	Test Report issued under the responsibility of: **NCB TÜV SÜD Product Service GmbH** **Ridlerstr. 65, 80339 Munich** **Germany**	

TEST REPORT

IEC 60950-1
Information technology equipment – Safety – Part 1: General requirements

Report Number. ..... :	PTI-1411085-000
Date of issue ..... :	2014/11/25
Total number of pages ..... :	49
Applicant's name ..... :	Hart InterCivic
Address ..... :	15500 Wells Port Drive Austin, TX 78728
Test specification:	
Standard ..... :	IEC 60950-1:2005 +A1:2009 +A2:2013; UL 60950-1/R:2014-10; CAN/CSA C22.2 No. 60950-1/A1:2011
Test procedure ..... :	CCA
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1F
Test Report Form(s) Originator .... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2014-02

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	Verity Voting devices, (Verity Scan, Verity Touch Writer, Verity Ballot Box, Verity Standard and Verity Accessible Booths)
Trade Mark ..... :	
Manufacturer ..... :	Hart InterCivic
Model/Type reference ..... :	3005350,3005352,3005357,3005358 and 3005359
Ratings ..... :	+24 V d.c.; 2.4 A (Verity input)

Testing procedure and testing location:			
☒	**Testing Laboratory:**	**Professional Testing Inc.**	
Testing location/ address.....:		1601 N. A. W. Grimes, Suite B, Round Rock, Texas, 78665, USA	
☐	**Associated Testing Laboratory:**		
Testing location/ address.....:			
Tested by (name + signature).....:		Deniz Kozdereli	
Approved by (name + signature).....:		Kent Delahay	
☐	**Testing procedure: Elsewhere:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Approved by (name + signature).....:			

List of Attachments (including a total number of pages in each attachment):

Attachment 1 – US National Deviation (6)
Attachment 2 – Canada National Deviation (5)
Attachment 3 – Photographs (6)
Attachment 4 – Verity Electronics Specification 4005461 (37)
Attachment 5 – Verity Operational Guide 6640001 (68)
Attachment 6 – Verity Polling Place Operations Technical Reference manual 6610-100 (101)
Attachment 7 – Verity Service and Maintenance Technical Reference Manual 6610-001 (183)

Summary of testing:

1.5.2 Evaluation and testing of components	Components were either separately approved devices or were tested as part of the unit.
1.6.2 Input current	The equipment is a Class III device which is powered by a separately approved external limited power source (LPS). The LPS shall provide a nominal output voltage of +24Vd.c. Equipment was tested with a fluctuation in the dc voltage.
1.7.2 Language	The instructions and product marking shall be in a language acceptable to the country in which the equipment is sold. The US English version was reviewed.
4.1 Stability	The mechanical stability tests were completed assuming normal usage. Verity Touch Writer was locked on to either the Standard Booth or the Accessible Booth and Verity Scan was locked on to the Ballot Box.
4.2.3;4.2.4 Steady force	The steady force tests were completed on the Verity Touch Writer, Verity Scan and the Verity tablet.
4.2.5 Impact	The impact test was completed on the Verity Touch Writer and Verity Scan.
4.2.6 Drop test	The units are not transportable by the operator/voter. The equipment is moved and set up by trained personnel.
4.3.8 Batteries	The tablet has a battery pack that has been previously and separately approved. Report Reference: MH29443-20130906/UL File MH29443) The battery is within the tablet and is operator accessible. The battery connector is keyed to avoid improper installation. The battery is not charged while installed in the tablets. They are charged in a separate device that is not included with this evaluation.
4.5 Thermal Requirements	The equipment is specified for operation in a maximum ambient temperature of 35°C.

Tests performed (name of test and test clause):	Testing location:
1.6.2 Input current 1.7.11 Marking durability 4.1 Mechanicals 4.3.2 Handles 4.5 Thermals 5.3 Abnormal operating conditions	Professional Testing (EMI) Inc. 1601 N. A.W. Grimes, Suite B Round Rock, Texas, 78665, USA

Summary of compliance with National Differences:

List of countries addressed

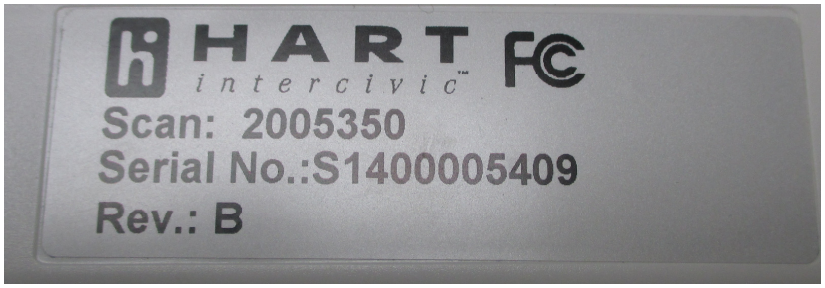
USA, Canada

☒ **The product fulfils the requirements of** IEC 60950-1:2005.

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective Certification Bodies that own these marks.

Trademark



Verity Scan Label

Verity Touch Writer Label

Verity Scan input ratings

Verity Touch Writer input ratings

Tablet Battery label

Test item particulars.....:	
Equipment mobility.....:	[X] movable [] hand-held [X] transportable [] stationary [] for building-in [] direct plug-in
Connection to the mains.....:	[] pluggable equipment [] type A [] type B [] permanent connection [] detachable power supply cord [] non-detachable power supply cord [X] not directly connected to the mains
Operating condition.....:	[X] continuous [] rated operating / resting time:
Access location .....:	[X] operator accessible [] restricted access location
Over voltage category (OVC) .....:	[] OVC I [] OVC II [] OVC III [] OVC IV [X] other:
Mains supply tolerance (%) or absolute mains supply values .....:	Equipment is not directly connected to the mains. Powered by external power supply. (output has +/- 5%)
Tested for IT power systems .....:	[] Yes [X] No
IT testing, phase-phase voltage (V) .....:	N/A
Class of equipment .....:	[] Class I [] Class II [X] Class III [] Not classified
Considered current rating of protective device as part of the building installation (A) .....:	N/A
Pollution degree (PD) .....:	[] PD 1 [X] PD 2 [] PD 3
IP protection class .....:	IPX0
Altitude during operation (m) .....:	<3200m
Altitude of test laboratory (m) .....:	225m
Mass of equipment (kg) .....:	Verity Scan 10.8kg; Verity Touch Writer 10.6kg; Ballot box 11kg; Tablet 2.6kg

Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2014/02/04; 2014/11/04
Date (s) of performance of tests.....:	2014/02/10 – 2014/02/14; 2014/11/04-2014/11/17

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... : TS3 Technology, Inc.
4855 Alpine Drive
Stafford, TX 77477

General product information:

The Verity is a voting system that includes voting devices and components that have features for scanning paper ballots, as well as an external device for voters with disabilities. The Verity voting devices that contain electrical components are the Verity Scan (3005350) and the Verity Touch Writer (3005352). If ballots have contents that are marked incorrectly, the Verity Scan will display instruction messages so that voters have an opportunity to correct mismarks before casting the ballot. Once ballots are cast through the ballot feed slot, they drop into the secure ballot box for storage. The Verity Touch Writer is a touch screen ballot marking device that prints voter's ballots to a commercial off the shelf printer. The Verity Access is an interface component with tactile buttons, audio ballot voting and compatibility with additional two-switch adaptive devices.

The Verity Scan and Touch Writer are powered with a separately approved external LPS (Limited power sources) that is provided with the unit. The LPS supplies +24V d.c. power to the Verity system. There is an internally mounted battery pack (separately approved) within the tablet that can be used for back-up power for up to 2 hours or when allowing access to voters with disabilities.

There are no primary circuits internal to the Verity Scan and Touch Writer devices. All internal components are powered by non-hazardous energy. Scan and Touch Writer contain the same basic PCB assembly with minor variations.

The Ballot Box, Standard and Accessible Booths, 3005357, 3005358 and 3005359 do not have electronics. They will be utilized when completing the mechanical testing of the devices.

Abbreviations used in the report:

- normal conditions	**N.C.**	- single fault conditions	**S.F.C**
- functional insulation	**OP**	- basic insulation	**BI**
- double insulation	**DI**	- supplementary insulation	**SI**
- between parts of opposite polarity	**BOP**	- reinforced insulation	**RI**

Indicate used abbreviations (if any)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	**GENERAL**		**P**
1.5	**Components**		**P**
1.5.1	General		**P**
	Comply with IEC 60950-1 or relevant component standard	(see appended tables 1.5.1)	**P**
1.5.2	Evaluation and testing of components	All components are used within their ratings and comply with the applicable parts of this standard and/or a relavent component standard.	**P**
1.5.3	Thermal controls	No thermal controls.	**N/A**
1.5.4	Transformers	No isolating transformers used in this equipment.	**N/A**
1.5.5	Interconnecting cables		**N/A**
1.5.6	Capacitors bridging insulation		**N/A**
1.5.7	Resistors bridging insulation		**N/A**
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		**N/A**
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		**N/A**
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		**N/A**
1.5.8	Components in equipment for IT power systems		**N/A**
1.5.9	Surge suppressors		**N/A**
1.5.9.1	General		**N/A**
1.5.9.2	Protection of VDRs		**N/A**
1.5.9.3	Bridging of functional insulation by a VDR		**N/A**
1.5.9.4	Bridging of basic insulation by a VDR		**N/A**
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		**N/A**
1.6	**Power interface**		**P**
1.6.1	AC power distribution systems	Class III device.	**N/A**
1.6.2	Input current	(see appended table 1.6.2)	**P**
1.6.3	Voltage limit of hand-held equipment		**N/A**
1.6.4	Neutral conductor		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7	**Marking and instructions**		**P**
1.7.1	Power rating and identification markings		**P**
1.7.1.1	Power rating marking		**P**
	Multiple mains supply connections.....:	No multiple mains supply connections.	**N/A**
	Rated voltage(s) or voltage range(s) (V) .....:	24 V d.c.	**P**
	Symbol for nature of supply, for d.c. only.....:		**P**
	Rated frequency or rated frequency range (Hz) ....:		**N/A**
	Rated current (mA or A) .....:	2.4 A.	**P**
1.7.1.2	Identification markings		**P**
	Manufacturer's name or trade-mark or identification mark .....:		**P**
	Model identification or type reference .....:	3005350,3005352,3005357,3005358 and 3005359.	**P**
	Symbol for Class II equipment only .....:	Not Class II equipment.	**N/A**
	Other markings and symbols .....:		**N/A**
1.7.1.3	Use of graphical symbols		**N/A**
1.7.2	Safety instructions and marking	Operating instructions are provided for the user.	**P**
1.7.2.1	General		**P**
1.7.2.2	Disconnect devices	The separately approved PS will be considered the disconnect device.	**P**
1.7.2.3	Overcurrent protective device		**N/A**
1.7.2.4	IT power distribution systems	No connection to IT power distribution systems.	**N/A**
1.7.2.5	Operator access with a tool		**N/A**
1.7.2.6	Ozone	Equipment does not produce ozone.	**N/A**
1.7.3	Short duty cycles		**N/A**
1.7.4	Supply voltage adjustment .....:		**N/A**
	Methods and means of adjustment; reference to installation instructions .....:		**N/A**
1.7.5	Power outlets on the equipment .....:	No power outlets.	**N/A**
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....:		**N/A**
1.7.7	Wiring terminals	No wiring terminals.	**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.7.1	Protective earthing and bonding terminals .... :		**N/A**
1.7.7.2	Terminals for a.c. mains supply conductors		**N/A**
1.7.7.3	Terminals for d.c. mains supply conductors		**N/A**
1.7.8	Controls and indicators		**N/A**
1.7.8.1	Identification, location and marking ..... :		**N/A**
1.7.8.2	Colours ..... :		**N/A**
1.7.8.3	Symbols according to IEC 60417 ..... :		**N/A**
1.7.8.4	Markings using figures ..... :		**N/A**
1.7.9	Isolation of multiple power sources ..... :		**N/A**
1.7.10	Thermostats and other regulating devices ..... :		**N/A**
1.7.11	Durability		**N/A**
1.7.12	Removable parts		**N/A**
1.7.13	Replaceable batteries ..... :	Lithium battery for real time clock (RTC) and battery pack are not located in operator access area. The replaceable battery found in the tablet is a separately approved device.	**N/A**
	Language(s) ..... :		—
1.7.14	Equipment for restricted access locations..... :	Equipment not intended for installation in RAL.	**N/A**

2	**PROTECTION FROM HAZARDS**		**P**
2.1	**Protection from electric shock and energy hazards**		**N/A**
2.1.1	Protection in operator access areas	No energy hazards; Class III equipment has SELV circuits only.	**N/A**
2.1.1.1	Access to energized parts		**N/A**
	Test by inspection ..... :		**N/A**
	Test with test finger (Figure 2A) ..... :		**N/A**
	Test with test pin (Figure 2B) ..... :		**N/A**
	Test with test probe (Figure 2C) ..... :		**N/A**
2.1.1.2	Battery compartments		**N/A**
2.1.1.3	Access to ELV wiring		**N/A**
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)		—
2.1.1.4	Access to hazardous voltage circuit wiring		**N/A**
2.1.1.5	Energy hazards ..... :		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.6	Manual controls		**N/A**
2.1.1.7	Discharge of capacitors in equipment		**N/A**
	Measured voltage (V); time-constant (s)..... :		**—**
2.1.1.8	Energy hazards – d.c. mains supply		**N/A**
	a) Capacitor connected to the d.c. mains supply .. :		**N/A**
	b) Internal battery connected to the d.c. mains supply :		**N/A**
2.1.1.9	Audio amplifiers ..... :		**N/A**
2.1.2	Protection in service access areas		**N/A**
2.1.3	Protection in restricted access locations		**N/A**
2.2	**SELV circuits**		**P**
2.2.1	General requirements	SELV limits are not exceeded in normal or single fault conditions.	**P**
2.2.2	Voltages under normal conditions (V) ..... :	Within SELV limits.	**P**
2.2.3	Voltages under fault conditions (V) ..... :	Within SELV limits.	**P**
2.2.4	Connection of SELV circuits to other circuits ..... :	SELV circuits are only connected to SELV circuits.	**P**
2.3	**TNV circuits**		**N/A**
2.3.1	Limits	No TNV circuits.	**N/A**
	Type of TNV circuits..... :		—
2.3.2	Separation from other circuits and from accessible parts		**N/A**
2.3.2.1	General requirements		**N/A**
2.3.2.2	Protection by basic insulation		**N/A**
2.3.2.3	Protection by earthing		**N/A**
2.3.2.4	Protection by other constructions ..... :		**N/A**
2.3.3	Separation from hazardous voltages		**N/A**
	Insulation employed..... :		—
2.3.4	Connection of TNV circuits to other circuits		**N/A**
	Insulation employed..... :		—
2.3.5	Test for operating voltages generated externally		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.4	**Limited current circuits**		**N/A**
2.4.1	General requirements	No limited current circuits.	**N/A**
2.4.2	Limit values		**N/A**
	Frequency (Hz) ..... :		—
	Measured current (mA) ..... :		—
	Measured voltage (V) ..... :		—
	Measured circuit capacitance (nF or µF) ..... :		—
2.4.3	Connection of limited current circuits to other circuits		**N/A**
2.5	**Limited power sources**		**N/A**
	a) Inherently limited output	No such outputs.	**N/A**
	b) Impedance limited output		**N/A**
	c) Regulating network or IC current limiter, limits output under normal operating and single fault condition		**N/A**
	Use of integrated circuit (IC) current limiters		**N/A**
	d) Overcurrent protective device limited output		**N/A**
	Max. output voltage (V), max. output current (A), max. apparent power (VA) ..... :		—
	Current rating of overcurrent protective device (A) .:		—
2.6	**Provisions for earthing and bonding**		**N/A**
2.6.1	Protective earthing	Class III device.	**N/A**
2.6.2	Functional earthing	Class III device.	**N/A**
	Use of symbol for functional earthing .....:		**N/A**
2.6.3	Protective earthing and protective bonding conductors		**N/A**
2.6.3.1	General		**N/A**
2.6.3.2	Size of protective earthing conductors		**N/A**
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
2.6.3.3	Size of protective bonding conductors		**N/A**
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
	Protective current rating (A), cross-sectional area (mm^2), AWG..... :		—

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)..... :		**N/A**
2.6.3.5	Colour of insulation ..... :		**N/A**
2.6.4	Terminals		**N/A**
2.6.4.1	General	Class III device.	**N/A**
2.6.4.2	Protective earthing and bonding terminals		**N/A**
	Rated current (A), type, nominal thread diameter (mm)..... :		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		**N/A**
2.6.5	Integrity of protective earthing		**N/A**
2.6.5.1	Interconnection of equipment		**N/A**
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		**N/A**
2.6.5.3	Disconnection of protective earth		**N/A**
2.6.5.4	Parts that can be removed by an operator		**N/A**
2.6.5.5	Parts removed during servicing		**N/A**
2.6.5.6	Corrosion resistance		**N/A**
2.6.5.7	Screws for protective bonding		**N/A**
2.6.5.8	Reliance on telecommunication network or cable distribution system		**N/A**
2.7	**Overcurrent and earth fault protection in primary circuits**		**N/A**
2.7.1	Basic requirements	No primary circuits.	**N/A**
	Instructions when protection relies on building installation		**N/A**
2.7.2	Faults not simulated in 5.3.7		**N/A**
2.7.3	Short-circuit backup protection		**N/A**
2.7.4	Number and location of protective devices ..... :		**N/A**
2.7.5	Protection by several devices		**N/A**
2.7.6	Warning to service personnel ..... :		**N/A**
2.8	**Safety interlocks**		**N/A**
2.8.1	General principles	No safety interlocks.	**N/A**
2.8.2	Protection requirements		**N/A**
2.8.3	Inadvertent reactivation		**N/A**
2.8.4	Fail-safe operation		**N/A**
	Protection against extreme hazard		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.8.5	Moving parts		**N/A**
2.8.6	Overriding		**N/A**
2.8.7	Switches, relays and their related circuits		**N/A**
2.8.7.1	Separation distances for contact gaps and their related circuits (mm) .....:		**N/A**
2.8.7.2	Overload test		**N/A**
2.8.7.3	Endurance test		**N/A**
2.8.7.4	Electric strength test		**N/A**
2.8.8	Mechanical actuators		**N/A**
2.9	**Electrical insulation**		**P**
2.9.1	Properties of insulating materials	No rubber, asbestos, or hygroscopic materials used.	**P**
2.9.2	Humidity conditioning		**N/A**
	Relative humidity (%), temperature (℃) ..... :		—
2.9.3	Grade of insulation	Functional insulation only.	**P**
2.9.4	Separation from hazardous voltages	Class III device.	**N/A**
	Method(s) used ..... :		—
2.10	**Clearances, creepage distances and distances through insulation**		**N/A**
2.10.1	General	Class III device.	**N/A**
2.10.1.1	Frequency ..... :		**N/A**
2.10.1.2	Pollution degrees ..... :		**N/A**
2.10.1.3	Reduced values for functional insulation		**N/A**
2.10.1.4	Intervening unconnected conductive parts		**N/A**
2.10.1.5	Insulation with varying dimensions		**N/A**
2.10.1.6	Special separation requirements		**N/A**
2.10.1.7	Insulation in circuits generating starting pulses		**N/A**
2.10.2	Determination of working voltage		**N/A**
2.10.2.1	General		**N/A**
2.10.2.2	RMS working voltage		**N/A**
2.10.2.3	Peak working voltage		**N/A**
2.10.3	Clearances	Class III device.	**N/A**
2.10.3.1	General		**N/A**
2.10.3.2	Mains transient voltages		**N/A**
	a) AC mains supply ..... :		**N/A**
	b) Earthed d.c. mains supplies ..... :		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	c) Unearthed d.c. mains supplies ..... :		**N/A**
	d) Battery operation ..... :		**N/A**
2.10.3.3	Clearances in primary circuits		**N/A**
2.10.3.4	Clearances in secondary circuits		**N/A**
2.10.3.5	Clearances in circuits having starting pulses		**N/A**
2.10.3.6	Transients from a.c. mains supply ..... :		**N/A**
2.10.3.7	Transients from d.c. mains supply ..... :		**N/A**
2.10.3.8	Transients from telecommunication networks and cable distribution systems ..... :		**N/A**
2.10.3.9	Measurement of transient voltage levels		**N/A**
	a) Transients from a mains supply		**N/A**
	For an a.c. mains supply ..... :		**N/A**
	For a d.c. mains supply ..... :		**N/A**
	b) Transients from a telecommunication network :		**N/A**
2.10.4	Creepage distances	Class III device.	**N/A**
2.10.4.1	General		**N/A**
2.10.4.2	Material group and comparative tracking index		**N/A**
	CTI tests..... :		—
2.10.4.3	Minimum creepage distances		**N/A**
2.10.5	Solid insulation	Class III device.	**N/A**
2.10.5.1	General		**N/A**
2.10.5.2	Distances through insulation		**N/A**
2.10.5.3	Insulating compound as solid insulation		**N/A**
2.10.5.4	Semiconductor devices		**N/A**
2.10.5.5.	Cemented joints		**N/A**
2.10.5.6	Thin sheet material – General		**N/A**
2.10.5.7	Separable thin sheet material		**N/A**
	Number of layers (pcs) ..... :		—
2.10.5.8	Non-separable thin sheet material		**N/A**
2.10.5.9	Thin sheet material – standard test procedure		**N/A**
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure		**N/A**
	Electric strength test		—
2.10.5.11	Insulation in wound components		**N/A**
2.10.5.12	Wire in wound components		**N/A**
	Working voltage ..... :		**N/A**
	a) Basic insulation not under stress ..... :		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	b) Basic, supplementary, reinforced insulation ..... :		**N/A**
	c) Compliance with Annex U ..... :		**N/A**
	Two wires in contact inside wound component; angle between 45° and 90° ..... :		**N/A**
2.10.5.13	Wire with solvent-based enamel in wound components		**N/A**
	Electric strength test		—
	Routine test		**N/A**
2.10.5.14	Additional insulation in wound components		**N/A**
	Working voltage ..... :		**N/A**
	- Basic insulation not under stress ..... :		**N/A**
	- Supplementary, reinforced insulation ..... :		**N/A**
2.10.6	Construction of printed boards	Class III device.	**N/A**
2.10.6.1	Uncoated printed boards		**N/A**
2.10.6.2	Coated printed boards		**N/A**
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		**N/A**
2.10.6.4	Insulation between conductors on different layers of a printed board		**N/A**
	Distance through insulation		**N/A**
	Number of insulation layers (pcs) ..... :		**N/A**
2.10.7	Component external terminations	No external terminations.	**N/A**
2.10.8	Tests on coated printed boards and coated components		**N/A**
2.10.8.1	Sample preparation and preliminary inspection		**N/A**
2.10.8.2	Thermal conditioning		**N/A**
2.10.8.3	Electric strength test		**N/A**
2.10.8.4	Abrasion resistance test		**N/A**
2.10.9	Thermal cycling		**N/A**
2.10.10	Test for Pollution Degree 1 environment and insulating compound		**N/A**
2.10.11	Tests for semiconductor devices and cemented joints		**N/A**
2.10.12	Enclosed and sealed parts		**N/A**

3	**WIRING, CONNECTIONS AND SUPPLY**		**P**
3.1	**General**		**P**
3.1.1	Current rating and overcurrent protection		**P**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.1.2	Protection against mechanical damage	Wireways are smooth and free from sharp edges.	**P**
3.1.3	Securing of internal wiring		**P**
3.1.4	Insulation of conductors		**P**
3.1.5	Beads and ceramic insulators		**N/A**
3.1.6	Screws for electrical contact pressure		**N/A**
3.1.7	Insulating materials in electrical connections		**N/A**
3.1.8	Self-tapping and spaced thread screws		**N/A**
3.1.9	Termination of conductors		**N/A**
	10 N pull test		**N/A**
3.1.10	Sleeving on wiring		**N/A**
3.2	**Connection to a mains supply**		**N/A**
3.2.1	Means of connection	Connected to separately approved power adaptor.	**N/A**
3.2.1.1	Connection to an a.c. mains supply		**N/A**
3.2.1.2	Connection to a d.c. mains supply		**N/A**
3.2.2	Multiple supply connections	Equipment does not have multiple supply connections.	**N/A**
3.2.3	Permanently connected equipment	Equipment is not permanently connected.	**N/A**
	Number of conductors, diameter of cable and conduits (mm) ..... :		—
3.2.4	Appliance inlets		**N/A**
3.2.5	Power supply cords	Refer below.	**N/A**
3.2.5.1	AC power supply cords	Power supply cord is part of a separately approved device.	**N/A**
	Type ..... :		—
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
3.2.5.2	DC power supply cords	Power supply cord is part of a separately approved device.	**N/A**
3.2.6	Cord anchorages and strain relief		**N/A**
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage		**N/A**
3.2.8	Cord guards		**N/A**
	Diameter or minor dimension D (mm); test mass (g) ..... :		—

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Radius of curvature of cord (mm) ..... :		—
3.2.9	Supply wiring space		**N/A**
3.3	**Wiring terminals for connection of external conductors**		**N/A**
3.3.1	Wiring terminals	No wiring terminals in device.	**N/A**
3.3.2	Connection of non-detachable power supply cords		**N/A**
3.3.3	Screw terminals		**N/A**
3.3.4	Conductor sizes to be connected		**N/A**
	Rated current (A), cord/cable type, cross-sectional area (mm^2) ..... :		—
3.3.5	Wiring terminal sizes		**N/A**
	Rated current (A), type, nominal thread diameter (mm) ..... :		—
3.3.6	Wiring terminal design		**N/A**
3.3.7	Grouping of wiring terminals		**N/A**
3.3.8	Stranded wire		**N/A**
3.4	**Disconnection from the mains supply**		**N/A**
3.4.1	General requirement		**N/A**
3.4.2	Disconnect devices		**N/A**
3.4.3	Permanently connected equipment		**N/A**
3.4.4	Parts which remain energized		**N/A**
3.4.5	Switches in flexible cords		**N/A**
3.4.6	Number of poles - single-phase and d.c. equipment		**N/A**
3.4.7	Number of poles - three-phase equipment		**N/A**
3.4.8	Switches as disconnect devices		**N/A**
3.4.9	Plugs as disconnect devices		**N/A**
3.4.10	Interconnected equipment		**N/A**
3.4.11	Multiple power sources		**N/A**
3.5	**Interconnection of equipment**		**N/A**
3.5.1	General requirements		**N/A**
3.5.2	Types of interconnection circuits ..... :		**N/A**
3.5.3	ELV circuits as interconnection circuits		**N/A**
3.5.4	Data ports for additional equipment		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	**PHYSICAL REQUIREMENTS**		**P**
4.1	**Stability**		**P**
	Angle of 10°		**P**
	Test force (N) .....:	44 N (Scan); 29.4 N (Touch Writer)	**P**
4.2	**Mechanical strength**		**P**
4.2.1	General		**P**
	Rack-mounted equipment.	Equipment is not rack-mounted.	**N/A**
4.2.2	Steady force test, 10 N		**N/A**
4.2.3	Steady force test, 30 N		**N/A**
4.2.4	Steady force test, 250 N		**P**
4.2.5	Impact test		**P**
	Fall test	1.3m.	**P**
	Swing test		**N/A**
4.2.6	Drop test; height (mm) .....:	Tablet dropped from 1 m.	**P**
4.2.7	Stress relief test		**N/A**
4.2.8	Cathode ray tubes	Equipment does not use cathode ray tubes.	**N/A**
	Picture tube separately certified .....:		**N/A**
4.2.9	High pressure lamps	Equipment does not contain high pressure lamps.	**N/A**
4.2.10	Wall or ceiling mounted equipment; force (N) .....:	Equipment is not wall or ceiling mounted.	**N/A**
4.3	**Design and construction**		**P**
4.3.1	Edges and corners	Rounded and smooth.	**P**
4.3.2	Handles and manual controls; force (N)..... :	50N (12lbf).	**P**
4.3.3	Adjustable controls	No adjustable controls.	**N/A**
4.3.4	Securing of parts		**N/A**
4.3.5	Connection by plugs and sockets		**N/A**
4.3.6	Direct plug-in equipment	Equipment is not direct plug-in equipment.	**N/A**
	Torque .....:		—
	Compliance with the relevant mains plug standard .....:		**N/A**
4.3.7	Heating elements in earthed equipment		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.8	Batteries	Batteries are separately approved devices. See separate battery test report.	**P**
	- Overcharging of a rechargeable battery	Batteries can not be charged while docked on equipment.	**N/A**
	- Unintentional charging of a non-rechargeable battery	Battery is rechargeable. See summary of testing.	**N/A**
	- Reverse charging of a rechargeable battery	Charger is not part of this evaluation.	**N/A**
	- Excessive discharging rate for any battery		**P**
4.3.9	Oil and grease	Equipment does not use oil or grease.	**N/A**
4.3.10	Dust, powders, liquids and gases	Equipment does not use dust, powders, liquids or gases.	**N/A**
4.3.11	Containers for liquids or gases		**N/A**
4.3.12	Flammable liquids .....:	Equipment does not use flammable liquids.	**N/A**
	Quantity of liquid (l) .....:		**N/A**
	Flash point (°C) .....:		**N/A**
4.3.13	Radiation		**N/A**
4.3.13.1	General		**N/A**
4.3.13.2	Ionizing radiation		**N/A**
	Measured radiation (pA/kg) .....:		—
	Measured high-voltage (kV) .....:		—
	Measured focus voltage (kV) .....:		—
	CRT markings .....:		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		**N/A**
	Part, property, retention after test, flammability classification .....:		**N/A**
4.3.13.4	Human exposure to ultraviolet (UV) radiation .....:	Equipment does not use UV radiation.	**N/A**
4.3.13.5	Lasers (including laser diodes) and LEDs	Diffused LED's only.	**N/A**
4.3.13.5.1	Lasers (including laser diodes)		**N/A**
	Laser class .....:		—
4.3.13.5.2	Light emitting diodes (LEDs)		
4.3.13.6	Other types .....:		**N/A**

4.4	**Protection against hazardous moving parts**		**P**
4.4.1	General	Refer below:	**P**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.4.2	Protection in operator access areas ..... :	The scanner is covered but some moving parts are still accessible, these parts stop within moments of opening the cover. No safety concern.	**P**
	Household and home/office document/media shredders	Equipment is not a shredder.	**N/A**
4.4.3	Protection in restricted access locations ..... :	Not in a restricted access location.	**N/A**
4.4.4	Protection in service access areas		**N/A**
4.4.5	Protection against moving fan blades	Equipment does not contain fans.	**N/A**
4.4.5.1	General		**N/A**
	Not considered to cause pain or injury. a)……:		**N/A**
	Is considered to cause pain, not injury. b) ……..:		**N/A**
	Considered to cause injury. c) ……:		**N/A**
4.4.5.2	Protection for users		**N/A**
	Use of symbol or warning ……..:		**N/A**
4.4.5.3	Protection for service persons		**N/A**
	Use of symbol or warning ……..:		**N/A**

4.5	**Thermal requirements**		**P**
4.5.1	General	Refer below:	**P**
4.5.2	Temperature tests		**P**
	Normal load condition per Annex L ..... :	L7 considered (other equipment).	—
4.5.3	Temperature limits for materials	(see appended table 4.5)	**P**
4.5.4	Touch temperature limits	(see appended table 4.5)	**P**
4.5.5	Resistance to abnormal heat ..... :	No hazardous voltages present.	**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.6	**Openings in enclosures**		**N/A**
4.6.1	Top and side openings	No hazardous voltages.	**N/A**
	Dimensions (mm) ..... :		—
4.6.2	Bottoms of fire enclosures		**N/A**
	Construction of the bottomm, dimensions (mm) .. :		—
4.6.3	Doors or covers in fire enclosures		**N/A**
4.6.4	Openings in transportable equipment	Class III equipment.	**N/A**
4.6.4.1	Constructional design measures		**N/A**
	Dimensions (mm) ..... :		—
4.6.4.2	Evaluation measures for larger openings		**N/A**
4.6.4.3	Use of metallized parts		**N/A**
4.6.5	Adhesives for constructional purposes	No adhesives used for contructional purposes.	**N/A**
	Conditioning temperature (°C), time (weeks) ..... :		—
4.7	**Resistance to fire**		**P**
4.7.1	Reducing the risk of ignition and spread of flame	Method 1 is used.	**P**
	Method 1, selection and application of components wiring and materials	(See appended table 1.5.1).	**P**
	Method 2, application of all of simulated fault condition tests		**N/A**
4.7.2	Conditions for a fire enclosure		**N/A**
4.7.2.1	Parts requiring a fire enclosure		**N/A**
4.7.2.2	Parts not requiring a fire enclosure		**N/A**
4.7.3	Materials		**P**
4.7.3.1	General	Components and materials have adequate flammability ratings. (See appended table 1.5.1).	**P**
4.7.3.2	Materials for fire enclosures		**N/A**
4.7.3.3	Materials for components and other parts outside fire enclosures	No fire enclosure required.	**N/A**
4.7.3.4	Materials for components and other parts inside fire enclosures		**N/A**
4.7.3.5	Materials for air filter assemblies		**N/A**
4.7.3.6	Materials used in high-voltage components		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

5	**ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS**		**P**
5.1	**Touch current and protective conductor current**		**N/A**
5.1.1	General		**N/A**
5.1.2	Configuration of equipment under test (EUT)	Class III device.	**N/A**
5.1.2.1	Single connection to an a.c. mains supply	No direct connection to mains.	**N/A**
5.1.2.2	Redundant multiple connections to an a.c. mains supply		**N/A**
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		**N/A**
5.1.3	Test circuit	No hazardous voltage present.	**N/A**
5.1.4	Application of measuring instrument		**N/A**
5.1.5	Test procedure		**N/A**
5.1.6	Test measurements		**N/A**
	Supply voltage (V) .....:		—
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
	Measured protective conductor current (mA) .....:		—
	Max. allowed protective conductor current (mA)...:		—
5.1.7	Equipment with touch current exceeding 3,5 mA		**N/A**
5.1.7.1	General .....:		**N/A**
5.1.7.2	Simultaneous multiple connections to the supply		**N/A**
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks		**N/A**
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		**N/A**
	Supply voltage (V) .....:		—
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
5.1.8.2	Summation of touch currents from telecommunication networks		**N/A**
	a) EUT with earthed telecommunication ports .....:		**N/A**
	b) EUT whose telecommunication ports have no reference to protective earth		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	**Electric strength**		**N/A**
5.2.1	General	Class III device.	**N/A**
5.2.2	Test procedure	Class III device.	**N/A**
5.3	**Abnormal operating and fault conditions**		**P**
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	**P**
5.3.2	Motors	Stepper motors used in printer and scanner.	**N/A**
5.3.3	Transformers	No such device.	**N/A**
5.3.4	Functional insulation.....:		**N/A**
5.3.5	Electromechanical components		**N/A**
5.3.6	Audio amplifiers in ITE .....:		**N/A**
5.3.7	Simulation of faults		**N/A**
5.3.8	Unattended equipment		**P**
5.3.9	Compliance criteria for abnormal operating and fault conditions	Refer below:	**P**
5.3.9.1	During the tests	No fire or molten materials; no excessive temperatures.	**P**
5.3.9.2	After the tests		**N/A**
6	**CONNECTION TO TELECOMMUNICATION NETWORKS**		**N/A**
6.1	**Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment**		**N/A**
6.1.1	Protection from hazardous voltages		**N/A**
6.1.2	Separation of the telecommunication network from earth		**N/A**
6.1.2.1	Requirements	No connection to telecommunications systems.	**N/A**
	Supply voltage (V) .....:		—
	Current in the test circuit (mA) .....:		—
6.1.2.2	Exclusions .....:		**N/A**
6.2	**Protection of equipment users from overvoltages on telecommunication networks**		**N/A**
6.2.1	Separation requirements	No connection to telecommunications systems.	**N/A**
6.2.2	Electric strength test procedure		**N/A**
6.2.2.1	Impulse test		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.2.2.2	Steady-state test		**N/A**
6.2.2.3	Compliance criteria		**N/A**
6.3	**Protection of the telecommunication wiring system from overheating**		**N/A**
	Max. output current (A) .....:	No connection to telecommunications systems.	—
	Current limiting method .....:		—
7	**CONNECTION TO CABLE DISTRIBUTION SYSTEMS**		**N/A**
7.1	**General**	No connection to cable distribution systems.	**N/A**
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		**N/A**
7.3	Protection of equipment users from overvoltages on the cable distribution system		**N/A**
7.4	Insulation between primary circuits and cable distribution systems		**N/A**
7.4.1	General		**N/A**
7.4.2	Voltage surge test		**N/A**
7.4.3	Impulse test		**N/A**
A	**ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE**		**N/A**
A.1	**Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)**	Flammability tests not required.	**N/A**
A.1.1	Samples.....:		—
	Wall thickness (mm) .....:		—
A.1.2	Conditioning of samples; temperature (°C) .....:		**N/A**
A.1.3	Mounting of samples .....:		**N/A**
A.1.4	Test flame (see IEC 60695-11-3)		**N/A**
	Flame A, B, C or D .....:		—
A.1.5	Test procedure		**N/A**
A.1.6	Compliance criteria		**N/A**
	Sample 1 burning time (s) .....:		—
	Sample 2 burning time (s) .....:		—
	Sample 3 burning time (s) .....:		—

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
A.2	**Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)**		**N/A**
A.2.1	Samples, material .....:		—
	Wall thickness (mm) .....:		—
A.2.2	Conditioning of samples; temperature (°C) .....:		**N/A**
A.2.3	Mounting of samples .....:		**N/A**
A.2.4	Test flame (see IEC 60695-11-4)		**N/A**
	Flame A, B or C .....:		—
A.2.5	Test procedure		**N/A**
A.2.6	Compliance criteria		**N/A**
	Sample 1 burning time (s) .....:		—
	Sample 2 burning time (s) .....:		—
	Sample 3 burning time (s) .....:		—
A.2.7	Alternative test acc. to IEC 60695-11-5, cl. 5 and 9		**N/A**
	Sample 1 burning time (s) .....:		—
	Sample 2 burning time (s) .....:		—
	Sample 3 burning time (s) .....:		—
A.3	**Hot flaming oil test (see 4.6.2)**		**N/A**
A.3.1	Mounting of samples		**N/A**
A.3.2	Test procedure		**N/A**
A.3.3	Compliance criterion		**N/A**

B	**ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)**		**N/A**
B.1	**General requirements**	All motors are DC stepper motors.	**N/A**
	Position .....:		—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
B.2	**Test conditions**		**N/A**
B.3	**Maximum temperatures**		**N/A**
B.4	**Running overload test**		**N/A**
B.5	**Locked-rotor overload test**		**N/A**
	Test duration (days) .....:		—
	Electric strength test: test voltage (V) .....:		—

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
B.6	**Running overload test for d.c. motors in secondary circuits**		**N/A**
B.6.1	General		**N/A**
B.6.2	Test procedure		**N/A**
B.6.3	Alternative test procedure		**N/A**
B.6.4	Electric strength test; test voltage (V) .....:		**N/A**
B.7	**Locked-rotor overload test for d.c. motors in secondary circuits**		**N/A**
B.7.1	General		**N/A**
B.7.2	Test procedure		**N/A**
B.7.3	Alternative test procedure		**N/A**
B.7.4	Electric strength test; test voltage (V) .....:		**N/A**
B.8	**Test for motors with capacitors**		**N/A**
B.9	**Test for three-phase motors**		**N/A**
B.10	**Test for series motors**		**N/A**
	Operating voltage (V) .....:		—
C	**ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)**		**N/A**
	Position .....:	No such transformers used.	—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
	Method of protection..... :		—
C.1	**Overload test**		**N/A**
C.2	**Insulation**		**N/A**
	Protection from displacement of windings..... :		**N/A**
D	**ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)**		**N/A**
D.1	**Measuring instrument**		**N/A**
D.2	**Alternative measuring instrument**		**N/A**
E	**ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)**		**N/A**
F	**ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)**		**N/A**
G	**ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES**		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.1	**Clearances**	Class III device.	**N/A**
G.1.1	General		**N/A**
G.1.2	Summary of the procedure for determining minimum clearances		**N/A**
G.2	**Determination of mains transient voltage (V)**	Class III device.	**N/A**
G.2.1	AC mains supply .....:		**N/A**
G.2.2	Earthed d.c. mains supplies .....:		**N/A**
G.2.3	Unearthed d.c. mains supplies .....:		**N/A**
G.2.4	Battery operation .....:		**N/A**
G.3	**Determination of telecommunication network transient voltage (V) ..... :**	No connection to telecommunications systems	**N/A**
G.4	**Determination of required withstand voltage (V)**		**N/A**
G.4.1	Mains transients and internal repetitive peaks .....:		**N/A**
G.4.2	Transients from telecommunication networks .....:		**N/A**
G.4.3	Combination of transients		**N/A**
G.4.4	Transients from cable distribution systems		**N/A**
G.5	**Measurement of transient voltages (V)**	Class III device.	**N/A**
	a) Transients from a mains supply		**N/A**
	For an a.c. mains supply		**N/A**
	For a d.c. mains supply		**N/A**
	b) Transients from a telecommunication network		**N/A**
G.6	**Determination of minimum clearances ..... :**	Class III device.	**N/A**

H	**ANNEX H, IONIZING RADIATION (see 4.3.13)**		**N/A**

J	**ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)**		**N/A**
	Metal(s) used .....:		—

K	**ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)**		**N/A**
K.1	Making and breaking capacity	No such device used.	**N/A**
K.2	Thermostat reliability; operating voltage (V) .....:		**N/A**
K.3	Thermostat endurance test; operating voltage (V) .....:		**N/A**
K.4	Temperature limiter endurance; operating voltage (V) .....:		**N/A**
K.5	Thermal cut-out reliability		**N/A**
K.6	Stability of operation		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

L	**ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)**		**P**
L.1	Typewriters		**N/A**
L.2	Adding machines and cash registers		**N/A**
L.3	Erasers		**N/A**
L.4	Pencil sharpeners		**N/A**
L.5	Duplicators and copy machines		**N/A**
L.6	Motor-operated files		**N/A**
L.7	Other business equipment	Considered.	**P**

M	**ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)**		**N/A**
M.1	Introduction	No ringing signals in or produced by equipment.	**N/A**
M.2	Method A		**N/A**
M.3	Method B		**N/A**
M.3.1	Ringing signal		**N/A**
M.3.1.1	Frequency (Hz) .....:		—
M.3.1.2	Voltage (V) .....:		—
M.3.1.3	Cadence; time (s), voltage (V) .....:		—
M.3.1.4	Single fault current (mA) .....:		—
M.3.2	Tripping device and monitoring voltage .....:		**N/A**
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		**N/A**
M.3.2.2	Tripping device		**N/A**
M.3.2.3	Monitoring voltage (V) .....:		**N/A**

N	**ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)**		**N/A**
N.1	ITU-T impulse test generators	Not a telecommunications device.	**N/A**
N.2	IEC 60065 impulse test generator		**N/A**
P	**ANNEX P, NORMATIVE REFERENCES**		—

Q	**ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)**		**N/A**
	- Preferred climatic categories .....:		**N/A**
	- Maximum continuous voltage .....:		**N/A**
	- Combination pulse current .....:		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Body of the VDR Test according to IEC60695-11-5.....:		**N/A**
	Body of the VDR. Flammability class of material (min V-1).....:		**N/A**
R	**ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES**		**N/A**
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		**N/A**
R.2	Reduced clearances (see 2.10.3)		**N/A**
S	**ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)**		**N/A**
S.1	Test equipment	Not a telecommunications device.	**N/A**
S.2	Test procedure		**N/A**
S.3	Examples of waveforms during impulse testing		**N/A**
T	**ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)**		**N/A**
			—
U	**ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)**		**N/A**
			—
V	**ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)**		**N/A**
V.1	Introduction	Class III device. No direct connection to AC distribution systems.	**N/A**
V.2	TN power distribution systems		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
W	**ANNEX W, SUMMATION OF TOUCH CURRENTS**		**N/A**
W.1	Touch current from electronic circuits	Class III device. No direct connection to AC distribution systems.	**N/A**
W.1.1	Floating circuits		**N/A**
W.1.2	Earthed circuits		**N/A**
W.2	Interconnection of several equipments		**N/A**
W.2.1	Isolation		**N/A**
W.2.2	Common return, isolated from earth		**N/A**
W.2.3	Common return, connected to protective earth		**N/A**
X	**ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)**		**N/A**
X.1	Determination of maximum input current	No such device used.	**N/A**
X.2	Overload test procedure		**N/A**
Y	**ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)**		**N/A**
Y.1	Test apparatus .....:	Does not produce UV radiation.	**N/A**
Y.2	Mounting of test samples .....:		**N/A**
Y.3	Carbon-arc light-exposure apparatus .....:		**N/A**
Y.4	Xenon-arc light exposure apparatus .....:		**N/A**
Z	**ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)**		**N/A**
AA	**ANNEX AA, MANDREL TEST (see 2.10.5.8)**		**N/A**
BB	**ANNEX BB, CHANGES IN THE SECOND EDITION**		—
CC	**ANNEX CC, Evaluation of integrated circuit (IC) current limiters**		**N/A**
CC.1	General		**N/A**
CC.2	Test program 1.....:		**N/A**
CC.3	Test program 2.....:		**N/A**
CC.4	Test program 3.....:		**N/A**
CC.5	Compliance.....:		**N/A**
DD	**ANNEX DD, Requirements for the mounting means of rack-mounted equipment**		**N/A**
DD.1	General	Equipment is not rack-mounted.	**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
DD.2	Mechanical strength test, variable N……..:		**N/A**
DD.3	Mechanical strength test, 250N, including end stops……:		**N/A**
DD.4	Compliance……:		**N/A**
EE	**ANNEX EE, Household and home/office document/media shredders**		**N/A**
EE.1	General	Equipment is not a shredder.	**N/A**
EE.2	Markings and instructions		**N/A**
	Use of markings or symbols……:		**N/A**
	Information of user instructions, maintenance and/or servicing instructions……:		**N/A**
EE.3	Inadvertent reactivation test……:		**N/A**
EE.4	Disconnection of power to hazardous moving parts:		**N/A**
	Use of markings or symbols……:		**N/A**
EE.5	Protection against hazardous moving parts		**N/A**
	Test with test finger (Figure 2A) ……:		**N/A**
	Test with wedge probe (Figure EE1 and EE2) ……:		**N/A**

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components				
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
Enclosure, Case	Prismier Mechanical Contract manufacturing or equivalent.	2005005;2005006;2005007;2005008;2005011;2005012	Wonderloy PC-510 Min. Thickness:2.54mm (0.1inch)	UL 94	E56070-100239180
Rear Panel, Touch Writer and Scan	Prismier Mechanical Contract manufacturing or equivalent	1005190	0.0808” AL	-	None; tested as part of the equipment.
Power Adapter (limited power source)	XP Power or equivalent.	AHM85PS24 or equivalent.	Input 100-240V ~1.0A, 50/60Hz Output +24V DC, 3.54A	UL60601-1	UL E302267
Li-ion Battery	Totex mfg. Inc	3INR19/66-2	Li-ion battery 10.8V;6.7Ah;72.0Wh	UL 2054	UL MH29443
Scanner	Peripheral Dynamics, Inc or equivalent	105-8559-211 or equivalent	24Vdc+/-5%;30W; 0℃ - 50℃	-	None; tested as part of the equipment.
2.5” Thermal Printer (x2)	Seiko or equivalent	DPU-D2-00A-E or equivalent	+5to +9Vdc @ 30W; -10℃ - 50℃	-	None; tested as part of the equipment.
Supplementary information: **[1]) Provided evidence ensures the agreed level of compliance. See OD-CB2039.**					

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: Opto Electronic Devices	N/A

Manufacturer ..... :
Type..... :
Separately tested ..... :
Bridging insulation ..... :
External creepage distance..... :
Internal creepage distance ..... :
Distance through insulation ..... :
Tested under the following conditions..... :

Input..... :
Output..... :

supplementary information

Not applicable.

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
24 Vd.c.	1.4	2.4	-	-	-	1)
24.0 Vd.c.	2.4	2.4	-	-	-	2)

Supplementary information:

1) Verity Scan module, fully loaded with “shoe shine” program allowing the scanner to process the paper every 30 seconds.
2) Verity Touch Writer module, fully loaded.

Lab environmental conditions: 11/07/2014 –19.8°C@50%RH Tested by: D. Kozdereli/T.Macias

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

2.1.1.5 c) 1)	TABLE: max. V, A, VA test	N/A

Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)
-	-	-	-	-

supplementary information:

Not applicable.

2.1.1.5 c) 2)	TABLE: stored energy	N/A

Capacitance C (µF)	Voltage U (V)	Energy E (J)
-	-	-

supplementary information:

Not applicable.

2.2	TABLE: evaluation of voltage limiting components in SELV circuits	N/A

Component (measured between)	max. voltage (V) (normal operation)		Voltage Limiting Components
	V peak	V d.c.	
-	-	-	-

Fault test performed on voltage limiting components	Voltage measured (V) in SELV circuits (V peak or V d.c.)
-	-

supplementary information:

Not applicable.

2.5	TABLE: Limited power sources	N/A

Circuit output tested:

Note: Measured Uoc (V) with all load circuits disconnected:

Components	Sample No.	Uoc (V)	I_{sc} (A)		VA	
			Meas.	Limit	Meas.	Limit
-	-	-	-	-	-	-

supplementary information:

Not applicable.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

2.10.2	Table: working voltage measurement			N/A
Location		RMS voltage (V)	Peak voltage (V)	Comments
-		-	-	-
supplementary information:				
Not applicable.				

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements					N/A
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
-	-	-	-	-	-	-
Supplementary information: Not applicable.						

2.10.5	TABLE: Distance through insulation measurements				N/A
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
-	-	-	-	-	-
Supplementary information: Not applicable.					

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.3.8	TABLE: Batteries		N/A
The tests of 4.3.8 are applicable only when appropriate battery data is not available			N/A
Is it possible to install the battery in a reverse polarity position?		Battery connector is keyed.	N/A

	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition	-	-	-	-	-	-	-	-	-
Max. current during fault condition	-	-	-	-	-	-	-	-	-

Test results:		Verdict
- Chemical leaks		N/A
- Explosion of the battery		N/A
- Emission of flame or expulsion of molten metal		N/A
- Electric strength tests of equipment after completion of tests		N/A

Supplementary information:
Battery is separately approved device.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.3.8	TABLE: Batteries	N/A
Battery category ..... :	(Lithium, NiMh, NiCad, Lithium Ion …)	
Manufacturer ..... :		
Type / model..... :		
Voltage ..... :		
Capacity..... :	mAh	
Tested and Certified by (incl. Ref. No.) ..... :		
Circuit protection diagram:		
Battery is separately approved device.		

MARKINGS AND INSTRUCTIONS (1.7.13)	
Location of replaceable battery	
Language(s) ……..:	
Close to the battery ……..:	
In the servicing instructions ……..:	
In the operating instructions ……..:	

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: Thermal requirements				P
	Supply voltage (V d.c.) .....:	22.89	24.00	25.00	—
	Ambient T_{min} (°C) .....:	22	20	22	—
	Ambient T_{max} (°C) .....:	24	24	24	—
Maximum measured temperature T of part/at.....:		T (°C)			Allowed T_{max} (°C)
		1	2	3	
Ambient		23/40	23/40	23/40	Information only.
Surface Select button		24/41	24/41	24/41	85℃ TB4C
Surface Help button		24/41	24/41	24/41	85℃ TB4C
Surface Move button		36/53	25/42	24/41	85℃ TB4C
Surface small printer interior (metal)		36/53	24/41	24/41	60℃ TB4C
Ambient inside		30/47	28/45	29/46	Information only.
Ambient input		31/48	30/47	30/47	Information only.
Inside surface touch access USB		30/47	29/46	29/46	70℃ TB4C
Inside ambient		30/47	29/46	29/46	Information only.
Surface printer metal		37/54	36/53	36/53	60℃ TB4C
Surface on/off button		27/44	26/43	27/44	85℃ TB4C
Surface top cover		24/41	24/41	23/40	85℃ TB4C
Surface Poll button		27/44	26/43	26/43	85℃ TB4C
Surface metal handle		23/40	24/41	22/39	55℃ TB4C
Surface handle rubber		23/40	24/41	22/39	85℃ TB4C
Tablet ambient coin cell		46/63	45/62	46/63	60℃ MFR (1)
Tablet Surface switch		36/52	35/52	35/52	70℃ TB4C
Tablet surface back		32/49	31/48	31/48	95℃ TB4C
Tablet surface touch screen		34/51	33/50	33/50	65℃ TB4C
Battery connection		35/52	34/51	34/51	85℃ TB4C

Supplementary information: Verity Touch Writer Test 1[11/10/2014; 19.8℃@46%RH], Tests 2 and 3 [11/11/2014; 20.3℃@45%RH], Normal conditions. Test by Tomas Macias.

TB4C = Table 4C; MFR = Manufacturer

1) Based on the manufacturer temperature characteristics the RTC (real time clock) battery has descreased performance at higher temperatures. There is no safety risk.

Temperature T of winding:	t_1 (℃)	R_1 (Ω)	t_2 (℃)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
-	-	-	-	-	-	-	-

Supplementary information:

Not applicable.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: Thermal requirements				P
	Supply voltage (V d.c.) .....:	22.89	24.00	25.00	—
	Ambient T_{min} (°C) .....:	22	20	22	—
	Ambient T_{max} (°C) .....:	24	24	24	—
Maximum measured temperature T of part/at.....:		T (°C)			Allowed T_{max} (°C)
		4	5	6	
Ambient scan		24/41	25/42	24/41	Information only.
Surface Poll button		22/39	23/40	22/39	85°C TB4C
Surface on button		29/46	28/45	28/45	85°C TB4C
Handle surface metal		25/42	25/42	24/41	60°C TB4C
Surface handle rubber		24/41	24/41	24/41	85°C TB4C
Ambient input		33/50	32/49	33/50	Information only.
Ambient scanner		34/51	33/50	34/51	Information only.
Metal surface under scanner		33/50	33/50	33/50	70°C TB4C
Audio junction		31/48	30/47	30/47	70°C TB4C
Scan cover		26/43	25/42	25/42	95°C TB4C
Tablet ambient coin cell battery		47/64	46/63	47/64	60°C MFR (1)
Tablet surface switch		35/52	34/51	34/51	70°C TB4C
Tablet surface battery connector		38/55	34/54	37/54	95°C TB4C
Surface interface		41/58	40/57	40/57	60°C TB4C
Surface touch screen		35/52	35/52	35/52	65°C TB4C
tablet back surface		31/48	30/47	31/48	95°C TB4C

Supplementary information: Verity Scan Test 4[11/10/2014; 19.8°C@46%RH], Tests 5 and 6 [11/11/2014; 20.3°C@45%RH], Normal conditions. Test by Tomas Macias.

TB4C = Table 4C; MFR = Manufacturer

1) Based on the manufacturer temperature characteristics the RTC (real time clock) battery has descreased performance at higher temperatures. There is no safety risk.

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	Allowed T_{max} (°C)	Insulation class
-	-	-	-	-	-	-

Supplementary information:

Not applicable.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: Thermal requirements					P
	Supply voltage (V d.c.) .....:	22.89	22.89	22.89	22.89	—
	Ambient T_{min} (°C) .....:	20	20	19	20	—
	Ambient T_{max} (°C) .....:	21	22	20	22	—
Maximum measured temperature T of part/at.....:		T (°C)				Allowed T_{max} (°C)
		7	8	9	10	
Ambient		23/40	23/40	23/40	23/40	Information only.
Surface Select button		26/43	25/42	24/41	26/43	85℃ TB4C
Surface Help button		26/43	25/42	24/41	26/43	85℃ TB4C
Surface Move button		26/43	25/42	24/41	26/43	85℃ TB4C
Surface small printer interior (metal)		25/42	25/42	24/41	26/43	Information only.
Ambient inside		28/45	28/45	25/42	30/47	Information only.
Ambient input		29/46	30/47	25/42	31/48	Information only.
Inside surface touch access USB		29/46	30/47	25/42	30/47	70℃ TB4C
Inside ambient		28/45	27/44	24/41	29/46	Information only.
Surface printer metal		35/52	28/45	30/47	38/55	60℃ TB4C
Surface on/off button		26/43	28/45	24/41	28/45	85℃ TB4C
Surface top cover		25/42	25/42	24/41	25/42	85℃ TB4C
Surface Poll button		26/43	27/44	24/41	27/44	85℃ TB4C
Surface metal handle		24/41	24/41	24/41	24/41	55℃ TB4C
Surface handle rubber		24/41	24/41	24/41	24/41	85℃ TB4C
Tablet ambient coin cell		45/62	40/57	39/56	47/64	Information only.
Tablet Surface switch		37/54	31/58	32/49	39/56	70℃ TB4C
Tablet surface back		31/48	29/46	27/44	32/49	95℃ TB4C
Tablet surface touch screen		34/51	39/56	31/48	35/52	65℃ TB4C
Battery connection		33/50	35/52	33/50	36/53	85℃ TB4C

Supplementary information: Verity Touch Writer

Test 7-10 tested by T. Macais on 11/13/2014[19.2℃@24%RH] TB4C = Table 4C

Test 7: SFC Tablet battery short.; Test 8: SFC Tablet connection short Test 9 SFC Tablet USB short TEST10 Printer USB short

Temperature T of winding:	t_1 (℃)	R_1 (Ω)	t_2 (℃)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
-	-	-	-	-	-	-	-

Supplementary information:

Not applicable.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: Thermal requirements				P
	Supply voltage (V d.c.) .....:	22.89	22.89	22.89	—
	Ambient T_{min} (°C) .....:	20	20	20	—
	Ambient T_{max} (°C) .....:	22	21	22	—
Maximum measured temperature T of part/at.....:		T (°C)			Allowed T_{max} (°C)
		11	12	13	
Ambient		23/40	23/40	23/40	Information only.
Surface Select button		25/42	25/42	25/42	85℃ TB4C
Surface Help button		25/42	25/42	25/42	85℃ TB4C
Surface Move button		26/43	26/43	26/43	85℃ TB4C
Surface small printer interior (metal)		25/42	26/43	26/43	Information only.
Ambient inside		29/46	30/47	30/47	Information only.
Ambient input		31/48	31/48	31/48	Information only.
Inside surface touch access USB		30/47	30/47	30/47	70℃ TB4C
Inside ambient		30/47	30/47	28/45	Information only.
Surface printer metal		37/54	37/54	37/54	60℃ TB4C
Surface on/off button		27/44	27/44	27/44	85℃ TB4C
Surface top cover		24/41	24/41	24/41	85℃ TB4C
Surface Poll button		27/44	27/44	27/44	85℃ TB4C
Surface metal handle		23/40	24/41	24/41	55℃ TB4C
Surface handle rubber		24/41	24/41	24/41	85℃ TB4C
Tablet ambient coin cell		47/64	47/64	47/64	Information only.
Tablet Surface switch		38/55	38/55	38/55	70℃ TB4C
Tablet surface back		32/49	32/49	32/49	95℃ TB4C
Tablet surface touch screen		34/51	34/51	34/51	65℃ TB4C
Battery connection		35/52	35/52	35/52	85℃ TB4C

Supplementary information: Verty Touch Writer TB4C = Table 4C
Tested by T.Macais {11/12/2014 19.1℃@33%RH}
TEST 11: SFC Audio short TEST12: USB1 (compartment) short; TEST13: USB2 (compartment) short

Temperature T of winding:	t_1 (℃)	R_1 (Ω)	t_2 (℃)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
-	-	-	-	-	-	-	-

Supplementary information:
Not applicable.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: Thermal requirements					P
	Supply voltage (V d.c.) .....:	22.89	22.89	22.89	22.89	—
	Ambient T_{min} (°C) .....:	20	20	19	20	—
	Ambient T_{max} (°C) .....:	21	22	20	22	—
Maximum measured temperature T of part/at.....:		T (°C)				Allowed T_{max} (°C)
		14	15	16	17	
Ambient scan		25/42	24/41	25/42	26/43	Information only.
Surface Poll button		23/40	23/40	23/40	24/41	85℃ TB4C
Surface on button		28/45	29/46	25/42	29/46	85℃ TB4C
Handle surface metal		30/47	25/42	24/41	26/43	60℃ TB4C
Surface handle rubber		29/46	24/41	24/41	25/42	85℃ TB4C
Ambient input		32/49	31/48	26/43	34/51	Information only.
Ambient scanner		31/48	33/50	25/42	35/52	Information only.
Metal surface under scanner		31/48	35/52	25/42	34/51	70℃ TB4C
Audio junction		30/47	30/47	26/43	31/48	70℃ TB4C
Scan cover		26/43	32/49	24/41	26/43	95℃ TB4C
Tablet ambient coin cell battery		246/63	43/60	41/58	48/65	Information only.
Tablet surface switch		36/53	30/47	32/49	35/52	70℃ TB4C
Tablet surface battery connector		36/53	39/56	35/52	39/56	95℃ TB4C
Surface interface		38/55	34/51	30/47	41/58	60℃ TB4C
Surface touch screen		35/52	41/58	33/50	36/53	65℃ TB4C
tablet back surface		30/47	30/47	28/45	32/49	95℃ TB4C
Supplementary information: Verity Scan Test by T. Macais Tests 14-16: 11/13/2014; 19.2℃@24%RH: Test 17: 11/12/2014[19.1℃@45%RH TB4C = Table 4C Test 14: SFC Tablet battery short.; Test 15: SFC Tablet connection short Test 16: SFC Tablet USB short. Test 17: SFC Audio port short						

Temperature T of winding:	t_1 (℃)	R_1 (Ω)	t_2 (℃)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
-	-	-	-	-	-	-	-

Supplementary information:
Not applicable.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: Thermal requirements			P
	Supply voltage (V d.c.) .....:	22.89	22.89	—
	Ambient T_{min} (°C) .....:	22	20	—
	Ambient T_{max} (°C) .....:	24	22	—
Maximum measured temperature T of part/at.....:		T (°C)		Allowed T_{max} (°C)
		18	19	
Ambient scan		26/43	26/43	Information only.
Surface Poll button		27/44	25/42	85°C TB4C
Surface on button		29/46	29/46	85°C TB4C
Handle surface metal		26/43	25/42	60°C TB4C
Surface handle rubber		25/42	25/42	85°C TB4C
Ambient input		34/51	34/51	Information only.
Ambient scanner		35/52	35/52	Information only.
Metal surface under scanner		34/51	34/51	70°C TB4C
Audio junction		31/48	32/49	70°C TB4C
Scan cover		26/43	26/43	95°C TB4C
Tablet ambient coin cell battery		48/65	48/65	Information only.
Tablet surface switch		36/53	35/52	70°C TB4C
Tablet surface battery connector		39/56	39/56	95°C TB4C
Surface interface		41/58	41/58	60°C TB4C
Surface touch screen		36/53	26/53	65°C TB4C
tablet back surface		32/49	32/49	95°C TB4C

Supplementary information: Verity Scan Tesedt by T. Macais TB4C = Table 4C
Tests18-19: 11/12/2014 19.1°C@33%RH
TEST18: USB1 (compartment) short; TEST19: USB2 (compartment) short

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
-	-	-	-	-	-	-	-

Supplementary information:
Not applicable.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5.5	TABLE: Ball pressure test of thermoplastic parts		N/A
	Allowed impression diameter (mm) .....:	≤ 2 mm	—
Part		Test temperature (°C)	Impression diameter (mm)
-		-	-
Supplementary information: Not applicable.			

