

# Certification Test Plan – Modification

## Unisyn OpenElect Voting System 1.3.0.2.A

UNI-1302A-CTP-01

Prepared for:

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<b>Vendor System</b>	<i>OpenElect Voting System 1.3.0.2.A</i>
<b>EAC Application No.</b>	<i>UNS10121966-1.3.0.2.A</i>
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***Accredited by the Election  
Assistance Commission (EAC) for  
Selected Voting System Test  
Methods or Services***



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## Revision History

Date	Release	Author	Revision Summary
Nov. 8 <sup>th</sup> , 2017	1.0	M. Santos	Initial Draft
Dec. 18 <sup>th</sup> , 2017	1.1	M. Santos	Updated for EAC comments
Dec. 21 <sup>st</sup> , 2017	1.2	M. Santos	Final EAC comment update
Jan. 3 <sup>rd</sup> , 2018	1.3	M. Santos	Removed references to OVI-7

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## TABLE OF CONTENTS

<b>CERTIFICATION TEST PLAN – MODIFICATION</b> .....	<b>1</b>
<b>1 INTRODUCTION</b> .....	<b>5</b>
1.1 OVERVIEW OF THE UNISYN VOTING SYSTEM .....	5
1.1.1 <i>Definition of the Baseline Certified System</i> .....	5
1.2 REFERENCES .....	7
1.3 TERMS AND ABBREVIATIONS.....	8
1.4 TESTING RESPONSIBILITIES.....	10
1.4.1 <i>Project Schedule</i> .....	10
1.5 SCOPE OF TESTING .....	11
1.5.1 <i>Modifications</i> .....	11
1.5.2 <i>Initial Assessment of Impact of the Modifications</i> .....	11
1.5.3 <i>Regression Testing</i> .....	12
1.5.4 <i>EAC Interpretations – RFI</i> .....	12
1.5.5 <i>EAC Notices of Clarification</i> .....	12
<b>2 PRE-CERTIFICATION TESTING AND ISSUES</b> .....	<b>12</b>
2.1 EVALUATION OF PRIOR VSTL TESTING.....	12
2.2 EVALUATION OF PRIOR NON-VSTL TESTING.....	13
2.3 KNOWN FIELD ISSUES .....	13
<b>3 MATERIALS REQUIRED FOR TESTING</b> .....	<b>13</b>
3.1 SOFTWARE/FIRMWARE.....	13
3.1.1 <i>Manufacturer Software/Firmware</i> .....	13
<i>COTS Software/Firmware</i> .....	14
3.2 EQUIPMENT .....	17
3.2.1 <i>Manufacturer Equipment</i> .....	17
3.2.2 <i>COTS Equipment</i> .....	18
3.2.3 <i>Additional Supporting Test Equipment</i> .....	18
3.3 TEST MATERIALS .....	18
3.4 DELIVERABLE MATERIALS.....	18
3.5 PROPRIETARY DATA .....	19
<b>4 TEST SPECIFICATIONS</b> .....	<b>19</b>
4.1 REQUIREMENTS.....	19
4.2 HARDWARE CONFIGURATION AND DESIGN .....	19
4.3 SOFTWARE SYSTEM FUNCTIONS .....	19
4.3.1 <i>OpenElect Voting Interface (OVI)</i> .....	20
4.3.2 <i>System-level Test Design</i> .....	20
4.4 TDP EVALUATION.....	20
4.4.1 <i>Document Review</i> .....	20
4.5 SOURCE CODE REVIEW .....	20
4.6 TRUSTED BUILD.....	21
4.7 STANDARD VSTL TEST METHODS AND UNCERTAINTY OF TEST DATA MEASUREMENT .....	22
<b>5 TEST DATA</b> .....	<b>22</b>
5.1 DATA RECORDING .....	22
5.2 TEST DATA CRITERIA.....	22
<b>TEST PROCEDURE AND CONDITIONS</b> .....	<b>23</b>
5.3 FACILITY REQUIREMENTS.....	23



5.4 TEST SETUP.....23  
5.5 TEST OPERATIONS PROCEDURES.....23  
**6 APPROVAL SIGNATURES.....24**



## 1 INTRODUCTION

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This Modification Test Plan outlines the test approach SLI Compliance will follow when performing system modification testing on the **Unisyn OVS 1.3.0.2.A** voting system against the 2005 Voluntary Voting System Guidelines (VVSG). The purpose of this document is to provide a clear understanding of the work SLI will conduct and a detailed plan outlining the test effort.

