to each designated person if, before receiving access, the person enters into a written agreement with the board that obligates the person to exercise the highest degree of reasonable care to maintain the confidentiality of all proprietary information to which the person is provided access, unless otherwise permitted in a contract entered into under sub. (5).

(5) A county or municipality may contract with the vendor of an electronic voting system to permit a greater degree of access to

software components used with the system than is required under sub. (4).

History: 2005 a. 92.

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 approved by the board. The board may revoke its approval of any ballot, device, equipment or materials at any time for cause. No such ballot, voting device, automatic tabulating equipment or related equipment or material may be approved 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.

**5.91 ELECTIONS — GENERAL PROVISIONS; BALLOTS & Updated 09–10 Wis. Stats. Database 22
VOTING**

(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.

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

5.92 Bond may be required. Before entering into a contract for the purchase or lease of an electronic voting system or any ballots, voting devices, automatic tabulating equipment or related equipment or materials to be used in connection with a system, any municipality may require the vendor or lessor to provide a performance bond with a licensed surety company as surety, guaranteeing the supply of additional equipment, parts or materials, provision of adequate computer programming, preventive

maintenance or emergency repair services, training of election officials and other municipal employees or provision of public educational materials for a specified period, or guaranteeing the security of the computer programs or other equipment or materials to be utilized with the system to prevent election fraud, or such other guarantees as the municipality determines to be appropriate.

History: 1979 c. 311.

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

5.93 Administration. The board may promulgate reasonable rules for the administration of this subchapter.

History: 1979 c. 311; 1985 a. 332 s. 251 (1).

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

5.94 Sample ballots; publication. When an electronic voting system employing a ballot that is distributed to electors is used, the county and municipal clerk of the county and municipality in which the polling place designated for use of the system is located shall cause to be published, in the type B notices, a true actual-size copy of the ballot containing the names of offices and candidates and statements of measures to be voted on, as nearly as possible, in the form in which they will appear on the official ballot on election day. The notice may be published as a newspaper insert. Municipal clerks may post the notice if the remainder of the type B notice is posted.

History: 1979 c. 311; 2001 a. 16.

5.95 Elector information. The board shall prescribe information to electors in municipalities and counties using various types of electronic voting systems to be published in lieu of the information specified in s. 10.02 (3) in type B notices whenever the type B notice information is inapplicable.

History: 1979 c. 311.

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

Chapter GAB 7

APPROVAL OF ELECTRONIC VOTING EQUIPMENT

GAB 7.01 Application for approval of electronic voting system.
GAB 7.02 Agency testing of electronic voting system.

GAB 7.03 Continuing approval of electronic voting system.

Note: Chapter EIBd 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.

GAB 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 board, 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 board 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 board 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 board shall determine if the application is complete and, if it is, shall so notify the vendor in writing. If it is not complete, the board 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 board.

History: Cr. Register, June, 2000, No. 534, eff. 7-1-00.

GAB 7.02 Agency testing of electronic voting system. (1) The board shall conduct a test of a voting system, submitted for approval under s. GAB 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 non-partisan election combined with a presidential preference vote.

(2) The board may use a panel of local election officials and electors to assist in its review of the voting system.

(3) The board 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.

GAB 7.03 Continuing approval of electronic voting system. (1) The board 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 board's approval for the use of the voting system, the vendor shall inform the board 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 board, 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 board.

(5) For good cause shown, the board may exempt any electronic voting system from strict compliance with ch. GAB 7.

History: Cr. Register, June, 2000, No. 534, eff. 7-1-00.



United States Election Assistance Commission

Certificate of Conformance



ES&S Unity 3.4.0.0
Election Systems & Software

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the *2002 Voting System Standards (2002 VSS)*. 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: Unity

Model or Version: Version 3.4.0.0

Name of VSTL: Wyle Laboratories

EAC Certification Number: ESSUnity3400

Date Issued: October 31, 2012

*Chief Operating Officer and Acting Executive Director,
U.S. Election Assistance Commission*

Scope of Certification Attached

Manufacturer: Election Systems & Software
System Name: Unity 3.4.0.0
Certificate: ESSUnity3400

Laboratory: Wyle Laboratories
Standard: VSS 2002
Date: October 31, 2012



Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

ES&S Unity 3.4.0.0 is comprised of the AutoMARK Voter Assist Terminal (AutoMARK), Model 100 (M100), DS200 Precinct Digital Scanner (DS200), DS850 high-speed Central Count Digital Scanner, Model 650 high-speed Central Count Scanner (M650), Audit Manager (AM), Election Data Manager (EDM) and ES&S Ballot Image Manager (ESSIM), AutoMARK Information Management System (AIMS), Hardware Program Manager (HPM), Election Reporting Manager (ERM), Log Monitor Service, and VAT Previewer.