4.7	TABLE: Resistance to fire					N/A
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence	
-	-	-	-	-	-	
Supplementary information: Not applicable.						

5.1	TABLE: touch current measurement			N/A
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions	
-	-	-	-	
supplementary information:				
Not applicable.				

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			N/A
Test voltage applied between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No	
-	-	-	-	
Supplementary information: Not applicable.				

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.3	TABLE: Fault condition tests		P
	Ambient temperature (°C) .....:	23	—
	Power source for EUT: Manufacturer, model/type, output rating .....:	TDK Lambda GEN1500W	—

Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Verity Scan	USB 1 short circuit	22.8	01:27:00	-	-	Equipment continued to operate normally.
Verity Scan	USB 2short circuit	22.8	01:17:00	-	-	Equipment continued to operate normally.
Verity Scan	RCA port short circuit	22.8	01:18:00	-	-	Equipment continued to operate normally..
Verity Scan	Battery short circuit	22.8	01:02:00	-	-	Equipment continued to operate normally.
Verity Scan	Tablet UBS short circuit	22.8	01:02:00	-	-	Equipment continued to operate normally.
Verity Scan	Tablet connector short circuit	22.8	01:03:00	-	-	Equipment continued to operate normally.
Verity Touch Writer	Battery short circuit	22.8	01:02:00	-	-	Equipment continued to operate normally.
Verity Touch Writer	USB 1 short circuit	22.8	01:27:00	-	-	Equipment continued to operate normally.
Verity Touch Writer	USB 2short circuit	22.8	01:17:00	-	-	Equipment continued to operate normally.
Verity Touch Writer	Printer short circuit	22.8	01:07:00	-	-	Equipment continued to operate normally.
Verity Touch Writer	RCA port short circuit	22.8	01:18:00	-	-	Equipment continued to operate normally.
Verity Touch Writer	Tablet UBS short circuit	-	01:02:00	-	-	Main unit shutdown, Tablet continued to operate normally.
Verity Touch Writer	Tablet connector short circuit	22.8	01:03:00	-	-	Equipment continued to operate normally.

Supplementary information:

None.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

C.2	TABLE: transformers	N/A

Loc.	Tested insulation	Working voltage peak / V (2.10.2)	Working voltage rms / V (2.10.2)	Required electric strength (5.2)	Required clearance / mm (2.10.3)	Required creepage distance / mm (2.10.4)	Required distance thr. insul. (2.10.5)
-	-	-	-	-	-	-	-

Loc.	Tested insulation			Test voltage/ V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers
-	-			-	-	-	-

supplementary information:

Not applicable.

C.2	TABLE: transformers	N/A

Transformer

List of test equipment used:
A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to TMP/CTF stage 1 or WMT/CTF stage 2 procedure has been used.

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
All	Lab environment	1801/Weather Station	-	05/29/2014 05/29/2015
1.6.2; 4.5	Input Current	2157/ Power Supply, DC	0-30 Vd.c.	CBU
1.6.2	Input current; Voltage	1654/ Multimeter	0-5A; 0-30Vdc	04/30/2015
1.6.2	Input current	1687/Cap/Leakage Current Switch Box	-	01/24/2015
1.6.2	Input current	2007/Cap/Leakage Current Switch Box	-	07/15/2015
1.6.2	Input Current	1330/1883 / AC Power supply	0-270 V AC	CBU
4.5	Thermal	2000/Data Acquisition	-	01/20/2015
4.5	Thermal	1708/20-Channel Multiplexer Card	-	11/20/2014
4.5	Thermal	0873/20-Channel Multiplexer Card	-	06/10/2015
4.2.5	Impact test	1651/Steel Ball, 50mm, 500g	-	12/15/2008 (ICO)
4.2.5	Impact test	2058/Guide Tube, Impact Test	-	05/16/2013 (ICO)
4.2; 1.7.11	Steady force; Durability	1891/Stop Watch		04/08/2014
4.2.4	Steady force	2003/ Force Gauge	0-300N	11/07/2014
4.3.2	Handels	G001/Force Gauge	0-30 lbf	05/16/2014
2.1.1.1; 4.2	Access to energized parts; Steady force	0358/ Safety Test Probe Set	-	09/01/2012 (ICO)
4.1	Stability	1740/Digi-Level Protractor	-	03/11/2014

IEC60950_1F ATTACHMENT 1			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT 1- TO TEST REPORT IEC 60950-1 with A1: 2009 and A2:2013
U.S.A. NATIONAL DIFFERENCES

Information technology equipment – Safety – Part 1: General requirements

Differences according to.....:	UL 60950-1-07(Second Edition) + A1: 2011 + A2: 2014
Attachment Form No. .....:	US_ND_IEC60950_1F
Attachment Originator.....:	UL
Master Attachment.....:	Date 2014-07

	Special national conditions		**P**
1.1.1	All equipment is designed as to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and if applicable, the National Electrical Safety Code, IEEE C2		**P**
	Also, unless marked or otherwise identified, installation is allowed per the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75		**P**
1.1.2	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors	Equipment is not baby monitor.	**N/A**
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A		**N/A**
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the /NEC	Power cord/power supply is part of a separately approved device, which is not considered in this report.	**N/A**
	For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the NEC are required to have special construction features and identification markings		**N/A**
1.7.1	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings		**N/A**
	A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and		**N/A**
	- if it is part of a range that extends into the Table 2 "Normal Operating Conditions"		**N/A**

IEC60950_1F ATTACHMENT 1			
Clause	Requirement + Test	Result - Remark	Verdict
	Likewise, a voltage rating is not to be lower than the specified "Normal Operating Conditions," unless it is part of a range that extends into the "Normal Operating Conditions"		**N/A**
1.7.7	Wiring terminals intended to supply Class 2 outputs in accordance with NEC or CEC Part 1 or NEC are marked with the voltage rating and “Class 2” or equivalent		**N/A**
	- Marking is located adjacent to the terminals		**N/A**
	- Marking is visible during wiring		**N/A**
2.5	Fuse providing Class 2, Limited Power Source, or TNV current limiting is not operator-accessible unless it is not interchangeable		**N/A**
2.6	Equipment with isolated ground (earthing) receptacles is in compliance with NEC 250.146(D) and CEC 10-112 and 10-906(8)		**N/A**
2.7.1	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is provided for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.		**N/A**
	Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, provided with special transformer overcurrent protection		**N/A**
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains is in accordance with the NEC/CEC		**N/A**
3.2.1	Attachment plugs of power supply cords are rated not less than 125 percent of the rated current of the equipment		**N/A**
3.2.1.2	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment comply with special earthing, wiring, marking and installation instruction requirements		**N/A**
3.2.3	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs		**N/A**
3.2.5	Power supply cords are no longer than 4.5 m in length		**N/A**
	Minimum cord length is 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement		**N/A**

IEC60950_1F ATTACHMENT 1			
Clause	Requirement + Test	Result - Remark	Verdict
	Flexible power supply cords are compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC		**N/A**
3.2.9	Permanently connected equipment has a suitable wiring compartment and wire bending space	Equipment is not permanently connected.	**N/A**
3.3	Wiring terminals and associated spacings for field wiring connections comply with CSA C22.2 No. 0		**N/A**
3.3.3	Wire binding screws are not attached with conductors larger than 10 AWG (5.3 mm2)		**N/A**
3.3.4	Terminals for permanent wiring, including protective earthing terminals, are suitable for Canadian/US wire gauge sizes, are		**N/A**
	- rated 125 per cent of the equipment rating, and		**N/A**
	- are specially marked when specified (1.7.7)		**N/A**
3.3.5	Revise first column of Table 3E to “Smaller of the RATED CURRENT of the equipment or the PROTECTIVE CURRENT RATING of the circuit under consideration”		**N/A**
3.4.2	Motor control devices are provided for cord-connected equipment with a motor if the equipment is rated more than 12 A,		**N/A**
	- or if the motor has a nominal voltage rating greater than 120 V		**N/A**
	- or is rated more than 1/3 hp (locked rotor current over 43 A)		**N/A**
3.4.8	Vertically-mounted disconnect switches and circuit breakers have the "on" position indicated by the handle in the up position		**N/A**
3.4.11	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes have a battery disconnect means that may be connected to the computer room remote power-off circuit	Not for computer room applications.	**N/A**
4.3.12	The maximum quantity of flammable liquid stored in equipment complies with NFPA 30	No flammable liquid in equipment.	**N/A**
4.3.13.5.1	Equipment with lasers meets the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No lasers in equipment.	**N/A**
4.7	For computer room applications, automated information storage systems with combustible media greater than 0.76 m^3 (27 cu ft) have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge		**N/A**

IEC60950_1F ATTACHMENT 1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9m^2 (10 sq ft) or a single dimension greater than 1.8 m (6 ft) have a flame spread rating of 50 or less		**N/A**
	For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less		**N/A**
4.7.3.1	Non-metallic enclosures of equipment for use in spaces used for environmental air (plenums) are required to comply with UL 2043		**N/A**
Annex H	Equipment that produces ionizing radiation complies with U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370)		**N/A**
	Other National Differences		**N/A**
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury have component or material ratings in accordance with the applicable national (Canadian and/or U.S.) component or material standard requirements. These components include: attachment plugs, battery backup systems, battery packs, cathode ray tubes, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), cord sets and power supply cords, direct plug-in equipment, electrochemical capacitor modules (energy storage modules with ultracapacitors), enclosures (outdoor), flexible cords and cables, fuses (branch circuit), fuseholders, ground-fault current interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring, protectors for communications circuits, receptacles, solid state controls, supplementary protectors, switches (including interlock switches), thermal cut-offs, thermostats, (multi-layer) transformer winding wire, surge protective devices, tubing, vehicle battery adapters, wire connectors, and wire and cables	Considered.	**N/A**
1.6.1.2	A circuit for connection to the DC Mains Supply is classified as a SELV Circuit, TNV-2 Circuit or Hazardous Voltage Circuit depending on the maximum operating voltage of the supply		**N/A**
	This maximum operating voltage includes consideration of the battery charging “float voltage” associated with the intended supply system, regardless of the marked power rating of the equipment		**N/A**

IEC60950_1F ATTACHMENT 1			
Clause	Requirement + Test	Result - Remark	Verdict
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 V_{peak} or 60 Vd.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions		**N/A**
2.3.2.1	In the event of a single fault between TNV and SELV circuits, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts		**N/A**
2.6.2	Equipment with functional earthing marked with the functional earthing symbol (IEC 60417-6092)		**N/A**
2.6.3.4	Protective bonding conductors of non-standard protective bonding constructions (e.g., printed circuit traces) may be subjected to the additional limited short circuit test conditions specified		**N/A**
4.2.8.1	Enclosures around CRTs with a face diameter of 160 mm or more reduce the risk of injury due to the implosion of the CRT		**N/A**
4.3.2	Equipment with handles complies with special loading tests		**N/A**
4.3.8	Battery packs for both portable and stationary applications comply with special component requirements	Batteries are a separately approved device; and are not charged when installed in the equipment.	**N/A**
5.1.8.3	Equipment intended to receive telecommunication ringing signals comply with a special touch current measurement tests		**N/A**
5.3.7	Internal (e.g., card cage) SELV circuit connectors and printed wiring board connectors that are accessible to the operator and that deliver power are overloaded	SELV connectors and PCB connectors do not deliver power.	**N/A**
	During abnormal operating testing, if a circuit is interrupted by the opening of a component, the test is repeated twice (three tests total) using new components as necessary		**N/A**
6.4	Equipment intended for connection to telecommunication network outside plant cable is protected against overvoltage from power line crosses in accordance with 6.4 and Annex NAC	Equipment is not connected to a telecommunication system or network.	**N/A**
Annex EE	Articulated accessibility probe (Fig EE.3) is used for assessing accessibility to document/media shredders instead of the Figure 2A test finger		**N/A**
Annex M.2	Continuous ringing signals up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions		**N/A**

IEC60950_1F ATTACHMENT 1			
Clause	Requirement + Test	Result - Remark	Verdict
Annex NAD	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear comply with special acoustic pressure requirements	Equipment is not connected to a telecommunication system or network.	**N/A**

TRF

IEC 60950_1C ATTACHMENT 2			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT 2 TO TEST REPORT IEC 60950-1
CANADA NATIONAL DIFFERENCES

Information technology equipment – Safety –

Part 1: General requirements

Differences according to.....:	CAN/CSA-C22.2 NO. 60950-1A-07
Attachment Form No.....:	CA_ND_IEC60950_1C
Attachment Originator .....:	TÜV SÜD Product Service GmbH
Master Attachment.....:	Date (2012-08)

	Special national conditions		**P**
1.1.1	All equipment is to be designed to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2.		**P**
	Also, unless marked or otherwise identified, installation is allowed per the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.		**P**
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.		**N/A**
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the CEC/NEC.		**N/A**
	For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the CEC are required to have special construction features and identification markings.	Power cord/power supply is part of a separately approved device, which is not considered in this report.	**N/A**
1.7.1	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings.		**N/A**
	A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and		**N/A**
	- if it is part of a range that extends into the Table 2 "Normal Operating Conditions."		**N/A**

IEC 60950_1C ATTACHMENT 2			
Clause	Requirement + Test	Result - Remark	Verdict
	A voltage rating is not be lower than the specified "Normal Operating Conditions," unless it is part of a range that extends into the "Normal Operating Conditions."		**N/A**
1.7.7	Wiring terminals intended to supply Class 2 outputs in accordance with CEC Part 1 or NEC are marked with the voltage rating and “Class 2” or equivalent.		**N/A**
	- Marking is located adjacent to the terminals		**N/A**
	- Marking is visible during wiring		**N/A**
2.5	Fuse providing Class 2, Limited Power Source, or TNV current limiting is not operator-accessible unless it is not interchangeable.		**N/A**
2.6.3.3	Modify first column on Table 2D to “Smaller of the RATED CURRENT of the equipment or the PROTECTIVE CURRENT RATING of the circuit under consideration.”		**N/A**
2.7.1	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is provided for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.		**N/A**
	Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, provided with special transformer overcurrent protection.		**N/A**
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains is in accordance with the NEC/CEC.		**N/A**
3.2.1	Attachment plugs of power supply cords are rated not less than 125 percent of the rated current of the equipment.		**N/A**
3.2.1.2	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment comply with special earthing, wiring, marking and installation instruction requirements.		**N/A**
3.2.3	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.		**N/A**
3.2.5	Power supply cords are no longer than 4.5 m in length.		**N/A**

IEC 60950_1C ATTACHMENT 2			
Clause	Requirement + Test	Result - Remark	Verdict
	Minimum cord length is 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement.		**N/A**
	Flexible power supply cords are compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC.		**N/A**
3.2.9	Permanently connected equipment have a suitable wiring compartment and wire bending space.	Equipment is not permanently connected.	**N/A**
3.3	Wiring terminals and associated spacings for field wiring connections comply with CSA C22.2 No. 0.		**N/A**
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm2).		**N/A**
3.3.4	Terminals for permanent wiring, including protective earthing terminals, are suitable for Canadian/US wire gauge sizes, are		**N/A**
	- rated 125 percent of the equipment rating, and		**N/A**
	- are specially marked when specified (1.7.7).		**N/A**
3.3.5	Revise first column of Table 3E to “Smaller of the RATED CURRENT of the equipment or the PROTECTIVE CURRENT RATING of the circuit under consideration.”		**N/A**
3.4.2	Motor control devices are provided for cord-connected equipment with a motor if the equipment is rated more than 12 A,		**N/A**
	- or if the motor has a nominal voltage rating greater than 120 V		**N/A**
	- or is rated more than 1/3 hp (locked rotor current over 43 A)		**N/A**
3.4.8	Vertically-mounted disconnect switches and circuit breakers have the "on" position indicated by the handle in the up position.		**N/A**
3.4.11	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes have a battery disconnect means that may be connected to the computer room remote power-off circuit.	Not for computer room applications.	**N/A**
4.3.12	The maximum quantity of flammable liquid stored in equipment complies with NFPA 30.	No flammable liquid in equipment.	**N/A**
4.3.13.5	Equipment with lasers meet the Canadian Radiation Emitting Devices Act, REDR C1370 and/or Code of Federal Regulations 21 CFR 1040, as applicable.	No lasers in equipment.	**N/A**

IEC 60950_1C ATTACHMENT 2			
Clause	Requirement + Test	Result - Remark	Verdict
4.7	For computer room applications, automated information storage systems with combustible media greater than 0.76 m^3 (27 cu ft) have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.		**N/A**
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m^2 (10 sq ft) or a single dimension greater than 1.8 m (6 ft) have a flame spread rating of 50 or less.		**N/A**
	For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less.		**N/A**
Annex H	Equipment that produces ionizing radiation comply with the Canadian Radiation Emitting Devices Act, REDR C1370 and/or Code of Federal Regulations, 21 CFR 1020, as applicable.		**N/A**
	Other National Differences		**N/A**
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury have component or material ratings in accordance with the applicable national (Canadian and/or U.S.) component or material standard requirements.		**N/A**
1.6.1.2	A circuit for connection to the DC Mains Supply is classified as either a SELV Circuit, TNV-2 Circuit or Hazardous Voltage Circuit depending on the maximum operating voltage of the supply.		**N/A**
	This maximum operating voltage includes consideration of the battery charging “float voltage” associated with the intended supply system, regardless of the marked power rating of the equipment.		**N/A**
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vpeak or 60 Vd.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.		**N/A**
2.3.2.1	In the event of a single fault between TNV and SELV circuits, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts.		**N/A**
2.6.3.4	Protective bonding conductors of non-standard protective bonding constructions (e.g., printed circuit traces) may be subjected to the additional limited short circuit test conditions specified.		**N/A**

IEC 60950_1C ATTACHMENT 2			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.8.1	Enclosures around CRTs with a face diameter of 160 mm or more reduce the risk of injury due to the implosion of the CRT.		**N/A**
4.3.2	Equipment with handles complies with special loading tests.		**N/A**
5.1.8.3	Equipment intended to receive telecommunication ringing signals comply with a special touch current measurement tests.		**N/A**
5.3.7	Internal (e.g., card cage) SELV circuit connectors and printed wiring board connectors that are accessible to the operator and that deliver power are overloaded.	SELV connectors and PCB connectors do not deliver power.	**N/A**
	During abnormal operating testing, if a circuit is interrupted by the opening of a component, the test shall be repeated twice (three tests total) using new components as necessary		**N/A**
6.4	Equipment intended for connection to telecommunication network outside plant cable is protected against overvoltage from power line crosses in accordance with 6.4 and Annex NAC.	Equipment is not connected to a telecommunication system or network.	**N/A**
Annex EE	Articulated accessibility probe (Fig EE.3) is used for assessing accessibility to document/media shredders instead of the Figure 2A test finger.		**N/A**
M.2	Continuous ringing signals up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.		**N/A**
Annex NAD	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear comply with special acoustic pressure requirements.	Equipment is not connected to a telecommunication system or network.	**N/A**

Attachment No. 3

ATTACHMENT TO TEST REPORT
Photographs

Report Reference No.: PTI-1411085-000

Dated of issue: 2014-11-25

Photographs: (1 of 10)

Verity Scan on Ballot box

IEC 60950_1E – Photo Attachment

Photographs: (2 of 10)

Access stand and Verity Touch on stand

IEC 60950_1E – Photo Attachment

Photographs: (3 and 4 of 10)

Verity Scan and Touch Writer case (front)

Verity Scan and Touch Writer case (back)

IEC 60950_1E – Photo Attachment

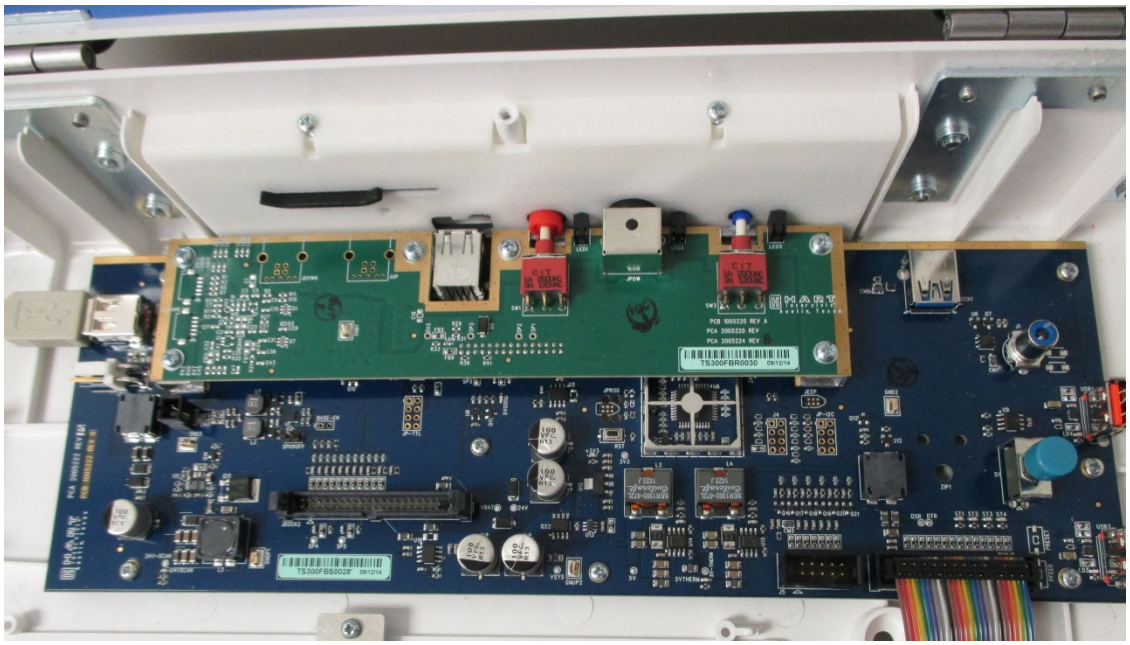
Photographs: (5 and 6 of 10)

Verity Scanner – opened

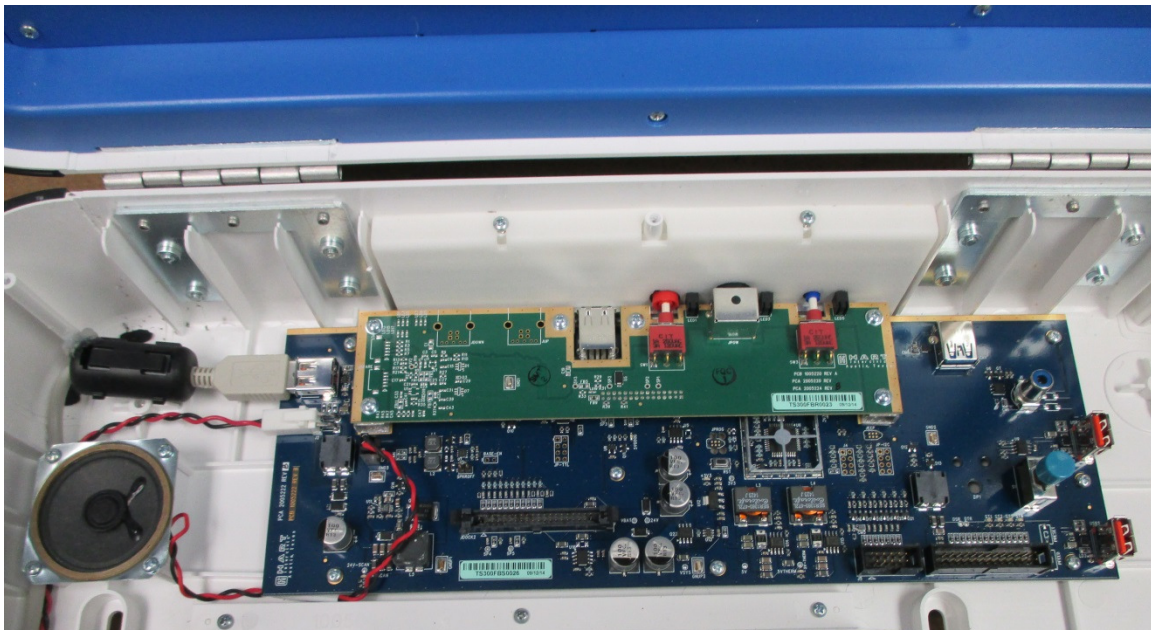
Verity Touch - opened

IEC 60950_1E – Photo Attachment

Photographs: (7 and 8 of 10)



PCB – Verity Touch



PCB – Verity Scan

IEC 60950_1E – Photo Attachment

Photographs: (9 and 10 of 10)

Verity Touch Access pad

Power supply

Attachment No. 4

ATTACHMENT TO TEST REPORT

Report Reference No.: PTI1411085-000

Dated of issue: 2014-11-25

Attachment contains

Cover page ..... : 1 page

Verity Electronics
specification 4005461 .. : 36 pages

Total: 37 pages

Verity System Design

Verity Electronics Specification

CONFIDENTIAL AND PROPRIETARY

Hart InterCivic	
Document Number: 4005-461	Revision: A.04
Document Name: Verity Electronics Specification– Design Document	
File Name: Verity Electronics Specification 4005461 A04.docx	Page 1 of 36

Change History

Version	Date	Author(s)	Description
0.1	10.11.2012	Carlos Gomez	Initial Framework
0.2	10.12.2012	Carlos Gomez	Reformatted, Added more content, Updated Block Diagrams and Text.
0.3	10.15.2012	Carlos Gomez	Added Duplex Scanner Section; ATI Diagram; Docking connector pin-out; power up flow chart. Updated Verity System Diagram; System Requirements Table; Adlink Panel (Tablet); Power & Signal Distribution Board Figure; Microcontroller Required Signaling Table; Base Station Microprocessor Figure. Deleted some Terms and Acronyms from the table.
0.4	10.23.2012	Carlos Gomez	Post Team meeting updates. Thermal printer will be RS-232; Add Fuse to Mains; Added table Field Serviceable, Customer Serviceable, Hart Serviceable; Added Brick Spec; Add Battery Fuse Requirement; Restructured document; Added Back Panel Configuration Table.
0.5	10.26.2012	Carlos Gomez	Added MCU Non Volatile Memory note. Removed Docking signal from MCU
0.6	10.31.2012	Carlos Gomez	Corrected spelling; added ATI module image; Updated Table of figures; Updated Power Block Diagram; removed DRE daisy chain power requirement - TBD; Removed Section 2, terms and acronyms; updated Microcontroller Signal Requirements table; removed 12.1 and 12.2 sections; Revised Battery Requirements Chart; Changed Document Name to Verity Electronics Specification.
1.0	11.12.2012	Carlos Gomez	Revised document to 1.0, Updated Power Block Diagram, Updated Docking Connector pinout table, updated System diagram; updated table of contents, table of tables and table of figures. Added Expansion Header section.
A.00	6.6.2014	Carlos Gomez	Rewrite and Restructure based on Rev. B hardware
A.01	6.20.2014	Carlos Gomez	Rewrite and Restructure based on Rev. B hardware
A.02	7.1.2014	Carlos Gomez	Rewrite and Restructure based on Rev. B hardware
A.03	7.26.2014	Carlos Gomez	Rewrite and Restructure based on Rev. B hardware
A.04	19Nov2014	Hart InterCivic	Updated Figure Numbers Update Power Brick specifications to XP Power 85W

Owners and List of Contacts

Name	Email	Phone	Role	Sign-off
Jim Canter	jcanter@hartic.com	512.252.6410	VP of Engineering	N/R
Steve Blachman	sblachman@hartic.com	512.252.6458	Software Manager	N/R
Dan Gately	dgately@hartic.com	512.252.6817	Supply Chain Manager	N/R
David Smith	dsmith@hartic.com	512.252.6634	Hardware Engineer	N/R

Table of Contents

Table of Figures

Table of Tables

1 PURPOSE OF DOCUMENT

The contents of this document outline Hart's Verity physical Hardware and touch on System Configuration. Tangible hardware such as System Block Diagrams, Schematics, Layout and connectivity will be covered in this document. System Configuration, Software and usage models may be touched on but will not be covered extensively. These topics are reserved for Marketing and Software Manuals.

2 INTRODUCTION

Verity is Hart InterCivic's next generation Voting Equipment designed to meet and exceed the latest VVSG requirements and customer demands. The system can be tailored to satisfy most any Polling place requirement. Verity's modular design allows the customer to request multiple configurations to address their needs from satellite poling centers to central count, all in a compact light solution.

This document will address two fundamental configurations - Touch and Scan. These two along with sub configurations create the matrix for the Hart Voting Experience. ***Figure 1 Touch & Scan*** illustrate the two fundamental pieces of equipment outlined in this document.

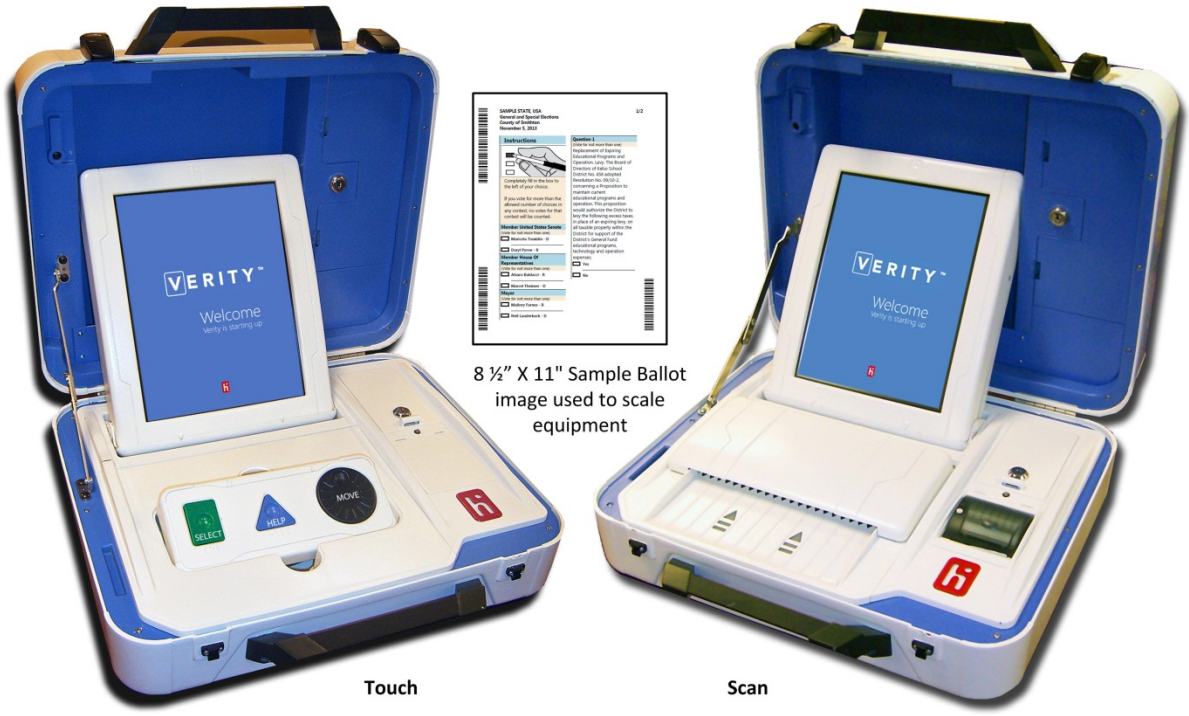


Figure 1 Touch & Scan

Naming conventions: Throughout this document the Bottom half of the equipment or case will be noted as the "Base Station". The top half of the case will be the "Lid" and the removable display will be noted as the "Verity Smart Panel". On the left side of Figure 1 the rectangular device with buttons and a wheel is called the "Access Controller"; on the right side of Figure 1 in the center of the equipment is the "Ballot Scanner" and right of center is the "Thermal Printer". Underneath the white locked panel in the Base Station houses the "USB Memory Sticks".

Figure 2 - Verity Configuration Flow Chart illustrate components common to both configurations and those added by the factory to build Tablet & Scan Systems. The optional Battery and the External COTs printer (not shown) are the only two Customer Configurable devices, the rest are configured in the Factory where the final modules are added under the plastics.

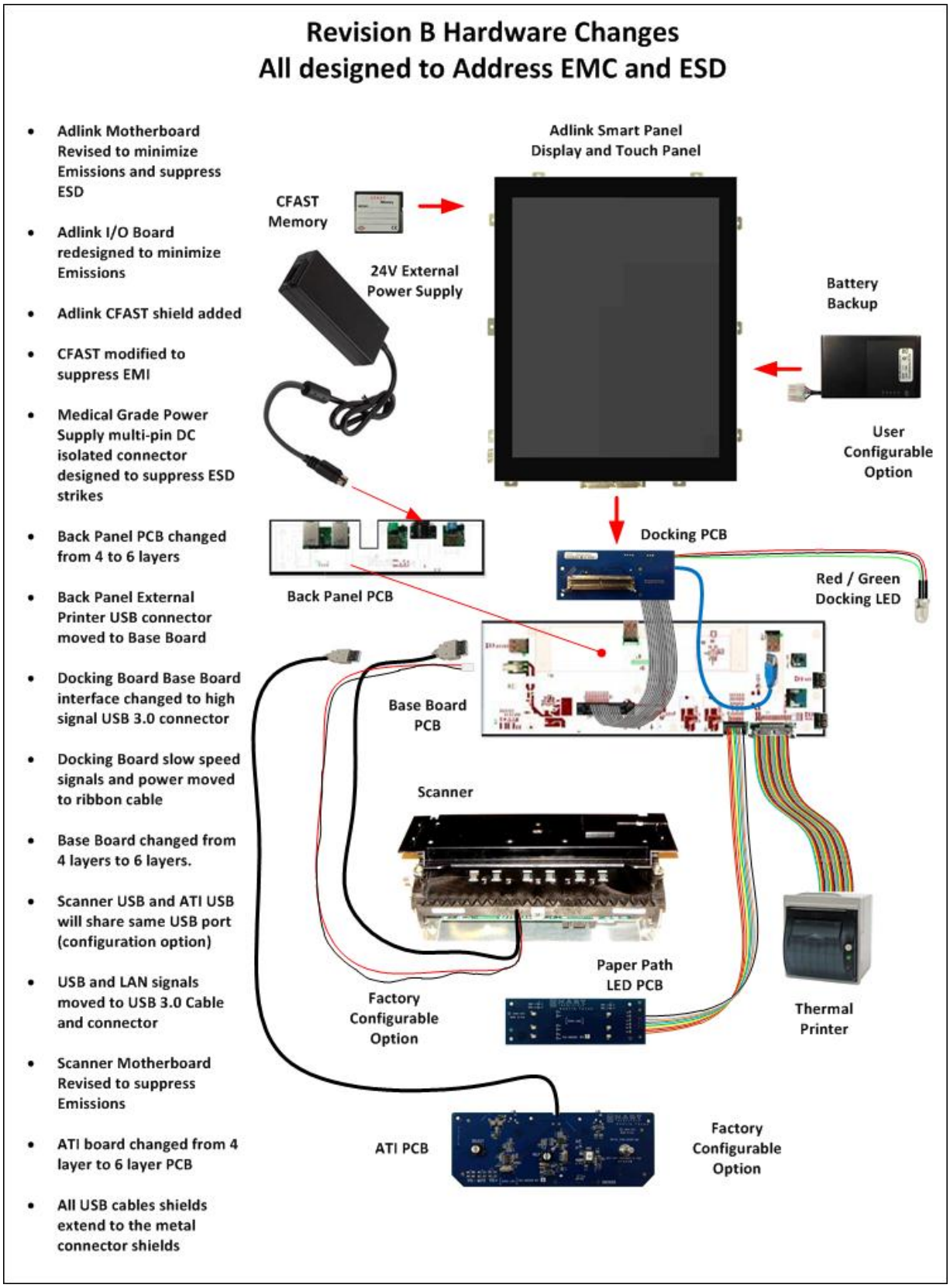


Figure 2 - Verity Hardware Components

Please refer to **Figure 2 - Verity Hardware Components** as a guide for the next section of this document. The flow chart outlines 5 major blocks that make the core of the Verity Configuration. The next section provides an abridged explanation of the various blocks.

1. **Hardware Common to all Verity Configurations**. Starting in the upper left corner moving clockwise:
    a. CFAST Memory will store the Hart InterCivic Specific Code common to all elections. CFAST may also be partitioned to store as a memory backup for Election Data.
    b. Smart Panel Display and Touch Screen. The Smart Panel is designed to operate in "stand alone mode" to address "Curb Side Voting". The Panel is designed to detach from an active base station and run independently on battery backup while undocked from the base station. Combined with the display and touch panel is an x86 Microprocessor Board with USB, Ethernet and COM port interfaces that connect directly to the Base Station.
    c. Battery Cable. The battery cable will be installed by default in most smart tablets. The exposed cable plug is designed to plug into a 2hr battery backup pack.
    d. Docking LED cable and Red/Green LED is used as a visual Docking indicator. Red = undocked or docked improperly. Green = Good connection on the docking connector.
    e. USB Memory will be used to store Election Ballot style and CVR (Cast Vote Records). Data stored in the USB Memory (MBB) is specific to the election.
    f. Base Board PCB is designed for power and data distribution.
    g. Docking PCB is designed to provide the interface between the Smart Tablet and the Base Station.
    h. Back Panel Board interfaces to the outside world. The external power input, power switch, Poll-worker switch, Proprietary Secure USB interface and Proprietary Secure Daisy Chain Ports.
    i. 24V 85W External power supply provides main power. The complete system actually uses less than half of the supply's capability.
2. **Add for Touch Configuration**
    a. An Access Controller and a proprietary secure USB port cable are installed in the factory to configure the system as a Verity Touch System.
3. **Add for Scan Configuration**
    a. A Duplex Scanner is added for the Verity Scan Configuration. Ballots are scanned in from the front and deposited out of the back of the scanner into a secure ballot box.
    b. Power and USB Data Cables power the scanner and pass data through USB to the Base Board and up to the Tablet with a direct path to the Microprocessor motherboard.
    c. Paper Path LEDs and Cable are used as a visual guide in feeding the ballot into the scanner. A set of Red LEDs indicate the scanner is not ready. A pulsing set of Green LEDs indicates the scanner paper path is clear and ready to read a new ballot.
4. **Add for Battery Backup**
    a. The Battery Pack is optional and user configurable. The user decides if they require a 2hr battery backup. The battery only activates under two conditions. In the event of a power outage and if the Smart Tablet is removed and taken for Curb Side Voting.
5. **Add for some Touch & Scan Configurations**
    a. A Thermal Printer and cable are available for configurations that require paper feedback. The printer is powered through the data cable so only one cable is required.

Configuration Matrix:

Please refer to marketing documents for a complete matrix of available Verity Configurations. **Table 1 - Verity Feature Matrix** outlines most common configurations. The chart is included only to familiarize the reader with the flexibility of the equipment and modules.

Verity Feature Matrix						
	Scan	Touch (DAU JBC-Standalone)	Touch (JBC)	Touch (Daisy Chain)	Touch (DAU MBP)	Ballot on Demand (Vote Centers)
Core Components						
Verity Smart Panel	√	√	√	√	√	√
CFAST (Firmware & Backup)	√	√	√	√	√	√
Battery Cable	√	√	√	√	√	√
Hart Docking PCB	√	√	√	√	√	√
Hart Base PCB	√	√	√	√	√	√
Hart Back Panel PCB	√	√	√	√	√	√
USB Memory (MBB)	√	√	√	√	√	√
Docking LED Cable	√	√	√	√	√	√
External Power Supply	√	√	√	√	√	√
Add On (per configuration)						
Battery Backup	√	√	√	√	√	√
Thermal Printer - 2.5"	√	√	√			
ATI Module		(optional)		(optional)	√	
COTS 8.5x17" Printer					√	√
Duplex Scanner	√					

Table 1 - Verity Feature Matrix

3 OBJECTIVE

The objective of this text is to identify and document Verity's hardware and requirements. While doing so, there will be sections of the document that encompass all hardware components regardless of configuration. Other sections of the document will focus on individual components in an effort to outline the usage model, requirement and to provide details of the component.

To reiterate, in some cases, sections within this document will cover a superset of components required for a given configuration – in other words, all components will be present much like the detailed block diagram where no particular configuration is provided. In other cases, sections will be targeted to one given configuration.

Referenced throughout this document will be **Figure 3 - Verity System Overview Diagram** and **Figure 4 - Verity Detailed System Diagram**. Please keep these two drawings easily available.

4 SYSTEM OVERVIEW

Figure 3 - Verity System Overview Diagram provides an overview of available hardware. The diagram is sectioned into 3 major building blocks – the "Verity Smart Panel", the "Base Board & Back Panel Board" and finally the "Peripherals". The "Base Board & Back Panel Board" and "Peripherals" constitute the Base Station.

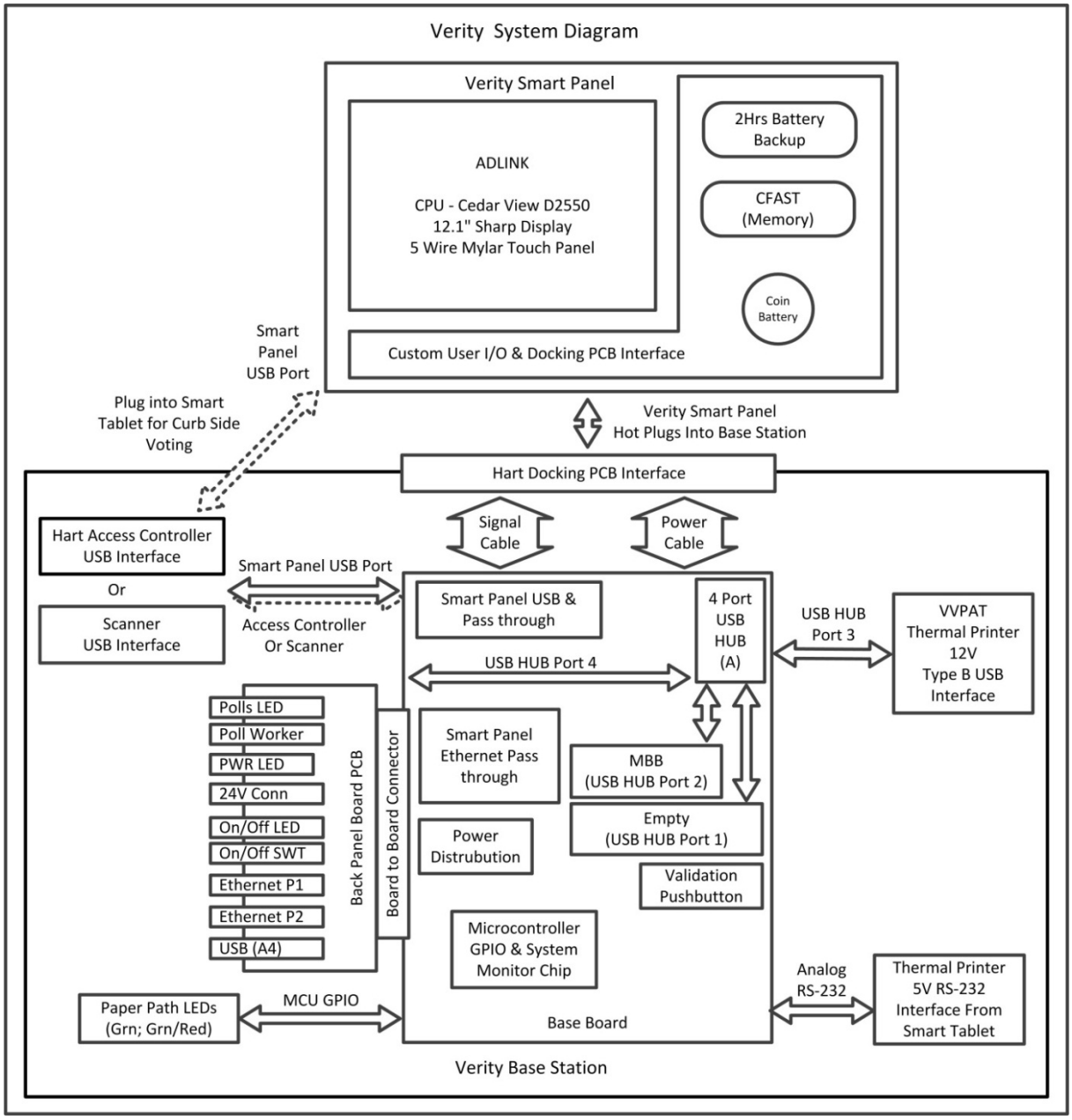


Figure 3 - Verity System Overview Diagram

The Verity Smart Panel, located at the top of the diagram, houses the main CPU, display, touch screen, main memory module and optional 2hr battery backup. Greater details of the Smart Panel are available within this document.

The second major block is the Base Board and Back Panel board. The Base Board provides power and accepts I/O from the Smart Panel. It provides main power distribution throughout the system as well as houses a USB HUB and a standalone MCU which monitors peripherals and provides a communication path to the Smart Panel. The Base Board also provides the ports for the VBPAT,

Thermal printer, Paper Path LEDs and a USB port for the Scanner or the Hart Access Controller. The Back Panel Board provides Input / Output of the outside world. On it are the Polls LED, Poll Worker Switch, Power LED, 24V Power connector, On/Off LED, On/Off Switch, 2 Ethernet Ports, USB Port and a Board to Board connector which provides both Power and Signal interfaces.

The third major functional blocks are the peripherals that provide the system personality or system configuration.

All major functional blocks will be covered in detail later in this document.

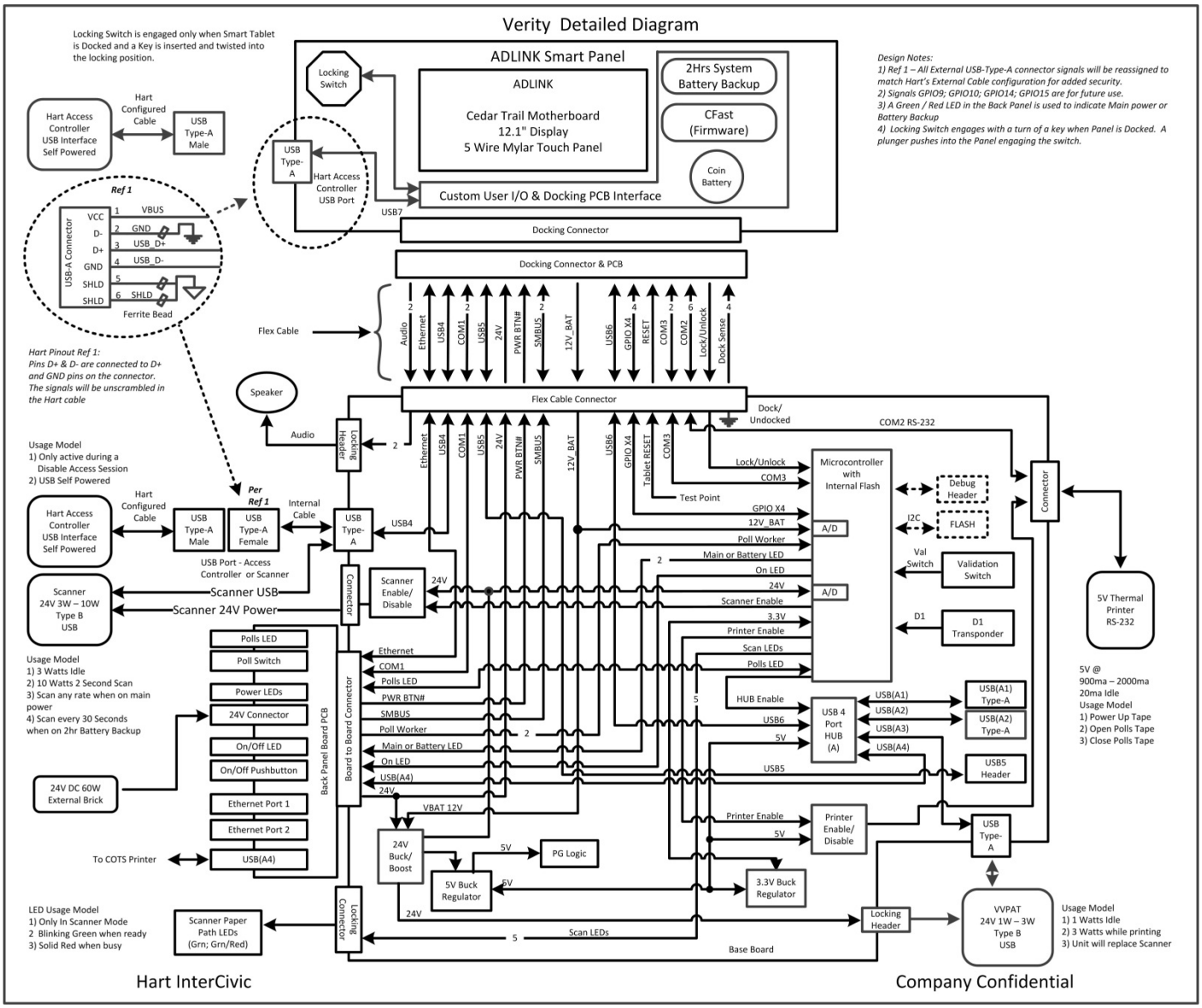


Figure 4 - Verity Detailed System Diagram

Time to market, accuracy, cost of goods, flexibility, light weight and simple to setup are some of the many criteria that drive this design. However disable access is one of the greatest criteria that drive many of the decisions of this design.

In terms of overall system requirement, the following table outlines those criteria. ***Table 2 - System Requirements*** table provides an overview of the system level requirements.

Feature	Comments
Platform	
Cedar Trail Platform	X86 Architecture Platform
Operating System	
Windows Standard Embedded 7	OS
Bios	
Secure Boot Loader	Security based in the BIOS
Spread Spectrum	Designed to suppress EMI
Watch Dog Timer	Used to manage system interruptions
Boot Media	
CFAST	OS, Firmware, Election Backup data
RTC	
Real Time Clock w/ Battery Backup	3 - 5 Year Battery Life
Display	
12.1” XGA LCD Color Display	Display (4:3 Aspect Ratio) Portrait Mode
Touch Panel	
12.1” Touch Panel - 5 Wire Mylar	Touch Panel (4:3 Aspect Ratio) Portrait Mode
Mechanical Access	
Backup Battery Access	Customer accessible compartment
CFAST	Field accessible compartment
RTC Battery Accessible	Field accessible compartment
BIOS Write Jumper	Field accessible - BIOS Write Jumper Factory Configurable
Base Station Microcontroller (MCU)	
Offload Base Station Microcontroller	Controller to handle GPIO, Enables, LED Control
Ethernet Ports	
External Ethernet Port	DRE Daisy Chain Communication Support
USB Ports	
Internal USB Port	Internal USB Port for the system MBB
Internal USB Port	Extra Internal Secure USB Port
Internal USB Port	Scanner / Access Controller Internal USB Port
RS-232 Port	Thermal Printer RS-232 Port
External USB Port	External COTs Printer support
External Tablet USB Port	Tablet USB to support ATI module
System Configurable Hardware	
2.5 inch Thermal Printer	System Status and Tally Report printouts
Duplex Scanner	Ballot Scanner
VVPAT	Electronic to Paper Trail Journal

Access Controller Module	Access Controller for the Visually Impaired
Power	
External Power Button	External Power On Push Button Switch
24V Power Supply	Single External 85W Power supply
System Backup Batteries	2hrs System Battery Backup
Power Control Logic	System must switch between 24V main power and Battery Backup Power
Battery Fuse	Internal Smart Battery Fuse
24V Main System Fuse	Internal Smart Fuse
LED	
Scanner Paper Path LEDs	Ready to scan (Green) & Busy (Red) LEDs
24V / Battery Power LED	Green = 24V; Red = Battery
On / Off LED	Green On LED
System Polling Activity LED	Green LED to indicate Polls are Open
Misc.	
Docking capable Tablet	Support Curb Side Voting
Tactile Switches	Access Controller Module
Tactile Switches	Poll Worker
Tactile Switches	Validation Pushbutton Switch
Tactile Switches	D1 Transducer (FOB)
USB Peripheral Reset Capable	Processor controlled USB Reset to HUB
Shielded Docking Connector	Minimum of 5000 insertions
Audible Speaker	Audible Speaker for User Alerts
Resets	
Internal System RESET	Pushbutton Switch to Reboot / Reset Smart Panel
USB HUB Reset	Reset 4 Port USB HUB from the Microcontroller.
Scanner Enable	Scanner Power Enable to reset the scanner
Thermal Printer Power Enable	Thermal Printer Power management
Expansion Headers	
I2C from Smart Panel	I2C originating from the Smart Panel
I2C from MCU	I2C originating from the on board MCU
USB from Smart Panel	Extra unused USB port directly from the Smart Panel
COM2 Analog port	COM2 Analog from Smart Tablet to Thermal Printer
COM3 Digital port	MCU COM3 from Smart Tablet
COM1 Digital port	Extra COM1 from Smart Tablet to Back Panel
GPIO Pins from Smart Panel	Extra unused GPIO Pins from Smart Panel

Power Rails 24V, 12V, 5V & 3.3V	Expansion headers shall be accompanied by power and gnd.

Table 2 - System Requirements

5 PROJECT OVERVIEW

5.1 Adlink Smart Panel Requirements

The Adlink Smart Panel contains the main processor board, a 12.1" display, touch panel, a 2hr system backup battery, FLASH memory media (CFAST), coin battery, one external USB Port and a docking connector that passes signals to and from the Base Station. To address "Curb Side Voting" the Panel is designed to detach from the base station and run anomalously on battery backup while undocked until the Tablet is returned to the docking station.

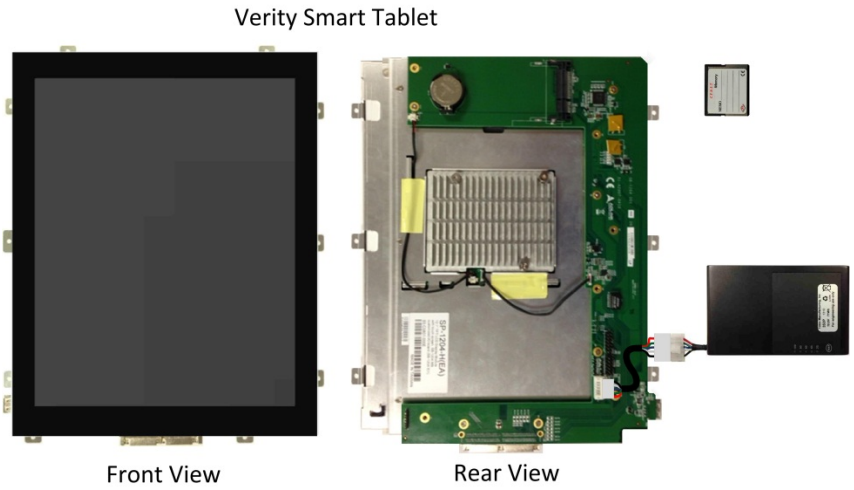


Figure 5 - Smart Panel Images

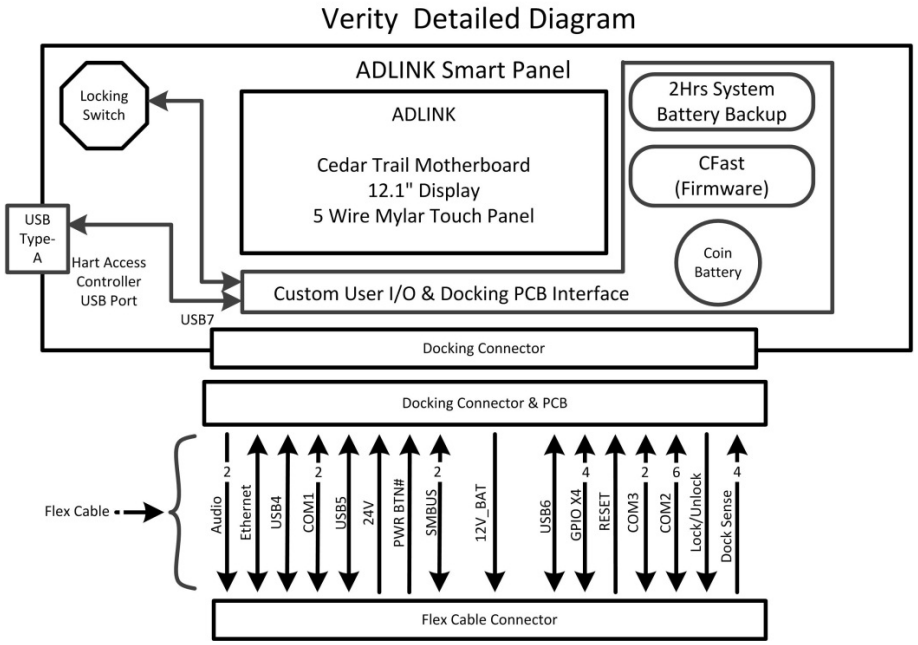


Figure 6 - Adlink Smart Panel Diagram

5.1.1 Operating System

- Windows Embedded Standard 7

5.1.2 BIOS Support

- Custom BIOS support – Custom BIOS support will include:
  - Spread Spectrum
  - Secure BOOT
  - Watch Dog Timer functionality
  - Hart Logo images during power up.

5.1.3 MCU

- Intel Cedar Trail Chip Set – Cedar Trail is the newest Intel Chipset and aligns with Hart's requirement of longevity and low power initiative.

5.1.4 Memory

- DDR3 Memory – minimum of 2G required for Hart's applications.
- CFAST – minimum of 4G required. Firmware and Election Backup will be stored in the CF card. Factory access to the CF card is available.

5.1.5 Power Input

- 24V DC from Base Station – 24V originates from the Base Station and is passed to the Smart Tablet. 24V is always present as long as 24V power is plugged and good. The On/Off power pushbutton does not affect the 24V to the system. The back panel's "Power On/Off" pushbutton switch routes to the Smart Panel. The Tablet controls system power on and off. Please refer ***to Figure 14 - Power Distribution*** and ***Table 6-Docking Truth Table***.
- 12V Backup Smart Batteries – If the system's 24V drops below 12V or is inadvertently removed and the Tablet is active the Smart Panel switches to Battery Backup to provide power for 2 hrs to the Tablet and the Base Station. The Base Station will run on Battery Backup till 24V is restored or the Battery is depleted in 2hrs time.

5.1.6 Connectors

- External USB Port with non-standard pin-out connector – All external communication ports are required to provide non-standard pin-out or non-standard connectors. The Smart Panel's external USB is no exception.
- All internal connectors – connectors not accessible to the user – are high retention or locking connectors.
- Internally accessible Smart Backup Battery Connector – The Battery and cable connect is user serviceable through a back panel door. The interface cable between the Smart Panel and the battery will be via an in series connector.
- Internally accessible RTC Coin Battery – The Real Time Clock coin battery is factory serviceable hidden behind a sealed door or panel.

5.1.7 Support Hot Docking

The Smart Panel supports Hot Docking better known as Hot Swapping. The Smart Panel may be used for curb side voting and seamlessly supports the removal from the base station, travel to the curb under battery power, maintains battery power throughout the voting process and supports reinstallation back to the base station to download the CVR. To accomplish this, the following conditions must be considered; Lock/Unlock, Dock/Undock and the state of the power button. All but Docked/Undocked signals report through the Base Station's MCU to the tablet though COM port 3. Please refer to the power section of this document

- **Lock/Unlock Signal** - A Lock/Unlock alerts the Base Station MCU to an Undocking event. The base station MCU detects the Unlock event and alerts the Smart Panel through serial communication through the docking connector to the processor board. The Smart Panel then takes the appropriate measures to close the communication ports to the base station and prepares for battery backup mode.
- **Dock/Undock Signal** – A 4 corner docking pin configuration is used to ensure that all 4 corners of the docking connector are engaged. A Bi-Color LED indicator provides immediate user feedback. A Red LED indicates the Smart Panel is not docked or is docked incorrectly. A Green LED indicates the Smart Panel is docked properly. The Base Station MCU's communication path is severed when the table is removed. Power to the Base Station will also be terminated.
- **Base Station Microprocessor communication** – The Base Station MCU communicates with the tablet through COM Port #3 which is a 2 signal digital RS232 serial port.
- **On/Off Back Panel Pushbutton**– A push pushbutton triggers a soft On/Off of the Smart Panel. The Smart Panel provides a Base Enable signal down to the Base Station enabling the base station power.

5.1.8 Docking connector Signals

Please refer to ***Table 8 - Docking Station Pin-out*** for details.

Signal	Signal Count	Comment
Amplified Audio	2	Amplified Audio is connected to a speaker in the Base Station. The speaker provides warning tones to the user while in scanning mode.
1 USB Port	2	One USB port originating from the Smart Panel connect to a USB HUB, an Access Controller or Scanner and one port reserved for future expansion.
Ethernet Port	4	Ethernet is used for DRE configuration.
3 Serial Ports	12	One serial port is used for the Thermal Printer, the second for MCU communication with the Smart Panel, the third is a spare going to the Back Panel PCB.
SMBUS	2	Spare signal pair going to the Back Panel PCB.
GPIO	4	Spare GPIO signals go to the MCU.
Docked/Undocked	4	4 pins are used to provide proper docking through a Red / Green LED.
Locked/Unlocked	1	1 pin is used to provide a Locked status to the Base Board MCU.
Power Signals	**Count**	**Comment**
24V Main Power	6	24V provides power to the Smart Panel and the Base Station. The Smart Panel enables or disables Base Station power.
On/Off Pushbutton	1	The On/Off Pushbutton turns the Smart Panel on and off. The Smart Panel controls the Base Station's power
12V Battery Backup	7	The Battery provides 2hrs of operation in the event of a power outage. The battery is located in the Smart Panel.