The **Unisyn OVS 1.3.0.2.A** voting system is a modification of the **OVS 1.3.0.2** voting system, that consists of an update to properly handle the “Pennsylvania Straight Party Method” when selecting a candidate from a different political party after a straight party ticket when the straight party selected nominates less than a full slate of candidates. When this scenario occurs, the straight party marked candidates are deselected. In **OVS 1.3.0.2**, the straight party selected candidates were not being deselected.

When the testing is complete, SLI will submit a Certification Test Report that details all test results and findings from the Certification Test effort, as well as a recommendation to the EAC.

### 1.1 Overview of the Unisyn Voting System

This system contains a description of the previously certified system, the specific modifications to the current system version, and the impact of those modifications on the system and certification testing.

#### 1.1.1 Definition of the Baseline Certified System

The OVS is a paper ballot precinct voting system that uses touch screen and scan technology to scan and validate ballots, provides voter assisted ballots for special needs voters, and tabulates precinct results.

The OVS consists of:

- **OpenElect® Central Suite (OCS)**
- **OpenElect® Voting Optical (OVO)**
- **OpenElect® Voting Interface (OVI-VC)**
- **OpenElect® Voting Central Scan (OVCS)**



## **Open Elect Central Suite (OCS)**

The OCS System supports elections on the OVO, OVI-VC and OVCS systems. It includes Ballot Layout Manager, Election Manager, Election Server, Tabulator Client, Tabulator Server, Adjudicator, and Tabulator Reports. In addition, the OCS includes the Software Server (SS) system for updating and validating the OVO and the OVI-VC (voting device) software.

## **OpenElect Voting Optical (OVO)**

The OVO is a full-page dual-sided optical scan precinct scanner that scans and validates voter ballot pages and provides a summary of all ballot pages cast. The OVO consists of the following components:

- **Personal Computer (PC)** - The PC utilizes a Mini-ITX form factor motherboard and is configured with either a VIA C7 motherboard or an Intel Atom. Computer component (with a touch panel display) has Unisyn pre-installed server software (that manages data and communication) and Unisyn pre-installed client software that provides a user interface for voting and maintenance.  
A new election loaded via the Election Server or manually via a Transport Media (TM) sets passwords, parameters, and ballot styles for that election. (Valid ballots for a poll location are reinitialized or set on Election Day startup by scanning a ballot header card).
- **Transport Media (TM)** – 1 GB or larger USB thumb drive that provides the means of transporting audit, optional ballot page images and vote files from the precinct on Election Night to Election Headquarters where the central count system resides.
- **Ballot Reader** - Dual-sided scanner connected to the PC to scan data from marked ballot pages. The Ballot Reader ejects accepted ballot pages into an attached ballot box or rejects unaccepted ballot pages back out to the voter.
- **Printer** - 58 mm thermal receipt printer connected to the PC to print receipts and reports at the OVO.
- **UPS** - Uninterruptible power supply is provided as part of the system.

## **OpenElect Voting Interface (OVI-VC)**

The OVI-VC is a ballot marking device (BMD) that supports both ADA and Regional Early Voting requirements. The OVI-VC has a 15-inch display and consists of the following components:

- **Personal Computer (PC)** - The PC utilizes a Mini-ITX form factor motherboard and is configured with either a VIA C7 motherboard or an Intel



Atom. Computer component (with a touch panel display) has Unisyn pre-installed software that provides user interfaces for voting and maintenance. A new election loaded via the Election Server or manually via a Transport Media (TM) sets passwords, parameters, audio, and ballot styles for that election.

- **Transport Media (TM)** - USB device with 1 GB or larger storage provides the means of transporting audit files to the OCS system.
- **Printer** – 82.5 mm thermal printer is connected to the PC to print OVI Ballots and reports at the OVI.
- **UPS** - Uninterruptible power supply is provided as part of the system.

### **OpenElect Voting Central Scan (OVCS)**

The OVCS units reside at election headquarters and are designated to read absentee, provisional or recount ballots in large jurisdictions or read the entire election's ballots at a central count location in smaller jurisdictions. The OVCS also captures Write-In data images and produces a Write-In image report for manual processing upon request. The OVCS system consists of the following components:

- **PC Desktop** – A desktop PC configuration with the following minimum characteristics:
  - PC: 1.8 GHz Processor, 2 GB RAM, 250GB (or larger) Hard Drive, USB Ports, Network Interface Port (Ethernet), CDRW/DVD, Video Port
  - 16:9 LCD
  - Keyboard and Mouse
- **Bulk Scanner** – A dual-sided scanner that is connected to the PC to scan data from marked ballots.

## **1.2 References**

The following key documents were used in preparing this test plan.