- AutoMARK Voter Assist Terminal enables voters who are visually or physically impaired and voters more comfortable reading or hearing instructions and choices in an alternative language to privately mark optical scan ballots. The AutoMARK supports navigation through touchscreen, physical keypad or ADA support peripheral such as a sip and puff device or two position switch.

- The ES&S Model 100 is a precinct-based, voter-activated paper ballot tabulator. The system uses Intelligent Mark Recognition (IMR) visible light scanning technology to accurately detect completed ballot targets. The Model 100 accepts ballots inserted in any orientation – top first, face up; bottom first, face down; etc. Optical sensors simultaneously read both sides of the ballot, and accurately record voter selections, as the Counter passes the ballot to the integrated ballot box.
- DS200 digital scanner is a paper ballot tabulator designed for use as a polling place scanner. After the voter makes their selections on their paper ballot, their ballot is inserted into the unit for immediate tabulation. Both sides of the ballot are scanned at the same time using a high-resolution image-scanning device that produces ballot images.
- The DS850 is a high-speed, digital scan central ballot counter that uses cameras and imaging algorithms to capture voter selections on the front and back of a ballot, evaluate results and then sort ballots into discrete bins without interrupting scanning. A dedicated audit printer generates a continuous event log. Machine level reports are produced from a second, laser printer. The scanner saves voter selections and ballot images to an internal hard disk and exports results to a USB Memory stick for processing with Election Reporting Manager.
- M650 high-speed central count scanner is programmed by jurisdiction officials for a specific election with an election definition from a Zip disk. M650 prints a continuous audit log to a dedicated audit log printer and can print results reports directly from the scanner to a second connected printer. The scanner saves results to a Zip disk that officials can use to format and print results from a PC running Election Reporting Manager.
- Audit Manager runs in the background of the other Unity programs and provides password security and a real-time audit log of all user inputs and system outputs. Election coders use Audit Manager to set Unity system passwords and track user activity.
- Election Data Manager (EDM) is used to enter the election definition. Typically, a master election database is created one time and contains all precincts, districts, and precinct and district relationships. This master file is then used to build each election-specific file to which election-specific contests can be manually added or merged from a previous election file.
- ES&S Ballot Image Manager (ESSIM) is a desktop publishing tool that allows users to design and print ES&S paper ballots. ESSIM uses ballot style information created by EDM to display the WYSIWYG ballots. Users can then apply typographic formatting (font, size, attributes, etc.) to individual components of the ballot. Text and graphic frames can also be added to the ballot.
- AutoMARK Management Information System (AIMS) is composed of a compatible PC computer and the AIMS application software that manages all of the information required by the AutoMARK Voter Assist Terminal (VAT) for an election. AIMS imports data configured in ESSIM to configure the audio and visual ballot presentation for the AutoMARK and to mark inserted ballots.
- Hardware Program Manager (HPM) enables the user to import, format, and convert the election file; define districts; specify election contests and candidates; create election definitions for ballot scanning equipment; burn PCMCIA Cards, Zip Disks, Compact Flash

Cards or USB media device. The Hardware Programming Manager is primarily used for converting the election IFC file for use with the Election Reporting Manager and for creating and loading election parameters; however, it may also be used for coding the election.

- Election Reporting Manager (ERM) is ES&S election results reporting program. ERM generates paper and electronic reports for election workers, candidates, and the media. ERM can also display updated election totals on a monitor as ballot data is tabulated, and it can send results reports directly to media outlets.

Certified System before Modification:

Unity 3.2.1.0

Anomalies and/or Additions addressed in Unity 3.4.0.0:

For the ES&S Unity 3.4.0.0 Voting System, Wyle only tested the DS200 for modifications, inclusion and integration of the DS850, and both interfaces with the EMS.

Mark definition:

ES&S' declared level mark recognition for the DS200 and DS850 is a mark across the oval that is 0.2" long x 0.03" wide at any direction.

Tested Marking Devices:

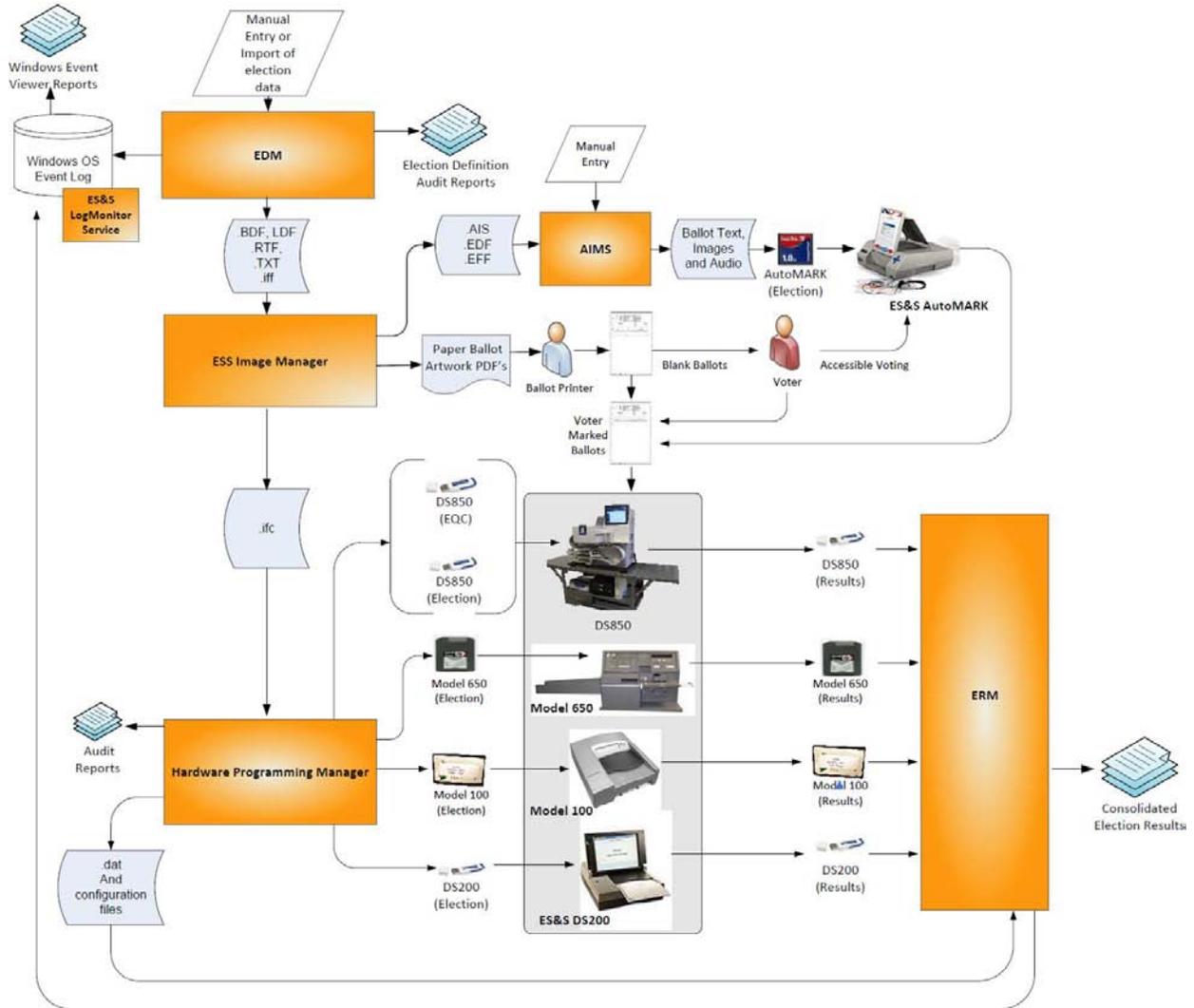
Bic Grip Roller Pen

Language capability:

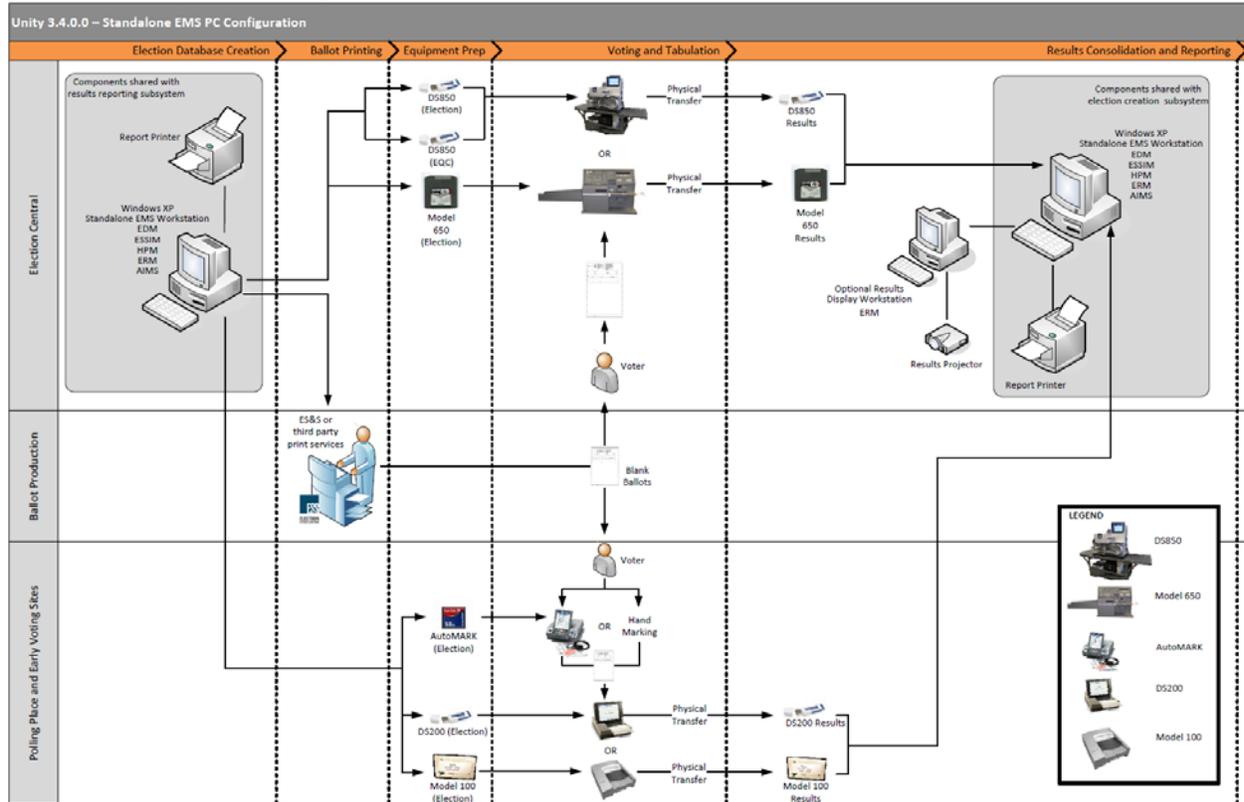
Unity 3.4.0.0 supports only English and Spanish ballot languages.

Components Included:

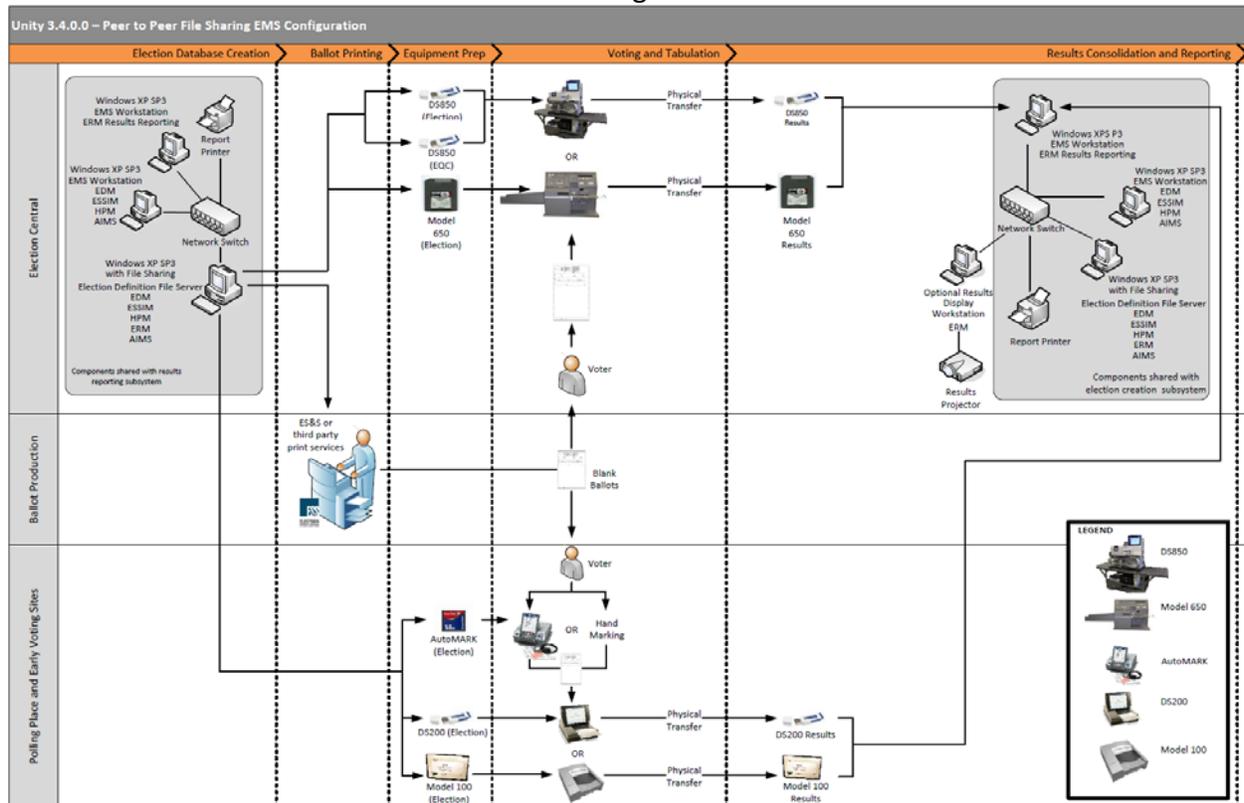
This section provides information describing the components and revision level of the primary components included in this Certification.