5.2 Base Station Requirements

The Base Station is configurable per ***Table 1 - Verity Feature Matrix*** to match any polling place requirement from a Scan to a Touch system. For the purpose of this section there will be no delineation between configurations thus all hardware will be identified and discussed. System configuration will not be addressed in this section.

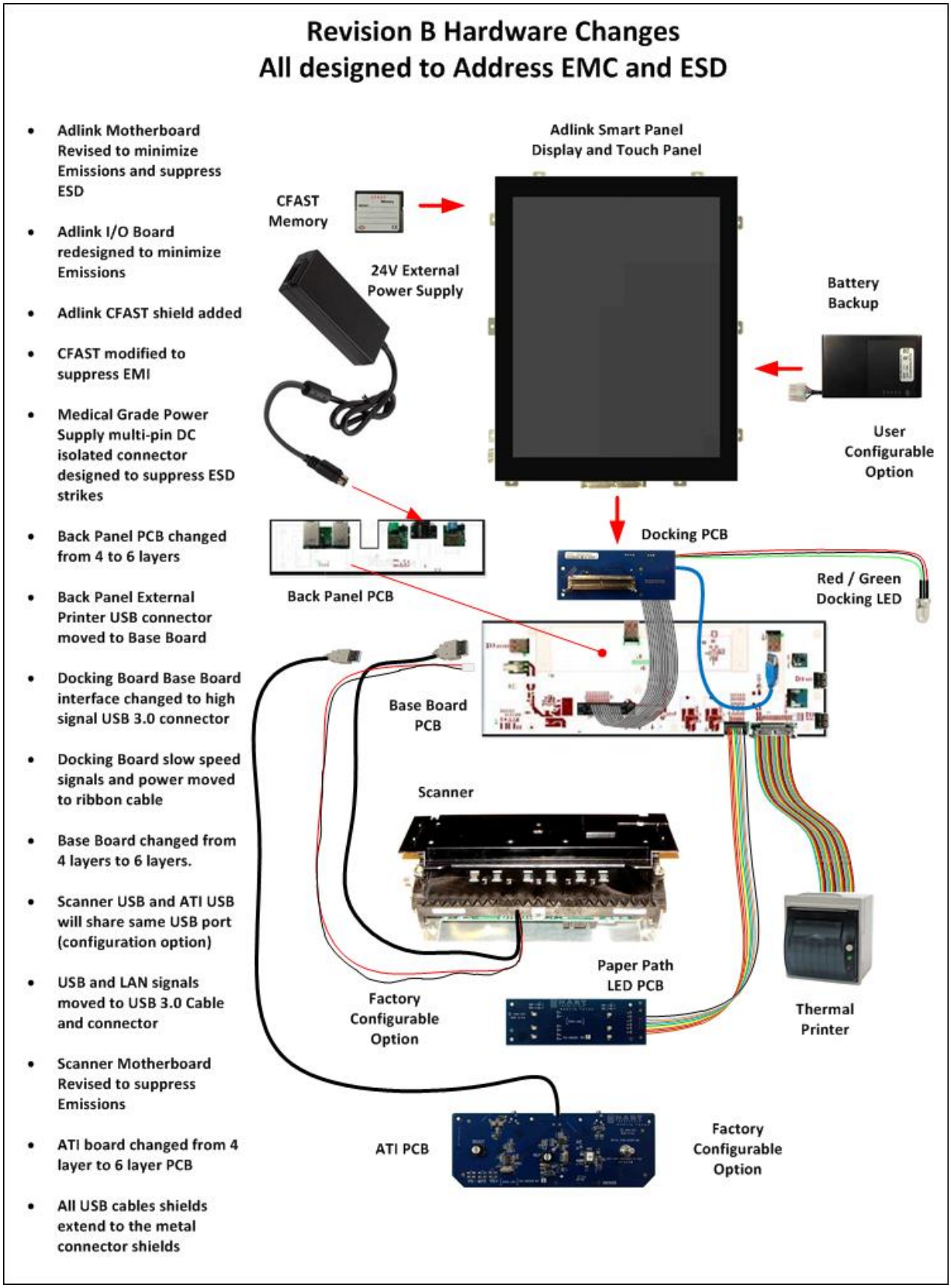


Figure 7 - Base Station Hardware

The Base Station is comprised of several PCBs, Cables, Keyed and Locking headers, LEDs and Hardware modules. The Base Station has 4 main PCBs to distribute power and signals throughout the system – plus an Access Controller Board:

- The Back Panel Board
- Base Board
- Docking connector board
- Scanner LED board
- Access Controller Board

The Base Station also has several pieces of supporting hardware:

- Thermal Printer
- Duplex Scanner
- VVPAT
- Access Control module.

The Base Station is designed to provide the Smart Panel a clear communication path as well as power to manage the complexities of a Base Station and Docking capable Smart Panel combination. The Smart Panel seamlessly transitions from a docking position to an undocked autonomous unit till it is returned to the Base Station's docking connector to off load data.

5.2.1 Main PCB Boards

There are 4 main PCB boards used to distribute power and signals. Each will be outlined below.

5.2.1.1 Back Panel Board

The Back Panel Board Figure 6 - Back Panel Board is the main external system interface and is located in the back of the system. The board is comprised of – from left to right:

- Polls Open/Closed LED
- Poll Worker Pushbutton Switch
- Green (24V) / Red (Battery) Power indicator LED
- 24V external Power Connector
- Green Power ON indicator
- On/Off pushbutton power switch
- Ethernet Port 1
- Ethernet Port 2
- USB port

Figure 8 - Back Panel Plate

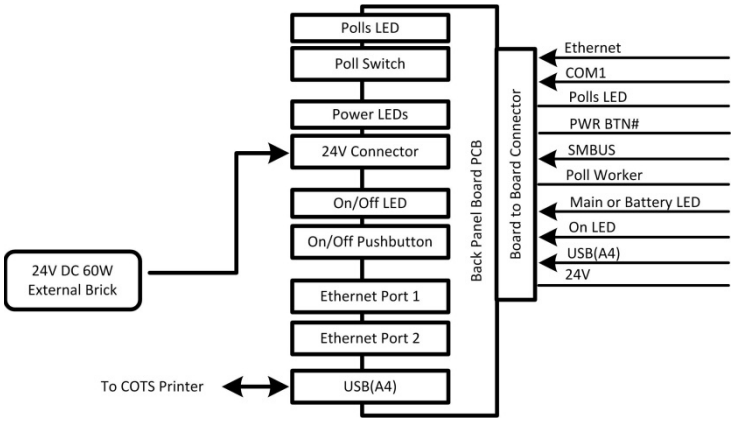


Figure 9 - Back Panel Diagram

- **Open/Closed Polls LED -** A Blue LED indicates Polls open**.**
- **Poll Worker** Pushbutton – The Poll Worker pushbutton is monitored by the Base Board's MCU. The functionality of this button is determined by the system firmware.
- **Power LED indicator** – A Green (24V) and Red (Battery) LED is used to provide visual status between Main and Battery power.
- **24V Power Connector** – DC power from an in line power brick provides main power, Gnd (Digital Gnd & Shield) to the system through this standard 3.5mm barrel connector.
- **On/Off LED** – A Green LED illuminates when the system is powered on.
- **On/Off Power Pushbutton** – A pushbutton switch triggers a soft On/Off of the Smart Panel. The smart panel then sends a signal down to a 24V FET Enabling the base station.
- **2 External Ethernet Port** – All external ports are required to provide non-standard pin-out (not to destroy standard appliances) or non-standard connectors. These two Ports will are used to provide Daisy Chain communication between DREs.
- **External USB Port** - All external communication ports provides non-standard pin-out (not to destroy standard appliances) or non-standard connectors. This port is used to provide communication to a COTs printer.
- **Multi signal Internal Locking Interface Header** – Interfacing the Back Panel Board and the Base Board is a multi-signal board to board connector.

5.2.1.2 Power and Signal Distribution Board

Figure 10 - Base Board Image is a photo of a Base Board. The black connector located in the Bottom Right Center interfaces to the Back Panel board. The two connectors above it are the Docking Board cable Connectors. One power cable and one data cable provide the power and signals required to support the Smart Panel. The board will be described in detail in the following sections.

The Base Board distributes both power and signals to the rest of the base station as well as provides power and communications to the tablet. I/O connectors, functional logic blocks, one USB HUB, an MCU, power regulators all reside in the distribution board as illustrated in ***Figure 7 – Base Board***.

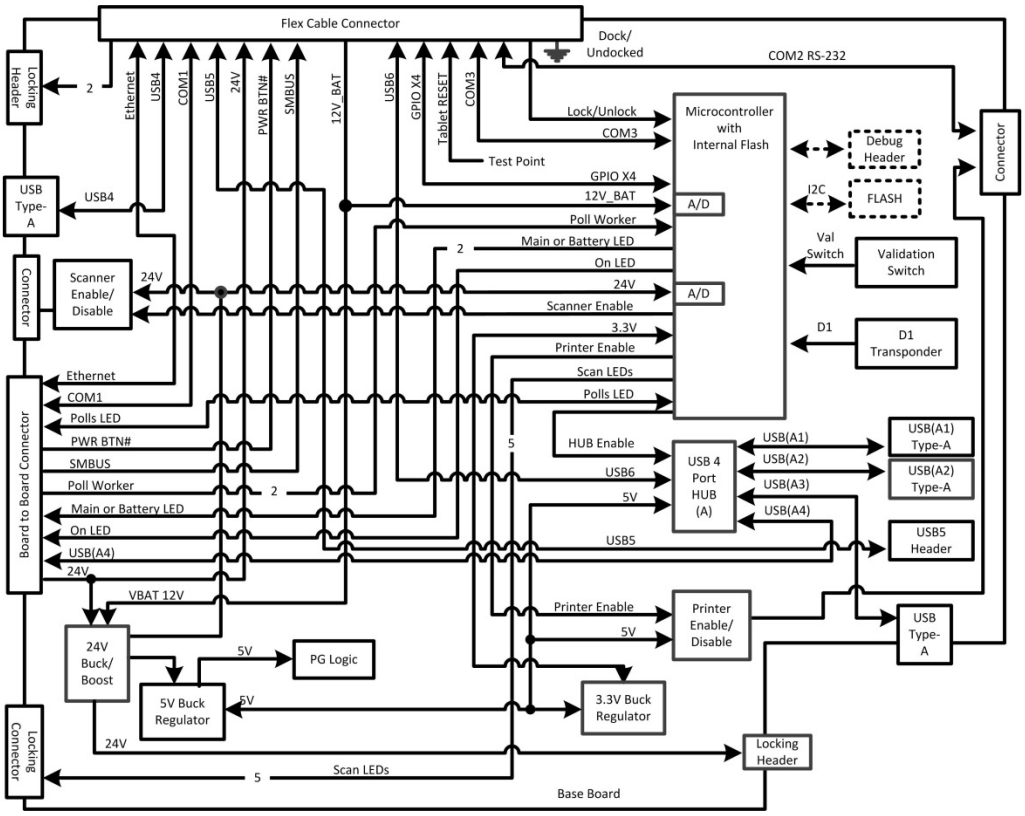


Figure 10 – Base Board

- **I/O Connectors & Headers** – The Base Board has several styles of headers and connectors. All connectors are keyed and lockable to avoid accidental miss insertion and accidental disconnect. Horizontal mounting connectors are preferred where possible to minimize height clearance issues. All Internal common USB port connectors are high retention where possible. There are 8 locking headers and 3 Type-A USB connectors on the board. Starting at the top center going clockwise we have the following.

  - **Back Panel Multi Signal Header** – A mixed signal board to board header provides the interface between the Base Board and Back Panel board. Signals included in this header are: 1 Poll Worker signal, 1 downstream USB Port, 1 Ethernet Port, 3 signals for Main or Battery power, , On/Off Power LED, pins for Power and Gnd and one signal for power On/Off.

  - **4 Port USB HUB -**
    - One port is used to provide an MBB Memory Port
    - One port is used for expandability – spare port
    - One port connects to the Back Panel PCB for external connectivity
    - The last port can be used for VVPAT device.

  - **VVPAT Printer** – VVPAT power originates from a 24V Buck/Boost Regulator. USB communications originate from the on board USB HUB.

  - **D1 Wire** – The D1 Wire is a Transducer used in conjunction with a FOB that sends a signal to the MCU alerting the application that the poll worker needs to intervene. There are multiple applications that may utilize this feature however from a hardware perspective one signal triggers the alert. How the firmware utilizes this feature is dependent on the application.

- **Validation Pushbutton** - One pushbutton switch is required to provide a user Validation signal to the Base Board MCU. The switch will be a momentary push button.

- **Thermal Printer Connector** – Thermal Printer power and COM signals utilize one ribbon connector. The Thermal printer is powered from a dedicated on board 5V Buck regulator. RS-232 communications originate from the Smart Panel's analog COM port.

- **LED Scanner Paper Path Header** – One TTL Level power connector supplies power to 2 sets of LEDs required for Poll Worker or Voter feedback. Please refer to the LED section for the functionality of the LEDs.

- **Flex Cable Docking Connector** - Note that one end of a flex cable located between the Smart Panel and the Base Station is plugged into this connector. All efforts have been taken to maintain differential impedance where possible. The following signals will be present on the connector:
  - **Analog Audio Output Port** – Analog out passes through the docking connector to the base station where it is connected to a speaker. The speaker provides warning tones to the user while in scanning mode.
  - **Ethernet Port** – the Ethernet port passed through the base board to the back panel where it is used to provide DRE connectivity.
  - **Three USB Ports** – Three USB ports pass from Smart Panel to the Base Station. The first USB port passes through to the base board and supplies connectivity to the Access Controller module or a Scanner through an internal connector. The second USB port is used on the base board to supply a 4 Port USB HUB, the third USB signal is used to provide connectivity through a connector to a VVPAT dependent on the system configuration.
  - **24V Power** – 24V is the main power supply to both the Smart Panel and the Base Station. 24V main power is filtered and passed up from the base station to the tablet.
  - **On/Off Pushbutton Switch Detect** – One signal passes up from the base station to the tablet indicating a push button event. The Tablet monitors the pushbutton switch for activity. It the tablet is off and it receives a push button event the tablet will turn off. If the push button is held down for more than 3 seconds and the tablet on, the tablet will turn the system off. These two features can be overridden in the application or firmware.
  - **12V Backup Battery** from the Tablet – In the event of a power outage the Smart Panel will provide system power for a minimum of 2hrs.
  - **Two Rx/Tx serial Ports** – One of two serial ports is used to communicate to the base station microprocessor. The Rx/Tx originates in the Tablet and is passed down to the Base Station through the docking connector to the processor. The other port connects to the Thermal printer – this second port is analog and contains the full communication signal suite.
  - **Lock/Unlock Signal** – A Lock/Unlock signal connect from the Smart Panel to the on Base Board MCU where it is monitored. .Locked will report a 0 to the processor, unlocked will report a 1.

- **Scanner / Access Controller USB Type-A Connector –** The Scanner and the Access Controller use the same USB Port. This port connects directly to the Smart Panel. Signal originate from the Smart Panel USB port and pass down through the docking connector into the Base Board PCB to this connector. A standard high retention USB type-A connector is used.

- **24V Scanner Power** Header – One 24V power connector supplies power to the Duplex Scanner. Supplying power to the Scanner is a BUCK/Boost regulator. Power is maintained even on low Battery Power as low as 7.5V.

- **Analog Speaker Header (2 pin) –** Analog out passes through the docking connector and to the base station where it is connected to a speaker. The speaker provides warning tones to the user while in scanning mode.

5.2.1.3 Access Controller

The Access Controller module is a part of the system but it does not reside inside the Base Station so this module will not be addressed in this section. ***Please refer to the Access Controller Module section of this document.***

5.2.2 Functional Blocks

Multiple functional blocks will be identified in the following section. Each is designed to best known methodologies to maintain quality.

5.2.2.1 24V Filter & Power Distribution

The Base Board's 24V power input is filtered through an In-Rush and Smart Fuse integrated circuit. This circuit provides ESD, EMI and Inrush system protection.. .

5.2.2.2 5V Buck Regulator

The 5V buck regulator is capable of switching from 24V Mains power to 12V – 8V battery backup instantaneous. It supplies 5V @ peak amperage of 3.5A and a steady state of 1.2A.

5.2.2.3 Microcontroller

The primary task of the microprocessor is to serve as an "offload engine" for the voting base station. It is under host computer control via a TTL level RS232 bus (Tx/Rx). This microprocessor communicates through a Windows 7 system over a serial port. Please refer to ***Table 3 - Microcontroller Signal.***

The Microcontroller powers up in a known state enabling all peripherals to power up on demand. The MCU is programmed at the factory only – there are no user program capabilities.

Name	Function	I/O	Sample Rate	Pass State through Serial Port	Comment
Communications					
Rx/Tx	Processor Serial Port	Bidirectional	Standard	Yes	Communications with the Table (3.3V Positive Logic Level TTL)
Debug Serial Port	Debug development	Bidirectional	Standard	No	Debug serial port – not user accessible.
MCU GPIO-O					
Polls Open Blue LED	Indicate Polls Open	Output	500ms max	No	Polls open BLUE LED
Power Green LED	Main Power	Output	500ms max	No	Indicates Device is under Main Power
Power Red LED	Battery Power	Output	500ms max	No	Indicates Device is under Battery Power
Scanner_Enable	Enable or Disable	Output	One time	Yes	Signal to disable

	scanner		event		scanner power
HUB_Reset	Reset 4 Port USB HUB	Output	One time event	Yes	USB HUB Reset
Thermal Printer Enable	Enable or Disable thermal printer	Output	NA	Yes	Used for System Power Management.
Scanner Paper Path LED(1) Green	Green Paper Path LED(1)	Output	500ms	Yes	The state of the LEDs originals from the tablet app through the protocol
Scanner Paper Path LED(2) Green	Green Paper Path LED(2)	Output	500ms	Yes	The state of the LEDs originals from the tablet app through the protocol
Scanner Paper Path LED(3) Green	Green Paper Path LED(3)	Output	500ms	Yes	The state of the LEDs originals from the tablet app through the protocol
Scanner Paper Path LED(1) RED	RED Paper Path LED(1)	Output	500ms	Yes	The state of the LEDs originals from the tablet app through the protocol
Scanner Paper Path LED(2) RED	RED Paper Path LED(2)	Output	500ms	Yes	The state of the LEDs originals from the tablet app through the protocol
GPIO-I					
Lock/Unlock	Unlocking Activity Signal	Input	250ms	Yes	Unlock Activity alter to processor
Poll Worker	Poll Worker pushbutton Switch	Input	100ms	Yes	Poll Worker pushbutton
Validation Switch	Validation Switch Enable	Input	250ms	Yes	Pushbutton Indicate Validation Event
Power On/Off	Power Button	Input	100ms	No	Push Button power button
Special Functions					
VBAT_12V	A/D Converter Input	Input	1ms	No	Processor to detect battery levels and report Green, Yellow, Red status to the appropriate LEDs. Comparator may be useful.
24V	A/D Converter Input	Input	1ms	Yes	Processor to detect 24V levels and report Green, Yellow, Red status to the appropriate LEDs. Comparator may be

					useful.
I2C	I2C port	Bidirectional	Standard	Yes	I2C communication to an external FLASH.
Non Volatile				Yes	128bytes 1M write cycles
Non Volatile				Yes	128bytes 1000 write cycles

Table 3 - Microcontroller Signal Requirements

5.2.2.4 On Board 4 Port USB HUB Chip

One 4 Port USB HUB is required to support the Base Station's USB requirements. Three USB Ports from the Smart Panel are passed down through the docking connector and onto the Power Distribution Board. One of these 3 Smart Panel USB downstream ports is used to communicate to the on board 4 Port USB HUB.

5.2.2.5 Scanner Buck/Boost Regulator

The Scanner Buck / Boost Regulator instantaneously transitions between 24V Main power input to 12V – 8V Battery Backup voltage, without compromising load conditions. The regulator also has a power enable input to cycle power on the Base Station.

6 SUPPORT HARDWARE

6.1 Thermal Printer

The Thermal Printer's power and RS-232 Communications are included in one ribbon cable connection. A dedicated 5V on board regulator is used to power the device. The MCU has the ability to enable or disable the printer on demand for power management if required.

Please refer to the Seiko DPU-D2/D3 Series Thermal Printer technical reference manual for product specific information. The following table provides a snapshot of some of the parameters.

Thermal Printer Requirements		Comments
Interface	RS-232 / USB	Analog signals
Voltage	5V	
Drivers	Windows 7	
Memory	Rx Buffer	4Kbytes
Paper	Width	57mm
	Type	55-70 g/m2
	Roll Diameter	max.050 mm
Temp	Operating	-10-50'C
	Storage	20'C - 60'C

Humidity	Operating	30-85% Rh
	Storage	15-90% Rh
Dimensions	Length	69mm
	Width	80mm
	Height	85.5mm
Weight	In Grams	120
Specs	Resolution	8 dot/mm
Printer Speed	Lines / sec.	80 mm/sec max

Table 4 - Thermal Printer Requirements

6.2 Duplex Scanner

6.2.1 Hardware Requirements

Outlined below are the hardware requirements for the digital scanner. The PDI scanner meets all requirements.

- The scanner will scan paper in width of 8.5 inches ONLY.
- The scanner paper length should be a minimum of 5 and ½ inches, and a maximum of 24 inches at a scanning speed of no less than 8 inches per second.
- The scanner will require traction wheels in front of, and behind the scanner heads, to allow the scanner to "hold" a ballot in "Escrow" while the ballot image is processed; once the image is processed, the traction wheels can advance the ballot to the ballot tub.
- The scanner must support a reverse action for the traction wheels. This allows for the ballot to be returned to the voter in the case where the ballot is rejected.
- The scanner must be duplex, scanning both the front and back sides of a ballot in one pass.
- The scanner must support a USB 2.0 High-Speed device interface.
- The scanner must support image processing in hardware. At a minimum, image processing supported by the scanner allows for:
    - Image de-skew
    - Image contrast
    - Image brightness
    - Image sharpen/blur
    - Image cropping
    - Image de-speckle
    - Image scaling

6.2.2 Software Requirements

Outlined below are the software requirements for the digital scanner as a required component of the Verity Scan:

- The scanner must have a native software device driver for the Windows Embedded Standard 7 operating system
- The scanner device driver must allow the application to programmatically adjust image-processing parameters. A minimum requirements list contains:
    - Contrast level
    - Brightness level
    - Sharpness/blur level
    - De-skew ON/OFF
    - Cropping ON/OFF
    - Sharpness ON/OFF

    - Auto-calibration mechanism or mode
- The scanner device driver must allow low-level motor control to allow the application to advance or reject a scanned ballot:
    - Scanner motor direction (forward or backward)
    - Scanner motor ON
    - Scanner motor OFF
- The scanner device driver must support three USB “transfer types”
    - BULK TRANSFER, to transfer the scanned image from the scanner to the V-Scan.
    - INTERRUPT TRANSFER, to allow the V-Scan to receive notification from the scanner that a ballot has been scanned and is ready for a BULK TRANSFER.
    - CONTROL TRANSFER, to allow the V-Scan to receive status messages from the scanner, and to allow the V-Scan to transmit configuration messages to the scanner.

6.3 Access Control Module

The ATI module has 3 tactile Buttons, one USB Audio Port, one port for 2 external tactile buttons and a custom Hart USB cable. Jacks for headphones and adaptive devices are located at the top edge of the device. The device also has a gripping surface on either side.

6.3.1 Block Diagram

The Access Control Module has the following major functional blocks: 2 Port USB HUB to provide downstream communications to a USB Audio 2.0 device and a USB HID device. The Audio Device provides the user an audio stream with directions and ballot content. The USB HID device provides tactile interface for a Rotary 2 phase Decoder, a Help Button, an Enter Button, and two External Tactile switches which are designed to take the place of the Enter, the Help and the Rotary Decoder.

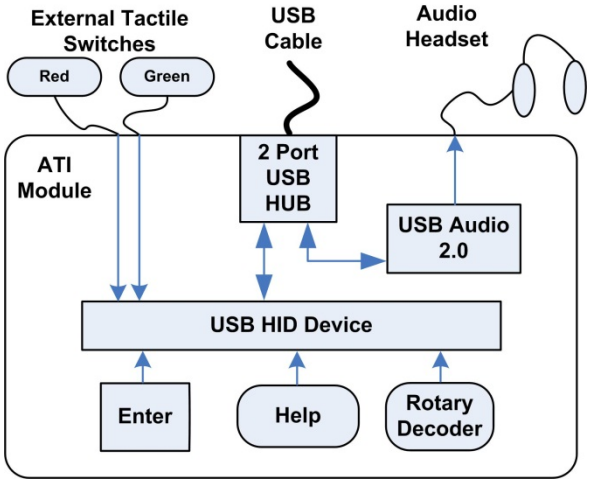


Figure 11 - ATI Block Diagram

6.3.2 Mechanicals

The device shall have three buttons, each button will have a unique color; colors TBD

- “SELECT” button
- “HELP” button
- “MOVE” wheel

Orientation of buttons shall be:

- SELECT – far left; rectangle shape
- HELP – middle; triangular shaped
- MOVE – far right; circular wheel provides navigation through a ballot.
- Each button is equipped with Braille text

Figure 12 - Verity ATI Module Image

7 USB EXTERNAL PORTS

All external USB and Ethernet ports are connected in a nontraditional pin-out or a non-typical connector to deter connectivity with non-Hart Components. **Figure 16 - USB External Connector Pin-Out** illustration outlines Hart's External USB configuration. Special Hart Proprietary cables are custom made to interface with external USB ports.

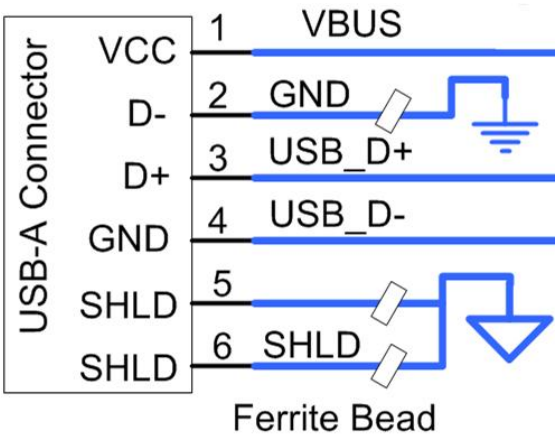


Figure 13 - USB External Connector Pin-Out

8 SYSTEM LED FUNCTIONALITY

There are several sets of Single and Bi-State LEDs in Verity that provide user feedback. The following section describes those LEDs.

1. Blue Polls LED - Located on the Back Panel is a Blue LED which indicates the state of the Polls. Open = On; Closed = Off.

2. Green / Red Power LED - One Bi-State LED located on the Back Panel is used to indicate if the system is powered by 24V main Power or Battery Power. A Green LED indicates the system is running on 24V Main Power. A Red LED indicates the system is running on Battery Power.
3. Green On/Off LED – A Green light indicates the system is on. No light indicates the system is off.
4. Docking LED – A docking LED located on the Base Station below the Memory Access Lock (where the USB memory is stored) is used to indicate the state of the Smart Panel and the docking connector. Once power is applied to the Base Station the Docking LED will illuminate. If the Smart Panel is undocked or has a poor dock the LED will shine Red. If the Smart Panel is successfully docked the LED will turn Green.
5. Paper Path LEDs – There are 3 sets of Bi-State Green / Red LEDs indicating scanner readiness. If the scanner is ready to accept a ballot a series of blinking green LEDs will guide the user to insert the ballot. If the scanner is not ready a set of Red LEDs will remain in steady state on till the scanner is ready for a ballot. Please refer to the following illustrations:

Green LED will provide Poll Status. The tablet will drive three states: OFF, Solid Green "open polls" or blinking green "voting session in progress"

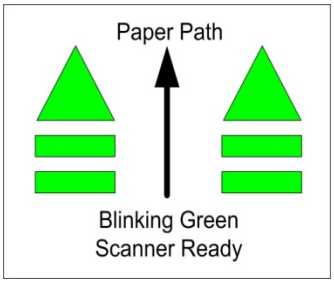


Figure 14 - Scanner Ready Blinking Green

One set of solid Red LEDs will be active when the scanner is not ready or busy. When the Red LEDs are active the scanner is not ready to accept a new ballot.

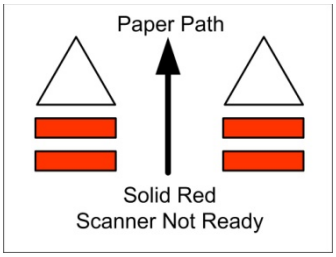


Figure 15 - Scanner Busy / Not Ready

9 POWER BUDGET

Current Ratings & Power in Watts				
	Watts			Comment
	Min	Nom	Max	
Adlink Motherboard	3.00	4.01	7.01	Measured in Watts
Display Backlight	6.00	8.40	9.63	Backlight 100% = 9.63W
Display Logic	2.34	2.34	2.34	Display Logic
Scanner	3.00	3.00	10.00	1.2A (max, scanning) 1.8A (Peak)
Base Board	3.00	3.50	4.50	Currents measured in Amps
Thermal Printer	0.00	0.00	8.25	1.07A max - Assume off when not in use
Peak Watt Totals	17.34	21.25	41.73	Totals

Table 5 - Power Budget Table

10 SYSTEM POWER

There are two power sources for the Verity system. Main power is supplied by an external 24V DC supply. Secondary power or Battery Backup is available when main power is inadvertently removed. Battery backup is located in the rear of the Smart Panel.

- **Power "On/Off" states** - The Tablet monitors a On/Off pushbutton switch mounted on the back panel board. When pressed, the tablet will perform a soft power up and send a "Base Station Enable" signal to power the Base Station. A second push button will turn the system off. A pushbutton and hold event will power the Smart Panel down immediately. These three states can be modified or ignored by the application. However for this section of the document we will assume the three states are valid. When the tablet detects the Off push button event the Base Board Enable signal becomes tri state and turn the Base Station off.

Please refer to ***Figure 14 - Power Distribution*** as a guide for the **Verity Power distribution.**

1. The Back Panel supplies 24V to the Smart Panel always. The On/Off push button is not connected to the 24V power rail. 24V is always be present on the docking connector at all-time unless the power supply is not plugged in.
2. An “On/Off pushbutton switch” located on the Back Panel provides a signal that passes through the Base Board to the Docking Board to the Smart Panel.
3. The Tablet senses a button push and powers up the Smart Panel
4. The Smart Panel, in turn, asserts a "Base Station Enable" to power up the base station.
5. The Smart Panel haves full control over the power states.
    - Push button event powers the tablet. The tablet powers the base station
    - A second push button event begins to power the system down. The tablet will power down the base station and then power itself off.
    - When the tablet is removed, the “Base Station Enable” signal is removed and the base station is powered down.
    - When the tablet is returned and running on Battery power and is on, the “Base Station Enable” signal returns and the base station is powered up.

10.1 System Power Truth Table

Actions	With Battery	Without Battery	On Dock	Off Dock	Display On (off Dock)	Display Off (Off Dock)
Base Pushbutton Power Switch Pushed “On”	System on (Emulate power on button event)	System on (Emulate power on button event)	System on (Emulate power on button event)	Remaining power state	Remaining on	Remaining off
Base Pushbutton Power pushed a second time (Switched off)	System off (Emulate power on button event long press for soft off)	System off (Emulate power on button event long press for soft off)	System off (Emulate power on button event long press for soft off)	System off while display module back on docked	Remaining on	Remaining off

Table 6- Docking Truth Table

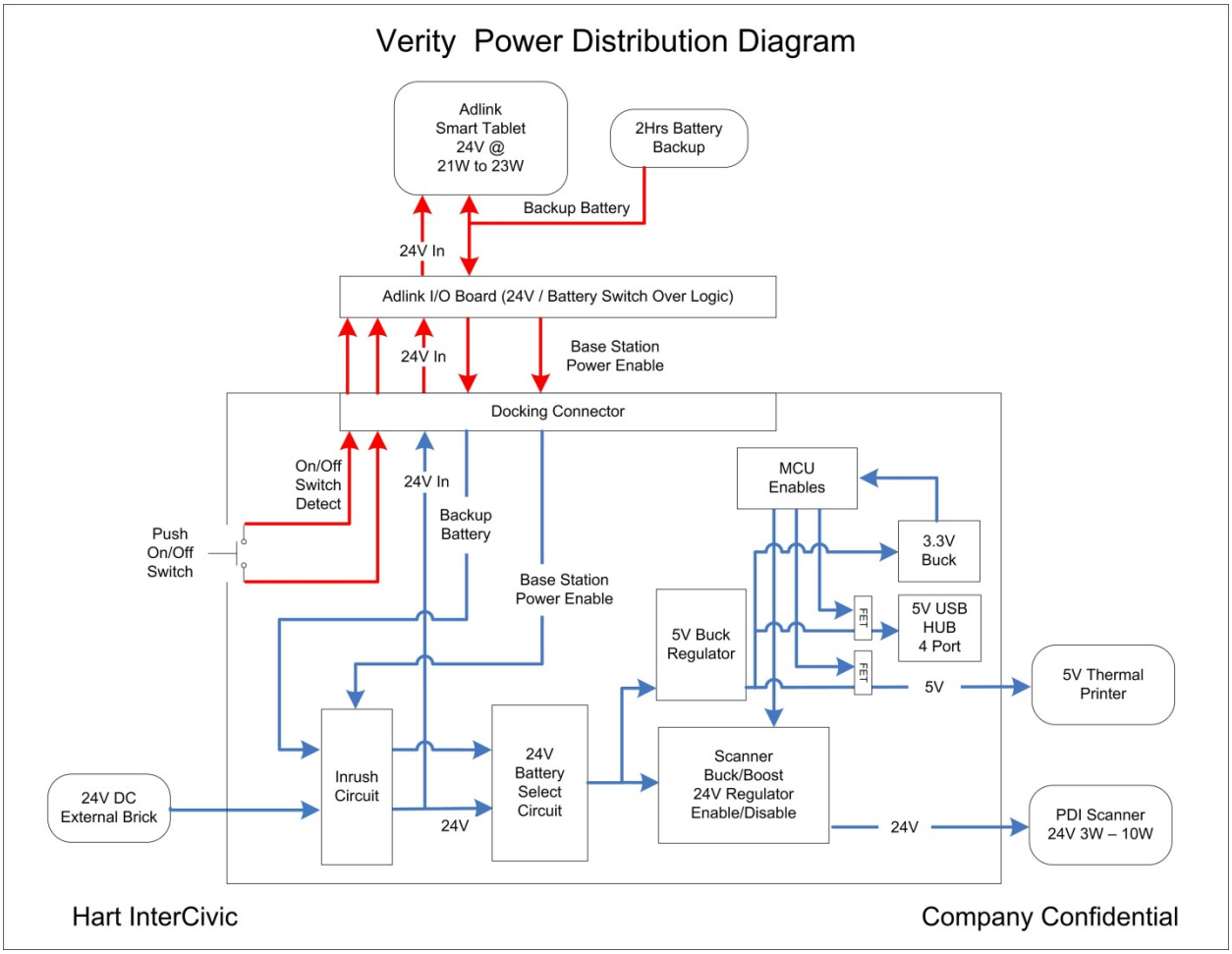


Figure 16 - Power Distribution

11 BATTERY REQUIREMENT

Batteries will be charged outside of the Verity Systems. There is no Battery Recharge capability inside the Verity System. The batteries will be charged by county personnel in warehouse setting using battery vendor recommended chargers.

Please refer to ***Table 5 - Power Budget Table*** for power budgets.

Subject	Requirement	Comment
Power Output	12V – 9V	Battery fully charged will measure 12V. A discharged battery will measure 8V or less.
Connection	7 pin Pigtail	3 to 5 inch Pigtail
Amp/Hour	6600mAH	Battery configuration sets this figure to +/- 5% which is acceptable
Case	Hard Plastic mandatory	Battery package is hard plastic to avoid issues with Li-Ion safety given our usage and handling model.
Buss	I2C	Battery Communicates through 12C
Smart Battery	Gas Gauge	The OS provides a gas gauge for the user.
LED status	Optional	Smart Battery provides a series of LED which indicate charge strength.
Safety Circuit	Mandatory	Built in safety circuitry is standard on Li-Ion batteries.
Charge Circuit	System will not charge batteries	Gang charging under warehouse or office conditions recommended.

Table 7 - Battery Requirements

Please refer to HART 3S2P NCR18650A Battery Pack Specifications for Battery backup details. The chart below provides a snapshot of several required parameters.

Agency	Mandatory	UL 60950 and UN
Agency Test	Mandatory	Certification tests done by manufacturer
Shock/Vibe	Mandatory	MIL-STD-810D
Drop Test	Mandatory	MIL-STD-810D, (4” drop test)
Dimensions	TBD	TBD by manufacturer with Hart's input
Operating Temperature	-20 to +60’C	Discharge rating
Storage & Transportation Temperature	-20 to +35’C	Storage
Operating Humidity	45% to 85% RH non-condensing	Operating and storage
Recharge Cycles	Within 4 to 6 Hrs after a complete drain	Gang chargers will be used to charge the batteries in a warehouse environment.

12 DOCKING CONNECTOR INSERTION MODEL

Choosing the right connector for any electrical application is paramount however choosing the correct docking connector increases in magnitude due to the equipment's mechanical mass. Docking two heavy objects takes special considerations.

To sustain a long lasting quality product, many considerations must be at the forefront such as pin count, physical size, mechanical alignment, shielding, differential signal integrity, pin corrosion and oxidation, and durability. For a docking connector, durability is most important.

This section will address the durability aspect of the connector based on worse case and typical election cycles.

12.1 Insertion Cycle Definition

It is important to note the Smart Panel must be removed from its storage department and docked into the docking station before it can be powered up. Inversely for storage, the tablet is removed from its cradle and placed into its storage compartment within the case. One insertion and removal is considered one docking cycle.

In order to select an appropriate docking connector for the life of the product, a worse case docking cycle estimate must be calculated. Estimating the number of insertion cycles based on average and worse case numbers must be considered.

Table 9 - Estimated Docking Cycles outlines three typical election models based on Hawaii, Oklahoma and a US models. Each step requires at least one Smart Tablet insertion cycle. Early Voting ranges from 14 days to 30 days in this model. It is assumed, worse case, that each piece of equipment is shut down and stored for the evening and setup the next Early Voting day.

Estimates below are based on a maximum number of insertion cycles to be 5000 cycles.

Steps	Hawaii	Oklahoma	US	Action
1	1	1	1	Reset and Clean systems to prepare for elections
2	1	1	1	Perform LAT
3	1	1	1	Predefine Systems to match polling place
4	14	3	30	Election Day (one day) or Early Voting (x number of days)
Total Cycles				
	17	6	33	Total number of insertions per election cycle
Elections per year				
	2	11	4	Elections per year
Total Cycles per election				
	34	66	132	Insertion Cycles per year
Total Number of Years to reach 5000 cycles				
	147	75	37	Estimated Number of years @ 5000 insertion cycles

Table 8 - Estimated Docking Cycles

12.2 Durability

Two times the life expectancy of Hart equipment with a several years margin is approximately 30 years. ***Table 9 - Estimated Docking Cycles*** shows an estimated 37 years worse case durability on a connector rated at 5000 cycles. Given this estimate, a 5000 cycle connector is a comfortable margin for this system.

12.3 Requirement

The docking connector chosen has a durability rating of a minimum of 5000 cycles.

13 EXPANSION HEADERS

Expansion headers are located in both the Base Board and Back Panel Board for debug and future use.

13.1 Base Board

Several expansion headers will be located in the Base Board.

- An MCU I2C port with Power and Gnd is located close to the MCU circuitry.
- An extra USB Port from the Smart Panel has been taken to a stake header for future use. The header may be used for VBO or any other appliance requiring USB.
- Extra MCU GPIOs are taken to a header along with Power and Gnd. The header will be located near the MCU.

13.2 Back Panel Board

Several expansion headers will be located in the Back Panel Board.

- A Smart Panel I2C Port with Power and Gnd is located in the Back Panel.
- An extra COM port with Power and Gnd is located in the Back Panel.

14 ENVIORNMENTAL TESTING

The following is a list of environmental testing milestones.

IEC 61000-4-2 Electromagnetic Compatibility (EMC) Part 4: Testing and (1995-01) Measurement Techniques. Section 2 Electrostatic Discharge Immunity Test (Basic EMC publication).

IEC 61000-4-3 Electromagnetic Compatibility (EMC) Part 4: Testing and (1996) Measurement Techniques. Section 3 Radiated Radio-Frequency Electromagnetic Field Immunity Test.

IEC 61000-4-4 Electromagnetic Compatibility (EMC) Part 4: Testing and

(1995-01) Measurement Techniques. Section 4 Electrical Fast Transient/Burst Immunity Test.

IEC 61000-4-5 Electromagnetic Compatibility (EMC) Part 4: Testing and (1995-02) Measurement Techniques. Section 5 Surge Immunity Test.

IEC 61000-4-6 Electromagnetic Compatibility (EMC) Part 4: Testing and (1996-04) Measurement Techniques. Section 6 Immunity to Conducted Disturbances Induced by Radio-Frequency Fields.

IEC 61000-4-8 Electromagnetic Compatibility (EMC) Part 4: Testing and (1993-06) Measurement Techniques. Section 8 Power-Frequency Magnetic Field Immunity Test. (Basic EMC publication).

IEC 61000-4-11 Electromagnetic Compatibility (EMC) Part 4: Testing and (1994-06) Measurement Techniques. Section 11. Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests.

IEC 61000-5-7 Electromagnetic compatibility (EMC) Part 5-7: Installation and Ed. 1.0 b:2001 mitigation guidelines—Degrees of protection

The test for electromagnetic radiation shall be conducted in compliance with the FCC Part 15 Class B requirements by testing per ANSI C63.4.

15 24V DC EXTERNAL POWER SUPPLY

Power supply specifications:

Input

Wattage 85W
Input Voltage • 80-264 VAC
Input Frequency • 47-63 Hz
Input Current • 0.8 A @ 115VAC
Inrush Current • 70A-120A at 230 VAC, cold start at 25 °C
Earth Leakage Current • 70uA-180uA
Power Factor • >0.9@ 115VAC/60Hz
No Load Input Power • <0.5 W
Input Protection • Internal T2.5A/250V

Output

Output Voltage • See tables
Output Voltage Trim • Not user-adjustable
Minimum Load • No minimum load required
Start Up Delay • 100-300 ms typical, model dependant(1)
Hold Up Time • 20 ms typical

Line Regulation • ±1.5% maximum
Load Regulation • ±3.0% maximum
Transient Response • 5% max. deviation, recovery to within1% in 500 µs for a 25% load change
Ripple & Noise • Typically less than 1%, 1.5% max pk-pk(2)
Overvoltage Protection • 125% typical, Recycle input to reset
Overtemperature Protection • Unit shuts down, auto recovery
Overload Protection • 115-175%, auto recovery
Short Circuit Protection • Trip and restart (hiccup mode)
Temperature Coefficient • 0.05 %/°C

Environmental

Operating Temperature • +0 °C to +40 °C,
Cooling • Convection-cooled
Operating Humidity • 5-95% RH, non-condensing
Storage Temperature • -40 °C to +85 °C
Operating Altitude • 3500 m
Shock • 3 x 30 g/11 ms shocks in both +ve & -ve
directions along the 3 orthogonal axis, total 18 shocks.
Vibration • Three axis 5-500 Hz at 2 g x 10 sweeps

EMC & Safety

Emissions • EN55011/22, class B conducted EN55011/22, class B radiated
Harmonic Currents • EN61000-3-2, class A Voltage Flicker • EN61000-3-3
ESD Immunity • EN61000-4-2, level 3, Perf Criteria A
Radiated Immunity • EN61000-4-3, level 3, Perf Criteria A
EFT/Burst • EN61000-4-4, level 3, Perf Criteria A
Surge • EN61000-4-5, installation class 3, Perf Criteria A
Conducted Immunity • EN61000-4-6, level 3, Perf Criteria A
Magnetic Field • EN61000-4-8, level 3, Perf Criteria A
Dips & Interruptions • EN61000-4-11, EN60601-1-2
Safety Approvals • EN60601-1, ANSI/AAMI ES60601-1, CSA22.2 No. 60601-1 per cUL, Including Risk Management, EN60950, UL60950. Denan (PSE) certification

16 APPENDICES

16.1 Voting System Acronyms

Voting Systems Acronyms.docx - Link to Acronyms

16.2 Voting System Terminology

Voting Systems Glossary - Link to Glossary

Attachment No. 5

ATTACHMENT TO TEST REPORT

Report Reference No.: PTI-1411085-000

Dated of issue: 2014-11-25

Attachment contains

Cover page ..... : 1 page

Verity Operational Guide
6640001 ..... : 67 pages

Total: 68 pages

HART intercivic™

VERITY™

The next generation of trust.

Operational Guide

6640001 A09

CONFIDENTIAL AND PROPRIETARY

Hart InterCivic is committed to consistently providing high quality products and services for its customers through adherence to its established Quality Management System, complying with customer, statutory and regulatory requirements, and a commitment to continual improvement. Hart InterCivic is also committed to the integrity and the security of the information used in both the product development process and by the products themselves. Management will establish and maintain an information security management system to ensure that contractual requirements are met, employees are trained in information security, and risks to information security are managed.

Document number 6640001 A.09

Hart InterCivic, Inc.
P.O. Box 80649
Austin, Texas 78708
Telephone: (866) ASK-HART | (866) 275-4278
URL: www.hartintercivic.com

Table of Contents

1. IMPORTANT SAFEGUARDS

In addition to the related material presented in this document, follow all warnings and instructions marked on the equipment and in this section.

Read Instructions

All of the safety and operating instructions must be read before operating this voting system.

Retain Instructions

These safety and operating instructions should be retained for future use.

Water and Moisture

Do not use this product near water – for example, many polling places are setup in schools that may have swimming pools, it is suggested that the equipment not be setup near a swimming pool or other areas where there is excessive moisture.

Power Sources

Use only Hart approved power supplies, uninterruptable power supplies, and tablet batteries specified by Hart for use with the equipement.

Do not overload wall power outlets or extension cords as this may cause a fire.

If you are not sure of the type of power supplied to a polling location, call the local power company before proceeding.

Use only grounded, three prong outlets, and the power cord supplied with the equipment by Hart InterCivic. Equipment shall be located near power outlets and power outlets shall remain easily accessible after equipment is plugged-in and in use. Power cords should be routed so that they are not likely to be walked on or have objects placed on them.

Servicing

DANGER: Do not attempt to service this unit yourself. Opening the unit will result in exposure to electrical shock or other hazards.

Only the battery and printer doors should be opened by polling place personnel. Refer all other servicing to qualified personnel only. When replacement parts are required, be sure to use only Hart InterCivic approved parts. Unplug the unit from the wall outlet and refer servicing to qualified personnel under the following conditions:

- When the power cord or plug is damaged
- If liquid has been spilled on the product
- If the product has been exposed to rain
- If the product does not operate normally after following the operating instructions

Verity Tablet Battery

DANGER: Failure to follow these instructions may present risk of explosion, fire, or high temperatures.

- Do not improperly discharge the battery
- Do not short circuit the battery
- Do properly dispose of battery
    - Batteries are considered Hazardous Watse
    - Consult your local watse management office/company for guidelines on how these batteries should be disposed of.

CAUTION: Proper Handling

- USE ONLY Hart Battery, Hart I/N 1005015, if replaced.
- Do not expose battery module to temperatures above 140F (60C).
- Do not mishandle or disassemble battery module.

Cleaning Case or Tablet

- Unplug the equipment from the wall outlet and any other equipment before cleaning.
- Use only isopropyl alcohol and lint-free wipes to clean Verity tablet display.
- Do not use detergent-based cleaners. Do not use aerosol cleaners. Do not spray cleaner directly on the unit.

DANGER: Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts that could result in fire or electric shock.

Caution: If liquid is spilled or sprayed on the product, turn it off immediately, wipe away the liquid, and then return the unit to the local election officials for servicing.

Carts and Caddies

DANGER: Do not place this product on an unstable cart, caddy, stand, tripod, bracket, or table. The product may fall, causing serious injury and serious damage to the product.

The product and cart (caddy) combination must be moved with care. **Quick stops, excessive force, and uneven surfaces may cause the product and caddy combination to overturn, causing serious injury.**

2. INTRODUCTION

Welcome to the Verity Voting system, an election creation and management system. Verity Voting comprises hardware and software tools.

The Verity Operational Readiness Guide introduces Verity Voting System hardware components used for voting. This guide also discusses maintenance, setup, troubleshooting, and other relevant topics needed by those who store, maintain, set up, and troubleshoot hardware components of the Verity Voting system.

This guide provides the following information for election officials, support personnel, and warehouse staff:

In this chapter we introduce polling place system hardware, Verity security, the Verity work flow and device configuration, and some very important safeguards.

3. BRIEF DESCRIPTION

Verity Voting 1.0 - Abstract

The Verity Voting system includes software, hardware, device, and peripheral components that allow election professionals to accomplish the following high-level tasks:

Pre-voting tasks:

- Ballot definition and production
- Voting machine configuration and use

Voting tasks:

- Polling place ballot marking device
- Polling place digital scanning for paper ballots

Post-voting tasks:

- High-speed, large-volume ballot scanning
- Ballot adjudication
- Counting of votes
- Consolidation and reporting of results and audit logs

Verity Voting Configurations

The following image is a general workflow of all Verity Voting system components working together. Different system configurations are available depending on the size of voting centers, the expected support for the number of voters, and polling place needs.

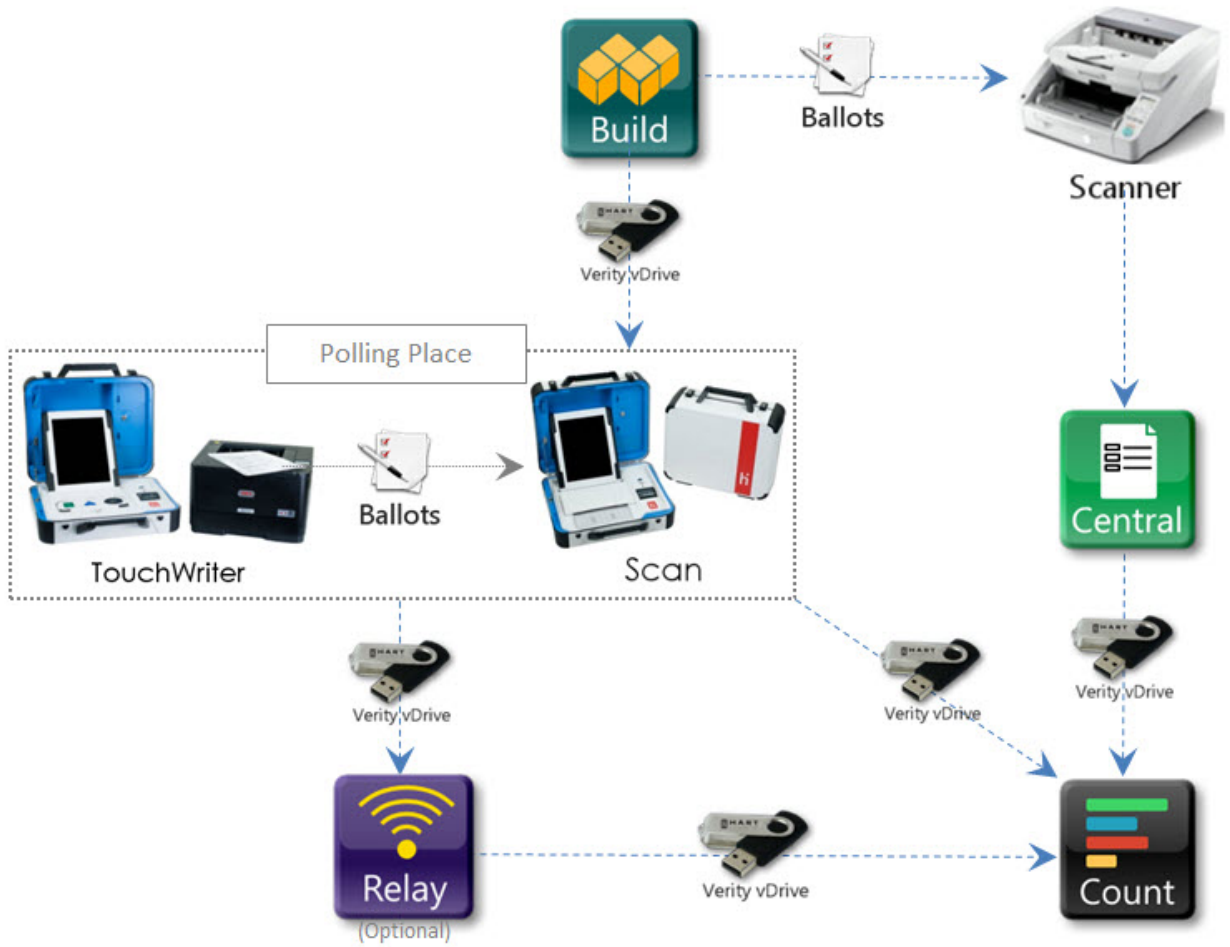


Figure 1 - Verity Voting System Component Abstract Diagram

Overview of the diagram:

- The components are displayed as touch points of data access, transfers, and verification.
- Dotted lines show the flow of data and air gaps using vDrives.
- The Verity Touch Writer and Verity Scan components are part of the Polling Place setup.
- Verity Key (not shown) is required for user access into components to load election elections, use features, and generate reports. Feature access depends on the roles applied to user accounts.
- The diagram does not include the Election Management or User Management components available through all Verity Voting systems.

The system in Figure 1 supports the following workflow:

Pre-Voting

- Verity Build provides capabilities to define an election definition and ballot for an election, including all contests, parties, and options. Verity Touch Writer, Verity

Scan, Verity Central, and Verity Count can all receive the election definition and ballots generated and locked for usage from Verity Build.
- Verity Build provides the capabilities to securely transfer the election definition by generating Verity Key devices for authenticating election definitions for Verity Touch Writer, Verity Scan, Verity Central, and Verity Count.
- Verity Build provides the capabilities for election's paper ballot production.

Voting

- Election definitions have been properly loaded on to all Verity Touch Writer and Verity Scan devices. Verity Touch Writer and Verity Scan process accepted ballots, locked and ready for voting during open polls.
- Touch Writer provides digital voting through a touchscreen tablet system or accessibility interface (Verity Access using audio-tactile interface, jelly buttons, and sip-and-puff devices).
- Verity Scan scans completed printed ballots provided by voter marking ballot sheets manually or printed ballots generated from Touch Writer. Scanned ballots become Cast Vote Records (CVRs) on vDrives for transferring into the central voting office/center.
- Verity Touch Writer and Verity Scan have properly closed polls.

Post-Voting

- Verity Central provides capabilities to scan ballot batches through a high volume scanner, review all ballots, and resolve any ballots marked as having an issue. These ballots may not have enough or too many marks for contest votes, write-in choices, or ranked choices.
- Verity Count provides final collection and tabulation of ballots into election and contest results. Count also provides adjudication of Verity Scan Write-In votes, ranked choices, and mismarked ballots. Count will provide reports for election auditing process from ballot production, voting device activities, to Central and Count activities

Additional configurations are possible with the Verity Voting system:

- Verity Build and Verity Count stand-alone components can be on the same workstation. All other components must be on their own workstations.
- Verity Build can include a client/server configuration with multiple Build workstations on a LAN. These workstations cannot have an installation of Verity Count sharing the same system. A database should be installed on one of the LAN connected Build workstations as the "server", accessed by all of the workstations. The LAN should not access other LANs of Verity Voting system workstations.
- Verity Count can include a client/server configuration with multiple Build workstations on a LAN. These workstations cannot have an installation of Verity Build sharing the same system. A database should be installed on one of the LAN

connected Count workstations as the “server”, accessed by all of the workstations. The LAN should not access other LANs of Verity Voting system workstations.

- The Verity Central workstation allows officials to scan large volumes of ballot batches and resolve ballots for write-ins, ranked choice, and ballots marked with issues such as too many marks, too few marks, or oddly placed marks. Once all ballots are resolved, they are converted into CVRs and transferable on vDrives to Relay (optional) or Count.
- Verity Central can include a client/server configuration with multiple Central workstations on a LAN. A database should be installed on one of the LAN connected Central workstations as the “server”, accessed by all of the workstations. The LAN should not access other LANs of Verity Voting system workstations.
- Depending on the needs and size of a voting jurisdiction, the installed and deployed Verity Voting system may include numerous Relay Sending stations on a network and multiple Central workstations to handle large volumes of ballots for scanning and resolving.
- Depending on the laws of a state, customers will be required to purchase both Touch Writer and Scan. Smaller jurisdictions (such as cities, towns, etc) may buy only Touch Writers or only Scan devices.

The Verity Voting system components can be purchased and installed in different configurations depending on the size of jurisdictions and voting needs. All installations do require Verity Build, Verity Scan, and Verity Count to create election definitions, print ballots, scan ballots into CVRs, resolve ballots, and tabulate votes.

The following images detail additional configuration options for the components. The flow of data simulates the workflow for an in-progress election.

Verity Voting Software Components

This section provides a high-level introduction to the components with the Verity Voting system components, including hardware and peripherals.

- Verity Build – Election and ballot definition software with options to configure contests, voting, and devices
- Verity Central – Ballot scanning and resolution software stations
- Verity Count – CVR tabulation and election auditing software
- Verity User Management – User account and access management for all Verity Voting system applications
- Verity Election Management – Election definition and data loading and management for all Verity Voting system components

4. PRE-VOTING - VERITY BUILD

For a complete description Verity Build's activities that outline the pre-voting functionality for this application, refer to Verity Build Quick Reference Guide (I/N 6620002).

Personnel Requirements

Personnel operating Verity Build workstations must receive training from Hart on the application and hardware in order to obtain the skill level required to successfully operate Verity Build.

The number of personnel required to operate Verity Build would be 1 person per workstation.

5. VOTING - VERITY POLLING PLACE EQUIPMENT

Verity Voting Devices

Introduction

Verity Polling Place devices are designed to meet all requirements related to performance, reliability, maintainability, physical characteristics and environmental conditions.

Verity Scan and Touch Writer provide paper-based voting and precinct count functionality.

Performance

Verity devices are designed to provide approximately 10-years of usage for the customer. The Verity device designs insured component life expectancies are at least 10-years.

Memory components have been selected to ensure they meet the requirements for data retention; all Verity non-volatile memory is designed to have at least 10 years for data retention for normal usage.

Verity Scan will meet the performance and accuracy requirements for a precinct count system, this is accomplished by using a high-resolution scanner in conjunction with Hart's voting geometry software engine, provides the most advanced, accurate, and intuitive interface for the voter and poll worker.

Accessibility

Verity devices use touch displays in conjunction with the Design for Democracy[i] interface allow voters to understand and accurately make the choices they desire.

Verity Access provides accessibility interfaces for individuals with hearing or physical disabilities. The Verity Access design implements Hart's patented navigation wheel and other technologies to create the ease of use and trust of use voters require.

Reliability

Verity devices are portable, but care shall be given to the devices during transportation, setup, and teardown to maintain the systems reliability through its expected lifetime.

Verity devices are designed with safety in mind; they are small and weigh less than 29lbs per device.

All devices are designed with materials that are durable and provide an expected life expectancy of 10 years.

Each Verity Device has a backup battery in case of loss of A/C Power, these backup batteries supply enough power to operate the Scan or Touch Writer for at least 2-hours. The Touch Writer ballot printer requires a separate UPS to provide power during periods of A/C Power lose.

Security

The devices have several physical security features to minimize access to the device during storage, transportation, and voting.

- The devices have dual case locks.
- The vDrive USB port is located in the case and is inside a locked compartment.
- The tablet computer must be locked in place to be operational.
- Security policies and best practices are provided.

The Verity Security Requirements document provides a detailed set of requirements for Verity security.

Maintainability

Verity devices were designed with maintainability in mind from both the hardware and software perspectives. This guide and The Verity Service and Maintenance Guide provide details regarding self-diagnosis of failures and preventative maintenance schedules

Equipment Environmental Standards

Table 1 - Environmental Standards.

Equipment	Specifications	Operating	Storage and Transportation

Verity Scan Verity Touch Writer	Temperature	41 to 104 °F	-40 to 150 °F
	Humidity	0 to 85 percent relative humidity, non-condensing	5 to 95 percent relative humidity, non-condensing
	Vibration	Per MIL-STD-810	Per MIL-STD-810
	Drop Height	Per MIL-STD-810	Per MIL-STD-810
	Power Requirement	Use Only Hart Approved Power Supply Input: 100-240 VAC, 1.0@100V, 50-60 Hz Output: +24VDC +/-5% @ 3.5A	

Personnel Requirements

Personnel operating Verity devices (Scan and Touch Writer) must receive training from Hart or Hart-trained personnel on the device in order to obtain the skill level required to successfully operate Verity Scan and Touch Writer.

The number of personnel required to prepare and operate Verity devices for deployment to the polling place would be 2 persons per 50 devices.

The number of pollworkers required to operate the devices at the polling place should be 1 person per device.

Verity Scan (I/N 3005350)

Verity Scan is a digital paper ballot scanner. Scan provides second-chance voting, with voter instructions for mismarked ballots. Scan includes additional accessibility features, and is attached to a secure ballot box.

When opening the polls, a poll worker activates the Verity Scan device and prepares it to receive marked paper ballots. Voters may privately and independently insert their marked ballots to scan and cast the ballot.

Verity Scan records ballots and audit log data in redundant, secure storage locations. One of these storage locations is removable electronic media. The removable election media allows the ballots to be transferred to the Verity Count tabulation component.

Verity Touch Writer (I/N 3005352)

Verity Touch Writer is a touch-screen Ballot Marking Device (BMD) that prints voter-marked ballots to a commercial off-the-shelf printer. Voters activate their ballot session by entering a unique access code that provides voter anonymity.

Voters use the electronic interface to privately and independently make their selections on the ballot. When voters finish making their selections, they print the marked ballot. Verity Touch Writer is also compatible with Verity Access, an optional interface component (with tactile buttons, audio ballot voting, and compatibility with additional two-switch adaptive devices).

Verity Touch Writer records audit log data in redundant, secure storage locations. One of these storage locations is removable electronic media. The removable election media allows the audit logs to be transferred to the Verity Count's audit report generation component.

