

**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF STATE**

**RESULTS OF KNOWINK ELECTRONIC POLL BOOK**

**POLL PAD 1.3.3 EVALUATION**



**Issued By:**

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**Robert Torres**  
**Acting Secretary of the Commonwealth**  
**October 5, 2018**

## **RESULTS OF THE KNOWINK ELECTRONIC POLL BOOK POLL PAD 1.3.3 EVALUATION**

### **I. INTRODUCTION**

Pennsylvania's voter registration law, Act 3 of 2002 (Act 3), 25 Pa.C.S. §§ 1101 et seq., requires that the poll book or district register "shall be in a form prescribed and approved by the Secretary" for both paper and electronic poll books, (25 Pa. C.S. §1402(b)(2)). Pursuant to the request by Knowink, the Department of State (Department) evaluated the Poll Pad 1.3.3, Electronic Poll Book (EPB) to ensure that the system complies with all the applicable requirements of Act 3, including the regulations implementing Act 3, 4 Pa. Code §§ 183.1 et seq., and the Pennsylvania Election Code, 25 P.S. §§ 2601 et seq., and therefore can be used in Pennsylvania elections. The evaluation consisted of in person system demonstration conducted by Mitch Milleville, Product Manager representing Knowink, email communication and conference calls with Knowink personnel, and documentation review. The system demonstration happened on May 30, 2018 in Ocean room of Keystone Building located at 400 North Street, Harrisburg, Pennsylvania. Jonathan Marks, Commissioner of the Department's Bureau of Commissions, Elections and Legislation, Jessica Myers, Deputy Director of Policy; and Sindhu Ramachandran, Voting Systems Analyst represented the Secretary of the Commonwealth during the demonstration. Staff members of Bureau of Commissions Elections and Legislation (BCEL) and the Department's Office of Chief Counsel also attended the demonstration. The Department videotaped the demonstration.

### **II. Poll Pad 1.3.3 ELECTRONIC POLL BOOK**

The Poll Pad 1.3.3 EPB demonstrated for use in Pennsylvania included the following components:

1. Poll Pads – Poll Pads are iPads configured for use at the polling place to perform voter check in activities. The Poll Pad 1.3.3 software application installed on

iPad, allows poll workers to perform the polling place activities typically performed using a printed paper poll book. The Poll Pads work in kiosk mode allowing the poll workers to access only the poll pad application.

2. ePulse 1.3.3 (ePulse) - ePulse is a web based platform that supports the management functions of the EPB system. ePulse allows the election officials to prepare the voter and precinct data for use on Poll Pads. It also provides an Election Day monitoring platform that connects election officials to polling places. The system facilitates managing election day operations by providing functionalities like monitoring polling place status, hardware health, and operational status etc. Monitoring functionalities allow election officials to address potential issues and have better control of polling places on Election Day. The system also allows election officials to prepare customizable reports for analysis.
3. Poll Pad case and stand with assembling accessories
4. Label Printer Star Micronics Printer, Model TSP 650

(Refer to Attachment D for a list all the items in the Poll Pad EPB system case)

### **III. EVALUATION APPROACH, PROCEDURES AND RESULTS**

#### **A. Evaluation Approach**

To evaluate whether Poll Pad 1.3.3 EPB can be successfully used for elections in the Commonwealth of Pennsylvania and meets all the requirements mandated by Act 3 and the Pennsylvania Election Code the following approach was used: (1) System Demonstration; and (2) Documentation Review.

The Department requires a System Demonstration to examine and confirm on a field-ready system that the EPB satisfies all the statutory requirements. The demonstration also allows the Department to understand the complete capabilities of the system. The

documentation review consisted of analyzing the system specifications, user manuals, state certification and third-party test reports pertaining to Knowink Poll Pad system. Electronic poll books are heavily configurable distributed systems, typically consisting of networked tablets or laptops used at the polling place to check-in voters. They work in conjunction with a central server performing the management functions, which include: preparing the election data, performing voter history updates and monitoring deployed devices at polling places. The documentation review was conducted to confirm that the system can be efficiently used for elections in the Commonwealth of Pennsylvania and to aid in deciding the EPB connectivity configuration to be approved for use in Pennsylvania.

## **B. Procedures**

### **1. System Demonstration**

A Knowink representative demonstrated the Poll Pad 1.3.3 system on May 30, 2018. The demonstration included an end to end set up and capability walkthrough of both the Apple iPad tablet installed with Poll Pad 1.3.3. application used at the polling place, and the ePulse 1.3.3 system used to perform the data preparation and management functions. Knowink used the test data supplied by the Department for the demonstration. The purposes of the demonstration were to (a) validate that the system complies with Pennsylvania's statutory requirements for poll books; (b) discuss the overall capabilities of the system; and (c) to evaluate level of compliance with the Commonwealth Information Technology Policies(ITPs) outlined in Attachment C of this report.

### **2. Documentation Review**

The Department requested the following documentation from Knowink for review.

1. System Specifications;
2. Hardware/Software/Peripherals/Additional Equipment Requirements;
3. Technical Data Sheet;
4. User Manual;
5. Usability Reports;

6. Security and Penetration Testing Reports and;
7. Test Reports from other states using the system.

Department staff reviewed the supplied documentation and analyzed the documentation of the system in detail.

### **3. Results**

#### **1. System Demonstration Results**

- a) Conformance to statutory requirements - The vendor successfully demonstrated that the Poll Pad 1.3.3 EPB system conforms to the statutory requirements outlined in Pennsylvania law. The demonstration proved that the system can be configured to meet the statutory requirements. *See Attachment A* for the list of statutory requirements discussed and validated during the demonstration.
- b) Review of system capabilities - The Department reviewed the overall system capabilities during the demonstration and documentation review. *See Attachment B* for a summary of the demonstration discussion points.
- c) Level of Compliance with Commonwealth IT policies – The Department provided Knowink with a copy of the Commonwealth of Pennsylvania IT policies relating to the security of distributed systems and network connectivity. The Department also provided Knowink with a questionnaire to evaluate the system security posture, which was completed and submitted as part of the evaluation request. Time was set aside during the demonstration to discuss the security of the system. The written response to the questionnaire and the security discussion with Knowink team during the demonstration allowed Department staff to evaluate the system’s level of compliance to Commonwealth IT policies, and to understand the security features of the system. *See Attachment C* for the specific policies and discussion summary that occurred during the demonstration and the questionnaire.