1. Election Assistance Commission Voluntary Voting System Guidelines (EAC VVSG), 2005 Version 1.0 Volumes I and II.
2. NIST Handbook 150: 2016.
3. NIST Handbook 150-22: 2008.
4. EAC Voting System Testing and Certification Program Manual, United States Election Assistance Commission, v 2.0, May 2015
5. SLI VSTL Quality System Manual, Rev. 2.4, prepared by SLI, dated October 20<sup>th</sup>, 2017.



## 1.3 Terms and Abbreviations

The following terms and abbreviations will be used throughout this document:

**Table 1 – Terms and Abbreviations**

Term	Abbreviation	Description
American Association for Laboratory Accreditation	A2LA	A nonprofit, non-governmental, public service, membership society whose mission is to provide comprehensive services in laboratory accreditation and laboratory-related training.
Ballot Marking Device	BMD	An accessible computer-based voting system that produces a marked ballot (usually paper) that is the result of voter interaction with visual or audio prompts.
Central Count Scanner	CCS	High Speed Optical Scanner is a mark sense-based ballot and vote counting device typically located at a central count facility and is operated by an automated multi-sheet feeding capability.
Compact Flash card	CF	This is a type of flash memory card in a standardized enclosure often used in voting systems to store ballot and/or vote results data.
Commercial Off the Shelf	COTS	Term used to designate computer software, hardware or accessories that are ready-made and available for sale, lease, or license to the general public
Direct Recording Electronic	DRE	Voting systems that, using Touch Screen or other user interfaces, directly record the voter's selections in each race or contest on the ballot in electronic form.
Election Assistance Commission	EAC	An independent, bipartisan commission created by the Help America Vote Act (HAVA) of 2002 that operates the federal government's voting system certification program.
Election Management System	EMS	Typically a database management system used to enter jurisdiction information (district, precincts, languages, etc.) as well as election specific information (races, candidates, voter groups (parties), etc.). In addition, the EMS is also used to layout the ballots, download the election data to the voting devices, upload the results and produce the final results reports.
Electromagnetic Compatibility	EMC	The goal of EMC is to validate the correct functioning of different equipment in the same environment and the avoidance of any interference effects between them.



Term	Abbreviation	Description
Functional Configuration Audit	FCA	The testing activities associated with the functional testing of the system.
Institute of Electrical and Electronics Engineers	IEEE	A non-profit professional association for the advancement of technology.
National Institute of Standards and Technology	NIST	A non-regulatory federal agency within the U.S. Dept. of Commerce. Its mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.
National Voluntary Laboratory Accreditation Program	NVLAP	A division of NIST that provides third-party accreditation to testing and calibration laboratories.
Physical Configuration Audit	PCA	The testing activities associated with the physical aspects of the system (hardware, documentation, builds, source code, etc.).
Precinct Count Scanner	PCS	A precinct-count optical scanner is a mark sense-based ballot and vote counting device located at a precinct and is typically operated by scanning one ballot at a time.
Request For Information	RFI	A means used by testing laboratories and manufacturers to request that the EAC provide an interpretation of a technical issue related to testing of voting systems.
Requirements Matrix	N/A	A matrix that traces the VVSG requirements to the various test modules and test methods.
Technical Data Package	TDP	The data package supplied by the vendor, which includes Functional Requirements, Specifications, End-user documentation, Procedures, System Overview, Configuration Management Plan, Quality Assurance Program, and manuals for each of the required hardware, software, firmware components of a voting system.
Voluntary Voting System Guidelines	VVSG	A set of specifications and requirements against which voting systems can be tested to determine if the systems provide all of the basic functionality, accessibility and security capabilities required for EAC certification.
Voter Verifiable Paper Audit Trail	VVPAT	An independent verification system for voting machines designed to allow voters to verify that their vote was cast correctly, to detect possible election fraud or malfunction, and to provide a means to audit the stored electronic results.



Term	Abbreviation	Description
Voting System Test Lab	VSTL	An independent testing organization accredited by NVLAP and the EAC to conduct voting system testing for EAC certification.
Voting System Under Test	VSUT	The designation for a voting system that is currently being tested.
Voting Test Specialist	VTS	An SLI employee within the Compliance division who has been qualified to perform EAC voting system certification testing.

## 1.4 Testing Responsibilities

The following project schedule contains owner assignments and identifies test procedure (module) development, test case (suite) development, 3<sup>rd</sup> party tests, and EAC and Manufacturer dependencies.

### 1.4.1 Project Schedule

The subsections below describe the project schedule.