Verity Touch Writer Printer (I/N 3005370)

Verity Touch Writer Printer is a commercial-off-the-shelf (COTS) product. Verity Touch Writer can only use Hart specified printers.

Printer	Description	Power	Interface	FCC Class B
OKIDATA 431d	Ballot Printer Monochrome 8.5x11 8.5x14 8.5x17 (MPT)	120 VAC	USB	Yes

Verity Touch Writer UPS (I/N 3005362)

Hart also offers an optional Uninterruptable Power Supply (UPS) for the Touch Writer Printer, to allow printing of ballots in case of power loss at the polling place, I/N 3005362. The number of ballots that can be printed during loss of power to the polling place is limited to 5 (single sheet) ballots.

Verity Tablet (I/N 2005302)

The Verity Tablet is composed of the main processor board; a 12.1" display and touch panel units. Also included in the tablet is a backup battery, non-volatile memory that is use as redundant Election Backup memory, a coin battery for the Real Time Clock, an external USB Port for Verity Access connections, and a docking connector to pass signals to and from the base station.

For storage purposes, the tablet is designed to detach from a base station and to be placed in the Verity Case's tablet storage compartment.

6. VERITY HARDWARE COMPONENTS

Verity Ballot Box (I/N 3005357)

Verity Ballot Box is a purpose built ballot box that allows Verity Scan to automatically deposit scanned ballots into a secure box; the ballot box also allows for manual insertion of ballots by the voter. Installing privacy screens on the ballot box insures each voter the privacy of their vote throughout the voting process.

Verity Ballot Box is easily setup and collapsed to allow for the product to be easily managed for transportation and storage.

Personnel Requirements

Personnel deploying and setting up Verity Ballot Boxes must receive training from Hart or Hart-trained personnel on the device in order to obtain the skill level required to successfully deploy the ballot box.

The number of personnel required to prepare the ballot box is 1 person per box.

Verity Standard Booth (I/N 3005358)

Verity Booth is a purpose-built voting booth that allows Verity Touch Writer to be used by each voter that ensures the voter privacy when voting.

Verity Booth is easily set up and collapsed to allow for the product to be easily managed for transportation and storage.

Personnel Requirements

Personnel deploying and setting up Verity Booth must receive training from Hart or Hart-trained personnel on the device in order to obtain the skill level required to successfully deploy the booth.

The number of personnel required to prepare the booth is 1 person per booth.

Verity Accessible Booth (I/N 3005359)

Verity Accessible Booth is a purpose-built voting booth that allows Verity Touch Writer to be used by voter with accessibility needs that ensures the voter privacy when voting.

Verity Booth is easily set up and collapsed to allow for the product to be easily managed for transportation and storage.

Personnel Requirements

Personnel deploying and setting up Verity Booth must receive training from Hart or Hart-trained personnel on the device in order to obtain the skill level required to successfully deploy the booth.

The number of personnel required to prepare the booth is 1 person per booth.

Verity Access (I/N 2005010)

Verity Access is an interface module that can be connected to Verity Touch Writer voting devices. The module has three tactile buttons, one audio port, one port for external tactile buttons, and a custom USB cable. Jacks for headphones and adaptive devices are located on the top edge of the device, and the device has grip surfaces on either side.

Personnel Requirements

Personnel deploying and setting up Verity Touch Writer with Verity Access must receive training from Hart or Hart-trained personnel on the device in order to obtain the skill level required to successfully deploy the device.

The number of polling place workers required to demonstrate Verity Access operations is 1 person per Touch Writer.

Verity Key (I/N 2001586)

Verity Key, or Key, is a small security device that is programmed for each election and generated by the Verity Build application. Key is activated once inserted into a Verity device's or Verity workstation's USB port.

Key is part of Verity's two-factor authentication process. Two-factor authentication requires each user to know something (the password associated with the Key) and physically have something (a programmed Verity Key). Both the user password and the Key must be authenticated together.

Once verified, Verity Systems read the Key before allowing operations to occur. Operations will not engage without a programmed Key. Each Key is valid for one and only one election. If a Key fails, it may not have been programmed properly for the current election.

Personnel Requirements

Personnel using Verity Keys must receive training from Hart or Hart-trained personnel in order to obtain the skill level required to use the Verity Key.

The number of personnel required is 1 person per Key.

vDrive (I/N 1004781)

vDrive is a small, portable memory device that collects and stores cast vote record (CVR) data and audit logs. CVR data includes the ballot data collected when votes are cast. Audit logs are electronic records of all activity performed in the Verity Voting system as it occurs. Each Verity component (application or device) maintains its own audit log. Audit logs are a critical part of ensuring that security is maintained by providing an audit trail.

vDrives are used in voting devices at polling places and throughout the Verity Voting system.

Personnel Requirements

Personnel installing Verity vDrives must receive training from Hart or Hart-trained personnel in order to obtain the skill level required to install the vDrive.

The number of personnel required is 1 person per device.

Verity Parts List

Hart Item Number	Item Description
3005350	Scan, (In Carton)
3005351	Controller, (In Carton)
3005352	Touch, (In Carton)
3005353	Touch with Access, (In Carton)
3005354	Touch Writer, (In Carton)
3005355	Touch Writer, with Access, (In Carton)
3005356	Ballot, (In Carton)
3005357	Ballot Box, Scan, Verity (In Carton)
3005358	Booth, Standard, (In Carton)
3005359	Booth, Access, (In Carton)
3005360	Charger, 1 Bay, Verity Battery w/ AC Power Supply (In Carton)
3005361	Key, Verity, Ibutton, in Holder, (In Carton)
3005362	UPS, 1.5KVA (In Carton)
3005365	Charger, 6 Bay, Verity Battery w/ AC Power Supply (In Carton)
3005370	OKI B431d Printer for Touch Writer, (In Carton)

7. POST-VOTING - VERITY CENTRAL

For a complete description Verity Central's activities that outline the post-voting functionality for this application, refer to Verity Central Quick Reference Guide (I/N 6620004).

Personnel Requirements

Personnel operating Verity Central workstations must receive training from Hart on the application and hardware in order to obtain the skill level required to successfully operate Verity Central.

The number of personnel required to operate Verity Central would be 1 person per workstation.

The number of personnel required to scan ballots with Verity Central would be 2 persons per workstation/scanner.

The number of personnel required to resolve (adjudicate) ballots with Verity Central would be 2 persons per workstation.

8. POST-VOTING - VERTIY COUNT

For a complete description Verity Count's activities that outline the post-voting functionality for this application, refer to Verity Count Quick Reference Guide (I/N 6620005).

Personnel Requirements

Personnel operating Verity Count Workstations must receive training from Hart on the application in order to obtain the skill level required to successfully operate Verity Count.

The number of personnel required to operate Verity Count would be 1 person per workstation.

The number of personnel required to resolve (adjudicate) ballots with Verity Count would be 2 persons per workstation.

9. STORAGE AND DEPLOYMENT

Storage Procedures

This section reviews the storage of Verity hardware components. Recommendations are based on best practices. Where applicable, refer to hardware manufacturer recommendations.

Create a spreadsheet that shows registered voters by precinct and precincts assigned per polling place. This helps to determine the equipment requirements for each polling place. The use of the term "Precinct" to also define an Election Day polling place varies by jurisdiction. Also, requirements vary by state in regard to machine allocation versus voter registration.

You should maintain the polling place components in precinct sequence if at all possible. While the Verity Scan and Touch Writer do not require this, it is much easier to

allocate and access units stored in this manner since most assignments to the system are done by precinct.

At this time you need your spreadsheet showing allocation of equipment to polling places. The easiest layout is to begin with the first precinct/polling place first and increment until you have all precincts/polling places accounted for. If you need one Verity Scan and 6 Verity Touch Writers in Polling Place #1, load them and other items sent to polling places together on a pallet or other type of transfer container designated for Polling Place #1. Include items such as a transfer case, cell phones, signs, tape, pens, and other items that are not dated. Continue this process until all polling places are completed. One way to identify polling place locations within the facility is by painting the numbers on the floor to insure the proper placement when the polling place equipment is being moved.

The Verity Scan and Touch Writer printer paper purchased through Hart InterCivic has a shelf life of seven years after it has been imaged. The manufacturer recommends that it be imaged within three years of the manufacturing date. Store the paper at temperatures below 77 °F with relative humidity of 45 – 65%. Do not expose to direct light.

The storage facility should have at least one workstation with AC power available for functionality testing, etc. A set of one Verity Scan and one Verity Touch Writer requires approximately 0.5 amps (AC) per device to operate, so the use of standard 15 amp circuits will be adequate. If extension cords are necessary when testing the system or setting up for an election, be aware that pulling cords throughout your facility may be time consuming or inconvenient. Accordingly, the use of drop cords that contain multiple outlets is highly recommended, as this allows several polling place sets to be serviced at one time while minimizing the number of cords pulled throughout the facility. Conveyor belts or hand trucks can be used to transport equipment from storage to workstations.

Personnel Requirements

Personnel storing or deploying Verity equipment must receive training from Hart or Hart-trained personnel on the components in order to obtain the skill level required to successfully store and deploy equipment.

The number of personnel required is 1 person piece of equipment.

Delivery Procedures

After all testing has been finalized, begin preparing the system for delivery to the polls. The procedures to move the voting system vary by jurisdiction, so the need to organize the process is essential.

- It is very useful to work with other staff members to create a survey to be mailed to your polling locations far in advance of the election. Ascertain basic information such as availability of AC power, tables and chairs, phone, access during voting hours.
- Create a checklist of polling places and ALL items that are to be shipped to minimize shortage calls on Election Day.
- If you use a moving company to deliver your voting system, arrangements must be made in advance.
- Keep in mind that AC power must be available at the polls and you may need extension cords and/or 2-prong adapters for some polling places.
- Provide the mover with the list of polling locations and the equipment assigned to each.
- If there are locations with special delivery requirements, let the mover know in advance.
- If you have assigned the equipment as suggested previously, you should have everything needed for a polling place on one pallet.
- It is very helpful to have a spreadsheet showing the equipment numbers and the polling places to which they are assigned (equipment serial number is located on the bottom of all units).
- Keep logs of voting devices sent to each polling place. Track by device serial numbers. Also log the wire seal serial number for each device.
- Keep your facility organized. Move polling place equipment to loading area in the reverse order it comes off the truck; first on, last off.

Transportation and Storage

Verity Scan and Touch Writer are electro-mechanical pieces of equipment and need to be protected when transporting or storing. Moving parts, optics within the scanner, and tablet computers are sensitive to excessive dust, moisture, and vibration.

Always use a Hart-approved shipping container, such as the original cardboard Verity Device box, when transporting the Device between facilities (for example, to or from a polling place).

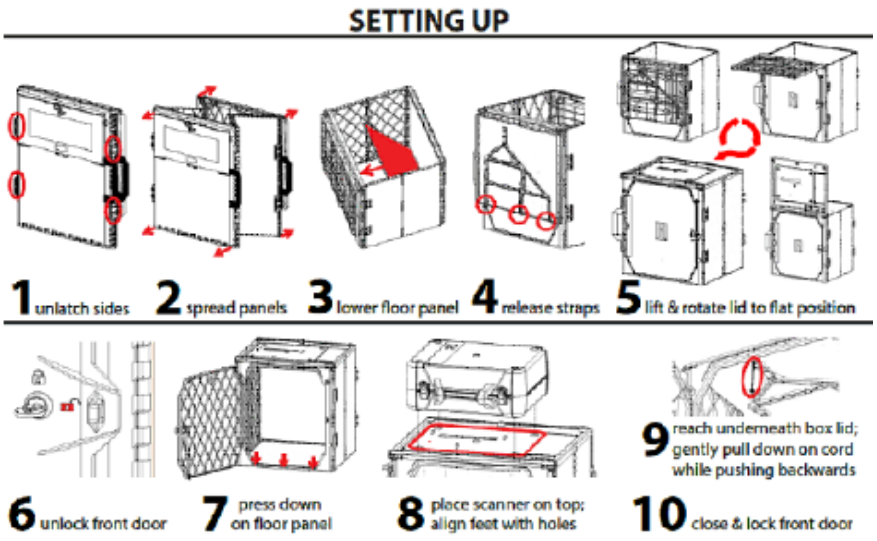
Heavy-duty shipping containers are available for purchase from the Hart catalog.

Do not store Verity Devices in high humidity or dusty environments; this causes moisture to collect on the glass surfaces of the scanner and may reduce the quality of scanned ballot images.

Polling Place Deployment

Verity Scan

Verity Scan Setup

	Tasks
	Ensure sufficient electricity is available in the area. **Do not connect Verity Scan to AC Power at this time**.
	Open and remove Verity Scan case from shipping carton.
	Ensure the ballot box is assembled properly. 1. Unlatch sides 2. Spread panels 3. Lower floor 4. Release straps 5. Lift and rotate lid to flat position 6. Unlock front door 7. Secure floor 8. Properly seat Verity Scan on top of the ballot box 9. Secure Verity Scan to ballot box 10. Close and lock front door 

	Open Verity Scan case and secure lid in upright position.
	Remove the tablet from its storage location.
	Remove the battery cover and press the battery check button on the battery. The battery charge indicator should indicate a battery charge >=80% **If it does not contact the appropriate election personnel.** Place the battery cover back on the tablet case.
	Place the tablet in the Verity Scan tablet cradle.
	Lock the tablet in place.
	Retrieve the power supply from the case's storage compartment.
	Connect the power supply to Verity Scan.
	Connect the Verity Scan's power brick to an AC Power source. Do not use 3– to 2–prong adapters.
	Attach the privacy screens to the ballot box.
	Turn on Verity Scan

Verity Touch Writer

Verity Touch Writer Setup

	Tasks
	Ensure sufficient electricity is available in the area. **Do not connect Verity Touch Writer to AC Power at this time**.
	Open and remove Verity Touch Writer case from shipping carton.
	Remove booth from carrying case.

	Ensure the booth is assembled properly. 1. Booth legs are properly attached 2. Booth is opened and Booth top is secure. 3. Properly seat Verity Touch Writer on top of the booth 4. Secure Verity Touch Writer to booth
	Open Verity Touch Writer case and secure lid in upright position.
	Remove the tablet from its storage location.
	Remove the battery cover and press the battery check button on the battery. The battery charge indicator should indicate a battery charge >=80% **If it does not contact the appropriate election personnel.** Place the battery cover back on the tablet case.
	Place the tablet in the Verity Touch Writer tablet cradle.
	Lock the tablet in place.
	Retrieve the power supply from the case's storage compartment.
	Touch Writer Printer Setup
	A table or second booth must be setup for the printer. The Hart specific USB printer cable is 2 meters long must be used. The printer must be located close to the Touch Writer.
	Remove printer from shipping carton.
	Set the printer on the 2nd booth or table.
	Retrieve Hart USB Printer cable for Touch Writer storage compartment. Connect the Hart USB Printer cable into printer's USB port.
	Connect the USB printer cable in to the Touch Writer Printer port.
	Connect the printer into AC Power source.

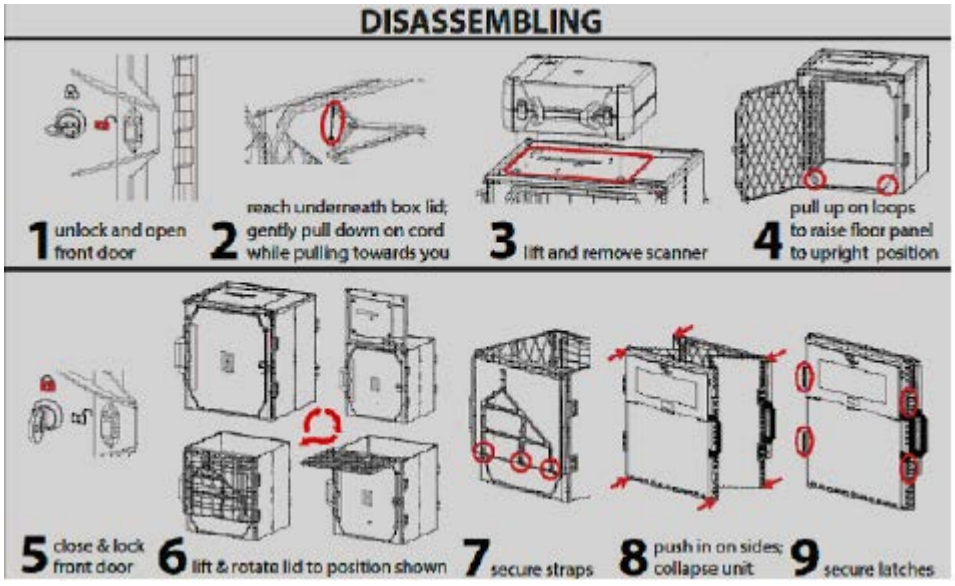
	Turn the printer On.
	If a Verity Booth is used for the printer, attach the privacy screens to the booth.
	Touch Writer Setup Completion
	Connect the power supply to Verity Touch Writer.
	Connect the Verity Scan's power brick to an AC Power source. Do not use 3– to 2–prong adapters.
	Attach the privacy screens to the booth.
	Turn on Verity Touch Writer

Decommissioning equipment for return to warehouse

Verity Scan

Verity Scan Disassembly

	Tasks
	Turn off Verity Scan and allow it to shut down.
	Remove and store the privacy screens from the Ballot Box.
	Unplug Verity Scan from AC Power source. Unplug power connection on back of Verity Scan.
	Properly store AC Power brick and cords in storage compartment.
	Unlock the vDrive secure storage compartment. Remove the vDrive and store in secure vDrive container and enter vDrive information in to the election log.

	Unlock, remove, and store the Verity Scan tablet in shipping carton.
	Store Verity Scan tablet in shipping carton.
	Close and lock Verity Scan case.
	Properly disassemble Ballot Box
	1. Unlock ballot box door 2. Unlock Verity Scan from ballot box 3. Lift Verity Scan off the top of the ballot box 4. Raise ballot box floor 5. Close and lock front door 6. Lift and rotate lid 7. Secure straps 8. Push to collapse the box 9. Secure latches 
	Ensure ballot box is ready for transportation
	Place Verity Scan in shipping carton.

	Ensure both Verity Scan case and tablet are in carton
	Close carton and ensure it is ready for transportation

Verity Touch Writer

Verity Touch Writer Disassembly

	Tasks
	Turn off Touch Writer and allow it to shut down.
	Remove and store the privacy screens from the Booth(s).
	Unplug Touch Writer from AC Power source. Unplug power cord on back of Touch Writer.
	Turn off printer. Unplug printer from AC Power source. Unplug power cord from printer.
	Unlock the vDrive secure storage compartment. Remove the vDrive and store in secure vDrive container and enter vDrive information in to the election log.
	Unplug USB Printer cable from Touch Writer and printer.
	Place printer in shipping carton. Place printer power cord in printer shipping carton.
	Close printer shipping carton and that it is ready for transportation
	Properly store USB printer cable in Touch Writer case's storage compartment.

	Properly store AC Power brick and cords in Touch Writer case's storage compartment.
	On back of Touch Writer securely seal the USB Printer port cover.
	Unlock and remove Verity Touch Writer tablet from the cradle.
	Store Verity Touch Writer tablet in shipping carton.
	Close and lock Verity Touch Writer case.
	Unlock the Touch Writer from the booth.
	Place the Touch Writer in the shipping carton.
	Ensure both Touch Writer case and tablet are in the shipping container. Close carton and ensure it is ready for transportation
	Properly collapse booth and place in carrying case. Close case and ensure it is ready for transportation.

10. PREVENTIVE MAINTENANCE PROCEDURES

Maintenance procedures for the Verity Scan and Touch Writer devices are minimal. Retest and record any problems detected in functionality testing and return damaged equipment to Hart for replacement. There are only a few regularly scheduled maintenance procedures necessary:

- Cleaning the Equipment Screens
- Cleaning the Verity Scan Scanner Path
- Checking battery levels and charging batteries
- Other repair, replacement, and miscellaneous maintenance procedures

- Verity Touch Writer printer, PC printer, Verity Central PC scanner, and PC peripheral maintenance

Voting Device Maintenance

Because Verity Scan may have been stored for long periods of time between uses, and the scanner has moving parts and optics that are sensitive to excessive dust, moisture and vibration, perform these steps at least once per year, or prior to every election:

- Always clean the upper and lower glass plates on each scanner with lint-free isopropyl alcohol wipes.
- Do not pour or spray liquids on the glass plates as this can cause streaking on the bottom surface of the glass plates.
- Have Hart replace the internal CMOS battery every 3 to 4 years through the preventative maintenance program.

Personnel Requirements

Personnel maintaining up Verity componets must receive training from Hart or Hart-trained personnel on the device in order to obtain the skill level required to successfully maintain the device.

The number of personnel required to maintain a Verity device is 1 person per device.

Touch Writer Printer Maintenance

Dust and debris are the main causes of poor-quality printing. Although these can never fully be eliminated, much can be done to reduce their effects.

- Ensure that printing and storage rooms are kept clean and dust-free.
- Perform all manufacturer-recommended printer cleaning and maintenance on schedule, even during the election off-season.
- Prior to each election event, conduct full preventative maintenance on ballot printing equipment, including checking for proper paper and toner supplies.
- Hart offers preventative maintenance programs for paper ballot scanners that provide onsite visits from the scanner vendor with preferred response times. Contact the Customer Support Center (CSC) for additional details.
- Use only original equipment manufacturer (OEM) toner cartridges.
- Remanufactured toner cartridges may have premature failures, leading to printer downtime. They may also produce low quality images.

Reducing Paper Dust

- Paper dust accumulates in the fuser area and creates image-quality issues by contaminating components, and causing a variety of difficult-to-diagnose problems.
- Perforated paper should be as free as possible of paper dust and chaff, which can cause machine contamination.
- Fan paper thoroughly on all four sides to remove any dust or shavings from edges.
- Using paper specifically designed for laser printing will ensure high-quality images and proper printer maintenance.
- For best results, always use Hart Official Ballot Paper.

Cleaning Rollers Contaminated With Paper Dust

Rollers can usually be cleaned with a damp lint-free cloth and an isopropyl alcohol solution. Always follow the instructions in the printer's operator guide for cleaning and replacing the feed rollers.

- If the fuser rollers cannot be cleaned or replaced by the operator, call for service.
- Keep printers in a dust-free environment, closed off from outside and manufacturing areas. Ensure doors and windows remain closed.

Voting Device Storage

Storing the Scan power supply (or "brick") inside the storage compartment:

- Simplifies transporting the Scan to and from the polling place.
- Lessens the chance for damage to the brick caused by handling errors. Because the fuse inside the power brick is fragile, sudden jarring can cause the fuse to break (such as when dropped on the floor).

Paper Storage

Paper is very sensitive to moisture changes, and this fluctuation can cause print quality issues. The temperature of the room where paper is stored can have a significant effect on how that paper performs in the machine. Humidity control is essential to ensure proper paper handling and performance.

- Optimum paper storage and printer operating temperature is 68 to 76 degrees Fahrenheit.

- Optimum storage conditions include areas with a relative humidity of 35% to 55%. Overloading of the storage or work area with external air from open doors and excessive in-and-out traffic may defeat environmental control systems.
- Do not store paper directly on the floor, since that increases the possibility of moisture absorption. Store paper on pallets, shelves, or in cabinets in an area protected from extremes of temperature and humidity.
- Only open sealed reams of paper when they are ready to be loaded into the printer.

Conditioning Paper

When paper is moved from a storage area to a location with a different temperature and humidity, allow the paper to acclimate to the new location before use.

Cleaning the Equipment Screens

Table 1-9. ***Cleaning the equipment screens.***

	Tasks
	Use a minimum 50% isopropyl alcohol and lint-free wipes. **Avoid ammonia-based and detergent-based formulas.**
	Wipe the Verity Scan and Touch Writer screens clean.
	Include a minimum 50% isopropyl alcohol and lint-free wipes with the polling place supplies, and ask poll workers to clean the screens at least once daily during election events.

Verity Tablet Battery Maintenance

The following battery maintenance procedures apply for Verity system hardware components.

Only use Hart approved battery charger when charging tablet batteries.

Table 2. ***Battery charging.***

Battery Charger Visual Queue	Definition	Notes
<80%	Recommended time to recharge battery.	To test the charge level, press and hold the test button on the battery.
Red pulsing light on battery	Battery cannot be charged	When the battery is fully drained, it may indicate a pulsing red light. Try leaving it in the charger for 30 minutes to see if it will begin pulsing green (take a charge).
Green pulsing light on battery	Battery is charging	
Green solid light on battery	Battery is fully charged	

Table 3. ***Battery charge and drain statistics.***

Battery Statistics	Timeline	Notes
Battery charge time	4-5 hours	for a fully discharged battery
approx. 0.5%/month	on-shelf drain rate	
approx. 5.0%/week	Device on power	
Storage percentage	On-shelf	Suggest charge for storage is 60%

Cleaning the Verity Scan Scanner Path

Table 1-10. ***Cleaning the scanner path.***

	Tasks
	Raise the top cover to the scanner section of the Verity Scan.
	Raise the inside cover to the scanner.
	Use isopropyl alcohol and lint-free wipes. **Avoid ammonia-based and detergent-based formulas.**
	Wipe the scanner path clean of small paper debris. **NOTE**: Do not use a pressurized air canister. Doing so may result in debris becoming trapped under the scanner glass.
	Clean the transport mechanism (rollers under the inside cover) using a isopropyl alcohol and lint-free wipes. **Avoid ammonia-based and detergent-based formulas.**

Calibrating the Verity Scan Scanner

To ensure proper ballot scanning, you may need to periodically calibrate the Verity Scan ballot feed slot.

> Note: Calibrate the Verity Scan once per year at most. If you are unsure of when or why to calibrate the Verity Scan, contact a Hart representative.

11. SECURITY

Proper security is critical to safeguarding the election process. Hart combines technology and best practices to ensure that Verity is secure. Hart ensures that security policies and procedures for both jurisdictions and physical security (both in-person voting devices and electronic and paper ballots) are fully documented. Verity was designed for cost-effective and meaningful security solutions. To ensure security at every level, Verity Voting engages the AAA (authentication, authorization, and audit) security framework.

Quality Certified

In addition to measures taken by Hart to protect Verity security, all Verity software and hardware has been tested by an outside auditing agency to ensure proper security and functionality.

Layered Defense

A multi-layer defense strategy and application verification process is used to provide security throughout Verity Voting. Software independence measures are employed, which means that voters can verify ballot choices before they are cast and counted, and elections and software can be audited independently.

In addition to the Verity devices phyiscal security attributes that reduce the possibility of undetected, unauthorized access, the Verity devices employ a secure boot BIOS to significantly minimize the ability of unauthorized modification of the systems software. If unauthorized software modification is detected, the Verity device will shutdown.

After the secure boot process has successfully passed, the Verity device performs a self-test to ensure proper system functionality. If an error occurs, Verity alerts the user.

Tamper Evident

Verity Key software independence ensures that, in the event the software was altered in any way, the alteration would be evident in the audit log (i.e., tamper evident).

CVR Protection

Users are unable to view, access, or alter CVR (cast vote record) data. To protect voter privacy, CVRs are stored in randomized order so that voting order cannot be determined. CVRs do not contain any information that can connect a vote to a specific voter.

Audit Logs

Comprehensive audit logs are generated for all user authentication attempts, data transfers, configuration changes, and errors. Audit logs are designed to be complete and easy to understand. Audit logs are created uniformly across system components, software applications, and voting devices.

General Security Best Practices

- Have members of the election staff work in pairs. This will greatly reduce the potential for accidental errors and opportunity for deliberate mischief or fraud by a rogue employee.
- Use surveillance cameras, motion sensors and other advanced means to monitor both access and usage of computers for additional security.
- Review voting equipment storage and work areas to ensure that only authorized personnel have access to them.
- Maintain a list of personnel with door keys or electronic access badges to election office work areas and voting equipment storage locations. Ensure all door keys are accounted for and only authorized personnel have them.
- Document the controlled physical access to voting systems and the facility where the systems are stored. Document all security-related repairs and modifications to the physical components of the facility where voting systems are stored.
- Develop and apply procedures and policies requiring that keys or combination locks be changed periodically.
- Review election office work areas to ensure that office space is appropriately visible and that undetected access by unauthorized individuals is not possible.
- Preview polling places and identify secure areas for equipment drop-off, storage and pickup.
- Ensure that blank ballot paper stocks are controlled at all times.
- Have an impartial third party conduct a security review and establish and implement applicable election management system security measures. Resources might be found in county and municipal information technology staff, or local community college or technical school staff.
- Maintain staffing levels adequate to monitor voting booths.
- Allow only qualified voters, persons assisting voters, and poll workers entrance to the voting booth area.
- Queue the line of voters at the ballot issuing station, not at the voting area. Do not issue voters Access Codes or paper ballots, or allow them to enter the voting booth area, until a booth is open and available for use.
- Report any suspicious activity in or around voting machines to the local election officer.

Computer Security Best Practices

- Keep computer equipment in locked facilities, and use a log to monitor access.
- Log and limit access to Verity Keys.
- Remove Verity Keys from equipment when not in use.
- Maintain an accurate inventory of all voting system computers and peripherals by make, model, location and serial number.
- Maintain an accurate inventory of vDrives.
- Keep vDrives secured at all times.
- Keep computers running at optimal performance by following these guidelines:
    - Use a properly grounded anti-static mat beneath each computer.
    - Make sure the system is plugged into a surge protector.
    - Make sure the system is in a secure, stable position to avoid vibration.
    - Make sure the system has proper ventilation to prevent overheating.
- In general, it is best not to abort a process that is midstream. Instead let the process complete, and then take corrective action.
- Performing hard shut down of equipment, disconnecting cables to avoid a data transfer, or other process-interruptive steps can lead to equipment failures. This is a common best practice when working with any technology, not just the Verity equipment.
- For mission-critical computer systems, such as the Count computer, use an uninterruptable power supply (UPS) to prevent the loss of data in the event of a power outage during Election Night reporting.
- Always exit Windows by choosing "Shutdown" from the Start menu.

Voting Device Security Best Practices

- Cover and seal all unused connections on the voting systems, devices, and hardware, including USB, parallel, and other ports.
- Ensure that blank ballot paper stocks are controlled at all times.
- Use security cameras in the voting system storage facility.
- Use a secure access system and limit the number of keys or access badges to the voting system storage facility.
- Use a burglar and fire alarm system in the storage facility. Periodically test their functionality.

- Use chain-of-custody forms when transporting equipment for any reason.
- Verify that all voting devices are returned to storage after each election; confirm that the device seals have not been tampered with during transport and sign the chain-of-custody document upon receipt of the voting devices.
- Maintain an inventory of election materials, including voting devices, vDrives, security seals, voter registration (poll) lists, election results tapes and printouts, field supervisors' reports, poll workers' daily logs, reconciliation reports, audit data, and other items.
- Store voting equipment on racks and off the floor. Cover racks to protect voting devices from water damage from above (e.g., leaking roofs) and below (e.g., building flooding).
- When returning equipment to Hart for repair, seal the inner box with serialized tamper-evident tape, log the seal number on the chain-of-custody form, and use an outer shipping box.
- When equipment is returned from repair, perform acceptance testing within 10 business days to confirm functionality and firmware version. Perform hash code testing to confirm that the certified firmware has not been compromised, where applicable.
- Maintain an accurate inventory of all voting system equipment by type, location and serial number.
- Prior to the Early Voting period or Election Day, maintain polling place devices under the chief election officer's close supervision at all times.
- Require the lead poll worker to verify the numbers of all seals or tamper-resistant tape on all voting devices and inspect the voting devices for any evidence of tampering.
- Require the lead poll worker and all poll workers to use and sign a checklist to verify that all opening procedures were followed.
- Control access to the voting device power control, power supply, and election results storage media.
- Maintain a physical barrier between the voter and the undistributed ballots to limit unauthorized access.
- Arrange the polling place with the exterior of each voting device in plain view of the poll workers at all times.
- Allow only poll workers and registered voters in the voting device area. Allow voters to enter this area only when a voting device is available for use.

- Train lead poll workers to operate ballot activation devices (e.g., the Touch, Touch Writer, or Controller).
- Treat the Voting devices with the same sensitivity as you would a secure ballot box containing paper ballots.
- Never leave the voting devices unattended at any time (e.g., in an automobile, an unlocked room, etc.).
- Only break or remove the security seal from the voting devices in strict accordance with close polls or central count tabulation procedures.
- Throughout the voting day, monitor voting devices closely to protect against malicious tampering.
- Pay especially close attention to ports, cable connections, and external power supplies on voting devices. Do not allow unauthorized persons access to these areas.
- Establish times for poll workers to verify the number of voters processed with the number of votes recorded (the ballot count) on the voting devices. Train poll workers to log and reconcile inconsistencies.
- Early Voting or Absentee-In-Person Equipment:
    - Record the ballot and lifetime counts of all devices at the beginning and the end of each voting day using a reconciliation log.
    - At the end of each voting day, close and secure all voting devices with tamper-evident seals. Store all devices in a locked location.
    - Verify the numbers on all protective seals and public counters before using the voting devices the next day.
    - Follow all Election Day voting security Best Practices.
- Pay especially close attention to ports on the back of voting devices and keep all storage compartments closed to restrict access to cables. Do not allow unauthorized persons access to these areas.
- Monitor the security and integrity of all voting system cable connections to ensure that voting will not be disrupted because the connection inserted is inadvertently broken. Ensure that cable connections are firmly tightened and that cables are placed where they will not be tripped over or pulled upon.

vDrive Security Best Practices

- Secure vDrives within the voting device vDrive compartment with a tamper-evident security seal.

- Record voting device serial numbers, as well as security seal numbers, during official election events so deployed equipment can be physically authenticated at the polling place.
- At the end of Election Day, follow local procedures to transport the voting devices and/or vDrives from the voting location to the jurisdiction elections office by a sworn election official or a law enforcement officer.
- Establish procedures to secure the voting devices and ballot boxes each day after suspending polls. Voting devices may be sealed, locked and/or chained, and paper ballot marking booths may remain assembled.
- Conduct the delivery of voting equipment to polling place locations with the same degree of control as applied to warehouse storage of sensitive election equipment.
- Require that the delivery person or company (or in some cases the supervising poll worker) use a chain-of-custody document that contains the voting device serial numbers, and security seal numbers for each voting location where equipment has been delivered.
- Use the chain-of-custody form in triplicate. Delivery personnel may require training on its proper use.
- Use only lockable buildings or locations that are capable of monitoring the secure storage of voting equipment at polling places.
- Tightly strap all equipment being delivered in place both horizontally and vertically inside delivery vehicles to avoid damage to the voting units (in-transit damage may appear to be a security violation, when in fact it is simply the mishandling of equipment).
- Always keep doors on delivery vehicles locked when unattended.

12. SPECIFICATIONS

The Verity polling place components can be stored in quickly and easily deployable cartons and carriers. The following image depicts the entire voting system collapsed for storage. The procedures presented in this guide help to make accessing and deploying system components easy.

Verity Scan Specifications, I/N 3005350

Verity Scan is lightweight and designed for convenient storage. Verity Scan sits atop a Verity Ballot Box for election events. The Ballot Box is collapsible so it can easily be stored.

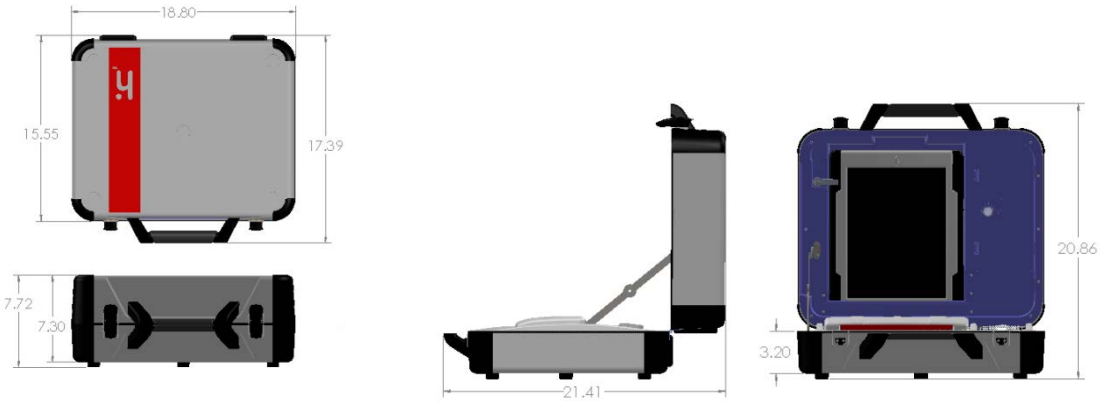


Table 2 - Verity Scan specifications.

Setting	Description
Scan Accuracy	Scan accuracy has been validated to be 100% Note Scanner must be maintained per the Preventative Maintenance Schedule listed in this document.
Scan Rate	1 Ballot Sheet (8.5" x 17", double-sided) every 30 seconds
Height	7.7 inches
Width	18.8 inches
Depth	15.6 inches
Weight	28.3 pounds
Weight with batteries	29.1 pounds
Display	12.1 inches
Screen Size	12.1 inches

Verity Scan Paper Specifications

Table 3 - Verity Scan thermal, BPA-free paper specifications.

Setting	Description
Width in inches	2.25
Basis Weight	53 g/m^2
Length in feet	80.0

Verity Scan Ballot Box Specification, I/N 3005357

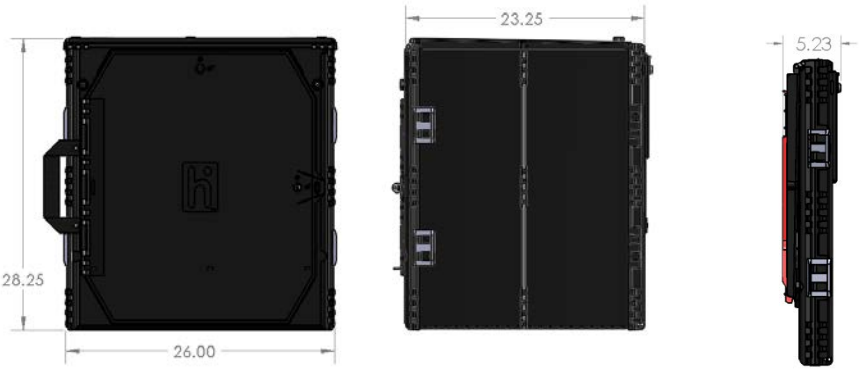


Table 4 - Verity Scan Ballot Box specifications.

Dimensions & Weight	Collapsed in Bag	Collapsed	Deployed
Height in inches	28.5	28.3	28.3
Width in inches	26.5	26.0	26.0
Depth in inches	5.5	5.2	23.3
Weight in pounds	26.9	25.6	25.6

Verity Touch Writer Specifications, I/N 3005352

The Verity Touch Writer is lightweight and designed for convenient storage. Touch Writer can sit on top of a standard Verity Booth or, as shown below, atop a lightweight, ADA-compliant Accessible Verity Booth that can be collapsed for easy storage.

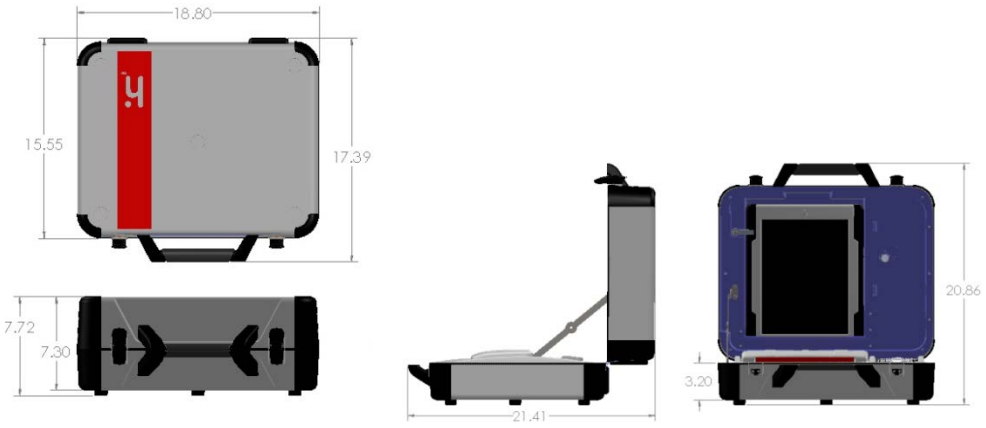


Table 5 - Verity Touch Writer specifications.

Setting	Description
Audio-Tactile Interface	Verity Access provides accessibility interfaces for the voters with physical or hearing disabilities.
Height	7.7 inches
Width	18.8 inches
Depth	15.6 inches
Weight	28.3 pounds
Weight with batteries	29.1 pounds
Display	12.1 inches
Screen Size	12.1 inches

Verity Touch Writer Thermal Paper Specifications

Table 6 - Verity Touch Writer thermal, BPA-free paper specifications.

Setting	Description
Width in inches	2.25
Basis Weight	53 g/m^2
Length in feet	80.0

Verity Touch Writer Printer Specifications, I/N 3005370

The Verity Touch Writer Printer is lightweight and designed for convenient storage.

Table 7 - Verity Touch Writer Printer specifications.

Setting	Description
Dimensions	15.2" x 14.3" x 9.6" (38.7 cm x 36.4 cm x 24.5 cm)
Weight	26 lbs (11.4 kg)

Verity Touch Writer Printer UPS Specifications, I/N 3005362

The Verity Touch Writer Printer UPS is designed for convenient storage.

Table 8 - Verity Touch Writer Printer UPS specifications.

Setting	Description
Dimensions	9.1″ x 5.9″ x 17.5″

Weight	35.6 lbs

Verity Touch Writer Ballot Paper Specifications

Table 9 - Verity Touch Writer thermal, BPA-free paper specifications.

Setting	Description
Brightness	>92
Basis Weight	28 lbs
Ballot sizes	8.5″ x 11″ 8.5″ x 14″ 8.5″ x 17″ (Multi-Purpose Tray)

Standard Verity Touch Writer Booth Specification, I/N 3005-358

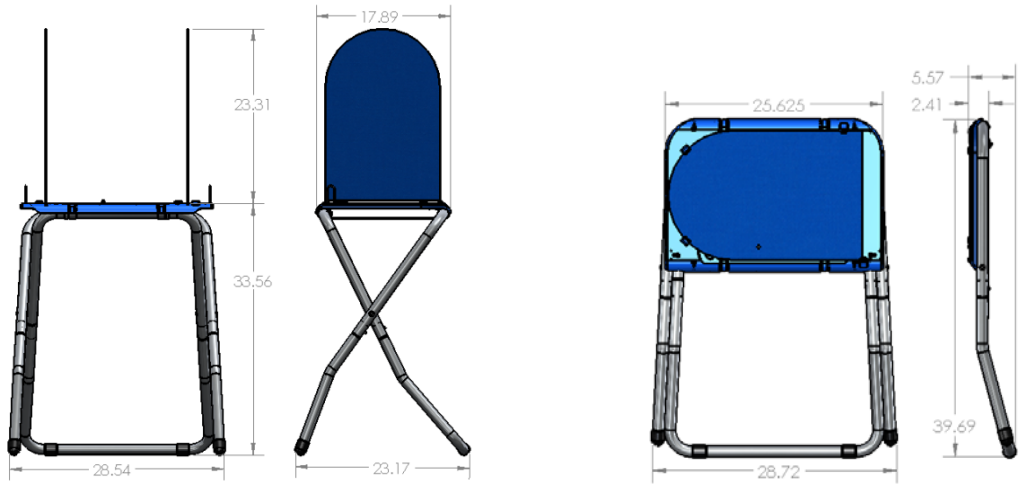


Table 10 - Standard Verity Touch Writer Booth specifications.

Dimensions & Weight	Collapsed in Bag	Collapsed	Deployed
Height in inches	22.0	39.7	33.6
Width in inches	31.5	29.0	28.8

Depth in inches	4.0	5.5	23.3
Weight in pounds	11.7	10.1	10.1

Accessible Verity Touch Writer Booth Specifications, I/N 3005-359

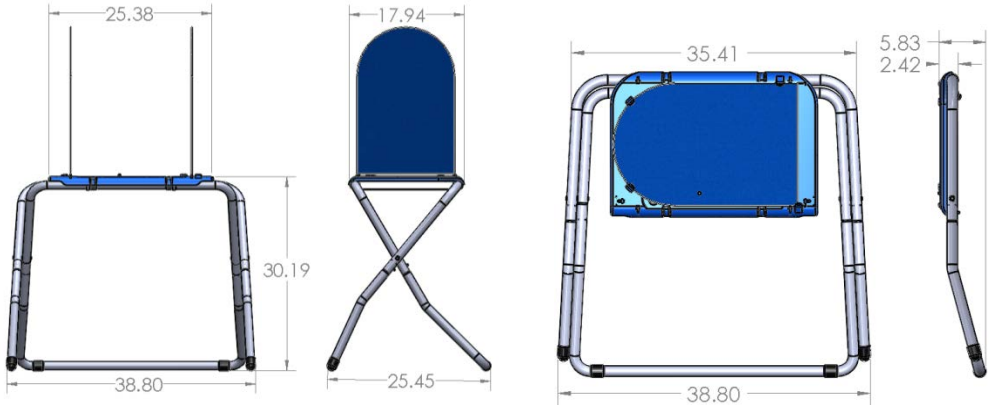


Table 11 - Accessible Verity Touch Writer Booth specifications.

Dimensions & Weight	Collapsed in Bag	Collapsed	Deployed
Height in inches	19.5	37.9	30.2
Width in inches	41.5	39.1	38.8
Depth in inches	4.0	5.8	25.5
Weight in pounds	11.0	10.1	10.1

Equipment Environmental Standards

Equipment	Specifications	Operating	Storage and Transportation
Verity Scan	Temperature	50° to 95° F	-4° to 140° F

Verity Touch Writer	Humidity	0 to 85 percent relative humidity, non-condensing	5 to 95 percent relative humidity, non-condensing
	Vibration	Per MIL-STD-810	Per MIL-STD-810
	Drop Height	Per MIL-STD-810	Per MIL-STD-810
	Power Requirement	120 VAC, 60 Hz, 60 W	

13. TROUBLESHOOTING PROCEDURES FOR SUPPORT PERSONNEL

The Help Desk Call Log is included here for use by trained local support personnel at the Elections Office Help Desk. The log includes fields for documentation of the Help Desk operator name, time, date, polling place site calling, caller, problem, resolution, and call back confirmation. This log, or one like it, should be used to document and track problems encountered.

Field personnel providing technical support should also use a log, and for that reason the Polling Place Troubleshooting & Observation Log is included here. Information recorded in this log should be cross-referenced to the Help Desk Call Logs used. Log serial numbers should be used for this purpose.

Post-election debriefing meetings should include an analysis of logs to determine issues that need resolution and how those resolutions will take place, and to identify issues that can be prevented in future election events.

Taking a Systematic Approach to Troubleshooting

When faced with a troubleshooting situation, apply this systematic troubleshooting approach.

Troubleshooting guidelines.

	Tasks
	Remain calm.
	Identify the issue, or the symptoms, as reported.
	Gather further information. Think broadly. Do not jump to conclusions. Ask questions.
	Establish a theory to explain the source of the problem.
	Research resolution steps, based on your theory.
	Use documentation available to you to identify the resolution steps necessary.

	Attempt resolution.
	Check for success.
	Repeat.

Remember, as with all electronics systems, many equipment issues can be solved by simply checking connections.

Verity Scan Troubleshooting Guide

Restarting Scan

If you need to restart (cycle power to) Scan because of an error, follow these steps.

Troubleshooting: Restarting Scan.

	Tasks
	Make certain that all voters currently voting have access to the emergency ballot slot on the Scan Ballot Box.
	Press the Scan power switch to the OFF position.
	Wait 30 seconds.
	Press the Scan power switch to the ON position.
	Type the required password.
	File all tapes that print in the appropriate envelope.
	Continue normal operations.

Ballots deposited in the Scan Ballot Box emergency slot will need to be scanned at the central counting station and/or according to local procedures.

Power Fails

Verity Scan will operate for at least 2-hours when the tablet battery is fully charged. The tablet battery is charged with a Hart approved external battery charger, the battery is not charged by the tablet or when connected to AC power.

Troubleshooting: Scan power failure.

	Tasks
	Check the power connection on the back of the Scan device, at the power brick, and at the wall. If Scan is plugged into a surge protector that has a switch, check the switch.
	If power to the facility fails, call the Elections Office or Help Desk and report the power failure.
	Have voters use the emergency slot in the Scan ballot box until power resumes.
	Unplug Scan from the outlet in order to avoid a power surge to the device when power returns.
	File the tapes printed upon restart in the appropriate envelope.

Ballots deposited in the emergency slot will need to be scanned at the central counting station and/or according to local protocol.

Scan Does Not Work

Troubleshooting: Scan does not work.

	Tasks
	Check all of the Scan power connections.
	Check the AC power connection on the back of Scan, at the power brick, and at the wall.
	If Scan is plugged into a switched surge protector, check the switch.
	Tasks
	Make certain that the Scan tablet is securely seated in the cradle and locked in to place. Press the power switch to the **OFF** position, wait 30 seconds, and press the switch to the **ON** position.
	If Scan shows an error or alert message, try restarting the device. Press the power switch to the **OFF** position, wait 30 seconds, and press the switch to the **ON** position.
	Enter the required password and follow the prompts.
	If Scan still does not work, use the ballot box emergency slot for ballots and call the Elections Office or Help Desk.

Scan Replacement

Troubleshooting: Replacing Scan.

	Tasks
	Do not close polls to replace equipment.
	If replacing a Scan device, first disconnect all power sources and remove, box, and tag the inoperable Scan.
	Set up the replacement Scan.
	Connect the Scan black power cord to the power brick and then to an electrical outlet, and press the power switch to the ON position.
	Select the polling place from the list provided and tap **Accept**. Tip: Type the polling place name to filter the option in the list.
	Confirm the selected polling place by tapping **Yes, assign it**.
	Tap **Print Zero Report**.
	Write the Scan ballots total, found at the bottom of the screen to the right of **Ballots** in the appropriate polling place log.
	Tap **Open the Polls**.
	Type the Open Polls Code and tap **Accept**. The **Polls Open** screen appears.
	Complete the support log, as applicable.

vDrive Removal

Only remove the vDrive if your instructions specifically call for this. Otherwise bring the entire Scan to the substation or central counting facility.

Troubleshooting: Removing the vDrive.

	Tasks
	To remove the vDrive, break the wire security seal securing the locked compartment on the right side of the Scan.
	Using the appropriate key, unlock the compartment and remove the lid.
	Remove the vDrive.
	Follow procedures for transporting the vDrive to a substation or central counting station.

Ballot Jam

Troubleshooting: A ballot is jammed in Scan.

	Tasks
	If a ballot causes a paper jam in the scanner path, carefully lift both the external AND internal scanner covers and remove all pieces of paper. Take care not to touch any glass surfaces in the scanner path.
	Using a pressurized air canister, blow the scanner path clean of small paper debris.
	Replace the scanner covers, spoil the voter's ballot if it is damaged, and have the voter mark a replacement ballot.
	Rescan either the original ballot (if not damaged/spoiled) OR the replacement ballot.
	If the problem persists, call the Elections Office or Help Desk.

Invalid Password

Troubleshooting: Password is not accepted.

	Tasks
	If you get an error message after entering a Scan password, verify the password.
	From the error message screen, tap **Continue** and follow the screens to restart the sequence you were attempting to perform.
	If you still get an error message, call the Elections Office or Help Desk.

Thermal Printer Error

Troubleshooting: Printer error.

	Tasks
	If the Printer error screen displays, check the Scan printer.
	Open the printer cover and check the paper path.
	Verify that the printer feed lever is in the DOWN position and close the printer cover.
	Tap **Retry** on the screen.
	If the printer error message continues to display tap **Cancel Print** and call the Elections Office or Help Desk and report the problem.

Scan will continue to function properly for all tasks other than report printing. If deemed necessary, replace Scan.

Changing the Thermal Printer Paper

The thermal printer is on the right side of the Scan device. It works with a special type of thermal rolled paper. Changing printer paper is similar to feeding paper into a typewriter or a dot-matrix printer. Follow these steps to change printer paper.

Troubleshooting: Changing the paper roll in Scan.

	Tasks
	Open the lid to the printer compartment. Before removing the old roll, notice how the spindle is inserted through the paper roll and observe the routing of the paper under the rubber roller.
	On the right side of the printer compartment, there is a feed lever. In order for the printer to print, it must be DOWN. In order to change the paper, it must be UP. Lift the lever.
	Take the old paper off the spindle and insert the spindle into the new roll of paper. Gently peel the free end of the paper off the roll and insert the new roll into its place in the printer compartment so that the roll feeds from the bottom. The spindle tips go into the slots.
	Slip the free end of the paper under the rubber roller and turn the roller by hand to feed the paper through.
	After you get enough paper fed through (around the rubber roller and past the shield) pull some extra paper out and thread it through the slot on the printer cover so that you have some lead when you close the lid.
	Push the feed lever DOWN and close the lid. You are ready to print.

Printing Reports

If you must print additional copies of reports immediately after closing polls, tap the appropriate report from either the Polls Closed or the Polls Suspended screen.

Verity Touch Writer Troubleshooting Guide

Personnel Requirements

Personnel troubleshooting Verity devices must receive training from Hart on the device in order to obtain the skill level required to successfully maintain the device.

The number of personnel required to troubleshoot a Verity device is 1 person per device.

Restarting Touch Writer

If you need to restart (cycle power to) Touch Writer because of an error, follow these steps.

Troubleshooting: Restarting Touch Writer.

	Tasks
	Press the Touch Writer power switch to the OFF position.
	Wait 30 seconds.
	Press the Touch Writer power switch to the ON position.
	Type the required password.
	File all tapes that print in the appropriate envelope.
	Continue normal operations.

Power Fails

Verity Touch Writer will operate for at least 2-hours when the tablet battery is fully charged. The tablet battery is charged with a Hart approved external battery charger, the battery is not charged by the tablet or when connected to AC power.

Troubleshooting: Touch Writer power failure.

	Tasks
	Check the power connection on the back of the Touch Writer device, at the power brick, and at the wall. If Touch Writer is plugged into a surge protector that has a switch, check the switch.
	If power to the facility fails, call the Elections Office or Help Desk and report the power failure.
	Unplug Touch Writer from the outlet in order to avoid a power surge to the device when power returns.
	File the tapes printed upon restart in the appropriate envelope.

Touch Writer Does Not Work

Troubleshooting: Touch Writer does not work.

	Tasks
	Check all of the Touch Writer power connections.
	Check the AC power connection on the back of Touch Writer, at the power brick, and at the wall.
	If Touch Writer is plugged into a switched surge protector, check the switch.
	Check the AC Power connection on the Touch Writer printer.
	Tasks
	Make certain that the Touch Writer tablet is securely seated in the cradle and locked in to place. Press the power switch to the **OFF** position, wait 30 seconds, and press the switch to the **ON** position.
	If Touch Writer shows an error or alert message, try restarting the device. Press the power switch to the **OFF** position, wait 30 seconds, and press the switch to the **ON** position.
	Enter the required password and follow the prompts.
	Check the USB cable connections at both the printer and Touch Writer USB ports.
	If Touch Writer still does not work, use the ballot box emergency slot for ballots and call the Elections Office or Help Desk.

Touch Writer Replacement

Troubleshooting: Replacing Touch Writer.

	Tasks
	Do not close polls to replace equipment.
	If replacing a Touch Writer device, first disconnect all power sources and remove, box, and tag the inoperable Scan.
	Set up the replacement Touch Writer.
	Connect the Touch Writer black power cord to the power brick and then to an electrical outlet, and press the power switch to the ON position.
	Select the polling place from the list provided and tap **Accept**. Tip: Type the polling place name to filter the option in the list.
	Confirm the selected polling place by tapping **Yes, assign it**.
	Tap **Print Zero Report**.
	Write the Touch Writer ballots total, found at the bottom of the screen to the right of **Ballots** in the appropriate polling place log.
	Tap **Open the Polls**.
	Type the Open Polls Code and tap **Accept**. The **Polls Open** screen appears.
	Complete the support log, as applicable.

vDrive Removal

Only remove the vDrive if your instructions specifically call for this. Otherwise bring the entire Scan to the substation or central counting facility.

Troubleshooting: Removing the vDrive.

	Tasks
	To remove the vDrive, break the wire security seal securing the locked compartment on the right side of the Scan.
	Using the appropriate key, unlock the compartment and remove the lid.
	Remove the vDrive.
	Follow procedures for transporting the vDrive to a substation or central counting station.

Ballot Jam in Printer

Troubleshooting: A ballot is jammed in Touch Writer Printer.

	Tasks
	If a ballot causes a paper jam in the printer path, carefully examine the paper path in the printer.
	Remove all paper that is stuck in the paper path
	Allow the voter to reprint either the original ballot (if not damaged/spoiled) OR the replacement ballot.
	If the problem persists, call the Elections Office or Help Desk.

Invalid Password

Troubleshooting: Password is not accepted.

	Tasks
	If you get an error message after entering a Touch Writer password, verify the password.
	From the error message screen, tap **Continue** and follow the screens to restart the sequence you were attempting to perform.
	If you still get an error message, call the Elections Office or Help Desk.

Thermal Printer Error

Troubleshooting: Printer error.

	Tasks
	If the Printer error screen displays, check the Touch Writer thermal printer.
	Open the printer cover and check the paper path.
	Verify the printer cover is closed and the LED is green.
	Tap **Retry** on the screen.
	If the printer error message continues to display tap **Cancel Print** and call the Elections Office or Help Desk and report the problem.

Scan will continue to function properly for all tasks other than report printing. If deemed necessary, replace Scan.

Changing the Thermal Printer Paper

The thermal printer is on the right side of the Scan device. It works with a special type of thermal rolled paper. Changing printer paper is similar to feeding paper into a typewriter or a dot-matrix printer. Follow these steps to change printer paper.

Troubleshooting: Changing the paper roll in Scan.

	Tasks
	Open the lid to the printer compartment. Before removing the old roll, observe the routing of the paper in the well.
	Gently peel the free end of the paper off the roll and insert the new roll into its place in the printer compartment so that the roll feeds from the bottom.
	Pull some extra paper out so that you have some lead when you close the lid.
	Close the lid, the LED should be green. You are ready to print.

Printing Reports

If you must print additional copies of reports immediately after closing polls, tap the appropriate report from either the Polls Closed or the Polls Suspended screen.

[i] Art Institute of Graphics Art (AIGA) – Design for Democracy are a set of design tools to increase civic participation by creating easily understandable, efficient, and trustworthy interactive communcation technologies.

Attachment No. 6

ATTACHMENT TO TEST REPORT

Report Reference No.: PTI-1411085-000

Dated of issue: 2014-11-25

Attachment contains

Cover page ..... : 1 page

Verity Polling Place Operations Technical Reference Manual 6610-100 ..... : 100 pages

Total: 101 pages

Polling Place

Operations Technical Reference Manual

Document number 6610-100-A01

Hart InterCivic is committed to consistently providing high quality products and services for its customers through adherence to its established Quality Management System, complying with customer, statutory and regulatory requirements, and a commitment to continual improvement. Hart InterCivic is also committed to the integrity and the security of the information used in both the product development process and by the products themselves. Management will establish and maintain an information security management system to ensure that contractual requirements are met, employees are trained in information security, and risks to information security are managed.

Document number 6610-100-A01.

Hart InterCivic, Inc.
P.O. Box 80649
Austin, Texas 78708
Telephone: (866) ASK-HART | (866) 275-4278
URL: www.hartintercivic.com

Table of Contents

Introduction

The Verity Polling Place Operations Guide provides device overview information for elections officials and support personnel in the following main sections:

Verity Voting System

Welcome to the Verity Voting system. The Verity Voting system is a robust voting system that enables all voters to easily and quickly make selections and cast votes. At the polls, Verity Voting comprises Touch Writer, a touch-screen voting device, and Scan, a paper ballot scanning device.

Verity Touch Writer

As poll workers, you can open the polls, generate ballot Access Codes, close the polls, and print reports.

On the Touch Writer, voters use a touch screen or an accessibility device to make their selections on the ballot privately and independently. When a voter finishes making selections, a marked ballot prints so the voter can cast the ballot.

Verity Access is an accessibility device that allows voters with disabilities to vote privately and independently. Access provides a Move wheel to navigate through the ballot and a Select button to make ballot selections. A Help button is included in case the voter requires assistance. Access includes accessibility device connectivity for headphones, Tactile Input switches, and Sip and Puff devices.

Verity Scan

Scan is a digital scanner that quickly scans voters' paper ballots. Ballots are scanned through the ballot feed slot, selections are read by Scan, and votes are cast. Then the ballots drop into Scan's secure ballot box for locked storage. If ballots have contests that are marked incorrectly, Scan displays instructions so that voters have an opportunity to correct mismarked ballots before casting their votes.

Next Topics

The next chapter review the supplies required to operate an efficient polling place. Following that are chapters on Touch Writer and Scan, as well as other topics.

Touch Writer

This chapter includes detailed information for setting up, configuring, and using Touch Writer in a polling place. Included are all of the instructions needed for initial set up, usage by voters, and managing systems on Election Day.

This chapter describes the following:

Touch Writer Parts

The Touch Writer comes with the portable device for entering votes and a printer to print completed ballots. Certified Hart Ballot Stock is recommended.

Verity Access

Verity Access is an accessibility device that allows voters with disabilities to vote privately and independently. Access provides a Move wheel to navigate through the ballot and a Select button to make ballot selections. A Help button is included in case the voter requires assistance. Access includes accessibility device connectivity for headphones, Tactile Input switches, and Sip and Puff devices.

Uninterruptible Power Supply

Hart recommends using a uninterruptible power supply (UPS) as a backup for the Touch Writer *printer* in the event of a power loss at the polling place. Contact Hart for purchasing of approved UPS.

The Touch Writer itself has a battery that provides up to two hours of continued usage in the case of power loss. The battery indicator on the Touch Writer screen is green from 100-20% charged. Below the 20% threshold, the battery indicator is marked with a circle with a line through it, indicating that the battery needs to be recharged.

Setting Up Touch Writer

Booth Setup

	Steps
☐	1. Ensure that the Touch Writer and printer setup location is near a power outlet and that the outlet is not blocked by the booth. Route power cords so that they cannot be tripped over.
☐	2. Attach the rear leg extension to the left and right legs by locking them in place (fit the button into the hole).
☐	3. Lock the front-right leg extension in place (fit the button into the hole).
☐	4. Lock the front-left leg extension in place (fit the button into the hole).
☐	5. Lift up the booth so that it is standing on its legs.
☐	6. Unfold the booth so that it stands up on its own.
☐	7. Lock down the tray.
☐	8. Insert privacy screens into the notches on the sides of the booth.