#### **2. Documentation Review Results**

Department staff analyzed the documentation provided by Knowink to understand the system capabilities in detail. The submitted documentation included test reports for Poll Pad EPB system by NTS Huntsville (Wyle Laboratories), a federally recognized VSTL at the time of testing, to attest conformance to Ohio and Indiana state statutory requirements. The VSTL report indicates successful validation of all the requirements for the state of Indiana and Ohio. Knowink Poll Pad EPB system was approved for use in State of California on May 22, 2018. The Department reviewed examiner test reports prepared by SLI Compliance, a federally recognized VSTL, and the system approval report prepared by the California Secretary of State's office, as part of the California State approval. The review of the test reports allowed the Department to understand in depth the functionality of the system and further assess the security and accessibility properties of the EPB system.

The demonstration and documentation review determined that Poll Pad 1.3.3 consists of iPads installed with Poll Pad 1.3.3 application configured as Poll Pad kiosks (Poll Pads) to perform voter check-in activity at the polling place and ePulse 1.3.3 hosted on a cloud server to perform administrative functions. The system allows the following modes of configuration:

- A live (fully connected) mode where data flows continuously between cloud-based ePulse servers and all Poll Pads in use at a polling place;
- A restricted server communication mode where the system can be configured to transfer only operational/performance data from the Poll Pads to the ePulse cloud server. The data transmitted doesn't contain any voter check-in data. This configuration allows monitoring of the polling place devices remotely;
- A peer to peer communication mode where the Poll Pads at a polling place communicate to each other without any connection to the ePulse cloud server. This configuration allows voter check-in data to sync up in a polling place, thus allowing the use of multiple Poll Pads at a polling place.

The networked environment makes the EPB system vulnerable to hacking attempts that can compromise the integrity of check-in data and/or result in unauthorized access to voter data. The Department staff analyzed the connectivity configurations discussed during the demonstration in conjunction with the documentation provided and existing Department test protocols for Electronic Poll Books to come up with the connectivity approved for use in Commonwealth of Pennsylvania, which minimizes the security risks and maximizes the benefits in moving to an EPB solution.

### **3. Observations**

Department staff noted the following as part of the demonstration and documentation review.

- 1) Poll Pad 1.3.3 uses software configuration features to determine the final functional behavior of the system. Even though the demonstration and subsequent evaluation showed that the system can be configured to satisfy all the statutory requirements, the Department will need assurance that the system setup complies with the approved configuration after purchase.
- 2) The deployed system security posture will depend on the parameters selected during setup. This will necessitate validating the configuration during and after setup to ensure that the system is configured in a secure manner.
- 3) Poll Pad 1.3.3 deployed in live (fully connected) and restricted server communication mode communicates with the cloud server located outside of the polling place and transmits transactional and operational data throughout Election Day to the ePulse server. The demonstration included a discussion of the complete capabilities of the system. The live (fully connected) and restricted communication mode maintains a communication channel between the polling place and cloud server for the entire time the polls are open on Election Day.
- 4) The data from Statewide Uniform Registry of Electors (SURE) system is prepared for loading on Poll Pads using the ePulse system. The data preparation process runs scripts on the extracted data from SURE system to prepare a proprietary database for use on Poll Pads. The script used in the data preparation process splits the extracted

data file from the SURE system into two separate files, one file with only the voter signatures, and the other file with the rest of the voter data. The data preparation process is reconciled via a high-level onscreen summary of the records processed on ePulse, but the prepared data will need to be validated for accuracy and completeness after loading to the Poll Pads to avoid any data inconsistencies on Election Day.

- 5) The review of California State testing reports suggests that there were security test findings with minimal overall impact that will be remediated in a future release. The vendor response to the findings indicate that a future release will be presented for administrative approval to the State of California.
- 6) Knowink provided system manuals and a Technical Data Package (TDP) to describe the functionality of the system. However, the supplied documentation lacked a full TDP containing details of election setup, secure configuration, etc.
- 7) The system log files do not contain the device identifier of the originating device. The county election official uploading the log file will have to ensure that the uploaded log file name has the device identifier.

#### IV. CONDITIONS FOR APPROVAL

Based on the evaluation, the Secretary of the Commonwealth of Pennsylvania approves Poll Pad 1.3.3 subject to the following conditions:

- A. The Poll Pads in operation at a polling place **must not** be configured to communicate to the ePulse server during the polling hours on Election Day. The tablets in operation at a polling place can communicate to synchronize voter check-in data between each other at the polling place during the polling hours. Any data transfer required between the ePulse system and Poll Pads must happen outside of polling hours.
- B. The tablets at an individual polling place communicating with each other must be configured and managed in a secure manner and may never connect to a publicly accessible network. The network at the polling place must be a “closed network”



allowing only components of the EPB system to connect and encryption must be enabled. The security settings must prevent other devices from detecting and connecting to the network at the polling place.

- C. Any components which are/were part of the EPB system, including removable media, must not be connected to the Electronic Voting system. This includes, but is not limited to: PEB encoders and Voter Access Cards encoded on the EPB systems; USBs; SD cards; printers; CDs; etc.
  
- D. Jurisdictions implementing Poll Pad 1.3.3 EPB system **must not** use the driver's license or ID card bar code scanning capability to check in voters. This is to avoid voters being asked for an ID when not required by law. Counties must implement the system with the bar code scanning option disabled. The system must not present poll workers the option of checking in voters by scanning an identification card with bar code.
  