#### 1.4.1.1 Owner Assignments

- System Analysis and Review will be conducted by Source Code Review, Security and Voting Test Specialists, with oversight by the Test Manager
- Source code review will be conducted by Source Code Review Specialists, with oversight by the Test Manager
- Test Suite Development will be conducted by Voting Test Specialists, utilizing SLI's formal Test Methods, with oversight by the Test Manager
- Formal Test Execution will be conducted by Voting Test Specialists, with oversight by the Test Manager

#### 1.4.1.2 Test Suite Development

Test Suites will be developed to help group and focus testing around key areas of the modification being implemented. The Test Suites will contain multiple test modules providing clear and traceable test scripts and information.

#### 1.4.1.3 Formal Test Execution

Formal execution of the approved Test Suites and modules will be conducted to verify the system's compliance with the VVSG requirements.

#### 1.4.1.4 EAC & Manufacturer Dependencies

The Test Plan will require EAC approval prior to finalization.



**Unisyn** will be required to provide all source code, documentation, equipment and supporting materials identified as part of the voting system.

The source code must have all discrepancies resolved, be able to be built successfully, installed, as well as successfully complete operational status checks prior to Formal Test Execution.

In addition, **Unisyn** is required to provide training on the voting system and support, as needed, throughout the life of the project.

## 1.5 Scope of Testing

The test engagement described in this Certification Test Plan utilizes only standard VSTL test methods that conform to the EAC Testing and Certification Program Manual and the identified voting system standard.

### 1.5.1 Modifications

An issue was found with the **OVI-VC** in the way straight party voting was handled when there are fewer choices for a given straight party selection than the number of choices allowed in a contest.

For example, in a “vote for 4” contest, if a given selected party only has 3 (or fewer) choices, and the voter then selects another candidate from a party other than their straight-party selection, the choices for the straight party selected remain selected, where they should have been de-selected, according to the “Pennsylvania Straight Party Method”.

The change was incorporated to fix the handling of under voted contests on the touchscreen (OVI) interface when the contest is populated by a straight ticket selection. When the voter selects a choice on the contest, all choices populated by the straight ticket option should be deselected, and only the selected candidate is marked, even when the contest is under voted and the selected candidate was previously unselected.

A fix for this issue is implemented in the release under review, and will be verified.

### 1.5.2 Initial Assessment of Impact of the Modifications

An initial assessment of the impact of this modification on the system and past certification indicates that this is an isolated fix to the OVI. The modification deals with how the OVI handles the Pennsylvania Straight Party Method when a pertinent contest has fewer than the allowable number of choices for a selected party, and how the contest is handled when a choice from another party is selected.



### 1.5.3 Regression Testing

This section describes what system elements will be regression tested to establish assurance that the modifications have no adverse impact on the compliance, integrity or performance of the system.

The OVI will be tested to verify the fix put in place for the Pennsylvania Straight Party Method, that the correct choices will be verified for the screen presentation and the voter's printed ballot, as well as for all variations of Straight Party, as declared in Unisyn's documentation.

An additional non-Pennsylvania General election will be run, in order to verify that the system continues to correctly process non- Pennsylvania straight party method contests.

### 1.5.4 EAC Interpretations – RFI

This Certification Test Plan and the execution of tests for the voting system identified in this plan do not include any additional EAC Requests For Information.

### 1.5.5 EAC Notices of Clarification

Additional EAC clarifications that affect the test plan and test methodology are as follows:

- Conduct Directive Att C - Pennsylvania Method

## 2 PRE-CERTIFICATION TESTING AND ISSUES

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### 2.1 Evaluation of prior VSTL testing

SLI evaluated the published Final Test Report for the **OVS 1.3.0.2** voting system in order to baseline the current system under test.

VSTL testing performed for the State of Pennsylvania found an issue in how straight party voting was handled when there were fewer choices for a given straight party selection than the number of choices allowed in a contest. For example, in a “vote for 4” contest, if a given selected party only has 3 (or fewer) choices, and the voter then selects another candidate from a party other than their straight-party selection, the choices for the straight party selected remain selected, where they should have been de-selected, according to the “Pennsylvania Straight Party Method”.

This issue is corrected in this release under review, and will be verified.



## 2.2 Evaluation of prior Non-VSTL testing

No prior non-VSTL testing of the OVS 1.3.0.2 modification was considered for this test campaign.

## 2.3 Known Field Issues

**OVS 1.3.0.2.A** is a modification to a previously certified system and has not been fielded. The system version **OVS 1.3.0.2** has not been fielded either, and there are no known field issues reported at the time of this test plan creation, other than the issue described in “Evaluation of prior VSTL testing”, above.

