



## Election Systems & Software

MAINTAINING VOTER CONFIDENCE.  
ENHANCING THE VOTING EXPERIENCE.

EXPERIENCE  
RELIABILITY  
SECURITY  
INNOVATION

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March 2, 2007

STATE OF WISCONSIN  
ELECTIONS BOARD

**VIA FACSIMILE: (608) 267-0500**  
**AND FIRST CLASS MAIL**

Mr. Kevin Kennedy  
Executive Director  
Wisconsin State Elections Board  
17 West Main Street, Suite 310  
Madison, WI 53701

**RE: Response to Voter Action Complaint Filed with the Wisconsin Elections Board**

Dear Mr. Kennedy:

Election Systems & Software, Inc. ("ES&S") is in receipt of your letter dated February 5, 2007 requesting that ES&S provide the State of Wisconsin Elections Board ("Board") with information related to ES&S' iVotronic Direct Recording Electronic voting system ("iVotronic"), specifically information addressing certain issues identified in the Voter Action Complaint (the "Complaint") filed with the Board. Although ES&S does not believe it is legally required to submit such information as ES&S is not a named party to the Complaint and is not subject to any subpoena, in order to assist the Board in responding to the Complaint, ES&S is providing the following response addressing the issues you have identified in the Complaint.

**Security and Reliability of the iVotronic**

The iVotronic voting system is secure and reliable. Comprehensive checks and balances are integrated into the iVotronic system to ensure all voter selections are secure, reliable and accurate. These security features also ensure the iVotronic is not susceptible to tampering by outside individuals. The following security features are incorporated into the iVotronic system to ensure such security, reliability and accuracy:

- The iVotronic utilizes a closed system and a unique and proprietary personal electronic ballot ("PEB") which are not open to either wireless or wire-based systems, and do not allow Internet connections, direct phone line connections, or direct network connections. Therefore, the system is protected from any kind of outside manipulation;
- The PEB is designed as an integrated part of the iVotronic system. It is not accessible without specific read/write mechanisms supplied by ES&S to only the election administrators of the iVotronic system;

- The iVotronic has three physical independent memory chips that store the electronic ballot data. The data from all three memories are checked for verification with each other prior to allowing a vote or the casting of a vote to ensure no vote is allowed or cast if there is an error;
- In addition to the three physical independent memory chips, the iVotronic also features a removable compact flash card to supply additional memory. The card inserts in the rear of the unit and a security seal is placed on the compartment door to prevent and/or detect any unit tampering. Seals can also be placed on the iVotronic voting booth and communications pack to prevent opening to the unit and gaining access to voter terminals and PEBs without detection;
- The iVotronic employs a number of common failsafe features such as election and poll place-specified password protection, public and protective ballot counters, date and time stamps for audit log events, as well as physical seals and secure procedural process to prevent the chance of mistakes or election fraud; and
- The iVotronic system is fully auditable. Accuracy can be verified for each terminal through current electronic ballot records already stored within the terminals and with random audits of polling locations.

In addition to the above security features incorporated into the iVotronic, ES&S also utilizes a proprietary operating system that is unique and secure, not one that a State or county can "buy off the shelf". The advantages of this approach are three-fold: first, this type of proprietary operating system is much more efficient and compact because it is built specifically to operate the iVotronic. Second, this type of proprietary platform is much more tamper-proof because, as independent assessments have shown, it is less susceptible to hacking or other security breaches. And, third, this type of operating system is much more secure because it does not support "plug and play" devices or other peripheral equipment which would be compatible with commercially available systems.

Further, ES&S has incorporated into its iVotronic a unique internal audit system that provides an extremely reliable verification mechanism. This audit system includes two separate audit trails within our redundant memory functions. One audit trail captures all of the "voting events" which is the date and the time a vote is cast. The other stores a ballot image for every ballot cast. This separation of audit trails ensures anonymity of the voting process, while providing an extremely reliable method of replicating the entire election process. In fact, through this internal audit system ES&S can produce ballot images to re-verify every ballot cast in an election. Importantly, after polls are closed, results from a PEB are cross-checked against these audit trails to confirm, once again, that all of the votes that have been cast are counted.