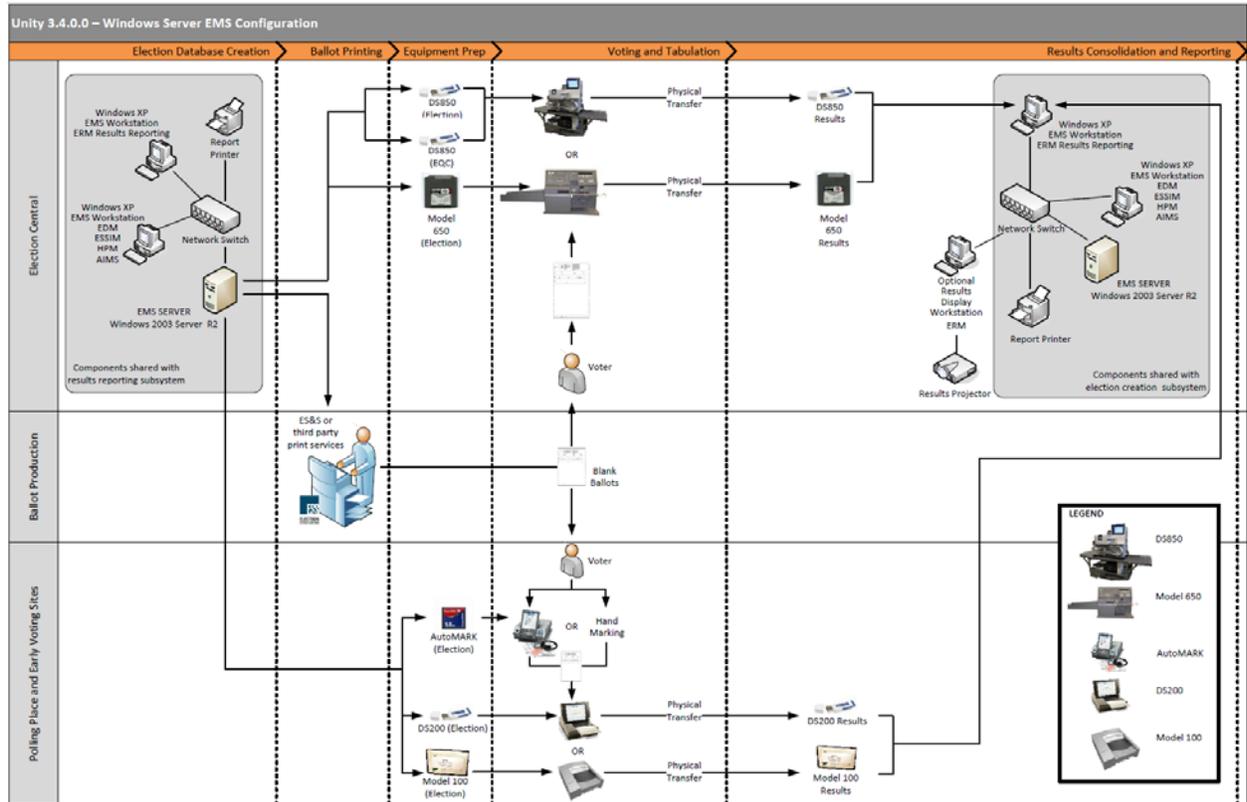
Standalone System – Single EMS Workstation



Shared EMS File Server – Peer to Peer File Sharing with Windows XP



Local EMS Network with Windows 2003 Server



System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
DS200	1.6.1.0	1.2		Precinct Digital Scanner
M100	5.4.4.5	1.3		Precinct Optical Scanner
Model 650	2.2.2.0	1.1, 1.2		Central Count Scanner, high-speed
AutoMARK A100	1.3.2907	1.0		ADA Ballot Marking Device
AutoMARK A200	1.3.2907	1.1, 1.3		ADA Ballot Marking Device
DS850	2.2.0.0	1.0		Central Count Scanner, high-speed
Ballot Box Hardware		1.2, 1.3		Plastic ballot box
Ballot Box Hardware		1.0, 1.1, 1.2		Metal ballot box with/without