## 3 MATERIALS REQUIRED FOR TESTING

Any materials that are used in an election cycle must be provided to SLI to facilitate testing of the voting system. This section outlines these required materials.

### 3.1 Software/Firmware

All software and firmware that is to be used by the declared voting system, whether directly or indirectly, in a production environment, must be validated during the certification process.

The following software/firmware is required for the execution of hardware, software, telecommunications, and security tests. This includes all supporting software such as operating systems, compilers, assemblers, application software, firmware, any applications used for burning of media, transmission of data or creation/management of databases.

#### 3.1.1 Manufacturer Software/Firmware

**Table 2 – Unisyn OVS 1.3.0.2.A Software/Firmware**

Firmware/Software	Version
Adjudicator	1.3.0
Ballot Layout Manager	1.3.0
Common (Library)	1.3.0
Election Manager	1.3.0.2
Election Server	1.3.0
OCS Installer	1.3.0
Regkey Builder	1.3.0



Firmware/Software	Version
Software Server	1.3.0
Tabulator	1.3.0
Tabulator Client	1.3.0
Tabulator Reports	1.3.0
OVCS Application	1.3.0
OVI Firmware	1.3.0.2.A
OVO Firmware	1.3.0
Scripter	1.3.0
Validator	1.3.0
Logger (Library)	1.3.0

## COTS Software/Firmware

**Table 3. Baseline (OVS 1.3) OCS and OVCS COTS Software Components**

Software	Version	Filename	Hash Value (MD5)
Java SE Development Kit	Development Kit 6 Update 2 for Linux j	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
Apache Tomcat	6.0.13	apache-tomcat-6.0.13.tar.gz	50442a96332f0ec0cc1fba354f733ad6
PDI Scanner Driver and Libraries for OVCS	2.1.4	PS3_Canon_libraries_2014J an06A.zip	6b28a3c6dccab539261ca96bd94dd1e5

**Table 4. Baseline (OVS 1.3) COTS Operating System Software Components**

Software	Version	Filename	Hash Value (MD5)
Linux CentOS Distribution for OVS 1.3 (used for the OVO/OVI with old motherboard)	5.0	CentOS-5.0-i386-bin-1of6.iso CentOS-5.0-i386-bin-2of6.iso CentOS-5.0-i386-bin-3of6.iso CentOS-5.0-i386-bin-4of6.iso CentOS-5.0-i386-bin-5of6.iso CentOS-5.0-i386-bin-6of6.iso	f749d7e17fa01604b9956304efba2333; 963258ceafda5c5e6f79be86028b6b3d; a08ec9ccfdc89c24f3d6567219f90c42; b31c239009b780d1c89c311c192e43be ;



Software	Version	Filename	Hash Value (MD5)
			0c3990be2271bf44c1495a a0003b5552; 9e6f91a5292f46b0277713 3765fc03fe
Linux CentOS Distribution (used for the OCS and OVCS)	5.7	CentOS-5.2-i386-bin-DVD.iso	c89db7f5294465d593e7b 02c232e0e90 70111487
Linux CentOS Distribution (used for the OVO/OVI with new motherboard)	6.3	CentOS-6.3-i386-bin-DVD1.iso	0285160d8ba3cfc720ea55 e98e464eac
Linux CentOS Distribution used for OCS and OVCS	6.5	CentOS-6.5- i386-binDVD1.iso	c98e8040b9ac107153fc17 57b4874198

**Table 5. Baseline (OVS 1.3) OVO Third-Party Software (COTS) Components**

Software	Version	Filename	Hash Value (MD5)
<b>Common Files</b>			
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161 da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73 a5ed204bca01e7a
Apache Tomcat	6.0.13	apache-tomcat-6.0.13.tar.gz	50442a96332f0ec0cc 1fba354f733ad6
PDI Scanner Driver and Libraries for OVO	6.3.32	PS3_Canon_libraries_201 4Aug12A.zip	6b28a3c6dccab5392 61ca96bd94dd1e5
Citizen Printer for OVO	1.11.2.7	CSA_JPOS11127_set upEN .bin	d150d08693bf7dbe7 58adfdab94f655d
OpenCSV	2.3	opencsv-2.3-src-withlibs.tar.gz	d3423d8e3b0ae5c89 9cee32baa17a36f
<b>Jetway J7F2</b>			
openChrome Video Driver	0.2.900-7.e15	xf86-video-openchrome-0.2.900.tar.gz	3e36895eb4b4d61e2 1aa27d370f151c8
eGalax Touchscreen	3.00.3719	eGalaxTouch-	51c835408093ccfc40



