ClearVote 2.1

ClearAccess Hardware Specification

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Document history

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Preface

This section defines the purpose of this document. It contains the following subsections:

- About this document
- Scope of this document
- Intended audience

About this document

This document provides the hardware specifications for the ClearAccess accessible voting system. It complies with the documentation requirements of *VVSG Volume I, 4 Hardware Requirements* and *Volume II, 2.4 System Hardware Specification*.

A ClearVote® system can comprise the ClearAccess®, ClearAudit®, ClearCast®, ClearCount® and ClearDesign® products. Jurisdictions are not required to purchase all products. You can ignore references to any ClearVote products that are not part of your voting system. Also ignore implementation options that are not relevant to your policies and procedures.

Scope of this document

This document contains the following sections:

- Chapter 1. Hardware requirements
- Chapter 2. System hardware characteristics
- Chapter 3. System hardware design and construction

Intended audience

This document is intended for state and federal election officials and their voting system test laboratories as part of the technical data package (TDP) required to certify the ClearVote voting system for use. This document is also used by Clear Ballot personnel who support election officials and election staff.

Chapter 1. Hardware requirements

1.1 Performance requirements

1.1.1 Accuracy requirements

While the ClearAccess accessible voting system is a paper-based system, it is not used to scan ballots and convert ballots selections into digital data.

The ClearAccess accessible voting system is neither a DRE, nor precinct- or central count voting system.

1.1.2 Environmental requirements

Clear Ballot demonstrates compliance with the referenced environmental requirements by means of testing and evaluation on the part of the VSTL.

1.1.2.1 Shelter requirements

The ClearAccess accessible voting system is designed for storage and operation in any enclosed facility ordinarily used as a warehouse or polling place, subject to the temperature and humidity constraints set out in the ClearAccess station manufacturing specifications.

1.1.2.2 Space requirements

The ClearAccess accessible voting system is designed to be compact in footprint, and can easily be installed in a typical polling environment. The space required by the ClearAccess accessible voting system will not impede the duties of polling place officials, the orderly flow of voters through the polling place, or the ability for the voter to vote in private.

For dimensions of ClearAccess components, see the documentation provided by the manufacturer. This documentation is available from Clear Ballot Technical Support.

1.1.2.3 Furnishings and fixtures

The ClearAccess station provides the ability to cover and secure ports from intrusion. Protection is designed around these concepts:

- Unused ports are obscured from intrusion. This also provides a measure of protection against damage.
- Ports needed for operation of ClearAccess are provided a measure of physical protection and/or tamper evidence.
- Access to on/off switches (usually buttons) is minimized, so as to mitigate the ability to approach a ClearAccess computer and rapidly power it off.

ClearAccess stations should be configured with the voting screens supplied by Clear Ballot.

1.1.2.4 Electrical supply

The COTS ClearAccess stations are compatible with the electrical supplies ordinarily found in polling places (Nominal 120 Vac/60Hz/1 phase).

UPS units can be used to ensure the continuity of power in the event of a power outage. Power loss will not compromise the integrity of the encrypted Accessible Definition File (ADFx) providing election and ballot information. No voting data is retained by the ClearAccess accessible voting system.

1.1.2.5 Electrical power disturbance

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.6 Electrical fast transient

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.7 Lightning surge

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.8 Electrostatic disruption

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.9 Electromagnetic emissions

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.10 Electromagnetic susceptibility

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.11 Conducted RF immunity

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.12 Magnetic fields immunity

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.13 Environmental control - operating environment

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

The sip-and-puff is designed for use in a conditioned office environment. Normal sensor calibration error is a maximum +/- 1% Full Scale (FS), from 0C to 85C (185-degrees F). One percent full scale corresponds with approximately 0.17 inch of water column. The sensor will operate from -40C to 85C with 2% FS accuracy error. After 500-hours of heat soak at 85C and 85% RH, maximum accuracy deviation is 3% Full Scale (FS).

1.1.2.14 Environmental control - transit and storage

The COTS hardware components of the ClearAccess accessible voting system have been designed and tested to demonstrate compliance with this requirement.

1.1.2.15 Data network requirements

This requirement is not applicable to the ClearAccess accessible voting system, as it is not designed for use over a data network.

1.1.3 Election management system requirements

These requirements are not applicable to the ClearAccess accessible voting system, as it is not an election management system.

1.1.4 Vote recording requirements

1.1.4.1 Common requirements

The ClearAccess accessible voting system is designed to be used with a voting screen. It is easily configured, remains stable while in use, and offers the voter the necessary privacy while voting. It also meets the accessibility requirements of Subsection 3.2.

1.1.4.2 Paper-based recording requirements

Marks identifying a ballot's unique format are made outside the area in which votes are recorded on the ballot. The alignment marks used to locate the vote response fields on the ballot are positioned outside the area in which votes are recorded.