- E. Portable media used to transfer files between any components of the EPB system must be new, unmodified and not refurbished. Alternatively, removable media that is being reused must be fully reformatted before each election. All removable media used for elections must be managed with proper chain of custody and administrative safeguards to protect against disclosure, theft, or damage.
  
- F. Any unused ports in the Poll Pad used at the polling place must be sealed with tamper-evident seals. The Poll Pad case also must be locked and sealed.
  
- G. Counties purchasing the Poll Pad 1.3.3 EPB system must work with Knowink and BCEL (Bureau of Commissions, Elections and Legislation) to do the following:
  - 1. Implement Poll Pad 1.3.3 EPB system in a manner that satisfies all statutory requirements outlined in Act 3 and the Pennsylvania Election

Code. The parameter configuration and the text of informational messages must be approved by BCEL.

2. Implement Poll Pad 1.3.3 EPB system in a secure manner that complies with applicable county and Commonwealth IT policies and any directives or guidance published by Department of State BCEL. The system configuration, connectivity set up, password configuration and password management policies must be approved by BCEL; and
3. Implement Poll Pad 1.3.3 EPB system with sound administrative practices and proper chain of custody in the same manner as counties deploy Electronic Voting Systems.

H. Counties implementing Poll Pad 1.3.3 must change all default passwords during implementation. County election officials must implement processes to confirm and maintain records that default passwords were changed before fielding the system. The proof must be documented using export of the system log files whenever possible. In situations where the log entries are not detailed enough a screenshot of the password change action performed at the election office or checklist can suffice. County election officials with administrative access on ePulse server must take proper precautions for password management and protection.

I. Counties must work with Knowink to ensure that the Poll Pads are configured in kiosk mode or Guided Access Mode. The iPads must be hardened with only the required software for the EPB system. No additional software applications or utilities shall be installed on the Apple iPads being used at the polling place.

J. Counties implementing Knowink Poll Pad 1.3.3 EPB system shall implement at least two (2) Poll Pads per polling location and must allow peer to peer communication to enable check-in activity to synchronize between the Poll Pads. This is necessary to ensure data storage redundancy.

- K. Jurisdictions implementing the Poll Pad 1.3.3 EPB system must keep an inventory of all the device ids deployed in the county. The systems must be audited at the beginning of the Election cycle for any required maintenance. Any devices sunset, returned or otherwise disposed of at the end of a lease or end of useful life must be free of any software and voter data. Counties must implement processes to ensure that the “clean wipe” is validated documented and maintained for audit purposes.
  
- L. Counties must have a contingency plan to ensure that an election will not be affected should any component (including connectivity and power supply) of the EPB system fail due to malfunction or cyber incident on Election Day. The contingency plan must ensure that no “check in” information is lost. The contingency plan must be reviewed and approved by BCEL. At a minimum, the contingency plan must ensure the availability of a full voter list and a process for maintaining and reproducing a list of voters who have already checked in if the EPB fails during voting hours.
  
- M. Counties purchasing the Poll Pad 1.3.3 must work with BCEL to decide what portion of the data from the Statewide Uniform Registry of Electors (SURE) system can be shared with the vendor. The counties shall not allow the vendor to run any data extraction utilities against the SURE database/system. Any data transfer must happen via a file extract and secure file transfer process and must be encrypted. The voter data extract must not contain any additional data elements than what was shared during the evaluation. The data elements and sharing mechanism must be approved by BCEL. Counties must ensure the accuracy of data loaded to the EPB system and maintain appropriate reports as necessary for auditability.
  
- N. Counties purchasing the Poll Pad 1.3.3 must work with BCEL to finalize the process of voter history updates. Knowink must be able to adhere to the extract format and timing of the update suggested by SURE system administrators.

- O. Knowink must notify the Department of State of any changes made to Poll Pad 1.3.3 EPB system. This includes any changes to the software of the EPB system and to the environment of the EPB system, including but not limited to Knowink's development locations, cloud service vendors, data center locations, for example.
- P. Knowink must escrow a copy of the code, trusted build, any verification/identification software used and installation instructions for safekeeping to the Commonwealth of PA and add the Commonwealth as a beneficiary to any Escrow accounts they have for safekeeping of the Poll Pad 1.3.3 code.
- Q. Knowink must provide fully prepared and version controlled user and system manuals for counties purchasing the EPB. The manuals must clearly identify each user configurable parameter. Copies of the final user manuals and any subsequent updated user manuals must be submitted to the Department before sale of the product or any subsequently approved product upgrades in Pennsylvania.
- R. Counties must perform a thorough evaluation and User Acceptance Test of the EPB system before purchase. This test should include all expected activities occurring as part of the election including interactions to the SURE system. This approval is based on a demonstration by the vendor and documentation review. Demonstration by the vendor cannot be considered equivalent to testing.
- S. Counties implementing the Poll Pad 1.3.3 must work with Knowink to define and implement policies on data retention and archiving of the EPB system including external servers and any removable media. Any election data stored on devices outside of the county network must be deleted and/or archived to physical media with access control as soon as it is no longer required or no later than ninety (90) days after Election Day. Voter data shared with the vendor must be tracked and deleted to avoid data breaches. Counties must retain, as required by law, archived copies of data sent and received from the vendor for audit purposes. Knowink must keep audit logs of

every data access event and make those audit logs available for inspection to the counties or BCEL upon request.