Driver		3.00.3719- 32b-k26.tar.gz	55a9eab9537998
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	a2fd2c07061303883d6bf89eb2b259ff
<b>Jetway 2550</b>			
Xenarc Touchscreen Driver	2.5.2107	eGTouch_v2.5.2107.Lx.tar.gz	cfb148b3997257ed0e4a8eb3fa6b3932
Linux Kernel	3.4.13	linux-3.4.13.tar.bz2	9c850d00c898ba792f29eb6a5973961c
Bash	4.1.2-15.el6	bash-4.1.2-15.el6_5.2.i686.rpm	3f85b5595b60f655f646aee702398a93
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
Apache Tomcat	6.0.13	apache-tomcat-6.0.13.tar.gz	50442a96332f0ec0cc1fba354f733ad6
PDI Scanner Driver and Libraries for OVO	6.3.32	PS3_Canon_libraries_2014Jan06A.zip	6b28a3c6dccab539261ca96bd94dd1e5
Citizen Printer for OVO	1.11.2.7	CSA_JPOS11127_setupEN .bin	d150d08693bf7dbe758adfdab94f655d
OpenCSV	2.3	opencsv-2.3-src-withlibs.tar.gz	d3423d8e3b0ae5c899cee32baa17a36f

**Table 6. Baseline (OVS 1.3) OVO Third-Party Software (COTS) Components**  
(continued)

Software	Version	Filename	Hash Value (MD5)
<b>Jetway J7F2</b>			
openChrome Video Driver	0.2.900-7.el5	xf86-video-openchrome-0.2.900.tar.gz	3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	3.00.3719	eGalaxTouch-3.00.3719- 32b-k26.tar.gz	51c835408093ccfc4055a9eab9537998
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	a2fd2c07061303883d6bf89eb2b259ff
<b>Jetway 2550</b>			
Xenarc Touchscreen Driver	2.5.2107	eGTouch_v2.5.2107.Lx.tar.gz	cfb148b3997257ed0e4a8eb3fa6b3932
Linux Kernel	3.4.13	linux-3.4.13.tar.bz2	9c850d00c898ba792f29eb6a5973961c
Bash	4.1.2-15.el6	bash-4.1.2-15.el6_5.2.i686.rpm	3f85b5595b60f655f646aee702398a93

**Table 7. Baseline (OVS 1.3) OVI-VC Third-Party Software (COTS) Components**

Software	Version	Filename	Hash Value (MD5)
<b>Common Files</b>			
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
RXTX - Library and Jar	2.1-7r2	rxtx-2.1-7-bins-r2.zip	5f21ae633602a24fd3cdd096951476c2
<b>Jetway J7F2</b>			
openChrome Video Driver	0.2.900-7.e15	xf86-video-openchrome-0.2.900.tar.gz	3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	3.00.3719	eGalaxTouch-3.00.3719- 32b-k26.tar.gz	51c835408093ccfc4055a9eab9537998
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	a2fd2c07061303883d6bf89eb2b259ff
<b>Jetway 2550</b>			
Xenarc Touchscreen Driver	2.5.2107	eGTouch_v2.5.2107.Lx.tar.gz	cfb148b3997257ed0e4a8eb3fa6b3932
Linux Kernel	3.4.13	linux-3.4.13.tar.bz2	9c850d00c898ba792f29eb6a5973961c

## 3.2 Equipment

The following equipment is required for the execution of the hardware, software, telecommunications, and security tests. This includes system hardware, general purpose data processing and communications equipment, and any test instrumentation required.

### 3.2.1 Manufacturer Equipment

The following manufacturer equipment will be used in testing:

- 1 **OVO** precinct level optical scanner
- 2 **OVI-VC** ballot marking devices
- 1 **OVCS** central scan system

### 3.2.2 COTS Equipment

The following Commercial Off-the-Shelf equipment will be used in testing:

- 1 EMS laptop
- 2 Transport Media thumb drives

### 3.2.3 Additional Supporting Test Equipment

No additional support equipment will be used in testing.

## 3.3 Test Materials

The following test materials are required for the performance of testing including, as applicable, test ballot layout and generation materials, test ballot sheets, test ballot cards and control cards, standard and optional output data report formats, and any other materials used in testing.

- Ballots
- Transport Media
- Ballot marking pens
- Printer paper rolls

## 3.4 Deliverable Materials

The following are documents to be delivered as a part of the **Unisyn OVS 1.3.0.2.A** system. Note that the first two items are specific to this release.