Uninterruptible Power Supply Setup

	Steps
☐	1. Place the UPS near an unblocked power outlet and near the Touch Writer printer that will plug into it. Only the printer will use the UPS. Other devices have built in battery backup. Route power cords so that they cannot be tripped over.
☐	2. Plug the power cord into the power outlet.
☐	3. Turn on the UPS.

Touch Writer Device Setup

	Steps
☐	1. Ensure that the Touch Writer and printer setup location does not block the power outlet. Route the power cords so that they cannot be tripped over.
☐	1. Set the Touch Writer on top of the booth by aligning the footpads with the indentions on the boot tray.
☐	2. From the rear of the booth, reach underneath and lock the Touch Writer into place by pulling the latch.
☐	3. Unlock the Touch Writer case.
☐	4. Unlatch and open the Touch Writer case and lock the support bar in place.
☐	5. Remove the Tablet from its storage location.
☐	6. Secure the tablet into the docking cradle.
☐	7. Lock the Tablet into place using the appropriate key.
☐	8. Open the compartment to the right of the tablet and remove the power cords. Close the compartment.
☐	9. Insert the power cord into the AC power brick.
☐	10. Insert the round end of the power cord into the back of the Touch Writer.

	Steps
☐	11.Plug the power cord into a power outlet or UPS.
☐	12.Position the ballot printer on a table near the Touch Writer.
☐	13.Insert the power cord into the printer and then into the UPS.
☐	14.Insert the square end of the USB printer cord into the printer.
☐	15.Insert the other end of the USB printer cord into the rear of the Touch Writer.
☐	16.Load the ballot printer with ballot paper.

Beginning of Day Procedures

Opening the Polls on the Touch Writer

	Steps
☐	1. Press the power button on the ballot printer. Wait while it powers up.
☐	2. Press the green power button on the Touch Writer. Wait while it powers up. The Power-On Self Test Report prints.
☐	3. Tap in the maintenance code using the keypad on the Enter Maintenance Code screen and tap **Accept**. Wait while the election loads. This may take several minutes.
☐	4. Tap **Print Zero Report**. Check the Zero Report to verify the polling place and/or precincts. Leave the Zero Report on the Touch Writer; it will be filed at the end of Opening Polls.
☐	5. Write the Ballot Count total in the Reconciliation Log.
☐	6. Verify that the time on the Touch Writer is correct.
☐	7. Tap **Open the Polls**.
☐	8. Tap in the Open Polls code using the keypad and tap **Accept**. Wait while the Open Polls Report prints.
☐	9. Tear off the reports and file in the appropriate envelope.
☐	10. The Touch Writer displays the Start Your Ballot screen or the Choose Your Language screen if more than one language is available.

When re-opening the polls during early voting, use the same process except step four. Do not print a Zero Report when re-opening the polls during early voting.

Working with Voters

Creating Access Codes

Follow these steps to create an Access Code after:

- The voter has been qualified
- The voter's precinct I.D. has been verified
- An open booth is available

	Steps
☐	1. Press the blue Poll Worker button.
☐	2. Tap in the Poll Worker code using the keypad and tap **Accept**.
☐	3. Tap **Create ballot access code**.
☐	4. Tap the correct precinct from the list and tap **OK**.
☐	5. Tap **Yes, print the code**. Only print an Access Code if there is an open booth. Access Codes expire if they are not entered into Touch Writer.
☐	6. Verify the voter's precinct I.D. on the Access Code slip. Give the Access Code slip to the voter, and instruct the voter to follow the instructions at the booth.
☐	7. The Touch Writer again displays the Start Your Ballot screen or the Choose Language screen if more than one language is available.

Helping Touch Writer Voters

	Steps
☐	1. Go to the booth where a voter has requested help.
☐	2. Stand beside the privacy screen to maintain voter privacy.
☐	3. Ask the voter how you may be of assistance.
☐	4. Ask appropriate questions to learn what part of the voting process the voter needs help with (for example, "What screen is visible?").
☐	5. *Always* ask for the voter's explicit permission before seeing the ballot or touching the voter's Touch Writer machine.
☐	6. Follow state and local guidelines to complete the appropriate assistance forms, if required.

Marking a Ballot

To mark your ballot on the Touch Writer, follow these steps:

	Steps
☐	1. If using a multilingual ballot, select the language.
☐	2. Enter the pass code you just received from the poll worker.
☐	3. Navigate through the contests and make your selections.

	Steps
☐	4. Read or listen to the Review Your Ballot page carefully. If any contests are marked incorrectly, select the contest to return to the contest screen and select another option. Only after all of your desired choices have been made, select **Print**. Clicking the **View Summary** button from a contest displays the ballot summary of contest choices. Clicking a contest returns you to that contest to make or change a selection. The Review Your Ballot page always appears before the ballot is printed so that you can review your selections and make changes, if desired.  You can change your selections at any time before the **Print** button is clicked. Once the **Print** button is clicked, you cannot change your vote. If the **Print** button is clicked in error, speak to a poll worker. In multi-page ballot summaries, turn the **Move** wheel or click **Next** to move to the last page and then click **Print**.
☐	5. When your ballot finishes printing, feed it through the Scan. You have finished voting when the waving American flag is displayed, or when the audio indicates that your vote has been recorded.

Spoiling a Ballot

Sometimes is may be necessary to spoil a ballot. As long as the voter has not cast the ballot, a ballot may be spoiled. Spoil a ballot if any of the following are true:

- A voter receives the wrong ballot style.
- A voter receives a ballot in the wrong language.
- A voter wishes to make changes to a previously marked ballot.
- A voter walks away from the booth with an active ballot without tapping Cast Ballot. Refer to the Elections Office guidelines for this situation.

Follow state and local guidelines to issue a replacement ballot.

	Steps
☐	1. Press the blue Poll Worker button.
☐	2. Tap in the Poll Worker code using the keypad and tap **Accept**.
☐	3. Tap **Spoil current ballot**.
☐	4. Tap **Spoil the ballot**.
☐	5. Tap **OK**.
☐	6. Tap **Exit** to return to the Start Your Ballot screen or the Choose Language screen if more than one language is available.

Using Verity Access

Using Headphones

Headphones are ideal for voters who may have trouble reading the ballot. Headphones can be plugged into the port with the headphones symbol.

- Volume may be adjusted using the Audio button on the Touch Writer screen. If the headphones have a volume control built into the wiring, sliding the volume control lever up produces louder audio; sliding the level down produces quieter audio.
- Orient blind or visually impaired voters to the Verity Access Move wheel and Select button.
- If necessary, read the Access Code to the voter, allowing the voter to enter the code independently and begin voting.

Using Tactile Input Switches

Tactile input switches are designed for voters who have mobility impairments.

- Check to make sure that the tactile input switches are plugged in to the correct port on the Access device. The disabled access port has a wheelchair symbol next to it.
- For visually impaired voters who need headphones and tactile input switches, a poll worker must orient the voter to the switches. The poll worker should identify by color and function which switch is on the left and which is on the right. The red switch is for moving. The green switch is for selecting.
- A voter's personal *sip-and-puff* device can plug into the disabled access port in place of the tactile input switches. *Sipping* is similar to turning the Move wheel in a clockwise direction; *puffing* is similar to clicking the Select button.

End of Day Procedures

Suspending Polls for Early Voting

	Steps
☐	1. Wait for all voters in the polling place to finish voting.
☐	2. Press the blue Poll Worker button on the back of the Touch Writer.
☐	3. Tap in the Maintenance code using the keypad and tap **Accept**.
☐	4. Tap **Suspend Polls**.
☐	5. Tap in the Suspend Polls code using the keypad and tap **Accept**.
☐	6. Tap **Yes, suspend the polls** on the **Confirmation Required** screen. The Suspend Polls report prints. Leave this on the Touch Writer to be filed with other end-of-day reports.
☐	7. Write the Ballot Count total in the Reconciliation Log.
☐	8. Tap **Print Ballot Count** to print the Ballot Count Report. Additional copies of the Ballot Count report may be printed if necessary or desired.
☐	9. File the reports in the appropriate envelope(s).
☐	10.Tap **Print Ballot Count** again. Leave this copy of the Ballot Count report on the Touch Writer.
☐	11.Check that you have all Election Day reports: • Polls Open reports filed • Polls Suspended reports filed • Ballot Count report left on the Touch Writer
☐	12.Press the green power button on the rear of the Touch Writer.
☐	13.If this is the last day of Early Voting, disconnect and pack up all equipment.

Closing the Polls on Election Day

Check Local Procedures

At the close of polls, your jurisdiction will print a report detailing the total number of paper ballots cast.

Closing the Polls

At the close of polls, your jurisdiction will print a report detailing the number of paper ballots printed.

	Steps
☐	1. Wait for all voters in the polling place to finish voting.
☐	2. Press the blue Poll Worker button on the back of the Touch Writer.
☐	3. Tap in the Poll Worker code using the keypad and tap **Accept**.
☐	4. Tap **Close Polls**.
☐	5. Tap in the Close Polls code using the keypad and tap **Accept**.
☐	6. Tap **Yes, close the polls** on the Confirmation Required screen. The Close Polls report prints. Leave this on the Scan to be filed with other end of day reports.
☐	7. Are you authorized to select the Print Tally option, if available, on the Polls Closed screen? Print the Tally Report only if specifically instructed to do so by your local Elections Office. • If Yes, proceed to Step 8. • If No, proceed to Step 9.
☐	8. Tap **Print Tally Report**. Repeat as necessary to print additional copies of the Tally report in accordance with state and local guidelines.
☐	9. Tap **Print Access Code Summary** and tear off the report.
☐	10. Tap **Print Write-In Report**, if applicable, and tear off the report.
☐	11. Write the Ballot Count total in the Reconciliation Log and file the reports in the appropriate envelope(s).
☐	12. Tap **Print Tally Report** again or **Print Ballot Count**. Leave this copy on the Touch Writer.

	Steps
☐	13.Check that you have all Election Day reports: • Polls Open reports filed • Polls Closed reports filed • Final Report left on the Touch Writer
☐	14.Press the green power button on the rear of the Touch Writer.
☐	15.Wait until the screen is dark, and then unplug the Touch Writer's AC power cable from the outlet or UPS.
☐	16.Prepare appropriate envelopes, logs, and all other paperwork for transport to the location specified by the Elections Office.
☐	17.Follow local procedures to transport the Touch Writer and/or vDrives to the location specified by the Elections Office.

Packing Up the Touch Writer

End-of-Day, Early Voting

Complete the following tasks at the end of each day during early voting.

	Steps
☐	1. Disconnect the Touch Writer from all power sources.
☐	2. Disconnect the Ballot Printer from all power sources.
☐	3. Secure the entire room where the Touch Writer is located, or secure the individual Touch Writer as directed by the Elections Office.
☐	4. Typically, vDrives remain inside their respective device. Do not remove the vDrive unless specifically instructed to do so.
☐	5. Secure the logs.

End of Voting

Complete the following tasks at the end of the final day of early voting and at the end of Election Day.

	Steps
☐	1. Disconnect the Touch Writer from all power sources.
☐	2. Disconnect the Ballot Printer from all power sources.
☐	3. Detach the Touch Writer and disassemble Touch Writer booths.
☐	4. Prepare appropriate envelopes, logs, and all other paperwork for transport to the location specified by the Elections Office.
☐	5. Follow local procedures to transport the Touch Writer and/or vDrive to the location specified by the Elections Office.

Touch Writer Polling Place Troubleshooting Quick Guide

Problem	Resolution Steps	Reference
AC power fails without battery backup	1. Check all power connections. 2. Call the Elections Office or Help Desk to notify them of the situation. 3. Unplug the device from the wall outlet. 4. When AC power returns, refer to the "Ballots Not Complete" report to print new access codes for voters.	• Power fails • Ballots Not Complete report
AC power fails, but battery power takes over	No resolution needed. Be aware that the device may get warm if running on battery for an extended period of time.	• Battery operations • Power fails • Power status
Battery does not work	1. Check that the battery is present. 2. Check that the battery is connected correctly. 3. Check that the battery is fresh by pressing and holding the Test button. Battery should have a power indicator of at least 80%. 4. If necessary, request a new battery.	• Connecting device battery • When device battery does not work
Battery shuts off before close polls reports are printed.	1. Press the power button to turn the device on. 2. Enter the appropriate passwords to return to the Polls Closed screen. 3. Finish printing reports.	• Device battery power when closing polls.
"Corrupt vDrive" or "Invalid vDrive" error message.	Replace the device.	• Corrupt or Invalid vDrive
Darkened display screen	1. If the unit has been in direct sunlight, or in a closed vehicle, move it to a shaded, cooler, area. 2. Check that the device is not running on battery power alone, if AC power is accessible. 3. Verify that the docking indicator light is illuminated. 4. If it still does not respond, replace the device.	• Darkened device screen

Problem	Resolution Steps	Reference
Device does not work	1. Look at the "Power-On Self Test Report" and check that the correct version is installed (check with jurisdiction for correct version). If the version is incorrect contact the jurisdiction for a replacement device. 2. Restart the system. If there was an error message on the malfunctioning device, disconnect the battery pack after powering off the device, reconnect the battery pack, then power on the device. 3. If the device is still unresponsive, replace the device.	• Device does not work • Device replacement
Device is hot or smells hot	1. Verify that the battery pack is connected correctly, not in reverse polarity. 2. If problem persists, replace the device.	• Screen on device is dark • Power status • Device replacement
Error displays	1. Follow procedures for the specific error. 2. Check power and tablet connections and restart the device. 3. Call the Elections Office or Help Desk for assistance.	• Device replacement
Extra Access Codes	1. On the back of the extra access code, write a note explaining what happened. 2. File the access code in the appropriate envelope. The access code will appear as Expired on the end-of-day reports. 3. Press the Poll Worker Button on the back of the device. 4. Enter the Poll Worker password. 5. Tap the button to "Deactivate an Access Code". 6. Follow the prompts to deactivate the Access Code.	• Extra Access Codes

Problem	Resolution Steps	Reference
Headphones and/or Tactile Input Switches do not work	1. Check that volume control on headphones is pushed up. 2. Check that the connection to headphone jack and/or tactile input switches jack is secure. 3. Verify that the plug is connected to the correct jack. 4. On the device, tap the Options button to verify the volume settings. 5. If the peripheral is still not functioning, reboot the device. 6. If the peripheral is still not functioning after the reboot, replace the device.	• Headphones and/or Tactile Input Switches do not work • Device replacement
Password does not work	Verify you are using the correct password.	• Password is invalid
Polling Place and/or Voting Type identified incorrectly	1. Refer to the "Election Identification" report to confirm polling place name and voting type. **OR** 1. Refer to any report header to confirm the Polling Place name. 2. If the Polling Place name or voting type is incorrect, call the Elections Office or Help Desk to verify and replace Scan.	• Polling Place and/or Voting Type identified incorrectly • Scan replacement
Polls closed too early	1. In Early Voting, restart the system. 2. On Election Day, verify that a Polls Closed screen is displayed and then replace the device.	• Polls closed too early
Printing reports after closing or suspending polls and powering off	1. If you must restart the device to print reports after polls are suspended or closed: 2. Power on the device. 3. Type the password requested and tap Accept. 4. In Early Voting mode, press the Poll Worker Button and follow prompts to type passwords, suspend polls, and print Ballot Count. **OR** In Election Day mode, follow prompts to print a Tally report.	• Reports, printing

Problem	Resolution Steps	Reference
Report Printer error	1. Respond to the error message, as appropriate. 2. Check paper orientation. It should be rolling out from the bottom. 3. Ensure the paper is extending through the cover. 4. Pull out a short length of paper to ensure the paper is not jammed. 5. If the problem persists, contact the Elections Office or Help Desk for assistance.	• Printer errors • Printer paper, changing
Report Printer paper, changing	1. Open the lid of the printer compartment and note printer paper routing. 2. Remove old paper and insert and route new paper. 3. Feed paper through lid and close lid.	• Printer paper, changing
Restarting the device	1. Make certain voters have access to the emergency slot on the Scan ballot box. 2. Press the power button until the device shuts down. 3. Wait 15-30 seconds. 4. Press the power button to turn the device on. 5. Follow prompts on the device screen.	• Restarting the device
vDrive error	1. Check connections and restart the system. 2. Call the Elections Office or Help Desk.	• vDrive error
vDrive removal error message	1. Restart the device. 2. If the problem persists, replace the device.	• vDrive removal
Voter issues	(Not equipment issues, but may not be applicable to troubleshooters)	• Voter enters wrong language choice • Voter gets wrong ballot style • Voter needs Verity Access features • Voter's precinct I.D. is incorrect. • Voter requests a receipt

Next Topics

You are now familiar with Touch Writer and have an overall view of Verity Voting. Next we'll take a look at Scan. After that, we'll turn our attention to assisting voters with disabilities.

Polling Place Supplies

This section details all of the supplies required in order to set up the polling place. The polling place requires a number of supplies, plans, and information when installing, configuring, and using Verity Voting system components during elections.

This chapter describes the following topic:

Supply Lists

This section provides lists of the supplies and voter information for the Verity Voting system at the polling place.

Your jurisdiction may use some, all, or more than these supplies.

General Supplies

- Polling Place Layout, if available
- Traffic Control Plan, if available
- Extra ballots: Enough for voters to cast ballots by hand
- Pens: Enough for voters to use for voting
- Extra rolls of thermal paper

Instructive Supplies for Voters

- Sample Ballots, if available
- Voter Instruction Flyers
- Voter Instruction Script
- Voter Instruction Placards
- Voter Instruction Video and video player, if available

Logs and Envelopes

Table 1. Logs and envelopes.

	Supplies	Details
☐	Reconciliation Log	
☐	Spoiled Ballot Log	
☐	Appropriate Envelopes	

Next Topics

Now that you have been introduced to Verity Voting and have your supplies in order, continue on to the next chapter where we will review Touch Writer.

Scan

This chapter details how to set up, use, and pack away Verity Scan.

This chapter describes the following:

Scan Parts

The following image depicts Verity Scan atop a ballot box. As ballots are scanned, they are fed into the ballot box, locked and secured.

Setting Up Scan

Assembling the Ballot Box

Instructions for setting up and taking down the ballot box are on the label affixed to the back of the ballot box.

	Tasks
☐	1. Ensure that the ballot box setup location is near a power outlet and that the outlet is not blocked by the ballot box. Route power cords so that they cannot be tripped over.
☐	2. Position the collapsed ballot box upright by orienting the instruction label on the back of the ballot box upright.
☐	3. Unlatch the four clips: two on the right side, and two on the left side.
☐	4. Pull open the ballot box by separating the front and back.
☐	5. Press the side panels outward until they are flat.
☐	6. Lower the bottom panel (do not press down).
☐	7. Pull down gently on the Emergency Ballot Bag to give it shape.
☐	8. Release the top panel by unhooking the three straps.
☐	9. Pull up on the string to slide the lock to the unlocked position.
☐	10. Lift the top panel while gently pulling it outward, lay it across the top of the ballot box, and then press it onto the top.
☐	11. Lock the top in place by sliding any one of the three sliding pegs toward the back of the ballot box.
☐	12. Unlock the front door using the key.
☐	13. Press firmly on the bottom panel to secure it in place.
☐	14. Lock the front door using the key.

Scan Device Setup

	Tasks
☐	1. Set the Scan on top of the ballot box and align the footpads with the indentations on the ballot box.
☐	2. Reach underneath the lid of the ballot box. Gently pull down on the cord while pushing it towards the back of the ballot box.
☐	3. Unlock the Scan case.
☐	4. Unlatch and open the Scan case, and lock the support bar in place.
☐	5. Remove the tablet and attach it.
☐	6. Open the compartment to the right of the tablet and remove the power cords. Close the compartment.
☐	7. Lock the Tablet into place using the corresponding key.
☐	8. Insert the power cord into the AC power brick.
☐	9. Insert the round end of the power cord into the power port on the back of the Scan.
☐	10.Plug the power cord into a power outlet.

Beginning of Day Procedures

Opening the Polls on the Scan

	Tasks
☐	1. Press the green power button on the back of the Scan. Wait while the Scan powers up.
☐	2. Tap in the Maintenance code using the keypad on the Enter Maintenance Code screen and tap **Accept**. Wait while the election loads.
☐	3. Tap **Print Zero Report**. Check the Zero Report to verify the polling place and/or precincts. Leave the Zero Report on the Scan. It will be filed at the end of Opening Polls.
☐	4. Write the Ballot Count total in the Reconciliation Log.
☐	5. Verify that the time on the Scan is correct.
☐	6. Tap **Open the Polls.**
☐	7. Tap in the Open Polls code using the keypad and tap **Accept**. Wait while the Open Polls Report prints.
☐	8. Tear off the reports and file in the appropriate envelope(s).
☐	9. Scan displays the Insert Ballot screen. Scan is ready to scan ballots.

Re-Opening Polls for Early Voting

	Tasks
☐	1. Insert the power cord into the AC power brick.
☐	2. Insert the round end of the power cord into the power port on the back of the Scan.
☐	3. Plug the power cord into a power outlet.
☐	4. Press the green power button on the back of the Scan. Wait while Scan powers up.

	Tasks
☐	5. Tap the Maintenance code using the keypad on the Enter Maintenance Code screen and tap **Accept**. Wait while the election loads.
☐	6. Tap **Open the Polls**.
☐	7. Tap in the Open Polls code using the keypad and tap **Accept**. Wait while the Open Polls Report prints.
☐	8. Write the Ballot Count total in the Reconciliation Log.
☐	9. Tear off the reports and file in the appropriate envelope(s).
☐	10. The Scan displays the Insert Ballot screen. The Scan is ready to scan ballots.

Working with Voters

Voter Instructions in Case of Power Loss

If hand-marking ballots, explain how to mark ballots properly before each voter gets to a voting booth.

	Tasks
☐	1. Please use black or blue pen to mark your ballot.
☐	2. To vote for your choice in each contest, completely fill in the box to the left of your choice. Make the mark clear and distinct.
☐	3. If more than the allowable number of marks are placed on the ballot for a given contest, the vote will not be counted for that contest.
☐	4. To vote for a write-in candidate, if applicable, completely fill in the box to the left of the words "Write-In" and write the candidate's name on the adjacent line.

Helping Scan Voters

	Tasks
☐	1. Go to the booth where a voter has requested help.
☐	2. Stand beside the privacy screen to protect the voter's privacy.
☐	3. Ask the voter how you may be of assistance.
☐	4. Ask appropriate questions to learn what part of the voting process the voter needs help with (for example, what screen are you on).
☐	5. *Always* ask for the voter's explicit permission before seeing the ballot.
☐	6. Follow state and local guidelines to complete appropriate assistance forms, if required.

Scanning and Casting a Ballot

	Tasks
☐	1. Scan displays **Insert Ballot** when the machine is available for the next ballot.
☐	2. Insert the ballot into the ballot feed slot. Scan scans ballots inserted in any orientation.
☐	3. Wait while Scan reads the ballot.
☐	4. If the ballot is properly marked, Scan accepts and stores the ballot and displays the waving American flag to indicate that the ballot has been recorded. If the ballot has improperly marked contests, refer to **Helping Voters with Improper Marks on Ballots**.

Helping Voters with Improper Marks on Ballots

	Tasks
☐	1. The Scan displays **Insert Ballot** when the machine is available for the next ballot.
☐	2. Insert the ballot into the ballot feed slot. The Scan scans ballots inserted in any orientation.
☐	3. Wait while the ballot processes and then displays a message for the improperly marked ballot.
☐	4. Respond to any Voter Instruction messages. For improperly marked contests, the Ballot is Not Properly Marked screen displays, listing each contest that requires attention.
☐	5. Identify the contest name and the type of improper mark(s) on that contest. • Overvote: Too many options marked • Undervote: Too few options marked • Blank ballot: No options marked on the entire ballot
☐	6. To make changes to the ballot, the voter may remove his or her ballot from the Scan and obtain a new ballot from a poll worker.

	Tasks
☐	7. To cast the ballot as-is, the voter may do the following depending on Scan settings: • Tap **Cast the ballot as-is** • Request assistance from a Poll Worker
☐	8. If assistance is requested, Poll Workers should confirm that the voter wishes to cast the ballot as-is by asking, "Are you sure you want to cast your ballot?"
☐	9. To accept the voter's ballot, tap **Cast the ballot as is**. Scan displays the waving American flag to indicate that the ballot has been recorded.

Spoiling a Ballot

If a voter makes a mistake when marking a ballot, it may be necessary to spoil that ballot. As long as the ballot has not been cast, it may be spoiled. Spoil a ballot if any of the following are true:

- A voter receives the wrong ballot style.
- A voter receives a ballot in the wrong language.
- A voter wishes to make changes to a previously marked ballot.
- A voter walks away from the booth with an active ballot without tapping Cast Ballot. Refer to the Elections Office guidelines for this situation.

Follow state and local guidelines to issue a replacement ballot.

End of Day Procedures

Suspending Polls for Early Voting

	Tasks
☐	1. Wait for all voters in the polling place to finish voting.
☐	2. While the Insert Ballot screen is displayed, press the green Poll Worker button on the back of the Scan.
☐	3. Tap **Suspend the Polls**.
☐	4. Tap in the Suspend Polls code using the keypad and tap **Accept**.
☐	5. Tap **Yes, suspend the polls** on the **Confirmation Required** screen. The Suspend Polls report prints. Leave this on the Scan to be filed with other end-of-day reports.
☐	6. Write the Ballot Count total in the Reconciliation Log.
☐	7. Tap **Print Ballot Count** to print the Ballot Count Report. Additional copies of the Ballot Count report can be printed.
☐	8. Remove both reports and file them in the appropriate envelope(s).
☐	9. Tap **Print Ballot Count** again. Leave this copy of the Ballot Count report on the Scan.
☐	10.Check that you have all Election Day reports: • Polls Open reports filed • Polls Suspended reports filed • Ballot Count report left on the Scan
☐	11.Press the blue power button on the back of the Scan.
☐	12.If this is the last day of Early Voting, disconnect and pack up all equipment.

Closing the Polls on Election Day

Check Local Procedures

At the close of polls, your jurisdiction will print a report detailing the total number of paper ballots cast. In addition, the option to print an Unofficial Tally Report may be available, depending on local procedures.

Check local procedures to confirm whether an Unofficial Tally Report is to be printed or not, and then follow the appropriate section of this desk reference.

Option 1: Closing the Polls with Ballot Count Report

The Ballot Count Report includes only a summary of the total number of ballots cast per precinct. The report includes no unofficial totals. The Ballot Count Report can be printed on each of the Scan devices in the polling place after the close of polls.

	Tasks
☐	1. Wait for all voters in the polling place to finish voting.
☐	2. While the Insert Ballot screen is displayed, press the blue Poll Worker button on the back of the Scan.
☐	3. Tap **Close the polls**.
☐	4. Tap in the Close Polls code using the keypad and tap **Accept**.
☐	5. Tap **Yes, close the polls** on the **Confirmation Required** screen. The Close Polls report prints. Leave this on the Scan to be filed with other end of day reports.
☐	6. Write the Ballot Count total in the Reconciliation Log.
☐	7. Tap **Print Ballot Count** to print the Ballot Count Report. Additional copies of the Ballot Count Report can be printed.
☐	8. Tap **Write-in Report.**
☐	9. File the reports in the appropriate envelope(s).
☐	10. Tap **Print Ballot Count** again. Leave this copy of the Ballot Count report on the Scan.

	Tasks
☐	11.Check that you have all Election Day reports: • Polls Open reports filed • Polls Closed reports filed • Ballot Count report left on the Scan
☐	12.Press the power button on the back of the Scan.

Option 2: Closing the Polls with Tally Report

The Tally Report includes unofficial totals on a precinct-specific basis. The option to print this report after the close of polls will appear only if your jurisdiction has configured Scan in this manner.

	Tasks
☐	1. Wait for all voters in the polling place to finish voting.
☐	2. While the Insert Ballot screen is displayed, press the blue Poll Worker button on the back of the Scan.
☐	3. Tap **Close the Polls**.
☐	4. Tap in the Close Polls code using the keypad and tap **Accept**.
☐	5. Tap **Yes, close the polls** on the Confirmation Required screen. The Close Polls report prints. Leave this on the Scan to be filed with other end of day reports.
☐	6. Tap **Print Tally Report**. Additional copies of the Ballot Count report can be printed.
☐	7. Write the Ballot Count total in the Reconciliation Log and file reports in the appropriate envelope(s).
☐	8. Tap **Write-in Report**.
☐	9. Tap **Print Tally Report** again. Leave this copy of the Tally Report on the Scan.
☐	10.Check that you have all Election Day reports: • Polls Open reports filed • Polls Closed reports filed • Tally report left on the Scan
☐	11.Press the green power button on the back of the Scan.
☐	12.Unplug Scan's AC power cable.
☐	13.Unlock the Scan ballot box and place voted ballots into a transfer case in accordance with state and local guidelines.

	Tasks
☐	14.Follow local procedures to transport the Scan and/or vDrives to the location specified by the Elections Office.
☐	15.Prepare appropriate envelopes, logs, and all other paperwork for transport to the location specified by the Elections Office.

Packing Up the Scan

End-of-Day, Early Voting

Complete the following tasks at the end of each day during early voting.

	Tasks
☐	1. Disconnect the Scan from all power sources.
☐	2. Confirm that the Scan ballot box is securely locked.
☐	3. Secure the entire room where the Scan is located, or secure the individual Scan as directed by the Elections Office.
☐	4. Typically, vDrives remain inside their respective device. Do not remove the vDrive unless specifically instructed to do so.
☐	5. Secure envelopes and supplies.

End of Voting

Complete the following tasks at the end of the final day of early voting and at the end of Election Day.

	Tasks
☐	1. Disconnect the Scan from all power sources.
☐	2. Unlock the Scan ballot box and place voted ballots into a transfer case, in accordance with state and local guidelines.
☐	3. Detach the Scan and disassemble the Scan booths.
☐	4. Prepare appropriate envelopes, logs, and all other paperwork for transport to the location specified by the Elections Office.
☐	5. Follow local procedures to transport the Scan and/or vDrive to the location specified by the Elections Office.

Disassembling the Scan Ballot Box

Instructions for disassembling the ballot box are printed on the label affixed to the back of the ballot box.

	Steps
☐	1. Unlock and open the front door.
☐	2. Reach underneath the lid of the ballot box. Gently pull down on the cord while pulling it towards the front of the ballot box.
☐	3. Lift and remove the scanner from the top of the ballot box.
☐	4. With the front door open, reach to the base of the walls and pull up on the loops to raise the floor panel. Lift the floor panel to a fully upright position.
☐	5. Close and lock the front door.
☐	6. Lift the lid of the ballot box until it rotates on its hinges and rests against the outside wall of the ballot box.
☐	7. Using the elastic bands, secure the lid to the side of the ballot box.
☐	8. Push in on both sides of the ballot box to collapse it. The front and rear panels collapse inward in the centers.
☐	9. When the ballot box is fully collapsed, secure all four latches to ensure the ballot box stays in its collapsed position.

Scan Polling Place Troubleshooting Quick Guide

Table 4-1. Verity Scan troubleshooting at the polling place: Quick Guide.

Problem	Resolution Steps	Reference
AC power fails without battery backup	1. Check all power connections. 2. Call the Elections Office or Help Desk to notify them of the situation. 3. Unplug Scan from the wall outlet. 4. Use the emergency ballot slot to deposit ballots until the power returns.	• Power fails
Error displays	1. Follow the procedures for the specific error. 2. Check connections and restart the system. 3. Call the Elections Office or Help Desk.	• Scan replacement
Scan does not work	1. Check all power connections. 2. Restart the system.	• Scan does not work Scan replacement
"vDrive removal" error message	Reboot. If this message persists, replace the unit.	• vDrive removal
Paper (ballot) jammed in Scan	1. Lift the scanner cover. 2. Remove the ballot and wipe the scanner path clean with an alcohol wipe. Use, at a minimum, 50% isopropyl alcohol and lint-free wipes. **Never use ammonia-based and detergent-based formulas.** 3. Close the cover and rescan the ballot (or the replacement ballot if the original was spoiled).	• Paper (ballot) jam
Password is invalid	1. Verify the password.	• Invalid password
Polling Place and/or Voting Type identified incorrectly	1. Refer to the "Election Identification" report to confirm the polling place name and voting type. OR 1. Refer to any report header to confirm the Polling Place name. 2. If the Polling Place name or voting type is incorrect, call the Elections Office or Help Desk to verify and replace Scan.	• Polling Place and/or Voting Type identified incorrectly • Scan replacement
Polls closed too early	1. In Early Voting, restart the system. 2. On Election Day, verify that a **Polls Closed** screen is displayed and replace Scan.	• Polls closed too early

Problem	Resolution Steps	Reference
Printer error	1. Check the paper orientation. It should be rolling out from the bottom. 2. Select **RETRY**.	• Printer error • Printer paper, changing
Printer paper, changing	1. Open the lid of the printer compartment and note the printer paper routing. 2. Remove the old paper and insert and route the new paper. 3. Feed paper through lid and close lid.	• Printer paper, changing
Reports after closing or suspending polls AND powering off	If you must restart Scan to print reports after polls are suspended/closed: 1. Power on Scan. 2. Type the password requested and tap **Accept**. 3. In Early Voting mode, press the **Poll Worker** button and follow the prompts to type passwords, suspend polls, and print **Ballot Count**. OR In Election Day mode, follow the prompts to print the **Tally** report or to print the **Ballot Count**.	• Reports, printing
Restarting	1. Make certain voters have access to the emergency slot on the Scan ballot box. 2. Press the power button briefly to Scan off. The lights on the report printer will darken. 3. Wait 30 seconds. 4. Press the power button to turn Scan on. The lights on the report printer will illuminate. Follow the prompts on the Scan screen.	• Restarting the Scan

Next Topics

So far, we have been introduced to Verity Voting, reviewed our supplies, and learned about Touch Writer and Scan. Good job! Now let's take a look at how we can assist voters with disabilities.

Assisting Persons with Disabilities

This chapter details the knowledge, awareness and sensitivity needed to assist persons with disabilities using the Verity Voting system at the polls.

This chapter describes the following:

General Considerations

Putting People First

With the Verity Voting system, all voters have equal access to secure and private voting.

The use of outdated language and words to describe persons with disabilities contributes greatly to perpetuating old stereotypes. It is especially important to remember that disability labels do not define people; they are simply terms that provide persons with functional limitations access to services. Accordingly, use language that puts the person before the disability. For example, it is better to say "person with a disability" rather than "disabled person." Similarly, avoid referring to *the* blind, *the* disabled, *the* retarded, and so forth.

Awareness, Respect and Acceptance

Persons with disabilities are individuals, just like their non-disabled peers. Therefore, all people who have disabilities are not alike; the disabled community includes both genders, all ages, and individuals from all ethnic and socioeconomic backgrounds. Give persons with disabilities the same respect and acceptance that you would anyone else; they are not tragic victims suffering from an affliction, nor are they especially courageous or superhuman. Like persons without disabilities, they are individuals who want to be treated with dignity and respect, not pity and charity.

Use Appropriate Language

Putting people first means using language that is appropriate for a diverse population of persons with disabilities.

Say	Instead Of
Person with a disability; has a disability	*The* disabled, *the* handicapped, invalid, cripple
Disability	Handicap
Wheelchair user	"wheelchair-bound" or "confined to a wheelchair"
Able-bodied	Healthy
Non-disabled	Normal
Person with (disability name)	Victim of, suffers from (disability name)
Speech or communication disability	Mute

(Adapted from New York University, Steinhardt School of Education)

Conversation Etiquette

In preparation for serving voters with disabilities, review the following conversation etiquette guidelines. They will help to facilitate a more effective and pleasant voting experience.

- When speaking to a person with a disability, look at and speak directly to that person, rather than through a companion or sign language interpreter.
- Relax. Feel free to use accepted, common expressions such as "See you later," or "Did you hear about that?"
- To get the attention of a person with a hearing impairment, tap the person on the shoulder or wave your hand to get his or her attention. Speak directly to the person without raising your voice. Keep your hands away from your mouth.
- Offer to shake hands. People with limited hand use or who wear an artificial limb can usually shake hands. (Shaking hands with the left hand is an acceptable greeting.)
- Identify yourself and others who may be with you when interacting with a person who is blind or visually impaired. For example, "On my right is Jane Smith."

- Say the name of the person to whom you are speaking, especially when conversing in a group.
- Do not shout at a person with a hearing impairment. Shouting distorts sounds accepted through hearing aids and it inhibits lip reading.
- Do not shout at a person who is blind or visually impaired. He or she can hear you!
- When offering assistance, wait until your offer is accepted. Then listen to or ask for instructions on how to help. If you are unsure of how to help, ask questions of the individual you are assisting.
- Remember that service animals are working, and you should not interact with them as you would a pet.
- Listen attentively when you are talking with a person who has difficulty speaking. Be patient and wait for the person to finish. Ask questions that require short answers, repeat what you have understood, and allow the person to respond.
- Place yourself at eye level with a person who uses a wheelchair or crutches to facilitate communication.

(Provided by the Texas Governor's Committee on People with Disabilities. www.governor.state.tx.us)

General Voting Assistance and Instructions

Available Accommodations

Before each voter goes to a booth, explain the features available for persons with disabilities. Always ask voters if they would like to use any of these features.

Access Buttons

Move wheel: Rotate to move between choices. Rotating the Move wheel moves through the items on the screen. Audio announces the currently highlighted item.

Select button: Press to make a selection.

Help button: Press for help.

Headphones/Audio Ballot for Blind or Visually-Impaired Voters

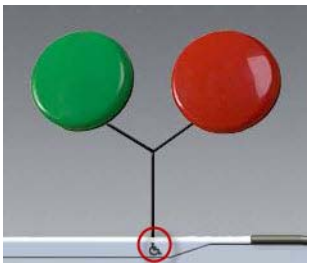
Ballot audio enables blind or visually-impaired voters to vote with privacy and independence.

Headphones can be plugged into the headphone jack, which is marked on the Access device with a raised image of headphones.

While audio is playing, pressing **Select** pauses the audio; pressing **Select** again, unpauses the audio.

Jelly Switches or Sip-and-Puff

.



Tactile-input switches, also known as *jelly switches*, are available to voters with limited dexterity. Jelly switches and sip-and-puff devices enable voters with limited body mobility to vote independently and privately.

Beside the headphone jack is another access jack marked with a raised image of a wheelchair. This jack can be used for plugging in the red and green jelly switches or a voter's sip-and-puff device. Voters use their own sip-and-puff devices.

For the Poll Worker

Following these steps will help you to assist voters with disabilities effectively and efficiently.

	Steps
☐	1. Ensure that the accessible path of travel from the parking space to the polling booths is unobstructed by locked doors, furniture, and so forth.
☐	2. Move obstructions that block the path of travel. Re-evaluate as the polling place becomes more crowded.
☐	3. Allow the voter with a disability to choose the accommodation he or she requires to vote (headphones, jelly switches, and so forth).
☐	4. Assist persons with visual impairments in signing the poll book by placing a card or signature guide along the line.
☐	5. Allow persons with visual impairments to take your arm when assisting them to a new location.
☐	1. Explain how to vote using Verity Touch Writer and Scan. Point to the voter instructions. Then speak to the voter and say: "You will be voting on the Touch Writer today. You can navigate through the election and make your selections by using the touch screen or tactile input devices. You can use...[read the following bulleted items]." • The **Move** wheel and **Select** button, or • Tactile input switches, or • A sip-and-puff device.
☐	2. Orient individuals to voting devices by giving detailed verbal instructions. Be patient. If voters continue to have difficulty, ask if they would like for you to "show" them using their hands. Be sure to release their hands periodically so they can explore the layout of the device.
☐	3. If you are not using the Touch Writer voting system and the voter asks you to read the ballot, communicate all of the information on the ballot, and be sure to respect the voter's privacy. Follow local procedures to sign Voter Assistance forms.
☐	4. When giving voters instructions, offer all voters the choice of an audio ballot on the Touch Writer.

For the Voter

To mark your ballot on the Touch Writer, follow these steps:

	Steps
☐	1. If using a multilingual ballot, select the language.
☐	2. Enter your pass code, or have an assistant enter the pass code you just received from the poll worker.
☐	3. Navigate through the contests and make your selections using your preferred tool.
☐	4. Read or listen to the Review Your Ballot page carefully. If any contests are marked incorrectly, select the contest to return to the contest screen and select another option. Only after all of your desired choices have been made, select **Print**. Clicking the **View Summary** button from a contest displays the ballot summary of contest choices. Clicking a contest returns you to that contest to make or change a selection. The Review Your Ballot page always appears before the ballot is recorded so that you can review your selections and make changes, if desired.  You can change your selections at any time before the **Print** button is clicked. Once the **Print** button is clicked, you cannot change your vote. If the **Print** button is clicked in error, speak to a poll worker for assistance in spoiling your ballot and starting again. In multi-page ballot summaries, turn the **Move** wheel or click **Next** to move to the last page and then click **Cast Ballot**.
☐	5. When your ballot finishes printing, feed it through the Scan. You have finished voting when the waving American flag is displayed, or when the audio indicates that your vote has been recorded.

Assisting a Voter with Visual Impairment

Note: Never pet or interfere with a service animal.

Follow these steps to assist each voter with registration and to orient him or her to Access.

	Steps
☐	1. If applicable, ask the voter for permission to take his or her hand and guide it to the proper signature line in the poll book. Use a signature guide (or a ruler/straight edge) to help indicate where the voter should sign.
☐	2. Ask the voter if he or she would like to use headphones in order to hear the ballot.
☐	3. Ask the voter if he or she would like to take your arm (at or about the elbow) so that you may guide the voter to the voting booth.
☐	4. Check to make sure that the headphones are plugged into the correct jack. The headphones jack has a picture of a pair of headphones beside it.
☐	5. Before handing the headphones to the voter, offer an orientation to Access. • Orient the voter to the **Move** wheel, the **Select** button, and the **Help** button by giving clear verbal directions (for example, right, left, clockwise, counterclockwise) and by offering to place the voter's hands on the Touch Writer. • Place the headphones in the voter's hands, and orient the voter to the built-in volume control located on the wire, if applicable. Sliding the volume control lever up produces louder audio, down produces quieter audio. Audio volume and speed may also be modified using the Audio button on the Touch Writer screen. • The **Move** wheel is a trigger for the audio. Instruct the voter to turn the wheel slowly. One click clockwise moves through the Touch Writer options, one line at a time. Turning the wheel counterclockwise will repeat what the voter just heard. The voter does not have to listen to all options, if he or she chooses not to. While listening to the audio, clicking the **Select** button pauses the audio; clicking it again continues the audio.
☐	6. Read the Access Code to the voter, allowing the voter to enter the code independently. Read slowly so that the voter can enter the number without missing the next number.
☐	7. Remind the voter that the **Help** button is available or that he or she can request assistance from a poll worker.
☐	8. Explain the ballot printing process. When the ballot is finished printing, the voter will be notified.

Assisting a Voter with Limited Dexterity

A voter with limited dexterity or limited upper body mobility may vote by using the tactile input jelly switches.

The red jelly switch is similar to the Move wheel. Click the red jelly to move through options.

The green jelly switch is similar to the Select button. Click the green jelly to make selections.

Follow these steps to assist a voter with limited dexterity or limited upper body mobility:

	Steps
☐	1. If the voter is unable to sign his or her name during the registration process, follow the local jurisdiction's policy to verify the voter's ID and note that the voter is unable to sign the poll book.
☐	2. After accompanying the voter to the Touch Writer booth, ask the voter if he or she prefers to vote sitting or standing. If the voter prefers to sit, make sure a chair is available near the Touch Writer booth, ready to be moved into place.
☐	3. Before entering the Access Code, plug the tactile input switches into the disabled access jack on Access.
☐	4. Position the tactile input switches in a comfortable location that the voter specifies, remembering to keep the red switch on the right (like the Move wheel). A flat surface, such as a table, may be helpful in preventing the switches from falling.

	Steps
☐	5. Provide verbal instructions on the use of the tactile input switches. Be patient. If the voter would like to read instructions, offer to hold the instructions while the voter reads, or place the instructions where the voter indicates. • On the Select Language and Access Code pages, press the red switch to navigate through options and the green switch to select the option. • Use the red and green switches to learn about the ballot or to start the ballot. • On the ballot page, use the red switch to navigate through the contest options in a loop that includes the title bar. Press the green switch to select choices. After a choice is made, move to the Next button. When it is highlighted press the green switch. • To skip a contest, press the green switch to move to the Next button. When it is highlighted press the green switch. • The tactile input switches only move forward, not backward. • When the voter reaches the end of the ballot, the voter will see a ballot summary screen. Use the red switch to Print, and press the green switch to enter the selection.

Assisting a Voter with Sip-and-Puff Device

A voter with limited body mobility may vote by using his or her personal sip-and-puff device after it is disconnected from the wheelchair and connected to Access.

- "Sipping" functions similarly to the Move wheel.
- "Puffing" is similar to the Select button.

Follow these steps to assist a voter with limited body mobility.

	Steps
☐	1. Follow the local jurisdiction's policy to verify the voter's ID and note that the voter is unable to sign his or her name.
☐	2. Accompany the voter to the Touch Writer booth by walking beside the voter's wheelchair.
☐	3. Pull up a chair next to the voter and inform him or her that you will explain how to vote on the Touch Writer before connecting the sip-and-puff device. Be patient. If the voter would prefer to read instructions, offer to hold the instructions while the voter reads, or place the instructions where the voter indicates. • On the Select Language and Access Code pages, Sip to navigate the highlight bar through selections. To enter highlighted selections, Puff. • Sip to begin voting or learn about the ballot. • On the ballot page, Sip to navigate the highlight bar through the contest options in a loop that includes the title bar. Puff to enter choices. After a selection is made, navigate to Next. • To skip a contest, navigate to Next. • When the voter reaches the end of the ballot, the voter will see a ballot summary screen. Sip to review selections or Print, and Puff to enter the selection.
☐	4. Ask for the voter's permission to remove his or her sip-and-puff device from the wheelchair and connect it to the Touch Writer. Before entering the language selection (if applicable) and the Access Code, plug the sip-and-puff device into the disabled access jack on Access. Ask the voter if he or she wants you to remain while the voter enters the language selection and/or Access Code, and then leave once the ballot is on the screen.
☐	5. Because the Help button is not available to a voter using a sip-and-puff device, inform the voter that you will be nearby in case assistance is needed. Let the voter know that as soon as he or she is finished, you will return to reconnect the sip-and-puff device to the voter's wheelchair.

Next Topics

You are finished reading the instructions for helping to provide the voting public with a quick and easy voting experience.

Continue on to the appendices. The appendices cover the following topics:

Polling Place Security, starting on page 71

Frequently Asked Questions, starting on page 93

Troubleshooting, starting on page 97

Polling Place Security

This appendix introduces polling place security and includes the following sections:

Ensuring Polling Place Security

At the polling place, poll workers are responsible for maintaining security, the integrity of the vote and the protection of voting equipment and supplies. Poll workers must be vigilant throughout Election Day and be aware of who is in the polling room. Frequent monitoring of voting machines and voting supplies protects against any malicious attempt to compromise the accurate gathering and reporting of the vote. The following steps should be taken to ensure that the voting equipment and the voting process are secure at all times in every precinct.

Secure Access to the Physical Facility

Many polling places do not provide an ideal physical security environment. For instance, church lobbies, school gymnasiums and other places may not always be locked or secured. However, it is important to maximize the use of whatever security features exist. Use locking doors to secure equipment whenever possible, and consider alternatives to regulate access to equipment.

Equipment Delivery

Delivery of voting equipment to polling place locations should be conducted with the same degree of control as applied to warehouse storage of sensitive election equipment.

- The delivery person or company, or in some cases the supervising poll worker, should provide documentation containing voting device serial numbers, seal numbers and identification for each voting location where equipment has been delivered.
- A list of persons involved in equipment delivery should be maintained by the jurisdiction election officer.
- Voting devices should remain locked and/or sealed and stored in a secure location. Multiple devices awaiting assembly should be secured together by a keyed or combination lock and a single cable or chain.
- Polling places should be in locked buildings or locations that are capable of monitoring secure storage of voting equipment.

Securing Access to the Verity System

Voting Devices

Maintain strict control over the voting devices at all times. Treat the devices with all of the sensitivity that you would apply to a secure ballot box containing paper ballots.

Prior to election day, the voting devices should be maintained under the chief election officer's close physical control at all times. Do not leave voting devices unattended at any time (for example, in an automobile or in an unlocked room). Do not break or remove the wire ballot box seal from voting devices.

At the end of Election Day, voting devices should be transported from the voting location to the jurisdiction elections office by a sworn election official or a sworn law enforcement officer.

For early voting, establish procedures to secure voting devices each evening after suspending polls. Voting devices may also be sealed and/or locked.

vDrive

vDrives must be secured. vDrives should be stored within voting devices, under a tamper-proof ballot box seal. Do not remove the voting device seal at the polling place. Voting device serial numbers and seal numbers should be recorded so that deployed equipment can be physically authenticated at the polling place.

Access Codes

Only issue Access Codes when there is a Touch Writer booth available for use. Treat access code slips with the same care that you would apply to a paper ballot. In order to prevent Access Codes from being misplaced or fraudulently passed to others, voters should not stand in line with "live" Access Codes.

Before issuing an Access Code, ensure that the voter has been properly qualified and is entitled to an electronic ballot.

In all instances where a voter could potentially be re-issued a new Access Code, always use the "Deactivate an Access Code" function on the poll worker menu to check the status of the voter's original Access Code. Voters whose ballots have been "assigned and cast" may NOT receive a new access code. Follow state and local procedures governing the re-issuance of Access Codes in other situations.

Touch Writer and Scan Booths in the Voting Area

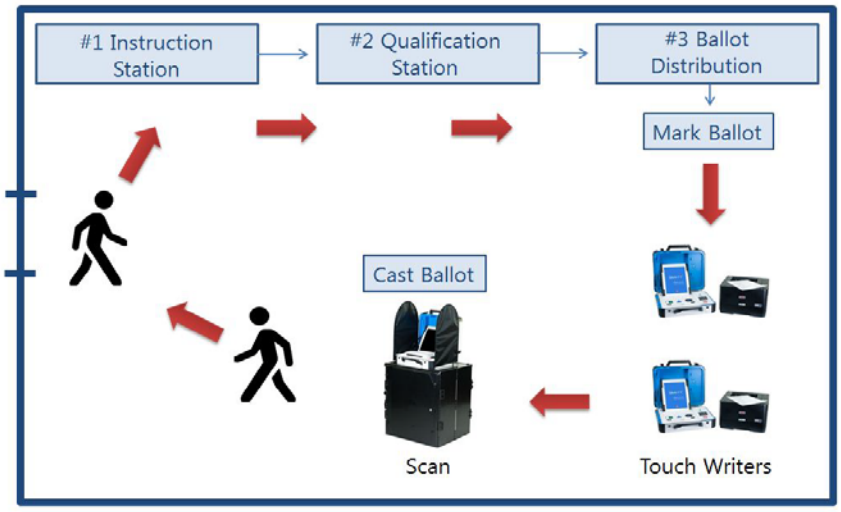
Maintain staffing levels adequate to monitor voting booths. Voters should not be allowed to enter the voting booth area until a booth is open and available for use. No person other than a voter, a person assisting a voter, or a poll worker may enter the voting area.

Locate cables where they will not be tripped over, pulled upon, or otherwise disturbed. Keep booth storage compartments closed to restrict access.

If Touch Writer is used for early voting, establish procedures to secure the devices each evening after suspending polls. Touch Writer may also be sealed and/or locked.

Report any suspicious activity in or around voting machines to the local election officer and call 911 in case of a serious emergency that threatens polling place safety.

Sample Polling Place Layout



Touch Writer and Scan Security Features

Access Codes Protect Voters' Privacy

Access Codes enable qualified voters to get the correct ballot style for their precinct, without giving up voter privacy. The only purpose of the Access Code is to display the correct ballot when the assigned five digits are entered. The Access Code is not tied to the cast ballot in any way, and the Access Code cannot be used to retrieve the voter's cast ballot record. Also, the Access Code remains anonymous because no voter information is entered into the electronic voting system.

Multiple Memory Storage Protects Cast Ballots

Cast vote records are saved on flash memory cards called vDrives, as well as on the internal memory of the Scan. In this way, each cast ballot is stored in redundant places to provide extra backup to paper ballots. The integrity of cast vote records is not affected by power outages, power spikes, magnets, or rough handling.

Protecting Ballots

Digital encryption and self-contained components protect ballots. With the Verity Voting system, election administrators use encryption devices containing secret keys specific to the election at the time that vDrives are written, thereby creating a means to authenticate vDrives at critical points in the election process and protect the integrity of the election database, ballot definitions, and cast vote records. Only an authorized user with an encryption device containing the matching secret keys may access secure functions in the Verity Voting system. In addition to having the encryption device, the authorized user must also know its password in order to perform secure functions. Furthermore, the voting device components are self-contained and have no external network access that would allow intrusion.

Audit Logs Provide Transparency

Touch Writer and Scan units maintain complete electronic audit logs of all events that occur during the voting process. From the time that a Touch Writer or a Scan is powered-on until it is powered-off, entries are made to the audit log. Each Touch Writer and Scan maintains its own audit log of events that are specific to that unit. Voting devices will record system events (for example, Scan is out of thermal printer paper), poll worker activities (for example, Open Polls), and voter activities (for example, Ballot Printed and Ballot Scanned). The audit log includes the time and date that each ballot was cast (but not which cast vote record). All audit log entries are saved in flash memory and are unaffected by power outages, power spikes, magnets, or rough handling.

APPENDIX B

Device Reports

This section provides samples of Verity Scan and Verity Touch Writer reports.

This chapter describes the following:

Overview

This section provides sample report data using Verity Scan and Touch Writer reports.

The reports are printed on the devices thermal printer. Reports with appropriate information are automatically printed at the appropriate time:

Power-up Self Test Reports are printed after the device has started and has determined the status of several system components that are shown in the report.

Open Polls Reports are automatically printed once the device has successfully loaded an election and the poll worker has requested the device to open polls.

Close Polls Reports are automatically printed once the poll worker has requested the device to close (or suspend) polls.

Sample Verity Touch Writer Reports

Touch Writer Power-On Self Test Report

Power-On Self Test Report

02/07/2014 6:05 PM

S/N: Not Implemented

Verity Writer

Version: Not Implemented

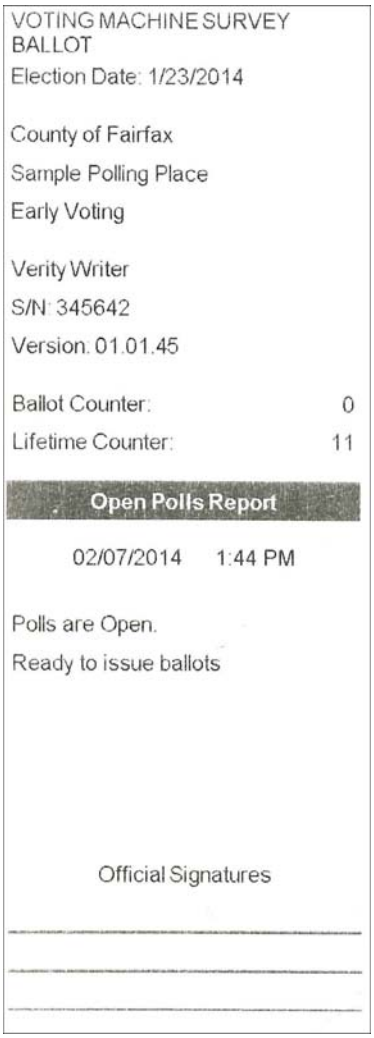
Power On Diagnostics

MCU FW:13 PV:2	Pass
Battery (85% capacity)	High
Main Power	Present
vDrive Ports	Pass
Touch Screen	Pass
BallotPrinter (OKI B411 (Copy 3))	Present

Notes

None

Touch Writer Open Polls Report



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Writer
S/N: 345642
Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 11

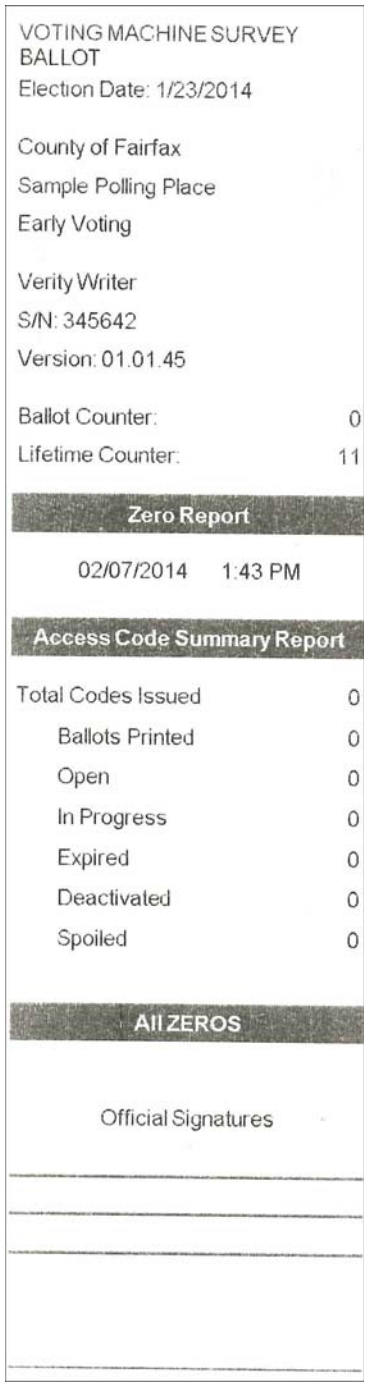
Open Polls Report

02/07/2014 1:44 PM

Polls are Open.
Ready to issue ballots

Official Signatures

Early Voting Touch Writer Zero Report Summary



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Writer
S/N: 345642
Version: 01.01.45

Ballot Counter:	0
Lifetime Counter:	11

Zero Report

02/07/2014 1:43 PM

Access Code Summary Report

Total Codes Issued	0
Ballots Printed	0
Open	0
In Progress	0
Expired	0
Deactivated	0
Spoiled	0

All ZEROS

Official Signatures

Touch Writer Access Code Ticket

Touch Writer Close Polls Report

VOTING MACHINE SURVEY
BALLOT
Election Date: 2/22/2014

County of Fairfax
Sample Polling Place
Election Day Voting

Verity Writer
S/N: 345642
Version: 01.01.45

Ballot Counter:	3
Lifetime Counter:	15

Close Polls Report

02/07/2014 6:43 PM

Polls are Closed

Ballot Count Precinct Report

Precincts/Splits Included:	5
Total Precincts Voted:	2
Total Ballots Printed:	3

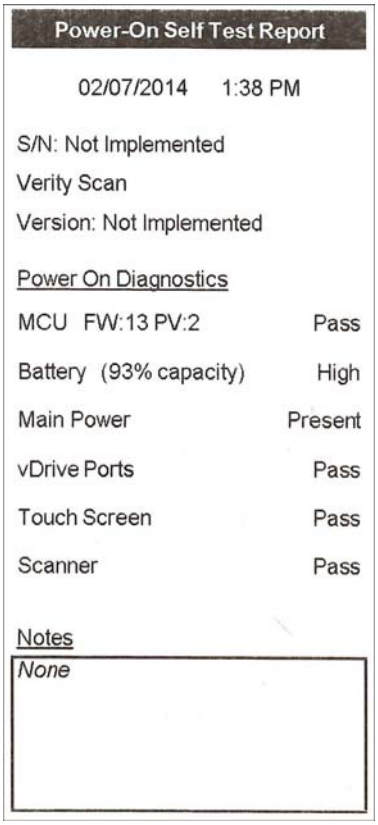
Precinct	Total
Greenspring Village	0
Mt. Vernon	0
St. Anthony's	2
Tyson's Corner Mall	1
Reston Comm. Ctr.	0
Total	3

Official Signatures

_____

Sample Verity Scan Reports

Scan Power-On Self Test Report



Power-On Self Test Report

02/07/2014 1:38 PM

S/N: Not Implemented
Verity Scan
Version: Not Implemented

Power On Diagnostics

MCU FW:13 PV:2	Pass
Battery (93% capacity)	High
Main Power	Present
vDrive Ports	Pass
Touch Screen	Pass
Scanner	Pass

Notes

None

Scan Open Polls Report

VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 5034

Open Polls Report

02/07/2014 1:46 PM

Polls are Open.
Ready to accept ballots

Official Signatures

Early Voting Scan Zero Report

VOTING MACHINE SURVEY BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Version: 01.01.45

Ballot Counter:	0
Lifetime Counter:	5034

Zero Report

02/07/2014 1:43 PM

Tally Summary Report By Contest

Precincts/Splits Included: 5

Mayor of Mount Rushmore

George Washington	0
Thomas Jefferson	0
Abraham Lincoln	0
Theodore Roosevelt	0
Write-ins	0
Undervotes	0
Overvotes	0

Member Mount Rushmore Park Authority

Benjamin Franklin	0
Patrick Henry	0
Betsy Ross	0
John Hancock	0
Paul Revere	0
Alexander Hamilton	0
Write-ins	0
Undervotes	0
Overvotes	0

Proposed Change to Mount Rushmore

Yes	0
No	0
Undervotes	0
Overvotes	0
Total Ballots	0

All ZEROS

Official Signatures

_____

_____

_____

Configuration Readiness Report

VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Firmware Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 5034

Configuration Readiness Report

02/07/2014 1:44 PM

vDrive ID: 1

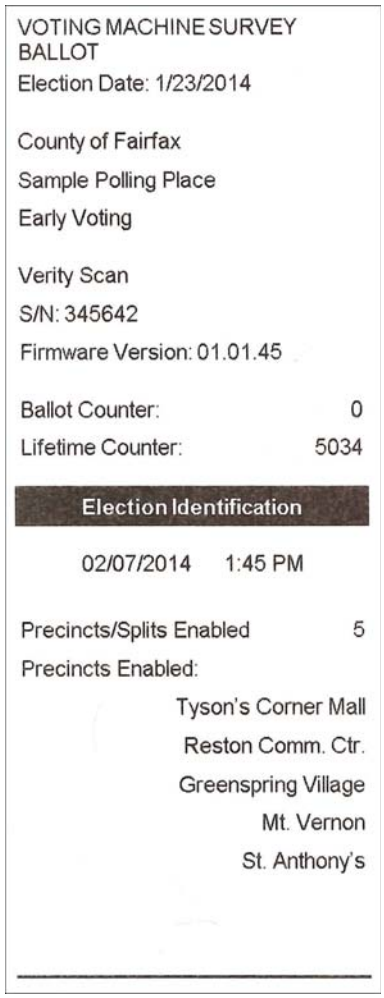
Sample Polling Place

Tamper Evident Seal # _____
Tamper Evident Seal # _____
Tamper Evident Seal # _____

Prepared By: _____

_____

Election Identification Report



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Firmware Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 5034

Election Identification

02/07/2014 1:45 PM

Precincts/Splits Enabled 5
Precincts Enabled:
Tyson's Corner Mall
Reston Comm. Ctr.
Greenspring Village
Mt. Vernon
St. Anthony's

Scan Close Polls Report

VOTING MACHINE SURVEY
BALLOT
Election Date: 2/22/2014

County of Fairfax
Sample Polling Place
Election Day Voting

Verity Scan
S/N: 345642
Version: 01.01.45

Ballot Counter:	3
Lifetime Counter:	5038

Close Polls Report

02/07/2014 6:37 PM
Polls are Closed

Tally Summary Report By Contest

Precincts/Splits Included: 5

Member Mount Rushmore Park Authority	
Benjamin Franklin	1
Patrick Henry	0
Betsy Ross	1
John Hancock	1
Paul Revere	0
Alexander Hamilton	1
Write-ins	1
Undervotes	1
Overvotes	0
Proposed Change to Mount Rushmore	
Yes	1
No	1
Undervotes	1
Overvotes	0
Total Ballots	3

Official Signatures

Frequently Asked Questions

Following is a list of frequently asked questions and suitable answers about Verity Voting.