- T. All jurisdictions implementing the Poll Pad 1.3.3 must carry out full Logic and Accuracy testing prior to every election on each device and maintain records of this testing. The Department recommends creating a county specific plan for Logic and Accuracy testing that includes all peripherals and anticipated check in scenarios on Election Day. The vendor supplied Logic and Accuracy checklist should be used as a reference but must not be accepted in lieu of a county specific plan.
- U. Knowink must provide audit log specification documentation to BCEL and counties purchasing Poll Pad 1.3.3 system. The county election officials and IT personnel must work with Knowink to understand the system logging capabilities. The county must be able to identify and gather logs that provide audit trail of the election data preparation and transactions at the polling place, and logs that aid in identifying and managing security incidents, fraudulent activity and operational problems. Processes must be implemented to harvest and safekeep the logs after the election for future analysis and review. The log files must be extracted and saved in a manner that allows identifying the device from which the logs files were extracted. The EPB log files must be retained for five (5) years in accordance with the statutory retention period for poll books.
- V. Knowink must ensure that future releases of the software with enhanced security features are presented for approval to Department. This includes the version released remediating the test findings from California State testing. Refer to Observation 5, on page 8 of this document.
- W. Knowink shall not assign, in whole or in part, its rights, duties, obligations, or responsibilities with respect to software development, manufacturing of any

proprietary hardware, service and maintenance of a system approved by the Secretary, without written notification to the Department and approval from the Secretary. For the purposes of this condition, the term “assign” shall include, but shall not be limited to, the sale, gift, assignment, pledge or other transfer of any ownership interest in the system approved by the Secretary. The vendor must submit to the Secretary a request notifying the change, including information regarding the ownership and business interests of the assignee, and evidence the submission by a written assignment agreement executed by the vendor and its assignee in which the assignee agrees to be legally bound by all of the terms and conditions of the approval and to assume the duties, obligations, and responsibilities being assigned. If a transfer of ownership/assignment of rights occurs such as in the event that the vendor assigns its rights and/or duties to another entity and once the assignment of said rights and duties to the new entity has been approved by the Secretary, the new entity shall be required to execute all security, confidentiality and Non-Disclosure Agreements that were executed by the originating vendor.

- X. Knowink must ensure that all the involved entities in the system supply chain will follow all the applicable conditions in this report.

## V. RECOMMENDATIONS

The Secretary makes the following recommendations to the counties purchasing the Poll Pad 1.3.3 EPB system:

- a) Counties should consider using the EPB in pilot mode during the first use in an election. This allows the jurisdictions to ensure that all appropriate checks and balances are in place before using the EPB system in full production mode. For larger counties, the county should also consider implementing in a phased approach to mitigate any unforeseen issues that may arise during implementation.

- b) The Secretary urges counties to ensure that all poll workers and election officials receive appropriate training and are comfortable using the EPB. The training activities should include, but not be limited to: hands-on training on devices to perform election set up and operations at a polling place, cyber hygiene practices and procedures for detecting cyber-attacks. The training should ensure that poll workers and elections officials can detect any warnings that signal cyber-attacks and immediately respond to it. Involvement of poll workers during the implementation project from start to finish with onsite trainings at the polling place is also recommended.
- c) Counties using EPBs should implement processes of reconciliation at the open and close of polls to avoid any data discrepancies. Checklists should be developed for poll workers to ensure compliance with all requirements and reduce the chance of human error. Counties should also work with Knowink to produce quick reference cards and/or help files for use at the polling place on election day.
- d) The Secretary recommends that counties purchasing the Poll Pad 1.3.3 EPB system perform proof of concept testing onsite at all polling places to ensure peer to peer connectivity and power supply availability. The Secretary further recommends that the test is conducted with a test system using components of the same make, model and configuration as that being used on Election Day.
- e) Counties using the Poll Pad 1.3.3 EPB system should develop and implement a disaster recovery plan that is considerate of the possibility of a data breach or cyber-attack on the EPB. The plan should detail processes and procedures to be followed by poll workers and election officials in the event of a malfunction or cyber-attack.

## **VI. CONCLUSION**

Based on the demonstration, documentation review, and consultation with the Department staff, the Secretary of Commonwealth concludes that the Knowink Poll Pad 1.3.3 EPB meets all of the applicable requirements set forth in Act 3 and the Pennsylvania Election Code, and can be used for checking in voters during elections, provided that all of the conditions listed in Section IV of this report are met.



### Attachment A - Statutory Requirements

<b>Requirement</b>	<b>Demonstrated (Yes/No)</b>
The computer list shall be in a form prescribed and approved by the Secretary. (25 Pa. C.S. §1402(b)(2)).	<b>Yes</b>
<b>Form of the Electronic Poll Book</b>	
Each screen of the EPB shall contain the name of the county. (25 Pa.C.S. § 1402(b)(2))	<b>Yes</b>
Each screen of the EPB shall contain the election district. (25 Pa.C.S. § 1402(b)(2)).	<b>Yes</b>
Each screen of the EPB shall contain the date of the election. (25 Pa.C.S. § 1402(b)(2)).	<b>Yes</b>
Each screen of the EPB shall contain the date and time the list was prepared. (25 Pa. C.S. § 1402(b)(2)).	<b>Yes</b>
<b>Content of the List:</b>	
For each election district, the EPB shall contain an accurate list of the names of the registered electors- alphabetically by last name. (25 Pa.C.S. §1402(b)(2) and 1402(c)).	<b>Yes</b>
<p>Poll workers must have access to the list at all times so that voters can be checked in without interruption. The Electronic Poll Book should provide for the following relating to data recovery and adequate contingencies should one or more elements of the Electronic Poll Book fail:</p> <ul style="list-style-type: none"> <li>▪ Memory Redundancy <ul style="list-style-type: none"> <li>• Internal</li> <li>• External</li> </ul> </li> <li>▪ Data Preservation</li> </ul>	<b>Yes</b>