- OpenElect Voting Systems Release 1.3.0.2.A System Operations Procedures: Election Day Poll Worker's Guide OVO and OVI Document Number: 04-00463, Version 1.0
- OpenElect Voting System Release 1.3.0.2.A System Overview Document Number: 04-00446, Version 1.0
- Ballot Layout Manager User Guide04-00428, Release 1.3, Version 1.0
- Election Manager User Guide04-00427, Release 1.3.0.2, Version 1.0
- Election Server User Guide04-00429, Release 1.3, Version 1.0
- Software Server User Guide04-00430, Release 1.3, Version 1.0
- Tabulator Client User Guide04-00431, Release 1.3, Version 1.0
- Tabulator User Guide04-00432, Release 1.3, Version 1.1
- Adjudicator User Guide04-00530, Release 1.3, Version 1.0
- Tabulator Reports User Guide04-00433, Release 1.3, Version 1.0
- OVCS User Guide04-00495, Release 1.3, Version 1.2
- System Operations Guide, Warehouse Technicians Guide04-00460, Release 1.3, Version 1.4



- Election Day Troubleshooter's Guide04-00462, Release 1.3, Version 1.0
- Personnel Training and Deployment Requirements04-00445, Release 1.3, Version 1.0
- System Maintenance Procedures04-00459, Release 1.3, Version 1.0
- OVS Acronyms04-00494, Release 1.3, Version 1.0
- OVS Paper Specification04-00503, Release 1.3, Version 1.0

### 3.5 Proprietary Data

No proprietary data is used in this certification project.

## 4 TEST SPECIFICATIONS

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The following are the specifications for testing to be conducted on the **Unisyn OVS 1.3.0.2.A** system. The specifications contain details on the focus of testing, configuration(s), and the functions to be tested

### 4.1 Requirements

The **Unisyn OVS 1.3.0.2.A** will be tested to the pertinent 2005 VVSG requirement, "2.1.7.2 Voting Variations, Straight Party", as well as the EAC issued, "Conduct Directive Att C - Pennsylvania Method".

### 4.2 Hardware Configuration and Design

The **Unisyn OVS 1.3.0.2.A** as declared in the application for certification submitted to the EAC, consists of:

- An EMS workstation.
- At the precinct level, optical scanners (OVO) and ballot marking devices (OVI).
- The central count location employs a high speed COTS scanner OVCS for tabulation of absentee ballots.
- The consolidation, tally and reporting location employs a workstation as well as a printer.

### 4.3 Software System Functions

The **Unisyn OVS 1.3.0.2.A** system operations documentation was reviewed relative to the updates implemented in this modification. Based on this review, the applicable system functions have been identified for testing. The following key areas of voting system functionality were evaluated.



### 4.3.1 OpenElect Voting Interface (OVI)

The **OVI-VC** will be tested for proper implementation of the Pennsylvania Straight Party method, dealing with how choices are selected/deselected depending on how the voter manages their vote selection for different contests and candidates.

### 4.3.2 System-level Test Design

System level test suites will include the following:

- **General Election**

This is a General election that will include N of M voting, partisan offices, non-partisan offices, straight party voting, ballot formatting, precincts and districts, and precinct level voting on the OVI, OVO and OVCS as well as tally and reporting functionality.

## 4.4 TDP Evaluation

SLI has completed an assessment of the deliveries of the Technical Data Package pertinent to the **Unisyn OVS 1.3.0.2.A** voting system modifications.

### 4.4.1 Document Review

SLI will conduct a PCA review of all vendor traced documents submitted for review in the delivery of the **Unisyn OVS 1.3.0.2.A** TDP. These include:

- System configuration overview
- User/system operations procedures
- *System change notes – N/A (first time certification)*

## 4.5 Source Code Review

### 4.5.1.1 Source Code Review

The certification campaign for the **Unisyn OVS 1.3.0.2.A** voting system includes software and firmware that have been created as proprietary to **Unisyn** as well as review of any commercial off the shelf products. SLI will conduct a source code review of all modified proprietary source code and modified COTS products submitted in the voting system TDP for compliance to the VVSG, version 2005, Volume 2, Section 6.6. The coding languages involved in the vendor's applications include:

- Java



Source Code Review Tools utilized by SLI include

- Module Finder: an SLI proprietary application used to parse module names from C/C++ and VB code and populate the identified module names into the review documents
- ExamDiff Pro: a commercial application used to compare revised code to previously reviewed code

Any subsequent re-reviews of source code will be the result of fixes to discrepancies identified in the Functional Configuration Audit activities.