1. What is the Access Code for?

   Access Codes enable qualified voters to get the correct ballot style for their precinct. The only purpose of the Access Code is to display the correct ballot when five digits are entered. The Access Code is not tied to the cast ballot in any way, and the Access Code cannot be used to retrieve the voter's ballot. Also, the Access Code remains anonymous because no voter information is entered into the electronic voting system.

2. Is this system based on a touch screen, like some ATMs?

   Yes. However, Access is available for voters with disabilities. The voter uses a rotary Move wheel to navigate through the ballot and highlight his or her selections. This interface was chosen because voters who are blind or have other impairments find the differently shaped buttons and the rotary Move wheel easy to identify and use.

3. How do I know that the electronic voting system records my ballot the same way that I mark it?

   There are two ways to check your ballot. First, each time you click **Select** to make a selection, the check box indicates your selection. Second, when you finish voting, the voting machine will display a summary of the selections you made. The Review Your Ballot page enables you to double-check your selections before casting the ballot. To change a selection, click the **Return to Ballot** button. To move through contests, click the **Next** and **Back** buttons. When you are sure that all of your selections are correct, press the **Print** button to print your ballot in order to cast it in Scan. In Scan, your vote has been recorded when you see the waving American flag.

4. Using Access on the Touch Writer, what if I change my mind or make a mistake before I have pressed the Next button?

   To change a choice, use the Move wheel to highlight the new option you want to vote for, and then press Select. The earlier choice is erased, and the new choice is marked.

5. Can I change my ballot choices at any time using the Touch Writer?

   A voter can change any of his or her selections at any time before the Print button is pressed from the Review Your Ballot page. If there is a problem after the ballot is printed, a Poll Worker may be able to spoil the ballot before it is scanned. A voter will always see the Review Your Ballot page before the ballot is printed. Once the ballot has been read into Scan and the waving American flag is displayed, the ballot is recorded and cannot be changed.

6. What if I accidentally vote more than the number of options allowed in a contest? Will my vote be discarded?

   Your vote will not be discarded. Touch Writer does not allow voters to vote for more than the allowed number of options. Scan will reject the ballot and alert you to the error. If you have filled in a ballot by hand and you have selected more than the permitted number of options in a contest, contact a Poll Worker for assistance.

7. How do I know my voting choices are private and that my selections will not be revealed?

   If you are voting on the Touch Writer, you will be given an anonymous, randomly generated five-digit Access Code that enables the system to display the correct ballot for your precinct. The only purpose of the Access Code is to enable the correct ballot style; it is not associated with you, or with your ballot selections. With no information about you in the electronic voting system, there is no way to trace your private voting selections.

8. Is the Touch Writer ballot available in multiple languages?

   Yes. The Touch Writer will display ballots in languages selected by local Election Officials, according to federal, state, and local election guidelines.

9. In the past, I always had assistance when voting. Will I still be able to have someone help me with this system?

   Yes. Although Touch Writer has on-screen guidance although available through the Help button, there is also voter instruction materials available to familiarize you with the voting machine before you enter the voting booth. The voting system also accommodates accessories so that persons with disabilities can vote with minimal assistance. The voter may always choose how much assistance he or she needs and ask a Poll Worker for assistance.

10. If power fails or if there is some other computer failure will my voted ballot be lost?

    No. Once the waving American flag is displayed, your voted ballot is stored. In the unlikely event that the system fails, all data is protected in memory and cannot be lost, even in case of a power outage. The system also has a battery back up that immediately engages if an electrical failure should occur. However, if a power loss occurs *before* you see the waiving American flag, you vote will not be counted.

11. Has the voting equipment been tested by our local elections office before the elections?

    Yes. Before any vote is cast, there are procedures available to Election Officials to test the voting equipment to ensure that all equipment is working as expected. Two tests, a Functionality Test and a Logic and Accuracy Test, allow Election Officials to ensure that the equipment is working properly and that votes are accurately recorded and reported as they are cast.

12. What if a recount is necessary?

    The voting system provides Elections Officials with cast vote records of each ballot cast on Scan. These cast vote records provide an accurate means of recounting ballots recorded for each specific contest in an election. Recounts may be conducted either electronically or with printed paper cast vote records.

Troubleshooting

In Case of Power Failure

The following applies in case of power failure.

Note: These rules apply only if uninterruptible power supplies (UPS) are fully charged. Ensure your warehouse charges all UPS units fully immediately prior to distribution. UPS units lose power while shelved.

Note: Adhere to time limits to maintain voting system integrity.

Table 1. Changes to voting system conditions due to power failure.

Item	Use During Power Failure
Scan	Can use for 2 hours, only. After 2 hours, stop using Scan to avoid a mid-scan battery failure. Suspend polls.
Touch Writer	Can use for 2 hours, only. After 2 hours, stop using Touch Writer. Suspend polls.
Ballot Printer	No more than 6 sheets (1 sheet = 2 sides of a page) over a 2-hour period. Adhere to the 6-sheet per 2 hours limit regardless of how rapidly the printer seems to print. Anticipated print rate is 2 sides of a page over a 20-minute period.
Uninterruptible power supply (UPS)	Usable for no more than 2 hours. Stop using the UPS after 2 hours to maintain voting system integrity.

Note: The battery indicator on Verity device screens is green from 100-20% charged. Below the 20% threshold, the battery indicator is marked with a circle with a line through it, indicating that the battery needs to be recharged.

Systematic Approach to Troubleshooting

When faced with a troubleshooting situation, apply this systematic troubleshooting approach.

Table D-1. Troubleshooting guidelines.

	Tasks
☐	Remain calm.
☐	Identify the issue, or the symptoms, as reported.
☐	Gather further information. Think broadly. Do not jump to conclusions. Ask questions.
☐	Establish a theory to explain the source of the problem.
☐	Research resolution steps, based on your theory.
☐	Use documentation available to you to identify the resolution steps necessary.
☐	Attempt resolution.
☐	Check for success.
☐	Repeat.

Remember, as with all electronics systems, many equipment issues can be solved by simply checking connections.


HART
intercivic™

Attachment No. 7

ATTACHMENT TO TEST REPORT

Report Reference No.: PTI-1411085-000

Dated of issue: 2014-11-25

Attachment contains

Cover page ..... : 1 page

Verity Service and Maintenance Technical Reference Manual 6610-001 ..... : 182 pages

Total: 183 pages

VERITY™

Service and Maintenance

Verity Voting Maintenance Information

Technical Reference Manual

Document number 6610-001-A01

Hart InterCivic is committed to consistently providing high quality products and services for its customers through adherence to its established Quality Management System, complying with customer, statutory and regulatory requirements, and a commitment to continual improvement. Hart InterCivic is also committed to the integrity and the security of the information used in both the product development process and by the products themselves. Management will establish and maintain an information security management system to ensure that contractual requirements are met, employees are trained in information security, and risks to information security are managed.

Document number 6610-001-A01.

Hart InterCivic, Inc.
P.O. Box 80649
Austin, Texas 78708
Telephone: (866) ASK-HART | (866) 275-4278
URL: www.hartintercivic.com

Table of Contents

CHAPTER 1

Introduction

This is the introductory chapter in the Verity Voting Service and Maintenance Operations Guide. This chapter details the following introductory information:

Verity Service and Maintenance Overview

Welcome to the Verity Voting system, an election creation and management system. Verity Voting comprises hardware and software tools.

The Verity Service and Maintenance Operations Guide introduces Verity Voting System hardware components used for voting. This guide also discusses maintenance, setup, troubleshooting, and other relevant topics needed by those who store, maintain, set up, and troubleshoot hardware components of the Verity Voting system.

This guide provides the following information for election officials, support personnel, and warehouse staff:

- Introduction
- Procedures: Storage, Delivery, and Maintenance
- Polling Place Equipment Testing
- Procedures: Pre- and Post-Election
- Procedures: Field Techs & Help Desk
- Troubleshooting Procedures for Support Personnel
- Device Reports
- vDrive Processing and Election Night Procedures

In this chapter we introduce polling place system hardware, Verity security, the Verity work flow and device configuration, and some very important safeguards.

Polling Place System Hardware

Verity Touch Writer

Verity Touch Writer is a touch-screen enabled Ballot Marking Device that prints voter-marked ballots to a commercial off-the-shelf printer. Voters activate their ballot session by entering a unique access code that provides voter anonymity.

Voters use the electronic interface to privately and independently make their selections on the ballot. When voters finish making their selections, they print the marked ballot. Verity Touch Writer is also compatible with Verity Access, an optional input device (with tactile buttons, audio ballot voting, and compatibility with additional two-switch adaptive devices).

Verity Scan

Verity Scan is a digital paper ballot scanner. Scan provides second-chance voting, with voter instructions for mismarked ballots. Scan includes additional accessibility features, and is attached to a secure ballot box.

Verity Scan records ballots and audit log data in redundant, secure storage locations. One of these storage locations is removable

electronic media. The removable election media allows the ballots to be transferred to the Verity Count tabulation component.

When opening the polls, a poll worker activates the Verity Scan device and prepares it to receive marked paper ballots. Voters may privately and independently insert their marked ballots to scan and cast the ballot.

Other Verity Hardware Components

Verity Ballot Box

Verity Ballot Box is a purpose built ballot box that allows Verity Scan to automatically deposit scanned ballots into a secure box; the ballot box also allows for manual insertion of ballots by the voter. Installing privacy screens on the ballot box insures each voter the privacy of their vote throughout the voting process.

Verity Ballot Box is easily setup and collapsed to allow for the product to be easily managed for transportation and storage.

Verity Booth

Verity Booth is a purpose-built voting booth that allows Verity Touch Writer to be used by each voter that ensures the voter privacy when voting.

Verity Booth is easily set up and collapsed to allow for the product to be easily managed for transportation and storage.

Verity Accessible Booth

Verity Accessible Booth is a purpose-built voting booth that allows Verity Touch Writer to be used by voter with accessibility needs that ensures the voter privacy when voting.

Verity Booth is easily set up and collapsed to allow for the product to be easily managed for transportation and storage.

Verity Access

Verity Access is an optional input device that can be connected to Verity Touch Writer voting devices. The module has three tactile buttons, one audio port, and a port for external tactile buttons. Jacks for headphones and adaptive devices are located on the top edge of the device, and the device has grip surfaces on either side.

Verity Key

Verity Key, or Key, is a small security device that is programmed for each election and generated by the Verity Build application. Key is activated once inserted into a Verity device's or Verity workstation's USB port.

Key is part of Verity's two-factor authentication process. Two-factor authentication requires each user to know something (the password associated with the Key) and physically have something (a programmed Verity Key). Both the user password and the Key must be authenticated together.

Once verified, Verity Systems read the Key before allowing operations to occur. Operations will not engage without a programmed Key. Each Key is valid for one and only one election. If a Key fails, it may not have been programmed properly for the current election.

vDrive

vDrive is a small, portable memory device that collects and stores cast vote record (CVR) data and audit logs. CVR data includes the ballot data collected when votes are cast. Audit logs are electronic records of all activity performed in the Verity Voting system as it occurs. Each Verity component (application or device) maintains its own audit log. Audit logs are a critical part of ensuring that security is maintained by providing an audit trail.

vDrives are created in Verity Build, each vDrive is uniquely identified with data written by Build on to the device; Build also loads the election definition on to the vDrive, including election specific audio and images.

vDrives are used in voting devices at polling places to record device auditing information and cast vote records (in Scan).

vDrives are used in Central to record device auditing information and cast vote records from scanned paper ballots.

vDrives are used to transfer the CVRs and audit information to Verity Count for tabulation.

Personnel Requirements

Personnel operating Verity devices (Scan and Touch Writer) must receive training from Hart or Hart-trained personnel on the device in order to obtain the skill level required to successfully operate Verity Scan and Touch Writer.

The number of personnel required to prepare and operate Verity devices for deployment to the polling place would be 2 persons per 50 devices.

The number of poll workers required to operate the devices at the polling place should be 1 person per device.

Verity Security

Proper security is critical to safeguarding the election process. Hart combines technology and best practices to ensure that Verity is secure. Hart ensures that security policies and procedures for both jurisdictions and physical security (both in-person voting devices and electronic and paper ballots) are fully documented. Verity was designed for cost-effective and meaningful security solutions. To ensure security at every level, Verity Voting utilizes the AAA (authentication, authorization, and audit) security framework.

Quality Certified

In addition to measures taken by Hart to protect Verity security, all Verity software and hardware has been tested by an outside auditing agency to ensure proper security and functionality.

Layered Defense

Verity performs a self-test at start-up. If an error occurs, Verity alerts the user.

A multi-layer defense strategy and application verification process is used to provide security throughout Verity Voting. Software independence measures are employed, which means that voters can verify ballot choices before they are cast and counted, and elections and software can be audited independently.

Tamper Evident

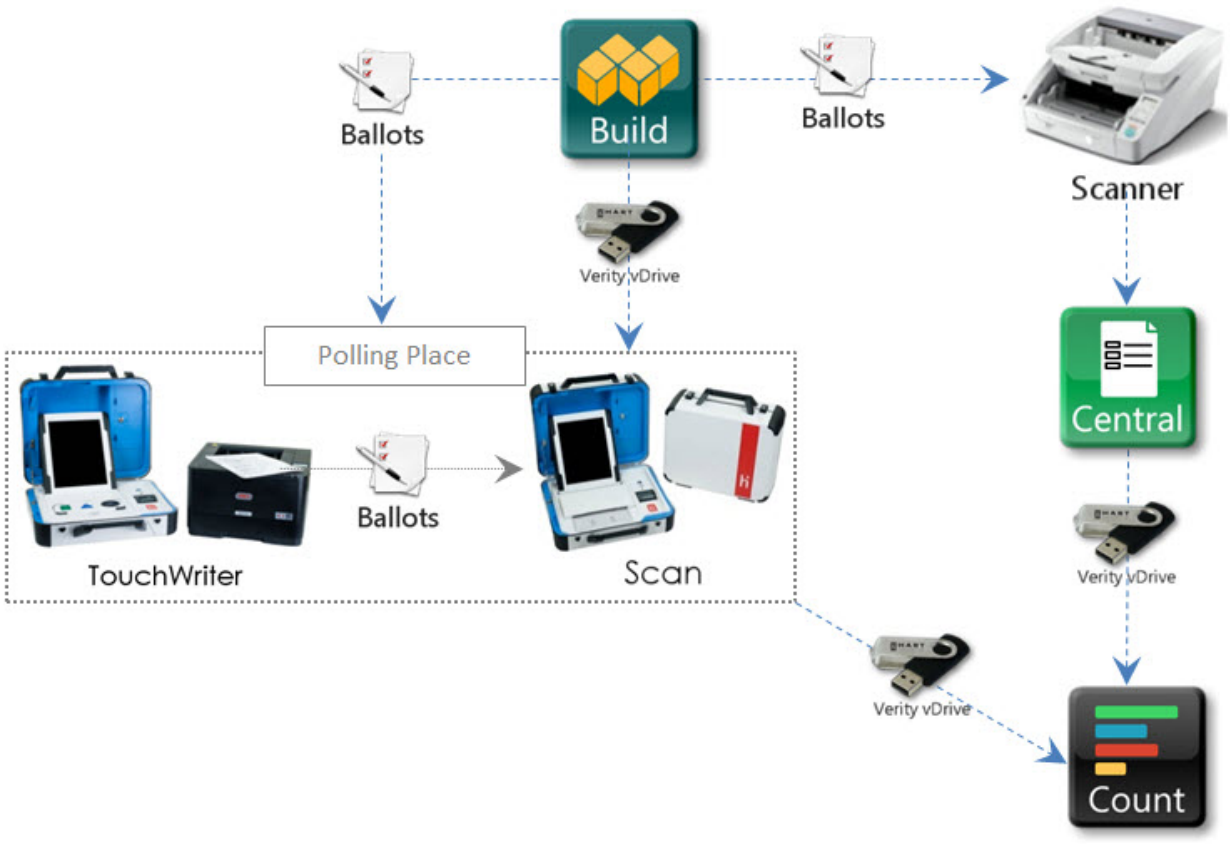
Verity security ensures that, in the event the software was altered in any way, the alteration would be evident (i.e., tamper evident).

Audit Logs

Comprehensive audit logs are generated for all user authentication attempts, data transfers, configuration changes, and errors. Audit logs are designed to be complete and easy to understand. Audit logs are created uniformly across system components, software applications, and voting devices. Audit logs have redundant and secure storage locations. One of these storage locations is removable electronic media.

Verity Voting System

Following is the Verity Voting device component chart.



Important Safeguards

In addition to the related material presented in this document, follow all warnings and instructions marked on the equipment and in this section.

Read Instructions

All of the safety and operating instructions must be read before operating this voting system.

Retain Instructions

These safety and operating instructions should be retained for future use.

Attachments

Use only Hart InterCivic approved attachments in this voting system. Use of other attachments is unsafe.

DANGER: Never place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury and serious damage to the product. Use only with a booth, cart, or stand approved by Hart InterCivic or sold with the product. A product and caddy combination must be moved with care. **Quick stops, excessive force, and uneven surfaces may cause the product and caddy combination to overturn, causing serious injury.**

Water and Moisture

Never use this product near water. For example, safeguard against inclement weather.

Servicing

DANGER: Never attempt to service this unit yourself. Opening the unit will result in exposure to dangerous voltages or other hazards. Only the battery and printer doors should be opened by polling place personnel. Refer all other servicing to qualified personnel only. When replacement parts are required, be sure to use only Hart InterCivic approved parts. Unplug the unit from the wall outlet and refer servicing to qualified personnel under the following conditions:

- When the power cord or plug is damaged
- If liquid has been spilled on the product
- If the product has been exposed to rain
- If the product does not operate normally after following the operating instructions

Power Sources

Use only Hart specified power supply, XP Power AMP85W24P, and Hart's replaceable battery. The power supply will operate with 110V or 220V AC wall power as shown on the equipment. If you are not sure of the type of power supplied to a polling location, call the local power company before proceeding. Power cords should be routed so that they are not likely to be walked on or have objects placed on them.

- Use only grounded, three prong outlets
- Use Hart supplied power cords
- Do not use 3-prong to 2-prong adapters
- Do not attach too many devices to a wall power outlet or extension cords, overloaded electrical circuits may result in damaged equipment or other electrical issues.

Verity Tablet Battery Caution

- Do not discharge, short circuit, or dispose of in water.
- Do not expose battery module to temperatures above 60C (140F).
- Do not mishandle or disassemble battery module.

Failure to follow these instructions may present risk of explosion, fire, or high temperatures.

Cleaning Verity Voting Devices

- Unplug the equipment from the wall outlet and any other equipment before cleaning.
- Use only isopropyl alcohol (50% or higher) and lint-free wipes to clean Verity tablet display.
- Never use detergent-based cleaners. Never use aerosol cleaners. Never spray cleaner directly on the unit.

DANGER: Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts that could result in fire or electric shock.

Caution: Never spill or spray anything on or into the product. If liquid is spilled on the product, turn it off immediately, wipe away the liquid, and then return the unit to the local election officials for servicing.

Carts and Caddies

DANGER: Do not place this product on an unstable cart, caddy, stand, tripod, bracket, or table. The product may fall, causing serious injury and serious damage to the product.

The product and cart (caddy) combination must be moved with care. **Quick stops, excessive force, and uneven surfaces may cause the product and caddy combination to overturn, causing serious injury.**

CHAPTER 2

Procedures: Storage, Delivery, and Maintenance

This section details all aspects of storing, receiving, and maintaining the Verity Voting system. This chapter describes the following:

Overview

The Verity polling place components can be stored quickly and easily. The following image depicts the entire voting system collapsed for storage. The procedures presented in this guide help to make accessing and deploying system components easy.

Verity Touch Writer Specifications

The Verity Touch Writer is lightweight and designed for convenient storage. Touch Writer can sit on top of a standard booth or, as shown below, atop a lightweight, ADA-compliant booth, which can be collapsed for easy storage. ADA-compliance means that Touch Writer is accessible to persons with disabilities according to the Americans with Disabilities Act of 1990 (ADA) Standards for Accessible Design (2010 Standards).

Verity Touch Writer Specifications

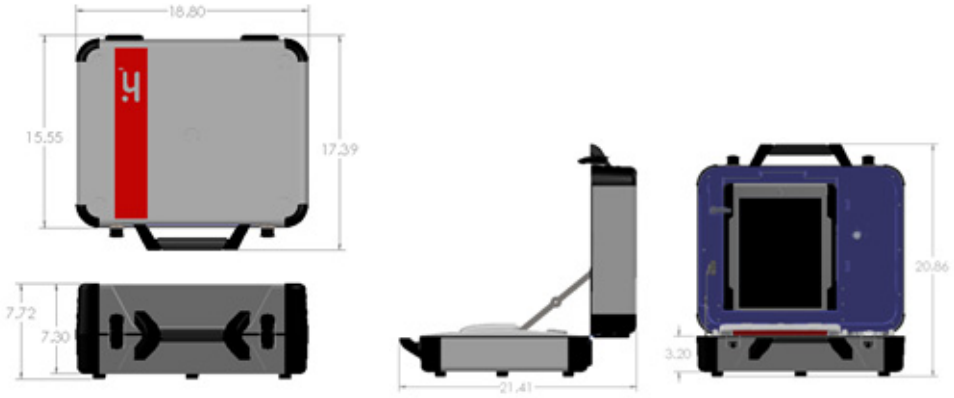


Table 1. Verity Touch Writer specifications.

Setting	Description
Height in inches	7.7
Width in inches	18.8
Depth in inches	15.6
Weight in pounds	28.5
Weight with batteries in pounds	29.3
Display in inches	12.1
Screen Size in inches	12.1
OS	Windows 7 Standard

Standard Verity Touch Writer Booth Specification

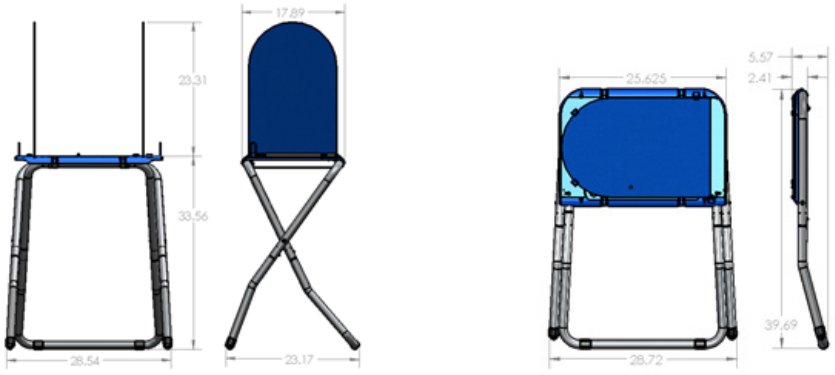


Table 2. Standard Verity Touch Writer Booth specifications.

Dimensions & Weight	Collapsed in Bag	Collapsed	Deployed
Height in inches	22.0	39.7	33.6
Width in inches	31.5	29.0	28.8
Depth in inches	4.0	5.5	23.3
Weight in pounds	11.7	10.1	10.1

Accessible Verity Touch Writer Booth Specifications

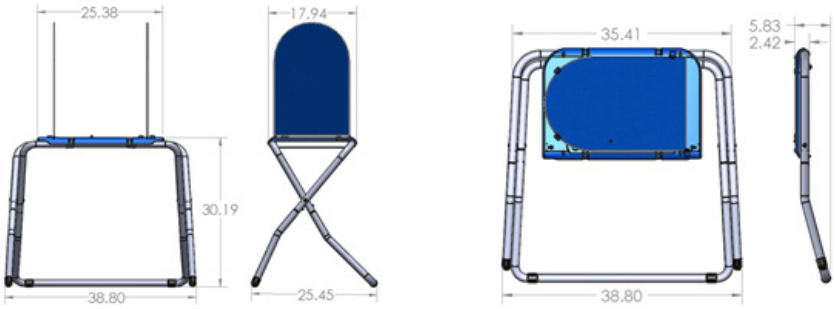


Table 3. Accessible Verity Touch Writer Booth specifications.

Dimensions & Weight	Collapsed in Bag	Collapsed	Deployed
Height in inches	19.5	37.9	30.2
Width in inches	41.5	39.1	38.8

Dimensions & Weight	Collapsed in Bag	Collapsed	Deployed
Depth in inches	4.0	5.8	25.5
Weight in pounds	11.0	10.1	10.1

Verity Touch Writer Ballot Printer Paper Specifications

Verity Touch Writer Ballot Printer have been specifically selected for performance and capabilities, no other printers can be substituted for these printers.

NOTE: Prior to an election, the printer must be configured to support the elections ballot size.

Properly set the paper size the paper tray can accept

Table 4. Verity Touch Writer Ballot Printers

Printer	Description
OKI B431d	Monochrome Duplexing Laser Printer with USB interface, no Ethernet
Weight:	26 lb. (11.4 kg)
Dimensions:	15.2" x 14.3" x 9.6" (38.7 cm x 36.4 cm x 24.5 cm)

Table 5. Verity Touch Writer Printer UPS

UPS	Description
Eaton 5P1500	1500VA Uninterruptable Power Supply
Weight:	35.6 lbs
Dimensions:	9.1″ x 5.9″ 17.5″

Verity Touch Writer Report Printer Paper Specifications

Table 6. Verity Touch Writer thermal, BPA-free paper specifications.

Setting	Description
Brightness	92 or greater

Setting	Description
Basis Weight	28 lbs
Paper Sizes	8.5″x11′ 8.5″x14″ 8.5″x17″

Verity Scan Specifications

The Verity polling place components can be stored in quickly and easily deployable cartons and carriers. The following image depicts the entire voting system collapsed for storage. The procedures presented in this guide help to make accessing and deploying system components easy.

Verity Scan is lightweight and designed for convenient storage. Verity Scan sits atop a Ballot Box for election events. The Ballot Box is collapsible so it can easily be stored.

Verity Scan Specifications

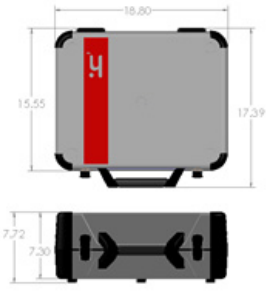


Table 7. Verity Scan specifications.

Setting	Description
Height	7.7 inches

Setting	Description
Width	18.8 inches
Depth	15.6 inches
Weight	28.3 pounds
Weight with batteries	29.1 pounds
Display	12.1 inches
Screen Size	12.1 inches
OS	Windows 7 Standard

Verity Scan Ballot Box Specification

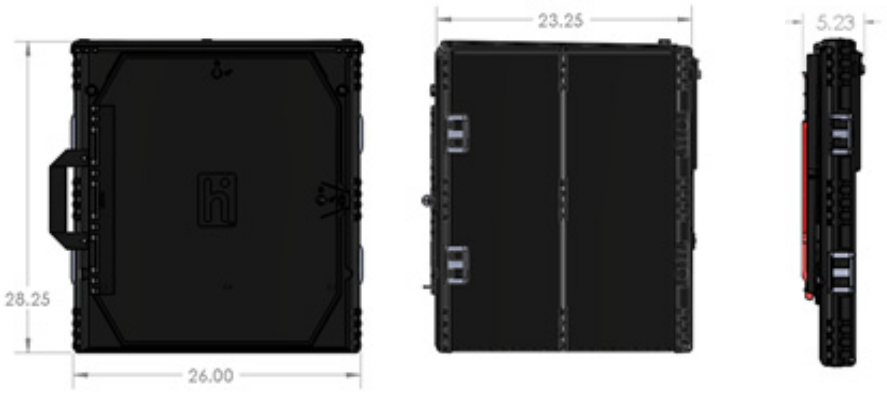


Table 8. Verity Scan Ballot Box specifications.

Dimensions & Weight	Collapsed in Bag	Collapsed	Deployed
Height in inches	28.5	28.3	28.3
Width in inches	26.5	26.0	26.0
Depth in inches	5.5	5.2	23.3
Weight in pounds	26.9	25.6	25.6

Verity Scan Thermal Printer Paper Specifications

Table 9. Verity Scan thermal, BPA-free paper specifications.

Setting	Description
Width in inches	2.25
Basis Weight	53 g/m2
Length in feet	80.0

Equipment Environmental Standards

General Report Options

Table 10. General reports options.

Equipment	Specifications	Operating	Storage and Transportation
Verity Scan and Touch Writer	Temperature	50 to 95 °F	-40 to 150 °F
	Humidity	15 to 85 percent relative humidity, non-condensing	5 to 95 percent relative humidity, non-condensing
	Vibration	Per MIL-STD-810	Per MIL-STD-810
	Drop Height	Per MIL-STD-810	Per MIL-STD-810
	Power Requirement	120 VAC, 60 Hz, 60 W	

Storage Procedures

This section reviews the storage of Verity hardware components. Recommendations are based on best practices. Where applicable, refer to hardware manufacturer recommendations.

Create a spreadsheet that shows registered voters by precinct and precincts assigned per polling place. This helps to determine the equipment requirements for each polling place. The use of the term "Precinct" to also define an Election Day polling place varies by jurisdiction. Also, requirements vary by state in regard to machine allocation versus voter registration.

You should maintain the polling place components in precinct sequence if at all possible. While the Verity Scan and Touch Writer do not require this, it is much easier to allocate and access units stored in this manner since most assignments to the system are done by precinct.

At this time you need your spreadsheet showing allocation of equipment to polling places. The easiest layout is to begin with the first precinct/polling place first and increment until you have all precincts/ polling places accounted for. If you need one Verity Scan and 6 Verity Touch Writers in Polling Place #1, load them and other items sent to polling places together on a pallet or other type of transfer container designated for Polling Place #1. Include items such as a transfer case, cell phones, signs, tape, pens, and other items that are not dated. Continue this process until all polling places are completed. One way to identify polling place locations within the facility is by painting the numbers on the floor to insure the proper placement when the polling place equipment is being moved.

Report Printer Paper

The Verity Scan and Touch Writer printer paper purchased through Hart InterCivic has a shelf life of seven years after it has been imaged. The manufacturer recommends that it be imaged within three years of the manufacturing date. Store the paper at temperatures below 77 °F with relative humidity of 45 – 65%. Do not expose to direct light.

Power Accessibility

The storage facility should have at least one workstation with AC power available for functionality testing, etc. A set of one Verity Scan and one

Verity Touch Writer requires approximately 0.5 amps (AC) per device to operate, so the use of standard 15 amp circuits will be adequate. If extension cords are necessary when testing the system or setting up for an election, be aware that pulling cords throughout your facility may be time consuming or inconvenient. Accordingly, the use of drop cords that contain multiple outlets is highly recommended, as this allows several polling place sets to be serviced at one time while minimizing the number of cords pulled throughout the facility. Conveyor belts or hand trucks can be used to transport equipment from storage to workstations.

Predefine Procedures

The following steps walk you through the predefining process for Verity Scan and Verity Touch Writer (Verity Device). This section comprises the following processes:

- Programming Verity Key to the Verity Device
- Loading the current election
- Printing the Zero Tape Report
- Printing the Election Identification Report

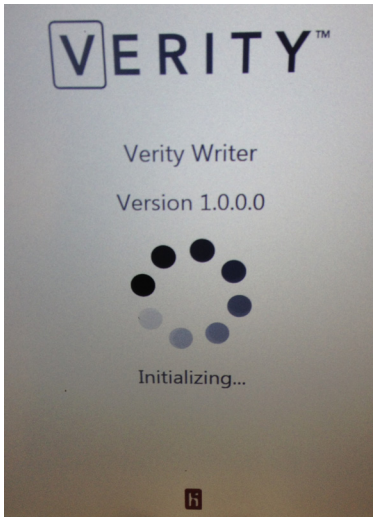
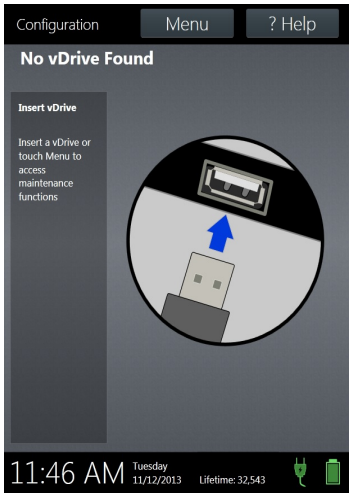
Steps for all of these processes are explained in the following sections in case they are ever needed. Usually, however, the first two steps are completed at the warehouse for each election, depending on each precinct's adopted procedures. When the Verity Device arrives at the polling place along with the vDrive, the Zero Tape Report should still be attached to the report roll in the Verity Device.

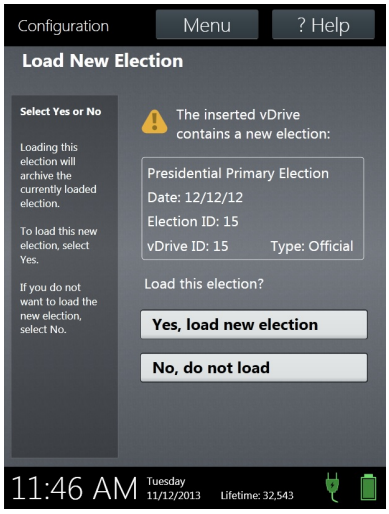
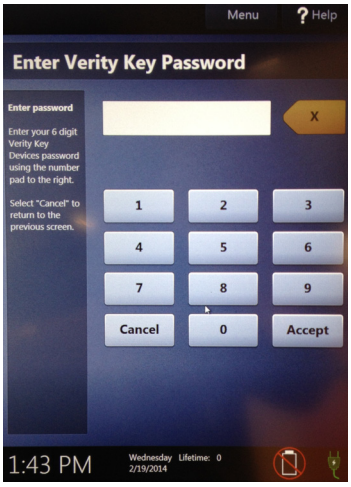
Programming Verity Key to the Verity Device

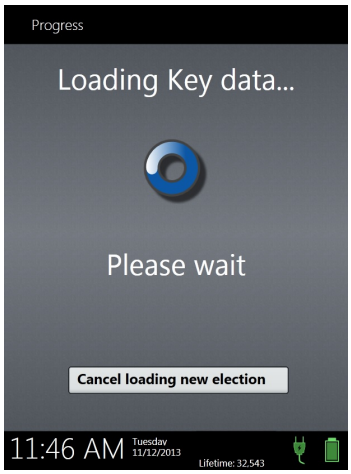
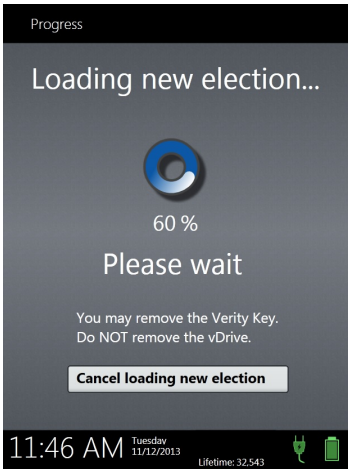
vDrives and Keys are created at the same time in Build, so they contain compatible election information. When an election is loaded into the Verity Device, the device is programmed to ensure that the vDrive is authentic. Both the vDrive and the Key are required in order to load an election. The vDrive contains the election data, and the Key contains Verity secrets. To load the election, you need to have the vDrive and the Verity Key. Once the Verity Key has been successfully read, it should be removed from the device.

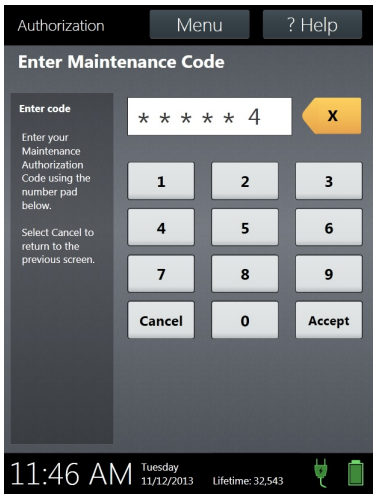
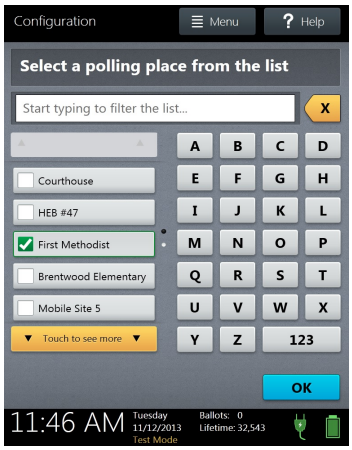
Loading the Election

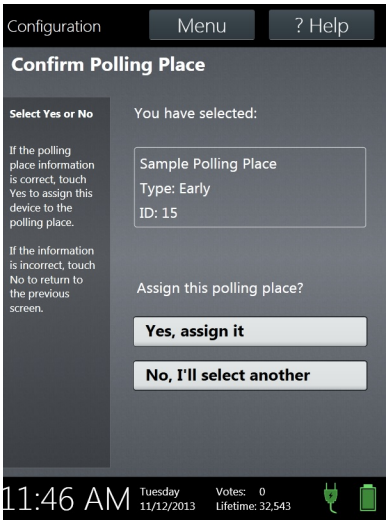
Note: Both the vDrive and Verity Key are required in order to load an election.

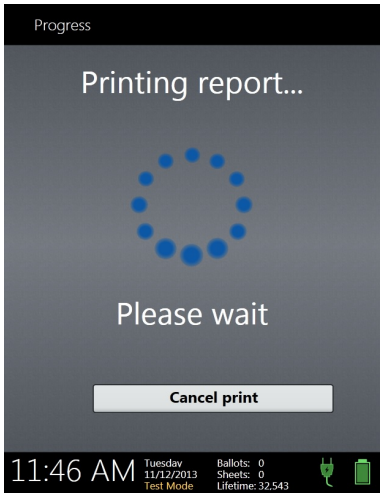
On-Screen	Steps
	1. Press the green Power Button to turn on Verity Device. Wait while Verity starts. This may take a few minutes. The Verity wall paper displays. The Verity Device Initializing screen displays. Wait while the rotating progress wheel spins. This may take a few minutes. The Power-On Self Test Report prints on the thermal paper. Then the Insert vDrive screen displays.
	2. Insert the vDrive for the current election.

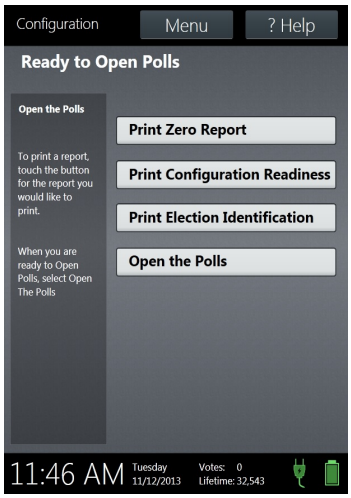
On-Screen	Steps
	3. The Load New Election screen displays. Click **Yes, load new election**.
	4. The Insert Verity Key screen displays. Insert the Verity Key.
	5. The Enter Verity Key Password screen displays. Enter the password for the Verity Key and tap **Accept**.

On-Screen	Steps
 	6. The Loading Key Data screen displays, and then the Loading New Election screen displays. You may remove Verity Key now. *Do not remove the vDrive* because the election is loading from it. Wait throughout this setup period. The Setting Up Election screen displays. Continue to wait. Election setup can take some time.

On-Screen	Steps
	7. When the election is finished loading, the Enter Maintenance Code screen displays. Enter the Maintenance Code and tap **Accept**.
	8. The Select Polling Place screen displays. Tap a polling place to select it. 9.

On-Screen	Steps
	10.The Confirm Polling Place screen displays. Tap **Yes, Assign it** to confirm.

On-Screen	Steps
 	11. The Verity Device then asks you to print the Zero Report. It is required. Click **Print Zero Report**. The Zero Report prints.

On-Screen	Steps
	12.The Ready to Open Polls screen displays.This is the point at which the warehouse sends you the equipment, including the vDrive installed in the device. The Zero Report should still be attached. If not, print a new Zero Report.

Print Zero Report

When the Verity equipment arrives from the warehouse, it should have a Zero Report attached on the thermal paper roll. If it is not there, print a Zero Report.

	Steps
☐	1. Press the Power Button on the Touch Writer. Wait while it powers up. The Power-On Self Test Report prints.
☐	2. Tap in the maintenance code using the keypad on the Enter Maintenance Code screen and tap **Accept**. Wait while the election loads.
☐	3. On the Ready to Open Polls screen, tap **Print Zero Report**. Check the Zero Report to verify the polling place and/or precincts. Leave the Zero Report on the Touch Writer; it will be filed at the end of Opening Polls.

Hardware

	Item	Number
☐	Scan	3005350
☐	Touch Writer (includes tablet)	3005352
☐	Tablet	2005302
☐	Access	2005010
☐	Headphones	1001-275
☐	Power Brick	2005332
☐	vDrive	1005324
☐	Key	2005361
☐	Ballot Box	3005357
☐	Standard Booth	3005358
☐	Accessible Booth	3005359
☐	Uninterruptible Power Supply	2005362

Delivery Procedures

Preparation

After all testing has been finalized, begin preparing the system for delivery to the polls. The procedures to move the voting system vary by jurisdiction, so the need to organize the process is essential.

- It is very useful to work with other staff members to create a survey to be mailed to your polling locations far in advance of the election. Ascertain basic information such as availability of AC power, tables and chairs, phone, access during voting hours.
- Create a checklist of polling places and ALL items that are to be shipped to minimize shortage calls on Election Day.
- If you use a moving company to deliver your voting system, arrangements must be made in advance.
- Keep in mind that AC power must be available at the polls and you may need extension cords and/or 2-prong adapters for some polling places.
- Provide the mover with the list of polling locations and the equipment assigned to each.
- If there are locations with special delivery requirements, let the mover know in advance.
- If you have assigned the equipment as suggested previously, you should have everything needed for a polling place on one pallet.
- It is very helpful to have a spreadsheet showing the equipment numbers and the polling places to which they are assigned (equipment serial number is located on the bottom of all units).
- Keep logs of voting devices sent to each polling place. Track by device serial numbers. Also log the wire seal serial number for each device.
- Keep your facility organized. Move polling place equipment to loading area in the reverse order it comes off the truck; first on, last off.

Voting Device Delivery and Deployment

Transportation and Storage

Verity Scan and Touch Writer are electro-mechanical pieces of equipment and need to be protected when transporting or storing. Moving parts, optics within the scanner, and tablet computers are sensitive to excessive dust, moisture, and vibration.

Always use a Hart-approved shipping container, such as the original cardboard Verity Device box, when transporting the Device between facilities (for example, to or from a polling place).

Heavy-duty shipping containers are available for purchase from the Hart catalog.

Do not store Verity Devices in high humidity or dusty environments; this causes moisture to collect on the glass surfaces of the scanner and may reduce the quality of scanned ballot images.

Polling Place Deployment, Verity Touch Writer

Verity Touch Writer setup.

	Tasks
☐	Ensure sufficient electricity is available in the area. **Do not connect Verity Touch Writer to AC Power at this time.**
☐	Open and remove Verity Touch Writer case from shipping carton.
☐	Remove booth from carrying case.
☐	Ensure the booth is assembled properly. 1. Booth legs are properly attached 2. Booth is opened and Booth top is secure. 3. Properly seat Verity Touch Writer on top of the booth 4. Secure Verity Touch Writer to booth
☐	Open Verity Touch Writer case and secure lid in upright position.
☐	Remove the tablet from its storage location.
☐	Remove the battery cover and press the battery check button on the battery.

	Tasks
☐	The battery charge indicator should indicate a battery charge >=80% **If it does not contact the appropriate election personnel.** Place the battery cover back on the tablet case.
☐	Place the tablet in the Verity Touch Writer tablet cradle.
☐	Lock the tablet in place.
☐	Retrieve the power supply from the case's storage compartment, ensure the power supply is the XP Power Model AHM85PS24.
	Touch Writer Printer Setup
☐	On a table or second booth must be setup for the printer. The Hart specific USB printer cable is 2 meters long. The printer must be located close to the Touch Writer.
☐	Remove printer from shipping carton.
☐	Set the printer on the 2nd booth or table.
☐	Retrieve Hart USB Printer cable for Touch Writer storage compartment. Connect the Hart USB Printer cable into printer's USB port.
☐	Connect the USB printer cable in to the Touch Writer Printer port.
☐	Connect the printer into AC Power source.
☐	Turn the printer On.
☐	If a Verity Booth is used for the printer, attach the privacy screens to the booth.
	Touch Writer Setup Completion
☐	Connect the power supply (XP Power Model AHM85PS24) to Verity Touch Writer.
☐	Connect the Verity Touch Writer's power brick to an AC Power source, DO NOT USE 3-to-2 prong AC adapter.
☐	Attach the privacy screens to the booth.
☐	Turn on Verity Touch Writer

Polling Place Deployment, Verity Scan

Verity Scan setup.

	Tasks
☐	Ensure sufficient electricity is available in the area. **Do not connect Verity Scan to AC Power at this time.**
☐	Open and remove Verity Scan case from shipping carton.
☐	Ensure the ballot box is assembled properly. 1. Unlatch sides 2. Spread panels 3. Lower floor 4. Release straps 5. Lift and rotate lid to flat position 6. Unlock front door 7. Secure floor 8. Properly seat Verity Scan on top of the ballot box 9. Secure Verity Scan to ballot box 10.Close and lock front door
☐	Open Verity Scan case and secure lid in upright position.
☐	Remove the tablet from its storage location.
☐	Remove the battery cover and press the battery check button on the battery. The battery charge indicator should indicate a battery charge >=80% **If it does not contact the appropriate election personnel.** Place the battery cover back on the tablet case.
☐	Place the tablet in the Verity Scan tablet cradle.
☐	Lock the tablet in place.
☐	Retrieve the power supply from the case's storage compartment, ensure the power supply is the XP Power Model AHM85PS24.
☐	Connect the power supply to Verity Scan.
☐	Connect the Verity Scan's power brick to an AC Power source. DO NOT USE 3– to 2–prong AC adapters.
☐	Attach the privacy screens to the ballot box.
☐	Turn on Verity Scan

Polling Place Disassembly, Verity Touch Writer

Verity Touch Writer disassembly.

	Tasks
☐	Turn off Touch Writer and allow it to shut down.
☐	Remove and store the privacy screens from the Booth(s).
☐	Unplug Touch Writer from AC Power source.
☐	Unplug power cord on back of Touch Writer.
☐	Turn off printer. Unplug printer from AC Power source. Unplug power cord from printer.
☐	Unplug USB Printer cable from Touch Writer and printer.
☐	Place printer in shipping carton. Place printer power cord in printer shipping carton.
☐	Close printer shipping carton and that it is ready for transportation
☐	Properly store USB printer cable in Touch Writer case's storage compartment.
☐	Properly store AC Power brick and cords in Touch Writer case's storage compartment.
☐	On back of Touch Writer securely seal the USB Printer port cover.
☐	Unlock and remove Verity Touch Writer tablet from the cradle.
☐	Store Verity Touch Writer tablet in shipping carton.
☐	Close and lock Verity Touch Writer case.
☐	Unlock the Touch Writer from the booth.
☐	Place the Touch Writer in the shipping carton.
☐	Ensure both Touch Writer case and tablet are in the shipping container. Close carton and ensure it is ready for transportation
☐	Properly collapse booth and place in carrying case. Close case and ensure it is ready for transportation.

Polling Place Disassembly, Verity Scan

Verity Scan disassembly.

	Tasks
☐	Turn off Verity Scan and allow it to shut down.
☐	Remove and store the privacy screens from the Ballot Box.
☐	Unplug Verity Scan from AC Power source. Unplug power connection on back of Verity Scan.
☐	Properly store AC Power brick and cords in storage compartment.
☐	Unlock, remove, and store the Verity Scan tablet in shipping carton.
☐	Store Verity Scan tablet in shipping carton.
☐	Close and lock Verity Scan case.
☐	Properly disassemble Ballot Box 1. Unlock ballot box door 2. Unlock Verity Scan from ballot box 3. Lift Verity Scan off the top of the ballot box 4. Raise ballot box floor 5. Close and lock front door 6. Lift and rotate lid 7. Secure straps 8. Push to collapse the box 9. Secure latches
☐	Ensure ballot box is ready for transportation
☐	Place Verity Scan in shipping carton. Ensure both Verity Scan case and tablet are in carton
☐	Close carton and ensure it is ready for transportation

Preventative Maintenance Procedures

Maintenance procedures for the Verity Scan and Touch Writer devices are minimal. Retest and record any problems detected in functionality testing and return damaged equipment to Hart for replacement. There are only a few regularly scheduled maintenance procedures necessary:

- Cleaning the Equipment Screens
- Cleaning the Verity Scan Scanner Path
- Calibrating the Verity Scan
- Checking battery levels and charging batteries
- Performing functionality tests
- Other repair, replacement, and miscellaneous maintenance procedures
- Verity Touch Writer ballot printers, Verity workstation printer,s Verity Central workstation scanners, and workstation peripheral maintenance

Voting Device Maintenance

Verity Scan may be stored for long periods of time between uses, and the scanner's moving parts and optics are sensitive to dust, moisture, and vibration. To keep Verity devices in good condition, perform these steps at least once per year, or prior to every election:

- Always clean the upper and lower glass plates on each scanner with lint-free isopropyl alcohol wipes.
- Never pour or spray liquids on the glass plates as this can cause streaking on the bottom surface of the glass plates.
- Have Hart replace the internal CMOS battery every 3 to 4 years through the preventative maintenance program.

Maintenance for Commercial Printers

Dust and debris are the main causes of poor-quality printing. Although these can never fully be eliminated, much can be done to reduce their effects.

Ensure that printing and storage rooms are kept clean and dust-free.

Perform all of the manufacturer's recommended printer cleaning and maintenance on schedule, even during the election off-season.

Prior to each election event, conduct full preventative maintenance on ballot printing equipment, including checking for proper paper and toner supplies.

Hart offers preventative maintenance programs for paper ballot printers that provide on-site visits from the printer vendor with preferred response times. Contact the Customer Support Center (CSC) for additional details.

Use only original equipment manufacturer (OEM) toner cartridges.

Re-manufactured toner cartridges may have premature failures, leading to printer downtime. They may also produce low quality images.

During Ballot Printing

If printing on-demand, make certain that the printer has been serviced and maintained.

If printing with a contract print vendor, make certain that the vendor is Hart-certified or qualified.

Always use high-quality paper stock that satisfies the Hart Secure Ballot Stock specification.

Paper dust problems can increase with large variations in moisture, poor formation (especially in 100% recycled-content grade), excessive variability of roll hardness (probably caused by poor winding at the mill) and other large variations in process parameters (caliper, weight, etc.).

Use the same weight paper for all ballots in the election.

Consult your printer model's manual for paper weight calibration information.

Never double-print ballots for custom stub printing (paper that runs through the printer twice may contain fuser oil or lubricant, making it more susceptible to slippage).

When printing ballots on demand, use only a Hart-approved printer.

Reducing Paper Dust

Paper dust accumulates in the printer fuser area and creates image-quality issues by contaminating components, and causing a variety of difficult-to-diagnose problems.

Perforated paper should be as free as possible of paper dust and chaff, which can cause machine contamination.

Fan paper thoroughly on all four sides to remove any dust or shavings from edges.

Using paper specifically designed for laser printing will ensure high-quality images and proper printer maintenance.

For best results, always use paper stock that satisfies the Hart Secure Ballot Stock specification.

Cleaning Rollers Contaminated With Paper Dust

Always follow the printer manufacturers suggested cleaning practices, consult the printer's maintenance section in the user manual. Rollers can usually be cleaned with a damp lint-free cloth and in some cases isopropyl alcohol solution may be used. Always follow the instructions in the printer's operator guide when replacing the feed rollers.

If the fuser rollers cannot be cleaned or replaced by the operator, call for service.

Keep printers in a dust-free environment, closed off from outside and manufacturing areas. Ensure doors and windows remain closed.

Printing issues

There may be times when a printer is not recognized by the Verity application or Verity Touch Writer.

If there are Error messages displayed in the application or device, make note of these messages.

Ensure the USB connection between the printer and the workstation/ device is properly connected at both ends of the cable.

Ensure the printer power cord is properly plugged in to both the AC outlet and printer. If the printer is used with Touch Writer and the printer is connected to an uninterpretable power supply (UPS), ensure the UPS is plugged into the AC wall outlet and that it is not indicating any issues (see manufacturers user guide).

Power cycle the printer, if the error clears then the system is ready to use. If the error persists, then the workstation or device may be required to be rebooted to recover the printer-to-workstation/device connection.

If issues persist, call Hart Customer Services, 866.275.4278

Maintenance for Commercial Scanners

Dust and debris are the main causes of poor-quality scanner, that may result in higher percentage of instances requiring ballot adjudication. Although debris can never fully be eliminated, much can be done to reduce their effects.

Ensure that scanner and storage rooms are kept clean and dust-free.

Perform all of the manufacturer's recommended scanner cleaning and maintenance on schedule, even during the election off-season.

Prior to each election event, conduct full preventative maintenance on ballot scanner equipment as describe in the manufacturers maintenance guide, including cleaning glass lenses, paper path, and depending on amount of use roller replacement may be recommended.

During each election event, conduct full maintenance on ballot scanner equipment as describe in the manufacturers maintenance guide, as required to provide the highest quality scanning function.

Hart offers preventative maintenance programs for paper ballot scanners that provide on-site visits from the scanner vendor with preferred response times. Contact the Customer Support Center (CSC) for additional details.

Use only original equipment manufacturer (OEM) replacement parts.

During Ballot Scanning

Make certain that the scanner has been serviced and maintained.

Always use high-quality paper stock that satisfies the Hart Secure Ballot Stock specification.

Paper dust problems can increase with large variations in moisture, inferior quality (especially in 100% recycled-content grade), excessive variability of roll hardness and other large variations in process parameters (caliper, weight, etc.).

Consult your scanner model's manual for paper weight calibration information.

Reducing Paper Dust

Paper dust accumulates throughout the scanner paper path and creates image-quality issues by contaminating components, and causing a variety of difficult-to-diagnose problems.

Perforated paper should be as free as possible of paper dust and chaff, which can cause machine contamination.

Fan paper thoroughly on all four sides to remove any dust or shavings from edges.

Using high-quality paper stock will promote high-quality images and proper printer maintenance.

For best results, always use paper stock that satisfies the Hart Secure Ballot Stock specification.

Cleaning Rollers Contaminated With Paper Dust

Rollers can usually be cleaned with a damp lint-free cloth and the suggested roller cleaner solution. Always follow the instructions in the scanner's operator guide for cleaning and replacing the rollers.

If the rollers cannot be cleaned or replaced by the operator, call for service.

Keep scanners in a dust-free environment, closed off from outside and manufacturing areas. Ensure doors and windows remain closed.

Scanning issues

There may be times when a scanner is not recognized by the Verity Central application/workstation.

If there are Error messages displayed in the application, make note of these messages.

Ensure the USB connection between the scanner and the workstation is properly connected at both ends of the cable.

Ensure the scanner power cord is properly plugged in to both the AC outlet and scanner.

Power cycle the scanner, if the error clears then the system is ready to use. If the error persists, then the workstation may be required to be rebooted to recover the scanner-to-workstation connection.

If issues persist, call Hart Customer Services, 866.275.4278

Verity Workstation Maintenance

Verity Build, Central, and Count workstations may be stored for long periods of time between uses. To keep Verity workstations in good condition, perform these steps at least once per year, or prior to every election:

- Always clean the exterior of the workstation, keyboard, mouse, and display with moist lint-free cloth.
- Never pour or spray liquids on the glass plates as this can cause streaking on the bottom surface of the glass plates.
- Have Hart replace the internal CMOS battery every 3 to 4 years through the preventative maintenance program.

Workstation issues

There may be times when a scanner/printer is not recognized by the Verity application/workstation.

If there are Error messages displayed in the application, make note of these messages.

Ensure the USB connection between the printer/scanner and the workstation is properly connected at both ends of the cable.

Ensure the printer/scanner power cord is properly plugged in to both the AC outlet and scanner.

Power cycle the printer/scanner, if the error clears then the system is ready to use. If the error persists, then the workstation may be required to be rebooted to recover the printer/scanner-to-workstation connection.

If issues persist, call Hart Customer Services, 866.275.4278

Voting Device Storage

Storing the Scan power supply (or "brick") inside the storage compartment:

- Simplifies transporting the Scan to and from the polling place.
- Lessens the chance for damage to the brick caused by handling errors. Because the fuse inside the power brick is fragile, sudden jarring can cause the fuse to break (such as when dropped on the floor).

Paper Storage

Paper is very sensitive to moisture changes, and this fluctuation can cause print quality issues. The temperature of the room where paper is stored can have a significant effect on how that paper performs in the machine. Humidity control is essential to ensure proper paper handling and performance.

Optimum paper storage and printer operating temperature is 68 to 76 degrees Fahrenheit.

Optimum storage conditions include areas with a relative humidity of 35% to 55%. Overloading of the storage or work area with external air from open doors and excessive in-and-out traffic may defeat environmental control systems.

Never store paper directly on the floor, since that increases the possibility of moisture absorption. Store paper on pallets, shelves, or in cabinets in an area protected from extremes of temperature and humidity.

Only open sealed reams of paper when they are ready to be loaded into the printer.

Conditioning Paper

When paper is moved from a storage area to a location with a different temperature and humidity, allow the paper to acclimate to the new location before use.

Cleaning the Equipment Screens

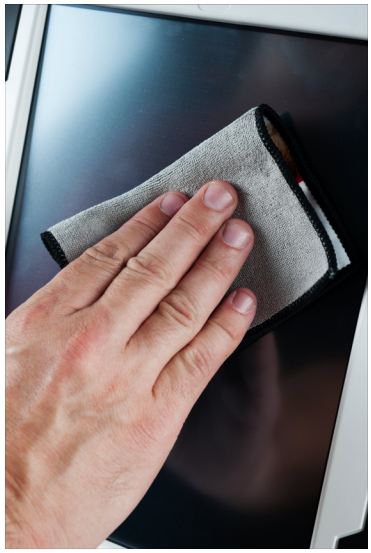


Table 11. Cleaning the equipment screens.

	Tasks
☐	Use, at a minimum, 50% isopropyl alcohol and lint-free wipes. Never use ammonia-based and detergent-based formulas.
☐	Wipe the Verity Scan and Touch Writer screens clean.
☐	Include a minimum 50% isopropyl alcohol and lint-free wipes with the polling place supplies, and ask poll workers to clean the screens at least once daily during election events.

Cleaning the Verity Scan Scanner Path

Table 12. Cleaning the scanner and ballot entry paths and the scanner glass and heads.

	Tasks
☐	Raise the top cover to the scanner section of the Verity Scan.
☐	Raise the inside cover to the scanner.
☐	Use, at a minimum, 50% isopropyl alcohol and lint-free wipes. **Never use ammonia-based and detergent-based formulas.**
☐	Wipe the upper and lower plates on the scanner path clean of small paper debris. **NOTE**: Never use a pressurized air canister. Doing so may result in debris becoming trapped under the scanner glass.
☐	Clean the transport mechanism (rollers under the inside cover) using a minimum 50% isopropyl alcohol and lint-free wipes. **Never use ammonia-based and detergent-based formulas.**

Battery Maintenance

The following battery maintenance procedures apply for Verity system hardware components.

Battery Design

The battery is fully rechargeable with built-in test and protection circuitry built by the manufacturer. The battery supports 500+ charging cycles. Hart provides two options for the charging bay for the batteries, a one-to-one and a one-to-six battery bay.

Manufacturer's Caution

Never discharge, short circuit, or dispose of battery/ies in water.

Never expose battery module to temperatures above 140F (60C).

Never mishandle or disassemble battery module.

Failure to follow these instructions may present risk of explosion, fire, or high temperatures.

Table 13. Battery maintenance.

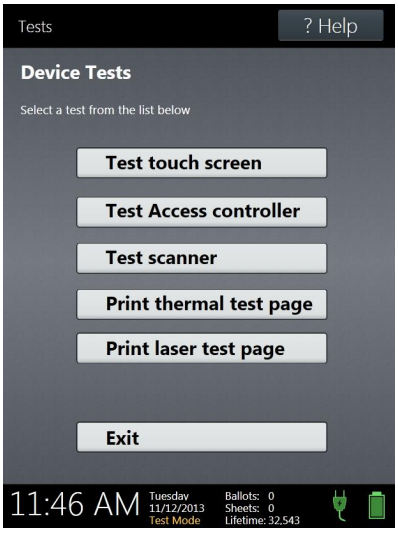
Visual Queue	Definition	Notes
<80%	Recommended time to recharge battery.	To test the charge level, press and hold the test button on the battery.
Red pulsing light on battery	Battery cannot be charged	When the battery is fully drained, it may indicate a pulsing red light. Try leaving it in the charger for 30 minutes to see if it will begin pulsing green (take a charge).
Green pulsing light on battery	Battery is charging	
Green solid light on battery	Battery is fully charged	

Table 14. Battery charge and drain statistics.