<ul style="list-style-type: none"> <li>▪ If the contingency for Electronic Poll Book failure is the printing of paper poll books/precinct lists from the EPB, the EPB must provide for the printing of a paper poll book AND a copy of the list of registered voters within the precinct.</li> </ul> <p><b>Demonstration Comments:</b> EPB system keeps the data during operation on the hard disk of the Poll Pad. Data redundancy at a polling place can be maintained by having multiple Poll Pads in a polling place, and having the check in data synchronized between them. The system also allows using an iSync drive and the poll workers can create backups as needed. Reports can be configured, exported, and saved to preserve data at any point in time.</p> <p>The EPB must prevent multiple “check-ins” by the same voter.</p> <p><b>Demonstration Comments:</b> The system demonstration showed that the system identifies an attempt to check in an already checked in voter. The Poll Pad displays an indication of the original check in. The system can be configured for the poll worker to take additional actions like cancelling the check in, reprinting the voter slip etc. In an environment where there are multiple Poll Pads connected, data syncing between the devices must be functioning to ensure multiple “check ins” are prevented on different devices.</p>	
<p>A legible digitized signature for each registered elector. (25 Pa.C.S. § 1402(b)(2)).</p> <p>The official digitized signature for each registered elector must be obtained from the Statewide Uniform Registry of Electors (SURE) and it must be displayed in such a manner as only the poll worker can see the official signature at the time a voter is signing the EPB.</p>	<b>Yes</b>
<p>Street address of each registered elector. (25 Pa.C.S. § 1402(b)(2)).</p>	<b>Yes</b>

Political party designation of each registered elector. (25 Pa.C.S. § 1402(b)(2)).	<b>Yes</b>
Suitable space for insertion of the signature of the registered elector. (25 P.S. § 3050(a.3); 25 Pa.C.S. § 1402(b)(2)).	<b>Yes</b>
Suitable space for insertion by the proper election official of the number and letter of the stub of the ballot issued to the registered elector or the registered elector's number in the order of admission to the voting systems. (25 P.S. § 3050(a.3); 25 Pa.C.S. § 1402(b)(2)).	<b>Yes</b>
<p>Suitable space for insertion of the initials of the election official who enters the record of voting in the district register. (25 P.S. § 3050(a.3); 25 Pa.C.S. § 1402(b)(2)).</p> <p>If the EPB is designed in such a manner as it provides for unique login credentials for each election official, this requirement can be satisfied by a system-generated audit report that identifies by unique election official ID which voters were checked in by that election official.</p> <p>Demonstration comments: The application has a "Poll Worker Initial" box that captures the initials of the poll worker performing the check in.</p>	<b>Yes</b>
Indication of whether the elector needs assistance to vote and, if so, the nature of the disability. (25 Pa.C.S. § 1402(b)(2)).	<b>Yes</b>
The date of birth of the registrant. (4 Pa. Code § 183.11(b)(4)).	<b>Yes</b>
The SURE registration number of the registrant. (4 Pa. Code § 183.11(b)(5)).	<b>Yes</b>

The following elector's affirmation must appear above the signature area: "I hereby certify that I am qualified to vote in this election." (25 P.S. § 3043).	<b>Yes</b>
An identification of whether the registrant's status is active or inactive. (25 Pa.C.S. § 1901(c); 4 Pa. Code § 183.11(b)(6)).	<b>Yes</b>
<b>Voter Status Flags required by the SURE system:</b>	
For voters who are "Inactive," affirmation is required. (25 Pa.C.S. § 1901(c) and (d)(3); 4 Pa. Code § 183.11).	<b>Yes</b>
"ID Required"-identification of whether the voter needs to present voter identification. An elector who appears to vote in an election district for the first time must present valid voter identification. (25 P.S. § 3050(a)).	<b>Yes</b>
"Absentee Ballot"-If an elector who voted an absentee ballot is in the municipality on Election Day, he or she must vote in the precinct, and the absentee ballot is voided. (25 P.S. § 3146.6(b)).	<b>Yes</b>
"Must vote in person"-Identification of whether the voter needs to present voter identification if the elector votes for the first time by mail. (Federal: 42 U.S.C. § 15483(b)).	<b>Yes</b>

## **Attachment B - EPB Functionalities**

### **Specific “check in”/voter handling Scenarios demonstrated**

- a) **Provisional Ballot -**  
The process of performing a provisional check in and issuing a provisional ballot was demonstrated. The system allows the poll worker to enter a reason for issuing the provisional ballot. The dropdown options for the reason can be configured by the county. The system can also be configured to print the statutorily required affirmations on demand using the receipt printer.
  
- b) **Absentee Ballot -**  
The system functionality that allows the poll worker to check in a voter who voted an absentee ballot was demonstrated. The county can configure the system to give appropriate instructions to the poll workers about any reconciliations that will need to be performed at the close of polls to ensure that the submitted absentee ballot is voided since the voter was allowed to vote at the polling place.
  
- c) **Cancel Check in -**  
The system allows cancelling a check in that was already performed. Counties can configure the system to require an additional password for performing the cancel check in function. The system also allows capturing a reason for cancellation. It was also demonstrated that the system can be configured to add additional workflow steps to the process, like having the poll worker/supervisor review and sign before committing the cancel check-in.
  
- d) **Reissue Ballot -**  
The procedure for reissuing a new ballot in place of a spoiled ballot was demonstrated. The system allows tracking the number of ballots issued to a voter and allows capturing a reason for reissue.
  
- e) **Inactive Voter Check in -**  
The process of checking in an Inactive voter with required affirmations was demonstrated. The county can configure the system to give appropriate instructions to the poll workers about the affirmation process and any reconciliations that will need to be performed at the close of polls. The system allows the voter affirmation process to be configured for on-demand printing using the receipt printer.
  
- f) **Redirecting a voter to the correct polling place -**

If the voter is at the wrong polling location, the system can assist the poll worker in identifying the correct polling location. The poll worker can perform a voter look up and the system shows the record highlighted, with an indication “wrong precinct”. Upon navigating to the voter record, the system shows a pop-up window with the correct polling location address. The address can be printed out and given to the voter. Additional functionalities like driving directions, email, text message etc. can be configured depending on the connectivity at the polling place.

g) Search/Lookup voter Capabilities of the EPB -

The system allows a poll worker to look up the voter list to find a specific voter, by scanning an ID with a barcode or by manual entry of voter details. The basic manual entry search allows the poll worker to enter the last name and first name of the voter. The poll worker can enter any number of characters in the fields and the search results will get filtered as additional characters are entered. The vendor recommends entering 3 characters in both the first name and last name field to reduce the number of records returned. The system also provides an advanced search option which allows searching the voter by Date of Birth, Address etc. The search options available under the advanced search are configurable.

h) Check-in a voter multiple times -

System behavior/messages when poll worker tries to check in an already checked in voter was demonstrated.