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
				diverter
Audit Manager (AM)	7.5.2.0			
Election Data Manager (EDM)	7.8.1.0			
ESS Ballot Image Manager (ESSIM)	7.7.1.0			
Hardware Programming Manager (HRM)	5.8.0.0			
Election Results Manager (ERM)	7.8.0.0			
Log Monitor Service	1.0.0.0			
AutoMARK Information Management System (AIMS)	1.3.257			
Server PC		Dell Optiplex GX260		
Server PC		Dell Precision T3500		
Client PC		Dell Optiplex 760		
VAT Previewer	1.3.2907			
Ballot on Demand Printer		OKI C9650		
Ballot on Demand Printer		OKI B430		
DS850 Report Printer		OKI B431dn		Laser report printer
DS850 Report Printer		Microline 420		Dot Matrix Printer
DS850 Audit Log		HP LaserJet 4050N		
Zip Disk				Results storage for M650
Headphones		Avid FV 60		
USB Flash Drive		SanDisk 2GB Cruzer Micro		
USB Flash Drive		Delkin 512MB		
USB Flash Drive		Delkin 4GB		
USB Flash Drive		Delkin 8 GB		
USB Flash Drive		Delkin 1 GB		
USB Flash Drive		Delkin 2 GB		
Compact Flash		Delkin Devices 1 GB Compact		

System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
		Flash		

System Limitations

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

Characteristic	Limiting Component	Limit	Comment
Precincts Allowed in an Election	HPM/ERM	2900	1639 if using paper ballot coded by precinct
Precinct included per poll (reporting limit)	ERM	1900	
Candidate/counters per election	ERM	21000	
Maximum candidates	HPM	9900	
Contest allowed in an election	ERM	Depends on election	Limited by 21000 maximum counters
Candidates/counters allowed per precinct	ERM import	1000	
Ballot styles allowed per election	HPM (ballot sequence code)	5500	1639 if using paper ballot coded by style
Contests allowed per ballot style	HPM	200	Or number of ballot positions
Precincts allowed per ballot style	HPM	1500	
Candidates (ballot choices) allowed per contest	HPM	175	
Count for any precinct element	ERM Report (ERM results import)	500000	65550 from any tabulator media
Number of parties allowed	HPM	18	
“Vote for” per contest	HPM	90	
Blanket Primary Elections			Not supported

Component Limitations:

PAPER BALLOT LIMITATIONS

1. The paper ballot code channel, which is the series of black boxes that appear between the timing track and ballot contents, limits the number of available ballot variations depending on how a jurisdiction uses this code to differentiate ballots. The code can be used to differentiate ballots by Sequence (limited to 1-1639 variations), Type (1-30 variations) or Split (1-40 variations).

2. If Sequence is used as a ballot style ID, it must be unique election-wide and the Split code will always be 1.

3. If Sequence is used as a precinct ID, it limits the number of styles in a precinct to 1200 (30 Types x 40 Splits).

DS200

1. A DS200 coded for Election Day counting will not support more than 18 precincts.
2. The DS200 does not support more than 40 ballot styles in a single absentee precinct in a ballot by-style election. If an election definition contains more than 40 ballot styles, the user has to define more than one absentee precinct and then separate the ballots into groups for processing.
3. All optical scan ballots used in a given election must be the same size and have the same position capacity.
4. An early vote station will only support a maximum limit of 9999 precincts. A large number of precincts may result in small ballot processing delays.
5. An early vote station will not be able to print a precinct-by-precinct report by default.

MODEL 100 (M100)

1. The Model 100 does not support more than 18 Election Day precincts, or 450 early voting precincts.
2. A Model 100 PCMCIA card can only contain a maximum of 18 precincts. The user should not assign more than 18 precincts to a Model 100 polling place in HPM.
3. The Model 100 does not support more than 40 ballot styles in a single absentee precinct in a ballot by-style election. If an election definition contains more than 40 ballot styles, the user has to define more than one absentee precinct and then separate the ballots into groups for processing.
4. The M100 supports a maximum of 200 contests per ballot style.
5. All ballots used in a given election must be the same size and have the same position capacity.
6. An early vote station will only support a maximum limit of 450 precincts. This limit is due to the limited memory capacity of both the PCMCIA card and the internal memory of the Model 100 precinct tabulator.
7. An early vote station will not be able to use ballots-by-style.
8. An early vote station will not be able to use a modem to transmit totals.
9. An early vote station will not be able to print a precinct-by-precinct report by default.

MODEL 650

1. The Model 650 supports a maximum 37503 candidates or counters for any election.
2. The M650 does not support more than 100 ballot styles for a single absentee precinct in a ballot by-style election. If an election definition contains more than 100 ballot styles, the user

has to define more than one absentee precinct and then separate the ballots into groups for processing

3. All optical scan ballots used in a given election must be the same size and have the same position capacity.
4. The M650 does not support the Arrow style response area.
5. Ballots must be fed in one particular orientation.
6. The Model 650 can interpret a maximum of 1499 office group codes in an election definition. (An “office group” is defined as the collection of one or more contests (including rotation) that always appear together on any ballot style.). This limitation restricts the number of precincts allowed in an election if “precinct only” offices are defined (District Type PRC) because each “precinct only” office always appears in a different office group.