The allowable range of paper stocks is governed by the jurisdiction's choice in ballot printer.

Requirements regarding marking devices are not applicable to the ClearAccess accessible voting system, since the system is used to print a ballot once it has been voted electronically.

Frames or fixtures for printed ballot cards are not applicable to the ClearAccess accessible voting system.

It is incumbent on the jurisdiction using the ClearAccess accessible voting system to ensure that voted ballots are secured in the appropriate containers, of the appropriate dimensions and with the necessary means of being locked or sealed.

1.1.4.3 DRE system recording requirements

This section does not apply to ClearAccess, since it is not a DRE.

1.1.5 Paper-based conversion requirements

This requirement is not applicable to the ClearAccess accessible voting system, since it is not used to read ballots and translate vote selections into electronic signals for later processing.

1.1.6 Tabulation processing requirements

This requirement is not applicable to the ClearAccess accessible voting system, since it is not used to accumulate or consolidate vote tallies.

1.1.7 Reporting requirements

This requirement is not applicable to the ClearAccess accessible voting system, since it does not use external storage media, nor is it used to print reports of the vote count.

1.1.8 Vote data management requirements

This requirement is not applicable to the ClearAccess accessible voting system, since it is not used to manage, process, or report voting data after having been consolidated at the polling place or other jurisdictional levels.

1.2 Physical characteristics

This section covers physical characteristics of all voting systems and components that affect their general utility and suitability for election operations.

1.2.1 Size

The dimensions of the components of the ClearAccess accessible voting system are compatible with the system's intended use as well as the polling environment the system is intended to be used in.

1.2.2 Weight

The weight of each component of the ClearAccess accessible voting system is compatible with its intended use and the polling environment it is intended to be used in.

1.2.3 Transport and storage of precinct systems

Components of the ClearAccess accessible voting system can be transported safely using the original manufacturer packaging.

The hardware components of the system are typically relatively light weight, and require minimal effort in terms of configuration for voting.

1.3 Design, construction, and maintenance characteristics

1.3.1 Materials, processes, and parts

The ClearAccess accessible voting system is composed of COTS hardware components. No components of the system are designed in-house.

A complete list of hardware components of the ClearAccess accessible voting system is provided in the *ClearVote Approved Parts List*.

1.3.2 Durability

The COTS components of the ClearAccess accessible voting system have been designed to withstand normal use without deterioration or excessive maintenance cost for a period of ten years.

1.3.3 Reliability

The components of the ClearAccess accessible voting system adhere to this requirement in virtue of their COTS status. For more information on ClearAccess reliability characteristics, see "Reliability" in "Quality attributes" in the *ClearAccess System Overview*.

1.3.4 Maintainability

For information on ClearAccess maintainability characteristics, see "Maintainability" on page 15.

1.3.4.1 Physical attributes

All electronic equipment used with the ClearAccess accessible voting system consists of standard, unmodified COTS components. These components adhere to their respective manufacturers' requirements for reliability and maintainability. In addition, each component can be purchased with a service contract directly from a manufacturer or through a variety of resellers. Each of the components bears labels that allow a service technician to know the serial number and model number.

Figure 1-1. ClearAccess station

1.3.4.2 Additional attributes

Clear Ballot's specification of the attributes of the equipment takes into account the requirements for serviceability and built-in diagnostic capabilities. For example, upon boot, computers routinely perform a series of internal self-tests on the integrity of RAM and fail to boot if the memory is corrupted. ClearAccess printers also perform a power-on self-test and display their status at all times when powered.

1.3.5 Availability

The components of the ClearAccess accessible voting system adhere to these requirements in virtue of their COTS status. For more information on ClearAccess availability characteristics, see "Availability" in "Quality attributes" in the ClearAccess System Overview.

1.3.6 Product marking

The COTS ClearAccess stations and printers can be assigned nameplates (if they are not already present) containing the name of the manufacturer or vendor, the name of the device, its part or model number, its power requirements, and revision and model number, where applicable.

It is incumbent on the jurisdiction using the ClearAccess accessible voting system to maintain a record of any servicing performed on ClearAccess system components.

Any applicable advisory or warning instructions for the purpose of ensuring safe operation are affixed to the designated ClearAccess voting system components.

1.3.7 Workmanship

The components of the ClearAccess accessible voting system adhere to these requirements in virtue of their COTS status.

1.3.8 Safety

The ClearVote system runs solely on COTS hardware. Therefore, CE, UL, or FCC labeling is affixed to each component. All relevant safety information is provided with the system component as part of the manufacturer's documentation and can also be obtained from your Clear Ballot representative.

Chapter 2. System hardware characteristics

2.1 Performance characteristics

2.1.1 Operational scenarios

Operational scenarios that describe the manner in which system functions are invoked are documented in the *ClearAccess Supervisor Guide*.