## 4.6 Trusted Build

The Trusted Build will be conducted prior to SLI's official testing and will be completed on site at SLI's facility or a secure lab at the vendor's facility approved by SLI. SLI will use its approved standard lab procedure that details the processes for controlling, managing, and conducting the Trusted Build. This process includes the following:

- Preparation for the Trusted Build – SLI will obtain and review **Unisyn's** procedure for constructing the build platform, verify the target build platform, and acquire and verify the necessary materials.
- Execution of the Trusted Build – SLI will perform the Trusted Build by using the step-by-step build procedure provided by **Unisyn** to create a pristine build environment. SLI records and ascertains the following items throughout the build process:
  - Build environment and file hashes at various key points
  - Build environment hardware characteristics
  - Build results from code compilation and file hashes
  - Final software install files and file hashes
  - Build virtual machine files
- Deliverables to Testing – Upon completion of the Trusted Build, certain items are sent to the SLI test group. The final result will be media containing the following:
  - Final software install files
  - Hash values to validate install files
- Final Record Keeping and Archiving Procedures – At the conclusion of the Trusted Build process, SLI completes all final record keeping and archiving procedures at SLI's facility. This record keeping includes any unique identifiers, results of the build with version numbers and dates, and descriptions of all hashes and images in the repository.



## 4.7 Standard VSTL Test Methods and Uncertainty of Test Data Measurement

This test campaign utilizes Standard VSTL test methods and nominal type test data only.

## 5 TEST DATA

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Test data for the **Unisyn OVS 1.3.0.2.A** voting system has been compiled such that all functionality declared will be tested to determine conformance to the standards.

### 5.1 Data Recording

SLI has evaluated the system functionality, as described by manufacturer technical documentation, as well as requirements as listed in the EAC 2005 VVSG, and made determinations as to expected results of all data inputs into the **Unisyn OVS 1.3.0.2.A** voting system. This includes:

- Election type
- Voting variations employed, specifically straight party, utilizing the Pennsylvania Straight Party Method
- Votes cast for each candidate, as relevant to the Pennsylvania Straight Party Method

The data is contained in one master data record, including each input and each expected output. This data is incorporated into the appropriate test suite, populating test modules with exact expected data for the function being tested.

Testing information is recorded in the test suites, as well as in test notebooks, which are utilized according to SLI's standard lab procedure *SLP-VC-30 - Test Notebooks*.

### 5.2 Test Data Criteria

SLI has evaluated the system functionality as implemented for the Pennsylvania Straight Party Method, and made determinations as to expected output of all data inputs into the **Unisyn OVS 1.3.0.2.A** voting system, particularly for the OVI ballot marking device. A data matrix has been recorded into one master data record that couples data inputs to their expected output, as determined above. The system's execution shall be measured against the expected results.



## TEST PROCEDURE AND CONDITIONS

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This section describes the test conditions and procedures for execution of tests. If a particular sequence is mandatory for the execution of suites, a rationale will be given. Additionally, this section is used to describe procedures for setting up equipment that will be utilized in the execution of the test suites.

### 5.3 Facility Requirements

Testing will be performed on site at SLI in Colorado.

All TDP and test documentation is stored on site at SLI's facility in a secure project directory on SLI's secure Voting server.

### 5.4 Test Setup

All delivered **OVS 1.3.0.2.A** equipment will be set up as detailed in Unisyn documentation.

Operational Status Checks will be performed prior to test execution. Successful completion of operational status checks will indicate that the system is ready for test execution.

### 5.5 Test Operations Procedures

An inventory has been performed to verify the voting equipment received contains hardware and software elements as defined in the TDP prior to commencement of testing.

Throughout the testing effort, test suites and modules will be marked as follows:

- **Accept** – Test is accepted as successful.
- **Reject** – Test is rejected as unsuccessful.
- **NT** – Not Testable is used for test modules that cannot be completed. For example, if failure of one test modules failure precludes attempting subsequent test modules, the latter will be marked as NT.

Test results **Reject** and **NT** will include comments by the VTS explaining the reason for the result.

Issues encountered during review and testing will be documented on the Discrepancy Report. Test findings showing that an aspect of the voting system does not conform to the requirements of the identified test standard will be marked as **Documentation Discrepancies** or **Functional Discrepancies**.

Issues that are encountered during testing or documentation review but are not addressed by the applicable standard will be added to the Discrepancy report and



noted as **Informational**. The vendor has the option whether to address Informational issues. All responses provided by the vendor are noted in the Discrepancy Report attachment to the Certification Test Report.

## 6 Approval Signatures

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SLI:

A handwritten signature in blue ink, appearing to read 'John G. ...', written over a light blue rectangular background.

VSTL Director  
January 3<sup>rd</sup>, 2018

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End of Certification Test Plan

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