#### **iVotronic Security Features to Eliminate Human Error**

In addition to the security features set forth above, ES&S has created a process to ensure the iVotronic system is not susceptible to human error. Through the use of built-in security features in the iVotronic, ES&S has created a process before, during and after an election to ensure the security of the iVotronic system. The process is set forth below:

##### *Before and Election*

- **Clear and Test:** A supervisor PEB cannot open voter terminal for voting until they have passed the 'cleared and tested' function on the password-protected service menu. This test ensures that the public count resets to zero before any new election activity.
- **Qualification Code.** The iVotronic also employs an election specific qualification code (EQC) that provides system-wide security. During preventative maintenance, a single supervisor terminal electronically generates an election-specific EQC. This EQC is then transferred via the supervisor terminal to all Election Day and early-voting PEBs. Next, these PEBs download the election-specific EQC into terminal memories when individual voter and supervisor terminals are cleared and tested. Thus, in order to activate for voting, the PEB and terminal must contain the same EQC. This EQC ensures that all equipment used in an election has been through the proper preventative maintenance. Most importantly, this EQC system prevents "pirate" PEBs or terminals from being entered into the system. If such an attempt is made, the system documents the attempt in the event log for audit purposes.
- **Focused Security.** Voter terminals will not allow voting until properly opened by the supervisor PEB, a specified number of which are programmed with ballots. These supervisor PEBs are distributed to precinct officials separately from the voter terminals. This process places election security in the hands of the trained officials, instead of solely on those at the equipment or storage facility.
- **Detect Pre-existing Vote Totals:** If a supervisor PEB already contains votes, it cannot open a voter terminal in the normal manner. A supervisor PEB normally stores votes at the end of the election, not when the voter terminals are being opened for voting. Therefore, if a supervisor PEB contains votes, that supervisor PEB already has closed at least one voter terminal and holds a copy of that terminal's vote totals. If this supervisor PEB continues to be used in the current election, these existing vote totals would be reported on the precinct results. To avoid error, the voter terminal always checks the supervisor terminal for pre-existing vote totals. If a supervisor PEB already contains votes, the voter terminal issues a message on its screen alerting the precinct official. The voter terminal then requires entry of a precinct-specific override password before the terminal will open for voting. This requirements assures that the situation will be called to the precincts official's attention and would allow a precinct official to not use that PEB, if necessary.
- **The Public Count.** The voter terminals display their public count on the screen when powered up by any PEB. Precinct officials can and should check that the public count is zero when opening the voter terminals for voting. In addition, the public count can be sued throughout Election Day to cross-check against the number of votes recorded in the poll book. Additionally, the protective count present in each terminal can be verified against the public count.

- **Voter Terminals Must be Zero to Open.** If the public count is zero, the precinct official should receive a message when inserting the PEB in the voter terminal to open it for voting: "Open Terminal now for above named polling location?" If any votes already exist on the voter terminal, the public counter displayed on the screen will not be zero and the precinct official would instead get one of the following messages: "Do you want to close this terminal?" or "Do you want to recollect the votes?" If the precinct official receives the "want to recollect?" Message, this voter terminal has not been "cleared and tested" since its last use. If the precinct official receives the "want to close?" message, the voter terminal is already open for voting and may or may not have votes on it, depending on the public county. This open terminal may be the result of attempted vote fraud; however, it is more than likely this message is a result of elections officials testing the voter terminal in advance of an election. They may simply have neglected to close this particular voter terminal after testing. In both cases, the precinct official will need to have trained service personnel clear and test the terminal before using it in the current election. Service personnel are required because of the password-protection feature of the voter terminal service menu as well as the "clear and test" option itself.
- **Opening Date and Time Recorded.** The iVotronic limits access to the "set date and time" feature via password-protection. Time and date stamping occurs throughout the iVotronic election process including each terminal opening date and time. Each voter terminal always records the exact date and time that it was opened for voting. Additionally, the precinct report includes the opening date and time for each voter terminal as well as the date and time the report tape was printed. Finally, the current date and time setting displays every time the voter terminal is powered by a PEB.

#### *During an Election*

- **Override Password Needed to Close Polls Early.** As an added precaution against potential pre-election vote fraud, voter terminals cannot be closed and have their votes collected before the official election closing date and time without the precinct-specific override password that accompanies the ballot. This override password is selected and programmed into the PEBs by election officials prior to Election Day. To close the polls in pre-election testing, election officials need access to the override password for each precinct to be tested.
- **Limited Master PEB Exposure.** Typically, each precinct has only one master supervisor PEB on site. Precinct officials always maintain possession of the master supervisor PEB, which is critical to running the election. The master supervisor PEB opens the voter terminals for voting at the beginning of the election, cancels or casts any unfinished votes if necessary, closes the polls, collects the votes, and issues the precinct report. At all other times, the master supervisor PEB remains idle in a secure location.
- **Check the Ballot.** Voter terminals check the incoming ballot for the same unique ballot qualification code that was programmed into the supervisor PEB, which

opened the terminals for voting. If the ballot is not coded for the specified precinct and election, the terminal will not accept it for voting. Instead, the terminal will issue an audible alarm and display a message explaining that the PEB has not been qualified properly and cannot be used in this election until it has been reprogrammed. The iVotronic system also requires verification for voter-activated PEBs. Before the supervisor terminal loads a ballot into a voter PEB, it checks the voter PEB for the unique ballot identification code from the ballot last loaded into the voter PEB. If no previous ballot identification code exists on the PEB, the supervisor terminal loads the ballot normally. Similarly, if the ballot identification data on the voter PEB matches the ballot identification code that is about to be loaded onto the voter PEB, the supervisor terminal loads the ballot normally. However, if the ballot identification code in the voter PEB does not match the unique ballot identification code for this precinct and election, the supervisor terminal issues an audible alarm and displays the message that this voter PEB has not been properly qualified since the last election and cannot be used in this election until it has been qualified.