### **SURE System Interaction**

a) Capability to import data files from SURE -

It was demonstrated that the system allows loading data extracted in an agreed upon format from SURE system. The process was explained as follows:

- 1) The data from SURE system is extracted and uploaded to ePulse system via a file loader within ePulse system.
- 2) The extracted .mdb file is first converted to a csv file. The converted file contains all data elements except signature.
- 3) The signature is extracted separately from the mdb file using a script written by Knowink.
- 4) The csv file and signature file is processed on ePulse to generate the database file for use on the Poll Pad.

The data preparation process on ePulse displays the steps involved, progress, and records processed. The display also shows a breakdown of the number of voters by status. The breakdown allows monitoring and reconciliation during the

data preparation process. The ePulse system also displays any errors encountered in the data preparation process.

The converted data can be loaded to Poll Pads used at each of the polling places. Poll Pads are connected to ePulse, and data transfer request is initiated from the Poll Pad application. The process of loading the election requires enhanced access to the Poll Pad application for additional security. The system allows loading incremental voter data extract files from SURE using the same process.

- b) Reconciliation of the data load to the EPB -  
The demonstration and discussion showed that the voter list/data load to the EPB system is reconciled and there is a process to handle exceptions.
- c) Voting History Updates -  
The process of generating a voter history update file that can be loaded to SURE system was discussed.
  - 1) After the election, the data from each Poll Pad is synchronized with ePulse by initiating the data transfer request from Poll Pad application
  - 2) After all the Poll Pads are synchronized, the county can create an import file that can be used to update voter history in SURE.

In a fully connected environment the Poll Pads at each polling place will be automatically synchronized with ePulse and, hence counties will not need to perform the step of synchronizing the data after the Election Day.

- d) County self-sufficiency in managing the interactions with SURE -  
The system allows the county personnel to use the ePulse system to prepare the data from SURE for use in elections. Knowink personnel is available for any support required.

#### **Usability/User Interface**

- a) Procedures for setting up the Field System/Poll Pad -  
The procedures for setting up the Poll Pad at the polling place was demonstrated. The system comes in a lime green carrying case and contains only the required components. The assembly at the polling place was demonstrated and requires
  - Taking the components out of the case
  - Attaching the stand arm to the iPad
  - Connecting the arm to the base

- Connecting the printer and power adapter, if a printer is being used by the jurisdiction.

The poll worker may also need to set up the battery base/power adapter for the iPad depending on the configuration selected by county.

The system also has a photo id tray that can be used to scan IDs that contain barcodes. The user manual describes the set-up process with easy to follow instructions and images.

- b) Poll worker ability to access the system and login -  
The process of poll worker accessing the application was demonstrated. The passwords are managed and configured as part of the data preparation process on ePulse. The system allows the county election officials to set up unique passwords for each poll worker.
- c) Screen navigation capabilities -  
The screen navigation capabilities of the Poll Pad application were demonstrated and further discussed. The system navigation was clear enough to follow and used colors to identify flags on the voter data, like absentee, needs assistance, wrong precinct etc. Knowink representative pointed out that there is customization possible with messages and colors for better readability using configurable parameters without software changes. The system does not allow customization of the screens based on individual voter profiles. Any settings decided during the data conversion process will apply to the entire EPB system.
- d) Languages Supported by the system -  
Knowink representatives suggested that the system can support multiple languages. The poll worker screens and voter facing screens can be translated if required. The discussion suggested that most counties in the United States use the approach of translating the voter facing screens. Spanish is one of the supported languages. The system is currently being modified to support all the 14 languages required to be supported by California state statutes. The system demonstrated was configured for English display only. The actions required by the poll worker to change the language was discussed.
- e) Clarity of the messages displayed to the poll worker -  
The system messages displayed to the poll worker during operation was demonstrated. The discussion suggested that the wording of the messages can be configured based on county requirements without software changes.
- f) System power up and shutdown procedures -



The processes for powering up the iPad and launching the Poll Pad 1.3.3 was demonstrated. The power on process will automatically launch the Poll Pad application. The user manual has a checklist for poll worker to ensure that the system is set up appropriately for use at the polling place.

- g) System help availability -  
The system allows to configure and display customized messages for poll workers. The messages guide poll workers through the voter processing steps. The county has the capability to edit the wording of the messages and link it to the criteria that will trigger the message to be displayed.
- h) Peripheral Connection Capabilities -  
The Poll Pad used at the polling place allows to connect only restricted external devices. Only Apple approved iSync drive, which communicates to the Poll Pad application can be used. The system allows to connect a label printer Star Micronics TSP 650. The printer communicates to the Poll Pad application via Bluetooth.
- i) Other functionalities discussed -  
Administrative maintenance functions including tools and settings, status report, poll worker attendance tracking, security key management options, software installation, removal options, and use of training mode were demonstrated and discussed.
- j) Election setup -  
The steps used by county officials to create an election and preparing the Poll Pad for use at the polling place was demonstrated and discussed. The steps also include appropriate check points that officials can use to ensure the correctness of data. The system also allows importing polling place and poll worker data.
- k) EPulse Polling Place Monitoring Capabilities –  
The election official dashboards on ePulse “at a glance” page was demonstrated and discussed. Additional monitoring and messaging functionalities available on ePulse was discussed.