Battery Statistics	Timeline	Notes
Battery charge time	4-5 hours	for a fully discharged battery
approx. 0.5%/month	on-shelf drain rate	
approx. 2.0%/week	plugged-in drain rate	

Performing Functionality Tests

Figure 1. Device Tests Menu screen.



Device Tests Menu Screen	
Description	Allows the user to run device tests.
Tab order	Buttons, top to bottom

Test Touch Screen Button	
Description	Navigates to the **Touchscreen Test** screen

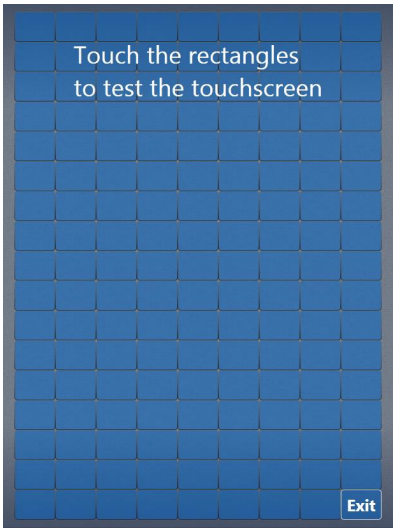
Test Access Controller Button	
Description	Navigates to the Access Controller Test screen
Dependencies	This option is only available on the Verity Touch and Touch Writer

Test Scanner Button	
Description	Navigates to the Scanner Test screen
Dependencies	This option is only available on the Verity Scan

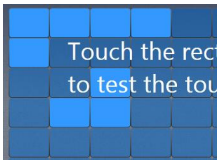
Print Thermal Test Page Button	
Description	Prints a test page to the thermal printer. Transitions to a **Progress** screen during printing. Transitions to the **Device Tests Menu** screen after printing.

Print Laser Test Page Button	
Description	Prints a test page to the COTS printer. Transitions to a **Progress** screen during printing. Transitions back to the **Device Tests Menu** screen after printing.
Dependencies	This option only appears on Verity Touch Writer and Verity Ballot.

Figure 2. Touchscreen Test Screen.



Touchscreen Test Screen	
Description	Allows users to test the touch screen to ensure it registers touches accurately
Tab order	Buttons, left to right then top to bottom

Rectangular toggle buttons	
Description	Toggles color when touched 
Allowed values	Unchecked =  Checked = 

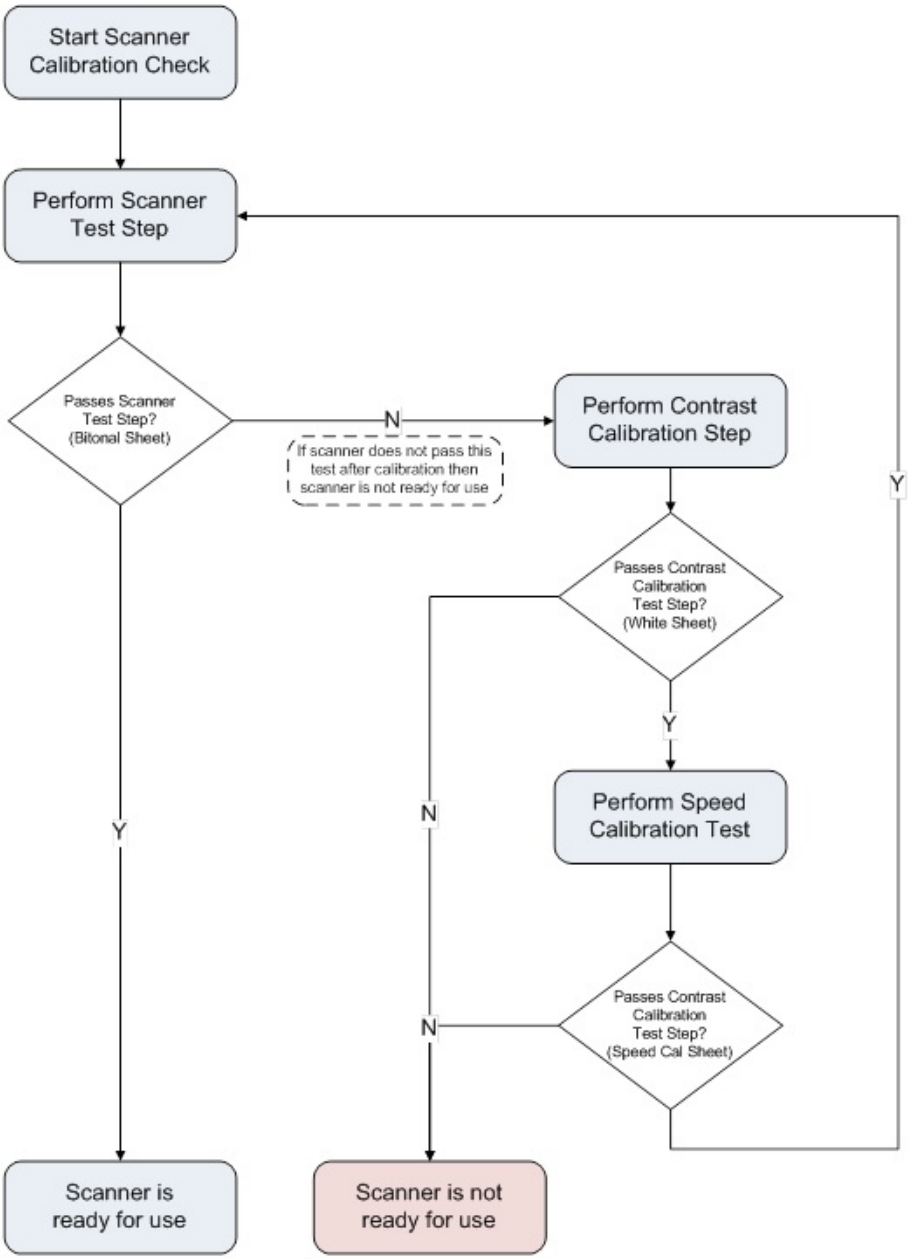
Exit button	
Description	Toggles the background when touched Transitions the UI to the **Device Tests** screen
Allowed values	Unchecked =  Checked = 

Figure 3. Verity Access test screen.

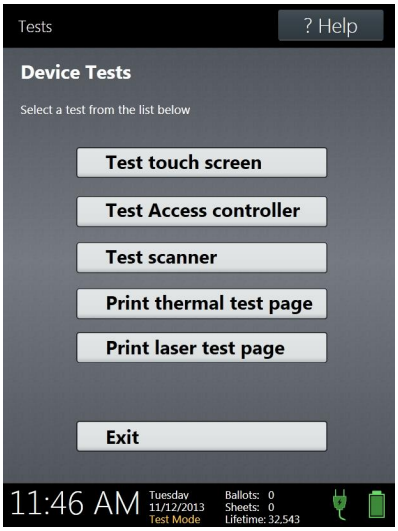
Test Access Controller Screen	
Description	Allows the user to test that the Access buttons, peripherals, and audio functionality are working correctly. When a button is pushed on the Access, the UI will: 1. Briefly light up the button with a yellow overlay 2. Toggle a green check mark to indicate success. The check mark state will be persistent until the button is pushed again. 3. Play the name of the pressed button so that the user can verify correct audio functionality **Note**: See wireframe project for a working example with animations, icons, etc. ***Figure 4. Button test highlight and success icons.***  
Tab order	N/A

Testing the Scanner

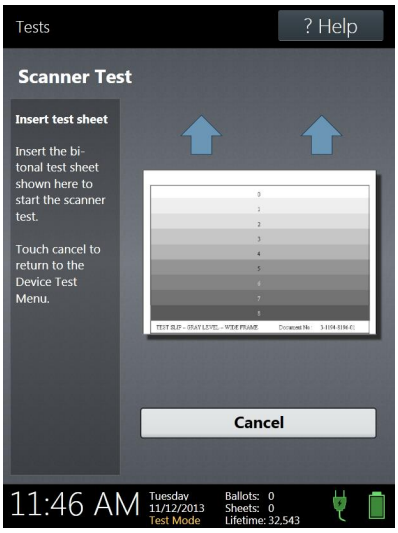
The scanner withing the Scan unit should have the calibration checked at least once per year. The following flow chart depicts the calibration process.



To test if the scanner is within calibration, press **Test Scanner** on the Device Tests screen.



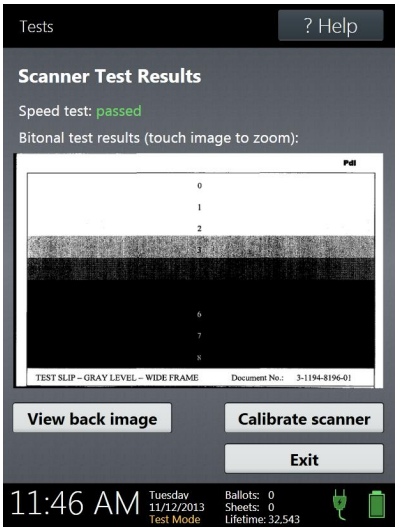
Insert Bitonal Sheet, as shown.



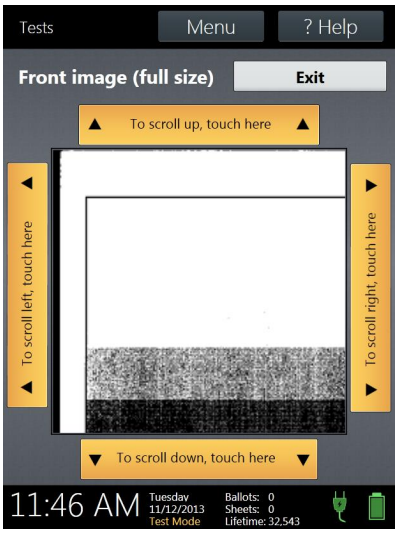
If results of Speed Test are **passed**, the next step is to view the upper and lower images at full scale.

As part of the image review, you must view the entire screen to look for any potential flaws. The following image is a reduced-size view. It must be enlarged to visually see any small size indicators of potential issues.

To view the entire screen, click **View Back Image** on the Scanner Test Results screen.



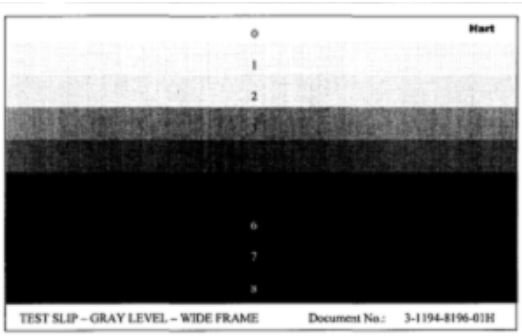
Use the scroll buttons to view the various regions of the image.



The output images should be as follows:

- Zone 0: Always white.
- Zones 1-4: Can be white or speckled.
- Zones 5-8: Should be completely black.

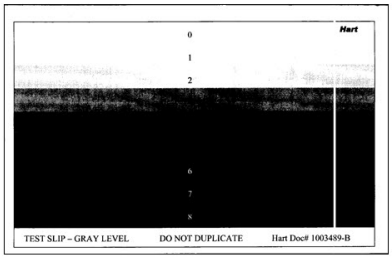
Following is an example of a good image.



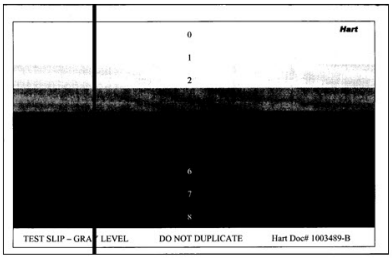
If the results of the Speed Test are **passed** and if images are approved, no calibration is required. The scanner is ready for use.

Following are some examples of bad images.

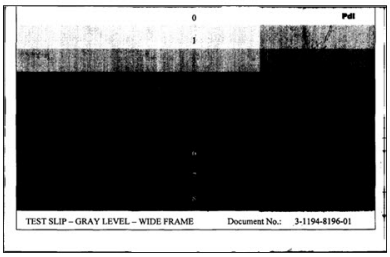
Bad pixel (always off)



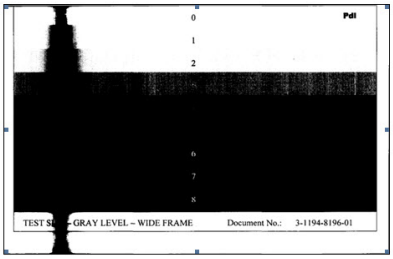
Bad pixel (always on) or debris on glass



Bad read head



Bad red LED sector



If the scanner test does not pass, the next step is to attempt calibrating the scanner for speed and image contrast.

Calibrating the Scanner

Scanner Calibration Supplies

The following supplies are needed in order to perform the Scanner Calibration:

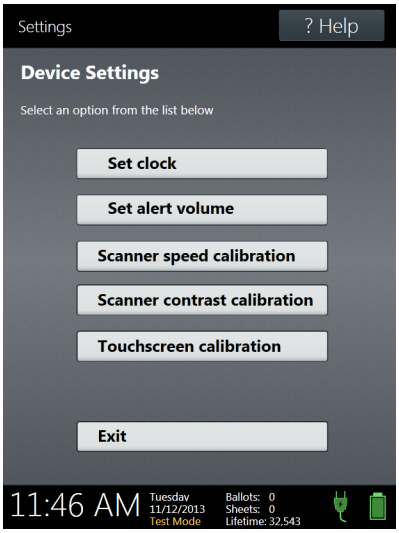
- Bitonal Sheet provided by Hart InterCivic (part # 1003489)-do not duplicate
- Speed Calibration Sheet provided by Hart InterCivic (part # 1003494)-do not duplicate
- Letter-size white paper, 92 brightness – clean no smudges

Performing Scan Calibration

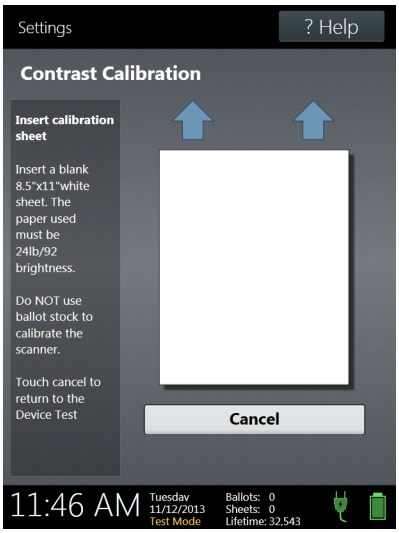
Whenever you perform calibration, you should perform both the white sheet calibration and the speed calibration in the order below:

- White Sheet Calibration: This option sets the white-level values for the scanner to ensure uniform contrast on scanned ballots. This test must be performed using an 8.5 x 11 sheet of white paper with a brightness of 92 or greater that is clear of marks.
- Speed Calibration: This option allows you to calibrate the scanner motors. You will need to use the Speed Calibration Sheet.

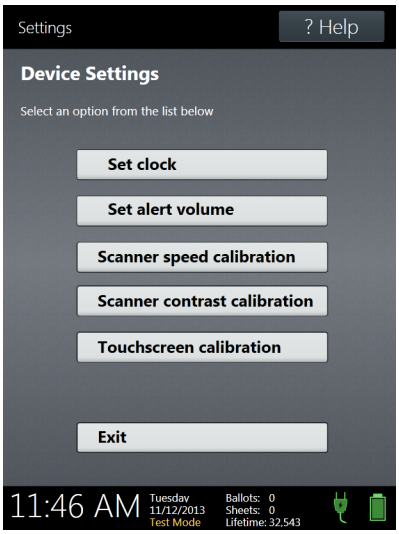
First perform the Scanner Contrast Calibration and if it passes then perform the **Scanner Speed Calibration** step.



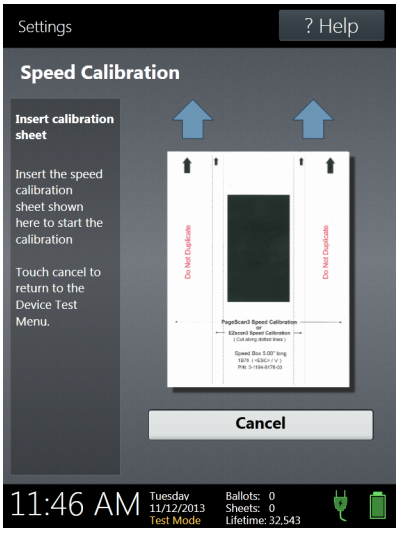
Select **Scanner Contrast Calibration**, and then—within 2 to 10—seconds insert a clean, blank white sheet of paper with a brightness of 92 into the scanner. The sheet will be returned to you after the test is done. If the test *passes*, proceed to the Speed Calibration step. If the test does *not pass*, RMA the unit.



Next select **Scanner Speed Calibration**, and then—within 2 to 10—seconds insert a **Speed Cal** form into the scanner. The sheet will be returned to you after the test is complete.



Insert **Speed Cal** sheet as shown.



Note: Use only clean, crisp forms with no smudges or lines. Poor-quality forms will negatively affect the calibration of the unit.

If the test *passes*, repeat the **Scanner Test** step to be able to view Bitonal Image and to check if the scanner now passes.

If the test does not pass, RMA the unit.

CHAPTER 3

Polling Place Equipment Testing

This section details the equipment acceptance and functionality tests performed on all devices and workflows at polling places.

This chapter describes the following:

Overview

This chapter covers testing the equipment. There are several types of tests, such as Acceptance, Functional, and Logic and Accuracy. The Acceptance Test is a comprehensive test of the functionality of the polling place equipment when you receive it. By performing an Acceptance Test, you are verifying that you have received the equipment in good working order.

The Functionality Test is a test that you perform between election cycles to verify that the equipment is still operating correctly and is election-ready. Functionality Tests can be performed as often as you want. Hart recommends that you perform functionality tests a minimum of once per year.

Neither of these tests is a Logic and Accuracy Test or a ballot proofreading exercise.

Refer to the *Polling Place Operations Guide* for complete equipment operations as performed in the polling place.

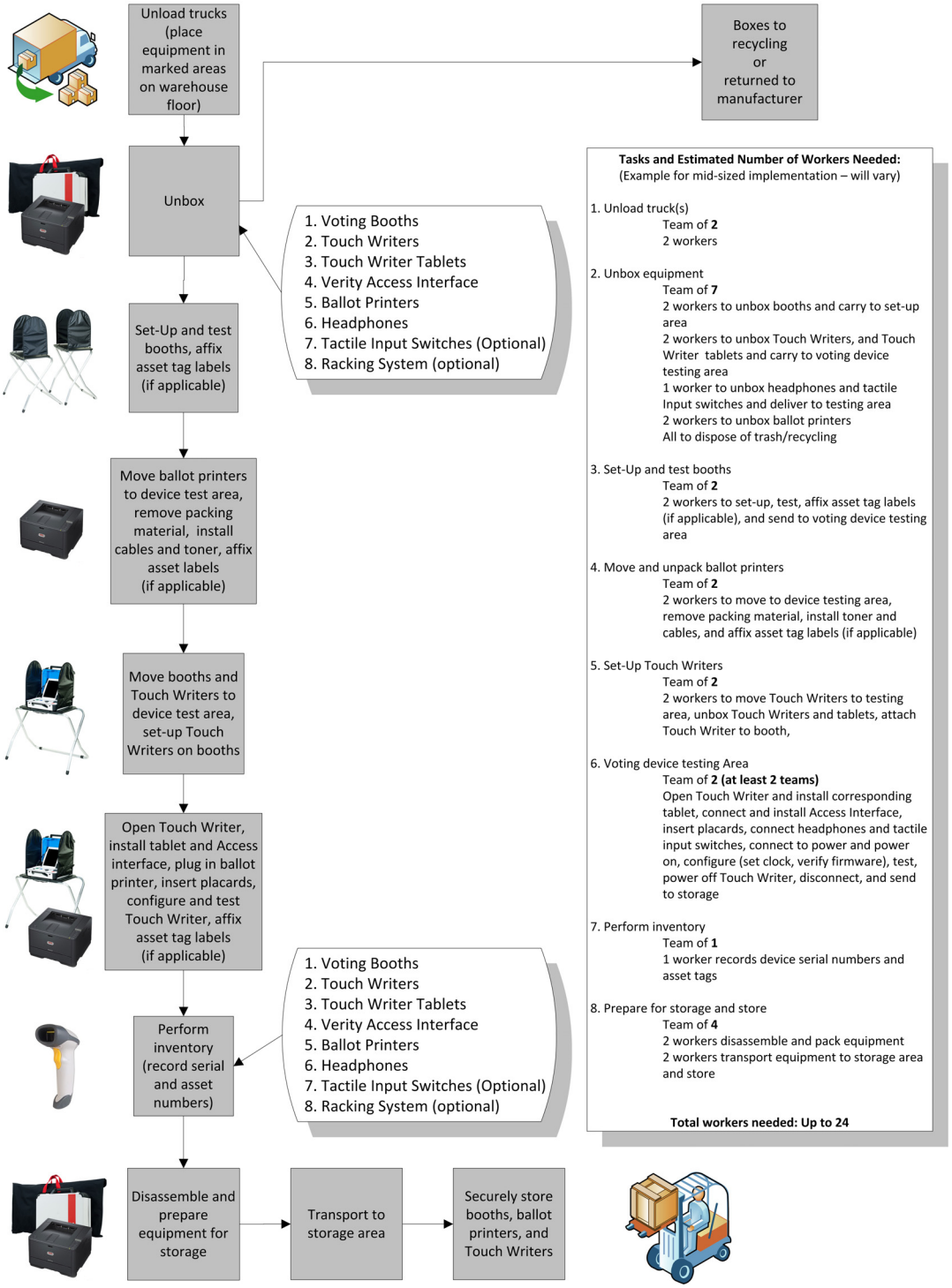
Touch Writer Testing Supplies

Table 1. Testing supplies checklist: Verity Touch Writer.

	Supplies	Details
☐	1 Verity Touch Writer	
☐	1 set of headphones per Verity Touch Writer	
☐	1 Verity Access booth per Verity Touch Writer	
☐	1 set of tactile input switches (jelly switches) per Verity Touch Writer	Optional
☐	1 Verity Touch Writer Ballot Printer per Verity Touch Writer	
☐	1 ream of ballot paper per Verity Touch Writer Ballot Printer.	
☐	1 test Verity vDrive per testing line	The Verity vDrive holds the ballot information. The vDrive should include both Early Voting and Election Day polling places with more than 6 precincts assigned to each, and it should be accompanied by the "Polling Place List <EV or ED> Summary" report.
☐	Spare Verity Scan/Touch Writer printer paper roll	If the printer roll is near its end, replace it while testing.
☐	1 Verity Key with local security data	
☐	Extension cords, as necessary	
☐	1 surge protector/plug bar per testing line	Optional – **AVOID SURGE PROTECTORS WITH ON/OFF SWITCHES**
☐	Envelopes or file system for device reports	Optional
☐	Shipping and inventory lists	
☐	Functionality Documentation	Refer to the Election Logs

Touch Writer Acceptance and Functionality Test Workflow

Verity Touch Writer System Acceptance Test Staffing Workflow



Touch Writer Test Preparation

Use this checklist when performing Touch Writer acceptance and functionality tests.

Table 2. Acceptance and functionality test procedures checklist: Verity Touch Writer.

	Steps	Details
☐	Set up teams and assignments for each member within each team. Teams will vary per implementation, and they will vary depending on the task – an initial acceptance test is much more involved than later functional tests.	This process is simple if tasks are separated into distinct areas and teams. Team members should each have distinct tasks within their teams. Assignments might include: • Unloading trucks • Unboxing equipment • Setting up Touch Writers • Testing (inspecting) Touch Writers, affixing serial number, and inserting instructional placards • Moving Touch Writers to testing area • Connecting Touch Writers, setting up Verity Access peripherals, taking down Touch Writers • Adding equipment to local inventory list
☐	Set up an area where Touch Writers will be inspected, serial number labels will be affixed, and instructional placards will be inserted.	Refer to the Election Logs tab for a booth inspection checklist.
☐	Verity firmware validation.	1. Insert stick. 2. Push button. 3. Remove stick. 4. Insert stick.

	Steps	Details
☐	Program key device steps.	A factory security key has been programmed to the voting devices. This key must match the key on the vDrives being used in testing equipment. This key should be used only for initial testing. If necessary, program each Verity Touch Writer with the key that matches the key on the vDrives being used in the test.
☐	Verify quantity of each product.	Compare to shipment list for accuracy.

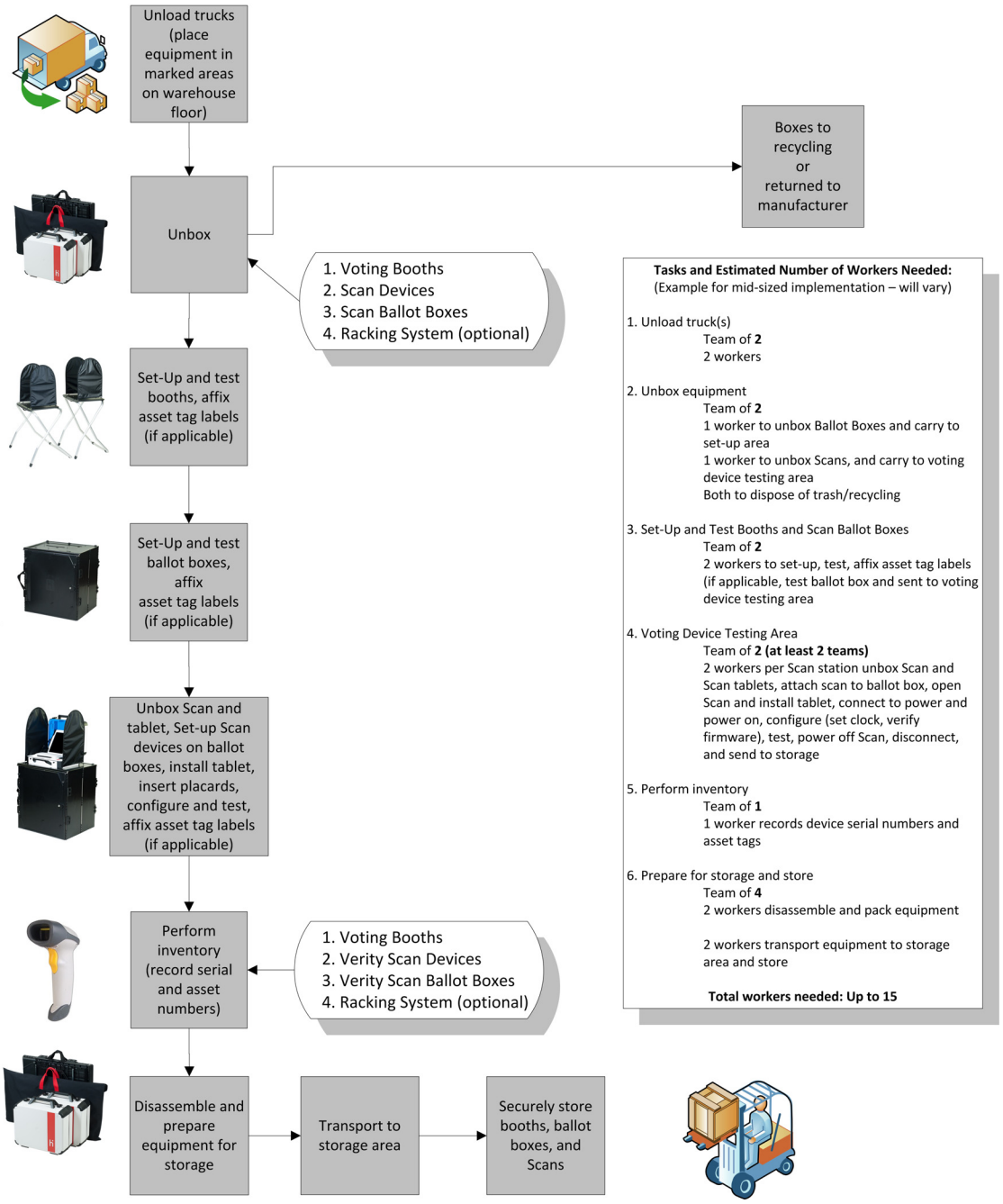
Scan Testing Supplies

Table 3. Verity Scan testing supplies checklist.

	Supplies	Details
☐	Verity Scan devices	
☐	Verity Scan ballot boxes	
☐	Verity Scan booths	
☐	Booth storage racks	
☐	1 test vDrive per Scan device	
☐	Voted and blank Test ballots	
☐	Spare printer paper rolls	
☐	1 Verity Key with Acceptance Testing security data	
☐	1 Verity Key with local security data	
☐	Extension cords, as necessary	
☐	1 surge protector/plug bar per testing line	
☐	Alcohol wipes	For cleaning Scan scanner path
☐	Envelopes or file system for device reports.	Optional
☐	Shipping and inventory lists	
☐	Functionality Documentation	
☐	1 table per work area	Testing areas must have AC power available
☐	PostIt notes and pens for team members	Various uses
☐	The *Polling Place List Election Day Summary* report.	This report is used to identify the Polling Place.
☐	Bar code scanner	Optional – if supported by local inventory control process

Scan Acceptance and Functionality Test Workflow

Verity Scan System Acceptance Test Staffing Workflow



Scan Test Preparation

Use this checklist when performing Scan acceptance and functionality tests.

Table 4. Acceptance and functionality test procedures checklist: Verity Scan.

	Supplies	Details
☐	Set up teams and assignments for each member within each team. Teams will vary per implementation, and they will vary depending on the task – an initial Acceptance Test is much more involved than later functional tests.	This process is simple if tasks are separated into distinct areas and teams. Team members should each have distinct tasks within their teams. Assignments might include: • Unloading trucks • Unboxing equipment • Setting up booths • Testing (inspecting) booths, inserting instructional placards, and taking down booths • Testing (inspecting) Scan ballot boxes • Moving Scan ballot boxes to testing area • Setting up Scans atop Scan ballot boxes and operating Scans • Adding equipment to local inventory list • Testing and loading storage racks, if used
☐	Set up area where Scan Ballot Boxes will be inspected.	Refer to the Scan ballot box inspection checklist.
☐	Set up an area where booths will be inspected and instructional placards will be inserted.	Refer to the Election Logs tab for a booth inspection checklist.
☐	Verity firmware validation.	1. Insert stick. 2. Push button. 3. Remove stick. 4. Insert stick.

	Supplies	Details
☐	Program key device steps.	A factory security key has been programmed to the voting devices. This key must match the key on the vDrives being used in testing equipment. This key should be used only for initial testing. If necessary, program each Verity Scan with the key that matches the key on the vDrives being used in the test.
☐	Verify quantity of each product.	Compare to shipment list for accuracy.

CHAPTER 4

Procedures: Pre- and Post-Election

This chapter describes the following:

Overview

This chapter details Pre-Election and Post-Election procedures. These procedures include the following:

- Preparing polling place equipment before distribution to the polling sites
- Planning polling place layout and equipment requirements per polling place, based on prior turnout
- Establishing and implementing optional equipment setup procedures
- Cleaning, performing an inventory analysis, and repairing equipment after an election event

Pre-Election Checklist

The following checklist is a guide for warehouse use when preparing for an election.

Table 1. Pre-election procedures checklist.

	Tasks
☐	Perform Verity Scan, Touch Writer, and/or Central scanner Functionality Testing.
☐	Perform Verity Scan, Touch Writer, and/or Central scanner cleaning, including device screens and cleaning accessible parts of Verity Scan scanner paper path with a lint-free cloth and isopropyl alcohol.
☐	Make sure the printers in all Verity Scan and Touch Writers have a new roll of paper.
☐	Program each Verity Scan and/or Touch Writer with the security key.
☐	Verify Firmware on the systems.
☐	Test and charge all battery packs and label with test date and battery level.
☐	Install and connect the battery packs.
☐	Identify Polling Place equipment needs and plan layouts.
☐	Prepare Scans and Touch Writers.
☐	Prepare headphones for each Touch Writer and tactile input switches if necessary and stow them within the equipment compartment.
☐	Prepare printers and Verity USB cable for each Touch Writer, as well as uninterpretable power supplies (UPS) if required.
☐	Distribute polling place layout plans to deployment area.
☐	Distribute spare equipment to emergency use deployment area.
☐	Receive Device/vDrive Tracking Log.
☐	Install vDrives and seals in Scans and/or Touch Writers, enter serial number, and seal number information in.
☐	Organize Scans and/or Touch Writers for polling place deployment based on the number needed per polling place.
☐	Set up Scans and/or Touch Writers with polling place identification information, predefining polling places.

	Tasks
☐	Distribute Scans and/or Touch Writers to deployment area (specific to polling places and labeled per polling place, if predefined).
☐	Distribute spare Scans and/or Touch Writers, (without predefined polling places) to emergency use deployment area and keep under lock and key.
☐	Distribute spare battery packs, headphones, and tactile input switches to emergency use deployment area.
☐	Configure Touch Writer ballot printers to print the proper ballot size for the election.

Equipment Allocation

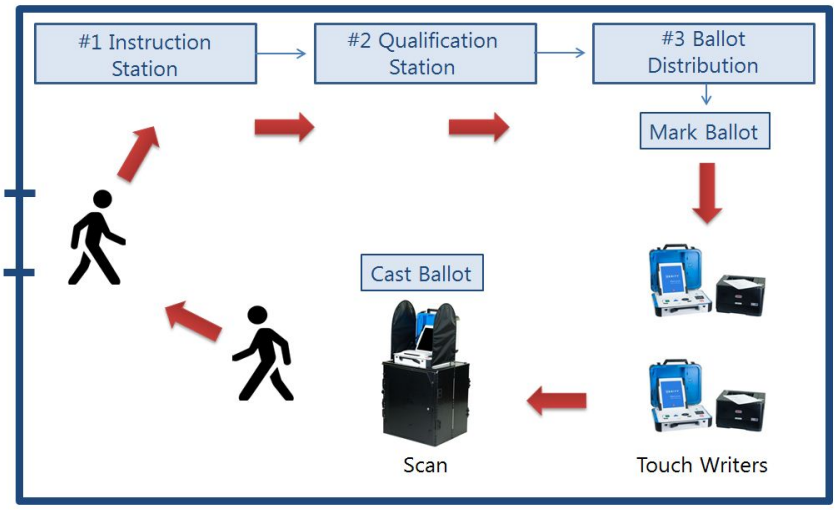
Create a spreadsheet that shows registered voters by precinct and precincts assigned per polling place. This helps to determine the equipment requirements for each polling place. The use of the term "Precinct" to also define an Election Day polling place varies by jurisdiction. Also, requirements vary by state in regard to machine allocation versus voter registration.

You should maintain the polling place components in precinct sequence if at all possible. While the Verity Scan and Touch Writer do not require this, it is much easier to allocate and access units stored in this manner since most assignments to the system are done by precinct.

At this time you need your spreadsheet showing allocation of equipment to polling places. The easiest layout is to begin with the first precinct/polling place first and increment until you have all precincts/ polling places accounted for. If you need one Verity Scan and six Verity Touch Writers in Polling Place #1, load them and other items sent to polling places together on a pallet or other type of transfer container designated for Polling Place #1. Include items such as a transfer case, cell phones, signs, tape, pens, and other items that are not dated. Continue this process until all polling places are completed. One way to identify polling place locations within the facility is by painting the numbers on the floor to insure the proper placement when the polling place equipment is being moved.

Planning Polling Place Layout

Use voter turnout records to determine equipment needed per polling place, if possible. Before setting up booths and equipment, plan the layout of the polling place to accommodate a flow of traffic that is efficient. Plan a traffic pattern that allows poll workers to monitor the polling place constantly. We recommend mapping the polling place layout and traffic patterns. If the Elections Office has already set up the layout, follow that plan.



Predefining the Touch Writer and Scan

Using this procedure, the Verity customer warehouse personnel can define the polling place on each Scan and/or Touch Writer. This is a recommended procedure that reduces the number of steps poll workers must complete when opening polls.

The Polling Places are associated with the precincts for the polling place, and the precincts have contests associated with them, determining the ballot style. By predefining the Polling Place at the warehouse you:

- Ensure that each polling place has the correct ballot styles.
- Decrease the number of steps that the poll worker must complete in order to open polls.
- Create a paper trail (reports printed at the warehouse) to verify that the Scan and/or Touch Writer remained in a standby condition between the time it left the warehouse and the time that polls opened.

After predefining the Scan and/or Touch Writer, unplug the power cable and disconnect the battery. You may plan to keep the battery connected to reduce steps for poll workers.

Predefining Procedure for Touch Writer and Scan

Equipment and Information Needed

Table 2. Predefining equipment and information needed: Scan and Touch Writer.

	Requirements
☐	Scans and/or Touch Writers with power cable
☐	Device batteries
☐	A Verity Key for the election
☐	Election Mode vDrives
☐	Maintenance Code
☐	Ballot box security seals
☐	A copy of a serial number tracking log

Predefining Procedure Checklist

Table 3. Predefining procedures checklist: Scan and Touch Writer.

	Tasks
☐	Install and connect the device battery.
☐	Connect AC power.
☐	Power on the Scan or Touch Writer.
☐	Insert Election Mode vDrive.
☐	Insert Verity Key for this election.
☐	When Device ask to load New Election? Review Election ID and Election Name to ensure it is the correct election Tap **Yes, load new election**.
☐	Type the Maintenance Code. The new election will begin loading.

	Tasks
☐	**Remove Verity Key**
☐	Select the appropriate polling place from the list. **Note**: Begin typing the polling place name to filter the list.
☐	Tap **Accept**.
☐	Tap **Yes, assign it** to confirm the polling place.
☐	Tap **Configuration Readiness Report** and tear off (optional).
☐	Tap **Print Zero Report** to print the Zero Report. **Note**: The poll worker will be required to print the Zero Report again when powering on the device at the polling place.
☐	Turn off the device.
☐	Ensure Verity Key has been removed. Lock the vDrive compartment.
☐	Attach a security seal to the vDrive compartment. When attaching the security seal, log the seal number and the device serial number on the tracking log.
☐	Prepare the device for shipping to the polling place according to local procedures.
☐	Repeat for remaining devices.

Battery-Only Operations

This table provides background information on device battery-only operations, including timeout period (that is, period of inactivity allowed before battery automatically shuts off).

Table 4. Battery-only operations and timeout.

State	Screen	Timeout Period
Open Polls	Printer Error	2 minutes
	No vDrive Found	2 minutes
	Load New Election	2 minutes
	Enter Maintenance Code	2 minutes
	Remove vDrive	2 minutes
	Select Polling Place	2 minutes
	Confirm Polling Place	2 minutes
	Print Zero Tape	N/A
	Please Wait (Zero Tape)	N/A
	Ready to Open Polls	N/A
	Enter Open Polls Code	N/A
	Password Incorrect	N/A
	Polls Open	N/A
Polls Suspended or Closed	Confirmation required	2 minutes
	Enter Close/Suspend Polls Code	2 minutes
	The Polls are Closed	2 minutes
Other	Main Menu	2 minutes
	Administrator Menu	2 minutes
	Ballot Processing Rules	2 minutes
	Create Recovery vDrive	2 minutes
	Device Settings	2 minutes
	Device Tests	2 minutes

If the device times-out, battery power is restored by either connecting to AC power or by disconnecting the battery pack and then reconnecting the battery pack. To reset the timeout period, press any key, print a report, or process a report.

Post-Election Checklist

The following checklist is a guide for warehouse use after an election.

Table 5. Post-election procedures checklist.

	Tasks
☐	Tag, inventory, and log problems for devices from election that are in need of maintenance or replacement.
☐	Remove vDrives from spare Scans and Touch Writers (if installed). (These vDrives may already have been removed and processed in Count as a security measure.)
☐	Perform inventory and store vDrives from spare Scans and Touch Writers (if installed and available).
☐	Disconnect, remove, and charge device battery packs.
☐	Remove, inventory, and warehouse headphones and tactile input switches.
☐	Perform inventory for Scan and Touch Writers.
☐	Clean Scan and Touch Writer screens. Use, at a minimum, 50% isopropyl alcohol and lint-free wipes. **Never use ammonia-based and detergent-based formulas.**
☐	Clean Scan scanner path. Use, at a minimum, 50% isopropyl alcohol and lint-free wipes. **Never use ammonia-based and detergent-based formulas.**
☐	Perform an inventory on Touch Writer Printers.
☐	Store Scans, Touch Writers, and Touch Writer Printers.
☐	Perform routine maintenance tasks.
☐	Ship damaged Scan and/or Touch Writers for maintenance or replacement.
☐	Test equipment functionality before next election cycle.

CHAPTER 5

Procedures: Field Techs & Help Desk

This section details how to establish and run procedures for support staff including field technicians and help desk operators. The section provides information on how to work with polling place equipment, with a focus on troubleshooting software, hardware, and peripherals.

This chapter describes the following:

Overview

Field technicians and Help Desk operators should be personnel taken from the ranks of staff and temporary employees who are experienced with the polling place equipment. Local poll worker trainers, for example, make excellent Help Desk operators. Field technicians are often hired as part-time technical support.

Recommendations

Field technicians and Help Desk operators should receive the Verity Troubleshooting Course training specific to locally implemented equipment immediately prior to the election event.

Logs

Field technicians and Help Desk operators should keep detailed logs. These logs should be cross-referenced whenever possible. Help Desk Logs should be serially numbered per operator. Calls from polling places should come into the Help Desk. Help Desk operators should attempt to solve problems over the phone. If a field technician is dispatched, that call should come from the Help Desk, and the field technician should be given the Help Desk log number to use as a Troubleshooting Log number. A real-time Help Desk database set up to track calls and equipment movement (e.g., equipment moved due to high turnout at a particular polling place) is an excellent tool. Logs are useful sources of historical data that can help to prevent problems during future election events.

Field Technicians

Field technicians should have appropriate documentation and equipment. Refer to the following pages in this section for these details. Field technicians should be assigned a group of polling places in a geographical area. Depending on the implementation, there should be one field technician per 5-25 polling places. Technicians should start the day at an assigned polling place. It is essential for field technicians to begin the day by introducing themselves to lead poll workers. It is good practice to start technicians at a polling place where poll workers have a history of problems, did not do well in their courses, have voiced concern, and/or are short-handed. Technicians may use the Troubleshooting Logs to document observations. Technicians should

visit their assigned polling places several times a day. Technicians should end the day at a polling place that has displayed a need for assistance at poll closing time. Situations that require true troubleshooting activities should be handled by the technician calling the Help Desk for a log number (document at the Help Desk, and the Help Desk supplies the technician with that log number).

Help Desk Operators

The Help Desk should have one phone per operator. The Help Desk number should be shared with poll workers often, both in training and in documentation. The Help Desk number should roll to an open phone when operators are on other calls. Depending on the implementation, there should be one Help Desk operator per 25-100 polling places. Each operator should have a series of uniquely numbered logs (e.g., "1-001" through "1-100"). There should be at least one Help Desk manager in charge of general management and dispatch of field technicians. It is imperative that the Help Desk is set up with at least one replica of a polling place system in use in the jurisdiction supported (e.g., a Verity Scan with the current election in TEST mode, and/or a Verity Touch Writer). Help Desk operators will use this setup to walk through problems poll workers are reporting in order to provide real-time solutions. It is also important that Help Desk operators remain calm and courteous.

The following Field Support Responsibilities and Help Desk Operator Responsibilities sections are also available as separate documents appropriate for customization and dispersal during Troubleshooting Course training.

Field Technician Responsibilities and Training

This section outlines the basic equipment responsibilities of the field technicians assigned to support polling places for an election event.

- Technicians are responsible for troubleshooting assistance on equipment at the polling places, as well as subsequent documentation and record-keeping.
- Troubleshooting should occur in a timely manner.
- As little time as possible should be spent at each polling place in order to reduce possible distractions to voters.
- Technicians should only communicate with Election Judges or their designees, NOT with voters.
- Technicians should not leave a cell phone number with poll workers.
- Technicians should speak to poll workers calmly and respectfully.
- Technicians should dress in business casual attire, displaying no visible printed messages.
- Technicians should refer media to the office of the Registrar of Voters.

The responsibilities outlined in the following page are only examples. Field technician responsibilities will vary per implementation.

Table 1. Field technician responsibilities and training.

Task		Department Responsible	Notes
Start of Day	Deliver equipment.	County or Individual Entities	
	Start with a screwdriver set, needle-nosed pliers, and a flashlight.	Technician	Technician Provides
	Start with 1 Verity Scan and/or 1 Verity Touch Writer.	Technician	Also batteries, printer paper, seals, Troubleshooting Log, as necessary
	Start the day at an assigned polling place and call in.	Technician	Call number assigned by jurisdiction.
	Set up booths.	Poll Workers	
	Set up voting equipment.	Poll Workers	
	Open polls.	Poll Workers	

Task		Department Responsible	Notes
End of Day	Close polls.	Poll Workers	
	Print device reports. Tally Report for Election Day.	Poll Workers	
	Deliver sealed device/vDrive to the appropriate drop-off location.	Poll Workers	
	Take down booths.	Poll Workers	
	Set booths and all other equipment aside in designated area for pick up.	Poll Workers	
	End the day at an assigned polling place and call in.	Technician	Call number assigned by jurisdiction.
	At the end of the day, deliver excess replacement equipment and troubleshooting logs to the designated site and call in once delivery is complete.	Technician	Return equipment. Call number assigned by jurisdiction.
Trouble-shooting	Reply to calls from the central Help Desk and obtain log numbers for cross-reference.	Technician	Record log number
	Throughout the day, check in at assigned polling places and ask Election Judge if any technical assistance is needed.	Technician	Log; no log number necessary
	Complete troubleshooting/ observation log per call and/or site visit.	Technician	Fill in log number from Help Desk for troubleshooting, NOT for observations.
	Assist in equipment problems at polling places (not procedures).	Technician	If call did not come from Help Desk, do not fill in log number. If you need to contact the Help Desk for assistance, a log number will be assigned.
	Pull faulty equipment out of service if necessary: • Tag equipment • Secure booths with a seal • NEVER remove equipment from the polling place	Technician	Replace equipment only under direction from Help Desk operators. Tag equipment. Secure booths that are pulled off line with a seal. Record both the ballot box seal number and equipment serial number in the troubleshooting log. Leave original equipment at the polling place.

Field Technician Equipment List

- Field technicians should receive training just prior to the election event.
- Use documentation during training and send that documentation with technicians after training.
- An efficient way to distribute replacement equipment is to check it out to technicians after training.
- An efficient way to collect replacement equipment at the end of the election event (e.g., Election Night) is to set up a check-in station specifically for field technicians at the central counting station and/or at substations.

Documentation

- Responsibilities document
- Troubleshooting procedures section of this document
- Applicable troubleshooting addenda
- Maps
- Polling Place Assignments list
- *Polling Place Operations Guide*
- Troubleshooting Log

Hardware

- Cell phone
- Screwdrivers, needle-nose pliers, and a flashlight
- Verity Scan (sealed with vDrive, not predefined)
- Verity Touch Writer with Access (sealed with vDrive, not predefined)
- Voting device printer paper
- Equipment battery packs
- Extra seals

Help Desk Operator

This section outlines the basic responsibilities of Help Desk operators assigned to support polling places on Election Day.

- Help Desk operators are responsible for providing phone line troubleshooting assistance on equipment at polling places, documenting assistance provided, determining when on-site support is needed, and contacting technicians for on-site support.
- Operator attire during Help Desk hours should be both comfortable and professional.

Hours

Help Desk hours of operation vary by jurisdiction. Typically, one hour before polls open and two hours after polls close.

Schedule breaks as needed and as time allows. Ideally, operators will get two 30–45-minute meal breaks during the day.

Procedures for Help Desk Operators

Table 2. Help Desk operator procedures checklist.

	Tasks
☐	Receive calls from the polling places. Answer with: "<Jurisdiction Name> Help Desk, this is <Your First Name Here>." No matter what the situation is, be calm and courteous.
☐	Log every call on a separate Help Desk Log. Use the Help Desk Log packet specific to your assignment. Fill in the log completely as you proceed through providing assistance.
☐	Use your *Polling Place Operations Guide* as a first resource and walk poll workers through procedures, referring to page numbers in the Desk Reference.
☐	Use your Troubleshooting Procedures guide as a second reference.
☐	If the poll worker is still having trouble, tell him/her that you will send a technician out. Managers will call for technicians. Temporarily transfer the Help Desk Log to a manager so that the information therein can be communicated. The name of the technician dispatched should be recorded on the Help Desk Log, and the log should be returned to you. File the logs sequentially and retain the file folder.

	Tasks
☐	If you do not hear back from the troubleshooting technician or the polling place within the hour, make a follow-up call and record it on the original Help Desk Log.

Help Desk Log Management

Each Help Desk operator should have a set of uniquely numbered logs. These logs should be assigned per operator, so that questions can be directed back to the operators, should questions arise later.

Table 3. Sample Help Desk log.

Log Series	Assigned to Operator Name
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Help Desk Operator Equipment List

Help Desk operators should receive training just prior to the election event. Even though documentation may be used in training, provide new sets of documentation at the Help Desk.

Documentation

- Responsibilities document
- Troubleshooting Procedures section from this document
- Applicable Troubleshooting addenda
- Polling Place Assignment list
- *Polling Place Operations Guide*
- Help Desk Log
- Maps (at least one set per Help Desk)
- Index to field technician clusters and cell phone numbers (for Help Desk manager)
- Index to polling place names, addresses, phone numbers, and lead poll worker names (for Help Desk manager)

Hardware

- One set of polling place equipment set up in TEST mode (Early Voting or Election Day, as applicable)
- White board and markers

CHAPTER 6

Troubleshooting Procedures for Support Personnel

This section details troubleshooting and support information for all support personnel for the Verity Voting system.

This chapter describes the following:

Overview

The Help Desk Call Log is included here for use by trained local support personnel at the Elections Office Help Desk. The log includes fields for documentation of the Help Desk operator name, time, date, polling place site calling, caller, problem, resolution, and call back confirmation. This log, or one like it, should be used to document and track problems encountered.

Field personnel providing technical support should also use a log, and for that reason the Polling Place Troubleshooting & Observation Log is included here. Information recorded in this log should be cross-referenced to the Help Desk Call Logs used. Log serial numbers should be used for this purpose.

Post-election debriefing meetings should include an analysis of logs to determine issues that need resolution and how those resolutions will take place, and to identify issues that can be prevented in future election events.

Systematic Approach to Troubleshooting

When faced with a troubleshooting situation, apply this systematic troubleshooting approach.

Table 1. Troubleshooting guidelines.

	Tasks
☐	Remain calm.
☐	Identify the issue, or the symptoms, as reported.
☐	Gather further information. Think broadly. Do not jump to conclusions. Ask questions.
☐	Establish a theory to explain the source of the problem.
☐	Research resolution steps, based on your theory.
☐	Use documentation available to you to identify the resolution steps necessary.
☐	Attempt resolution.
☐	Check for success.
☐	Repeat.

Remember, as with all electronics systems, many equipment issues can be solved by simply checking connections.

Verity Touch Writer Polling Place Troubleshooting Quick Guide

Problem	Resolution Steps	Reference
AC power fails without battery backup	1. Check all power connections. 2. Call the Elections Office or Help Desk to notify them of the situation. 3. Unplug the device from the wall outlet. 4. When AC power returns, refer to the "Ballots Not Complete" report to print new access codes for voters.	• Power fails • Ballots Not Complete report
AC power fails, but battery power takes over	No resolution needed. Be aware that the device may get warm if running on battery for an extended period of time.	• Battery operations • Power fails • Power status
Battery does not work	1. Check that the battery is present. 2. Check that the battery is connected correctly. 3. Check that the battery is fresh by pressing and holding the Test button. Battery should have a power indicator of at least 80%. 4. If necessary, request a new battery.	• Connecting device battery • When device battery does not work
Battery shuts off before close polls reports are printed.	1. Press the power button to turn the device on. 2. Enter the appropriate passwords to return to the Polls Closed screen. 3. Finish printing reports.	• Device battery power when closing polls.
"Corrupt vDrive" or "Invalid vDrive" error message.	Replace the device.	• Corrupt or Invalid vDrive
Darkened display screen	1. If the unit has been in direct sunlight, or in a closed vehicle, move it to a shaded, cooler, area. 2. Check that the device is not running on battery power alone, if AC power is accessible. 3. Verify that the docking indicator light is illuminated. 4. If it still does not respond, replace the device.	• Darkened device screen

Problem	Resolution Steps	Reference
Device does not work	1. Look at the "Power-On Self Test Report" and check that the correct version is installed (check with jurisdiction for correct version). If the version is incorrect contact the jurisdiction for a replacement device. 2. Restart the system. If there was an error message on the malfunctioning device, disconnect the battery pack after powering off the device, reconnect the battery pack, then power on the device. 3. If the device is still unresponsive, replace the device.	• Device does not work • Device replacement
Device is hot or smells hot	1. Verify that the battery pack is connected correctly, not in reverse polarity. 2. If problem persists, replace the device.	• Screen on device is dark • Power status • Device replacement
Error displays	1. Follow procedures for the specific error. 2. Check power and tablet connections and restart the device. 3. Call the Elections Office or Help Desk for assistance.	• Device replacement
Extra Access Codes	1. On the back of the extra access code, write a note explaining what happened. 2. File the access code in the appropriate envelope. The access code will appear as Expired on the end-of-day reports. 3. Press the Poll Worker Button on the back of the device. 4. Enter the Poll Worker password. 5. Tap the button to "Deactivate an Access Code". 6. Follow the prompts to deactivate the Access Code.	• Extra Access Codes

Problem	Resolution Steps	Reference
Headphones and/or Tactile Input Switches do not work	1. Check that volume control on headphones is pushed up. 2. Check that the connection to headphone jack and/or tactile input switches jack is secure. 3. Verify that the plug is connected to the correct jack. 4. On the device, tap the Options button to verify the volume settings. 5. If the peripheral is still not functioning, reboot the device. 6. If the peripheral is still not functioning after the reboot, replace the device.	• Headphones and/or Tactile Input Switches do not work • Device replacement
Password does not work	Verify you are using the correct password.	• Password is invalid
Polling Place and/or Voting Type identified incorrectly	1. Refer to the "Election Identification" report to confirm polling place name and voting type. **OR** 1. Refer to any report header to confirm the Polling Place name. 2. If the Polling Place name or voting type is incorrect, call the Elections Office or Help Desk to verify and replace Scan.	• Polling Place and/or Voting Type identified incorrectly • Device replacement
Polls closed too early	1. In Early Voting, restart the system. 2. On Election Day, verify that a Polls Closed screen is displayed and then replace the device.	• Polls closed too early
Printer out of Ballot paper	1. Pull the paper tray of the printer open. 2. Add additional ballot stock. 3. Slide the paper tray until it is closed 4. Insure Touch Writer is indicating the printer is OK	• Printer ballot stock

Problem	Resolution Steps	Reference
Printing reports after closing or suspending polls and powering off	1. If you must restart the device to print reports after polls are suspended or closed: 2. Power on the device. 3. Type the password requested and tap Accept. 4. In Early Voting mode, press the Poll Worker Button and follow prompts to type passwords, suspend polls, and print Ballot Count. **OR** In Election Day mode, follow prompts to print a Tally report.	• Reports, printing
Report Printer error	1. Respond to the error message, as appropriate. 2. Check paper orientation. It should be rolling out from the bottom. 3. Ensure the paper is extending through the cover. 4. Pull out a short length of paper to ensure the paper is not jammed. 5. If the problem persists, contact the Elections Office or Help Desk for assistance.	• Printer errors • Printer paper, changing
Report Printer paper, changing	1. Open the lid of the printer compartment and note printer paper routing. 2. Remove old paper and insert and route new paper. 3. Feed paper through lid and close lid.	• Printer paper, changing
Restarting the device	1. Make certain voters have access to the emergency slot on the Scan ballot box. 2. Press the power button until the device shuts down. 3. Wait 15-30 seconds. 4. Press the power button to turn the device on. 5. Follow prompts on the device screen.	• Restarting the device
vDrive error	1. Check connections and restart the system. 2. Call the Elections Office or Help Desk.	• vDrive error
vDrive removal error message	1. Restart the device. 2. If the problem persists, replace the device.	• vDrive removal

Problem	Resolution Steps	Reference
Voter issues	(Not equipment issues, but may not be applicable to troubleshooters)	• Voter enters wrong language choice • Voter gets wrong ballot style • Voter needs Verity Access features • Voter's precinct I.D. is incorrect. • Voter requests a receipt

Verity Scan Polling Place Troubleshooting Quick Guide

Table 2. Verity Scan troubleshooting at the polling place: Quick Guide.

Problem	Resolution Steps	Reference
AC power fails without battery backup	1. Check all power connections. 2. Call the Elections Office or Help Desk to notify them of the situation. 3. Unplug Scan from the wall outlet. 4. Use the emergency ballot slot to deposit ballots until the power returns.	• Power fails
Error displays	1. Follow the procedures for the specific error. 2. Check connections and restart the system. 3. Call the Elections Office or Help Desk.	• Scan replacement
Scan does not work	1. Check all power connections. 2. Restart the system.	• Scan does not work Scan replacement
"vDrive removal" error message	Reboot. If this message persists, replace the unit.	• vDrive removal
Paper (ballot) jammed in Scan	1. Lift the scanner cover. 2. Remove the ballot and wipe the scanner path clean with an alcohol wipe. Use, at a minimum, 50% isopropyl alcohol and lint-free wipes. **Never use ammonia-based and detergent-based formulas.** 3. Close the cover and rescan the ballot (or the replacement ballot if the original was spoiled).	• Paper (ballot) jam
Password is invalid	1. Verify the password.	• Invalid password
Polling Place and/or Voting Type identified incorrectly	1. Refer to the "Election Identification" report to confirm the polling place name and voting type. OR 1. Refer to any report header to confirm the Polling Place name. 2. If the Polling Place name or voting type is incorrect, call the Elections Office or Help Desk to verify and replace Scan.	• Polling Place and/or Voting Type identified incorrectly • Scan replacement
Polls closed too early	1. In Early Voting, restart the system. 2. On Election Day, verify that a **Polls Closed** screen is displayed and replace Scan.	• Polls closed too early

Problem	Resolution Steps	Reference
Printer error	1. Check the paper orientation. It should be rolling out from the bottom. 2. Select **RETRY**.	• Printer error • Printer paper, changing
Printer paper, changing	1. Open the lid of the printer compartment and note the printer paper routing. 2. Remove the old paper and insert and route the new paper. 3. Feed paper through lid and close lid.	• Printer paper, changing
Reports after closing or suspending polls AND powering off	If you must restart Scan to print reports after polls are suspended/closed: 1. Power on Scan. 2. Type the password requested and tap **Accept**. 3. In Early Voting mode, press the **Poll Worker** button and follow the prompts to type passwords, suspend polls, and print **Ballot Count**. OR In Election Day mode, follow the prompts to print the **Tally** report or to print the **Ballot Count**.	• Reports, printing
Restarting	1. Make certain voters have access to the emergency slot on the Scan ballot box. 2. Press the power button briefly to Scan off. The lights on the report printer will darken. 3. Wait 30 seconds. 4. Press the power button to turn Scan on. The lights on the report printer will illuminate. Follow the prompts on the Scan screen.	• Restarting the Scan

Verity Scan Polling Place Troubleshooting Guide

Scan Does Not Work

Table 3. Troubleshooting: Scan does not work.

	Tasks
☐	Check the Scan power connections. • Make certain that the Scan cable connections are seated and firmly connected. • Check the AC power connection on the back of Scan, at the power brick, and at the wall. • If Scan is plugged into a switched surge protector, check the switch.
☐	If Scan shows an error or alert message, try restarting the device: 1. Press the power button briefly to Scan off. The lights on the report printer will darken. 2. Wait 30 seconds. 3. Press the power button to turn Scan on. The lights on the report printer will illuminate.
☐	Enter the required password and follow the prompts.
☐	If Scan still does not work, use the ballot box emergency slot for ballots and call the Elections Office or Help Desk.

Scan Replacement

CAUTION: Never close polls to replace equipment.

Table 4. Troubleshooting: Replacing Scan.

	Tasks
☐	1. Reboot the device.
☐	2. If the error persists, replace the device.

vDrive Removal Error Message

Table 5. vDrive Removal error message.

	Tasks
☐	Reboot the device.
☐	If error persists, replace the device.

Ballot Jam

Table 6. Troubleshooting: A ballot is jammed in Scan.

	Tasks
☐	If a ballot causes a paper jam in the scanner path, carefully lift the scanner cover and remove all pieces of paper. Take care not to touch any glass surfaces in the scanner path.
☐	Using a lint-free cloth, wipe the scanner path clean of small paper debris.
☐	Replace the scanner cover. Spoil the voter's ballot if it is damaged, and have the voter mark a replacement ballot.
☐	Rescan either the original ballot (if not damaged/spoiled) OR the replacement ballot.
☐	If the problem persists, call the Elections Office or Help Desk.

Invalid Password

Table 7. Troubleshooting: Password is not accepted.

	Tasks
☐	If you get an error message after entering a Scan password, verify the password.
☐	From the error message screen, tap Continue and follow the screens to restart the sequence you were attempting to perform.
☐	If you still get an error message, call the Elections Office or Help Desk.

Polling Place Identified Incorrectly

If the device has been assigned to the wrong polling place:

Table 8. Polling place identified incorrectly.

	Tasks
☐	1. Call the election office as it may just have been swapped with another polling place.
☐	2. If the polls have not been opened, swap the equipment.
☐	3. If the device truly was predefined incorrectly, replace the device.

Polls Closed Too Early

If polls have been closed in Election Day mode, Scan must be replaced in order to continue processing voters.

If Scan contains any cast votes, it must be replaced. Check for cast votes by looking at the Ballots total at the bottom of the screen.

Power Fails

Table 9. Troubleshooting: Scan power failure.

	Tasks
☐	Check all power connections to the Scan. • Make certain that the Scan cable connections are firmly seated. • Check the AC power connection on the back of the Scan device, at the power brick, and at the wall. • If Scan is plugged into a surge protector that has a switch, check the switch.
☐	If power to the facility fails, call the Elections Office or Help Desk and report the power failure.
☐	Have voters use the emergency slot in the Scan ballot box until power resumes.
☐	Unplug Scan from the outlet in order to avoid a power surge to the device when power returns.

	Tasks
☐	File the tapes printed upon restart in the appropriate envelope.

Ballots deposited in the emergency slot will need to be scanned at the central counting station and/or according to local protocol.