- **Password Protection.** Password protection restricts access to the services menu and the election central application menu. These menu passwords differ from the precinct-specific override passwords that precinct officials need in the event of a deviation in the election process. The ballots for each election contain different precinct-specific override passwords. These passwords are maintained by election officials and are not utilized by the precinct officials. If the precincts require the service menu or elections central application menu passwords, extenuating circumstances exist and trained support personnel should be present at the precinct to oversee the situation.

#### *After an Election*

- **Accountability.** The single supervisor PEB used to open all voter terminals at the beginning of the election also produces a "zero tape," a printed log that shows which serial number terminals were opened, exactly what date and time they were opened, and the number of votes on each voter terminal when it was opened. That same supervisor PEB closes all voter terminals and collects all votes. Because the supervisor PEB recorded the serial numbers of all opened voter terminals, it requires that all opened voter terminals also be closed. This feature assists precinct officials in ensuring no terminals were inadvertently missed. If a reason for not closing a terminal develops, the precinct official can enter an override password and proceed normally. However, the precinct report still includes the serial numbers of any unclosed voter terminals and lists them as "not closed."
- **Closing Date and Time Recorded.** Voter terminals include their closing date and time on the master supervisor PEB when closed. The supervisor PEB then reports the closing date and time for each voter terminal directly beneath its corresponding opening date and time on the precinct report. This inclusion allows election officials to audit when each voter terminal at a precinct was

opened and closed on Election Day. This data can also be compared to the zero tape, which was produced during the opening process

- **Must Close Voter Terminal to Read Votes.** The supervisor PEB first must close a voter terminal before it can collect the terminal's vote totals. Once closed, the voter terminal cannot be voted on again until it is cleared and tested and opened for voting. When a supervisor PEB closes a voter terminal, the voter terminal reads the supervisor PEB first to see if this supervisor PEB has already been closed and collected vote totals for this serial number voter terminal. If it has, the voter terminal will not copy its vote totals to the supervisor terminal.
- **Physical Security.** Seals are placed on the iVotronic voting booths to prevent opening of the unit and gaining access to the voter terminal without detection.

In addition to the above security requirements to prevent tampering, ES&S provides state and county officials extensive training on the operation of the iVotronic system. ES&S works closely with election administrators to train and educate those who will be carrying out elections about the iVotronic system and the processes and procedures, ES&S have established to maintain the integrity of the voting process. ES&S offers poll worker training classes conducted on-site at a state or county facility provide hands on practice with the iVotronic system as well as allows the poll workers the ability to answer any questions related to the iVotronic system. The combination of the security features built into the iVotronic and the on-site election support services, training and documentation that ES&S provides to county and state election administrators that results in a secure, reliable, accurate voting solution

### **Compliance with State of Wisconsin Law**

ES&S' iVotronic voting system meets the requirements as set forth under applicable Wisconsin law. ES&S' iVotronic voting system is first tested against ES&S' own stringent internal requirements prior to submitting the system to the Independent Testing Authorities ("ITA") for testing against the Federal Voting System Guidelines. The ITAs are charged with demonstrating that the iVotronic meets or exceeds government standards. The ITA testing and certification process verify that ES&S iVotronic system meet federal and state requirements on a number of fronts -- including source code, hardware, software, environmental, functional, logic and reliability. Once the ITA testing has been completed and the system has been certified by the appropriate federal authority in charge of certifying such systems, currently the Election Assistance Commission, the system is then put through an additional level of testing at the state level. The iVotronic system has been tested and certified by the State of Wisconsin for use in the State. Such certification provides that ES&S' iVotronic system has met the requirements of the Board as set forth in Chapter 7 of the Elections Board Administrative Code and other applicable Wisconsin statutory requirements.

As discussed in detail above, ES&S has incorporated numerous security features into its system to ensure ES&S' iVotronic voting system is secure, reliable and accurate. In addition, ES&S has developed and employs a detailed training curriculum to provide extensive training to state and county election officials and poll workers on the use of the iVotronic system. Finally,

Mr. Kevin Kennedy  
March 2, 2007  
Page 7

the iVotronic system undergoes internal, federal and state testing to ensure the system meets specific requirements for use in an election.

If you have questions or need additional information related to the above referenced matter, please contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read "T. Hallett", with a long horizontal stroke extending to the right.

Timothy J. Hallett  
Associate General Counsel

cc: Eric A. Anderson, Esq. – ES&S  
Steven M. Pearson – ES&S