#### **Auditability - Transaction Logging and Reports**

- a) Transaction Logging capability for EPB -  
The logging capabilities for the Poll Pad and ePulse were discussed. The Poll Pad logging capabilities were demonstrated and discussed in detail. The log viewer

functionality and the types of logs available were elaborated. The mechanism to export the logs was discussed. Knowink further provided a copy of the logs to the Department for analysis.

b) Reporting -

The capability to configure and create reports from the EPB system was discussed. The system provided a utility that allows election officials to customize reports using a WYSIWIG editor. It was suggested that county can work with Knowink personnel to customize and configure reports if necessary.

### **Communication and Multiple Unit Synchronization**

a) Modes of configuration –

It was discussed that the system allows, peer to peer, restricted and fully connected modes of connectivity. These modes are discussed in detail on Page 6 of this report.

b) Frequency of check in activity sync up between tablets -

The Poll Pads at a polling place, if connected, synchronizes near real time. If there is a connectivity issue, then the units in operation at a polling place will not communicate check in data. Once the connectivity is restored the transaction sync up will happen and will include all the transactions during the period of connectivity loss.

c) ePulse Hosting -

It was discussed that Knowink uses cloud hosting services from a leading vendor for ePulse system.

### **Capacity, Redundancy, Fault tolerance and Continuity of Operations**

a) Data Preservation -

Knowink representatives explained that there are multiple ways to ensure data preservation and redundancy. On each individual Poll Pad, the data is stored on the tablet local hard drive. If the system is running in peer to peer mode voter check in data is synchronized between all iPads in a polling place. If the jurisdiction is running EPB system connected to the ePulse server, all voter check in transactions are synchronized to the ePulse server throughout the day. The tablet also allows to back up data as required to an iSync drive.

- b) **Power Supply and Battery Life -**  
The power supply and battery life of the system was discussed to ensure that the system can work on battery as well as power. Jurisdictions purchasing the system can customize the battery options as required.
- c) **Ability to remove/add new units without disturbing existing units -**  
A new Poll Pad can be introduced to the polling place without disturbing the existing units in operation.
- d) **System capability to support the volume of voters in any county in Pennsylvania -**  
It was discussed that the system will be able to support the volume of voters in any of the counties in PA without any performance degradations.

#### **System Monitoring and Notification of system Errors or Deviations**

- a) **Capability to perform a self-test for peripheral connectivity -**  
The printer allows to perform a test print once the setup is completed. The system also shows a green printer icon on the Poll Pad once when the connection is completed.
- b) **Visible display indicating system connectivity -**  
The demonstration showed that the system has a display of whether the unit is connected and communicating to other tablets and/or the ePulse server.
- c) **Visible display indicating power supply/batter power -**  
The demonstration showed that the system has an indication that alerts the poll worker when running on battery. The system alerts the poll worker when the battery charge reaches 30% by changing the color of the battery indicator.

#### **Security and Chain of Custody**

- a) **Password configuration on tablet -**  
The system allows passwords to be set up for each device, polling place or poll worker. The system has the capability to configure a supervisor password for functions requiring enhanced security. Multiple password requirement can be configured for accessing functions. The functions requiring enhanced security can be defined by the county during set up.
- b) **Information displayed to the voter on the signature pad -**

The screen presented to the voter for signature doesn't display the signature on file. It contains the voter affirmation and has an assigned location for the voter to sign using the stylus.

- c) Access controls for ePulse -  
ePulse system allows administrators to create new users. The user can then setup their password with an expiring token sent via email. ePulse can also be configured to require MFA.
- d) Data in Motion Security -  
Please refer to Item H in Attachment C.
- e) Data at Rest Security -  
Please refer to Item D in Attachment C.

### **Maintenance, Support and Training**

- a) Hardware and software acquisition options and support -  
Knowink representatives suggested that they work with the county to configure an optimal system for use in the county. County can purchase the hardware from any of their existing contract options if available. The iPads are hardened and per-enrolled in the Mobile Device Management (MDM) system before deployment. Support personnel and call center support is available for jurisdictions. It was suggested that the usual practice is to have personnel onsite for the first few elections.
- b) Service Agreement and Warranty Options -  
Knowink representatives explained that there are several Service Agreement and Warranty options available for the jurisdictions interested in the system.
- c) Training Options -  
Knowink suggested that the county will be offered training options at purchase. The usual practice is to have a training session at county site and then providing the county with poll worker training materials. Knowink personnel also is available to hold the training if necessary.

## **Attachment C - Commonwealth IT Policies**

- A) ITP-SEC001 – Policy that governs Commonwealth’s antivirus agent, host intrusion prevention agent (host-based intrusion prevention system), incident response servlet and patch management agent for all servers.

### **Discussion Summary:**

Poll Pads used at the polling place use iOS which has unique security features that negate the need for anti-virus software. It was represented that, iOS also achieves a reduced attack surface by limiting listening ports and removing unnecessary network utilities such as telnet, shells, or a web server. No additional firewall software is needed on iOS devices. The Poll Pads run in kiosk mode where only the required software is installed and available for use. The Mobile Device Management (MDM) system also serves as an intrusion monitoring and prevention system. Capability to connect external media is also very limited.

ePulse system is hosted by a leading cloud services provider. The answers to the IT policy evaluation questionnaire suggest multiple layers of security for the data hosted.

Knowink represented that they test all patches before deployment and has a patch management policy that considers the election schedule and use the MDM for deployment of the patches. The MDM solution also allows locking and erasing the device if a compromise happens.

- B) ITP -SEC004 - Establishes policy and enterprise-wide standards for commonwealth agencies on Web Application Firewalls

### **Discussion Summary:**

The discussions suggest that the Poll Pad and ePulse systems maintain multiple levels of security to ensure confidentiality and integrity of all devices, communications, data, and systems. Poll Pads use iOS and ePulse is cloud hosted. The ePulse system uses many defenses to keep the system both secure and available during peak periods, like an election. Traffic is encrypted and the database resources are isolated from public Internet. Traffic is distributed using application load balancer to maintain high availability and scalability of internal resources. Application servers are hosted on different availability zones. ePulse follows best practices for access control and provides detailed audit trail of transactions.