2.1.2 Environmental capabilities

Environmental capabilities of the ClearAccess accessible voting system are comprised in the temperature and humidity specifications included in the COTS component specifications supplied with the ClearVote TDP submission.

2.1.3 Life expectancy

ClearAccess accessible voting system component life expectancies are documented in the COTS component specifications supplied with the ClearVote TDP submission.

2.1.4 Essential aspects of system performance

Examples of ClearAccess system performance attributes are provided in section "Performance characteristics" in the *ClearAccess System Overview*.

2.2 Physical characteristics

2.2.1 Suitability for intended use

For information on ClearAccess suitability for intended use, see the following:

- "Overview" in the *ClearAccess Supervisor Guide* (See the beginning of this section.)
- "Usability" and "Usability study" in the *ClearAccess System Overview*

2.2.2 Transportation/storage requirements

Requirements for transportation and storage of ClearAccess system components are addressed in "Transport and storage guidance" in the *ClearAccess Maintenance Guide*.

2.2.3 Health/safety criteria

Safety criteria of the ClearAccess accessible voting system are addressed in the COTS component specifications supplied with the ClearVote TDP submission.

2.2.4 Security criteria

Security characteristics of the ClearAccess accessible voting system are detailed in "ClearAccess Security Specifications" in the *ClearAccess Security Specification*.

2.2.5 Vulnerability to adverse environmental factors

Environmental requirements of the ClearAccess accessible voting system are comprised in the temperature and humidity specifications included in the COTS component specifications supplied with the ClearVote TDP.

2.3 Reliability

The components of the ClearAccess accessible voting system adhere to this requirement in virtue of their COTS status. For more information on ClearAccess reliability characteristics, see "Reliability" in "Quality attributes" in the *ClearAccess System Overview*.

2.4 Maintainability

2.4.1 Ease of maintenance

Scheduled maintenance activities should take place in the context of preventive maintenance prior to every election, and can optionally also be organized after the completion of the election. Corrective maintenance activities can be resolved on an as-needed basis, or synchronized to accommodate the election management schedule.

2.4.2 Failure prevention

The following actions result in minimal failures of the ClearAccess system:

- Execution of the acceptance test documented in the *ClearAccess Acceptance Test Checklist* following system receipt from Clear Ballot
- Preparation of system components prior to every election using the preventive maintenance instructions provided in "Preventive maintenance" in the *ClearAccess Maintenance Guide*
- Exhaustive testing of the ClearAccess accessible voting system and applicable ballot styles for every voting location in the context of logic and accuracy testing
- Resolution of any potential anomalous behavior using the corrective maintenance instructions provided in "Troubleshooting and corrective maintenance" in the *ClearAccess Maintenance Guide*

2.4.3 Failure resolution

Any user-facing error messages uses clear and simple language, assuring an easy-to-follow process to resolve the condition at hand.

ClearAccess error messages are listed with recommended resolution procedures in "Error Messages" in the *ClearAccess Supervisor Guide*.

2.4.4 Self-diagnosis capabilities

The ability for ClearAccess stations to perform self-diagnosis is inherent to the Windows operating system used to run the stations.

2.4.5 Scheduled/unscheduled events

Scheduled maintenance activities should take place in the context of preventive maintenance prior to every election, and can optionally also be organized after the completion of the election. Corrective maintenance activities can be resolved on an as-needed basis, or synchronized to accommodate the election management schedule.

2.5 Environmental conditions

Temperature, humidity and electrical requirements of the ClearAccess accessible voting system are provided in the COTS component specifications supplied with the ClearVote TDP.

Components of the ClearAccess accessible voting system can be stored in any typical warehouse environment and operated in a typical office-style setting, provided the environment corresponds to the required temperature, humidity and electrical specifications.

Telecommunications requirements are not applicable to the ClearAccess accessible voting system, since it is not used to communicate with remote devices or systems.

Chapter 3. System hardware design and construction

The ClearAccess system configuration submitted for testing is documented in the *ClearVote Approved Parts LIst*.

3.1 Materials, processes, and parts

The ClearAccess accessible voting system is composed of COTS hardware components. No components of the system are designed in-house.

A complete list of hardware components of the ClearAccess accessible voting system is provided in the *ClearVote Approved Parts List*.

3.2 Electromagnetic environment

The electromagnetic environment generated by the system is documented in the COTS component specifications supplied with the ClearVote TDP.

3.3 Operator and voter safety considerations

Compliance with the applicable voter and operator safety standards is ensured for the COTS hardware components that comprise the ClearAccess accessible voting system.

Constraints on voting system operation and the environment in which the system is used is contained within the temperature and humidity requirements included in the COTS component specifications supplied with the ClearVote TDP.

3.4 Human factors considerations

Human factors considerations are documented in the usability study referenced in "Usability" in "Quality attributes" in the *ClearAccess System Overview*.