DS850

1. All ballots used in a given election must be the same size and have the same position capacity.

AUTOMARK VOTER ASSIST TERMINAL

1. ES&S AutoMARK capacities exceed all documented limitations for the ES&S election management, vote tabulation and reporting system. For this reason, Election Management System and ballot tabulator limitations define the boundaries and capabilities of the AutoMARK system as the maximum capacities of the ES&S AutoMARK are never approached during testing
2. The AutoMARK recognizes ballot content by the code channel. If the Sequence code is used for Ballot Style ID and the election definition has more than one precinct that uses a specific ballot style, the AutoMARK will not determine which precinct the ballot is associated with. The user should not define ballot style names in the election definition that imply precinct.

ELECTION DATA MANAGER

1. In both open and closed primary elections, operational procedures to define the election in EDM must be strictly followed.
2. The user must input the Party Preference (or Pick Contest) title as “Party Preference” in the Office Title box in the Add Office Information window.
3. The user must add a “crossover party” using the Parties option under the **County** menu when the election is an open primary with a party preference race.
4. There is a limitation of 99 candidates for rotation positions. This limit does not apply to positions that float and do not change candidate order.
5. The maximum number of languages supported is 13.
6. The ability to delete parties under the **County** and **Election** menu is not supported.
7. In a primary election, the system does not support displaying the contest(s) from another party’s ballot if a third party in the election has candidates in that contest.

ES&S BALLOT IMAGE MANAGER

1. ESS Image Manager requires the installation of Adobe Type Manager for assurance that screen displays of the ballot match the printed ballot.
2. ESSIM does not give a column number or position to straight party candidates in the .ifc. The user must assign these manually in HPM.

BALLOT ON DEMAND

1. Ballot on Demand requires an Oki printer.
2. Batch Ballot printing is not reflected in any BOD reports.
3. Batch Ballot serial numbers are not supported with multi-page ballots.

HARDWARE PROGRAMMING MANAGER (WINDOWS)

1. Hardware Programming Manager supports no more than 18 parties for a single election. This limit is reduced to 12 parties, counting “nonpartisan” as a party, for an Open Primary election that uses two page ballots with the second page containing only non-partisan contests. Party/partisan contents CANNOT flow between pages in an Open Primary.

2. When coding an election for an Open primary, the user cannot include (in total voting) the crossover party listed in the **Description** box in the Election Specifications window. The party type displays in the numbered description box, but the user should clear the **Include** check box next to the crossover party type.

3. When coding an election for an open primary, the party preference contests must be identified as nonpartisan.

4. There is a maximum of 31 Statistical Party Counters.

5. Change/Add Polling Place

- A polling place may be identified to contain all precinct in the election
- There is a limit of 80 Precincts that can be assigned to a Polling Place with the following exceptions:
- The M100 and DS200 have a limit of 18 individually selected precincts that can be assigned to a polling place.

6. Ballot Styles

- In an Open Primary, the number of contest associated with any party (or “nonpartisan” designation) within a ballot style cannot exceed 70. For an Open Primary election, this limitation replaces the 200 contest limit.

7. Districts

- A district is identified by a code that contains 7 positions but is constructed of a 3 position District Type code and a 4 position District code within the type. There are a limit of 19 District Types and 39 Districts for any given type except for the “PRC” district type. The “PRC” district type is used in an election where virtually all precincts have one or two unique precinct specific contests. When the “PRC” district type is active, the District code is designated by the 4 position precinct ID code. The number of precincts that can use this code is a function of the election content and limited by the M650. See “Section 2.2.1.”
- A precinct can only have 39 total districts associated with it.

8. Candidates

- The maximum number of candidate rotations per contest is 140. This includes candidate position sets where candidate order is not changed, but use alternate position numbers.

ELECTION REPORTING MANAGER

1. The Election Reporting Manager requires a minimum monitor screen resolution of 800 x 600.
2. ERM's maximum page size for reports is 5,000 pages.
3. Serve650 continues to run after ERM is stopped via the Windows Task Manager. If the ERM task is ended, Serve650 must also be canceled, or the PC rebooted.
6. Mixed equipment within a single SPP file is not supported. Each equipment type must have its own SPP file.
7. Contest/Precinct selection pop up display limited to 2,900 contests/precincts.
8. Dynamic Precinct Reports are not supported when updating results from iVotronic Audit Data.
9. Foreign characters are not supported in ERM. This has to do with the creation of the XML results file out of ERM.
10. Generating a District Canvass Report without first properly creating a .DST file can result in inaccurate totals reports and inconsistent report formatting.
11. When retrieving election data from DS200 tabulators; ERM supports a maximum of 1900 precincts for an "All Precincts Included" Poll.