- C) ITP-SEC019 and ITP -SEC016 – Establishes policy and procedures to protect commonwealth electronic data.

Discussion Summary:

Knowink represented that they have an appointed contact for security coordination who adheres to the company's Information Security Policy for handling security related duties. A copy of the information security policy was made available for review to the Department. It was also represented that Knowink uses a third-party company for yearly security assessment of software and facilities.

- D) ITP-SEC020 - Establishes policy and standards for encryption of data at rest

Discussion Summary:

Knowink represented that all data is encrypted at rest. Data at rest on Poll Pads and ePulse is encrypted. All data is encrypted to FIPS 140-2 standards.

- E) ITP-SEC024 – Establishes policies, procedures and standards related to reporting and managing of cyber security incidents.

Discussion Summary:

Knowink supplied their information security policy which suggests defined process in responding to security incidents. It was also represented that Knowink uses a third-party security service provider to perform security assessments of the software and facilities.

- F) ITP-SEC025 – Establishes guidelines for the proper electronic use and disclosure of Personally Identifiable Information.

Discussion Summary:

Knowink suggested that it complies with ITP-SEC025. Knowink provided the company Information Security Policy which governs the use of sensitive data. It was represented that they have not had a breach and have never had a client that suffered a data breach for implementing the EPB solution.

- G) ITP-SEC029 - Establishes policy and procedures for commonwealth agencies for physical security of IT resources.

Discussion Summary:

The Poll Pad device and peripheral components including printers, ID scanning trays, stylus, charging cables and stand is locked in the Nanuk weatherproof/shockproof cases provided as part of the solution. Authentication requirements will prevent access to the Poll Pad and ePulse application. External hardware connection capability is limited to the Apple-approved, proprietary Knowink iSync drive and printers

- H) ITP-SEC031 - Establishes policy and standards for encryption of data in transit to improve the confidentiality and integrity of data.

Discussion Summary:

Knowink suggested that the poll book system involves encryptions and secure transmission protocols. All traffic to and from ePulse and between Poll Pad and ePulse is encrypted using TLS 1.2 encryption, a certificate authority signed certificate, and AES 128 or 256-bit encryption, depending on what the user's browser supports. This data encryption applies equally to wireless traffic encryption as well as application-level data encryption which is based on Apple's "sandbox" wherein applications on a device do not share or access each other's data. The Nanuk weatherproof/shockproof cases are lockable to further ensure there is no physical tampering with the devices.

- I) ITP-SEC032 Establishes compliance standards for enterprise Data Loss Prevention (DLP).

Discussion Summary: The policy refers compliance to the below mentioned policies.

- 1) ITP-SEC019 - Policy and Procedures for Protecting Commonwealth Electronic Data

Refer to Item C above.

- 2) ITP-SEC020 - Encryption Standards for Data at Rest

Refer to Item D above.

- 3) ITP-SEC031 - Encryption Standards for Data in Transit

Refer Item H above

- 4) ITP-SEC017 - CoPA Policy on Credit Card Use for e-Government Applications (if applicable)

Not applicable.

The information security policy suggests that Knowink enforces secure coding guidelines. The system had undergone code review and security testing as part of approval for California State certification testing.

- J) ITP-SEC035 - This Information Technology Policy establishes policy, responsibilities, and procedures for connecting and using mobile communication devices to access commonwealth IT resources.

Discussion Summary:

The discussion suggests that EPB Solution utilizes an MDM solution to manage the Poll Pads. The county can work with Knowink to configure the system in the most effective way to manage election cycles. The iPads are hardened and patches are controlled not to conflict with the election cycles. The discussion suggests that the Poll Pad can be configured to adhere to the MDM configuration guidelines mentioned in ITP-SEC035.

- K) ITP-SEC007 - This Information Technology Policy establishes establish minimum standards for the implementation and administration of user, system, network, device, application account IDs, passwords, and requirements around multi-factor authentication.

Discussion Summary:

The discussion suggests that the PollPad 1.3.3 EPB system can be configured in compliance with the Commonwealth ITP-SEC007. ePulse management system usernames and passwords are customizable and can only be set and known by the user. Poll Pad field system passwords may be set by the election administrator. Poll Pad passwords may be set to be the same for each device, or customized by specific polling place or user. The default password requirements ensure the use of strong passwords. Multi-factor authentication (MFA) can be required to launch the Poll Pad application or access the Tools and Settings menu in the application. ePulse also allows configuring with MFA. ePulse user access levels may also be customized and restricted to certain modules and functions.

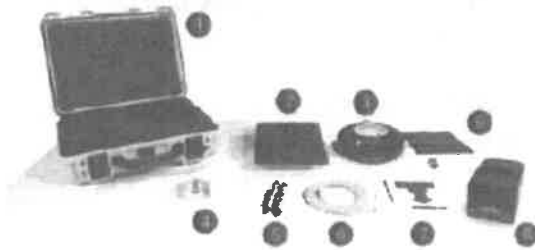


## Attachment D - Poll Pad Components

(The below screenshot is Page 4 of the Poll Pad Guide submitted as part of the application for approval)



### WHAT'S IN THE POLL PAD CASE



1. Green Case
2. Poll Pad & Stand Arm
3. Poll Pad Base or Battery Base
4. Lightning to USB Cable & USB Power Adapter
5. (2) Stylus
6. Green Power Cable
7. ID Tray
8. Printer
9. iPad Screen Cloth

### POLL PAD STAND & ACCESSORIES



- |                             |                 |
|-----------------------------|-----------------|
| 1. Power Button             | 5. Battery Base |
| 2. Home Button              | 6. Camera       |
| 3. Poll Pad & Plastic Shell | 7. ID Tray      |
| 4. Stand Arm                |                 |