Report Printer Error

Table 10. Troubleshooting: Printer error.

	Tasks
☐	If the Printer error screen displays, check the Scan printer.
☐	Open the printer cover and check the paper path. It should roll out from the bottom.
☐	Pull some paper out and close the printer cover.
☐	Tap **Retry** on the screen.
☐	If the printer error message continues to display tap Cancel Print and call the Elections Office or Help Desk and report the problem.

Scan will continue to function properly for all tasks other than report printing. If deemed necessary, replace Scan.

Changing the Report Printer Paper

The printer is on the right side of the Scan device. It works with a special type of thermal rolled paper. Follow these steps to change printer paper.

Table 11. Troubleshooting: Changing the paper roll in Scan.

	Tasks
☐	Open the lid to the printer compartment. Before removing the old roll. Observe the routing of the paper under the rubber roller. It should roll out from the bottom.
☐	Take out the old paper and insert the new roll of paper. Gently peel the free end of the paper off the roll and insert the new roll into its place in the printer compartment so that the roll feeds from the bottom.

	Tasks
☐	Pull some extra paper out so that you have some lead when you close the lid.
☐	Close the lid. You are ready to print.

Printing Reports

If you must print additional copies of reports immediately after closing polls, tap the appropriate report from either the Polls Closed or the Polls Suspended screen.

Restarting Scan

If you need to restart (cycle power to) Scan because of an error, follow these steps.

Table 12. Troubleshooting: Restarting Scan.

	Tasks
☐	Make certain that all voters currently voting have access to the emergency ballot slot on the Scan Ballot Box.
☐	Press the Scan power button until Scan turns off.
☐	Wait 30 seconds.
☐	Press the Scan power button until Scan turns on.
☐	Type the required password.
☐	File all reports that print in the appropriate envelope.
☐	Continue normal operations.

Ballots deposited in the Scan Ballot Box emergency slot will need to be scanned at the central counting station and/or according to local procedures.

CHAPTER 7

Device Reports

This section provides samples of Verity Scan and Verity Touch Writer reports.

This chapter describes the following:

Overview

This section provides sample report data using Verity Scan and Touch Writer reports.

The reports are printed on the devices thermal printer. Reports with appropriate information are automatically printed at the appropriate time:

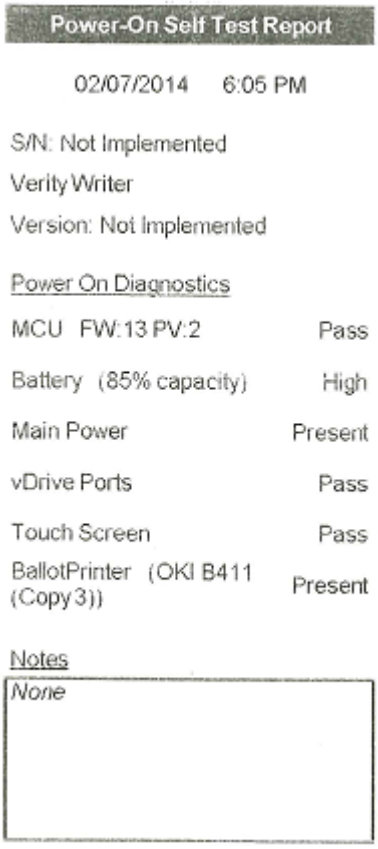
Power-up Self Test Reports are printed after the device has started and has determined the status of several system components that are shown in the report.

Open Polls Reports are automatically printed once the device has successfully loaded an election and the poll worker has requested the device to open polls.

Close Polls Reports are automatically printed once the poll worker has requested the device to close (or suspend) polls.

Sample Verity Touch Writer Reports

Touch Writer Power-On Self Test Report



Power-On Self Test Report

02/07/2014 6:05 PM

S/N: Not Implemented

Verity Writer

Version: Not Implemented

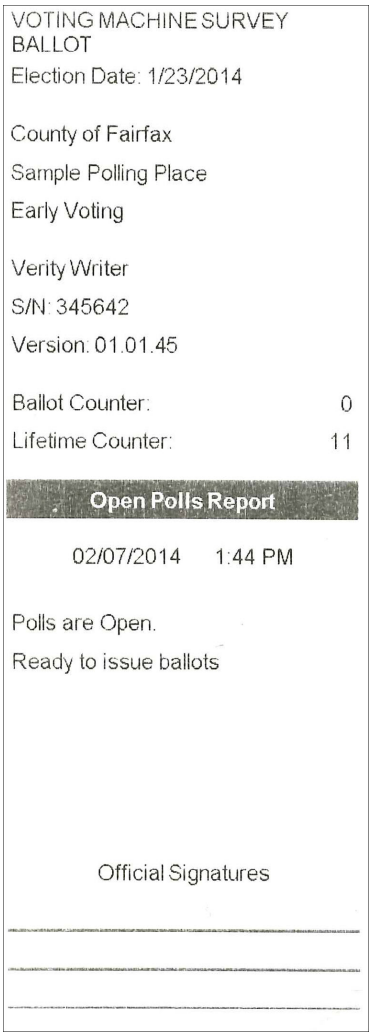
Power On Diagnostics

MCU FW:13 PV:2	Pass
Battery (85% capacity)	High
Main Power	Present
vDrive Ports	Pass
Touch Screen	Pass
BallotPrinter (OKI B411 (Copy 3))	Present

Notes

None

Touch Writer Open Polls Report



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Writer
S/N: 345642
Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 11

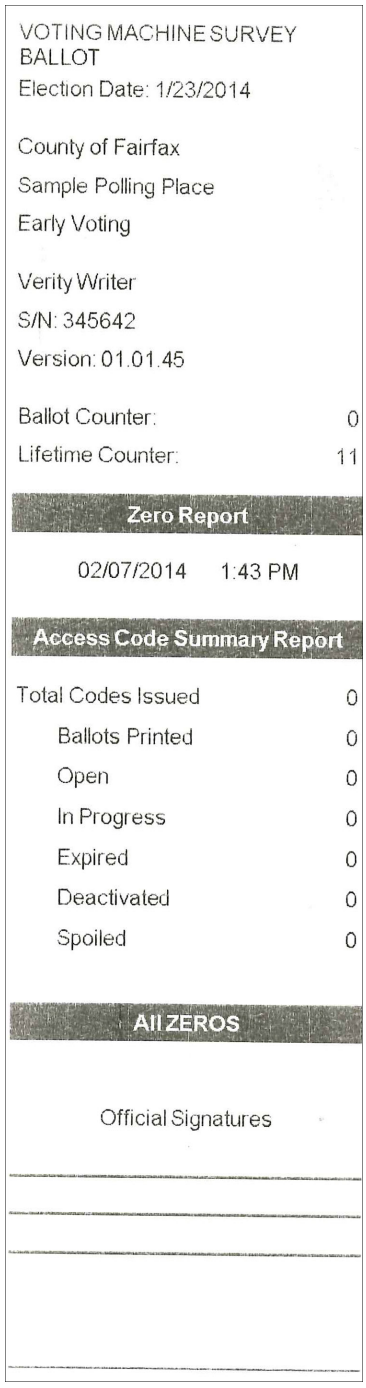
Open Polls Report

02/07/2014 1:44 PM

Polls are Open.
Ready to issue ballots

Official Signatures

Early Voting Touch Writer Zero Report Summary



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Writer
S/N: 345642
Version: 01.01.45

Ballot Counter:	0
Lifetime Counter:	11

Zero Report

02/07/2014 1:43 PM

Access Code Summary Report

Total Codes Issued	0
Ballots Printed	0
Open	0
In Progress	0
Expired	0
Deactivated	0
Spoiled	0

All ZEROS

Official Signatures

Touch Writer Access Code Ticket

Touch Writer Close Polls Report

VOTING MACHINE SURVEY
BALLOT
Election Date: 2/22/2014

County of Fairfax
Sample Polling Place
Election Day Voting

Verity Writer
S/N: 345642
Version: 01.01.45

Ballot Counter:	3
Lifetime Counter:	15

Close Polls Report

02/07/2014 6:43 PM

Polls are Closed

Ballot Count Precinct Report

Precincts/Splits Included:	5
Total Precincts Voted:	2
Total Ballots Printed:	3

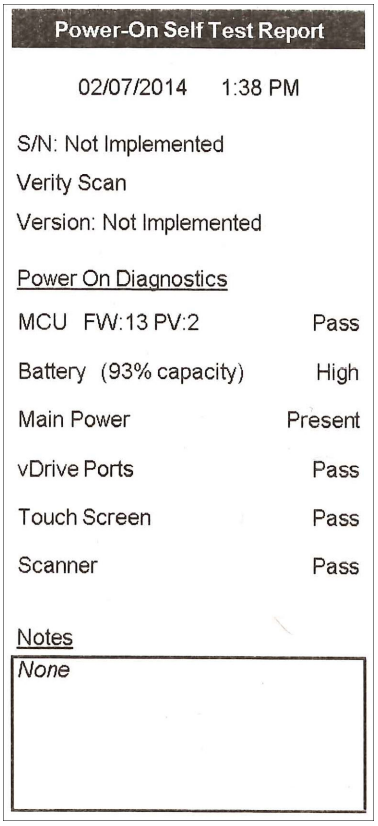
Precinct	Total
Greenspring Village	0
Mt. Vernon	0
St. Anthony's	2
Tyson's Corner Mall	1
Reston Comm. Ctr.	0
Total	3

Official Signatures

_____

Sample Verity Scan Reports

Scan Power-On Self Test Report



Power-On Self Test Report

02/07/2014 1:38 PM

S/N: Not Implemented
Verity Scan
Version: Not Implemented

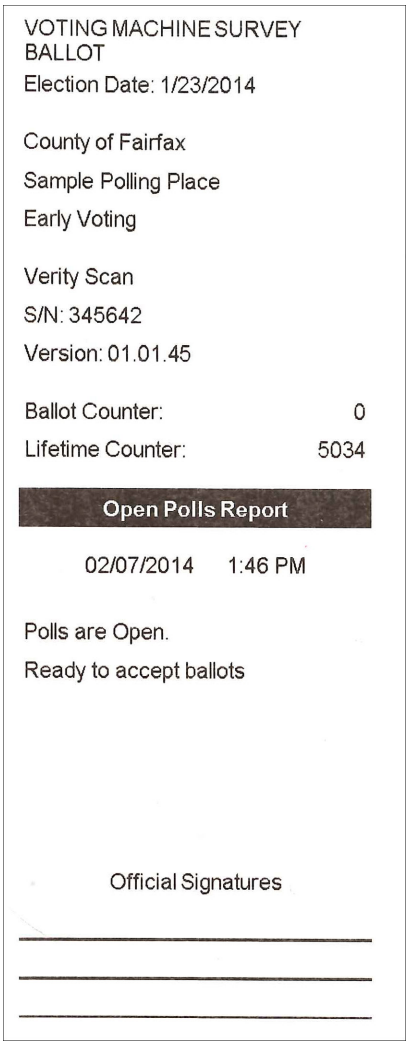
Power On Diagnostics

MCU FW:13 PV:2	Pass
Battery (93% capacity)	High
Main Power	Present
vDrive Ports	Pass
Touch Screen	Pass
Scanner	Pass

Notes

None

Scan Open Polls Report



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 5034

Open Polls Report

02/07/2014 1:46 PM

Polls are Open.
Ready to accept ballots

Official Signatures

Early Voting Scan Zero Report

VOTING MACHINE SURVEY BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Version: 01.01.45

Ballot Counter:	0
Lifetime Counter:	5034

Zero Report

02/07/2014 1:43 PM

Tally Summary Report By Contest

Precincts/Splits Included: 5

Mayor of Mount Rushmore	
George Washington	0
Thomas Jefferson	0
Abraham Lincoln	0
Theodore Roosevelt	0
Write-ins	0
Undervotes	0
Overvotes	0

Member Mount Rushmore Park Authority	
Benjamin Franklin	0
Patrick Henry	0
Betsy Ross	0
John Hancock	0
Paul Revere	0
Alexander Hamilton	0
Write-ins	0
Undervotes	0
Overvotes	0

Proposed Change to Mount Rushmore	
Yes	0
No	0
Undervotes	0
Overvotes	0
Total Ballots	0

All ZEROS

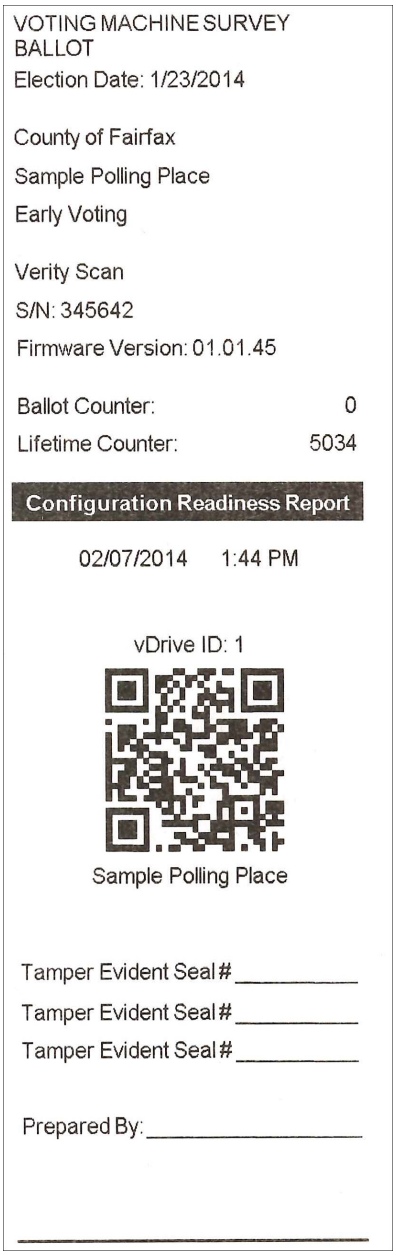
Official Signatures

_____

_____

_____

Configuration Readiness Report



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Firmware Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 5034

Configuration Readiness Report

02/07/2014 1:44 PM

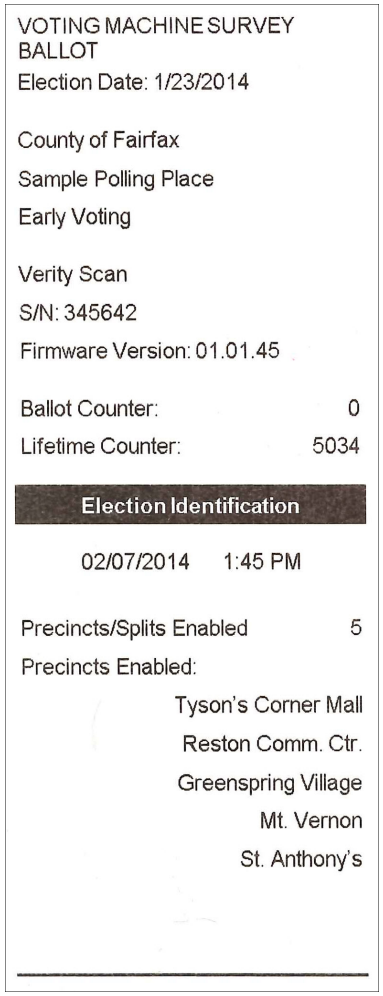
vDrive ID: 1

Sample Polling Place

Tamper Evident Seal # _____
Tamper Evident Seal # _____
Tamper Evident Seal # _____

Prepared By: _____

Election Identification Report



VOTING MACHINE SURVEY
BALLOT
Election Date: 1/23/2014

County of Fairfax
Sample Polling Place
Early Voting

Verity Scan
S/N: 345642
Firmware Version: 01.01.45

Ballot Counter: 0
Lifetime Counter: 5034

Election Identification

02/07/2014 1:45 PM

Precincts/Splits Enabled 5
Precincts Enabled:
Tyson's Corner Mall
Reston Comm. Ctr.
Greenspring Village
Mt. Vernon
St. Anthony's

Scan Close Polls Report

VOTING MACHINE SURVEY
BALLOT
Election Date: 2/22/2014

County of Fairfax
Sample Polling Place
Election Day Voting

Verity Scan
S/N: 345642
Version: 01.01.45

Ballot Counter:	3
Lifetime Counter:	5038

Close Polls Report

02/07/2014 6:37 PM
Polls are Closed

Tally Summary Report By Contest

Precincts/Splits Included: 5

Member Mount Rushmore Park Authority	
Benjamin Franklin	1
Patrick Henry	0
Betsy Ross	1
John Hancock	1
Paul Revere	0
Alexander Hamilton	1
Write-ins	1
Undervotes	1
Overvotes	0
Proposed Change to Mount Rushmore	
Yes	1
No	1
Undervotes	1
Overvotes	0
Total Ballots	3

Official Signatures

CHAPTER 8

vDrive Processing and Election Night Procedures

This section serves as a guide for vDrive processing procedures during Early Voting and Election Day.

This chapter describes the following:

vDrive Processing and Election Night Procedures

This section serves as a guide for vDrive processing procedures at a Central Counting Station during Early Voting and Election Day. Follow these procedures to process vDrives at the end of Election Day.

Recommended Procedures

If you like to use Verity logs, the recommended procedures are as follows.

The vDrive Transfer Envelope label goes on the vDrive Transfer Envelope after the vDrive is removed from the device. The envelope contains the vDrive, the device seal, and the Ballot & Seal Certificate. After processing, the envelope goes to the counting station.

Materials and Supplies Needed

Table 1. Materials and supplies checklist: Election night.

	Tasks
☐	Paperwork from Predefine process of devices for checking seal and serial numbers
☐	Extra paper for Tally printing (in case Verity Scan or Touch Writer has no paper)
☐	Pens, black and red permanent markers, and Post-It Notes
☐	Surge strips and extension cords
☐	Folding tables and chairs

vDrive Processing

Table 2. Early Voting Ballot Board procedures checklist.

	Tasks
☐	Receive sealed devices, Reconciliation Logs, Spoiled Ballot log, and the appropriate envelopes from Early Voting sites no earlier than the close of Early Voting and from Election Day sites no earlier than the close of polls.
☐	Verify Ballots Cast on Scan tape matches the expected count and total number voters checked in (signatures). If tape was not left on device, power up and print tape.
☐	If Ballots Cast on the Scan report and total number of voters checked in do not match, reconcile using the daily device reports and the device Reconciliation Log from the polling place.
☐	Record total Ballots Cast on vDrive transfer envelope.
☐	Record the number of ballots in black permanent marker on each Verity Scan device tape (pull extra tape through and mark).
☐	Record the total number of Scan Ballots Cast on Ballot & Seal Certificate.
☐	Verify seal numbers from Device/vDrive Tracking Log, and record seal numbers on Ballot & Seal Certificate. Collect signatures. Make a copy to go in the vDrive transfer envelope and keep the original certificate.
☐	Break device seal and remove vDrive from device. Place vDrive in transfer envelope.
☐	Place broken device seal into the vDrive transfer envelope.
☐	Deliver vDrives to Count Station.
☐	Store Verity Scan and Touch Writer equipment securely.

Election Day Count Procedures

Table 3. Election Day procedures checklist: Count.

	Tasks
☐	Print Count zero report.
☐	Open vDrive envelope. Inspect original device seal numbers and confirm with Ballot & Seal Certificate, which also serves as the receipt (for by-mail system, printed report in envelope serves as receipt).
☐	Read Early Voting in-person (and by-mail, if applicable) vDrives into Count. Return vDrives to envelopes after they are read, and then mark vDrives and envelopes "processed."
☐	After each vDrive is read, print Polling Place Status and/or vDrive Status reports to verify that the total number of votes cast match the number of Ballots Cast (optional step).
☐	Read and process Election Day vDrives in Count. Mark vDrives Processed. Return vDrives to envelopes after they are read, and mark envelopes Processed.
☐	After each vDrive is processed in Count, print Polling Place Status and/or vDrive Status reports to verify that the total number of votes cast matches the number of Ballots Cast (optional step).
☐	Process Write-In votes in Count, if applicable.
☐	Print cumulative results reports to be certified and signed by Central Count Station Official.
☐	Print and prepare Count application reports. Verify reports.
☐	Read and process late by-mail vDrives in Count, if applicable, process provisional ballots, and print final official Canvass reports at the appropriate date and time.

APPENDIX A

Security Best Practices

This appendix provides best practices for implementing and maintaining proper security. It is not intended to be exhaustive and does not replace other best practices.

General Security Recommendations

- Have members of the election staff work in pairs. This will greatly reduce the potential for accidental errors and opportunity for deliberate mischief or fraud by a rogue employee.
- Use surveillance cameras, motion sensors and other advanced means to monitor both access and usage of computers for additional security.
- Review voting equipment storage and work areas to ensure that only authorized personnel have access to them.
- Maintain a list of personnel with door keys or electronic access badges to election office work areas and voting equipment storage locations. Ensure all door keys are accounted for and only authorized personnel have them.
- Document the controlled physical access to voting systems and the facility where the systems are stored. Document all security-related repairs and modifications to the physical components of the facility where voting systems are stored.
- Develop and apply procedures and policies requiring that keys or combination locks be changed periodically.
- Review election office work areas to ensure that office space is appropriately visible and that undetected access by unauthorized individuals is not possible.
- Preview polling places and identify secure areas for equipment drop-off, storage and pickup.
- Ensure that blank ballot paper stocks are controlled at all times.
- Have an impartial third party conduct a security review and establish and implement applicable election management system security measures. Resources might be found in county and municipal information technology staff, or local community college or technical school staff.
- Maintain staffing levels adequate to monitor voting booths.
- Allow only qualified voters, persons assisting voters, and poll workers entrance to the voting booth area.
- Queue the line of voters at the ballot issuing station, not at the voting area. Do not issue voters Access Codes or paper ballots, or allow them to enter the voting booth area, until a booth is open and available for use.
- Report any suspicious activity in or around voting machines to the local election officer.

Computer Security Recommendations

- Keep computer equipment in locked facilities, and use a log to monitor access.
- Log and limit access to Verity Keys.
- Remove Verity Keys from equipment when not in use.
- Maintain an accurate inventory of all voting system computers and peripherals by make, model, location and serial number.
- Maintain an accurate inventory of vDrives.
- Keep vDrives secured at all times.
- Keep computers running at optimal performance by following these guidelines:
  - Use a properly grounded anti-static mat beneath each computer.
  - Make sure the system is plugged into a surge protector.
  - Make sure the system is in a secure, stable position to avoid vibration.
  - Make sure the system has proper ventilation to prevent over-heating.
- In general, it is best not to abort a process that is midstream. Instead let the process complete, and then take corrective action.
- Performing hard shut down of equipment, disconnecting cables to avoid a data transfer, or other process-interruptive steps can lead to equipment failures. This is a common best practice when working with any technology, not just the Verity equipment.
- For mission-critical computer systems, such as the Count computer, use an uninterruptable power supply (UPS) to prevent the loss of data in the event of a power outage during Election Night reporting.
- Always exit Windows by choosing “Shutdown” from the Start menu.

Voting Device Security Recommendations

Early Voting or Absentee-In-Person Equipment:

- Cover and seal all unused connections on the voting systems, devices, and hardware, including USB, parallel, and other ports.
- Ensure that blank ballot paper stocks are controlled at all times.
- Use security cameras in the voting system storage facility.
- Use a secure access system and limit the number of keys or access badges to the voting system storage facility.
- Use a burglar and fire alarm system in the storage facility. Periodically test their functionality.
- Use chain-of-custody forms when transporting equipment for any reason.
- Verify that all voting devices are returned to storage after each election; confirm that the device seals have not been tampered with during transport and sign the chain-of-custody document upon receipt of the voting devices.
- Maintain an inventory of election materials, including voting devices, vDrives, security seals, voter registration (poll) lists, election results tapes and printouts, field supervisors' reports, poll workers' daily logs, reconciliation reports, audit data, and other items.
- Store voting equipment on racks and off the floor. Cover racks to protect voting devices from water damage from above (e.g., leaking roofs) and below (e.g., building flooding).
- When returning equipment to Hart for repair, seal the inner box with serialized tamper-evident tape, log the seal number on the chain-of-custody form, and use an outer shipping box.
- When equipment is returned from repair, perform acceptance testing within 10 business days to confirm functionality and firmware version. Perform hash code testing to confirm that the certified firmware has not been compromised, where applicable.
- Maintain an accurate inventory of all voting system equipment by type, location and serial number.
- Prior to the Early Voting period or Election Day, maintain polling place devices under the chief election officer's close supervision at all times.
- Require the lead poll worker to verify the numbers of all seals or tamper-resistant tape on all voting devices and inspect the voting devices for any evidence of tampering.

- Require the lead poll worker and all poll workers to use and sign a checklist to verify that all opening procedures were followed.
- Control access to the voting device power control, power supply, and election results storage media.
- Maintain a physical barrier between the voter and the undistributed ballots to limit unauthorized access.
- Arrange the polling place with the exterior of each voting device in plain view of the poll workers at all times.
- Allow only poll workers and registered voters in the voting device area. Allow voters to enter this area only when a voting device is available for use.
- Train lead poll workers to operate ballot activation devices (e.g., the Touch, Touch Writer, or Controller).
- Treat the Voting devices with the same sensitivity as you would a secure ballot box containing paper ballots.
- Never leave the voting devices unattended at any time (e.g., in an automobile, an unlocked room, etc.).
- Only break or remove the security seal from the voting devices in strict accordance with close polls or central count tabulation procedures.
- Throughout the voting day, monitor voting devices closely to protect against malicious tampering.
- Pay especially close attention to ports, cable connections, and external power supplies on voting devices. Do not allow unauthorized persons access to these areas.
- Establish times for poll workers to verify the number of voters processed with the number of votes recorded (the ballot count) on the voting devices. Train poll workers to log and reconcile inconsistencies.
- Early Voting or Absentee-In-Person Equipment:
  - Record the ballot and lifetime counts of all devices at the beginning and the end of each voting day using a reconciliation log.
  - At the end of each voting day, close and secure all voting devices with tamper-evident seals. Store all devices in a locked location.
  - Verify the numbers on all protective seals and public counters before using the voting devices the next day.
  - Follow all Election Day voting security Best Practices.
- Pay especially close attention to ports on the back of voting devices and keep all storage compartments closed to restrict access to cables. Do not allow unauthorized persons access to these areas.

- Monitor the security and integrity of all voting system cable connections to ensure that voting will not be disrupted because the connection inserted is inadvertently broken. Ensure that cable connections are firmly tightened and that cables are placed where they will not be tripped over or pulled upon.

vDrive Security Recommendations

- Secure vDrives within the voting device vDrive compartment with a tamper-evident security seal.
- Record voting device serial numbers, as well as security seal numbers, during official election events so deployed equipment can be physically authenticated at the polling place.
- At the end of Election Day, follow local procedures to transport the voting devices and/or vDrives from the voting location to the jurisdiction elections office by a sworn election official or a law enforcement officer.
- Establish procedures to secure the voting devices and ballot boxes each day after suspending polls. Voting devices may be sealed, locked and/or chained, and paper ballot marking booths may remain assembled.
- Conduct the delivery of voting equipment to polling place locations with the same degree of control as applied to warehouse storage of sensitive election equipment.
- Require that the delivery person or company (or in some cases the supervising poll worker) use a chain-of-custody document that contains the voting device serial numbers, and security seal numbers for each voting location where equipment has been delivered.
- Use the chain-of-custody form in triplicate. Delivery personnel may require training on its proper use.
- Use only lockable buildings or locations that are capable of monitoring the secure storage of voting equipment at polling places.
- Tightly strap all equipment being delivered in place both horizontally and vertically inside delivery vehicles to avoid damage to the voting units (in-transit damage may appear to be a security violation, when in fact it is simply the mishandling of equipment).
- Always keep doors on delivery vehicles locked when unattended.

Glossary

A

abandoned ballot

Ballot that the voter did not place in the ballot box or record as cast on DRE before leaving the polling place.

absentee ballot

Ballot cast by a voter unable to vote in person at his or her polling place on Election Day.

acceptance testing

Examination of a voting system and its components by the purchasing election authority (usually in a simulated-use environment) to validate performance of delivered units in accordance with procurement requirements, and to validate that the delivered system is, in fact, the certified system purchased.

Access Board

Independent federal agency whose primary mission is accessibility for people with disabilities and a leading source of information on accessible design.

accessibility

Measurable characteristics that indicate the degree to which a system is available to, and usable by, individuals with disabilities. The most common disabilities include those associated with vision, hearing and mobility, as well as cognitive disabilities.

accessible voting station

Voting station equipped for individuals with disabilities.

accreditation

Formal recognition that a laboratory is competent to carry out specific tests or calibrations.

accreditation body

(1) Authoritative body that performs accreditation.

(2) An independent organization responsible for assessing the performance of other organizations against a recognized standard, and for formally confirming the status of those that meet the standard.

accuracy

(1) Extent to which a given measurement agrees with an accepted standard for that measurement.

(2) Loseness of the agreement between the result of a measurement and a true value of the particular quantity subject to measurement. Accuracy is a qualitative concept and is not interchangeable with precision.

accuracy for voting systems

Ability of the system to capture, record, store, consolidate and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data.

active in count

When a Locked for Tabulation election is opened in Verity Count, the state will change to Active in Count for tabulating and determining the winner of the election categories.

adequate security

Security commensurate with the risk and the magnitude of harm resulting from the loss, misuse, unauthorized access to, or modification of, information. This includes ensuring that systems and applications operate effectively and provide appropriate confidentiality, integrity, and availability, through the use of cost-effective management, personnel, operational, and technical controls.

Air Gap

A physical separation that describes how non-certified and certified voting system components relate to each other and manage data. A variety of methods can support a physical "air gap," primarily the absence of any network connection between non-certified and certified components. These air gaps act as a physical firewall for all data and access ensuring integrity and security.

alternative format

The ballot or accompanying information is said to be in an alternative format if it is in a representation other than the standard ballot language and format. Examples include, but are not limited to, languages other than English, Braille, ASCII text, large print, recorded audio.

application

The main process that modules run in.

application audit log

Captures information for activities resulting from using the application or device, such as Verity login or logout, casting votes, poll worker interaction with a device, and inserting or removing vDrives.

The application audit log travels with CRV data and is used to track all of the activities that occur or are attempted on all machines along the voting process path. This log records every activity performed on or by the machine, indicating the event and when it happened.

audio ballot

A ballot in which a set of offices is presented to the voter in spoken, rather than written, form.

audio-tactile interface (ATI)

Voter interface designed to not require visual reading of a ballot. Audio is used to convey information to the voter and sensitive tactile controls allow the voter to communicate ballot selections to the voting system.

audit

Systematic, independent, documented process for obtaining records, statements of fact or other relevant information and assessing them objectively to determine the extent to which specified requirements are fulfilled.

audit trail

Recorded information that allows election officials to review the activities that occurred on the voting equipment to verify or reconstruct the steps followed without compromising the ballot or voter secrecy.

audit trail for direct-recording equipment

Paper printout of votes cast, produced by direct-recording electronic (DRE) voting machines, which election officials may use to crosscheck electronically tabulated totals.

availability

The percentage of time during which a system is operating properly and available for use.

B

ballot

The official presentation of all of the contests to be decided in a particular election. Also, a collection of one or more ballot sheets. See also, application audit log, ballot image, video ballot, electronic voter interface.

ballot configuration

Particular set of contests to appear on the ballot for a particular election district, their order, the list of ballot positions for each contest, and the binding of candidate names to ballot positions

ballot counter

Process in a voting device that counts the votes cast in an election.

ballot counting logic

The software logic that defines the combinations of voter choices that are valid and invalid on a given ballot and that determines how the vote choices are totaled in a given election.

ballot format

The concrete presentation of the contents of a ballot appropriate to the particular voting technology being used. The contents may be rendered using various methods of presentation (visual or audio), language or graphics.

ballot image

Electronically produced record of all votes cast by a single voter. See also cast vote record (CVR).

ballot instructions

Information provided to the voter during the voting session that describes the procedure for executing a ballot. Such material may (but need not) appear directly on the ballot.

ballot measure

(1) A question that appears on the ballot for approval or rejection.

(2) A contest on a ballot where the voter may vote yes or no.

ballot page

A ballot page is a single side of a sheet, and always contains ballot content (we do not number sides marked “This page left intentionally blank”).

ballot position

A specific place in a ballot where a voter's selection for a particular contest may be indicated. Positions may be connected to row and column numbers on the face of a voting machine or ballot, particular bit positions in a binary record of a ballot (for example, an electronic ballot image), the equivalent in some other form. Ballot positions are bound to specific contests and candidate names by the ballot configuration.

ballot preparation

Ballot preparation includes a series of procedures prior to running elections. Select the specific contests and questions to be contained in a ballot format and related instructions. Prepare and test election-specific software containing these selections. Produce all possible ballot formats. Finally, validate the correctness of ballot materials and software containing these selections for an upcoming election.

ballot production

Process of generating ballots for presentation to voters, e.g., printing paper ballots or configuring the ballot presentation on a DRE.

ballot rotation

Process of varying the order of the candidate names within a given contest.

ballot scanner

Device used to read the voter selection data from a paper ballot or ballot card.

ballot sheet

A ballot sheet is a single piece of paper on which one or both sides of the sheet have ballot content.

ballot style

See ballot configuration.

BLM

Ballot Layout Management (BLM) is the Verity Election Office module used to manage data such as ballot content, ballot formats, and ballot style previews.

BMD

Ballot Marking Device (BMD) is an electronic vote-capture device via an electronic voter interface that allows the voter to alter previously made choices without spoiling the ballot. After selections are marked and reviewed, the BMD produces a printed, human-readable paper ballot that reflects the voter's selections. The BMD does capture or retain any cast vote record data.

BPS

The Hart InterCivic Ballot Production Service (BPS) is a fee-based service that provides ballot programming and ballot printing service for customers who use Hart InterCivic voting devices.

C

candidate

Person contending in a contest for office. A candidate may be explicitly presented as one of the choices on the ballot or may be a write-in candidate.

candidate register

Record that reflects the total votes cast for the candidate. This record is augmented as each ballot is cast on a DRE or as digital signals from the conversion of voted paper ballots are logically interpreted and recorded.

canvass

Compilation of election returns and validation of the outcome that forms the basis of the official results by political subdivision.

cast ballot

Ballot that has been deposited by the voter in the ballot box or electronically submitted for tabulation.

cast vote record (CVR)

Permanent record of all votes produced by a single voter whether in electronic, paper or other form. Also referred to as ballot image when used to refer to electronic ballots.

catastrophic system failure

Total loss of function or functions, such as the loss or unrecoverable corruption of voting data or the failure of an on board battery of volatile memory.

central count voting system

A voting system that tabulates ballots from multiple precincts at a central location. Voted ballots are placed into secure storage at the polling place. Stored ballots are transported or transmitted to a central counting place which produces the vote count report.

certification

Procedure by which a third party gives written assurance that a product, process or service conforms to specified requirements. See also state certification and national certification.

certification testing

Testing performed under either national or state certification processes to verify voting system conformance to requirements.

challenged ballot

Ballot provided to an individual who claim they are registered and eligible to vote but whose eligibility or registration status cannot be confirmed when they present themselves to vote. Once voted, such ballots must be kept separate from other ballots and are not included in the tabulation until after the voter's eligibility is confirmed. Michigan is an exception in that they determine voter eligibility before a ballot is issued. See also provisional ballot.

checksum

Value computed from the content of a document or data record. Typically this is the sum of the numeric representations of all the characters in the text. Checksums are used to aid in detecting errors or alterations during transmission or storage.

claim of conformance

Statement by a vendor declaring that a specific product conforms to a particular standard or set of standard profiles. For voting systems, NASED qualification or EAC certification provides independent verification of a claim.

closed primary

Primary election in which voters receive a ballot listing only those candidates running for office in the political party with which the voters are affiliated. In some states, non-partisan contests and ballot issues may be included. In some cases, political parties may allow unaffiliated voters to vote in their party's primary.

commercial off-the-shelf (COTS)

Commercial, readily available hardware devices (such as card readers, printers or personal computers) or software products (such as operating systems, programming language compilers, or database management systems).

Common Industry Format (CIF)

Refers to the format described in ANSI/INCITS 354-2001 "Common Industry Format (CIF) for Usability Test Reports."

component

Element within a larger system; a component can be hardware or software. For hardware, it is a physical part of a subsystem that can be used to compose larger systems (e.g., circuit boards, internal modems, processors, computer memory). For software, it is a module of executable code, that can be moved around as a whole that performs a well-defined function and interacts with other components.

confidentiality

Prevention of unauthorized disclosure of information.

configuration management

Discipline applying technical and administrative direction and surveillance to identify and document functional and physical characteristics of a configuration item, control changes to these characteristics, record and report change processing and implementation status, and verify compliance with specified requirements.

configuration management plan

Document detailing the process for identifying, controlling and managing various released items, such as code, hardware and documentation.

configuration status accounting

An element of configuration management, consisting of the recording and reporting of information needed to manage a configuration effectively. This includes a listing of the approved configuration identification, the status of proposed changes to the configuration, and the implementation status of approved changes.

conformance

Fulfillment of specified requirements by a product, process or service.

conformance testing

Also known as certification testing, this is the process of testing an implementation against the requirements specified in one or more standards. The outcomes of a conformance test are generally a pass or fail result, possibly including reports of problems encountered during the execution.

contest

Decision to be made within an election, which may be a contest for office or a referendum, proposition and/or question. A single ballot may contain one or more contests.

count

Process of totaling votes. See tabulation.

counted ballot

Ballot that has been processed and whose votes are included in the candidates and measures vote totals.

corrective action

Action taken to eliminate the causes of an existing deficiency or other undesirable situation in order to prevent recurrence.

cross filing

Also referred to as cross-party endorsement, this is the endorsement of a single candidate or slate of candidates by more than one political party. The candidate or slate appears on the ballot representing each endorsing political party.

cryptographic key

Value used to control cryptographic operations, such as decryption, encryption, signature generation or signature verification.

cryptography

Discipline that embodies the principles, means, and methods for the transformation of data in order to hide their semantic content, prevent their unauthorized use, prevent their undetected modification and establish their authenticity.

cumulative voting

A method of voting exclusive to multi-member district election (e.g. county board) in which each voter may cast as many votes as there are seats to be filled and may cast two or more of those votes for a single candidate.

CCOS

Central Count Optical Scan (CCOS). Paper ballot scanning system that processes marked paper ballots at a central location. CCOS systems are capable of reading marked ballots and saving cast vote records based on voter marks. Note: "Central Count Optical Scan" is a standard VVSG term that makes no assumptions about the technology used for scanning purposes. More specifically, "optical scan" may include digital scanning technology.

COTS

Commercial-off-the-shelf hardware and software products.

CVR

See *cast vote record*.

D

data accuracy

(1) Data accuracy is defined in terms of ballot position error rate. This rate applies to the voting functions and supporting equipment that capture, record, store, consolidate and report the specific selections, and absence of selections, made by the voter for each ballot position.

(2) The system's ability to process voting data absent internal errors generated by the system. It is distinguished from data integrity, which encompasses errors introduced by an outside source.

data integrity

Invulnerability of the system to accidental intervention or deliberate, fraudulent manipulation that would result in errors in the processing of data. It is distinguished from data accuracy that encompasses internal, system-generated errors.

decertification

Revocation of national or state certification of voting system hardware and software.

decryption

Process of changing encrypted text into plain text.

device

Functional unit that performs its assigned tasks as an integrated whole.

digital signature

An asymmetric key operation where the private key is used to digitally sign an electronic document and the public key is used to verify the signature. Digital signatures provide data authentication and integrity protection.

direct-recording electronic (DRE) voting system

An electronic voting system that utilizes electronic components for the functions of ballot presentation, vote capture, vote recording, and tabulation which are logically and physically integrated into a single unit. A DRE produces a tabulation of the voting data stored in a removable memory component and in printed hard copy.

directly verifiable

Voting system feature that allows the voter to verify at least one representation of his or her ballot with his/her own senses, not using any software or hardware intermediary. Examples include a mark-sense paper ballot and a DRE with a voter verifiable paper record feature.

disability

With respect to an individual, a disability is a physical or mental impairment that substantially limits one or more of the major life activities of such individual, with a record of such an impairment as per the definition from the Americans with Disabilities Act.

dynamic voting system software

Software that changes over time once it is installed on the voting equipment. See also voting system software.

DRE

Direct-Record Electronic. A voting system that records votes by means of a ballot display provided with mechanical or electro-optical components that can be activated by the voter; that processes data by means of a computer program; and that records voting data and ballot images in memory components. A DRE produces a tabulation of the voting data stored in a removable memory component and as printed copy.

E

EAC Election Day

Election Assistance Commission (www.eac.gov)

early voting

Voting conducted before Election Day where the voter completes the ballot in person at a county office or other designated polling place or ballot drop site prior to Election Day.

election

A formal process of selecting a person for public office or of accepting or rejecting a political proposition by voting.

election databases

Data file or set of files that contain geographic information about political subdivisions and boundaries, all contests and questions to be included in an election, and the candidates for each contest.

election definition

Definition of the contests and questions that will appear on the ballot for a specific election.

election district

Contiguous geographic area represented by a public official who is elected by voters residing within the district boundaries. The district may cover an entire state or political subdivision, may be a portion of the state or political subdivision, or may include portions of more than one political subdivision.

election management system (EMS)

Set of processing functions and databases within a voting system that defines, develops and maintains election databases, performs election definitions and setup functions, format ballots, count votes, consolidates and report results, and maintains audit trails

election officials

The people associated with administering and conducting elections, including government personnel and poll workers.

Election Preferences Profile

A profile that retains jurisdiction-specific preferences concerning election rules and settings. The purpose of the profile is to minimize a user's need to keep re-entering data that is applicable to most of the user's elections. Information stored in an election preferences profile typically does not change frequently, and the profile is user-editable.

election programming

Process by which election officials or their designees use voting system software to logically define the ballot for a specific election.

electronic cast vote record

An electronic version of the cast vote record.

electronic voter interface

Subsystem within a voting system which communicates ballot information to a voter in video, audio or other alternative format which allows the voter to select candidates and issues by means of vocalization or physical actions

electronic voting machine

Any system that utilizes an electronic component. Term is generally used to refer to Direct-Record Electronics (DREs). See also voting equipment, voting system.

electronic voting system

An electronic voting system is one or more integrated devices that utilize an electronic component for one or more of the following functions: ballot presentation, vote capture, vote recording, and tabulation. A DRE is a functionally and physically integrated electronic voting system which provides all four functions electronically in a single device. An optical scan (also known as mark-sense) system where the voter marks a paper ballot with a marking instrument and then deposits the ballot in a tabulation device is partially electronic in that the paper ballot provides the presentation, vote capture and vote recording functions. An optical scan system employing a ballot marking device adds a second electronic component for ballot presentation and vote capture functions.

encryption

Process of obscuring information by changing plain text into ciphertext for the purpose of security or privacy. See also cryptography and decryption.

error correcting code

Coding system that allows data being read or transmitted to be checked for errors and, when detected, corrects those errors.

EAC

Election Assistance Commission (EAC). Federal agency created by HAVA chartered with, among other things, overseeing the testing and certification of voting systems.

EDM

Election Data Management (EDM). Verity Election Office module used to manage data such as election types, contest information, voting logic, audio recordings, and multi-language data.

Election Preferences Profile

A profile that retains jurisdiction-specific preferences concerning election rules and settings. The purpose of the profile is to minimize a user's need to keep re-entering data that is applicable to most of the user's elections. Information stored in an election preferences profile typically does not change frequently, and the profile is user-editable.

EMS

Election management system (EMS). Appendix A – Glossary of VVSG 1.1 defines an election management system as "[a] set of processing functions and databases within a voting system that defines, develops and maintains election databases, performs election definitions and setup functions, format ballots, count votes, consolidates and report results, and maintains audit trails."

F

Federal Information Processing Standards

Standards for federal computer systems developed by NIST. These standards are developed when there are no existing industry standards to address federal requirements for system interoperability, portability of data and software, and computer security.

firmware

Computer programming stored in programmable read-only memory thus becoming a permanent part of the computing device. It is created and tested like software.

Functional Configuration Audit (FCA)

Exhaustive verification of every system function and combination of functions cited in the vendor's documentation. The FCA verifies the accuracy and completeness of the system's Voter Manual, Operations Procedures, Maintenance Procedures, and Diagnostic Testing Procedures.

functional test

Test performed to verify or validate the accomplishment of a function or a series of functions.

G

general election

Election in which voters, regardless of party affiliation, are permitted to select candidates to fill public office and vote on ballot issues.

guidelines

See product standard.

GUI

Graphic User Interface (GUI). The human-computer interface in software applications.

H

hash

Algorithm that maps a bit string of arbitrary length to a fixed-length bit string.

hash function

A function that maps a bit string of arbitrary length to a fixed length bit string. Approved hash functions satisfy the following properties:

1. (One-way) It is computationally infeasible to find any input that maps to any prespecified output.

2. (Collision resistant) It is computationally infeasible to find any two distinct inputs that map to the same.

I

indirectly verifiable

Voting system feature that allows a voter to verify his or her selections via a hardware or software intermediary. An example is a touch screen DRE where the voter verifies the ballot selections through the assistance of audio stimuli.

implementation statement

Also known as implementation conformance statement, this is the statement by a vendor indicating the capabilities, features, and optional functions as well as extensions that have been implemented.

Independent Testing Authority (ITA)

Replaced by "accredited testing laboratories" and "test labs." Prior usage referred to independent testing organizations accredited by the National Association of State Election Directors (NASED) to perform voting system qualification testing.

information security

Protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide integrity, confidentiality, and availability.

inspection

Examination of a product design, product, process or installation and determination of its conformity with specific requirements or, on the basis of professional judgment, with general requirements. Inspection of a process may include inspection of staffing, facilities, technology and methodology.

integrity

Guarding against improper information modification or destruction, and ensuring information non-repudiation and authenticity.

J

JDM

Jurisdiction Data Management. Verity Election Office module used to associate politically significant geographic units with specific variable data. For Verity 1.0, JDM requirements are not defined, as any jurisdiction information relevant to a specific election will be managed through EDM.

K

key management

Activities involving the handling of cryptographic keys and other related security parameters (e.g., passwords) during the entire life cycle of the keys, including their generation, storage, establishment, entry and output, and zeroization.

L

logic and accuracy testing

Testing of the tabulator setups of a new election definition to ensure that the content correctly reflects the election being held (i.e., contests, candidates, number to be elected, ballot styles) and that all voting positions can be voted for the maximum number of eligible candidates and that results are accurately tabulated and reported.

logical correctness

Condition signifying that, for a given input, a computer program will satisfy the program specification and produce the required output.

M

mark-sense

System by which votes are recorded by means of marks made in voting response fields designated on one or both faces of a ballot card or series of cards. Mark-sense systems may use an optical scanner or similar sensor to read the ballots. Also known as optical scan.

measure register

Record that reflects the total votes cast for and against a specific ballot issue. This record is augmented as each ballot is cast on a DRE or as digital signals from the conversion of voted paper ballots are logically interpreted and recorded.

mechanical lever voting machine

Machine that directly records a voter's choices via mechanical lever-actuated controls into a counting mechanism that tallies the votes without using a physical ballot.

module

A module is a bounded, self-contained, complete set of user defined functionality and is likely to be involved multiple layers of the architecture.

multi-seat contest

Contest in which multiple candidates can run, up to a specified number of seats. Voters may vote for no more than the specified number of candidates.

MRD

Market Requirements Document (MRD) articulating the market opportunity, requirements, business justification for pursuing it and the required solution to exploit it.

N

NASED

National Association of State Election Directors, (www.nased.org)

national certification testing

Examination and testing of a voting system to determine if the system complies with the performance and other requirements of the national certification standards and with its own specifications.

national certification test report

Report of results of independent testing of a voting system by an accredited test lab delivered to the EAC with a recommendation regarding granting a certification number.

NIST

National Institute of Standards and Technology (NIST)

non-partisan office

Elected office for which candidates run without political party affiliation.

nonvolatile memory

Memory in which information can be stored indefinitely with no power applied. ROMs and PROMs are examples of nonvolatile memory.

NVLAP

The National Voluntary Laboratory Accreditation Program (NVLAP) operated by NIST.

O

open primary

Primary election in which any voters can participate, regardless of their political affiliation. Some states require voters to publicly declare their choice of party ballot at the polling place, after which the poll worker provides or activates the appropriate ballot. Other states allow the voters to make their choice of party ballot within the privacy of the voting booth.

operational environment

All software, hardware (including facilities, furnishings and fixtures), materials, documentation, and the interface used by the election personnel, maintenance operator, poll worker, and voter, required for voting equipment operations.

optical scan, optical scan system

System by which votes are recorded by means of marks made in voting response fields designated on one or both faces of a ballot card or series of cards. An optical scan system reads and tabulates ballots, usually paper ballots, by scanning the ballot and interpreting the contents. Also known as mark-sense.

overvote

An overvote is an abundance of vote options over the allowed limit for the race, such as voting for two candidates in the same race. This amount is used with undervotes to determine the accuracy of voting.

P

paper-based voting system

Voting system that records votes, counts votes, and tabulates the vote count, using one or more ballot cards or paper ballots.

paper record

Paper cast vote record that can be directly verified by a voter. See also ballot image, cast vote record.

partisan office

An elected office for which candidates run as representatives of a political party.

personal assistive device

A device that is carried or worn by an individual with some physical impairment whose primary purpose is to help compensate for that impairment.

Physical Configuration Audit (PCA)

Inspection by an accredited test laboratory that compares the voting system components submitted for certification testing to the vendor's technical documentation and confirms that the documentation submitted meets the national certification requirements. Includes witnessing of the build of the executable system to ensure that the certified release is built from the tested components.

political subdivision

Any unit of government, such as counties and cities, school districts, and water and conservation districts having authority to hold elections for public offices or on ballot issues.

polling location

Physical address of a polling place.

polling place

Facility to which voters are assigned to cast in-person ballots.

precinct

Election administration division corresponding to a contiguous geographic area that is the basis for determining which contests and issues the voters legally residing in that area are eligible to vote on.

precinct count

Counting of ballots in the same precinct in which those ballots have been cast.

precinct count voting system

A voting system that tabulates ballots at the polling place. These systems typically tabulate ballots as they are cast and print the results after the close of polling. For DREs, and for some paper-based systems, these systems provide electronic storage of the vote count and may transmit results to a central location over public telecommunication networks.

precinct split

Some entities represented on the ballot do not follow precinct boundaries when determining voter eligibility. For example, half of a precinct could lay in School District A and the other half in School District B. In this case, the precinct must be split to accommodate the need to deliver different ballots to voters in each half of the precinct. In jurisdictions with multiple overlapping election entities, a precinct may need to be split multiple times.

precision

(1) Extent to which a given set of measurements of the same sample agree with their mean. Thus, precision is commonly taken to be the standard deviation estimated from sets of duplicate measurements made under conditions of repeatability, that is, independent test results obtained with the same method on identical test material, in the same laboratory or test facility, by the same operator using the same equipment within short intervals of time.

(2) Degree of refinement in measurement or specification, especially as represented by the number of digits given.

primary election

Election held to determine which candidate will represent a political party for a given office in the general election. Some states have an open primary, while others have a closed primary. Sometimes elections for nonpartisan offices and ballot issues are held during primary elections.

primary presidential delegation nomination

Primary election in which voters choose the delegates to the presidential nominating conventions allotted to their states by the national party committees.

privacy

The ability to prevent others from determining how an individual voted.

private key

The secret part of an asymmetric key pair that is typically used to digitally sign or decrypt data.

product standard

Standard that specifies requirements to be fulfilled by a product or a group of products, to establish its fitness for purpose.

provisional ballot

Ballot provided to individuals who claim they are registered and eligible to vote but whose eligibility or registration status cannot be confirmed when they present themselves to vote. Once voted, such ballots must be kept separate from other ballots and are not included in the tabulation until after the voter's eligibility is confirmed. In some jurisdictions called an affidavit ballot. See also challenged ballot.

public key

Public part of an asymmetric key pair that is typically used to verify digital signatures or encrypt data.

public network direct-recording electronic (DRE) voting system

A DRE that transmits vote counts to a central location over a public telecommunication network.

PPM

Polling Place Data Management. Verity Election Office module used to manage data such as polling place names polling place facility information. For Verity 1.0, PPM requirements are not defined, as any polling-place information relevant to a specific election will be managed through EDM. In future versions of Verity, PPM may manage data that is not election specific, such as facility information, poll workers associated with polling places, and so forth.

PRD

Product Requirements Document (this document) follows an MRD and specifies use cases, functional and non-functional requirements for a system component.

Q

qualification number

A number issued by NASED (National Association of State Election Directors) to a system that has been tested by an accredited Independent Testing Authority for compliance with the voting system standards. Issuance of a qualification number indicates that the system conforms to the national standards.

qualification test report

Report of results of independent testing of a voting system by an Independent Test Authority documenting the specific system configuration tested, the scope of tests conducted and when testing was completed.

qualification testing

Examination and testing of a voting system by a NASED-accredited Independent Test Authority to determine if the system conforms to the performance and other requirements of the national certification standards and the vendor's own specifications.

R

ranked order voting

Practice that allows voters to rank candidates in a contest in order of choice 1, 2, 3 and so on. A candidate receiving a majority of the first choice votes wins that election. If no candidate receives a majority, the last place candidate is deleted, and all ballots are counted again, with each ballot cast for the deleted candidate applied to the next choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote. The practice is also known as instant runoff voting, preferences or preferential voting, or choice voting.

recall issue with options

Process that allows voters to remove elected representatives from office prior to the expiration of their terms of office. The recall may involve not only the question of whether a particular officer should be removed, but also the question of naming a successor in the event that there is an affirmative vote for the recall.

recertification

Re-examination, and possibly retesting of a voting system that was modified subsequent to receiving national and/or state certification. The object of is to determine if the system as modified still conforms to the requirements.

recount

Retabulation of the votes cast in an election.

referendum

Process whereby a state law or constitutional amendment may be referred to the voters before it goes into effect.

reproducibility

Ability to obtain the same test results by using the same test method on identical test items in different testing laboratories with different operators using different equipment.

requirement

Provision that conveys criteria to be fulfilled.

residual vote

Total number of votes that cannot be counted for a specific contest. There may be multiple reasons for residual votes (such as declining to vote for the contest, overvoting in a contest).

risk assessment

The process of identifying the risks to system security and determining the probability of occurrence, the resulting impact, and safeguards that would mitigate this impact.

runoff election

Election to select a winner following a primary or a general election, in which no candidate in the contest received the required minimum percentage of the votes cast. The two candidates receiving the most votes for the contest in question proceed to the runoff election.

S

secure receptacle

The container for storing VVPAT paper audit records.

security analysis

An inquiry into the potential existence of security flaws in a voting system. Includes an analysis of the system's software, firmware, and hardware, as well as the procedures associated with system development, deployment, operation and management.

security controls

Management, operational, and technical controls (such as safeguards or countermeasures) prescribed for an information system to protect the confidentiality, integrity, and availability of the system and its information.

semi-static voting system software

Software that may change in response to the voting equipment on which it is installed or to election-specific programming.

Smart clients

Smart clients are easily deployed and managed client applications that provide an adaptive, responsive and rich interactive experience by leveraging local resources and intelligently connecting to distributed data sources.

split precinct

A precinct that contains an election district subdivision, e.g., a water district or school board district, requiring an additional ballot configuration spoiled ballot.

Software Independent System

A voting system in which independent verification is facilitated by producing multiple records of ballot selections that can be audited to a high level of precision. At least two records of voter selections are produced with one stored such that it cannot be modified by the voting system and where the verification process for each is independent of the other and at least one of the records is verified directly by the voter.

staged election acceptance

Selectively accepting only certain portions of an election data set

state certification

State examination and possibly testing of a voting system to determine its compliance with state requirements for voting systems.

static voting system software

Software that does not change based on the election being conducted or the voting equipment upon which it is installed such as executable code for straight party voting.

symmetric (secret) encryption algorithm

Encryption algorithms using the same secret key for encryption and decryption.

system audit log

Captures system-specific information, such as operating system login or logout and operating system alerts, faults, and failures (i.e., running on battery).

T

tabulation

Process of totaling votes. See also count.

t-coil

Inductive coil used in some hearing aids to allow reception of an audio band magnetic field signal, instead of an acoustic signal. The magnetic or inductive mode of reception is commonly used in conjunction with telephones, auditorium loop systems and other systems that provide the required magnetic field output.

tabulator

Device that counts votes.

technical data package

Vendor documentation relating to the voting system required to be submitted with the system as a precondition of certification testing.

telecommunications

Transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

test

Technical operation that consists of the determination of one or more characteristics of a given product, process or service according to a specified procedure.

test campaign

Sum of the work by a voting system test lab on a single product or system from contract through test plan, conduct of testing for each requirement (including hardware, software, and systems), reporting, archiving, and responding to issues afterwards.

testing standard

Standard that is concerned with test methods, sometimes supplemented with other provisions related to testing, such as sampling, use of statistical methods or sequence of tests.

test method

Specified technical procedure for performing a test.

test plan

Document created prior to testing that outlines the scope and nature of testing, items to be tested, test approach, resources needed to perform testing, test tasks, risks and schedule.

touch screen voting machine

A voting machine that utilizes a computer screen to display the ballot and allows the voter to indicate his or her selections by touching designated locations on the screen.

U

undervote

Occurs when the number of choices selected by a voter in a contest is less than the maximum number allowed for that contest or when no selection is made for a single choice contest. This amount is used with overvotes to determine the accuracy of voting.

usability

Effectiveness, efficiency and satisfaction with which a specified set of users can achieve a specified set of tasks in a particular environment. Usability in the context of voting refers to voters being able to cast valid votes as they intended quickly, without errors, and with confidence that their ballot choices were recorded correctly. It also refers to the usability of the setup and operation in the polling place of voting equipment.

usability testing

Encompasses a range of methods that examine how users in the target audience actually interact with a system, in contrast to analytic techniques such as usability inspection.

V

valid vote

Vote from a ballot or ballot image that is legally acceptable according to state law

validation

Process of evaluating a system or component during or at the end of the development process to determine whether it satisfies specified requirements verification

Verity Access

Verity's Audio-Tactile Interface device.

Verity Ballot

Verity polling place ballot on demand device. Ballot provides an interface for preparing ballots for use, including configurations, internationalization, recording audio for disabilities and exporting ballots.

Verity Build

Verity ballot production software. Build allows you to review and proof elections, create ballots and generate media for running the elections.

Verity Central

Verity vote resolution software. Central processes high volumes of paper ballot scanning to compile and send to Verity Count for tabulation and results. These results can be

Verity Controller

Verity's polling place controlling device that provide election officials to control a daisy-chained configuration.

Verity Count

Verity vote tabulation software. Count receives, reads, aggregates and reports on election results. The system analyzes results, providing deeper details based on specified options such as the types of votes and elections.

Verity Key

Verity election crypto module.

Verity Relay

Verity election data transmission software. Relay provides remote transmission of election results through a series of sending stations connected to a receiving station. All collected results are delivered to Verity Count for faster submission and tabulation.

Verity Scan

Verity polling place scanning device. These devices scan physical printed and marked ballots for collecting and tabulating votes.

Verity Touch

Verity polling place direct recording electronics (DRE) device.

Verity Touch Writer

Verity polling place ballot marking device, with print capabilities for paper ballots.

Verity vDrive

Electronic media for transferring election definitions, election data, and cast vote records; provides an method to transfer information over an air gap between systems.

video ballot

Electronic voter interface which presents ballot information and voting instructions as video images. See also ballot.

vote for N of M

A ballot choice in which voters are allowed to vote for a specified number ("N") of candidates in a multi-seat ("M") contest.

voted ballot

Ballot that contains all of a voter's selections and has been cast.

voter verifiable

A voting system feature that provides the voter an opportunity to verify that his or her ballot selections are being recorded correctly, before the ballot is cast.

voter verifiable audit record

Human-readable printed record of all of a voter’s selections presented to the voter to view and check for accuracy.

voting equipment

All devices, including the voting machine, used to display the ballot, accept voter selections, record voter selections, and tabulate the votes.

voting machine

The mechanical, electromechanical and electric components of a voting system that the voter uses to view the ballot, indicate their selections, verify their selections. In some instances, the voting machine also casts and tabulates the votes. See voting equipment.

voting officials

Term used to designate the group of people associated with elections, including election personnel, poll workers, ballot designers and those responsible for the installation, operation and maintenance of the voting systems.

voting position

Specific response field on a ballot where the voter indicates the selection of a candidate or ballot proposition response.

voting station

The location within a polling place where voters may record their votes. A voting station includes the area, location, booth or enclosure where voting takes place as well as the voting machine. See voting machine.

voting system

The total combination of mechanical, electromechanical or electronic equipment (including the software, firmware, and documentation required to program, control, and support the equipment) that is used to define ballots, cast and count votes, report or display election results; and to maintain and produce any audit trail information; and the practices and associated documentation used to identify system components and versions of such components; to test the system during its development and maintenance; to maintain records of system errors and defects; to determine specific system changes to be made to a system after the initial qualification of the system; and to make available any materials to the voter (such as notices, instructions, forms or paper ballots).

voting system software

All the executable code and associated configuration files needed for the proper operation of the voting system. This includes third party software such as operating systems, drivers, and database management tools. See also dynamic voting system software, semi-static voting system software, and static voting system software.

voting system testing
Examination and testing of a computerized voting system by using test methods to determine if the system complies with the requirements in the Voluntary Voting System Guidelines and with its own specifications.

voting system test laboratory

Test laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to be competent to test voting systems. When NVLAP has completed its evaluation of a test lab, the Director of NIST will forward a recommendation to the EAC for the completion of the accreditation process.

VSTL

Voting System Test Laboratory. Independent non-federal test laboratory accredited by the Election Assistance Commission and qualified to test voting systems to approved voting system standards.

VVPAT

Voter-Verifiable Paper Audit Trail. Human-readable printed record of all voter selections presented to the voter to review and check for accuracy.

VVSG

Voluntary Voting System Guidelines. Standards created by the National Institute of Science and Technology and used by the EAC to test and certify voting systems.

W

write-in voting

To make a selection of an individual not listed on the ballot. In some jurisdictions, voters may do this by using a marking device to physically write their choice on the ballot or they may use a keypad, touch screen or other electronic means to enter the name.

WYSIWYG

What You See Is What You Get. Term used to describe a visual method of rendering ballot styles, to see an accurate representation of how ballots are laid out. As used in Verity PRDs, WYSIWYG refers to rendering only, and not to edit functions.

Index

R

S

T

U

V


HART
intercivic™