AUTOMARK INFORMATION MANAGEMENT SYSTEM (AIMS)

If the number of precincts imported from Election Data Manager exceeds 840, an election administrator must manually configure the code channel for precinct number 840 within AIMS. Code channel information for all other precincts imports properly.

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	No	
Accessibility		
Forward Approach	Yes	
Parallel (Side) Approach	No	
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open Standard (provide definition of how supported)	Yes	
Primary: Open Blanket (provide definition of how supported)	No	
Partisan & Non-Partisan:		

Feature/Characteristic	Yes/No	Comment
Partisan & Non-Partisan: Vote for 1 of N race	Yes	
Partisan & Non-Partisan: Multi-member (“vote for N of M”) board races	Yes	
Partisan & Non-Partisan: “vote for 1” race with a single candidate and write-in voting	Yes	
Partisan & Non-Partisan “vote for 1” race with no declared candidates and write-in voting	Yes	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	Yes	
Write-in Voting: Without selecting a write in position.	Yes	
Write-in: With No Declared Candidates	Yes	
Write-in: Identification of write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	No	
Slate & Group Voting: one selection votes the slate.	No	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	Yes	
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	Yes	
Straight Party: Vote for each candidate individually	Yes	
Straight Party: Modify straight party selections with crossover votes	Yes	
Straight Party: A race without a candidate for one party	Yes	
Straight Party: N of M race (where “N”>1)	Yes	
Straight Party: Excludes a partisan contest from the straight party selection	Yes	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	Yes	
Split Precincts:		
Split Precincts: Multiple ballot styles	Yes	
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	Yes	
Split Precincts: DRE matches voter to all applicable races.	No	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	Yes	It is possible to list the number of voters.
Vote N of M:		
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	No	
Vote for N of M: Invalidates all candidates in an overvote (paper)	No	

Feature/Characteristic	Yes/No	Comment
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 2 nd 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 2 nd contest.)	No	Overtured - US District Court 7/29/03: CA Election Code sect. 11383
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	No	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	No	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	No	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	No	
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	No	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	No	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	No	
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	Yes	

Feature/Characteristic	Yes/No	Comment
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	Yes	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	Yes	
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	Yes	
Overvotes: DRE: Prevented from or requires correction of overvoting.	No	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	No	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	Yes	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	Yes	
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	Yes	
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	Yes	
Networking		
Wide Area Network – Use of Modems	No	
Wide Area Network – Use of Wireless	No	
Local Area Network – Use of TCP/IP	No	
Local Area Network – Use of Infrared	No	
Local Area Network – Use of Wireless	No	
FIPS 140-2 validated cryptographic module	No	
Used as (if applicable):		
Precinct counting device	Yes	M100, DS200
Central counting device	Yes	M650, DS850

Baseline Certification Engineering Change Order's (ECO)

This table depicts the ECO's certified with the voting system:

Change ID	Date	Component	Description	Inclusion
000683	5/10/11	DS200	Modify locking hooks/tabs on LCD housing	De Minimis Optional
000819	5/10/11	DS200 Ballot Box	Modify emergency bin to improve stacking	De Minimis Optional

Change ID	Date	Component	Description	Inclusion
000821	5/10/11	DS200 Ballot Box	Modify emergency bin to improve stacking	De Minimis Optional
000852	5/10/11	DS200 Ballot Box	Modify carry case to improve paper handling	De Minimis Optional
000702	6/16/11	DS200	Add alternate display switch	De Minimis Optional
000839	6/16/11	DS200 Ballot Box	Change caster mounts to ease assembly	De Minimis Optional
864	8/11/11	AutoMARK	Printed Circuit Boards End of Life	De Minimis Optional
871	8/30/11	DS200/DS850	Second Source for USB Connector for Delkin 4-8gb	De Minimis Optional
872	6/25/12	DS200/DS850	Release a new 4 GB USB thumb drive	De Minimis Optional
873	6/25/12	DS200/DS850	Release a new 8 GB USB thumb drive	De Minimis Optional
875	6/25/12	AutoMARK	Release 1GB Compact Flash	De Minimis Optional
876	11/10/11	AutoMARK	Redefine AutoMARK hardware revision level	De Minimis Optional
878	6/25/12	AutoMARK	End of Life AutoMARK components	De Minimis Optional
881	8/31/12	DS200/DS850	Allow color housing on 1gb, 2gb, 4gb and 8gb USB drives	De Minimis Optional
882	10/26/12	DS200/DS850	Introduce Delkin 1gb & 2gb USB drives	De Minimis Optional
884	8/31/12	DS200	Add rubber gasket for steel ballot box	De Minimis Optional
1029	8/31/12	DS200/DS850	Introduce new delkin compact flash	De Minimis Optional